

Policy Brief

Redesigning PPE: enhancing the comfort and safety of healthcare workers wearing isolation gowns to treat patients with COVID-19

Professor Katherine Townsend, Fashion and Textile Research Centre, Nottingham Trent University
Team: Dr Sonja Sterman, University of Maribor, Slovenia; Karen Harrigan and Eloise Salter, NTU.

KEY INFO

Research question: How can we improve the design, procurement and sustainability of PPE gowns to fit and protect a diverse workforce while reducing environmental impact?

Policy area or themes

- Healthcare
- Equality, Diversity and Inclusion

Methods: Literature review; PPE gown review; Online survey of healthcare workers (100+ ongoing); Scoping interviews with nursing team and procurement leads (6 ongoing); Reusable gown design; Wearer trials; Qualitative interviews following wearer trails (10).

Exchanges with other researchers e.g. Professor Anandi Ramamurthy, Nursing Narratives; Textile Services Association (TSA); Union of Concerned Researchers in Fashion (UCRF); Centre for Circular Design (CFCD).

Geographical area: UK-wide

Research stage: In progress

Summary of the research

The research addresses the design and procurement of PPE (personal protective equipment). As 75% of nurses are women, many from ethnic minorities, the 'one-size-fits-all' disposable gown approach is unsafe and unsustainable with poor sizing and fit affecting safety and performance while impacting the environment. By investigating nurses' first-hand experiences of wearing gowns, we identified the key issues relating to gown fabrication, length, fastenings, donning and doffing. We also established the limitations of the procurement process, based on offshore production, lack of knowledge or investment in UK suppliers or reusable models. The team have experience in fashion and textile, corporate wear and uniform design research. Our partners include Nottingham University Hospital Trust, Diaverum UK, Anze Ltd, Toray Textiles Europe Ltd and the TSA. The Department for Health and Social Care should update its procurement policy to meet the urgent need for healthcare safety, diversity and a Net Zero NHS.

Policy recommendations

- **Design:** PPE needs to be made in breathable, washable textiles for the people who wear it e.g. mainly female nurses, from ethnic minorities with different body shapes. By developing a



reusable gown system across multiple sizes, the workforce will be provided with garments that fit, are safe, comfortable and respect cultural diversity and the environment.

- **Procurement:** Procurement needs to move away from the current model based on importing up to 80% of disposable PPE from offshore suppliers, towards reusable onshore production. Orders should be localised, involving companies (small or large) with experience of laundering and manufacturing surgical gowns.
- **Production:** A local/ national infrastructure of reusable PPE service providers needs to be identified and mapped and where there are geographical gaps, invested in by the UK government and/or research funding.
- **Policy:** The Cabinet Office and Department for Health and Social Care should review the 'technical specifications for PPE' towards reusable products, including the removal of plastic (PU) coatings. NHS trusts require support in prioritising reusable over disposable PPE through new funding models in line with incremental Net Zero NHS targets.

Key findings

- **PPE:** reusable gowns are identical to surgical gowns, apart from laundering requirements. Lack of knowledge of UK PPE providers has led to them being overlooked in favour of offshore suppliers.
- **Sizing:** our ongoing survey of nurses shows that most are still wearing disposable gowns in one-size, L and XL, causing performance and comfort issues for smaller female (and male) staff.
- **Design and fabrication:** common issues identified by healthcare workers via our research includes: overlong gown and sleeve lengths; tight or gaping necklines; fiddly back-neck fastenings that make donning and doffing difficult; heat inducing plastic (PU) coated fabrics; the desire to be sustainable.
- **Fabrication:** Fluorocarbon coated breathable polyester textiles are more comfortable to wear and easier to launder than plastic (PU) coated products. Research into recycling the former is being undertaken to complete the circular design approach.
- **Local infrastructure:** we have identified existing textile suppliers, PPE gown manufacturers and laundry facilities to support the local/ regional network required to develop a redistributed manufacturing (RDM) circular economy (CE) model.
- **Reusable gown system:** our collaboration with Anze Ltd and other members of the TSA has reinforced similarities between the established practice of manufacturing and laundering surgical gowns and the viability of developing a UK-wide reusable gown system.

Further information

Official AHRC/ UKRI project information: <https://gtr.ukri.org/projects?ref=AH%2FV015842%2F1>

Video (1 29 min) : <https://nottinghamtrentuniversity.wistia.com/medias/sbw4xhktsw>

Gown Survey: <https://ntusurvey.onlinesurveys.ac.uk/grading-gowns-redesigning-one-size-ppe-to-fit-and-protect>

Instagram: @ppe_refashioned

Contact details

Dr Katherine Townsend | Professor of Fashion and Textile Practice

Nottingham Trent University | Shakespeare Street | Nottingham | NG1 4BU

T: +44 (0) 115 848 8479 | M: +44(0) 7988 355276 | E: katherine.townsend@ntu.ac.uk

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