

1 **Indigenous Australian household structure:**
2 **a simple data collection tool and**
3 **implications for close contact transmission**
4 **of communicable diseases**

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29 **ABSTRACT**

30 Households are an important location for the transmission of communicable diseases. Social contact
31 between household members is typically more frequent, of greater intensity, and is more likely to involve
32 people of different age groups than contact occurring in the general community. Understanding household
33 structure in different populations is therefore fundamental to explaining patterns of disease transmission
34 in these populations. Indigenous populations in Australia tend to live in larger households than non-
35 Indigenous populations, but limited data is available on the structure of these households, and how they
36 differ between remote and urban communities. We have developed a novel approach to the collection of
37 household structure data, suitable for use in a variety of contexts, which provides a detailed view of age,
38 gender, and room occupancy patterns in remote and urban Australian Indigenous households. Here we
39 report analysis of data collected using this tool, which quantifies the extent of crowding in Indigenous
40 households, particularly in remote areas. We use this data to generate matrices of age-specific contact
41 rates, as used by mathematical models of infectious disease transmission. To demonstrate the impact
42 of household structure, we use a mathematical model to simulate an influenza-like illness in different
43 populations. Our simulations suggest that outbreaks in remote populations are likely to spread more
44 rapidly and to a greater extent than outbreaks in non-Indigenous populations.

45 1. Household Size distribution for Australian Bureau of Statistics Census data (2011) for the towns
46 selected in ABC study

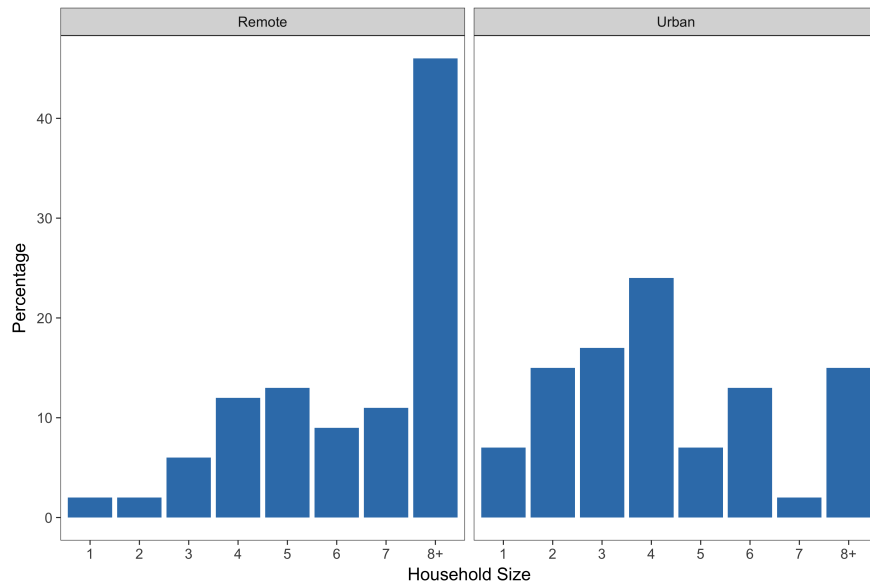


Figure 1. Household Size distribution for Census data

2. Contact matrices for each shire

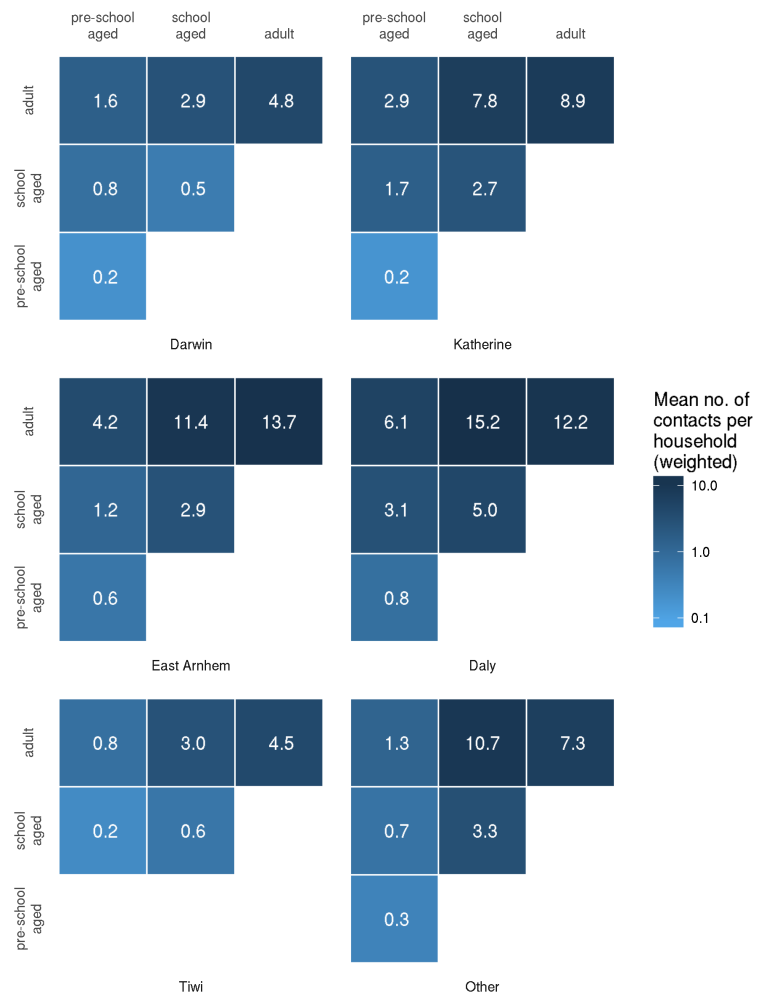


Figure 2. Household Contact matrices for shires

3. Effect of weighting by rooms on contact matrices

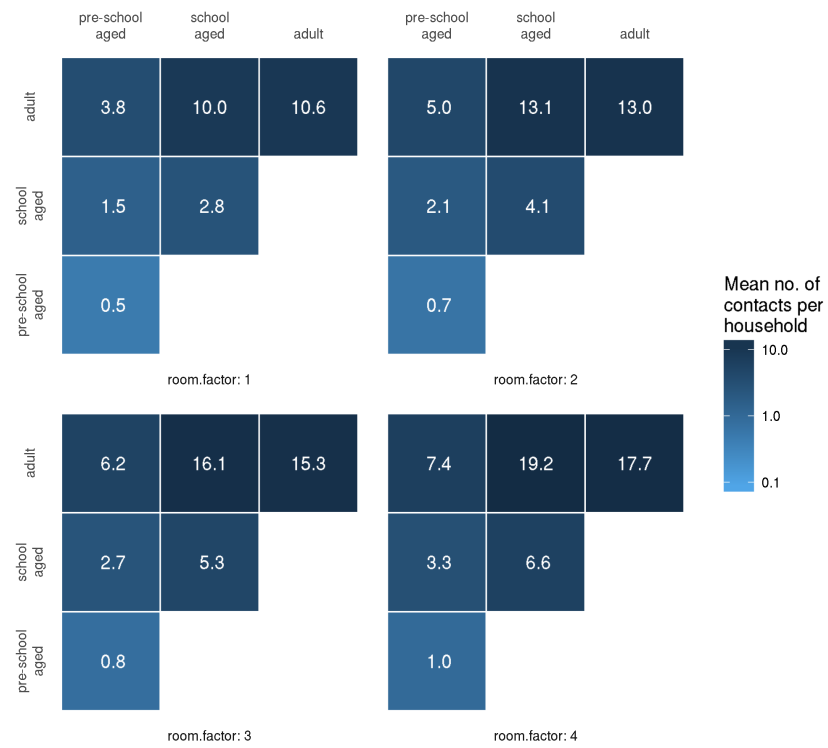


Figure 3. Effect of weighting by rooms on contact matrices