

Hospitalisation Trends For All Intestinal Infectious Diseases Since the Introduction of Rotavirus Gastroenteritis (RVGE) in Ireland

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INTRODUCTION

Since the introduction of the Rotavirus gastroenteritis (RVGE) vaccine on the Irish national immunisation programme in 2016, almost 2,000 RVGE hospitalisations have been avoided with an associated economic impact of €3.7m between December 2016 and November 2020 (Murphy et al 2023). National inpatient data shows prior to this, RVGE accounted for 16% of all intestinal infectious diseases amongst children under 5, falling to 10% in the 4 years after. There is a risk such data can be underreported owing to misclassification or miscoding.

OBJECTIVE

To examine hospitalisation trends for all intestinal infectious diseases (ICD-10-AM A00-A09) and the associated economic impact since the introduction of the RVGE vaccine amongst children under 5 years in Ireland.

METHODS

Data: National Hospital Inpatient Enquiry Data (HIPE) – national data for all Irish Public Hospitals

- Dec. 2013-Nov. 2020.
- Intestinal infectious diseases (ICD-10-AM A00-A09)
- Children under 5 years, pre- and post-vaccine introduction.

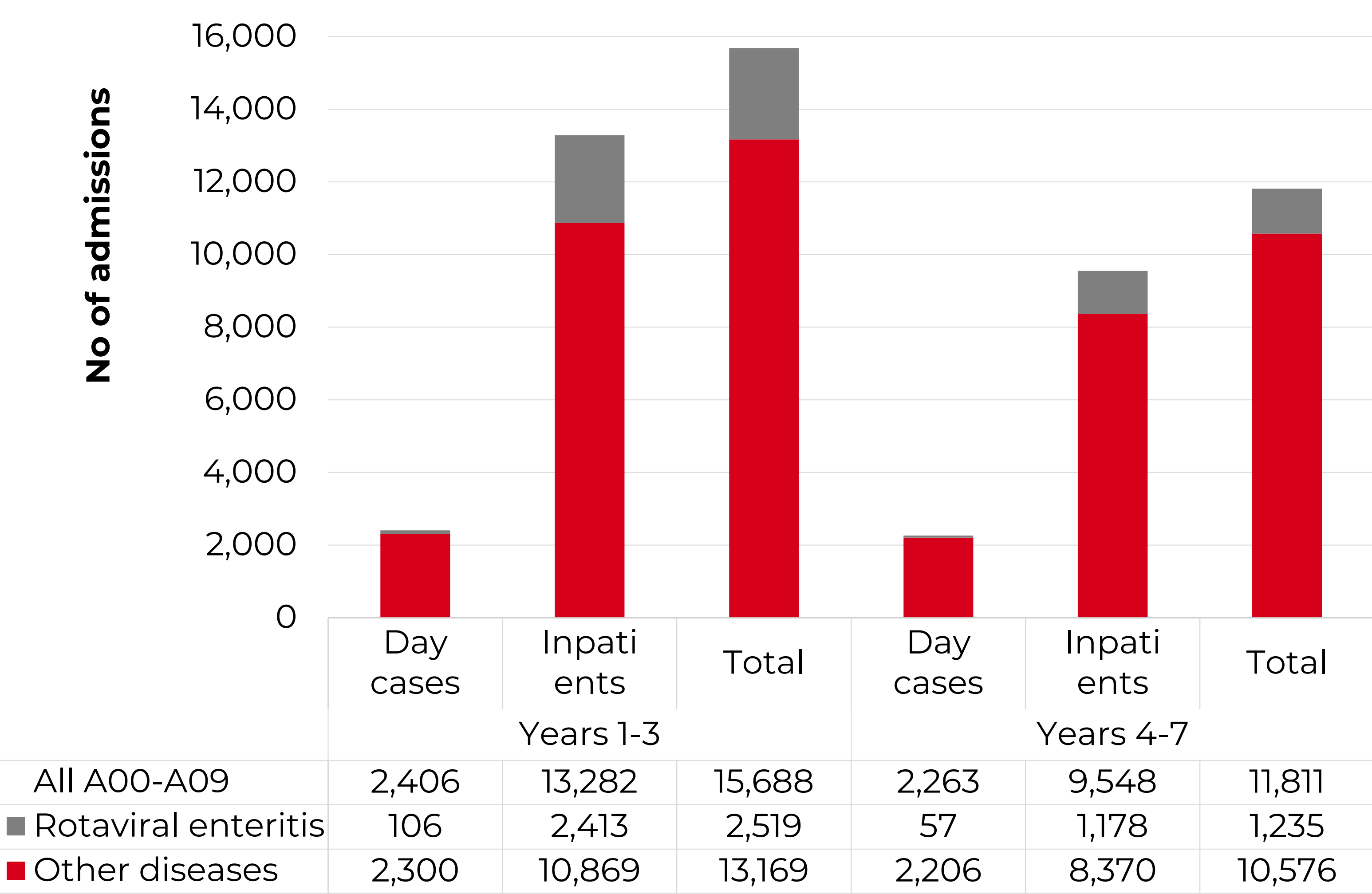
Costs: Health Pricing Office

Quantitative Analysis

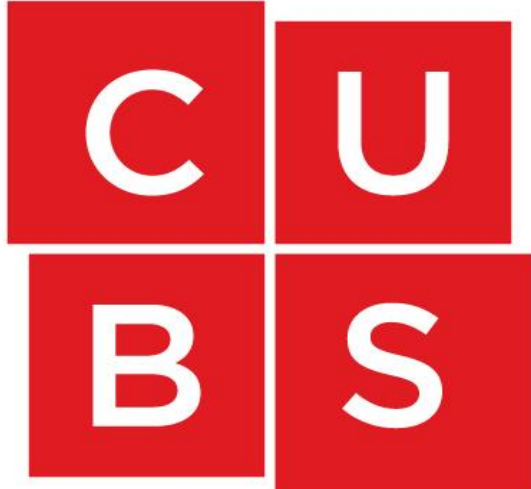
- Descriptive Statistics
- Probit Regression
- Interrupted Time Series Analysis (ITSA)

RESULTS

Figure 1 Total Admissions ICD-10-AM A00-A09



Where: Year 1 = Dec '13 – Nov '14; Year 2 = Dec '14 – Nov '15; Year 3 = Dec '15 – Nov '16; Year 4 = Dec '16 – Nov '17 (programme introduced); Year 5 = Dec '17 – Nov '18; Year 6 = Dec '18 – Nov '19; Year 7 = Dec '19 – Nov '20.



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Table 1 All intestinal Infections before/after the RVGE vaccine

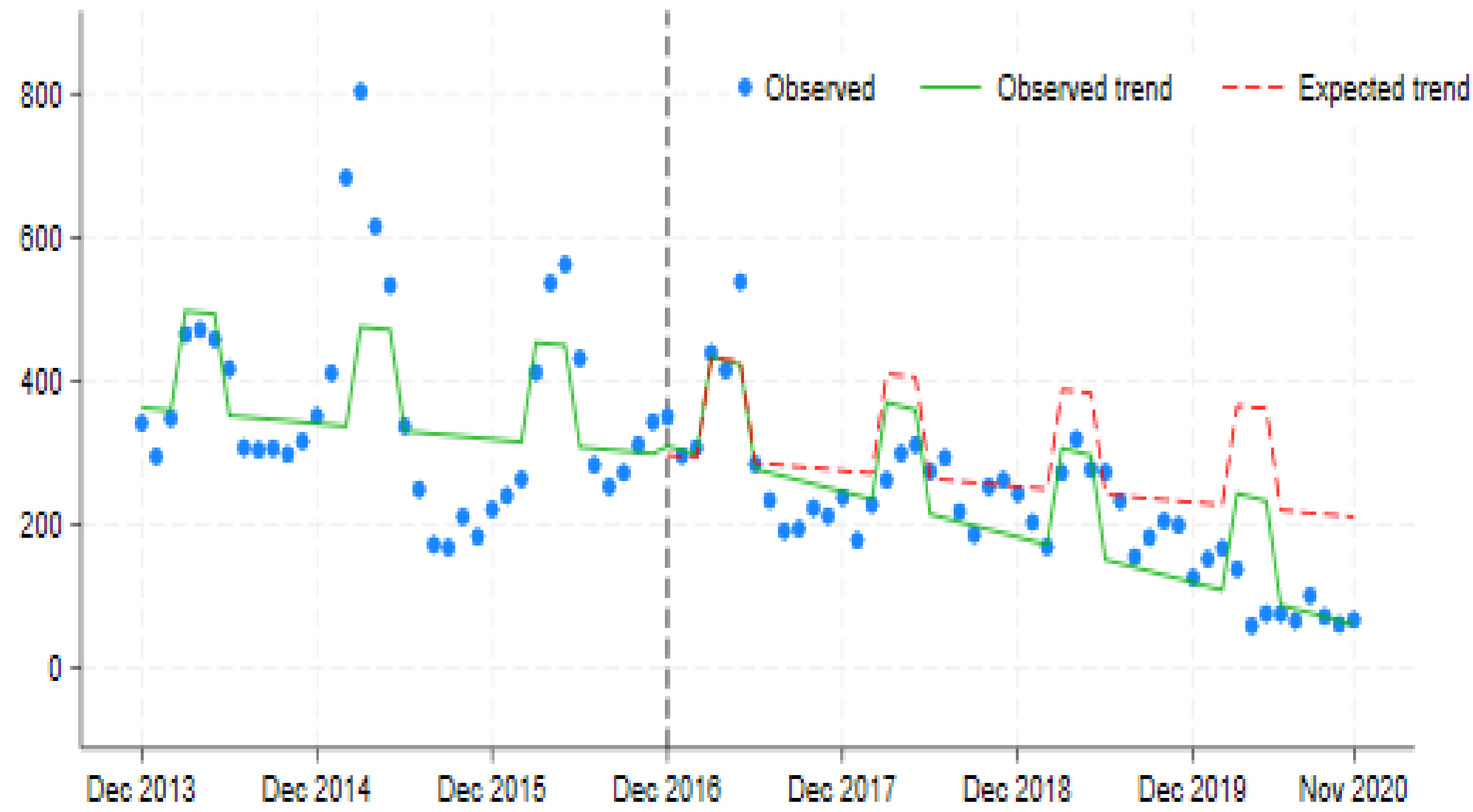
	dy/dx	Std err
Age 12-23m	-.036***	.008
Age 24-35m	.004	.009
Age 36-47m	.042***	.011
Age 48-59 m	.032**	.012
Male	-.007	.007
Inpatient length of stay	.001	.002
Rota Vaccine	-.010***	.009

^Marginal effects at the mean | *** Statistically significant at 1%

- All intestinal infectious diseases are considered. The control for RVGE cases is less likely to be observed after the introduction of the vaccine programme (p=0.000).
- Children aged 12-23 months are less likely to be hospitalised for intestinal infections in the post vaccination period (p=0.000) while as expected older children aged 36-59 months are more likely to be in the post vaccination period.

Figure 2: Interrupted Time Series Analysis Results

All Intestinal Infection Hospitalisations



Note: Excludes RVGE

Table 2: Estimated Economic Impact (Years 1- 7)

Costs	Total €	Day Cases €	Inpatient €
Observed	39,803,591	1,382,734	38,420,857
Expected Without Vaccine	43,335,317	1,874,234	41,461,083
Estimated Costs Avoided	3,531,726	491,500	3,040,226

CONCLUSIONS

- Results concur with Pereira et al. (2020) that the RVGE vaccine has indirect effects and is reducing all intestinal infectious hospitalisations.
- The reduction in hospitalisations for all Intestinal infectious diseases amongst children under 5 yrs since the introduction of the RVGE vaccination, signals spillovers and the potential for significant cost savings for the Irish Healthcare system.

REFERENCES

Murphy A, Kirby A, De Blasio F. The economic impact of the introduction of universal rotavirus vaccination on rotavirus gastroenteritis related hospitalisations in children in Ireland. *Vaccine*. 2023 Apr 17;41(16):2656-2663. doi: 10.1016/j.vaccine.2023.03.010. Epub 2023 Mar 21. PMID: 36948981.

Pereira, P., Vetter, V., Standaert, B. & Benninghoff, B. 2020. Fifteen years of experience with the oral live-attenuated human rotavirus vaccine: reflections on lessons learned. *Expert Review of Vaccines*, 19, 755-769

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