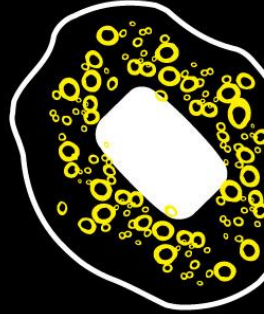
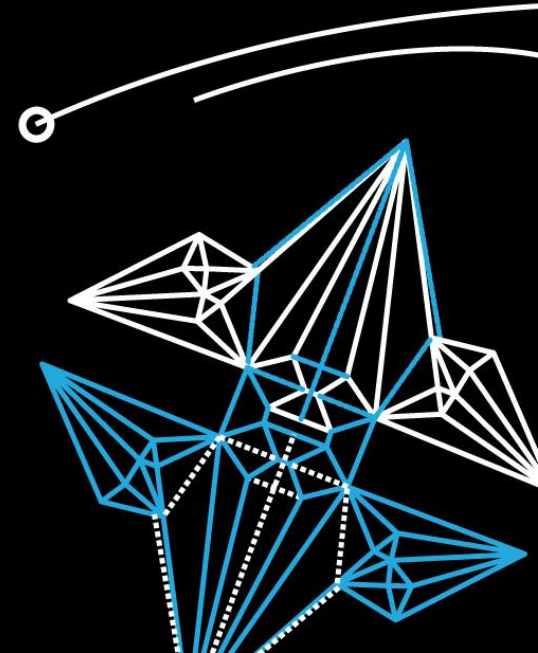


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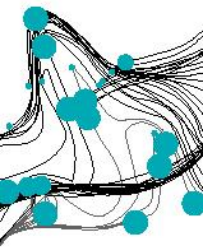


# TAKING A PRE-SWIM SHOWER

WHY THEY DON'T AND HOW CAN WE GET THEM TO DO SO?



Nadja Zwilling, Maarten Keuten, Pascal Wilhelm & Mark van Vuuren

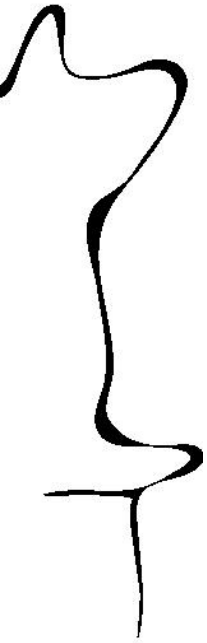


## The context of the study

- Water pollution mainly caused by humans: anthropogenic pollutants
  - Continual → sweating in water
  - Incidental → human excreta
  - Initial → pollution from peoples' bodies

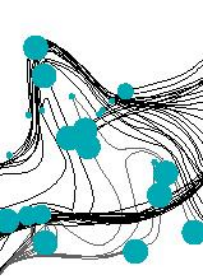
(Keuten, Schets, Schijven, & van Dijk, 2012)

How can we reduce the initial pollution?



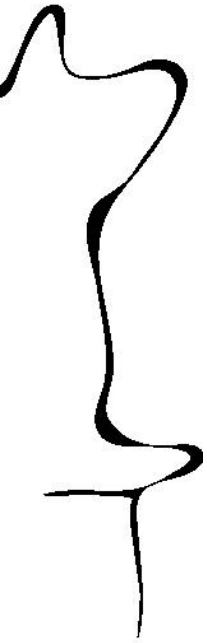
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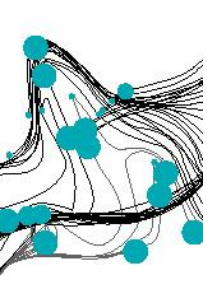




## Reduction of initial pollution

- Pre-swim showering
  - Preferably 60 seconds  
(Keuten et al., 2012)
- Minimal Intervention Strategy (MIS)
  - Small, cheap, unobtrusive, nudging  
(Thaler & Sunstein, 2009)
- Automatic behaviour
  - 95% of all human behaviour is automatic, not conscious  
(Pol, Swankhuisen, & van Vendeloo, 2006)





# PRE-STUDY: Why people [don't] take a shower?

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## Method

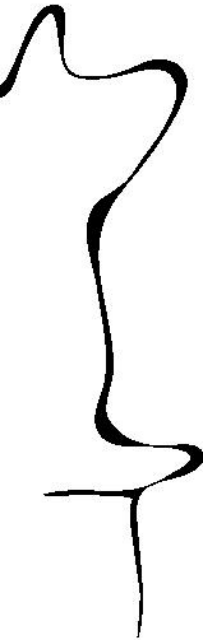
- Participants: adult swimmers at two swimming pools (n = 51) + minors at soccer club (n = 18)
- Questionnaire (17 questions)

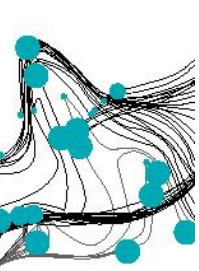
## Results

- 63.8% said to take a pre-swim shower
  - Hygiene (34.8%)
  - Mandatory (21.7%)

## Conclusion

- Looks like bathers do not really think about their behaviour: automatic!





# Three interventions

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## MAKE IT A GAME

- It is a fun thing to take a shower

## INFORMATIVE

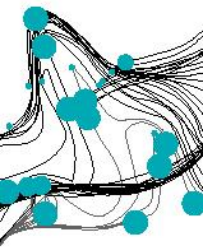
- Name the desired behaviour and explain why this is important/beneficial

## DESCRIBE THE NORM

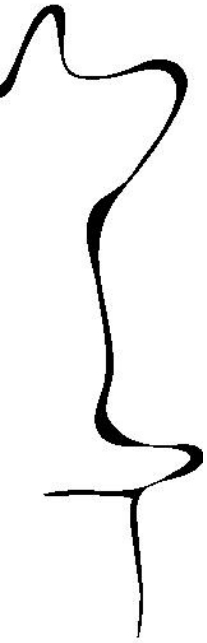
- Compliance to normal behaviour

(Cialdini, 2003; Cialdini, Demaine, Sagarin, Barrett, Rhoads & Winter, 2006; Goldstein, Cialdini & Griskevicius, 2008; Grant & Hofmann, 2011; Johnson, Sholcosky, Gabello, Ragni & Ogonosky, 2003; Kretzer & Larson, 1998; Nichols, 2014; Petty & Cacioppo, 1986; Pittet, Harbarth, Mourouga, Sauvan, Touveneau & Perneger, 2000; Pol & Swankhuisen, 2006; Schultz, Khazian & Zaleski, 2008; Schultz, Nolan, Cialdini, Goldstein & Griskevicius, 2007)





# INTERVENTION: Routing game



- 'Peripheral' cue
- (Johnson et al., 2003, Pol et al., 2014)

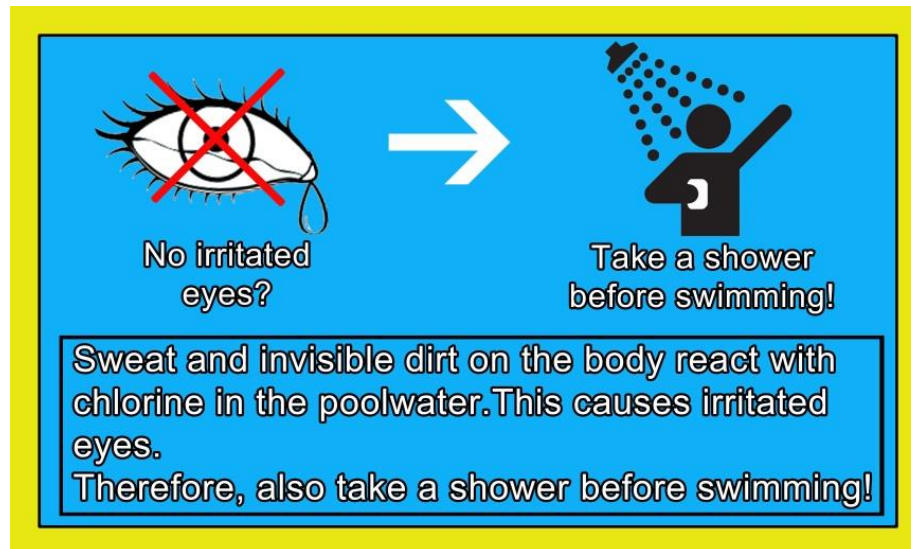


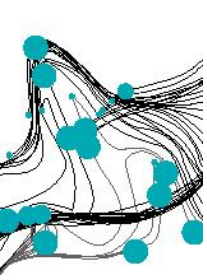


# INTERVENTION: INFORMATION

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- 
- 'Central' route
  - Based on sign 'negative consequences' (Nichols, 2014; Grant & Hofmann, 2011)





# INTERVENTION: SOCIAL NORM

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Conformity and compliance (Cialdini, 2003)

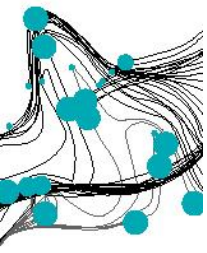


Most swimmers also  
take a shower  
before swimming.

This is cleaner for  
you and for the  
other swimmers.

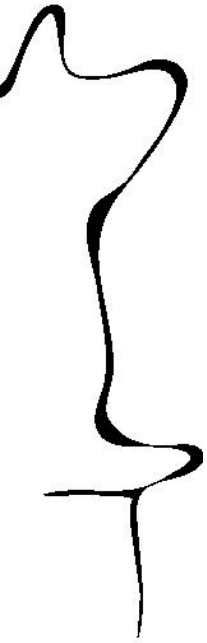






# THREE INTERVENTIONS, THREE POOLS

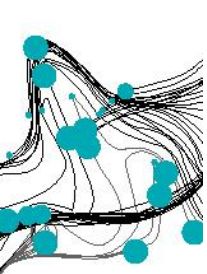
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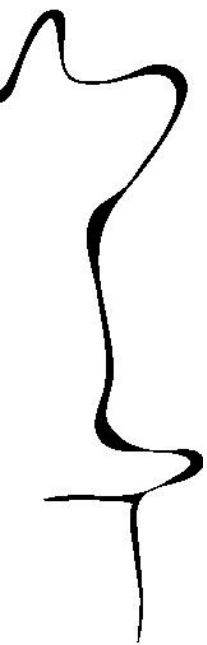
- Participants: 3188 persons
- Three swimming pools in the Netherlands
- Observations
  - Baseline measurement
  - Post measurement (after implementation interventions on floor)
  - 'unnoticeable' spots, pre-printed list
- Post questionnaire: 62 participants



So.....?



# FINDINGS



*Percentage of participants that did take a shower before swimming*

Intervention	Before intervention (%)	After intervention (%)
Routing game	25.3	24.4
Information	23.5*	28*
Social norm	55	57.4

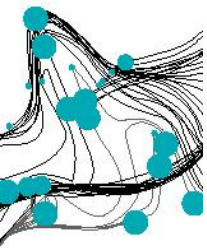
\*  $p < .05$

Note: effect size low for intervention 'Information' (= .07)



No irritated eyes?      Take a shower before swimming!

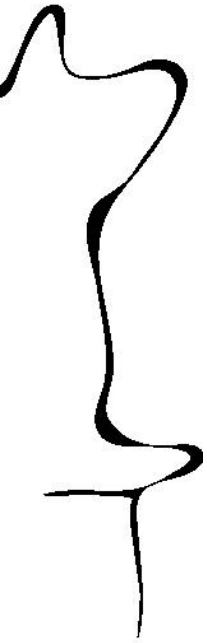
Sweat and invisible dirt on the body react with chlorine in the poolwater. This causes irritated eyes. Therefore, also take a shower before swimming!

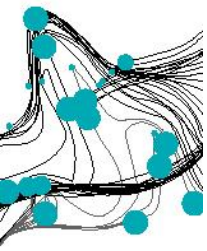


## FINDINGS

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- Baseline and post measurement
  - Intervention 'Information'
    - More men than women took a pre-swim shower
    - Age groups 21-30 years + 40-51 years showered significantly more
    - 1 accompanying person: increase pre-swim showering
  - All locations:
    - More men than women showered
    - Carrying belongings → less showering
    - 71% - 83% showered less than 30 seconds

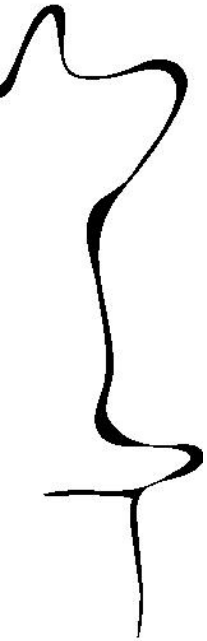


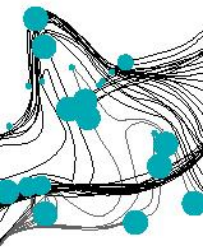


# FINDINGS

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- Post questionnaire
  - Intervention 'Routing game' (n = 22)
    - 63.6% did see intervention
  - Intervention 'Information' (n = 29)
    - 31% did see intervention
  - Intervention 'Social norm' (n = 11)
    - 45.5% did see intervention
  - All interventions were positively evaluated



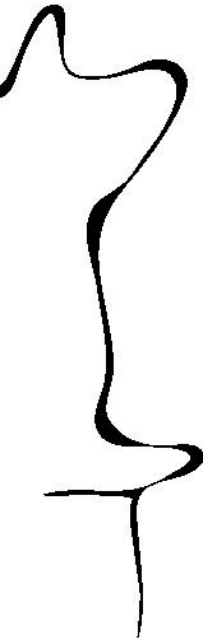


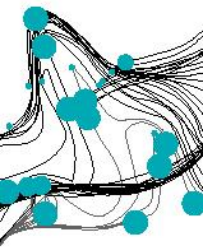
# CONCLUSION AND DISCUSSION (1)

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## Three major findings

- Minimal interventions can influence behaviour (intervention 'Information')
  - Effect size low (still practical importance if costs and effort are low) (Nandy, 2012)
  
- Participants knew the norm: a pre-swim shower
  - Did not act like it
  
- Carrying belongings → less pre-swim showering



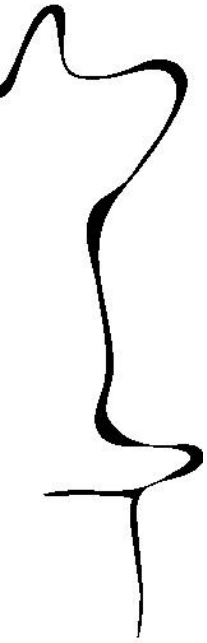


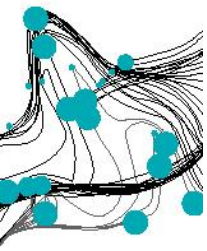
## CONCLUSION AND DISCUSSION (2)

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### Interventions

- Intervention 'routing game'
  - Seen the most, least effect
- Intervention 'Information'
  - Seen the least, largest effect
- Intervention 'Social norm'
  - No significant increase

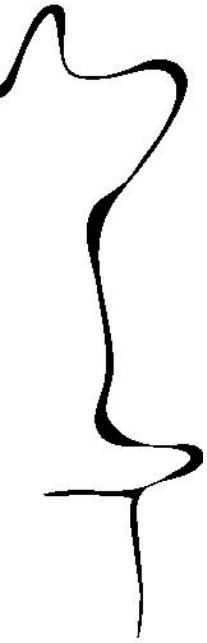


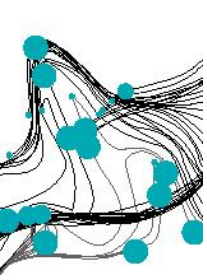


## LIMITATIONS

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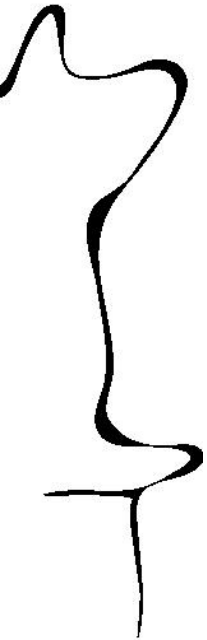
- Timing: spring/ summer → outdoor swimming pools open
- Invalid results of two water measurements
- Small sample pre-study and post questionnaire
- Visibility interventions 'Information' and 'Social norm'





# IMPLICATIONS

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## Research

- Optimizing effect intervention 'Information'
- Differences between sex and pre-showering
- Age groups differences, minors have to be influenced in another way
- Extend shower duration

## Practice

- Intervention 'Information' can already be implemented
- Belongings important: a temporally place to store them

