Tumor-Specific Decisions Using Tumor-Agnostic Evidence from Basket Trials: A Bayesian Hierarchical Approach

Running title: Bayesian Hierarchical Models for Tumor-Agnostic Therapies

Supplementary File

eTable 1. Estimated intraclass correlation metrics of random-effects models

Outcome	**Value**
Objective response rate	0.02
Median Progression-free Survival	0.87
Median Overall Survival	0.70

eTable 2. Sensitivity analysis for modeling objective response rate

Mean (95%CrL)	Trial	Uninformative prior			Weakly informative prior	
		Base case τ~Uniform(0, 3)	τ~Uniform(0, 5)	τ~Truncnorm(0, 100)	τ~Exp(1)	τ~Exp(0.3)
Colorectal	0.33	0.35 (0.25-0.45)	0.35 (0.25-0.45)	0.35 (0.25-0.45)	0.35 (0.26-0.45)	0.35 (0.25-0.45)
Endometrial	0.48	0.44 (0.34-0.55)	0.44 (0.34-0.55)	0.44 (0.34-0.55)	0.43 (0.34-0.54)	0.44 (0.34-0.55)
Gastric	0.31	0.34 (0.22-0.45)	0.34 (0.22-0.45)	0.34 (0.22-0.45)	0.35 (0.23-0.45)	0.34 (0.22-0.45)
Cholangiocarcinoma	0.41	0.39 (0.25-0.54)	0.39 (0.26-0.54)	0.39 (0.25-0.54)	0.38 (0.26-0.53)	0.39 (0.26-0.53)
Pancreatic	0.18	0.3 (0.14-0.43)	0.3 (0.14-0.43)	0.3 (0.14-0.43)	0.31 (0.15-0.44)	0.3 (0.14-0.43)
Small intestine	0.48	0.42 (0.29-0.58)	0.42 (0.29-0.58)	0.42 (0.29-0.58)	0.41 (0.29-0.57)	0.41 (0.29-0.58)
Ovarian	0.53	0.36 (0.22-0.49)	0.36 (0.22-0.49)	0.36 (0.22-0.49)	0.36 (0.23-0.48)	0.36 (0.22-0.49)
Predicted (RE)		0.37 (0.15-0.64)	0.37 (0.15-0.64)	0.37 (0.15-0.63)	0.37 (0.18-0.59)	0.37 (0.16-0.61)
Pooled (RE)		0.37 (0.26-0.47)	0.37 (0.26-0.47)	0.37 (0.26-0.47)	0.37 (0.27-0.46)	0.37 (0.27-0.47)
Between-tumor SD		0.4 (0.02-1.11)	0.41 (0.03-1.13)	0.4 (0.03-1.13)	0.33 (0.02-0.9)	0.38 (0.03-1.05)

Abbreviations: RE, random-effects model; SD, standard deviation; Exp, exponential distribution; Truncnorm, truncated normal distribution.

eTable 3. Sensitivity analysis for modeling median progression-free survival

Mean (95%CrL)	**Trial**	**Likelihood: Lognormal Distribution**			
		Base case $\tau \sim$Uniform(0, 5)	$\tau \sim$Exp(1)	$\tau \sim$Truncnorm(0, 4)	$\tau \sim$Uniform(0, 3)
Colorectal	4.1	4.1 (2.87-5.83)	4.1 (2.88-5.8)	4.1 (2.9-5.83)	4.09 (2.87-5.82)
Endometrial	13.1	12.7 (9.25-17.41)	12.66 (9.22-17.33)	12.69 (9.26-17.36)	12.73 (9.31-17.5)
Gastric	3.2	3.23 (2.11-4.96)	3.24 (2.11-4.98)	3.22 (2.1-4.95)	3.23 (2.1-4.94)
Cholangiocarcinoma	4.2	4.18 (2.34-7.42)	4.18 (2.36-7.41)	4.16 (2.32-7.39)	4.16 (2.34-7.5)
Pancreatic	2.1	2.21 (1.22-3.95)	2.23 (1.25-4.01)	2.21 (1.23-3.97)	2.21 (1.23-3.97)
Small intestine	23.4	20.47 (11.53-35.94)	20.07 (11.4-35.11)	20.28 (11.62-35.75)	20.52 (11.75-35.86)
Ovarian	2.2	2.29 (1.3-4.02)	2.33 (1.33-4.03)	2.31 (1.31-4.05)	2.3 (1.31-4.02)
Brain	1.1	1.29 (0.6-2.76)	1.33 (0.62-2.84)	1.31 (0.61-2.77)	1.3 (0.6-2.8)
Predicted (RE)		3.75 (0.24-50.45)	3.83 (0.37-36.83)	3.83 (0.28-44.13)	3.82 (0.25-51.09)
Pooled (RE)		3.7 (1.46-8.19)	3.87 (1.7-7.87)	3.81 (1.55-7.99)	3.79 (1.51-8.23)
Between-tumor SD		3.27 (1.87-10.12)	2.83 (1.8-6.22)	3.09 (1.85-7.97)	3.23 (1.86-9.14)

Abbreviations: RE, random-effects model; SD, standard deviation; Exp, exponential distribution; Truncnorm, truncated normal distribution.

eTable 4. Sensitivity analysis for modeling median overall survival

Mean (95%CrL)	Trial	Likelihood: Lognormal Distribution			
		Base case $\tau \sim$Uniform(0, 5)	$\tau \sim$Exp(1)	$\tau \sim$Truncnorm(0, 4)	$\tau \sim$Uniform(0, 3)
Colorectal	33*	32.39 (22.78-46.08)	32.17 (22.58-45.83)	32.31 (22.67-46.22)	32.29 (22.67-45.98)
Endometrial	46.5*	45.34 (33.08-62.2)	45.19 (32.96-62.13)	45.33 (33.04-62.48)	45.36 (32.93-62.35)
Gastric	11.0	11.15 (7.2-17.2)	11.21 (7.29-17.17)	11.16 (7.22-17.25)	11.17 (7.27-17.18)
Cholangiocarcinoma	19.4	19.15 (10.7-34.37)	19.1 (10.67-34.02)	19.07 (10.6-34.34)	19.1 (10.56-34.65)
Pancreatic	3.7	4.1 (2.22-7.49)	4.21 (2.32-7.65)	4.13 (2.27-7.52)	4.09 (2.23-7.49)
Small intestine	36+	75.48 (25.57-782.8)	63.8 (24.69-372.1)	70.59 (25.36-536)	73.37 (25.32-620.1)
Ovarian	33.6	32.01 (18.2-56.07)	31.63 (17.88-54.94)	31.93 (18.28-55.76)	31.84 (18.08-55.97)
Brain	5.6	6.26 (2.91-13.35)	6.47 (3.04-13.54)	6.34 (2.95-13.39)	6.26 (2.92-13.24)
Predicted (RE)		13.76 (0.42-276.5)	15.23 (1.13-172.4)	14.32 (0.72-222)	14.22 (0.59-254.5)
Pooled (RE)		13.9 (4.02-34.49)	15.11 (5.8-32.71)	14.47 (4.95-33.77)	14.18 (4.68-33.82)
Between-tumor SD		3.92 (1.92-19.78)	3.1 (1.82-8.31)	3.5 (1.9-11.47)	3.69 (1.91-12.75)

Abbreviations: RE, random-effects model; SD, standard deviation; Exp, exponential distribution; Truncnorm, truncated normal distribution.
+, censored at the end of the study period; * Estimated from the fitted exponentiation distribution to the digitized KM curve data.