

Relative importance of different settings for COVID-19 acquisition in England and Wales: Analysis of the Virus Watch Community Cohort

Introduction

Restriction of contact within a wide range of settings has become a fundamental aspect of COVID-19 control globally. Although it is known that prolonged close contact in indoor settings leads to the highest risk of onward transmission, the relative importance of different settings in terms of their overall contribution to COVID-19 transmission has remained elusive. This limits the ability to make evidence-based decisions about which settings should be the focus of control measures at different stages of the pandemic. We aimed to assess the relative importance of different settings for COVID-19 transmission in a large community cohort (Virus Watch)

Methods

Virus Watch is a large household community cohort study which began recruitment in June 2020 and has recruited circa 50,000 individuals with weekly online follow up and self-reporting of any positive COVID-19 tests. In March 2021 participants who had self-reported a confirmed COVID-19 infection at any point during follow up were asked a) Whether they had contact with a known case of COVID-19 or a suspected case of COVID-19 in the 14 days before testing positive for COVID-19 b) Where they thought they had acquired COVID-19 (participants were allowed to select more than one setting category).

Results

Of 1142 participants who self-reported a positive COVID-19 test and responded to the survey question, 499 (44%) reported known contact with a confirmed case, 120 (10%) contact with a suspected case and 523 (46%) reported no known contact. Amongst all cases the perceived setting of acquisition was, in descending order of frequency, within the home (33%), at work (23%), in an essential shop (18%), in a leisure venue (10%), in a place of education (8%), in healthcare settings (8%), on public transport (7%), in someone else's home (6%), and other venues (11%).

This varied considerably by whether or not the person was a contact of a known case or not. For those with known contact the perceived venues for transmission in descending order were: Home (47%), work (23%), education (9%), someone else's home (8%), healthcare setting (7%), essential shop (6%), leisure venue (3%), and other venues (5%). For those with no recognized contact with a known or suspected case the perceived venues for acquisition in descending order were: an essential shop (32%), work (19%), home (19%), a leisure venue (16%), transport (11%), healthcare (9%), education (8%), someone else's home (3%) and other venues (19%).

The most important perceived venue for transmission varied by age group: education was more important than home for children aged 0-17, home and work were of similar importance for working age adults, and home and essential shops were the most important settings for those aged over 65 years. Young adults were more likely than other age groups to perceive leisure venues and public transport as the venue of acquisition.

Interpretation

Confirmation of cases was reliant on community testing so are most likely to represent cases acquired after the first UK lockdown following initiation of the Test, Trace and Isolate programme. Perceived venue of acquisition in those with known contact is likely biased toward venues such as home, work, and education where contact tracing can readily lead to identification of known contact. Conversely those with no known contact may be more likely to conclude they acquired COVID in settings where they are in contact with strangers (such as in shops).

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Conclusion

The findings illustrate the central importance of home, work and education as the most important venues for transmission although the relative importance of different settings is likely to change as society unlocks. In children, education is most important and in older adults essential shopping is of high importance. In the event of future waves of transmission these findings can support public health messaging about infection control in the home, advice on working from home, restrictions in different venues, and advice to vulnerable elderly to reduce exposure to shops, for example through online shopping.

Table 1. Perceived Setting of COVID-19 Acquisition by Contact Status

	Contact with Confirmed or Suspected Case			Overall ¹ , N=1142
	Confirmed ¹ , N=499	Suspected ¹ , N=120	None ¹ , N=523	
Home	234 (47%)	41 (34%)	98 (19%)	373 (32.7%)
Someone else's home	39 (7.8%)	12 (10%)	13 (2.5%)	64 (5.6%)
Work	116 (23%)	42 (35%)	101 (19%)	259 (22.7%)
Place of education	44 (8.8%)	10 (8.3%)	42 (8.0%)	96 (8.4%)
Public transport	10 (2.0%)	7 (5.8%)	58 (11%)	75 (6.6%)
Essential shop	28 (5.6%)	6 (5.0%)	167 (32%)	201 (17.6%)
Healthcare setting	35 (7.0%)	7 (5.8%)	48 (9.2%)	90 (7.9%)
Leisure	17 (3.4%)	9 (7.5%)	86 (16%)	112 (9.8%)
Other	25 (5.0%)	5 (4.2%)	99 (19%)	129 (11.2%)

¹n (%); **Note:** participants could select multiple locations so proportions are of category total not column total

Table 2. Perceived Setting of COVID-19 Acquisition by Age

	Overall					Contact with Confirmed or Suspected Case				
	0 to 17, N = 120 ¹	18 to 34, N = 191 ¹	35 to 49, N = 262 ¹	50 to 64, N = 361 ¹	65+, N = 206 ¹	0 to 17, N = 120 ¹	18 to 34, N = 191 ¹	35 to 49, N = 262 ¹	50 to 64, N = 361 ¹	65+, N = 206 ¹
Home	53 (44%)	64 (34%)	94 (36%)	100 (28%)	61 (30%)	41 (53%)	45 (42%)	71 (47%)	81 (42%)	36 (41%)
Someone else's home	2 (1.7%)	9 (4.7%)	9 (3.4%)	21 (5.8%)	23 (11%)	1 (1.3%)	6 (5.7%)	7 (4.6%)	18 (9.3%)	19 (22%)
Work	2 (1.7%)	61 (32%)	87 (33%)	98 (27%)	11 (5.3%)	1 (1.3%)	35 (33%)	56 (37%)	60 (31%)	6 (6.9%)
Place of education	63 (52%)	15 (7.9%)	8 (3.1%)	8 (2.2%)	1 (0.5%)	37 (47%)	10 (9.4%)	3 (2.0%)	3 (1.5%)	0 (0%)
Public transport	4 (3.3%)	22 (12%)	15 (5.7%)	22 (6.1%)	12 (5.8%)	1 (1.3%)	3 (2.8%)	4 (2.6%)	6 (3.1%)	3 (3.4%)
Essential shop	6 (5.0%)	28 (15%)	51 (19%)	70 (19%)	46 (22%)	1 (1.3%)	3 (2.8%)	7 (4.6%)	14 (7.2%)	9 (10%)
Healthcare setting	0 (0%)	14 (7.3%)	20 (7.6%)	32 (8.9%)	24 (12%)	0 (0%)	10 (9.4%)	12 (7.9%)	12 (6.2%)	8 (9.2%)
Leisure	5 (4.2%)	28 (15%)	19 (7.3%)	36 (10.0%)	24 (12%)	2 (2.6%)	7 (6.6%)	4 (2.6%)	8 (4.1%)	5 (5.7%)
Other	4 (3.3%)	15 (7.9%)	19 (7.3%)	43 (12%)	48 (23%)	0 (0%)	3 (2.8%)	7 (4.6%)	12 (6.2%)	8 (9.2%)

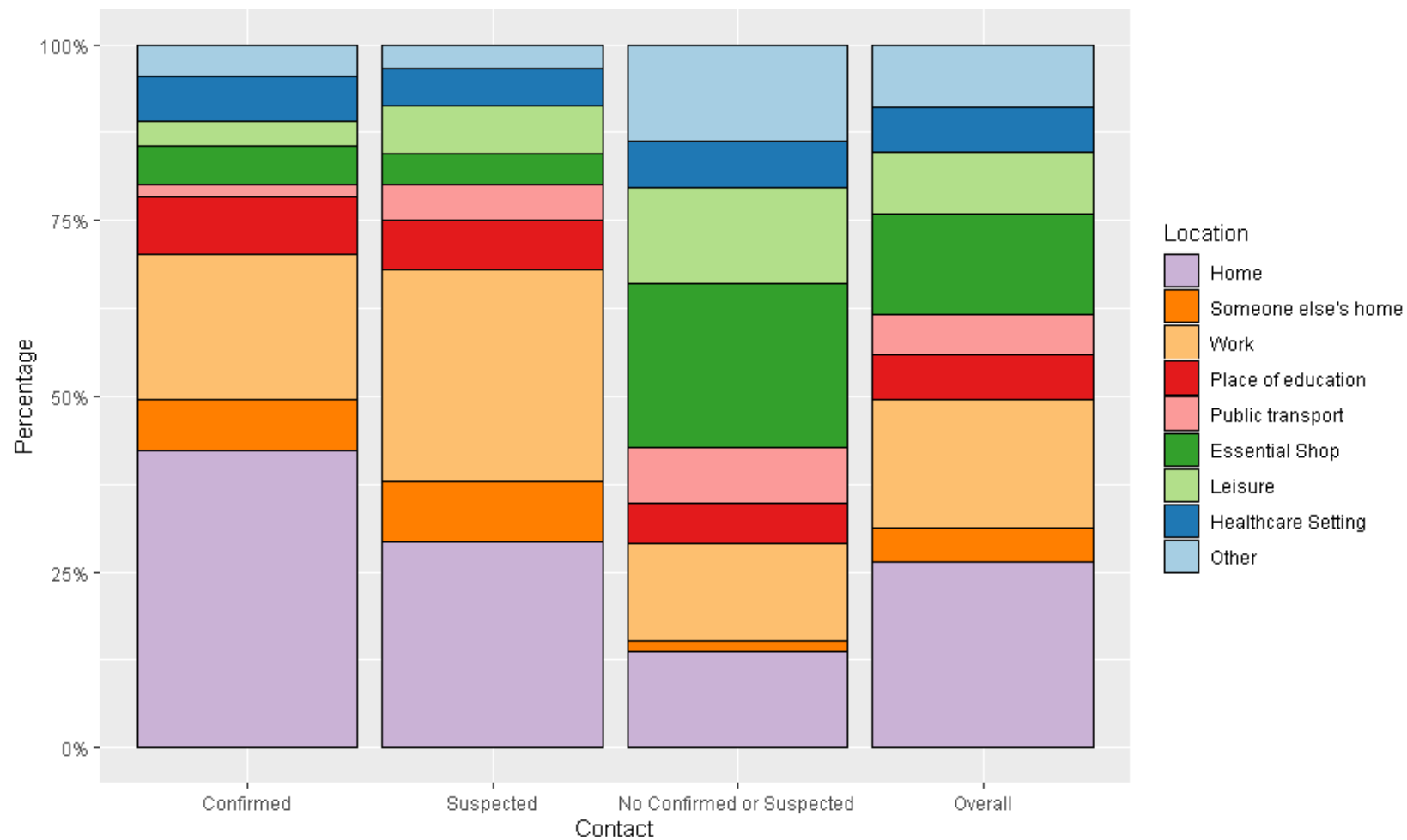
¹n (%); * Two cases excluded due to missing age; **Note:** Participants could select multiple locations so proportions are calculated from group *n* and may sum to >100.0%

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Perceived Setting of COVID-19 Acquisition by Contact Status

Note: Participants could select multiple locations so proportions are calculated from group n and may sum to >100.0%

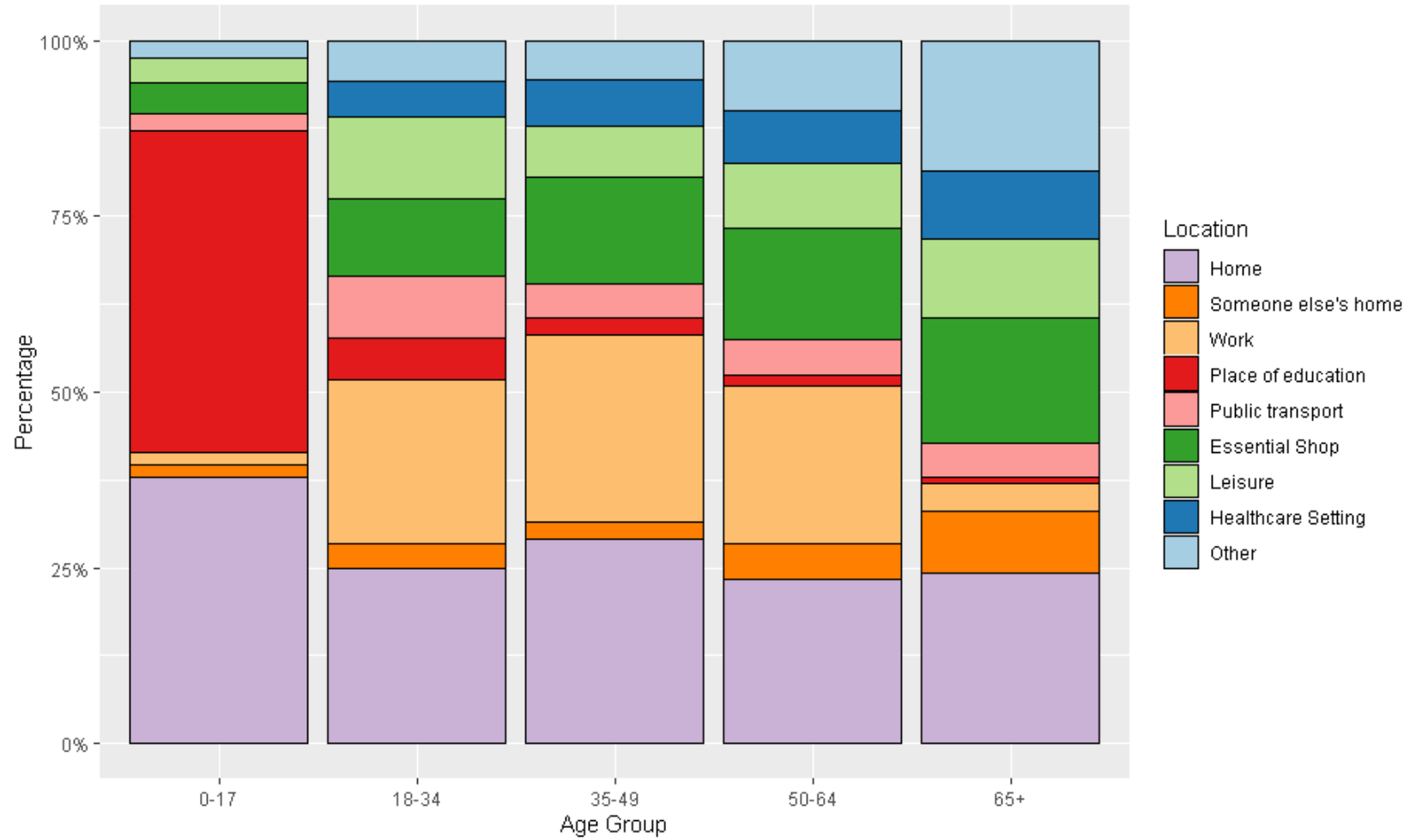


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Perceived Setting of COVID-19 Acquisition by Age

Note: Participants could select multiple locations so proportions are calculated from group n and may sum to $>100.0\%$



Virus Watch

Findings so far

Perceived Setting of COVID-19 Acquisition by Age – Contacts of Confirmed or Suspected Cases

Note: Participants could select multiple locations so proportions are calculated from group n and may sum to >100.0%

