

An industrial landscape with several tall smokestacks emitting thick plumes of dark smoke. A large, stylized silhouette of a cloud is superimposed over the scene, partially obscuring the smoke. The sky is a mix of blue and orange, suggesting a sunset or sunrise. The foreground shows a body of water reflecting the light.

**HarnEssing
Artificial_Intelligence
to
Lead
Transformative
Healthcare_(HEALTH)**

Prof Sarah Slight



Department
for Environment
Food & Rural Affairs



Department
for Environment
Food & Rural Affairs

Public Health
England

Local
Government
Association

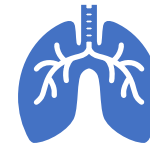
Air Quality

A Briefing for Directors of Public Health

March 2017



**Identify potential
vulnerable groups**



Identify local sources of air
pollution (working with
Environmental Health team)



Implement things and
evaluate improvements



Educate the public about the
local issues and possible
solutions



Short-term air pollution

Index bands



Step 1: Determine whether you are likely to be at risk

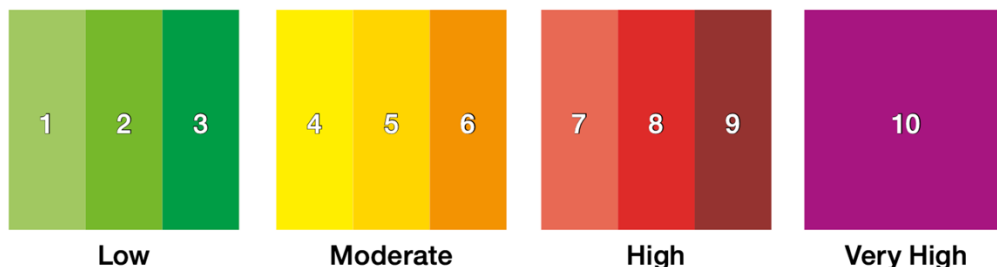
- **Adults and Children with lung or heart conditions** - It is known that, when levels of air pollutants rise, adults suffering from heart conditions, and adults and children with lung conditions, are at increased risk of becoming ill and needing treatment. Only a minority of those who suffer from these conditions are likely to be affected and it is not possible to predict in advance who will be affected. Some people are aware that air pollution affects their

Air Pollution Level (DAQI score)	Accompanying health messages for at-risk individuals*	Accompanying health messages for the general population
Low (DAQI 1-3) The 'Low' bands indicate air pollution levels where it is unlikely that anyone will suffer any adverse effects of short-term exposure, including people with lung or heart conditions who may be more susceptible to the effects of air pollution	Enjoy your usual outdoor activities.	Enjoy your usual outdoor activities.
Moderate (DAQI 4-6) The 'Moderate' band represents levels of air pollutants at which there are likely to be small effects for susceptible people only	Adults and children with lung problems, and adults with heart problems, who experience symptoms , should consider reducing strenuous physical activity, particularly outdoors.	Enjoy your usual outdoor activities.
High (DAQI 7-9) Values for the 'High' bands are associated with significant effects in susceptible people	Adults and children with lung problems, and adults with heart problems, should reduce strenuous physical exertion, particularly outdoors, and particularly if they experience symptoms. People with asthma may find they need to use their reliever inhaler more often. Older people should also reduce physical exertion.	Anyone experiencing discomfort such as sore eyes, cough or sore throat should consider reducing activity, particularly outdoors.



Short-term air pollution

Index bands



Step 1: Determine whether you are likely to be at risk

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Short-term exposure to air pollution and hospital admission for pneumonia: a systematic review and meta-analysis

[Jeong Yee](#), [Young Ah Cho](#), [I](#)

Review

> [Lancet](#). 2013 Sep 21;382(9897):1039-48. doi: 10.1016/S0140-6736(13)60898-3.

[Environmental Health](#) **20**, A Epub 2013 Jul 10.

4162 Accesses | 45 Citat

Global association of air pollution and heart failure: a systematic review and meta-analysis

[Anoop S V Shah](#)¹, [Jeremy I](#)
[Ken Donaldson](#), [David E Newby](#)

Review

> [BMJ](#). 2015 Mar 24;350:h1295. doi: 10.1136/bmj.h1295.

Affiliations + expand

PMID: 23849322 PMCID: I

[Free PMC article](#)

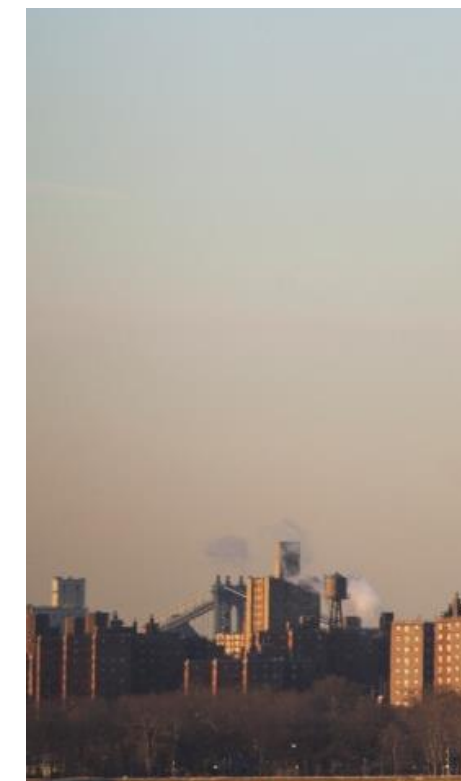
Short term exposure to air pollution and stroke: systematic review and meta-analysis

[Anoop S V Shah](#)¹, [Kuan Ken Lee](#)², [David A McAllister](#)³, [Amanda Hunter](#)², [Harish Nair](#)³,
[William Whiteley](#)⁴, [Jeremy P Langrish](#)², [David E Newby](#)², [Nicholas L Mills](#)²

Affiliations + expand

PMID: 25810496 PMCID: [PMC4373601](#) DOI: [10.1136/bmj.h1295](#)

[Free PMC article](#)





Invited Review

Health inequalities are worsening in the North East of England

- Shorter lifespan
- Larger proportion of their shorter lives in ill health
- Higher health & care needs in North East
- Air pollution exert disproportionately large health effects on disadvantaged groups



HarnEssing
Artificial
Intelligence
to
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Healthcare
(HEALTH)



Key objectives



To develop and internally validate a 'proof-of-concept' risk score to identify those at increased risk



To understand **what** information individuals want to receive about elevated air pollution levels, **when**, **where** and **how** they would like to receive it



To describe how we can **mitigate against digital exclusion** in disadvantaged and vulnerable groups



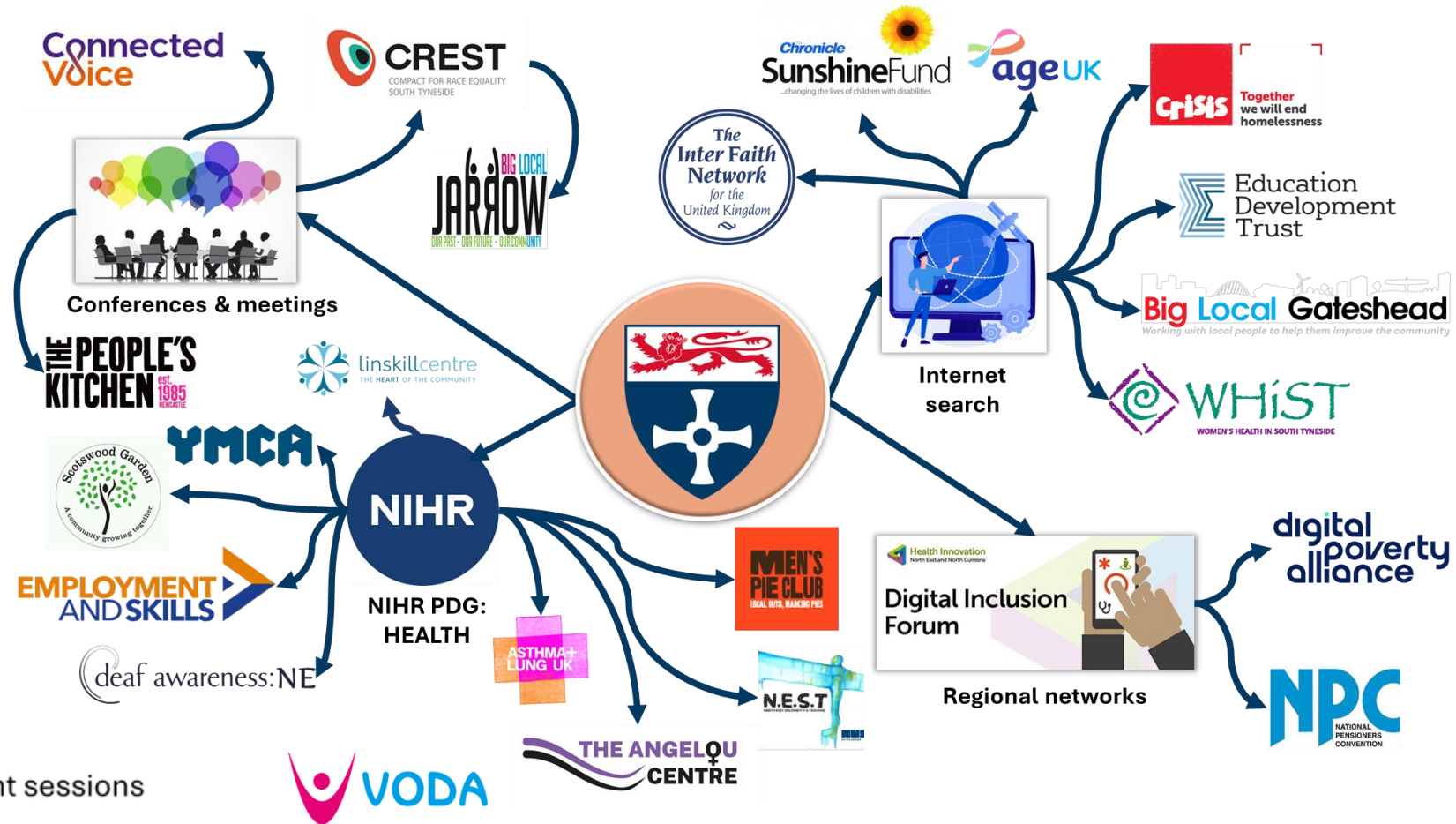
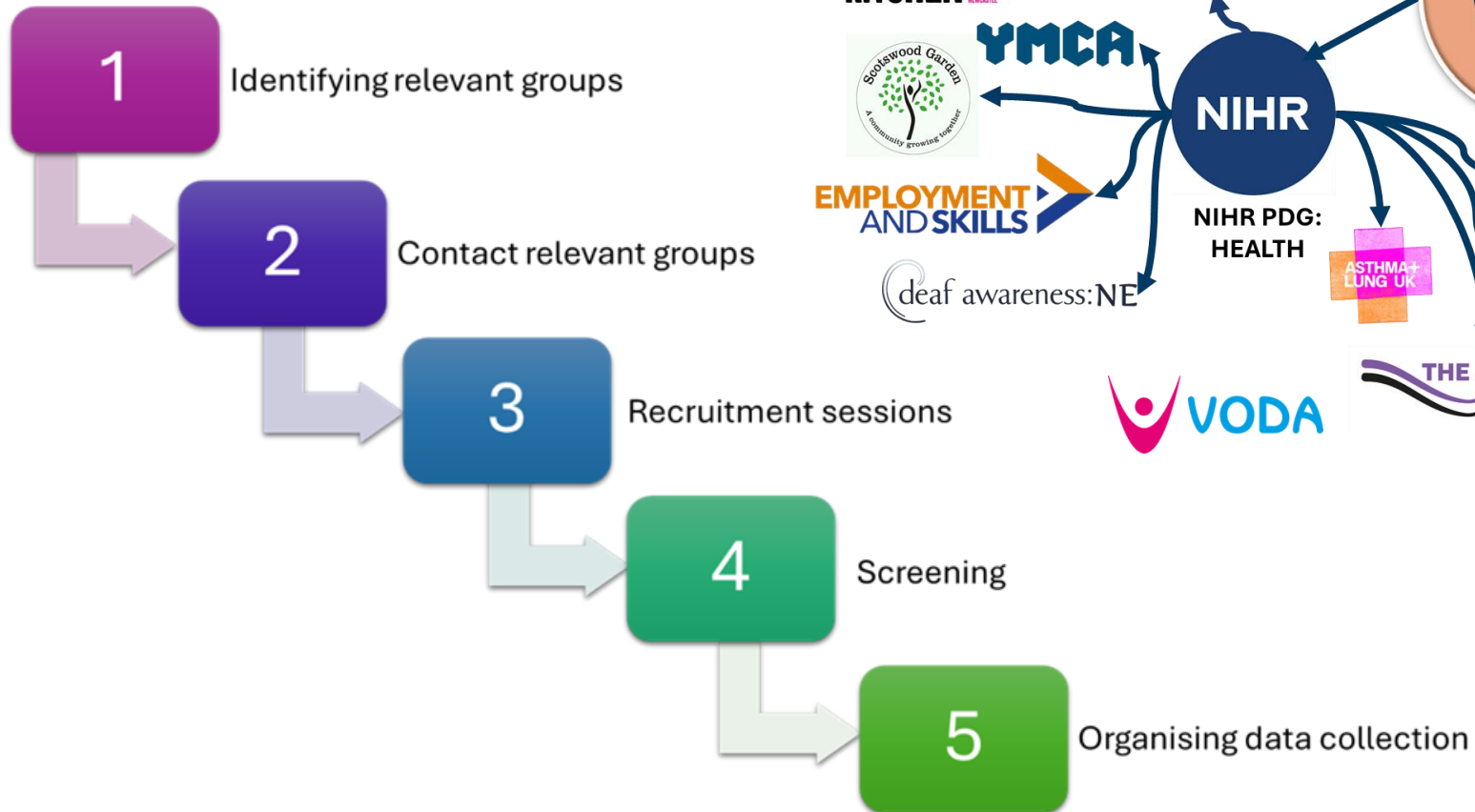
To describe what participants want in terms of local authority initiatives and infrastructure to help to support their desired change,

Aim: Co-production of ambient air pollution messages with the public: a qualitative study

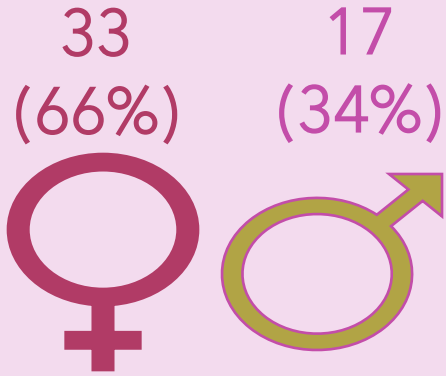
OBJECTIVES:

- To understand *what* information individuals want to receive about elevated air pollution levels, *when, where* and *how* they would like to receive it, and potential benefits and barriers of each
- To co-produce the *content* of the behavioural messaging, the range of actionable recommendations, and explore any potential unintended consequences.

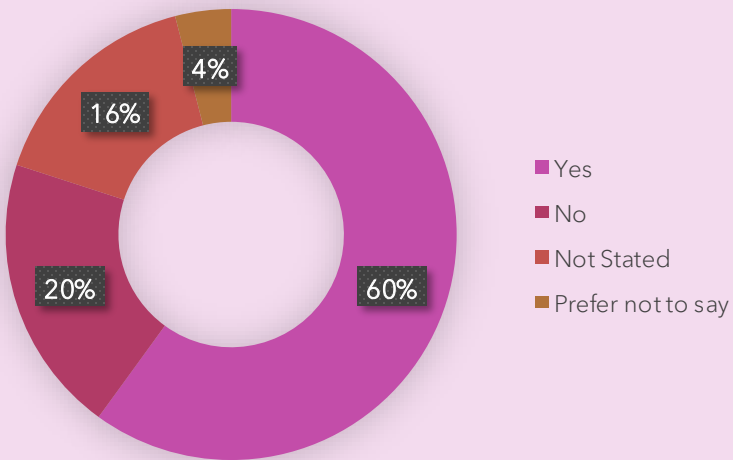
Recruitment process



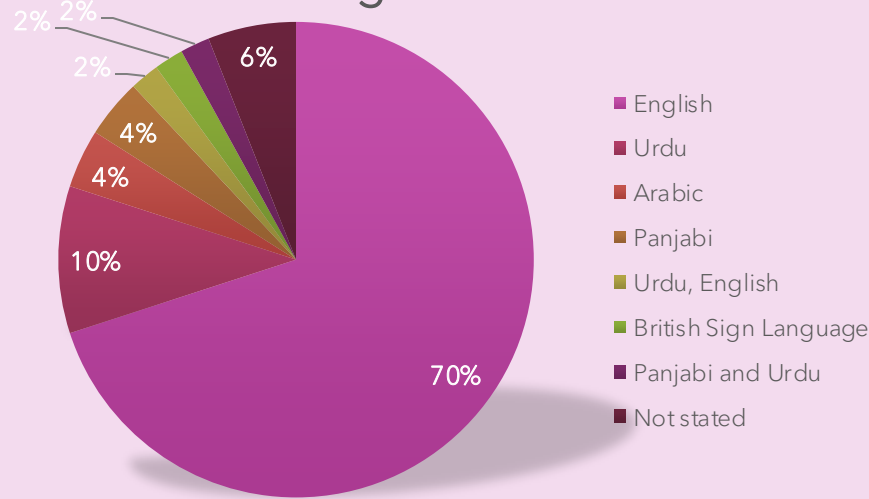
50 participants



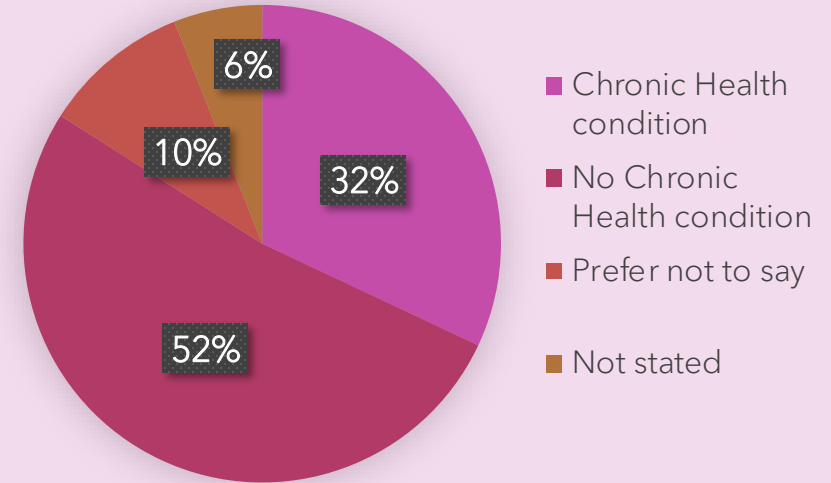
Is this your first time participating in research?



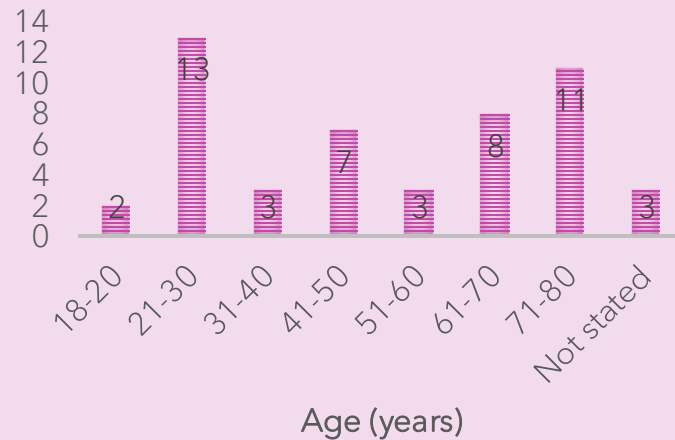
Over 1 in 4 from minority backgrounds



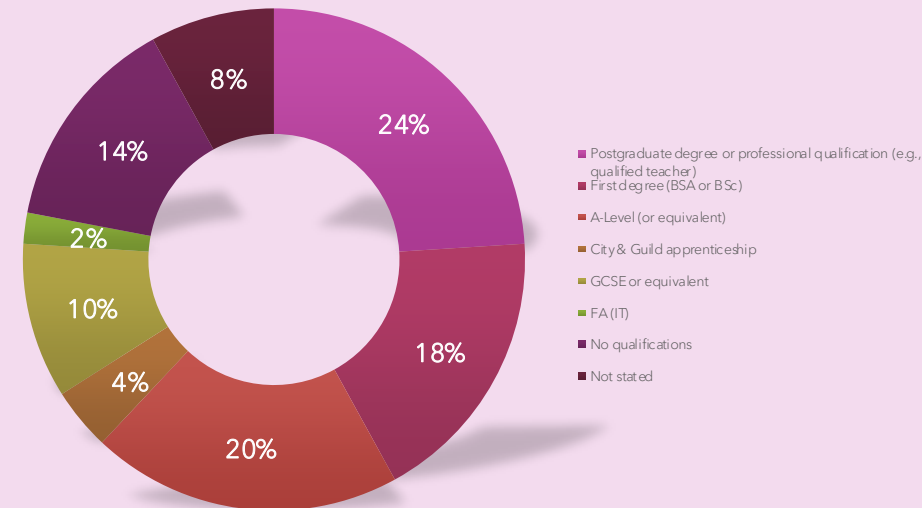
A quarter had chronic health conditions



AGE



1 in 10 had no qualifications



What information do individuals want to receive?

Risks and Harms

- Tangible descriptions of health impacts 'struggle to breathe'
- Tailored

Information about the pollutants

- Source
- Traffic light coded representation of scale
- Location

How to reduce their exposure

- Tailored actionable information
- To improve health
- Minimise anxiety
- Facilitative rather than restrictive

How to improve air quality

- What are local / national government doing
 - Mitigate frustration
 - Mitigate anxiety

Influence of knowledge and sociodemographic factors

Key objectives



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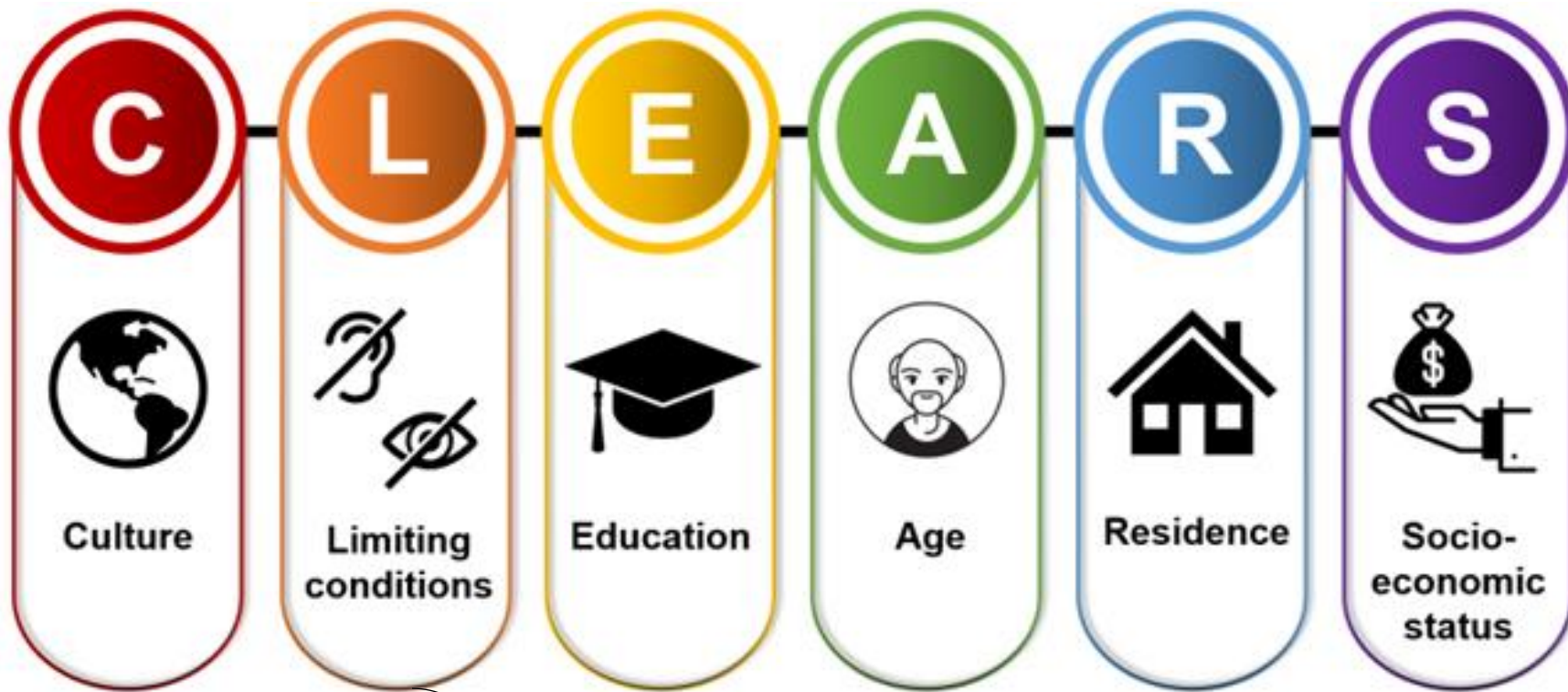
To understand **what** information individuals want to receive about elevated air pollution levels, **when**, **where** and **how** they would like to receive it



To describe how we can mitigate against digital exclusion in disadvantaged and vulnerable groups



To describe what participants want in terms of local authority initiatives and infrastructure to help to support their desired change,



Also included those with chronic health conditions

<https://doi.org/10.1038/s41746-024-01177-7>

Recommendations to advance digital health equity: a systematic review of qualitative studies

Check for updates

Sarah Wilson¹, Clare Tolley¹, Riona Mc Ardle², Lauren Lawson¹, Emily Beswick³, Nehal Hassan¹, Robert Slight⁴ & Sarah Slight^{1,4}✉

The World Health Organisation advocates Digital Health Technologies (DHTs) for advancing population health, yet concerns about inequitable outcomes persist. Differences in access and use of DHTs across different demographic groups can contribute to inequities. Academics and policy makers have acknowledged this issue and called for inclusive digital health strategies. This systematic review synthesizes literature on these strategies and assesses facilitators and barriers to their implementation. We searched four large databases for qualitative studies using terms relevant to digital technology, health inequities, and socio-demographic factors associated with digital exclusion summarised by the CLEARs framework (Culture, Limiting conditions, Education, Age, Residence, Socioeconomic status). Following the PRISMA guidelines, 10,401 articles were screened independently by two reviewers, with ten articles meeting our inclusion criteria. Strategies were grouped into either outreach programmes or co-design approaches. Narrative synthesis of these strategies highlighted three key themes: firstly, using user-friendly designs, which included software and website interfaces that were easy to navigate and compatible with existing devices, culturally appropriate content, and engaging features. Secondly, providing supportive infrastructure to users, which included devices, free connectivity, and non-digital options to help access healthcare. Thirdly, providing educational support from family, friends, or professionals to help individuals develop their digital literacy skills to support the use of DHTs. Recommendations for advancing digital health equity include adopting a collaborative working approach to meet users' needs, and using effective advertising to raise awareness of the available support. Further research is needed to assess the feasibility and impact of these recommendations in practice.

Tailor information to different groups

Qualitative study (North East):

- Interviews and focus groups with digitally excluded individuals within the Northeast
- Interviews with different stakeholders

We are developing recommendations on how information should be tailored to different groups and how their digital inclusion can be supported within healthcare.



One section of the visualisation



Thank you!

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