

# IMPERIAL

## WellHome – Aerosol size distribution, PM chemical composition and gaseous measurements in homes



### WellHome

West London Healthy Home and Environment Study

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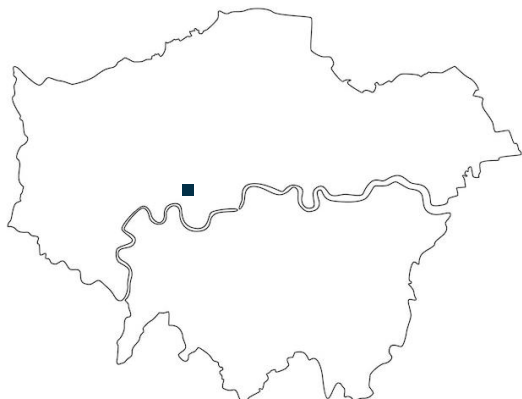


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# WellHome

West London Healthy Home and Environment Study

## Our local community at White City: in facts and figures

### Population and Economy

Population of  
~100,000<sup>6</sup>



46% of adults born  
outside of the UK<sup>8</sup>



In some areas, 20% of households  
are without an adult with English as a  
first language<sup>9</sup>

45% of housing is  
socially rented<sup>10</sup>



36% of households are  
estimated to be living in  
relative poverty<sup>1</sup>

23% of children live  
in families that receive  
of out of work  
benefits<sup>11</sup>



### Health

Life expectancy varies by almost



10  
years  
in men<sup>2</sup>



4.5  
years  
in women<sup>2</sup>

Premature deaths  
are 3 times  
more likely in some  
parts of the  
community  
compared to  
others<sup>13</sup>



81% of pensioner  
households have a  
pensioner living  
alone<sup>12</sup>



23% of  
10-11 year  
olds are  
classified as  
obese<sup>14</sup>

### Education

65% of children obtain 5  
A\*-C in GCSEs including  
Maths and English<sup>4</sup>

25% of children  
eligible for free  
school meals<sup>15</sup>



4.8% of children  
are persistently  
absent from school  
(>15% of the time),  
in some parts this is  
as high as 7%<sup>4</sup>



**WP1: Establishing a community air quality research network**

**WP2: Household exposure to gases and aerosols in the indoor:outdoor continuum**

**WP3: Quantitative profiling of social health inequalities and policy disconnects using toxicological paradigms**

**WP4: Occupant understanding and behavioural factors in indoor air quality**

**WP5: Characterising sources and behaviour that reduce exposure in the West London community and BAME asthmatic children in the UK**

**WP6: Harmonising the data and statistical analysis of relationships between exposures, behaviours and symptoms**

# Study Design

## **100 Homes**

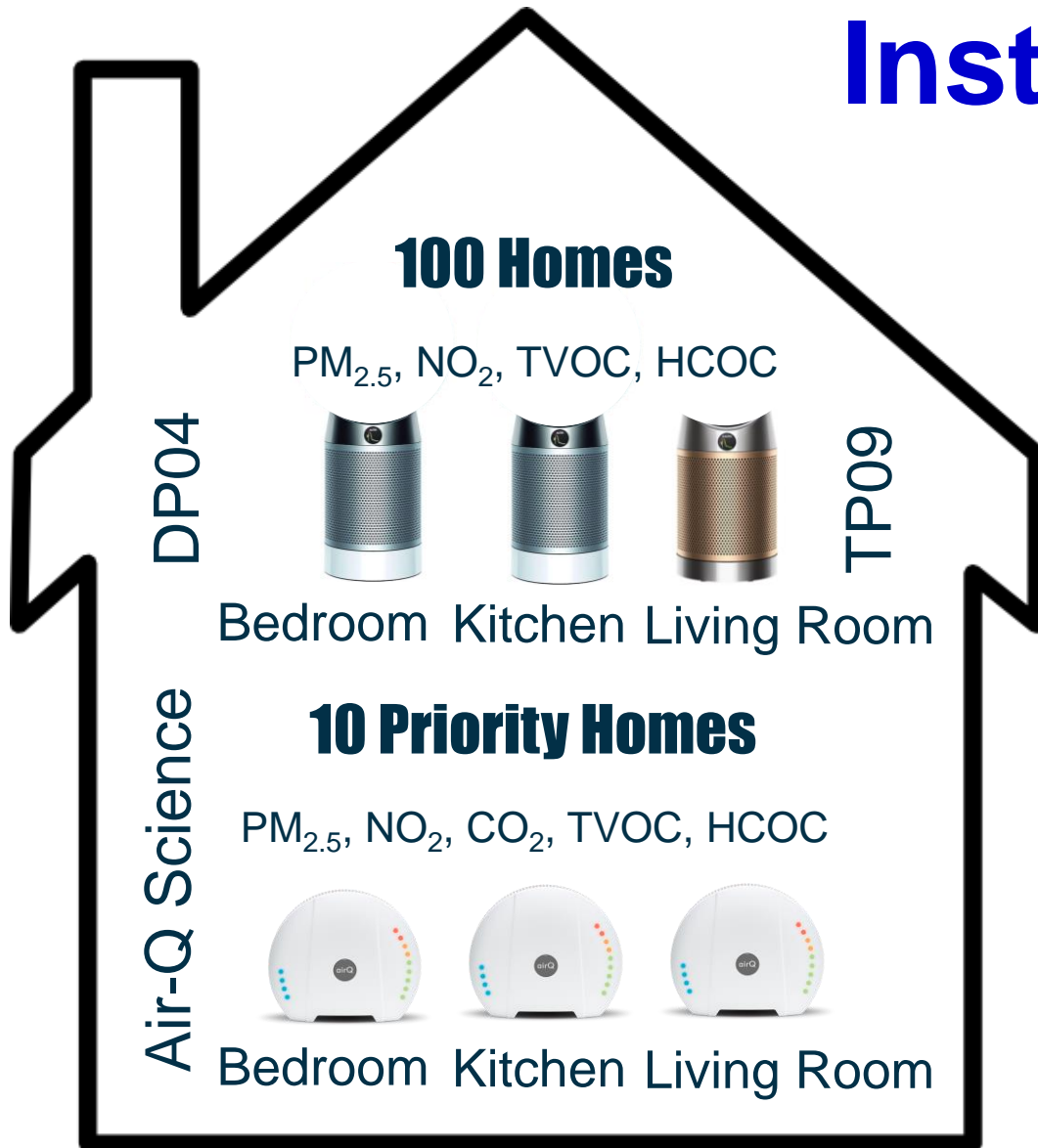
Cohorts of 20  
4 week sampling  
2 seasons  
Oct 22 - Jun 24

## **10 Priority Homes**

12 month sampling campaign  
4 week intensive sampling  
5 day intensive  
2 seasons  
Jun 23 - Oct 24

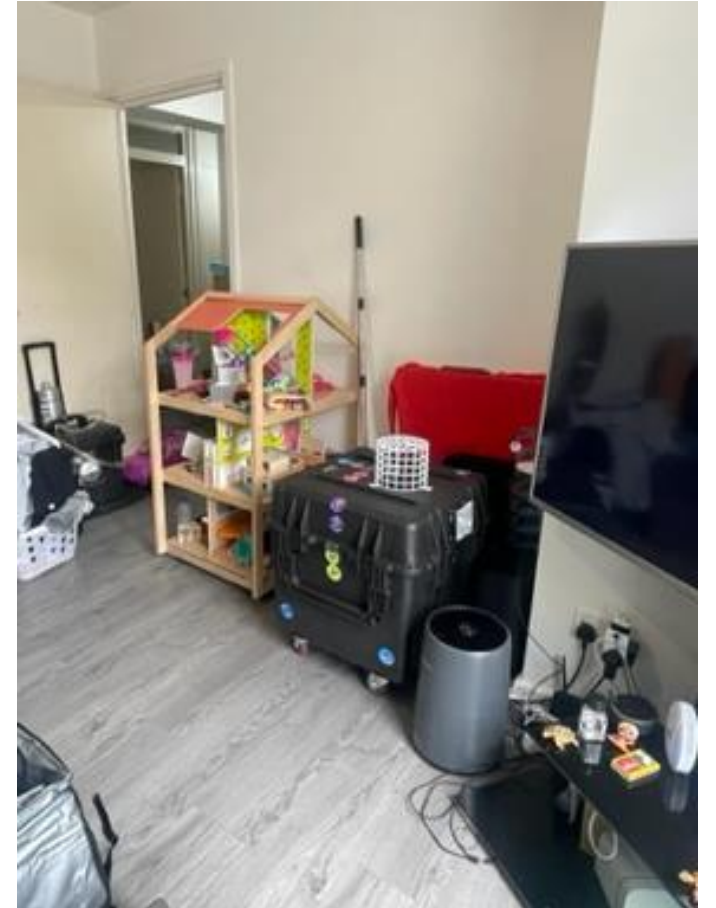
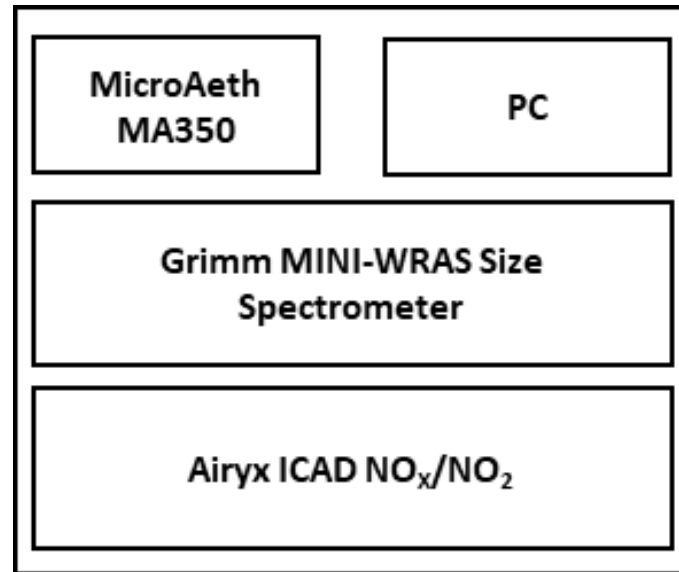


# Instrumentation





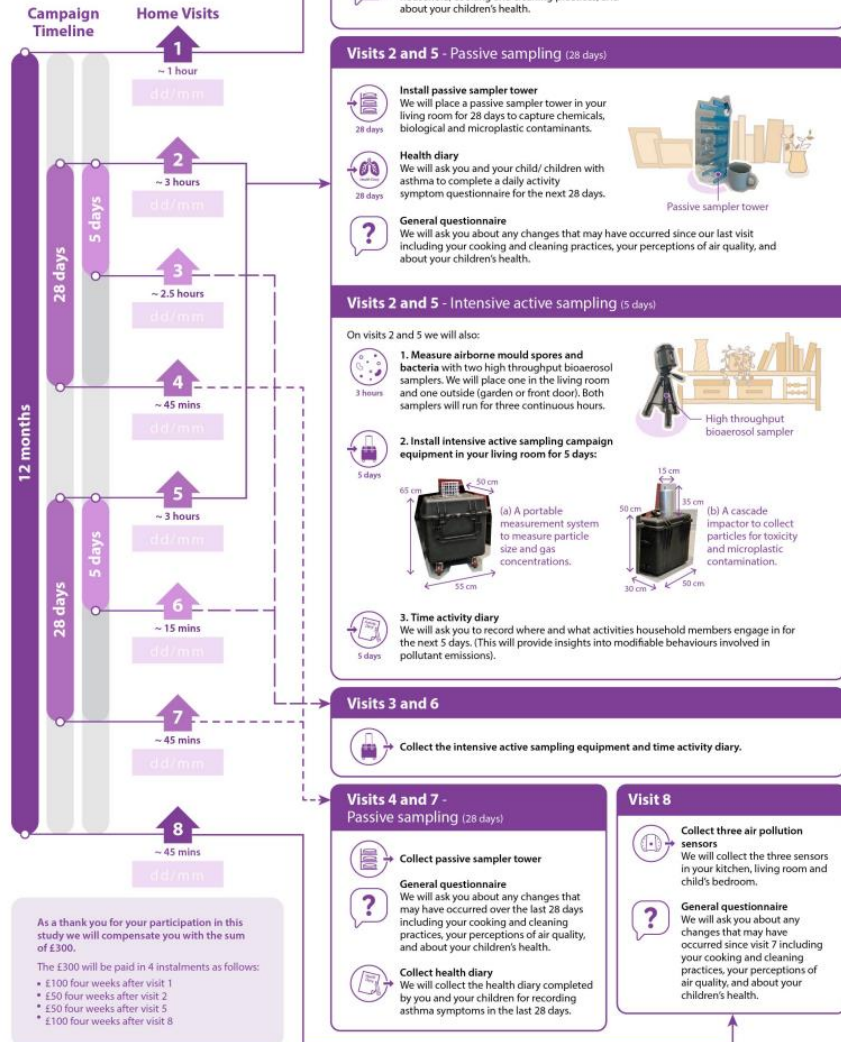
# Priority Homes



### 10 Priority Homes 12-month Timeline

As one of our 10 Priority Homes, you will help us gather indoor air pollution data during a 12-month period through 3 different sampling campaigns. This unique data set will improve our understanding of air pollution in our homes.

The WellHome team will be conducting 8 visits to your home to install and collect equipment. This chart shows the tasks we will be engaging you with on each visit.



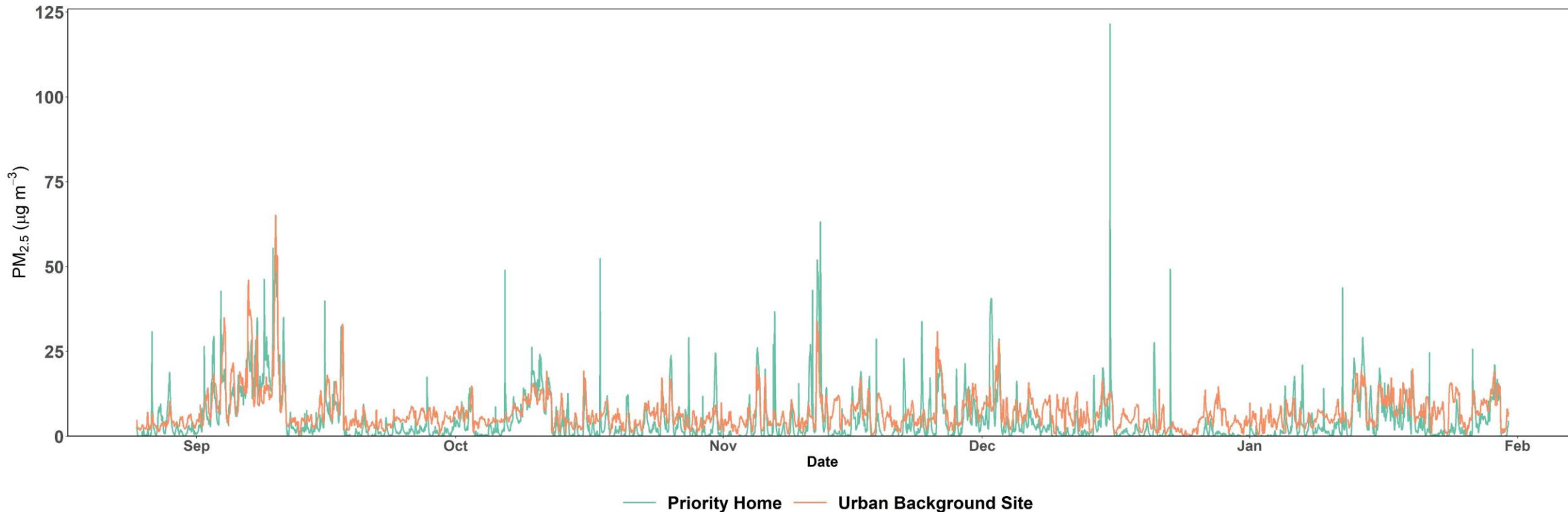
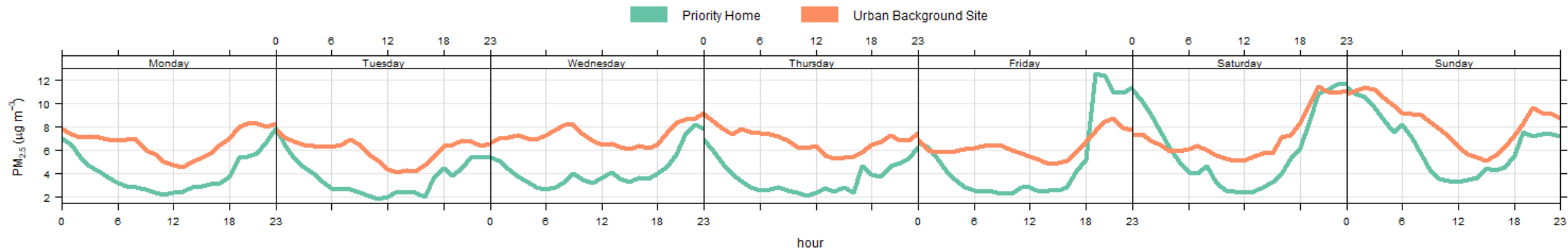
## Infographic showing the 12-month timeline for the 10 Priority Homes

- The WellHome team conducted 8 home visits to each home
- Visit 1 installed the three AirQ Science sensors (12 months)
- Visits 2 and 5 installed the intensive sampling equipment (5 days)
- Visits 3 and 6 collected the intensive sampling equipment
- Visit 8 collected the three AirQ Science sensors

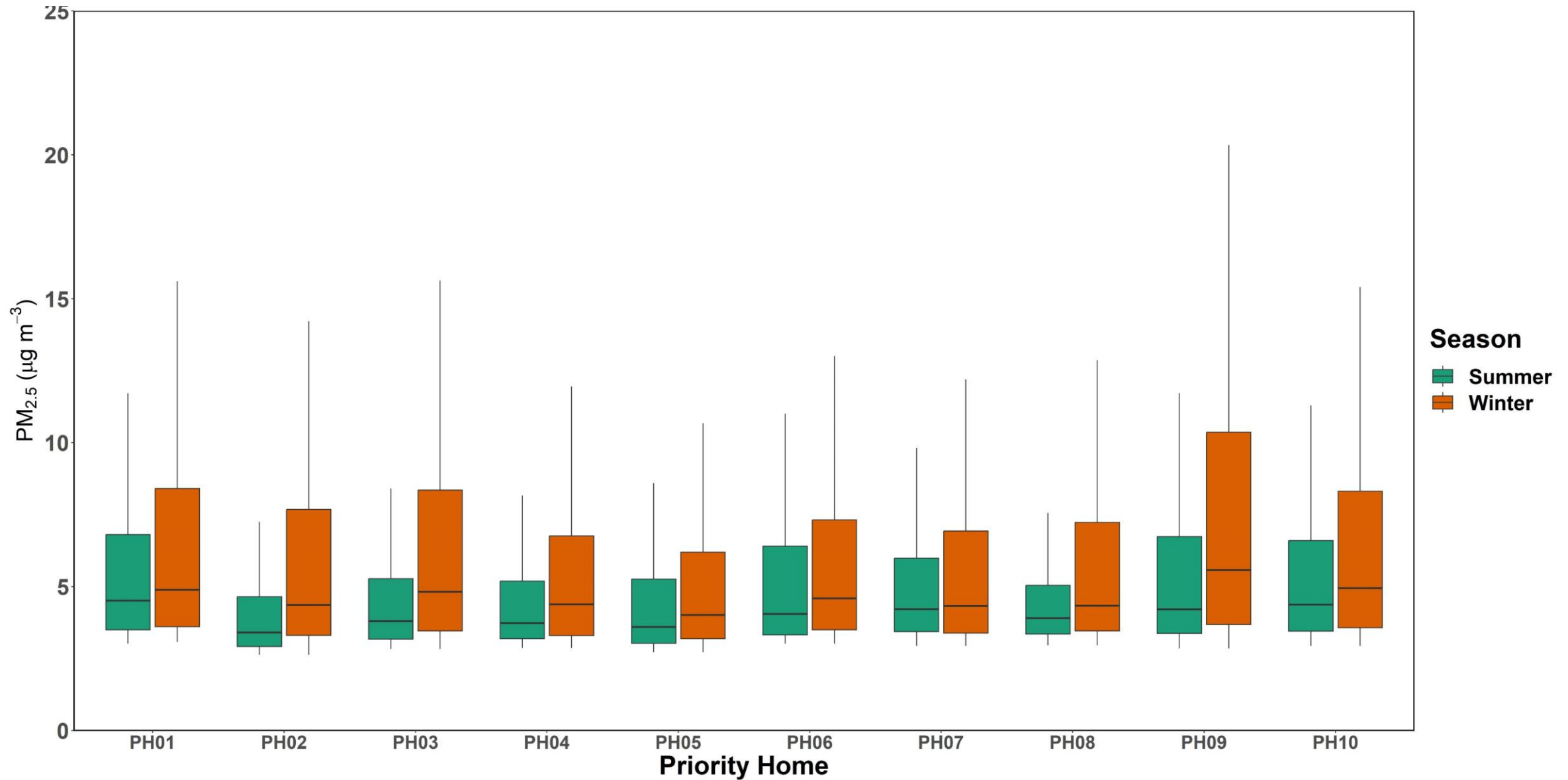
## Challenges

- Comparability and traceability between sensors and between homes over 1-2 years
- Ethical limitations
- Resource limitations

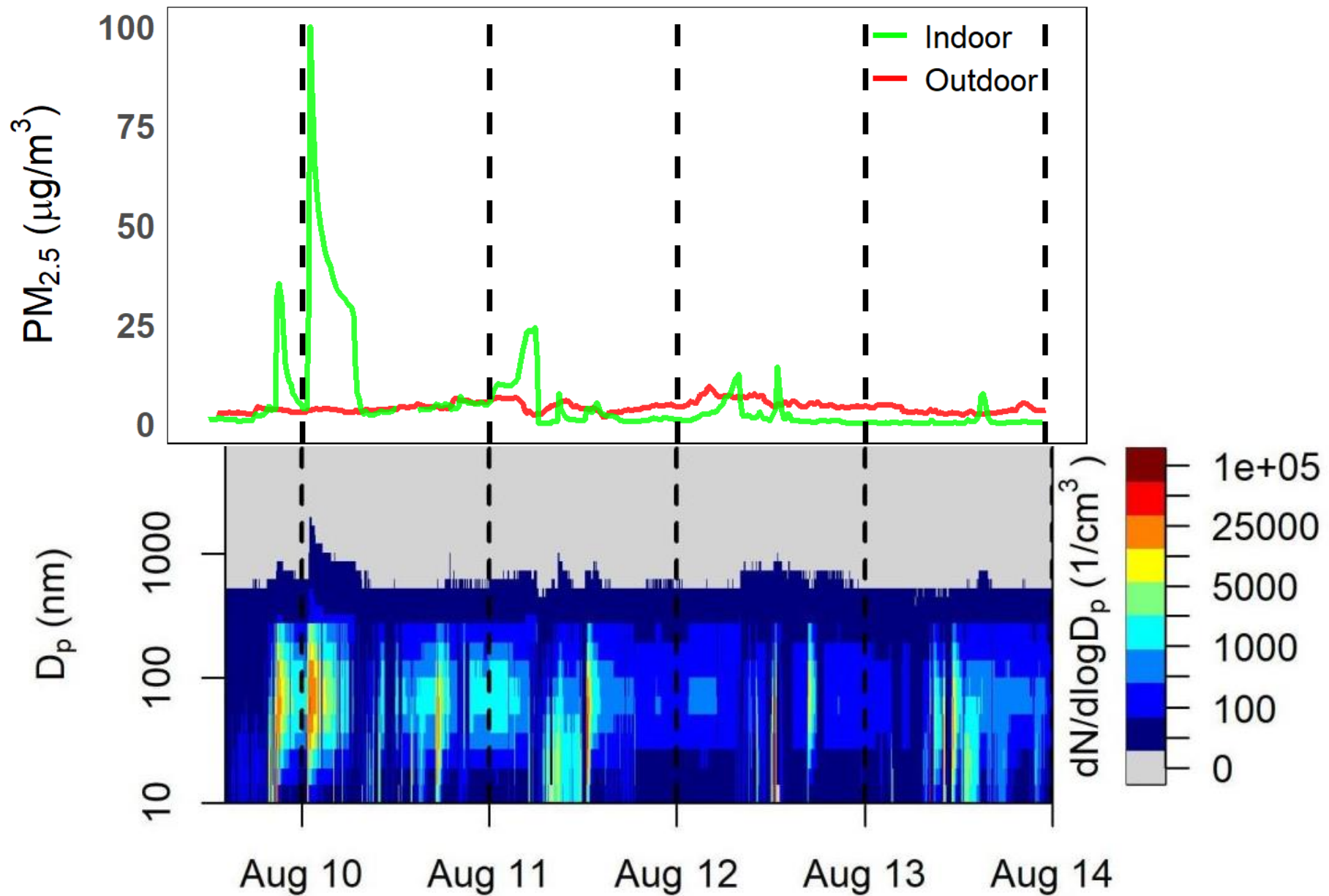
# Priority Home Comparison with an Urban Background Site



# Seasonal Comparison of Living Room AIRQ sensors







# Next Steps

- Assess variation in response over time
- Assess response to other sources, especially wider range of cooking emissions
- Provide final calibration factors for pollutants measured by the Dyson and AirQ Science sensors


# Take Home Messages

- To ensure traceability and comparability for indoor studies we need well-designed quality assurance programmes
- We need to account for:
  - Sensor drift
  - Variations in environment
  - Variations in source
- There is a need to use reference instruments suitable for the aerosol source

# Thank You

## 15.45 – 17.15 Parallel Sessions

1.6	Chair: Henry Burridge Co-Chair: Marta O'Brien	Variations in Exposure to Indoor Air Pollution	Corelli
	Diana Varaden	WellHome: a community-based study for investigating indoor air pollution in an urban community in london	Abstracts Page: 26 - 29
	David Shaw:	The impact of air change rates on the indoor air chemistry of homes in Bradford: a modelling study within the INGENIOUS project	
	Yunqi Shao:	Exploring the chemical characteristics of particulate matter in real household environments in Bradford, UK	
	Roberto Sommariva:	A study of cooking and cleaning activities with the MBM-Flex indoor air quality mode	

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