Personal protective equipment: getting the right fit for women

In the workplace personal protective equipment can save lives. Yet in many occupations, in spite of the increasing numbers of women employed, this equipment continues to be designed by men for men. A number of recent initiatives seek to design protective gear catering for the different shape of the female body.

Aída Ponce Del Castillo
ETUI

In occupations like airline pilot where women represent only a tiny majority of workers, their specific needs are still too frequently ignored in the design of work equipment.
Image: © Belga

There is a scarcity of personal protective equipment (PPE) specifically designed for female workers. Anecdotal evidence from women is that PPE tends to be "shaped for men and to pop open in the wrong places"; that "arms and legs are too long"; that "it doesn't fit where it needs to"; and that "safety footwear in the right sizes is very difficult to find". Reported experiences of wearing PPE confirm that by limiting effective protection, it forms a barrier to employment opportunities. Research data show that designing PPE for women requires different parameters and a commitment on the part of manufacturers and suppliers to developing this equipment which, if and when it is actually available, makes such a big difference in the working lives of the women concerned.

During the "Women's health and work" conference organised by the European Trade Union Institute (ETUI) in March 2015, a panel had the task of examining this important issue. Here we will look at three examples that show the benefits of taking women's morphology into account when designing and using PPE. These cases also demonstrate how doing this can improve working conditions and how it is possible to change the perceptions of manufacturers designing PPE.

Fitting PPE to women's needs

Women are not a "scaled-down" version of men. The lack of PPE designed for women can pose potential employment issues and result in productivity losses or failures. Because finding correctly fitting PPE can delay hiring, users sometimes "adapt" what is available to try and ensure that it fits them, with potentially dangerous consequences for both the individual and the process. PPE and protective clothing that are properly adapted to fit the individual worker help avoid accidents.

The cockpit was a male-controlled space *par excellence*.

Dorothy Wigmore, a health and safety specialist from Canada, has shown that anthropometric data demonstrating the importance of PPE design do exist. In the early 1970s and 1980s, the United States and Canada started collecting these data. The US Army conducted research and collected anthropometric data that showed that, for women, body size distributions, proportions, measurements and sizes cannot be scaled down from those of men. This information was used to design and size personal protective equipment, clothing and even workstations in different ways for men and for women.

Similar issues exist in other sectors. Publications specialising in health and safety have also asked questions about workers in coal mines, construction and non-traditional workplaces, and about the use and effectiveness of women's PPE and clothing. The US National Anthropometry Survey of Female Firefighters addressed the lack of the information required to ensure that women firefighters are included in design parameters, while highlighting additional cause for concern in terms of adapting the equipment and apparatus for women firefighters (women's under-bust, waist circumference, hips, torso, head, etc.).

Albeit to a limited extent, women's PPE is manufactured and available on the market; yet it is still not reaching all the workers who need it. Such equipment is rarely displayed or sometimes not labelled as women's products; or else there may be a restrictive purchasing policy within organisations. Positive examples do, nonetheless, exist. Miller

Fall Protection – a subsidiary of the US conglomerate Honeywell – offers the "Ms. Miller Harness", a full-body harness that keeps the shoulder straps at the side and away from the female chest, with hip support. Rosies, a US family- and female-run company provides overalls and coveralls designed to fit a woman's body and gloves fit for a woman's hand. In Canada, Covergalls Inc. designs, produces and promotes women's industrial workwear.

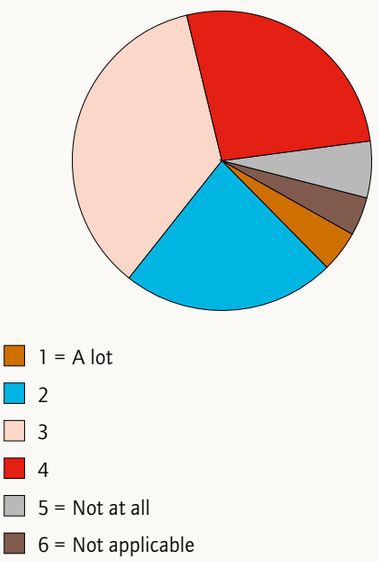
Purple Boots Campaign

In the UK, the Women's Engineering Society (WES) looked into improving safety and working conditions in engineering and construction. Because of the lack of robust data, the WES set up a safety clothing survey distributed among suppliers, male and female workers, as well as women's networks in Britain. The survey had two objectives. First, the intention was to investigate the general problems arising with PPE for women in various sectors such as construction, software & technology, gas & electric. Secondly, it looked at the type of PPE that is most problematic and how it could be improved for women.

The results of the survey showed a lack of availability of PPE clothing specifically designed for women. Jackets, gloves, shoes, trousers and headwear proved to be the most problematic items. Additionally, no maternity PPE is available. The majority (75%) of PPE worn by women respondents was designed for men. Over half of the respondents reported that their PPE hampered their work and efficiency and could be a factor in deciding to stop working in the sector (see figure).

As a result, WES has been working in partnership with Dunlop Safety and other organisations and has developed the "Purple Boot Campaign", with the aim of designing and developing a new range of safety boots for female engineers.

On a scale to 1 to 5, to what extent has ill fitting PPE hampered your work?



Source: Larmour J. *et al.* (2010) WES Safety Clothing and Footwear Survey, Women's Engineering Society

Women in the cockpit

Although the first female pilots started appearing in the early 1900s, female captains are still in a minority. Globally 3% of pilots are women, or about 4 000 out of 130 000 pilots worldwide[1]. This historical disparity is due, in two different ways, to the roots of aviation. On the one hand, the profession was predominantly military and, on the other hand, aircrafts and related equipment, from an engineering and design point of view, have always been male-oriented.

In Spain, the trade union-related research institute ISTAS conducted a survey to understand how the role of the pilot has evolved since the 1980s and, more specifically, how female airline pilots have or have not benefitted from better working conditions over time. Women in aviation have faced difficulties from the start, as shown by the personal interviews conducted by ISTAS. These revealed that women working as pilots faced stereotyped forms of disapproval and were given fewer opportunities to fly compared with their male colleagues. Women pilots were also expected to continuously prove themselves and demonstrate very high skill levels.

The cockpit was found to be a male-controlled space *par excellence*. The engineering specifications, instruments, tools, PPE and other facilities were designed to fit the measurements and proportions of the male body. In order to operate the cockpit, a certain strength and height were required, which prevented some women from becoming pilots. Due to design choices, 70% of women could not reach the pedals, flight deck controls, levers and points of visibility, which was obviously critical. Even the best designed and equipped cockpit could not be considered efficient and safe if it imposed limitations on its users and operators, be they men or women.

Later on, as safety became an even higher priority in aviation, the sector was forced to make changes. The goal was to reduce the number of human errors and accidents and improve the safety of piloting. This fact, together with the worldwide discussion of social and human rights, formed a window of opportunity for women's upward mobility in aviation.

The transformation started with the design of safer, more functional and more advanced cockpit systems. The automation of cockpits required different skill sets and less physical effort was needed. In the early 1990s a new organisational culture started to emerge, in particular through training procedures such as "Cockpit Resource Management" and "Crew Resource Management", which promoted interpersonal communication, leadership and decision-making in the cockpit, integrated the role of the co-pilot and stressed the need to work with the whole crew. Both technical and organisational changes have promoted the development of new safety-oriented working conditions.

Nonetheless, with the emergence of new business models and the so-called "low-cost airlines", working and employment

1. Prendergast J. (2015) High flyers: Why aren't there more women airline pilots? BBC News http://www.bbc.com/news/uk-31491754

In security-related jobs it is not easy for women to find shoes that fit.
Image © Belga

> Women are not a "scaled-down" version of men.

conditions are once more facing major change. The role and number of female pilots in the future is bound to change and the developments in question will certainly call for discussion.

PPE needs to be "individually adapted"

The safety-oriented design and production of Personal Protective Equipment are critically important for the protection of all workers. PPE continues to be required for a wide range of occupations, which is why its correct selection, use and maintenance need to be up to date. From the facts supplied above we can draw three points of conclusion.

Firstly, when considering PPE, standardisation is important because standards need to be met, and ergonomic requirements and health and safety approaches need to be incorporated into the design. On the first point, including the gender dimension in the ergonomic analysis helps to reduce accidents and musculoskeletal discomfort. With regard to safety approaches, the practical experience of the user – the feedback method – can be made available to the various standards committees and allow a two-way flow in developing appropriate standards.

Secondly, the cases reported show the concerns, experiences and needs voiced by women workers and how these have actually transformed their work. The transfer of women's knowledge helps to recognise those aspects of their work that can constitute a hazard or lead to specific women's health problems. Women's voices and experiences can even highlight issues relating to women's health that have hitherto remained invisible.

All of this is in line with the principle laid down in the EU Regulation on Personal Protective Equipment that PPE needs to be "individually adapted". This means that there must be PPE available that meets the specific needs and characteristics of each end-user: man, woman or young worker, as well as persons with disabilities. There are examples of manufacturers who feature these products more prominently in their catalogues.

Finally, there is still a need to gather further robust pan-European data, through more action-oriented studies or research initiatives with a multidisciplinary approach. Trade unions, government authorities, standardisation bodies, employers, ergonomists and women's networks must seek ways of working together on this issue. ●

References

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