Out in the cold: Improving emergency responder uniforms for cold weather environments

A pilot study examining police uniform conditions in the cold chamber.

Key details

Lead institution	Liverpool John Moores University
Principal researcher(s)	Dr Amanda Farrell, Dr Ben Edwards, Professor David Low and Steve Jones A.L.Farrell@ljmu.ac.uk
Police region	North West
Collaboration and partnership	• Cheshire Constabulary • Dr Camilla De Camargo and Dr Stephanie Wallace, Lancaster University
Level of research	Professional/work based
Project start date	September 2025
Date due for completion	July 2026

Research context

Winter Storm 2024 and the Winter Storm Conference (2025) have sparked a research agenda that includes personal protective equipment, specifically uniforms, and whether these are fit for purpose in extreme weather. This area of research was informed by feedback from participants at Winter Storm 2024 and has been supported by De Camargo and others' findings in the national uniform and equipment survey report (2025).

We have succeeded in securing innovation funding to do a pilot study with Liverpool John Moores University (LJMU) Sports Science, examining three police uniform conditions in the cold chamber. To further develop this project, we will examine the same three conditions with a more robust and diverse sample of police officers, as well as including fire fighters and paramedics. This will allow us to develop evidence-based uniform procurement and policy guidance, which can be disseminated at the local, regional and national levels. Additionally, since this project has been developed in consideration of and in partnership with practitioners, it represents co-produced policy recommendations.

Research methodology

The pilot will involve one male and one female officer who will be asked to participate in three separate testing events. Each event will involve the participants taking a core temperature sensing pill, then they will be placed in a simulated vehicle, with the temperature around 19 degrees Celsius. They will then respond to a call and enter the cold chamber. There will be images projected onto the wall related to the call they are responding to. They will be assigned periods of standing and moderate exertion, interspersed with job-related tasks, cognitive testing and dexterity testing. The first testing session will involve only the issued uniform equipment (bronze standard/baseline), the second session will be the standard issue with the addition of a base layer (silver standard), and the third session will involve specialist kit (gold standard), from the agencies represented, if available. An example of this specialist kit is the Cheshire Constabulary rural crimes team uniform – which is all Keela products meant for extreme weather. In the absence of specialist kit, the goal will be to use kit similar to Keela products, base layers and waterproof boots for the 'gold standard' condition. The larger study will include more participants, as well as participants from the fire service and paramedic service.

References

De Camargo CR and others. 2025. 'National Uniform and Equipment Survey Results'. Lancaster University.

Project website