BCEA : : CHEAT SHEET

Introduction

Bayesian Cost-Effectiveness Analysis in R

Given a random sample of suitable variables of costs (*cost*) and clinical benefits (*eff*) for two or more interventions produces a health economic evaluation. Inputs may be the results of a Bayesian model (possibly based on MCMC) in the form of simulations from the posterior distributions.
For *s*sample points compares one of the *m*interventions (*ref*erence) to the others (.*comparison*).

bcea(eff, cost, ref, .comparison, interventions**)**

INPUT ARRAY PAIRCONSTITUENT FUNCTIONS

cost

eff

compute_U() : Expected utility for each WTP & intervention
compute_Ustar() : Maximum 'known-distribution' utility for each WTP
compute_vi() : Value of information for each WTP
bcea()compute_ol() : Opportunity Loss for each WTP
s**compute_ICER()** : Incremental cost-effectiveness ratio
compute_IB() : Incremental benefit for each WTP
compute_CEAC() : Cost-effectiveness acceptability for each WTP
compute_EIB() : Expected incremental benefit for each WTP
compute_kstar() : WTP break-even value

m

bcea() calculates numerous cost-effectiveness analysis statistics. These can be called directly, using the constituent functions, but would require some pre-processing which is already handled by **bcea().**

Plot

Standard cost-effectiveness analysis output plots. Base R, ggplot2 and plotly versions of plots are available and can be called directly but require extra default parameters.

Cost-effectiveness acceptability curve

Expected incremental benefit **ceac_plot(**he, comparison = NULL, pos = c(1, 0), graph = c("base", "ggplot2", "plotly"), ...**)**
calls: ● **ceac_plot_base()** ● **ceac_plot_ggplot()** ● **ceac_plot_plotly()**

eib.plot(he, comparison = NULL, pos = pos = c(1, 0), graph = c("base", c(1, 0), size = NULL, plot.cri = NULL, graph "ggplot2", "plotly"), ...**)**
= c("base", "ggplot2", "plotly"), ...**)**calls: ● **eib_plot_base()** ● **eib_plot_ggplot()** ● **eib_plot_plotly()**

Cost-effectiveness plane

ceplane_plot(he, comparison = NULL, pos = c(1, 0), graph = c("base", "ggplot2", "plotly"), ...**)**
calls: ● **ceplane_plot_base()** ● **ceplane_plot_ggplot()** ● **ceplane_plot_plotly()**

Expected value of information

evi.plot(he, graph = c("base", "ggplot2", "plotly"), ...**)**

Cost-effectiveness planes with contours

contour2(he, comparison = 1, scale = 0.8, nlevels = 4, levels = NULL, pos = c(1, 0), xlim = NULL, ylim = NULL, graph = c("base", "ggplot2"), ...**)**

Grid of CE plane, EIB, EVI & CEAC

plot.bcea(x, comparison = NULL, pos = c(1, 0), graph = c("base", "ggplot2", "plotly"), ...**)**

Compare optimal scenario to mixed case

plot.mixedAn(x, y.limits = NULL, pos = c(0, 1), graph = c("base", "ggplot2"), ...**)**

plot.evppi(x, pos = c(0, 0.8), graph = c("base", "ggplot2"), col = NULL, ...**)**

Expected value of perfect partial information

Value assignment

There are 3 equivalent ways to assign values to analysis parameters.

1. *In Constructor*: When first creating a bcea object.

   he <-**bcea(**eff, cost, ref, .comparison, ...**)**

2. *Using Setters*: Change directly using replacement functions.

   setComparison(he) <-comparison
   setKmax(he**)** **<-**Kmax
   setReference(he**)** <-ref

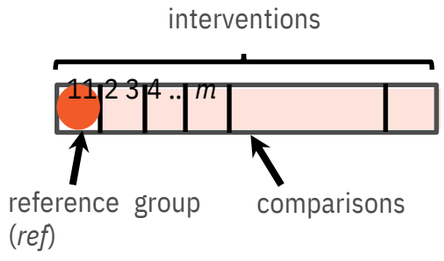
3. *In plotting call*: At the point of making a plot.

   eib.plot(he, comparison, ...**)**
   ceac.plot(he, comparison, ...**)**
   ceplane.plot(he, comparison, ...**)**

SELECTING ANALYSIS INTERVENTIONS

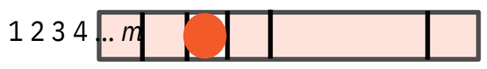
Default

The first columns in (*eff*, *cost*) are the default reference intervention. All other interventions are the comparison interventions unless defined otherwise. E.g. for *m*interventions



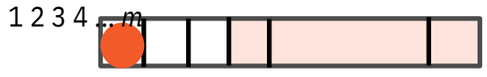
Set reference

Changing the reference group keeps all the other groups as comparison groups e.g. changing to reference group 3



Set comparisons

Changing the comparison groups keeps the reference group the same e.g. changing to comparison groups 4 to *m*



Summarise data

Summary statistics and formatted tables can be used to interrogate a **bcea**() object.

summary.bcea(he, ...**)**
Prints a table with summary results of the health economic evaluation

summary.mixedAn(he, ...**)**
Prints summary table for results of mixed analysis

sim.table(he, ...**)**
Summary table of simulations from the cost-effectiveness analysis

make.report(he, ...**)**
Constructs the automated report from the output of the BCEA