

Supplementary Material for “A dose-schedule-finding design for phase I/II clinical trials”

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Table 1: A demonstration of violation of model (2) for scenarios 9-11 used in the simulation study

Dose	α_{jk}			β_{jk}			$\beta_{jk} - \alpha_{jk}$		
	Schedule			Schedule			Schedule		
	1	2	3	1	2	3	1	2	3
Scenario 9									
1	-2.30	-1.80	-2.50	-0.40	-0.60	-1.20	1.90	1.20	1.30
2	-1.90	-1.70	-2.30	-0.30	-0.40	-0.70	1.60	1.30	1.60
3	-0.20	-1.10	-2.20	0.90	0.50	-0.40	1.10	1.60	1.80
4	0.20	0.10	-2.00	1.30	1.60	-0.30	1.10	1.50	1.70
Scenario 10									
1	-2.20	-1.60	-2.00	-1.00	-0.20	-0.30	1.20	1.40	1.70
2	-0.40	-0.20	-1.40	0.90	1.40	0.45	1.30	1.60	1.85
3	-0.30	-0.10	-0.50	1.10	1.60	0.70	1.40	1.70	1.20
4	-0.20	0.20	-0.40	1.30	1.70	0.70	1.50	1.50	1.10
Scenario 11									
1	-0.20	-2.00	-2.10	0.90	-0.70	-0.50	1.10	1.30	1.60
2	-0.10	-1.90	-1.10	1.10	-0.50	0.36	1.20	1.40	1.46
3	0.00	-1.00	0.10	1.30	0.42	1.50	1.30	1.42	1.40
4	0.20	-0.10	0.30	1.60	1.40	1.80	1.40	1.50	1.50

Note: In order for a scenario to satisfy model (2) in the paper, $\beta_{jk} - \alpha_{jk}$ must be a constant across all (j, k) .

Table 2: Selection probability and number of patients treated at each dose-schedule combination assuming $\delta \sim U(0, 6)$ and $\gamma \sim U(0, 6)$

Dose	Selection percentage			Number of patients			Selection percentage			Number of patients		
	Schedule			Schedule			Schedule			Schedule		
	1	2	3	1	2	3	1	2	3	1	2	3
	Scenario 1						Scenario 2					
1	0.3	0.3	0.8	2.1	2.0	2.2	4.6	2.9	5.3	2.6	2.5	2.7
2	3.6	2.6	17.5	2.8	2.4	4.9	11.4	48.8	18.4	5.4	8.8	5.7
3	48.7	5.2	4.1	8.4	2.9	4.3	0.7	5.4	1.9	2.3	4.1	2.6
4	3.7	9.5	1.2	2.8	3.1	1.7	0.1	0.2	0.0	0.8	1.4	1.0
	Scenario 3						Scenario 4					
1	38.6	7.8	0.4	6.5	3.3	2.0	0.4	0.8	3.0	2.1	2.2	2.5
2	19.7	8.5	15.0	6.4	4.9	4.7	0.0	1.0	3.6	2.1	2.2	2.8
3	0.4	0.2	8.2	1.9	1.9	5.2	0.6	2.5	13.2	2.2	2.5	4.4
4	0.0	0.0	0.1	0.7	0.6	1.7	1.9	10.7	62.1	2.5	3.8	10.7
	Scenario 5						Scenario 6					
1	0.0	0.2	0.1	2.0	2.0	2.0	0.0	0.6	2.1	2.0	2.1	2.9
2	0.7	1.7	2.5	2.1	2.4	2.6	1.7	42.2	1.0	2.5	8.8	2.2
3	2.0	16.1	43.1	2.6	4.8	7.7	41.2	6.4	0.5	8.4	5.1	0.9
4	15.7	8.6	8.3	3.8	4.0	3.8	3.9	0.1	0.2	3.0	1.6	0.3
	Scenario 7						Scenario 8					
1	2.0	5.7	18.0	2.2	2.9	4.3	0.0	0.1	0.0	2.0	2.0	2.0
2	29.1	13.9	10.6	6.1	5.4	4.6	0.7	28.6	1.2	2.2	6.2	2.3
3	10.8	3.7	2.2	5.2	3.1	2.4	28.3	7.0	28.7	6.1	4.5	6.0
4	1.9	0.2	0.1	1.7	1.0	0.8	3.0	0.5	1.9	2.5	1.7	2.4
	Scenario 9						Scenario 10					
1	0.2	0.1	0.0	2.0	2.0	2.0	0.7	7.7	1.3	2.2	3.2	2.3
2	14.0	5.6	0.0	4.3	2.9	2.0	14.7	6.5	35.4	5.2	4.4	6.7
3	7.8	60.3	0.6	5.0	10.0	2.1	5.4	1.3	19.3	3.7	2.0	5.7
4	0.2	3.7	5.7	2.0	2.8	2.7	0.9	0.1	5.2	1.3	0.8	2.2
	Scenario 11						Scenario 12					
1	4.7	0.2	2.2	3.4	2.0	2.3	0.6	2.1	1.0	2.2	2.4	2.3
2	2.0	3.8	40.9	2.9	2.6	9.0	1.3	1.9	1.8	2.3	2.4	2.5
3	0.3	40.6	0.9	1.2	8.7	3.2	1.7	4.5	4.6	2.3	2.8	2.9
4	0.0	1.9	0.1	0.5	2.7	1.2	5.1	17.2	57.0	3.2	4.8	9.8

Table 3: Selection probability and number of patients treated at each dose-schedule combination assuming $\delta \sim U(0, 8)$ and $\gamma \sim U(0, 6)$

Dose	Selection percentage			Number of patients			Selection percentage			Number of patients		
	Schedule			Schedule			Schedule			Schedule		
	1	2	3	1	2	3	1	2	3	1	2	3
	Scenario 1						Scenario 2					
1	0.2	0.0	0.7	2.0	2.0	2.1	3.9	2.6	4.3	2.6	2.3	2.7
2	3.5	1.3	19.6	2.7	2.2	5.1	14.2	51.4	14.2	5.7	9.0	5.4
3	49.8	4.6	4.7	8.5	2.9	4.4	1.5	5.6	1.5	2.3	4.1	2.5
4	4.4	8.7	0.7	3.0	3.1	1.7	0.1	0.2	0.1	0.9	1.4	1.0
	Scenario 3						Scenario 4					
1	36.1	8.8	0.6	6.2	3.1	2.1	0.1	0.2	2.9	2.1	2.1	2.6
2	19.4	9.8	14.9	6.5	5.2	4.7	0.7	1.6	4.1	2.1	2.3	2.8
3	0.5	0.6	8.4	1.9	2.1	5.2	0.8	2.1	13.5	2.1	2.4	4.4
4	0.0	0.0	0.2	0.6	0.6	1.7	2.4	9.3	62.1	2.5	3.9	10.6
	Scenario 5						Scenario 6					
1	0.2	0.2	0.2	2.0	2.0	2.0	0.1	1.0	3.2	2.0	2.1	2.9
2	0.6	3.1	1.9	2.1	2.6	2.5	1.7	42.0	1.1	2.4	8.9	2.3
3	2.8	17.8	41.7	2.6	4.9	7.6	39.4	6.1	0.3	8.3	5.1	1.0
4	16.2	7.3	7.2	3.9	3.8	3.7	4.5	0.6	0.0	2.9	1.7	0.4
	Scenario 7						Scenario 8					
1	0.9	6.4	20.0	2.3	3.0	4.3	0.0	0.4	0.1	2.0	2.1	2.0
2	28.2	12.3	7.9	6.1	5.2	4.7	0.7	26.8	0.7	2.3	5.8	2.3
3	13.2	3.9	3.4	5.3	2.9	2.4	28.4	6.6	30.0	5.9	4.7	6.1
4	2.2	0.2	0.1	1.8	1.1	0.8	2.4	0.4	3.2	2.5	1.7	2.6
	Scenario 9						Scenario 10					
1	0.6	0.5	0.0	2.1	2.1	2.0	1.2	9.1	1.7	2.2	3.3	2.2
2	13.9	6.4	0.1	4.6	3.0	2.0	13.6	7.1	31.7	5.1	4.6	6.2
3	8.5	57.5	0.9	5.0	9.4	2.1	7.2	0.4	21.7	3.9	2.0	6.0
4	0.8	3.5	5.4	1.9	2.9	2.7	0.9	0.1	4.7	1.3	0.8	2.3
	Scenario 11						Scenario 12					
1	5.0	0.2	1.7	3.5	2.0	2.4	0.8	1.8	1.8	2.2	2.4	2.4
2	2.8	3.8	42.7	2.9	2.7	9.2	1.4	1.9	2.2	2.2	2.4	2.5
3	0.5	37.3	1.1	1.2	8.6	3.0	1.7	4.4	5.3	2.4	2.8	3.0
4	0.3	2.4	0.1	0.4	2.7	1.2	4.9	17.6	55.0	3.2	4.9	9.4

Table 4: Selection probability and number of patients treated at each dose-schedule combination assuming $\delta \sim U(0, 6)$ and $\gamma \sim U(0, 10)$

Dose	Selection percentage			Number of patients			Selection percentage			Number of patients		
	Schedule			Schedule			Schedule			Schedule		
	1	2	3	1	2	3	1	2	3	1	2	3
	Scenario 1						Scenario 2					
1	0.3	0.1	0.7	2.1	2.0	2.1	3.2	2.9	4.5	2.6	2.5	2.8
2	4.1	2.0	18.0	2.8	2.3	5.0	13.8	51.5	14.7	5.4	9.0	5.9
3	49.1	6.2	4.7	8.3	3.0	4.6	0.8	5.3	2.1	2.3	3.9	2.5
4	3.5	8.3	0.9	2.9	2.9	1.8	0.1	0.3	0.2	0.8	1.3	0.9
	Scenario 3						Scenario 4					
1	34.9	7.7	0.4	6.3	3.2	2.1	0.0	1.1	2.3	2.1	2.2	2.5
2	21.8	7.1	18.2	6.6	4.8	5.1	0.4	0.7	4.5	2.1	2.2	2.8
3	0.4	0.3	6.9	1.9	1.9	5.2	1.0	2.2	13.9	2.2	2.6	4.4
4	0.0	0.0	0.5	0.6	0.6	1.6	1.9	10.0	61.6	2.5	3.9	10.5
	Scenario 5						Scenario 6					
1	0.3	0.2	0.1	2.0	2.0	2.0	0.1	1.1	3.2	2.0	2.2	3.0
2	0.7	2.0	2.3	2.2	2.4	2.5	1.5	44.1	0.8	2.4	9.2	2.2
3	1.8	17.0	44.4	2.6	4.8	8.2	37.0	6.8	0.1	7.8	5.1	0.9
4	15.5	9.0	5.9	3.8	3.7	3.7	4.5	0.5	0.1	3.1	1.7	0.4
	Scenario 7						Scenario 8					
1	1.3	7.2	20.5	2.3	3.0	4.7	0.0	0.1	0.0	2.0	2.0	2.0
2	28.8	12.4	8.7	6.2	5.2	4.6	0.7	31.5	1.3	2.2	6.4	2.4
3	11.9	3.4	1.9	5.1	3.0	2.2	27.3	6.1	27.4	5.8	4.5	6.0
4	1.8	0.2	0.0	1.7	1.0	0.8	2.2	0.2	3.1	2.5	1.6	2.5
	Scenario 9						Scenario 10					
1	0.4	0.2	0.0	2.1	2.1	2.0	1.2	8.2	1.3	2.2	3.1	2.2
2	13.5	6.3	0.0	4.4	3.0	2.0	15.1	6.8	34.9	5.4	4.3	6.6
3	10.4	58.4	0.3	5.2	9.8	2.1	7.1	0.7	18.9	3.9	2.1	5.9
4	0.2	2.9	5.5	2.0	2.7	2.6	1.0	0.0	3.8	1.3	0.7	2.1
	Scenario 11						Scenario 12					
1	6.5	0.2	1.7	3.5	2.0	2.3	0.9	1.8	1.7	2.2	2.4	2.3
2	2.1	2.7	41.8	3.0	2.6	8.9	1.1	2.0	1.9	2.2	2.3	2.3
3	0.3	39.4	1.4	1.2	8.8	3.3	0.8	4.3	3.7	2.3	2.8	2.9
4	0.0	1.8	0.0	0.4	2.6	1.2	4.4	17.5	59.0	3.0	5.0	10.1

Table 5: Selection probability and number of patients treated at each dose-schedule combination assuming $\delta \sim U(0, 8)$ and $\gamma \sim U(0, 10)$

Dose	Selection percentage			Number of patients			Selection percentage			Number of patients		
	Schedule			Schedule			Schedule			Schedule		
	1	2	3	1	2	3	1	2	3	1	2	3
	Scenario 1						Scenario 2					
1	0.3	0.2	0.4	2.1	2.0	2.1	3.2	3.0	4.9	2.5	2.4	2.8
2	2.8	1.5	20.0	2.6	2.3	5.1	14.0	53.0	14.3	5.5	9.5	5.5
3	50.2	4.4	3.7	8.5	2.9	4.4	1.1	4.2	1.5	2.3	3.8	2.5
4	4.4	8.7	0.5	3.0	3.0	1.7	0.0	0.1	0.0	0.8	1.3	1.0
	Scenario 3						Scenario 4					
1	37.3	8.3	0.5	6.6	3.2	2.0	0.1	0.9	2.4	2.1	2.3	2.4
2	22.6	6.5	15.3	7.1	4.8	4.6	0.4	1.2	5.5	2.1	2.2	3.0
3	0.8	0.9	6.3	1.9	1.9	4.9	0.2	2.2	10.5	2.1	2.4	4.0
4	0.0	0.1	0.3	0.7	0.6	1.6	2.6	11.1	61.8	2.6	4.1	10.5
	Scenario 5						Scenario 6					
1	0.2	0.1	0.0	2.0	2.1	2.1	0.1	0.3	3.4	2.0	2.1	3.0
2	0.3	2.4	1.6	2.1	2.4	2.5	2.0	40.6	1.4	2.4	8.6	2.3
3	2.6	15.3	44.3	2.6	4.6	8.2	42.4	5.1	0.1	8.8	5.1	0.9
4	17.3	7.5	7.4	3.9	3.7	3.8	3.8	0.5	0.1	2.9	1.7	0.3
	Scenario 7						Scenario 8					
1	1.6	7.9	19.4	2.4	3.0	4.3	0.0	0.3	0.0	2.0	2.1	2.0
2	32.0	11.0	8.6	6.3	5.1	4.8	0.3	30.2	1.2	2.2	6.1	2.4
3	9.5	4.1	2.0	5.0	3.2	2.2	27.5	5.9	28.9	5.9	4.4	6.3
4	1.8	0.4	0.0	1.7	1.1	0.8	3.1	0.2	2.4	2.5	1.6	2.5
	Scenario 9						Scenario 10					
1	0.2	0.5	0.0	2.0	2.1	2.0	0.8	9.8	1.4	2.2	3.4	2.3
2	13.2	6.6	0.2	4.4	3.0	2.0	16.2	6.4	33.9	5.3	4.2	6.6
3	7.3	61.2	0.4	4.8	10.1	2.1	6.1	0.7	17.1	4.0	2.0	5.6
4	0.4	2.1	4.9	1.9	2.7	2.6	1.0	0.2	5.4	1.4	0.7	2.2
	Scenario 11						Scenario 12					
1	5.9	0.2	1.8	3.5	2.0	2.4	0.6	1.4	2.0	2.2	2.4	2.3
2	2.0	2.4	42.3	2.8	2.6	9.2	1.1	1.6	1.8	2.2	2.3	2.4
3	0.4	39.1	1.4	1.2	8.6	3.1	1.7	4.0	4.9	2.4	2.8	3.0
4	0.0	1.9	0.4	0.4	2.6	1.2	4.5	17.9	56.6	3.1	4.9	9.9

Table 6: Selection probability and number of patients treated at each dose-schedule combination assuming $\sigma^2 = 1$

Dose	Selection percentage			Number of patients			Selection percentage			Number of patients		
	Schedule			Schedule			Schedule			Schedule		
	1	2	3	1	2	3	1	2	3	1	2	3
	Scenario 1						Scenario 2					
1	0.7	0.8	1.2	2.1	2.1	2.2	5.0	3.3	5.7	2.8	2.5	2.8
2	4.7	2.4	19.4	2.8	2.5	5.0	12.5	49.8	14.4	5.3	9.2	5.5
3	46.4	5.0	2.0	8.2	3.0	4.0	1.2	5.8	1.5	2.3	3.9	2.4
4	3.5	9.3	1.4	2.9	3.2	1.7	0.1	0.2	0.1	0.9	1.4	0.9
	Scenario 3						Scenario 4					
1	40.4	8.3	1.2	7.0	3.1	2.2	0.5	0.7	3.9	2.1	2.2	2.7
2	20.3	7.8	12.5	6.9	4.9	4.0	0.5	1.1	5.9	2.2	2.3	3.1
3	0.6	0.6	6.8	2.0	1.9	4.7	0.6	3.3	12.5	2.2	2.6	4.3
4	0.1	0.3	0.4	0.7	0.6	1.7	2.6	10.4	58.0	2.5	3.8	10.0
	Scenario 5						Scenario 6					
1	0.6	0.5	0.6	2.1	2.1	2.1	0.3	0.5	2.6	2.0	2.2	3.1
2	0.4	3.5	2.8	2.1	2.7	2.8	1.5	39.3	1.8	2.4	8.2	2.3
3	3.1	13.9	40.9	2.7	4.3	7.7	42.7	5.6	0.5	8.9	4.8	1.0
4	18.9	6.9	7.1	4.3	3.6	3.5	3.8	1.1	0.1	3.0	1.7	0.3
	Scenario 7						Scenario 8					
1	2.5	8.3	22.3	2.3	3.2	5.1	0.0	0.3	0.6	2.0	2.1	2.1
2	27.1	9.3	8.2	6.0	4.8	4.4	1.0	30.8	2.1	2.3	6.3	2.5
3	9.8	5.8	2.9	4.8	3.0	2.7	24.0	6.4	27.5	5.4	4.4	5.8
4	2.0	0.7	0.2	1.8	1.1	0.9	3.2	1.1	3.0	2.7	1.7	2.7
	Scenario 9						Scenario 10					
1	1.7	1.1	0.1	2.2	2.1	2.0	0.9	8.9	1.8	2.2	3.3	2.3
2	14.8	5.7	0.3	4.3	2.9	2.0	15.2	4.5	34.2	5.2	4.5	6.6
3	7.7	55.0	1.5	4.9	9.4	2.3	7.9	1.1	18.8	3.9	2.2	5.4
4	1.7	2.8	5.0	2.0	2.8	2.9	0.7	0.2	4.8	1.3	0.8	2.3
	Scenario 11						Scenario 12					
1	6.2	0.2	2.2	3.6	2.1	2.4	1.0	2.7	2.3	2.2	2.5	2.6
2	2.5	3.1	40.8	2.9	2.5	9.0	1.4	1.8	2.5	2.3	2.4	2.5
3	0.8	39.8	0.8	1.2	8.8	3.0	1.9	5.3	5.0	2.5	3.0	3.2
4	0.1	1.3	0.2	0.4	2.6	1.2	4.5	16.3	53.3	3.0	4.5	9.2

Table 7: Selection probability and number of patients treated at each dose-schedule combination assuming $\sigma^2 = 0.2$

Dose	Selection percentage			Number of patients			Selection percentage			Number of patients		
	Schedule			Schedule			Schedule			Schedule		
	1	2	3	1	2	3	1	2	3	1	2	3
	Scenario 1						Scenario 2					
1	0.2	0.1	0.7	2.0	2.0	2.1	4.3	3.4	3.4	2.7	2.6	2.5
2	4.2	0.5	20.6	2.8	2.2	5.3	15.9	50.3	14.8	6.0	9.2	5.7
3	49.4	4.7	4.6	8.5	2.9	4.6	0.9	4.7	1.6	2.3	3.7	2.4
4	4.7	8.2	0.2	2.8	2.9	1.8	0.0	0.2	0.0	0.8	1.3	0.8
	Scenario 3						Scenario 4					
1	34.9	7.8	0.1	6.0	3.2	2.0	0.0	0.3	0.8	2.0	2.0	2.2
2	20.2	8.0	17.5	6.3	5.1	5.4	0.6	0.4	2.2	2.1	2.1	2.5
3	0.6	0.4	9.3	1.8	2.0	5.2	0.5	1.9	10.1	2.1	2.3	4.0
4	0.0	0.0	0.1	0.6	0.6	1.6	2.1	10.9	69.6	2.6	4.1	11.8
	Scenario 5						Scenario 6					
1	0.0	0.0	0.1	2.0	2.0	2.0	0.0	0.4	3.0	2.0	2.2	2.9
2	0.0	1.6	1.9	2.0	2.4	2.5	1.7	42.6	1.2	2.4	8.8	2.3
3	2.7	17.2	44.0	2.6	5.1	8.1	40.4	6.6	0.0	8.7	5.3	0.9
4	14.9	9.1	7.7	3.8	3.8	3.6	3.3	0.3	0.0	2.6	1.7	0.3
	Scenario 7						Scenario 8					
1	1.6	5.4	17.2	2.3	2.9	4.0	0.0	0.4	0.0	2.0	2.1	2.0
2	28.7	15.1	10.5	6.3	5.6	4.8	0.7	31.4	0.4	2.2	6.4	2.3
3	12.7	3.8	2.0	5.1	3.2	2.3	25.2	8.0	29.2	5.6	4.7	6.2
4	1.7	0.1	0.0	1.6	1.0	0.8	2.1	0.0	2.4	2.4	1.7	2.4
	Scenario 9						Scenario 10					
1	0.1	0.2	0.0	2.0	2.0	2.0	1.2	8.5	1.4	2.2	3.0	2.2
2	13.2	6.8	0.0	4.4	3.0	2.0	15.9	8.4	32.2	5.6	4.5	6.4
3	11.8	57.6	0.3	5.5	9.2	2.1	6.8	0.5	20.6	3.8	2.0	6.0
4	0.5	3.6	4.0	2.0	2.8	2.7	0.2	0.0	2.7	1.3	0.7	2.0
	Scenario 11						Scenario 12					
1	3.9	0.1	2.4	3.2	2.0	2.4	0.4	1.2	0.6	2.1	2.2	2.2
2	2.1	2.7	43.7	2.7	2.6	9.5	0.5	1.5	0.8	2.2	2.3	2.2
3	0.5	40.0	1.0	1.1	9.0	3.2	1.4	2.5	2.0	2.3	2.6	2.4
4	0.1	1.8	0.1	0.3	2.4	1.2	5.6	20.9	60.4	3.3	5.5	10.6