

# Delivery of an indoor air quality campaign in social housing: Tenant experiences (briefing 3)

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## Key points from this briefing

- This briefing reports on a 12-month campaign to improve the air quality of more than 200 homes in the Cheshire and Merseyside region (Liverpool, St Helens, Warrington). Its aim was to improve respiratory health for young children (under 11 years) living in social housing.
- Beyond: Cheshire and Merseyside ICB Children and Young People's Transformation programme funded the campaign and its evaluation. Torus Housing Group (Assets) provided match funding to secure additional monitors. Torus Foundation (the charitable part of Torus) delivered the campaign through its Healthy Neighbours project.
- Among tenant interview participants, the motivations for taking part in the campaign ranged from health concerns for family members, to a wish to use the monitor to validate problems with living conditions. Tenants also sought to assess air quality improvements after remedial interventions, while others were driven by an interest in the health of their home environment.
- The functions of the monitors themselves, coupled with concerns about surveillance and costs, also influenced interest in the campaign, and the campaign's success varied by locality, with areas having strong community ties appearing to show higher engagement.
- The campaign's impact was multifaceted and included use of monitor readings to legitimise IAQ complaints. There was a marked change in IAQ awareness, with tenant's self-rated knowledge increasing. This newfound knowledge triggered behavioural changes, such as altered cleaning habits.
- Challenges encountered in the campaign included tenants facing difficulties in receiving and interpreting regular air quality reports. Technical problems, like relocating monitors, also cropped up and a few tenants unplugged their monitors, leading to data gaps. Tenant concerns about temperature drops and outdoor pollution sometimes affected their decisions to increase ventilation by opening windows.

## Background

Poor air quality has been highlighted as the world's greatest environmental health risk (1), linked with several short- and long-term health consequences. These include impacts on lung development in children, heart disease, strokes, cancer, and asthma (2). In the UK, between 28,000 and 36,000 deaths a year are estimated to be associated with poor air quality (3). However, these figures are based primarily on outdoor air pollution, despite the average person in the UK spending ~90% of their time indoors (4), where the brunt of these exposures occur. Additional to outdoor air pollution coming indoors, there are a range of other sources of poor indoor air quality (IAQ) including emissions from cleaning products, building materials, cooking and heating, and tobacco products. Moreover, poor building conditions can exacerbate IAQ through high humidity leading to damp, condensation, and mould (5).

The challenges and opportunities of improving IAQ are particularly prescient at the moment owing to a series of high-profile reports in 2022, including from the UK Government's Air Quality Expert Group (6), and explicit mentions in the Chief Medical Officer's Annual Report on Air Pollution (2). Public and political attention is exemplified through media and government focus following the death of a toddler, Awaab Ishak, caused by mould exposure in his family's social housing (7).

## The Indoor Air Quality campaign

This briefing reports on a campaign to improve indoor air quality (IAQ) in social housing, which was delivered across Liverpool, St Helens and Warrington in the Cheshire and Merseyside region. The campaign's aim was to improve respiratory health for young children living in social housing through the use of digital technology. Beyond: Cheshire and Merseyside ICB Children and Young People's Transformation programme funded the campaign and its evaluation. Torus Housing Group (Assets) provided match funding to secure additional monitors. Torus Foundation (the charitable part of Torus) delivered the campaign through its Healthy Neighbours project.

To qualify for a free monitor, a tenant needed to:

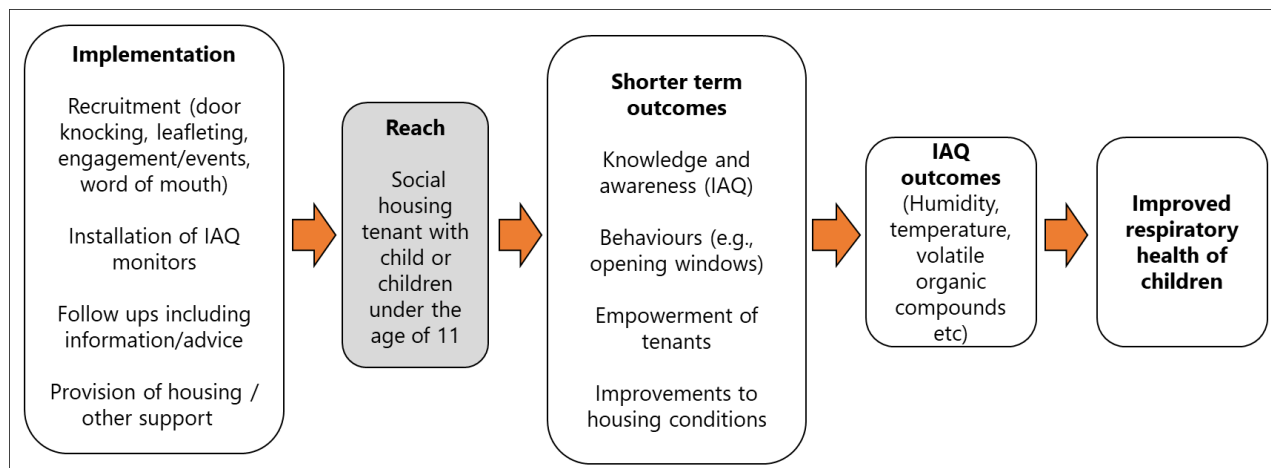
- Be a Torus housing customer
- Have a child or children under the age of 11 (initially under 5 years then extended)
- Live in one of the specific areas under the pilot scheme.

Where families expressed interest in taking part, they were offered smart IAQ monitors to detect the levels of humidity, temperature, volatile organic compounds and ambient pollutants. Following the identification of eligible families, the campaign involved the following stages: (i) recruitment and engagement (ii) installation of monitors (iii) follow up visits/contacts involving the provision of advice/information and or support from housing or other providers. Figure 1 provides an overview of the campaign's delivery and its intended outcomes.

Staff and volunteers from the Torus Foundation and its Healthy Neighbours project were closely involved with the campaign's delivery, on hand to promote uptake, support the set-up of devices, maintain engagement and troubleshoot. The Healthy Neighbours project is delivered across Torus neighbourhoods in Liverpool, St Helens and Warrington, commissioning local organisations to help

to deliver targeted activities to tackle local health issues. Each area has a dedicated volunteer - coordinator and volunteers who are helping to encourage community members to take part in a range of activities.

*Figure 1: Indoor air quality campaign logic model*



## About the evaluation

In 2022, Lancaster University and NAQTS (National Air Quality Testing Services Ltd.) were commissioned to deliver an evaluation of the campaign. The evaluation used mixed methods.

- Monitor data was shared with NAQTS who analysed this to understand IAQ in households at the start of the campaign, and to assess IAQ changes following their installation.
- Interviews were held with Healthy Neighbour and Torus Foundation staff closely involved with delivery of the campaign (n=6 staff members).
- Telephone interviews with social housing tenants who had installed monitors (n=7 tenants).
- Two focus groups with tenants, Healthy Neighbour and Torus Foundation staff (17 tenants and staff).

This briefing is part of a series that reports the findings of the evaluation. In this briefing we focus on learning about the factors influencing uptake of monitors, impacts of the campaign, and challenges and constraints that may have limited the degree of impact.

**All the briefings from this evaluation are available at the following link:**

<http://www.torusfoundation.org.uk/indoorairquality>

## What did we find?

### Factors influencing uptake of monitors:

During the interviews, different factors were highlighted as having motivated families' decisions to take part in the campaign. This included individual family motivations as well as broader contextual factors (e.g. extent of cohesion in the area) as well as wider drivers of interest in IAQ such as the heightened coverage in the media following the death of Awaab Ishak in Rochdale.

### *Concerns for health of the family*

For parents and carers with children or a child with health/respiratory conditions, professional interviewees described there being 'a lot of interest' and enthusiasm for taking part in the campaign. Some of the parents/carers taking up the monitors were reported to have children attending Alder Hay hospital due to respiratory issues.

*you did have [parents] that was really interested in it, and 'I've got children that have obviously have got asthma or respiratory issues' and they were straight away 'yeah, yeah, I'll have one [IAQ Professional Interview 6]*

In addition to this, this interviewee also noted that some parents had 'almost felt privileged' about the opportunity to take part because they were being given access to 'state-of-the-art equipment that could actually be saving their own child's lives.'

### *Using monitor readings to support complaints about IAQ*

Where families had existing concerns about housing conditions such as damp or mould this had promoted interest in the monitors:

*And then you then had other families there, obviously mould and damp is a lot of with massive at the minute so straight away was well, I've got mould and damp yes, put one in mine. [IAQ Professional Participant 6]*

In this regard, taking up the offer of a monitor was described '*as a means of applying some light pressure on us as a landlord. So where they can see that the air quality might be poor, then they're able to ring us up and say, you know, I'm looking for I need some repairs'* [IAQ Professional Participant 1].

Tenant interview participants confirmed they were partly motivated by a desire to use the monitor to lend strength to pre-existing complaints about their homes. Tenant Participant 1 shared concerns about the health of his family, with instances of chest and throat infections since moving into their current property. He had previously sought help from Torus and had been frustrated with the lack of serious help he had received from surveyors:

*I wasn't getting nowhere with any help with the issues I was having with the house... We had surveyors around. Torus, you know, had people come out and had a look at the situation like they couldn't figure out what was going on... I had*

*surveyors out twice before that and they was like, oh, you just have to open your windows more. [Tenant Participant 1]*

### *Assessing the Impact of Remedial Work*

Another motivation for agreeing to take part in the campaign was to monitor the effects of remedial work intended to reduce air quality problems. Tenant Participant 5 used the monitor to assess the effects of ongoing damp rectification on her daughter's asthma. She hoped to use the monitor to provide indications of whether the dampness was contributing to her daughter's condition or if another cause was to blame:

*We're waiting for the damp to be rectified at the moment, so I'm hoping once the damp is rectified it can give me an indication whether it was the damp that was making it [her daughter's asthma] the way that it is. [Tenant Participant 5]*

Participant 6 also wanted to monitor remedial work, but in her case it had already been initiated. She was interested in using the monitor to assess the effectiveness of measures taken to reduce damp, but also future works planned with the purpose of improving the warmth of the home:

*I would like to have the monitor again when the house has been done... to see if then the temperature does stay warmer in the front room if that's what the problem has been. [Tenant Participant 6]*

### *Interest in checking the health of the home*

Some participants, without known air quality issues in their homes, were motivated to use the monitor out of curiosity. For example, the tenant below expressed this enthusiastic interest in the concept of monitoring indoor air quality:

*Like basically how clean the air is in your home. Quite fascinated to see what it would say. [Tenant Participant 3]*

As well as curiosity, tenant participants saw the monitor as an opportunity to learn about the overall health of their family's home environment. It was, therefore, reassuring to receive readings within the safe range.

## **Other factors influencing uptake**

### *Perceptions of the monitors*

Professionals involved in delivering the campaign highlighted questions or concerns that tenants raised about the monitors before they agreed to take part. These ranged from suspicions of being recorded in their homes, to questions about the cost:

*Some of them was thinking that it was watching them and listening to them and obviously I tried to reassure them as best I could and but there was some reluctances behind it. [IAQ Professional Interview 6]*

One isolated incident had occurred where a tenant contacted the police after a monitor had been installed, as they had been unsure if the person undertaking the installation was genuine. In this instance action was taken to ensure staff and anyone involved in the campaign's delivery carried ID.

More generally, however, where concerns or questions were raised, recruitment approaches that allowed for open discussions about the monitors, such as within a community venue, were reported to have gone some way to mitigate these concerns:

*I think you know because it's so new and because it's, you know, things like VLC's PM's don't make much kind of, you know, sense to people. You do need that time to be able to go through it with tenants... it's trying to get through as much as you can to support them. [IAQ Professional Participant 2]*

### *Media coverage of indoor air quality*

The heightened news coverage of social housing and information about indoor air quality, damp, mould, and condensation was also reported to have increased interest in the broader issues underpinning the campaign. In turn, this was perceived to have influenced tenants' interest and uptake:

*We've definitely seen an increased interest following the Rochdale case where obviously that wider media attention has brought more to the force of the importance of indoor air quality, and so we definitely saw more of an uptake following that [IAQ Professional Participant 1]*

### *Community cohesion*

The campaign was also situated in localities experiencing high levels of socio-economic inequalities. Alongside this, varying levels of trust and cohesion were reported across particular estates:

*Compared to Neighbourhood 1, I would say that Neighbourhood 2 has a lot more community connection .... There's no kind of real connection with the people nothing going on there that suggest that people are together trying to work together. It's all kinds of individualised and you know, it's like. Always arguments on the streets and stuff [IAQ Professional Participant 5]*

This level of atomism and lack of social cohesion could be a barrier to the campaign's ability to engage with local people.

*I found it quite challenging. Because of the first point I pointed out [above], there's no connection or real trust around there [IAQ Professional Participant 5]*

In contrast, in areas with a robust network of community centres or a strong volunteering base, engagement seemed to be greater. The following quote illustrates how the Healthy Neighbours project built on existing community bonds:



*There's a couple of community centres that are in the area, so I've made links in with them, and the local pub . You know anything in that area that that people would use, so I could try and you know, integrate with them and get them involved in the Healthy Neighbours project. [IAQ Professional Participant 3]*

Similarly, where an area was reported to have a 'tight knit' community, this could help to extend interest and awareness of the campaign through 'word of mouth' (see briefing 1 on recruitment engagement).

## Impacts of the campaign

### *Leveraging monitor readings as evidence for air quality complaints*

Tenant participants valued the monitor and the objective readings it gave as a means to substantiate and legitimise their concerns about IAQ. For Tenant Participant 1, this perception was shaped by an experience in which the mere presence of the monitor appeared to have had a significant impact on the actions of a surveyor:

*As soon as I mentioned that we did have this monitor in checking the air, it's you sort of shocked him... I don't think he was expecting us to have it. So it sort of shocked him. Knowing that we had and he started doing like more checks, he got this gun thing out and he was checking, you know, obviously if there was any sort of damp behind the wall and he started doing more checks. [Tenant Participant 1]*

This type of experience suggests the monitor readings can play a role in changing the perception of tenant complaints from uncertain grievances into credible concerns. There were similarities in the account given by Tenant Participant 7 who also had an experience suggesting the monitor was valuable for lending authority to his complaints of damp in his home:

*So then you [the surveyor] come out at first and you just sort of said, oh, yeah, you've got your couch too close to the wall. ... so the second time the guy did do a job and he got, you know, you got workers out to change the plaster and stuff. So yeah, it's definitely been a lot better since then. And like I said, I do think the monitor sort of pushed them to actually do something about it as well. [Tenant Participant 7].*

Such experiences suggest a potentially important role for the monitor in empowering tenants to make stronger demands for safer living conditions.

### *Changes in knowledge and behaviour*

At the start of the campaign, it was evident that families' awareness of IAQ was poor, reflecting wider trends in awareness in the general population.

*I think what we recognize is that you know indoor air quality and cleaner indoors is something that's quite new to people you know, it's not something that a lot of*

*families have really ...thought about or spoken a lot about. [IAQ Professional Interview 2]*

*I think one or two, maybe 10% of the parents would have said that they were sort of maybe a 7 [with respect to their levels of awareness]. The rest of them was absolutely no. ... even the young mum that has got the son, that's really, really poorly with asthma. She thought that her knowledge was pretty mediocre. [IAQ Professional Interview 4]*

Professional interview participants felt that changes in knowledge and awareness were the main outcome observed through the campaign. Those interviewed described examples of awareness improving, with examples provided of action being taken:

*For mum, it's been a real eye opener. So right from the offset review that we did do with her, she was looking at the products that she's using in the household, ... She always likes the air to smell what she thinks she's clean. And so we have a conversation, what does clean look like? What can you do to obviously look at different solutions? So she's really gone out there. I've got a second review with her actually next week. It'll be really interesting to see because I've popped on [the dashboard] and had a look and from us having the conversation and all of her VOC's and things have come really, really down... [IAQ Professional Interview 4]*

*Air quality was so new for people, .... tenant[s] rated their knowledge and understanding at 2.3 out of 10 [in the baseline questionnaire], which again highlighted towards that, it's very new to people. People don't know too much about it. And then based off the follow up, which is of course just after one follow up that's gone up to 5.7 out of 10... [IAQ Professional Participant 2]*

These views were supported by tenant interview data suggesting the campaign had increased participant's knowledge of air quality, and, for some participants, changes in behaviour. An example of increases in knowledge and changes in perspective was the 'eye-opening' moment participant 6 had when she observed the spike in readings at the time her friend returned into the house after smoking outside:

*When my friend is around and she's been outside, had a cigarette and then come back in, which was really like 'Wow'... Even though she's gone outside, she's smoked outside. She's still bringing that pollution back into the house. [Tenant Participant 6]*

Although Tenant Participant 3 had not received the normal number of air quality readings, she still benefited from using the real-time information provided on the monitor's display, leveraging it to ask her husband to smoke outside and get washed and changed when returning from work in clothing that could contain pollutants:

*It has made me get the baby's dad to smoke near the back door... He works to help with Tarmac, so it's all high fumed stuff anyway. So when he's walking into the room and he walks past the monitor straight away it changes numbers. Like, yeah, Go on. Go get a shower. Get out! [Tenant Participant 3]*

Observing the monitor's display had also empowered this tenant to make beneficial adjustments to her cleaning habits to limit the impact on air quality:

*You can tell when you've used like just the type of chemicals inside the room as well because it does pick that up... So with, for example the fly spray, I won't use it in the living room. Now I'll only use it in the kitchen... I don't use the brush in the living room no more because it's picking up making all the dust, but all the dirt go into the air... so we'll only ever use the Hoover now in the in the living room, and it's only a quick go over [Tenant Participant 3]*

Professional interview participants also gave example of growing awareness leading to changes in behaviour such as increasing ventilation, use of cleaning products or swapping products:

*You know, having a better insight and understanding more about the air quality in the home, which they want to know enough before lots of kind of lifestyle awareness as well in terms of using cleaning products and sprays and now knowing what the impact they can have... [IAQ Professional Participant 2]*

Such experiences suggest the campaign had a degree of success in connecting theoretical knowledge to practical changes in behaviour.

### *Reassurance the property is in good and healthy condition*

The monitoring campaign achieved a form of impact for some participants by providing assurance and verifying that their home's air quality was safely within acceptable limits. This knowledge gave tenants a sense of contentment from knowing that their young families were not exposed to any significant risks:

*When I got the report through, I was happy to see it was all in average range .  
[Tenant Participant 3]*

*It made me a bit happier knowing that everything was OK [Tenant Participant 4]*

### *Impetus to actions taken by the housing provider*

During interviews, examples were given where the equipment helped to identify and monitor problems, leading to action being taken. In one example, the monitor data provided evidence that the conditions were not related to tenants:

*we were able to go back and look at the data and say, actually, the average temperature for that particular property for the last two or three weeks with 22 degrees. So there's no issue with the way they're heating the home, and clearly there must be something else. (IAQ Professional participant 2]*

Similarly, the conversations during follow ups could also inform a plan of action, as this coordinator explained in relation to mould in the property:

*we've been able to direct him down the right route of who he needs to go to, who needs to report and he has actually got an assessment coming out this Thursday, actually to speak to him. So I think what's happening on the back of the monitors and those doing those reviews is really starting to highlight areas [IAQ Professional Interview 4]*

## Challenges experienced by Tenants

### *Lack of regular reports:*

Tenant participant 2 reported receiving only the first report detailing monitor readings and subsequently experienced a prolonged period without any further communication:

*I only got the 1st monthly report. That was it, then. Nothing. (Participant 4)*

This lack of regular reports limited her ability to track and evaluate the air quality in her home.

### *Difficulties in understanding the reports*

Participant 3 had some difficulties understanding the meaning of the readings in her report and she attributed this to not receiving adequate information explaining the readings at the outset:

*They could have sent more information when they first gives the air quality metres to Tenants. When I got it, I didn't really have that much information about it or I just knew that it was just going to read the quality and it'll help understand if you've got clean air in the home or not, whereas if they had given more information when first given it, then I think it would help tenants understand it better. [Tenant Participant 3]*

This lack of information meant that she lacked a broader understanding of the meaning of the readings and their implications, even if she knew that lower readings for particulate matter (PM) were desirable:

*Not really like had just the first number, the PM one. I don't exactly understand that. [Tenant Participant 3]*

### *Technical issues and user experience*

The monitor was generally seen as user-friendly, convenient, and unobtrusive but three participants had minor complaints about the user experience. Participant 3, for instance, encountered an issue when relocating the monitor, causing it to stop working temporarily. The lack of information provided to her about the possibility of battery depletion and the process of replacement led to a sense of frustration:

*It stopped working when I moved it from my living room... The family finally got it working again. It needed new batteries... I didn't know how to get the batteries out of it. [Tenant Participant 3]*

Participant 2 found it hard to find an appropriate position to place the monitor without it being knocked by family members, resulting in some damage to the wires:

*Because of where the plug socket is and everything, it was just getting pulled, knocked all the time. It wasn't in a in a good place, but there was only one plug... I've not had the readings back from that yet, and I've not had it plugged in since the wires gone a bit dodgy and it wasn't staying on. [Tenant Participant 2]*

Participant 6 had similar problems with family members tripping over the wires:

*Having to have one plugged in and then the other one quite close by just because of the house where I wanted to put them on it. So that was a pain because the kids kept tripping on it. [Tenant Participant 6]*

## Challenges experienced by staff

### *Tenants turning off the monitor*

Once the monitors have been installed, professional interview participants gave various accounts of the monitors being switched off. One reason for this was the longer period between installation and follow up, with the latter taking place later than anticipated.

*It's part of kind of learning really, but having like the monitors unplugged for example. So what that kind of meant is that you know the data would only pull through obviously when the monitors were plugged in... which meant that we, even though they had the monitor in, we might not have had the most up-to-date air quality information for them. [IAQ Professional Participant 2]*

Where monitors were switched off, staff re-engaged with the family to understand why this had happened and to check if they wanted to remain involved in the campaign. This engagement was suggested to work well particularly where the staff member was known to local families.

*We started back in August time. I've tried to make contact with families that I may have installed early on and they're not getting back to me and I've had a look and they've turned it off, and so that's been quite hard, but when once you reengage with the with the family and explain. So if you plug it back in. Would you like to be still part of the study, yes or no, and then if they do which they all have. [IAQ Professional Participant 3]*

Other reasons for switching off related to tenants' anxiety either because of safety fears about the monitor (e.g., getting too warm), or that the tenant was concerned that the negative readings could have consequences for their housing situation.

*Yeah. So we, yeah, we've got one family...It's very complex and there's a lot of stuff going on at the minute with that family, to the point where there was a lot of mould and a lot of damp and that we've actually moved the family out of the home. So theirs [the monitor] was only in for two days and those two days of because they said one of the kids had spilt something on*

*it. But I think they'd panicked. And from what I've just said, that they think it's watching them. [IAQ Professional Interview 6]*

Other factors included practical issues such as a lack of plug sockets particularly in large households. In another reported example, the monitor had gone off because the family had not been able to put money on the electricity meter.

A further issue was that when monitors were switched off for a long period of time this ran the battery down more quickly.

*it causes a sensors to run out of battery a lot quicker than expected because the sensor is always trying to find the hope and the hubs not online. So it just depletes the battery a lot quicker. [IAQ Professional Participant 2]*

## Constraints to behaviour change

Taking action to improve IAQ are not always simple when placed in the context of the challenges of people's daily lives. A key concern of tenants was the reduction in temperature in the home when windows were opened for ventilation, although staff had explained 'temperature doesn't drop that much if you open the window.'

*Yeah, I think a lot of it's kind of linked in with seasonal as well. You know, I think kind of in in winter, you know, of course, very low temperatures. ... tenants kind of obviously you know [are] less inclined to open the window because it's so cold and it's about kind of how we overcome that and just kind of encouraging them. [IAQ Professional Participant 2]*

While concerns about safety issues or anti-social behaviour had been expected (as a result of opening windows), these did not materialise in practice. But one coordinator did note that she was asked about links between indoor and outdoor air quality; tenants questioned if opening windows would let in more air pollution because they lived in an area with traffic etc.

*... people looked at outdoor air quality and the roads and having your window open and 'does stuff come through your window more [than] letting stuff go out your window?' That's the that's the biggest bit of feedback I've had. [IAQ Professional Interview 3]*

For another parent with a child experiencing respiratory problems, they made a number of changes to improve air quality but were also dealing with stressful life events. For the tenant, activities such as burning candles might be detrimental to air quality but were a means of relaxation, as the coordinator explained: '*she doesn't have an awful lot. They tend to be her nice things that she does have a clean home and she sits in the nighttime with a cosy candle and all of these things.*'

## Conclusion

The motivations for tenants taking part in the campaign ranged from health concerns, especially for children with respiratory issues, to utilising monitors to validate housing complaints. Tenants also sought to assess air quality improvements after remedial interventions, while others were driven by an interest in the health of their home environment. The functions of the monitors themselves, coupled with concerns about surveillance and costs, also influenced decisions, and the campaign's success varied by locality, with areas having strong community ties seemingly showing higher engagement.

The campaign's impact was multifaceted and included use of monitor readings to legitimise complaints. There was a marked increase in IAQ awareness among tenants. This newfound knowledge triggered behavioural changes, such as altered cleaning habits.

The campaign wasn't without challenges. Some tenants faced difficulties in receiving and interpreting regular air quality reports. Technical problems, like relocating monitors, also cropped up and a few tenants unplugged their monitors, leading to data gaps. Concerns about temperature drops and outdoor pollution limited tenant's ventilation of their homes, and while some tenants try to enhance IAQ, personal stressors may lead to choices, like burning candles, that can counteract those efforts.

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