Suportting information 1

Script used in WinBugs14 software to model the relative risk of developing visceral leishmaniasis by coverage area based on the clinical cases recorded in Belo Horizonte, Minas Gerais, Brazil, between 2008 and 2011.

```
model {

        # Likelihood
        for (i in 1 : N) {
                O[i]  ~ dpois(mu[i])
                log(mu[i]) <- log(E[i]) + alpha0 + b[i]
                RR[i] <- exp(alpha0 + b[i])                                    # Area-specific relative risk
(for maps)
        }

        # CAR prior distribution for random effects:
        b[1:N] ~ car.normal(adj[], weights[], num[], tau)
        for(k in 1:totalvizinhos) {
                weights[k] <- 1
        }

        # Other priors:
        alpha0  ~ dflat()
        tau  ~ dgamma(0.5, 0.0005)                              # prior on precision
        sigma <- sqrt(1 / tau)                                  # standard deviation

}

Data
list(N = 147,
O=c(5,2,1,4,4,1,1,2,1,2,4,2,2,3,2,0,1,3,0,3,4,6,2,2,0,0,
2,3,4,5,4,2,5,4,1,1,9,3,4,7,15,3,5,2,3,9,5,4,4,1,3,
7,2,7,4,1,7,1,6,9,4,0,0,2,6,3,1,3,2,1,5,4, 10,4,0,4,
1,3,3,6,3,3,4,2,1,6,4,3,5,6,6,1,5,0,0,6,0,0,3,5,1,
1,5,0,8,2,8,6,3,4,4,5, 10, 11,3,2,3,3,4,0,2,2,0,3,5,1,
3,6,2,3,1,2,3,7,3,3,5,3,4,1,4,3,4,1,1,3,6),
E = c(
4.06,3.03,3.31,2.17,4.43,1.79,2.07,2.83,2.10,3.61,3.50,3.65,2.94,3.33,3.94,1.74,3.88,4.29,
10.01,3.18,8.54,2.42,8.24,4.09,4.90,5.26,1.96,3.01,2.62,3.39,1.90,2.92,7.09,8.83,2.76,3.72,7.21,3.20,2.09
,2.39,3.01,5.65,2.30,1.77,2.35,3.77,2.83,2.88,2.88,1.68,6.78,
2.87,1.66,4.85,4.22,1.98,3.18,3.28,2.81,6.45,2.74,0.71,1.28,
4.03,4.84,2.64,3.43,4.21,5.64,4.29,3.69,4.63,2.92,2.65,1.77,3.86,1.86
,2.71,2.57,2.81,1.42,2.15,3.04,1.80,1.42,3.98,3.09,4.44,9.05,
5.15,4.66,2.04,2.89,5.79,1.46,7.85,1.82,2.46,1.57,4.43,0.85,
3.02,6.27,3.01,4.08,3.19,3.18,3.58,5.91,2.85,4.40,3.42,4.05,3.51,3.28
,2.82,2.34,4.98,2.76,2.52,0.87,1.79,2.46,2.99,3.54,1.68,2.35,
4.17,2.96,2.77,2.37,4.03,8.30,2.72,2.56,2.17,3.41,1.74,2.86,1.25,2.40,1.29,2.23,2.48,0.85,1.14,3.21),
num = c(
5,6,3,4,6,3,3,5,4,7,5,6,2,5,4,6,6,7,8,4,7,4,4,5,6,6,3,7,6,5,3,7,8,8,4,5,6,6,1,4,6,7,6,5,5,5,11,7,5,4,5,4,4,5,6,5,5,5,3,8,4,8,4,
3,6,6,4,6,6,5,7,5,7, 10,7,8,5,7,7,5,6,4,6,5,5,4,7,7,6,5,6,5,5,5,5,9,4,5,7,6,6,5,4,5,5,7,4,5,6,5,8,4,4,4,4,4,4,
9,7,3,3,4,6,8,8,4,3,5,4,5,3,7,9,3,2,6,8,5,7,7,4,3,4,7,3,5,7),
adj = c(
147,11,8,5,2,
10,8,14,12,11,1,
120,10,12,
10,5,15,8,
15,9,7,8,1,4,
14,119,16,
127,5,9,
10,2,1,5,4,
127,13,5,7,
120,15,2,12,3,8,4,
147,119,14,1,2,
16,119,14,10,3,2,
127,9,
119,6,12,11,2,
120,10,5,4,
125,119,18,91,12,6,
34,26,20,19,85,33,
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91,89,24,22,21,23,16,
26,25,24,23,22,20,21,17,
85,21,17,19,
126,85,23,32,20,19,18,
24,23,18,19,
21,19,22,18,
89,25,22,18,19,
96,89,74,26,19,24,
74,33,17,34,19,25,
31,28,30,
38,37,36,31,29,30,27,
51,50,45,37,28,31,
121,38,35,28,27,
27,28,29,
126,121,39,38,35,33,21,
126,85,36,34,32,38,26,17,
74,54,42,36,33,17,37,26,
38,121,30,32,
37,38,33,28,34,
51,42,28,29,36,34,
32,35,30,28,36,33,
32,
49,47,45,46,
144,49,46,56,134,43,
55,54,52,37,34,47,51,
144,53,44,56,146,41,
144,138,53,43,140,
50,47,46,29,40,
49,41,134,45,40,
100,84,75,55,51,50,40,45,49,144,42,
74,68,63,57,54,52,55,
41,46,40,144,47,
51,29,47,45,
29,50,37,47,42,
54,42,55,48,
43,44,146,140,
74,42,34,52,48,
101,100,42,47,52,48,
146,145,134,43,41,
74,68,65,63,48,
73,71,62,61,69,
66,60,118,
118,73,69,66,65,68,128,59,
71,70,58,62,
99,92,71,70,96,69,58,61,
74,65,48,57,
71,143,72,
128,68,57,63,74,60,
73,72,67,59,60,118,
103,72,66,118,
118,48,57,65,101,60,
73,128,96,60,62,58,
71,62,99,92,61,
143,58,61,62,73,70,64,
143,66,73,67,64,
143,69,58,60,66,72,71,
128,96,26,34,25,54,48,57,63,65,
84,80,78,138,144,124,47,
141,137,136,133,115,109,83,139,
137,123,83,82,78,
137,82,81,80,75,124,77,
142,139,131,124,123,83,140,
137,84,81,75,78,
137,132,80,84,100,78,
123,124,78,77,
137,77,76,123,79,139,
100,47,80,75,81,
126,21,33,20,17,
99,93,87,88,
147,92,93,95,86,97,99,
99,98,93,90,94,96,86,
96,90,24,18,91,25,
94,91,89,96,88,
125,94,18,90,89,16,
147,62,87,99,70,
95,88,98,86,87,
```

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125,98,90,91,88,
97,98,125,93,87,
128,99,89,25,74,90,88,69,62,
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88,96,62,86,92,87,70,
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117,118,67,102,
133,118,101,132,102,
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116,113,111,107,110,114,136,
113,106,116,135,
129,109,111,130,105,
133,130,115,111,76,108,
116,114,131,139,106,
129,113,112,115,136,109,106,108,
129,111,113,105,
106,107,111,112,
136,139,110,106,
76,136,109,111,
135,110,106,107,
122,102,133,103,
68,60,101,104,103,102,67,66,59,
147,16,125,14,12,11,6,
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30,32,35,
133,117,130,105,
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142,138,140,79,123,82,78,75,
147,91,16,94,119,98,97,95,
32,85,21,33,
9,7,13,
74,96,65,69,60,
108,111,112,105,
133,109,122,108,105,
79,139,110,
141,137,133,81,100,104,101,
132,104,141,76,109,130,122,117,102,
56,46,41,
116,107,
139,76,114,115,111,106,
141,77,78,80,81,83,76,132,
44,144,124,140,75,
79,136,131,114,110,83,76,
146,145,138,124,79,53,44,
137,76,132,133,
124,123,79,
73,71,72,64,
41,43,44,138,75,49,47,
146,56,140,
145,56,140,53,43,
119,125,11,97,1,87,92),
totalvizinhos = 790 )
```

Inits

```
list(tau = 1, alpha0 = 0,
b=c(0,0,0,0,0,0,0,0,0,0,
    0,0,0,0,0,0,0,0,0,0,
    0,0,0,0,0,0,0,0,0,0,
    0,0,0,0,0,0,0,0,0,0,
    0,0,0,0,0,0,0,0,0,0,
    0,0,0,0,0,0,0,0,0,0,
    0,0,0,0,0,0,0,0,0,0,
    0,0,0,0,0,0,0,0,0,0,
    0,0,0,0,0,0,0,0,0,0,
    0,0,0,0,0,0,0,0,0,0,
    0,0,0,0,0,0,0,0,0,0,
    0,0,0,0,0,0,0,0,0,0,
    0,0,0,0,0,0,0,0,0,0,
    0,0,0,0,0,0,0,0,0,0,
          0,0,0,0,0,0,0))
```