

# Description of the contact matrix extrapolation

August 29, 2021

## 0.1 Contact matrices calculation

For each location  $L$  (home, school, work, other locations) the age-specific contact matrix  $\mathbf{C}^L = (c_{i,j}^L) \in \mathbb{R}_+^{16 \times 16}$  is defined such that  $c_{i,j}^L$  is the average number of contacts that a typical individual aged  $i$  has with individuals aged  $j$ . As there is no contact survey available for the Philippines, the matrices  $\mathbf{C}^L$  were obtained by extrapolating contact matrices from China, where a contact survey was conducted in 2017 [?]. The original matrices from China are denoted  $\mathbf{Q}^L = (q_{i,j}^L) \in \mathbb{R}_+^{16 \times 16}$ , where  $q_{i,j}^L$  is defined using the same convention as for  $c_{i,j}^L$ . The matrices  $\mathbf{Q}^L$  were extracted using the R package “socialmixr” (v 0.1.8) and the next paragraph describes how these contact matrices were then adjusted to account for age distribution differences between the Philippines and China.

Let  $\pi_j$  denote the proportion of people aged  $j$  in the Philippines, and  $\rho_j$  the proportion of people aged  $j$  in China. The contact matrices  $\mathbf{C}^L$  were obtained from:

$$c_{i,j}^L = q_{i,j}^L \times \frac{\pi_j}{\rho_j}.$$