CASE STUDY

Research

KNOWING WHEN COLD WINTERS AND WARM SUMMERS CAN REDUCE AMBULATORY CARE PERFORMANCE IN LONDON

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CONTEXT

As part of a climate change risk assessment, Public Health England took the initiative to analyse the impact of cold winters and warm summers on the number of ambulance call-outs and ambulance response times in London. This study is the first of its kind in the United Kingdom. Initial findings show that there is a clear relationship between air temperature and emergency ambulance calls. Further research shows that as well as developing operational adaptation methods for ambulance trusts using real time incident modeling, it will be possible to use real-time ambulance response data to feedback timely emergency warnings *(27)*. For example, the percentage of respiratory or cardiac ambulance calls that are considered life threatening can provide valuable early morbidity information for cold-related or heat-related illnesses.

Within England there are currently 11 National Health Service (NHS) organizations that provide ambulance services and more than 9 million emergency calls were received in the year ending March 2013, of which 77% required an emergency response *(28)*. In 2012/13 there were 2.95 million Category A (CatA - life threatening) incidents with a response rate (such as arriving at the scene of the incident) of 75.5% within 8 minutes (NHS target 75% within 8 minutes). That is close to 25 000 emergency calls per day of which more than 8 000 are triaged as CatA. The total number of emergency patient journeys was 5.02 million and 1.99 million patients were treated at the scene. The total cost of the NHS ambulance service is close to £2 billion per year, of which about £1.5 billion is spent on emergency services and the rest on ambulatory (pre-arranged) services.

The London Ambulance Service employs more than 5 000 staff serving the Greater London population of more than 8 million people. In 2013, over 1.7 million emergency ambulance calls were received of which 1.1 million were responded to (on average 3 000 incidents/day), of which nearly half a million were considered life threatening. This level of activity is increasing year by year (increasing elderly population, additional tourists, more people with mobile phones, etc.), which puts additional pressure on shrinking resources. It was known that hot and cold weather put additional stress on the system but it was not known to what extent.

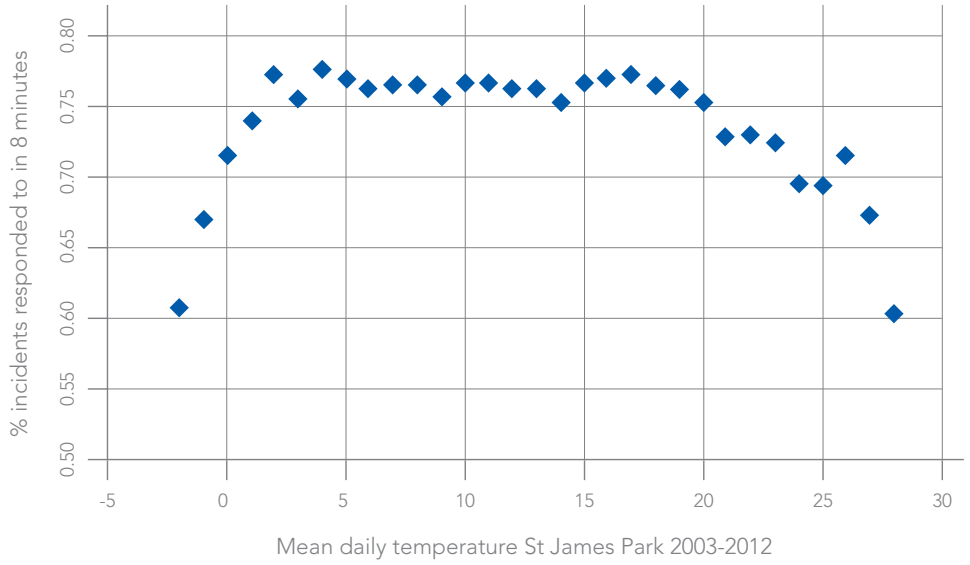
NEW APPROACHES

Daily data was obtained from the London Ambulance Service for 2003–2012, including the number of responded calls, the number of CatA calls, the % of responses within 8 minutes (target 75%) and illness codes. This data was then compared to mean daily temperature data from St James Park (SJP) in London, accessed via the UK Meteorological Office. The heatwaves of 2003 and 2006 plus the very cold December of 2010 are included in the dataset, which gives a good cross-section of weather events.

Figure 4.13 shows a snapshot of the results obtained (which are discussed in detail elsewhere *(29–31)*. The overall relationship between the mean daily temperature and the mean percentage of CatA incidents responded to within 8 minutes (performance target) for each temperature is shown. Mean temperature thresholds that influence performance can be identified as above 20°C and below 2°C. More research is required to identify which illnesses increase beyond these thresholds. Figure 4.13 shows that, on average, performance drops off more quickly as the mean temperature drops below 2°C compared to the reduction in performance when the temperature rises above 20°C. This could be partly because performance at low temperatures is also affected by slippery roads due to ice and snow, whereas in warm temperatures the roads are not normally affected. This figure shows that the weather does not have to be severe for an impact on ambulance services to occur.

There is also a seasonal change in the number and type of incidents, which means that the performance of the ambulance service in London is marginally better in spring and autumn and worst in summer and winter. Both warm and cold weather exaggerate these variations and cause a significant reduction in performance, especially during 'heatwaves' and 'coldwaves'. Ongoing research is being conducted in a collaboration between the London Ambulance Service and Public Health England. It is planned to incorporate weather forecasts into predictions of demand on a daily to weekly time scale.

Figure 4.14 Mean daily temperature versus % of CatA incidents responded to within 8 minutes (averaged for each temperature, 2003–2012).



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BENEFITS AND LESSONS

The weather impacts directly on day-to-day operations, while the climate contributes to the level of service required (e.g. the number of staff and ambulances). As the climate changes and/or the frequency of hot and cold weather changes, so too must the ambulance service become more resilient and better prepared with bespoke weather forecasts and climate predictions.

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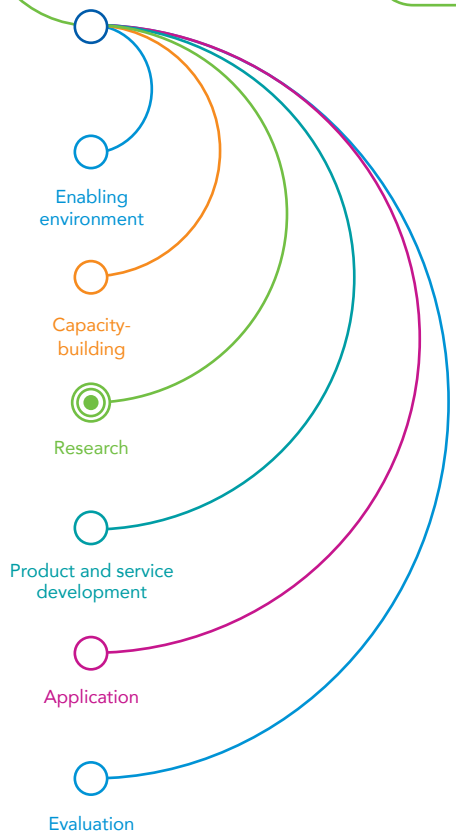

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LONDON

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