

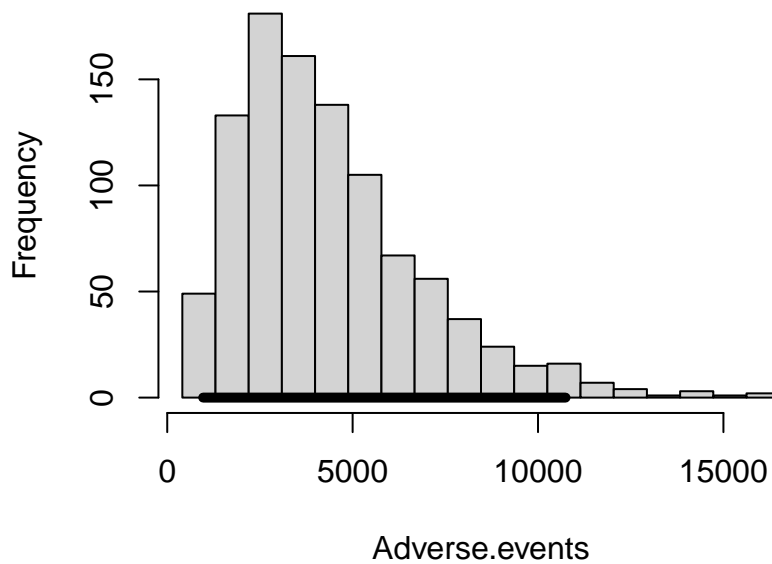
# Auto-generated report from BCEAweb

Version: 17 June, 2021

## Distributional assumptions

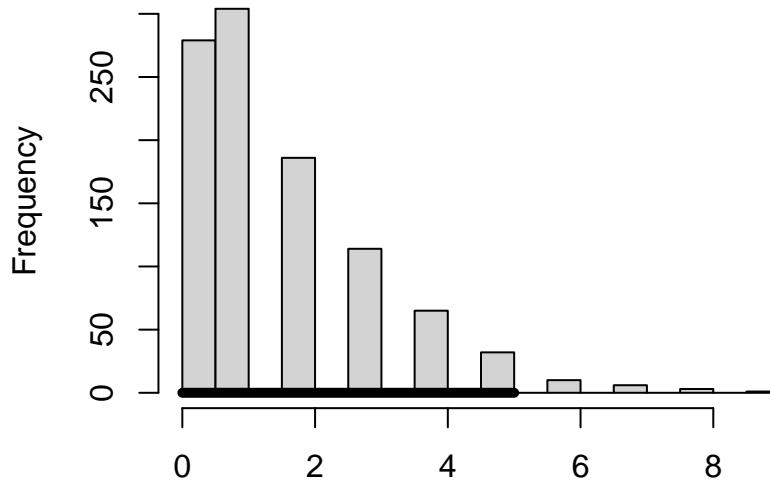
This sections presents graphical and tabular summaries to check the distributional assumptions used for the  $n = 56$  parameters included in the economic model. For each parameter, a histogram of the distribution is presented together with a summary table, reporting some relevant statistics.

### Histogram of Adverse.events



Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
4384.479	2518.102	969.425	3874.5	10740.8	79.58956

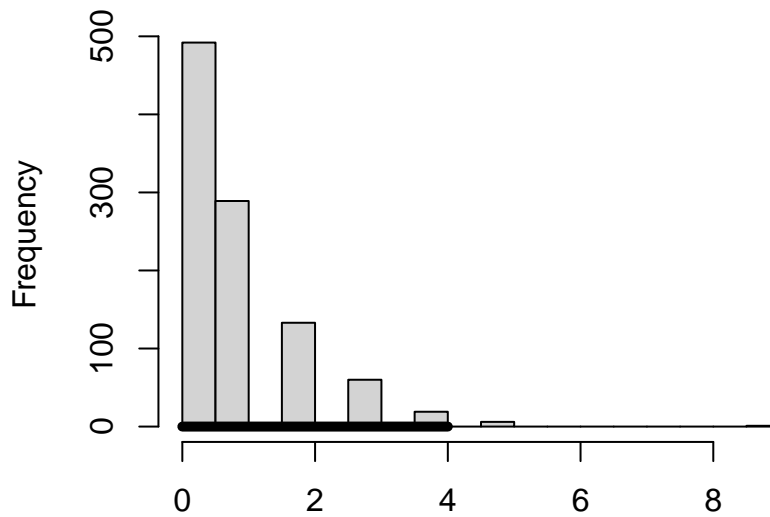
### Histogram of Death.1.1.



Death.1.1.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
1.573	1.539169	0	1	5	0.0486484

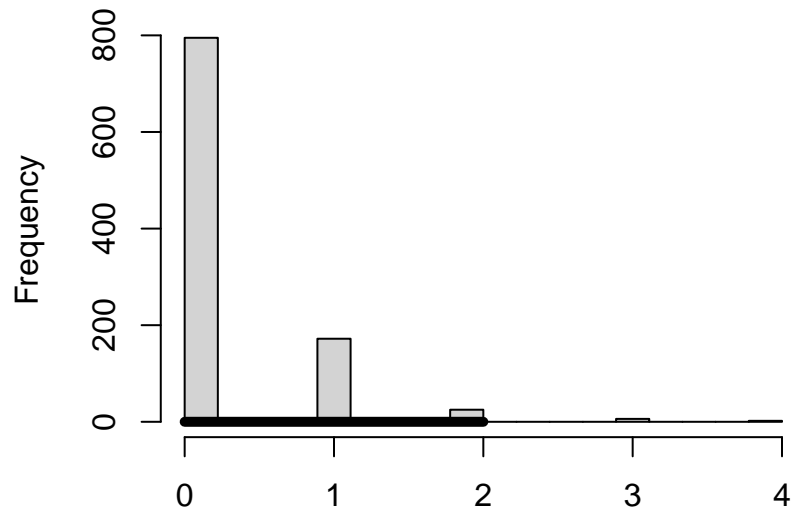
### Histogram of Death.2.1.



Death.2.1.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.85	1.083824	0	1	4	0.0342564

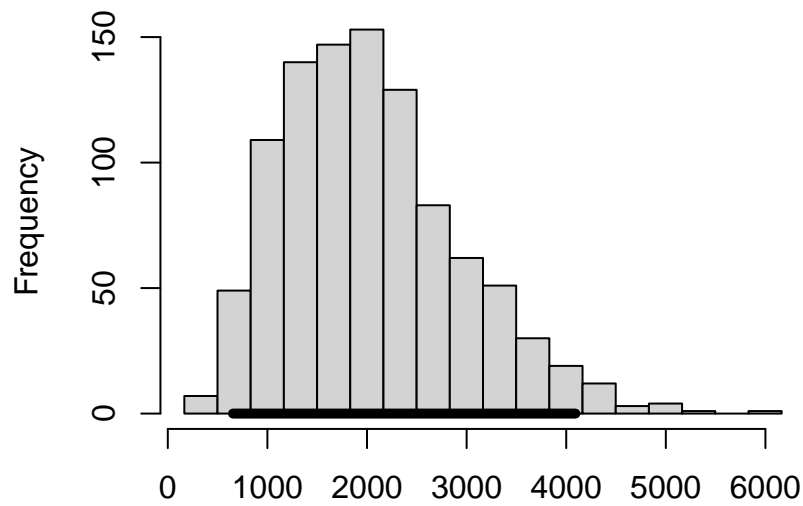
### Histogram of Death.2.2.



Death.2.2.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.248	0.5447869	0	0	2	0.0172191

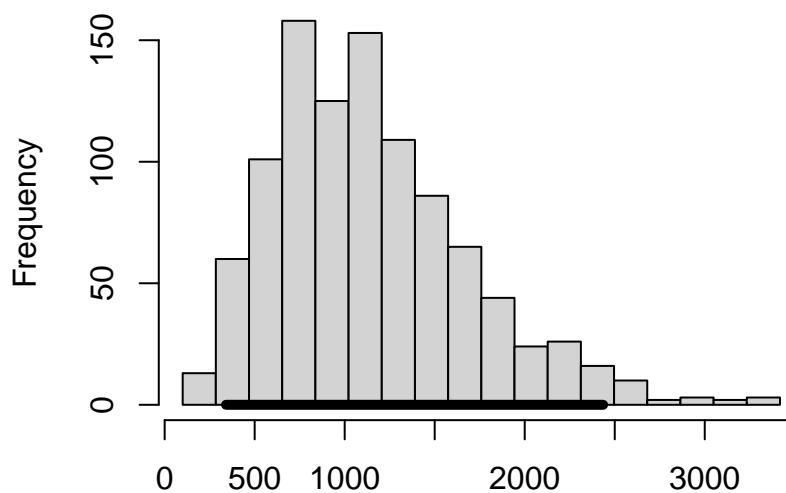
### Histogram of GP.1.1.



GP.1.1.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
2045.987	896.964	654.925	1938.5	4092.15	28.35031

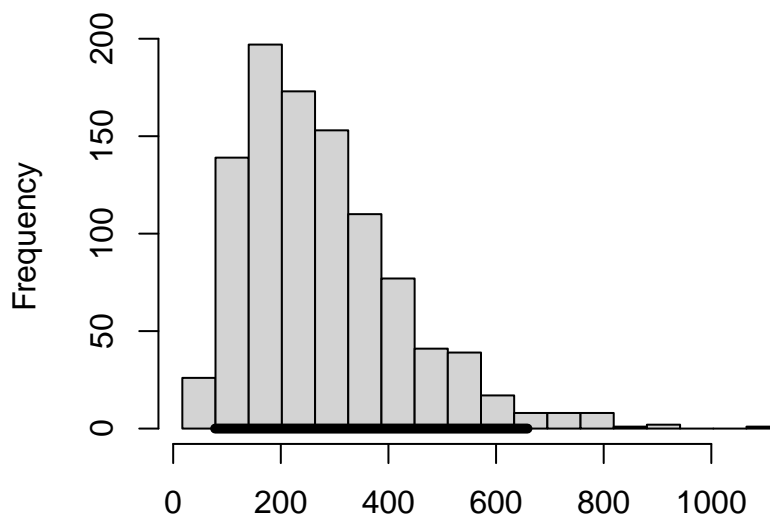
### Histogram of GP.2.1.



GP.2.1.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
1148.308	543.1979	340.925	1083	2435.475	17.16883

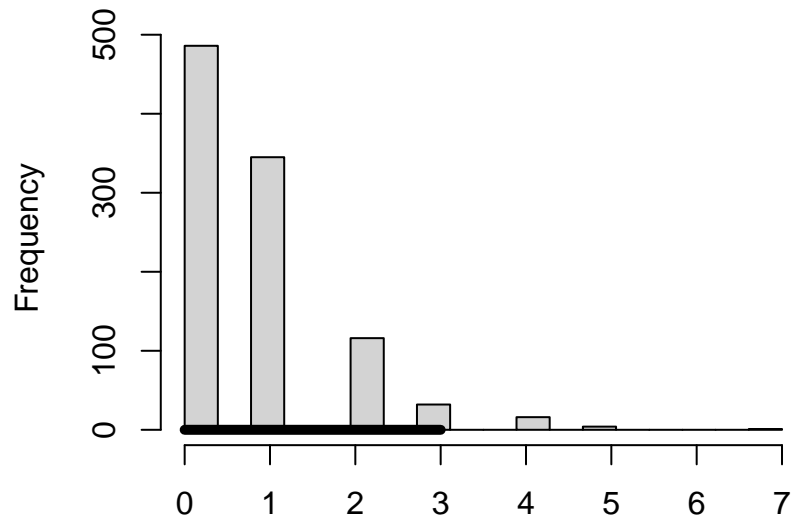
### Histogram of GP.2.2.



GP.2.2.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
279.658	151.5797	78	249.5	658.325	4.790975

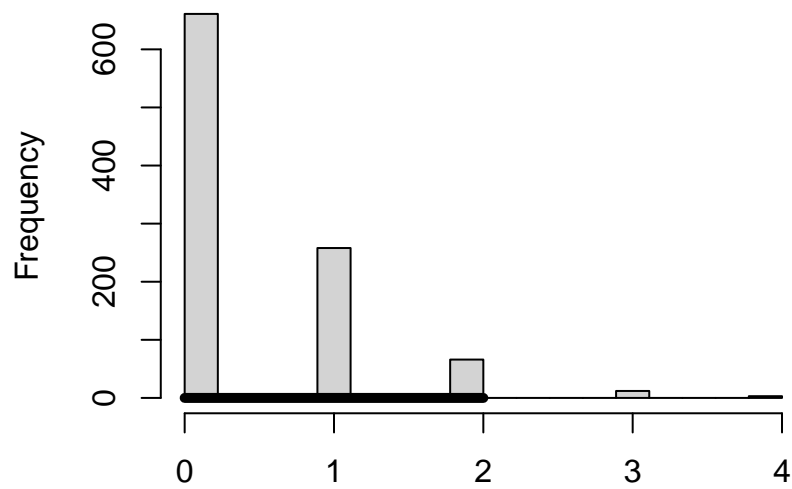
### Histogram of Hospital.1.1.



Hospital.1.1.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.764	0.9587613	0	1	3	0.0303035

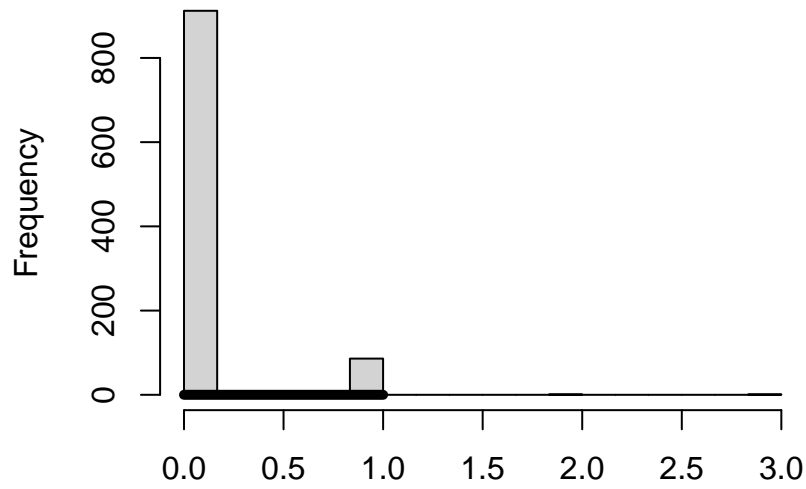
### Histogram of Hospital.2.1.



Hospital.2.1.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.438	0.6975978	0	0	2	0.0220489

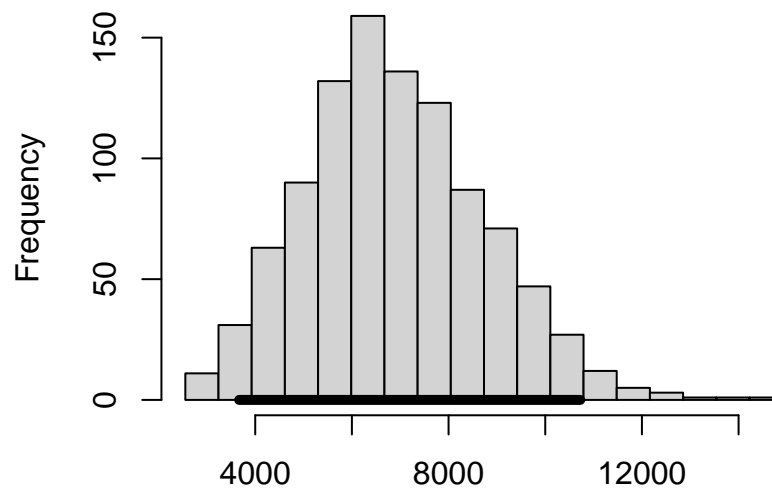
### Histogram of Hospital.2.2.



Hospital.2.2.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.091	0.3013467	0	0	1	0.0095247

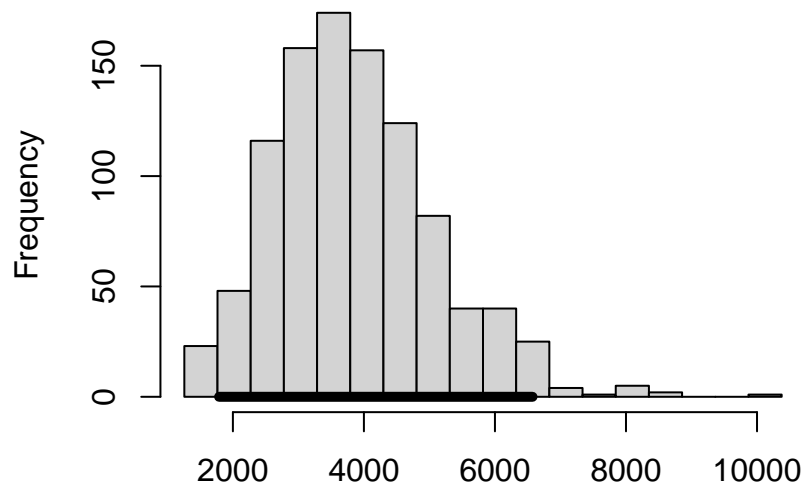
### Histogram of Infected.1.1.



Infected.1.1.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
6904.96	1850.256	3667.9	6763	10724.17	58.48097

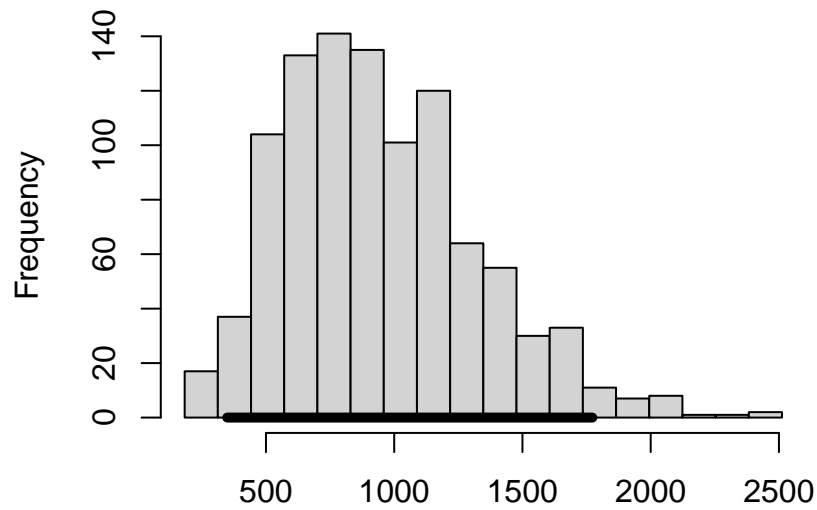
### Histogram of Infected.2.1.



Infected.2.1.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
3874.547	1236.974	1789.575	3744	6573.125	39.097

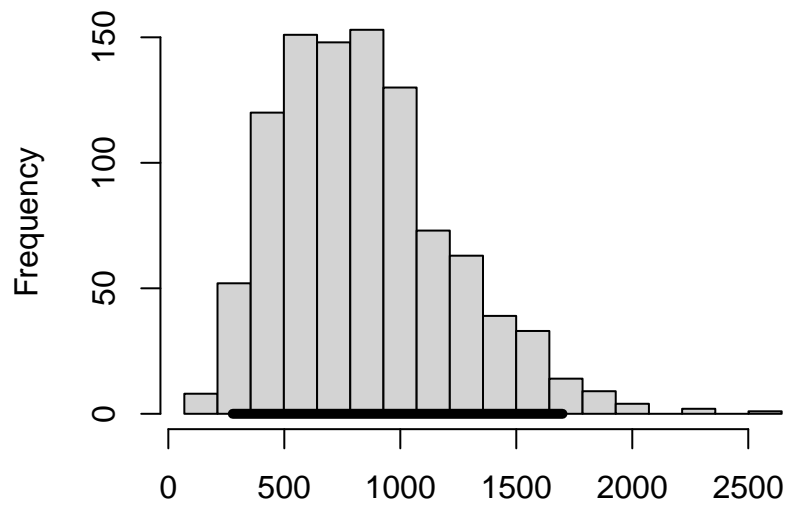
### Histogram of Infected.2.2.



Infected.2.2.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
944.874	378.7866	348.875	895	1772.5	11.97229

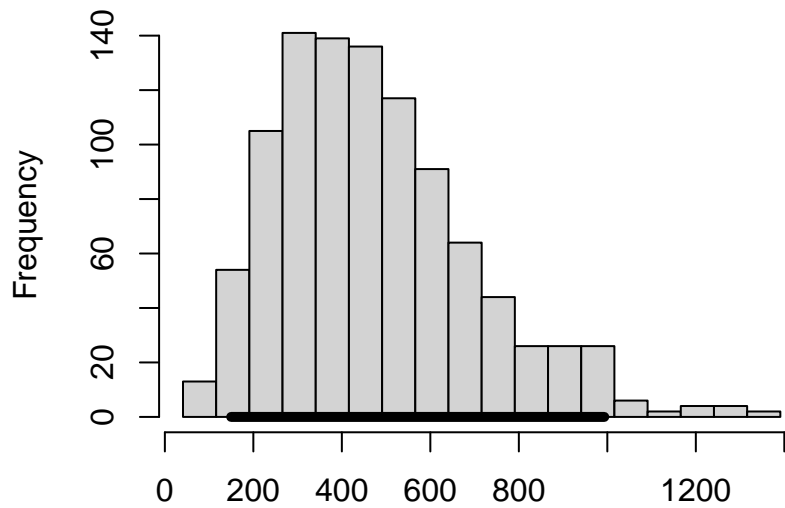
### Histogram of Mild.Compl.1.1.



Mild.Compl.1.1.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
847.747	374.6328	277.9	800	1699.1	11.841

### Histogram of Mild.Compl.2.1.

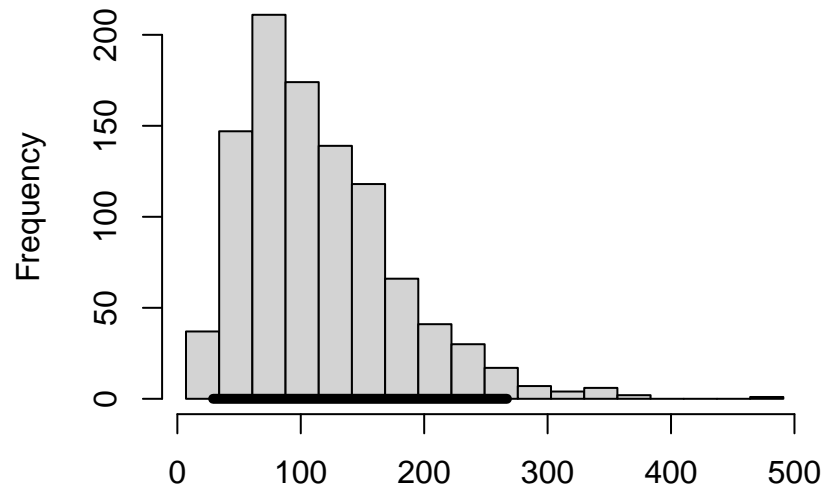


Mild.Compl.2.1.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
476.486	225.2089	149.875	446	993.075	7.118168



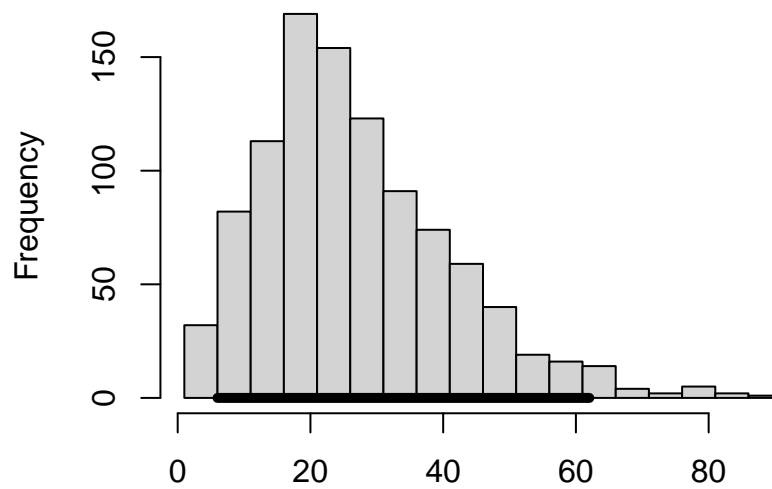
### Histogram of Mild.Compl.2.2.



Mild.Compl.2.2.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
115.59	63.15335	29	102	267.05	1.996086

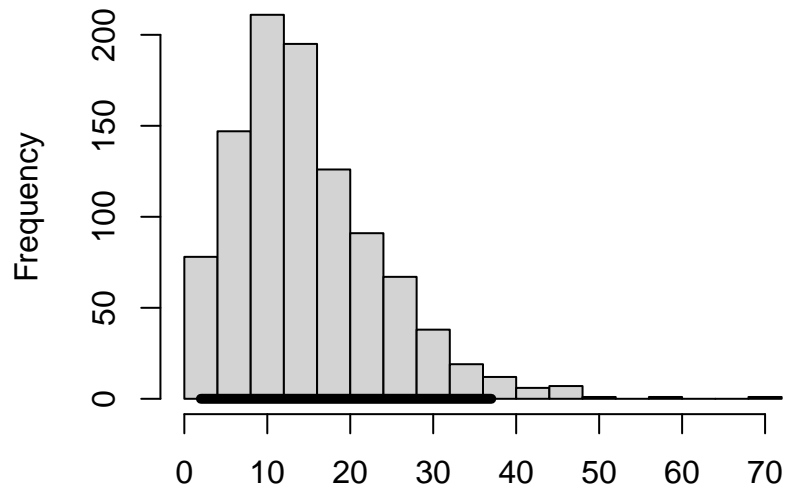
### Histogram of Pneumonia.1.1.



Pneumonia.1.1.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
27.438	14.51919	6	25	62.025	0.4589076

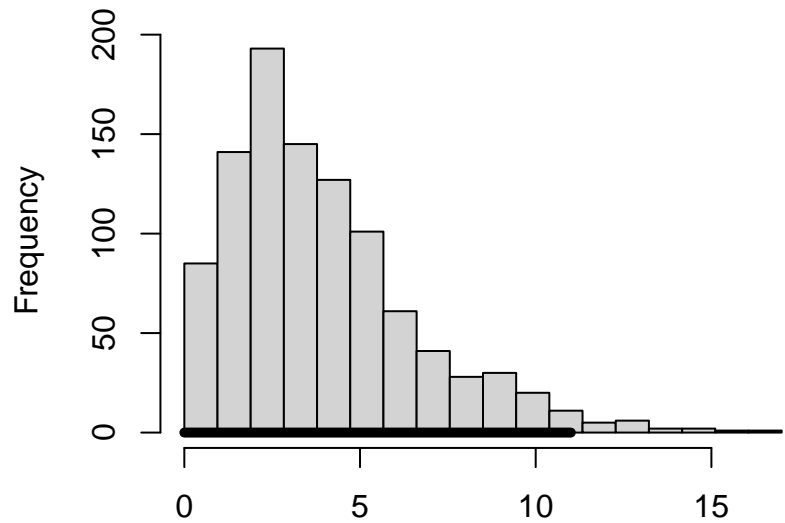
### Histogram of Pneumonia.2.1.



Pneumonia.2.1.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
15.353	9.095555	2	14	37	0.2874829

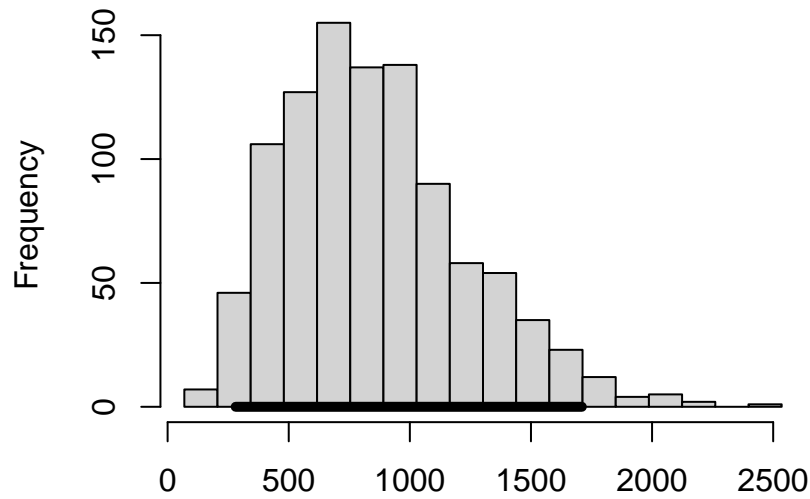
### Histogram of Pneumonia.2.2.



Pneumonia.2.2.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
3.672	2.859824	0	3	11	0.0903904

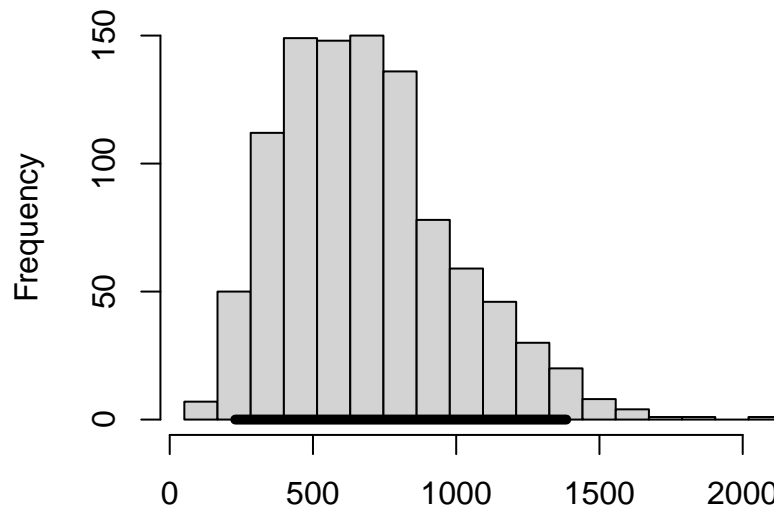
**Histogram of Trt.1.1.1.**



Trt.1.1.1.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
859.031	375.9444	281	816	1710.025	11.88246

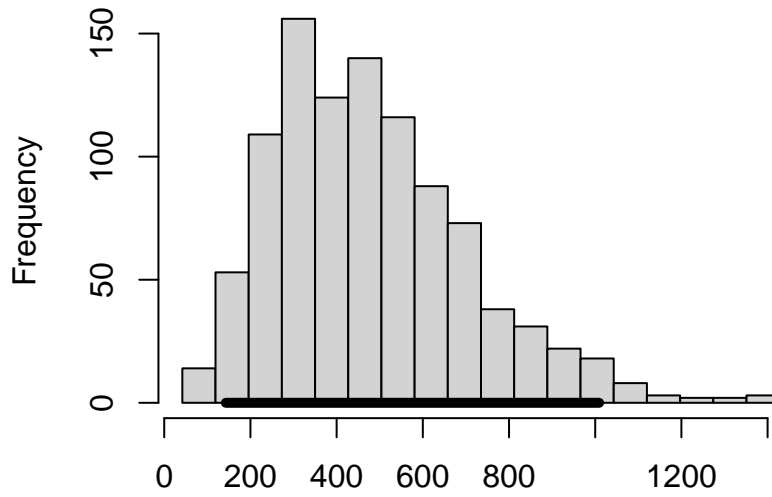
**Histogram of Trt.2.1.1.**



Trt.2.1.1.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
689.768	303.9169	228.875	653	1384.2	9.605891

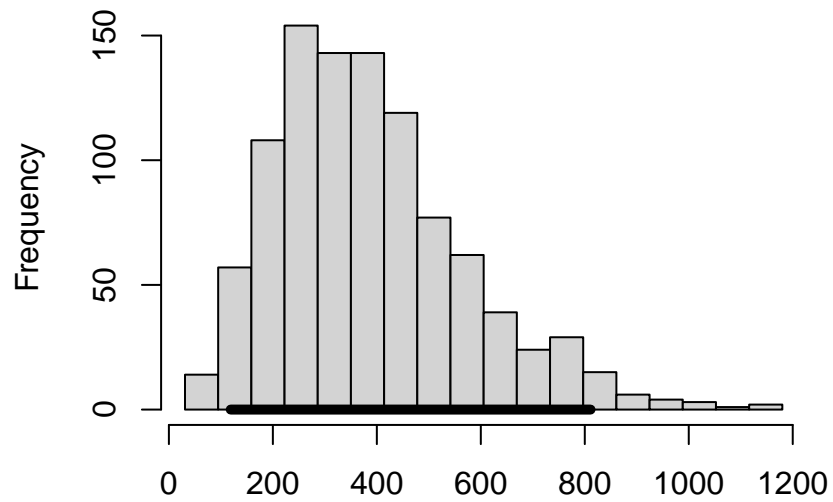
### Histogram of Trt.1.2.1.



Trt.1.2.1.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
481.877	227.604	143	455	1009.075	7.19387

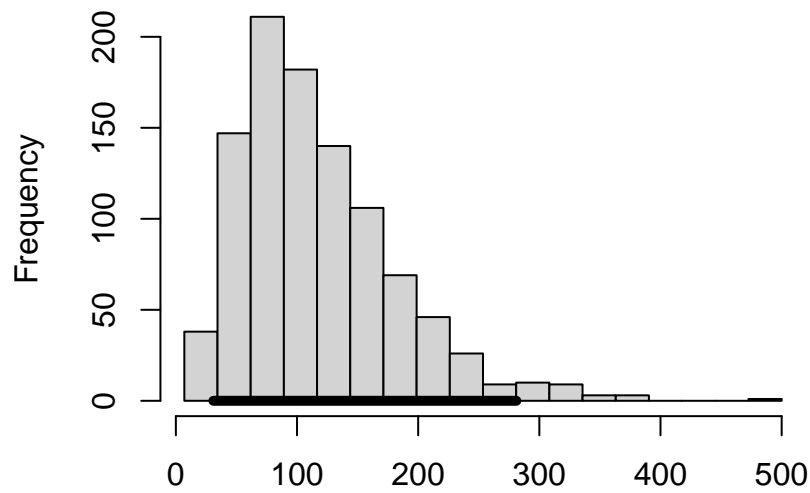
### Histogram of Trt.2.2.1.



Trt.2.2.1.

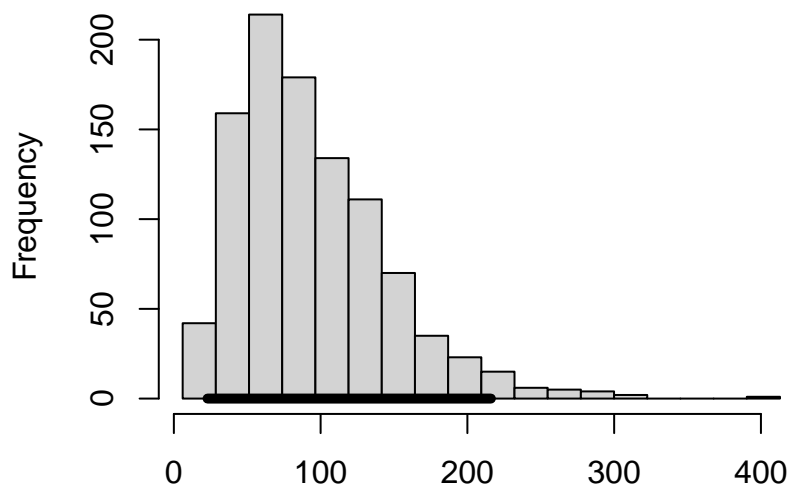
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
388.103	183.2891	118.975	364	811.05	5.793213

**Histogram of Trt.1.2.2.**



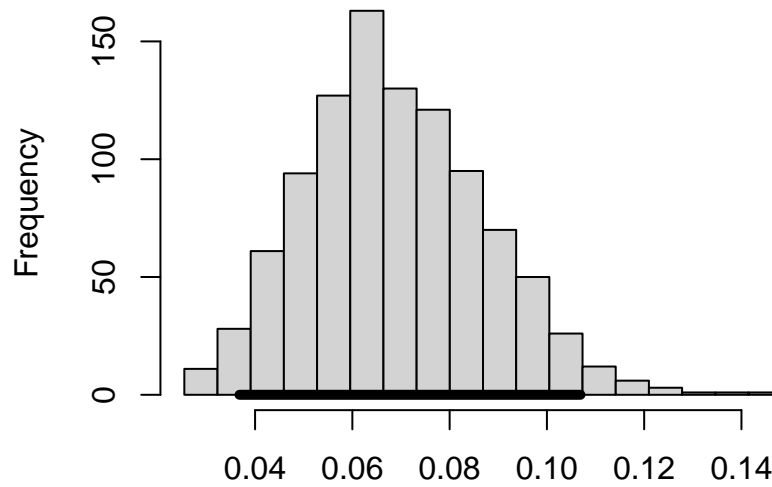
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
117.33	64.61155	30.975	105	281.025	2.042175

**Histogram of Trt.2.2.2.**



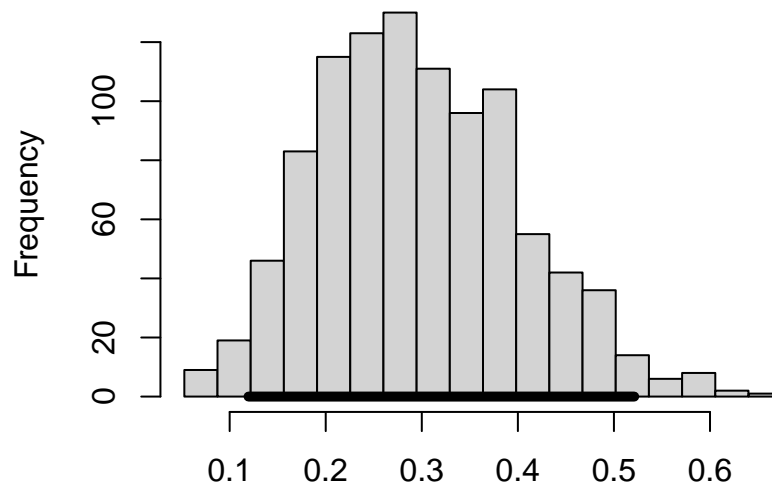
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
94.158	51.4585	22.975	83	216	1.626447

### Histogram of beta.1.



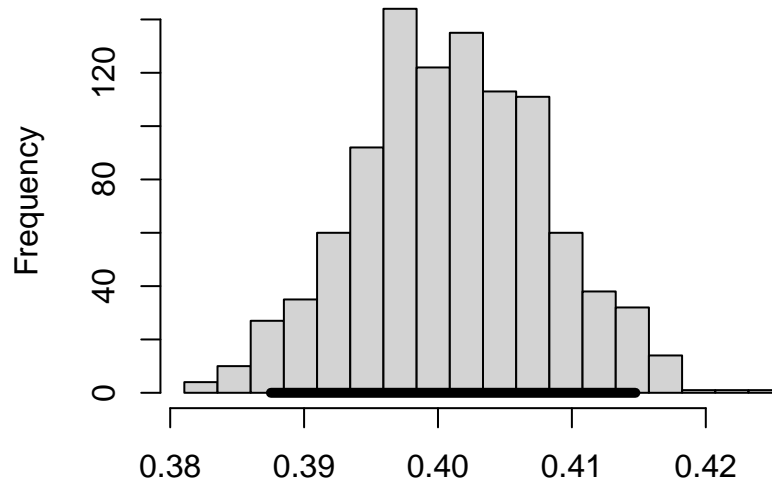
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.0690728	0.0185195	0.0367975	0.0676216	0.1069079	0.0005853

### Histogram of beta.2.



Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.2971902	0.1047984	0.1196443	0.2898017	0.5211321	0.0033124

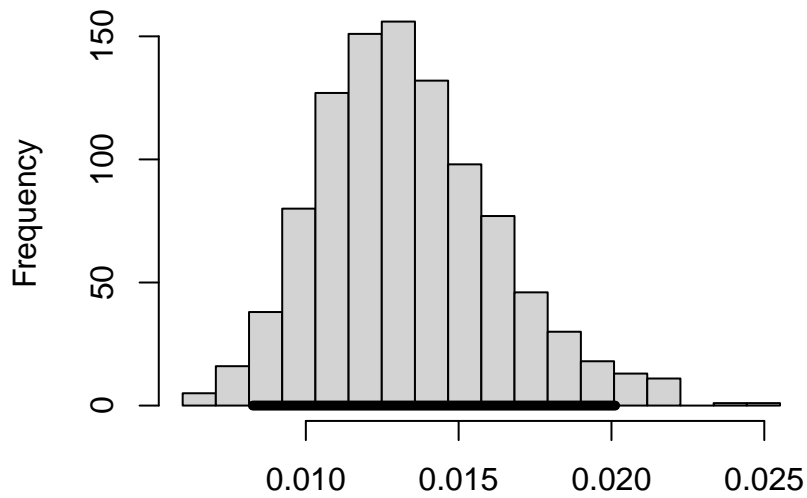
### Histogram of beta.3.



beta.3.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.4010433	0.00703	0.3875232	0.4009802	0.4147382	0.0002222

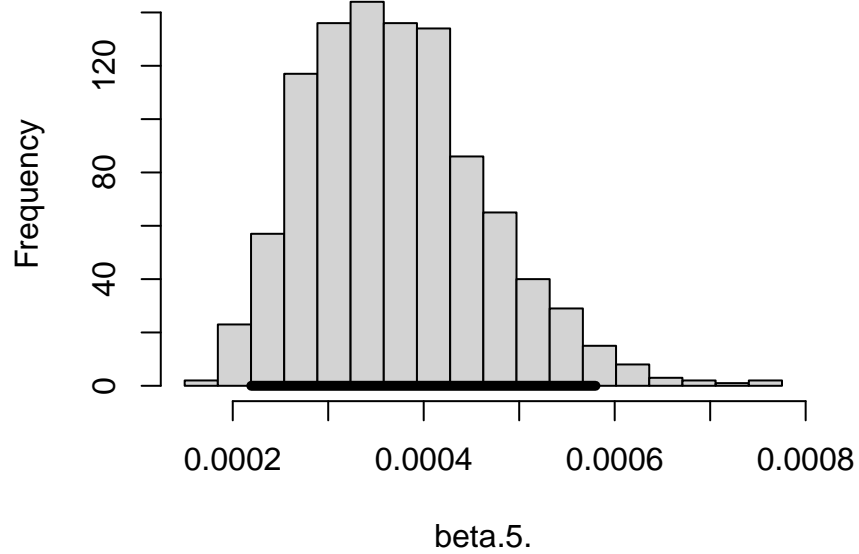
### Histogram of beta.4.



beta.4.

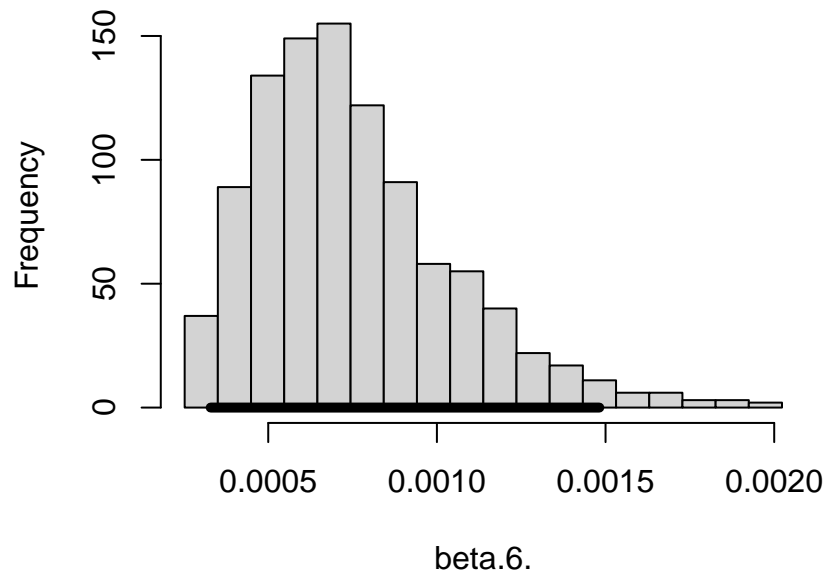
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.013347	0.0029279	0.0082679	0.0130898	0.020119	0.0000925

### Histogram of beta.5.



Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.0003727	0.0000944	0.0002194	0.0003636	0.0005799	0.000003

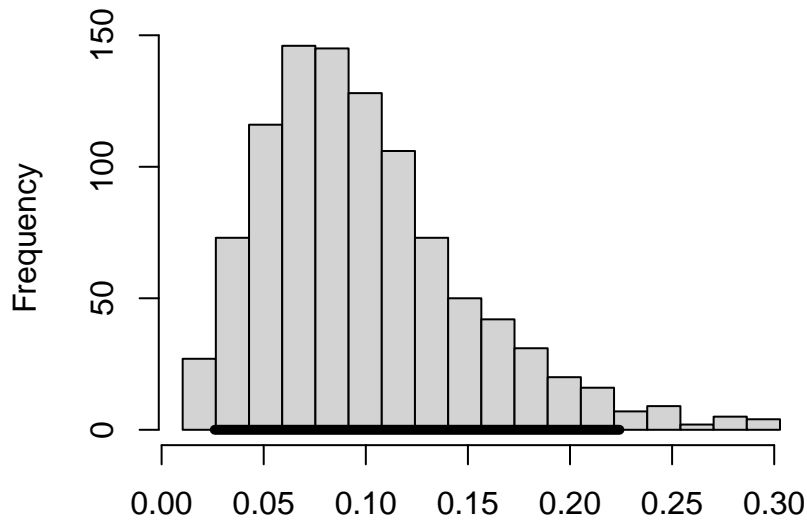
### Histogram of beta.6.



Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.0007564	0.0002967	0.0003294	0.0007006	0.0014815	0.0000094



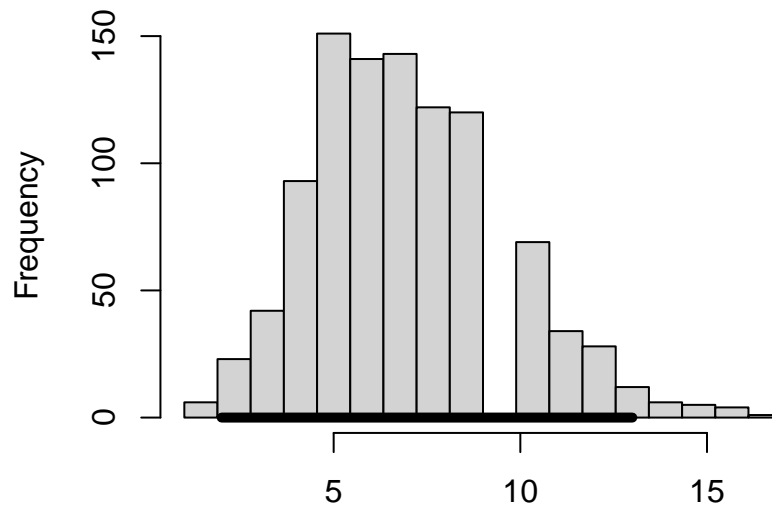
### Histogram of beta.7.



beta.7.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.0997926	0.051201	0.0260358	0.0906289	0.2241951	0.0016183

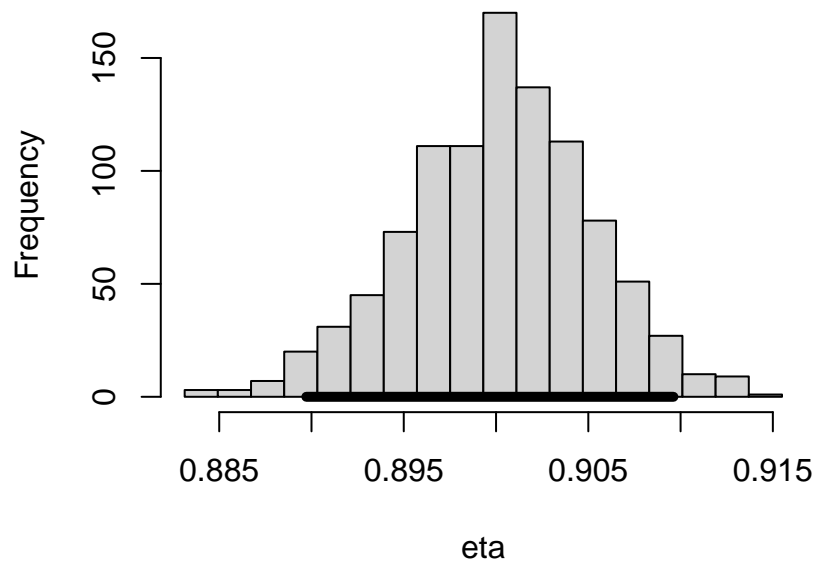
### Histogram of delta



delta

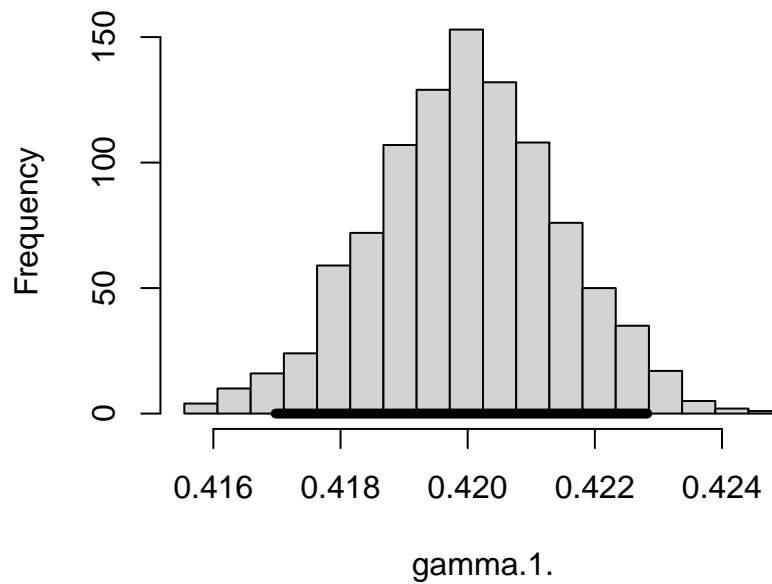
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
7.004	2.643667	2	7	13	0.0835583

### Histogram of eta



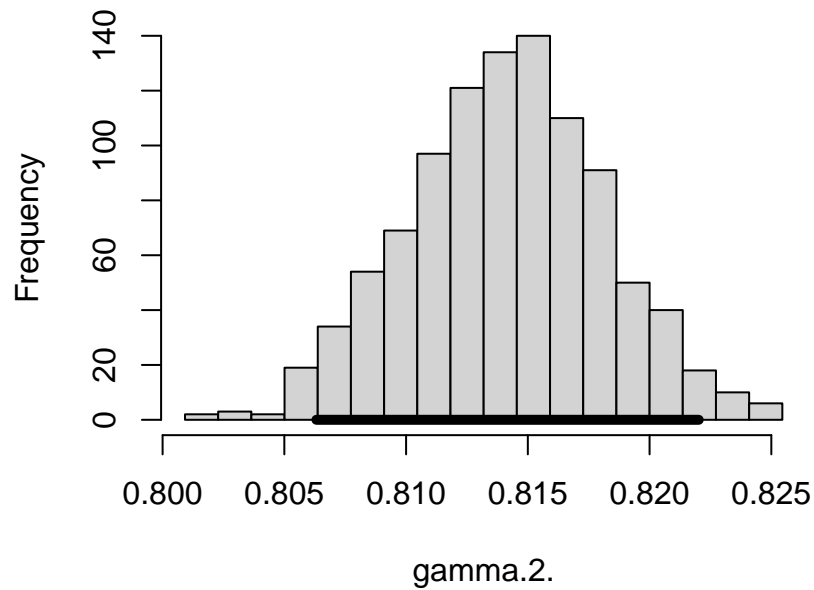
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.9001309	0.0050356	0.8897217	0.9002975	0.9096117	0.0001592

### Histogram of gamma.1.



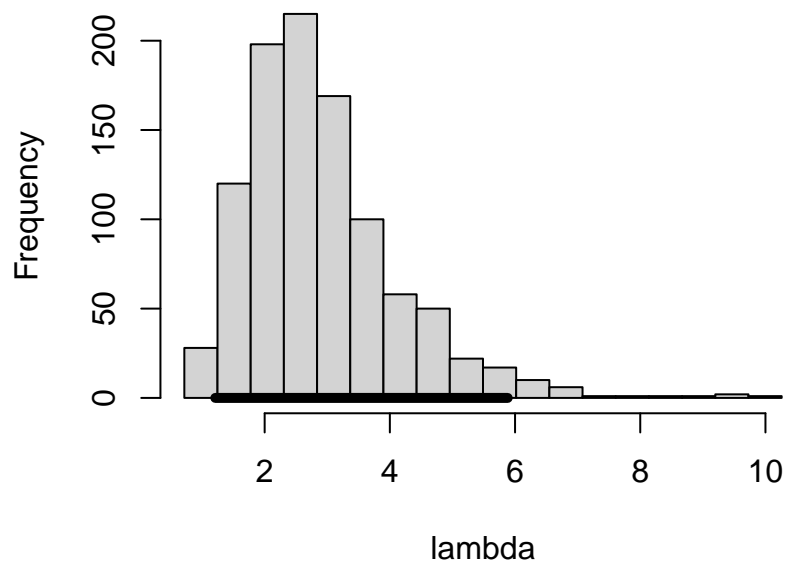
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.4199825	0.0014766	0.4169795	0.4199816	0.4228245	0.0000467

### Histogram of gamma.2.



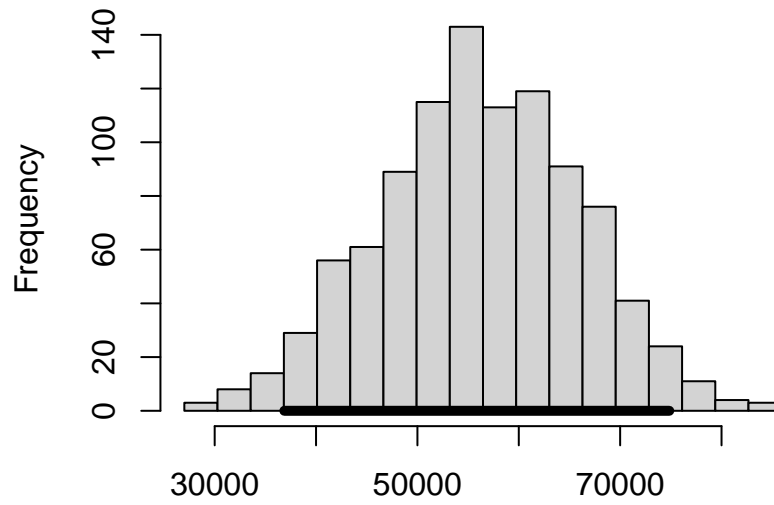
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.8141167	0.004001	0.8063162	0.8141551	0.822019	0.0001265

### Histogram of lambda



Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
2.905089	1.225704	1.211919	2.681323	5.88241	0.0387408

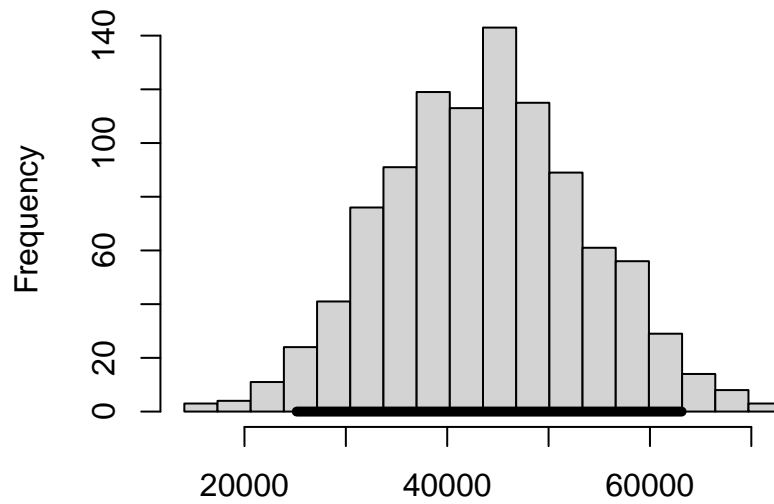
### Histogram of n.1.2.



n.1.2.

Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
56170.33	9860.615	36874.55	56216.5	74843.7	311.6641

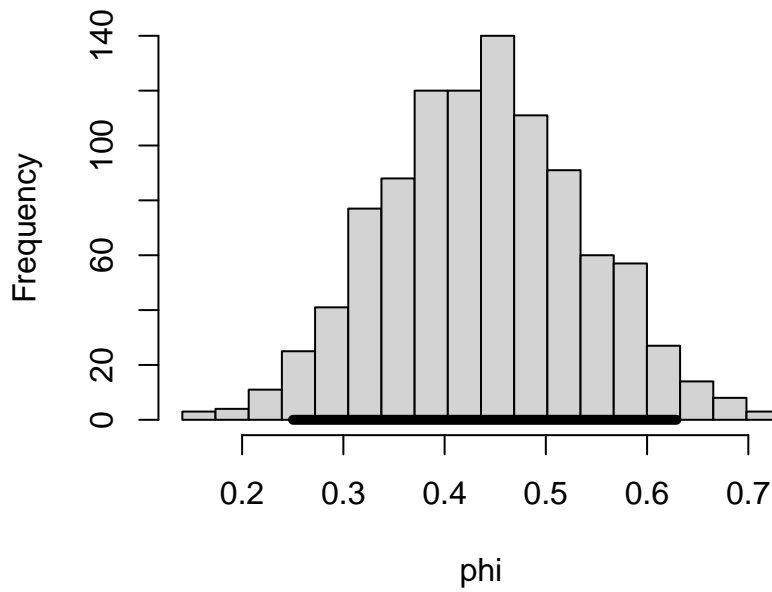
### Histogram of n.2.2.



n.2.2.

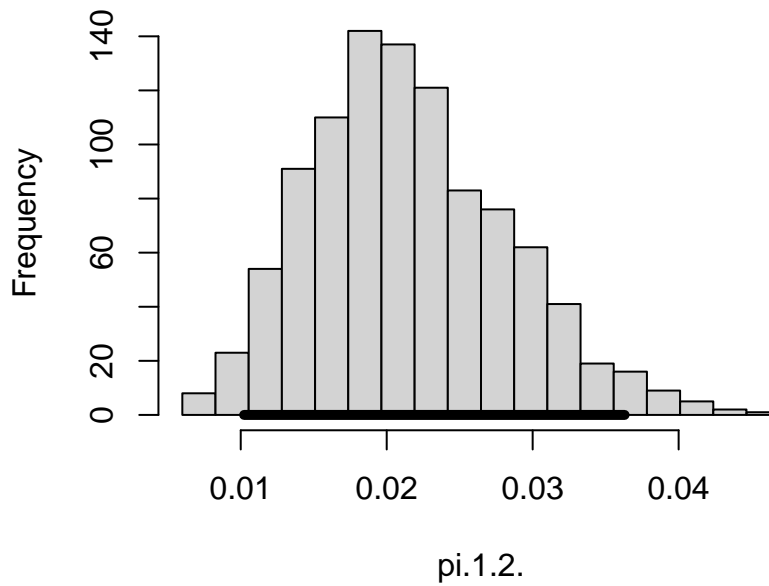
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
43829.67	9860.615	25156.3	43783.5	63125.45	311.6641

### Histogram of phi



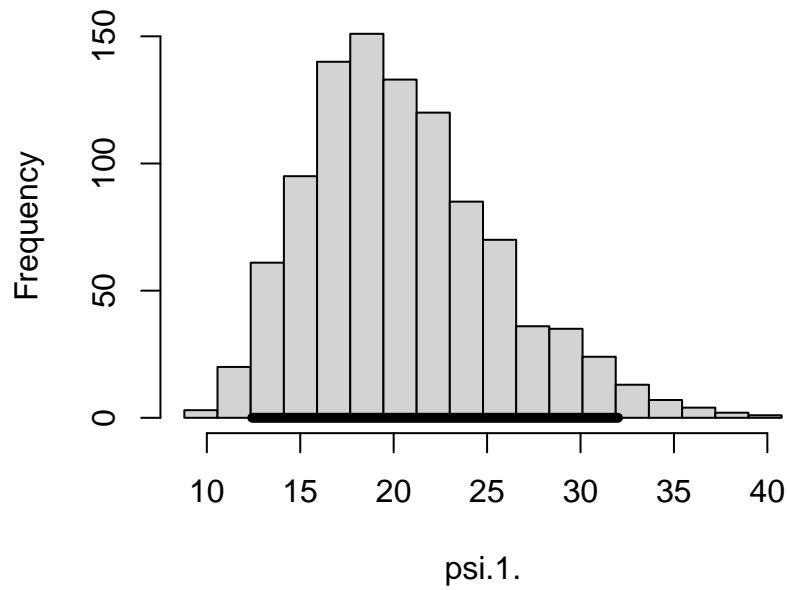
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.4382939	0.098694	0.2502404	0.4381762	0.6289504	0.0031194

### Histogram of pi.1.2.



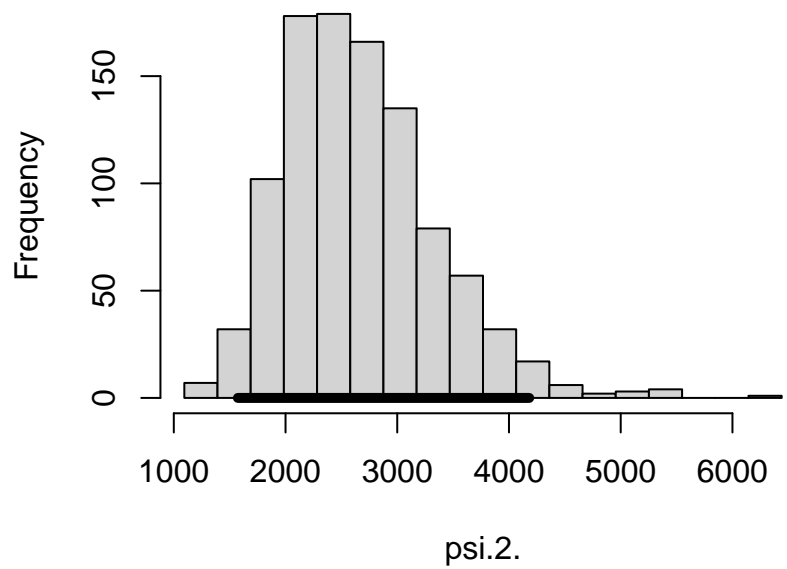
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.0215133	0.0068073	0.0102327	0.0207813	0.0362975	0.0002152

### Histogram of psi.1.



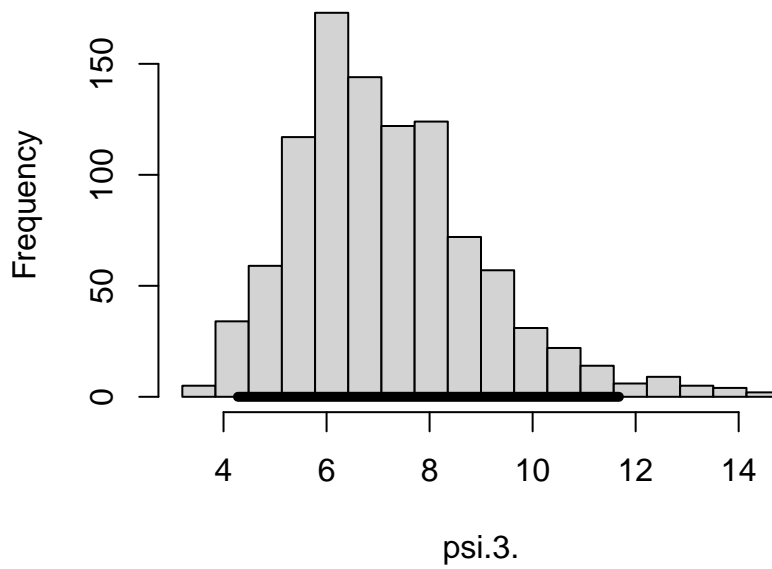
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
20.50602	5.086617	12.4331	20.01152	32.00584	0.1607725

### Histogram of psi.2.



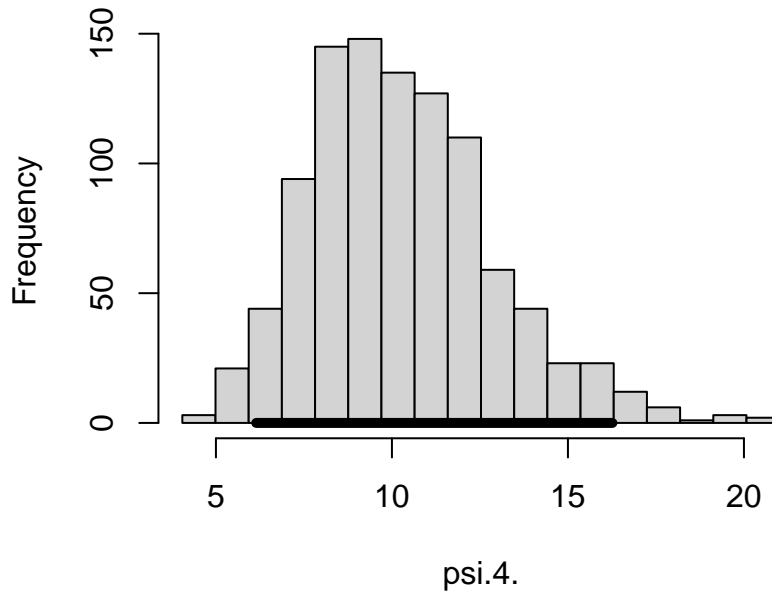
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
2661.843	684.1538	1573.676	2583.913	4181.041	21.62402

### Histogram of psi.3.



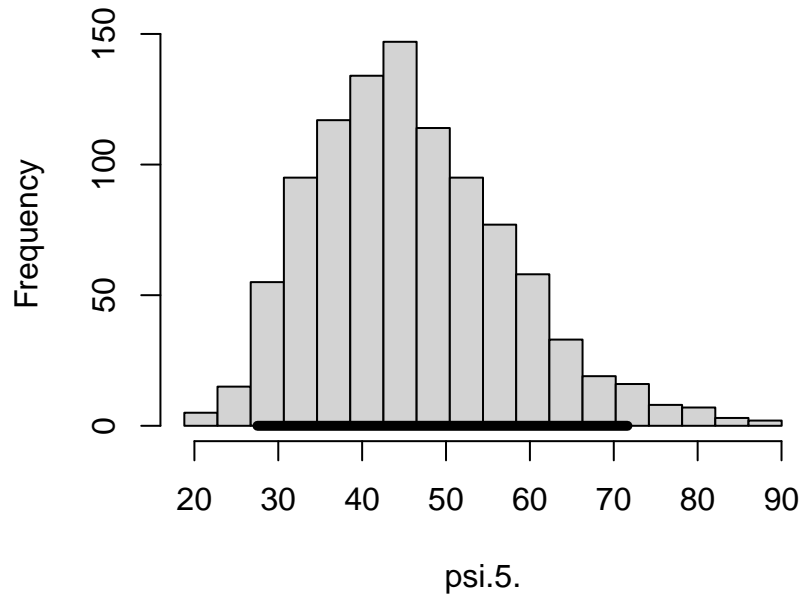
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
7.199515	1.83873	4.279942	6.90417	11.67563	0.0581167

### Histogram of psi.4.



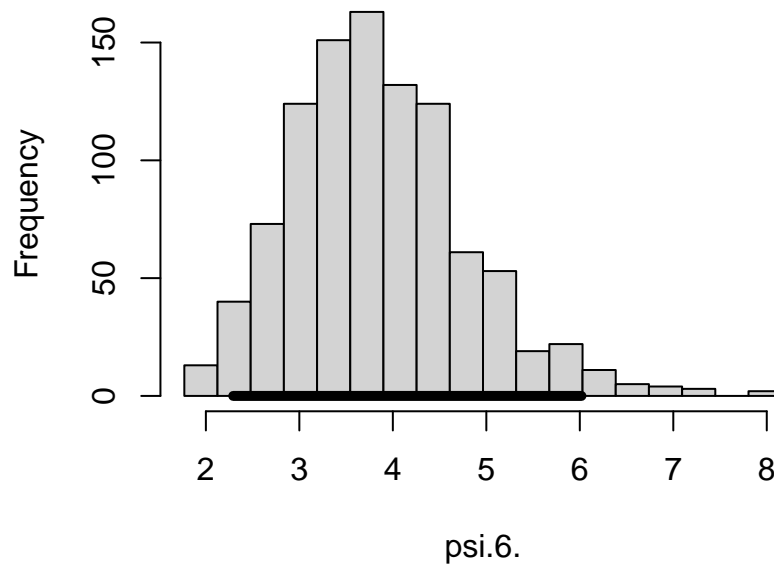
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
10.29213	2.607787	6.143624	9.955699	16.26332	0.0824242

**Histogram of psi.5.**



Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
45.91777	11.68489	27.51898	44.53583	71.62707	0.3693238

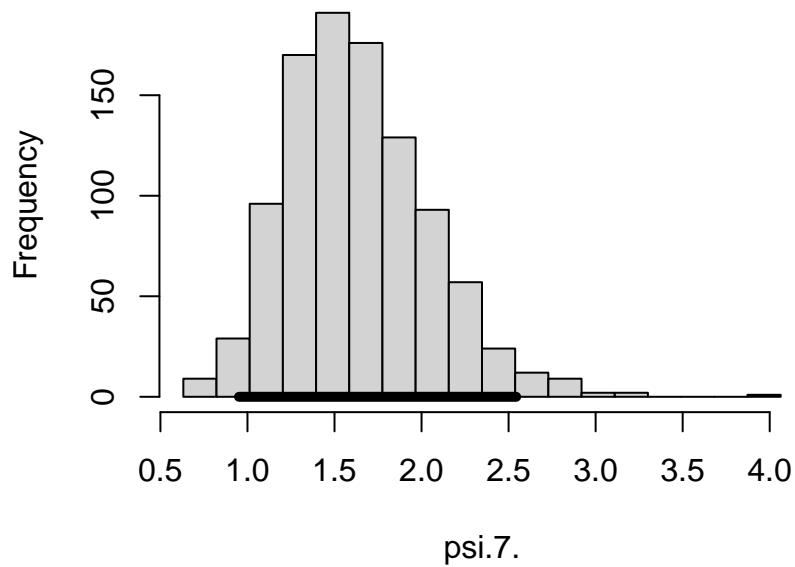
**Histogram of psi.6.**



Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
3.854695	0.9479262	2.292722	3.755557	6.017339	0.0299611

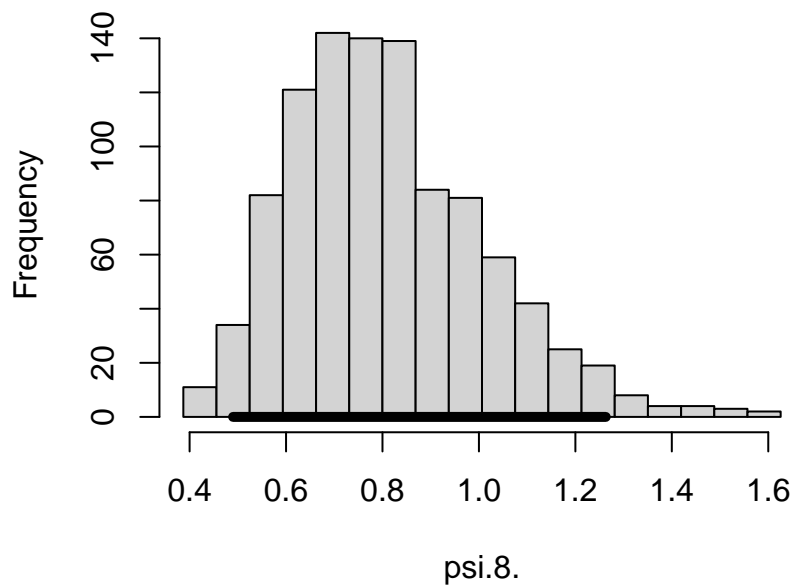


### Histogram of psi.7.



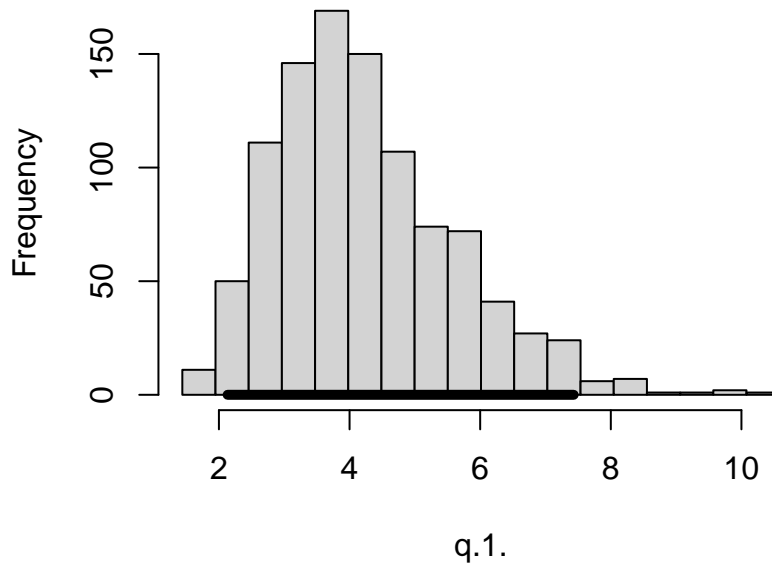
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
1.635824	0.4130969	0.9513184	1.591567	2.543868	0.0130567

### Histogram of psi.8.



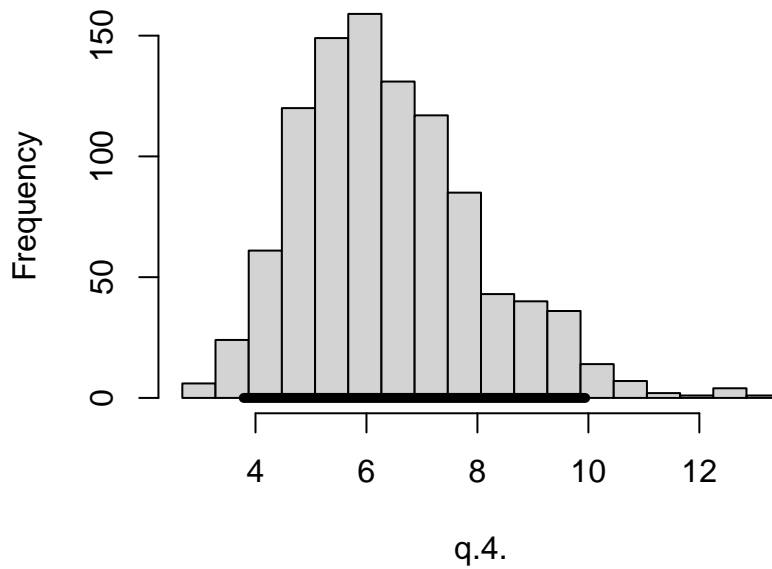
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.8108407	0.2026673	0.4901607	0.7876551	1.262942	0.0064057

### Histogram of q.1.



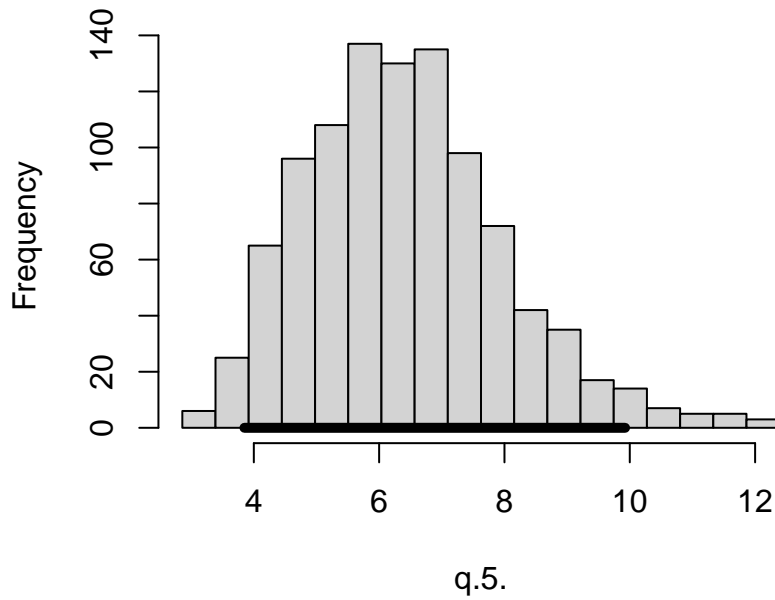
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
4.245515	1.380328	2.133401	4.020643	7.43128	0.043628

### Histogram of q.4.



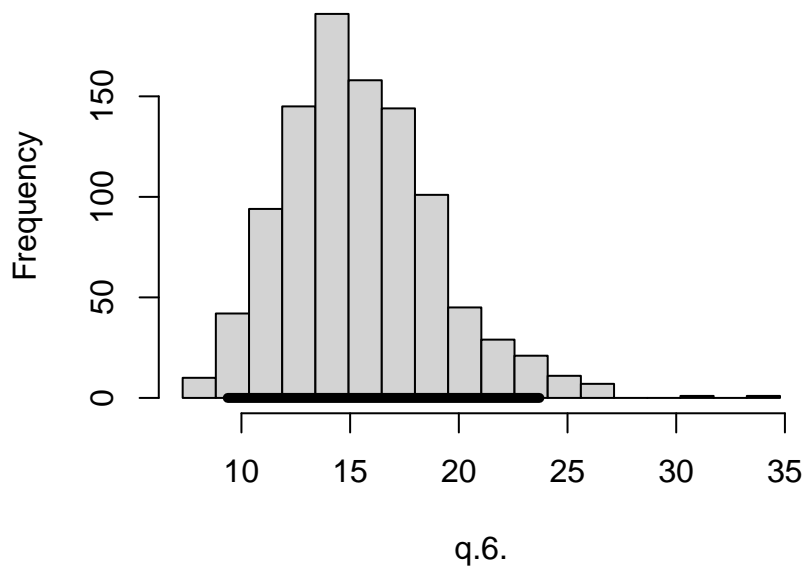
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
6.414003	1.640791	3.78795	6.185502	9.942465	0.0518604

### Histogram of q.5.



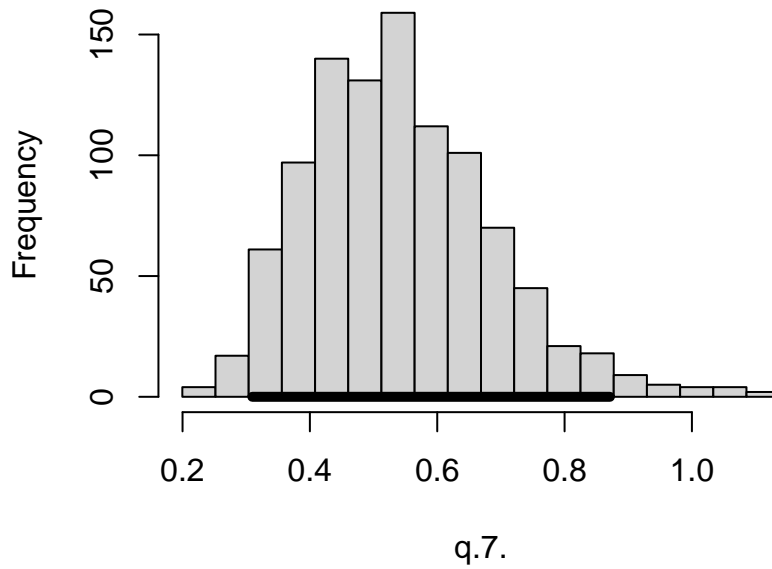
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
6.42076	1.584056	3.850581	6.285484	9.924699	0.0500672

### Histogram of q.6.



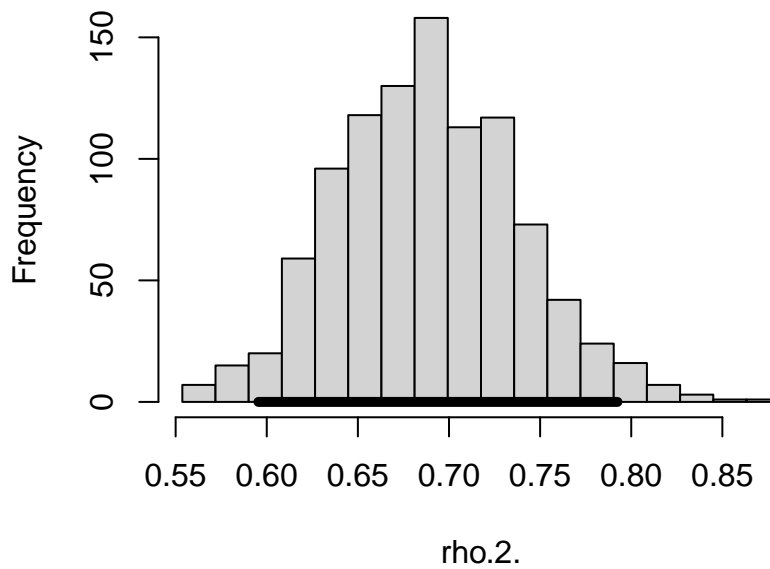
Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
15.48614	3.549163	9.37079	15.09543	23.70509	0.1121783

### Histogram of q.7.

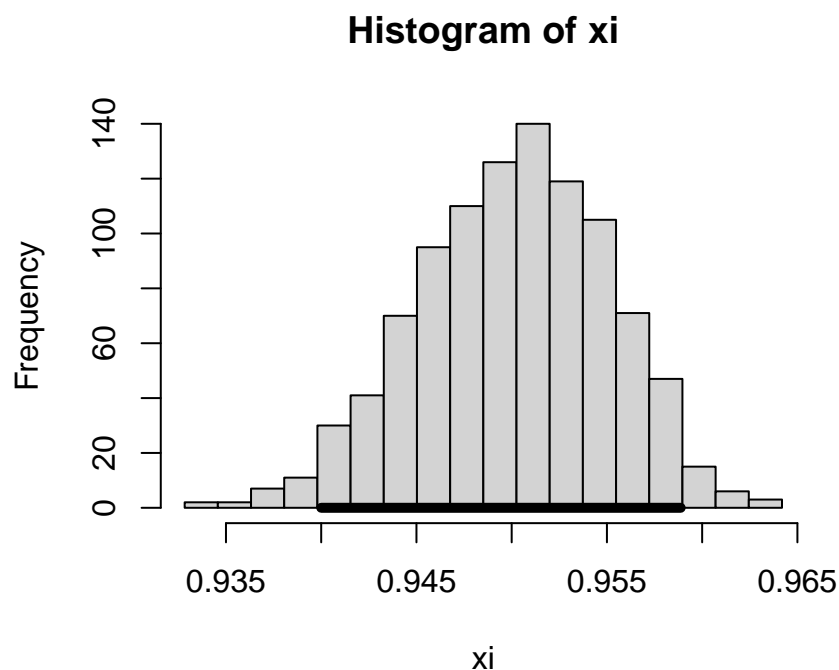


Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.5424171	0.1463549	0.3095674	0.528529	0.8712211	0.0046258

### Histogram of rho.2.



Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.6888042	0.0496164	0.5954323	0.6872181	0.7924515	0.0015682



Mean	Standard deviation	2.5%	Median	97.5%	Monte Carlo SE
0.9500773	0.0049722	0.9400008	0.9502989	0.9588729	0.0001572

## Economic Analysis

This section contains a summary of the economic evaluation.

### Cost-effectiveness analysis

This sub-section presents a summary table reporting basic economic results as well as the optimal decision, given the selected willingness-to-pay threshold  $k = 25000$ .

Cost-effectiveness analysis summary

Reference intervention: Vaccination

Comparator intervention: Status Quo

Analysis for willingness to pay parameter  $k = 25000$

	Expected utility
Status Quo	-36.054
Vaccination	-34.826

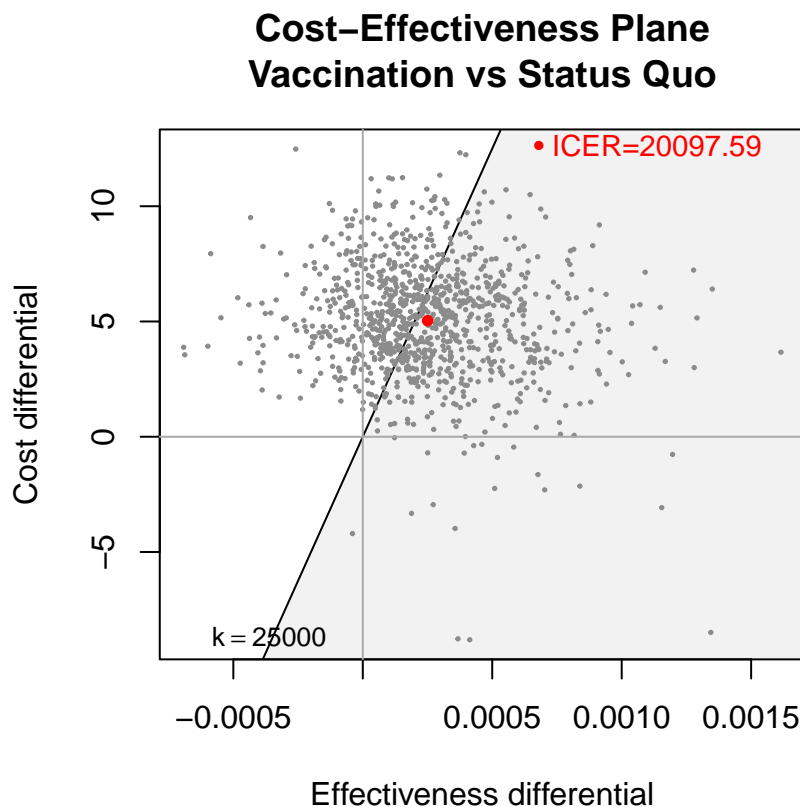
	EIB	CEAC	ICER
Vaccination vs Status Quo	1.2284	0.529	20098

Optimal intervention (max expected utility) for  $k=25000$ : Vaccination

## Cost-effectiveness plane

The following graph shows the cost-effectiveness plane. This presents the joint distribution of the population average benefit and cost differential,  $(\Delta_e, \Delta_c)$ .

Each point in the graph represents a ‘potential future’ in terms of expected incremental economic outcomes. The shaded portion of the plane is the ‘*sustainability area*’. The more points lay in the sustainability area, the more likely that the reference intervention will turn out to be cost-effective, at a given willingness to pay threshold,  $k$  (in this case selected at  $k = 25000$ )

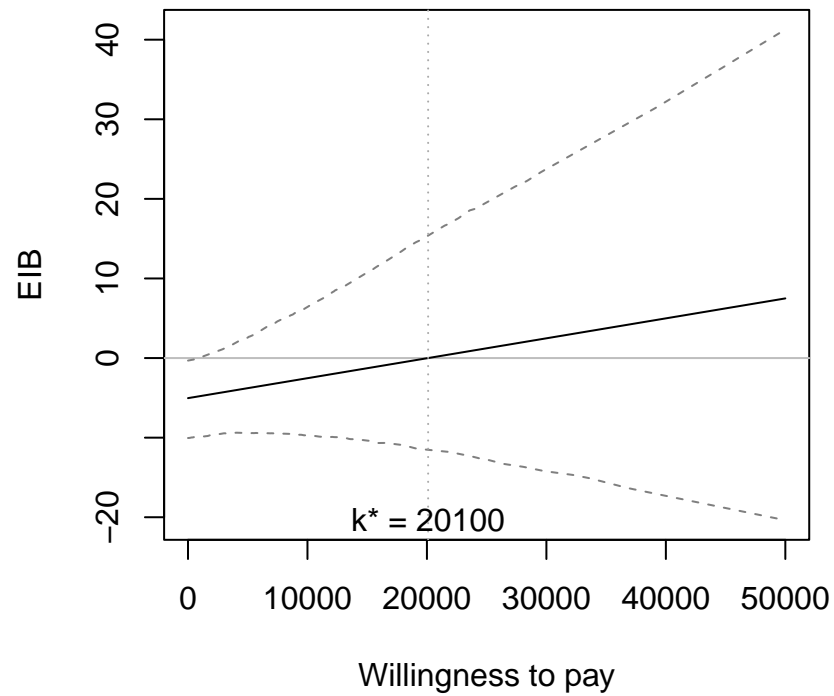


## Expected Incremental Benefit

The following graph shows the Expected Incremental Benefit (EIB), as a function of a grid of values for the willingness to pay  $k$  (in this case in the interval 0 - 50000).

The value for  $k$  in correspondence of which the line crosses the  $x$ -axis is termed the ‘*break-even point*’ and represents the point(s) at which the optimal decision changes. The graph also reports the 95% credible limits around the EIB.

### Expected Incremental Benefit and 95% credible intervals



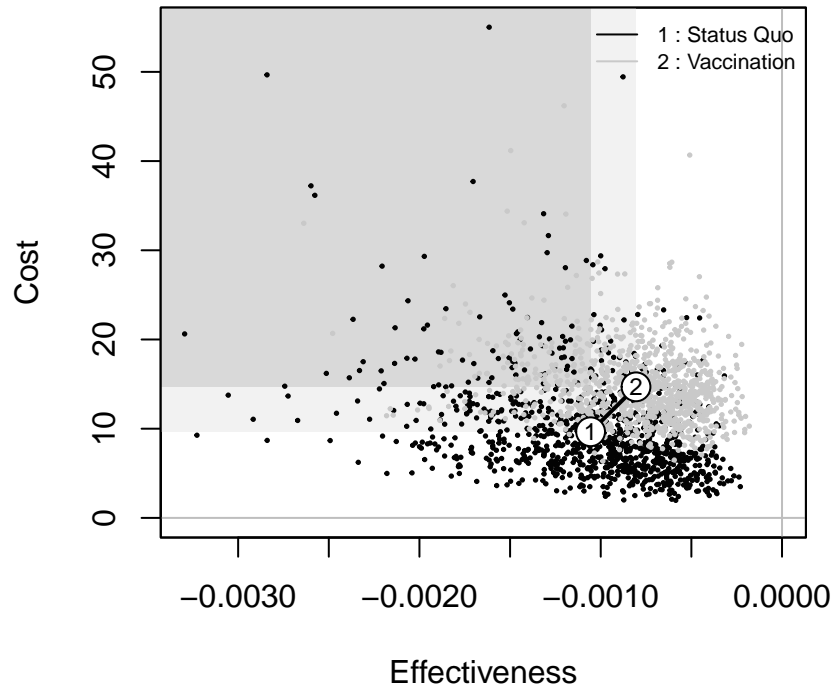
### Cost-effectiveness efficiency frontier

Cost-effectiveness efficiency frontier summary

Interventions on the efficiency frontier:

	Effectiveness	Costs	Increase slope	Increase angle
Status Quo	-0.00105595	9.6555	NA	NA
Vaccination	-0.00080537	14.6914	20098	1.5707

## Cost–effectiveness efficiency frontier



## Probabilistic Sensitivity Analysis

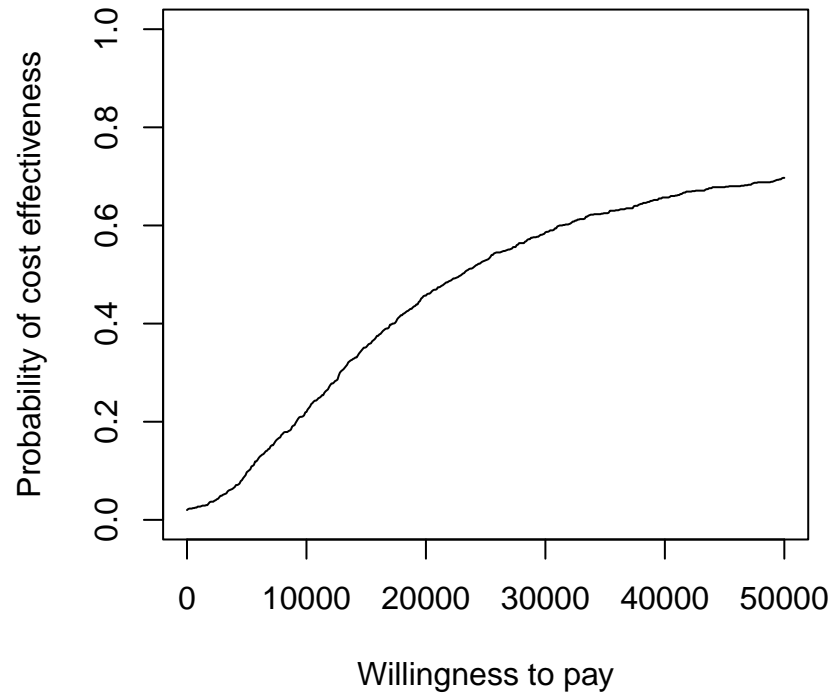
This section presents the results of Probabilistic Sensitivity Analysis (PSA). PSA is used to assess the impact of parameter uncertainty on the decision-making process.

### Cost–effectiveness acceptability curve

The following graph shows the cost–effectiveness acceptability curve (CEAC). The CEAC represents the proportion of ‘potential futures’ in which the reference intervention is estimated to be more cost-effective than the comparator. Thus, it can be interpreted as the ‘probability of cost-effectiveness’.



## Cost Effectiveness Acceptability Curve



### Info-rank plot

This section presents the results of the Info-rank plot. This is an extension of the Tornado plot, which is used to identify the most important parameters. Instead of using deterministic sensitivity analysis, however, the Info-rank plot is based on the analysis of the Expected Value of Partial Perfect Information (EVPPI).

For each parameter and value of the willingness-to-pay threshold  $k$ , a barchart is plotted to describe the ratio of EVPPI (specific to that parameter) to EVPI. This represents the relative 'importance' of each parameter in terms of the expected value of information.

## Info-rank plot for willingness to pay = 20100

