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UNDERSTANDING PUBLIC PERCEPTION OF NANOMATERIALS AND THEIR SAFETY IN THE EU

Final report

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Disclaimer

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Abstract

Although nanotechnology is considered to be a key enabling technology and manufactured nanomaterials are an integral part of our everyday lives, there are concerns on the safety of some of the established and newer applications of traditional and more advanced nanomaterials. Therefore, the need to examine how nanomaterials are perceived by the public is important. This study investigates the public perception of manufactured nanomaterials as a group, and their use in different consumer products together with shopping habits, trust in authorities, preferred information sources and labelling requirements among the general population in five European countries – Austria, Bulgaria, Finland, France and Poland.

The data was collected using the Computer-Assisted Web Interviewing (CAWI) methodology survey in February 2020. The survey questionnaire was drafted based on a literature search concerning the perception of nanomaterials or nanotechnologies as reflected in published literature. This desk research also provides hypotheses which are further analysed in the study together with trends over time, regional differences, socio-demographic factors, and cognitive drivers affecting the public perception of nanomaterials.

Executive summary

Many products containing manufactured nanomaterials, such as car tyres, cosmetics, textiles and food packaging, have become an integral part of our everyday lives. Numerous studies were conducted over the past two decades on the public's perception of the risks and benefits of the use of nanomaterials and despite the widespread use of nanomaterials in consumer products, the level of awareness of the public about their applications and associated potential risks, benefits and the safe use of nanomaterials remains low. However, together with increasing and changing consumer uses and applications, measuring changes in the public's perception remains topical. How does the public actually perceive nanomaterials, if at all? Are they perceived as hazardous, or safe, or neither? When consumers consider purchasing a product that contains nanomaterials, are they more or less likely to buy the product, or are they indifferent? And how do these attitudes concerning perceived risks of nanomaterials differ across different socio-demographic groups of the European population?

This study aims to examine these questions and to provide insight into the public perception of risks associated with nanomaterials. Its aim is to give an updated measurement of public perception and to analyse key trends and how they have developed in the last decade. The results aim to support authorities and regulators in improving the available information on nanomaterials and the overall communication of that information to enable consumers to better understand how nanomaterials and nanotechnology are used in different products and what the public consider as important information to better understand their benefits and risks.

Methodology

A literature study was carried out to analyse the outcomes of previous research. 1,480 potentially relevant publications were retrieved and systematically screened. The inclusion criteria taking into account the study design, population and geography resulted in the total number of 402 publications regarded as relevant and used for data extraction. Through a systematic meta-analysis of these studies, a matrix of collected evidence was compiled, summarising how each of the identified relevant studies addresses different research questions. This allowed subsequent analysis of trends and comparison of similarities and/or differences in perceptions based on different socio-demographic variables.

Based on this analysis of previous research results, main trends, outcomes and gaps were identified and described. Identified key questions, as well as gaps, were considered in developing a questionnaire to explore the current situation regarding public perception of manufactured nanomaterials in the EU. The final questionnaire aimed to investigate the public perception of the risks and benefits associated with the use of nanomaterials as well as to validate the awareness and knowledge of respondents.

Five target countries were selected based on:

- Size
- Year of accession to the EU
- Population
- GDP per capita
- Turnout in the elections to the European Parliament in 2019
- Existence (or non-existence) of a national inventory of nanomaterials or products containing nanomaterials
- Research and development spendings by GDP
- Share of filed patents related to nanotechnology
- Share of primary/secondary/tertiary sectors in the economy
- Expenditure on pharmaceuticals per capita
- Gross fixed capital formation in the health care sector as a share of GDP
- Other indicators such as freedom of press, tendency to trust EU authorities and satisfaction with life

Based on these criteria and expert judgement, the survey was carried out in Austria, Bulgaria, Finland, France and Poland as a representative sample of EU countries. A representative sample of 1,000 respondents in each country was selected and recruited through National Managed Access Panels. Computer-Assisted Web Interviewing (CAWI) methodology was used to collect 5,000 responses in the target countries between 3 February 2020 and 17 February 2020.

General awareness of nanomaterials/nanotechnology

Despite manufactured nanomaterials being a common part of our everyday lives through various products (foodstuffs, chemicals, textiles and apparel or electronics to name just a few), general awareness about the nature, characteristics and properties of manufactured nanomaterials is very low. However, the level of awareness has clearly increased over time and is projected to continue to do so. This result is derived by comparing the results from Eurobarometer 63.1 (Papacostas 2006), Eurobarometer 73.1 (Anonymous 2013) and the present study. As the methodologies of the surveys are similar, it is possible to compare the level of awareness of nanomaterials/nanotechnology in Europe and individual European countries in 2005, 2010 and 2020.

The prompted answers on uses of nanomaterials indicate that the public is aware (or can logically deduce) the wide use and various applications of nanomaterials, but there is very limited understanding of how the use of nanomaterials brings benefit to different technologies and products, and ultimately to the users and consumers of these products. When provided with particular examples, respondents mostly linked the use of nanomaterials with electronics, surface treatment, cosmetics, and textiles.

Shopping habits and behaviour related to products containing nanomaterials

As the population becomes more aware that human health also reflects, to an extent, lifestyle choices and as the public shows a growing interest in environmental issues, consumers become more cautious when buying goods. They are more interested in knowing the origins and content of the products they buy as they can impact their health and the environment. When buying a product for the first time, more than half of the respondents claim to read information about its contents and safety information.

A growing interest in a healthy lifestyle is confirmed by the majority of respondents willing to pay a higher price for a safer product. Respondents indicated their willingness to pay 1-20% more for a product that is guaranteed to be safer.

If consumers were presented with clear information that a product contains nanomaterials, the majority would take a cautious stand of either not buying such a product, or deciding based on the category of the product (less concern was observed with electronics, car equipment, electrical appliances etc., more with food, food packagings, medicines and cosmetics). However, this attitude is clearly linked to the level of respondents' knowledge about nanomaterials. The lower the level of knowledge, the less likely the respondent is to buy a product containing nanomaterials or utilising nanotechnologies. The public is most cautious when buying a product where direct exposure is likely or inevitable (e.g. food or cosmetics).

General risk perception

The respondents generally perceive health risks as an important issue for their lives. At least on a declarative level, the majority of the population is quite vigilant. Only a small minority of respondents indicated that they are not interested in health risks.

When asked about their perception of modern technologies and other potentially concerning areas regarding human health and the environment and presented with examples, two-thirds of the respondents were concerned about the impact of using asbestos, accumulation of plastic

waste, global warming, use of pesticides and GMOs. Less than one-quarter of the respondents were concerned about the impact of modern technologies such as computers, mobile phones, electronics or social networks on human life.

Compared to other modern trends and technologies, the impact of nanomaterials on human health does not raise significant concerns in the public mind. Approximately one-quarter of the respondents in the presented survey were worried about the possible impact of nanomaterials on their life (comparable with those concerned about computer use, social networks and electronics). Around the same number of respondents do not have a distinct opinion, which seems to be associated with the lack of knowledge about the topic.

Risk perception related to nanomaterials

The desk research carried out within the presented study concluded that public perception of risks and benefits associated with nanomaterials is highly variable, depending on the applications and types of products in which nanomaterials are used. Although not explicitly discussed or studied in detail in most studies, the perception of risks and benefits seems to be associated with the level of expected exposure to nanomaterials arising from different uses and/or groups of products (e.g. food contact materials or cosmetic products, such as sunscreens, raise higher concerns in most studies than products where lower/none or indirect exposure to nanomaterials is expected, e.g. computers).

The presented study (both the desk research as well as the online survey) indicates that the perception of risks is directly linked to the level of awareness and knowledge about nanomaterials. Nearly half of the respondents could not decide when asked about their perception of the level of safety of using products containing nanomaterials. A higher level of concern is declared only by one-fifth of the respondents, mostly people over 50 years of age.

The level of concern increases when referring to direct exposure to nanomaterials – two-thirds of the respondents are concerned about getting into direct contact with nanomaterials. In this regard, dermal exposure is perceived as most likely. Their concerns are mainly associated with what they perceive as yet to be discovered impacts and properties of nanomaterials and limited means to avoid exposure. However, respondents also tend to think that negative impacts can be avoided or prevented by proper use and treatment of nanomaterials.

The survey results confirmed the hypothesis that the higher the knowledge about nanomaterials, the higher the certainty of a respondent that nanomaterials can be used in a safer or equally safe way when compared with traditional products. This correlation indicates the need to better inform the public about nanomaterials as a common part of everyday life.

Possible drivers in the perception of risks and benefits of nanomaterials/nanotechnology

People of over 50 years of age, respondents with a lower level of education and respondents who claim that religion plays an important role in their lives are more concerned about the risks that may arise from the use of nanotechnologies and nanomaterials. The same concern about risks is also more often demonstrated by women.

Some studies conclude that the perception of risks and benefits by the public is driven predominantly by cognitive factors rather than other factors, e.g. psycho-social or socio-demographic. In other words, people who tend to be cautious and reserved to adopting new technologies and are concerned about potential risks associated with innovations that significantly alter how consumers, industries, or businesses operate (i.e. disruptive technologies) are more likely to be concerned about the presence of nanomaterials in products.

Attitudes related to nanomaterials

According to the findings, standpoints towards the areas of applications of nanomaterials vary. The respondents take a positive or neutral stand regarding their expectations about new possibilities and positive impacts of nanotechnologies on everyday lives. Usually, the respondents tend to agree with nanomaterials being used for strengthening rubber tyres, more efficient treatment of wastewater or in cars and electronics. However, they are more cautious when it comes to direct contact with nanomaterials, e.g. in food technologies – for example, to reduce salt content in foods, enrich foods with vitamins and other nutrients.

This variability in answers leads to segmentation of the population into four groups. The most unambiguous group are people with a very positive attitude towards nanomaterials (called „Enthusiasts" throughout this report). This group represents 19% of the population, most frequently people of 40 - 49 years of age, inhabitants of big cities with higher education (university level).

A relatively similar attitude can be observed within the most populated group (46% of respondents) characterised by an open, tolerating attitude towards nanomaterials (segment name – Tolerating). A typical representative of this group is a person younger than 29 years, student, or a person with university-level education.

The third group differs significantly from the previous ones – it represents nanomaterial rejectors (segment name – Fearing). This group is represented mostly by people above 50 years of age, with lower than university-level education, females more often than males and comprises 23% of the studied population.

The fourth group, represented by 12% of the population, does not have a clear attitude towards nanomaterials, their uses, characteristics and impacts (segment name – No opinion). Demographically, this segment is similar to the Fearing, with the only difference being age (30-39 years).

Information sources

More than half of the respondents claimed that they feel equally informed about nanomaterials compared to other modern technologies. The primary sources where respondents encountered information about nanomaterials are TV and the Internet. When looking for information actively, the Internet is the main source of information for the highest number (almost half) of the respondents. Only one in five respondents claims awareness of any specific websites or databases with centralised information about nanomaterials or products containing them.

Trust in authorities

The most preferred institutions/persons with regards to information about nanomaterials are scientists/researchers (universities, research institutes, etc.), national health and occupational health and safety authorities, but also EU authorities (e.g. European Commission, European Chemicals Agency).

EU authorities are the third most preferred source of information about the safety of nanomaterials by the respondents. 14% of respondents place "absolute trust" in them and half of the respondents place "a bit of trust" in them, comparable to the trustworthiness given to consumer and environmental organisations and pharmacists. However, the difference between the trustworthiness of the individual sources of information is not significant.

The general public tends to put the least trust in politicians and producers or distributors of the products containing nanomaterials as sources of information about nanomaterials.

Labelling of products containing nanomaterials

87% of respondents think that they should be informed when buying a product containing

nanomaterials, for example on a label or packaging. The most significant need for labelling products containing nanomaterials is stated to be for food and food-related products, medicines, cosmetics, clothing/textiles, toys and detergents or household products.

The general requirement is usually a warning against possible negative impacts and risks or just general information about nanomaterial content. However, this study was not aiming at exploring what kind of information should be presented on labels and in what form as it would significantly extend the survey questionnaire and would require a completely new set of questions and case studies to be explored.

Recommendations

The awareness of nanomaterials in Europe should be increased to ensure that the public is able to make informed choices about products containing nanomaterials, including their benefits and risks. A clear communication strategy plays a key role in informing about the risks and benefits of nanomaterials use.

The communication strategy should include three phases in the following order:

1. Awareness-raising
2. Communication of benefits
3. Safety level information

Phase 1 aims to inform the public about the existence of nanomaterials and nanotechnology as a common part of daily life and to clearly communicate about the distinction between different nanomaterials as they can have very different properties, benefits and risks, as is the case with all chemicals.

It is necessary to raise awareness about nanomaterials with claims and facts that are comprehensible and close to the interests of the general public, using common layman language e.g. a claim that the public will associate with the term nanomaterials. An example of such a claim could be "Nanomaterial x is a common part of daily life" or "Nanotechnology is crucial for progress". It is also key to ensure granularity in communicating about nanomaterials and to clearly communicate that some nanomaterials are safe and others are not and why this is the case (i.e. how they are regulated and what the scientific data shows).

The communication channels for this phase should be as broadly followed by the public as possible – the most visited portals on the Internet, TV, newspapers, magazines, schools (all levels), well-structured website as a primary source of information (e.g. www.nanomaterials.com).

Phase 2 should explain why and how nanomaterials use can be beneficial for society. The examples must be specific, available to the public and easy to understand. In addition to the communication channels listed for Phase 1, it is key for this phase that the producers of products containing nanomaterials or being treated by nanotechnology clearly state the benefits that the nanomaterials in their products bring, for example on the product labels and during marketing communication.

Regarding safety level information (Phase 3), three main areas of products and applications were identified based on potential for exposure:

1. Manufacture of computers, cars, spacecraft, other industrial applications – areas with uses of nanomaterials in components of products that the public is not directly exposed to
2. Clothes and apparel, accessories, household products, detergents, food packaging, toys etc. – areas of products that are a common part of the public's lives and can come into direct contact with their skin
3. Food, foodstuffs, cosmetics, medicines – products that are directly ingested or can cause exposure through inhalation

For the first group of products/applications, it does not seem efficient to communicate the potential risks/safety information as there is no exposure, they are the most distant from the public's everyday life and based on the study findings, the categories that the public seem to be least concerned about in terms of their safety. For the second group, safety information should be communicated in cases where any adverse effects on human health/environment are known. The products belonging to the third group should be clearly labelled and informing about the content of nanomaterials, their possible impacts on human health, safe use information etc.

The authors of this report recommend continuing and broadening the study in the following areas:

1) Current pandemic situation (COVID19) and how it has affected the public perception of nanomaterials, for example due to increased applications in medical devices such as products impregnated with antimicrobial nanomaterials
2) Use of specific research methods to allow detailed study of nanomaterials risk perception (concepts testing, qualitative techniques etc.)
3) A detailed study focused on the broad topic of labelling products containing nanomaterials
4) A study on the public's perception of a representative group of combinations of nanomaterials and their applications such as carbon nanotubes in golf clubs, silica in car tyres or ZnO in sunscreen
5) Researching the whole EU27 to allow detailed study of regional differences
6) Workshops/focus groups on developing a detailed communication strategy for the public

1. Methodology

1.1 Primary Literature Review

Methodology

As the first step, reports and publications from previous research on the perception of nanomaterials were collected. The aim of this task was two-fold:

1. To analyse the outcomes of previous research, identify main observations and issues with the public perception of nanomaterials.

2. To provide the basis for the development of the survey questionnaire which will be used in the project – identify questions which can/should be re-used in the current survey, derive new/related questions and especially identify gaps which have not yet been addressed by existing research.

The collection and analysis of existing research reports and publications was carried out through systematic desk research.

Systematic desk research and collection of previous research reports and publications

The starting point for collecting published reports and publications from previous research related to public perception of nanomaterials were the following:

- Gaskell, G., et al. (2004). "Public attitudes to nanotechnology in Europe and the United States." Nature Materials 3: 496.
- Peter D. Hart Research Associates, I. (2008). "Awareness of and attitudes toward nanotechnology and synthetic biology."
- Zimmer, R. (2008). "Public perceptions about nanotechnology – Representative survey and basic morphological-psychological study." 113.
- (2012). "The Harris Poll."
- Grobe, A. and M. E. Rissanen (2012). "Nanotechnologies in agriculture and food - An overview of different fields of application, risk assessment and public perception." Recent Patents on Food, Nutrition and Agriculture 4(3): 176-186.
- Correia Carreira, G. (2016). "Nanoview – Influencing factors on the perception of nanotechnology and target group-specific risk communication strategies." 162.

As some of these publications include reviews of other studies carried out in the field, citation pearl growing search strategy was used to identify other potentially relevant studies for further analysis – i.e. papers referenced in these publications were also screened and considered for further analysis. The desk research then continued with systematic searches for potentially relevant publications in Web of Science[1] and SCOPUS[2]. The searches were aimed at retrieving scientific as well as grey literature related to one of the following areas:

- Public or consumer perception of nanomaterials and nanotechnologies (either in general or in relation to specific groups of products, e.g. foods)

- Scientific communication strategies on emerging and novel technologies

[1] https://www.webofknowledge.com/
[2] https://www.scopus.com/

- Risk communication strategies on emerging and novel technologies

Based on the pilot searches, the following search queries were used to retrieve potentially relevant publications:

Web of Science

Search date: 8 October 2019

Search query: TS=(nano* AND ((public* NEAR/15 (perception* OR view* OR opinion* OR feeling* OR communica* OR connot* OR survey* OR cognit*) OR (consumer* NEAR/15 (perception* OR view* OR opinion* OR feeling* OR communica* OR connot* OR survey* OR cognit*)))))

Timespan: All years. Databases: WOS, BCI, CCC, DRCI, DIIDW, KJD, MEDLINE, RSCI, SCIELO, ZOOREC.

Search language=Auto
Number of retrieved references: 1059

SCOPUS

Search date: 8 October 2019

Search query: TITLE-ABS-KEY (nano* AND (public* W/15 (perception* OR view* OR opinion* OR feeling* OR communica* OR connot* OR survey* OR cognit*)) OR (consumer* W/15 (perception* OR view* OR opinion* OR feeling* OR communica* OR connot* OR survey* OR cognit*)))

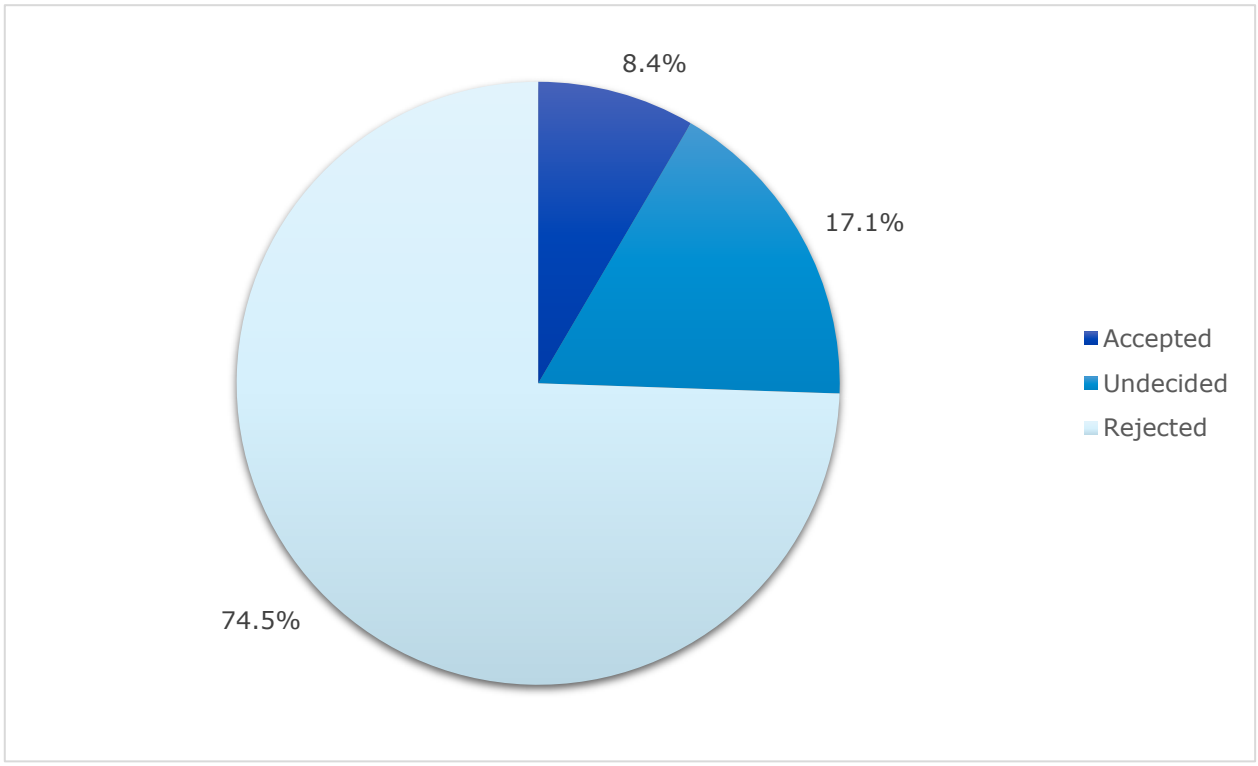
Number of retrieved references: 903

Study selection

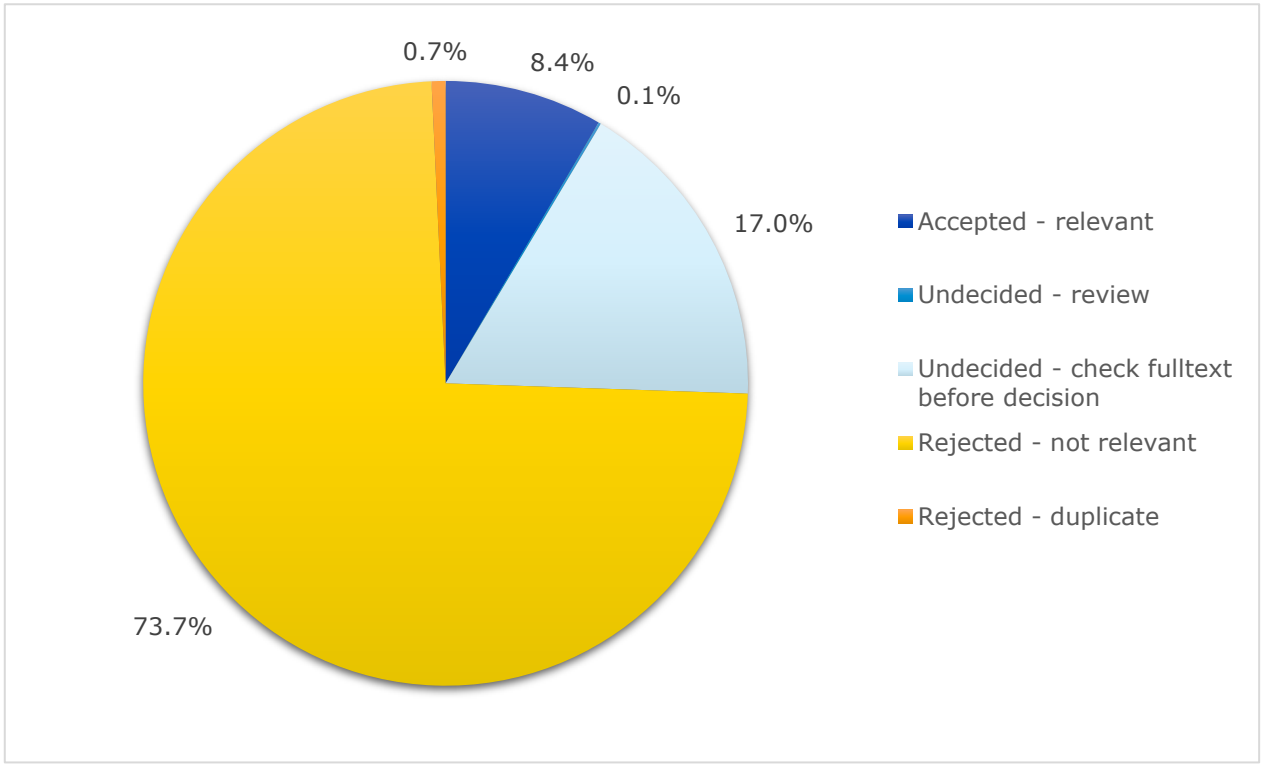
After deduplicating the records, the final number of retrieved references was 1480 (see Annex I for the full list of retrieved references). To minimize the risk of excluding potentially relevant publications, a conservative approach was taken in the application of the inclusion/exclusion criteria by the reviewers – i.e. in case of uncertainty that a reference can be excluded it was by default included (accepted) in the stage of screening of titles and abstracts to be further investigated in subsequent steps. As a result, out of the 1480 publications systematically screened for relevance based on their titles and abstracts, 264 were identified as potentially relevant. In detail, the first basic sorting of the articles according to the relevance of the information in the abstracts provided the following results illustrated by Graph 1 - Abstract screening results and Graph 2 - Abstract screening results - detailed:

- Articles accepted as relevant – 125 (8.4%)
- Undecided articles – reviews – 2 (0.1%)
- Undecided articles – to check the full-text before decision – 251 (17.0%)
- Articles rejected as irrelevant – 1091 (73.7%)
- Articles rejected as duplicates - 11 (0.7%)

Graph 1 - Abstract screening results



Graph 2 - Abstract screening results - detailed



The first screening of abstracts to identify relevant publications provided a total number of 402 articles for the subsequent full text rating and possible data extraction. For the screening of titles and abstracts and subsequent study selection, clear inclusion and exclusion criteria were set a priori (based on pilot screening of retrieved literature) to harmonise approaches of individual reviewers participating in the study selection phase. The inclusion and exclusion criteria for study selection are the following:

- Description of the methodology study design: the study needs to be well described so the methodology/study design can be understood, and associated strengths and weaknesses of the study can be identified

- Methodology/study design: studies based on a quantitative research design which are directly associated with the aims of the project will be preferred, but also studies using qualitative methods (e.g. dialogues, focus groups etc.) will be included in the analyses and review

- Population: Only studies on general public or layman audience are relevant considering the aims of the project, but also studies carried out on experts (e.g. researchers) will be analysed to identify additional survey questions which might be relevant also for the general public

- Geography: Studies from all countries (EU as well as non-EU) will be included in the analyses as comparing studies from different countries can bring questions exploring regional differences in perceptions of nanomaterials which can be studied in the current project to compare perceptions in different EU countries and regions

The rating of full texts according to the criteria above led to the following results illustrated by Graph 3 and Graph 4:

- Accepted – relevant – 96 (25.4%)

- Rejected – not a survey – 160 (42.3%)

- Rejected – not about nanotechnology – 13 (3.4%)

- Rejected – duplicate – 20 (5.3%)

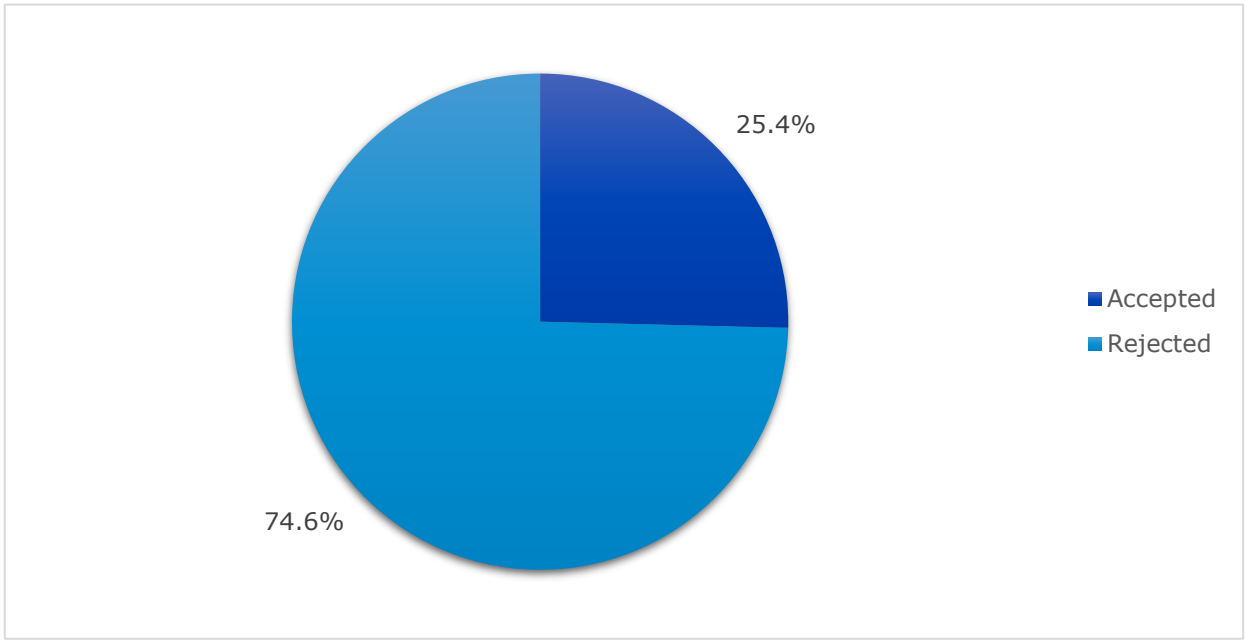
- Rejected – full-text not found – 16 (4.2%)

- Rejected – language barrier (studies not in English) – 11 (2.9%)

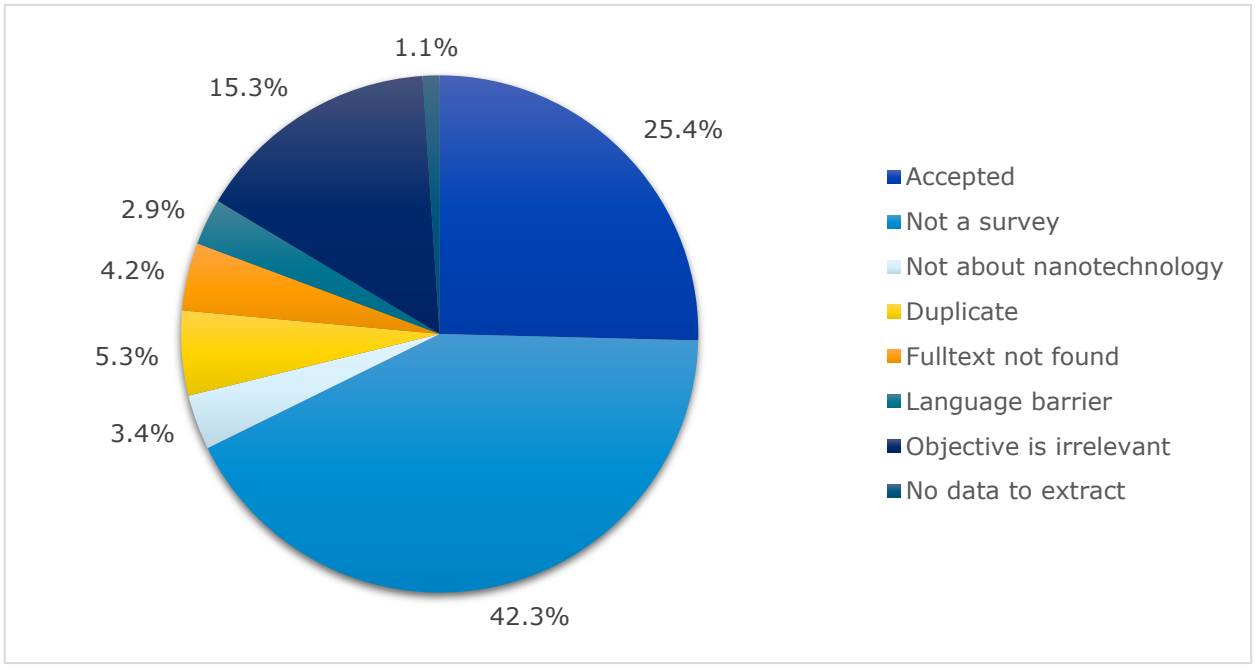
- Rejected – the objective is irrelevant – 58 (15.3%)

- Rejected – no data to extract – 4 (1.1%)

Graph 3 - Full-texts screening results



Graph 4 - Full-texts screening results – detailed



Data extraction

To extract relevant data from the accepted articles, reviewers were asked to fill out the following information about every study (if available):

- Number of participants of the survey
- Time period of execution
- Location
- Means of the survey
- Characteristics of the respondent group (public, experts, students, etc.)
- Objective of the study
- Specific area of application of nanotechnology/nanomaterials the study focusses on
- Are consumers aware of what nanomaterials/nanotechnology is?
- Are consumers aware of what applications the nanomaterials/nanotechnology have?
- What risks do consumers associate with nanomaterials/nanotechnology?
- What benefits do consumers associate with nanomaterials/nanotechnology?
- How do consumers think they are exposed to nanomaterials?
- Are consumers concerned about the presence of nanomaterials in the products they use?
- Are there specific areas that consumers are particularly interested in but feel they do not have sufficient information available?
- Who do consumers trust the most when seeking information on nanomaterials (authorities, companies, NGOs, others)?
- What sources do consumers use when looking for information on the safety and risks of nanomaterials?
- Is labelling discussed? What is the conclusion?
- Interesting hypotheses addressed in the survey
- Key socio-demographic factors studied
- Conclusions
- Comments

Through a systematic meta-analysis of studies identified as relevant, the matrix of collected evidence was compiled, summarising how each of the identified relevant studies addresses the main questions identified as setting the framework for the overall study. These questions were:

- Are consumers aware of what nanomaterials are?
- Are consumers aware of where nanomaterials are used?
- What risks do consumers associate with nanomaterials?
- What benefits do consumers associate with nanomaterials?
- How do consumers think they are exposed to nanomaterials?
- Are consumers concerned about nanomaterials in the products they use?
- Are there specific areas that consumers are particularly interested in but feel they do not have sufficient information available?
- Who do consumers trust most for information on nanomaterials (authorities, companies, NGOs, others)?
- What source do consumers use when looking for information on the safety and risks of nanomaterials?
- How do consumers see the role of authorities (both national and EU) in ensuring the safe use of nanomaterials?

Such a matrix of evidence allowed the subsequent analysis of trends and comparison of similarities and/or differences in perceptions based on different socio-demographic variables.

1.2 Methodology of data collection on the public's perception of nanomaterials and how their safety is perceived in the EU

Based on the analyses of previous research results, main trends, outcomes, and gaps were identified and described in an interim report 1. Identified key questions, as well as gaps, were considered in developing the survey questionnaire.

Designing a targeted survey (questionnaire and survey methodology)

Drafting the survey questions based on the aims of the project and outcomes of collection and analysis of previous research

Survey questions to study the public perception of nanomaterials were divided into 3 main areas:

1. Public awareness
2. Perception of risks and benefits
3. Communication strategies

Annex 2 – Questionnaire presents the questionnaire which was developed to address the aims of the project according to discussions with ECHA and the results of the literature search. Some of the questions were reproduced from previous research, while several other questions are analogous, only tailored to the field of nanomaterials. Repeating some questions which were already studied in previous research allows the studying of latest trends in the perception of nanomaterials and enables comparison of the results of the current study with countries where previous research was carried out.

The questionnaire presented in Annex 2 – Questionnaire was drafted with the following aims:

- The questionnaire should be easy to understand by the general population
- The questionnaire should investigate and validate awareness and knowledge of the respondents about nanomaterials to allow comparison of the perception of nanomaterials between less informed and well-informed groups of the population, it should also be meaningful for respondents who have never heard of nanomaterials
- Studied questions and areas should allow meaningful quantifications
- The questionnaire should not take longer than 20 minutes to fill out to an average respondent

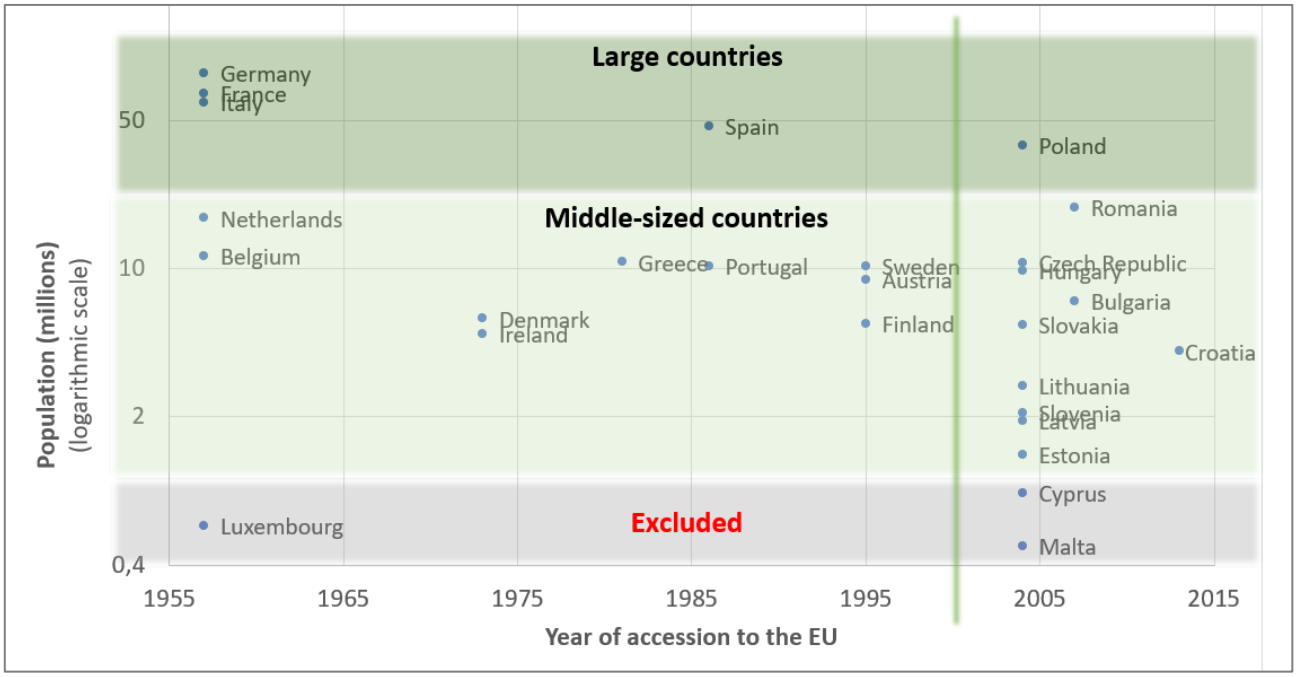
Selection of target countries for the survey

The study was supposed to identify national differences and regional and EU-wide commonalities in the public's perception of nanomaterials as well as differences between different consumer groups based on demographic breakdowns such as age or gender.

It was therefore understood that the selection of EU member states where the survey was to be carried out should be representative of the EU's general population while also allowing comparison between population groups, regions and countries with different socio-demographic profiles and background.

Based on the scope of this study to capture a representative sample of EU countries, it was decided to narrow the number of surveyed EU member states to five. To select target countries, EU member states were plotted into a two-dimensional chart presenting their population and the year of accession to the European Union in the first phase.

Figure 1 – EU member states: population and year of accession to the EU



Countries with a population less than 1,000,000 inhabitants were excluded from the selection as their population is considered too small for the selection of an appropriate sample fit for representing the EU general population and comparison of relevant socio-demographic factors.

In the second phase, the country selection was based on the following hard and soft indicators:

- Hard selection indicators
    - Population
    - Year of accession to the EU
    - GDP per capita
    - Turnout in the elections to the European Parliament in 2019
    - Existence of national inventory of nanomaterials or products containing nanomaterials
    - Research and development spending by GDP
    - Share of patents related to nanotechnologies or nanomaterials
    - Share of primary/secondary/tertiary sector in the economy
    - Expenditure on pharmaceuticals per capita
    - Gross fixed capital formation in the health care sector as a share (%) of GDP

- Soft selection indicators
    - Freedom of press/media
    - A tendency to trust EU authorities
    - Satisfaction with life
    - Performance of the innovation system
    - Self-reported health status

Rationale for the selection of indicators for the selection of target countries

- *Population*

  It was considered vital to have at least two large countries (with a population above 30 mil. inhabitants) and at least two small/medium-sized (with a population of 1 – 30 mil. inhabitants) countries in the selection. This allowed comparing whether there is a more unified perception of nanomaterials in small/medium-sized countries which usually tend to have lower regional, cultural, and socio-economic diversity in comparison with large countries.

- *Year of accession to the EU*

  It was assumed that the general public in countries with a longer history of EU membership may have different habits and perceptions related to: access and trust in information coming from EU authorities, support of EU initiatives, trust in EU authorities in general and different levels of civic engagement. It was therefore considered important to select at least two member states which joined the EU before 2000 and at least two which joined the EU after 2000.

- *GDP per capita*

  GDP per capita is a standard indicator used in most large-scale surveys allowing to capture the socio-economic diversity of the studied population. Selected target countries should cover a broad range of GDP per capita among all EU member states.

- *Turnout in 2019 elections to the European Parliament*

  Turnout in elections to the European Parliament (EP) may indicate (to a certain extent) the level of civic engagement in different EU member states, trust in EU authorities and satisfaction with the political situation and with life in general. The selection of countries was supposed to include at least one country with a high turnout (60% or higher) in 2019 EP elections, at least one country with an average turnout (40 – 60%) and at least one country with a low turnout (lower than 40%).

- *Freedom of press/media*

  Freedom of press/media is an important indicator which may influence the general public's trust in media as well as national authorities and therefore also communication strategies; – communication strategies effective in countries with a high level of freedom of press/media might be inefficient in countries where freedom of press/media is lower and vice versa. Selected countries, therefore, cover a broad range of countries according to their freedom of press/media ranking.

- *Tendency to trust EU authorities*

  Analogous to the indicator "freedom of press/media", tendency to trust EU authorities might influence the efficiency of different communication strategies informing the public about environmental/health-related issues. As a supporting indicator, it is considered useful to select countries where over 50% of people have trust in the EU as well as countries where trust in EU authorities is lower than 50%.

- *Satisfaction with life*

  This indicator is often used to capture the socio-economic and behavioural diversity of a population. It was therefore used as a supporting indicator for the selection of target countries.

- *Existence of national inventories/registries of nanomaterials or products containing nanomaterials*

  It was assumed that there is higher public awareness about nanomaterials and products containing nanomaterials in countries where national inventories/registries of products containing nanomaterials had been established. Establishment of such inventories typically includes information campaigns as well as public and expert consultations. Also, various stakeholders (NGOs, journalists, consultants, etc.) subsequently use information in these inventories/registries to inform the public on the potential risks associated with nanomaterials and products containing nanomaterials. After all, public access to information is usually one of the main drivers for establishing such national inventories/registries. It was therefore deemed vital to ensure that at least one of the selected countries had a national registry/inventory of nanomaterials or products containing nanomaterials to allow analysis and comparison of public perception with countries where such initiatives are not implemented.

- *R&D and innovation-related indicators (Research and development spending by GDP, Performance of innovation system, the share of patents related to nanotechnologies or nanomaterials)*

  It was assumed that people in countries with bigger spending on R&D, better performance of innovation systems and stronger research and development in nanotechnologies might be better informed about nanomaterials and might have a different perception on acceptance of new technologies and nanotechnologies in particular. Selecting countries with different profiles of R&D and innovation-related indicators will allow complex analyses and correlations of perceptions of nanomaterials with R&D and innovation potential.

- *Share of primary/secondary/tertiary sector in the economy*

  Public perception of modern technologies may be different in countries with different proportions of primary (raw materials), secondary (manufacturing) and tertiary (services) economic sectors. It was therefore considered relevant to select countries with different profiles of economic sectors.

- *Indicators showing attitude towards the protection of own health*

  It is expected that population groups with higher concerns about health-related issues will also tend to be more concerned about emerging technologies and materials with unknown or potentially harmful effects. Three factors indicating attitude towards the protection of own health were combined to select countries with different profiles for these factors.

Table 1 - Indicators used for selection of target countries for the survey

Member State	Country Code	Excluded countries (population < 1 mil.)	ACCESSION to the EU	POPULATION	AREA (square km)	GDP per capita (USD)	2019 Elections to the EP: Turnout (%)[3]	Freedom of the press: WORLD / GLOBAL RANKING[4]	Tend to trust the EU (2018)[5]	% of people very satisfied with life (2018)[6]	Existence of national inventory of nanomaterials or products containing nanomaterials	Performance of EU Member States' innovation systems[7]	R&D spendings by GDP (2014)[8]	Share of countries in nanotechnology patents 2010 - 2013 (into EU)[9]	Share of primary sector in economy (2017)[10]	Share of secondary sector in economy (2017)[8]	Share of tertiary sector in economy (2017)[8]	Self-reported health status, 2014 (% very good)[11]	Expenditure on pharmaceuticals per capita, 2014 (or nearest year) – EUR[9]	Gross fixed capital formation in the health care sector as a share (%) of GDP, 2014 (or nearest)[9]
Denmark	DK		1973	5 806 081	43 075	60,692	66	9	60	71%	yes	leaders	3,1%	1%	2,8%	22,1%	75,2%	72	201	0,66
Sweden	SE		1995	10 230 185	449 964	53,873	55	2	59	48%	yes	leaders	3,2%	4%	1,1%	28,2%	70,7%	80	336	0,49
Netherlands	NL		1957	17 282 163	41 543	53,106	42	3	57	57%	no	leaders	2,0%	8%	1,2%	17,2%	81,6%	77	298	0,53
Finland	FI		1995	5 517 919	338 424	49,845	41	4	52	38%	no	leaders	3,2%	2%	2,7%	28,2%	69,1%	69	342	0,39
Germany	DE		1957	83 019 214	357 021	48,264	61	15	51	31%	no	strong innovators	2,9%	29%	0,7%	30,7%	68,6%	65	551	0,69
Belgium	BE		1957	11 467 923	30 528	46,724	88	7	52	23%	yes	strong innovators	2,5%	5%	0,7%	22,1%	77,2%	75	459	0,90
France	FR		1957	67 028 048	640 679	42,878	50	33	33	19%	yes	strong innovators	2,3%	22%	1,6%	19,4%	78,9%	68	467	0,64
Luxembourg	LU	excluded	1957	613 894	2 586	114,234	84	17	52	34%	no	strong innovators	1,3%	0%	0,3%	12,8%	86,9%	73	375	0,18
Austria	AT		1995	8 858 775	83 855	51,509	60	11	45	35%	no	strong innovators	3,1%	1%	1,3%	28,4%	70,3%	70	443	0,75
Ireland	IE		1973	4 904 226	70 273	76,099	50	16	50	43%	no	strong innovators	1,5%	1%	1,2%	38,6%	60,2%	83	523	0,47
Estonia	EE		2004	1 324 820	45 227	22,990	38	12	53	14%	no	strong innovators	1,3%	0%	2,8%	29,2%	68,1%	52	230	0,55
Italy	IT		1957	60 359 546	301 338	34,260	55	46	36	7%	no	moderate innovators	1,3%	5%	2,1%	23,9%	73,9%	68	405	0,37
Spain	ES		1986	46 934 632	504 030	30,697	61	31	38	20%	no	moderate innovators	1,2%	4%	2,6%	23,2%	74,2%	73	391	0,45
Malta	MT	excluded	2004	493 559	316	31,058	73	65	56	33%	no	moderate innovators	0,9%	0%	1,4%	11,4%	87,2%	75		0,68
Portugal	PT		1986	10 276 617	92 390	23,186	31	14	55	3%	no	moderate innovators	1,3%	1%	2,4%	23,1%	74,4%	46	297	0,47
Cyprus	CY	excluded	2004	875 898	9 251	28,340	45	25	41	29%	no	moderate innovators	0,5%	0%	2,3%	11,0%	86,8%	78	253	0,21
Greece	EL		1981	10 722 287	131 990	20,408	59	74	26	5%	no	moderate innovators	1,0%	0%	4,0%	16,0%	80,0%	74	468	0,13
Poland	PL		2004	37 972 812	312 685	15,431	46	57	47	16%	no	moderate innovators	0,9%	1%	2,4%	40,2%	57,4%	58	248	0,42
Latvia	LV		2004	1 919 968	64 589	18,032	34	24	49	12%	no	moderate innovators	0,5%	0%	3,9%	22,4%	73,7%	46	251	0,47
Lithuania	LT		2004	2 794 184	65 200	19,143	53	36	65	18%	no	moderate innovators	0,9%	0%	3,3%	28,5%	68,3%	45	356	0,19
Slovenia	SI		2004	2 080 908	20 273	26,243	29	32	37	30%	no	moderate innovators	2,4%	0%	1,8%	32,2%	65,9%	65	347	0,37
Croatia	HR		2013	4 076 246	56 594	14,816	30	57	48	14%	no	moderate innovators	0,8%	0%	3,7%	26,2%	70,1%	58	287	0,22
Czech Republic	CZ		2004	10 649 800	78 866	22,850	29	34	32	17%	no	moderate innovators	2,0%	1%	2,5%	37,8%	59,7%	61	286	0,38
Hungary	HU		2004	9 797 561	93 030	15,924	43	73	48	9%	no	moderate innovators	1,4%	0%	3,9%	31,3%	64,8%	58	387	0,32
Slovakia	SK		2004	5 450 421	49 035	19,582	23	27	43	17%	no	moderate innovators	0,9%	0%	3,8%	35,0%	61,2%	65	396	0,26
Romania	RO		2007	19 401 658	238 391	12,285	51	44	50	6%	no	modest innovators	0,4%	0%	4,2%	33,2%	62,6%	71	283	0,10
Bulgaria	BG		2007	7 000 039	110 994	9,267	33	111	53	5%	no	modest innovators	0,7%	0%	5,1%	27,5%	67,4%	66	438	0,31

[3] Source: https://www.election-results.eu/turnout/
[4] Source: https://en.wikipedia.org/wiki/European_Union_statistics
[5] Source: https://ec.europa.eu/commfrontoffice/publicopinion/index.cfm/Survey/getSurveyDetail/instruments/STANDARD/yearFrom/1974/yearTo/2018/surveyKy/2215
[6] On the whole are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead? Source: https://ec.europa.eu/commfrontoffice/publicopinion/index.cfm/Chart/getChart/chartType
[7] Source: https://ec.europa.eu/docsroom/documents/36281
[8] Source: https://en.wikipedia.org/wiki/List_of_countries_by_research_and_development_spending#cite_note-battelle-14
[9] Source: https://www.oecd.org/sti/nanotechnology-indicators.htm
[10] Source: https://www.cia.gov/library/publications/resources/the-world-factbook/
[11] Source: https://ec.europa.eu/health/sites/health/files/state/docs/health_glance_2016_rep_en.pdf

It is clear that combining the selection criteria listed in Table 1 into a set of countries with diverse profiles for the survey required a number of countries to be selected to allow comparison of various regional and socio-demographic factors between different population groups and between individual countries.

Based on the criteria detailed above and on expert judgment, the following five countries were proposed for the survey:

1) France: representative of traditional EU members and large European countries with a strong economy (high GDP per capita) and rather high levels of innovation. A vital criterion for selecting France (instead of e.g. Germany and Italy) is the fact that France has established a national registry of nanomaterials. France is also one of the EU leaders of innovations in nanotechnologies, and has a rather broad regional diversity.

2) Finland: Finland, besides a rather small population, is one of the EU innovation leaders with high GDP per capita and ranks in the top 5 among EU countries in indicators related to freedom of press/media. Other countries with a similar profile which can be considered for the selection are Sweden and Denmark. The deciding point for Finland is the fact that Sweden and Denmark both have national registries of nanomaterials (or products containing nanomaterials), while Finland does not. Since France was already proposed as a target country for the survey, it was not considered necessary to select another country with a registry of nanomaterials.

3) Austria: Austria has a profile similar to Finland with comparable GDP per capita, innovation potential and performance and structure of the economy. With a population slightly larger than Finland, it also has similar results in surveys studying satisfaction with life. The reason why it was proposed to the selection was to allow comparison of two similar, yet regionally and culturally different countries and the influence of various socio-demographic factors on the perception of nanomaterials, any potential concerns they raise and on the efficiency of different communication strategies in these countries. Also, Austria had a significantly higher turnout in recent elections to the European Parliament, indicating that there may be a change in civic engagement, while the Finnish turnout has been almost constant in the four latest elections (since 2004) to the European Parliament.

4) Poland: Representative of countries with a shorter history of EU membership while representing member states with a large population. Compared to France, Finland and Austria, Poland has a significantly lower GDP per capita and scores much lower in indicators related to innovation potential and performance. Poland is in a specific political situation. The population is not very satisfied with life (results similar to those for France) and the standard of living is lower compered to other selected countries. Poland also ranks much lower in freedom of press/media. An interesting point for the selection of Poland was that it has the highest share of the secondary sector (manufacturing) among EU economies.

5) Bulgaria: Like Poland, Bulgaria represents countries with a rather short history of EU membership. Located in the Balkans, it represents a completely different geographic region than the other selected countries. Bulgaria has the lowest GDP per capita among EU member states and ranks lowest in freedom of press/media and satisfaction with life. Bulgaria has the highest share of the primary sector (raw materials) among EU economies. Compared to other selected countries, Bulgaria has a poor position in the field of nanotechnologies and innovations in general. A country with a similar profile is Romania. The reason why Bulgaria was proposed as a target country was that it scores much higher in the indicator "expenditure on pharmaceuticals per capita", indicating that the population may be more receptive to information on health-related issues.

A well-balanced selection of target countries was presented based on clearly defined criteria. A key factor in the selection was the proposal of five countries that have significantly different socio-demographic indicators.

The selection included two large countries (France and Poland) and three innovation leaders (France, Finland and Austria) with strong economies, one of them already having a national registry of nanomaterials (France was the first EU member state to establish such a registry).

Poland and Bulgaria represent countries with lower GDP per capita and ranking lower in the indicators: freedom of press/media and innovation potential, with Bulgaria ranked still significantly lower than Poland. Poland, therefore, represents countries which still rank lower in some (especially economic) indicators than members with a longer history of EU membership (pre-2000 members).

The selection was also regionally and culturally very diverse and should, therefore, allow for analysing the influence of different factors on the perception of nanomaterials, including a comparison between individual countries, regions, and groups of the population.

Selection of target audience – survey universe, sample size and sampling approach

The target audience of the survey was the general population. In other words, no population groups were excluded based on education level, level of knowledge about nanomaterials or other confounding factors. Instead, a sample representing a wide range of population groups were selected to allow comparison of perceptions among different groups of the EU population.

The population for the survey comprised a local language-speaking population between the ages of 16 and 60 years in each of the target countries. It was decided to target the survey at an economically active population or young generation which should become economically active in the near future. Hence the upper limit of 60 years, after which economically active residents enter retirement in some EU member states. On the other side, setting the lower limit as low as 16 years of age ensured that also youngsters who will soon become economically active were included and represent a generation which may have a different perception of modern technologies and may also have different habits of working with information and communication technologies. Setting the limit lower than 16 years of age would hit legal barriers in some EU member states.

A representative sample of 1,000 respondents in each country was selected from this universe. The sample size was sufficient to guarantee statistically valid data and allow in-depth analysis to obtain objective and complex information about the awareness and perception of nanomaterials. Size of n=1000 respondents in each country is the regular sample size in standard Eurobarometer surveys[12]. The required sample size of n=1000 means that 1,000 fully completed survey questionnaires were collected in each target country. Incomplete questionnaires were disregarded.

[12] Source: https://www.gesis.org/eurobarometer-data-service/survey-series/standard-special-eb/population-countries-regions/

To ensure that the survey was carried out on a representative population sample, a quota sampling approach using the following criteria was envisaged:

- Gender
- Age
- Region
- Size of residence
- Education

In accordance with best practice in systematic surveys, screening questions were used to ensure that the respondents were qualified to participate without introducing excessive bias (e.g. people employed in the fields of nanotechnology, journalism and marketing/market research were not invited to take part in the survey). A screening questionnaire was developed for the recruitment of quota-compliant participants.

The quota sampling approach resembles the method of probability-based stratified sampling, but it was considered better suited for the purpose of this survey for the following reasons:

1. Quota sampling ensured that different groups of the target population were not underrepresented or overrepresented in the survey. Quota criteria were set proportionally to the demographic profiles of the whole population in target countries to minimize sampling bias.

2. Quota sampling eliminates the issue of low response rates – non-responsiveness in a quota sample is handled by the selection of another respondent fitting the quota. Quota sampling was therefore fit for the purpose of this survey as it allowed a fast collection of responses from a sample population representing different population groups in target countries.

The quota sampling approach was also applied in the past studies[13] on the public perception of nanotechnologies.

Respondents were recruited through National Managed Access Panels in each of the target countries. Access to online data collection panels was acquired through Data Collect s.r.o.[14] which is part of the Talk Online Panel group. Talk Online Panel group incorporates national access panels from 24 European countries managed in accordance with ESOMAR guidelines[15]. For example, all panellists are registered following a triple-opt-in and are deemed active according to ISO standards, meaning they must show activity at least once a year. Registered panellists are incentivised to participate in online surveys ensuring high response rates.

[13] Correia Carreira, G. (2016). "Nanoview – Influencing factors on the perception of nanotechnology and target group-specific risk communication strategies.".
[14] https://www.datacollect.cz/
[15]https://www.esomar.org/uploads/public/knowledge-and-standards/codes-and-guidelines/ESOMAR_Guideline-for-online-research.pdf

Justification for the recruitment of respondents

Using nationally managed access panels is an efficient method to ensure that enough respondents fulfilling set quota criteria will be recruited in each of the target countries within a very short time (typically within two weeks). National access panels in each of the targeted countries all have at least 25,000 panellists according to the latest panel book[16], which was sufficient for the selection of a representative sample of at least 1,000 responses in each of the countries.

Thanks to fully managed national panels, relevant information about all registered panel members (e.g. gender, age, education level, etc.) were retrieved directly from the database, enabling the selection of a high-quality sample and even target groups that would be difficult to reach by other sampling methods. Furthermore, since these databases include also socio-demographic information about registered panellists, this information did not have to be collected by the survey questionnaire which could focus purely on topic-related questions, making the questionnaire shorter and thus improving participants' willingness to respond.

Managed access panels provided very high-quality data as the control and validation of the identity of all panel members follows strict rules. There are various control touchpoints such as birth number, bank account number or validation of addresses of respondents by registered mail delivery. Respondents are "protected" from repeating surveys on the same topic and have a limited number of surveys set per year. Using access panels for the collection of data also eliminates the issue of management of personal information as personal data of all respondents are managed fully in compliance with the General Data Protection Regulation (EU) 2016/679 (GDPR).

Since national online panels in all target countries were accessed through a single supplier (Data Collect s.r.o.) who carried out representative sampling according to the given criteria, the final sample size was therefore representative without any data weighting.

Developing the questionnaire dissemination strategy/data collection methodology

Taking into account that the minimum sample size considered appropriate for this survey was 5,000 respondents in total from 5 different countries (1,000 respondents from each country) and the timeframe for collecting data (running interviews/questionnaires) is ca. 3.5 months, only methodologies using computer-assisted (online) interviewing through questionnaires were considered to fulfil the objectives of the project.

To allow efficient collection of a high number of responses (fully filled out survey questionnaires from at least 1,000 respondents in each of the target countries) in a short time (in less than two weeks), the Computer-Assisted Web Interviewing (CAWI) method was used. CAWI (sometimes also referred to as Computer-Assisted Self Interviewing (CASI)) allows the respondents to autonomously answer the survey questions on their computer, tablet, smartphone or any other device with a browser.

Thanks to a high level of internet penetration in all considered countries, online interviewing guaranteed that responses were collected from a representative sample of the general population in each country. Consequently, analyses of the collected responses can be deemed valid for the whole corresponding population.

[16] https://images.mindtake.com/CONT_MT/TalkOnlinePanel/Panelbook_TalkOnlinePanel.pdf

Justification of the methodology – dissemination strategy/data collection methodology

The CAWI methodology allows questionnaires to be more complex and provides extensive guidance to respondents. The clear disadvantage is that it can only be used where a statistically representative share of the population has access to the internet and is willing to answer these surveys. Willingness to answer the survey by at least 1,000 respondents in each target country was ensured by using national managed access panels (see detailed description above) and the fact that internet penetration in all considered countries was high enough (France: 86 %, Finland: 94 %, Austria: 84 %, Poland: 73 %, Bulgaria: 59 %[17]). The collected responses can therefore be considered representative of the population in the countries.

Data was collected using OpenSurvey[18] software.

[17]

[18] https://web.opensurvey.com/

2. Data Collection

2.1 Questionnaire preparation and testing

Prior to the dissemination of the questionnaire to all potential respondents, two rounds of testing and piloting of the questionnaire were performed.

Firstly, the questionnaire was tested internally by employees of the contractor to check if the questionnaire was implemented correctly, whether the technical solution works and is intuitive and if the questionnaire is easy to understand. As employees of the contractor are mostly experts in the field (either experts on chemical safety or market researchers), this round of testing was aimed especially on the technical check of the implemented questionnaire.

After the formal approval of the master English questionnaire and its functionality, national local questionnaires were prepared - the English master questionnaire was delivered through Data Collect s.r.o. to local national translators.

Translated questionnaires were then delivered to ECHA for formal approval. After the approval, Data Collect s.r.o. programmed the questionnaires into online interactive questionnaires in target languages.

When technical and logical aspects of the English electronic questionnaire were agreed by all partners, Data Collect s.r.o. started preparation of local electronic versions - 5 languages (Polish, Bulgarian, German, French and Finnish).

As the next level of control, local electronic questionnaires were tested to ensure correct data recording and its validation against the originally tested English version.

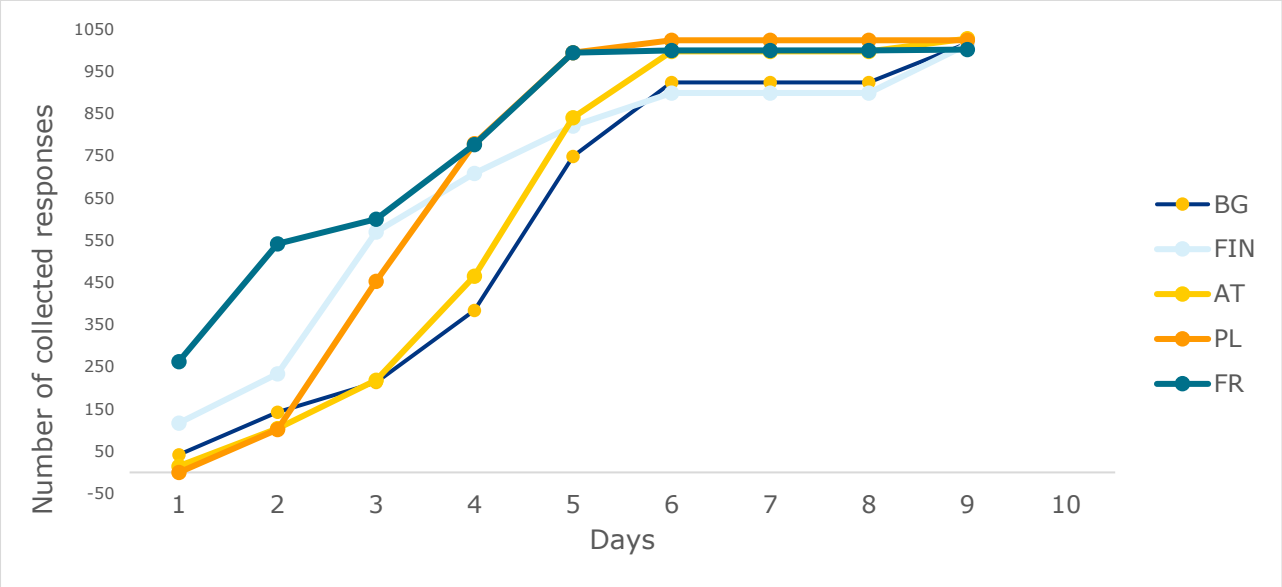
Following the above-mentioned controls, the pilot stage or "soft launch" started. In each country up to 30 pilot interviews were carried out to check the correct functionality of the questionnaire and its understandability for the respondents in the target countries.

2.2 Fieldwork

Hard data collection was launched on 3 February 2020. Respondent sampling was representative according to basic demographical quotas, specifically gender, age, region, size of residence and education (as described in Selection of target audience – survey universe, sample size and sampling approach).

Fieldwork progress was successful and the requested number of interviews (N=1000 per each country) was reached within approximately 10 days without any withstanding issues. Graph 5 indicates fieldwork development in individual countries:

Graph 5 - Data collection in individual countries - comparison



2.3 First data check and preparation of data

After data collection, the screening of collected data was carried out (exclusion of incomplete interviews and demographical check).

To guarantee correct follow-up statistical analysis, the data was cleaned and standardised to ensure the missing answers did not affect the calculated percentages.

As the next step of data handling, open-ended questions were processed - the answers were translated into English to enable coding (integration of answers into the aggregated categories representing all collected answers in open-ended questions). Annexes 2 and 3 contain all the collected data.

3. Analysis of the collected and extracted data

3.1 General awareness of nanomaterials

This chapter deals with the general awareness of the term "nanomaterial" or "nanoparticle" and its meaning. In the corresponding part of the survey, the respondents were asked to provide a spontaneous description of what they think the terms mean and what they have heard about them, their awareness of some specific products containing nanomaterials they might be using, followed by prompted questions of the nanomaterials content in specific types of products.

The list of survey questions analysed in this chapter (questions with an asterisk are open-ended):

Q1. Have you heard something about nanomaterials?

a. *Nothing at all*
b. *A little*
c. *A lot*

Q2. What have you heard about nanomaterials? *

Q3. What is a nanomaterial in your opinion? *

Q4. Name three groups of products which may contain nanomaterials/nanoparticles*

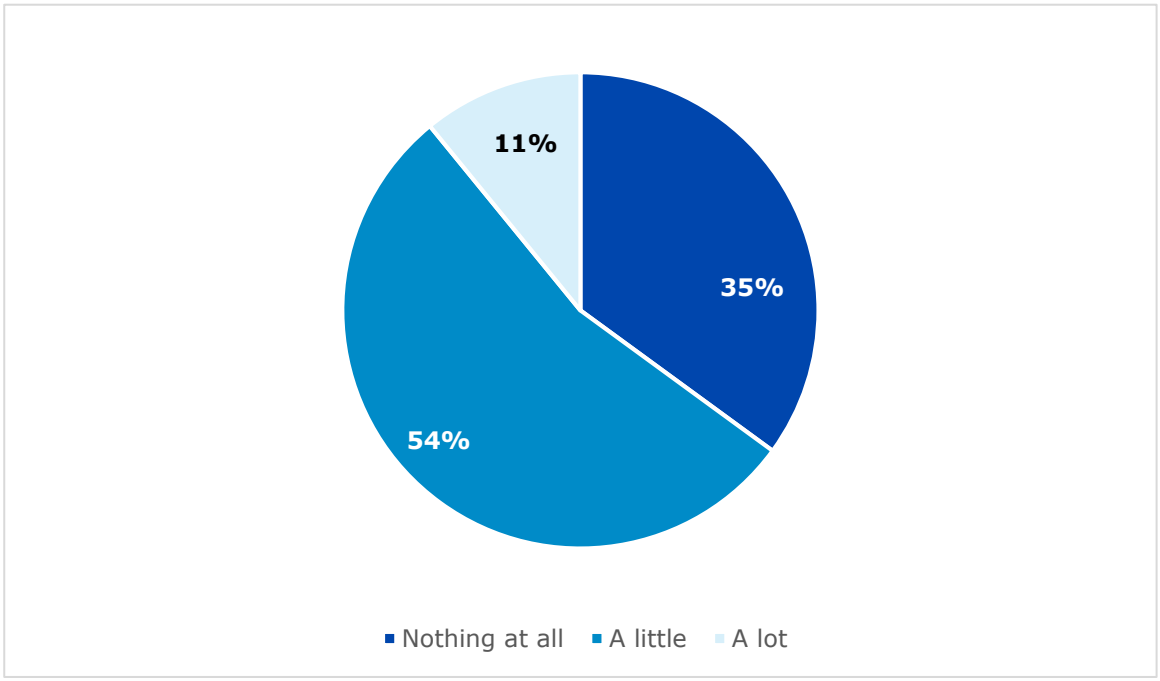
Q5. Which of the following products may contain nanomaterials/nanoparticles in your opinion?

a. *Cars*
b. *Sports equipment*
c. *Medicines*
d. *Paints/Varnishes/Surface coatings*
e. *Foods*
f. *Plastics*
g. *Household electrical appliances*
h. *Computers and electronics*
i. *Clothing/textiles*
j. *Construction materials*
k. *Detergents/household cleaning products*
l. *Cosmetics*
m. *Toys*
n. *Kitchenware*
o. *Pesticides and plant protection products*
p. *Car care products*
q. *Other (please specify)*

Declarative awareness level

All survey respondents were asked about their general awareness of nanomaterials. As illustrated by Graph 6, the current level of general awareness is quite low, with more than a third of respondents claiming they "have not heard anything about nanomaterials" before. Only 11% of respondents claim to have heard "a lot" about nanomaterials.

Graph 6 - Have you heard anything about nanomaterials? *(N=5000, question Q1)*



In terms of demographical profile, higher awareness of nanomaterials is typical for males, inhabitants in big cities, higher and upper-middle-classes, those with a university-level education, business proprietors, owners (full or partner) of companies and managers. No direct correlation between the age group of the respondents and their awareness of nanomaterials was observed. The demographic profile is detailed in Table 2.

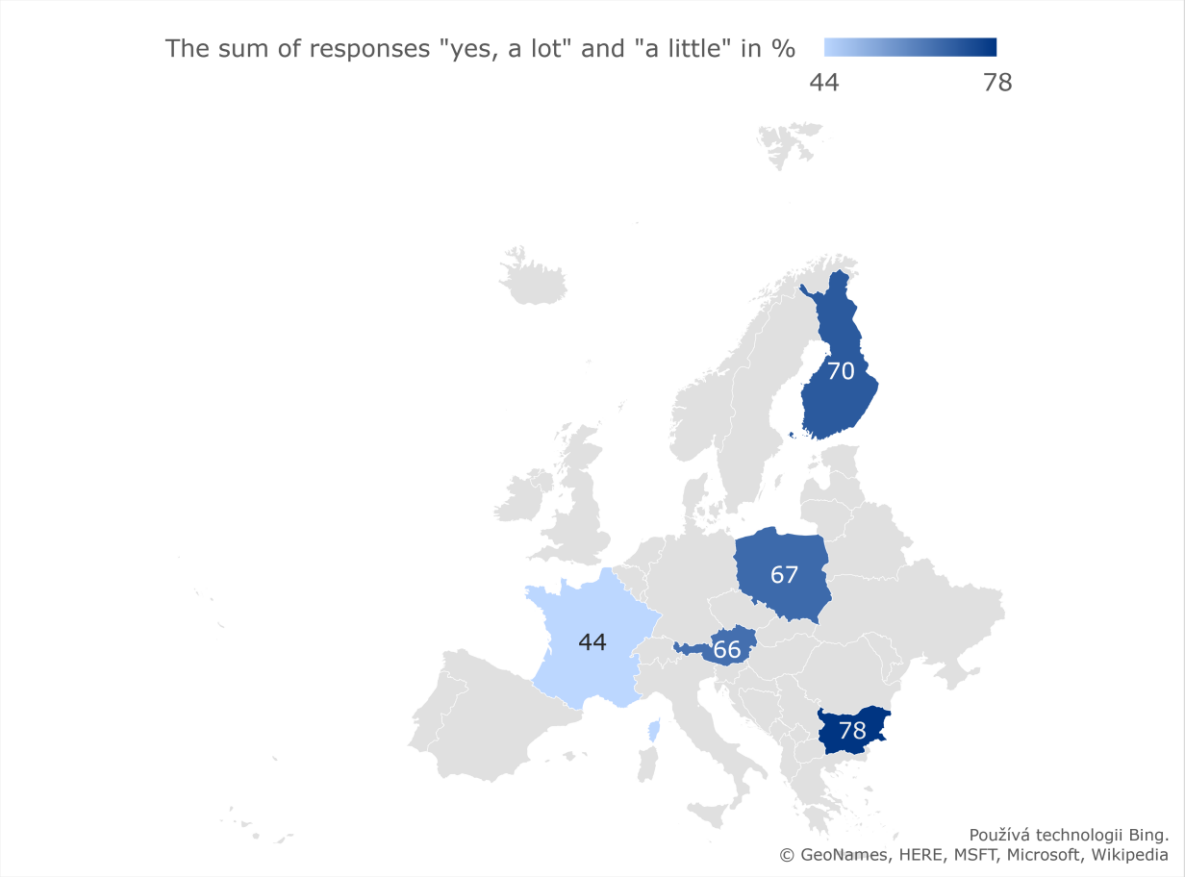
Table 2 - Nanomaterials awareness - Demographic profile

HAVE YOU HEARD ANYTHING ABOUT NANOMATERIALS?			
	Nothing at all	A little	A lot
Age	does not differentiate	does not differentiate	does not differentiate
Gender	women	does not differentiate	men
Size of city	villages and smallest cities up to 50 000 Inhabitants	biggest cities over 200 000 inhabitants and capital	big cities up to 200 000 inhabitants
Education	basic or middle	the highest level, university etc.	does not differentiate
Society category	lower class	upper-middle-class	higher and upper-middle-class
Economic activity	manual workers, servants, not working - at home	lawyer, medical practitioner, accountant, etc., middle management	farmers, fishermen, business proprietors, owners, general management, director, or top management
Religiosity	does not differentiate	does not differentiate	does not differentiate

The average percentage of respondents that were aware of nanomaterials in 2005 was 43%. In 2010 the number increased to 47% and in 2020 it is 65% (sum of the percentage answering "heard something" and "heard a lot"), measured on the representative sample of 5000 respondents from 5 different EU member states.

The demographic profile indicates that besides education, lifestyle plays a big role in the awareness of nanomaterials in general. Active lifestyle, interest in the surrounding life and education seems to be associated with a higher level of awareness of nanomaterials.
The level of awareness of nanomaterials differs between the surveyed countries. See Cartogram 1

Cartogram 1 - Have you heard anything about nanomaterials? *(N=1000 per country, question Q1)*



According to the survey results, the stated awareness of nanomaterials is the lowest in France and the highest in Bulgaria.

Hypothesis: "Is there a higher sense of responsibility among the general population in France compared to other surveyed countries? More optimistic attitudes or lower demand for information in Bulgaria?"

The lower level of awareness of nanomaterials in France can be associated with higher social responsibility (respondents who have some knowledge about the topic do not feel that their knowledge is significant enough, therefore are not prone to choose the answer "yes, a lot" even though objectively their level of knowledge might be the same as of less socially responsible respondents claiming "a lot" of knowledge). This result also implies that the existence of national nanomaterials inventories (as in France) do not necessarily raise the awareness of nanomaterials, at least as they are implemented now.

Other explanations may lie in regional specificities, e.g. relationship to technologic or scientific news in the context of daily life. Only 42% of the respondents from France declared interest in

various scientific topics in contrast with 59% in Bulgaria and 56% in Finland. The French are also (similar to Austrians) more sceptical to the future use of nanomaterials. Only one-third of the respondents in France agree that they are going to use nanomaterials gladly in the future if these will have a positive impact on the quality of products. The opinion that "the whole nano thing is a marketing trick to improve sales of certain products" is the strongest among the respondents in France (compared to other surveyed countries).

The overall level of awareness of nanomaterials is comparable with the conclusions of previous research results in different countries and regions.

In 2004, a survey on nanomaterials showed that 29% of the 1005 participants in the UK have heard the term "nanomaterial", with 19% able to offer any sort of definition (Society and Engineering 2004).

In 2005, the Eurobarometer showed that 42% of 28694 participants in Europe have heard the term "nanomaterial" (Papacostas 2006).

In a Swiss study from 2006, the respondents stated they were using sportswear made with nanotechnology or had nanomaterials in their household. Others, however, complained that they were possibly using such products without even being aware that they might contain nanoparticles (Burri and Bellucci 2008).

In a paper published in 2007, respondents in Switzerland indicated whether they had heard the term "nanotechnology" before the survey. 65% of the 375 respondents answered yes, and 35% answered no (Siegrist, Keller et al. 2007). In 2008, 23 % of the 994 participants in Germany heard nothing about nanomaterials, 68% heard something, 9% heard a lot (Zimmer, R. et al. 2008).

In a 2009 study, 66% of the 750 respondents in Germany were unfamiliar with nanomaterials, 34% were familiar (Vandermoere, Blanchemanche et al. 2010). In 2010, in a survey from the UK, 38% of the 613 participants heard nothing at all about nanomaterials, 29% heard a little, 9% heard a lot (Erdem 2018).

Of the 31238 respondents of the 2010 Eurobarometer, 47% had heard the term "nanotechnology", 53% did not, 1% frequently talks about nanotechnology, 6% occasionally talks about nanotechnology, 6% talked about nanotechnology once or twice, 11% never talked about nanotechnology, 0.1% did not know (Gaskell, Allansdottir et al. 2011).

According to an Italian study from 2011 (Bottini, Rosato et al. 2011), approximately 72% of Italian citizens had heard about nanotechnology, however, approx. 80% of them only knew a little about this scientific field. Most of the respondents thought that nanotechnology may have the biggest use in medicine, only 38% of them were aware of nanotechnology-treated consumables. 80% of respondents that were aware of nanomaterials knew that electronic devices are often made with nanotechnology. A lower percentage knew that nanoparticles are already present in drugs (15%) and beauty products (5%). Less than 5% knew that foods already contain nanoparticles.

In 2012, respondents in the Netherlands (n=1907) "showed low knowledge of what is nanotechnology" (van Giesen, Fischer et al. 2018). In the same year, in Turkey, 43.6% of the 513 participants heard about nanotechnology before (Senocak 2014). And in Germany, 9.1% of the 1200 participants heard nothing about nanomaterials/nanotechnology, 72.2% heard something, 18.5% heard a lot (Guido Correia Carreira, Jan-Peter Ferdinand et al. 2016).

Amongst 141 students of the Wageningen University in the Netherlands, low familiarity with nanotechnology was observed in 2016. (Steenis and Fischer 2016)

In 2019, a survey conducted in Denmark, Spain and Germany showed that the public awareness of nanotechnology remains low, the average score on the scale of 1 to 5 was 1.91 (with 1 being the lowest score, 5 being the highest) (Porcari, Borsella et al. 2019).

Nano-products were mostly associated with high-tech (electronics, medicine, research) and rarely with everyday products in a 2011 UK survey of 18 participants. Nanosilver was associated with electronics and computers. Participants appeared to be unaware of already marketed products such as nanosilver in washing machines, socks, or deodorants. On a material level, a few participants rightly associated nanosilver with coatings, but little awareness existed that products containing nanosilver were already on the market (Feindt and Poortvliet 2019).

The awareness of the terms nanomaterials or nanotechnology is illustrated in Table 3. Only data with specific numerical values (percentage of the respondents being familiar with the terms "nanotechnology" or "nanomaterials") were included and rounded off.

Table 3 - Awareness of nanomaterials - evidence table

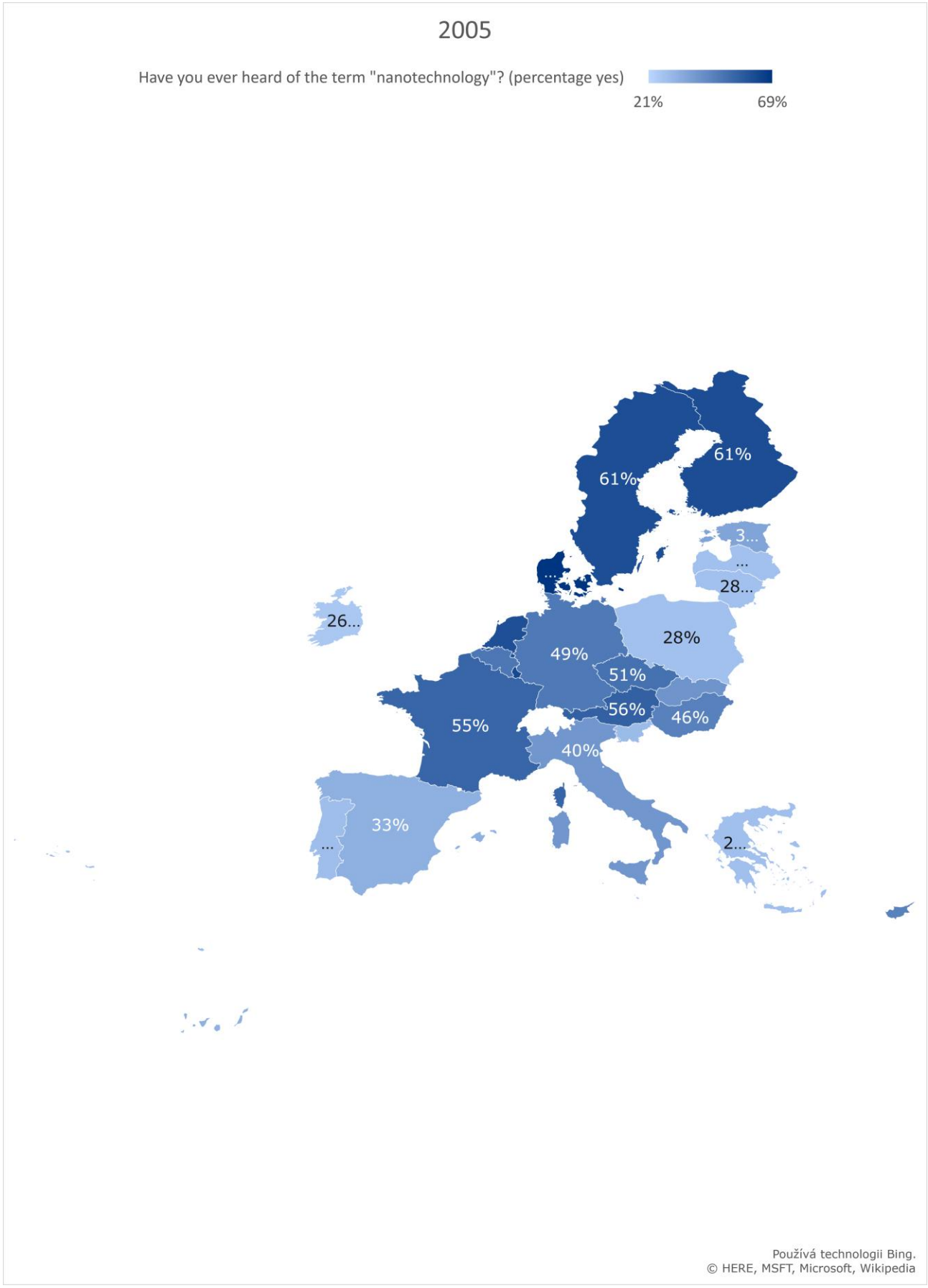
Reference area	Study	Year	n	Have you heard of the terms "nanotechnology" or "nanomaterials"? (percentage yes)
Great Britain (GB-GBN)	Royal Society, 2004	2004	1005	29%
Portugal (PT)	Papacostas, 2006	2005	482	29%
Malta (MT)	Papacostas, 2006	2005	261	28%
Poland (PL)	Papacostas, 2006	2005	498	28%
Spain (ES)	Papacostas, 2006	2005	500	33%
Northern Ireland (GB-NIR)	Papacostas, 2006	2005	145	21%
Ireland (IE)	Papacostas, 2006	2005	504	26%
Slovakia (SK)	Papacostas, 2006	2005	552	41%
Lithuania (LT)	Papacostas, 2006	2005	501	28%
Cyprus (CY)	Papacostas, 2006	2005	252	46%
Italy (IT)	Papacostas, 2006	2005	507	40%
Belgium (BE)	Papacostas, 2006	2005	521	49%
Greece (GR)	Papacostas, 2006	2005	504	28%
Slovenia (SI)	Papacostas, 2006	2005	501	30%
Estonia (EE)	Papacostas, 2006	2005	521	36%
Austria (AT)	Papacostas, 2006	2005	478	56%
Europe (EU)	Papacostas, 2006	2005	28694	42%
Hungary (HU)	Papacostas, 2006	2005	498	46%
Great Britain (GB-GBN)	Papacostas, 2006	2005	523	44%
Latvia (LV)	Papacostas, 2006	2005	488	28%
France (FR)	Papacostas, 2006	2005	516	55%
Luxembourg (LU)	Papacostas, 2006	2005	247	63%
Czech Republic (CZ)	Papacostas, 2006	2005	503	51%
The Netherlands (NL)	Papacostas, 2006	2005	497	61%
West Germany (DE-W)	Papacostas, 2006	2005	503	49%
East Germany (DE-E)	Papacostas, 2006	2005	282	54%
Finland (FI)	Papacostas, 2006	2005	508	61%
Sweden (SE)	Papacostas, 2006	2005	515	61%
Denmark (Tzur, Rosset et al.)	Papacostas, 2006	2005	514	69%
Switzerland (CH)	Siegrist, 2007	2007	375	65%
Germany (DE)	Zimmer, 2008	2008	994	77%
Germany (DE)	Vandermoere, 2010	2009	750	34%
Belgium (BE)	Eurobarometer 73.1, 2013	2010	517	47%

Bulgaria (BG)	Eurobarometer 73.1, 2013	2010	529	41%
Switzerland (CH)	Eurobarometer 73.1, 2013	2010	509	31%
Cyprus (CY)	Eurobarometer 73.1, 2013	2010	482	76%
Czech Republic (CZ)	Eurobarometer 73.1, 2013	2010	251	37%
East Germany (DE-E)	Eurobarometer 73.1, 2013	2010	520	59%
West Germany (DE-W)	Eurobarometer 73.1, 2013	2010	266	66%
Denmark (Tzur, Rosset et al.)	Eurobarometer 73.1, 2013	2010	503	64%
Estonia (EE)	Eurobarometer 73.1, 2013	2010	525	77%
Spain (ES)	Eurobarometer 73.1, 2013	2010	486	47%
Europe (EU)	Eurobarometer 73.1, 2013	2010	497	32%
Finland (FI)	Eurobarometer 73.1, 2013	2010	31238	47%
France (FR)	Eurobarometer 73.1, 2013	2010	538	73%
Great Britain (GB-GBN)	Eurobarometer 73.1, 2013	2010	519	54%
GB-NIR	Eurobarometer 73.1, 2013	2010	503	48%
Greece (GR)	Eurobarometer 73.1, 2013	2010	158	33%
Croatia (HR)	Eurobarometer 73.1, 2013	2010	533	45%
Hungary (HU)	Eurobarometer 73.1, 2013	2010	489	45%
Ireland (IE)	Eurobarometer 73.1, 2013	2010	530	47%
Iceland (IS)	Eurobarometer 73.1, 2013	2010	509	33%
Italy (IT)	Eurobarometer 73.1, 2013	2010	235	60%
Lithuania (LT)	Eurobarometer 73.1, 2013	2010	516	37%
Luxembourg (LU)	Eurobarometer 73.1, 2013	2010	519	36%
Latvia (LV)	Eurobarometer 73.1, 2013	2010	248	57%
Malta (MT)	Eurobarometer 73.1, 2013	2010	487	52%
The Netherlands (NL)	Eurobarometer 73.1, 2013	2010	232	22%
Norway (NO)	Eurobarometer 73.1, 2013	2010	517	61%
Poland (PL)	Eurobarometer 73.1, 2013	2010	483	78%
Portugal (PT)	Eurobarometer 73.1, 2013	2010	534	31%
Romania (RO)	Eurobarometer 73.1, 2013	2010	511	21%
Sweden (SE)	Eurobarometer 73.1, 2013	2010	538	26%
Slovenia (SI)	Eurobarometer 73.1, 2013	2010	497	75%
Slovakia (SK)	Eurobarometer 73.1, 2013	2010	505	46%
Turkey (TR)	Eurobarometer 73.1, 2013	2010	506	35%
Great Britain (GB-GBN)	Eurobarometer 73.1, 2013	2010	470	25%
Great Britain (GB-GBN)	Erdem, 2018	2010	613	38%
Turkey (TR)	Senocak, 2014	2012	513	44%
Germany (DE)	Guido Correia Carreira, 2016	2012	1200	91%
Finland (FI)	Present study	2019	1000	70%
France (FR)	Present study	2019	1000	44%
Poland (PO)	Present study	2019	1000	67%
Bulgaria (BG)	Present study	2019	1000	78%
Austria (AU)	Present study	2019	1000	66%

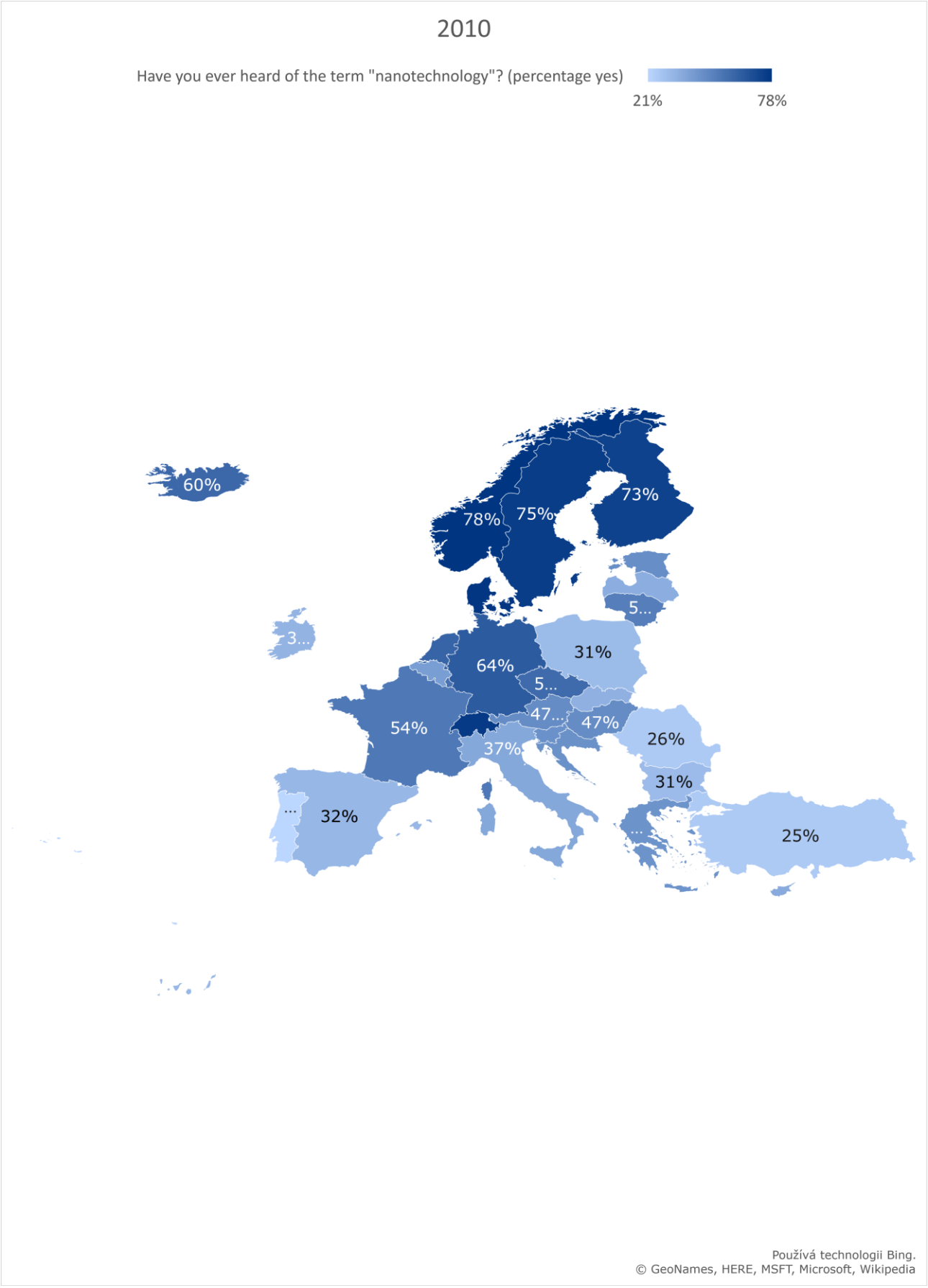
As the methodologies of the surveys Eurobarometer 63.1 (Papacostas 2006), Eurobarometer 73.1 (Anonymous 2013) and the present study are similar, it is possible to compare the level of awareness of nanomaterials/nanotechnology in Europe and individual European countries in 2005, 2010 and 2020.

In 2005, the region with the least aware respondents was Northern Ireland (21%), whereas, in 2010, the lowest awareness was measured in Portugal (21%). In 2005, the country with the highest awareness was Denmark (69%). In 2010, the country with most awareness was Norway (78%), which was not included in the 2005 Eurobarometer. The detailed data collected are illustrated by the following Cartogram 2, Cartogram 3, Graph 7, Graph 8 and Graph 9.

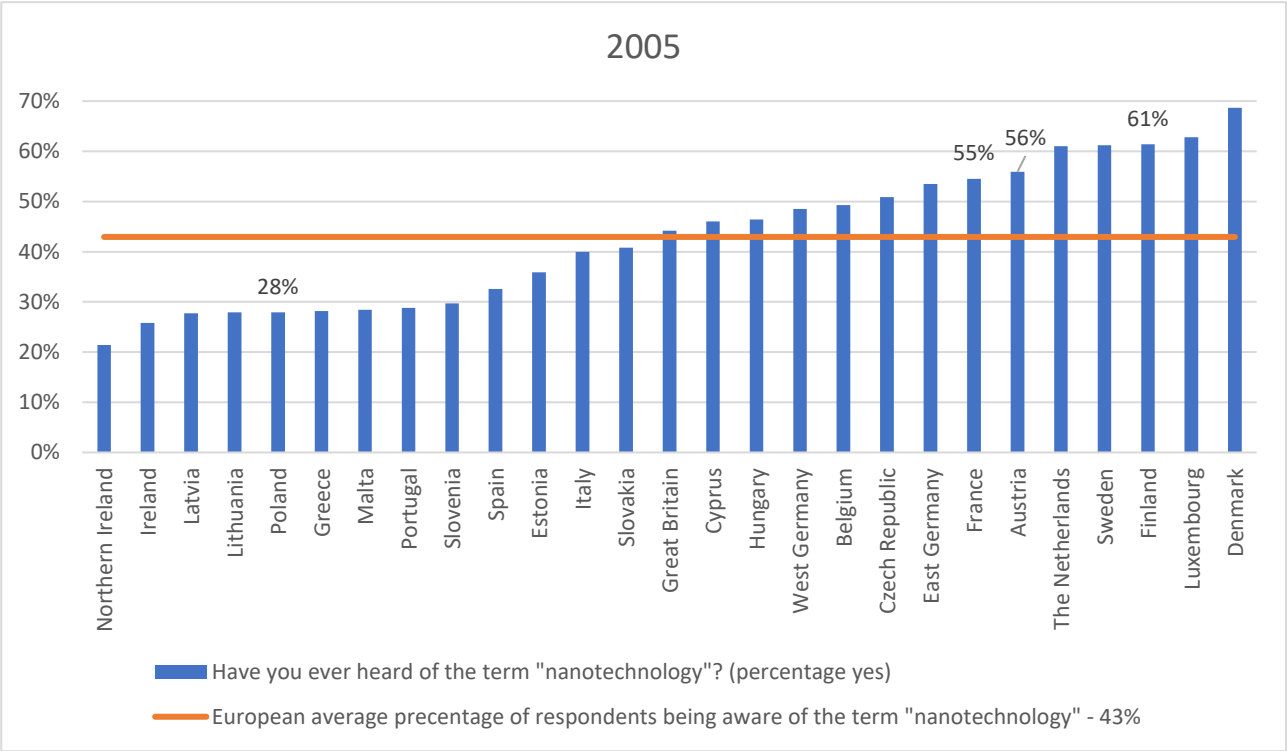
Cartogram 2 - Nanomaterial awareness in 2005



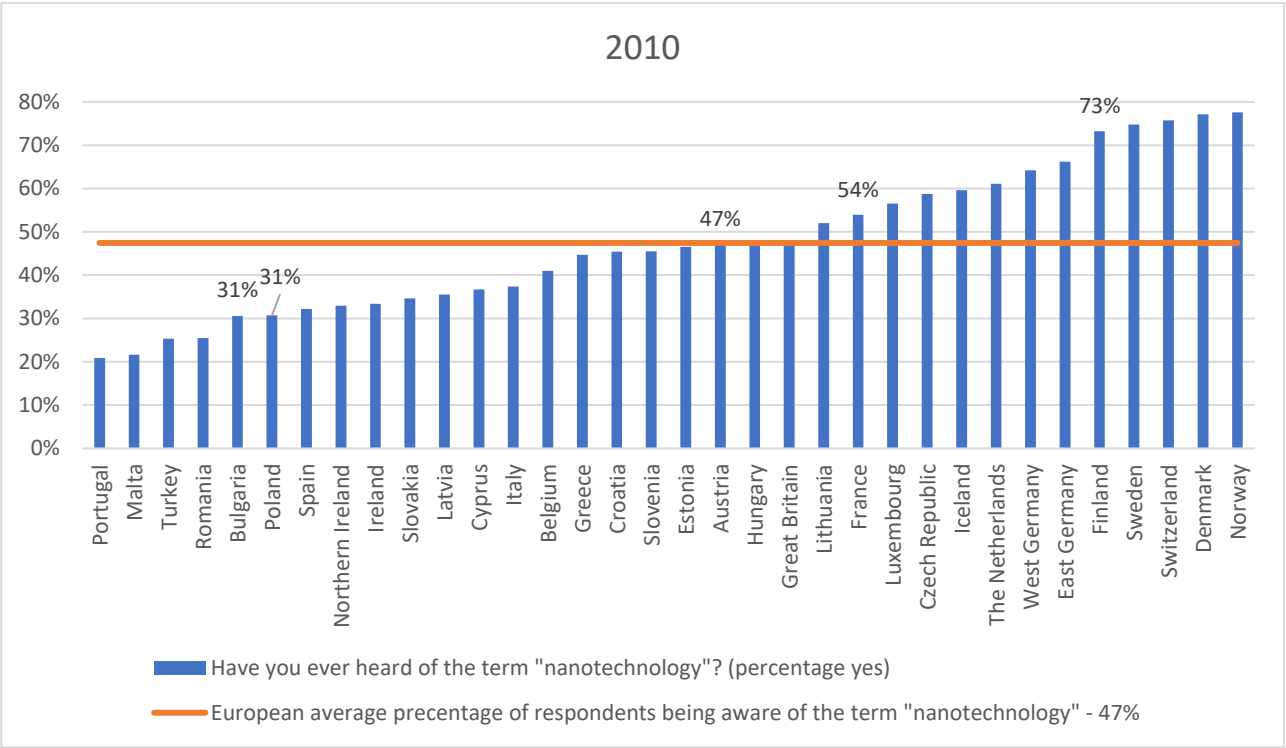
Cartogram 3 - Nanomaterial awareness in 2010



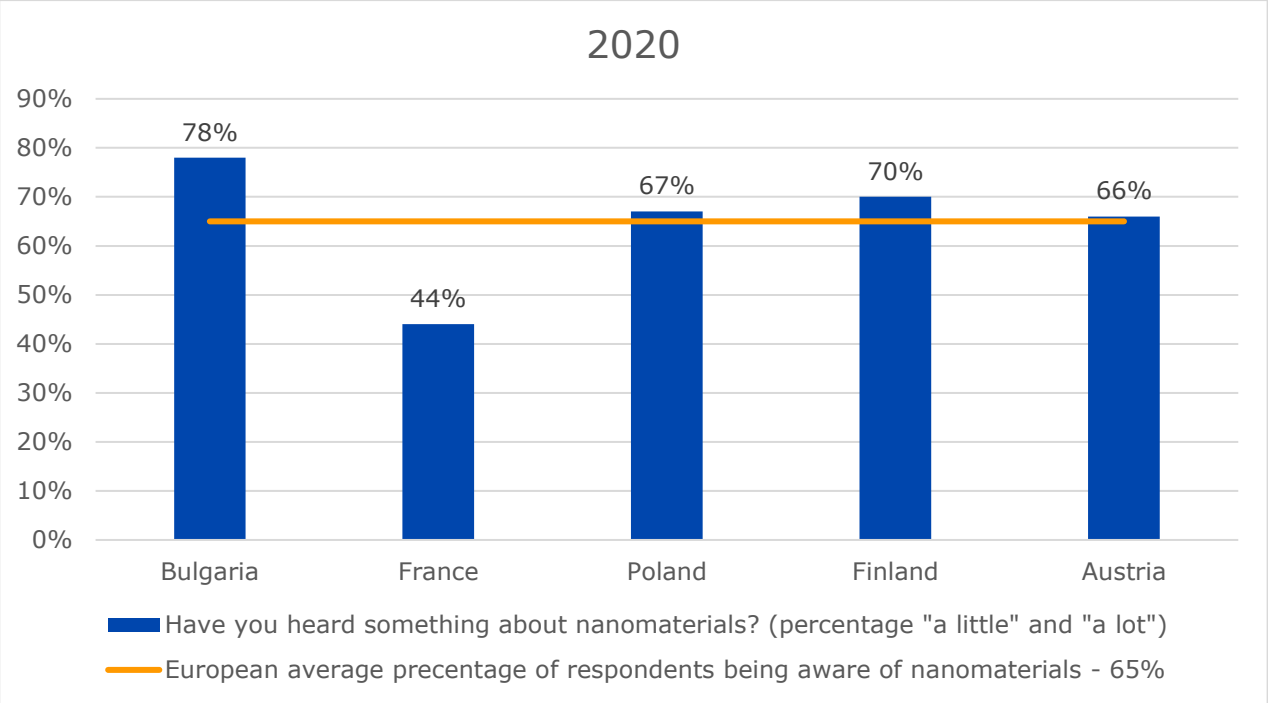
Graph 7 - Nanomaterial awareness in European countries in 2005



Graph 8 - Nanomaterial awareness in European countries in 2010



Graph 9 - Nanomaterial awareness in the surveyed countries in 2020



Specific knowledge about nanomaterials

Spontaneous survey answers to the question "What have you heard or read about nanomaterials?" among those who declare at least some nanomaterials awareness are mainly concentrated in the technical area, specifically about microparticles as well as the wide uses of these materials. No negative association with possible adverse effects on human health was mentioned at this stage. The most frequent response – "small particles, materials" was mentioned across the population.

Worldcloud 1 – Spontaneous survey knowledge of what the term "nanomaterials" means

Detailed answers:

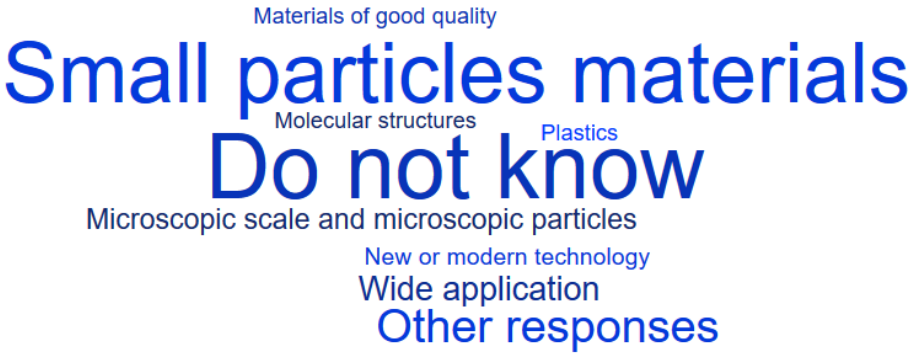
Table 4 - Spontaneous survey knowledge of what the term "nanomaterials" means *(Base: those who declared at least some awareness of nanomaterials, question Q2)*

VIEW BY COUNTRIES						
answers in %	Total	Poland	Bulgaria	Austria	France	Finland
Number of respondents	*3248*	*669*	*779*	*657*	*441*	*702*
Small particles, materials	22	27	18	25	27	14
The various way in which nanomaterials can be used	15	7	19	19	6	18
Nanoparticles, nanotechnologies	8	7	10	8	12	5
New or modern technology	5	7	6	2	5	6
Various qualities, durability, flexibility, etc.	5	5	3	8	3	5
Microscopic scale and microscopic particles	3	3	4	3	3	1
Chemical substances, chemistry	3	0	4	0	0	7
Molecular structures	2	9	1	0	0	0
Wide and different uses	1	1	1	1	3	1
Do not know	19	17	17	16	20	22
Other responses	18	16	19	17	20	20

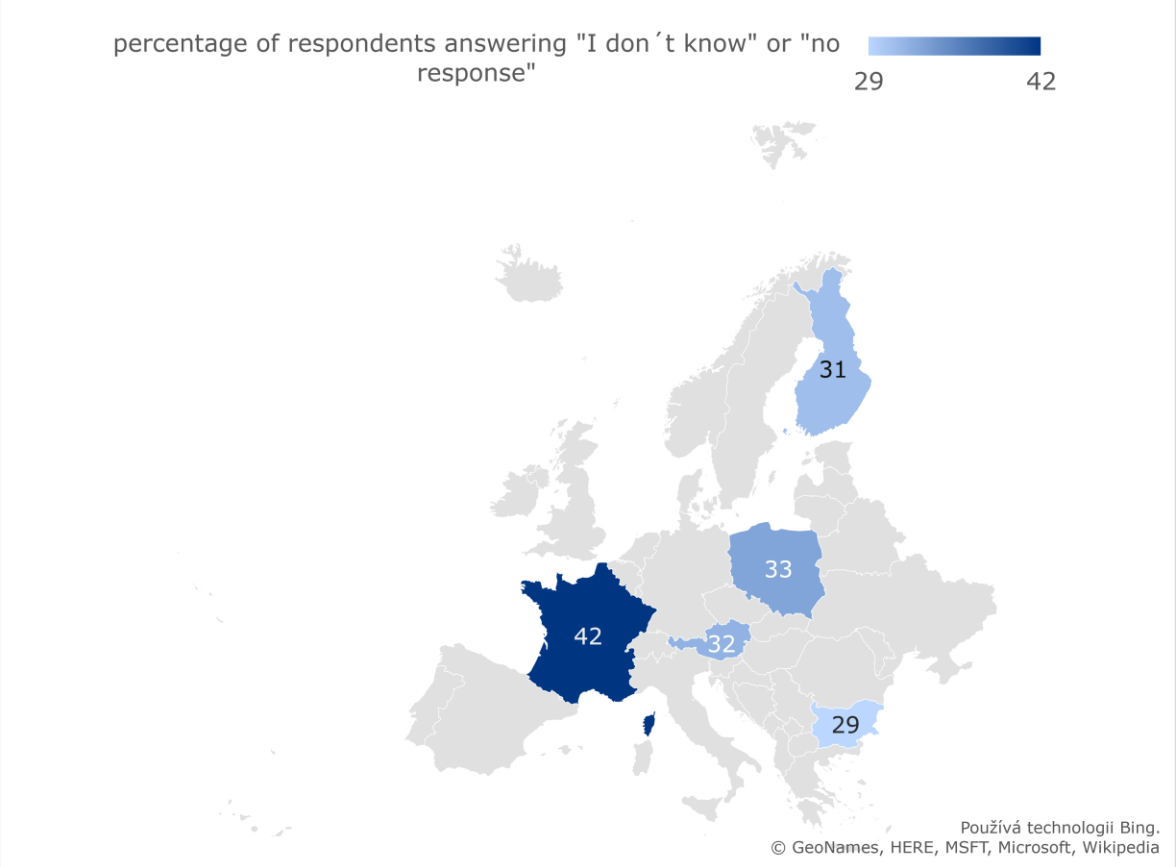
Spontaneous associations with the term “nanomaterials”

Regardless of the overall knowledge of nanomaterials, all respondents were asked for their opinion about nanomaterials. Similarly, to the question on specific awareness above, people mentioned primarily technical aspects such as “microparticles”. About a third of the respondents were not aware of what the term “nanomaterials” means. This group is represented mainly by women, older members of the population and lower socio-economic classes. Education level has a strong correlation with the awareness of nanomaterials. The lower the education level of the respondents, the less aware they are of nanomaterials.

Worldcloud 2 - Spontaneous associations with the term "nanomaterials"

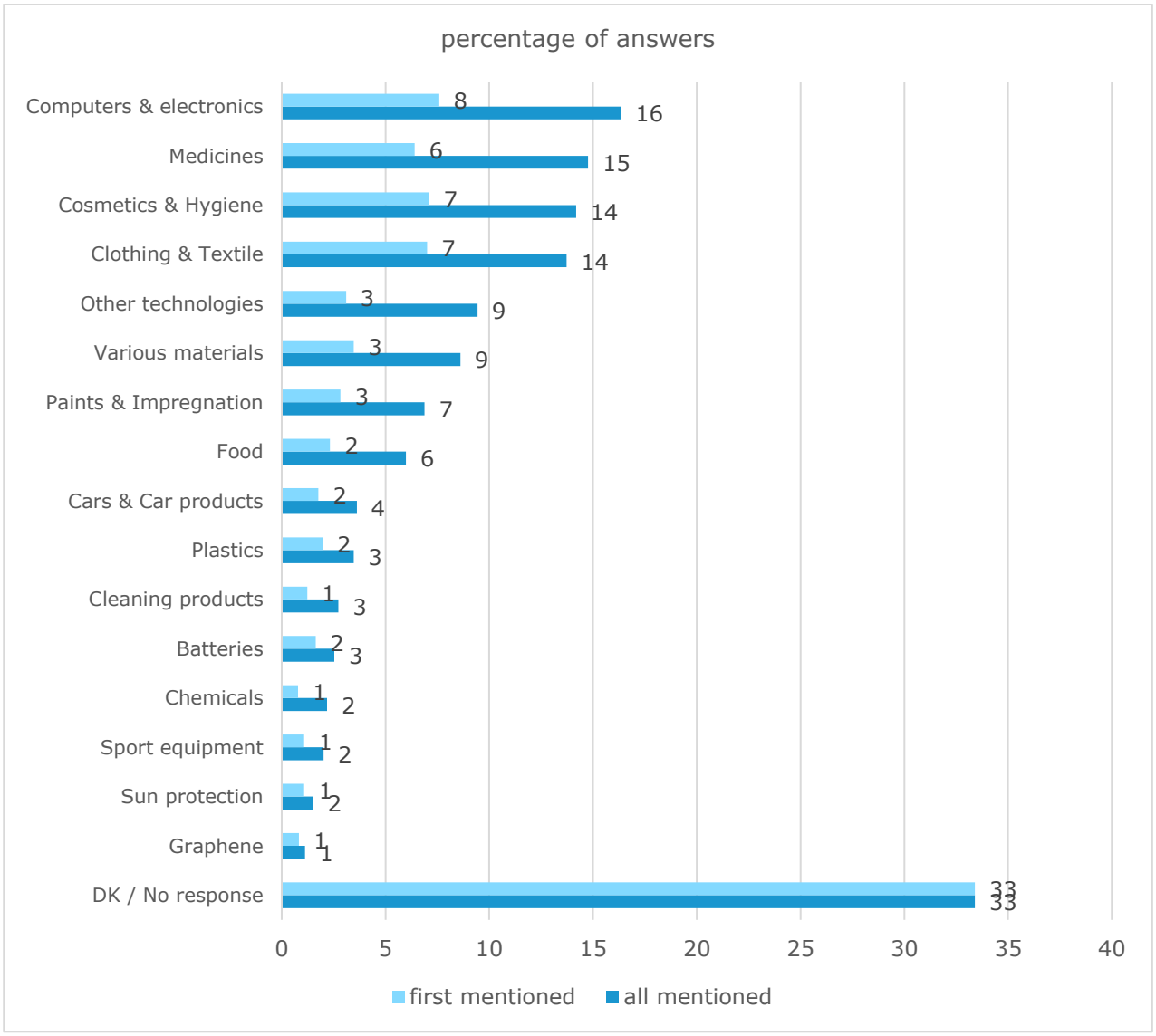


Cartogram 4 - Level of nanomaterials awareness *(N=5000, question Q3)*



When asked to name three products (or groups of products) which may contain nanomaterials (without giving the respondents a list of options to select from), the respondents most frequently mentioned computers and electronics (characteristic for all countries except for Austria), followed by medicines (except for Austria and Finland) and chemical products, specifically cosmetics (except for France).

Graph 10 - Spontaneously mentioned product categories possibly containing nanomaterials
(N=5000, question Q4)

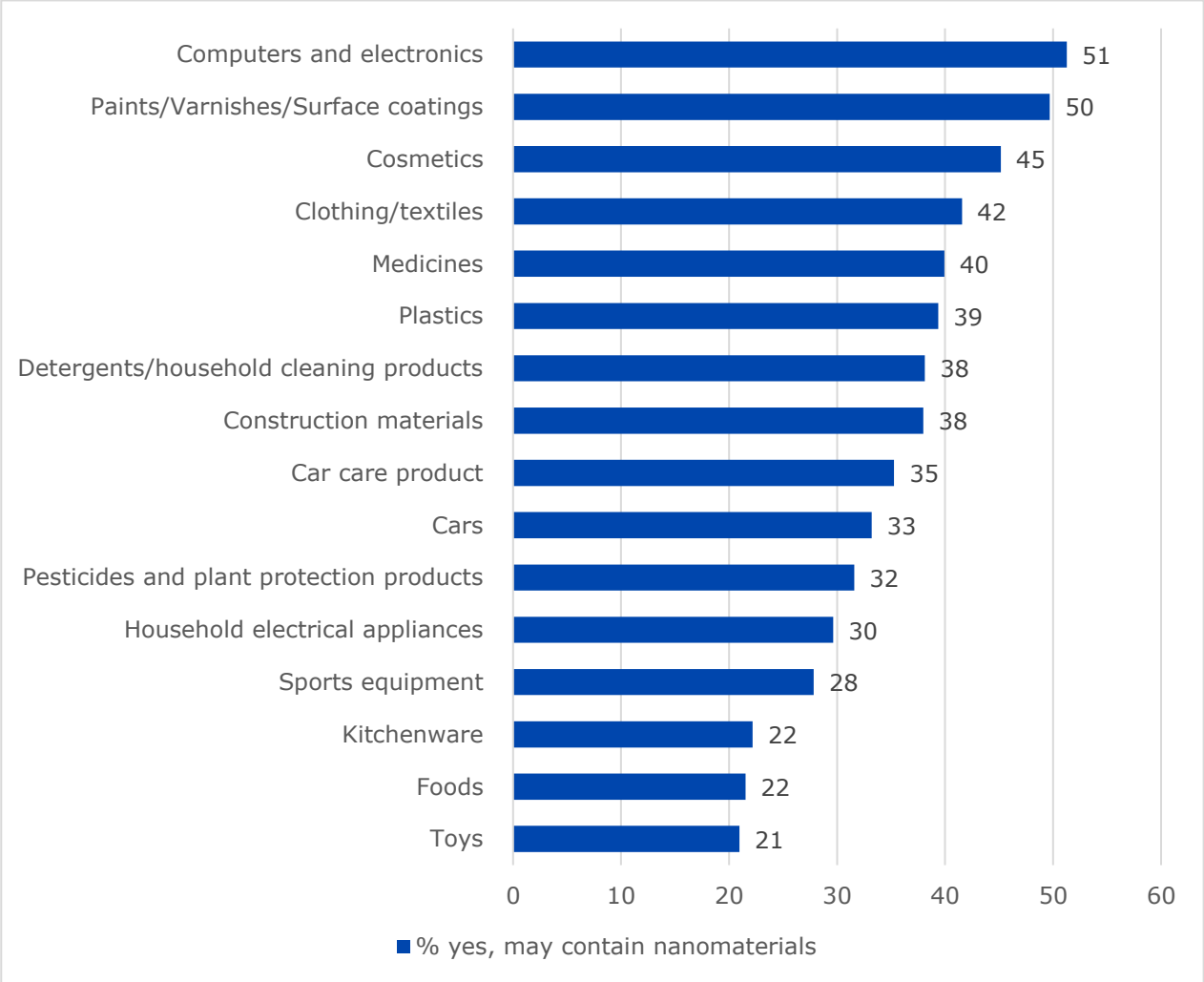


Prompted associations with the term "nanomaterials"

People associate the term "nanomaterials" primarily with hi-tech or chemical products.

About half of the respondents associated nanomaterials with their use in computers or electronics in general (in Bulgaria 60%) and paints or varnishes (the majority in Austria, 58%). Over 40% of the respondents associated it also with cosmetics (the majority in Finland, 54%) and textiles (there is a great difference between countries – highest percentage observed in Finland and Austria (51%), lowest in Bulgaria and France (33%)). Products where the lowest percentage of the respondents would expect nanomaterials are kitchenware, toys, and food.

Graph 11 - Prompted associations with common product types which may contain nanomaterials *(N=5000, question Q5)*



The association of nanomaterials with different products is strongly dependent on the level of education of the respondents throughout all the countries. People with a university degree or current students tend to associate nanomaterials with specific products more often than those with lower or middle-level degrees. This can be valid for new technologies in general, however, the current survey did not study this phenomenon.

Nanomaterials awareness outside of Europe

Americas

In 2002, a survey about nanomaterials was conducted in the USA (n=1500). The term "nano" was familiar to roughly 60% of individuals ages 14-59. The term was less familiar to children under 14 and those 60 and over. Across the sample, slightly more people had heard of "nano" than "nanotechnology". The term nanotechnology was most familiar to those ages 14-28, and this age group could sometimes offer a correct definition. The majority (90%) did not know the term nanotechnology, and those who gave a correct or semi-correct answer said they learned about nanotechnology because they were avid readers, science enthusiasts, National Public Radio listeners or investors. 1% of the entire sample could correctly define the terms. (Waldron, Spencer et al. 2006)

In 2004, more than 80% out of 1536 respondents in the USA indicated that they heard little or nothing about nanotechnology. On average, respondents could answer just one of three factual true or false questions correctly (Mir 2007).

In 2005, familiarity remains low, with 57% of respondents in the USA and 64% of Canadians indicating they are ''not at all familiar'' or ''not very familiar'' with nanotechnology (Priest 2006). In 2005, out of 978 students and staff of a university in the USA, over 18 years old and not related to science and engineering fields, 17% were aware of the term nanotechnology, 45% heard about it. Majority of women did not know about nanotechnology.

The study subjects of a 2006 USA study reported being relatively unfamiliar with nanotechnology. The vast majority (over 80%) reported having heard either "just a little" (28%) or "nothing at all" (54%) about it. Only 4% reported having heard "a lot" about nanotechnology before the study, and 14% reported having heard "some", an amount in between "just a little" and "a lot." (Kahan, Braman et al. 2009)

A study conducted in South Carolina through 2007 – 2010 showed that 64.5% of the 76 respondents were familiar with nanomaterials/nanotechnology, however, the state's flagship university "*had created a nanotechnology research program and significant outreach activities took place; the community leaders and Sierra Club members, recruited disproportionately from the state capital of Columbia where this flagship university is located, were much more likely to be familiar with the term "nanotechnology" than those from the other groups, representing smaller cities and towns."* (Priest, Lane et al. 2011)

During a project on emerging nanotechnologies in 2007, a study found out that 49% of the 1003 responding Americans have heard nothing at all about nanomaterials/nanotechnology, 26% heard a little, 17% heard some, 7% heard a lot, 1% were not sure. (Peter D. Hart Research Associates 2008)

In the 2012 Harris Poll, 36% of the 2467 respondents heard nothing at all about nanomaterials/nanotechnology. 26% knew the term, but that was all, 21% knew a little, 12% knew some, 5% knew a lot. (Anonymous 2012)

A Canadian survey from 2016 with 1600 participants from the general public, revealed a very low level of knowledge labout nanotechnology. (Goddard, Muringai et al. 2018)

Table 5 summarises the data collected from previous studies carried out in the Americas.

Table 5 - Nanomaterials awareness in the Americas

Reference area	Study	Year of survey	n	Have you heard of nanotechnology/ nanomaterials? (percentage yes)
USA	Waldron, 2006	2002	1500	60%
USA	Mir, 2007	2004	1536	20%
USA	Kahan, 2009	2006	NA	46%
South Carolina	Priest, 2011	2007-2010	76	65%
USA	Peter D. Hart Research Associates, 2008	2007	1003	50%
USA	The Harris Poll, 2012	2012	2467	64%

Asia

A long-term study conducted from 2005 to 2015 in Iran showed that the respondents have limited knowledge about nanomaterials/nanotechnology (Farshchi, Sadrnezhaad et al. 2011). According to a survey taking place in South Korea in 2010, most of the 1007 surveyed consumers did not clearly understand nanotechnology, nanomaterials and nanoproducts (Kim, Lee et al. 2014).

In a 2012 study in the megacities of Iran, "*the obtained results showed that around 38% of people did not have any information on nanotechnology and could not even tell us any applications or products coming from nanotechnology. Around 34% of the people interviewed showed that they had some preliminary information about the field of nanotechnology and more than 22% of the responders knew somewhat and could tell us some examples of nanotechnology products and applications. Finally, around 5% of them had specific information"* (Rahimpour et al. 2012). The study does not state the number of people participating to the survey. From those who were familiar with nanotechnologies:

- 39% had heard and had some information about applications of nanotechnology in medical sciences
- 32% in industry
- More than 9% in agriculture and natural and environmental sciences
- around 20% neither knew nor remembered any specific application of nanotechnology

In a study carried out in 2012 in Singapore (n=1080), over 80% of respondents reported being familiar with nanotechnology. 7% indicated their understanding as 'a lot', 40% as 'some', 34% as 'a little,' and 19% as 'nothing at all'. About half of the respondents (48%) were, to some extent, aware of the availability of consumer products containing nanomaterials (George, Kaptan et al. 2014).

88% of the 741 respondents in China in 2013 reported having heard of nanotechnology, although they possessed little knowledge about it (Zhang, Wang et al. 2016).

A study among general public in Russia in 2014 reported low knowledge about nanomaterials/nanotechnology (Mikhaylova 2014). In 2017 in Malaysia (n=407), 53% of the respondents had at least some knowledge about them (Kamarulzaman, Lee et al. 2019).

The results are summarised in Table 6.

Table 6 - Nanomaterials awareness in Asia

Reference area	Study	Year of survey	n	Have you heard of nanotechnology/ nanomaterials? (percentage yes)
Iran	Rahimpour, 2012	2012	NA	61%
Singapore	George, 2014	2012	1080	81%
China	Zhang, 2016	2013	741	88%
Malaysia	Kamarulzaman, 2019	2017	407	53%

Australia and New Zealand

The first information about the public awareness of nanomaterials/nanotechnology in Australia and New Zealand comes from a 2012 survey with 1000 participants, where the majority (77%) reported having zero knowledge about the topic (Cormick and Hunter 2014).

In 2013, however, when the public (1355 respondents) were asked for examples of nanotechnology, it elicited positive images of miniaturised products such as computers. In particular, an Australian survey found public perceptions of nanotechnology were focused on medical or implant devices; microtechnology/miniaturisation; small robots; computing or computing components; and cosmetic or healthcare products (Capon, Rolfe et al. 2016).

3.2 General shopping habits and shopping behaviour related to products containing nanomaterials

This chapter covers general habits of reading safety information when buying a product for the first time and willingness to pay a higher price for potentially safer products. The key question of this chapter is also the willingness to purchase various types of products if they contain nanomaterials including spontaneous reasons for reservations towards them.

List of questions analysed in this chapter (questions marked with an asterisk are open-ended):

Q7. When buying a new product for the first time, do you read safety information to determine whether the product is safe to be used in the way you intend to use it?

a. *Yes, always*
b. *Sometimes, when I have doubts whether the product is safe or not*
c. *No, never*

Q8. When deciding between buying two products with the same functional properties, which of the following statements would you agree with?

a. *I am willing to pay a much higher price (over 20%) for the product which is less harmful to my health and/or the environment*
b. *I am willing to pay a slightly higher price (1-20%) for the product which is less harmful to my health and/or the environment*
c. *I am not willing to pay a higher price for the product which is less harmful to my health and/or the environment*

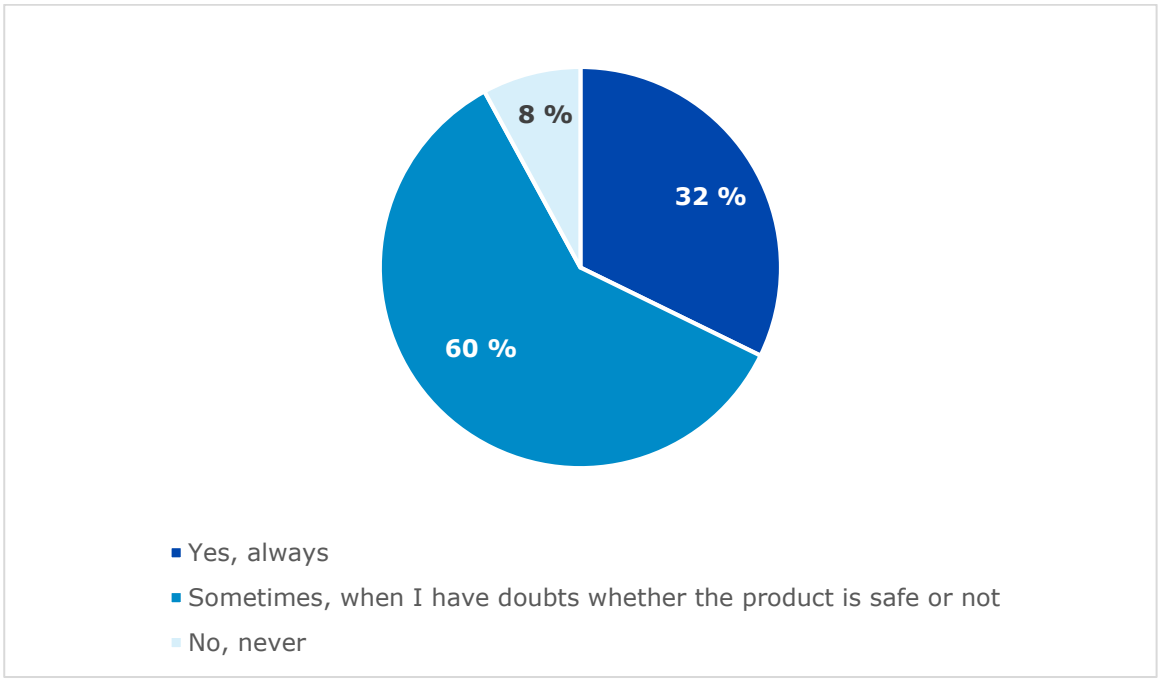
Q9. Would you buy products from the following groups if they contained nanomaterials?

	Yes, even more likely than products not containing nanomaterials	*Yes, without any concern*	*Yes, but with some reservations*	*Definitely not*	*Main reasons why not:*	*DK, I can't decide*
Cars	○	○	○	○	.....	
Sports equipment	○	○	○	○	.....	
Medicines	○	○	○	○	.....	
Paints/Varnishes/Surface coatings	○	○	○	○	.....	
Foods	○	○	○	○	.....	
Plastics	○	○	○	○	.....	
Household electrical appliances	○	○	○	○	.....	
Computers and electronics	○	○	○	○	.....	
Clothing/textiles	○	○	○	○	.....	
Construction materials	○	○	○	○	.....	
Detergents/household cleaning products	○	○	○	○	.....	
Cosmetics	○	○	○	○	.....	
Toys	○	○	○	○	.....	
Kitchenware	○	○	○	○	.....	
Pesticides and plant protection products	○	○	○	○	.....	
Car care products						

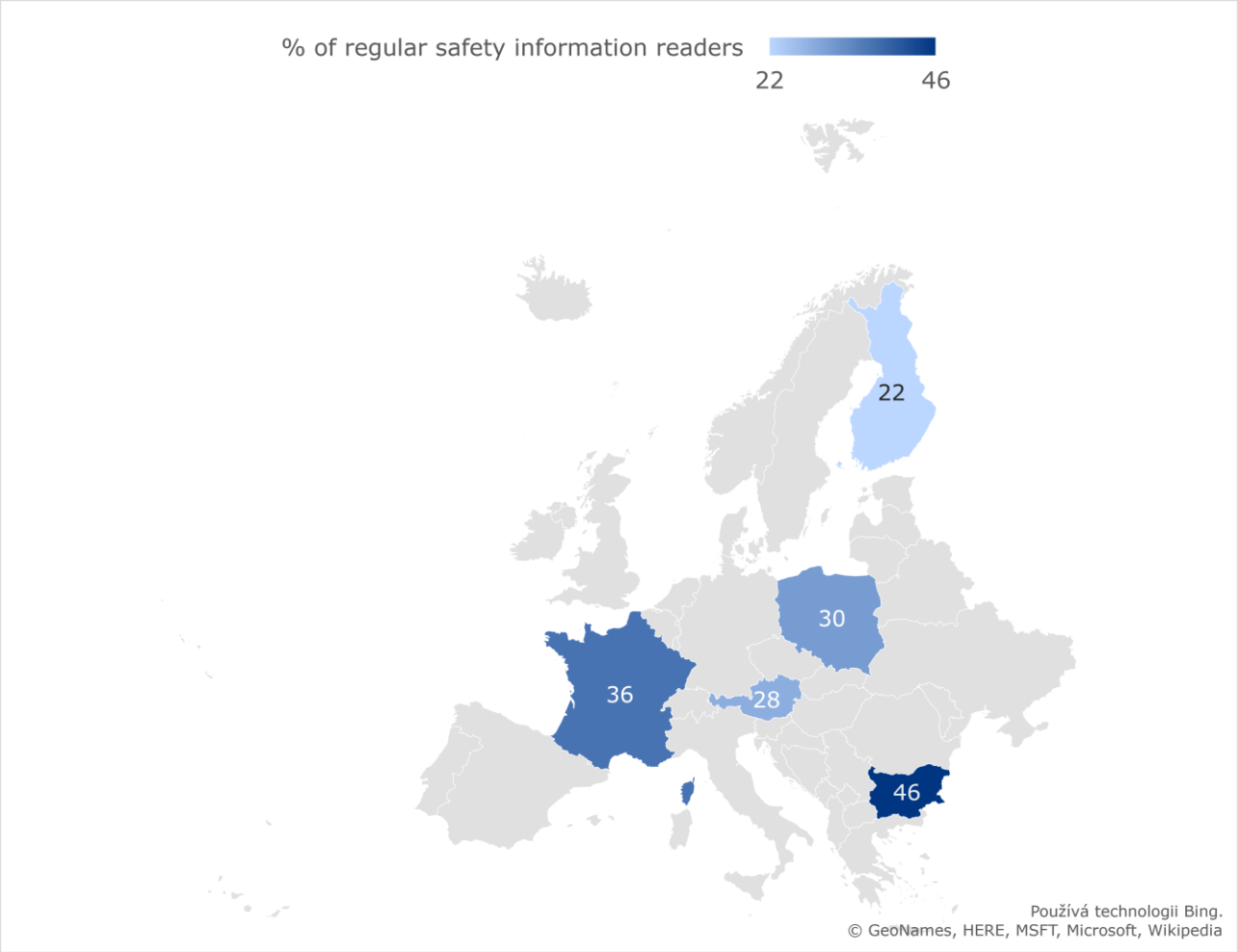
Searching for information when buying goods

Only a third of respondents declared to be reading safety information regularly when buying a product for the first time. The fact that another 60% reads this information whenever in doubt about the safe use of a product indicates the importance of such information.

Graph 12 - When buying a new product for the first time, do you read safety information to determine whether the product is safe to be used in the way you intend to use it? *(N=5000, question Q7)*



Cartogram 5 - Percentage of respondents who read safety information regularly when buying a new product *(N=1000 per country, question Q7)*

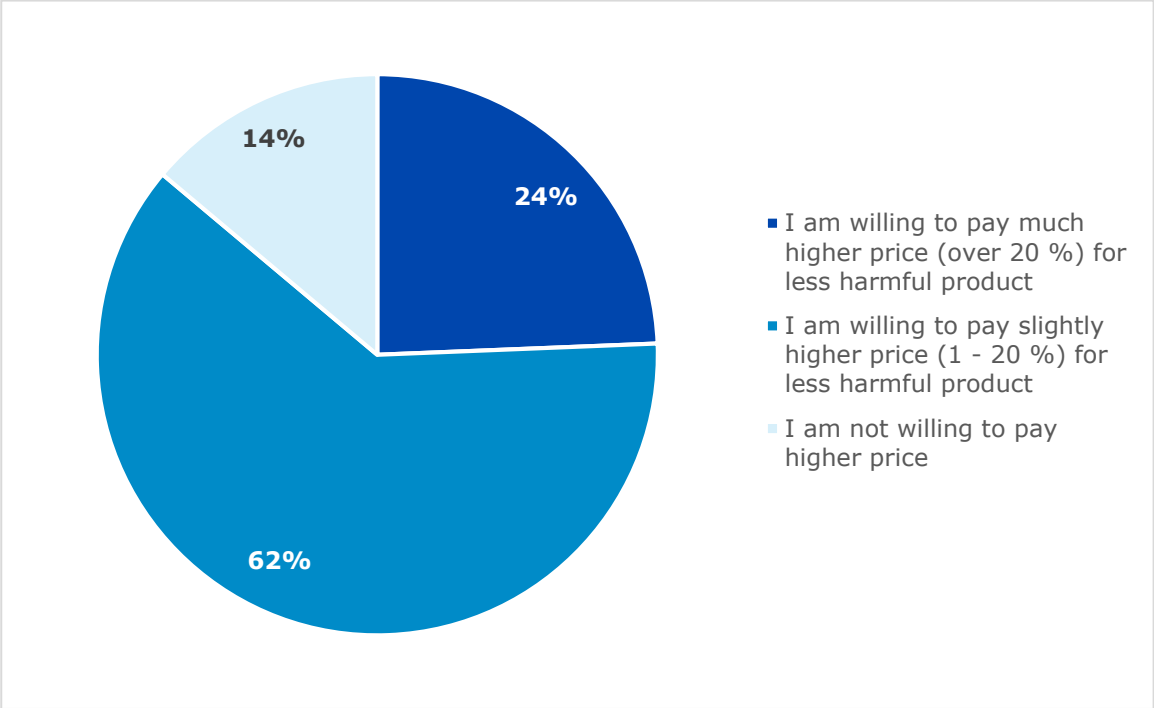


Bulgaria and France have the highest share of consumers that look for safety information regularly when buying a new product. Consumers in other countries, especially Finland, indicate a high level of trust in the products they are buying – besides the lowest percentage of consumers who read safety information about purchased products on a regular basis, the respondents from Finland also claim to trust the manufacturers of the products as well as the authorities more than the respondents from the other surveyed countries. A further reason for this, although not further investigated in this study, may be attributed to differences in labelling and information requirements to consumers in the individual countries.

Willingness to buy, shopping habits

In line with the growing trend of a healthy lifestyle, people are willing to invest in safer products and goods. More than 80% are open to paying a higher price for products which are potentially safer to human health or the environment.

Graph 13 - Willingness to pay a higher price for a potentially safer product *(N=5000, question Q8)*



Willingness to pay more for safer products correlates with age. The higher the age, the lower the interest to pay a higher price. The same pattern was indicated for income and social-economic status.

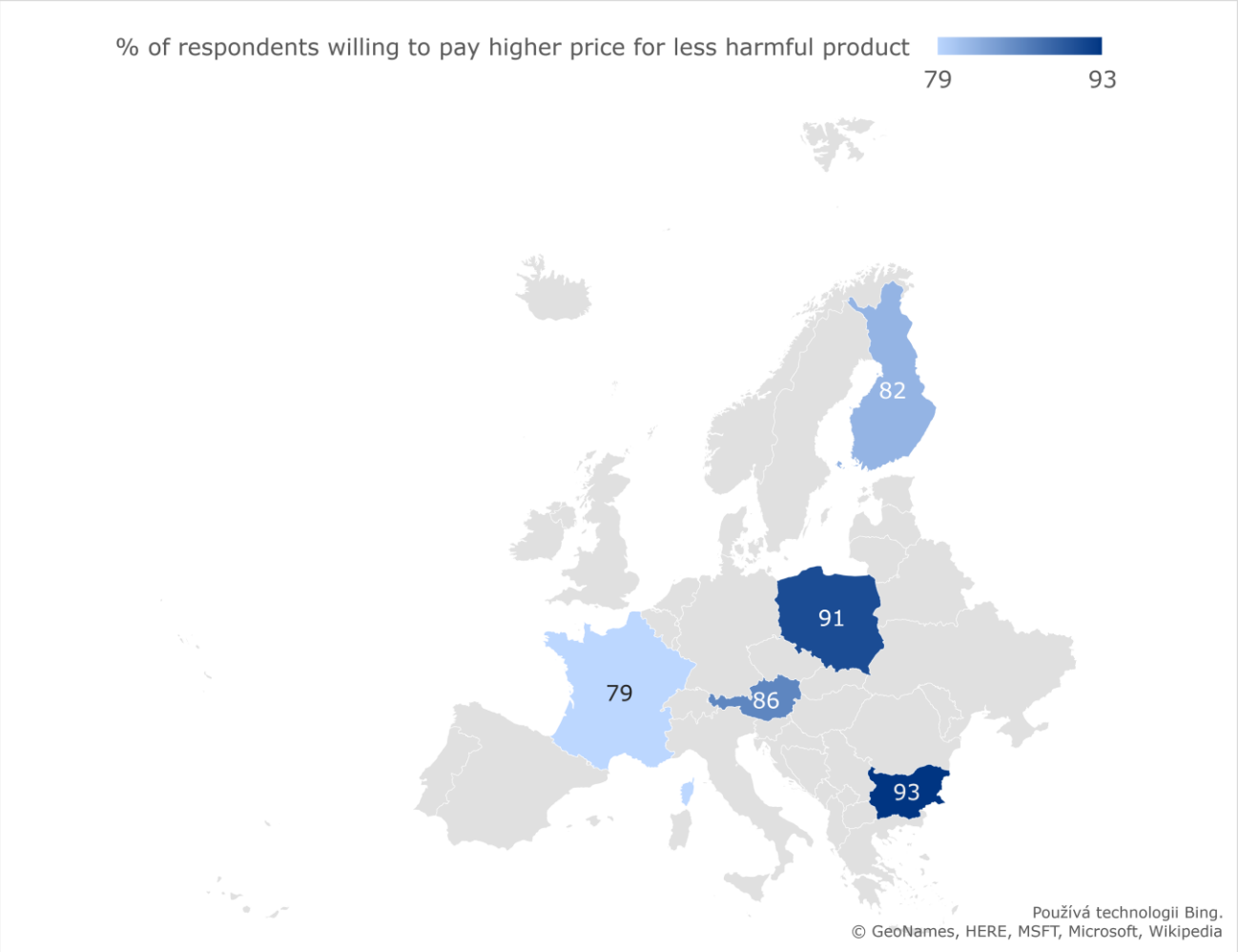
Table 7 - Willingness to pay more for a safer product by age group

VIEW BY AGE GROUPS					
answers in %	Total	16 - 29 years	30 - 39 years	40 - 49 years	50 - 60 years
Number of respondents	*5000*	*1265*	*1268*	*1255*	*1212*
willing to pay over 20 %	24	26	25	24	21
willing to pay + 1 – 20 %	62	64	62	61	60
not willing to pay higher price	14	10	12	15	18

Hypothesis: "With the progressive ageing of the young generation, for example, Generation Z, the importance of healthy and safer products will grow".

Even though the willingness to pay more for a safer product seemingly declines with age, it is assumed that the trend is more linked to generational lifestyle choices than age. As the younger generations are assumed to be more interested in a healthy lifestyle and care about the environment, their willingness to pay more is likely to persist in the future as their natural lifestyle choice.

Cartogram 6 - Willingness to pay a higher price for a safer product *(N=1000 per country, question Q8)*



According to the collected published studies, the public is less likely to buy food and personal care products containing nanomaterials/processed with nanotechnology than products without (Siegrist, Stampfli et al. 2009).

For nanotechnology-treated food packaging, the perceived benefits were still substantially higher than other products (Steenis and Fischer 2016).

However, most of the studies did not analyse shopping habits and public willingness to buy concerning nanotechnology.

Purchase intentions for products containing nanomaterials

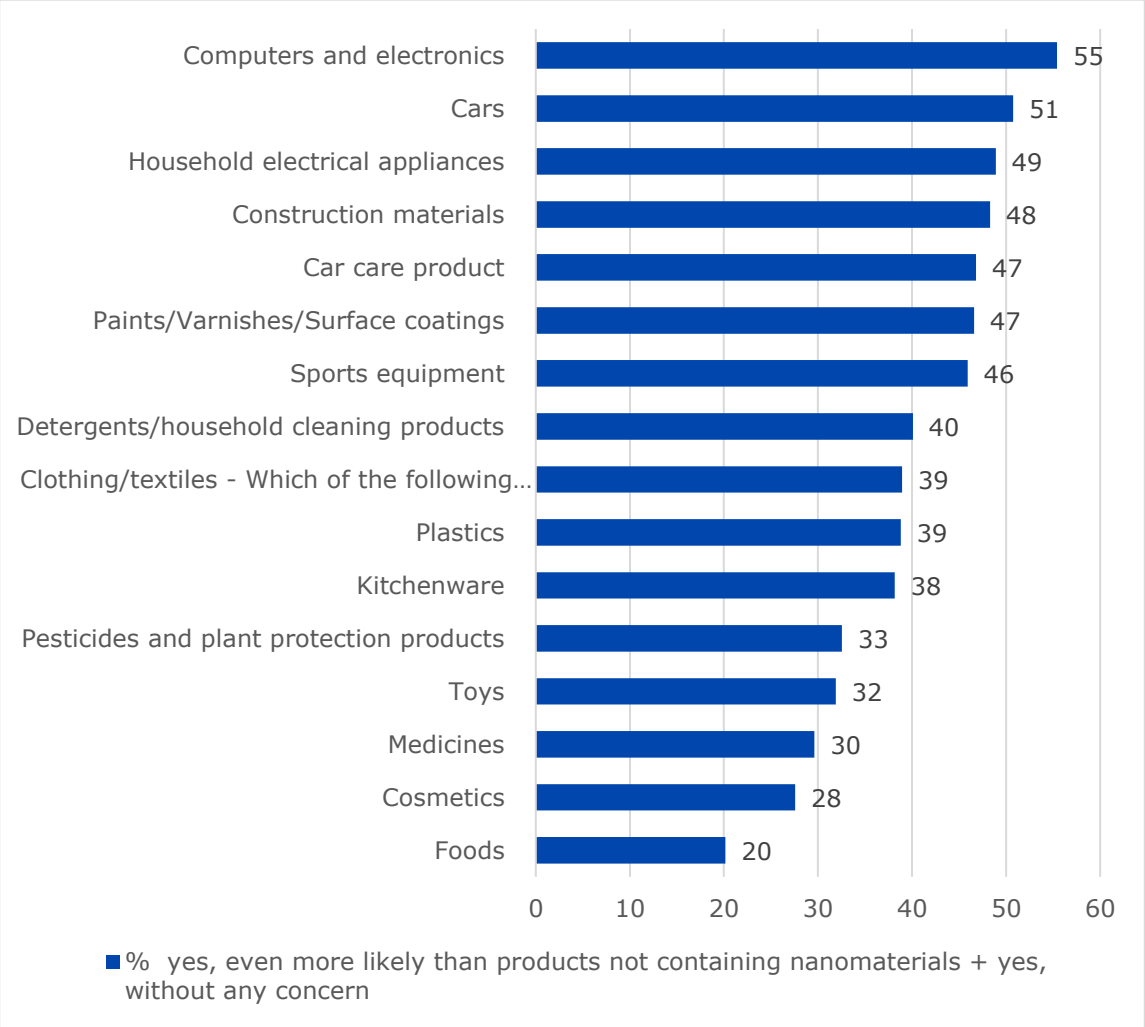
Regarding willingness to buy them, the types of products containing nanomaterials can be divided into three groups:

The first group represents products or goods of long-term usage with a high level of willingness to buy without any concern, particularly electronics, electrical appliances, cars or car products, paints or varnishes and sports equipment.

The second group are household cleaning products, textiles, clothing, or kitchenware. The willingness to buy these products if containing nanomaterials is still relatively high.

The last group are medicines, cosmetics, food and to some extent also toys. The respondents are the least likely to buy food containing nanomaterials, as they are not sure what effects on their health it can have.

Graph 14 - Would you buy products from the following groups if they contained nanomaterials? *(N=5000, question Q9)*



Willingness to buy products containing nanomaterials strongly correlates with the respondents' awareness of nanomaterials. If people are aware of nanomaterials or they are informed about their impact on human health and the environment, the consequent level of potential rejection is low.

Hypothesis: "Transparent communication about a product's content should not be a crucial barrier for the future purchase or usage of the product".

In 2007, in the German-speaking part of Switzerland, a survey about willingness to buy products using nanotechnology was launched. Only the people responsible for grocery shopping in their household were responding to the questionnaire after being given general information about nanotechnology. The willingness to buy the following products was studied:

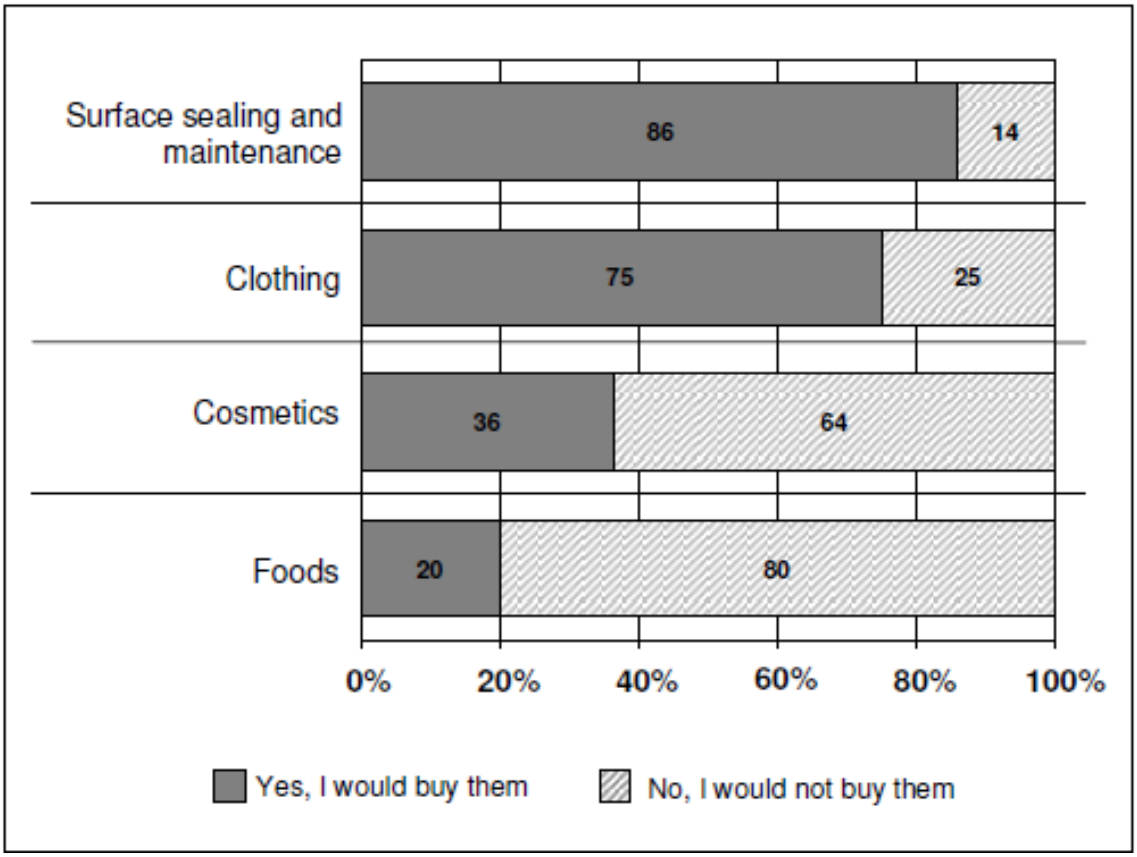
- Food packaging – antibacterial synthetic material containing nano-silver
- Tomatoes coated by applying nanotechnology
- Bread with integrated nanocapsules containing fish oil
- Juice with incorporated nano-beta-carotene

A description of risks and benefits was provided for each product. The respondents were highly reluctant to buy these products; however, they were more likely to buy the food packaging than the food treated by nanotechnology. The study, therefore, suggests that benefit alone does not guarantee acceptance (Siegrist, Cousin et al. 2007).

Another study conducted a year later in the same territory confirms the hypothesis that consumers are more likely to buy food packaging treated with nanotechnology than the food itself (Siegrist, Stampfli et al. 2008).

A 2008 study conducted by the German Federal Institute for Risk Assessment (BfR) (Zimmer, R. 2008) summarises its findings of consumers' willingness to buy products containing nanomaterials/treated by nanotechnologies in Figure 2.

Figure 2 - Willingness to purchase nanoproducts in various product groups (Zimmer, R. 2008)



A study about consumer acceptance of food nanotechnology in Italy in 2014 was conducted (Sodano, Gorgitano et al. 2016): *"A questionnaire was administered to a sample of about 300 people to gather information about the willingness to buy six nano foods (namely: creamier ice cream with the same fat content; salt and sugar that do not form lumps with moisture; fruit juices enriched with bioactive molecules; bread enriched with Omega-3; plastic bottles for beer; antimicrobial food packaging for meat) and psychological characteristics, measured by several attitudinal scales. In order to study the influence of the attitudinal factors on the willingness to buy nanotechnology a simultaneous equations model was estimated, defining both its structural and reduced form.*

Findings – Respondents show a certain reluctance to buy foods produced using nanotechnologies. The estimates of the econometric model indicate that willingness to buy products containing nanomaterials is affected by the risks and benefits perceived with respect to the six nano foods under consideration; the level of neophobia, as captured through the food technology neophobia scale; and the level of trust in food industry.

… Our study confirmed some general results previously attained by other studies, that is a certain reluctance to buy foods produced using nanotechnologies due mainly to the following factors: a comparatively higher perception of risks associated with the new technologies than the expected benefits; a low level of trust; a certain degree of food technophobia. According to this view, policymakers should engage in communication aimed at increasing public acceptance, conveying information on benefits, and urging greater trust in industry and science. This would be in order to sidestep several of the mistakes made in the field of gene technology and stirring the commercialisation of the new nano products."

The data from an Irish study in 2019 indicates that consumer acceptance and willingness to eat (a hypothetical product) decreased when nanotechnology was introduced. They also indicate that nanoparticle based surface coatings have higher levels of acceptance than nano-inside applications. However, the results also indicate that consumers evaluate products in terms of a combination of attributes and that negative utilities for some attributes (i.e. the use of nanotechnology) can sometimes be offset by the presence of another consumer relevant benefit (Henchion, McCarthy et al. 2019).

Purchase intentions for products containing nanomaterials outside the EU

In a 2013 Australian study, of the 5 studied product categories offered to respondents of a survey, food was of most concern, followed by cosmetics/sunscreen, medicines, and pesticides with a similar level of concern raised among the general public. Tennis racquets and computers containing nanomaterials were of much lower concern to consumers (Capon, Gillespie et al. 2015).

Intentions of 565 New Zealanders to purchase lamb or beef made using nanotechnology were studied in 2006. In terms of agreement percentage, prevalent was the belief that eating the meat would feel unnatural. Most also agreed that animals used to make this product may suffer unforeseen health problems and most agreed that this food example would be unnatural. Almost one half agreed that the development of this product is more about making money than making better food. In addition, nearly one half believed there was a risk that the use of modified animals will result in the contamination of farmland (Cook and Fairweather 2007).

Reasons for reservations when buying products containing nanomaterials

Table 8 - Reasons for reservations when buying products containing nanomaterials *(FILTER: only those, who would not buy given products/goods due to nanomaterial content)*

VIEW BY REASONS										
Answers in %	REASONS									
GOODS	**Unnecessary to use**	**Harmful / Dangerous**	**Environment protection**	**No trust**	**Too expensive**	**Unhealthy**	**Unnatural**	**Unknown effects**	**Other reason**	**Do not know**
Cars	19	14	11	9	2	-	-	-	9	38
Sports equipment	17	24	6	10	2	-	-	-	11	30
Medicines	7	34	1	22	-	-	-	-	15	21
Paints/Varnishes/Surface coatings	11	28	8	10	2	-	-	-	14	28
Foods	4	19	1	9	-	27	16	4	8	10
Plastics	12	20	17	8	1	3	1	3	13	23
Household electrical appliances	5	22	10	12	3	8	-	4	7	28
Computers and electronics	8	21	7	6	2	10	2	2	3	39
Clothing/textiles	7	13	5	10	-	31	7	4	4	19
Construction materials	10	17	7	9	2	12	2	4	7	31
Detergents/household cleaning products	15	22	13	13	1	0	0	0	15	22
Cosmetics	5	8	3	9	-	40	10	5	8	11
Toys	4	44	2	8		11	5	4	7	14
Kitchenware	8	39	5	10	1	11	4	4	5	13
Pesticides and plant protection products	4	19	16	7	1	7	14	2	17	14
Car care products	24	16	10	8	1	-	-	-	12	29

As demonstrated by Table 8, the most frequently mentioned reason in this study for reservations when buying products containing nanomaterials is generally the apprehension of unspecified possible negative impacts on human life. This standpoint indicates "the fear of unknown" without a direct link to health aspects.

The second most frequently mentioned concern is the potential adverse effects on human health, specifically with regard to products that are intended to be in direct contact with the human body (food, kitchenware, cosmetics, medicines, clothing/textiles, toys). The public considers the use of nanomaterials in these types of products to be unnatural, which indicates

a lack of awareness of the reasons and benefits of using such materials.

This is further confirmed by another spontaneously mentioned opinion of the public – the unnecessity of using nanomaterials (typically regarding the production of cars, sports equipment, detergents/household cleaning products and car care products).

The low awareness and level of knowledge about nanomaterials also projects into the high tendency of the respondents not to buy goods containing nanomaterials for unspecified reasons. Typically, this is the case for goods intended for long-term use – cars, sports equipment, paints/varnishes/surface coatings and household electrical appliances.

3.3 Risk perception

This chapter analyses the personal attitudes of the respondents towards selected new trends, technologies, or areas in terms of their possible impact on one´s life and health.

List of questions analysed in this chapter (questions marked with an asterisk are open-ended):

Q10. What is your personal attitude to the following new trends, technologies, or areas in terms of possible impact on your life?

	I am concerned about possible negative impacts on my life	*I'm not worried about possible negative impact on my life*	*I do not care*	*Cannot say*
Nanomaterials	○	○	○	○
Biofuels from genetically modified crops	○	○	○	○
Mobile phones	○	○	○	○
Self-driving (autonomous) cars	○	○	○	○
Foods from genetically modified crops	○	○	○	○
Asbestos	○	○	○	○
Social networks	○	○	○	○
Pesticides and plant protection products	○	○	○	○
Plastic wastes	○	○	○	○
Globalisation	○	○	○	○
Electronics and computers	○	○	○	○
Artificial intelligence	○	○	○	○
Global warming	○	○	○	○

Q11. With regard to health, the main issue is not to what extent you are exposed to harmful materials, but whether or not you are exposed to them at all.

a. *Completely disagree*
b. *Rather disagree*
c. *Neither nor*
d. *Rather agree*
e. *Completely agree*
f. *DK, cannot say*

Q12. If a person is exposed to an extremely small amount of a material that is harmful at larger amounts, then that person will probably be seriously ill some day in the future, even if the amount is extremely small.

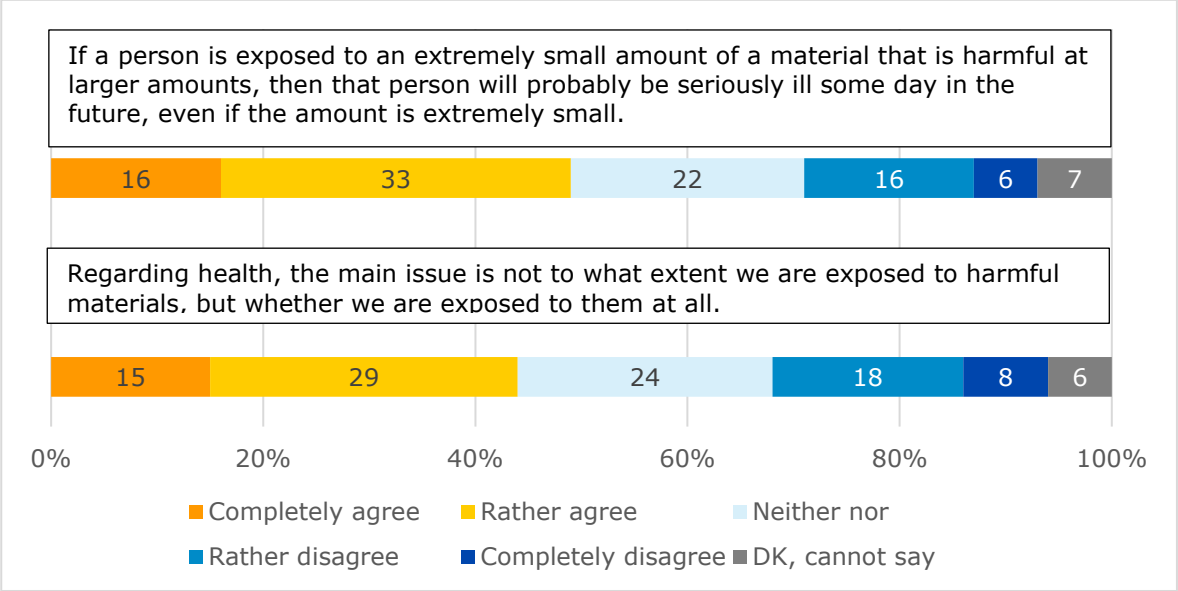
a. *Completely disagree*
b. *Rather disagree*
c. *Neither nor*
d. *Rather agree*
e. *Completely agree*
f. *DK, cannot say*

General attitudes to health risks

Respondents perceive health risks as an important issue, at least on a declarative level they are quite vigilant (almost half of the surveyed population).

Health risk vigilance is typical mainly for Bulgaria and France. Finland is significantly more benevolent in this matter.

Graph 15 - Attitude to health risks *(N=5000, questions Q12, Q11)*



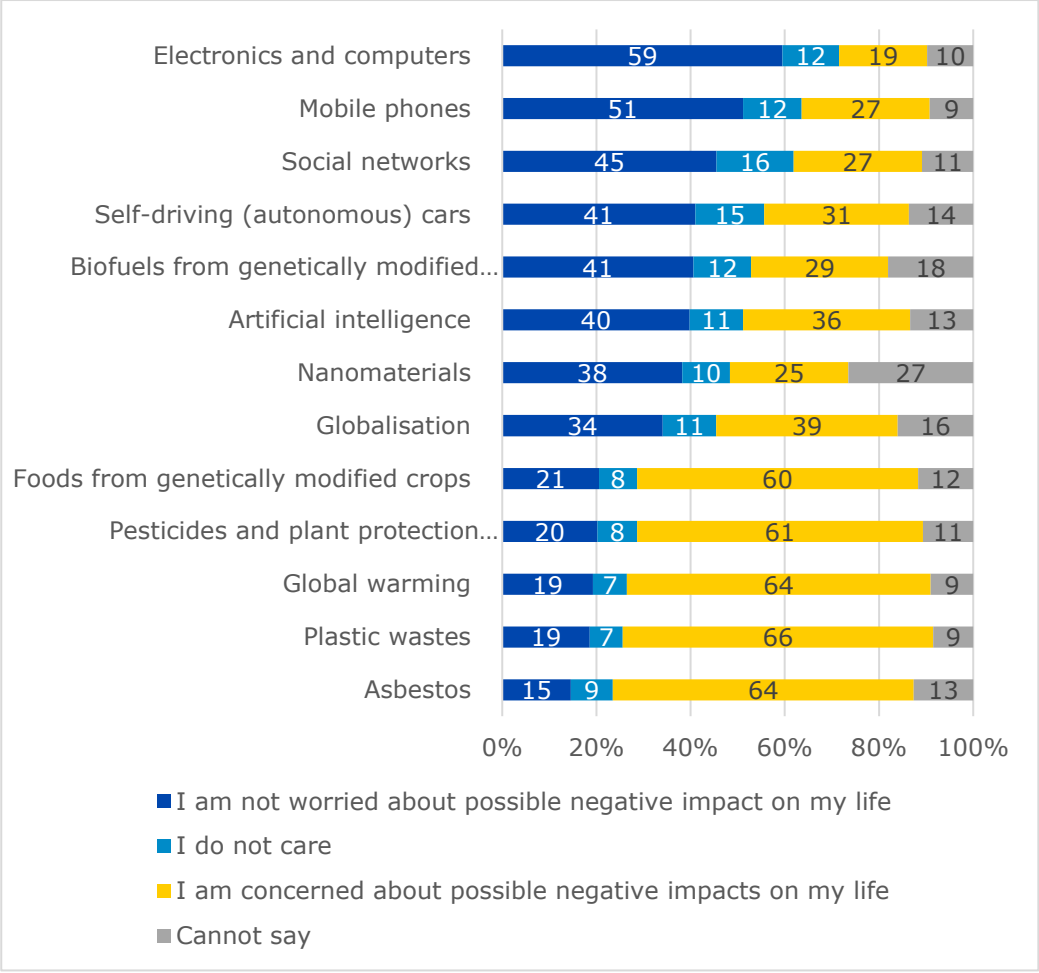
Health risks vigilance slightly differs according to demographical aspects. A more vigilant attitude is more common among women, people over 40, those with a higher level of education and people for whom religion plays an important role.

Attitudes to new trends and possible impact on everyday life

When asking the respondents about the perceived impact of selected global issues, phenomena and technologies on their life, asbestos, plastic wastes, global warming, genetically modified crops and plant protection products are among those raising the most concern. On the contrary, concerns are almost insignificant in technology areas (such as computers, mobiles, autonomous cars etc.).

In comparison with other new trends and technologies, slightly more than one-third of the respondents are worried about possible impacts of nanomaterials on their lives, which is around the same level as generally accepted areas - electronics, computers, social networks etc.

Graph 16 - What is your personal attitude to the following new trends, technologies, or areas in terms of the possible impact on your life? *(N=5000, question Q10)*



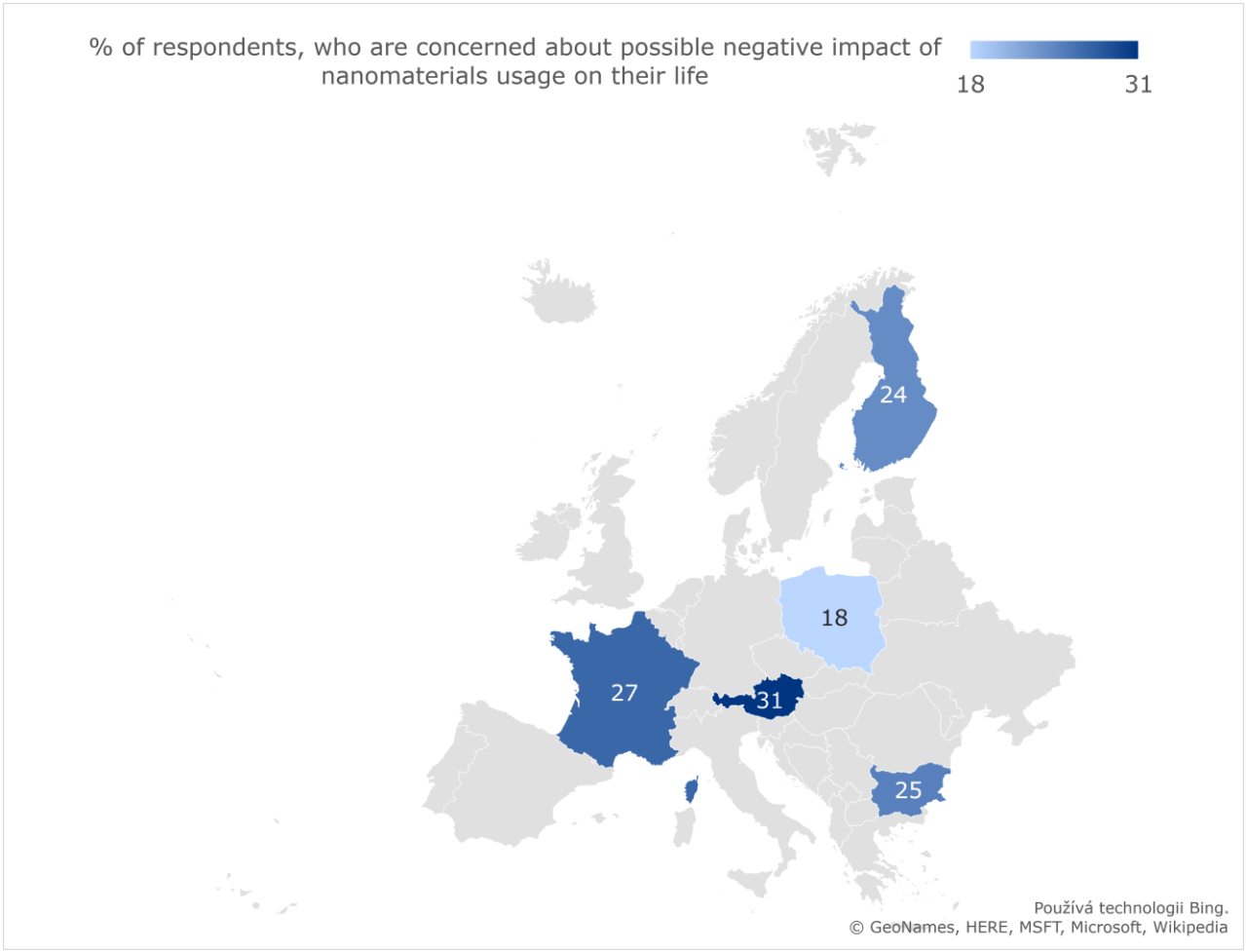
Concerns about the potential negative impact on respondents' lives associated with nanomaterials do not differ dramatically between individual countries.

Table 9 - Concerns about the potential negative impact of nanomaterials on respondents´ lives

VIEW BY LEVEL OF WHAT PEOPLE HEARD ABOUT NANOMATERIALS				
		What people heard about nanomaterials		
Concern level related to nanomaterials	Total	Nothing at all	A little	A lot
Number of respondents	*5000*	*1752*	*2703*	*545*
I am concerned about possible negative impacts on my life	25%	21%	27%	30%
I am not worried about possible negative impact on my life	38%	23%	45%	57%
I do not know + I do not care	37%	57%	28%	14%

The standpoint of "I don't know" or "I don't care" is primarily declared by the respondents with no awareness of nanomaterials. The higher the knowledge, the lower the concern about the negative impact of nanomaterials on one's life.

Cartogram 7 - Level of concern about the potential negative impact of nanomaterials on respondents´ lives *(N=1000 per country, question Q10)*



3.4 Risk perception of nanomaterials

This chapter covers the public perception of the safety of products containing nanomaterials and concerns about being exposed to them. Spontaneous perception of risks and benefits of nanomaterials is studied as well as its change after providing the respondents with short information about the properties of nanomaterials and/or their risks and/or their benefits.

List of questions analysed in this chapter (questions with an asterisk are open-ended):

Q13. Would you say that products containing nanomaterials are:

a. *…safer to use than products that do not contain nanomaterials*
b. *…equally safe to use as products that do not contain nanomaterials*
c. *…less safe to use than products that do not contain nanomaterials*
d. *I cannot decide*

Q14. To what extent do you believe that risks (if any) associated with nanomaterials may be eliminated when nanomaterials are used in a proper way?

a. *Completely disagree*
b. *Rather disagree*
c. *Neither nor*
d. *Rather agree*
e. *Completely agree*
f. *DK, cannot say*

Q15. Are you concerned about being exposed to nanomaterials?

a. *Not at all*
b. *A little*
c. *A lot*

Q16. What are the risks that you associate with nanomaterials?

a. *So far unknown properties of nanomaterials*
b. *Difficult prevention of exposure (tiny particles can get anywhere)*
c. *Other, please specify*
d. *None*

Q17. Which way do you feel is the most likely for people to be directly exposed to nanomaterials?

a. *Inhalation (by breathing)*
b. *Dermal (by skin contact)*
c. *Oral (by swallowing)*
d. *None of the above*

Q18. Now that you have some further information, are you concerned about being exposed to nanomaterials?

a. *Not at all*
b. *A little*
c. *A lot*

Q19. With this information on nanomaterials, how do you estimate the risks and benefits for the following uses?

Use of nanomaterials for…	*The risks associated with using nanomaterials will by far exceed the benefits.*	*The risks associated with using nanomaterials will slightly exceed the benefits.*	*The benefits associated with using nanomaterials slightly exceed the risks.*	*The benefits associated with using nanomaterials will by far exceed the risks.*	*Cannot say*
… a reduction of the salt content in foods while retaining the same taste	○	○	○	○	○
… the enrichment of foods with vitamins and other nutrients	○	○	○	○	○
… indoor paint that prevents the accumulation of odours (e.g. cigarette smoke)	○	○	○	○	○
… an increase in the efficiency of sunscreen	○	○	○	○	○
… active substances of skin cream that reach deeper skin layers	○	○	○	○	○
… the prevention of the occurrence of unpleasant odours in textiles	○	○	○	○	○
… improving texture or colour of foods	○	○	○	○	○
… developing new tastes of foods and flavours	○	○	○	○	○
… extending shelf-life by maintaining or improving the condition of packaged foods	○	○	○	○	○
… drugs which release their active substance in a concentration at the desired spot	○	○	○	○	○
… the repair of damaged tooth (teeth filling or coating)	○	○	○	○	○
…more efficient cleaning of wastewater	○	○	○	○	○
… strengthening the rubber in tyres and other rubber products	○	○	○	○	○
… making plastics (e.g. PET bottles) more durable	○	○	○	○	○
… keeping children's toys clean (reducing bacteria) and making them last longer	○	○	○	○	○
… protecting plants against pests/diseases	○	○	○	○	○

Public perception of risks linked to nanomaterials

Areas, where consumers perceived risks of nanotechnology in the past are the following (sorted according to its relative importance to the consumers – number of their mentions in the researched studies):

- Health risks (accumulation in the body, carcinogenicity, penetrating the blood/brain barrier, harmful food production, etc.)
- Harm to the environment (mainly risks of pollution and contamination of air and water)
- Loss of personal privacy (invisible surveillance devices, mind control)
- Use in weapons (arms race, terrorism)
- Uncertainty about the possible risks coming from an insufficient level of knowledge
- Economic disruption (worsening of the wealth gap, jobs loss, increase of public expenses)
- Uncontrollable spread of self-replicating nanorobots

Generally, the public was concerned about the risks more than the expert groups (researchers, scientists, technology professionals).

An inverse association could have been observed between the level of knowledge about nano and the level of concern about its risks, i.e. the higher the general awareness about nanomaterials is, the less concern the consumers tend to have.

Most respondents perceived the benefits of nanotechnology as outweighing the risks.

Benefits of nanotechnology and nanomaterials as perceived by the consumers were the following (sorted by the author according to its relative importance to the consumers – number of their mentions in the researched studies):

- Development of nanomedicine – better ways to diagnose diseases, targeted drug administration, etc.
- Better care of the environment – water and air treatment, etc.
- Improvement of the quality of life (cheaper, better products)
- New materials and computing
- Economic growth
- Increased national security and defence
- Solution to energy problems
- Food applications
- New opportunities in the job market

The Following is a collection of statements derived from the verbiage contributed by Survey 2001 respondents to provide an overview of concerns associated with nanotechnology. Their relative occurrence was not specified in the study (Bainbridge 2002).

- *The implications of nanotechnology are not fully understood, because it is relatively new.*
- *It is hard to be sure whether human beings will or will not benefit greatly from the use of nanotechnology.*
- *It is hard to evaluate nanotechnology until scientific advance actually produces some applications.*
- *Nanotechnology faces some almost insurmountable theoretical problems.*
- *Proponents of nanotechnology have greatly underestimated the difficulties that must be faced before achieving their most ambitious goals. Nanotechnology may not prove practical outside the laboratory.*
- *It is hard to see how we could benefit from nanotechnology.*
- *Nanotechnology will be applied to some special problems, but it will not greatly benefit mankind.*
- *The impact of nanotechnology is a very complicated issue, since a benefit for one person might harm another.*
- *Old jobs replaced by nanotechnology will be substituted by new jobs related to nanotechnology.*
- *Nanotechnology can be both beneficial and deadly.*
- *We must be cautious in the application of nanotechnology, lest we create unforeseeable conditions that might harm our civilization.*
- *It is still too early to tell how best to use nanotechnology.*
- *The potential benefits of nanotechnology pale in comparison to the bounty that nature has already provided us.*
- *Nanotechnology has the potential to unleash unknown dangers.*
- *Nanotechnology goes against Nature, so it is best left unexplored.*
- *Research in areas like nanotechnology is making us less human.*
- *If we begin to build based on nanotechnology, not only will we be overpopulating with people, but also with structures, materials, and machines.*
- *People's civil liberties will be threatened by the use of nanotechnology in information gathering.*
- *Nanotechnology will make it difficult for an individual to assess whether privacy of body, home or personal life in general is being invaded and manipulated.*
- *The products resulting from nanotechnology will be too expensive for the majority of people.*
- *Corporations will benefit from things like nanotechnology, but individual human beings will find their lot worsened.*
- *The problem with nanotechnology is that it is driven by the profit motive and not by the benefit which can be derived through the breakthroughs.*
- *The biggest risk of nanotechnology is a widening gap between wealthy nations with access to the new technology and nations that do not have access.*
- *We do not have the social maturity to deal with the possible conflicts that may arise from nanotechnology."*

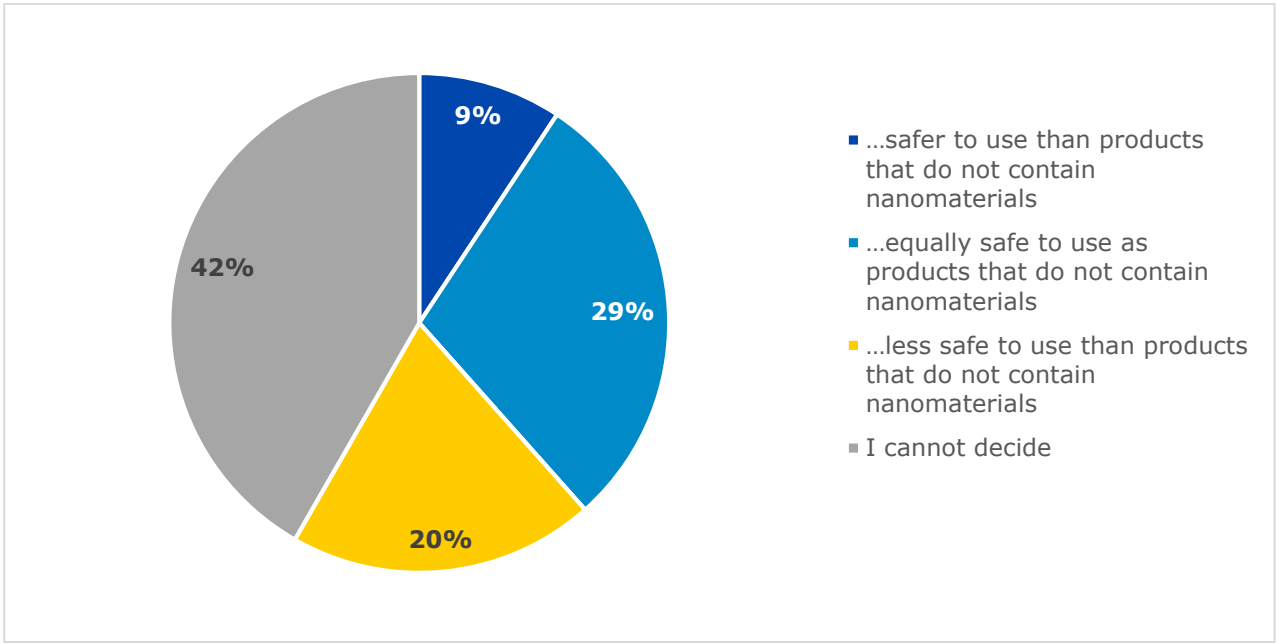
In a study carried out in Switzerland in 2006, 70 citizens feared that nanoparticles might enter the human body and cross the blood-brain barrier, and they were worried that nanoparticles might accumulate in the environment, or that they might be harmful when being integrated

into food. Some people also mentioned that this research might increase a divide between rich and poor countries and that it might result in the loss of certain jobs (Burri and Bellucci 2008).

Eurobarometer 64.3 (Christensen 2009) studied the perception of risks associated with nanomaterials on 28694 respondents in 2002 with the following results:

- 8.6% were very confident in the safety of nanotechnology
- 47.5% were fairly confident
- 29.1% were not very confident
- 14.9% were not confident at all
- 9% totally agreed that nanotechnologies are risky for society
- 28.8% tend to agree
- 44.9% tend to disagree
- 17.4% totally disagreed

Graph 17 - Would you say that products containing nanomaterials are... *(N=5000, question Q13)*



Safety attitudes to products containing nanomaterials strongly correlate with age. The higher the respondent's age, the less safe the products containing nanomaterials seem to the consumers.

Table 10 - Attitudes about the safety of products containing nanomaterials

VIEW BY AGE GROUPS					
answers in %	Total	16 - 29 years	30 - 39 years	40 - 49 years	50 - 60 years
Number of respondents	*5000*	*1265*	*1268*	*1255*	*1212*
Safer or equally safe than products that do not contain nanomaterials	38%	42%	40%	37%	34%

Answers to the question "To what extent do you believe that risks (if any) associated with nanomaterials may be eliminated when nanomaterials are used properly?" indicate a significant level of optimism.

Similarly to previous questions about safety, acceptance of the use of nanomaterials in a proper way goes mainly across Poland and Bulgaria. However, Austria, France and Finland countries are more or less cautioned, Austria especially.

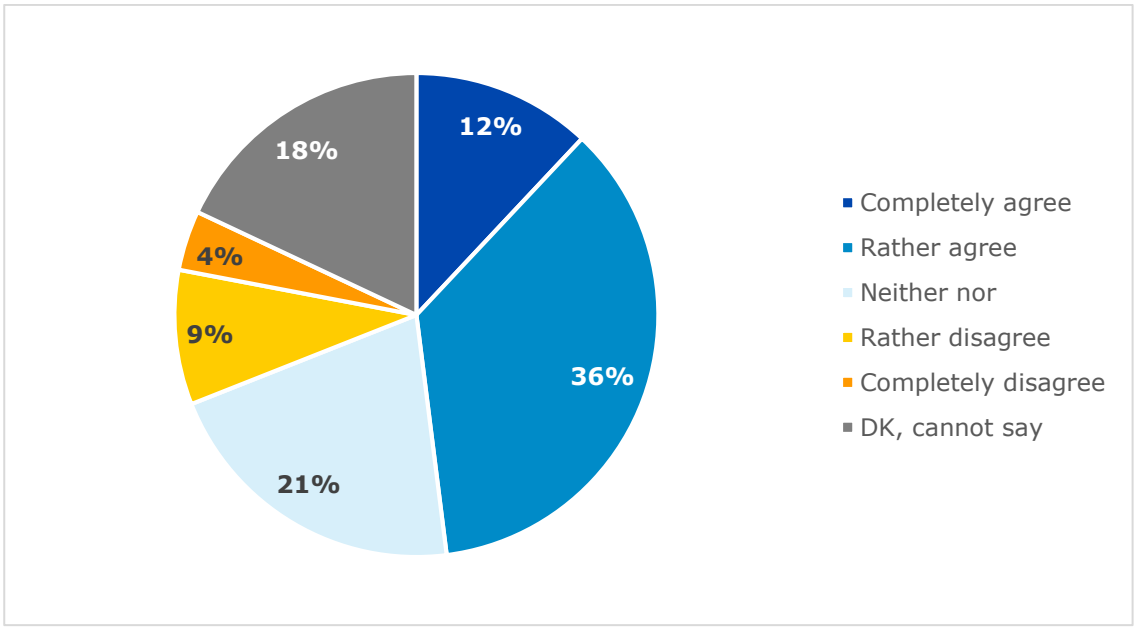
Safety attitudes to products containing nanomaterials also strongly correlated with the level of nanomaterials awareness, see Table 11.

Table 11 - Attitudes to the safety of products containing nanomaterials and nanomaterials awareness

VIEW BY LEVEL OF NANOMATERIALS AWARENESS (what people heard about nanomaterials)				
	Total	Nothing at all	A little	A lot
Number of respondents	*5000*	*1752*	*2703*	*545*
Products containing nanomaterials are safer or equally safe than products which do not contain nanomaterials	38%	23%	43%	63%

The survey results confirmed the hypothesis that the higher the knowledge about nanomaterials, the higher the certainty of a respondent that nanomaterials are safer or equally safe than traditional products. This correlation indicates the need to educate the public about nanomaterials as a common part of everyday life.

Graph 18 - To what extent do you believe that risks (if any) associated with nanomaterials may be eliminated when nanomaterials are used properly? *(N=5000, question Q14)*



Possible exposure of people to nanomaterials certainly does not cause panic. Only a marginal group represented by 7% of all respondents is concerned about possible risks.

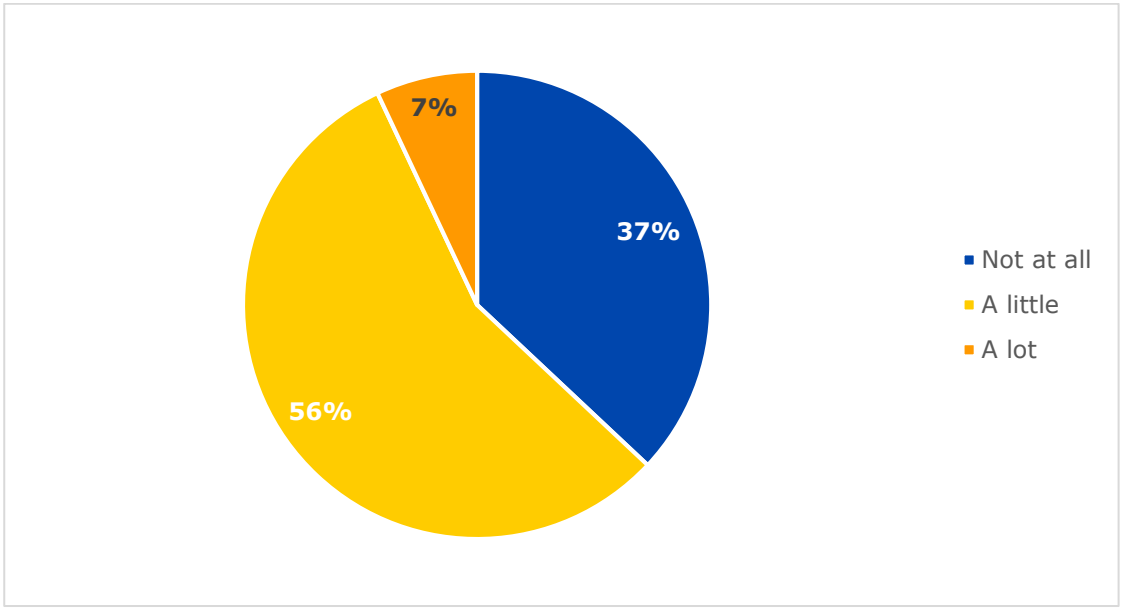
People concerned about potential risks typically have the lowest levels of education, however, the level of knowledge about nanomaterials does not affect this disquieting attitude. The group of people declaring strong concerns about being exposed to nanomaterials is relatively homogenous in terms of nanomaterials awareness.

Conversely, the trust in nanomaterials safety (if they are used properly) strongly correlates with the level of nanomaterials awareness (see Table 12).

Table 12 - The level of agreement that the risks (if any) associated with nanomaterials may be eliminated by their proper use

VIEW BY LEVEL OF NANOMATERIALS AWARENESS (what people heard about nanomaterials)				
	Total	Nothing at all	A little	A lot
Number of respondents	*5000*	*1752*	*2703*	*545*
% of answer: **rather agree + definitely agree**	48%	33%	53%	67%

Graph 19 - Are you concerned about being exposed to nanomaterials? *(N=5000, question Q15)*



Similarly, the level of awareness correlates with the respondents' concern about being exposed to nanomaterials (see Table 13).

Table 13 - Concerns about nanomaterials exposure

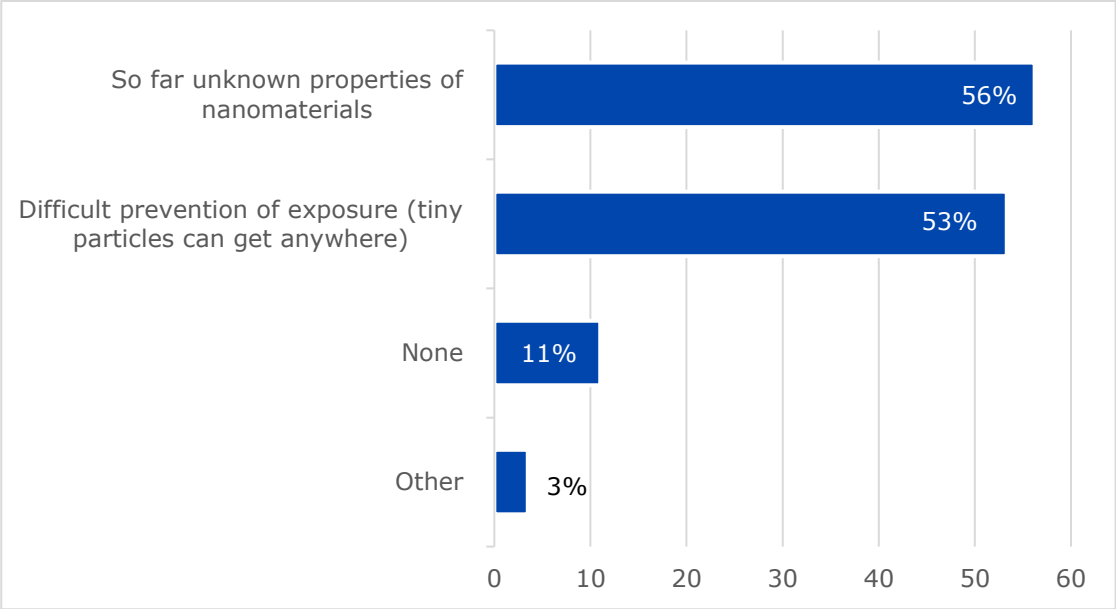
VIEW BY LEVEL OF NANOMATERIALS AWARENESS (what people heard about nanomaterials)				
% of answers	Total	Nothing at all	A little	A lot
Number of respondents	*5000*	*1752*	*2703*	*545*
not at all	37%	32%	38%	50%
a little	56%	59%	57%	42%
a lot	7%	9%	5%	8%

The least concern about potential exposure to nanomaterials is among the respondents who declare extensive knowledge about nanomaterials. The lower the level of knowledge about nanomaterials is, the higher are the concerns about being exposed to them.

Potential risks of nanomaterials

The potential risks perceived are most often associated with the unknown properties of nanomaterials as well as the respondents' inability to avoid or limit exposure effectively. This attitude again resonates with a low level of understanding about nanomaterials (illustrated by Table 14).

Graph 20 - Perceived risks associated with nanomaterials (What are the risks that you associate with nanomaterials?) *(N=5000, question Q16)*



Concerns related to various ways of exposure to nanomaterials do not represent a strong threat. Out of three answer options, skin contact seems to be the most often perceived risk.

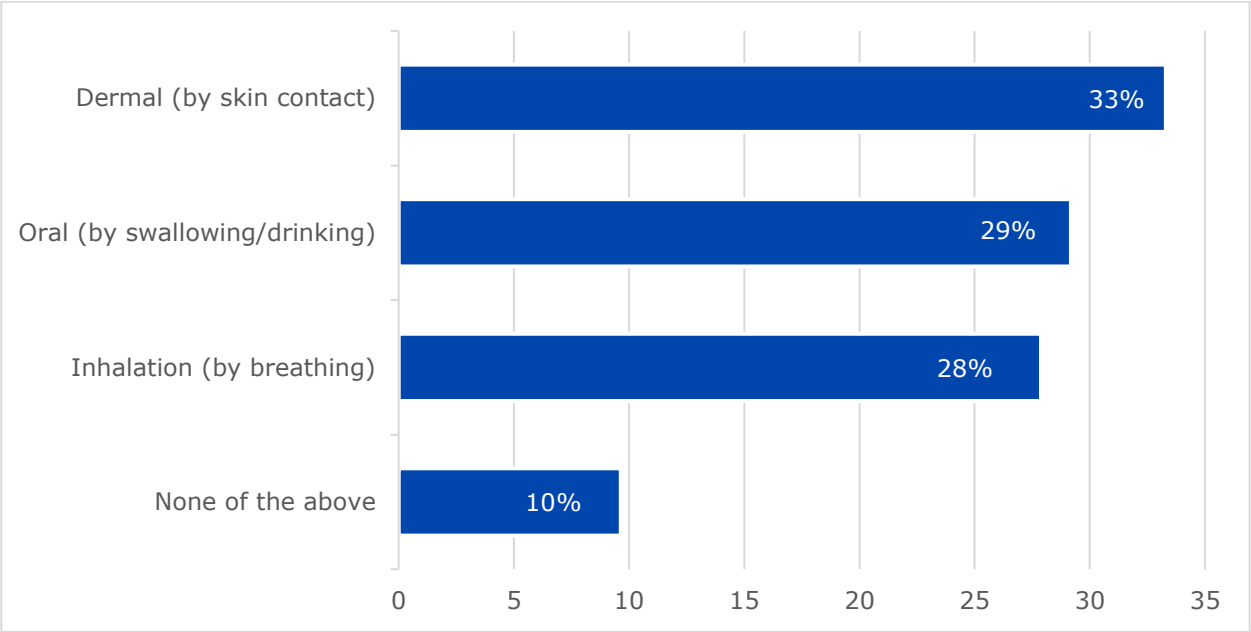
Surprisingly, these attitudes are not strongly differentiated by various demographic aspects.

Table 14 - Perceived risks associated with nanomaterials

PERCEIVED RISKS VS. NANOMATERIALS AWARENESS (what people heard about nanomaterials)				
% of answers	Total	Nothing at all	A little	A lot
Number of respondents	*5000*	*1752*	*2703*	*545*
So far unknown properties of nanomaterials	56%	51%	59%	60%
Difficult prevention of exposure (tiny particles can get anywhere)	53%	49%	56%	55%

Some disconcertion related to the unknown properties of nanomaterials is typical for Bulgaria and Finland while difficulties in preventing exposure to nanomaterials are of more concern among respondents from Austria and Finland.

Graph 21 - Route of exposure to nanomaterials perceived to be most likely *(N=5000, question Q17)*



Results from individual countries show slight variation as shown by Table 15.

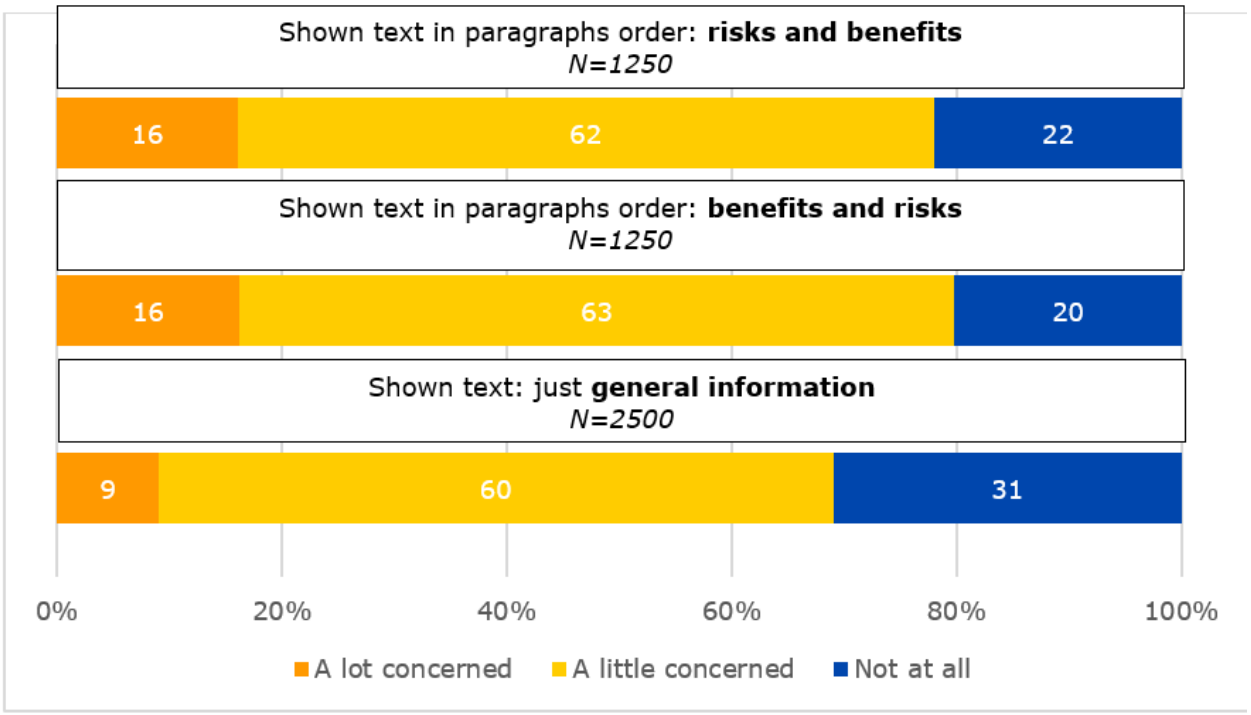
Table 15 - Route of exposure to nanomaterials perceived to be most likely in individual countries

VIEW BY COUNTRIES						
	Total	Poland	Bulgaria	Austria	France	Finland
Number of respondents	*3248*	*669*	*779*	*657*	*441*	*702*
Inhalation (by breathing, %)	28	31	16	26	33	33
Dermal (by skin contact, %)	33	30	39	35	28	36
Oral (by swallowing/drinking, %)	29	25	35	31	31	25
None of the above (%)	10	14	11	8	9	6

Explanatory text about nanomaterials – the impact of communication on attitudes

Before asking the following two questions on exposure to nanomaterials, different variants of the text describing nanomaterials were presented to the respondents.

Graph 22 - Now that you have some further information, are you concerned about being exposed to nanomaterials? *(question Q18)*



Half of the respondents were presented with the following relatively neutral text:

General information:
Nanomaterials contain particles with a size of one-millionth of a millimetre (that's how thin a human hair split 50,000 times is). Materials made up of these particles have special physical, chemical and biological properties.

The other half was presented with a text describing the benefits of nanomaterials as well as risks in varying order. Half of them received a description of benefits first, then a description of risks and the other half in the reverse order.

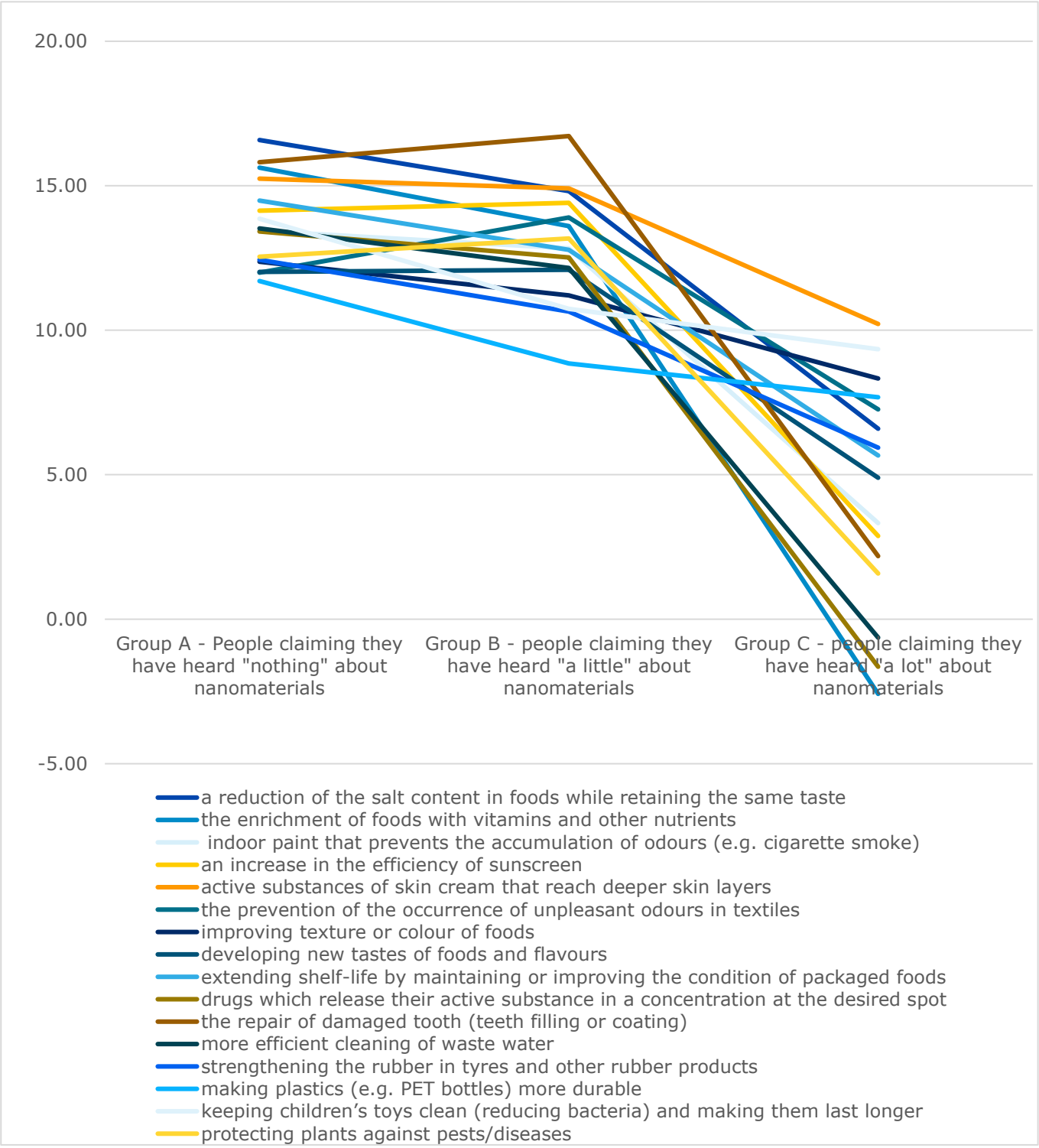
Benefits-oriented paragraph:
Several scientists are assuming significant progress through nanotechnology. Even today, nanomaterials can improve the properties of paints, clothing, and cosmetics. In the future, they may contribute among other things, to treating diseases more effectively, making food keep for longer, improving computers and repairing environmental damage. That's why they could possibly even trigger a new economic boom.

Risks-oriented paragraph:
Several scientists have pointed out the possible risks of nanotechnology. Nanomaterials could for example penetrate into organisms and endanger our health. They could promote resistance to certain bacteria and possibly cause cancer. They might also pollute the environment. Wider use of nanomaterials and more intensive research began just 20 years ago, some risks associated with the use of nanomaterials may have not yet been discovered.

This approach was used to determine the possible impact of communication on respondents´ behaviour depending on the specific content and messages given by the text.

The results indicate that any communication about nanomaterials that also warns of potential risks finally affects respondents´ attitudes and consequently their behaviour.

Graph 23 - The percentual difference in concerns about uses of nanomaterials in different areas after presenting information about the risks of nanomaterials



Those who have been provided with the text about nanomaterials describing, among other aspects, information about possible risks, declare stronger concern. This group is represented more often by those who initially had no information about nanomaterials. However, well-informed people did not change their attitudes significantly based on the description provided by the survey text. Graph 23 describes this phenomenon in detail. In this graph, we can see the percentual difference in respondents´ concerns about different uses of nanomaterials after

presenting them with information about nanomaterial risks. The increase in the subjective concerns of respondents who claimed to have heard "a lot" about nanomaterials is significantly lower than of those who have heard "nothing" or "a little" about nanomaterials prior to the survey.

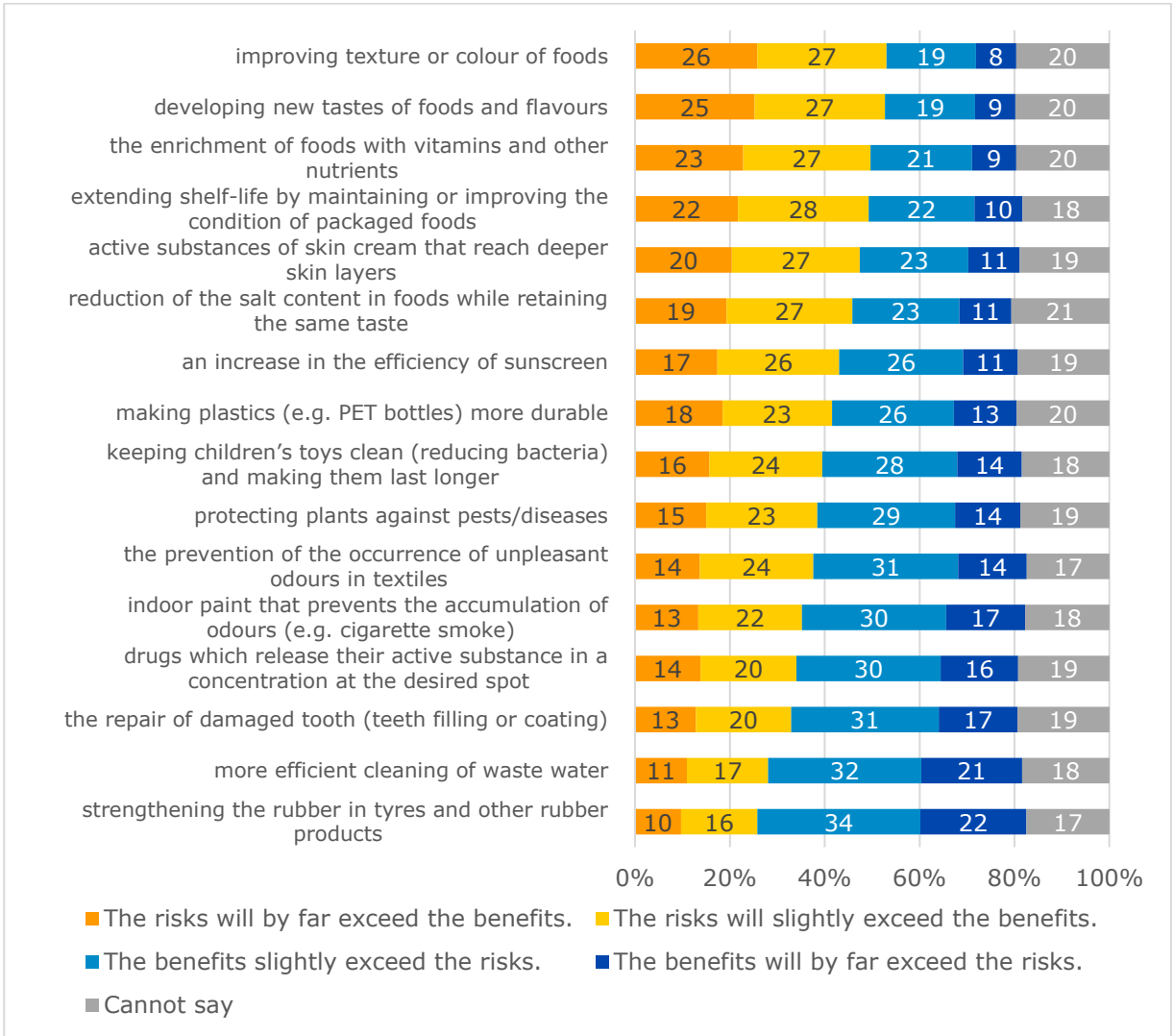
The respondents' typical attitude correlates with a low level of understanding about nanomaterials. Almost half of the respondents are unable to make a clear decision whether they associate products containing nanomaterials to be more, or less risky than "traditional products" (products not containing nanomaterials).

Based on the presented description of nanomaterials, respondents evaluated their level of potential risks versus their benefits within various areas.

Graph 24 shows a visible tendency that the perceived risks outweigh the benefits in products intended for direct consumption or materials in contact with such products (i.e. packaging). The only exceptions from this clear trend can be observed with healthcare products (e.g. tooth fillings or medicines).

On the contrary, technological areas (such as tyre manufacture or wastewater treatment) do not cause strong concerns and the perceived benefits outweigh the risks associated with these products and technologies.

Graph 24 - Now that you have some further information about nanomaterials, how do you estimate the risks and benefits of the following uses of nanomaterials? *(N=5000, question Q19)*



Attitudes towards the uses described above go across the population without any specific or significant demographic differentiation.

In terms of specific countries, the public in Austria tends to be more sensitive to potential risks as the risk perception in particular areas is higher compared to other countries. Vice versa, France and especially Poland are among the countries with a lower risk perception within most of the evaluated areas.

The type of information presented to consumers affects their general perception of nanomaterials use safety. As illustrated by Graph 25, respondents, who have been presented with a description of potential risks tend to be significantly more sceptical – they are inclined to think that the risks will outweigh the benefits in all areas of use.

Graph 25 - Impact on attitudes related to nanomaterials, comparison between different types of submitted text *(N=2500 per subgroup, question Q19)*

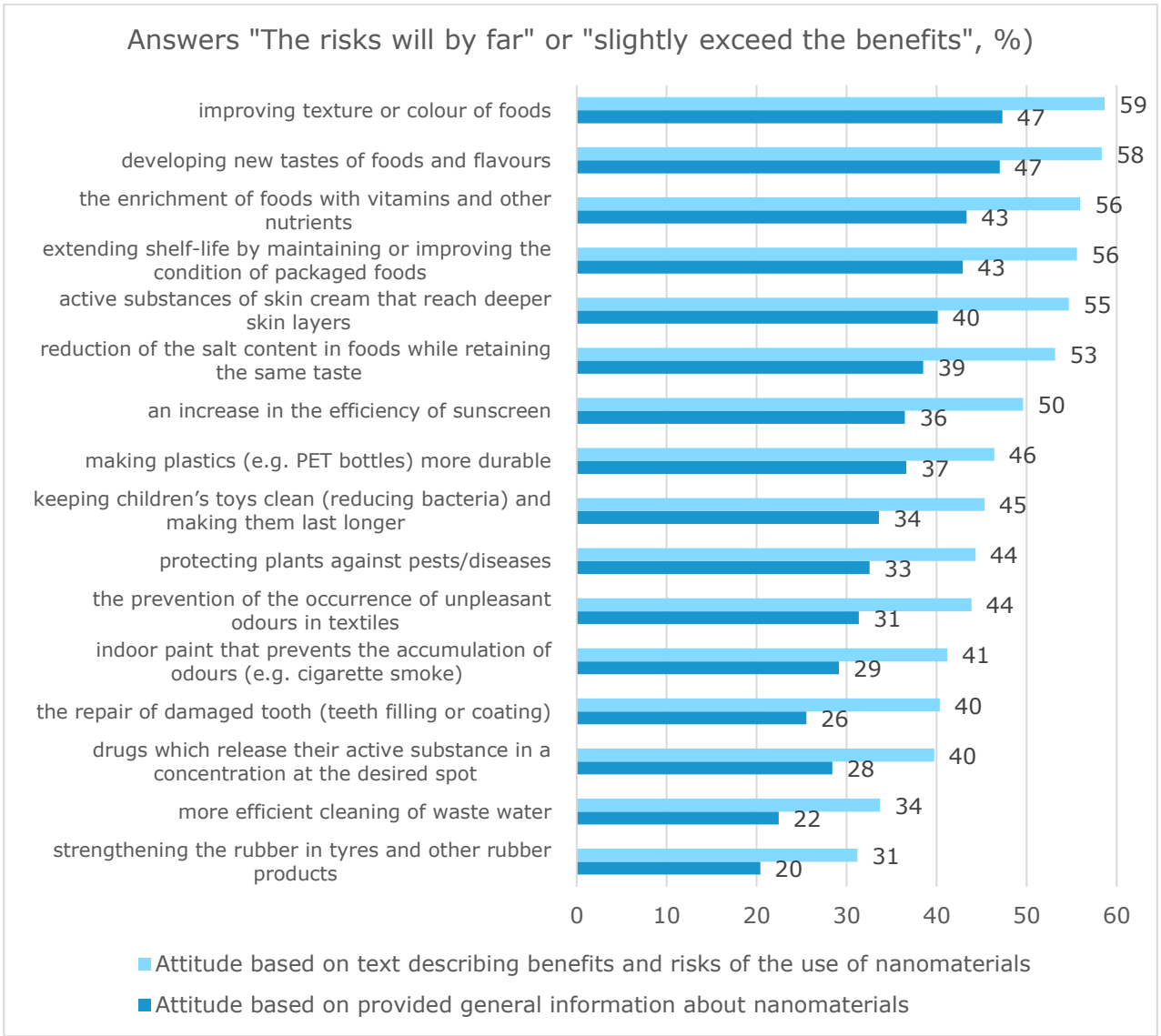


Figure 3 illustrating the comparison of risks perceived by layperson was retrieved from (Siegrist, Keller et al. 2007).

Figure 3 - Perceived risks (Mean and standard deviation) of the layperson and expert samples (Siegrist, Keller et al. 2007)

	Laypeople		Experts	
Hazards	*M*	*SD*	*M*	*SD*
Asbestos	4.19	1.04	3.91	0.96
Cellular phones	3.41	1.08	2.52	1.03
Genetically modified tomatoes	3.27	1.23	2.61	1.20
Sunscreen	3.15	1.19	2.48	1.19
Ammunition	3.02	1.47	2.84	1.61
Food packagings	3.02	1.15	2.35	1.10
Release of medications	3.01	1.13	2.24	1.18
Biosensors	2.92	1.09	1.87	1.05
Water sterilization	2.87	1.18	2.26	1.08
Clothing	2.78	1.20	2.20	1.00
Surface impregnation of building materials	2.75	1.12	2.13	1.09
Medical nanorobots	2.68	1.11	1.95	1.03
Monitors	2.63	1.13	1.52	0.78
Lightweight construction of building materials	2.63	1.11	1.87	0.83
Cancer treatment with nanocapsules	2.62	1.08	1.74	0.88
Implant coating	2.60	1.05	1.70	0.81
Car tires	2.59	1.15	2.39	1.20
Storage of hydrogen as a gasoline substitute	2.44	1.06	1.63	0.85
Car paints	2.43	1.10	1.87	0.92
Building blocks	2.36	1.16	1.91	0.96
Photographic paper	2.32	1.06	1.74	0.95
Data memory	2.32	1.14	1.46	0.78
Skis	1.99	0.98	1.61	0.83

Note: N varies between 366 and 370 for the layperson sample, and *N* varies between 44 and 46 for the expert sample.

In this study carried out in Switzerland to assess perceived benefits (and risks), the following question was asked: "How beneficial (risky) do you consider each of the following items to be for Swiss society as a whole?" The endpoints of the 5-point scales were labelled from "very low" (1) to "very high" (5). Asbestos received the highest risk ratings in both the layperson and expert samples. In the layperson sample, cellular phones and genetically modified tomatoes ranked as number two and three, respectively. Among the nanotechnology applications, sunscreen, ammunition, food packaging, and release of medication received the highest risk ratings in the layperson sample. Overall, experts assessed the risks associated with nanotechnology applications as being much lower than laypeople did (Siegrist, Keller et al. 2007).

In a German study from 2008, 20% of the 994 participants feel that the risks greatly outweigh benefits, 46% think the risks slightly outweigh benefits, 24% consider benefits slightly outweighing risks, 9% feel benefits greatly outweigh risks, 1% do not know (Zimmer, Scherzberg et al. 2008).

Nanoparticles are listed on the 19th place in order of growing risk perception of the public, within 24 risk evaluations in total. The mean value is 1.94 on an ordinal scale from 1 (almost no risk) to 4 (high risk). The full table reproduced from (Berube, Cummings et al. 2011) is illustrated in Figure 4.

Figure 4 - Descriptive statistics for 24 risk evaluations (Berube, Cummings et al. 2011)

Risk	Mean	SD	N
Cigarette smoking	3.61	0.85	306
Street drugs	3.58	0.95	294
Chemical pollution	3.35	0.89	306
Nuclear waste	3.32	1.11	296
Obesity	3.32	0.98	304
AIDS	3.18	0.92	305
Stress	3.18	0.92	284
Pesticides in food	3.01	1.18	303
Motor vehicle accidents	2.97	1.05	306
Sun tanning	2.82	1.13	296
Bacteria in food	2.75	1.19	298
Air pollution	2.67	1.15	306
Genetically engineered bacteria	2.66	1.29	305
Radon in the home	2.63	1.24	297
Drinking alcohol	2.56	1.23	306
Cloning	2.4	1.36	289
Coal or oil burning plants	2.34	1.18	304
Nuclear power plants	2.28	1.30	306
Storms and floods	2.12	1.20	300
Nanoparticles	1.94	1.20	269
Blood transfusions	1.91	1.14	298
Medical X-rays	1.71	1.05	307
Cell phone use	1.67	1.06	298
Commercial air travel	1.57	1.02	304

Note: Risk evaluations are sorted in descending order according to the mean. Original question-wording: "Please indicate whether you think that each of the following poses almost no risk, a slight risk, a moderate risk, or a high risk to your health:" Responses were measured on an ordinal scale from 1 ("almost no risk") to 4 ("high risk")

Eurobarometer 73.1 (Anonymous 2013) studied the perception of risks associated with nanomaterials on 31238 respondents in 2010 with the following results:

- 14.7% tend to disagree that nanotechnologies are good for the economy, 7% totally disagree
- 8.1% totally agree that nanotechnologies are not good for them and their family, 19.5% tend to agree
- 20.4% tend to disagree that nanotechnologies are safe for future generations, 10% totally disagree
- 11.3% totally agree that nanotechnologies make them feel uneasy, 20.6% tend to agree
- 22.1% tend to disagree that nanotechnologies are safe for their health, 37.5% totally

disagree
- 44.6% tend to disagree that nanotechnologies are safe for the environment, 7.5% totally disagree

In a 2011 Italian study (Bottini, Rosato et al. 2011), the 790 respondents perceived the following risks of nanotechnology in the corresponding percentages:

- pollution (36%)
- division among social classes (33%)
- increase of public expenses (32%
- human health (27%)

A study among German public (Guido Correia Carreira, Jan-Peter Ferdinand et al. 2016) found that:

- 15.8% of the 1200 participants feel that the risks of nanotechnology greatly outweigh the benefits
- 44.2% think the risks slightly outweigh the benefits
- 25.9% consider that the benefits slightly outweigh the risks
- 9.5% feel that the benefits greatly outweigh the risks
- 4.5% do not know

Public perception of risks and benefits of nanomaterials outside the EU

In a public survey conducted in 2007 in the USA with 1536 respondents (Mir 2007), the following numbers of respondents agreed that they are perceiving certain risks regarding nanotechnology:

- losing personal privacy (31.9%)
- arms race (23.8%)
- breathing nanoparticles that accumulate in the body (18.6%)
- economic disruption (13.8%)
- the uncontrollable spread of nanorobots (12%)

In the USA in 2007, the following risks were perceived among 1015 respondents of a survey (Ho, Scheufele et al. 2013):

- Nanotechnology may lead to the loss of personal privacy because of tiny new surveillance devices
- Nanotechnology may lead to an arms race between the U.S. and other countries
- Nanotechnology may lead to new human health problems
- Nanotechnology may be used by terrorists against the U.S
- Because of nanotech, we may lose more U.S. jobs
- Nanotechnology may lead to the uncontrollable spread of very tiny self-replicating robots
- Nanotechnology may lead to more pollution and environmental contamination

Out of 76 participants in another USA survey in 2007 (Priest, Lane et al. 2011):

- 36.8% perceived as a risk associated with NT unexpected consequences, harmful side effects, unknown effects
- 13.2% feared weaponization and possible terrorism, NT ending up in the wrong hands
- 9.2% feared medical and health issues, cancer agent, water contamination, health side effects
- 5.3% was concerned in the invasion of privacy

- 5.3% feared the lack of control over nanotechnology
- 5.3% did not perceive any risks at all
- 3.9% felt that NT costs too much to develop, the government will spend too much on it
- 2.6% feared that nanotechnology may not work, products may malfunction
- 2.6% was concerned about the displacement of workers
- 2.6% feared that nano chemicals may be unstable

Compared with earlier studies, 177 scientists surveyed in 2007 in the USA generally rated the risks of nanotechnology substantially lower than the benefits based on their average ratings. The two areas of highest concern were with regards to human health risk and the potential use of nanotechnology in weapons (Besley, Kramer et al. 2008).

According to a 2008 USA study (Conti, Satterfield et al. 2011), experts worry that:

- the "tiny sensors" will degrade over time becoming toxic to fish or humans who use or drink the water
- nanosilver is considered a water pollutant; if it turns up in our rivers or oceans, fish, and other marine life may be widely harmed
- leaks in privacy may be unstoppable or irreversible

In the year 2012, Harris Poll (Anonymous 2012) was conducted in the USA with the following results:

- 6% think the risks outweigh the benefits
- 27% think the risks and benefits are about equal
- 37% think the benefits outweigh the risks
- 30% are not at all sure

In 2013 in China, the respondents of a study (Zhang, Wang et al. 2016) were concerned by the following risks:

- the negative impact of nanoparticles on the environment (e.g. on air, water, and soil) (chosen 193 times – 26%)
- nano-devices violating people's privacy (chosen 159 times – 21.5%)
- the negative impact of nanotechnology on health (chosen 157 times – 21.2%)
- nano-weapons' threats to national and personal security (chosen 134 times – 18.1%)
- nanotechnology controlling human thought (chosen 112 times – 15.1%)
- nanotechnology widening the wealth gap (chosen 106 times – 14.3%)
- other (chosen 3 times – 0.4%).

3.5 Attitudes related to nanomaterials

This chapter describes the respondents' level of agreement with the possible use of nanomaterials in different product types and technology areas.

List of questions analysed in this chapter (questions marked with an asterisk are open-ended):

Q6. To what extent do you approve or disapprove of the following uses of nanomaterials?

Use of nanomaterials for…	*I fully approve*	*I tend to approve*	*I tend to disapprove*	*I fully disapprove*	*I don't know*
… a reduction of the salt content in foods while retaining the same taste	○	○	○	○	○
… the enrichment of foods with vitamins and other nutrients	○	○	○	○	○
… indoor paint that prevents the accumulation of odours (e.g. cigarette smoke)	○	○	○	○	○
… an increase in the efficiency of sunscreen	○	○	○	○	○
… active substances of skin cream that reach deeper skin layers	○	○	○	○	○
… the prevention of the occurrence of unpleasant odours in textiles	○	○	○	○	○
… improving texture or colour of foods	○	○	○	○	○
… developing new tastes of foods and flavours	○	○	○	○	○
… extending shelf-life by maintaining or improving the condition of packaged foods	○	○	○	○	○
… drugs which release their active substance in a concentration at the desired spot	○	○	○	○	○
… repairing damaged teeth (filling or coating)	○	○	○	○	○
…more efficient cleaning of wastewater	○	○	○	○	○
… strengthening the rubber in tyres and other rubber products	○	○	○	○	○
… making plastics (e.g. PET bottles) more durable	○	○	○	○	○
… keeping children's toys clean (reducing bacteria) and making them last longer	○	○	○	○	○
… protecting plants against pests/diseases	○	○	○	○	○

Q20. Which of the following statements do you personally agree with?

	Strongly disagree	*Disagree*	*Neither agree nor disagree*	*Agree*	*Strongly agree*	*Cannot say*
Nanomaterials will open up fantastic opportunities for technical development	○	○	○	○	○	
I am very interested in scientific topics	○	○	○	○	○	
If my country (programming: name the particular country here) wants to be globally competitive, it has to embrace technologies using nanomaterials	○	○	○	○	○	

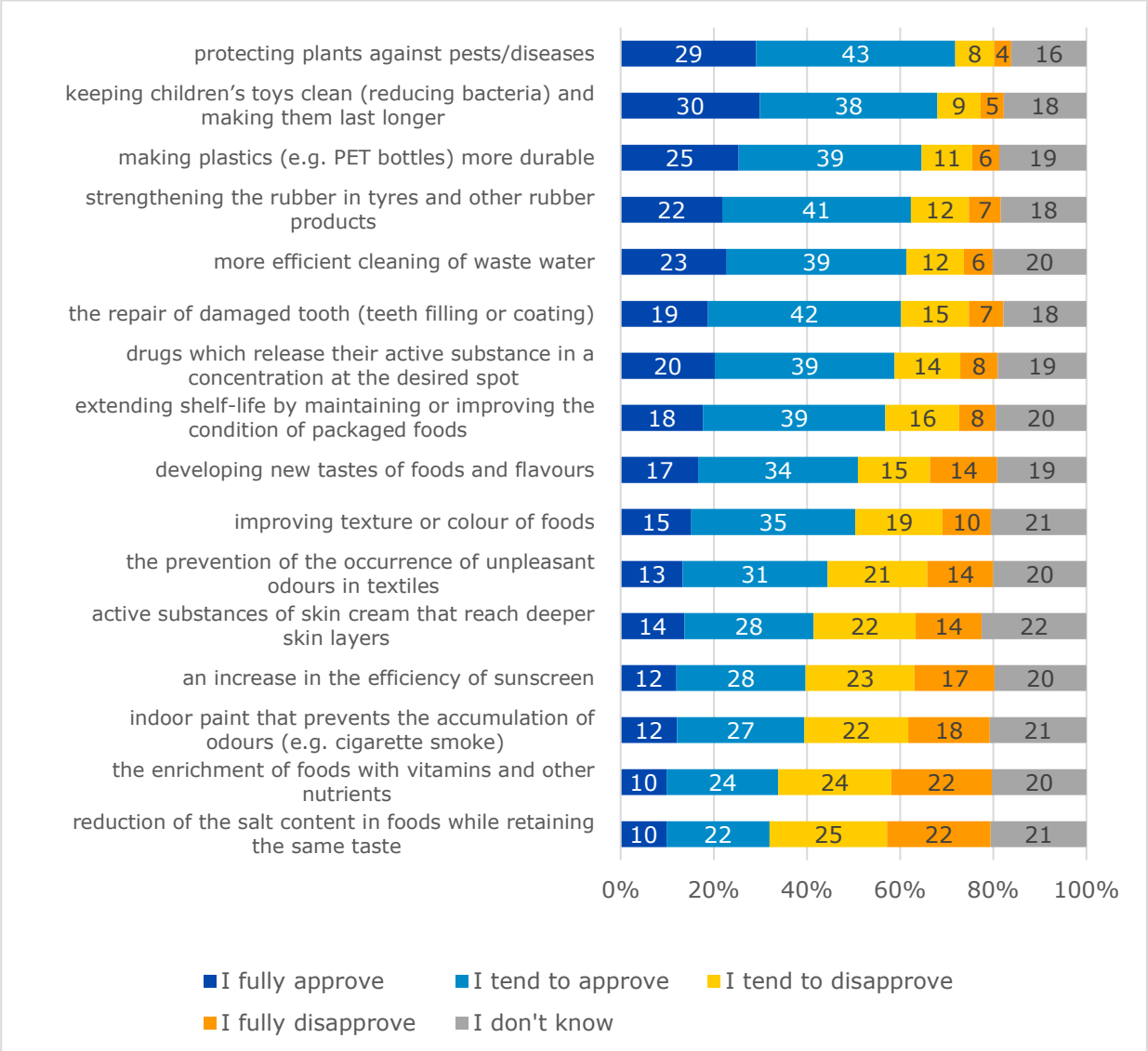
If nanomaterials make everyday products better, I'll gladly use them	○	○	○	○	○	
I am looking forward to the many nano-products that will soon be on the market	○	○	○	○	○	
I believe this whole nano thing is a marketing trick to improve sales of certain products	○	○	○	○	○	
I believe nanomaterials offer many possibilities to cure and recognise diseases	○	○	○	○	○	
I am sure that using nanomaterials will help to protect the environment and limit or repair environmental damage	○	○	○	○	○	
I am convinced that using nanomaterials is of benefit to society	○	○	○	○	○	
It's really frightening how many nano-products there are or soon will be	○	○	○	○	○	
I'm worried that using nanomaterials could lead to completely new health problems	○	○	○	○	○	
I'm concerned that using nanomaterials instead of traditional materials could damage the environment	○	○	○	○	○	
I believe that nanotechnology can lead to job cuts in traditional branches of industry	○	○	○	○	○	
I'm afraid that nanotechnology will result in more individuals to be monitored and controlled by miniaturised technology	○	○	○	○	○	
I believe it's hardly possible to control the health risks of using nanomaterials	○	○	○	○	○	
I would approve nanomaterials development being promoted through state funding	○	○	○	○	○	

Use of nanomaterials in various types of products

Use of nanomaterials in different areas of everyday life is perceived quite optimistically and most of the used examples did not raise serious concerns.

Despite this, respondents' attitudes can be divided into two illustrative groups that reflect their level of agreement on different uses of nanomaterials.

Graph 26 - Attitudes related to uses of nanomaterials for various purposes *(N=5000, question Q6)*



The first group reflects more cautious attitudes where people tend to disagree with the direct application of nanomaterials. This group is represented by uses like food modification to get a better taste or enriched content, cosmetic products, painting products for indoor usage and so on.

These are areas where people feel that they are directly in contact with nanomaterials. Women and people over 50 years are more concerned about these areas.

The second group of products is associated with more open attitudes where respondents are more receptive to the use of nanomaterials. These are in more technical areas, such as plant protection, production of more resistant materials, cleaning and protective products and equipment.

Within these areas, the positive attitude towards the use of nanomaterials is more typical for men. However, age does not affect the results significantly.

Table 16 shows the level of agreement among countries.

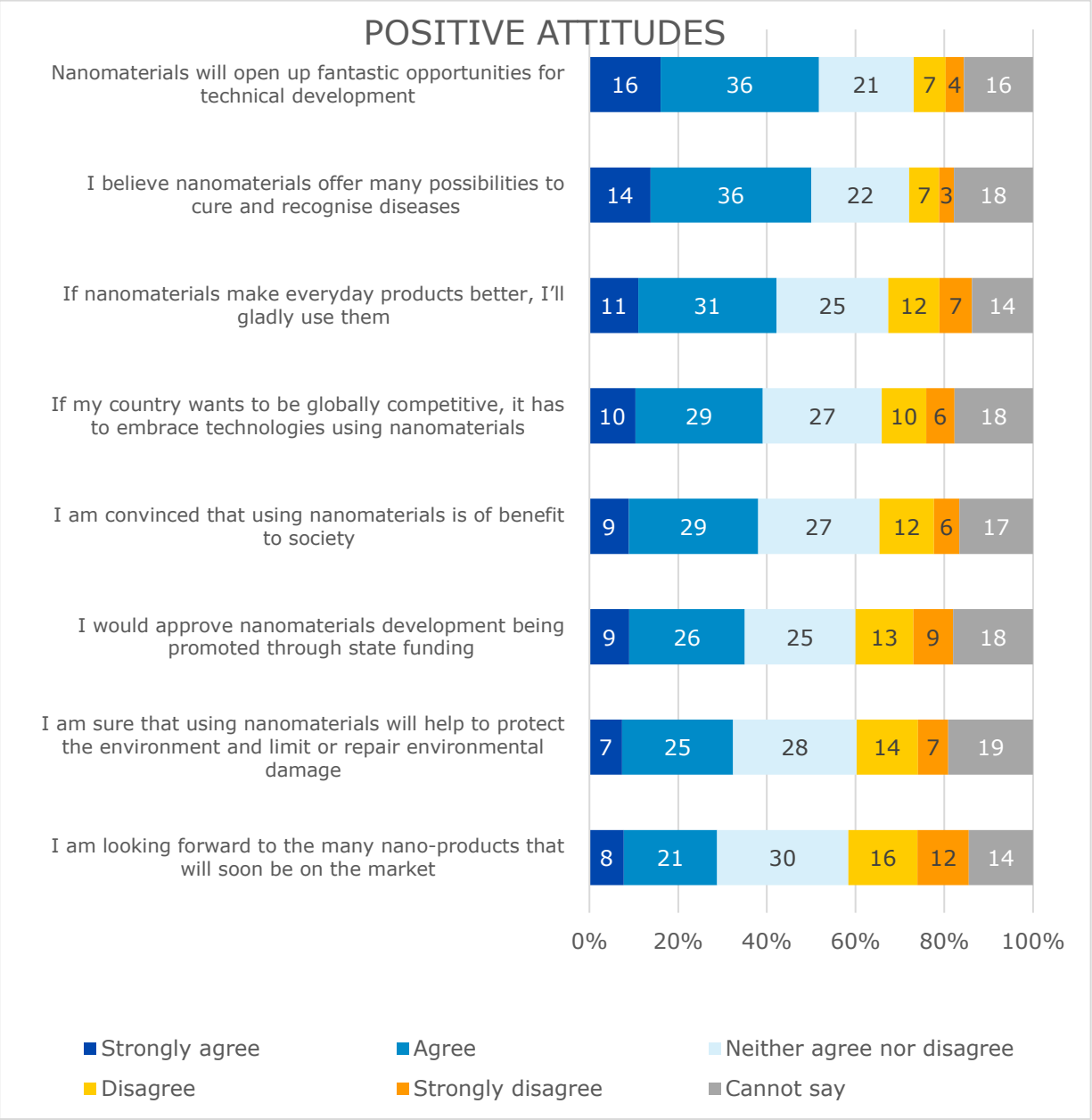
Table 16 - Attitudes related to uses of nanomaterials for various purposes (To what extent do you approve or disapprove of the following uses of nanomaterials?) *(question Q6)*

VIEW BY COUNTRIES						
answers in %	Total	Poland	Bulgaria	Austria	France	Finland
Number of respondents	*5000*	*1000*	*1000*	*1000*	*1000*	*1000*
for strengthening the rubber in tyres and other rubber products	72	71	78	67	65	78
for more efficient cleaning of waste water	68	68	78	61	60	74
for repairing damaged teeth (filling or coating)	65	69	71	59	56	68
for indoor paint that prevents the accumulation of odours	62	68	77	52	58	56
for drugs which release their active substance in a concentration at the desired spot	61	60	68	58	55	66
for the prevention of the occurrence of unpleasant odours in textiles	60	64	72	51	52	62
for keeping children's toys clean (reducing bacteria) and making them last longer	59	60	69	53	53	59
for protecting plants against pests/diseases	57	59	67	45	53	59
for making plastics (e.g. PET bottles) more durable	51	55	57	37	48	58
for an increase in the efficiency of sunscreen	50	50	64	41	46	51
for active substances of skin cream that reach deeper skin layers	44	58	57	30	42	36
for reduction of the salt content in foods while retaining the same taste	41	44	45	33	43	43
for extending shelf-life by maintaining or improving the condition of packaged foods	40	49	41	28	40	41
for the enrichment of foods with vitamins and other nutrients	39	45	46	27	39	41
for developing new tastes of foods and flavours	34	40	45	19	34	31
for improving texture or colour of foods	32	39	34	18	34	35

General attitudes towards nanomaterials

Generally, positive attitudes including neutral answers reflect the expectation of new possibilities and improvements in everyday life. Potentially undecided opinions are linked to an overall low awareness of nanomaterials.

Graph 27 – Which of the following statements do you personally agree with? *(N=5000, question Q20)*



Graph 28 shows that people are to some extent concerned, that unknown health issues, as well as possible negative environmental impacts, may arise from the use of nanomaterials.

Graph 28 - Which of the following statements do you personally agree with? *(N=5000, question Q20)*

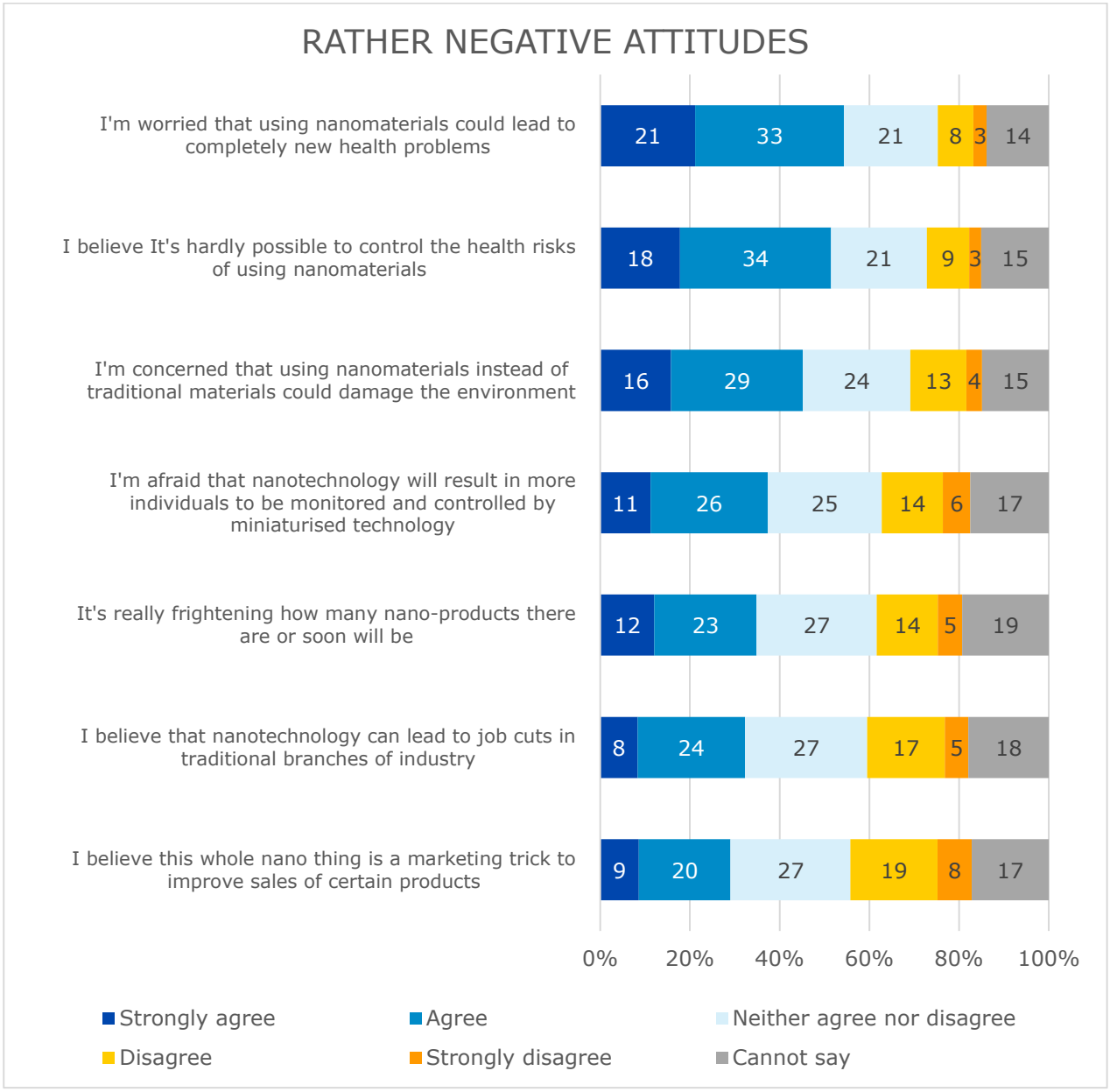


Table 17 shows the level of agreement with possible negative attitudes among countries.

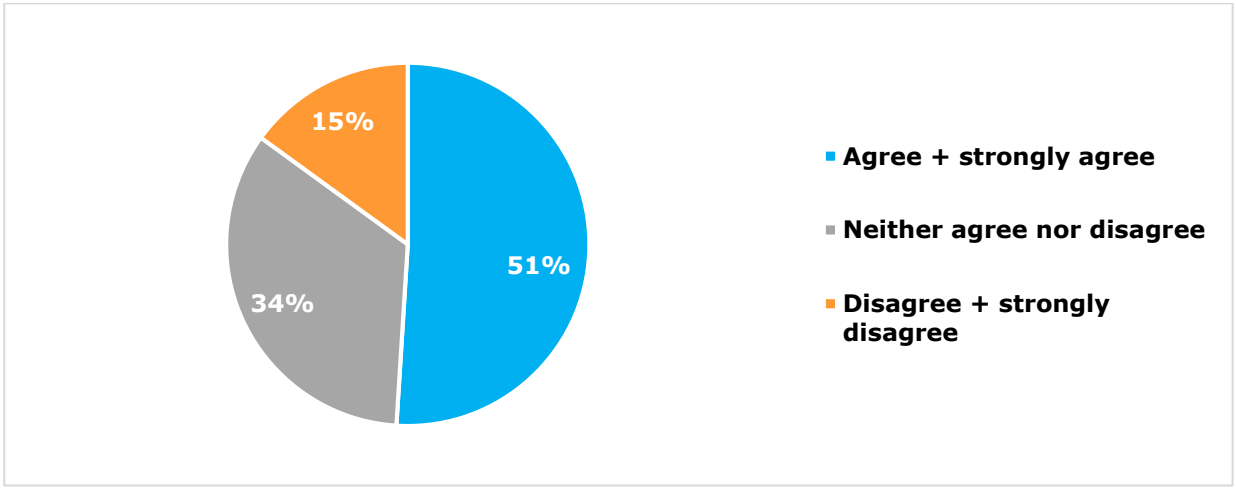
Table 17 - Negative attitudes related to nanomaterials *(detailed, question Q20)*

VIEW BY COUNTRIES						
% strongly agree + agree	Total	Poland	Bulgaria	Austria	France	Finland
Number of respondents	*5000*	*1000*	*1000*	*1000*	*1000*	*1000*
I'm worried that using nanomaterials could lead to completely new health problems	54	50	54	59	56	53
I believe It's hardly possible to control the health risks of using nanomaterials	51	47	51	55	51	54
I'm concerned that using nanomaterials instead of traditional materials could damage the environment	45	37	40	52	52	45
I'm afraid that nanotechnology will result in more individuals to be monitored and controlled by miniaturised technology	37	40	47	28	44	29
It's frightening how many nano-products there are or soon will be	35	32	36	38	46	22
I believe that nanotechnology can lead to job cuts in traditional branches of industry	24	27	29	19	25	19
I believe this whole nano thing is a marketing trick to improve sales of certain products	29	26	33	30	34	23

Concerns about the possible health risks and negative impact on the environment are declared slightly more often in Austria, while Poland is more tolerant in this respect. On the contrary, the respondents from Bulgaria and France are more worried about the possibility to be monitored and controlled by miniaturised technology.

The respondents were asked to what level they are interested in scientific topics to investigate whether interest in scientific topics can affect the attitude towards nanomaterials. The answers to this question are presented in Graph 29.

Graph 29 - Agreement with the statement: "I am very interested in scientific topics" *(N=5000, question Q20)*

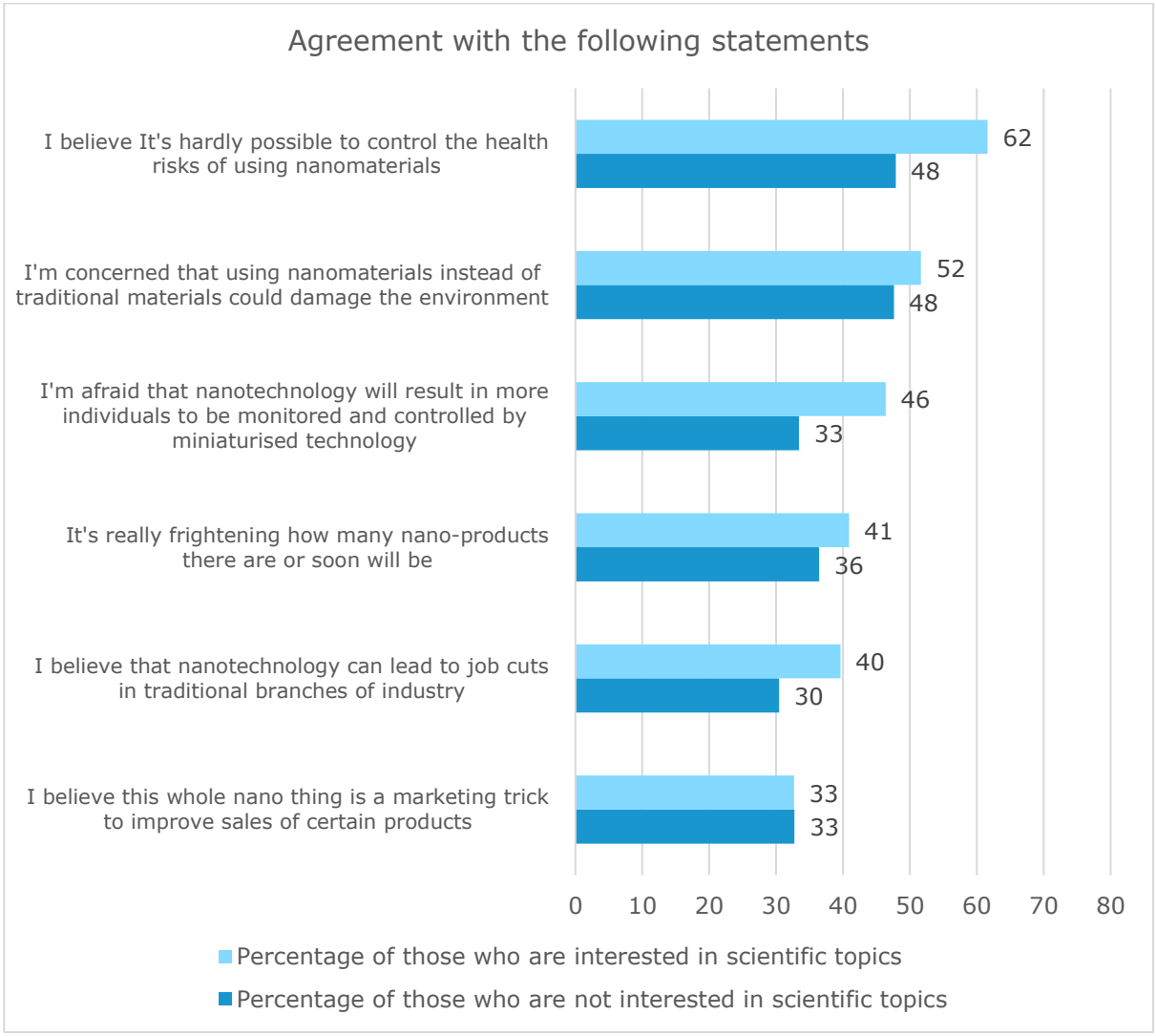


The study showed that respondents´ interest in scientific topics significantly impacts their attitudes towards the use of nanomaterials (see Graph 30).

Graph 30 - Positive attitudes related to nanomaterials use *(N=5000, question Q20)*

Graph 30 illustrates that the respondents generally interested in scientific topics are significantly more likely to be open towards the use of nanomaterials. On the other hand, they are also more aware of the risks (see Graph 31).

Graph 31 - Negative attitudes related to uses of nanomaterials *(N=5000, question Q20)*



Segmentation of the population related to their perception of nanomaterials

A segmentation of the population based on their perception of nanomaterials was developed based on attitudinal questions. It was developed using cluster analysis of the block of questions about nanomaterials risk perception (Q19) and general attitudes to nanomaterials in the context of the development of science and society in general (Q20).

Based on this approach, respondents can be divided into 4 categories:

Enthusiasts

The most unambiguous group are people, who have a very positive attitude towards nanomaterials. This group represents 19% of the population.

Tolerating

Relatively close to this group is the largest group representing almost half (46%) of the population. They have an open, tolerating attitude towards nanomaterials.

Fearing

Contrary to the previous groups, these respondents generally reject the use of nanomaterials, representing 23% of the population.

No opinion

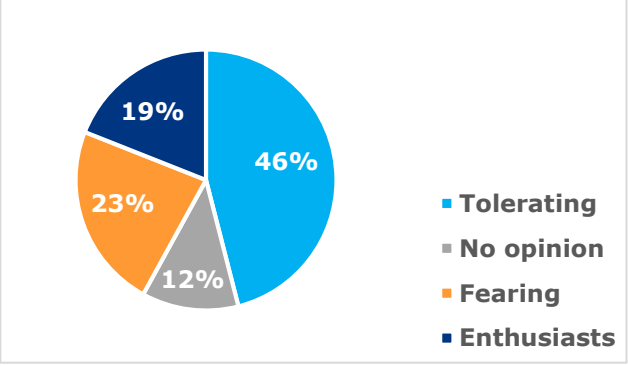
Finally, the last group aggregates those who have no clear attitude related to nanomaterials, representing 12% of the population.

A more detailed description of the segments and their respective profiles is provided below (Table 18, Table 19, Table 20, Table 21, Table 22, Table 23, Table 24, Table 25, Table 26 and Table 27.)

Table 18 - Segments based on attitudes to nanomaterials – breakdown by country

VIEW BY COUNTRIES						
Answers in %	Total	Poland	Bulgaria	Austria	France	Finland
Number of respondents	*5000*	*1000*	*1000*	*1000*	*1000*	*1000*
Enthusiasts	19	27	23	14	16	16
Tolerating	46	43	44	42	45	53
Fearing	23	15	25	32	22	21
No opinion	13	15	8	12	17	10

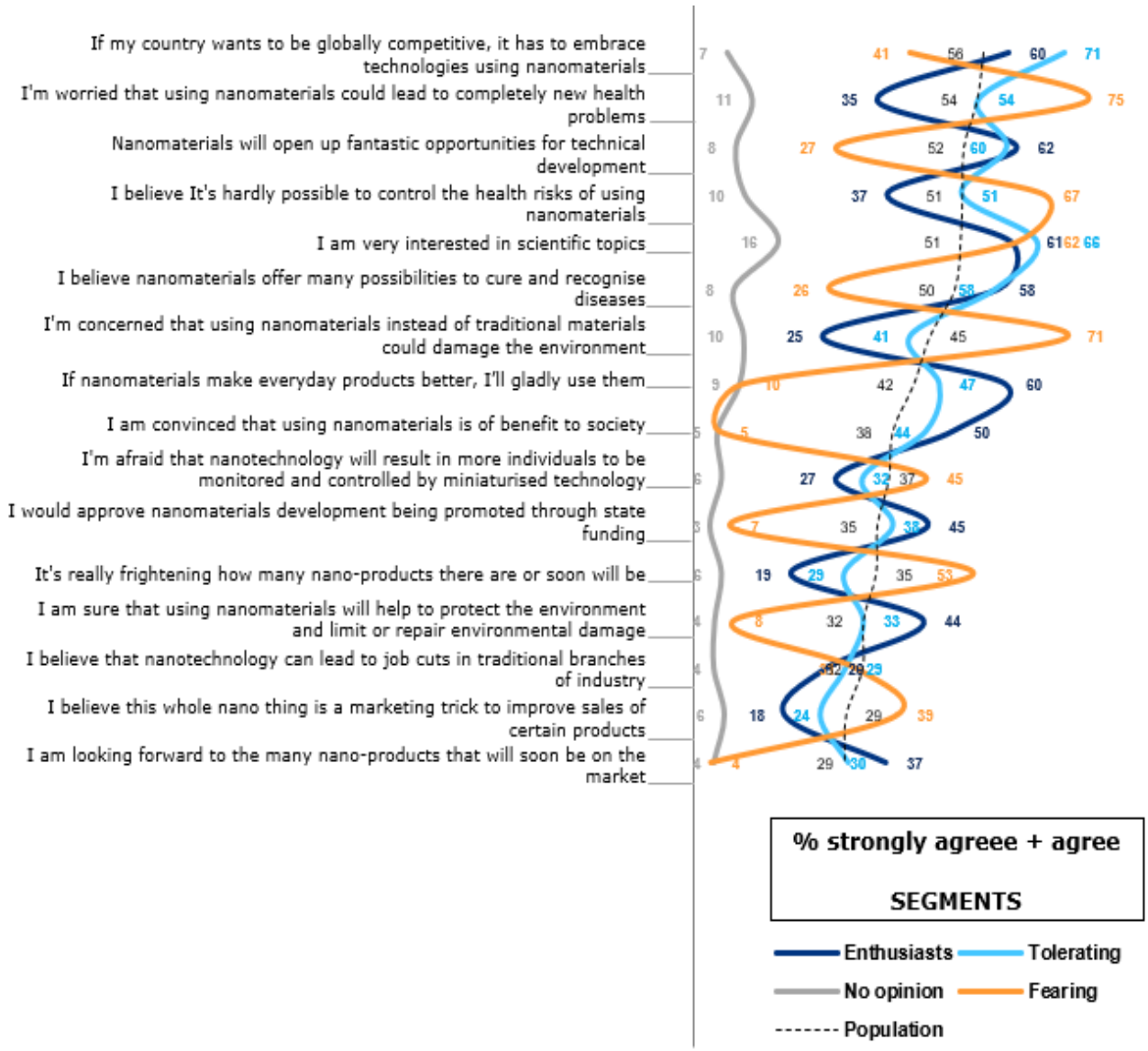
Graph 32 - Segments of respondents based on attitudes towards various uses of nanomaterials



Graph 33 - Segments profiling, general attitudes related to statements on the uses of nanomaterials (positive) ***(question Q20)***Graph 33 shows the description of the different

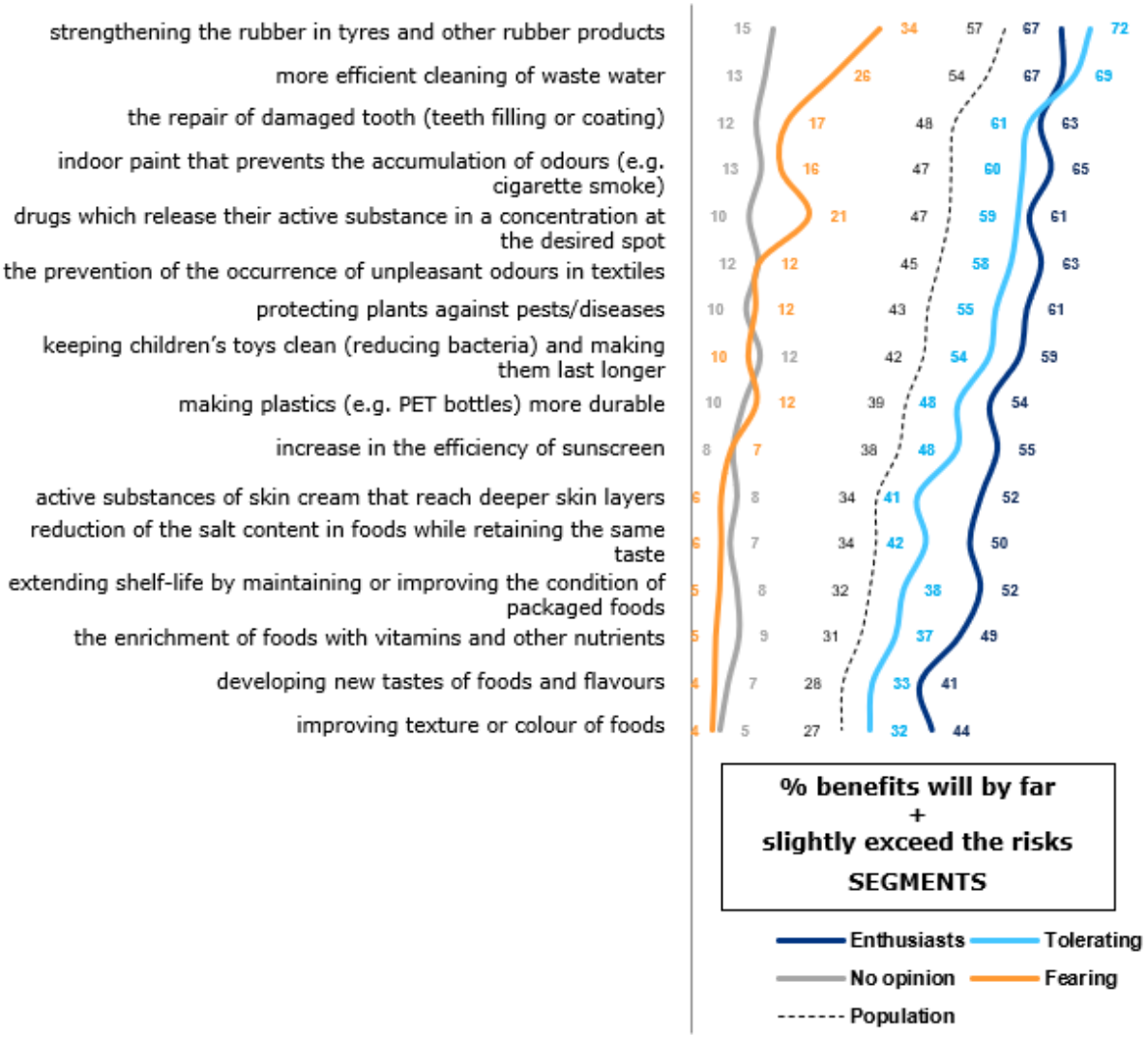
Graph 33 - Segments profiling, general attitudes related to statements on the uses of nanomaterials (positive) *(question Q20)*

segmented groups based on their general attitudes towards nanomaterials concerning general statements about societal development.



Graph 34 describes the segmented groups according to the use of nanomaterials in various areas:

Graph 34 - Segments profiling, attitudes related to nanomaterial uses in various areas
(question Q19)



The results in Graph 34 show how much particular segments are open to the use of nanomaterials. The Fearing, the group that mostly rejects nanomaterials, have relatively tolerant attitudes to areas where nanomaterials are used for more technical purposes.

Table 19 - Segments description - Basic demography

SEGMENTS DESCRIPTION				
	Enthusiast	**Tolerating**	**Fearing**	**No opinion**
Age	40-49 years	up to 29 years	50-60 years	30 - 39 years
Gender	unisex	men	women	women
City size	big cities over 200 000 inhabitants excluding capital	middle and big cities	villages and smallest cities up to 50 000 inhabitants	villages and smallest cities up to 50 000 inhabitants
Education	the highest level, university	students or the highest level, university	basic or middle	basic or middle

Table 20 - Segments description - General awareness of nanomaterials

SEGMENTS DESCRIPTION 1				
	Enthusiast	**Tolerating**	**Fearing**	**No opinion**
Overall awareness	rather shallow	rather shallow	rather shallow	almost none
Typical products containing nanomaterials	paints/varnishes/ surface coatings plastics	computers and electronic cosmetics paints/varnishes/ surface coatings	paints/varnishes/ surface coatings cosmetics	no idea

Table 21 - Segments description - General shopping habits and behaviour related to nanomaterials

SEGMENTS DESCRIPTION 2				
	Enthusiast	**Tolerating**	**Fearing**	**No opinion**
Reading safety information	sometimes	sometimes	always	never
Willing to pay more for safer products	yes, 1 - 20% or rather not	yes, 1 - 20%	yes, over 20%	not
A typical product containing nanomaterials they would buy	detergents/household cleaning products clothing/textile	computers and electronics sports equipment	almost none	none

Table 22 - Segments description - Risk perception

SEGMENTS DESCRIPTION 3				
	Enthusiast	**Tolerating**	**Fearing**	**No opinion**
Concern about negative impact in a specific area	global warming asbestos	global warming asbestos	nanomaterials foods from genetically modified crops pesticides and plant protection products	no idea, if something, then … asbestos plastic waste
Agreement with the statement: *the main issue is not to what extent you are exposed to harmful materials, but whether or not you are exposed to them at all*	neither nor	rather disagree	completely agree	neither nor or do not know
Agreement with the statement: *If a person is exposed to an extremely small amount of a material that is harmful at larger amounts, then will probably be seriously ill even if the amount is extremely small*	rather disagree	rather disagree	completely agree	neither nor or do not know

Table 23 - Segments description - Risks related to nanomaterials

SEGMENTS DESCRIPTION 4				
	Enthusiast	**Tolerating**	**Fearing**	**No opinion**
Products with nanomaterials compared to products without them are:	safer	equally safe	less safe	cannot decide
Risks (if any) associated with nanomaterials may be eliminated when nanomaterials are used properly	completely agree	rather agree	rather disagree	cannot say
Concerns about exposure to nanomaterials	not at all	not at all	a little	a lot
Risks associated with nanomaterials	none	difficult prevention of exposure	difficult prevention of exposure	none
The most likely route of exposure to nanomaterials	none	skin contact	inhalation	none
Areas where risks associated with using nanomaterials will by far exceed the benefits	nowhere	for improving texture or colour of foods for extending shelf-life by maintaining or improving the condition of packaged foods for developing new tastes of foods and flavours	everywhere	everywhere

Table 24 - Segments description - Attitudes related to nanomaterials

SEGMENTS DESCRIPTION 5				
	Enthusiast	**Tolerating**	**Fearing**	**No opinion**
Typical areas where the use of nanomaterials is accepted	for extending shelf-life by maintaining or improving the condition of packaged foods	strengthening the rubber in tyres and other rubber products for more efficient cleaning of wastewater	almost for nothing	almost for nothing
Attitudes about nanomaterials regarding general statements on societal development	if nanomaterials make everyday products better, I'll gladly use them ensure that using nanomaterials will help to protect the environment and limit or repair environmental damage	I am very interested in scientific topics if my country wants to be globally competitive, it has to embrace technologies using nanomaterials	concerned that using nanomaterials instead of traditional materials could damage the environment worried that using nanomaterials could lead to completely new health problems	mostly without opinion, if some, then: I believe this whole nano thing is a marketing trick to improve sales of certain products

Table 25 - Segments description - Information sources

SEGMENTS DESCRIPTION 6				
	Enthusiast	**Tolerating**	**Fearing**	**No opinion**
Information level about nanomaterials in comparison with other modern technologies	feel less informed	feel less informed	feel less informed	equally informed
Current information channels	internet magazines	internet school, university, college	newspaper TV	other unspecified sources
Intended information channels	products websites	You Tube	magazines personal discussion with experts	internet

Table 26 - Segments description - Trust in authorities

SEGMENTS DESCRIPTION 7				
	Enthusiast	**Tolerating**	**Fearing**	**No opinion**
Awareness of the European Union Observatory for Nanomaterials (EUON)	no	no	no	no
Information sources among institutions	producer of the product scientists/researchers (universities, research institutes, etc.)	scientists/researchers (universities, research institutes, etc.) EU authorities (e.g. European Commission, European Chemicals Agency) distributor/seller from whom I bought the product	consumer organisations environmental organisations	none
Trustworthy institutions	product distributor/seller product producer EU authorities (e.g. European Commission, European Chemicals Agency)	EU authorities (e.g. European Commission, European Chemicals Agency) doctors	consumer organisations environmental organisations	none

Table 27 - Segments description - Labelling of products containing nanomaterials

SEGMENTS DESCRIPTION 8				
	Enthusiast	**Tolerating**	**Fearing**	**No opinion**
Products that should be labelled if they contain nanomaterials	medicines cosmetics toys paints/varnishes/surface coatings	cosmetics food medicines	kitchenware detergents/household cleaning products construction materials clothing/textiles paints/varnishes/surface coatings and many others…	none

3.6 Information sources

The following chapter covers general knowledgeability about nanomaterials compared to other modern technologies, the sources of information respondents use/are being exposed to to learn about nanomaterials and the public awareness of databases or websites providing centralized information about nanomaterials with specific attention to the European Union Observatory for Nanomaterials (EUON).

List of questions analysed in this chapter (questions marked with an asterisk are open-ended):

Q21. How well informed do you feel about nanomaterials compared to other modern technologies?

a. *I feel better informed about nanomaterials compared to other new modern technologies*
b. *Equally informed*
c. *I feel less informed about nanomaterials compared to other new modern technologies*

Q22a. Where have you already heard, read, or seen something about nanomaterials?

a. *TV*
b. *Radio*
c. *Social media (Facebook, Twitter, LinkedIn, etc.)*
d. *YouTube*
e. *Internet*
f. *Online media*
g. *Product websites*
h. *Blogs*
i. *Newspapers*
j. *Magazines*
k. *School, university, college*
l. *Workplace*
m. *Personal discussion with family and/or friends*
n. *Personal discussion with experts (e.g. doctors, chemists, scientists, journalists, etc.)*
o. *Other – please specify*

Q23. Are you aware of any websites or databases with centralized information about nanomaterials or products containing nanomaterials?

a. *Yes*
b. *no*

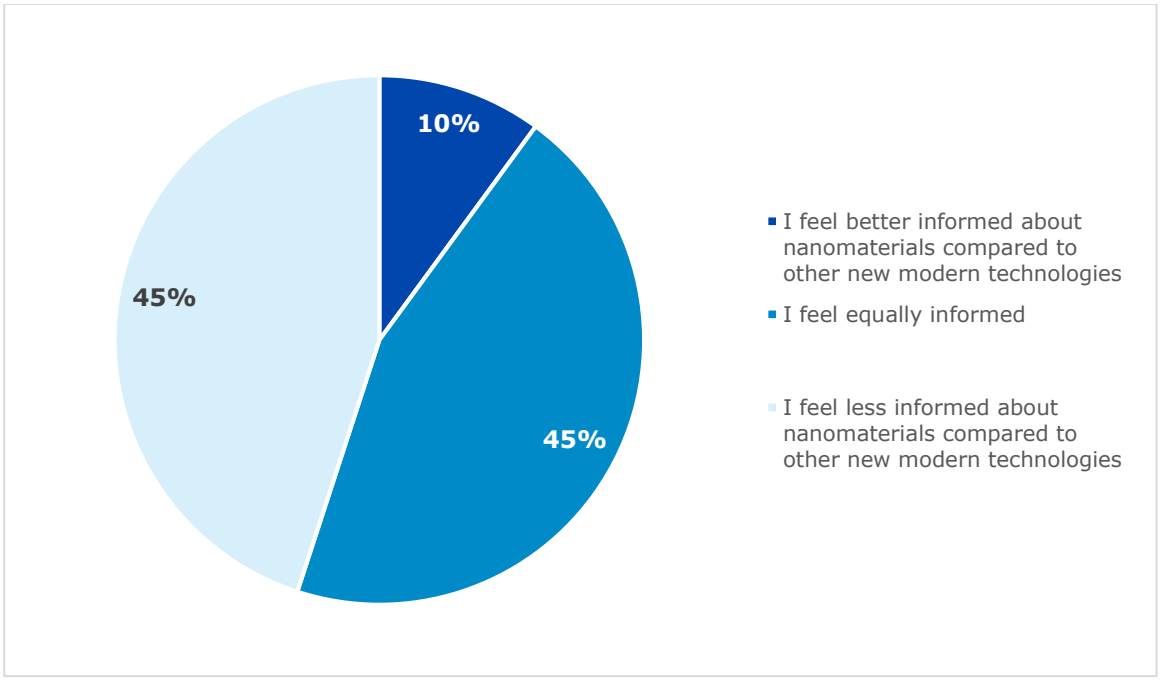
Awareness of nanomaterials

In earlier studies, the respondents felt they were not adequately informed about the nanotechnology research and applications and have shown the intention to search for further information.

The level of knowledge (amount of information related to nanomaterials in comparison to other new modern technologies) divides society into two halves.

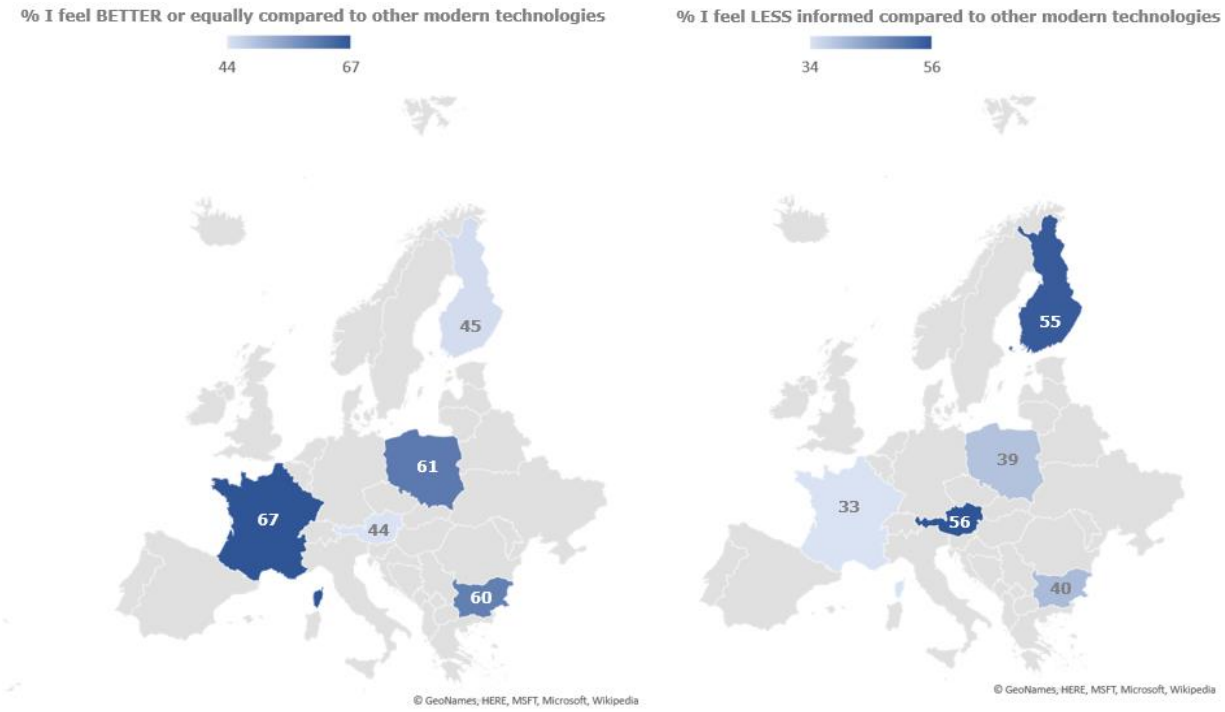
Men, students, those between the ages of 16 and 29 and religious people tend to feel better informed (based on question Q21 – "How well informed do you feel about nanomaterials compared to other modern technologies?").

Graph 35 - How well informed do you feel about nanomaterials compared to other modern technologies? *(N=5000, question Q21)*



The following Cartogram 8 shows the country-specific comparison.

Cartogram 8 - How well informed do you feel about nanomaterials compared to other modern technologies? *(percentage of participants, N=5000, question Q21)*



Based on Cartogram 8, respondents from Austria and Finland feel that they suffer from a lack of information about nanomaterials in comparison to other modern technologies (the other modern technologies in this question were not specified).

Information sources

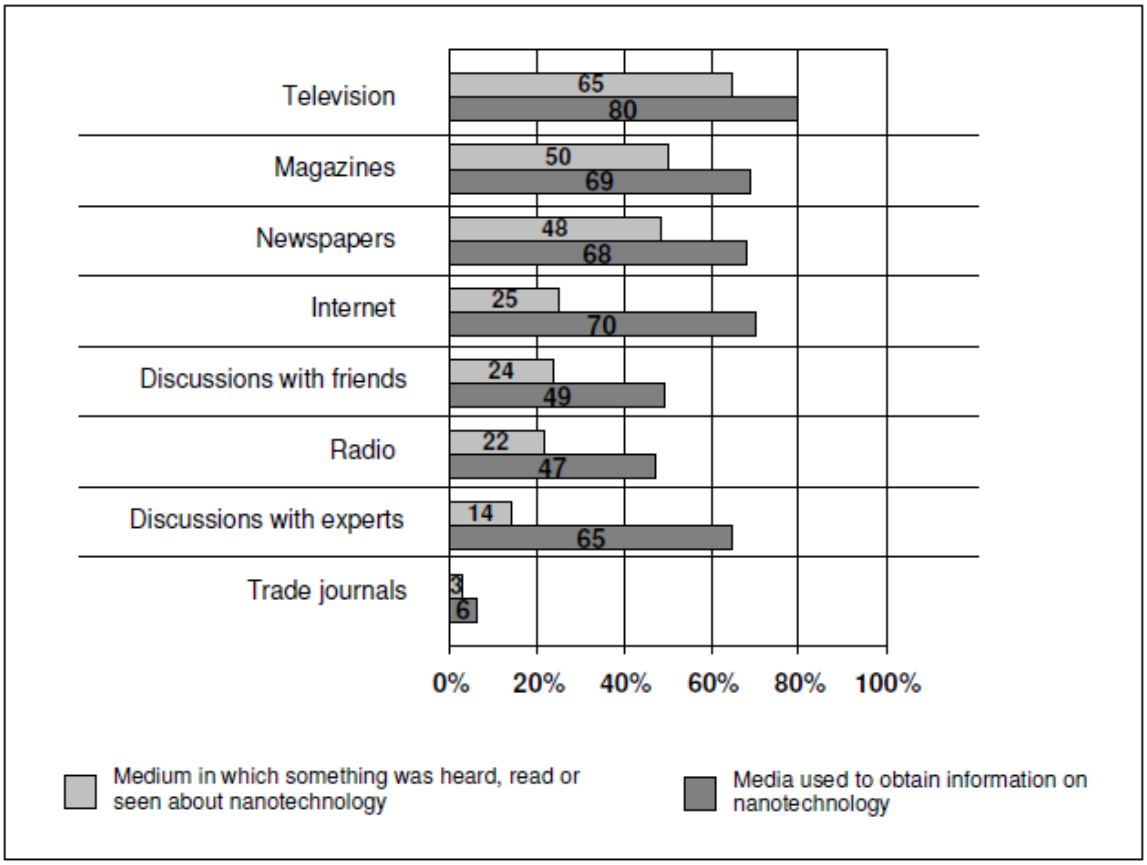
The German Federal Institute for Risk Assessment (BfR) summarised the importance of different media for the dissemination of information on nanotechnology in 2008 (Zimmer, R. 2008), as presented in Figure 5 with the following commentary:

"Based on the question of whether the respondent was informed in the respective media about nanotechnology, no priority can be identified for a specific medium and none of the media included can be ruled out. In the case of television, magazines, and newspapers the proportion of "yes" responses is between around 70% and 80%. Radio reaches approximately 50%. Discussions with experts are particularly important. In this area, too, there are major differences above all for the Internet and radio. From the results, it can be concluded that no medium has to be ruled out for the dissemination of knowledge about nanotechnology."

"Approximately 72% of Italian citizens have heard about nanotechnology, mainly from television and the Internet" according to 2011 Italian study. (Bottini, Rosato et al. 2011)

In a 2014 study in Turkey (Senocak 2014) 63.9% of respondents listed media (TV, internet, newspapers or magazines) as their knowledge source about nanotechnology, 18% listed conversations with friends, 9.6% obtained their knowledge from school, 8.6% from "other sources".

Figure 5 - Importance of different media for dissemination up to 2008 of information on nanotechnology *(Zimmer, R. 2008)*

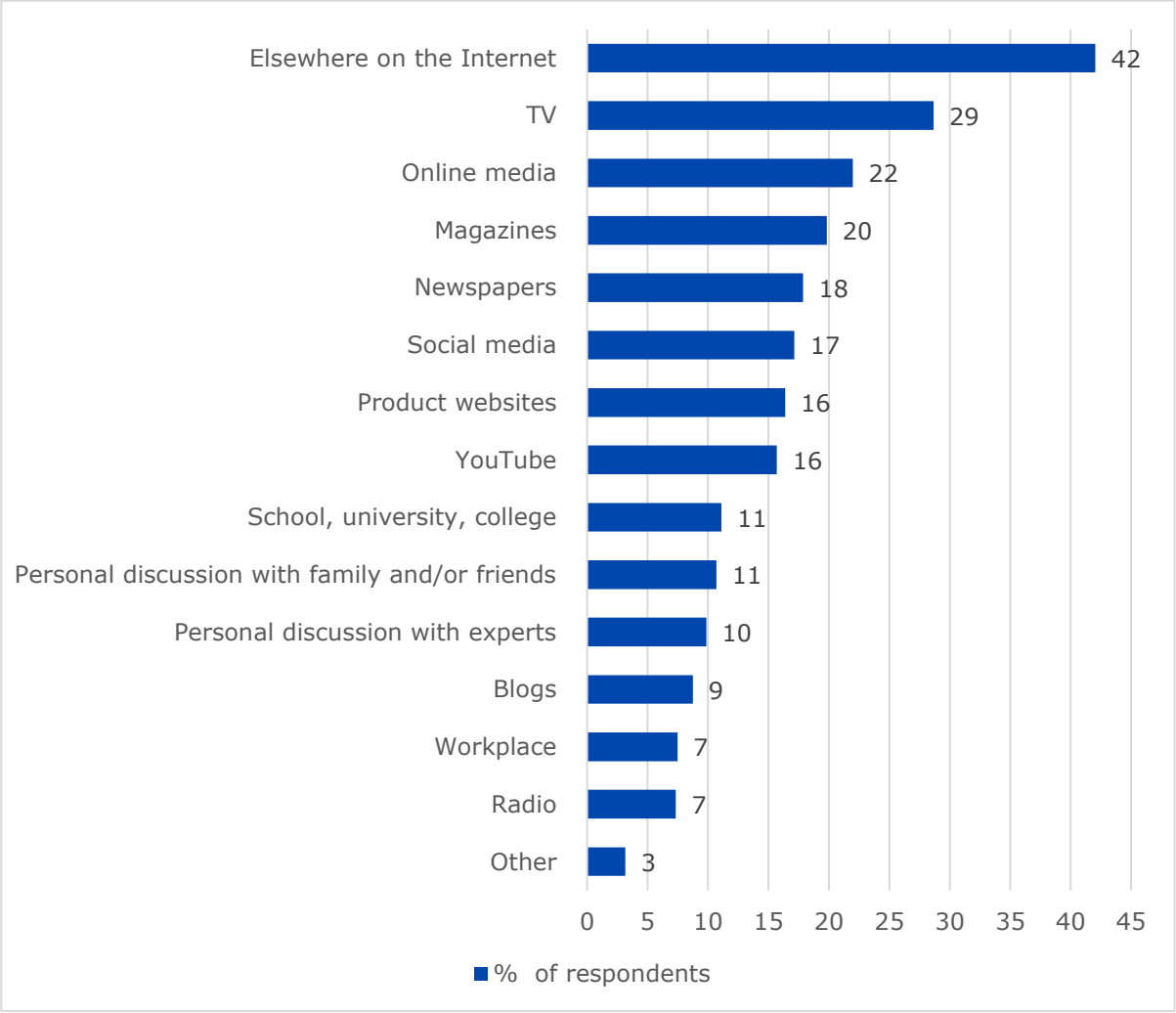


In the study presented in this report, the Internet and TV are the primary sources for obtaining information about nanomaterials among those who feel that they are at least to some extent aware of what nanomaterials are.

France has a relatively specific source preference, compared to the rest of the countries. The French population is getting information primarily from the TV or YouTube, while the Internet

in general terms is on the fourth place regarding usage and preference.

Graph 36 - Where have you already heard, read, or seen something about nanomaterials? *(FILTER: those, who are aware of nanomaterials, N=3248, Q22a)*



A similar pattern was identified among those who feel they have less or no information about nanomaterials. Generally, the most used source is the Internet while a secondary source would be product websites.

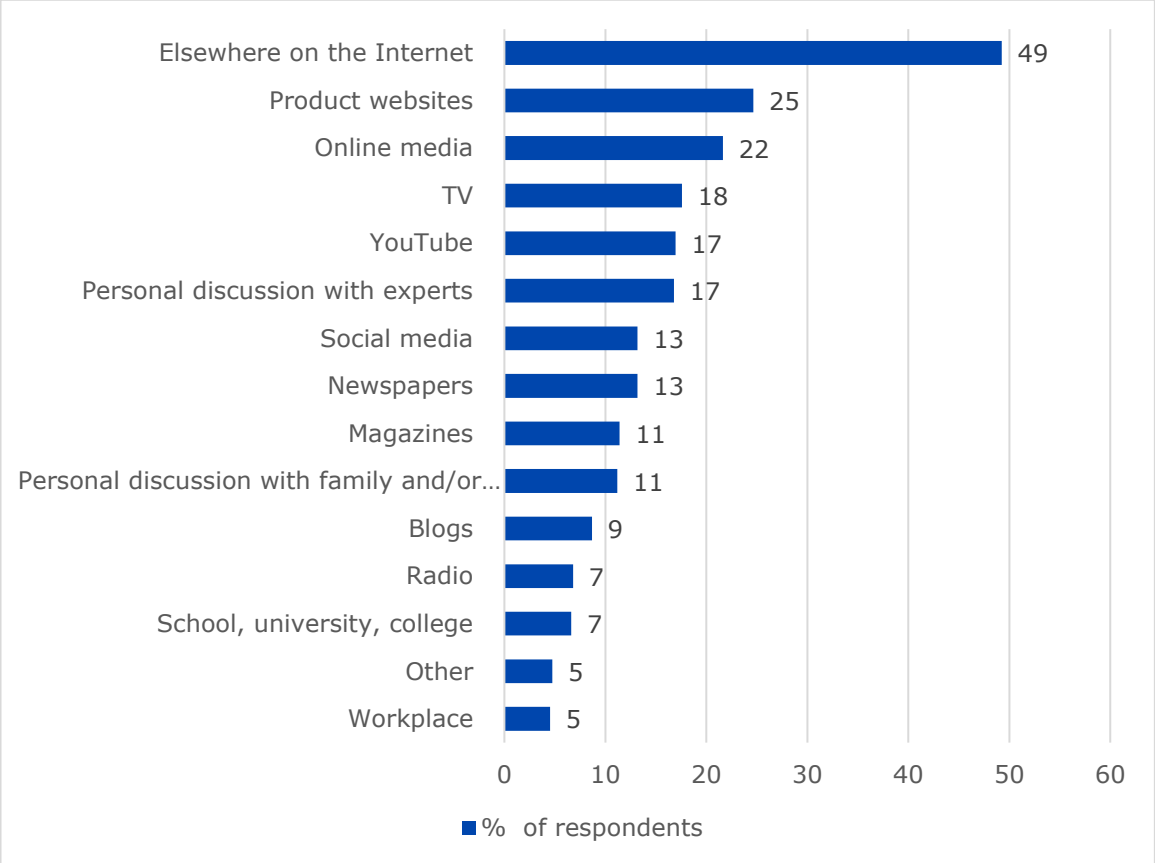
Relatively specific behaviour was identified among the French population. The population in France tends to use product websites as their primary sources together with other Internet sources. Personal discussion with experts, family or friends is also a very strong information source.

Demographic profile in detail:

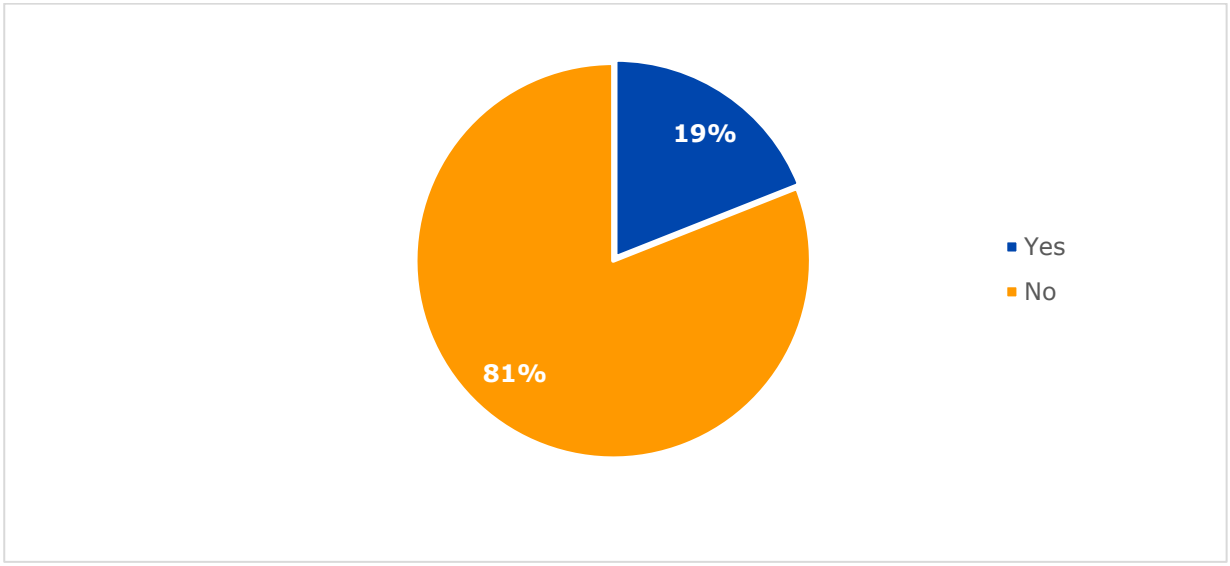
Table 28 - Information sources on nanomaterials - demographic profile

USED SOURCE	DEMO PROFILE (subgroups using given source more often)
Internet	rather men, cities over 100 000 inhabitants, the highest education – university
TV	age over 50 years, basic education
Online media	men, age 16 – 39 years, cities over 100 000
Magazines	no specific differentiation
Newspapers	no specific differentiation
Social media	age 16 – 29 years, middle town 50 – 100 000 inhabitants
Product websites	no specific differentiation
YouTube	men, age 16 – 29 years, students
School, university, college	age 16 – 29 years, cities over 200 000 inhabitants and capital, students
Personal discussion with family and/or friends	no specific differentiation
Personal discussion with experts	cities over 200 000 inhabitants and capital
Blogs	no specific differentiation
Workplace	no specific differentiation
Radio	no specific differentiation

Graph 37 - Where would you look for information about nanomaterials? *(FILTER: those, who are not aware of nanotechnology, N=1725, question Q22b)*



Graph 38 - Are you aware of any websites or databases with centralised information about nanomaterials or products containing nanomaterials? *(N=5000, question Q23)*



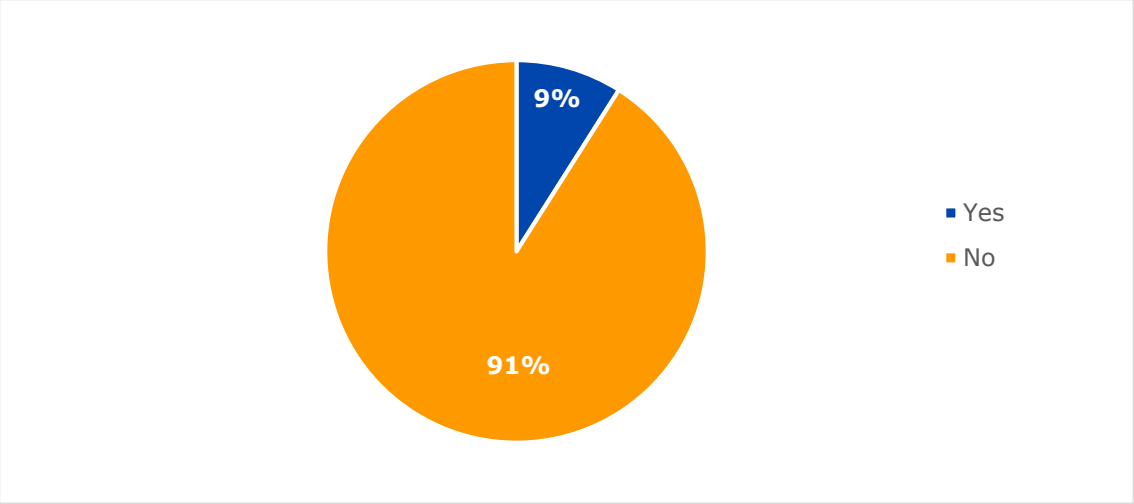
19% of respondents stated a clear awareness of some sources with centralised information about nanomaterials.

Men and ages 16-29 expressed awareness of specific websites or databases more often. This correlates with these demographic groups being significantly more aware of nanomaterials in general.

European Union Observatory for Nanomaterials (EUON) awareness

9% of the respondents claimed to be aware of the European Union Observatory for Nanomaterials.

Graph 39 - Are you aware of the European Union Observatory for Nanomaterials (EUON)?
(N=5000, question Q24)



Awareness of the EUON is strongly dependent on age. The higher the age, the lower the awareness. As all of the respondents in this survey are internet users, the higher awareness of EUON in the younger population is most likely caused by being more accustomed to look for information on the internet proactively, while the higher the age, the more the respondent is generally accustomed to receive information from "traditional media" (newspapers, TV, radio), where the possibility of exposure to any information linked with EUON is lower.

Those aware of EUON are usually respondents with a higher level of education (e.g. lawyers, medical practitioners, directors, top managers etc.) Detailed demographics are provided in Table 29 and Table 30.

Table 29 - Awareness of EUON based on age groups

VIEW BY AGE GROUPS					
answers in %	Total	16 - 29 years	30 - 39 years	40 - 49 years	50 - 60 years
Number of respondents	*5000*	*1265*	*1268*	*1255*	*1212*
Yes	9	16	9	7	4
No	91	84	91	93	96

Table 30 - Awareness of EUON based on segments

VIEW BY SEGMENTS BASED ON ATTITUDES TO NANOMATERIALS					
	Total	**Enthusiast**	**Tolerating**	**Fearing**	**No opinion**
Awareness of the European Union Observatory for Nanomaterials (EUON)	9%	5%	9%	9%	1%

3.7 Trust in authorities

The following chapter investigates the respondent's preference and trust in different authorities when searching for/being presented with information about nanomaterials.

List of questions analysed in this chapter is following (questions marked with an asterisk are open-ended):

Q25. What would be your primary source of information about nanomaterials?

	1 (this is my first source of information)	*2 (this is my second source of information)*	*3 (this is my third source of information)*	*None of them*
Distributor/seller from whom I bought the product	○	○	○	
Producer of the product	○	○	○	
Scientists/researchers (universities, research institutes, etc.)	○	○	○	
Health and occupational safety authorities	○	○	○	
Pharmacists	○	○	○	
Doctors (e.g. your doctor)	○	○	○	
Consumer organisations	○	○	○	
Government representatives, politicians	○	○	○	
EU authorities (e.g. European Commission, European Chemicals Agency)	○	○	○	
Environmental organisations	○	○	○	

Q26. How much trust would you place in the following persons or institutions if they were to inform you about safety of nanomaterials?

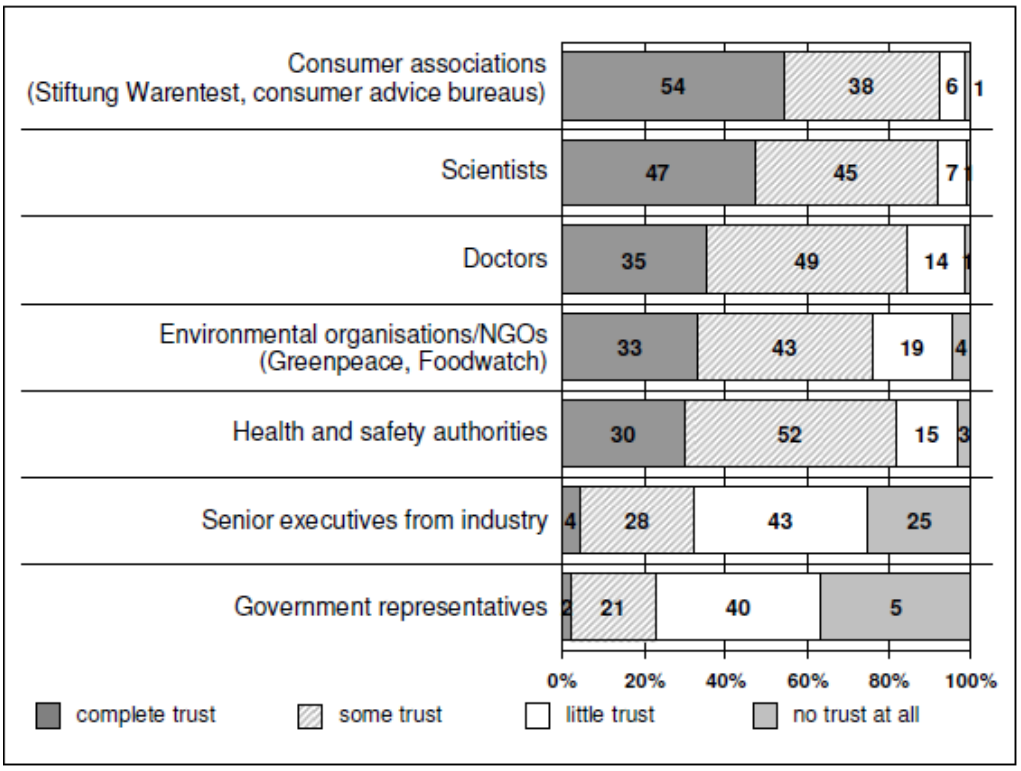
	Absolute trust	*Bit of trust*	*Not much trust*	*No trust at all*
Distributor/seller from whom I bought the product	○	○	○	○
Producer of the product	○	○	○	○
Scientists/researchers (universities, research institutes, etc.)	○	○	○	○
Health and occupational safety authorities	○	○	○	○
Pharmacists	○	○	○	○
Doctors (e.g. your doctor)	○	○	○	○
Consumer organisations	○	○	○	○
Government representatives, politicians	○	○	○	○
EU authorities (e.g. European Commission, European Chemicals Agency)	○	○	○	○
Environmental organisations	○	○	○	○

Trust in authorities in Europe

The trustworthiness of groups of individuals and institutions in the dissemination of information on nanotechnology was summarised by Zimmer et al. (René Zimmer 2008) as illustrated in Figure 6, together with the following commentary:

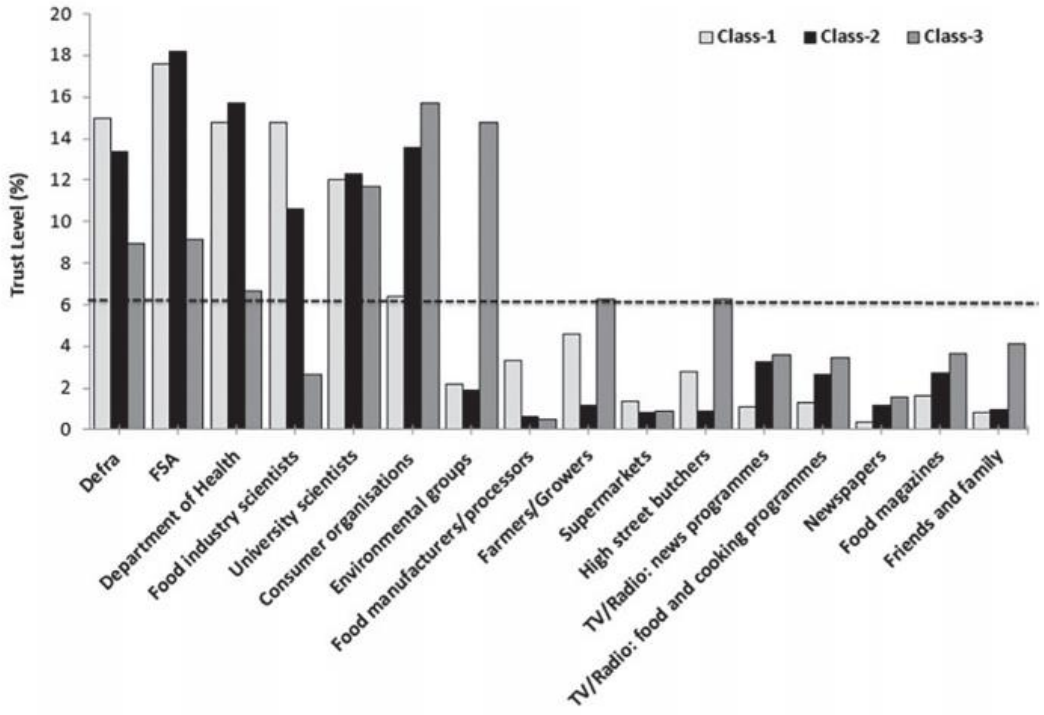
"Consumer associations are in an excellent position. In the survey the terms used to describe them were "for example Stiftung Warentest or consumer advice bureaus". More than 90% of respondents have some trust in these associations and more than 50% have complete trust in them. Scientists have similarly high values to the consumer associations. Around one-third of participants have absolute trust in doctors, environmental organisations and health and safety authorities; around half have some trust. It should be stressed that the values of the environmental organisations are far lower than those of the consumer associations. It seems, therefore, to make sense to differentiate between the stakeholders which represent the interests of citizens. The values of senior executives from industry and government representatives are far lower than for the other groups and institutions. Not even one-third of respondents had at least some trust in industry and not even one-quarter of respondents had some trust in government representatives."

Figure 6 - Trustworthiness of groups of individuals and institutions in the dissemination of information on nanotechnology *(René Zimmer 2008)*



In 2010, a UK study found that in general, all consumers regard government institutions trustworthy about providing accurate information on nanotechnology (Erdem 2018). According to this study, *"consumers tend to have more trust in information sources that are closer to "public" interest or at least not bringing vested interests."* The complete results are listed in Figure 7.

Figure 7 - Distribution level of trust (%) (Erdem 2018)



Public trust in the institutions providing information about nanomaterials in a 2014 Turkish study (Senocak 2014) is summarised in Figure 8.

Figure 8 - Public trust in scientists, business leaders and politicians (Senocak 2014)

	Answer					
	A Lot		*Some*		*A Little*	
	%	*N*	*%*	*N*	*%*	*N*
Scientists	21.3	109	54.5	280	24.2	124
Business leaders	14.6	75	45.7	235	39.6	203
Politicians	7.6	39	21.8	112	70.6	362

According to a 2012 Germany study (Guido Correia Carreira, Jan-Peter Ferdinand et al. 2016), 47.6% of 1200 survey respondents completely trust scientists, 42.5% trust consumer organisations, 33.2% trust doctors, 30.5% trust environmental organisations, 30.2% trust health and safety authorities, 3.2% trust industry executives and only 1.1% trust government representatives.

In a 2019 study performed in Denmark, Germany and Spain (Porcari, Borsella et al. 2019), trust in information sources was not studied systematically, but there was consensus on the crucial importance of having unbiased, scientific and trustable information regarding the potential impacts of nanomaterials and nano-related products on the environment, health and safety.

Trust in authorities outside of Europe

According to a public survey in the USA in 2004, a majority of Americans report low trust in business leaders within the nanotechnology industry to protect them from potential risks (Mir 2007).

In 2006, those who had a great deal or quite a lot of confidence in all three government agencies (USDA, EPA, and FDA) mentioned in the survey to maximise the benefits and minimise the risks associated with scientific and technological advancements were only 0.7 times as likely as those who had no trust in any of the three agencies to know a lot or some about nanotechnology (Smith, Hosgood et al. 2008).

In 2007 in the USA, the citizens listed mass media and scientific news as their preferred sources of information about nanotechnology (Ho, Scheufele et al. 2010).

1007 South Koreans in 2010 were asked which of the following groups they trusted to provide them with information about nanotechnology: international organisations, the central government, corporations, consumer and environmental organisations, teachers and professors, research institutes, experts, the media, people, and other. The analysis revealed that "media" was the highest, followed by "people", "the central government", and "teachers and professors", regardless of household income (Kim 2014, Kim, Lee et al. 2014).

A Chinese study from 2013 mentioned that mass media news reports and advertisements were the top means of communication about nanotechnology for its participants (Zhang, Wang et al. 2016).

Citizens of South Korea reported in 2014 that they trust professionals including professors, researchers and specialists, nongovernment organisations, and central government. The answers from the consumer group also included the central government, NGOs, and other professionals. International organisations scored lower than the media in both groups (Kim, Lee et al. 2014).

84.4% of 759 respondents in Iran between 2005 and 2015 trust scientists as their primary source of information about nanotechnology and 61.5% trust government agency regulators (Farshchi, Sadrnezhaad et al. 2011).

Scientists and science organisations were most trusted by the public to explain the risks and benefits of nanotechnologies, followed by government agencies and regulators and then non-government organisations in Australia in 2012 (Cormick and Hunter 2014).

According to another Australian study from 2013 (Capon, Rolfe et al. 2016), the public does have less trust in scientists and the health department to keep them safe from any potential health effects of manufactured nanomaterials than those working in nanotechnology in academia or government. Studies have shown that the Australian public is more likely to trust scientists and scientific institutions, followed by government agencies with industry and mass media receiving the least amount of trust.

Preferred information sources for nanomaterials

Scientists or researchers are the most preferred sources when people need to find information about nanomaterials, followed by health and occupational safety authorities.

EU authorities (e.g. European Commission, European Chemicals Agency) are declared as the third-most preferred source while government representatives and politicians are the least trusted.

EU authorities including ECHA are the most preferred source of information mainly in Finland (41%) and least preferred in Austria (14%). Other countries range from 20% to 27% (very close to the average preference level).

Graph 40 - Preferred sources of information about nanomaterials *(N=5000, question Q25)*

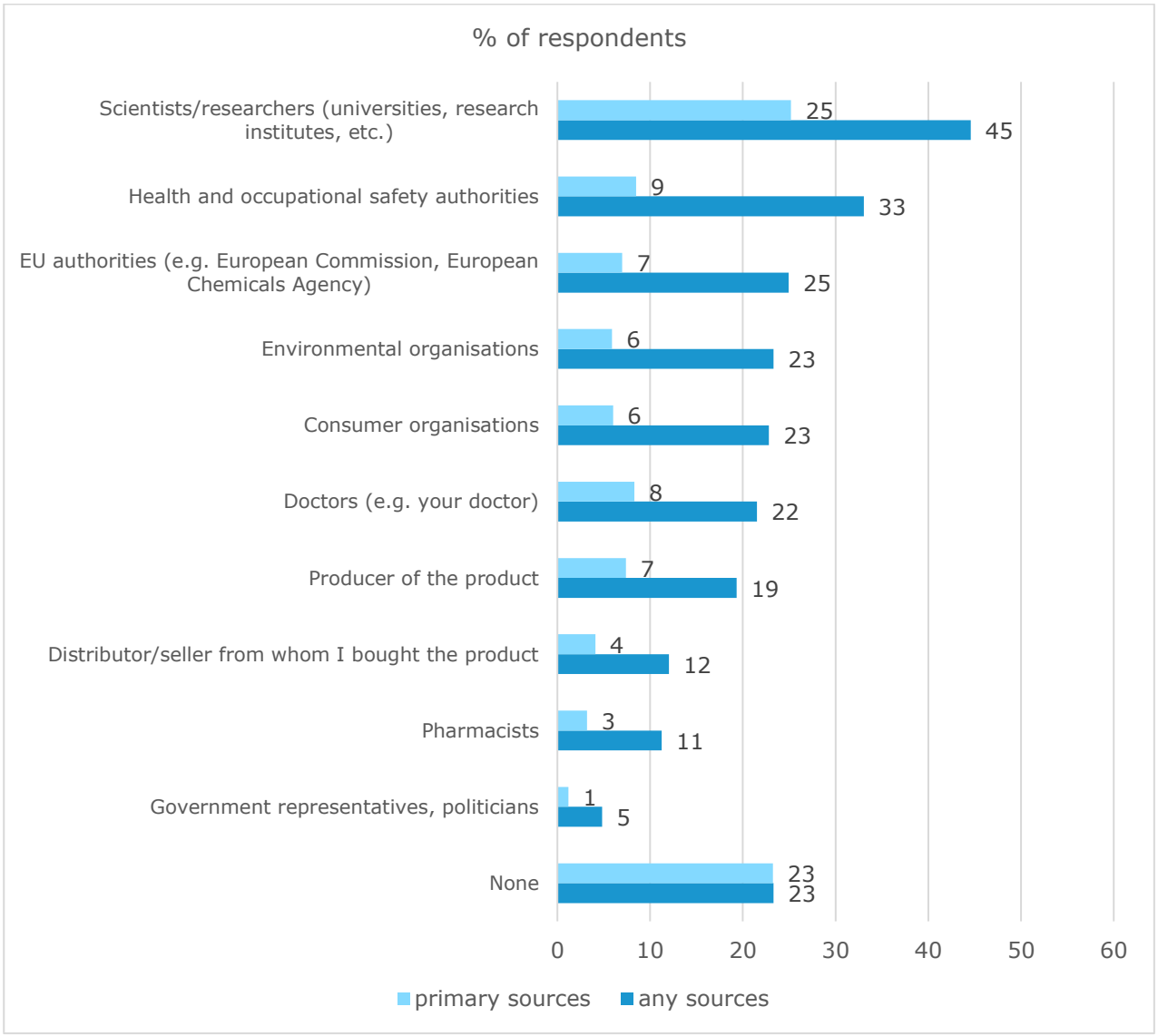


Table 31 - Preferred sources of information about nanomaterials - view by segments

VIEW BY SEGMENTS BASED ON ATTITUDES TO NANOMATERIALS				
	Enthusiast	**Tolerating**	**Fearing**	**No opinion**
Preferred sources of information about nanomaterials	producer of the product scientists/researchers (universities, research institutes, etc.)	scientists/researchers (universities, research institutes, etc.) EU authorities (e.g. European Commission, European Chemicals Agency) distributor/seller from whom I bought the product	consumer organisations environmental organisations	None

The question is whether the declaratively preferred sources of information are also credible. Graph 41 confirms a strong link between preference and credibility for scientists or researchers, as well as for health and occupational health and safety authorities. EU authorities suffer to some extent from a lack of trustworthiness.

While EU authorities were stated by 25% of the respondents as a preferred source of information, only 14% of the respondents consider EU authorities as a trustworthy source of information on the safety of nanomaterials.

Graph 41 – How much trust would you place in the following persons or institutions if they were to inform you about safety of nanomaterials? *(N=5000, question Q26)*

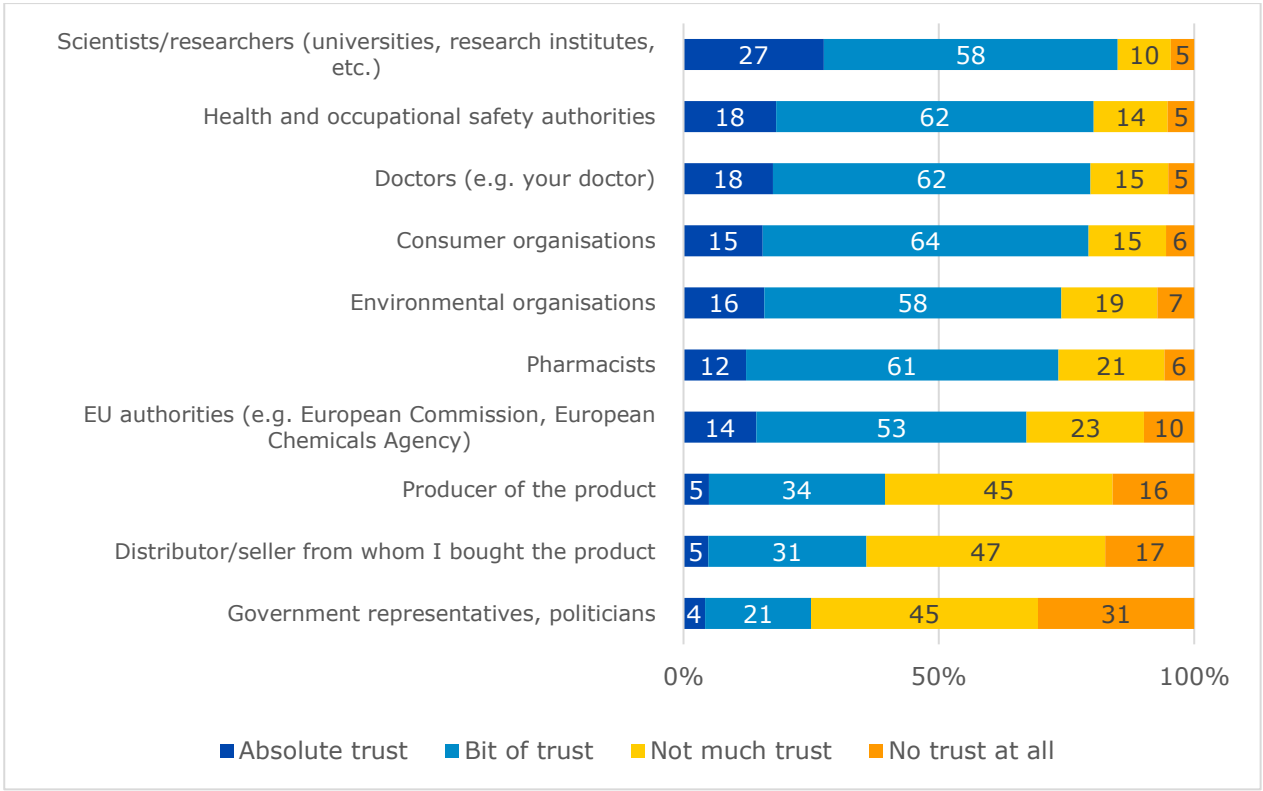


Table 32 - Trust in information sources - view by segments

VIEW BY SEGMENTS BASED ON ATTITUDES TO NANOMATERIALS				
	Enthusiast	**Tolerating**	**Fearing**	**No opinion**
Credible sources	product distributor/seller product producer EU authorities (e.g. European Commission, European Chemicals Agency)	EU authorities (e.g. European Commission, European Chemicals Agency) doctors	consumer organisations environmental organisations	none

3.8 Labelling of products containing nanomaterials

This chapter covers the respondents´ subjective interest in authorities establishing a labelling duty for products containing nanomaterials, and to some extent the content of the information provided on such a label.

List of questions analysed in this chapter (questions with an asterisk are open ended):

Q27. When buying a product containing nanomaterials, do you think you should be informed about it (for example on the label or on the packaging)?

a. No
b. Yes

Q27a. What kind of information would you expect on the label of a product containing a nanomaterial? *

Q28. For which of the following products do you think you should be informed (for example on the label or on the packaging) when buying a product containing nanomaterials?

a. Cars
b. Sports equipment
c. Medicines
d. Paints/varnishes/surface coatings
e. Foods
f. Plastics
g. Household electrical appliances
h. Computers and electronics
i. Clothing/textiles
j. Construction materials
k. Detergents/household cleaning products
l. Cosmetics
m. Toys
n. Kitchenware
o. Pesticides and plant protection products
p. Car care products

Need for information

Due to the relatively low level of knowledge of nanomaterials overall, people want to be informed whether the products they buy contain nanomaterials. 87% of the respondents think that they should be informed when buying a product containing nanomaterials, for example on a label or packaging.

From earlies studies where labelling of products containing nanomaterials was addressed, the conclusive opinion of the public and the experts is that the obligatory and precisely regulated labelling is necessary and beneficial for consumers. However, prior to the labelling, consumers feel that they need to be informed about the risks and benefits of nanotechnologies and products containing nanomaterials in general. General information and awareness about nanotechnologies and nanomaterials combined with proper labelling should, according to public perception, enable consumers to perform an informed decision when buying products containing nanomaterials/processed by nanotechnologies.

In a 2006 study in Switzerland concerning products containing synthetic nanoparticles, many participants stated that they should be provided with a declaration that reveals the compounds. This would enable every citizen to make a decision on buying a nano product or not (Burri and Bellucci 2008).

Almost all interviewees (88%) of 790 Italians surveyed in 2011 indicated that the presence of nanoparticles should be explicitly stated for consumables, and believed that it is necessary to create a commission of control to regulate the use of nanotechnology, especially with regard to health and environmental pollution (Bottini, Rosato et al. 2011).

Labelling of nanoproducts was also discussed by Feindt and Poortvliet 2019. The more detailed product information 'Contains nanosilver' was perceived to be more attractive and more informative than the '10^{-0}' label. However, the overwhelming opinion was that the information was still not sufficient. In particular, more information was required about nanotechnology as well as the characteristics and effects of nanosilver. Participants also remarked that the propertie and benefits of nanosilver were not communicated. Several participants felt that the label had no practical meaning for them, and that it was unclear whether the label was meant to be an attractor or a warning. Some participants would be enticed by the label to look for more information. In each group, participants said that they would not trust the label. It was suggested that more trust would be derived from the label being better designed and presented, backed by an approved standard, linked to a renowned brand or the product being sold by a trustworthy outlet. The label would not influence the purchasing decision of most participants, but some participants felt cautioned and discouraged from buying the product due to insufficient information. For individual participants, the label would generate interest in the product.

Labelling as a regulatory measure divided the Swedish experts in 2017. The high perceived benefit of nanomaterials/nanotechnology decreased support for government regulation of labelling, while high perceived risk and ethical concerns about nanomaterials/nanotechnology increased support for government regulations regarding labelling (Larsson, Jansson et al. 2019).

A very high percentage (95%) of 3101 consumers participating in an online consumer survey in Denmark, Germany and Spain in 2019 think that if a product contains nanomaterials, they have to be highlighted in the list of ingredients on the label. In the same way, some participants in the Delphi study think that: "*nano-labelling could give a wrong message that all nano-products are dangerous since consumers are not aware or competent to distinguish between sensible and non-sensible applications*" (Porcari, Borsella et al. 2019).

Graph 42 - When buying a product containing nanomaterials, do you think you should be informed about it (for example on the label or the packaging)? *(N=5000, question Q27)*

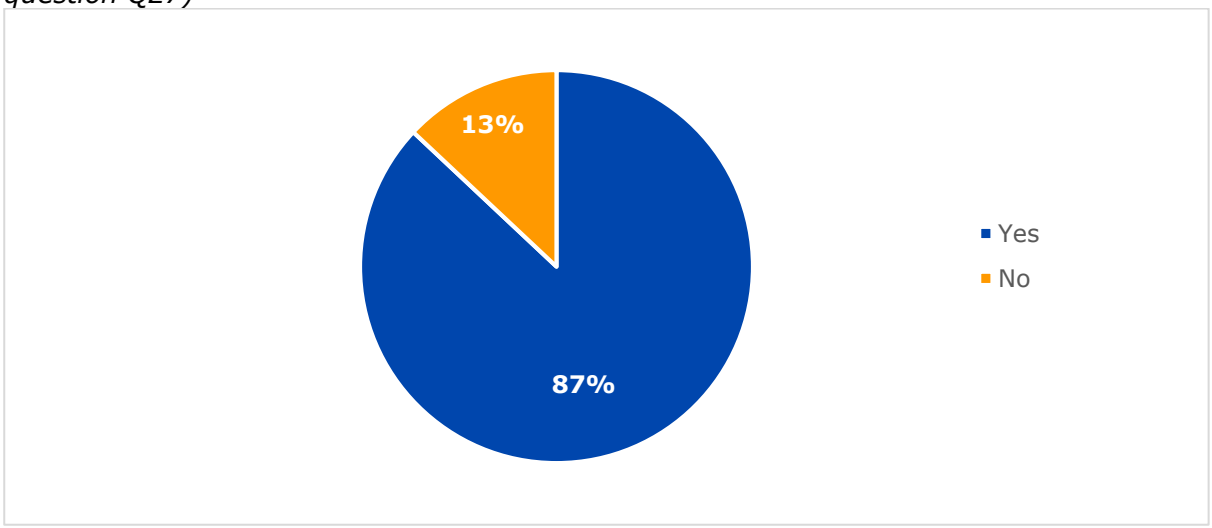


Table 33 - Need for information on the label - based on segments

VIEW BY SEGMENTS BASED ON ATTITUDES TO NANOMATERIALS					
answer yes:	**Total**	**Enthusiast**	**Tolerating**	**Fearing**	**No opinion**
Need for information when buying a product containing nanomaterials (for example on the label or on the packaging)	86%	87%	86%	91%	79%

The need for information is similar among most of the studied countries with slightly higher percentages in Bulgaria and Finland.

The request for information on the label reflects general attitudes on the uses of nanomaterials.

People request clear information and labelling on the products where direct or more extensive exposure is expected or suspected (categorised by the responses to question 9, illustrated by Graph 18, e.g. foods and food-contact materials, medicines, cosmetics or toys). These are products that come into direct contact with the human body and are therefore perceived as potentially risky to human health.

Respondents care less about whether products in technical areas contain nanomaterials or not. This includes products such as electronics, cars, rubber tyres, paints, and varnishes, etc. The detailed results are illustrated in Graph 43.

From a regional point of view, the information requirements for products are comparable. Only the population in Bulgaria is slightly more demanding, especially concerning food and medicines, while in France the demand for labelling products containing nanomaterials is lower.

Table 34 - What kind of information would you expect on the label of a product containing nanomaterials? *(FILTER: respondents who request to be informed that they are purchasing a product containing nanomaterial (N=4347, question Q27a))*

VIEW BY COUNTRIES						
Answers in %	**Total**	Poland	Bulgaria	Austria	France	Finland
Number of respondents	***4347***	*854*	*924*	*856*	*801*	*912*
Warning against possible negative impacts / risks	**19**	16	21	9	27	24
Warning - contains nanomaterials	**14**	17	14	16	10	14
Complete information	**12**	14	19	10	9	7
Symbol or stamp	**9**	13	4	18	7	3
Amount of nanomaterials / quantity	**7**	6	8	5	7	8
Type of nanomaterials used	**4**	6	5	2	5	5
Other type of information	**13**	12	13	15	14	14
DK / no response	**20**	15	16	26	21	25

Table 35 - Labelling of products - view by segments

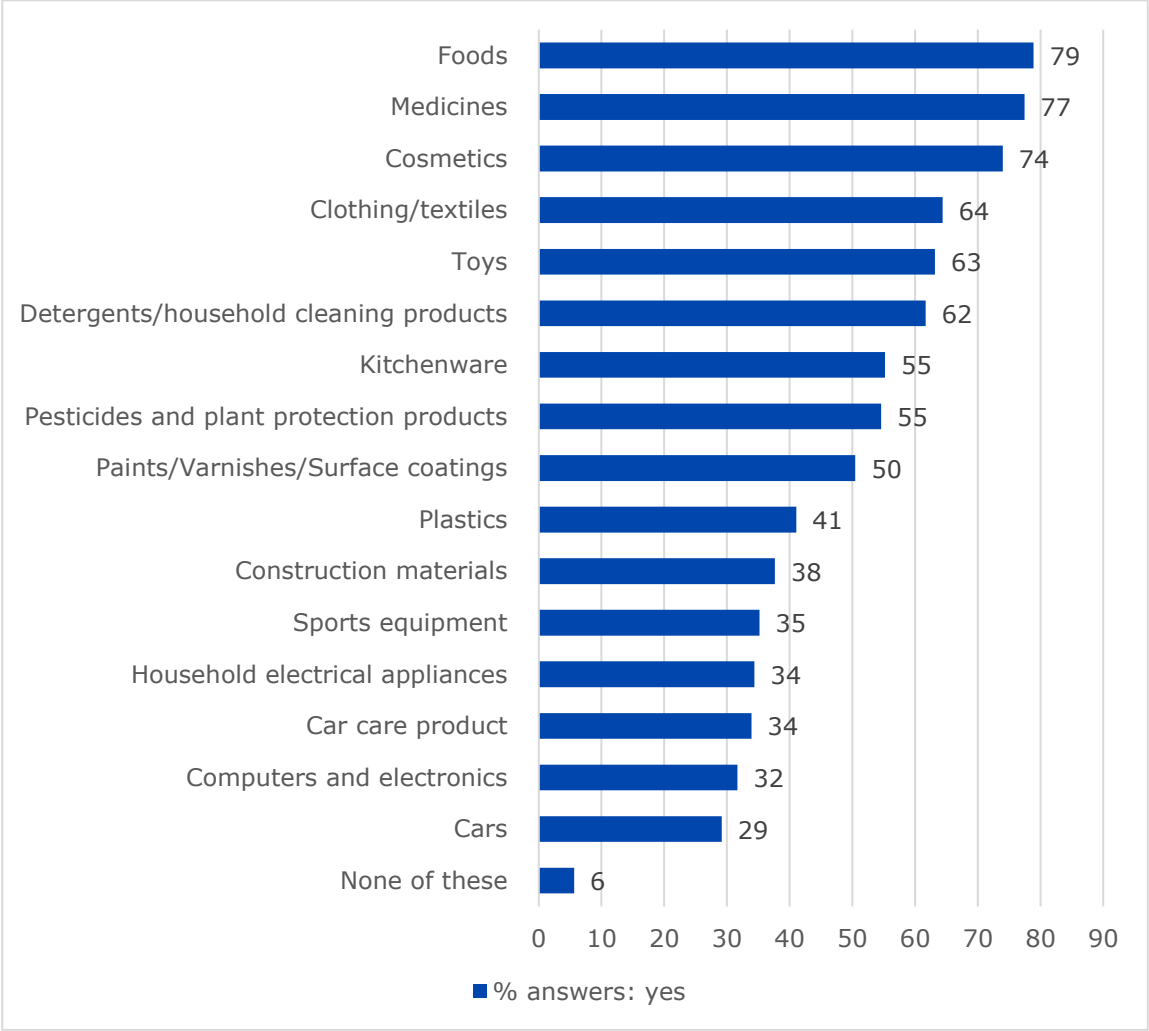
VIEW BY SEGMENTS BASED ON ATTITUDES TO NANOMATERIALS				
	Enthusiast	**Tolerating**	**Fearing**	**No opinion**
Products that should be labelled if they contain nanomaterials	medicines cosmetics toys paints/varnishes/surface coatings	cosmetics food medicines	kitchenware detergents/household cleaning products construction materials clothing/textiles paints/varnishes/surface coatings and many others…	None

The respondents primarily expect the label to contain the warning against possible negative impacts/risks of nanomaterials. This requirement is relatively significant in all countries, mainly in France and Finland. Higher percentages of respondents from Austria considered a symbol or a stamp to be sufficient for labelling. The second most required labelling element is a warning that a product contains nanomaterials.

The complete information about nanomaterial content, its amount and possible negative impact is the third most required option. This is relevant mainly for Bulgaria while citizens in other countries are relatively relaxed.

There is also a strong group of respondents, who require some information on the label, but they are not able to specify its content. This attitude is prevalent in Austria and Finland.

Graph 43 - For which of the following products do you think you should be informed (for example on the label or on the packaging) when buying a product containing nanomaterials? *(N=5000, question Q28)*



Need for information outside the EU

In Australia in 2013, most respondents believed that regulatory authorities should make labelling of nano products obligatory to inform citizens. The product that should most likely be affected by labelling was food followed by off-the-shelf medicines, cosmetics/sunscreens, pesticides, computers, and sports equipment. According to this study, labelling will increase the competitiveness of the product containing nanomaterials/treated by nanotechnology (Capon, Gillespie et al. 2015).

According to a USA study from 2015, higher trust does not mean lower desires for labelling and lower trust does not mean higher desires either. This is an interesting finding and perhaps suggests that labelling is mediated by other factors like the consumer´s right to know and choose, rather than trust to ensure safety. The role of labelling may not be seen as a government restrictive policy to ensure safety, but rather could be performed to provide a choice (Yue, Zhao et al. 2015).

Higher levels of knowledge in science are associated with increased support for nano-food labelling, but not banning the product. One of the most interesting findings from the study conducted in Singapore by Chuah, Leong et al. (2018) is the relationship between attitudes toward technology and support for the labelling of nano-food. The results found attitudes

toward technology to be positively associated with support for labelling. Due to an inherent desire for personal control in the purchasing process, consumers would prefer making their own decisions based on the labels and keep their purchasing options open rather than the banning of these food products. People who dislike technology tend to support the banning of nano-food (Chuah, Leong et al. 2018).

The government staff in Malaysia believe that the benefit and risk information in the form of a label on nanoproducts serves as a communication tool that assists the public with making decisions (Kamarulzaman, Lee et al. 2019).

4. Summary

4.1 Awareness of nanomaterials/nanotechnology

Are consumers aware of what nanomaterials are and where they are used?

Despite nanomaterials being a common part of our everyday lives through various products (foodstuffs, chemicals, textiles and apparel or electronics to name just a few), general awareness about the nature, characteristics and properties of nanomaterials is very low – a lack of awareness of nanomaterials (or a very shallow knowledge) is more common than awareness. However, the awareness is clearly increasing over time. The average percentage of respondents that are aware of nanomaterials in 2005 was 43%, in 2010 the number increased to 47% and in 2020 it is 65% (sum of the percentage answering "heard something" and "heard a lot"), measured on the representative sample of 5000 respondents from 5 different EU member states.

The prompted answers on uses of nanomaterials indicate that the public is aware of (or can logically deduce) the wide use and various applications of nanomaterials, but there is very limited understanding how the use of nanomaterials brings benefit to different technologies and products, and ultimately to the users and consumers of the products. When provided with examples, respondents mostly linked the use of nanomaterials with electronics, surface treatment, cosmetics, and textiles.

4.2 Shopping habits and behaviour related to products containing nanomaterials

As the population becomes more aware that human health is connected to lifestyle choices and with growing interest in environmental issues, consumers are more cautious when buying goods. That means, that consumers are more interested in the origins and content of the products they buy in the context of the impacts on human health and the environment. When buying a product for the first time, more than half of the respondents claim to read information about its content and safety information.

The growing interest in a healthy lifestyle is confirmed by most respondents willing to pay a higher price for a safer product. Respondents claim willingness to pay 1-20% more for a guaranteed safer product, however, it can be expected that the real willingness will be closer to the lower limit of this range.

If consumers were presented with clear information that a product contains nanomaterials, the majority would take a cautious stand of either not buying such a product, or decide based on the category of the product (less concern was observed with electronics, car equipment, electrical appliances etc., more with food, food packaging, medicines and cosmetics). However, this attitude is clearly linked to the respondent's level of knowledge about nanomaterials. The lower the level of knowledge, the less likely the respondent is to buy a product containing nanomaterials or treated with nanotechnologies. The public is most cautious when buying a product where direct exposure is likely or inevitable (e.g. food or cosmetics).

4.3 General risk perception

The respondents generally perceive health risks as an important issue for their lives, at least on a declarative level, most of the population is quite vigilant. Only a small percentage of respondents indicate a fundamental lack of interest in health risks.

When presented with examples of modern technologies and other potential areas of concern regarding human health and the environment and asked about their perception of them, two-

thirds of respondents were concerned about the impact of using asbestos, accumulation of plastic waste, global warming, use of pesticides and GMOs. On the contrary, less than one-quarter of the respondents were concerned about the impact of modern technologies such as computers, mobile phones, electronics, or social networks on human life.

Compared to other modern trends and technologies, the impact of nanomaterials on human life does not cause significant concerns. Approximately one-quarter of survey respondents were worried about the possible impact of nanomaterials on their life (comparable with those concerned about computer use, social networks, and electronics). Around the same number of respondents do not have a distinct opinion, which seems to be caused by the lack of knowledge about the topic.

4.4 Risks perception related to nanomaterials

Are consumers concerned about nanomaterials in the products they use? What risks/benefits do consumers associate with nanomaterials? How do consumers think they are exposed to nanomaterials?

The desk research carried out within the presented study concluded that public perception of risks and benefits associated with nanomaterials is highly variable depending on the applications and types of products in which nanomaterials are used. Although not explicitly discussed or studied in detail in most studies, it is obvious that public perception of risks and benefits is associated with the level of expected exposure to nanomaterials in relation to different uses and/or groups of products (e.g. food contact materials or cosmetics products such as sunscreens raise higher concerns in most studies than products where lower/none or indirect exposure to nanomaterials is expected, e.g. computers).

The presented study (both the desk research as well as the online survey) indicates that the perception of risks is directly linked to the level of awareness and knowledge about nanomaterials. Nearly half of the respondents could not decide when asked about their perception of the level of safety of using products containing nanomaterials. A higher level of concern is declared only by one-fifth of respondents, mostly people over 50 years of age.

The level of concern increases when talking about direct exposure to nanomaterials – two-thirds of the respondents are concerned to get into direct contact with nanomaterials. The concerns are mainly associated with yet to be discovered impacts and properties of nanomaterials, as well as limited means to avoid exposure. In this regard, dermal exposure is perceived as most likely. However, the respondents also tend to think that negative impacts can be avoided or prevented by proper use and treatment of nanomaterials.

Possible drivers in the perception of risks and benefits of nanomaterials/nanotechnology

Some studies conclude that the perception of risks and benefits by the public is driven predominantly by cognitive factors rather than other factors, e.g. psycho-social or socio-demographic. In other words, people who tend to be cautious and reserved to adopting new technologies and are concerned about potential risks associated with disruptive technologies are more likely to be concerned about the presence of nanomaterials in products.

Hypothesis 1: Gender may affect the risk and benefit perception of nanotechnology

Bainbridge (Bainbridge 2002), Smith et al. (Smith, Hosgood et al. 2008) and Bottini et al. (Bottini, Rosato et al. 2011) concluded that women are less enthusiastic about nanotechnologies than men.

This hypothesis was confirmed by the present study – there are gender-related differences in the risks and benefits perception of nanotechnology (see Table 19).

Women are generally more concerned that nanotechnology may have a negative impact on their lives.

Hypothesis 2: Religiosity may affect the risk and benefit perception of nanotechnology

The study of Ho et al. (Ho, Scheufele et al. 2010) concludes that highly religious individuals are less supportive of funding of nanotechnology than less religious individuals, whereas individuals who held high deference for scientific authority were more supportive of funding of the emerging technology than those low in deference.

According to another study, "*individuals who are high on religiosity significantly perceived higher risks than those who are low on religiosity among the public"* (Conti, Satterfield et al. 2011). The study suggests that those who report vulnerability and affirm environmental justice, display sensitivity toward risk information and as a result tend to rate nanotechnology applications described as risky and less acceptable. However, the study of Bottini et al. (Bottini, Rosato et al. 2011) concludes that religiosity does not have an impact on the risk and benefit perception of nanotechnologies.

The hypothesis was supported by the present study - there is a correlation between the declared importance of religious beliefs and the risks and benefits perception of nanotechnology (see chapter Attitudes to new trends and possible impact on everyday life). Respondents, who claim that religion is important for them are more concerned about nanotechnology having a negative impact on their lives.

Hypothesis 3: Level of education may affect the risk and benefit perception of nanotechnology

According to Bottini et al. (Bottini, Rosato et al. 2011), level of education may have an impact on the risk and benefit perception of nanotechnologies.

This hypothesis was confirmed by the present study – level of education does affect the risks and benefits perception of nanotechnology (see Table 19). Respondents with a lower level of education are more likely to be concerned about nanotechnology having a negative impact on their lives.

Hypothesis 4: Age does not affect the risk and benefit perception of nanotechnology

The study of Bottini (Bottini, Rosato et al. 2011) suggests that age does not have an impact on the risk and benefit perception of nanotechnologies.

This hypothesis was disproved by the present study – age does affect the risks and benefits perception of nanotechnology (see Table 19). The respondents under 30 years of age are mostly enthusiastic about nanotechnology, whereas the respondents over 50 years of age are fearing it. The respondents between 30 and 49 years of age claim mostly to have no opinion on the matter, or they are not strongly concerned.

4.5 Attitudes related to nanomaterials

According to the present study, standpoints towards nanomaterials vary. The respondents are taking a positive or neutral stand to expectations regarding new possibilities and their positive impact on everyday life. Usually, the respondents tend to agree with nanomaterials being used in strengthening rubber tyres, more efficient treatment of wastewater or in cars and

electronics. However, they are more cautious when it comes to direct contact with nanomaterials – reduction of the salt content in foods, enrichment of foods with vitamins and other nutrients etc.

This variability in answers allows the segmentation of the population into four groups. The most unambiguous group are people with a very positive attitude towards nanomaterials (called „Enthusiasts" throughout this report). This group represents 19% of the population, most frequently people of 40 - 49 years of age, inhabitants of big cities with higher education (university level).

A relatively similar attitude can be observed within the most populated group (46% of the respondents) characterised by an open, tolerating attitude towards nanomaterials (segment name – Tolerating). A typical representant of this group is a person younger than 29 years, a student, or a person with university-level education.

The third group differs significantly from the previous ones – it represents nanomaterials rejectors (segment name – Fearing). This group represented mostly by people above 50 years of age, with lower than university-level education, females more often than males comprise 23% of the studied population.

The fourth group, represented by 12% of the population, does not have a clear attitude towards nanomaterials, their uses, characteristics, and impacts (segment name – No opinion). This segment is similar to the Fearing, with the only difference being age (30-39 years).

4.6 Information sources

What source do consumers use when looking for information on the safety and risks of nanomaterials?

More than half of the respondents claimed that they are equally informed about nanomaterials compared to other modern technologies. The primary sources where the respondents encountered information about nanomaterials are TV and the internet. When looking for information actively, the internet is the main source of information for the highest number of respondents (almost half of the respondents). Only one in five respondents claim awareness of any specific websites or databases with centralised information about nanomaterials or products containing them.

4.7 Trust in authorities

Who do consumers trust most for information on nanomaterials (authorities, companies, NGOs, others)?

The most trustworthy institutions/persons regarding information about nanomaterials are scientists/researchers (universities, research institutes, etc.), national health and occupational health and safety authorities, but also EU authorities (e.g. European Commission, European Chemicals Agency).

EU authorities are the third most preferred source of information about the safety of nanomaterials by the respondents. 14% of respondents place "absolute trust" in them and half of the respondents place "a bit of trust" in them, comparable to the trustworthiness given to consumer and environmental organisations and pharmacists. However, the difference between the trustworthiness of the individual sources of information is not significant.

The public tends to put the least trust in politicians and producers or distributors of the products containing nanomaterials.

4.8 Labelling of products containing nanomaterials

Are there specific areas that consumers are particularly interested in but feel they do not have sufficient information available?

87 % of the respondents think that they should be informed when buying a product containing nanomaterials, for example on the label or packaging.

The most significant need for labelling products containing nanomaterials is stated to be in food and food-related products, medicines, cosmetics, clothing/textiles, toys and detergents or household products.

The general requirement is usually a warning against possible negative impacts and risks or just general information about nanomaterials content. However, this study was not aiming at exploring what kind of information should be presented on labels and in what form as it would significantly extend the survey questionnaire and would require a completely new set of questions and case studies to be introduced.

4.9 Comparison between Europe and other countries

The awareness of nanomaterials and nanotechnology both within and outside the EU is similar and low, with the exception of Asia (mainly Singapore and China), where awareness and knowledge are higher.

The only studies researching purchase intentions for products containing nanomaterials outside the EU were conducted in Australia and New Zealand, and the results correspond with the findings of this study. Nanomaterials used in food raises the most concern among the respondents, while industrial usage of nanomaterials does not concern them.

Regarding the perception of risks and benefits of nanomaterials, Americans are more concerned about nanotechnology leading to arms race and weaponisation, nanotechnology being used by terrorists, and nanotechnology leading to economic disruption than citizens of other countries. The citizens of China often mentioned violating people's privacy and nano-weapon threats to national and personal security as a potential risk of nanomaterials use.

The trusted and preferred sources of information are very similar in all continents - scientists, universities. Also, the labelling needs do not differ significantly between continents - respondents of all countries agree that they should be informed about nanomaterial content on the label of a product to be able to make informed purchase decisions.

5. Recommendations

Although the awareness of nanomaterials among the public has slightly increased over the last fifty years, it does not correspond with the increasing and changing number of consumer uses and applications. As a general lack of awareness and knowledge causes concerns and emotional reactions, it is deemed necessary to gradually raise awareness and inform the population about the existence, properties, uses and possible impacts of nanomaterials in daily life.

An increased level of knowledge of nanomaterials help ensure that the public is able to make informed choices about products containing nanomaterials, including their benefits and risks and eliminate future barriers in acceptance by the public and willingness to buy, which can stem from a lack of knowledge (mostly about potential negative impacts of nanomaterials on human health and the environment). A clear communication strategy plays a key role in informing about the risks and benefits of nanomaterials use.

The communication strategy should include these phases in the following order:

1. Awareness-raising
2. Communication of benefits
3. Safety level information

Phase 1: Increasing awareness

This phase aims to raise awareness and inform the public about the existence of nanomaterials and nanotechnology as a common part of daily life and to clearly communicate about the distinction between different nanomaterials as they can have very different properties, benefits and risks, as is the case with all chemicals.

It is necessary to raise awareness about nanomaterials with claims and facts that are comprehensible and close to the interests of the general public, using common layman language e.g. a claim that the public will associate with the term nanomaterials. An example of such a claim could be "Nanomaterial x is a common part of daily life" or "Nanotechnology is crucial for progress". It is also key to ensure granularity in communicating about nanomaterials and to clearly communicate that some nanomaterials are safe and others are not and why this is the case (i.e. how they are regulated and what the scientific data shows). The awareness-raising phase aims to limit the concerns that stem from a lack of knowledge.

This communication phase should include:

- Description of what nanomaterials are
- Uses of nanomaterials
- History of nanotechnology (the discovery and progress, popularised text form)

The communication channels for this phase should be as broadly followed by the public as possible. As the key information is that nanomaterials and nanotechnology are a common part of daily life, this information should be presented via communication channels that are also a common part of the public's daily life. The examples are the following:

- The Internet – the most visited portals, news portals
- TV
- Newspaper, magazines
- Schools (from elementary level to university level)
- Well-structured and easy to understand website dedicated to nanomaterials that would be the primary source of exhaustive information about the properties, uses, history, benefits, and risks of nanomaterials. Ideally, an easily found and remembered domain,

e.g. www.nanomaterials.com

Phase 2: Communication of benefits

The second phase of raising awareness among the public about nanomaterials and nanotechnology concentrates on presenting the benefits of using them – the reasons why nanotechnology is applied. The public needs to be presented with unambiguous cases of successful applications of nanomaterials that benefit human life and society, and that they may have benefited from personally. The examples must be specific, available to the layperson and easy to understand. One example can be the manufacture of mouthpieces including nanomaterials, that show promising results as personal protection equipment against the transmission of the COVID19 coronavirus (case of personal protective equipment development during COVID19 pandemic in the Czech Republic). Other examples are e.g. the nanomaterial carwash programmes, more durable clothes, lower amount of salt in foods etc.

In addition to the communication channels mentioned in the first phase, it is key for this phase for the producers of products containing nanomaterials or being treated by nanotechnology to clearly state on the labels and during marketing communication the benefits that the nanomaterials in their products bring.

Phase 3: Safety level information

Regarding safety level information, three main areas of products and applications were identified:

1. Manufacture of computers, cars, spacecraft, other industrial applications – areas with uses of nanomaterials in components of products that the public is not directly exposed to

2. Clothes and apparel, accessories, household products, detergents, food packaging, toys etc. – areas of products that are a common part of the public's lives and can come into direct contact with their skin

3. Food, foodstuffs, cosmetics, medicines – products that are directly ingested or can cause exposure through inhalation

For the first group of products/applications, it does not seem efficient to communicate the potential risks/safety information as there is no direct exposure, they are the most distant from the public's everyday life and based on the study findings, the categories that the public seem to be least concerned about in terms of their safety.

For the second group, safety information should be communicated in cases where any adverse effects on human health/environment are known.

The situation is very different for the products belonging to the third group – products that are directly ingested or can cause inhalation exposure. These products should be clearly labelled and provide information about the presence of nanomaterials. It is recommended to make an additional study of the most suitable labelling and information requirements for the consumer products belonging to this group, factoring in the product type. This information could include content of nanomaterials, their possible impacts on human health (if applicable), safety use information, etc. It could be provided to consumers in the form of a label, a leaflet coming with the packaging or information material provided by the authorities with clearly listed risks and benefits.

As mentioned above, the order of the phases is crucial to ensure the understanding and approval of nanomaterials and nanotechnology by the public.

Recommendations for further studies

The collective of authors recommends continuing and broadening the study namely in the following areas:

1) Current pandemic situation (COVID19)

   The present study results from a survey presented to the respondents before the outbreak of a pandemic situation caused by COVID19 in Europe. It can be expected that the situation is changing the public perception of (not only) nanomaterials significantly. The amount of information about nanomaterials in public media rapidly increased due to nanomaterials being used for the manufacture of very effective personal protective equipment. This fact can lead to the following implications:

   - The public awareness of nanomaterials may be higher
   - The public may link nanomaterials with their benefits (more efficient protection against the virus)
   - The public may be less concerned about being exposed to nanomaterials as they get used to being in direct skin contact with them

   On the other hand, the overall concern and the perceived importance of health protection may also increase and lead to a more cautious approach to any health risks, incuding those related to very small particles that are similar in size to viruses.

2) Use of specific research methods to allow detailed study of nanomaterial risk perception (concepts testing, qualitative techniques etc.)

3) A detailed study focused on the broad topic of labelling products containing nanomaterials

4) A study on the public's perception of a representative group of combinations of nanomaterials and their applications such as carbon nanotubes in golf clubs, silica in car tyres or ZnO in sunscreen.

5) Researching the whole EU27 to allow detailed study of regional differences that might be caused for example by the national registry of nanomaterials, marketing campaigns, specified university research etc.

6) Workshop/focus groups on developing the detailed communication strategy for informing and raising awareness among the public about nanomaterials and nanotechnology, including the development of a specific informative web portal dedicated to them

6. References

Anonymous (2012). "The Harris Poll."

Anonymous (2013). "Eurobarometer 73.1: The European Parliament, Biotechnology, and Science and Technology, January-February 2010." Inter-university Consortium for Political and Social Research.

Bainbridge, W. S. (2002). "Public attitudes toward nanotechnology." Journal of Nanoparticle Research **4**(6): 561-570.

Bainbridge, W. S. (2002). "Public attitudes toward nanotechnology." JOURNAL OF NANOPARTICLE RESEARCH **4**: 561.

Berube, D. M., et al. (2011). "Comparing nanoparticle risk perceptions to other known EHS risks." Journal of Nanoparticle Research **13**(8): 3089-3099.

Besley, J. C., et al. (2008). "Interpersonal Discussion Following Citizen Engagement About Nanotechnology What, If Anything, Do They Say?" Science Communication **30**: 209.

Bottini, M., et al. (2011). "Public optimism towards nanomedicine." INTERNATIONAL JOURNAL OF NANOMEDICINE **6**: 3473.

Bottini, M., et al. (2011). "Public optimism towards nanomedicine." International Journal of Nanomedicine **6**: 3473-3485.

Burri, R. V. and S. Bellucci (2008). "Public perception of nanotechnology." Journal of Nanoparticle Research **10**(3): 387-391.

Capon, A., et al. (2015). "Comparative analysis of the labelling of nanotechnologies across four stakeholder groups." Journal of Nanoparticle Research **17**(8).

Capon, A., et al. (2015). "Perceptions of risk from nanotechnologies and trust in stakeholders: A cross sectional study of public, academic, government and business attitudes." BMC Public Health **15**(1).

Capon, A., et al. (2016). "Is the risk from nanomaterials perceived as different from the risk of 'chemicals' by the Australian public?" Public Health Research and Practice **26**(2).

Christensen, T. (2009). "Eurobarometer 64.3: Foreign Languages, Biotechnology, Organized Crime, and Health Items, November - December, 2005." UK Data Archive **14 January 2008 (2nd Edition)**.

Chuah, A. S. F., et al. (2018). "Label it or ban it? Public perceptions of nano-food labels and propositions for banning nano-food applications." Journal of Nanoparticle Research **20**.

Conti, J., et al. (2011). "Vulnerability and social justice as factors in emergent U.S. nanotechnology risk perceptions." Risk Analysis **31**(11): 1734-1748.

Cook, A. J. and J. R. Fairweather (2007). "Intentions of New Zealanders to purchase lamb or beef made using nanotechnology." British Food Journal **109**: 675.

Cormick, C. and S. Hunter (2014). "Valuing Values: Better Public Engagement on Nanotechnology Demands a Better Understanding of the Diversity of Publics." NanoEthics **8**(1): 57-71.

Erdem, S. (2018). "Who do UK consumers trust for information about nanotechnology?" Food Policy **77**: 133-142.

Farshchi, P., et al. (2011). "Nanotechnology in the public eye: the case of Iran, as a developing country." Journal of Nanoparticle Research **13**: 3511.

Feindt, P. H. and P. M. Poortvliet (2019). "Consumer reactions to unfamiliar technologies: mental and social formation of perceptions and attitudes toward nano and GM products." Journal of Risk Research.

Gaskell, G., et al. (2011). "The 2010 Eurobarometer on the life sciences." Nature Biotechnology **29**(2): 113-114.

George, S., et al. (2014). "Awareness on adverse effects of nanotechnology increases negative perception among public: survey study from Singapore." Journal of Nanoparticle Research **16**(12).

Goddard, E., et al. (2018). "Food Integrity and Food Technology Concerns in Canada: Evidence from Two Public Surveys." Journal of Food Quality **2018**.

Correia Carreira, G. et al. (2016). "Nanoview – Influencing factors on the perception of nanotechnology and target group-specific risk communication strategies." 162.

Henchion, M., et al. (2019). "Big issues for a small technology: Consumer trade-offs in acceptance of nanotechnology in food." Innovative Food Science and Emerging Technologies **58**.

Ho, S. S., et al. (2010). "Making sense of policy choices: Understanding the roles of value predispositions, mass media, and cognitive processing in public attitudes toward nanotechnology." Journal of Nanoparticle Research **12**(8): 2703-2715.

Ho, S. S., et al. (2013). "Factors influencing public risk-benefit considerations of nanotechnology: Assessing the effects of mass media, interpersonal communication, and elaborative processing." Public Understanding of Science **22**(5): 606-623.

Kahan, D. M., et al. (2009). "Cultural cognition of the risks and benefits of nanotechnology." Nature Nanotechnology **4**(2): 87-90.

Kamarulzaman, N. A., et al. (2019). "Psychological and sociological perspectives for good governance of sustainable nanotechnology development in Malaysia." Journal of Nanoparticle Research **21**(7).

Kim, M. S. (2014). "Nanotechnology and food." Rutgers University Community Repository.

Kim, Y. R., et al. (2014). "Comparative analysis of nanotechnology awareness in consumers and experts in South Korea." International Journal of Nanomedicine **9**: 21-27.

Kim, Y. R., et al. (2014). "Interactive survey of consumer awareness of nanotechnologies and nanoparticles in consumer products in South Korea." International Journal of Nanomedicine **9**: 11-20.

Larsson, S., et al. (2019). "Expert stakeholders' perception of nanotechnology: risk, benefit, knowledge, and regulation." Journal of Nanoparticle Research **21**(3).

Mikhaylova, E. A. (2014). "Nanotechnology risks and public perception." Sotsiologicheskij Zhurnal: 59.

Mir, L. (2007). "Laypeople's and experts' perception of nanotechnology hazards Perception des dangers des nanotechnologies par les experts et les profanes." Environnement, Risques et Santé **6**: 331.

Mir, L. (2007). "Perception of the dangers of nanotechnologies by experts and the uninformed." Environnement Risques & Santé **6**: 331.

Papacostas, A. (2006). "Eurobarometer 63.1 (2005)." GESIS Data Archive for the Social Sciences **1.0.0**.

Peter D. Hart Research Associates, I. (2008). "Awareness of and attitudes toward nanotechnology and synthetic biology."

Porcari, A., et al. (2019). "From risk perception to risk governance in nanotechnology: a multi-stakeholder study." Journal of Nanoparticle Research **21**(11).

Priest, S. (2006). "The North American opinion climate for nanotechnology and its products: Opportunities and challenges." Journal of Nanoparticle Research **8**(5): 563-568.

Priest, S., et al. (2011). "Envisioning emerging nanotechnologies: A three-year panel study of South Carolina citizens." Risk Analysis **31**(11): 1718-1733.

Rahimpour, M., et al. (2012). "Public Perceptions of Nanotechnology: A Survey in the Mega Cities of Iran." NanoEthics **6**(2): 119-126.

Zimmer, R. et al. (2008). "Public perceptions about nanotechnology – Representative survey and basic morphological-psychological study." 113.

Senocak, E. (2014). "A Survey on Nanotechnology in the View of the Turkish Public." Science, Technology and Society **19**(1): 79-94.

Siegrist, M., et al. (2007). "Public acceptance of nanotechnology foods and food packaging: The influence of affect and trust." Appetite **49**(2): 459-466.

Siegrist, M., et al. (2007). "Laypeople's and experts' perception of nanotechnology hazards." Risk Analysis **27**(1): 59-69.

Siegrist, M., et al. (2009). "Acceptance of nanotechnology foods: A conjoint study examining consumers' willingness to buy." British Food Journal **111**(7): 660-668.

Siegrist, M., et al. (2008). "Perceived risks and perceived benefits of different nanotechnology foods and nanotechnology food packaging." APPETITE **51**: 283.

Smith, S. E. S., et al. (2008). "Americans' nanotechnology risk perception: Assessing opinion change." Journal of Industrial Ecology **12**: 459.

Royal Society and R. A. o. Engineering (2004). Nanoscience and Nanotechnologies: Opportunities and Uncertainties, Royal Society.

Sodano, V., et al. (2016). "Consumer acceptance of food nanotechnology in Italy." British Food Journal **118**: 714.

Sodano, V., et al. (2016). "Consumer acceptance of food nanotechnology in Italy." British Food Journal **118**(3): 714-733.

Steenis, N. D. and A. R. H. Fischer (2016). "Consumer attitudes towards nanotechnology in food products: an attribute-based analysis." British Food Journal **118**(5): 1254-1267.

Tzur, S., et al. (2010). "Missense mutations in the APOL1 gene are highly associated with end stage kidney disease risk previously attributed to the MYH9 gene." Human Genetics **128**: 345.

van Giesen, R. I., et al. (2018). "Changes in the influence of affect and cognition over time on consumer attitude formation toward nanotechnology: A longitudinal survey study." Public Understanding of Science **27**(2): 168-184.

Vandermoere, F., et al. (2010). "The morality of attitudes toward nanotechnology: About god, techno-scientific progress, and interfering with nature." Journal of Nanoparticle Research **12**(2): 373-381.

Viscecchia, R., et al. (2018). "On consumers' acceptance of nanotechnologies: An Italian case study." International Journal on Food System Dynamics **9**: 321.

Waldron, A. M., et al. (2006). "The current state of public understanding of nanotechnology." Journal of Nanoparticle Research **8**(5): 569-575.

Yue, C., et al. (2015). "Investigating factors influencing consumer willingness to buy GM food and nano-food." Journal of Nanoparticle Research **17**(7).

Zhang, J., et al. (2016). "High support for nanotechnology in China: A case study in Dalian." Science and Public Policy **43**(1): 115-127.

ZIMMER, R. et al. (2008). 'Nanotechnology and public opinion - The Perception of Innovative Technology', in Scherzberg, A; Wendorff, JH. (ed.) *NANOTECHNOLOGIE: GRUNDLAGEN, ANWENDUNGEN, RISIKEN, REGULIERUNG.* Berlin: WALTER DE GRUYTER & CO, pp. 93-110.

Annex 1 – Complete demographic profile of the respondents

VIEW BY COUNTRIES						
Answers in %	Total	Poland	Bulgaria	Austria	France	Finland
Number of respondents	*5000*	*1000*	*1000*	*1000*	*1000*	*1000*
GENDER						
Male	50	50	51	50	49	51
Female	50	50	49	50	51	49
AGE CATEGORIES						
16 - 29 years	25	28	24	24	24	27
30 - 39 years	25	26	25	25	27	24
40 - 49 years	25	23	25	26	27	24
50 - 60 years	24	23	26	25	22	25
SIZE OF RESIDENCE						
up to 5 000 inhabitants	21	22	8	38	33	7
5 – 50 000 inhabitants	27	22	23	28	31	30
50 – 200 000 inhabitants	23	25	28	8	22	33
over 200 000 inhabitants excl. Capital	13	23	16	2	9	16
Capital	15	8	24	24	5	15
ECONOMICAL ACTTIVITY						
Farmer, Fishermen	1	1	1	1	1	1
Professional (lawyer, medical practitioner, accountant, etc.)	3	3	5	2	3	3
Owners of shops or companies, craftsmen, self-employed persons	2	2	4	3	3	1
Business proprietors, owner (full or partner) of a company	3	3	4	1	1	4
Employed professional (employed lawyer, practitioner, accountant)	7	13	7	1	3	10
General management, director or top management	1	1	1	1	3	1

Middle management, other management	8	9	10	11	4	5
Employed position, working mainly at a desk	22	22	20	25	26	17
Employed position, not at a desk but travelling (salesmen, driver)	1	1	2	2	1	1
Employed position, not at a desk, but in a service job (hospital, restaurant, police, firemen, etc.)	8	4	6	12	13	7
Supervisors	2	1	1	1	4	2
Skilled manual workers	11	12	15	10	9	10
Other (unskilled) manual workers, servants	2	2	2	2	2	2
Responsible for ordinary shopping and looking after the home, or without any current occupation, not working	6	8	8	7	6	2
Student	8	7	4	9	5	13
Unemployed or temporarily not working	8	3	6	7	11	14
Retired or unable to work through illness	6	6	3	7	5	9
LIFE PHASE OF RESPONDENTS						
Student: younger than 25, living with parents or alone	8	7	5	10	7	10
Young adult: 20-39 years old, working (not student), with or without partner	24	28	23	25	20	25
Young family: children up to 10 years old, in case of more children, the youngest up to 10 years old	18	21	22	15	20	12
Family with grown children: youngest child is 10 to 18 years old	14	13	15	11	22	11
Empty Nesters: middle age, children over 18 years old or without children	18	19	25	18	14	14
Silver Age: Couple or single person in retirement	4	4	2	6	3	6
Other	13	8	8	16	14	22
SOCIETY CATEGORY						
Higher class	2	2	2	2	3	2
Upper middle class	11	7	7	15	14	10

Middle class	49	55	53	51	48	38
Lower middle class	25	26	29	20	23	25
Lower class	7	4	3	4	8	14
Do not know	7	6	6	8	4	11
AGE WHEN THE EDUCATION ENDED						
Up to 15 years	2	1	1	4	3	2
16–19 years	30	13	26	53	36	19
20 + years	59	76	66	35	57	61
Still studying	10	10	7	8	5	18
POLITICAL ORIENTATION						
Clear left	5	6	2	4	6	8
Rather left	17	17	9	18	19	24
Center	23	21	26	34	24	12
Rather right	16	16	17	17	13	17
Clear right	7	9	6	3	8	7
Do not know	31	31	40	24	31	32
ROLE OF RELIGION						
Plays very important role	16	21	28	10	12	8
Plays rather important role	24	30	35	20	19	15
Plays rather peripheral role	22	19	16	27	18	29
Plays absolutely peripheral role	26	21	8	35	31	38
Do not know	12	10	13	8	20	10

Annex 2 – Questionnaire

Q1. Have you heard something about nanomaterials?

(single-choice)

a. Nothing at all
b. A little
c. A lot

Q2. What have you heard or read about nanomaterials?

(Skip logic: Q2 will be skipped if the answer to Q1 is "a. Nothing at all")

Open-ended question with a single free-text field

Q3. What is a nanomaterial in your opinion?

Open-ended question with a single free-text field

Q4. Name three groups of products which may contain nanomaterials/nanoparticles

Open-ended question with 3 free-text fields

Q5. Which of the following products may contain nanomaterials/nanoparticles in your opinion?

(multiple-choice) (programming: selection items will be randomly rotated)

a. Cars
b. Sports equipment
c. Medicines
d. Paints/Varnishes/Surface coatings
e. Foods
f. Plastics
g. Household electrical appliances
h. Computers and electronics
i. Clothing/textiles
j. Construction materials
k. Detergents/household cleaning products
l. Cosmetics
m. Toys
n. Kitchenware
o. Pesticides and plant protection products/
p. Car care products
q. Other (please specify) *(if "Other" is selected, a free-text field will be prompted)*

Q6. To what extent do you approve or disapprove of the following uses of nanomaterials?

(programming: the items will be randomly rotated, one option should be selected in each row)

Use of nanomaterials for…	I fully approve	I tend to approve	I tend to disapprove	I fully disapprove	I don't know
… a reduction of the salt content in foods while retaining the same taste	○	○	○	○	○
… the enrichment of foods with vitamins and other nutrients	○	○	○	○	○
… indoor paint that prevents the accumulation of odours (e.g. cigarette smoke)	○	○	○	○	○
… an increase in the efficiency of sunscreen	○	○	○	○	○

… active substances of skin cream that reach deeper skin layers	○	○	○	○	○
… the prevention of the occurrence of unpleasant odours in textiles	○	○	○	○	○
… improving texture or colour of foods	○	○	○	○	○
… developing new tastes of foods and flavours	○	○	○	○	○
… extending shelf-life by maintaining or improving the condition of packaged foods	○	○	○	○	○
… drugs which release their active substance in a concentration at the desired spot	○	○	○	○	○
… repairing damaged teeth (filling or coating)	○	○	○	○	○
…more efficient cleaning of waste water	○	○	○	○	○
… strengthening the rubber in tyres and other rubber products	○	○	○	○	○
… making plastics (e.g. PET bottles) more durable	○	○	○	○	○
… keeping children's toys clean (reducing bacteria) and making them last longer	○	○	○	○	○
… protecting plants against pests/diseases	○	○	○	○	○

Willingness to buy, shopping habits

Q7. When buying a new product for the first time, do you read safety information to determine whether the product is safe to be used in the way you intend to use it?

(single-choice)

a. Yes, always
b. Sometimes, when I have doubts whether the product is safe or not
c. No, never

Q8. When deciding between buying two products with the same functional properties, which of the following statements would you agree with?

(single-choice)

a. I am willing to pay a much higher price (over 20 %) for the product which is less harmful to my health and/or the environment
b. I am willing to pay a slightly higher price (1 – 20 %) for the product which is less harmful to my health and/or the environment
c. I am not willing to pay a higher price for the product which is less harmful to my health and/or the environment

Q9. Would you buy products from the following groups if they contained nanomaterials?

(programming: the items will be randomly rotated, one option should be selected for each row)

	Yes, even more likely than products not containing nanomaterials	Yes, without any concern	Yes, but with some reservations	Definitely not	Main reasons why not: *(programming: this item will be triggered if "Definitely not" is selected)*	DK, I can't decide
Cars	○	○	○	○	.....	
Sports equipment	○	○	○	○	.....	
Medicines	○	○	○	○	.....	
Paints/Varnishes/Surface coatings	○	○	○	○	.....	
Foods	○	○	○	○	.....	
Plastics	○	○	○	○	.....	
Household electrical appliances	○	○	○	○	.....	
Computers and electronics	○	○	○	○	.....	
Clothing/textiles	○	○	○	○	.....	
Construction materials	○	○	○	○	.....	
Detergents/household cleaning products	○	○	○	○	.....	
Cosmetics	○	○	○	○	.....	
Toys	○	○	○	○	.....	
Kitchenware	○	○	○	○	.....	
Pesticides and plant protection products	○	○	○	○	.....	
Car care products						

Awareness about chemical risks

Q10. What is your personal attitude to the following new trends, technologies or areas in terms of possible impact on your life?

(programming: the items will be randomly rotated; one option should be selected for each row)

	I am concerned about possible negative impacts on my life	I'm not worried about possible negative impact on my life	I do not care	Cannot say
Nanomaterials	○	○	○	○
Biofuels from genetically modified crops	○	○	○	○
Mobile phones	○	○	○	○

Self-driving (autonomous) cars				
Foods from genetically modified crops				
Asbestos				
Social networks				
Pesticides and plant protection products				
Plastic wastes				
Globalisation				
Electronics and computers				
Artificial intelligence				
Global warming				

Q11. With regard to health, the main issue is not to what extent you are exposed to harmful materials, but whether or not you are exposed to them at all.

(Please use a scale from 1 to 5, where '1' means "completely disagree" and '5' "completely agree")

1 completely disagree	2 rather disagree	3 Neither nor	4 rather agree	5 completely agree	DK, cannot say

Q12. If a person is exposed to an extremely small amount of a material that is harmful at larger amounts, then that person will probably be seriously ill some day in the future, even if the amount is extremely small.

(Please use a scale from 1 to 5, where '1' means "completely disagree" and '5' "completely agree")

1 completely disagree	2 rather disagree	3 Neither nor	4 rather agree	5 completely agree	DK, cannot say

Perception of risks associated with nanomaterials

Q13. Would you say that products containing nanomaterials are …

(single-choice) (programming: items a, b, c will be sorted a-c in 50 % of cases and c-a in 50 % of cases)

a. … safer to use than products that do not contain nanomaterials
b. … equally safe to use as products that do not contain nanomaterials
c. … less safe to use than products that do not contain nanomaterials
d. I cannot decide

Q14. To what extent do you believe that risks (if any) associated with nanomaterials may be eliminated when nanomaterials are used in a proper way?

(Please use a scale from 1 to 5, where '1' means "completely disagree" and '5' "completely agree")

1 completely disagree	2 rather disagree	3 Neither nor	4 rather agree	5 completely agree	DK, cannot say

Q15. Are you concerned about being exposed to nanomaterials?

(single-choice)

a. Not at all
b. A little
c. A lot

Q16. What are the risks that you associate with nanomaterials?

(multiple-choice)

a. So far unknown properties of nanomaterials
b. Difficult prevention of exposure (tiny particles can get anywhere)
c. Other, please specify *(free-text field will be prompted)*
d. None

Q17. Which way do you feel is the most likely for people to be directly exposed to nanomaterials?

(single-choice) (programming: items will be randomly rotated)

a. Inhalation (by breathing)
b. Dermal (by skin contact)
c. Oral (by swallowing/drinking)
d. None of the above

(programming: not back)

Now let us give you a bit of information about nanomaterials.
Nanomaterials contain particles with a size of one millionth of a millimetre (that's how thin a human hair split 50,000 times is). Materials made up of these particles have special physical, chemical and biological properties.

(Programming: a) no further text is provided to the respondent (neutral description), b) rotation of the following two paragraphs – benefits-oriented and risks-oriented)

Benefits-oriented paragraph: Several scientists are assuming significant progress through nanotechnology. Even today, nanomaterials can improve the properties of paints, clothing and cosmetics. In the future, they may contribute among other things, to treating diseases more effectively, making food keep for longer, improving computers and repairing environmental damage. That's why they could possibly even trigger a new economic boom. *(56 words)*

Risks-oriented paragraph: Several scientists have pointed out the possible risks of nanotechnology. Nanomaterials could for example penetrate into organisms and endanger our health. They could promote resistance to certain bacteria and possibly cause cancer. They might also pollute the environment. Wider use of nanomaterials and more intensive research began just 20 years ago, some risks associated with the use of nanomaterials may have not yet been discovered. *(65 words)*

Q18. Now that you have some further information, are you concerned about being exposed to nanomaterials?

(single-choice)

a. Not at all
b. A little
c. A lot

Q19. With this information on nanomaterials, how do you estimate the risks and benefits for the following uses?

(programming: the items will be randomly rotated, one option should be selected for each row)

Use of nanomaterials for…	The risks associated with using nanomaterials will by far exceed the benefits.	The risks associated with using nanomaterials will slightly exceed the benefits.	The benefits associated with using nanomaterials slightly exceed the risks.	The benefits associated with using nanomaterials will by far exceed the risks.	Cannot say
… a reduction of the salt content in foods while retaining the same taste	○	○	○	○	○
… the enrichment of foods with vitamins and other nutrients	○	○	○	○	○
… indoor paint that prevents the accumulation of odours (e.g. cigarette smoke)	○	○	○	○	○
… an increase in the efficiency of sunscreen	○	○	○	○	○
… active substances of skin cream that reach deeper skin layers	○	○	○	○	○
… the prevention of the occurrence of unpleasant odours in textiles	○	○	○	○	○
… improving texture or colour of foods	○	○	○	○	○
… developing new tastes of foods and flavours	○	○	○	○	○
… extending shelf-life by maintaining or improving the condition of packaged foods	○	○	○	○	○
… drugs which release their active substance in a concentration at the desired spot	○	○	○	○	○
… the repair of damaged tooth (teeth filling or coating)	○	○	○	○	○
…more efficient cleaning of waste water	○	○	○	○	○
… strengthening the rubber in tyres and other rubber products	○	○	○	○	○
… making plastics (e.g. PET bottles) more durable	○	○	○	○	○
… keeping children’s toys clean (reducing bacteria) and making them last longer	○	○	○	○	○
… protecting plants against pests/diseases	○	○	○	○	○

Q20. Which of the following statements do you personally agree with?

(programming: the items will be randomly rotated, one option should be selected for each row)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Cannot say
Nanomaterials will open up fantastic opportunities for technical development	○	○	○	○	○	
I am very interested in scientific topics	○	○	○	○	○	
If my country *(programming: name the particular country here)* wants to be globally competitive, it has to embrace technologies using nanomaterials	○	○	○	○	○	
If nanomaterials make everyday products better, I'll gladly use them	○	○	○	○	○	
I am looking forward to the many nano-products that will soon be on the market	○	○	○	○	○	
I believe this whole nano thing is a marketing trick to improve sales of certain products	○	○	○	○	○	
I believe nanomaterials offer many possibilities to cure and recognise diseases	○	○	○	○	○	
I am sure that using nanomaterials will help to protect the environment and limit or repair environmental damage	○	○	○	○	○	
I am convinced that using nanomaterials is of benefit to society	○	○	○	○	○	
It's really frightening how many nano-products there are or soon will be	○	○	○	○	○	
I'm worried that using nanomaterials could lead to completely new health problems	○	○	○	○	○	
I'm concerned that using nanomaterials instead of traditional materials could damage the environment	○	○	○	○	○	
I believe that nanotechnology can lead to job cuts in traditional branches of industry	○	○	○	○	○	
I'm afraid that nanotechnology will result in more individuals to be monitored and controlled by miniaturised technology	○	○	○	○	○	
I believe it's hardly possible to control the health risks of using nanomaterials	○	○	○	○	○	
I would approve nanomaterials development being promoted through state funding	○	○	○	○	○	

Information sources

Q21. How well informed do you feel about nanomaterials compared to other modern technologies?

(single-choice)

a. I feel better informed about nanomaterials compared to other new modern technologies
b. Equally informed
c. I feel less informed about nanomaterials compared to other new modern technologies

Q22.a Where have you already heard, read or seen something about nanomaterials?

(multiple-choice) (Skip logic: Q21.a will be showed only to the respondents who selected option "b. A little" or " c. A lot" in Q1)

a. TV
b. Radio
c. Social media (Facebook, Twitter, LinkedIn, etc.)
d. YouTube
e. elsewhere on the Internet
f. Online media
g. Product websites
h. Blogs
i. Newspapers
j. Magazines
k. School, university, college
l. Workplace
m. Personal discussion with family and/or friends
n. Personal discussion with experts (e.g. doctors, chemists, scientists, journalists, etc.)
o. Other - please specify *(free-text open field will be prompted if this option is selected)*

Q22.b If you are looking for some information about nanotechnology, which resources will you use?

(multiple-choice) (Skip logic: Q21.b will be showed only to the respondents who selected option "a. Nothing at all" in Q1)

a. TV
b. Radio
c. Social media (Facebook, Twitter, LinkedIn, etc.)
d. YouTube
e. Internet
f. Online media
g. Product websites
h. Blogs
i. Newspapers
j. Magazines
k. School, university, college
l. Workplace
m. Personal discussion with family and/or friends

n. Personal discussion with experts (e.g. doctors, chemists, scientists, journalists, etc.)

o. Other - please specify *(free-text open field will be prompted if this option is selected)*

Q23. Are you aware of any websites or databases with centralised information about nanomaterials or products containing nanomaterials?

(single-choice) (all respondents)

a. Yes *(If "Yes", which ones? Please specify)*

b. No

Q24. Are you aware of the European Union Observatory for Nanomaterials (EUON)?

a. Yes

b. No

Trust in authorities

Q25. What would be your primary source of information about nanomaterials? (Select your first - most preferred option in column 1, second option in column 2, third option in column 3, if non of them is relevant, pleas euse option non of them)

	1 (this is my first source of information)	2 (this is my second source of information)	3 (this is my third source of information)	None of them
Distributor/seller from whom I bought the product	○	○	○	
Producer of the product	○	○	○	
Scientists/researchers (universities, research institutes, etc.)	○	○	○	
Health and occupational safety authorities	○	○	○	
Pharmacists	○	○	○	
Doctors (e.g. your doctor)	○	○	○	
Consumer organisations	○	○	○	
Government representatives, politicians	○	○	○	
EU authorities (e.g. European Commission, European Chemicals Agency)	○	○	○	
Environmental organisations	○	○	○	

Q26. **How much trust would you place in the following persons or institutions if they were to inform you about safety of nanomaterials?**

	Absolute trust	Bit of trust	Not much trust	No trust at all
Distributor/seller from whom I bought the product	○	○	○	○
Producer of the product	○	○	○	○
Scientists/researchers (universities, research institutes, etc.)	○	○	○	○
Health and occupational safety authorities	○	○	○	○
Pharmacists	○	○	○	○
Doctors (e.g. your doctor)	○	○	○	○
Consumer organisations	○	○	○	○
Government representatives, politicians	○	○	○	○
EU authorities (e.g. European Commission, European Chemicals Agency)	○	○	○	○
Environmental organisations	○	○	○	○

Labelling of products containing nanomaterials

Q27. **When buying a product containing nanomaterials, do you think you should be informed about it (for example on the label or on the packaging)?**

(single-choice)

a. No
b. Yes

Q27a. **What kind of information would you expect on the label of a product containing a nanomaterial?**

(programming: only if the answer to Q27 is"yes")

(open-ended question)

……..

Q28. **For which of the following products do you think you should be informed (for example on the label or on the packaging) when buying a product containing nanomaterials?**

(all respondents) (multiple-choice) (programming: items will randomly rotate)

a. Cars
b. Sports equipment
c. Medicines
d. Paints/Varnishes/Surface coatings
e. Foods
f. Plastics
g. Household electrical appliances
h. Computers and electronics

i. Clothing/textiles
j. Construction materials
k. Detergents/household cleaning products
l. Cosmetics
m. Toys
n. Kitchenware
o. Pesticides and plant protection products
p. Car care products

DEMOGRAPHY

D0 Country:

Poland
Bulgaria
Austria
France
Finland

D1 You are:

1) Male
2) Female

D2 Year of birth:

D3 What is the population of the town you live in?

1) Less than 999 people
2) Less than 2.000 people
3) 2.001 to 5.000 people
4) 5.001 to 20.000 people
5) 20.001 to 50.000 people
6) 50.001 to 100.000 people
7) 100.001 to 200.000 people
8) More than 200.000 people, excluding Capital
9) Capital
10) Refused to answer

D4 You are:

1) Married or in long-term relationship
2) Single
3) Widowed
4) Divorced

99. I don't know

D5 How many people, including you, live in your household?

Write down: ……..

D6. What is your economical stuts?

Self - employed

1) Farmer, Fishermen
2) Professional (lawyer, medical practitioner, accountant, etc.)
3) Owners of shops or companies, craftsmen, self-employed persons
4) Business proprietors, owner (full or partner) of a company

Employed

5) Employed professional (employed lawyer, practitioner, accountant)
6) General management, director or top management
7) Middle management, other management
8) Employed position, working mainly at a desk

9) Employed position, not at a desk but travelling (salesmen, driver)
10) Employed position, not at a desk, but in a service job (hospital, restaurant, police, firemen, etc.)
11) Supervisors
12) Skilled manual workers
13) Other (unskilled) manual workers, servants

Non-active

14) Responsible for ordinary shopping and looking after the home, or without any current occupation, not working
15) Student
16) Unemployed or temporarily not working
17) Retired or unable to work through illness

D7. If you are employed, do you work:

1) In public sector
2) In private sector
3) Elsewhere

D8. In what phase of your life are you?

1) Student: younger than 25, living with parents or alone
2) Young adult: 20-39 years old, working (not student), with or without partner
3) Young family: children up to 10 years old, in case of more children, the youngest up to 10 years old
4) Family with grown children: youngest child is 10 to 18 years old
5) Empty Nesters: middle age, children over 18 years old or without children
6) Silver Age: Couple or single person in retirement
7) Other: *please specify* …….

D9. Considering all incomes and property of your household, would you say you are:

1) Very well comfortable
2) Solidly comfortable
3) Averagely comfortable
4) Poorly comfortable
5) I'm a poor person
6) I don't know

D10. Some people divide the society into higher, middle and lower classes. Whether you agree with this or not, try to place yourself in one of following categories:

1) Higher class
2) Upper middle class
3) Middle class
4) Lower middle class
5) Lower class
6) I don't know

D11 When have you completed your final education?

1) Up to 15 years
2) 16–19 years
3) 20 + years
4) Still studying

D12 In politics, the concept of "right" and "left" is often used. How would you classify yourself based on your opinions?

1) Clear left
2) Rather left
3) Center
4) Rather right
5) Clear right
6) I don't know

D13. Religious belief in your life:

1) Plays very important role
2) Plays rather important role
3) Plays rather peripheral role
4) Plays absolutely peripheral role
5) I don't know

Annex 3 – close ended questions – raw data

Q1 Have you heard something about nanomaterials?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
Have you heard something about nanomaterials?	Nothing at all	35	33	22	34	56	30
	A little	54	54	65	57	36	59
	A lot	11	13	13	9	8	11
Q2 What have you heard or read about nanomaterials?		ALL COUNTRIES	COUNTRY				
			Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES	**FILTER: THOSE WHO HAVE AT LEAST SOME AWARENES ACCORDING Q1**	3248	669	779	657	441	702
What specifically have you heard or read about nanomaterials?	Small particles / materials	22	27	18	25	27	14
	New / modern technology	5	7	6	2	5	6
	Nanoparticles / nanotechnologies	8	7	10	8	12	5
	Microscopic	3	3	4	3	3	1
	Molecular structures	2	9	1	0	0	0

	Chemical substances / chemistry	3	0	4	0	0	7
	Area of usage	15	7	19	19	6	18
	Other qualities	5	5	3	8	3	5
	Quality materials	1	1	1	1	3	1
	Other	18	16	19	17	20	20
	DK / No response	19	17	17	16	20	22
Q3 What is a nanomaterial in your opinion?		ALL COUNTRIES	COUNTRY				
			Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
What is a nanomaterial in your opinion?	Small particles / materials	31	28	32	35	31	32
	New / modern technology	2	5	4	1	1	2
	Microscopic	4	5	5	3	4	2
	Molecular structures	1	4	1	0	1	1
	Chemical substances	3	1	6	1	0	10
	Plastic	1	0	0	3	0	1
	Other qualities	3	4	1	5	3	2
	Usage	6	6	5	7	6	6
	Quality materials	1	0	1	1	1	1

	Other	13	15	16	13	11	13
	DK / No response	34	33	29	32	42	31
Q4_1 Name three groups of products which may contain nanomaterials/nanoparticles		ALL COUNTRIES	COUNTRY				
			Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
First mentioned groups of products which may contain nanomaterials/nanoparticles	Cosmetics & Hygiene	7	8	8	6	3	10
	Computers & electronics	8	9	11	3	10	4
	Clothing & Textile	7	7	3	9	2	14
	Medicines	6	8	8	5	7	5
	Food	2	1	5	3	2	0
	Plastics	2	1	1	5	0	2
	Paints & Impregnation	3	4	2	5	1	3
	Sport equipment	1	0	0	2	0	3
	Sun protection	1	0	1	1	0	4
	Other technologies	3	2	4	2	4	3
	Cars & Car products	2	1	2	4	0	1
	Graphene	1	3	0	0	0	0
	Cleaning products	1	2	1	3	0	0

	Various materials	3	4	2	3	7	1
	Batteries	2	0	5	1	0	2
	Chemicals	1	1	0	0	1	1
	Other	16	15	15	20	21	12
	DK / No response	33	32	32	29	41	33
Q4_1_2_3 Name three groups of products which may contain nanomaterials/nanoparticles		ALL COUNTRIES	COUNTRY				
			Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
All mentioned groups of products which may contain nanomaterials/nanoparticles	Cosmetics & Hygiene	14	14	17	13	7	20
	Computers & electronics	16	19	23	10	20	9
	Clothing & Textile	14	14	9	18	5	22
	Medicines	15	19	18	12	13	11
	Food	6	4	13	6	4	3
	Plastics	3	1	2	9	2	4
	Paints & Impregnation	7	7	6	13	2	7
	Sport equipment	2	2	0	3	1	4
	Sun protection	2	0	1	1	0	5
	Other technologies	9	8	12	8	11	7

	Cars & Car products	4	3	4	7	1	3
	Graphene	1	4	1	0	1	1
	Cleaning products	3	3	2	6	1	2
	Various materials	9	11	5	8	14	5
	Batteries	3	1	7	1	0	5
	Chemicals	2	3	2	2	2	3
	Other	36	38	30	42	43	25
	DK / No response	33	32	32	29	41	33
Q5 Which of the following products may contain nanomaterials/nanoparticles in your opinion?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
Cars		33	33	27	41	32	34
Sports equipment		28	27	15	40	23	34
Medicines		40	39	44	37	38	42
Paints/Varnishes/Surface coatings		50	49	45	58	43	54
Foods		22	19	22	26	22	20
Plastics		39	50	30	21	40	55
Household electrical appliances		30	30	25	29	33	32

Computers and electronics		51	51	60	46	49	50
Clothing/textiles		42	41	33	51	33	51
Construction materials		38	37	27	41	42	44
Detergents/household cleaning products		38	38	28	51	33	42
Cosmetics		45	43	43	48	38	54
Toys		21	19	13	30	21	21
Kitchenware		22	26	18	27	18	23
Pesticides and plant protection products		32	28	26	35	34	34
Car care product		35	38	27	42	29	40
Other		0	0	0	0	0	0
Q6 To what extent do you approve or disapprove of the following uses of nanomaterials?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
Use of nanomaterials for a reduction of the salt content in foods while retaining the same taste	I fully approve	14	13	17	10	13	16
	I tend to approve	28	31	28	23	30	28
	I tend to disapprove	22	19	24	23	19	24
	I fully disapprove	14	9	13	20	14	15
	I don't know	22	28	18	24	24	18

Use of nanomaterials for the enrichment of foods with vitamins and other nutrients	I fully approve	12	12	17	9	11	12
	I tend to approve	27	33	29	19	28	29
	I tend to disapprove	22	18	24	25	20	25
	I fully disapprove	18	12	16	26	18	15
	I don't know	21	26	15	22	23	19
Use of nanomaterials for indoor paint that prevents the accumulation of odours	I fully approve	22	23	33	17	16	20
	I tend to approve	41	45	43	35	42	37
	I tend to disapprove	12	9	10	16	12	16
	I fully disapprove	7	3	3	10	8	10
	I don't know	18	20	10	22	21	18
Use of nanomaterials for an increase in the efficiency of sunscreen	I fully approve	15	14	22	13	12	15
	I tend to approve	35	36	42	28	34	35
	I tend to disapprove	19	16	16	24	17	21
	I fully disapprove	10	8	7	13	12	12
	I don't know	21	26	13	22	25	17
Use of nanomaterials for active substances of skin cream that reach deeper skin layers	I fully approve	13	16	19	10	13	10
	I tend to approve	31	42	38	20	29	27
	I tend to disapprove	21	14	20	26	20	27
	I fully disapprove	14	7	9	22	14	18

	I don't know	20	22	13	22	24	19
Use of nanomaterials for the prevention of the occurrence of unpleasant odours in textiles	I fully approve	19	20	28	14	13	18
	I tend to approve	42	44	43	37	39	44
	I tend to disapprove	15	11	12	19	15	16
	I fully disapprove	7	3	4	11	11	8
	I don't know	18	22	12	19	22	15
Use of nanomaterials for improving texture or colour of foods	I fully approve	10	10	11	5	12	12
	I tend to approve	22	29	22	13	23	23
	I tend to disapprove	25	21	29	26	23	27
	I fully disapprove	22	13	21	35	21	20
	I don't know	21	26	16	20	22	18
Use of nanomaterials for developing new tastes of foods and flavours	I fully approve	10	11	14	5	10	10
	I tend to approve	24	30	31	13	25	21
	I tend to disapprove	24	20	24	27	20	30
	I fully disapprove	22	14	16	34	23	21
	I don't know	20	26	14	20	23	18
Use of nanomaterials for extending shelf-life by maintaining or improving the condition of packaged foods	I fully approve	12	14	13	9	11	13
	I tend to approve	28	35	28	19	29	28
	I tend to disapprove	23	18	25	27	20	27

	I fully disapprove	17	9	20	26	16	15
	I don't know	20	24	14	20	23	17
Use of nanomaterials for drugs which release their active substance in a concentration at the desired spot	I fully approve	23	21	28	22	16	26
	I tend to approve	39	39	40	36	38	40
	I tend to disapprove	12	12	14	14	12	10
	I fully disapprove	6	3	5	7	10	5
	I don't know	20	24	13	21	23	19
Use of nanomaterials for repairing damaged teeth (filling or coating)	I fully approve	25	25	31	25	18	28
	I tend to approve	39	43	41	34	39	40
	I tend to disapprove	11	8	11	13	12	10
	I fully disapprove	6	3	5	7	9	5
	I don't know	19	20	12	22	22	18
Use of nanomaterials for more efficient cleaning of waste water	I fully approve	30	26	39	28	19	38
	I tend to approve	38	42	39	33	42	36
	I tend to disapprove	9	9	8	11	11	7
	I fully disapprove	5	3	4	7	7	4
	I don't know	18	20	10	22	22	15
Use of nanomaterials for strengthening the rubber in tyres and other rubber products	I fully approve	29	26	35	30	21	34
	I tend to approve	43	45	43	37	44	44

	I tend to disapprove	8	8	8	10	10	7
	I fully disapprove	4	2	3	5	6	3
	I don't know	16	19	11	19	19	13
Use of nanomaterials for making plastics (e.g. PET bottles) more durable	I fully approve	17	17	20	12	13	21
	I tend to approve	34	38	37	25	35	37
	I tend to disapprove	15	11	17	20	15	14
	I fully disapprove	14	11	14	22	15	11
	I don't know	19	23	12	21	22	18
Use of nanomaterials for keeping children’s toys clean (reducing bacteria) and making them last longer	I fully approve	20	20	29	19	15	19
	I tend to approve	39	40	40	34	39	40
	I tend to disapprove	14	13	14	15	14	15
	I fully disapprove	8	5	5	11	10	9
	I don't know	19	23	12	21	23	16
Use of nanomaterials for protecting plants against pests/diseases	I fully approve	18	17	24	14	16	18
	I tend to approve	39	42	43	32	38	41
	I tend to disapprove	16	12	16	21	15	16
	I fully disapprove	8	5	5	12	10	7
	I don't know	20	24	12	22	22	18

Q7 When buying a new product for the first time, do you read safety information to determine whether the product is safe to be used in the way you intend to use it?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
When buying a new product for the first time, do you read safety information to determine whether the product is safe to be used in the way you intend to use it?	Yes, always	32	30	46	28	36	22
	Sometimes, when I have doubts whether the product is safe or not	60	62	50	65	54	69
	No, never	8	8	5	8	10	10
Q8 When deciding between buying two products with the same functional properties, which of the following statements would you agree with?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
When deciding between buying two products with the same functional properties, which of the following statements would you agree with?	I am willing to pay a much higher price (over 20 %) for the product which is less harmful	24	24	36	22	27	14
	I am willing to pay a slightly higher price (1 – 20 %) for the product which is less harmful	62	67	58	64	52	68
	I am not willing to pay a higher price for the product which is less harmful to my health and/or the environment	14	9	7	14	21	18
Q9 Would you buy products from the following groups if they contained nanomaterials?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland

NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
Cars	Yes, even more likely than products not containing nanomaterials	11	8	21	11	8	8
	Yes, without any concern	39	49	44	34	32	39
	Yes, but with some reservations	24	18	17	25	31	27
	Definitely not	6	4	4	7	11	6
	DK, I can't decide	19	22	13	23	18	20
Sports equipment	Yes, even more likely than products not containing nanomaterials	10	8	17	9	9	7
	Yes, without any concern	36	47	42	28	25	37
	Yes, but with some reservations	26	20	20	29	31	32
	Definitely not	9	4	7	12	15	7
	DK, I can't decide	19	22	14	22	19	17
Medicines	Yes, even more likely than products not containing nanomaterials	8	7	13	6	8	6
	Yes, without any concern	22	25	25	15	19	25
	Yes, but with some reservations	33	31	32	32	31	38
	Definitely not	17	11	17	24	22	14
	DK, I can't decide	20	26	14	23	20	17

Paints/Varnishes/Surface coatings	Yes, even more likely than products not containing nanomaterials	11	10	20	10	8	7
	Yes, without any concern	36	45	43	28	27	35
	Yes, but with some reservations	28	21	22	31	33	35
	Definitely not	8	4	4	10	15	6
	DK, I can't decide	17	19	11	20	18	17
Foods	Yes, even more likely than products not containing nanomaterials	6	5	8	4	9	4
	Yes, without any concern	14	19	16	9	13	16
	Yes, but with some reservations	27	27	30	19	24	34
	Definitely not	32	21	32	47	33	28
	DK, I can't decide	21	28	15	20	21	19
Plastics	Yes, even more likely than products not containing nanomaterials	9	8	14	6	9	7
	Yes, without any concern	30	44	35	16	24	31
	Yes, but with some reservations	27	21	25	24	30	37
	Definitely not	12	6	12	17	18	9
	DK, I can't decide	21	21	13	38	19	16
Household electrical appliances	Yes, even more likely than products not containing	10	8	19	7	9	6

	nanomaterials						
	Yes, without any concern	39	47	44	31	32	41
	Yes, but with some reservations	27	22	21	31	33	32
	Definitely not	6	4	5	8	10	5
	DK, I can't decide	17	19	12	23	17	16
Computers and electronics	Yes, even more likely than products not containing nanomaterials	14	11	27	9	11	11
	Yes, without any concern	42	51	44	36	34	43
	Yes, but with some reservations	23	18	15	27	29	26
	Definitely not	5	3	4	7	9	5
	DK, I can't decide	16	18	10	21	18	15
Clothing/textiles	Yes, even more likely than products not containing nanomaterials	9	8	14	8	7	7
	Yes, without any concern	30	40	34	22	23	32
	Yes, but with some reservations	31	24	27	33	33	37
	Definitely not	13	7	12	18	18	9
	DK, I can't decide	17	21	13	20	18	16
Construction materials	Yes, even more likely than products not containing nanomaterials	11	9	20	10	9	6

	Yes, without any concern	38	50	46	26	33	35
	Yes, but with some reservations	26	18	18	33	29	33
	Definitely not	7	3	4	8	11	8
	DK, I can't decide	18	20	12	23	19	18
Detergents/household cleaning products	Yes, even more likely than products not containing nanomaterials	9	9	17	7	8	6
	Yes, without any concern	31	41	39	21	24	29
	Yes, but with some reservations	31	25	27	33	34	39
	Definitely not	12	5	7	19	17	11
	DK, I can't decide	17	20	10	21	17	16
Cosmetics	Yes, even more likely than products not containing nanomaterials	7	7	14	5	8	4
	Yes, without any concern	20	29	25	12	17	18
	Yes, but with some reservations	31	30	30	28	29	38
	Definitely not	22	12	18	33	27	21
	DK, I can't decide	19	23	13	23	19	20
Toys	Yes, even more likely than products not containing nanomaterials	7	6	12	6	8	5
	Yes, without any concern	25	34	30	15	22	23

	Yes, but with some reservations	29	27	28	27	31	35
	Definitely not	19	9	16	30	22	18
	DK, I can't decide	20	24	15	23	18	20
Kitchenware	Yes, even more likely than products not containing nanomaterials	8	7	15	6	8	5
	Yes, without any concern	30	41	36	22	25	27
	Yes, but with some reservations	29	25	27	29	31	36
	Definitely not	14	6	11	20	19	15
	DK, I can't decide	18	21	12	23	17	17
Pesticides and plant protection products	Yes, even more likely than products not containing nanomaterials	8	7	13	6	7	5
	Yes, without any concern	25	34	29	16	21	25
	Yes, but with some reservations	28	24	29	25	30	34
	Definitely not	19	10	14	30	24	15
	DK, I can't decide	21	25	15	23	19	21
Car care products	Yes, even more likely than products not containing nanomaterials	10	8	19	11	7	7
	Yes, without any concern	36	48	44	30	28	33
	Yes, but with some reservations	24	19	20	23	29	28

	Definitely not	9	3	5	14	16	9
	DK, I can't decide	20	21	14	23	20	23
Q9X Main reasons why do not buy products if they contained nanomaterials		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES	**FILTER:** THOSE WHO ANSWER IN QUESTION Q9 "DEFINITELY NOT"	312	35	41	71	106	59
Cars	Unnecessary / No use	19	17	15	20	9	37
	Harmful / Dangerous	14	17	20	13	16	5
	Environment protection	11	0	2	25	8	10
	No trust	9	9	12	4	13	5
	Too expensive	2	0	0	3	2	2
	Other	9	11	7	8	11	3
	DK / No response	38	46	44	27	40	37
NUMBERS OF RESPONSES	**FILTER:** THOSE WHO ANSWER IN QUESTION Q9 "DEFINITELY NOT"	455	38	70	124	153	70
Sports equipment	Unnecessary / No use	17	21	7	15	18	27
	Harmful / Dangerous	24	13	23	26	27	24
	Environment protection	6	0	4	16	0	7

	No trust	10	16	9	6	14	7
	Too expensive	2	3	0	2	1	3
	Other	11	0	17	14	11	7
	DK / No response	30	47	40	23	29	24
NUMBERS OF RESPONSES	**FILTER:** THOSE WHO ANSWER IN QUESTION Q9 "DEFINITELY NOT"	869	107	169	239	218	136
Medicines	Unnecessary / No use	7	9	5	8	5	8
	Harmful / Dangerous	34	26	33	42	35	24
	Environment protection	1	0	1	4	0	0
	No trust	22	33	25	14	23	20
	Too expensive	0	0	0	0	1	0
	Other	15	14	9	17	13	22
NUMBERS OF RESPONSES	**FILTER:** THOSE WHO ANSWER IN QUESTION Q9 "DEFINITELY NOT"	396	38	43	102	152	61
Paints/Varnishes/Surface coatings	Unnecessary / No use	11	11	7	16	5	18
	Harmful / Dangerous	28	16	28	27	33	23
	Environment protection	8	5	2	18	5	3
	No trust	10	8	16	3	14	11
	Too expensive	2	3	0	0	3	2

	Other	14	13	16	20	13	10
	DK / No response	28	45	30	17	28	33
NUMBERS OF RESPONSES	**FILTER:** THOSE WHO ANSWER IN QUESTION Q9 "DEFINITELY NOT"	1613	214	318	472	333	276
Foods	Unnecessary / No use	4	2	4	6	5	5
	Harmful / Dangerous	19	14	19	23	19	13
	Environment protection	1	0	0	4	0	2
	No trust	9	11	7	7	15	9
	Too expensive	0	0	1	0	1	0
	Unhealthy	27	33	25	25	27	28
	Unnatural	16	21	20	14	12	16
	Unknown effects	4	5	4	4	3	4
	Other	8	4	7	11	6	9
	DK / No response	10	10	12	7	12	14
NUMBERS OF RESPONSES	**FILTER:** THOSE WHO ANSWER IN QUESTION Q9 "DEFINITELY NOT"	619	60	118	171	182	88
Plastic	Unnecessary / No use	12	12	13	13	9	14
	Harmful / Dangerous	20	23	31	13	20	16
	Environment protection	17	10	14	18	16	24

	No trust	8	3	3	8	13	5
	Too expensive	1	2	0	0	1	1
	Unhealthy	3	3	2	4	3	5
	Unnatural	1	3	1	1	2	0
	Unknown effects	3	3	3	2	2	5
	Other	13	8	9	17	14	13
	DK / No response	23	32	24	23	20	19
NUMBERS OF RESPONSES	**FILTER:** THOSE WHO ANSWER IN QUESTION Q9 "DEFINITELY NOT"	317	37	49	84	99	48
Household electrical appliances	Unnecessary / No use	5	3	2	10	1	10
	Harmful / Dangerous	22	16	39	12	31	6
	Environment protection	10	3	2	24	6	10
	No trust	12	14	12	10	12	15
	Too expensive	3	5	2	1	3	2
	Unhealthy	8	5	8	13	7	4
	Unnatural	0	0	0	1	0	0
	Unknown effects	4	3	4	7	1	8
	Other	7	11	8	5	5	10
	DK / No response	28	41	22	18	33	33

NUMBERS OF RESPONSES	**FILTER:** THOSE WHO ANSWER IN QUESTION Q9 "DEFINITELY NOT"	265	25	36	67	92	45
Computers and electronics	Unnecessary / No use	8	8	0	15	5	11
	Harmful / Dangerous	21	12	33	13	27	13
	Environment protection	7	0	0	18	4	7
	No trust	6	4	0	6	9	7
	Too expensive	2	0	3	3	2	2
	Unhealthy	10	4	6	10	14	7
	Unnatural	2	0	0	3	2	2
	Unknown effects	2	8	0	1	1	2
	Other	3	0	6	4	3	0
	DK / No response	39	64	53	25	32	49
NUMBERS OF RESPONSES	**FILTER:** THOSE WHO ANSWER IN QUESTION Q9 "DEFINITELY NOT"	641	67	115	184	184	91
Clothing/textiles	Unnecessary / No use	7	1	5	9	8	5
	Harmful / Dangerous	13	7	19	11	16	10
	Environment protection	5	0	1	12	1	7
	No trust	10	15	10	6	10	11
	Too expensive	0	0	0	1	1	0

	Unhealthy	31	24	25	35	34	31
	Unnatural	7	12	7	6	6	7
	Unknown effects	4	7	5	5	3	3
	Other	4	3	8	4	4	1
	DK / No response	19	30	19	11	18	25
NUMBERS OF RESPONSES	**FILTER:** THOSE WHO ANSWER IN QUESTION Q9 "DEFINITELY NOT"	347	34	39	84	110	80
Construction materials	Unnecessary / No use	10	9	5	8	11	15
	Harmful / Dangerous	17	12	26	12	20	16
	Environment protection	7	3	8	15	5	5
	No trust	9	12	5	7	9	10
	Too expensive	2	6	0	2	2	0
	Unhealthy	12	0	5	17	15	9
	Unnatural	2	3	0	2	3	0
	Unknown effects	4	3	8	5	1	5
	Other	7	9	8	6	5	9
	DK / No response	31	44	36	25	29	31
NUMBERS OF RESPONSES	**FILTER:** THOSE WHO ANSWER IN QUESTION Q9 "DEFINITELY NOT"	584	52	68	188	168	108

Detergents/household cleaning products	Unnecessary / No use	15	13	3	11	17	25
	Harmful / Dangerous	22	12	31	26	24	12
	Environment protection	13	4	4	25	6	13
	No trust	13	33	10	6	18	7
	Too expensive	1	0	1	0	2	0
	Other	15	8	13	18	15	17
	DK / No response	22	31	37	15	18	26
NUMBERS OF RESPONSES	**FILTER:** THOSE WHO ANSWER IN QUESTION Q9 "DEFINITELY NOT"	1097	117	177	332	266	205
Cosmetics	Unnecessary / No use	5	1	5	7	5	6
	Harmful / Dangerous	8	10	13	5	10	6
	Environment protection	3	2	1	7	1	3
	No trust	9	11	13	5	11	6
	Too expensive	0	0	0	0	1	0
	Unhealthy	40	37	37	43	42	36
	Unnatural	10	15	8	11	9	9
	Unknown effects	5	3	7	5	2	7
	Other	8	7	6	6	6	16
	DK / No response	11	14	11	9	14	10

NUMBERS OF RESPONSES	**FILTER:** THOSE WHO ANSWER IN QUESTION Q9 "DEFINITELY NOT"	942	92	158	295	216	181
Toys	Unnecessary / No use	4	0	3	7	4	2
	Harmful / Dangerous	44	42	49	38	46	50
	Environment protection	2	0	1	6	1	2
	No trust	8	17	11	6	8	4
	Too expensive	0	1	1	0	0	1
	Unhealthy	11	9	7	18	10	5
	Unnatural	5	3	6	6	3	3
	Unknown effects	4	1	1	5	3	6
	Other	7	10	6	4	7	12
	DK / No response	14	16	15	10	17	16
NUMBERS OF RESPONSES	**FILTER:** THOSE WHO ANSWER IN QUESTION Q9 "DEFINITELY NOT"	713	60	107	203	194	149
Kitchenware	Unnecessary / No use	8	2	2	9	12	7
	Harmful / Dangerous	39	47	41	38	33	45
	Environment protection	5	2	1	11	2	3
	No trust	10	12	16	7	11	9
	Too expensive	1	2	2	0	1	1

	Unhealthy	11	8	7	12	14	8
	Unnatural	4	3	4	4	4	5
	Unknown effects	4	2	1	4	4	5
	Other	5	3	9	4	4	5
	DK / No response	13	20	17	9	16	11
NUMBERS OF RESPONSES	**FILTER:** THOSE WHO ANSWER IN QUESTION Q9 "DEFINITELY NOT"	930	97	140	301	241	151
Pesticides and plant protection products	Unnecessary / No use	4	1	1	6	3	5
	Harmful / Dangerous	19	21	26	13	21	19
	Environment protection	16	12	11	25	8	15
	No trust	7	3	9	7	6	7
	Too expensive	1	0	1	0	1	0
	Unhealthy	7	7	6	7	10	3
	Unnatural	14	16	11	13	18	13
	Unknown effects	2	2	2	2	2	3
	Other	17	14	13	20	17	15
	DK / No response	14	23	18	8	14	20
NUMBERS OF RESPONSES	**FILTER:** THOSE WHO ANSWER IN QUESTION Q9 "DEFINITELY NOT"	467	33	46	139	156	93

Cars care products	Unnecessary / No use	24	18	13	25	15	43
	Harmful / Dangerous	16	18	26	17	21	4
	Environment protection	10	3	7	19	3	10
	No trust	8	9	11	4	13	4
	Too expensive	1	3	0	1	2	1
	Unhealthy	0	0	0	0	0	0
	Unnatural	0	0	0	0	0	0
	Unknown effects	0	0	0	0	0	0
	Other	12	12	7	11	15	11
	DK / No response	29	36	37	23	31	27
Q10 What is your personal attitude to the following new trends, technologies or areas in terms of possible impact on your life?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
Nanomaterials	I am concerned about possible negative impacts on my life	25	18	25	31	27	24
	I am not worried about possible negative impact on my life	38	41	52	28	29	41
	I do not care	10	11	4	9	15	11
	Cannot say	27	30	18	32	30	23

Biofuels from genetically modified crops	I am concerned about possible negative impacts on my life	29	28	33	31	26	27
	I am not worried about possible negative impact on my life	41	40	48	35	37	43
	I do not care	12	12	8	12	15	15
	Cannot say	18	20	12	22	22	15
Mobile phones	I am concerned about possible negative impacts on my life	27	28	32	28	27	21
	I am not worried about possible negative impact on my life	51	48	58	48	41	61
	I do not care	12	12	5	15	18	13
	Cannot say	9	12	6	9	14	5
Self-driving (autonomous) cars	I am concerned about possible negative impacts on my life	31	30	26	33	30	34
	I am not worried about possible negative impact on my life	41	39	53	39	35	39
	I do not care	15	14	8	13	18	20
	Cannot say	14	16	14	14	17	7
Foods from genetically modified crops	I am concerned about possible negative impacts on my life	60	57	76	63	53	50
	I am not worried about possible negative impact on my life	21	23	14	17	20	30
	I do not care	8	7	4	7	12	11

	Cannot say	12	13	6	13	16	10
Asbestos	I am concerned about possible negative impacts on my life	64	69	60	67	63	61
	I am not worried about possible negative impact on my life	15	12	16	12	15	18
	I do not care	9	7	8	7	9	14
	Cannot say	13	12	17	15	13	7
Social networks	I am concerned about possible negative impacts on my life	27	27	27	30	28	24
	I am not worried about possible negative impact on my life	45	41	56	43	36	51
	I do not care	16	19	9	16	22	17
	Cannot say	11	14	8	11	14	7
Pesticides and plant protection products	I am concerned about possible negative impacts on my life	61	61	66	66	56	54
	I am not worried about possible negative impact on my life	20	19	21	15	19	27
	I do not care	8	7	5	8	11	11
	Cannot say	11	13	7	12	14	8
Plastic wastes	I am concerned about possible negative impacts on my life	66	66	71	70	57	65
	I am not worried about possible negative impact on my life	19	16	18	16	20	23

	I do not care	7	7	5	5	11	7
	Cannot say	9	10	6	8	13	5
Globalisation	I am concerned about possible negative impacts on my life	39	40	43	41	29	39
	I am not worried about possible negative impact on my life	34	33	40	32	28	38
	I do not care	11	11	5	10	17	13
	Cannot say	16	17	12	16	25	10
Electronics and computers	I am concerned about possible negative impacts on my life	19	20	20	20	19	15
	I am not worried about possible negative impact on my life	59	55	69	57	48	68
	I do not care	12	14	4	12	19	12
	Cannot say	10	11	7	12	14	5
Artificial intelligence	I am concerned about possible negative impacts on my life	36	36	38	40	29	35
	I am not worried about possible negative impact on my life	40	36	46	35	37	46
	I do not care	11	12	6	10	17	12
	Cannot say	13	15	11	16	18	8
Global warming	I am concerned about possible negative impacts on my life	64	65	73	64	59	63

	I am not worried about possible negative impact on my life	19	18	18	18	20	22
	I do not care	7	7	3	7	10	9
	Cannot say	9	10	6	11	12	6
Q11 With regard to health, the main issue is not to what extent you are exposed to harmful materials, but whether or not you are exposed to them at all.		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
With regard to health, the main issue is not to what extent you are exposed to harmful materials, but whether or not you are exposed to them at all.	Completely disagree	8	5	14	11	4	8
	Rather disagree	18	13	20	24	11	23
	Neither nor	24	24	16	21	30	29
	Rather agree	29	36	26	27	33	23
	Completely agree	15	18	22	11	16	8
	DK, cannot say	6	4	3	6	7	9
Q12 If a person is exposed to an extremely small amount of a material that is harmful at larger amounts, then that person will probably be seriously ill some day in the future, even if the amount is extremely small.		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000

If a person is exposed to an extremely small amount of a material that is harmful at larger amounts, then that person will probably be seriously ill some day in the future, even if the amount is extremely small.	Completely disagree	6	4	7	5	3	10
	Rather disagree	16	17	14	19	7	26
	Neither nor	22	25	16	20	23	27
	Rather agree	33	36	35	32	39	21
	Completely agree	16	11	26	17	21	7
	DK, cannot say	7	8	2	8	7	8
Q13 Would you say that products containing nanomaterials are		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
Would you say that products containing nanomaterials are	Safer to use than products that do not contain nanomaterials	9	10	15	6	11	6
	Equally safe to use as products that do not contain nanomaterials	29	38	27	24	26	30
	Less safe to use than products that do not contain nanomaterials	20	12	18	24	23	23
	I cannot decide	42	41	41	46	41	41
Q14 To what extent do you believe that risks (if any) associated with nanomaterials may be eliminated when nanomaterials are used in a proper way?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
To what extent do you believe that	Completely disagree	4	2	6	6	4	3

risks (if any) associated with nanomaterials may be eliminated when nanomaterials are used in a proper way?	Rather disagree	9	6	8	11	10	7
	Neither nor	21	21	14	21	30	19
	Rather agree	36	41	38	30	28	43
	Completely agree	12	13	21	8	8	11
	DK, cannot say	18	19	13	24	20	16
Q15 Are you concerned about being exposed to nanomaterials?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
Are you concerned about being exposed to nanomaterials?	Not at all	37	35	35	36	29	51
	A little	56	61	58	52	63	44
	A lot	7	4	6	12	8	5
Q16 What are the risks that you associate with nanomaterials?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
So far unknown properties of nanomaterials		56	49	61	49	55	67
Difficult prevention of exposure (tiny particles can get anywhere)		53	50	48	58	54	58
Other		3	2	3	4	3	5
None		11	14	6	12	12	12

Q17 Which way do you feel is the most likely for people to be directly exposed to nanomaterials?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
Which way do you feel is the most likely for people to be directly exposed to nanomaterials?	Inhalation (by breathing)	28	31	16	26	33	33
	Dermal (by skin contact)	33	30	39	35	28	36
	Oral (by swallowing/drinking)	29	25	35	31	31	25
	None of the above	10	14	11	8	9	6
Q18 Now that you have some further information, are you concerned about being exposed to nanomaterials?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
Now that you have some further information, are you concerned about being exposed to nanomaterials?	Not at all	26	28	23	20	24	35
	A little	61	64	64	59	62	57
	A lot	13	8	12	21	14	8
Q19 With this information on nanomaterials, how do you estimate the risks and benefits for the following uses?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
Use of nanomaterials for a reduction of the salt content in	The risks associated with using nanomaterials will by far exceed	19	14	20	28	18	18

foods while retaining the same taste	the benefits.						
	The risks associated with using nanomaterials will slightly exceed the benefits.	27	23	24	28	28	30
	The benefits associated with using nanomaterials slightly exceed the risks.	23	25	25	15	20	28
	The benefits associated with using nanomaterials will by far exceed the risks.	11	15	15	7	11	7
	Cannot say	21	24	15	23	23	18
Use of nanomaterials for the enrichment of foods with vitamins and other nutrients	The risks associated with using nanomaterials will by far exceed the benefits.	23	17	24	34	19	20
	The risks associated with using nanomaterials will slightly exceed the benefits.	27	25	27	26	28	29
	The benefits associated with using nanomaterials slightly exceed the risks.	21	23	23	14	19	28
	The benefits associated with using nanomaterials will by far exceed the risks.	9	13	12	7	10	6
	Cannot say	20	22	14	20	25	17
Use of nanomaterials for indoor paint that prevents the accumulation of odours (e.g.	The risks associated with using nanomaterials will by far exceed the benefits.	13	9	10	18	16	13

cigarette smoke)	The risks associated with using nanomaterials will slightly exceed the benefits.	22	15	18	25	25	25
	The benefits associated with using nanomaterials slightly exceed the risks.	30	33	35	24	24	36
	The benefits associated with using nanomaterials will by far exceed the risks.	17	24	26	11	12	10
	Cannot say	18	19	11	21	23	16
Use of nanomaterials for an increase in the efficiency of sunscreen	The risks associated with using nanomaterials will by far exceed the benefits.	17	14	16	24	16	17
	The risks associated with using nanomaterials will slightly exceed the benefits.	26	22	25	28	26	28
	The benefits associated with using nanomaterials slightly exceed the risks.	26	26	29	20	24	32
	The benefits associated with using nanomaterials will by far exceed the risks.	11	14	18	8	11	8
	Cannot say	19	24	13	20	24	16
Use of nanomaterials for active substances of skin cream that reach deeper skin layers	The risks associated with using nanomaterials will by far exceed the benefits.	20	15	18	30	17	22
	The risks associated with using nanomaterials will slightly exceed	27	22	27	27	27	32

	the benefits.						
	The benefits associated with using nanomaterials slightly exceed the risks.	23	26	26	16	22	25
	The benefits associated with using nanomaterials will by far exceed the risks.	11	15	16	6	11	6
	Cannot say	19	22	13	21	23	16
Use of nanomaterials for the prevention of the occurrence of unpleasant odours in textiles	The risks associated with using nanomaterials will by far exceed the benefits.	14	9	12	19	15	13
	The risks associated with using nanomaterials will slightly exceed the benefits.	24	19	20	25	27	28
	The benefits associated with using nanomaterials slightly exceed the risks.	31	32	34	27	25	35
	The benefits associated with using nanomaterials will by far exceed the risks.	14	19	23	10	12	9
	Cannot say	17	20	12	19	22	15
Use of nanomaterials for improving texture or colour of foods	The risks associated with using nanomaterials will by far exceed the benefits.	26	21	27	36	21	23
	The risks associated with using nanomaterials will slightly exceed the benefits.	27	23	28	26	27	32

	The benefits associated with using nanomaterials slightly exceed the risks.	19	22	18	12	19	24
	The benefits associated with using nanomaterials will by far exceed the risks.	8	11	11	5	10	5
	Cannot say	20	23	15	21	23	16
Use of nanomaterials for developing new tastes of foods and flavours	The risks associated with using nanomaterials will by far exceed the benefits.	25	20	22	38	21	25
	The risks associated with using nanomaterials will slightly exceed the benefits.	27	25	28	26	27	33
	The benefits associated with using nanomaterials slightly exceed the risks.	19	20	23	12	19	21
	The benefits associated with using nanomaterials will by far exceed the risks.	9	10	13	5	10	5
	Cannot say	20	25	14	20	23	17
Use of nanomaterials for extending shelf-life by maintaining or improving the condition of packaged foods	The risks associated with using nanomaterials will by far exceed the benefits.	22	17	24	31	19	18
	The risks associated with using nanomaterials will slightly exceed the benefits.	28	24	28	27	27	32
	The benefits associated with using nanomaterials slightly	22	24	22	16	21	30

	exceed the risks.						
	The benefits associated with using nanomaterials will by far exceed the risks.	10	14	14	7	10	6
	Cannot say	18	22	13	19	23	15
Use of nanomaterials for drugs which release their active substance in a concentration at the desired spot	The risks associated with using nanomaterials will by far exceed the benefits.	14	11	16	17	14	10
	The risks associated with using nanomaterials will slightly exceed the benefits.	20	19	19	22	24	17
	The benefits associated with using nanomaterials slightly exceed the risks.	30	29	29	27	27	40
	The benefits associated with using nanomaterials will by far exceed the risks.	16	18	23	12	13	15
	Cannot say	19	22	13	21	22	18
Use of nanomaterials for the repair of damaged tooth (teeth filling or coating)	The risks associated with using nanomaterials will by far exceed the benefits.	13	9	13	16	15	10
	The risks associated with using nanomaterials will slightly exceed the benefits.	20	17	17	24	23	20
	The benefits associated with using nanomaterials slightly exceed the risks.	31	32	33	27	26	39

	The benefits associated with using nanomaterials will by far exceed the risks.	17	21	25	11	13	14
	Cannot say	19	21	12	22	24	18
Use of nanomaterials for more efficient cleaning of waste water	The risks associated with using nanomaterials will by far exceed the benefits.	11	7	12	15	14	8
	The risks associated with using nanomaterials will slightly exceed the benefits.	17	12	16	21	20	16
	The benefits associated with using nanomaterials slightly exceed the risks.	32	30	32	28	30	41
	The benefits associated with using nanomaterials will by far exceed the risks.	21	31	29	14	13	19
	Cannot say	18	19	11	23	23	16
Use of nanomaterials for strengthening the rubber in tyres and other rubber products	The risks associated with using nanomaterials will by far exceed the benefits.	10	7	9	12	13	7
	The risks associated with using nanomaterials will slightly exceed the benefits.	16	14	15	19	19	15
	The benefits associated with using nanomaterials slightly exceed the risks.	34	32	34	32	30	44
	The benefits associated with using nanomaterials will by far	22	29	31	17	16	19

	exceed the risks.						
	Cannot say	17	19	11	20	22	15
Use of nanomaterials for making plastics (e.g. PET bottles) more durable	The risks associated with using nanomaterials will by far exceed the benefits.	18	16	21	26	17	12
	The risks associated with using nanomaterials will slightly exceed the benefits.	23	20	22	25	26	23
	The benefits associated with using nanomaterials slightly exceed the risks.	26	25	25	18	22	39
	The benefits associated with using nanomaterials will by far exceed the risks.	13	16	19	9	12	10
	Cannot say	20	23	13	22	23	17
Use of nanomaterials for keeping children's toys clean (reducing bacteria) and making them last longer	The risks associated with using nanomaterials will by far exceed the benefits.	16	11	14	22	16	15
	The risks associated with using nanomaterials will slightly exceed the benefits.	24	18	23	27	24	26
	The benefits associated with using nanomaterials slightly exceed the risks.	28	30	32	21	25	34
	The benefits associated with using nanomaterials will by far exceed the risks.	14	19	20	9	12	9

	Cannot say	18	22	11	20	23	16
Use of nanomaterials for protecting plants against pests/diseases	The risks associated with using nanomaterials will by far exceed the benefits.	15	11	14	22	16	12
	The risks associated with using nanomaterials will slightly exceed the benefits.	23	19	22	27	25	24
	The benefits associated with using nanomaterials slightly exceed the risks.	29	31	32	21	23	37
	The benefits associated with using nanomaterials will by far exceed the risks.	14	17	20	9	13	9
	Cannot say	19	22	12	20	23	17
Q20 Which of the following statements do you personally agree with?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
Nanomaterials will open up fantastic opportunities for technical development	Strongly disagree	4	2	4	6	4	4
	Disagree	7	4	6	9	9	8
	Neither agree nor disagree	21	18	17	21	24	26
	Agree	36	40	41	30	33	34
	Strongly agree	16	19	22	14	12	13

	Cannot say	16	15	9	20	19	15
I am very interested in scientific topics	Strongly disagree	5	2	4	6	7	4
	Disagree	10	9	9	12	12	9
	Neither agree nor disagree	24	26	21	23	28	23
	Agree	34	36	39	33	29	35
	Strongly agree	17	15	20	16	13	21
	Cannot say	10	13	8	10	12	8
If my country (programming: name the particular country here) wants to be globally competitive, it has to embrace technologies using nanomaterials	Strongly disagree	6	3	7	11	6	5
	Disagree	10	7	9	14	11	9
	Neither agree nor disagree	27	25	25	25	29	31
	Agree	29	33	34	22	26	29
	Strongly agree	10	12	13	8	10	10
	Cannot say	18	21	12	20	19	16
If nanomaterials make everyday products better, I'll gladly use them	Strongly disagree	7	2	7	11	10	7
	Disagree	12	7	11	16	11	13
	Neither agree nor disagree	25	23	22	26	29	27
	Agree	31	37	38	25	23	32
	Strongly agree	11	14	15	7	9	10
	Cannot say	14	17	7	15	19	11

I am looking forward to the many nano-products that will soon be on the market	Strongly disagree	12	6	9	21	13	9
	Disagree	16	12	14	19	15	18
	Neither agree nor disagree	30	34	29	25	30	31
	Agree	21	22	29	14	18	22
	Strongly agree	8	9	11	4	8	7
	Cannot say	14	17	9	17	17	13
I believe this whole nano thing is a marketing trick to improve sales of certain products	Strongly disagree	8	7	9	8	6	9
	Disagree	19	23	21	17	15	23
	Neither agree nor disagree	27	25	27	26	26	29
	Agree	20	18	23	21	24	17
	Strongly agree	9	7	10	10	10	6
	Cannot say	17	20	10	19	19	18
I believe nanomaterials offer many possibilities to cure and recognise diseases	Strongly disagree	3	1	3	6	3	3
	Disagree	7	5	7	9	7	6
	Neither agree nor disagree	22	20	20	22	25	23
	Agree	36	39	40	30	33	39
	Strongly agree	14	15	17	10	11	16
	Cannot say	18	19	13	24	20	14
I am sure that using	Strongly disagree	7	4	7	11	8	6

nanomaterials will help to protect the environment and limit or repair environmental damage	Disagree	14	9	14	19	12	15
	Neither agree nor disagree	28	27	28	25	26	33
	Agree	25	32	30	18	24	22
	Strongly agree	7	8	10	6	7	5
	Cannot say	19	21	11	22	23	19
I am convinced that using nanomaterials is of benefit to society	Strongly disagree	6	2	6	9	6	5
	Disagree	12	9	11	18	12	12
	Neither agree nor disagree	27	25	26	26	29	31
	Agree	29	35	37	20	26	29
	Strongly agree	9	11	12	6	8	8
	Cannot say	17	19	9	20	20	16
It's really frightening how many nano-products there are or soon will be	Strongly disagree	5	7	6	3	3	8
	Disagree	14	15	17	9	9	18
	Neither agree nor disagree	27	27	29	24	22	33
	Agree	23	23	25	22	29	16
	Strongly agree	12	10	11	16	18	6
	Cannot say	19	20	13	25	20	19
I'm worried that using nanomaterials could lead to completely new health problems	Strongly disagree	3	3	3	3	3	3
	Disagree	8	10	10	5	6	8

	Neither agree nor disagree	21	19	23	18	19	26
	Agree	33	35	34	32	32	33
	Strongly agree	21	15	20	27	24	20
	Cannot say	14	18	10	16	16	10
I'm concerned that using nanomaterials instead of traditional materials could damage the environment	Strongly disagree	4	3	5	3	3	5
	Disagree	13	16	19	9	8	11
	Neither agree nor disagree	24	25	26	20	21	28
	Agree	29	26	27	31	32	31
	Strongly agree	16	11	13	21	20	14
	Cannot say	15	19	11	16	16	12
I believe that nanotechnology can lead to job cuts in traditional branches of industry	Strongly disagree	5	4	5	7	5	6
	Disagree	17	17	15	22	14	18
	Neither agree nor disagree	27	25	28	26	27	31
	Agree	24	27	29	19	25	19
	Strongly agree	8	7	12	6	10	7
	Cannot say	18	20	11	21	19	19
I'm afraid that nanotechnology will result in more individuals to be monitored and controlled by miniaturised technology	Strongly disagree	6	5	6	8	3	9
	Disagree	14	14	14	17	9	15
	Neither agree nor disagree	25	23	24	25	25	30

	Agree	26	29	30	21	29	21
	Strongly agree	11	10	16	7	15	8
	Cannot say	17	19	10	22	19	17
I believe It's hardly possible to control the health risks of using nanomaterials	Strongly disagree	3	1	4	2	3	3
	Disagree	9	10	12	7	9	9
	Neither agree nor disagree	21	21	23	18	21	24
	Agree	34	37	34	31	33	34
	Strongly agree	18	10	17	24	18	19
	Cannot say	15	20	10	18	16	11
I would approve nanomaterials development being promoted through state funding	Strongly disagree	9	5	9	16	7	8
	Disagree	13	9	12	19	12	13
	Neither agree nor disagree	25	23	25	24	26	28
	Agree	26	32	31	15	25	27
	Strongly agree	9	10	11	7	10	7
	Cannot say	18	21	12	20	20	17
Q21 How well informed do you feel about nanomaterials compared to other modern technologies?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000

How well informed do you feel about nanomaterials compared to other modern technologies?	I feel better informed about nanomaterials compared to other new modern technologies	11	12	11	6	18	7
	Equally informed	45	49	49	38	49	38
	I feel less informed about nanomaterials compared to other new modern technologies	45	39	40	56	34	55
Q22A Where have you already heard, read or seen something about nanomaterials?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
TV		19	14	25	22	13	19
Radio		5	5	4	5	4	5
Social media		11	10	20	7	8	10
YouTube		10	12	12	7	9	11
Elsewhere on the Internet		27	39	35	23	8	32
Online media		14	13	26	16	5	11
Product websites		11	8	22	8	7	8
Blogs		6	5	11	4	3	5
Newspapers		12	7	8	16	9	19
Magazines		13	12	13	16	8	15

School, university, college	7	8	6	7	4	11
Workplace	5	6	5	5	2	6
Personal discussion with family and/or friends	7	6	7	9	7	5
Personal discussion with experts	6	5	10	6	5	7
Other	2	1	2	3	1	3
Q22B If you are looking for some information about nanotechnology, which resources will you use?	ALL COUNTRIES	Country				
	results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES	5000	1000	1000	1000	1000	1000
TV	6	4	5	6	13	4
Radio	2	2	2	3	4	1
Social media	5	4	5	5	6	3
YouTube	6	4	4	7	11	4
Elsewhere on the Internet	17	21	12	17	17	20
Online media	8	5	8	13	6	6
Product websites	9	3	10	6	19	6
Blogs	3	2	5	3	4	2
Newspapers	5	2	2	5	7	6
Magazines	4	3	2	5	8	3

School, university, college		2	2	2	3	3	3
Workplace		2	1	2	1	3	1
Personal discussion with family and/or friends		4	2	3	5	8	2
Personal discussion with experts		6	2	4	5	14	5
Other		2	3	0	2	1	2
Q23 Are you aware of any websites or databases with centralised information about nanomaterials or products containing nanomaterials?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
Are you aware of any websites or databases with centralised information about nanomaterials or products containing nanomaterials?	Yes	19	17	18	24	17	18
	No	81	83	82	76	83	82
Q23 Spontaneously mentioned websites or databaseswith centralised information about nanomaterials or products containing nanomaterials:		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES	**FILTER:** THOSE WHO HAVE MENTIONED AWARENES OF SOME WEBSITES ….	950	170	184	240	174	182
Google		15	14	14	25	11	7
YouTube		5	6	5	5	5	4
Wikipedia		15	16	13	24	13	3

Facebook		4	5	2	3	8	1
other websites		54	60	50	42	54	68
Other		5	5	3	8	3	3
DK / No response		14	11	17	8	18	17
Q24 Are you aware of the European Union Observatory for Nanomaterials (EUON)?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
Are you aware of the European Union Observatory for Nanomaterials (EUON)?	Yes	9	8	8	8	12	9
	No	91	92	92	92	88	91
Q25 What would be your primary source of information about nanomaterials?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
PRIMARY SOURCE	Distributor/seller from whom I bought the product	4	4	6	5	3	3
	Producer of the product	7	10	3	11	6	7
	Scientists/researchers (universities, research institutes, etc.)	25	28	22	14	24	38
	Health and occupational safety authorities	9	10	8	4	7	14

	Pharmacists	3	3	3	4	4	2
	Doctors (e.g. your doctor)	8	8	7	8	13	6
	Consumer organisations	6	3	4	9	9	5
	Government representatives, politicians	1	1	1	1	2	1
	EU authorities (e.g. European Commission, European Chemicals Agency)	7	7	7	4	7	11
	Environmental organisations	6	6	6	6	8	4
	None	23	21	33	35	18	10
Q25 What would be your secondary source of information about nanomaterials?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
SECONDARY SOURCE	Distributor/seller from whom I bought the product	4	3	5	5	2	4
	Producer of the product	6	8	2	7	6	7
	Scientists/researchers (universities, research institutes, etc.)	11	10	8	9	12	16
	Health and occupational safety authorities	13	16	9	5	12	22
	Pharmacists	5	5	4	5	6	3

	Doctors (e.g. your doctor)	7	7	7	6	10	6
	Consumer organisations	8	7	5	8	12	10
	Government representatives, politicians	2	2	2	1	2	1
	EU authorities (e.g. European Commission, European Chemicals Agency)	9	11	8	4	10	14
	Environmental organisations	8	8	7	9	11	7
	None	28	24	43	41	18	11
Q25 What would be your third source of information about nanomaterials?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
THIRD SOURCE	Distributor/seller from whom I bought the product	4	5	4	5	4	4
	Producer of the product	8	8	2	6	6	8
	Scientists/researchers (universities, research institutes, etc.)	12	8	6	7	10	12
	Health and occupational safety authorities	18	13	8	7	12	18
	Pharmacists	2	4	4	3	6	2
	Doctors (e.g. your doctor)	5	6	7	5	7	5

	Consumer organisations	10	8	6	8	11	10
	Government representatives, politicians	2	3	2	1	3	2
	EU authorities (e.g. European Commission, European Chemicals Agency)	16	9	5	6	7	16
	Environmental organisations	11	8	7	7	12	11
	None	13	28	49	45	21	13
Q25 What would be your source of information about nanomaterials?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
SOURCES TOTAL USAGE	Distributor/seller from whom I bought the product	12	11	15	15	9	11
	Producer of the product	21	25	8	23	18	22
	Scientists/researchers (universities, research institutes, etc.)	48	46	36	30	46	65
	Health and occupational safety authorities	39	39	25	16	32	54
	Pharmacists	9	12	11	11	15	7
	Doctors (e.g. your doctor)	21	22	21	19	29	17
	Consumer organisations	24	18	15	25	32	25

	Government representatives, politicians	4	6	4	3	8	3
	EU authorities (e.g. European Commission, European Chemicals Agency)	33	27	20	14	24	41
	Environmental organisations	25	21	20	22	31	22
Q26 How much trust would you place in the following persons or institutions if they were to inform you about safety of nanomaterials?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
Distributor/seller from whom I bought the product	Absolute trust	5	4	6	5	6	4
	Bit of trust	31	37	27	29	32	31
	Not much trust	47	44	48	47	45	51
	No trust at all	17	16	20	20	18	14
Producer of the product	Absolute trust	5	6	4	6	5	4
	Bit of trust	34	42	29	30	34	38
	Not much trust	45	38	48	47	43	47
	No trust at all	16	15	18	18	18	11
Scientists/researchers (universities, research institutes, etc.)	Absolute trust	27	30	25	28	18	36
	Bit of trust	58	56	57	58	62	56
	Not much trust	10	9	13	10	14	6

	No trust at all	5	5	5	4	7	3
Health and occupational safety authorities	Absolute trust	18	19	12	22	13	25
	Bit of trust	62	66	58	63	59	66
	Not much trust	14	11	24	11	20	7
	No trust at all	5	5	7	5	8	2
Pharmacists	Absolute trust	12	9	10	19	14	10
	Bit of trust	61	64	52	62	65	63
	Not much trust	21	21	30	15	15	23
	No trust at all	6	7	9	5	6	4
Doctors (e.g. your doctor)	Absolute trust	18	16	15	22	19	16
	Bit of trust	62	64	56	62	63	66
	Not much trust	15	15	22	12	12	15
	No trust at all	5	6	7	4	6	3
Consumer organisations	Absolute trust	15	14	11	24	15	14
	Bit of trust	64	69	58	58	62	72
	Not much trust	15	13	23	13	16	11
	No trust at all	6	4	9	5	7	3
Government representatives, politicians	Absolute trust	4	4	6	3	6	3
	Bit of trust	21	25	16	16	27	21

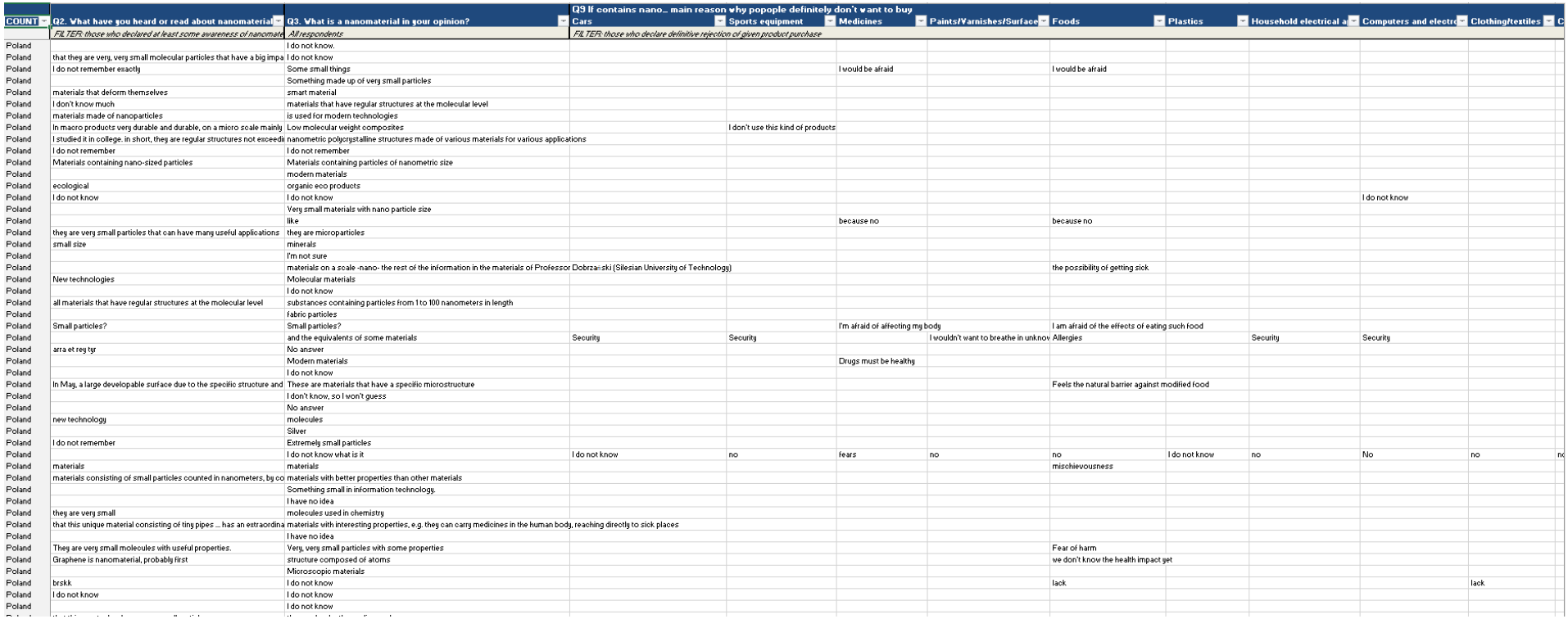
	Not much trust	45	44	43	43	41	52
	No trust at all	31	28	35	39	26	25
EU authorities (e.g. European Commission, European Chemicals Agency)	Absolute trust	14	17	16	11	10	18
	Bit of trust	53	57	51	48	51	58
	Not much trust	23	17	23	27	29	19
	No trust at all	10	9	10	13	11	5
Environmental organisations	Absolute trust	16	12	15	22	18	13
	Bit of trust	58	62	52	56	61	60
	Not much trust	19	19	25	16	14	20
	No trust at all	7	7	8	6	7	7
Q27 When buying a product containing nanomaterials, do you think you should be informed about it (for example on the label or on the packaging)?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
When buying a product containing nanomaterials, do you think you should be informed about it (for example on the label or on the packaging)?	No	13	15	8	14	20	9
	Yes	87	85	92	86	80	91
Q27a What kind of information would you expect on the label of a product containing a nanomaterial?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland

NUMBERS OF RESPONSES	**FILTER**: THOSE WHO SHOULD BE INFORMED	4347	854	924	856	801	912
Negative impacts / risks		19	16	21	9	27	24
If it contains nanomaterials		14	17	14	16	10	14
Amount of nanomaterials / Quantity		7	6	8	5	7	8
Symbol or stamp		9	13	4	18	7	3
Complete information		12	14	19	10	9	7
Type of nanomaterials		4	6	5	2	5	5
Other		13	12	13	15	14	14
DK / No response		20	15	16	26	21	25
Q28 For which of the following products do you think you should be informed (for example on the label or on the packaging) when buying a product containing nanomaterials?		ALL COUNTRIES	Country				
		results in %	Poland	Bulgaria	Austria	France	Finland
NUMBERS OF RESPONSES		5000	1000	1000	1000	1000	1000
Cars		29	26	26	32	31	30
Sports equipment		35	32	28	46	33	38
Medicines		77	77	85	78	67	81
Paints/Varnishes/Surface coatings		50	50	49	51	48	53
Foods		79	78	85	81	69	82
Plastics		41	36	40	39	43	47

Household electrical appliances	34	33	37	35	35	33
Computers and electronics	32	32	30	32	34	32
Clothing/textiles	64	60	71	70	54	67
Construction materials	38	35	35	41	35	43
Detergents/household cleaning products	62	62	60	70	52	65
Cosmetics	74	74	81	76	61	78
Toys	63	65	66	69	51	65
Kitchenware	55	56	57	57	46	61
Pesticides and plant protection products	55	51	53	60	49	60
Car care product	34	36	31	36	31	35
None of these	6	7	3	5	9	5

Annex 4 – open ended questions

Click on the image below to open the Excel file.



COUNT	Q2. What have you heard or read about nanomaterial	Q3. What is a nanomaterial in your opinion?	Q9 If contains nano... main reason why popople definitely don't want to buy									
	FILTER: those who declared at least some awareness of nanomate	All respondents	Cars	Sports equipment	Medicines	Paints/Varnishes/Surface	Foods	Plastics	Household electrical a	Computers and electr	Clothing/textiles	C
			FILTER: those who declare definitive rejection of given product purchase									
Poland		I do not know.										
Poland	that they are very, very small molecular particles that have a big impa	I do not know										
Poland	I do not remember exactly	Some small things			I would be afraid		I would be afraid					
Poland		Something made up of very small particles										
Poland	materials that deform themselves	smart material										
Poland	I don't know much	materials that have regular structures at the molecular level										
Poland	materials made of nanoparticles	is used for modern technologies										
Poland	In macro products very durable and durable, on a micro scale mainly	Low molecular weight composites		I don't use this kind of products								
Poland	I studied it in college. in short, they are regular structures not exceedi	nanometric polycrystalline structures made of various materials for various applications										
Poland	I do not remember	I do not remember										
Poland	Materials containing nano-sized particles	Materials containing particles of nanometric size										
Poland		modern materials										
Poland	ecological	organic eco products										
Poland	I do not know	I do not know								I do not know		
Poland		Very small materials with nano particle size										
Poland		like			because no		because no					
Poland	they are very small particles that can have many useful applications	they are microparticles										
Poland	small size	minerals										
Poland		I'm not sure										
Poland		materials on a scale -nano- the rest of the information in the materials of Professor Dobrzański (Silesian University of Technology)					the possibility of getting sick					
Poland	New technologies	Molecular materials										
Poland		I do not know										
Poland	all materials that have regular structures at the molecular level	substances containing particles from 1 to 100 nanometers in length										
Poland		fabric particles										
Poland	Small particles?	Small particles?			I'm afraid of affecting my body		I am afraid of the effects of eating such food					
Poland		and the equivalents of some materials	Security	Security		I wouldn't want to breathe in unknov	Allergies		Security	Security		
Poland	arra et reg tyr	No answer										
Poland		Modern materials			Drugs must be healthy							
Poland		I do not know										
Poland	In Mag, a large developable surface due to the specific structure and	These are materials that have a specific microstructure					Feels the natural barrier against modified food					
Poland		I don't know, so I won't guess										
Poland		No answer										
Poland	new technology	molecules										
Poland		Silver										
Poland	I do not remember	Extremely small particles										
Poland		I do not know what is it	I do not know	no	fears	no	no	I do not know	no	No	no	n
Poland	materials	materials					mischievousness					
Poland	materials consisting of small particles counted in nanometers, by co	materials with better properties than other materials										
Poland		Something small in information technology.										
Poland		I have no idea										
Poland	they are very small	molecules used in chemistry										
Poland	that this unique material consisting of tiny pipes ... has an extraordina	materials with interesting properties, e.g. they can carry medicines in the human body, reaching directly to sick places										
Poland		I have no idea										
Poland	They are very small molecules with useful properties.	Very, very small particles with some properties					Fear of harm					
Poland	Graphene is nanomaterial, probably first	structure composed of atoms					we don't know the health impact yet					
Poland		Microscopic materials										
Poland	brskk	I do not know					lack				lack	
Poland	I do not know	I do not know										
Poland		I do not know										

Annex 5 – List of articles researched

Accepted and processed articles

1. BREDAHL, L. Consumers' cognitions with regard to genetically modified foods. Results of a qualitative study in four countries. APPETITE, 1999, vol. 33, iss. 3, p. 343-360. ISSN 01956663 (ISSN).

2. BAINBRIDGE, W. S. Public attitudes toward nanotechnology. JOURNAL OF NANOPARTICLE RESEARCH, 2002, vol. 4, p. 561.

3. GASKELL, G. et al. Public attitudes to nanotechnology in Europe and the United States. NATURE MATERIALS, 2004, vol. 3, p. 496.

4. ROYAL SOCIETY and ENGINEERING, R. A. O. Nanoscience and Nanotechnologies: Opportunities and Uncertainties. Royal Society, 2004. p. (Great Britain). ISBN 9780854036042.

5. SHEETZ, T. et al. Nanotechnology: Awareness and societal concerns. Technology in Society, 2005, vol. 27, p. 329.

6. PAPACOSTAS, A. Eurobarometer 63.1 (2005). GESIS Data Archive for the Social Sciences, 2006, vol. 1.0.0.

7. PRIEST, S. The North American opinion climate for nanotechnology and its products: Opportunities and challenges. JOURNAL OF NANOPARTICLE RESEARCH, 2006, vol. 8, p. 563.

8. WALDRON, A. M. et al. The current state of public understanding of nanotechnology. JOURNAL OF NANOPARTICLE RESEARCH, 2006, vol. 8, p. 569.

9. COOK, A. J. a FAIRWEATHER, J. R. Intentions of New Zealanders to purchase lamb or beef made using nanotechnology. BRITISH FOOD JOURNAL, 2007, vol. 109, p. 675.

10. MIR, L. Perception of the dangers of nanotechnologies by experts and the uninformed. ENVIRONNEMENT RISQUES & SANTE, 2007, vol. 6, p. 331.

11. SIEGRIST, M. et al. Public acceptance of nanotechnology foods and food packaging: The influence of affect and trust. APPETITE, 2007, vol. 49, p. 459.

12. SIEGRIST, M. et al. Laypeople's and experts' perception of nanotechnology hazards. RISK ANALYSIS, 2007, vol. 27, p. 59.

13. BESLEY, J. C. et al. Expert opinion on nanotechnology: risks, benefits, and regulation. JOURNAL OF NANOPARTICLE RESEARCH, 2008, vol. 10, p. 549.

14. BESLEY, J. C. et al. Interpersonal Discussion Following Citizen Engagement About Nanotechnology What, If Anything, Do They Say? SCIENCE COMMUNICATION, 2008, vol. 30, p. 209.

15. BURRI, R. V. a BELLUCCI, S. Public perception of nanotechnology. JOURNAL OF NANOPARTICLE RESEARCH, 2008, vol. 10, p. 387.

16. CURRALL, S. C. et al. What Drives Public Acceptance of Nanotechnology? 2008.

17. PETER D. HART RESEARCH ASSOCIATES, I. Awareness of and attitudes toward nanotechnology and synthetic biology 2008.

18. ZIMMER, R. et al. Public perceptions about nanotechnology – Representative survey and basic morphological-psychological study 2008, p. 113. ISSN 1614-3795.

19. SIEGRIST, M. et al. Perceived risks and perceived benefits of different nanotechnology foods and nanotechnology food packaging. APPETITE, 2008, vol. 51, p. 283.

20. SMITH, S. E. S. et al. Americans' nanotechnology risk perception: Assessing opinion change. JOURNAL OF INDUSTRIAL ECOLOGY, 2008, vol. 12, p. 459.

21. BROSSARD, D. et al. Religiosity as a perceptual filter: Examining processes of opinion formation about nanotechnology. PUBLIC UNDERSTANDING OF SCIENCE, 2009, vol. 18, iss. 5, p. 546-558. ISSN 09636625 (ISSN).

22. CHRISTENSEN, T. Eurobarometer 64.3: Foreign Languages, Biotechnology, Organized Crime, and Health Items, November - December, 2005. UK Data Archive, 2009, vol. 14 January 2008 (2nd Edition).

23. CHRISTENSEN, T. Eurobarometer 58.0: Services of General Interest, New Technologies, ICT, Health, Environment, and Public Safety, September - October, 2002. UK Data Archive, 2009.

24. KAHAN, D. M. et al. Cultural cognition of the risks and benefits of nanotechnology. NATURE NANOTECHNOLOGY, 2009, vol. 4, p. 87.

25. PIDGEON, N. et al. Deliberating the risks of nanotechnologies for energy and health applications in the United States and United Kingdom. NATURE NANOTECHNOLOGY, 2009, vol. 4, p. 95.

26. SIEGRIST, M. et al. Acceptance of nanotechnology foods: a conjoint study examining consumers' willingness to buy. BRITISH FOOD JOURNAL, 2009, vol. 111, p. 660.

27. ANDERSON, A. A. et al. The changing information environment for nanotechnology: online audiences and content. JOURNAL OF NANOPARTICLE RESEARCH, 2010, vol. 12, p. 1083.

28. BESLEY, J. Current research on public perceptions of nanotechnology. EMERGING HEALTH THREATS JOURNAL, 2010, vol. 3, p. e8.

29. HO, S. S. et al. Making sense of policy choices: understanding the roles of value predispositions, mass media, and cognitive processing in public attitudes toward nanotechnology. JOURNAL OF NANOPARTICLE RESEARCH, 2010, vol. 12, s. 2703.

30. LEINONEN, A. a KIVISAARI, S. NANOTECHNOLOGY PERCEPTIONS: LITERATURE REVIEW ON MEDIA COVERAGE, PUBLIC OPINION AND NGO PERSPECTIVES, 2010, vol. 2559, p. 7.

31. STAMPFLI, N. et al. Acceptance of nanotechnology in food and food packaging: A path model analysis. JOURNAL OF RISK RESEARCH, 2010, vol. 13, iss. 3, p. 353-365. 13669877 (ISSN).

32. VANDERMOERE, F. et al. The morality of attitudes toward nanotechnology: about God, techno-scientific progress, and interfering with nature. JOURNAL OF NANOPARTICLE RESEARCH, 2010, vol. 12, p. 373.

33. 최찬웅 et al. Risk Communication Study for Nanotechnology Using Risk Cognitive Map. ENVIRONMENTAL HEALTH AND TOXICOLOGY, 2010, vol. 25, p. 187.

34. BERUBE, D. M. et al. Comparing nanoparticle risk perceptions to other known

EHS risks. JOURNAL OF NANOPARTICLE RESEARCH, 2011, vol. 13, p. 3089.

35. BOTTINI, M. et al. Public optimism towards nanomedicine. INTERNATIONAL JOURNAL OF NANOMEDICINE, 2011, vol. 6, p. 3473.

36. CACCIATORE, M. A. et al. From enabling technology to applications: The evolution of risk perceptions about nanotechnology. PUBLIC UNDERSTANDING OF SCIENCE, 2011, vol. 20, p. 385.

37. CONTI, J. et al. Vulnerability and Social Justice as Factors in Emergent US Nanotechnology Risk Perceptions. RISK ANALYSIS, 2011, vol. 31, p. 1734.

38. CORLEY, E. A. et al. Leading US nano-scientists' perceptions about media coverage and the public communication of scientific research findings. JOURNAL OF NANOPARTICLE RESEARCH, 2011, vol. 13, p. 7041.

39. DRUCKMAN, J. N. a BOLSEN, T. Framing, Motivated Reasoning, and Opinions About Emergent Technologies. JOURNAL OF COMMUNICATION, 2011, vol. 61, p. 659.

40. FARSHCHI, P. et al. Nanotechnology in the public eye: the case of Iran, as a developing country. JOURNAL OF NANOPARTICLE RESEARCH, 2011, vol. 13, p. 3511.

41. GASKELL, G. et al. The 2010 Eurobarometer on the life sciences. NATURE BIOTECHNOLOGY, 2011, vol. 29, p. 113.

42. GRUÉRE, G. P. Labeling nano-enabled consumer products. NANO TODAY, 2011, vol. 6, iss. 2, p. 117-121. ISSN 17480132 (ISSN).

43. HO, S. S. et al. Value Predispositions, Mass Media, and Attitudes Toward Nanotechnology: The Interplay of Public and Experts. SCIENCE COMMUNICATION, 2011, vol. 33, p. 167.

44. MCCOMAS, K. A. a BESLEY, J. C. Fairness and Nanotechnology Concern. RISK ANALYSIS, 2011, vol. 31, p. 1749.

45. PRIEST, S. et al. Envisioning Emerging Nanotechnologies: A Three-Year Panel Study of South Carolina Citizens. RISK ANALYSIS, 2011, vol. 31, p. 1718.

46. SIEGRIST, M. a KELLER, C. Labeling of Nanotechnology Consumer Products Can Influence Risk and Benefit Perceptions. RISK ANALYSIS, 2011, vol. 31, p. 1762.

47. VANDERMOERE, F. et al. The public understanding of nanotechnology in the food domain: The hidden role of views on science, technology, and nature. PUBLIC UNDERSTANDING OF SCIENCE, 2011, vol. 20, p. 195.

48. The Harris Poll 2012.

49. GUPTA, N. et al. Factors influencing societal response of nanotechnology: an expert stakeholder analysis. JOURNAL OF NANOPARTICLE RESEARCH, 2012, vol. 14.

50. LOPEZ-VAZQUEZ, E. et al. Perceived risks and benefits of nanotechnology applied to the food and packaging sector in Mexico. BRITISH FOOD JOURNAL, 2012, vol. 114, p. 197.

51. RAHIMPOUR, M. et al. Public Perceptions of Nanotechnology: A Survey in the Mega Cities of Iran. NANOETHICS, 2012, vol. 6, p. 119.

52. SIEGRIST, M. Predicting the future: Review of public-perception studies of nanotechnology. NANOTECHNOLOGY: ETHICAL AND SOCIAL IMPLICATIONS, 2012, p. 321.

53. Eurobarometer 73.1: The European Parliament, Biotechnology, and Science and Technology, January-February 2010. Inter-university Consortium for Political and Social Research, 2013.

54. ANDERSON, A. A. et al. What's in a name? How we define nanotech shapes public reactions. JOURNAL OF NANOPARTICLE RESEARCH, 2013, vol. 15.

55. FISCHER, A. R. H. et al. Attitudes and attitudinal ambivalence change towards nanotechnology applied to food production. PUBLIC UNDERSTANDING OF SCIENCE, 2013, vol. 22, p. 817.

56. GUPTA, N. et al. Expert views on societal responses to different applications of nanotechnology: a comparative analysis of experts in countries with different economic and regulatory environments. JOURNAL OF NANOPARTICLE RESEARCH, 2013, vol. 15.

57. HO, S. S. et al. Factors influencing public risk-benefit considerations of nanotechnology: Assessing the effects of mass media, interpersonal communication, and elaborative processing. PUBLIC UNDERSTANDING OF SCIENCE, 2013, vol. 22, p. 606.

58. SATTERFIELD, T. et al. Understanding shifting perceptions of nanotechnologies and their implications for policy dialogues about emerging technologies. SCIENCE AND PUBLIC POLICY, 2013, vol. 40.

59. YAMAGUCHI, T. et al. The Challenge of Nanotechnology Derived Food: Addressing the Concerns of the Public. 2013.

60. CORMICK, C. and HUNTER, S. Valuing Values: Better Public Engagement on Nanotechnology Demands a Better Understanding of the Diversity of Publics. NANOETHICS, 2014, vol. 8, p. 57.

61. GEORGE, S. et al. Awareness on adverse effects of nanotechnology increases negative perception among public: survey study from Singapore. JOURNAL OF NANOPARTICLE RESEARCH, 2014, vol. 16.

62. KIM, M. S. Nanotechnology and food. Rutgers University Community Repository, 2014.

63. KIM, Y.-R. et al. Interactive survey of consumer awareness of nanotechnologies and nanoparticles in consumer products in South Korea. INTERNATIONAL JOURNAL OF NANOMEDICINE, 2014, vol. 9, p. 11.

64. KIM, Y.-R. et al. Comparative analysis of nanotechnology awareness in consumers and experts in South Korea. INTERNATIONAL JOURNAL OF NANOMEDICINE, 2014, vol. 9, p. 21.

65. MIKHAYLOVA, E. A. Nanotechnology Risks and Public Perception. SOTSIOLOGICHESKIJ ZHURNAL, 2014, p. 59.

66. SECHI, G. et al. The perception of nanotechnology and nanomedicine: a worldwide social media study. NANOMEDICINE, 2014, vol 9, p. 1475.

67. SENOCAK, E. A Survey on Nanotechnology in the View of the Turkish Public. SCIENCE TECHNOLOGY AND SOCIETY, 2014, vol. 19, p. 79.

68. CAPON, A. et al. Perceptions of risk from nanotechnologies and trust in stakeholders: a cross sectional study of public, academic, government and business attitudes. BMC PUBLIC HEALTH, 2015, vol. 15.

69. CAPON, A. et al. Comparative analysis of the labelling of nanotechnologies across four stakeholder groups. JOURNAL OF NANOPARTICLE RESEARCH, 2015, vol. 17.

70. CASOLANI, N. et al. Consumer Perceptions of Nanotechnology Applications in Italian Wine. ITALIAN JOURNAL OF FOOD SCIENCE, 2015, vol. 27, p. 221.

71. GUPTA, N. et al. Ethics, Risk and Benefits Associated with Different Applications of Nanotechnology: a Comparison of Expert and Consumer Perceptions of Drivers of Societal Acceptance. NANOETHICS, 2015, vol. 9, p. 93.

72. KUIKEN, T. et al. Public's Understanding, Perceptions, and Acceptance of Nanotechnology through the Lens of Consumer Products. Nanoengineering: Global Approaches to Health and Safety Issues, 2015, p. 151.

73. LIANG, X. et al. Value predispositions as perceptual filters: Comparing of public attitudes toward nanotechnology in the United States and Singapore. PUBLIC UNDERSTANDING OF SCIENCE, 2015, vol. 24, p. 582.

74. ROOSEN, J. et al. Trust and willingness to pay for nanotechnology food. FOOD POLICY, 2015, vol. 52, p. 75.

75. THIELMANN, D. A. Potential and acceptance of nanotechnology. 1st Joint Symposium on Nanotechnology, 2015, p. 35.

76. VAN GIESEN, R. I. et al. Affect and Cognition in Attitude Formation toward Familiar and Unfamiliar Attitude Objects. PLOS ONE, 2015, vol. 10.

77. VIDIGAL, M. C. T. R. et al. Food technology neophobia and consumer attitudes toward foods produced by new and conventional technologies: A case study in Brazil. LWT-FOOD SCIENCE AND TECHNOLOGY, 2015, vol. 60, p. 832.

78. YUE, C. et al. Investigating factors influencing consumer willingness to buy GM food and nano-food. JOURNAL OF NANOPARTICLE RESEARCH, 2015, vol. 17.

79. BEARTH, A. a SIEGRIST, M. Are risk or benefit perceptions more important for public acceptance of innovative food technologies: A meta-analysis. TRENDS IN FOOD SCIENCE & TECHNOLOGY, 2016, vol. 49, p. 14.

80. BERTOLDO, R. et al. Great deeds or great risks? Scientists' social representations of nanotechnology. JOURNAL OF RISK RESEARCH, 2016, vol. 19, p. 760.

81. CAPON, A. et al. Is the risk from nanomaterials perceived as different from the risk of 'chemicals' by the Australian public? PUBLIC HEALTH RESEARCH & PRACTICE, 2016, vol. 26.

82. DIJKSTRA, A. M. a CRITCHLEY, C. R. Nanotechnology in Dutch science cafes: Public risk perceptions contextualised. PUBLIC UNDERSTANDING OF SCIENCE, 2016, vol. 25, p. 71.

83. GUIDO CORREIA CARREIRA, A. E. M. L. G.-F. B. et al. Nanoview – Influencing factors on the perception of nanotechnology and target group-specific risk communication strategies 2016, p. 162. 1614-3841 (ISSN).

84. SODANO, V. et al. Consumer acceptance of food nanotechnology in Italy. BRITISH FOOD JOURNAL, 2016, vol. 118, p. 714.

85. STEENIS, N. D. a FISCHER, A. R. H. Consumer attitudes towards nanotechnology in food products: an attribute-based analysis. BRITISH FOOD JOURNAL, 2016, vol. 118, p.

1254.

86. SU, L. Y.-F. et al. Attitudinal gaps: How experts and lay audiences form policy attitudes toward controversial science. SCIENCE AND PUBLIC POLICY, 2016, vol. 43, p. 196.

87. ZHANG, J. et al. High support for nanotechnology in China: A case study in Dalian. SCIENCE AND PUBLIC POLICY, 2016, vol. 43, p. 115.

88. CHANG, H. H. et al. The effects of innovative, consumer and social characteristics on willingness to try nano-foods Product uncertainty as a moderator. INFORMATION TECHNOLOGY & PEOPLE, 2017, vol. 30, p. 653.

89. PILLAI, R. G. a BEZBARUAH, A. N. Perceptions and attitude effects on nanotechnology acceptance: an exploratory framework. JOURNAL OF NANOPARTICLE RESEARCH, 2017, vol. 19.

90. VAN DIJK, H. et al. Determinants of stakeholders' attitudes towards a new technology: nanotechnology applications for food, water, energy and medicine. JOURNAL OF RISK RESEARCH, 2017, vol. 20, p. 277.

91. BURRI, R. V. Models of Public Engagement: Nanoscientists' Understandings of Science-Society Interactions. NANOETHICS, 2018, vol. 12, p. 81.

92. CHUAH, A. S. F. et al. Label it or ban it? Public perceptions of nano-food labels and propositions for banning nano-food applications. JOURNAL OF NANOPARTICLE RESEARCH, 2018, vol. 20, iss. 2. 1388-0764 1572-896X (ISSN).

93. ERDEM, S. Who do UK consumers trust for information about nanotechnology? FOOD POLICY, 2018, vol. 77, p. 133.

94. GODDARD, E. et al. Food Integrity and Food Technology Concerns in Canada: Evidence from Two Public Surveys. JOURNAL OF FOOD QUALITY, 2018.

95. HARTMANN, C. et al. A risk perception gap? Comparing expert, producer and consumer prioritization of food hazard controls. FOOD AND CHEMICAL TOXICOLOGY, 2018, vol. 116, p. 100.

96. LAHERTO, A. et al. SCIENTISTS' PERCEPTIONS ON THE NATURE OF NANOSCIENCE AND ITS PUBLIC COMMUNICATION. PROBLEMS OF EDUCATION IN THE 21ST CENTURY, 2018, vol. 76, p. 43.

97. VAN GIESEN, R. I. et al. Changes in the influence of affect and cognition over time on consumer attitude formation toward nanotechnology: A longitudinal survey study. PUBLIC UNDERSTANDING OF SCIENCE, 2018, vol. 27, p. 168.

98. VISCECCHIA, R. et al. On consumers' acceptance of nanotechnologies: An Italian case study. International Journal on Food System Dynamics, 2018, vol. 9, p. 321.

99. ZHOU, G. a HU, W. Public acceptance of and willingness-to-pay for nanofoods in the US. FOOD CONTROL, 2018, vol. 89, p. 219.

100. AKIN, H. et al. Are attitudes toward labeling nano products linked to attitudes towards GMO? Exploring a potential 'spillover' effect for attitudes toward controversial technologies. JOURNAL OF RESPONSIBLE INNOVATION, 2019, vol. 6, p. 50.

101. FEINDT, P. H. and POORTVLIET, P. M. Consumer reactions to unfamiliar technologies: mental and social formation of perceptions and attitudes toward nano and GM products. JOURNAL OF RISK RESEARCH, 2019.

102. HEKMAT, S. a DAWSON, L. N. Students' knowledge and attitudes towards GMOs and nanotechnology. NUTRITION & FOOD SCIENCE, 2019, vol. 49, p. 628.

103. HENCHION, M. et al. Big issues for a small technology: Consumer trade-offs in acceptance of nanotechnology in food. Innovative Food Science and Emerging Technologies, 2019, vol. 58.

104. KAMARULZAMAN, N. A. et al. Psychological and sociological perspectives for good governance of sustainable nanotechnology development in Malaysia. JOURNAL OF NANOPARTICLE RESEARCH, 2019, vol. 21.

105. LARSSON, S. et al. Expert stakeholders' perception of nanotechnology: Risk, Benefit, Knowledge, and Regulation. JOURNAL OF NANOPARTICLE RESEARCH, 2019, vol. 21.

106. PORCARI, A. et al. From risk perception to risk governance in nanotechnology: a multi-stakeholder study. JOURNAL OF NANOPARTICLE RESEARCH, 2019, vol. 21, iss. 11. 13880764 (ISSN).

107. XENAKI, V. et al. Use of nanomaterials in dentistry: covariates of risk and benefit perceptions among dentists and dental hygienists in Norway. Acta odontologica Scandinavica, 2019, p. 1.

Rejected articles

1. Nanomedicine: grounds for optimism, and a call for papers. LANCET, 2003, vol. 362, s. 673.

2. Responding to 'nanotech' concerns. NATURE MATERIALS, 2003, vol. 2, s. 499.

3. Electronic Journal of Boundary Elements. Volume 1, Number 2 (Archival Information Package). Rutgers University Community Repository, 2003.

4. Don't believe the hype. NATURE, 2003, vol. 424, s. 237.

5. Debate, what debate? NATURE, 2003, vol. 423, s. 669.

6. Nanotech is not so scary. NATURE, 2003, vol. 421, s. 299.

7. Candidate Countries Eurobarometer 2002.3, October-November 2002: Science and Technology. Inter-university Consortium for Political and Social Research, 2004.

8. FaraPack Briefing sparks new ideas. Packaging Magazine, 2004, vol. 7, s. 13.

9. Report on public view of nanotech. CHEMICAL & ENGINEERING NEWS, 2005, vol. 83, s. 27.

10. Value-free nanotech? NATURE, 2005, vol. 437, s. 451.

11. Democratizing sequencing. Nature Methods, 2005, vol. 2, s. 633.

12. Through the eyes of Colin Ashmore. Engineering Management, 2005, vol. 15, s. 8.

13. What does EPA have in store? Chemical Processing, 2006, vol. 69, s. 17.

14. A little knowledge. NATURE NANOTECHNOLOGY, 2007, vol. 2, s. 731.

15. Materials Research Society Symposium Proceedings - Role of Life-Long Education in Nanoscience and Engineering 2008, vol. 1105.

16. Keeping the public under the microscope. NATURE NANOTECHNOLOGY, 2009, vol. 4, s. 695.

17. Getting to know the public. NATURE NANOTECHNOLOGY, 2009, vol. 4, s. 71.

18. 2009 Atlanta Conference on Science and Innovation Policy, ACSIP 2009 2009.

19. Proceedings of the Workshop on Semantic Web Applications in Scientific Discourse 2009, SWASD 2009 - Collocated with the 8th International Semantic Web Conference, ISWC 2009 2009, vol. 523.

20. Conference Proceedings - 5th International Conference on Advanced Optoelectronics and Lasers, CAOL' 2010 2010.

21. Chemistry's understated majesty. NATURE, 2011, vol. 469, s. 5.

22. SePublica 2011 - Proceedings of the 1st Workshop on Semantic Publishing 2011, Co-located with the 8th Extended Semantic Web Conference, ESWC 2011 2011, vol. 721.

23. Small steps. NATURE, 2012, vol. 488, s. 557.

24. Eurobarometer 64.3 (Nov-Dec 2005). GESIS Data Archive for the Social Sciences, 2012, vol. 1.0.1.

25. Eurobarometer 58.0 (Sep-Oct 2002). GESIS Data Archive for the Social Sciences, 2012, vol. 1.0.1.

26. Eurobarometer 63.1 (Jan-Feb 2005). GESIS Data Archive for the Social Sciences, 2012, vol. 1.1.0.

27. Battery Power 2012 2012.

28. 2013 2nd International Symposium on Manufacturing Systems Engineering, ISMSE 2013 2013, vol. 404.

29. 2013 2nd International Conference on Sustainable Energy and Environmental Engineering, ICSEEE 2013 2014, vol. 522-524.

30. Erratum: A pharmacophore-based virtual screening approach for the discovery of Trypanosoma cruzi GAPDH inhibitors (Future Medicinal Chemistry (2013) 5:17 (2019-2035)). Future Medicinal Chemistry, 2014, vol. 5.

31. Erratum: Influence of stabilizers on the production of disulfiram-loaded poly(lactic-co-glycolic acid) nanoparticles and their anticancer potential (Therapeutic Delivery (2015) 6:1 (17-25) DOI: 10.4155/tde.14.99). Therapeutic Delivery, 2015, vol. 8, s. 1109.

32. Retraction: Intercalated Polyaniline/Halloysite Nanocomposites by a Solvent-Free Mechanochemical Method (NANO: Brief Reports and Reviews (2016) 11:10 (1650112)). NANO, 2016, vol. 11.

33. List of opinions of the Scientific Committee on Consumer Safety (SCCS) adopted and published in January to June 2016. Contact Dermatitis, 2016, vol. 75, s. 261.

34. Specialty Optical Fibers, SOF 2016 2016.

35. Corrigendum: A pharmacophore-based virtual screening approach for the

discovery of Trypanosoma cruzi GAPDH inhibitors (Future Medicinal Chemistry (2013) 5: 17 (2019-2035) DOI: 10.4155/fmc.13.166). Future Medicinal Chemistry, 2017, vol. 9, s. 706.

36. Correction: Programmable RNA microstructures for coordinated delivery of siRNAs (Nanoscale (2016) 8 (17542-17550)). Nanoscale, 2017, vol. 9, s. 5019.

37. List of opinions of the Scientific Committee on Consumer Safety (SCCS) adopted and published January to August 2018. Contact Dermatitis, 2018, vol. 79, s. 261.

38. EFSA statement on the review of the risks related to the exposure to the food additive titanium dioxide (E 171) performed by the French Agency for Food, Environmental and Occupational Health and Safety (ANSES). EFSA JOURNAL, 2019, vol. 17.

39. ABBAS, K. A. et al. The recent advances in the nanotechnology and its applications in food processing: A review. JOURNAL OF FOOD AGRICULTURE & ENVIRONMENT, 2009, vol. 7, s. 14.

40. ABRAHAM, A. D. et al. Two distinct nanovirus species infecting faba bean in Morocco. ARCHIVES OF VIROLOGY, 2010, vol. 155, s. 37.

41. ACHTERBERG, P. et al. Unknowing but supportive? Predispositions, knowledge, and support for hydrogen technology in the Netherlands. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2010, vol. 35, s. 6075.

42. ACKLAND, R. et al. Engaging With the Public? Assessing the Online Presence and Communication Practices of the Nanotechnology Industry. SOCIAL SCIENCE COMPUTER REVIEW, 2010, vol. 28, s. 443.

43. ADAM, V. a VACULOVICOVA, M. CE and nanomaterials - PartII: Nanomaterials in CE. ELECTROPHORESIS, 2017, vol. 38, s. 2405.

44. ADAMS, J. et al. 2008, *Imagery i.e. nano-scale imagery, making apparatus for e.g. clock, has wafer forming small image by reflecting circle, square and rectangular pixels of colors, where image has single intermediate color at preset distance away from image*, US2008054624-A1.

45. ADAY, M. S. a YENER, U. Assessing consumers' adoption of active and intelligent packaging. BRITISH FOOD JOURNAL, 2015, vol. 117, s. 157.

46. ADERHOLD, C. Raising public awareness of Nanotechnology - A communication concept. Nanofair 2005: New Ideas for Industry, 2005, vol. 1920, s. 257.

47. AGGELOPOULOU, A. et al. Dialogue-based public engagement with nanotechnology 2008, vol. 1105, s. 1.

48. AGZENAI, Y. et al. Advanced Self-Healing Asphalt Composites in the Pavement Performance Field: Mechanisms at the Nano Level and New Repairing Methodologies. RECENT PATENTS ON NANOTECHNOLOGY, 2015, vol. 9, s. 43.

49. AHMADI, M. a AHMADI, L. Ethical considerations of nanobiotechnology. Journal of Biomaterials and Tissue Engineering, 2013, vol. 3, s. 335.

50. AHTEENSUU, M. Assumptions of the Deficit Model Type of Thinking: Ignorance, Attitudes, and Science Communication in the Debate on Genetic Engineering in Agriculture. JOURNAL OF AGRICULTURAL & ENVIRONMENTAL ETHICS, 2012, vol. 25, s. 295.

51. AHULU, S. a DANUOR, S. K. Ghana's experience in the establishment of a national digital seismic network observatory. JOURNAL OF SEISMOLOGY, 2015, vol. 19, s.

667.

52. AITIO, A. et al. Gold and Gold Mining. 2015. s.

53. AKIL, E. et al. Patent Landscape on Structured Lipids Produced by Enzyme Technology. Recent patents on biotechnology, 2018, vol. 12, s. 252.

54. AKIN, H. et al. Mapping the Landscape of Public Attitudes on Synthetic Biology. BIOSCIENCE, 2017, vol. 67, s. 290.

55. AKYILDIZ, I. F. a JORNET, J. M. THE INTERNET OF NANO-THINGS. IEEE WIRELESS COMMUNICATIONS, 2010, vol. 17, s. 58.

56. ALAVI, M. et al. Data_Sheet_1_Responsiveness of Physical Rehabilitation Centers in Capital of Iran: Disparities and Related Determinants in Public and Private Sectors.PDF. Figshare, 2018.

57. ALDAY, L. F. J. et al. 2008, *Consumer battery has electricity generating unit and fuel carrying unit, both of which form passive tubular fuel cell, where electricity generating unit has outer and inner tubular current collectors*, US2008124611-A1.

58. ALI, S. et al. Seroprevalence, Molecular Detection and Risk Factors Associated With Bovine Brucellosis in Pakistan. Abstracts of the General Meeting of the American Society for Microbiology, 2014, vol. 114, s. 501.

59. ALI, Z. et al. Synthesis and application of functionalized nano silica for Ag(Viscecchia, De Devitiis et al.) ions sequestration. Desalination and Water Treatment, 2017, vol. 84, s. 292.

60. ALKAM, D. et al. Three Complete Genome Sequences of Genotype G Mumps Virus from the 2016 Outbreak in Arkansas, USA. MICROBIOLOGY RESOURCE ANNOUNCEMENTS, 2017, vol. 5.

61. ALLAN, R. The future of sensors. Electronic Design, 2004, vol. 52, s. 51.

62. ALLAN, S. et al. Framing risk: nanotechnologies in the news. JOURNAL OF RISK RESEARCH, 2010, vol. 13, s. 29.

63. ALLEN, C. et al. Research highlights: investigating the role of nanoparticle surface charge in nano-bio interactions. ENVIRONMENTAL SCIENCE-NANO, 2017, vol. 4, s. 741.

64. ALLEN, E. E. a BASSETT, D. R. Listen up! the need for public engagement in nanoscale science and technology. Nanotechnology Law and Business, 2008, vol. 5, s. 429.

65. ALMEIDA, R. Molecular epidemiology of Banana bunchy top virus in Hawaii. PHYTOPATHOLOGY, 2006, vol. 96, s. S5.

66. ALMEIDA, R. P. P. et al. Spread of an introduced vector-borne banana virus in Hawaii. MOLECULAR ECOLOGY, 2009, vol. 18, s. 136.

67. AL-MUMEN, H. Optoelectronic properties of dome-shaped substrate UV detector with optical coating. International Journal of Applied Engineering Research, 2016, vol. 11, s. 8916.

68. ÅM, T. G. Trust in Nanotechnology? On Trust as Analytical Tool in Social Research on Emerging Technologies. NANOETHICS, 2011, vol. 5, s. 15.

69. AMMER, K. Thermology 2003 - A computer-assisted literature survey with a focus

on non medical applications of thermal imaging. Thermology International, 2004, vol. 14, s. 5.

70. ANANDHI, J. et al. Screening banana plants for banana bunchy top virus with primers specific to Indian isolates. JOURNAL OF PLANT DISEASES AND PROTECTION, 2007, vol. 114, s. 101.

71. ANDERSEN, P. D. et al. Technology foresight on Danish nano-science and nano-technology. Foresight, 2005, vol. 7, s. 64.

72. ANDERSON, A. et al. Nanotechnology, risk and communication. 2009. s.

73. ANDERSON, A. et al. Nanotechnology and News Production: Journalists', Editors' and Scientists' Views, 2003-2004. UK Data Archive, 2006, vol. 1.

74. ANDERSON, A. A. et al. News coverage of controversial emerging technologies. Evidence for the issue attention cycle in print and online media. Politics and the life sciences : the journal of the Association for Politics and the Life Sciences, 2012, vol. 31, s. 87.

75. ANDERSON, L. J. et al. Strategic priorities for respiratory syncytial virus (RSV) vaccine development. VACCINE, 2013, vol. 31, s. B209.

76. ANDRAS, P. Research: metrics, quality, and management implications. RESEARCH EVALUATION, 2011, vol. 20, s. 90.

77. ANONYMOUS 5th International Conference on Biomedicine and Pharmaceutics, Zhuhai, PEOPLES R CHINA, December 15 -17, 2017. Indian Journal of Pharmaceutical Sciences, 2018, vol. 80, s. 2.

78. ANSARI, M. A. et al. Synthesis and characterization of the antibacterial potential of ZnO nanoparticles against extended-spectrum beta-lactamases-producing Escherichia coli and Klebsiella pneumoniae isolated from a tertiary care hospital of North India. APPLIED MICROBIOLOGY AND BIOTECHNOLOGY, 2012, vol. 94, s. 467.

79. ANTONACCI, A. et al. Commercially Available (Sodano, Gorgitano et al.)sensors in the Agrifood Sector. Comprehensive Analytical Chemistry, 2016, vol. 74, s. 315.

80. APREDA, R. et al. Functions and failures: how to manage technological promises for societal challenges. TECHNOLOGY ANALYSIS & STRATEGIC MANAGEMENT, 2014, vol. 26, s. 369.

81. ARAFAT, H. A. a ARAFAT, H. A. Desalination Sustainability: A Technical, Socioeconomic, and Environmental Approach. 2017. s.

82. ARAUJO MEIRELLES, L. M. a RAFFIN, F. N. Clay and Polymer-Based Composites Applied to Drug Release: A Scientific and Technological Prospection. JOURNAL OF PHARMACY AND PHARMACEUTICAL SCIENCES, 2017, vol. 20, s. 115.

83. ARCURI, A. S. A. et al. DEVELOPING STRATEGIES IN BRAZIL TO MANAGE THE EMERGING NANOTECHNOLOGY AND ITS ASSOCIATED RISKS. NANOMATERIALS: RISKS AND BENEFITS, 2009, s. 299.

84. ARNEY, S. Designing for MEMS reliability. MRS BULLETIN, 2001, vol. 26, s. 296.

85. ARNING, K. et al. Risk perception and acceptance of CDU consumer products in Germany. 13TH INTERNATIONAL CONFERENCE ON GREENHOUSE GAS CONTROL TECHNOLOGIES, GHGT-13, 2017, vol. 114, s. 7186.

86. ARNOLD, H. CONSUMER ATTITUDES TO NEW AND EMERGING FOOD

TECHNOLOGIES. FOOD AUSTRALIA, 2014, vol. 66, s. 21.

87. ASAAD, N. Y. et al. Detection and Characterization of Chickpea Chlorotic Stunt Virus in Syria. JOURNAL OF PHYTOPATHOLOGY, 2009, vol. 157, s. 756.

88. ATAKAN, B. Molecular communications and nanonetworks: From nature to practical systems. 2014. s.

89. ATLI-ŞEKEROĞLU, Z. From nanotechnology to nanogenotoxicology: Genotoxic effect of cobalt-chromium nanoparticles Nanoteknolojiden Nanogenotoksikolojiye: Kobalt-krom nanopartiküllerinin genotoksik etkisi. Turk Hijyen ve Deneysel Biyoloji Dergisi, 2013, vol. 70, s. 33.

90. AUTINO, B. et al. International migrations and HIV care in the rural district of Nanoro, Burkina Faso. TROPICAL MEDICINE & INTERNATIONAL HEALTH, 2011, vol. 16, s. 367.

91. AZAMAT, A. a KUNAL, S. Risks of nanotechnology in the food industry: A review of current regulation. Nanotechnology Perceptions, 2015, vol. 11, s. 27.

92. AZNAR, R. et al. Quantification and size characterisation of silver nanoparticles in environmental aqueous samples and consumer products by single particle-ICPMS. TALANTA, 2017, vol. 175, s. 200.

93. BABAYANI, M. et al. Onychomycosis due to dermatophytes species in Iran: Prevalence rates, causative agents, predisposing factors and diagnosis based on microscopic morphometric findings. JOURNAL DE MYCOLOGIE MEDICALE, 2018, vol. 28, s. 45.

94. BACANLI, M. a BAŞARAN, N. Nanotoxicology - New research area in toxicology Nanotoksikoloji - toksikolojide yeni bir araştrma alani. Turkish Journal of Pharmaceutical Sciences, 2014, vol. 11, s. 231.

95. BACHMANN, G. a BRAND, L. Governmental Strategy for the Support of Nanotechnology in Germany. The Nano-Micro Interface: Bridging the Micro and Nano Worlds: Second Edition, 2015, vol. 1-2, s. 19.

96. BADDELA, V. S. et al. Physicochemical Biomolecular Insights into Buffalo Milk-Derived Nanovesicles. APPLIED BIOCHEMISTRY AND BIOTECHNOLOGY, 2016, vol. 178, s. 544.

97. BAINBRIDGE, W. S. Sociocultural meanings of nanotechnology: research methodologies. JOURNAL OF NANOPARTICLE RESEARCH, 2004, vol. 6, s. 285.

98. BAL, R. et al. Public Perceptions of Fairness in NBIC Technologies. 2011. s.

99. BALL, P. Material witness: The case for talking. NATURE MATERIALS, 2004, vol. 3, s. 140.

100. BALLARD, S.-B. et al. Epidemiology and Genetic Characterization of Noroviruses among Adults in an Endemic Setting, Peruvian Amazon Basin, 2004-2011. PLOS ONE, 2015, vol. 10.

101. BALLARINI, R. et al. Biological structures mitigate catastrophic fracture through various strategies. INTERNATIONAL JOURNAL OF FRACTURE, 2005, vol. 135, s. 187.

102. BANERJEE, P. et al. First principles design of Li functionalized hydrogenated h-BN nanosheet for hydrogen storage. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2016, vol. 41, s. 14437.

103. BANGPRA, D. et al. New design of nano-porous pottery for water saving and possibility for commercialization. INNOVATION, MANAGEMENT AND SERVICE, ICMS 2011, 2011, vol. 14, s. 322.

104. BAO, S. et al. Survey of faba bean and field pea viruses in Yunnan Province, China. AUSTRALASIAN PLANT PATHOLOGY, 2007, vol. 36, s. 347.

105. BARANAO, L. Science in Argentina. Where do we go from here? MEDICINA-BUENOS AIRES, 2012, vol. 72, s. 339.

106. BARAÑAO, L. Science in Argentina. Where do we go from here? ¿Hacia dónde va la ciencia Argentina? Medicina (Argentina), 2012, vol. 72, s. 339.

107. BARNES, A. P. et al. Quantifying ambivalence towards sustainable intensification: an exploration of the UK public's values. FOOD SECURITY, 2016, vol. 8, s. 609.

108. BARNETT, A. J. et al. The role of public participation GIS (PPGIS) and fishermen's perceptions of risk in marine debris mitigation in the Bay of Fundy, Canada. OCEAN & COASTAL MANAGEMENT, 2016, vol. 133, s. 85.

109. BARON, W. et al. NanoTruck on tour: A journey to the Nanokosmos NanoTruck on Tour: Reise in den Nanokosmos. Vakuum in Forschung und Praxis, 2004, vol. 16, s. 291.

110. BARONI, S. a HOLMES, B. Science & technology communication: Nanotechnology - A positive issue. Chemist, 2013, vol. 86, s. 35.

111. BARTOLOMÉ, J. et al. D-band magnetism of Ag, Au, Pd and Pt studied with XMCD 2013, vol. 194, s. 92.

112. BASHA, H. T. et al. Unsteady flow of chemically reacting nanofluid over a cone and plate with heat source/sink. Defect and Diffusion Forum, 2018, vol. 387, s. 615.

113. BASU, I. et al. Utility of whole genome sequencing for multidrug resistant Mycobacterium tuberculosis isolates in a reference TB laboratory in New Zealand. New Zealand Medical Journal, 2018, vol. 131, s. 15.

114. BATT, C. Communicating nanoscale sdence and engineering to the general public 2008, vol. 1105, s. 30.

115. BATT, C. A. Thinking small is not easy. NATURE NANOTECHNOLOGY, 2008, vol. 3, s. 121.

116. BATT, C. A. et al. Numbers, scale and symbols: The public understanding of nanotechnology. JOURNAL OF NANOPARTICLE RESEARCH, 2008, vol. 10, s. 1141.

117. BAUER, C. A. et al. An Integrated, Multipart Experiment: Synthesis, Characterization, and Application of CdS and CdSe Quantum Dots as Sensitizers in Solar Cells. JOURNAL OF CHEMICAL EDUCATION, 2018, vol. 95, s. 1179.

118. BAUER, M. et al. 2007, *Integrated freshness indicator device for analyzing age and/or quality of natural product has colored and biodegradable polymer layer that degrades to change color which is visible to human eye*, WO2008104242-A1.

119. BAUHUS, J. et al. Political Strategy for Food Labelling Joint Statement of the Scientific Advisory Boards on Consumer and Food Policy and on Agricultural Policy at the Federal Minisity of Food. Agriculture and Consumer Protection September 2011. BERICHTE UBER LANDWIRTSCHAFT, 2012, vol. 90, s. 35.

120. BAWA, R. Regulating Nanomedicine - Can the FDA Handle It? CURRENT DRUG DELIVERY, 2011, vol. 8, s. 227.

121. BAYART, E. a COHEN-HAGUENAUER, O. Technological overview of iPS induction from human adult somatic cells. Current Gene Therapy, 2013, vol. 13, s. 73.

122. BECKER, S. Nanotechnology in the marketplace: how the nanotechnology industry views risk. JOURNAL OF NANOPARTICLE RESEARCH, 2013, vol. 15.

123. BEIG, M. et al. Screening Approaches Towards Trypanothione Reductase. 2013. s.

124. BELAK, S. et al. New developments in the diagnosis of avian influenza. REVUE SCIENTIFIQUE ET TECHNIQUE-OFFICE INTERNATIONAL DES EPIZOOTIES, 2009, vol. 28, s. 233.

125. BELL, L. Engaging the public in technology policy: A new role for science museums. SCIENCE COMMUNICATION, 2008, vol. 29, s. 386.

126. BENDI, R. et al. Flexible supercapacitors. Nanomaterials for Supercapacitors, 2017, s. 422.

127. BENELLI, G. Spread of Zika virus: The key role of mosquito vector control. ASIAN PACIFIC JOURNAL OF TROPICAL BIOMEDICINE, 2016, vol. 6, s. 468.

128. BENELLI, G. et al. Mosquito vectors and the spread of cancer: an overlooked connection? PARASITOLOGY RESEARCH, 2016, vol. 115, s. 2131.

129. BENNET, D. et al. Public Perceptions of Nanotechnologies: Lessons from GM Foods. NANOTECHNOLOGIES IN FOOD, 2010, s. 36.

130. BENNETT, D. et al. Public Perceptions of Nanotechnologies: Lessons from Genetically Modified Foods. NANOTECHNOLOGIES IN FOOD, 2ND EDITION, 2017, vol. 42, s. 60.

131. BENNETT, K. M. Research pathways and outreach to drive cellulosic nanomaterials development. TAPPI JOURNAL, 2016, vol. 15, s. 358.

132. BENSAUDE-VINCENT, B. Two cultures of nanotechnology? Hyle, 2004, vol. 10, s. 67.

133. BENSAUDE-VINCENT, B. Nanotechnology: a new regime for the public in science? Scientiae Studia, 2012, vol. 10, s. 85.

134. BENSAUDE-VINCENT, B. et al. TWO CULTURES OF NANOTECHNOLOGY? 2006. s.

135. BENSEBAA, F. Challenges and Perspectives. Interface Science and Technology, 2013, vol. 19, s. 517.

136. BEREAN, K. J. et al. A unique in vivo approach for investigating antimicrobial materials utilizing fistulated animals. SCIENTIFIC REPORTS, 2015, vol. 5.

137. BERGER, L. et al. Synthesis and properties of Al-based amorphous and nanocrystalline thin films. METASTABLE, MECHANICALLY ALLOYED AND NANOCRYSTALLINE MATERIALS, 2002, vol. 386-3, s. 315.

138. BERGER, L. et al. Migration-resistant amorphous AlY metallizations for surface acoustic wave filters. IECON 2000: 26TH ANNUAL CONFERENCE OF THE IEEE INDUSTRIAL ELECTRONICS SOCIETY, VOLS 1-4: 21ST CENTURY TECHNOLOGIES AND INDUSTRIAL

OPPORTUNITIES, 2000, s. 1862.

139. BERNAUER, U. Opinion of the Scientific Committee on Consumer Safety (SCCS) - Revision of the Opinion on hydroxyapatite (nano) in cosmetic products. REGULATORY TOXICOLOGY AND PHARMACOLOGY, 2018, vol. 98, s. 274.

140. BERUBE, D. a SHIPMAN, J. D. Denialism: Drexler vs. Roco. IEEE Technology and Society Magazine, 2004, vol. 23, s. 22.

141. BERUBE, D. M. Regulating nanoscience: A proposal and a response to J. Clarence Davies. Nanotechnology Law and Business, 2006, vol. 3, s. 485.

142. BERUBE, D. M. The public acceptance of nanomedicine: a personal perspective. WILEY INTERDISCIPLINARY REVIEWS-NANOMEDICINE AND NANOBIOTECHNOLOGY, 2009, vol. 1, s. 2.

143. BERUBE, D. M. et al. Intuitive Toxicology: The Public Perception of Nanoscience. 2008. s.

144. BERUBE, D. M. et al. The rhetoric of nanotechnology. 2004. s.

145. BERUBE, D. M. et al. The Audience Is the Message: Nanomedicine as Apotheosis or Damnatio Memoriae. 2016. s.

146. BERUBE, D. M. et al. Nanoscience and Water: Public Engagement At and Below the Surface. 2009. s.

147. BESLEY, J. C. The National Science Foundation's science and technology survey and support for science funding, 2006-2014. PUBLIC UNDERSTANDING OF SCIENCE, 2018, vol. 27, s. 94.

148. BESLEY, J. C. a NISBET, M. How scientists view the public, the media and the political process. PUBLIC UNDERSTANDING OF SCIENCE, 2013, vol. 22, s. 644.

149. BESPROZVANNYKH, V. V. Epizootiological aspects of some trematode infections in the Primorye Territory. Meditsinskaya Parazitologiya i Parazitarnye Bolezni, 1994, vol. 0, s. 28.

150. BESSER, P. R. 2013, *Method for forming integrated circuit system of e.g. cellular phone, involves providing via over integrated circuit device, forming selective metal in via, forming nanotube over selective metal, and forming cap over nanotubes*, US2013072014-A1.

151. BEUMER, K. Publics, issues, and nanotechnology in Indian news media. JOURNAL OF SCIENTOMETRIC RESEARCH, 2015, vol. 4, s. 143.

152. BEUMER, K. On the elusive nature of the public. NATURE NANOTECHNOLOGY, 2019, vol. 14, s. 510.

153. BEUMER, K. a BHATTACHARYA, S. Emerging technologies in India: Developments, debates and silences about nanotechnology. SCIENCE AND PUBLIC POLICY, 2013, vol. 40, s. 628.

154. BHALODIA, J. A. a MANKADIA, S. R. Sintering temperature effect on the structural and electrical transport properties of nanophasic Nd0.7Sr0.3MnO3 manganite 2014, vol. 209, s. 216.

155. BHANDARI, D. et al. Development of a UPLC-ESI-MS/MS method to measure urinary metabolites of selected VOCs: Benzene, cyanide, furfural, furfuryl alcohol, 5-

hydroxymethylfurfural, and N-methyl-2-pyrrolidone. Journal of chromatography. B, Analytical technologies in the biomedical and life sciences, 2019, vol. 1126-1127, s. 121746.

156. BHUSHAN, S. a KAUL, G. Health hazards associated with engineered nanomaterials. Asian Biotechnology and Development Review, 2013, vol. 15, s. 37.

157. BIANCO, C. TESTING STRATEGIES LOOKING FORWARD. VOX SANGUINIS, 2010, vol. 99, s. 66.

158. BIKETOVA, L. V. et al. Carbonyl process capability. Tsvetnye metally, 2014, s. 63.

159. BINDER, A. R. Understanding public opinion of nanotechnology. Nanotechnology in Dermatology, 2013, vol. 9781461450344, s. 269.

160. BINDER, A. R. et al. Measuring risk/benefit perceptions of emerging technologies and their potential impact on communication of public opinion toward science. PUBLIC UNDERSTANDING OF SCIENCE, 2012, vol. 21, s. 830.

161. BISHOP, L. M. et al. Enhancing Graduate Student Communication to General Audiences through Blogging about Nanotechnology and Sustainability. JOURNAL OF CHEMICAL EDUCATION, 2014, vol. 91, s. 1600.

162. BLITZSTEIN, J. a MENG, X. L. Nano-project qualifying exam process: An intensified dialogue between students and faculty. American Statistician, 2010, vol. 64, s. 282.

163. BOCCA, A. L. et al. Paracoccidioidomycosis: eco-epidemiology, taxonomy and clinical and therapeutic issues. FUTURE MICROBIOLOGY, 2013, vol. 8, s. 1177.

164. BOERSMA, R. et al. The elephant in the room: How a technology's name affects its interpretation. PUBLIC UNDERSTANDING OF SCIENCE, 2019, vol. 28, s. 218.

165. BOETE, C. et al. Engaging scientists: An online survey exploring the experience of innovative biotechnological approaches to controlling vector-borne diseases. PARASITES & VECTORS, 2015, vol. 8.

166. BOHOLM, A. a LARSSON, S. What is the problem? A literature review on challenges facing the communication of nanotechnology to the public. JOURNAL OF NANOPARTICLE RESEARCH, 2019, vol. 21.

167. BÖL, G. F. Perceived and real risks: Research on risk perception and risk communication as tasks of a German federal institute Gefühlte und tatsächliche Risiken: Risikowahrnehmungsforschung und Risikokommunikation als Aufgaben eines Bundesinstituts. Zentralblatt fur Arbeitsmedizin, Arbeitsschutz und Ergonomie, 2014, vol. 64, s. 315.

168. BOLOGNESI, C. et al. Recent developments in the risk assessment of chemicals in food and their potential impact on the safety assessment of substances used in food contact materials. EFSA JOURNAL, 2016, vol. 14.

169. BONTEMS, V. K. How to Accommodate to the Invisible? The 'halo' of 'nano'. NANOETHICS, 2011, vol. 5, s. 175.

170. BOONHAM, N. et al. Improved surveillance of diseases using nano-pore sequencing. PHYTOPATHOLOGY, 2018, vol. 108.

171. BOS, M. J. W. et al. Adolescent responses toward a new technology: first associations, information seeking and affective responses to ecogenomics. PUBLIC

UNDERSTANDING OF SCIENCE, 2009, vol. 18, s. 243.

172. BOS, M. J. W. et al. Early Exposures to Ecogenomics: Effects of Priming and Web Site Interactivity Among Adolescents. SCIENCE COMMUNICATION, 2010, vol. 32, s. 232.

173. BOSTROM, A. a LOEFSTEDT, R. E. Nanotechnology Risk Communication Past and Prologue. RISK ANALYSIS, 2010, vol. 30, s. 1645.

174. BOSWELL, B. et al. A review identifying the effectiveness of minimum quantity lubrication (MQL) during conventional machining. INTERNATIONAL JOURNAL OF ADVANCED MANUFACTURING TECHNOLOGY, 2017, vol. 92, s. 321.

175. BOUCHARD, C. et al. Multicriteria decision analysis for the selection of a small drinking water treatment system. JOURNAL OF WATER SUPPLY RESEARCH AND TECHNOLOGY-AQUA, 2010, vol. 59, s. 230.

176. BOUCHEMAL, K. et al. Strategies for Prevention and Treatment of Trichomonas vaginalis Infections. CLINICAL MICROBIOLOGY REVIEWS, 2017, vol. 30, s. 811.

177. BOUILLARD, J. X. et al. Nanosafety by design: risks from nanocomposite/nanowaste combustion. JOURNAL OF NANOPARTICLE RESEARCH, 2013, vol. 15.

178. BOUNEB, I. a KERROUR, F. Nanometric Modelisation to characterize dynamics carriers in a HEMT heterostructure (AlGaAs/GaAs) using an effectif doping 2015, vol. 644, s. 26.

179. BOUWMEESTER, J. a GUO, J. Survey of worldwide nanosatellite projects and subsystem technology 2009, vol. 5, s. 3871.

180. BOUWMEESTER, J. a GUO, J. Survey of worldwide pico- and nanosatellite missions, distributions and subsystem technology. ACTA ASTRONAUTICA, 2010, vol. 67, s. 854.

181. BOVERHOF, D. R. et al. Comparative assessment of nanomaterial definitions and safety evaluation considerations. REGULATORY TOXICOLOGY AND PHARMACOLOGY, 2015, vol. 73, s. 137.

182. BOY, D. GMOs: The European view OGM: L'opinion des Européens. Futuribles: Analyse et Prospective, 2012, s. 119.

183. BRAISCH, B. et al. Preparation and Flow Behaviour of Oil-In-Water Emulsions Stabilised by Hydrophilic Silica Particles. CHEMICAL ENGINEERING & TECHNOLOGY, 2009, vol. 32, s. 1107.

184. BRAS, J. a SAINI, S. Nanocellulose in functional packaging. Cellulose-Reinforced Nanofibre Composites: Production, Properties and Applications, 2017, s. 175.

185. BRAUERHOCH, F.-O. et al. Talking biotech with the public. Biotechnology Journal, 2007, vol. 2, s. 1076.

186. BREWER, P. R. a LEY, B. L. Media Use and Public Perceptions of DNA Evidence. SCIENCE COMMUNICATION, 2010, vol. 32, s. 93.

187. BREWER, P. R. a LEY, B. L. Contested evidence: Exposure to competing scientific claims and public support for banning bisphenol A. PUBLIC UNDERSTANDING OF SCIENCE, 2014, vol. 23, s. 395.

188. BRIDDON, R. W. Cotton leaf curl disease, a multicomponent begomovirus complex. MOLECULAR PLANT PATHOLOGY, 2003, vol. 4, s. 427.

189. BRIDDON, R. W. a MARKHAM, P. G. Cotton leaf curl virus disease. VIRUS RESEARCH, 2000, vol. 71, s. 151.

190. BROSSARD, D. New media landscapes and the science information consumer. PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, 2013, vol. 110, s. 14096.

191. BROSSARD, D. a SCHEUFELE, D. A. Science, new media, and the public. SCIENCE, 2013, vol. 339, s. 40.

192. BROWER, V. Is nanotechnology ready for primetime? JOURNAL OF THE NATIONAL CANCER INSTITUTE, 2006, vol. 98, s. 9.

193. BROWN, J. et al. Altruism and skepticism in public attitudes toward food nanotechnologies. JOURNAL OF NANOPARTICLE RESEARCH, 2015, vol. 17.

194. BROWN, J. a KUZMA, J. Hungry for Information: Public Attitudes Toward Food Nanotechnology and Labeling. REVIEW OF POLICY RESEARCH, 2013, vol. 30, s. 512.

195. BROWN, S. The New Deficit Model. NATURE NANOTECHNOLOGY, 2009, vol. 4, s. 608.

196. BROWNSWORD, R. Rights, Regulation, and the Technological Revolution. 2009. s.

197. BRUMFIEL, G. A little knowledge. NATURE, 2003, vol. 424, s. 246.

198. BRUNS, N. et al. Biocatalytic precipitation ATRP as assay for malaria diagnostics. ABSTRACTS OF PAPERS OF THE AMERICAN CHEMICAL SOCIETY, 2017, vol. 254.

199. BRYKSA, B. C. a YADA, R. Y. Challenges in Food Nanoscale Science and Technology. JOURNAL OF FOOD AND DRUG ANALYSIS, 2012, vol. 20, s. 418.

200. BRYNER, M. The scoop on nano safety. Chemical Week, 2007, vol. 169.

201. BRYNILDSRUD, O. B. et al. Acquisition of virulence genes by a carrier strain gave rise to the ongoing epidemics of meningococcal disease in West Africa. PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, 2018, vol. 115, s. 5510.

202. BRYNILDSRUD, O. B. et al. Gauging the epidemic potential of a widely circulating non-invasive meningococcal strain in Africa. MICROBIAL GENOMICS, 2019, vol. 5.

203. BUBELA, T. et al. Synthetic biology confronts publics and policy makers: Challenges for communication, regulation and commercialization. TRENDS IN BIOTECHNOLOGY, 2012, vol. 30, s. 132.

204. BUBICI, G. et al. Biological Control Agents Against Fusarium Wilt of Banana. FRONTIERS IN MICROBIOLOGY, 2019, vol. 10.

205. BUMBUDSANPHAROKE, N. a KO, S. Nano-Food Packaging: An Overview of Market, Migration Research, and Safety Regulations. JOURNAL OF FOOD SCIENCE, 2015, vol. 80, s. R910.

206. BURKE, D. GM food and crops: What went wrong in the UK? EMBO REPORTS, 2004, vol. 5, s. 432.

207. BURLON, O. About audience-specific communication. Biotechnology Journal, 2007, vol. 2, s. 1070.

208. BURRI, R. V. Deliberating risks under uncertainty: Experience, trust, and attitudes in a Swiss nanotechnology stakeholder discussion group. NANOETHICS, 2007, vol. 1, s. 143.

209. BURRI, R. V. Coping with uncertainty: Assessing nanotechnologies in a citizen panel in Switzerland. PUBLIC UNDERSTANDING OF SCIENCE, 2009, vol. 18, s. 498.

210. BUTLER, N. Promoting confidence in textiles - The Hohenstein Institutes. Technical Textiles International, 2006, vol. 15, s. 27.

211. CACCIATORE, M. A. Public engagement: The benefits of communicating. NATURE NANOTECHNOLOGY, 2014, vol. 9, s. 749.

212. CAI, X. 2014, *Visual interface device for LCD used in e.g. consumer electronic product, has matrix substrate that includes electrodes which are staggered, and nano micro-structural layer that is arranged between transparent substrate and electrodes*, CN103487974-A.

213. CAI, Y. P. et al. Investigation of public's perception towards rural sustainable development based on a two-level expert system. Expert Systems with Applications, 2009, vol. 36, s. 8910.

214. CALCERRADA, A. B. et al. Influence of the carbon support on the Pt-Sn anodic catalyst for the electrochemical reforming of ethanol. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2019, vol. 44, s. 10616.

215. CALVET, X. et al. Diagnosis and Epidemiology of Helicobacter pylori Infection. HELICOBACTER, 2013, vol. 18, s. 5.

216. CAMILLI, L. et al. Self-Assembly Of Ordered Graphene Nanodot Arrays. Zenodo, 2017.

217. CAMPBELL, N. et al. The sounds of nanotechnology. NATURE NANOTECHNOLOGY, 2017, vol. 12, s. 606.

218. CAMPO, E. M. et al. Nano Opto-Mechanical Systems NOMS as a proposal for tactile displays. NANO-OPTO-MECHANICAL SYSTEMS (NOMS), 2011, vol. 8107.

219. CAO, Y. et al. Nanopore sequencing: a rapid solution for infectious disease epidemics. SCIENCE CHINA-LIFE SCIENCES, 2019, vol. 62, s. 1101.

220. CAO, Z. et al. Research on numerical simulation of gas flow in shale matrix micro pore 2018, vol. 783, s. 73.

221. CAPON, A. et al. Are Australians concerned about nanoparticles? A comparative analysis with established and emerging environmental health issues. AUSTRALIAN AND NEW ZEALAND JOURNAL OF PUBLIC HEALTH, 2015, vol. 39, s. 56.

222. CAROPPO, C. et al. Phytoplankton dynamics with a special emphasis on harmful algal blooms in the Mar Piccolo of Taranto (Ionian Sea, Italy). ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 2016, vol. 23, s. 12691.

223. CARVALHO, A. a NUNES, J. A. Assembling Upstream Engagement: the Case of the Portuguese Deliberative Forum on Nanotechnologies. NANOETHICS, 2018, vol. 12, s. 99.

224. CASADEI, S. Information on the measurement of ultra-fine particles. Particle instruments: Results you can count on Notizie - La misura del particolato ultrafine. Particle instruments: Result you can count on. Rivista dei Combustibili, 2009, vol. 63, s. 62.

225. CASOLANI, N. et al. Consumer perceptions of nanotechnology applications in Italian wine. Italian Journal of Food Science, 2015, vol. 27, s. 93.

226. CASTELLINI, O. M. et al. Nanotechnology and the public: Effectively communicating nanoscale science and engineering concepts. JOURNAL OF NANOPARTICLE RESEARCH, 2007, vol. 9, s. 183.

227. CATALANO, E. 2019, *Process of constructing structure used for producing building carbon nanotube sheet core component, involves doping carbon nanotube material, spraying coating, and forming material into structure which is rigidified by electrifying material*, CA2992758-A1.

228. CAVALIN, C. et al. Risks linked to crystalline silica: Established or still unknown? Uncertainties and the search for proof of occupational and environmental diseases. ENVIRONNEMENT RISQUES & SANTE, 2013, vol. 12, s. 352.

229. CÉLANIRE, S. a CAMPO, B. Recent advances in the drug discovery of metabotropic glutamate receptor 4 (mGluR4) activators for the treatment of CNS and non-CNS disorders. Expert Opinion on Drug Discovery, 2012, vol. 7, s. 261.

230. CERQUEIRA, M. A. et al. Design of Bio-nanosystems for Oral Delivery of Functional Compounds. FOOD ENGINEERING REVIEWS, 2014, vol. 6, s. 1.

231. CHAI, J. Y. et al. Fish-borne parasitic zoonoses: Status and issues. INTERNATIONAL JOURNAL FOR PARASITOLOGY, 2005, vol. 35, s. 1233.

232. CHANDRAN, A. a GEORGE, K. C. Defect induced modifications in the optical, dielectric, and transport properties of hydrothermally prepared ZnS nanoparticles and nanorods. JOURNAL OF NANOPARTICLE RESEARCH, 2014, vol. 16.

233. CHANG, H. et al. 2009, *Manufacture of electrode of supercapacitor, involves heating poly(acrylonitrile) fabric comprising poly(acrylonitrile) fibers, forming carbon fiber fabric, and cutting carbon fiber fabric*, EP2075810-A2.

234. CHANG, W. et al. 2019, *Method for fabricating ceramic and plastic composite, involves injecting plastics onto surface of ceramic matrix to form plastic layer and combining plastic layer with surface of ceramic matrix through nanoholes to form composite*, US2019071369-A1.

235. CHATTERJEE, S. et al. Effect of laser post-treatment on Al2O3-TiB2-TiN composite coating with free hBN. INTERNATIONAL JOURNAL OF ADVANCED MANUFACTURING TECHNOLOGY, 2012, vol. 61, s. 559.

236. CHAU, R. Challenges and opportunities of emerging nanotechnology for VLSI nanoelectronics. 2007. s.

237. CHAUBE, R. et al. Effectiveness of a dynamic load balancing library for scientific applications. 2007. s.

238. CHAUDHRY, Q. Opinion of the Scientific Committee on Consumer safety (SCCS) - Revision of the opinion on the safety of the use of titanium dioxide, nano form, in cosmetic products. REGULATORY TOXICOLOGY AND PHARMACOLOGY, 2015, vol. 73, s. 669.

239. CHAUDHRY, Q. Opinion of the Scientific Committee on Consumer safety (SCCS) -

Second revision of the opinion on carbon black, nano-form, in cosmetic products. REGULATORY TOXICOLOGY AND PHARMACOLOGY, 2016, vol. 79, s. 103.

240. CHAUDHRY, Q. et al. Nanotechnologies in Food: What, Why and How? NANOTECHNOLOGIES IN FOOD, 2ND EDITION, 2017, vol. 42, s. 1.

241. CHAUDHRY, Q. et al. Nanotechnologies in Food: The Knowns, Unknowns, and Unknown Unknowns. NANOTECHNOLOGIES IN FOOD, 2ND EDITION, 2017, vol. 42, s. 252.

242. CHEFTEL, J. C. a HEFNAWY, M. Emerging Risks Related to Food Technology. ADVANCES IN FOOD PROTECTION: FOCUS ON FOOD SAFETY AND DEFENSE, 2011, s. 223.

243. CHEKMAN, I. S. [Nanoparticles: properties and application prospects]. Ukrains'kyi biokhimichnyi zhurnal (1999), 2009, vol. 81, s. 122.

244. CHEN, G. 2007, *Light emitting diode for use in, e.g., optical display, has diffusing layer formed on LED layer, scattered with nano silicon dioxide particles of specific size*, US2007045634-A1.

245. CHEN, H. et al. Quantum dot-enhanced LCDs with wide color gamut and broad angular luminance distribution 2016, vol. 47, s. 1413.

246. CHEN, M. et al. 2009, *Speaker e.g. electrostatic speaker, structure for e.g. computer, has supporting member forming space between vibrating film structure and metal electrode for vibration of vibrating film structure*, US2009060234-A1.

247. CHEN, M.-F. et al. Public attitudes toward nanotechnology applications in Taiwan. TECHNOVATION, 2013, vol. 33, s. 88.

248. CHEN, X. et al. A Novel Quantitative Microarray Antibody Capture Assay Identifies an Extremely High Hepatitis Delta Virus Prevalence Among Hepatitis B Virus-Infected Mongolians. HEPATOLOGY, 2017, vol. 66, s. 1739.

249. CHEN, Y. a HOGG, T. 2006, *Random microscale-to-nanoscale interface for electronic devices e.g. computer, has grid-like intersections of microscale or sub-microscale address signal lines and nanowires has random or pseudorandom distribution of interconnections*, US2006189112-A1.

250. CHEN, Y. C. et al. Design and experimental verification of cell actuators in a flexible electret-based loudspeaker system 2010, s. 239.

251. CHEN, Y. P. et al. The presence of chronic bee paralysis virus infection in honey bees (Apis mellifera L.) in the USA. JOURNAL OF APICULTURAL RESEARCH, 2011, vol. 50, s. 85.

252. CHENG, C. et al. 2010, *Lithium battery i.e. lithium-ion secondary battery e.g. for electronic equipment, includes thermal protective film provided to cover material of cathode or anode plate, where film undergoes crosslinking reaction to inhibit thermal runaway*, US2010167129-A1.

253. CHENG, D. L. et al. Fabrication of nanocrystalline TiO2 films by aerosol deposition method for dye-sensitized solar cells 2010, vol. 654-656, s. 2807.

254. CHENG, H. M. et al. Research progress on multi-scale coupling simulation of ceramic tool materials 2009, vol. 628 629, s. 453.

255. CHENG, N. et al. Nickel oxide nanosheets array grown on carbon cloth as a high-performance three-dimensional oxygen evolution electrode. INTERNATIONAL JOURNAL OF

HYDROGEN ENERGY, 2015, vol. 40, s. 9866.

256. CHENG, S. et al. 2019, *Photo-detecting apparatus, has the first metal line that is configured to control amount of first type of photo-generated carriers generated inside first germanium-based light absorption material to be collected by second region*, US2019267498-A1.

257. CHIANG, K. 2013, *Display unit i.e. LCD unit, for use in e.g. communication industry, has rear polarizer formed over color filter, where conductive carbon or polymer with nano-scale reduces width of transparent conductive electrodes*, US8362490-B2.

258. CHIANG, K. 2010, *Display unit i.e. LCD, for use in e.g. computer, has transparent electrode formed over liquid crystals, transparent substrate formed on drain electrode, color filter arranged on transparent substrate, and polarizer placed on color filter*, US2010328566-A1.

259. CHINN, S. et al. In consensus we trust? Persuasive effects of scientific consensus communication. PUBLIC UNDERSTANDING OF SCIENCE, 2018, vol. 27, s. 807.

260. CHIOU, K. a LEE, T. 2007, *Thermal interface material composition for heat sink of electronic product in e.g. computers comprises phase change thermoplastic resin, liquid crystal polymer and carbon nanotube*, US2007161729-A1.

261. CHIPOULINE, A. a KÜPPERS, F. Relaxation of inverted quantum system coupled with metallic nanoobjects. Springer Series in Optical Sciences, 2018, vol. 211, s. 271.

262. CHOI, H. et al. 2010, *Automatic remote meter reading system for underground lines, has power module utilized for producing direct current, low-noise amplifier fixed in power amplifier, and planar antenna integrally adhered to outer side of transformer*, KR963793-B1.

263. CHOI, J. H. et al. Kinematic design consideration based on actuator placement of five-bar planar robot for arm rehabilitation 2015, vol. 625, s. 638.

264. CHOI, K. et al. Epidemiological Characteristics of Novel Influenza A (H1N1) in Antiviral Drug Users in Korea. PLOS ONE, 2012, vol. 7.

265. CHOI, S. H. 2006, *Nano-wire structure for lithium ion rechargeable battery used in medical device, has cathode comprising several nano-wires grown in nano-pores formed by anodizing aluminum layer*, US2006216603-A1.

266. CHOTIVANICH, K. et al. Transmission-blocking activities of quinine, primaquine, and artesunate. ANTIMICROBIAL AGENTS AND CHEMOTHERAPY, 2006, vol. 50, s. 1927.

267. CHOUHAN, S. et al. Antimicrobial Activity of Some Essential Oils-Present Status and Future Perspectives. Medicines (Basel, Switzerland), 2017, vol. 4.

268. CHOWDHURY, P. et al. Intellectual Property Rights for Nanotechnology in Agriculture. NANOSCIENCE IN FOOD AND AGRICULTURE 2, 2016, vol. 21, s. 1.

269. CHRISTENSEN, T. Eurobarometer 63.1: Science and Technology, Social Values, and Services of General Interest, January - February, 2005. UK Data Archive, 2009.

270. CHRISTENSEN, T. Eurobarometer 58.0: Services of General Interest, New Technologies, ICT, Health, Environment, and Public Safety, September-October 2002. Inter-university Consortium for Political and Social Research, 2010.

271. CHRISTENSEN, T. a SOUFFLOT DE MAGNY, R. Eurobarometer 58.0 (2002).

GESIS Data Archive for the Social Sciences, 2002, vol. 1.0.0.

272. CHUN, A. L. Will the public swallow nanofood? NATURE NANOTECHNOLOGY, 2009, vol. 4, s. 790.

273. CHUNG, Y. et al. Public engagement in nanotechnology policy 2010, s. 1223.

274. CHURCH, C. et al. Intestinal Infections in Humans in the Rocky Mountain Region, United States. JOURNAL OF PARASITOLOGY, 2010, vol. 96, s. 194.

275. CIGANER, P. a BARWELL, O. Topic: Governmental investment in low TRL in the United States: Funding innovative companies from concepts to systems 2004, s. 281.

276. CIOLACU, L. et al. Edible coatings for fresh and minimally processed fruits and vegetables. GLOBAL SAFETY OF FRESH PRODUCE: A HANDBOOK OF BEST PRACTICE, INNOVATIVE COMMERCIAL SOLUTIONS AND CASE STUDIES, 2014, vol. 260, s. 233.

277. CIPITRIA, A. et al. Design, fabrication and characterization of PCL electrospun scaffolds-a review. JOURNAL OF MATERIALS CHEMISTRY, 2011, vol. 21, s. 9419.

278. CLARK, T. et al. Micropublications: a semantic model for claims, evidence, arguments and annotations in biomedical communications. JOURNAL OF BIOMEDICAL SEMANTICS, 2014, vol. 5.

279. COATES, J. F. Opportunities and consequences in science and technology. RESEARCH-TECHNOLOGY MANAGEMENT, 1999, vol. 42, s. 36.

280. COBB, M. D. Framing effects on public opinion about nanotechnology. SCIENCE COMMUNICATION, 2005, vol. 27, s. 221.

281. COBB, M. D. Creating informed public opinion: citizen deliberation about nanotechnologies for human enhancements. JOURNAL OF NANOPARTICLE RESEARCH, 2011, vol. 13, s. 1533.

282. COBB, M. D. a MACOUBRIE, J. Public perceptions about nanotechnology: Risks, benefits and trust. JOURNAL OF NANOPARTICLE RESEARCH, 2004, vol. 6, s. 395.

283. CODAY, B. D. et al. Evaluating membrane performance in osmotically driven membrane processes: Enhancement of testing methods for industrial wastewater treatment applications 2013, s. 967.

284. COENEN, C. a GRUNWALD, A. Responsible research and innovation (RRI) in quantum technology. ETHICS AND INFORMATION TECHNOLOGY, 2017, vol. 19, s. 277.

285. CONNER, P. European standardization in nanotechnologies and its relation to international work: How can standardization help the industry and regulators to develop safe products? 2017, s. 231.

286. CONNOR, M. a SIEGRIST, M. The Power of Association: Its Impact on Willingness to Buy GM Food. HUMAN AND ECOLOGICAL RISK ASSESSMENT, 2011, vol. 17, s. 1142.

287. CONSOLI, L. Scientific misconduct and science ethics: a case study based approach. SCIENCE AND ENGINEERING ETHICS, 2006, vol. 12, s. 533.

288. COOPER, K. L. F. a GOERING, R. V. Sequence-based epidemiological analysis of methicillin-resistant Staphylococcus aureus (MRSA): Multi-locus sequence typing (MLST) vs. electronic microarray analysis using polC and gyrA. Abstracts of the General Meeting of the American Society for Microbiology, 2003, vol. 103, s. C.

289. CORMICK, C. Piecing Together the Elephant: Public Engagement on Nanotechnology Challenges. SCIENCE AND ENGINEERING ETHICS, 2009, vol. 15, s. 439.

290. CORMICK, C. Why do we need to know what the public thinks about nanotechnology? NANOETHICS, 2009, vol. 3, s. 167.

291. CORNER, A. et al. Messing with nature? Exploring public perceptions of geoengineering in the UK. GLOBAL ENVIRONMENTAL CHANGE-HUMAN AND POLICY DIMENSIONS, 2013, vol. 23, s. 938.

292. CORNER, A. a PIDGEON, N. Like artificial trees? The effect of framing by natural analogy on public perceptions of geoengineering. CLIMATIC CHANGE, 2015, vol. 130, s. 425.

293. CORNER, A. et al. Perceptions of geoengineering: public attitudes, stakeholder perspectives, and the challenge of 'upstream' engagement. WILEY INTERDISCIPLINARY REVIEWS-CLIMATE CHANGE, 2012, vol. 3, s. 451.

294. CORNER, A. a RANDALL, A. Selling climate change? The limitations of social marketing as a strategy for climate change public engagement. GLOBAL ENVIRONMENTAL CHANGE-HUMAN AND POLICY DIMENSIONS, 2011, vol. 21, s. 1005.

295. COUISSINIERPARIS, P. et al. IDENTIFICATION OF A MAJOR T-CELL IMMUNOGEN IN THE ANTI-SCHISTOSOME RESPONSE OF ADULT RESIDENTS IN AN AREA ENDEMIC FOR SCHISTOSOMA-MANSONI. EUROPEAN JOURNAL OF IMMUNOLOGY, 1995, vol. 25, s. 903.

296. CRONE, W. Public understanding of nanotechnology and the role of informal science education 2008.

297. CRONE, W. C. Bringing nano to the public through informal science education 2007, vol. 2, s. 1171.

298. CRONE, W. C. et al. Public understanding of nanotechnology: Effective communication of nanoscale concepts 2006, vol. 3, s. 1518.

299. CRONIN, K. a HUTCHINGS, J. Supergrans and nanoflowers: reconstituting images of gender and race in the promotion of biotechnology and nanotechnology in Aotearoa New Zealand. NEW GENETICS AND SOCIETY, 2012, vol. 31, s. 55.

300. CSUK, R. Betulinic acid and its derivatives: A patent review (2008-2013). EXPERT OPINION ON THERAPEUTIC PATENTS, 2014, vol. 24, s. 913.

301. CUI, J. et al. Influence on optical properties of the new-type rear projection screen by the content of additive TiO2 nano-particle 2005, vol. 475-479, s. 997.

302. CUMMINGS, C. L. et al. Influences of individual-level characteristics on risk perceptions to various categories of environmental health and safety risks. JOURNAL OF RISK RESEARCH, 2013, vol. 16, s. 1277.

303. CUMMINGS, C. L. et al. Public perceptions of climate geoengineering: a systematic review of the literature. CLIMATE RESEARCH, 2017, vol. 73, s. 247.

304. CUMMINS, D. et al. 2009, *Composition for minimizing color fading in oral care composition comprises organic dye-encapsulated silica shell nanoparticle matrix, a stable fluoride ion-providing compound, and a stable peroxide species-providing compound*, WO2009023393-A1.

305. CUNNINGHAM, B. a SUTTON, B. 2012, *Wearable speech generation device for use as e.g. bracelet on wrist of user, used to permit user to communicate with others by*

producing digitized or synthesized speech, has CPU that is communicatively coupled to display device and speaker, WO2012009335-A1.

306. CURRALL, S. C. New insights into public perceptions. NATURE NANOTECHNOLOGY, 2009, vol. 4, s. 79.

307. CURRALL, S. C. et al. What drives public acceptance of nanotechnology? NATURE NANOTECHNOLOGY, 2006, vol. 1, s. 153.

308. CURRALL, S. C. et al. How fast should nanotechnology advance? [2]. NATURE NANOTECHNOLOGY, 2007, vol. 2, s. 327.

309. CURTIS, A. Novel data on cell adhesion. New Cell Adhesion Research, 2009, s. 85.

310. CUTCLIFFE, S. H. et al. Framing the Discussion: Nanotechnology and the Social Construction of Technology-What STS Scholars Are Saying. NANOETHICS, 2012, vol. 6, s. 81.

311. DAGAR, J. C. a SHARMA, P. C. Introduction. Innovative Saline Agriculture, 2016, s. 1.

312. DALTON-BROWN, S. Public Engagement and Nanotechnology in Australia. CAMBRIDGE QUARTERLY OF HEALTHCARE ETHICS, 2016, vol. 25, s. 518.

313. DANA, D. A. The nanotechnology challenge: Creating legal institutions for uncertain risks. 2011. s.

314. DANA, D. A. Nanotechnology and the Public: Risk Perception and Risk Communication. SCIENCE COMMUNICATION, 2013, vol. 35, s. 540.

315. DANILUK, A. RHEED intensities from two-dimensional heteroepitaxial nanoscale systems of GaN on a Si surface. Computer Physics Communications, 2016, vol. 207, s. 536.

316. DANILUK, A. RHEED intensities from two-dimensional heteroepitaxial nanoscale systems of GaN on a 3C-SiC(111) surface. Computer Physics Communications, 2017, vol. 221, s. 419.

317. DANILUK, A. RHEED intensities from two-dimensional heteroepitaxial nanoscale systems of GaN on AlN(0 0 0 1) and AlN(0 0 0 1^{-}) surfaces. Computer Physics Communications, 2019, vol. 244, s. 487.

318. DAO, G. T. et al. 2014, *Method for forming electromechanical power switch e.g. microelectromechanical switch, for e.g. semiconductor device, involves switching off voltage to one circuit block in response to actuation of electromechanical power switch*, US8786130-B1.

319. DASCALU, S. Video_1_Measles Epidemics in Romania: Lessons for Public Health and Future Policy.MP4. Figshare, 2019.

320. DASCALU, S. Table_3_Measles Epidemics in Romania: Lessons for Public Health and Future Policy.DOCX. Figshare, 2019.

321. DASCALU, S. Table_1_Measles Epidemics in Romania: Lessons for Public Health and Future Policy.DOCX. Figshare, 2019.

322. DASCALU, S. Table_2_Measles Epidemics in Romania: Lessons for Public Health and Future Policy.DOCX. Figshare, 2019.

323. DASKALOPOULOS, D. The Anglo-Greek review: Some residual puzzles. The

British Council and Anglo-Greek Literary Interactions, 1945-1955, 2018, s. 155.

324. DAVIES, S. R. How we talk when we talk about nano: The future in laypeople's talk. FUTURES, 2011, vol. 43, s. 317.

325. DAVIES, S. R. Constituting Public Engagement: Meanings and Genealogies of PEST in Two UK Studies. SCIENCE COMMUNICATION, 2013, vol. 35, s. 687.

326. DAVIES, S. R. a MACNAGHTEN, P. Narratives of Mastery and Resistance: Lay Ethics of Nanotechnology. NANOETHICS, 2010, vol. 4, s. 141.

327. DAVIES, S. R. a SELIN, C. Energy Futures: Five Dilemmas of the Practice of Anticipatory Governance. ENVIRONMENTAL COMMUNICATION-A JOURNAL OF NATURE AND CULTURE, 2012, vol. 6, s. 119.

328. DE BRUIN, W. B. a BOSTROM, A. Assessing what to address in science communication. PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, 2013, vol. 110, s. 14062.

329. DE LA RUE, R. M. et al. Micro-/nano-photonic device structures applied to communications, sensing and consumer optoelectronics 2010, s. 1.

330. DE LARA GONZALEZ, A. a ALBERTO GARCIA-AVILES, J. STUDY ABOUT ONLINE VIDEO QUALITY IN SCIENCE COMMUNICATION. PERSPECTIVAS DE LA COMUNICACION, 2019, vol. 12, s. 185.

331. DE QUEIROZ, J. A. a VASCONCELOS ROCHA, M. A. Consumer relationship with textile innovations conducted by nanotechnology. DOBRAS, 2017, vol. 10, s. 49.

332. DEBABZA, M. et al. Dissemination of Extended-Spectrum Beta-Lactamase-Producing Enterobacteriaceae in an Urban Wastewater Treatment Plant and Their Emission to a River. JOURNAL OF ENVIRONMENTAL ENGINEERING, 2018, vol. 144.

333. DELICADO, A. et al. Media analysis of the representations of fusion and other future energy technologies. 2015 4TH INTERNATIONAL CONFERENCE ON ADVANCEMENTS IN NUCLEAR INSTRUMENTATION MEASUREMENT METHODS AND THEIR APPLICATIONS (ANIMMA), 2015.

334. DEMIRCI, U. B. Ammonia borane, a material with exceptional properties for chemical hydrogen storage. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2017, vol. 42, s. 9978.

335. DEPROPHETIS, W. A. et al. Communicating the benefits and risks of of nanotechnology to the public. ABSTRACTS OF PAPERS OF THE AMERICAN CHEMICAL SOCIETY, 2003, vol. 226, s. U227.

336. DERRA, K. et al. Profile: Nanoro Health and Demographic Surveillance System. INTERNATIONAL JOURNAL OF EPIDEMIOLOGY, 2012, vol. 41, s. 1293.

337. DEVASAHAYAM, S. Overview of an internationally integrated nanotechnology governance. International Journal of Metrology and Quality Engineering, 2017, vol. 8.

338. DHANDA, M. S. et al. 2012, *Method for restricting access to uplink communication channel communicating with e.g. internet by wireless communication station and cellular phone, involves transmitting message to wireless communication device*, WO2012139075-A1.

339. DIALLO, S. Y. a TOLK, A. Adaptive generative grammar for JC3IEDM web services

2006, s. 656.

340. DIETZ, T. Bringing values and deliberation to science communication. PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, 2013, vol. 110, s. 14081.

341. DINAS, P. C. et al. Innovative Methods for the Benefit of Public Health Using Space Technologies for Disaster Response. DISASTER MEDICINE AND PUBLIC HEALTH PREPAREDNESS, 2015, vol. 9, s. 319.

342. DINH-DUY, P. et al. Pulmonary drug delivery systems for tuberculosis treatment. INTERNATIONAL JOURNAL OF PHARMACEUTICS, 2015, vol. 478, s. 517.

343. DIXON, P. et al. 2011, *Anode for lithium ion-battery used in consumer electronics, has nanocomposite of agglomerated nanocomposites having portion of dendritic particle in electrical communication with portion of dendritic particle of adjacent nanocomposite*, WO2011041468-A1.

344. DIXON, P. et al. Therapeutic contact lenses: a patent review. EXPERT OPINION ON THERAPEUTIC PATENTS, 2015, vol. 25, s. 1117.

345. DO, L. a MOBLEY, W. Single Figure Publications: Towards a novel alternative format for scholarly communication. F1000Research, 2015, vol. 4, s. 268.

346. DOAK, S. H. Opinion of the Scientific Committee on consumer safety (SCCS) - Opinion on the use of 2,2 '-methylene-bis-(6-(2H-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)ph enol) (nano)-S79-In cosmetic products. REGULATORY TOXICOLOGY AND PHARMACOLOGY, 2016, vol. 76, s. 215.

347. DOBON, A. et al. The sustainability of communicative packaging concepts in the food supply chain. A case study: part 2. Life cycle costing and sustainability assessment. INTERNATIONAL JOURNAL OF LIFE CYCLE ASSESSMENT, 2011, vol. 16, s. 537.

348. DOBON, A. et al. The sustainability of communicative packaging concepts in the food supply chain. A case study: part 1. Life cycle assessment. INTERNATIONAL JOURNAL OF LIFE CYCLE ASSESSMENT, 2011, vol. 16, s. 168.

349. DOHLE, S. et al. Mobile Communication in the Public Mind: Insights from Free Associations Related to Mobile Phone Base Stations. HUMAN AND ECOLOGICAL RISK ASSESSMENT, 2012, vol. 18, s. 649.

350. DOLAN, M. C. et al. Ability of Two Natural Products, Nootkatone and Carvacrol, to Suppress Ixodes scapularis and Amblyomma americanum (Acari: Ixodidae) in a Lyme Disease Endemic Area of New Jersey. JOURNAL OF ECONOMIC ENTOMOLOGY, 2009, vol. 102, s. 2316.

351. DONOFRIO, N. M. Processors and memory: The drivers of embedded systems toward the networked world 2004, vol. 47, s. 19.

352. DONVAL, A. et al. Passive Light Power Control Enabled by Nanotechnology. 2008. s.

353. DOS SANTOS, G. F. a SALAY, E. AFFECT and risk and benefit perception of individuals related to acai, Coari County, State of Amazonas. ACTA AMAZONICA, 2014, vol. 44, s. 329.

354. DOVGALEV, A. S. [Distribution and infection rate of mollusks--intermediate hosts of trematodes in the Central Amur region]. Meditsinskaia parazitologiia i parazitarnye bolezni, 1988, s. 71.

355. DOVGALEV, A. S. et al. [Biology of Far Eastern trematodes and the epidemiology of the diseases they cause. III. The role of wild carnivorous animals in circulating trematodes in the southern Far East]. Meditsinskaia parazitologiia i parazitarnye bolezni, 1980, vol. 49, s. 64.

356. DOVGALEV, A. S. et al. [Characteristics of the helminthological situation in the zone of the eastern portion of the Baikal-Amur mainline]. Meditsinskaia parazitologiia i parazitarnye bolezni, 1978, vol. 47, s. 3.

357. DOWLING, A. Think small. New Scientist, 2005, vol. 185, s. 19.

358. DRAGOJLOVIC, N. a EINSIEDEL, E. Playing God or just unnatural? Religious beliefs and approval of synthetic biology. PUBLIC UNDERSTANDING OF SCIENCE, 2013, vol. 22, s. 869.

359. DRUCKMAN, J. N. How scientific evidence links attitudes to behaviors. The Nanotechnology Challenge: Creating Legal Institutions for Uncertain Risks, 2011, s. 84.

360. DRUMMOND, C. a FISCHHOFF, B. Individuals with greater science literacy and education have more polarized beliefs on controversial science topics. PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, 2017, vol. 114, s. 9587.

361. DU SHOUZHONG, A. et al. 2011, *Method for manufacturing component such as enclosure e.g. battery cover for electronic device, involves performing manufacturing process resulting in heating of bi-metallic sheet, and physically constraining sheet from deformation,* US2011239725-A1.

362. DUBE, A. Nanomedicines for Infectious Diseases. PHARMACEUTICAL RESEARCH, 2019, vol. 36.

363. DUDO, A. Scientists, the Media, and the Public Communication of Science. SOCIOLOGY COMPASS, 2015, vol. 9, s. 761.

364. DUDO, A. et al. Food nanotechnology in the news. Coverage patterns and thematic emphases during the last decade. APPETITE, 2011, vol. 56, s. 78.

365. DUDO, A. et al. An analysis of nanoscientists as public communicators. NATURE NANOTECHNOLOGY, 2014, vol. 9, s. 841.

366. DUTTA, A. et al. NANOBIOTECHNOLOGY AND NANOMEDICAL TRENDS AND FUTURE PERSPECTIVE. 2010. s.

367. EATON, M. Nanomedicine: Industry-wise research. NATURE MATERIALS, 2007, vol. 6, s. 251.

368. EBELING, M. F. E. Mediating uncertainty - Communicating the financial risks of nanotechnologies. SCIENCE COMMUNICATION, 2008, vol. 29, s. 335.

369. EBELING, M. F. E. a COOPER, G. Spinning science: The commercialisation of nanotech and financial news 2006, vol. 1, s. 572.

370. EBRAHIM, S. A. et al. Publication Trends in Drug Delivery and Magnetic Nanoparticles. NANOSCALE RESEARCH LETTERS, 2019, vol. 14.

371. EDWIN, M. A. Nanotechnology: Obtaining of nanoparticles and nanocomposites and their use in food and drug packaging. Nanoparticles: New Research, 2008, s. 307.

372. EDWIN MONCADA, A. et al. NANOTECHNOLOGY: OBTAINING OF NANOPARTICLES AND NANOCOMPOSITES AND THEIR USE IN FOOD AND DRUG PACKAGING. 2010. s.

373. EE, H.-S. a PARK, H.-G. Design of tunable silicon metasurfaces with cross-polarization transmittance over 80%. PHYSICA SCRIPTA, 2018, vol. 93.

374. EKPERUSI, A. O. et al. Application of common duckweed (Lemna minor) in phytoremediation of chemicals in the environment: State and future perspective. CHEMOSPHERE, 2019, vol. 223, s. 285.

375. ELDESOUKY, A. et al. The Role of Packaging and Presentation Format in Consumers' Preferences for Food: An Application of Projective Techniques. JOURNAL OF SENSORY STUDIES, 2015, vol. 30, s. 360.

376. ELLIS, G. a MASCONE, C. F. Update: Science on a world stage. Chemical Engineering Progress, 2008, vol. 104, s. 6.

377. ENTRADAS, M. et al. Preaching to the converted? An analysis of the UK public for space exploration. PUBLIC UNDERSTANDING OF SCIENCE, 2013, vol. 22, s. 269.

378. ERICKSON, B. E. Nano TV series debuts. Chemical and Engineering News, 2008, vol. 86, s. 40.

379. ESCOFFIER, L. The European union consultation on nanotechnology. Nanotechnology Law and Business, 2010, vol. 7, s. 97.

380. ESPEITX BERNAT, E. et al. The influence of information on cognitions and perceptions towards new food technologies El papel de la información en las cogniciones y percepciones hacia nuevas tecnologías aplicadas a los alimentos. Politica y Sociedad, 2014, vol. 51, s. 95.

381. EVANS, M. S. Supporting Science: Reasons, Restrictions, and the Role of Religion. SCIENCE COMMUNICATION, 2012, vol. 34, s. 334.

382. EVERS, J. a D'SILVA, J. Knowledge transfer from citizens' panels to regulatory bodies in the domain of nano-enabled medical applications. INNOVATION-THE EUROPEAN JOURNAL OF SOCIAL SCIENCE RESEARCH, 2009, vol. 22, s. 125.

383. FADEEL, B. et al. Adverse Effects of Engineered Nanomaterials: Exposure, Toxicology, and Impact on Human Health: Second Edition. 2017. s.

384. FAISAL, M. et al. DESIGN OF A COMPACT ACADEMIC COURSE FOR SATELLITE NAVIGATION AND CONTROL WITH A REAL-TIME OPERATING SYSTEM. INTED2016: 10TH INTERNATIONAL TECHNOLOGY, EDUCATION AND DEVELOPMENT CONFERENCE, 2016, s. 4886.

385. FAJERWERG, K. et al. Gold nanoparticles to favour meetings between science and society Nanoparticules d'or pour susciter des rencontres entre science et société. Actualite Chimique, 2018, s. 29.

386. FAN, Y. a MOON, J. J. Particulate delivery systems for vaccination against bioterrorism agents and emerging infectious pathogens. WILEY INTERDISCIPLINARY REVIEWS-NANOMEDICINE AND NANOBIOTECHNOLOGY, 2017, vol. 9.

387. FANGRAT, J. a PACHMAN, A. Energy efficiency in construction in the light of BUILDING UP project results. Sustainable Environment Research, 2013, vol. 23, s. 351.

388. FAR, A. A 220nA Bandgap Reference With 80dB PSRR Targeting Energy Harvesting. 2016 IEEE CANADIAN CONFERENCE ON ELECTRICAL AND COMPUTER ENGINEERING (CCECE), 2016.

389. FARBER, D. a LAKHTAKIA, A. Scenario planning and nanotechnological futures. EUROPEAN JOURNAL OF PHYSICS, 2009, vol. 30, s. S3.

390. FARHANG, B. Nanotechnology and Applications in Food Safety. Global Issues in Food Science and Technology, 2009, s. 401.

391. FATTAL, D. A. et al. 2011, *Optical device i.e. star coupler, for distributing stream of data from laser light source to compact disk player of fiber optic cable TV systems, has partial reflectivity mirrors comprising guide mode resonance or nanodot mirrors*, WO2011115624-A1.

392. FAUNCE, T. A. Toxicological and public good considerations for the regulation of nanomaterial-containing medical products. Expert Opinion on Drug Safety, 2008, vol. 7, s. 103.

393. FAVI, P. M. et al. Is Nanotechnology Toxic? Was Prince Charles Correct? 2016. s.

394. FAZARRO, D. E. a FITZSIMMONS, V. Nanotechnology Safety Certification. Nanotechnology Safety, 2013, s. 207.

395. FEDELE, L. a MONTELEONE, L. Safety, maintenance and nanotechnologies: An introductory state of art about the risk assessment methodologies and the potentialities 2017, s. 1299.

396. FELSTED, K. F. a WRIGHT, S. D. [5.1] to [5.2] Moderate Versions of the Inflection Point and Positive Derivative. TOWARD POST AGEING: TECHNOLOGY IN AN AGEING SOCIETY, 2014, vol. 1, s. 53.

397. FERNANDES COSTA, A. et al. Development, characterization, and in vitro-in vivo evaluation of polymeric nanoparticles containing miconazole and farnesol for treatment of vulvovaginal candidiasis. MEDICAL MYCOLOGY, 2019, vol. 57, s. 52.

398. FERNANDEZ NOVELL, J. M. et al. SCIENCE AND BIOTECHNOLOGY KNOWLEDGE: SCIENCE TEACHERS OPINIONS FROM SPANISH SECONDARY SCHOOL. 2011. s.

399. FERREIRA, A. J. et al. Therapeutic targeting of the angiotensin-converting enzyme 2/Angiotensin-(1-7)/Mas cascade in the renin-angiotensin system: a patent review. EXPERT OPINION ON THERAPEUTIC PATENTS, 2012, vol. 22, s. 567.

400. FERREIRA, A. J. et al. Nanoparticles, nanotechnology and pulmonary nanotoxicology. REVISTA PORTUGUESA DE PNEUMOLOGIA, 2013, vol. 19, s. 28.

401. FIDANZA, P., KURINNYI, A. 2018, *Method for determining creditworthiness and issuing loans to consumers and generating behavioral profile of consumers, involves generating behavioral profile and correlating periodic location patterns to loan and transactional activities*, US2018349991-A1.

402. FIELDING, K. S. et al. Comparing Public Perceptions of Alternative Water Sources for Potable Use: The Case of Rainwater, Stormwater, Desalinated Water, and Recycled Water. WATER RESOURCES MANAGEMENT, 2015, vol. 29, s. 4501.

403. FIRTH, N. Space for hire. Engineer, 2007, vol. 293, s. 20.

404. FISK, K. et al. CONTROVERSIAL NEW SCIENCES IN THE MEDIA: CONTENT

ANALYSIS OF GLOBAL REPORTING OF NANOTECHNOLOGY DURING THE LAST DECADE. MEDIA INTERNATIONAL AUSTRALIA, 2014, s. 156.

405. FITZGERALD, S. T. a RUBIN, B. A. RISK SOCIETY, MEDIA, AND POWER: THE CASE OF NANOTECHNOLOGY. SOCIOLOGICAL SPECTRUM, 2010, vol. 30, s. 367.

406. FLORCZYK, S. J. a SAHA, S. Ethical issues in nanotechnology. Journal of long-term effects of medical implants, 2007, vol. 17, s. 271.

407. FLYNN, R. et al. Risk perception of an emergent technology: The case of hydrogen energy. Forum Qualitative Sozialforschung, 2006, vol. 7.

408. FOA, V. et al. Diseases due to vegetal textile fibers PATOLOGIA DA FIBRE TESSILI VEGETALI. Medicina del Lavoro, 1975, vol. 66, s. 527.

409. FOCA, E. et al. Monitoring the toxicity related to HAART from 2001 to 2009 in Burkina Faso: clinical adverse events vs. laboratory adverse events: prevalence, grading and outcome. INFECTION, 2010, vol. 38, s. 24.

410. FOLADORI, G. et al. RELEVANCE AND PUBLIC SUPPORT OF NANOTECHNOLOGY RESEARCH IN MEXICO. ANDULI, 2015, s. 195.

411. FOLADORI, G. a CARROZZA, T. Políticas de nanotecnología en Argentina a la luz de criterios de la OCDE. Ciencia, docencia y tecnología, 2017, s. 115.

412. FOLADORI, G. a GARCIA GUERRERO, M. The role of historical experience and trust in the communication of emerging technologies: the case of nanotechnologies. HISTORIA Y COMUNICACION SOCIAL, 2017, vol. 22, s. 221.

413. FOLADORI, G. et al. Mexico-U.S. Scientific Collaboration in Nanotechnology. Frontera norte, 2012, vol. 24, s. 145.

414. FORNASIER, M. D. O. REGULATION OF NANOTECHNOLOGIC RISK AND DEMOCRATIC PARTICIPATION AND: POSSIBILITIES AND OBSTACLES. VEREDAS DO DIREITO, 2015, vol. 12, s. 63.

415. FOSTER, B. Microscopy and spectroscopy open new vistas in the emerging world of nanotechnology: Part 1. AMERICAN LABORATORY, 2003, vol. 35, s. 11.

416. FOTIE, J. a BRAHMACHARI, G. The Potential of Peptides and Depsipeptides from Terrestrial and Marine Organisms in the Fight against Human Protozoan Diseases. 2015. s.

417. FOURNIER, E. Potential health hazards from the use of pesticides Toxicologie humaine des pesticides. Qualitas Plantarum et Materiae Vegetabiles, 1970, vol. 20, s. 69.

418. FRANKEL, F. et al. Envisioning and communicating nanotechnology to the public. 2001. s.

419. FRANKEL, M. S. Commentary: Public Outreach by the FDA: Evaluating Oversight of Human Drugs and Medical Devices. JOURNAL OF LAW MEDICINE & ETHICS, 2009, vol. 37, s. 625.

420. FRANKLYNE, J. S. et al. Essential oil micro- and nanoemulsions: promising roles in antimicrobial therapy targeting human pathogens. LETTERS IN APPLIED MICROBIOLOGY, 2016, vol. 63, s. 322.

421. FREWER, L. Opinion. Food Science and Technology, 2007, vol. 21, s. 15.

422. FREWER, L. et al. Nanotechnology in Foods: Understanding Public Response to its

Risks and Benefits. 2010. s.

423. FREWER, L. J. Consumer acceptance and rejection of emerging agrifood technologies and their applications. EUROPEAN REVIEW OF AGRICULTURAL ECONOMICS, 2017, vol. 44, s. 683.

424. FREWER, L. J. et al. Consumer response to novel agri-food technologies: Implications for predicting consumer acceptance of emerging food technologies. TRENDS IN FOOD SCIENCE & TECHNOLOGY, 2011, vol. 22, s. 442.

425. FREWER, L. J. et al. Consumer attitudes towards nanotechnologies applied to food production. TRENDS IN FOOD SCIENCE & TECHNOLOGY, 2014, vol. 40, s. 211.

426. FRIED, B. et al. Food-borne intestinal trematodiases in humans. PARASITOLOGY RESEARCH, 2004, vol. 93, s. 159.

427. FRIEDMAN, S. M. a EGOLF, B. P. Nanotechnology: Risks and the media. IEEE Technology and Society Magazine, 2005, vol. 24, s. 5.

428. FRIEDMAN, S. M. a EGOLF, B. P. A Longitudinal Study of Newspaper and Wire Service Coverage of Nanotechnology Risks. RISK ANALYSIS, 2011, vol. 31, s. 1701.

429. FRITSCHE, T. R. et al. PRAZIQUANTEL FOR TREATMENT OF HUMAN NANOPHYETUS-SALMINCOLA (TROGLOTREMA-SALMINCOLA) INFECTION. JOURNAL OF INFECTIOUS DISEASES, 1989, vol. 160, s. 896.

430. FU, S. a TIAN, C. Nanocellulose and its application for shape-memory materials. Advanced Structured Materials, 2015, vol. 74, s. 101.

431. FUNAHASHI, H. et al. Understanding public acceptance of elite sport policy in Japan: a structural equation modelling approach. EUROPEAN SPORT MANAGEMENT QUARTERLY, 2015, vol. 15, s. 478.

432. FUNG, I. C.-H. et al. Social Media's Initial Reaction to Information and Misinformation on Ebola, August 2014: Facts and Rumors. PUBLIC HEALTH REPORTS, 2016, vol. 131, s. 461.

433. GABOULAUD, V. et al. Prevalence of IgG antibodies to human parvovirus B19 in haemophilia children treated with recombinant factor (F)VIII only or with at least one plasma-derived FVIII or FIX concentrate: results from the French haemophilia cohort. BRITISH JOURNAL OF HAEMATOLOGY, 2002, vol. 116, s. 383.

434. GAIKWAD, K. K. et al. Functional Corrugated Board with Organic and Inorganic Materials in Food Packaging Applications: A Review. Journal of Korea Society of Packaging Science & Technology, 2016, vol. 22, s. 49.

435. GAJEWICZ, A. Development of valuable predictive read-across models based on "real-life" (sparse) nanotoxicity data. ENVIRONMENTAL SCIENCE-NANO, 2017, vol. 4, s. 1389.

436. GALA, R. P. et al. Development of Non-Conjugated Meningitis Particulate Vaccine. 2015. s.

437. GALIMULLINA, E. Z. et al. Foresight requirements to the teacher on the verge of cognitive revolution. Man in India, 2017, vol. 97, s. 157.

438. GALLAGHER, M. J. et al. Research highlights: applications of life-cycle assessment as a tool for characterizing environmental impacts of engineered nanomaterials. ENVIRONMENTAL SCIENCE-NANO, 2017, vol. 4, s. 276.

439. GAMAL KHEDR, M. Nanofiltration of oil field-produced water for reinjection and optimum protection of oil formation. Desalination and Water Treatment, 2015, vol. 55, s. 3460.

440. GANAU, M. et al. Principles of Nanoethics: Theoretical Models and Clinical Practice. 2016. s.

441. GANEEV, A. A. et al. Analysis of exhaled air for early-stage diagnosis of lung cancer: opportunities and challenges. RUSSIAN CHEMICAL REVIEWS, 2018, vol. 87, s. 904.

442. GANGULI, P. a JABADE, S. Nanotechnology intellectual property rights: Research, design, and commercialization. 2017. s.

443. GARDNER, G. et al. Students' Risk Perceptions of Nanotechnology Applications: Implications for science education. INTERNATIONAL JOURNAL OF SCIENCE EDUCATION, 2010, vol. 32, s. 1951.

444. GARDNER, G. E. et al. Factors Influencing Postsecondary STEM Students' Views of the Public Communication of an Emergent Technology: a Cross-National Study from Five Universities. RESEARCH IN SCIENCE EDUCATION, 2017, vol. 47, s. 1011.

445. GARLEPP, B. W. et al. 2017, *Ultrasonic sensor for ultrasonic wave sensing in medical application, has array controller that controls selection of ultrasonic transducers during receive operation according to receive pattern*, US2017326593-A1.

446. GASKELL, G. et al. Social values and the governance of science. SCIENCE, 2005, vol. 310, s. 1908.

447. GASKELL, G. et al. Imagining nanotechnology: cultural support for technological innovation in Europe and the United States. PUBLIC UNDERSTANDING OF SCIENCE, 2005, vol. 14, s. 81.

448. GAUTIER, J. et al. Recent advances in theranostic nanocarriers of doxorubicin based on iron oxide and gold nanoparticles. JOURNAL OF CONTROLLED RELEASE, 2013, vol. 169, s. 48.

449. GAVANKAR, S. et al. Critical Components of Uncertainty Communication in Life Cycle Assessments of Emerging Technologies: Nanotechnology as a Case Study. JOURNAL OF INDUSTRIAL ECOLOGY, 2015, vol. 19, s. 468.

450. GEHRKE, P. J. Ecological validity and the study of publics: The case for organic public engagement methods. PUBLIC UNDERSTANDING OF SCIENCE, 2014, vol. 23, s. 77.

451. GELPERINA, S. et al. The potential advantages of nanoparticle drug delivery systems in chemotherapy of tuberculosis. AMERICAN JOURNAL OF RESPIRATORY AND CRITICAL CARE MEDICINE, 2005, vol. 172, s. 1487.

452. GENDRE, L. et al. Measurement of Nanoparticles Release during Drilling of Polymer Nanocomposites. 4TH INTERNATIONAL CONFERENCE ON SAFE PRODUCTION AND USE OF NANOMATERIALS (NANOSAFE2014), 2015, vol. 617.

453. GEORGE, S. et al. The multi-facets of sustainable nanotechnology - Lessons from a nanosafety symposium. NANOTOXICOLOGY, 2015, vol. 9, s. 404.

454. GERICOTA, M. G. et al. A framework for fault tolerant real time systems based on reconfigurable FPGAs. 2006 IEEE CONFERENCE ON EMERGING TECHNOLOGIES & FACTORY AUTOMATION, VOLS 1 -3, 2006, s. 477.

455. GHANY, N. A. A. et al. Revolution of Graphene for different applications: State-of-the-art. SURFACES AND INTERFACES, 2017, vol. 9, s. 93.

456. GHEORGHE, I. et al. Extended-spectrum Beta-lactamase Production in Pseudomonas aeruginosa and Acinetobacter baumannii Strains: Epidemiology, Molecular Characterization and Novel Proteomics-based Diagnostic Tools. CURRENT PROTEOMICS, 2014, vol. 11, s. 108.

457. GHOSH, D. et al. Innovation in Healthy and Functional Foods. 2016. s.

458. GHOSH, S. K. a MANDAL, D. Bio-assembled, piezoelectric prawn shell made self-powered wearable sensor for non-invasive physiological signal monitoring. APPLIED PHYSICS LETTERS, 2017, vol. 110.

459. GILARDI, G. a SMIT, M. K. Generic InP-Based Integration Technology: Present and Prospects. PROGRESS IN ELECTROMAGNETICS RESEARCH-PIER, 2014, vol. 147, s. 23.

460. GILES, E. L. et al. Consumer acceptance of and willingness to pay for food nanotechnology: a systematic review. JOURNAL OF NANOPARTICLE RESEARCH, 2015, vol. 17.

461. GILES, J. Nanotechnology - What is there to fear from something so small? NATURE, 2003, vol. 426, s. 750.

462. GILES, J. Nanotech takes small step towards burying 'grey goo'. NATURE, 2004, vol. 429, s. 591.

463. GLUSCHENKO, N. N. a OLKHOVSKAYA, I. P. ECOLOGICAL SAFETY IN ENERGETICS. CHARACTERISTICS OF FLY ASH PARTICLES FROM COAL POWER PLANTS. Izvestiya Rossiiskoi akademii nauk. Energetika, 2014, s. 20.

464. GNANADESIGAN, M. et al. Nano Drugs for Curing Malaria: The Plausibility. 2019. s.

465. GNESIN, S. et al. First in-human radiation dosimetry of the gastrin-releasing peptide (GRP) receptor antagonist 68 Ga-NODAGA-MJ9. EJNMMI Research, 2018, vol. 8.

466. GODMAN, M. a HANSSON, S. O. European public advice on nanobiotechnology - Four convergence seminars. NANOETHICS, 2009, vol. 3, s. 43.

467. GOGOS, A. et al. Nanomaterials in Plant Protection and Fertilization: Current State, Foreseen Applications, and Research Priorities. JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY, 2012, vol. 60, s. 9781.

468. GOLIN, C. B. et al. Toward a comprehensive framework for nanomaterials: An interdisciplinary assessment of the current Environmental Health and Safety Regulation regarding the handling of carbon nanotubes. Journal of Chemical Health and Safety, 2013, vol. 20, s. 9.

469. GOLNABI, H. Carbon nanotube research developments in terms of published papers and patents, synthesis and production. SCIENTIA IRANICA, 2012, vol. 19, s. 2012.

470. GOLUCHOWICZ, K. a BLIND, K. Identifying future fields of standardisation:Methodology and empirical experiences. International Journal of Foresight and Innovation Policy, 2011, vol. 7, s. 286.

471. GOMEZ-CRUZ, J. et al. Flow-through nanohole array based sensor implemented on analogue smartphone components. PLASMONICS: DESIGN, MATERIALS, FABRICATION, CHARACTERIZATION, AND APPLICATIONS XV, 2017, vol. 10346.

472. GOMEZ-FERRI, J. et al. PUBLIC COMMUNICATION OF EMERGING SCIENCES AND TECHNOLOGIES. PROBLEMS AND CHALLENGES IN THE CASE OF NANOTECHNOLOGY. ARBOR-CIENCIA PENSAMIENTO Y CULTURA, 2014, vol. 190.

473. GONG, L. et al. Multiparty quantum dialogue protocol based on continuous variable squeezed states 2017, s. 36.

474. GONZÁLEZ, B. et al. Dendritic macromolecules: New possibilities for advanced bioceramics. Key Engineering Materials, 2010, vol. 441, s. 235.

475. GONZALEZ-ESCALONA, N. et al. Closed Genome Sequence of Salmonella enterica Serovar Richmond Strain CFSAN000191, Obtained with Nanopore Sequencing. MICROBIOLOGY RESOURCE ANNOUNCEMENTS, 2018, vol. 7.

476. GONZALEZ-ROMO, F. a PICAZO, J. J. Development of new vaccines. ENFERMEDADES INFECCIOSAS Y MICROBIOLOGIA CLINICA, 2015, vol. 33, s. 557.

477. GOODSHIP, V. et al. Building in Multifunctionality in Plastic Components: Complexity, Cost and Sustainability. ADVANCES IN MANUFACTURING TECHNOLOGY XXXI, 2017, vol. 6, s. 377.

478. GORRIE, C. L. et al. Antimicrobial-Resistant Klebsiella pneumoniae Carriage and Infection in Specialized Geriatric Care Wards Linked to Acquisition in the Referring Hospital. CLINICAL INFECTIOUS DISEASES, 2018, vol. 67, s. 161.

479. GOTO, M. et al. Effect of trace impurities on high-cycle fatigue damage of ultrafine grained copper processed by equal channel angular pressing 2008, vol. 584-586 PART 2, s. 809.

480. GOTTLIEB, K. T. et al. Magnets in the GI tract. GASTROINTESTINAL ENDOSCOPY, 2013, vol. 78, s. 561.

481. GOVEN, J. et al. Community engagement in the management of biosolids: Lessons from four New Zealand studies. JOURNAL OF ENVIRONMENTAL MANAGEMENT, 2012, vol. 103, s. 154.

482. GOVIL, J. et al. Nano technology/networks in molecular communication: An advance step of electrical communications 2012, vol. 110-116, s. 3770.

483. GRACE, A. N. et al. ADVANCED MATERIALS FOR SUPERCAPACITORS. 2017. s.

484. GRANBERG, F. et al. Novel technologies applied to the nucleotide sequencing and comparative sequence analysis of the genomes of infectious agents in veterinary medicine. REVUE SCIENTIFIQUE ET TECHNIQUE-OFFICE INTERNATIONAL DES EPIZOOTIES, 2016, vol. 35, s. 25.

485. GRANT, P. M. Scientific credit and credibility. NATURE MATERIALS, 2002, vol. 1, s. 139.

486. GREENE, G. et al. Building Open Access to Research (OAR) Data Infrastructure at NIST. Data science journal, 2019, vol. 18.

487. GRIEGER, K. D. et al. International Implications of Labeling Foods Containing Engineered Nanomaterials. JOURNAL OF FOOD PROTECTION, 2016, vol. 79, s. 830.

488. GRIEGER, K. D. et al. Improving risk governance of emerging technologies through public engagement: The neglected case of nano-remediation? Australian Journal of Emerging Technologies and Society, 2012, vol. 10, s. 61.

489. GRIGORAS, I. et al. Genome diversity and evidence of recombination and reassortment in nanoviruses from Europe. JOURNAL OF GENERAL VIROLOGY, 2014, vol. 95, s. 1178.

490. GRINBAUM, A. Cognitive barriers in perception of nanotechnology. JOURNAL OF LAW MEDICINE & ETHICS, 2006, vol. 34, s. 689.

491. GROBE, A. Public perception of nanotechnologies - Requirements for business communication 2010, s. 1007.

492. GROBE, A. a RISSANEN, M. E. Nanotechnologies in agriculture and food - an overview of different fields of application, risk assessment and public perception. Recent patents on food, nutrition & agriculture, 2012, vol. 4, s. 176.

493. GROBOLJSEK, B. a MALI, F. Daily Newspapers' Views on Nanotechnology in Slovenia. SCIENCE COMMUNICATION, 2012, vol. 34, s. 30.

494. GROFFMAN, P. M. et al. Restarting the conversation: challenges at the interface between ecology and society. FRONTIERS IN ECOLOGY AND THE ENVIRONMENT, 2010, vol. 8, s. 284.

495. GROOTAERT, P. a SHAMSHEV, I. V. The fast-running flies (Diptera, Hybotidae, Tachydromiinae) of Singapore and adjacent regions. European Journal of Taxonomy, 2012, vol. 5, s. 1.

496. GROVES, C. The public perception of nanotechnology: Is it all about risk? Nanotechnology Perceptions, 2010, vol. 6, s. 85.

497. GROVES, K. et al. Food Innovation and nanotechnology - Do they go together? Nanotechnology Perceptions, 2011, vol. 7, s. 141.

498. GRUERE, G. P. Labeling nano-enabled consumer products. NANO TODAY, 2011, vol. 6, s. 117.

499. GUEGUEN, M. et al. Shellfish and Residual Chemical Contaminants: Hazards, Monitoring, and Health Risk Assessment Along French Coasts. REVIEWS OF ENVIRONMENTAL CONTAMINATION AND TOXICOLOGY, VOL 213, 2011, vol. 213, s. 55.

500. GUENTHER, L. a JOUBERT, M. Support for research in climate change and nuclear energy, but less so for fracking: Born-free South Africans' attitudes towards scientific controversies. AFRICAN JOURNAL OF SCIENCE TECHNOLOGY INNOVATION & DEVELOPMENT, 2018, vol. 10, s. 114.

501. GUINE, R. P. F. et al. New Foods, New Consumers: Innovation in Food Product Development. CURRENT NUTRITION & FOOD SCIENCE, 2016, vol. 12, s. 175.

502. GUIRAUD, I. et al. Population-based incidence, seasonality and serotype distribution of invasive salmonellosis among children in Nanoro, rural Burkina Faso. PLOS ONE, 2017, vol. 12.

503. GUL, S. et al. Research output on Lavender, 2008-2012. EUROPEAN JOURNAL OF INTEGRATIVE MEDICINE, 2015, vol. 7, s. 460.

504. GÜNGÖR-DEMIRCI, G. et al. How do people make a decision on bottled or tap water? Preference elicitation with nonparametric bootstrap simulations. Water and Environment Journal, 2016, vol. 30, s. 243.

505. GUO, Y. et al. Developing a user community in the photosciences: a website for

spectral data and access to PhotochemCAD. REPORTERS, MARKERS, DYES, NANOPARTICLES, AND MOLECULAR PROBES FOR BIOMEDICAL APPLICATIONS XI, 2019, vol. 10893.

506. GUO, Z. 2018, *Macromolecular engineering plastic used for preparing e.g. cell phone, TV, and washing machine comprises nano-silicon dioxide, talc, crosslinking agent, antioxidant, composite material, compatibilizer, flexibilizer and glass fiber*, CN107573583-A.

507. GUPTA, N. et al. Acceptance of Agri-Food Nanotechnology: Insights from the Evolution of Food Technology, Novel Foods and the Psychology of Novel Food Acceptance and Evidence from Present Research. NANOTECHNOLOGIES IN FOOD, 2ND EDITION, 2017, vol. 42, s. 39.

508. GURTLER, V. a PAVIA, C. Developments in immunological technologies leading to improvements in point-of-care diagnostic testing. JOURNAL OF MICROBIOLOGICAL METHODS, 2011, vol. 86, s. 275.

509. GUSTON, D. H. Building the capacity for public engagement with science in the United States. PUBLIC UNDERSTANDING OF SCIENCE, 2014, vol. 23, s. 53.

510. GUVEN, O. et al. Microplastic litter composition of the Turkish territorial waters of the Mediterranean Sea, and its occurrence in the gastrointestinal tract of fish. ENVIRONMENTAL POLLUTION, 2017, vol. 223, s. 286.

511. HABER, B. a STAEHLE, S. Nanotechnology in Food Fact or Fiction? DEUTSCHE LEBENSMITTEL-RUNDSCHAU, 2008, vol. 104, s. 8.

512. HADAVAND, M. a HASNI, S. Exosomal biomarkers in oral diseases. Oral Diseases, 2019, vol. 25, s. 10.

513. HADJICHRISTODOULOU, C. et al. A Case-Control Study on the Risk Factors for Meningococcal Disease among Children in Greece. PLOS ONE, 2016, vol. 11.

514. HAEGERBAEUMER, A. et al. Impacts of Micro- and Nano-Sized Plastic Particles on Benthic Invertebrates: A Literature Review and Gap Analysis. FRONTIERS IN ENVIRONMENTAL SCIENCE, 2019, vol. 7.

515. HALKIER, B. Mundane science use in a practice theoretical perspective: Different understandings of the relations between citizen-consumers and public communication initiatives build on scientific claims. PUBLIC UNDERSTANDING OF SCIENCE, 2017, vol. 26, s. 40.

516. HALLMAN, W. K. et al. Consumer perceptions of nanomaterials in functional foods. 2015. s.

517. HAN, Y. et al. Crackle template based metallic mesh with highly homogeneous light transmission for high-performance transparent EMI shielding. SCIENTIFIC REPORTS, 2016, vol. 6.

518. HANDY, R. D. a SHAW, B. J. Toxic effects of nanoparticles and nanomaterials: Implications for public health, risk assessment and the public perception of nanotechnology. HEALTH RISK & SOCIETY, 2007, vol. 9, s. 125.

519. HANSEN, S. F. et al. NanoRiskCat: a conceptual tool for categorization and communication of exposure potentials and hazards of nanomaterials in consumer products. JOURNAL OF NANOPARTICLE RESEARCH, 2013, vol. 16.

520. HANSEN, S. F. et al. NanoRiskCat: a conceptual tool for categorization and communication of exposure potentials and hazards of nanomaterials in consumer products

(vol 16, 2195, 2014). JOURNAL OF NANOPARTICLE RESEARCH, 2017, vol. 19.

521. HANSEN, S. F. a KRISTENSEN, H. V. Horizon-scanning and identification of emerging risks among nanotech companies in Denmark. Nanotechnology Law and Business, 2014, vol. 11, s. 82.

522. HANSON, V. L. Amidst nanotechnology's molecular landscapes: The changing trope of subvisible worlds. SCIENCE COMMUNICATION, 2012, vol. 34, s. 57.

523. HANSSEN, L. et al. Small particles, big issues. An issue analysis of the Dutch national dialogue nanotechnology. TIJDSCHRIFT VOOR COMMUNICATIEWETENSCHAP, 2013, vol. 41, s. 122.

524. HAQUE, A. et al. A review of Zika virus: hurdles toward vaccine development and the way forward. ANTIVIRAL THERAPY, 2018, vol. 23, s. 285.

525. HARRIS, J. et al. The demographics of nuclear power: Comparing nuclear experts', scientists' and non-science professionals' views of risks, benefits and values. ENERGY RESEARCH & SOCIAL SCIENCE, 2018, vol. 46, s. 29.

526. HARROP, P. Flexible integrated circuit. Polymers Paint Colour Journal, 2010, vol. 200.

527. HART, P. W. TAPPI Journal reinstates the "Technical Brief" short-form research paper. TAPPI JOURNAL, 2019, vol. 18, s. 337.

528. HARTHORN, B. H. et al. Risk perception, public participation, and sustainable global development of nanotechnologies. Can Emerging Technologies Make a Difference in Development?, 2013, s. 188.

529. HASSANIN, A. et al. Comparative phylogeography of African fruit bats (Chiroptera, Pteropodidae) provide new insights into the outbreak of Ebola virus disease in West Africa, 2014-2016. COMPTES RENDUS BIOLOGIES, 2016, vol. 339, s. 517.

530. HAWKES, P. W. Scribble, scribble, scribble. Ultramicroscopy, 2013, vol. 126, s. 60.

531. HAYES, S. L. et al. Identification by microarray of a common pattern of gene expression in intact intestine and cultured intestinal cells exposed to virulent Aeromonas hydrophila isolates. Journal of Water and Health, 2006, vol. 4, s. 381.

532. HAYHURST, R. Nanotechnology and the media: Front page or no story? Successful Science Communication, 2011, s. 256.

533. HAYHURST, R. et al. TALKING NANO - WHAT MAKES NANOTECHNOLOGY SPECIAL "While technology shapes the future, it is people who shape technology, and decide what it can and should be used for" (Kofi Annan). 2007. s.

534. HAYMAN, D. T. S. et al. Evidence of Henipavirus Infection in West African Fruit Bats. PLOS ONE, 2008, vol. 3.

535. HAYS, S. A. et al. Public attitudes towards nanotechnology- enabled cognitive enhancement in the United States. Nanotechnology, the Brain, and the Future, 2013, s. 43.

536. HAZRA, S. a SETUA, S. K. Trust based secure wireless communication in Ubiquitous network 2014.

537. HE, C. Decoding the transcriptome and DNA methylome of human primordial

germ cells. SCIENCE CHINA-LIFE SCIENCES, 2015, vol. 58, s. 729.

538. HE, T. et al. Electrochemical Hydrogen Production. 2017. s.

539. HEIDMANN, I. a MILDE, J. Communication about scientific uncertainty: how scientists and science journalists deal with uncertainties in nanoparticle research. Environmental Sciences Europe, 2013, vol. 25.

540. HEINZE, T. a BAUER, G. Characterizing creative scientists in nano-S&T: Productivity, multidisciplinarity, and network brokerage in a longitudinal perspective. SCIENTOMETRICS, 2007, vol. 70, s. 811.

541. HEINZE, T. a KUHLMANN, S. Analysis of heterogeneous collaboration in the German research system with a focus on nanotechnology. New Forms of Governance in Research Organizations: Disciplinary Approaches, Interfaces and Integration, 2007, s. 187.

542. HELLER, A. C. et al. Surgery of the mind and mood: A mosaic of issues in time and evolution. Neurosurgery, 2006, vol. 59, s. 720.

543. HENRY, M. a DEBARBIEUX, L. Tools from viruses: Bacteriophage successes and beyond. VIROLOGY, 2012, vol. 434, s. 151.

544. HEO, J. et al. Constructions of secure entanglement channels assisted by quantum dots inside single-sided optical cavities. Optics Communications, 2017, vol. 396, s. 239.

545. HESSENBRUCH, A. et al. BEYOND TRUTH: PLEASURE OF NANOFUTURES. 2006. s.

546. HEYDARNEZHAD, H. R. et al. Conducting Electroactive Polymers via Photopolymerization: A Review on Synthesis and Applications. POLYMER-PLASTICS TECHNOLOGY AND ENGINEERING, 2018, vol. 57, s. 1093.

547. HIBBERT, L. Small is beautiful...and functional too. Professional Engineering, 2004, vol. 17, s. 31.

548. HILBICH, D. et al. Stretchable electronics for wearable and high-current applications. NANOSENSORS, BIOSENSORS, AND INFO-TECH SENSORS AND SYSTEMS 2016, 2016, vol. 9802.

549. HILL, S. C. et al. Early Genomic Detection of Cosmopolitan Genotype of Dengue Virus Serotype 2, Angola, 2018. EMERGING INFECTIOUS DISEASES, 2019, vol. 25, s. 784.

550. HILVERDA, F. et al. Social media mediated interaction with peers, experts and anonymous authors: Conversation partner and message framing effects on risk perception and sense-making of organic food. FOOD QUALITY AND PREFERENCE, 2017, vol. 56, s. 107.

551. HIX, P. a HECKL, W. M. Public understanding of research: The open research laboratory at the Deutsches museum. Successful Science Communication, 2011, s. 372.

552. HO, S. S. et al. Effects of value predispositions, mass media use, and knowledge on public attitudes toward embryonic stem cell research. INTERNATIONAL JOURNAL OF PUBLIC OPINION RESEARCH, 2008, vol. 20, s. 171.

553. HO, S. S. et al. Seeking Information About Climate Change: Effects of Media Use in an Extended PRISM. SCIENCE COMMUNICATION, 2014, vol. 36, s. 270.

554. HO, S. S. et al. Science Literacy or Value Predisposition? A Meta-Analysis of Factors Predicting Public Perceptions of Benefits, Risks, and Acceptance of Nuclear Energy.

ENVIRONMENTAL COMMUNICATION-A JOURNAL OF NATURE AND CULTURE, 2019, vol. 13, s. 457.

555. HOENEN, T. et al. Nanopore Sequencing as a Rapidly Deployable Ebola Outbreak Tool. EMERGING INFECTIOUS DISEASES, 2016, vol. 22, s. 331.

556. HOET, P. H. M. Opinion of the Scientific Committee on Consumer Safety (SCCS) - Revision of the opinion on the safety of the use of Silica, Hydrated Silica, and Silica Surface Modified with Alkyl Silylates (nano form) in cosmetic products. REGULATORY TOXICOLOGY AND PHARMACOLOGY, 2016, vol. 74, s. 79.

557. HOMAN, R. N. et al. Detection of Ranavirus in Ohio, USA. Herpetological Review, 2013, vol. 44, s. 615.

558. HOSNEDLOVA, B. et al. Carbon Nanomaterials for Targeted Cancer Therapy Drugs: A Critical Review. CHEMICAL RECORD, 2019, vol. 19, s. 502.

559. HUA, F. et al. 2017, *High-definition light wall paper base paper comprises base paper layer, acrylic resin layer, and superfine light calcium/nano silicon dioxide layer,* CN206503037-U.

560. HUANG, J. J. et al. Nitride Semiconductor Light-Emitting Diodes (LEDs): Materials, Technologies and Applications. 2013. s.

561. HUANG, J. J. et al. Nitride Semiconductor Light-Emitting Diodes (LEDs): Materials, Technologies, and Applications: Second Edition. 2017. s.

562. HUANG, S. et al. Cellular communication promotes mammosphere growth and collective invasion through microtubule-like structures and angiogenesis. Oncology Reports, 2018, vol. 40, s. 3297.

563. HUANG, Y. 2010, *Anti-glare and anti-microbial surface paint for touch panel used in e.g. mobile communication device, flat computer, digital camera and digital music player, comprises nano molecule of cyclic metal containing siloxane polymer*, CN102464942-A.

564. HUANG, Y. et al. Solid electrolyte for thin film energy storage devices 2001, vol. 2, s. 887.

565. HUDSON, J. a ORVISKA, M. European public opinion warms to nanotechnology. NANO TODAY, 2009, vol. 4, s. 455.

566. HUMPHRIES, D. L. et al. data_sheet_1_Cross-Jurisdictional Resource Sharing in Local Health Departments: Implications for Services, Quality, and Cost.docx. Figshare, 2018.

567. HUSSAIN, M. M. et al. CMOS technology: A critical enabler for free-form electronics-based killer applications 2016, vol. 9836.

568. HWANG, B. et al. 2013, *Carbon active compound composite, used as energy storage material in e.g. mobile phone, includes first carbon materials, active compounds, and second carbon materials prepared from carbohydrate materials coupled with e.g. active compounds,* US2013320270-A1.

569. HWANG, W. et al. New trends in low power SoC design technologies. 2003. s.

570. IELMINI, D. a LACAITA, A. L. Phase change materials in non-volatile storage. MATERIALS TODAY, 2011, vol. 14, s. 600.

571. IM, H. J. a SHIM, W. S. 2009, *Publication i.e. fairy tale book, for use by children,*

has printing paper provided in printed colorless type photolithography part, where colorless type photonic ink is provided in shapelessness photolithography paper, KR2009004501-U.

572. IMAM, S. S. et al. Photocatalytic degradation of ciprofloxacin in aqueous media: a short review. TOXICOLOGICAL AND ENVIRONMENTAL CHEMISTRY, 2018, vol. 100, s. 518.

573. INTEL, R. C. Challenges and opportunities of emerging nanotechnology for VLSI nanoelectronics 2007.

574. INVENTOR, U. 2018, *Self-cleaning function featured public storage cabinet, has base equipped with ventilating pipe that is provided with active carbon filter screen and screen, and cabinet body whose top part is equipped with exhaust fan*, CN108741785-A.

575. IOANNIS, M. a VAN RODEN, M. Spirited Skies project: Silica Aerogel in Art and Design Applications. MRS ADVANCES, 2017, vol. 2, s. 3491.

576. ISAACS, J. A. et al. Engaging stakeholders in nano-EHS risk governance. Environment Systems & Decisions, 2015, vol. 35, s. 24.

577. ISLAM, M. N. et al. molecular-cloning, sequence-analysis, and detection of Banana bunchy top virus isolates from different parts of India. INDIAN JOURNAL OF VIROLOGY, 2008, vol. 19, s. 133.

578. ISRAELI, O. et al. Complete Genome Sequence of the First Camelpox Virus Case Diagnosed in Israel. MICROBIOLOGY RESOURCE ANNOUNCEMENTS, 2019, vol. 8.

579. ISWARYA, V. et al. Combined toxicity of two crystalline phases (anatase and rutile) of Titania nanoparticles towards freshwater microalgae: Chlorella sp. AQUATIC TOXICOLOGY, 2015, vol. 161, s. 154.

580. IWULSKA, A. a ŚLIWIŃSKI, G. Preparation and characterization of TiO2 nanostructures for catalytic CO2 photoconversion 2012, vol. 183, s. 89.

581. JAIN, K. K. Advances in use of functionalized carbon nanotubes for drug design and discovery. Expert Opinion on Drug Discovery, 2012, vol. 7, s. 1029.

582. JAMALI, H. R. et al. Shared keywords and shared publication journals of converging technologies. Figshare, 2018.

583. JAMIESON, K. H. et al. The oxford handbook of the science of science communication. 2017. s.

584. JAMISON, A. a MEJLGAARD, N. Contextualizing Nanotechnology Education: Fostering a Hybrid Imagination in Aalborg, Denmark. SCIENCE AS CULTURE, 2010, vol. 19, s. 351.

585. JANG, S. M. a HART, P. S. Polarized frames on "climate change" and "global warming" across countries and states: Evidence from Twitter big data. GLOBAL ENVIRONMENTAL CHANGE-HUMAN AND POLICY DIMENSIONS, 2015, vol. 32, s. 11.

586. JANI, A. J. Anti-quorum sensing nanonetwork. Indian Journal of Public Health Research and Development, 2018, vol. 9, s. 1108.

587. JANSEN, H. P. et al. Development of indirect potable reuse in impacted areas of the United States. WATER SCIENCE AND TECHNOLOGY, 2007, vol. 55, s. 357.

588. JAYAPRAKASH, N. et al. An assortment of synthesis methods of silver nanoparticles: A review. Asian Journal of Chemistry, 2019, vol. 31, s. 1405.

589. JENSEN, J. D. et al. Communicating Uncertain Science to the Public: How Amount and Source of Uncertainty Impact Fatalism, Backlash, and Overload. RISK ANALYSIS, 2017, vol. 37, s. 40.

590. JERGOVIC, B. Philosophy, Science and the Media. SYNTHESIS PHILOSOPHICA, 2010, vol. 25, s. 251.

591. JI, F. et al. Development of an immunochromatographic strip test for the rapid detection of zearalenone in wheat from Jiangsu province, China. PLOS ONE, 2017, vol. 12.

592. JIMÉNEZ, A. a RUSECKAITE, R. A. Nano-Biocomposites for Food Packaging. Green Energy and Technology, 2012, vol. 50, s. 393.

593. JIMENEZ, A. S. a VAN TONGEREN, M. Assessment of Human Exposure to ENMs. Advances in experimental medicine and biology, 2017, vol. 947, s. 27.

594. JIN, H. et al. RETRACTED: Facilely self-assembled magnetic nanoparticles/aptamer/carbon dots nanocomposites for highly sensitive up-conversion fluorescence turn-on detection of tetrodotoxin (Retracted article. See vol. 204, pg. 882, 2019). TALANTA, 2018, vol. 176, s. 277.

595. JIN, H. et al. Retraction notice to "Facilely self-assembled magnetic nanoparticles/aptamer/carbon dots nanocomposites for highly sensitive up-conversion fluorescence turn-on detection of tetrodotoxin"(Talanta (2018) 176 (277–283), (S0039914017308627), (10.1016/j.talanta.2017.08.043)). TALANTA, 2019, vol. 204, s. 882.

596. JIN, Z. et al. Inserting MOF into flaky CdS photocatalyst forming special structure and active sites for efficient hydrogen production. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2019, vol. 44, s. 19640.

597. JINCHU, I. et al. Dye sensitized solar cell using natural dyes as chromophores-review. Materials Science Forum, 2014, vol. 771, s. 39.

598. JINDAL, R. P. Compact noise models for MOSFETs. IEEE TRANSACTIONS ON ELECTRON DEVICES, 2006, vol. 53, s. 2051.

599. JOCHUM, T. et al. Integrated circuit amplifiers for multi-electrode intracortical recording. JOURNAL OF NEURAL ENGINEERING, 2009, vol. 6.

600. JOHNSI, M. a SUTHANTHIRARAJ, S. A. Preparation, zinc ion transport properties, and battery application based on poly(vinilydene fluoride- co -hexa fluoro propylene) polymer electrolyte system containing titanium dioxide nanofiller. High Performance Polymers, 2015, vol. 27, s. 877.

601. JONES, R. What have we learned from public engagement? NATURE NANOTECHNOLOGY, 2007, vol. 2, s. 262.

602. JONES, R. The economy of promises. NATURE NANOTECHNOLOGY, 2008, vol. 3, s. 65.

603. JONES, R. A. C. Virus diseases of annual pasture legumes: incidences, losses, epidemiology, and management. CROP & PASTURE SCIENCE, 2012, vol. 63, s. 399.

604. JONES, R. A. L. Introduction public engagement in an evolving science policy landscape. Successful Science Communication, 2011, s. 1.

605. JONES, R. A. L. Reflecting on public engagement and science policy. PUBLIC UNDERSTANDING OF SCIENCE, 2014, vol. 23, s. 27.

606. JOVANOVIC, D. et al. AGE OF HYPER, MICRO AND NANOTARGETING. 2014. s.

607. JOYE, I. J. Cereal biopolymers for nano- and microtechnology: A myriad of opportunities for novel (functional) food applications. TRENDS IN FOOD SCIENCE & TECHNOLOGY, 2019, vol. 83, s. 1.

608. JUNG, J. a PERRUT, M. Particle design using supercritical fluids: Literature and patent survey. Journal of Supercritical Fluids, 2001, vol. 20, s. 179.

609. JUREWICZ, M. [The use of nanotechnology in medicinal products in the light of European Union law]. Polski merkuriusz lekarski : organ Polskiego Towarzystwa Lekarskiego, 2014, vol. 37, s. 369.

610. JUREWICZ, M. The use of nanotechnology in medicinal products in the light of European Union law Wykorzystanie nanotechnologii w produktach leczniczych w s¨wietle prawa Unii Europejskiej. Polski Merkuriusz Lekarski, 2014, vol. 37, s. 369.

611. KAFETZOPOULOU, L. E. et al. Metagenomic sequencing at the epicenter of the Nigeria 2018 Lassa fever outbreak. SCIENCE, 2019, vol. 363, s. 74.

612. KAH, M. Nanopesticides and Nanofertilizers: Emerging Contaminants or Opportunities for Risk Mitigation? FRONTIERS IN CHEMISTRY, 2015, vol. 3.

613. KAH, M. et al. Nano-enabled strategies to enhance crop nutrition and protection. NATURE NANOTECHNOLOGY, 2019, vol. 14, s. 532.

614. KAHAN, D. Fixing the communications failure. NATURE, 2010, vol. 463, s. 296.

615. KAHAN, D. M. NANOTECHNOLOGY AND SOCIETY The evolution of risk perceptions. NATURE NANOTECHNOLOGY, 2009, vol. 4, s. 705.

616. KALE, N. S. MEMS: Design, Fabrication; & their Applications as Chemical & Biosensors. 2015 28TH INTERNATIONAL CONFERENCE ON VLSI DESIGN (VLSID), 2015, s. 8.

617. KAMALI, S. M. et al. Highly tunable elastic dielectric metasurface lenses. LASER & PHOTONICS REVIEWS, 2016, vol. 10, s. 1002.

618. KAMMHUBER, J. et al. Data accompanying the publication "Conductance through a helical state in an indium antimonide nanowire". 4TU.Centre for Research Data, 2017.

619. KAMPERS, F. Advances in nanotechnologies How they are creating better foods. AGRO FOOD INDUSTRY HI-TECH, 2010, vol. 21, s. 55.

620. KAMPERS, F. W. H. et al. Opportunities for Nanotechnologies in Food Production. XXVIII INTERNATIONAL HORTICULTURAL CONGRESS ON SCIENCE AND HORTICULTURE FOR PEOPLE (IHC2010): COLLOQUIA AND OVERVIEW, 2011, vol. 916, s. 113.

621. KAMRAN, A. et al. Full genome sequence analysis and putative host-shifting of Milk vetch dwarf virus infecting tobacco (Nicotiana tabacum) in China. VIROLOGY JOURNAL, 2019, vol. 16.

622. KANAMA, D. Multimodal evaluations of japan's nanotechnology competitiveness. International Journal of Innovation and Technology Management, 2013, vol. 10.

623. KANE, C. D. et al. Novel therapeutic uses and formulations of botulinum neurotoxins: A patent review (2012-2014). EXPERT OPINION ON THERAPEUTIC PATENTS, 2015, vol. 25, s. 675.

624. KANG, F. et al. 2015, *Rechargeable zinc ion battery for use in different*

applications, has main body comprising electrode that comprises electrolyte, where active material of electrode is selected as nano-carbon material and electrolyte is selected as gel, CN104272522-A.

625. KANNAN, S. et al. Genesis of Antibiotic Resistance XVI: "Role of Lax Regulations on Pharmaceuticals and personal care products (PPCPs) in AR Pandemic" Antibiotics, and Estradiol are detected in four surface water sites of Edwards Aquifer Authority (EAA), San Antonio, Texas. FASEB JOURNAL, 2016, vol. 30.

626. KANNAN, S. et al. Genesis of Antibiotic Resistance XVI: "Role of Lax Regulations on Pharmaceuticals and personal care products (PPCPs) in AR Pandemic" - Antibiotics, and Estradiol are detected in four surface water sites of Edwards Aquifer Authority (EAA), San Antonio, Texas. FASEB JOURNAL, 2016, vol. 30.

627. KAR, U. K. et al. Integral membrane proteins: bottom-up, top-down and structural proteomics. EXPERT REVIEW OF PROTEOMICS, 2017, vol. 14, s. 715.

628. KATTEL, R. a PRIMI, A. The periphery paradox in innovation policy: Latin America and Eastern Europe compared. Development and Semi-Periphery: Post-Neoliberal Trajectories in South America and Central Eastern Europe, 2012, s. 265.

629. KAUR, I. et al. Nano electronics: A new era of devices. Solid State Phenomena, 2015, vol. 222, s. 99.

630. KAUR, P. et al. Non-covalent functionalization of graphene with poly(diallyl dimethylammonium) chloride: Effect of a non-ionic surfactant. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2015, vol. 40, s. 1541.

631. KAWASAKI, H. Multi-fingered haptic interface robot and its application systems 2009, vol. 144, s. 1.

632. KAWASHIMA, R. a NAKASUKA, S. An attempt of space outreach using nano-satellites - Challenges of UNISEC 2004, vol. 9, s. 5667.

633. KAZACOS, K. R. IMPROVED METHOD FOR RECOVERING ASCARID AND OTHER HELMINTH EGGS FROM SOIL ASSOCIATED WITH EPIZOOTICS AND DURING SURVEY STUDIES. AMERICAN JOURNAL OF VETERINARY RESEARCH, 1983, vol. 44, s. 896.

634. KEARNES, M. et al. Narrative, Nanotechnology and the Accomplishment of Public Responses: a Response to Thorstensen. NANOETHICS, 2014, vol. 8, s. 241.

635. KELLER, A. A. et al. Release of engineered nanomaterials from personal care products throughout their life cycle. JOURNAL OF NANOPARTICLE RESEARCH, 2014, vol. 16.

636. KESSLER, R. Engineered nanoparticles in consumer products: understanding a new ingredient. Environmental health perspectives, 2011, vol. 119, s. a120.

637. KHANDELWAL, N. et al. Budding trends in integrated pest management using advanced micro- and nano-materials: Challenges and perspectives. JOURNAL OF ENVIRONMENTAL MANAGEMENT, 2016, vol. 184, s. 157.

638. KHOSRAVI, N. a SADEGHI, M. The Marketing Strategy for Successful Product Development Performance in Iranian Nanotechnology-based Enterprises. 2014 IEEE INTERNATIONAL CONFERENCE ON INDUSTRIAL ENGINEERING AND ENGINEERING MANAGEMENT (IEEM), 2014, s. 270.

639. KIEMDE, F. et al. IMPACT OF A MALARIA RAPID DIAGNOSTIC TEST DETECTING PLASMODIUM FALCIPARUM-SPECIFIC HISTIDINE-RICH PROTEIN-2 (RDT-PFHRP2) ON THE

MANAGEMENT OF FEBRILE CHILDREN UNDER-5 YEARS OF AGE IN A HIGH SEASONAL MALARIA TRANSMISSION AREA. AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE, 2017, vol. 97, s. 405.

640. KIKTENKO, E. et al. Post-processing procedure for industrial quantum key distribution systems 2016, vol. 741.

641. KIM, D. E. Nano to macro-scale tribological issues in industrial technology 2009, s. 581.

642. KIM, J. et al. Selective perception of novel science: how definitions affect information processing about nanotechnology. JOURNAL OF NANOPARTICLE RESEARCH, 2017, vol. 19.

643. KIM, J. et al. Disentangling the Influence of Value Predispositions and Risk/Benefit Perceptions on Support for Nanotechnology Among the American Public. RISK ANALYSIS, 2014, vol. 34, s. 965.

644. KIM, J. H. A Hyperlink and Semantic Network Analysis of the Triple Helix (University-Government-Industry): The Interorganizational Communication Structure of Nanotechnology. JOURNAL OF COMPUTER-MEDIATED COMMUNICATION, 2012, vol. 17, s. 152.

645. KIM, J. H. a MENQ, C. 2006, *Active visual measurement system using electronic imaging, calculates six-degree of freedom rigid body motion by conducting two-dimensional Fourier transform fringe pattern analysis using inner control loop and outer control loop*, US2007013916-A1.

646. KIM, K. et al. Bioproduction of mushroom mycelium of Agaricus bisporus by commercial submerged fermentation for the production of meat analogue. JOURNAL OF THE SCIENCE OF FOOD AND AGRICULTURE, 2011, vol. 91, s. 1561.

647. KIM, S. et al. Individual perception vs. structural context: Searching for multilevel determinants of social acceptance of new science and technology across 34 countries. SCIENCE AND PUBLIC POLICY, 2014, vol. 41, s. 44.

648. KIM, S.-H. et al. Pathways to support genetically modified (GM) foods in South Korea: Deliberate reasoning, information shortcuts, and the role of formal education. PUBLIC UNDERSTANDING OF SCIENCE, 2013, vol. 22, s. 169.

649. KIM, Y. et al. Nanoscientists and political involvement: Which characteristics make scientists more likely to support engagement in political debates? SCIENCE AND PUBLIC POLICY, 2017, vol. 44, s. 317.

650. KIM, Y. G. et al. Application of the theory of planned behavior to genetically modified foods: Moderating effects of food technology neophobia. FOOD RESEARCH INTERNATIONAL, 2014, vol. 62, s. 947.

651. KIM, Y.-R. et al. Organization of research team for nano-associated safety assessment in effort to study nanotoxicology of zinc oxide and silica nanoparticles. INTERNATIONAL JOURNAL OF NANOMEDICINE, 2014, vol. 9, s. 3.

652. KIMBRELL, G. A. Nanotechnology and Nanomaterial Personal Care Products: Necessary Oversight and Recommendations. Global Regulatory Issues for the Cosmetics Industry, 2007, s. 117.

653. KIOKES, G. et al. Design and implementation of an OFDM system for vehicular communications with FPGA technologies 2011.

654. KIRIHATA, T. a ROSENBLATT, S. Dynamic intrinsic chip ID for hardware security. VLSI: Circuits for Emerging Applications, 2017, s. 357.

655. KNIGHT, J. Students set up forum to debate hot topics. NATURE, 2004, vol. 431, s. 390.

656. KOGASAKA, R. et al. THE 33-NM TO 39-NM VIRUS-LIKE PARTICLES, TENTATIVELY DESIGNATED AS SAPPORO AGENT, ASSOCIATED WITH AN OUTBREAK OF ACUTE GASTROENTERITIS. JOURNAL OF MEDICAL VIROLOGY, 1981, vol. 8, s. 187.

657. KOGUCHI, H. a TANAKA, Y. Interaction of dislocations at interfaces in multilayered materials 2017, vol. 258, s. 102.

658. KÖHLER, A. a SOM, C. How do those who invented the products of tomorrow treat the question of risks? Comment ceux qui inventent les produits de demain traitent-ils la question des risques? Environnement, Risques et Sante, 2009, vol. 8, s. 302.

659. KOMMEL, L. UFG microstructure processing by ECAP from double electron-beam melted rare metal 2008, vol. 584-586 PART 1, s. 349.

660. KONKLE, J. J. et al. A Convex Formulation for Magnetic Particle Imaging X-Space Reconstruction. PLOS ONE, 2015, vol. 10.

661. KORSTEN, U. Nano from CHT's and Sarastro's point of view: A challenge to textile finishing. Textile Network, 2006, s. 30.

662. KRABBENBORG, L. a MULDER, H. A. J. Upstream Public Engagement in Nanotechnology: Constraints and Opportunities. SCIENCE COMMUNICATION, 2015, vol. 37, s. 452.

663. KRAMMER, E.-M. a BOUCKAERT, J. M. J. Norovirus devours human milk oligosaccharides rich in alpha-fucose. JOURNAL OF BIOLOGICAL CHEMISTRY, 2018, vol. 293, s. 11966.

664. KRICKA, L. J. Point-of-care technologies for the future: Technological innovations and hurdles to implementation. Point of Care, 2009, vol. 8, s. 42.

665. KRITTIKA, S. et al. Evidence of nanoemulsion as an effective control measure for fruit flies Drosophila melanogaster. SCIENTIFIC REPORTS, 2019, vol. 9.

666. KRONBERGER, N. et al. Consequences of media information uptake and deliberation: focus groups' symbolic coping with synthetic biology. PUBLIC UNDERSTANDING OF SCIENCE, 2012, vol. 21, s. 174.

667. KUDASHOV, V. I. Social technologies in the knowledge society: Cognitive Aspects. Vestnik Tomskogo gosudarstvennogo universiteta. Filosofiya. Sotsiologiya. Politologiya, 2012, s. 58.

668. KUDISH, I. I. Rough contacts modeled by nonlinear coatings. 2008. s.

669. KUEHNEL, D. et al. Environmental impacts of nanomaterials: providing comprehensive information on exposure, transport and ecotoxicity - the project DaNa2.0. Environmental Sciences Europe, 2014, vol. 26.

670. KUELKAMP-GUERREIRO, I. C. et al. Influence of nanoencapsulation on the sensory properties of cosmetic formulations containing lipoic acid. INTERNATIONAL JOURNAL OF COSMETIC SCIENCE, 2013, vol. 35, s. 105.

671. KUHLBUSCH, T. A. J. et al. NANOTECHNOLOGIES AND ENVIRONMENTAL RISKS Measurement Technologies and Strategies. NANOMATERIALS: RISKS AND BENEFITS, 2009, s. 233.

672. KUIKEN, T. et al. Nanomedicine: Ethical Considerations. 2016. s.

673. KUMAR, P. L. et al. Coat protein-based genealogy of Banana bunchy top virus in the sub-Saharan Africa. PHYTOPATHOLOGY, 2009, vol. 99, s. S68.

674. KUMAR, Y. et al. First report of Ageratum enation virus infecting Crassocephalum crepidioides (Benth.) S. Moore and Ageratum conyzoides L. in India. JOURNAL OF GENERAL PLANT PATHOLOGY, 2011, vol. 77, s. 214.

675. KUNTWORBE, N. et al. Malaria Intervention Policies and Pharmaceutical Nanotechnology as a Potential Tool for Malaria Management. DRUG DEVELOPMENT RESEARCH, 2012, vol. 73, s. 167.

676. KUORWEL, K. K. et al. Review of Mechanical Properties, Migration, and Potential Applications in Active Food Packaging Systems Containing Nanoclays and Nanosilver. COMPREHENSIVE REVIEWS IN FOOD SCIENCE AND FOOD SAFETY, 2015, vol. 14, s. 411.

677. KURATH, M. a GISLER, P. Informing, involving or engaging? Science communication, in the ages of atom-, bio- and nanotechnology. PUBLIC UNDERSTANDING OF SCIENCE, 2009, vol. 18, s. 559.

678. KUTTSCHREUTER, M. a HILVERDA, F. "Listen, did you hear...?" A structural equation model explaining online information sharing on the risks of nanotechnology in food. FOOD QUALITY AND PREFERENCE, 2019, vol. 76, s. 118.

679. KUZMA, J. Nanotechnology in animal production-Upstream assessment of applications. LIVESTOCK SCIENCE, 2010, vol. 130, s. 14.

680. KUZMA, J. Society and policy maker’s responsibilities. Consumer Perception of Product Risks and Benefits, 2017, s. 547.

681. KUZMA, J. et al. Evaluating Oversight Systems for Emerging Technologies: A Case Study of Genetically Engineered Organisms. JOURNAL OF LAW MEDICINE & ETHICS, 2009, vol. 37, s. 546.

682. KUZMA, J. a PRIEST, S. Nanotechnology, Risk, and Oversight: Learning Lessons from Related Emerging Technologies. RISK ANALYSIS, 2010, vol. 30, s. 1688.

683. KYLE, R. a DODDS, S. Avoiding Empty Rhetoric: Engaging Publics in Debates About Nanotechnologies. SCIENCE AND ENGINEERING ETHICS, 2009, vol. 15, s. 81.

684. KYLE, S. et al. Production of self-assembling biomaterials for tissue engineering. TRENDS IN BIOTECHNOLOGY, 2009, vol. 27, s. 423.

685. LABOUISSE, J.-P. et al. Achievements in breeding coconut hybrids for tolerance to coconut foliar decay disease in Vanuatu, South Pacific. EUPHYTICA, 2011, vol. 177, s. 1.

686. LACHANCE, P. A. Nutraceutical/drug/anti-terrorism safety assurance through traceability. TOXICOLOGY LETTERS, 2004, vol. 150, s. 25.

687. LACHANCE, P. A. a BAGCHI, D. Nutraceutical/Drug/Anti-Terrorism Safety Assurance Through Traceability. 2008. s.

688. LACHAPELLE, E. et al. Public Perceptions of Expert Credibility on Policy Issues:

The Role of Expert Framing and Political Worldviews. POLICY STUDIES JOURNAL, 2014, vol. 42, s. 674.

689. LADIKAS, M. et al. Science and technology governance and ethics: A global perspective from Europe, India and China. 2015. s.

690. LAM, M. M. C. et al. Convergence of virulence and MDR in a single plasmid vector in MDR Klebsiella pneumoniae ST15. JOURNAL OF ANTIMICROBIAL CHEMOTHERAPY, 2019, vol. 74, s. 1218.

691. LAMBERTI, A. et al. ArgoMoon: A nano-eyewitness for space exploration 2016.

692. LAN, Y. et al. Physics and applications of aligned carbon nanotubes. ADVANCES IN PHYSICS, 2011, vol. 60, s. 553.

693. LANDAU, J. et al. Visualizing nanotechnology: the impact of visual images on lay American audience associations with nanotechnology. PUBLIC UNDERSTANDING OF SCIENCE, 2009, vol. 18, s. 325.

694. LANDRIAULT, M. a MINARD, P. Does standing up for sovereignty pay off politically? Arctic military announcements and governing party support in Canada from 2006 to 2014. INTERNATIONAL JOURNAL, 2016, vol. 71, s. 41.

695. LAPRESTA-FERNANDEZ, A. et al. Public concern over ecotoxicology risks from nanomaterials: Pressing need for research-based information. ENVIRONMENT INTERNATIONAL, 2012, vol. 39, s. 148.

696. LARA, R. J. et al. Vibrio cholerae in waters of the Sunderban mangrove: relationship with biogeochemical parameters and chitin in seston size fractions. WETLANDS ECOLOGY AND MANAGEMENT, 2011, vol. 19, s. 109.

697. LASKA, L. Literature review: Nanotech safety: Professor Laska's guide to literature and resources. Nanotechnology Law and Business, 2011, vol. 8, s. 61.

698. LATIFF, N. et al. Toxicity of layered semiconductor chalcogenides: beware of interferences. RSC ADVANCES, 2015, vol. 5, s. 67485.

699. LAURENT, B. Science museums as political places. Representing nanotechnology in European science museums. Journal of Science Communication, 2012, vol. 11.

700. LAUX, P. et al. Nanomaterials: certain aspects of application, risk assessment and risk communication. ARCHIVES OF TOXICOLOGY, 2018, vol. 92, s. 121.

701. LEBEDEV, A. A. SiC electronics in the new century. Journal of Wide Bandgap Materials, 2000, vol. 8, s. 129.

702. LECELLIER, C.-H. The democratic side of science-fiction. M S-MEDECINE SCIENCES, 2011, vol. 27, s. 433.

703. LECELLIER, C. H. The democratic side of science-fiction Le côté démocratique de la science-fiction. Medecine/Sciences, 2011, vol. 27, s. 433.

704. LEE, B. I. et al. Nanoparticles for materials design: present & future. JOURNAL OF CERAMIC PROCESSING RESEARCH, 2005, vol. 6, s. 31.

705. LEE, C. J. et al. Public attitudes toward emerging technologies - Examining the interactive effects of cognitions and affect on public attitudes toward nanotechnology. SCIENCE COMMUNICATION, 2005, vol. 27, s. 240.

706. LEE, C.-J. a SCHEUFELE, D. A. The influence of knowledge and deference toward scientific authority: A media effects model for public attitudes toward nanotechnology. JOURNALISM & MASS COMMUNICATION QUARTERLY, 2006, vol. 83, s. 819.

707. LEE, E. W. J. a HO, S. S. The perceived familiarity gap hypothesis: examining how media attention and reflective integration relate to perceived familiarity with nanotechnology in Singapore. JOURNAL OF NANOPARTICLE RESEARCH, 2015, vol. 17.

708. LEE, E. W. J. a HO, S. S. Are Photographs Worth More Than a Thousand Words? Examining the Effects of Photographic-Textual and Textual-Only Frames on Public Attitude Toward Nuclear Energy and Nanotechnology. JOURNALISM & MASS COMMUNICATION QUARTERLY, 2018, vol. 95, s. 948.

709. LEE, H. et al. Investigation of norovirus occurrence in groundwater in metropolitan Seoul, Korea. SCIENCE OF THE TOTAL ENVIRONMENT, 2011, vol. 409, s. 2078.

710. LEE, H. et al. Various On-Chip Sensors with Microfluidics for Biological Applications. SENSORS, 2014, vol. 14, s. 17008.

711. LEE, J. et al. Code of conduct for nanotechnology researchers 2010, s. 1189.

712. LEE, J. et al. Public and Experts Perception about Nanotechnology Hazards in Korea. Environmental Health and Toxicology, 2008, vol. 23, s. 247.

713. LEE, K.-K. et al. Public and Experts Perception Analysis about Negative Effects in Nanotechnology Based on Conjoint Analysis. Journal of the Society of Korea Industrial and Systems Engineering, 2015, vol. 38, s. 49.

714. LEE, K.-S. et al. Feature issue introduction: organic and polymeric materials for photonic applications. OPTICAL MATERIALS EXPRESS, 2017, vol. 7, s. 2691.

715. LEE, L.-H. a RAGHUNATH, P. Editorial: Vibrionaceae Diversity, Multidrug Resistance and Management. FRONTIERS IN MICROBIOLOGY, 2018, vol. 9.

716. LEE, S. H. 2009, *Printing paper, has printing layer provided with powder and solution i.e. nano liquid/perfume liquid emitting flavor, while printing layer is formed in phase of film that is treated by primer for making film to be used for printing purpose*, KR2009012311-U.

717. LEINONEN, A. a KIVISAARI, S. Nanotechnology perceptions: Literature review on media coverage, public opinion and NGO perspectives. VTT Tiedotteita - Valtion Teknillinen Tutkimuskeskus, 2010, s. 1.

718. LEM, K. W. et al. Use of Nanosilver in Consumer Products. RECENT PATENTS ON NANOTECHNOLOGY, 2012, vol. 6, s. 60.

719. LEONG, C. C. et al. Controversial science-based technology public attitude formation and regulation in comparative perspective: The state construction of policy alternatives in Asia. Technology in Society, 2011, vol. 33, s. 128.

720. LEPERS, J. P. et al. [Malaria in a village of the high plateau area of Madagascar in 1987. Present status of Plasmodium falciparum sensitivity to chloroquine. In vitro study. Some epidemiologic findings]. Archives de l'Institut Pasteur de Madagascar, 1988, vol. 54, s. 133.

721. LEPPIN, A. L. et al. Table_1_Applying Social Network Analysis to Evaluate Implementation of a Multisector Population Health Collaborative That Uses a Bridging Hub Organization.XLSX. Figshare, 2018.

722. LERNER, I. Nanotechnology faces recent problems in public image. Chemical Market Reporter, 2003, vol. 263, s. 10.

723. LEWALTER, D. et al. Comparing the Effectiveness of Two Communication Formats on Visitors' Understanding of Nanotechnology. Visitor Studies, 2014, vol. 17, s. 159.

724. LEWENSTEIN, B. V. Introduction - Nanotechnology and the public. SCIENCE COMMUNICATION, 2005, vol. 27, s. 169.

725. LI, F. J. et al. Design and analysis InGaAs near-IR nanowire photodetector for high speed satellite laser communication application 2014, vol. 556-562, s. 5163.

726. LI, G. et al. Pulmonary hypofunction due to calcium carbonate nanomaterial exposure in occupational workers: a cross-sectional study. NANOTOXICOLOGY, 2018, vol. 12, s. 571.

727. LI, G. a YAMAN, F. 2014, *Fabricating silicon from silica, comprises heating silica and solid magnesium in container to produce first product containing magnesium oxide and magnesium silicide, cooling and annealing to produce second product containing silicon*, US2014328741-A1.

728. LI, H. et al. Combined Atomistic-continuum Modeling of Nano-EDM Process 2014, vol. 887-888, s. 1210.

729. LI, J., LI, Y. 2014, *Portable public security organ forensic case wireless nanometer-level-range monitoring device, has telescope mirror case connected with upper part of camera lens shell, and telescope object lens placed in lens hole*, CN103546718-A.

730. LI, J. H. et al. 2010, *Cover-lay film for printed circuit board in e.g. computer, has composite material layer containing epoxy resin, black substance and additive and has core layer between composite material layer and adhesion layer*, JP3159661-U.

731. LI, L. The study on effects resulted from job burnout on performance appraisal of professional coaches in China 2012, vol. 345, s. 405.

732. LI, Q. et al. Cobalt phosphide nanoparticles film growth on carbon cloth: A high-performance cathode for electrochemical hydrogen evolution. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2014, vol. 39, s. 16806.

733. LI, R. et al. Microfluidics for cell-cell interactions: A review. FRONTIERS OF CHEMICAL SCIENCE AND ENGINEERING, 2016, vol. 10, s. 90.

734. LI, Z. P. et al. Concentration aware routing protocol in molecular communication nanonetworks 2014, vol. 556-562, s. 5024.

735. LIANG, X. et al. Information snapshots: What Google searches really tell us about emerging technologies. NANO TODAY, 2012, vol. 7, s. 72.

736. LIANG, X. et al. Building Buzz: (Scientists) Communicating Science in New Media Environments. JOURNALISM & MASS COMMUNICATION QUARTERLY, 2014, vol. 91, s. 772.

737. LIAO, S. et al. 2003, *Nano-structured tungsten carbide bulk material for use as cutting tool, comprises tungsten carbide bulk having carbide phase with nano-structures, which is sintered from tungsten carbide and metal nano-powders,* US6814927.

738. LIATENI, K. et al. Advanced integrated solution for MEMS design. DESIGN, TEST, AND MICROFABRICATION OF MEMS AND MOEMS, PTS 1 AND 2, 1999, vol. 3680, s. 161.

739. LIAW, I. I. et al. THE DEVELOPMENT AND APPLICATION OF UV EXCIMER LAMPS IN NANOFABRICATION. FUNCTIONALIZED NANOSCALE MATERIALS, DEVICES AND SYSTEMS, 2008, s. 61.

740. LIMA, M. A. V. A. Desafios futuros: de uma análise da genética e biotecnologia na imprensa portuguesa durante o biénio 1994/5 para novas tecnologias nas sociedades actuais. Ambiente & Sociedade, 2006, vol. 9, s. 175.

741. LIMA, M. A. V. A. Future challenges: From an analysis of genetics and biotechnology in Portuguese press during 1994/5 to new technologies in actual societies Desafios futuros - De uma análise da genética e biotecnologia na imprensa Portuguesa durante o biénio 1994/5 para novas tecnologias nas sociedades actuais. Ambiente e Sociedade, 2006, vol. 9, s. 175.

742. LIN, A. et al. What Is Responsible Development of Nanotechnology? NANOTECHNOLOGY: DELIVERING ON THE PROMISE, VOL 1, 2016, vol. 1220, s. 111.

743. LIN, C. et al. 2017, *Method for manufacturing package structure of e.g. thin film capacitors for electronic products in vehicles, involves performing post-treatment process to remove protective film from electrode pin, and heating multiple xylene dimers*, US2017110256-A1.

744. LIN, H. N. et al. Statistical analysis of EMI noise measurement for Flash Memory 2011, s. 245.

745. LIN, H. Y. Communication transmission device based on new nano material 2013, vol. 722, s. 9.

746. LIN, S.-F. et al. Are Science Comics a Good Medium for Science Communication? The Case for Public Learning of Nanotechnology. INTERNATIONAL JOURNAL OF SCIENCE EDUCATION PART B-COMMUNICATION AND PUBLIC ENGAGEMENT, 2015, vol. 5, s. 276.

747. LIN, Y. et al. 2011, *Semiconductor device e.g. integrated semiconductor devices, has Integrated Passive Device (IPD) which is mounted on conductive layer such that IPD is arranged between conductive pillars*, US2011163414-A1.

748. LIN, Y. P. et al. Perceptions of nano-products and nanotechnology by Taiwanese adults. Taiwan Journal of Public Health, 2010, vol. 29, s. 431.

749. LIN, Y.-P. et al. Public Perceptions of Nanotechnology in Taiwan. EPIDEMIOLOGY, 2011, vol. 22, s. S67.

750. LINDSAY, A. J. Monoclonal Antibody Production: A Project-Based Laboratory Program for Final Year Biotechnology Undergraduate Students. JOURNAL OF CHEMICAL EDUCATION, 2019.

751. LIU, G. et al. Fabrication of silver nanoparticle sponge leather with durable antibacterial property. JOURNAL OF COLLOID AND INTERFACE SCIENCE, 2018, vol. 514, s. 338.

752. LIU, H. a ASCENCIO, J. A. Structural stability and thermal transformation of Pt-Sn bimetallic nano clusters. Journal of Nano Research, 2010, vol. 12, s. 131.

753. LIU, H. a PRIEST, S. Understanding public support for stem cell research: media communication, interpersonal communication and trust in key actors. PUBLIC UNDERSTANDING OF SCIENCE, 2009, vol. 18, s. 704.

754. LIU, J. et al. Dual-stage nanofiltration seawater desalination: Water quality,

scaling and energy consumption. Desalination and Water Treatment, 2014, vol. 52, s. 134.

755. LIU, T. et al. One-step electrodeposition of Ni-Co-S nanosheets film as a bifunctional electrocatalyst for efficient water splitting. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2016, vol. 41, s. 7264.

756. LIU, X. et al. Is "nano safe to eat or not"? A review of the state-of-the art in soft engineered nanoparticle (sENP) formulation and delivery in foods. Advances in food and nutrition research, 2019, vol. 88, s. 299.

757. LIU, Z. et al. Measuring dynamic sales impacts of LBA using wireless communication technology 2013, vol. 662, s. 896.

758. LIU, Z. M. et al. Influence factors concept model for public participation in nanotechnology risk communication. Journal of Donghua University (English Edition), 2016, vol. 33, s. 327.

759. LO, C.-C. et al. An empirical study of commercialization performance on nanoproducts. TECHNOVATION, 2012, vol. 32, s. 168.

760. LOCHAROENRAT, K. Review article: Mechanism of resonant enhancement of gold- and copper-nanowires arrays 2014, vol. 902, s. 29.

761. LOCK, S. J. et al. "Nuclear energy sounded wonderful 40 years ago": UK citizen views on CCS. ENERGY POLICY, 2014, vol. 66, s. 428.

762. ŁOJKOWSKI, W. et al. Quo Vadis Nanotechnology? The Nano-Micro Interface: Bridging the Micro and Nano Worlds: Second Edition, 2015, vol. 1-2, s. 79.

763. LOK, C. Science funding: Science for the masses. NATURE, 2010, vol. 465, s. 416.

764. LOMBARDI, S. a ESPOSITO, F. A NEW METHOD FOR IDENTIFICATION OF THE ANIMAL ORIGIN OF MOSQUITO BLOODMEALS BY THE IMMUNOBINDING OF PEROXIDASE-ANTI-PEROXIDASE COMPLEXES ON NITROCELLULOSE. JOURNAL OF IMMUNOLOGICAL METHODS, 1986, vol. 86, s. 1.

765. LOPEZ, D. et al. MEMS technology for the advancement of science. JOURNAL OF LOW TEMPERATURE PHYSICS, 2004, vol. 135, s. 51.

766. LOPEZ, N. V. et al. 2013, *Package for e.g. in-the-wash particulate added to laundry washing machine in home during washing cycle, has dosing cup comprising vent opening unobstructed by shrink sleeve, which bridges over portion of recessed portion*, US2013075422-A1.

767. LORENZET, A. Fear of being irrelevant? Science communication and nanotechnology as an 'internal' controversy. Journal of Science Communication, 2012, vol. 11.

768. LOUVEL, S. a HUBERT, M. The use of foreign examples in research policy. Public funding for nanoscience and nanotechnology in France. REVUE FRANCAISE DE SOCIOLOGIE, 2016, vol. 57, s. 473.

769. LU, C. Y. a XU, L. X. Design of a MEMS broadband microstrip patch antenna based on Minkowski fractal boundary 2012, vol. 503, s. 227.

770. LU, X. Fabrication of edible biocompatible carbohydrate particle-based Pickering emulsions. Rutgers University Community Repository, 2017.

771. LUBSCH, A. a TIMMERMANS, K. Texture analysis of Laminaria digitata (Phaeophyceae) thallus reveals trade-off between tissue tensile strength and toughness along lamina. BOTANICA MARINA, 2017, vol. 60, s. 229.

772. LUBY, Š. a LUBYOVÁ, M. Nanoethics - A new chapter in ethical studies. Informatologia, 2015, vol. 48, s. 95.

773. LUCONI, L. et al. H2 production from lightweight inorganic hydrides catalyzed by 3d transition metals. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2019, vol. 44, s. 25746.

774. LUKE, T. et al. Fully Human Immunoglobulin G From Transchromosomic Bovines Treats Nonhuman Primates Infected With Ebola Virus Makona Isolate. JOURNAL OF INFECTIOUS DISEASES, 2018, vol. 218, s. S636.

775. LUTHER, W. a ZWECK, A. Safety aspects of engineered nanomaterials. 2013. s.

776. LYMBERIS, A. et al. Smart Systems and Personalized Health: The Real Challenge of Bridging the Innovation Gap. PHEALTH 2014, 2014, vol. 200, s. 3.

777. MA, C. et al. The investigation of the microstructures and properties of the submicron barium titanate based X7R ceramics. Xiyou Jinshu Cailiao Yu Gongcheng/Rare Metal Materials and Engineering, 2005, vol. 34, s. 1023.

778. MA, X. a SANCHEZ, S. Self-propelling micro-nanorobots: challenges and future perspectives in nanomedicine. NANOMEDICINE, 2017, vol. 12, s. 1363.

779. MAASS, G. et al. VISUALIZATION BY ELECTRON-MICROSCOPY OF 28 NM VIRUS-PARTICLES (ASTROVIRUSES) IN FECES OF NEWBORNS WITH ACUTE NON-BACTERIAL GASTROENTERITIS. ZENTRALBLATT FUR BAKTERIOLOGIE MIKROBIOLOGIE UND HYGIENE SERIES A-MEDICAL MICROBIOLOGY INFECTIOUS DISEASES VIROLOGY PARASITOLOGY, 1978, vol. 242, s. 423.

780. MACNAGHTEN, P. et al. Understanding Public Responses to Emerging Technologies: A Narrative Approach. JOURNAL OF ENVIRONMENTAL POLICY & PLANNING, 2019, vol. 21, s. 504.

781. MACNAGHTEN, P. et al. Nanotechnology, Risk and Public Perceptions. IN PURSUIT OF NANOETHICS, 2014, vol. 10, s. 167.

782. MACOUBRIE, J. Nanotechnology: public concerns, reasoning and trust in government. PUBLIC UNDERSTANDING OF SCIENCE, 2006, vol. 15, s. 221.

783. MACPHAIL, R. C. et al. Assessing nanoparticle risk poses prodigious challenges. WILEY INTERDISCIPLINARY REVIEWS-NANOMEDICINE AND NANOBIOTECHNOLOGY, 2013, vol. 5, s. 374.

784. MACPHERSON, C. N. L. Human behaviour and the epidemiology of parasitic zoonoses. INTERNATIONAL JOURNAL FOR PARASITOLOGY, 2005, vol. 35, s. 1319.

785. MAGAUDDA, P. Nanotechnologies and emerging cultural spaces for the public communication of science and technologies: An introduction. Journal of Science Communication, 2012, vol. 11.

786. MAGNUSON, B. A. et al. Benefits and challenges of the application of nanotechnology to food 2007, vol. 2, s. 594.

787. MAHMOUDI, M. R. H. et al. Calcination effects on texture and porosimetric

properties of regular and nano-structured alumina utilized as catalyst support for the FT Synthesis 2012, vol. 468-471, s. 87.

788. MAIMON, O. et al. NHECD - Nano Health and Environmental Commented Database. 2010. s.

789. MAITRA, P. a BRAHMS, J. C. 2008, *Cosmetic or pharmaceutical composition for improving the appearance of biological surfaces, e.g. skin, includes nanocomposite pigment comprising of core and shell comprising nanoparticles, and vehicle*, WO2008079758-A1.

790. MAITRA, P. a ZHENG, T. Cosmetic nanocomposites based on in-situ cross-linked POSS materials. Official Gazette of the United States Patent and Trademark Office Patents, 2012.

791. MAITRA, P. a ZHENG, T. Cosmetic nanocomposites based on in-situ crosslinked POSS materials. Official Gazette of the United States Patent and Trademark Office Patents, 2013.

792. MAKKOUK, K. M. et al. First record of Beet western yellows virus, Chickpea chlorotic dwarf virus, Faba bean necrotic yellows virus and Soybean dwarf virus infecting chickpea and lentil crops in Iran. PLANT PATHOLOGY, 2002, vol. 51, s. 387.

793. MAKKOUK, K. M. a KUMARI, S. G. Epidemiology and integrated management of persistently transmitted aphid-borne viruses of legume and cereal crops in West Asia and North Africa. VIRUS RESEARCH, 2009, vol. 141, s. 209.

794. MALAKOFF, D. Nanotechnology research - Congress wants studies of nanotech's 'dark side'. SCIENCE, 2003, vol. 301, s. 27.

795. MALSCH, N. H. Biomedical Nanotechnology. 2005. s.

796. MANCA, G. et al. Sentinel lymph node biopsy in breast cancer: A technical and clinical appraisal. Nuclear Medicine Communications, 2016, vol. 37, s. 570.

797. MANOUKIAN, E. B. Electromagnetic propagation across a metal: the causal propagator. JOURNAL OF ELECTROMAGNETIC WAVES AND APPLICATIONS, 2016, vol. 30, s. 677.

798. MARANO, F. "The timing of research": From problem identification to scientific response, through the history of particulate pollution « le temps de la recherche »: De l'identification du problème à la réponse scientifique à travers l'histoire de la pollution particulaire. Pollution Atmospherique, 2010, s. 29.

799. MARCHANT, G. E. et al. Risk management principles for nanotechnology. NANOETHICS, 2008, vol. 2, s. 43.

800. MARCHANT, G. E. et al. What Does the History of Technology Regulation Teach Us about Nano Oversight? JOURNAL OF LAW MEDICINE & ETHICS, 2009, vol. 37, s. 724.

801. MARCU, A. et al. Analogies, metaphors, and wondering about the future: Lay sense-making around synthetic meat. PUBLIC UNDERSTANDING OF SCIENCE, 2015, vol. 24, s. 547.

802. MARIMON, J. M. et al. Antibody microarray typing, a novel technique for Streptococcus pneumoniae serotyping. JOURNAL OF MICROBIOLOGICAL METHODS, 2010, vol. 80, s. 274.

803. MARKS, N. J. Speech acts and performances of scientific citizenship: Examining

how scientists talk about therapeutic cloning. PUBLIC UNDERSTANDING OF SCIENCE, 2014, vol. 23, s. 494.

804. MARSCHALEK, I. a HOFER, M. Nano and the public. NATURE NANOTECHNOLOGY, 2017, vol. 12, s. 92.

805. MARTIN, D. et al. Toxicity and regulatory perspectives of carbon nanotubes. 2011. s.

806. MARTURANO, A. Bioinformatics and Ethics. Encyclopedia of Applied Ethics, 2012, s. 278.

807. MASHINCHIAN, O. et al. Stem-Cell Nanoengineering from Bench to Bed. 2015. s.

808. MASSAWE, E. Nanomaterials for Environmental Remediation: Investigating the Role of Nanoinformatics in Support of Environmental, Health, and Safety Oversight of Nanotechnologies at the Local Level. JOURNAL OF ENVIRONMENTAL HEALTH, 2013, vol. 76, s. 8.

809. MATHEW, S. et al. Computational screening of known broad-spectrum antiviral small organic molecules for potential influenza HA stem inhibitors. PLOS ONE, 2018, vol. 13.

810. MATHIAS, F. T. et al. Assessment of Toxic and Environmental Effects of Silver Salt Nanoparticles. Revista de Ciencias Farmaceuticas Basica e Aplicada, 2014, vol. 35, s. 187.

811. MATHIAS, F. T. et al. Assessment of toxic and environmental effects of silver salt nanoparticles Avaliação dos efeitos toxicológicos e ambientais de nanopartículas de sais de prata. Revista de Ciencias Farmaceuticas Basica e Aplicada, 2014, vol. 35, s. 187.

812. MATHUR, M. a DEVI, V. K. Potential of novel drug delivery systems in the management of topical candidiasis. JOURNAL OF DRUG TARGETING, 2017, vol. 25, s. 685.

813. MATSUURA, J. Expecting the public backlash: Public relations lessons for nanotechnology from the biotechnology experience 2004, vol. 3, s. 491.

814. MAYNARD, A. D. a KIDD, J. Are assumptions of consumer views impeding nano-based water treatment technologies? NATURE NANOTECHNOLOGY, 2018, vol. 13, s. 673.

815. MCCOMAS, K. When even the 'best-laid' plans go wrong - Strategic risk communication for new and emerging risks. EMBO REPORTS, 2004, vol. 5, s. S61.

816. MCCOMAS, K. When even the 'best-laid' plans go wrong. EMBO REPORTS, 2004, vol. 5 Spec No, s. S61.

817. MCCOMAS, K. A. Researcher Views About Funding Sources and Conflicts of Interest in Nanotechnology. SCIENCE AND ENGINEERING ETHICS, 2012, vol. 18, s. 699.

818. MCCOMAS, K. A. et al. Risky business perceived behavior of local scientists and community support for their research. RISK ANALYSIS, 2008, vol. 28, s. 1539.

819. MCCRAY, P. How nanotechnology captured the public imagination. NATURE, 2010, vol. 467, s. 271.

820. MCGOWAN, M. Tunneling nanotubes - Crossing the bridge Nanotüp Tünelleme-Köprüyü geçmek. Journal of Cell and Molecular Biology, 2011, vol. 9, s. 11.

821. MCLAREN, D. et al. Public conceptions of justice in climate engineering: Evidence from secondary analysis of public deliberation. GLOBAL ENVIRONMENTAL CHANGE-HUMAN AND POLICY DIMENSIONS, 2016, vol. 41, s. 64.

822. MEGHANI, Z. a KUZMA, J. The "Revolving Door" between Regulatory Agencies and Industry: A Problem That Requires Reconceptualizing Objectivity. JOURNAL OF AGRICULTURAL & ENVIRONMENTAL ETHICS, 2011, vol. 24, s. 575.

823. MEJIAS SÁNCHEZ, Y. et al. La nanotecnología y sus posibilidades de aplicación en el campo científico-tecnológico. Revista Cubana de Salud Publica, 2009, vol. 35, s. 0.

824. MEJIAS SÁNCHEZ, Y. et al. Nanotechnology and its possibilities of application in the scientific-technological field La nanotecnología y sus posibilidades de aplicación en el campo científico-tecnológico. Revista Cubana de Salud Publica, 2009, vol. 35.

825. MEKSI, N. a MOUSSA, A. A review of progress in the ecological application of ionic liquids in textile processes. JOURNAL OF CLEANER PRODUCTION, 2017, vol. 161, s. 105.

826. MENDELSON, M. et al. A nanotechnology course for undergraduates. International Journal of Engineering Education, 2007, vol. 23, s. 960.

827. MEREL, S. et al. Spatial and thematic distribution of research on cyanotoxins. TOXICON, 2013, vol. 76, s. 118.

828. MEYER, M. Are patenting scientists the better scholars? 2005. s.

829. MEYER, M. Are patenting scientists the better scholars? An exploratory comparison of inventor-authors with their non-inventing peers in nano-science and technology. RESEARCH POLICY, 2006, vol. 35, s. 1646.

830. MEYER, M. Knowledge integrators or weak links? An exploratory comparison of patenting researchers with their non-inventing peers in nano-science and technology. SCIENTOMETRICS, 2006, vol. 68, s. 545.

831. MEYER, M. et al. Knowledge integrators or weak links? Inventor-authors: An exploratory comparison of patenting researchers with their non-inventing peers in nano-science and technology. 2005. s.

832. MIAH, A. Nanoethics, Science Communication, and a Fourth Model for Public Engagement. NANOETHICS, 2017, vol. 11, s. 139.

833. MICHEL, J. P. The future of geriatric medicine. EUROPEAN GERIATRIC MEDICINE, 2012, vol. 3, s. 233.

834. MICHELSON, E. S. et al. Nanotech Ethics and the Policymaking Process: Lessons Learned for Advancing Equity and Equality in Emerging Nanotechnologies. 2011. s.

835. MICHELSON, E. S. a REJESKI, D. Failing Through the Cracks? Public Perception, Risk, and the Oversight of Emerging Nanotechnologies. 2006. s.

836. MICHELSON, E. S. a REJESKI, D. Falling through the cracks? Public perception, risk, and the oversight of emerging nanotechnologies 2006.

837. MIHALACHE, D. et al. PROCEEDINGS OF THE ROMANIAN ACADEMY - SERIES A: AN ACCOUNT OF THE PHYSICS SECTION. ROMANIAN REPORTS IN PHYSICS, 2018, vol. 70.

838. MIHRANYAN, A. et al. Current status and future prospects of nanotechnology in cosmetics. PROGRESS IN MATERIALS SCIENCE, 2012, vol. 57, s. 875.

839. MIKHELASHVILI, V. et al. Optically sensitive devices based on Pt nano particles fabricated by atomic layer deposition and embedded in a dielectric stack. JOURNAL OF APPLIED PHYSICS, 2015, vol. 118.

840. MILETI, A. et al. Nanomarketing: A New Frontier for Neuromarketing. PSYCHOLOGY & MARKETING, 2016, vol. 33, s. 664.

841. MILITARU, G. a IONESCU, S. An examination of whether and how can reduce the barriers to nanotechnology transfer: A conceptual approach. Metalurgia International, 2013, vol. 18, s. 150.

842. MILLER, R. R. 2014, *Two-tier broadband wireless access network e.g. neighborhood area networks, for e.g. wireless gaming device, has network concatenation device for forming indoor network serving communication device at location associated with subscriber*, US8625547-B1.

843. MILLS, J. K. The language of nanotechnology and its role in intellectual property, regulatory settings, and consumer perception. Nanotechnology in Dermatology, 2013, vol. 9781461450344, s. 261.

844. MINOLI, D. Nanotechnology Applications to Telecommunications and Networking. 2005. s.

845. MIR, L. Laypeople's and experts' perception of nanotechnology hazards Perception des dangers des nanotechnologies par les experts et les profanes. Environnement, Risques et Sante, 2007, vol. 6, s. 331.

846. MIRABELLO, V. et al. Metallic nanoparticles as synthetic building blocks for cancer diagnostics: from materials design to molecular imaging applications. JOURNAL OF MATERIALS CHEMISTRY B, 2015, vol. 3, s. 5657.

847. MIRDAMADI, S. M. et al. Analysis of socio-cultural obstacles for dissemination of nanotechnology from Iran's agricultural Experts perspective. World Academy of Science, Engineering and Technology, 2011, vol. 73, s. 426.

848. MIRJANA, D. et al. THE IMPORTANCE AND USE OF NANOPACKING IN FOOD INDUSTRY. Veterinarski Glasnik, 2015, vol. 69, s. 139.

849. MISHIRO, S. et al. TUBULAR FORMS OF HEPATITIS-B SURFACE-ANTIGEN BIND WITH THE NUCLEUS OF 22-NM SPHERICAL HBSAG PARTICLES. JOURNAL OF MEDICAL VIROLOGY, 1980, vol. 6, s. 269.

850. MISHRA, D. K. et al. Transdermal immunization: biological framework and translational perspectives. EXPERT OPINION ON DRUG DELIVERY, 2013, vol. 10, s. 183.

851. MONCADA A, E. NANOTECNOLOGÍA, APLICACIONES EN EMBALAJES PARA ALIMENTOS Y PRODUCTOS FARMACÉUTICOS. Vitae, 2007, vol. 14, s. 114.

852. MONCADA, A. E. a CARLSON, E. D. NANOTECNOLOGY: OBTAINING OF NANOPARTICLES AND NANOCOMPOSITES AND THEIR USE IN FOOD AND DRUG PACKAGING. 2009. s.

853. MONEADA, E. Nanotechnology: Obtaining of nanoparticles and nanocomposites and their use in food and drug packaging. Progress in Nanoparticles Research, 2008, s. 137.

854. MOORE, A. Waiter, there's a nanobot in my martini! As nanotechnology gives birth to nanobiotechnology, definitions and perceptions are at risk of becoming mixed into an exotic cocktail. EMBO REPORTS, 2004, vol. 5, s. 448.

855. MORALES-YANEZ, F. et al. ULTRASENSITIVE DETECTION OF <it>TOXOCARA CANIS</it> EXCRETORY-SECRETORY ANTIGENS BY A NANOBODY ELECTROCHEMICAL MAGNETOSENSOR ASSAY. AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE,

2018, vol. 99, s. 238.

856. MORDINI, E. Technology and fear: is wonder the key? TRENDS IN BIOTECHNOLOGY, 2007, vol. 25, s. 544.

857. MORGAN, D. W. 2003, *Portable device e.g. mobile phone sends received input data to configured constructive probabilistic neural network and receives output from constructive probabilistic neural network, in accordance with configuration parameter information*, GB2401205-A.

858. MORGENEYER, M. et al. STEM imaging to characterize nanoparticle emissions and help to design nanosafer paints. CHEMICAL ENGINEERING RESEARCH & DESIGN, 2018, vol. 136, s. 663.

859. MORIMOTO, K. et al. Efficacy of enterotoxigenic Escherichia coli vaccine for bovine clinical mastitis. JOURNAL OF DAIRY RESEARCH, 2011, vol. 78, s. 149.

860. MORITA, K. et al. Thermal characteristics of scattering stencil reticle for electron beam stepper. Japanese Journal of Applied Physics, Part 1: Regular Papers and Short Notes and Review Papers, 1999, vol. 38, s. 7027.

861. MORRIS, J. The role of governmental organizations in communicating about regulating science. The Oxford Handbook of the Science of Science Communication, 2017, s. 197.

862. MORRISSEY, S. R. Managing nanotechnology. CHEMICAL & ENGINEERING NEWS, 2006, vol. 84, s. 34.

863. MOVASSAGHI, S. et al. Wireless Body Area Networks: A Survey. IEEE COMMUNICATIONS SURVEYS AND TUTORIALS, 2014, vol. 16, s. 1658.

864. MUDHOO, A. et al. A review of research trends in the enhancement of biomass-to-hydrogen conversion. WASTE MANAGEMENT, 2018, vol. 79, s. 580.

865. MULLEN, R. A. 2008, *Low photonic energy harvesting and aggregating method for e.g. robotics application, involves aggregating harvested energy from photons until aggregated energy exceeds activation energy level, and driving photon activated process*, WO2008073630-A2.

866. MÜLLER, R. H. et al. Nanostructured lipid carriers (NLC): The second generation of solid lipid nanoparticles. Percutaneous Penetration Enhancers Chemical Methods in Penetration Enhancement: Nanocarriers, 2016, s. 161.

867. MULLER, R. H. et al. Nanosuspensions - Formulations for poorly soluble drugs with poor bioavailability - 2. Stability, biopharmaceutical aspects, possible drug forms and registration aspects. PHARMAZEUTISCHE INDUSTRIE, 1999, vol. 61, s. 175.

868. MULLER, R. H. et al. Nanosuspensions - Formulations for poorly soluble drugs with poor bioavailability - 1st communication: Production and properties. PHARMAZEUTISCHE INDUSTRIE, 1999, vol. 61, s. 74.

869. MÜLLER, R. H. et al. Nanosuspensions - Formulations for poorly soluble drugs with poor bioavailability / 2nd communication: Stability, biopharmaceutical aspects, possible drug forms and registration aspects Nanosuspensionen - Formulierungen fur schwerlosliche arzneistoffe mit geringer bioverfugbarkeit: 2. Mitteilung: Stabilitat, biopharmazeutische aspekte, mogliche arzneiformen und zulassungsfragen. PHARMAZEUTISCHE INDUSTRIE, 1999, vol. 61, s. 175.

870. MULLER, R. H. et al. 20 years of lipid nanoparticles (SLN and NLC): present state of development and industrial applications. Current Drug Discovery Technologies, 2011, vol. 8, s. 207.

871. MÜLLER, R. H. et al. 20 years of lipid nanoparticles (SLN & NLC): Present state of development & industrial applications. Current Drug Discovery Technologies, 2011, vol. 8, s. 207.

872. MULLINER, J. Miniaturization and powerful software drive photonics industry. Photonics Spectra, 2004, vol. 38.

873. MULVANEY, P. et al. Nanocenter Directors Gather from around the World. ACS NANO, 2013, vol. 7, s. 7437.

874. MUNIVENKATESH, N. a ISLAM, N. Managing business risks in nanotechnology. Nanotechnology: Recent Trends, Emerging Issues and Future Directions, 2014, s. 195.

875. MURPHY, P. et al. The Challenges of "Upstream" Communication and Public Engagement for Irish Nanotechnology. 2009. s.

876. MURPHY, P. et al. Nanotechnology, Society, and Environment. 2011. s.

877. MYNBAEV, D. K. a SUKHARENKO, V. Plasmonic-based devices for optical communications. International Journal of High Speed Electronics and Systems, 2012, vol. 21.

878. NABINEJAD, A. R. et al. Evaluation of silver residues accumulation in tissues of Broilers treated with nanosilver using MNSR (A Clinical Trial). Archives of Razi Institute, 2016, vol. 71, s. 51.

879. NAIM, J. P. Global scenario in anti-aging & regenerative medicine. Turkiye Klinikleri Journal of Medical Sciences, 2009, vol. 29.

880. NAJAR, A. et al. A survey of viruses affecting faba bean (Vicia faba) in Tunisia includes first record of Soybean dwarf virus. PLANT DISEASE, 2003, vol. 87, s. 1151.

881. NAJER, A. et al. Challenges in Malaria Management and a Glimpse at Some Nanotechnological Approaches. INFECTIOUS DISEASES AND NANOMEDICINE III, 2018, vol. 1052, s. 103.

882. NATAMA, H. M. et al. Diagnosing congenital malaria in a high-transmission setting: clinical relevance and usefulness of P.falciparum HRP2-based testing. SCIENTIFIC REPORTS, 2017, vol. 7.

883. NATAMA, M. H. et al. COMMUNITY-BASED SCHEDULED SCREENING AND TREATMENT OF MALARIA DURING PREGNANCY PROVIDES ADDITIONAL PROTECTION AGAINST FEBRILE ILLNESSES DURING THE FIRST YEAR OF LIFE IN A BIRTH COHORT STUDY IN BURKINA FASO. AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE, 2017, vol. 97, s. 509.

884. NAU, K. et al. THE DANA(2.0) KNOWLEDGE BASE ON NANOMATERIALS - COMMUNICATING CURRENT NANOSAFETY RESEARCH BASED ON EVALUATED LITERATURE DATA. JOURNAL OF MATERIALS EDUCATION, 2016, vol. 38, s. 93.

885. NELSON, J. R. et al. The View from Above: A Survey of the Public's Perception of Unmanned Aerial Vehicles and Privacy. JOURNAL OF URBAN TECHNOLOGY, 2019, vol. 26, s. 83.

886. NERLICH, B. a LEMAŃCZYK, S. Nanotechnology: Social and Cultural Aspects.

International Encyclopedia of the Social & Behavioral Sciences: Second Edition, 2015, s. 188.

887. NEUMANN, R. V. Nanotechnology and the environment. 2009. s.

888. NEVES, A. R. et al. New Approaches from Nanomedicine and Pulmonary Drug Delivery for the Treatment of Tuberculosis. 2018. s.

889. NEWSOME, R. 2013 IFT International Food Nanoscience Conference: Proceedings. COMPREHENSIVE REVIEWS IN FOOD SCIENCE AND FOOD SAFETY, 2014, vol. 13, s. 190.

890. NEWSOME, R. NEW INSIGHTS ON FOOD NANOSCIENCE. FOOD TECHNOLOGY, 2014, vol. 68, s. 50.

891. NG, E. et al. 2017, *Piezoelectric Micromachined Ultrasonic Transducer (PMUT) device for ultrasonic wave generation and sensing, has interior support structure mounted within cavity and connected to substrate and membrane*, US2017322290-A1.

892. NGATAT, S. et al. Long term evaluation of the susceptibility of 16 Musa genotypes to banana bunchy top disease in Cameroon, Central Africa. PHYTOPATHOLOGY, 2013, vol. 103, s. 103.

893. NGÔ, C. a VAN DE VOORDE, M. Nanotechnology in a nutshell: From simple to complex systems. 2014. s.

894. NIELEN, M. W. F. et al. Challenges in Chemical Food Contaminants and Residue Analysis. FOOD CONTAMINANTS AND RESIDUE ANALYSIS, 2008, vol. 51, s. 1.

895. NIESPODZIANA, K. et al. Fabrication and properties of titanium–hydroxyapatite nanocomposites. MATERIALS CHEMISTRY AND PHYSICS. 2010;123:160-5, vol. 151, s. 217.

896. NIEWIADOMSKI, P. Short overview of the effects of nanoparticles on mechanical properties of concrete 2015, vol. 662, s. 257.

897. NIKOLIC, V. M. et al. On the tungsten carbide synthesis for PEM fuel cell application - Problems, challenges and advantages. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2014, vol. 39, s. 11175.

898. NIOLA, V. a QUAREMBA, G. The Gear Whine Noise: The influence of manufacturing process on vibro-acoustic emission of gear-box 2011, s. 175.

899. NISBET, M. C. a GOIDEL, R. K. Understanding citizen perceptions of science controversy: bridging the ethnographic-survey research divide. PUBLIC UNDERSTANDING OF SCIENCE, 2007, vol. 16, s. 421.

900. NISBET, M. C. a SCHEUFELE, D. A. WHAT'S NEXT FOR SCIENCE COMMUNICATION? PROMISING DIRECTIONS AND LINGERING DISTRACTIONS. AMERICAN JOURNAL OF BOTANY, 2009, vol. 96, s. 1767.

901. NISHINO, A. et al. GNSS-based M2M Early Warning System for the Improved Reach of Information. 2016 IEEE AEROSPACE CONFERENCE, 2016.

902. NIYONGERE, C. et al. Understanding banana bunchy top disease epidemiology in Burundi for an enhanced and integrated management approach. PLANT PATHOLOGY, 2013, vol. 62, s. 562.

903. NORF, H. et al. Responses of Biofilm-Dwelling Ciliate Communities to Planktonic and Benthic Resource Enrichment. MICROBIAL ECOLOGY, 2009, vol. 57, s. 687.

904. NORTH, T. a HEATLY, M. M. 2007, *Heat conduction apparatus for information*

handling system (IHS) e.g. personal computer, has sealed case including cavity filled with working fluid comprising nanoparticles, US2008186678-A1.

905. NOWOTNY, H. High- and low-cost realities for science and society. SCIENCE, 2005, vol. 308, s. 1117.

906. NUCCI, M. L. a HALLMAN, W. K. The Role of Public (Mis)perceptions in the Acceptance of New Food Technologies: Implications for Food Nanotechnology Applications. Communication Practices in Engineering, Manufacturing, and Research for Food and Water Safety, 2015, s. 89.

907. NZIHOU, A. et al. Dioxin emissions from municipal solid waste incinerators (MSWIs) in France. WASTE MANAGEMENT, 2012, vol. 32, s. 2273.

908. O'CALLAGHAN, K. A. M. a KERRY, J. P. Consumer attitudes towards the application of smart packaging technologies to cheese products. FOOD PACKAGING AND SHELF LIFE, 2016, vol. 9, s. 1.

909. OLIVEIRA, A. et al. Impact of food matrix components on nutritional and functional properties of fruit-based products. CURRENT OPINION IN FOOD SCIENCE, 2018, vol. 22, s. 153.

910. OMAE, K. et al. 2012, *Sensor i.e. optical sensor, for optical communication, using infrared remote control, such as television, has metal oxide film equipped with metal oxide particle, and metal oxides particle diameter is in specific nanometer*, JP4853596-B1.

911. OMBABA, M. M. et al. Nanowire enabled photodetection. Photodetectors: Materials, Devices and Applications, 2016, s. 87.

912. OMRANI, A. a VALLASTER, C. Accepting a new nano-tech-based technology in the fruit storage industry: A B2B perspective from the middle east. Islamic Perspectives on Marketing and Consumer Behavior: Planning, Implementation, and Control, 2015, s. 268.

913. OMRANI, A. a VALLASTER, C. Accepting a New Nano-Tech-Based Technology in the Fruit Storage Industry: A B2B Perspective From the Middle East. 2018. s.

914. ONISHCHENKO, G. G. Incidence of nosocomial infections in the Russian Federation. Gigiena i Sanitariya, 2008, s. 4.

915. ONISHCHENKO, G. G. et al. Legal and theoretical premises of use of nanotechnology and nanomaterials in diagnostics, prevention and treatment of quarantine infectious diseases. ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII, 2008, s. 93.

916. ORVISKA, M. et al. STANDARDIZATION EN PETIT: ENGAGING THE CONSUMER? 2010. s.

917. OSHIRO, L. S. et al. A 27-nm virus isolated during an outbreak of acute infectious non-bacterial gastroenteritis in a convalescent hospital - a possible new serotype. JOURNAL OF INFECTIOUS DISEASES, 1981, vol. 143, s. 791.

918. OTT, I. a PAPILLOUD, C. Convergence or mediation? Experts of vulnerability and the vulnerability of experts' discourses on nanotechnologies - a case study. INNOVATION-THE EUROPEAN JOURNAL OF SOCIAL SCIENCE RESEARCH, 2008, vol. 21, s. 41.

919. OVCHENKOVA, E. A. Journals on nanotechnologies in the system of scientific periodicals in Russia. Scientific and Technical Information Processing, 2013, vol. 40, s. 30.

920. OYEWO, O. A. et al. Current Methods for the Remediation of Acid Mine Drainage Including Continuous Removal of Metals From Wastewater and Mine Dump. Bio-Geotechnologies for Mine Site Rehabilitation, 2018, s. 103.

921. PALMER, S. E. a SCHIBECI, R. A. What conceptions of science communication are espoused by science research funding bodies? PUBLIC UNDERSTANDING OF SCIENCE, 2014, vol. 23, s. 511.

922. PALMER, T. T. et al. CHLOROQUINE SENSITIVITY OF PLASMODIUM-FALCIPARUM IN ETHIOPIA .2. RESULTS OF AN INVITRO TEST. AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE, 1976, vol. 25, s. 10.

923. PANDEY, P. S. et al. Vimal (iron pyrite): A medicinal mineral drug of Ayurveda - An approach to develop its mineralogical monograph. Asian Journal of Pharmaceutics, 2018, vol. 12, s. 288.

924. PAPACOSTAS, A. Eurobarometer 63.1: Science and Technology, Social Values, and Services of General Interest, January-February 2005. Inter-university Consortium for Political and Social Research, 2008.

925. PAPACOSTAS, A. Eurobarometer 64.3: Foreign Languages, Biotechnology, Organized Crime, and Health Items, November-December 2005. Inter-university Consortium for Political and Social Research, 2010.

926. PARET, M. L. et al. Photocatalysis: Effect of Light-Activated Nanoscale Formulations of TiO2 on Xanthomonas perforans and Control of Bacterial Spot of Tomato. PHYTOPATHOLOGY, 2013, vol. 103, s. 228.

927. PARISI, C. et al. Agricultural Nanotechnologies: What are the current possibilities? NANO TODAY, 2015, vol. 10, s. 124.

928. PARK, C. a LEE, D. W. Performance analysis of Korea's new growth engine promotion program using total factor productivity analysis. International Journal of Technology, Policy and Management, 2018, vol. 18, s. 291.

929. PARK, E. et al. Attitudes toward biomedical technology and products in South Korea. HEALTH AND TECHNOLOGY, 2016, vol. 6, s. 111.

930. PARK, E. a OHM, J. Y. Factors influencing the public intention to use renewable energy technologies in South Korea: Effects of the Fukushima nuclear accident. ENERGY POLICY, 2014, vol. 65, s. 198.

931. PARK, H. a 배강원 A Study on the Future Spatial Characteristics Utilized Nanotechnology. Journal of Integrated Design Research, 2012, vol. 11, s. 8.

932. PARK, S. Differences in Perception of Korea and China on Promising Futuristic Technologies. The Journal of Eurasian Studies, 2012, vol. 9, s. 223.

933. PARK, S. et al. 2015, *Organic light emitting display device for electronic apparatus has reflective metal layer disposed between substrate and light emitting structure and that includes nanowires and openings defined by nanowires*, US2016043349-A1.

934. PARMAR, M. S. Kidney stones. BMJ-BRITISH MEDICAL JOURNAL, 2004, vol. 328, s. 1420.

935. PARR, D. Will nanotechnology make the world a better place? TRENDS IN BIOTECHNOLOGY, 2005, vol. 23, s. 395.

936. PATENAUDE, J. et al. Nanoengineering: Ethical Issues and Social Governance. Nanoengineering: Global Approaches to Health and Safety Issues, 2015, s. 305.

937. PATRA, C. R. et al. Lanthanide phosphate nanorods as inorganic fluorescent labels in cell biology research. CLINICAL CHEMISTRY, 2007, vol. 53, s. 2029.

938. PATTON, W. E. 2011, *System for determining insurance evaluation of entity has processor, which evaluates insurability of entity in response to retrieved data representing public perception and outputs result of evaluation as insurance evaluation of entity*, US2011191125-A1.

939. PAWADE, B. S. et al. Rapid and selective detection of experimental snake envenomation - Use of gold nanoparticle based lateral flow assay. TOXICON, 2016, vol. 119, s. 299.

940. PAYNE, A. C. et al. Communicating science to the public through a university-museum partnership. JOURNAL OF CHEMICAL EDUCATION, 2005, vol. 82, s. 743.

941. PAZHAMALAI, P. et al. Hierarchical copper selenide nanoneedles grown on copper foil as a binder free electrode for supercapacitors. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2016, vol. 41, s. 14830.

942. PEIXOTO, F. J. M. Identifying nanotechnological systems of innovation: Developing indicators as a tool to support nanotechnology innovation policy in Brazil. Materials Science and Engineering: Concepts, Methodologies, Tools, and Applications, 2017, vol. 2-3, s. 742.

943. PEJCIC, B. et al. Environmental monitoring of hydrocarbons: A chemical sensor perspective. ENVIRONMENTAL SCIENCE & TECHNOLOGY, 2007, vol. 41, s. 6333.

944. PELTIER, S. et al. Effects of nanofiltration on water quality in the distribution system. JOURNAL OF WATER SUPPLY RESEARCH AND TECHNOLOGY-AQUA, 2002, vol. 51, s. 253.

945. PENDERS, J. et al. Research Data Supporting "Single Particle Automated Raman Trapping Analysis". Zenodo, 2018.

946. PERKEL, J. M. The ups and downs of nanobiotech. Scientist, 2004, vol. 18, s. 14.

947. PERRIER, M. et al. Precipitation sequence and kinetics in an Fe-Si-Ti alloy. Solid State Phenomena, 2011, vol. 172-174, s. 833.

948. PETERS, H. P. et al. Public communication of science 2.0: Is the communication of science via the "new media" online a genuine transformation or old wine in new bottles? EMBO REPORTS, 2014, vol. 15, s. 749.

949. PETERSEN, A. a ANDERSON, A. A question of balance or blind faith?: Scientists' and science policymakers' representations of the benefits and risks of nanotechnologies. NANOETHICS, 2007, vol. 1, s. 243.

950. PETERSEN, A. et al. Opening the black box: scientists' views on the role of the news media in the nanotechnology debate. PUBLIC UNDERSTANDING OF SCIENCE, 2009, vol. 18, s. 512.

951. PETERSEN, A. et al. Nanotechnologies, risk and society. HEALTH RISK & SOCIETY, 2007, vol. 9, s. 117.

952. PETRAS, M. a ADAMKOVA, V. Impact of quadrivalent human papillomavirus

vaccine in women at increased risk of genital warts burden: Population-based cross-sectional survey of Czech women aged 16 to 40 years. VACCINE, 2015, vol. 33, s. 6264.

953. PETRESCU, A. M. A. et al. The World of Nanomaterials and Solar Energy in the Perception of General Public. 2016. s.

954. PFAFF, K. et al. Contaminants from food packaging. New developments in risk assessment. BUNDESGESUNDHEITSBLATT-GESUNDHEITSFORSCHUNG-GESUNDHEITSSCHUTZ, 2017, vol. 60, s. 707.

955. PHADNIS, V. S. et al. ENGINE MOUNT DESIGN STRATEGIES TO MITIGATE LINEAR VIBRATIONS IN A TATA NANO. 2018. s.

956. PHADNIS, V. S. et al. Engine mount design strategies to mitigate linear vibrations in a Tata Nano 2018, vol. 3.

957. PHILLIPS, L. ARMED RESISTANCE. NATURE, 2012, vol. 488, s. 576.

958. PHILLIPS, L. J. Analysing the dialogic turn in the communication of research-based knowledge: An exploration of the tensions in collaborative research. PUBLIC UNDERSTANDING OF SCIENCE, 2011, vol. 20, s. 80.

959. PHILP, J. C. et al. Synthetic biology, the bioeconomy, and a societal quandary. TRENDS IN BIOTECHNOLOGY, 2013, vol. 31, s. 269.

960. PI, S. et al. Nanoscale memristive radiofrequency switches. NATURE COMMUNICATIONS, 2015, vol. 6.

961. PIDGEON, N. et al. Exploring early public responses to geoengineering. PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY A-MATHEMATICAL PHYSICAL AND ENGINEERING SCIENCES, 2012, vol. 370, s. 4176.

962. PIDGEON, N. et al. Nanotech: Good or bad? Chemical Engineer, 2009, s. 37.

963. PIDGEON, N. et al. Nanotechnology Risk Perceptions and Communication: Emerging Technologies, Emerging Challenges. RISK ANALYSIS, 2011, vol. 31, s. 1694.

964. PIDGEON, N. et al. Cross-national comparative communication and deliberation about the risks of nanotechnologies. The Oxford Handbook of the Science of Science Communication, 2017, s. 147.

965. PIDGEON, N. a ROGERS-HAYDEN, T. Opening up nanotechnology dialogue with the publics: Risk communication or 'upstream engagement'? HEALTH RISK & SOCIETY, 2007, vol. 9, s. 191.

966. PIEGORSCH, W. W. a SCHULER, E. Communicating the risks, and the benefits, of nanotechnology. International journal of risk assessment and management, 2008, vol. 10, s. 57.

967. PINILI, M. S. et al. Molecular Analysis of Banana bunchy top virus First Isolated in Bali, Indonesia. Journal of Agricultural Science Tokyo Nogyo Daigaku, 2011, vol. 56, s. 125.

968. PITKETHLY, M. More information = better decision making? NANO TODAY, 2008, vol. 3, s. 6.

969. PLOETZ, R. C. et al. Diseases of banana and plantain. 2003. s.

970. POLLEY, S. et al. Identification of specific structural element in the leader RNA of Chandipura virus and its implication in Phosphoprotein recognition. FASEB JOURNAL, 2006,

vol. 20, s. A930.

971. POLONELLI, T. et al. Smart LED Lights Control Using Nano-Power Wake Up Radios. SENSOR SYSTEMS AND SOFTWARE, 2017, vol. 205, s. 93.

972. POWELL, M. et al. Imagining Ordinary Citizens? Conceptualized and Actual Participants for Deliberations on Emerging Technologies. SCIENCE AS CULTURE, 2011, vol. 20, s. 37.

973. PRAKASH, B. a KIRAN, S. Essential oils: a traditionally realized natural resource for food preservation. CURRENT SCIENCE, 2016, vol. 110, s. 1890.

974. PRAKASH, T. a GHOSH, D. Review of the ultra wideband pulse generation 2016, s. 310.

975. PRASAD, A. S. et al. Magnetic behavior of functionally coated super-paramagnetic Ni0.5Cu0.5Fe2O4-polypyrrole nano-composites (Retraction of vol 24, 1987, 2010). MODERN PHYSICS LETTERS B, 2014, vol. 28.

976. PRASAD, A. V. S. S. et al. Low-power design strategies for mobile computing 2006, vol. 2006, s. 3.

977. PRATI, E. a SHINADA, T. Single-Atom nanoelectronics. 2013. s.

978. PRATSINIS, S. E. Overview - Nanoparticulate dry (flame) synthesis & applications 2006, vol. 1, s. 301.

979. PRIEST, S. et al. Biotechnology, Nanotechnology, Media, and Public Opinion. 2008. s.

980. PRIEST, S. H. Risk Communication for Nanobiotechnology: To Whom, About What, and Why? JOURNAL OF LAW MEDICINE & ETHICS, 2009, vol. 37, s. 759.

981. PRIEST, S. H. a GREENHALGH, T. Nanotechnology as an experiment in democracy: how do citizens form opinions about technology and policy? JOURNAL OF NANOPARTICLE RESEARCH, 2011, vol. 13, s. 1521.

982. PRIOR, J. a RAI, T. Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas. SCIENCE OF THE TOTAL ENVIRONMENT, 2017, vol. 601, s. 1649.

983. PUKAZHSELVAN, D. et al. Synthesis of catalytically active rock salt structured MgxNb1-xO nanoparticles for MgH2 system. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2014, vol. 39, s. 18984.

984. PUNNOOSE, A. et al. Novel magnetic hydrogen sensing: a case study using antiferromagnetic haematite nanoparticles. NANOTECHNOLOGY, 2007, vol. 18.

985. PYRRHO, M. a SCHRAMM, F. R. Nanotecnociencia e Humanidade. 2016. s.

986. PYTLIKZILLIG, L. M. et al. Prompting deliberation about nanotechnology: Information, instruction, and discussion effects on individual engagement and knowledge. Journal of Public Deliberation, 2017, vol. 13.

987. QIANG, W. et al. Refractive index estimation of nanoporous silicon in visible and near-infrared spectrum range 2013, vol. 710, s. 8.

988. QIU, C. et al. A review of green techniques for the synthesis of size-controlled starch-based nanoparticles and their applications as nanodelivery systems. Trends in Food

Science and Technology, 2019, vol. 92, s. 138.

989. QIU, J. Nano-safety studies urged in China. NATURE, 2012, vol. 489, s. 350.

990. QUICK, J. et al. Rapid draft sequencing and real-time nanopore sequencing in a hospital outbreak of Salmonella. GENOME BIOLOGY, 2015, vol. 16.

991. RABINOVICH, A. a MORTON, T. A. Unquestioned Answers or Unanswered Questions: Beliefs About Science Guide Responses to Uncertainty in Climate Change Risk Communication. RISK ANALYSIS, 2012, vol. 32, s. 992.

992. RADAD, K. et al. Recent advances in benefits and hazards of engineered nanoparticles. ENVIRONMENTAL TOXICOLOGY AND PHARMACOLOGY, 2012, vol. 34, s. 661.

993. RAI, M. et al. Smart nanopackaging for theenhancement of foodshelf life. ENVIRONMENTAL CHEMISTRY LETTERS, 2019, vol. 17, s. 277.

994. RAI, M. et al. Nanotechnologies in food and agriculture. 2015. s.

995. RAI, S. K. et al. Changing Trend of Infectious Diseases in Nepal. INFECTIOUS DISEASES AND NANOMEDICINE III, 2018, vol. 1052, s. 19.

996. RAMACHANDRAIAH, K. et al. Micro- and nano-scaled materials for strategy-based applications in innovative livestock products: A review. TRENDS IN FOOD SCIENCE & TECHNOLOGY, 2018, vol. 71, s. 25.

997. RAMANI, R. V. et al. Synthesis and optical characterization of CuO nanoparticles on solar borosilicate glass. Journal of Nano Research, 2016, vol. 37, s. 68.

998. RAN, H. 2018, *Multifunctional public toilet air cleaner, has air cleaner body fixed with left side of air outlet, where left side of air cleaner body is provided with heat exchanger and left side of heat exchanger is provided with smoke filtering layer*, CN108954589-A.

999. RAN, X.-Z. et al. Experimental Research on the Management of Combined Radiation-Burn Injury in China. RADIATION RESEARCH, 2011, vol. 175, s. 382.

1000. RAO, M. Electrical Modeling of Copper/Multiwalled Carbon nanotubes for 3D IC applications. 2017 IEEE 17TH INTERNATIONAL CONFERENCE ON NANOTECHNOLOGY (IEEE-NANO), 2017, s. 506.

1001. RASHED, A. a HAMDAN, M. Physicians' and Nurses' Perceptions of and Attitudes Toward Incident Reporting in Palestinian Hospitals. JOURNAL OF PATIENT SAFETY, 2019, vol. 15, s. 212.

1002. RATHNAVEL, K. et al. Government bus tracking with passenger details. International Journal of Recent Technology and Engineering, 2019, vol. 8, s. 99.

1003. RAVENSDALE, J. T. et al. Integration of Emerging Biomedical Technologies in Meat Processing to Improve Meat Safety and Quality. COMPREHENSIVE REVIEWS IN FOOD SCIENCE AND FOOD SAFETY, 2018, vol. 17, s. 615.

1004. RAVIATHUL BASARIYA, M. a PADMANABHAN, K. A. Mesoscopic scale modeling of "superplastic" flow in geological and glacial materials 2018, vol. 385 DDF, s. 33.

1005. RAYNER, B. Front lines of cleantech. Electronic Engineering Times, 2008, s. 32.

1006. ŘEHÁK, J. et al. Moisture survey of former convent in the vicinity of Prague castle 2017, vol. 731 KEM, s. 74.

1007. REID, G. a NORRIS, S. P. Scientific media education in the classroom and beyond: a research agenda for the next decade. CULTURAL STUDIES OF SCIENCE EDUCATION, 2016, vol. 11, s. 147.

1008. REIHLEN, A. et al. The German REACH Congress 2016: a workshop report. ARCHIVES OF TOXICOLOGY, 2018, vol. 92, s. 1343.

1009. REINHOLD, C. Benefits will drive acceptance. NANO TODAY, 2007, vol. 2, s. 1.

1010. REIS, R. M. a LYSHEVSKI, S. E. Analysis, modeling, and characterization of solar cells 2016, vol. 2, s. 27.

1011. REISCH, L. A. a GWOZDZ, W. Chubby cheeks and climate change: childhood obesity as a sustainable development issue. INTERNATIONAL JOURNAL OF CONSUMER STUDIES, 2011, vol. 35, s. 3.

1012. REISCH, L. A. et al. 'Better safe than sorry': consumer perceptions of and deliberations on nanotechnologies. INTERNATIONAL JOURNAL OF CONSUMER STUDIES, 2011, vol. 35, s. 644.

1013. REJESKI, D. a MICHELSON, E. S. International Governance Perspectives on Nanotechnology Water Innovation. Nanotechnology Applications for Clean Water: Solutions for Improving Water Quality: Second Edition, 2014, s. 573.

1014. REJON GUARDIA, F. et al. MOTIVATIONAL FACTORS THAT INFLUENCE THE ACCEPTANCE OF MICROBLOGGING SOCIAL NETWORKS: THE mu BTAM MODEL. EDULEARN11: 3RD INTERNATIONAL CONFERENCE ON EDUCATION AND NEW LEARNING TECHNOLOGIES, 2011, s. 3196.

1015. RENGASAMY, S. et al. Simple Respiratory Protection-Evaluation of the Filtration Performance of Cloth Masks and Common Fabric Materials Against 20-1000 nm Size Particles. ANNALS OF OCCUPATIONAL HYGIENE, 2010, vol. 54, s. 789.

1016. RENNIE, J. Five ways to kill the biotech industry (and one to help it prosper). CAMBRIDGE QUARTERLY OF HEALTHCARE ETHICS, 2004, vol. 13, s. 185.

1017. RETZBACH, A. a MAIER, M. Communicating Scientific Uncertainty: Media Effects on Public Engagement With Science. COMMUNICATION RESEARCH, 2015, vol. 42, s. 429.

1018. RETZBACH, A. et al. Public understanding of science and the perception of nanotechnology: the roles of interest in science, methodological knowledge, epistemological beliefs, and beliefs about science. JOURNAL OF NANOPARTICLE RESEARCH, 2011, vol. 13, s. 6231.

1019. REYNOLDS, M. E. et al. Occurrence and characterization of Escherichia coli ST410 co-harbouring bla(NDM-5), bla(CMY-42) and bla(TEM-190) in a dog from the UK. JOURNAL OF ANTIMICROBIAL CHEMOTHERAPY, 2019, vol. 74, s. 1207.

1020. RHODES, J. et al. Genomic epidemiology of the UK outbreak of the emerging human fungal pathogen Candida auris. EMERGING MICROBES & INFECTIONS, 2018, vol. 7.

1021. RICCI, M. et al. Hydrogen: Too dangerous to base our future upon? 2006, s. 42.

1022. RICKERBY, D. G. Societal and policy aspects of the introduction of nanotechnology in healthcare. International Journal of Healthcare Technology and Management, 2006, vol. 7, s. 463.

1023. RIP, A. Futures of ELSA Science & Society Series on Convergence Research.

EMBO REPORTS, 2009, vol. 10, s. 666.

1024. RISTANOVIC, E. et al. Ethical Aspects of Bioterrorism and Biodefence. DEFENCE AGAINST BIOTERRORISM: METHODS FOR PREVENTION AND CONTROL, 2018, s. 255.

1025. ROBERTSON, G. L. Crisis management and risk communication - Why the food industry must get it right. FOOD AUSTRALIA, 2006, vol. 58, s. 367.

1026. ROBINSON, L. et al. Global Foot-and-Mouth Disease Research Update and Gap Analysis: 3-Vaccines. TRANSBOUNDARY AND EMERGING DISEASES, 2016, vol. 63, s. 30.

1027. ROCO, M. C. Broader societal issues of nanotechnology. JOURNAL OF NANOPARTICLE RESEARCH, 2003, vol. 5, s. 181.

1028. ROCO, M. C. a BAINBRIDGE, W. S. Societal implications of nanoscience and nanotechnology: Maximizing human benefit. JOURNAL OF NANOPARTICLE RESEARCH, 2005, vol. 7, s. 1.

1029. RODOV, V. et al. Biotechnological approaches to improving quality and safety of fresh-cut fruit and vegetable products. Proceedings of the International Conference on Quality Management of Fresh Cut Produce, 2007, s. 181.

1030. RODRIGUEZ-NEGRETE, E. A. et al. A sensitive method for the quantification of virion-sense and complementary-sense DNA strands of circular single-stranded DNA viruses. SCIENTIFIC REPORTS, 2014, vol. 4.

1031. ROESSLEIN, M. et al. Nanomaterials and Ceramic Nanoparticles - Use without Side-Effects? JOURNAL OF CERAMIC SCIENCE AND TECHNOLOGY, 2013, vol. 4, s. 123.

1032. ROLLER, M. Differences between the data bases, statistical analyses, and interpretations of lung tumors of the 19-dust study - Two controversial views. Experimental and Toxicologic Pathology, 2007, vol. 58, s. 393.

1033. ROLLIN, F. et al. Consumers and new food technologies. TRENDS IN FOOD SCIENCE & TECHNOLOGY, 2011, vol. 22, s. 99.

1034. RONDAO, A. I. B. et al. Response to comments on "Ionic transport in (Nano)composites for fuel cells, Int. J. Hydrogen Energy 41 (2016) 7666-7675" Mishandling of literature data on ionic conductivity enhancement in oxide plus salt composites. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2017, vol. 42, s. 24590.

1035. RONTELTAP, A. et al. Societal response to nanotechnology: converging technologies-converging societal response research? JOURNAL OF NANOPARTICLE RESEARCH, 2011, vol. 13, s. 4399.

1036. RONTELTAP, A. et al. How Technology Features Influence Public Response to New Agrifood Technologies. JOURNAL OF AGRICULTURAL & ENVIRONMENTAL ETHICS, 2016, vol. 29, s. 643.

1037. ROOSEN, J. et al. The Effect of Information Choice and Discussion on Consumers' Willingness-to-Pay for Nanotechnologies in Food. JOURNAL OF AGRICULTURAL AND RESOURCE ECONOMICS, 2011, vol. 36, s. 365.

1038. ROSE, K. M. et al. The Values of Synthetic Biology: Researcher Views of Their Field and Participation in Public Engagement. BIOSCIENCE, 2018, vol. 68, s. 782.

1039. ROSE, K. M. et al. Engaging the Public at a Science Festival: Findings From a Panel on Human Gene Editing. SCIENCE COMMUNICATION, 2017, vol. 39, s. 250.

1040. ROSENTHAL, P. J. Proteases of malaria parasites: New targets for chemotherapy. EMERGING INFECTIOUS DISEASES, 1998, vol. 4, s. 49.

1041. ROTH, C. D. et al. Customization and Multistage Nanofiltration Applications for Potable Water, Treatment, and Reuse. Nanotechnology Applications for Clean Water: Solutions for Improving Water Quality: Second Edition, 2014, s. 201.

1042. ROTH, C. D. et al. Customization and Multistage Nanofiltration Applications for Potable Water, Treatment, and Reuse. 2009. s.

1043. RUBINSTEIN, R. D. Demands for regulation of nano-silver - The first battle for the industry's future? Nanotechnology Law and Business, 2009, vol. 6, s. 382.

1044. RUNGE, K. K. et al. Pink slimed: Media framing of novel food technologies and risk related to ground beef and processed foods in the US. MEAT SCIENCE, 2018, vol. 143, s. 242.

1045. RUNGE, K. K. et al. Tweeting nano: how public discourses about nanotechnology develop in social media environments. JOURNAL OF NANOPARTICLE RESEARCH, 2013, vol. 15.

1046. RUSSO, M. Z. Nanomaterials: Progress in science of healthcare and public awareness. Journal of Applied Cosmetology, 2013, vol. 31, s. 97.

1047. RYAN, C. et al. Current Trends in Chitosan-related Research in the Biomedical Field: A Short Review. NATURAL PRODUCT COMMUNICATIONS, 2017, vol. 12, s. 855.

1048. SABATIER, M. a CHOLLET, B. Is there a first mover advantage in science? Pioneering behavior and scientific production in nanotechnology. RESEARCH POLICY, 2017, vol. 46, s. 522.

1049. SAHA, P. et al. Microelectromechanical Systems from Aligned Cellulose Nanocrystal Films. ACS APPLIED MATERIALS & INTERFACES, 2018, vol. 10, s. 24116.

1050. SAHIN, N. a EKLI, E. Nanotechnology awareness, opinions and risk perceptions among middle school students. INTERNATIONAL JOURNAL OF TECHNOLOGY AND DESIGN EDUCATION, 2013, vol. 23, s. 867.

1051. SAID, Z. et al. Radiative properties of nanofluids. INTERNATIONAL COMMUNICATIONS IN HEAT AND MASS TRANSFER, 2013, vol. 46, s. 74.

1052. SAITO, S. Studies on parasites in Yamagata primary focus of studies over a 26-year period. Yamagata Medical Journal, 2004, vol. 22, s. 79.

1053. SAKAMOTO, N. et al. Clinical phase 1b study results for safety, pharmacokinetics and efficacy of ND-L02-s0201, a novel targeted lipid nanoparticle delivering HSP47 SIRNA for the treatment of Japanese patients with advanced liver fibrosis. JOURNAL OF HEPATOLOGY, 2018, vol. 68, s. S242.

1054. SALGADO-BELTRAN, L. et al. Attitudes and Sensory Perceptions of Food Consumers towards Technological Innovation in Mexico: A Case-Study on Rice-Based Dessert. SUSTAINABILITY, 2018, vol. 10.

1055. SALOMON, P. R. et al. European roadmaps for MOEMS applications. MOEMS AND MINATURIZED SYSTEMS III, 2003, vol. 4983, s. 1.

1056. SANCHEZ, A. et al. Telco services for end customers within spanish programmes. IEEE Communications Magazine, 2008, vol. 46, s. 24.

1057. SANDELL, T. A. et al. Infections by Renibacterium salmoninarum and Nanophyetus salmincola Chapin are associated with reduced growth of juvenile Chinook salmon, Oncorhynchus tshawytscha (Walbaum), in the Northeast Pacific Ocean. JOURNAL OF FISH DISEASES, 2015, vol. 38, s. 365.

1058. SANDERSON, S. C. et al. Public Attitudes toward Consent and Data Sharing in Biobank Research: A Large Multi-site Experimental Survey in the US. AMERICAN JOURNAL OF HUMAN GENETICS, 2017, vol. 100, s. 414.

1059. SANER, D. et al. End-of-life and waste management in life cycle assessment-Zurich, 6 December 2011. INTERNATIONAL JOURNAL OF LIFE CYCLE ASSESSMENT, 2012, vol. 17, s. 504.

1060. SARATHCHANDRA, D. a MCCRIGHT, A. M. The Effects of Media Coverage of Scientific Retractions on Risk Perceptions. SAGE OPEN, 2017, vol. 7.

1061. SARDI, J. C. O. et al. Candida species: current epidemiology, pathogenicity, biofilm formation, natural antifungal products and new therapeutic options. JOURNAL OF MEDICAL MICROBIOLOGY, 2013, vol. 62, s. 10.

1062. SAREWITZ, D. Not by experts alone. NATURE, 2010, vol. 466, s. 688.

1063. SAREWITZ, D. CRISPR: Science can't solve it. NATURE, 2015, vol. 522, s. 413.

1064. SATO, T. et al. The strong correlation between interface microstructure and barrier height in Pt/n-InP Schottky contacts formed by an in situ electrochemical process. Japanese Journal of Applied Physics, Part 1: Regular Papers and Short Notes and Review Papers, 1999, vol. 38, s. 1103.

1065. SATTERFIELD, T. et al. Perceiving resilience: understanding people's intuitions about the qualities of air, water, and soil. ECOLOGY AND SOCIETY, 2018, vol. 23.

1066. SATTERFIELD, T. et al. Anticipating the perceived risk of nanotechnologies. NATURE NANOTECHNOLOGY, 2009, vol. 4, s. 752.

1067. SATTLER, K. D. Handbook of nanophysics: Functional nanomaterials. 2010. s.

1068. SATTLER, K. D. Handbook of nanophysics: Nanoparticles and quantum dots. 2016. s.

1069. SAVORY, F. R. et al. Identifying geographic hot spots of reassortment in a multipartite plant virus. EVOLUTIONARY APPLICATIONS, 2014, vol. 7, s. 569.

1070. SCARABELLI, L. et al. Design and Fabrication of Plasmonic Nanomaterials Based on Gold Nanorod Supercrystals. CHEMISTRY OF MATERIALS, 2017, vol. 29, s. 15.

1071. SCHALLIG, H. et al. SCREENING FOR MALARIA IN PREGNANCY WITH RDTS BY COMMUNITY HEALTH WORKERS IN NANORO, BURKINA FASO. AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE, 2017, vol. 97, s. 93.

1072. SCHEITLE, C. P. et al. Scientists and religious leaders compete for cultural authority of science. PUBLIC UNDERSTANDING OF SCIENCE, 2018, vol. 27, s. 59.

1073. SCHEUFELE, D. A. Five lessons in nano outreach. MATERIALS TODAY, 2006, vol. 9, s. 64.

1074. SCHEUFELE, D. A. Nano doesn't have a marketing problem... yet. NANO TODAY, 2007, vol. 2, s. 48.

1075. SCHEUFELE, D. A. Communicating science in social settings. PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, 2013, vol. 110, s. 14040.

1076. SCHEUFELE, D. A. et al. Scientists worry about some risks more than the public. NATURE NANOTECHNOLOGY, 2007, vol. 2, s. 732.

1077. SCHEUFELE, D. A. et al. Religious beliefs and public attitudes toward nanotechnology in Europe and the United States. NATURE NANOTECHNOLOGY, 2009, vol. 4, s. 91.

1078. SCHEUFELE, D. A. a LEWENSTEIN, B. V. The public and nanotechnology: How citizens make sense of emerging technologies. JOURNAL OF NANOPARTICLE RESEARCH, 2005, vol. 7, s. 659.

1079. SCHILLING, K. et al. Human safety review of "nano" titanium dioxide and zinc oxide. PHOTOCHEMICAL & PHOTOBIOLOGICAL SCIENCES, 2010, vol. 9, s. 495.

1080. SCHILLMEIER, M. Caring for social complexity in nanomedicine. NANOMEDICINE, 2015, vol. 10, s. 3181.

1081. SCHMALZ, G. a GALLER, K. M. Biocompatibility of biomaterials - Lessons learned and considerations for the design of novel materials. DENTAL MATERIALS, 2017, vol. 33, s. 382.

1082. SCHMIDT, M. et al. The Bio:Fiction film festival: Sensing how a debate about synthetic biology might evolve. PUBLIC UNDERSTANDING OF SCIENCE, 2015, vol. 24, s. 619.

1083. SCHMIDT, N. Tackling complexity in an interdisciplinary scholarly network: Requirements for semantic publishing. First Monday, 2016, vol. 21.

1084. SCHMOCH, U. a THIELMANN, A. Cyclical long-term development of complex technologies-Premature expectations in nanotechnology? RESEARCH EVALUATION, 2012, vol. 21, s. 126.

1085. SCHNETTLER, B. et al. Acceptance of a vegetable with designation of origin in two cities in southern Chile. REVISTA DE LA FACULTAD DE CIENCIAS AGRARIAS, 2015, vol. 47, s. 173.

1086. SCHOLL, G. et al. Deliberating converging technologies - an international comparative perspective on public engagement with emerging technologies. Australian Journal of Emerging Technologies and Society, 2012, vol. 10, s. 1.

1087. SCHOLL, G. et al. Consumer Conference on the Perception of Nanotechnology in the Areas of Food, Cosmetics, and Textiles, Germany. 2013. s.

1088. SCHOLZ, R. W. a SIEGRIST, M. Low Risks, High Public Concern? The Cases of Persistent Organic Pollutants (POPs), Heavy Metals, and Nanotech Particles. HUMAN AND ECOLOGICAL RISK ASSESSMENT, 2010, vol. 16, s. 185.

1089. SCHONBORN, K. J. et al. Nano education with interactive visualization. NANO TODAY, 2016, vol. 11, s. 543.

1090. SCHULER, E. The public has its own view of what is a risk. NATURE, 2003, vol. 425, s. 343.

1091. SCHUURBIERS, D. et al. Multidisciplinary engagement with nanoethics through education-the nanobio-RAISE advanced courses as a case study and model. NANOETHICS,

2009, vol. 3, s. 197.

1092. SCHWARZ-PLASCHG, C. Nanotechnology is like ... The rhetorical roles of analogies in public engagement. PUBLIC UNDERSTANDING OF SCIENCE, 2018, vol. 27, s. 153.

1093. SCHWINGHAMER, M. W. et al. Three aphid vectors of faba bean (Vicia faba) viruses in northern New South Wales and occurrence of Acyrthosiphon pisum-transmitted isolates of Soybean dwarf virus. AUSTRALASIAN PLANT PATHOLOGY, 2009, vol. 38, s. 262.

1094. SCRUGGS, C. E. a ORTOLANO, L. Creating safer consumer products: The information challenges companies face. Environmental Science and Policy, 2011, vol. 14, s. 605.

1095. SEAY, K. et al. The Vaginal Acquisition and Dissemination of HIV-1 Infection in a Novel Transgenic Mouse Model Is Facilitated by Coinfection with Herpes Simplex Virus 2 and Is Inhibited by Microbicide Treatment. JOURNAL OF VIROLOGY, 2015, vol. 89, s. 9559.

1096. SEBASTIAN, D. et al. Carbon supports for the catalytic dehydrogenation of liquid organic hydrides as hydrogen storage and delivery system. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2014, vol. 39, s. 4109.

1097. SEKIYA, M. et al. Bridge a Gap between Nanotechnology R&D, Business and Public. 2008. s.

1098. SELVARAJAN, R. et al. Cloning and sequence analysis of complete genome of BBTV infecting Hill banana in India. INDIAN JOURNAL OF VIROLOGY, 2008, vol. 19, s. 62.

1099. SENOCAK, E. A framing theory-based content analysis of a Turkish newspaper's coverage of nanotechnology. JOURNAL OF NANOPARTICLE RESEARCH, 2017, vol. 19.

1100. SEREEWATTHANAWUT, I. et al. Advances in Green Engineering for natural products processing: Nanoseparation membrane technology. Journal of Engineering Science and Technology Review, 2018, vol. 11, s. 196.

1101. SERVICE, R. F. Is nanotechnology dangerous? SCIENCE, 2000, vol. 290, s. 1526.

1102. SERVICE, R. F. Nanotoxicology: Nanotechnology grows up. SCIENCE, 2004, vol. 304, s. 1732.

1103. SETTER, N. a WASER, R. Electroceramic materials. ACTA MATERIALIA, 2000, vol. 48, s. 151.

1104. SHARIF, M. K. et al. Nanotechnology: A Pioneering Rebellion for Food Diligence. Impact of Nanoscience in the Food Industry, 2018, s. 29.

1105. SHARMA, C. et al. Nanotechnology: An Untapped Resource for Food Packaging. FRONTIERS IN MICROBIOLOGY, 2017, vol. 8.

1106. SHARMA, J. R. et al. Targeted destruction of HIV-positive cells. JOURNAL OF THE INTERNATIONAL AIDS SOCIETY, 2014, vol. 17, s. 136.

1107. SHATZ, W. et al. Strategies for modifying drug residence time and ocular bioavailability to decrease treatment frequency for back of the eye diseases. EXPERT OPINION ON DRUG DELIVERY, 2019, vol. 16, s. 43.

1108. SHAUKAT, N. et al. A survey on consumers empowerment, communication technologies, and renewable generation penetration within Smart Grid. RENEWABLE &

SUSTAINABLE ENERGY REVIEWS, 2018, vol. 81, s. 1453.

1109. SHAW, L. a DENNANY, L. Applications of electrochemical sensors: Forensic drug analysis. CURRENT OPINION IN ELECTROCHEMISTRY, 2017, vol. 3, s. 23.

1110. SHEIKHI, A. a VAN DE VEN, T. G. M. SUSTAINABLE SYNTHESIS OF VATERITE USING A FOREST NANO-PRODUCT. J-FOR-JOURNAL OF SCIENCE & TECHNOLOGY FOR FOREST PRODUCTS AND PROCESSES, 2015, vol. 5, s. 62.

1111. SHEN, F. X. a GROMET, D. M. Red States, Blue States, and Brain States: Issue Framing, Partisanship, and the Future of Neurolaw in the United States. ANNALS OF THE AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE, 2015, vol. 658, s. 86.

1112. SHERKHONOV, T. et al. National intestinal helminth survey among schoolchildren in Tajikistan: Prevalences, risk factors and perceptions. ACTA TROPICA, 2013, vol. 126, s. 93.

1113. SHERMERGOR, T. D. METROLOGICAL ASPECTS OF THE SCANNING SONDE-TYPE MICROSCOPE FOR THE NANOMETRIC RANGE (A SURVEY OF FOREIGN PUBLICATIONS). MEASUREMENT TECHNIQUES USSR, 1992, vol. 35, s. 799.

1114. SHI, S. Q. et al. Modification of soy-based adhesives to enhance the bonding performance. Bio-Based Wood Adhesives: Preparation, Characterization, and Testing, 2017, s. 86.

1115. SHI, X. et al. Dispersion and absorption of SBR latex in the system of mono-dispersed cement particles in water 2013, vol. 687, s. 347.

1116. SHI, Z. 2018, *Mobile phone protective toughened film comprises camera hole, decorative sticker, adhesive film, toughened film body, sound playing hole, and nano-oleophobic coating, where toughened film main body one end front surface set with key hole*, CN207014906-U.

1117. SHIGANOVA, L. et al. Self-propagating high-temperature synthesis of composite nanopowder AlN-BN from systems "sodium azide - Halides of aluminum and boron" 2016, vol. 685, s. 578.

1118. SHIH, T. J. Media and public ability to participate in scientific decision-making: Using nanotechnology as a case study. Mass Communication Research, 2015, s. 165.

1119. SHIMOKAWA, T. et al. What is required in cellulose nanofibers from domestic timbers - A market research report. Bulletin of the Forestry and Forest Products Research Institute, 2017, vol. 16, s. 13.

1120. SHIN, T. S. et al. Extracellular vesicles are key intercellular mediators in the development of immune dysfunction to allergens in the airways. ALLERGY, 2010, vol. 65, s. 1256.

1121. SHINN, T. a MARCOVICH, A. Cognitive/organizational blocks: Promethean, territorial and porous regimes. Social Science Information, 2009, vol. 48, s. 97.

1122. SHIRWAIKER, R. A. et al. Micro-scale fabrication and characterization of a silver-polymer-based electrically activated antibacterial surface. BIOFABRICATION, 2011, vol. 3.

1123. SHRESTHA, S. et al. Open-source platform: Exploring the opportunities for offline mobile learning 2011, s. 653.

1124. SHRIVASTAVA, M. 2016, *3D chip e.g. high power density power convertor, for consumer electronic devices, has super capacitors fabricated using graphene sheets, where*

intermediate levels comprise lateral heat transporters and vertical EMI shields, IN201501355-I4.

1125. SHU, D. et al. 2018, *Preparation method of spherical carbon-coated manganese dioxide nano composite material, involves dispersing weighed solid powder B in deionized water, and adding potassium permanganate solution to obtain solid powder C*, CN108630439-A.

1126. SHUR, M. Recent developments in terahertz sensing technology 2016, vol. 9836.

1127. SHVETS, V. I. 25 years of biotechnology and bionanotechnology chair. Russian Journal of Biopharmaceuticals, 2011, vol. 3, s. 3.

1128. SIBILLE, I. Biological stability in drinking water distribution systems: A review Stabilité biologique des réseaux de distribution d'eau potable. Annee Biologique, 1998, vol. 37, s. 117.

1129. SIDORKO, V. I. et al. Diamond micromachining of close-tolerance surfaces of non-metal optical parts. Sverkhtverdye Materialy, 1991, s. 58.

1130. SIEGRIST, M. Predicting the Future: Review of Public Perception Studies of Nanotechnology. HUMAN AND ECOLOGICAL RISK ASSESSMENT, 2010, vol. 16, s. 837.

1131. SIEGRIST, M. Public perception of nanotechnology in foods and food packaging. Food Engineering and Ingredients, 2010, vol. 35, s. 8.

1132. SIEGRIST, M. et al. Risks and nanotechnology: the public is more concerned than experts and industry. NATURE NANOTECHNOLOGY, 2007, vol. 2, s. 67.

1133. SIKORA, E. et al. Nanoemulsions as a form of perfumery products. Cosmetics, 2018, vol. 5.

1134. SIMEONIDIS, K. et al. Inorganic engineered nanoparticles in drinking water treatment: a critical review. ENVIRONMENTAL SCIENCE-WATER RESEARCH & TECHNOLOGY, 2016, vol. 2, s. 43.

1135. SIMIS, M. J. et al. The lure of rationality: Why does the deficit model persist in science communication? PUBLIC UNDERSTANDING OF SCIENCE, 2016, vol. 25, s. 400.

1136. SIMONS, J. et al. The slings and arrows of communication on nanotechnology. JOURNAL OF NANOPARTICLE RESEARCH, 2009, vol. 11, s. 1555.

1137. SINGH, B. et al. Recent Advances in Self-Emulsifying Drug Delivery Systems (SEDDS). CRITICAL REVIEWS IN THERAPEUTIC DRUG CARRIER SYSTEMS, 2014, vol. 31, s. 121.

1138. SINGH, B. et al. Enhancing global competitiveness for fresh produce retail shops in India: investigating consumers perceptions and opportunities. XXIX INT HORTICULTURAL CONGRESS ON HORTICULTURE: SUSTAINING LIVES, LIVELIHOODS AND LANDSCAPES: XVII INT SYMP ON HORTICULTURAL ECONOMICS AND MANAGEMENT AND V INT SYMP ON IMPROVING THE PERFORMANCE OF SUPPLY CHAINS IN THE TRANSITIONAL ECONOMIES, 2015, vol. 1103, s. 267.

1139. SINGH, B. N. et al. Antimicrobial nanotechnologies: what are the current possibilities? CURRENT SCIENCE, 2015, vol. 108, s. 1210.

1140. SINGH, G. a PAI, R. S. Recent advances of resveratrol in nanostructured based delivery systems and in the management of HIV/AIDS. JOURNAL OF CONTROLLED RELEASE,

2014, vol. 194, s. 178.

1141. SINGH, P. et al. Social media buzz created by # nanotechnology: insights from Twitter analytics. NANOTECHNOLOGY REVIEWS, 2018, vol. 7, s. 521.

1142. SINGH, S. et al. Channel Impairment Analysis in Nano Communication under CM-3 Scenario. 2019. s.

1143. SINGNURKAR, P. 2011, *Current source regulator used in mobile communication devices has second feedback loop having second sensing path to provide second sensing signal for comparison with second reference to generate charging current signal*, EP2273338-A1.

1144. SJOESTROEM, A. et al. Exploring Audience Judgments of Social Science in Media Discourse The Case of the Violent Video Games Debate. JOURNAL OF MEDIA PSYCHOLOGY-THEORIES METHODS AND APPLICATIONS, 2013, vol. 25, s. 27.

1145. SKARKOVA, P. et al. Gold nanoparticles do not induce adverse effects on terrestrial isopods Porcellio scaber after 14-day exposure. Acta Biologica Slovenica, 2016, vol. 59, s. 33.

1146. SKOVGAARD, N. New trends in emerging pathogens. INTERNATIONAL JOURNAL OF FOOD MICROBIOLOGY, 2007, vol. 120, s. 217.

1147. SLAVICKAS, R. Evaluating challenges and opportunities in the 21(st) century. 2007. s.

1148. SLUIS-CREMER, N. et al. E138A in HIV-1 reverse transcriptase is more common in subtype C than B: Implications for rilpivirine use in resource-limited settings. ANTIVIRAL RESEARCH, 2014, vol. 107, s. 31.

1149. SMALLMAN, M. Small Talk reveals all. NANO TODAY, 2007, vol. 2, s. 7.

1150. SMIT, P. H. et al. H2020 EU Research & Innovation Program Boost the Transfer of Technological Breakthroughs, Enable New Solutions for Personalised Health and Impact the Industry and Healthcare Systems. PROCEEDINGS OF THE 12TH INTERNATIONAL CONFERENCE ON WEARABLE MICRO AND NANO TECHNOLOGIES FOR PERSONALIZED HEALTH (PHEALTH 2015), 2015, vol. 211, s. 3.

1151. SOBBRIO, P. a JORQUI, M. An overview of the role of society and risk in xenotransplantation. Xenotransplantation, 2014, vol. 21, s. 523.

1152. SOFOS, J. N. et al. CLOSTRIDIUM-BOTULINUM CONTROL BY SODIUM-NITRITE AND SORBIC ACID IN VARIOUS MEAT AND SOY PROTEIN FORMULATIONS. JOURNAL OF FOOD SCIENCE, 1979, vol. 44, s. 1662.

1153. SOLAIMAN, S. M. et al. Nano-sunscreens - a double-edged sword in protecting consumers from harm: viewing Australian regulatory policies through the lenses of the European Union. CRITICAL REVIEWS IN TOXICOLOGY, 2019, vol. 49, s. 122.

1154. SOLBU, G. The Physiology of Imagined Publics: From a Deficit to an Ambivalence Model. SCIENCE AND TECHNOLOGY STUDIES, 2018, vol. 31, s. 39.

1155. SOLLER, J. A. Use of microbial risk assessment to inform the national estimate of acute gastrointestinal illness attributable to microbes in drinking water. Journal of Water and Health, 2006, vol. 4, s. 165.

1156. SONG, H.-R. et al. Effects of Publics' Technology Risk Characteristics and Trust on

Risk Perception, Risk Acceptability - Focused on Nano Technology. Crisisonomy, 2016, vol. 12, s. 69.

1157. SÖNMEZ, M. Frequency response comparison of photo-detectors for visible light communication systems 2018, vol. 915, s. 220.

1158. SOTTON, M. How to manage the « technological mayonnaise » Faire prendre la mayonnaise technologique. Industrie Textile, 2003, s. 50.

1159. SOZER, N. a KOKINI, J. L. Nanotechnology and its applications in the food sector. TRENDS IN BIOTECHNOLOGY, 2009, vol. 27, s. 82.

1160. SPARROW, R. Revolutionary and familiar, inevitable and precarious: Rhetorical contradictions in enthusiasm for nanotechnology. NANOETHICS, 2007, vol. 1, s. 57.

1161. SPINLER, J. K. et al. Planting the Microbiome. TRENDS IN MICROBIOLOGY, 2019, vol. 27, s. 90.

1162. SPORTELLI, M. C. et al. Spectroscopic Characterization and Nanosafety of Ag-Modified Antibacterial Leather and Leatherette. NANOMATERIALS, 2017, vol. 7.

1163. SREELEKSHMI, M. V. et al. Room temperature synthesized nano metal oxide humidity sensor. International Journal of Applied Engineering Research, 2013, vol. 8, s. 2361.

1164. SRIVASTAVA, S. a BHARGAVA, A. Introduction to biotechnology. Biotechnology: New Ideas, New Developments (A Textbook of Modern Technology), 2012, s. 1.

1165. ST ANGELO, S. K. Encouraging the Art of Communicating Science to Nonexperts with Don't Be Such a Scientist. JOURNAL OF CHEMICAL EDUCATION, 2018, vol. 95, s. 804.

1166. STANG, C. a SHEREMETA, L. Nanotechnology--a lot of hype over almost nothing? Health law review, 2006, vol. 15, s. 53.

1167. STEFAS, I. et al. New revolutionary ultrasensitive technique to detect pathogens based on their capture and concentration by ApoH coated nano-magnetic beads. INFECTION GENETICS AND EVOLUTION, 2008, vol. 8, s. S14.

1168. STEPHENS, L. F. News narratives about nano S&T in major US and non-US newspapers. SCIENCE COMMUNICATION, 2005, vol. 27, s. 175.

1169. STEVENS, M. a ROBERTS, C. The impact of future trends in new sciences on the practising pharmacist. Pharmaceutical Journal, 2007, vol. 279, s. 273.

1170. STONE, J. V. Public perceptions of agrifood nanotechnologies: Using extension to assess and link stakeholder knowledge with public policies. ABSTRACTS OF PAPERS OF THE AMERICAN CHEMICAL SOCIETY, 2009, vol. 237, s. 125.

1171. SU, L. Y.-F. et al. Information-Sharing and Community-Building: Exploring the Use of Twitter in Science Public Relations. SCIENCE COMMUNICATION, 2017, vol. 39, s. 569.

1172. SUGANUMA, N. et al. Update of occupational lung disease. JOURNAL OF OCCUPATIONAL HEALTH, 2019, vol. 61, s. 10.

1173. SUHAIMEE, S. et al. Public awareness and perception of nanotechnology in Malaysia. Nanotechnology Perceptions, 2013, vol. 9, s. 198.

1174. SUHAIMEE, S. et al. Public awareness and perception of nanotechnology among Malaysian. World Applied Sciences Journal, 2014, vol. 31, s. 367.

1175. SULIMOV, A. I. et al. Analysis and Simulation of Channel Nonreciprocity in Meteor-Burst Communications. IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, 2017, vol. 65, s. 2009.

1176. SUMETSKY, M. Basic elements for microfiber photonics: Micro/nanofibers and microfiber coil resonators. JOURNAL OF LIGHTWAVE TECHNOLOGY, 2008, vol. 26, s. 21.

1177. SUN, Q. a XU, C. Multilayer membranes based on ceramic materials - Sol-gel synthesis, characterization and membrane performance. PETROLEUM SCIENCE, 2007, vol. 4, s. 80.

1178. SUN, X.-H. et al. The First Report of Kadipiro Virus Isolation in China. Chinese Journal of Virology, 2009, vol. 25, s. 173.

1179. SWARTWOUT, M. et al. Mission results for Sapphire, a student-built satellite. ACTA ASTRONAUTICA, 2008, vol. 62, s. 521.

1180. SYLVESTER, D. J. et al. Not again! Public perception, regulation, and nanotechnology. REGULATION & GOVERNANCE, 2009, vol. 3, s. 165.

1181. TABORDA, E. A. et al. RETRACTION: Striking behavior of the rheology in heavy crude oils by adding nanoparticles. ADSORPTION SCIENCE & TECHNOLOGY, 2018, vol. 36, s. NP1.

1182. TAHITA, M. C. et al. Prevalence of the dhfr and dhps Mutations among Pregnant Women in Rural Burkina Faso Five Years after the Introduction of Intermittent Preventive Treatment with Sulfadoxine-Pyrimethamine. PLOS ONE, 2015, vol. 10.

1183. TAMJIDI, F. et al. Nanostructured lipid carriers (NLC): A potential delivery system for bioactive food molecules. INNOVATIVE FOOD SCIENCE & EMERGING TECHNOLOGIES, 2013, vol. 19, s. 29.

1184. TAN, B. K. et al. A Review of Natural Fiber Reinforced Poly(Vinyl Alcohol) Based Composites: Application and Opportunity. POLYMERS, 2015, vol. 7, s. 2205.

1185. TAN, C. W. et al. Enterovirus A71 DNA-Launched Infectious Clone as a Robust Reverse Genetic Tool. PLOS ONE, 2016, vol. 11.

1186. TAN, R. B. et al. Enlarge the field of view of nano CT in synchrotron radiation 2013, vol. 380-384, s. 1808.

1187. TANAKA, M. An industrial and applied review of new MEMS devices features. MICROELECTRONIC ENGINEERING, 2007, vol. 84, s. 1341.

1188. TANG, C. et al. Ni3S2 nanosheets array supported on Ni foam: A novel efficient three-dimensional hydrogen-evolving electrocatalyst in both neutral and basic solutions. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2015, vol. 40, s. 4727.

1189. TANG, C. Y. et al. Potable Water Reuse through Advanced Membrane Technology. Environmental Science and Technology, 2018, vol. 52, s. 10215.

1190. TANG, F. et al. 2018, *Product encapsulated foam structure, has material which is coated with adhesive layer and adhesive layer is coated with foamed silica gel and surface of foamed silica gel is wrapped by nano anti-fouling layer*, CN207523143-U.

1191. TANG, Y. et al. A historical review and bibliometric analysis of nanoparticles toxicity on algae. JOURNAL OF NANOPARTICLE RESEARCH, 2018, vol. 20.

1192. TANIGUCHI, K. et al. FURTHER-STUDIES OF 35-40-NM VIRUS-LIKE PARTICLES ASSOCIATED WITH OUTBREAKS OF ACUTE GASTROENTERITIS. JOURNAL OF MEDICAL MICROBIOLOGY, 1981, vol. 14, s. 107.

1193. TAŃSKI, T. et al. Tem investigations of (Ti, Si)N layer coated on magnesium alloy using PVD technique 2013, vol. 203-204, s. 198.

1194. TASAKORN, M. et al. A gold particle nano antenna by optical micro ring resonator 2013, vol. 770, s. 394.

1195. TENNE, R. et al. 2016, *Metal-alloy composite used for e.g. automotive applications, comprises metal alloy and inorganic layered nanostructured material*, WO2016193974-A1.

1196. TEO, W. Z. et al. Cytotoxicity of Exfoliated Transition-Metal Dichalcogenides (MoS2, WS2, and WSe2) is Lower Than That of Graphene and its Analogues. CHEMISTRY-A EUROPEAN JOURNAL, 2014, vol. 20, s. 9627.

1197. THAYER, A. M. Chance of a lifetime. Chemical and Engineering News, 2006, vol. 84, s. 10.

1198. THEODOSSIADIS, G. D. et al. Thermal joining of highly conductive bonds by using reactive Al-Ni nanofoils 2017, vol. 879, s. 1927.

1199. THOMAS, C. R. et al. Nanomaterials in the Environment: From Materials to High-Throughput Screening to Organisms. ACS NANO, 2011, vol. 5, s. 13.

1200. THOMAS, M. et al. Deliberating the perceived risks, benefits, and societal implications of shale gas and oil extraction by hydraulic fracturing in the US and UK. NATURE ENERGY, 2017, vol. 2.

1201. THOMPSON, D. P. a MANDAL, H. Oxynitride research in the nano era. NITRIDES AND OXYNITRIDES III, 2007, vol. 554, s. 1.

1202. THOMPSON, P. B. The presumptive case for nanotechnology. Nanotechnology and Society: Current and Emerging Ethical Issues, 2009, s. 39.

1203. THORPE, C. a GREGORY, J. Producing the Post-Fordist Public: The Political Economy of Public Engagement with Science. SCIENCE AS CULTURE, 2010, vol. 19, s. 273.

1204. THRONE-HOLST, H. et al. Risk, Responsibility, Rights, Regulation and Representation in the Value Chain of Nano-products. 2009. s.

1205. THRONE-HOLST, H. a STRANDBAKKEN, P. Nobody told me i was a nano-consumer: How nanotechnologies might challenge the notion of consumer rights. Journal of Consumer Policy, 2009, vol. 32, s. 393.

1206. TIAN, Y. et al. Effect of doping transition metal ions on photocatalysis of TiO2 nanowires 2012, vol. 217-219, s. 203.

1207. TIMOFEEV, A. et al. Optical and Electrical Characterization of a Large Kinetic Inductance Bolometer Focal Plane Array. IEEE TRANSACTIONS ON TERAHERTZ SCIENCE AND TECHNOLOGY, 2017, vol. 7, s. 218.

1208. TINKER, S. W. et al. Global energy and the role of geosciences: A North American perspective. Special Paper of the Geological Society of America, 2013, vol. 501, s. 21.

1209. TIPPU, S. Malaysian semiconductor foundries find niches. Electronic Engineering

Times, 2008, s. 21.

1210. TIRRE, F. et al. A Science Camp to science and science communication: students present nanoresearch. CHEMKON, 2015, vol. 22, s. 179.

1211. TOMALIA, D. A. International report on nanomedicine in the USA. NANOMEDICINE-NANOTECHNOLOGY BIOLOGY AND MEDICINE, 2006, vol. 2, s. 299.

1212. TORGERSEN, H. Synthetic biology in society: Learning from past experience? Systems and Synthetic Biology, 2009, vol. 3, s. 9.

1213. TOUMEY, C. Science and democracy. NATURE NANOTECHNOLOGY, 2006, vol. 1, s. 6.

1214. TOUMEY, C. Rules of engagement. NATURE NANOTECHNOLOGY, 2007, vol. 2, s. 386.

1215. TOUMEY, C. Indefinite particles. NATURE NANOTECHNOLOGY, 2008, vol. 3, s. 372.

1216. TOUMEY, C. Atom and Eve. NATURE NANOTECHNOLOGY, 2008, vol. 3, s. 2.

1217. TOUMEY, C. Hearts and minds and nanotechnology. NATURE NANOTECHNOLOGY, 2009, vol. 4, s. 136.

1218. TOUMEY, C. Seven Religious Reactions to Nanotechnology. NANOETHICS, 2011, vol. 5, s. 251.

1219. TOUMEY, C. a COBB, M. Nano in Sight: Epistemology, Aesthetics, Comparisons and Public Perceptions of Images of Nanoscale Objects. LEONARDO, 2012, vol. 45, s. 461.

1220. TRUSHINSKAYA, G. N. et al. THE USE OF INDECT SOLID-PHASE RADIOIMMUNOASSAY FOR INVESTIGATION OF INFLUENZA-VIRUS ANTIGENIC PROPERTIES. VOPROSY VIRUSOLOGII, 1980, s. 403.

1221. TSAI, H. et al. 2019, *Field emission enhanced handheld atmospheric pressure plasma generator, includes nanocarbon material layer formed on one or each of two sidewalls of cathode body and anode frame facing each other*, US10403479-B1.

1222. TSYKHANOVSKA, I. et al. Substantiation of the interaction mechanism between the lipo- and glucoproteids of rye-wheat flour and nanoparticles of the food additive «magnetofood» Обгрунтування механізму взаємодії ліпо- та глюкопротеїдів житньо-пшеничного борошна з наночастинками харчової добавки «Магнетофуд». Eastern-European Journal of Enterprise Technologies, 2018, vol. 4, s. 61.

1223. TU, J. et al. 2010, *Graphene/porous nickel oxide composite super capacitor film for e.g. consumer electronics field, has pore diameter range of about specific nanometer, and specific weight ratio between grapheme and nickel oxide*, CN102013330-A.

1224. TUCKER, I. M. et al. Laser Doppler Electrophoresis applied to colloids and surfaces. CURRENT OPINION IN COLLOID & INTERFACE SCIENCE, 2015, vol. 20, s. 215.

1225. TURCANU, C. et al. Public participation processes related to nuclear research installations: What are the driving factors behind participation intention? PUBLIC UNDERSTANDING OF SCIENCE, 2014, vol. 23, s. 331.

1226. TYSHENKO, M. G. Nanotechnology framing in the Canadian national news media. Technology in Society, 2014, vol. 37, s. 38.

1227. TYSHENKO, M. G. et al. Applying a precautionary risk management strategy for regulation of nanotechnology. INTERNATIONAL JOURNAL OF NANOTECHNOLOGY, 2010, vol. 7, s. 243.

1228. TZUR, S. et al. Missense mutations in the APOL1 gene are highly associated with end stage kidney disease risk previously attributed to the MYH9 gene. HUMAN GENETICS, 2010, vol. 128, s. 345.

1229. UELAND, Ø. et al. State of the art in benefit-risk analysis: Consumer perception. Food and Chemical Toxicology, 2012, vol. 50, s. 67.

1230. ULKAR, M. G. et al. Novel decoding methods of constant weight coding for molecular communications. NANO COMMUNICATION NETWORKS, 2019, vol. 19, s. 157.

1231. URBÁNEK, M. et al. Cross sectioning of optoelectronic device 2016, s. 788.

1232. VALDES, A. et al. Natural additives and agricultural wastes in biopolymer formulations for food packaging. FRONTIERS IN CHEMISTRY, 2014, vol. 2.

1233. VALENTE, M. a CHAVES, C. Perceptions and valuation of GM food: A study on the impact and importance of information provision. JOURNAL OF CLEANER PRODUCTION, 2018, vol. 172, s. 4110.

1234. VALINIA, A. et al. The role of smallsats in scientific exploration and commercialization of space 2019, vol. 10982.

1235. VAN CALSTER, G. Risk regulation, EU law and emerging technologies: Smother or smooth? NANOETHICS, 2008, vol. 2, s. 61.

1236. VAN CALSTER, G. a PRÉVOST, D. Research handbook on environment, health and the WTO. 2013. s.

1237. VAN DER LINDEN, E. et al. Delivery of Functionality in Complex Food Systems: Physically Inspired Approaches from Nanoscale to Microscale, Wageningen 18-21 October 2009. FOOD BIOPHYSICS, 2010, vol. 5, s. 255.

1238. VAN HARMELEN, T. et al. LICARA nanoSCAN - A tool for the self-assessment of benefits and risks of nanoproducts. ENVIRONMENT INTERNATIONAL, 2016, vol. 91, s. 150.

1239. VAN PARYS, M. Anticipating the future... assessing the impact. Unitex, 2006, s. 4.

1240. VAN RIJN, C. J. M. Author's note. Membrane Science and Technology, 2004, vol. 10, s. ix.

1241. VANDERTULIP, D. Are reuse quality standards too high or potable water quality standards too lax? 2009.

1242. VARADWAJ, P. R. Methylammonium Lead Trihalide Perovskite Solar Cell Semiconductors Are Not Organometallic: A Perspective. HELVETICA CHIMICA ACTA, 2017, vol. 100.

1243. VARGAS, M. P. et al. Business perception based on sentiment analysis through deep neuronal networks for natural language processing 2017, vol. 10531 LNCS, s. 365.

1244. VARJANI, S. J. et al. Introduction to Environmental Protection and Management. BIOREMEDIATION: APPLICATIONS FOR ENVIRONMENTAL PROTECTION AND MANAGEMENT, 2018, s. 1.

1245. VARMA, S. J. et al. Fiber-Type Solar Cells, Nanogenerators, Batteries, and Supercapacitors for Wearable Applications. ADVANCED SCIENCE, 2018, vol. 5.

1246. VASILE, A. et al. Coupling devices for smart transducers with optical fiber link used in automotive industry 2009, vol. 7297.

1247. VAUGHN, P. Food markets: Consumer perceptions, government regulations and health impacts. 2016. s.

1248. VELTRI, G. A. a ATANASOVA, D. Climate change on Twitter: Content, media ecology and information sharing behaviour. PUBLIC UNDERSTANDING OF SCIENCE, 2017, vol. 26, s. 721.

1249. VELVIZHI, R. et al. Graphene a fundamental of interaction globe. International Journal of Innovative Technology and Exploring Engineering, 2019, vol. 8, s. 661.

1250. VERBEKE, W. et al. Challenges and prospects for consumer acceptance of cultured meat. JOURNAL OF INTEGRATIVE AGRICULTURE, 2015, vol. 14, s. 285.

1251. VERELLA, J. T. a WARDAK, A. Modeling public opinion and voting as a complex system with agent-based simulations. 2008. s.

1252. VIDAL, F. Accuracy, Authenticity, Fidelity: Aesthetic Realism, the "Deficit Model," and the Public Understanding of Science. SCIENCE IN CONTEXT, 2018, vol. 31, s. 129.

1253. VIJAYAN, A. K. et al. Status of Viral Diseases of Large Cardamom (Amomum subulatum Roxb.) and its Management in Sikkim and Darjeeling, West Bengal. Journal of Mycology and Plant Pathology, 2014, vol. 44, s. 438.

1254. VILJOEN, M. et al. Identification of broad-based sensory attributes driving consumer preference of ready-to-drink rooibos iced tea with increased aspalathin content. SOUTH AFRICAN JOURNAL OF BOTANY, 2017, vol. 110, s. 177.

1255. VINUKONDA, N. a SHARMA, V. K. Review on contemporary trends in radiator design and testing of automobile radiators. International Journal of Mechanical Engineering and Technology, 2018, vol. 9, s. 671.

1256. VIOLET DHAYABARAN, V. et al. Polymeric nano composites as dexterous drug carriers in steering up brain drug targeting: An approach to combat depression. Asian Journal of Microbiology, Biotechnology and Environmental Sciences, 2015, vol. 17, s. 109.

1257. VIRK, H. S. a SHARMA, P. Heavy ion irradiation effects on Cadmium oxide (CdO) quantum dots prepared by quenching method. Journal of Nano Research, 2010, vol. 10, s. 69.

1258. VIRTANEN, P. a KAIVO-OJA, J. Public service systems and emerging systemic governance challenges. INTERNATIONAL JOURNAL OF PUBLIC LEADERSHIP, 2015, vol. 11, s. 77.

1259. VISEU, A. Integration of social science into research is crucial. NATURE, 2015, vol. 525, s. 291.

1260. VOGEL, D. et al. Fast and trusted intrinsic stress measurement to facilitate improved reliability assessments. MICROELECTRONICS RELIABILITY, 2016, vol. 64, s. 276.

1261. VOGEL, U. a CASSEE, F. R. Editorial: dose-dependent ZnO particle-induced acute phase response in humans warrants re-evaluation of occupational exposure limits for metal oxides. PARTICLE AND FIBRE TOXICOLOGY, 2018, vol. 15.

1262. VOGT, T. et al. Opportunities in the 'post-academic' world. NATURE NANOTECHNOLOGY, 2007, vol. 2, s. 329.

1263. VOLINSKY, R., JELINEK, R. 2013, *Nanowire structure used in e.g. thermoelectric device comprises pattern of linear sub-structures interconnected in it to form an elongated solid structure, each sub-structure is formed of nanoparticles and has specific average diameter*, US2013285008-A1.

1264. VOLKOV, Y. Quantum dots in nanomedicine: recent trends, advances and unresolved issues. BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, 2015, vol. 468, s. 419.

1265. VON ESCHENBACH, A. C. A vision for the National Cancer Program in the United States. NATURE REVIEWS CANCER, 2004, vol. 4, s. 820.

1266. VON ROTEN, F. C. Public perceptions of nanotechnology: What can we infer from early studies? Nanotechnology Perceptions, 2008, vol. 4, s. 215.

1267. VOPSON, M. M. Fundamentals of Multiferroic Materials and Their Possible Applications. CRITICAL REVIEWS IN SOLID STATE AND MATERIALS SCIENCES, 2015, vol. 40, s. 223.

1268. VULETA, G. et al. Safety of nanocosmetics Bezbednost kozmetičkih proizvoda sa nanočesticama. Arhiv za Farmaciju, 2009, vol. 59, s. 305.

1269. WADE, R. After the Crisis: Industrial Policy and the Developmental State in Low-Income Countries. GLOBAL POLICY, 2010, vol. 1, s. 150.

1270. WAHL, B. et al. Novel luminescence assay offers new possibilities for the risk assessment of silica nanoparticles. NANOTOXICOLOGY, 2008, vol. 2, s. 243.

1271. WAKAMATSU, M. H. a SALOMÃO, R. Ceramic nanoparticles: What else do we have to know? InterCeram: International Ceramic Review, 2010, vol. 59, s. 28.

1272. WAND, J. a MCCONVEY, I. NANOTECHNOLOGY: RESULTS OF A SURVEY OF THE PUBLIC PERCEPTION OF SAFETY. HAZARDS XXI: PROCESS SAFETY AND ENVIRONMENTAL PROTECTION, 2009, s. 90.

1273. WANG, C. 2006, *Related commodities of communication system and sales method hereof - accepting the authorization of an issuing company to provide various telecommunication services*, TW200638280-A.

1274. WANG, C.-C. et al. Multi-hop Deflection Routing Algorithm based on Q-Learning for Energy-harvesting Nanonetworks. 2018 IEEE 15TH INTERNATIONAL CONFERENCE ON MOBILE AD HOC AND SENSOR SYSTEMS (Bottini, Rosato et al.), 2018, s. 362.

1275. WANG, F. et al. Research Progress on High Performance Non-aqueous Lithium-air Batteries. RARE METAL MATERIALS AND ENGINEERING, 2015, vol. 44, s. 2074.

1276. WANG, H. et al. An integrated approach to supporting land-use decisions in site redevelopment for urban renewal in Hong Kong. HABITAT INTERNATIONAL, 2013, vol. 38, s. 70.

1277. WANG, J. a KIM, S. Searching for New Directions for Energy Policy: Testing the Cross-Effect of Risk Perception and Cyberspace Factors on Online/Offline Opposition to Nuclear Energy in South Korea. SUSTAINABILITY, 2019, vol. 11.

1278. WANG, J. et al. Starch-based biodegradable packaging materials of antimicrobial.

FRONTIERS OF MECHANICAL ENGINEERING AND MATERIALS ENGINEERING II, PTS 1 AND 2, 2014, vol. 457-458, s. 231.

1279. WANG, L. a GAI, S. The next generation mass storage devices - Physical principles and current status. CONTEMPORARY PHYSICS, 2014, vol. 55, s. 75.

1280. WANG, L. et al. Selection of aptamers against pathogenic bacteria and their diagnostics application. WORLD JOURNAL OF MICROBIOLOGY & BIOTECHNOLOGY, 2018, vol. 34.

1281. WANG, L. Y. et al. Preparation of Eu(BA)3phen/PVP fluorescent nanofibers by electrospinning 2014, vol. 919-921, s. 2084.

1282. WANG, M. 2013, *Nano healthcare household product obtained by adding softening agents into finished household product which undergoes purification treatment*, CN103132316-A.

1283. WANG, P. et al. 2013, *Touch-sensitive display panel for e.g. portable consumer electronic product, has spacer layer formed between panels, where spacer layer comprises conductive spacers for electrically connecting panels,* US2013009894-A1.

1284. WANG, R. et al. Biosensors for Rapid Detection of Avian Influenza. 2016. s.

1285. WANG, S. et al. 2009, *Nanowire photodiode for use in opto-electronic device, has two optical waveguides comprising tapered ends and tips, respectively, and nanowire connecting tips in bridging configuration*, US2009001498-A1.

1286. WANG, W. 2009, *Multi-seater public chair, has photo-catalyst coating layer composed of titanium dioxide grains uniformly distributed on surfaces of seat plates, where thickness of photo-catalyst coating layer is about specific nanometers*, CN101933726-A.

1287. WANG, X. Revisiting "Upstream Public Engagement": from a Habermasian Perspective. NANOETHICS, 2016, vol. 10, s. 63.

1288. WANG, X. et al. A new nanoPCR molecular assay for detection of porcine bocavirus. JOURNAL OF VIROLOGICAL METHODS, 2014, vol. 202, s. 106.

1289. WANG, X. et al. Know Your Enemy: How to Build and Vanquish a Global Fungal Scourge. MYCOPATHOLOGIA, 2012, vol. 173, s. 295.

1290. WANG, X., WANG, Z. 2015, *High efficient kitchen harmful gas purification device, has bonnet shell whose inner part is connected with suction fan and negative ion generator, and suction discharge circuit connected with needle tip*, CN204830088-U.

1291. WANG, Y., XUE, F. 2017, *Hard dual-mode based security mobile terminal, has nano-SIM card system connected with public network system, switching key connected with CPU through GPIO port private module, and Bluetooth module fixed with WIFI module*, CN206003101-U.

1292. WANG, Z. et al. 2006, *Optical information storage medium e.g. read-only CD, for e.g. electronic product, has spacer layer disposed above one reflective layer, and buffer layer disposed above spacer layer and including specific thickness in nanometers*, US2006257614-A1.

1293. WANG, Z. et al. Metal link: A strategy to combine graphene and titanium dioxide for enhanced hydrogen production. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2016, vol. 41, s. 22034.

1294. WARD, J. W. et al. 2014, *Method for altering operational output of e.g. anti-tampering reconfigurable device using graphene, involves restoring first state to carbon nanomaterial by applying electrical pulse of different magnitude to carbon nanomaterial*, US8816706-B1.

1295. WARDAK, A. et al. The product life cycle and challenges to nanotechnology regulation. Nanotechnology Law and Business, 2006, vol. 3, s. 507.

1296. WARSINGER, D. M. et al. A review of polymeric membranes and processes for potable water reuse. PROGRESS IN POLYMER SCIENCE, 2018, vol. 81, s. 209.

1297. WATANABE, A. O. et al. Multilayered Electromagnetic Interference Shielding Structures for Suppressing Magnetic Field Coupling. JOURNAL OF ELECTRONIC MATERIALS, 2018, vol. 47, s. 5243.

1298. WEBER, D. J. a RUTALA, W. A. COMMENTARY Self-Disinfecting Surfaces. INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY, 2012, vol. 33, s. 10.

1299. WEITZE, M.-D. a HECKL, W. M. Communicating science in the making - challenges and opportunities. NANOMEDICINE, 2015, vol. 10, s. 3099.

1300. WEN, Y. et al. Detection of nanobacteria in serum, bile and gallbladder mucosa of patients with cholecystolithiasis. CHINESE MEDICAL JOURNAL, 2005, vol. 118, s. 421.

1301. WESTERHOFF, P. et al. Low risk posed by engineered and incidental nanoparticles in drinking water. NATURE NANOTECHNOLOGY, 2018, vol. 13, s. 661.

1302. WICKSON, F. Public engagement means listening as well as talking. NATURE, 2007, vol. 448, s. 644.

1303. WICKSON, F. et al. Who or what is 'the public'? NATURE NANOTECHNOLOGY, 2010, vol. 5, s. 757.

1304. WIEDENMAN, B. et al. Multi-layer Copper-Dielectric Adhesion Challenges of 5-12 micron Lines/Spaces for Next Generation SOP (System-on-Package) / Microprocessor Package Substrates. 57TH ELECTRONIC COMPONENTS & TECHNOLOGY CONFERENCE, 2007 PROCEEDINGS, 2007, s. 1431.

1305. WIEDERHOLD, B. K. Build Trust, Engage People to Increase Understanding of Science. CYBERPSYCHOLOGY BEHAVIOR AND SOCIAL NETWORKING, 2011, vol. 14, s. 629.

1306. WILCOCK, A. et al. Food Safety: Consumer Perceptions and Practices. 2014. s.

1307. WILHELMI, V. et al. Zinc Oxide Nanoparticles Induce Necrosis and Apoptosis in Macrophages in a p47phox-and Nrf2-Independent Manner. PLOS ONE, 2013, vol. 8.

1308. WILSON, C. L. Intelligent and active packaging for fruits and vegetables. 2007. s.

1309. WILSON, R. Public engagement: both sides need to be realistic. NATURE, 2007, vol. 448, s. 644.

1310. WINNALL, W. R. et al. The maturation of antibody technology for the HIV epidemic. IMMUNOLOGY AND CELL BIOLOGY, 2014, vol. 92, s. 570.

1311. WINTLE, B. et al. How fast should nanotechnology advance? NATURE NANOTECHNOLOGY, 2007, vol. 2, s. 327.

1312. WOLF, S. M. et al. Gene Therapy Oversight: Lessons for Nanobiotechnology. JOURNAL OF LAW MEDICINE & ETHICS, 2009, vol. 37, s. 659.

1313. WU, J., WU, Y. 2015, *Warm-keeping shirt is manufactured by blending heating acrylic fiber and nanometer composite material, where weights of acrylic fiber and nanometer composite material are in specific ranges and fiber is formed with layer thin film*, CN104585887-A.

1314. WU, M. 2019, *Public toilet light plasma deodorizing and sterilizing device, has protection cover close to outlet is fixedly provided with air outlet that is provided with connecting ring, where connecting ring is provided with filter screen*, CN109395577-A.

1315. WU, M. Y. et al. 2010, *Preparing lithium phosphate compound with olivine crystal structure, comprises providing solution containing e.g. metal ion, adding reductant and carbon source to solution, dehydrating it followed by self-propagating combustion and heating*, US2010202951-A1.

1316. WU, Y. 2017, *Harmful gas-reduction movable public toilet has direct evaporative humidifier located above fans, cover connected with toilet top portion and wall, and flushing pipe located above toilet wall that is coated with nano-coating material*, CN106638849-A.

1317. WU, Y. 2017, *Public toilet, has toilet wall formed with vent hole and fixed with ventilation opening, humidifier located above fan, and flushing tube located above toilet wall, where toilet wall is coated with nanometer coating material*, CN106609598-A

1318. XAVIER, J. et al. Circulation of chikungunya virus East/Central/South African lineage in Rio de Janeiro, Brazil. PLOS ONE, 2019, vol. 14.

1319. XI, L. F. et al. Human Papillomavirus (HPV) Type 16 and Type 18 DNA Loads at Baseline and Persistence of Type-Specific Infection during a 2-Year Follow-Up. JOURNAL OF INFECTIOUS DISEASES, 2009, vol. 200, s. 1789.

1320. XIA, S. 2017, *Municipal engineering and public service environment-friendly nano-kiosk for public infrastructure construction and outdoor place, has storage battery whose output and input ends are electrically fixed to lamp and solar panel*, CN106988559-A.

1321. XIONG, X. et al. Introducing the small world-developing MEMS/nanotechnology curriculum 2009.

1322. XU, C. et al. 2014, *Rechargeable nickel ion battery, has film provided between positive electrode and negative electrode, where electrolyte includes ionic conductivity and nickel ions are contained in electrolyte that is in liquid or gel state*, WO2015131339-A1.

1323. XU, L. et al. Internal quality of coated eggs with soy protein isolate and montmorillonite: Effects of storage conditions. INTERNATIONAL JOURNAL OF FOOD PROPERTIES, 2017, vol. 20, s. 1921.

1324. XU, X. DNA methylation and cognitive aging. ONCOTARGET, 2015, vol. 6, s. 13925.

1325. YADAV, T. a VECOVEN, A. 2006, *Adhesive formulation, useful for packaging, paper and paperboard, health care, electronics, communications, pressure sensitive tape and consumer applications, comprises nanomaterials*, US2006035087-A1.

1326. YAKES, B. J. et al. ANYL 325-Novel detection method for Mycobacterium avium subsp paratuberculosis using surface-enhanced Raman scattering based immunoassays. ABSTRACTS OF PAPERS OF THE AMERICAN CHEMICAL SOCIETY, 2006, vol. 232.

1327. YAKOVENKO, A. V. Mutual co-influence of natural and socio-humanitarian sciences on social processes. SOTSIOLOGICHESKIE ISSLEDOVANIYA, 2016, s. 12.

1328. YAN, Y. Q. et al. Synthesis of nanosized ANNT series ceramic powder by citrate wet chemical method 2014, vol. 672-674, s. 731.

1329. YANG, H. et al. Detection of Listeria monocytogenes in biofilms with bioconjugated nanoparticles. Abstracts of the General Meeting of the American Society for Microbiology, 2005, vol. 105, s. 450.

1330. YANG, L. R. et al. Synthesis of ZnO nanorod arrays on chaleted sol-gel-derived ZnO thin films and its optical absorption in visible-light region 2013, vol. 750-752, s. 253.

1331. YAO, C. et al. Introduction to nanomedicine. NANOMEDICINE: TECHNOLOGIES AND APPLICATIONS, 2012, vol. 49, s. 3.

1332. YASMIN, T. et al. Comparison of purification methods employed for Pakistani isolate of banana bunchy top virus. PAKISTAN JOURNAL OF BOTANY, 2005, vol. 37, s. 389.

1333. YATA, V. K. et al. Nanoscience in food and agriculture: research, industries and patents. ENVIRONMENTAL CHEMISTRY LETTERS, 2018, vol. 16, s. 79.

1334. YAWSON, R. M. a KUZMA, J. Systems Mapping of Consumer Acceptance of Agrifood Nanotechnology. Journal of Consumer Policy, 2010, vol. 33, s. 299.

1335. YETISEN, A. K. et al. Art on the Nanoscale and Beyond. ADVANCED MATERIALS, 2016, vol. 28, s. 1724.

1336. YI, S. W. Risk and Risk Perception of Nanotechnology. Applied Science and Convergence Technology, 2010, vol. 19, s. 453.

1337. YI, X. et al. A high therapeutic efficacy of polymeric prodrug nano-assembly for a combination of photodynamic therapy and chemotherapy. COMMUNICATIONS BIOLOGY, 2018, vol. 1.

1338. YIN, H. Y. a TSAI, W. C. Advances of Nanomaterials for Food Processing. Handbook of Food Chemistry, 2015, s. 1137.

1339. YIN, Y. a CHEN, S. Design and implementation of a inter-chip bridge in a multi-core SoC1 2009, s. 102.

1340. YOKEL, R. et al. Metal-based nanoparticle interactions with the nervous system: the challenge of brain entry and the risk of retention in the organism. WILEY INTERDISCIPLINARY REVIEWS-NANOMEDICINE AND NANOBIOTECHNOLOGY, 2013, vol. 5, s. 346.

1341. YOSEFI, F. et al. A study on Prevalence of Gastrointestinal Parasitic Infections in HIV (+) Patients Referred to Ahvaz Razi Hospital in 2008-2009. JUNDISHAPUR JOURNAL OF MICROBIOLOGY, 2012, vol. 5, s. 424.

1342. YOU, Y. et al. Complete Genome Sequence of a Streptococcus pyogenes Serotype M12 Scarlet Fever Outbreak Isolate from China, Compiled Using Oxford Nanopore and Illumina Sequencing. MICROBIOLOGY RESOURCE ANNOUNCEMENTS, 2018, vol. 6.

1343. YOU, Y.-W. et al. Electron Tomography of HEK293T Cells Using Scanning Electron Microscope-Based Scanning Transmission Electron Microscopy. MICROSCOPY AND MICROANALYSIS, 2012, vol. 18, s. 1037.

1344. YOUSSEF, T. A. et al. A DDS-Based Energy Management Framework for Small Microgrid Operation and Control. IEEE TRANSACTIONS ON INDUSTRIAL INFORMATICS, 2018, vol. 14, s. 958.

1345. YOUTIE, J. The use of citation speed to understand the effects of a multi-institutional science center. SCIENTOMETRICS, 2014, vol. 100, s. 613.

1346. YOUTIE, J. et al. Perceptions and actions: relationships of views on risk with citation actions of nanotechnology scientists. RESEARCH EVALUATION, 2011, vol. 20, s. 377.

1347. YOUTIE, J. et al. Nanotechnology publications and citations by leading countries and blocs. JOURNAL OF NANOPARTICLE RESEARCH, 2008, vol. 10, s. 981.

1348. YU, C. Y. et al. Dry-reagent gold nanoparticle-based lateral flow biosensor for the simultaneous detection of Vibrio cholerae serogroups O1 and O139. JOURNAL OF MICROBIOLOGICAL METHODS, 2011, vol. 86, s. 277.

1349. ZAKHARENKO, A. M. et al. Using confocal laser scanning microscopy to study an ambers, a new approach 2019, vol. 806 KEM, s. 197.

1350. ZAKIKHANY, K. and EFSTRATIOU, A. Diphtheria in Europe: current problems and new challenges. FUTURE MICROBIOLOGY, 2012, vol. 7, s. 595.

1351. ZHANG, C. et al. Complete genomic characterization of milk vetch dwarf virus isolates from cowpea and broad bean in Anhui province, China. ARCHIVES OF VIROLOGY, 2017, vol. 162, s. 2437.

1352. ZHANG, H. et al. Moderating Effects of Nationality and Product Category on the Relationship between Innovation and Customer Equity in Korea and China. JOURNAL OF PRODUCT INNOVATION MANAGEMENT, 2013, vol. 30, s. 110.

1353. ZHANG, J. et al. Nitrogen-doped carbon nanoflower with superior ORR performance in both alkaline and acidic electrolyte and enhanced durability. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2018, vol. 43, s. 4311.

1354. ZHANG, L. et al. Phylogenetic analysis of porcine circovirus type 3 and porcine circovirus type 2 in China detected by duplex nanoparticle-assisted PCR. INFECTION GENETICS AND EVOLUTION, 2018, vol. 60, s. 1.

1355. ZHANG, M. et al. Field Evaluation of Integrated Management for Mitigating Citrus Huanglongbing in Florida. FRONTIERS IN PLANT SCIENCE, 2019, vol. 9.

1356. ZHANG, P. a WANG, Y. RETRACTION: A Study on the Nucleation Mechanism of Nano-Scale Precipitates of 7055 Aluminum Alloy (Retraction of Vol 12, 10.1142/S1793292017501478, 2017). NANO, 2018, vol. 13.

1357. ZHAO, B. et al. A Triple Functional Approach To Simultaneously Determine the Type, Concentration, and Size of Titanium Dioxide Particles. ENVIRONMENTAL SCIENCE & TECHNOLOGY, 2018, vol. 52, s. 2863.

1358. ZHAO, J. et al. Enhanced visible light activity of Ag-loaded TiO 2 nanotube arrays by AC electrodeposition 2012, vol. 512-515, s. 1708.

1359. ZHAO, K. 2015, *Internet things intelligent mirror has controller that is set with communication module, and frame that is set with controller and is connected with light sensor, temperature sensor, humidity sensor, voice sensor and air particle sensor*, CN204654406-U.

1360. ZHAO, M. T. Semiconductor quantum dot photodetector for high speed space optical communication 2014, vol. 644-650, s. 1456.

1361. ZHAO, S. X. et al. Do funded papers attract more usage? SCIENTOMETRICS,

2018, vol. 115, s. 153.

1362. ZHAO, X. D. et al. A research on release of copper ions and panels in shallow submergence of antifouling paints with nano-additives 2013, vol. 791, s. 179.

1363. ZHAO, Y. et al. Silicon-Based and -Related Materials for Lithium-Ion Batteries. PROGRESS IN CHEMISTRY, 2019, vol. 31, s. 613.

1364. ZHOU, X. a ZHAO, G. Global liposome research in the period of 1995-2014: a bibliometric analysis. SCIENTOMETRICS, 2015, vol. 105, s. 231.

1365. ZHU, L. a DUAN, Y. Research on the resource allocation model for the satellite constellation communication system 2010, vol. 121-122, s. 669.

1366. ZIESKE, J. D. et al. Extracellular Vesicles and Cell-Cell Communication in the Cornea. Anatomical record (Hoboken, N.J. : 2007), 2019.

1367. ZIMMER, R. et al. (2008). 'Nanotechnology and public opinion - The Perception of Innovative Technology', in Scherzberg, A; Wendorff, JH. (ed.) *NANOTECHNOLOGIE: GRUNDLAGEN, ANWENDUNGEN, RISIKEN, REGULIERUNG.* Berlin: WALTER DE GRUYTER & CO, pp. 93-110.

1368. ZOELLER, K. Science and the Lay Perspective: Lay People's Involvement in Assessing Tissue Engineering. TISSUE ENGINEERING PART A, 2014, vol. 20, s. 2561.

1369. ZUO, J. et al. Institute collection and analysis of Nanobodies (iCAN): a comprehensive database and analysis platform for nanobodies. BMC GENOMICS, 2017, vol. 18.

1370. ZWECK, A. et al. Nanotechnology in Germany: from forecasting to technological assessment to sustainability studies. JOURNAL OF CLEANER PRODUCTION, 2008, vol. 16, s. 977.

1371. ZWICKLE, A. et al. Comparing public concern and support for drone regulation to the current legal framework. BEHAVIORAL SCIENCES & THE LAW, 2019, vol. 37, s. 109.

1372. 김종천 A Study on the Safety Guarantee of Green Energy Nuclear in the View of Public Law. Journal of hongik law review, 2011, vol. 12, s. 107.

1373. 류청산 The Leadership Model of Conscious Technology Times & the Direction of Global Education. Korean Journal of Comparative Education, 2012, vol. 22, s. 147.

1374. 이호용 Risks of Nano Scale Materials in Daily Life and Legal Responses in the United States. HAN YANG LAW REVIEW, 2018, vol. 29, s. 35.