10.20 The following data give the number of casualties for 103 suicide attacks in Israel with explosives over a three-year period from November 6, 2000 to November 3, 2003 when there was a steep drop (the early period of the first "Intifada"). These data are provided by the International Policy Institute for Counter-Terrorism, and subsetted by Harrison (2006), and modeled in Kyung *et al.* (2011).

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 3 | 81 | 38 | 29 | 126 | 6 | 10 | 1 | 1 |
| 67 | 50 | 3 | 27 | 0 | 2 | 0 | 63 | 15 | 58 |
| 57 | 0 | 0 | 0 | 0 | 123 | 4 | 71 | 71 | 20 |
| 17 | 65 | 4 | 49 | 5 | 35 | 57 | 71 | 0 | 12 |
| 67 | 59 | 5 | 52 | 62 | 0 | 75 | 0 | 0 | 106 |
| 30 | 0 | 3 | 45 | 4 | 31 | 32 | 180 | 0 | 1 |
| 91 | 49 | 61 | 51 | 3 | 0 | 1 | 9 | 0 | 2 |
| 151 | 26 | 8 | 8 | 75 | 199 | 12 | 2 | 2 | 1 |
| 93 | 0 | 13 | 21 | 145 | 0 | 0 | 13 | 0 | 2 |
| 141 | 2 | 65 | 0 | 105 | 0 | 61 | 6 | 27 | 53 |
| 20 | 5 | 0 | | | | | | | |

There are two modes, with the larger one at zero. Fit a two-component gamma mixture model using data augmentation for $p$ (the probability of being in the right-mode) with a beta distribution, and with a binary assignment vector as part of the Gibbs sampler. At iteration $t$ the steps are:

- ▷ Draw $p$ from $\mathcal{BE}(\alpha + n_1, \beta + n_2)$.
- ▷ For each case $i$, draw $I_i \sim \mathcal{BR}(p)$.
- ▷ If $I_i = 0$, draw from $\mathcal{G}(\alpha_0, \beta_0)$.
- ▷ If $I_i = 1$, draw from $\mathcal{G}(\alpha_1, \beta_1)$.
- ▷ Determine $n_1$ and $n_2$ from the $I_i$ assignments.