GUIDELINES ON

DEVELOPING GENDER-RESPONSIVE STANDARDS

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Working Party 6 on Regulatory Cooperation and Standardization Policies

The Working Party on Regulatory Cooperation and Standardization Policies (WP.6) encourages increased regulatory coherence in specific sectors that have a critical impact on sustainable development and promotes greater resilience to natural and man-made hazards. WP.6 also works to:
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Abstract

There is a growing recognition that standards are not gender-responsive. Through the Declaration for Gender Responsive Standards and Standards Development, the United Nations Economic Commission for Europe (UNECE) has invited standards bodies to commit to take action to ensure the efficacy of standards for men, women, boys, and girls. Research has shown that the failure to account for women in standards development can have dire consequences. This document provides practical advice for standards developers on how they can improve the gender-responsiveness of their standards. Specifically, the guidelines address how to improve the representation of women on technical committees and ensure that meetings are inclusive to foster the participation of women, and how to ensure that standards are gender-responsive, regardless of the number of women participating on the technical committee. While the guidelines can be used by any standards developers to improve gender-responsiveness, leaders of technical committees and standards bodies play an important role in promoting and empowering the application of a gender-lens in standards development.

The guidelines provide recommendations on how to consider gender in standards development. These guidelines are intended to be a living document that, in the spirit of standards development, will need to be updated as knowledge in the area evolves. While the guidelines are specific to gender, many of the principles could also be applied to other groups who may be marginalized in the standards development process.

Information on advance copy

This document was finalized in 2021 after the 31st annual session of WP.6 and is intended to be officially presented tot he 32nd annual session which is planned in November 2022. In order to provide an opportunity for other organizations to comment before the session document has been completed, this advance copy is proposed. Any organization that would like to provide comments, may do so until 31st May 2022 by sending these to: regulatory.cooperation@un.org.

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On May 13th, 2019, over 50 standards organizations signed the United Nations Economic Commission for Europe's (UNECE) Declaration for Gender Responsive Standards and Standards Development.[1] The Declaration commits signatories to work towards ensuring that the standardization process and the standards produced are gender-responsive. The members of the UNECE Working Party on Regulatory Cooperation and Standardization Policies (WP.6) acknowledge the pervasive and influential role of standards in society and recognizes that too often representation of women in standards development is below parity and that the outcomes for men and women are not explicitly addressed during the standards development process.[2] This has led to women not being as well served by standards as men. The Declaration encourages standards development organizations (SDOs) of all types to create gender-responsive standards and achieve gender balance in their standards development processes.

This document aims to provide guidance on how standards development organizations can implement the Declaration. While the focus of this guidance is on addressing gender inequality, gender cannot be, and should not be, disentangled from other identities. Women and men do not form two homogenous groups. Rather gender can intersect with other identities (e.g., sexual-identity, ability, race, socio-economic status, etc.) to create unique outcomes for diverse groups of men and women. While it is beyond the scope of this guidance document to fully explore intersectionality, users are encouraged to consider how the principles addressed here can support diverse users of standards.[3]

1   What are gender-responsive standards?

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 equal 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.

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.

Cookstoves fueled 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.[4] Across cultures, women – and children – are disproportionately impacted by

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[1] UNECE, Press Release: UNECE and over 50 standards bodies sign Declaration on Gender Responsive Standards, May 13, 2019.

[2] UNECE Working Party of Regulatory Cooperation and Standardization Policies session, "Recommendation U on Gender-Responsive Standards," Nov. 2018, pg. 2.

[3] For example, by applying the principles of universal design, see for example: https://universaldesign.ie/What-is-Universal-Design/

[4] WHO, Household air pollution and health, 2018.

household pollution.[5] 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.[6] In the case of cookstoves, sex and gender differences put women at greater risk.

In 2018, the International Organisation for Standardisation (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 Organisation (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.[7]

2   Why is gender important for standardization?

The lack of gender-responsiveness in standardization has consequences. Standards are often referred to as invisible infrastructure; they touch all aspects of our lives, such as the products, processes, and services we use daily. As a result, when standards are not gender-responsive the impact is pervasive. The impact may be a seemingly mild inconvenience, for example when ventilation standards based on men's metabolism leave women feeling cold in the office. However, even seemingly benign impacts can be harmful. Research has shown that colder temperatures lower women's cognitive abilities and productivity.[8] In other words, businesses could be less competitive, productive, and profitable, because ventilation standards fail to account for the needs of women.

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.[9] 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.[10] Women are not seeing the same benefits from standardization.

The extent to which standards are not considering gender can be partly illustrated through work undertaken to map standards onto the United Nations Sustainable Development Goals.

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[5] WHO, Household air pollution and health, 2018.

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

[7] ISO, New guidance in the cookstoves series just published, 2018.

[8] Chang, T. Y., & Kajackaite, A. (2019). Battle for the thermostat: Gender and the effect of temperature on cognitive performance. *PloS one*, *14*(5), e0216362.

[9] 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.

[10] Parkouda, M. (2020). When one size does not protect all: Understanding why gender matters for standardization. Ottawa: Standards Council of Canada.

Preliminary mapping by SCC found that only 2 per cent of National Standards of Canada were contributing to SDG 5.

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.

3 Who needs to act to improve gender-responsiveness in standardization?

Standards are developed by committees of experts. These committees can be under the oversight of international, national, or other bodies. The oversight bodies establish the rules for participation and the process that needs to be followed by experts. Oversight bodies and expert panelists both play a vital role in ensuring standards are gender-responsive.

This guidance document aims to provide standards developers and technical committee experts and participants with the practical tools they need to enable them to ensure the standards they contribute to developing are gender-responsive. While the recommendations can be adopted by oversight bodies, which would certainly facilitate the development of gender-responsive standards, that is not a pre-condition for implementation.

4 How can standards developers ensure standards are gender-responsive?

Addressing the gender gap in standardization demands concerted action from all parties. The premise that gender-responsiveness as 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*. Research has shown that when gender inequality is framed as a problem of women's empowerment, the solution is to "fix the women."[11] 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:

- How to increase representation of women on technical committees and ensure that meetings are inclusive to foster the participation of women in standards development.
- How to ensure that standards are gender-responsive, regardless of the number of women participating on the technical committee.

The UNECE Declaration for Gender Responsive Standards recommends that standards development organizations develop a gender action plan. Having a gender action plan that incorporates these two activities can help to advance gender-responsiveness in standards development. For example, as a signatory of the Declaration on 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

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[11] 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.

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.

Given the breadth and depth of standardization, this document is meant to be as widely applicable as possible. This guidance provides key considerations and questions to empower every member of the technical committee to bring a gender-responsive lens to the standards development process.

5   Balanced representation

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 the Standards Council of Canada (SCC) for example, eight categories of stakeholders' interest are recognized,[12] and committees are evaluated based on how well the categories are represented. 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.[13]

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's 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.[14]

While comprehensive disaggregated data is scarce, it is generally recognized that women are under-represented in standards development. In 2020, only 7 per cent of technical committee chairs at IEC were women.[15] 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.[16] Consequently, to ensure gender-responsive standards, SDOs 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

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

[13] ISO/IECC. (2019). Guide 59: ISO and IEC recommended practices for standardization by national bodies. Switzerland: ISO/IEC.

[14] Forest Stewardship Council. Forest management standards development group. https://ca.fsc.org/en-ca/standards/new-national-forest-management-standard/national-standard-development/standards-development-group.

[15] Heß, P. (2020). SDG 5 and the Gender Gap in Standardization: Empirical Evidence from Germany. *Sustainability*, *12*(20), 8699.

[16] Fine, C., Sojo Monzon, V., & Lawford-Smith, H. (2020). Why does workplace gender diversity matter? Justice, organizational benefits, and policy.

and can improve the performance of the team.[17] This section will discuss strategies for increasing participation of women in standardization and how to ensure women's contributions are not marginalized.

6 Recruitment

Understanding that women are less likely (i) to volunteer in professional settings[18] and (ii) be proposed by their employers to participate in professional settings,[19] the 'expert volunteer led' processes employed by many standards development organizations (SDOs) may act as an impediment to greater female engagement/reinforce existing imbalance in technical committees.

SDOs and national standards bodies (NSBs) can take meaningful action to increase the participation of women, including:

- **Encourage women to volunteer:** 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.[20] 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 proportionately 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.

- **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

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[17] 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.

[18] 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. https://doi.org/10.1007/s11266-013-9430-1.

[19] 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.

[20] Wille, L., & Derous, 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.

insufficient information related to women's participation in standards development. Extensive data must be gathered and monitored over time to assess progress.

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 under-represented in media, across over 100 countries in 2019, only 24 per cent of subject matter experts interviewed by media were women.[21] With the BBC's 50:50 Project, 78 per cent of involved programs achieved gender balance with their contributors after at least 2 years. [22] It is possible to increase representation of women through such concerted action.

7   Inclusive Meetings

Increased representation in Technical Committees must be coupled with enabling greater participation through inclusive meetings. 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.[23] 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."[24] The issue is not how women and men act, but how those actions are perceived.

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 technical committee meetings. There are three areas that technical committee chairs and members should be mindful of:

- **Contributions:** Research has shown that in group settings women contribute proportionately less than men.[25] 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.[26] Women's participation in standardization will not reap as many benefits if they are not able, for whatever reason, to fully contribute.

- **Interruptions:** Despite the fact that 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

[21] Macharia, S. (2020). Global Media Monitoring Project (GMMP). *Who Makes the News?* *https://whomakesthenews.org/wp-content/uploads/2021/07/GMMP2020.ENG_.FINAL20210713.pdf*

[22] BBC. (2020). BBC continues global expansion of the 50:50 project to help increase female representation in the media. https://www.bbc.co.uk/mediacentre/latestnews/2020/50-50.

[23] 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*.

[24] 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.

[25] Karpowitz, C. F., Mendelberg, T., & Shaker, L. (2012). Gender inequality in deliberative participation. *American Political Science Review*, *106*(3), 533-547.

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

more than men.[27] The higher propensity to interrupt women more than men has been shown in diverse settings, including Supreme Court oral arguments[28] and for job candidates in engineering.[29] 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 women are less competent in male-dominated settings remains prevalent – even if only on a subconscious level.[30] 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 CV when it was attributed to a woman.[31] The discounting of women's expertise in technical committees will further erode their ability to meaningfully contribute and participate in standards development. The consequence being that fewer viewpoints are considered, which will negatively impact the quality of the standard.

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.[32]

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 gender bias.

Prior to meetings, it is essential that new members understand what to expect. Providing training and/or mentorship to new women and men 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 organizations should

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[27] 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.

[28] 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.

[29] 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.

[30] 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.

[31] 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.

[32] 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.

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.

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's 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.
- 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.

Standards development relies on panels of experts who share their knowledge and expertise using a consensus approach to reach solutions. By creating a respectful environment, where women 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 committee to ensure a more viable solution for end users.

8   Representation is important, but not the full solution

Experts on technical committees are typically drawn from a country's labour force. Globally, men are more likely to be in the labour force then women (75 per cent compared to 49 per cent).[33] Moreover, the distribution of women in the labour force is skewed by sector. Worldwide, women are over-represented in two sectors, healthcare/social assistance (75 per cent) and education (65 per cent), but they are significantly under-represented in utilities (21 per cent), transportation (17 per cent), mining (12 per cent), and construction (8 per cent) among other sectors.[34] Consequently, even with effective recruitment strategies and inclusive meetings, some technical committees may still be challenged to improve representation of women. Moreover, while increased participation of women is an important step to improve gender-responsiveness in standardization, it is not a panacea.
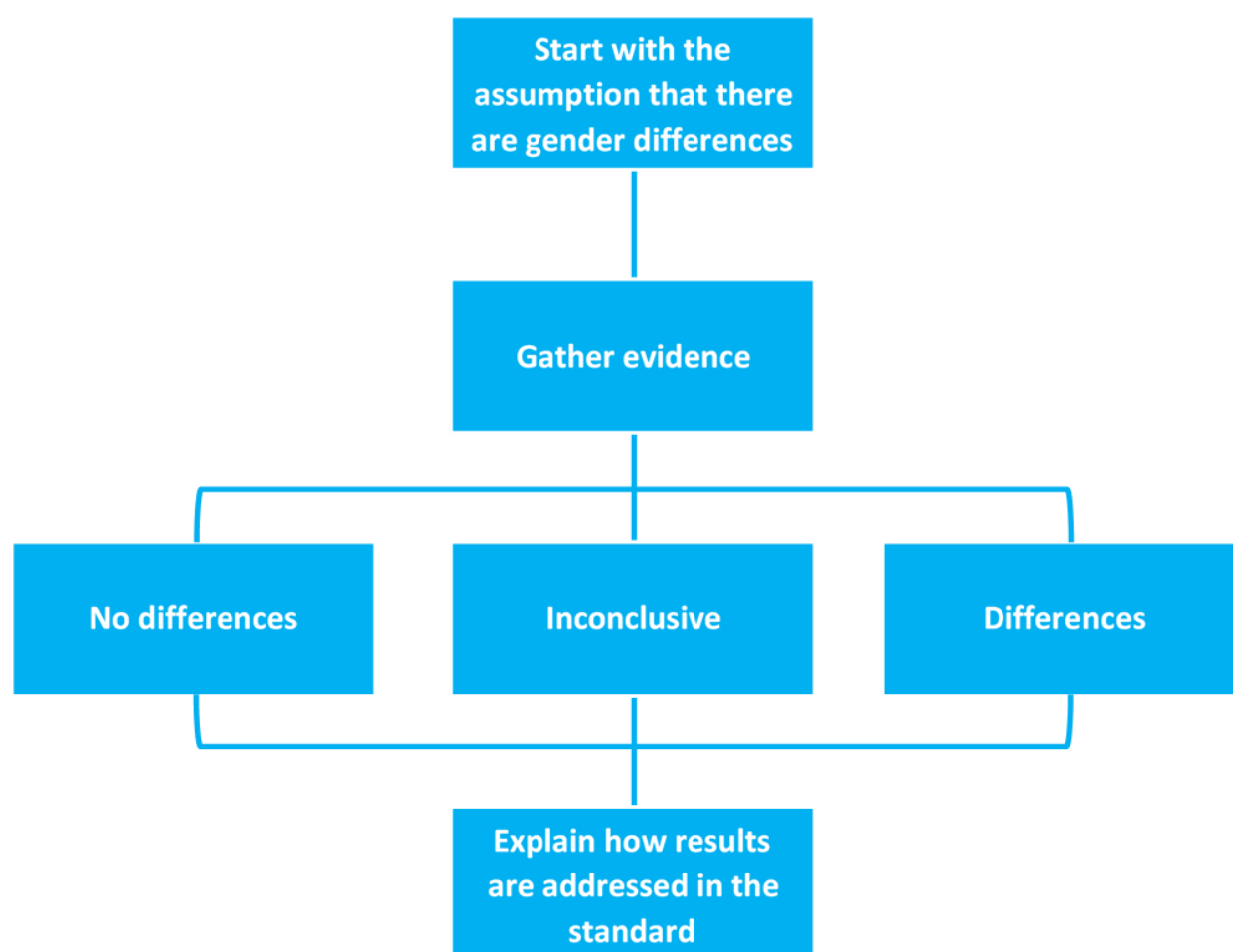
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[33] https://www.ilo.org/infostories/en-GB/Stories/Employment/barriers-women#gender-gap-matters

[34] World Economic Forum. (2021). Global Gender Gap Report 2021: Insight Report. World Economic Forum. http://www3.weforum.org/docs/WEF_GGGR_2021.pdf

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 persists[35] and tends to be perpetuated by those who think it doesn't exist. Consequently, regardless of the number of women on a technical 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.

In the following sections we outline three steps that committees can take: (i) start with the assumption that there are gender differences; (ii) gather evidence; and (iii) take targeted action (see figure 1). When applied these steps can significantly improve gender-responsiveness in standardization.

Figure 1: Steps to ensuring standards are gender responsive

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[35] 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.

9   Assume there are gender differences

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. 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 gender-neutral standards being, in reality, standards designed for men.[36] 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.[37]

To address this bias, standards developers should start with the assumption that there are gender differences. By explicitly considering how the standard impacts 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.

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 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?
- Does the standard anticipate and address how the standard might impact, or be used by, women?
- How will men and women use the product, process or service outlined in the standard?
- If there is a process in the standard, are the steps flexible and adaptable to accommodate differences in the size, strength, stature of the user?
- 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 respond to the different lived experiences of women and men?

Applying a gender lens to standards development may lead to a reassessment, whereby things that were assumed to be gender neutral are in fact not gender neutral. Snowplowing 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 snowplowing.[38] However, as they considered it further, they realized there were gender impacts. The prioritization and order in which areas were snow plowed impacted on men and women differently. This was because men and women use different

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[36] 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.

[37] Bailey, A. H., LaFrance, M., & Dovidio, J. F. (2020). Implicit androcentrism: Men are human, women are gendered. Journal of Experimental Social Psychology, 89, 103980.

[38] 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/.

modes and routes of transportation. By changing snowplowing practices, the city benefited from greater accessibility for all and reduced hospitalizations.[39] 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, impact men and women further downstream.

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 Organising for Change in Agriculture and Natural Resource Management (WOCAN).[40] The standard is intended to quantify women's empowerment and provides an avenue to invest in women 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 standardization to truly be gender-responsive, it cannot rely exclusively on a limited number of niche standards, it needs to be accounted for in all standards.

10 Gather evidence

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 development process. However, determining the exact nature of any potential modifications to the standard requires data, specifically sex-disaggregated data.

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 example, sex and gender are recognized as important determinants of health.[41] 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.[42]

It can be challenging to obtain 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.

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[39] Ibid.

[40] WOCAN. The W+ Standard. https://www.wplus.org/about-the-w-standard/.

[41] 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.

[42] 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, 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, https://eca.unwomen.org/en/news/stories/2020/5/op-ed-personal-protective-equipmentstandards-must-respond-to-womens-needs.

11 Take explicit action

After determining whether there are gender differences 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 considerations were assessed (i.e., was sex-disaggregated data used, existing research, etc.);
- What the outcome of the assessment was (i.e., no gender differences, gender differences, inconclusive); and
- What action was taken to ensure gender-responsiveness of the standard.

Even in cases where gender differences were not identified, or where the evidence was inconclusive addressing these items will improve performance of the standard since an understanding of potential limitations will enable more appropriate/effective use. If there are no gender differences, users can have confidence that men and women can both effectively use the standard and expect equivalent outcomes. If the evidence is inconclusive, then users can exercise their discretion when using the standard. Acknowledging that gender differences in the standard are inconclusive may also prompt additional action that will eventually lead to a more definitive answer on whether there are gender differences.

Finally, in cases where there are gender differences, 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. 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. 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.

Transparency is essential to avoid the pitfalls of androcentrism, the bias to see men as default and women as not representative of people. This bias was illustrated in the 1995 edition of the ISO 3411 standard for Earth-moving machinery – Human physical dimensions 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."[43]

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.[44] If a standard refers to humans, it is imperative that men and women

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[43] Emphasis added. ISO 3411:1995 - Earth-moving machinery – Human physical dimensions of operators and minimum operator space envelope.

[44] ISO 3411:2007 - to Earth-moving machinery — Physical dimensions of operators and minimum operator space envelope.

are explicitly addressed in the standard to ensure that the standard is equally applicable and effective.

While it may be easier to identify whether a standard has addressed gender considerations when it comes to human physical dimensions, it is equally important to consider gender implications for standards in which the gender component may not be 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, they can address gaps and improve outcomes for men and women. Similar to snow plowing in Sweden, what on the surface may seem neutral may in fact be perpetuating inequitable outcomes for men and women.

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, standards are achieving these outcomes while not fully addressing the needs of half the world's population. 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, 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 to the needs of the whole population.