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ORIGINAL ARTICLE

Impact of a blizzard on an Irish Emergency Department

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Abstract

Aim To examine the effect of a blizzard in March 2018 on presentations to TUH ED.

Methods A retrospective descriptive study of ED records from 1–5th of March 2018.

Results Of 479 presentations, 71 were related to the blizzard. Sixty-seven percent ($n = 48$) of presentations were due to injuries and 15% ($n = 11$) were due to medical conditions. Ten percent ($n = 7$) of presentations related to logistical issues and 7% ($n = 5$) were due to social reasons.

Discussion/conclusion The volume of attendance fell initially during snowfall then rose sharply as the weather improved. Injuries were the predominant cause of presentations. Physical exertion while outdoors in the snow caused several patients to present with medical complaints. Heightened public awareness of the impact of weather warnings may help to prevent some of the social and logistical presentations to the ED. The exceptional dedication of the emergency service workforce is acknowledged and appreciated. Future planning is needed to keep morbidity and mortality from blizzards low.

Keywords Blizzard · Climate · Climate change · Emergency department · Emergency medicine · Emergency Planning · Environment · Overcrowding · Planning · Preparedness · Prevention · Snow · Storm · Weather

Introduction

In March 2018, an exceptionally cold easterly airstream (dubbed the Beast from the East) covered the island of Ireland. Simultaneously, a further weather depression from the Bay of Biscay, called Storm Emma rose northwards towards the country. The cumulative effect of these weather conditions brought snow, ice and low temperatures to Ireland. This was the first blizzard in the country since 1982. Heavy falls of snow were reported, especially in the east and southeast of Ireland. Lowest air temperatures were recorded at − 7.0°, the lowest March temperatures since 1962 [1].

Met Éireann initially issued a red weather warning for Munster and Leinster for the 1st and 2nd of March and then extended this to a nationwide warning. The National Emergency Coordination Group issued statements regarding preparedness. The public was advised to stay home and not to drive for the duration of the red warning. Schools and businesses across the country largely shut down. Public transport services were ceased or reduced and airports closed. Court sittings were postponed for 2 days. Twenty-five thousand homes were without power and 10,000 were without water.

The HSE cancelled outpatient and non-emergency surgery lists. Emergency Departments across Ireland remained open, even in the most severely affected areas. Staff took alternative methods of transport to work, with some staff in particularly difficult road conditions being brought by the Defence Forces and Garda Armed Response Unit. Many staff members across Irish hospitals stayed in work after their shifts had finished, either due to the inability to travel home safely or due to concerns about a lack of staff for the next shift. In some hospitals, the accommodation was arranged in local hotels and in other cases, staff stayed in the hospital on temporary beds.

The effect of the blizzard on ED presentations was reviewed in the Tallaght University Hospital in Dublin. TUH is an urban university teaching hospital which serves a catchment area of 650,000 people, mostly in South Dublin and in Kildare. TUH provides separate adult and paediatric EDs to serve this population. There were 50,286 attendances to TUH adult ED in 2017.

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Methods

A retrospective descriptive study was undertaken, examining Emergency Department records from the period 1st–5th of March 2018. This includes the period of the red weather warning and heaviest snowfall (1st–2nd of March) and 72 h afterwards as transport routes began to re-open and restoration of normal services began. The presenting complaints related to the blizzard are considered and other patient needs which arose from the blizzard which were addressed by the ED are explored. The numbers of presentations are analysed and compared to the same dates in the previous year.

TUH ED uses the Symphony patient information software program. Symphony maintains electronic patient records such as manually inputted patient information and clinical notes by ED staff and scanned versions of hard copies such as paper clinical notes, ambulance notes and GP referral letters. All presentations from 1st–5th of March 2018 were selected from the Symphony program and were then individually reviewed. In addition, radiology request indications were reviewed on the electronic McKesson Radiology Manager program. Any patient records pertaining to adverse weather conditions were recorded on an Excel spreadsheet.

Results

There were 479 presentations to the ED from 1st to 5th of March (Table 1). This is an overall decrease from 681 presentations in the same time period in the previous year. There were unusually low numbers of presentations to TUH ED on the days of snowfall, 1st–3rd of March (71, 41 and 70 presentations respectively). However, attendances rose steeply on the 4th and 5th (115 and 179 presentations respectively). Seventy-one presentations were related to the blizzard (Table 2).

Sixty-seven percent ($n = 48$) of presentations were due to injuries. Two-thirds ($n = 30$) of these were soft tissue injuries which were treated and discharged. The other injuries consisted of fractures ($n = 17$) and dislocations ($n = 1$). There were ten fractured ankles, three wrist fractures and one foot fracture, one hip fracture, one spinal fracture and one hand fracture. There was a patient with a dislocated shoulder.

Table 1 Number of presentations by date

	2018	2017
1st of March	74	142
2nd of March	41	152
3rd of March	70	153
4th of March	115	109
5th of March	179	125
Total	479	681

Table 2 Types of presentations

1. 67% injuries ($N = 48$)	Soft tissue ($N = 30$)
	Fracture ($N = 17$)
	Dislocation ($N = 1$)
2. 7% social ($N = 5$)	Homeless ($N = 3$)
	Lack of social supports ($N = 2$)
3. 10% logistical ($N = 7$)	Pharmacy closed ($N = 4$)
	Prolonged ambulance wait ($N = 2$)
	Outpatients closed ($N = 1$)
4. 15% medical ($N = 11$)	Cardiac ($N = 9$)
	Psychiatric ($N = 2$)

Fifteen percent ($n = 11$) of presentations were due to medical conditions. These were mainly cardiac in nature ($n = 9$). Three patients presented with chest pain. Of these, two patients developed chest pain while shovelling snow and one patient developed chest pain while pushing a car out of snow. Two patients presented in cardiac arrest. Of these, one patient went into cardiac arrest while pushing a car out of snow, while another patient was discovered in cardiac arrest in a snow-covered field. Both patients in cardiac arrest died. Another patient presented with SVT, induced while pushing a car out of snow. One complained of high blood pressure while shovelling snow. The remainder of medical presentations ($n = 2$) was both patients with psychiatric conditions who were found behaving strangely and inappropriately dressed in the snow.

Ten percent ($n = 7$) of presentations related to logistical issues. Four patients attended the ED requesting medications, as they could not find an open pharmacy. One patient requested glucose-testing strips, another requested their methadone dose and another needed an inhaler. One patient presented having been given a prescription on discharge the previous day for antibiotics and analgesia from the ED but was unable to find a pharmacy to fill the prescription. In regard to other logistical issues, ambulances had difficulty travelling in the snow, which resulted in two patients having delayed transfers to the ED. One patient with a hip fracture waited for 8 h for an ambulance from Kildare to TUH (24 km) and another patient with a low level of consciousness waited for 7 h from Clondalkin to TUH (5 km). One patient also presented to the ED for review as they were due to attend a fracture clinic which had been cancelled.

Seven percent ($n = 5$) of presentations were due to social reasons. Three of these were people who were homeless, requesting shelter. These presented around midnight on the first and second nights of the snow and all were kept overnight in the ED. Two waited and were seen by social work and accommodation arranged while one patient left in the morning without being seen by social workers. The remainder ($n = 2$) of social presentations was elderly patients whose carers could not travel to their homes to care for them, due to the snow.

Discussion

There number of presentations from 1st–3rd of March 2018 was very low compared to the same dates on the previous year. This may have been due to public service announcements advising people to stay indoors during the red weather warning. Also, it was difficult to reach TUH due to difficult travel conditions locally. Driving was advised against during the weather warnings and snowdrifts were often too high for standard cars to pass. This was noted by hospital staff too, who had to use other vehicles to bring them to work and by paramedics who had difficulty reaching patient call outs. The volume of presentations rose sharply on 4th–5th of March, surpassing the volume for the same period of the previous year. It seems that many patients who could not attend during the snowfall proceeded to attend the ED once the warning was lifted.

As is to be expected, injuries were the predominant cause of presentations related to the blizzard. Although in urban areas footpaths and roads were salted and gritted, many patients still suffered slips and trips. Patients also engaged in winter sports which they cannot normally partake in the Irish climate, such as sledding and snowboarding.

Physical exertion while outdoors in the snow caused several patients to present for medical assessment. Sadly, two patients died while undertaking activities in the snow. The Coroner's findings were not reviewed and as such, the relevance of cold exposure on these patients' deaths is unknown.

Heightened public awareness of the impact of weather warnings may help to prevent some of the social and logistical presentations that attended the ED during the blizzard. Several patients in the TUH catchment area were unprepared for the shutting of pharmacies and unaware when pharmacies might reopen. Social media is very useful for broadcasting up to date bulletins with such information.

Additional emergency homeless services were opened in Dublin City during the adverse weather. Media and public service announcements advocated relatives and neighbours checking in on vulnerable people in the community during the bad weather. Very few patients presented from indoor environments requiring hospital attention and no patients presented with hypothermia from domestic environments.

Recognition should rightly be given to the emergency services who upheld patient welfare throughout hazardous weather conditions. In TUH ED, an excellent standard of care was maintained throughout the blizzard, at the expense of staff members' personal comfort and without the ability to go home after their shifts ended. Their sense of duty and willingness to prioritise patient safety above their own well-being was crucial to keeping emergency services operational.

Climate change is likely to result in increased frequency of storms in Ireland and intense storms tracking further south towards the island than previously seen. Although blizzards are a rare occurrence in Ireland, future planning is needed to keep morbidity and mortality from such events low. The Department of Health and the HSE, in conjunction with the Office of Emergency Planning, should maintain preparedness for future adverse weather conditions which are likely to become more frequent over the coming years.

Abbreviations *ED,* Emergency Department; *HSE,* Health Service Executive; *Met Éireann,* Irelands National Meteorological Service; *SVT,* Supraventricular tachycardia; *TUH,* Tallaght University Hospital

Reference

1. Met Eireann Monthly Weather Statements. Available from https://www.met.ie/climate/past-weather-statements. Last accessed December 2018