Comparison of three treatment strategies in mild asthma: A carbon-utility analysis – Supporting information

eTable 1. Model inputs and willingness thresholds

Variable	Value	Distribution	Source
A. Model inputs			
Kilograms CO_2 equivalent emissions – mean (SE)			
Budesonide DPI + salbutamol pMDI	17.3 (3.3)	Gamma	[1]
Salbutamol pMDI	26.2 (3.3)	Gamma	[1]
Budesonide/formoterol DPI	1.1 (3.3)	Gamma	[1]
Proportion of well controlled days per year [GINA classification] (SD)[a]			
Budesonide DPI + salbutamol pMDI	0.453 (0.036)	Beta	[2]
Salbutamol pMDI	0.328 (0.051)	Beta	[2]
Budesonide/formoterol DPI	0.301 (0.065)	Beta	[2]
Proportion of partly controlled days per year [GINA classification] (SD)[a]			
Budesonide DPI + salbutamol pMDI	0.406 (0.046)	Beta	[2]
Salbutamol pMDI	0.451 (0.045)	Beta	[2]
Budesonide/formoterol DPI	0.522 (0.053)	Beta	[2]
Proportion of poorly controlled days per year [GINA classification] (SD)[a]			
Budesonide DPI + salbutamol pMDI	0.142 (0.031)	Beta	[2]
Salbutamol pMDI	0.222 (0.030)	Beta	[2]
Budesonide/formoterol DPI	0.177 (0.017)	Beta	[2]
Proportion of days under exacerbations not resulting in ED visits [b]			
Budesonide DPI + salbutamol pMDI	0.003	-[c]	[2]
Salbutamol pMDI	0.008	-[c]	[2]
Budesonide/formoterol DPI	0.004	-[c]	[2]
Proportion of days under exacerbations resulting in ED visits [b]			
Budesonide DPI + salbutamol pMDI	0.0003	-[c]	[2]
Salbutamol pMDI	0.0004	-[c]	[2]
Budesonide/formoterol DPI	0	-[c]	[2]
Utilities – mean (SD)			
Well controlled asthma [GINA classification]	0.969 (0.045)	Beta	[3]
Partly controlled asthma [GINA classification]	0.935 (0.065)	Beta	[3]
Poorly controlled asthma [GINA classification]	0.884 (0.088)	Beta	[3]
Exacerbations not resulting in ED visits	0.864 (0.066[d])	Beta	[4]
Exacerbations resulting in ED visits	0.764 (0.066[d])	Beta	[4]
B. Willingness thresholds (per capita kilograms CO_2 equivalent emissions in the healthcare sector)			
China	250	NA	[5]
European Union	490	NA	[5]
United States	1720	NA	[5]

[a] Considering days without exacerbations; [b] Considering that the effects of exacerbations last for seven days, as frequently assumed in health economic evaluation studies[4, 6]; [c] No data on uncertainty available; [d] Average of the standard-deviations for the utilities associated with the different levels of asthma control.

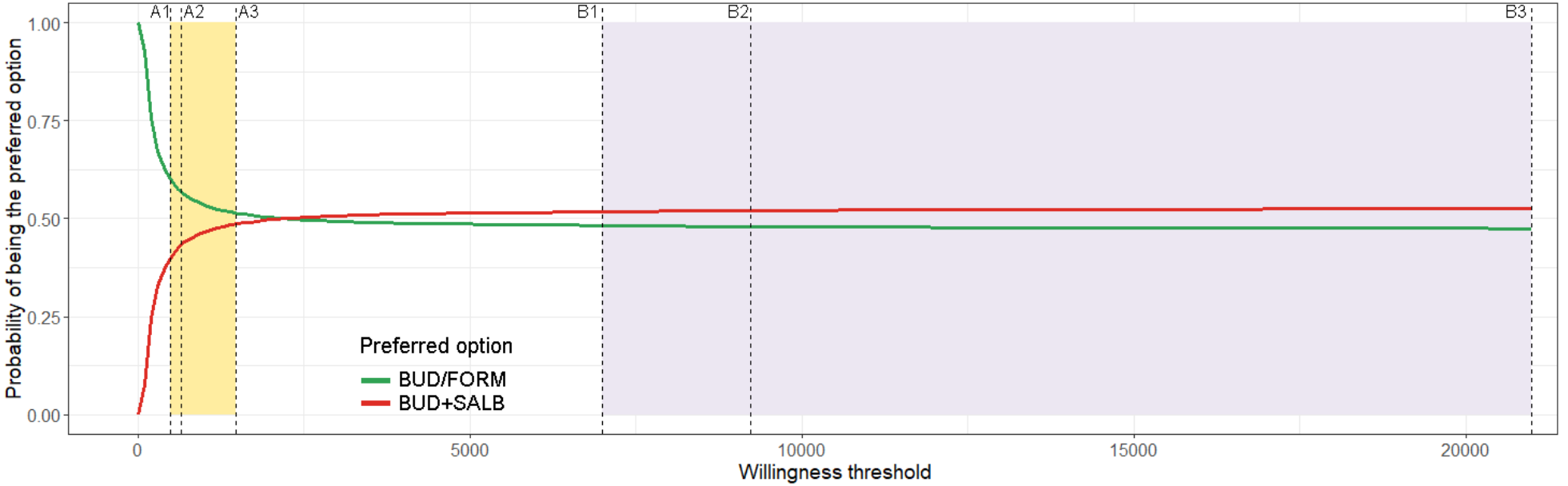
CO_2=Carbon dioxide; DPI=Dry powder inhaler; ED=Emergency department; GINA=Global Initiative for Asthma; NA=Not applicable; pMDI=pressurised metered-dose inhaler; SD=Standard-deviation; SE=Standard-error

eTable 2. Assessment of different willingness-to-emit thresholds considering the comparison between budesonide + salbutamol (BUD+SALB) *versus* budesonide/formoterol (BUD/FORM). Per capita $kgCO_2e$ emissions in the European Union are being considered.

Willingness-to-emit threshold [$kgCO_2e$ emissions/QALY gained]	**Difference in utilities**	**Maximum difference in $kgCO_2e$ emissions for BUD+SALB to be the preferred option (% of per capita $kgCO_2e$ emissions in the healthcare sector)**
Per capita $kgCO_2e$ emissions in the healthcare sector - 490	0.008	3.9 (0.8)
Per capita $kgCO_2e$ emissions in the healthcare sector adjusted to mean utilities in the general population [a] - 646	0.008	5.2 (1.1)
Two times per capita $kgCO_2e$ emissions in the healthcare sector - 980	0.008	7.8 (1.6)
Three times per capita $kgCO_2e$ emissions in the healthcare sector -1470	0.008	11.8 (2.4)
Per capita total $kgCO_2e$ emissions[7] - 7000	0.008	56.0 (11.4)
Per capita total $kgCO_2e$ emissions adjusted to mean utilities in the general population[7] [a] - 9235	0.008	73.9 (15.1)
Two times per capita total $kgCO_2e$ emissions[7] - 14000	0.008	112.0 (22.9)
Three times per capita total $kgCO_2e$ emissions[7] - 21000	0.008	168.0 (34.3)

[a] Portuguese values being considered as an example (0.758)[8]

eFigure 1. Results of the probabilistic sensitivity analysis considering different willingness-to-emit (WTE) thresholds. The yellow shade marks the probability of budesonide/formoterol (BUD/FORM) or budesonide + salbutamol (BUD+SALB) being the preferred option considering a set of WTE thresholds that ranges between 1 (A1) to 3 (A3) times the per capita $kgCO_2e$ emissions in the healthcare sector in the European Union (including an adjusted WTE threshold dividing A1 by the average utilities level in the general population – A2). The blue shade marks the probability of BUD/FORM or BUD+SALB being the preferred option considering a set of WTE thresholds that ranges between 1 (B1) to 3 (B3) times the per capita total $kgCO_2e$ emissions in the European Union (including an adjusted WTE threshold dividing B1 by the average utilities level in the general population – B2). For B1-B3, except for simulations in which BUD+SALB has been a dominated option, BUD+SALB is practically always the preferred option.



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