# Supplemental materials:

### Table 1: Summary of rotavirus vaccine effectiveness studies – USA, 2006-2017

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Reference number** | **Setting** | **Seasons** | **Type of controls** | **Study outcomes** | **Ages** | **RV type** | **Dose** | **Cases** | **Controls** | **VE** | **LCL** | **UCL** |
| [1] | 1 Hospital in TX | 2008-2009 | RV neg | H, ED | <3yr | RV5 | Full | 98 | 153 | 83 | 66 | 91 |
| [2] | 1 Hospital in TX | 2008 | RV neg | H | <3yr | RV5 | Full | 72 | 75 | 89 | 70 | 96 |
| [3] | Retrospective study at 5 centers in 3 states (MN, GA, CT) | 2007-2009 | RV neg | H, ED | <5yr | RV5 | Full | 283 | 341 | 89 | 81 | 94 |
| H | <5yr | RV5 | Full | 140 | 280 | 92 | 86 | 96 |
| ED | <5yr | RV5 | Full | 41 | 280 | 81 | 53 | 92 |
| [4] | Active surveillance at 5 hospitals in 2 states (GA, CT) | 2010-2011 | RV neg | H, ED | <5yr | RV1 | Full | 95 | 140 | 91 | 80 | 95 |
| H | <5yr | RV1 | Full | 30 | 140 | 98 | 90 | 99.999 |
| ED | <5yr | RV1 | Full | 65 | 140 | 86 | 67 | 94 |
| H, ED | <5yr | RV5 | Full | 79 | 73 | 92 | 75 | 97 |
| H | <5yr | RV5 | Full | 30 | 73 | 97 | 77 | 99.999 |
| ED | <5yr | RV5 | Full | 49 | 73 | 91 | 67 | 98 |
| [5] | 1 Hospital in CT | 2006-2009 | Hospital controls | H | <5yr | Either | Full | 39 | 65 | 96.3 | 28.9 | 99.8 |
| [6] | Active surveillance (NVSN) at 3 sites in 3 states (NY, OH, TN) | 2006-2008 | RV neg | H, ED | <3yr | RV5 | Full | 68 | 132 | 92 | 21 | 99 |
| [7] | Retrospective study of 2 hospitals in CT | 2006-2008 | RV neg | H | <3yr | RV5 | Full | 54 | 270 | 92.2 | 48 | 99.999 |
| [8] | 3 metropolitan hospitals in GA | 2013 | RV neg | H, ED | >=8m | RV1 | Full | 51 | 69 | 83 | 58 | 93 |
| H, ED | >=8m | RV5 | Full | 57 | 55 | 83 | 51 | 94 |
| [9] | 3 metropolitan hospitals in GA | 2010-2013 | RV neg | H, ED | <5yr | Either | Full | 174 | 353 | 79 | 69 | 86 |
| [10] | Retrospective cohort study based on national insurance claims database | 2001-2010 | No RVGE | H | <2yr | Either | >=1 | NA | NA | 90 | 75 | 96 |
| [11] | Active surveillance at 7 centers in 7 states (CA, WA, KS, TX, OH, TN, NY) | 2009-2011 | RV neg | H, ED | <5yo | RV1 | Full | 56 | 140 | 70 | 39 | 86 |
| H, ED | <5yo | RV5 | Full | 307 | 1445 | 84 | 78 | 88 |
| [12] | Active surveillance (NVSN) in 7 centers | 2012-2013 | RV neg | H, ED | <8yo | RV1 | Full | 99 | 735 | 80 | 68 | 88 |
| H | <8yo | RV1 | Full | 27 | 148 | 84 | 53 | 94 |
| ED | <8yo | RV1 | Full | 72 | 587 | 79 | 63 | 87 |
| H, ED | <8yo | RV5 | Full | 354 | 2117 | 80 | 74 | 84 |
| H | <8yo | RV5 | Full | 96 | 433 | 83 | 71 | 90 |
| ED | <8yo | RV5 | Full | 258 | 1684 | 77 | 69 | 83 |
| [13] | Active surveillance (NVSN) in 6 centers | 2011-2013 | RV neg | H, ED | "children" | Mixed | Full | 212 | 578 | 80 | 51 | 92 |
| [14] | Retrospective study of 2 hospitals in GA | 2007-2015 | RV neg | H, ED | "children" | RV5 or RV1 | Full | 596 | Not provided | 67.6 | 57.8 | 75.2 |
| H | "children" | RV5 or RV1 | Full | Not provided | Not provided | 64.6 | 52.2 | 73.7 |
| ED | "children" | RV5 or RV1 | Full | Not provided | Not provided | 82.9 | 41.7 | 95 |
| [15] | Active surveillance at 3 centers in 3 states (OH, TN, NY) | 2006-2009 | RV neg | H, ED | <4yo | RV5 | Full | 143 | 238 | 87 | 71 | 94 |
| H | <4yo | RV5 | Full | 40 | 49 | 95 | 48 | 99 |
| ED | <4yo | RV5 | Full | 59 | 76 | 74 | 16 | 92 |
| [16] | Retrospective cohort study based on national insurance claims database | 2007-2008 | DTaP only | H, ED, OP | Infants | RV5 | Full | NA | NA | 100 | 87 | 100 |
| [17] | Retrospective cohort study based on national insurance claims database | 2007-2008 | DTaP only | H, ED, OP | Infants | RV5 | 2 dose | NA | NA | 94 | 61 | 100 |

Abbreviations H: Hospital; ED: Emergency Department; OP: Outpatient; NA: Not applicable; yo: year old; RV neg: rotavirus negative

### Table 2: Vaccine healthcare utilization impact studies of children < 5 years old – USA, 2006-2017

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Study | Database | Prevax | Vax | Measure year | Age | RV Reduction | RVLCL | RVUCL | AGE Reduction | AGELCL | AGEUCL |
| Hospitalization-rate |
| [18] | HCUP | 2000-2006 | 2008-2012 | 2012 | <5yo | 94 | 94 | 95 | 55 | 54 | 55 |
| 2011 | <5yo | 79 | 79 | 80 | 47 | 47 | 48 |
| 2010 | <5yo | 90 | 90 | 90 | 48 | 47 | 48 |
| 2009 | <5yo | 63 | 62 | 64 | 33 | 32 | 33 |
| 2008 | <5yo | 70 | 69 | 71 | 31 | 30 | 31 |
| [19] | MarketScan | 2000-1/2007 | 1/2007-2010 |  | <5yo | 67 |   |   |   |   |   |
| [20] | MarketScan | 2001-2006 | 2007-2011 | 2010 | <5yo | 80 | 78 | 81 | 47 | 46 | 49 |
| 2009 | <5yo | 94 | 93 | 95 | 54 | 52 | 55 |
| 2008 | <5yo | 60 | 58 | 63 | 25 | 23 | 27 |
| 2007 | <5yo | 75 | 72 | 77 | 33 | 31 | 35 |
| [21] | NIS | 2000-2006 | 2008-2010  |  | <5yo | 80 | 72 | 86 | 42 | 34 | 50 |
| [22] | Utah hospital and ED | 2003-2007 | 2008-2010 | 2009 | <5yo | 88 | 81 | 93 |   |   |   |
| 2008 | <5yo | 68 | 57 | 75 |   |   |   |
| 2007 | <5yo | 77 | 68 | 84 |   |   |   |
| [23] | Indian Health Service | 2001-2006 | 2008-2010 | 2010 | <5yo | 44 |   |   |   |   |   |
| 2009 | <5yo | 38 |   |   |   |   |   |
| 2008 | <5yo | 25 |   |   |   |   |   |
| [24] | HCUP | 2000-2006 | 2008-2009 | 2009 | <4yo |   |   |   | 33 |   |   |
| 2008 | <4yo |   |   |   | 31 |   |   |
| [25] | MarketScan | 2001-2006 | 2007-2009  | 2008 | <5yo | 60 | 58 | 63 | 34 | 32 | 36 |
| 2007 | <5yo | 75 | 72 | 77 | 47 | 45 | 49 |
| [26] | CHMPC  | 2004-2005 | 2006-2009 | 2008 | <5yo |   |   |   | 60 | 35 | 63 |
| 2007 | <5yo |   |   |   | 50 | 34 | 62 |
| 2006 | <5yo |   |   |   | 28 | 7 | 44 |
| [27] | NY state hospitals | 2003-2006 | 2008 | 2008 | 1-23m | 83 |   |   | 35 |   |   |
| [28] | Military dependents | 2003-2006  | 2007-2009 | 2008 | <5yo | 55 | 49.6 | 60.3 |   |   |   |
| 2007 | <5yo | 70 | 65.1 | 73.9 |   |   |   |
|   | <5yo | 62 | 58.6 | 65.8 | 31.5 | 28.1 | 34.7 |
|   | Infant | 75 | 70.1 | 79.7 |   |   |   |
| [29] | HCUP | 2000-2006  | 2007-2008 | 2008 | <5yo |   |   |   | 45 |   |   |
| 2007 | <5yo |   |   |   | 16 |   |   |
| [30] | SDI Health | 2003-2006  | 2007-2008 | 2007 | Infant |   |   |   | 30 | 24 | 39 |
| <5yo | 81 | 77 | 84 |   |   |   |
| ED Visit Rate |
| [31] | SED (10 states) | 2003-2006  | 2008-2013 |   | <5yo |   |   |   | 10.3 | 10 | 10.6 |
| [32] | 28 EDs | 2005 | 2010 |   | Infant |   |   |   | 41 | 37 | 45 |
| [19] | MarketScan | 2000-1/2007 | 1/2007-2010 |   | <5yo | 57 |   |   |   |   |   |
| [22] | Utah children's hospital | 2003-2007 | 2008-2010 | 2009 | <5yo | 91 | 79 | 97 |   |   |   |
| 2008 | <5yo | 77 | 60 | 88 |   |   |   |
| 2007 | <5yo | 57 | 35 | 73 |   |   |   |
| [26] | CHMPC | 2004-2006 | 2006-2009 | 2008 | <5yo |  |   |   |   |   |   |
| 2007 | <5yo |  |   |   |   |   |   |
| 2006 | <5yo | -17 | -79 | 24 |   |   |   |
| [30] | National claims | 2003-2006 | 2007-2008 |   | Infant |   |   |   | 19 | 11 | 25 |
| Outpatient visit rate |
| [19] | MarketScan | 2000-1/2007 | 1/2007-2010 |   | <5yo | 57 |   |   |   |   |   |
| [23] | Indian Health Service | 2001-2006 | 2008-2010 | 2010 | <5yo |   |   |   | 36 |   |   |
| 2009 | <5yo |   |   |   | 21.2 |   |   |
| 2008 | <5yo |   |   |   | 15.6 |   |   |
| [30] | National claims | 2003-2006 | 2007-2008 |   | Infant |   |   |   | 12 | 5 | 20 |
| [26] | CHMPC (single center) | 2004-2006 | 2007-2008 | 2006 | <5yo |   |   |   | 6 | 1E-05 | 12 |

Abbreviations H: Hospital; ED: Emergency Department; OP: Outpatient; NA: Not applicable; yo: year old; RV neg: rotavirus negative

### **Table 3:** Vaccine healthcare utilization impact studies of unvaccinated children and adults – USA, 2006-2017

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Study | Year | Study type | Database | Prevax | Vax | Vaccine type | Measure year | Strata | Age | RV Reduction | RVLCL | RVUCL | AGE Reduction | AGELCL | AGEUCL |
| **Hospitalization** |
| [33] | 2015 | Ecologic | MarketSCan |   | 2008-2011 | RV5 |   | Child born 4/2006-7/2007 | >5 years (household members) |   |   |   | -21-50 |   |   |
| Child born 4/2006-7/2007 | 20-29 |   |   |   | 41 | 18 | 57 |
| Child born 4/2006-7/2007 | 20-29, female |   |   |   | 43 | 18 | 60 |
| Child born 8/2007-7/2008 | >5 yo (household members) |   |   |   | -28-27 |   |   |
| Child born 8/2007-7/2008 | 30-39, male |   |   |   | 32 | 1 | 53 |
| Child born 8/2008-7/2009 | >5 yo (household members) |   |   |   | -30-27 |   |   |
| [20] | 2014 | Ecologic | MarketScan Claims and commercially insured | 2001-2006 | 2007-2011 | RV5, RV1 | 2007 |   | <5 yo | 50 | 36 | 62 |   |   |   |
| 2008 | 2 | -17 | 18 |   |   |   |
| 2009 | 77 | 65 | 85 |   |   |   |
| 2010 | 25 | 4 | 41 |   |   |   |
| [34] | 2011 | Ecologic | HCUP's Nationwide Inpatient Sample | 2000-2006 | 2008 | RV5 |   |   | 5-14 | 71 | 55 | 81 | 29 | 22 | 35 |
| Hispanic | 5-14 | 84 | 63 | 93 | 42 | 31 | 51 |
|   | 15-24 | 65 | 18 | 85 | 8 | 2 | 14 |
| 25-64 | 26 | -16 | 53 | 1 | -3 | 5 |
| >=65 | 21 | -26 | 51 | -3 | -10 | 4 |
| [27] | 2010 | Ecologic | All NY state hospitals | 2003-2006 | 2007-2008 | RV5 |   |   |   | 70 |   |   | 12 |   |   |
| 10 sentinel hospitals |   | 70 |   |   | 9 |   |   |
| [28] | 2010 | Ecologic | Military dependents | 2003-2006 | 2007-2009 | RV5 |   |   | <4 yo | 57.2 | 52.7 | 61.3 |   |   |   |
| 2007 | <4 yo | 67.8 | 62.7 | 72.4 |   |   |   |
| 2008 | <4 yo | 45.6 | 38.5 | 52 |   |   |   |
|   | <1 yo | 60.3 | 51.4 | 67.9 |   |   |   |
| 1 yo | 54.5 | 46.4 | 61.5 |   |   |   |
| 2yo | 40.5 | 26 | 52.4 |   |   |   |
| 3yo | 18.2 | -13.1 | 41.4 |   |   |   |
| RV ED incidence |
| [33] | 2015 | Ecologic | MarketSCan |   | 2008-2011 | RV5 |   | Child born 4/2006-7/2007 | >5 yo (household members) |   |   |   | -16-25 |   |   |
| Child born 8/2007-7/2008 | >5 yo (household members) |   |   |   | -14-16 |   |   |
| Child born 8/2007-7/2008 | 20-29, female |   |   |   | 16 | 1 | 29 |
| Child born 8/2008-7/2009 | >5 yo (household members) |   |   |   | -12-16 |   |   |
| Child born 8/2008-7/2009 | 5-19 |   |   |   | 16 | 0 | 29 |
| [25] | 2011 | Ecologic | MarketScan | 2001-2006 | 2007-2009 | RV5 | 1/2008-6/2008 |   | <2 yo | 45 | 37 | 54 | 27 | 21 | 32 |
| 1/2009-6/2009 | 6 | -6 | 17 | -5 | -12 | 2 |

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