Water Efficiency Conference 2015

Presentation 6 – Thursday August 6th

Hendrickx et al

Objective measurement of showering behaviour in the UK and a behavioural intervention to reduce water use in the shower

RESEARCH & DEVELOPMENT

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OBJECTIVE MEASUREMENT OF SHOWERING BEHAVIOUR IN THE UK AND A BEHAVIOURAL INTERVENTION TO REDUCE WATER USE IN THE SHOWER

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With thanks to NEOPERL
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SEVERN TRENT WATER

ESSEX & SUFFOLK WATER

essex water

BACKGROUND

- Due to changing showering habits, water use for showering has become an sizeable component of household water consumption and an increasingly important target for water efficiency improvements

- Limited data is available on showering behaviour and the data is often based on self-report which has considerable drawbacks

- Few interventions based on behaviour change principles have been developed and tested specifically aimed at reducing water (& energy use) in the shower

RESEARCH AIMS

Using sensor technology, improve and refine the UK evidence base on showering and water use

To develop a scalable behavioural intervention to reduce water and energy use in the shower and test the impact of the intervention

To get an understanding of some of the determinants of shower duration/water use in the shower

MEASURING SHOWERING BEHAVIOUR

Shower monitor

Collects data through multiple sensors (rumble, acoustic, temperature, real time clock)
Algorithms to process the sensor data and derive the time, date and duration of showers

Flow rate measured separately at start of study

Shower diary

Participants fill out immediately after taking shower:
 initials, date and time of day

Crucial for determining *who* was using shower

Shower 1: Date _____   Time _____ Initials _____

Products used in the shower
(number by order used in shower, starting with 1)

__ Shampoo	__Skin exfoliator
__ Conditioner	__Skin moisturizer
__ Face wash	__Toothpaste
__ Body wash/shower gel	__Shaving
cream/shaver	
__ Bar soap	__Other

On a scale of 1-10, how enjoyable was the shower?
Not enjoyable 1 2 3 4 5 6 7 8 9 10 Very enjoyable

INTERVENTION

Water efficient showerhead

Flow rate 7.6 l/min

Feedback

LED light provides feedback about shower duration: blue to amber: 2 mins/amber to red 5 mins

Giving feedback is an effective behaviour change technique e.g. energy conservation

Commitment

Written pledge to change behaviour linked to specific goal.

"I commit to **3 short showers** per week"

Social influence

Our behaviour is influenced by what other people do, or by what other people think.

Family members 'publicly' shared their efforts to reduce their showering time using a chart in the bathroom.

QUESTIONNAIRES

Demographic   Data on house/members of household

Showering habits   Self-report of own showering behaviour + beliefs about other people's showering behaviour

Environmental self-identity/values

Extent to which you see yourself as a type of person who acts environmentally-friendly
Balance of egoistic, altruistic, environmental values

Sustainable Showering questionnaire

Acceptability of solutions to reduce water/energy from showering
Open-ended questions about intervention

STUDY DESIGN

Participating households

Representative sample across 5 main ACORN categories draw from 3 water company areas

Metered and unmetered properties

Essex and Suffolk
Wessex
Severn Trent

staggered start – Oct 2014 to March 2015

Phase 1: Baseline
1 month

Phase 2: Intervention
1 month

Visit 1   **Visit 2**   **Visit 3**

Monitoring under normal usage conditions

Intervention group vs control group
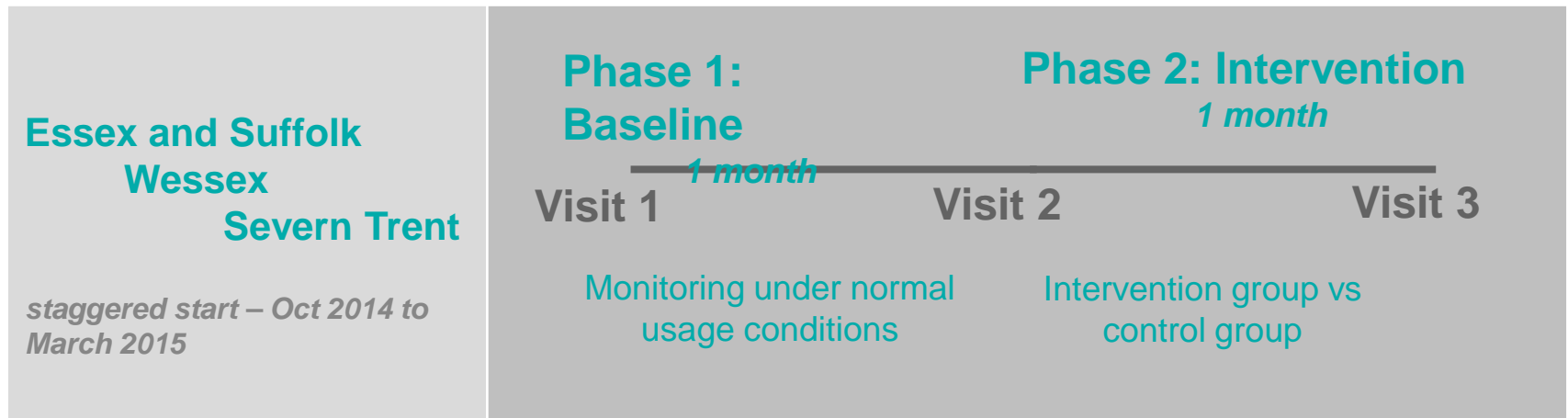
Intervention phase

Households were allocated to either 'Intervention', 'Control', or 'Excluded' groups.

Households were 'excluded' based on the suitability of their shower for taking the low flow showerhead: electric showers and power showers with a flow rate higher than 12l/min. Households then randomly assigned to either the 'Control' group or the 'Intervention' group

BASELINE: DURATION

16.600 invitation letters sent out: 339 households participated in study
Baseline: 6977 events across 295 showers for 276 households

What time of day do people shower?

Frequency of showering

Average frequency = **.4** showers per person per day
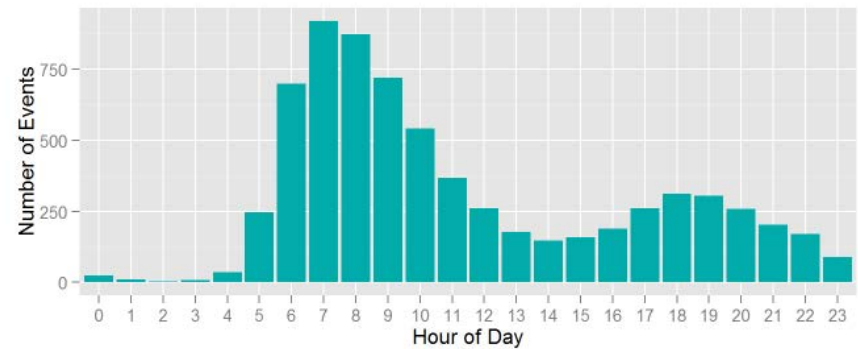
Shower duration
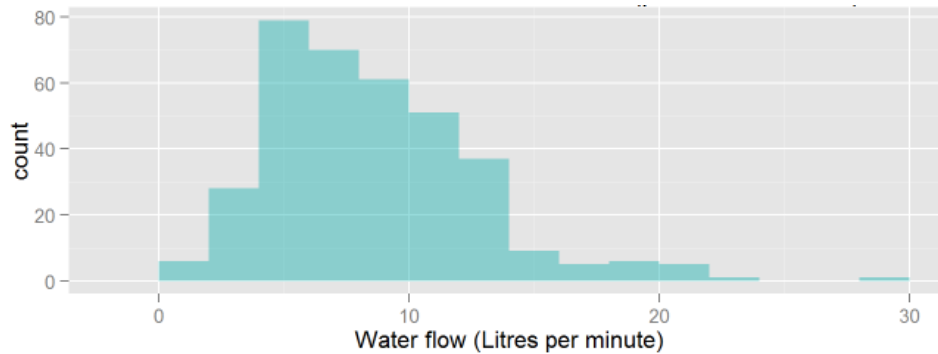
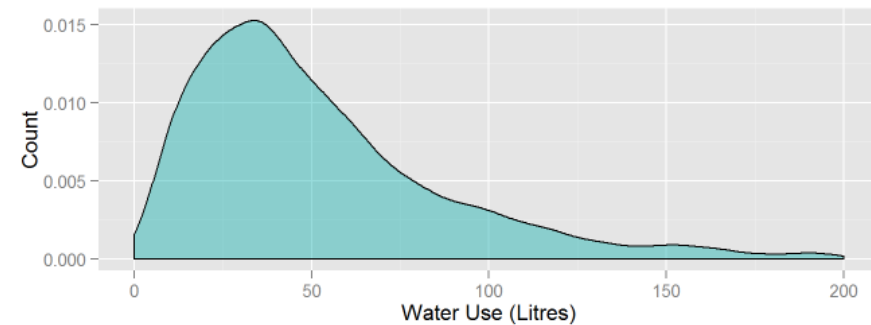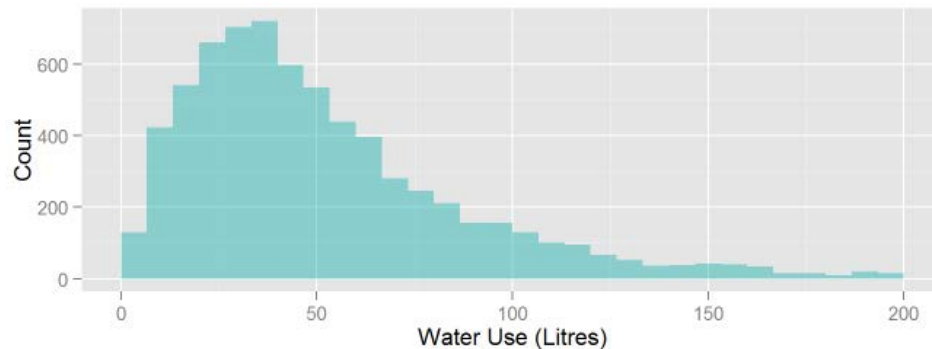Average shower length = **6 min 37 s**, median = 5 min 35 s
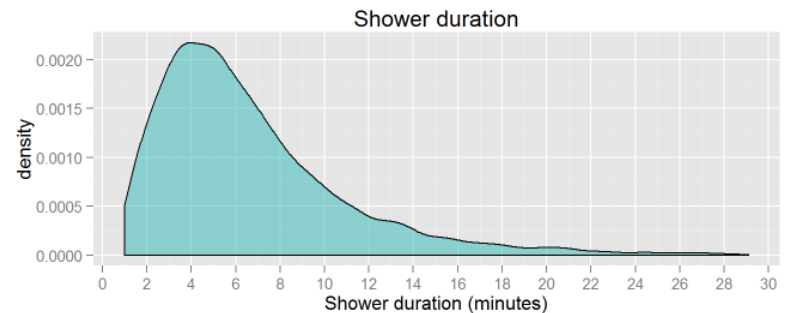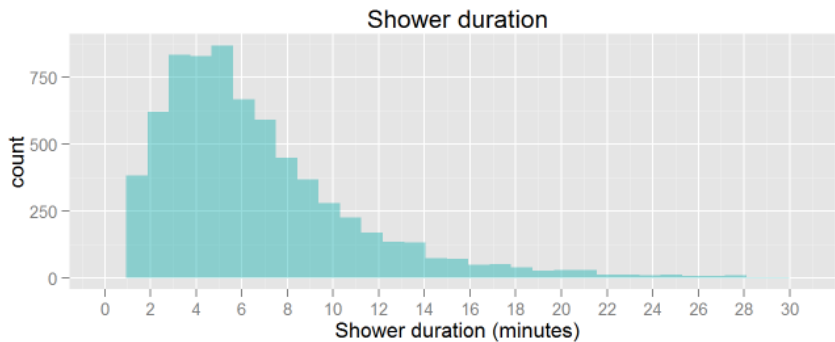
BASELINE: WATER USE

Flow rate
Average flow rate = **8.51 l/min**, Median = 8l/min
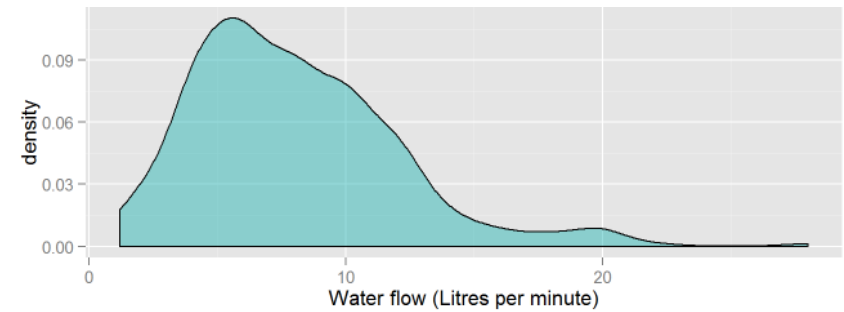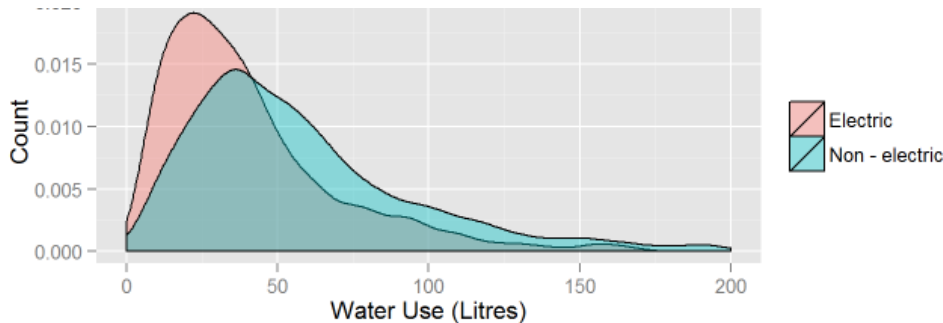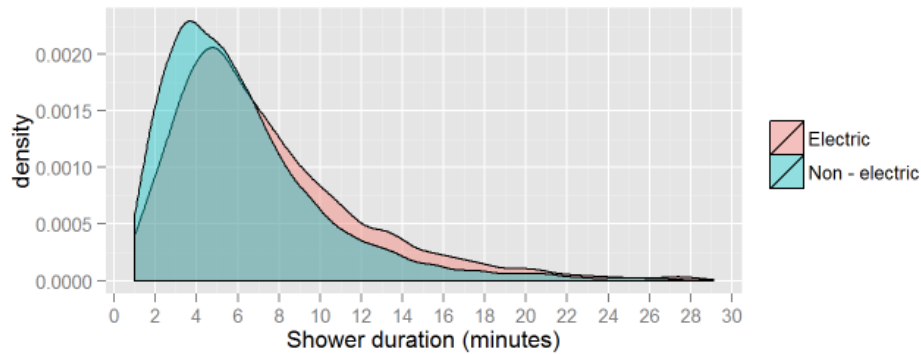

Water use (flow rate x duration)
Average water use = **53.65 l**, Median = 43.2 l

ELECTRIC/NON-ELECTRIC SHOWERS

	Duration	Water use
Electric	7 min 24 s	40.76 l
Non-electric	6 min 14 s	49.24 l

Correlation between flow rate and shower duration
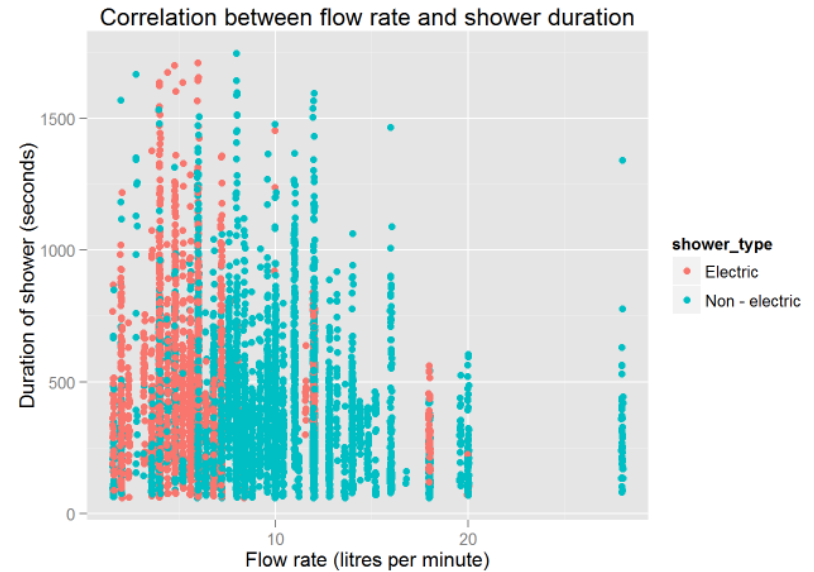
No clear relationship between flow rate and duration. Correlation = -.15

GENDER & AGE

Diary matches for 427 participants, 3592 matched events

Gender differences?

Shower duration for men and women: **6 min 53 s men** (n=190) and **6 min 38 s women** (n=237)

Age differences?

Shower duration split by age
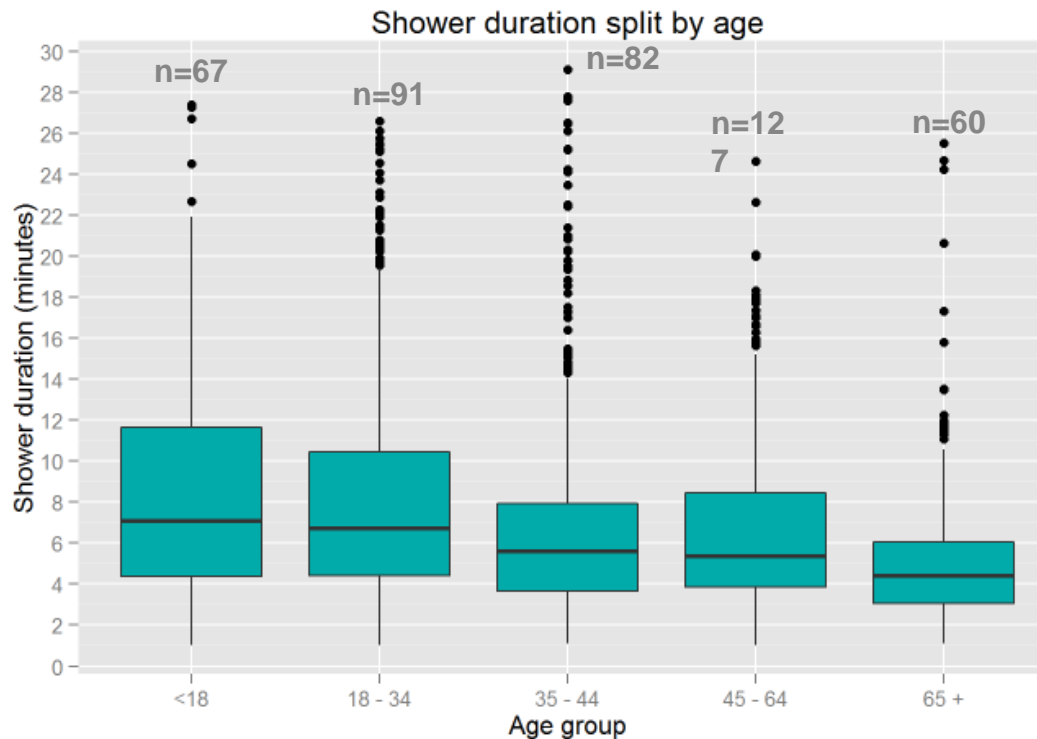
INTERVENTION: DURATION

Control group: 73 showers, 145 users, 4689 showering events
Intervention group: 65 showers, 102 users, 3159 showering events

Average shower duration

	Phase 1	Phase 2
Control	6 min 42 s	6 min 25 s
Intervention	6 min 20 s	5 min 9 s

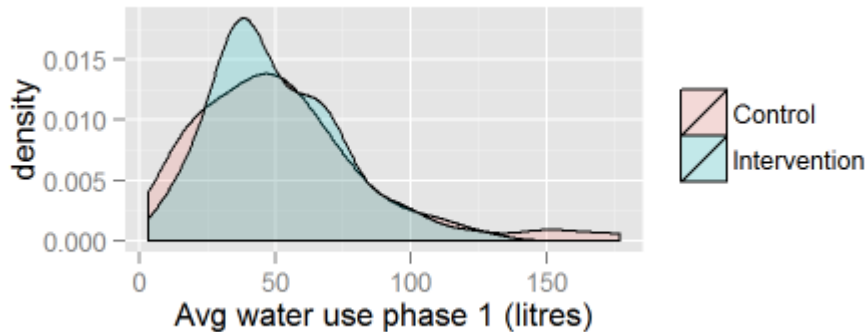Significant reduction in shower duration in intervention group compared to control group
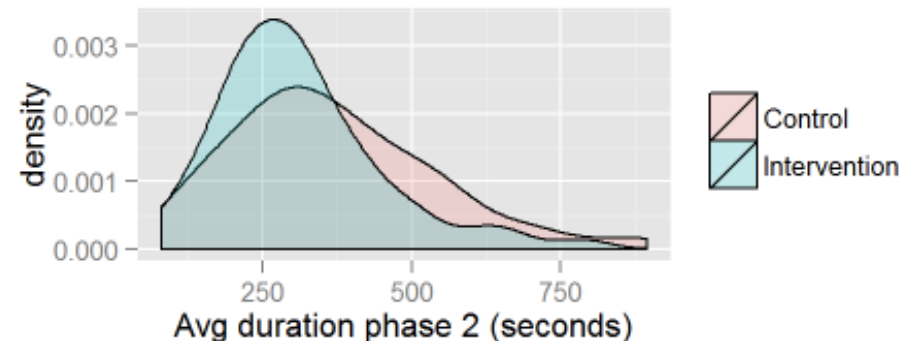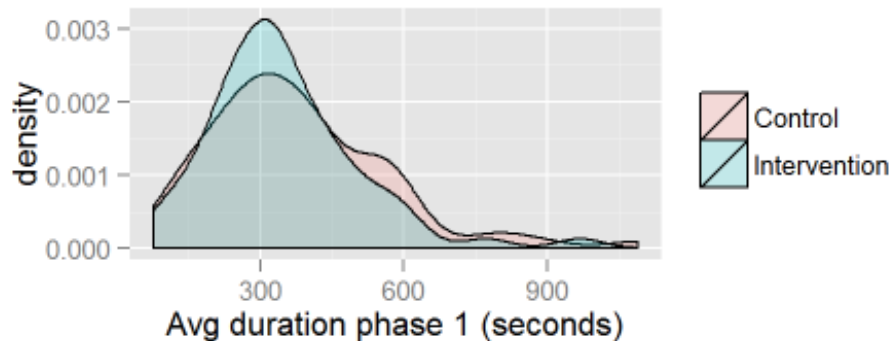
INTERVENTION: WATER USE

Average water use (l)

	Phase 1	Phase 2
Control	56.9	53
Intervention	55.1	45.1

Significant reduction in water use in intervention group compared to control group
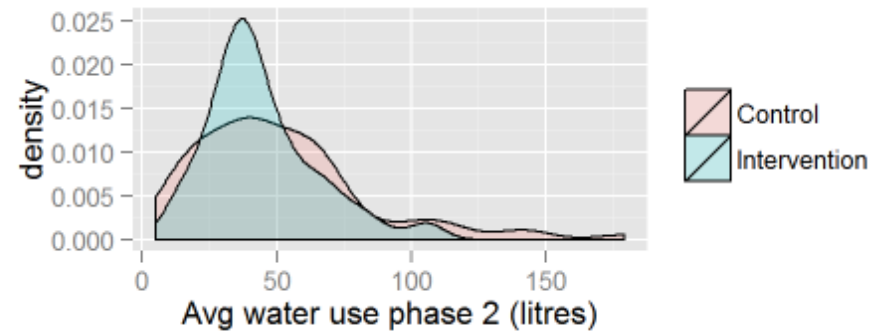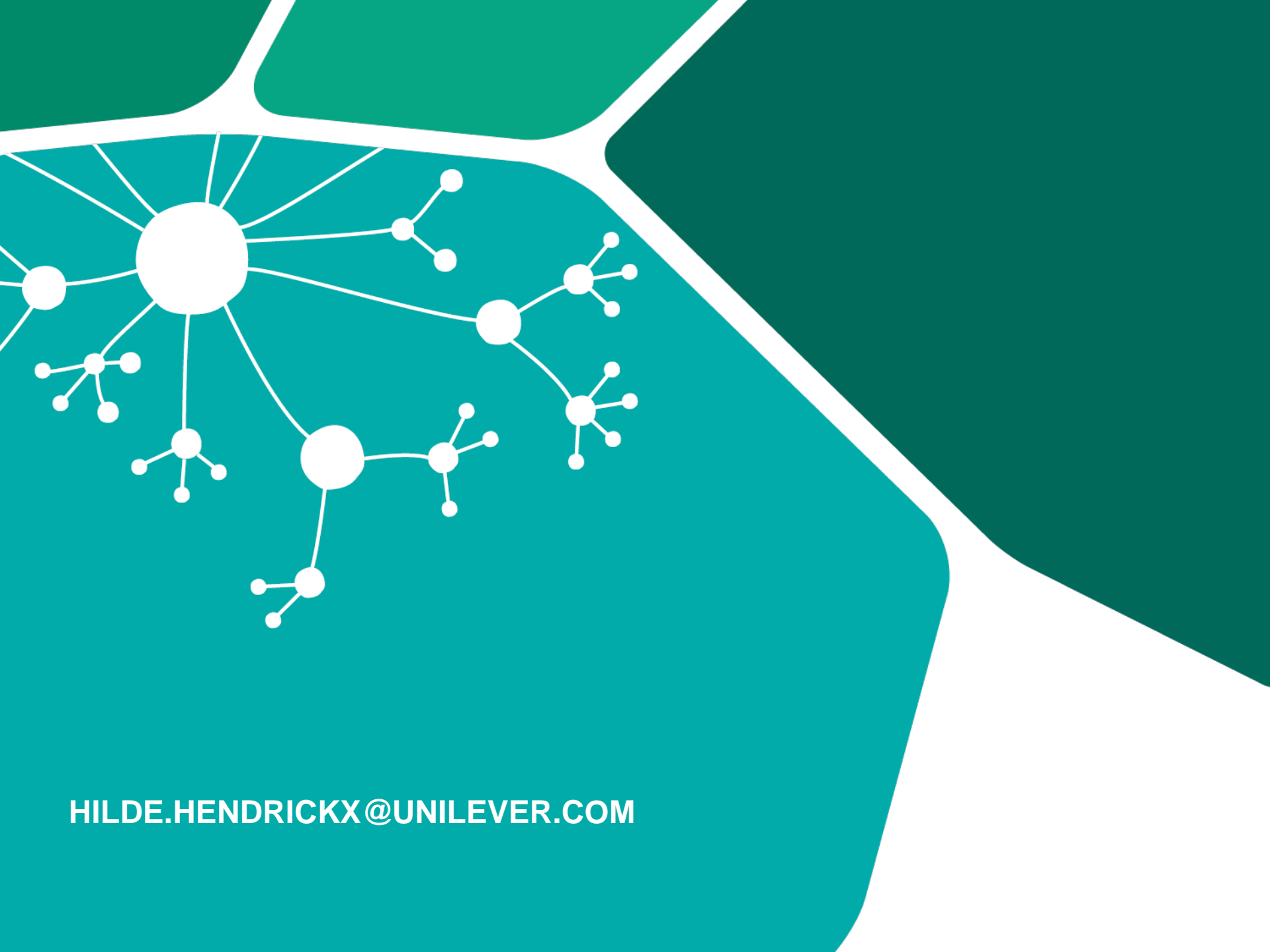
CONCLUSIONS

The use of sensor technology can help to give a more accurate picture of showering habits. To truly understand the behaviour, we will need a combination of methods and approaches.

Changing showering habits is possible. Further research is required into the long term impact of the interventions and to determine what the 'active' elements of the interventions are.

Developing 'behaviourally sensitive' devices is a promising way forward. Technology and product design based on behaviour principles can help to steer behaviour.

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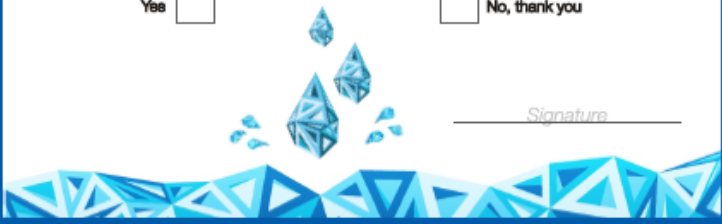
INTERVENTION MATERIALS

- **Shower Pledge:** Public commitment to a behaviour increases the chance that people will actually do it

- **Shower chart:** Use of social comparison and peer effects to change behaviour

- **Sticker:** Visible reminder to reinforce the behaviour