



University of
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Sheffield
City Council



Engaging with small business owners to improve indoor air quality

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Challenges to improving ventilation

Capability

A basic understanding of ventilation

“ Having an exchange of air really reduces the risk of picking [COVID] up. I think I only understand on a very basic level because of how much we’ve been encouraged to be outside. I don’t particularly understand the science behind it ”

Opportunity

Limited opportunities to improve ventilation

“but apart from saying open doors or windows, there wasn’t a vast amount of guidance that I could find ”

Motivation

Effective ventilation is not a top priority

“ If they’re cold they will close the door, and they will complain if they’re cold. ”

“ Noise complaints put our license at risk... so definitely, ventilation’s not really high on the agenda ”

Developing an intervention

Workshops with 3x venue owners/managers and EHOs

Workshop with 200 EHO's covering UK from Devon to Shetlands

Online surveys with 63 owners/managers

<https://iv4bv.sites.sheffield.ac.uk/>

Why should I ventilate my venue?

Spaces with poor ventilation have been shown to increase infections by nearly 50%¹



Improving ventilation in your venue can help to reduce respiratory infections.

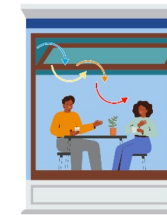
This will keep your customers safe and has been shown to reduce staff sick leave by 35%²



¹<https://onlinelibrary.wiley.com/doi/full/10.1034/j.1360-0668.2000.010004212.x>
²<https://jamanetwork.com/journals/jama/article-abstract/371466>

Short Term

Worried about keeping customers warm?



Open high level windows

The cold air will mix with the warmer room air before touching people. So, you and your customers won't feel cold.

Even just a small amount

Small or thin openings work well in winter. Cracking a window is better than nothing.

No opening windows?

If you only have larger openings, like your front door, use these for short periods to replace stale air with fresh air.

Make a ventilation plan

Ensure you have a clear plan for when you will replace the air, and who is responsible.



Medium Term

Worried about energy costs?



Consider using a CO₂ monitor to help you estimate your ventilation levels. This will allow you to adjust your ventilation to bring in the right amount of outdoor air, while minimising the impact on your heating bills. Use the short term options above if possible and work towards longer term changes.

800 PPM

1000

1200

1400

1500

These values indicate good ventilation.

These values indicate you should improve ventilation. If consistently above this value, work towards the long-term actions below.

A typical monitor can cost as little as £300

(Not including running costs)

Scan the QR code for further information on using CO₂ monitors.



Worried about noise?



Where noise is an issue preventing openings consider purchasing an Air Cleaner. These just plug into the wall.

Air cleaners that include a fan and HEPA filter are recommended.

An air cleaner system for a 110m² bar area costs from £2500

(Not including running costs)

Scan the QR code for further information on using air cleaners.



Long Term

Install mechanical systems

Wall mounted fans are easier to retrofit. Heat recovery systems are available and are recommended to reduce energy bills.



The typical cost for 100 people ranges from £1500* to £15000^b

*For fans only, building works and running costs not included.

^bFor heat recovery, including installation.

Scan the QR code for further information on mechanical ventilation.



Testing the intervention Methods

Field Study

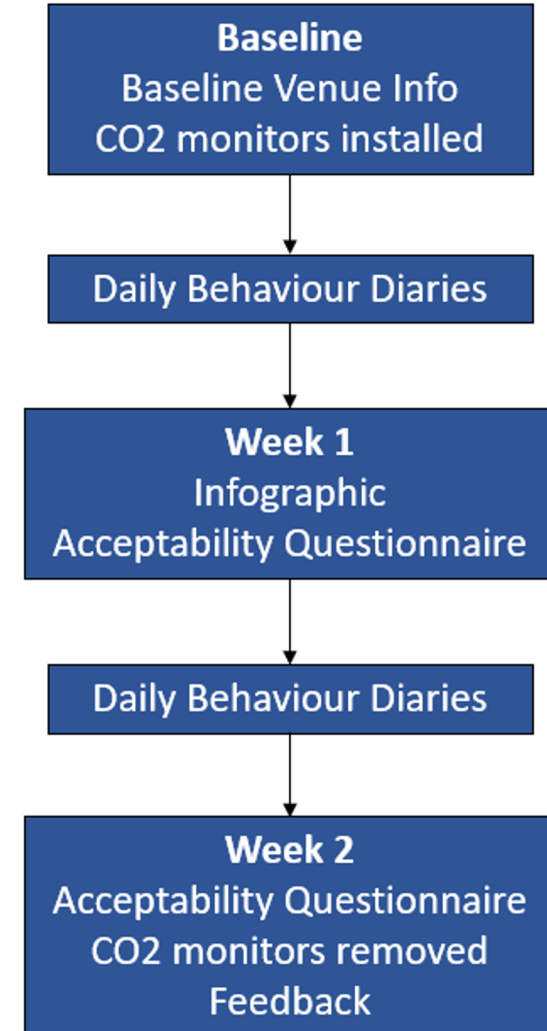
9 local small-scale hospitality venues and welcoming spaces with natural ventilation/wall-mounted extract(s)

CO₂ Monitoring

- Two Technologies
 - Wall mounted sensor with display
 - Cloud connected sensor with app
- Sensors located away from tampering and breathing zone

Behavioural

- Behaviour Diaries
- Acceptability Questionnaires



Testing the intervention

Methods

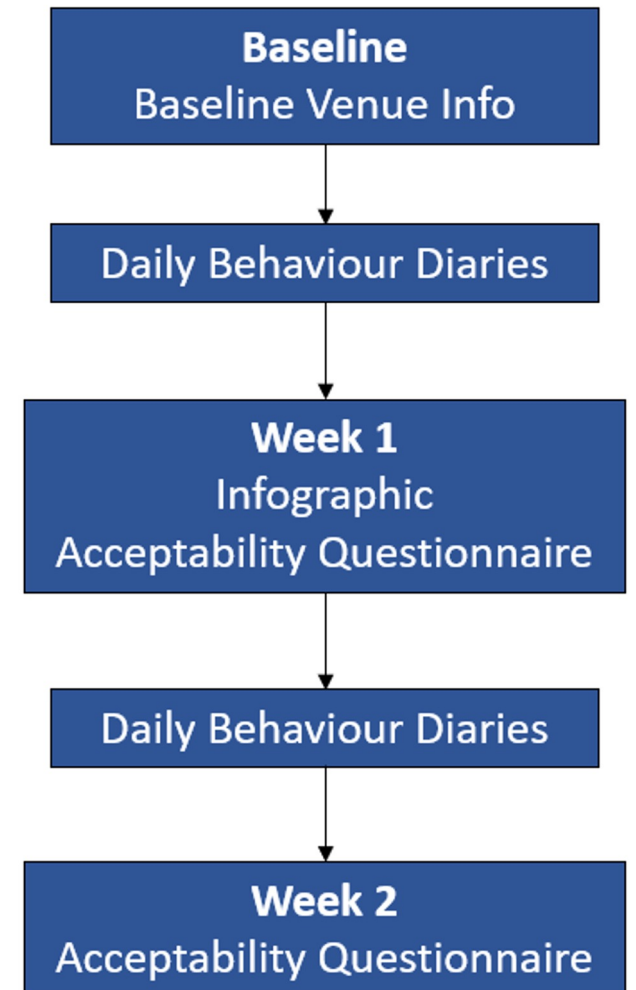
Online study

Online study

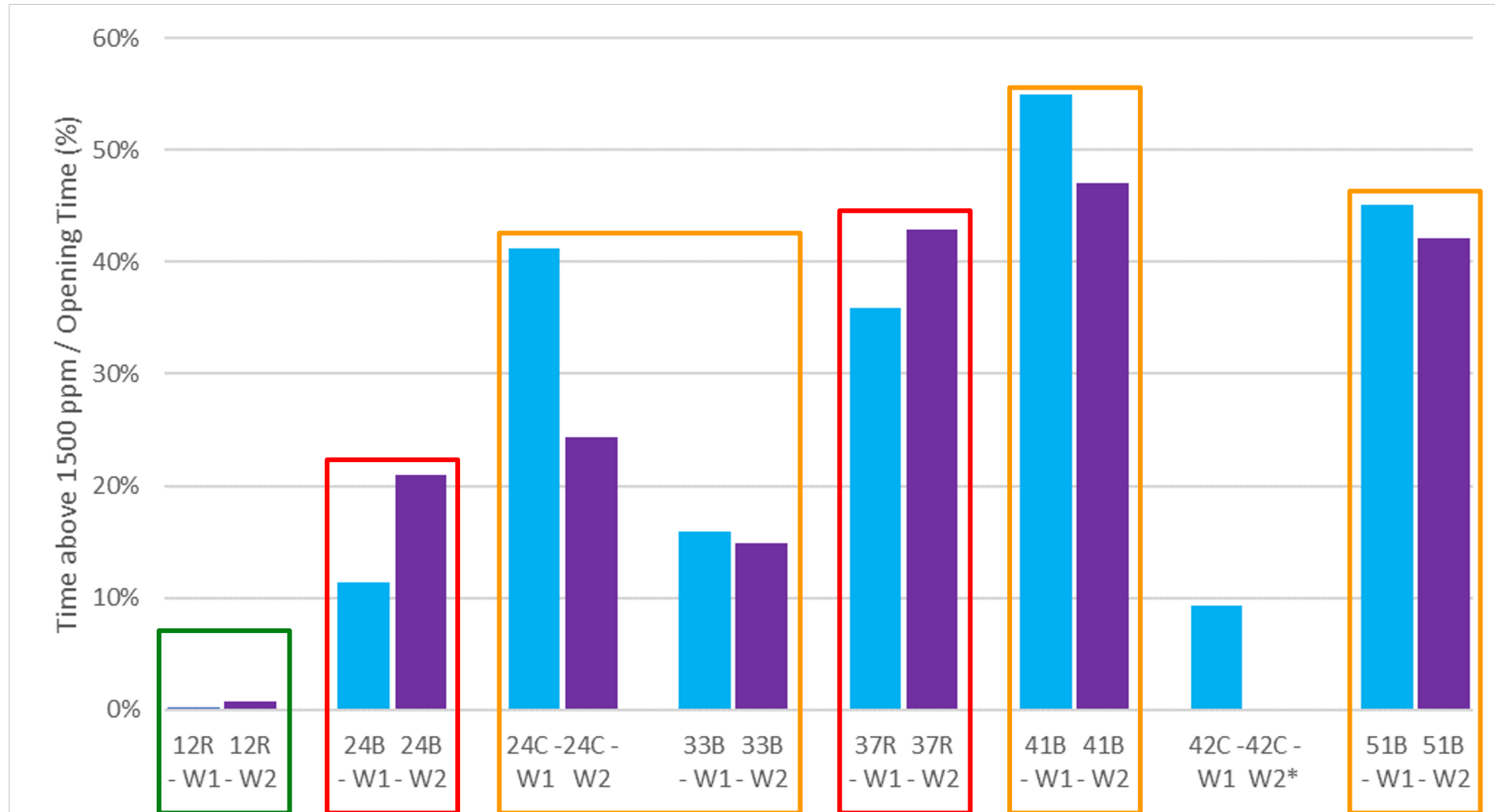
123 hospitality venues, other businesses (e.g. retail) and welcoming spaces in UK with natural ventilation/wall-mounted extract(s)

Behavioural

- Behaviour Diaries
- Acceptability Questionnaires

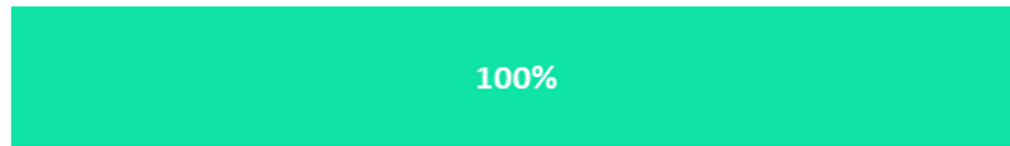


Field Study: Overview of CO₂ results



Field Study- Likelihood of Making Changes

Short-Term Actions (N = 7)



■ Unlikely ■ Neutral ■ Likely

Using CO2 monitors (N = 7)

Pre-intervention



■ Unlikely ■ Neutral ■ Likely

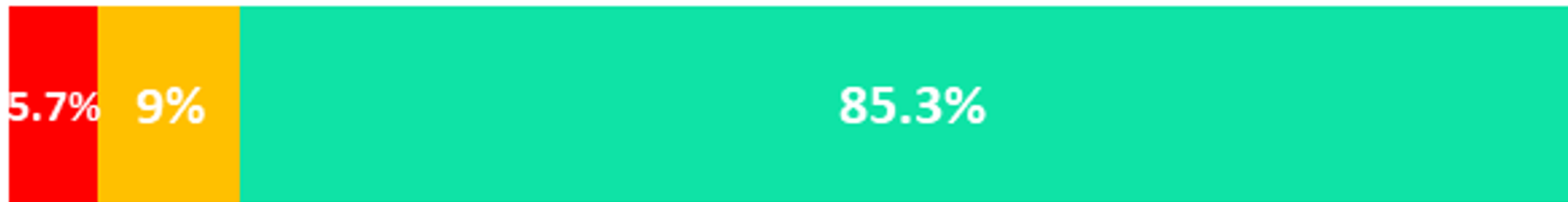
Post-intervention



■ Unlikely ■ Neutral ■ Likely

Online- Likelihood of Making Changes

Short-Term Actions (N = 123)



■ Unlikely ■ Neutral ■ Likely

Field Study- Likelihood of Making Changes

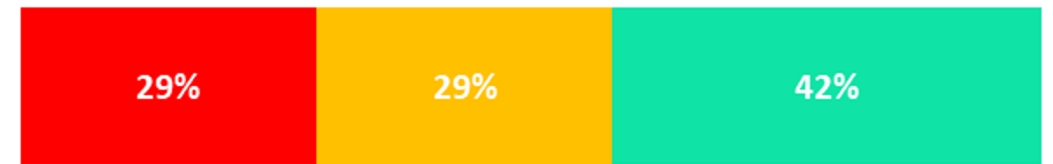
Purchasing air cleaners (N = 7)

Pre-intervention



■ Unlikely ■ Neutral ■ Likely

Post-intervention



■ Unlikely ■ Neutral ■ Likely

Installing mechanical ventilation (N = 7)

Pre-intervention



■ Unlikely ■ Neutral ■ Likely

Post-intervention



■ Unlikely ■ Neutral ■ Likely

Online- Likelihood of Making Changes

Purchasing air cleaners (N = 101)

Pre-intervention



■ Unlikely ■ Neutral ■ Likely

Post-intervention



■ Unlikely ■ Neutral ■ Likely

Installing mechanical ventilation (N = 123)

Pre-intervention



■ Unlikely ■ Neutral ■ Likely

Post-intervention



■ Unlikely ■ Neutral ■ Likely

Summary & recommendations

- Sector specific guidance is essential to improve indoor air quality
- Snap shot use of CO2 monitors may lead to greater interest in interventions.
- Use of information sheet with out CO2 monitoring likely to only lead to short term changes.

