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ISDS 2014 Conference Abstracts

ISDS INTERNATIONAL SOCIETY FOR DISEASE SURVEILLANCE

Syndromic Surveillance of Respiratory Pathogens using Routine ED Data in England

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Objective

Can syndromic surveillance using standard emergency department data collected using automated daily extraction be used to describe and alert the onset of the seasonal activity of named respiratory pathogens within the community?

Introduction

Within the UK, previous syndromic surveillance studies have used statistical estimation to describe the activity of respiratory pathogens.[1] The Emergency Department Syndromic Surveillance System (EDSSS) was initially developed in preparation of the London 2012 Olympic and Paralympic Games and has continued as a standard surveillance system, with expanding coverage across England and Northern Ireland.[2] All reporting to this system is completely passive, with no extra work required within the ED. The data collection includes the diagnosis for each attendance, where available, using the coding system in use locally. The coding varies by ED with ICD-10, Snomed-CT and the less detailed NHS Accident and Emergency Diagnosis Tables all in use. The use of diagnosis coding systems with differing levels of detail creates the need to have a variety of syndromic indicators to make best use of the data received.

We aim to describe the trends in respiratory attendances, and their comparison to the known circulating pathogens identified though laboratory surveillance to establish if any single syndromic indicator may be attributed to any one pathogen in particular. We also aim to describe the flexibility in the development of EDSSS syndromic indicators to best fit the data received.

Methods

Using the diagnosis coding received, respiratory indicators were developed, ranging from the most generic 'all respiratory conditions' which all EDs were able to provide, to more specific named conditions such as pneumonia and acute bronchitis which only those EDs using ICD10 or Snomed CT were able to report on.

Time series for these indicators were constructed and described. Multiple linear regression analysis was used to identify those indicators most sensitive to named pathogen activity as described by laboratory data.

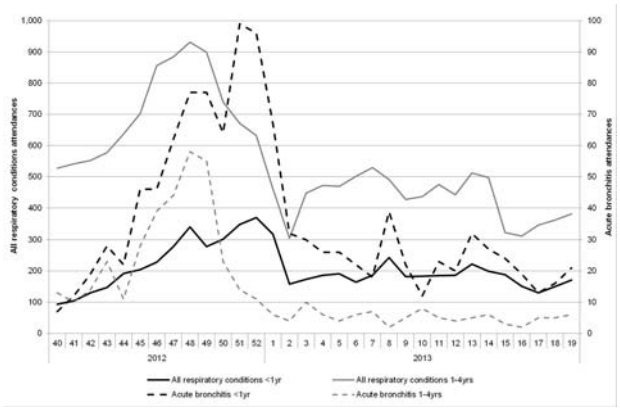
Results

As expected, the EDSSS indicators for acute respiratory infection and acute bronchitis, in patients aged less than 4 years in particular were found to be most sensitive to RSV activity.

The less detailed 'all respiratory disease' indicator in this younger age group was also found to be associated with RSV activity within the community.

Conclusions

The surveillance of named respiratory pathogens is possible using automated data extraction from EDs. Although there are differences in the diagnosis coding systems in use in EDs, with some providing more detail than others, this system is able to identify and report on RSV activity in particular using a combination of even the most basic diagnosis coding of 'all respiratory diseases' and patient age. The use of details in addition to the diagnosis of each patient allows for a flexible system, better able to provide both early detection and situational awareness for public health surveillance.



Weekly EDSSS attendances for 'all respiratory conditions' and acute bronchitis in infants aged 0-4 years during winter 2012/13

Keywords

Syndromic surveillance; emergency department; respiratory infection; respiratory syncytial virus

References

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