Spatio-temporal impact of self-financed Rotavirus vaccination on Rotavirus and acute gastroenteritis hospitalisations in the Valencia Region, Spain

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Rotavirus, vaccine impact, spatio-temporal, real-world data, Bayesian model
Abstract
Background Several studies have shown a substantial impact of Rotavirus (RV) vaccination on the burden of RV and all-cause acute gastroenteritis (AGE). However, the results of most impact studies could be confused by a dynamic and complex space-time process. Therefore, there is a need to analyse the impact of RV vaccination on RV and AGE hospitalisations in a space-time framework to detect geographical-time patterns while avoiding the potential confusion caused by population inequalities in the impact estimations.

Methods A retrospective population-based study using real-world data from the Valencia Region was performed among children aged less than 3 years old in the period 2005-2016. A Bayesian spatio-temporal model was constructed to analyse RV and AGE hospitalisations and to estimate the vaccination impact measured in averted hospitalisations.

Results We found important spatio-temporal patterns in RV and AGE hospitalisations, RV vaccination coverage and in their associated averted hospitalisations. Overall, ~1866 hospital admissions for RV were averted by RV vaccination during 2007–2016. Despite the low-medium vaccine coverage (~50%) in 2015-2016, relevant 36% and 20% reductions were estimated in RV and AGE hospitalisations respectively.

Conclusions The introduction of the RV vaccines has substantially reduced the number of RV hospitalisations, averting ~1866 admissions during 2007-2016 which were space and time dependent. This study improves the methodologies commonly used to estimate the RV vaccine impact and their interpretation.

Full Text
Due to technical limitations, full-text HTML conversion of this manuscript could not be completed. However, the manuscript can be downloaded and accessed as a PDF.

Figures
Figure 1

Description of RV vaccine coverage (%) by health care district and year.

Figure 2

Spatio-temporal impact of RV vaccination on RV and AGE hospitalisations. RV vaccine coverage (%) and number of averted hospitalisations by health care district and period estimated in the spatio-temporal model.

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