## **Extended data:**

Figure S1. Directed acyclic graph for estimating the total effect of Overcrowding on SARS-CoV-2 Infection.

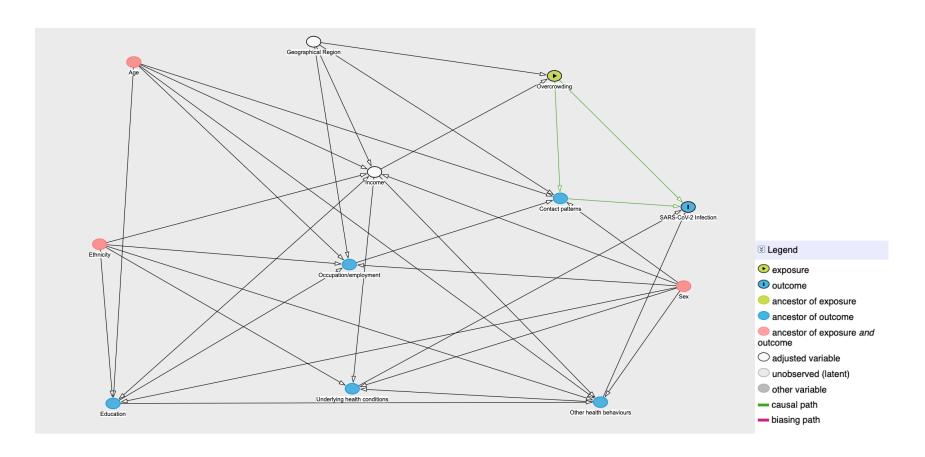
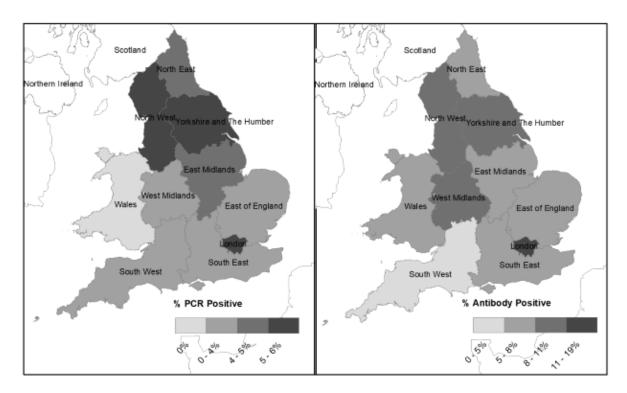


Figure S2. Regional map illustrating the regional distribution of PCR and antibody test results Virus Watch participants across England and Wales.



Note: PCR data for Wales were not included due to the use of linked surveillance data that were not available for participants in Wales.

Housing-related survey questions used in the February 2021 monthly survey.

Virus Watch	Resize font:
Household Details and Testing	
ousehold Details	
What type of accommodation do you live in?	O Detached whole house or bungalow
* must provide value	$\bigcirc$ Semi-detached whole house or bungalow
	<ul> <li>Terraced (including end-terrace) whole house or bungalow</li> </ul>
	<ul> <li>Flat, maisonette, or apartment in a purpose-built block of flats or tenement part of a converted house or shared house (including bedsits)</li> </ul>
	<ul> <li>Flat, maisonette, or apartment in a commercial building (e.g. office building, hotel, over a shop)</li> </ul>
	<ul> <li>A caravan or other mobile or temporary structure (including on a Traveller site, on a boat, in a caravan, in a van or truck) reset</li> </ul>
Which of the following best describes where you live:	On a transit Traveller site
* must provide value	On a permanent Traveller site
	On a holiday camp site
	On land you own
	On a roadside camp
	On a home online mooring
	On a winter online mooring
	On a waterway with a continuous cruising license
	On a marina
	Other
	reset
Is this accommodation self-contained? This means	○ Yes
that all rooms, including the kitchen, bathroom, and	O No
toilet, are behind a door that only this household can use?  * must provide value	reset
How many rooms are available for use only by this household?	v
Do NOT count bathrooms, toilets, halls or landings, or rooms that can be used only for storage (e.g. cupboards). Count all others rooms, e.g. kitchen, bedroom, living rooms, utility rooms, conservatories, studies. If two rooms have been converted into one, count them as one room.  * must provide value	
How many of these rooms are bedrooms?	•
Include all rooms built or converted for use as bedrooms, even if not currently used as a bedroom  * must provide value	

Does your accommodation have central heating - this is a central system that generates heat for multiple rooms?	○ Yes ○ No
* must provide value	
Does your household rent or own this	own outright
accommodation?	own with mortgage/finance or loan
* must provide value	O part own and part rent (shared owne
	rent (with or without housing benefi
	O live here rent free
	Oother
Who owns the land you live on?	Own outright
* must provide value	Council (local authority)
	Private landlord or letting agency
	Housing association
	Housing cooperative
	Registered social landlord
	Employer of a household member
	Relative or friend of a household me
	Other
Does your home have visible mould or fungus on the	○ Yes
walls or ceiling?	○ No
* must provide value	
Does your home have damp spots on the walls or	○ Yes
ceiling?	O No
* must provide value	