



Predicting fire risk and saving lives

The world's third largest firefighting organisation uses SAS® to explore risk and drive prevention strategies aimed at reducing fires, death and injury in the UK capital. London Fire Brigade can now reveal high risk areas and target resources, ensuring a focus on the biggest opportunities to protect life and property.

Industry

Public Sector

Business Issue

The world's third biggest firefighting organisation wanted to better analyse, predict and report on fire risk to prevent fires and save lives – across 7.5 million people living in 3.2 million households.

Solution

SAS® predictive analytics.

Benefits

Improved speed, flexibility and accuracy in understanding and predicting risk – targeting resources in prevention for high risks areas, saving lives and protecting property.

Run by the London Fire & Emergency Planning Authority, London Fire Brigade (LFB) is the UK's largest fire service. Employing 7,000 staff including 5,700 operational firefighters, it serves a population of 7.5 million people in 3.2 million households across 1,537 square kilometres. As you would expect, fire prevention programmes and raising public awareness are priorities. "It's really important that we target our Community Fire Safety activities at where they are most needed," says Andy Mobbs, Risk Information Manager, LFB. "We are using SAS to target people in their homes so we can carry out safety checks, give advice and fit smoke alarms. We want people to take better care in their homes so they won't need our services later." In 2008, LFB started using SAS in its *Incident Risk Analysis Toolkit*. "The information we provide using SAS has cascaded from top to bottom," says Mobbs.

"Our predictive capabilities have improved since we started working with SAS and provided us with a greater understanding of fire risk."

Modernising the fire service

The LFB requires the most robust, reliable and accurate analytics to understand and predict risk – to help it continue reducing the number of fires. Like any other local government structure, LFB also faces various operational pressures, from availability of resources to time pressures and controlling costs. So working in a more informed way – ensuring staff are deployed and activity is targeted where it can have the biggest

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impact – also helps address the 'efficiency agenda' in the public sector. Indeed, Mobbs says the brigade's use of software analytics, such as that provided by SAS, is clearly part of the push to modernise the fire service.

"Firefighters are busy people but there's inevitably downtime when you're not attending an emergency call," he explains. "We want to pick up on that time and see what can be done in the community to make people's lives safer. So this is about the better distribution of resources." Previously, Mobbs' team used free open source software for regression modelling that, he says, was fine for development purposes. When this work moved into the mainstream, however, and staff became more dependent on results, he saw the need for a more robust, dependable and better supported solution. "Moving to SAS was about embedding a stable product that we could rely on."

Predict and prioritise fire risk

Mobbs continues, "SAS analytics enable us to prioritise and understand risk. We have over three million homes in London and carry out 65,000 home safety visits each year. Even on that



LONDON FIRE BRIGADE



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scale of activity this would take over 50 years to complete for everyone. So this is very much about finding out *who* we think is at the most risk, and *what* the key indicators are.” A substantial amount of work on fire risk has already been done based on fire death reports but he says, “deaths by fire are relatively small in number so this can produce a skewed picture. We wanted to look at a much broader range of factors, a combination of lifestyles, property type and geographic area, then model all this to give us a better picture of risk. This is about expanding our knowledge into what we think are the drivers of risk.”

More than 60 different data elements feed into the SAS model, including census data and population demographics, broken down into 649 geographical areas (ward level), plus type of land use, data on deprivation, Mosaic lifestyle data, historic incidents and past prevention activity. The model aims to improve understanding of ‘incident likelihood’ – predicting where fires are most likely to occur, in particular ‘accidental dwelling fires’. “We wanted to move away from historic incidents, seeing where fires happened in the past and instead explore where they might happen,” says Mobbs.

Results, provided as user-friendly maps showing predicted incident levels, are mainly used at fire station level. Borough Commanders and local firefighters

use these insights to plan and target home visits in areas of highest risk. “Results help ensure home visits are based on targeted calling rather than random events – to ensure people are in specific districts, knocking on the right doors in the right streets, even down to a postcode level,” says David Wyatt, Head of Information Management, LFB. The results also emulate the 33 local authority borough structure of the capital: although the LFB treats London as a single entity, this approach reflects the fact that prevention work often involves working with local authorities and other partners in the borough.

Perception versus reality

The SAS models are typically updated quarterly with new incident data. “We’re running models more frequently now, to see how the risk picture changes,” continues Wyatt. “We also do ad hoc reports for internal policy teams, particularly in Community Fire Safety – for instance, looking at events around 5th November (Guy Fawkes bonfire night).” The results, he says, can challenge conventional wisdom on particular events: for example, the timings of incidents in the run-up to the night itself, crossover with other festivals, and so on. “The insights help us in our understanding as we work in partnership with the Greater London Authority, the Metropolitan Police and Transport for London. We can move away from best-guesses and perceptions.”

In terms of embedding a more risk aware culture and ‘selling’ his results inside the brigade, Mobbs says being able to prove his numbers is a big benefit. “People’s perception of risk isn’t always the same as the actual risk most of us experience. Being able to present hard numbers has a strong influence on bringing people round to our way of thinking of where the risk lies, which areas and which people. Another benefit is that SAS is a far easier environment to work in. It’s a boost to the team having a well-supported solution: they can focus on doing their jobs rather than struggling with the software.”

Mobbs adds, “I’m very pleased with what we’ve achieved, and I believe that in some respects we’re leading the way. Through informal networking with colleagues in other brigades and more formal ways, like the risk conference we hosted in London, we’re trying to share ideas and take forward the need for even greater understanding of the risk factors involved with fires.

“My team’s role is to look at risk, work on prevention and help reduce fires and casualties in London. As a result of our work, I believe we are directly supporting work that prevents fires and saves lives. And in terms of best practice I think our approach could be easily replicated in other brigades.



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