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Updating syndromic surveillnce baselines following public health interventions

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Objective

To adjust modelled baselines used for syndromic surveillance to account for public health interventions. Specifically to account for a change in the seasonality of diarrhoea and vomiting indicators following the introduction of a rotavirus vaccine in England.

Introduction

Public Health England's syndromic surveillance service monitor presentations for gastrointestinal illness to detect increases in health care seeking behaviour driven by infectious gastrointestinal disease. We use regression models to create baselines for expected activity and then identify any periods of signficant increases. The introduction of a rotavirus vaccine in England during July 2013 (Bawa, Z. et al. 2015) led to a reduction in incidence of the disease, requiring a readjustment of baselines.

Methods

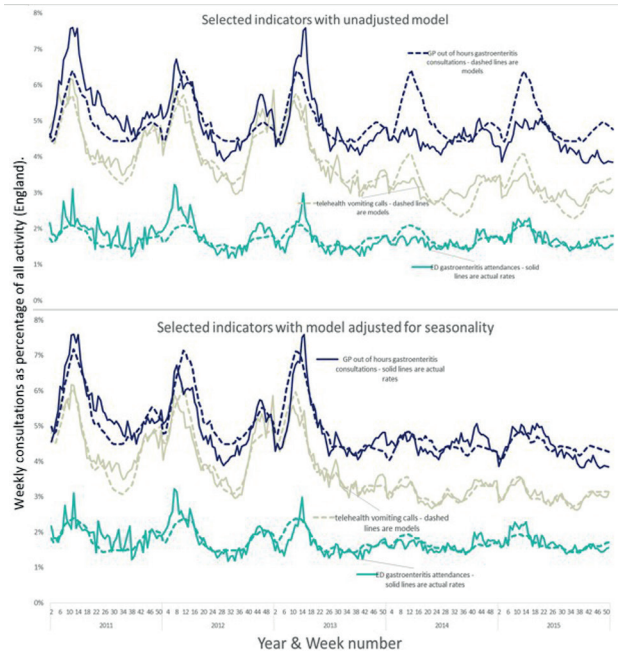
We identified syndromes where rates had dropped significantly following the vaccine's introduction. For these indicators, we introduced new variables into the regression models used to create baselines. Specifically we tested for a 'step-change' drop in rates and a change in the seasonality of baselines. Finally we checked the new models accuracy against actual syndromic data before and after the vaccine introduction.

Results

We were able to improve model fit post-intervention, with the best-fitting models based on a change in seasonality. All post-intervention regression models had reduced average residual square error. Reductions in residual errors ranged from <1% to 60% when a 'step-change' variable was included and 4% to 75% when accounting for seasonality. Furthermore, every syndrome showed a better model fit when a change in seasonality was included.

Conclusions

Prior to the vaccine's introduction, rotavirus caused a spring-time peak in vomiting and diarrhoea recorded by syndromic surveillance systems. Failure to account for the reduction in this peak post-vaccine would have made surveillance systems less effective. In particular, any increased activity during spring may have been undetected. Moreover, models that did not account for changes in seasonality would increase the chances of false alarms during other seasons. By adjusting our baselines for the changes in seasonality due to the vaccine we were able to maintain effective surveillance systems.



Selected syndromic indicators with baselines before and after intervention.

Keywords

intervention; aberration detection; syndromic; rotavirus

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References

Bawa, Z., et al. Assessing the Likely Impact of a Rotavirus Vaccination Program in England: The Contribution of Syndromic Surveillance. Clinical infectious diseases : an official publication of the Infectious Diseases Society of America 2015;61(1):77-85.

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