

An Introduction to Applied Bayesian Methods

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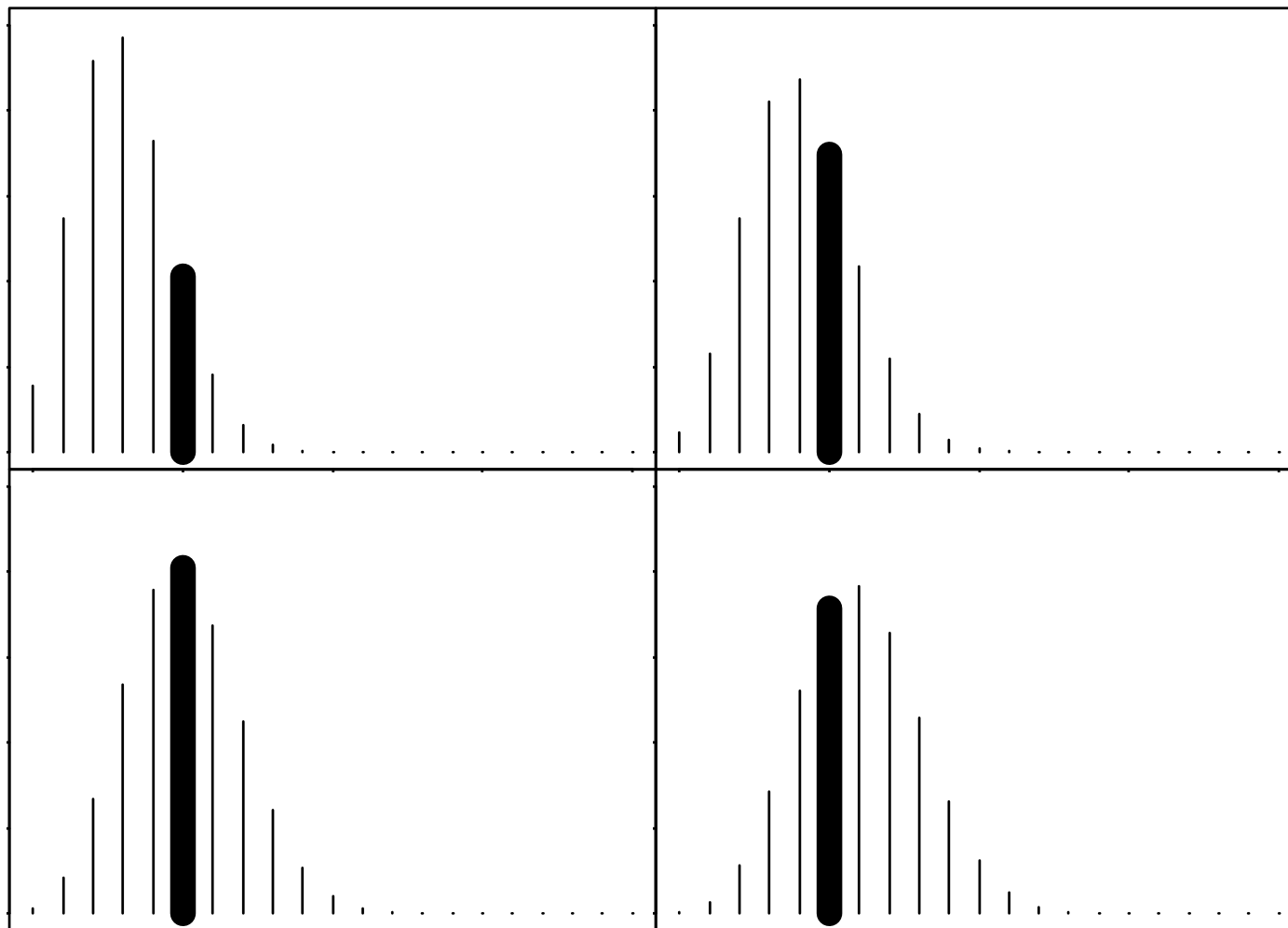


Figure 1: Probability distribution function for different values of θ . (a) $\theta = .15$, (b) $\theta = .20$, (c) $\theta = .25$, and (d) $\theta = .30$

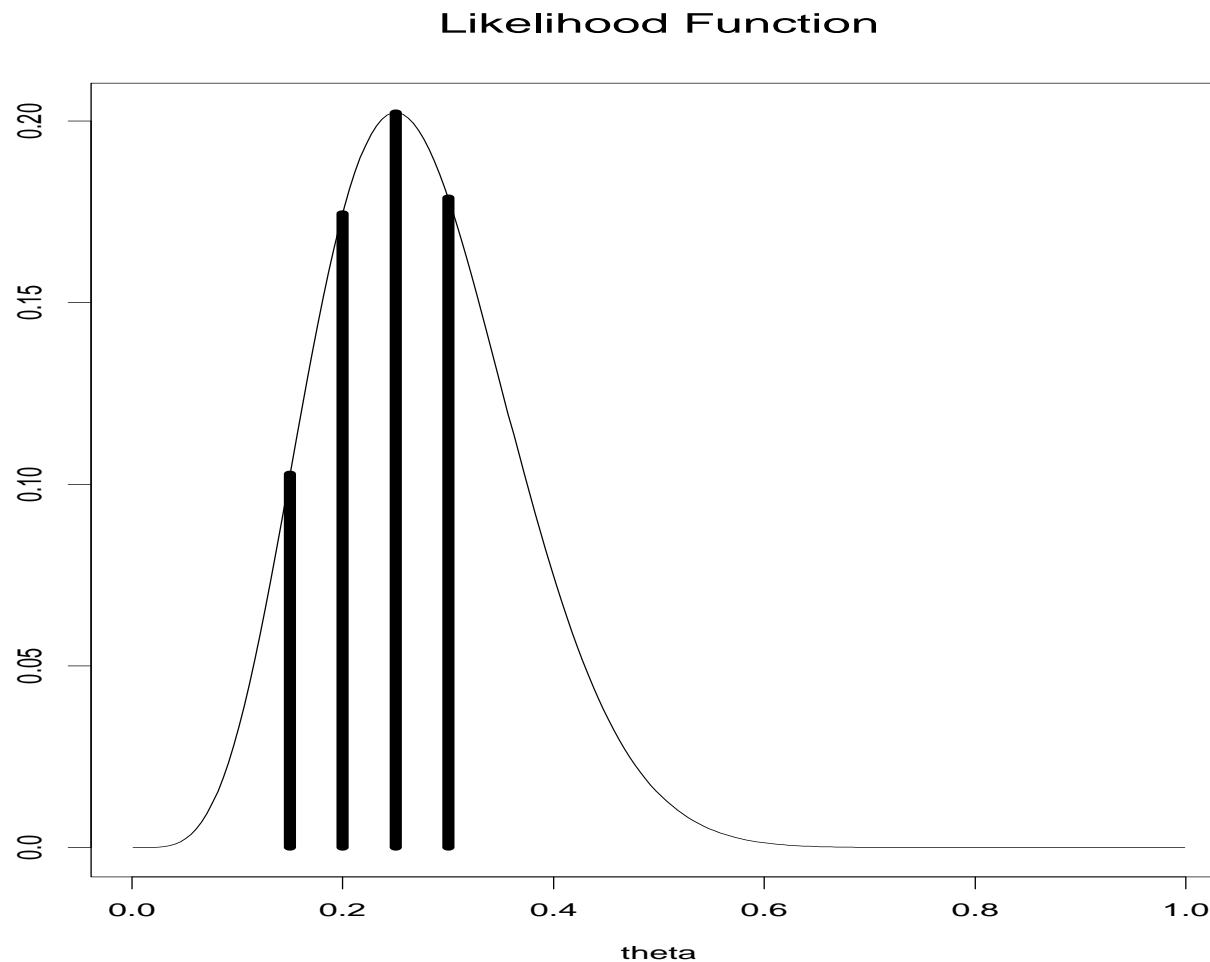


Figure 2: The likelihood function of binomial parameter θ when $Y = 5$ and $n = 20$. Solid lines are for the values of $\theta = .15, .20, .25, .30$.

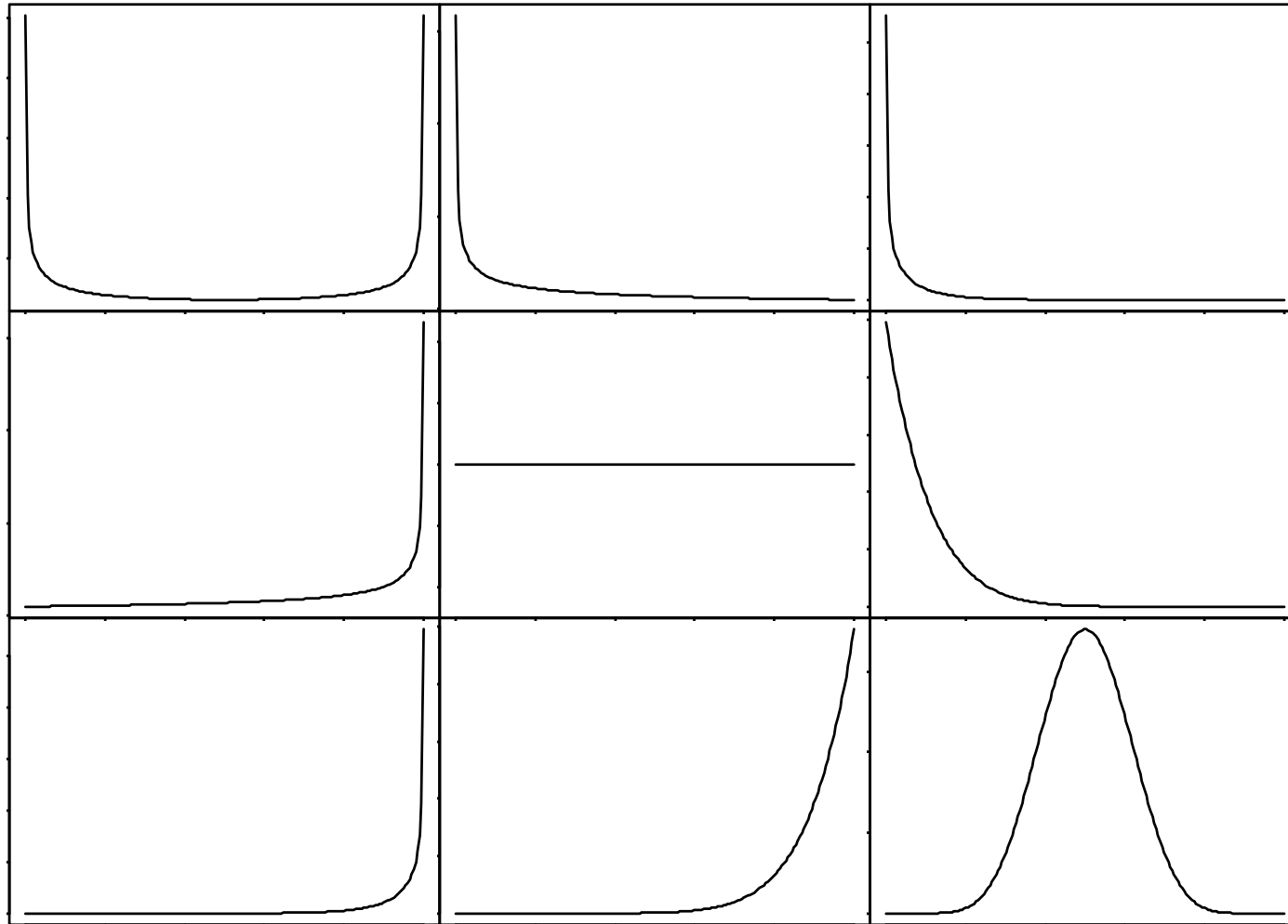


Figure 3: The beta distribution for different values of α and β . The rows (t-b) are for $\alpha < 1$, $\alpha = 1$, and $\alpha > 1$. The columns (l-r) are for $\beta < 1$, $\beta = 1$, $\beta > 1$.

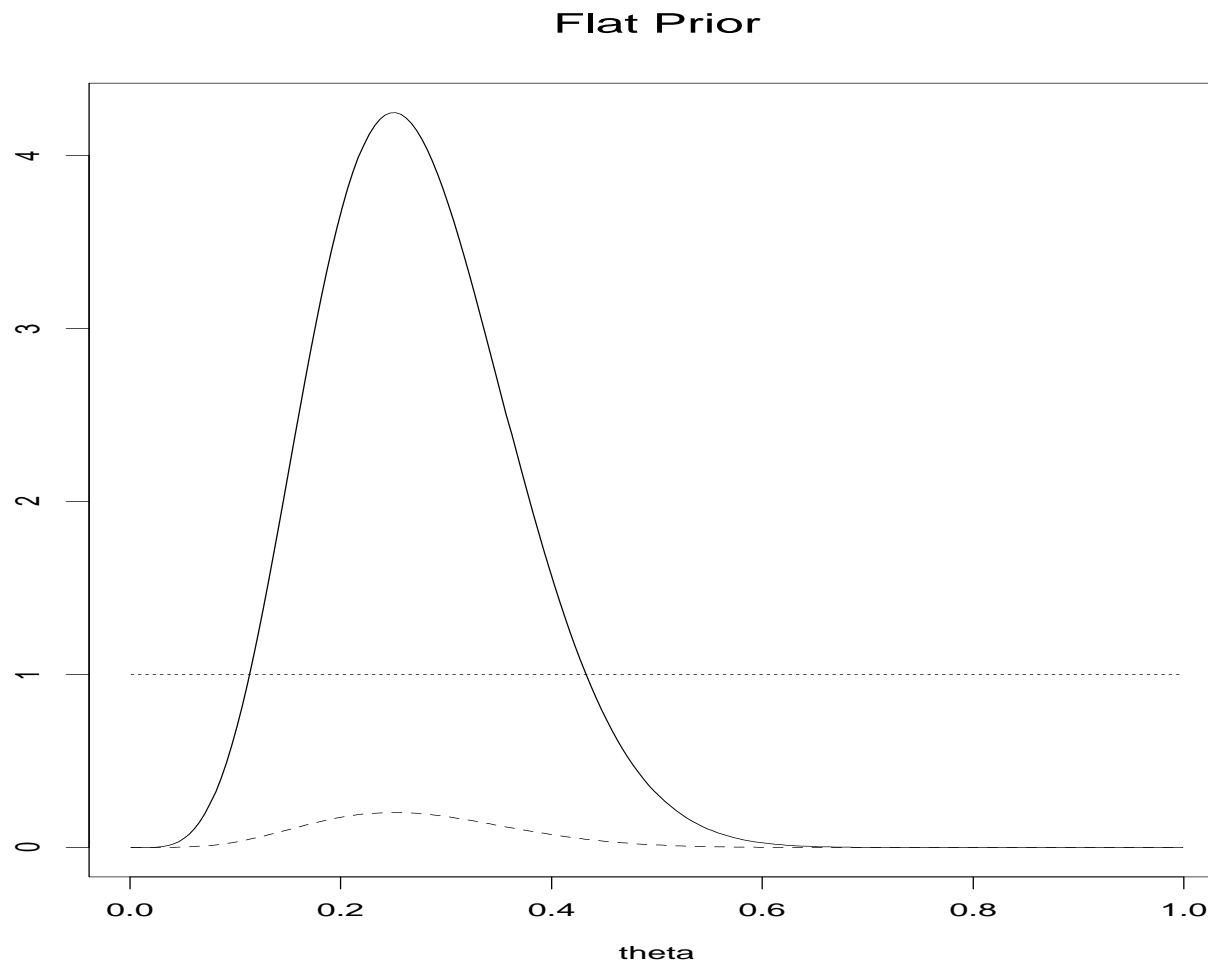


Figure 4: The prior is a $\text{Beta}(1,1)$. Dotted line: likelihood, dashed-dotted line: prior, and solid line: posterior distribution.

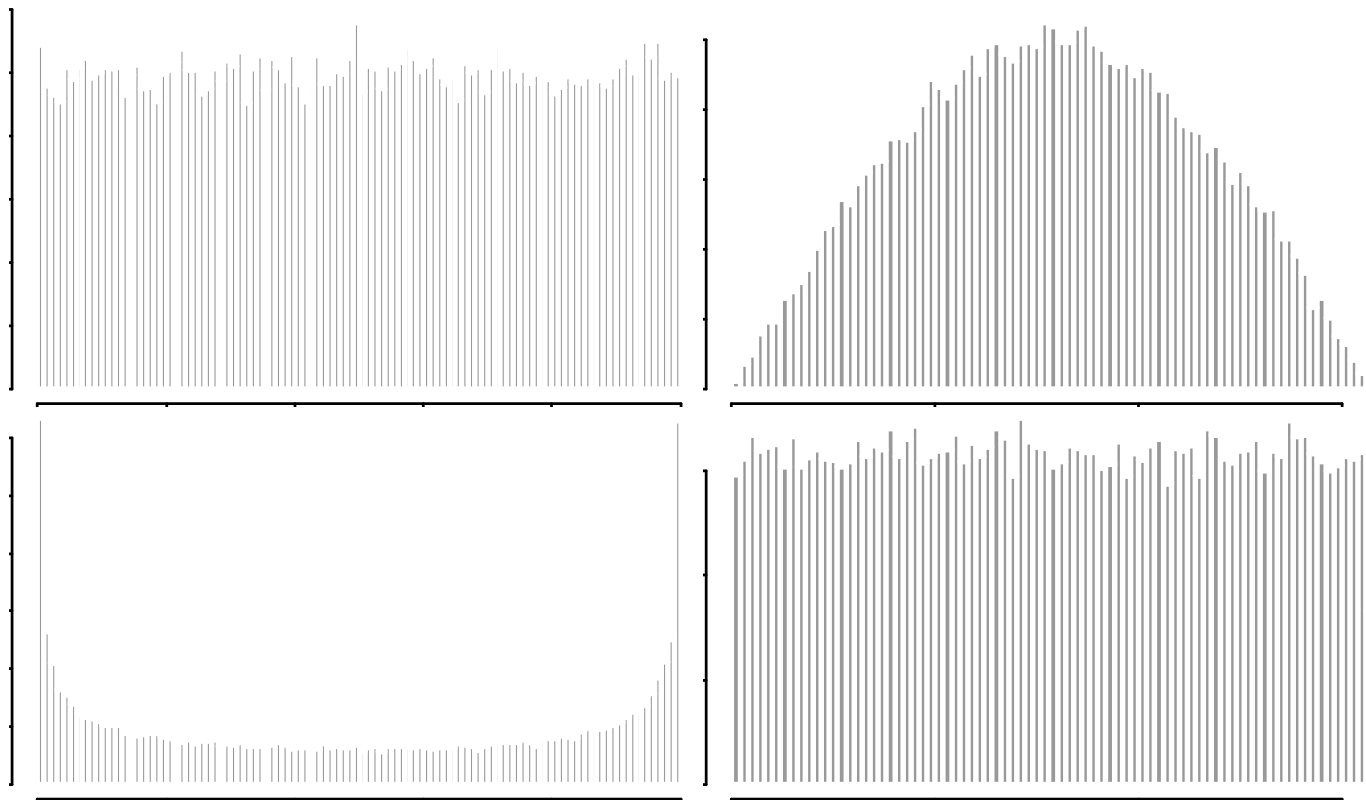


Figure 5: Each plot contains a histogram of a sample of 50,000 observations from the various distributions. The top row is from a $\text{Beta}(1,1)$ and the bottom row is for $\text{Beta}(1/2,1/2)$. The left column is for θ and the right column is for $\arcsin(\sqrt{\theta})$.

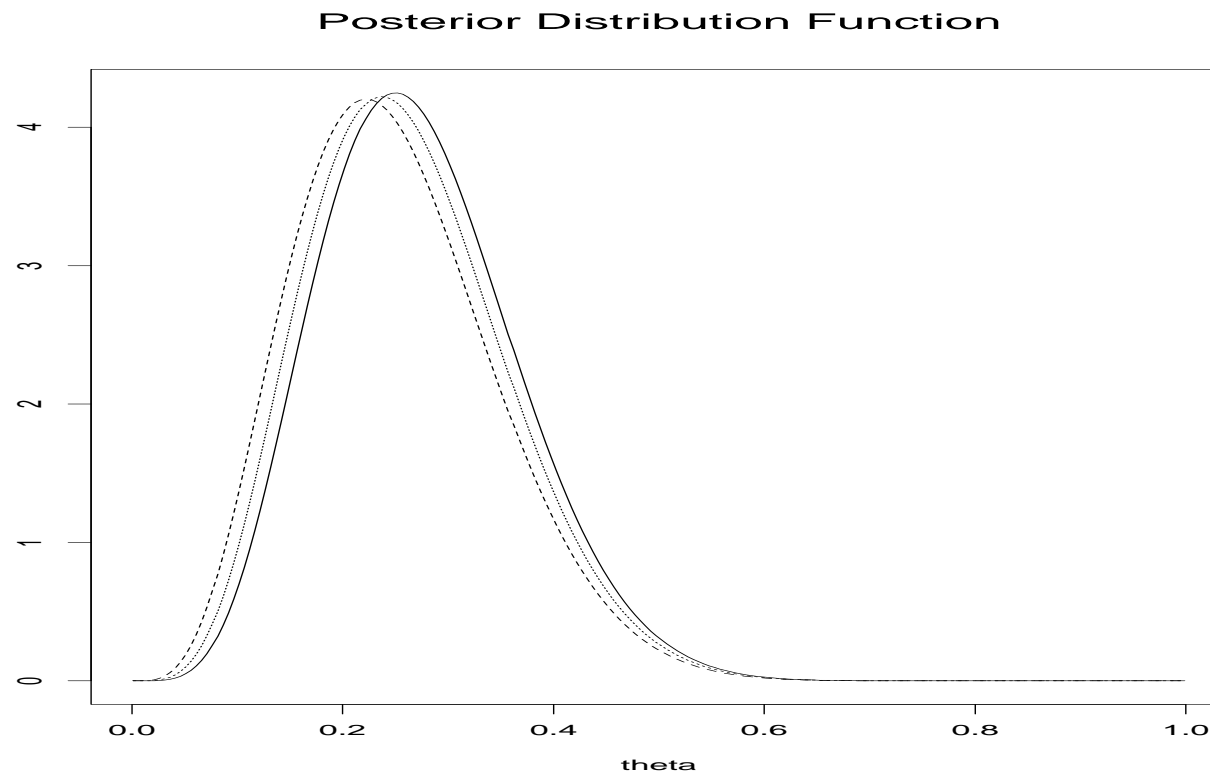


Figure 6: The posterior distributions for the priors: Beta(1,1)- solid line; Beta(.5,.5)- dotted line; Beta(0,0)- dashed line.

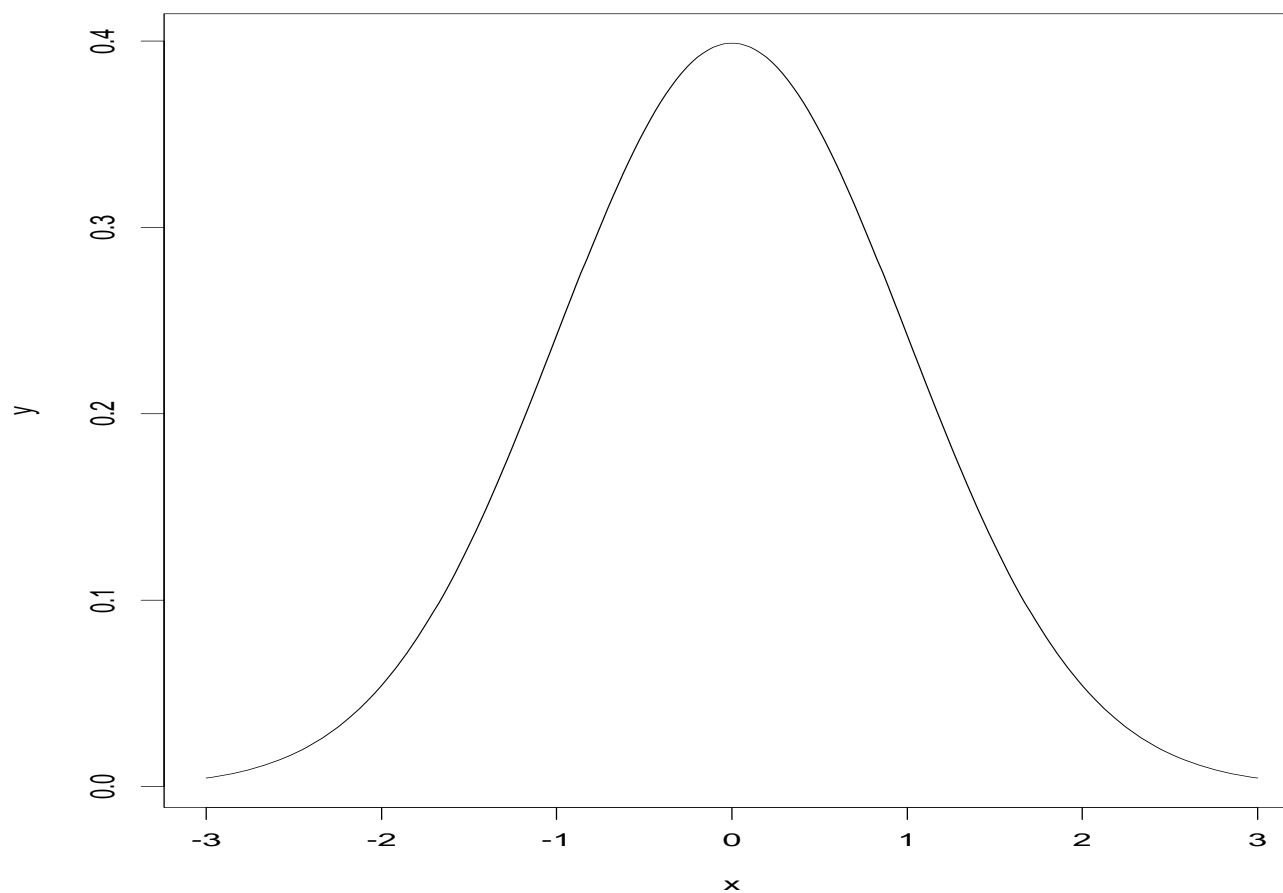


Figure 7: Normal curve with $\mu = 0$ and $\sigma = 1$

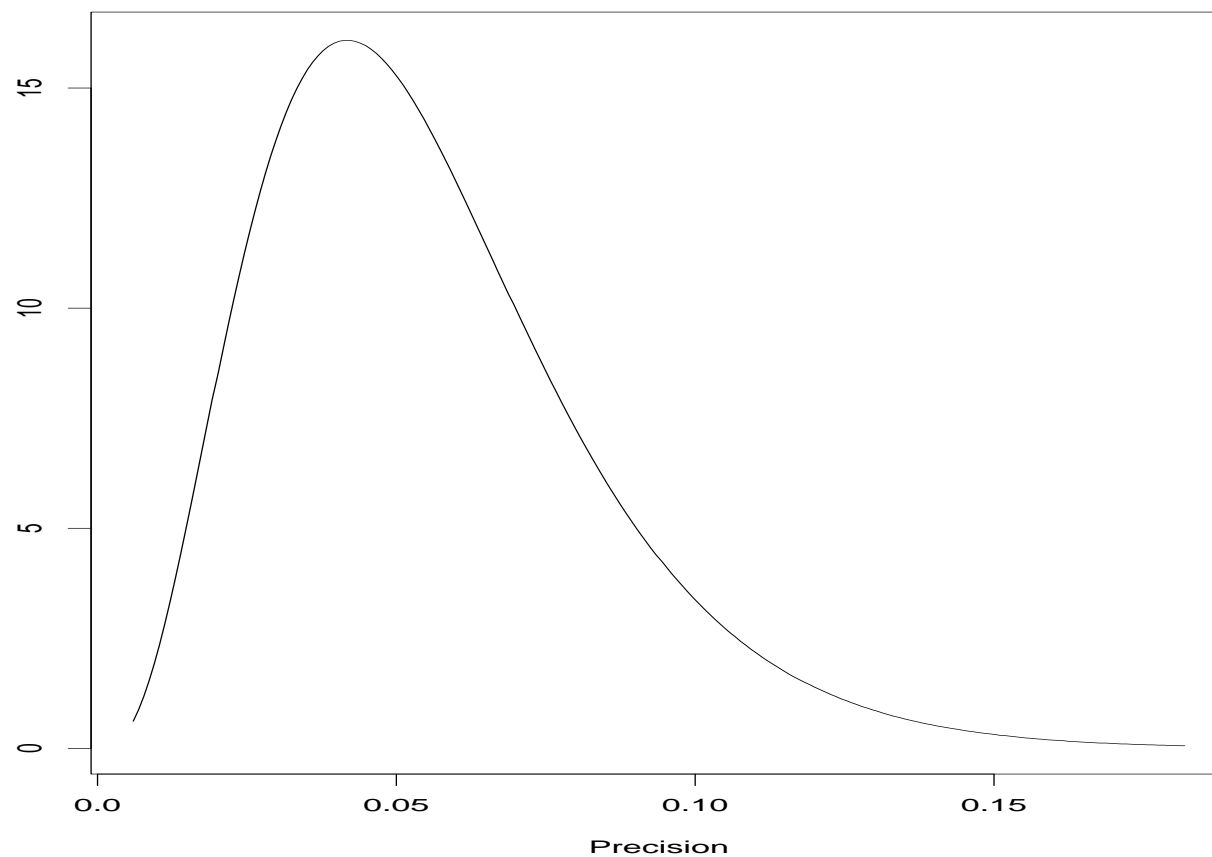


Figure 8: The Posterior density of the precision parameter τ .

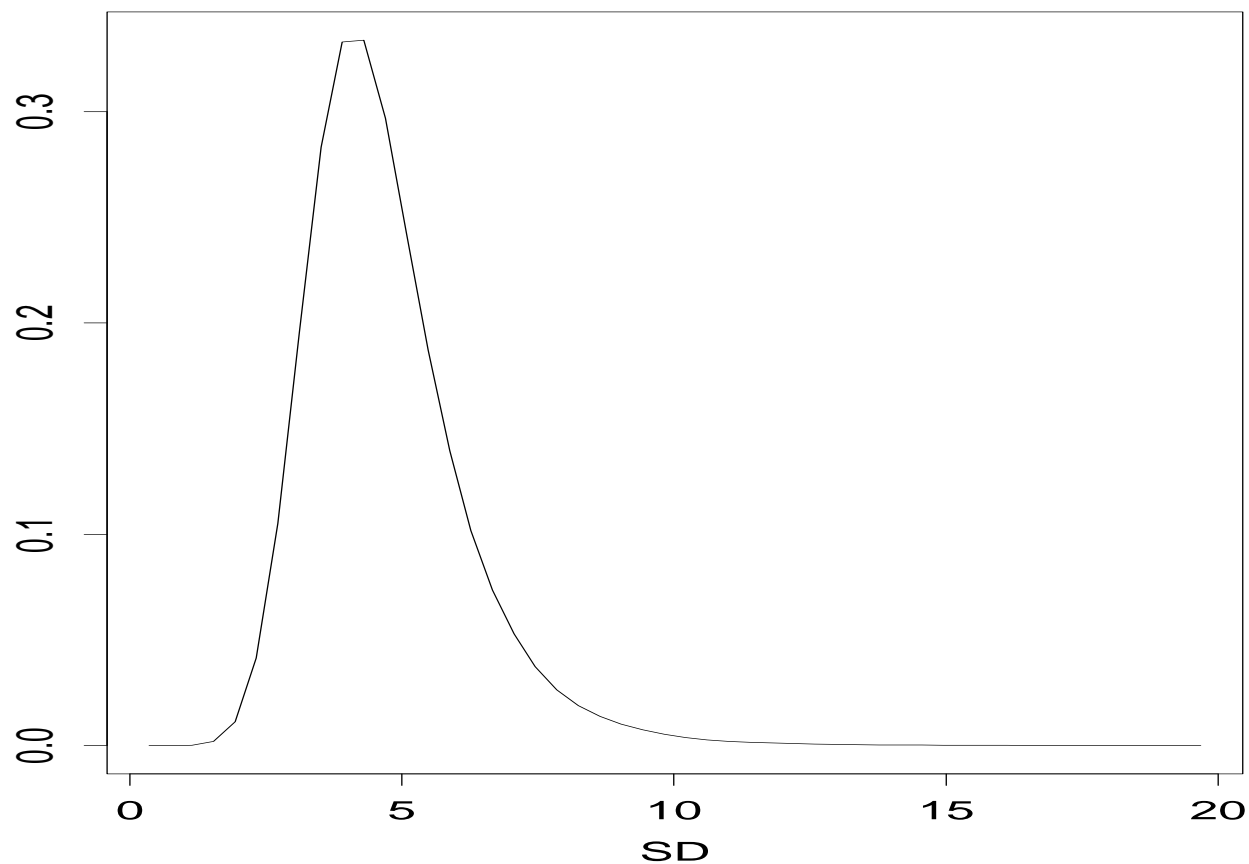


Figure 9: The Posterior density of the standard deviation which is $1/\sqrt{\tau}$.

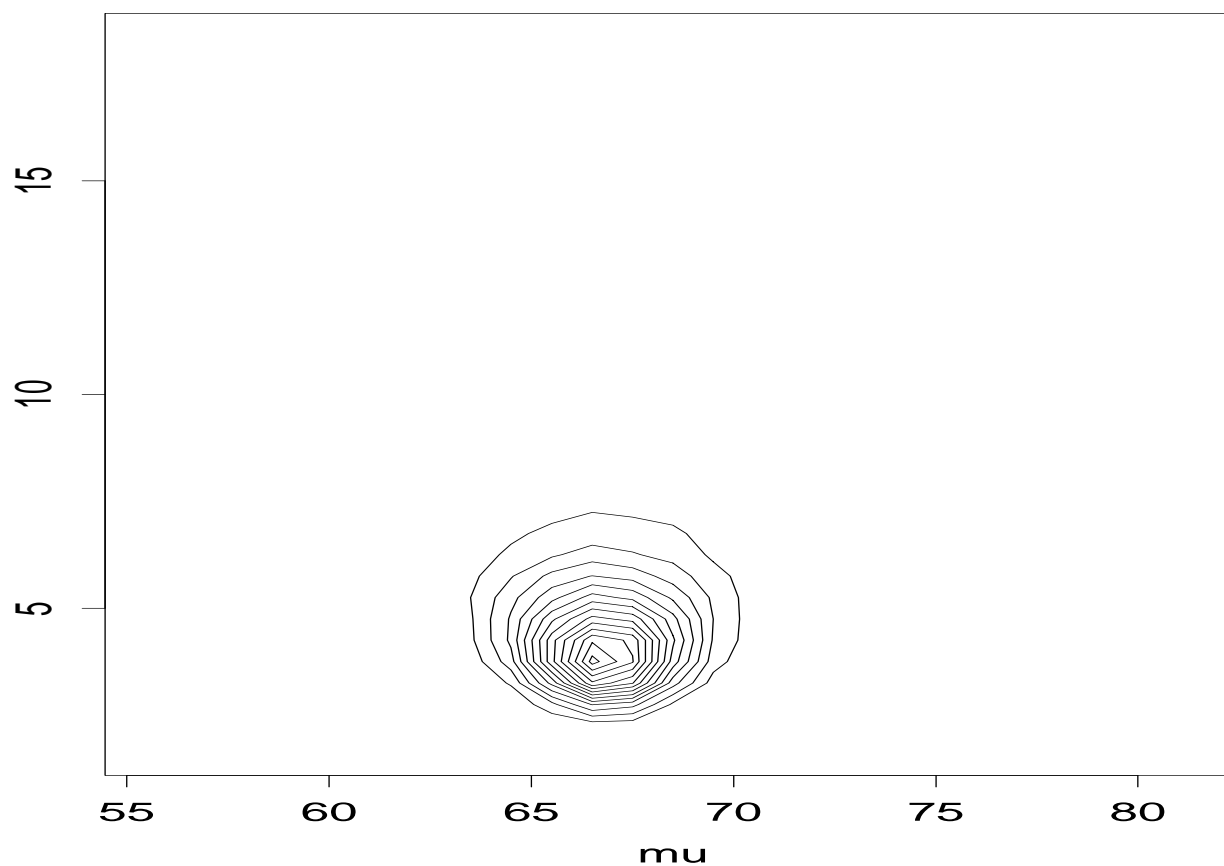


Figure 10: The joint posterior density of μ and $1/\sqrt{\tau}$. The area inside all the circles is a 95%-tile area.

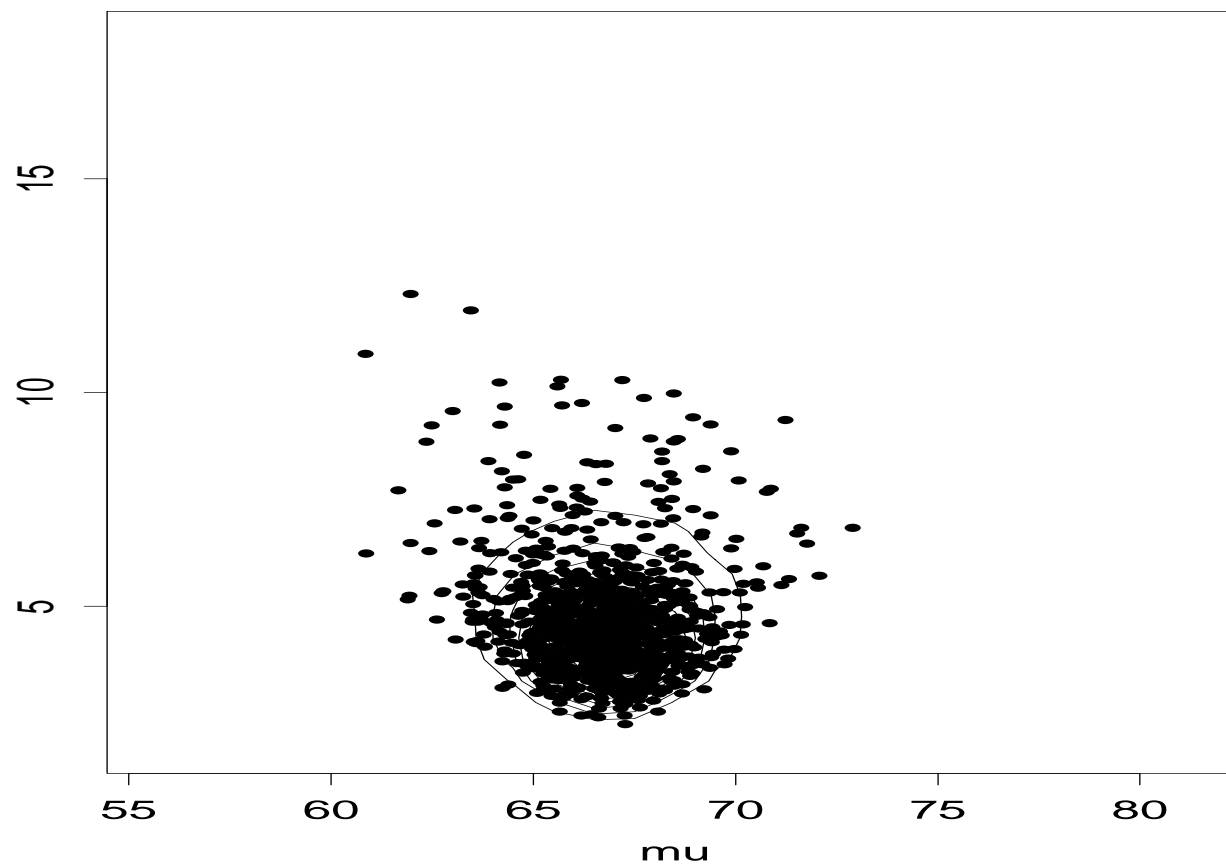


Figure 11: The joint posterior density of μ and $1/\sqrt{\tau}$, with 1,000 random points plotted.

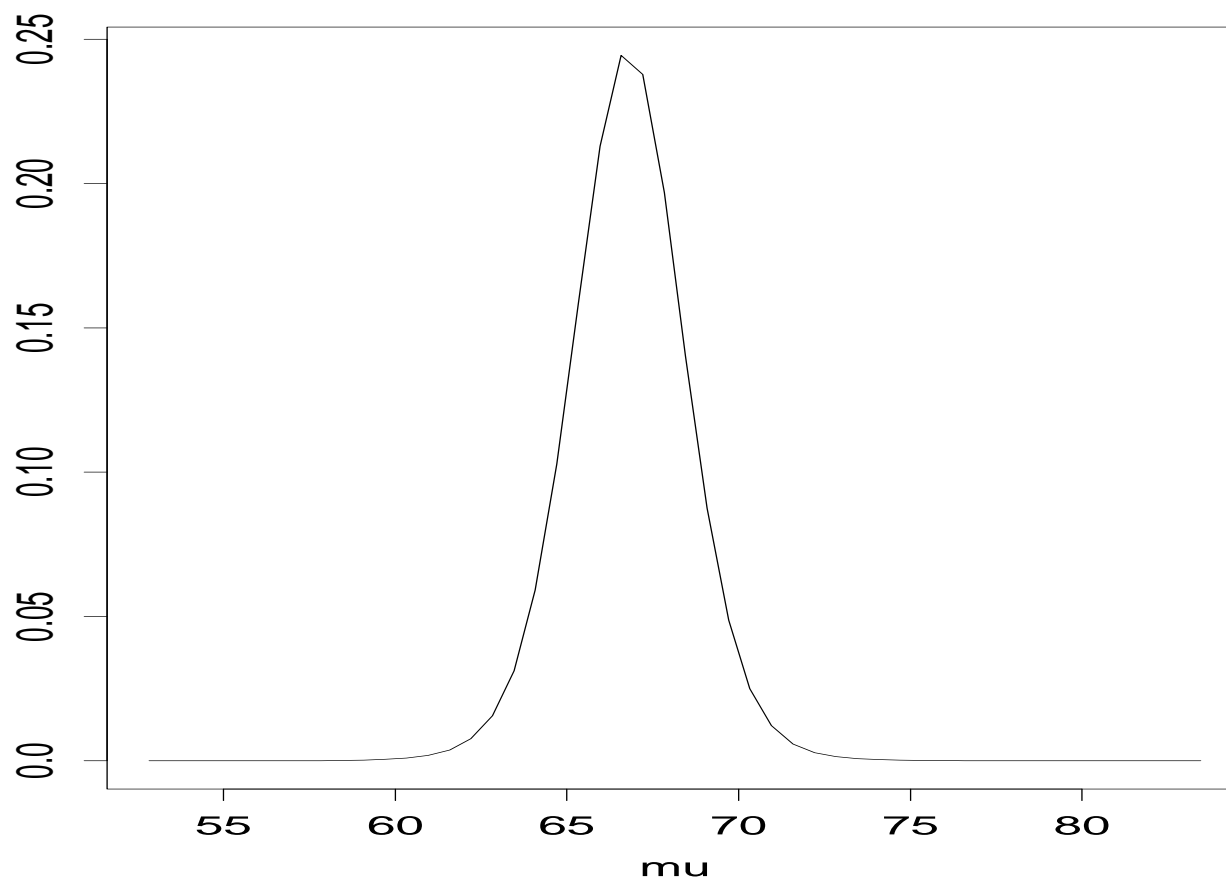


Figure 12: The marginal posterior density of μ .

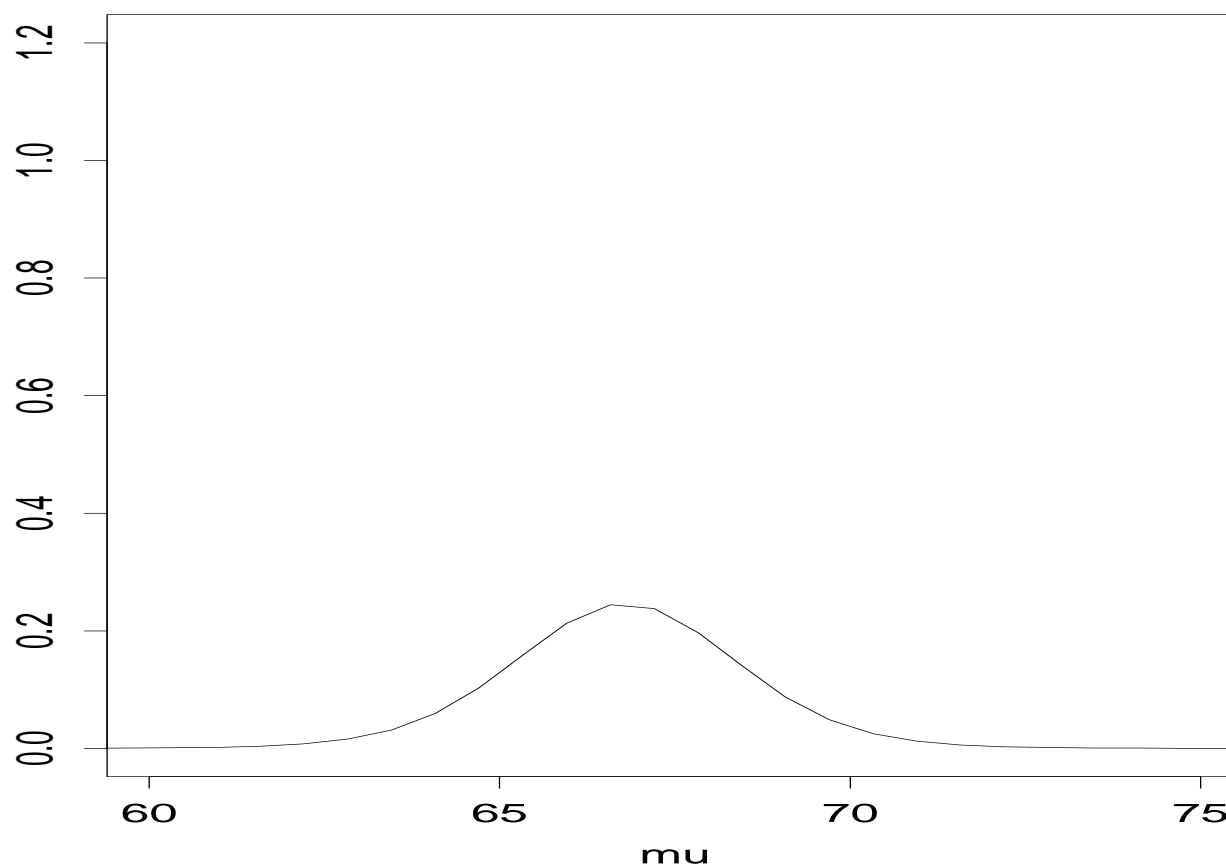


Figure 13: The marginal posterior density of μ . The solid line is for the small data set.

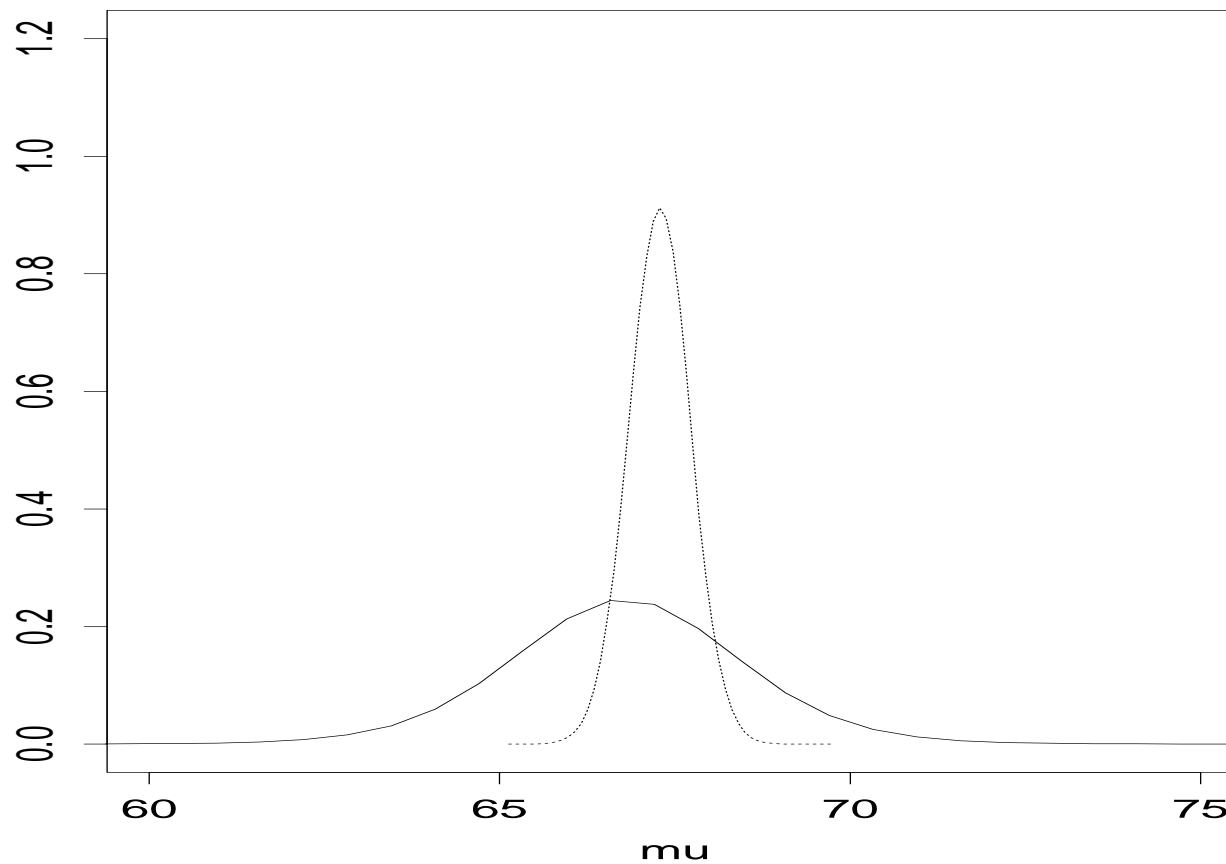


Figure 14: The marginal posterior density of μ . The solid line is for the small data set. The dashed line is for the larger data set.

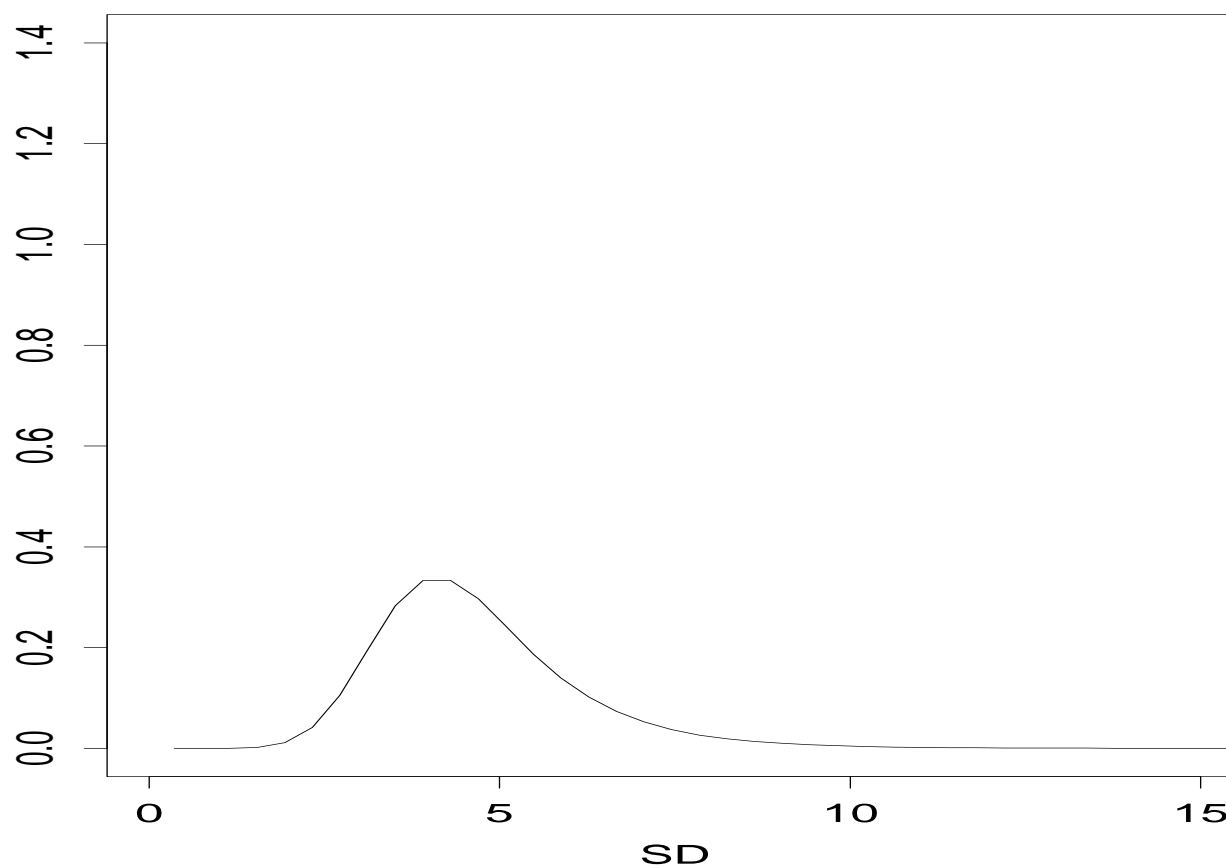


Figure 15: The marginal posterior density of $1/\sqrt{\tau}$. The solid line is for the small data set.

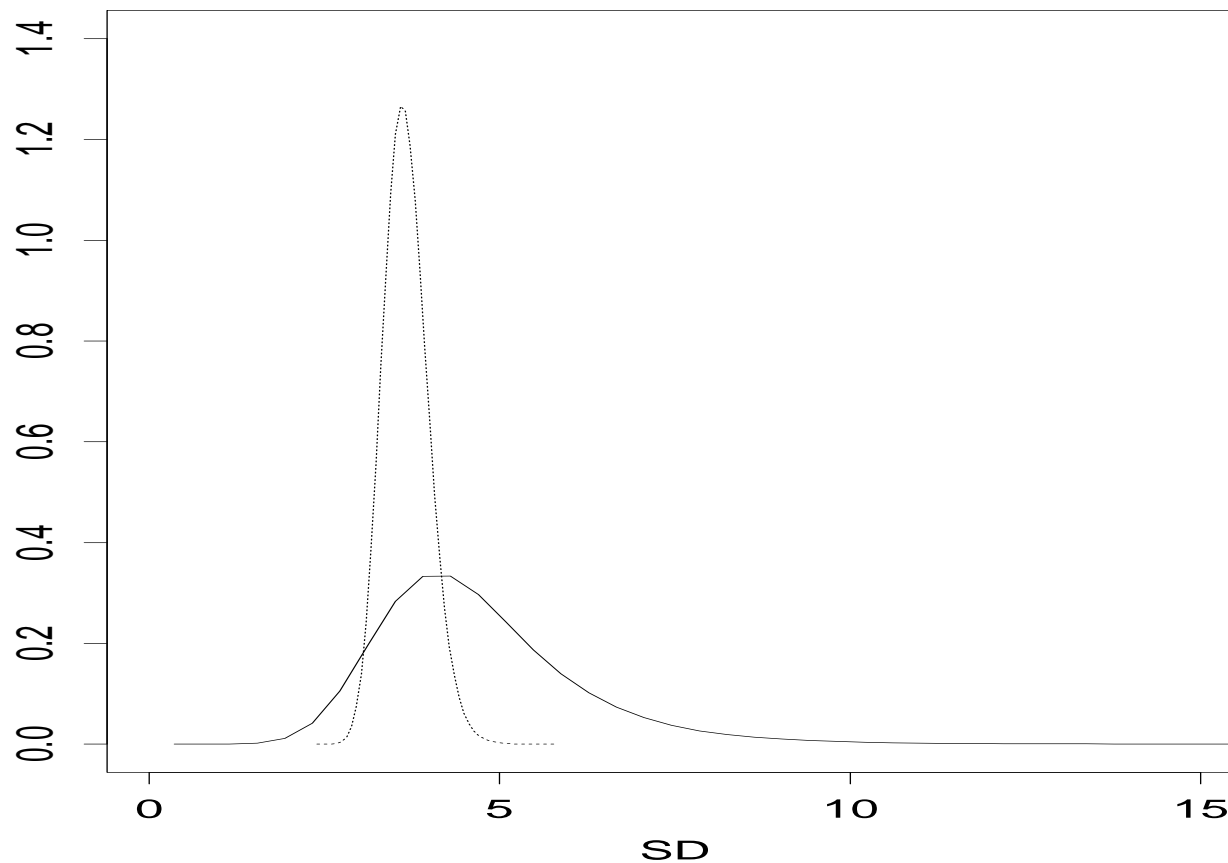


Figure 16: The marginal posterior density of $1/\sqrt{\tau}$. The solid line is for the small data set. The dashed line is for the larger data set.

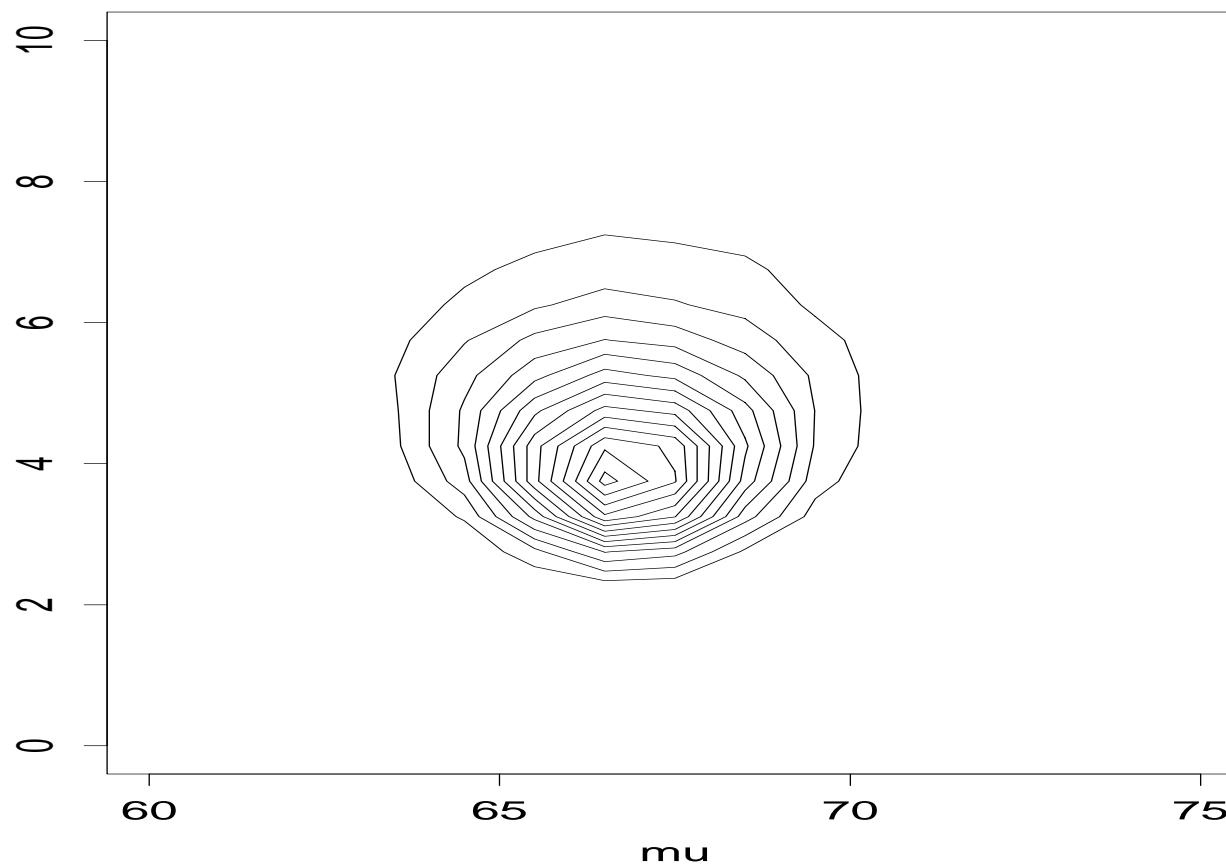


Figure 17: The joint distribution of $(\mu, 1/\sqrt{\tau})$. This is for the small data set.

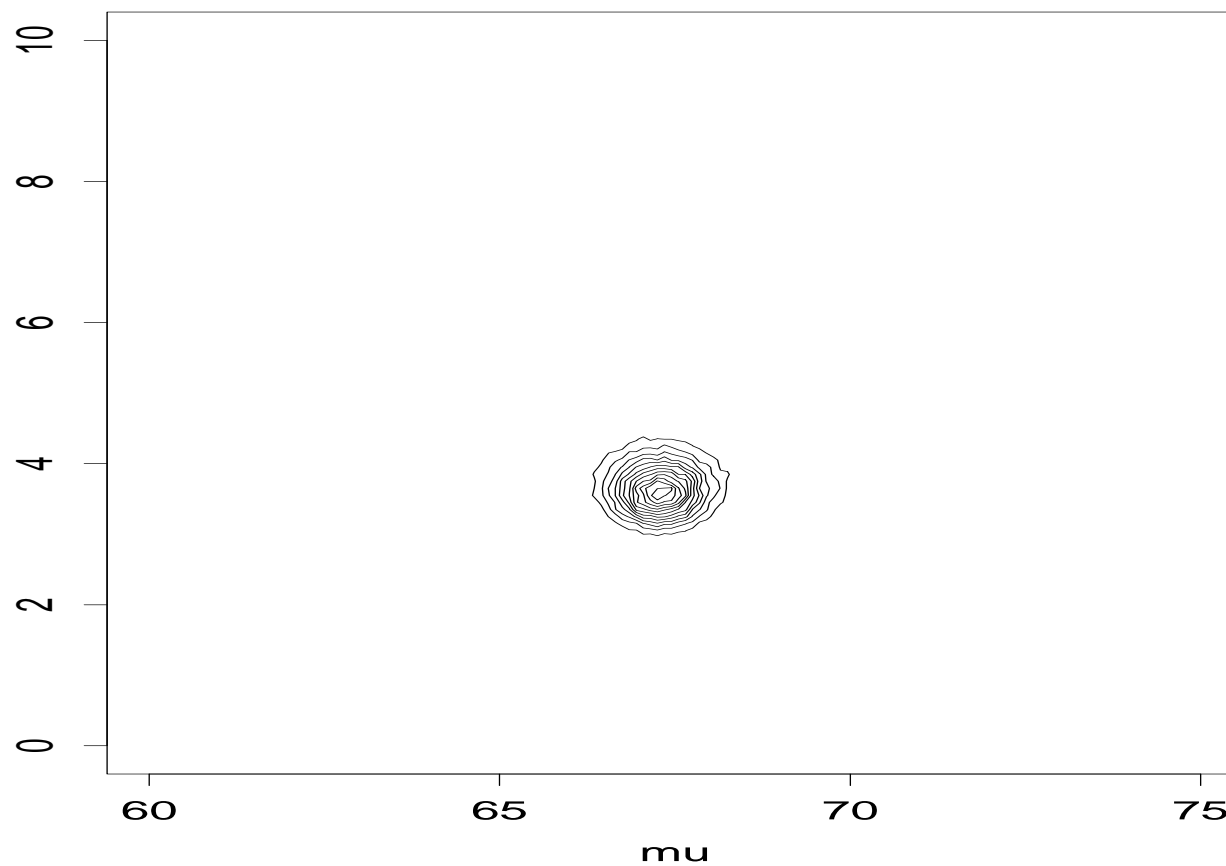
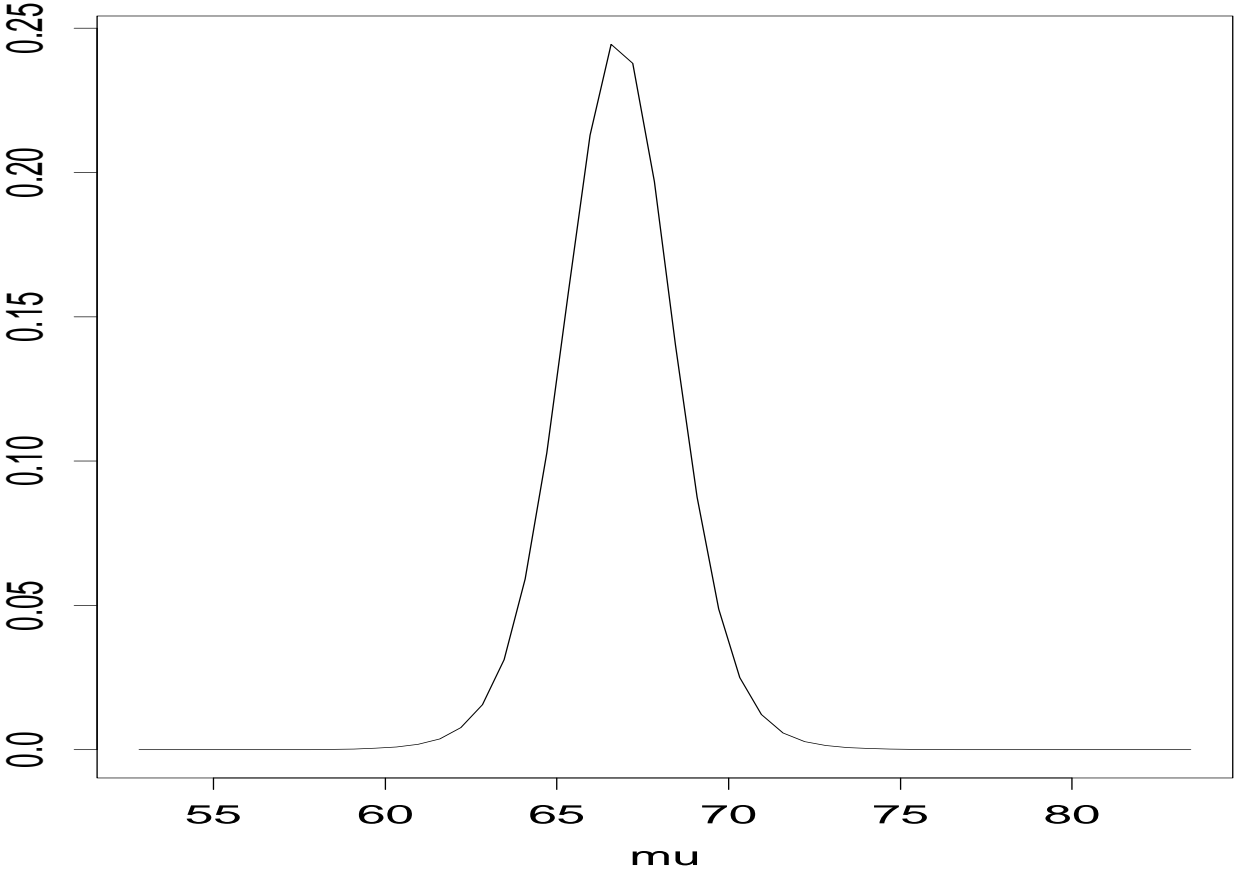
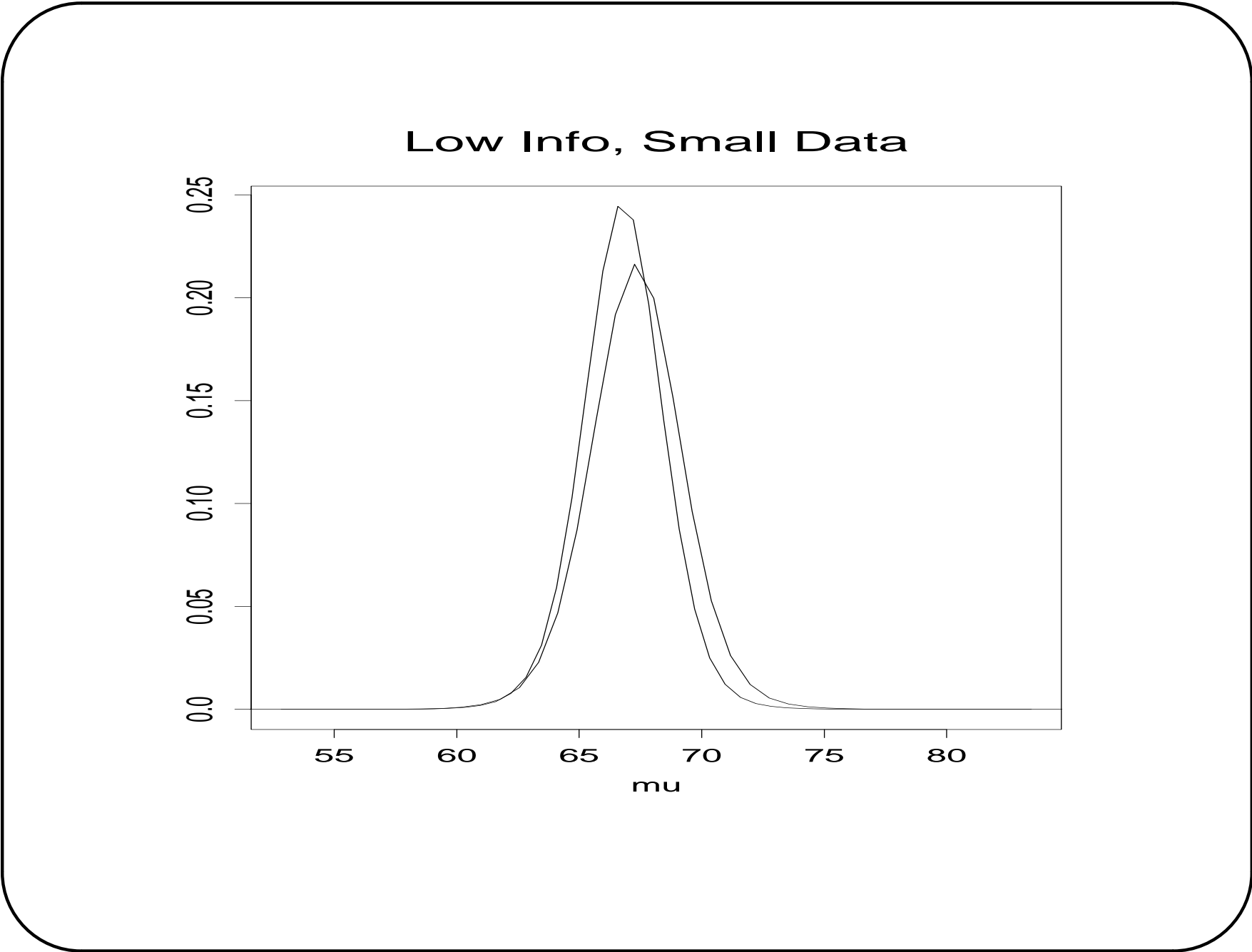


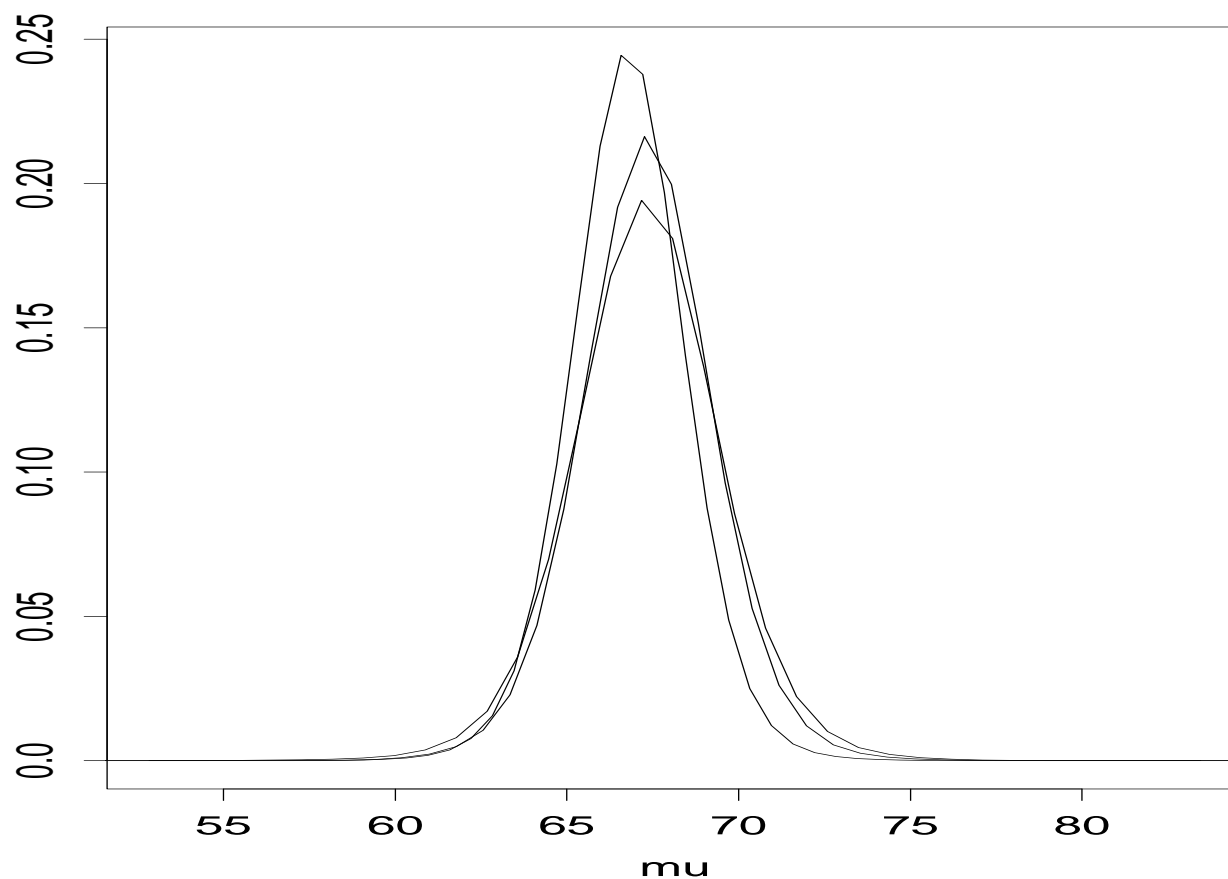
Figure 18: The joint distribution of $(\mu, 1/\sqrt{\tau})$. This is for the large data set.

Medium Info, Small Data

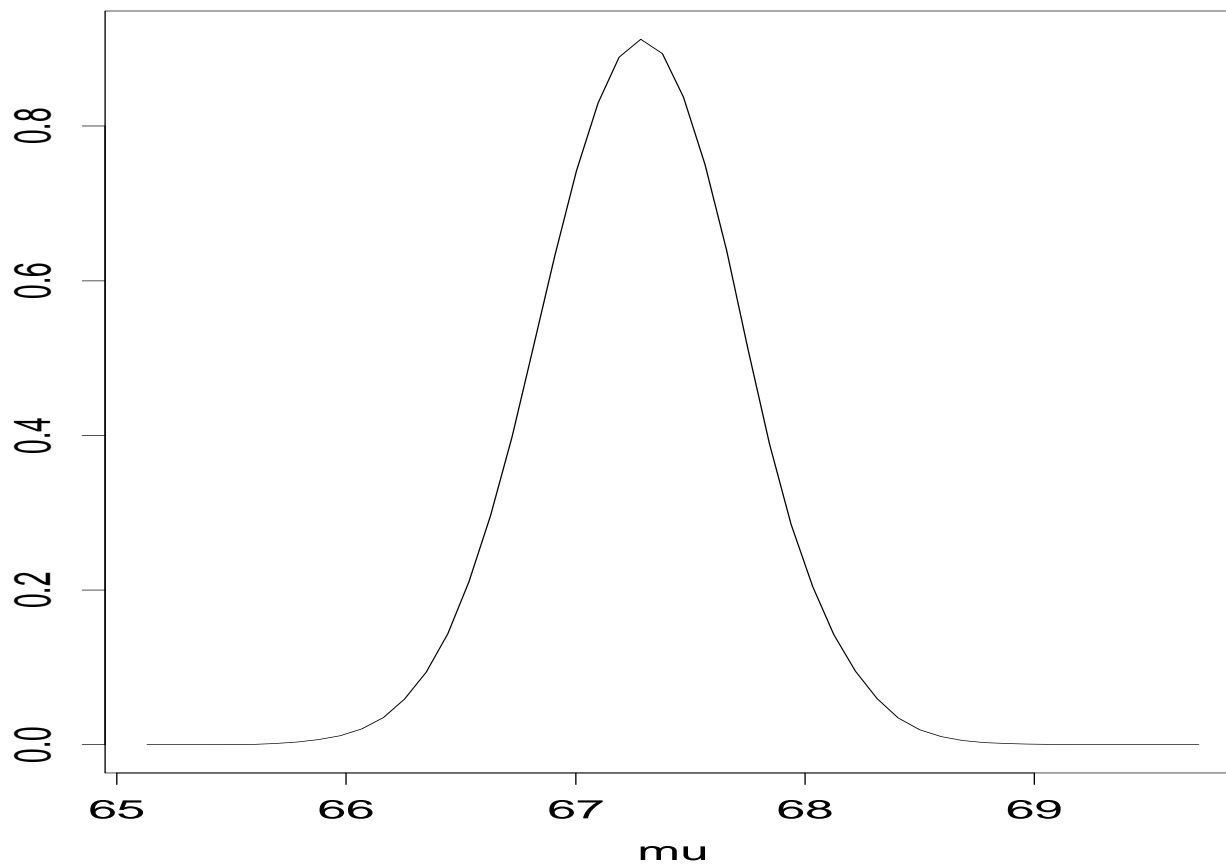




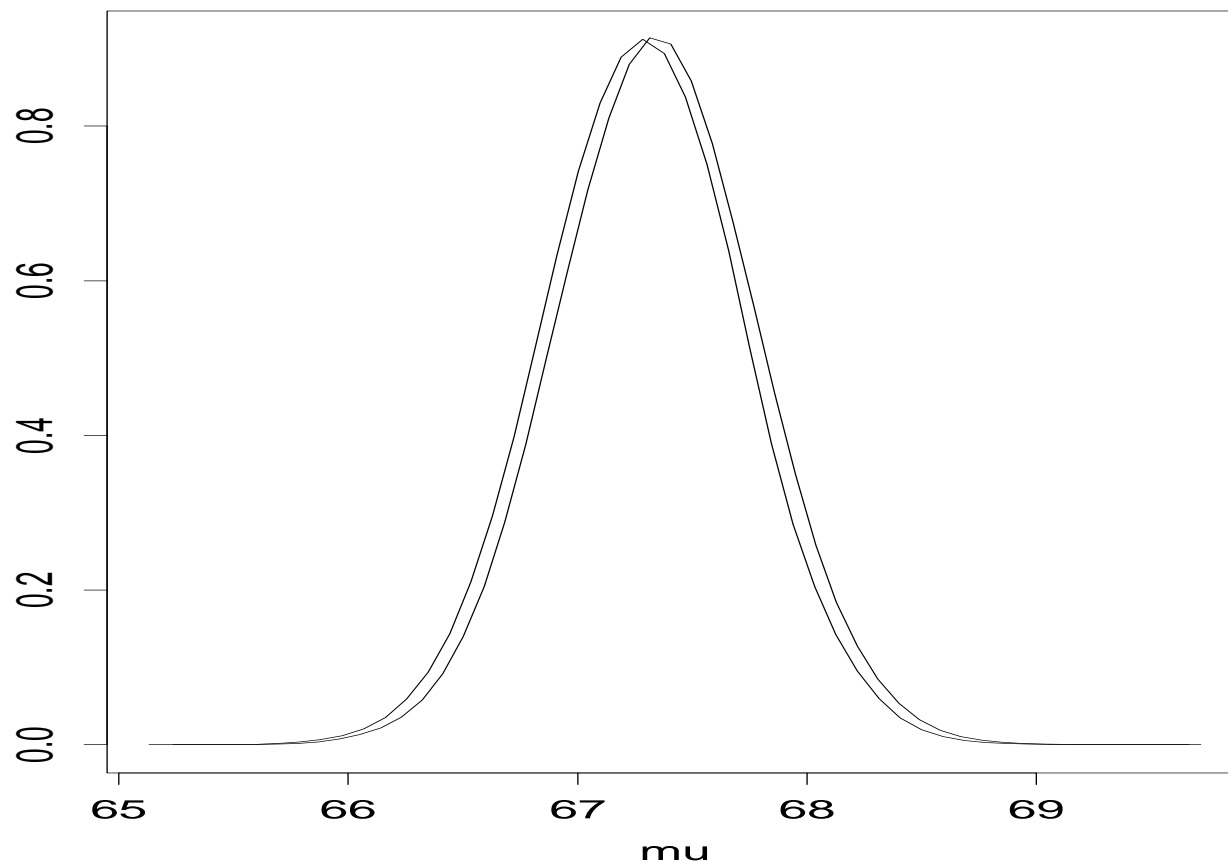
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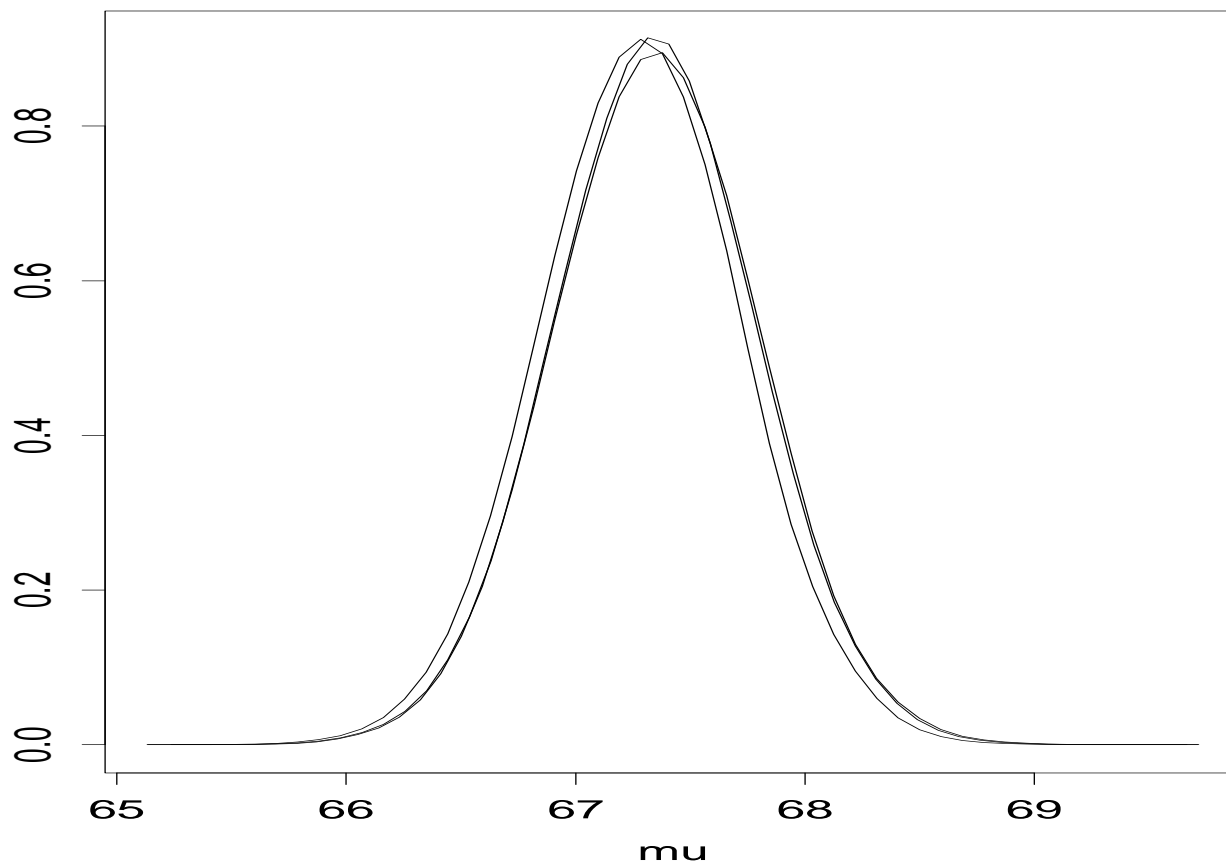
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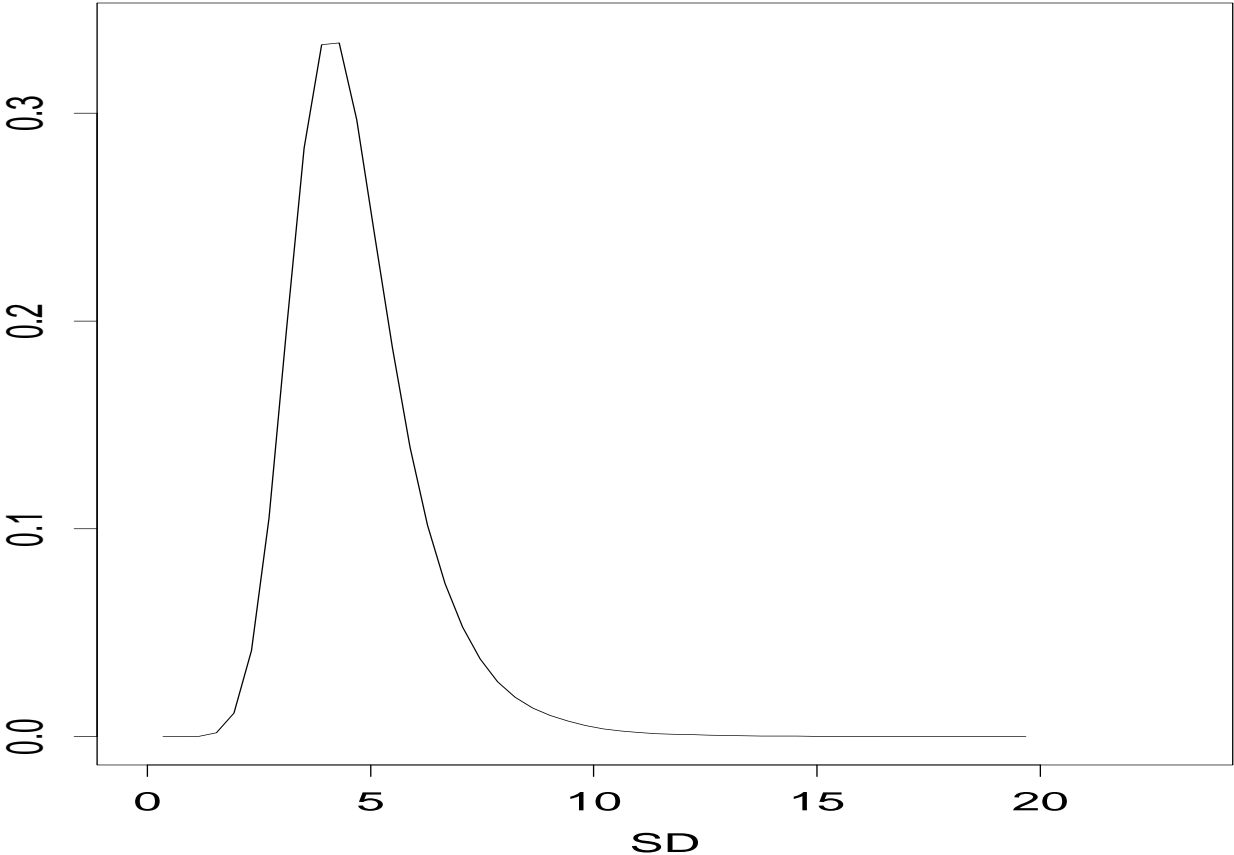
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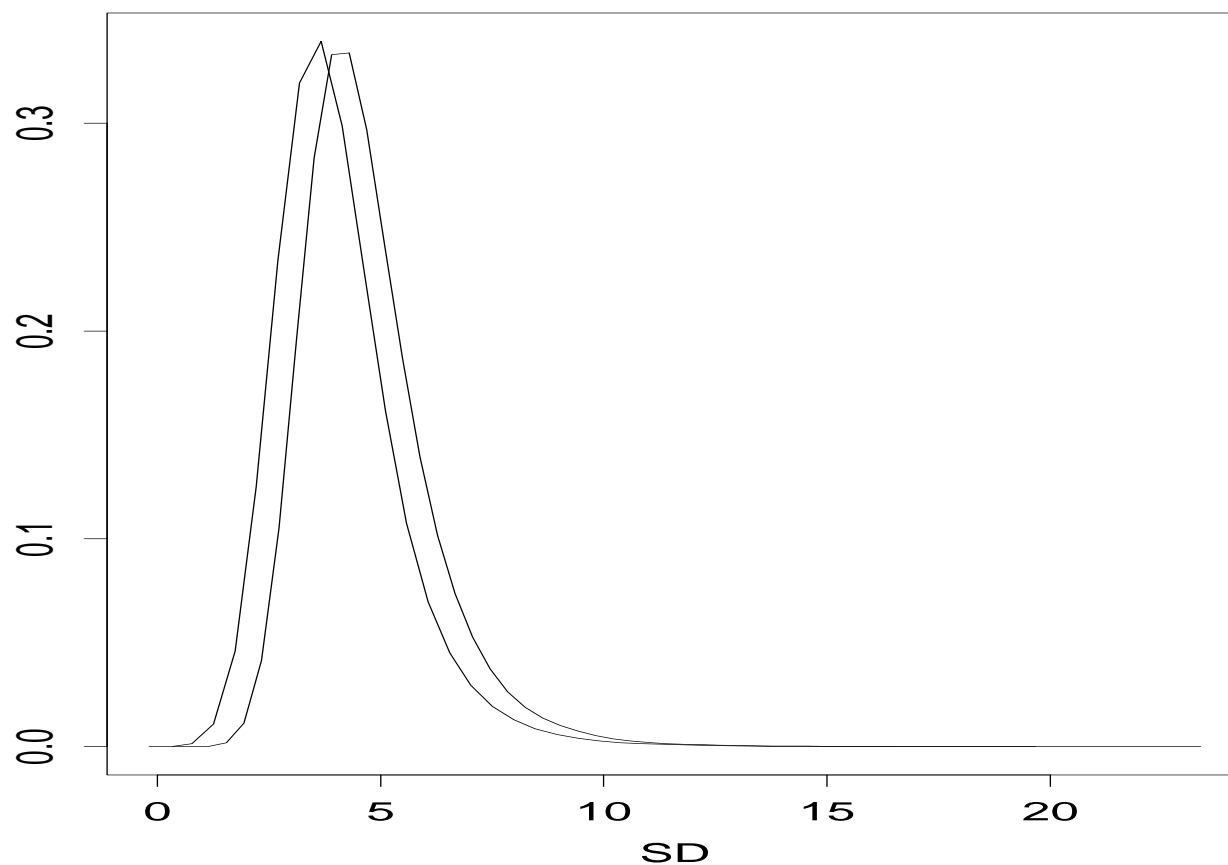
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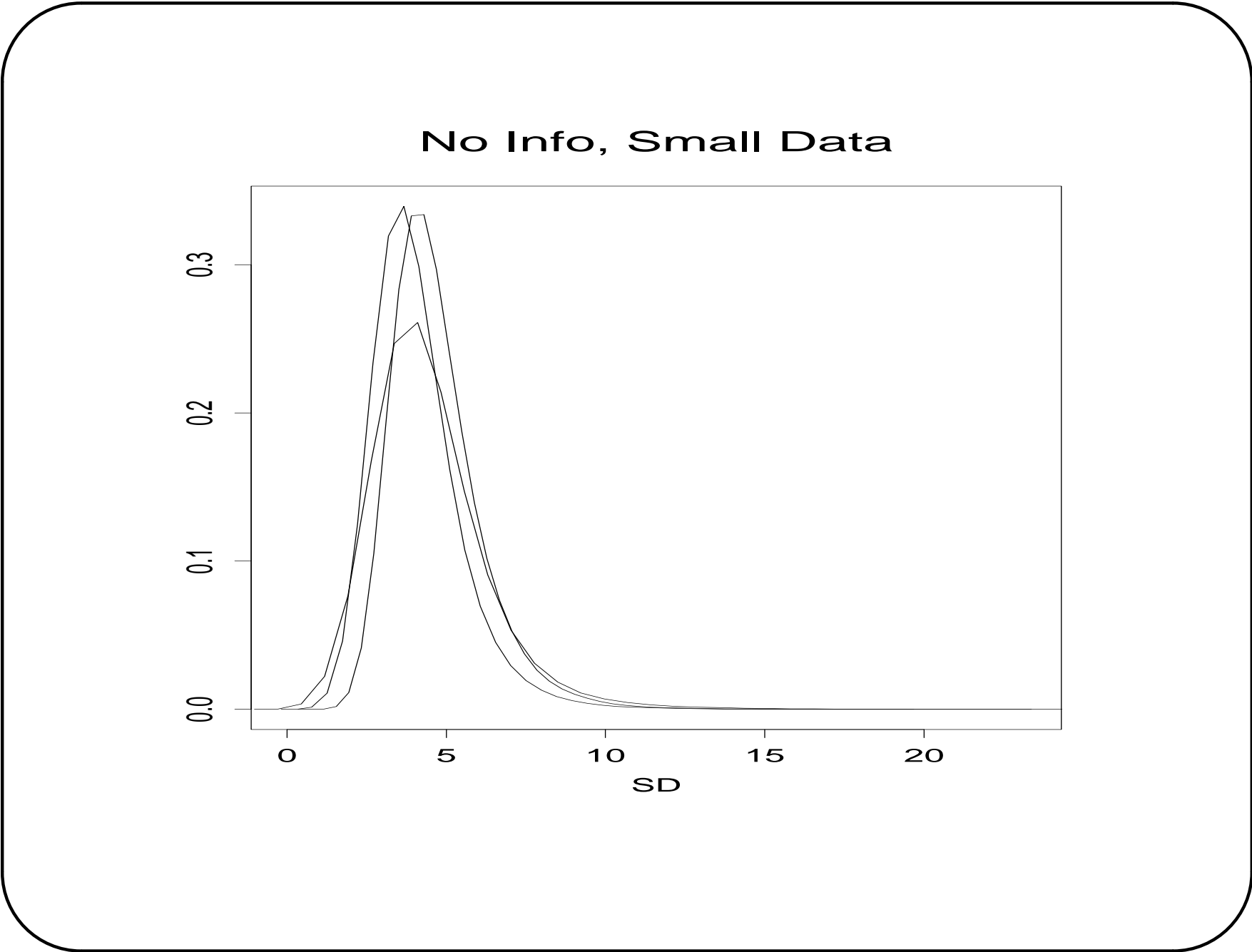


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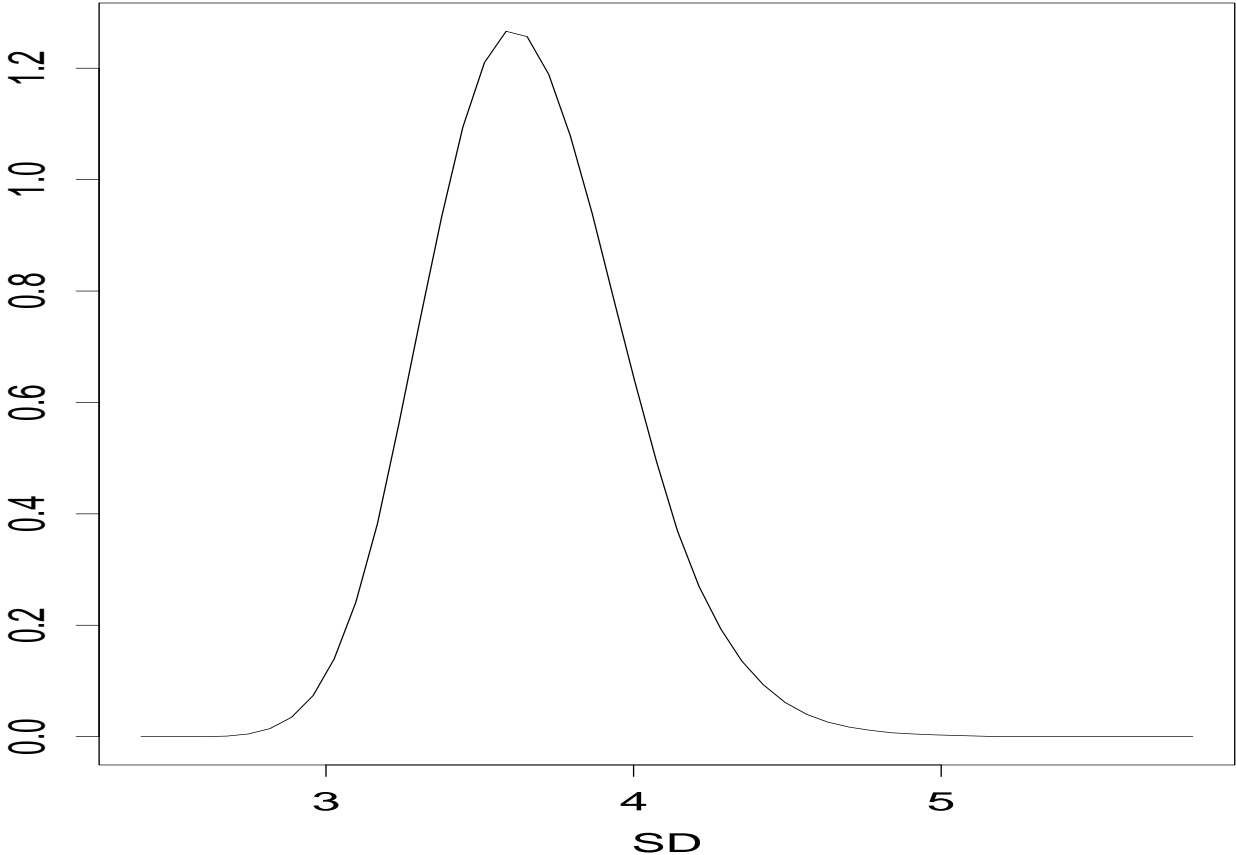


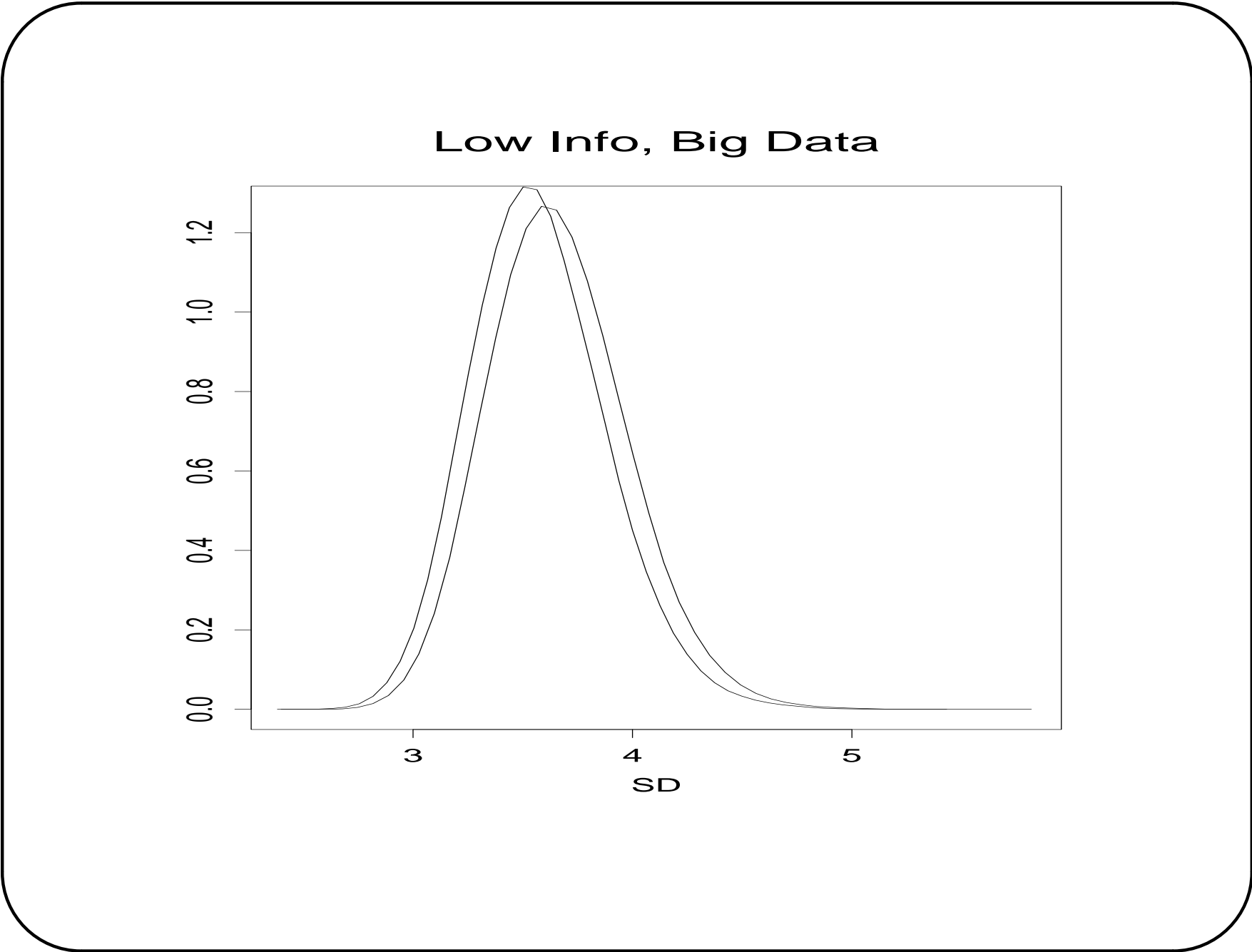
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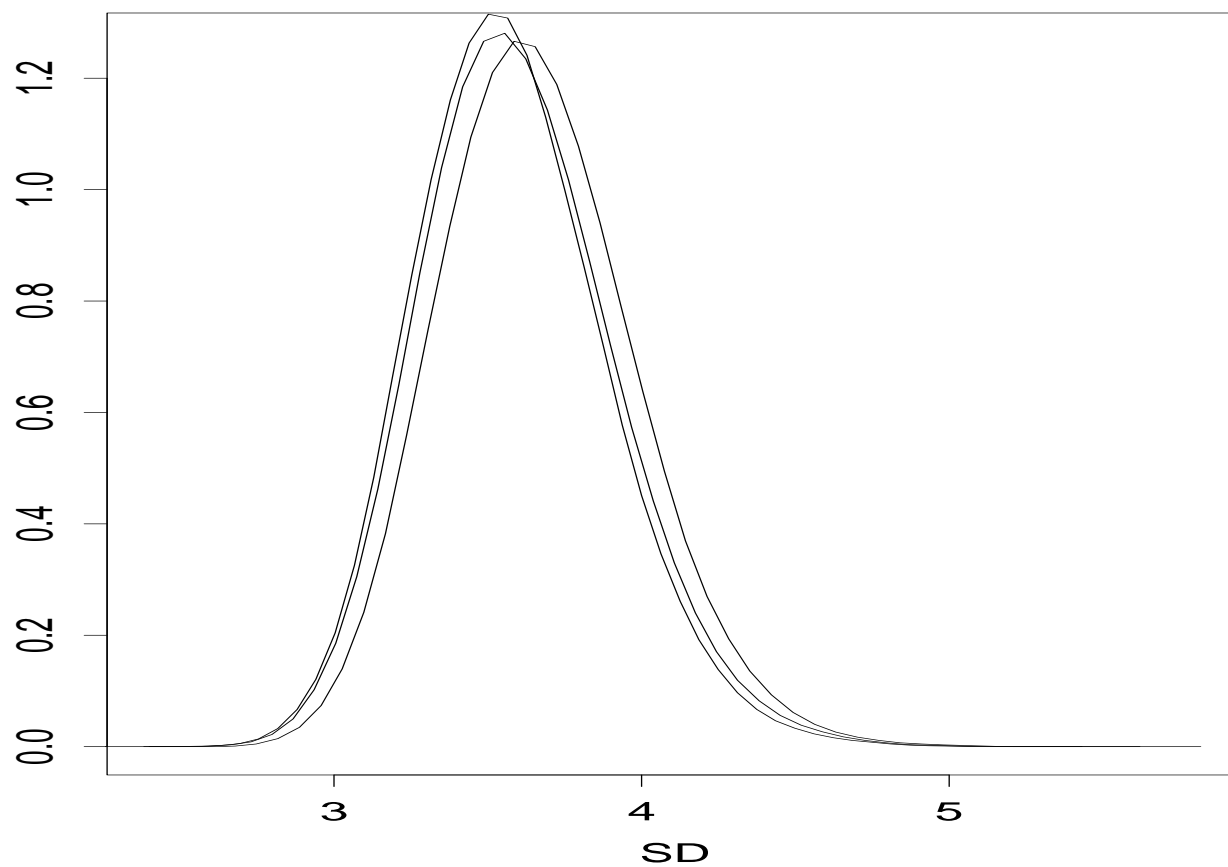


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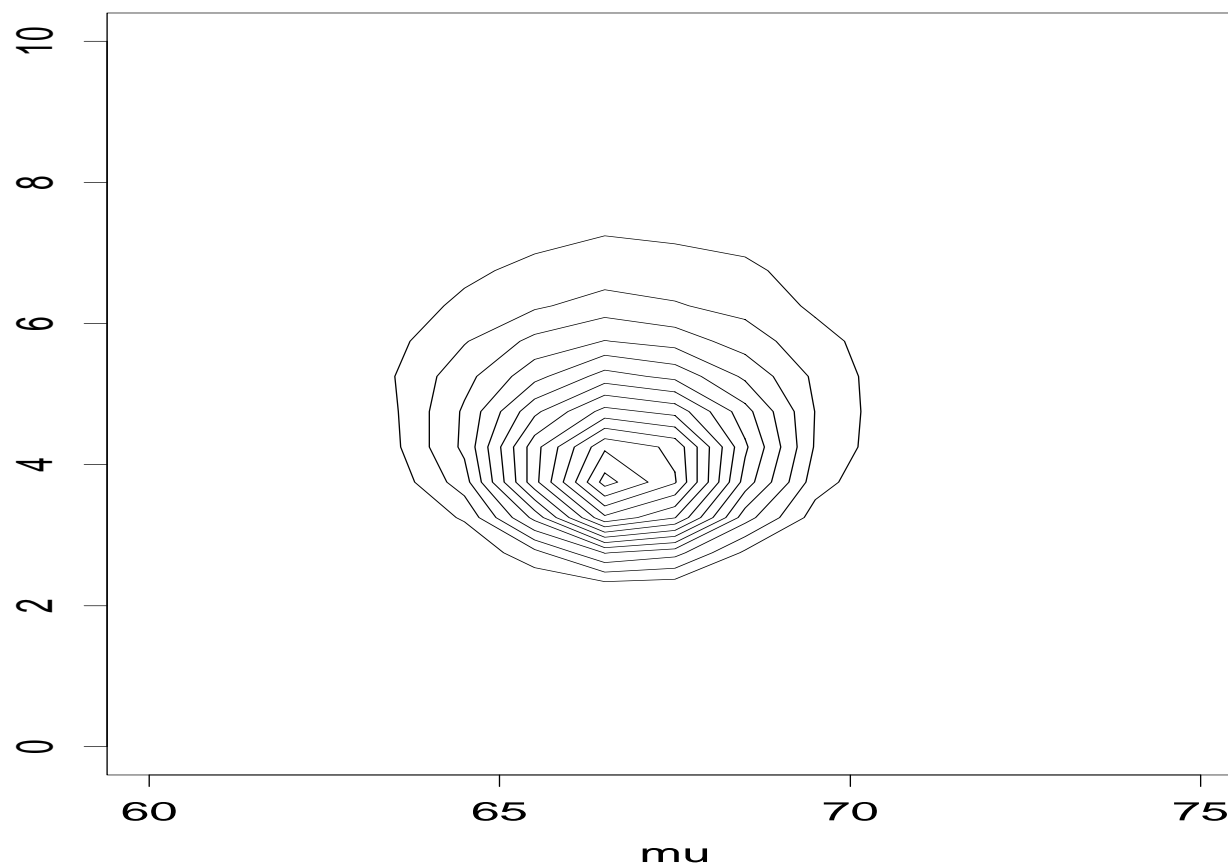




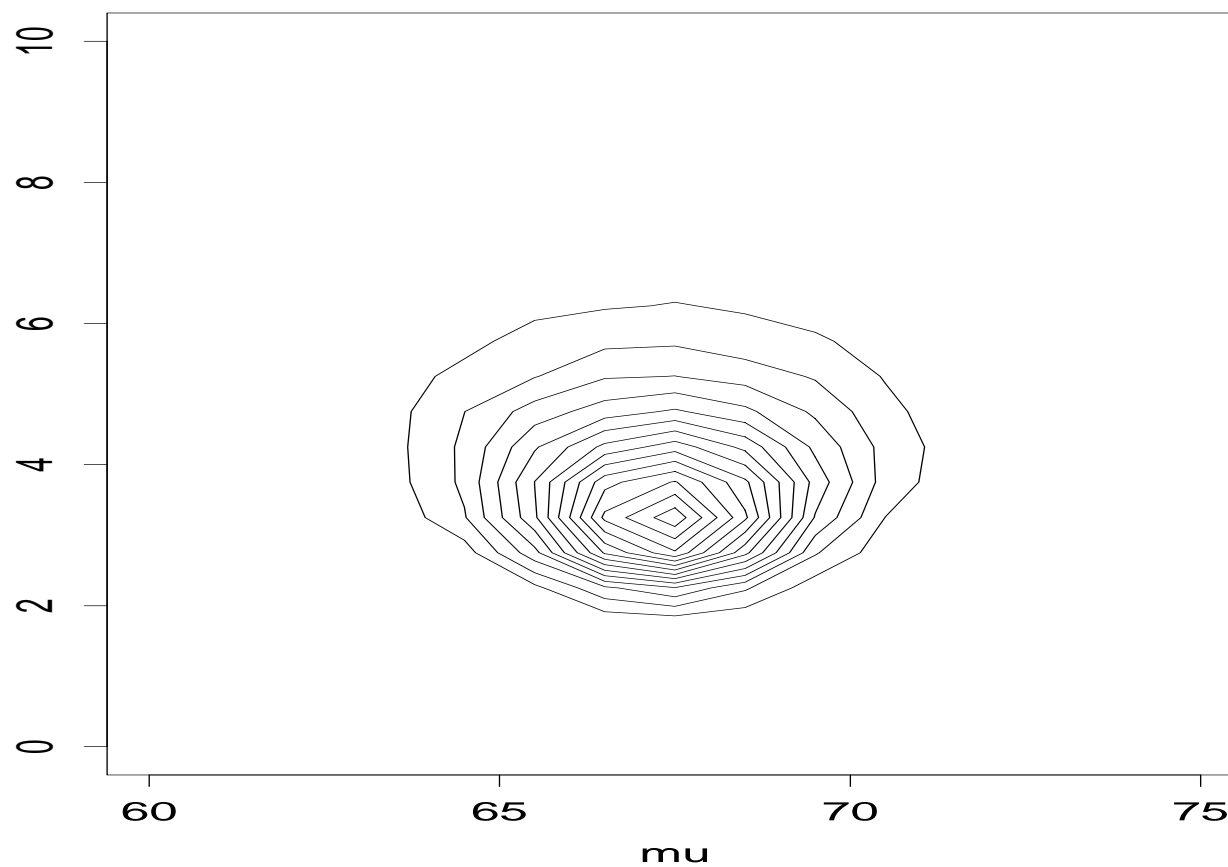
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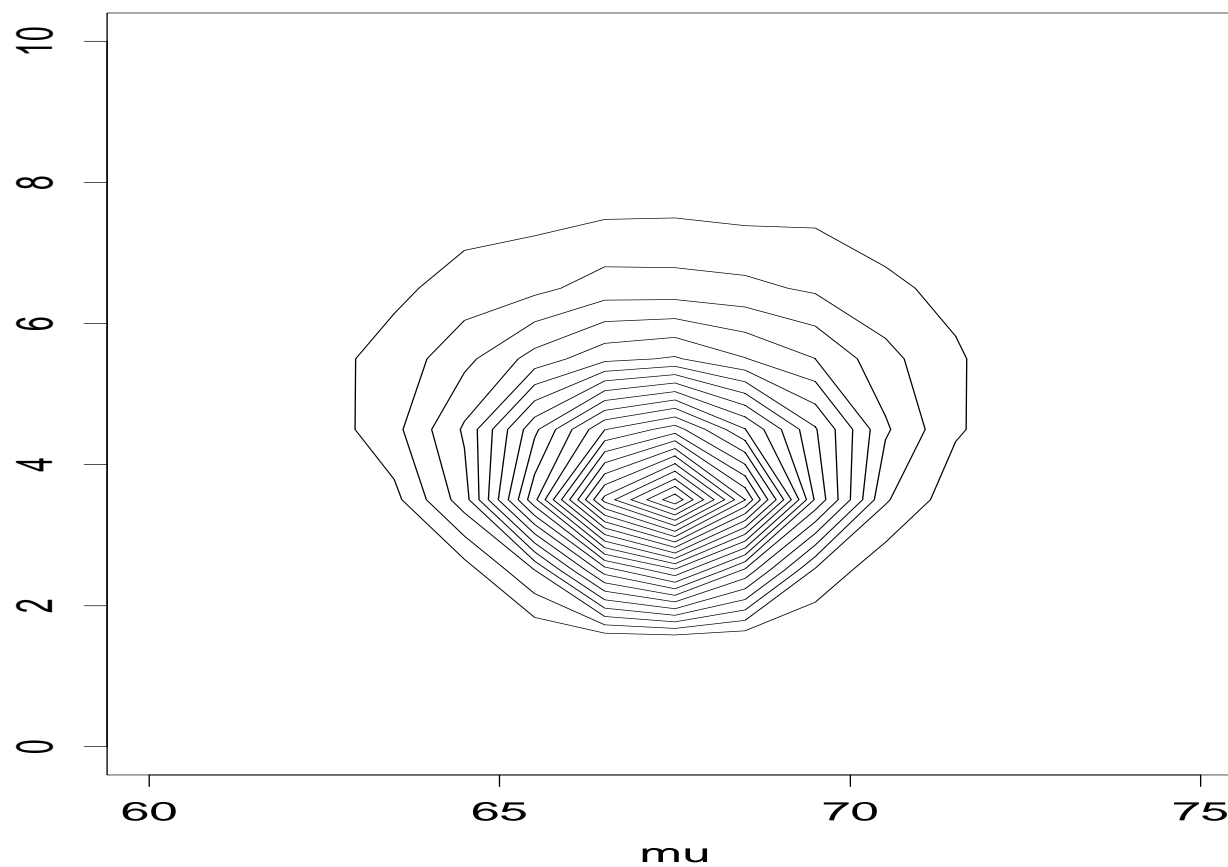
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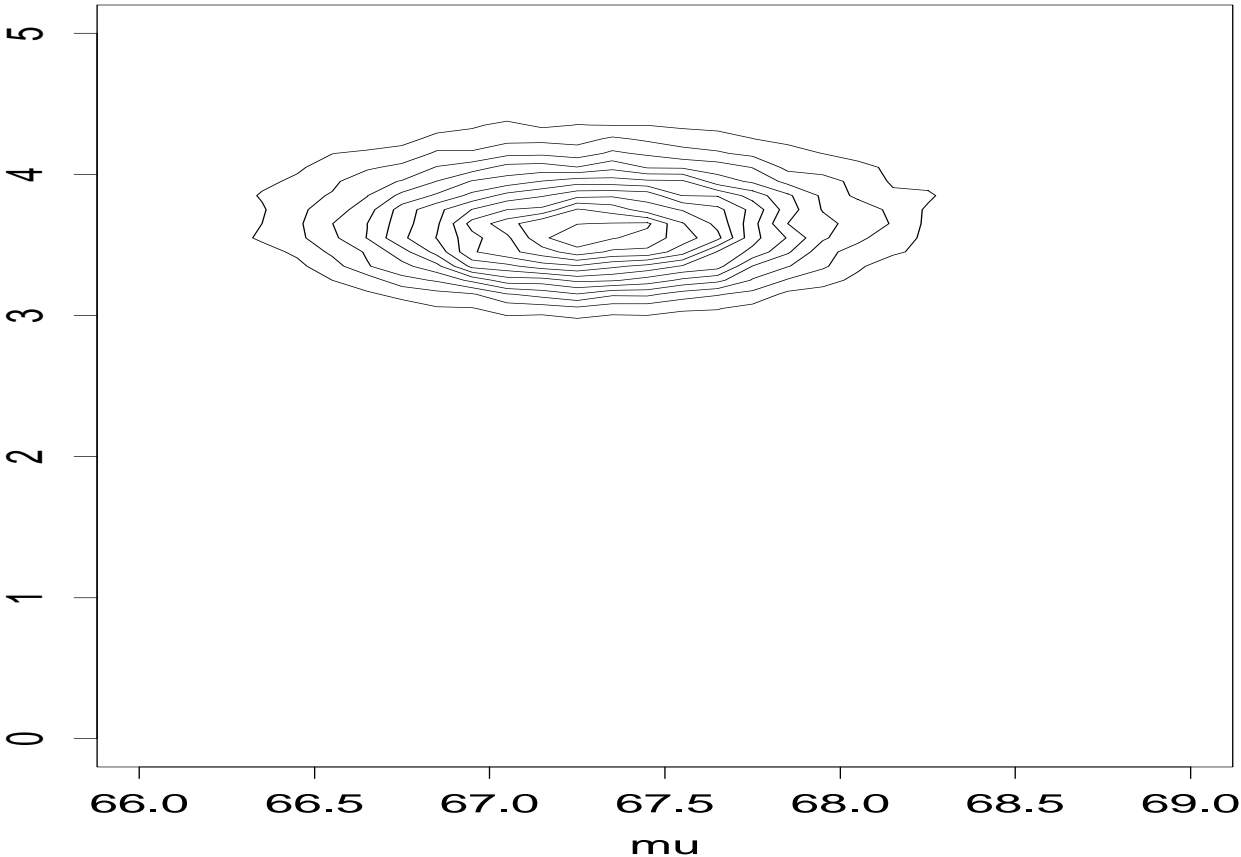
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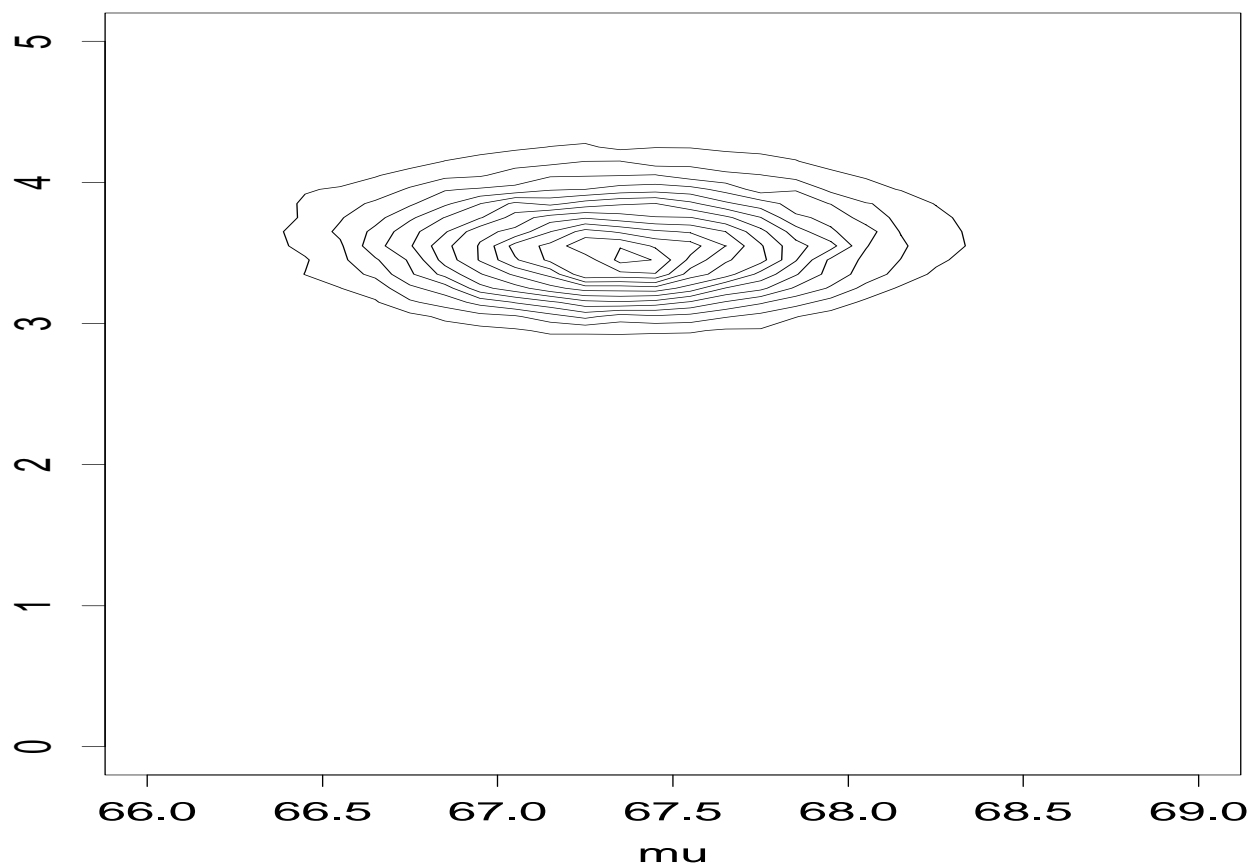
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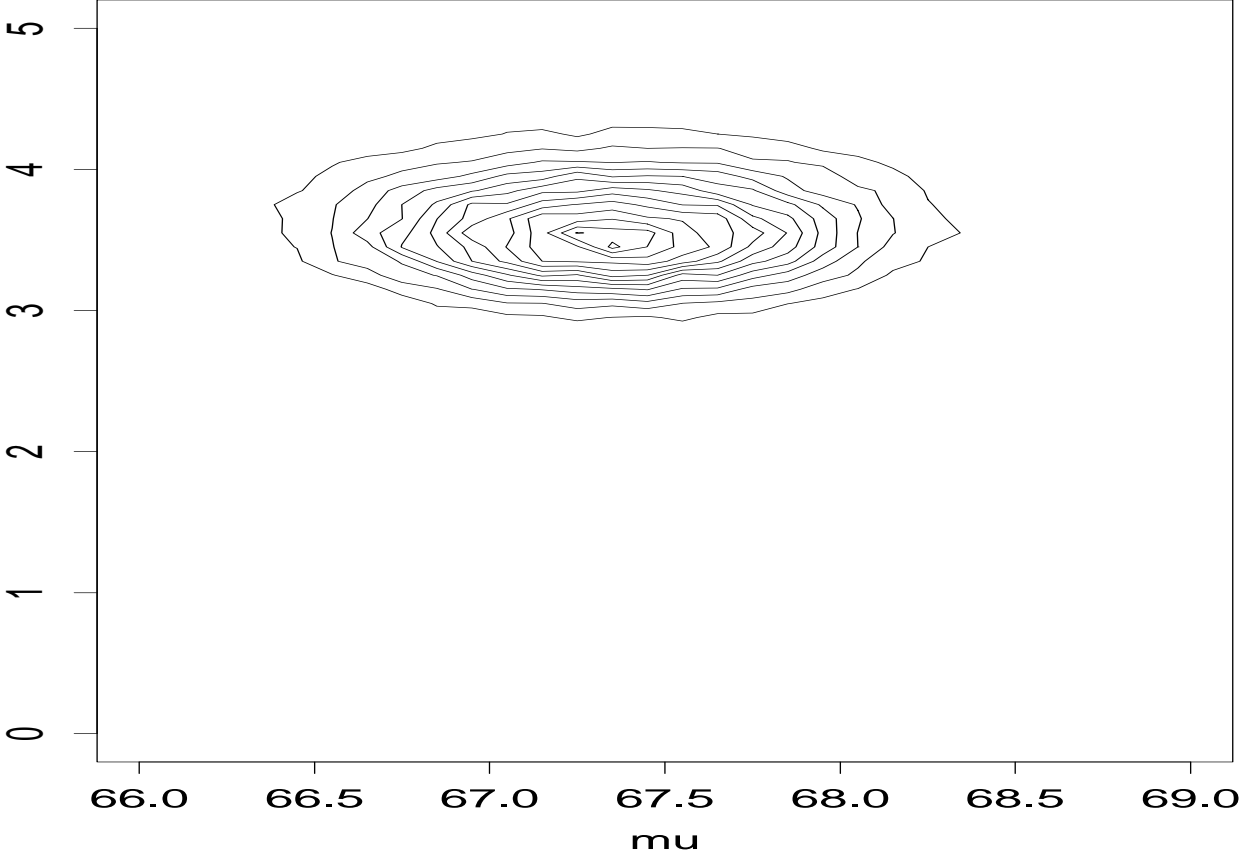
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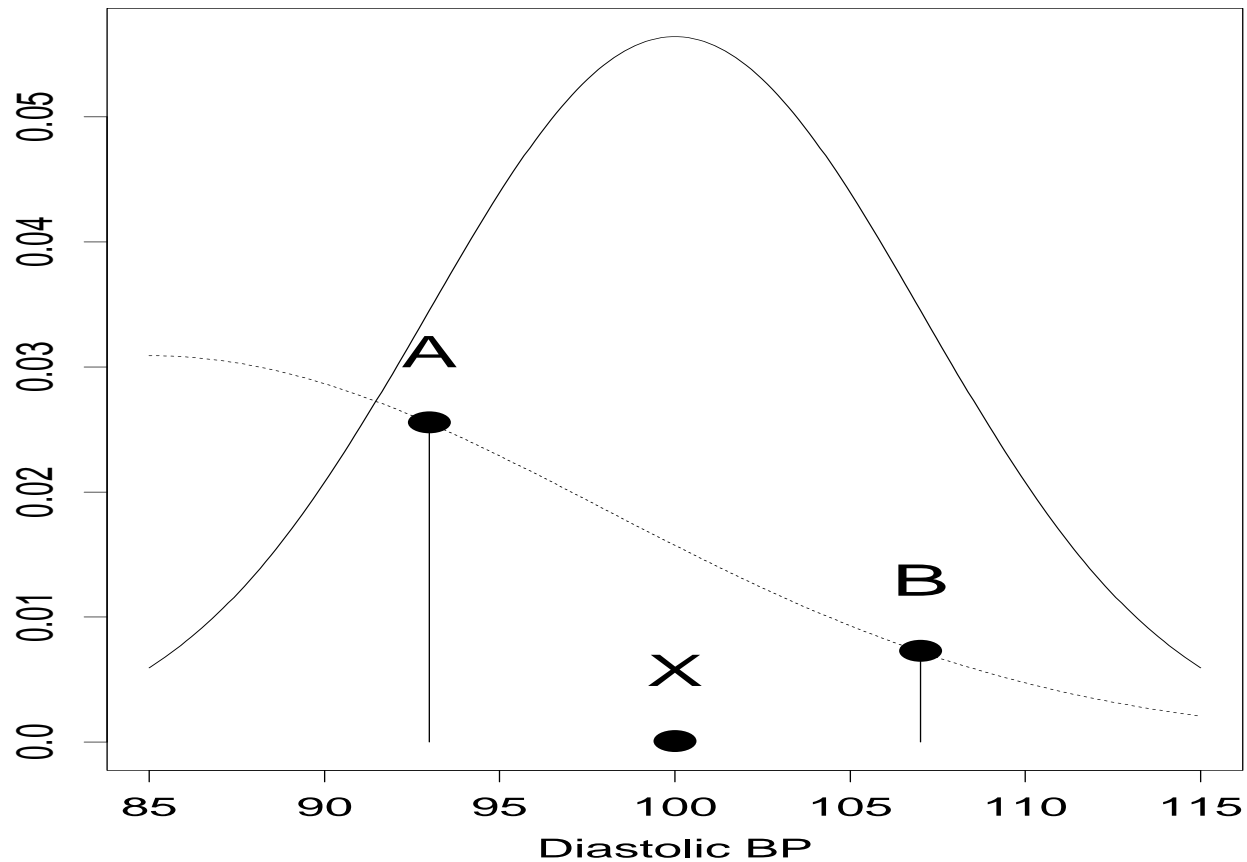


Figure 19: The likelihood and prior for diastolic BP for someone with a reading of 100. The solid line is the likelihood and the dotted line is the prior.