

Firework-related injuries

Identifying five-year trends to improve safety measures

Aims

Fireworks are widely used in celebrations, however can be associated with significant injuries, ranging from minor burns to life-threatening trauma. The period around Bonfire Night is one of the busiest for emergency services in Scotland (1).

The Care of Burns in Scotland (COBIS) network collects regional data about firework injuries annually, working closely with the Scottish Fire and Rescue Service and Scottish Government to support prevention campaigns. We have created a five-year summary of the collected data to identify trends in injury pattern and demographics, increase clinician awareness and support service preparedness.

Methods

Data was collected using an online survey, developed by COBIS and distributed to all Emergency Departments (ED) and Minor Injuries Units (MIU) in Scotland, for clinicians to easily record firework-related injuries. The survey was accessible via QR code on a poster which was sent to all sites for display.

Data was captured for four-week periods around Bonfire Night from 2019 to 2025, omitting 2020 and 2021 due to pressures during COVID-19. Variables collected included patient age, sex, injured body part, type of display, type of firework and onward treatment. Home postcode was collected to identify linkage with the Scottish Index of Multiple Deprivation (SIMD) (2). We then conducted an additional survey, capturing qualitative feedback from emergency medicine clinicians about their experience with firework injuries.

Outcomes

In total, 215 firework-related injuries were reported over five years, displaying an overall increasing annual trend. The typical patient sustaining an injury was a 17-year-old male. Most injuries occurred in private properties rather than organised public events. Analysis with SIMD showed 54% of injuries occurred in the most deprived areas (SIMD deciles 1-3). The hands and face were the most commonly injured body parts, with 45% of these cases requiring specialist follow-up or hospital admission. Sparklers were consistently found to be the main cause of firework-related injury in children under 5 years old.

In our follow-up survey, 62.5% of emergency medicine clinicians reported seeing 1-2 firework injuries annually. Clinicians suggested actions to improve firework safety in Scotland such as banning the general sale of fireworks without a licence, restricting use to public displays only and raising awareness through public health initiatives, highlighting the need for inclusive messaging in relation to other celebrations using fireworks e.g. Diwali.

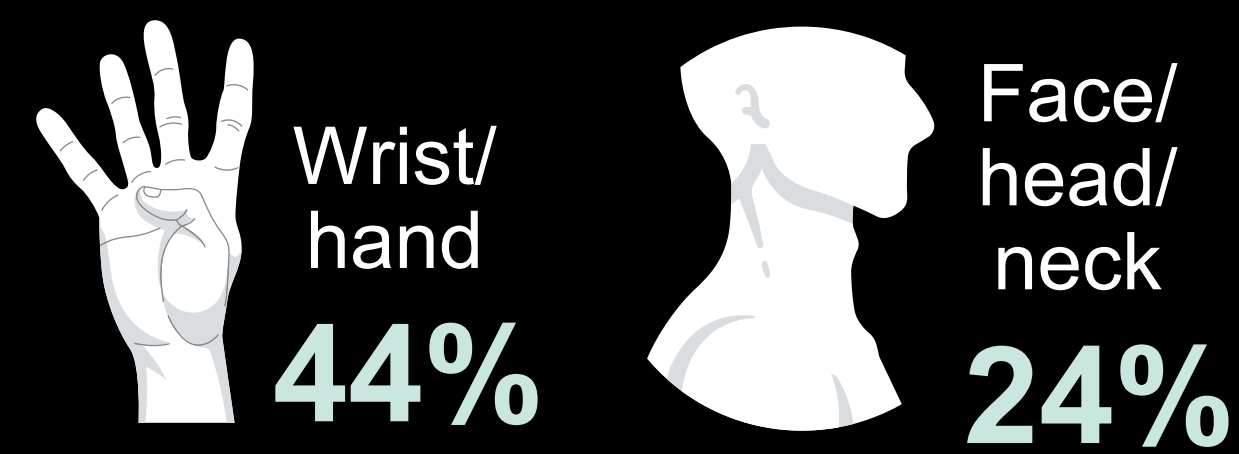
How many injuries over the 4 week collection period?



What sex are those injured?



Most common body part injured?



When do injuries happen?

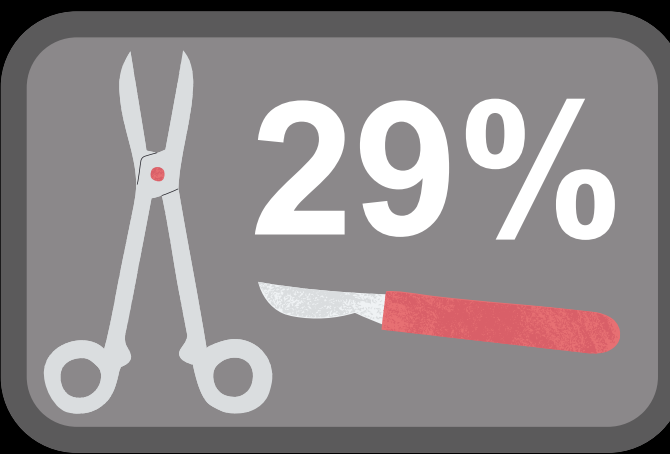


Each year the vast majority of injuries recorded were sustained over just 3 days in each 4 week period. Always directly around bonfire night (5th)

Most common type of firework to injure children under 5



What is the patient's outcome?

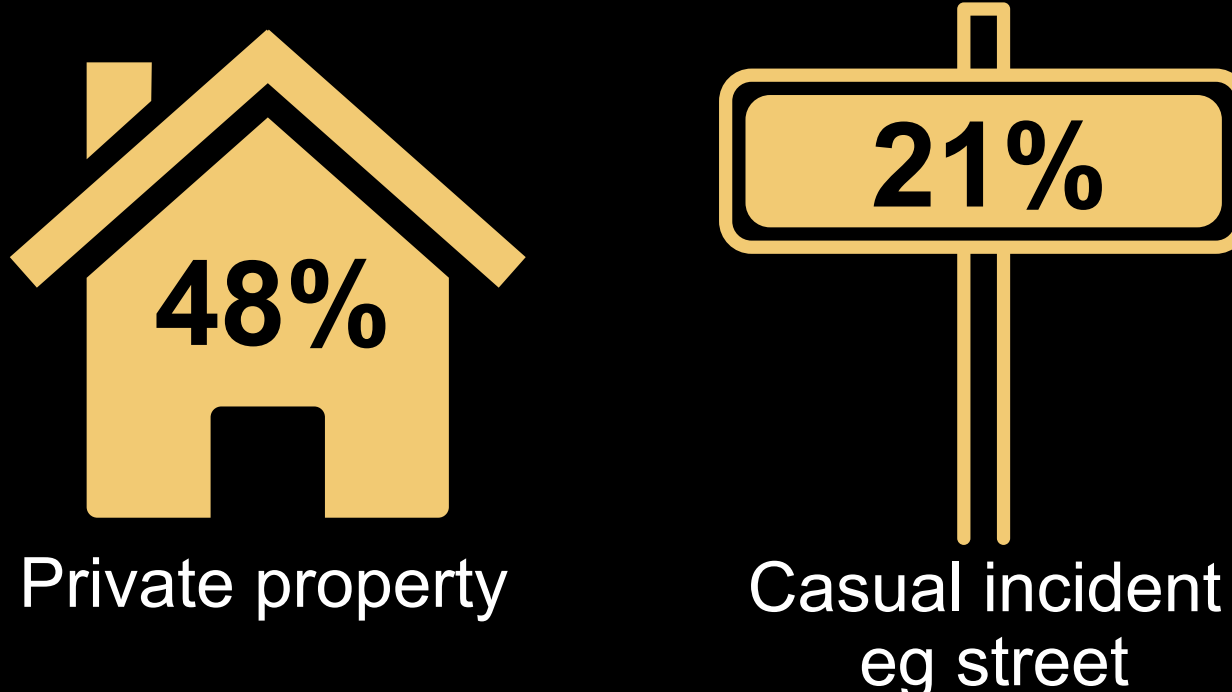


Of all injuries referred to plastic surgery or another speciality eg ophthalmology

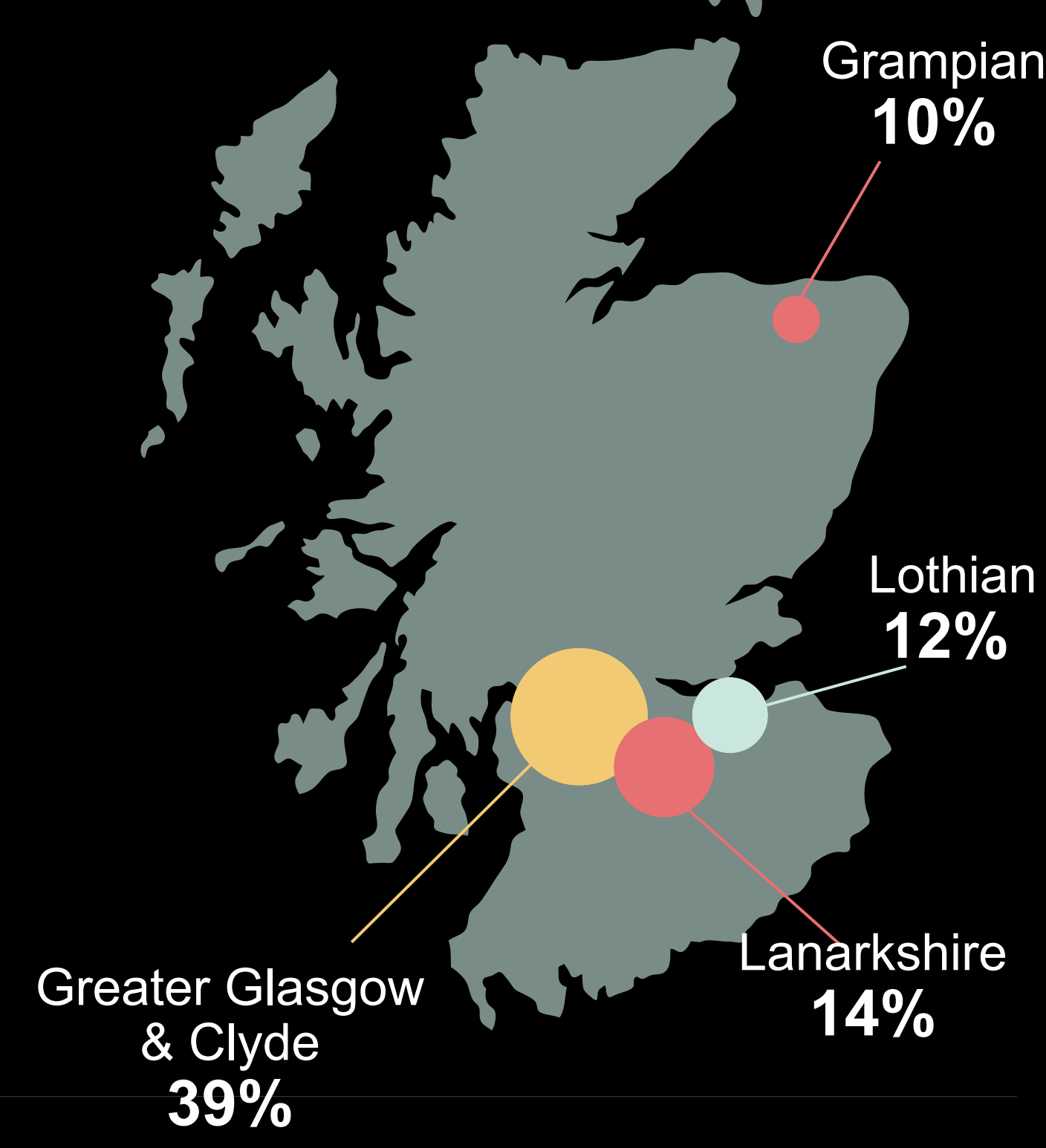
Most likely to be injured?

Teenagers / children under 15 years old

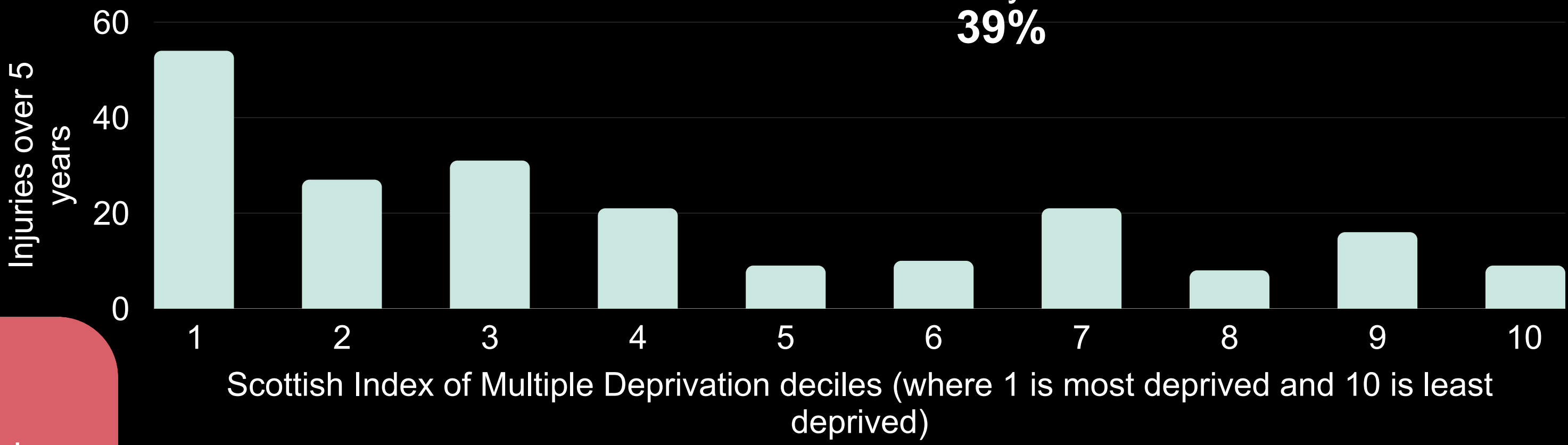
Where are injuries most likely to occur?



Where do most injured patients live?



Is deprivation a factor?



Conclusions

This data highlights the ongoing significance of firework-related injuries across Scotland, with a higher prevalence among young males aged 11-20 years and those living in the most deprived areas.

For children under 5, the prevalence of sparkler injuries emphasises the need for further action given current guidance advises sparklers should not be given to children in this age group. Despite the clear risks identified in this dataset, sparklers are currently classified as category F1 fireworks under Scottish law, meaning they are considered a "very low hazard" (3).

Firework injuries continue to show a significant peak during the Bonfire Night period, with an increasing trend recorded over the five years. The rising cost of fireworks (4), resulting in the usage of low-quality, non-compliant fireworks which are prone to malfunction, indefinite cancellation of popular public displays (5) or "rebound" of socialising post-COVID, may be contributing to this trend.

The Fireworks and Pyrotechnic Articles (Scotland) Act 2022 encouraged safe and appropriate use of fireworks by introducing restrictions on their purchase and use, however some legislation has not yet come into effect (3). Once this is finalised, ongoing data collection can help to assess the impact of such legislation and inform areas for improvement. While current guidance and public safety initiatives represent important progress, continuing efforts will be required to demonstrate a measurable reduction in firework-related injuries.

Acknowledgements

Gathering this data would not have been possible without collaboration from Emergency Departments and Minor Injury Units across Scotland.

Clinician experience offers a valuable real-world perspective which can be used to inform firework safety planning. Please share your experiences and ideas via the survey through the linked QR code.



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Chaos in Niddrie, Edinburgh in November 2023 where fireworks were thrown at police officers. Image credit: Michael Schofield, The Scottish Sun