



Falls involving ice and snow, transport accidents and respiratory conditions: the impact of winter (2009/10) on emergency hospital admissions in the North West

Summary

- This briefing identifies the impact of the recent winter on emergency hospital admissions in the North West.
- Average winter temperatures have dropped steadily over the past four years and numbers of emergency hospital admissions for falls have risen. The numbers of emergency hospital admissions in winter for transport accidents and respiratory conditions have remained relatively similar over time.
- The number of emergency hospital admissions for falls involving ice and snow increased dramatically last winter compared to the previous three winters, from 149 in the winter of 2006/07 rising to 3,170 admissions during the winter of 2009/10, an increase of over twentyfold.
- The most common type of fractures sustained from falls resulting in emergency hospital admissions last winter were fractured femur, lower leg, forearm, and shoulder and upper arm.
- Age standardised rates of emergency hospital admissions for falls involving ice and snow were highest in Stockport, Wirral, and Warrington, and lowest in Eden and Fylde local authorities. Geodemographic analysis revealed no significant difference by level of deprivation, although rates were generally highest in the more deprived communities. Further analysis is needed to understand these differences.
- The burden of falls involving ice and snow is likely to be greater still if data showing the numbers of people who attend Accident and Emergency (but are not admitted to hospital), visit their GP or self-treat at home were included for analysis.
- Local areas should consider health, environmental and economic impacts when planning their responses to adverse weather. The cost of measures to prevent falls resulting from the consequences of increasingly cold winter temperatures (such as keeping pavements and roads free of snow and ice and providing public advice) should be assessed against the costs of falls to individuals, employers and the NHS.

1. Introduction

Data from the Met Office indicates that the winter of 2009/10 was the UK's coldest on record since 1978/79.¹ The mean temperature in December - February 2009/10 across the North West was 1.7°C. This briefing paper examines the impact of the recent winter (2009/10) on emergency hospital admissions in the North West compared to the same winter period in previous years. In particular, data relating to emergency hospital admissions for falls, respiratory conditions and transport accidents were analysed as these conditions are known to display seasonal variation.

¹ Met Office (2010) Coldest UK winter for over 30 years [Online]. Available from: www.metoffice.gov.uk/corporate/pressoffice/2010/pr20100301.html Accessed 25th June 2010.

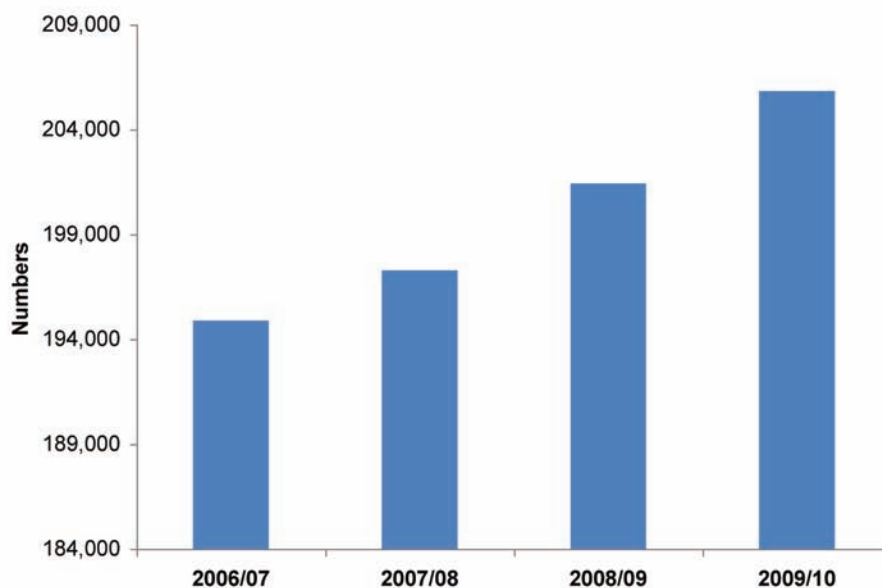
2. Method

Data was extracted for all emergency hospital admissions in the North West across four Hospital Episode Statistics (HES) years (2006/07, 2007/08, 2008/09 and provisional 2009/10). Winter is defined as the three month period from December in one year to February in the following year.² Data was extracted for key conditions (by external cause field in HES for falls³ and by HES primary diagnosis field for transport accidents and respiratory conditions, including 'Asthma' and 'Flu or pneumonia') and analysed by method of admission, admission date, month, age, lower super output area (LSOA) code and International Classification of Diseases (ICD10) code. For local authority level data, age standardised⁴ rates were calculated using mid-year 2008 population estimates for the 2009/10 time period.⁵ HES data however only shows the numbers of people admitted to hospital and not those who attend Accident and Emergency, visit their GP or self-treat at home; the burden on NHS services in winter could arguably be greater still if such data were included.

3. Emergency hospital admissions

The number of emergency hospital admissions in winter (December - February) across the North West has risen in the last four years (Figure 1).

Figure 1: Number of emergency hospital admissions in December-February. North West, 2006/07-2009/10.



Source: NWPFO from Hospital Episode Statistics.

4. Emergency hospital admissions by condition and temperature

Temperature data from the Met Office showed that the average temperature in winter across the North West in 2009/10 was colder than in each of the previous three winter periods (2006/07, 2007/08 and 2008/09). For example, the average temperature in the months of December - February 2006/07 was 5.7 °C compared with 1.7 °C in December - February 2009/10.

² Met Office (2010). Winter 2010 [Online]. Available from www.metoffice.gov.uk/climate/uk/2010/winter.html Accessed 1st June 2010.

³ See notes section for HES codes used and caveats regarding provisional HES data.

⁴ The age-specific rates of the subject population are applied to the age structure of the standard population. This gives the overall rate that would have occurred in the subject population if it had the standard age-profile.

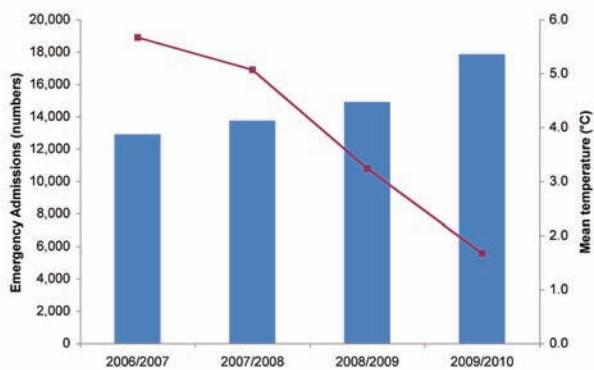
⁵ Mid-year 2009 population estimates are not currently available.

4.1 Falls

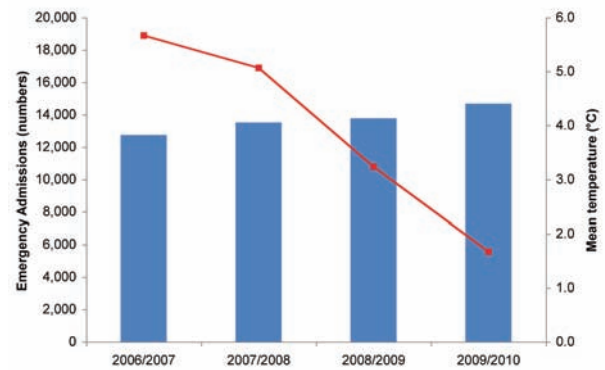
There has been an increase in the number of emergency hospital admissions for falls across the North West over the last four winters (Figure 2). However, this increase diminishes when data for falls involving ice and snow is excluded from the analysis. There has been a significant increase - over twentyfold - in the number of falls involving ice and snow over the last four years (from 149 emergency hospital admissions in the winter of 2006/07 to 3,170 admissions during the winter in 2009/10).

Figure 2: Average temperature and total number of emergency hospital admissions for all falls in December-February. North West, 2006/07 - 2009/10.

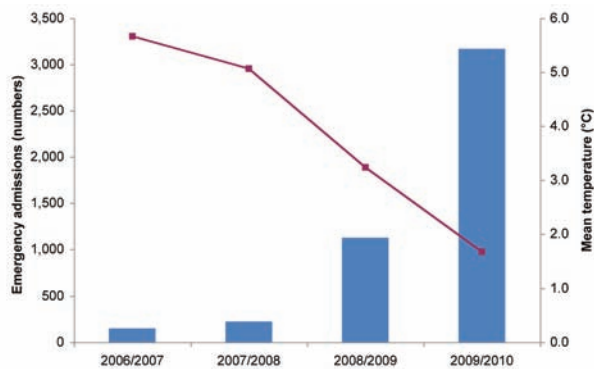
a) All falls



a) Falls (excluding those involving ice and snow)



c) Falls involving ice and snow

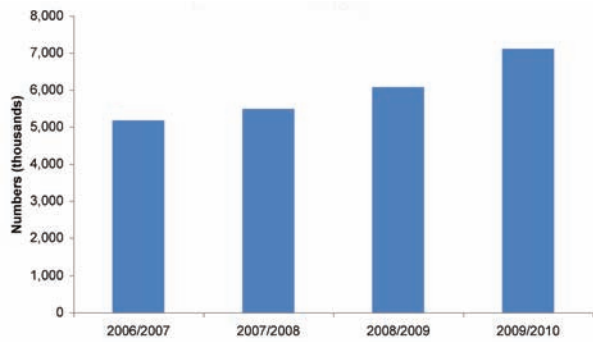


Source: NWPFO from Met Office and Hospital Episode Statistics.

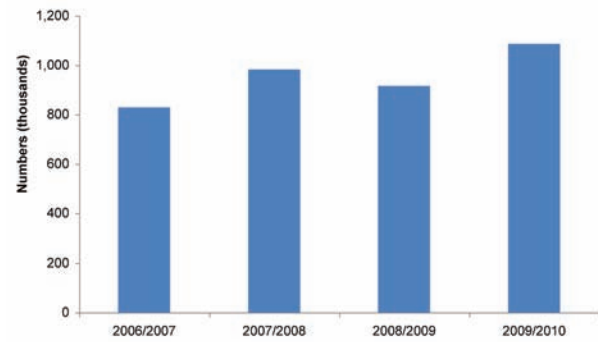
Data showing emergency hospital admission for falls at a sub regional level across the North West reveals similar results (Figure 3).

Figure 3: Total number of emergency hospital admissions for all falls in December-February, North West sub regions, 2006/07 - 2009/10.

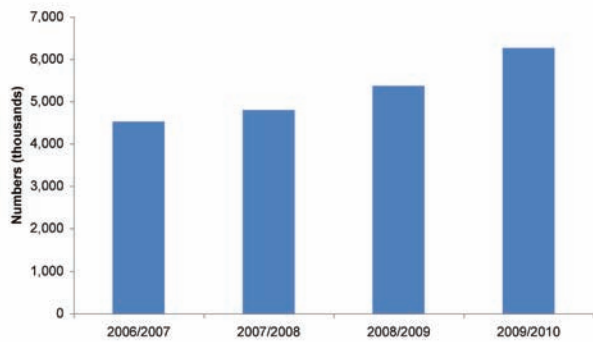
Cheshire and Merseyside



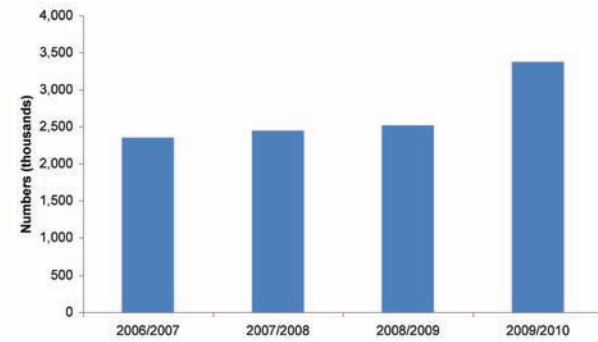
Cumbria



Greater Manchester



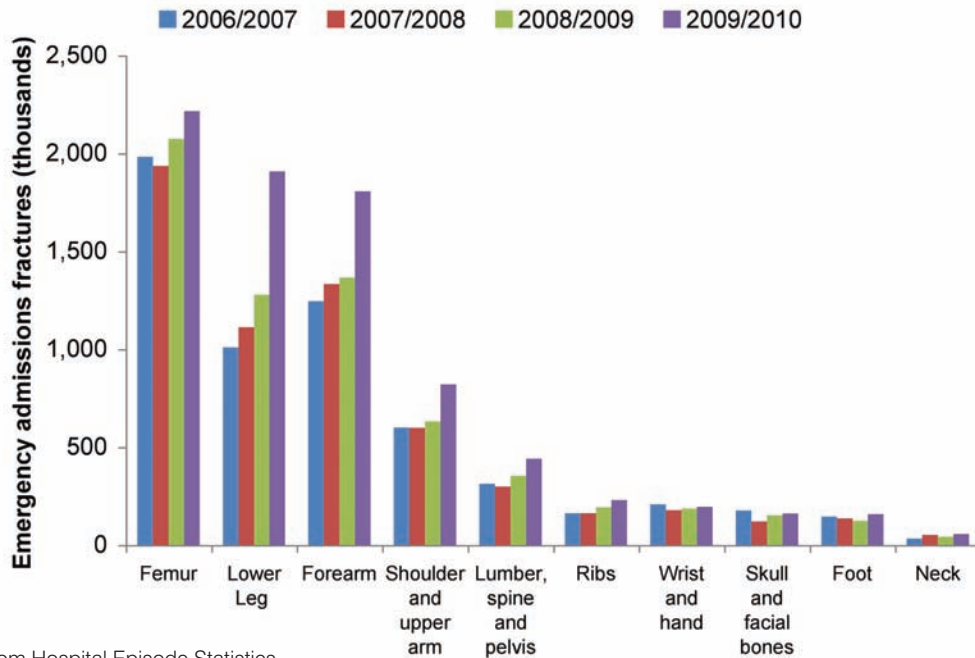
Lancashire



Source: NWPFO from Hospital Episode Statistics.

When emergency hospital admissions data for all falls across the North West is examined by primary diagnosis of fracture, the most common type of fractures sustained were those of the femur, lower leg, forearm or shoulder and upper arm in each of the four years (Figure 4). There was a marked increase in the number of lower leg and forearm fractures in 2009/10.

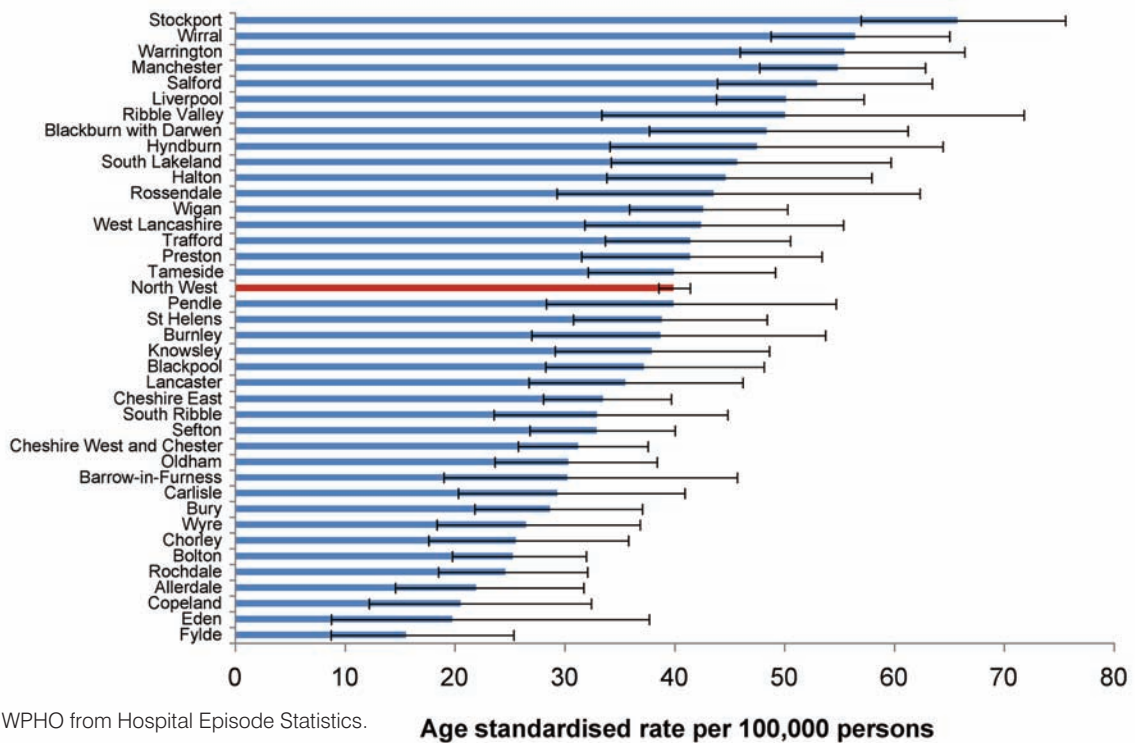
Figure 4: Total number of emergency hospital admissions for all falls in December - February by type of fracture. North West, 2006/07-2009/10.



Source: NWPHO from Hospital Episode Statistics.

There are significant variations in age standardised rates of emergency hospital admissions for falls involving ice and snow across local authority areas regionally. In winter 2009/10, Stockport had the highest rate in the North West (65.8 per 100,000 population), followed by Wirral, Warrington, Manchester, Salford and Liverpool. The lowest rates were seen in Fylde, Eden and Copeland (15.6, 19.8 and 20.6 per 100,000 persons respectively) (Figure 5).

Figure 5: Age standardised rate of emergency hospital admissions for falls involving ice and snow in December-February by local authority. North West, 2009/10.⁶

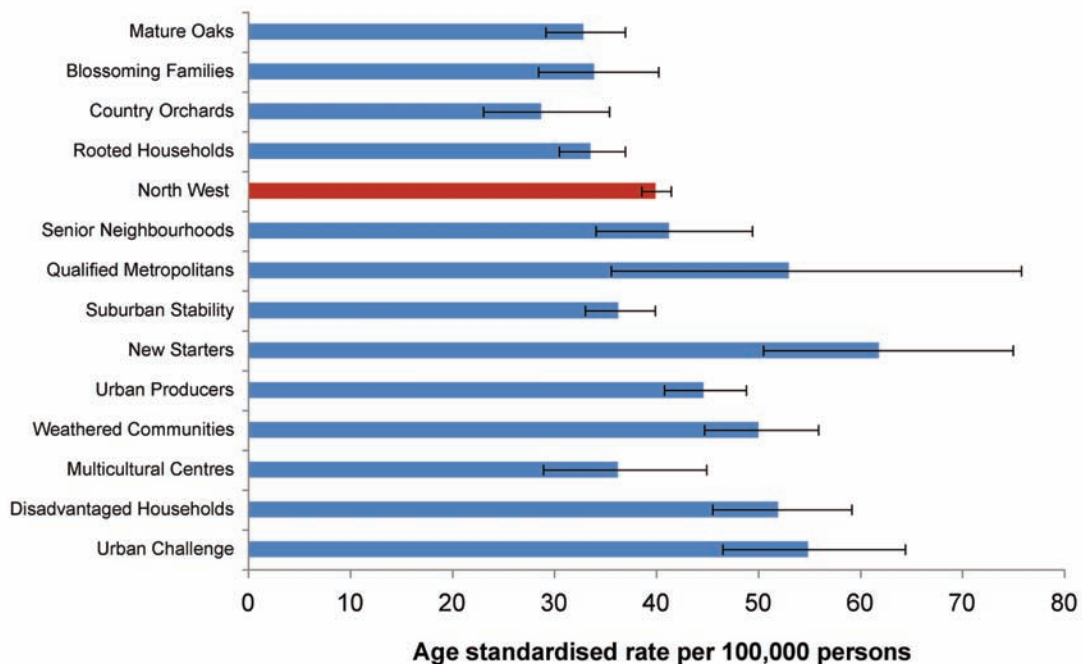


Source: NWPHO from Hospital Episode Statistics.

⁶ Confidence intervals on the bar chart show the range of values so that this range has a 95% probability of including the true value of the variable.

Geodemographic analysis by P² People and Places does not show a relationship between level of deprivation and emergency hospital admissions for falls involving ice and snow (Figure 6). However, people in 'Disadvantaged Households' and 'Urban Challenge' were significantly more likely to be admitted to hospital as an emergency due to falls involving ice and snow than in some of the more affluent groups such as 'Rooted Households' and 'Country Orchards'. 'New starters' had the highest rate of falls involving ice and snow in the most recent winter, however, rates of emergency admissions were generally highest in the more deprived area types.

Figure 6: Age standardised rate of emergency hospital admissions for falls involving ice and snow in December-February by P² People and Places⁷ classification. North West, 2009/10.



Source: NWPFO from Hospital Episode Statistics.⁸

4.2 Transport accidents

The number of emergency hospital admissions for transport accidents in the North West over the past four winters has remained similar (Figure 7); including transport accidents involving car occupants or pedestrians. Studies have shown that the majority of road accidents nationally (between 70% and 85%) take place in fine weather, possibly due to higher numbers of vehicles on the road as more people decide to travel, while accident numbers are often lower in extreme weather (such as snow) because drivers take more care on the roads or cancel trips altogether; the most common adverse weather condition recorded during accidents is rain.^{9(p.14)}

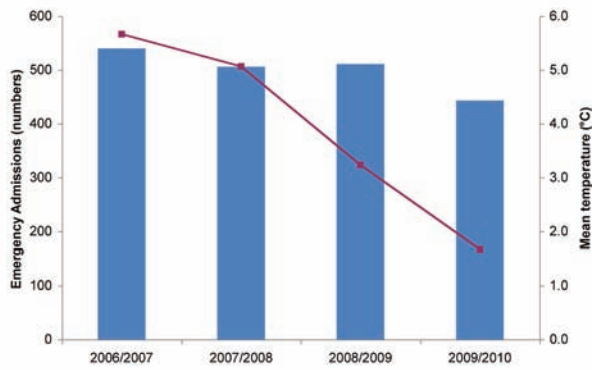
⁷ For further details see: www.beacon-dodsworth.co.uk/site/products/people_classification/

⁸ The North West regional rate data is derived from local authority areas fully within the North West.

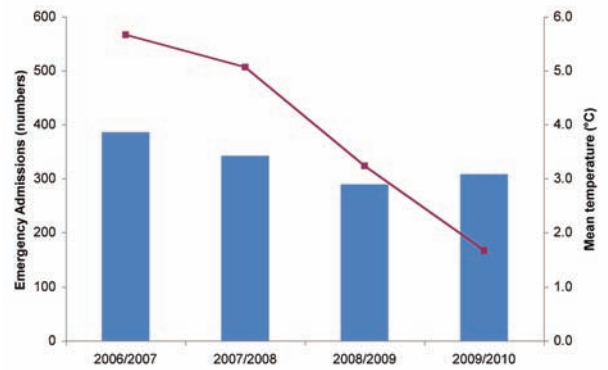
⁹ Hughes S, Bellis MA, Bird W and Ashton JR (2004). *Weather Forecasting as a Public Health Tool*. Liverpool: Centre for Public Health.

Figure 7: Average temperature and total number of emergency hospital admissions for transport accidents in December-February. North West, 2006/07 - 2009/10.

a) Car occupants injured



b) Pedestrians injured



Source: NWPFO from Met Office and Hospital Episode Statistics.

4.3 Respiratory conditions

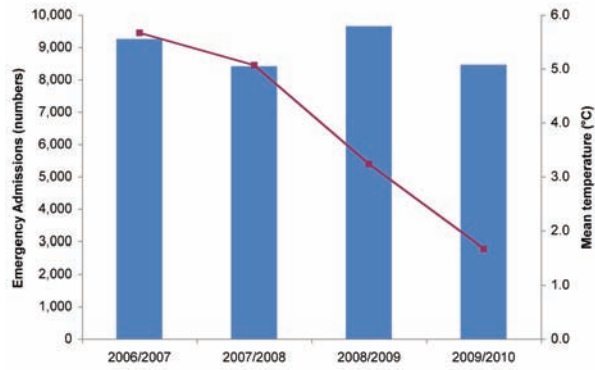
The number of emergency hospital admissions for respiratory conditions have remained at a relatively similar level over the last four winters. However, it should be noted that the burden of respiratory disease is much greater during the winter compared to the non-winter period.^{10,11} Data examined by primary care trust in the North West did not reveal any significant variation from the regional trends for each winter period over the last four years.

¹⁰ Afza M and Bridgman S (2001). Winter emergency pressures for the NHS: contribution of respiratory disease, experience in North Staffordshire district, *Journal of Public Health, Medicine*, 23, 4, p. 312-313.

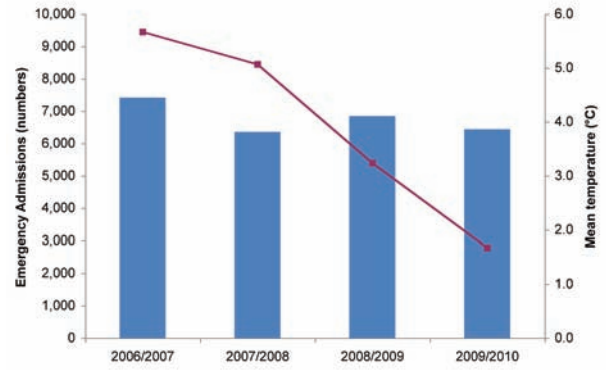
¹¹ NHS West Midlands Business Analytics Team (2009). *Retrospective analysis of urgent care capacity problems in Winter 2008/09*. Birmingham: NHS West Midlands.

Figure 8: Average temperature and total number of emergency hospital admissions for respiratory conditions in December-February. North West, 2006/07 - 2009/10.

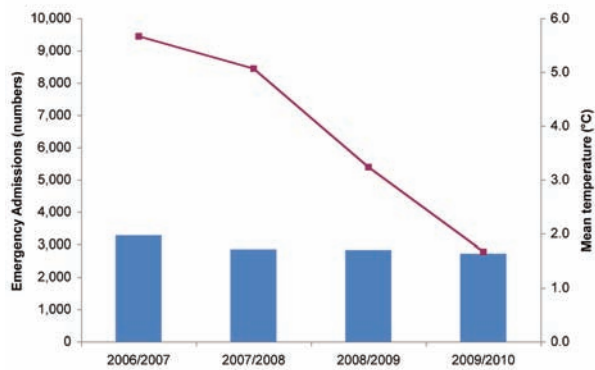
a) Chronic lower respiratory disease



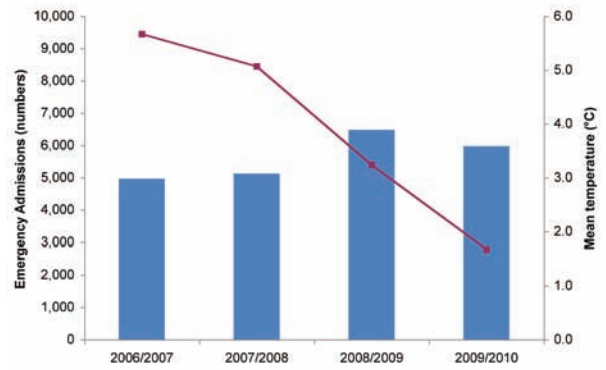
b) Other acute lower respiratory infection



c) Asthma



d) Flu and pneumonia



Source: NWPFO from Met Office and Hospital Episode Statistics.

5. Appendix

Table 1: Numbers of emergency admissions in winter (December - February). North West, 2006/07 - 2009/10.

	Falls	Falls - on same level involving ice and snow	Car occupant injured in transport accident	Pedestrian injured in transport accident	Flu and Pneumonia	Other acute lower respiratory tract	Chronic lower respiratory disease	Asthma
2006/07								
Dec	4,454	13	214	162	1,528	3,186	3,114	1,239
Jan	4,500	74	169	112	1,722	2,359	3,081	1,081
Feb	3,938	62	157	112	1,711	1,869	3,055	9,59
Total	12,892	149	540	386	4,961	7,414	9,250	3,279
2007/08								
Dec	4,954	151	186	129	1,885	3,103	3,126	1,077
Jan	4,405	28	135	119	1,848	1,968	2,908	929
Feb	4,381	44	185	94	1,390	1,284	2,378	850
Total	13,740	223	506	342	5,123	6,355	8,412	2,856
2008/09								
Dec	5,434	453	200	116	2,843	3,515	4,172	1,230
Jan	5,147	437	171	100	2,199	2,072	3,262	897
Feb	4,312	235	140	73	1,438	1,259	2,217	711
Total	14,893	1,125	511	289	6,480	6,846	9,651	2,838
2009/10								
Dec	6,874	1,415	163	118	2,383	3,304	3,271	1,096
Jan	6,417	1,623	131	94	1,952	1,855	2,775	790
Feb	4,559	132	149	96	1,637	1,277	2,413	838
Total	17,850	3,170	443	308	5,972	6,436	8,459	2,724

Source: NWPFO from Hospital Episode Statistics.

Notes

Provisional HES 2009/2010 data

The HES data in this report from 2009/2010 is provisional and may be incomplete or contain errors for which no adjustments have yet been made. Counts produced from provisional data are likely to be lower than those generated for the same period in the final dataset. This shortfall will be most pronounced in the final month of the latest period, ie November from the (month 9) April to November extract. It is also probable that clinical data are not complete, which may in particular affect the last two months of any given period. There may also be a variety of errors due to coding inconsistencies that have not yet been investigated and corrected. If you are unsure about this then please contact: hes.questions@ic.nhs.uk

Hospital Episode Statistics (HES):

HES is a data warehouse containing details of all admissions to NHS hospitals in England. Data is available for every financial year from 1989/90 onward, although during this time, the mechanisms for collecting the data have

changed considerably, often in response to changes in the organisation of the NHS HES data is released in fiscal years (April - March). See www.hesonline.nhs.uk/Ease/servlet/ContentServer?siteID=1937&categoryID=87.

ICD 10 codes used in the analysis:

J09-J18 (Influenza and pneumonia), J20-J22 (Other acute lower respiratory tract infections), J40-J47 (Chronic lower respiratory diseases), J45-J46 (Asthma), V40-V49 (Car occupant injured in transport accident), V01-V09 (Pedestrian injured in transport accident) and W00-W19 or R29.6 (Falls or Tendency to fall, not elsewhere classified)

W00 is the external cause code for 'Fall on same level involving ice and snow,' while the primary diagnosis field contains a code showing the consequence of the fall including: S72, S82, S52, S42, S32, S22, S62, S02, S92 or S12 (Fracture of Femur, Lower leg, Forearm, Shoulder and upper arm, Lumber, spine and pelvis, Ribs, Wrist and hand, Skull and facial bones, Foot or Neck respectively).

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