Supplemental Material for

Quantitative risk assessment: Developing a complete Bayesian approach to Dichotomous Dose-Response Model averaging

Matthew W. Wheeler[1], Kan Shao[2], Jeffrey S Gift[3], J. Allen Davis[4], Bruce C Allen[5], Todd Blessinger and Louis Olszyk

Appendix 1: Explanation of Marginal Approximation to the BMD

The approximation of the marginal is based upon the Taylor series expansion of $\pi(\theta|y)$ subject to the parameter of interest $\eta = g(\theta)$ and is described in Hsu (1). Define $\theta_\eta \in \Theta_\eta$ to be the value satisfying

$$\pi(\theta_\eta|y) = sup_{\theta \in \Theta_\eta} \pi(\theta|y),$$

where η fixed, $\Theta_\eta = \{\theta: \eta = g(\theta) \text{ for all } \theta \in \Theta\}$, and Θ is the unrestricted parameter space for θ. From (1.9) in Hsu, the posterior $\bar{\pi}^*(\theta|Y) \approx N(\theta_\eta, \bar{R}_\eta^{-1})$, where $\bar{R}_\eta$ is the negative hessian of the log posterior probability $\pi(\theta|y)$ evaluated at θ_η;

Equivalently $(x - \theta_\eta)^T \bar{R}_\eta (x - \theta_\eta) \approx \chi_k^2$, where k is the number of parameters constrained by $\eta = g(\theta)$.

Define $\theta^* \in \Theta$ such that

$$\pi(\theta^*|y) = sup_{\theta \in \Theta} \pi(\theta|y).$$

Now consider the Taylor expansion of $-2 \log \left[\frac{\pi(\theta|y)}{\pi(\theta^*|y)}\right]$ around θ_η. Under the restriction $\eta = g(\theta)$ one has $\theta_\eta - \theta^* \xrightarrow{p} 0$, and thus from the expansion is approximately $(\Theta^* - \theta_\eta)^T \bar{R}_\eta (\theta^* - \theta_\eta)$, which, from above, can be evaluated as a χ_k^2 random variable and be used to estimate the posterior distribution.

In the case of the BMD where one is interested in Pr(BMD < x), one computes the profile MAP at a grid of potential BMDs and compares this value to the value of the BMD defined at θ^* to the χ_k^2 random variable. As this RV folds both tails of the distribution into a single tail, the estimated probability is one half of the returned probability. A numerical example using the BMD calculated using the Weibull model from the approximation is given in figure. Note that MCMC sampling took 0.5 seconds, and the approximation took 0.005 seconds. Thus, the approximation was 100 times faster, which is significant when considering batch processing of large data sets.

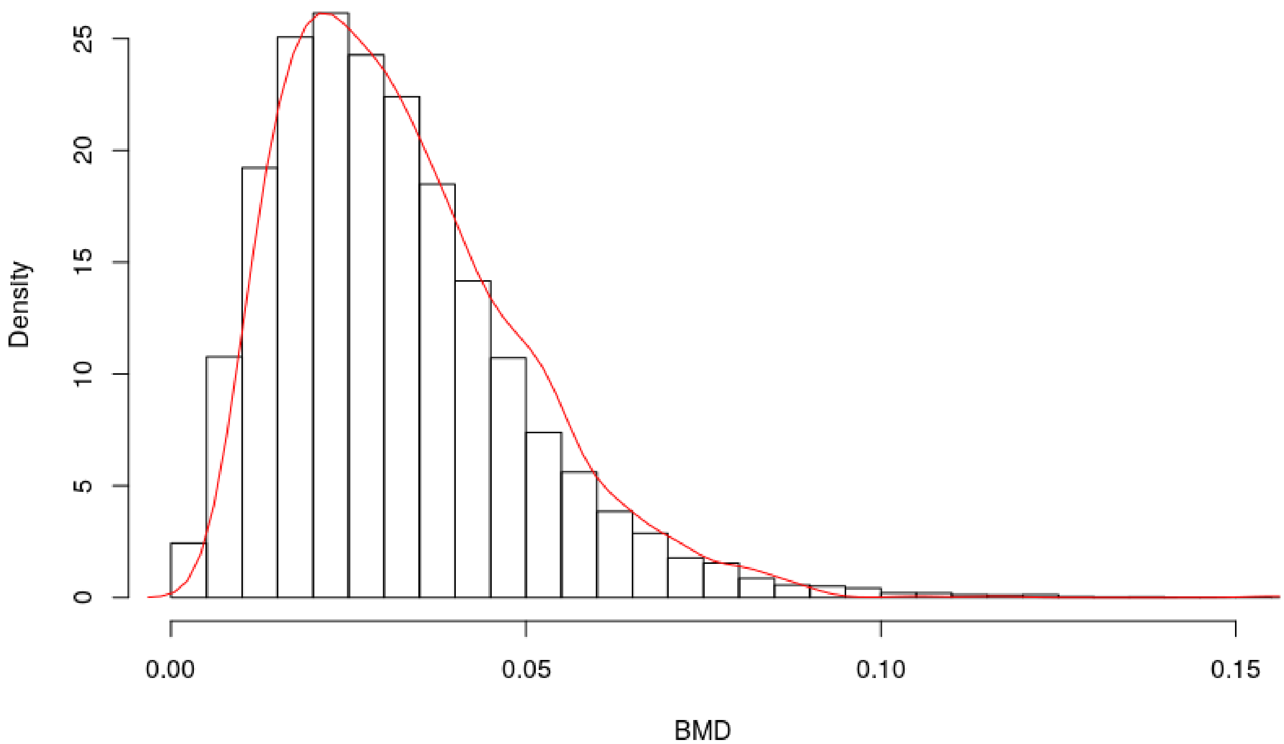

Figure SA1-1: Comparison of the true posterior distribution (calculated using MCMC) of the BMD calculated at a BMR=0.01 for the Weibull model compared to the approximate density (red line) generated using the approximation method.

Appendix 2: **Parametric simulation model forms M1-M26.**

As described in the manuscript, a variety of parametric models were considered in the simulation study. The parametric models were given in two varieties: 1) single dose-responses, M1-14 and M24-M26, and 2) those dose-response curves generated as a convex sum of models. The single parametric simulations were generated from the log-logistic and multistage 3° model, i.e.,

$$\pi_{LL}(d) = \gamma + \frac{1-\gamma}{1+\exp[-\beta_0 - \beta_1 \log(d)]}$$

and

$$\pi_{MS3}(d) = \gamma + (1-\gamma)[1 - \exp(-\beta_1 d - \beta_2 d^2 - \beta_3 d^3)].$$

Table SA2-1 gives the parameter values for each of these models.

Model	Parameter Values	BMD10	BMD01
M1	MS3: γ =0.01, β_1= 10, β_2= 0.5, β_3 = 9	0.012	0.001
M2	MS3: γ =0.01, β_1= 0, β_2= 0, β_3 = 20	0.174	0.080
M3	MS3: γ =0.01, β_1= 3, β_2= -9, β_3 = 10	0.040	0.003
M4	MS3: γ =0.01, β_1=1.1, β_2= -1, β_3 = 3.1	0.102	0.009
M5	MS3: γ =0.01, β_1= 0, β_2= 0, β_3 = 5	0.276	0.126
M6	LL : γ =0.01, β_0= 11, β_1= 4	0.569	0.458
M7	LL : γ =0.01, β_0= 18, β_1= 3	0.749	0.656
M8	MS3: γ =0.01, β_1= 3, β_1= -5, β_3 = 2.8	0.037	0.003
M9	MS3: γ =0.01, β_1= 0.7, β_1= 0.01, β_3 = 0.01	0.150	0.014
M10	MS3: γ =0.01, β_1= 0, β_1= 0, β_3 = 0.7	0.532	0.243
M11	LL : γ =0.01, β_0= 9, β_1= 0.4	0.749	0.574
M12	MS3: γ =0.01, β_1=1.25, β_2= -2, β_3 = 1.07	0.099	0.008
M13	MS3: γ =0.01, β_1=0.25, β_2= 0.01, β_3 = 0.01	0.411	0.040
M14	MS3: γ =0.01, β_1=0.01, β_2= 0.01, β_3 = 0.25	0.719	0.292
M24	MS3: γ = 0.2, β_1=0.27, β_2= -2.5, β_3 = 1	0.036	0.003
M25	MS3: γ = 0.2, β_1=0 , β_2= 0, β_3 = 1.5	0.413	0.189
M26	MS3: γ = 0.2, β_1=1 , β_2= 0.5, β_3 =-0.02	0.100	0.010

Table SA2-1: The true models, parameter values, and benchmark doses for models M1-M14 and M24-M26. Here MS3 is the multistage 3° model and LL is the log-logistic model. The manuscript gives parametrization of the MS3 and the LL models.

Dose-response simulations M15-24-M26 come from a convex sum of four parametric dose response models.

This convex sum takes the form

$$\pi_{MX} = \sum_i p_i \, \pi_i(d),$$

where X is 15 through 23 in the manuscript, the weights p_i sum to one, and the parametric models used are

$$\pi_{PRO}(d) = \Phi(-1.6 + 2.5d),$$

$$\pi_{QL}(d) = 0.02 + 0.98[1 - \exp(-1.6d)],$$

$$\pi_{LOG}(d) = 0.02 + \frac{0.98}{1+\exp[-1.3-2\times\log(d)]},$$

and

$$\pi_{WEI}(d) = 0.02 + 0.98[1 - \exp(-1.5d^{2.2})].$$

For these conditions, the weights assigned to the convex sum are in tables SA2-2 and SA2-3.

Model	True Model Weights	BMD-10	BMD-01
M15	LOG: 0.8; QL: 0.2	0.206	0.022
M16	LOG: 0.5; QL: 0.5	0.123	0.012
M17	LOG: 0.2; QL: 0.8	0.085	0.008
M23	LOG: 0.0; QL: 1.0	0.070	0.007

Table SA2-2: The weighting schemes for simulation models M15-M17 and M23 and corresponding BMD10 and BMD-01. The exact form of the logistic and quantal linear (QL) models are described in in the main text.

Model	True Model Weights	BMD10	BMD01
M18	PRO:0.55; QL:0.15; LOG:0.15; WEI:0.15	0.180	0.024
M19	PRO:0.15; QL:0.55; LOG:0.15; WEI:0.15	0.107	0.011
M20	PRO:0.15; QL:0.15; LOG:0.55; WEI:0.15	0.166	0.029
M21	PRO:0.15; QL:0.15; LOG:0.15; WEI:0.55	0.205	0.032
M22	PRO:0.25; QL:0.25; LOG:0.25; WEI:0.25	0.159	0.020

Table SA2-3: The weighting schemes for simulation models M18-M22 and corresponding BMD10 and BMD01. The exact form of the probit (PRO), logistic (LOG) and Weibull (WEI) models are described in the main text.

Appendix 3: Priors and Simulation Results

Table SA3-1: Proposed and Alternative Priors

	Priors 1a (Proposed)[1]	Priors 2	Priors 3	Priors 4 (Empirical)
Quantal Linear	$logit(\gamma) \sim N(0,2)$ $\beta \sim LN(0,1)$	$logit(\gamma) \sim N(-2.5,2)$ $\beta \sim LN(0,1)$	$logit(\gamma) \sim N(-2.5,1)$ $\beta \sim LN(-1,1)$	$logit(\gamma) \sim N(-2.5,2)$ $\beta \sim LN(-0.46,1.44)$
Multistage	$\text{logit}(\gamma) \sim N(0,2)$ $\beta_1 \sim LN(0,0.25)$ $\beta_2 \sim LN(0,1)$	$\text{logit}(\gamma) \sim N(-2.5,2)$ $\beta_1 \sim LN(0.5,0.44)$ $\beta_2 \sim LN(0,4)$	$\text{logit}(\gamma) \sim N(-2.5,1)$ $\beta_1 \sim LN(0.5,0.44)$ $\beta_2 \sim LN(0,4)$	$\text{logit}(\gamma) \sim N(-2.5,2)$ $\beta_1 \sim LN(-1.44,1.9)$ $\beta_2 \sim LN(-1.232,2)$
Weibull	$\text{logit}(\gamma) \sim N(0,2)$ $\alpha \sim LN(\log(2),0.18)$ $\beta \sim LN(0,1)$	$\text{logit}(\gamma) \sim N(-2.5,2)$ $\alpha \sim LN(\log(2),0.44)$ $\beta \sim LN(0,2)$	$\text{logit}(\gamma) \sim N(-2.5,1)$ $\alpha \sim LN(\log(2),0.44)$ $\beta \sim LN(0,2)$	$\text{logit}(\gamma) \sim N(-2.5,2)$ $\alpha \sim LN(0.64,0.1)$ $\beta \sim LN(-0.31,2)$
Gamma	$\text{logit}(\gamma) \sim N(0,2)$ $\alpha \sim LN(\log(2),0.18)$ $\beta \sim LN(0,1)$	$\text{logit}(\gamma) \sim N(-2.5,2)$ $\alpha \sim LN(\log(2),0.44)$ $\beta \sim LN(0,2)$	$\text{logit}(\gamma) \sim N(-2.5,1)$ $\alpha \sim LN(\log(2),0.44)$ $\beta \sim LN(0,2)$	$\text{logit}(\gamma) \sim N(-2.5,2)$ $\alpha \sim LN(0.82,0.19)$ $\beta \sim LN(0.76,0.85)$
Hill	$\text{logit}(\gamma) \sim N(0,2)$ $\text{logit}(\nu) \sim N(4,2)$ $a \sim N(0,0.25)$ $b \sim LN(\log(10),0.0625)$	$\text{logit}(\gamma) \sim N(-2.5,1)$ $\text{logit}(\nu) \sim N(4,2)$ $a \sim N(0,0.7)$ $b \sim LN(\log(10),0.44)$	$\text{logit}(\gamma) \sim N(-2.5,1)$ $\text{logit}(\nu) \sim N(4,2)$ $a \sim N(0,0.7)$ $b \sim LN(\log(10),0.44)$	$\text{logit}(\gamma) \sim N(-2.5,2)$ $\text{logit}(\nu) \sim N(2,2,0.5)$ $a \sim N(5.8,1.0)$ $b \sim LN(1.79,0.19)$
Logistic	$\beta_0 \sim N(0,2)$ $\beta_1 \sim LN(0.45,1)$	$\beta_0 \sim N(-2.5,2)$ $\beta_1 \sim LN(0.45,1)$	$\beta_0 \sim N(-2.5,1)$ $\beta_1 \sim LN(0.45,1)$	$\beta_0 \sim N(-2.5,2.2)$ $\beta_1 \sim LN(0,1)$
Log-Logistic	$\text{logit}(\gamma) \sim N(0,2)$ $\beta_0 \sim N(0,1)$ $\beta_1 \sim LN(\log(2),0.25)$	$\text{logit}(\gamma) \sim N(-2.5,2)$ $\beta_0 \sim N(0,1)$ $\beta_1 \sim LN(\log(2),0.44)$	$\text{logit}(\gamma) \sim N(-2.5,1)$ $\beta_0 \sim N(0,1)$ $\beta_1 \sim LN(\log(2),0.44)$	$\text{logit}(\gamma) \sim N(-2.5,2)$ $\beta_0 \sim N(0.25,4.5)$ β_1 $\sim LN(0.8329,0.316)$
Probit	$\beta_0 \sim N(0,2)$ $\beta_0 \sim N(0,1)$	$\beta_0 \sim N(-2.5,2)$ $\beta_0 \sim N(0,1)$	$\beta_0 \sim N(-2.5,1)$ $\beta_0 \sim N(0,1)$	$\beta_0 \sim N(-1.44,0.5)$ $\beta_0 \sim N(0.45,0.65)$
Log-Probit	$\text{logit}(\gamma) \sim N(0,2)$ $\beta_0 \sim N(0,1)$ $\beta_1 \sim LN(\log(2),0.25)$	$\text{logit}(\gamma) \sim N(-2.50,2)$ $\beta_0 \sim N(0,1)$ $\beta_1 \sim LN(\log(2),0.44)$	$\text{logit}(\gamma) \sim N(-2.50,1)$ $\beta_0 \sim N(0,1)$ $\beta_1 \sim LN(\log(2),0.44)$	$\text{logit}(\gamma) \sim N(-2.5,2)$ $\beta_0 \sim N(0.15,2)$ $\beta_1 \sim LN(0.41,0.4)$

[1] "Priors 1a" represent the proposed priors referred to in the manuscript. Simulation "Priors 1b" are the proposed priors with diffuse variance conditions (all parameters variances multiplied by 4). Simulation "Priors 1c" are the exact same as the proposed (Priors 1a) condition except the prior on the hill parameters were $a \sim N(0,0.25)$ and $b \sim LN(\log(2),0.25)$, which mimic the priors on the log-logistic model.

[2] Priors 2 and 3 are sensitivity analyses of the effect of the prior on the background rate, the diffuseness of the shape parameter, and the location of the quantal linear slope parameter.

[3] Priors 4 are empirical priors derived from BMD analyses documented in the EPA IRIS database.

Simulation Results

Table SA3-2: Coverage

	Priors 1a				Priors 1b (diffuse Hill)				Priors 1c (all diffuse)				Priors 2				Priors 3				Priors 4 (Emperical)				BMDS		BAYES NP		SHAO MA (MAKS)	
	BMR 0.1		BMR 0.01		BMR 0.1		BMR 0.01		BMR 0.1		BMR 0.01		BMR 0.1		BMR 0.01		BMR 0.1		BMR 0.01		BMR 0.1		BMR 0.01		BMR = 0.1	BMR = 0.01	BMR = 0.1		BMR = 0.1	BMR = 0.01
	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5						
M1	97.9%	97.0%	98.5%	97.0%	98.4%	97.6%	98.4%	97.6%	99.8%	99.0%	99.8%	99.0%	99.0%	98.4%	99.4%	98.4%	98.4%	97.8%	99.4%	98.4%	98.4%	97.6%	99.4%	97.7%	99.1%	99.3%	0.0%	0.0%	93.6%	93.3%
M2	99.7%	99.7%	100.0%	100.0%	99.5%	99.5%	100.0%	100.0%	99.7%	99.7%	100.0%	100.0%	99.6%	99.6%	100.0%	100.0%	99.6%	99.6%	100.0%	100.0%	99.9%	99.9%	100.0%	100.0%	90.8%	91.8%	100.0%	100.0%	100.0%	100.0%
M3	0.0%	0.0%	5.1%	4.2%	0.0%	0.0%	13.8%	13.7%	0.0%	0.1%	13.9%	13.9%	0.0%	0.0%	11.9%	11.7%	0.0%	0.0%	11.9%	11.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
M4	52.1%	55.6%	35.0%	45.7%	30.5%	43.4%	32.3%	43.7%	30.6%	40.5%	33.0%	41.0%	48.3%	51.2%	41.5%	46.6%	48.3%	50.6%	41.4%	45.9%	22.5%	36.5%	13.7%	32.2%	36.2%	31.0%	92.7%	86.1%	67.9%	32.5%
M5	98.8%	98.8%	100.0%	100.0%	98.1%	98.1%	100.0%	100.0%	98.3%	98.3%	100.0%	100.0%	98.2%	98.2%	100.0%	100.0%	98.2%	98.2%	100.0%	100.0%	97.9%	97.9%	99.1%	99.1%	77.8%	88.2%	99.2%	100.0%	100.0%	100.0%
M6	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	91.4%	100.0%	100.0%	100.0%	100.0%	100.0%
M7	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
M8	100.0%	100.0%	93.3%	61.3%	84.1%	56.3%	94.2%	69.8%	100.0%	100.0%	99.5%	92.4%	100.0%	100.0%	94.2%	64.8%	100.0%	100.0%	95.0%	67.1%	11.5%	6.1%	3.9%	0.2%	97.0%	98.5%	0.0%	0.0%	0.0%	0.0%
M9	87.4%	91.0%	88.8%	91.9%	89.2%	91.7%	90.8%	92.5%	93.2%	92.5%	94.0%	93.1%	84.4%	87.9%	85.6%	88.6%	84.9%	87.4%	86.0%	88.3%	84.3%	89.4%	84.6%	89.7%	88.0%	94.3%	94.1%	91.3%	68.9%	65.2%
M10	0.0%	0.0%	92.6%	92.5%	99.0%	99.0%	99.8%	99.8%	6.8%	1.5%	92.7%	92.8%	0.0%	0.0%	97.2%	97.2%	0.0%	0.0%	98.3%	98.3%	100.0%	100.0%	100.0%	100.0%	92.6%	91.5%	99.7%	100.0%	99.3%	99.5%
M11	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
M12	29.7%	6.2%	100.0%	100.0%	35.1%	9.7%	80.6%	32.4%	86.5%	55.4%	100.0%	100.0%	21.2%	1.9%	100.0%	100.0%	20.1%	1.8%	100.0%	100.0%	0.4%	0.2%	0.2%	0.1%	48.8%	52.1%	33.5%	4.0%	0.0%	0.0%
M13	67.7%	83.5%	60.8%	84.1%	79.3%	87.6%	79.0%	90.0%	79.7%	85.0%	86.1%	89.3%	72.2%	82.1%	71.7%	84.0%	72.4%	81.0%	71.5%	83.6%	76.9%	88.6%	75.5%	89.8%	80.9%	94.0%	98.8%	97.5%	82.9%	78.6%
M14	94.9%	95.0%	98.9%	98.9%	96.6%	97.0%	100.0%	100.0%	93.6%	94.3%	97.8%	97.8%	95.1%	95.5%	99.9%	99.9%	95.7%	95.7%	100.0%	100.0%	96.9%	97.6%	100.0%	100.0%	91.6%	95.9%	100.0%	100.0%	98.8%	100.0%
M15	94.9%	95.0%	98.9%	98.9%	82.7%	87.3%	61.1%	78.0%	93.6%	94.3%	97.8%	97.8%	95.1%	95.5%	99.9%	99.9%	95.7%	95.7%	100.0%	100.0%	78.2%	85.0%	48.9%	73.5%	57.8%	53.9%	97.2%	98.0%	78.8%	57.9%
M16	88.2%	95.1%	85.9%	94.7%	85.5%	94.6%	83.1%	94.5%	85.4%	93.5%	83.2%	93.3%	85.7%	94.0%	83.9%	93.3%	86.4%	94.4%	84.6%	93.6%	80.1%	92.7%	78.0%	92.6%	56.3%	72.7%	94.1%	92.0%	82.3%	75.2%
M17	91.6%	96.9%	91.6%	96.9%	93.1%	97.1%	92.8%	97.2%	94.0%	96.9%	94.4%	97.0%	93.1%	96.8%	93.4%	96.8%	93.4%	96.6%	93.5%	96.6%	89.7%	95.9%	89.3%	95.7%	81.2%	89.9%	89.2%	100.0%	61.9%	55.5%
M18	91.6%	93.1%	90.0%	92.1%	86.9%	90.3%	80.2%	86.6%	86.5%	89.3%	83.7%	88.0%	83.4%	87.4%	72.2%	82.5%	84.6%	87.9%	74.5%	82.9%	80.9%	86.3%	69.1%	81.7%	65.6%	85.9%	98.4%	100.0%	88.5%	84.0%
M19	95.5%	98.3%	95.3%	98.3%	93.5%	98.0%	92.8%	98.0%	93.6%	97.6%	93.4%	97.6%	95.4%	98.0%	95.2%	98.0%	95.4%	97.7%	95.1%	97.9%	89.2%	96.7%	88.1%	96.4%	73.6%	88.0%	97.1%	97.3%	89.6%	89.1%
M20	97.2%	97.9%	99.3%	99.4%	94.5%	96.7%	97.7%	98.7%	94.5%	96.5%	98.8%	99.2%	93.8%	95.6%	95.1%	96.9%	94.1%	95.7%	95.7%	97.1%	89.2%	94.3%	94.3%	96.5%	76.2%	97.0%	99.0%	100.0%	94.4%	97.9%
M21	91.5%	92.7%	100.0%	100.0%	89.3%	90.9%	89.3%	90.9%	88.4%	90.0%	100.0%	100.0%	84.1%	86.5%	100.0%	100.0%	85.6%	87.5%	100.0%	100.0%	85.7%	88.4%	85.7%	88.4%	78.7%	93.1%	99.2%	99.9%	88.4%	86.7%
M22	92.7%	94.5%	92.3%	94.2%	86.4%	91.7%	82.0%	90.0%	86.4%	90.9%	85.5%	89.9%	85.6%	90.1%	79.1%	87.6%	86.5%	90.4%	80.7%	87.7%	79.8%	87.4%	69.6%	84.1%	61.6%	84.0%	98.3%	99.7%	88.6%	85.5%
M23	89.6%	90.5%	90.1%	90.0%	92.0%	91.1%	91.5%	90.6%	95.5%	93.2%	95.7%	93.0%	92.4%	90.7%	92.6%	90.0%	92.5%	90.3%	92.8%	89.7%	86.2%	88.5%	86.3%	88.2%	87.5%	92.7%	83.7%	76.0%	50.9%	46.1%
M24	97.1%	99.9%	96.7%	99.9%	94.7%	99.6%	93.9%	99.6%	94.0%	99.6%	93.3%	99.5%	93.8%	99.5%	93.0%	99.5%	91.7%	99.1%	88.1%	99.1%	89.0%	98.8%	85.7%	98.7%	67.7%	91.7%	65.8%	37.6%	99.9%	99.9%
M25	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.8%	99.8%	99.5%	99.5%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.9%	99.9%	99.8%	99.8%	99.7%	99.0%	100.0%	100.0%	100.0%	100.0%
M26	95.8%	98.8%	95.8%	98.9%	96.0%	99.0%	95.2%	99.0%	95.4%	98.4%	94.7%	98.4%	96.9%	99.0%	96.7%	98.9%	97.2%	98.9%	96.9%	99.1%	89.8%	98.0%	88.3%	98.1%	53.1%	66.3%	95.4%	95.3%	96.5%	97.6%
M27	99.5%	99.8%	100.0%	100.0%	99.4%	99.7%	100.0%	100.0%	99.4%	99.7%	100.0%	100.0%	99.0%	99.4%	100.0%	100.0%	99.1%	99.6%	100.0%	100.0%	98.2%	99.1%	99.1%	99.5%	95.1%	99.4%	99.6%	100.0%	99.5%	100.0%
M28	100.0%	100.0%	40.6%	40.6%	100.0%	100.0%	27.4%	27.4%	100.0%	100.0%	18.5%	18.5%	100.0%	100.0%	41.9%	41.9%	100.0%	100.0%	42.1%	42.1%	100.0%	100.0%	20.3%	20.3%	100.0%	0.8%	100.0%	100.0%	100.0%	100.0%
M29	100.0%	100.0%	93.8%	95.5%	92.2%	92.0%	99.8%	99.8%	100.0%	100.0%	93.0%	96.1%	100.0%	100.0%	97.3%	98.5%	100.0%	100.0%	98.7%	99.4%	100.0%	100.0%	100.0%	100.0%	100.0%	92.1%	100.0%	100.0%	100.0%	100.0%
M30	92.7%	97.3%	92.2%	98.2%	97.6%	99.2%	75.1%	81.9%	95.3%	97.6%	96.4%	98.8%	96.0%	98.5%	94.7%	99.1%	96.6%	98.3%	96.7%	99.0%	97.1%	99.2%	99.1%	99.9%	93.2%	97.1%	99.8%	100.0%	97.6%	99.1%
M31	95.7%	99.0%	96.4%	99.2%	96.8%	99.1%	97.2%	99.3%	96.8%	99.2%	97.0%	99.4%	96.1%	99.3%	96.9%	99.6%	94.6%	99.0%	95.7%	99.3%	89.1%	98.4%	89.7%	98.6%	67.3%	88.4%	56.1%	46.9%	92.6%	94.2%
M32	95.9%	100.0%	94.5%	100.0%	100.0%	100.0%	100.0%	100.0%	95.0%	100.0%	97.7%	100.0%	97.0%	100.0%	98.7%	100.0%	97.0%	100.0%	98.7%	100.0%	100.0%	100.0%	99.9%	99.9%	77.7%	100.0%	100.0%	100.0%	100.0%	100.0%
M33	0.9%	36.4%	15.6%	92.7%	44.6%	46.0%	96.6%	97.5%	5.4%	69.7%	20.4%	99.4%	2.6%	49.2%	29.0%	97.5%	2.3%	49.4%	27.5%	96.1%	31.0%	42.6%	96.5%	99.3%	59.6%	99.9%	96.9%	100.0%	46.4%	98.3%
M34	80.7%	99.8%	92.6%	100.0%	99.9%	98.5%	100.0%	100.0%	95.3%	100.0%	96.8%	100.0%	79.8%	99.7%	87.6%	100.0%	80.7%	99.8%	87.4%	100.0%	65.8%	75.1%	72.3%	89.3%	99.7%	100.0%	98.9%	99.7%	83.7%	98.8%
AVG	82.9%	85.6%	86.3%	90.1%	86.3%	86.8%	86.6%	87.3%	84.8%	87.4%	86.9%	90.7%	82.0%	85.1%	86.7%	90.3%	82.1%	85.1%	86.8%	90.4%	79.6%	83.5%	77.5%	82.6%	77.8%	83.2%	84.9%	83.0%	80.9%	80.4%

Table SA3-3: Percent of True BMD

	Priors 1a				Priors 1b (diffuse Hill)				Priors 1c (all diffuse)				Priors 2				Priors 3				Priors 4 (Emperical)				BMDS		BAYES NP		SHAO MA (MAKS)	
	BMR 0.1		BMR 0.01		BMR 0.1		BMR 0.01		BMR 0.1		BMR 0.01		BMR 0.1		BMR 0.01		BMR 0.1		BMR 0.01		BMR 0.1		BMR 0.01		BMR = 0.1	BMR = 0.01	BMR = 0.1	BMR = 0.01	BMR = 0.1	BMR = 0.01
	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5						
M1	8.6%	99.9%	121.2%	101.6%	209.5%	125.9%	429.6%	179.5%	152.2%	104.9%	226.2%	118.3%	196.7%	115.6%	317.2%	140.3%	238.4%	134.3%	407.8%	180.1%	174.8%	117.7%	403.6%	175.6%	755.5%	3097.8%	274.5%	262.0%	246.8%	513.8%
M2	86.4%	86.2%	51.9%	51.8%	91.2%	91.0%	64.2%	64.1%	89.8%	89.7%	56.4%	56.4%	90.1%	90.0%	58.5%	58.5%	90.1%	90.1%	58.5%	58.5%	87.7%	87.5%	61.2%	61.1%	96.4%	69.0%	13.0%	58.4%	80.6%	55.4%
M3	431.8%	423.1%	959.6%	941.1%	458.2%	443.7%	1078.5%	1041.9%	461.9%	451.6%	1055.9%	1033.1%	457.1%	448.1%	1077.8%	1055.0%	457.4%	450.1%	1077.6%	1059.0%	463.2%	450.3%	1111.6%	1074.2%	448.9%	1175.1%	298.8%	251.2%	449.8%	1437.2%
M4	159.9%	155.7%	362.4%	351.5%	171.9%	165.0%	430.7%	407.3%	170.6%	165.4%	376.7%	361.9%	171.2%	166.9%	434.6%	419.9%	171.4%	167.8%	434.1%	421.8%	176.4%	170.4%	499.1%	475.2%	163.9%	382.1%	138.3%	118.5%	175.8%	569.1%
M5	96.4%	96.4%	75.3%	75.3%	98.7%	98.7%	82.9%	82.9%	97.6%	97.6%	75.8%	75.8%	98.4%	98.4%	79.6%	79.6%	98.4%	98.4%	79.6%	79.6%	98.0%	98.0%	83.3%	83.3%	110.2%	87.5%	38.3%	86.8%	93.8%	88.3%
M6	95.8%	95.8%	88.4%	88.4%	95.7%	95.7%	90.3%	90.3%	101.1%	101.1%	93.6%	93.6%	94.5%	94.5%	84.4%	84.4%	94.4%	94.4%	84.3%	84.3%	96.3%	96.3%	98.3%	98.3%	106.1%	108.9%	42.8%	90.4%	91.8%	85.7%
M7	78.6%	78.6%	69.4%	69.4%	77.8%	77.8%	69.1%	69.1%	84.0%	84.0%	75.0%	75.0%	76.7%	76.7%	65.5%	65.5%	76.5%	76.5%	65.4%	65.4%	77.1%	77.1%	73.4%	73.4%	113.6%	96.9%	35.4%	71.0%	78.8%	69.7%
M8	188.8%	240.7%	179.7%	246.3%	182.8%	230.4%	175.3%	234.2%	89.8%	149.3%	79.5%	149.2%	191.3%	240.8%	185.4%	246.1%	189.0%	239.3%	183.3%	244.3%	297.9%	286.7%	809.0%	527.6%	93.0%	67.3%	221.9%	199.7%	321.0%	412.5%
M9	134.3%	118.0%	228.4%	162.8%	129.2%	115.8%	207.7%	150.3%	124.4%	116.3%	199.8%	152.2%	137.2%	121.7%	258.1%	178.6%	135.4%	120.8%	245.1%	169.4%	132.2%	116.8%	209.5%	149.6%	105.6%	142.6%	146.3%	117.4%	175.8%	445.7%
M10	113.7%	113.2%	139.8%	139.0%	97.3%	96.8%	86.3%	85.7%	112.2%	111.4%	133.1%	131.8%	103.1%	102.7%	110.5%	109.7%	101.5%	101.0%	105.1%	104.1%	93.2%	92.3%	77.5%	76.3%	98.6%	85.1%	55.5%	88.1%	107.2%	139.7%
M11	100.0%	100.0%	99.0%	99.0%	83.7%	83.7%	69.1%	69.1%	97.6%	97.6%	95.2%	95.2%	86.4%	86.4%	73.7%	73.7%	85.0%	85.0%	71.7%	71.7%	76.7%	76.7%	63.7%	63.7%	103.3%	107.2%	39.3%	73.5%	100.2%	100.2%
M12	100.0%	364.3%	536.0%	416.9%	100.0%	485.2%	689.6%	509.5%	100.0%	318.3%	439.3%	394.0%	100.0%	392.3%	534.9%	409.6%	100.0%	404.7%	563.7%	478.9%	100.0%	339.8%	463.9%	372.4%	220.3%	240.8%	235.0%	179.0%	352.0%	685.1%
M13	152.7%	136.4%	335.1%	268.5%	185.6%	161.5%	334.2%	264.4%	193.5%	154.0%	395.5%	263.7%	171.6%	142.4%	347.3%	228.6%	165.4%	147.9%	343.1%	228.9%	137.6%	123.5%	243.5%	170.4%	109.1%	181.1%	160.7%	97.7%	133.0%	344.8%
M14	107.0%	105.9%	108.5%	106.0%	106.1%	104.7%	83.9%	81.2%	115.4%	112.6%	127.2%	116.0%	108.6%	107.1%	100.6%	90.8%	107.2%	108.2%	101.8%	90.6%	100.1%	98.5%	73.8%	64.5%	99.2%	72.6%	56.4%	83.9%	97.6%	96.2%
M15	120.0%	109.6%	325.1%	289.4%	116.9%	105.8%	294.2%	256.0%	122.6%	112.4%	328.0%	294.0%	124.8%	113.8%	373.1%	328.1%	121.4%	110.6%	341.6%	298.8%	120.8%	109.6%	325.5%	286.7%	118.2%	195.3%	152.0%	102.3%	132.8%	402.9%
M16	131.2%	112.4%	262.9%	203.4%	134.0%	112.6%	291.3%	212.0%	133.4%	114.7%	267.5%	205.3%	138.9%	117.1%	345.2%	252.2%	137.2%	116.3%	328.3%	241.1%	142.1%	119.3%	342.0%	253.8%	132.5%	181.0%	152.0%	120.6%	170.1%	429.9%
M17	127.7%	110.7%	192.3%	141.9%	132.1%	111.3%	241.1%	155.8%	125.5%	110.5%	202.9%	143.9%	132.9%	112.8%	257.6%	168.2%	132.7%	113.5%	254.8%	168.9%	141.3%	116.8%	304.9%	191.1%	118.7%	144.8%	13.3%	126.3%	185.3%	381.5%
M18	108.2%	98.3%	198.1%	173.9%	111.7%	99.8%	216.7%	184.0%	111.9%	101.4%	199.2%	174.2%	115.5%	104.0%	252.4%	216.0%	113.9%	102.9%	239.9%	206.0%	118.7%	107.0%	268.2%	233.8%	102.6%	133.9%	95.6%	99.1%	124.8%	260.2%
M19	114.5%	97.7%	187.1%	139.2%	121.1%	99.5%	241.4%	159.9%	116.5%	98.9%	201.8%	142.3%	122.0%	101.4%	262.4%	176.9%	121.9%	102.1%	258.8%	177.4%	130.6%	107.1%	310.9%	209.9%	114.1%	128.8%	118.4%	112.3%	158.9%	339.0%
M20	94.8%	82.9%	112.4%	90.5%	100.3%	85.5%	135.9%	103.3%	98.0%	85.3%	116.1%	91.0%	103.0%	88.8%	155.5%	120.1%	102.2%	88.6%	151.2%	117.7%	108.3%	93.3%	178.0%	140.3%	98.4%	78.7%	62.5%	92.7%	119.7%	172.3%
M21	100.0%	106.1%	174.0%	156.9%	100.0%	108.7%	185.8%	164.2%	100.0%	109.2%	171.3%	154.4%	100.0%	113.7%	221.6%	197.9%	100.0%	112.0%	210.3%	187.9%	100.0%	114.8%	229.6%	207.0%	106.0%	125.9%	84.5%	92.6%	118.2%	227.4%
M22	107.2%	95.0%	182.2%	152.1%	112.5%	97.5%	212.4%	168.6%	110.9%	98.0%	184.9%	151.8%	115.7%	101.3%	244.5%	196.7%	114.6%	100.9%	236.0%	191.1%	120.4%	105.4%	269.1%	220.1%	109.6%	132.0%	97.0%	97.9%	131.1%	267.3%
M23	123.8%	112.1%	164.3%	127.1%	128.0%	112.7%	211.1%	138.8%	116.9%	110.1%	170.8%	127.1%	126.8%	113.2%	209.1%	141.7%	127.2%	114.0%	210.8%	144.2%	142.5%	118.8%	326.3%	184.9%	110.2%	138.5%	136.1%	127.4%	184.1%	341.6%
M24	116.7%	89.0%	158.6%	108.0%	135.1%	101.1%	269.6%	169.3%	125.4%	98.4%	181.1%	131.7%	121.8%	96.2%	176.3%	127.1%	126.5%	102.7%	185.7%	139.3%	149.6%	114.4%	357.5%	224.8%	107.6%	130.6%	137.0%	126.4%	156.2%	191.4%
M25	51.4%	48.0%	41.1%	38.2%	51.8%	47.4%	41.0%	37.2%	57.2%	53.5%	52.3%	48.9%	50.7%	46.7%	40.2%	36.7%	49.3%	45.7%	38.1%	35.0%	55.3%	52.2%	54.2%	51.2%	52.5%	25.2%	18.5%	46.9%	40.7%	14.2%
M26	123.9%	103.0%	239.5%	173.5%	123.0%	100.1%	245.6%	163.0%	125.4%	105.1%	279.3%	200.9%	119.7%	98.5%	245.1%	166.6%	118.2%	98.5%	232.1%	161.2%	139.2%	112.4%	357.9%	247.1%	116.9%	173.8%	192.3%	134.2%	147.1%	184.6%
M27	100.0%	78.6%	64.5%	46.4%	100.0%	80.7%	73.4%	49.9%	100.0%	78.7%	65.3%	46.3%	100.0%	83.2%	85.2%	58.2%	100.0%	81.9%	81.5%	56.0%	100.0%	89.4%	107.7%	74.7%	15.6%	50.5%	53.3%	86.4%	105.8%	105.2%
M28	83.9%	83.9%	176.5%	176.5%	85.5%	85.5%	192.6%	192.6%	90.0%	90.0%	190.7%	190.7%	82.2%	82.2%	165.6%	165.6%	82.2%	82.2%	165.6%	165.6%	87.7%	87.7%	211.8%	211.8%	101.4%	273.0%	46.2%	66.0%	59.6%	85.8%
M29	84.5%	77.7%	236.6%	207.5%	84.5%	77.7%	111.4%	100.1%	99.3%	84.7%	257.1%	201.6%	79.0%	68.6%	151.9%	116.1%	78.5%	76.5%	143.6%	109.2%	62.9%	56.5%	79.9%	58.8%	313.9%	180.9%	64.1%	56.1%	85.0%	193.8%
M30	128.7%	111.9%	367.3%	287.9%	132.4%	112.1%	407.7%	277.0%	149.2%	120.4%	407.7%	277.0%	123.5%	103.0%	259.5%	175.9%	123.2%	112.1%	248.8%	170.0%	107.2%	93.3%	162.1%	113.6%	108.9%	253.7%	142.0%	87.9%	140.8%	365.1%
M31	123.8%	103.2%	155.8%	114.1%	133.8%	105.7%	237.0%	139.7%	120.4%	102.9%	154.2%	115.6%	119.4%	100.7%	166.7%	116.8%	123.5%	104.0%	178.3%	124.3%	182.2%	131.9%	551.7%	294.4%	126.0%	150.2%	148.9%	141.5%	182.6%	212.7%
M32	76.9%	76.9%	59.5%	59.4%	83.2%	83.2%	74.2%	74.2%	78.2%	78.2%	58.1%	58.1%	77.4%	77.4%	57.5%	57.5%	77.4%	77.4%	57.5%	57.5%	83.4%	83.4%	73.9%	73.9%	1276.1%	791.0%	34.9%	78.6%	61.9%	26.4%
M33	262.1%	225.5%	217.6%	165.5%	9875.0%	3211.8%	522.3%	4410.2%	618.1%	387.9%	403.6%	225.2%	480.6%	312.3%	307.7%	167.4%	524.1%	549.7%	329.1%	266.0%	232.7%	206.3%	151.3%	106.8%	2805.3%	1837.2%	98.5%	139.9%	259.0%	218.1%
M34	73.9%	92.9%	56.8%	73.6%	75.7%	89.5%	68.0%	75.7%	39.4%	60.1%	29.2%	46.6%	76.2%	92.9%	61.9%	74.1%	75.4%	92.1%	61.9%	73.7%	166.5%	145.2%	650.2%	439.2%	161.2%	12.8%	83.5%	97.0%	129.9%	129.3%
AVG	120.8%	124.4%	203.7%	177.7%	412.5%	217.8%	240.1%	310.6%	136.1%	128.1%	216.2%	180.7%	135.1%	129.7%	228.4%	185.3%	137.0%	138.3%	228.7%	189.0%	135.4%	129.3%	281.9%	214.4%	259.4%	259.4%	325.1%	108.4%	108.4%	112.1%

Table SA3-4: BMD/BMDL Ratio

	Priors 1a				Priors 1b (diffuse Hill)				Priors 1c (all diffuse)				Priors 2				Priors 3				Priors 4 (Emperical)				BMDS		BAYES NP		SHAO MA (MAKS)	
	BMR 0.1		BMR 0.01		BMR 0.1		BMR 0.01		BMR 0.1		BMR 0.01		BMR 0.1		BMR 0.01		BMR 0.1		BMR 0.01		BMR 0.1		BMR 0.01		BMR = 0.1	BMR = 0.01	BMR = 0.1	BMR = 0.01	BMR = 0.1	BMR = 0.01
	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5	Even	QL = 0.5						
M1	1.5	1.4	1.5	1.4	2.9	1.7	8.0	2.7	21.9	1.6	21.9	1.6	3.3	1.7	3.3	1.7	4.2	2.0	4.2	2.0	4.0	1.8	8.5	2.6	1.6	1.4	1.1	1.1	3.1	6.5
M2	1.4	1.4	1.4	1.4	1.4	1.4	2.4	2.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	2.2	2.3	1.3	2.3	1.5	1.5	2.3	6.2
M3	1.6	1.6	1.6	1.6	1.3	1.3	1.8	1.8	1.4	1.4	1.4	1.4	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.4	1.4	2.2	2.3	1.4	1.9	1.4	1.4	1.8	4.5
M4	1.6	1.7	1.6	1.7	1.4	1.4	2.2	2.3	1.4	1.5	1.4	1.5	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.4	1.5	2.4	2.6	1.5	2.6	1.6	1.6	1.9	4.8
M5	1.3	1.3	1.3	1.3	1.3	1.3	2.2	2.2	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.3	2.1	2.1	1.2	1.8	1.5	2.7	1.4	2.7
M6	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.3	1.3	1.1	1.2	1.1	3.5	1.3	2.0
M7	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.3	1.3	1.4	1.7	1.1	3.4	1.3	2.1
M8	5.4	2.6	5.4	2.6	1.6	1.3	3.5	1.5	319.2	196.9	319.2	196.9	4.4	2.6	4.4	2.6	4.5	2.8	4.5	2.8	4.3	3.0	20.1	7.7	812.6	1257443.0	1.3	1.3	1.5	1.7
M9	1.6	1.4	1.6	1.4	1.4	1.3	1.9	1.4	1.9	1.4	1.9	1.4	1.6	1.4	1.6	1.4	1.6	1.4	1.6	1.4	1.6	1.4	2.7	1.5	1.6	11.6	1.6	1.9	1.8	4.3
M10	1.4	1.4	1.4	1.4	1.3	1.3	2.1	2.2	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	2.1	2.2	1.2	1.7	1.4	3.5	1.5	3.6
M11	1.2	1.2	1.2	1.2	1.2	1.2	2.1	2.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.8	1.8	1.3	1.8	1.1	3.5	1.5	2.7
M12	2.4	1.6	2.4	1.6	1.5	1.4	1.7	1.5	1.0	18.6	18.6	3.8	1.0	2.0	1.0	2.0	2.0	1.5	1.0	2.0	2.4	1.6	9.0	2.2	1.8	23.2	1.6	1.7	1.8	2.8
M13	1.7	1.6	1.7	1.6	1.6	1.5	2.6	1.9	1.8	1.6	1.8	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.6	3.4	2.7	1.5	13.9	1.8	2.7	1.6	3.9
M14	1.3	1.3	1.3	1.3	1.3	1.4	2.2	3.2	1.3	1.4	1.3	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	2.2	2.8	1.3	1.8	1.4	3.4	1.4	4.5
M15	1.7	1.8	1.7	1.8	1.5	1.8	3.3	3.9	1.8	1.8	1.8	1.8	1.7	1.8	1.7	1.8	1.7	1.8	1.7	1.8	1.7	1.8	3.5	3.7	1.2	1.4	1.8	2.6	1.8	4.7
M16	1.7	1.5	1.7	1.5	1.8	1.5	3.4	2.5	1.8	1.5	1.8	1.5	1.8	1.5	1.8	1.5	1.8	1.5	1.8	1.5	1.8	1.5	3.4	2.3	1.2	1.3	1.7	1.9	1.9	4.4
M17	1.5	1.3	1.5	1.3	1.6	1.3	2.9	1.6	1.8	1.3	1.8	1.3	1.6	1.3	1.6	1.3	1.6	1.3	1.6	1.3	1.6	1.3	2.7	1.5	1.2	1.2	1.5	1.6	1.9	3.7
M18	1.7	1.8	1.7	1.8	1.6	1.8	3.7	4.0	1.8	1.7	1.8	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.8	3.6	3.6	1.2	1.5	1.7	2.3	1.8	4.4
M19	1.6	1.4	1.6	1.4	1.8	1.4	3.6	2.2	1.8	1.4	1.8	1.4	1.8	1.4	1.8	1.4	1.8	1.4	1.8	1.4	1.7	1.4	3.3	1.9	1.2	1.2	1.6	1.7	1.9	4.1
M20	1.7	1.6	1.7	1.6	1.8	1.7	4.0	3.6	1.8	1.6	1.8	1.6	1.9	1.7	1.9	1.7	1.9	1.7	1.9	1.7	1.8	1.7	3.8	3.1	1.2	1.3	1.7	1.9	1.9	4.5
M21	1.7	1.8	1.7	1.8	1.5	1.8	1.5	1.8	1.0	1.6	1.6	1.8	1.0	1.7	1.0	1.7	1.7	1.8	1.0	1.7	1.6	1.8	1.6	1.8	1.2	2.2	1.7	2.3	1.7	4.3
M22	1.7	1.7	1.7	1.7	1.7	1.7	3.9	3.7	1.8	1.7	1.8	1.7	1.9	1.7	1.9	1.7	1.9	1.7	1.9	1.7	1.8	1.7	3.7	3.2	1.2	1.4	1.7	2.0	1.9	4.4
M23	1.4	1.3	1.4	1.3	1.5	1.3	2.6	1.5	1.9	1.3	1.9	1.3	1.5	1.3	1.5	1.3	1.5	1.3	1.5	1.3	1.5	1.3	2.4	1.4	1.2	1.2	1.4	1.5	1.8	3.2
M24	1.9	1.4	1.9	1.4	2.3	1.9	4.9	3.3	2.3	1.5	2.3	1.5	1.9	1.6	1.9	1.6	2.0	1.7	2.0	1.7	2.1	1.6	3.8	2.1	1.3	1.3	1.3	1.3	2.4	2.9
M25	1.9	2.1	1.9	2.1	1.9	2.2	5.7	7.2	2.0	2.1	2.0	2.1	2.0	2.1	2.0	2.1	2.0	2.1	2.0	2.1	2.0	2.1	5.3	6.2	1.4	1.3	2.1	3.5	1.8	2.8
M26	1.8	1.5	1.8	1.5	1.9	1.6	3.8	2.4	2.0	1.5	2.0	1.5	1.9	1.4	1.9	1.4	1.9	1.5	1.9	1.5	1.9	1.5	3.4	1.8	1.2	1.3	1.9	2.6	1.9	2.5
M27	1.7	1.5	1.7	1.5	1.8	1.5	4.1	2.7	1.0	1.9	1.9	1.5	1.0	1.8	1.0	1.8	1.8	1.5	1.0	1.8	1.8	1.5	3.6	2.2	1.2	1.3	1.8	2.4	2.0	4.5
M28	1.3	1.3	1.3	1.3	1.1	1.1	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.7	1.7	1.1	1.3	2.0	4.4	2.0	7.2
M29	1.9	2.0	1.9	2.0	1.7	1.7	3.6	3.1	2.2	2.1	2.2	2.1	1.8	1.9	1.8	1.9	1.8	1.8	1.8	1.8	2.0	1.9	4.6	4.5	1.9	5.8	2.2	4.4	2.3	9.4
M30	1.9	1.9	1.9	1.9	1.7	1.7	3.0	2.3	2.3	1.9	2.3	1.9	1.8	1.7	1.8	1.7	1.8	1.7	1.8	1.7	1.8	1.7	4.2	3.4	1.9	14.4	2.1	3.8	2.3	6.9
M31	1.6	1.3	1.6	1.3	2.2	1.6	5.5	2.9	2.0	1.3	2.0	1.3	1.7	1.3	1.7	1.3	1.7	1.4	1.7	1.4	1.8	1.4	3.1	1.6	1.2	1.2	1.4	1.4	2.2	2.7
M32	1.5	1.5	1.5	1.5	1.6	1.6	4.5	4.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	3.8	3.8	1.5	1.9	1.7	3.9	1.5	2.8
M33	2.1	1.9	2.1	1.9	1.8	1.7	2.6	2.0	5.2	2.2	5.2	2.2	2.0	1.8	2.0	1.8	2.1	1.8	2.1	1.8	2.5	1.8	5.2	3.0	1.9	2.0	2.2	3.3	2.3	4.4
M34	4.9	2.7	4.9	2.7	1.8	1.5	6.3	4.2	162.4	89.4	162.4	89.4	4.1	2.7	4.1	2.7	4.2	2.9	4.2	2.9	3.9	3.1	15.7	7.8	201.7	36023.5	1.4	1.4	1.5	1.7
AVG	1.8	1.6	1.8	1.6	1.6	1.5	3.2	2.6	16.4	10.4	16.9	9.9	1.8	1.6	1.8	1.6	1.9	1.6	1.8	1.6	1.9	1.6	4.2	2.8	31.1	38046.4	1.6	2.4	1.9	4.0