First Steps to Smoke-free:

Using air quality feedback to facilitate smoke-free homes through the NHS Lanarkshire First Steps programme

Sean Semple

Respiratory Group, Institute of Applied Health Sciences, University of Aberdeen

sean.semple@abdn.ac.uk

FS2SF Study Design

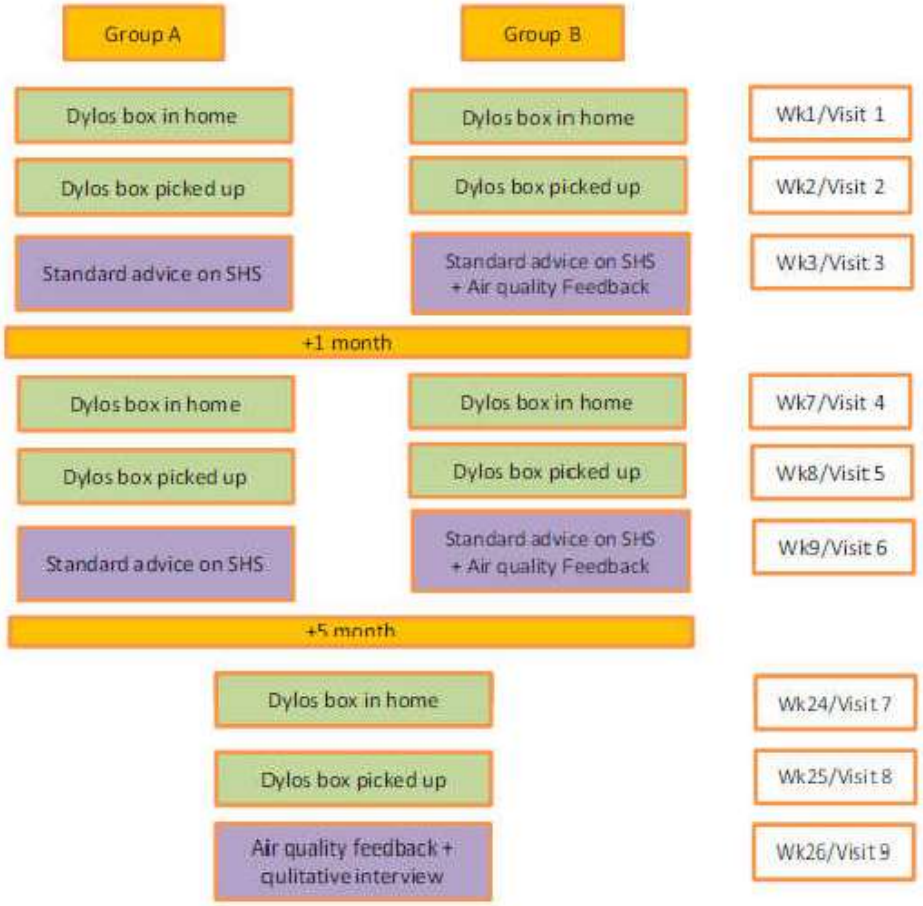
- Teamed up with NHS Lanarkshire First Steps Programme

- Does providing air quality feedback help people make their homes smoke-free?
- Randomised trial: two groups (A+B)
  - Group A receive standard NHS advice about SHS
  - Group B receive this advice + personalised feedback about SHS levels

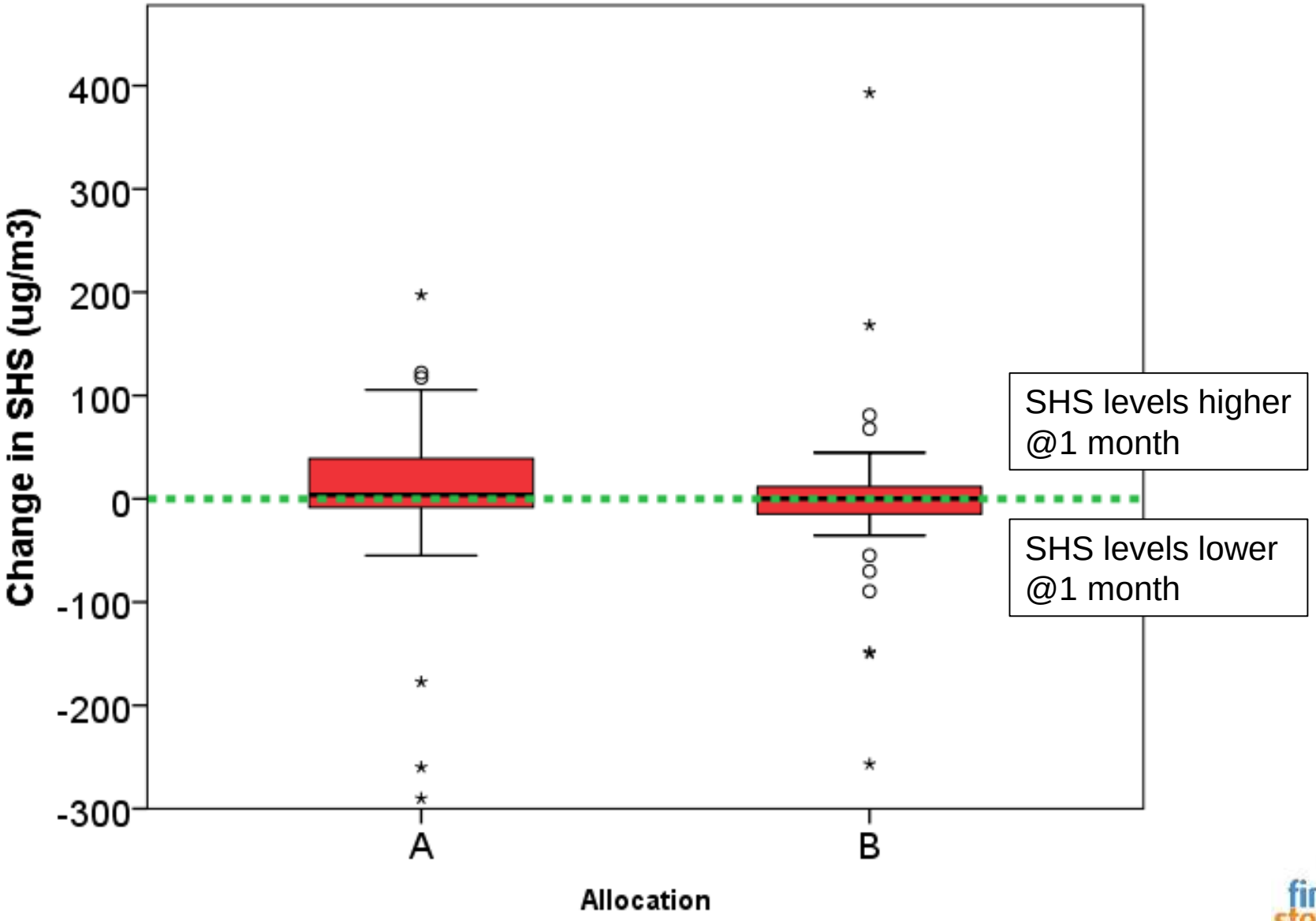
- SHS levels measured by a low-cost laser particle counter (Dylos DC1700) left in each home for 4-7 days
- Repeat measurements at +1 and +6 months later

What we did…

- 120 first-time mums recruited (70% response rate) (62A+58B)
- 117 homes took part in baseline
- 102 took part @1 month follow-up
- 78 took part @6 month follow-up
- 21 qualitative interviews



Differences between groups @ 1 month



Discussion of results

- Our results are contrary to previous studies using air quality feedback
- REFRESH intervention **-31%** reduction in SHS concentrations
- A similar study in Nottingham has indicated **-35%** reduction

- Participants living in more disadvantaged circumstances and experiencing more challenges in daily lives compared to REFRESH
- Qualitative results show that the enhanced intervention increased mothers' **capability** to change their smoking behaviour in the home, and their **motivation** to act. But when social and physical **opportunities** are limited, changing smoking behaviour in the home is less feasible.

The evidence is not sufficient to enable implementation of air quality feedback for this group of mothers

Acknowledgements

- NHS Lanarkshire
  - Tracy Henderson
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  - Lynn Adams
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- Project Advisory Board
  - Deborah Ritchie
  - John Watson (ASHS)
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  - Celia Gardiner (NHS HS)

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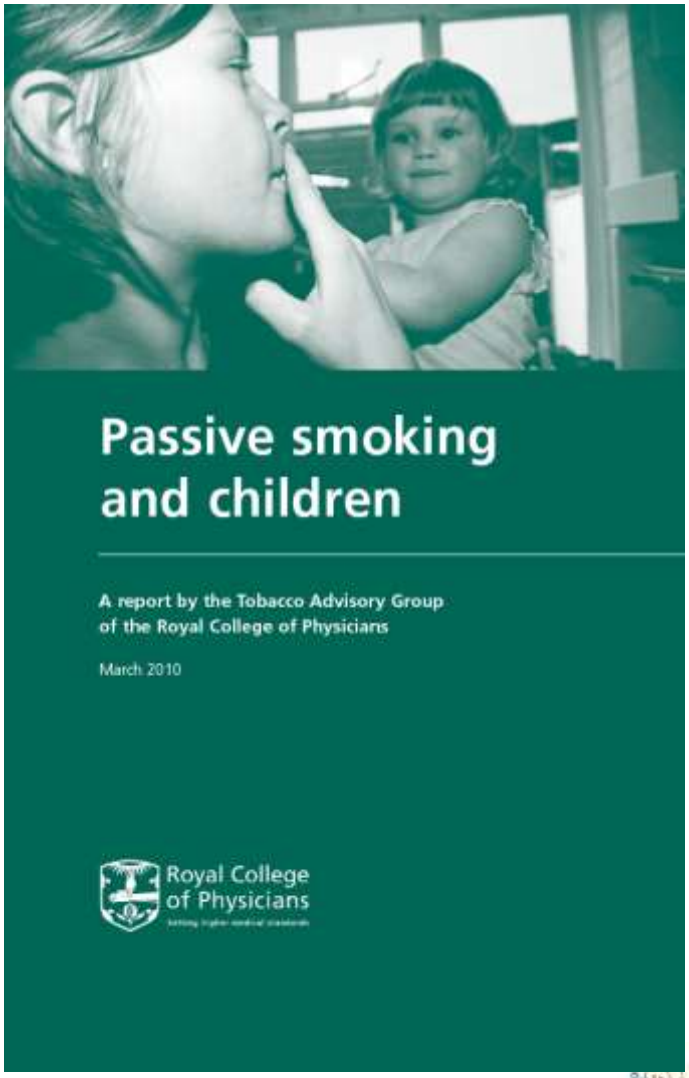
Why are smoke-free homes important?

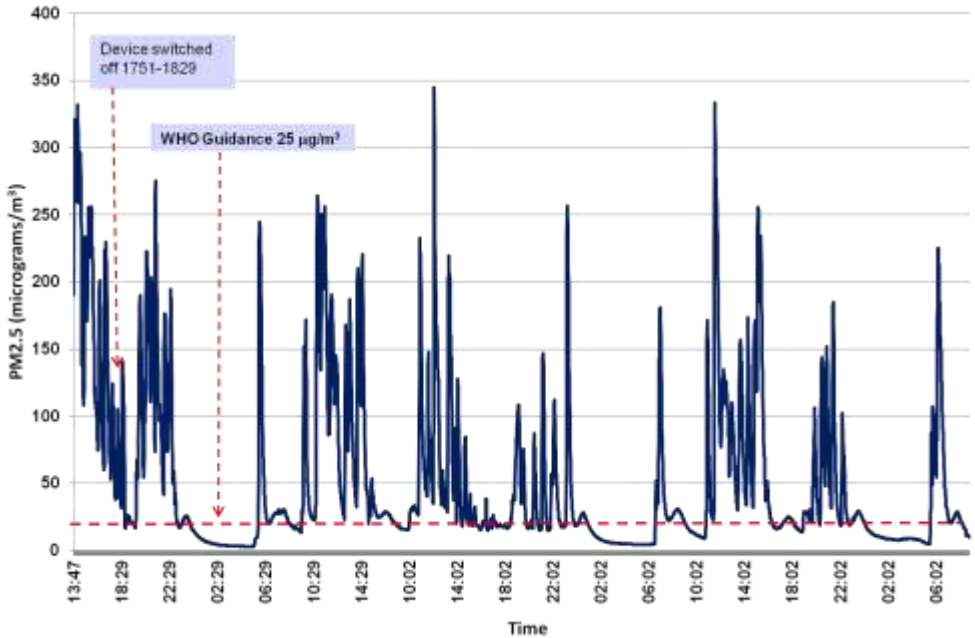
- As a result of SHS exposure related ill-health:
  - 800* children per day see a doctor
  - 25* children per day admitted to hospital
- A smoke-free home makes successful quitting **x5** more likely for smokers
- Reduced risk of child becoming an adult smoker...
  - Children of non-smoking parents 70% less likely to become smokers than children of smoking parents
- Current estimates are that 50,000 children in Scotland are still exposed to SHS at home



* UK figures – from RCP March 2010 report

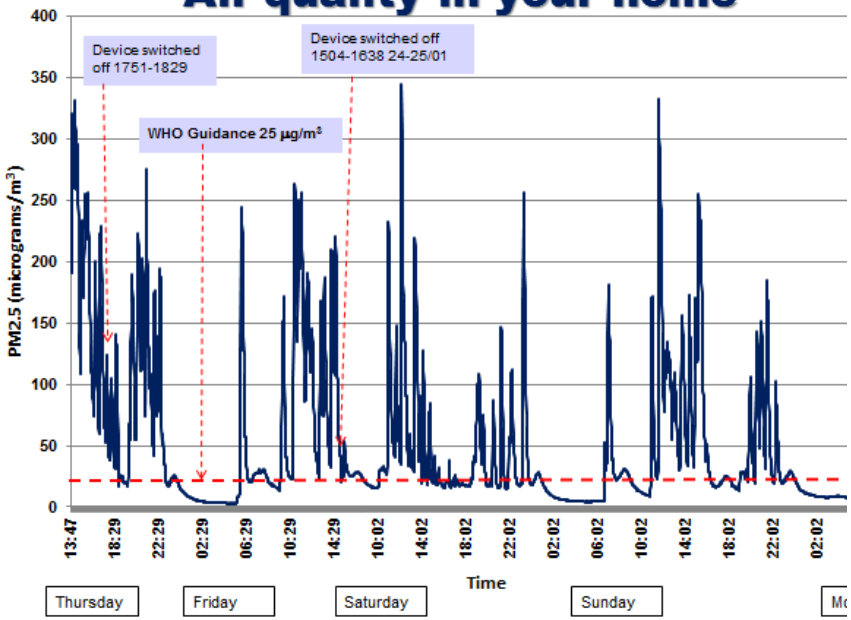
First Steps 2 Smoke-Free Project

- We use personalised feedback to change many types of behaviour (speeding, cholesterol, weight)
- Can we use measurement of household air quality to encourage parents to make their homes smoke-free?



Feedback – what did it look like?

Air quality in your home



Particulate matter levels in your home

- Total measurement time in your home = 4 days, 2 hours, 49 mins
- Average value = **54** µg/m^3

  (more than **two times** the World Health Organisation guidance limit of **25** µg/m^3)
- Maximum level recorded = **345** µg/m^3
- Total time that your air quality is above the WHO guidance value = **50%**
- Total time in your house when particle levels were above the average found in Scottish bars before they became smoke-free = **2%**

Fine particle levels in your home are **above** the WHO guidance limit for **about 12 hours each day** and suggest frequent smoking in your home leads to **poor air quality**

Second-hand smoke

Breathing in second-hand tobacco smoke has been shown to have many harmful effects on health. These include:

- An **increase in the risk** of heart attack, stroke and lung cancer for non-smokers
- **Children are particularly susceptible** to the damaging effects of breathing in smoke because they have smaller airways, they breathe faster and their immune systems are still developing
- Children exposed to smoke are **more likely to have chest infections** and suffer from wheezing and coughing
- Children living in a home where one parent smokes are 50% **more likely to have middle-ear infections**
- Approximately **9,500 children in the UK** are **admitted to hospital** every year because of illness linked to breathing in tobacco smoke
- Children who grow up around smokers are **three times** more likely to become a smoker themselves

What can you do?

- Set **a date** to make your home and car smoke-free
- **Discuss your plans** to go smoke-free with your family and friends and ask for their support
- **Remove ashtrays** from your home/car – put them outside or at the backdoor. Put an umbrella at the door for rainy days
- Make some **no-smoking signs** with your kids and put them in your home and car to remind everyone
- Make a list of things you can do to **distract yourself** when you feel like having a smoke
- Think about **quitting** – call 0500 600 332 for local NHS help

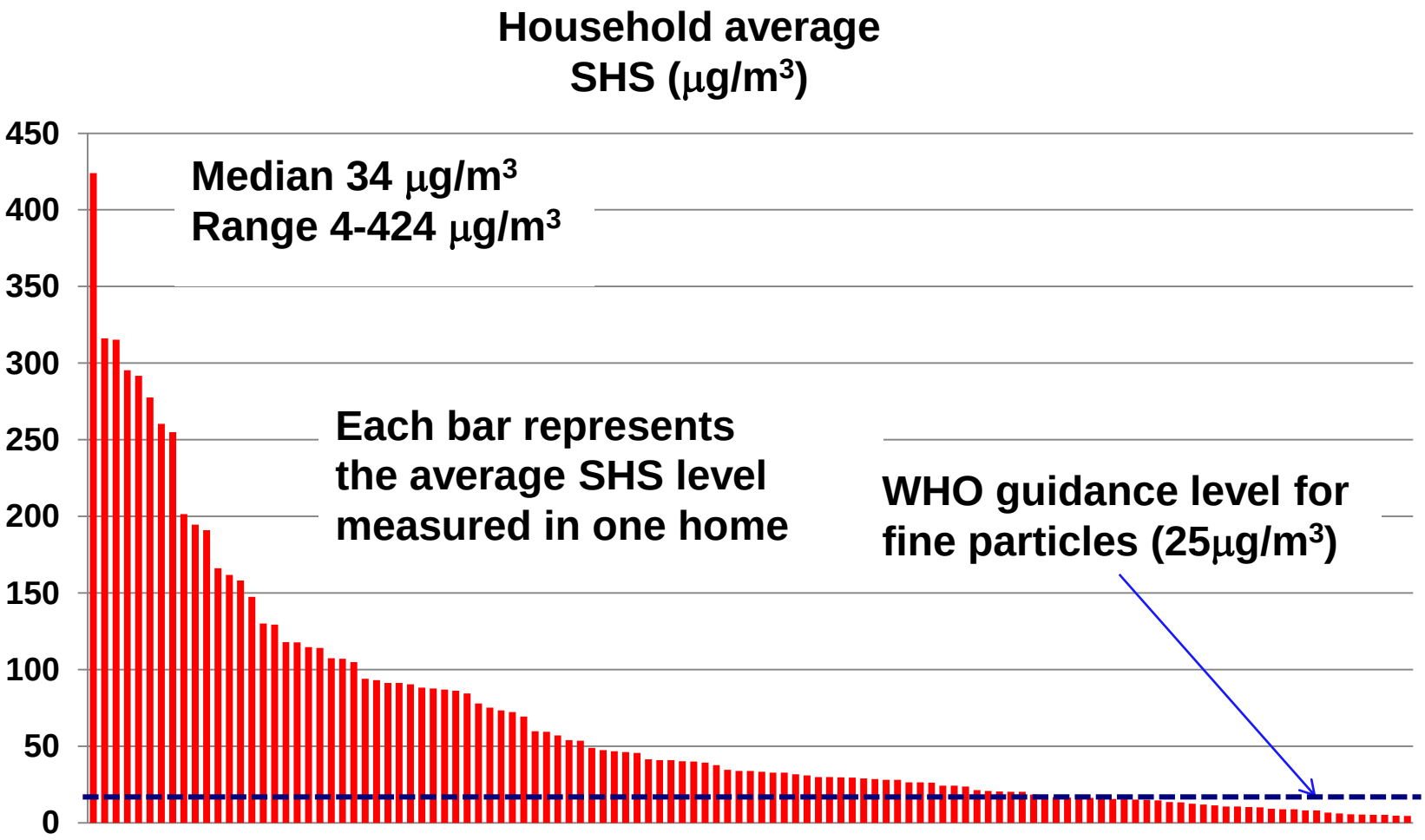
steps

Participant characteristics

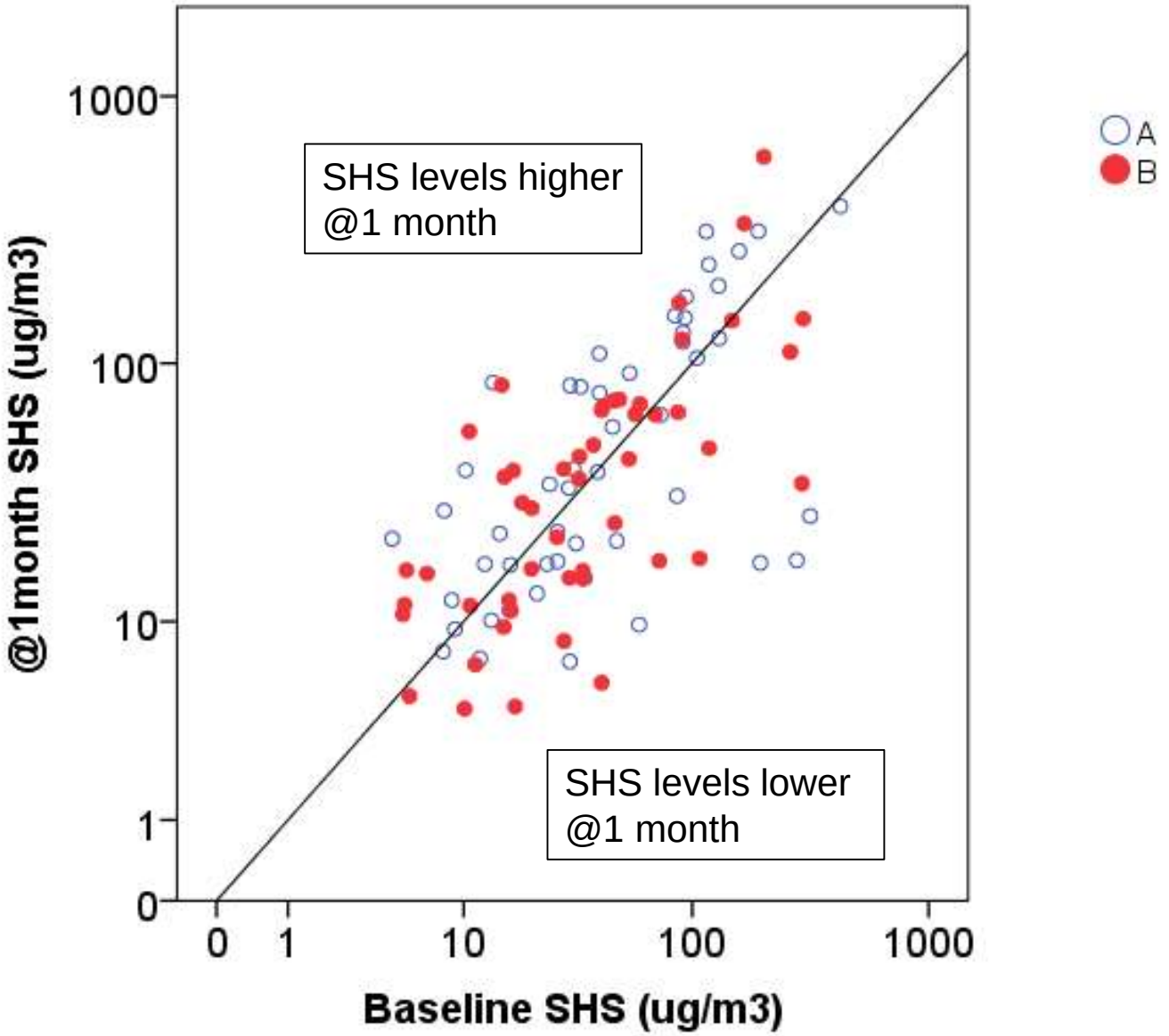
	Group A (n=59)	Group B (n=58)
Age (IQR)	21 (18-22)	20 (19-23)
SIMD decile (IQR)	2 (1-4)	2 (1-4)
Ante/post natal	39%/61%	17%/83%
Housing	68% flat	71% flat
Garden space	75%	64%

- Mean measurement duration 5.3 days at each visit
- Total measurement data: 2,278,614 minutes

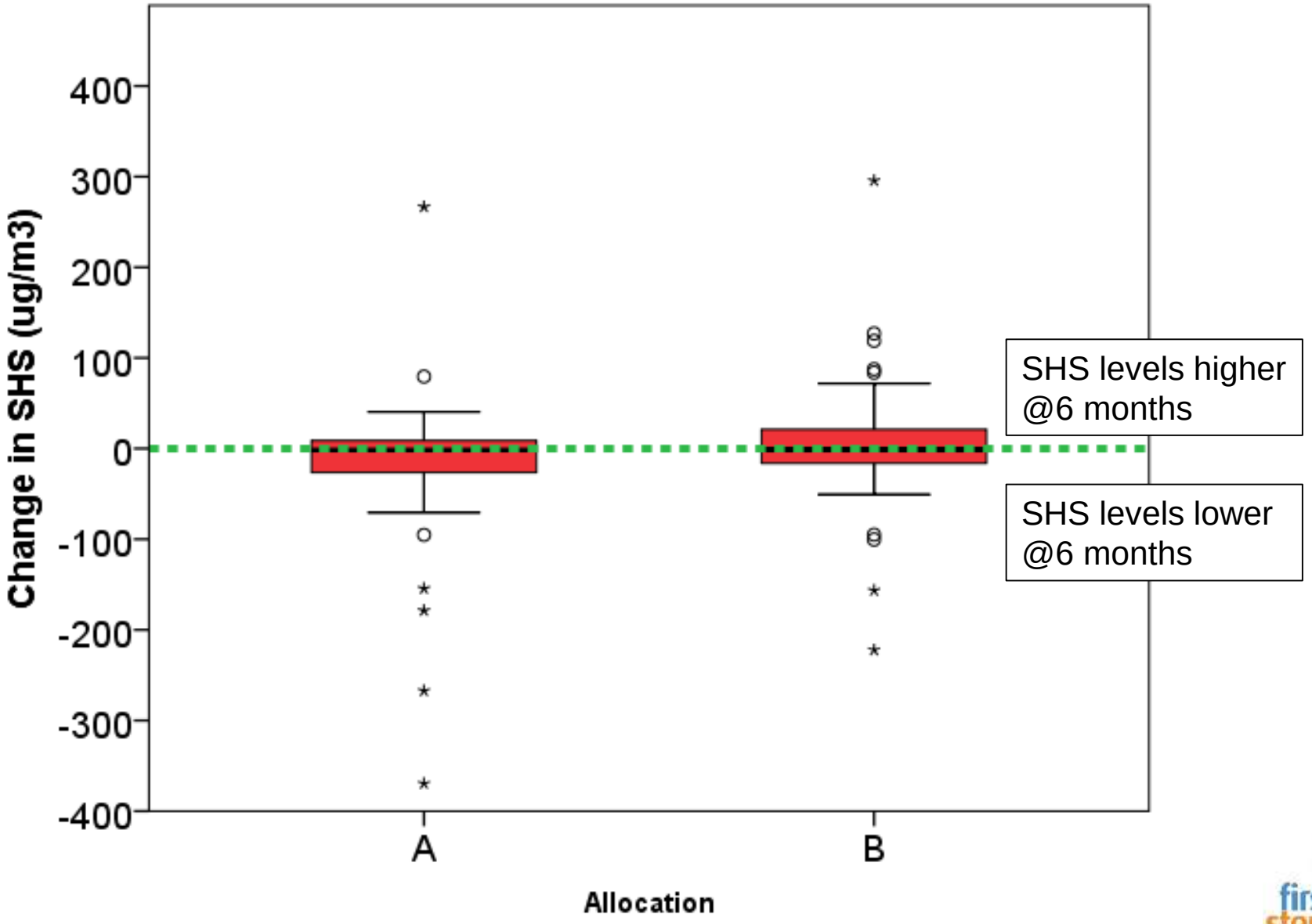
Results – baseline SHS measurements



Results – how did SHS levels change?



Differences between groups @ 6 months



Some secondary outcome data

- No major differences in self-reported household smoke-free rules @1 month

		Change in household smoke-free status			
		Became smoke-free	No change	Became smoking	Total
Allocation	A (standard)	10	35	2	47
	B (feedback)	12	27	6	45
Total		22	62	8	92

- Also no major differences in self-reported smoking behaviour (reduction or quitting) (A=10; B=12)

What next for smoke-free homes?

- Setting targets
  - 50% reduction in children's exposure by 2020 ☑
  - Further 50% reduction by 2025?
- Mass media campaign – rightoutside.org
- Making air quality feedback easier
  - AFRESH and TACKSHS

A Scientific Statement From the American Heart Association

IMPLICATIONS: Increased awareness of the adverse, lifetime cardiovascular consequences of childhood SHS may facilitate the development of innovative individual, family-centered, and community health interventions to reduce and ideally eliminate SHS exposure in the vulnerable pediatric population. This evidence calls for a robust public health policy that embraces zero tolerance of childhood SHS exposure.

Acknowledgements

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  - Tracy Henderson
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First Steps to Smoke-free Intervention: Findings from Qualitative Interviews with Mothers

Rachel O'Donnell and Amanda Amos

Respiratory Group, Institute of Applied Health Sciences, University of Aberdeen

Usher Institute for Population Health Sciences and Informatics, University of Edinburgh

rachel.o'donnell@abdn.ac.uk

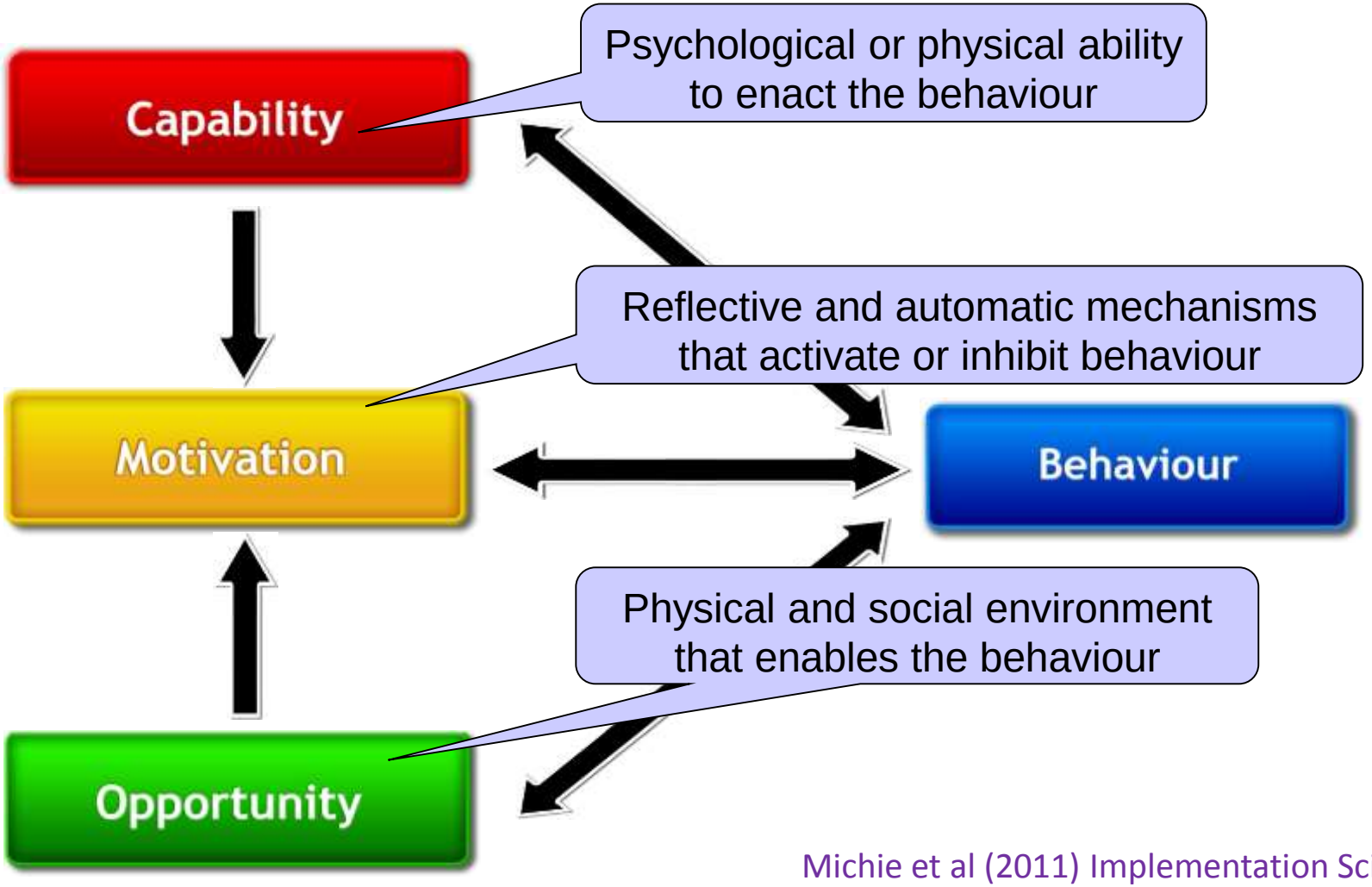
Background and Aims

- In Scotland, children's second-hand smoke (SHS) exposure in the home is highest among those living in the most deprived areas
- The REFRESH project (2010-13): personalised measurements of household air quality can promote changes in smoking behaviour that reduce SHS levels
- The FS2SF intervention: the first to test this approach in a real world setting
- FS2SF qualitative analysis: uses **the COM-B model (Michie et al., 2014)** to increase our understanding of facilitators/barriers to creating a smoke-free home

Methods

- 120 mothers recruited
  - 62 Group A
  - 58 Group B
- Group B – real time, personalised feedback on home air quality levels + advice on reducing SHS in their home
- Group A – standard advice on SHS, and personalised air quality feedback at the end of the intervention
- Qualitative interviews with 16 Group B mothers at 6 months (aged 17-27 years)
- Interviews analysed thematically, applying the COM-B model.

The COM-B model: Behaviour occurs as an interaction between three necessary conditions



Michie et al (2011) Implementation Science

Results

The analysis of the 16 interviews indicates that the enhanced intervention had the capacity to increase both mothers' **capability** to change their smoking behaviour in the home, and their **motivation** to act

Increasing capability to change

- By raising awareness/understanding:

"To start with I was a bit like 'nah, it's my house I'll do what I want. But aye, now I understand. It IS my house, aye, but it's my choice to smoke outside…it's gonna be beneficial for the wean."

Increasing capability to change

- By improving knowledge:

"I googled it on my computer, and it says that it lingers for up to about 5 hours, and I'm like that: 'No it doesnae, it disappears right away!' And clearly it does [linger for up to 5 hours], because it shows that on the meter [monitor]. So that's that then…you've got the proof to back it up…So it helps…It's the same with smoking in cars. I didn't think there was anything wrong with that, because you've got the windows down, but aye, clearly it just goes to show. Can you imagine putting one of they meters in a car? How bad would that be?"

Increasing motivation to act

- ***Through emotional reactions…***

"It shocked me…what the air quality was like in the house, and it made me think, and it has made me change my smoking habits in the house. So it was an eye-opener. It really made me aware of what my daughter was breathing in."

…and self-conscious intentions:

"I needed to stop anyway, because I'm going back to college to study as a midwife and I don't want to be a health professional that smokes." [laughs]

However, taking significant action was often constrained by mothers' limited, and often changing, social and physical opportunities...

Limited/changing social opportunities…

"There were quite a lot of people smoking here at the time. When it [the results] said it was worse than a pub I was like…*'no, we're gonna have to stop and go outside and smoke*'. But because ma wee sister and her partner an' all that were staying here wi' all her weans…I wasn't getting listened to. It was nae bother during the day but when it came to night an' they were going to their bed an' that…they would still spark up a fag, so…I just tried doing the same as I was telling them, but they were'nae bothering, and I just got to the point where I gave up trying myself."

Limited physical opportunities...

"I'm on the 13th floor of a high rise and the only place I can get to have my cigarette is in the kitchen, because the bedroom – he sleeps in there. I can't smoke in there, I wouldn't risk it. The bathroom, I wouldn't smoke in. We both share that, and then in here [living room], we both share. The only place he doesn't go is in the kitchen, so that's the only place I can go to have a cigarette. I can't exactly go out 13 floors just to have a cigarette, just to come in and find out he's been screaming for the last 5 minutes."