

# The rise in medical admissions, a “wicked problem” with additional complexity arising from periods of unexplained higher deaths

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## LIST OF ABBREVIATIONS:

CI confidence interval; ED emergency department; NISRA Northern Ireland Statistics and Research Agency;

## ABSTRACT

**Aims:** To study the trend in deaths for the 26 district councils in Northern Ireland from 1992 to 2013 and medical admissions from 2000/01 to 2013/14, and to determine if there is evidence for novel epidemic-like events linking deaths and medical admissions.

**Methods:** A running twelve month total of deaths for each district council were used to detect the onset and magnitude of a series of epidemic-like increases in deaths whose effect endures for 12 or more months. Financial year total medical admissions were matched with financial year increases in deaths.

**Results:** A series of epidemics can be identified clustering around the years 1993, 1996, 1999, 2003, 2008 and 2012 when deaths show distinct peaks. Each epidemic shows spatial spread between district councils and leads to a 12 to 18 month increase in deaths which eventually abates. Medical admissions also show a particular rise during these epidemics and there is an approximate 10:1 ratio in the number of medical admissions per death during the epidemics. The increase in medical admissions appears to endure beyond the point that deaths start to abate.

**Conclusions:** Outbreaks of a new type of disease entity are implicated and urgent research is required to clarify the agent and the mode of action. These outbreaks appear to explain why many initiatives to reduce emergency admissions appear to have failed, i.e. the problem is medical and not fundamentally due to failings in health and social care.

Keywords: Medical admissions; deaths; epidemics; spatial spread; infectious granularity; spatiotemporal effects