

NEWS IN FOCUS

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PUBLIC HEALTH ENGLAND



Specialist decontamination teams have until now been the first line of defence against bioterrorist attacks.

EMERGENCY RESPONSE

UK rolls out terror-attack plan

Front-line services being trained in new approach to dealing with decontamination of victims in direct aftermath of an event.

BY DECLAN BUTLER

A quick wipe-down with a paper towel can help to stem contamination of casualties in the event of a terrorist attack. That research finding is just one of several simple recommendations in the UK government's plan, now being rolled out, to treat mass civilian casualties in the immediate aftermath of a large-scale chemical, biological or radiological (CBR) attack, or an incident involving hazardous materials.

The Initial Operational Response (IOR)

programme, which is based on a raft of European research, largely classified until now, aims to help ambulance staff and other front-line emergency services to quickly deal with victims before specialists arrive. It introduces disrobing and improvised dry decontamination — patting down with paper towels or other readily available absorbent materials, for example — as the default initial response.

“Any decontamination has to be ‘quick and dirty’, to try to increase the chance of survival and to minimize spread of contamination,” says Ola Claesson of the Swedish Defence

Research Agency in Stockholm, who took part in the research.

The IOR, a Home Office-led initiative, marks a shift in UK policy on dealing with CBR events, and the research on which it is based has caught the attention of international agencies. Until now, UK plans for large-scale incidents involved waiting for specialized teams to arrive wearing hazmat suits, and bringing portable showering tents and other equipment. But with fewer specialized teams than emergency services, delays would be inevitable — an important factor given that many chemical agents, such as sarin nerve gas, can be fast-acting. The new plan eases this problem by placing the initial response emphasis on those first at the scene.

The changes stem from the findings of a European programme called ORCHIDS (Optimisation through Research of Chemical Incident Decontamination Systems). Led by the UK Health Protection Agency (HPA), it involved Czech, French and Swedish security-research centres, as well as collaborators in Australia, Canada, Japan and the United States. A companion UK project, ORCHIDS-2, was carried out by the HPA and by researchers at the University of Hertfordshire in Hatfield and the University of Surrey in Guildford.

The ORCHIDS programmes ran in parallel from 2008 to 2011. Some of their findings have already been published, but much is only now being declassified, explains Robert Chilcott, a toxicologist at the University of Hertfordshire and a lead scientist on both programmes.

The aim was to improve the science base for emergency-response policies to civilian CBR attacks. Much existing research on decontamination following such attacks has been conducted by the military and is geared towards combat situations; it is often not adapted to mass civilian incidents, Chilcott says.

The ORCHIDS research quantified the effects of disrobing and decontamination protocols on the speed and effectiveness of the removal of agents. Various scenarios were tested using *in vitro* models and animal experiments before being replicated in humans.

The scientists found that clothes could provide significant initial protection, but that it was important to remove them quickly to prevent agents from penetrating through to the skin. They also found that dry decontamination was effective — this is crucial, because sufficient warm soapy water is unlikely to be immediately available. Combined disrobing ▶

► and improvised decontamination bought precious time, the research found.

The ORCHIDS project also investigated how showers could best be used once they became available. It tested various regimens, and found, for example, that simple measures such as flannel use and vigorous towel-drying greatly improved the removal of

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agents. Showering for longer than 90 seconds provided little added benefit, a finding that could maximize the rate at which casualties are processed.

“Overall, the new IOR estab-

lishes the primary need to both disrobe and decontaminate individuals as soon as practically possible using any available method, and is based on experimental evidence,” says Chilcott. Training of emergency services in IOR techniques has already begun.

ORCHIDS data have been shared confidentially with security agencies in the United States and other countries. In 2012, the US Department of Health and Human Services, citing a need for similar research on US responses, awarded Chilcott a US\$6-million, two-year grant to apply ORCHIDS methodologies to optimize, for example, the mainstay of the US rapid on-scene response — the ‘ladder pipe’ system. In this, two fire trucks spray low-pressure water to form a decontamination corridor. The research is studying the effectiveness of the ladder-pipe system on clothed individuals.

US guidelines currently recommend that casualties disrobe to at least their underwear, but note that forcing people to undress could make them uncooperative and cause delays. The dilemma highlights the importance of such psychosocial aspects in the design of mass civilian decontamination plans (see go.nature.com/3jxvle).

Robert Gougelet, a researcher in emergency medicine at Dartmouth College in Hanover, New Hampshire, who is familiar with the ORCHIDS work, describes it as “novel and very credible”. He says that he has long advocated the need for a similar initial response phase in the United States. “One of the issues we have is that it’s easier for people just to sit back and say, ‘We are going to wait for the regional teams to arrive three hours later’. We are trying to change that way of thinking,” he adds.

Gougelet feels that having an improved solid science base will help. “It gives us all credibility to go back to the first responders and communities and say that this is scientifically based, this is the credible thing to do, the state of the art, and this is what you should be planning for.” ■



Wolves on Isle Royale in Lake Superior are suffering from spine problems as a result of inbreeding.

ECOLOGY

Iconic island study on its last legs

Ecologists call for genetic rescue of Isle Royale’s inbred wolves.

BY EMMA MARRIS

Since 1958, ecologists have watched wolf and moose populations on Isle Royale in Lake Superior wax and wane in response to each other, disease and the weather. But for the longest predator-prey study in the world, the wolf is now at the door. Devastated by inbreeding, the wolf population has dropped from 30 individuals a decade ago to just 10 spotted in field counts so far this year, leading the US National Park Service to consider importing new animals for a ‘genetic rescue’.

Now, nature is intervening — and could either save the landmark project without the need for tranquillizer darts and wolf crates, or sound its death knell. As temperatures plummeted last month, Lake Superior froze for the first time in six years. The 24-kilometre ice bridge could let wolves from the Canadian mainland cross to the US island, bringing an influx of genes (see ‘Wolf island’). But project scientists say that the opposite is more likely: free to roam, the last wolves could leave the island in search of mates.

That would put an end to a study that has

provided textbook ecology lessons for generations. It has shown how predation can structure populations of prey: when wolf numbers plummet, moose populations tend to soar (see ‘Ecosystem in flux’). And it has offered insights into wolf behaviour, moose physiology, the life cycle of moose ticks and how wolves might be driven to form packs to ward off scavengers such as ravens, rather than for any hunting advantage.



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