

ENHANCING SAFETY THROUGH ADAPTED PERSONAL PROTECTIVE EQUIPMENT IN UKRAINE

Field visit to Ukraine, 2024 © GICHD

WHAT IS PERSONAL PROTECTIVE EQUIPMENT?

Personal protective equipment (PPE) refers to all equipment and clothing designed to provide a reasonable degree of protection, which is intended to be worn, or held by an employee when conducting specific activities, and which protects them against one or more risks to their safety or health.

WHY THIS MATTERS NOW

Ukraine's mine action sector is expanding rapidly in response to widespread explosive ordnance contamination. Its success depends on the ability to recruit, retain, and protect a safe, skilled, and effective workforce at scale. As that workforce grows and diversifies, PPE designed around a narrow user profile risks undermining comfort, mobility, confidence, and operational performance.

Since 2022, large-scale mobilization of men into the Ukrainian Armed Forces has reshaped the labour market, accelerating the entry of women into sectors traditionally dominated by men, including mine action.[1] Women now make up around 29 per cent of the mine action workforce, with approximately 22 per cent of operational roles–such as clearance and survey–performed by women.[2] This shift has helped sustain capacity while highlighting the need for equipment, procedures, and safety systems that are better suited to a more diverse workforce.

PPE AS A CORE SAFETY REQUIREMENT

Mine action depends on strict risk management and safety measures. According to International Mine Action Standard (IMAS) 10.30 Safety and occupational health, personal protective equipment should be regarded as the "last resort" and the final protective measure after all planning, training and procedural efforts have been taken to reduce risk.[3]

Under IMAS 10.10 Occupational Health and Safety–general requirements, PPE provided shall fit the employee regardless of gender and be designed to provide reasonable comfort and protection against the predictable risks of a demining worksite.[4]

This principle is also reflected in Ukraine's national framework. The Law of Ukraine "On Labour Protection" (1992) defines occupational safety as a system of measures to preserve workers' health and working capacity.[5] Similarly, the national standard DSTU 8820:2023, on mine action management processes, specifies that PPE is intended for use by all personnel, including men and women, establishing a requirement for equipment to be appropriate and effective for a diverse workforce.

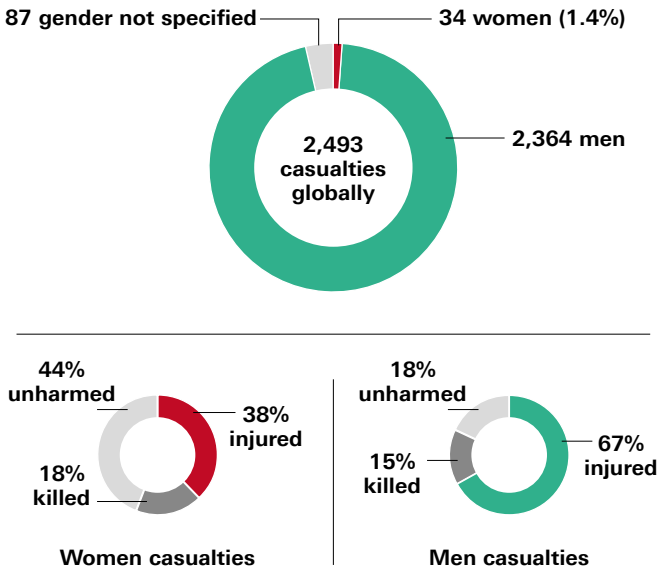
Adapted PPE is therefore not an optional add-on. It is part of meeting existing safety standards.

WHAT THE EVIDENCE SHOWS

Although global and Ukraine-specific accident data remain limited, available evidence points to the importance of ergonomics, usability, and user confidence in PPE design.

Accident data

The now-dormant Mine Action Central Repository of Accidents records 2,493 casualties globally between 1977 and 2024, including 34 women, 2,364 men, and 87 cases where gender was not specified. Women therefore account for 1.4 per cent of recorded casualties.[6]



Among recorded women casualties, 38 per cent were injured and 18 per cent were killed. Among recorded men casualties, 67 per cent were injured and 15 per cent were killed.[7] No Ukraine-specific data are available publicly.

These figures should be interpreted with caution. They may reflect historical workforce composition and uneven reporting practices across organizations and countries. No further disaggregation is publicly available to determine whether poorly fitting PPE was a contributing cause to specific incidents involving women, or the severity of consequences.

Ergonomic design and user experience

Research and field experience both highlight recurring usability challenges in existing PPE systems. A study by Norwegian People's Aid found that some visors were heavy, uncomfortable during prolonged wear, restrictive to visibility, and associated with head and neck strain for both men and women. The study also identified apron fit issues, including chafing and poor fit for some female users.[8]

Findings from a study by the Danish Refugee Council point to similar challenges. Clearance staff in Ukraine highlighted the physical demands of the work, noting that PPE weighing around 5 kg could be especially challenging for some women. The analysis also noted a shortage of PPE designed specifically for female personnel, with standard "unisex" equipment often failing to meet women needs. [9]

These findings suggest that PPE design can directly influence mobility, fatigue, comfort, concentration, and sustained operational effectiveness, underlining the importance of user-centred PPE.[10]

Workforce confidence

A study conducted by the NGO "Girls" and Fondation suisse de déminage found that one of the main concerns expressed by women was personal safety, including fear for life and health. Some interviewees also expressed limited confidence in existing safety measures despite the availability of training and protective equipment, highlighting the importance of trust, communication, and visible safety standards in the workplace.[11]

ADAPTING PPE IN PRACTICE

These challenges have prompted operators in Ukraine and elsewhere to introduce ergonomically adapted PPE as part of broader efforts to improve both safety and performance.[12] Recent initiatives have focused on developing modular demining aprons and visors designed to improve fit, mobility, and comfort for a more diverse workforce. These adaptations aim to enhance protection without increasing weight, while also improving usability in field conditions.[13]

This reflects a broader shift from one-size-fits-all equipment towards user-centred design informed by operational realities.

KEY IMPLICATIONS

Safety systems must adapt to the workforce they protect. PPE only fulfils its purpose when it fits the person using it.

This has several practical implications:

- Ergonomically adapted PPE is a core safety requirement, not an optional add-on.
- Inclusive design directly contributes to operational safety.
- Workforce diversification requires system-level adaptation to maintain safety standards.
- Sex-disaggregated casualty data should inform procurement and risk management.
- User feedback should be integrated into future PPE design.

ENDNOTES

1 GICHD (2025). Clearing the Way Forward: Women, Peace, and Security in Ukraine's Mine Action Response.

2 GICHD (2025). Clearing the Way Forward: Women, Peace, and Security in Ukraine's Mine Action Response.

3 IMAS 10.30 Safety and occupational health – Personal protective equipment, second edition, Amendment 5, 17 January 2023, IMAS 10.30 Safety and occupational health - Personal protective equipment.

4 IMAS 10.10 Occupational health and safety – general requirements, second edition, 16 May 2025. Occupational health and safety – general requirements.

5 The Law of Ukraine: "On Labour Protection," entered into force 24 November 1992, (Abstract text on 11 January 2005), On Labor Protection | on 11 January 2005 ⧉ 2694-XII (Abstract text).

6 Mine Action Central Repository of Accidents (MACRA), MACRA: HOME.

7 Mine Action Central Repository of Accidents (MACRA), MACRA: HOME.

8 Kyaw Lin Htut, "Exploratory Study on the Current Limitations of Personal Protective Equipment and the Potential for Innovation," *The Journal of Conventional Weapons Destruction*, Vol.25: 2, Art. 4 (2021), Exploratory Study on the Current Limitations of Personal Protective Equipment and the Potential for Innovation.

9 Danish Refugee Council, "Ukraine: Gendered Perceptions and Participation in the Mine Action Sector," Ukraine: Gendered Perceptions and Participation in the Mine Action Sector.

10 Kyaw Lin Htut, "Exploratory Study on the Current Limitations of Personal Protective Equipment and the Potential for Innovation," *The Journal of Conventional Weapons Destruction*, Vol.25: 2, Art. 4 (2021), Exploratory Study on the Current Limitations of Personal Protective Equipment and the Potential for Innovation.

11 Fondation suisse de déminage and NGO "Girls", "Research on Women's Perception of Employment in Humanitarian Mine Action: Key Barriers," Research on Women's Perception of Employment in Humanitarian Mine Action: Key Barriers.

12 ROFI, "Demining Vests Especially Designed for Women," *ROFI*, 17 May 2023, Demining vests especially designed for women.

13 ROFI, "Demining Vests Especially Designed for Women," *ROFI*, 17 May 2023, Demining vests especially designed for women.

Australian Aid

This project was made possible thanks to the generous financial support of the Government of Australia. The opinions, findings, and conclusions expressed herein are those of the authors and do not necessarily reflect the views of the Government of Australia.