Appetite Control & Energy Balance RESEARCH

UNIVERSITY OF LEEDS

How state of the art technology can help people maintain weight loss

James Stubbs

r.j.stubbs@leeds.ac.uk

nohow.eu

Obesity: Prevention is better than cure

- BUT >60% of the adult population are already collectively overweight or obese
- Projected health care costs are unsustainable
- No one organisation, approach or sector can solve the obesity problem.
- Evidence-based interventions and commercial programmes for weight loss are widely available and effective in the short-term.
- ~40% of adults report at least one weight loss attempt in the last 12 months- 80% re-gain their lost weight.
- Obesity is a chronic relapsing condition- no simple cure: management, disease prevention.
- Physiological and psychological predictors/correlates of weight loss, maintenance or relapse

Weight loss is a predictor of weight regain

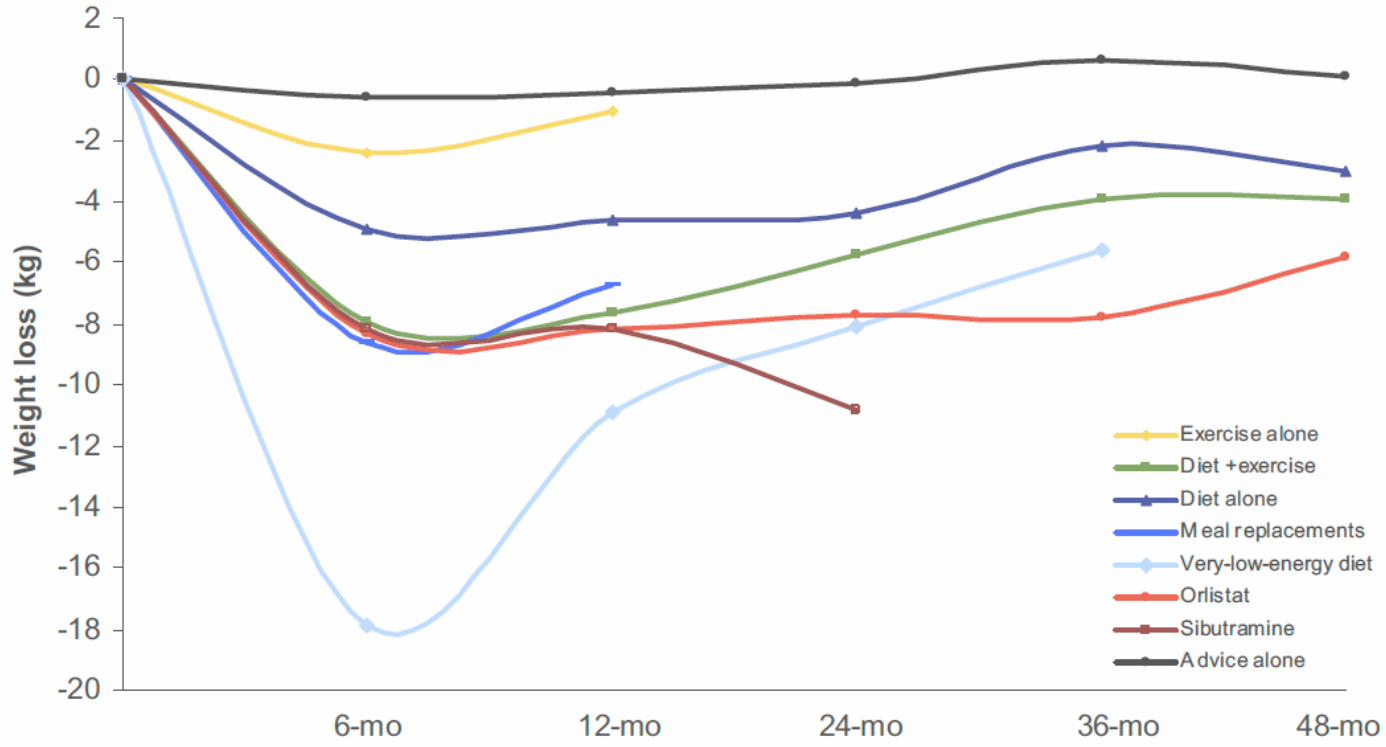
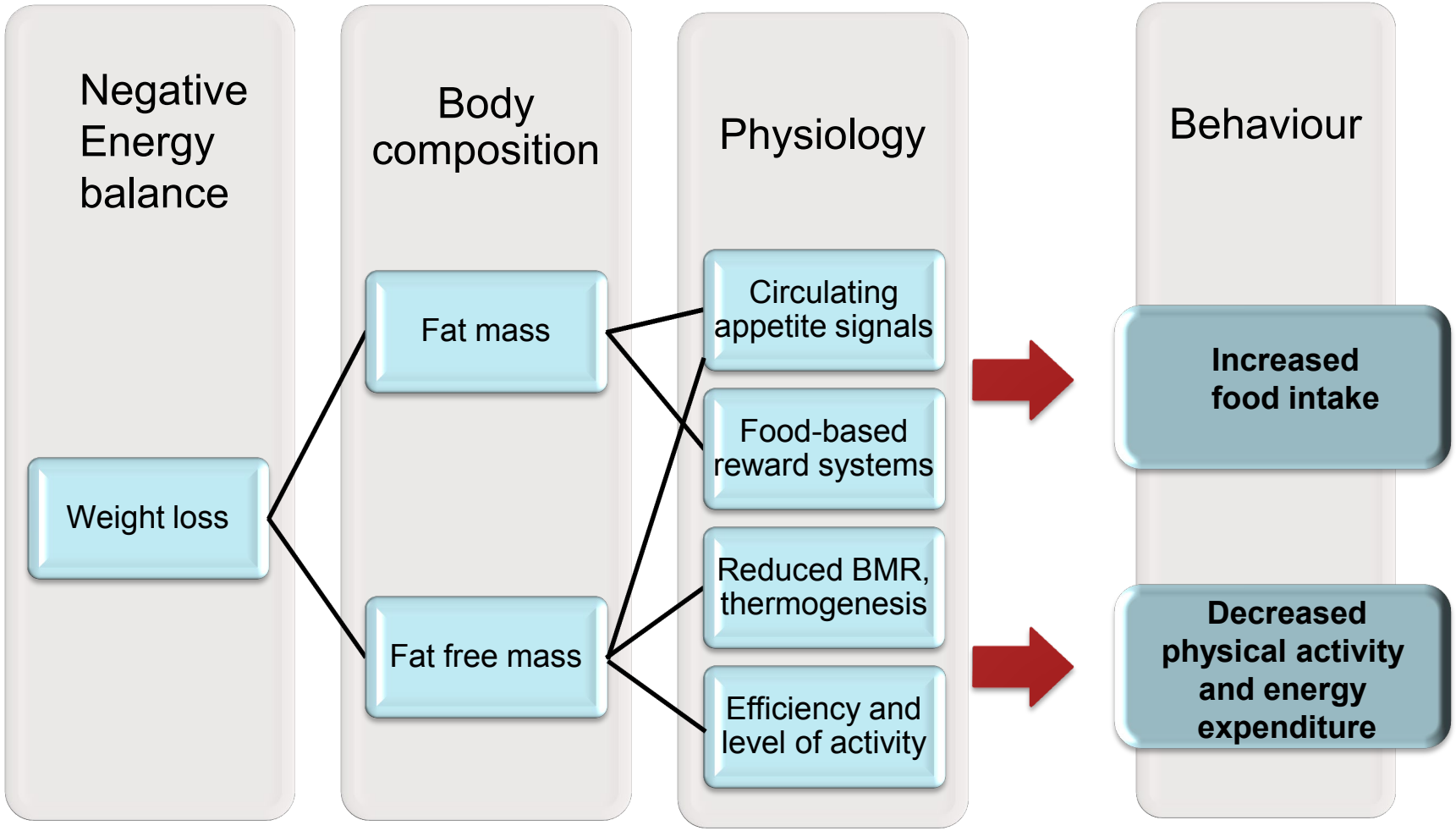


Figure 1. Average weight loss of subjects completing a minimum 1-year weight-management intervention; based on review of 80 studies (N=26,455; 18,199 completers [69%]).

No simple cure: prevention and management.

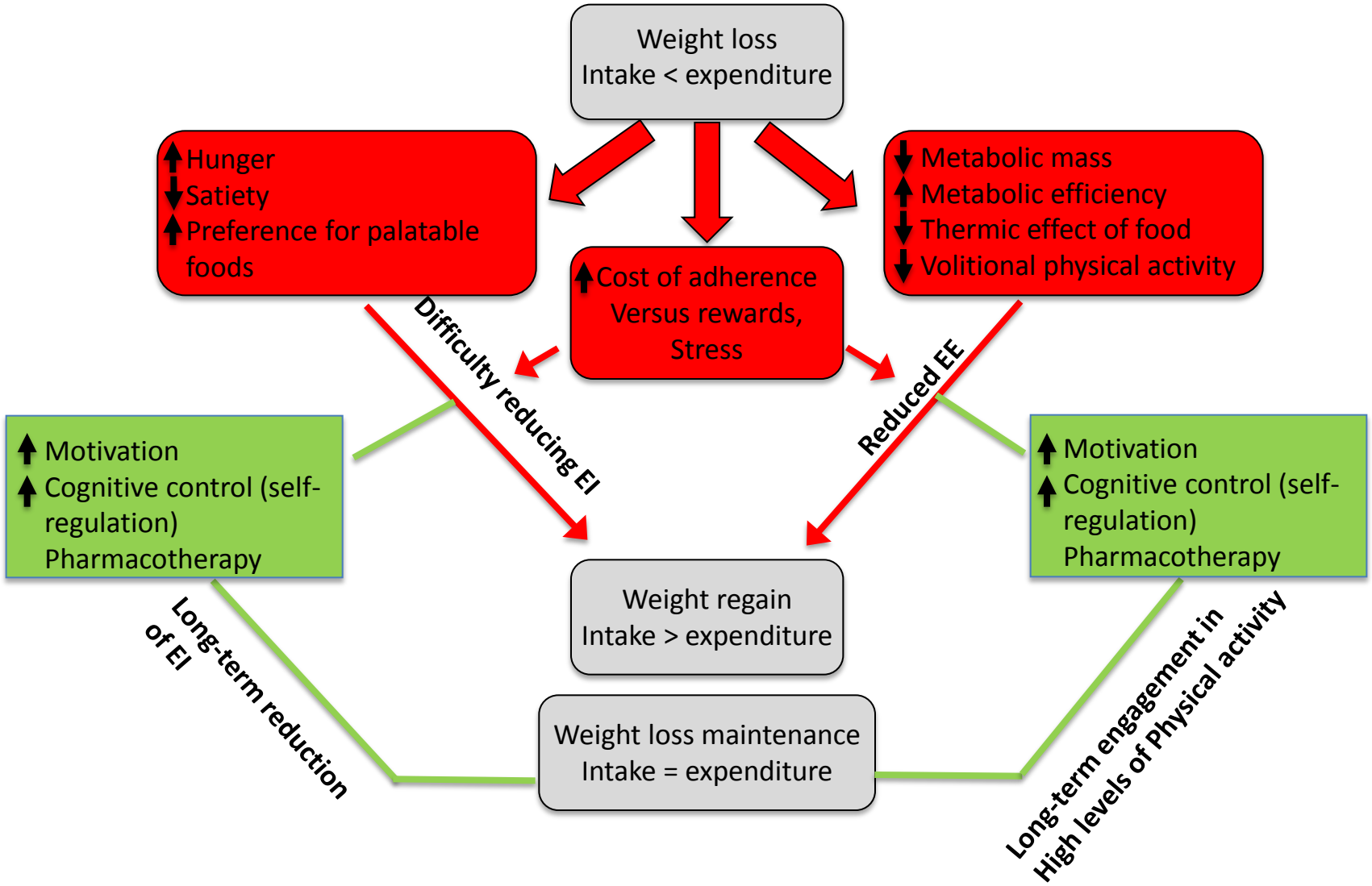
Franz et al. J Am Diet Assoc. 2007;107:1755-1767.

Physiological responses to weight loss can affect energy balance behaviours



Stubbs RJ, Lavin J. Nutrition Bulletin 2013: 38; 5-22.

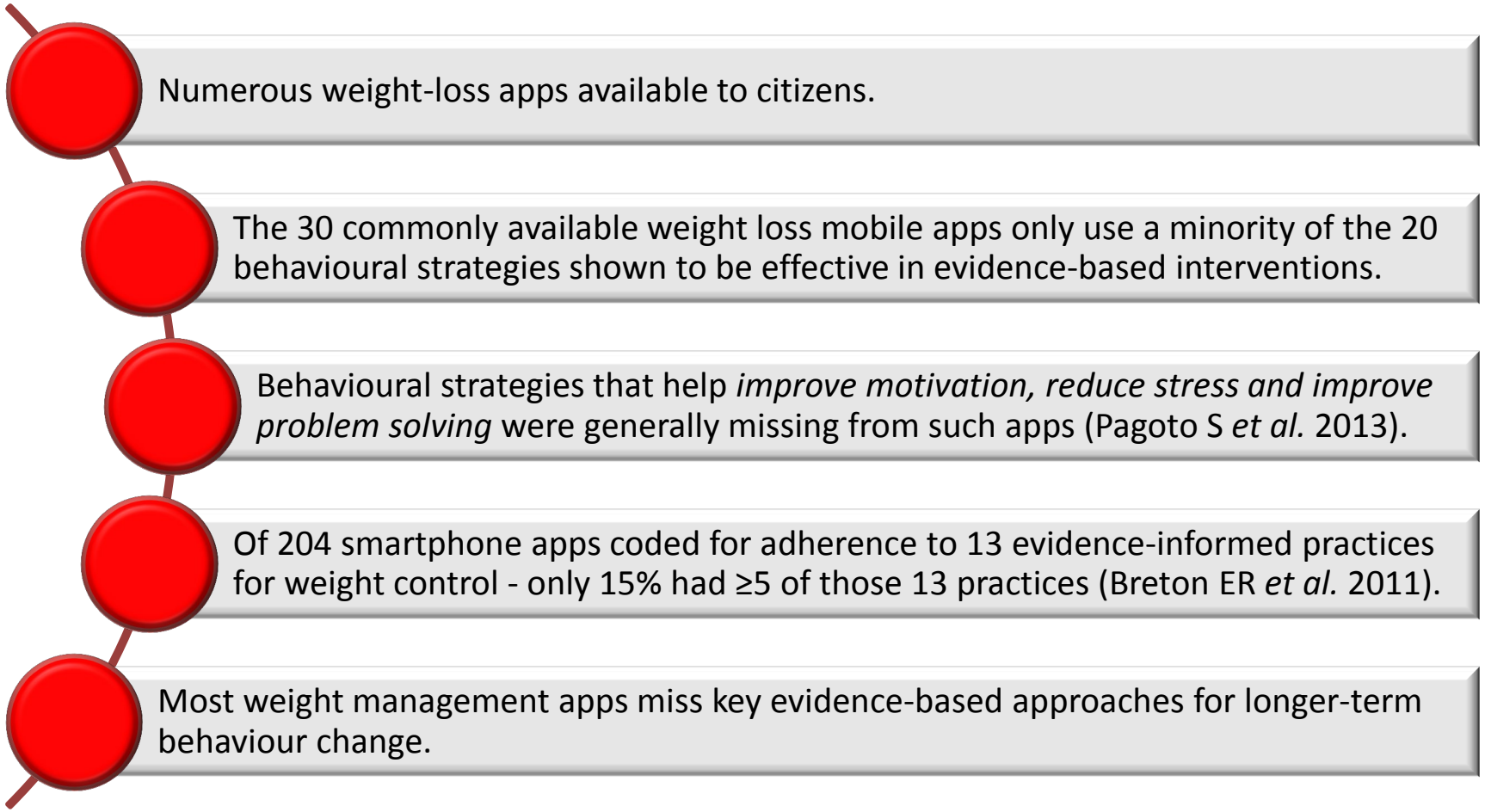
Physiological responses to weight loss define the the behavioural challenge for weight loss maintenance.



NIH Working Group Report: Innovative Research to Improve Maintenance of Weight Loss. Obesity 2015: 23; 7-15.

Can we design digital behaviour change interventions that overcome physiological resistance to weight loss?

Broken Market: most popular digital aproaches to weight management are not evidence based



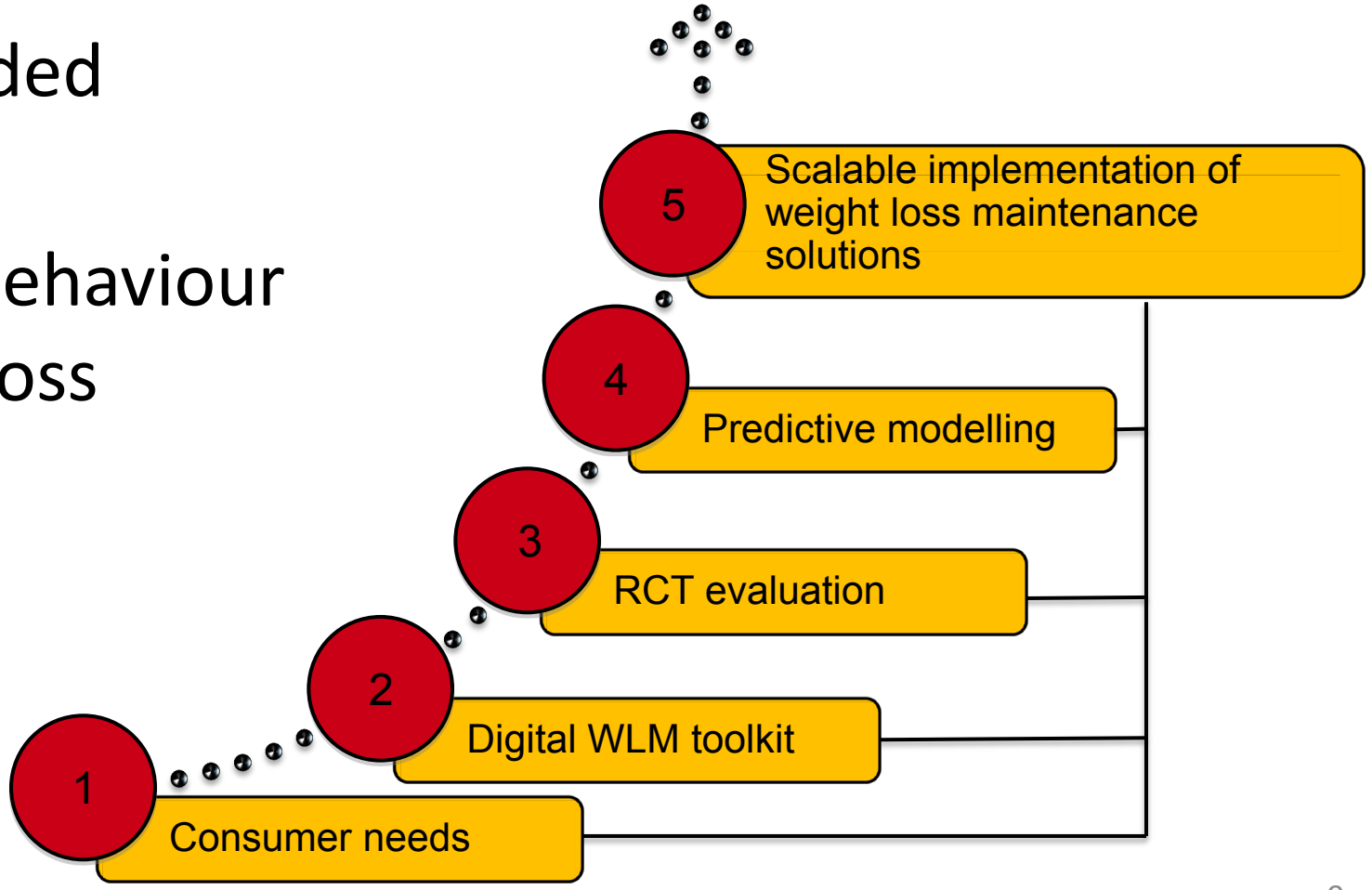
Prospective behavioural and psychological predictors of longer-term weight loss

	Psychosocial Factors	Relationship to longer-term weight loss
Self-regulation of eating and activity	Self-regulation of eating/activity	+
	Exercise self-efficacy	+
	Autonomous motivation	+
Stress, emotion, well-being	Perceived stress	-
	Decreased health-related QOL	-
	Depression	-
Control and loss of control of eating	Hunger	-
	Disinhibition	-

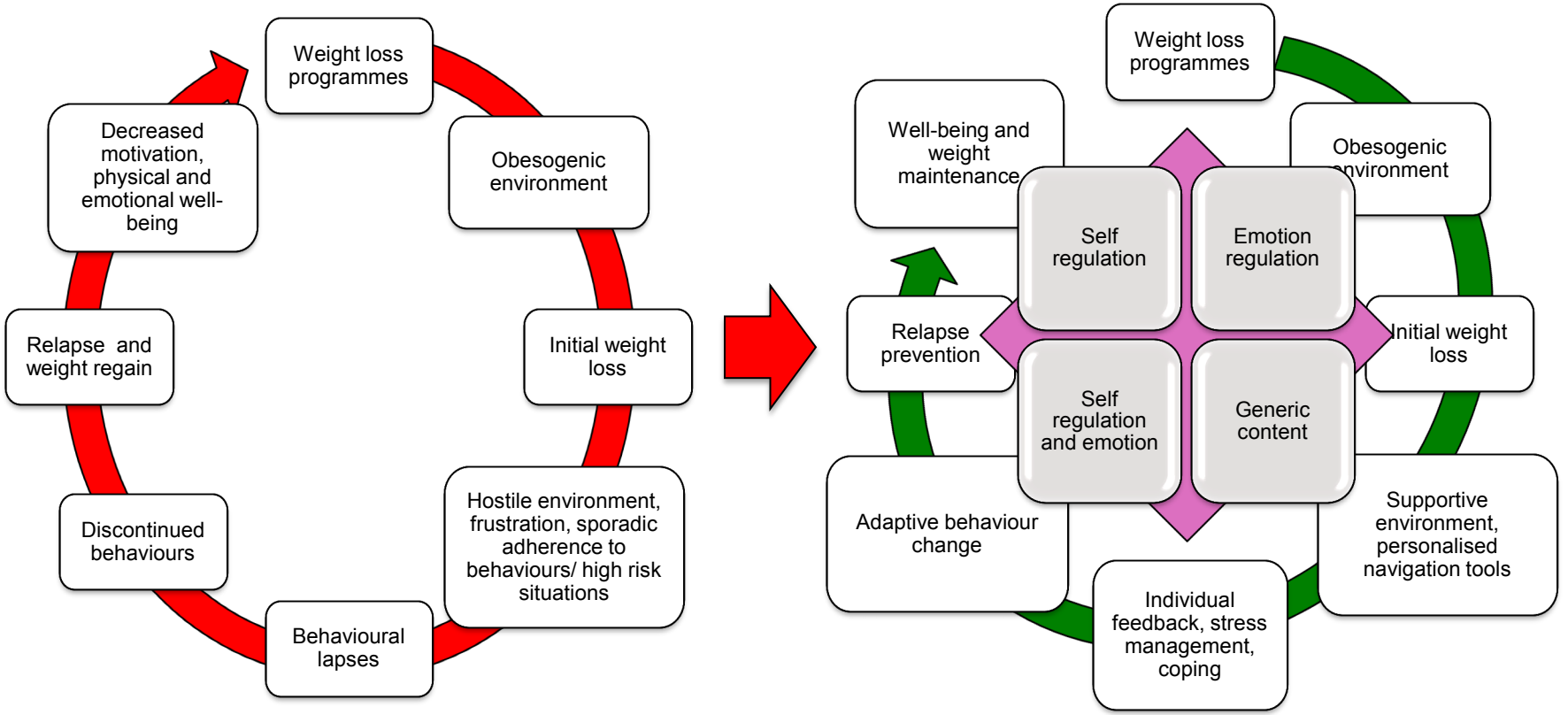
Wing et al. J Consult Clin Psychol 2008 76, 1015; Wadden et al. Obes Res 2011 12, 1515; Viera 2012 J Behav Med 36, 601; Delahanty et al Diabetes Care 2013 36, 34; Brantley et al. J Behav Med 2014 37 1155

Developing evidence-based behavioural strategies for weight loss maintenance in the general population: The NohoW project

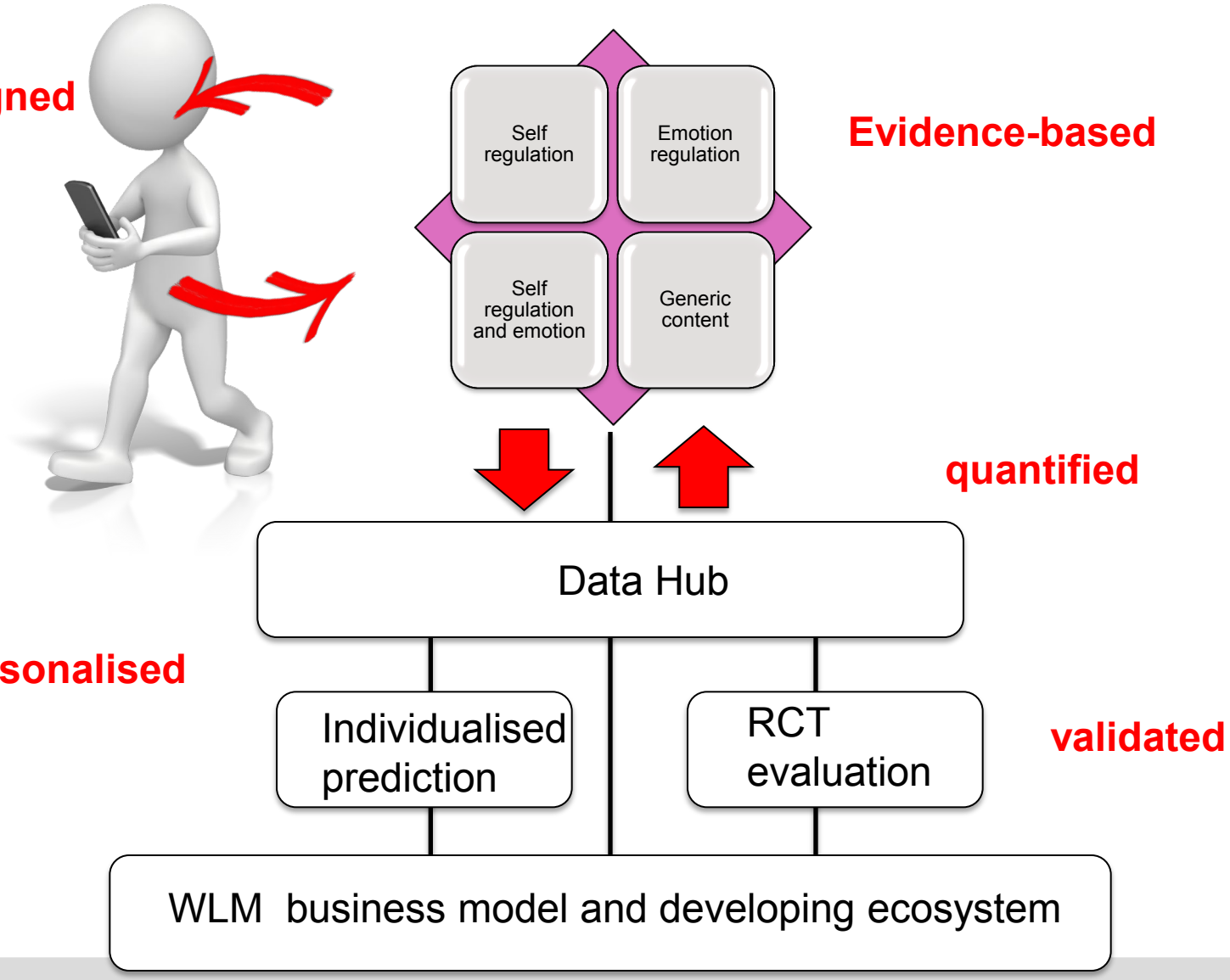
- 5 year, €5 million EC-funded project.
- Evidence-based, digital behaviour change tools for weight loss maintenance.



Using digital solutions to navigate to a healthier weight

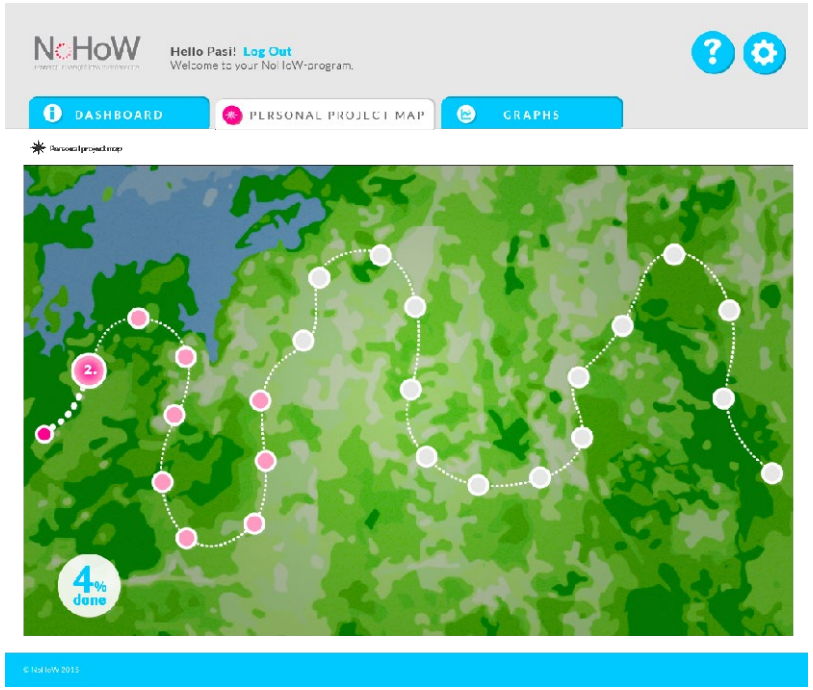


Digital toolkit for weight maintenance

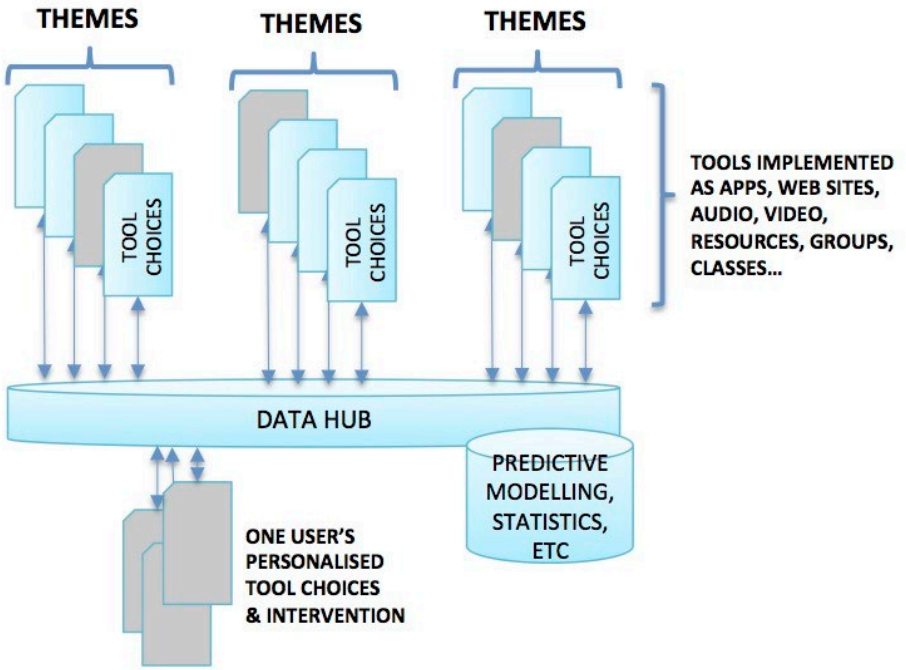


Personalisation

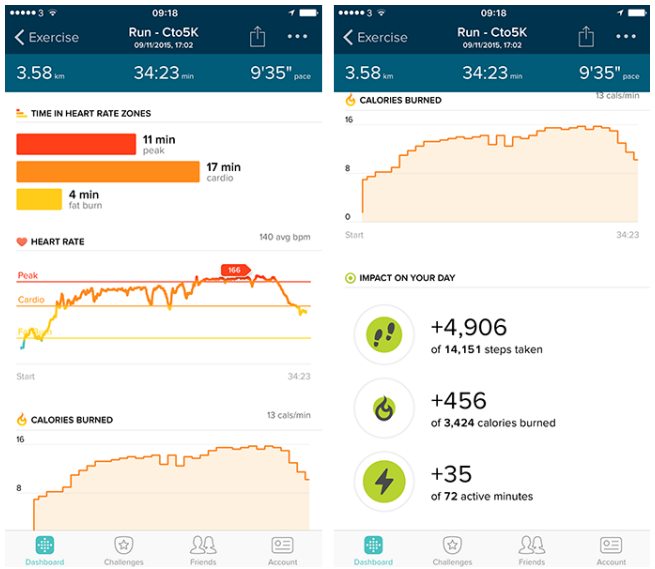
Profiling



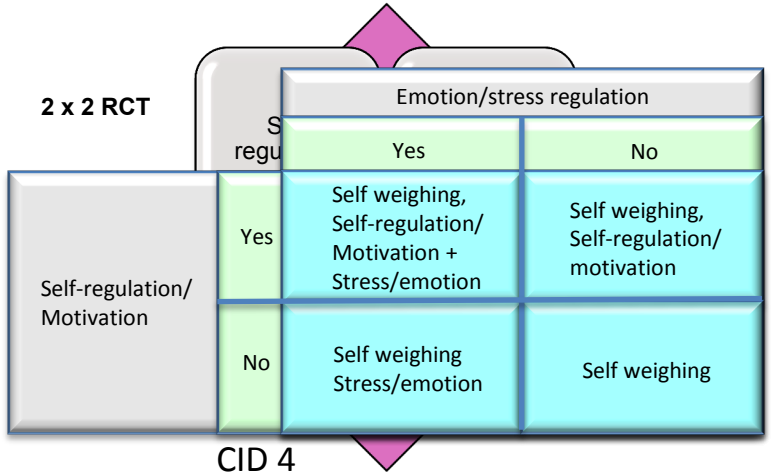
Choice



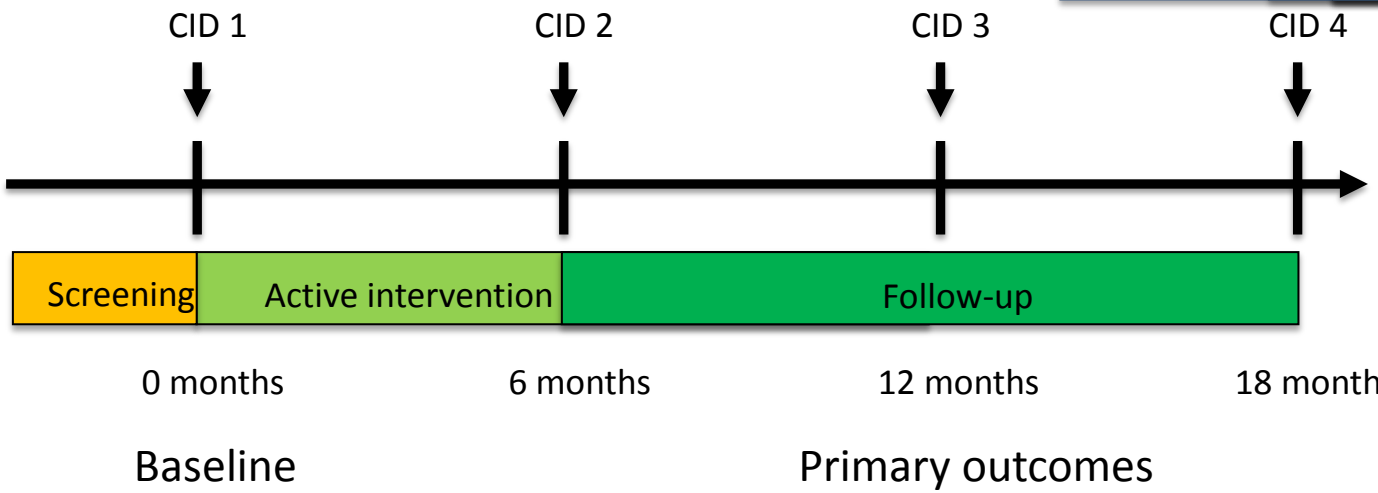
Tracking technologies



Trial design



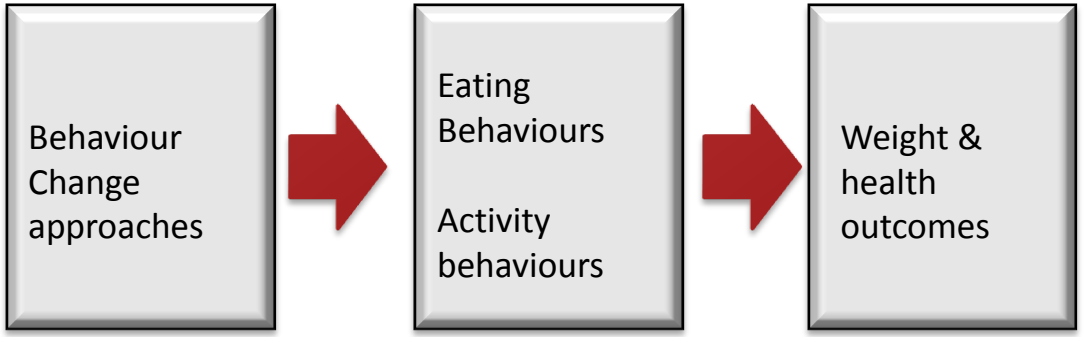
CID = Clinical investigation day



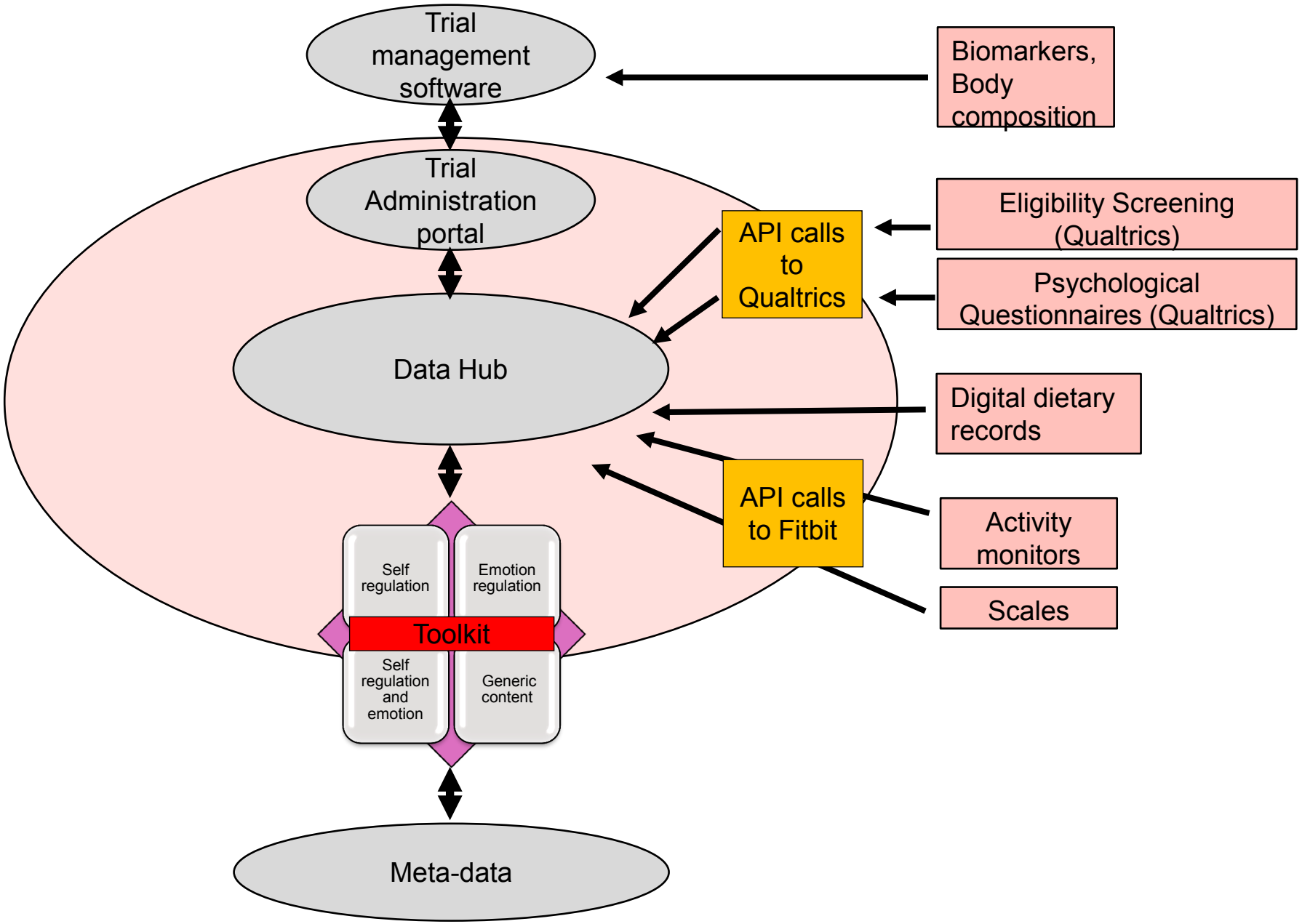
3 European countries (UK, DK, Pt)
1600 participants: BMI >25 and lost ≥5% in last 12 months

Digital measures and outcomes

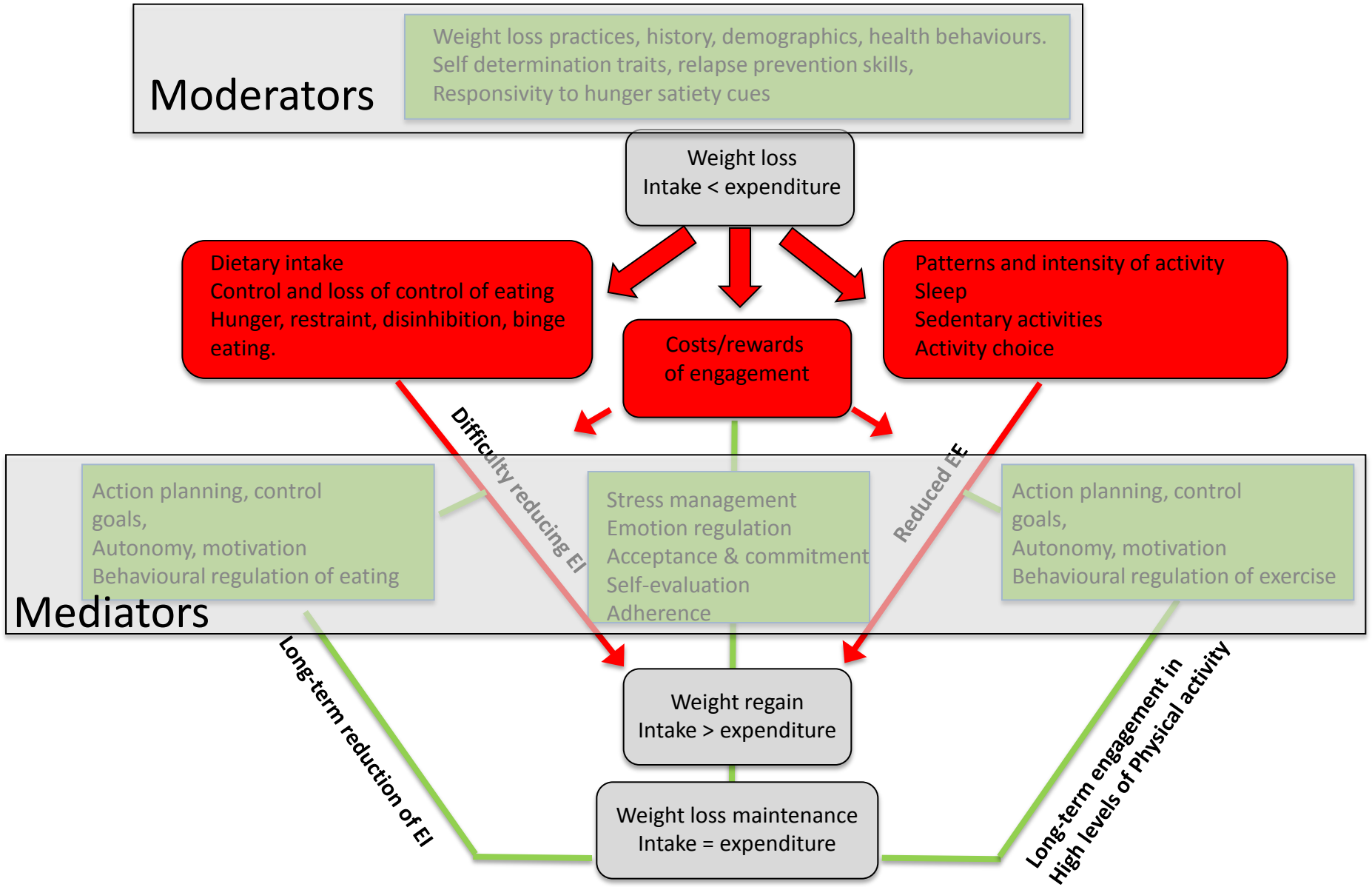
- **Screening**.
- **Baseline profiling** - moderators.
- **Primary outcomes** - weight.
- **Secondary outcomes** - health markers, psychological mediators of diet/activity, stress and emotion. Moderators of intervention effects.
- **Process evaluation** - intervention reach, dose, fidelity.
- **Wireless tracking** - weight, patterns, intensity of activity and sleep.
- **Dietary behaviors** - profile of food, energy and nutrient intake.



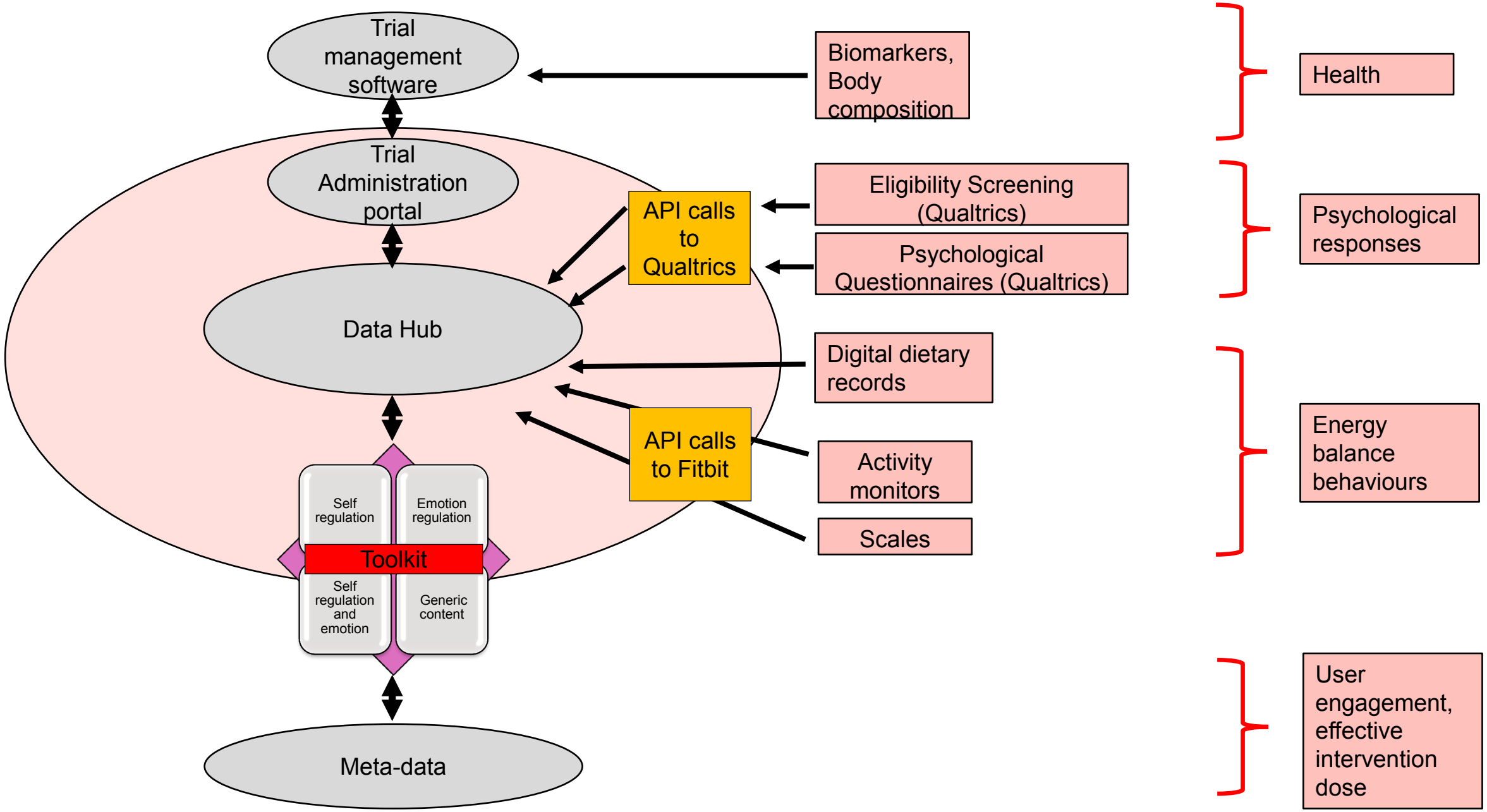
Digital architecture



Psychological an behavioural predictors of WLM in NoHoW



Digital architecture



Conclusions

- Weight loss induces physiological and behavioural changes that predispose us to weight regain.
- WLM interventions need to facilitate adjustment of individual energy balance behaviours to navigate around physiological resistance to weight loss.
- **Digital technologies:** routes to personalised navigation of energy balance behaviours.
- **Behaviour Change:** cause/effect models that consider self-regulation/motivation and emotion regulation/stress management as mediators of long-term energy balance behaviours.
- **Behavioural energy balance:** personalized solutions to long-term weight management through advanced tracking of EB behaviours and psychometric markers of likely change in such behaviours.

Acknowledgements

University of Leeds
Prof. John Blundell
Dr Graham Finlayson
Dr Catherine Gibbons
Dr Mark Hopkins
Dr Cristiana Duarte (Jan 2018)

<u>The Leeds NoHoW team</u>
Dr Sarah Scott
Beth Pearson
Lauren Ramsey
Fiona Croden
Joanna Michelowska

The NoHoW Consortium
Professor Berit Heitman, Region H, DK
Prof. Falko Sniehotta, University of Newcastle
Dr Liz Evans, University of Newcastle
Prof. Pedro Teixeira, FMH, Lisbon
Dr Antonio Palmeira, FMH, Lisbon
Dr Marta Marques, FMH, Lisbon
Dr Graham Horgan, BioSS, Aberdeen
Mr Euan Woodward, EASO
Dr Marcela Matos, CINEICC, Portugal
Dr Miika Ermes, VTT, Finland
Dr Paul Sacher, Slimming World
Prof. Liisa Lahteenmaki
Ciaran Clissman, Pintail, Dublin
Kylie O'Brien, Pintail, Dublin