

Predictors of Emergency Department attendance rates in small area populations.

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Objectives

Emergency Department (ED) use is known to be related to both socio-economic deprivation and distance to hospital. However, hospitals are often located in urban areas close to deprived populations. The objective of this study is to investigate the relationship between distance and attendance at EDs, controlling for deprivation.

Method

Multiple linear regression models were used to explore the relationship between deprivation and distance to hospital with age-sex standardised ED attendance rates at neighbourhood level. Distance to a Minor Injury Unit (MIU) was also included. Interaction between distance and deprivation was investigated. Separate models for children and adults were used because some populations had access to a dedicated children's ED.

Setting

The Government Office Region of the West Midlands, in central England. (population 5.4 million).

Population

Attendances of West Midlands residents to EDs in acute hospitals in financial year 2007/08 (n = 1,465,355) within 3,482 Lower Level Super Output Areas (LSOA), each containing approximately 1600 residents

Outcome measures

The response variable was the directly age-sex standardised ED attendance rate for each LSOA (square-root transformed). Predictor variables were distance from LSOA centroid to nearest ED and nearest MIU in kilometres and income deprivation score (high score = high deprivation).

Results

There was a significant positive relationship between attendance and deprivation, beta coefficient = 0.96 (p<0.001) in adults and 0.68 (p<0.001) in children. There was a significant negative relationship between attendance and distance, the beta coefficient = -0.24 (p<0.001) in adults and -0.37 (p<0.001) in children. Child attendance

appeared more sensitive to distance than adult attendance but less sensitive to deprivation

Attendance in deprived neighbourhoods was more sensitive to distance than in less deprived ones. For adults, at the third quartile of deprivation, $\sqrt{\text{attendance rate}} = -0.32 \text{ per km} + 19.50$ compared to $-0.18 \text{ per km} + 15.86$ at the first quartile. For children, at the third quartile of deprivation, $\sqrt{\text{attendance rate}} = -0.49 \text{ per km} + 21.30$ compared to $-0.30 \text{ per km} + 17.95$ at the first quartile. The paper goes on to describe the models in greater detail, (including the effect of MIUs)

Conclusion

Attendance at EDs is sensitive to income deprivation at neighbourhood level but distance from hospital appears to modify this relationship differently in deprived areas than in affluent ones. Also children's attendance appears to be more sensitive to distance than that of adults. This is useful to understand when comparing ED attendance between and within populations.