Supplementary Information

For *Dynamic social networks and the implications for the spread of infectious disease*. JM Read, KTD Eames, WJ Edmunds.

Here, we provide more detail on the participants, the survey and our findings. We present this information in the hope that it is useful for the parameterisation of individual-based epidemic models.

S1. Summary statistics of participants

Here, to help place the survey results in a better social context, we summarise some of the demographic information collected about the participant sub-population. Table S1 shows household demography by housing type, while figure S1 shows the age distribution of participants. Encounters made by participants reporting 'Bed-sit' and 'Lodgings' housing types were pooled with those made by 'Shared flat or house' into the 'Shared' category in Figure 2d and Table S4.

Housing type	Participants	Median age of participants	Mean household size (including participant)	Median age of other household members
Halls	11	24	8.5	23
Shared flat or house	16	25.5	3.9	25
Bed-sit	1	26	1	-
Lodgings	1	32	1	-
Family home	19	36	2.9	30

Table S1. Household demography of participants.

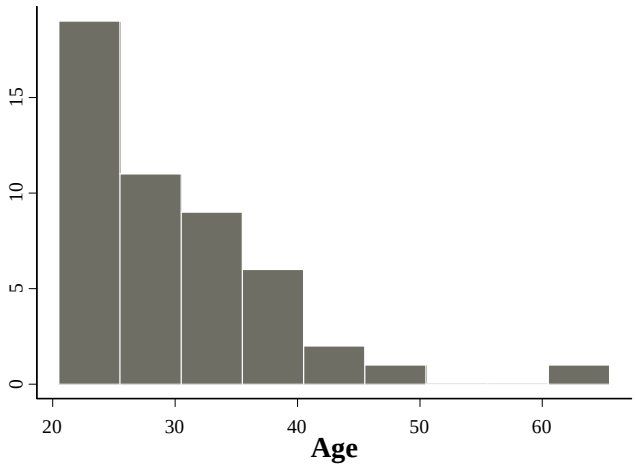

Figure S1. The distribution of participant age.

S2. Survey compliance and reporting accuracy

Table S2 shows the number of participants by the number of sample days recorded.

Number of days	Number of participants
14	16
13	18
12	5
11	3
10	3
9	2
<5	2

Table S2. The number of sample days completed by participants

As survey participants were invited to record contacts with fellow participants, the accuracy of general reporting can be estimated by considering the number of mismatches in reported contacts between participants, in terms of both absence/presence and agreement of contact type. 24.6% (*n*=1940, where the 95% binomial confidence interval is 22.7 to 26.6) of all encounters between participants were unreported by one of the pair. Of those encounters that were reported by both participants, 96.6% of encounters agreed on contact type (*n*=1463, 95.5 to 97.4), and 95.9% agreed on social context type (*n*=1463, 94.7 to 96.8). The correlation between unreported and misreported contacts is negative, suggesting that discrepancies are not associated with the same individuals. Individuals did appear to be consistent throughout the sampling period in their reporting accuracy of contact with other participants.

S3. Daily contacts during the week and at weekends

All social contexts showed a significant ($p < 0.05$) change in daily degree between weekdays and weekends (Table S3). Home, social and travel/shopping contacts were more numerous at the weekend, while work contacts were greater on weekdays.

Context`	**Mean degree**		***p***
	Weekdays (1^{st} quartile, median, 3^{rd} quartile)	**Weekend** (1^{st} quartile, median, 3^{rd} quartile)	
All contexts	16.14 (10,15,21)	8.96 (5,8,12)	<0.001
Home	2.16 (1,1,3)	2.74 (1,2,4)	0.038
Work	10.80 (6,10,15)	0.80 (0,0,0)	<0.001
Social	2.31 (0,0,3)	4.07 (0,2,6)	<0.001
Travel/Shopping	0.87 (0,0,1)	1.35 (0,0,2)	0.013

Table S3. The effect of weekday and weekends on the number of contacts made by participants. *p* values derived from the Welch modified t-test for a difference between weekday and weekend reported daily contacts.

S4. Clustering (transitivity) of encounters

Clustering, as measured by ϕ, the fraction of individuals with a mutual acquaintance who also know each other, is an important property of transmission networks, as greater clustering reduces the rate of transmission across the network. The data show some discrepancies between participants' recorded encounters, in terms of absence/presence. We assume these discrepancies are caused by failure to report an encounter that takes place rather than mistakenly reporting encounters that do not occur; there is some evidence for this as the mean ratio of in-degree to out-degree for contacts between participants (weighted by numbers of days completed) is greater than 1. Thus, before we analyse network clustering, we 'repair' the network by reciprocating missing reports.

If we consider the network of encounters recorded by participants across the entire survey period, we find clustering is higher for all contacts made between participants ($\phi = 0.69$, $n = 2155$) than for physical contacts made between participants ($\phi = 0.30$, $n = 139$). Thus, amongst work colleagues there is greater clustering for diseases that require casual-contact between hosts for transmission than for diseases requiring closer contact; the survey cannot elucidate accurately the degree of clustering beyond the work environment.

S5. Proportion of repeated encounters with individuals

An alternative way of considering repeat encounter to that presented in Figure 2 is the proportion of individuals (alters) that are only reported once by a participant; these are shown in Table S4, for each social context. Home context is not split by age, but by housing type of participant.

	Contact type		
Context	**Both (*n*)**	**Conversational (*n*)**	**Physical (*n*)**
All contexts	70.8 (8661)	70.0 (7455)	76.2 (1206)
Home	52.4 (1399)	67.4 (879)	46.3 (520)
Halls	59.1 (547)	59.9 (469)	64.8 (78)
Shared	53.2 (372)	61.1 (295)	44.6 (77)
Family	46.8 (472)	83.1 (112)	38.5 (360)
Work	59.1 (4985)	58.8 (4784)	89.0 (201)
20-24 yrs	48.9 (1542)	49.1 (1488)	90.8 (54)
25-29 yrs	61.4 (1589)	61.0 (1543)	87.4 (46)
30-34 yrs	62.9 (875)	62.9 (852)	85.7 (23)
35+ yrs	68.3 (979)	66.9 (901)	90.6 (78)
Social	90.0 (1676)	91.6 (1228)	87.8 (448)
20-24 yrs	87.2 (576)	90.7 (430)	84.1 (146)
25-29 yrs	88.4 (483)	89.5 (352)	76.7 (131)
30-34 yrs	89.3 (328)	89.7 (279)	100.0 (49)
35+ yrs	97.6 (289)	98.4 (167)	98.2 (122)
Travel & Shopping	94.0 (601)	96.4 (564)	100.0 (37)
20-24 yrs	90.7 (164)	98.5 (151)	100.0 (13)
25-29 yrs	93.6 (155)	93.1 (144)	100.0 (11)
30-34 yrs	97.2 (132)	97.2 (132)	—
35+ yrs	96.3 (150)	96.5 (137)	100.0 (13)

Table S4. The percentage of encounters with individuals reported only once. Percentages shown are the mean of those for each of the 49 participants, and are weighted by the number of survey days completed by participants. The total number of reported encounters in each context/type combination (*n*) is given in brackets for reference. Home context is split by housing type of participants, while work and social contexts are split by age group of participant.