Section: Estimating the healthcare-associated economic benefits of rotavirus vaccination introduction in England and Wales.

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**Methods**

**Healthcare outcomes averted**

*GP visits:* To generate a distribution for the annual GP consultations averted, we subtracted the 2013-4 observed number of GP consultations from the annual number of predicted GP consultations from the statistical model (section XX Methods). Consistent with the previously described statistical model, we assumed the annual incidence rate in each age group was log-normally distributed.

*Hospital visits: … <*ask for mid year population estimates for 2013-4 in order to calculate the predicted number of cases log(I / pop estimates)>

*A&E visits: …*

**Healthcare costs averted**

*GP visits*: To calculate the cost of a GP consultation, we used the 2014 Unit Costs of Health and Social Care, assigning the modal value as a consultation lasting 11.7 minutes (£46), with the lower and upper bounds as consultations that last for 7.1 minutes (£28) and 17.2 minutes (£67) respectively (ref: Curtis et al). We also assigned an additional prescription cost to each GP visit with a modal value as the cost for scripts that are “routinely” and “can be” used for GE (£2.30). Lower bound cost consisted of those “routinely” used for GE (£1.38) and upper bound (£3.79) cost of the modal value in addition to the cost for scripts that are rarely used for GE. Prescription costs were inflated from 2004 prices to 2014 using annual Health Services Pay and Prices Index (ref: Curtis et al). Adding together the cost of a consultation visit and prescription, we used a Triangular distribution of total GP consultation costs (mode £48.30, lower bound £29.38 and upper bound £70.79).

*Hospital visits*: We calculated the modal cost of a hospital visit for paediatric cases (<15 years) using a weighted average using national 2013–4 unit costs for elective, non-elective, non-elective short stay, and day-use hospital costs for paediatric infectious or non-infectious gastroenteritis (codes PF21A-PF21B), paediatric major gastrointestinal disorders (codes PF25A–PF25E) and paediatric other gastrointestinal disorders (codes PF26A–PF26C), with weights given by the admissions for each combination of code and type of admission. For non-paediatric cases (15 years or older) we used the same weighted average method using national average unit costs for elective, non-elective, non-elective short stay, and day-use hospital costs for gastrointestinal infections (codes FZ36G–FZ36Q). Similarly, lower and upper bounds on costs were calculated using a weighted average of the lower quartile and upper quartiles for unit costs respectively. (ref: National Reference Costs) These methods provided a Triangular distribution of hospital costs as such: non-paediatric hospital visit cost: mode: £1181.24, lower bound: £896.50, upper bound: £1343.44; paediatric hospital visit cost: mode: £921.47, lower bound: £622.27, upper bound: £1078.81.

Conservatively, we did not include excess bed days in hospital as these are not likely to be RVGE-related.

*A&E visits: …*

*Sampled output*: All costs and cases averted were sampled 100,000 times over their respective distributions for each age group. The healthcare costs averted per year were calculated as the product of the healthcare visits averted and the cost of healthcare visit for each age group.

**Results**

Table: Averted healthcare outcomes and associated costs (Median values presented with 95% CIs from Monte Carlo sampling)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Age (years) | Annual visits averted 2013/14 | | | Annual costs averted (2014 £) | | |
|  | GP (??) | Hospital (ENG) | A&E | GP (??) | Hospital (ENG) | A&E |
| <1 | 1307  (74,2702) | 5309  (2861,8103) |  | 63000 (4000,143000) | 4606000 (2391000, 7392000) |  |
| 1 | 1402  (356,2603) | 4979  (-88,12531) |  | 68000 (17000,138000) | 4311000  (-76000, 11139000) |  |
| 2 | 389  (-3,825) | 1680  (-113,4201) |  | 19000  (0,44000) | 1455000  (-99000, 3755000) |  |
| 3 | 240  (-10,525) | 700  (-145,1793) |  | 12000  (0,28000) | 606000  (-124000, 1599000) |  |
| 4 | 157  (-43,380) | 328  (-154,921) |  | 8000  (-2000,20000) | 284000  (-135000, 819000) |  |
| 5–14 | 500  (-156,1221) | 1025  (-209,2385) |  | 24000  (-8000,64000) | 887000  (-181000, 2144000) |  |
| 15–44 | 66  (-1532,1755) | 6163  (1424,11213) |  | 3000  (-78000,90000) | 6984000  (1599000, 13056000) |  |
| 45–64 | 30  (-1140,1287) | 9689  (2954,16992) |  | 1000  (-58000,66000) | 10975000  (3334000, 19794000) |  |
| 65+ | -622  (-2026,878) | 21836  (4613,40945) |  | -30000  (-105000,44000) | 24726000  (5176000, 47425000) |  |
|  |  |  |  |  |  |  |
| **All ages** | **3553 (451,6774)** | **52338**  **(31780,**  **74519)** |  | **171,000**  **(21000,362000)** | **55,574,000**  **(32,373,000, 82,278,000)** |  |