Growing interest in use of geographic information systems in health and healthcare research: a review of PubMed from 2003 to 2011

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DECLARATIONS

Competing interests

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Ethical approval

Not applicable as this study is an evaluation of PubMed papers

Guarantor

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Contributorship

NAG conceived and submitted the design, contributed to acquisition of data, analysis and interpretation of data, drafting the article and revising it. MS contributed to interpretation of data, drafting the article and revising it

Background

The earliest use of geographical information systems (GIS) in medicine possibly goes back to 1854, when John Snow mapped the outbreak of cholera in London and successfully traced the source of the disease.[1] Years have now passed and the term 'Geographic Information Systems' was added to the controlled vocabulary thesaurus of US National Library of Medicine – MeSH (Medical Subject Headings) – in 2003.[2] 'Geographic Information Systems' has been defined in PubMed as 'Computer systems capable of assembling, storing, manipulating, and displaying geographically referenced information, i.e. data identified according to their locations'.[3]

Objective

There has been an increasing interest in applying GIS into health and healthcare research in recent years.[4,5] However, this increasing interest has not yet been gauged. In order to address this, the current study was performed to examine the crude number and the annual rate of papers with 'Geographic Information Systems' among their MeSH Terms in PubMed (a free database which is maintained by US National Library of Medicine).

Design

The PubMed database was searched, from 1 January 2003 to 31 December 2011, for the papers with 'Geographic Information Systems' among their MeSH Terms. The number of papers obtained from the above search, for each one-year period, was divided by the total number of papers in PubMed over that specified time period. The rate and 95% confidence intervals (95% CI) were calculated.

Setting

The data used in this paper were based on an electronic literature search in PubMed.

Participants

Papers in PubMed from 2003 to 2011.

Main outcome measures

The first outcome measure was the crude number of papers with 'Geographic Information Systems' among their MeSH Terms, for each one-year period from 2003 to 2011. The second outcome measure was the rate of such papers in PubMed (Figure 1).

Results

Over the nine-year study period, there is a three-fold increase in the crude number of PubMed papers with GIS in their MeSH Terms (from 183 in 2003 to 574 in 2011; Figure 1). Similarly, a

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Provenance

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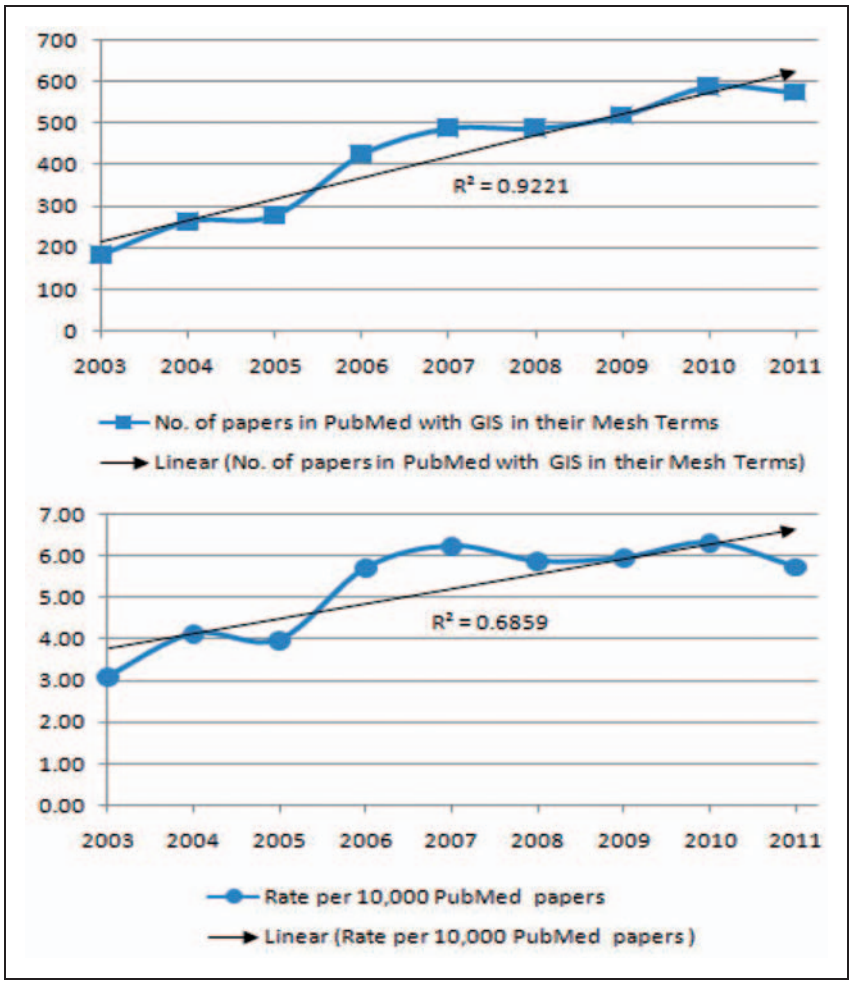

Figure 1. Crude number of PubMed papers and rate with GIS in their MeSH Terms (2003–2011).

significant increase can be seen in the rate of such papers in PubMed (from 3.09 [95% CI: 2.68–3.58] in 10,000 papers in 2003 to 5.74 [95% CI: 5.29–6.23] publications in 10,000 papers in 2011; Figure 1).

Conclusions

The findings provide objective evidence on the growing interest of using GIS in health and healthcare research. The authors suggest that epidemiologists and public health researchers should consider the possibility of location-allocation to their data in the data gathering part of their study in order to enable geocoding. Applying GIS on geocoded data could result in more information on the complex interplay of health issues and geographical location.

The current investigation was limited by searching only one database (PubMed). However, the observed significant increase in GIS-related publications in this major health database could reflect the situation in the whole world of health and healthcare research. Further studies are recommended to explore how this potential area of interdisciplinary cooperation between geographers and medical researchers could be further developed.

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