



Economic Commission for Europe

Steering Committee on Trade Capacity and Standards

**Working Party on Regulatory Cooperation
and Standardization Policies (WP.6)****Thirty-second session**

Geneva, 7–9 November 2022

Item 7 of the provisional agenda

Gender-Responsive Standards Initiative**Guidelines on Developing Gender-Responsive Standards****Submitted by the initiative Coordinator***Summary*

The Guidelines on Developing Gender-Responsive Standards offer practical steps to establishing effective policies and practices, which support women's equal participation as a strategic priority. The report acknowledges that standardization has traditionally been a male-dominated world and seeks to offer a baseline for standards development organizations (SDOs) aiming to ensure equity in their working processes and greater efficacy in the standards they develop.

The report constitutes the first attempt to develop guidelines for gender-responsive standards. Developed by the Gender-Responsive Standard Initiative's Project Team 2, the guidance is a product of the diverse perspectives and professional experiences of the multidisciplinary group of experts. The report distils best practice and focuses on providing understandable and informed solutions to longstanding challenges and structural impediments, which hinder women's participation in standards development.

The guidelines encourage SDOs to take concerted action and build their commitment to gender equality. Government agencies are invited to consider standards as instruments of change, capable of supporting marginalized communities and accelerating the achievement of the 2030 Agenda for Sustainable Development.

Document ECE/CTCS/WP.6/2022/9 is presented to the annual session for information.



I. What are gender-responsive standards?

1. Gender-responsive standards are standards which acknowledge the distinct needs of different genders and take concerted action to ensure the efficacy of the standard for all. A gender-responsive standard is not a separate standard for different genders, but rather a means of ensuring the impact of the standard is appropriate and provides equitable benefit. Gender equity and balanced representation in the process of standards development is crucial to better respond to the priorities of all genders, ensuring that they are gender-responsive.
2. Gender-responsive standards encompass both sex and gender. Whilst some erroneously use these terms interchangeably, understanding the distinction between the terms – “sex” being characteristics that are biologically defined and “gender” a social and cultural construct defining expectations for women and men – and the impact both can have on a standard is of critical importance. To demonstrate this influence on a particular standard, we can consider the example of the cookstove.
3. Cookstoves fuelled by solid fuels (e.g. coal, dung, etc.) and kerosene are a major contributor to indoor pollution. Indoor pollution is estimated to be responsible for 3.8 million premature deaths annually.¹ Across cultures, women and children are disproportionately impacted by household pollution. Due to gendered cultural norms women often spend more time on food preparation, increasing their exposure to harmful pollution. Moreover, research has shown that due to biological differences pollution poses a greater health threat to women than men.² In the case of cookstoves, sex and gender differences put women at greater risk.
4. In 2018, the International Organization for Standardization (ISO) released new guidance on cookstoves. Standards and guidelines are critical instruments in addressing indoor air pollution and the gendered impacts of unsafe cooking practices. Joint initiatives, such as the collaboration between ISO, the Clean Cooking Alliance (CCA) (formerly the Global Alliance for Clean Cookstoves), and the World Health Organization (WHO), are key to promoting the use of standards, such as those developed by ISO/TC 285 (Clean Cookstoves and Clean Cooking Solutions), and joint workshops enable local experts to receive training in the implementation of standards necessary for the testing of cookstoves and mitigation of unsafe practices.³ Arguably, the situation with cookstoves is not unique, in all standards, consideration should be given to the impact of sex and gender.

II. Why is gender important for standardization?

5. The lack of gender-responsiveness in standardization has consequences. Standards are often referred to as “invisible infrastructure”; they touch all aspects of our lives, through the products, processes, and services we use on a daily basis. As a result, when standards are not gender-responsive the impact can be simultaneously both pervasive and unidentified. When a consequence is apparent, the impact may be dismissed or misconstrued as a “mild inconvenience”. Taking the seemingly benign example of office ventilation, while ventilation standards based on men’s metabolism often leave women feeling cold in the office, the impacts extend beyond personal comfort. Recent studies have demonstrated that colder temperatures negatively impact a woman’s cognitive abilities and productivity.⁴ In this regard, the implementation of a standard which fails to meet the needs of women could lead a business to be less competitive, productive, and profitable.

¹ World Health Organization (WHO) (2018). Household air pollution and health. Available at: <https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health>.

² Clougherty, J. E. (2010). A growing role for gender analysis in air pollution epidemiology. *Environmental health perspectives*, 118 (2), 167–176. Available at: <https://doi.org/10.1289/ehp.0900994>.

³ International Organization for Standardization (2018). New guidance in the cookstoves series just published. Available at: <https://www.iso.org/news/ref2335.html>.

⁴ Chang, T. Y. & Kajackaite, A. (2019). Battle for the thermostat: Gender and the effect of temperature on cognitive performance. *PloS one*, 14(5), e0216362. Available at: <https://doi.org/10.1371/journal.pone.0216362>.

6. A lack of gender-responsiveness in standardization is also an issue of life and death. Women are 73 per cent more likely than men to be killed in a car accident because crash test dummies are based on male anthropometry.⁵ A cross-country analysis from the Standards Council of Canada (SCC) found that across 99 countries, standards are associated with a reduction in unintentional fatalities – for men.⁶ Women are not seeing the same benefits from standardization.

7. The extent to which standards are not considering gender can be partly illustrated through work undertaken to map standards to the United Nations Sustainable Development Goals (SDGs). Preliminary mapping by SCC found that only 2 per cent of national standards of Canada were contributing to SDG 5.

8. It is not just women who are impacted by the lack of gender-responsiveness in standardization. By failing to protect and foster the contributions of women – families, businesses, and countries are diminished.

III. Who needs to act to improve gender-responsiveness in standardization?

9. Standards are developed by committees or groups of experts – interested parties with knowledge and experience relevant to the specific standard or field. These committees can be under the oversight of international, national, or other bodies of varying types which are often referred to as standards development organizations (SDOs). The oversight bodies and/or SDOs establish the rules for participation and the process that needs to be followed by the standards developers. Oversight bodies, SDOs and standards developers have a vital role to play in ensuring standards are gender-responsive.

10. This guidance document aims to provide individual standards developers and SDOs with some of the practical tools they need to enable them to develop gender-responsive standards and create a gender-responsive standards development process and environment. While the recommendations can be adopted by SDOs and oversight bodies, which would certainly more comprehensively facilitate the development of gender-responsive standards, that is not a precondition for implementation; individual or committees/groups of standards developers can also implement the recommendations.

IV. How can standard developers ensure standards and standards development are gender-responsive?

11. Addressing the gender gap in standardization demands concerted action from all parties. The premise that gender-responsiveness is a “women’s issue”, rather than a fundamental human right, may limit the range of solutions that are considered. In fact, research has shown that how the issue is framed does have an impact on the solutions that are considered effective. When gender inequality is framed as a problem of women’s empowerment, the solution is to “fix the women.”⁷ However, gender inequality is a systems issue that requires structural changes. In the sections that follow we will provide guidance for standards experts on two areas intended to improve the gender-responsiveness of standardization:

⁵ Forman, J., Poplin, G. S., Shaw, C. G., McMurry, T. L., Schmidt, K., Ash, J. & Sunnevang, C. (2019). Automobile injury trends in the contemporary fleet: Belted occupants in frontal collisions. *Traffic injury prevention*, 20(6), 607-612. Available at: <https://doi.org/10.1080/15389588.2019.1630825>.

⁶ Parkouda, M. (2020). When one size does not protect all: Understanding why gender matters for standardization. Ottawa: Standards Council of Canada. Available at: <https://scc50ccn.ca/when-one-size-does-not-protect-all/>.

⁷ Kim, J. Y., Fitzsimons, G. M. & Kay, A. C. (2018). Lean in messages increase attributions of women’s responsibility for gender inequality. *Journal of Personality and Social Psychology*, 115(6), 974. Available at: <https://psycnet.apa.org/doi/10.1037/pspa0000129>.

- How to increase representation of women on technical committees and ensure that the standards development process and meetings are inclusive to improve the quality and gender-responsiveness of standards.
- How to ensure that standards are gender-responsive, independent of the gender composition of the committee.

12. The ECE Declaration for Gender-Responsive Standards recommends that SDOs develop a gender action plan. Having a gender action plan that incorporates these two activities can help to advance gender-responsiveness in standards and standards development. For example, as a signatory to the ECE Declaration for Gender-Responsive Standards and Standards Development, the Standards and Metrology Institute for Islamic Countries (SMIIC), which is largely composed of least-developed and emerging economy countries, has developed a targeted action plan to address their unique context. The SMIIC Strategic Plan 2021–2030 includes conducting training specifically tailored for women experts, as well as publishing women experts’ experiences in social media to encourage member States to assign more women experts to the technical committee works.

13. As previously noted, given the pervasiveness of standards and the myriad of SDOs this document is intended to be broadly applicable to diverse users and contexts. Below we highlight key considerations and questions that can assist users in ensuring the standards they develop are gender-responsive.

V. Balanced representation

14. Standards organizations recognize the importance of who is at the table when it comes to developing standards. Standards bodies typically set criteria for stakeholder categories that should be represented on technical committees. At SCC for example, eight categories of stakeholders’ interest are recognized, and committees are evaluated based on how well the categories are represented.⁸ Furthermore, a guide developed by ISO and the International Electrotechnical Commission (IEC) recommends that “no one organization or participant category should dominate the standards development process”, rather there needs to be an appropriate balance of interests.⁹

15. While standards developers have recognized that technical committee experts’ input may be influenced by their experience and role representing a specific sector (e.g., government, industry, etc.), less consideration seems to be given to the personal attributes of these experts and how that may influence their input. However, there are exceptions, the Forest Stewardship Council Canada Standards Development Group specifies that they have representation from specific categories of stakeholders which must consider regional representation as well as diversity of experience and gender balance.¹⁰

16. While comprehensive disaggregated data is scarce, it is generally recognized that women are underrepresented in standards development. In 2020, only 7 per cent of technical committee chairs at IEC were women.¹¹ In Canada, women make up almost half of the labour force and yet only account for 24 per cent of experts on Canadian technical committees at ISO and IEC. Importantly, there is evidence that improved gender representation is associated with increased gender-responsiveness for products and services.¹² Consequently, to ensure

⁸ Standards Council of Canada (2021). International Standards Development: Program Overview. Ottawa: Standards Council of Canada. Available at: https://www.scc.ca/en/system/files/publications/SCC_POV_International-Standards-Development-Council_v1_2021-08-10.pdf.

⁹ ISO/IECC (2019). Guide 59: ISO and IEC recommended practices for standardization by national bodies. Switzerland: ISO/IEC. Available at: <https://www.iso.org/standard/71917.html>.

¹⁰ Forest Stewardship Council. Forest management standards development group. Available at: <https://ca.fsc.org/ca-en>.

¹¹ Heß, P. (2020). SDG 5 and the Gender Gap in Standardization: Empirical Evidence from Germany. *Sustainability*, 12(20), 8699. Available at: <https://www.mdpi.com/2071-1050/12/20/8699>.

¹² Fine, C., Sojo Monzon, V. & Lawford-Smith, H. (2020). Why does workplace gender diversity matter? Justice, organizational benefits, and policy. Available at: <https://spssi.onlinelibrary.wiley.com/doi/abs/10.1111/sipr.12064>.

gender-responsive standards and standards development, organizations need to address the gender gap in participation on technical committees. While technical committees should strive for gender parity, research indicates that at least 30 per cent representation is necessary to ensure that women’s contributions are not marginalized and can improve the performance of the team.¹³ The following section will discuss strategies for increasing participation of women in standardization and how to ensure women’s contributions are not marginalized.

VI. Recruitment

17. Understanding that women are less likely (i) to volunteer in professional settings¹⁴ and (ii) be proposed by their employers to participate in professional settings,¹⁵ the “expert volunteer led” processes employed by many SDOs may act as an impediment to greater female engagement and reinforce existing imbalances in technical committees.

18. SDOs and national standards bodies (NSBs) can take meaningful action to increase the participation of women to improve gender balance on committees and foster gender-responsiveness in standards development. Specifically, they can, as appropriate:

- **Encourage women to apply:** When recruiting women, the choice of wording matters. Research has found that how a job advertisement is framed can impact the propensity of women to apply.¹⁶ Similarly, if an SDO or NSB wants to recruit more women for their technical committees they should address it explicitly. Job advertisers have called attention to the fact that women tend to view job requirements more strictly than men, which reduces the number of women applicants. In response some organizations have added explicit language to encourage women to apply even when they don’t meet all the job requirements.
- **Oversample women:** When reaching out to identify qualified women, SDOs may need to engage more women to achieve a more gender balanced committee.
- **Ask for women:** When organizations identify individuals to participate in standardization, if women are not included, ask the organization: “do you have qualified women who can participate?”
- **Seek women’s input:** If women are not able to commit to participating directly on the committee, steps should be taken by committee representatives to share the respective documentation with women, at their place of work, to solicit their input, particularly during public consultation stages and providing summaries of those consultations, when possible.
- **Seek input from women’s organizations:** Proactively seeking representatives, or input, from relevant women’s organizations can help to address knowledge gaps. These organizations can be a vital resource to build understanding of the specific implications of gender differences relevant to the subject area.
- **Track progress:** Improvements will not be seen if SDOs/NSBs do not monitor their levels of female participation and track progress accordingly. At present, there is insufficient information related to women’s participation in standards development. Extensive data must be gathered and monitored over time to assess progress.

¹³ See for example: Joecks, J., Pull, K., & Vetter, K. (2013). Gender diversity in the boardroom and firm performance: What exactly constitutes a critical mass? *Journal of business ethics*, 118(1), 61-72. Available at: <https://link.springer.com/article/10.1007/s10551-012-1553-6>.

¹⁴ Fyall, R. & Gazley, B. (2015). Applying social role theory to gender and volunteering in professional associations. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 26(1), 288–314. Available at: <https://doi.org/10.1007/s11266-013-9430-1>.

¹⁵ MacPhail, F. & Bowles, P. (2009). Corporate social responsibility as support for employee volunteers: Impacts, gender puzzles and policy implications in Canada. *Journal of Business Ethics*, 84(3), 405. Available at: <https://link.springer.com/article/10.1007/s10551-008-9716-1>.

¹⁶ Wille, L. & Deros, E. (2018). When job ads turn you down: how requirements in job ads may stop instead of attract highly qualified women. *Sex Roles*, 79(7), 464-475. Available at: <https://link.springer.com/article/10.1007/s11199-017-0877-1>.

19. It is possible to significantly increase the participation of women with targeted efforts. The British Broadcasting Corporation (BBC) has been held up as a model of increasing representation of women. Women are underrepresented in media: across over 100 countries in 2019, only 24 per cent of subject matter experts interviewed by media were women.¹⁷ With the BBC 50:50 Project, 78 per cent of involved programmes achieved gender balance with their contributors after at least 2 years.¹⁸ It is possible to increase representation of women through such concerted action.

VII. Inclusive meetings

20. Increased representation of women in standards development through more inclusive and targeted recruitment must be coupled with promoting participation through an inclusive standards development environment and process. Recent research has demonstrated that whilst women's and men's work patterns were indistinguishable, women were not advancing at the same rate as their male counterparts. In other words, women's behaviour was not the issue, rather it was how women are treated. Specifically, the researchers concluded that "gender inequality is due to bias, not differences in behaviour".¹⁹ The issue is not how women and men act, but how those actions are perceived.

21. Consequently, it is important to understand how biases, perceptions, and the behaviours that emanate from them can undermine women's ability to fully contribute to the development of standards. There are three areas that standards developers should be mindful of:

- **Contributions:** Research has shown that in group settings women contribute proportionately less than men.²⁰ During the COVID pandemic when many workers shifted to working from home and having virtual meetings, researchers found that 45 per cent of women business leaders reported difficulty speaking up in virtual meetings.²¹ Women's participation in standardization will not reap as many benefits if they are not able, for whatever reason, to fully contribute.
- **Interruptions:** Even though women speak up less in meetings, both men and women overestimate the contributions of women to a discussion. This misinterpretation has been associated with women being interrupted when they speak more than men. The higher propensity to interrupt women more than men has been shown in diverse settings, including Supreme Court oral arguments²² and for job candidates in engineering. Since interruptions can also be seen as an indication of dominance, interruptions can erode perceptions of women's expertise and undermine their ability to influence the standards development process.
- **Discounted and discredited:** Standards are traditionally a male-dominated field. This is important to acknowledge, because research has shown that the assumption that

¹⁷ Macharia, S. (2020). Global Media Monitoring Project (GMMP). Who Makes the News? Available at: https://whomakesthenews.org/wp-content/uploads/2021/07/GMMP2020.ENG_FINAL20210713.pdf.

¹⁸ BBC (2020). BBC continues global expansion of the 50:50 project to help increase female representation in the media. Available at: <https://www.bbc.co.uk/mediacentre/latestnews/2020/50-50>.

¹⁹ Turban, S., Freeman, L. & Waber, B. (2017). A study used sensors to show that men and women are treated differently at work. Harvard Business Review, 23. Pp. 4. Available at: <https://mitechnews.com/sbam/study-uses-sensors-determine-men-women-treated-differently-work/#:~:text=The%20study%2C%20published%20by%20Harvard%20Business%20Review%2C%20revealed,various%20seniority%20levels%20in%20a%20large%20business%20office>.

²⁰ Karpowitz, C. F., Mendelberg, T. & Shaker, L. (2012). Gender inequality in deliberative participation. American Political Science Review, 106(3), 533-547. Available at: http://journals.cambridge.org/abstract_S0003055412000329.

²¹ Marchant, N. (2021). Why women don't speak up on Zoom calls – and why that's a problem. World Economic Forum. Available at: <https://www.weforum.org/agenda/2021/01/women-gender-equality-workplace-meetings/>.

²² Feldman, A. & Gill, R. D. (2019). Power dynamics in supreme court oral arguments: The relationship between gender and justice-to-justice interruptions. Justice System Journal, 40(3), 173-195. Available at: <https://doi.org/10.1080/0098261X.2019.1637309>.

women are less competent in male-dominated settings remains prevalent – even if only on a subconscious level.²³ This assumption results in women needing to perform at a higher standard, only to be recognized as equally competent. In fact, in an experimental study academics in biology, chemistry and physics evaluated résumés with a male name as more competent to the identical résumés when they was attributed to a woman.²⁴ The discounting of women’s expertise on standards development committees will further erode their ability to meaningfully contribute to the standards being developed, which, in turn, will negatively impact the quality of the standard.

22. Notably, these three concerns can create a negative feedback loop. If you’re frequently interrupted or your contributions are discounted, you may be less likely to speak up. Therefore, it is important to recognize problematic behaviour and intervene early. In fact, interruptions early in a meeting set the tone that perpetuates gender inequities among status equals when left unchecked.²⁵

23. It must be emphasized that the negative behaviours that can impede women’s ability to fully contribute to meetings and the standards development process are frequently a result of unconscious bias. Unconscious bias that is exhibited by men as well as women. Recognizing that unconscious bias can influence meeting dynamics, the chairs and participants can take conscious action to mitigate the negative effects of unconscious bias.

24. Prior to meetings, it is essential that new members understand what to expect. Providing training and/or mentorship to new women, men, and gender experts on a committee, will enable their more effective participation. Members who are knowledgeable about the process and history of activities will likely feel more comfortable to contribute. Standards development organizations should consider specific training for new members and other means such as a mentor programme that would be designed for making new members feel more comfortable and prepared to participate. NSBs and SDOs should also consider providing training to technical committee members to build their expertise and understanding of the importance of considering gender in standards development.

25. During meetings:

- Establish ground rules, such as no talking over each other, speaking time duration to ensure equity of time, and raising hands to have the floor. Proactively address rule violations early to set expectations.
- Pay attention to who is speaking. If there is an imbalance in who is raising their hand and speaking, address it. This can be done by taking individuals aside and asking some to speak more, or less. Another option is to go around the room and ensure everyone has an opportunity to speak.
- Provide alternative ways to contribute to the discussion, this could be through real time polling, or by encouraging members to submit comments in advance or after the meeting.
- Be mindful of coded language, are women described as aggressive for behaviour that would lead to a man being considered confident? The concern is that this perpetuates stereotypes that justify dismissing or diminishing the input of women. Be prepared to question the language used to clarify the speakers’ intentions and enable them to correct themselves.

²³ Blair-Loy, M., Rogers, L. E., Glaser, D., Wong, Y. L., Abraham, D. & Cosman, P. C. (2017). Gender in engineering departments: Are there gender differences in interruptions of academic job talks?. *Social Sciences*, 6(1), 29. Available at: <https://www.mdpi.com/2076-0760/6/1/29>.

²⁴ Moss-Racusin, Corinne A., John F. Dovidio, Victoria L. Brescoll, Mark J. Graham, and Jo Handelsman. “Science Faculty’s Subtle Gender Biases Favor Male Students.” *Proceedings of the National Academy of Sciences of the United States of America* 109 (2012): 16474–79. Available at: <https://www.pnas.org/doi/10.1073/pnas.1211286109>.

²⁵ Cannon, B. C., Robinson, D. T. & Smith-Lovin, L. (2019). How Do We “Do Gender”? Permeation as Over-talking and talking Over. *Socius*, 5, 2378023119849347. Available at: <https://doi.org/10.1177/2378023119849347>.

- Amplify voices, reinforce/reiterate valuable comments, and acknowledge the contributor.
- Share office housekeeping, it often falls to women to take care of more administrative tasks. Consider tracking who is doing these activities and have a strategy to rotate.

26. Standards development relies on groups of individuals who share their knowledge and expertise using a consensus approach to reach solutions. By creating a respectful environment, where everyone can fully participate and have their voices heard, everyone will benefit. Participation will not be limited to the loudest voices and the standard will benefit from the collective wisdom of the group to ensure a more viable solution for users of the standard and those affected by its use.

VIII. Representation is important, but not the full solution

27. Participants in standards development are typically drawn from a country's labour force. Globally, men are more likely to be in the labour force than women (75 per cent compared to 49 per cent).²⁶ Moreover, the distribution of women in the labour force is skewed by sector. Worldwide, women are overrepresented in two sectors, healthcare/social assistance (75 per cent) and education (65 per cent), but they are significantly underrepresented in utilities (21 per cent), transportation (17 per cent), mining (12 per cent), and construction (8 per cent) among other sectors.²⁷ Consequently, even with effective recruitment strategies and inclusive meetings, some standards development groups may still be challenged to improve representation of women. Moreover, while increased participation of women for their subject matter expertise is an important step to improve gender-responsiveness in standardization, it is not a panacea.

28. Women can also be biased against women. In fact, the United Nations reports that globally the percentage of women who hold some form of gender bias is 86 per cent, compared to 90 per cent of men. Given that both men and women can be biased against women, it is perhaps not surprising that research has shown that even in professions where the representation of women has improved, gender bias persists²⁸ and tends to be perpetuated by those who think it doesn't exist. Therefore, having more women at the table does not necessarily equate to having gender expertise at the table. Consequently, regardless of the number of women on a standards development committee, and independent of the committee's potential blind spots or biases, there are steps committees can take to ensure that they are producing gender-responsive standards.

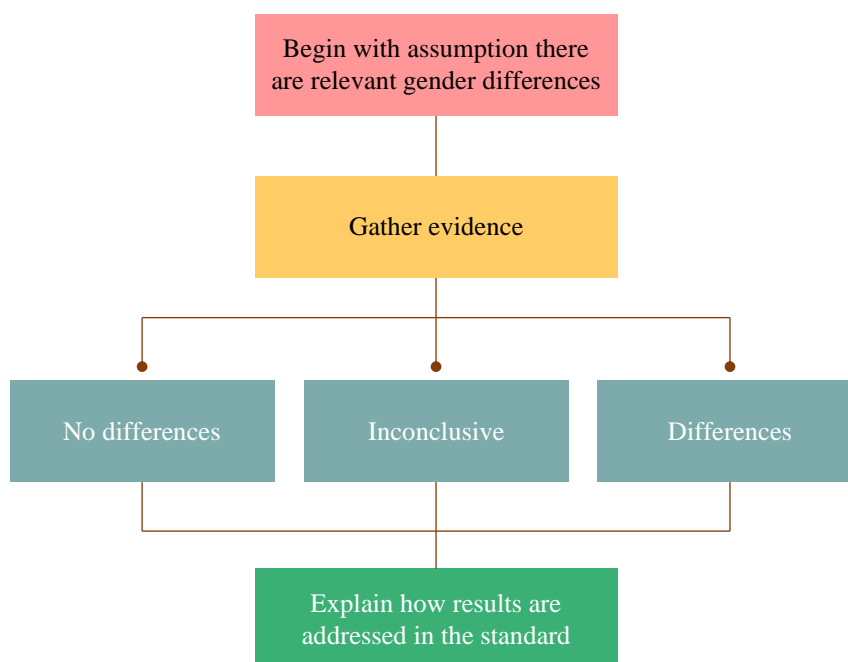
29. In the following sections we outline three steps that committees can take: (i) start with the assumption that gender differences are relevant to the content of the standard; (ii) gather evidence to quantify and elucidate the impact of those gender differences for the standard; and (iii) take targeted action to mitigate the impact of gender differences on the standard (see the figure below). When applied these steps can significantly improve gender-responsiveness in standardization.

²⁶ International Labour Organization (ILO) (2022). The gender gap in employment: What's holding women back? Available at: <https://www.ilo.org/infostories/en-GB/Stories/Employment/barriers-women#gender-gap-matters>.

²⁷ World Economic Forum (2021). Global Gender Gap Report 2021: Insight Report. World Economic Forum. Available at: http://www3.weforum.org/docs/WEF_GGGR_2021.pdf.

²⁸ Begeny, C. T., Ryan, M. K., Moss-Racusin, C. A. & Ravetz, G. (2020). In some professions, women have become well represented, yet gender bias persists – Perpetuated by those who think it is not happening. *Science Advances*, 6(26), eaba7814. Available at: <https://doi.org/10.1126/sciadv.aba7814>.

Steps to ensure standards are gender-responsive



Source: ECE.

IX. Assume there are gender differences that are relevant to the content of the standard

30. To ensure standards are gender-responsive, it is essential to start with the premise that there are gender differences inherent in the standard under development and that those differences will have meaningful implications. In standardization, as in other fields, men have often been the default, this is referred to as androcentrism. Research has shown that men and women are biased to view men as typical or representative and women as niche, which erroneously leads to things intended to be designed for “everyone and anyone” being, in reality, standards designed for men.²⁹ It is important to note, that this bias is not indicative of dislike, or a belief of men’s superiority, rather it is the tendency to associate men as prototypically human and women as not.³⁰

31. To address this bias, standards developers should start with the assumption that there are gender differences that will have implications for the standard. By explicitly considering how the standard impacts – directly and indirectly – men and women, boys, and girls, rather than just people, standards developers can reduce the likelihood of producing a standard for people who are only men, and potentially even only a subset of men.

32. To understand the impact of standards on men, women, boys, and girls, standards developers need to consider a series of questions, such as:

- How are diverse men, women, boys, and girls affected by the standard? Are they directly affected? Are there any indirect or unintended effects?
- What assumptions are being made in the standard? What are the limitations of those assumptions?

²⁹ Bailey, A. H., LaFrance, M. & Dovidio, J. F. (2019). Is man the measure of all things? A social cognitive account of androcentrism. *Personality and Social Psychology Review*, 23(4), 307-331. Available at: <https://doi.org/10.1177/1088868318782848>.

³⁰ Bailey, A. H., LaFrance, M. & Dovidio, J. F. (2020). Implicit androcentrism: Men are human, women are gendered. *Journal of Experimental Social Psychology*, 89, 103980. Available at: <https://doi.org/10.1016/j.jesp.2020.103980>.

- Does the standard anticipate and address who might be using or implementing the standard and if it is equally effectively for diverse men and women?
- How will men and women use the product, process or service outlined in the standard? Will the product, process, or service in the standard, be flexible and adaptable to accommodate differences in the size, strength, stature, etc. of the user?
- How will men and women be impacted by others' use of the product, process or service being standardized?
- Women and men are not homogenous groups, they are not all the same, are there further modifications that need to be made to ensure suitability for diverse women and men?
- Is the standard flexible enough to allow users to adapt it to suit the different experiences and needs of all women and men (e.g., based on age, culture, race, education, etc.)?

33. Applying a gender lens to standards development may lead to a reassessment, whereby things that were assumed to be gender neutral are in fact found to have gender implications. Snowploughing in Sweden is a classic example of indirect gender impacts of a policy. The city of Karlskoga had undertaken a gender equality programme and at least one staff member joked that gender would not be a consideration for snowploughing.³¹ However, as they considered it further, they realized there were gender impacts. The prioritization and order in which areas were snowploughed impacted on men and women differently. This was because men and women use different modes and routes of transportation. By changing snowploughing practices, the city benefited from greater accessibility for all and reduced hospitalizations.³² Gender differences are not always obvious, it is important to think through the implications of a product, process, or service to see how it may, even unintentionally or indirectly, impact men and women.

34. While the gender-responsiveness of all standards needs to be considered, targeted standards have been developed, or are under development, to address gender equality. And these standards play an important role too. One of the first such standards is the W+ Standard from Women Organizing for Change in Agriculture and Natural Resource Management (WOCAN).³³ The standard is intended to quantify women's empowerment and provides an avenue to invest in women-led businesses. And in 2021, ISO released an international workshop agreement (IWA) on the definition of women-owned and women-led businesses. These targeted standards address important gaps in gender equality. However, for standards to address systemic and pervasive gender inequalities and biases we cannot rely exclusively on a limited number of targeted standards, rather it can only be addressed by ensuring all standards are gender-responsive.

X. Gather evidence

35. Probing questions, such as those identified above, are essential to identifying whether there are gender considerations that need to be accounted for in the standards being developed. However, determining the exact nature of the gender implications and how to effectively address them requires knowledge, expertise, representative/inclusive data, and specifically sex-disaggregated data.

36. Standards developers need to ensure that the data they are using includes, and sufficiently represents, women. Sex-disaggregated data enables standards developers to identify gender differences that may be attributed to physical differences and/or gender roles that need to be considered to ensure the effectiveness of the standard for all users. For

³¹ Include Gender. Gender Equal Snow Clearing in Karlskoga (2014). Retrieved 23-08-2021 from <https://www.includegender.org/genderequality-in-practice/planning-and-urban-development/gender-equal-snow-clearing-in-karlskoga/>.

³² Ibid.

³³ Women Organizing for Change in Agriculture and Natural Resource Management (WOCAN). The W+ Standard. Available at: <https://www.wplus.org/about-the-w-standard/>.

example, sex and gender are recognized as important determinants of health.³⁴ Consequently, if standards for medical devices or precision medicine don't use sex-disaggregated data that considers the role of gender this may put patients – i.e., women – unnecessarily at risk. The COVID pandemic illustrates the importance of disaggregated data to understand the impact of standards. Throughout the pandemic there have been reports that women health-care workers have been at a higher risk of contracting COVID because personal protective equipment standards are better suited to men than women.³⁵

37. It can be challenging to obtain representative, inclusive sex-disaggregated data in many areas. When that is the case, standards developers will need to decide if they have the ability and capacity to collect supplemental data. If that is not possible, it is vital that data limitations are acknowledged in the standard and assumptions are articulated.

XI. Take explicit action

38. After determining whether there are gender differences that have implications that need to be considered in the development of a standard, it is vitally important that this information is transparently communicated. Specifically, the standard should address:

- How gender implications were assessed (i.e., was sex-disaggregated data used, existing research, etc.).
- What the outcome of the assessment was (i.e., no differences, differences, inconclusive).
- What action was taken to ensure the gender-responsiveness of the standard.

39. Even in cases where gender implications were not identified, or where the evidence was inconclusive, the analysis will improve performance of the standard since an understanding of potential limitations will enable more appropriate/effective use. If there are no gender differences identified, users can have confidence that men and women can both effectively use the standard, and everyone affected by its use can expect equivalent outcomes. If the evidence is inconclusive, then users can exercise their discretion about the need to make some adjustments when using the standard. Acknowledging that the analysis of gender implications for the standard were inconclusive may also prompt additional action that will eventually lead to more conclusive evidence of the gender implications for that standard.

40. Finally, in cases where there are gender implications, being explicit in describing what they are and any potential modifications that are required as a result will also increase users' confidence and avoid potentially harmful assumptions and impacts. Consider for example a standard for handheld tools that specifies that a firm grip is needed to avoid kickback. Grip strength varies by gender and by age, amongst other factors. A firm grip for a 25-year-old man is quite different from a firm grip for a 45-year-old woman. In the absence of information on how a firm grip is defined, the user may not have confidence in their ability to safely operate the device. If, however, the standard states that a firm grip is considered the average grip strength of an individual of a specified age and gender, users can make an informed decision regarding whether and how they should use the tool.

41. Transparency is essential to avoid the pitfalls of androcentrism, the bias to see men as default and women as not representative of “people”. This problem is illustrated in the 1995 edition of the ISO 3411 standard for *Earth-moving machinery – Human physical dimensions*

³⁴ Cirillo, D., Catuara-Solarz, S., Morey, C., Guney, E., Subirats, L., Mellino, S., ... & Mavridis, N. (2020). Sex and gender differences and biases in artificial intelligence for biomedicine and healthcare. *NPJ digital medicine*, 3(1), 1-11. Available at: <https://doi.org/10.1038/s41746-020-0288-5>.

³⁵ See for example: CDC (2020). Characteristics of Health Care Personnel with COVID-19 – United States, February 12–April 9, 2020, *Weekly / April 17, 2020 / 69 (15)*; 477–481. Available at: <https://www.cdc.gov/mmwr/volumes/69/wr/mm6915e6.htm>; Algayerova, O. and El-Yassir, A.A. (2020). Op-ed: Personal Protective Equipment standards must respond to women's needs to ensure the safety of all frontline workers during the COVID-19 pandemic, UN Women. Available at: <https://eca.unwomen.org/en/news/stories/2020/5/op-ed-personal-protective-equipment-standards-must-respond-to-womens-needs>.

of operators and minimum operator space envelope. The scope of which specified that: “this International Standard defines the dimensions of male operators of earth-moving machinery and specifies the minimum normal operating space envelope around the operator enclosures (cabs, roll-over protection systems (ROPS), fall-over protection systems (FOPS)) generally applicable to earth-moving machinery.”³⁶

42. Updated in 2007, the standard’s title was revised to *Earth-moving machinery – Physical dimensions of operators and minimum operator space envelope* and the introduction now clearly states that the operator dimensions are based on male and female data from Asia, Europe and the United States of America.³⁷ If a standard refers to humans, it is imperative that men and women are explicitly considered in the development of the standard to ensure that the standard provides equal experiences and outcomes for both.

43. While it may be easier to identify and address gender implications when it comes to human physical dimensions and direct interaction with people, it is equally important to consider gender implications for standards in which the gender implications may not be as immediately apparent. This may require standards developers to think through the downstream effects of their standards to ensure that the standard does not inadvertently perpetuate gender inequality. This will be an iterative process, and one of the strengths of the standardization system is that standards are continually updated and improved. As standards developer’s understanding of how the application of standards impacts gender equality evolves, they can address gaps and improve outcomes for men and women. Like snowploughing in Sweden, what on the surface may seem neutral may in fact be perpetuating inequitable outcomes for men and women.

44. Standards are regularly lauded for their ability to improve health and safety, to support interoperability, facilitate trade and increase economic growth for companies and countries. And yet, by not fully addressing the needs of half the world’s population standards are achieving these outcomes, primarily for men. While economists regularly quantify the cost of underutilizing women in the labour force, a similar analysis has not been done for standardization. Standards touch every facet of our lives, a lack of gender-responsiveness has been shown to have health and safety implications and given the importance of standards to the economy,³⁸ undoubtedly, the lack of gender-responsiveness would have implications there too. By taking action to improve representation of women in standardization and being intentional in considering gender in standards development, individuals, businesses, and countries will benefit from having standards that respond better to the needs of everyone.

³⁶ International Organization for Standardization (1995). ISO 3411:1995 – Earth-moving machinery – Human physical dimensions of operators and minimum operator space envelope. Available at: <https://www.iso.org/standard/24509.html>.

³⁷ International Organization for Standardization (2007). ISO 3411:2007 – to Earth-moving machinery – Physical dimensions of operators and minimum operator space envelope. Available at: <https://www.iso.org/standard/38911.html>.

³⁸ See for example, Hogan, O., Sheehy, C. & Jayasuriya, R. (2015). The economic contribution of standards to the UK economy. Available at: <https://www.bsigroup.com/LocalFiles/en-GB/standards/BSI-The-Economic-Contribution-of-Standards-to-the-UK-Economy-UK-EN.pdf>; BSI: London and Liao, D. (2021). Every standard counts – How standardization boosts the Canadian economy. Standards Council of Canada: Ottawa. Available at: <https://www.scc.ca/en/about-scc/publications/general/every-standard-counts>.