

# Hierarchical Normal Model

Congulation time (seconds) for randomly drawn blood

Diet      Measurements

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A	62, 60, 63, 59
B	63, 67, 71, 64, 65, 66
C	68, 66, 71, 67, 68, 68
D	56, 62, 60, 61, 63, 64, 63, 59

Posterior from 10 Gibbs sequences of length 100

Estimand	Posterior quantiles					$\hat{R}$
	2.5%	25%	median	75%	97.5%	
$\theta_1$	58.9	60.6	61.3	62.1	63.5	1.01
$\theta_2$	63.9	65.3	65.9	66.6	67.7	1.01
$\theta_3$	66.0	67.1	67.8	68.5	69.5	1.01
$\theta_4$	59.5	60.6	61.1	61.7	62.8	1.01
$\mu$	56.9	62.2	63.9	65.5	73.4	1.04
$\sigma$	1.8	2.2	2.4	2.6	3.3	1.00
$\tau$	2.1	3.6	4.9	7.6	26.6	1.05
$\log p(\mu, \log \sigma, \log \tau y)$	-67.6	-64.3	-63.4	-62.6	-62.0	1.02
$\log p(\theta, \mu, \log \sigma, \log \tau y)$	-70.6	-66.5	-65.1	-64.0	-62.4	1.01

# Hierarchical Normal Model

Parameter	Stepwise ascent			
	Crude estimate	First iteration	Second iteration	Third iteration
$\theta_1$	61.00	61.28	61.29	61.29
$\theta_2$	66.00	65.87	65.87	65.87
$\theta_3$	68.00	67.74	67.73	67.73
$\theta_4$	61.00	61.15	61.15	61.15
$\mu$	64.00	64.01	64.01	64.01
$\sigma$	2.29	2.17	2.17	2.17
$\tau$	3.56	3.32	3.31	3.31
$\log p(\theta, \mu, \log \sigma, \log \tau   y)$	-63.70	-61.42	-61.42	-61.42

Parameter	EM algorithm			
	Value at joint mode	First iteration	Second iteration	Third iteration
$\mu$	64.01	64.01	64.01	64.01
$\sigma$	2.17	2.33	2.36	2.36
$\tau$	3.31	3.46	3.47	3.47
$\log p(\mu, \log \sigma, \log \tau   y)$	-61.99	-61.835	-61.832	-61.832

Parameter	Posterior quantiles				
	2.5%	25%	median	75%	97.5%
$\theta_1$	59.15	60.63	61.38	62.18	63.87
$\theta_2$	63.83	65.20	65.78	66.42	67.79
$\theta_3$	65.46	66.95	67.65	68.32	69.64
$\theta_4$	59.51	60.68	61.21	61.77	62.99
$\mu$	60.43	62.73	64.05	65.29	67.69
$\sigma$	1.75	2.12	2.37	2.64	3.21
$\tau$	1.44	2.62	3.43	4.65	8.19