1. In a two-stage model, the major sources of variation in an estimate of a regression parameter (e.g. log relative risk) are (check all that apply):
   (a). statistical error the arises from imprecision in the finite set of measurements
   (b). Bayesian error
   (c). conjugate distribution error
   (d). natural variation in the true parameter values
   (e). stochastic correspondence deviations

2. In estimating the average parameter value (here, log relative risk) across cities, we should weight the city-specific estimates: (choose best answer):
   (a). inversely proportional to the standard error
   (b). proportional to the standard error
   (c). inversely proportional to the statistical variance
   (d). proportional to the statistical variance
   (e). inversely proportional to the sum of the statistical and natural variance

3. When the statistical variance is small relative to the natural variance, we estimate each city’s parameter value by: (choose best answers):
   (a). the un-weighted average of all the city-specific estimates
   (b). that city’s maximum likelihood estimate
   (c). the weighted average of all the city-specific estimates
   (d). a linear combination of the city-specific mle and the overall un-weighted average
   (e). a linear combination of the city-specific mle and the overall weighted average

4. As the natural variance increases, the standard error of the overall estimate (choose all correct answers):
   (a). decreases
   (b). stays the same
   (c). increases
   (d). decreases roughly proportional to the estimate so that the t-statistic is unchanged
   (e). increases roughly proportional to the estimate so that the t-statistic is unchanged

5. Relative to the mle, the empirical Bayes estimate for a city’s parameter (e.g. log relative risk) is: (check all correct answers)
   (a). is shrunk toward the overall estimate
   (b). is more biased
   (c). is more precise
   (d). is less biased
   (e). is less precise