

# SEASONAL INFLUENZA VACCINATION: PRIORITIZING CHILDREN OR OTHER TARGET GROUPS?

## PART II: COST-EFFECTIVENESS ANALYSIS – SUPPLEMENT 1.2





# SEASONAL INFLUENZA VACCINATION: PRIORITIZING CHILDREN OR OTHER TARGET GROUPS?

## PART II: COST-EFFECTIVENESS ANALYSIS – SUPPLEMENT 1.2

PHILIPPE BEUTELS, YANNICK VANDENDIJK, LANDER WILLEM, NELE GOEYVAERTS, ADRIAAN BLOMMAERT, KIM VAN KERCKHOVE, JOKE BILCKE, GERMAINE HANQUET, PIETER NEELS, NANCY THIRY, JORI LIESENBORGs, NIEL HENS



## COLOPHON

Title:	Seasonal influenza vaccination: prioritizing children or other target groups? Part II: cost-effectiveness analysis – Supplement 1.2.
Authors:	Philippe Beutels (Universiteit Antwerpen), Yannick Vandendijck (Universiteit Hasselt), Lander Willem (Universiteit Antwerpen), Nele Goeyvaerts (Universiteit Hasselt), Adriaan Blommaert (Universiteit Antwerpen), Kim van Kerckhove (Universiteit Hasselt), Joke Bilcke (Universiteit Antwerpen), Germaine Hanquet (KCE), Pieter Neels (FAGG – AFMPS), Nancy Thiry (KCE), Jori Liesenborgs (Universiteit Hasselt), Niel Hens (Universiteit Hasselt).
Reviewers:	Jo Robays, Frank Hulstaert and Raf Mertens.
External Experts:	Rik Baeten (VIGEZ), Johan Bots (Gemeenschappelijke Gemeenschapscommissie), Liesbeth Dejaegere (VIGEZ), Ann Malfroot (UZ Brussel), Daniel Reynders (SPF Santé Publique – FOD Volksgezondheid), Béatrice Swennen (Université Libre de Bruxelles), Isabelle Thomas (ISP – WIV), Geert Top (Vlaams Agentschap Zorg en Gezondheid), Patrick Tréfois (Question Santé), Yves Van Laethem (Centre Hospitalier Universitaire St. Pierre), Anne Vergison (Université Libre de Bruxelles), Françoise Wuillaume (ISP – WIV).
Acknowledgements:	<p>Yannick Vandendijck acknowledges support from a doctoral grant of the Universiteit Hasselt (BOF11D04FAEC). Lander Willem acknowledges support from an interdisciplinary doctoral grant of the Universiteit Antwerpen (ID-BOF25759), Nele Goeyvaerts is beneficiary of a postdoctoral grant from the AXA Research Fund, Adriaan Blommaert acknowledges support from the Universiteit Antwerpen concerted research action number 23405 (BOF-GOA), Joke Bilcke is supported by a postdoctoral grant from the Fund for Scientific Research Flanders (FWO), Niel Hens acknowledges support from the Universiteit Antwerpen scientific chair in Evidence-Based Vaccinology, financed in 2009–2013 by a gift from Pfizer. Support from the IAP Research Network P7/06 of the Belgian State (Belgian Science Policy) is gratefully acknowledged.</p> <p>For the simulations we used the infrastructure of the VSC - Flemish Supercomputer Center, funded by the Hercules foundation and the Flemish Government - department EWI. We thank Geert Jan Bex (Universiteit Hasselt and KULeuven) for support with using the VSC cluster, as well as Frank Van Reeth (Expertise Centre for Digital Media, Universiteit Hasselt).</p> <p>We are indebted to the following persons for their help mainly through general advice, data delivery, data interpretation or review.</p> <p>We thank Anthony Newall (University of New South Wales, Sydney, Australia) and Mark Jit (Health Protection Agency, The UK) for support in conducting systematic reviews of economic evaluations.</p> <p>We are grateful to Samuel Coenen and Niels Adriaenssens (Centre for General Practice &amp; Laboratory of Medical Microbiology, Vaccine &amp; Infectious Disease Institute, University of Antwerp), Curt Brugman (Julius Center for Health Science and Primary Care, UMC Utrecht, the Netherlands), Pierre Van Damme (Centre for the Evaluation</p>



of Vaccination, Vaccine & Infectious Disease Institute, University of Antwerp) and Herman Goossens (Laboratory of Medical Microbiology, Vaccine & Infectious Disease Institute, University of Antwerp, and coordinator of Genomics to combat Resistance against Antibiotics in Community-acquired LRTI in Europe – GRACE, DG Research, 2005) for helping with interpreting reviews and the medication data we collected through our survey on influenza like illness, and sharing antibiotics data of GRACE.

We also thank marketing research company “DayOne” (in particular Koen Van Bulck) for conducting the 2011-2012 influenza season survey on influenza like illness in the general population.

This study was made possible thanks to the collaboration of the Institut Scientifique de Santé Publique/Wetenschappelijk Instituut Volksgezondheid (ISP – WIV) that provided the sentinel laboratory and influenza data, the Reference Laboratory for *Streptococcus pneumoniae* at the UZ Leuven, the Technical Cell for the Minimal Clinical Data, the Federation Wallonia-Brussels, the Vlaams Agentschap Zorg en Gezondheid and the Observatorium voor Gezondheid en Welzijn van Brussel-Hoofdstad – Observatoire de la Santé et du Social de Bruxelles-Capitale for the data on the causes of death. We particularly thank Jan Verhaegen and Jozef Vandeven (UZ Leuven), Françoise Guillaume, Viviane van Casteren, Geneviève Ducoffre and Isabelle Thomas (ISP – WIV), Déogratias Mazina and Murielle Deguerry (Observatoire de la Santé et du Social de Bruxelles-Capitale – Observatorium voor Gezondheid en Welzijn van Brussel-Hoofdstad), Erik Hendrickx, Anne Kongs and Heidi Cloots (Vlaams Agentschap Zorg en Gezondheid), Virginie Charlier (Fédération Wallonie-Bruxelles), Yves Parmentier (INAMI – RIZIV), France Vrijens, Jo Robays, Carl Devos, Stephan Devriese and Frank Hulstaert (KCE). We also thank Esther Kissling (EpiConcept) and Bianca Cox (University Hasselt) for advices on STATA programming. We also thank Kristel De Gauquier (KCE) for continuous support and management throughout the study.

External Validators:

Daniel Brasseur (AFMPS – FAGG, European Medicines Agency and Hôpital Universitaire des Enfants Reine Fabiola), Marc Van Ranst (KULeuven, Hoge Gezondheidsraad – Conseil Supérieur de la Santé), Emilia Vynnycky (London School of Tropical Medicine and Hygiene).

Other reported interests:

Marc Van Ranst (MVR) has acted as principal investigator or consultant for projects for which the University of Leuven received grants and funds for research. These grants and funds were directly paid to the University and MVR received no personal remuneration for this work. Yves Van Laethem received funds for research and consultancy fees and fees to speak at conferences from companies involved in influenza vaccines but these activities were not related to influenza, and these fees were paid directly to the Research Unit of his hospital. Anne Vergison received consultancy fees from companies involved in pneumococcal vaccines to participate to scientific advisory boards and to speak at conferences on pneumococcal vaccination. These fees were paid directly to her hospital. Beatrice Swennen received a travel grant to participate at a scientific conference. Patrick Tréfois collaborates to the Vax Info journal which received unrestricted educational grant from GSK.

Layout:

Sophie Vaes



**Disclaimer:**

- The external experts were consulted about a (preliminary) version of the scientific report. Their comments were discussed during meetings. They did not co-author the scientific report and did not necessarily agree with its content.
- Subsequently, a (final) version was submitted to the validators. The validation of the report results from a consensus or a voting process between the validators. The validators did not co-author the scientific report and did not necessarily all three agree with its content.
- Finally, this report has been approved by common assent by the Executive Board.
- Only the KCE is responsible for errors or omissions that could persist. The policy recommendations are also under the full responsibility of the KCE

Publication date: 12 July 2013

Domain: Health Technology Assessment (HTA)

MeSH: Influenza Vaccines; Influenza, Human; Pregnancy; Comorbidity; Health Personnel; Infant; Child, Preschool; Child; Adolescent; Young Adult; Middle Aged; Aged; Cost-Benefit Analysis; Costs and Cost Analysis.

NLM Classification: WC 515

Language: English

Format: Adobe® PDF™ (A4)

Legal depot: D/2013/10.273/45

Copyright: KCE reports are published under a “by/nc/nd” Creative Commons Licence  
<http://kce.fgov.be/content/about-copyrights-for-kce-reports>.



**How to refer to this document ?**

Beutels P, Vandendijck Y, Willem L, Goeyvaerts N, Blommaert A, van Kerckhove K, Bilcke J, Hanquet G, Neels P, Thiry N, Liesenborgs J, Hens N. Seasonal influenza vaccination: prioritizing children or other target groups? Part II: cost-effectiveness analysis – Supplement 1.2. Health Technology Assessment (HTA) Brussels: Belgian Health Care Knowledge Centre (KCE). 2013. KCE Reports 204S1.2. D/2013/10.273/45.

This document is available on the website of the Belgian Health Care Knowledge Centre



## ■ SUPPLEMENT REPORT

### TABLE OF CONTENTS

<b>4.</b>	<b>DYNAMIC TRANSMISSION MODEL: ADDITIONAL RESULTS .....</b>	<b>13</b>
4.1.	MODIFIED CHILDREN OPTIONS + CURRENT ADULT VACCINATION (AVERAGE WANING IMMUNITY FIXED AT 1.68 YEARS) .....	13
4.1.1.	Effectiveness versus current situation .....	13
4.1.2.	Incremental analyses .....	31
4.2.	MODIFIED CHILDREN OPTIONS + CURRENT ADULT VACCINATION (WANING IMMUNITY FIXED AT AN AVERAGE OF 6 YEARS) .....	40
4.2.1.	Effectiveness versus current situation .....	40
4.2.2.	Cost-effectiveness versus current situation .....	58
4.3.	MODIFIED CHILDREN OPTIONS + MODIFIED ADULT VACCINATION TARGETS (WANING IMMUNITY FIXED AT AN AVERAGE OF 1.68 YEARS) .....	77
4.3.1.	Effectiveness versus current situation .....	77
4.3.2.	Incremental cost-effectiveness analysis .....	95
4.4.	MODIFIED CHILDREN OPTIONS + MODIFIED ADULT VACCINATION TARGETS (WANING IMMUNITY FIXED AT 6 YEARS) .....	128
4.4.1.	Effectiveness versus current situation .....	128
4.4.2.	Incremental cost-effectiveness analysis .....	146
4.4.3.	Sensitivity analysis: identifying the optimal expansion path under decreasing vaccination costs in children, with waning immunity of 1/6 years .....	167
4.5.	MODIFIED CHILDREN OPTIONS + MODIFIED ADULT VACCINATION REDUCTION (WANING IMMUNITY FIXED AT 1.68 YEARS) .....	170
4.5.1.	Effectiveness versus current situation .....	170
4.6.	MODIFIED CHILDREN OPTIONS + MODIFIED ADULT VACCINATION REDUCTION (WANING IMMUNITY FIXED AT 6 YEARS) .....	188
4.6.1.	Effectiveness versus current situation .....	188



## LIST OF FIGURES

Figure 36 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 10% coverage .....	13
Figure 37 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 20% coverage .....	15
Figure 38 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 30% coverage .....	17
Figure 39 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 40% coverage .....	19
Figure 40 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 50% coverage .....	21
Figure 41 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 60% coverage .....	23
Figure 42 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 70% coverage .....	25
Figure 43 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 80% coverage .....	27
Figure 44 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 90% coverage .....	29
Figure 45 – Incremental CEACs for remaining childhood vaccination options at 10% (top) and 20% (bottom) vaccination coverage after exclusion of dominated options, whilst assuming adult vaccination remains constant over a 10 year time span, and with immunity lasting an average of 1.68 years (i.e. exponential waning rate of 1/1.68 per year) .....	31
Figure 46 – Incremental CEACs for remaining childhood vaccination options at 30% (top) and 40% (bottom) vaccination coverage after exclusion of dominated options, whilst assuming adult vaccination remains constant over a 10 year time span, and with immunity lasting an average of 1.68 years (i.e. exponential waning rate of	



1/1.68 per year) .....	33
Figure 47 – Incremental CEACs for remaining childhood vaccination options at 50% (top) and 60% (bottom) vaccination coverage after exclusion of dominated options, whilst assuming adult vaccination remains constant over a 10 year time span, and with immunity lasting an average of 1.68 years (i.e. exponential waning rate of 1/1.68 per year) .....	35
Figure 48 – Incremental CEACs for remaining childhood vaccination options at 70% (top) and 80% (bottom) vaccination coverage after exclusion of dominated options, whilst assuming adult vaccination remains constant over a 10 year time span, and with immunity lasting an average of 1.68 years (i.e. exponential waning rate of 1/1.68 per year) .....	37
Figure 49 – Incremental CEACs for remaining childhood vaccination options at 90% vaccination coverage after exclusion of dominated options, whilst assuming adult vaccination remains constant over a 10 year time span, and with immunity lasting an average of 1.68 years (i.e. exponential waning rate of 1/1.68 per year).....	39
Figure 50 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 10% coverage, and with immunity lasting an average of 6 years .....	40
Figure 51 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 20% coverage .....	42
Figure 52 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 30% coverage .....	44
Figure 53 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 40% coverage .....	46
Figure 54 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 50% coverage .....	48
Figure 55 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 60% coverage .....	50
Figure 56 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 70% coverage .....	52
Figure 57 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP	



consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 80% coverage .....	54
Figure 58 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 90% coverage .....	56
Figure 59 – CEACs for 19 childhood vaccination options at 10% (top) and 20% (bottom) vaccination coverage versus the current situation, with immunity lasting an average of 6 years .....	58
Figure 60 – CEACs for 19 childhood vaccination options at 30% (top) and 40% (bottom) vaccination coverage versus the current situation, with immunity lasting an average of 6 years .....	60
Figure 61 – CEACs for 19 childhood vaccination options at 50% (top) and 60% (bottom) vaccination coverage versus the current situation, with immunity lasting an average of 6 years .....	62
Figure 62 – CEACs for 19 childhood vaccination options at 70% (top) and 80% (bottom) vaccination coverage versus the current situation, with immunity lasting an average of 6 years .....	64
Figure 63 – CEACs for 19 childhood vaccination options at 90% vaccination coverage versus the current situation, with immunity lasting an average of 6 years .....	66
Figure 64 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c1 (left) and Option c2 (right) versus the current situation, with immunity lasting an average of 6 years.....	67
Figure 65 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c3 (left) and Option c4 (right) versus the current situation, and with immunity lasting an average of 6 years.....	68
Figure 66 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c5 (left) and Option c6 (right) versus the current situation, and with immunity lasting an average of 6 years.....	69
Figure 67 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c7 (left) and Option c8 (right) versus the current situation, and with immunity lasting an average of 6 years.....	70
Figure 68 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c9 (left) and Option c10 (right) versus the current situation, and with immunity lasting an average of 6 years.....	71
Figure 69 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c11 (left) and Option c12 (right) versus the current situation, and with immunity lasting an average of 6 years.....	72
Figure 70 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c13 (left) and Option c14 (right) versus the current situation, and with immunity lasting an average of 6 years.....	73
Figure 71 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c15 (left) and Option c16 (right) versus the current situation, and with immunity lasting an average of 6 years.....	74
Figure 72 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c17 (left) and Option c18 (right) versus the current situation, and with immunity lasting an average of 6 years.....	75
Figure 73 – Boxplot of the distribution of the ICERs by 10% increases in vaccination coverage for Option c19	



versus the current situation, and with immunity lasting an average of 6 years .....	76
Figure 74 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 10% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	77
Figure 75 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 20% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	79
Figure 76 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 30% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	81
Figure 77 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 40% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	83
Figure 78 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 50% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	85
Figure 79 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c2) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 60% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	87
Figure 80 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c2) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 70% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	89
Figure 81 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c2) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 80% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	91
Figure 82 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c2) and most (bottom; At11c16) effective	



option amongst 437 combined child-adult options at 90% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	93
Figure 83 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 10% coverage level of the child components of the options, with immunity lasting an average of 1.68 years .....	97
Figure 84 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 20% coverage level of the child components of the options, and with immunity lasting an average of 1.68 years .....	103
Figure 85 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 30% coverage level of the child components of the options, and with immunity lasting an average of 1.68 years .....	108
Figure 86 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 40% coverage level of the child components of the options, and with immunity lasting an average of 1.68 years .....	112
Figure 87 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 50% coverage level of the child components of the options, and with immunity lasting an average of 1.68 years .....	115
Figure 88 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 60% coverage level of the child components of the options, and with immunity lasting an average of 1.68 years .....	118
Figure 89 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 70% coverage level of the child components of the options, and with immunity lasting an average of 1.68 years .....	121
Figure 90 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 80% coverage level of the child components of the options, and with immunity lasting an average of 1.68 years .....	124
Figure 91 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 90% coverage level of the child components of the options, and with immunity lasting an average of 1.68 years .....	127
Figure 92 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 10% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	128
Figure 93 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective	



option amongst 437 combined child-adult options at 20% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	130
Figure 94 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 30% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	132
Figure 95 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 40% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	134
Figure 96 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 50% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	136
Figure 97 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c2) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 60% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	138
Figure 98 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c2) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 70% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	140
Figure 99 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c2) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 80% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	142
Figure 100 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c2) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 90% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	144
Figure 101 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 10% coverage level of the child components of the options, and with immunity lasting an average of 6 years .....	147
Figure 102 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 20% coverage level of the child components of the options, and with immunity lasting	



an average of 6 years .....	150
Figure 103 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 30% coverage level of the child components of the options, and with immunity lasting an average of 6 years .....	153
Figure 104 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 40% coverage level of the child components of the options, and with immunity lasting an average of 6 years .....	156
Figure 105 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 50% coverage level of the child components of the options, and with immunity lasting an average of 6 years .....	159
Figure 106 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 60% coverage level of the child components of the options, and with immunity lasting an average of 6 years .....	162
Figure 107 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 10% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	170
Figure 108 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 20% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	172
Figure 109 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 30% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	174
Figure 110 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 40% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	176
Figure 111 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 50% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	178
Figure 112 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16)	



effective option amongst 171 combined child-adult options at 60% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	180
Figure 113 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 70% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	182
Figure 114 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 80% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	184
Figure 115 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 90% coverage for the child components of the option, and with immunity lasting an average of 1.68 years.....	186
Figure 116 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 10% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	188
Figure 117 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 20% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	190
Figure 118 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 30% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	192
Figure 119 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 40% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	194
Figure 120 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 50% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	196
Figure 121 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP	



consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 60% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	198
Figure 122 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 70% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	200
Figure 123 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 80% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	202
Figure 124 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 90% coverage for the child components of the option, and with immunity lasting an average of 6 years.....	204



## LIST OF TABLES

Table 32 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 10% in children (<18y), immunity lasting an average of 1.68 years.....	95
Table 33 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 20% in children (<18y) and with immunity lasting an average of 1.68 years .....	101
Table 34 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by (extended) dominance for a vaccination coverage of 30% in children (<18y) and with immunity lasting an average of 1.68 years .....	107
Table 35 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 40% in children (<18y), and with immunity lasting an average of 1.68 years .....	111
Table 36 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 50% in children (<18y), and with immunity lasting an average of 1.68 years .....	114
Table 37 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 60% in children (<18y), and with immunity lasting an average of 1.68 years .....	117
Table 38 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 70% in children (<18y), and with immunity lasting an average of 1.68 years .....	120
Table 39 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 80% in children (<18y), and with immunity lasting an average of 1.68 years .....	123
Table 40 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 90% in children (<18y), and with immunity lasting an average of 1.68 years .....	126
Table 41 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 10% in children (<18y), and with immunity lasting an average of 6 years .....	146
Table 42 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 20% in children (<18y), and with immunity lasting an average of 6 years .....	149



Table 43 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 30% in children (<18y), and with immunity lasting an average of 6 years .....	152
Table 44 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 40% in children (<18y), and with immunity lasting an average of 6 years .....	155
Table 45 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 50% in children (<18y), and with immunity lasting an average of 6 years .....	158
Table 46 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 60% in children (<18y), and with immunity lasting an average of 6 years .....	161
Table 47 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by (extended) dominance for a vaccination coverage of 70% in children (<18y), and with immunity lasting an average of 6 years .....	164
Table 48 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by (extended) dominance for a vaccination coverage of 80% in children (<18y), and with immunity lasting an average of 6 years .....	165
Table 49 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by (extended) dominance for a vaccination coverage of 90% in children (<18y), and with immunity lasting an average of 6 years .....	166
Table 50 – Selection of optimal expansion path along the efficiency frontier, identified by criteria of dominance and extended dominance for 19 child options for vaccination at 9 different coverage levels combined with 23 adult vaccination strategies (i.e. 3933 options), assuming various levels of vaccination costs per dose for child (<18y) vaccination and a duration until waned immunity of 6 years; the amounts listed are the incremental direct costs per QALY gained versus the next best alternative.....	167

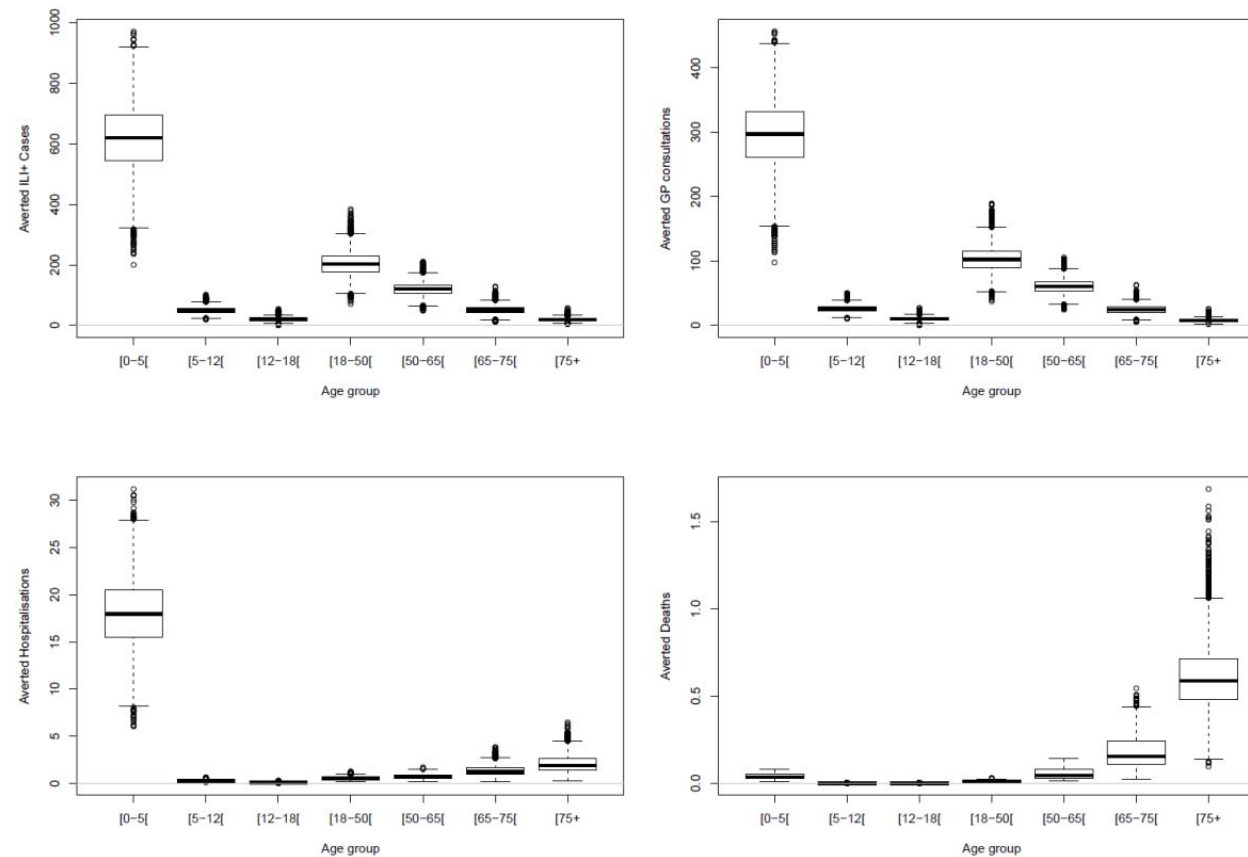


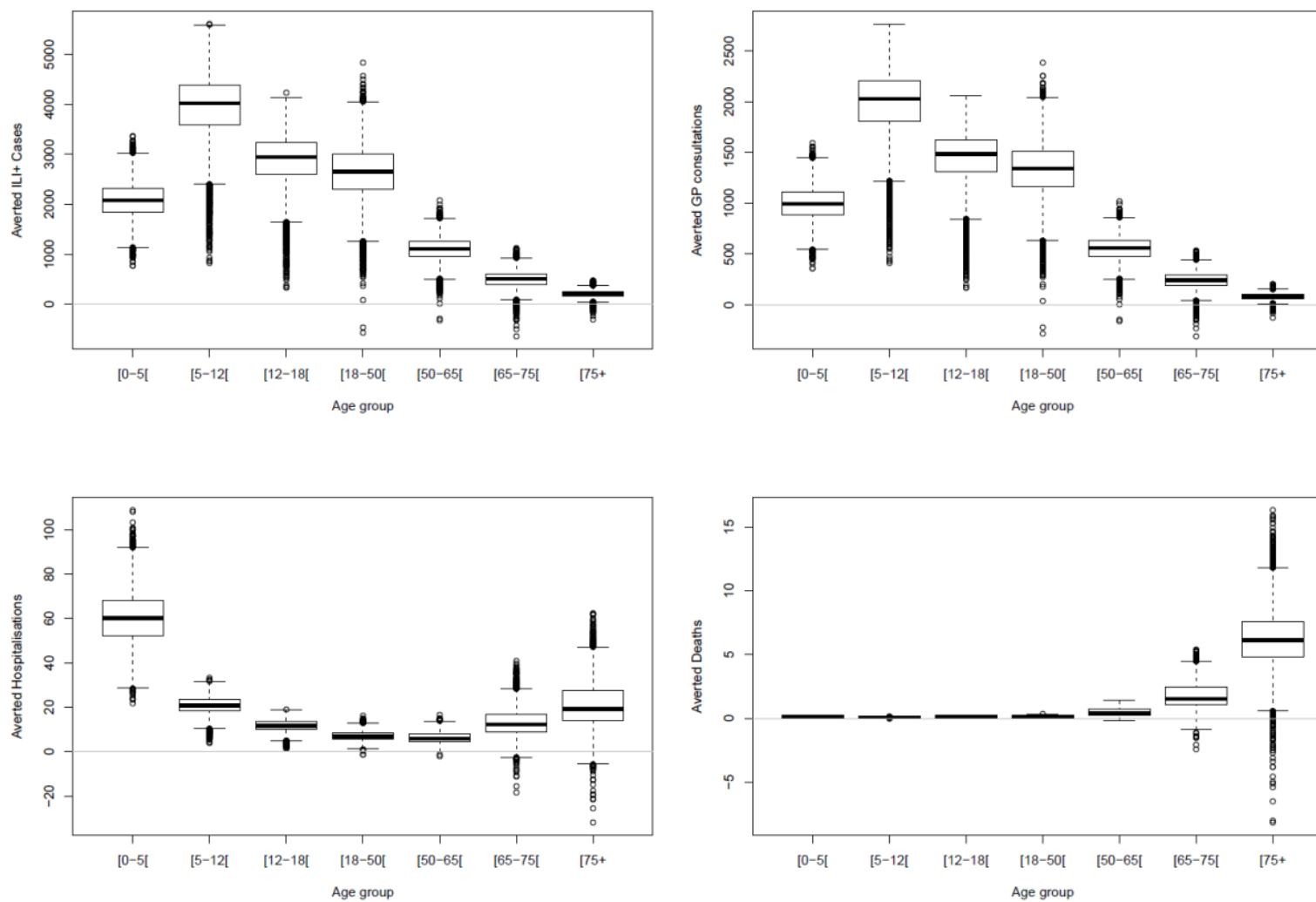
## 4. DYNAMIC TRANSMISSION MODEL: ADDITIONAL RESULTS

### 4.1. Modified children options + current adult vaccination (average waning immunity fixed at 1.68 years)

#### 4.1.1. Effectiveness versus current situation

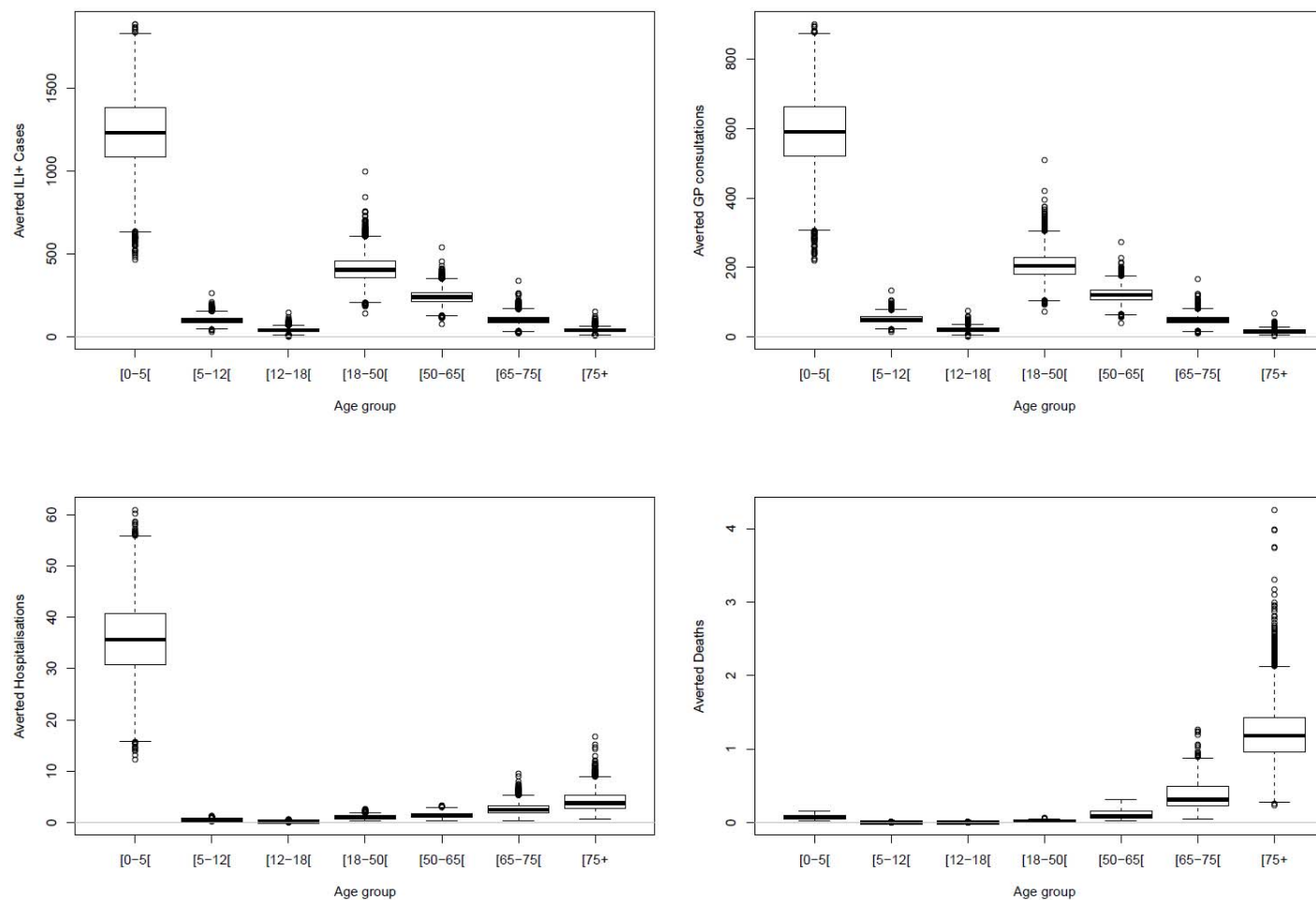
Figure 1 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 10% coverage

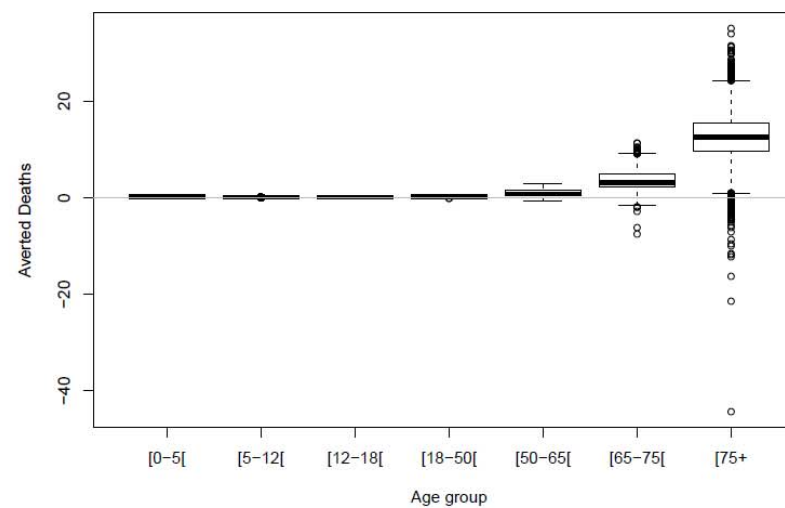
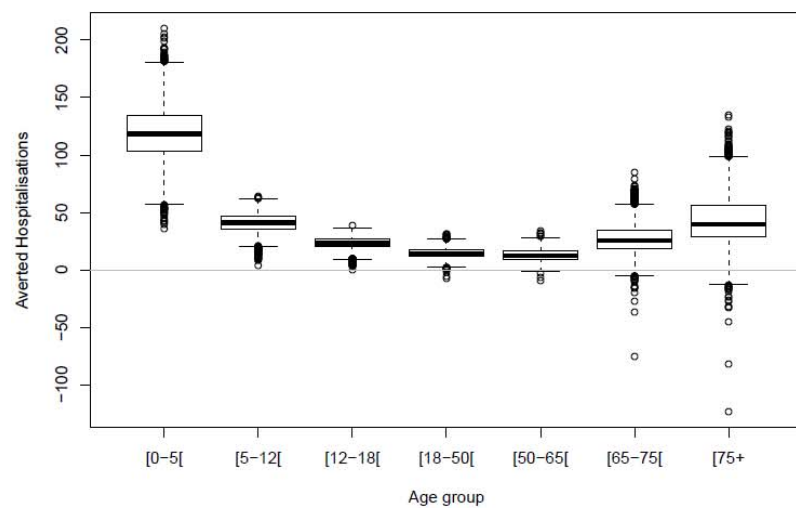
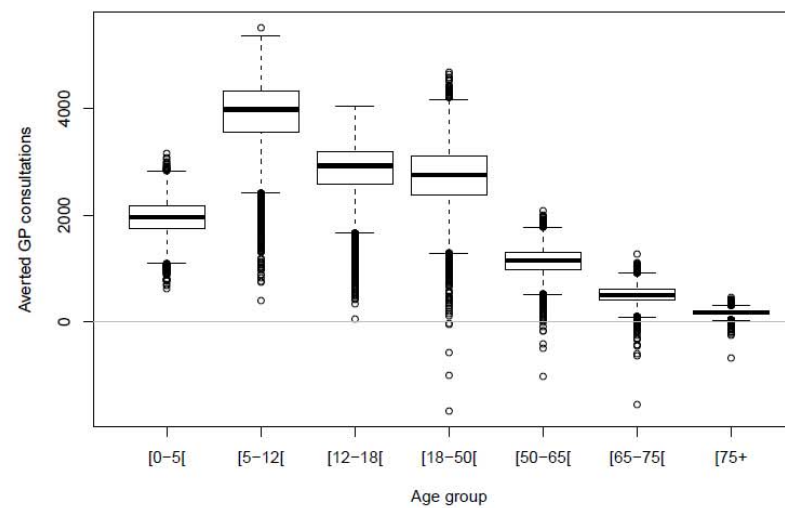
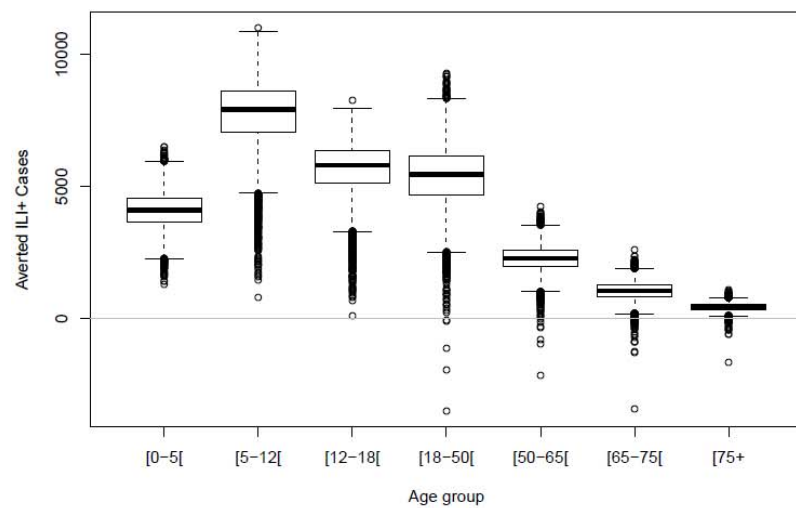






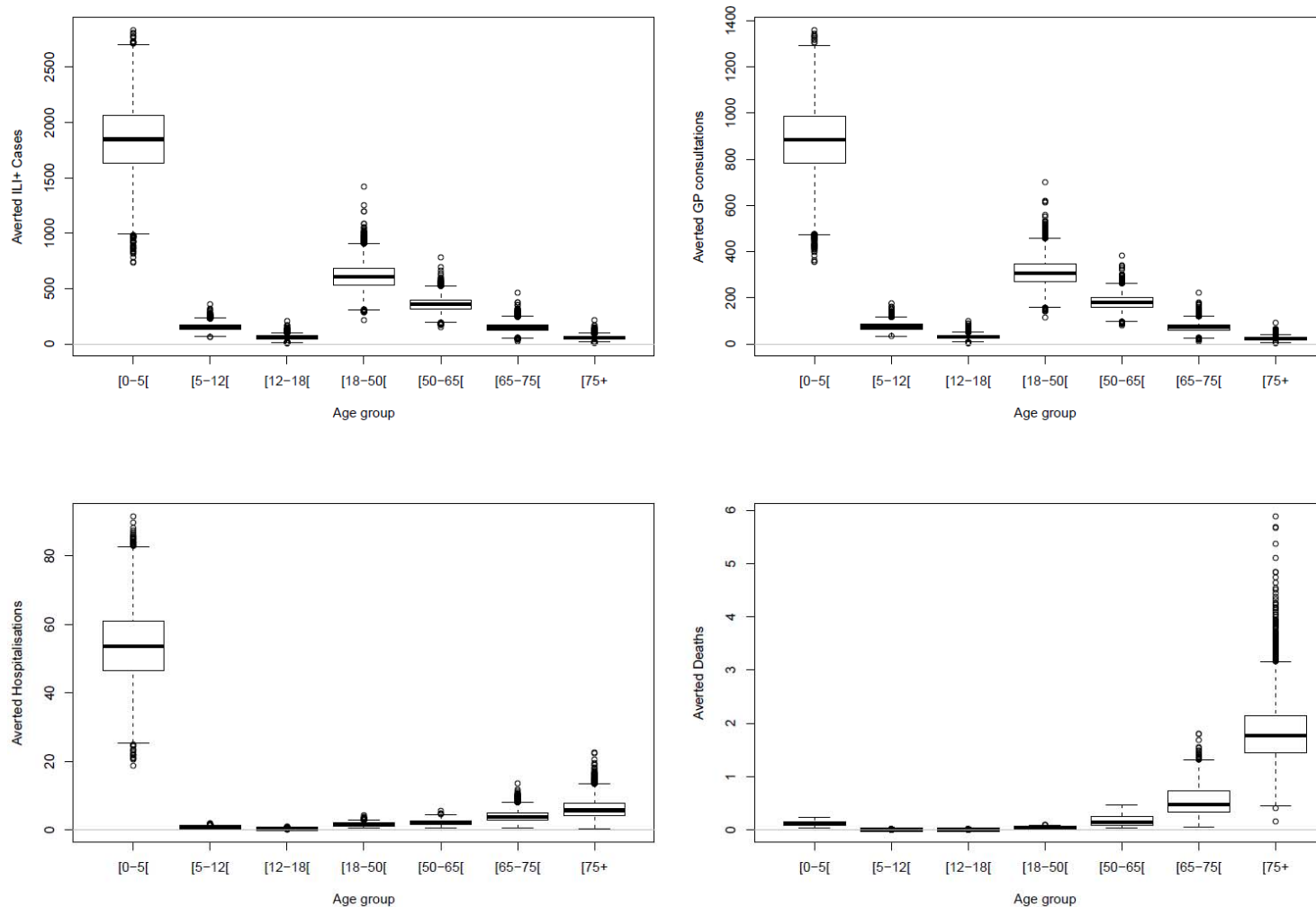
**Figure 2 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 20% coverage**

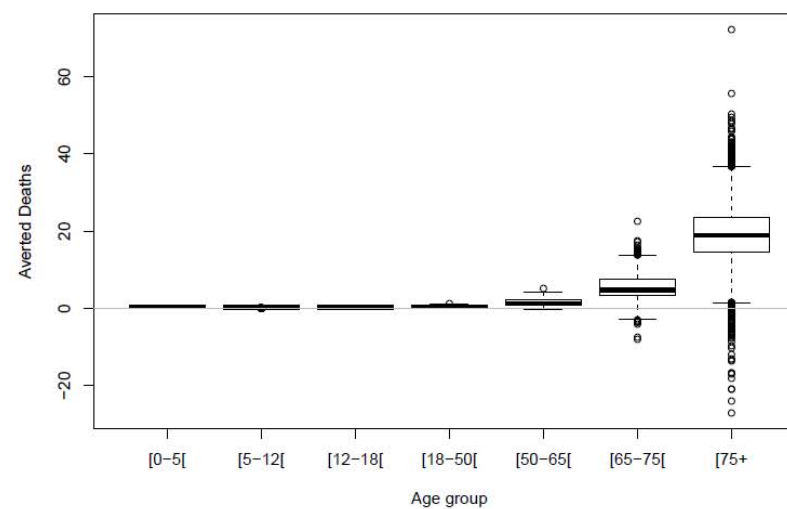
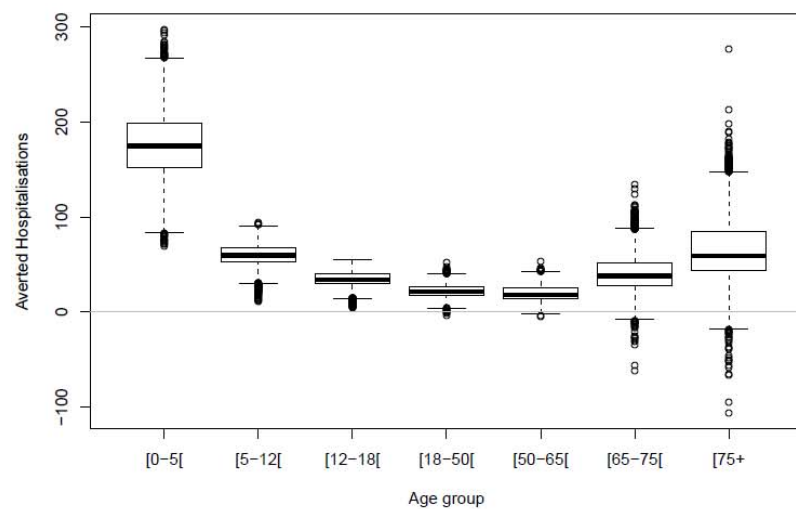
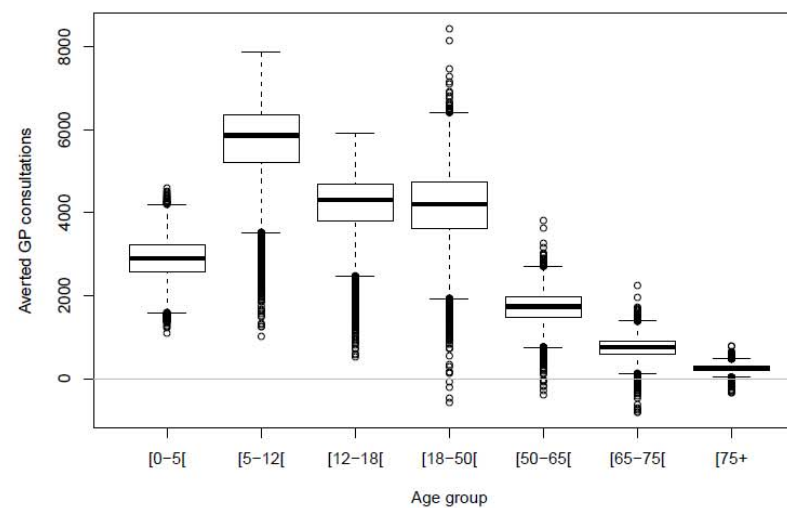
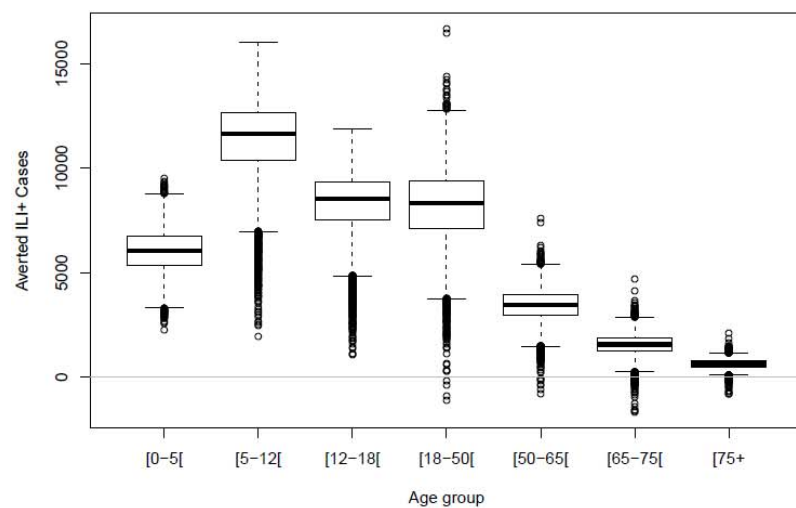






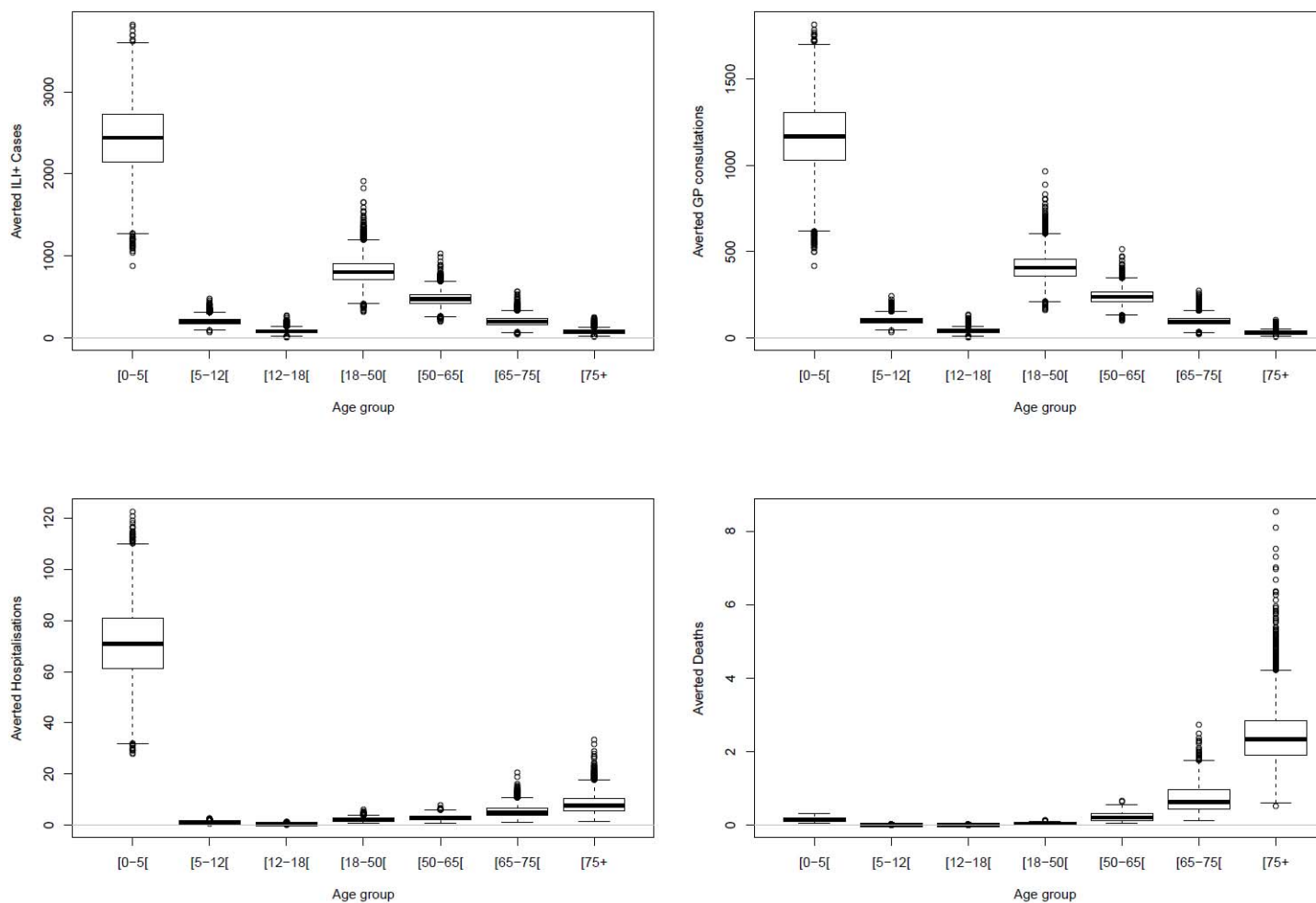
**Figure 3 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 30% coverage**

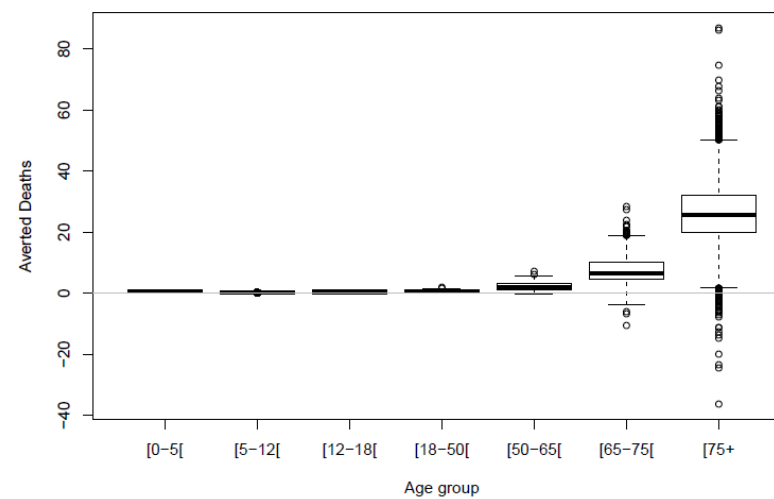
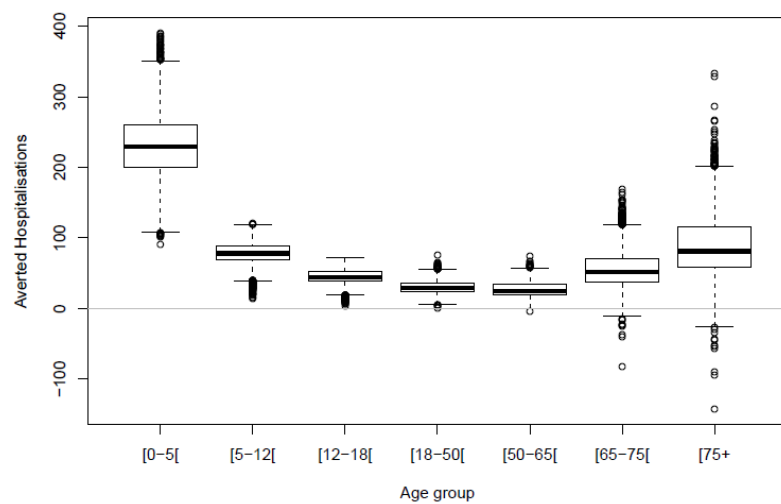
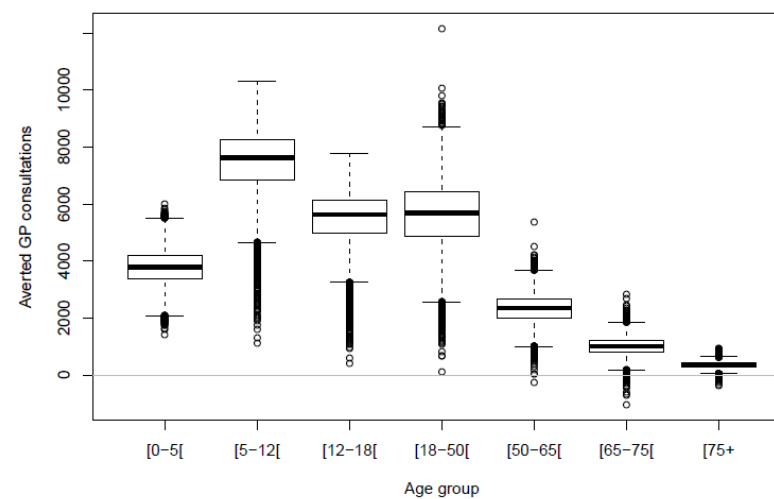
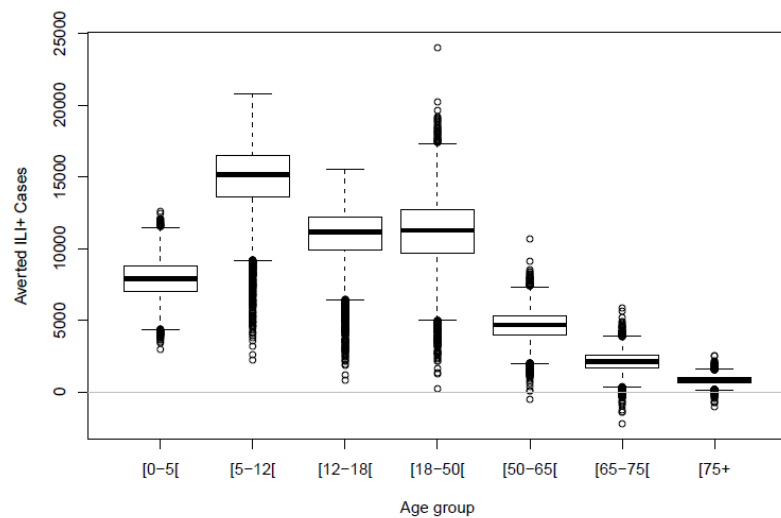






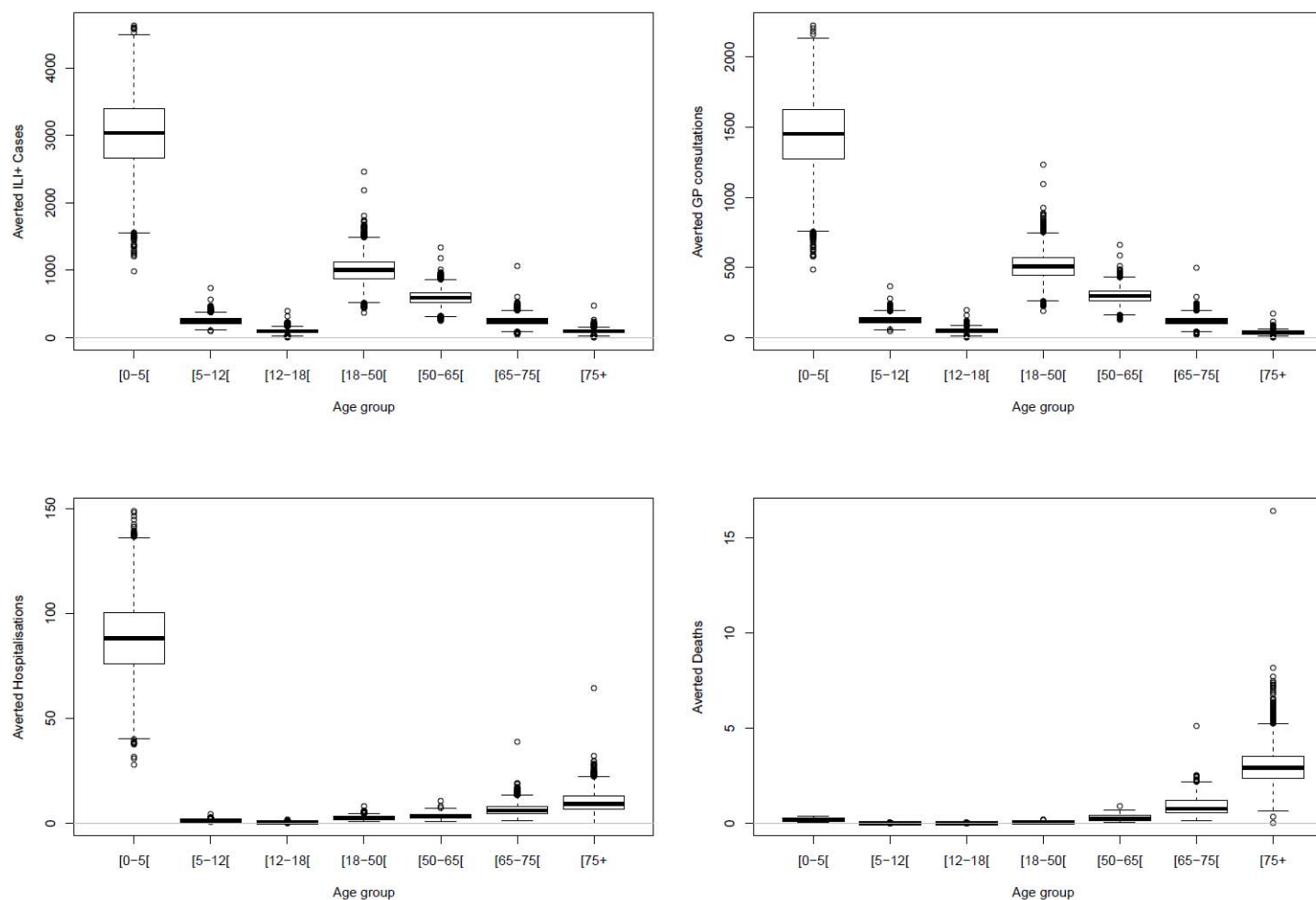
**Figure 4 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 40% coverage**

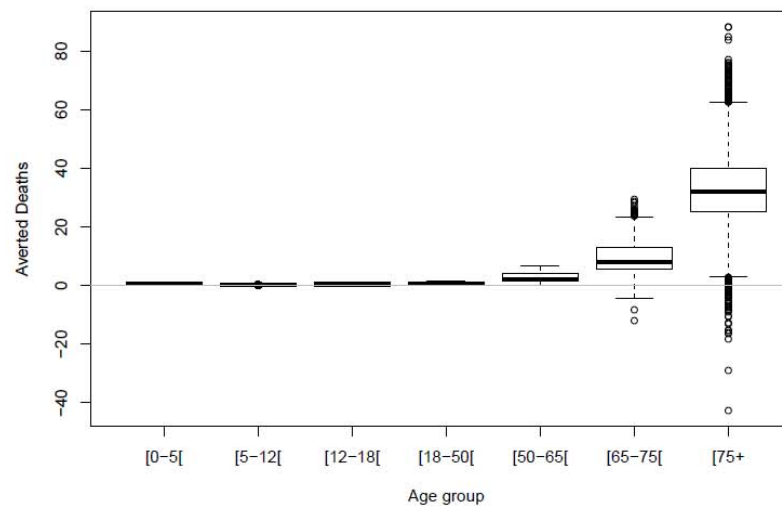
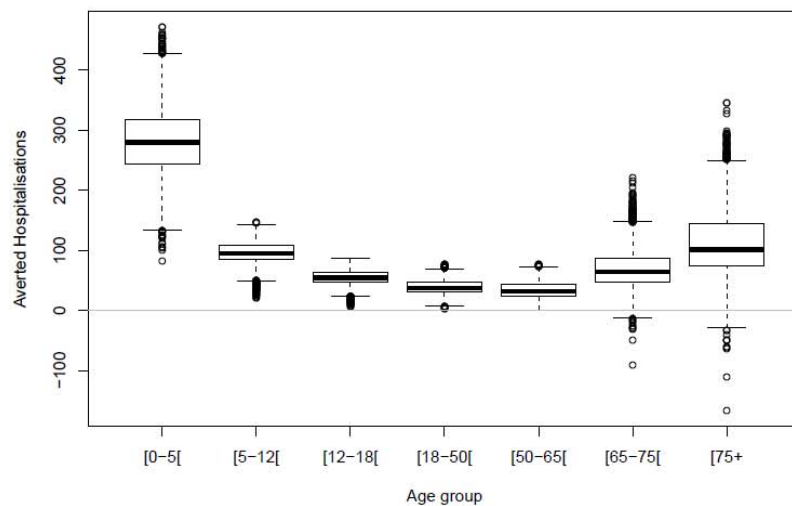
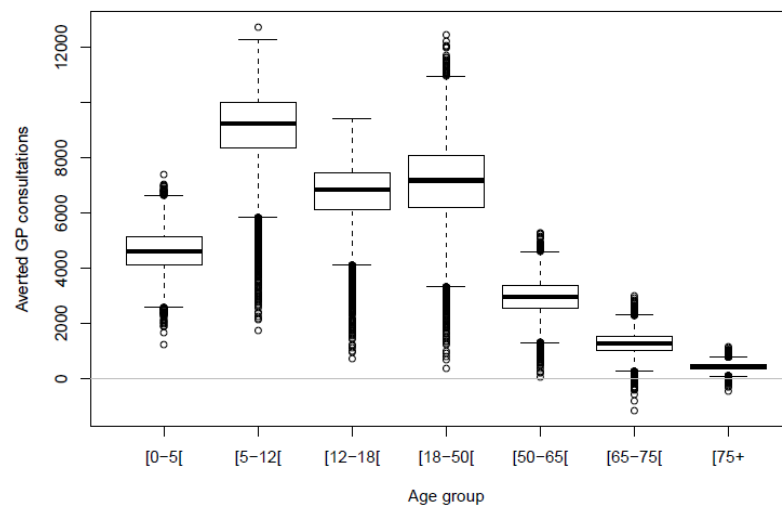
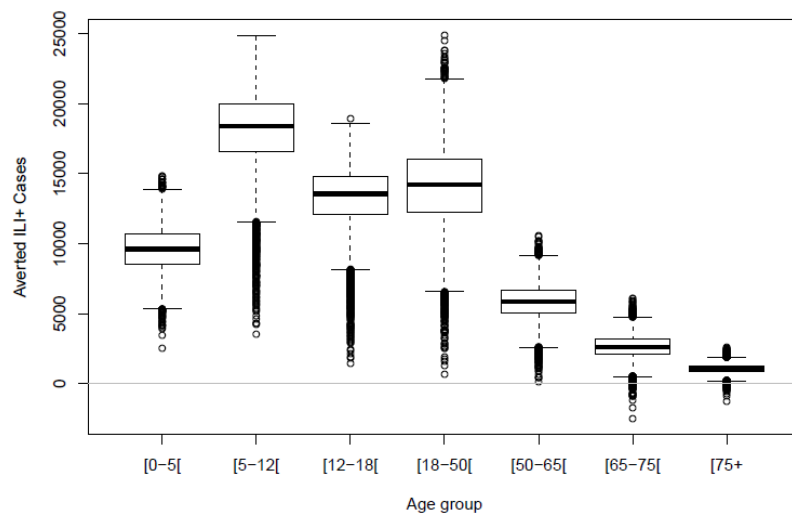






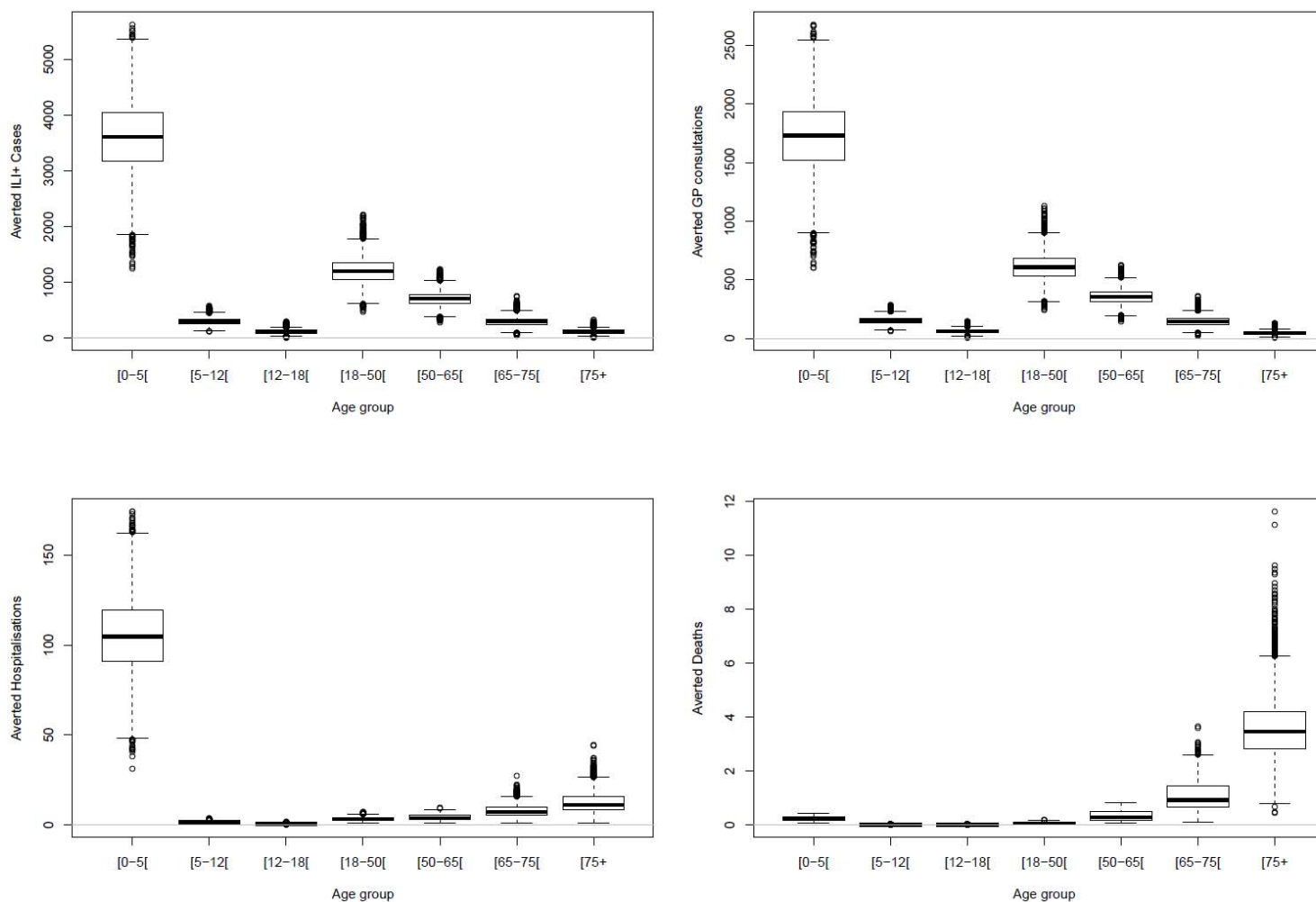
**Figure 5 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 50% coverage**

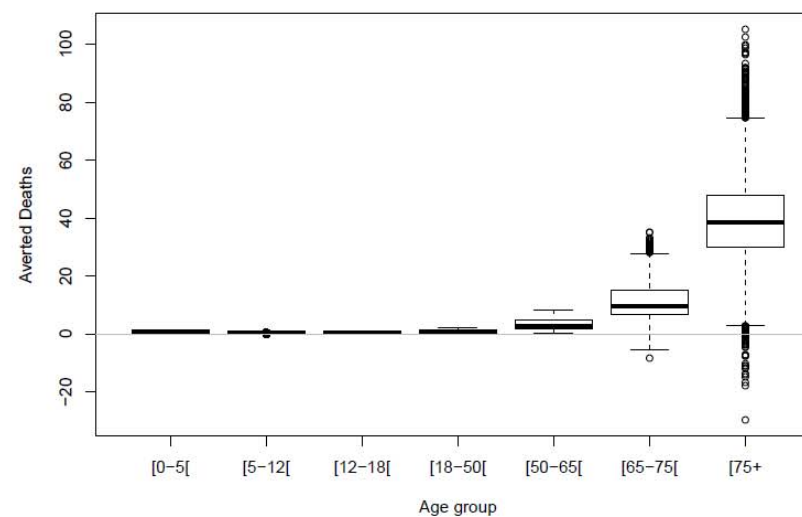
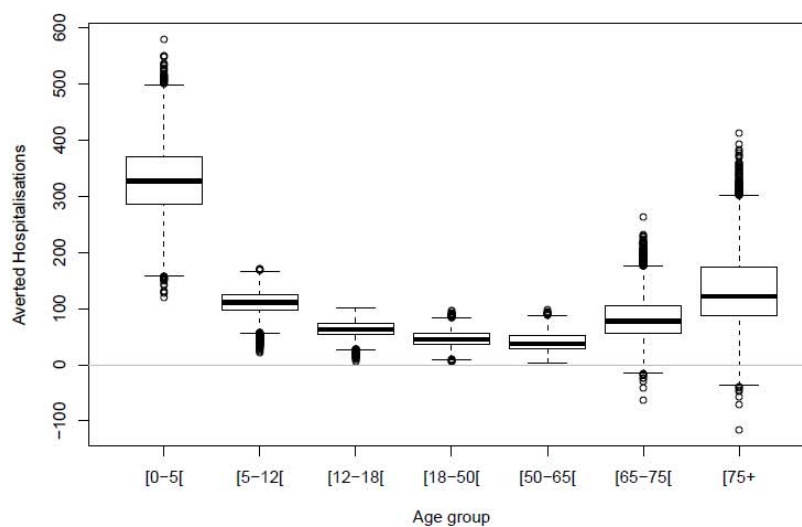
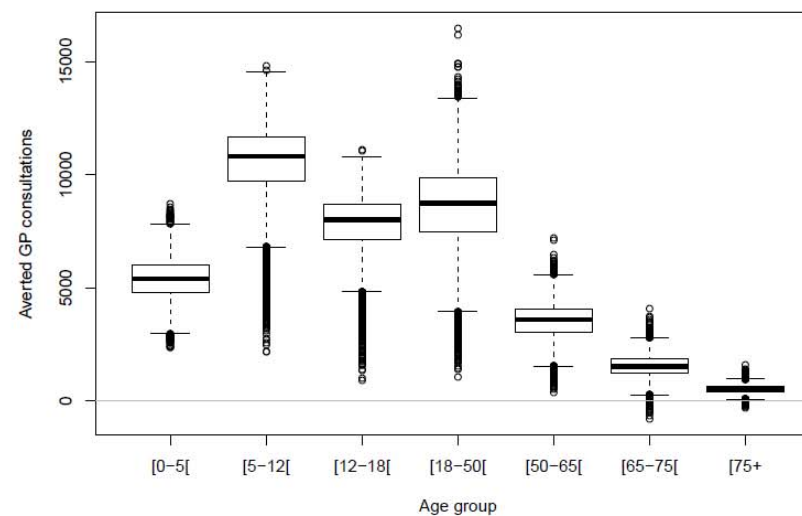
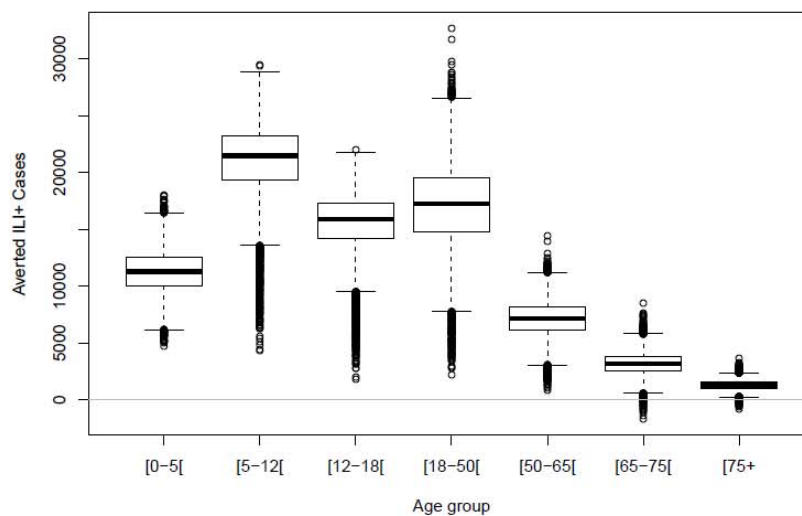






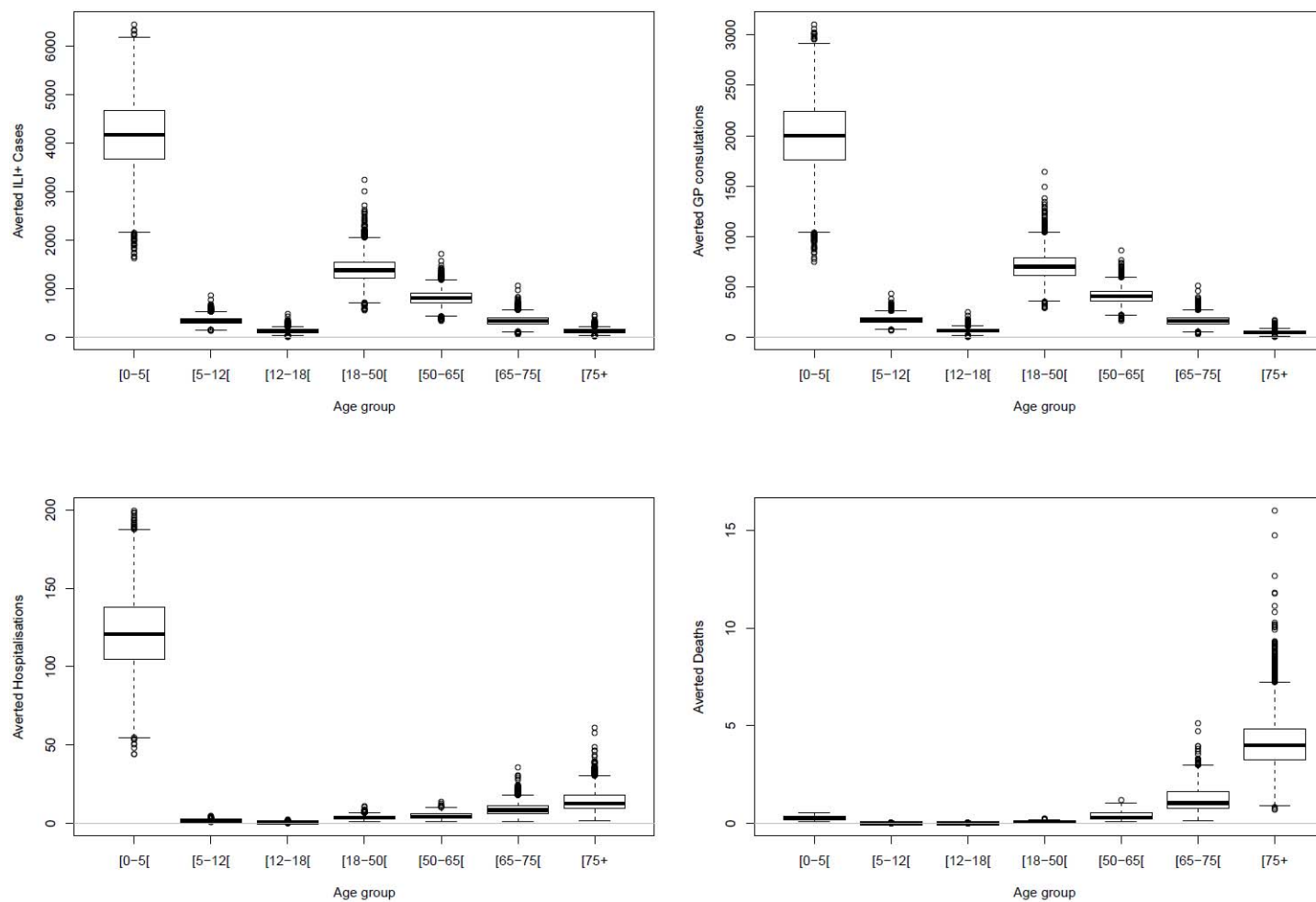
**Figure 6 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 60% coverage**

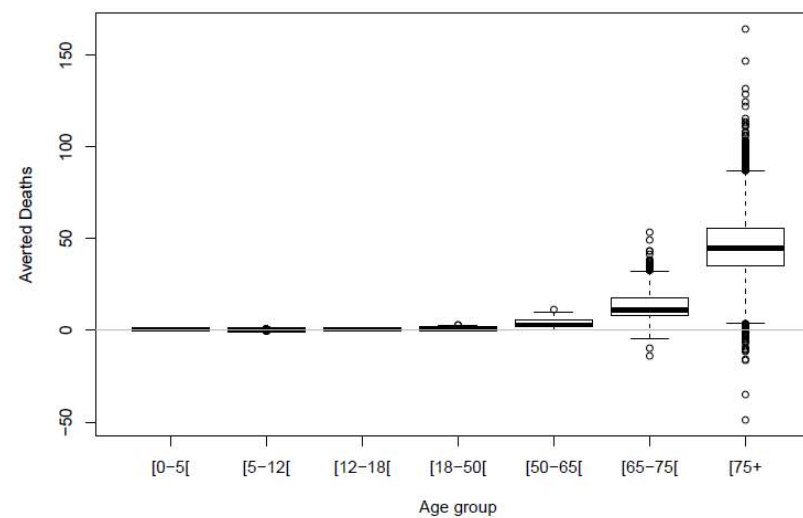
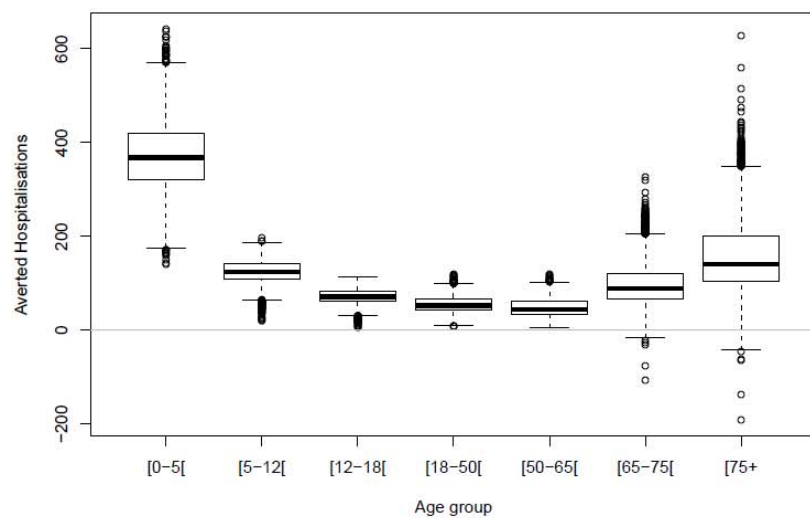
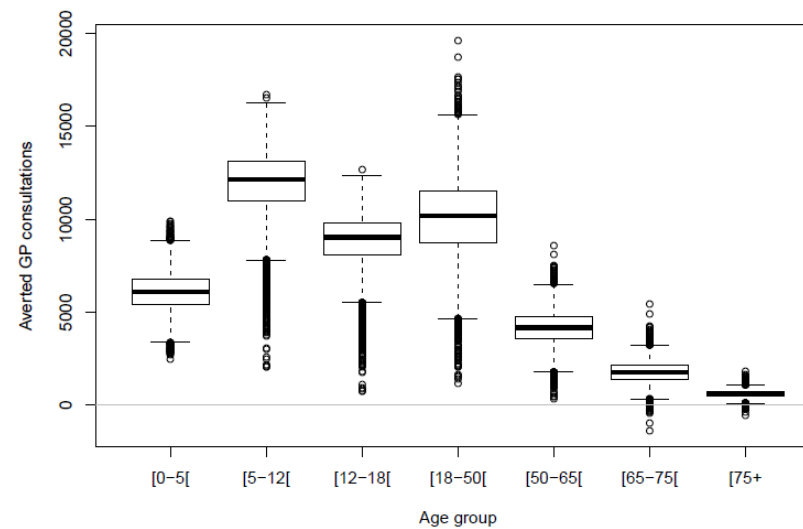
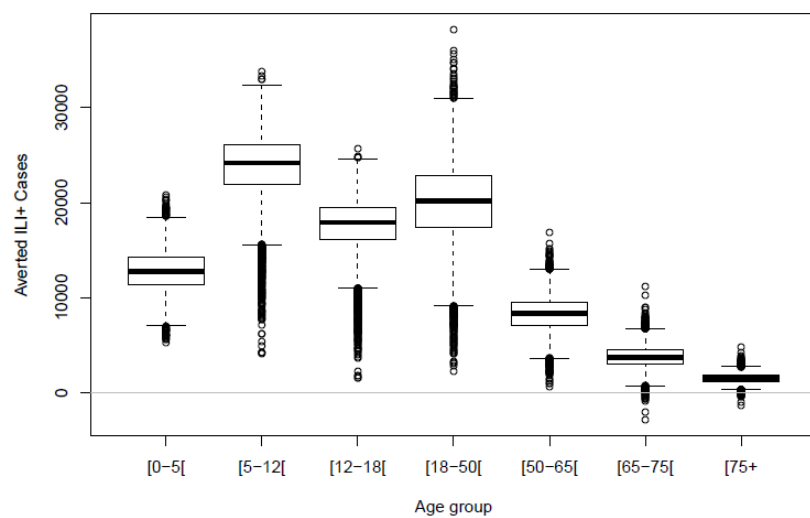






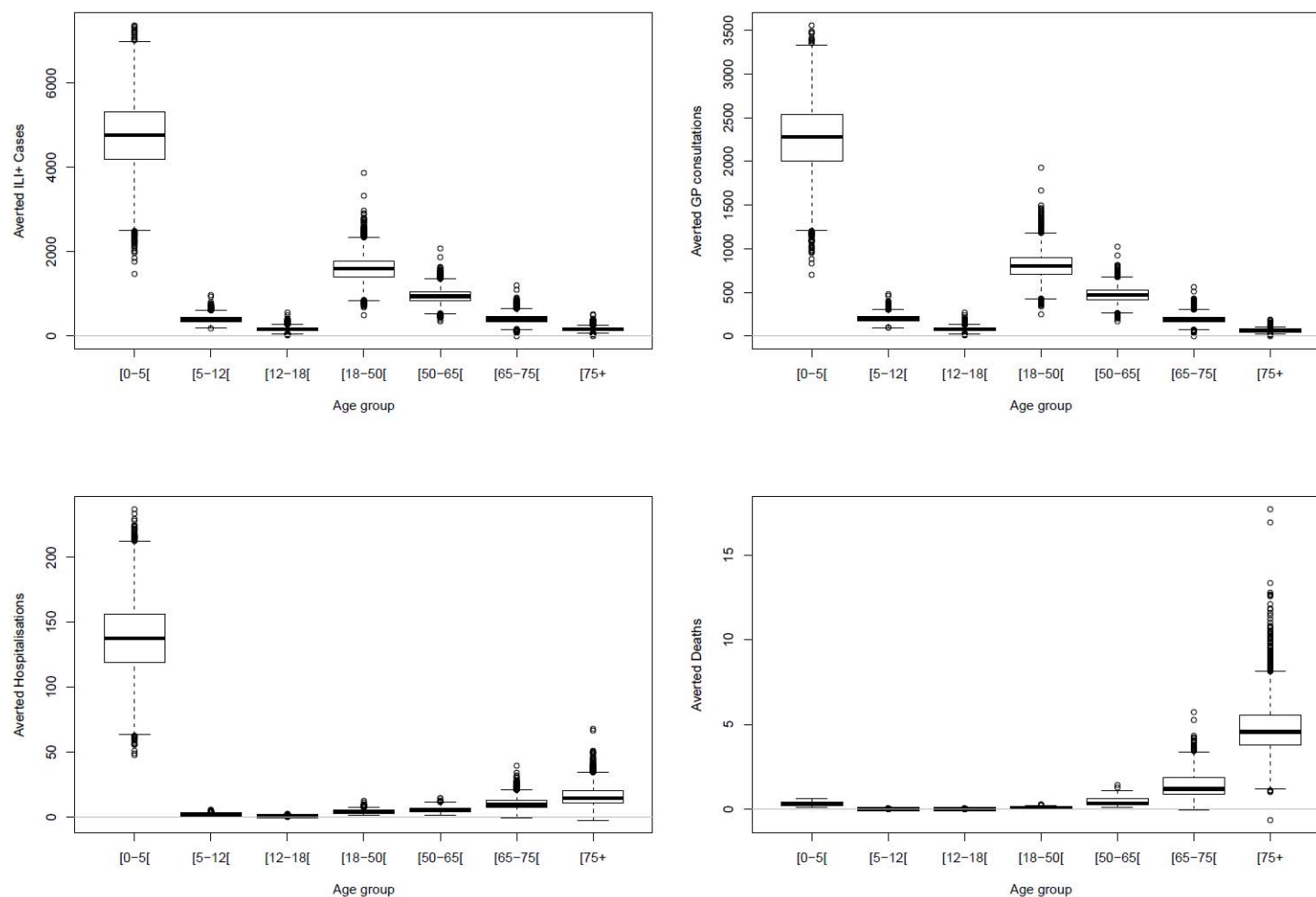
**Figure 7 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 70% coverage**

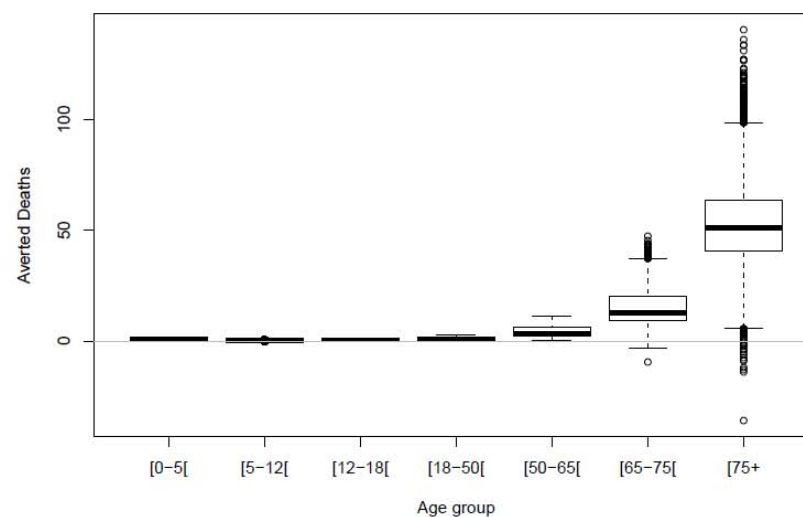
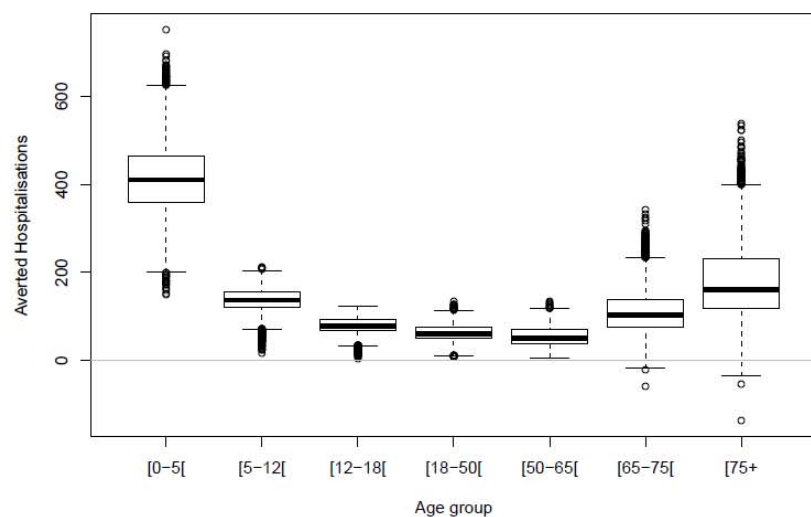
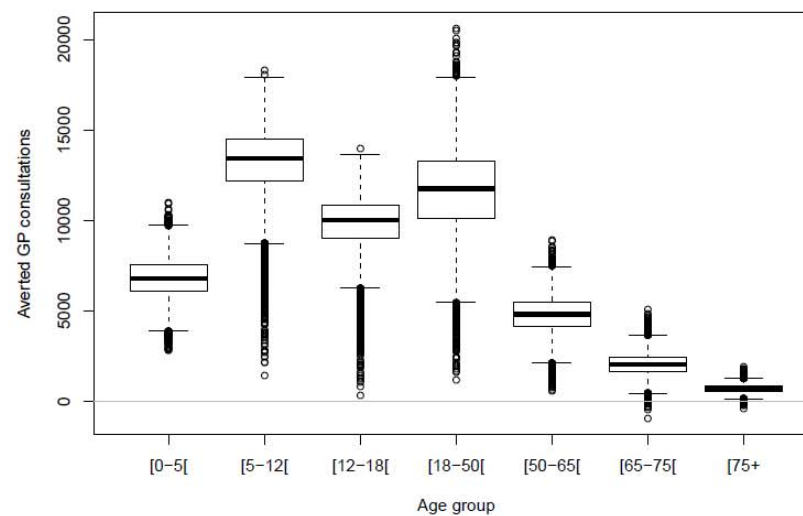
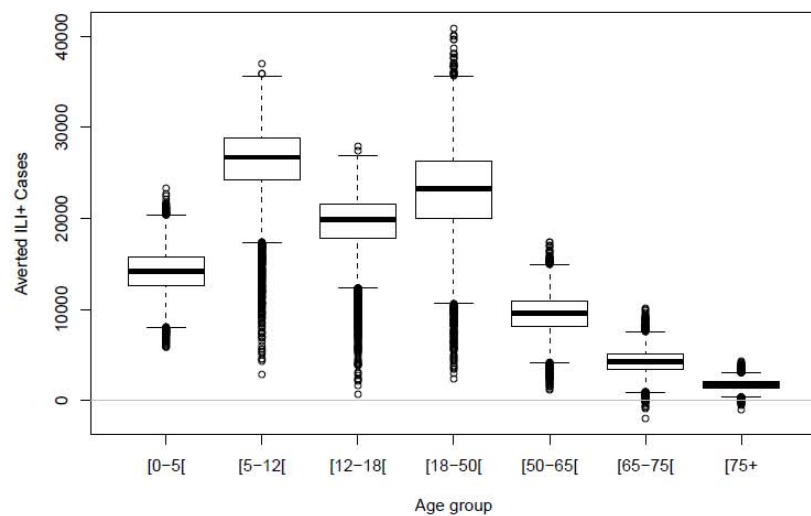






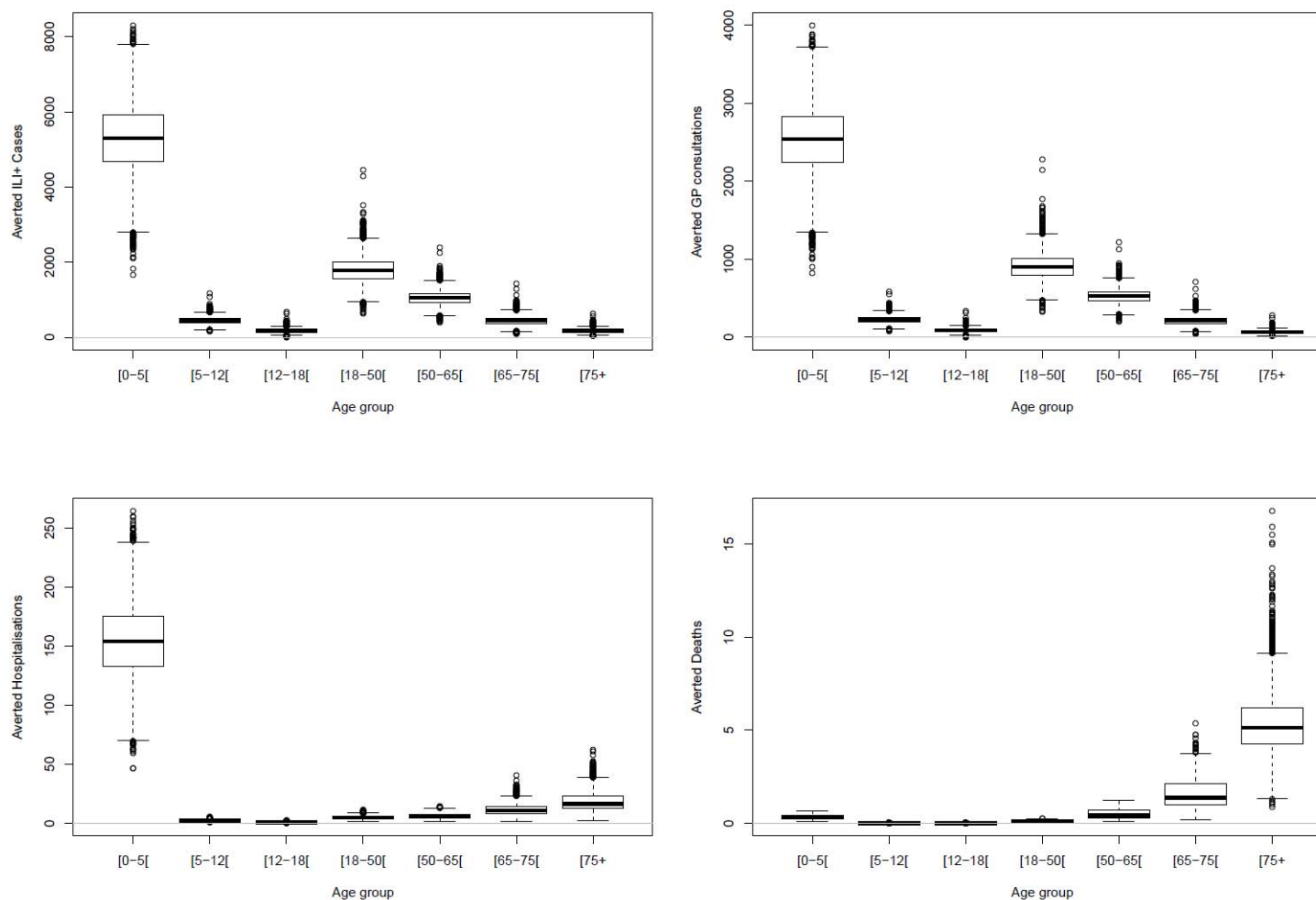
**Figure 8 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 80% coverage**

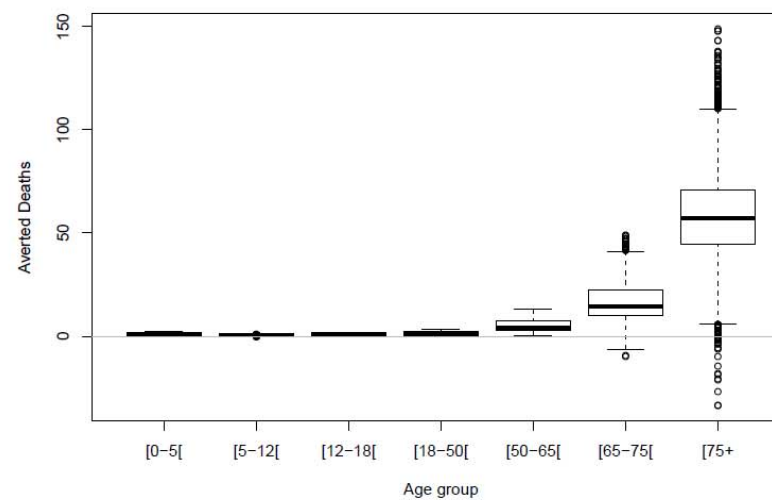
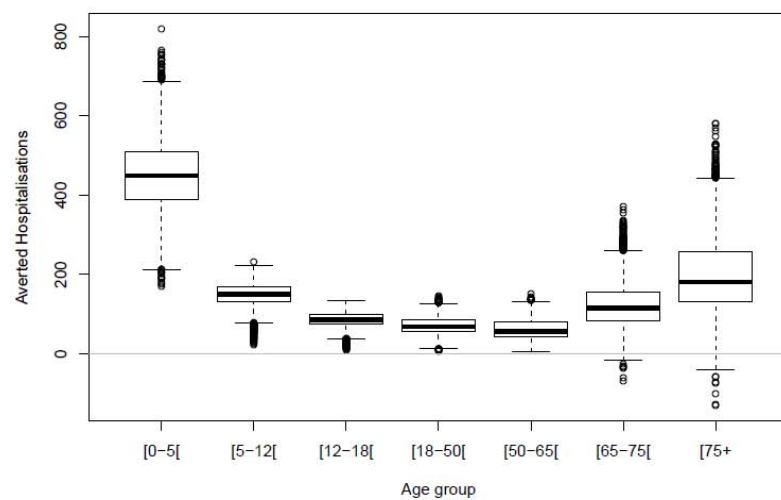
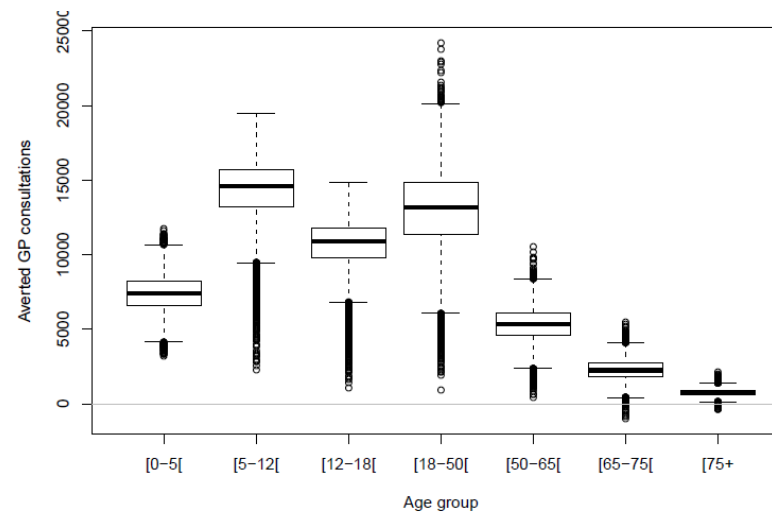
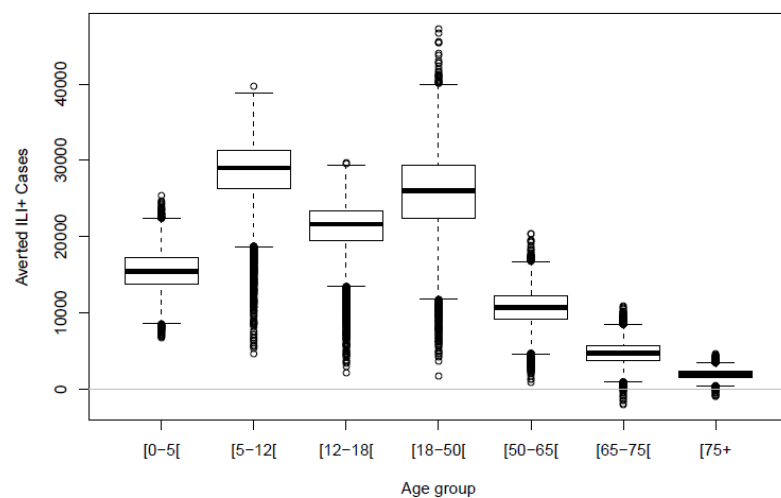






**Figure 9 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 90% coverage**

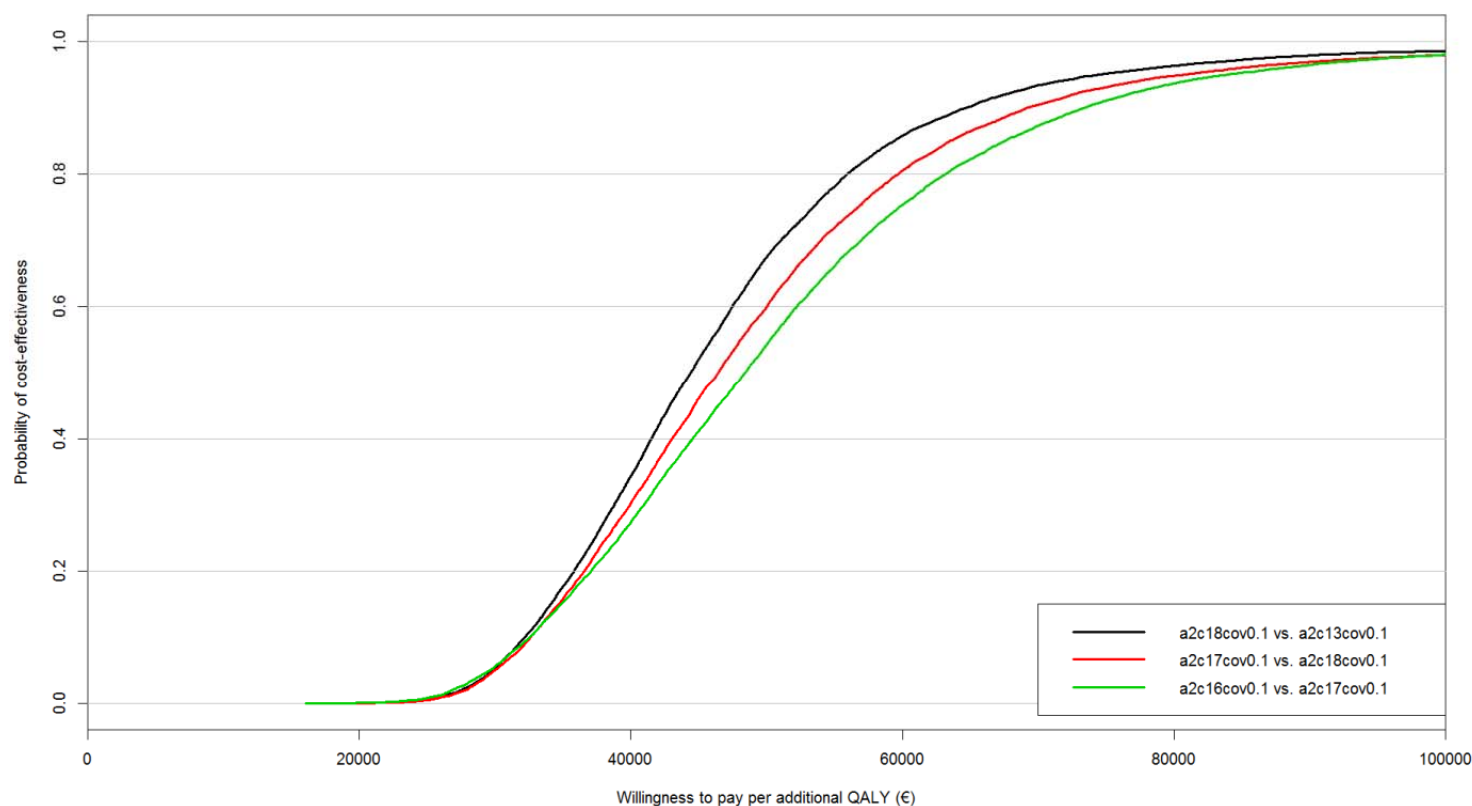


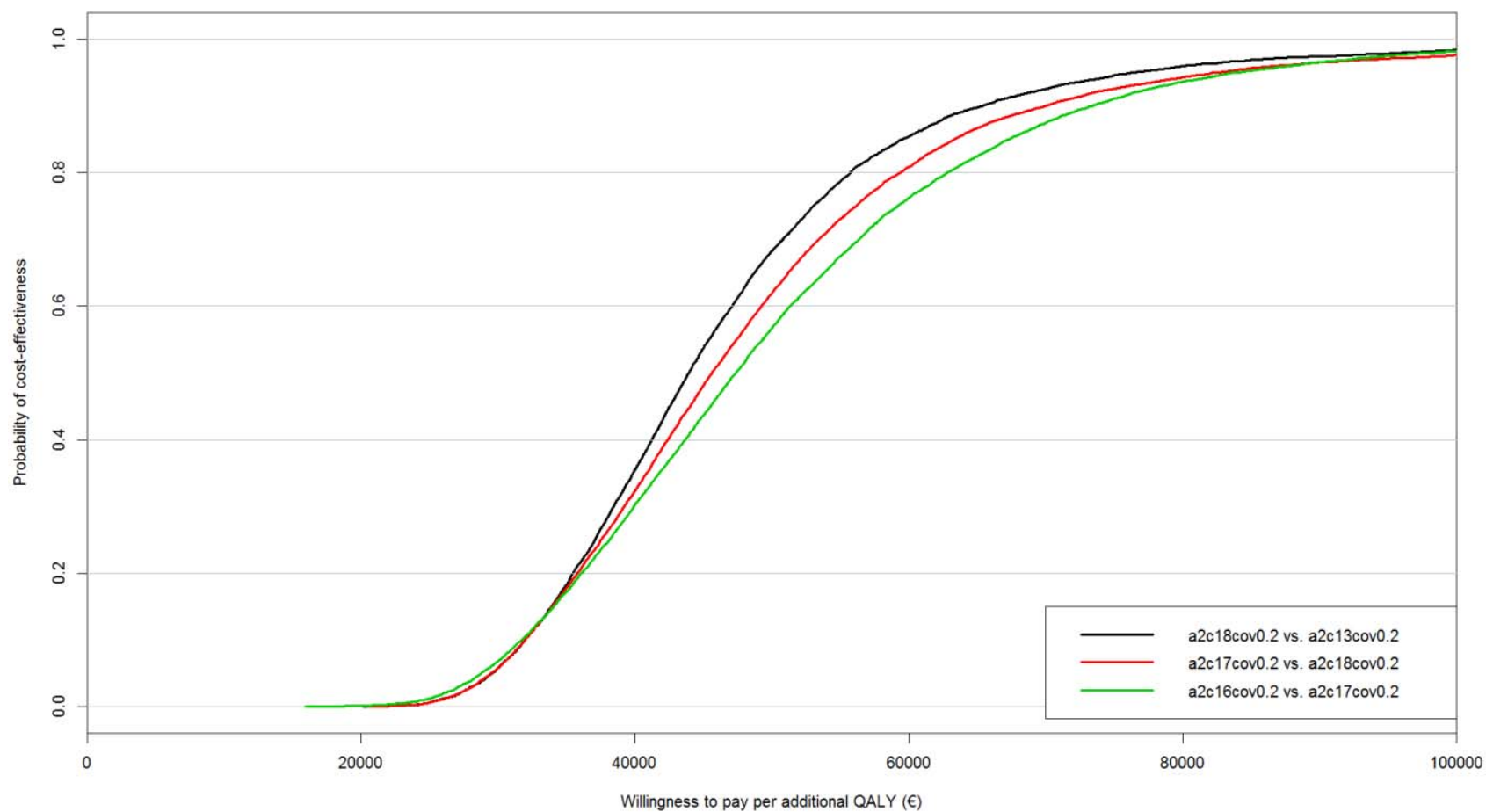




#### 4.1.2. Incremental analyses

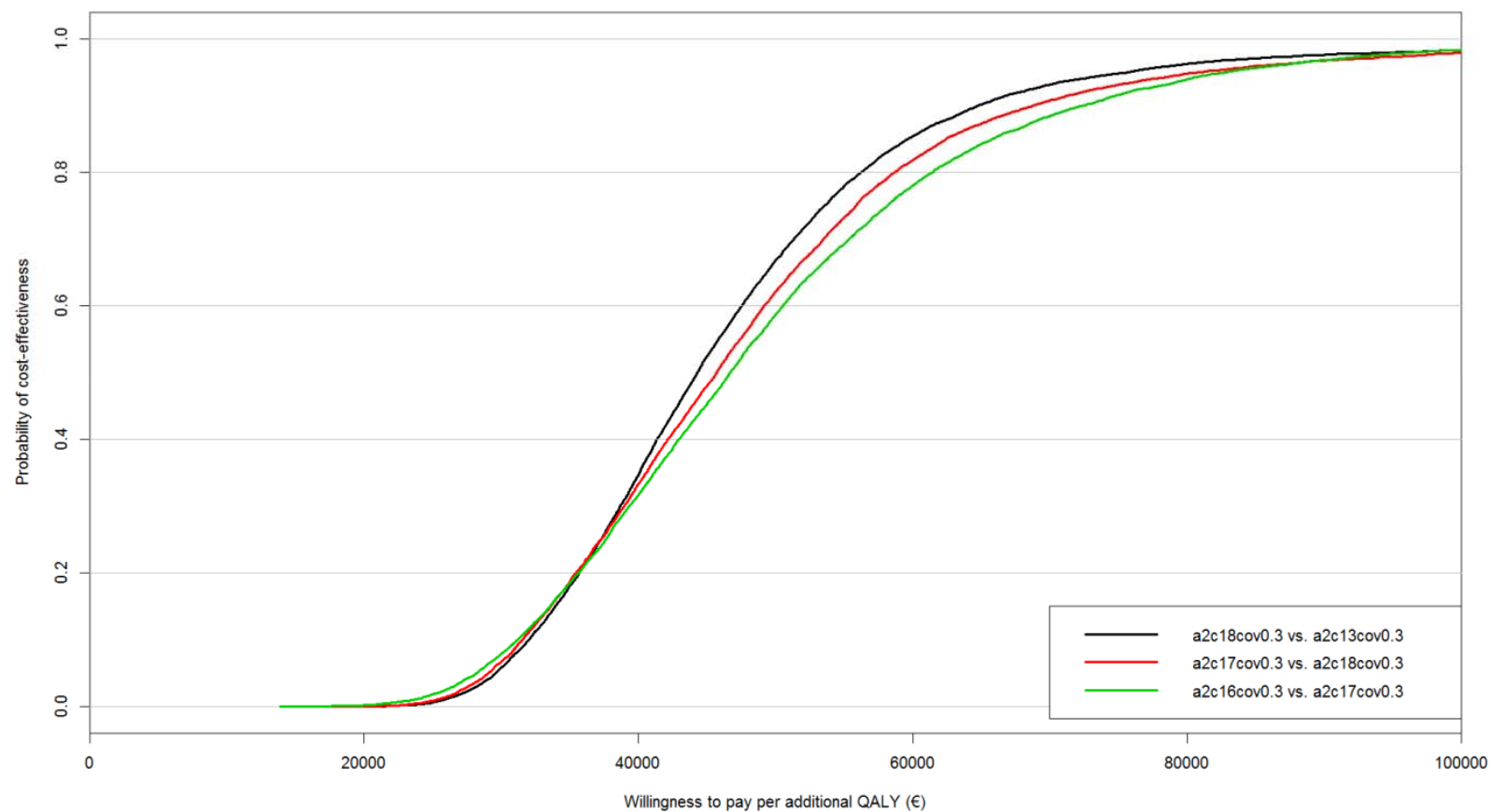
**Figure 10 – Incremental CEACs for remaining childhood vaccination options at 10% (top) and 20% (bottom) vaccination coverage after exclusion of dominated options, whilst assuming adult vaccination remains constant over a 10 year time span, and with immunity lasting an average of 1.68 years (i.e. exponential waning rate of 1/1.68 per year)**

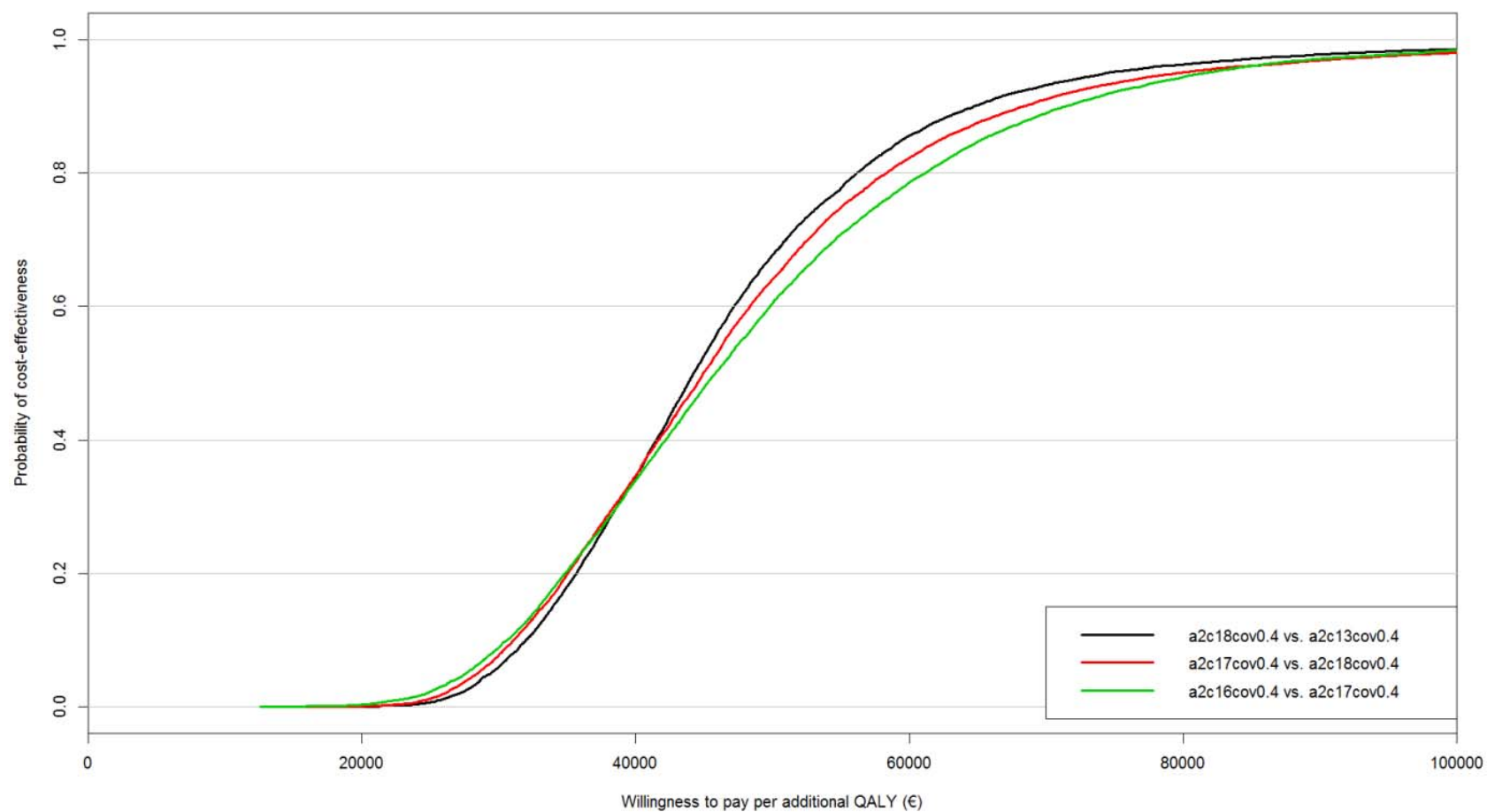






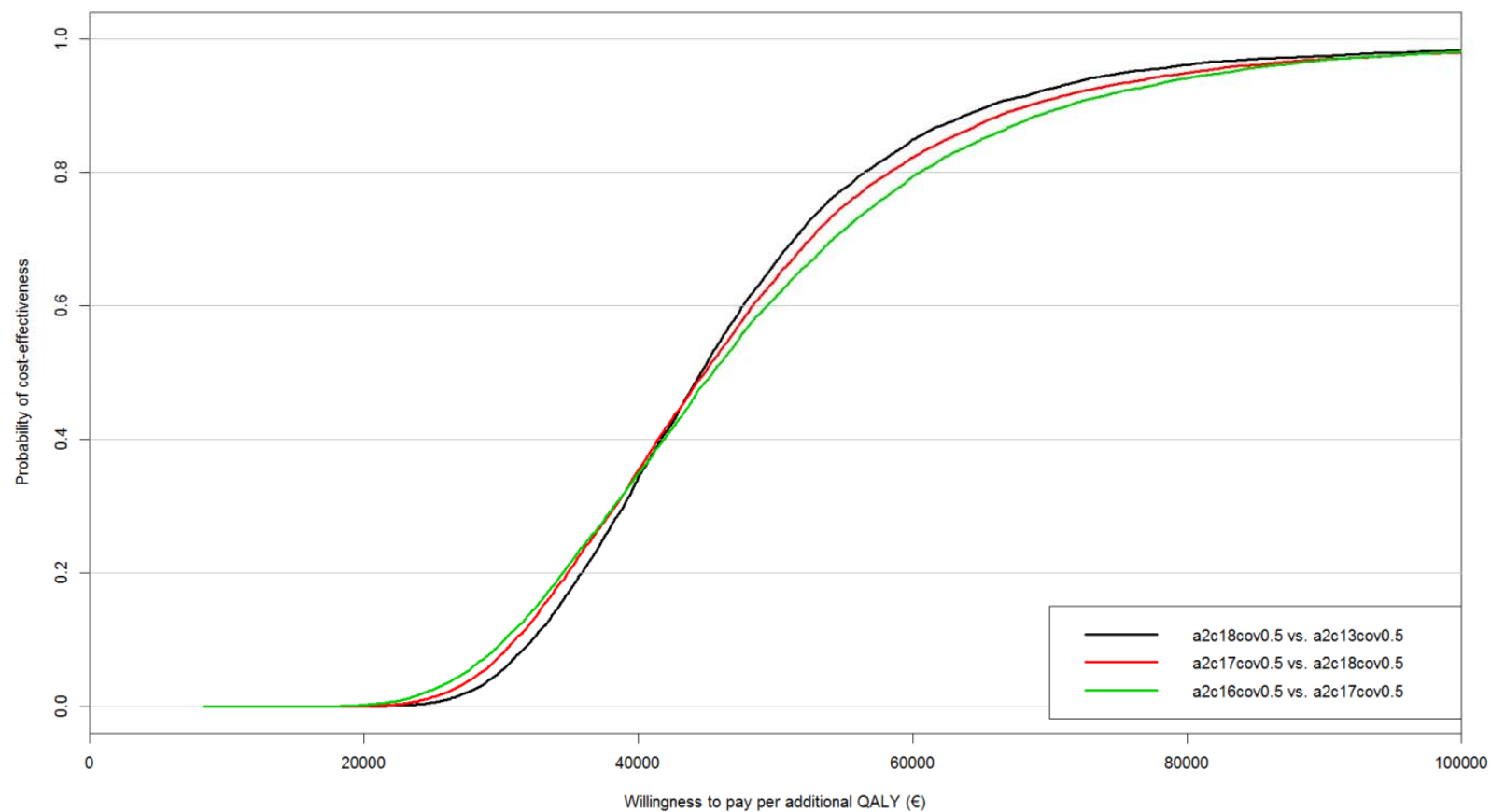
**Figure 11 – Incremental CEACs for remaining childhood vaccination options at 30% (top) and 40% (bottom) vaccination coverage after exclusion of dominated options, whilst assuming adult vaccination remains constant over a 10 year time span, and with immunity lasting an average of 1.68 years (i.e. exponential waning rate of 1/1.68 per year)**

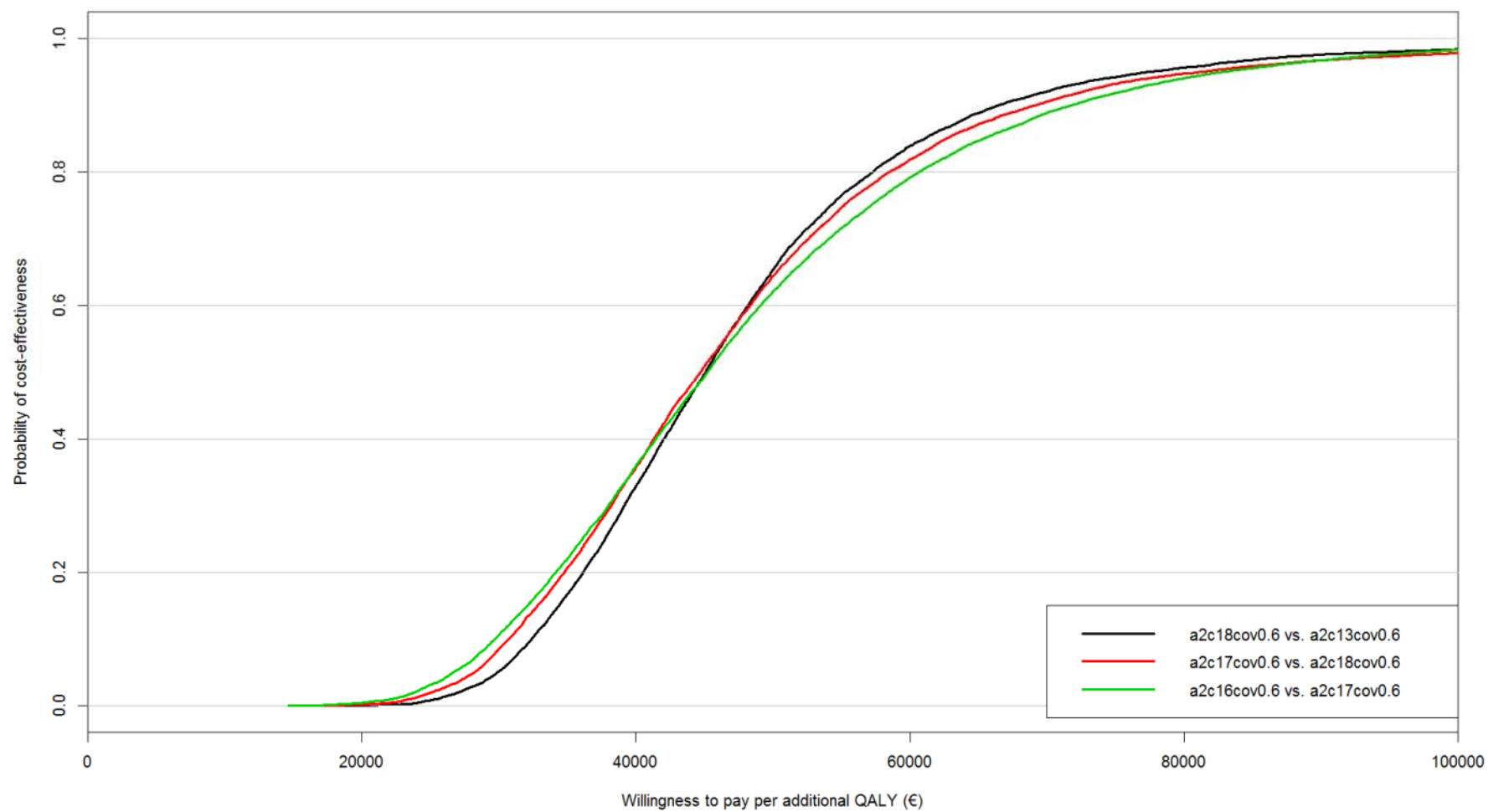






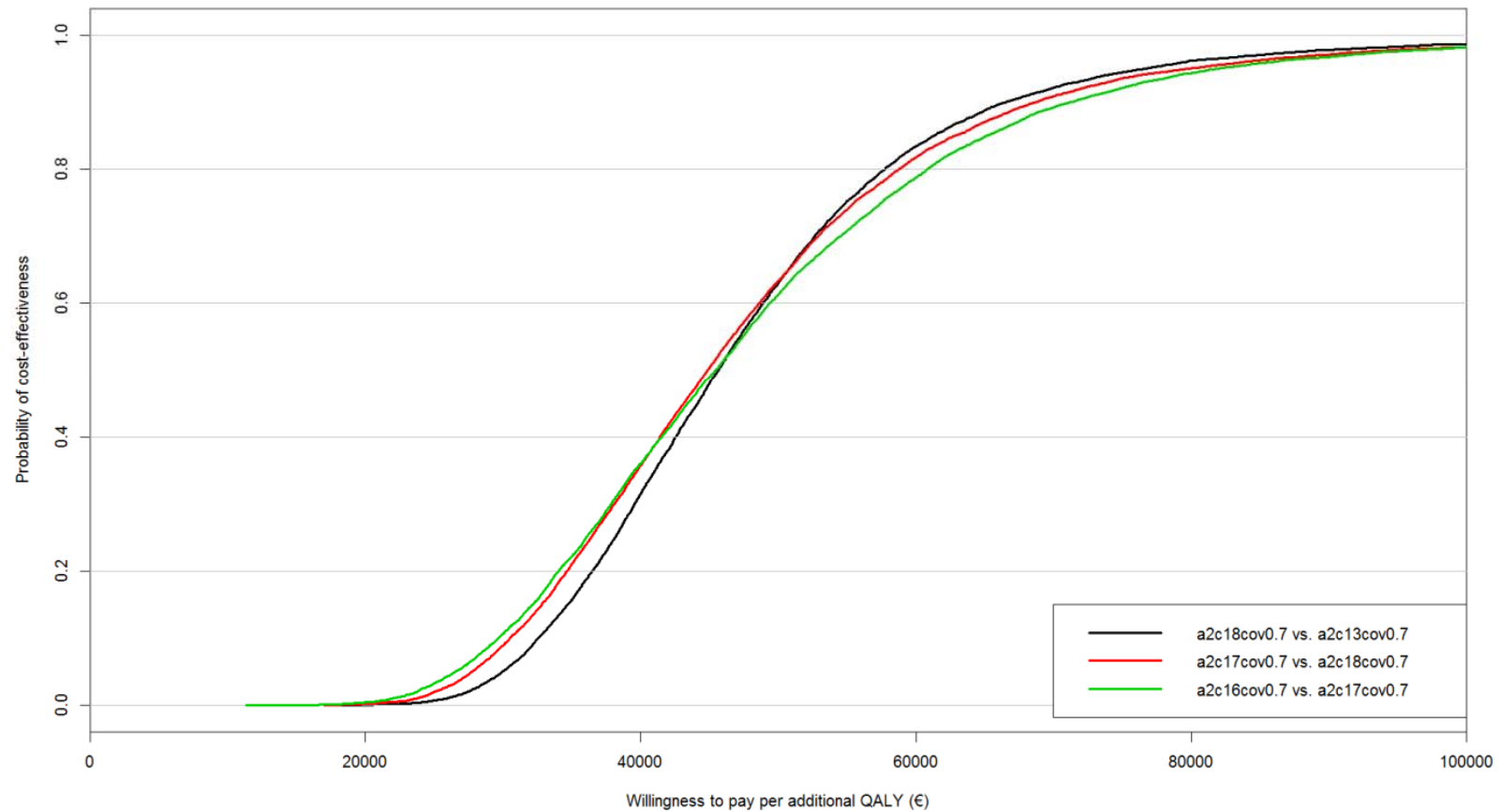
**Figure 12 – Incremental CEACs for remaining childhood vaccination options at 50% (top) and 60% (bottom) vaccination coverage after exclusion of dominated options, whilst assuming adult vaccination remains constant over a 10 year time span, and with immunity lasting an average of 1.68 years (i.e. exponential waning rate of 1/1.68 per year)**

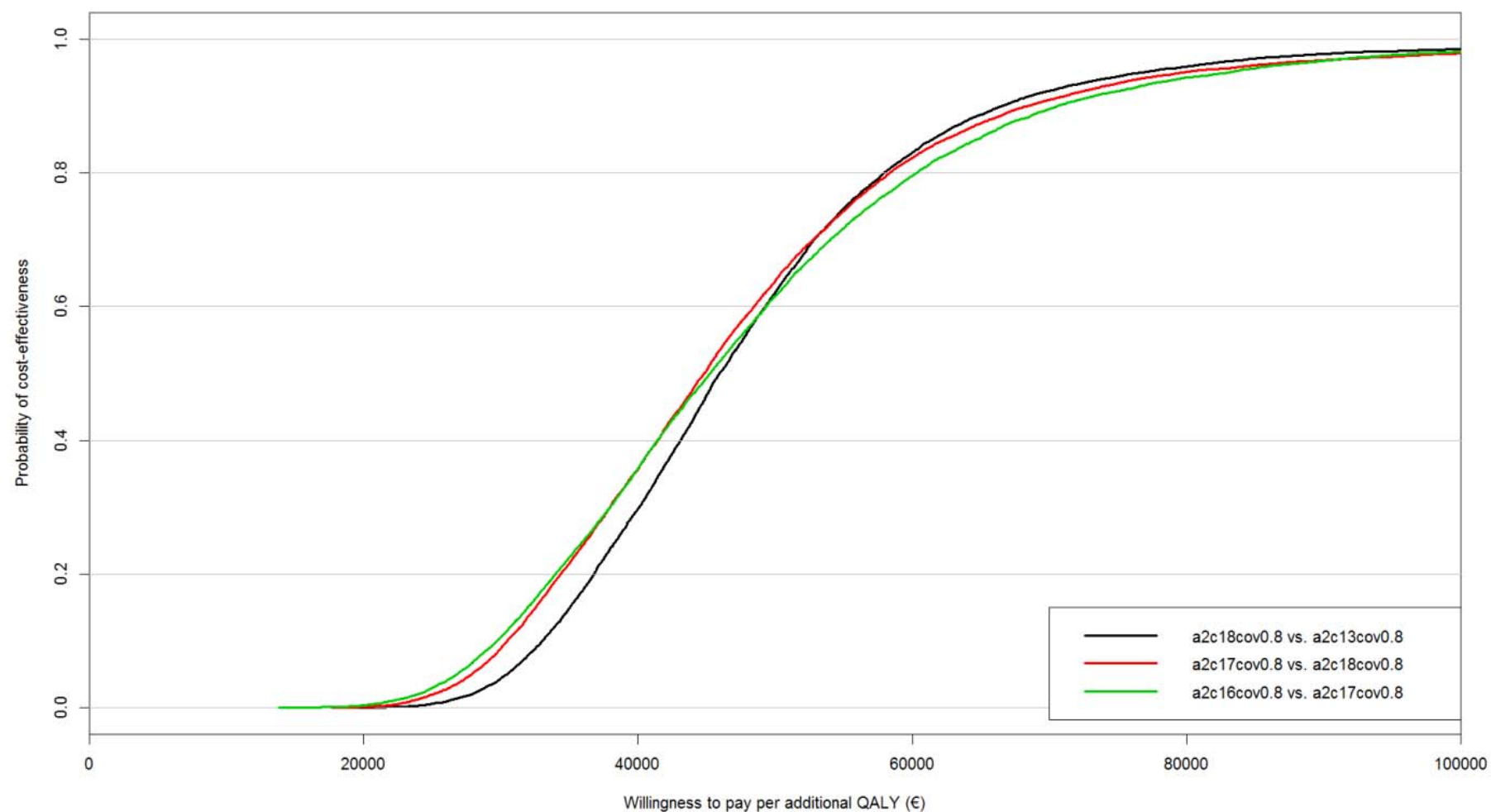






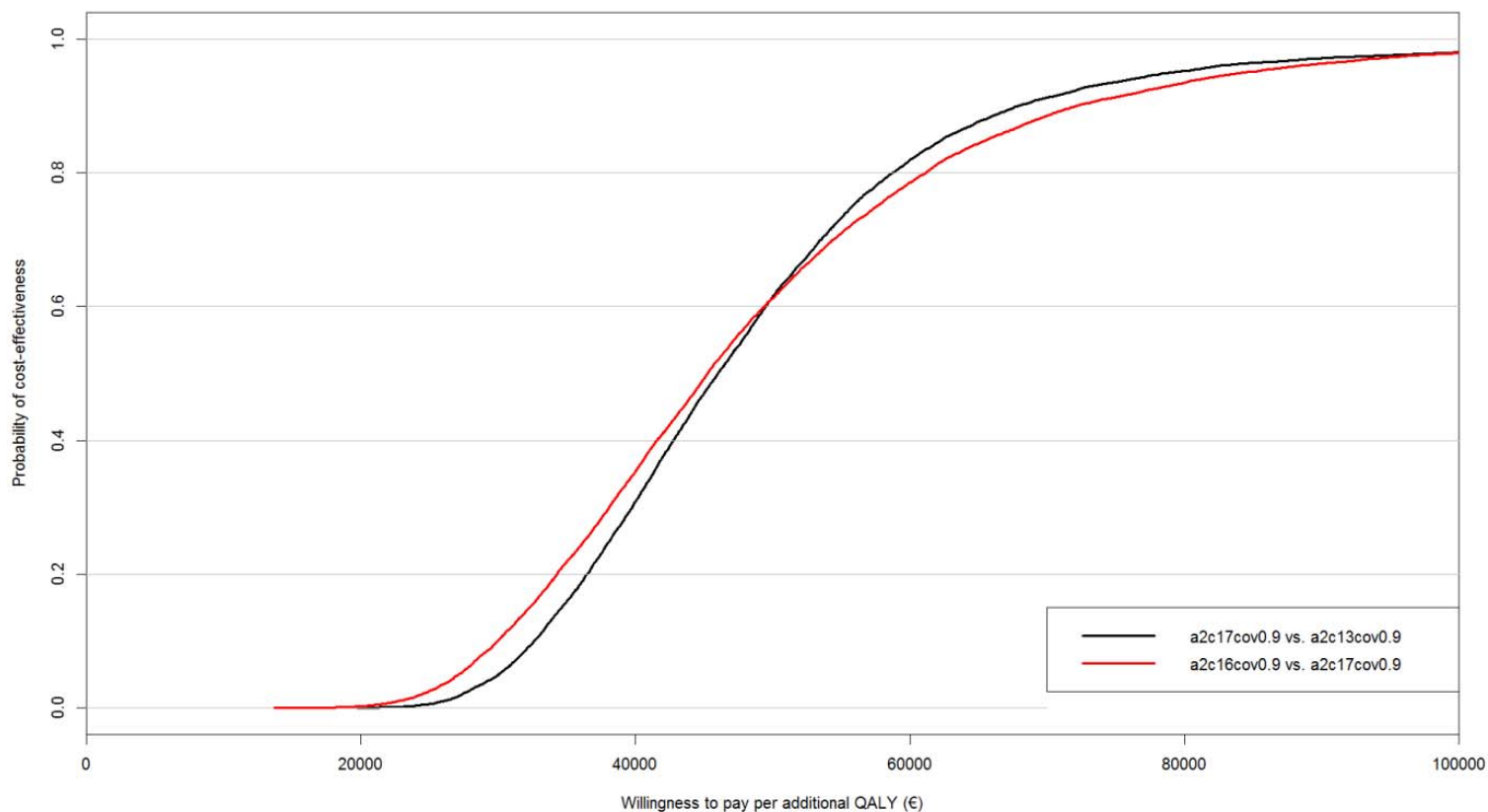
**Figure 13 – Incremental CEACs for remaining childhood vaccination options at 70% (top) and 80% (bottom) vaccination coverage after exclusion of dominated options, whilst assuming adult vaccination remains constant over a 10 year time span, and with immunity lasting an average of 1.68 years (i.e. exponential waning rate of 1/1.68 per year)**







**Figure 14 – Incremental CEACs for remaining childhood vaccination options at 90% vaccination coverage after exclusion of dominated options, whilst assuming adult vaccination remains constant over a 10 year time span, and with immunity lasting an average of 1.68 years (i.e. exponential waning rate of 1/1.68 per year)**

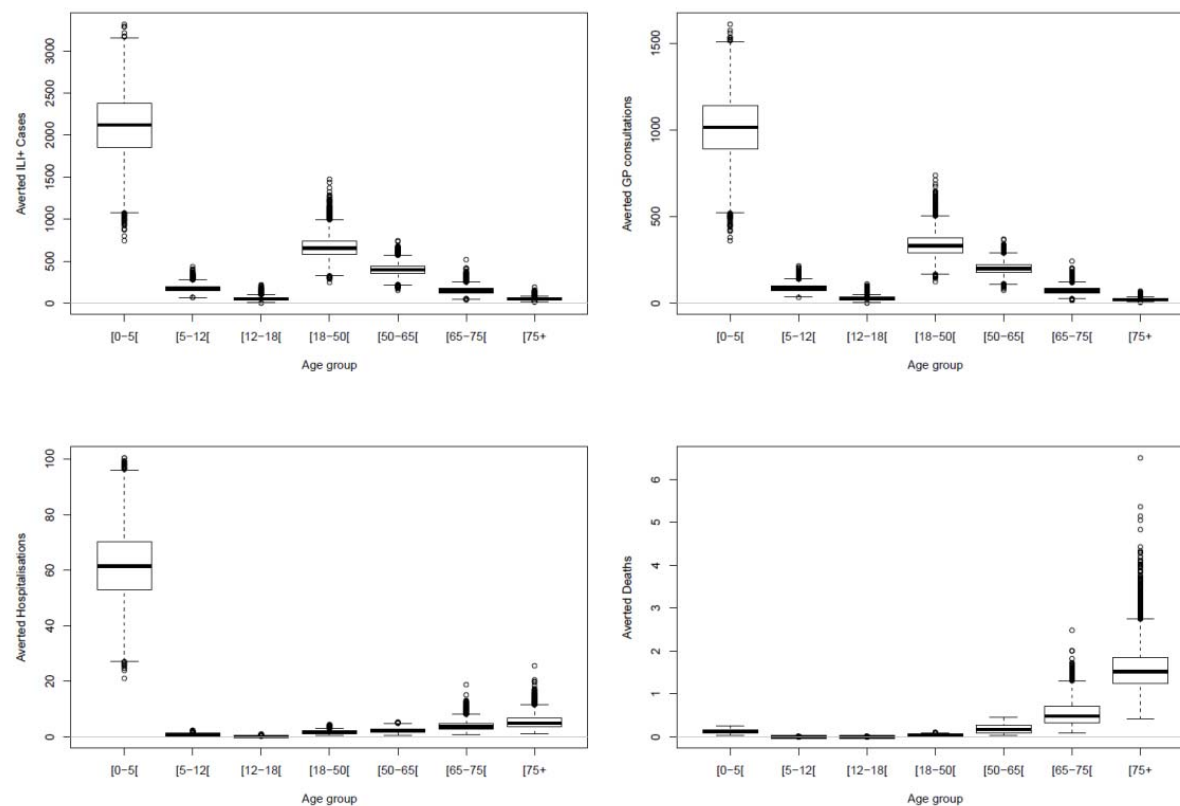


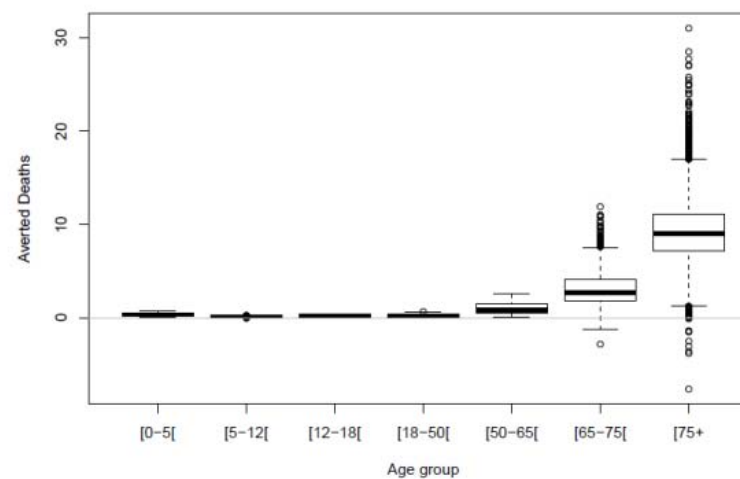
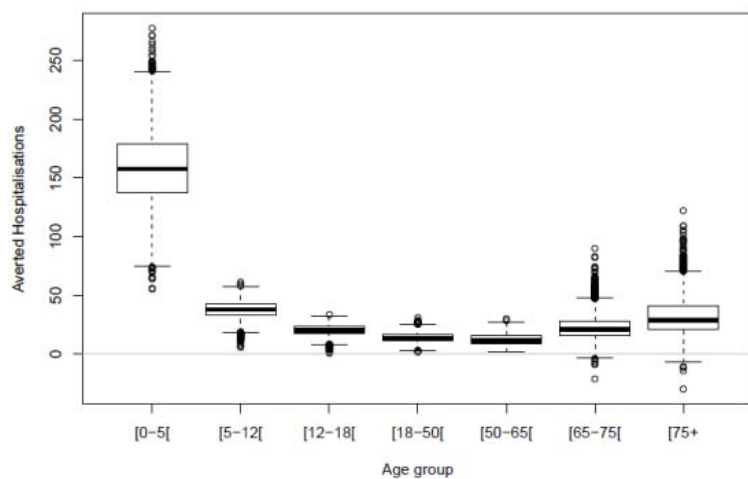
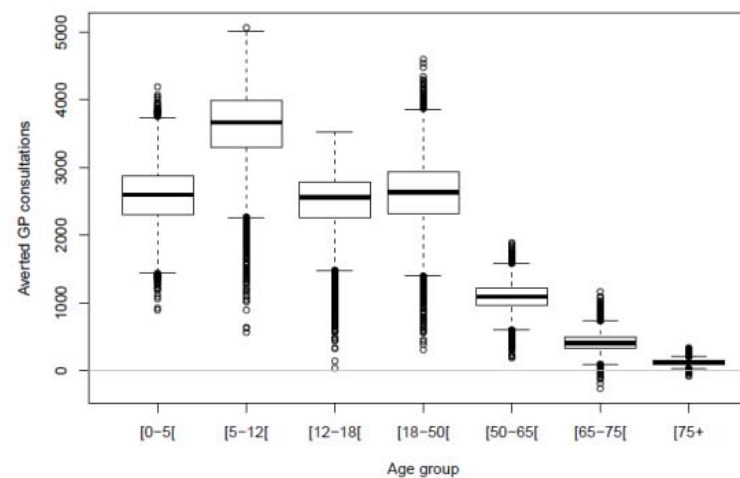
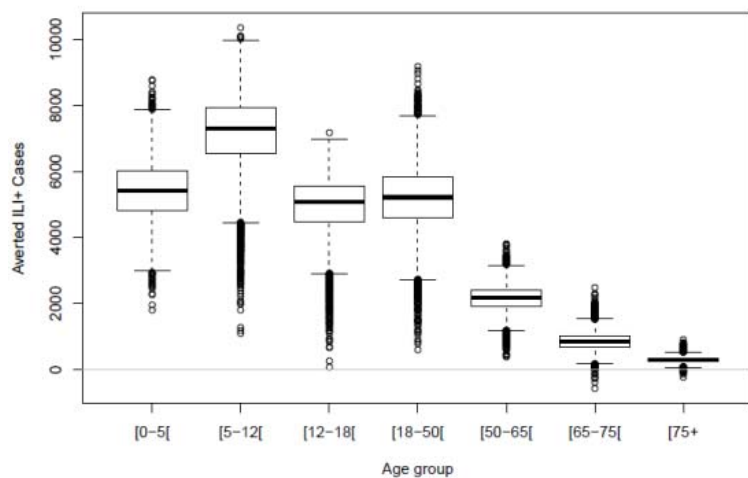


## 4.2. Modified children options + current adult vaccination (waning immunity fixed at an average of 6 years)

### 4.2.1. Effectiveness versus current situation

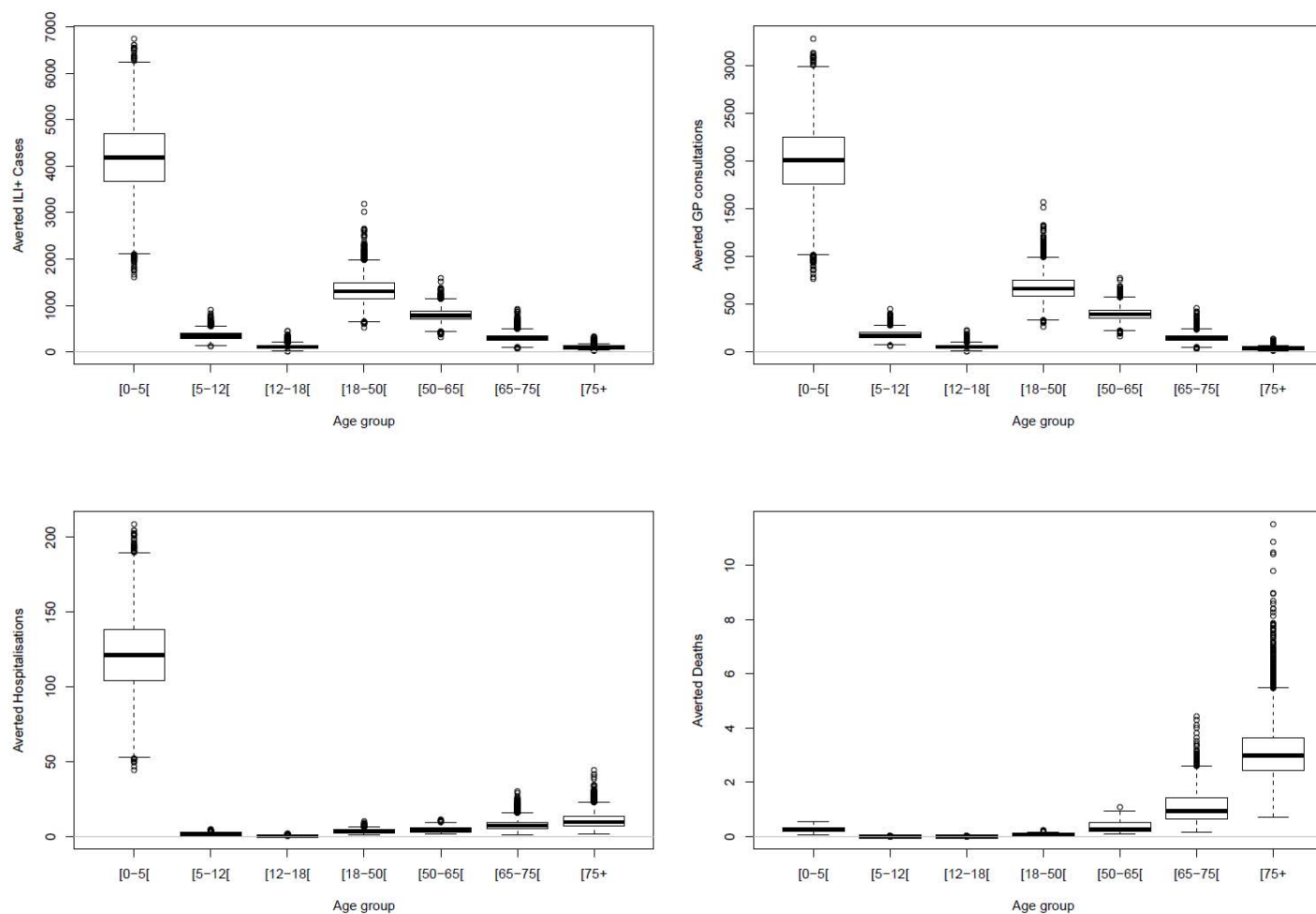
Figure 15 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 10% coverage, and with immunity lasting an average of 6 years

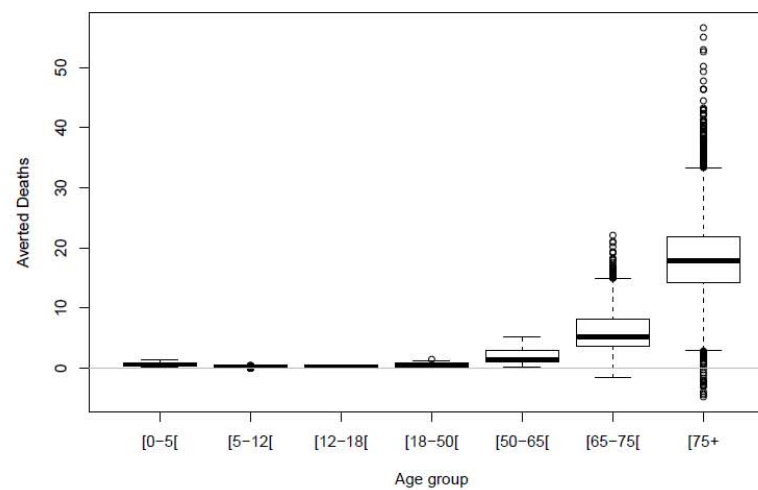
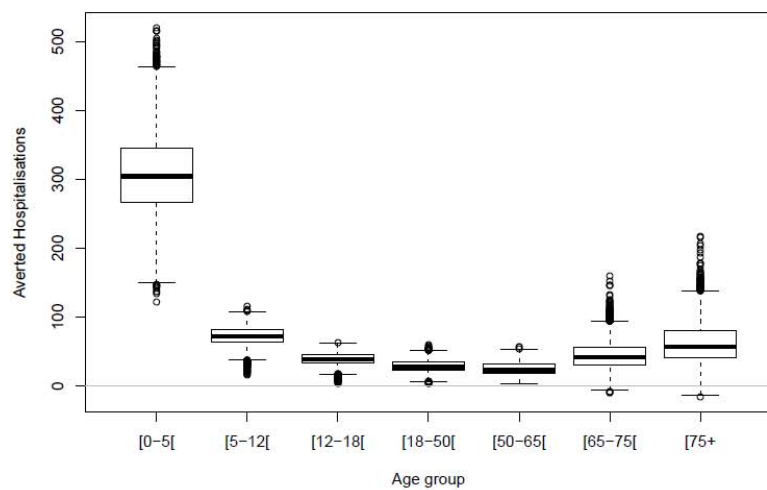
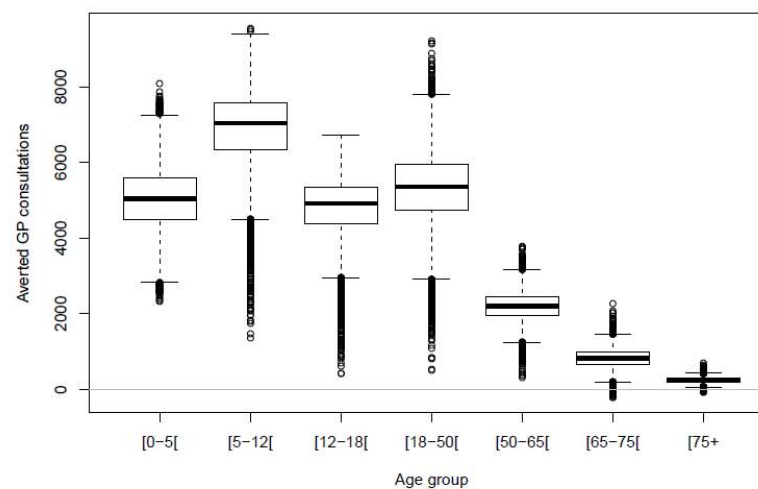
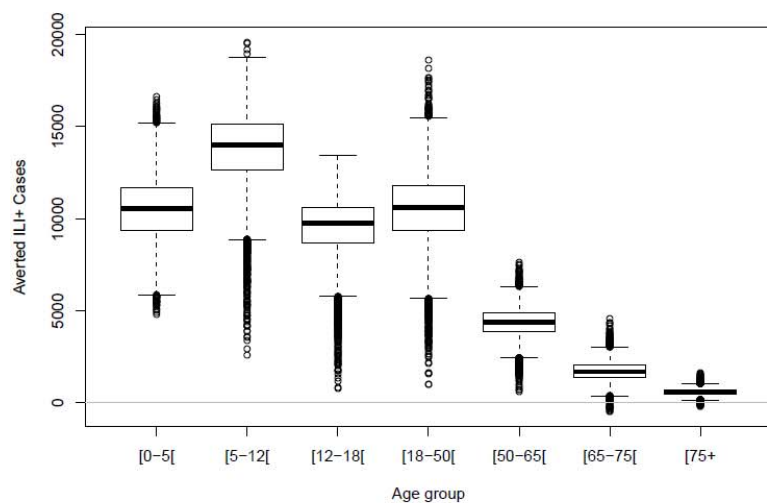






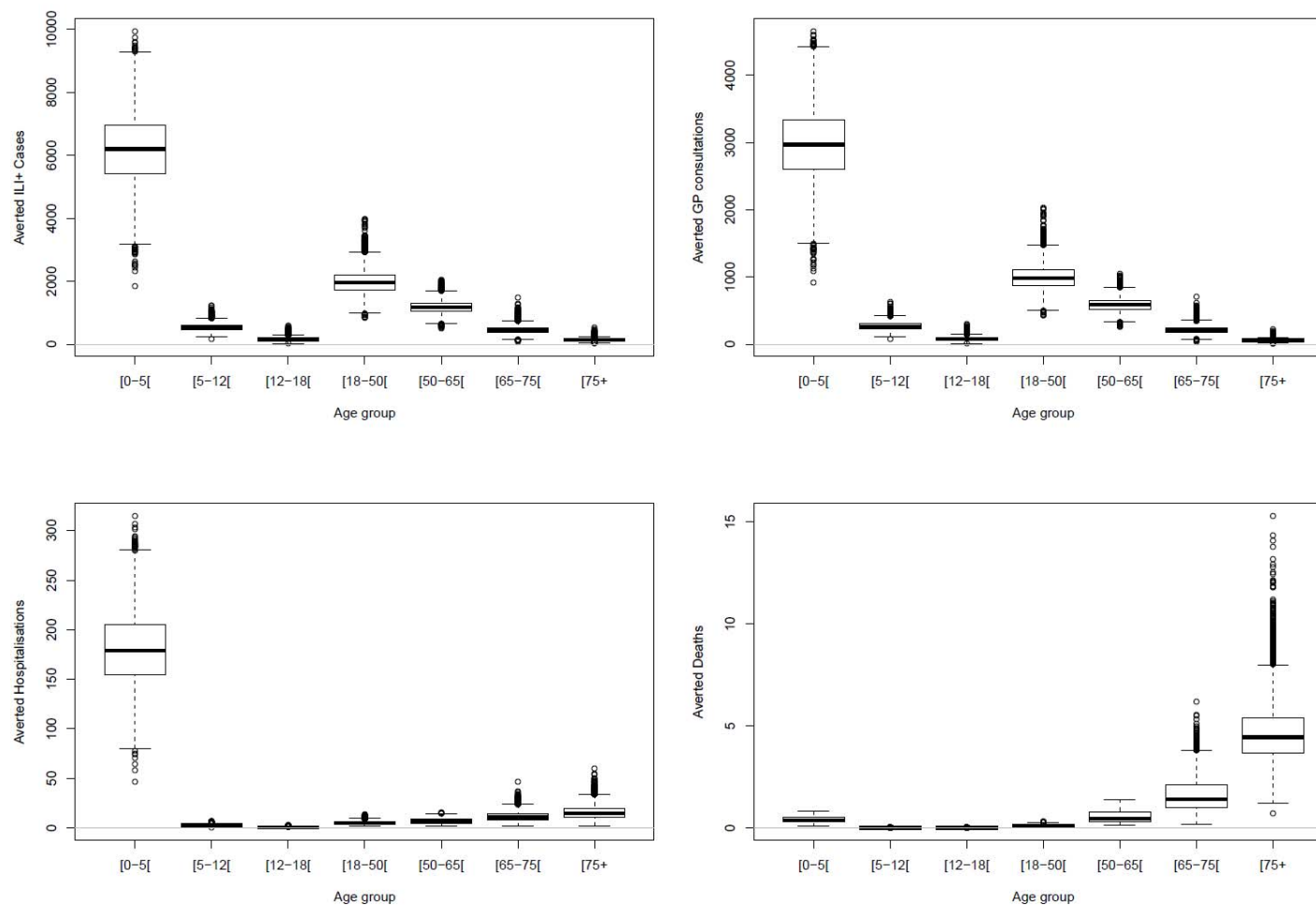
**Figure 16 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 20% coverage**

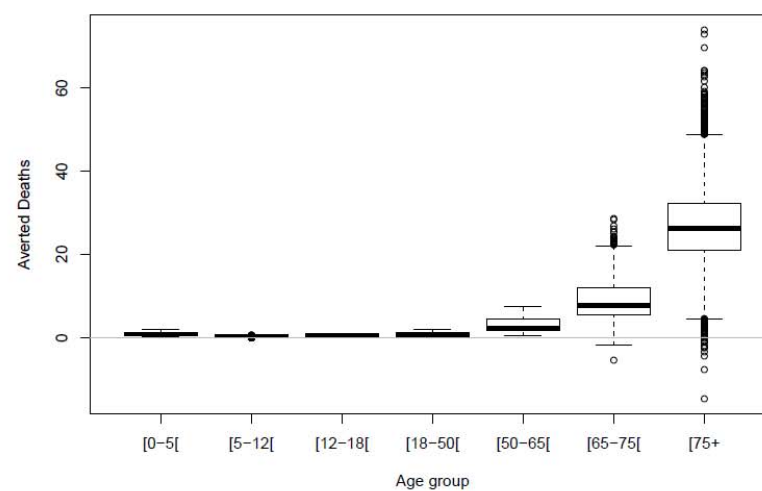
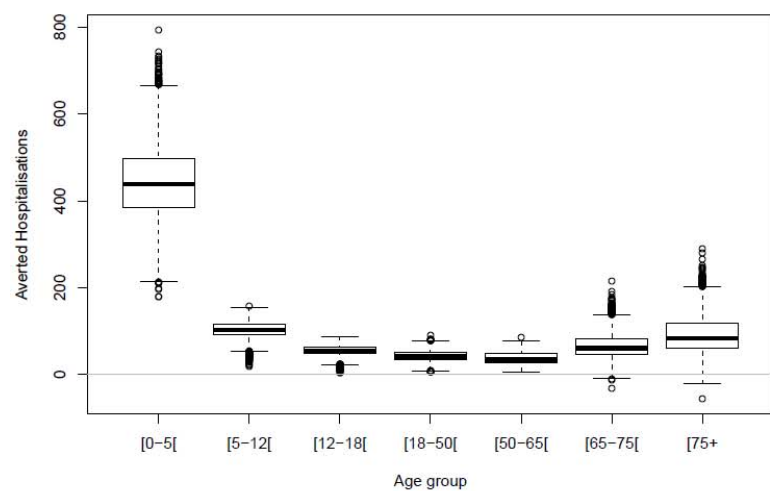
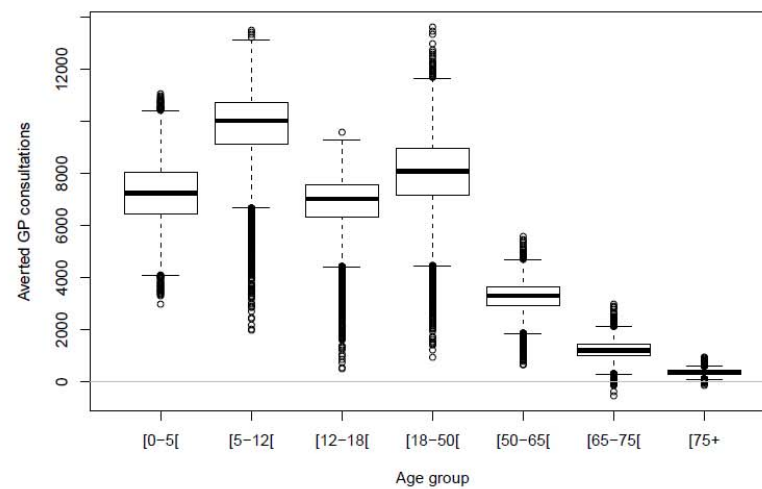
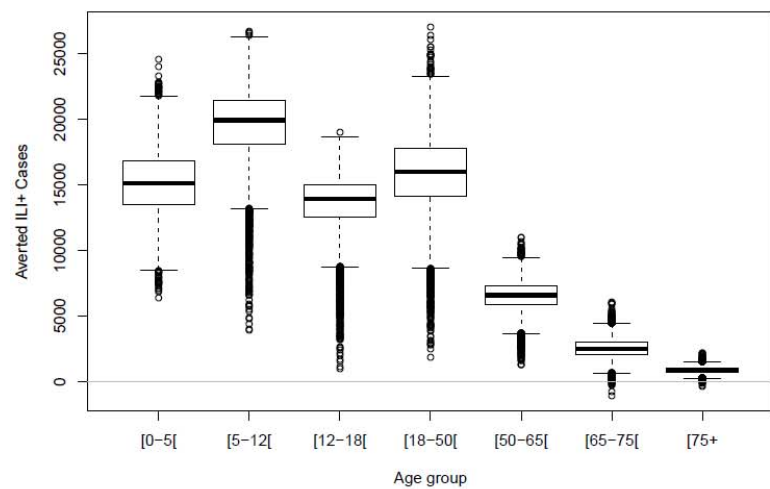






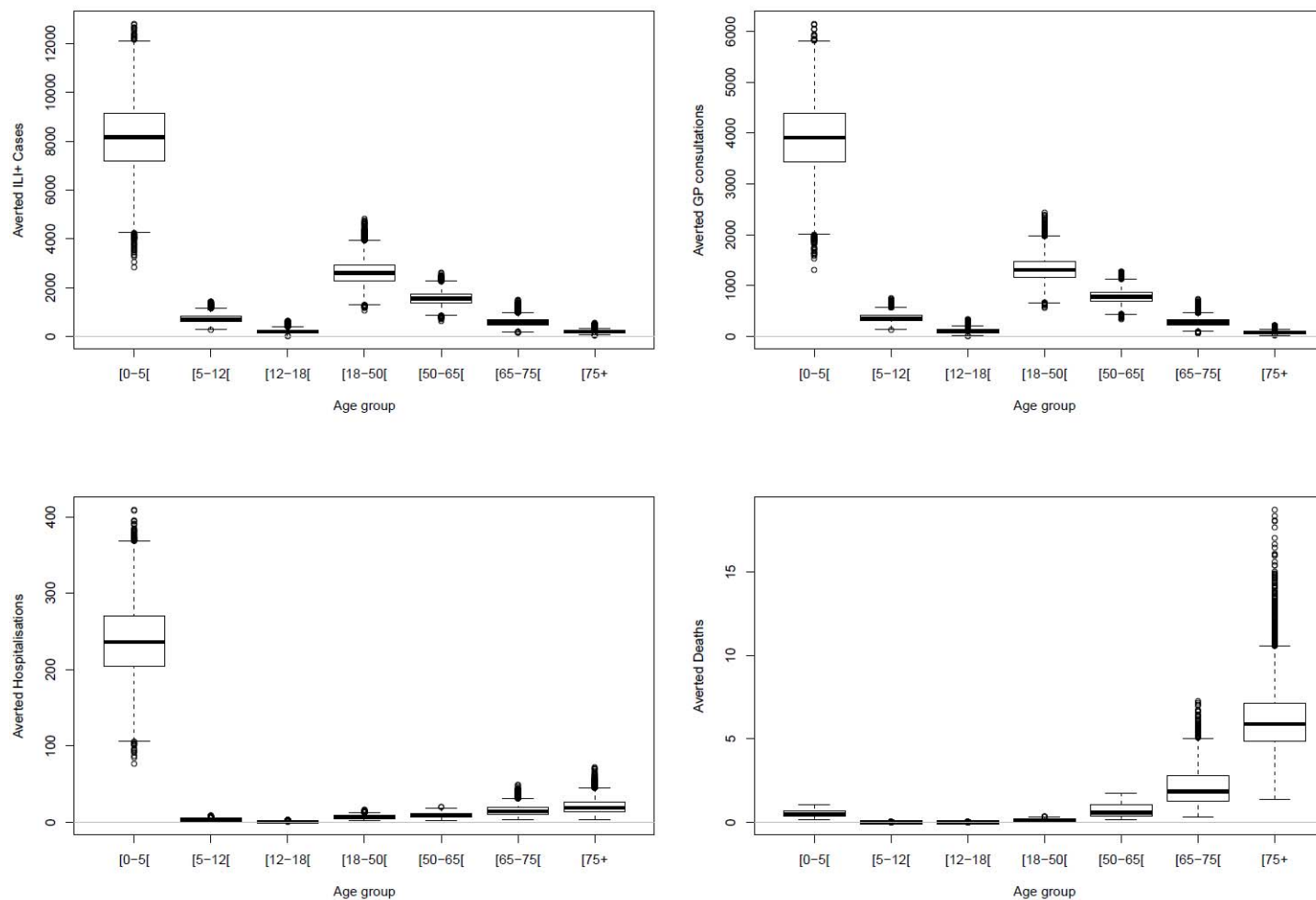
**Figure 17 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 30% coverage**

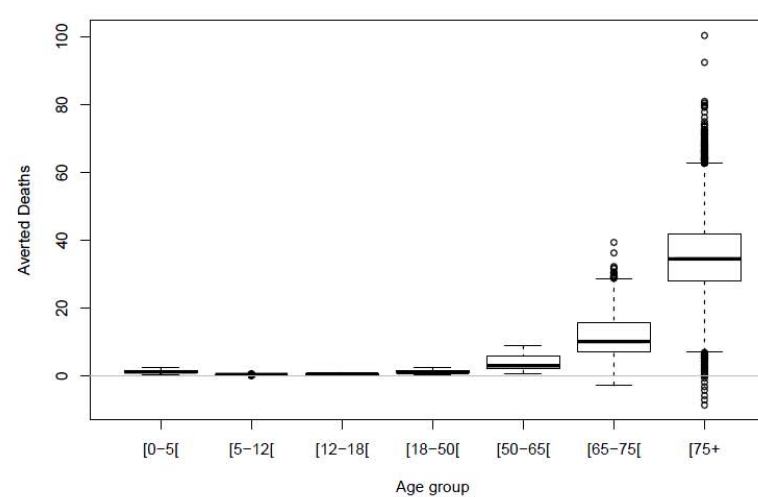
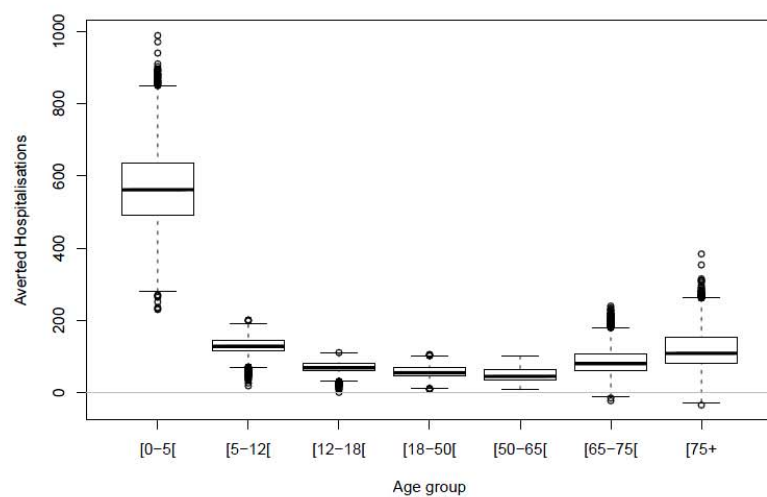
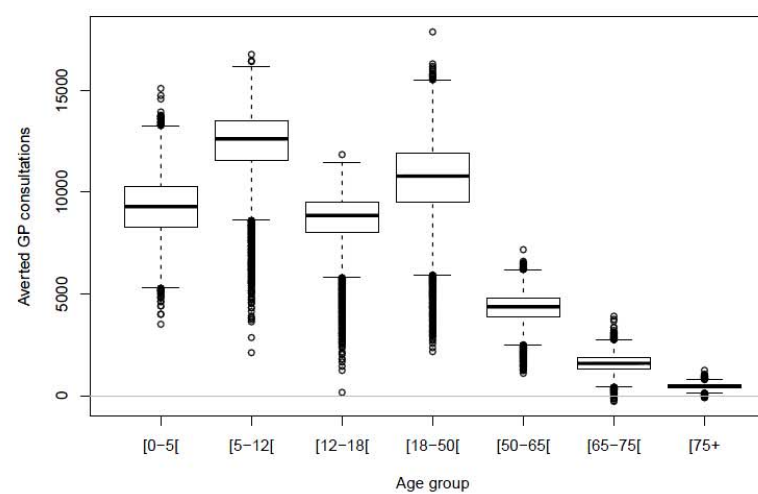
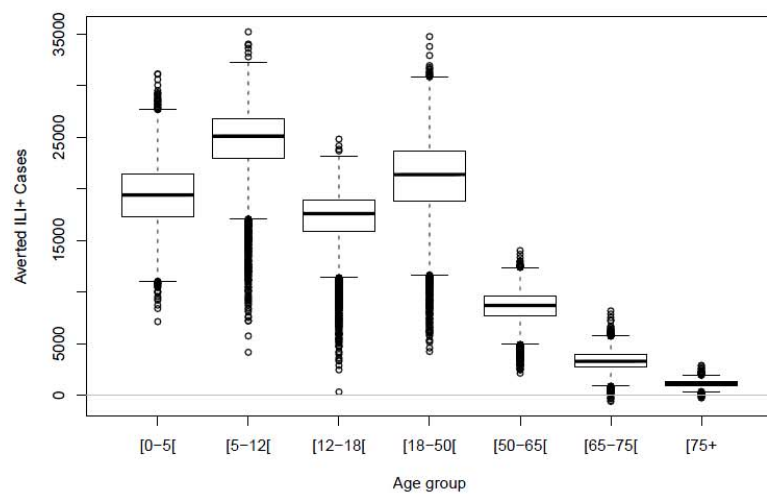






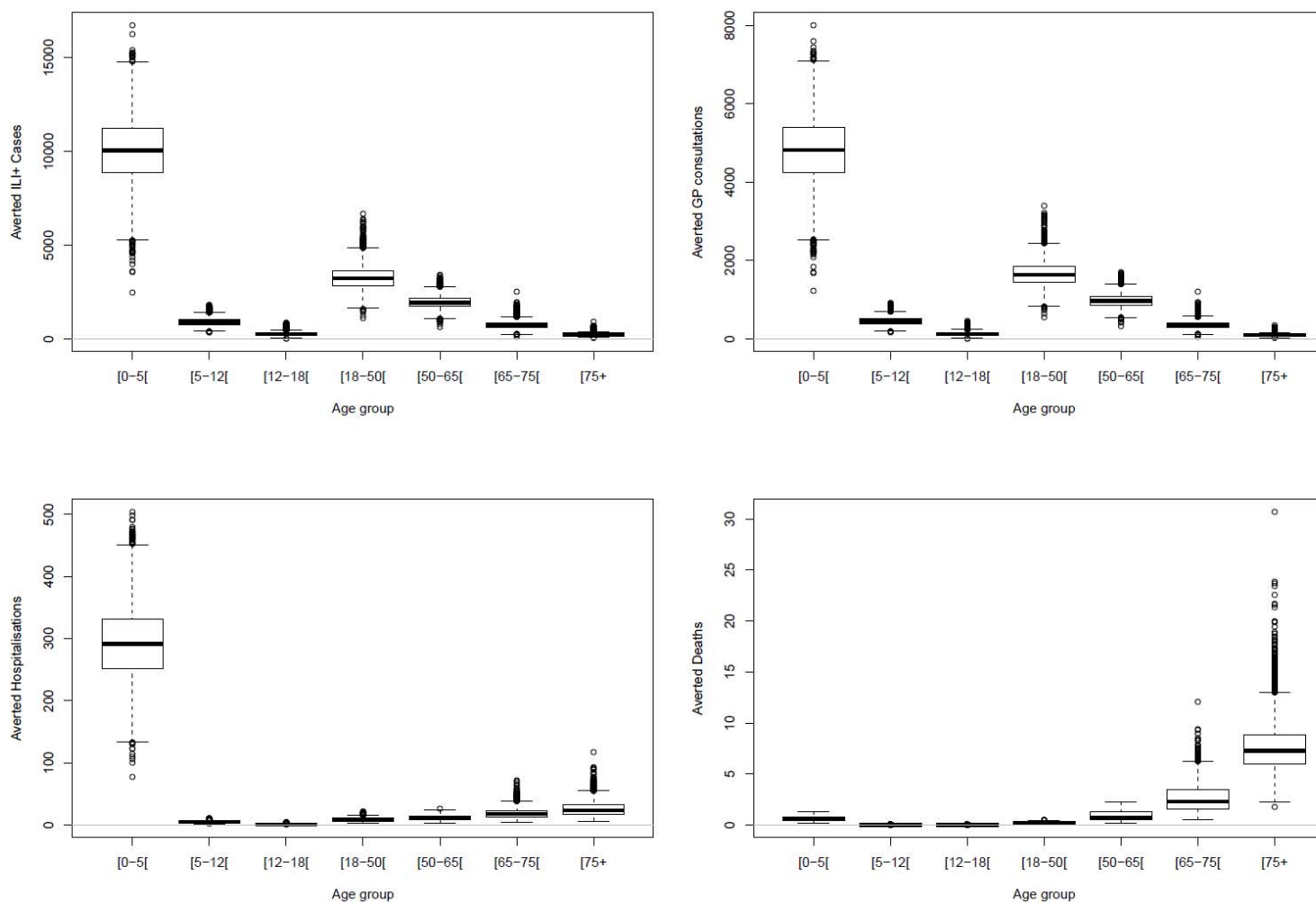
**Figure 18 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 40% coverage**

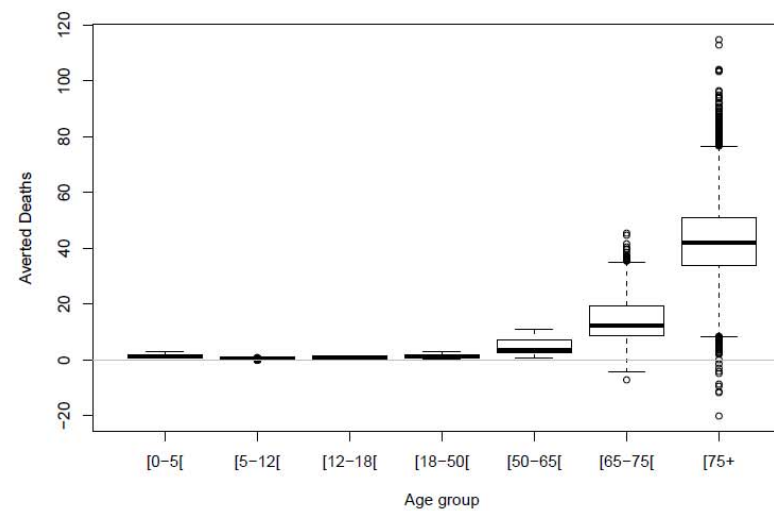
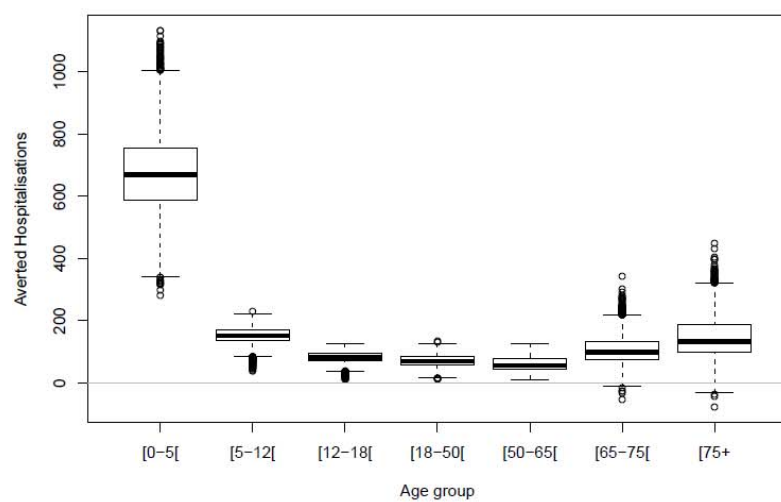
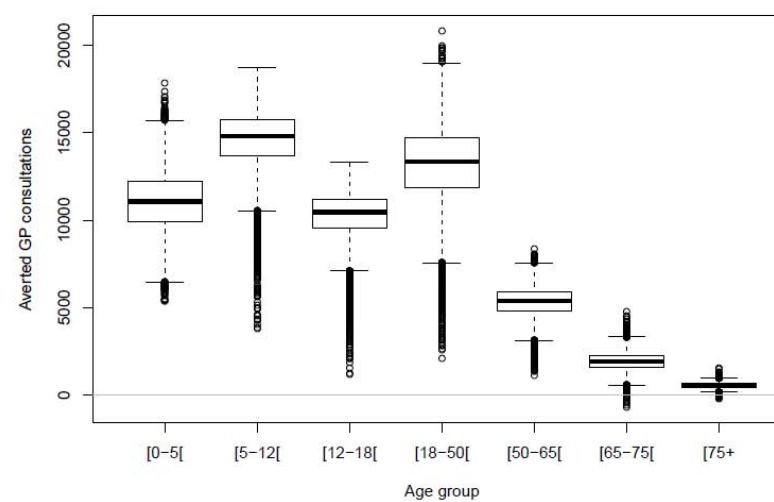
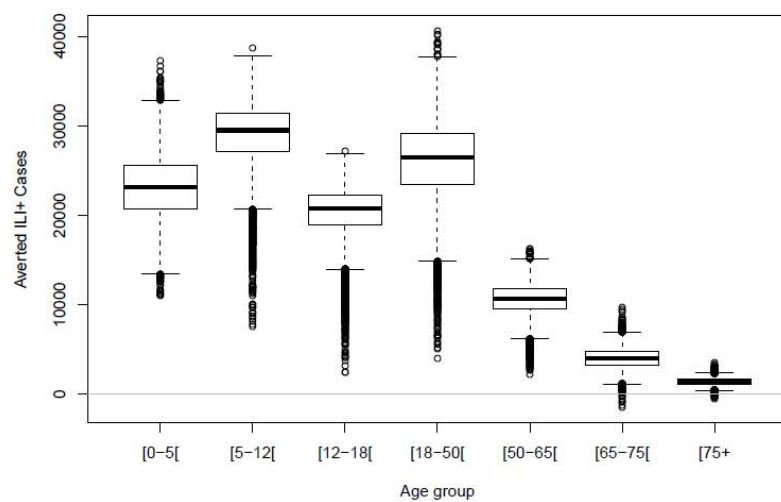






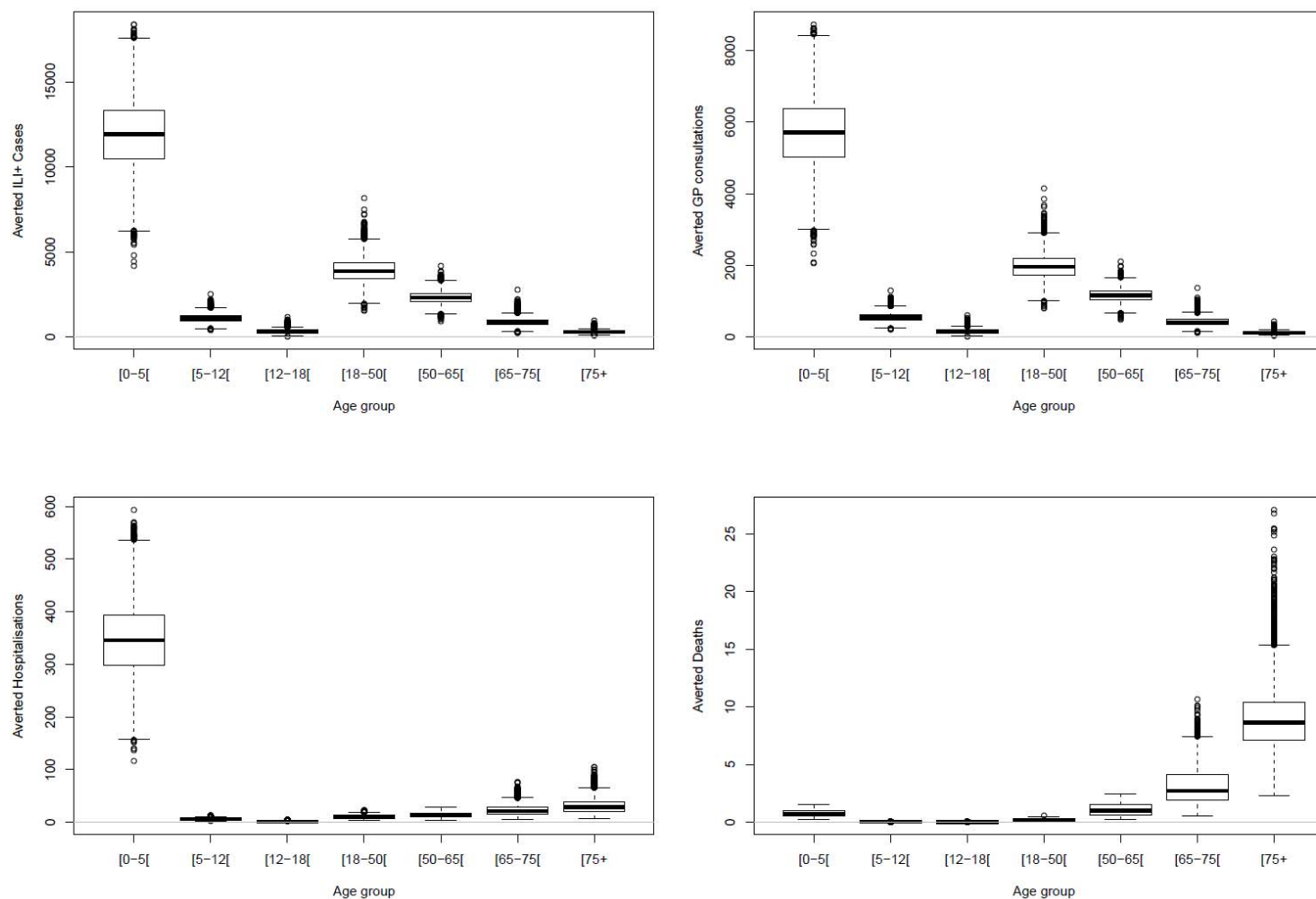
**Figure 19 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 50% coverage**

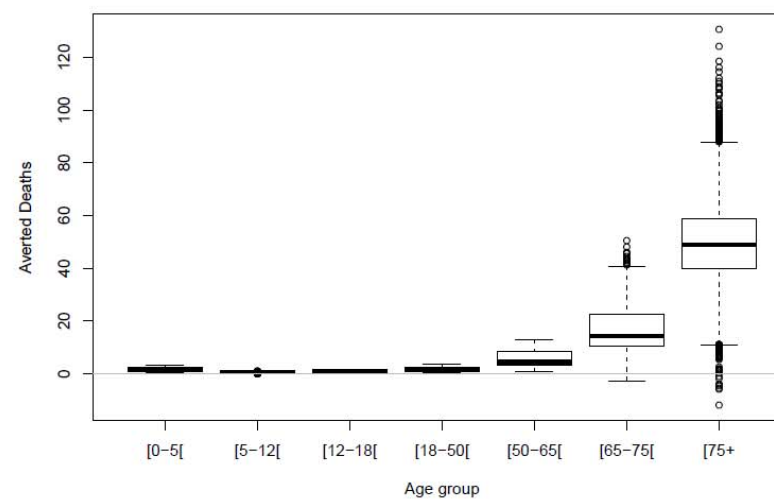
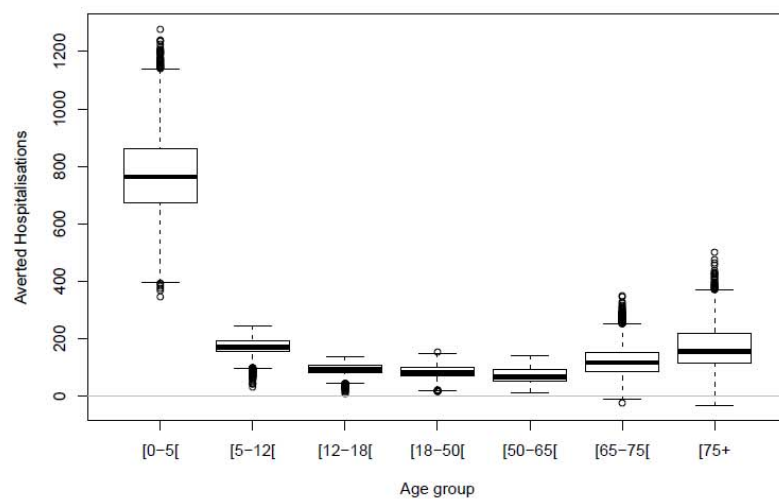
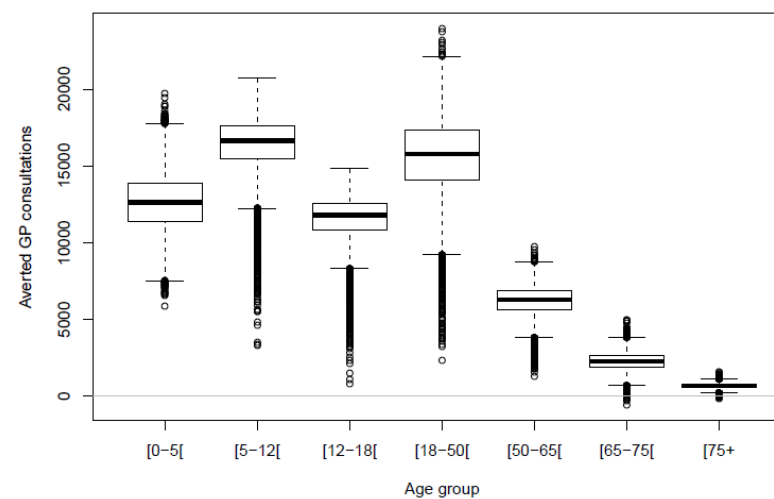
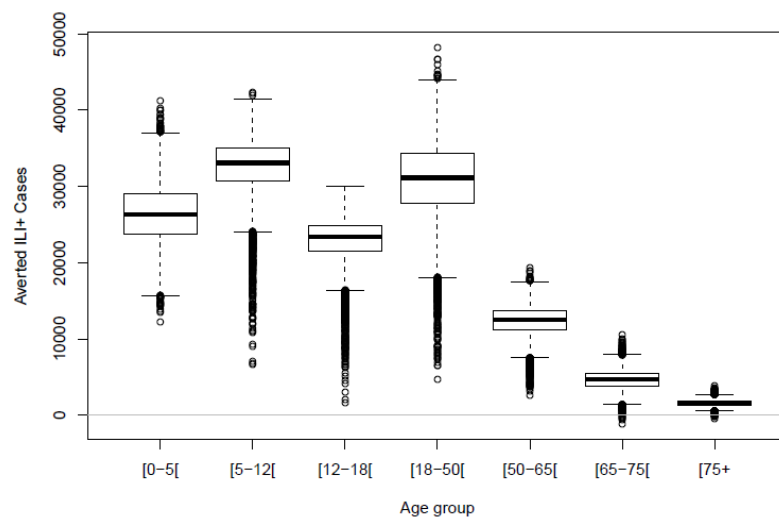






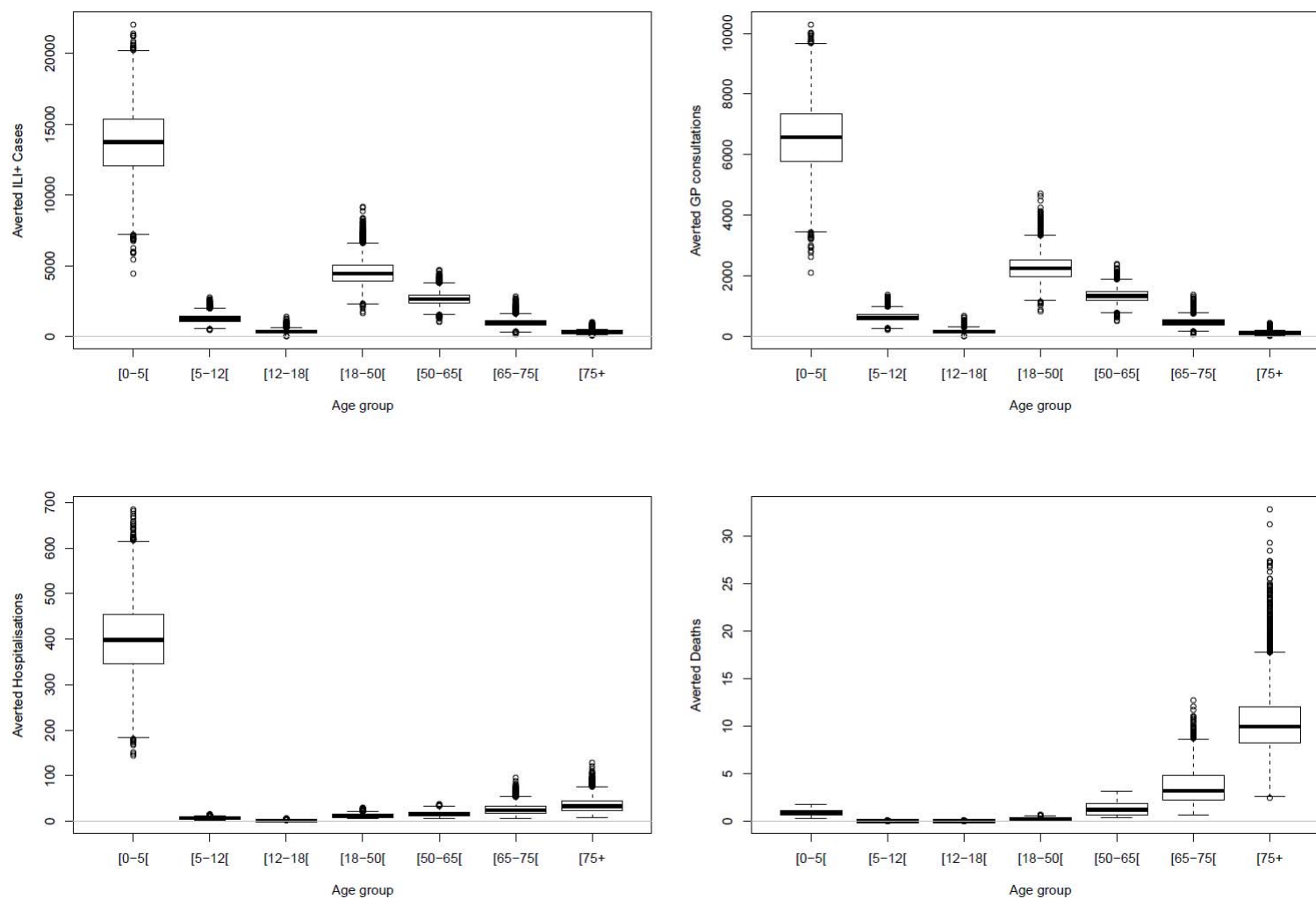
**Figure 20 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 60% coverage**

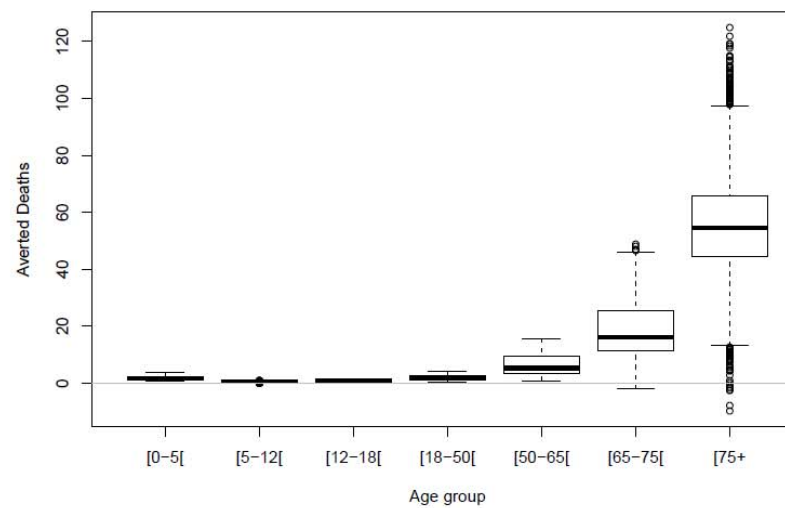
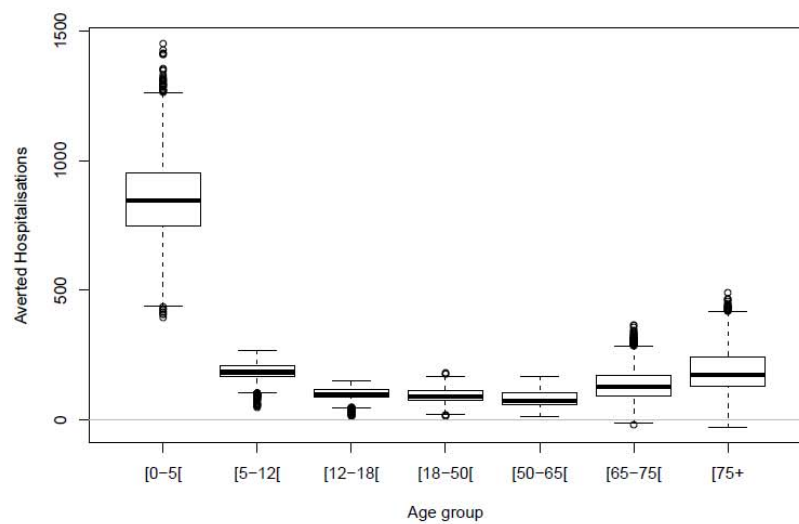
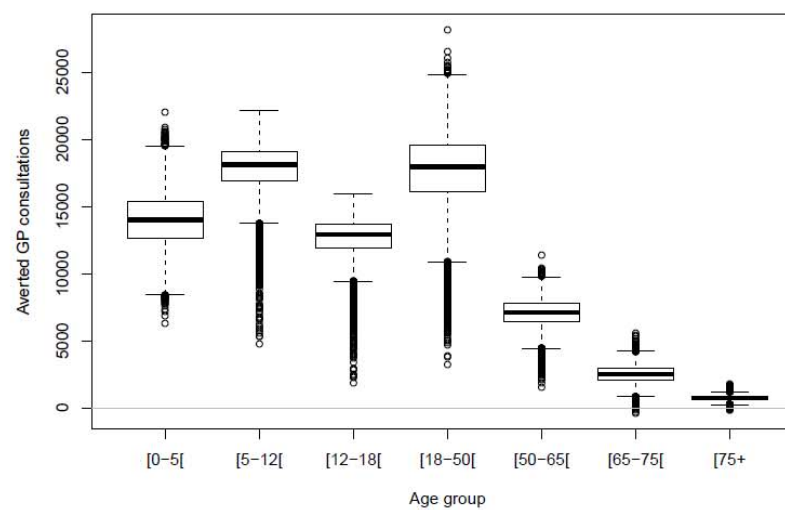
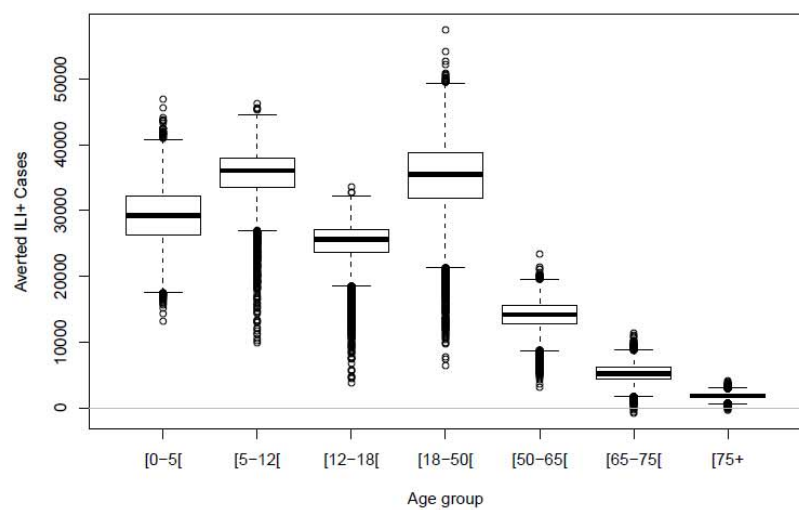






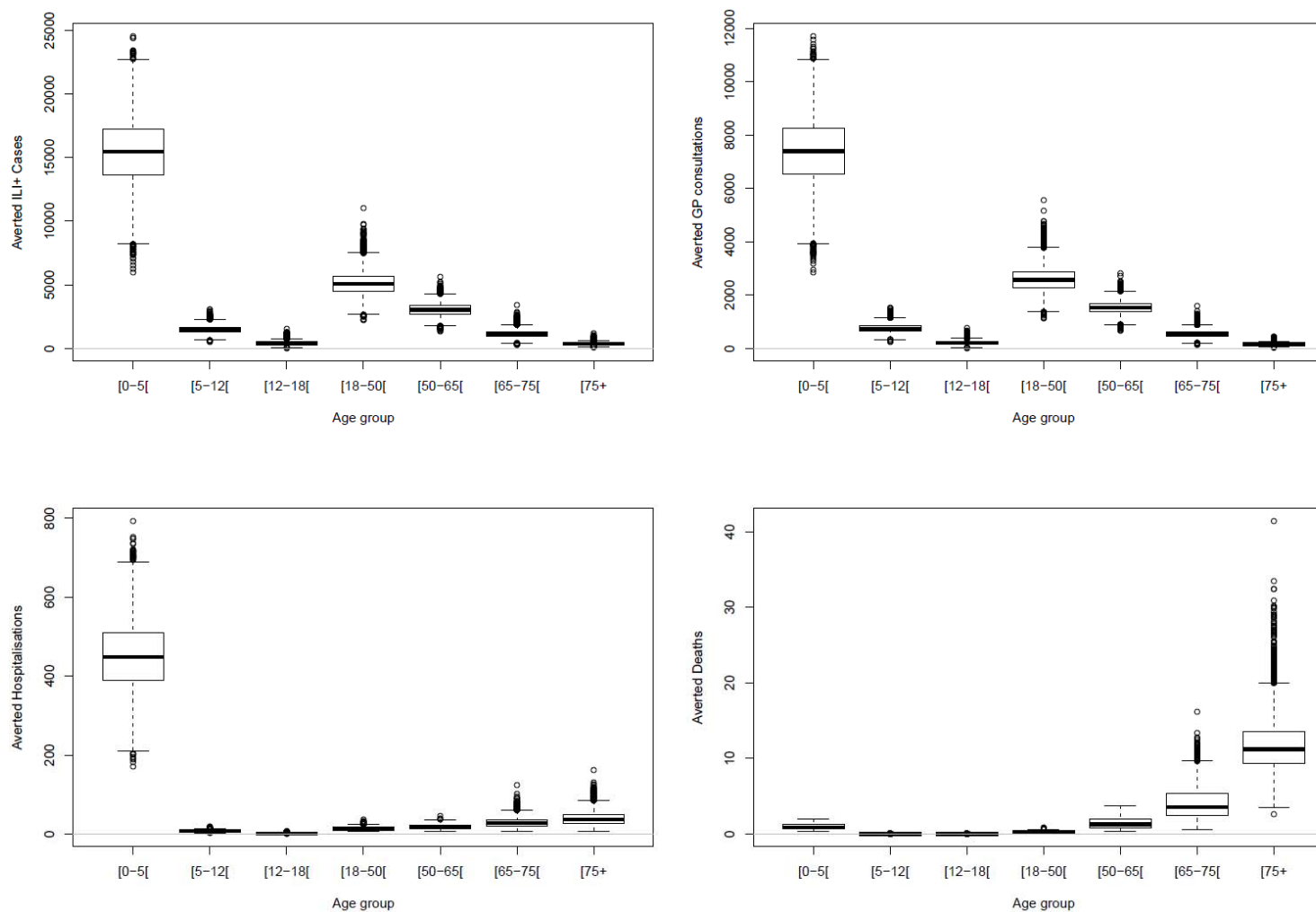
**Figure 21 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 70% coverage**

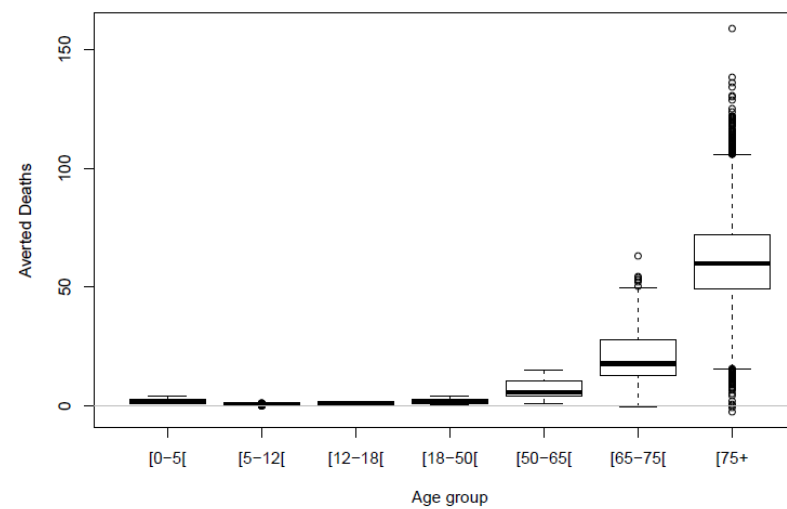
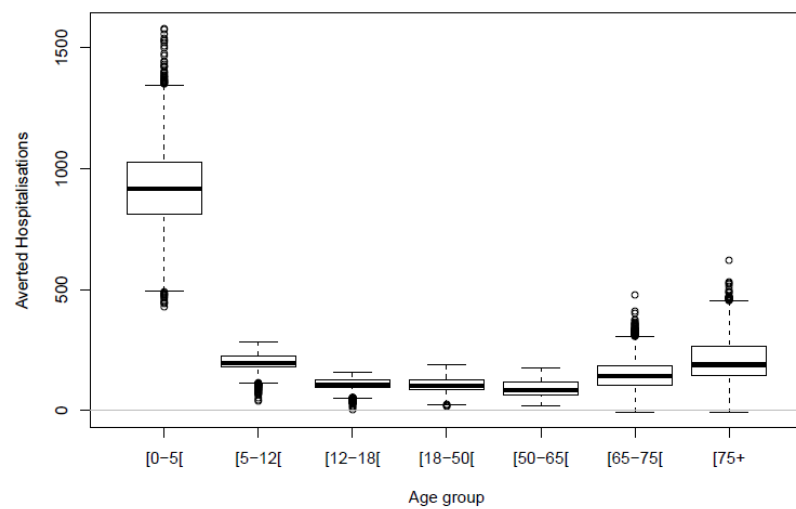
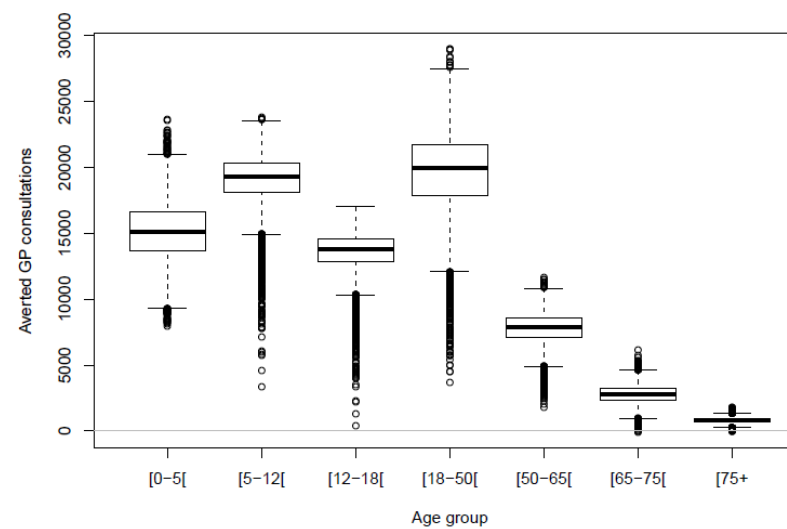
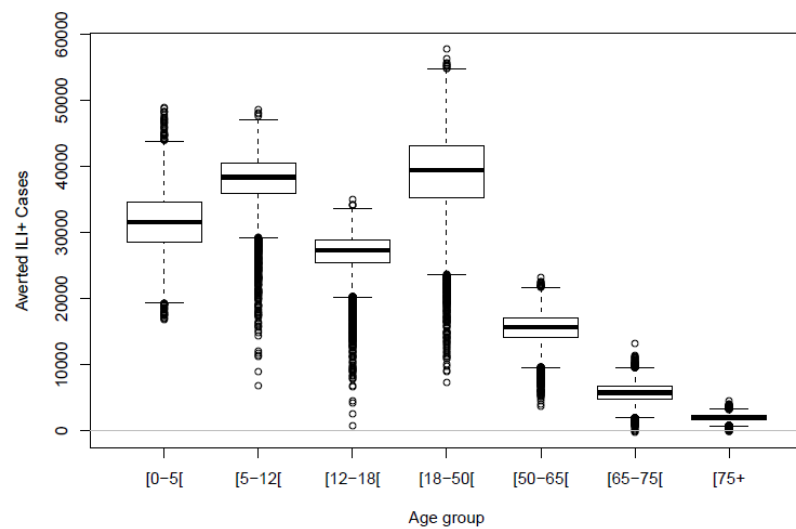






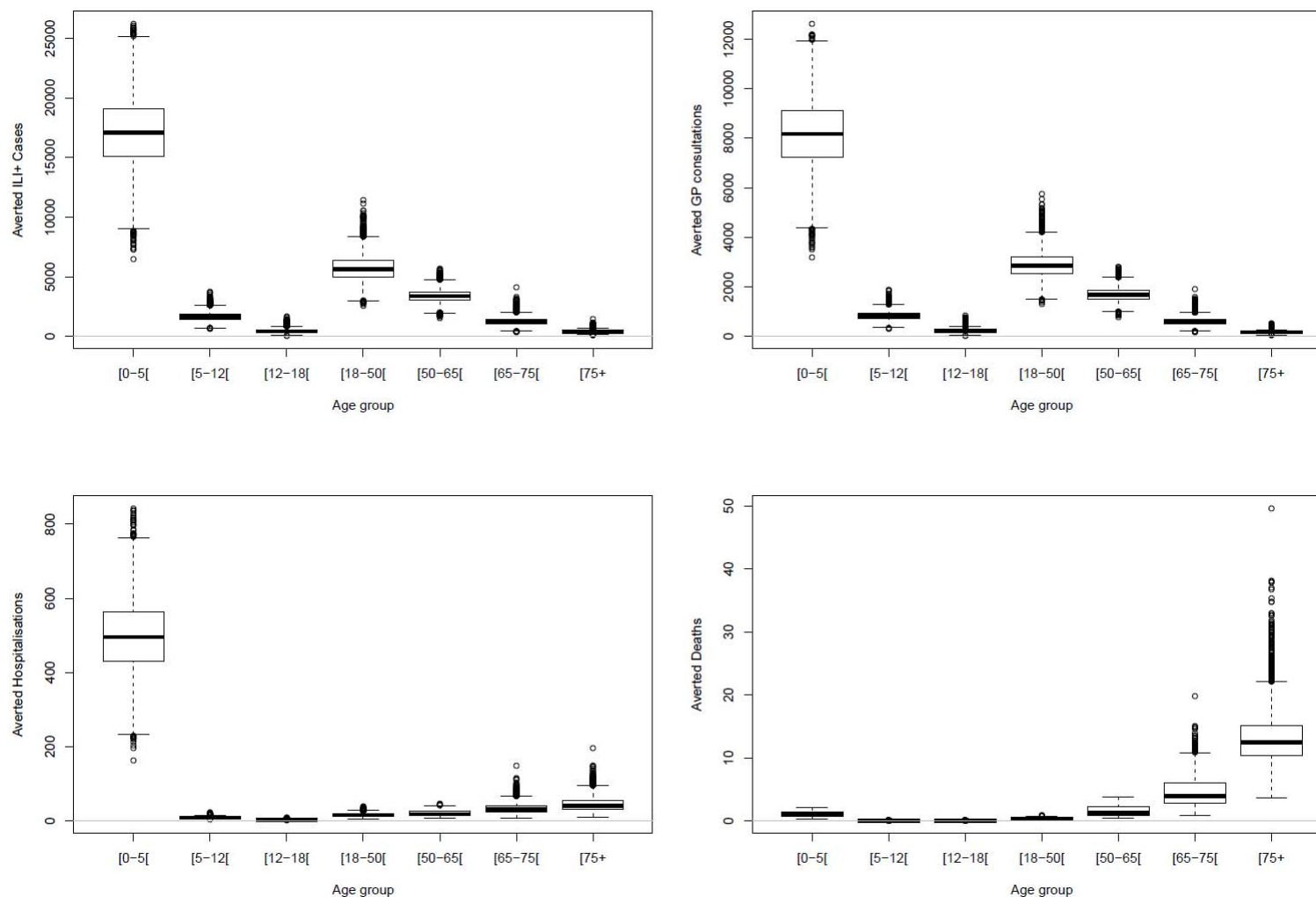
**Figure 22 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 80% coverage**

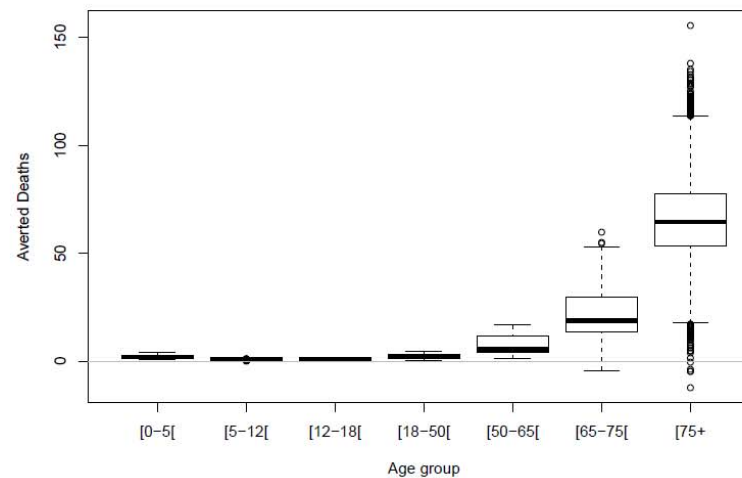
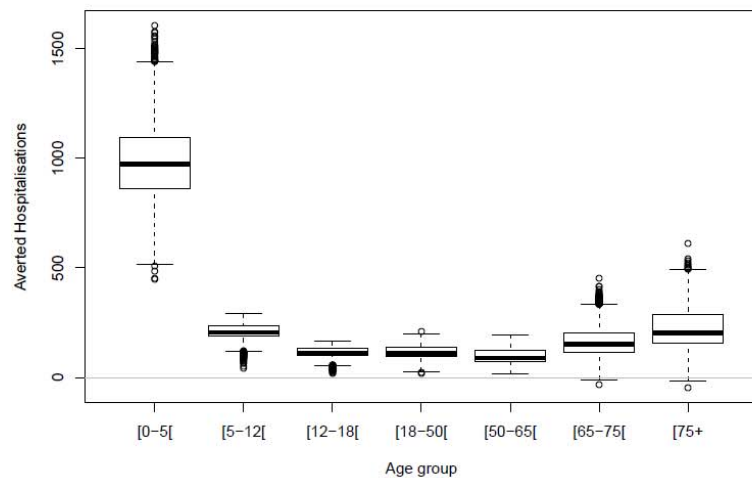
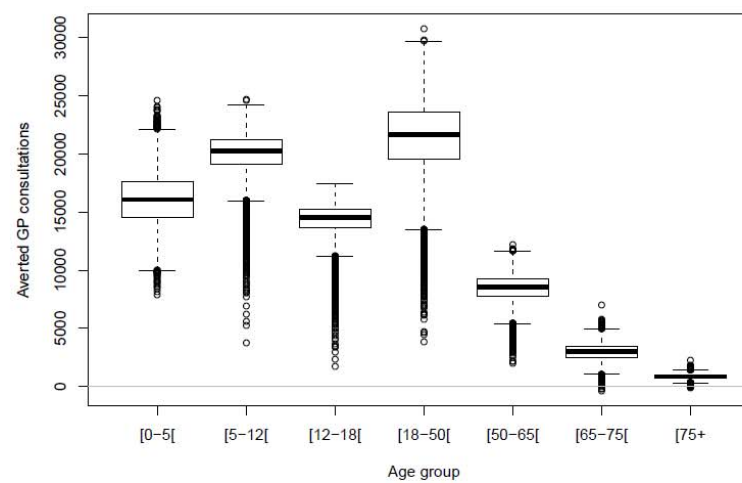
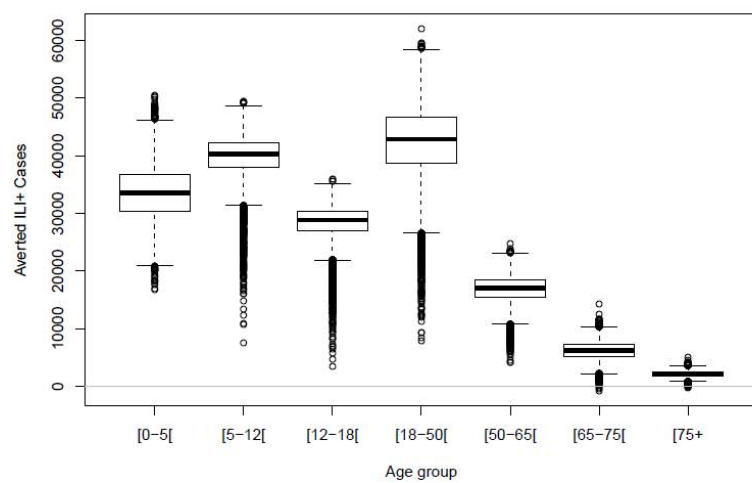






**Figure 23 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least effective option (in terms of QALYs gained) (top) and most effective option (bottom) amongst all the child options at 90% coverage**

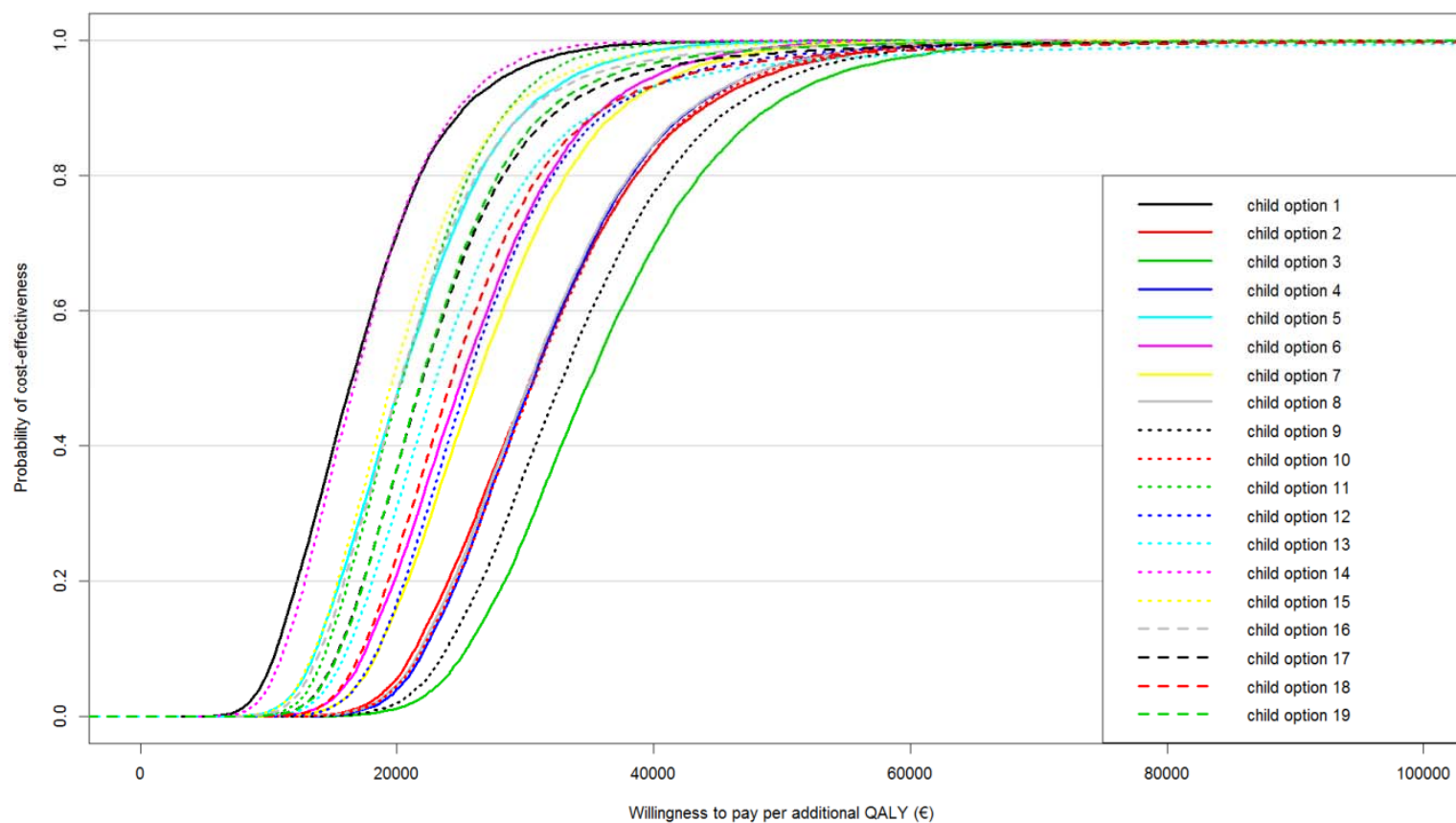






#### 4.2.2. Cost-effectiveness versus current situation

Figure 24 – CEACs for 19 childhood vaccination options at 10% (top) and 20% (bottom) vaccination coverage versus the current situation, with immunity lasting an average of 6 years



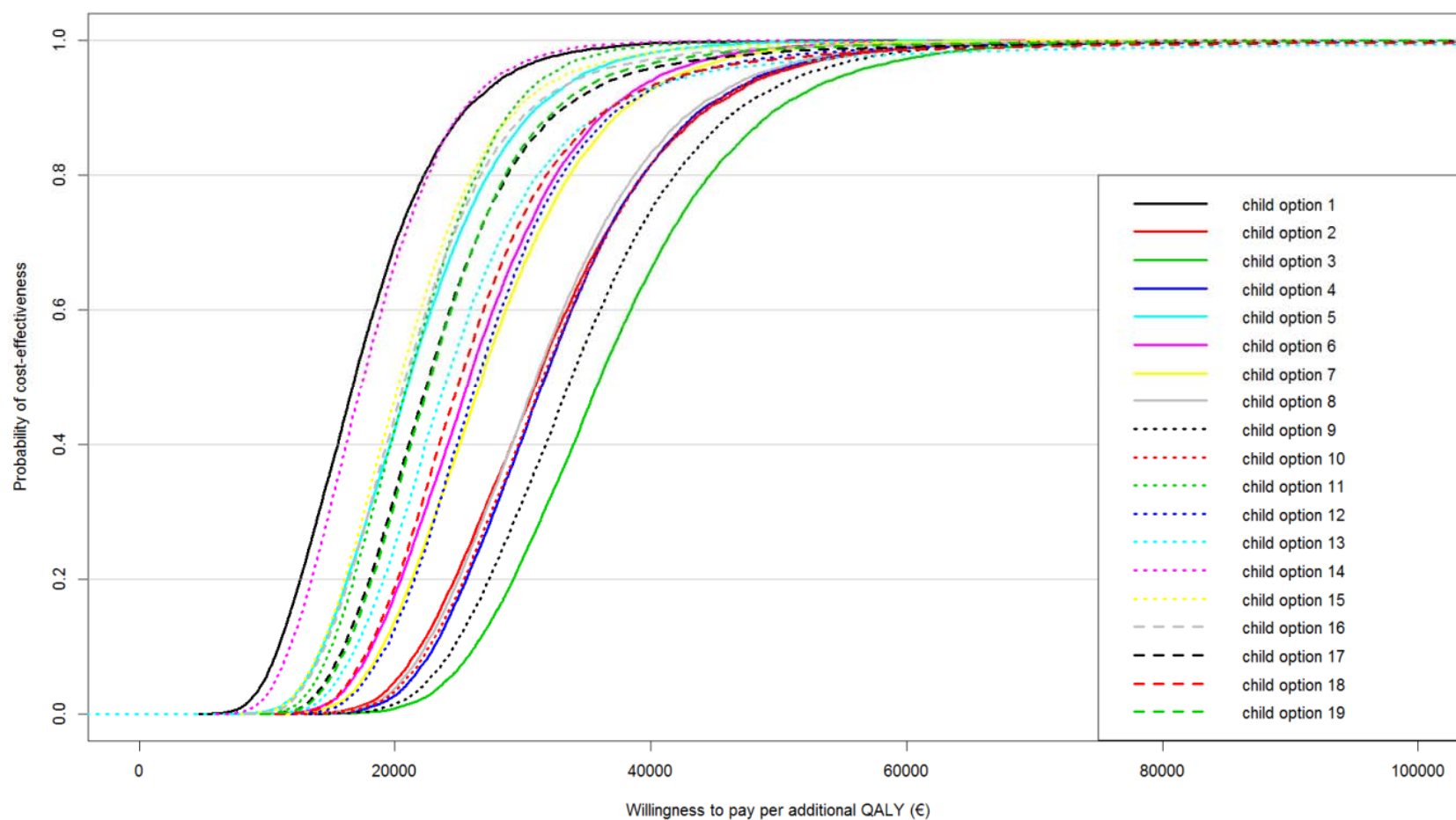
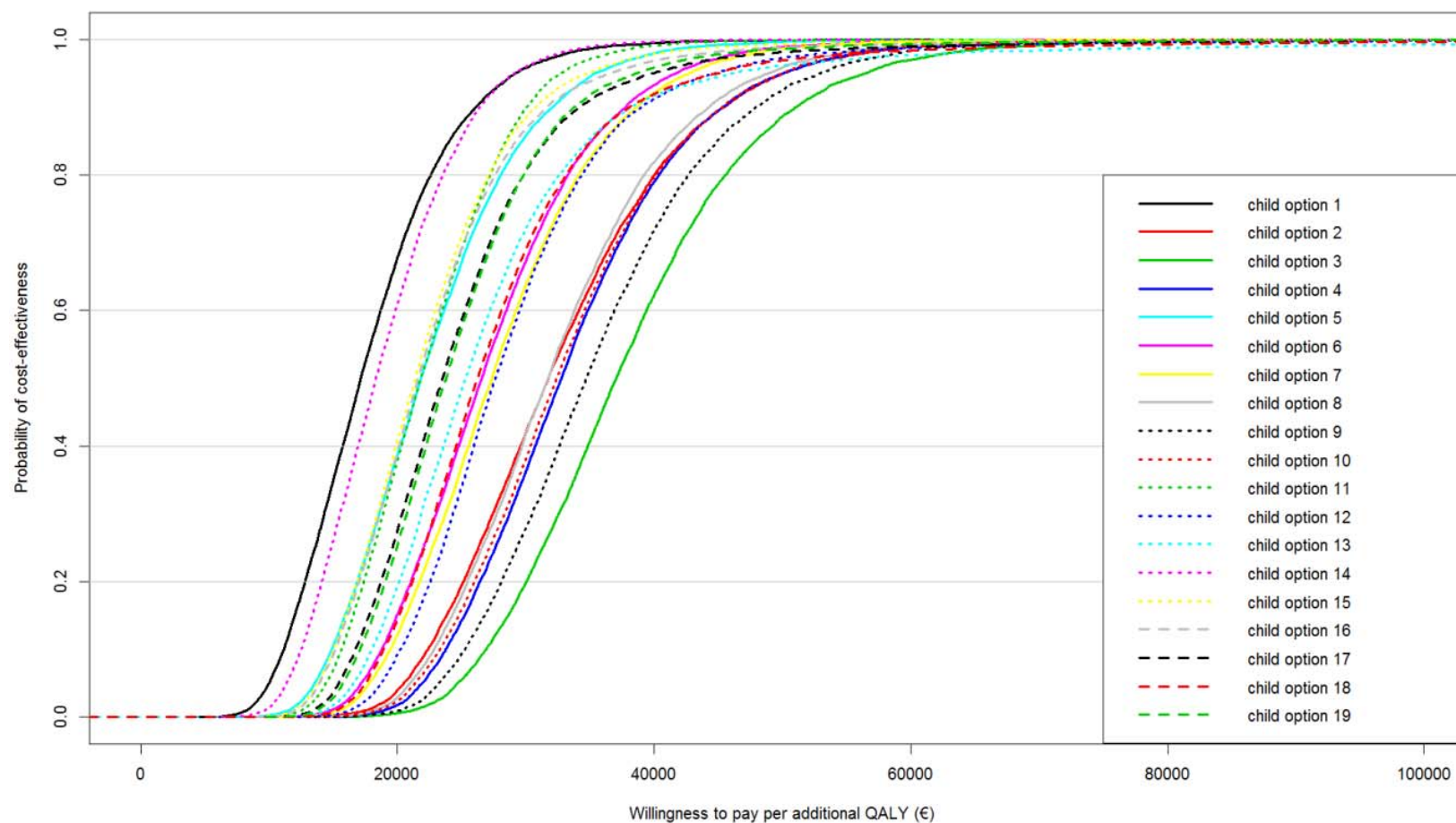




Figure 25 – CEACs for 19 childhood vaccination options at 30% (top) and 40% (bottom) vaccination coverage versus the current situation, with immunity lasting an average of 6 years



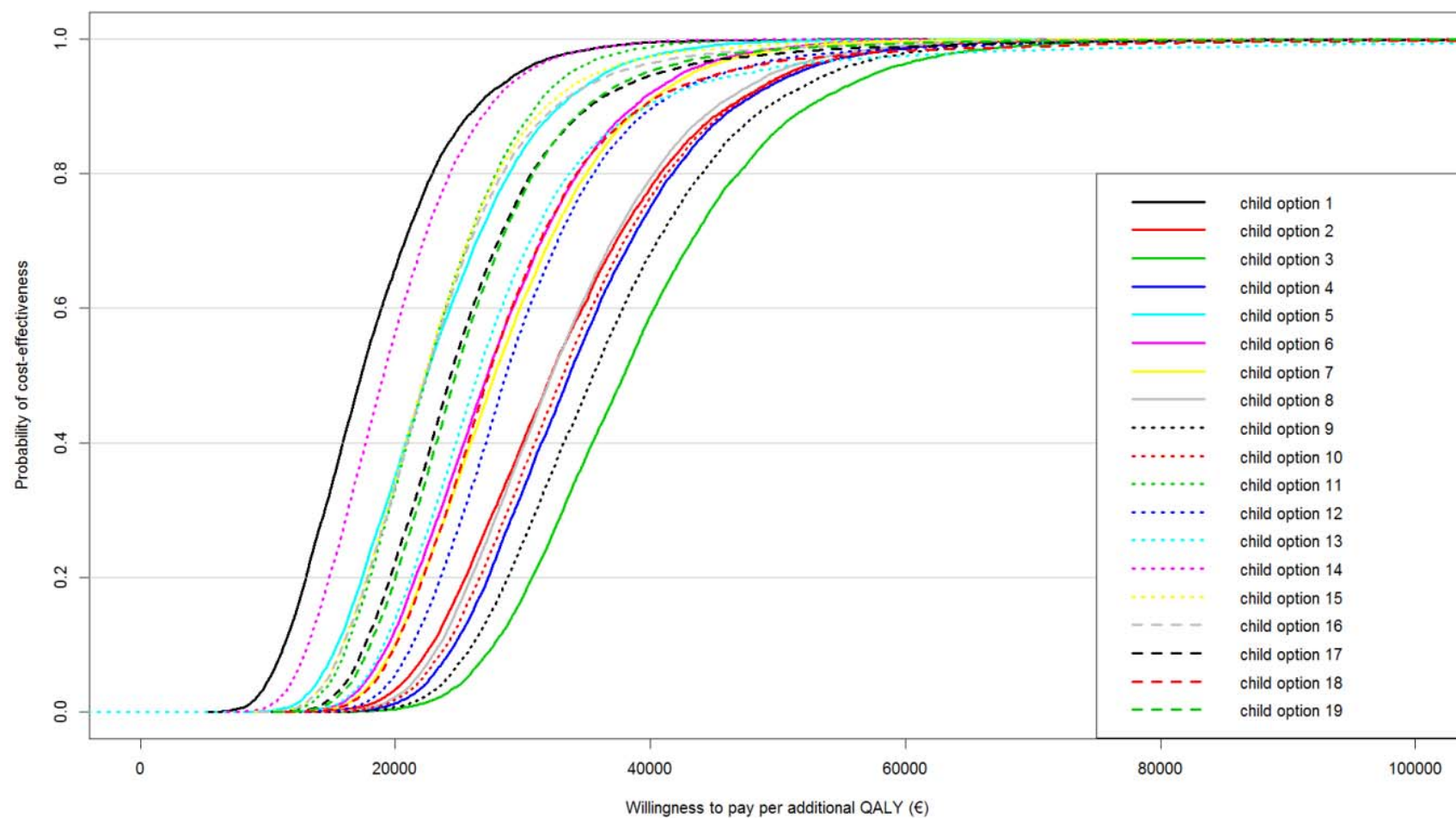
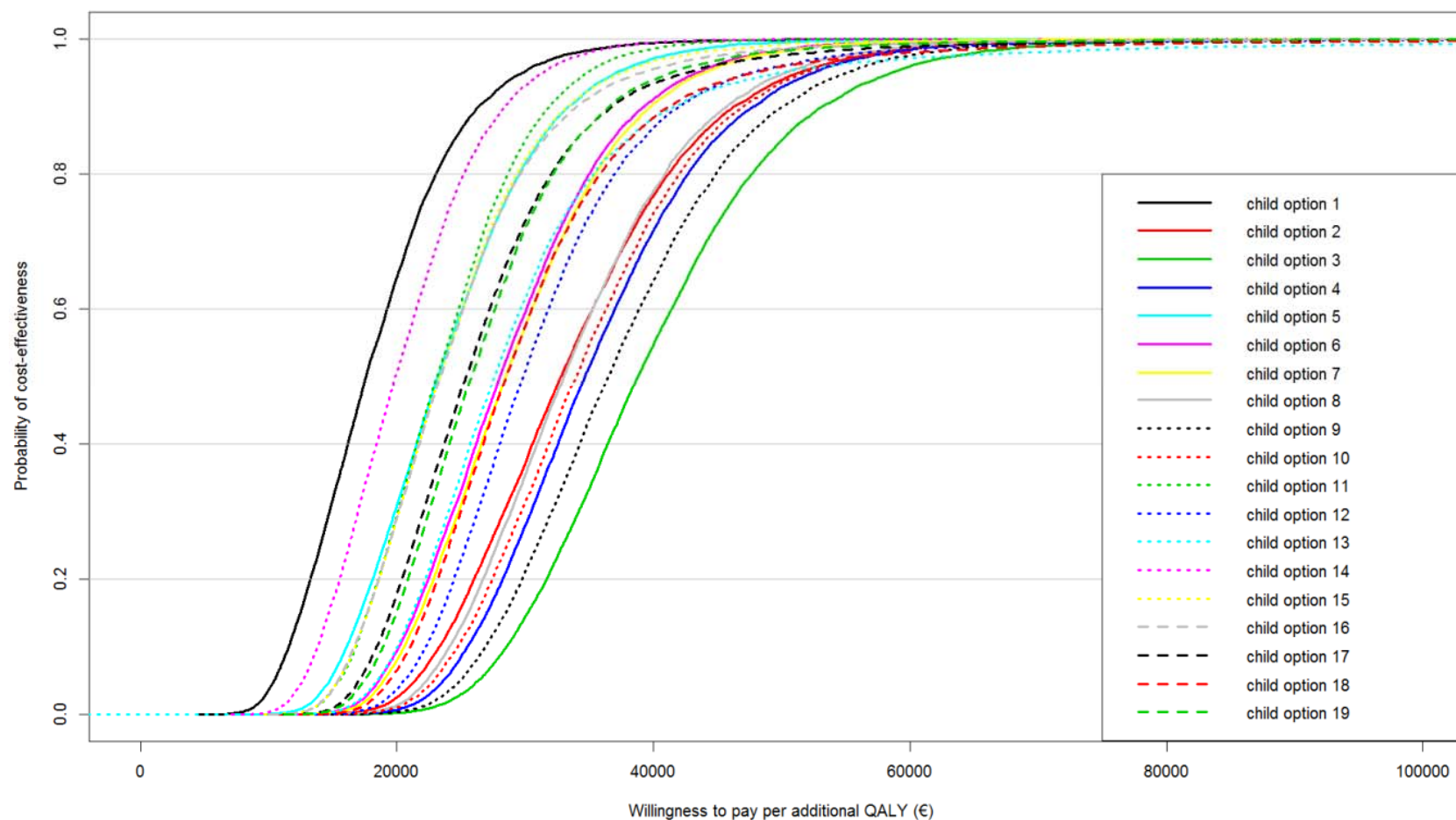




Figure 26 – CEACs for 19 childhood vaccination options at 50% (top) and 60% (bottom) vaccination coverage versus the current situation, with immunity lasting an average of 6 years



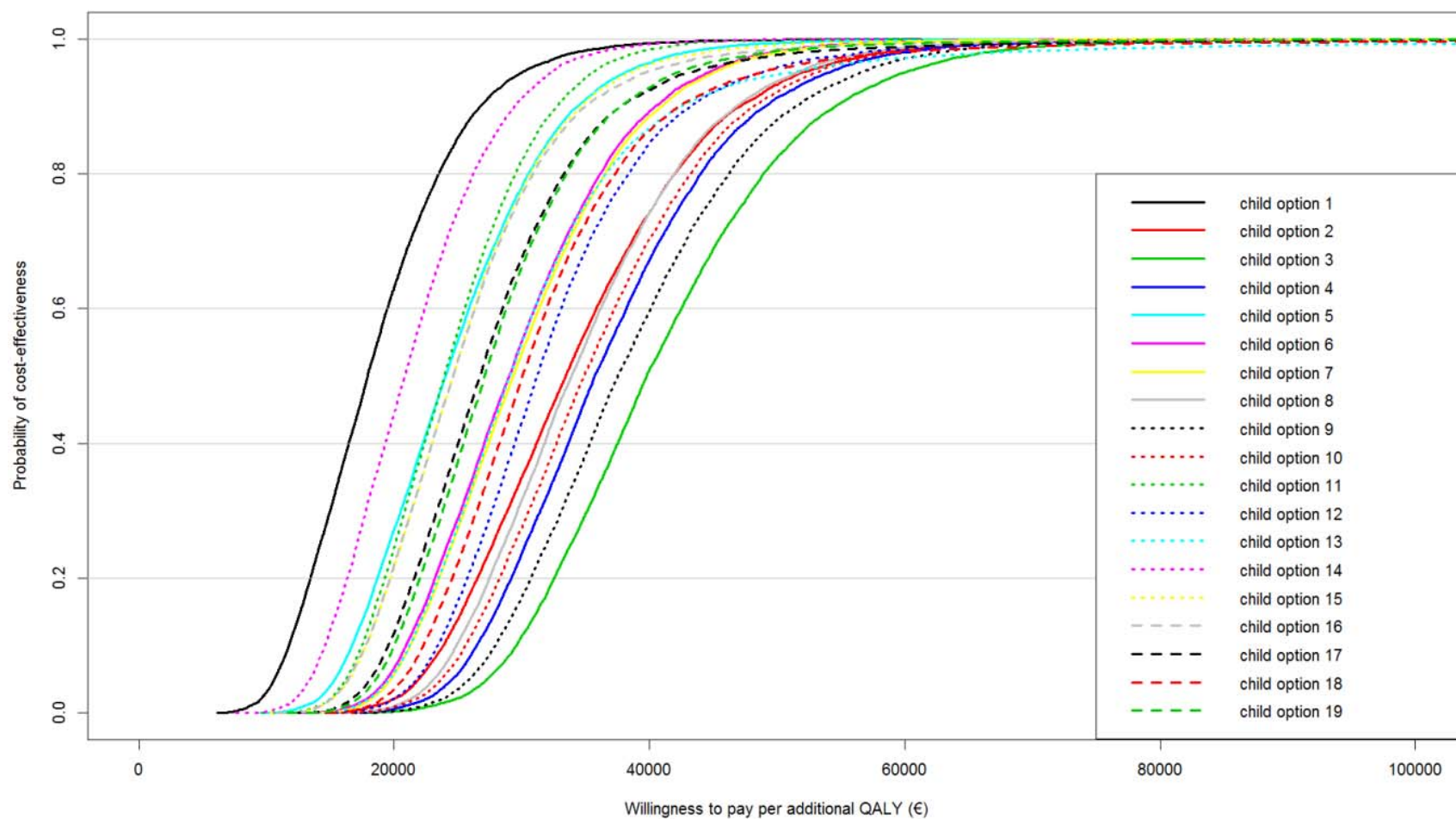
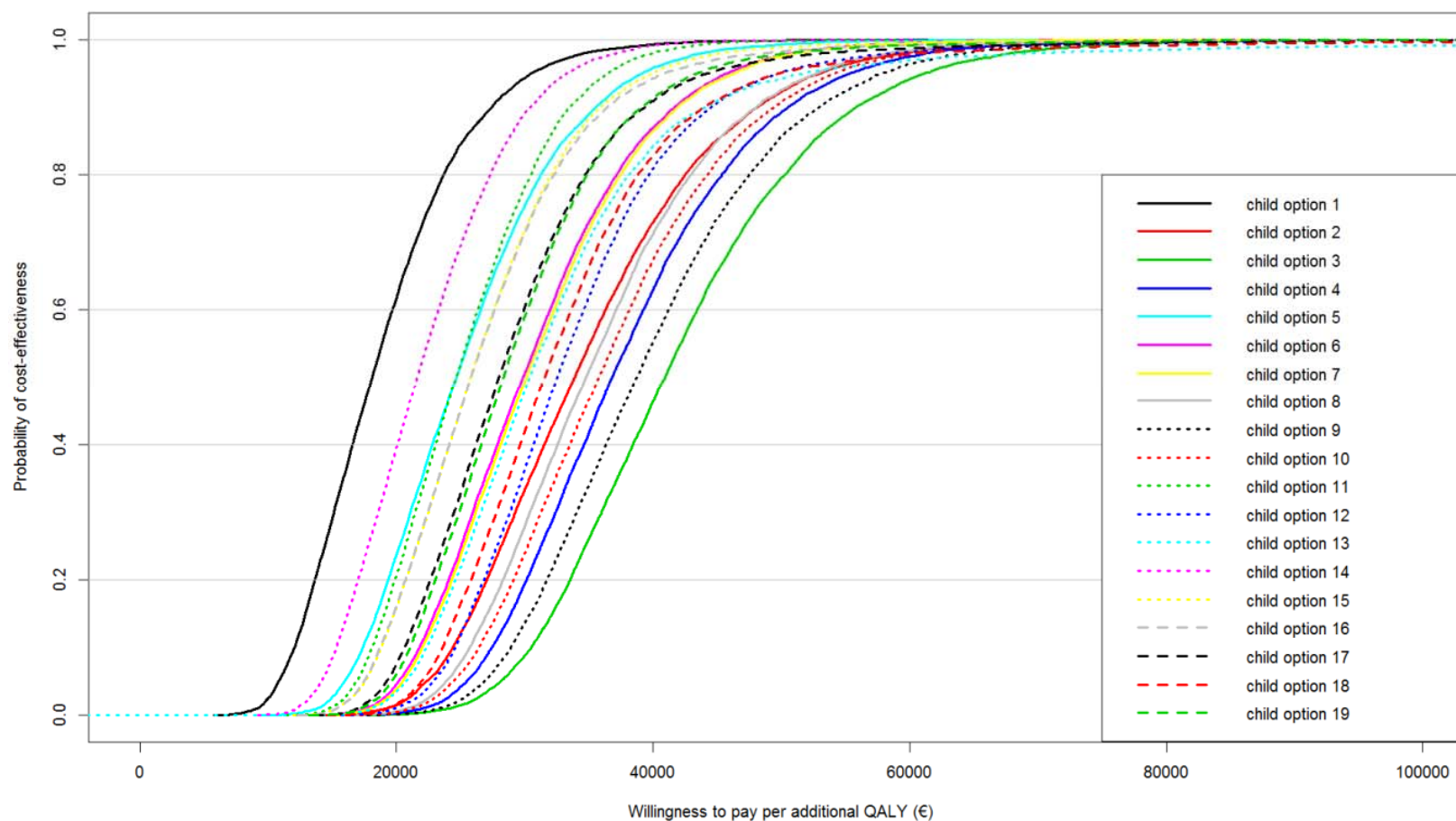




Figure 27 – CEACs for 19 childhood vaccination options at 70% (top) and 80% (bottom) vaccination coverage versus the current situation, with immunity lasting an average of 6 years



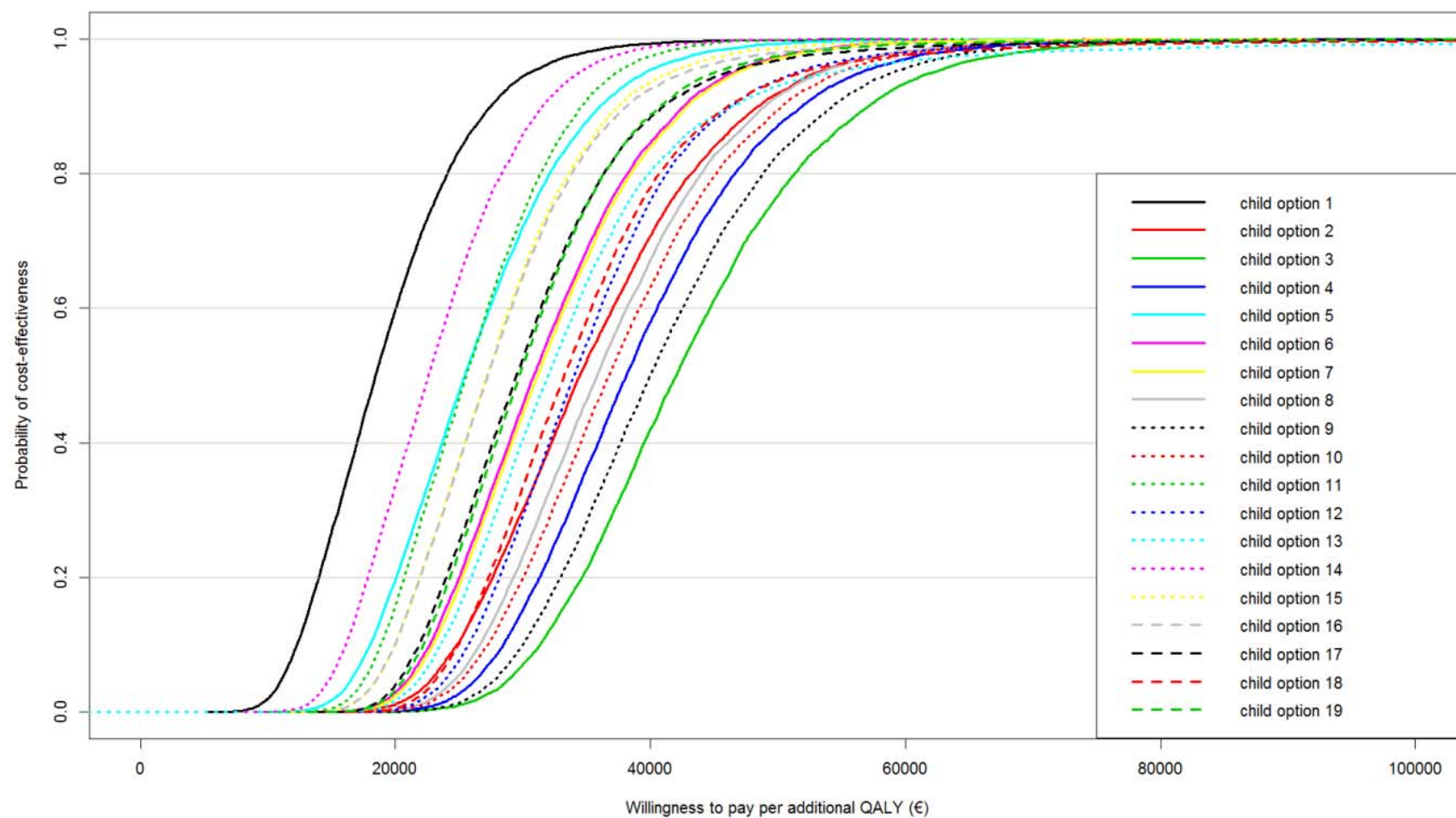




Figure 28 – CEACs for 19 childhood vaccination options at 90% vaccination coverage versus the current situation, with immunity lasting an average of 6 years

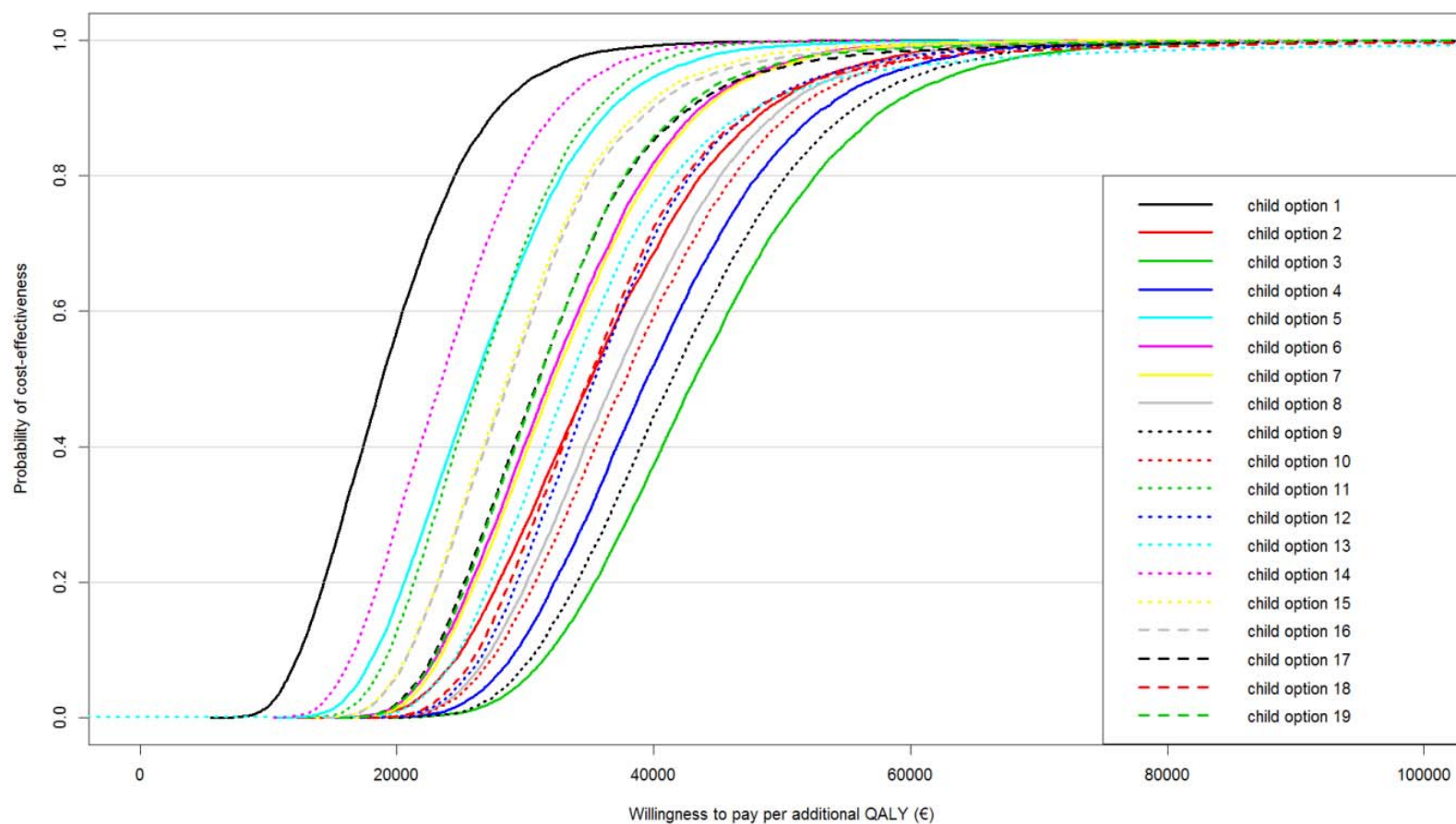
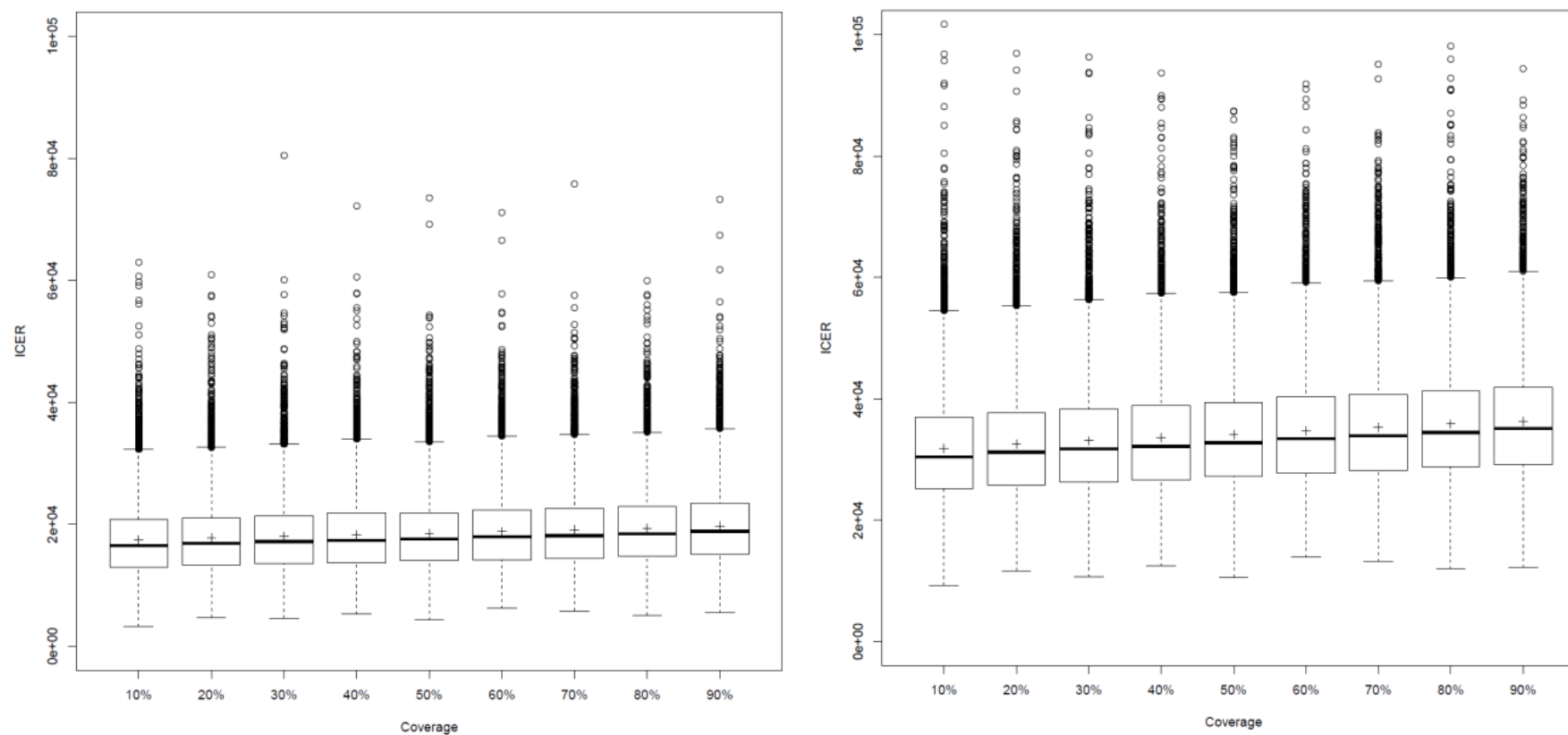


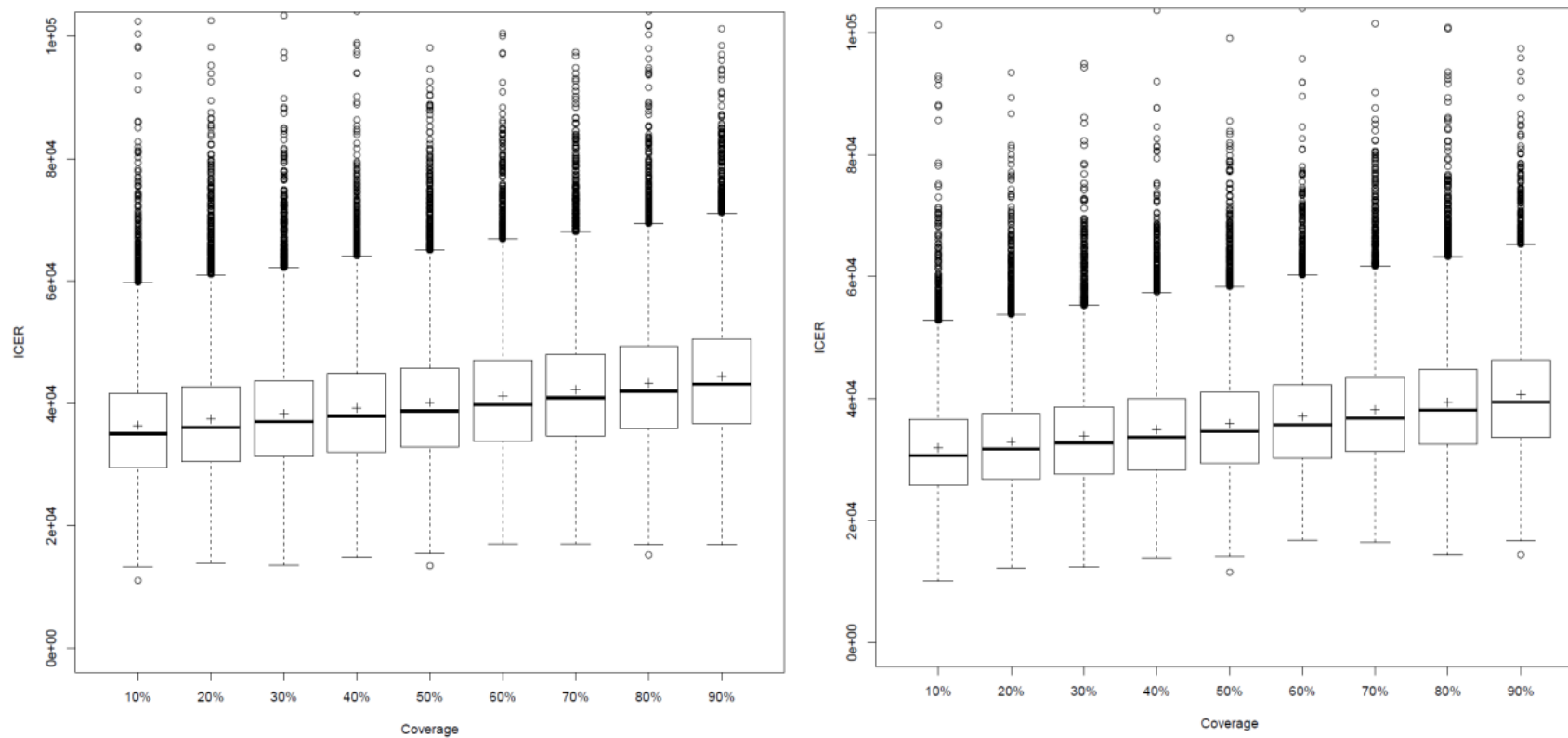


Figure 29 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c1 (left) and Option c2 (right) versus the current situation, with immunity lasting an average of 6 years





**Figure 30 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c3 (left) and Option c4 (right) versus the current situation, and with immunity lasting an average of 6 years**





**Figure 31 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c5 (left) and Option c6 (right) versus the current situation, and with immunity lasting an average of 6 years**

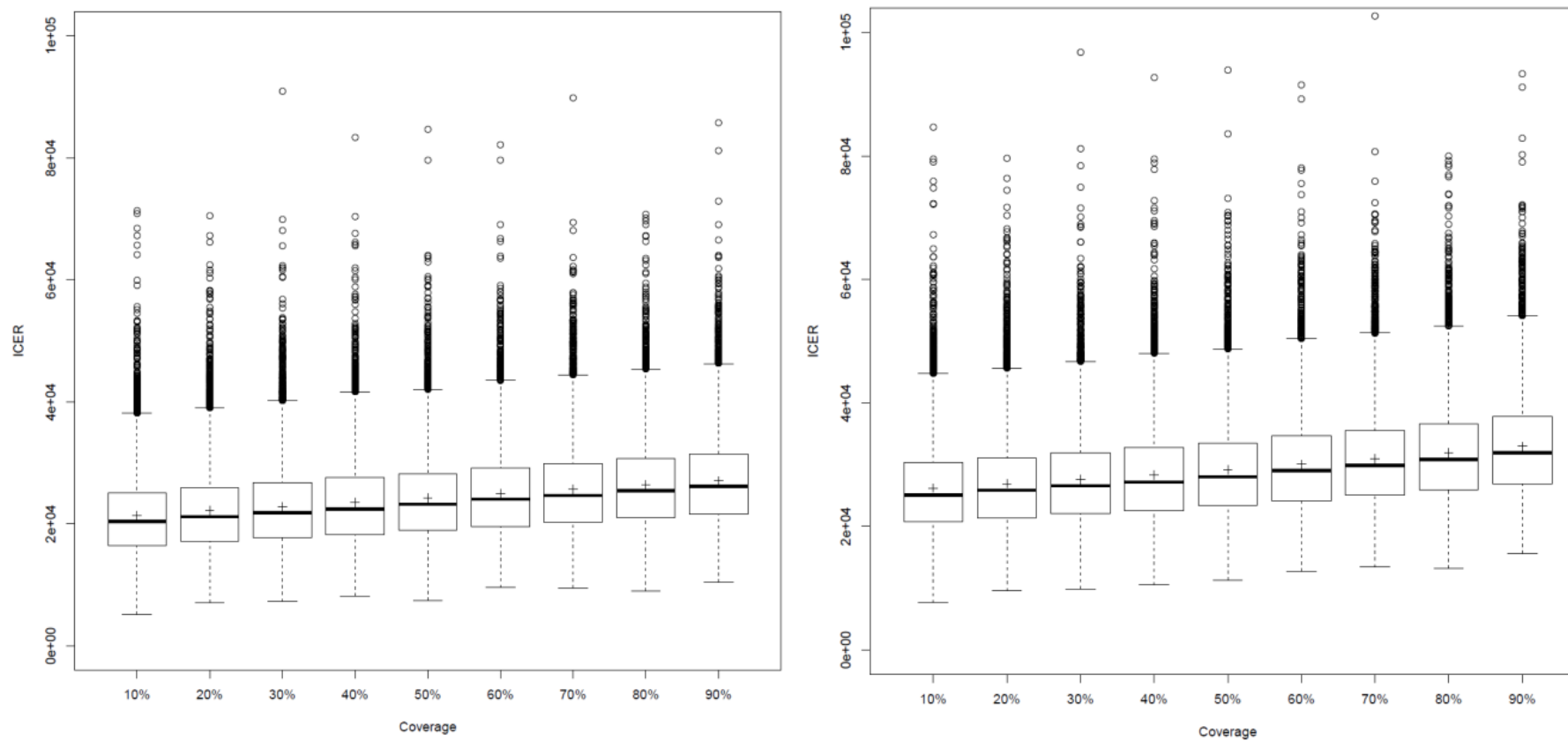




Figure 32 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c7 (left) and Option c8 (right) versus the current situation, and with immunity lasting an average of 6 years

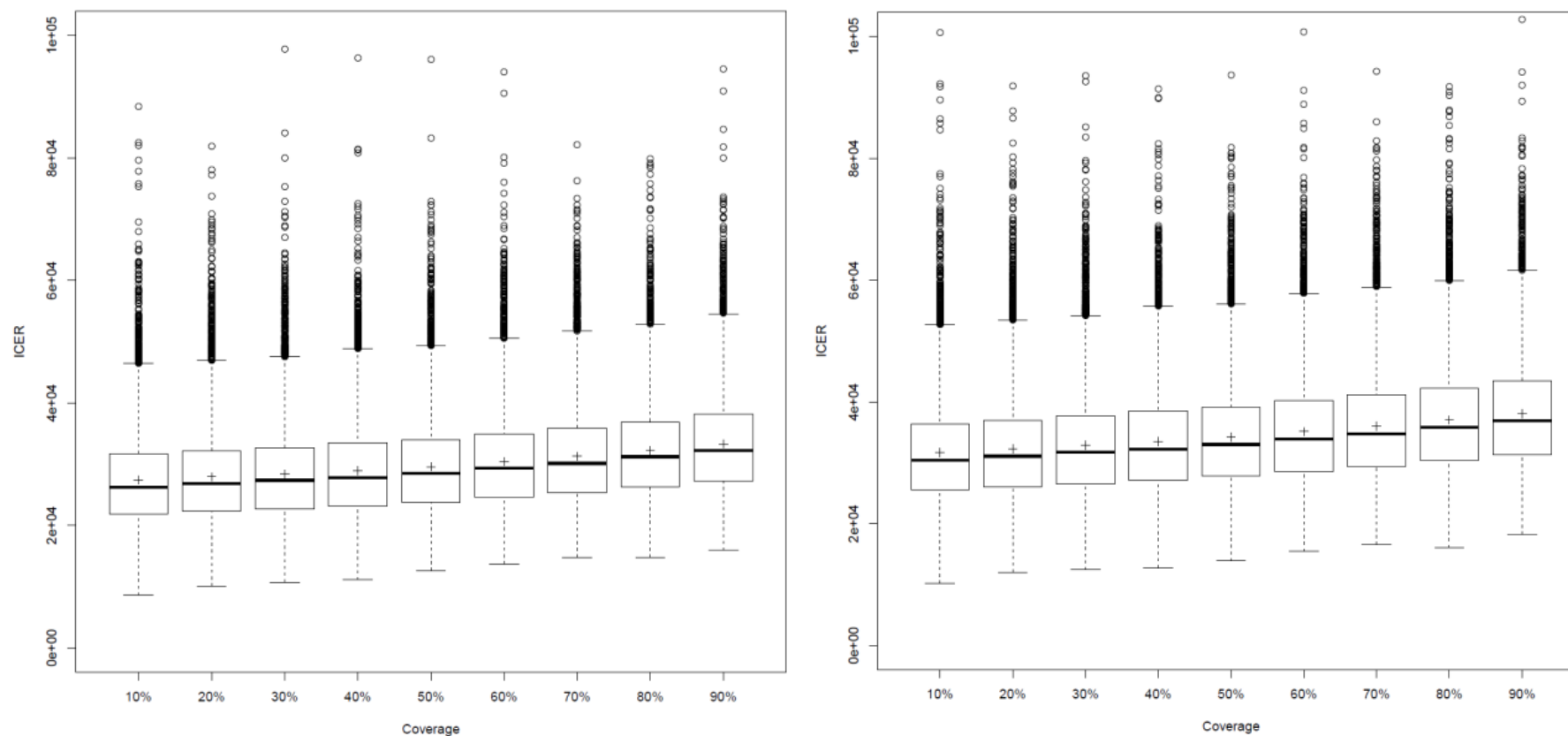




Figure 33 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c9 (left) and Option c10 (right) versus the current situation, and with immunity lasting an average of 6 years

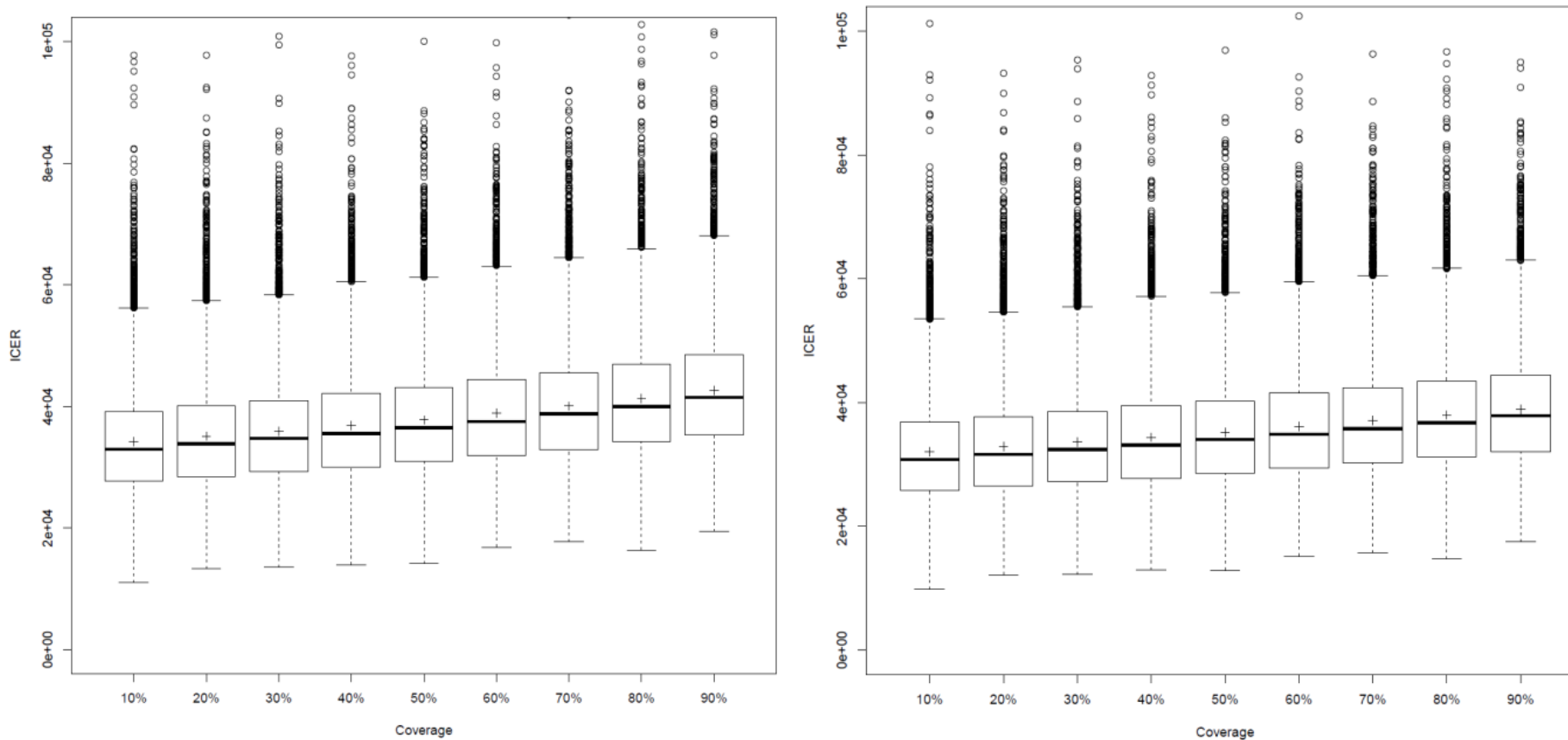




Figure 34 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c11 (left) and Option c12 (right) versus the current situation, and with immunity lasting an average of 6 years

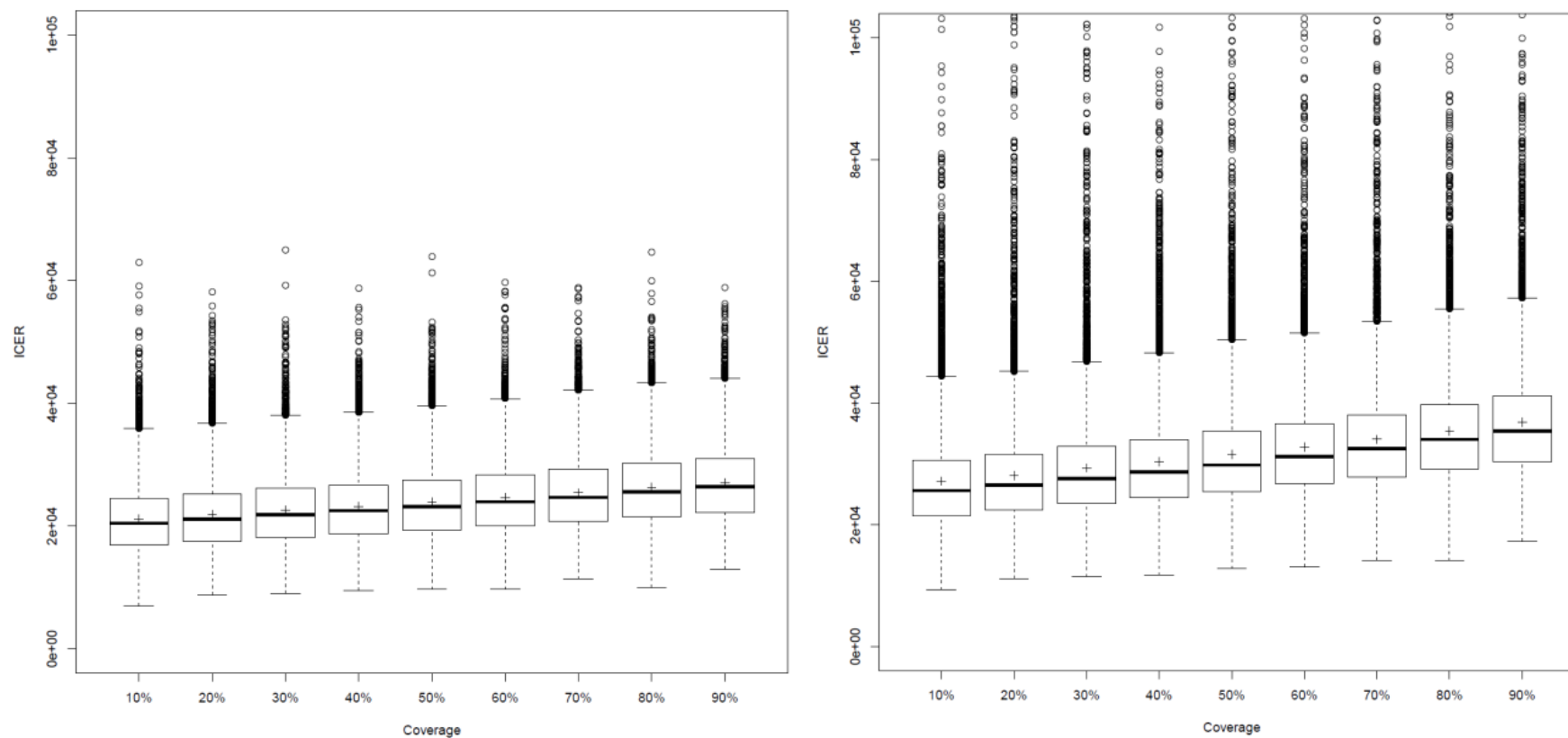




Figure 35 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c13 (left) and Option c14 (right) versus the current situation, and with immunity lasting an average of 6 years

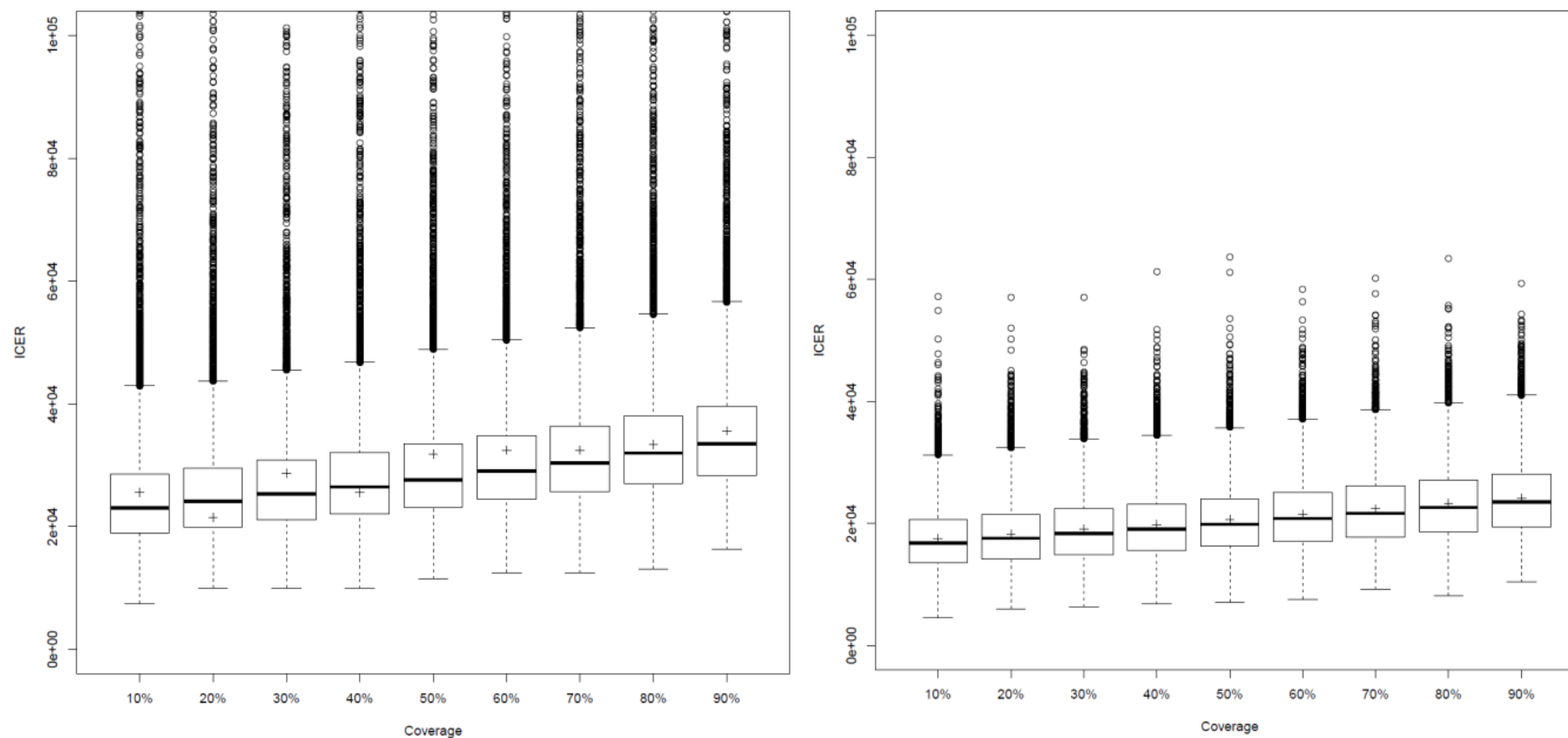




Figure 36 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c15 (left) and Option c16 (right) versus the current situation, and with immunity lasting an average of 6 years

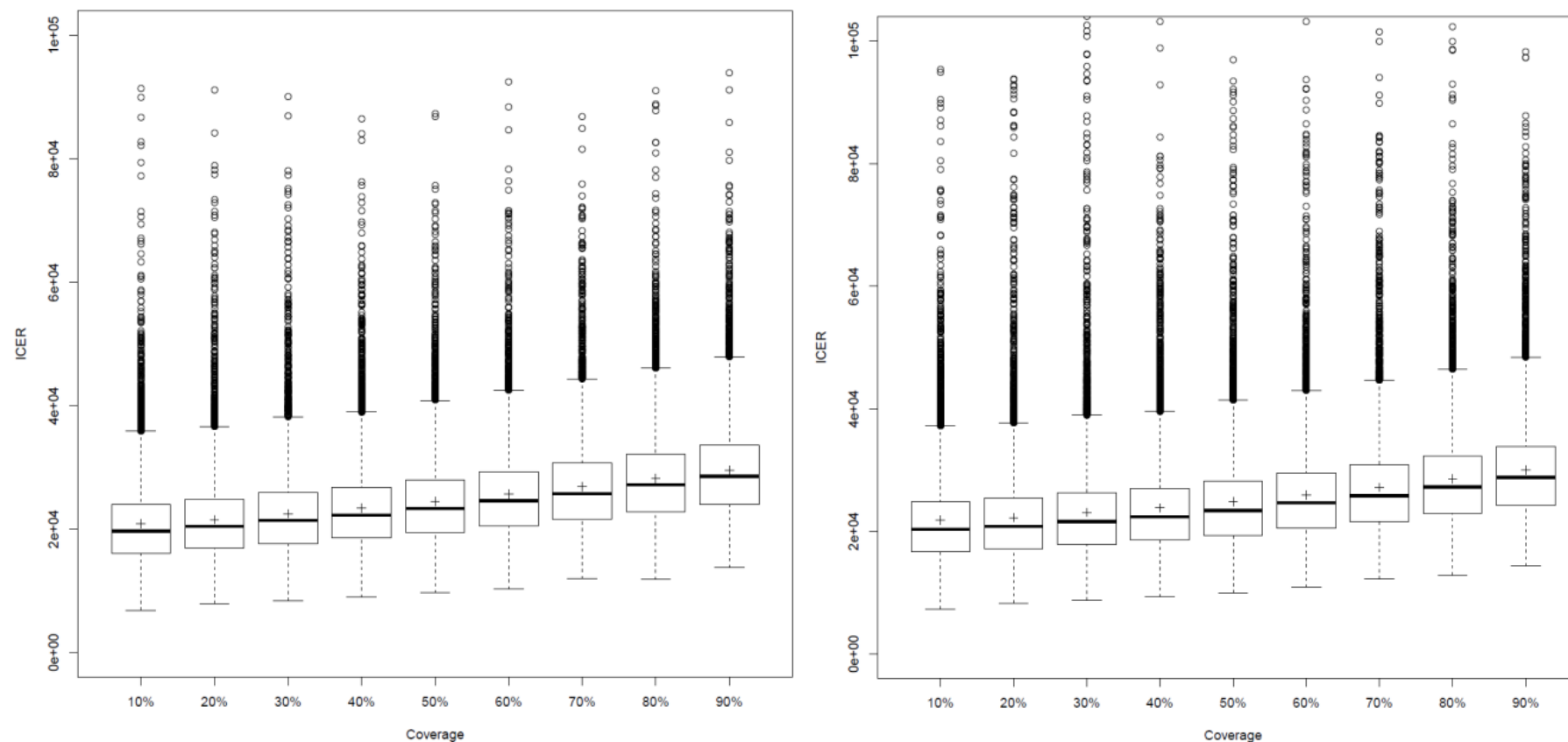
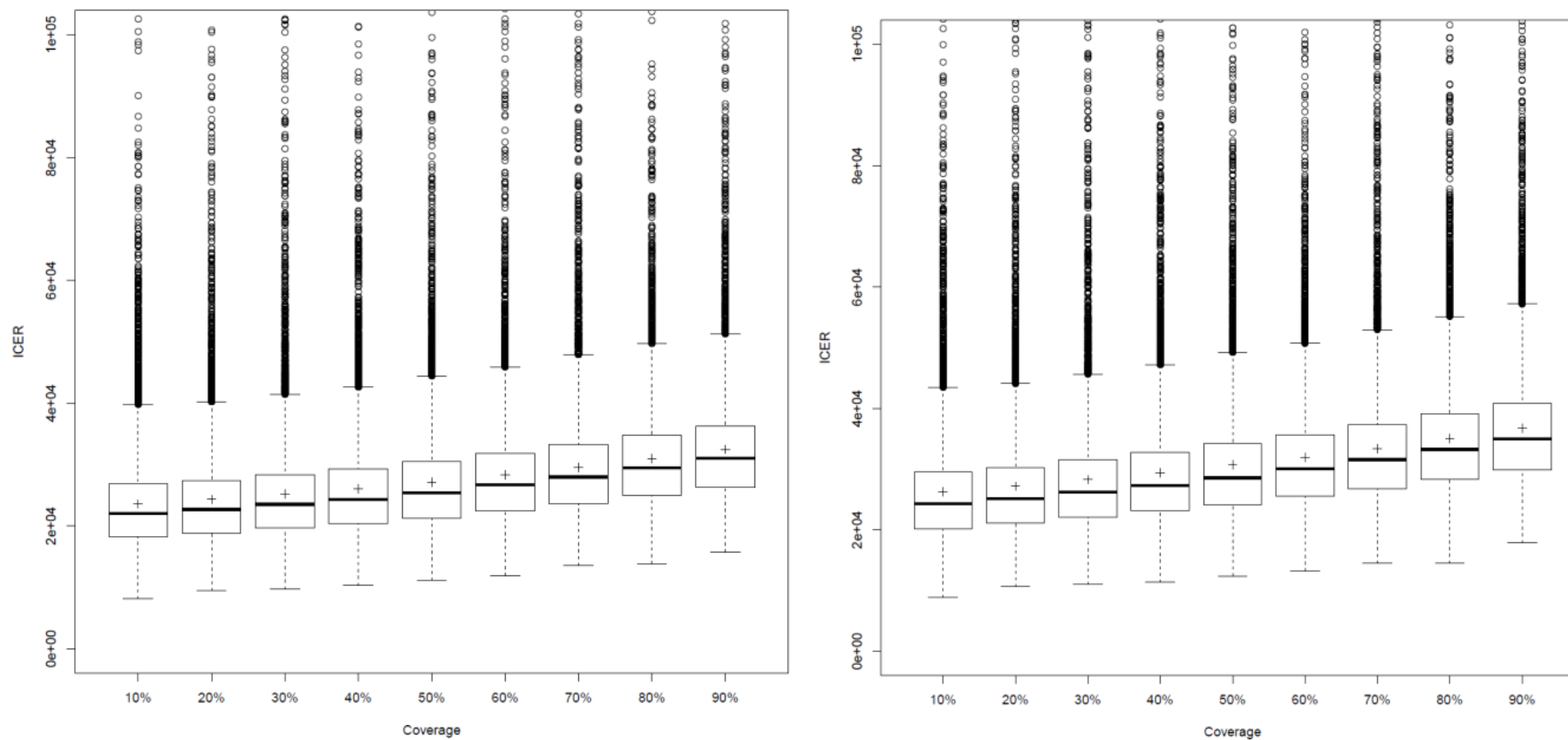


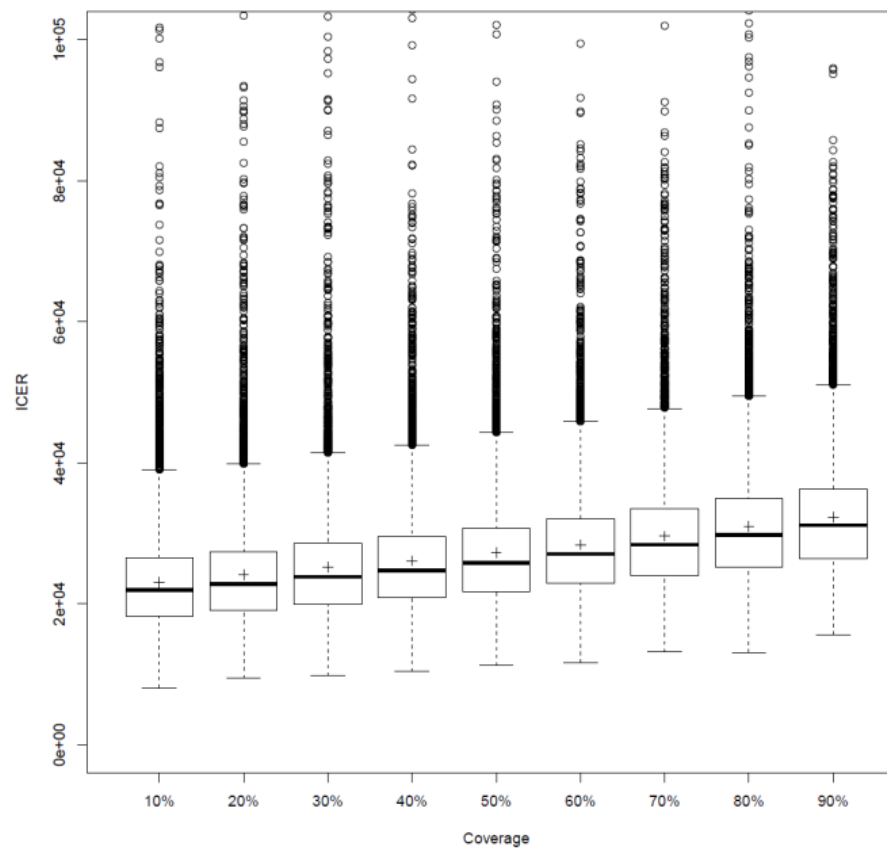


Figure 37 – Boxplots of the distribution of the ICERs by 10% increases in vaccination coverage for Option c17 (left) and Option c18 (right) versus the current situation, and with immunity lasting an average of 6 years





**Figure 38 – Boxplot of the distribution of the ICERs by 10% increases in vaccination coverage for Option c19 versus the current situation, and with immunity lasting an average of 6 years**

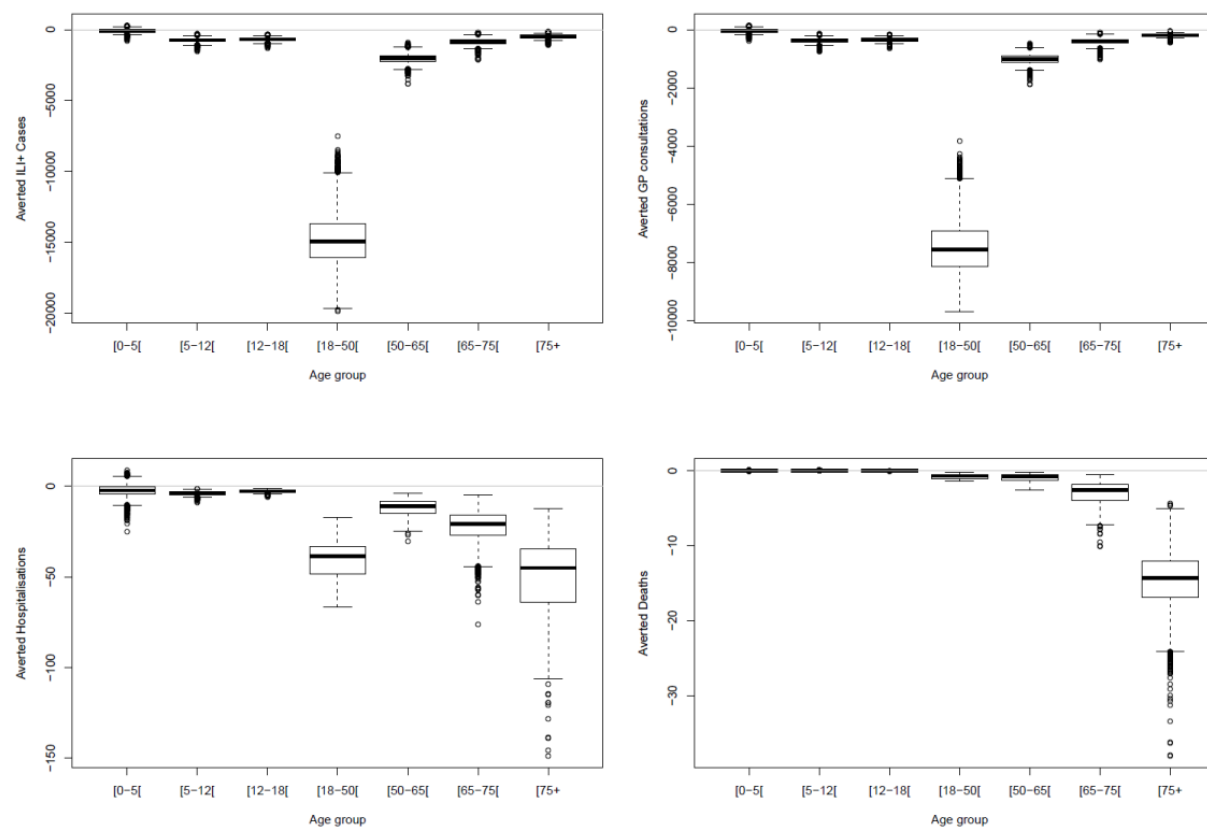


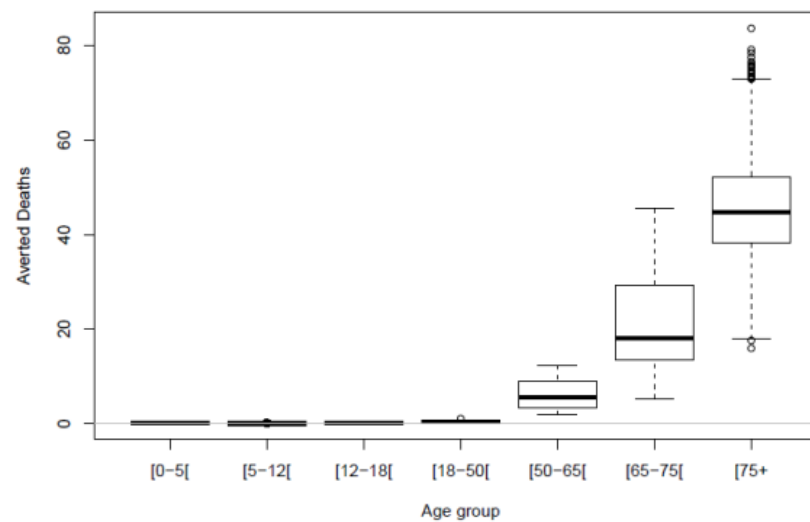
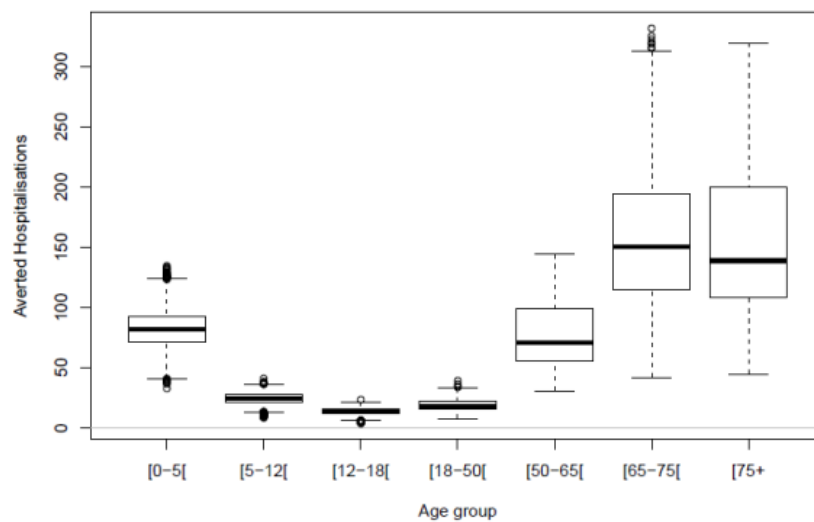
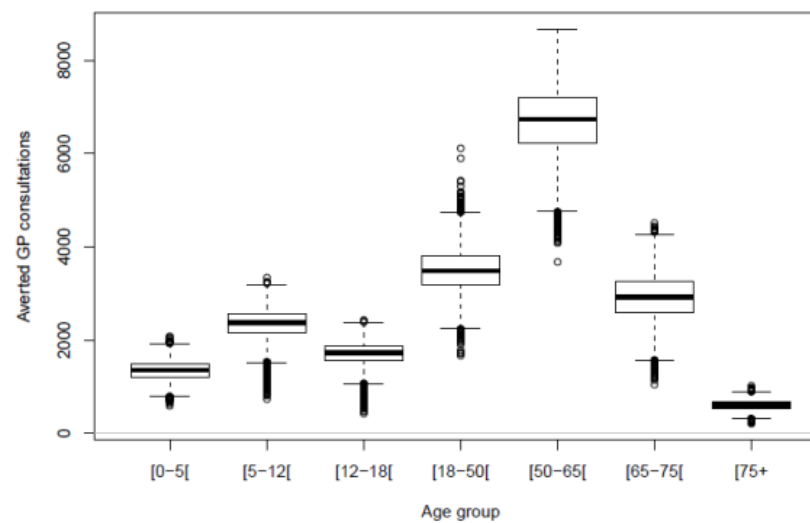
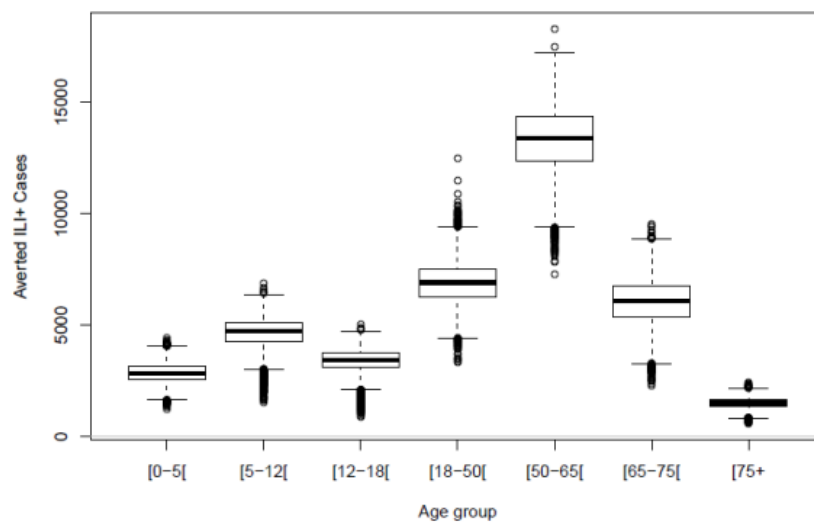


### 4.3. Modified children options + modified adult vaccination targets (waning immunity fixed at an average of 1.68 years)

#### 4.3.1. Effectiveness versus current situation

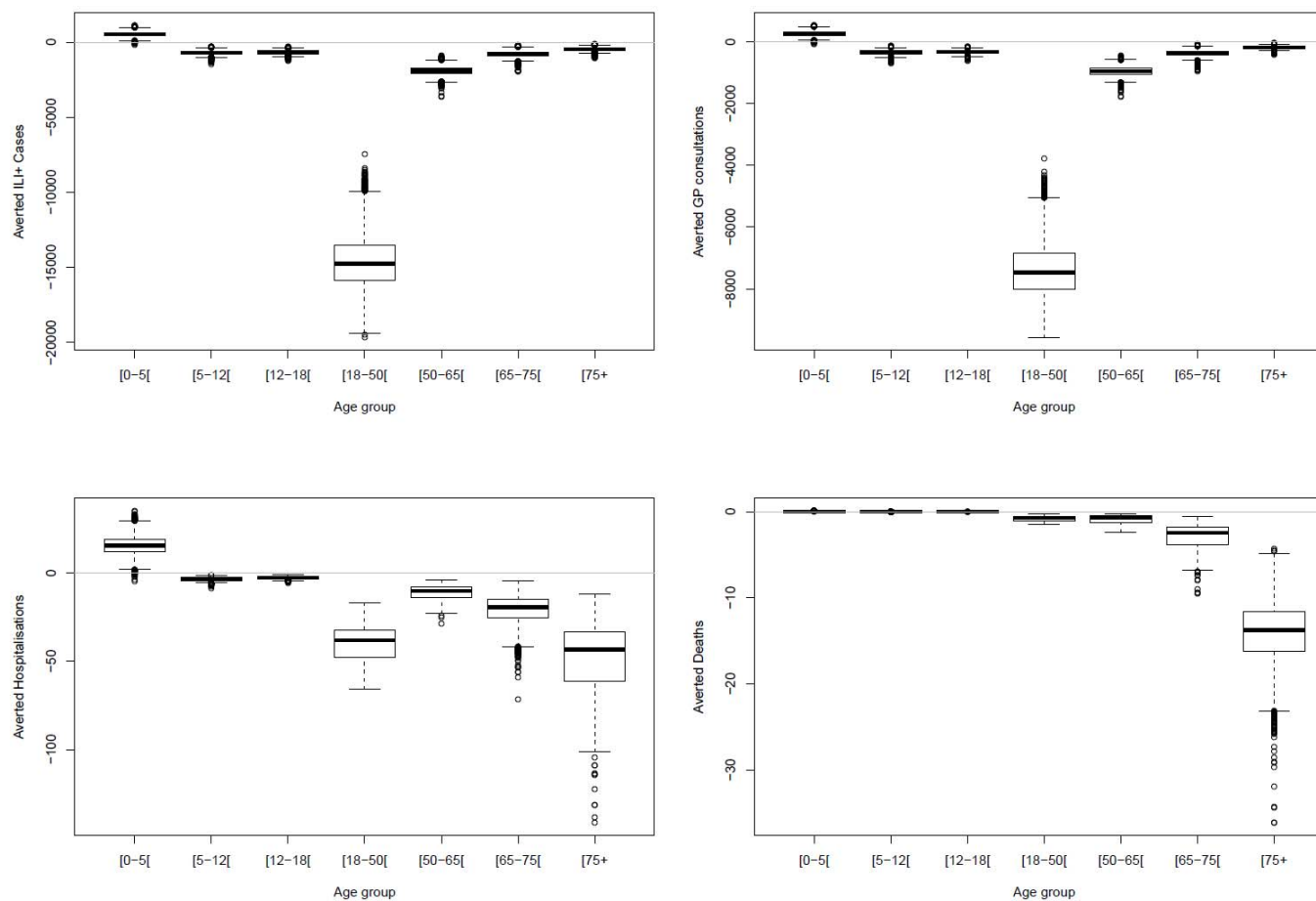
Figure 39 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 10% coverage for the child components of the option, and with immunity lasting an average of 1.68 years

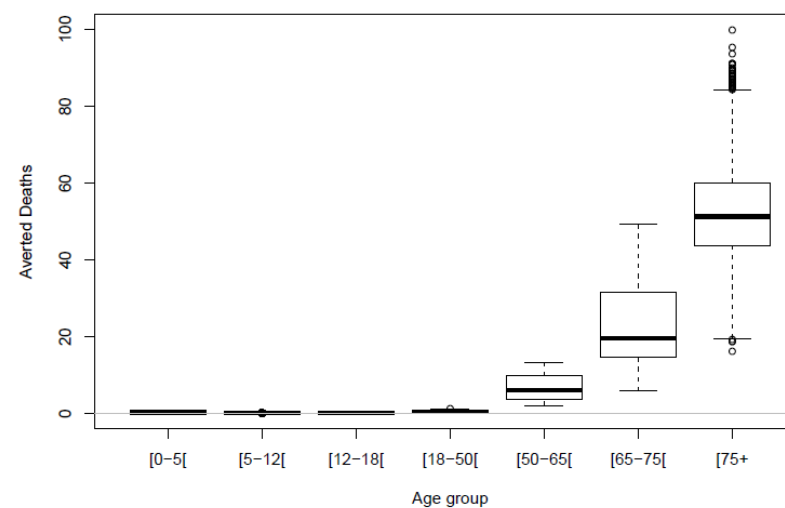
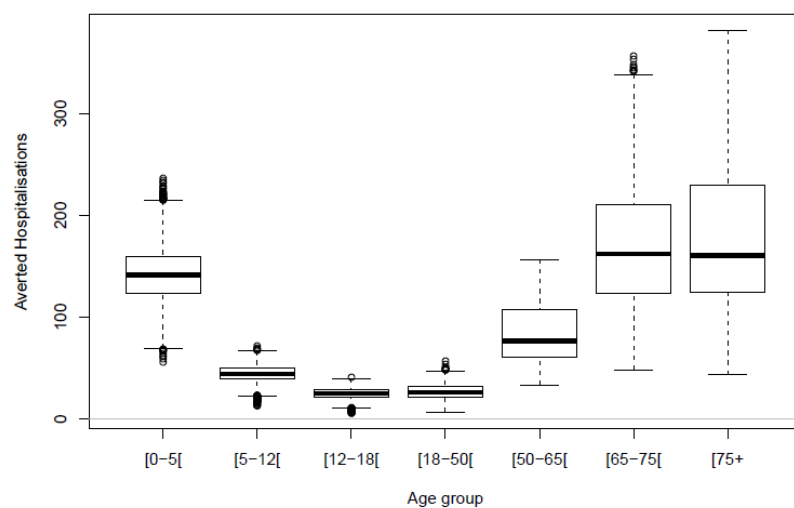
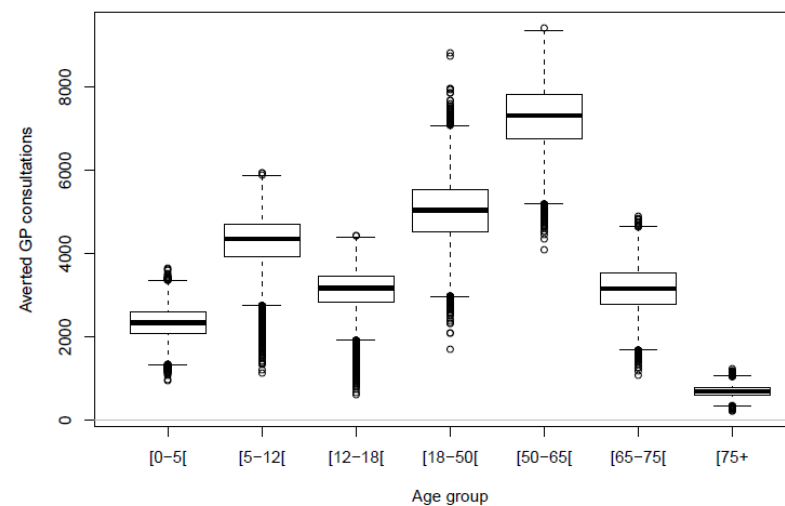
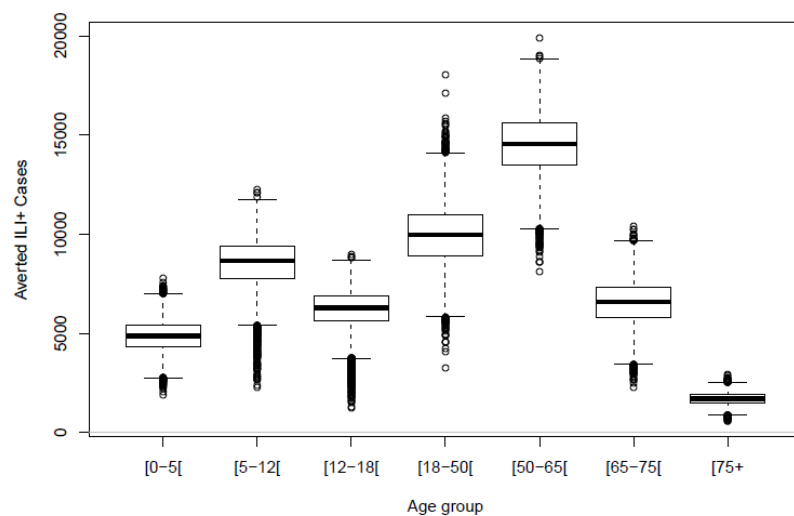






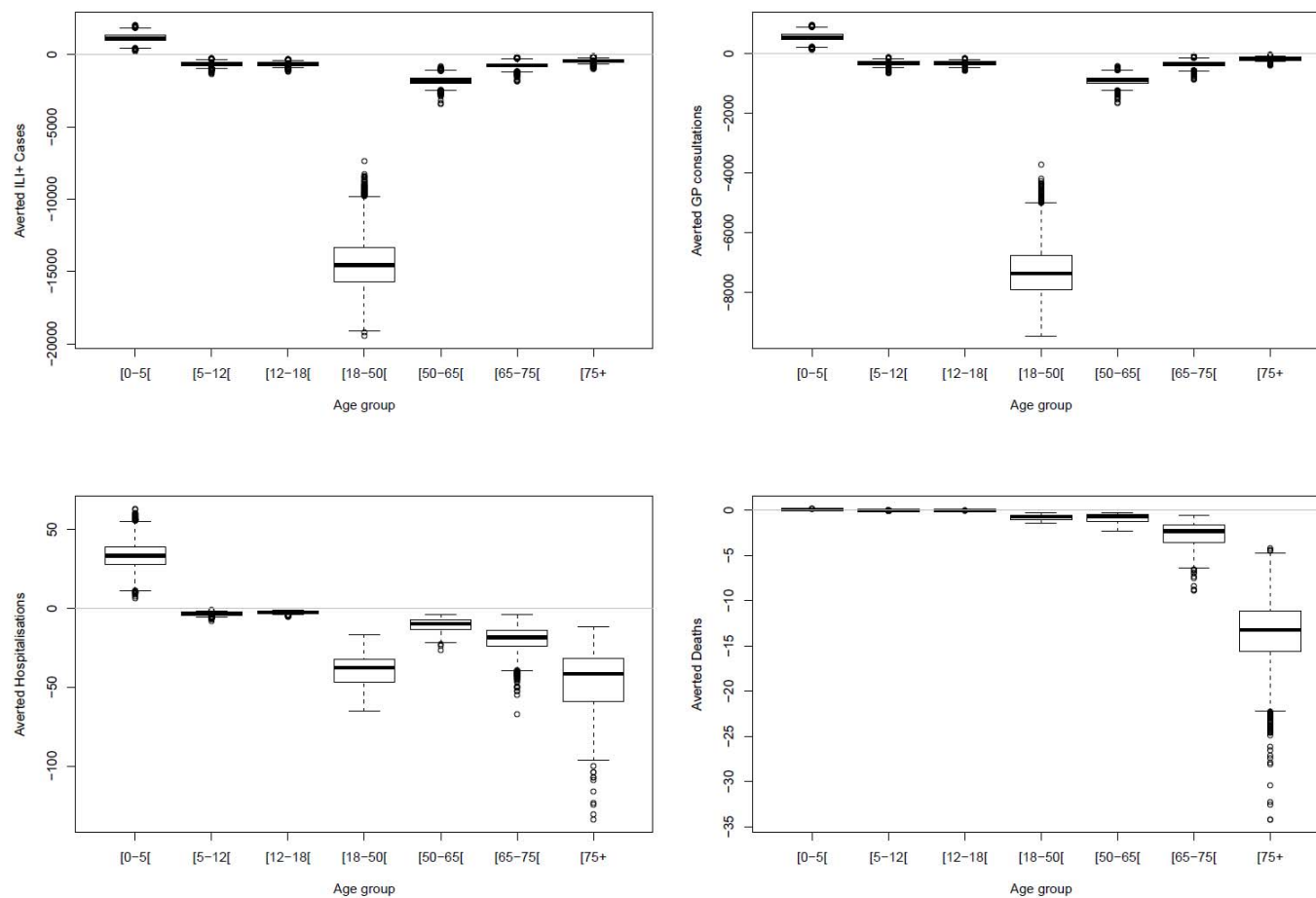
**Figure 40 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 20% coverage for the child components of the option, and with immunity lasting an average of 1.68 years**

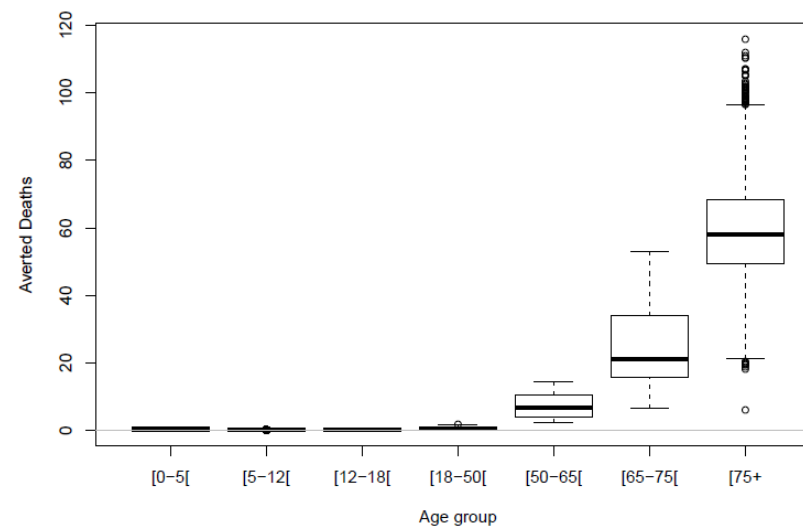
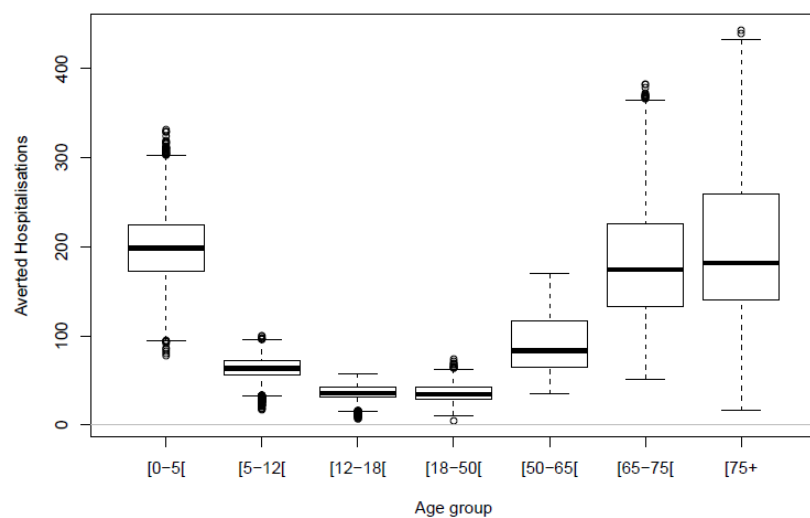
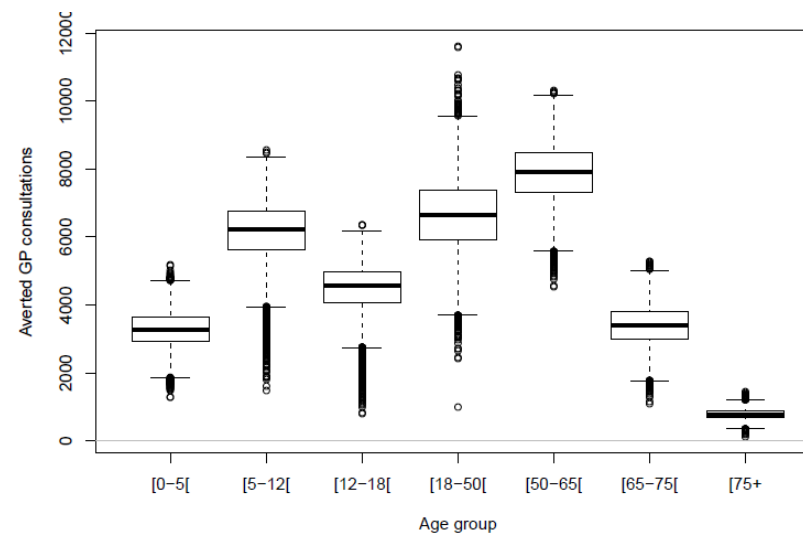
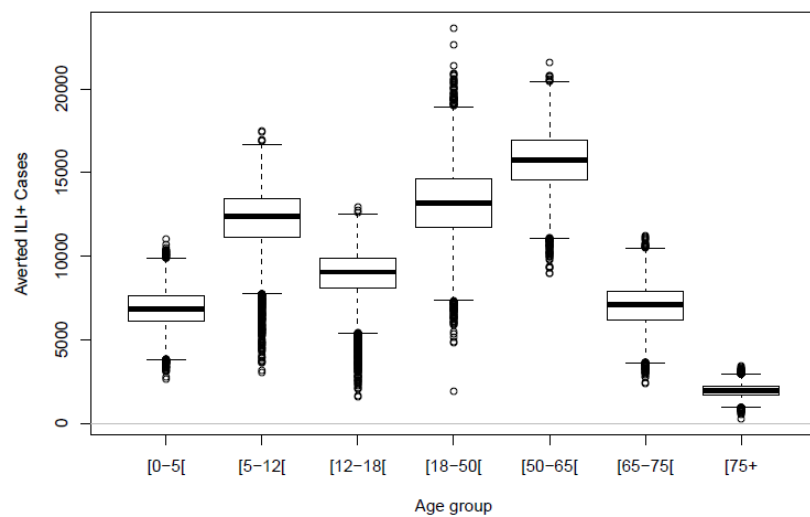






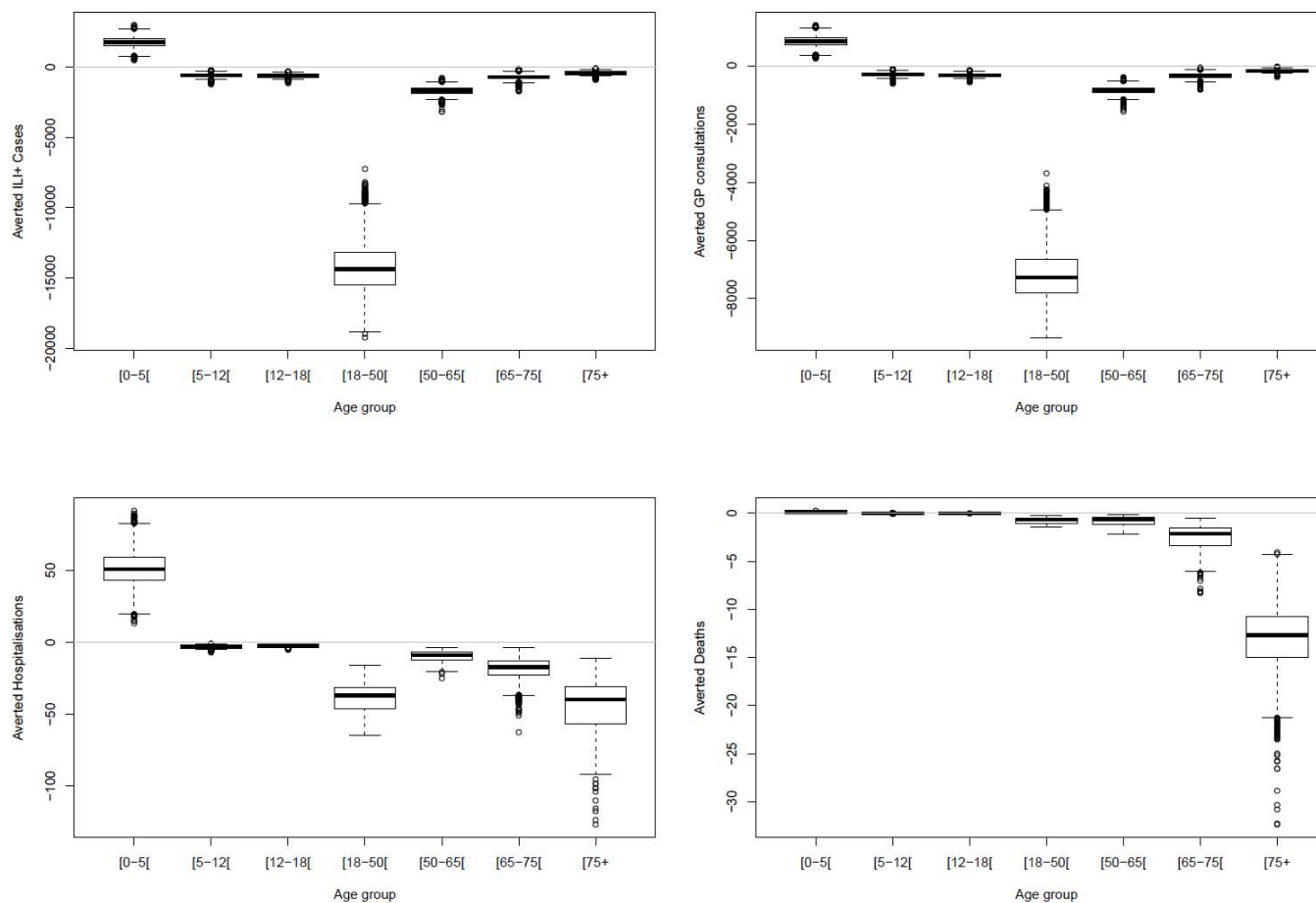
**Figure 41 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 30% coverage for the child components of the option, and with immunity lasting an average of 1.68 years**

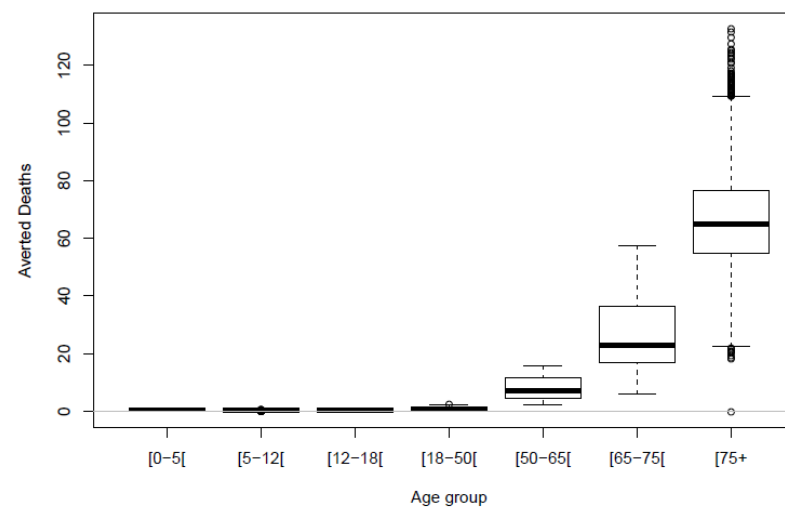
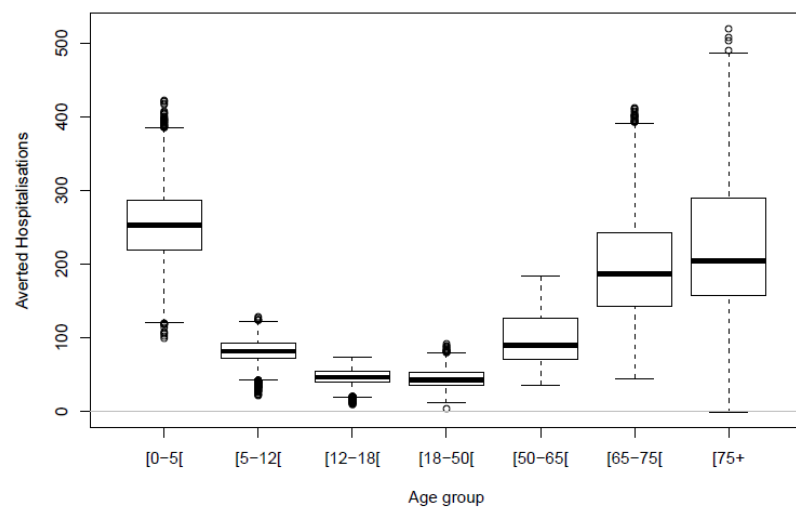
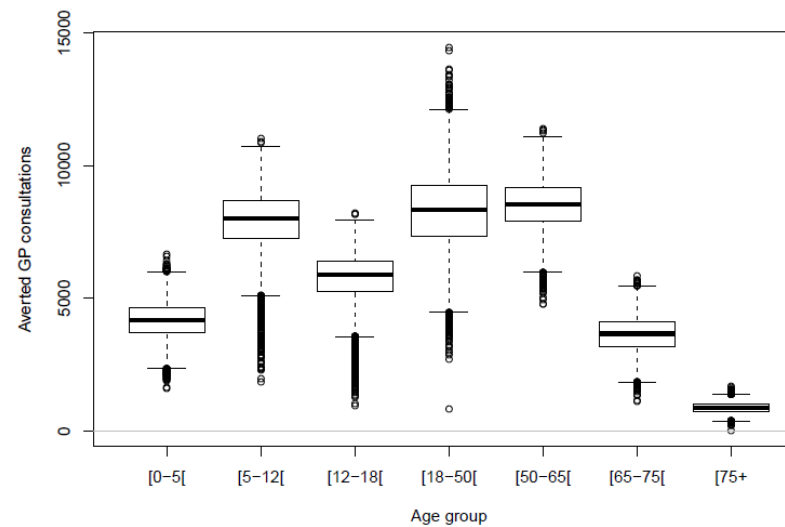
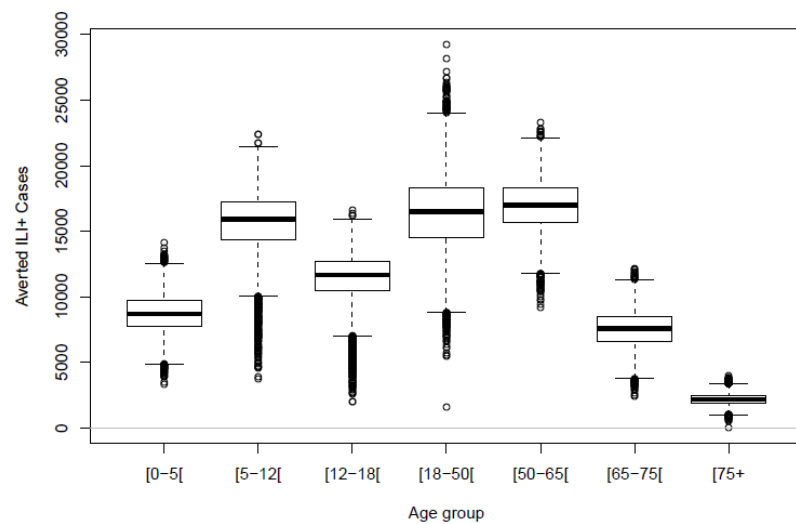






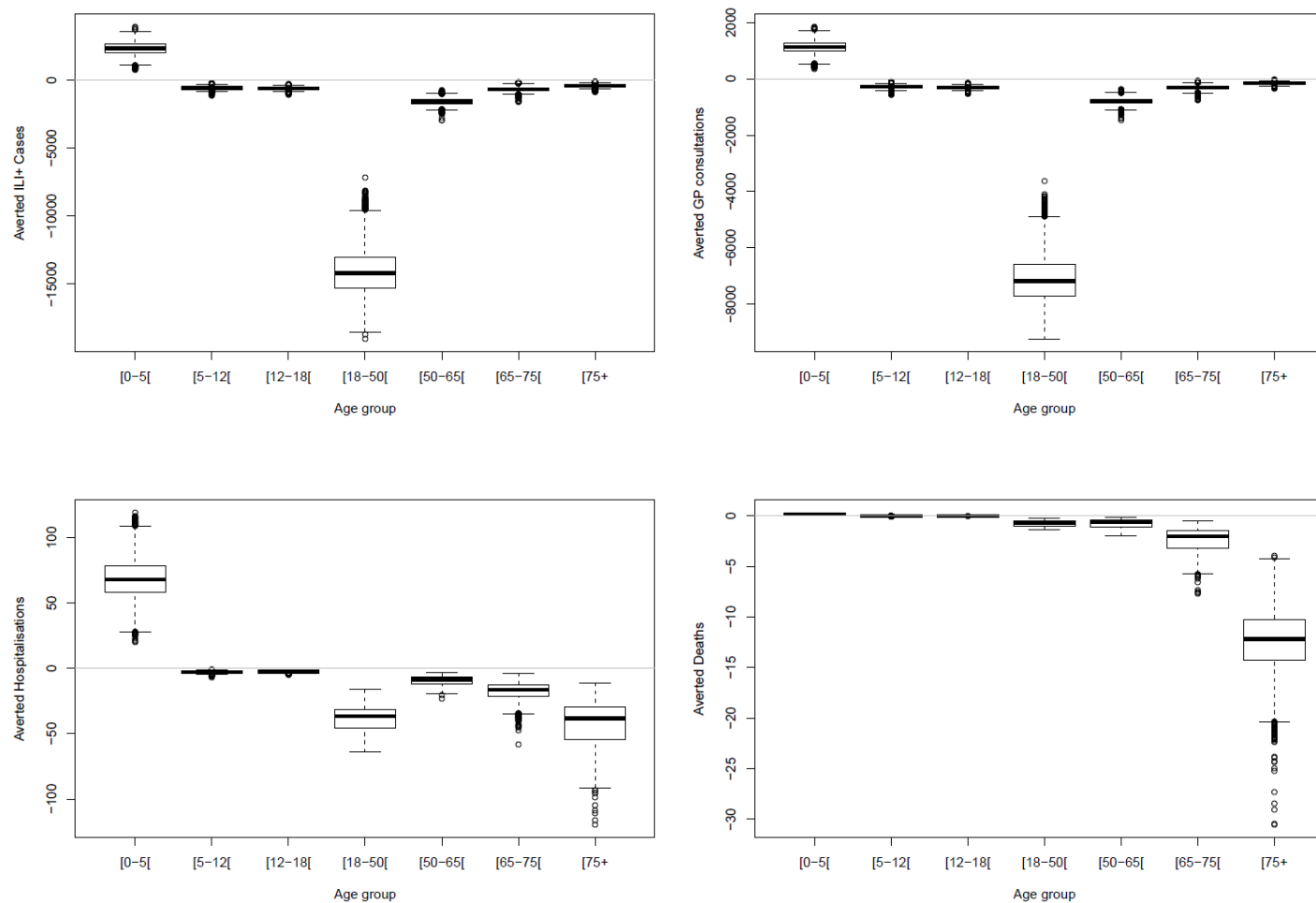
**Figure 42 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 40% coverage for the child components of the option, and with immunity lasting an average of 1.68 years**

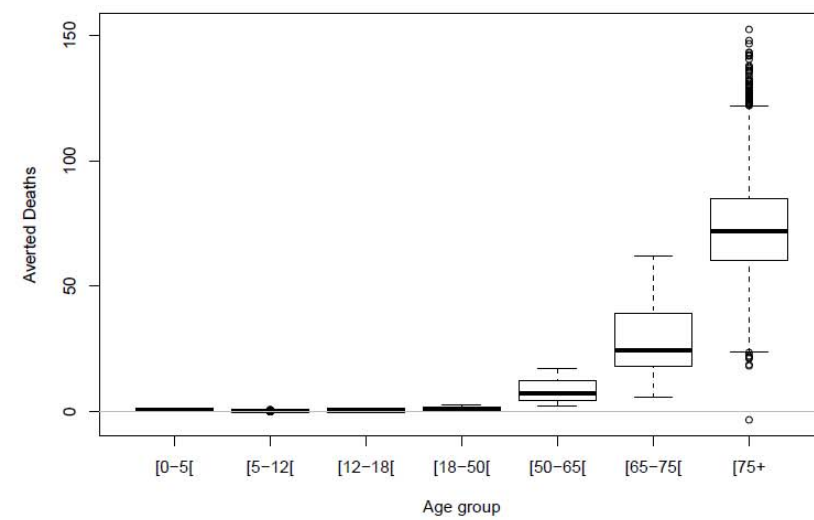
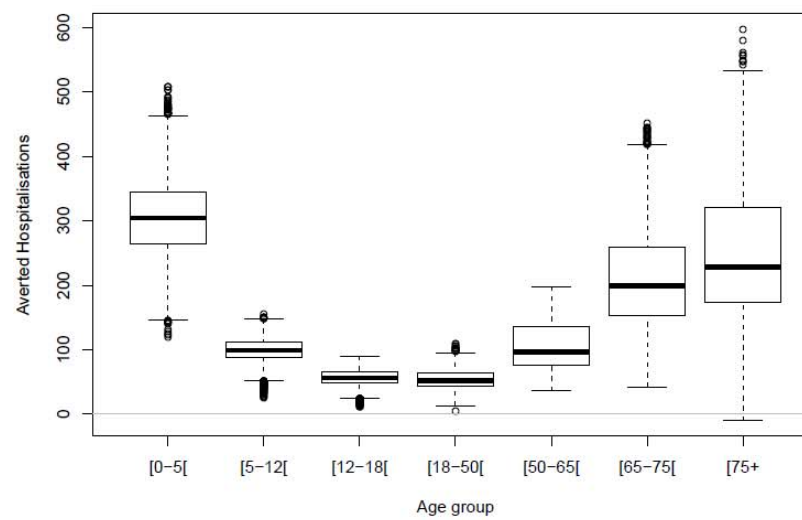
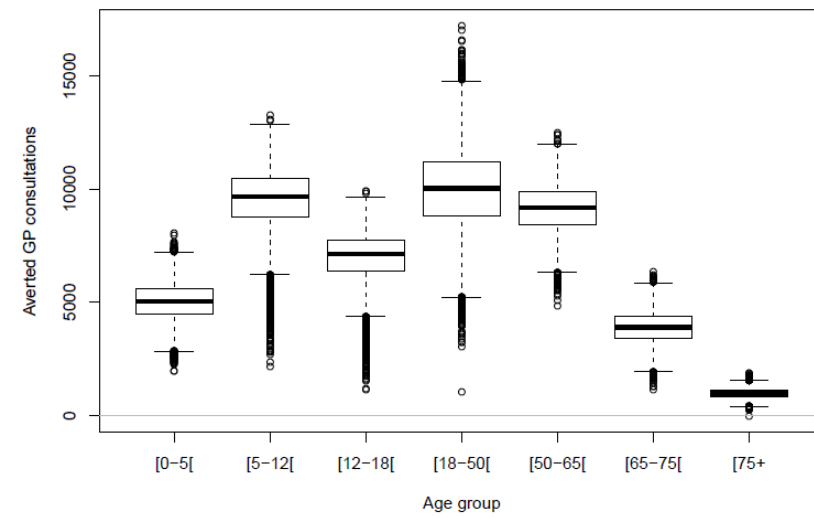
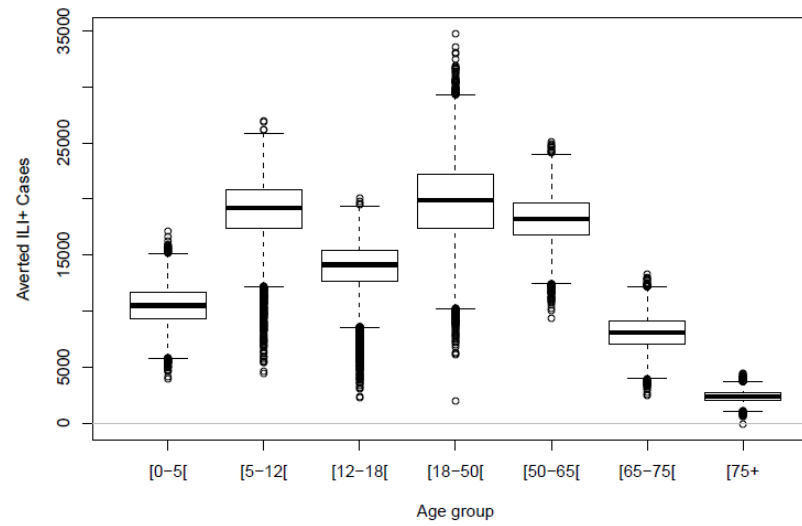






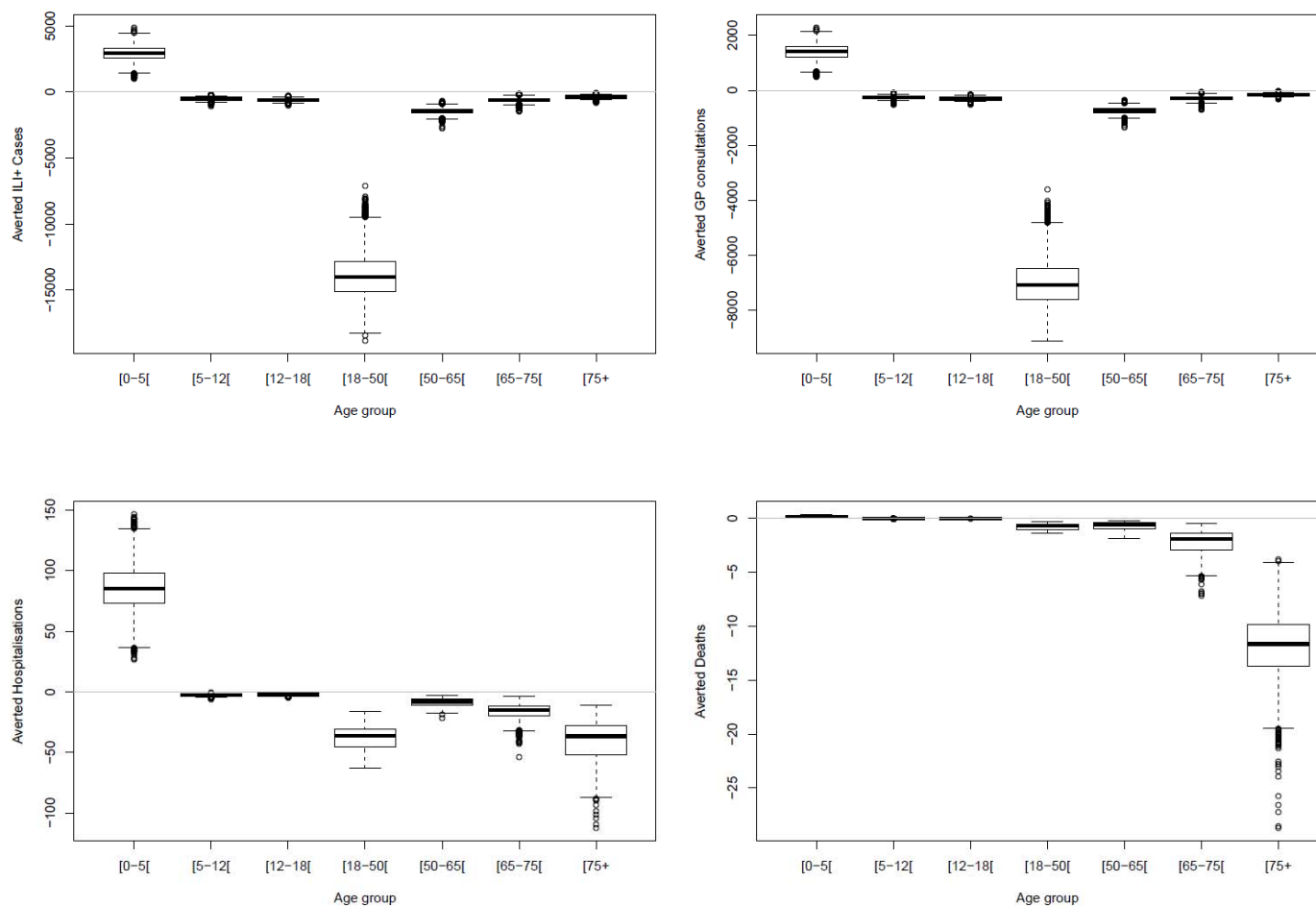
**Figure 43 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 50% coverage for the child components of the option, and with immunity lasting an average of 1.68 years**

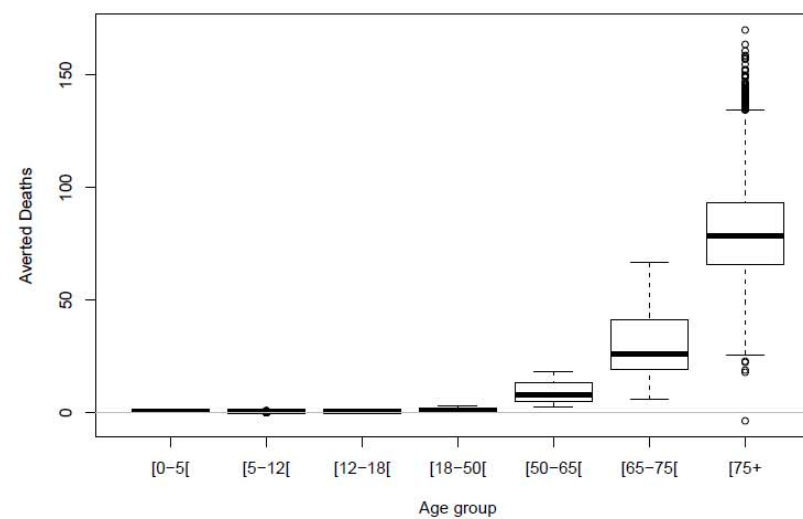
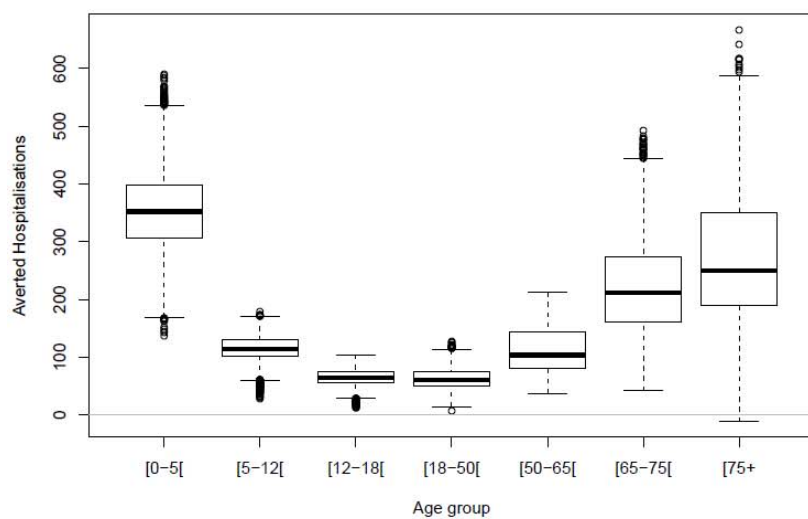
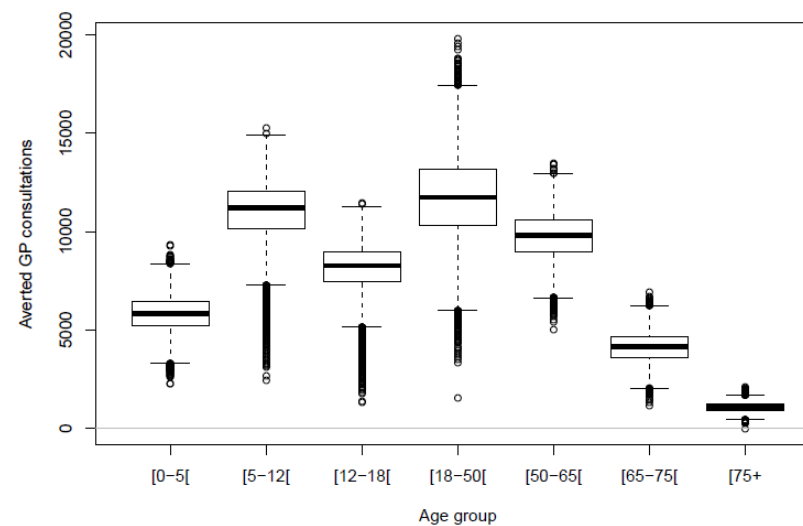
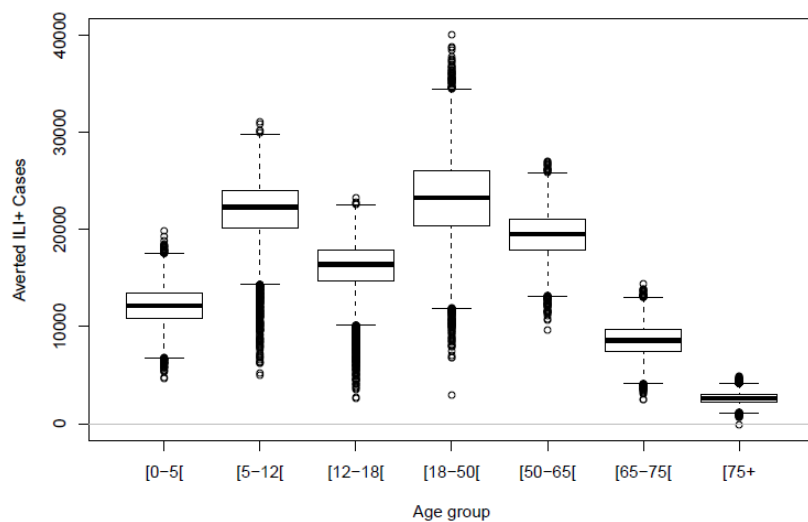






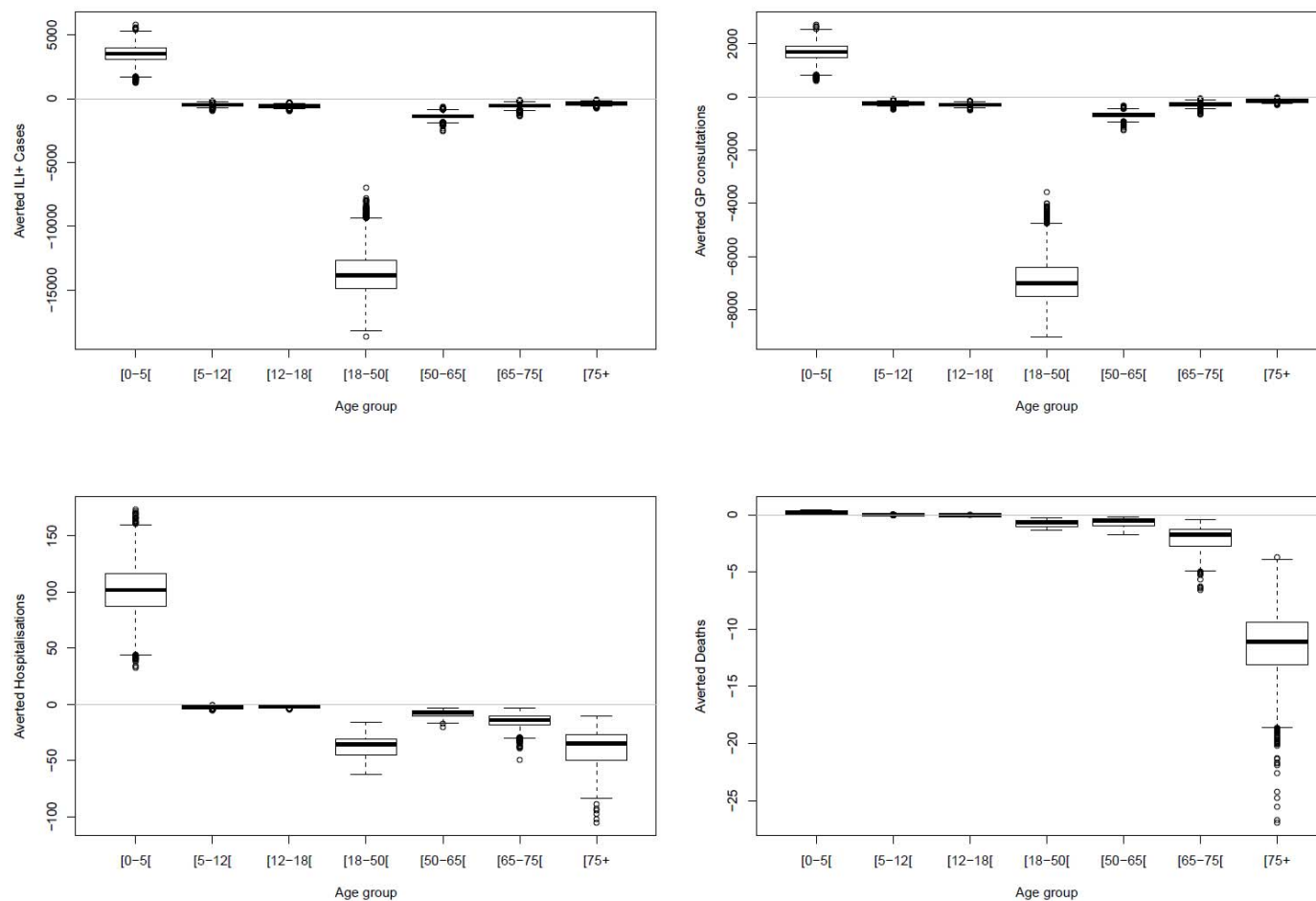
**Figure 44 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c2) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 60% coverage for the child components of the option, and with immunity lasting an average of 1.68 years**







**Figure 45 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c2) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 70% coverage for the child components of the option, and with immunity lasting an average of 1.68 years**



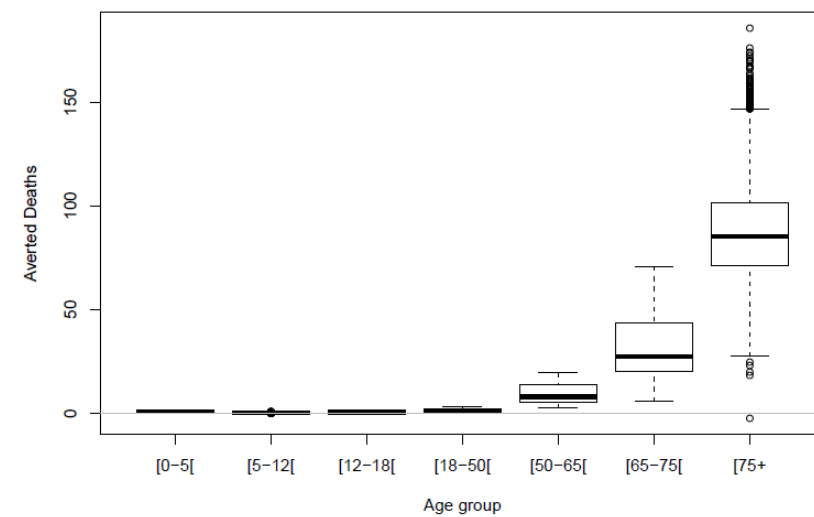
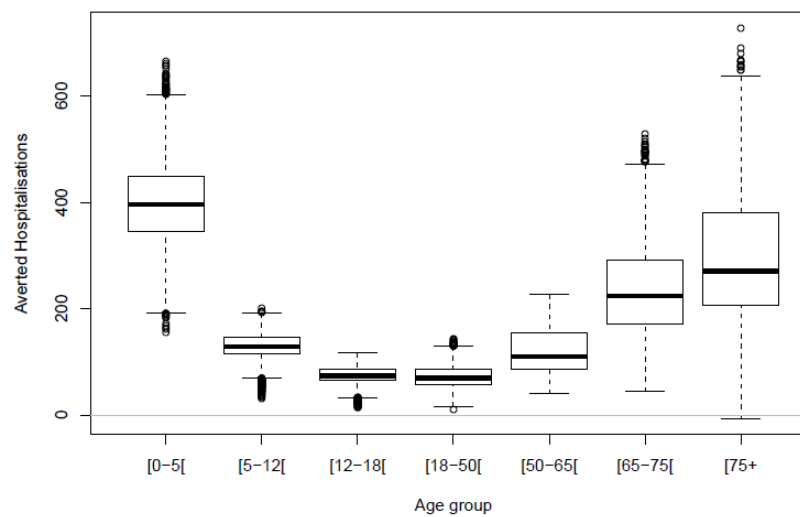
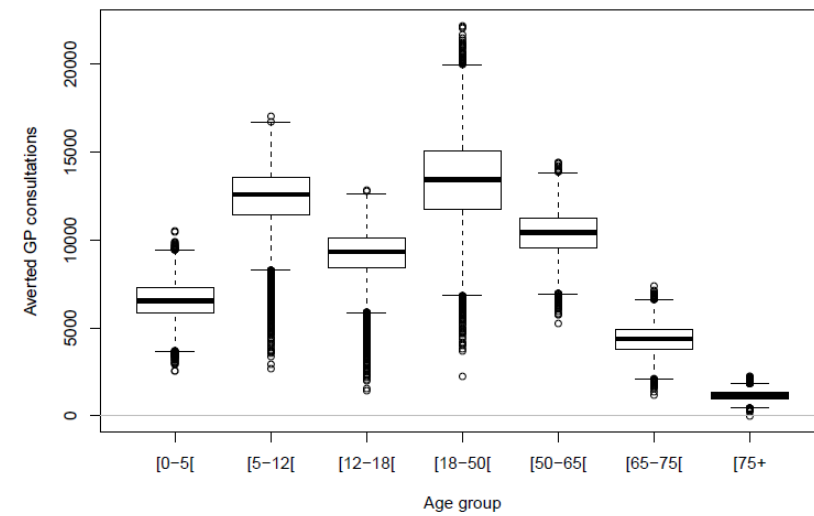
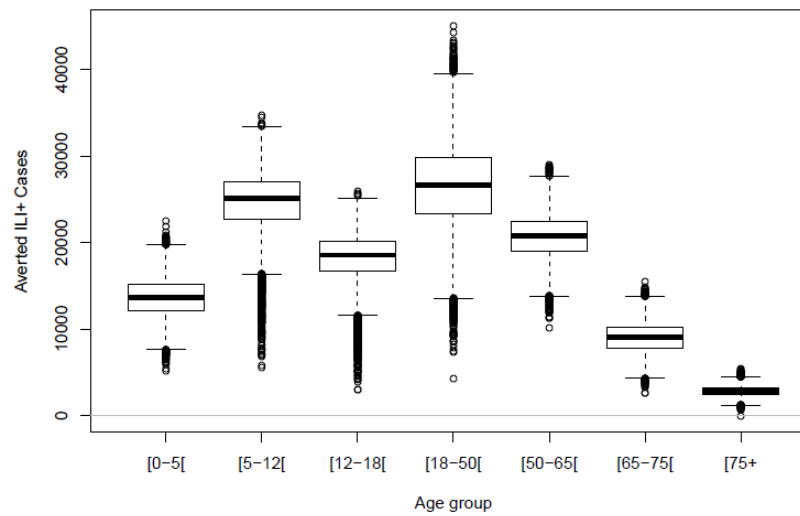
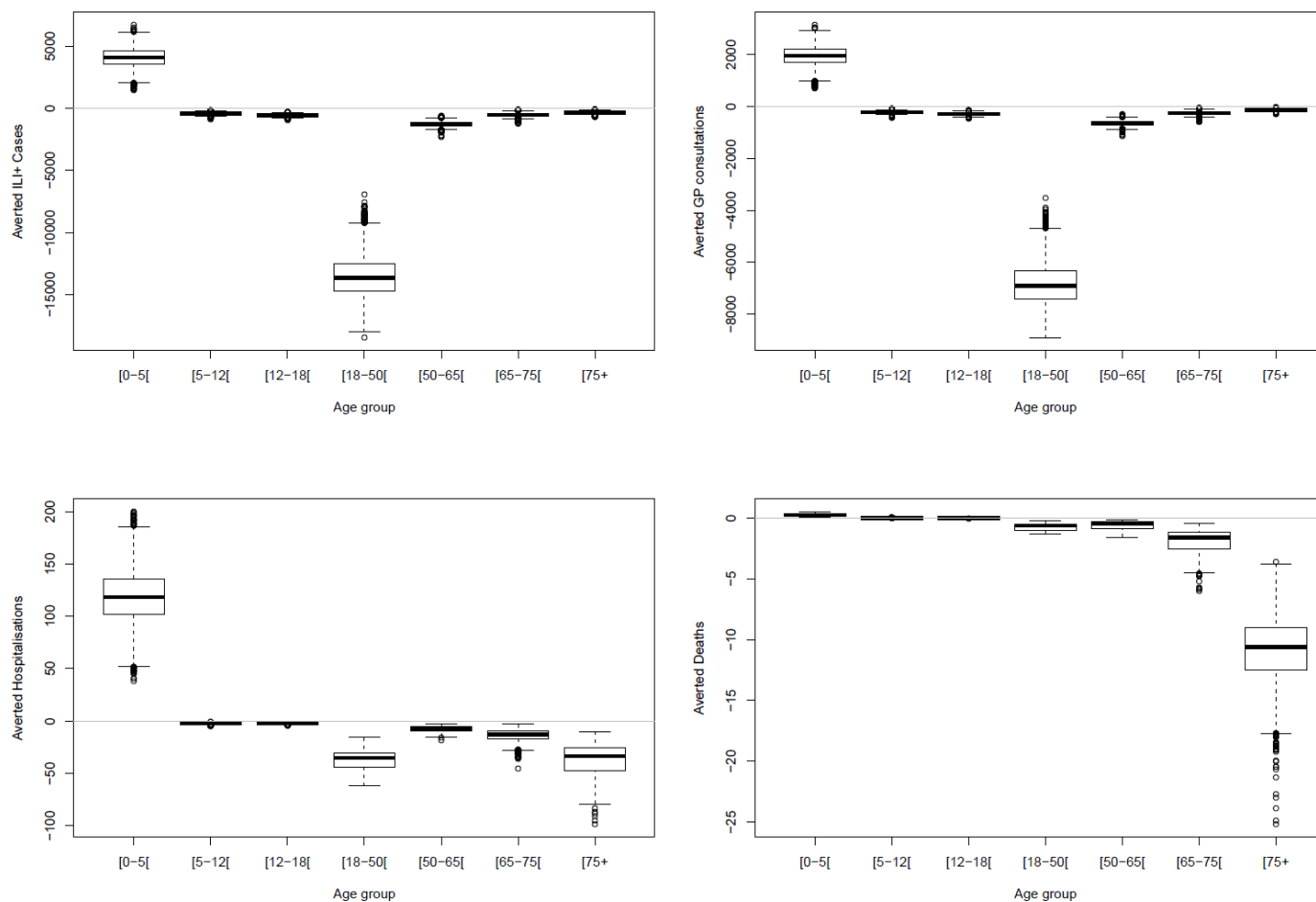
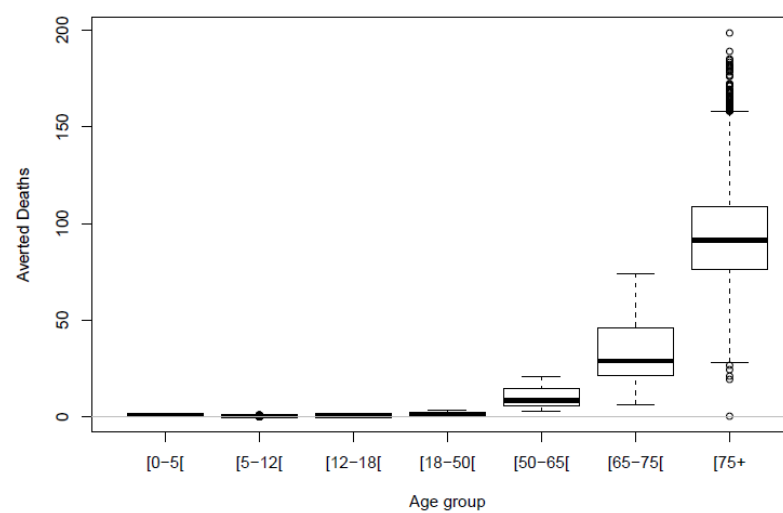
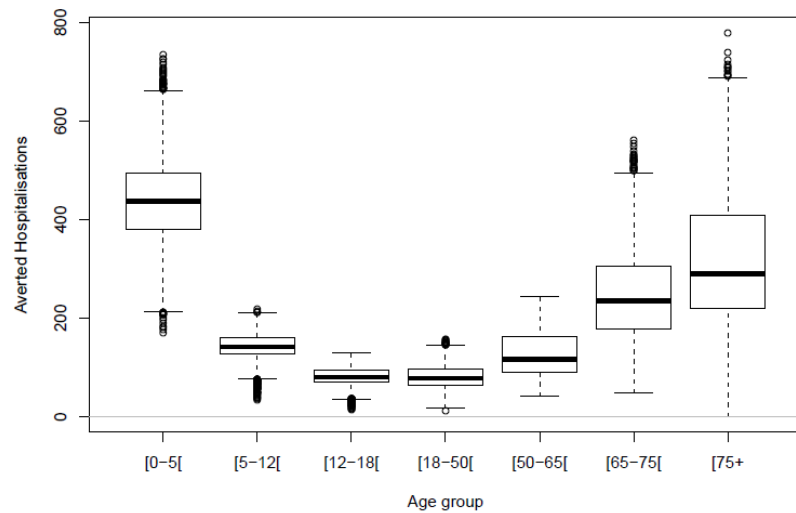
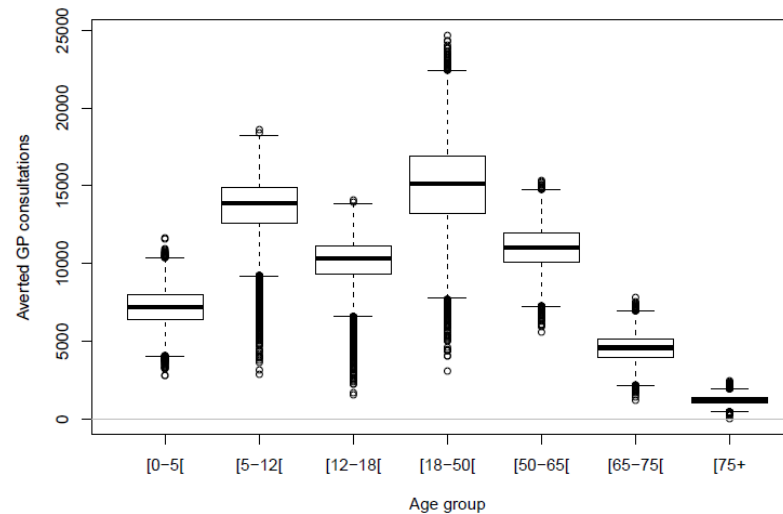
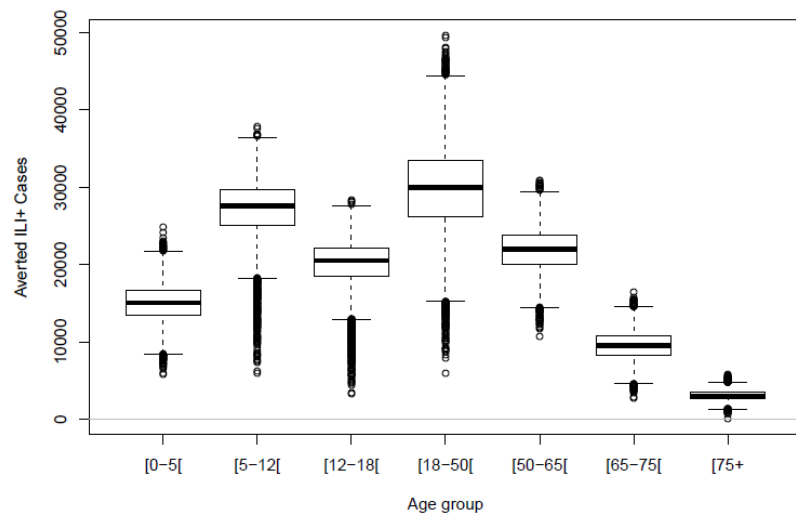




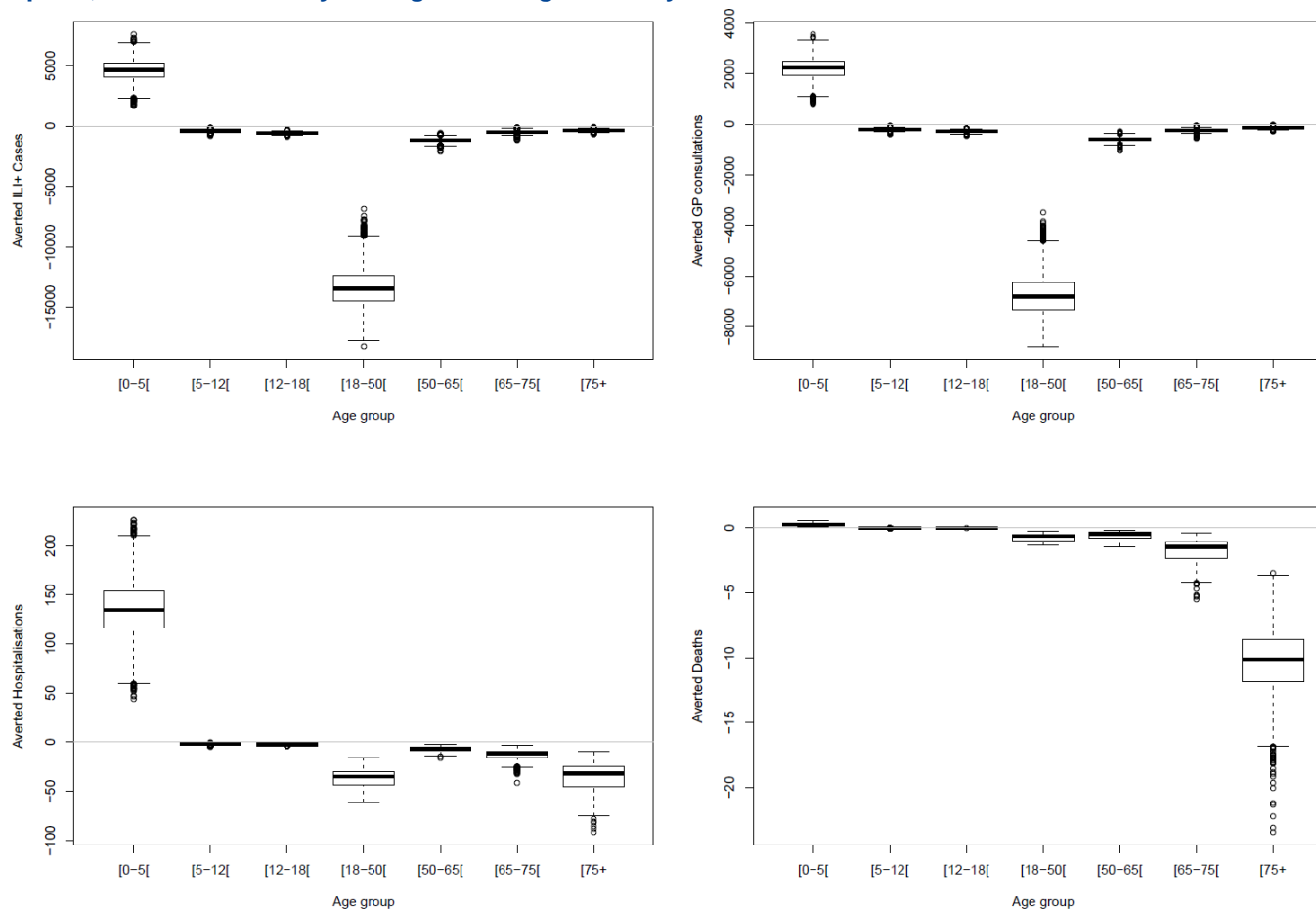
Figure 46 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c2) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 80% coverage for the child components of the option, and with immunity lasting an average of 1.68 years

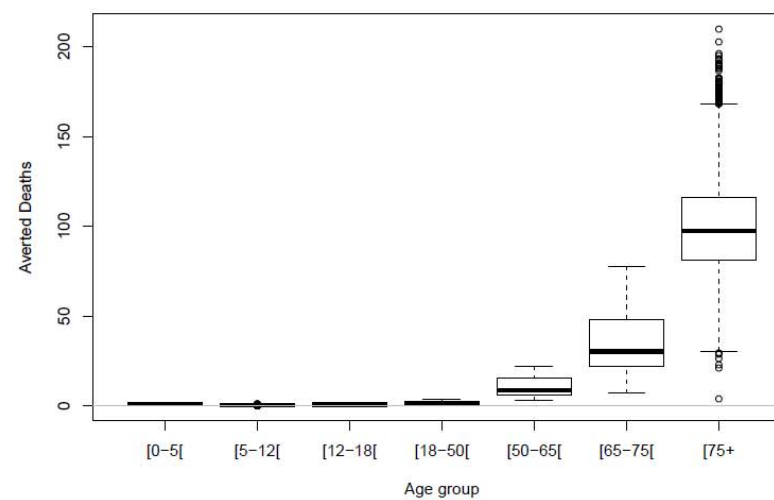
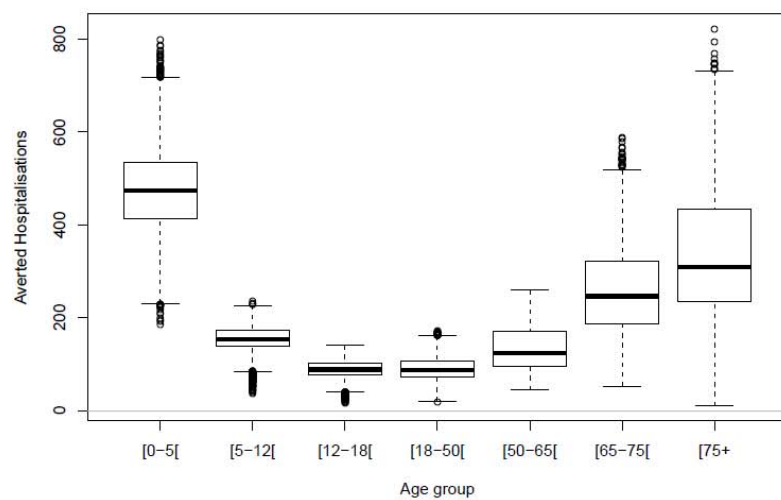
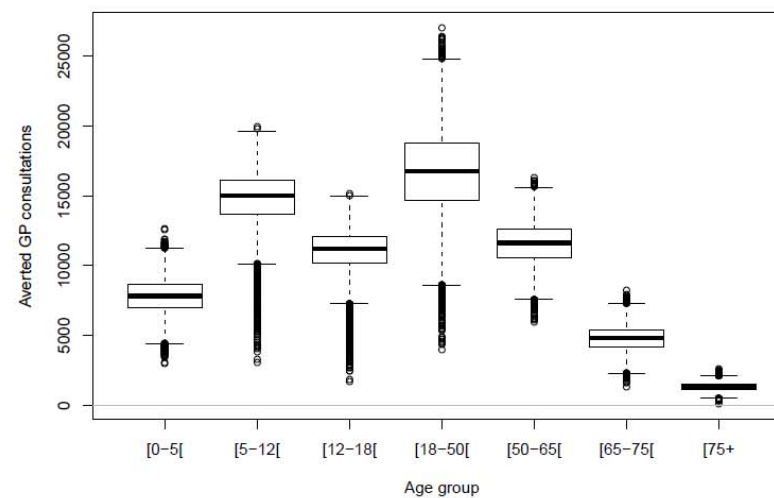
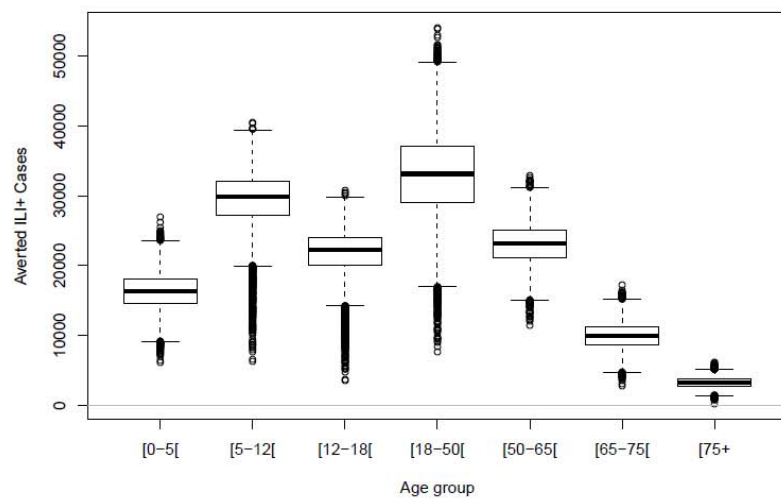






**Figure 47 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c2) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 90% coverage for the child components of the option, and with immunity lasting an average of 1.68 years**







#### 4.3.2. Incremental cost-effectiveness analysis

**Table 1 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 10% in children (<18y), immunity lasting an average of 1.68 years**

Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
At17c12cov0.1	-27 103 133	7	355	-74 006	-2 232 729	2 393 621	-75 392	-215 784	-41 560
At16c18cov0.1	-19 862 407	15	112	-57 218	-1 544 334	1 295 753	-103 695	-1 453 832	1 126 926
At17c10cov0.1	-13 934 975	37	403	-53 584	-1 306 753	1 345 296	-34 347	-67 812	-21 536
At17c19cov0.1	-15 086 679	243	459	-50 046	-568 896	373 032	-32 462	-72 251	-20 452
At14c13cov0.1	-22 277 016	285	827	-35 728	-1 000 267	882 654	-26 513	-57 643	-14 575
At15c1cov0.1	-20 457 370	441	1 162	-32 092	-597 811	566 355	-17 465	-32 090	-11 414
At15c11cov0.1	-14 664 062	552	1 208	-23 051	-252 686	188 085	-12 008	-20 444	-8 499
At15c4cov0.1	-10 415 384	659	1 255	-15 260	-102 036	-7 807	-8 205	-12 600	-6 307
At15c13cov0.1	-10 832 644	755	1 284	-14 074	-67 403	-8 238	-8 369	-12 944	-6 406
At15c12cov0.1	-2 631 664	848	1 305	-3 294	-5 382	1 858	-2 089	-3 996	662
At15c19cov0.1	9 420 195	1 076	1 407	8 779	1 147	33 801	6 777	1 029	16 680
At15c18cov0.1	16 144 493	1 296	1 486	12 470	3 606	37 368	10 907	3 404	24 286
At15c17cov0.1	28 152 033	1 531	1 590	18 338	7 194	46 778	17 755	7 147	36 991
At15c16cov0.1	34 284 966	1 649	1 644	20 746	8 754	50 238	20 849	8 849	43 028
At19c1cov0.1	42 212 596	1 835	2 029	23 065	9 285	52 359	20 850	8 827	41 819
At19c13cov0.1	51 733 899	2 162	2 157	23 990	10 761	47 952	24 056	10 785	46 831
At19c12cov0.1	59 923 288	2 263	2 178	26 485	12 462	51 104	27 542	12 761	52 978
At19c18cov0.1	78 542 331	2 739	2 371	28 721	14 717	52 634	33 212	16 074	62 211
At19c17cov0.1	90 465 866	2 985	2 474	30 334	15 988	54 902	36 662	18 025	68 159
At19c16cov0.1	96 624 846	3 110	2 531	31 071	16 566	56 357	38 252	18 936	71 280

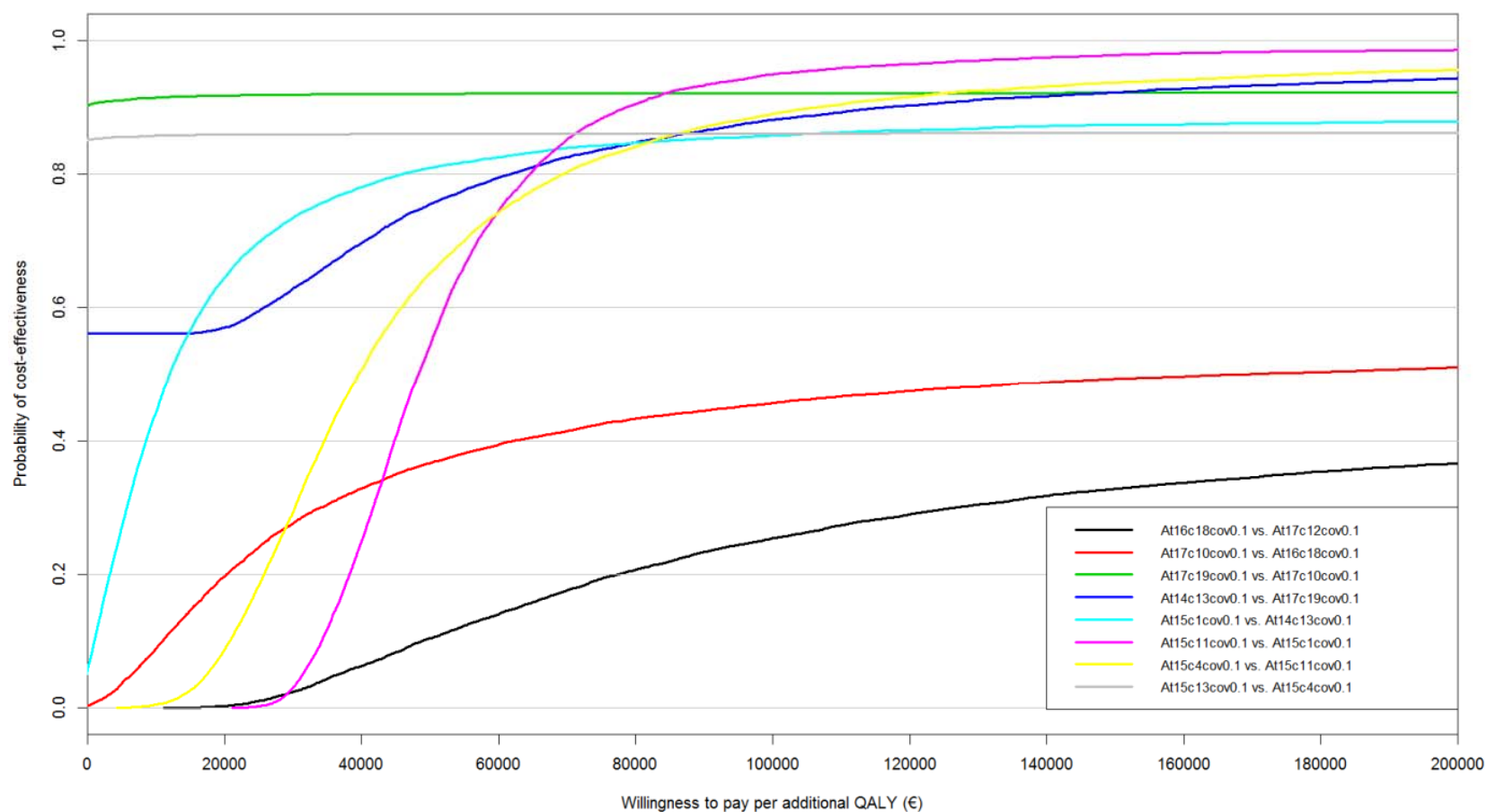


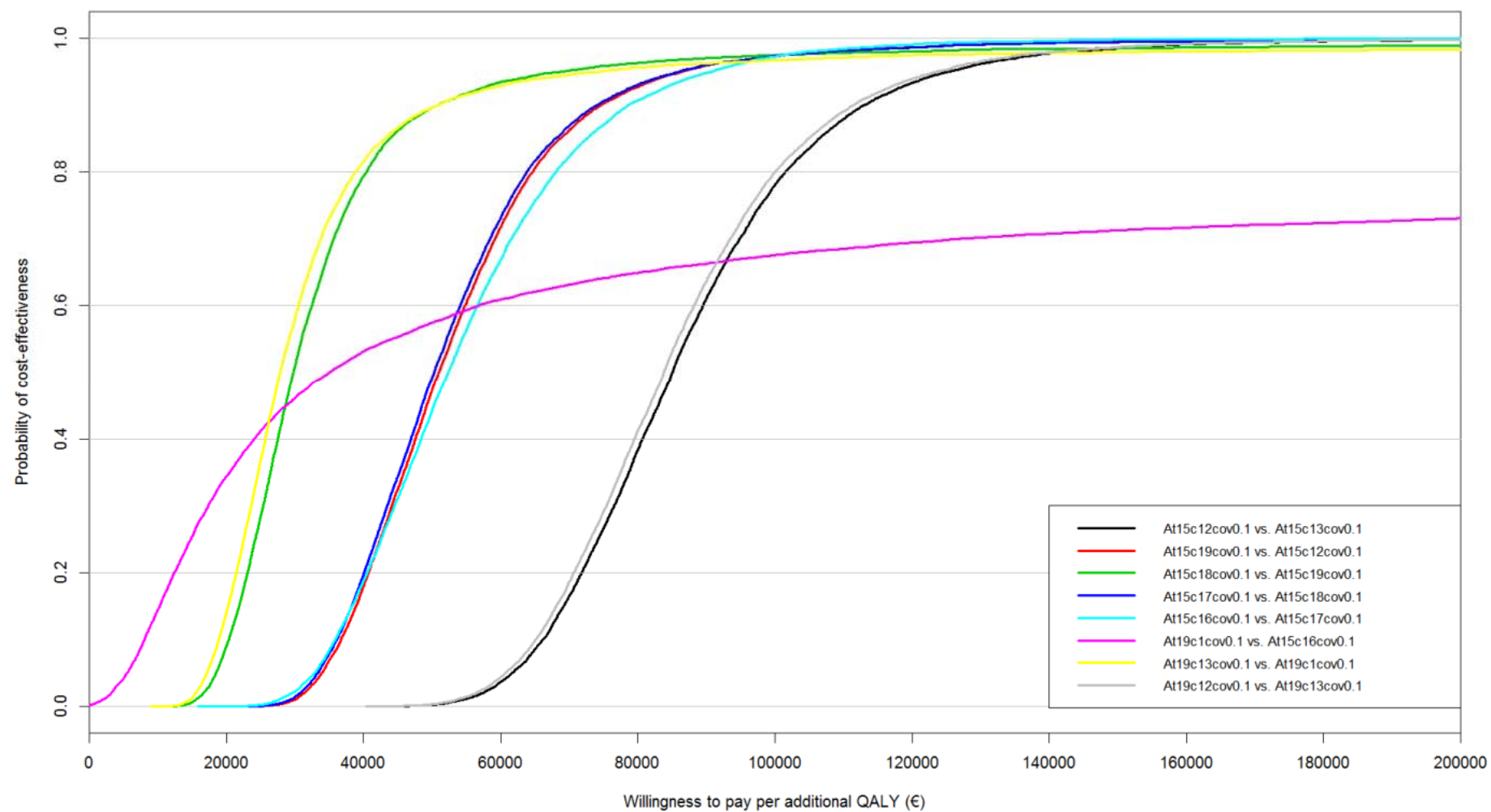
96	Seasonal influenza vaccination - Part II: Supplement 1.2							KCE Report 204S1.2	
<b>At23c13cov0.1</b>	114 439 261	3 560	3 008	32 249	16 965	56 978	38 132	18 836	70 371
<b>At23c12cov0.1</b>	122 624 614	3 662	3 030	33 545	17 968	58 508	40 553	20 197	74 563
<b>At23c18cov0.1</b>	141 141 526	4 159	3 222	34 031	18 917	58 013	43 876	22 256	79 892
<b>At23c17cov0.1</b>	153 062 468	4 409	3 333	34 782	19 580	58 854	45 954	23 477	83 725
<b>At23c16cov0.1</b>	159 146 940	4 534	3 389	35 147	19 875	59 512	46 952	23 995	85 603
<b>At7c13cov0.1</b>	179 056 444	4 777	3 379	37 573	22 064	63 438	53 096	27 792	95 771
<b>At7c18cov0.1</b>	205 618 796	5 398	3 618	38 173	22 953	63 049	56 908	30 137	102 115
<b>At7c17cov0.1</b>	217 464 820	5 651	3 738	38 471	23 253	63 335	58 221	30 952	104 658
<b>At7c16cov0.1</b>	223 539 836	5 780	3 799	38 654	23 392	63 921	58 870	31 286	106 141
<b>At11c13cov0.1</b>	241 478 978	6 225	4 242	38 870	23 176	65 261	57 060	29 934	102 161
<b>At11c18cov0.1</b>	267 964 134	6 855	4 489	39 172	23 781	64 537	59 813	31 713	106 799
<b>At11c17cov0.1</b>	279 779 939	7 120	4 605	39 331	23 969	64 636	60 792	32 296	108 602
<b>At11c16cov0.1</b>	285 868 662	7 253	4 671	39 471	24 045	64 966	61 271	32 541	109 686

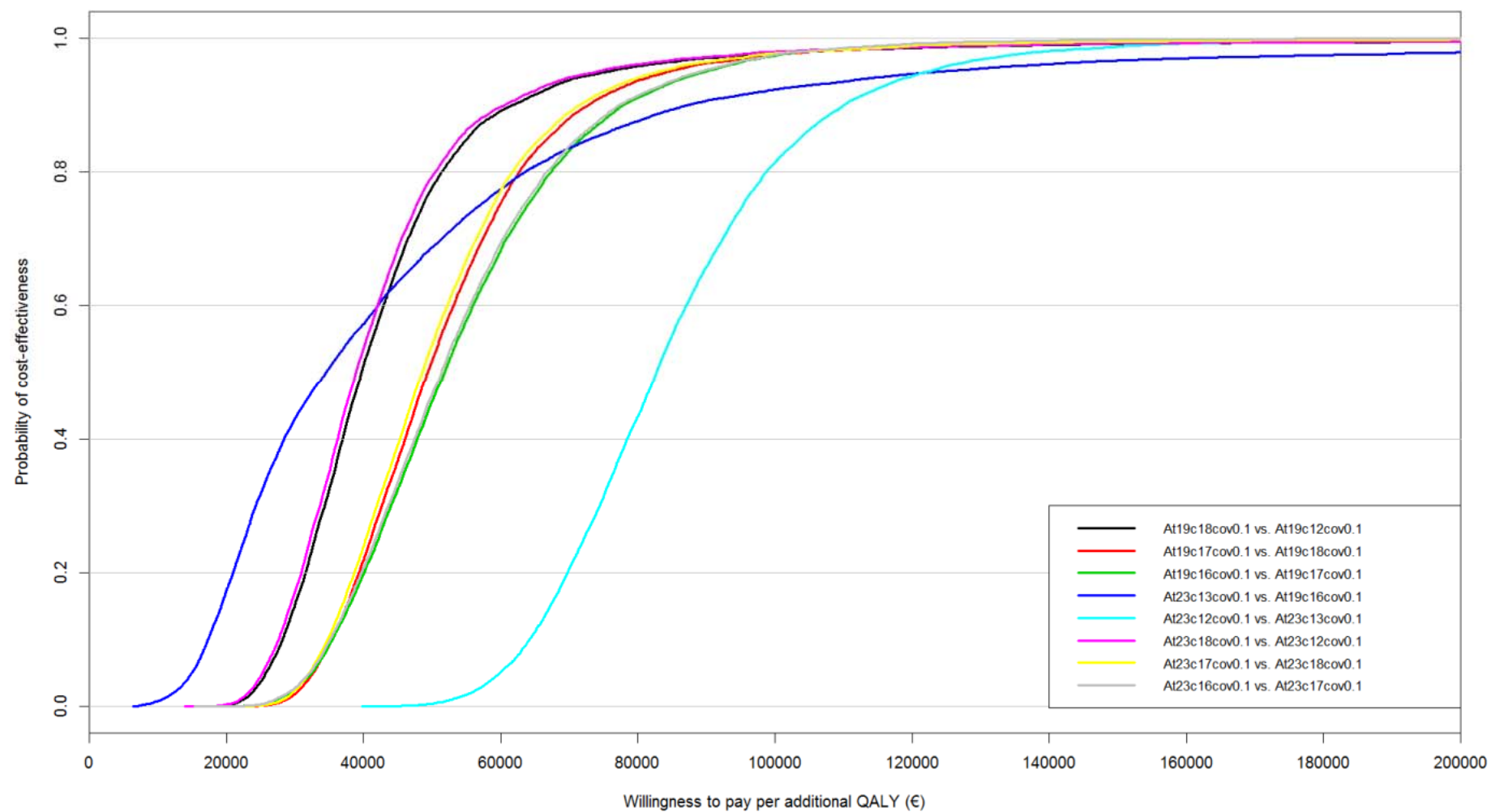
*Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.*

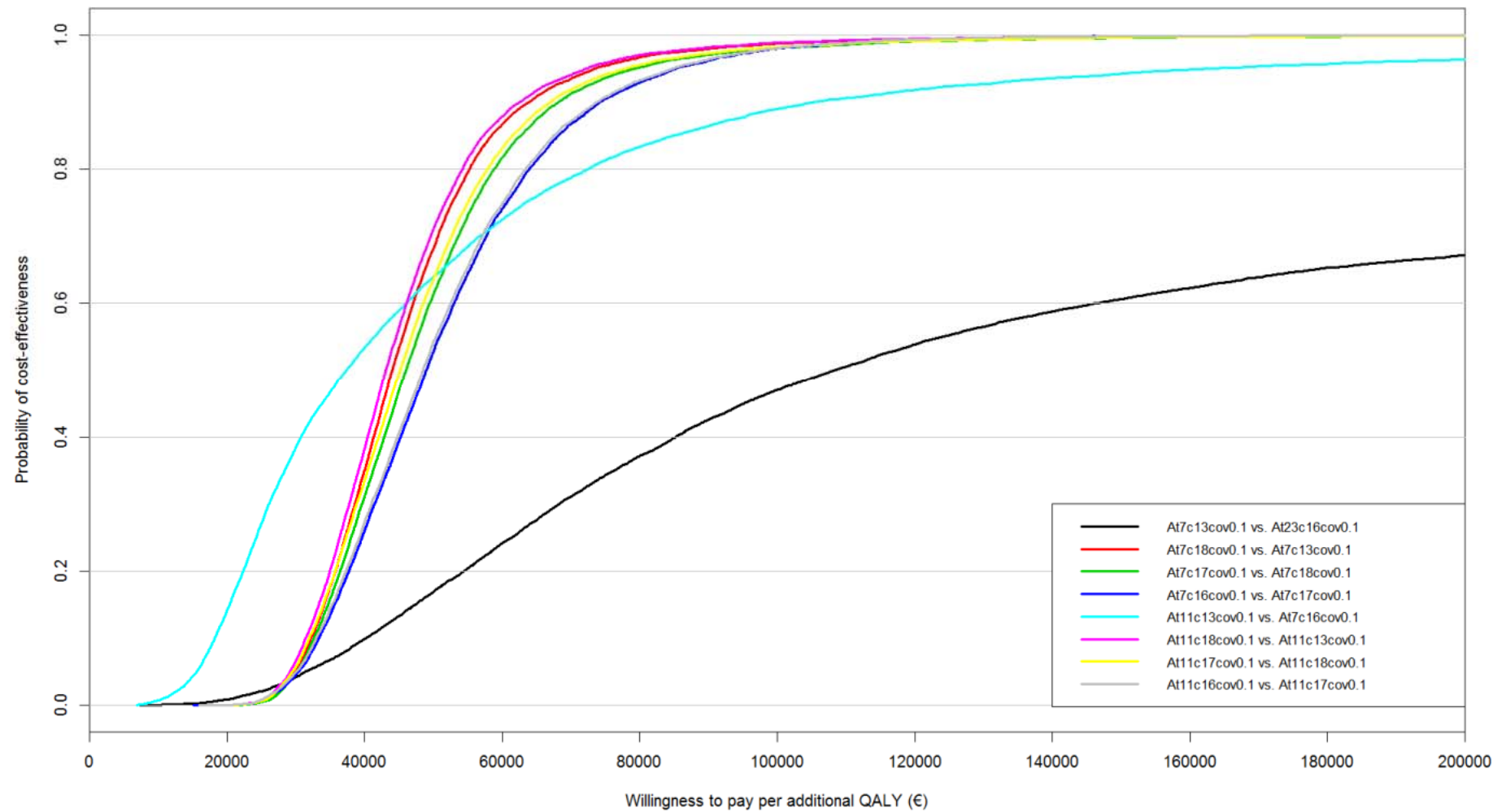


**Figure 48 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 10% coverage level of the child components of the options, with immunity lasting an average of 1.68 years**











**Table 2 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 20% in children (<18y) and with immunity lasting an average of 1.68 years**

Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
At17c4cov0.2	-15 445 830	153	466	-66 955	-1 142 727	1 053 361	-33 069	-59 572	-21 308
At17c14cov0.2	-11 544 452	155	464	-43 765	-794 851	730 693	-24 564	-47 365	-16 324
At17c13cov0.2	-16 398 354	366	520	-40 126	-308 898	232 568	-31 076	-69 878	-19 649
At15c1cov0.2	-11 184 431	560	1 219	-17 677	-193 572	132 455	-9 072	-14 321	-6 880
At14c13cov0.2	-3 320 164	714	1 008	-4 749	-8 574	-1 848	-3 311	-4 787	-454
At15c11cov0.2	475 792	781	1 309	488	-3 563	23 176	371	-2 599	5 102
At15c13cov0.2	8 148 292	1 188	1 461	6 823	479	26 822	5 653	461	14 471
At15c12cov0.2	24 645 913	1 378	1 503	17 904	6 719	45 666	16 448	6 435	34 360
At17c18cov0.2	37 492 510	1 512	962	24 675	13 171	78 034	38 989	18 949	96 187
At21c13cov0.2	46 233 012	1 778	1 408	25 999	14 122	47 353	32 964	16 490	60 716
At19c1cov0.2	51 481 274	1 958	2 088	26 398	11 254	56 942	24 687	10 937	48 884
At15c18cov0.2	62 215 844	2 307	1 876	26 892	13 795	58 680	33 131	15 805	65 629
At19c13cov0.2	70 574 276	2 626	2 341	26 939	13 380	50 567	30 171	14 365	57 024
At19c12cov0.2	87 022 151	2 824	2 386	30 844	16 216	55 118	36 529	17 983	67 949
At15c16cov0.2	98 443 032	3 023	2 203	32 546	17 803	67 329	44 725	22 265	87 922
At19c18cov0.2	124 427 678	3 801	2 775	32 794	18 573	58 651	44 948	22 851	83 518
At23c13cov0.2	133 189 663	4 048	3 194	33 030	18 102	56 950	41 749	21 039	76 474
At19c17cov0.2	148 372 287	4 281	2 991	34 657	19 977	61 909	49 627	25 514	92 770
At19c16cov0.2	160 593 426	4 529	3 109	35 495	20 556	63 345	51 789	26 685	96 899
At23c18cov0.2	186 801 607	5 236	3 647	35 672	20 940	60 476	51 358	26 671	93 335
At23c17cov0.2	210 660 927	5 739	3 862	36 741	21 769	62 600	54 560	28 552	99 355
At23c16cov0.2	222 921 658	5 987	3 978	37 258	22 133	63 832	56 069	29 333	102 135

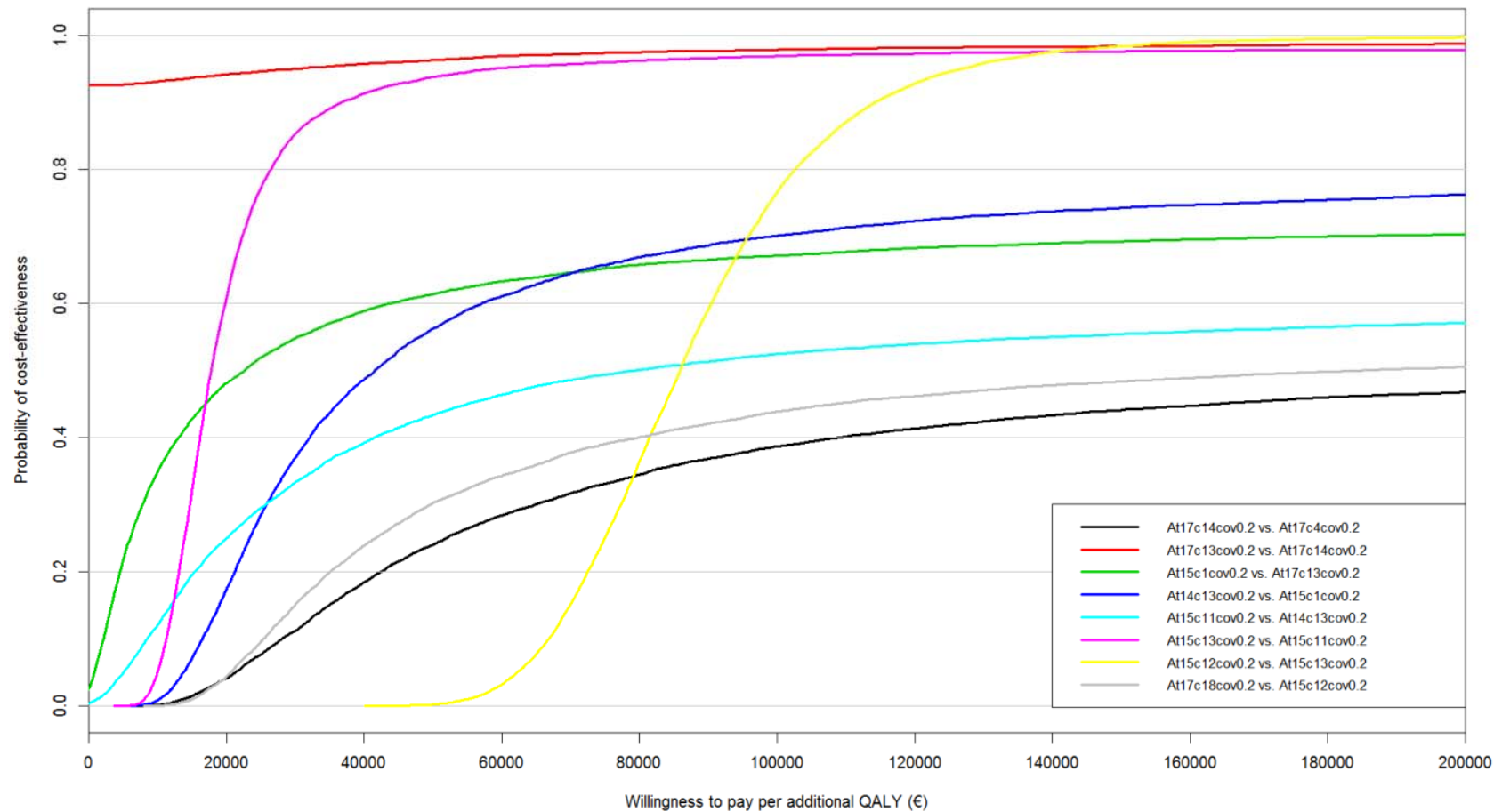


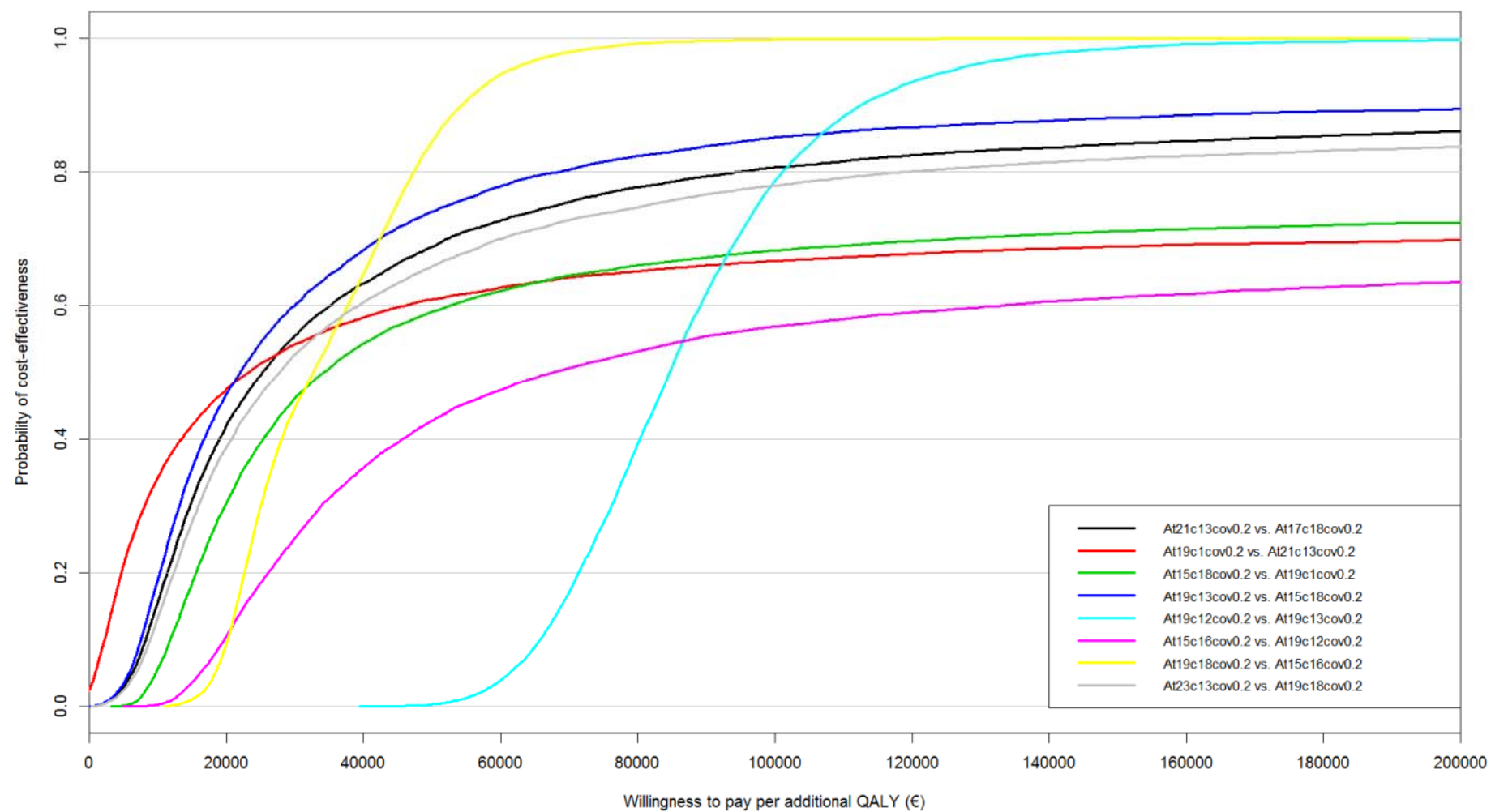
102	Seasonal influenza vaccination - Part II: Supplement 1.2							KCE Report 204S1.2	
<b>At7c18cov0.2</b>	250 995 349	6 497	4 074	38 567	23 721	63 375	61 721	33 017	111 551
<b>At11c13cov0.2</b>	260 054 307	6 729	4 453	38 753	23 403	64 108	58 440	30 948	104 747
<b>At7c17cov0.2</b>	274 750 214	7 025	4 317	39 133	24 120	64 709	63 756	34 178	115 453
<b>At11c18cov0.2</b>	313 191 256	7 978	4 962	39 221	24 185	64 024	63 257	33 810	113 450
<b>At11c17cov0.2</b>	336 946 482	8 510	5 208	39 550	24 437	64 693	64 959	34 710	116 760
<b>At11c16cov0.2</b>	349 167 401	8 769	5 334	39 797	24 557	65 344	65 687	35 022	118 545

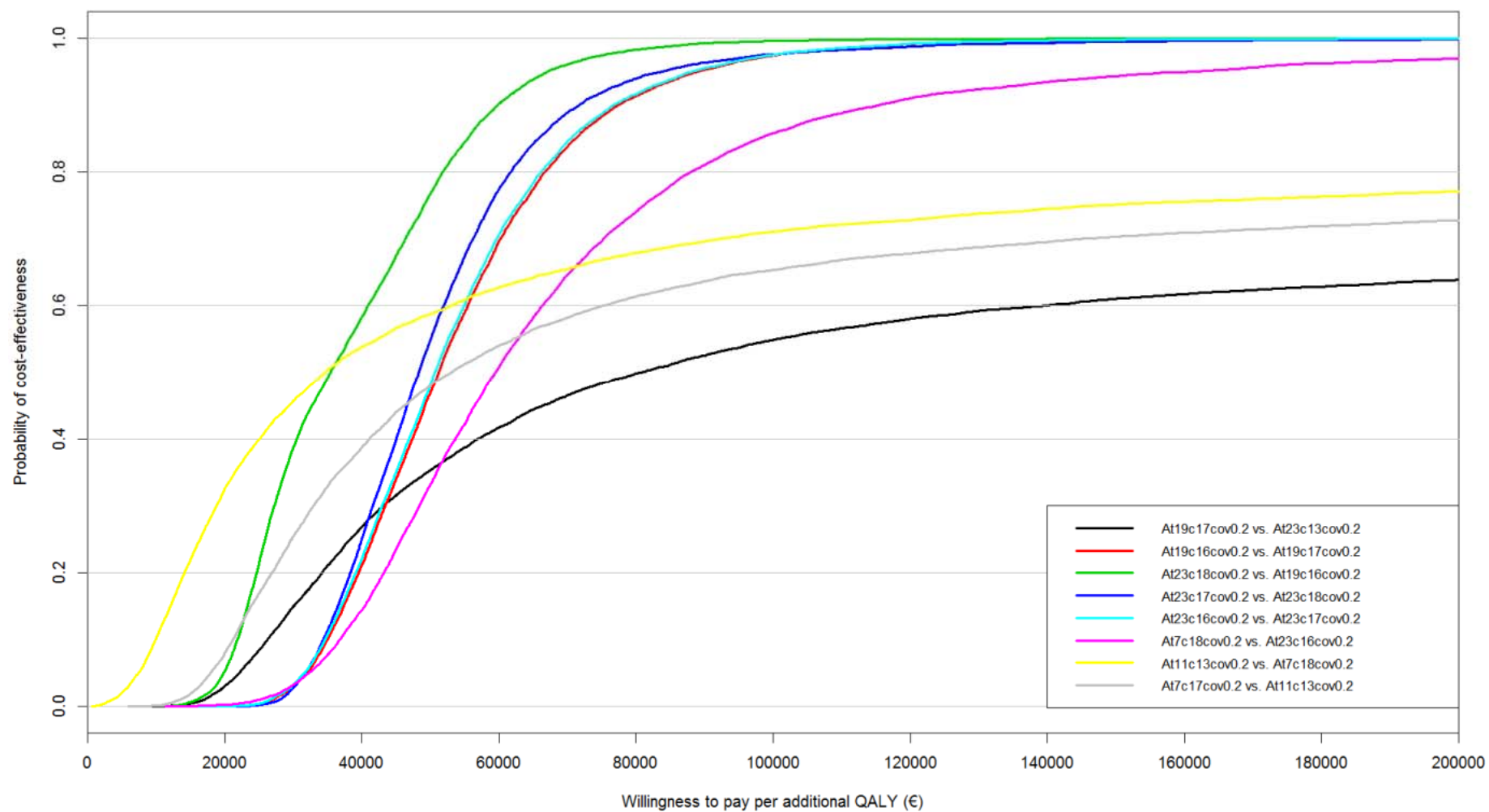
*Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.*

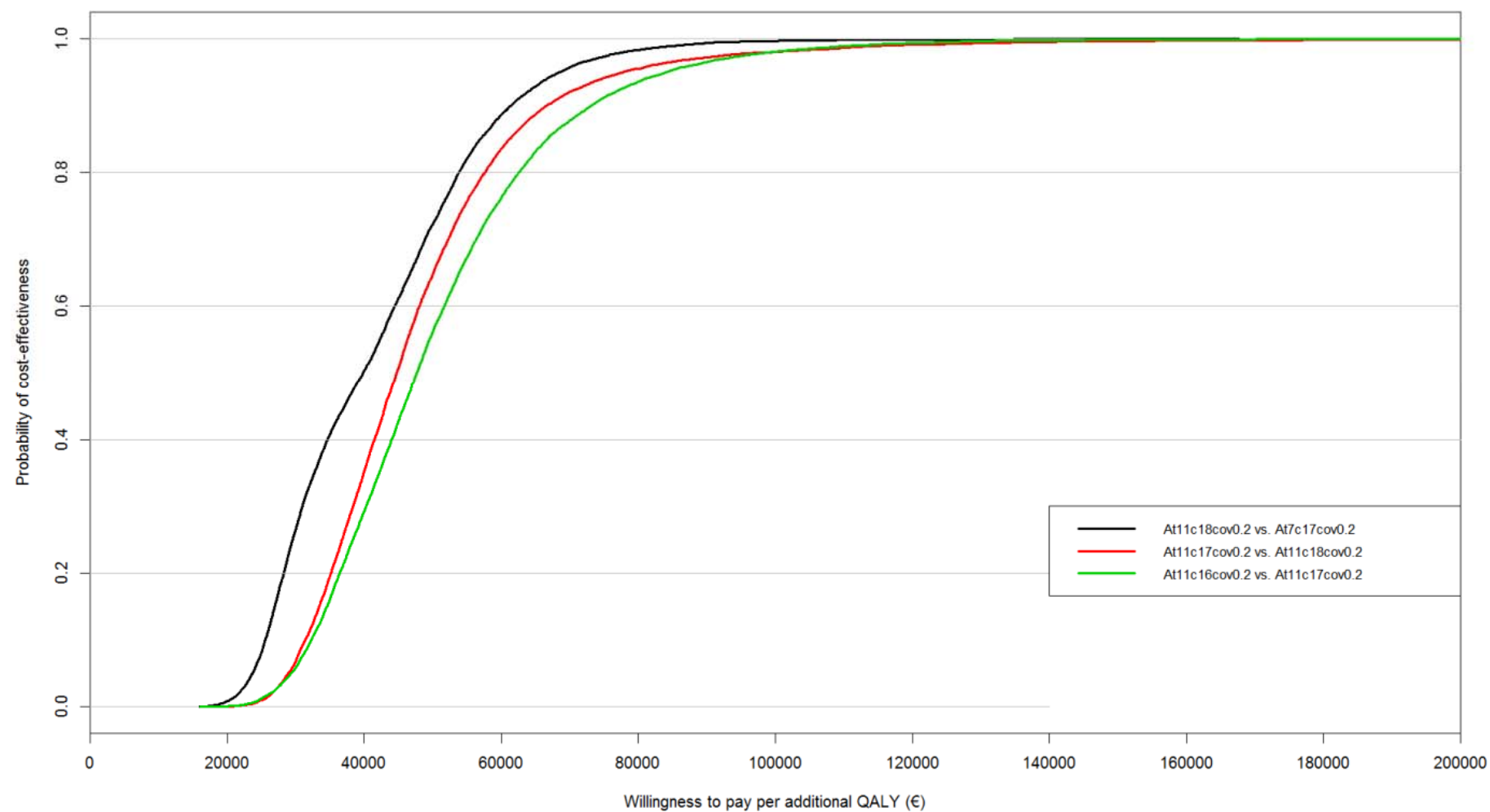


**Figure 49 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 20% coverage level of the child components of the options, and with immunity lasting an average of 1.68 years**











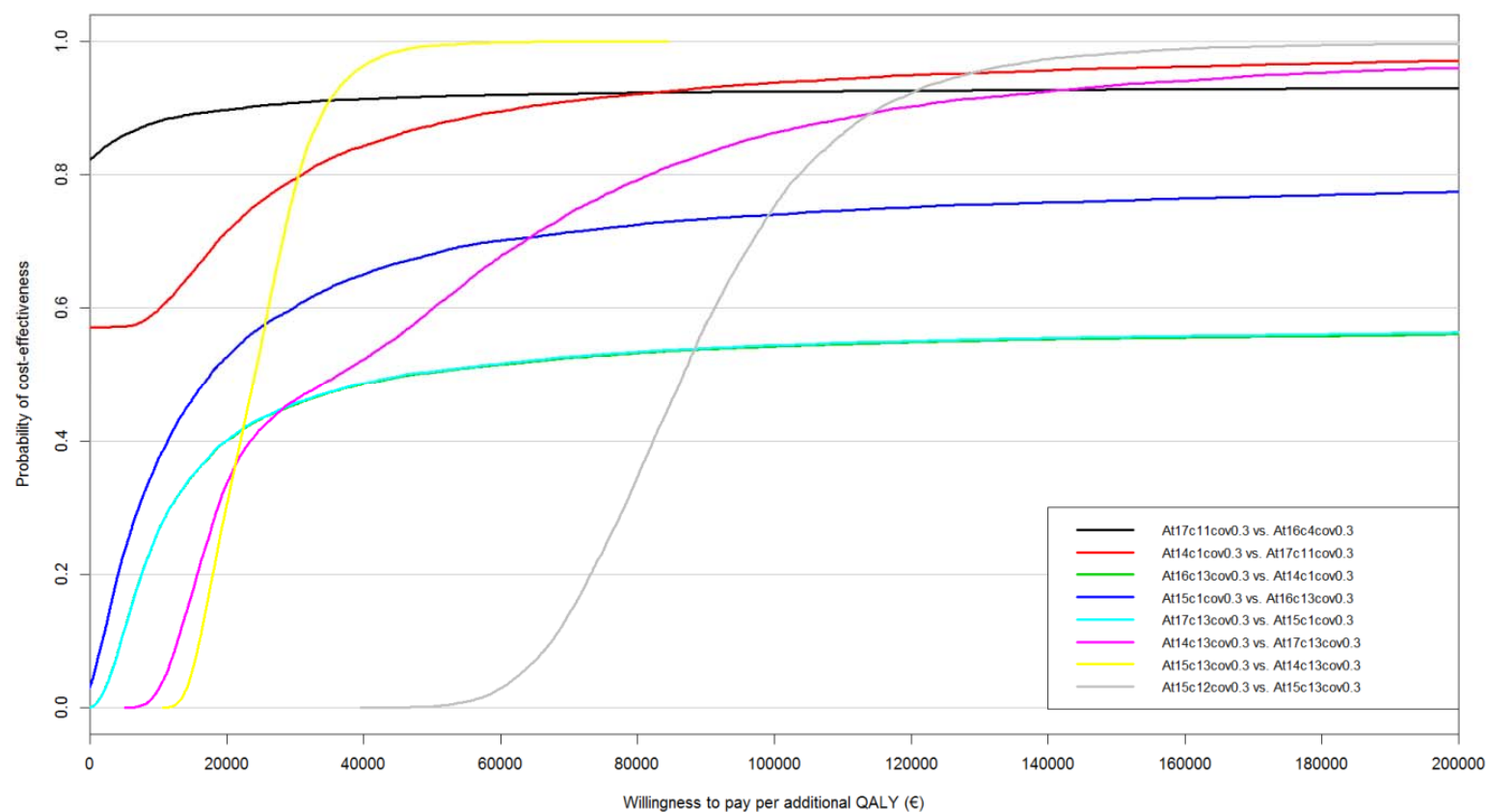
**Table 3 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by (extended) dominance for a vaccination coverage of 30% in children (<18y) and with immunity lasting an average of 1.68 years**

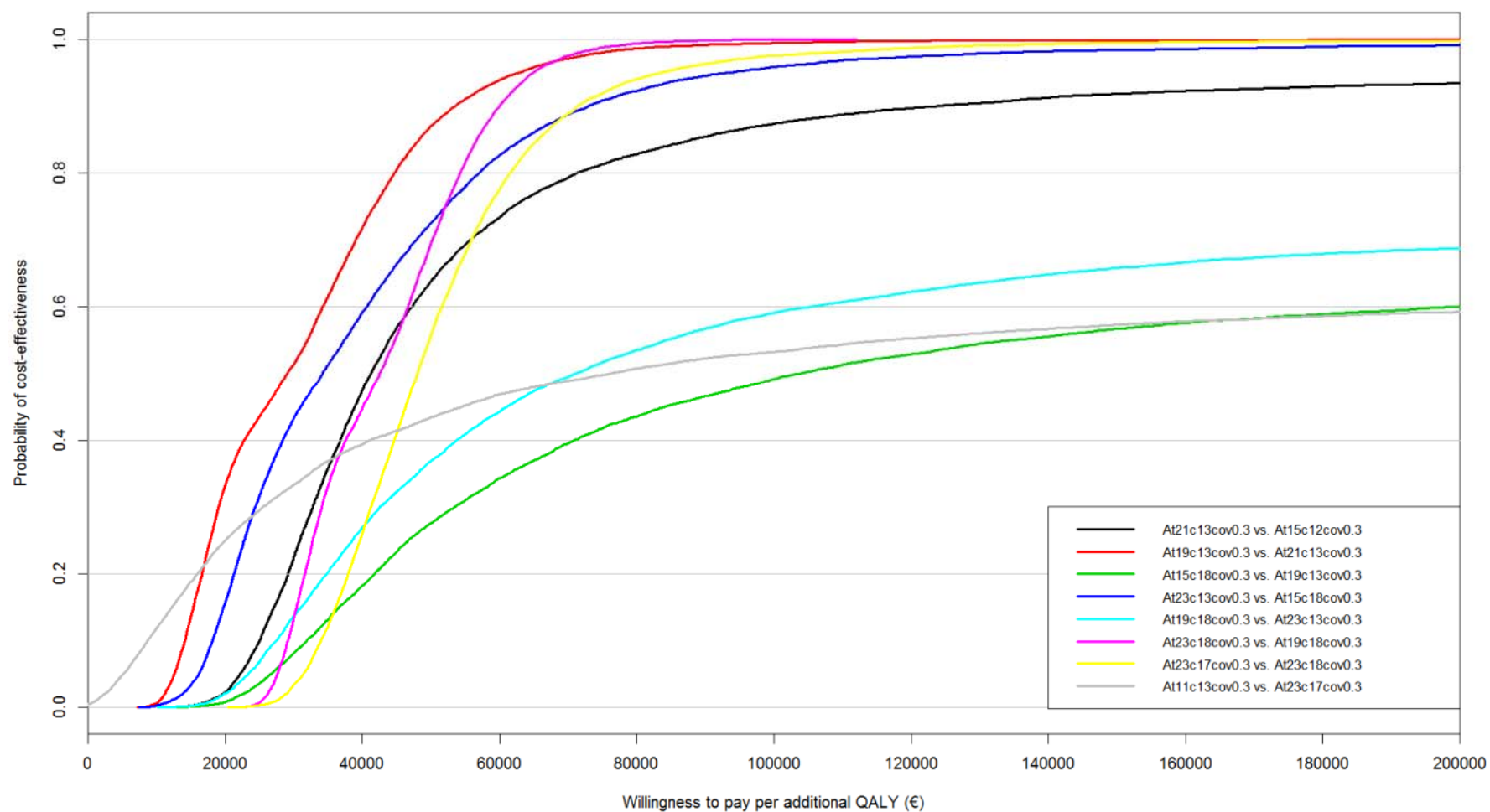
Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
<b>At16c4cov0.3</b>	-7 508 133	33	170	-34 763	-575 173	761 217	-44 827	-109 373	-20 253
<b>At17c11cov0.3</b>	-8 808 426	164	457	-33 351	-509 987	538 986	-18 866	-37 153	-13 053
<b>At14c1cov0.3</b>	-13 288 781	211	822	-21 156	-542 932	501 304	-15 929	-32 267	-9 602
<b>At16c13cov0.3</b>	-9 027 437	360	267	-20 512	-154 443	148 595	-30 335	-175 327	108 920
<b>At15c1cov0.3</b>	-1 879 772	681	1 275	-3 147	-6 419	9 946	-1 524	-3 740	1 956
<b>At17c13cov0.3</b>	2 495 380	814	702	2 865	-1 211	27 983	3 580	-925	18 803
<b>At14c13cov0.3</b>	15 642 687	1 153	1 189	13 414	3 955	53 225	13 242	4 183	32 599
<b>At15c13cov0.3</b>	27 151 694	1 622	1 635	16 681	6 483	44 100	16 608	6 545	35 009
<b>At15c12cov0.3</b>	51 915 398	1 912	1 700	27 189	13 286	57 550	30 518	14 337	60 199
<b>At21c13cov0.3</b>	64 995 690	2 243	1 595	28 935	16 499	53 994	40 946	20 950	76 122
<b>At19c13cov0.3</b>	89 443 539	3 085	2 527	29 063	15 301	53 452	35 457	17 436	66 599
<b>At15c18cov0.3</b>	108 161 510	3 308	2 271	32 713	18 393	68 576	47 739	23 993	94 828
<b>At23c13cov0.3</b>	151 980 070	4 509	3 392	33 784	19 006	57 901	44 910	22 909	82 059
<b>At19c18cov0.3</b>	170 267 849	4 813	3 183	35 362	20 868	63 136	53 587	27 809	100 725
<b>At23c18cov0.3</b>	232 583 814	6 278	4 066	37 044	22 284	63 294	57 344	30 131	104 822
<b>At23c17cov0.3</b>	268 399 409	7 023	4 406	38 185	23 189	65 701	61 094	32 210	112 330
<b>At11c13cov0.3</b>	278 699 399	7 216	4 667	38 703	23 552	63 715	59 792	31 772	107 165
<b>At23c16cov0.3</b>	286 725 683	7 396	4 582	38 782	23 470	66 900	62 703	32 954	115 527
<b>At7c18cov0.3</b>	296 509 957	7 586	4 535	39 112	24 278	64 749	65 531	35 184	119 447
<b>At11c18cov0.3</b>	358 592 758	9 095	5 439	39 442	24 548	64 517	66 118	35 534	119 402
<b>At11c17cov0.3</b>	394 200 453	9 910	5 821	39 861	24 783	65 863	67 933	36 472	123 362
<b>At11c16cov0.3</b>	412 437 372	10 302	6 027	40 105	24 864	66 663	68 632	36 816	125 476

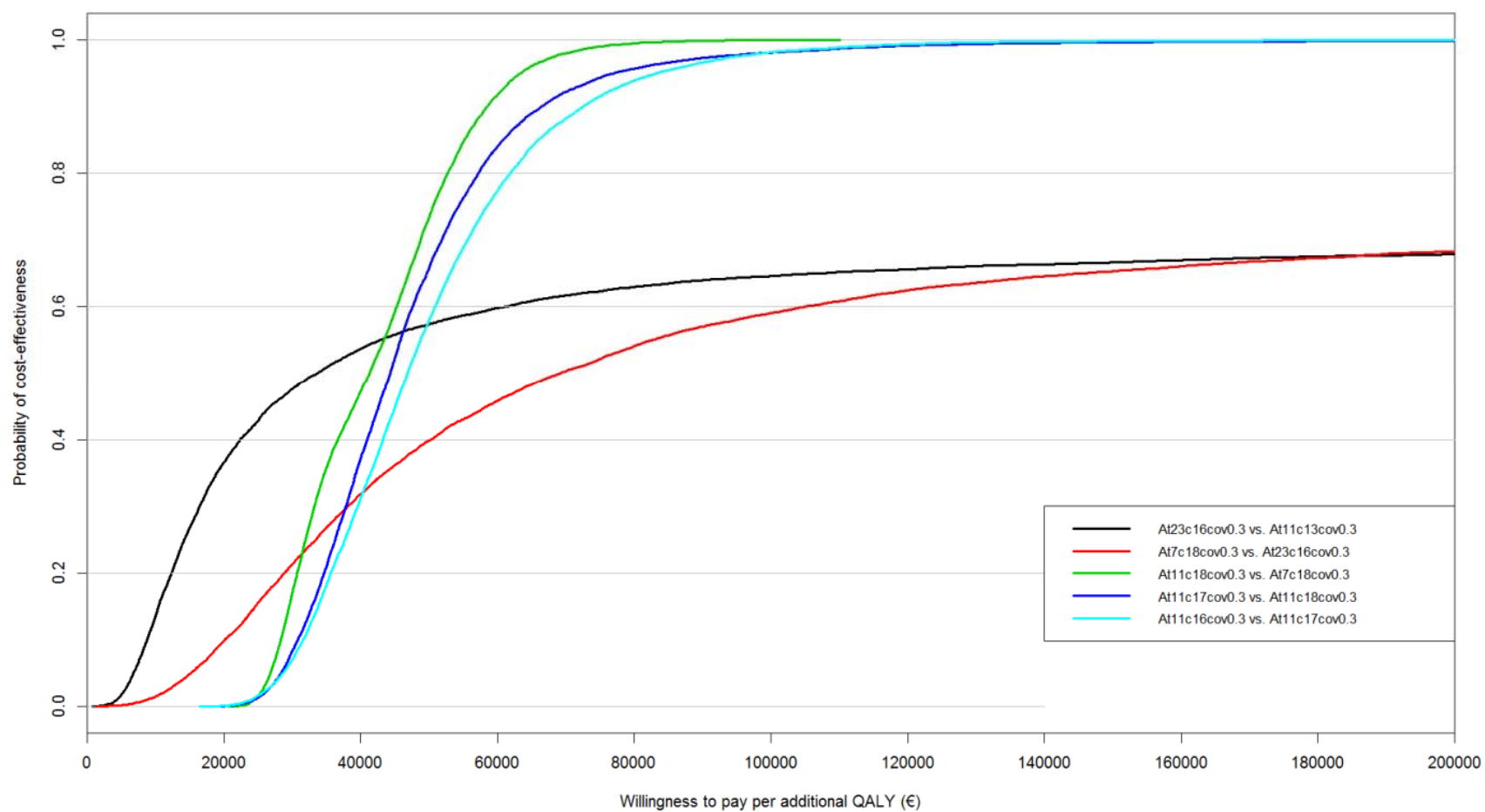
*Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.*



**Figure 50 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 30% coverage level of the child components of the options, and with immunity lasting an average of 1.68 years**









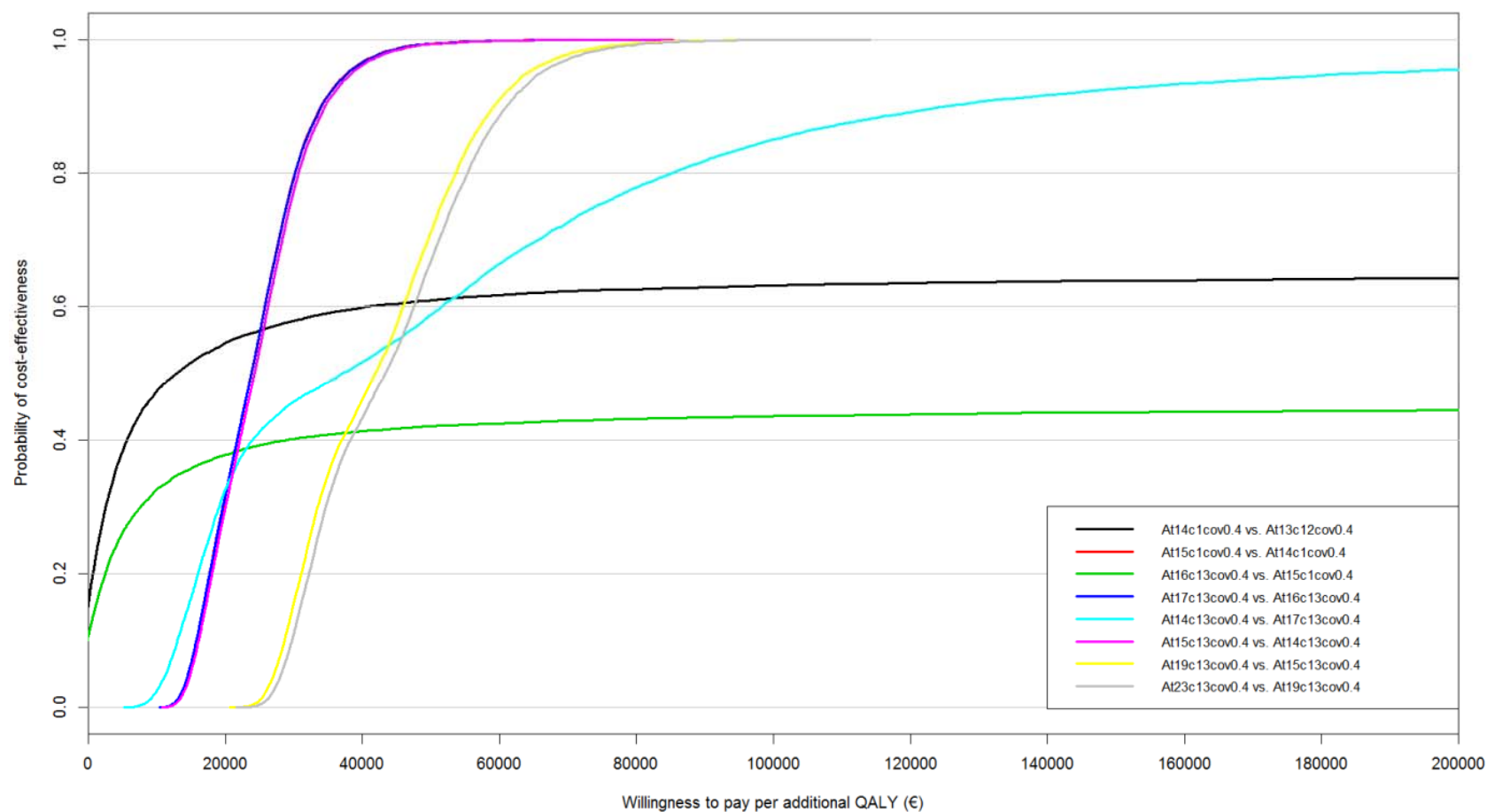
**Table 4 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 40% in children (<18y), and with immunity lasting an average of 1.68 years**

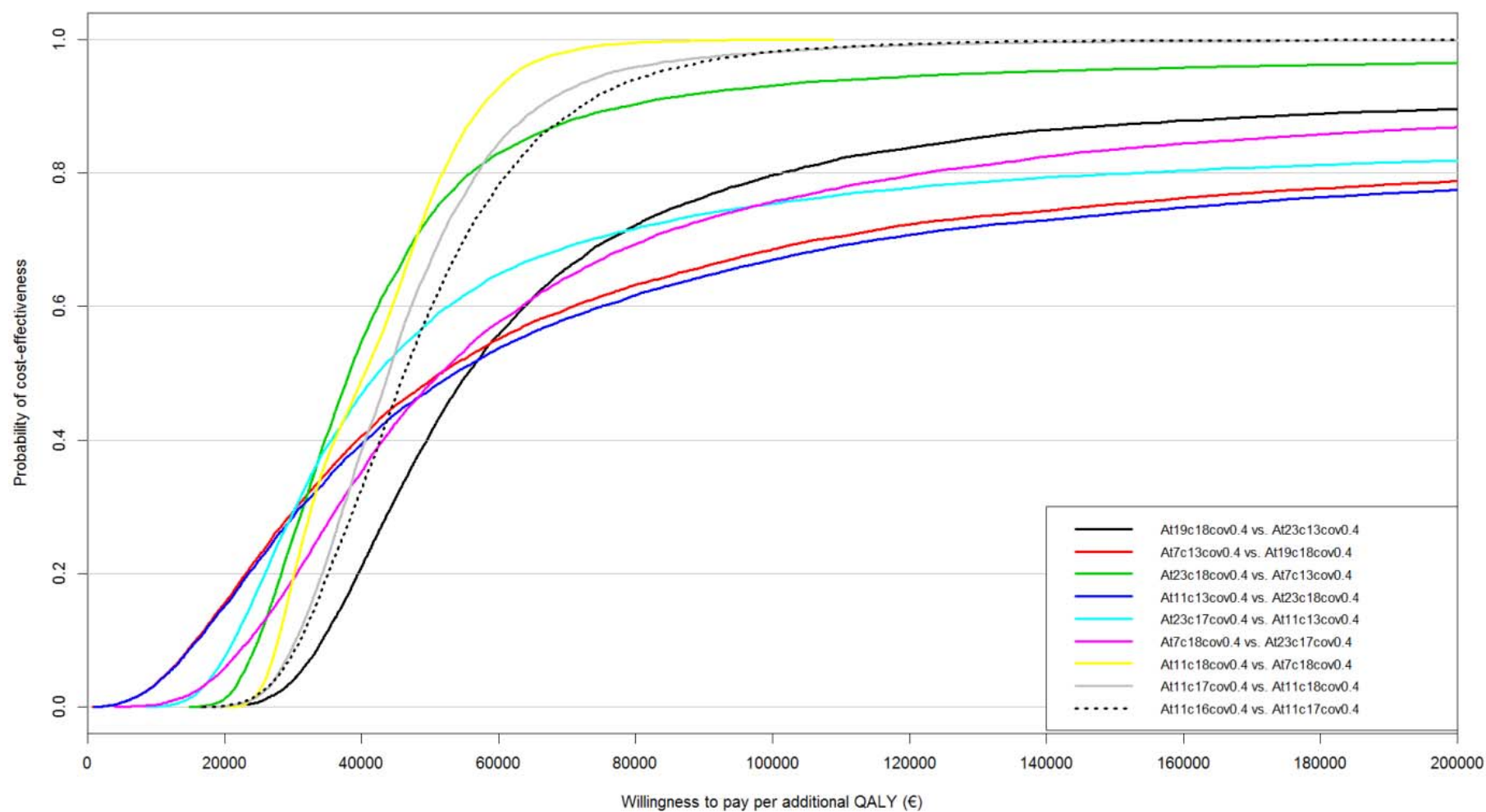
Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
At13c12cov0.4	-7 799 478	136	66	-21 847	-310 720	238 796	-43 447	-569 293	515 750
At14c1cov0.4	-4 016 235	326	877	-8 532	-124 030	113 148	-4 487	-5 919	-2 786
At15c1cov0.4	7 406 969	800	1 330	9 013	73	70 189	5 655	193	15 387
At16c13cov0.4	9 898 764	802	450	11 391	-60 215	93 045	20 476	-73 519	144 575
At17c13cov0.4	21 421 583	1 252	887	16 867	7 669	71 675	24 210	10 519	68 883
At14c13cov0.4	34 609 970	1 590	1 362	21 647	9 357	67 967	25 509	10 557	57 734
At15c13cov0.4	46 119 696	2 055	1 807	22 391	10 535	54 176	25 524	11 501	51 987
At19c13cov0.4	108 384 024	3 534	2 703	30 767	16 834	56 377	40 170	20 105	75 355
At23c13cov0.4	170 779 712	4 966	3 572	34 503	19 811	59 243	47 933	24 654	87 371
At19c18cov0.4	216 291 079	5 806	3 587	37 251	22 326	66 799	60 368	31 571	114 787
At7c13cov0.4	235 081 645	6 209	3 985	37 841	23 055	62 595	59 176	31 522	106 884
At23c18cov0.4	278 440 197	7 296	4 491	38 144	23 277	65 733	62 105	32 890	114 939
At11c13cov0.4	297 387 091	7 688	4 873	38 660	23 703	63 489	61 187	32 592	109 987
At23c17cov0.4	326 135 381	8 304	4 952	39 269	24 022	68 348	65 852	34 989	122 828
At7c18cov0.4	342 212 353	8 654	4 998	39 502	24 608	66 191	68 492	36 889	126 026
At11c18cov0.4	404 162 225	10 198	5 925	39 706	24 765	65 559	68 463	36 909	124 678
At11c17cov0.4	451 512 951	11 267	6 441	40 046	24 942	66 850	70 252	37 767	129 078
At11c16cov0.4	475 770 666	11 806	6 717	40 338	25 013	67 688	71 016	38 013	131 131

*Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.*



Figure 51 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 40% coverage level of the child components of the options, and with immunity lasting an average of 1.68 years







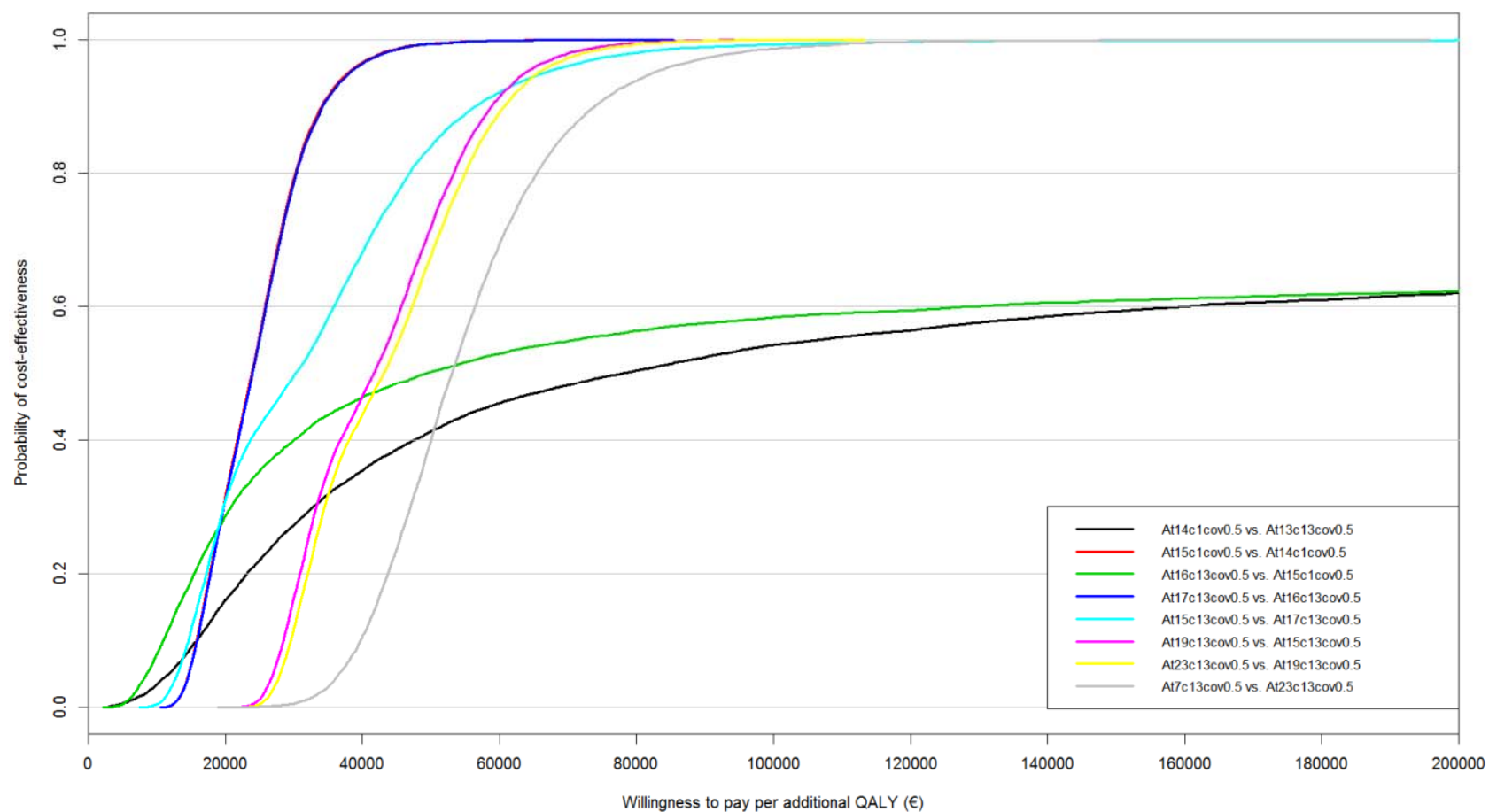
**Table 5 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 50% in children (<18y), and with immunity lasting an average of 1.68 years**

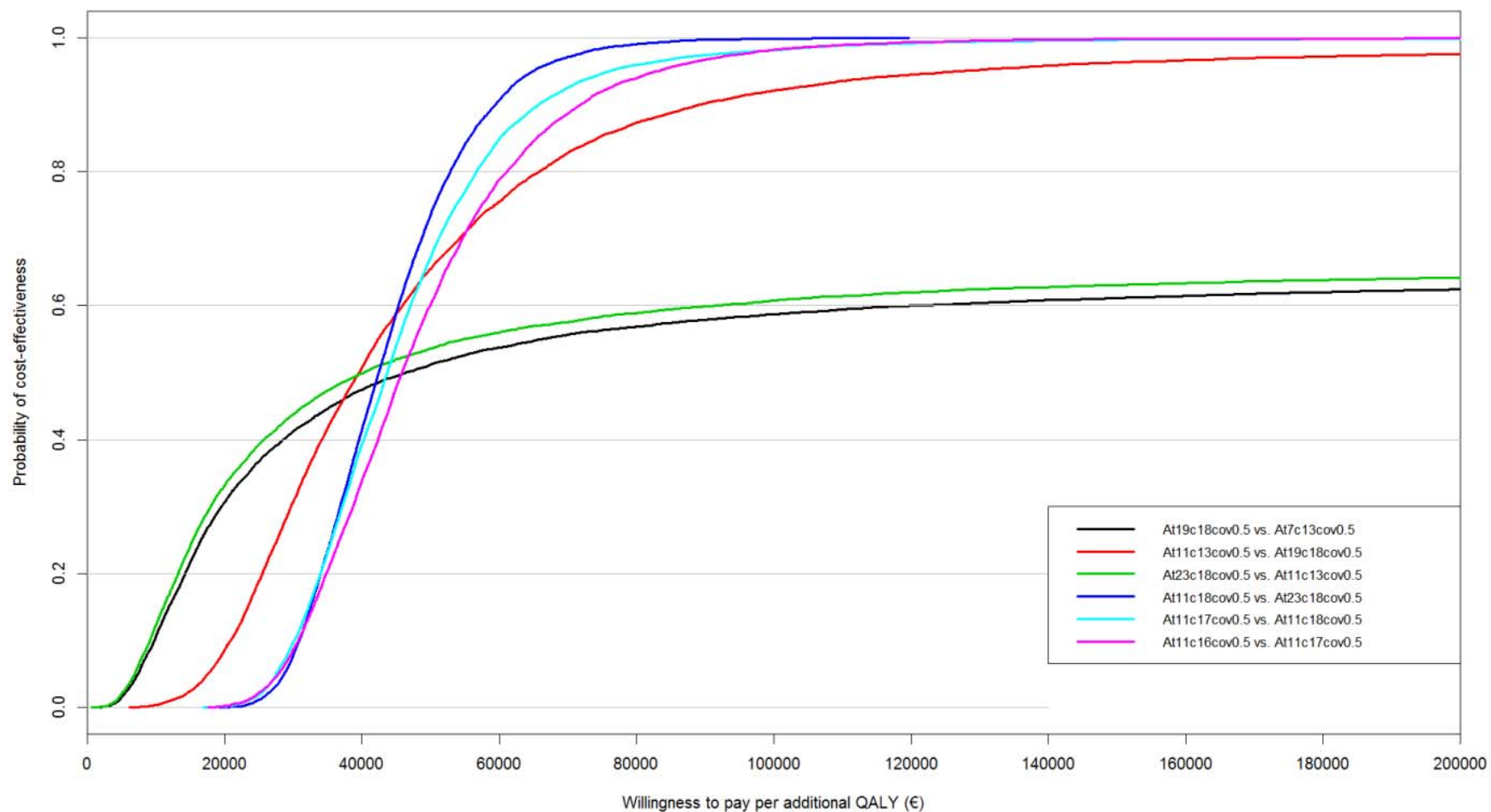
Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
<b>At13c13cov0.5</b>	-21 933 786	190	160	-46 595	-627 438	632 719	-84 355	-962 924	703 763
<b>At14c1cov0.5</b>	5 282 062	440	933	6 404	-202 064	216 617	5 706	-61	17 911
<b>At15c1cov0.5</b>	16 710 486	913	1 386	18 298	4 498	88 638	12 123	3 712	27 814
<b>At16c13cov0.5</b>	28 885 342	1 227	630	22 795	-39 265	123 177	44 142	-34 324	231 003
<b>At17c13cov0.5</b>	40 396 725	1 681	1 065	23 822	12 371	81 348	37 861	17 986	101 528
<b>At15c13cov0.5</b>	65 139 666	2 471	1 977	26 300	13 403	61 396	32 984	15 666	66 490
<b>At19c13cov0.5</b>	127 391 539	3 959	2 879	32 197	18 089	59 005	44 336	22 465	83 551
<b>At23c13cov0.5</b>	189 728 569	5 404	3 749	35 101	20 491	60 909	50 646	26 267	92 667
<b>At7c13cov0.5</b>	253 943 244	6 653	4 180	38 168	23 346	63 421	60 944	32 551	110 552
<b>At19c18cov0.5</b>	262 351 530	6 778	3 988	38 682	23 446	69 910	65 967	34 517	126 230
<b>At11c13cov0.5</b>	316 173 771	8 143	5 058	38 804	23 868	63 785	62 702	33 398	112 500
<b>At23c18cov0.5</b>	324 462 754	8 295	4 913	39 089	24 020	67 712	66 140	35 137	123 465
<b>At11c18cov0.5</b>	449 820 043	11 264	6 397	39 920	24 985	66 595	70 461	37 932	129 369
<b>At11c17cov0.5</b>	508 835 764	12 616	7 059	40 304	25 174	68 266	72 270	38 721	134 250
<b>At11c16cov0.5</b>	539 013 964	13 283	7 406	40 572	25 255	69 112	72 992	39 042	136 800

*Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.*



**Figure 52 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 50% coverage level of the child components of the options, and with immunity lasting an average of 1.68 years**







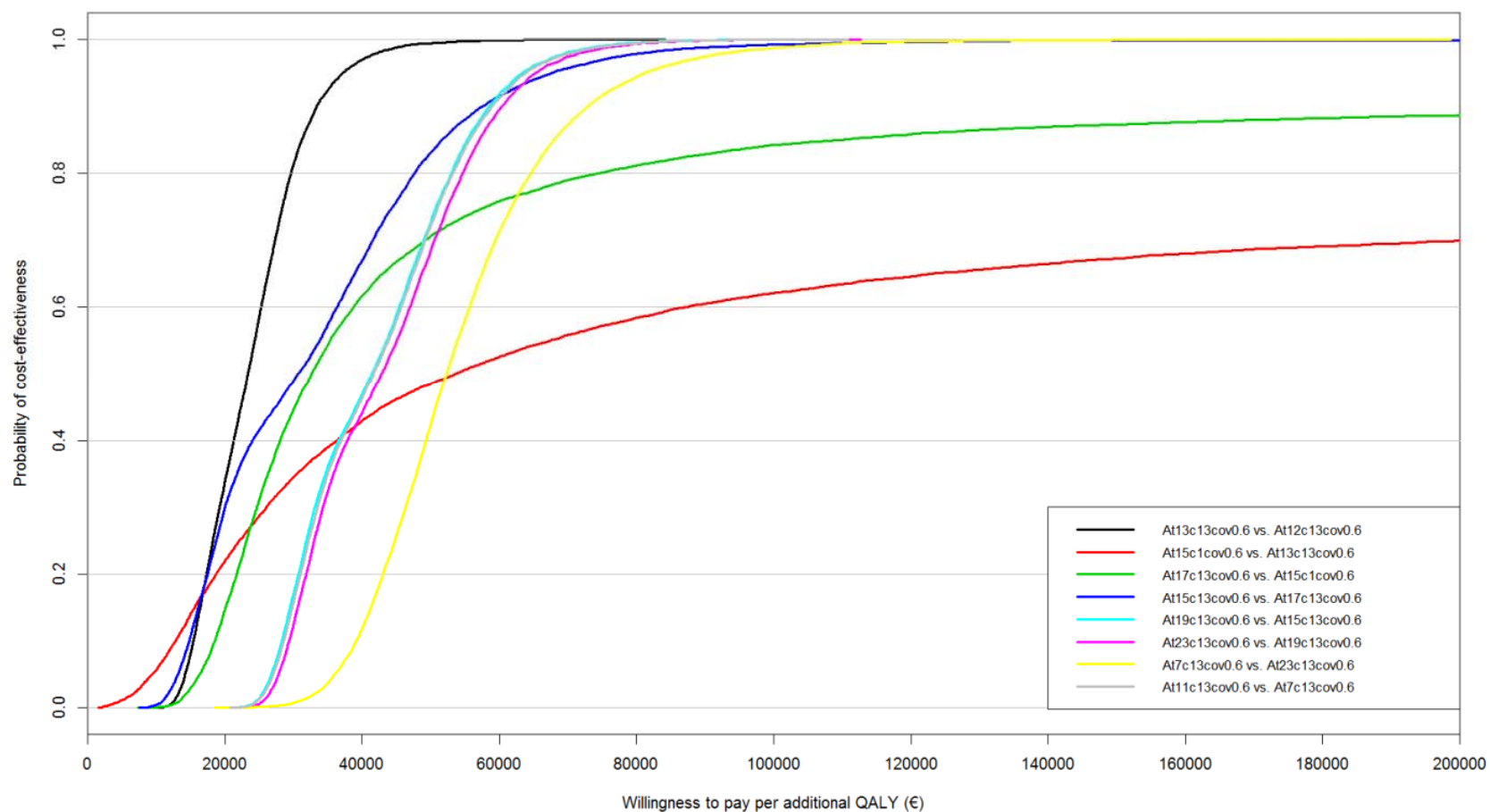
**Table 6 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 60% in children (<18y), and with immunity lasting an average of 1.68 years**

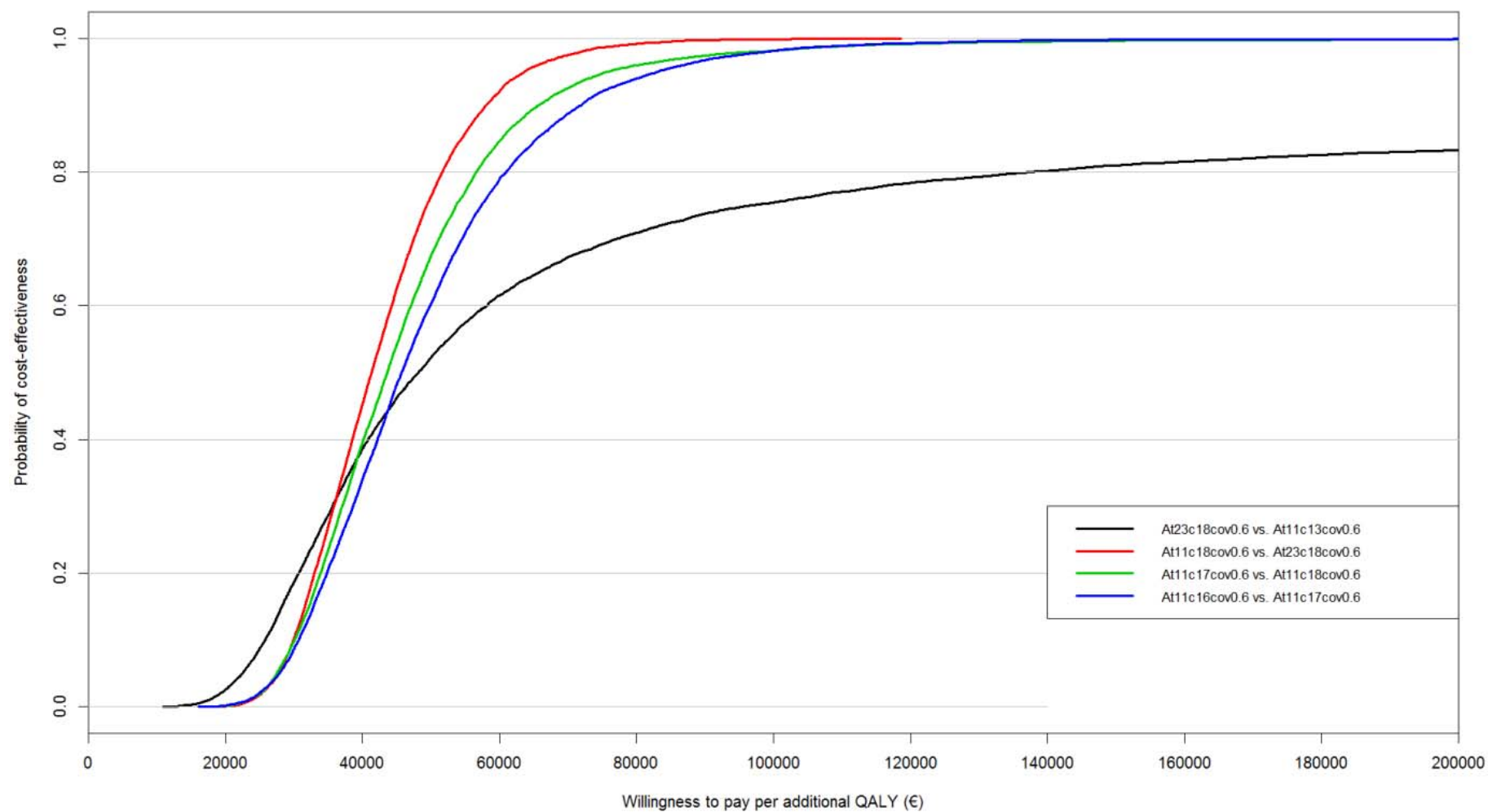
Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
<b>At12c13cov0.6</b>	-14 131 724	116	-115	-26 027	-425 124	433 774	31 136	-1 137 569	1 047 629
<b>At13c13cov0.6</b>	-2 872 980	600	330	-4 744	-8 631	-1 559	-8 626	-27 679	9 283
<b>At15c1cov0.6</b>	26 021 880	1 026	1 442	25 343	8 193	92 677	18 090	6 930	39 082
<b>At17c13cov0.6</b>	59 423 047	2 095	1 242	28 179	15 432	88 039	47 801	23 379	126 610
<b>At15c13cov0.6</b>	84 181 746	2 878	2 142	29 216	15 636	66 575	39 388	19 215	79 723
<b>At19c13cov0.6</b>	146 412 262	4 371	3 049	33 488	19 155	61 635	48 118	24 603	90 859
<b>At23c13cov0.6</b>	208 693 339	5 825	3 919	35 816	21 120	62 203	53 238	27 787	97 785
<b>At7c13cov0.6</b>	272 821 188	7 091	4 366	38 481	23 655	64 245	62 617	33 517	113 850
<b>At11c13cov0.6</b>	335 019 765	8 589	5 257	38 994	24 119	64 143	63 870	34 186	115 161
<b>At23c18cov0.6</b>	370 545 415	9 270	5 319	39 997	24 700	69 715	69 740	37 014	131 219
<b>At11c18cov0.6</b>	495 569 395	12 308	6 867	40 250	25 319	67 762	72 306	38 897	134 102
<b>At11c17cov0.6</b>	566 107 360	13 924	7 659	40 668	25 425	69 342	74 081	39 688	139 327
<b>At11c16cov0.6</b>	602 151 807	14 718	8 070	40 968	25 408	70 127	74 799	39 860	141 744

*Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.*



**Figure 53 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 60% coverage level of the child components of the options, and with immunity lasting an average of 1.68 years**







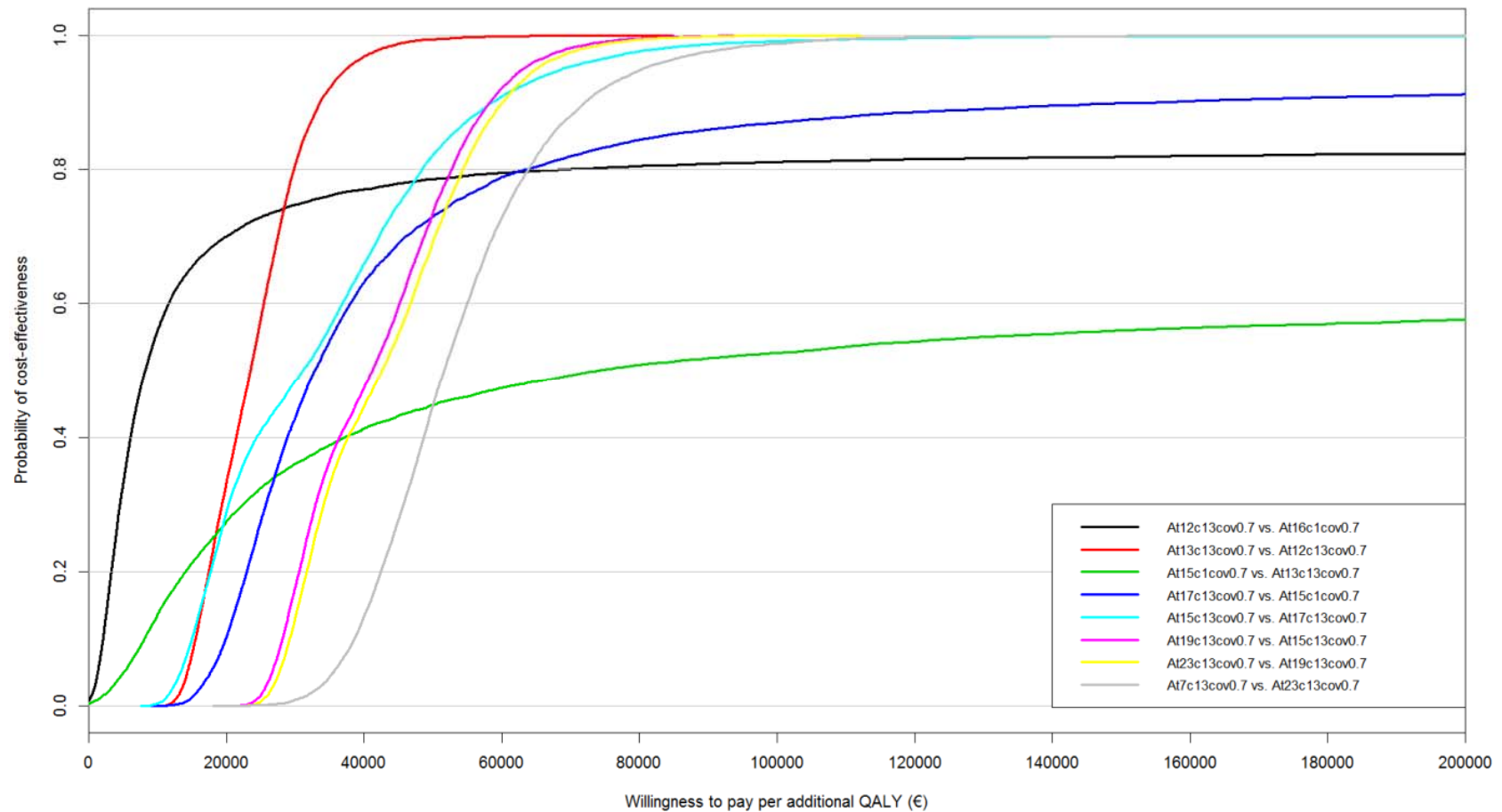
**Table 7 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 70% in children (<18y), and with immunity lasting an average of 1.68 years**

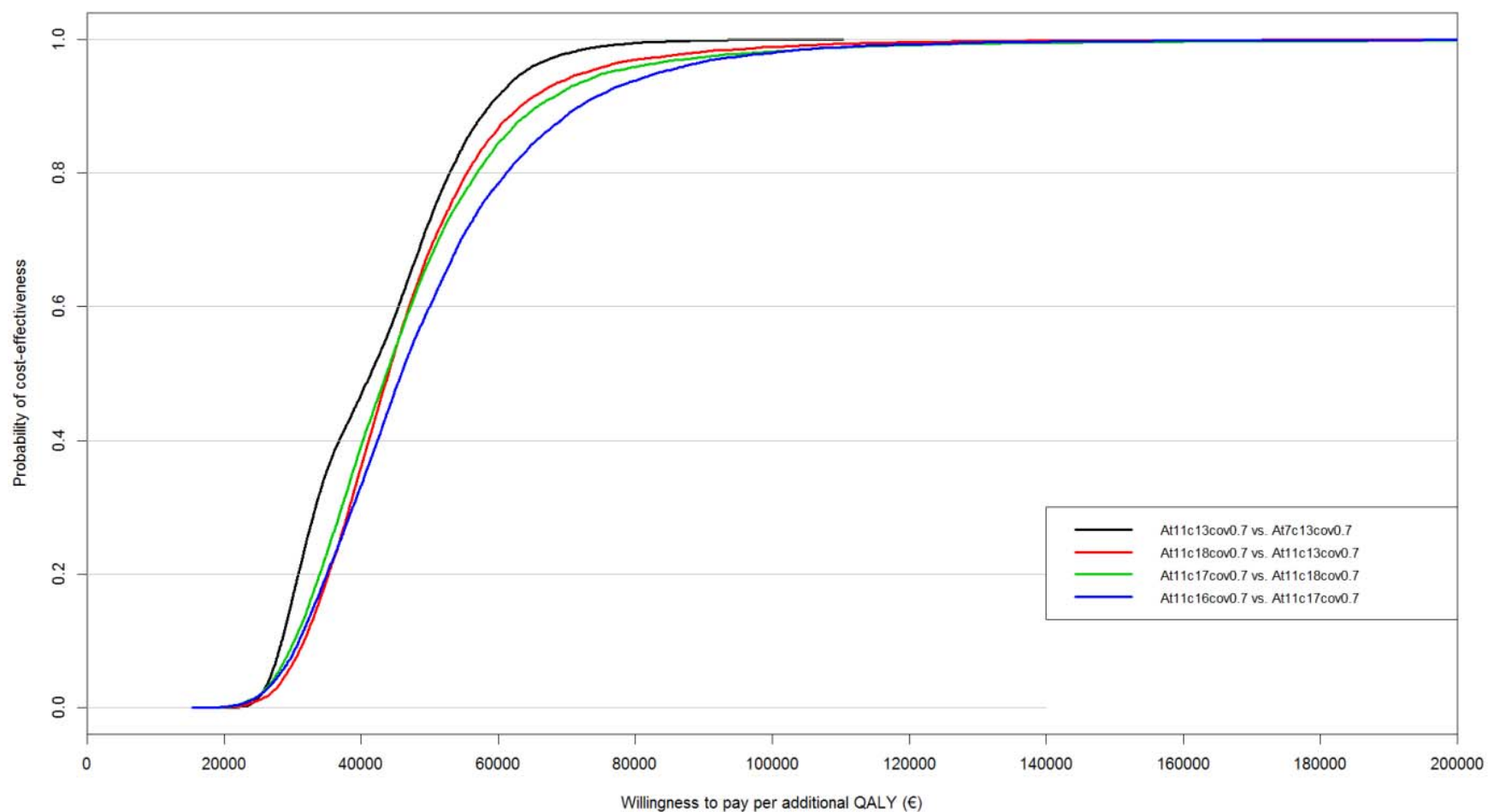
Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
<b>At16c1cov0.7</b>	-518 839	-172	102	1 274	-82 927	83 958	-4 557	-34 485	25 088
<b>At12c13cov0.7</b>	4 954 199	517	56	4 765	-103 340	104 053	5 625	-292 534	293 951
<b>At13c13cov0.7</b>	16 265 396	995	494	14 156	-120 444	132 323	28 620	-199 071	280 467
<b>At15c1cov0.7</b>	35 327 609	1 139	1 496	31 088	11 379	94 925	23 670	9 976	49 398
<b>At17c13cov0.7</b>	78 537 552	2 496	1 410	31 307	17 707	93 186	55 567	27 511	146 479
<b>At15c13cov0.7</b>	103 311 726	3 271	2 303	31 556	17 387	71 146	44 935	22 345	92 149
<b>At19c13cov0.7</b>	165 492 976	4 767	3 215	34 752	20 152	63 864	51 575	26 533	98 042
<b>At23c13cov0.7</b>	227 783 425	6 227	4 095	36 608	21 757	63 543	55 738	29 195	102 548
<b>At7c13cov0.7</b>	291 831 146	7 508	4 550	38 878	23 977	65 235	64 230	34 517	117 458
<b>At11c13cov0.7</b>	353 916 587	9 004	5 442	39 312	24 361	64 820	65 150	34 926	117 720
<b>At11c18cov0.7</b>	541 411 024	13 304	7 326	40 653	25 614	68 609	74 151	39 919	138 358
<b>At11c17cov0.7</b>	623 084 024	15 184	8 235	41 055	25 670	70 186	75 857	40 509	143 387
<b>At11c16cov0.7</b>	664 835 919	16 090	8 703	41 322	25 699	71 175	76 544	40 737	145 155

*Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.*



**Figure 54 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 70% coverage level of the child components of the options, and with immunity lasting an average of 1.68 years**







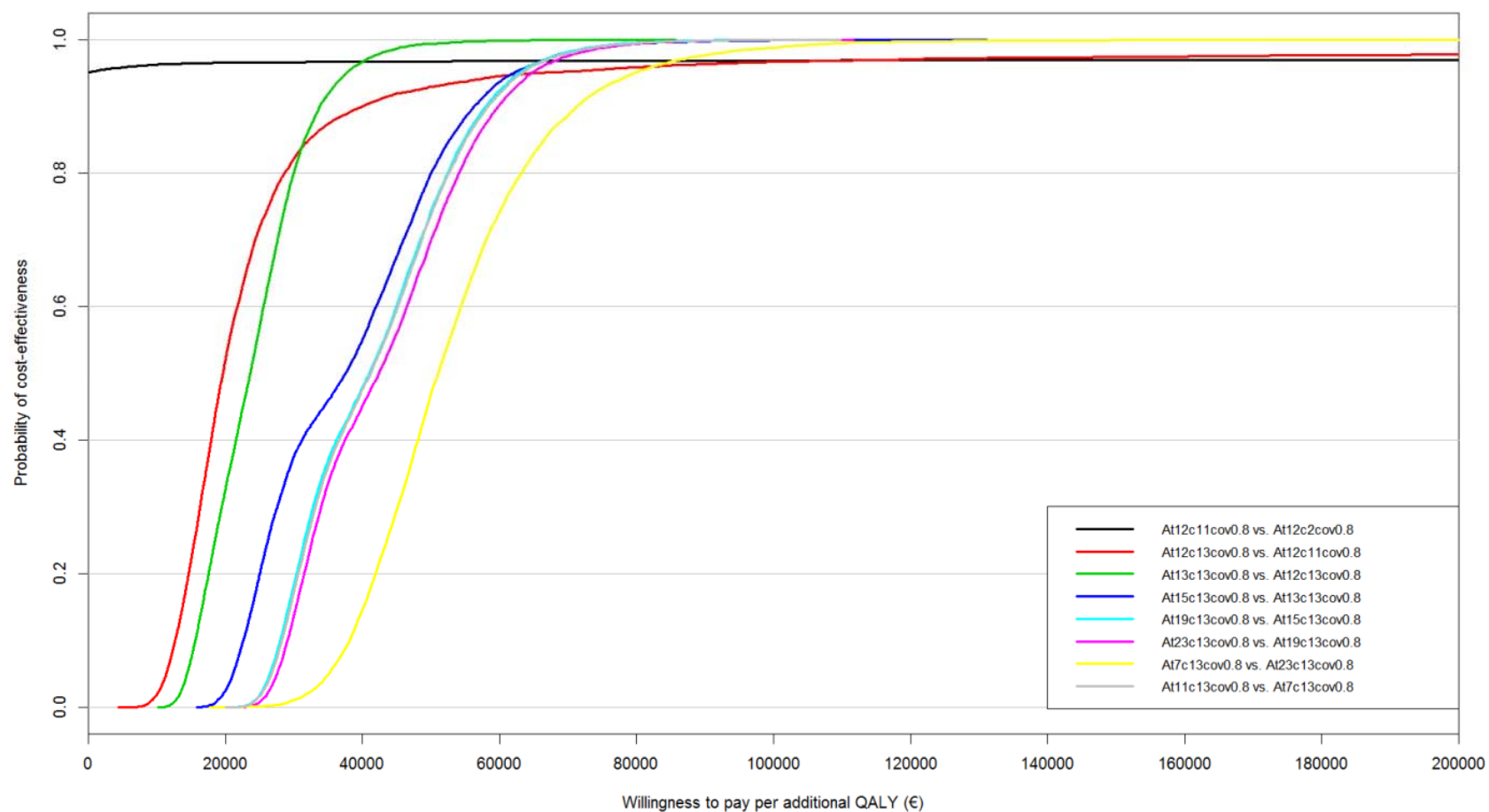
**Table 8 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 80% in children (<18y), and with immunity lasting an average of 1.68 years**

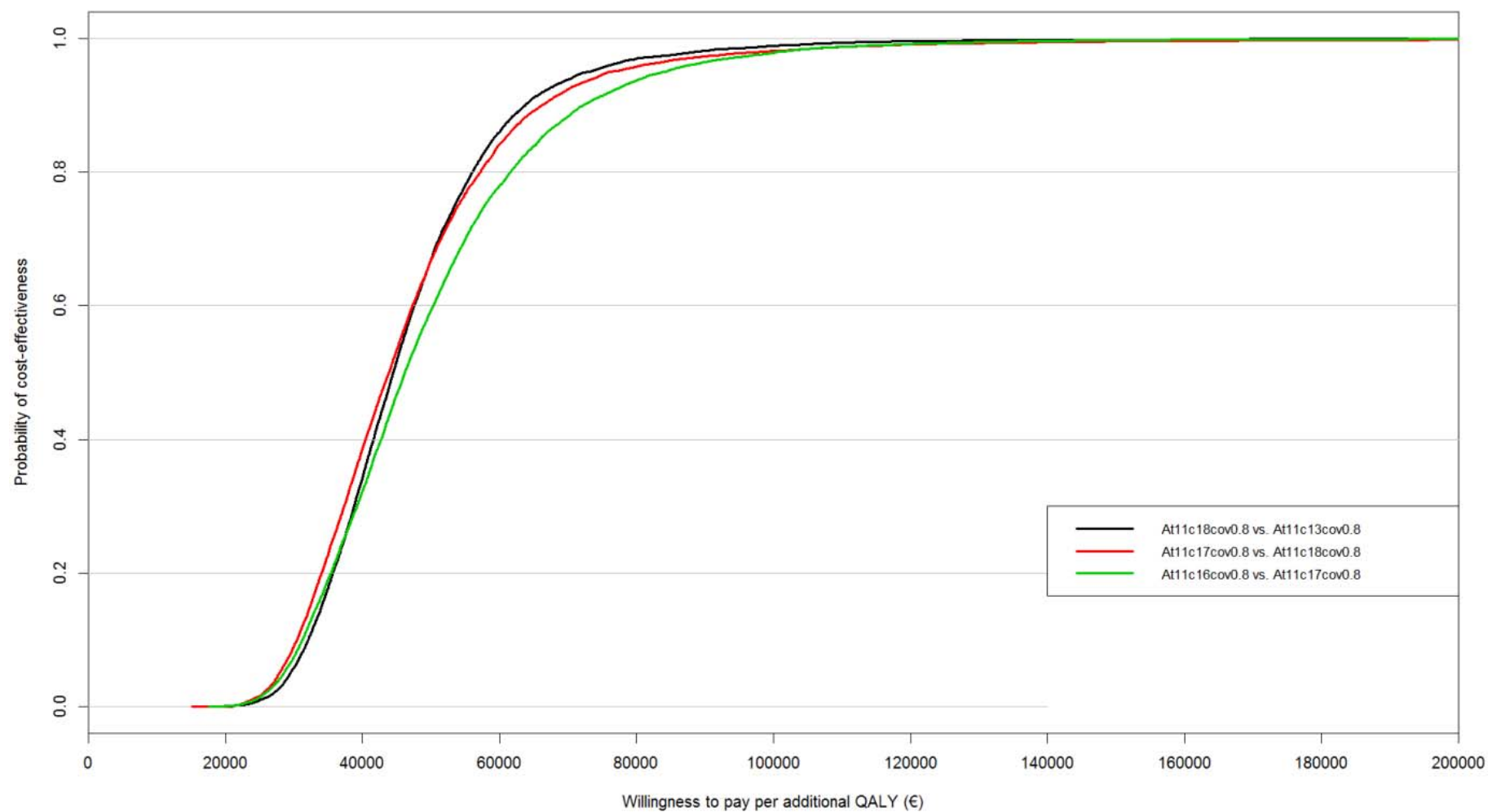
Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
<b>At12c2cov0.8</b>	-3 579 936	-1 196	-606	3 044	774	6 141	6 034	1 292	13 885
<b>At12c11cov0.8</b>	-6 915 367	-737	-443	9 371	1 565	43 111	15 610	2 683	58 321
<b>At12c13cov0.8</b>	24 092 430	904	220	21 501	-193 559	231 048	53 621	-753 299	775 035
<b>At13c13cov0.8</b>	35 471 514	1 376	650	24 009	-99 961	166 984	49 830	-229 935	354 927
<b>At15c13cov0.8</b>	122 491 568	3 654	2 458	33 495	18 894	75 334	49 925	25 084	102 918
<b>At19c13cov0.8</b>	184 658 836	5 152	3 376	35 881	20 992	65 762	54 777	28 382	104 782
<b>At23c13cov0.8</b>	246 910 045	6 622	4 261	37 320	22 345	64 971	58 165	30 471	107 339
<b>At7c13cov0.8</b>	310 940 282	7 906	4 726	39 303	24 297	66 324	65 915	35 413	120 671
<b>At11c13cov0.8</b>	372 920 652	9 429	5 631	39 609	24 616	65 621	66 393	35 680	120 568
<b>At11c18cov0.8</b>	587 197 278	14 278	7 757	41 152	25 928	69 609	75 980	40 841	142 362
<b>At11c17cov0.8</b>	679 341 953	16 379	8 778	41 452	25 960	71 203	77 655	41 402	147 060
<b>At11c16cov0.8</b>	726 529 560	17 406	9 304	41 751	26 064	71 890	78 278	41 644	149 078

*Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.*



Figure 55 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 80% coverage level of the child components of the options, and with immunity lasting an average of 1.68 years







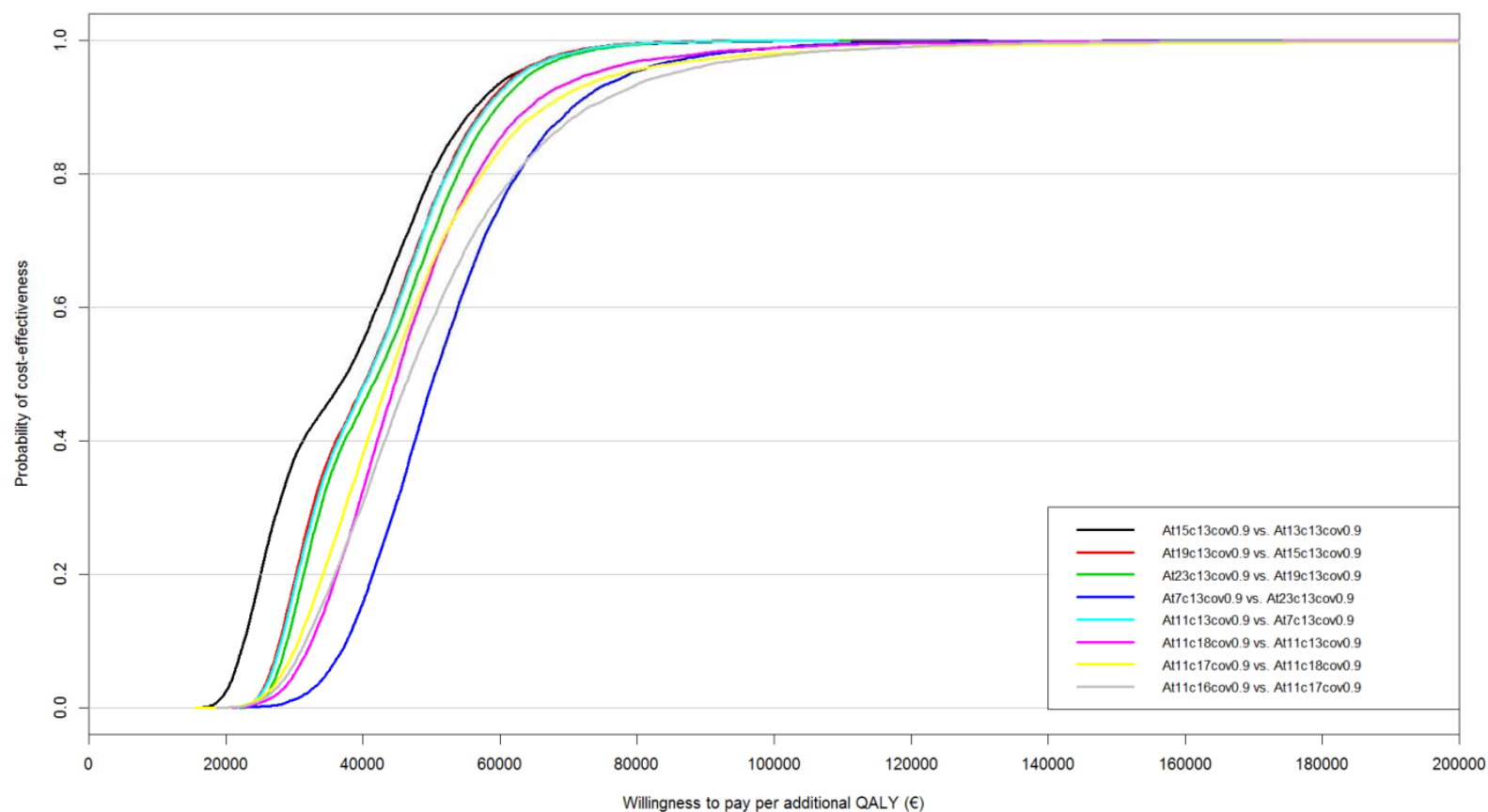
**Table 9 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 90% in children (<18y), and with immunity lasting an average of 1.68 years**

Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
<b>At13c13cov0.9</b>	54 731 474	1 742	802	29 962	-99 703	165 778	63 670	-231 170	399 596
<b>At15c13cov0.9</b>	141 729 524	4 020	2 607	35 222	20 212	78 302	54 531	27 588	112 714
<b>At19c13cov0.9</b>	203 805 090	5 524	3 532	36 929	21 775	68 132	57 799	30 125	111 012
<b>At23c13cov0.9</b>	266 102 615	6 997	4 416	38 012	22 909	66 349	60 337	31 734	111 895
<b>At7c13cov0.9</b>	330 090 138	8 293	4 896	39 771	24 667	67 204	67 552	36 318	123 693
<b>At11c13cov0.9</b>	392 068 448	9 834	5 806	39 956	24 870	66 299	67 727	36 418	123 297
<b>At11c18cov0.9</b>	632 246 107	15 197	8 167	41 612	26 302	70 524	77 644	41 797	145 924
<b>At11c17cov0.9</b>	734 100 202	17 496	9 288	41 918	26 356	71 956	79 198	42 273	150 616
<b>At11c16cov0.9</b>	786 688 976	18 624	9 871	42 245	26 502	73 044	79 920	42 527	152 418

*Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.*



**Figure 56 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 90% coverage level of the child components of the options, and with immunity lasting an average of 1.68 years**

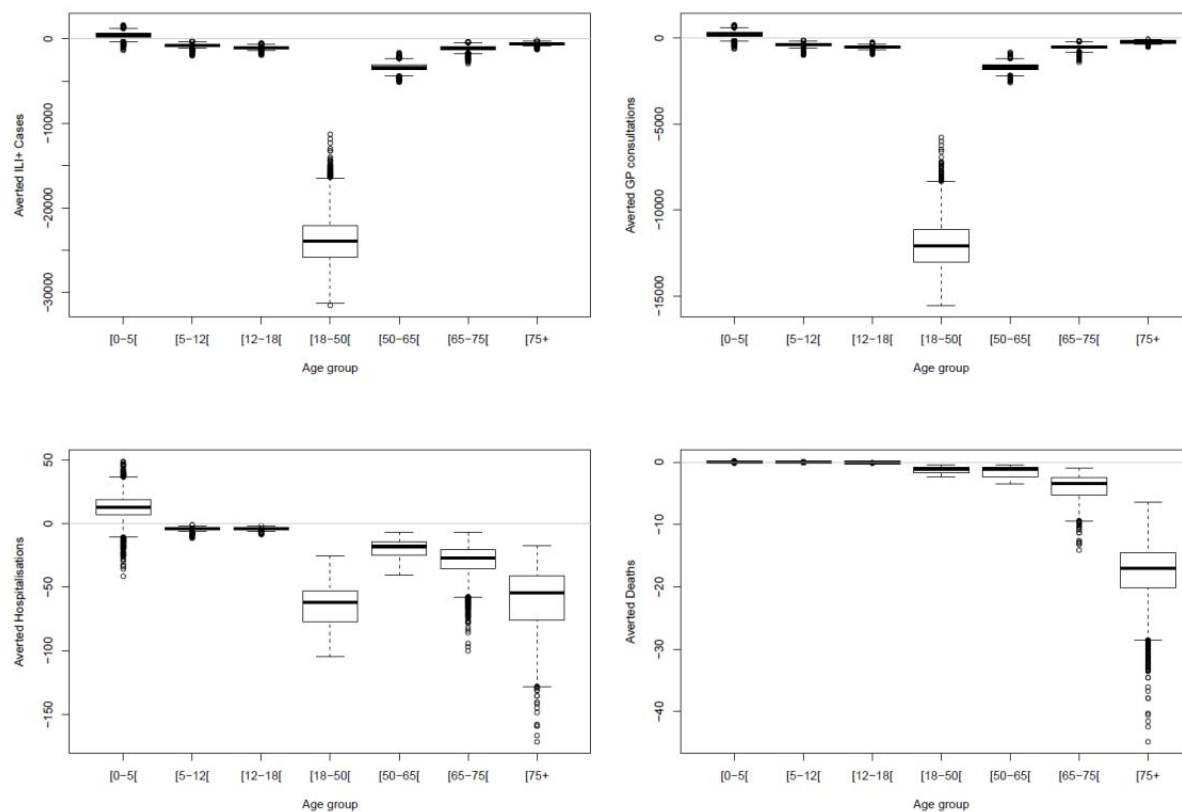


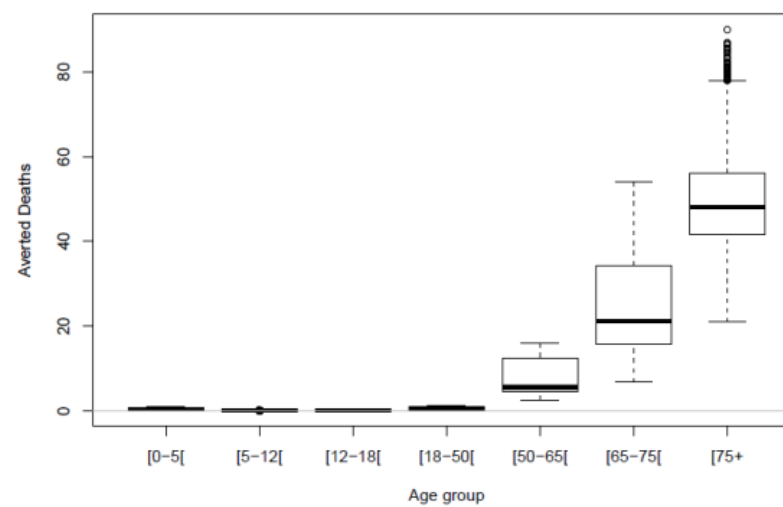
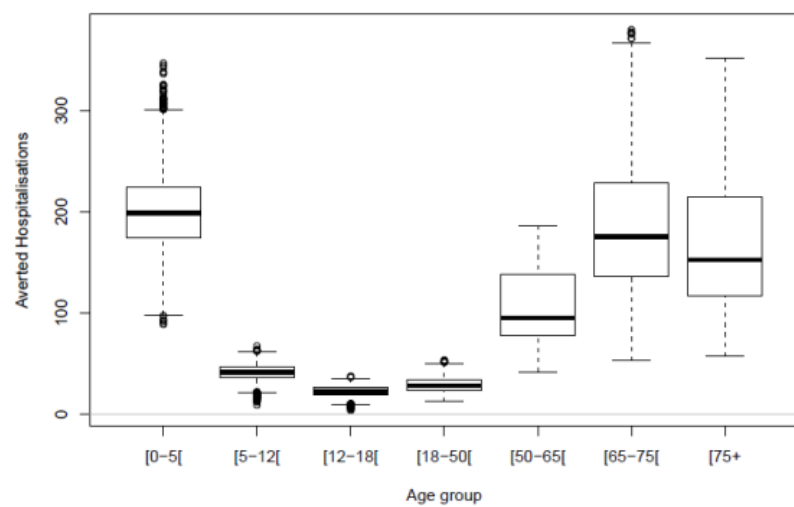
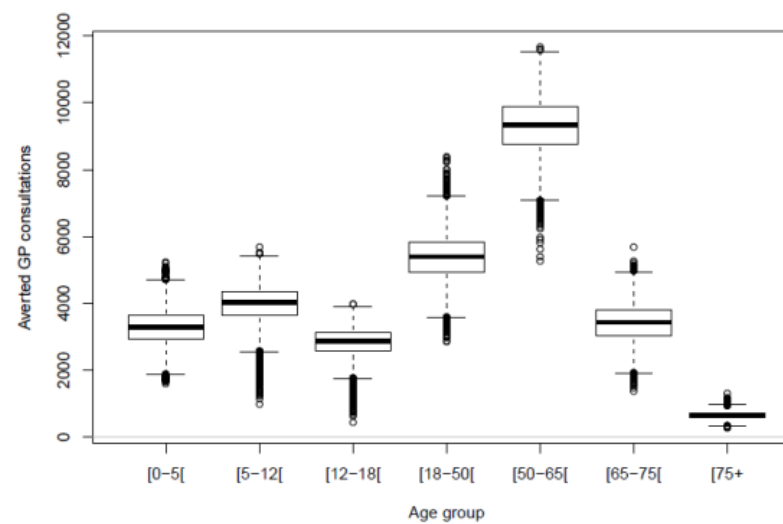
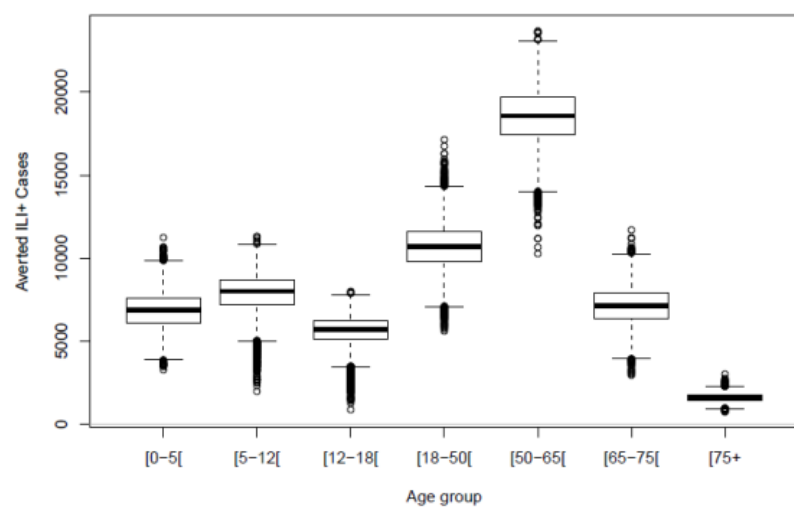


#### 4.4. Modified children options + modified adult vaccination targets (waning immunity fixed at 6 years)

##### 4.4.1. Effectiveness versus current situation

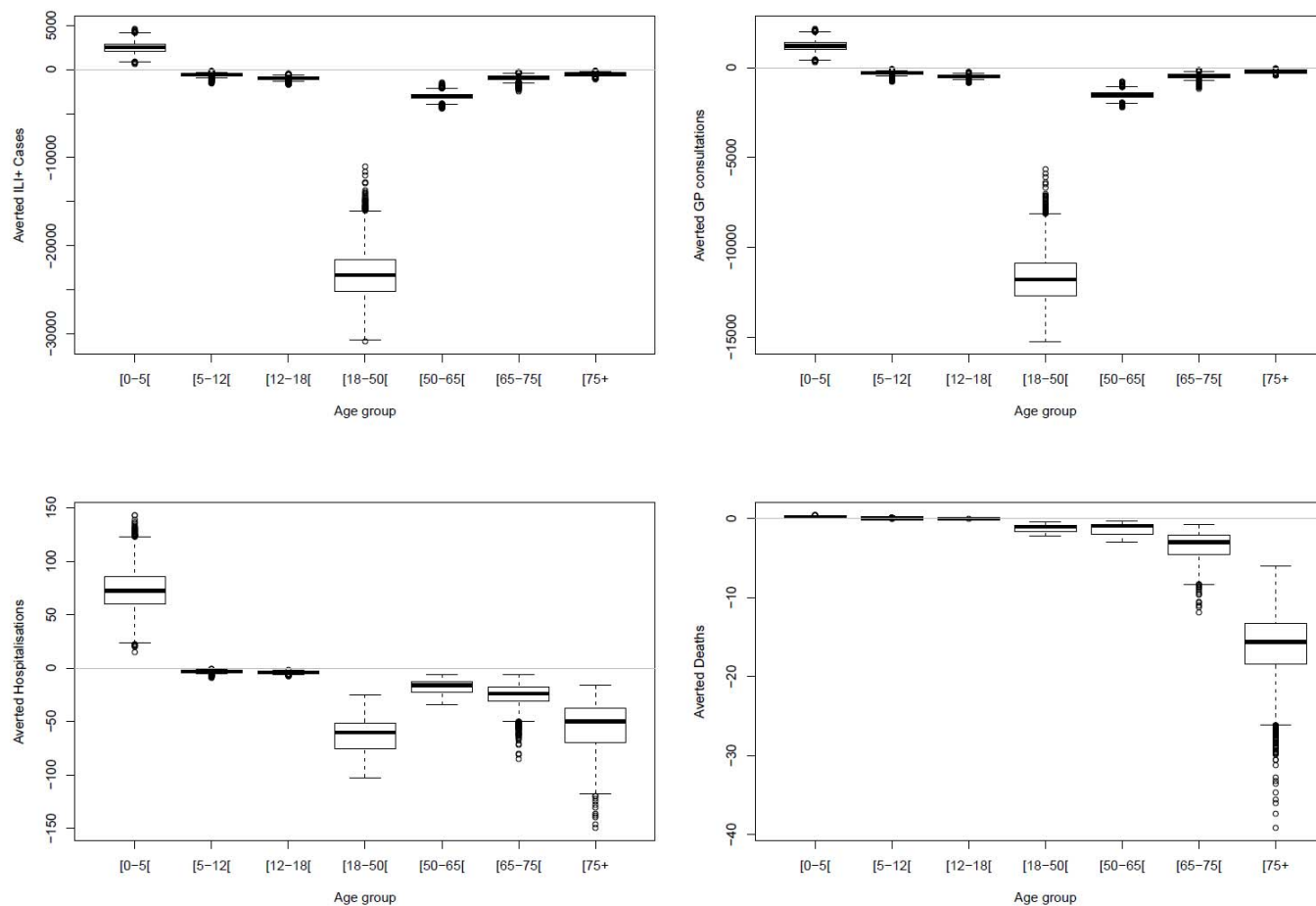
Figure 57 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 10% coverage for the child components of the option, and with immunity lasting an average of 6 years

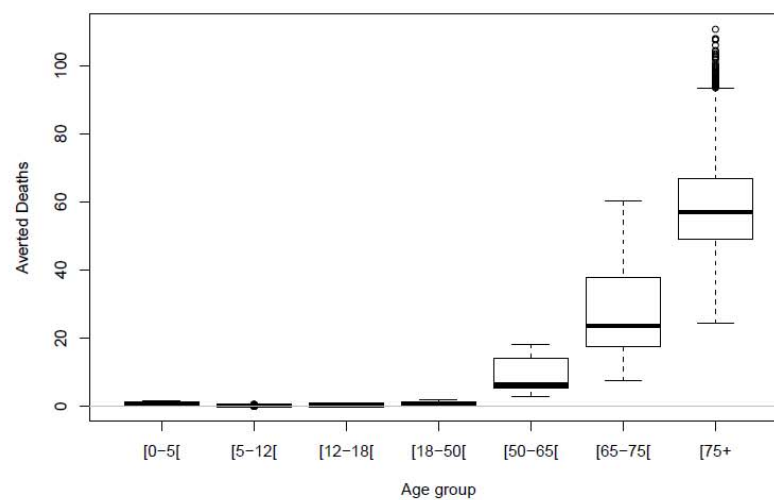
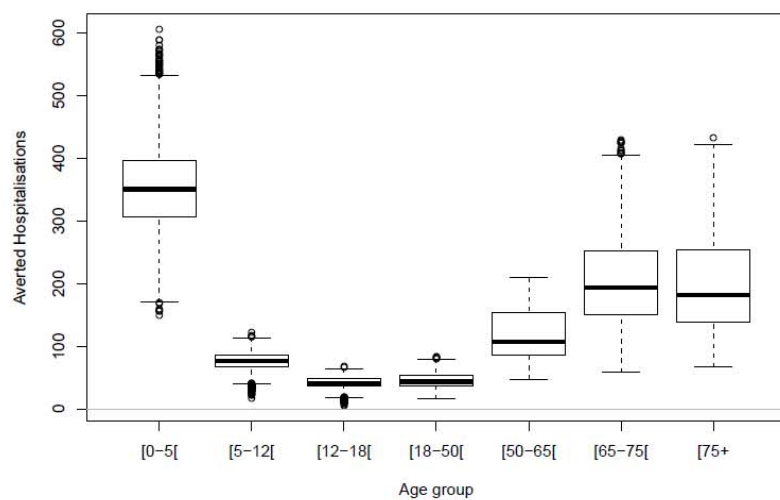
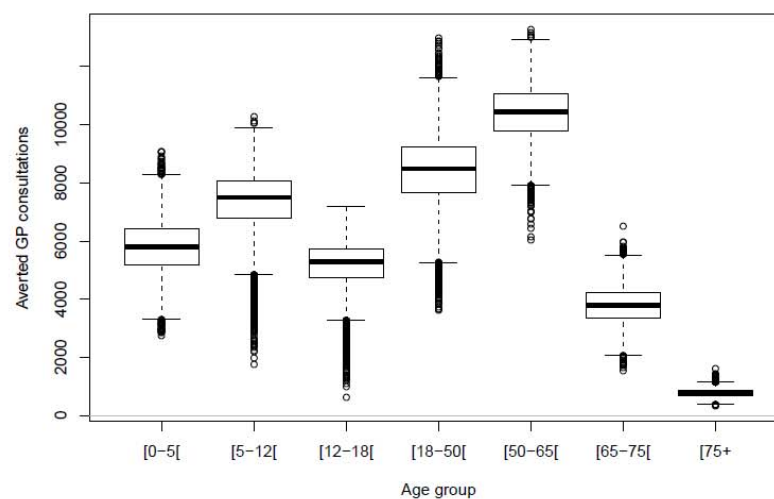
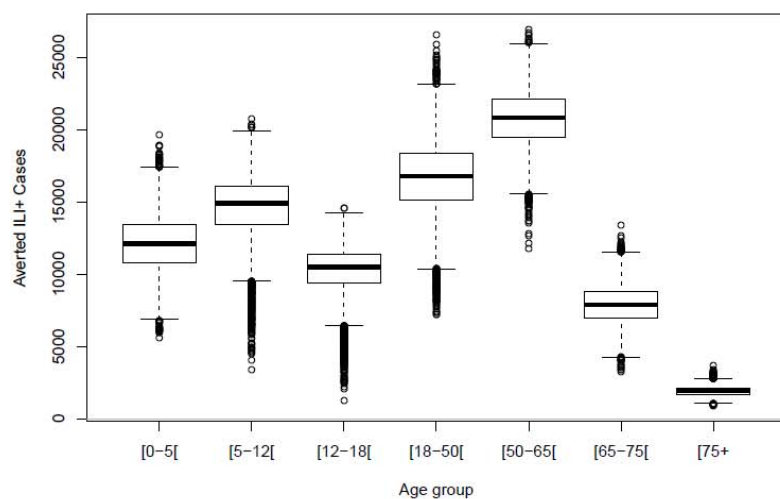






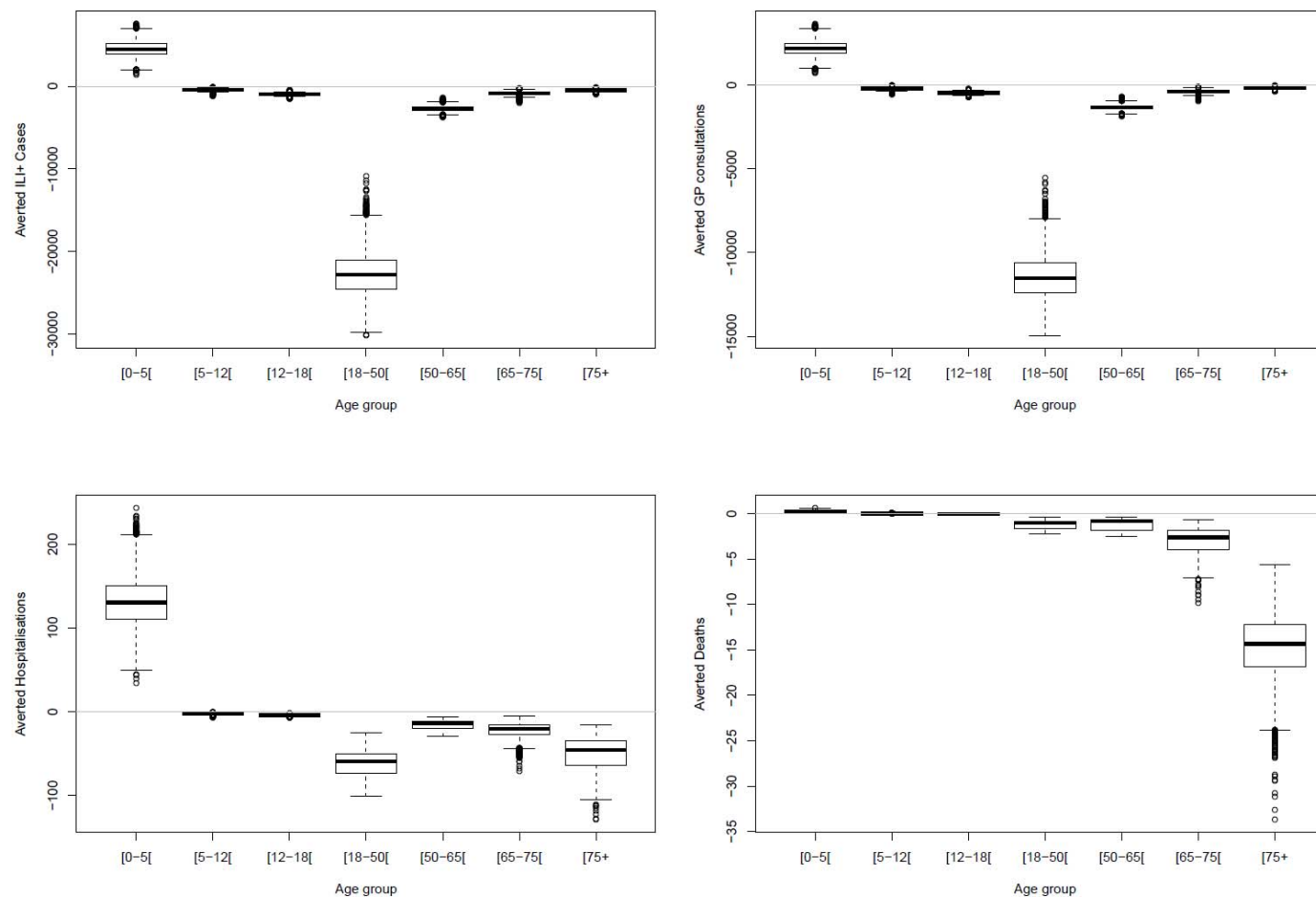
**Figure 58 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 20% coverage for the child components of the option, and with immunity lasting an average of 6 years**







**Figure 59 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 30% coverage for the child components of the option, and with immunity lasting an average of 6 years**



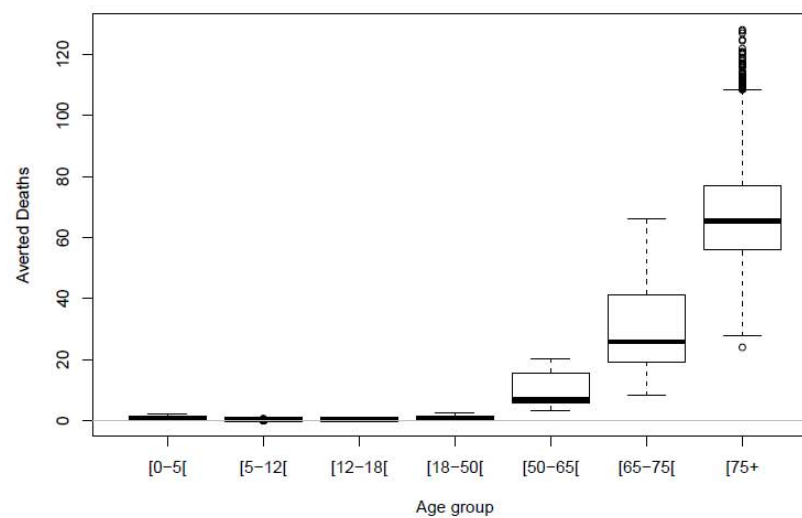
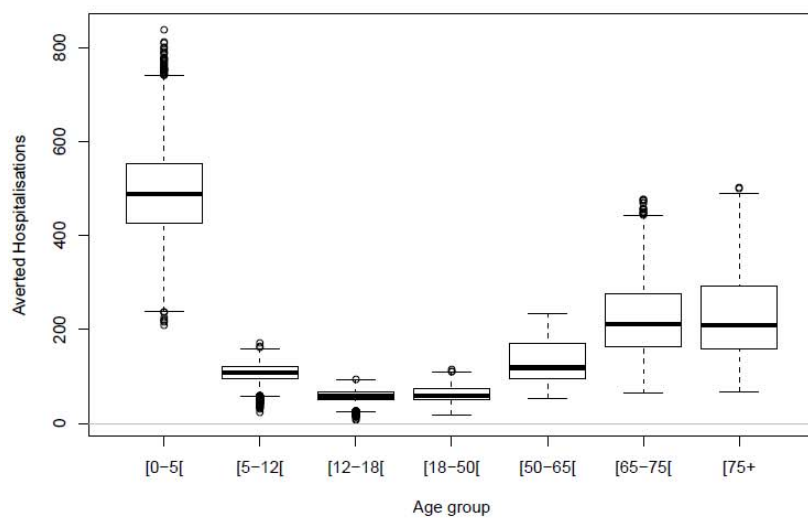
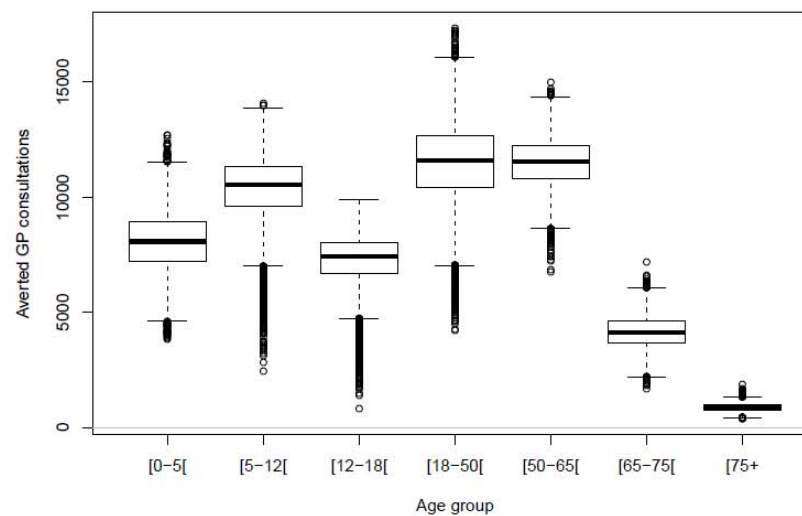
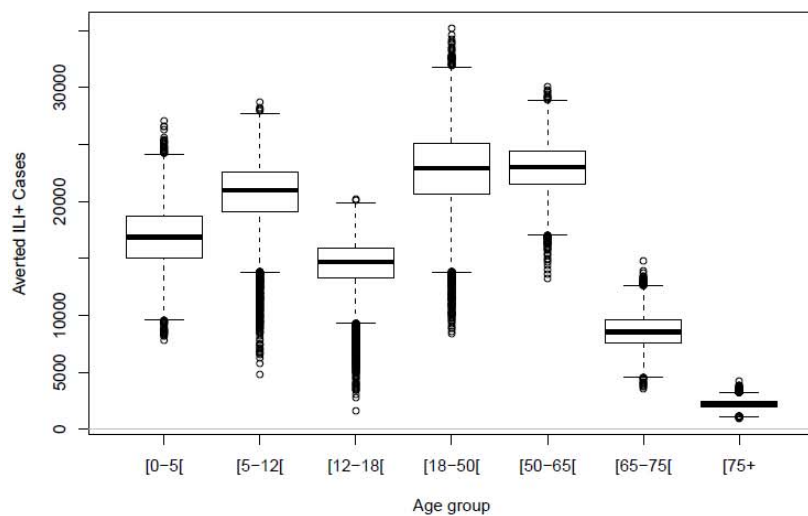
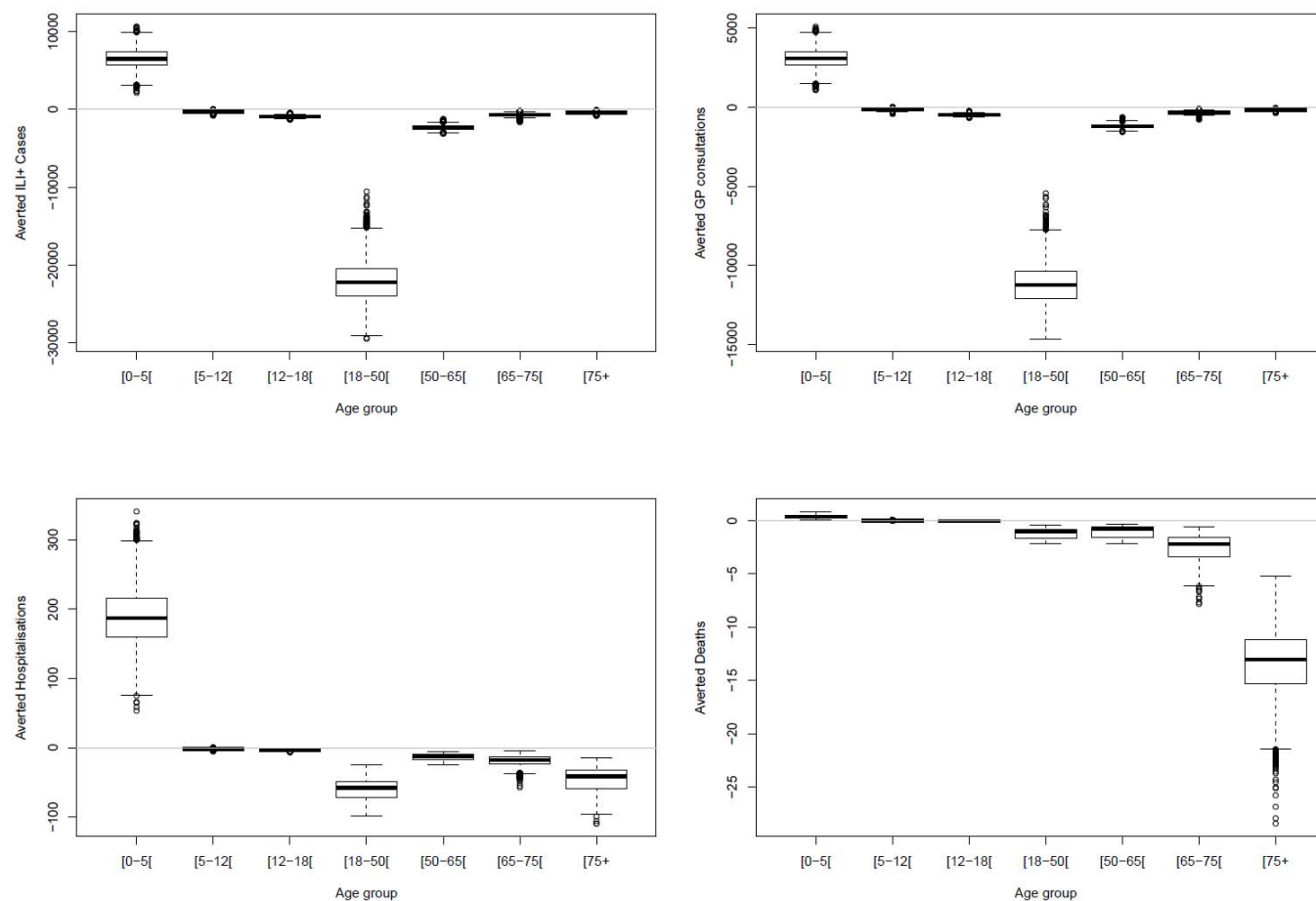




Figure 60 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 40% coverage for the child components of the option, and with immunity lasting an average of 6 years



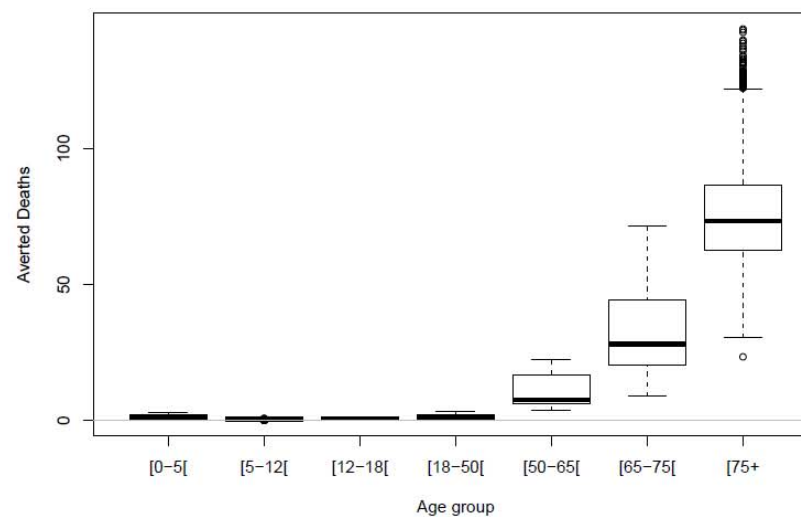
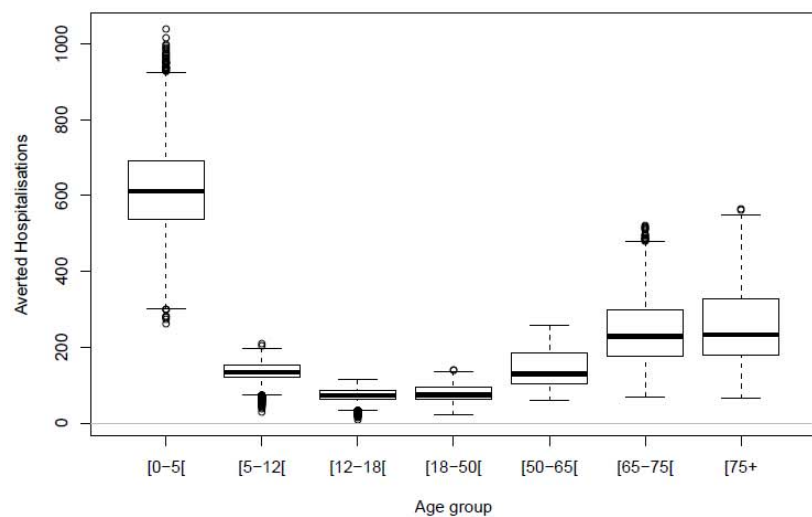
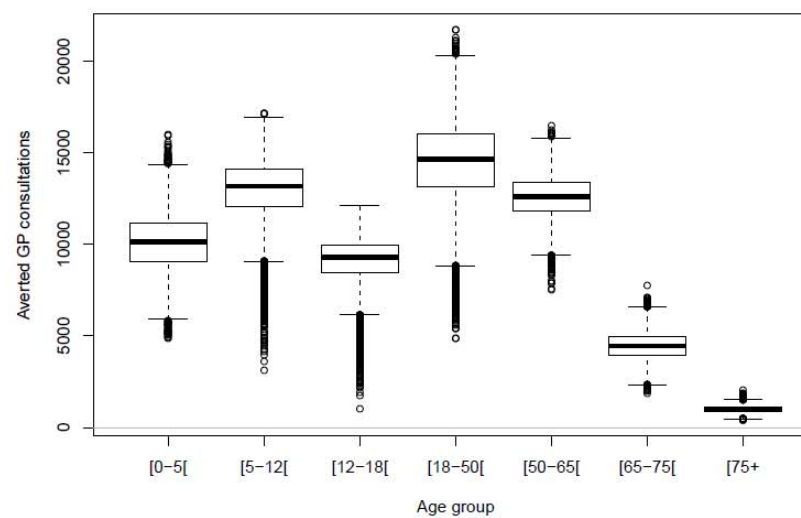
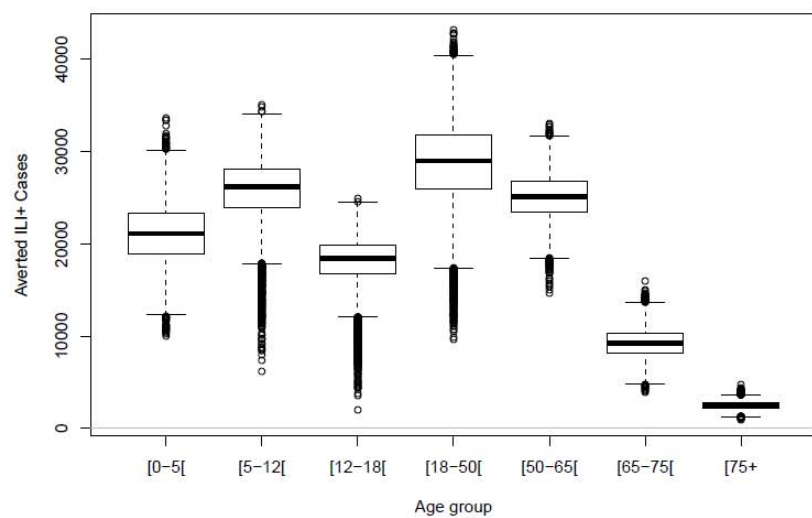
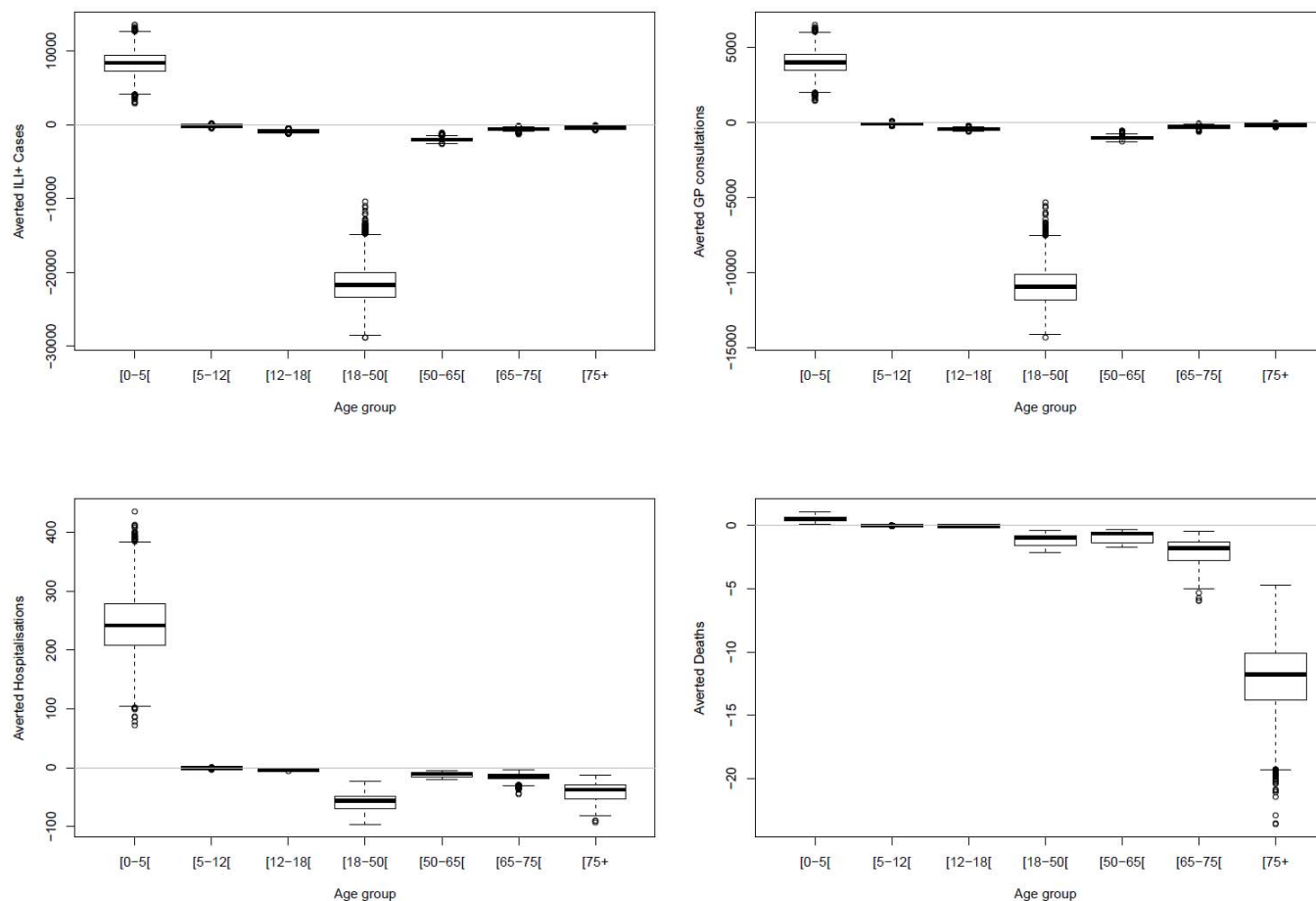




Figure 61 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c1) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 50% coverage for the child components of the option, and with immunity lasting an average of 6 years



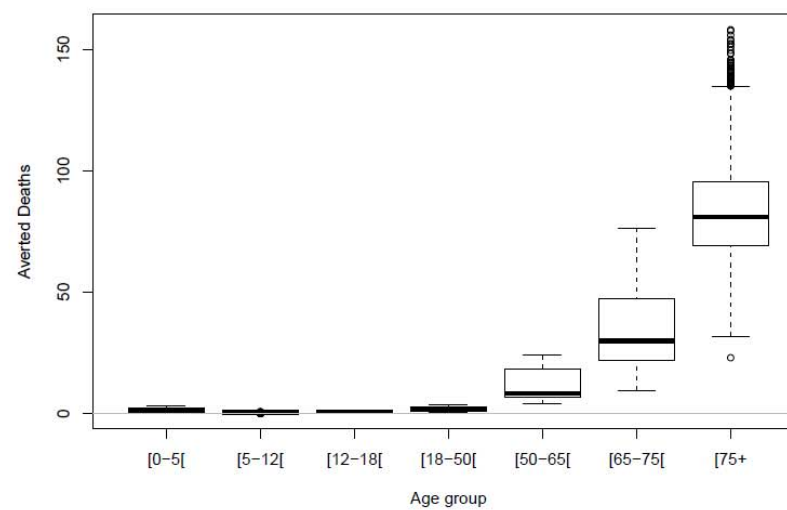
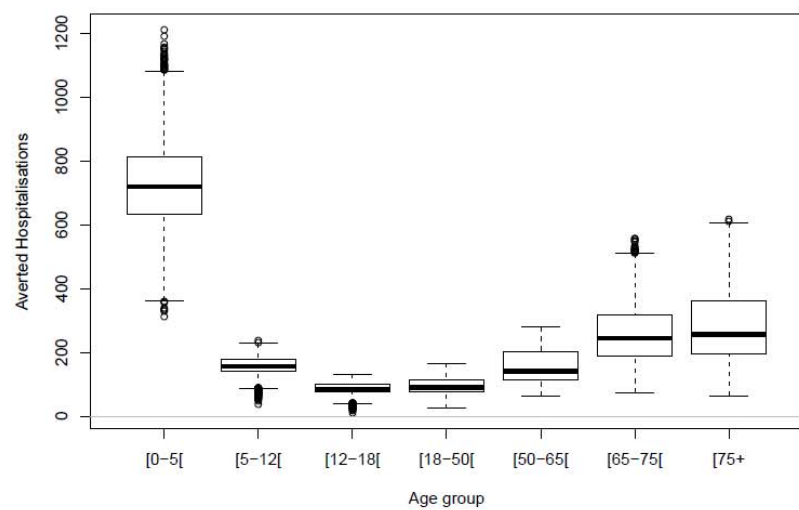
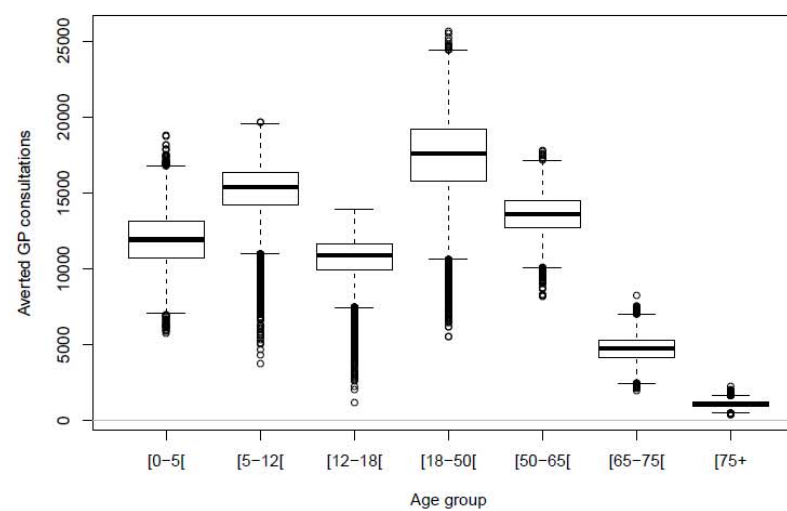
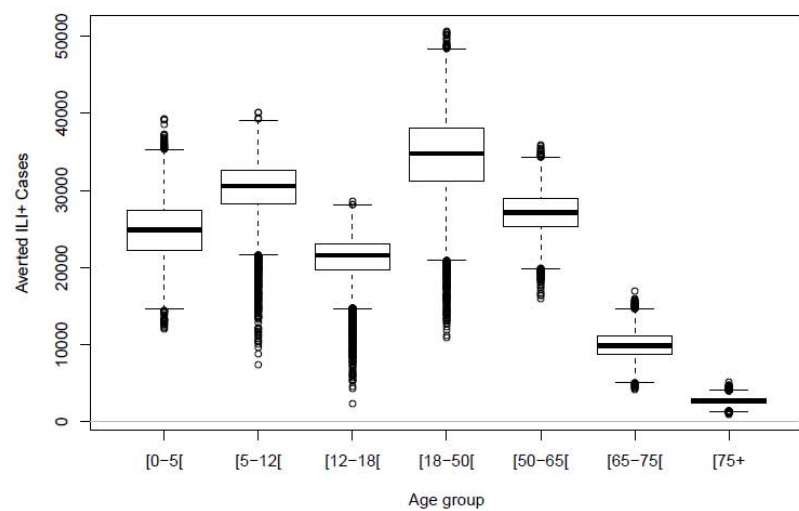
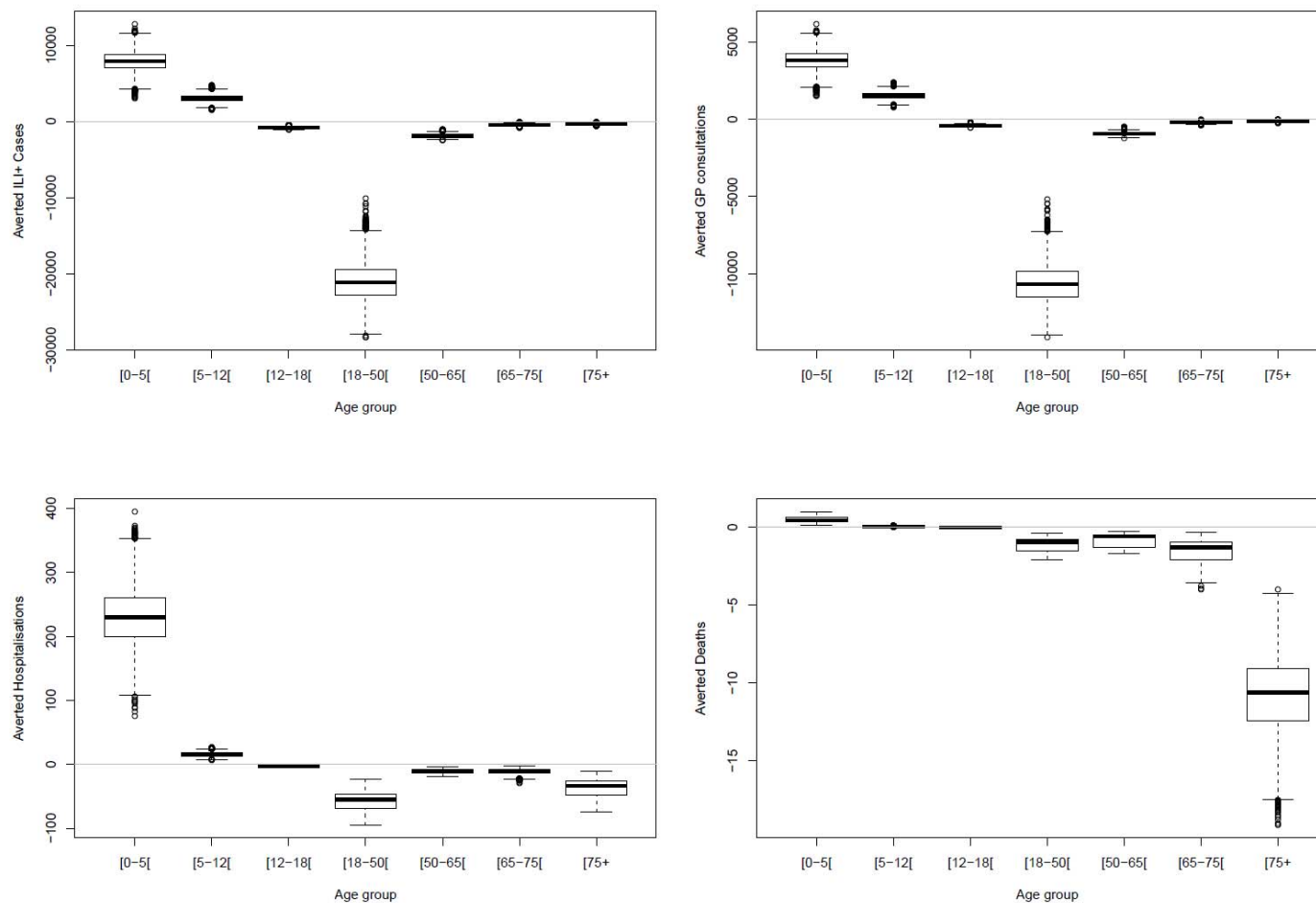




Figure 62 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c2) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 60% coverage for the child components of the option, and with immunity lasting an average of 6 years



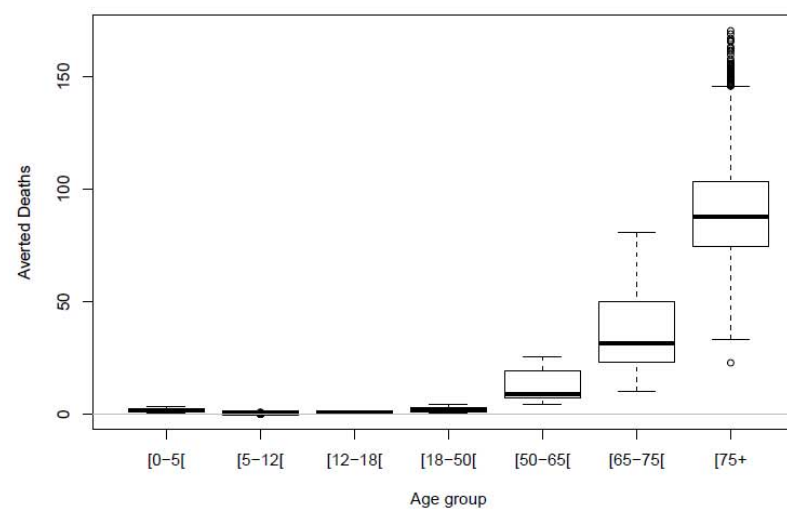
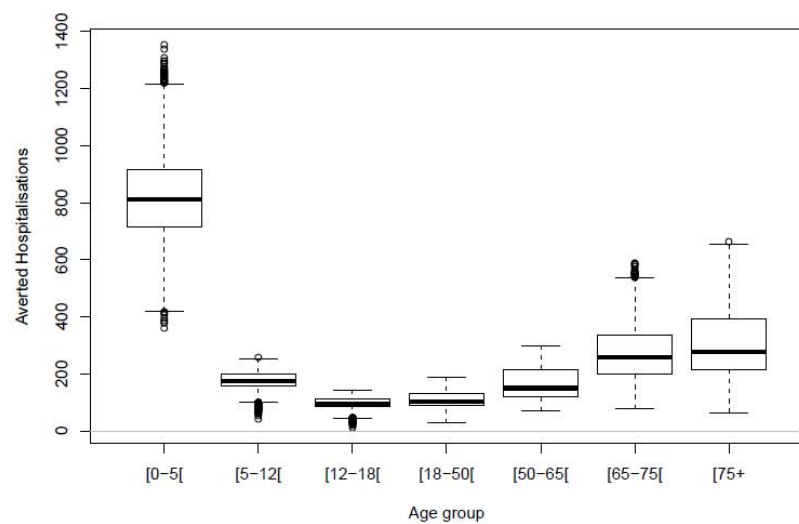
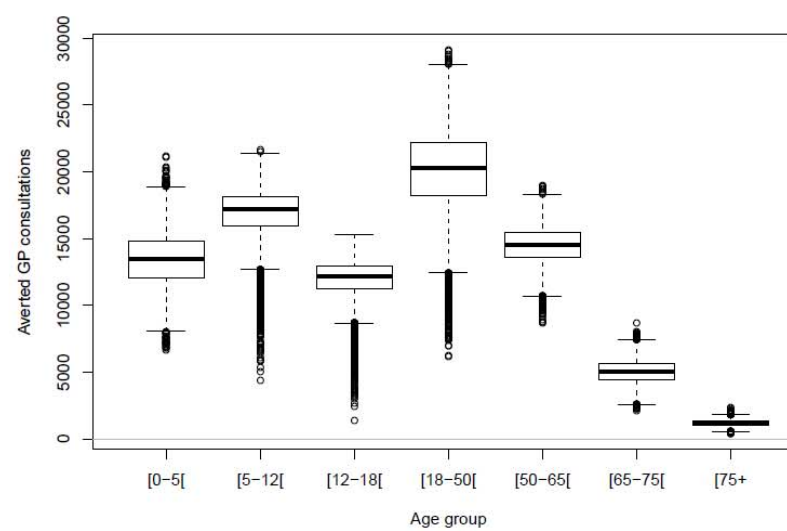
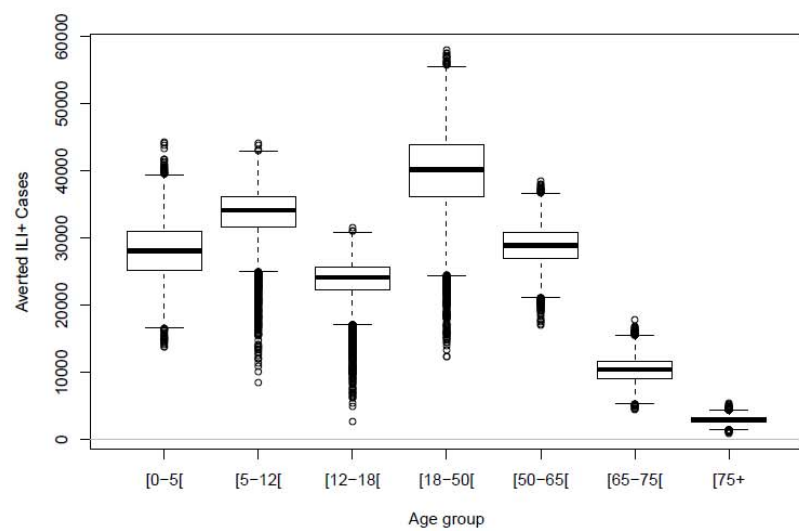
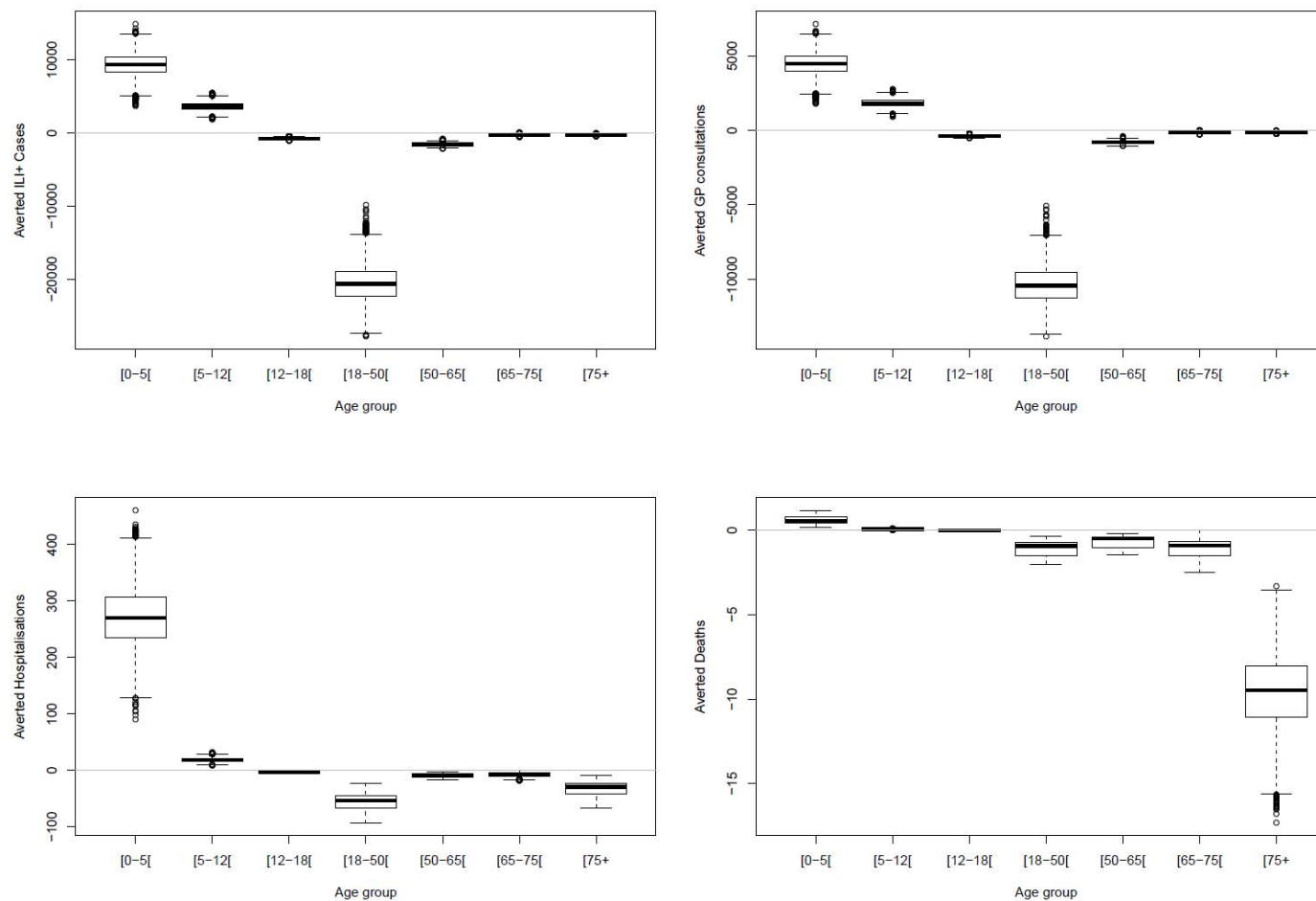




Figure 63 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c2) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 70% coverage for the child components of the option, and with immunity lasting an average of 6 years



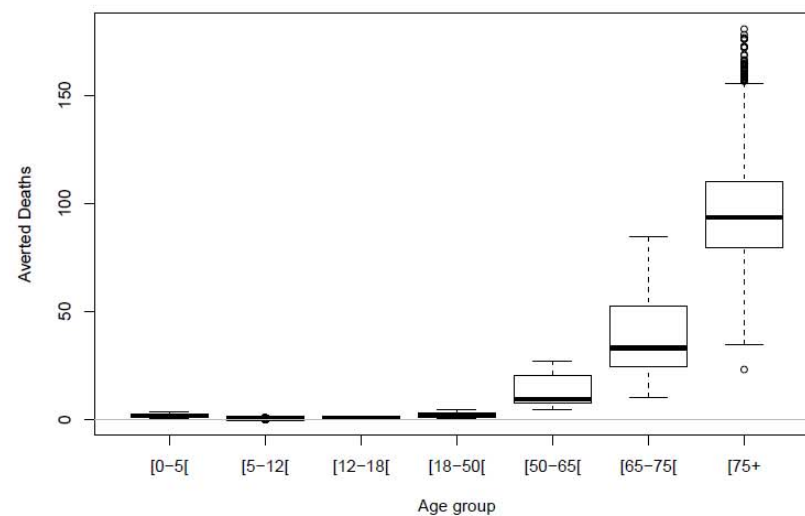
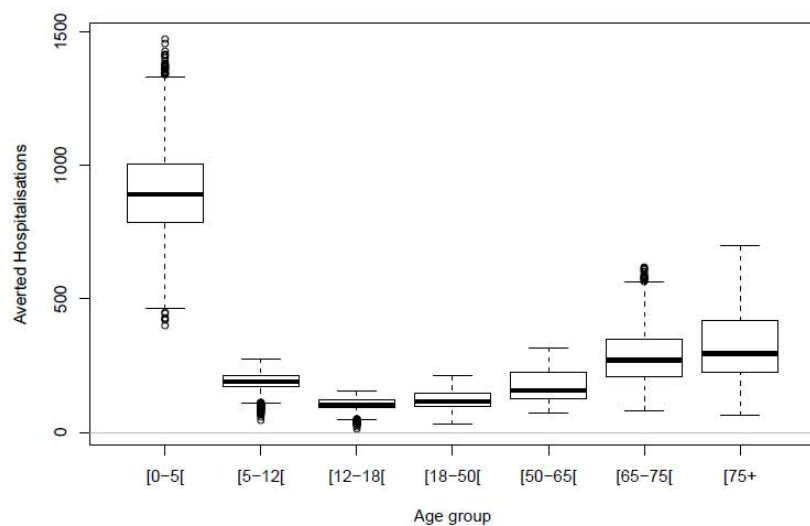
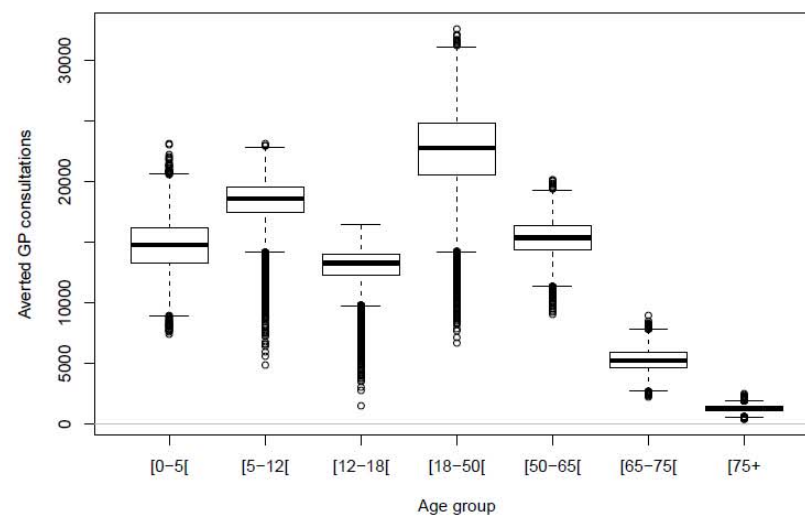
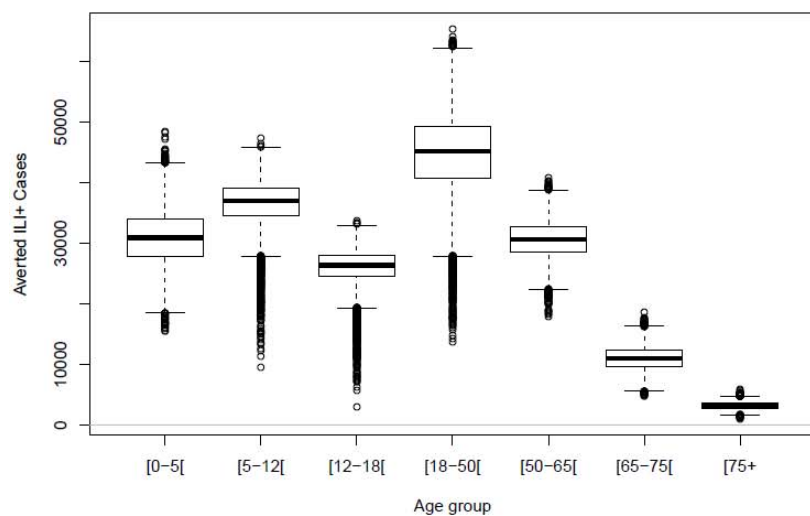
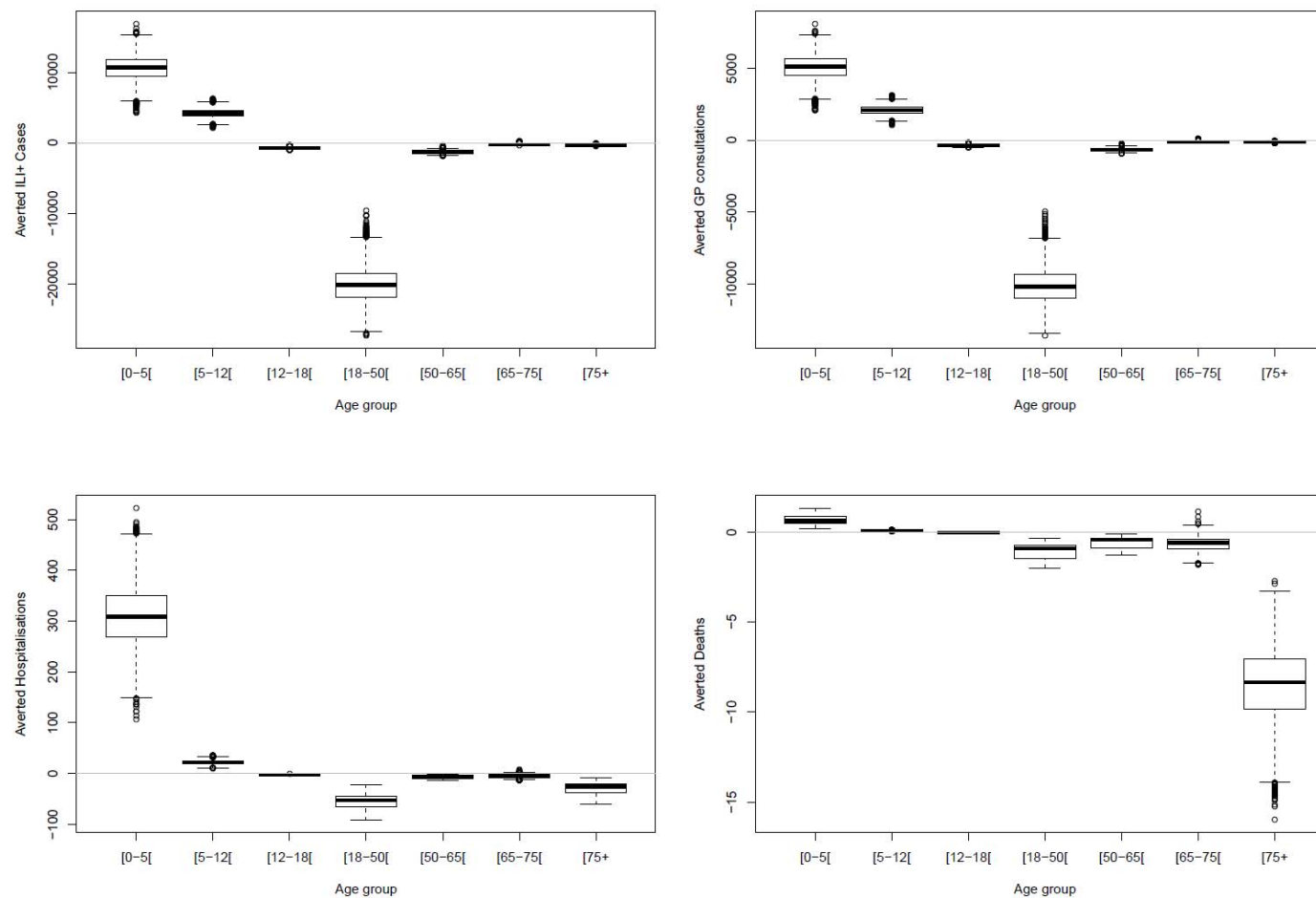




Figure 64 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c2) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 80% coverage for the child components of the option, and with immunity lasting an average of 6 years



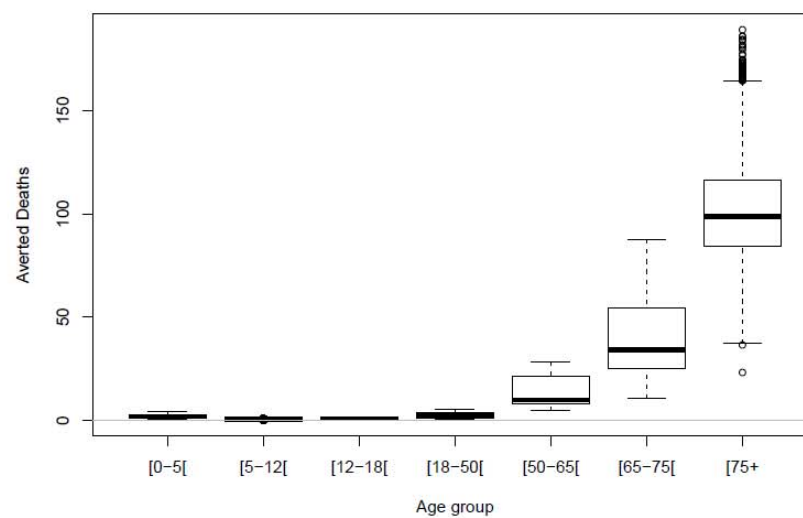
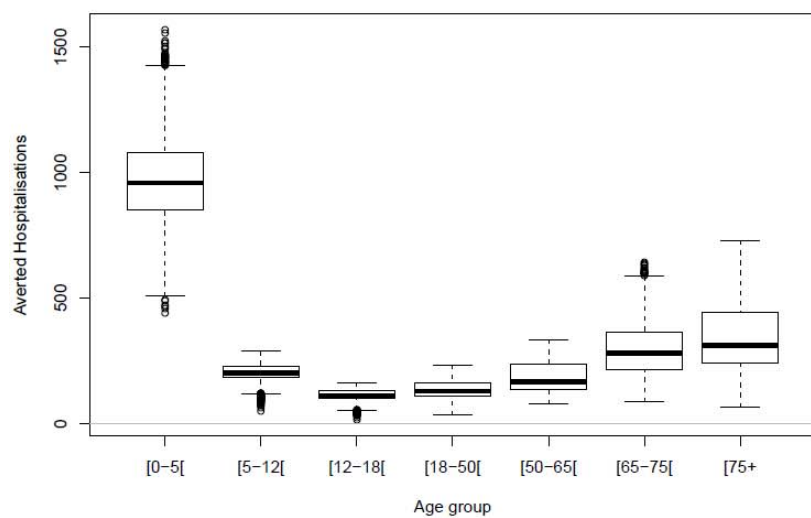
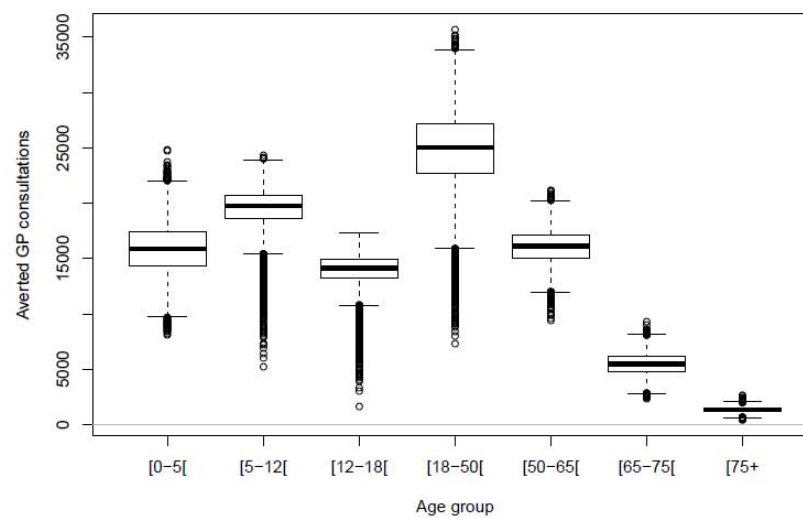
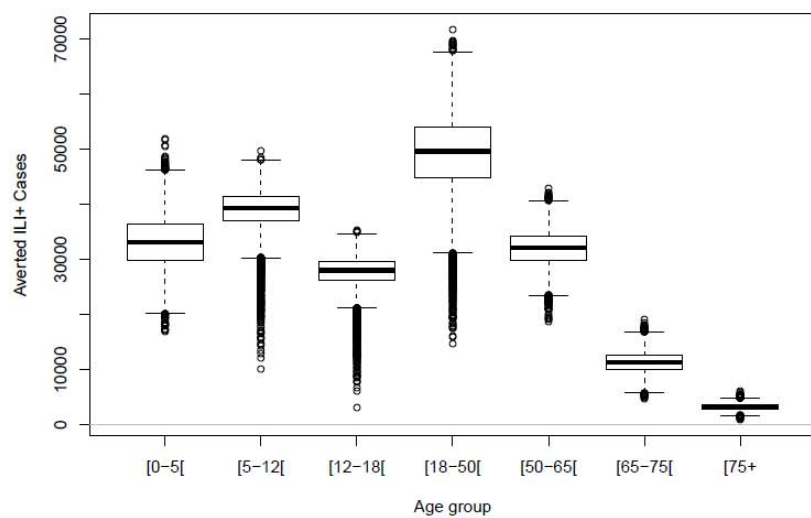
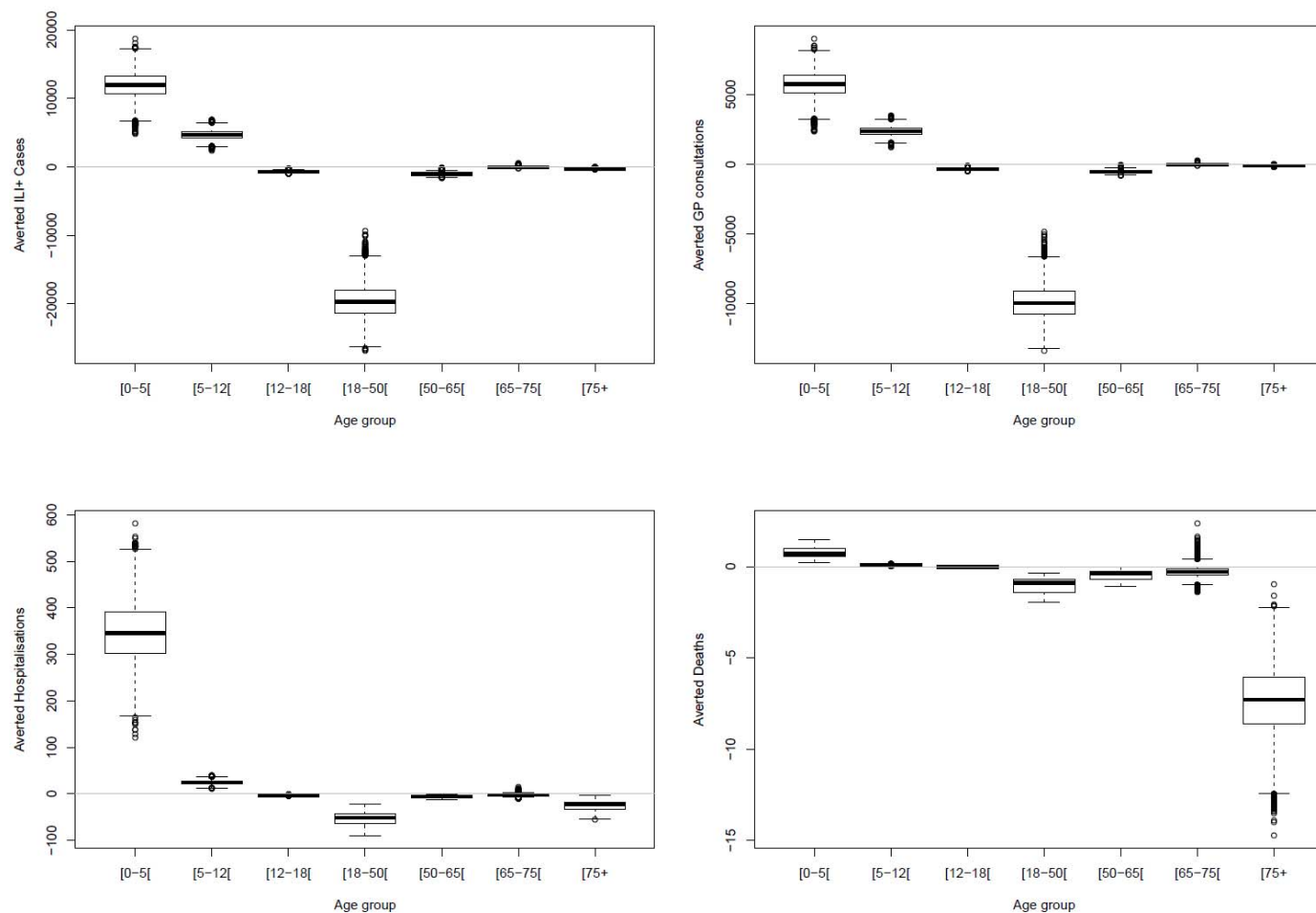
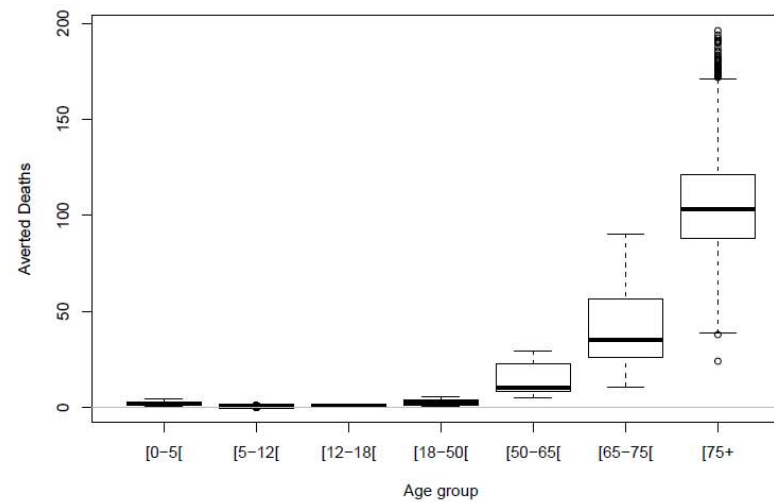
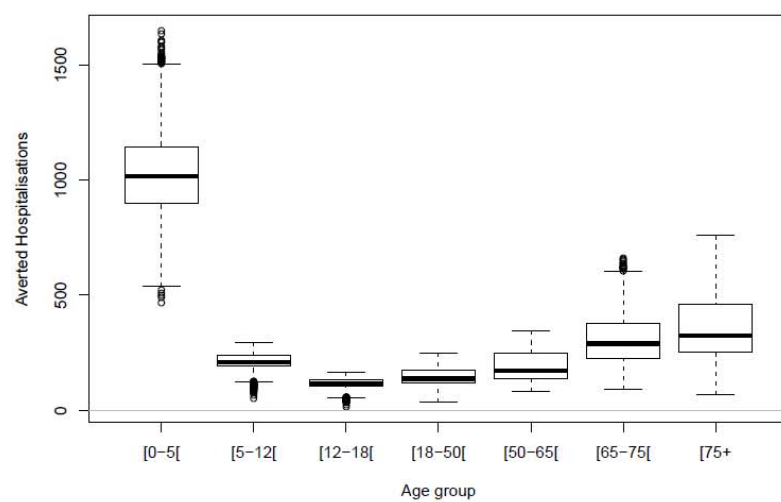
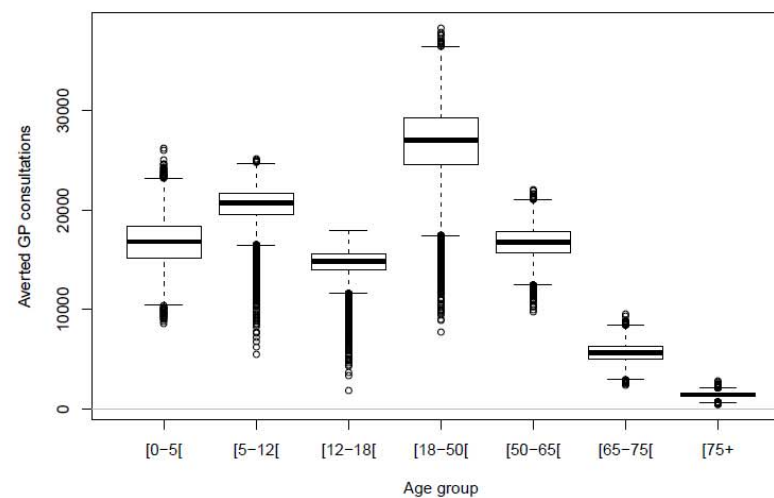
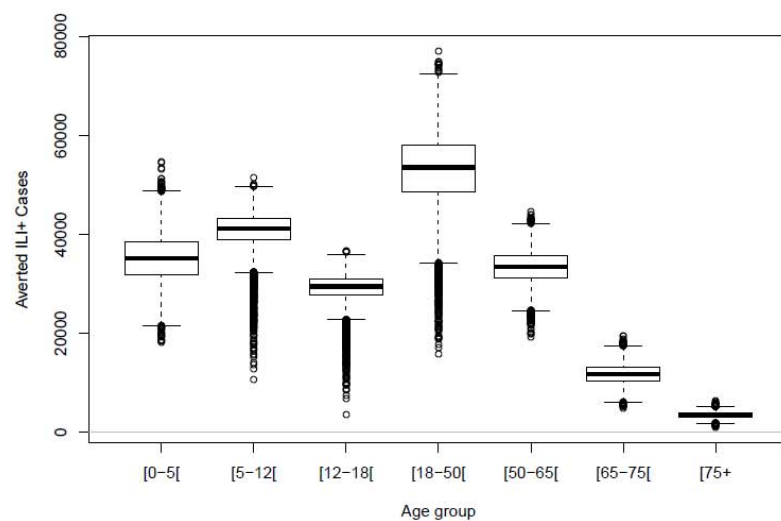




Figure 65 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; At12c2) and most (bottom; At11c16) effective option amongst 437 combined child-adult options at 90% coverage for the child components of the option, and with immunity lasting an average of 6 years







#### 4.4.2. Incremental cost-effectiveness analysis

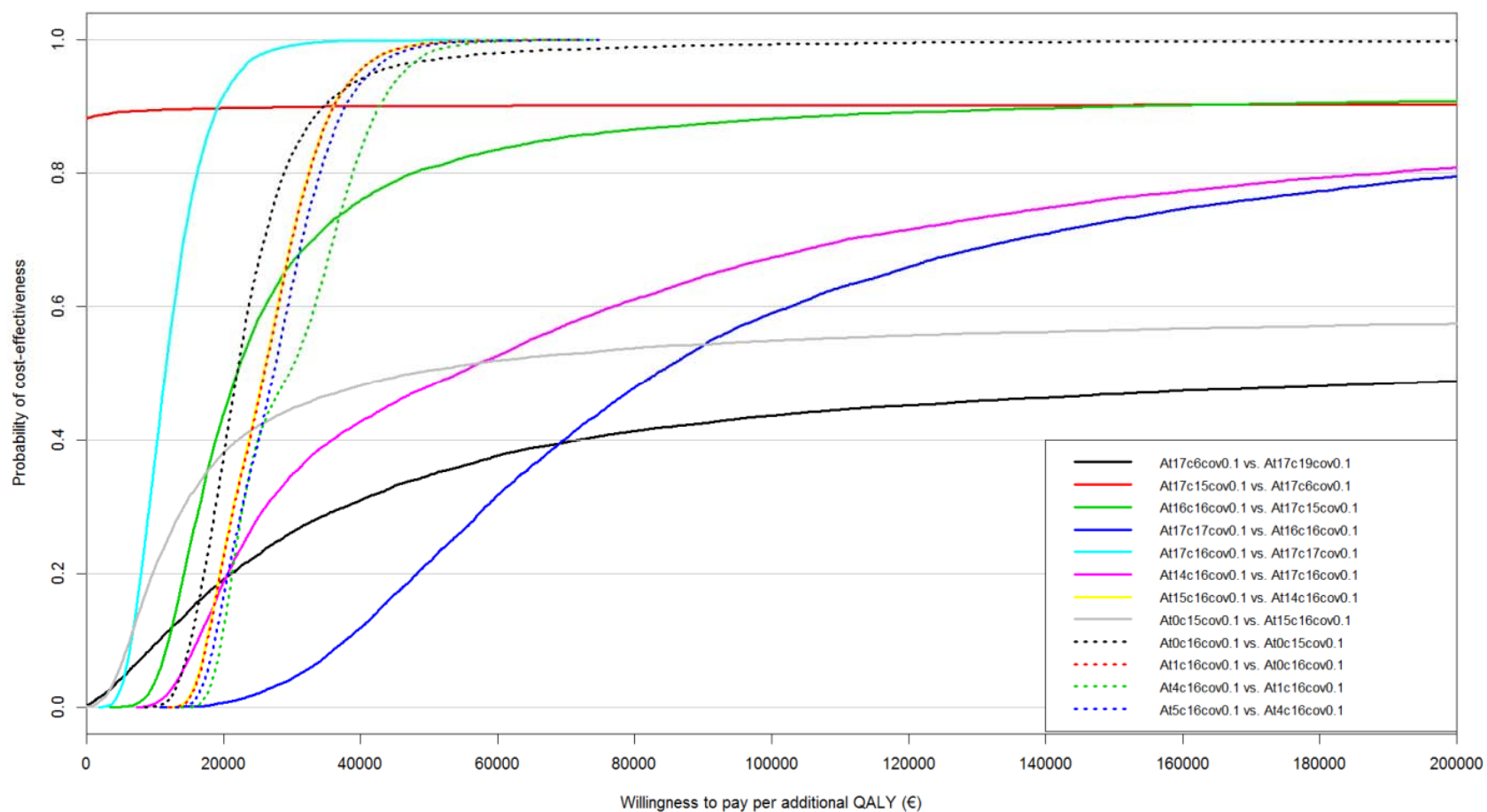
**Table 10 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 10% in children (<18y), and with immunity lasting an average of 6 years**

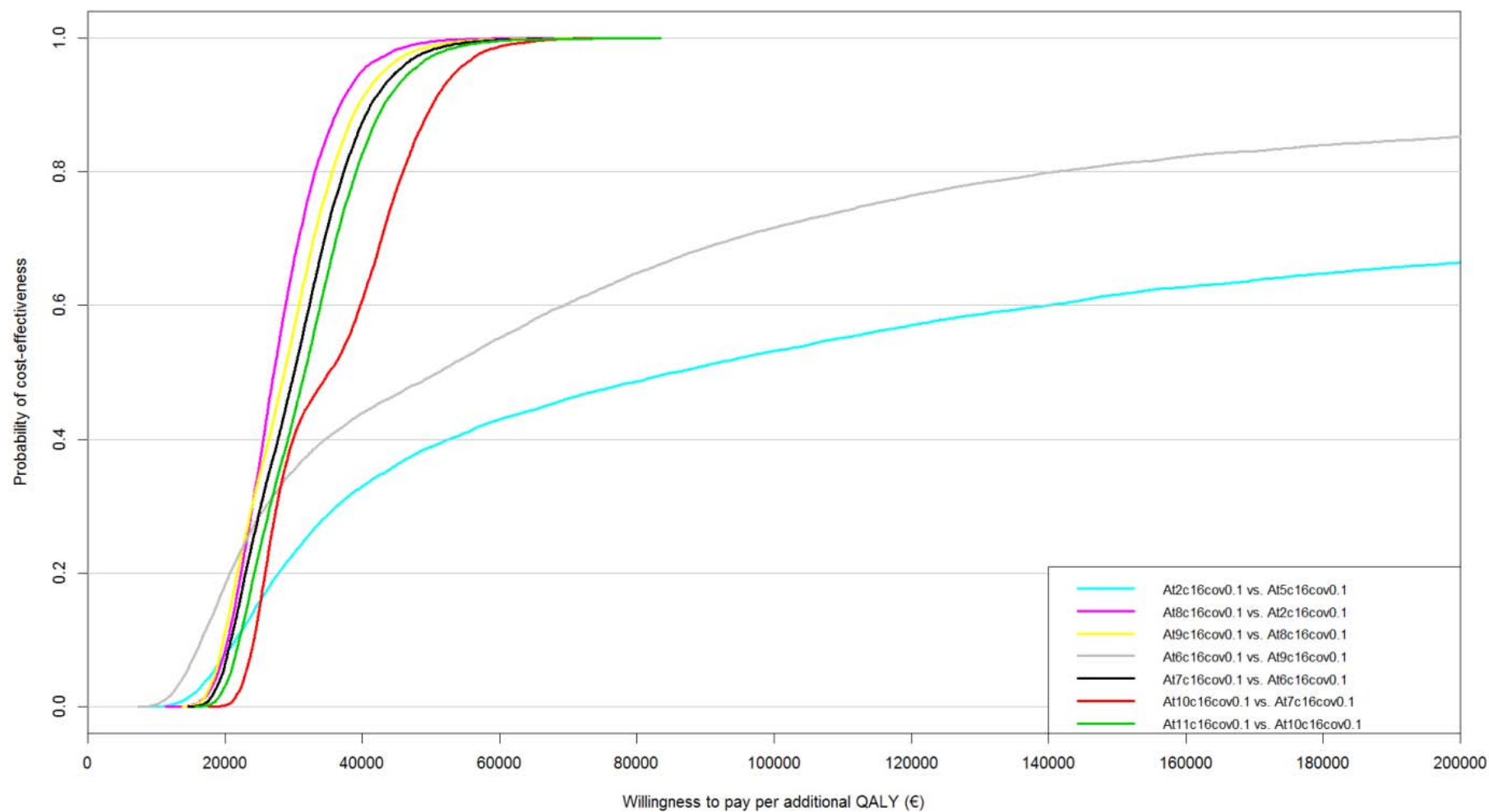
Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
At17c19cov0.1	-14 727 025	14	385	-32 591	-836 034	792 023	-37 138	-106 639	-21 195
At17c6cov0.1	-8 291 523	47	475	-28 533	-520 673	505 353	-16 908	-26 174	-12 273
At17c15cov0.1	-10 297 333	372	543	-23 354	-199 411	143 970	-18 278	-32 253	-12 732
At16c16cov0.1	-4 418 567	662	395	-6 444	-16 643	3 739	-9 478	-22 788	-1 298
At17c17cov0.1	2 771 588	737	651	3 130	-33 280	47 887	4 229	-1 295	30 493
At17c16cov0.1	7 147 254	1 103	818	6 188	-19 124	39 327	8 808	1 180	35 231
At14c16cov0.1	21 151 770	1 325	1 362	15 627	4 707	70 615	15 681	5 279	35 817
At15c16cov0.1	32 773 527	1 761	1 789	18 556	7 165	57 014	18 418	7 458	37 022
At0c15cov0.1	38 572 356	1 945	772	19 805	11 516	37 415	49 970	23 174	108 319
At0c16cov0.1	55 778 690	2 724	1 078	20 444	11 931	40 768	51 743	24 033	118 280
At1c16cov0.1	67 273 033	3 165	1 487	21 246	12 621	38 481	45 276	22 655	86 437
At4c16cov0.1	115 383 196	4 816	2 327	23 971	14 605	40 051	49 699	24 942	93 009
At5c16cov0.1	126 970 449	5 239	2 729	24 261	14 834	39 694	46 600	24 261	84 192
At2c16cov0.1	141 358 167	5 417	3 199	26 098	15 384	43 751	44 206	22 463	80 951
At8c16cov0.1	175 835 975	6 712	3 432	26 212	16 198	42 495	51 220	26 388	92 515
At9c16cov0.1	187 524 481	7 111	3 814	26 348	16 330	42 288	49 213	25 857	87 615
At6c16cov0.1	201 350 710	7 383	4 333	27 282	16 411	44 401	46 513	23 904	83 688
At7c16cov0.1	213 079 284	7 773	4 701	27 430	16 545	44 446	45 369	23 678	80 873
At10c16cov0.1	262 233 953	9 165	5 327	28 638	17 457	46 064	49 258	25 436	87 218
At11c16cov0.1	273 992 317	9 531	5 691	28 793	17 590	46 143	48 250	25 230	85 029

Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.



Figure 66 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 10% coverage level of the child components of the options, and with immunity lasting an average of 6 years







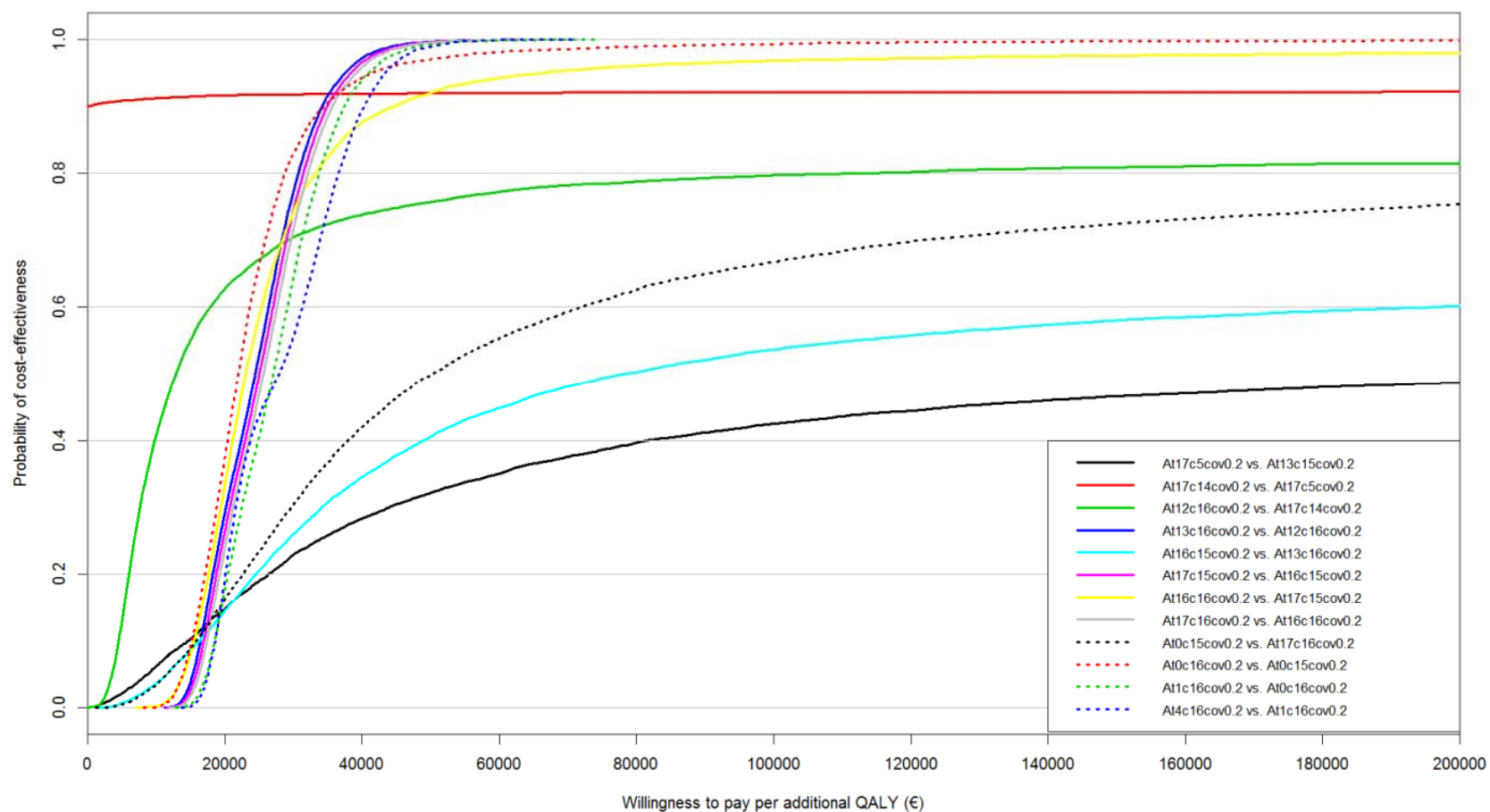
**Table 11 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 20% in children (<18y), and with immunity lasting an average of 6 years**

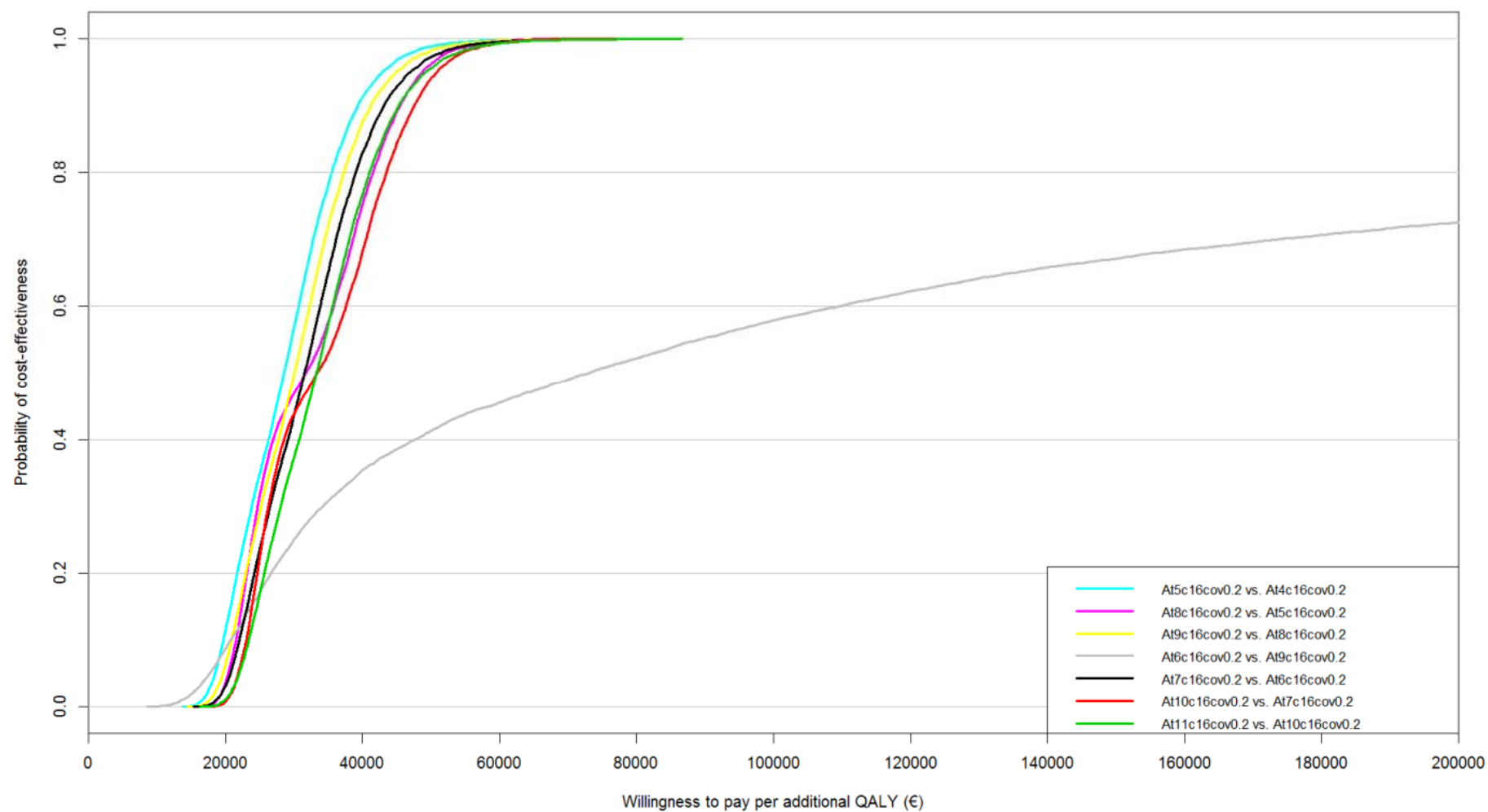
Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
<b>At13c15cov0.2</b>	-30 182 566	88	44	-59 049	-1 054 133	1 088 164	-139 498	-2 134 784	2 015 919
<b>At17c5cov0.2</b>	-13 030 644	125	542	-38 352	-919 526	826 763	-23 391	-36 108	-16 162
<b>At17c14cov0.2</b>	-14 713 883	344	601	-35 939	-353 253	238 261	-23 853	-37 773	-16 274
<b>At12c16cov0.2</b>	-6 424 026	1 069	177	-5 910	-13 616	813	-22 418	-188 322	145 380
<b>At13c16cov0.2</b>	5 004 394	1 525	593	2 746	-31 133	38 893	6 715	-88 235	99 623
<b>At16c15cov0.2</b>	18 474 898	1 630	768	11 158	4 048	49 946	23 510	7 062	94 987
<b>At17c15cov0.2</b>	29 983 134	2 073	1 199	14 500	6 711	44 614	25 119	10 103	61 598
<b>At16c16cov0.2</b>	53 444 396	3 105	1 345	17 154	8 715	55 200	39 366	15 728	130 515
<b>At17c16cov0.2</b>	65 025 455	3 536	1 758	18 419	9 798	49 997	37 002	16 458	90 794
<b>At0c15cov0.2</b>	78 107 170	3 801	1 512	20 531	12 080	38 171	51 678	24 245	110 083
<b>At0c16cov0.2</b>	112 643 312	5 367	2 135	20 966	12 369	41 236	52 748	24 681	118 786
<b>At1c16cov0.2</b>	124 229 415	5 788	2 529	21 413	12 779	39 915	49 217	24 056	99 038
<b>At4c16cov0.2</b>	171 922 351	7 530	3 412	22 863	13 848	39 363	50 605	24 908	97 725
<b>At5c16cov0.2</b>	183 529 951	7 938	3 805	23 169	14 081	39 188	48 542	24 556	90 702
<b>At8c16cov0.2</b>	232 080 274	9 468	4 573	24 516	15 023	40 831	50 939	25 837	94 441
<b>At9c16cov0.2</b>	243 841 782	9 859	4 943	24 751	15 213	40 674	49 451	25 581	89 881
<b>At6c16cov0.2</b>	258 004 998	10 072	5 415	25 607	15 496	42 353	47 695	24 471	86 670
<b>At7c16cov0.2</b>	269 881 433	10 449	5 771	25 813	15 676	42 454	46 786	24 376	84 093
<b>At10c16cov0.2</b>	318 672 085	11 917	6 442	26 745	16 394	43 583	49 515	25 612	88 570
<b>At11c16cov0.2</b>	330 564 047	12 269	6 776	26 949	16 539	43 685	48 729	25 522	86 775

*Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.*



Figure 67 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 20% coverage level of the child components of the options, and with immunity lasting an average of 6 years







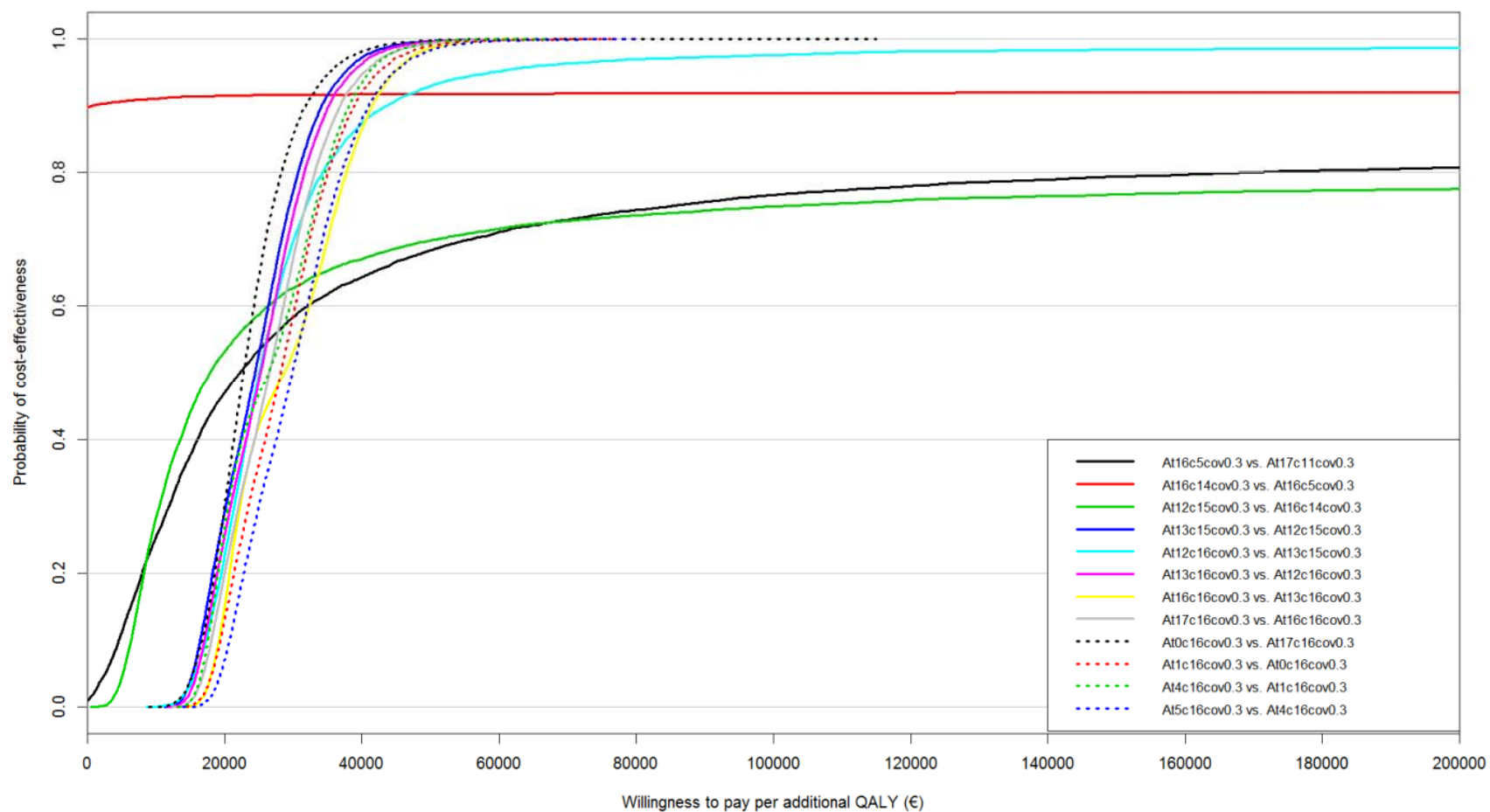
**Table 12 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 30% in children (<18y), and with immunity lasting an average of 6 years**

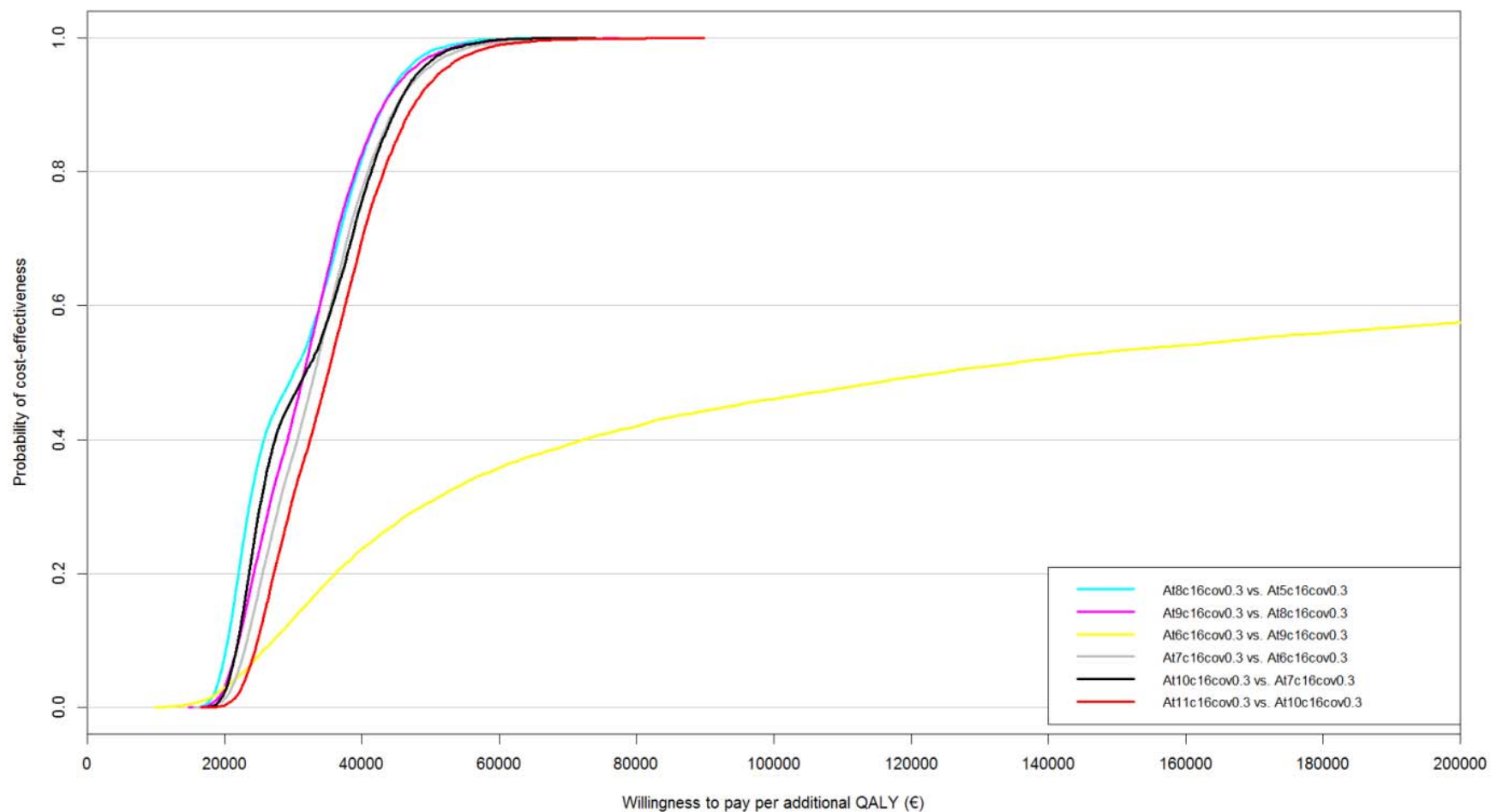
Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
At17c11cov0.3	-10 525 738	176	489	-30 327	-553 357	404 992	-20 418	-37 493	-13 692
At16c5cov0.3	-5 756 931	379	403	-13 624	-52 704	-9 245	-11 475	-19 887	-8 085
At16c14cov0.3	-8 111 633	710	494	-11 013	-28 361	-7 918	-14 221	-24 672	-9 632
At12c15cov0.3	-541 247	1 193	232	-868	-24 480	25 335	-6 557	-67 887	61 236
At13c15cov0.3	10 870 956	1 650	646	6 176	-28 656	46 087	15 435	-78 072	124 079
At12c16cov0.3	52 415 746	3 301	1 044	15 480	6 639	67 676	46 719	-153 741	307 487
At13c16cov0.3	63 863 419	3 737	1 452	16 800	8 317	62 041	42 987	14 996	176 831
At16c16cov0.3	111 942 757	5 396	2 254	20 741	11 745	52 387	49 703	22 016	134 608
At17c16cov0.3	123 583 207	5 824	2 653	21 251	12 184	48 485	46 691	21 837	107 083
At0c16cov0.3	170 305 033	7 847	3 143	21 665	12 979	41 946	54 288	25 733	119 863
At1c16cov0.3	181 978 342	8 261	3 516	21 969	13 245	41 013	51 791	25 298	105 814
At4c16cov0.3	229 306 533	10 089	4 438	22 752	13 776	39 964	51 907	25 384	101 445
At5c16cov0.3	240 960 164	10 475	4 810	23 012	14 017	39 733	50 297	25 167	95 344
At8c16cov0.3	289 195 321	12 091	5 629	23 925	14 688	40 262	51 474	25 893	97 238
At9c16cov0.3	300 991 120	12 462	5 980	24 148	14 882	40 172	50 437	25 759	93 161
At6c16cov0.3	315 461 608	12 582	6 411	25 091	15 278	41 864	49 221	25 225	90 502
At7c16cov0.3	327 335 659	12 934	6 751	25 322	15 441	42 020	48 584	25 196	87 767
At10c16cov0.3	375 912 286	14 468	7 490	25 940	15 956	42 683	50 422	26 037	90 603
At11c16cov0.3	387 910 073	14 816	7 806	26 136	16 142	42 808	49 768	26 018	88 702

*Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.*



Figure 68 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 30% coverage level of the child components of the options, and with immunity lasting an average of 6 years







**Table 13 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 40% in children (<18y), and with immunity lasting an average of 6 years**

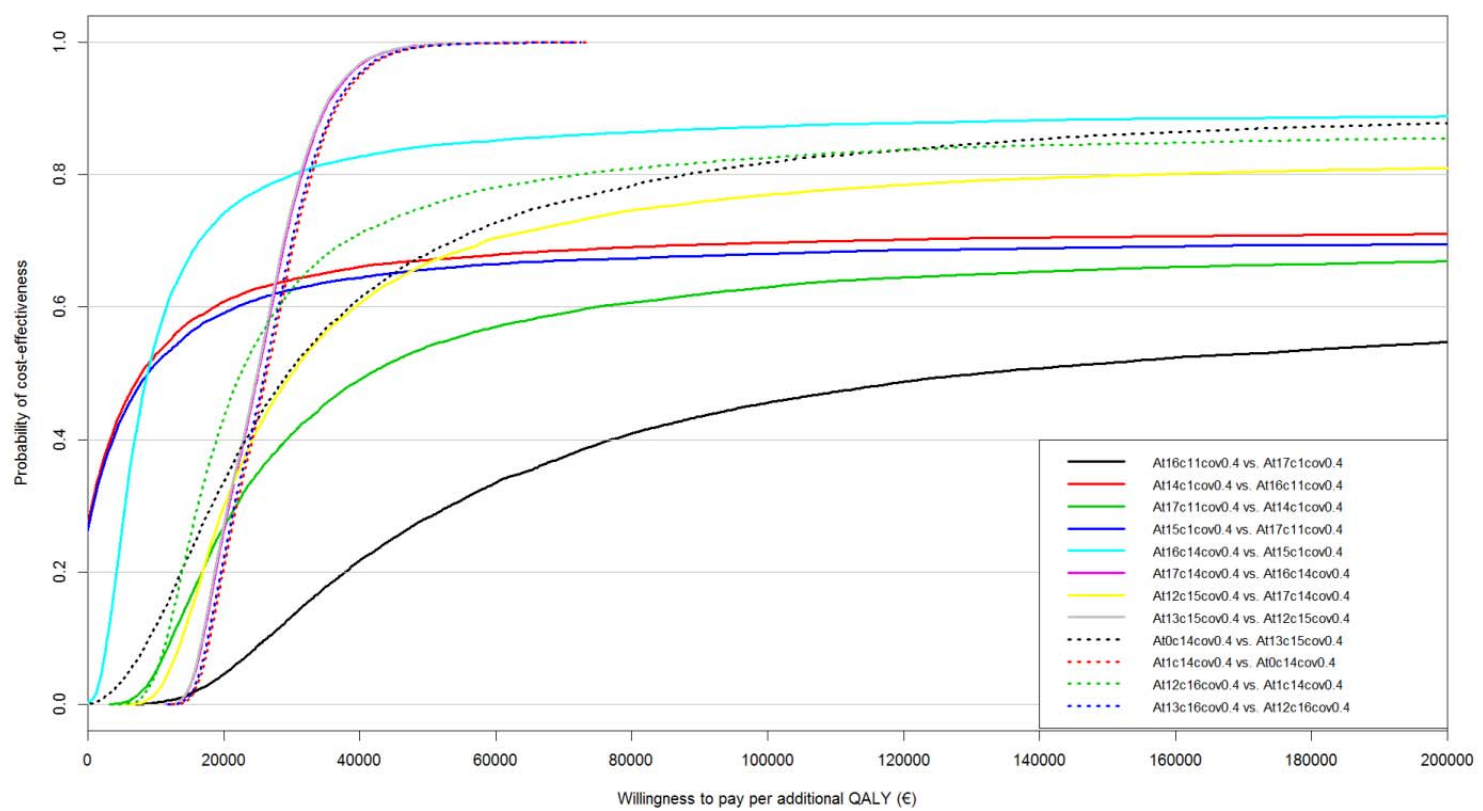
Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
At17c1cov0.4	-20 178 884	105	547	-54 880	-1 331 327	1 455 202	-36 427	-58 904	-23 390
At16c11cov0.4	-8 528 992	200	252	-23 010	-352 995	335 959	-28 411	-154 481	55 986
At14c1cov0.4	-6 407 233	387	1 099	-11 278	-168 823	161 510	-5 639	-6 986	-4 159
At17c11cov0.4	2 907 100	643	676	4 151	-1 561	39 724	4 312	-1 128	16 942
At15c1cov0.4	5 168 071	828	1 535	5 853	-1 710	71 551	3 437	-1 061	10 555
At16c14cov0.4	10 254 613	1 472	823	6 964	1 414	24 171	12 164	2 081	38 421
At17c14cov0.4	21 693 879	1 922	1 268	11 346	4 439	26 654	17 174	6 029	37 277
At12c15cov0.4	41 077 436	2 619	782	15 333	6 663	63 210	48 857	-162 806	302 431
At13c15cov0.4	52 500 064	3 062	1 195	16 969	8 554	59 042	43 267	16 503	164 398
At0c14cov0.4	69 980 949	3 653	1 588	19 170	11 084	32 558	44 385	21 093	87 390
At1c14cov0.4	81 495 882	4 092	1 996	19 898	11 699	33 067	41 027	20 570	76 212
At12c16cov0.4	112 007 468	5 365	1 863	20 687	11 498	66 414	58 895	21 656	229 633
At13c16cov0.4	123 544 867	5 797	2 262	21 227	12 072	60 691	54 167	24 003	175 897
At0c15cov0.4	159 265 520	7 119	2 845	22 368	13 617	40 006	56 192	27 140	114 633
At0c16cov0.4	228 884 672	10 155	4 072	22 496	13 679	42 693	56 264	27 051	121 459
At1c16cov0.4	240 659 546	10 556	4 438	22 784	13 892	42 153	54 322	26 685	110 543
At4c16cov0.4	287 627 185	12 449	5 397	23 109	14 120	40 738	53 405	26 222	104 821
At5c16cov0.4	299 341 274	12 833	5 753	23 344	14 324	40 567	52 236	26 107	99 606
At8c16cov0.4	347 228 197	14 504	6 617	23 956	14 767	40 548	52 667	26 478	99 659
At9c16cov0.4	359 092 524	14 866	6 956	24 180	14 950	40 471	51 728	26 369	96 265
At6c16cov0.4	373 952 781	14 890	7 330	25 099	15 415	41 922	51 135	26 153	94 308
At7c16cov0.4	385 897 271	15 234	7 661	25 308	15 601	42 029	50 484	26 154	91 898

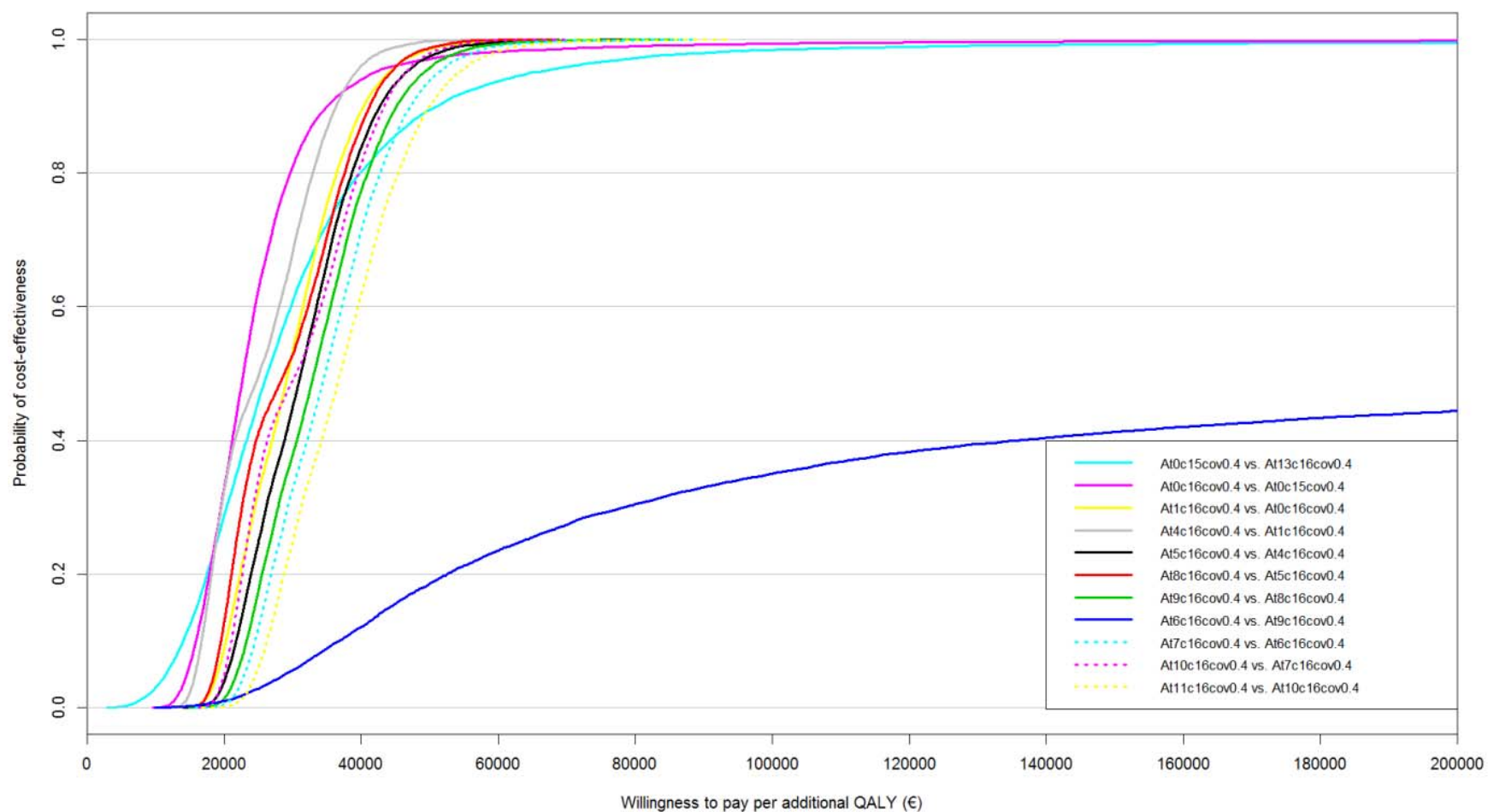


At10c16cov0.4	434 162 855	16 831	8 425	25 786	16 006	42 542	51 652	26 725	93 421
At11c16cov0.4	446 180 520	17 151	8 737	25 980	16 181	42 711	51 248	26 731	91 678

Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.

Figure 69 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 40% coverage level of the child components of the options, and with immunity lasting an average of 6 years







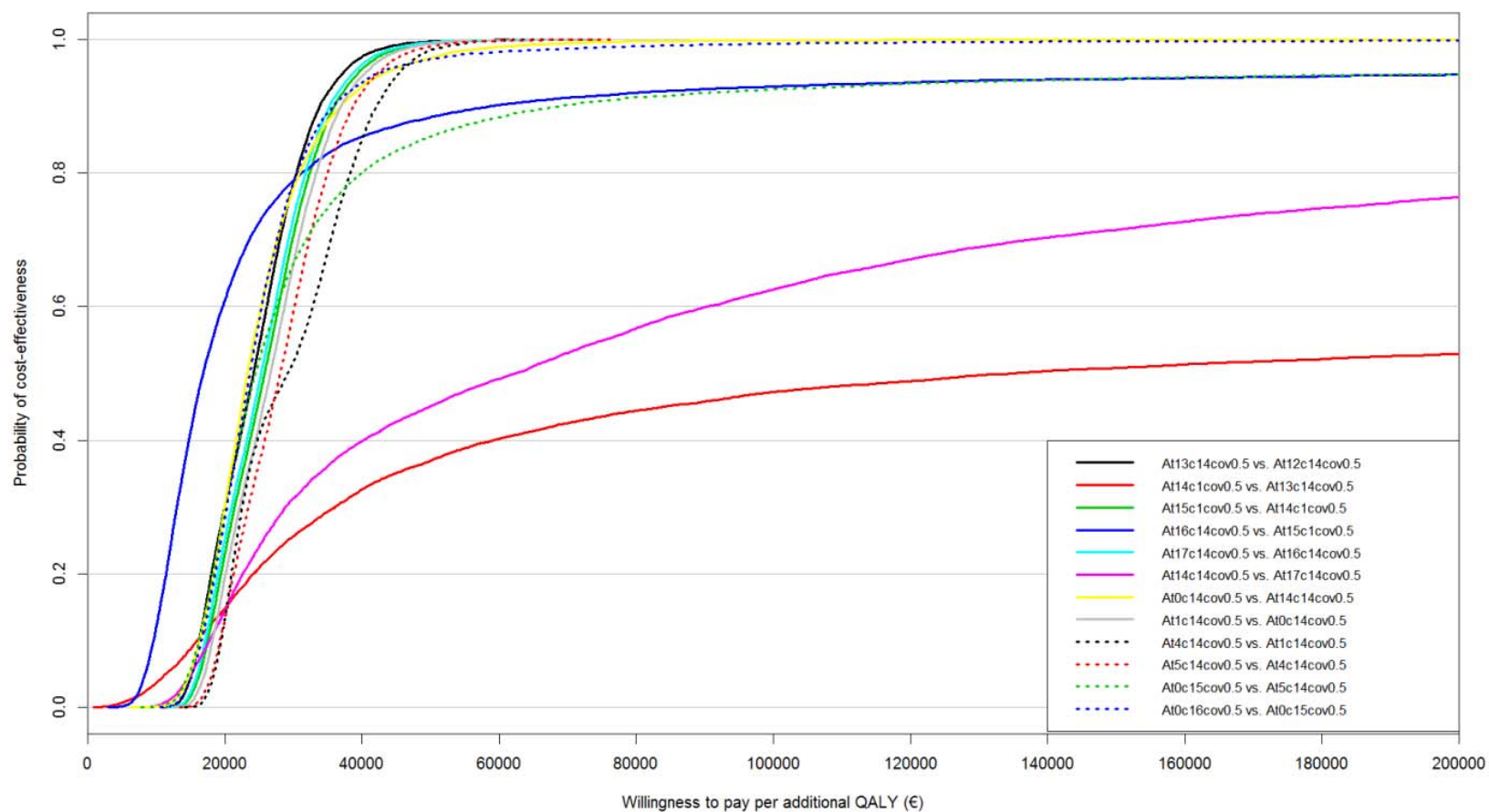
**Table 14 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 50% in children (<18y), and with immunity lasting an average of 6 years**

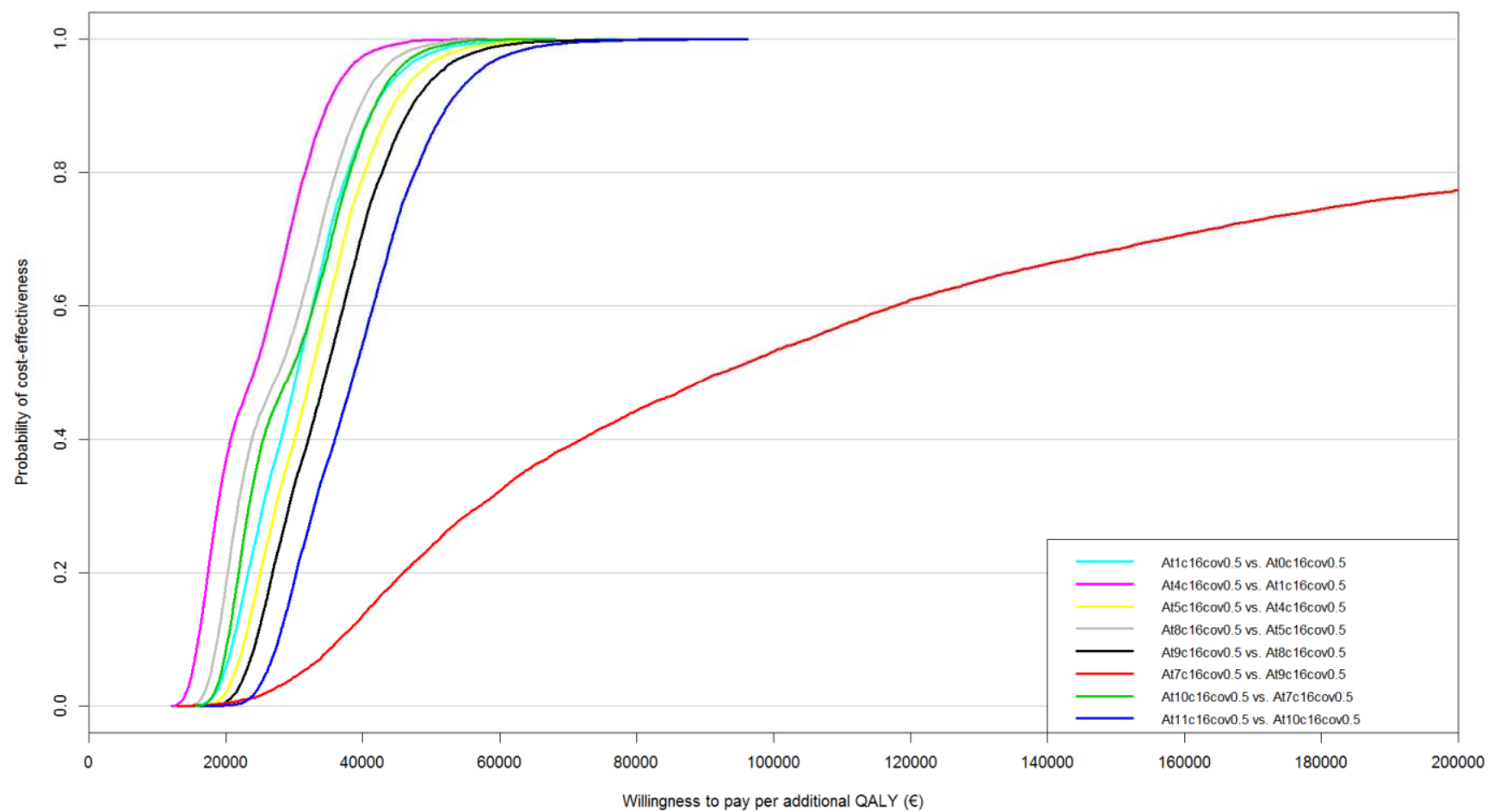
Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
At12c14cov0.5	-30 971 085	188	-23	-80 030	-1 192 811	1 056 289	85 828	-3 967 092	4 085 265
At13c14cov0.5	-19 630 576	650	399	-28 806	-143 629	83 215	-48 109	-162 565	44 801
At14c1cov0.5	1 184 763	723	1 252	1 323	-3 788	46 294	934	-2 591	7 615
At15c1cov0.5	12 764 322	1 168	1 688	10 984	1 548	47 954	7 619	1 307	18 294
At16c14cov0.5	28 916 980	2 189	1 126	13 276	5 923	30 509	25 486	9 357	59 296
At17c14cov0.5	40 340 856	2 640	1 570	15 342	7 500	30 465	25 865	11 053	51 541
At14c14cov0.5	54 404 858	2 859	2 092	19 091	9 008	38 269	26 178	11 195	51 218
At0c14cov0.5	88 402 066	4 418	1 921	20 018	11 783	33 588	46 328	22 325	90 388
At1c14cov0.5	99 927 077	4 852	2 327	20 597	12 227	33 945	43 184	21 746	80 094
At4c14cov0.5	147 905 793	6 525	3 159	22 677	13 755	37 149	46 905	23 613	87 053
At5c14cov0.5	159 595 812	6 940	3 554	23 013	13 997	37 342	45 056	23 207	82 203
At0c15cov0.5	200 788 486	8 547	3 426	23 505	14 510	41 142	58 852	28 830	117 285
At0c16cov0.5	288 460 795	12 241	4 934	23 537	14 522	43 693	58 676	28 586	123 421
At1c16cov0.5	300 220 843	12 630	5 287	23 754	14 676	43 254	56 962	28 252	114 969
At4c16cov0.5	346 907 858	14 594	6 277	23 809	14 695	41 739	55 353	27 447	108 539
At5c16cov0.5	358 683 027	14 954	6 621	24 012	14 857	41 604	54 173	27 329	103 966
At8c16cov0.5	406 287 035	16 682	7 526	24 379	15 153	41 301	54 410	27 389	102 611
At9c16cov0.5	418 248 039	17 026	7 854	24 580	15 320	41 292	53 688	27 322	99 386
At7c16cov0.5	445 374 837	17 317	8 480	25 724	16 029	42 611	52 728	27 370	95 856
At10c16cov0.5	493 459 906	18 957	9 285	26 013	16 287	42 789	53 422	27 675	96 434
At11c16cov0.5	505 533 907	19 259	9 584	26 223	16 439	42 953	52 968	27 715	94 808

*Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.*



**Figure 70 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 50% coverage level of the child components of the options, and with immunity lasting an average of 6 years**







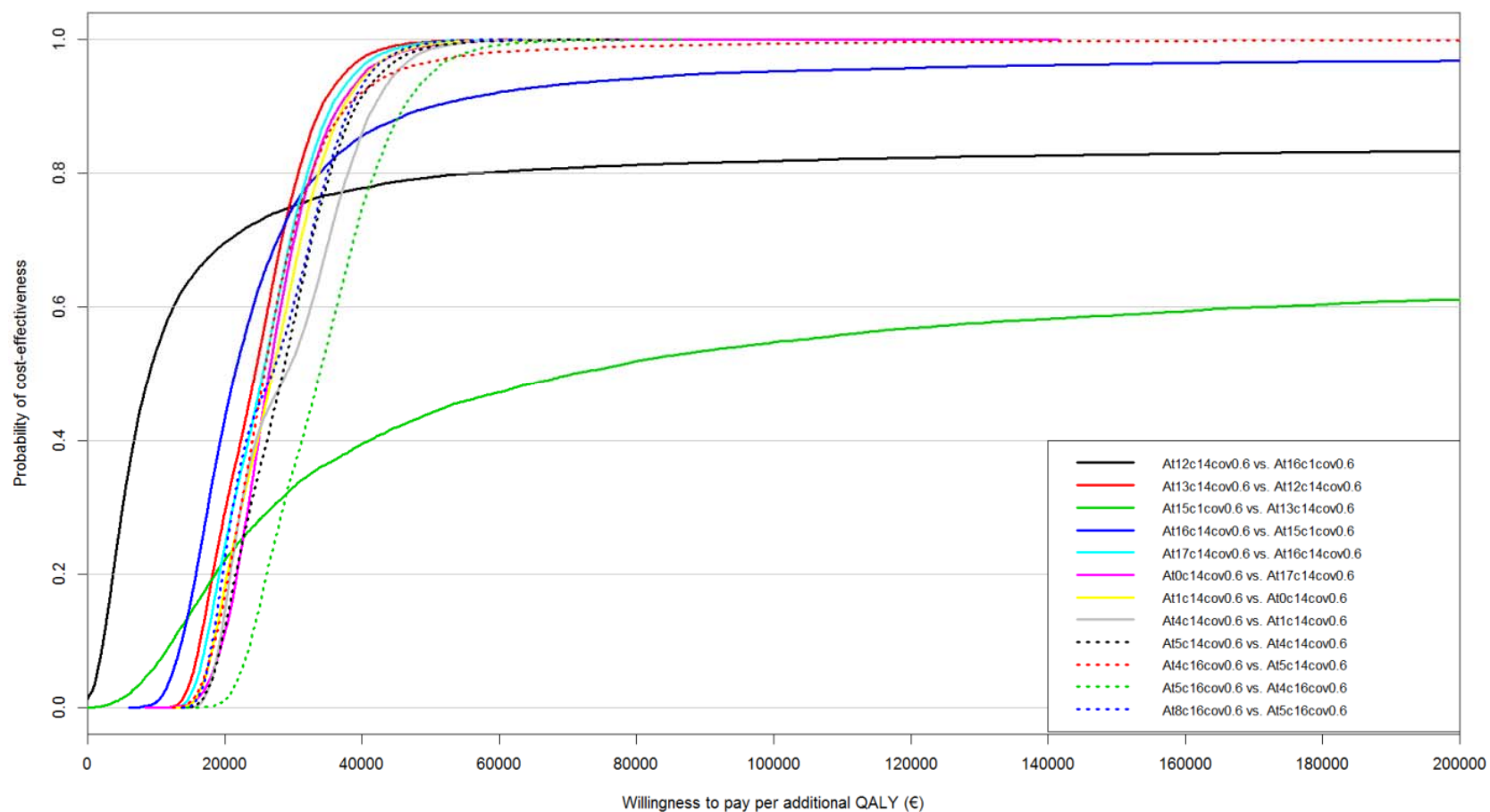
**Table 15 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by dominance and extended dominance for a vaccination coverage of 60% in children (<18y), and with immunity lasting an average of 6 years**

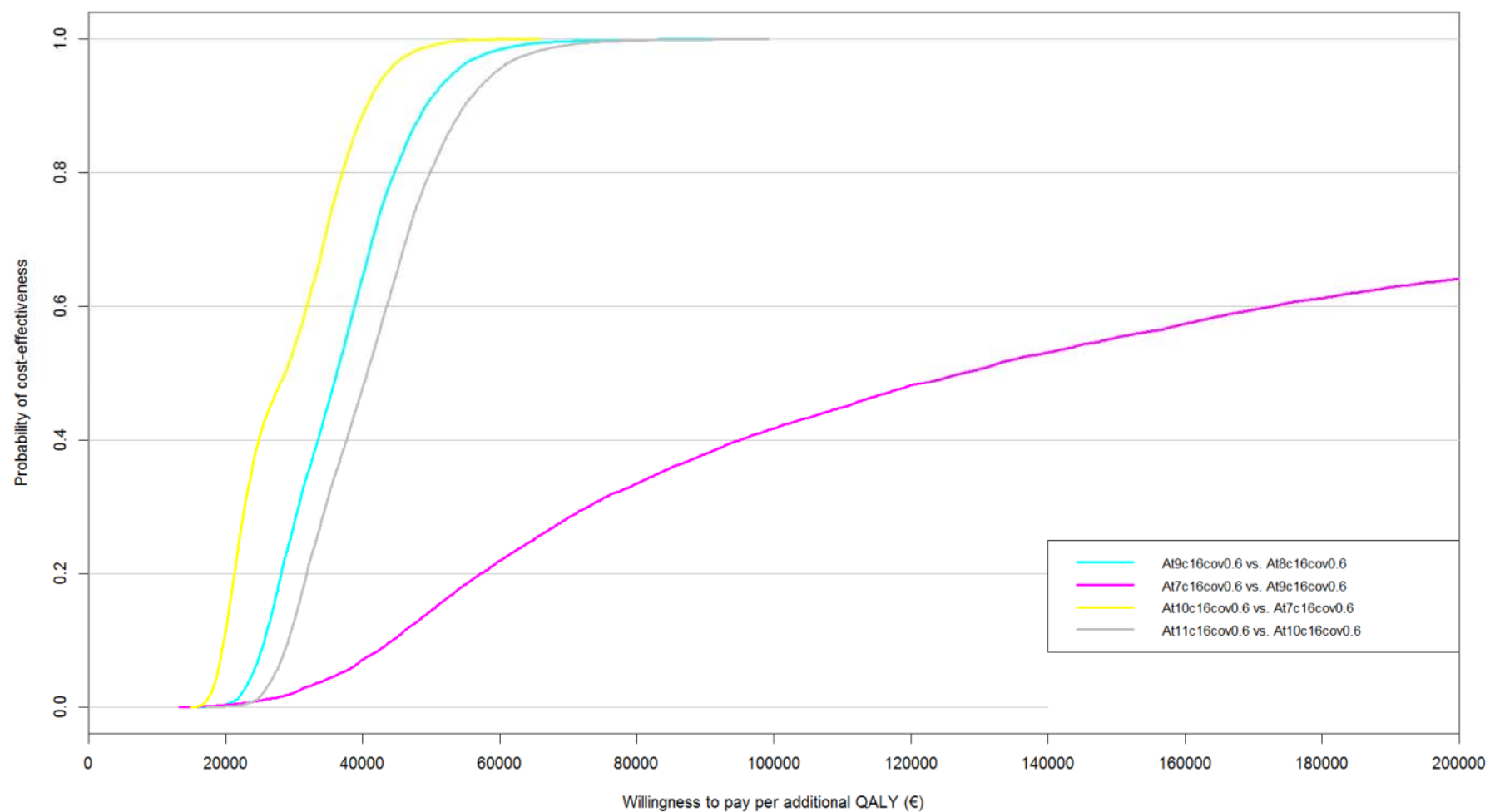
Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
<b>At16c1cov0.6</b>	-16 476 995	352	412	-41 001	-360 428	-20 899	-40 009	-64 385	-21 350
<b>At12c14cov0.6</b>	-12 068 202	831	243	-14 351	-51 321	16 042	-43 279	-298 186	172 860
<b>At13c14cov0.6</b>	-709 612	1 288	662	-649	-4 746	12 588	-1 149	-7 878	23 187
<b>At15c1cov0.6</b>	20 396 993	1 511	1 835	13 589	3 551	41 635	11 180	3 221	24 805
<b>At16c14cov0.6</b>	47 764 149	2 851	1 413	16 823	8 654	33 750	33 882	14 245	71 662
<b>At17c14cov0.6</b>	59 213 780	3 295	1 847	18 050	9 626	33 299	32 262	14 791	61 855
<b>At0c14cov0.6</b>	107 103 668	5 120	2 228	20 919	12 485	34 710	48 422	23 657	93 207
<b>At1c14cov0.6</b>	118 615 362	5 551	2 634	21 381	12 855	34 984	45 310	23 028	83 703
<b>At4c14cov0.6</b>	166 542 097	7 234	3 469	23 033	14 064	37 534	48 134	24 329	89 021
<b>At5c14cov0.6</b>	178 252 618	7 645	3 858	23 316	14 282	37 677	46 339	23 937	84 349
<b>At4c16cov0.6</b>	407 081 502	16 486	7 078	24 699	15 443	42 818	57 536	28 882	111 919
<b>At5c16cov0.6</b>	418 878 785	16 823	7 408	24 877	15 593	42 736	56 579	28 774	108 019
<b>At8c16cov0.6</b>	466 280 364	18 620	8 329	25 057	15 719	42 342	56 417	28 541	105 812
<b>At9c16cov0.6</b>	478 247 432	18 953	8 645	25 265	15 881	42 385	55 719	28 537	102 685
<b>At7c16cov0.6</b>	505 727 518	19 169	9 217	26 410	16 620	43 549	55 066	28 715	99 681
<b>At10c16cov0.6</b>	553 601 264	20 852	10 040	26 555	16 754	43 510	55 378	28 800	99 662
<b>At11c16cov0.6</b>	565 845 919	21 148	10 321	26 768	16 911	43 692	55 038	28 841	98 018

*Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.*



Figure 71 – CEACs of the incremental analyses on child-adult combined vaccination options after elimination of dominated options at a 60% coverage level of the child components of the options, and with immunity lasting an average of 6 years







**Table 16 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by (extended) dominance for a vaccination coverage of 70% in children (<18y), and with immunity lasting an average of 6 years**

Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
<b>At16c1cov0.7</b>	-8 830 200	705	581	-11 843	-20 003	-9 238	-13 109	-21 047	-9 573
<b>At17c1cov0.7</b>	2 633 169	1 155	1 018	2 289	-2 140	13 097	2 546	-2 374	12 585
<b>At12c14cov0.7</b>	6 867 044	1 413	484	4 724	-861	29 057	12 873	-44 073	101 017
<b>At13c14cov0.7</b>	18 261 055	1 866	909	9 745	3 120	31 612	20 045	5 614	62 393
<b>At0c1cov0.7</b>	51 267 699	2 800	1 302	18 338	10 048	33 840	39 692	18 314	83 798
<b>At16c14cov0.7</b>	66 702 418	3 455	1 676	19 333	10 673	36 052	39 955	17 923	80 732
<b>At17c14cov0.7</b>	78 134 114	3 897	2 104	20 133	11 301	35 530	37 353	17 820	70 178
<b>At0c14cov0.7</b>	125 842 913	5 766	2 511	21 864	13 187	35 940	50 586	25 044	96 131
<b>At1c14cov0.7</b>	137 399 467	6 188	2 913	22 221	13 510	36 122	47 489	24 341	87 275
<b>At4c14cov0.7</b>	185 280 947	7 881	3 750	23 541	14 458	38 190	49 483	25 201	91 235
<b>At5c14cov0.7</b>	196 999 983	8 286	4 135	23 785	14 672	38 276	47 791	24 777	86 615
<b>At8c14cov0.7</b>	245 771 199	9 786	4 844	25 197	15 616	40 415	50 775	26 126	91 646
<b>At9c14cov0.7</b>	257 547 550	10 176	5 210	25 379	15 747	40 556	49 454	25 827	88 555
<b>At4c16cov0.7</b>	467 655 806	18 159	7 789	25 749	16 286	44 132	60 123	30 490	115 980
<b>At5c16cov0.7</b>	479 534 699	18 500	8 108	25 924	16 427	43 956	59 253	30 371	111 944
<b>At8c16cov0.7</b>	526 902 270	20 303	9 043	25 941	16 443	43 452	58 607	29 940	109 251
<b>At9c16cov0.7</b>	538 905 155	20 625	9 343	26 144	16 588	43 386	57 998	29 931	106 175
<b>At7c16cov0.7</b>	566 633 759	20 785	9 869	27 276	17 352	44 715	57 677	30 247	103 701
<b>At10c16cov0.7</b>	614 326 705	22 512	10 703	27 318	17 399	44 475	57 689	30 126	102 961
<b>At11c16cov0.7</b>	626 539 834	22 791	10 974	27 508	17 537	44 585	57 354	30 153	101 406

*Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.*



**Table 17 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by (extended) dominance for a vaccination coverage of 80% in children (<18y), and with immunity lasting an average of 6 years**

Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
At13c11cov0.8	-2 167 775	286	179	-6 553	-42 327	25 146	-11 792	-69 896	45 606
At16c1cov0.8	-1 124 256	1 047	735	-1 082	-4 132	7 802	-1 411	-5 332	9 520
At17c1cov0.8	10 357 021	1 498	1 174	6 957	1 011	20 085	8 830	1 230	23 511
At12c14cov0.8	25 532 597	1 949	709	13 043	5 403	40 958	35 183	10 519	137 389
At13c14cov0.8	36 859 610	2 402	1 137	15 342	7 386	36 740	32 550	13 354	78 398
At0c1cov0.8	58 905 103	3 162	1 469	18 661	10 292	34 292	40 441	18 777	84 871
At1c1cov0.8	70 390 123	3 599	1 876	19 602	11 035	35 140	37 818	18 482	74 527
At16c14cov0.8	85 284 830	4 002	1 920	21 362	12 233	37 968	44 771	20 822	87 734
At17c14cov0.8	96 750 094	4 445	2 341	21 840	12 636	37 409	41 612	20 402	77 066
At0c14cov0.8	144 340 494	6 345	2 771	22 788	13 887	37 198	52 585	26 368	98 998
At1c14cov0.8	155 889 046	6 765	3 163	23 070	14 183	37 289	49 615	25 646	90 509
At4c14cov0.8	203 762 657	8 467	4 008	24 105	14 924	38 928	51 009	26 104	93 447
At5c14cov0.8	215 472 845	8 871	4 387	24 309	15 100	38 964	49 241	25 685	89 093
At8c14cov0.8	264 243 514	10 371	5 100	25 556	15 915	40 918	51 859	26 793	93 351
At9c14cov0.8	276 048 016	10 757	5 463	25 747	16 053	40 990	50 611	26 476	90 300
At6c14cov0.8	290 299 831	10 960	5 914	26 499	16 229	42 803	49 187	25 336	88 133
At7c14cov0.8	302 122 860	11 320	6 267	26 670	16 397	42 962	48 243	25 181	85 943
At4c16cov0.8	528 243 172	19 623	8 409	26 943	17 213	45 500	62 927	32 254	119 958
At8c16cov0.8	587 425 447	21 784	9 670	26 991	17 256	44 737	61 054	31 526	112 826
At9c16cov0.8	599 515 740	22 077	9 964	27 172	17 396	44 694	60 403	31 468	109 820
At10c16cov0.8	675 056 301	23 936	11 284	28 220	18 153	45 562	60 098	31 608	106 590
At11c16cov0.8	687 281 711	24 193	11 564	28 413	18 317	45 688	59 799	31 688	105 307

*Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.*



**Table 18 – Incremental costs, life-years gained, QALYs gained and ICERs for the combined child-adult vaccination options selected after a process of elimination by (extended) dominance for a vaccination coverage of 90% in children (<18y), and with immunity lasting an average of 6 years**

Vaccination option	Median incremental cost	Median QALYs gained	Median life-years gained	Incremental direct costs per QALY gained			Incremental direct costs per life-year gained		
				Median	2.50%	97.50%	Median	2.50%	97.50%
At12c11cov0.9	-470 580	144	-126	-4 929	-45 617	28 537	-2 780	-137 811	125 557
At16c1cov0.9	6 661 841	1 379	891	4 888	-266	17 579	7 363	-361	25 547
At17c1cov0.9	18 159 423	1 827	1 326	9 957	3 147	24 352	13 672	4 005	32 192
At14c1cov0.9	32 080 742	2 067	1 841	15 540	5 639	38 494	17 422	6 172	37 943
At15c1cov0.9	43 663 970	2 501	2 267	17 459	7 104	39 384	19 347	7 735	39 609
At13c14cov0.9	54 214 166	2 894	1 344	18 733	10 002	39 358	40 433	18 207	88 447
At0c1cov0.9	66 626 961	3 514	1 632	18 988	10 547	34 677	41 176	19 294	86 021
At1c1cov0.9	78 105 031	3 948	2 035	19 840	11 228	35 489	38 615	18 935	76 153
At4c1cov0.9	126 422 865	5 568	2 829	22 748	13 336	39 387	44 961	22 011	86 721
At5c1cov0.9	138 024 941	5 982	3 223	23 109	13 627	39 772	43 021	21 673	81 236
At0c14cov0.9	161 583 324	6 871	3 003	23 549	14 476	38 178	54 282	27 417	101 862
At1c14cov0.9	173 115 035	7 289	3 391	23 798	14 735	38 214	51 390	26 719	93 294
At4c14cov0.9	220 988 233	8 991	4 242	24 609	15 335	39 556	52 353	26 925	95 513
At5c14cov0.9	232 686 949	9 393	4 615	24 781	15 484	39 630	50 614	26 493	91 182
At8c14cov0.9	281 488 736	10 901	5 332	25 899	16 227	41 324	52 855	27 404	94 932
At9c14cov0.9	293 278 403	11 280	5 690	26 068	16 344	41 435	51 649	27 090	91 906
At6c14cov0.9	307 573 869	11 473	6 128	26 813	16 522	43 220	50 196	25 999	89 703
At7c14cov0.9	319 455 233	11 834	6 483	26 995	16 662	43 349	49 355	25 828	87 521
At10c14cov0.9	368 463 729	13 257	7 120	27 794	17 274	44 486	51 802	26 901	91 191
At11c14cov0.9	380 385 654	13 604	7 443	27 969	17 413	44 649	51 154	26 769	89 606
At8c16cov0.9	646 931 229	23 062	10 218	28 097	18 145	46 148	63 633	33 155	116 246
At9c16cov0.9	659 081 601	23 359	10 478	28 258	18 271	46 083	63 124	33 130	113 518
At10c16cov0.9	734 749 142	25 129	11 800	29 239	18 957	46 925	62 658	33 192	110 470



<b>At11c16cov0.9</b>	747 151 068	25 397	12 044	29 418	19 099	46 974	62 405	33 217	109 115
----------------------	-------------	--------	--------	--------	--------	--------	--------	--------	---------

Each incremental analysis uses as reference strategy the previous listed option. The first option is compared to the current situation.

#### 4.4.3. Sensitivity analysis: identifying the optimal expansion path under decreasing vaccination costs in children, with waning immunity of 1/6 years

We examine here the case of combining 23 adjusted adult vaccination options, with the potential addition of 19 childhood vaccination targets at 9 different levels of coverage for children (i.e. 3933 options in total), assuming immunity wanes at an annual exponential decline rate of 1/6 per year.

**Table 19 – Selection of optimal expansion path along the efficiency frontier, identified by criteria of dominance and extended dominance for 19 child options for vaccination at 9 different coverage levels combined with 23 adult vaccination strategies (i.e. 3933 options), assuming various levels of vaccination costs per dose for child (<18y) vaccination and a duration until waned immunity of 6 years; the amounts listed are the incremental direct costs per QALY gained versus the next best alternative**

Vaccination costs per dose	Base	25% reduction from base	50% reduction from base	75% reduction from base
<b>1</b>	At16c1cov0.6 vs. At12c14cov0.5 21 559	At12c14cov0.5 vs. At13c5cov0.5 -28 408	At12c5cov0.6 vs. At13c5cov0.5 -26 363	At12c5cov0.6 vs. At13c5cov0.5 -68 486
<b>2</b>	At13c14cov0.5 -7765	At12c5cov0.6 29 117	At12c6cov0.3 36 212	At12c6cov0.3 23 426
<b>3</b>	At12c14cov0.6 41 938	At12c6cov0.3 48 977	At16c1cov0.6 34 605	At13c7cov0.2 51 100
<b>4</b>	At12c16cov0.2 9348	At16c1cov0.6 -1921	At13c14cov0.5 -68 940	At13c14cov0.5 -27 867
<b>5</b>	At12c15cov0.3 38 732	At13c14cov0.5 -38 726	At12c14cov0.6 -21 973	At12c9cov0.4 8029
<b>6</b>	At13c14cov0.6 -5750	At12c14cov0.6 9730	At12c5cov0.7 6337	At12c14cov0.6 -48 031
<b>7</b>	At13c16cov0.2 9387	At12c16cov0.2 8690	At12c16cov0.2 -11 257	At12c5cov0.7 222
<b>8</b>	At13c15cov0.3 38 752	At12c15cov0.3 24 004	At12c15cov0.3 9208	At12c10cov0.5 76 242
<b>9</b>	At13c14cov0.7 16 684	At13c14cov0.6 -793	At13c14cov0.6 4941	At12c16cov0.2 -22 700
<b>10</b>	At17c14cov0.4 4757	At12c14cov0.7 13 812	At12c14cov0.7 -28 009	At12c15cov0.3 -5168
<b>11</b>	At12c14cov0.8 -6771	At13c16cov0.2 2737	At13c16cov0.2 14 989	At13c14cov0.6 10 297
<b>12</b>	At16c14cov0.5 7933	At13c15cov0.3 24 026	At13c15cov0.3 9266	At12c14cov0.7 -70 080
<b>13</b>	At12c15cov0.4 15 882	At13c14cov0.7 7995	At12c14cov0.8 -8524	At12c6cov0.4 15 094
<b>14</b>	At17c14cov0.5 -5031	At12c14cov0.8 16 545	At12c17cov0.3 11 689	At13c15cov0.3 -4579
<b>15</b>	At12c16cov0.3 10 396	At12c17cov0.3 14 098	At12c14cov0.9 -7594	At12c14cov0.8 -30 742



16	At13c16cov0.3	25 213	At13c14cov0.8	-5643	At12c15cov0.4	-1440	At12c7cov0.3	4622
17	At1c1cov0.9	328	At12c14cov0.9	6582	At13c14cov0.9	16 348	At12c14cov0.9	-19 297
18	At1c14cov0.4	4681	At12c15cov0.4	-4602	At12c16cov0.3	-8202	At12c15cov0.4	2018
19	At0c14cov0.5	21 386	At12c16cov0.3	11 643	At13c16cov0.3	25 213	At12c6cov0.5	1898
20	At1c14cov0.5	26 622	At13c16cov0.3	25 213	At12c15cov0.5	1802	At13c14cov0.9	-8977
21	At12c16cov0.4	8347	At12c15cov0.5	45 355	At12c17cov0.4	13 137	At12c16cov0.3	-10 561
22	At16c16cov0.3	-3536	At12c17cov0.4	16 844	At13c15cov0.5	6196	At12c15cov0.5	3994
23	At13c16cov0.4	24 818	At13c15cov0.5	3093	At12c16cov0.4	400	At12c17cov0.4	9325
24	At17c16cov0.3	-3493	At12c16cov0.4	8392	At13c16cov0.4	25 987	At12c19cov0.7	18 174
25	At0c16cov0.3	22 767	At13c16cov0.4	25 987	At12c15cov0.7	33 206	At13c15cov0.5	-7038
26	At1c16cov0.3	28 182	At12c16cov0.5	21 538	At12c16cov0.5	823	At13c17cov0.4	9293
27	At0c16cov0.4	24 821	At13c16cov0.5	26 767	At13c16cov0.5	26 767	At12c15cov0.6	-17 688
28	At1c16cov0.4	29 291	At17c16cov0.4	34 083	At12c16cov0.6	11 376	At12c16cov0.4	-5388
29	At4c16cov0.4	25 088	At12c16cov0.6	14 941	At13c16cov0.6	27 492	At12c17cov0.5	46 317
30	At5c16cov0.4	31 192	At13c16cov0.6	27 492	At12c16cov0.7	13 885	At13c16cov0.4	2463
31	At4c16cov0.5	26 937	At16c16cov0.5	6757	At13c16cov0.7	28 184	At12c15cov0.7	-10 637
32	At5c16cov0.5	32 488	At0c16cov0.4	19 964	At12c16cov0.8	16 776	At12c16cov0.5	-545
33	At8c16cov0.5	27 716	At1c16cov0.4	29 291	At13c16cov0.8	28 819	At13c16cov0.5	26 767
34	At9c16cov0.5	34 643	At0c16cov0.5	17 895	At12c16cov0.9	20 032	At12c15cov0.9	299
35	At8c16cov0.6	30 050	At1c16cov0.5	30 400	At13c16cov0.9	29 381	At12c16cov0.6	-4643
36	At9c16cov0.6	36 172	At0c16cov0.6	21 070	At16c16cov0.8	27 620	At13c16cov0.6	27 492
37	At8c16cov0.7	35 454	At1c16cov0.6	31 490	At0c16cov0.6	3425	At12c16cov0.7	-2169
38	At9c16cov0.7	37 675	At4c16cov0.5	6940	At17c16cov0.8	20 062	At13c16cov0.7	28 184
39	At10c16cov0.6	21 706	At5c16cov0.5	32 488	At1c16cov0.6	3307	At12c16cov0.8	-1871
40	At11c16cov0.6	40 616	At0c16cov0.7	19 598	At0c16cov0.7	11 343	At13c16cov0.8	28 819
41	At8c16cov0.8	30 497	At4c16cov0.6	20 322	At1c16cov0.7	32 512	At12c16cov0.9	-1769
42	At9c16cov0.8	39 054	At5c16cov0.6	33 797	At0c16cov0.8	13 848	At13c16cov0.9	29 381



43	At10c16cov0.7	27 689	At4c16cov0.7	23 716	At1c16cov0.8	33 503	At16c16cov0.8	50 229
44	At11c16cov0.7	42 398	At5c16cov0.7	35 042	At0c16cov0.9	16 609	At16c16cov0.9	8724
45	At8c16cov0.9	38 992	At8c16cov0.6	9891	At1c16cov0.9	34 417	At17c16cov0.9	31 352
46	At10c16cov0.8	32 973	At9c16cov0.6	36 172	At4c16cov0.8	22 930	At0c16cov0.7	57 088
47	At11c16cov0.8	44 105	At4c16cov0.8	22 835	At5c16cov0.8	36 254	At15c16cov0.9	-1641
48	At10c16cov0.9	49 911	At8c16cov0.7	23 145	At4c16cov0.9	15 637	At0c16cov0.8	4558
49	At11c16cov0.9	45 740	At9c16cov0.7	37 675	At5c16cov0.9	37 343	At0c16cov0.9	8131
50			At8c16cov0.8	27 181	At8c16cov0.8	35 654	At1c16cov0.9	34 417
51			At9c16cov0.8	39 054	At9c16cov0.8	39 054	At4c16cov0.8	42 286
52			At8c16cov0.9	32 119	At8c16cov0.9	14 986	At4c16cov0.9	7950
53			At9c16cov0.9	40 401	At9c16cov0.9	40 401	At5c16cov0.9	37 343
54			At10c16cov0.8	57 902	At7c16cov0.9	75 795	At8c16cov0.8	64 214
55			At11c16cov0.8	44 105	At10c16cov0.8	41 204	At8c16cov0.9	7863
56			At10c16cov0.9	32 569	At10c16cov0.9	21 742	At9c16cov0.9	40 401
57			At11c16cov0.9	45 740	At11c16cov0.9	45 740	At7c16cov0.9	75 795
58							At10c16cov0.9	27 366
59							At11c16cov0.9	45 740

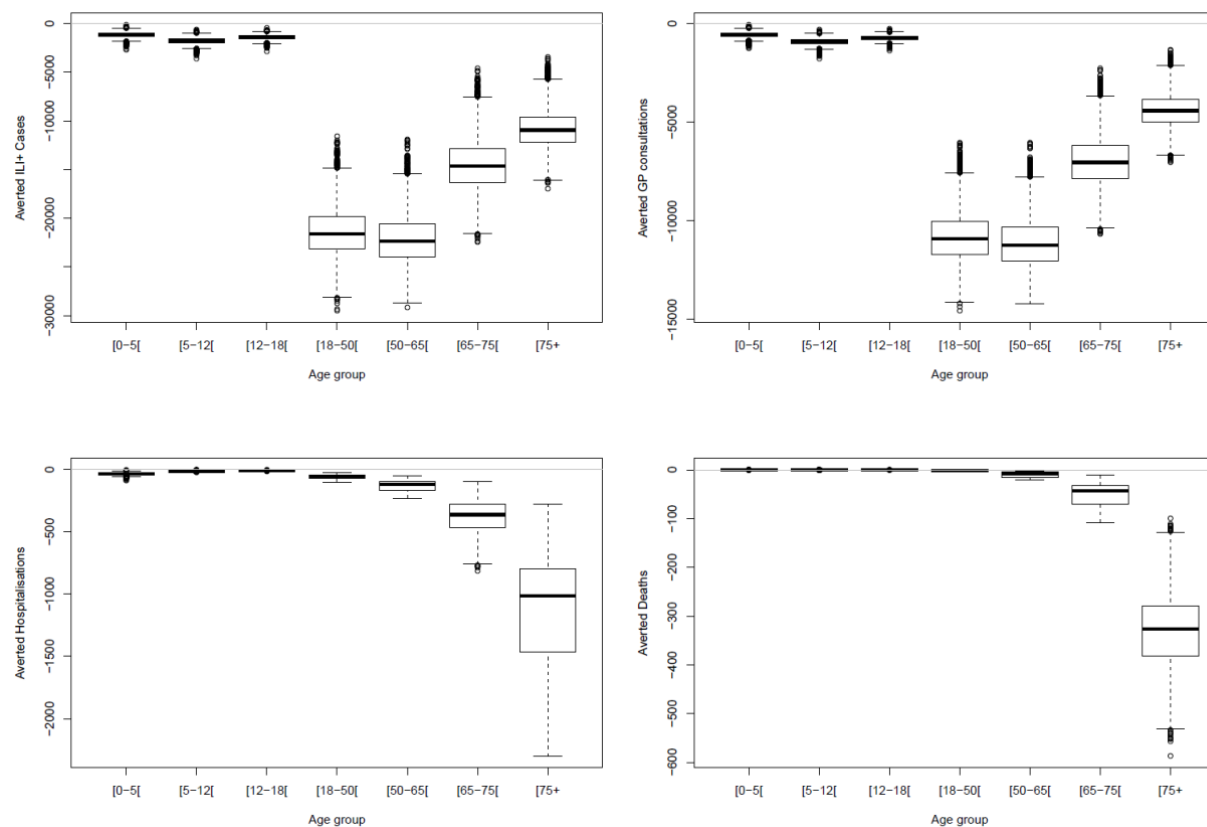
*Each incremental analysis uses as reference strategy the previous listed option.*

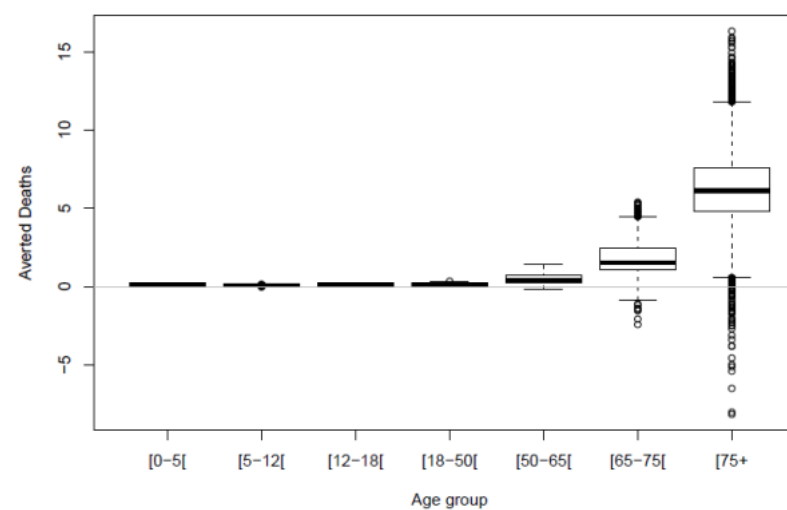
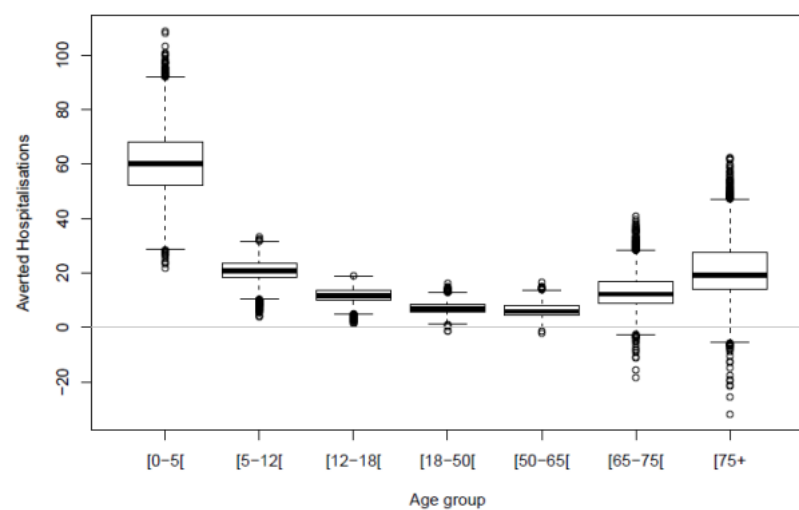
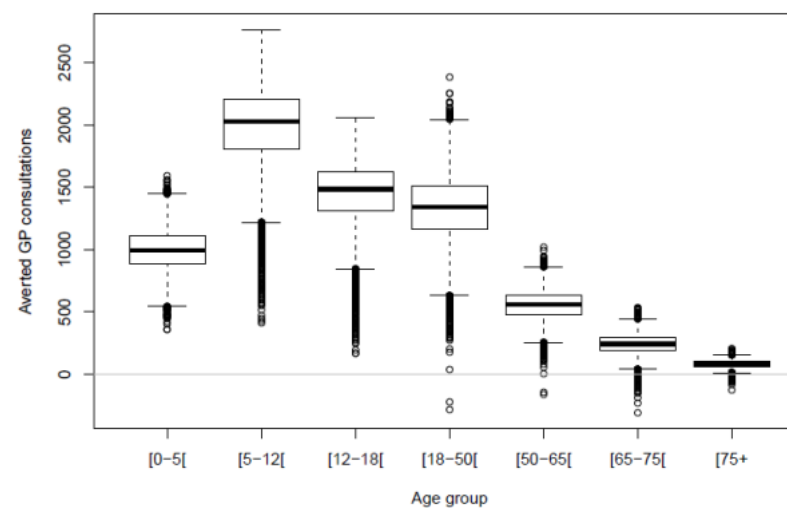
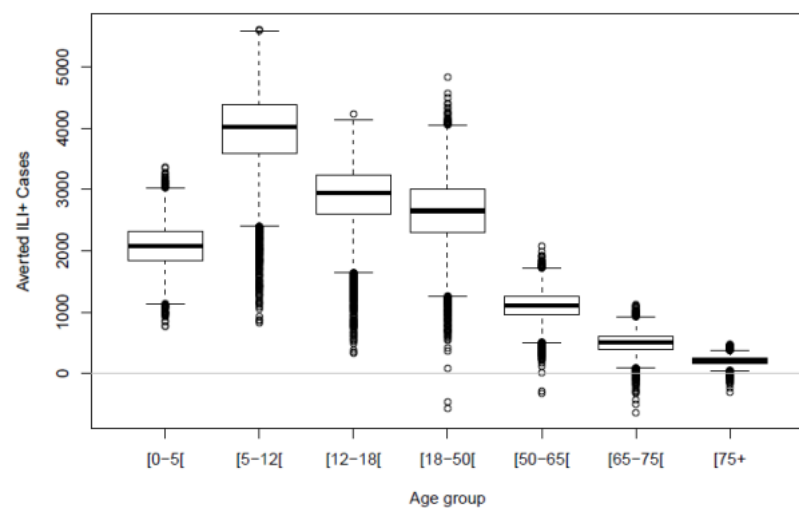


## 4.5. Modified children options + modified adult vaccination reduction (waning immunity fixed at 1.68 years)

### 4.5.1. Effectiveness versus current situation

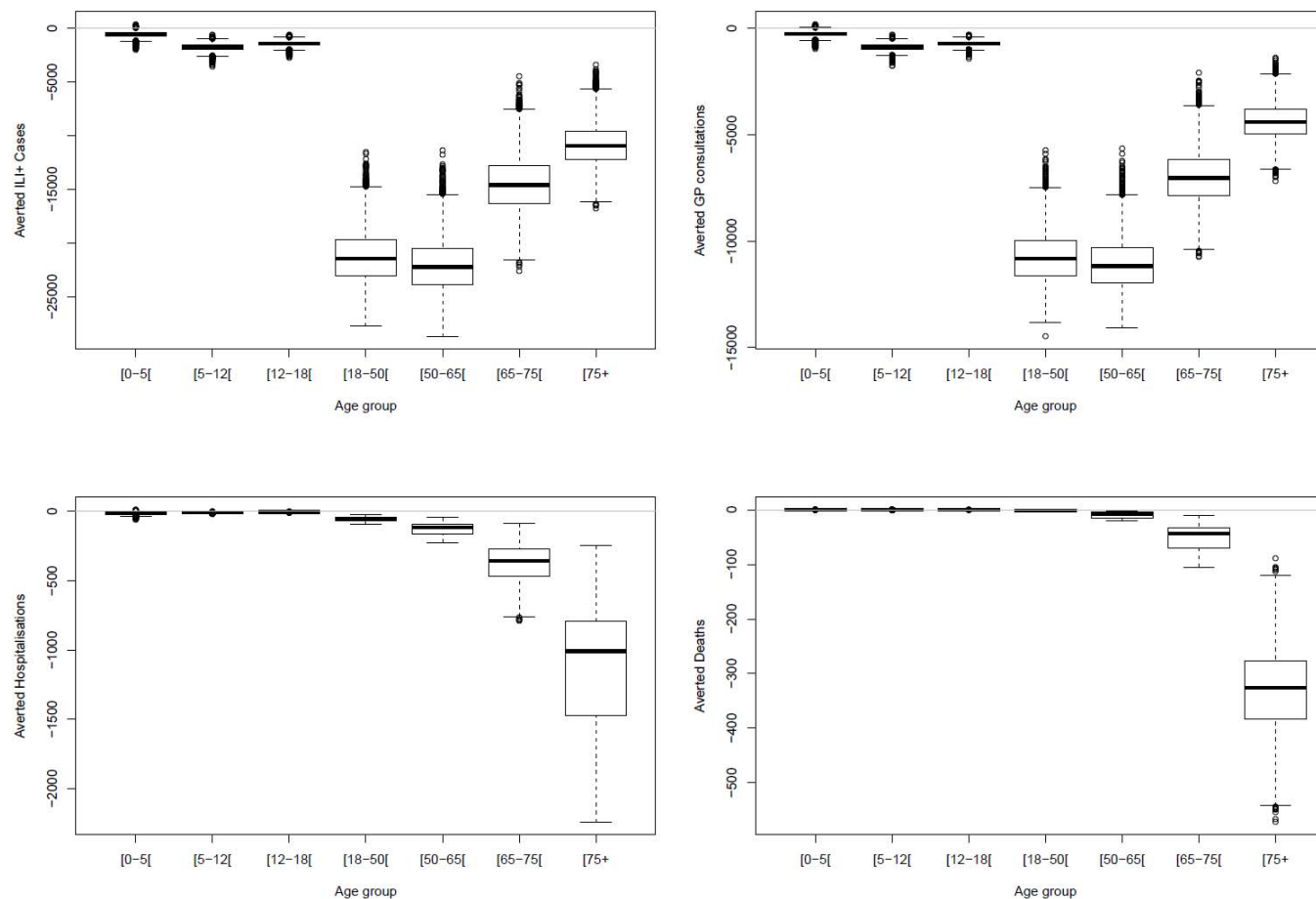
Figure 72 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 10% coverage for the child components of the option, and with immunity lasting an average of 1.68 years

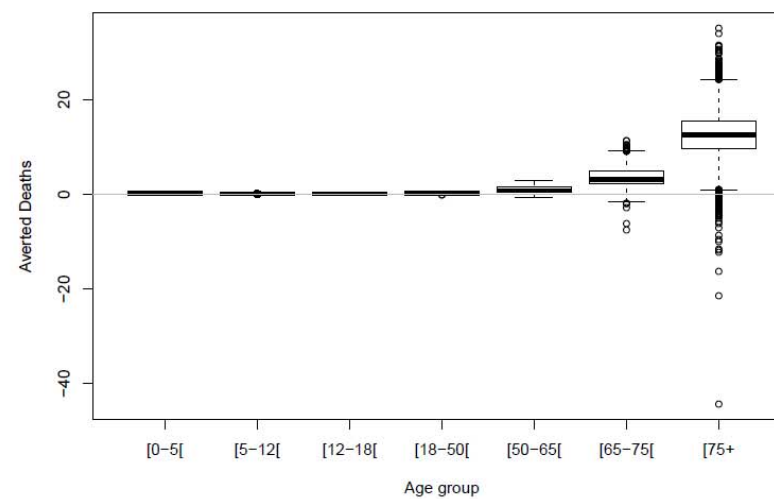
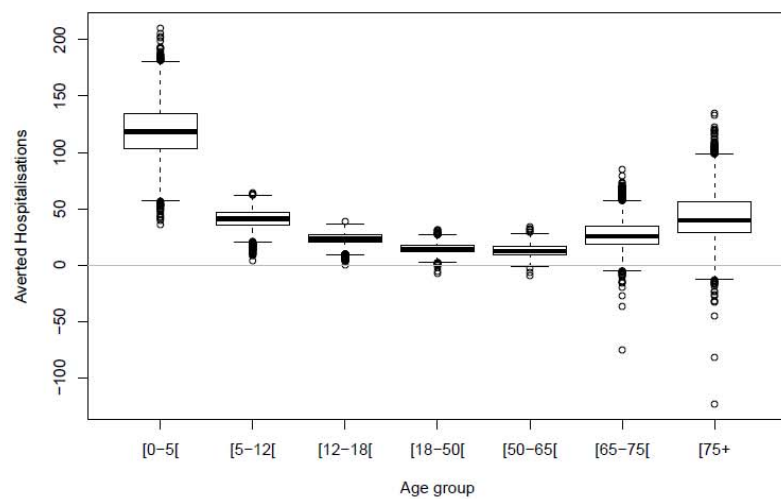
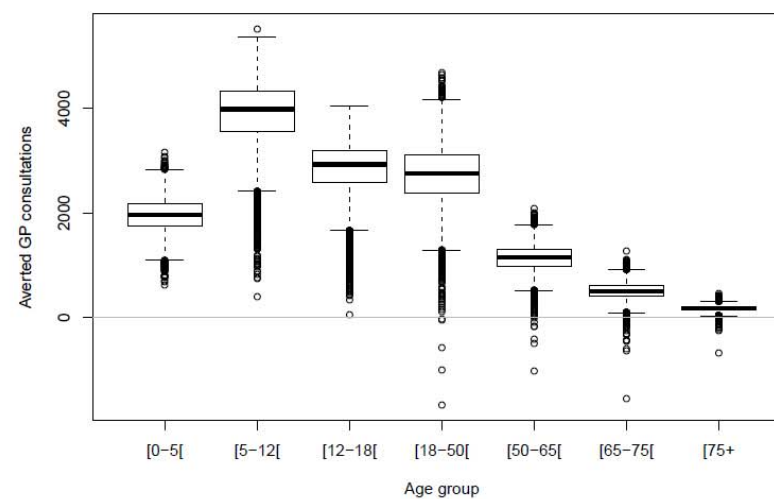
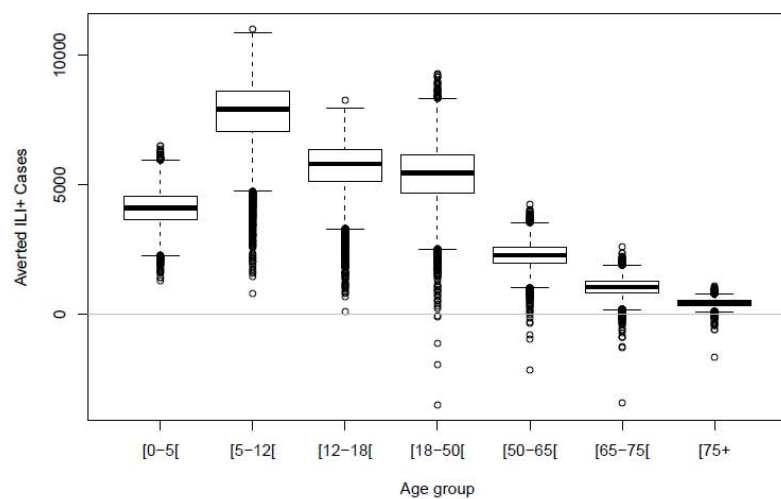






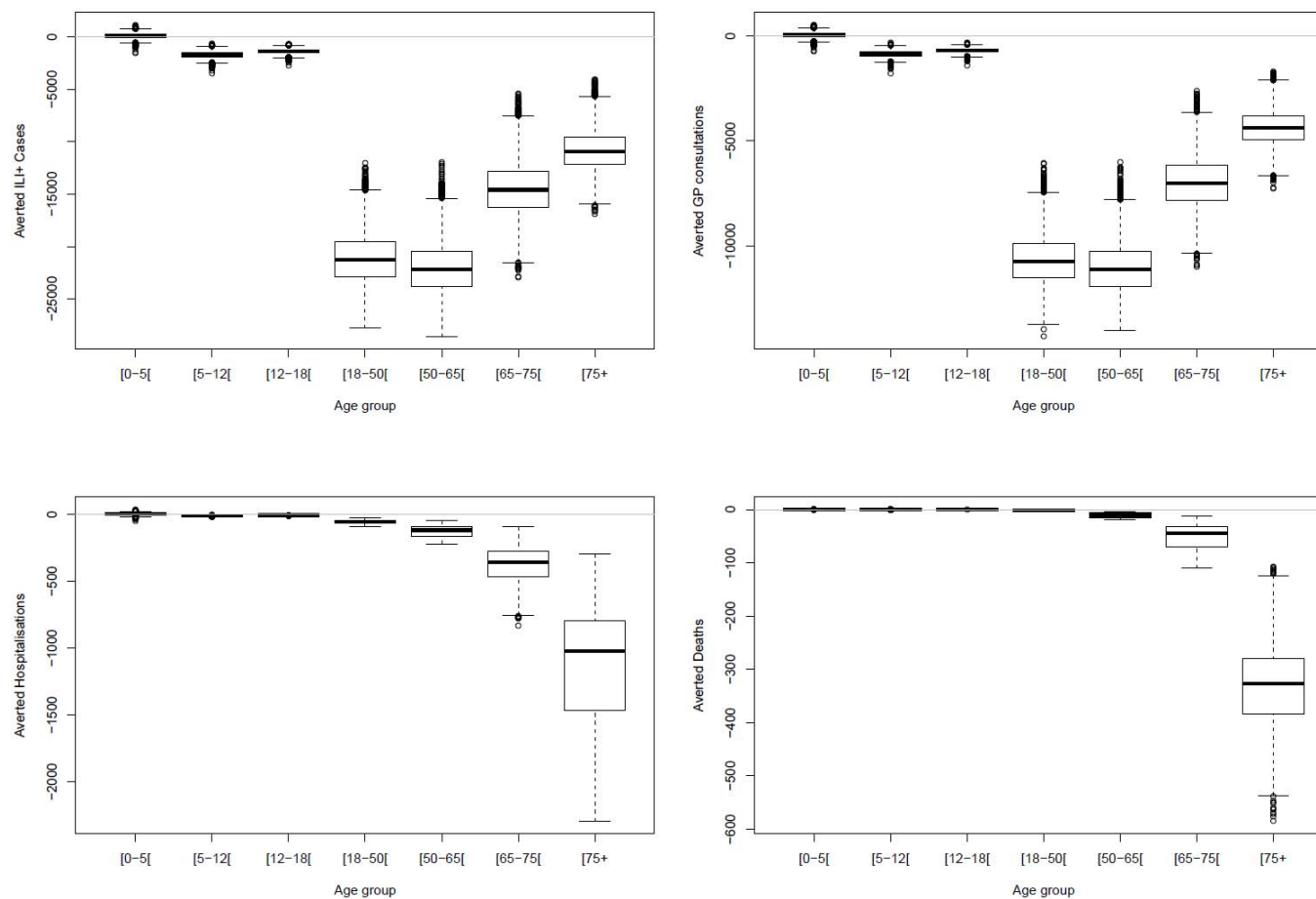
**Figure 73 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 20% coverage for the child components of the option, and with immunity lasting an average of 1.68 years**

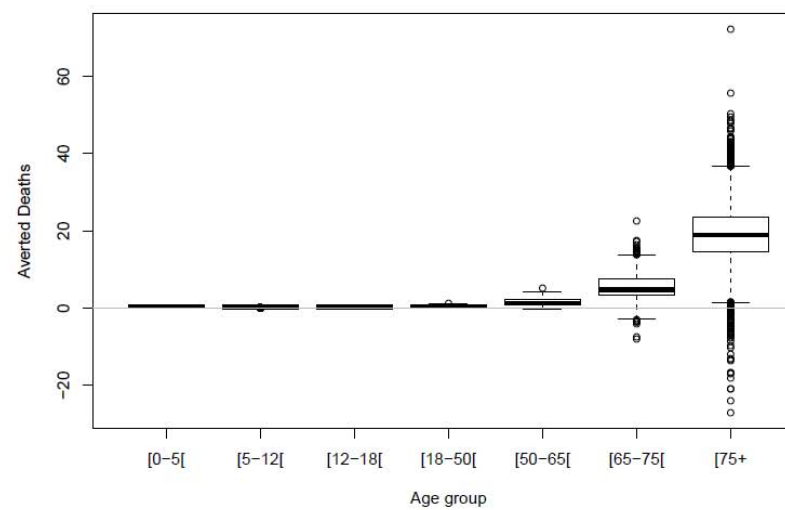
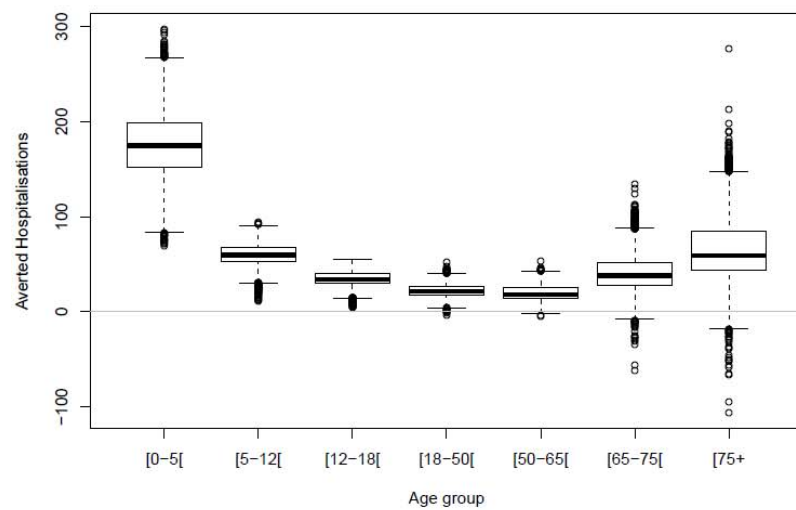
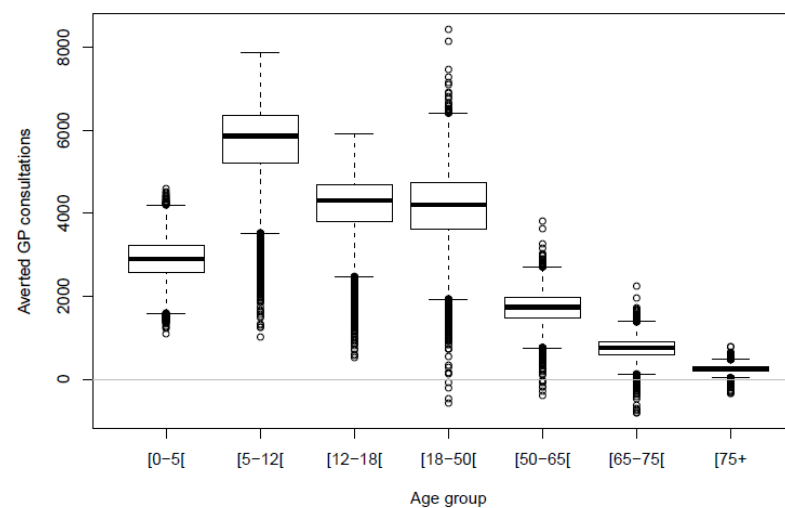
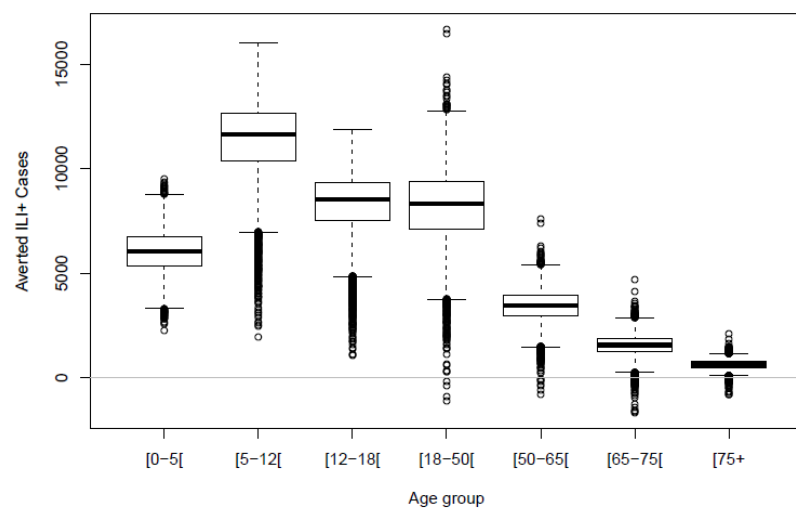






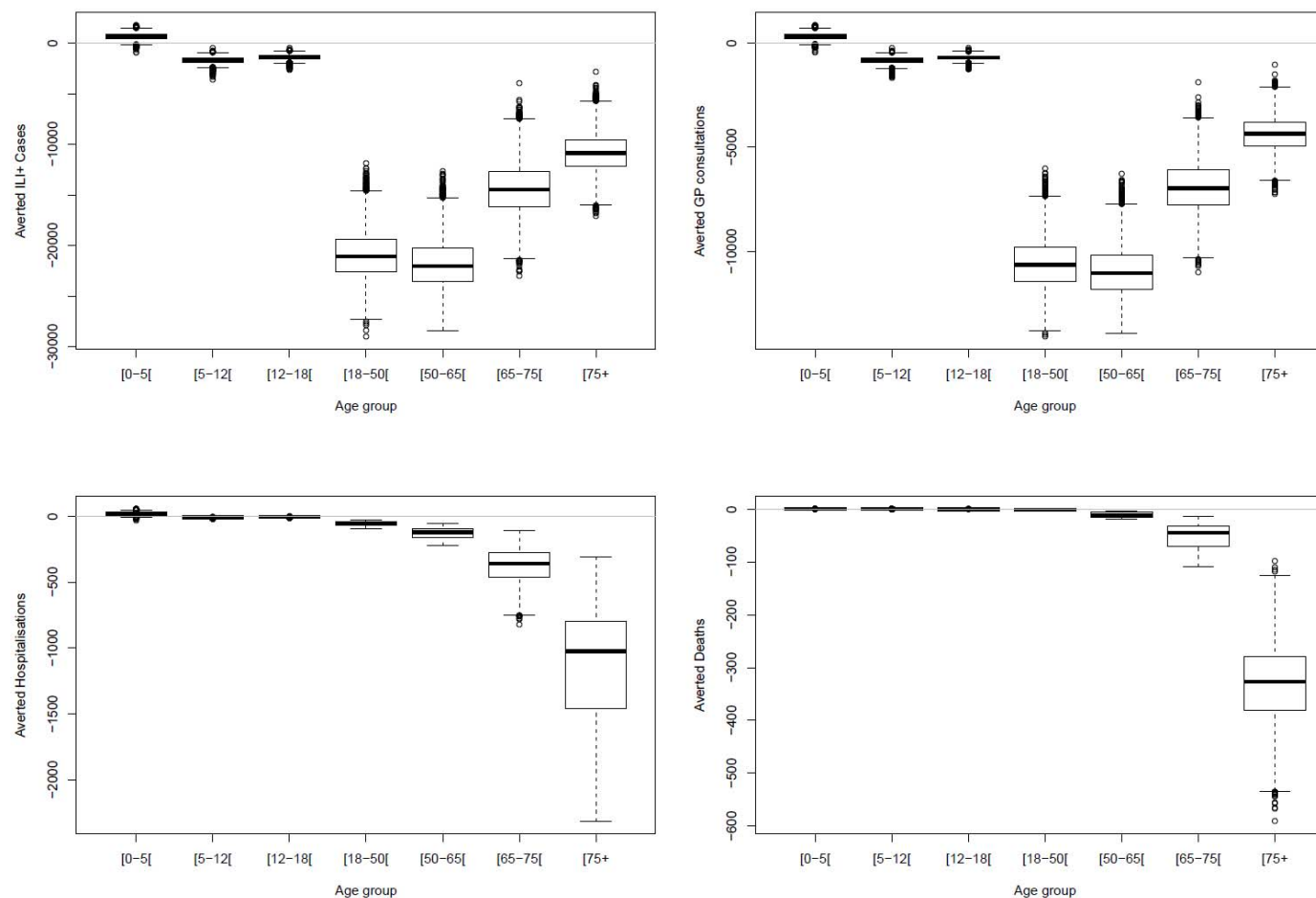
**Figure 74 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 30% coverage for the child components of the option, and with immunity lasting an average of 1.68 years**







**Figure 75 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 40% coverage for the child components of the option, and with immunity lasting an average of 1.68 years**



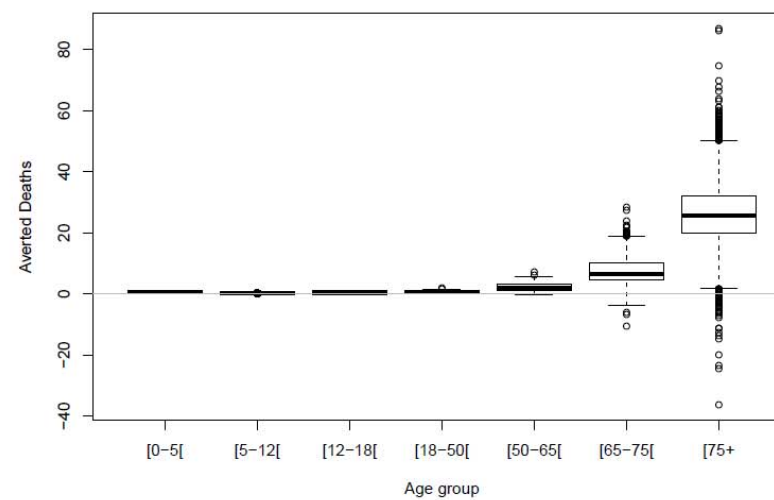
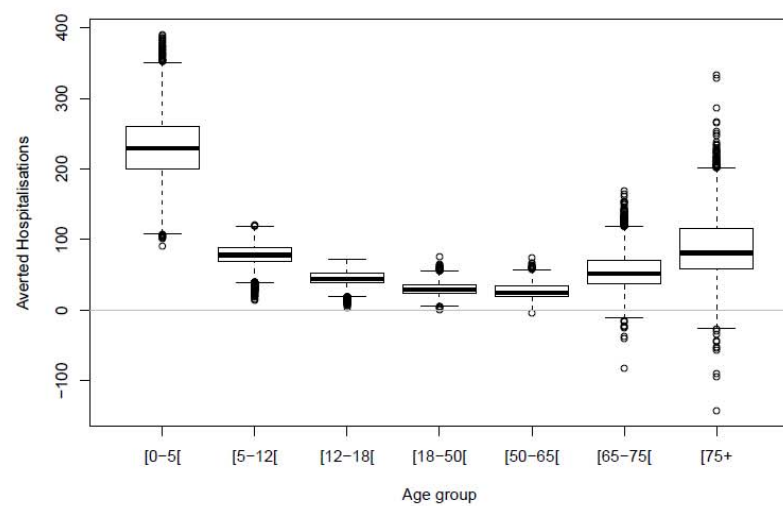
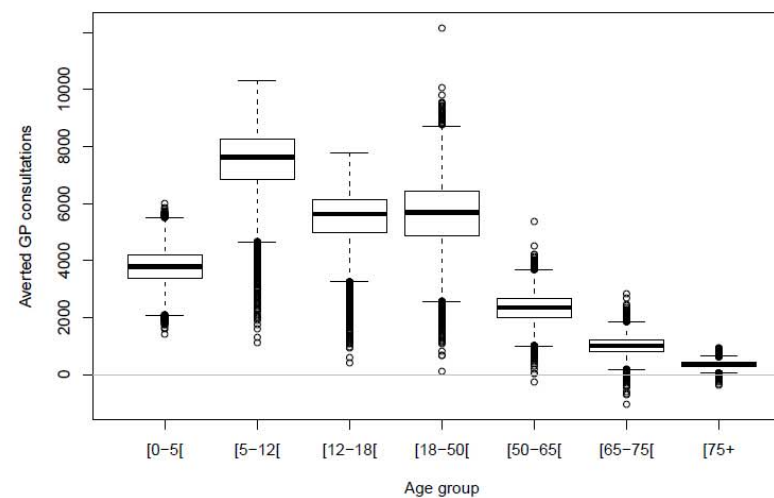
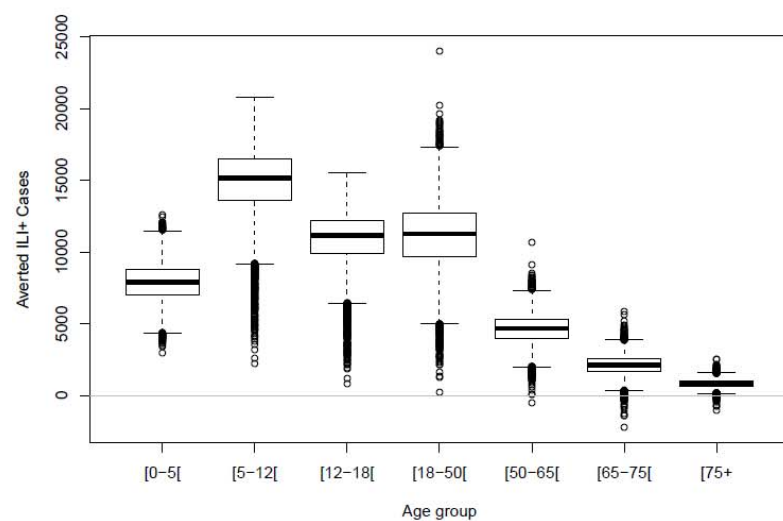
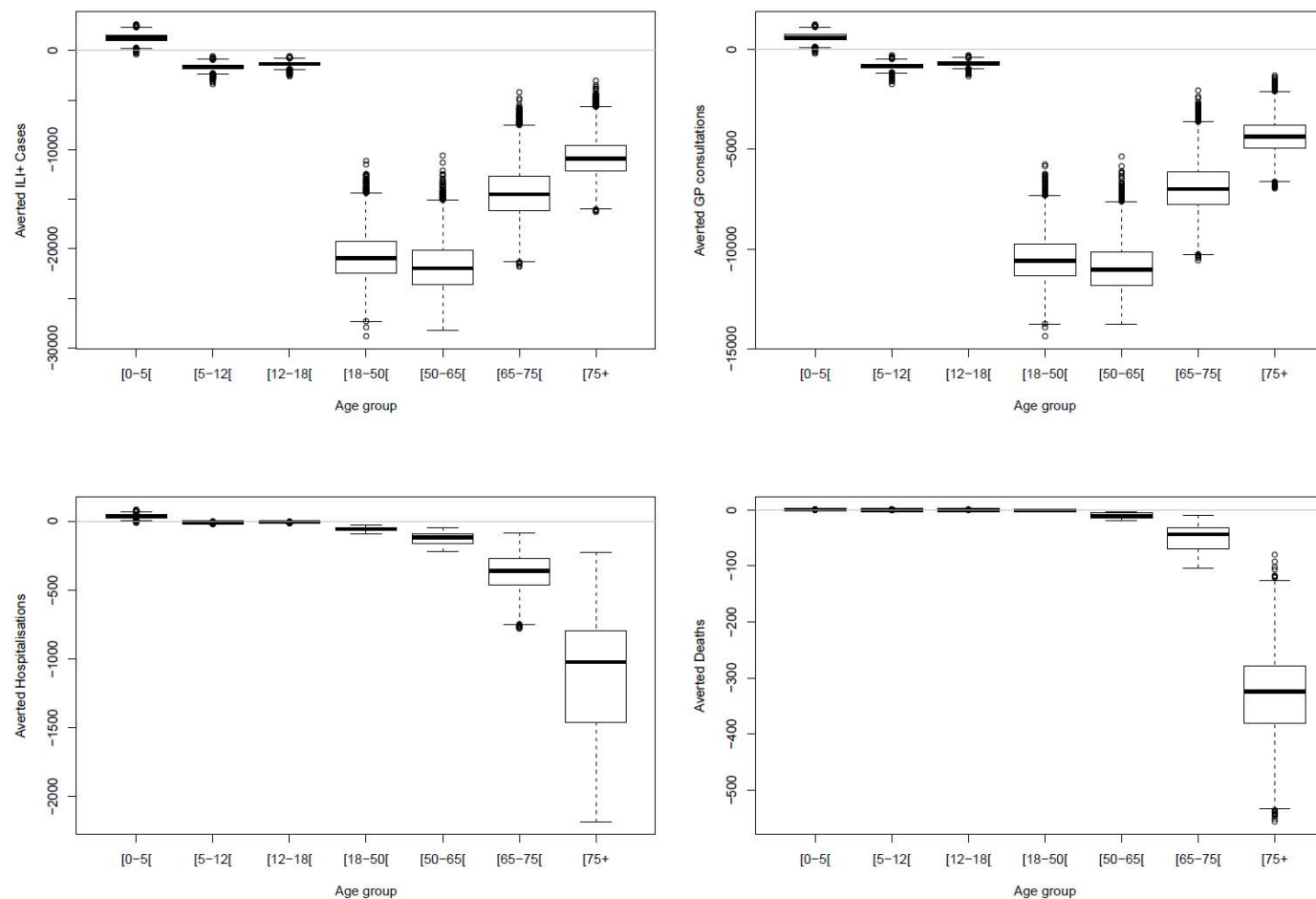
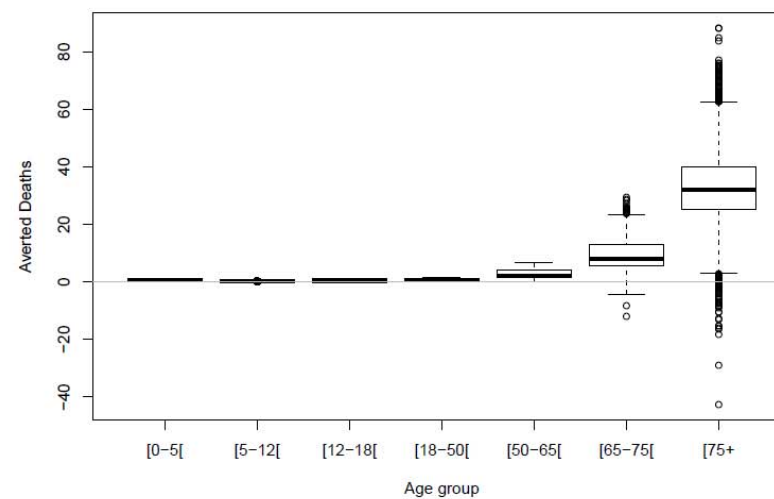
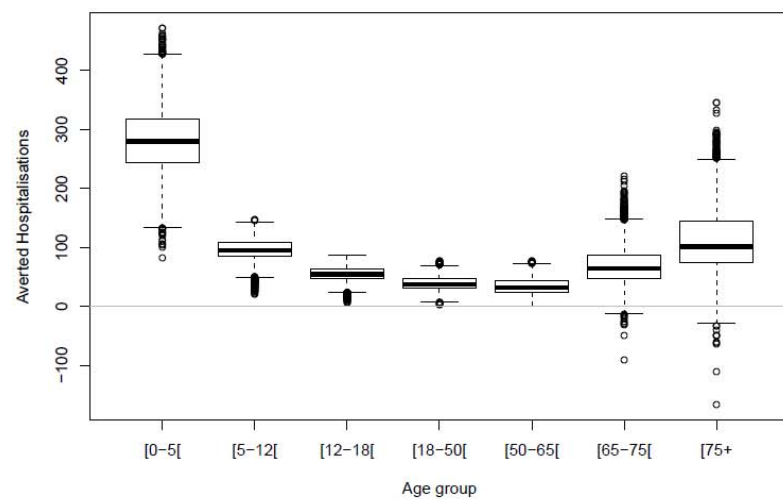
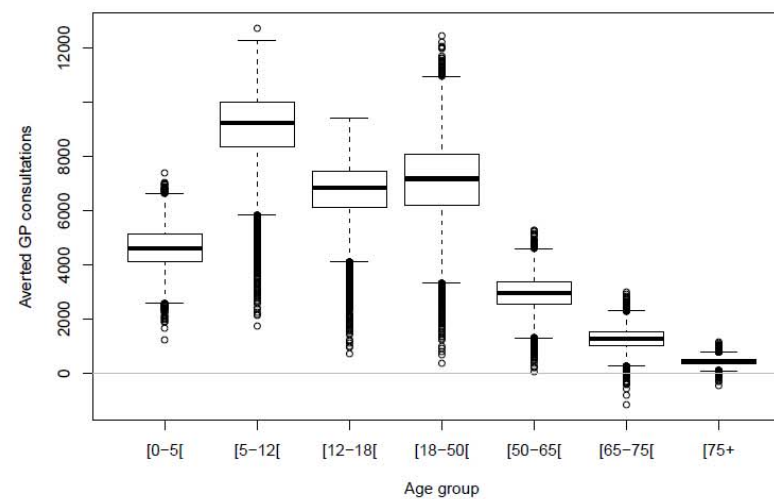
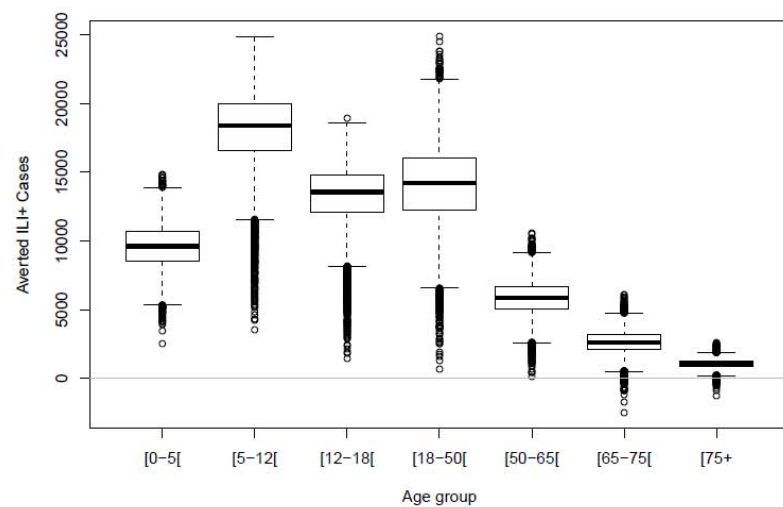




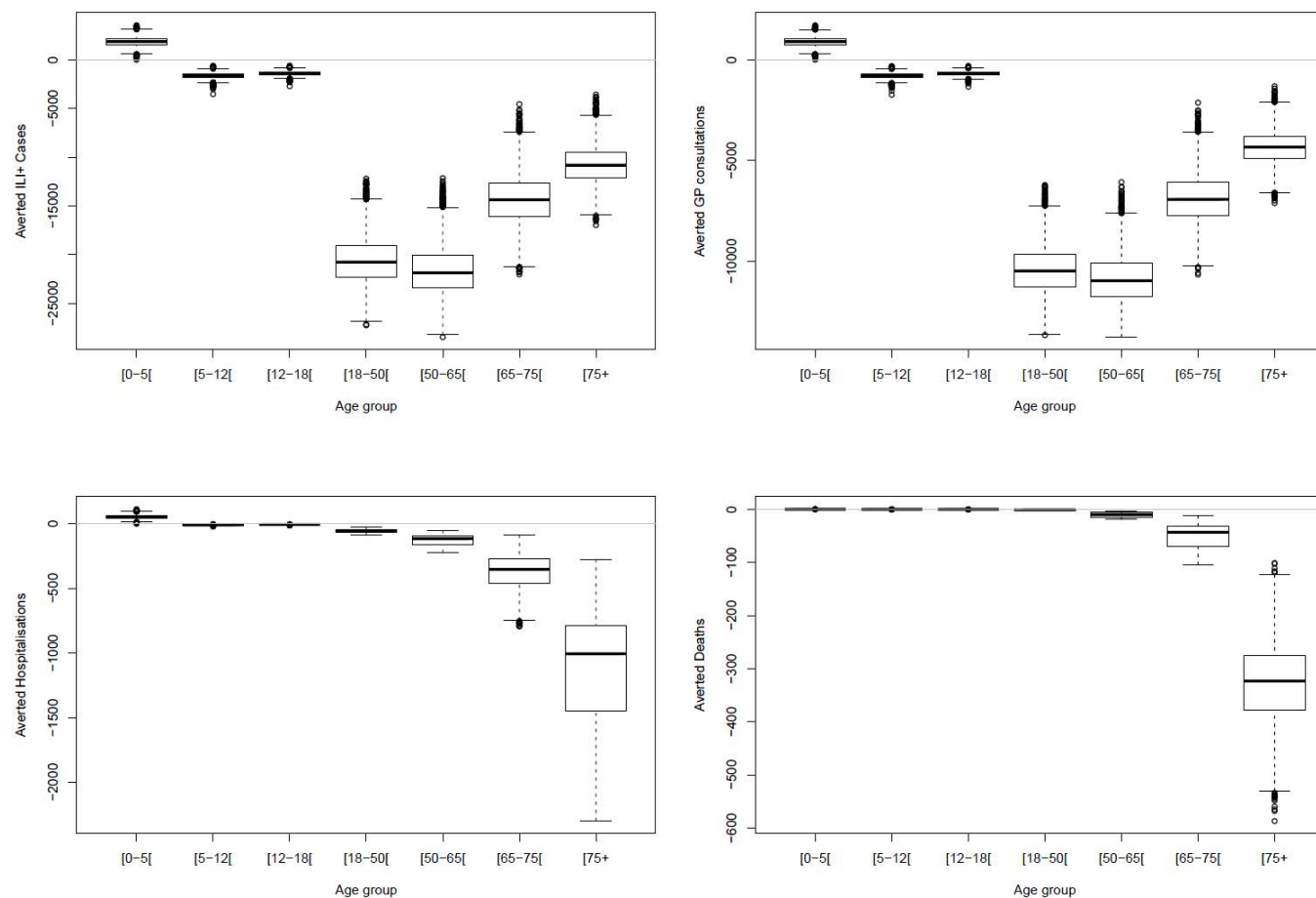
Figure 76 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 50% coverage for the child components of the option, and with immunity lasting an average of 1.68 years

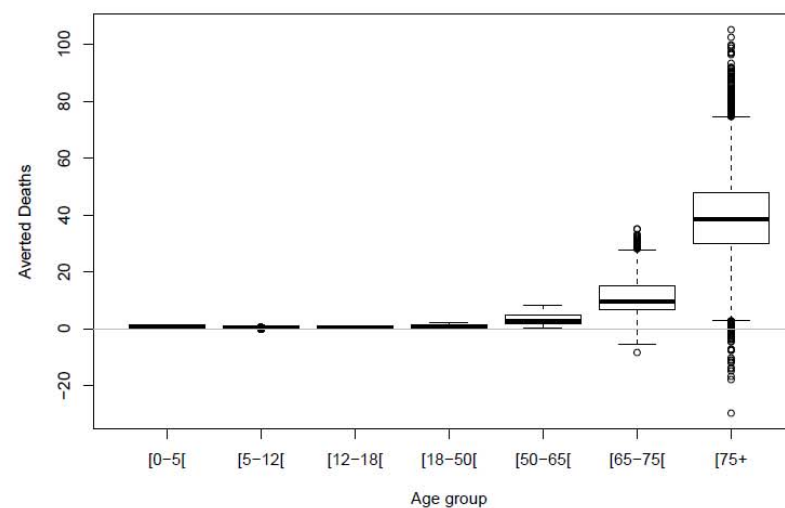
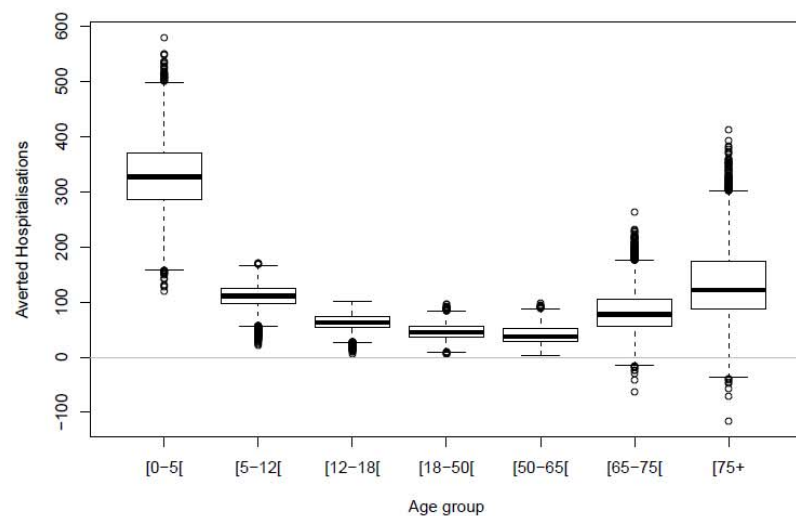
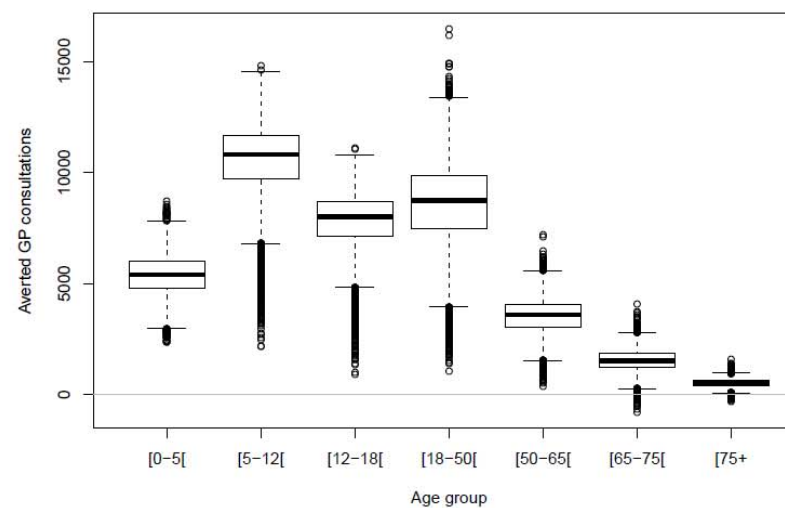
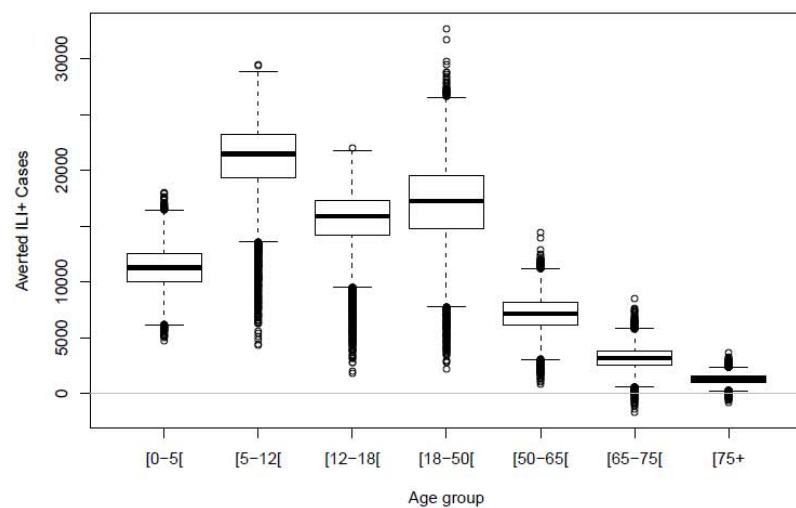






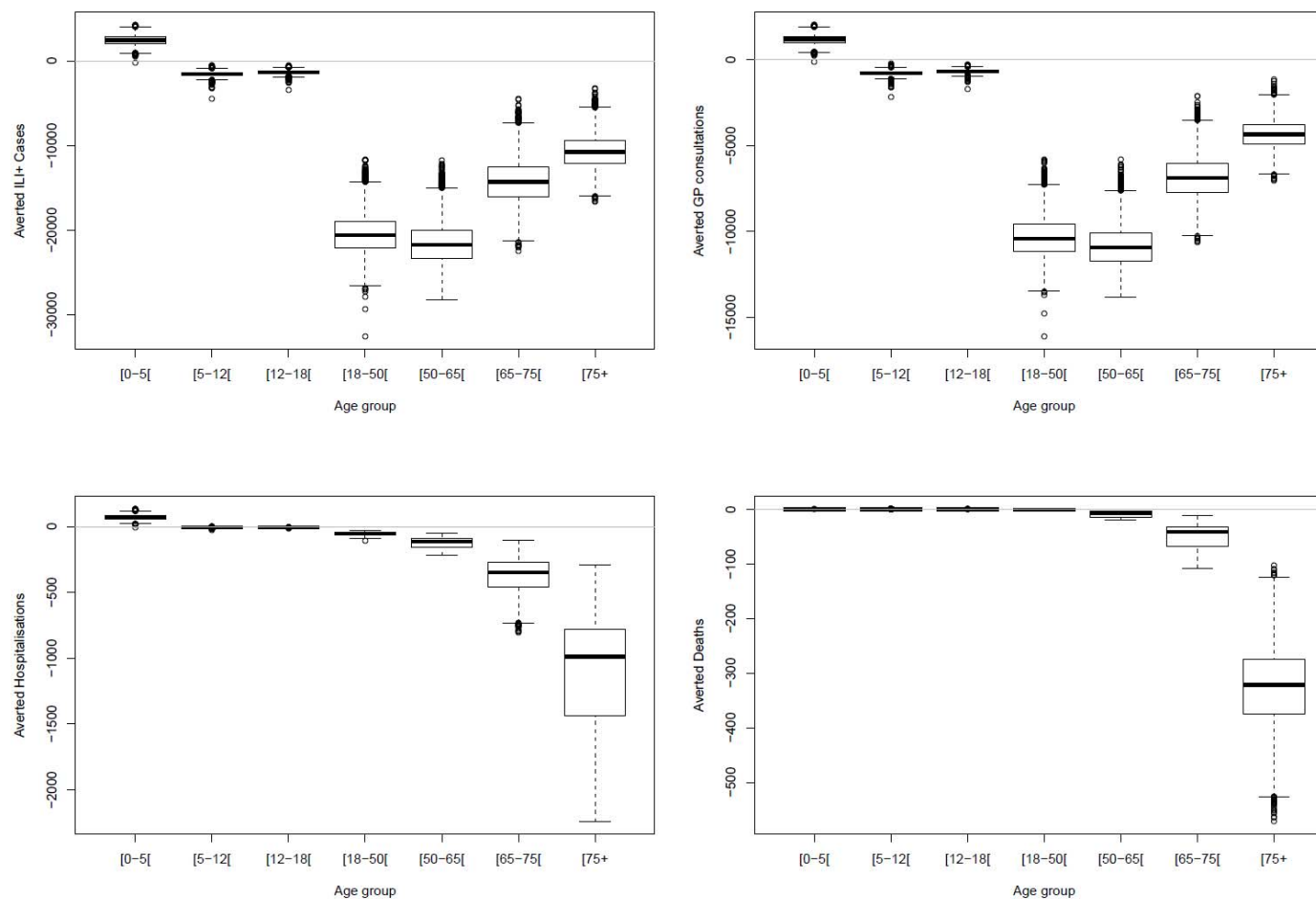
**Figure 77 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 60% coverage for the child components of the option, and with immunity lasting an average of 1.68 years**

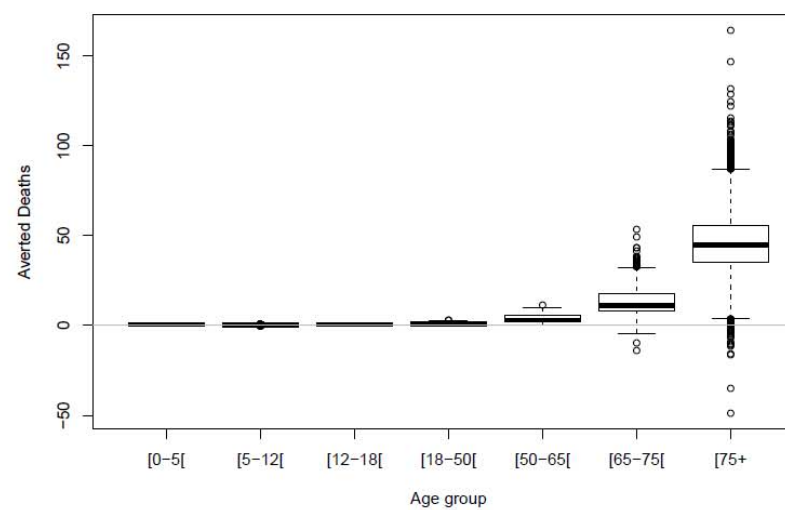
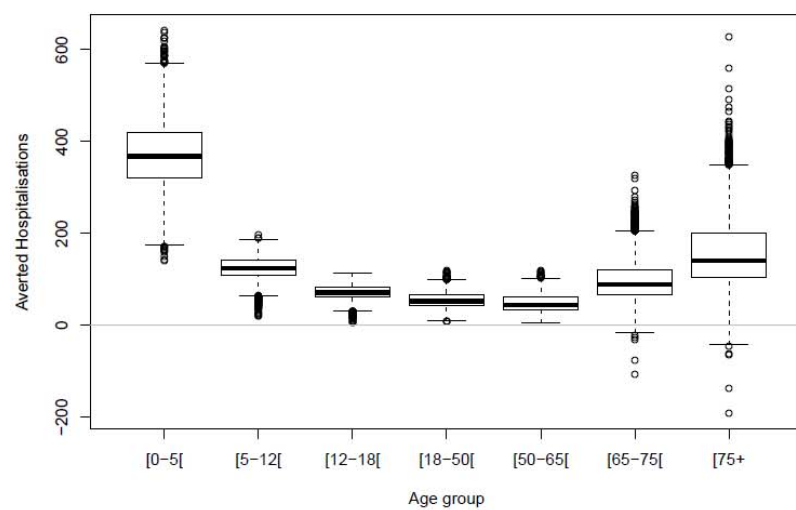
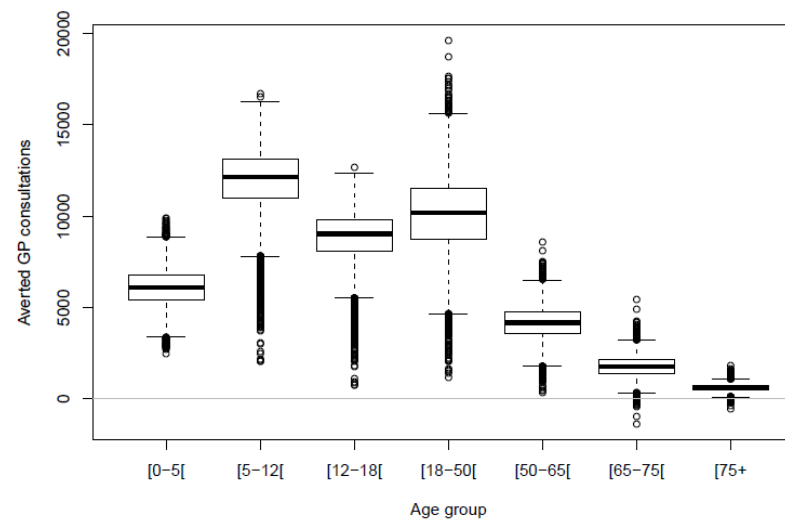
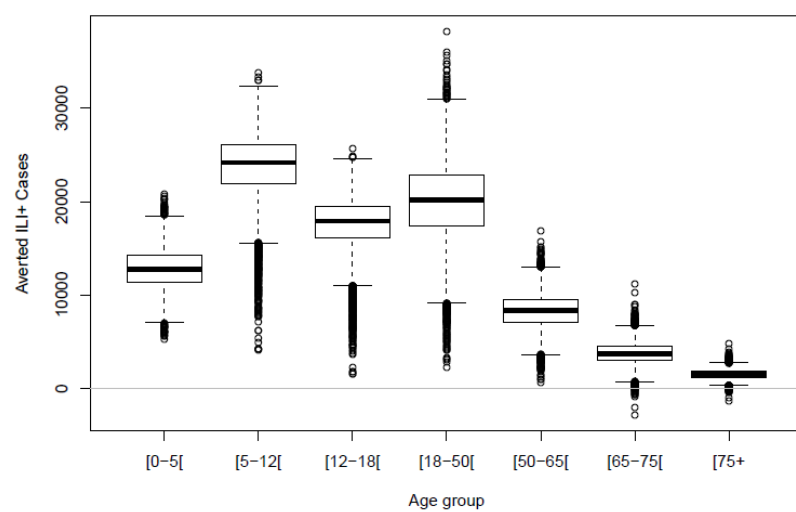






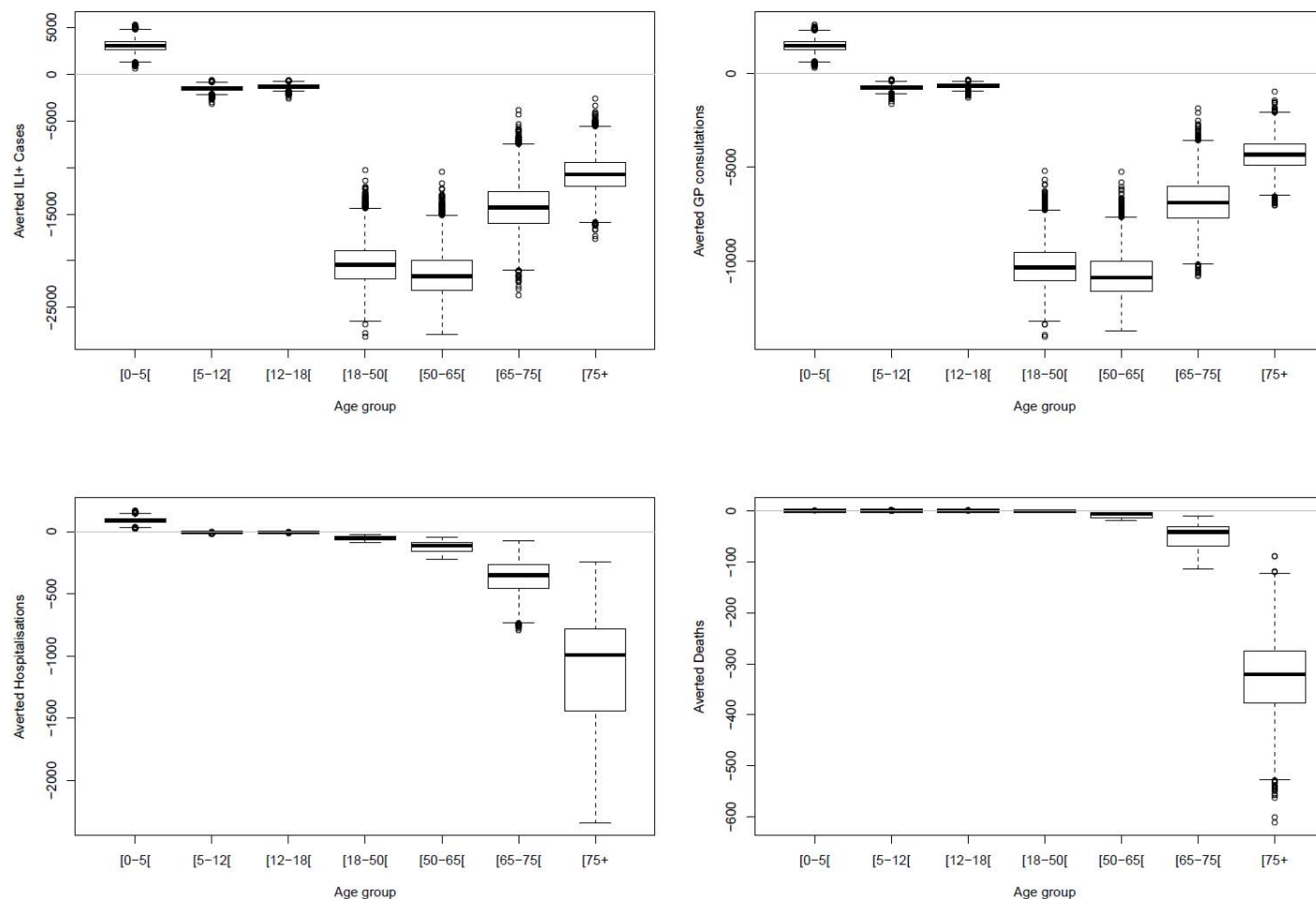
**Figure 78 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 70% coverage for the child components of the option, and with immunity lasting an average of 1.68 years**







**Figure 79 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 80% coverage for the child components of the option, and with immunity lasting an average of 1.68 years**



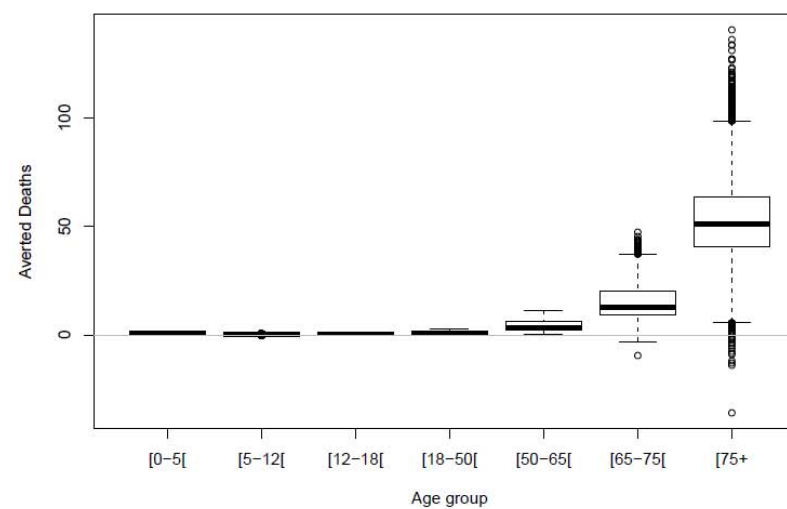
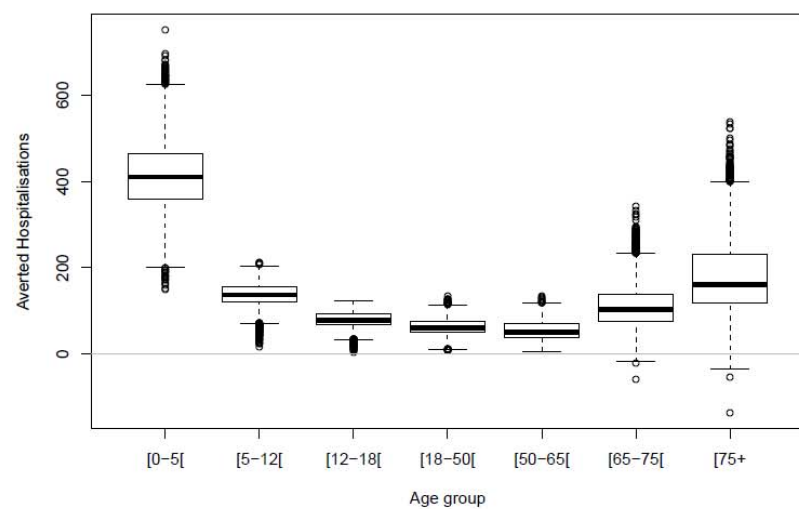
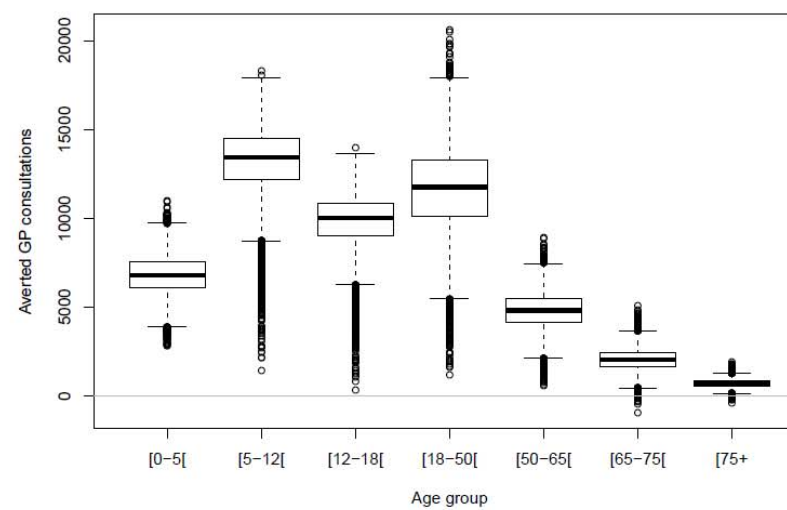
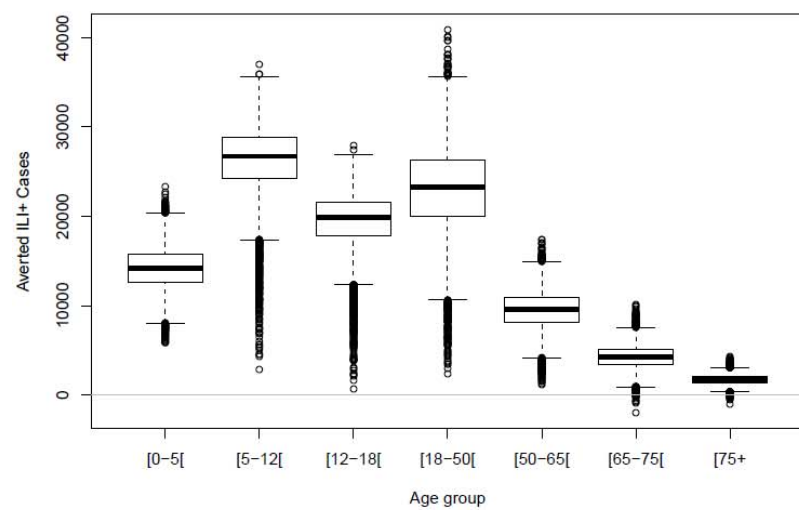
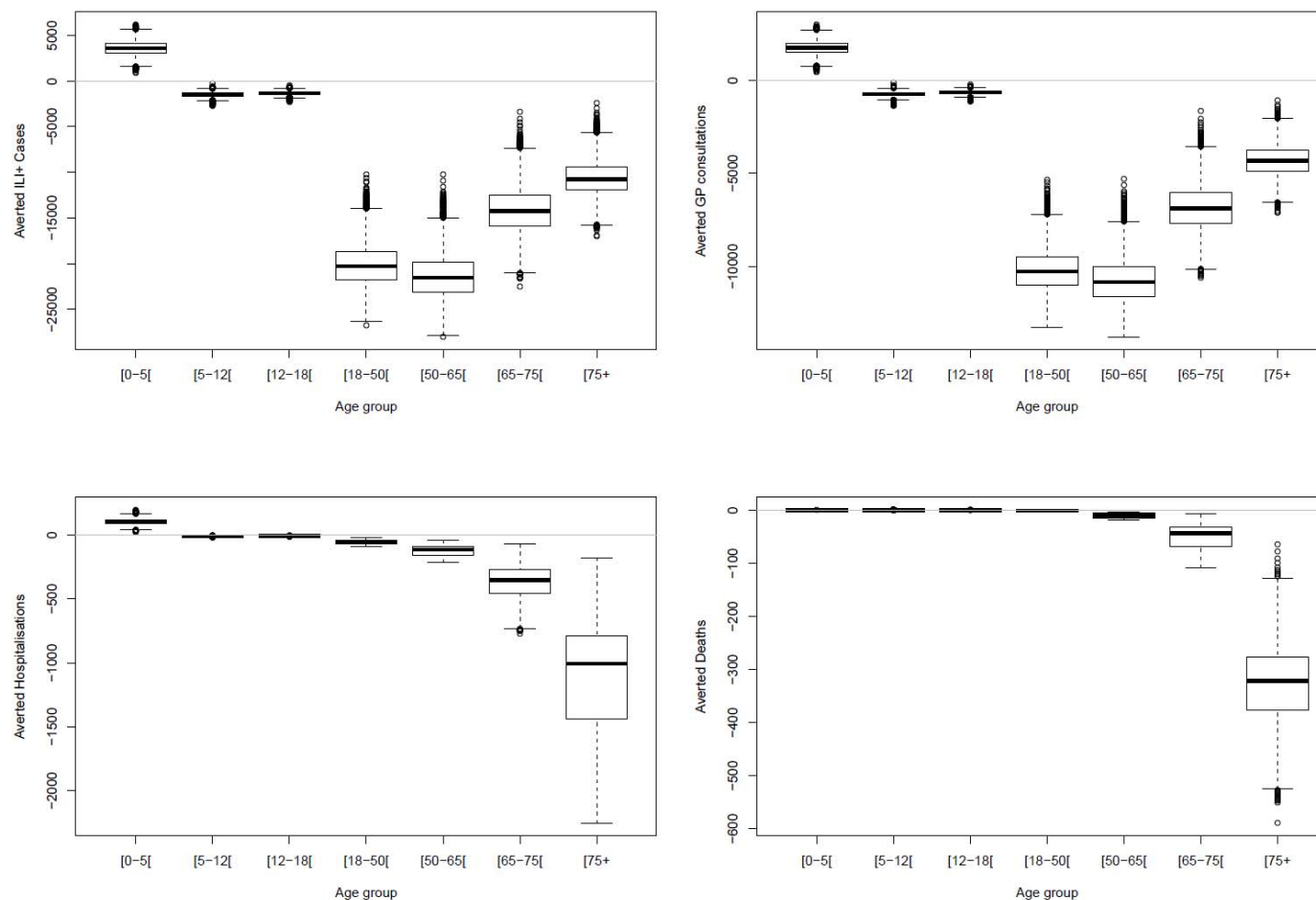
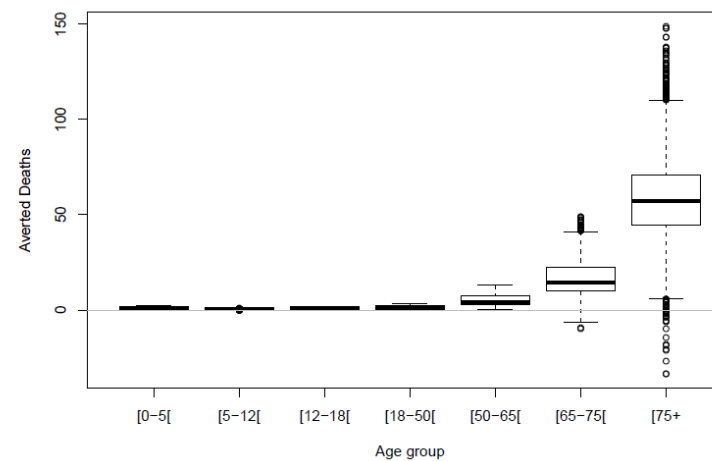
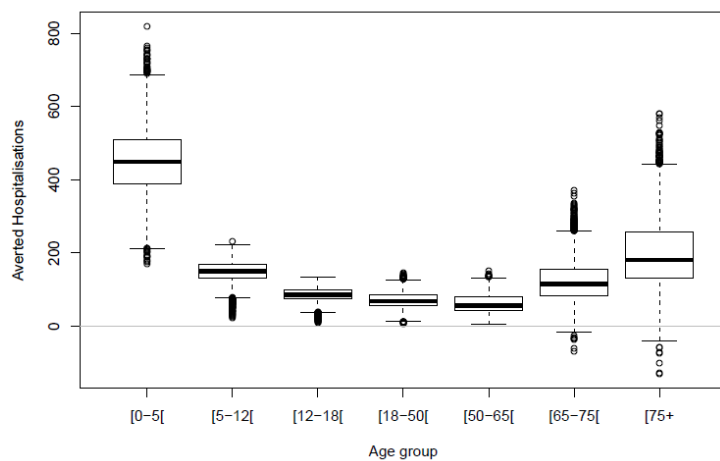
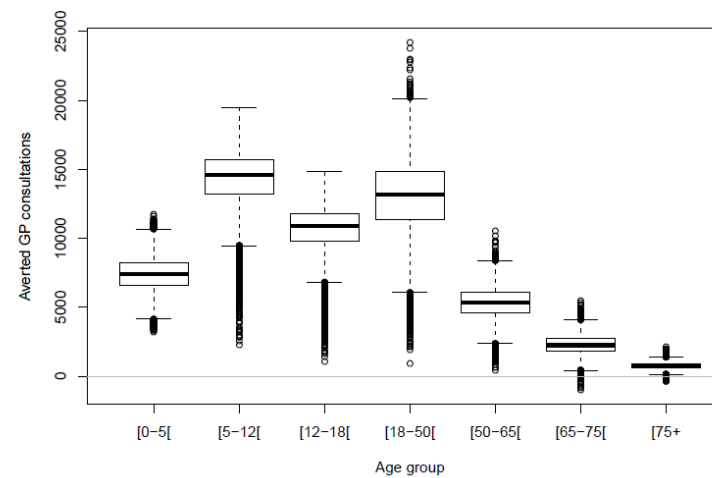
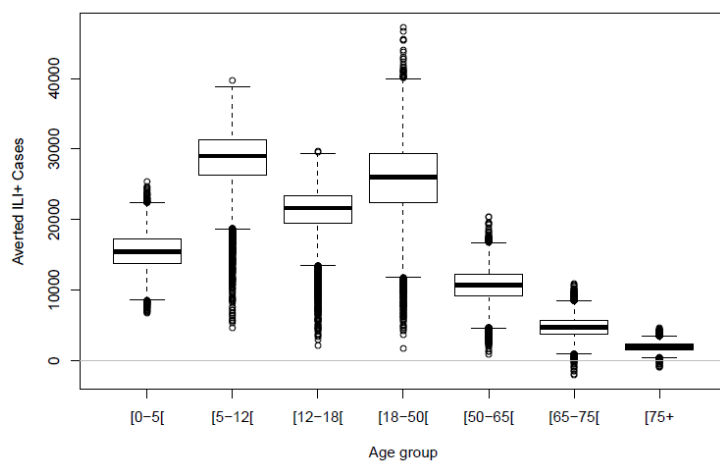




Figure 80 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c1) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 90% coverage for the child components of the option, and with immunity lasting an average of 1.68 years



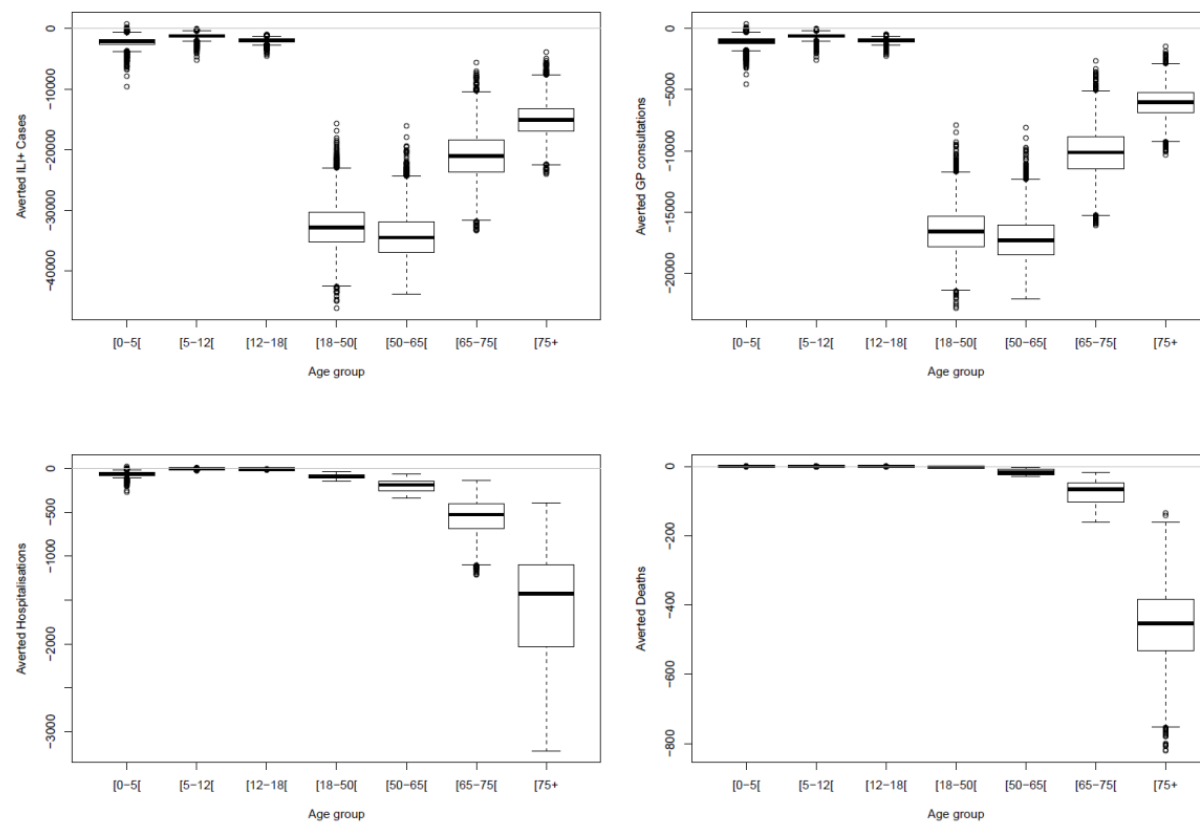


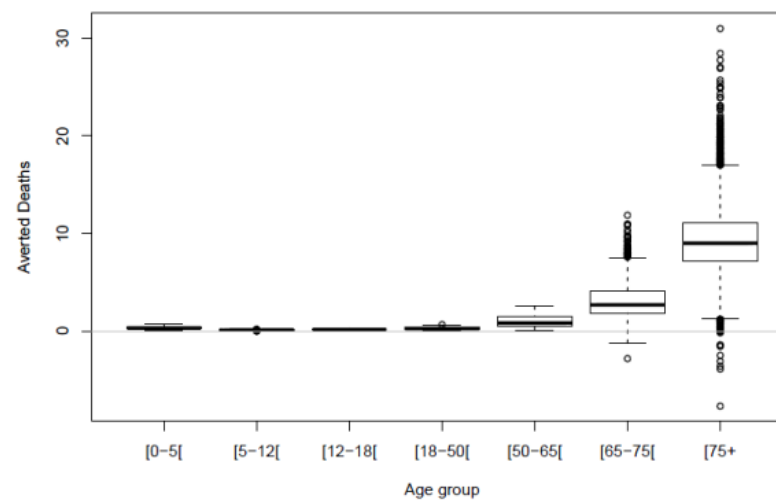
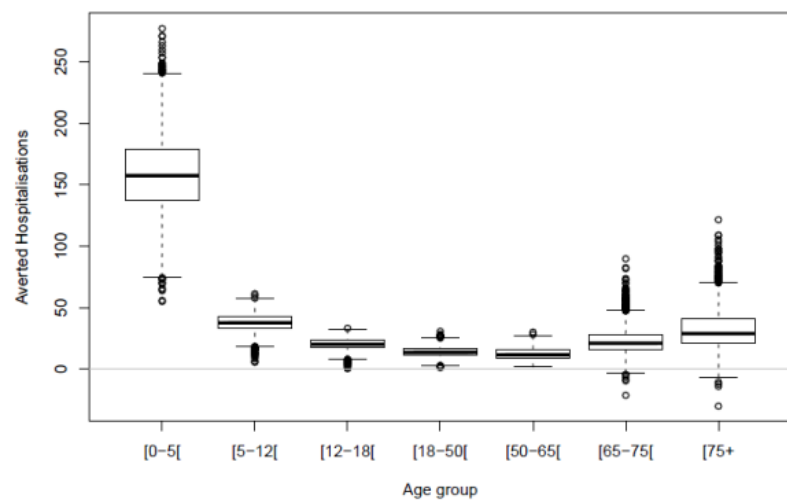
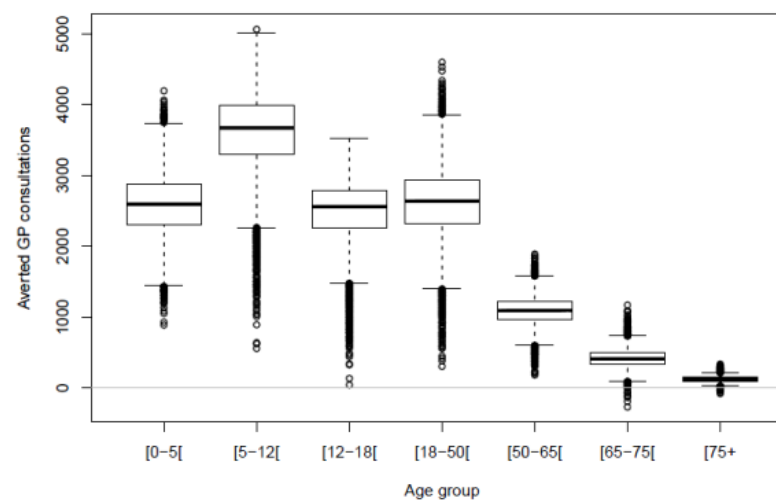
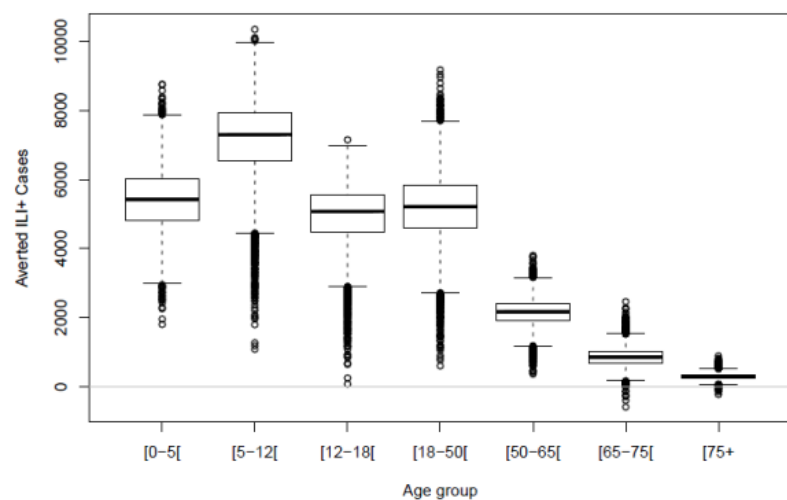


## 4.6. Modified children options + modified adult vaccination reduction (waning immunity fixed at 6 years)

### 4.6.1. Effectiveness versus current situation

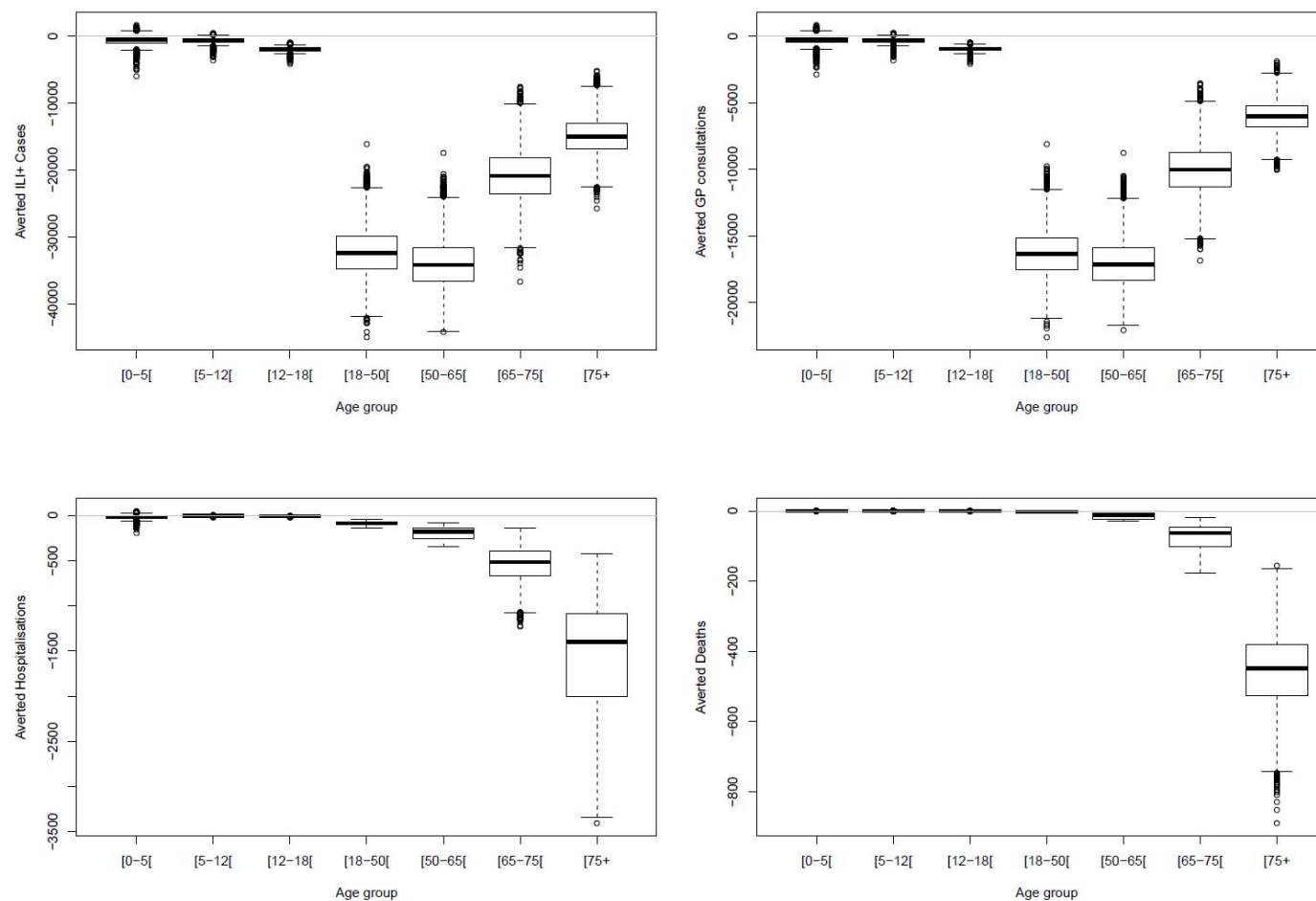
Figure 81 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 10% coverage for the child components of the option, and with immunity lasting an average of 6 years







**Figure 82 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 20% coverage for the child components of the option, and with immunity lasting an average of 6 years**



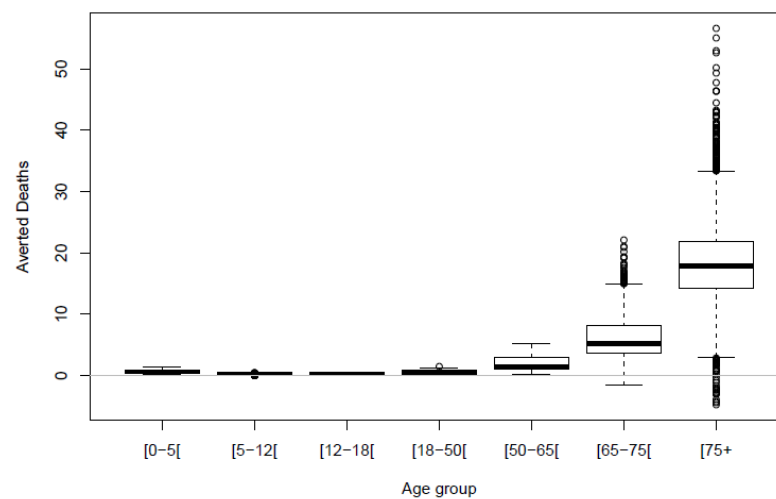
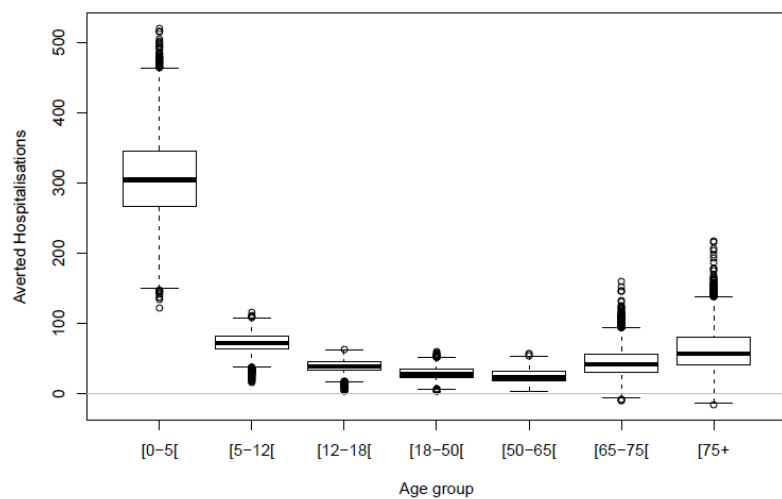
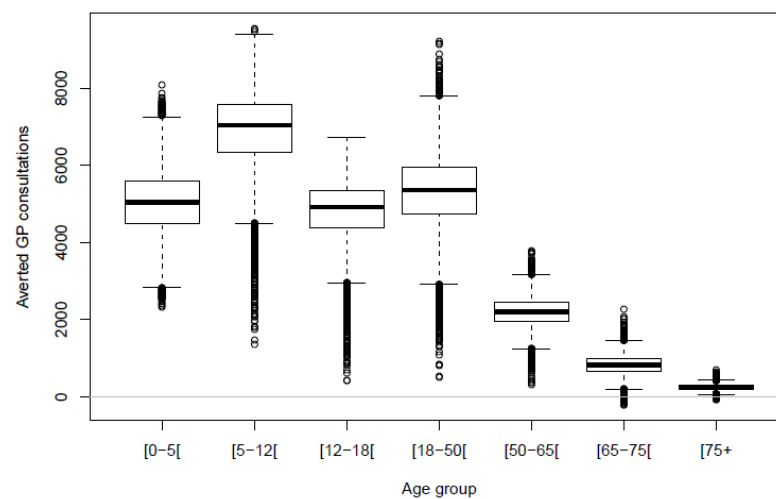
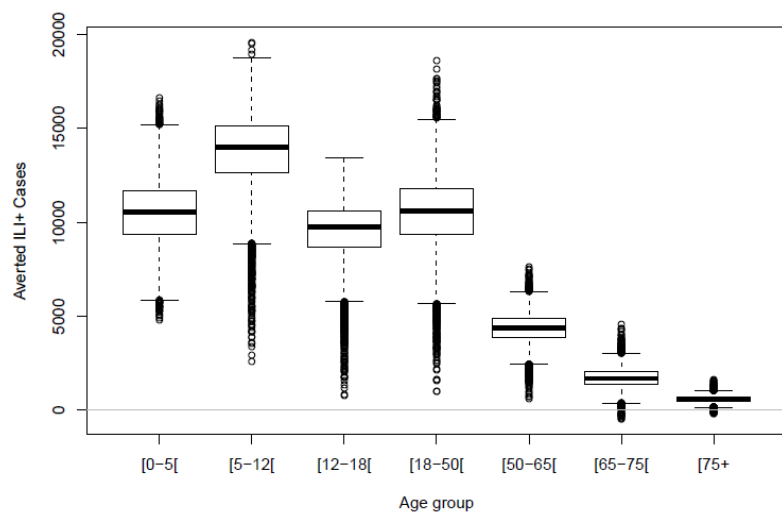
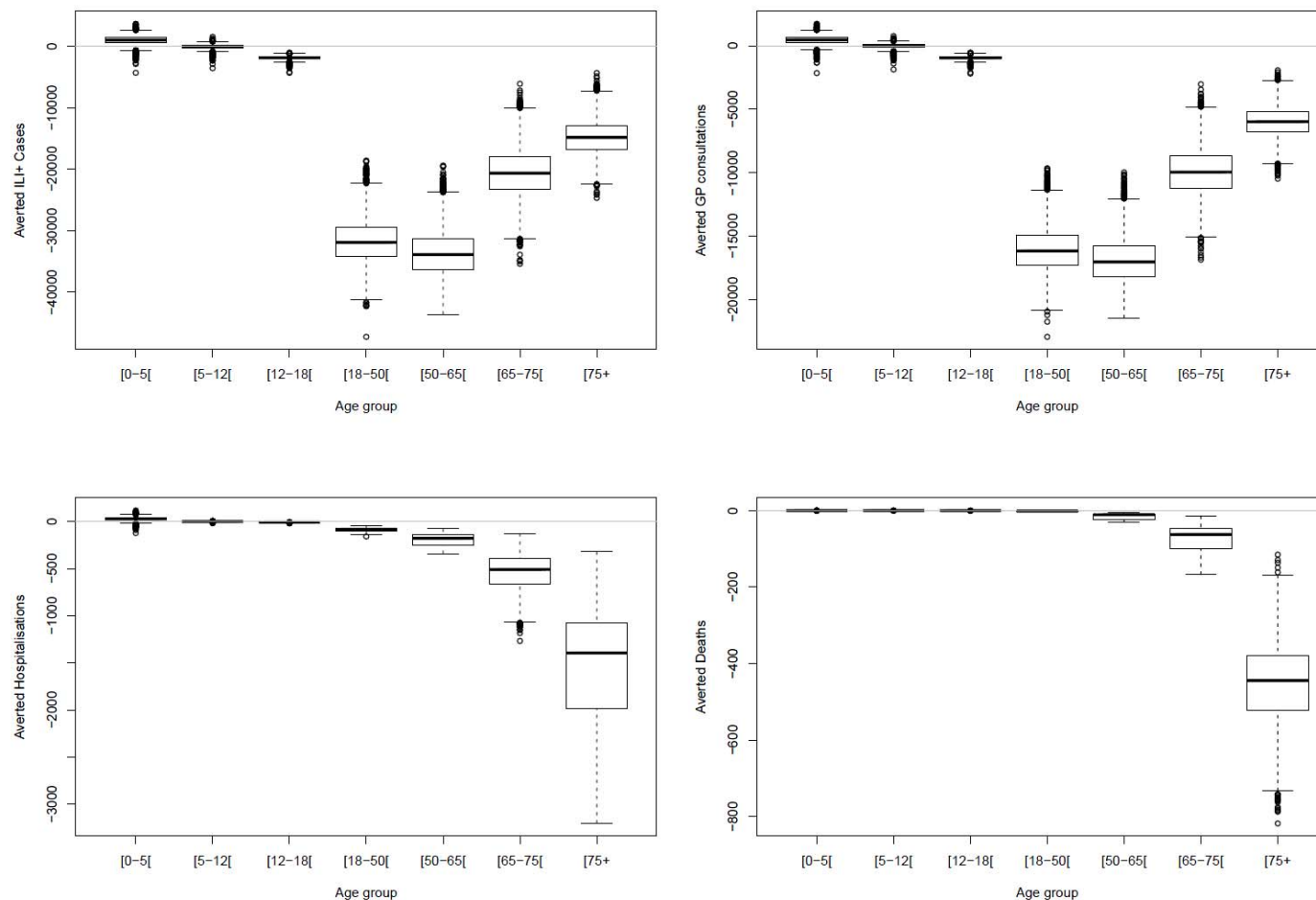




Figure 83 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 30% coverage for the child components of the option, and with immunity lasting an average of 6 years



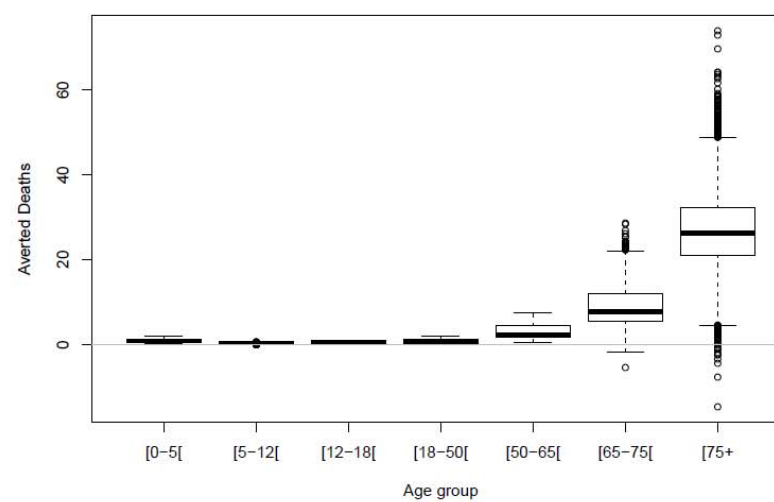
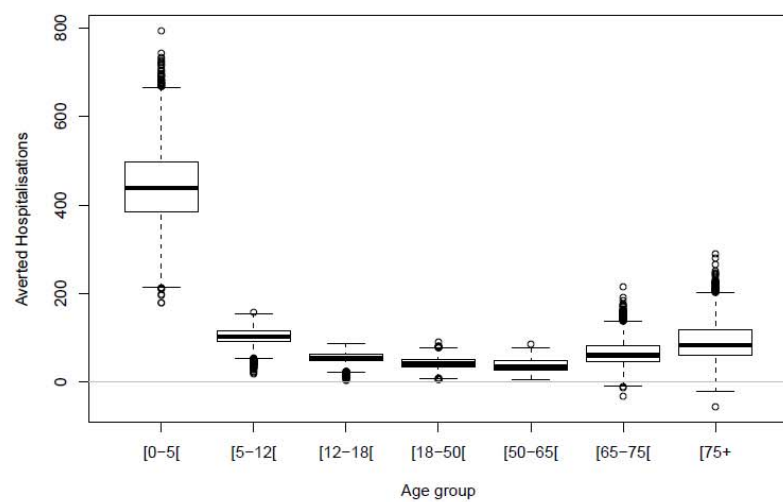
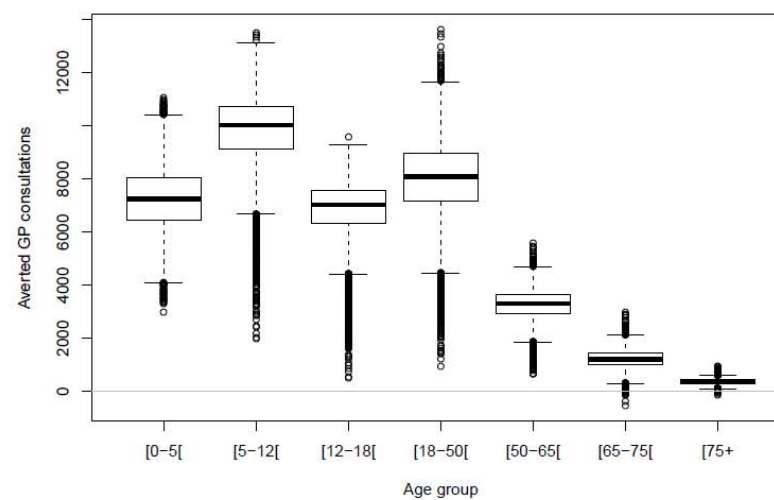
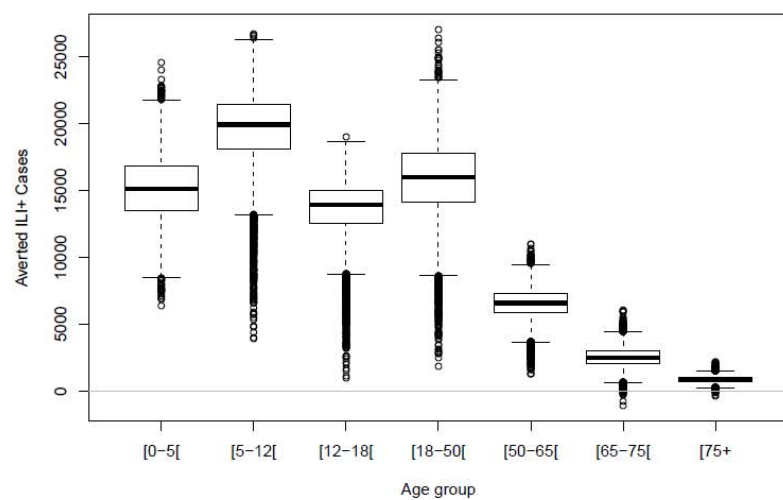
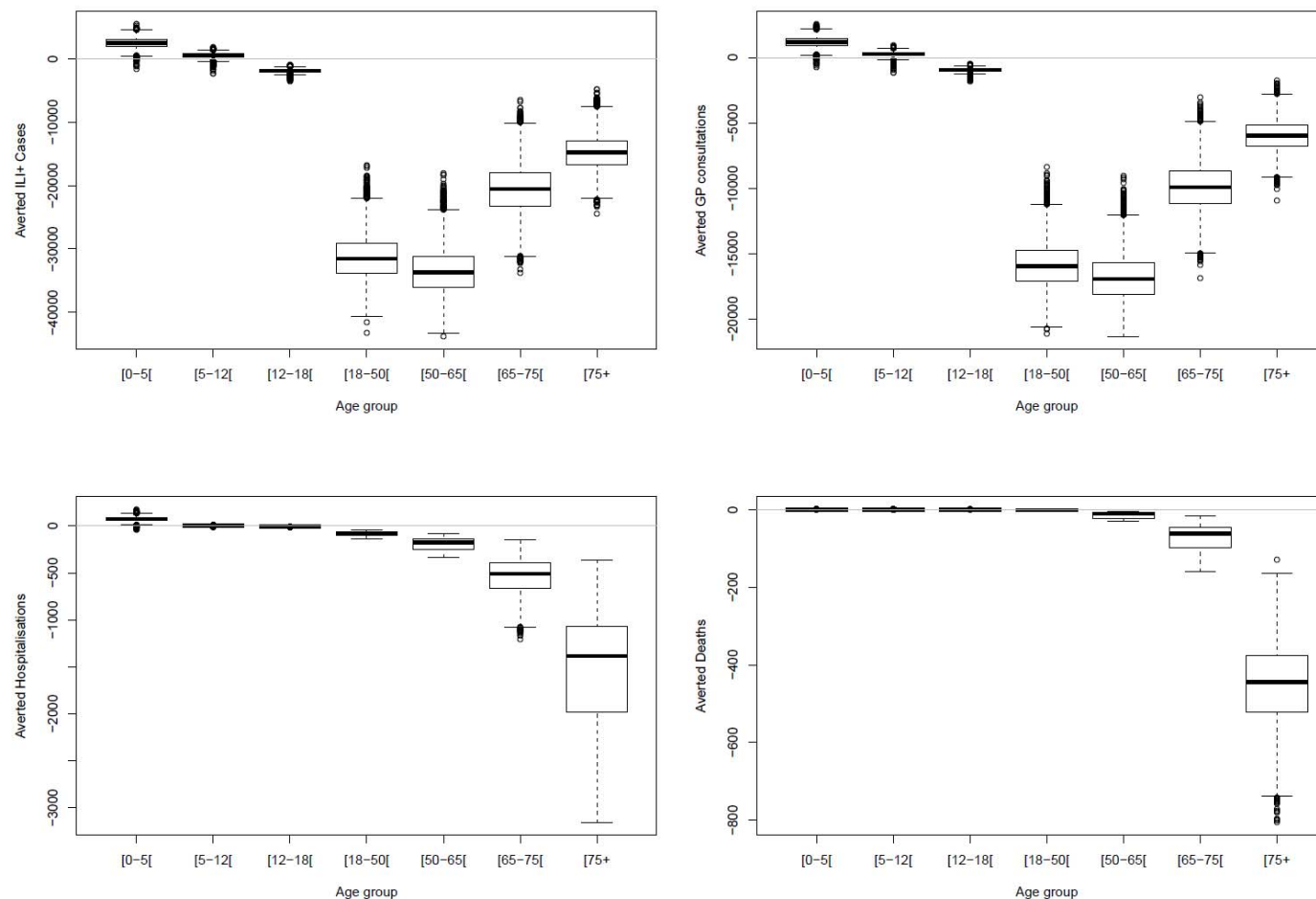




Figure 84 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 40% coverage for the child components of the option, and with immunity lasting an average of 6 years



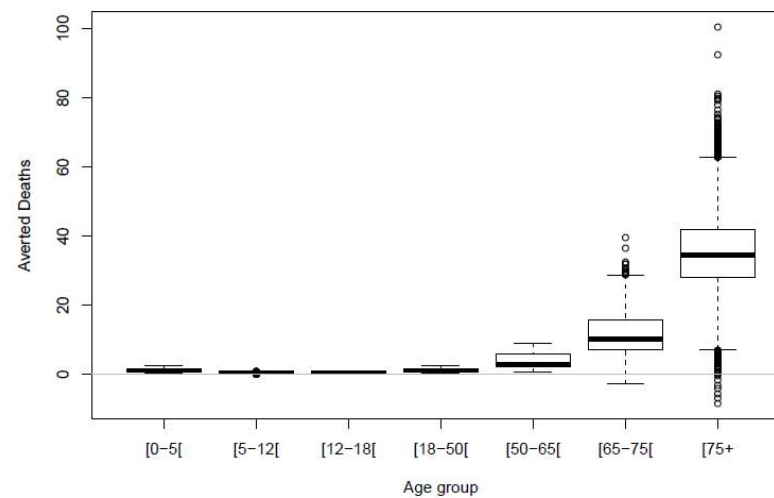
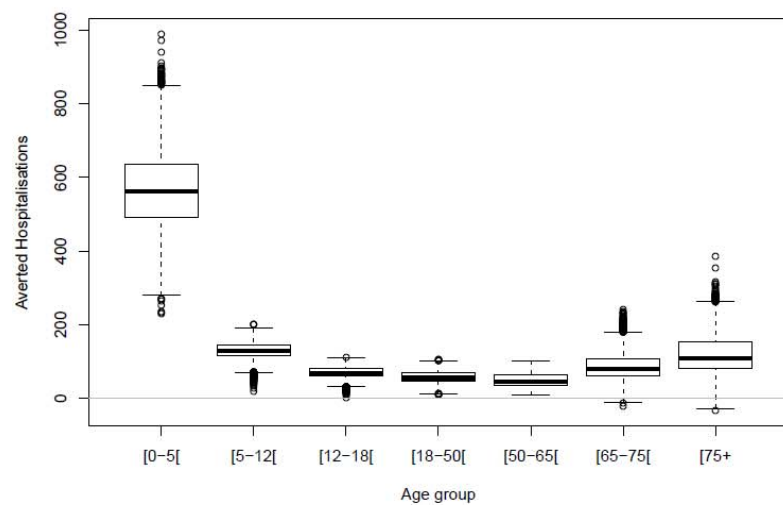
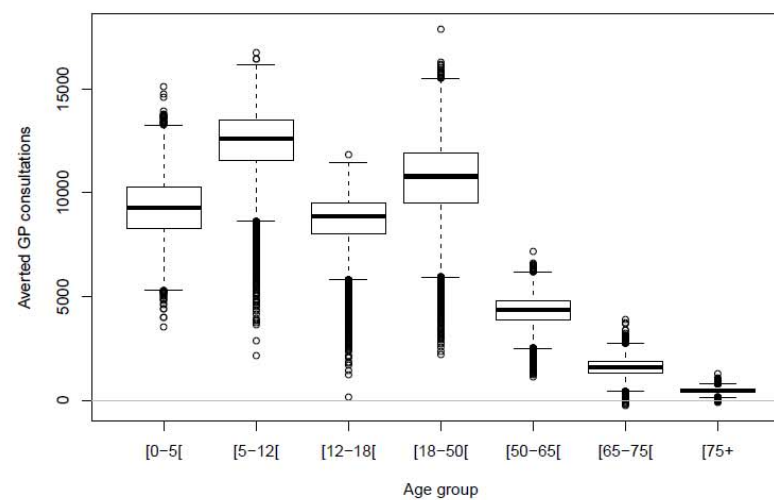
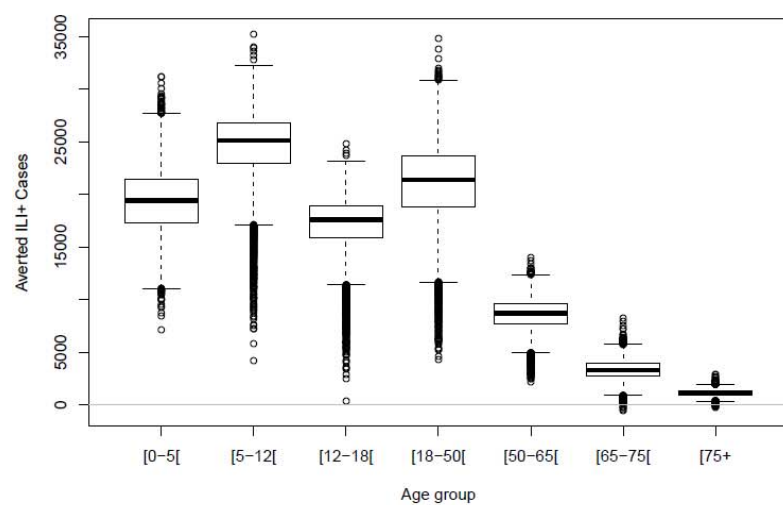
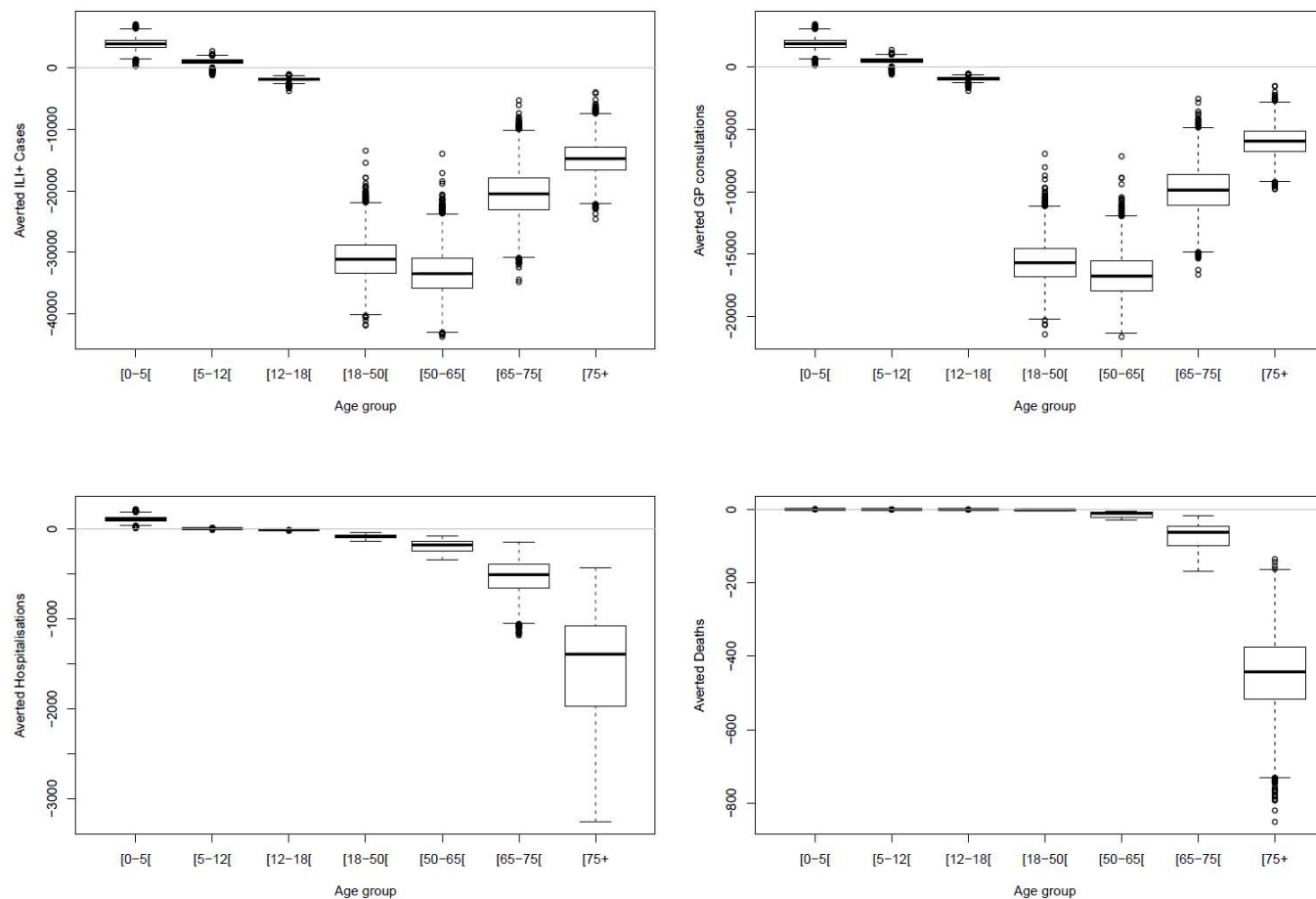




Figure 85 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 50% coverage for the child components of the option, and with immunity lasting an average of 6 years



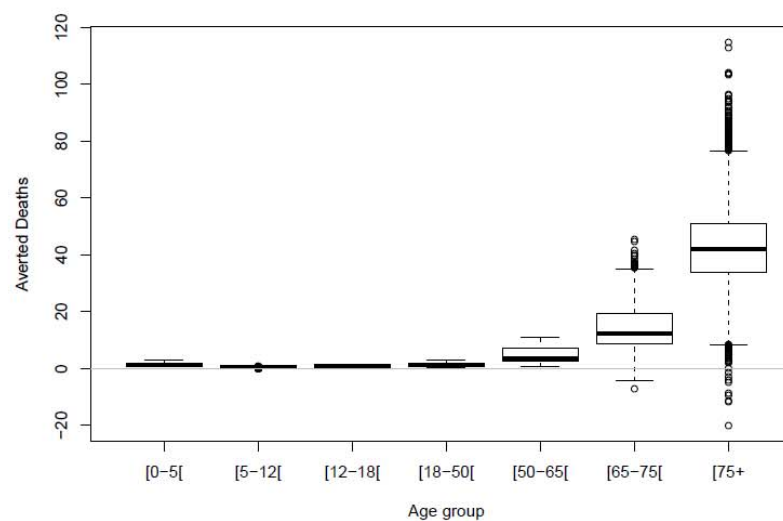
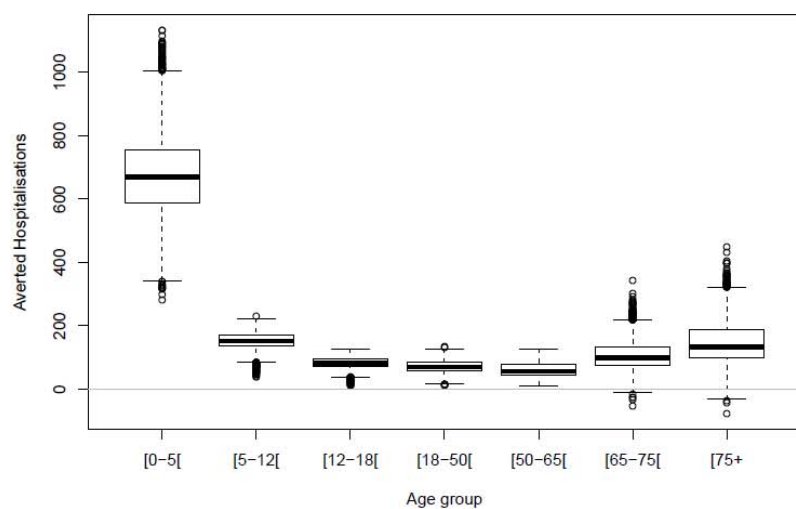
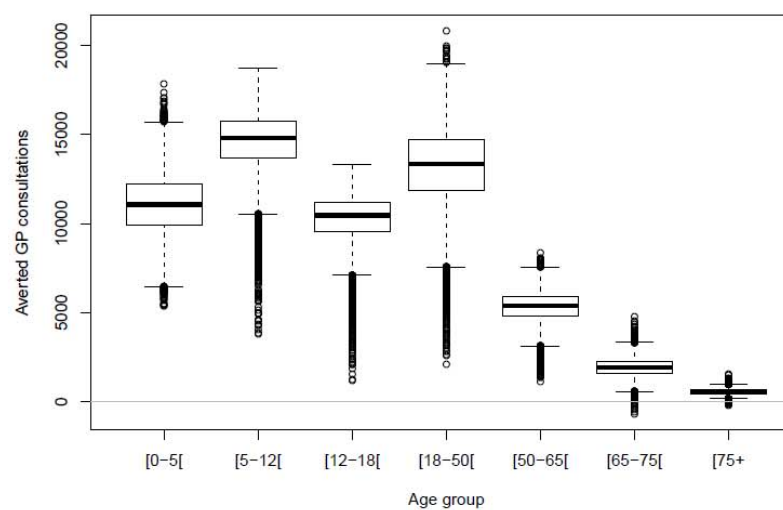
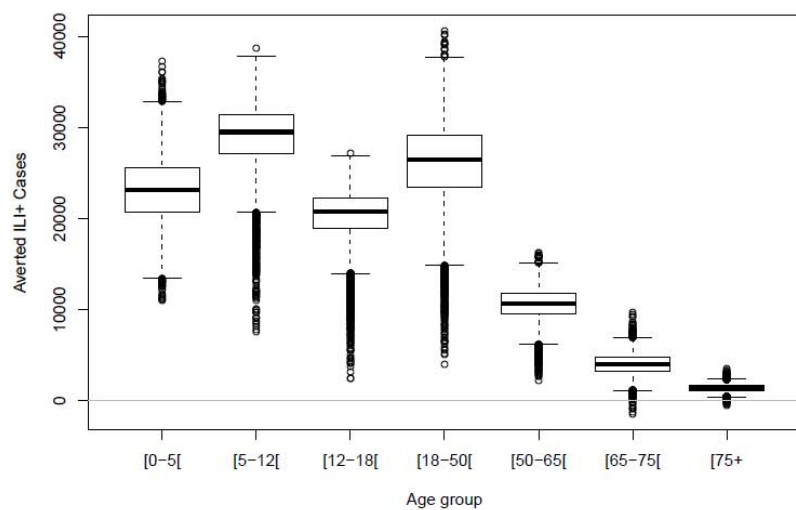
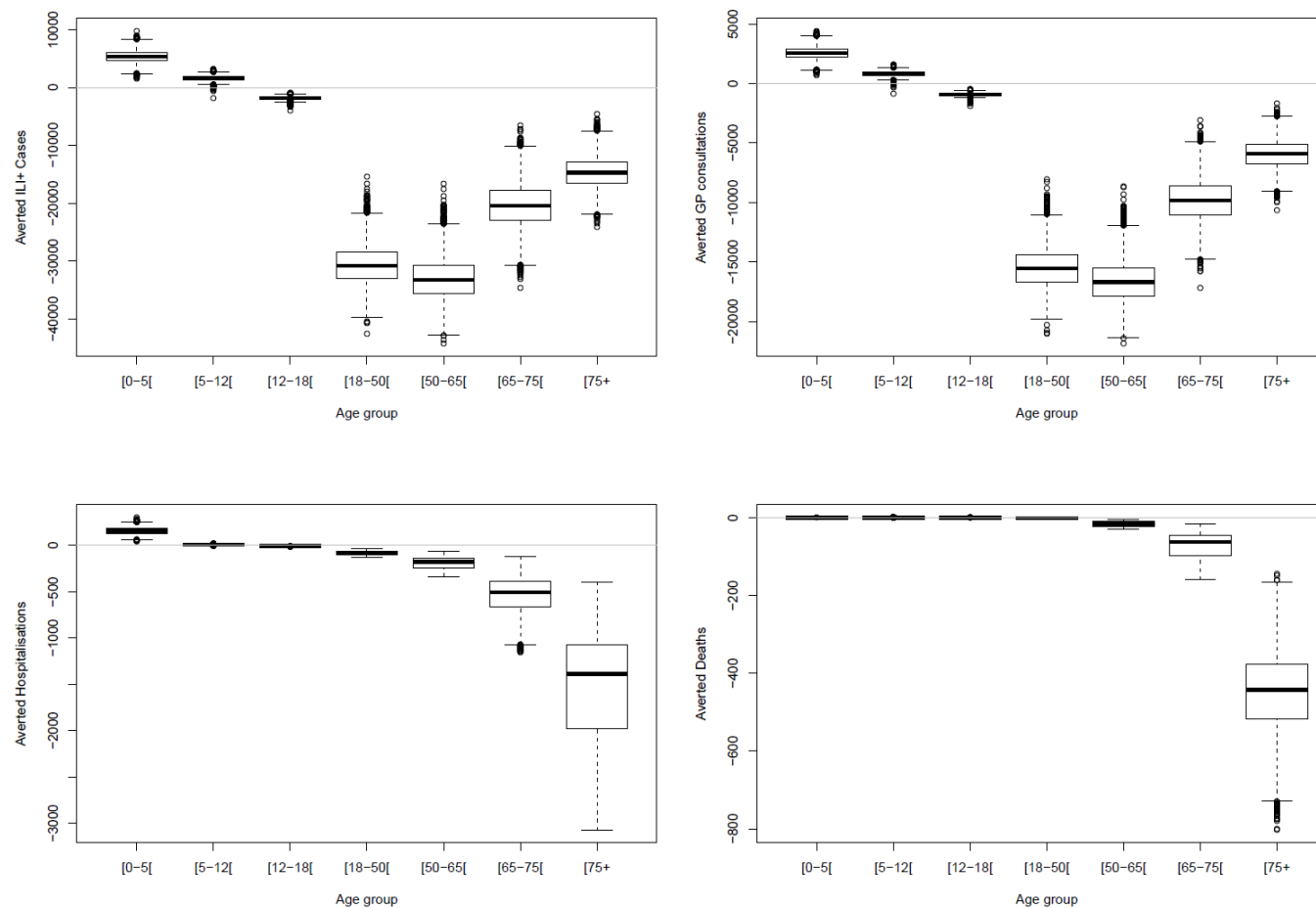




Figure 86 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 60% coverage for the child components of the option, and with immunity lasting an average of 6 years



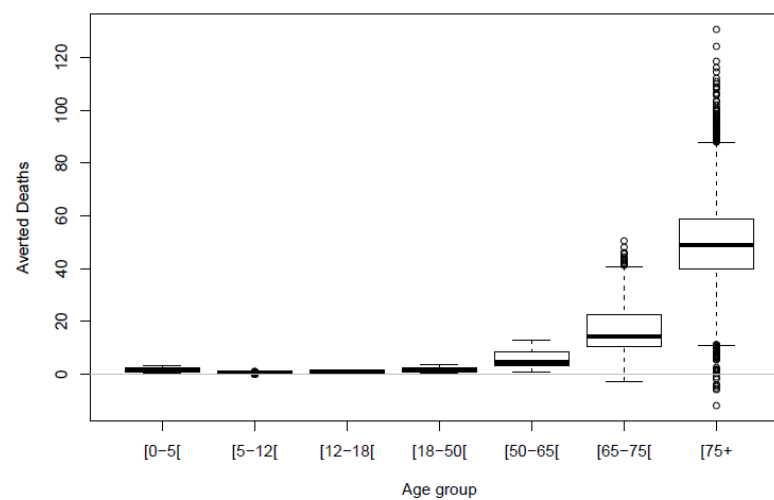
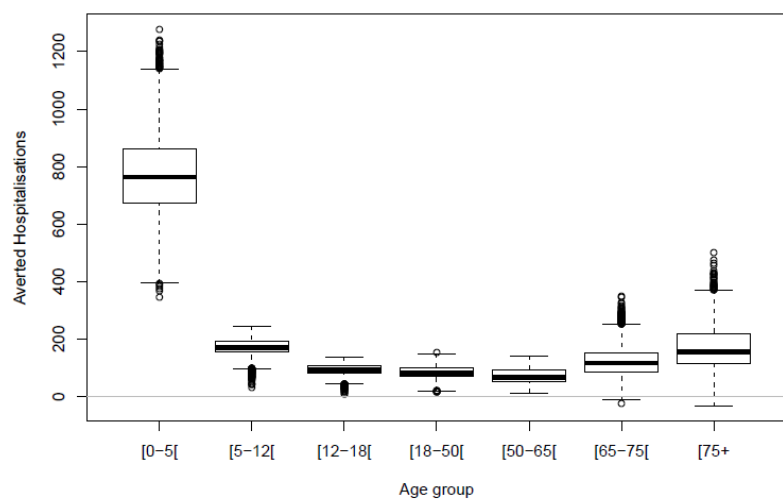
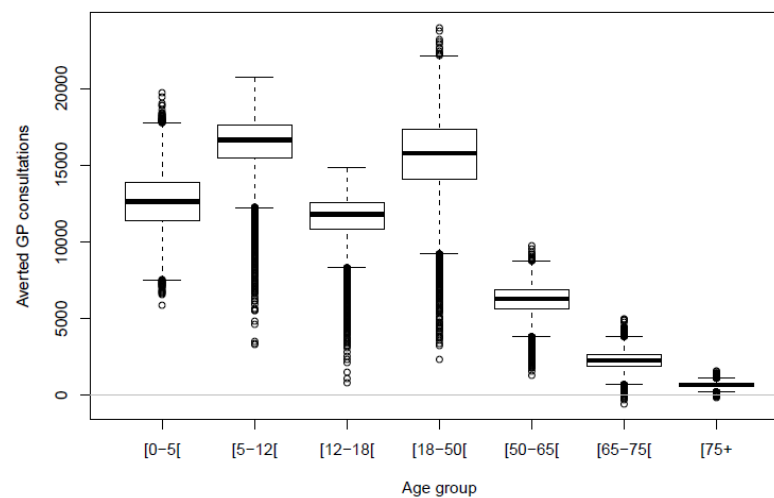
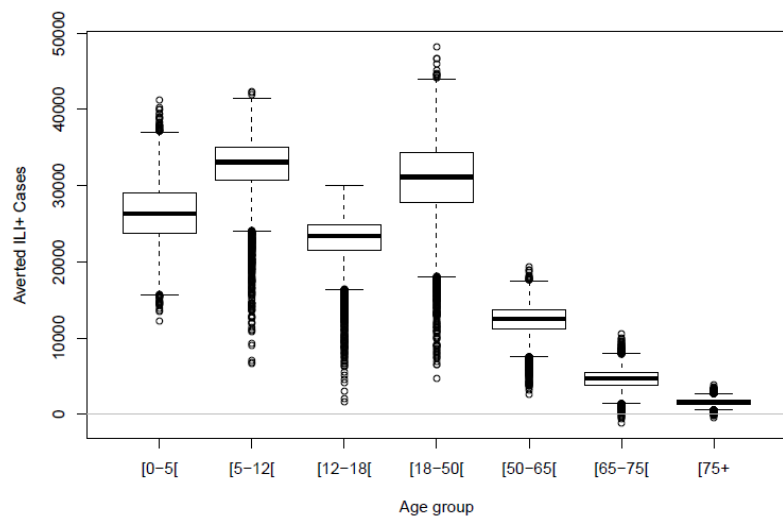
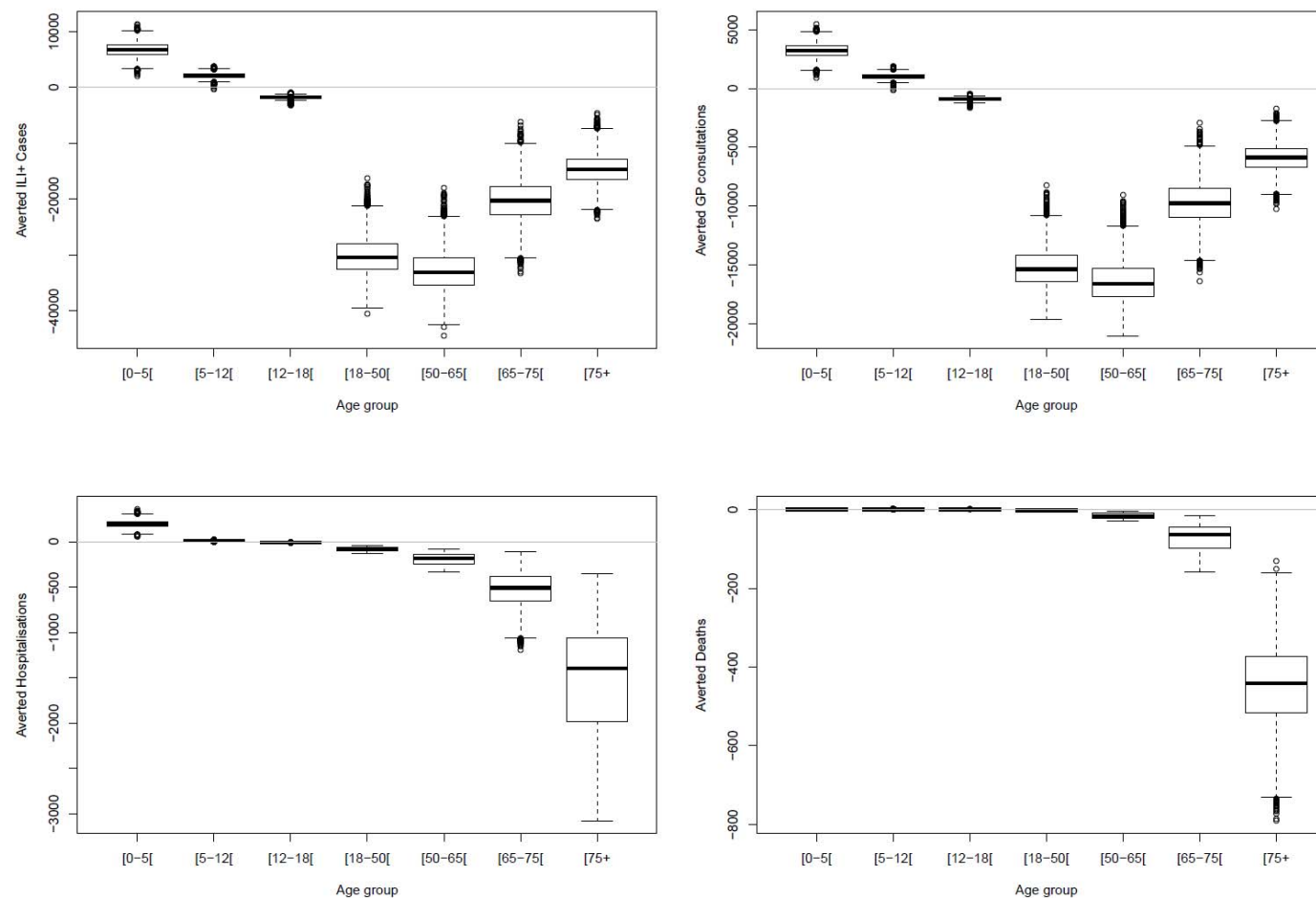
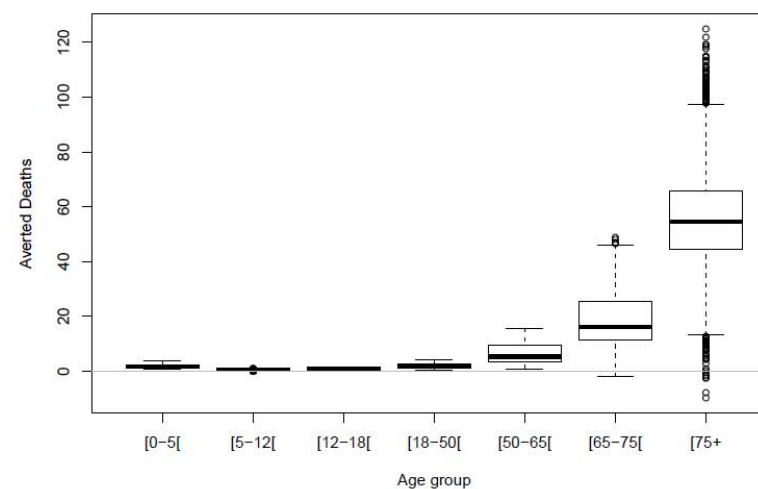
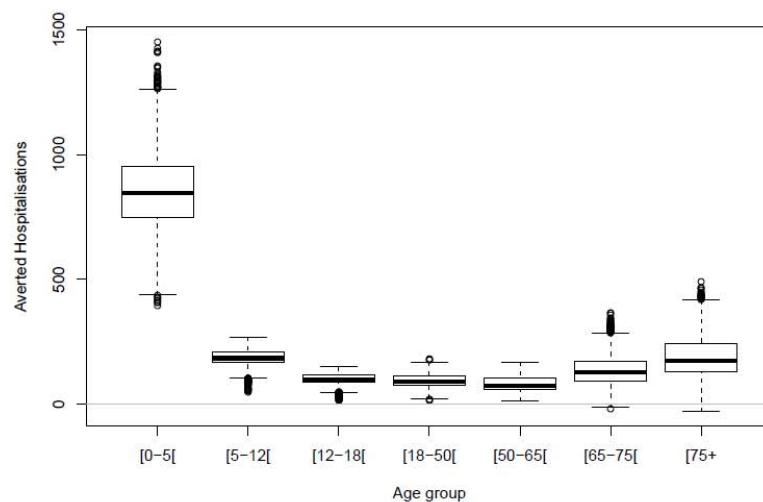
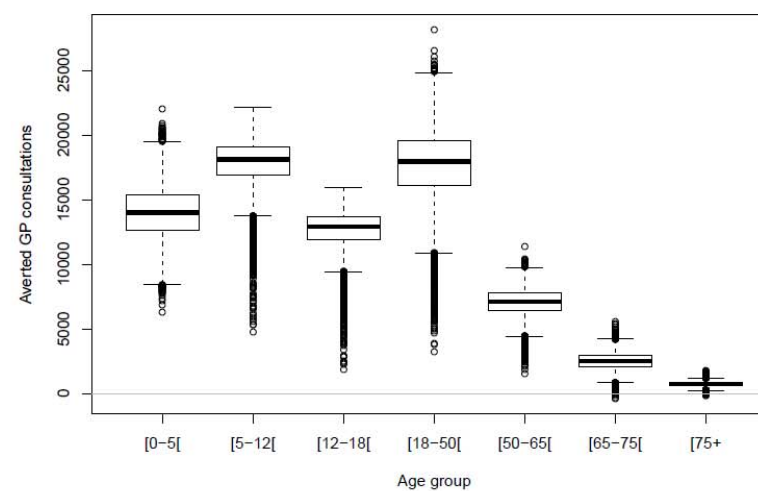
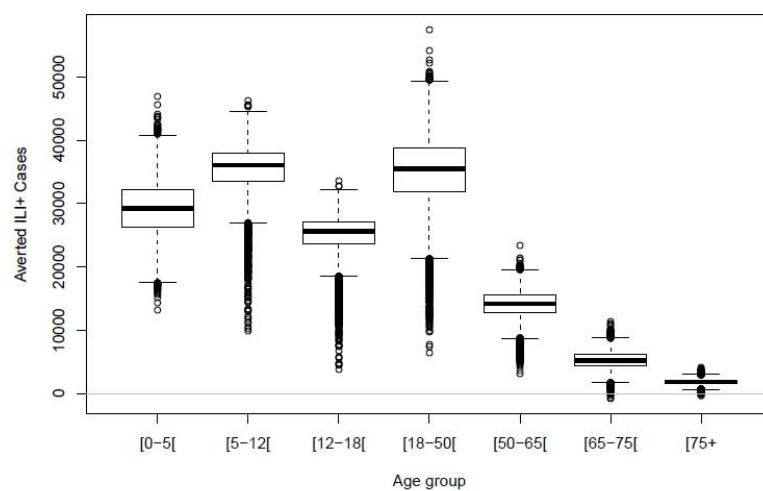




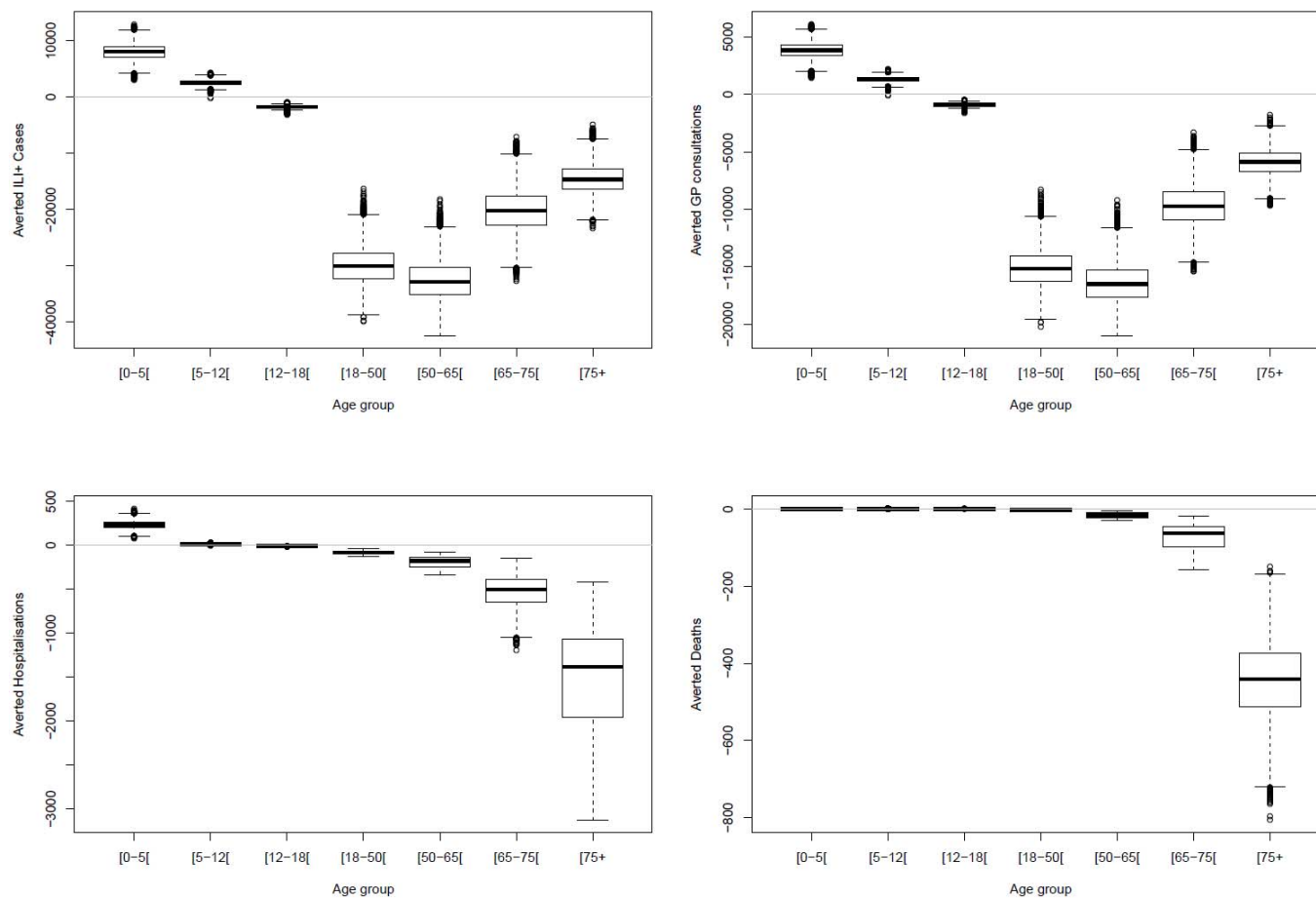
Figure 87 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 70% coverage for the child components of the option, and with immunity lasting an average of 6 years

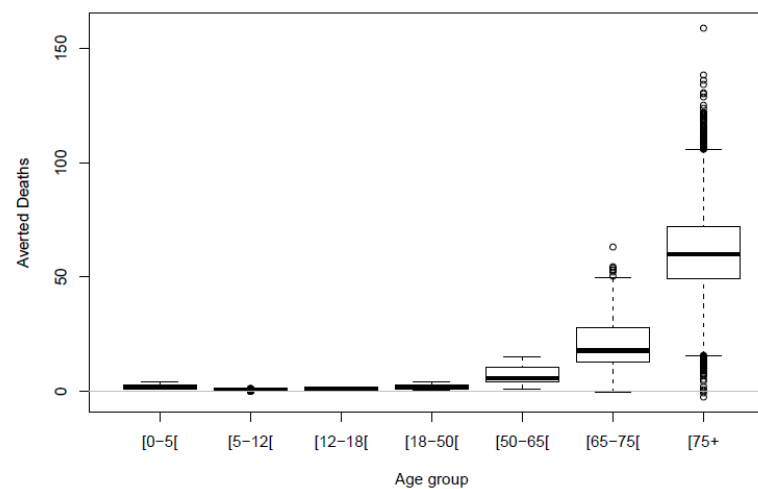
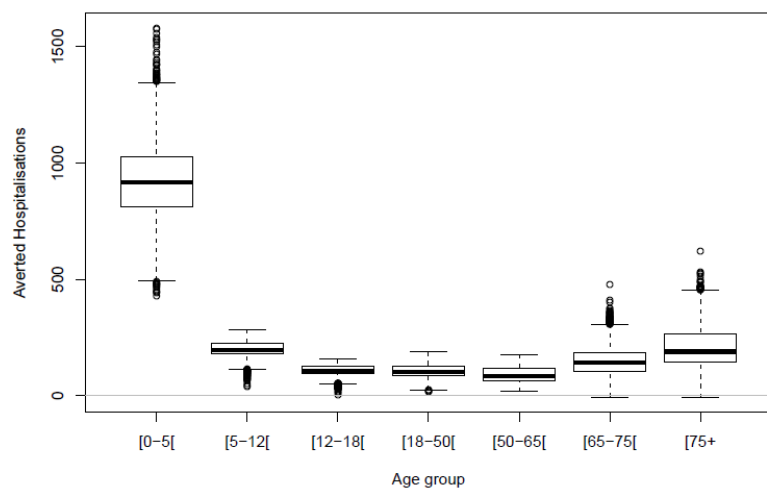
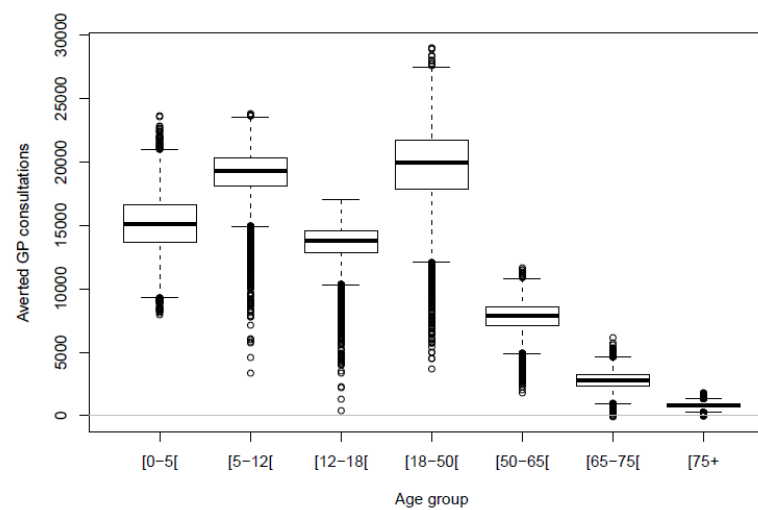
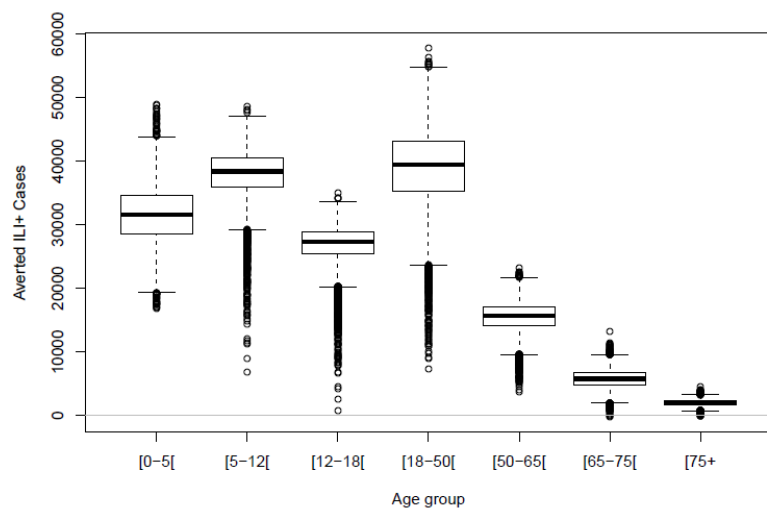






**Figure 88 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 80% coverage for the child components of the option, and with immunity lasting an average of 6 years**







**Figure 89 – Box plots of the per-season averaged averted numbers of cases of ILI+ (i.e. influenza), GP consultations, hospitalisations and deaths for the least (top; option a1c2) and most (bottom; option a2c16) effective option amongst 171 combined child-adult options at 90% coverage for the child components of the option, and with immunity lasting an average of 6 years**

