IMPERIAL

Breathe London: Evaluating behavioural and civic outcomes associated with co-designed air pollution data visualisations and messaging

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02/10/2024

Background
Breathe London overview

- Launched in Jan 2021
- Breathe London nodes
  - 421 total
  - 60 free Breathe London Community Programme (BLCP) nodes
- 3 rounds of open applications over 3 years
- 24 of 33 boroughs represented
- 104 members/points of community contact
- Open data (API) on www.breathelondon.org

Figure. 1 - Clarity Node-S – 165cm wide x 80cm height

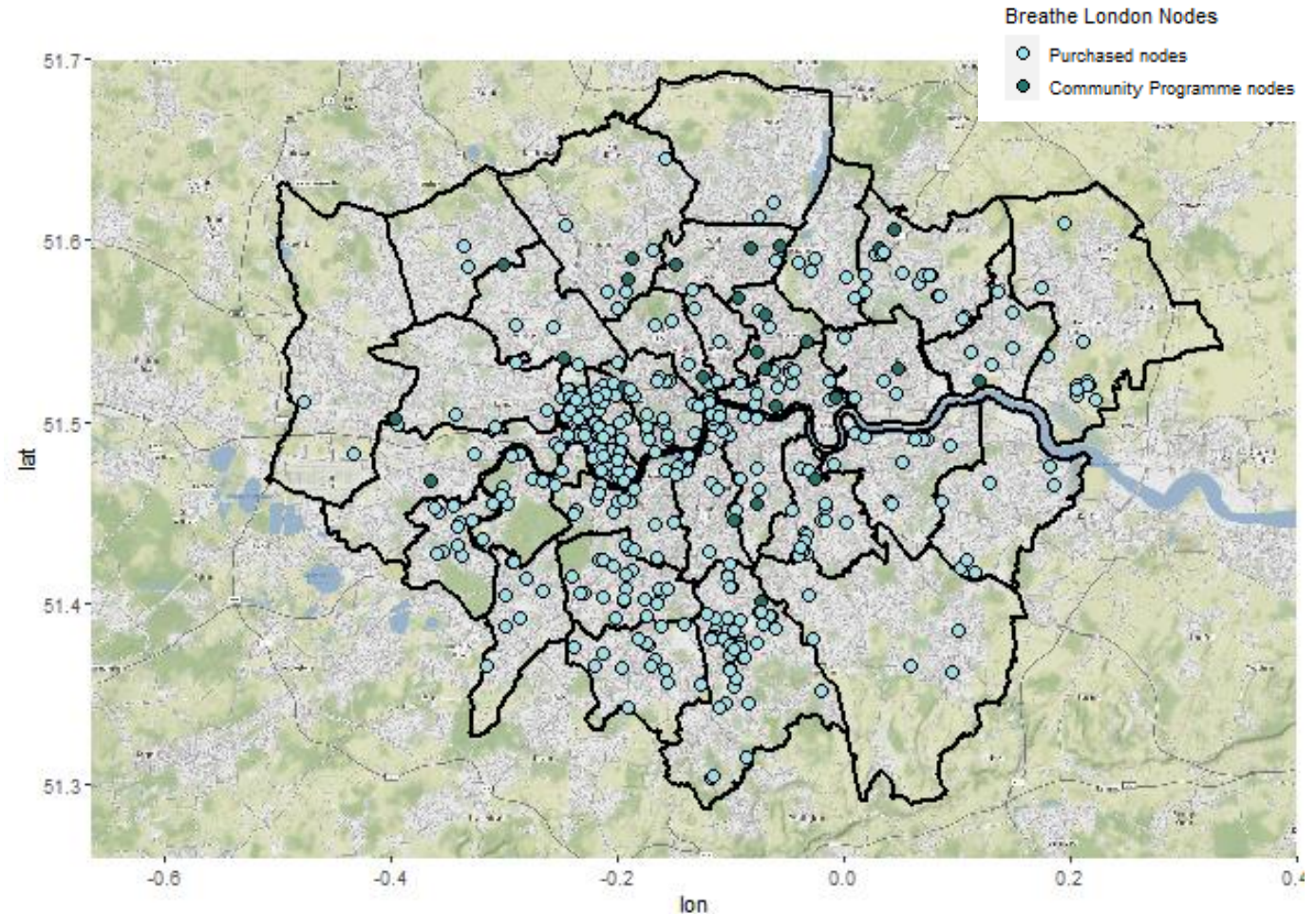Figure. 2 – Honour Oak Park Breathe London node co-location site

Figure. 3 – Map of Breathe London nodes in London, UK.

(based on data from 10th August 2023)

Background BL Community Programme

News > West London News > Environment

Life on one of the UK's most polluted high streets where murky air plagues locals

Locals have started measuring the amount of pollution in their area

SHARE   1 COMMENT   By Adam Shaw Local Democracy Reporter
14:56, 23 MAR 2022

NEWS

Enter your postcode for local news and info   Enter your postcode   Go   In ⌂ YourArea

Amandine Alexandre holds up a pollution monitor as part of a parent-led campaign to
Harlesden (Image: Jonathan Goldberg)

Parents in a North West London town have pleaded for action to clean up the air in
street in the UK". Residents of Harlesden in Brent have hit out at the poor air quality

Aberfeldy Estate, Poplar

2:05 / 2:45
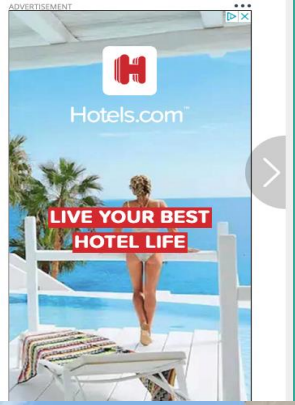
What does the future of air pollution in London look like? |5 News

Background
informational inequalities

- Gap in knowledge around how data from air sensors is best communicated among diverse, non-technical audiences to supports individual & collective actions to mitigate pollution.

- Individuals perceive risk or challenges through unique social lenses, even scientific knowledge is not unbiased

- Attention to the informational needs and values of specific stakeholder groups

- Real-time AQ information is convoluted and multiple

- Digital barriers & inequality - in the UK, the following were more likely to access air pollution information

- These factors contribute to low levels of access and potential exposure reducing health benefits.

How are different groups responding to the co-created data visualisations and action-oriented messaging delivered through Breathe London?

Methods
Mixed methods

Data

- Participatory co-design sessions
- Surveys
  - 1.) General project feedback
  - 2.) Rolling website feedback form

Analysis

- Thematic analysis (values & needs associated with real-time AQ information)
- Summary statistics

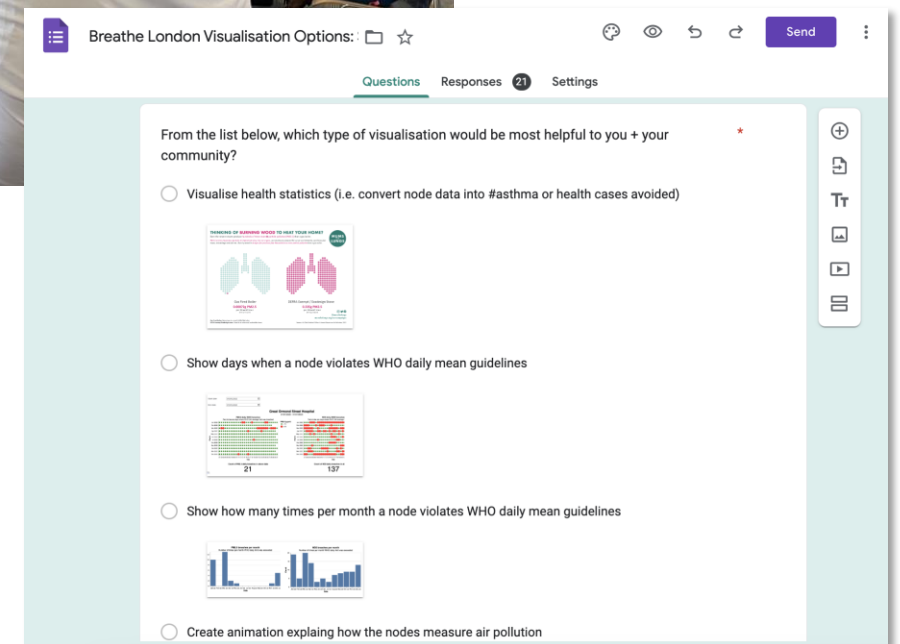Figure 4. Participatory co-design session

Figure 5. Survey to generate feedback about possible data visualisations & info needs

Results
Participatory co-design activities

- Participatory co-design sessions held in 2023 to inform revised data visualisations
  - Survey **(n=39)** and focus group (n=6) data
  - 36% preferred simple bar chart, followed by time series
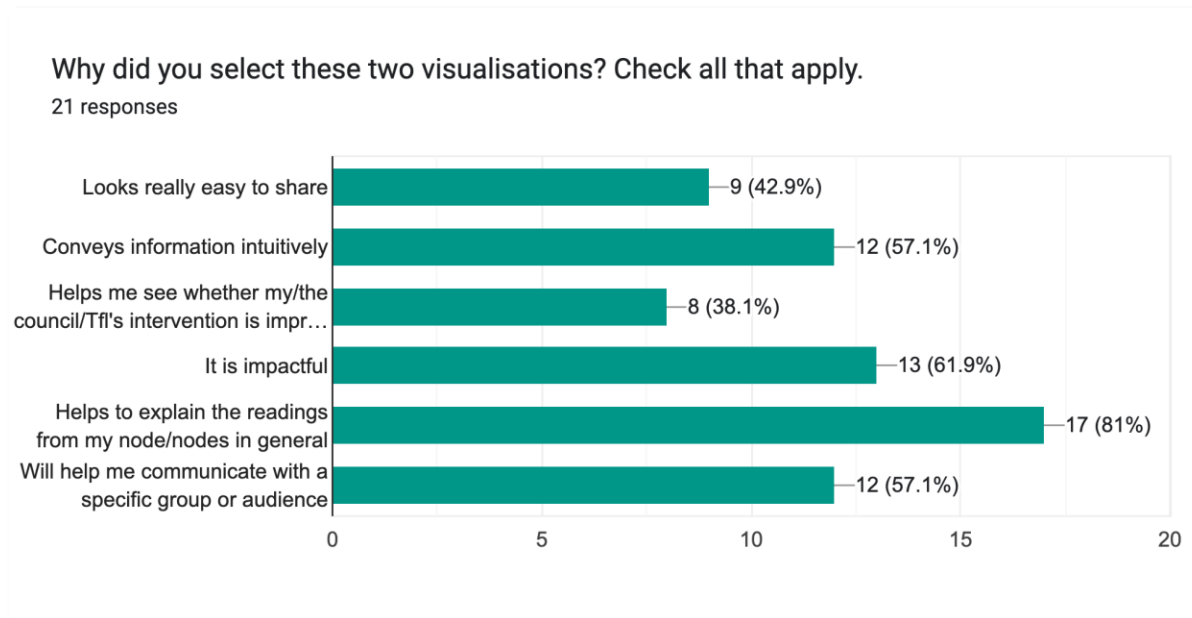- Launched website updates with revised data visualizations on June 20th 2024 (UK Clean Air Day!)

Figure. 6 – Results from co-design survey

	Overall (N=39)
Age Group	
18 - 25	1 (2.6%)
26 - 35	2 (5.1%)
36 - 45	7 (17.9%)
46 - 55	4 (10.3%)
56 - 65	1 (2.6%)
66 - 75	3 (7.7%)
76 - 85	1 (2.6%)
above 85	2 (5.1%)
Missing	18 (46.2%)
Gender	
Female	12 (30.8%)
Male	14 (35.9%)
Prefer not to say	1 (2.6%)
Missing	12 (30.8%)
Key audience	
Campaigners/advocates/volunteers	10 (25.6%)
Carer/parent	1 (2.6%)
Carer/parent,Individual with health condition	1 (2.6%)
Carer/parent,Local business or infrastructure organisation	1 (2.6%)
Decision maker (councillor, policymaker, etc.)	1 (2.6%)
Individual with health condition	2 (5.1%)
Local business or infrastructure organisation	1 (2.6%)
Young person/school student	8 (20.5%)
Missing	14 (35.9%)

Figure. 7 – Summary statistics for survey respondents

Results
Outcome of co-design activities

- Working with BLCP members and members of key stakeholder groups (*identified by BLCP members during prior focus groups*) to co-develop recommended actions around how to respond when presented with real-time air quality information.
- Implementation of bar charts with hourly, daily and annual breakdowns of the data

Results
Outcome of co-design activities

https://www.breathelondon.org/what-can-i-do
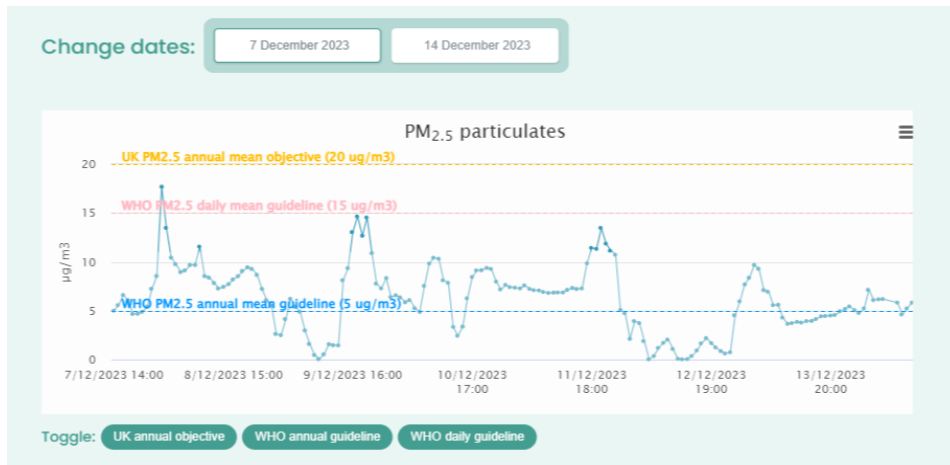
Examples of messages & categories:

- Carers, young person, campaigner, policy maker, **business or infrastructure org**, teachers, health workers, general

- *Civic actions*
    - Join the Alliance for Clean Air.
    - Write to your councillor, council leader and/or MP about air pollution in your area using this template or one of your choosing.
- *Reduce or eliminate contributors to air pollution*
    - When receiving deliveries, encourage drivers to stop idling and turn off their engine whilst unloading. This reduces the amount of vehicle emissions in your premises.
- *Reduce exposure to air pollution*
    - Maintain good indoor air quality by opening windows regularly or using extractor fan while cooking.
    - If your business is located near a polluted area, check the local levels of air pollution before opening windows (use Breathe London or LondonAir).

Results
Survey 1: General survey

- N = 69, 48 complete responses
- Survey shared after updates to the website were launched

Since Breathe London, I have been able to help change behaviours within my local community e.g. encourage people to drive less; to change their walking routes

Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree	Not applicable
1	6	0	1	1	60

Being connected to the Breathe London project/researchers at Imperial has helped me better understand air quality in my local area

Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree	Not applicable
6	2	0	0	1	60

	n	%
I am a Breathe London Community Programme group member	9	19
I work or live in London	19	40
I work for an organisation or charity	13	27
I am a researcher	2	4
AQ analyst Imperial	1	2
GLA	1	2
Member of Public with Interest in air quality and health	1	2
Work at UKHSA	1	2
consultant	1	2
Total	48	100
Gender		
Female	26	54
Male	21	44
Prefer not to say	1	2
Total	48	100
Age		
18-24	1	2
25-34	12	25
35-44	15	31
45-54	8	17
55-64	7	15
65+	5	10
Total	48	100
Ethnicity		
Asian or Asian British	2	4
Black African or Black African British	2	4
Chinese or Chinese British	2	4
Indian or Indian British	3	6
Prefer not to say	1	2
White or White British	37	77
Mixed White & Asian	1	2
Total	48	100
Education		
Further education qualifiations	2	4
Graduate/Postgraduate degree level	30	63
High school/secondary school qualifications	1	2
Undergraduate/college degree level	15	31
Total	48	100

Figure. 8 – Summary statistics for survey respondents

Results
Survey 2: Rolling website feedback

- N = 12
- Survey shared after updates to the website were launched

To what extent do you feel the node page updates have made information on the Breathe London website: more accessible?

Much more accessible	More accessible	Neither more or less accessible	Somewhat less accessible
3	4	1	1

To what extent do you feel the node page updates have made information on the Breathe London website: more actionable? (I.e. you know how to respond & take action based on the information provided)

Much more actionable	More actionable	Neither more or less actionable	Somewhat less actionable
2	4	1	1

Figure. 9 – Example of updates on Breathe London website

Summary
Discussion & next steps

- Survey respondent sample demographics align predominantly with literature regarding which population groups are most likely to interact with digitally available air quality information
  - Signals overlap with population that is most likely to already be engaging with air pollution/air quality information sources
- Respondents indicated that the co-designed data visualisations and messaging helped make information more accessible and actionable.
  - Caveat small sample sizes
- Identifying a change in engagement following with launch of new data visualisations and behavioural recommendations warrants additional evaluations.
- Next steps involve conducting a London-wide survey to examine penetration of Breathe London at this population level.

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Thank you

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clarity