APPENDICES

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I. Characteristics of cost-effectiveness models for infectious diseases

According to the NHS Economic Evaluation Database (NHS EED) "full economic evaluations are studies in which a comparison of two or more treatments or care alternatives are undertaken and in which both costs and outcomes of the alternatives are examined. This includes cost-benefit analyses, cost-utility analysis and cost-effectiveness analyses" (Centre for Reviews and Dissemination, 2011).[1]

Several methodological challenges need to be considered when developing a model to assess the CE of a vaccine robustly. One of the most relevant is how the cost-effectiveness model simulates the transmission of the disease.

The risk of infection that a person who is susceptible depends on the number of individuals in the population with the disease who can transmit it (referred to as infectious individuals) and how frequently they contact other individuals. This results in a constantly changing probability of the risk of infection with a non-linear transmission effect. This characteristic results in a crucial element: the herd immunity (HI) effect. The HI effect defined as *"the indirect protection experienced by unvaccinated individuals resulting from the presence of immune individuals in a population"* (Vynnycky and White, 2010). This phenomenon can modify the vaccine effectiveness in either a positive or negative manner.

Widely used methodologies such as decision trees or Markov models assume that the risk of infection is constant or not dependent on the effective contact rate between susceptible and infectious individuals.[2] Such models are commonly referred to as static models.

Static models follow a linear transmissibility rate, which might produce bias results as the spread of the disease and HI effect are not correctly estimated (Brisson and Edmunds, 2006).

The HI effect and its impact on the spread of infection are dependent on: the type of disease; the rate at which susceptible individuals become infected per unit time

[1] (Drummond et al., 2015) distinguishes between cost-effectiveness, cost-utility and cost-benefit analysis. By this distinction, the cost-effectiveness analysis measures the effects of the program in health outcomes; the cost-benefit analysis measures the effect of a program in monetary terms. Cost-utility is used when the outcome measure is weighted by utilities such as QALYs. For simplicity, the term cost-effectiveness used in this thesis incorporates cost-effectiveness, cost-benefit and cost-utility analyses. As described in Chapter 6, the cost-effectiveness analysis performed here follows a cost-utility approach since it measures the health outcomes in terms of QALYs.

[2] An effective contact refers to a contact between a susceptible and infectious individual that leads to an infection.

(defined as the force of infection); the extent of the vaccination program; and how well the vaccine prevents the circulation of the pathogen. HI can also produce a change in the distribution of age when infected. By this phenomenon, an increase or decrease in the mortality and morbidity in later ages can occur (Brisson and Edmunds, 2003).

More complex models explicitly take the non-linear risk of infection over time into consideration often through interaction between individuals. Such models are commonly referred to as dynamic models. In a dynamic model, the risk of infection is assumed to be a function of the number of infectious individuals in the population at a given point in time, multiplied by the effective contact rate between susceptible and infectious individuals.

Dynamic models provide a more realistic estimation of the spread of the disease. These type of models account for the potential HI effect produced by a vaccine intervention (Brisson and Edmunds, 2006). These models, however, can arguably be more difficult and time-consuming to implement.

Kim and Goldie, (2008), suggested that most of the published literature on the topic is based on a static setting, this was corroborated by the results of the literature search performed in this thesis. It has been argued that using a static approach may underestimate the effectiveness of the vaccine and therefore if the vaccine intervention is deemed to be CE within a static models, the use of a more complex dynamic model would not change the decision ((Margolis et al., 1996), cited in (Edmunds et al., 1999)). However, as commented above, the HI effect does not always increase the effectiveness of the intervention (Brisson and Edmunds, 2003). Therefore the overall impact of HI is unknown.

Whilst static and dynamic models can produce similar results when the vaccination program is small or where the vaccine does not effectively prevent the circulation of the pathogen, a dynamic model should be the preferred approach (Brisson and Edmunds, 2003). However, in many circumstances, particularly historically, this was not possible due to the available resources, data availability or researcher proficiency. In such circumstances, a static model might be a helpful tool for decision-making.

In general terms, a static model may be an acceptable choice when estimating a worst-case scenario where the HI is not relevant or when all parameters are known. (Brisson and Edmunds, 2003; Vynnycky and White, 2010). The WHO suggests that a static approach is acceptable when: *“human to human transmission is non-existent or exceptional; the vaccine does not reduce susceptibility to infection or infective transmission potential; the eligible target groups are not or do not include an epidemiologically influential subgroup (e.g.; elderly or travellers); where there are no*

negative externalities from vaccination or these are very likely to be smaller than the positive." If those elements are taken into consideration, and the static model shows favourable results for vaccination a static model is accepted (WHO 2008).

According to the WHO choosing between static and dynamic models is the pivotal choice in infectious disease modelling when aiming to estimate the CE of a vaccine intervention (WHO, 2008).

Both ODE and DES techniques are classified as dynamic models. However, a key difference between the two is how individuals are taken into consideration. The ODE method works on an aggregation of the population while DES tracks the progression of all or selected individuals in the model.[3]

An aggregate-level model assigns individuals to compartments depending on their status. The movement between stages or compartments is based on average values. In contrast, individual level models keep track of individuals within the simulation. The movement between stages in individual level models can depend on the individual's characteristics or previous history. The ODE model approach is part of the compartmental or System Dynamics (SD) technique. The SD technique is a continuous time, aggregate level method that models the relationship between elements in a system and how these influence its behaviour over time (more details are provided in Appendix II). The DES technique is a computer simulation approach. This approach is an individual level, continuous time model that employs a next event technique to control the behaviour of the model (more details are provided in Appendix III).

[3] Models classification depending on being static or dynamic and other characteristics has been discussed in Chapter 3

II. Brief theoretical background on compartmental models

According to (Kim and Goldie, 2008), and the literature review performed here, the most commonly used technique to model the CE of an infectious disease vaccine intervention within dynamic models is compartmental models (classed as SD in the terminology of this thesis). Such models are usually set in continuous time setting (although discrete time models can also be performed).[4] The structures of a system can be constructed based on difference, ordinary or partial differential equations to describe the rate of change of a particular state or condition (Brennan et al., 2006).

Such types of models stratify the population into different subgroups or "compartments". The models describe the transmission of the infection using the total number of individuals in each compartment. Individuals move between "compartments" according to parameters values at the aggregate level (Kim and Goldie, 2008). In infectious disease models, these "compartments" usually refer to individuals who are susceptible, pre-infectious or latent, infectious and recovered. However, these compartments can be modified depending on the type of disease analysed. For example, SI models track only susceptibles and infectious; SIS models: Susceptibles-infectious-susceptibles; SIR models: Susceptible-infectious-recovered; SIRS models: Susceptibles-infectious-recovered-susceptibles; and SEIR models: Susceptibles-pre-infectious or exposed-infectious-recovered.

Models based on difference equations describe the transitions between different compartments using discrete time steps. The model determines the number of individuals in each compartment at time $t + 1$ in terms of the number at time t. This approach offers some limitations since the size of the step can influence the model predictions, as the predicted epidemic curve becomes less smooth when the time steps increases. As the step size decreases the model tends towards resembling a continuous time model. The use of partial differential equations, however, allows the inclusion of another variable such as patient age. Partial differential equations can describe the spread of a disease in an age-structure population.

The risk of infection also known as force of infection is one of the most relevant parameters of an infectious disease model. The force of infection $\lambda(t)$ can be defined as the rate at which susceptible individuals become infected per unit time (Vynnycky and White, 2010). The force of infection is a function of two main parameters: the per-

[4] A discrete time finite difference equation can be used using the Euler-forward approximation (Brennan et al., 2006) or difference equation models.

capita effective contact rate per-unit time (β) and the number of infectious individuals in the population (I) (Vynnycky and White, 2010).

A susceptible individual can only acquire an infectious disease by entering into contact with an infectious individual. When this contact occurs the susceptible individual might or might not contract the disease. An effective contact rate (β) occurs when that contact would be sufficient to lead to an infection. The β depends on the frequency of contacts between other individuals in a given group and the proportion of those contacts that are "effective" or sufficient to transmit the disease (Vynnycky and White, 2010).

Mixing between individuals can be either homogeneous or heterogeneous. If homogeneous, individuals enter into contact with other individuals in proportion to the size of each group. However, when contacts are influenced by age or other characteristics, contact patterns are defined as "heterogeneous". Both stochastic and deterministic models can be constructed using homogeneous or heterogeneous mixing (Vynnycky and White, 2010).

III. Brief theoretical background on Discrete event simulation models

Discrete event simulation (DES) originated within operational research theory (Pidd, 2004) and is a continuous time model that employs a next event technique to control the behaviour of the model. The model only updates when a change of state occurs (Robinson, 2004). It is an individual level stochastic model as it tracks individual objects during the modelling using a random process.

A simplistic definition can see DES as a system of queues and activities (Pidd, 2004; Brailsford and Hilton, 2001). The main elements of a DES model are the individual "entities" as these are the components being simulated and tracked. Entities can be a representation of individuals as would be the case in an infectious disease model. Attributes can be assigned to each entity, usually in the form of a label allowing the possibility of different outcomes at the individual level. Based on the value of the attributes, the entities transit through different activities that alter their characteristics and influence future events. Depending on the order and conditions of these activities, the entities can be held in queues until it is time to engage in another activity or expire (Brennan et al., 2006; Pidd, 2004; Brailsford and Hilton, 2001). In the context of infectious disease modelling, individuals can be held in queues to simulate periods of latency, infectiousness or when a patient has recovered.

Entities can be organised into "classes" according to their attributes (such as age or gender) to engage in similar behaviour or to face similar conditions (Pidd, 2004). In the context of an infectious disease modelling the use of classes allows the possibility of heterogeneous mixing.

DES models can also be constrained by "resources". Resources are elements that are required for an activity to be undertaken. Therefore, within a health care context, a medical doctor may be required for a patient examination to occur, and thus the doctor would be represented as a resource. Although resources are not tracked in the same way as an entity, it is possible to record certain elements of their participation in the simulation process such as percentage of utilisation or time in the simulation.

It is also possible to keep a record of the "countable" elements in the simulation. Compared with resources these countable elements are not used directly to process an activity; however, they can be used as inputs to aid or modify its results. In the context of infectious disease modelling, infectious or susceptible individuals can be represented as countable and be used to determine the probability of acquiring a disease.

The “activities” are processed in another element of the DES simulation referred to as a “work centre”. Within the work centre, code can be written to modify the attributes of the entities and to determine which future event will occur first. Interactions between individual entities can also be simulated within the code to determine whether a susceptible individual meets an infectious person and whether this contact resulted in a transmission of the disease. This interaction, coupled with the changes of state from susceptible to exposed and then to infectious allows for a dynamic estimation of an infectious disease.

A DES model also employs a simulation clock that keeps track of the events within the model. The simulation determines the time of the next event and automatically jumps to that time. As such, there are no time cycles, although regular scheduled events can be coded to occur.

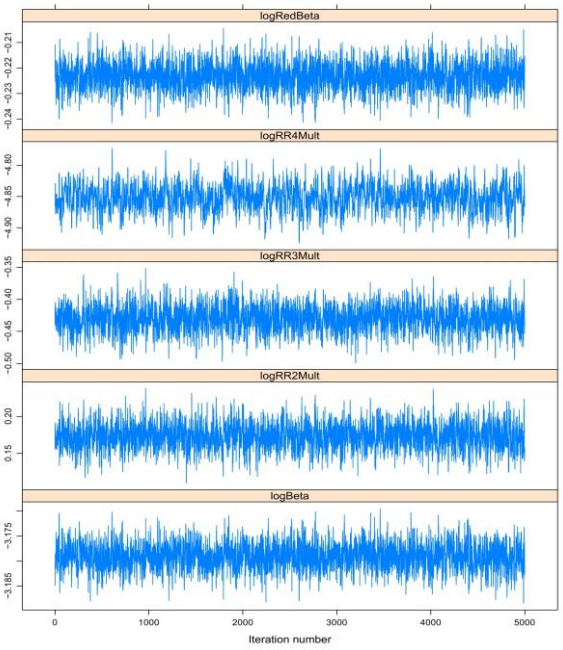
As the model operates at an individual level and is stochastic the construction and running time might prove to be computationally expensive (Brennan et al., 2006; Karnon, 2003).

IV. Additional information relating the calibration of the ODE model

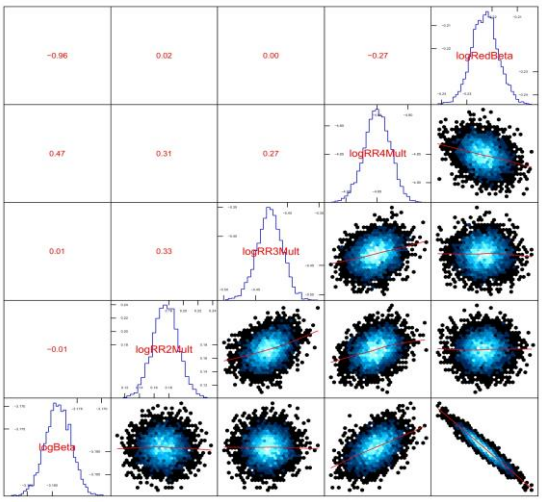
Figure IV.1 and Figure IV.2 show the diagnostic plots of the 0.75 and 0.001 RR calibrations

Figure IV.1 0.75 Diagnostic tests plots

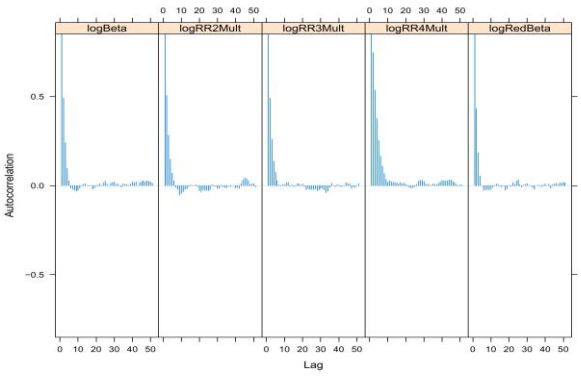
a) Trace plot



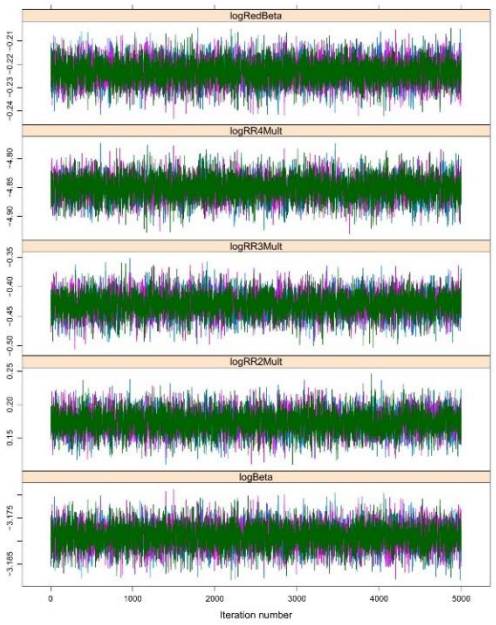
b) Density and correlation plots



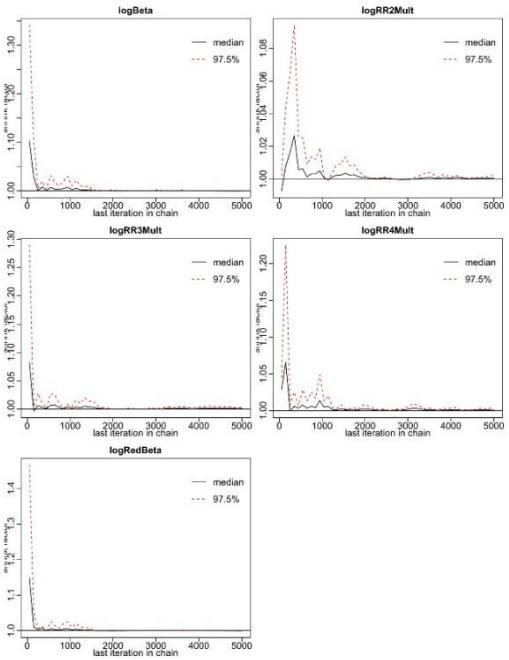
c) Autocorrelation plots



d) Overlayed trace plots



e) Gelman plots



f) Gelman diagnostics

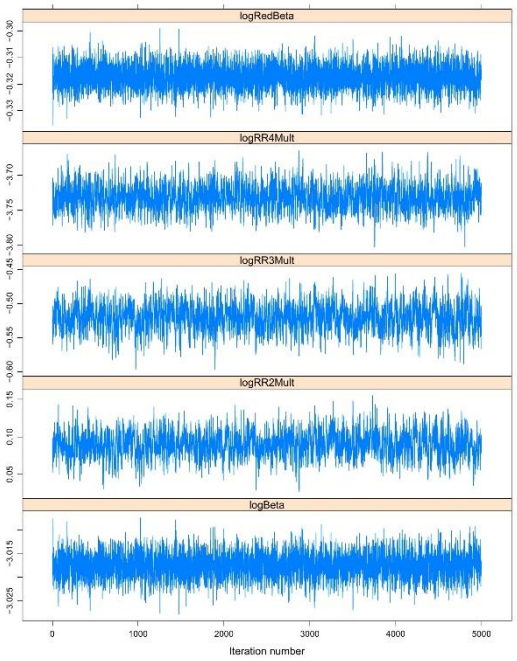
	Point est.	Upper C.I.
logBeta	1	1
logRR2Mult	1	1
logRR3Mult	1	1
logRR4Mult	1	1
logRedBeta	1	1

Multivariate psrf

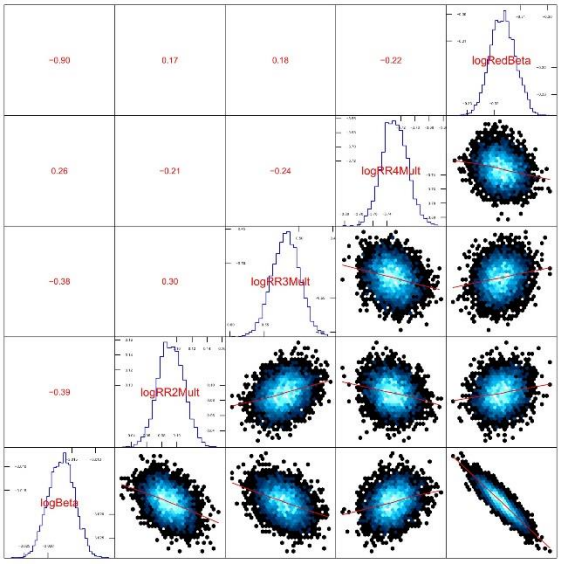
1

Figure IV.2 0.001 Diagnostic test plots

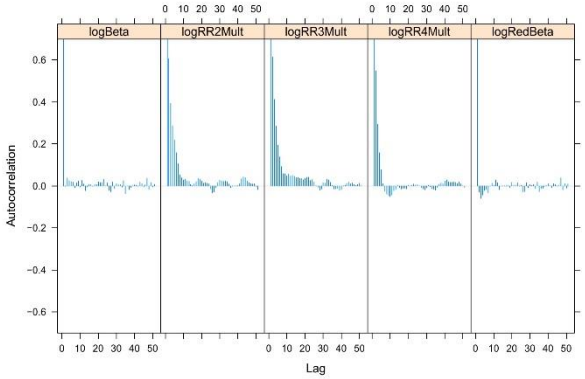
a) Trace plot



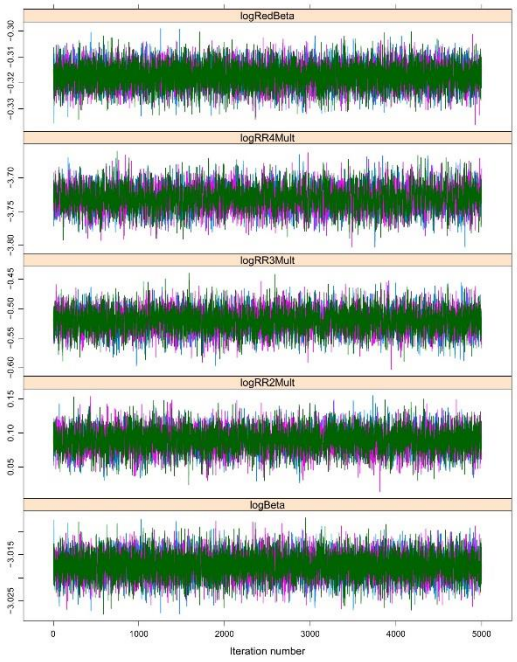
b) Density and correlation plots



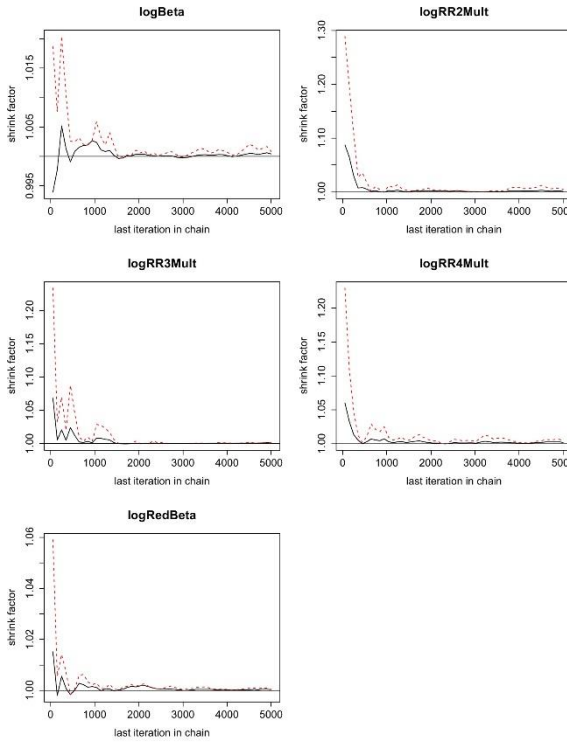
c) Autocorrelation plots



d) Overlayed trace plots



e) Gelman plots



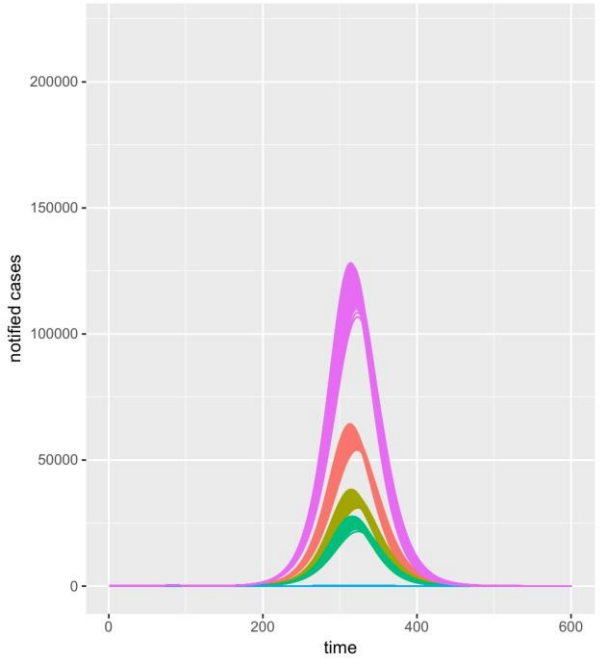
f) Gelman diagnostics

```
> gelman.diag(allmc)
Potential scale reduction factors:

            Point est. Upper C.I.
logBeta              1       1.00
logRR2Mult           1       1.01
logRR3Mult           1       1.00
logRR4Mult           1       1.00
logRedBeta           1       1.00

Multivariate psrf
```

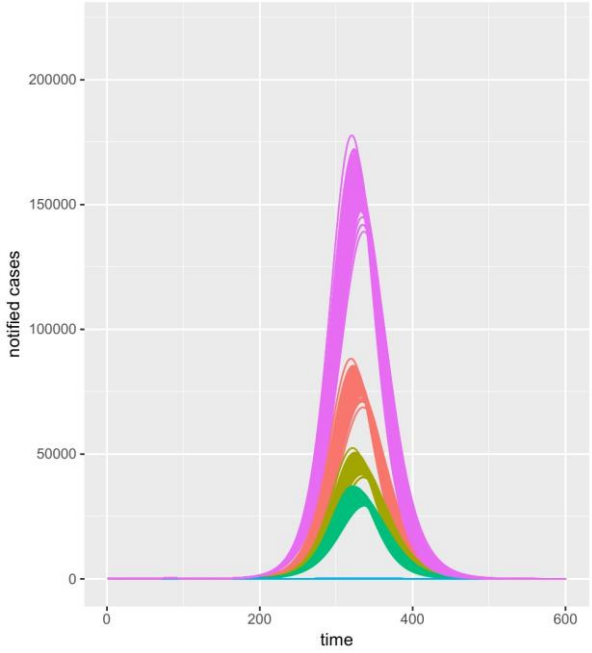
Figure IV.3 Spread of the pandemic by generational time: 1.3, 1.9 and 2.71 for the three RR scenarios (no vaccination)

a) 0.75 reporting rate scenario

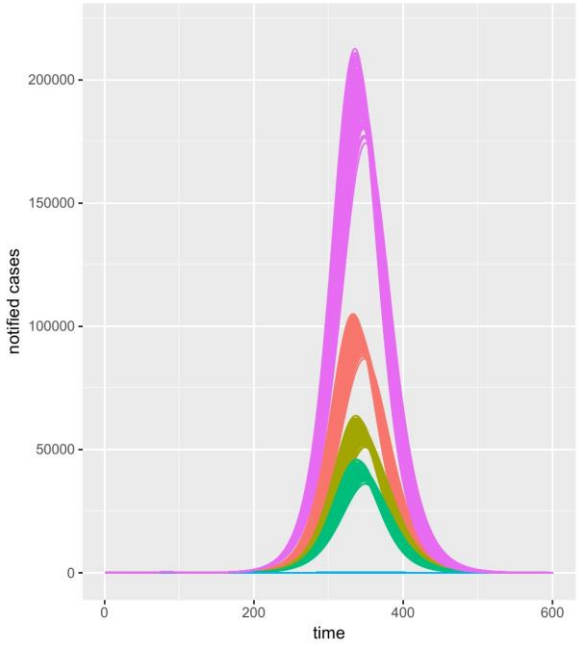
GI: 1.3



GI: 1.9 (base case)



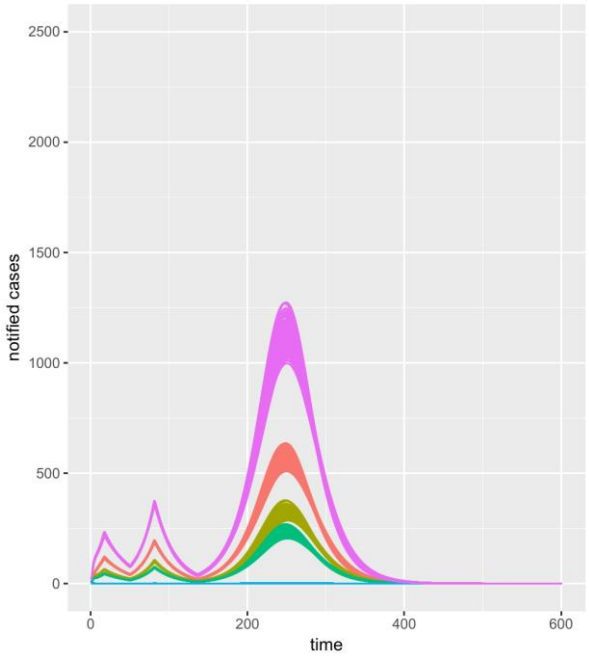
GI: 2.7



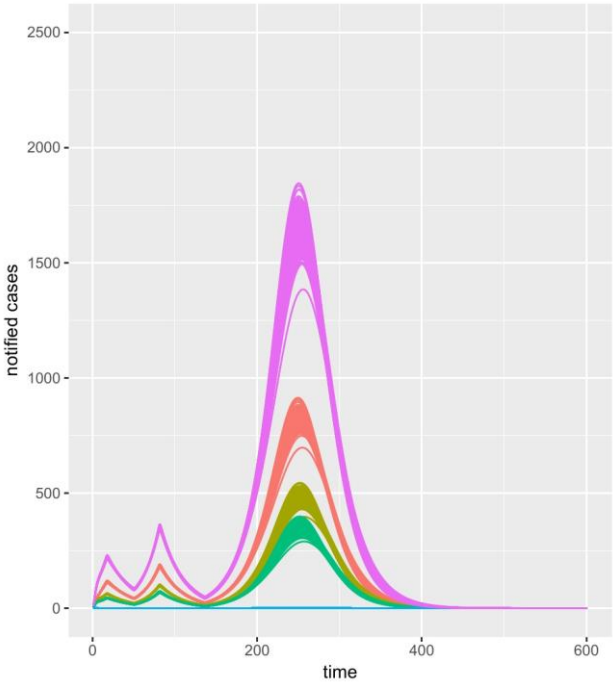
Lines in pink correspond to all age groups
Lines in orange correspond to the 0-15 age group
Lines in green olive correspond to the 16-39 age group
Lines in green correspond to the 40-59 age group
Lines in blue correspond to the 60 and over age group
the x-axis represents time, y-axis total number of notified cases;

b) 0.01 reporting rate scenario

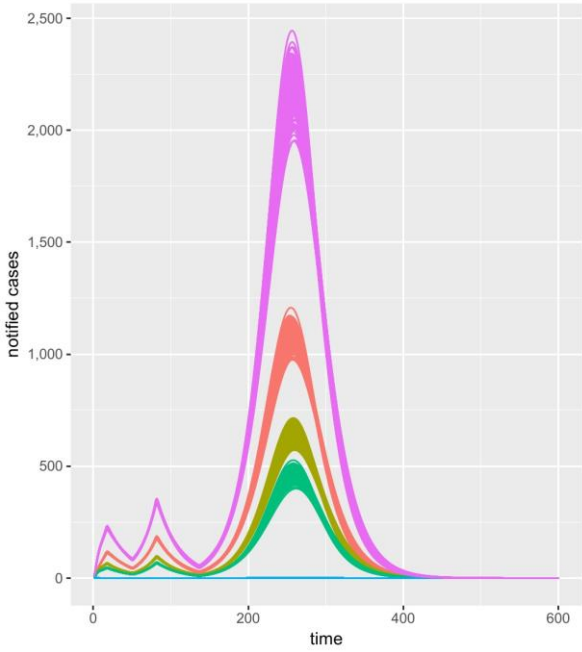
GI: 1.3



GI: 1.9 (base case)



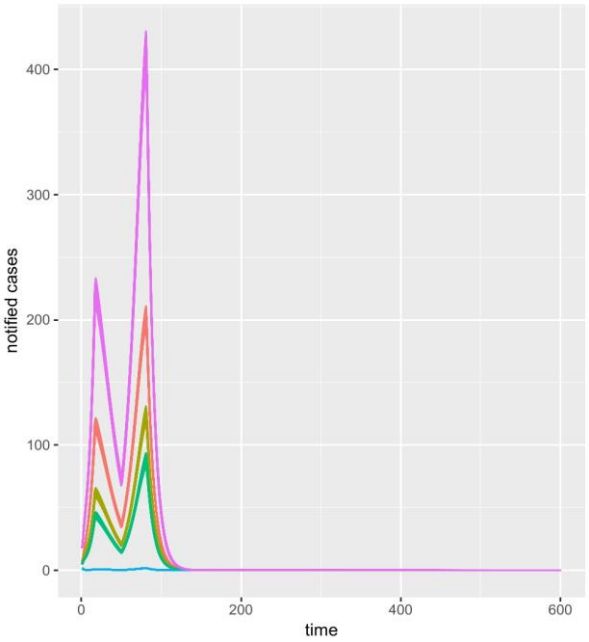
GI: 2.7



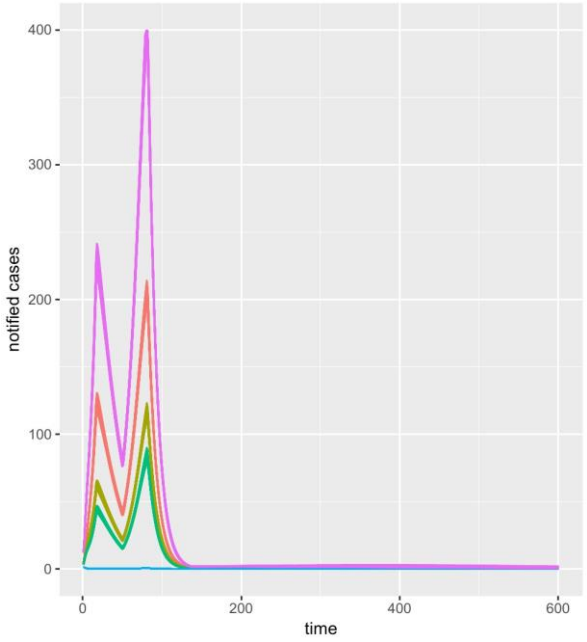
Lines in pink correspond to all age groups
Lines in orange correspond to the 0-15 age group
Lines in green olive correspond to the 16-39 age group
Lines in green correspond to the 40-59 age group
Lines in blue correspond to the 60 and over age group
the x-axis represents time, y-axis total number of notified cases;

c) 0.001 reporting rate scenario

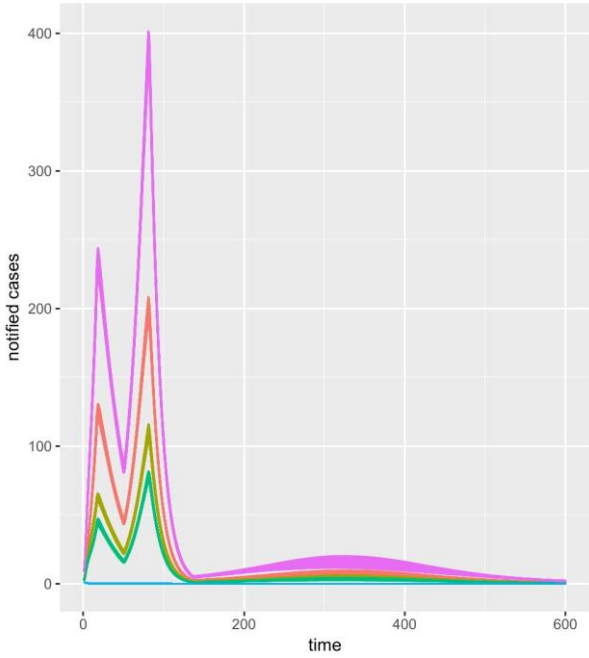
GI: 1.3



GI: 1.9 (base case)



GI: 2.7



Lines in pink correspond to all age groups
Lines in orange correspond to the 0-15 age group
Lines in green olive correspond to the 16-39 age group
Lines in green correspond to the 40-59 age group
Lines in blue correspond to the 60 and over age group
the x-axis represents time, y-axis total number of notified cases;

V. Additional information regarding the CE of the vaccine intervention

Table V.1, Table V.2 and Table V.3 provide additional information used to estimate the average wage loss per episode of A(H1N1) presented in Chapter 6, section 6.2.4 Productivity losses.

Table V.1 Daily wage during 2009 in Mexico

Minimum wages per day	Population under each wage
No income	3,608,910
$54.80	5,622,317
$82.20	9,623,854
$137.00	8,560,792
$191.80	7,709,365
$274.00	4,616,580
Not specified	3,602,458
Weighted average minimum wage per day	$126.20 MXN

Minimum wage per day in Mexico $54.80
Total workforce in Mexico during 2009 was composed by 43,334,276 habitants.
Information on 3,602,458 working individuals was not available
The calculations excluded the not specified category and assumes that all people in each category receive the corresponding minimum wage
Source: National Institute of Geography and Information (INEGI)

Table V.2 Proportion of population at work per relevant age group

Percentage of working population by age group	Total population	Working population	Proportion
14-29 (A)	31,353,019	13,831,158	0.441142781
30-59 (B)	38,306,904	26,035,148	0.679646363
60 and over (C)	9,087,542	3,461,936	0.380954058

Letter in parenthesis used as a reference for the columns in this Table

Table V.3 Productivity losses due to an A(H1N1) illness

Age group	Average daily wage (D)	Days in treatment (E)	Proportion of working days in a month (F)	Calculation *(Row reference from Table V.2 and column reference from Table V.3**Error! Reference source not found.**)*	Average wage loss per episode
Lost wages for those who receive outpatient care					
14-29	$126.20	5.00	0.714	(A)*(D)*(E)*(F)	$198.84
30-59				(B)*(D)*(E)*(F)	$306.34
60 and over				(C)*(D)*(E)*(F)	$171.71
Lost wage for those hospitalised					
14-29	$126.20	5.30	0.714	(A)*(D)*(E)*(F)	$210.77
30-59				(B)*(D)*(E)*(F)	$324.72
60 and over				(C)*(D)*(E)*(F)	$182.01
Lost wage for those who required ICU care					
14-29	$126.20	11.83	0.714	(A)*(D)*(E)*(F)	$470.46
30-59				(B)*(D)*(E)*(F)	$724.82
60 and over				(C)*(D)*(E)*(F)	$406.27

Letter in parenthesis used as a reference for the columns in this Table
AI prices in MXN

The information in Table V.4, Table V.5 and Table V.6 was used to estimate the outpatient costs of treatment shown in Chapter 6 Section 6.2.6.1

Table V.4 Cost of oseltamivir

Item	Description	Unit cost (MXN)
Oseltamivir (A)	One course of antiviral. Two tablets of Oseltamivir 75mg for five days for identified patients. One tablet per day for 10 days for prophylaxis treatment. Cost per tablet	$32.55
Paediatric Oseltamivir (B)	For three years and younger. One bottle presentation of 12mg/ml in 100 ml. An average weight between 15 and 23 kg is assumed. Doses of 45mg/day twice a day. The consumption of one whole package is assumed even if only a fraction is used. In this case, only 37% of the bottle is required. Cost per bottle	$320.00

Table V.5 Parameter estimations

Parameter	Description	Value
Proportion of children that had a consultation (0-3) (C)	Estimated by dividing the number of lab-confirmed individuals in the 0-3 age group and the total number of lab-confirmed in the dataset. The daily database was used as was the only with number of identified cases per age	8.5%
Family size (D)	Average family size in Mexico. Estimated with information obtained by the Institute of Statistics and Geography –INEGI- (INEGI, 2007)	4.8
Population at risk (E)	Estimated by dividing the population at risk (estimated at 18.5 million by the MMH, above 36 months) by the population above 36 months (99.8 million from (INEGI, 2007))	18.5%
Proportion of ILI cases requiring antiviral (F)	From Echevarría-Zuno et al. (2009)	75%

Table V.6 Out-patient cost estimation

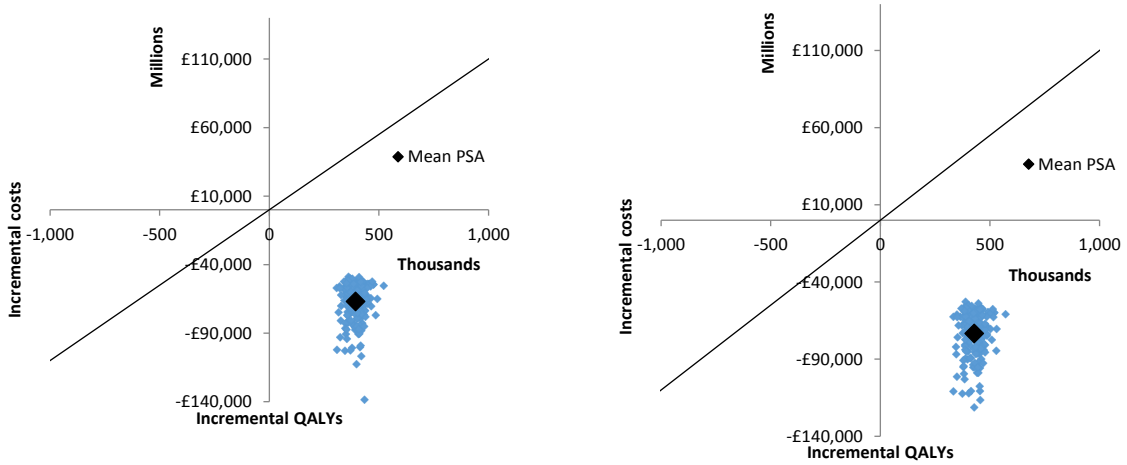
Item	Description	Estimation (Row in **Error! Reference source not found.** and **Error! Reference source not found.**)	Unit cost (MXN)
Oseltamivir	Cost per adult	(A)* doses per day*Days of treatment*(1-C)	$297.83
	Cost per children	(B)*(C)	$27.20
	Prophylaxis	(A)*Doses per day*Days of treatment*(D-1)*(E)*(F)	$171.61
Medical consultation	Two medical consultations	$517 per consultation	$1,034.00
Total cost per patient requiring out-patient care			$1,530.65

V.I Additional CE analysis graphs

Figure V.1 and Figure V.2 contain the scatterplot of the 0.75 and 0.001 RR for the base case scenario.

Figure V.1 Scatterplot: Base case scenario for the 0.75 RR scenario

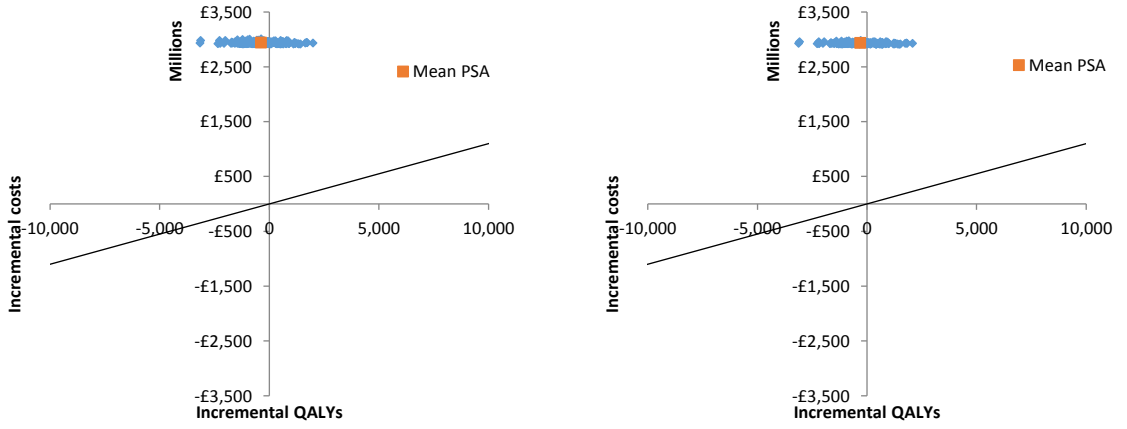
a) Population strategy b) Lab-confirmed strategy



The black straight line represents the $110,000 threshold.
Iterations to the right of the threshold line represents those where the vaccine intervention is cost-effective

Figure V.2 Scatterplot: Base case scenario for the 0.001 RR scenario

a) Population strategy b) Lab-confirmed strategy

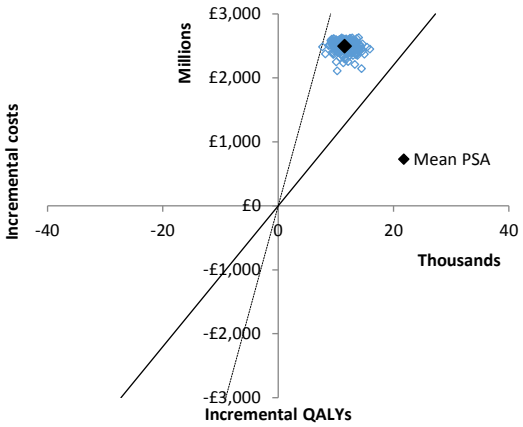


The black straight line represents the $110,000 threshold. Iterations to the right of the threshold lines represents those where the vaccine intervention is cost-effective

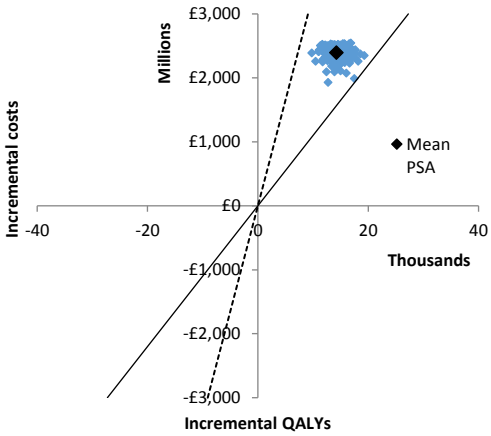
Figure V.3 and Figure V.4 shows the scatterplot, CEAC and CEAF of the secondary analysis, where vaccines arrived 31 days later than anticipated for the 0.01 RR. Figure V.5 and Figure V.6 shows the scatterplot for the 0.75 and 0.001 RR scenario.

Figure V.3 Scatterplot and CEAC: Secondary analysis for the 0.01 RR scenario

a) Population strategy

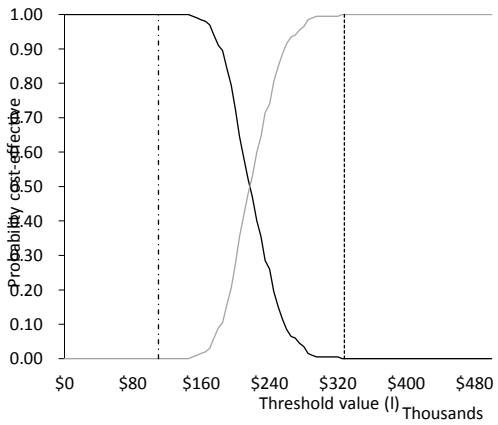


b) Lab-confirmed strategy

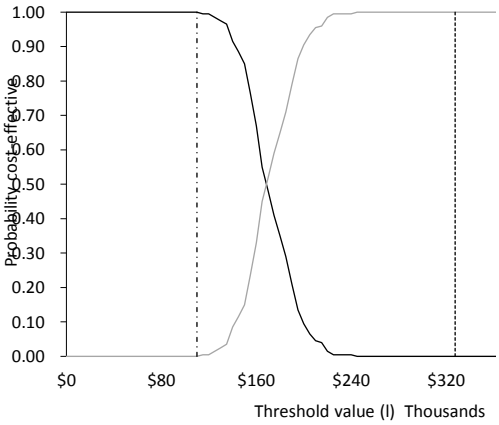


The black straight line represents the $110,000 threshold. Dashed line represents the $330,000 threshold. Iterations to the right of the threshold lines represents those where the vaccine intervention is cost-effective

c) Population strategy



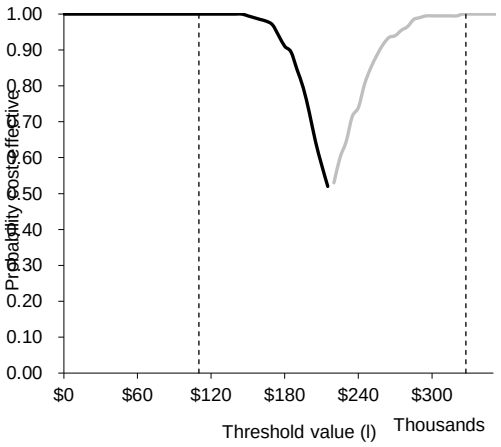
d) Lab-confirmed strategy



Black line: No vaccine strategy; Grey line: Vaccine strategy; Dashes line: $110,000 threshold; Dots and dashes line: $330,000 threshold.
Note different scale for threshold value (x-axis) between a), b) and c), d)

Figure V.4 CEAF: Secondary analysis for the 0.01 RR scenario

a) Population strategy



b) Lab-confirmed strategy

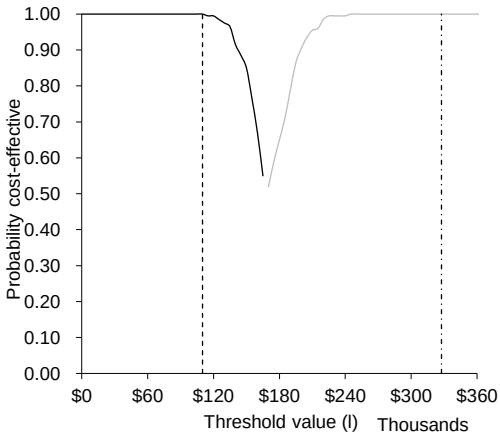
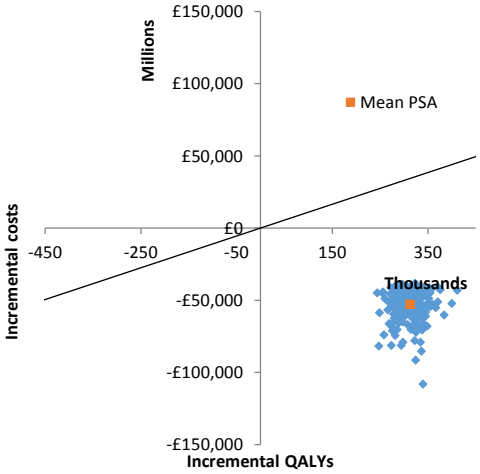


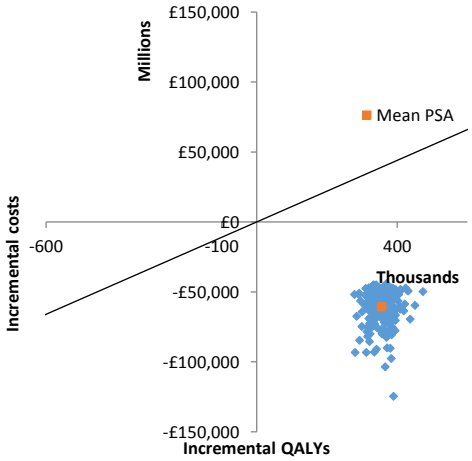
Figure V.5 Scatterplot: Secondary analysis for the RR of 0.75

Scatter plot

a) Population strategy



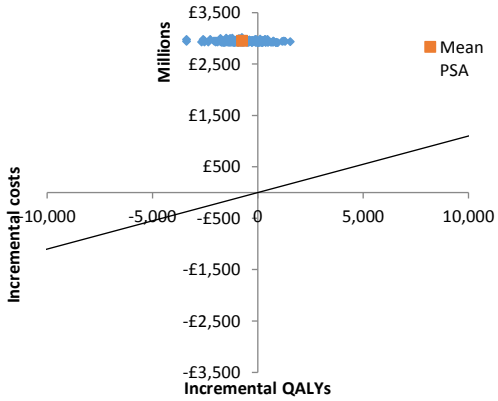
b) Lab-confirmed strategy



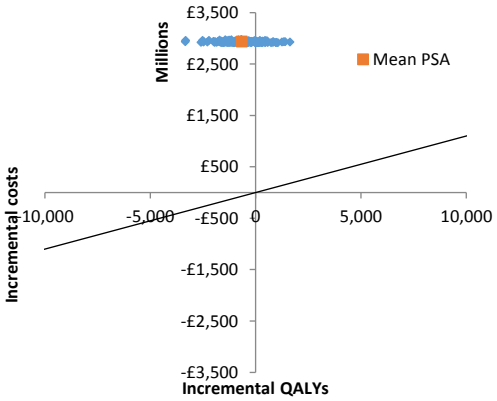
The black straight line represents the $110,000 threshold.
Iterations to the right of the threshold lines represents those where the vaccine intervention is cost-effective

Figure V.6 Scatterplot: Secondary analysis for the RR of 0.001

a) Population strategy



b) Lab-confirmed strategy

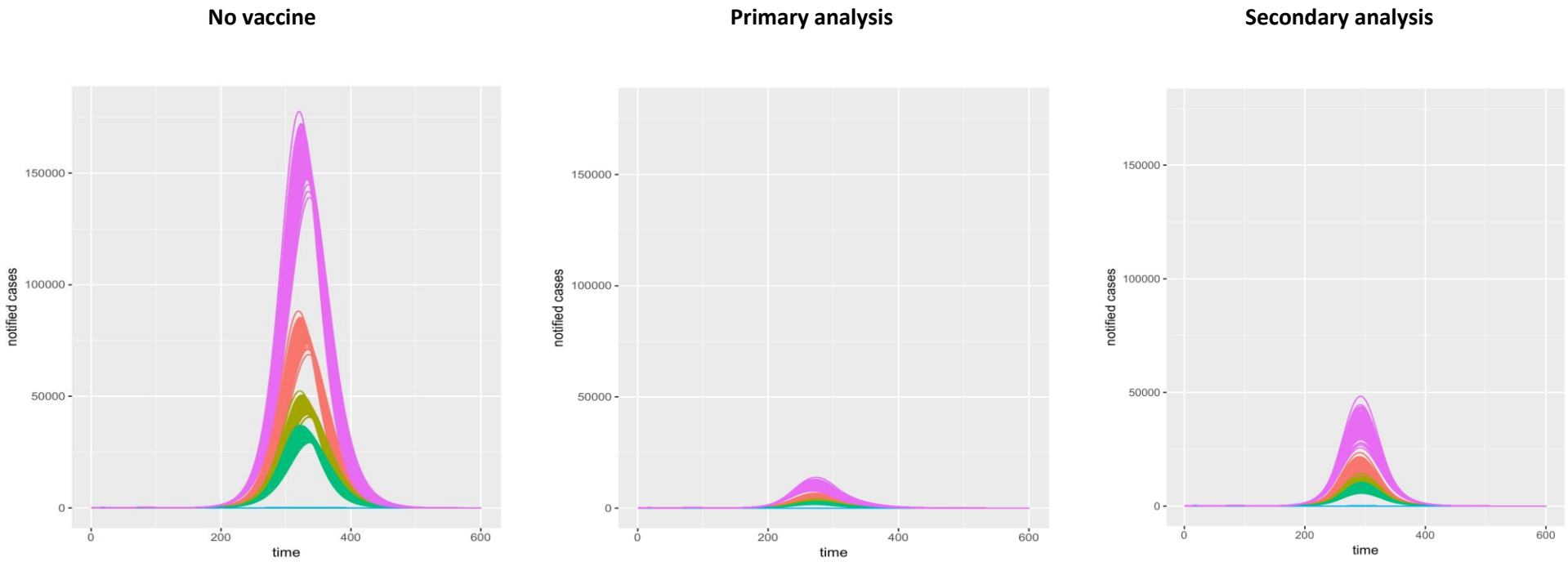


The black straight line represents the $110,000 threshold.
Iterations to the right of the threshold lines represents those where the vaccine intervention is cost-effective

Figure V.7 Shows a comparison of the spread of the disease for the no-vaccine, vaccination arriving as expected and 31 days for the lab-confirmed vaccine strategy for all RR.

Figure V.7 Comparison between the no-vaccine, vaccination arriving as expected (primary analysis) and 31 days later (secondary analysis) for the lab-confirmed vaccine strategy

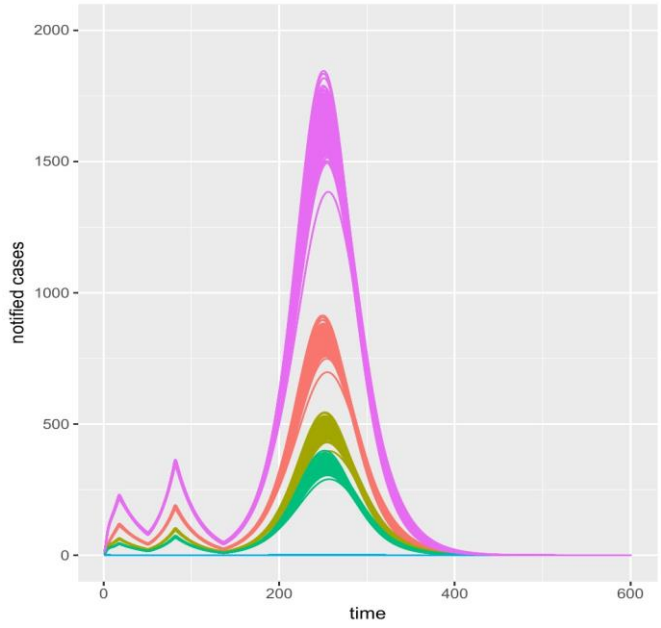
a) 0.75 RR



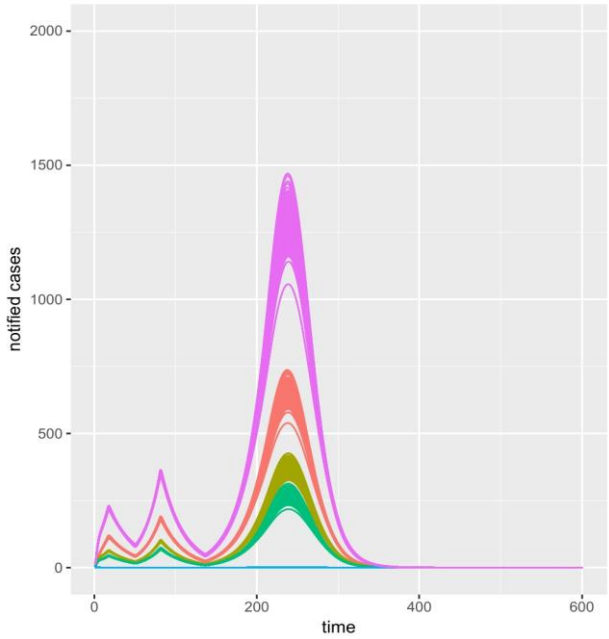
Lines in pink correspond to all age groups
Lines in orange correspond to the 0-15 age group
Lines in green olive correspond to the 16-39 age group
Lines in green correspond to the 40-59 age group
Lines in blue correspond to the 60 and over age group
the x-axis represents time, y-axis total number of notified cases;

b) 0.01 RR

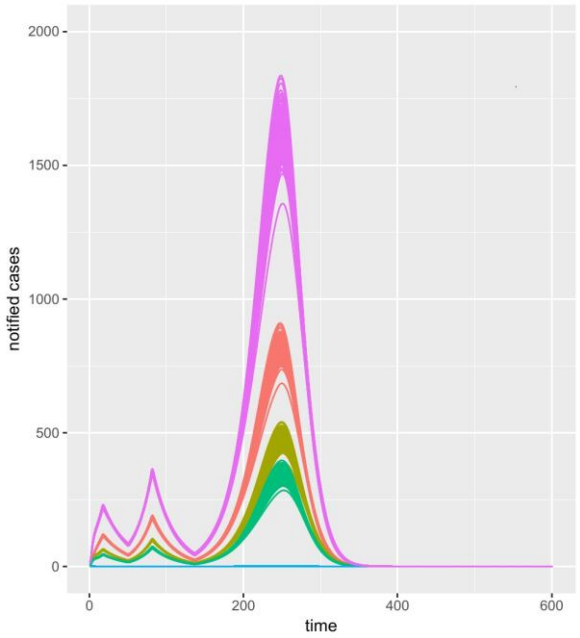
No vaccine



Primary analysis



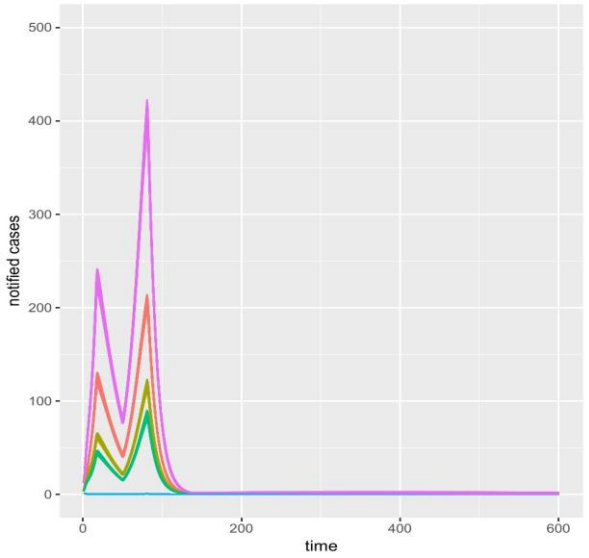
Secondary analysis



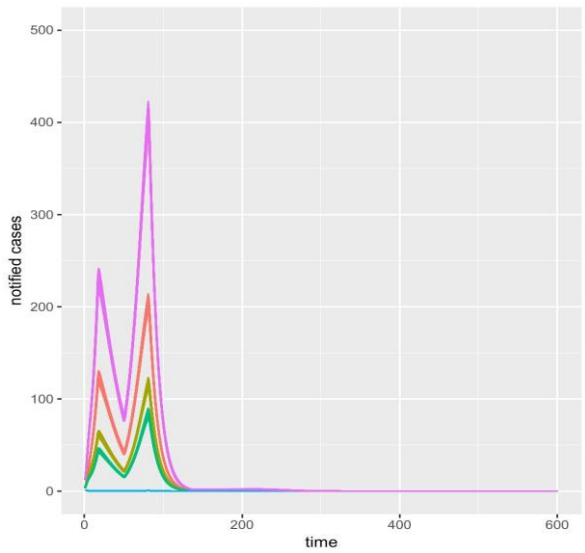
Lines in pink correspond to all age groups
Lines in orange correspond to the 0-15 age group
Lines in green olive correspond to the 16-39 age group
Lines in green correspond to the 40-59 age group
Lines in blue correspond to the 60 and over age group
the x-axis represents time, y-axis total number of notified cases;

c) 0.001 RR

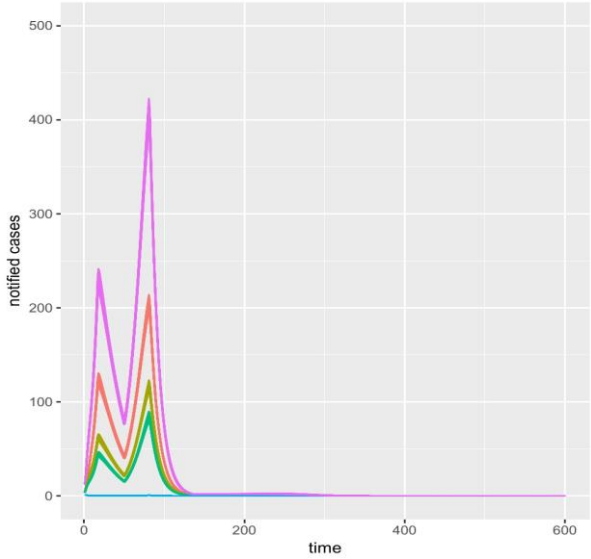
No vaccine



Primary analysis



Secondary analysis



Lines in pink correspond to all age groups
Lines in orange correspond to the 0-15 age group
Lines in green olive correspond to the 16-39 age group
Lines in green correspond to the 40-59 age group
Lines in blue correspond to the 60 and over age group
the x-axis represents time, y-axis total number of notified cases;

VI. Regional comparisons of methods to estimate the cost-effectiveness of vaccine interventions

This appendix aims to describe the analysis performed on how often the type of approaches (static and dynamic) and methodologies (DTM, MM, sHybrid, sSim, dSim, etc.) are used around the world. This would be providing information on whether regions like Latin America (LA) (where Mexico resides) require increasing its awareness of more complex strategies to achieve better estimations of CE of infectious disease vaccine interventions.

Section VI.I describe the methodology followed in the analysis and how the different retrieved articles were classified. Section VI.II provides a description of the results obtained, while section VI.III concludes with a summary of this appendix.

VI.I Methodology

A database was constructed, using the information retrieved from the analysis described in Chapter 3[5]. The information retrieved was: type of methodology used; geographical setting; author location; year of publication; type of disease; and whether HI was incorporated,

Articles were classified according to the country where the analysis was set (geographical location) and the location of the first author. A descriptive and regression analysis based on geographical and first author location, type of approached (static or dynamic) and year of publication was performed.

Articles were then classified according to their country of origin. Countries were classified according to their gross domestic product (GDP) per capita on purchase-power parity in 2012 (International Monetary Fund, 2017).

The GDP per capita by region was calculated based on the GDP by country weighted by the number of papers produced. There were clear differences in GDP amongst Asian countries with Singapore, Hong Kong, Taiwan, Japan, Israel and South Korea having a much higher weighted GDP per capita ($38,606 current international dollars (CID)[6]) than Thailand, China, Indonesia, Philippines, India, Vietnam, Pakistan and Afghanistan ($5,280 CID). Accordingly, Asia was split into two regions: developed and

[5] Only on the information retrieved first search (excluding the update between 2010 and 2017). This was not updated as the focus of the corrections were focused on the ODE mode its calibration, the CE analysis and updating the main literature review described in Chapter 3.

[6] The current international dollars (CID) monetary units represent the same purchasing power (PPP) over the GDP as in the US dollar has in the United States (US) (The World Bank, 2013).

non-developed. North America (NA) ($48,129 CID), Oceania ($41,386 CID), developed Asia ($38,606 CID) and Europe ($36,586 CID) were classified as regions with high GDP per capita. Latin America (LA) ($14,168 CID) was classified as a region with medium GDP per capita whilst non-developed Asia ($5,280 CID) and Africa ($3,994 CID) were classified as regions with low GDP per capita.

A logistic regression was performed to explore the relationship between the different GDP regions (grouped by geographical or author location) and the year of publication with whether the model was static or dynamic. The data was analysed using STATA 11 (College Station, Texas 77845 USA®).

VI.II Results

VI.II.I Analysis by geographical region

The identified articles evaluated the CE of a vaccine intervention in 57 different countries or regions. The majority were performed with the United States (US) followed by United Kingdom (UK) and Canada. Table VI.1, shows the countries in which the models were set, the total number of studies in each and the allocated geographical region.

Table VI.1 List of countries with at least one vaccine CE analysis

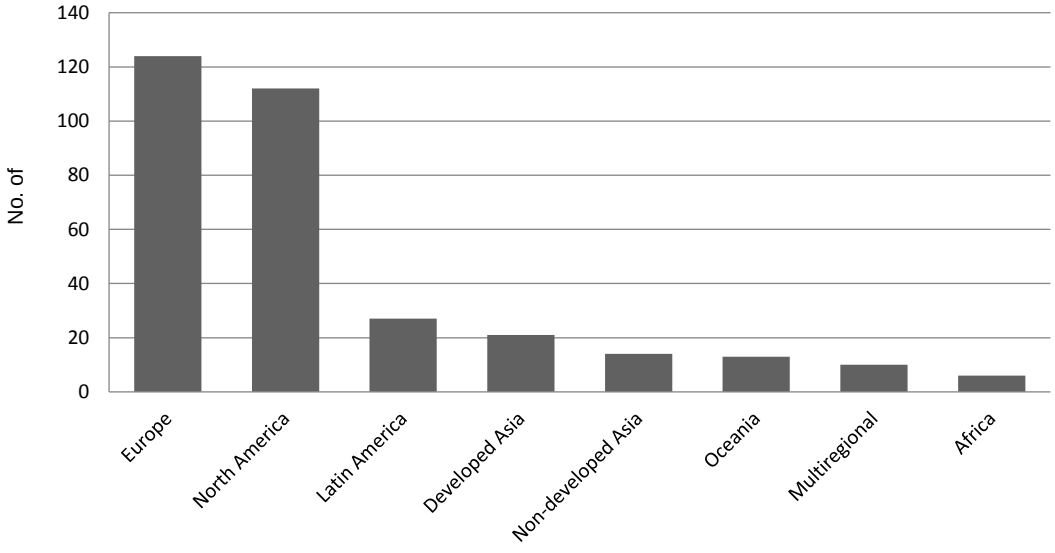
Country	No. Studies	Region	Country	No. Studies	Region	Country	No. Studies	Region
US	91	North America	Mexico	4	Latin America	Hungary	1	Europe
UK	23	Europe	European countries	4	Europe	Iceland	1	Europe
Canada	22	North America	Chile	3	Latin America	Indonesia	1	Asia non-developed
Spain	16	Europe	Hong Kong	3	Asia developed	Kenya	1	Africa
Netherlands	15	Europe	Japan	3	Asia developed	Lithuania	1	Europe
Germany	13	Europe	Multiregional (MR)	3	Multiregional*	Mozambique	1	Africa
Italy	13	Europe	Norway	3	Europe	India, Nigeria, Vietnam and Mozambique	1	Multiregional
Australia	13	Oceania	Latin America & Caribbean	3	Latin America	New Zealand	1	Oceania
Brazil	6	Latin America	China	2	Asia non-developed	Pakistan	1	Asia non-developed
France	6	Europe	South Korea	2	Asia developed	Peru	1	Latin America

Ireland	6	Europe	Slovenia	2	Europe	Philippines	1	Asia non-developed
Israel	6	Asia developed	Sweden	2	Europe	Russia	1	Europe
Switzerland	6	Europe	Thailand	2	Asia non-developed	Singapore	1	Asia developed
Colombia	5	Latin America	Vietnam	2	Asia non-developed	South Africa	1	Africa
Taiwan	5	Asia developed	Afghanistan	1	Asia non-developed	Sub-Saharan African	1	Africa
Developing countries*	5	Multiregional	Asia, pacific islanders	1	Asia	Venezuela	1	Latin America
Argentina	4	Latin America	Austria	1	Europe	West Africa	1	Africa
Belgium	4	Europe	Czech Republic	1	Europe	Zambia	1	Africa
Finland	4	Europe	Denmark	1	Europe	Total	328	
India	4	Asia non-developed						

**Developed and Developing countries were classified as multiregional countries unless all countries considered pertain to a specific region such as Europe, LA or NA.*

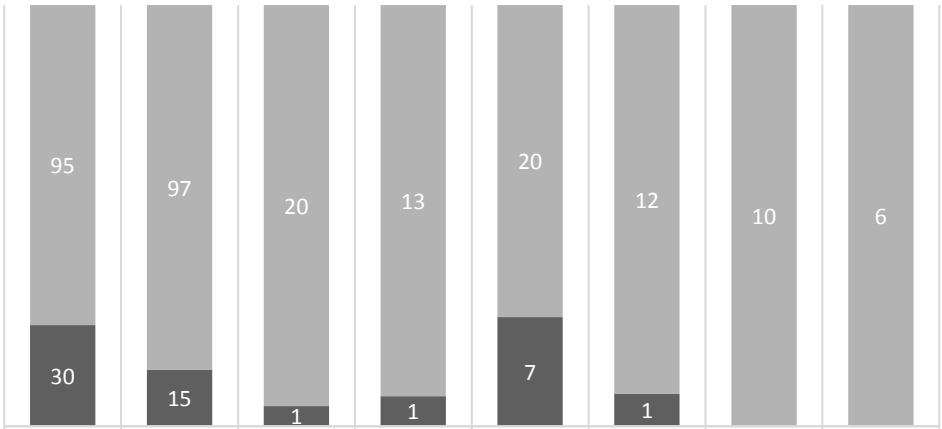
Figure VI.1 shows that most articles described models set in Europe and North America (NA) (72%), with only 2% in Africa. Figure VI.2 shows the use of methodologies across geographical regions. More than 70% of the models use a static model in all the geographical region regions, the proportion increased to 100% for studies set in Africa and multiregional (MR) studies, 95% in developed Asia, 93% in non-developed Asia, 92% in Oceania, 87% in NA, 77% in Europe and 74% in Latin America (LA).

Figure VI.1 Published articles by geographical region



Although the total number of studies using a dynamic approach was greater when the model was set in a European country (30 versus 15 and 7 in NA and LA respectively), LA had the biggest proportion of dynamic models (26%) compared with Europe (24%) and NA (13%). Oceania, non-developed Asia and developed Asia had 8%, 7%, 5%, respectively. No dynamic studies were set in Africa or in MRs (Figure VI.2).

Figure VI.2 Static and dynamic models by geographical region



	Europe	North America	Developed Asia	Non-developed Asia	Latin America	Oceania	Multiregional	Africa
Static	95	97	20	13	20	12	10	6
Dynamic	30	15	1	1	7	1	0	0

If the systematic review retrieved all the published CE of vaccine interventions (within the analysed period), then it is possible to conclude that greatest number of dynamic studies were set in high GDP per-capita regions whilst the biggest proportion of dynamic based articles were set in middle GDP per-capita regions (Table VI.2). However, some articles were excluded due to lack of information or being written in a language that was not English or Spanish.

Table VI.3Table VI.3 shows the results from the logistic regression when articles were classified according to geographical location and GDP per-capita. The setting of the model had no significant influence on the type of model chosen. It also shows that the use of dynamic models has increased over time; however, static models still predominate (Figure VI.3).

Table VI.2 Regional setting by type of model

Type of model	*GDP per-capita region*			
	High	**Medium**	**Low**	**Total**
Static	224	20	19	223
	83%	74%	95%	
Dynamic	46	7	1	54
	17%	26%	5%	
Total	270	27	20	317

**MR studies were excluded from the GDP per-capita regional setting and type of model*

Table VI.3 Regression analysis: geographical region and type of approach

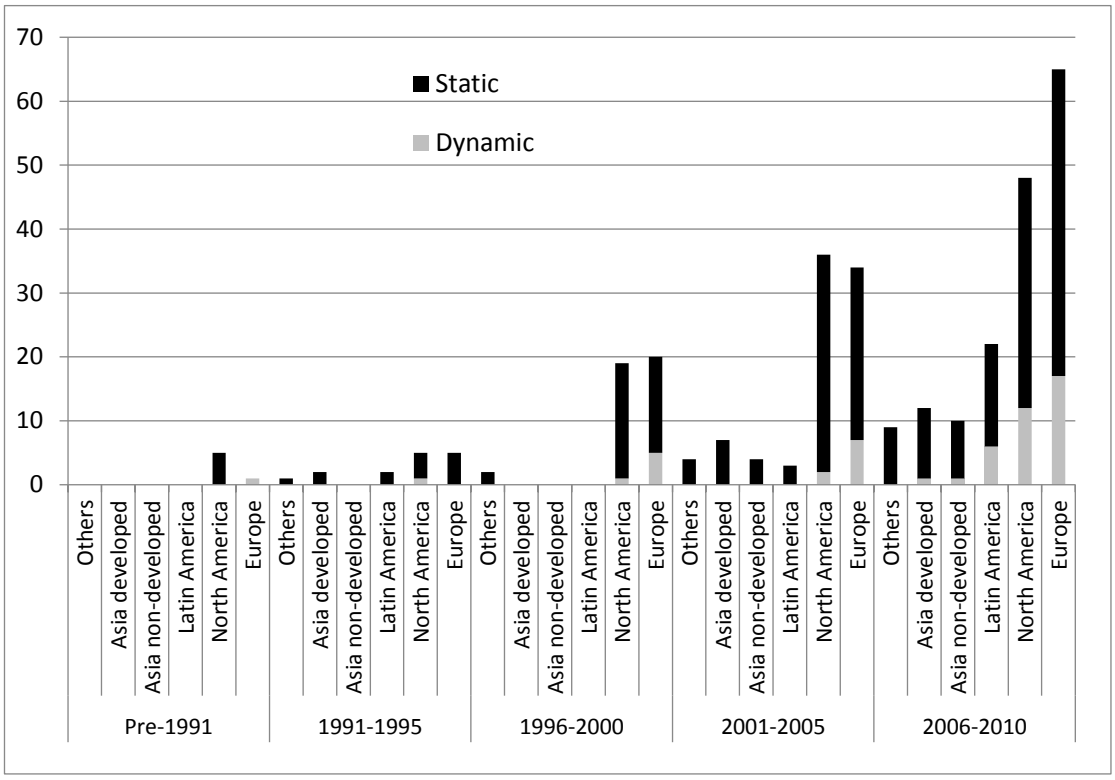
Logistic regression: Static vs. *Dynamic*

Model reference: Static

Variable	Odds ratio (95% CI)
Published between 2006-2010	2.5 (1.3-4.8)
	Reference: published before 2006
Medium income GDP	1.3 (0.5-3.2)
Low income GDP	0.2 (0.03-1.7)
	Reference: High-income GDP
	LR Chi2: 12.68
	*p-value = 0.005**
	Pseudo R2= 0.043

**This suggests that the model is statistical significant against a model with no independent variables*

Figure VI.3 Static and dynamic by year of publication



VI.II.II Comparison by type of model technique use

The distribution of methods was dominated by DTM and MM in all regions (Europe, 71%; NA, 78%; LA, 74%; Asia developed, 72%; Asia non-developed, 65%; Oceania, 92% and Africa and MR, 81% combined). The most used dynamic model (SD) was used in 5 regions: Europe, 10%; NA, 5%; LA, 11%; Asia developed, 5% and Asia non-developed, 7% (Table VI.4).

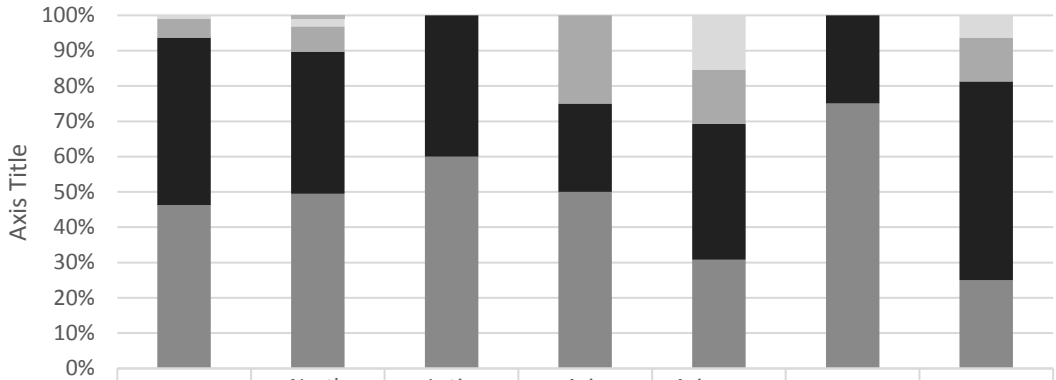
Table VI.4 Methods used by regions

	Europe	*North America*	*Latin America*	*Asia developed*	*Asia non-developed*	*Oceania*	*Other**	*Total*
DTM	44	48	12	10	4	9	4	131
	35%	43%	44%	48%	29%	69%	25%	
MM	45	39	8	5	5	3	9	114
	36%	35%	30%	24%	36%	23%	56%	
SD	13	6	3	1	1	0	0	24
	10%	5%	11%	5%	7%	0%	0%	
sHybrid	5	7	0	5	2	0	2	21
	4%	6%	0%	24%	14%	0%	13%	
dHybrid	8	6	2	0	0	1	0	17
	6%	5%	7%	0%	0%	8%	0%	
dMM	5	1	2	0	0	0	0	8
	4%	1%	7%	0%	0%	0%	0%	
dSim	4	2	0	0	0	0	0	6
	3%	2%	0%	0%	0%	0%	0%	
iMM	1	2	0	0	2	0	1	6
	1%	2%	0%	0%	14%	0%	6%	
sSim	0	1	0	0	0	0	0	1
	0%	1%	0%	0%	0%	0%	0%	
Total	125	112	27	21	14	13	16	328
	100%	100%	100%	100%	100%	100%	100%	328

Percentages relate to the total within the geographical region
**Africa and Multiregional studies*

In terms of the preferred type of model when was static, the majority followed a DTM or MM approach (Figure VI.4). The SD, dHybrid, dMM approach was most used in Europe NA and LA. The six simulation models were performed either in Europe or NA (Figure VI.5).

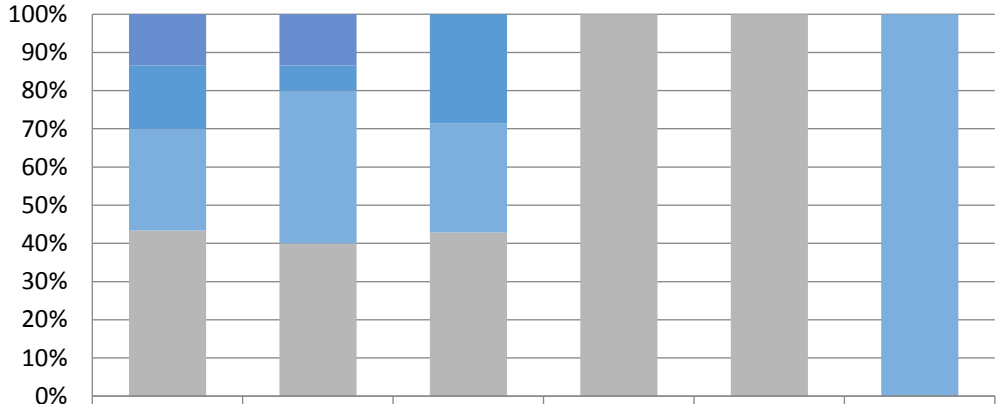
Figure VI.4 Type of static methodology used by geographical region



	Europe	North America	Latin America	Asia developed	Asia non-developed	Oceania	Other*
sSim	0	1	0	0	0	0	0
iMM	1	2	0	0	2	0	1
Hybrid	5	7	0	5	2	0	2
MM	45	39	8	5	5	3	9
DTM	44	48	12	10	4	9	4

**Africa and Multiregional*

Figure VI.5 Type of dynamic methodologies used by geographical region



	Europe	North America	Latin America	Asia developed	Asia non-developed	Oceania
dSim	4	2	0	0	0	0
dMM	5	1	2	0	0	0
dHybrid	8	6	2	0	0	1
SD	13	6	3	1	1	0

VI.II.III Analysis by author location

The 328 selected articles were produced by 242 different authors. The majority were based in Europe (41.3%) and NA (38.8%), whilst less than 1% resided in Africa. Only (42 (17%)) authors produced a dynamic model. Most of these were based in Europe (23 (55%)) and NA (14 (33%)) while only 4 (9.6%) resided in LA with 1 (2.4%) in Oceania. No authors using dynamic models were found in Asia (irrespective of development status) or Africa.

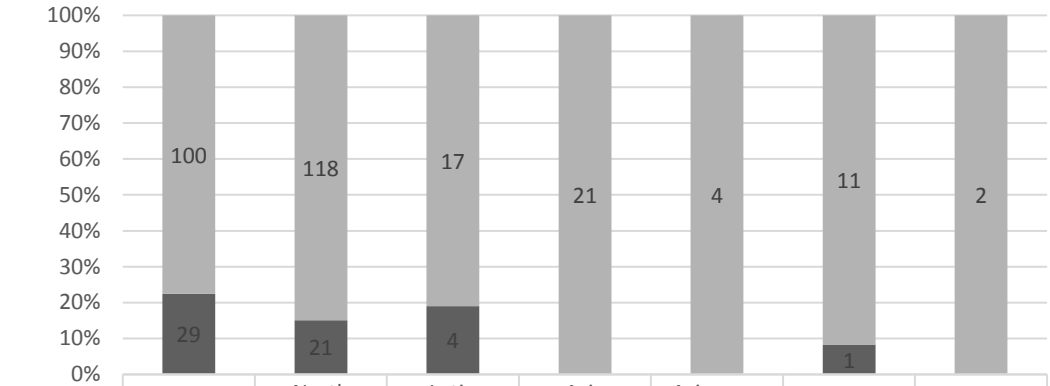
Of the 29 dynamic models set in Europe (26 (90%)) were performed by a Europe-based researcher. Similar numbers were found in NA where 86% (13 out of 15) were performed by an NA-based research, whilst in LA only 57% (4 out of 7) were performed by Latin America-based researchers. NA researchers performed most CE analysis in settings outside of their residence (38% of their total production). Europe-based authors only performed 7% of their dynamic models outside Europe. Authors in LA and Oceania did not produce any dynamic model outside their own region.

Figure VI.6 shows the proportion of methodologies used by first author location. The distribution is similar to the one shown in Figure VI.2. Most of the produced articles were performed using a static methodology regardless of author locations (more than 70% in all regions).

The number of dynamic studies was bigger in Europe and NA than in LA, but the proportion was very similar: 22%, 15% and 19% respectively.

Out of the four articles published in Mexico, the only dynamic model was performed by an NA-based researcher (Insinga et al., 2007).

Figure VI.6 Setting of static and dynamic models by author's location



	Europe	North America	Latin America	Asia developed	Asia non-developed	Oceania	Africa
Static	100	118	17	21	4	11	2
Dynamic	29	21	4	0	0	1	0

Similar conclusions can be drawn as when analysing the frequency of dynamic models by setting. The greatest number of dynamic studies was performed by authors based in high GDP per-capita regions whilst the greatest proportion was performed by authors based in medium GDP per-capita regions (Table VI.5).

Table VI.5 Authors location and type of models

	GDP per-capita region			
Type of model	High	Medium	Low	Total
Static	250	17	6	273
	83%	81%	100%	
Dynamic	51	4	0	55
	17%	19%	0%	
Total	301	21	6	328

The results of the logistic and multinomial logistic regression analysis (Table VI.6) show no statistically significant relation between the location of the first author and the type of approach used.

Table VI.6 Regression analysis: author location and type of approach used

Logistic regression: Static vs. Dynamic

Reference: Static

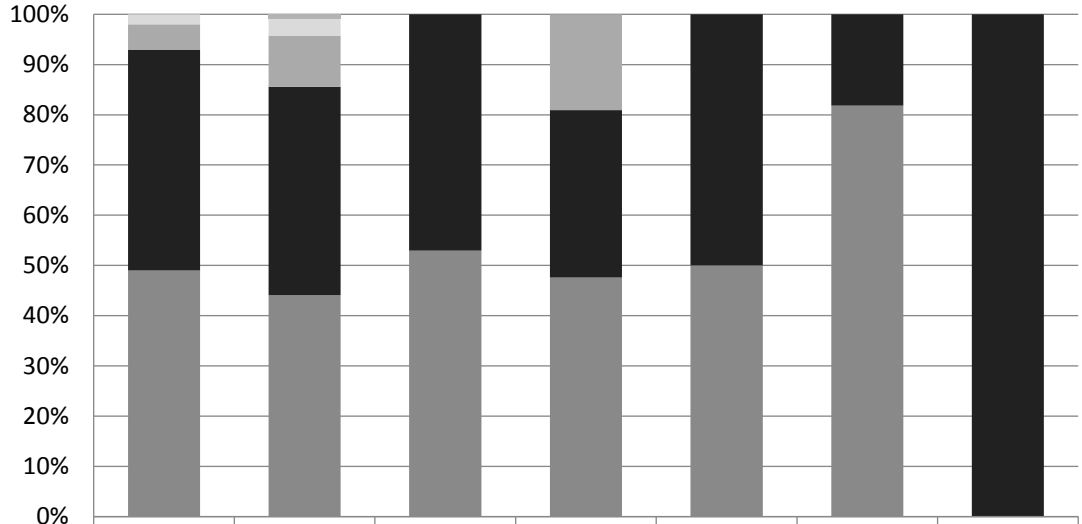
Variable	**Odds ratio** (95% CI)
	Reference: published before 2006
2006-2010	2.48 (1.3-4.6)
*Medium and low-income GDP**	1.4 (0.44 -4.2)
	Reference: High-income GDP
	LR Chi2: 8.68
	*p-value = 0.013**
	Pseudo R2= 0.029

**Since no article using a dynamic model in a low GDP region, this region was combined with the low-medium GDP per-capita region to perform the analysis*

VI.II.IV Comparison by type of modelling technique used

Overall, the dominant type of method by author's location was DTM and MM in all regions (Europe, 70%; NA, 72%; LA, 81%; Asia developed, 81%; Asia non-developed, 100%, Oceania, 92% and Africa, 100%) (Figure VI.7 and Figure VI.8).

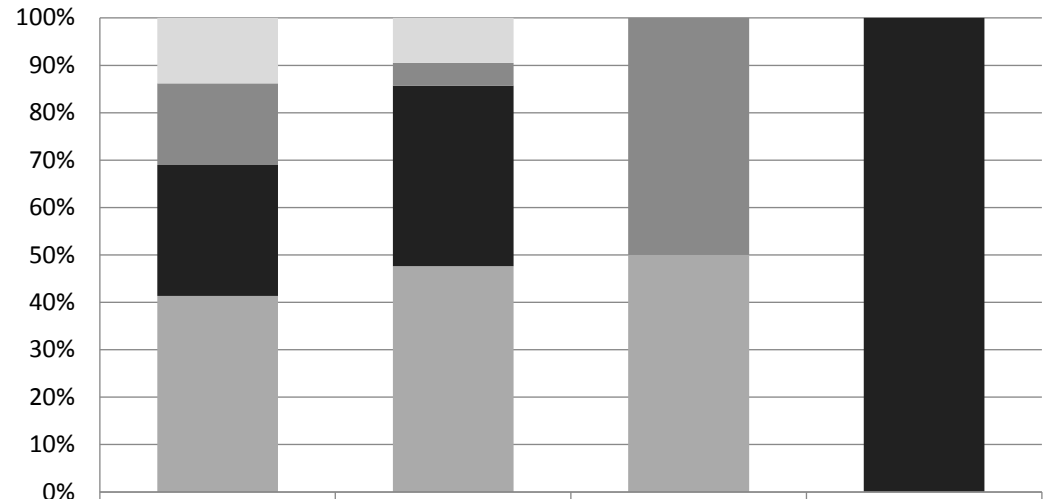
Figure VI.7 Static methods used by author's location



	Europe	North America	Latin America	Asia developed	Asia non-developed	Oceania	Africa
sSim	0	1	0	0	0	0	0
iMM	2	4	0	0	0	0	0
Hybrid	5	12	0	4	0	0	0
MM	44	49	8	7	2	2	2
DTM	49	52	9	10	2	9	0

When dynamic models were used, authors based in Europe, NA and LA preferred the SD approach, followed by the dHybrid approach. dSim were only performed by European and NA located authors. Authors located in Africa or Asia did not perform dynamic models (Figure VI.8).

Figure VI.8 Dynamic methods by author's location



	Europe	North America	Latin America	Oceania
dSim	4	2	0	0
dMM	5	1	2	0
dHybrid	8	8	0	1
SD	12	10	2	0

VI.III Summary

The identified articles are evaluating the CE of a vaccine intervention in 57 different countries or regions. A large concentration of papers was performed with the US, UK and Canada as setting comprising 41% of the published articles.

The greatest proportion of models followed a static approach in all geographical regions (60% or more). When analysing the proportion of articles by type of method used, most static models followed the DTM and MM techniques. When dynamic models were chosen, the preferred technique was SD. These conclusions were maintained when the analysis was made by author's location.

The number of dynamic models was greater in Europe that in NA or LA (30 versus 15 and 7 respectively), however, LA had the biggest proportion of dynamic models (26% versus 24% in Europe and 13% in NA).

The logistic regression when articles were classified according to geographical location and GDP per-capita showed that the setting of the model had no significant influence on the type of model chosen. Analyses showed that the frequency of dynamic model use has increased over time; however, static models still predominate. Similar results were obtained in the regression analysis when grouping by author's location and GDP per-capita.

Only four articles analysing the CE of a vaccine intervention were set in Mexico. Out of these, only one followed a dynamic approach. However, it was developed by an author residing in NA.

VII. Literature review search filters

VII.I Search filters used to identify the papers to explore the Cost-effectiveness of infectious disease vaccine interventions

List of the more common keys used to construct search terms in the electronic databases are shown in this section (Glanville, et al. 2009, Scottish Intercollegiate Guidelines Network filter (SIGN), ISI Web of Knowledge, 2010).

The cost effectiveness search filter was constructed using the brief version of the NHS Quality improvement Scotland filter, NHS Economic Evaluation Database filters (NHS EED) and the Scottish Intercollegiate Guidelines Network filter (SIGN). Additional search terms were added to capture any article published using Discrete Event Simulation and System dynamics methods.

The remaining search filters were constructed based on the most relevant terminology for each particular topic. This terminology varies depending on the electronic database used.

VII.II Medline

Medline symbols

Exp	The term has been exploded	**.hw.**	Subject heading word	**/**	A subject heading selected	**or/**	Combines search terms
.ab.	Abstract	**.mp.**	Free text search or search in the title, abstract and indexing	**:**	Truncation symbol		
.ti.	Title	**.sh.**	Subject heading	**?**	wildcard		
.tw.	Text word	**Adj**	Adjacent terms	**“”**	Look for a composed word “cost effectivene ss”		
.fs.	Floating subheading	*****	Major heading when precedes a subject heading else the heading was truncated or focused	**$**	Truncation symbol		

VII.II.I Costs effectiveness search filter

1. Exp Economics/
2. Exp “cost and cost analysis”/
3. Quality of life/
4. Value of life/
5. Quality-adjusted life years/
6. Models, economics/
7. Markov chains/
8. Monte Carlo methods/
9. Decision tree/
10. ec.fs.
11. economics$.tw.
12. (cost? or costing? or costly or costed).tw.
13. (price? or pricing?).tw.
14. (pharmacoeconomic? or (pharmaco adj economic?)).tw.
15. Economics, pharmaceutical/
16. Budget$.tw.
17. Expenditure$.tw.
18. (value adj 1 (money or monetary)).tw.
19. (fee or fees).tw.

20. “quality of life”.tw.
21. qol$.tw
22. hrqol$.tw.
23. “Quality adjusted life years$”.tw.
24. qaly $.tw.
25. cba.tw.
26. cea.tw.
27. cua.tw.
28. utili$.tw.
29. markov$.tw.
30. monte carlo.tw.
31. (decision adj2 (tree$ or analys$ or model$)).tw.
32. ((clinical or critical or patient) adj (path? or pathway?)).tw.
33. (managed adj2 (care or network?)).tw.
34. Discrete event simulation.mp.
35. Computer simulation/
36. System dynamics.mp.
37. or/1-36

VII.II.II Vaccine search filter

1. Vaccination/
2. Vaccine$.mp.
3. Vaccines/
4. Vaccines, Inactivated
5. Vaccines, Synthetic
6. Viral Vaccines
7. Vaccines, Combined
8. Vaccines, Attenuated
9. Vaccines, Acellular
10. Vaccines, Conjugate
11. Vaccines, Virosome
12. Mass Vaccination/
13. Immunization, Secondary/
14. Booster.mp.
15. Immunization Programs/
16. Immunization Schedule/
17. or/1-16

VII.III EMBASE

EMBASE symbols

Exp	Explode	**.tw.**	Text word	**$**	Truncation symbol
.af.	All fields	**.sh.**	Subject subheading	**?**	wildcard
.ab.	Abstract	**.hw.**	Heading word	**“”**	Look for a composed word “cost effectiveness”
.ti.	Title	**.fs.**	Floating subheading	**/**	A subject heading selected
.mp.	Free text search or search in the title, abstract and indexing	**Adj**	Adjacent terms	**or/**	Combines search terms

VII.III.I Cost effectiveness search filter

1. exp health economics/
2. exp health care cost/
3. exp quality of life/
4. Economic$.tw.
5. (cost? or costing? or costly or costed).tw.
6. (price? or pricing?).tw.
7. (pharmacoeconomics? or (pharmaco adj economic?)).tw.
8. budget$.tw.
9. expenditure$.tw.
10. (value adj1 (money or monetary)).tw.
11. (fee or fees).tw.
12. "quality of life".tw.
13. qol$.tw.
14. hrqol$.tw.
15. "quality adjusted life year$".tw.
16. qaly$.tw.
17. cba.tw.
18. cea.tw.
19. cua.tw.
20. utilit$.tw.
21. markov$.tw.
22. monte carlo.tw.
23. (decision adj2 (tree$ or analys$ or model$)).tw.
24. ((clinical or critical or patient) adj (path? or pathway?)).tw.
25. (managed adj2 (care or network?)).tw.
26. (value adj2 money).ti,ab.
27. exp simulation/
28. computer simulation/
29. Discrete event simulation.mp.
30. System Dynamics.mp.

31. or/1-30

VII.III.II Vaccine search filter

1. exp vaccination/
2. Booster.mp.
3. Immunization/
4. Mass Immunization/
5. or/1-4

VII.IV Econlit via Ovid

Econlit symbols

Exp	Explode	**.mp.**	Free text search or search in the title, abstract and indexing	*****	Major heading when precedes a subject heading else the heading was truncated or focused	**$**	Truncation symbol
.af.	All fields	**.sh.**	Subject subheading	**“”**	Look for a composed word “cost effectiveness”	**or/**	Combines search terms
.ab.	Abstract	**.hw.**	Heading word	**/**	A subject heading selected		
.ti.	Title	**.fs.**	Floating subheading	**?**	wildcard		
.tw.	Text word	**Adj**	Adjacent terms	**$**	Truncation symbol		

VII.IV.I I.3.1 Costs effectiveness search filter

1. Economics*.af.
2. Cost effectiveness*.af.
3. Cost utility*.af.
4. Cost benefit*.af.
5. Value of life.af.
6. Quality-adjusted life years.af.
7. "Quality of life*".af.
8. “Cost?*”.af.
9. (cost? or costing? or costly or costed).tw.
10. (cost adj analys?s*).af.
11. (price? or pricing?).tw.
12. (pharmacoeconomic? or (pharmaco adj economic?)).tw.
13. Pharmaceutical.tw.
14. Budget$.tw.
15. Expenditure$.tw.
16. (value adj 1 (money or monetary)).tw.
17. (fee or fees).tw.
18. qol$.tw
19. hrqol$.tw.
20. qaly $.tw.
21. cba.tw.
22. cea.tw.

23. cua.tw.
24. utili$.tw.
25. “Markov chains*”.af.
26. “Decision tree*”.af.
27. ec.af.
28. “Monte Carlo*”.af.
29. “Model*”.af.
30. markov$.tw.
31. monte carlo.tw.
32. (decision adj2 (tree$ or analys$ or model$)).tw.
33. ((clinical or critical or patient) adj (path? or pathway?)).tw.
34. (managed adj2 (care or network?)).tw.
35. Discrete event simulation*
36. Computer simulation*
37. System dynamics*
38. or/1-37

VII.IV.II I.3.2 Vaccine search filter

1. vaccine$*af.
2. Immunization*.af.
3. Booster.af.
4. Immunization program?.af.
5. or/1-4

VII.V CINAHL

CINAHL symbols

MH	Mayor subheading	*****	Truncation symbol	**“”**	Look for a composed word “cost effectiveness”
MM	Exact mayor subject heading	**?**	wildcard		
+	Explode	**W**	Within operator		
TI	Title	**N**	Near operator		
TX	Text word	**Adj**	Adjacent terms		

VII.V.I Costs effectiveness search filter

1. (MH “Economics+”)
2. (MH “Quality of life+”)
3. (MM “Quality-Adjusted Life Years”)
4. TX economic*
5. TX Cost OR TX costing? or TX costly or TX costed
6. TX price? or TX pricing*
7. TX pharmacoeconomic? OR pharmaco W5 economic? OR TX pharma* W5 economic*
8. TX budget*
9. TX expenditure*
10. TX value N1 money OR monetary
11. TX fee or fees
12. TX quality of life
13. TX qol*
14. TX hrqol*
15. TX qaly*
16. TX Quality adjusted life year*
17. TX cba
18. TX cea
19. TX cua
20. TX utilit*
21. TX markov*
22. TX monte carlo
23. TX decision W5 tree? OR analys* or model*
24. TX clinical or critical or patient N5 path? Or pathway?
25. TX managed N2 care or network?
26. (MH “Cost and Cost Analysis+”)
27. (MM “Cost benefit analysis”)
28. TX cost utility
29. TX Discrete event simulation
30. TX Computer simulation

31. TX System dynamics
32. or/1-31

VII.V.II Vaccine search filter

1. (MH “Vaccines+”)
2. TX Vaccine*.
3. (MH “Immunization+”)
4. TX Booster
5. or/1-4

VII.VI Web of Knowledge

Web of knowledge symbols

SAME	Adjacent terms
*	Wildcard
?	wildcard

VII.VI.I Costs effectiveness search filter

1. Cost*
2. Economic*
3. Quality SAME life
4. Cost* SAME analys?s
5. Cost* SAME benefit
6. Cost* SAME effectiveness
7. Cost* SAME benefit
8. Cost* SAME utility
9. pharmacoeconomic*
10. pharmaceutical SAME economic*
11. decision SAME (tree OR analys?s)
12. Markov SAME model
13. Discrete Event Simulation OR DES
14. Simulation SAME model
15. System dynamics
16. Dynamic SAME model*
17. Computer simulation
18. or/1-17

VII.VI.II Vaccine search filter

1. Vaccin*
2. Immunization
3. Booster
4. or/1-3

VII.VII SCOPUS

SCOPUS symbols

TITLE	Title	**W**	within
TITLE-ABS	Title or abstract search	**?**	wildcard
TITLE-ABS-KEY	Title, abstract or keyword search	*****	Wildcard
ABS	Abstract search	**“”**	Look for a composed word “cost effectiveness”
KEY	Keyword search		

VII.VII.I Costs effectiveness search filter

1. Cost
2. Economic
3. Quality W/2 life
4. Cost W/5 analys?s
5. cost W/2 benefit
6. cost W/2 effectiveness
7. cost W/2 benefit
8. cost W/2 utility
9. pharmacoeconomic*
10. pharmaceutical W/5 economic*
11. decision W/3 tree*
12. decision W/3 analys?s
13. Markov W/2 model
14. Discrete Event Simulation
15. Simulation W/5 model*
16. System dynamics
17. Dynamic* W/5 model*
18. Computer simulation
19. or/1-18

VII.VII.II Vaccine search filter

1. Vaccin*
2. Immunization
3. Booster
4. or/1-3

VII.VII.IIIHealth information resources

Vaccine search filter

1. vaccine*
2. Immunization
3. Booster

VII.VIII Filters for each specific analysed disease

No.	Vaccine	Search term						
		Medline	**Web of Knowledge**	**CINAHL**	**Embase**	**SCOPUS**	**Econlit**	**NHS EED**
1	Adenovirus	• Adenoviridae/ • acute respiratory disease.mp. • Adenovirus.mp.	• Adenovirus • Adenoviridae • acute SAME respiratory SAME disease	• Adenovirus • MM "Respiratory Distress Syndrome, Acute" • MM "Severe Acute Respiratory Syndrome" • MM "Respiratory Tract Diseases"	• Adenovirus/ • Acute respiratory disease.mp. • Acute respiratory tract disease/	• TITLE-ABS-KEY(Adenovirus) • Adenoviridae • Acute W/2 respiratory W/2 disease	• Adenovirus.af. • Acute respiratory disease.af. • Adenovirus.mp. • Adenovirus.tw. • Acute respiratory tract disease.af. • (Acute adj respiratory adj disease).af.	• Adenovirus • "Acute respiratory disease" • "Acute respiratory tract disease"
2	Diphtheria	• Diphtheria/ • Diphtheria Toxoid/ • Diphtheria Toxin/ • Diphtheria Antitoxin/ • Diphtheria.mp.	• Diphtheria • Diphtheria SAME Toxoid • Diphtheria SAME Antitoxin • Diphtheria SAME Toxin	• MH "Diphtheria" • MM "Diphtheria Antotoxin" • MH "Diphtheria Toxoid+"	• Diphtheria antibody/ • Diphtheria toxin/ • Diphtheria/ • Diphtheria toxoid/ • Diphtheria vaccine/	• TITLE-ABS-KEY(diphtheria)	• Diphtheria.af.	• Diphtheria
3	Haemophilus influenzae type b (Hib)	• Haemophilus influenzae type b/ • Hib.mp.	Haemophilus influenzae type b Hib	• MM "Haemophilus Influenzae" • MM "HIB Vaccine" • Haemophilus influenzae type b • MM "Influenza B Virus"	• Haemophilus influenzae type b/ • Haemophilus influenzae type b vaccine/	• TITLE-ABS-KEY (Haemophilus influenzae type b) •	• Haemophilus influenzae type b.af. • Hib.af.	• "Haemophilus influenzae type b" • "Hib"
4	Hepatitis A virus (HAV)	• Hepatitis A/ • Hepatitis A Antibodies/ • Hepatitis A virus/	• Hepatitis SAME A SAME Virus	• MM "Hepatitis A" • MM "Hepatitis A Vaccines"	• Hepatitis A/ • Hepatitis A.mp.	• TITLE-ABS-KEY("Hepatitis A")	• "Hepatitis A".af. • HAV.mp.	• "Hepatitis A" • HAV

		• HAV.mp.						
5	Hepatitis B virus (HBV)	• Hepatitis B Antigens/ • Hepatitis B virus/ • Hepatitis B, Chronic/ • Hepatitis B/ • Hepatitis B Surface Antigens/ • HBV.mp.	• Hepatitis SAME B SAME virus	• MH "Hepatitis B+" • MM "Hepatitis B Vaccines" • MM "Hepatitis B, Chronic"	• hepatitis B vaccine/ • Hepatitis B/	• TITLE ("Hepatitis B")	• "Hepatitis B".af. • HBV.mp.	• "Hepatitis B" • HBV
6	Hepatitis C virus (HCV)	• Hepatitis C/ • HCV.mp.	• Hepatitis SAME C SAME virus	• MH "Hepatitis C+") • MM "Hepatitis C, Chronic"	• Hepatitis C/ • Hepatitis C virus/	• TITLE("Hepatitis C")	• "Hepatitis C".af. • HCV.mp	• "Hepatitis C" • HCV
7	Human Papillomavirus (HPV)	• Papillomaviridae/ • Papillomavirus Infections/ • HPV.mp.	• Papillomavirus Infections • Papillomavirus • HPV	• (MH "Papillomavirus Infections+") • (MM "Papillomaviruses") • (MM "Papillomavirus vaccine")	• Papiloma virus/	• TITLE(Papillomavirus)	• Papillomaviridae.af. • HPV.mp.	• Papillomaviridae • HPV • Papillomavirus
8	Measles	• Measles/ • Measles virus/ • Measles Vaccine/ • Measles.mp	• Measles • Measles SAME virus	• MH "Measles+" • (MH "Measles Vaccine+")	• Measles vaccine/ • Measles/ • Measles vaccination/ • Measles virus/ • Measles antibody/	• TITLE (Measles) •	• Measles.af.	• Measles
9	Meningococcal	• Meningitis, Meningococcal/ • Meningococcal Infections/ • Meningococcal Vaccines/ • Meningococcal disease.mp.	• Meningococcal SAME disease • Meningococcal • Meningococcal • SAME infection	• (MM "Meningitis, Meningococcal") • (MH "Meningococcal Infections+") • (MH "Meningitis, Bacterial+")	• Meningococcus vaccine/ • Meningococcosis/	• TITLE-ABS-KEY (Meningococcal)	• Meningococcal.af • Meningitis.af.	• Meningococcal
10	Mumps	• Mumps/ • Mumps virus/ • Mumps Vaccine/	• Mumps • Mumps SAME virus	• MM "Mumps" • MH "Mumps Vaccine+"	• Mumps vaccine/ • Mumps/ • Mumps virus/	• TITLE(Mumps)	• Mumps.af.	• Mumps

		• Mumps.mp.						
11	Pertussis	• Pertussis.mp • Whooping Cough/	Pertussis Whooping Cough	• MH "Pertussis Vaccine+" • MM "Whooping Cough"	• Pertussis toxin/ • Bordetella pertussis/ • Pertussis/ • Pertussis vaccine/	• TITLE(Pertussis)	• Pertussis.af.	• Pertussis
12	Plague	• Exp plague vaccine/ • Exp plague/ • Plague.mp.	• Plague	• (MM "Plague")	• Plague vaccine/ • Plague/	• TITLE-ABS-KEY(Plague) •	• Plague.af.	• Plague
13	Pneumococcal	• Streptococcus pneumoniae/ • Pneumococcal Infections/ • Pneumococcal Vaccines/ • Pneumonia, Pneumococcal/ • Pneumococcal disease.mp.	• Pneumococcal • Pneumococcal SAME Infection* • Pneumococcal SAME disease • Streptococcus pneumoniae	• (MM "Pneumococcal Infections") • (MM "Pneumococcal Vaccine")	• Pneumococcal infection/ • Streptococcus pneumoniae/	• TITLE(Streptococcus pneumonia) • TITLE(Pneumococcal)	• "Pneumococcal disease".af. • Streptococcus pneumoniae.af.	• Streptococcus pneumonia • Pneumococcal disease
14	Poliomyelitis	• Poliomyelitis/ • Polio.mp.	• Poliomyelitis • Polio	• MH "Poliomyelitis+"	• Poliomyelitis vaccine/ • Poliomyelitis virus 1/ • Poliomyelitis virus/ • Ppoliomyelitis/	• TITLE(Poliomyelitis) • TITLE(Polio)	• Polio.af. • Poliomyelitis.af.	• Polio • Poliomyelitis
15	Rubella	• Rubella/ • Rubella virus/ • Rubella Vaccine/ • Rubella.mp.	• Rubella • Rubella SAME virus	• (MH "Rubella+") • (MH "Rubella Vaccine+")	• Rubella vaccine/ • Rubella/ • Rubella virus/ • Rubella antibody/	• TITLE(Rubella)	• Rubella.af.	• Rubella
16	Tetanus	• Tetanus/ • Tetanus Toxoid/ • Tetanus Toxin/ • Tetanus Antitoxin/ • Tetanus.mp.	• Tetanus • Tetanus SAME toxoid • Tetanus SAME Antitoxin	• (MM "Tetanus") • (MH "Tetanus Antitoxin+") • (MM "Tetanus Immune Globulin") • (MM "Tetanus Toxin") • (MH "Tetanus Toxoid+")	• Tetanus antibody/ • Tetanus/ • Tetanus toxin/ • Tetanus prophylaxis/ • Tetanus toxoid/ •	• TTITLE(Tetanus)	• Tetanus.af.	• Tetanus

17	Tuberculosis (BCG)	• Tuberculosis, Pulmonary/ • Tuberculosis/ • Tuberculosis Vaccines/ • Tuberculosis.mp. • BCG.mp.	• Tuberculosis • BCG	• (MH "Tuberculosis+") • (MM "Mycobacterium Tuberculosis")	• Tuberculosis/ • BSG.mp.	• TITLE(Tuberculosis)	• Tuberculosis.af. • BCG.af.	• Tuberculosis • BCG
18	Varicella	• Chickenpox/ • Herpes zoster/ • Varicella.mp.	Chickenpox Herpes zoster Varicella.mp.	• (MM "Chickenpox Vaccine") • (MM "Chickenpox") • Varicella	• Chickenpox/ • Chickenpox vaccine/	• TITLE-ABS-KEY(chickenpox) • TITLE-ABS-KEY(varicella)	• Varicella.af. • Chickenpox.af. • Herpes Zoster.af.	• Varicella • Chickenpox • Herpes Zoster
Combined vaccines								
19	Diphtheria-Tetanus	• Diphtheria-Tetanus.mp. • DT.mp • No. 2 AND No.15	• Diphtheria SAME Tetanus • DT • No. 2 AND No.16	• "Diphtheria-Tetanus"	• Diphtheria-Tetanus.mp. • No. 2 AND No.16	• TITLE-ABS-KEY("diphtheria-Tetanus") • No.2 AND No. 16	• DT.af. • “Diphtheria Tetanus”.af.	• Diphtheria AND Tetanus • DT
20	Diphtheria-Tetanus-Pertussis	• Diphteria-Tetanus-Pertussis.mp. • Diphtheria-Tetanus-Pertussis Vaccine/ • DTP.mp • No.2 AND No.11 AND 15	• Diphtheria SAME Tetanus SAME Pertussis • DTP • No.2 AND No.11 AND 16	• "Diphtheria-Tetanus-Pertussis"	• Diphtheria-Tetanus-Pertussis.mp. • No.2 AND No.11 AND No. 16	• TITLE-ABS-KEY("diphtheria-tetanus-Pertussis") • No.2 AND No.11 AND No. 16	• Diphtheria-Tetanus-Pertussis.af. • DTP.af.	• Diphtheria AND Tetanus AND Pertussis • DTP
21	Diphtheria-Tetanus-Pertussis-HBV	• DTP-HBV.mp. • No. 2 AND No. 5 AND 11 AND 15	• DTP SAME HBV • No. 2 AND No. 5 AND 11 AND 16	• “Diphtheria-Tetanus-Pertussis-HBV”	• Diphtheria pertussis tetanus hepatitis B vaccine.mp. • Diphtheria pertussis tetanus hepatitis b vaccine/	• TITLE-ABS-KEY(diphtheria-tetanus-pertussis-“hepatitis b”) • TITLE(dtp-“hepatitis b”) • TITLE(dtp-hbv) • No.2 AND No.5 AND No.11 AND No. 16	• "Diphtheria Tetanus Pertussis Hepatitis B".af • "DTP-Hepatitis B".af. • "DTP-HBV".af.	• Diphtheria AND Tetanus AND Pertussis AND Hepatitis B • “DTP-HBV”
22	Diphtheria-Tetanus-Pertussis-Hib	• No. 2 AND No.3 AND No.11 AND 15	• No. 2 AND No.3 AND No.11 AND 16	• “Diphtheria-Tetanus-Pertussis-Hib”	• Diphtheria pertussis tetanus Haemophilus influenzae type b vaccine/	• TITLE-ABS-KEY("diphtheria-Pertussis-Tetanus-Haemophilus influenzae	• "Diphtheria-Tetanus-Pertussis-Haemophilus influenzae type b".af. • "DTP-Hib".af.	• Diphtheria AND Tetanus AND Pertussis AND Haemophilus influenzae type b

					• Diphtheria-Tetanus-Pertussis-Hib vaccine.mp.	type b") OR TITLE-ABS-KEY("DTP-Hib") • No.2 AND No.3 AND No.11 AND No. 16		• "DTP Hib"
23	Diphtheria-Tetanus-Pertussis-Hib-Polio	• No. 2 AND No.11 AND No.13 AND 15	• No. 2 AND No.11 AND No.14 AND 16	• "Diphtheria-Tetanus-Pertussis-Hib-Polio"	• Diphtheria pertussis poliomyelitis tetanus Haemophilus influenzae type b hepatitis B vaccine/	• TITLE-ABS-KEY("diphtheria-Tetanus-Pertussis-Haemophilus influenzae type b-Poliomyelitis") • TITLE-ABS-KEY("DTP-Hib-Polio") • No.2 AND No.3 AND No.11 AND No. 14 AND No.16	• (Diphtheria adj Tetanus adj Pertussis adj Haemophilus influenzae type b adj Polio).af. • DTP Hib Polio.af.	• Diphtheria AND Tetanus AND Pertussis AND Haemophilus influenzae type b AND poli • DTP Hib Polio
24	HAV-HVB	• No. 4 AND No. 5	• No. 4 AND No. 5	• No. 4 AND No. 5	• Hepatitis A hepatitis B Vaccine.mp. • Hepatitis A hepatitis B vaccine/ • No. 5 AND No. 6	• TITLE("hav-hbv") • No. 4 AND No.5	• Hepatitis A Hepatitis B.af. • HAV HBV.af. • No.4 AND No.5	• Hepatitis A AND Hepatitis B • "HAV HBV"
25	HBV-Hib	• No. 5 AND No. 3	• No. 5 AND No. 3	• No. 3 AND No. 5	• Hepatitis B Haemophilus influenzae type b Vaccine.mp. • Haemophilus influenzae type b hepatitis B vaccine/ • No. 3 AND No.5	• TITLE("hbv-hib") • No.3 AND No. 5	• No. 3 AND No. 5	• Hepatitis B AND Haemophilus influenzae type b • HBV AND Hib
26	Measles-Mumps	• Measles-Mumps.mp. • MM.mp. • No 8 AND No. 10	• Measles-Mumps • No 8 AND No. 10	• "Measles-Mumps"	• measles mumps vaccine/	• TITLE-ABS-KEY("Measles-Mumps") • No. 8 AND No.10	• No. 8 AND No. 10 • Measles-Mumps.af.	• "Measles AND Mumps" • "MM"
27	Measles-Mumps-Rubella	• Measles-Mumps-Rubella Vaccine/ • MMR.mp. • No 8 AND No. 10 AND No.14	• Measles SAME Mumps SAME Rubella • No 8 AND No. 10 AND No.15	• "Measles-Mumps-Rubella"	• Measles-Mumps-Rubella.mp.	• TITLE("measles-mumps-Rubella") • TITLE("MMR") • No.8 AND No.10 AND No.15	• Measles-Mumps-Rubella.af. • No. 8 AND No. 10 AND No. 15	• Measles AND Mumps AND Rubella • MMR

28	Measles-Mumps-Rubella-Varicella	• Measles-Mumps-Rubella-Varicella.mp. • MMR-V.mp. • No. 1 AND No. 2 AND 3 AND No.4	• Measles SAME Mumps SAME Rubella SAME Varicella • No. 1 AND No. 2 AND No. 15 AND No.18	• "Measles-Mumps-Rubella-Varicella"	• Chickenpox measles mumps rubella vaccine.mp. • Chickenpox measles mumps rubella vaccine/	• TITLE(measles-mumps-rubella-chickenpox) • TITLE(measles-mumps-rubella-varicella) • TITLE("MMRV") • No.8 AND No.10 AND No.15 AND No.18	• Measles-Mumps-Rubella-Varicella.af. • No. 8 AND No.10 AND No. 15 AND No. 18	• Measles AND Mumps AND Rubella AND Varicella • MMRV
29	Influenza-pneumococcal	• Influenza search terms AND No. 12	• Influenza search terms AND No. 13	• Influenza search filter + No.13	• Influenza search filter + No.13	• Influenza Search Filters AND No. 13	• Influenza Search filters AND No. 13	• Influenza AND Pneumococcal
30	Pneumococcal-meningococcal	• No. 12 AND No. 9	• No. 9 AND No. 13	• Pneumococcal search filters + No. 9	• Pneumococcal search filters + No. 9	• Pneumococcal Search Filters AND No.9	• Pneumococcal Search Filters AND No.9	• Pneumococcal AND Meningococcal

VII.IX References dataset

No	Author	Year	Method	Disease
1	A., Kuhlmann	2017	MM	Pneumococcal
2	Gerlier, L	2017	SD	Influenza
3	H., Christensen	2017	SD	Meningococcal
4	Largeron, Nathalie	2017	SD	HPV
5	M.J., Germar	2017	MM	HPV
6	N., Sundaram	2017	MM	Pneumococcal
7	P., Le	2017	MM	Herpes
8	L., Nagy	2016	SD	Influenza
9	A., Doroshenko	2016	dSim	Pertussis
10	A., Garcia	2016	MM	Influenza
11	Bar-Zeev, Naor	2016	DTM	Rotavirus
12	Blommaert, Adriaan	2016	MM	Pneumococcal
13	Boiron, L	2016	SD	HPV
14	Brisson, Marc	2016	dSim	HPV
15	C., Stoecker	2016	MM	Pneumococcal
16	C., Vargas Parada	2016	MM	HPV
17	D., Curran	2016	dHybrid	HAV
18	D., Setiawan	2016	MM	HPV
19	D., Yamin	2016	SD	Rotavirus
20	D., Zhao	2016	DTM	Pneumococcal
21	Durham, David P	2016	SD	HPV
22	E., Belchior	2016	MM	Herpes
23	E., Delgleize	2016	MM	Pneumococcal
24	E., Shim	2016	SD	Influenza

25	H., Christensen	2016	dHybrid	Meningococcal
26	J.-F., Laprise	2016	dSim	HPV
27	K.A., Maurer	2016	MM	Pneumococcal
28	Kamiya, Hajime	2016	MM	Tdap
29	Lecocq, Heloise	2016	MM	meningococcal
30	Liu, Yi-Jun	2016	MM	HPV
31	Moodley, Nishila	2016	MM	HIV
32	Newall, A T	2016	MM	Pneumococcal
33	P., Chanthavilay	2016	SD	HPV
34	P., de Wals	2016	MM	Meningococcal
35	P.H., Le	2016	MM	Herpes
36	P.T., de Boer	2016	dHybrid	Influenza
37	R., Gasparini	2016	DTM	Meningococcal
38	S., Coretti	2016	MM	Herpes
39	Sartori, Ana Marli Christovam	2016	DTM	Tadp
40	Smith, Kenneth J	2016	MM	Influenza
41	Wu, David Bin-Chia	2016	MM	Pneumococcal
42	Wu, Joseph T	2016	DTM	Enterovirus
43	Y., Mousavi Jarrahi	2016	MM	Rotavirus
44	Aguilar, Ida Berenice Molina	2015	sSim	HVP
45	Ahmeti, Albana	2015	DTM	Rotavirus
46	Baguelin, Marc	2015	SD	Influenza
47	Burger, Emily A	2015	SD	HPV
48	Caldwell, Ronald	2015	DTM	Pneumococcal
49	Chit, Ayman	2015		Influenza
50	Chit, Ayman	2015	DTM	Influenza
51	Damm, Oliver	2015	dHybrid	Influenza

52	de Soarez, Patricia Coelho	2015	MM	Pneumococcal
53	Dhankhar, Praveen	2015	SD	HAV
54	Diop, Abdou	2015	DTM	Rotavirus
55	Graham, Donna M	2015	MM	HPV
56	E.A., Burger	2015	dHybrid	HPV
57	Haasis, Manuel Alexander	2015	MM	Pneumococcal
58	Hoshi, Shu-ling	2015	MM	Pneumococcal
59	J.B., Ditkowsky	2015	MM	Varicella
60	Javanbakht, Mehdi	2015	DTM	Rotavirus
61	Jit, Mark	2015	SD	HPV
62	Kieninger, Martha Pena	2015	DTM	Pneumococcal
63	Komakhidze, T	2015	DTM	Pneumococcal
64	L.B., Connelly	2015	MM	HPV
65	Le, Phuc	2015	MM	Hib
66	Le, Phuc	2015	DTM	Herpes
67	Littlewood, Kavi J	2015	SD	MMRV
68	Mangen, Marie-Josee J	2015	MM	Pneumococcal
69	Marti, Sebastian Garcia	2015	MM	Rotavirus
70	Meeyai, Aronrag	2015	SD	Influenza
71	Meier, G	2015	MM	Influenza
72	Mezones-Holguin, Edward	2015	DTM	Pneumococcal
73	Mirelman, Andrew J	2015	MM	Norovirus
74	Novaes, Hillegonda Maria	2015	sSim	HPV
75	Owusu-Edusei, Kwame Jr	2015	SD	Chlamydia
76	Paternina-Caicedo, Angel	2015	DTM	Rotavirus
77	R.H., Doshi	2015	MM	Routine immunization
78	S., Shakerian	2015	DTM	Rotavirus

79	S.-C., Chen	2015	dHybrid	Influenza
80	S.E.W., Puteh	2015	SD	HPV
81	Sibak, Mohammed	2015	DTM	Pneumococcal
82	Sigei, Charles	2015	DTM	Rotavirus
83	Thommes, Edward W	2015	SD	Influenza
84	Tirani, Marcello	2015	MM	Meningitis
85	Uruena, Analia	2015	DTM	Rotavirus
86	Vucina, V Visekruna	2015	DTM	Pneumococcal
87	Walwyn, Leslie	2015	sSim	HPV
88	Yin, Juan	2015	sHybrid	HBV
89	You, Joyce H S	2015	DTM	Influenza
90	Aidelsburger, Pamela	2014	MM	Rotavirus
91	Al Awaidy, Salah Thabit	2014	MM	Rotavirus
92	Alkoshi, Salem	2014	DTM	Rotavirus
93	Blakely, Tony	2014	MM	HPV
94	Bresse, Xavier	2014	SD	HPV
95	Chen, Jieling	2014	MM	Pneumococcal
96	Christensen, Hannah	2014	SD	Meningitis
97	Chui, Ka-Sing	2014	DTM	Varicella
98	Clements, Karen M	2014	DTM	Influenza
99	Ditkowsky, Jared B	2014	MM	TBS
100	Drolet, Melanie	2014	dSim	HPV
101	Freiesleben de Blasio, Birgitte	2014	SD	Rotavirus
102	Gomez, Jorge Alberto	2014	MM	HPV
103	Halder, Nilimesh	2014	dSim	Pre-pandemic influenza
104	Han, Kyu-Tae	2014	MM	HPV
105	Hoshi, Shu-ling	2014	MM	Mumps

106	Isshiki, Takahiro	2014	DTM	HPV
107	Jia, Yuanxi	2014	sHybrid	HBV
108	Jiang, Yiling	2014	MM	Pneumococcal
109	Jit, Mark	2014		HPV
110	Kiatpongsan, Sorapop	2014	sSim	HPV
111	Knight, Gwenan M	2014	SD	TBS
112	L., Channing	2014	MM	TB
113	Laprise, Jean-Francois	2014	dSim	HPV
114	M., Khatibi	2014	DTM	HPV
115	Mezones-Holguin, Edward	2014	DTM	Pneumococcal
116	Newall, Anthony T	2014	SD	Influenza
117	Ordonez, Jaime E	2014	MM	Pneumococcal
118	Regnier, Stephane A	2014	MM	Meningitis
119	Rheingans, Richard	2014	DTM	Rotavirus
120	Suwantika, Auliya A	2014	sHybrid	HAV
121	Tu, Hong Anh T	2014	MM	meningococcal
122	Van Bellinghen, Laure-Anne	2014	MM	Influenza
123	Vemer, Pepijn	2014	DTM	Pneumococcal
124	You, Joyce H S	2014	MM	Influenza
125	Zhou, Fangjun	2014	DTM	Imunization program
126	A., Clark	2013	DTM	HiB
127	A., Paternina-Caicedo	2013	DTM	Varicella
128	Boccalini, Sara	2013	DTM	Pneumococcal
129	Chang, Wan-Chi	2013	DTM	Rotavirus
130	D.B.C., Wu	2013	DTM	Pneumococcal
131	Fonseca, Allex Jardim da	2013	MM	HPV
132	Gupta, Madhu	2013	MM	Hib

133	Hepkema, Hiltsje	2013	MM	Meningococcal
134	Hoshi, Shu-ling	2013	MM	Pneumococcal
135	Itatani, Tomoya	2013	MM	Pertussis
136	J., Aponte-Gonzalez	2013	MM	HPV
137	J., Luttjeboer	2013	MM	HPV
138	K., Yamabe	2013	SD	HPV
139	Kim, JJ	2013	MM	HPV
140	Kim, JJ	2013	MM	HPV
141	Klok, Rogier M	2013	sHybrid	Pneumococcal
142	Kulpeng, Wantanee	2013	MM	Pneumococcal
143	M, Bakir	2013	DTM	Rotavirus
144	M., Gouveia	2013	MM	Pneumococcal
145	M., Gupta	2013	DTM	Hib
146	M., Hacimustafaoglu	2013	DTM	Rotavirus
147	Mamma, Maria	2013	DTM	H1N1
148	McGarry, Lisa J	2013	sHybrid	Tdap
149	N., Demarteau	2013	MM	HPV
150	P., Ayieko	2013	MM	Pneumococcal
151	P.T., de Boer	2013	MM	Herpes
152	Pitman, R J	2013	SD	Influenza
153	Pouwels, Koen B	2013	MM	Meningococcal
154	R., Itzler	2013	MM	Rotavirus
155	S.-C., Chen	2013	SD	Influenza
156	S.G., Marti	2013	MM	Pneumococcal
157	Stoecker, Charles	2013	MM	Pneumococcal
158	X., Bresse	2013	MM	Herpes
159	Y., Fu	2013	MM	Pneumococcal

160	Kelso J	2013	dSim	Pandemic influenza
161	A.J., van Hoek	2012	SD	Pneumococcal
162	Atkins, Katherine E	2012	SD	Rotavirus
163	B.Y., Lee	2012	MM	Influenza
164	Baguelin, M	2012	SD	Influenza
165	Bilcke, Joke	2012	MM	Herpes
166	Blank, Patricia R	2012	DTM	Pneumococcal
167	Brydak, Lidia	2012	DTM	Influenza
168	By, Asa	2012	MM	Pneumococcal
169	C., Castaneda-Orjuela	2012	MM	Pneumococcal
170	Campos, Nicole G	2012	MM	HPV
171	Christovam Sartori, Ana Marli	2012	DTM	Pneumococcal
172	Coupe, Veerle M H	2012	iMM	HPV
173	Coyle, Doug	2012	MM	Rotavirus
174	D.N., Fisman	2012	MM	Rotavirus
175	D.R., Strutton	2012	MM	Pneumococcal
176	Demarteau, Nadia	2012	MM	HPV
177	Dempsey, Amanda F	2012	DTM	Cytomegalovirus
178	Earnshaw, Stephanie R	2012	sHybrid	Pneumococcal
179	Goldie, SJ	2012	iMM	HPV
180	Grzesiowski, Pawel	2012	MM	Pneumococcal
181	H.A.T., Tu	2012	DTM	Rotavirus
182	H.A.T., Tu	2012	MM	HAV
183	Hoshi, Shu-ling	2012	MM	Pneumococcal
184	J., Luyten	2012	MM	HAV
185	J.-E., Tarride	2012	DTM	Influenza
186	Jiang, Yiling	2012	MM	Pneumococcal

187	K.J., Smith	2012	MM	Pneumococcal
188	Kawai, Kosuke	2012	SD	HPV
189	Knerer, Gerhart	2012	MM	Pneumococcal
190	Kuhlmann, Alexander	2012	MM	Pneumococcal
191	Lugner, AK	2012	SD	Pandemic Influenza
192	Moradi-Lakeh, Maziar	2012	DTM	Hib
193	Muangchana, Charung	2012	DTM	Rotavirus
194	N., Yamamoto	2012	MM	HPV
195	Patterson, Brian W	2012	MM	Influenza
196	Rozenbaum, Mark H	2012	SD	Pertussis
197	Sartori, Ana Marli C	2012	SD	HAV
198	Schaetti, Christian	2012	MM	Cholera
199	Schaetti, Christian	2012	MM	Cholera
200	Sharma, M	2012	iMM	HPV
201	Termrungruanglert, Wichai	2012	MM	HPV
202	van Hoek, Albert Jan	2012	MM	Rotavirus
203	van Hoek, AlJ	2012	SD	Varicella
204	Vanni, T	2012	dSim	HPV
205	Voko, Zoltan	2012	MM	HPV
206	Wu, David Bin-Chia	2012	SD	Pneumococcal
207	A., Perez-Rubio	2011	DTM	Rotavirus
208	Akin, Levent	2011	DTM	Pneumococcal
209	Alvis, Nelson	2011	MM	Tetanus
210	Babigumira, Joseph B	2011	SD	Measles
211	Bishai, David	2011	SD	Measles
212	Boccalini, Sara	2011	MM	Pneumococcal
213	Castaneda-Orjuela, Carlos	2011	DTM	Pneumococcal

214	Chesson, Harrell W	2011	SD	HPV
215	Clements, Karen M	2011	DTM	Influenza
216	de Soarez, Patricia Coelho	2011	DTM	Meningococcal
217	Demarteau, Nadia	2011	MM	HPV
218	Gutierrez-Aguado, Alfonso	2011	MM	HPV
219	Hontelez, Jan A C	2011	dSim	HIV
220	J., Diez-Domingo	2011	DTM	Pneumococcal
221	Jit, Mark	2011	SD	Rotavirus
222	Lee, Vernon J	2011	MM	HPV
223	M.M., Touray	2011		Pneumococcal
224	Morano, Raul	2011	DTM	Pneumococcal
225	Mucino-Ortega, Emilio	2011	DTM	Pneumococcal
226	Nakamura, Mari M	2011	DTM	Pneumococcal
227	Newall, Anthony T	2011	MM	Pneumococcal
228	Praditsitthikorn, Naiyana	2011	MM	HPV
229	Prosser, Lisa A	2011	DTM	H1N1
230	R., Morano	2011	DTM	Pneumococcal
231	R.F., Itzler	2011	MM	Rotavirus
232	Robberstad, Bjarne	2011	MM	Pneumococcal
233	Rozenbaum, Mark H	2011	DTM	Rotavirus
234	Sato, Takanori	2011	MM	Rotavirus
235	Sato, Takanori	2011	MM	Rotavirus
236	Siddiqui, MR	2011	MM	HBV
237	Smith, Emily R	2011	DTM	Rotavirus
238	Szucs, Thomas D	2011	MM	Herpes
239	Takahashi, Kenzo	2011	DTM	Measles
240	Tilson, L	2011	SD	Rotavirus

241	Tonolio Neto, Joao	2011	DTM	Pneumococcal
242	Tyo, Karen Richards	2011	MM	Pneumococcal
243	U.K., Griffiths	2011	DTM	HiB
244	Uruena, Analia	2011	DTM	Pneumococcal
245	V., Mogasale	2011	DTM	Influenza
246	Alvis, N. et al	2010	DTM	Pneumococcal
247	Alvis, N. et al	2010	MM	Polio
248	Baguelin, Marc. et al	2010	dHybrid	H1N1
249	Dasbach, E J. et al	2010	SD	HPV
250	Dee, A. et al	2010	MM	HPV
251	Demarteau, N. et al	2010	MM	Cervical Cancer
252	Dhankhar, P. et al	2010	DTM	Pneumococcal
253	Diaz, M. et al	2010	iMM	HPV
254	Giglio, N D. et al	2010	MM	Pneumococcal
255	Hutton, D W. et al	2010	sHybrid	HBV
256	Konno, R. et al	2010	MM	Cervical Cancer
257	Lee, B Y. et al	2010	DTM	Pandemic Influenza
258	Lee, B Y. et al	2010	DTM	Influenza
259	Liu, Pang-Hsiang. et al	2010	MM	Cervical Cancer
260	Mogasale, V. et al	2010	DTM	Influenza
261	Moore, L. et al	2010	MM	Herpes zoster
262	Newall, A T. et al	2010	dHybrid	Pandemic Influenza
263	Obradovic, M. et al	2010	MM	HPV
264	Olsen, Jens. et al	2010	dSim	HPV
265	Robin de Vries. et al	2010	dSim	Pertussis
266	Rozenbaum, M H. et al	2010	DTM	Pneumococcal
267	Rozenbaum, M H. et al	2010	DTM	Pneumococcal

268	Rozenbaum, M H. et al	2010	DTM	Pneumococcal
269	Rubin, Jaime L. et al	2010	DTM	Influenza
270	Sander, B. et al	2010	dSim	H1N1
271	Smith, K J. et al	2010	MM	Pneumococcal
272	Sohn, Hyun Soon. et al	2010	DTM	Pneumococcal
273	Torvinen, S. et al	2010	MM	HPV
274	Vanagas, G. et al	2010	dMM	HPV
275	Westra, T A. et al	2010	DTM	Pertussis
276	Accetta, Gabriele	2010	MM	HPV
277	Berry, Stephen A	2010	DTM	Rotavirus
278	Giachetto Larraz, Gustavo	2010	MM	Pneumococcal
279	Giglio, N D	2010	MM	Pneumococcal
280	Iskedjian, Michael	2010	MM	Pertussis
281	Kim, Jane J	2010	MM	HPV
282	Kim, Sun-Young	2010	MM	Rotavirus
283	Kim, SY	2010	MM	Pneumococcal
284	L., Annemans	2010	MM	Herpes
285	Mangen, Marie-Josee J	2010	MM	Rotavirus
286	N.A., Guzman	2010	DTM	Pneumococcal
287	Sander, B	2010	dHybrid	Influenza
288	Annemans, L. et al	2009	MM	HPV
289	Anonychuk, Andrea M. et al	2009	dHybrid	Cervical Cancer
290	Atherly, D. et al	2009	MM	HBV
291	Banz K. et al	2009	dHybrid	Varicella
292	Beigi, R H. et al	2009	DTM	Influenza
293	Claes, C. et al	2009	MM	Pneumococcal
294	Clark, A D. et al	2009	DTM	Rotavirus

295	Colantonio, L. et al	2009	MM	Cervical Cancer
296	Coudeville, L. et al	2009	SD	Pertussis
297	Coupe, V M H. et al	2009	MM	HPV
298	Dabral, M. et al	2009	DTM	Measles
299	De Kok, Inge M C M. et al	2009	MM	HPV
300	Gasparini, R. et al	2009	DTM	HPV
301	Ginsber, G M. et al	2009	MM	Cervical Cancer
302	Giorgi-Rossi, P. et al	2009	DTM	Pneumococcal
303	Hillemanns, P. et al	2009	MM	HPV
304	Hung, H F. et al	2009	sHybrid	HBV
305	Khazeni, N. et al	2009	dHybrid	H1N1
306	Khazeni, N. et al	2009	dHybrid	Pandemic H5N1
307	Kim, JJ. et al	2009	dHybrid	HPV
308	Kim, JJ. et al	2009	iMM	HPV
309	Kim, SY. et al	2009	sHybrid	Rotavirus
310	Lee, V J. et al	2009	DTM	Pandemic Influenza
311	Martin, A. et al	2009	MM	Rotavirus
312	Massad, E. et al	2009	SD	HCV
313	Mennini, F S. et al	2009	MM	HPV
314	Najafzadeh, M. et al	2009	sSim	Herpes zoster
315	O'Brien, M A. et al	2009	MM	Otitis media
316	Oddsson, K. et al	2009	MM	HPV
317	Poirier, B. et al	2009	DTM	Pneumococcal
318	Porras-Ramirez, A. et al	2009	DTM	Influenza
319	Ray, G T. et al	2009	DTM	Pneumococcal
320	Reynales-Shigematsu, LM. et al	2009	MM	HPV
321	Rogoza, R M. et al	2009	MM	HPV

322	Rose, J. et al	2009	MM	Rotavirus
323	Sander, B. et al	2009	dSim	Pandemic Influenza
324	Schooling, C M. et al	2009	DTM	Influenza
325	Silfverdal, Sven Arne. Et al	2009	DTM	Pneumococcal
326	Sinanovic, E. et al	2009	MM	Cervical Cancer
327	Smith, K J. et al	2009	MM	Pneumococcal
328	Tediosi, F. et al	2009	dSim	Malaria
329	Thiry, N. et al	2009	MM	HPV
330	Van Hoek, A J. et al	2009	MM	Herpes zoster
331	Vespa, G. et al	2009	DTM	Pneumococcal
332	You, J H S. et al	2009	MM	Pneumococcal
333	Zahdi, M R. et al	2009	DTM	HAV
334	Zechmeister, I. et al	2009	dMM	HPV
335	Bergeron, C. et al	2008	MM	HPV
336	Bergman, A C S. et al	2008	MM	Pneumococcal
337	Bonanni, P. et al	2008	dHybrid	Varicella
338	Brisson, M. et al	2008	MM	Herpes zoster
339	Chesson, H W. et al	2008	DTM	HPV
340	Dasbach, E J. et al	2008	SD	HPV
341	Dasbach, E J. et al	2008	SD	HPV
342	Dasbach, E J. et al	2008	SD	HPV
343	Diaz, M. et al	2008	iMM	HPV
344	Goldhaber-Fiebert, J D. et al	2008	iMM	HPV
345	Goldie, S J. et al	2008	iMM	HPV
346	Gutierrez-Delgado, C. et al	2008	MM	Cervical Cancer
347	Jit, M. et al	2008	SD	HPV
348	Kim, JJ. et al	2008	dHybrid	HPV

349	Kim, JJ. et al	2008	iMM	HPV
350	Kulasingam, S. et al	2008	MM	HPV
351	Largeron, N. et al	2008	MM	HPV
352	Lee, G M. et al	2008	MM	Pertussis
353	Lenne, X. et al	2008	MM	HPV
354	Lesley T. et al	2008	MM	HBV
355	Lloyd A. et al	2008	DTM	Pneumococcal
356	Luce, B R. et al	2008	DTM	Influenza
357	Newall, A T. et al	2008	DTM	Influenza
358	Ortega-Sanchez, I R. et al	2008	MM	meningococcal
359	Perez-Rubio, A. et al	2008	DTM	Chinken Pox
360	Prosser, L A. et al	2008	DTM	Influenza
361	Quezada, A. et al	2008	dMM	HAV
362	Rogoza, R M. et al	2008	sHybrid	Cervical Cancer
363	Schmier, J. et al	2008	DTM	Influenza
364	Shin, S. et al	2008	DTM	HiB
365	Sinha, A. et al	2008	DTM	Pneumococcal
366	Smith, K J. et al	2008	MM	Pneumococcal
367	Standaert, B et al	2008	MM	Rotavirus
368	Suarez, E. et al	2008	MM	Cervical Cancer
369	Szucs, T. et al	2008	MM	HPV
370	Tilson, L. et al	2008	MM	HBV
371	Tilson, L. et al	2008	MM	Pneumococcal
372	Usher, C. et al	2008	dSim	HPV
373	Valentim, J. et al	2008	SD	Varicella
374	Zhou, F J. et al	2008	DTM	Varicella
375	Zhuang, G H. et al	2008	MM	HAV

376	Aballea, S. et al	2007	DTM	Influenza
377	Aballea, S. et al	2007	DTM	Influenza
378	Akumu, A O. et al	2007	MM	HiB
379	Armstrong, G L. et al	2007	MM	HAV
380	Bauch, C T. et al	2007	SD	HAV
381	Brisson, M. et al	2007	MM	HPV
382	Broughton, E I. et al	2007	DTM	HiB
383	De Wals, P. et al	2007	dMM	meningococcal
384	Elamin H. E. et al	2007	SD	HPV
385	Ellis, A. et al	2007	MM	HAV
386	Evers, S. et al	2007	DTM	Pneumococcal
387	Goldie, S J. et al	2007	dHybrid	HPV
388	Hammerschmidt, T. et al	2007	dHybrid	Varicella
389	Hibbert, C L. et al	2007	DTM	Influenza
390	Hoshi, S L. et al	2007	DTM	Influenza
391	Hutton, D W. et al	2007	sHybrid	HBV
392	Insinga, R P. et al	2007	SD	HPV
393	Jakiche, R. et al	2007	DTM	HAV/HBV/HCV
394	Kim, JJ. et al	2007	dHybrid	HPV
395	Kulasingam, S. et al	2007	MM	HPV
396	Lee, G M. et al	2007	MM	Pertussis
397	Lopez, E. et al	2007	dMM	HAV
398	Marchetti, M. et al	2007	sHybrid	Influenza
399	Merito, M. et al	2007	MM	Pneumococcal
400	Navas, E. et al	2007	DTM	Influenza
401	Neilson, A R. et al	2007	dMM	HPV
402	Pellissier, J M. et al	2007	MM	Herpes zoster

403	Rein, D B. et al	2007	MM	HAV
404	Rheingans, R D. et al	2007	DTM	Rotavirus
405	Rothberg, M B. et al	2007	MM	Herpes zoster
406	Sinha, A. et al	2007	DTM	Pneumococcal
407	Thompson, K M. et al	2007	SD	Polio
408	Widdowson, Marc-Alain. et al	2007	MM	Rotavirus
409	Alvis, N. et al	2006	DTM	HiB
410	Baio, G. et al	2006	MM	Influenza
411	Cai, Li. et al	2006	DTM	Influenza
412	Guzmán, N A. et al	2006	DTM	HiB
413	Hornberger, J. et al	2006	MM	Herpes zoster
414	Lenne, X. et al	2006	SD	Varicella
415	Maciosek, M V. et al	2006	DTM	Influenza
416	Martin-Fernandez, J. et al	2006	DTM	Influenza
417	Platonov, A E. et al	2006	DTM	HiB
418	Prosser, L A. et al	2006	DTM	Influenza
419	Ray, G T. et al	2006	DTM	Pneumococcal
420	Salo, H. et al	2006	DTM	Influenza
421	Skowronski, D M. et al	2006	DTM	Influenza
422	Trotter, C L. et al	2006	SD	meningococcal
423	Turner, D A	2006	DTM	Influenza
424	Vijayaraghavan, M. et al	2006	MM	Measles
425	Wisloff, T. et al	2006	MM	Pneumococcal
426	Caro, J Jaime. Et al	2005	MM	Pertussis
427	Chodick, G. et al	2005	sHybrid	Varicella
428	Goldman, G S	2005	MM	Varicella
429	Griffiths, U K. et al	2005	MM	HBV

430	Gutierrez, J P t al	2005	DTM	Influenza
431	Iskedjian, M. et al	2005	MM	Pertussis
432	Krahn, M. et al	2005	MM	HCV
433	Mangtani, P. et al	2005	MM	Pneumococcal
434	Marchetti, M. et al	2005	MM	Pneumococcal
435	McIntosh, E. et al	2005	DTM	Pneumococcal
436	Meltzer M. et al	2005	DTM	Influenza
437	Navas, E. et al	2005	DTM	Pneumococcal
438	Rothberg, M B. et al	2005	sHybrid	HBV
439	Salo, H. et al	2005	MM	Pneumococcal
440	Shepard, CW. et al	2005	DTM	meningococcal
441	Tseng, H F. et al	2005	DTM	Varicella
442	Valenzuela, M T. et al	2005	MM	HAV
443	Vimolket, T. et al	2005	DTM	HBV
444	Zhou, F J. et al	2005	DTM	diphtheria/tetanus toxoids/acellular pertussis; tetanus/diphtheria toxoids; HiB conjugate; inactivated poliovirus; measles/mumps/rubella; HBV; varicella vaccines
445	Al V. Taira. et al	2004	dHybrid	HPV
446	Butler, J R G. et al	2004	DTM	Pneumococcal
447	Coudeville, L. et al	2004	dMM	Varicella
448	Dayan, G H. et al	2004	DTM	Measles
449	De Wals, P. et al	2004	MM	meningococcal
450	De Wals, P. et al	2004	MM	meningococcal
451	Goldie, S J. et al	2004	MM	HPV
452	Griffiths, U K. et al	2004	MM	Tetanus

453	Iskedjian, M. et al	2004	MM	Pertussis
454	Jacobs, R J. et al	2004	MM	HBV
455	Melegaro, A. et al	2004	MM	Pneumococcal
456	Peña-Rey, I. et al	2004	DTM	Varicella
457	Postma, M J. et al	2004	DTM	HAV
458	Purdy, K W. et al	2004	MM	Pertussis
459	Scuffham, P A. et al	2004	MM	Pertussis
460	Thiry, N. et al	2004	sHybrid	Varicella
461	Welte, R. et al	2004	DTM	meningococcal
462	Zhou, F J. et al	2004	DTM	Mumps/Rubella
463	Aggarwal, R. et al	2003	MM	HBV
464	Banz K. et al	2003	dHybrid	Varicella
465	Bos, J M. et al	2003	DTM	Pneumococcal
466	Brisson, M. et al	2003	SD	Varicella
467	Claes, C. et al	2003	MM	Pneumococcal
468	Ess, S M. et al	2003	DTM	Pneumococcal
469	Hanslik, T. et al	2003	DTM	Varicella
470	Hersh, A L. et al	2003	MM	BCG
471	Hsu, H C. et al	2003	MM	Chinken Pox
472	Jaccard Ruedin, H. et al	2003	DTM	Pneumococcal/Meningococal
473	Jacobs, R J. et al	2003	MM	HAV/HBV
474	Jacobs, R J. et al	2003	MM	HAV
475	Kulasingam, S. et al	2003	MM	HPV
476	Lebel, Marc H. et al	2003	sHybrid	Pneumococcal
477	McIntosh, E. et al	2003	DTM	Pneumococcal
478	Péchevis, M. et al	2003	DTM	HAV
479	Rancourt, C. et al	2003	DTM	meningococcal

480	Ruedin, H Jaccard. Et al	2003	DTM	Pneumococcal/Meningococal
481	Sanders, GD. et al	2003	sHybrid	HPV
482	Sisk JE. et al	2003	MM	Pneumococcal
483	Banz K. et al	2002	dHybrid	Varicella
484	Brisson, M. et al	2002	SD	Varicella
485	Chodick, G. et al	2002	sHybrid	HAV
486	Das Gupta, R. et al	2002	DTM	Influenza
487	Edmunds, W J. et al	2002	dHybrid	Pertussis
488	Getsios, D. et al	2002	DTM	Varicella
489	Pepper, P V. et al	2002	sHybrid	Pneumococcal
490	Pisu, M. et al	2002	DTM	HBV
491	Plans, P. et al	2002	DTM	Pneumococcal
492	Rothberg, M B. et al	2002	MM	Varicella
493	Scott RD II. et al	2002	DTM	meningococcal
494	Stevenson, M. et al	2002	dMM	Pertussis
495	Teppakdee, A. et al	2002	MM	HAV
496	Trotter, C L. et al	2002	DTM	meningococcal
497	Wutzler, P. et al	2002	SD	Varicella
498	Zhou, F J. et al	2002	DTM	HiB
499	Bos, J M. et al	2001	DTM	meningococcal
500	Chodick, G. et al	2001	sHybrid	HAV
501	Dayan, G H. et al	2001	DTM	Influenza
502	Diel, R. et al	2001	MM	HAV
503	Du Chatelet, I P. et al	2001	DTM	meningococcal
504	Edmunds, W J. et al	2001	MM	Herpes zoster
505	Fitzner, K A. et al	2001	DTM	Influenza
506	Ginsber, G M. et al	2001	MM	HAV

507	Harris, A. et al	2001	MM	HAV
508	Iskedjian, M. et al	2001	DTM	Pertussis
509	Jacobs, R J. et al	2001	DTM	HAV/Varicella/Pneumococcal
510	Limcangco, M R. et al	2001	DTM	HiB
511	Luce, B R. et al	2001	DTM	Influenza
512	Meltzer M. et al	2001	DTM	HAV
513	Muennig, P A. et al	2001	DTM	Influenza
514	Pokorn, M. et al	2001	DTM	HiB
515	Postma, M J. et al	2001	MM	Pneumococcal
516	Skull, S A. et al	2001	DTM	meningococcal
517	Skull, S A. et al	2001	DTM	meningococcal
518	Tucker, A W. et al	2001	DTM	Polio
519	Weaver, M. et al	2001	DTM	Pneumococcal/Influenza
520	Ament, A. et al	2000	DTM	Pneumococcal
521	De Graeve, D. et al	2000	DTM	Pneumococcal
522	Forcen, T. et al	2000	sHybrid	Chinken Pox
523	Gessner, B D. et al	2000	DTM	Respiratory syncytal virus
524	Hyer, R N. et al	2000	DTM	Adenovirus
525	Jacobs, R J. et al	2000	DTM	HAV
526	Lieu, T A. et al	2000	sHybrid	Pneumococcal
527	Pepper, P V. et al	2000	sHybrid	Pneumococcal
528	Rajan, E. et al	2000	DTM	HAV
529	Saab, S. et al	2000	DTM	HAV
530	Sisk JE. et al	2000	MM	Pneumococcal
531	Smith, K J. et al	2000	MM	Chinken Pox
532	Szucs, T. et al	2000	DTM	HAV/HBV
533	Weycker, D. et al	2000	DTM	Otitis media

534	Zurn, P. et al	2000	DTM	HBV
535	Barry O'Connor, J. et al	1999	MM	HAV
536	Beutels, P. et al	1999	MM	Pertussis
537	Bovier, P A. et al	1999	MM	meningococcal
538	Coudeville, L. et al	1999	SD	Varicella
539	Das, A. et al	1999	sHybrid	HAV
540	Deuson, R R. et al	1999	DTM	HBV
541	Domingo, J D. et al	1999	sHybrid	Varicella
542	Fendrick, A M. et al	1999	sHybrid	HiB/HBV
543	Pathania, V S, et al	1999	SD	BCG
544	Postma, M J. et al	1999	DTM	Influenza
545	Scuffham, P A. et al	1999	DTM	Varicella
546	Scuffham, P A. et al	1999	DTM	Varicella
547	Howell, M R. et al	1998	DTM	Adenovirus
548	Krahn, M. et al	1998	MM	HBV
549	Pelletier, L. et al	1998	SD	Measles
550	Shiell, A. et al	1998	DTM	Measles
551	Smith, W J. et al	1998	DTM	Chinken Pox
552	Tormans, G. et al	1998	MM	Pertussis
553	Arnal, J M. et al	1997	sHybrid	HAV
554	Baltussen, R. et al	1997	DTM	Pneumococcal
555	Garuz, R. et al	1997	dHybrid	HBV
556	Gray, A M. et al	1997	DTM	Varicella
557	Nettleman, M D. et al	1997	MM	Varicella
558	Smith, S. et al	1997	MM	HAV
559	Beutels, P. et al	1996	MM	Varicella
560	Fenn, P. et al	1996	MM	HBV

561	JR, WILLIAMS	1996	SD	HBV
562	Miller, M A. et al	1996	DTM	Polio
563	Williams, J R. et al	1996	SD	HBV
564	Antonanzas, F. et al	1995	MM	HBV
565	Jackson, L A. et al	1995	DTM	meningococcal
566	Lieu, T A. et al	1995	DTM	Varicella
567	Margolis, H S. et al	1995	DTM	HBV
568	Shepard, DS. et al	1995	MM	Measles/tetanus/typhoid/HBV/DTP
569	Van Damme, P. et al	1995	DTM	HBV
570	Huse, D M. et al	1994	MM	Pneumococcal
571	Lieu, T A. et al	1994	SD	Varicella
572	Levine, O S. et al	1993	MM	HiB
573	Tormans, G. et al	1993	DTM	HBV
574	Vittorio D. et al	1993	MM	HBV
575	Antonanzas, F. et al	1992	DTM	HBV
576	Ginsber, G M. et al	1992	DTM	HBV
577	Ginsber, G M. et al	1992	DTM	HBV
578	Fernandez B R. et al	1991	DTM	HBV
579	Carducci, A. et al	1989	SD	Tetanus
580	Hutchison, B. et al	1988	DTM	Tetanus
581	Preblud, S R. et al	1985	MM	Varicella
582	Riddiough, M A. et al	1983	MM	Influenza
583	Mulley, A G. et al	1982	DTM	HBV
584	Patrick, K M. et al	1981	DTM	Pneumococcal

References

Brailsford, S. and Hilton, N. (2001) **A Comparison of Discrete Event Simulation and System Dynamics for Modelling Healthcare Systems**

Brennan, A., Chick, S.E. and Davies, R. (2006) A taxonomy of model structures for economic evaluation of health technologies. **Health Economics**, 1310 (August): 1295–1310

Brisson, M. and Edmunds, W. (2003) Economic evaluation of vaccination programs: The impact of herd-immunity. **Medical Decision Making**, 23 (1): 76–82

Brisson, M. and Edmunds, W. (2006) Impact of model, methodological, and parameter uncertainty in the economic analysis of vaccination programs. **Medical Decision Making**, 26 (5): 434–446

Centre for Reviews and Dissemination (2011) **CRD Database [online]** [online]. Available from: http://www.crd.york.ac.uk/crdweb/ [Accessed 5 August 2011]

Drummond, Sculpher, Torrance, et al. (2015) **Methods for Economic Evaluation of Health Care progremes**. Fourth. Oxford University Press

Echevarría-Zuno, S., Mejía-Aranguré, J., Mar-Obeso, A., et al. (2009) Infection and death from influenza A H1N1 virus in Mexico: a retrospective analysis. **Lancet**, 374 (9707): 2072–9

Edmunds, W., Medley, G. and Nokes, D. (1999) Evaluating the cost-effectiveness of vaccination programmes: A dynamic perspective. **Statistics in Medicine**. 18 (23) pp. 3263–3282

INEGI (2007) **Estadistícas a propósito del día de la familia mexicana. Datos Nacionales**

Insinga, R., Dasbach, E., Elbasha, E., et al. (2007) Cost-effectiveness of quadrivalent human papillomavirus (HPV) vaccination in Mexico: a transmission dynamic model-based evaluation. **Vaccine**, 26 (1): 128–139

International Monetary Fund (2017) **World Economic Outlook Database April 2017** [online]. Available from: https://www.imf.org/external/pubs/ft/weo/2017/01/weodata/index.aspx [Accessed 24 October 2012]

Karnon, J. (2003) Alternative decision modelling techniques for the evaluation of health care technologies: Markov processes versus discrete event simulation. **Health economics**, 12 (10): 837–48

Kim, S. and Goldie, S. (2008) Cost-effectiveness analyses of vaccination programmes: A focused review of modelling approaches. **PharmacoEconomics**, 26 (3): 191–215

Margolis, H.S., Coleman, P.J. and Mast, E.E. (1996) Cost-effectiveness of hepatitis B virus immunization - Reply. **Jama-Journal of the American Medical Association**, 275 (12): 909

Pidd, M. (2004) **Computer simulation in Managment Science**. 5th ed. John Wiley & Sons, Ltd

Robinson, S. (2004) **Simulation: The Practice of Model Development and Use**. John Wiley & Sons, Ltd

The World Bank (2013) **GDP per capita, PPP (current international $)** [online]. Available from: http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD [Accessed 7 June 2013]

Vynnycky, E. and White, R. (2010) **Infectious Disease Modelling**. Oxford University Press

WHO (2008) **WHO guide for standardization of economic evaluations of immunization programmes**