MANUAL WITH GUIDELINES FOR ASSESSMENT/EVALUATION OF THE GENDER DIMENSION IN RESEARCH CONTENT

Technology Agency of the Czech Republic, funding programme ZÉTA, 4th call for proposals

2019

This manual was created as part of the project GEECCO. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 741128. The document reflects the views only of the author(s), and the Commission cannot be held responsible for any use which may be made of the information contained therein.

GOALS OF THIS MANUAL

The aim of this manual is to offer a guideline that helps to determine whether sex and/or gender are relevant to a research proposal and plan. This guide also shows how to integrate sex and/or gender dimension in research goals, methodology and proposed application in a way that maximizes benefits. Besides grant applicants, this text is intended for peer reviewers and rapporteurs and is supposed to assist in evaluating whether the sex and gender dimension has been adequately considered and incorporated in a given project proposal.

As a public funding provider, the Technology Agency of the Czech Republic (TA CR) is aware of its responsibility for the quality and impact of research and innovation activities. By emphasising the sex and gender dimension, it strives for relevance and safety of research results and innovation for all and their equally positive impact on lives of both men and women. One of the aims is to deepen reflexiveness towards the diversity of users of research results and innovations and the impacted subjects in general – including diversity related to age, ethnicity, disability or sexual orientation.

Integration of the gender dimension in research content is part of the strategy of the European Commission for gender equality in research and innovation and is listed under one of the six priorities of the European Research Area. As a standard, the relevance of sex and gender dimension is evaluated under Horizon 2020 programme. By evaluating integration of the gender dimension into research and innovation content, TA CR joins other European organisations such as Fraunhofer Gesellschaft, Irish Research Council (IRC), Austrian Research Promotion Agency (FFG), Centre National de la Recherche Scientifique (CNRS) or Research Council of Norway (RCN).

SEX VERSUS GENDER DIMENSION

It is necessary to determine whether a research proposal should consider possible role of gender and/or sex in the research problem. While the concept of "**sex**" refers to partial biological differences of women and men, "**gender**" is related to socially produced differences between women and men that change over time and differ across cultures.

Reflecting on possible physical differences (sex) or possible differences in experience, perspectives and needs of women and men (gender) makes sense always when humans are research objects or when they use or are impacted by research results and innovations.

- Humans as research objects: interviewing people, analysing data related to humans, research working with human tissue, etc.
- Humans as users of research results and innovation: consumers, patients and other users.
- Humans as persons on which research results or innovations can have potential impact: research or innovation that in any way influences the environment, research on animals or animal tissue, which results can be later extrapolated to humans, etc.

When assessing the **relevance of sex dimension**, it is necessary to focus on the fact whether the research problem or product development is by any way affected by anatomic or physiological differences between men and women – such as (usually) bigger height or size of body parts, manipulation strength, movement range, voice pitch, sense of temperature, etc.

Several examples of relevance of sex dimension (cf. Schiebinger et al. 2011-2019, European Commission 2013):

- *Diagnostic models for osteoporosis have been based on women using bone mineral density (BMD) norms of healthy young white women, and reference criteria to identify risk in men were*

not sufficiently defined.[1] For a long time, sex differences in manifestations have been overlooked in research and treatment.

- *Similar deficits have been discovered in the design of some technologies – automatic text writing or device control did not equally respond to lower and higher voice pitch, automatic recognition of movement or body parts was not configured to persons of varied height, ethnicity or body build (e.g. women, wheelchair users, left-handed people), etc.*

To assess the **relevance of gender dimension** for a project, it is necessary to consider the following (cf. Schiebinger et al. 2011-2019):

- Could there be differences in experience, perspectives and needs of researched women and men that can enter the research problem or planned application?
- Can women and men (or their subgroups) have different expectations concerning the functions of the created product or service? Is it possible that different groups would use them in different ways?
- Can women and men or other groups of potential users have different needs, as far as the content solution of the resulting product is concerned?
- Can different groups of potential users have different expectations about the exterior design of the technology?
- Is there a risk that due to a specific setting of processes and services, certain groups might be excluded from their use?
- Have the previous solutions of this research problem or prior product versions deepened gender inequality or stereotypes, which your project can help to remove?

Several examples of relevance of the gender dimension (cf. Schiebinger et al. 2011-2019, European Commission 2013):

- *Studies of public transportation usually categorise trips according to several purposes: work or study, shopping, entertainment and leisure, visits, etc. However, a deeper analysis working with sex-disaggregated data and other factors (age, family status, ethnicity, etc.) revealed an important mobility pattern more frequently employed by women – mobility related to care (for children, the elderly, household). It also highlighted specific needs of previously neglected users, which influenced transport planning as well as the design of transport means and settings (number of connections that make chaining of trips possible, barrier-free access, wider alleys and doors, glass sheltered stations, lighted on-request stops in evening time for greater safety).[2]*
- *A recent analysis of Google algorithms confirmed a significant gender imbalance: in job search, men were much more likely than women to be offered ads for high-paying jobs, word embeddings showed risk of perpetuating harmful stereotypes, such as "man: computer programmer vs. woman: homemaker", and the automatic translator exhibited a strong masculine default.[3]*
- *A significant need to reflect on the gender dimension was identified also in development of assistive technologies for the elderly. Besides specific needs related primarily to sex differences (women live on average longer than men and suffer more frequently from dementia or arthritis, while men face hearing or dexterity impairments), the construction of technologies should take into account factors such as potential lesser experience of women with technologies and less positive attitude towards them. Due to higher longevity, many women live alone, which implies*

[1] More information: https://genderedinnovations.stanford.edu/case-studies/osteoporosis.html#tabs-2
[2] More information: http://genderedinnovations.stanford.edu/case-studies/transportation.html#tabs-2
[3] More information: http://genderedinnovations.stanford.edu/case-studies/machinelearning.html#tabs-2

a stronger need for interaction. It is also appropriate to consider gendered patterns of interaction for humanoid robots.[4]

RELEVANCE OF SEX AND GENDER FOR DIVERSE FIELDS (cf. European Commission 2014):

Health and medicine. *This field should consider sex and gender e.g. when studying risk factors, biological mechanisms, disease causes, clinical manifestations or outcomes, and various ways of treatment of diseases and disorders.*

Food, agriculture and biotechnologies. *Sex and gender can play a role in food production, in different uses of agricultural products (food and non-food), and influence performed roles, responsibility and ownership, sustainability in the production and management of resources, and of products and processes.*

Nanotechnologies, new materials and production technologies. *Gender aspects in applied nanosciences intersect with other research fields such as environment, healthcare, food, agriculture and biotechnology as well as energy, information and communication. Nanoparticles can have different effect on female and male bodies.*

Energy. *This field should consider gender aspects e.g. in access to energy technologies, reflection on technology-related risks, energy needs and use.*

Environment. *Gender roles and identities play a key role in sustainable economy and all human activities. Gender affects how technologies are perceived, used and how much they are needed, and also influences the perception of their risks and impact.*

Transport and urban planning. *In this area, insight into sex and gender should be considered in the context of direct social and safety impacts resulting from different preferences and needs related to uses of public space, housing culture or transportation system, such as different trip distance, use of transport means, combining different transport modes, frequency of journeys and destinations (e.g. home – child care – work – leisure); different demands on safety and standards in transportation or public space; services and other public facilities tailored to the needs of mothers, fathers, elderly people and other groups of citizens; new housing typologies and regimes, etc.*

Social sciences and humanities. *All research and innovation in this field are directly related to society, and so there is a gender dimension to all activities that are undertaken.*

Information and communication technologies and robotics. *In this area, insight into sex and gender should be considered in the context of equal opportunities, access to internet and related technologies, ICT in educational curricula and employment support, capacities in technical fields and digital literacy, de-stereotyping of information and entertainment content, reflection of different impact of ICTs on men and women or in equal participation of women and men in decision-making. Development in cybernetics and robotics in health- and social care should reflect diverse needs and communication patterns of "human – machine" of women and men.*

BENEFITS OF INTEGRATING SEX AND GENDER DIMENSION (cf. Schiebinger et al. 2011-2019, European Commission 2013):

Considering sex and gender dimension improves research quality and maximizes usability of its results and social benefits.

[4] More information: http://genderedinnovations.stanford.edu/case-studies/robots.html#tabs-2

1. Increasing research quality and validity of results

Integrating sex and/or gender dimension can deepen the knowledge about the researched topic and increase validity of its results. In case the gender dimension of a certain issue gets overlooked, the research results can be valid only partially. For example, research often uses male body as a general model or works with a generalized image of human body, which is implicitly defined as male.[5] However, the outcomes of such research are not necessarily valid for women, either because of different bodily characteristics or different life experience.

2. Relevance of research results and innovation for diverse groups and their safety

Insufficient reflexivity of possible sex and gender differences can sometimes have harmful results for the omitted group of people. In the US, for example, several prescription drugs had to be banned, because testing of these medicaments relied on studies of male bodies and male animals or tissue, and their use was not equally safe for women. Similarly, the development of seatbelts originally used male body as a model, as a result of which seatbelts were less safe for women and for pregnant women, even a small crash could result in fetal injury or death.[6] Considering possible sex- or gender- related differences in results application and innovation thus contributes to greater relevance of created products and services for various societal groups (products that fit all, and their use is equally safe and comfortable for diverse groups).

3. Widening the spectrum of users and market potential of research and innovation outcomes

Increased relevance of research results and created products and services for diverse social groups is related to widening the spectrum of users. Utilizing gender perspectives can help to modify products and services that implicitly counted on a narrow circle of users. Their use might have not been sufficiently comfortable or safe for some groups and excluded them. Applying the knowledge about sex and gender patterns can thus increase the quality of life of previously neglected groups and have a market potential.

4. A path to new knowledge, services and products

Reflecting on a possible role of sex and gender can open new paths of discovery. For example, including animals of both sexes and a thorough reflexion on the role of sex as a variable has helped to develop a new way of treatment for traumatic brain injuries and to understand development mechanisms of certain auto-immune diseases.[7]

HOW TO SYSTEMATICALLY INTEGRATE SEX AND GENDER DIMENSION IN RESEARCH?

In case you identify a potential role sex and/or gender can play in your researched topic, it is necessary to integrate this dimension also in the research goals, methodological design of the project and the description of expected application of its results. You can find guidelines in the following questions (see European Commission 2014, Schiebinger et al. 2011-2019):

Research goals, questions and hypotheses

- Should the research consider partial physiological differences of men and women (hormonal production, ergonomic, manipulation strength, height or bodily proportions, voice pitch, etc.) or their different experience, needs and preferences?

[5] Often, findings based on studies of male animal models are generalised: Zucker, I., A. Beery. 2010. "Males Still Dominate Animal Studies." *Nature Editorials* 465: 690; Marts, S., S. Keitt. 2004. "Foreword: A Historical Overview of Advocacy for Research in Sex-Based Biology." Advances in Molecular and Cell Biology 34: 5-13.
[6] More information: http://genderedinnovations.stanford.edu/case-studies/crash.html#tabs-2
[7] More information: http://genderedinnovations.stanford.edu/case-studies/animals.html#tabs-2

- Is it relevant to assume different results for men and women in the research context?
- Should different impact on women and men (or groups of women and men) be expected?
- Are there implicit assumptions about the nature of men and women or about male and female bodies that can influence the research design?

Methodology, research design, collected data

- Are the research design and tools (questionnaires, focus groups, etc.) capable of capturing relevant sex or gender differences, or confirming nonexistence of these?
- Are data collected from members of both sexes and are both men and women (equally) interviewed?
- Are both female and male cells or tissue analysed and members of both sexes (in case result extrapolation is planned) studied?

Analysis

- Does the data analysis consider the relevance of sex and/or gender?
- Are other factors that might intersect with sex and/or gender analysed?

Application and impact

- Will the resulting product or service (if not focused on one sex only) meet the needs of men and women? Will its content, functions and design meet the expectations of women and men (or subgroups of these) equally?
- Will the resulting products or services be equally safe for men and women? (e.g. development and testing of drugs, safety features, food components, etc.)
- Will the potential positive effects of the project impact lives of men and women equally? (Such as in urban planning, transport, public services, etc.)
- Will the planned product or services be equally available to both men and women (and other groups)?

Communication and dissemination

- Are relevant conclusions concerning sex or gender dimension of the topic presented as part of the analysis?
- Are null findings (no sex difference) also reported?
- Are relevant sex or gender differences presented using visualisation through statistics, tables and figures?
- Have you considered a specific publication, conference presentation or event on gender-related findings?

WHAT TO AVOID

When evaluating, whether the researched topic has or has not a sex or gender dimension, it is vital to avoid several potential problems (see Schiebinger et al. 2011-2019):

1. Incorporating sex and gender dimension must **avoid using stereotypes**. For example, creation of "pink versions" of products for girls and women indirectly supports gender stereotypes about women interests and essentialist ways of perception. Often, products based on stereotypes do not correspond to user preferences and may be viewed as utterly offensive and can meet with resentment.

2. Gender and sex characteristics **should not be automatically handled as binary categories** (i.e. existing in two versions – male and female). It is necessary to reflect on intra-group diversity

and multiple masculinities and femininities, as well as on a possible nonexistence of differences between men and women.

3. Any effort to incorporate sex and gender dimension must be sensitive to **mutual interconnection of these variables with other characteristics** (age, ethnicity, social background etc.).

4. **Differences identified between men and women should not be automatically ascribed to sex** (sex and gender dimension should not be confused).

5. It is not only problematic not to reflect on the possible sex and/or gender dimension, but also to **highlight these dimensions without sufficient foundation for their role in the given issue** (or emphasise them at the expense of other variables that can play a more significant role).

EXAMPLES OF FULFILLING THIS CRITERION IN ISTA APPLICATION

It is relevant to integrate gender dimension in the research proposal:

Example No. 1: Responsible transport planning

1. **Does the research involve humans as research objects?** Yes, our research aims to optimize methodologies for planning public transport in towns up 15 000 inhabitants. The main research tool is a survey focused on space movement of citizens, which questionnaire will consider the diversity of target population: men and women, various age groups, people with different family status and jobs, etc. The purpose of this division is to find optimal solution taking into account trajectories of public transport use connecting different point (home, work, leisure, school, health care or social care facilities). Focus groups are conceived in a similar way. Questionnaire and focus groups are thus suitable tools to reveal potential difference in mobility preferences of town inhabitants.
2. **Are humans among the users of research results or innovations?** The main outcome of the project will be the methodology for planning public transport in towns up 15 000 inhabitants. This methodology is designed for townhall transport sections employers and municipalities. Ways of its use should not be impacted by sex or gender differences. The end users of the research results employing the methodology will be humans, and the potential diversity thus will impact the sample construction, tools of data collection as well as the analysis and recommended methodological procedures.
3. **Are humans potentially impacted by research results or innovation?** Yes, humans are unequivocally impacted by effects of using the results in practice. The methodology wants to ensure that transport planning takes into account preferences of different groups, so that public transport can be used widely. Implicit notion of city public transport presupposes trajectories between home and work/school, or leisure activities. However, these are not sufficient form many other groups that use public transport (source). The methodology tries to reduce number of transfers, lower connection time for certain groups (e.g. senior citizens, people caring for a child or senior, students under 15 years of age, etc.).

Example No. 2: Application for calling first aid

1. **Does the research involve humans as research objects?** Yes, humans definitely are research objects, because we focus on creating application for seniors living alone which enables them to call help in case of need. The application will be used as part of smart city concept

development. Data will be collected about various future target groups (women, men, seniors of different age using different forms of autonomous living).

2. **Are humans among the users of research results or innovations?** Yes, the application is intended to be used by humans. It can be expected that men and women will use it to a different extent, prefer different functions and have differing technical literacy as its users. Thus, the research will focus on identifying problematic moments for various groups of seniors with the intention to respond by technical customization of the application (e.g. by adapting the offered functions, design choices, making the application attractive via game-based assessment, etc.).
3. **Are humans potentially impacted by research results or innovation?** Yes, humans are impacted by the research results, as the application is designed to increase their safety. There are evident differences between men and women in senior age: women tend to live longer, and they are more frequently afflicted by health complications at home (source). Since they often live alone, help might not reach them in time. On the other hand, men show greater willingness to use technical solutions (source). The aim of the project is to assist elderly people in safe aging and extend their self-sufficient living.

It is not relevant to integrate gender dimension in the research proposal:

Example No. 1: Optimizing the size of battery cages

1. **Does the research involve humans as research objects?** Humans will not be objects of this research, as it focuses on analysing various parameters of egg lay in in dependence on the size of battery cages.
2. **Are humans among the users of research results or innovations??** Humans are not direct users of research results; they are not impacted by the size of cages. Battery cages are not transferable, they are inbuilt, and thus different manipulation strength of men and women does not play a role.
3. **Are humans potentially impacted by research results or innovation?** The project does not intend to analyse direct impact on humans; only secondary impact can be expected concerning a more ethical farming (higher willingness to buy the product – eggs, or partial difference in the composition). It has been proved that women (and people with higher education) show greater preference for products from ethical farming (source).

Example No. 2: Development of a miniaturized PC chip

1. **Does the research involve humans as research objects?** When developing new hardware components, no human data are used.
2. **Are humans among the users of research results or innovations?** Even if humans are the end users of research results, especially if they are utilized in PCs, there is no direct manipulation of human users with the given hardware, which is part of the technical solution.
3. **Are humans potentially impacted by research results or innovation?** People working in chip manufacturing might be potentially impacted. Nevertheless, the impact of materials and processes used in the manufacturing has already been studied, and no negative health effects were found (source).

SOURCES AND USEFUL LINKS

European Commission. 2014 (2009). *Toolkit - Gender in EU-funded Research*. Luxembourg: Publications Office of the European Union. Available at: <https://publications.europa.eu/en/publication-detail/-/publication/c17a4eba-49ab-40f1-bb7b-bb6faaf8dec8>.

Schiebinger, L., I. Klinge, I. Sánchez de Madariaga, H. Y. Paik, M. Schraudner, and M. Stefanick (Eds.). 2011-2019. *Gendered Innovations in Science, Health & Medicine, Engineering and Environment*. Available at: < https://genderedinnovations.stanford.edu/>.

European Commission. 2013. *Gendered Innovations: How Gender Analysis Contributes to Research.* Luxembourg: Publications Office of the European Union. Available at: <https://ec.europa.eu/programmes/horizon2020/en/news/%E2%80%9Cgendered-innovations-how-gender-analysis-contributes-research%E2%80%9D>.

Korsvik, T. R., L. M. Rustad. 2018. *What is the Gender Dimension in Research? Cases Studies in Interdisciplinary Research*. Lysaker: Kilden. Available at: <http://kjonnsforskning.no/sites/default/files/what_is_the_gender_dimension_roggkorsvik_kilden_genderresearch.no_.pdf>.

Criado Perez, C. 2019. *Invisible Women: Exposing Data Bias in a World Designed for Men*. London: Chatto & Windus.

Videos:

Assessing Sex and Gender Integration in Peer Review (Canadian Institutes of Health Research): https://www.youtube.com/watch?v=Hlceez1Dx5E&feature=youtu.be

GENDER-NET IGAR Video (GENDER-NET Project): http://igar-tool.gender-net.eu/en

Sex and Gender in Health Research (Canadian Institutes of Health Research): https://www.cihr-irsc-igh-isfh.ca/

Understanding gender dimension for MSCA projects (European Commission): https://ec.europa.eu/research/mariecurieactions/gallery/understanding-gender-dimension-msca-projects_en