

$$\begin{aligned}
& \log(\mu_{it}^I) = \beta_t^I(\text{Lat}_i, \text{Lon}_i) + \alpha_{1t}^I(\text{Lat}_i, \text{Lon}_i) \times \log(I_{i,t-1}) + \alpha_{2t}^I \log(S_{i,t-1}/N_i) \\
& + \theta_{1t}^I \text{Mobility}_{i,t-7} + \theta_{2t}^I \text{Control}_{i,t-7} + f_{1t}^I(\text{Disadvantage}_i) + f_{2t}^I(\text{Affluence}_i) \\
& + f_{3t}^I(\text{Urban}_i) + f_{4t}^I(\text{Gini}_i) + f_{5t}^I(\text{AA}_i) + f_{6t}^I(\text{HL}_i) + f_{7t}^I(\text{MF}_i) \\
& + f_{8t}^I(\text{Old}_i) + f_{9t}^I(\text{PD}_i) + f_{10,t}^I(\text{Tbed}_i) + f_{11,t}^I(\text{EHPC}_i) + f_{12,t}^I(\text{NHIC}_i)
\end{aligned}$$