

# The science of habit formation

Adrian Gore

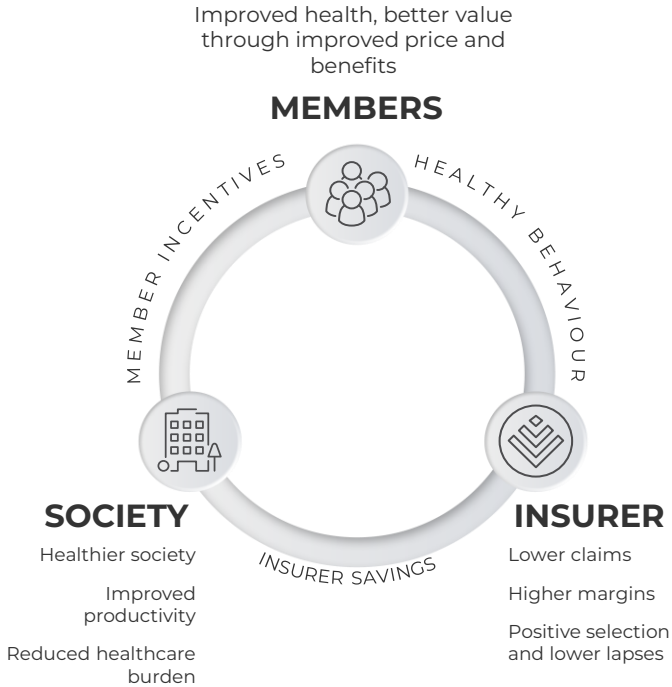
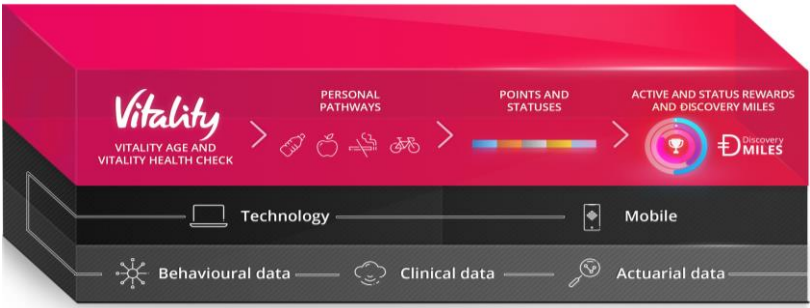
The Vitality logo is a white circle containing the word "Vitality" in a red, cursive script. It is surrounded by several curved lines in white, light blue, purple, and yellow. The background is a solid magenta color.

*Vitality*

**The Vitality dataset stands alone  
in its uniqueness**

# The Vitality Shared-Value Model is globally relevant

*Make people healthier and enhance and protect their lives*



40

Markets

>40m

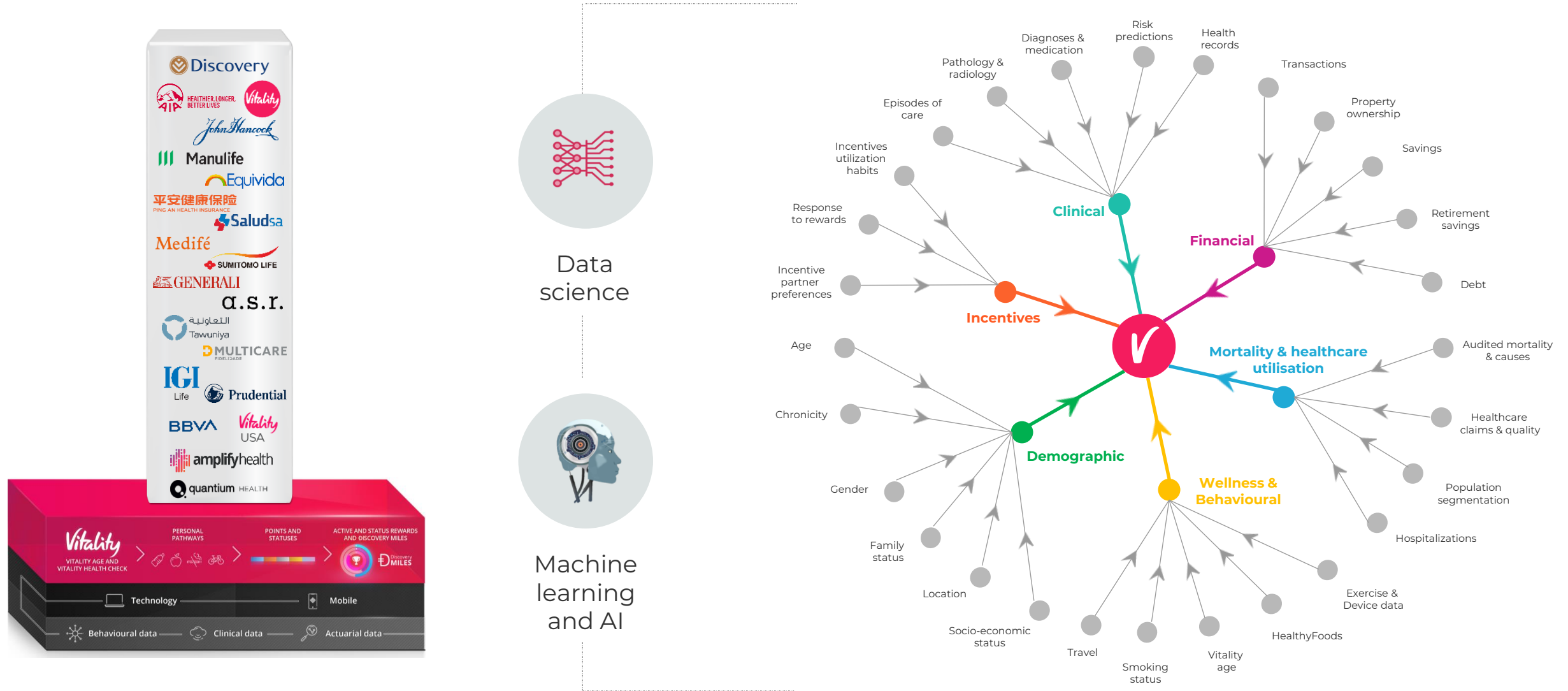
Lives impacted globally

In over 85%

Of global insurance market share

1 Source: Swiss Re

# Vitality's rich and comprehensive dataset allows for a sophisticated understanding of behaviour and the impact on mortality

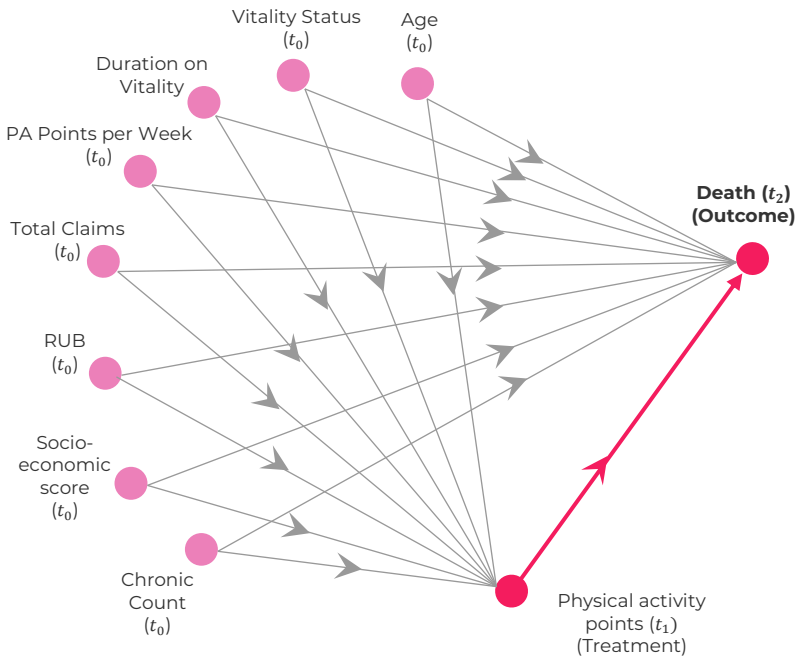


**The effect of behaviour change  
exceeds expectations**

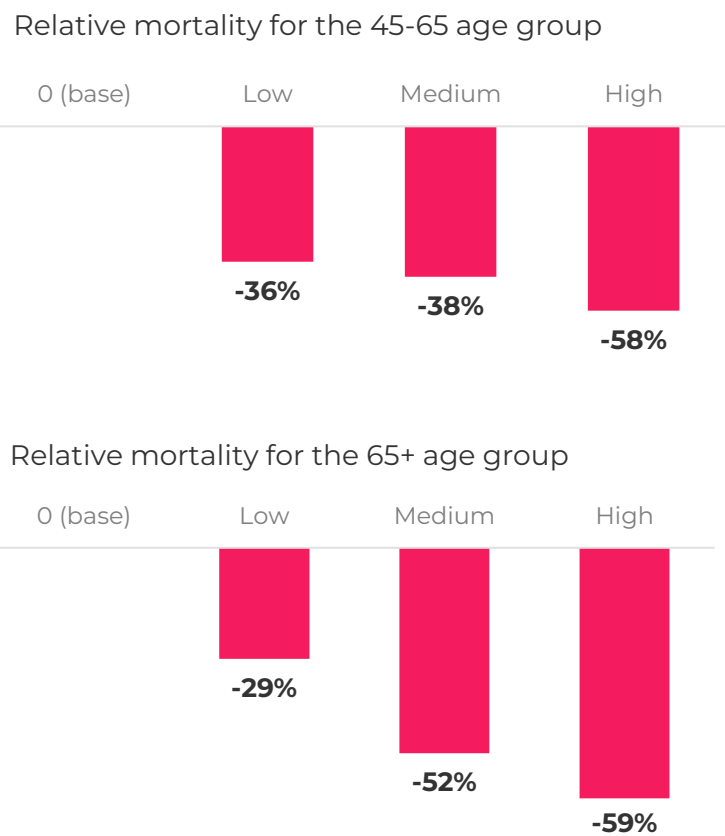
# Behaviour change has a causal impact on health and mortality and the impact increases with age



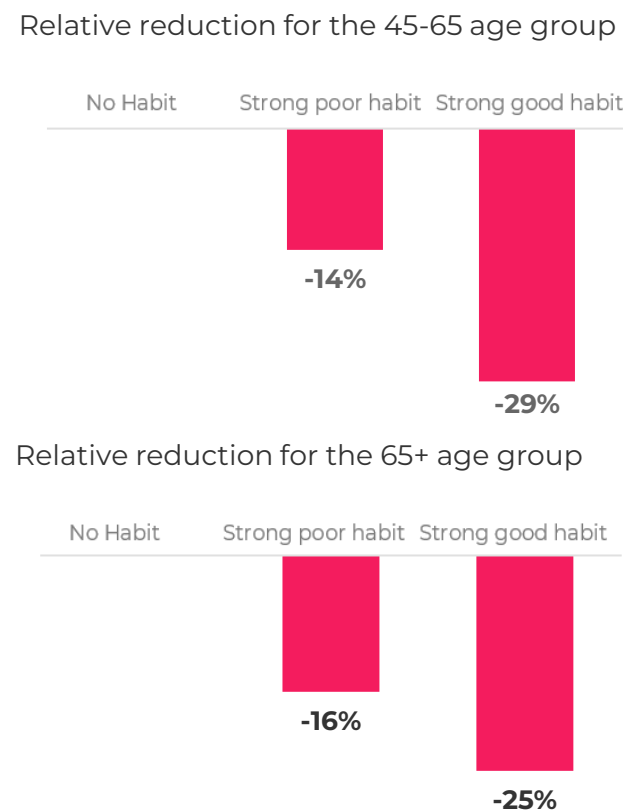
## Understanding the impact of physical activity on mortality after adjusting for confounding factors



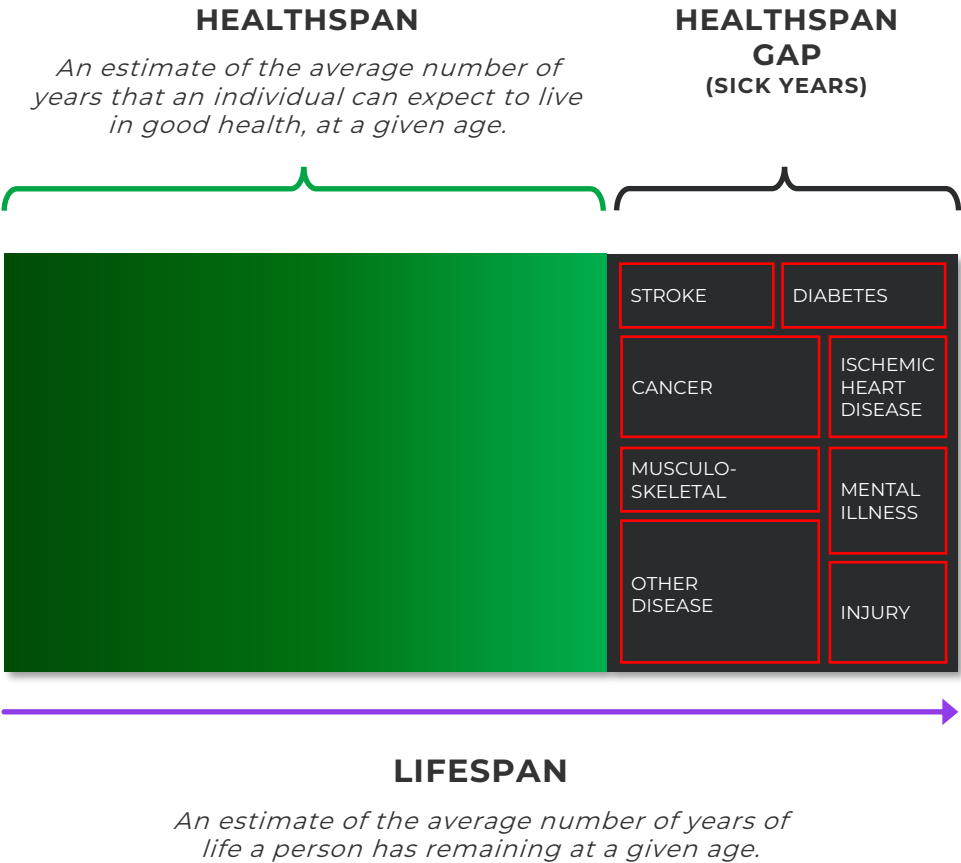
## Physical activity has a significant impact on mortality and it increases by age



## Physical impact has a significant impact on healthcare costs

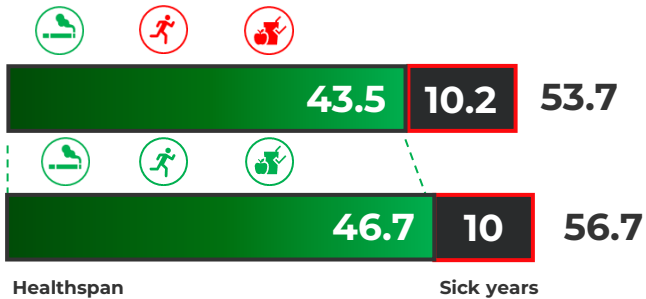


# The effects of behaviour change increase with age and chronicity



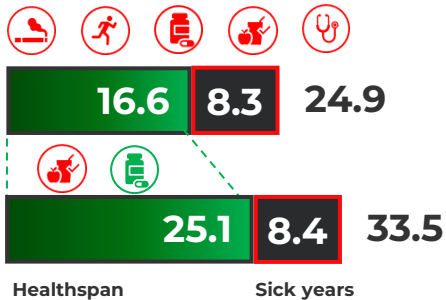
Young moderately healthy 30-year-old

**+7%**  
increase in healthspan



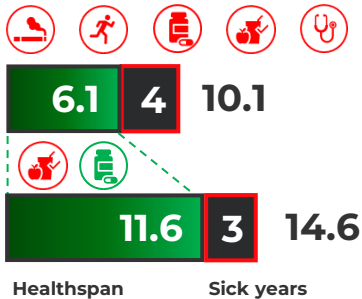
Middle age unhealthy 50-year-old

**+51%**  
increase in healthspan



Advanced age unhealthy 70-year-old

**+90%**  
increase in healthspan



# The power of physical activity and the paradox of 10,000 steps



# Where does the 10,000-step concept come from?

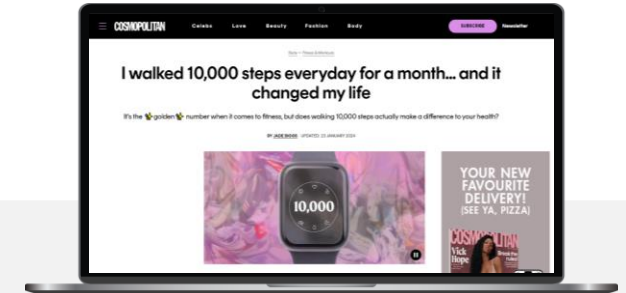


In 1965, a Japanese company created a device called the Manpo-meter as a **marketing tool**, which directly translates to **10,000-step meter**<sup>1</sup>



*"...more steps per day (up to about 10 000 steps) was associated with declines in mortality risks and decreased cancer and CVD incidence."*

**Study published by the Journal of American Medical Association (JAMA) in JAMA Neurology and in JAMA Internal Medicine**



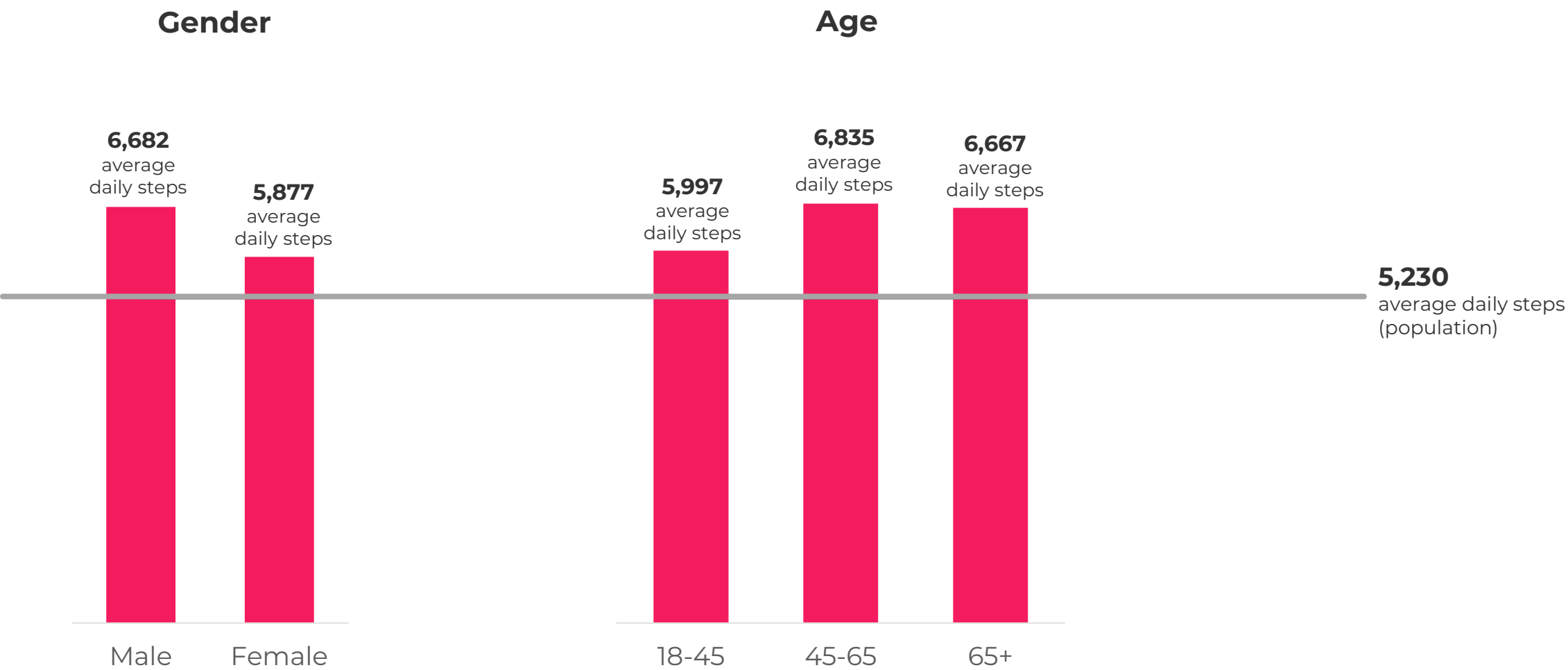
*"I walked 10,000 steps everyday for a month... and it changed my life."*

**Cosmopolitan Magazine**  
23 January 2024

"10k Steps A Day" videos collectively have **22.8 million** views on TikTok

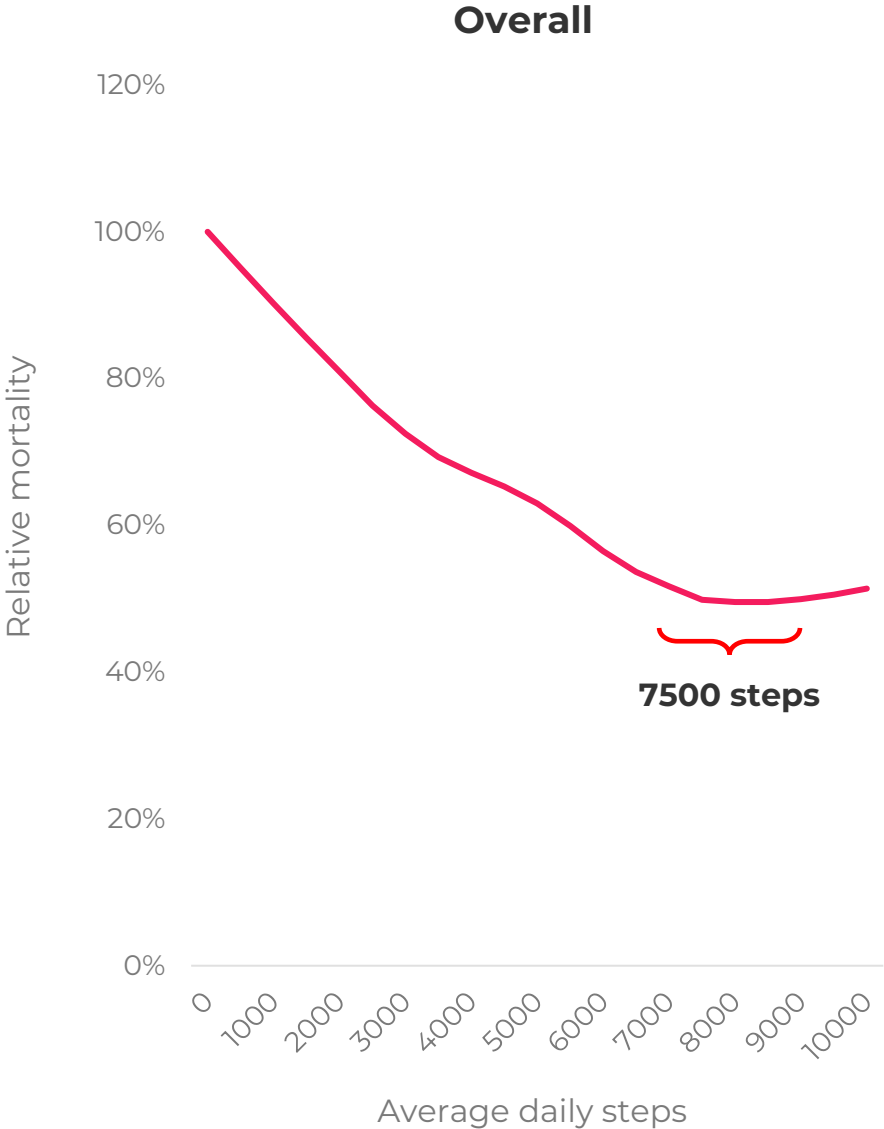
<sup>1</sup> Source: Havard Medical School

# Steps are a standard unit of currency for physical activity



**What is the data telling us?**

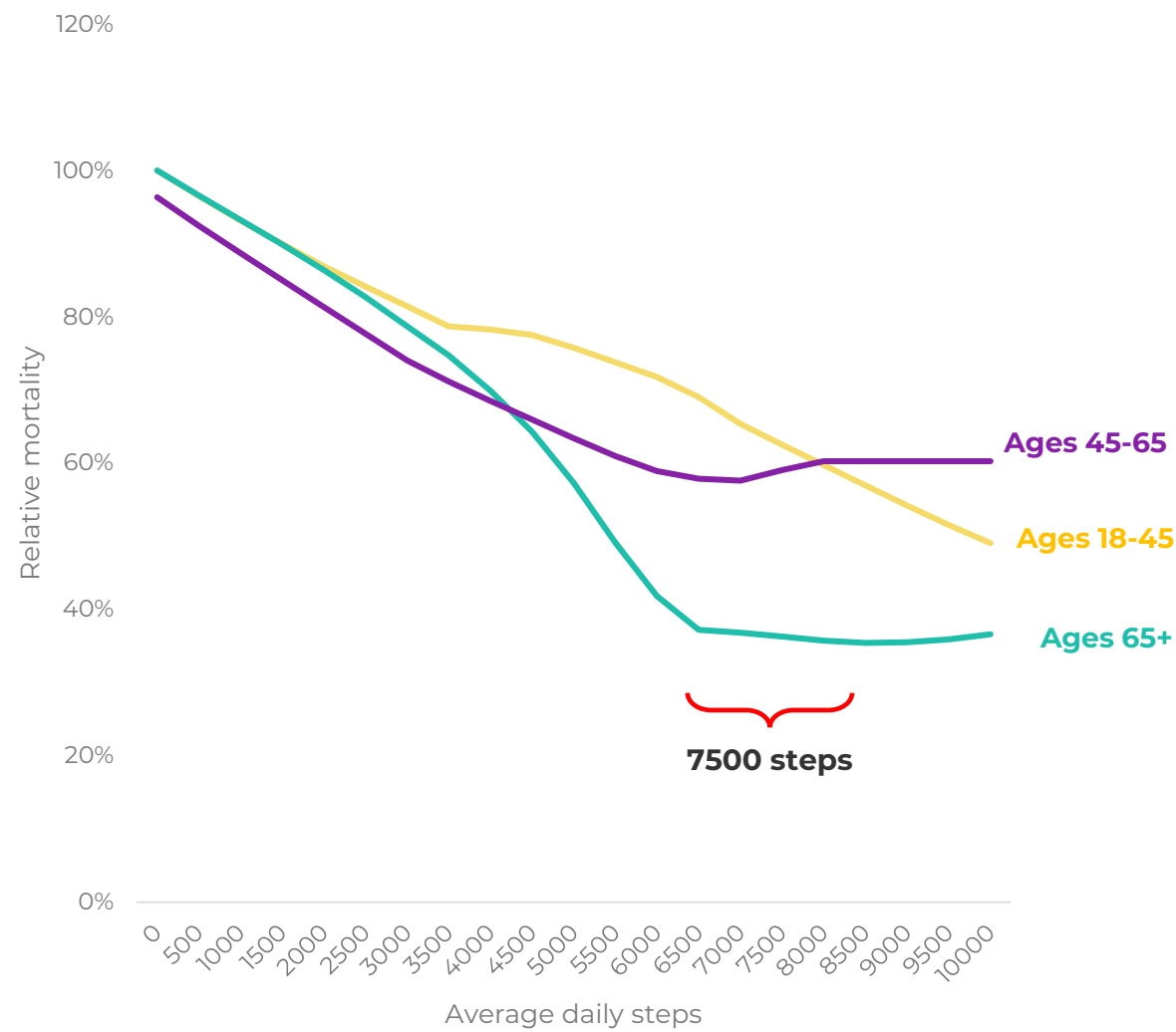
# Every step counts towards a better life



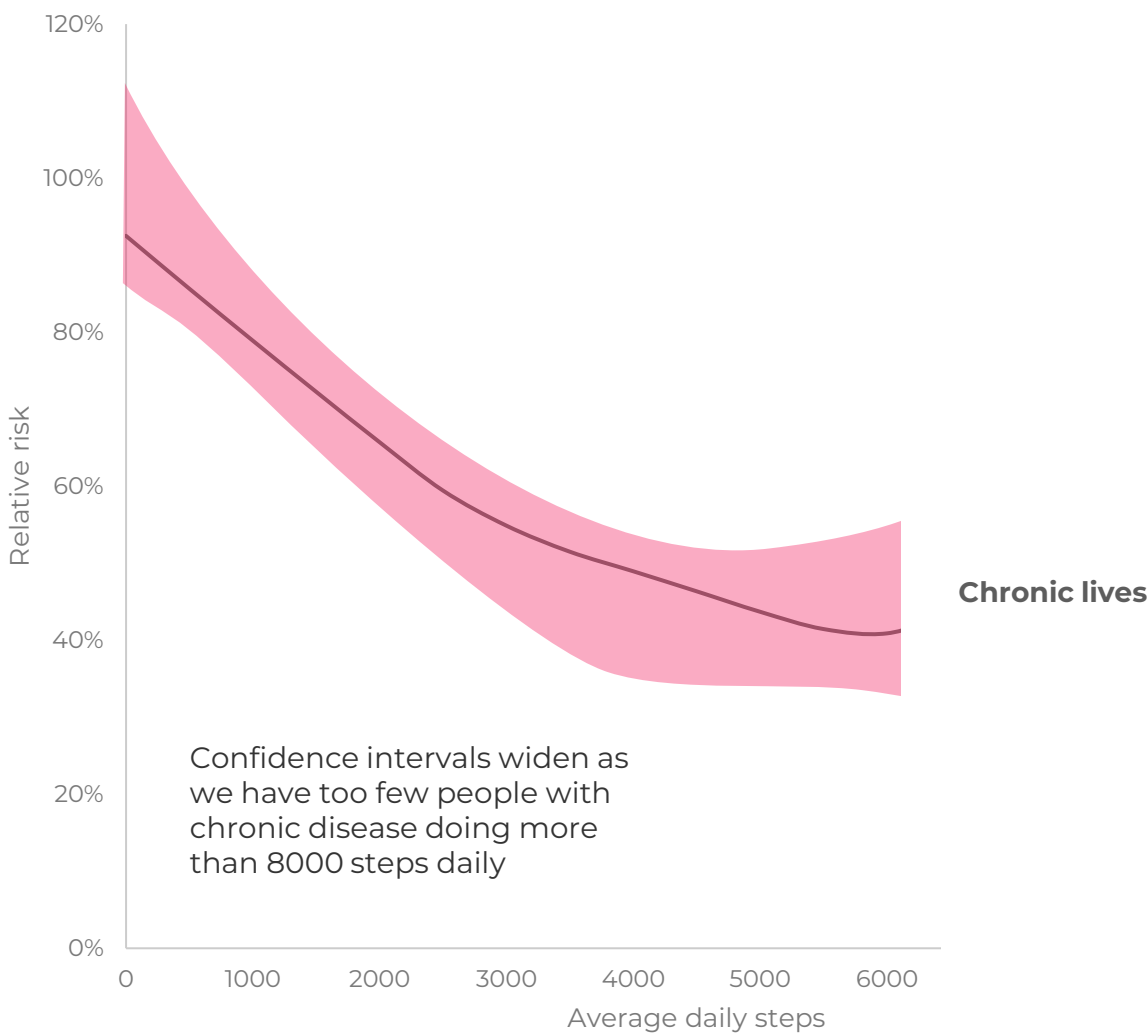
# Every step counts towards a better life



Age

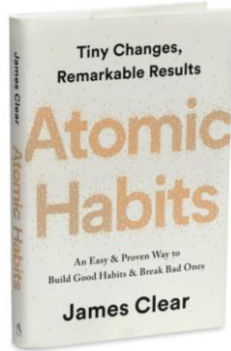


Chronicity



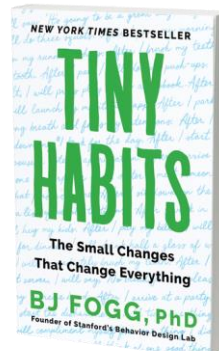
# Making behaviour habitual – how long and how?

# Habits are key to changing behaviour



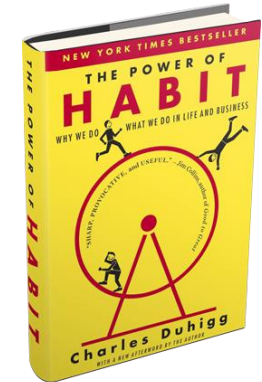
*"A habit is a routine or behavior that is performed regularly – and, in many cases, automatically"*

**Atomic Habits**  
James Clear



*"...strong habits – behaviors you do without thinking, like holding a pencil or tying your shoes."*

**Tiny Habits**  
BJ Fogg



*"When a habit emerges, the brain stops fully participating in decision making. It stops working so hard, or diverts focus to other tasks. So unless you deliberately fight a habit – unless you find new routines – the pattern will unfold automatically."*

**The power of habit**  
Charles Duhigg

# Using habits to understand behaviour change



## Actions are simply events

- A **specific, intentional, and often conscious activity or task** that an individual engages in at a particular moment in response to a specific situation or goal.
- Determined by looking at event data.



## Behaviours are repeated patterns of actions

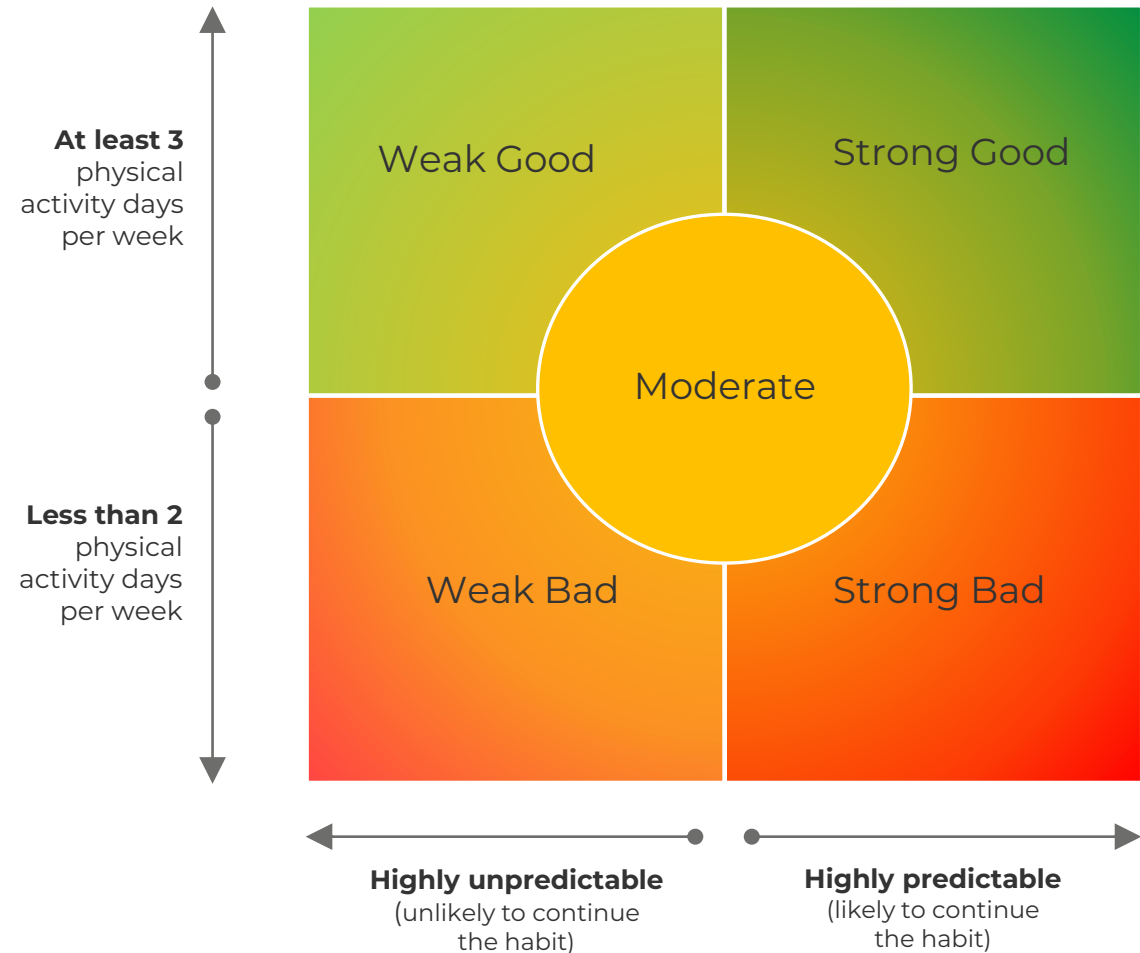
- Determined by looking at a **pattern of an event or a series of events**.
- Influenced by emotions, thoughts, & environmental factors.



## Habits are predictable patterns of behaviours

- Specific pattern of behaviours that become **ingrained & automatic through repetition**.
- Performed regularly and are typically formed through consistent practice.

## Exercise habits can be categorized based on their intensity and predictability





# Using data to understand the process of habit formation



**1.1 million members**  
(mean age: 40 years)



**Study length**  
2016- 2022  
(Excluding the pandemic period)



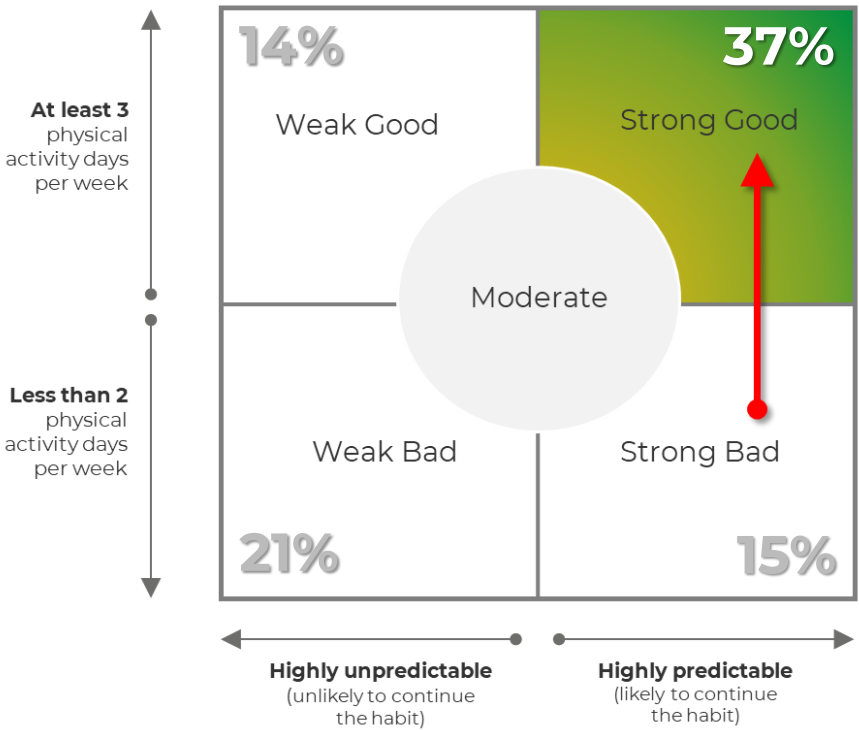
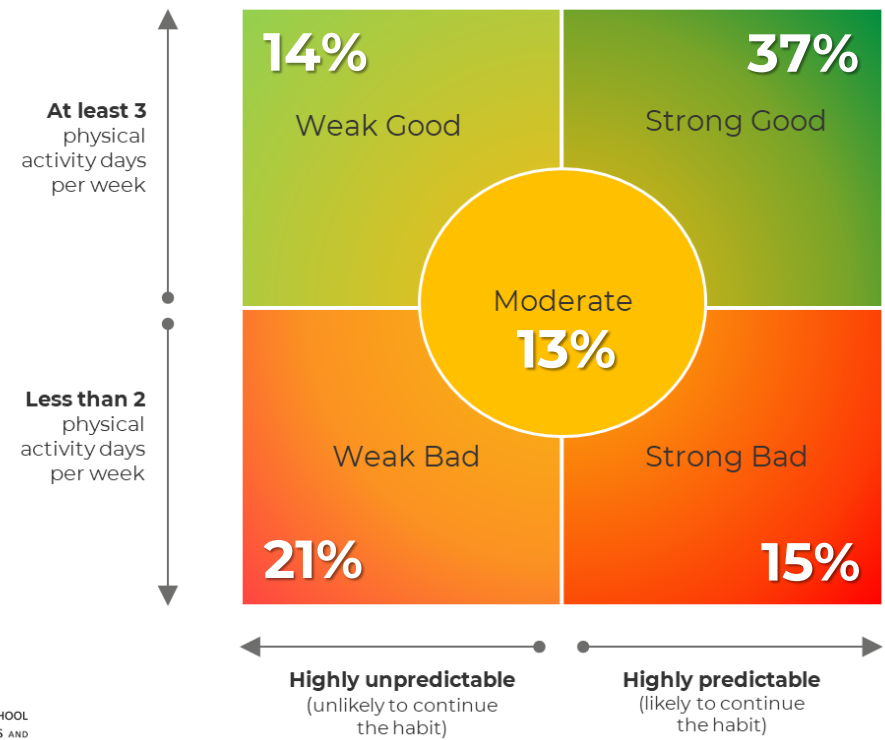
**Model used**  
Lasso logistic regression

Combining the intensity and frequency of physical activity to model the process of habit formation

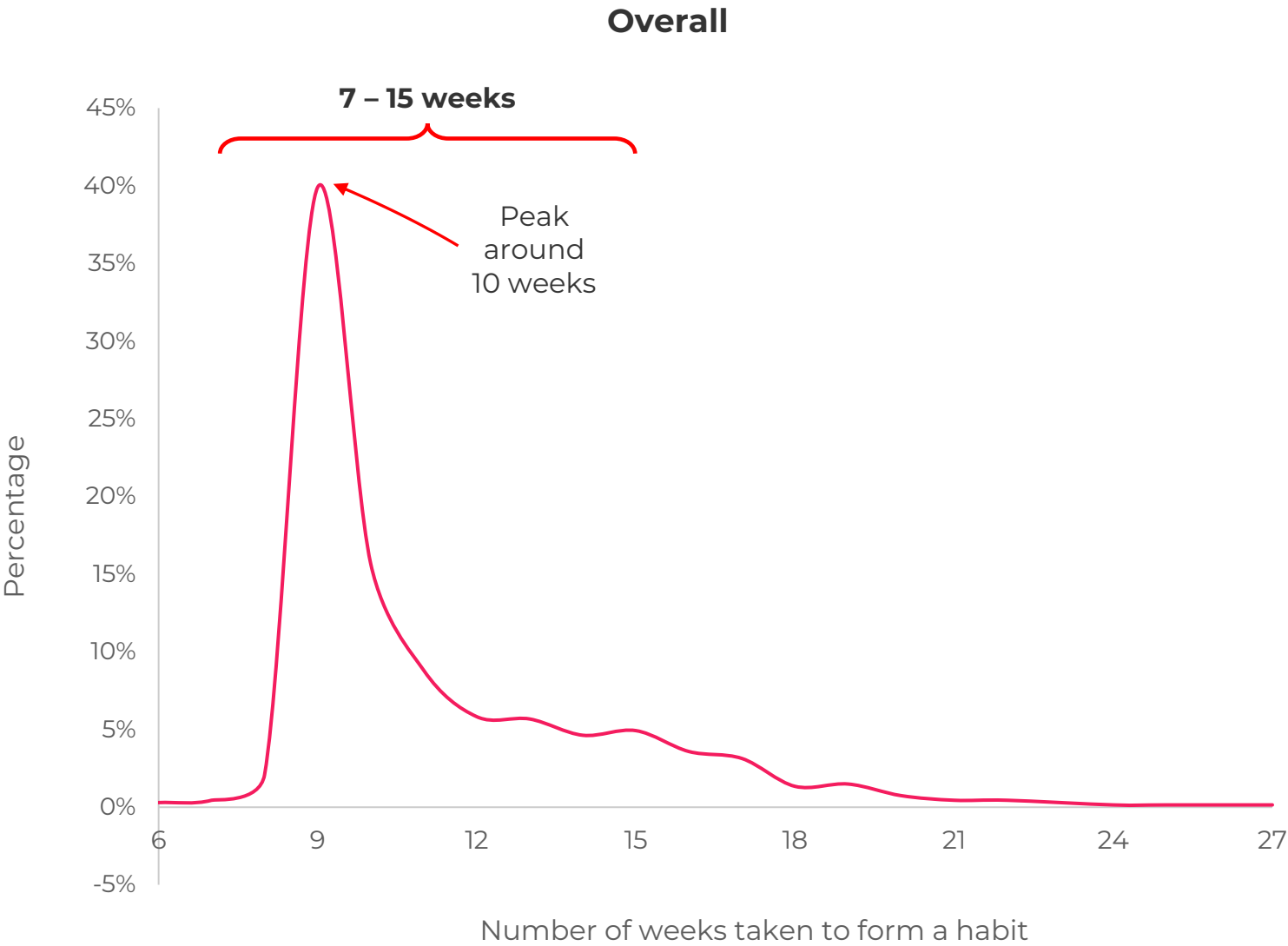
*Captures the level of predictability*

$$H_I = R^2 \times \overline{E_{pw}}$$

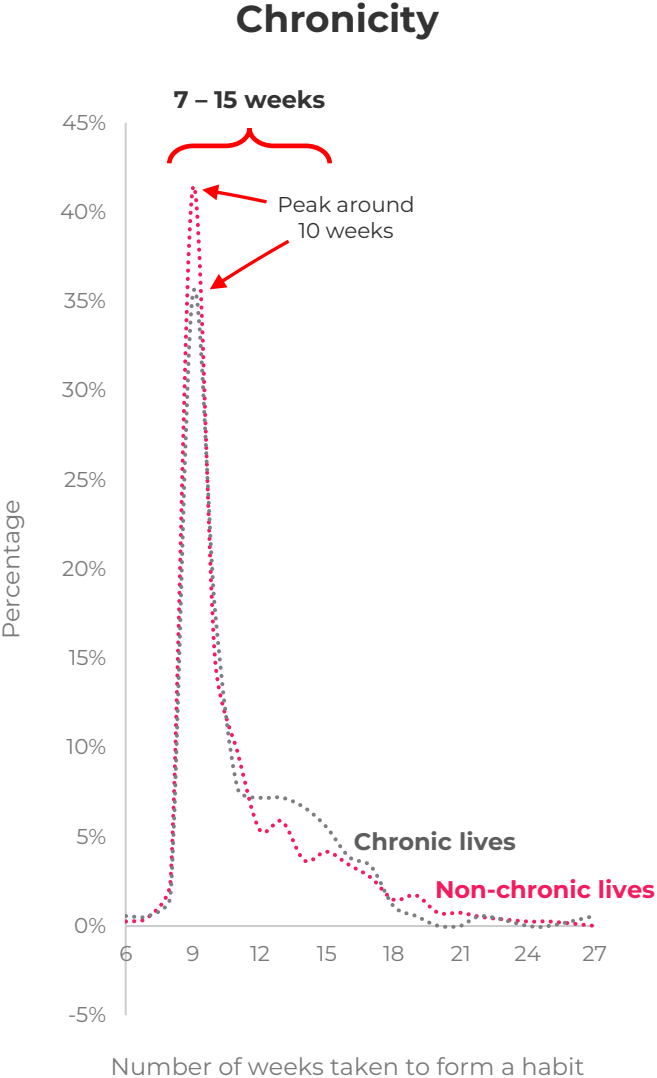
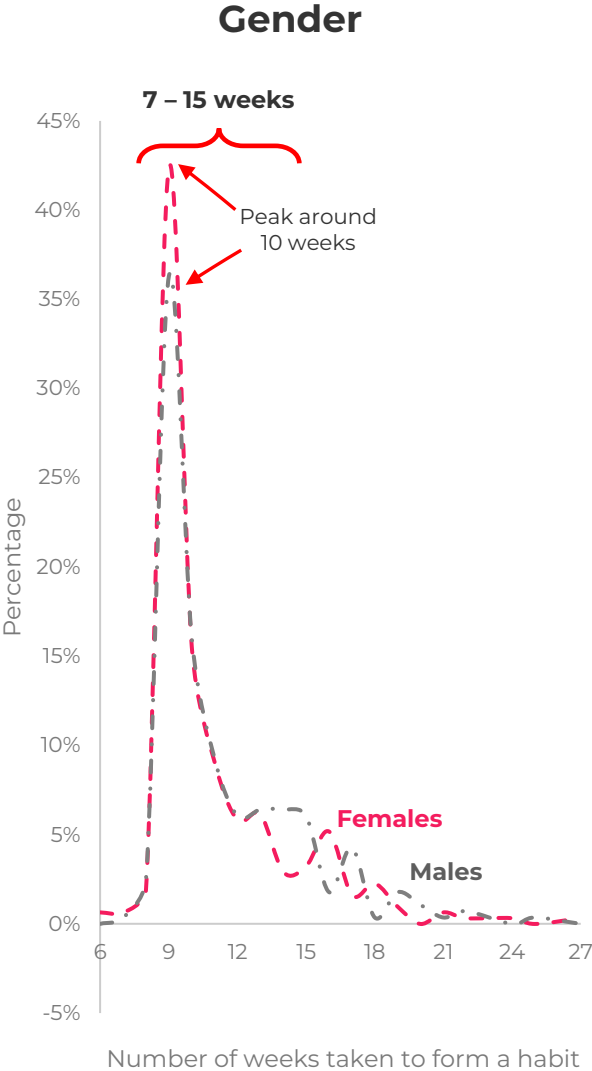
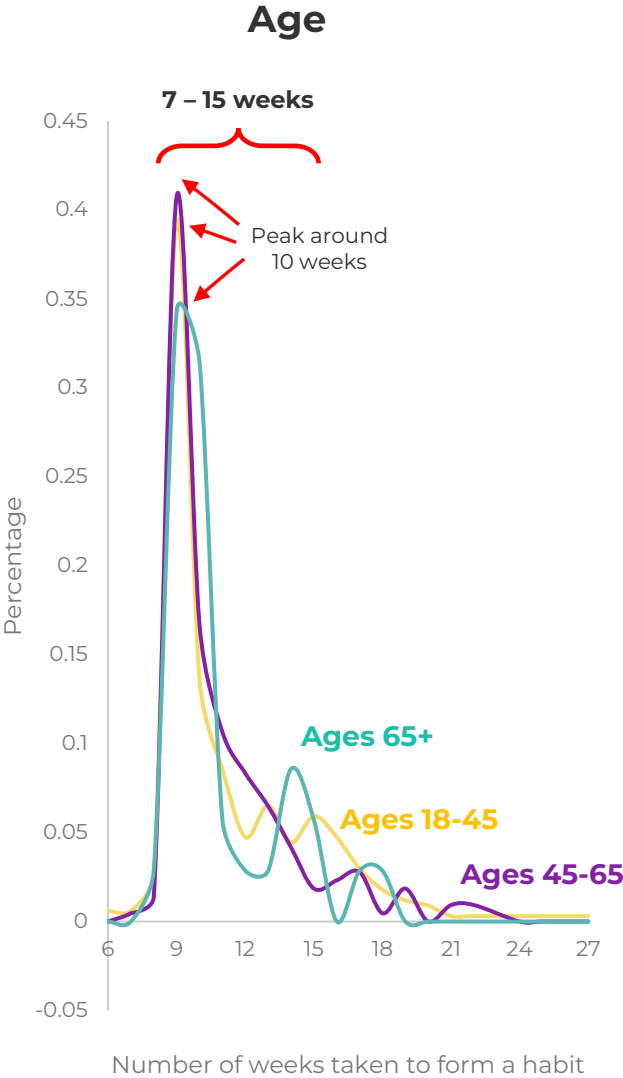
*Habit Index* *Captures the volume or intensity of a member's behaviour*



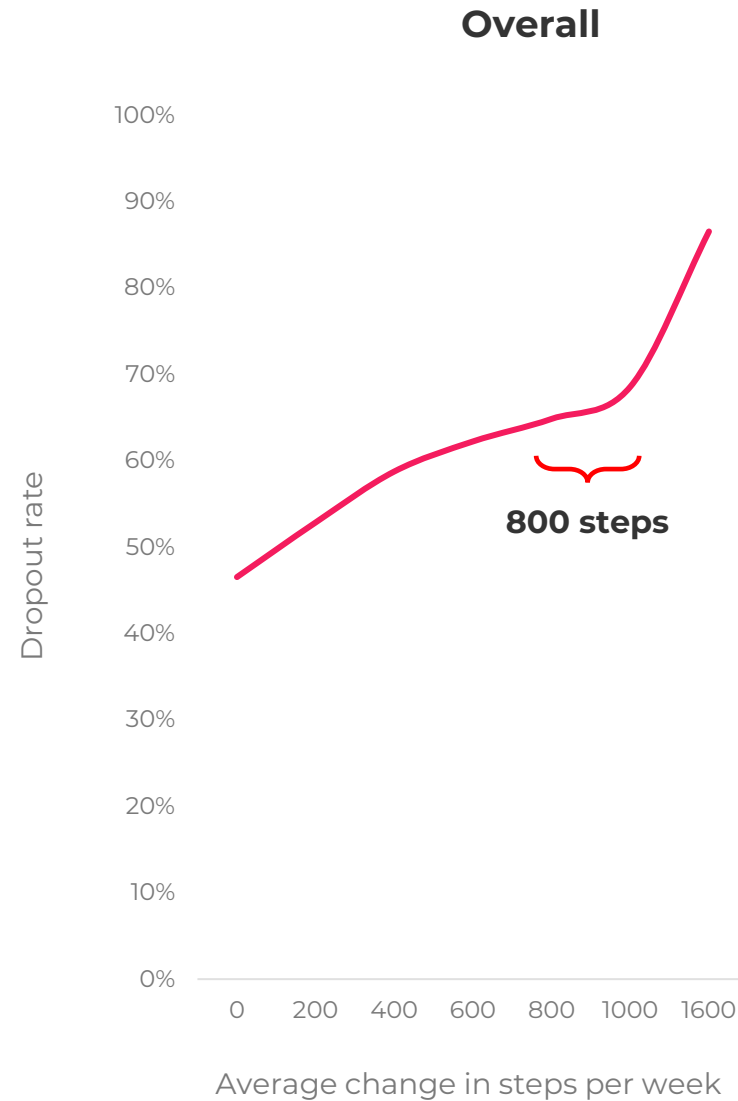
# It only takes 7-15 weeks to form a habit



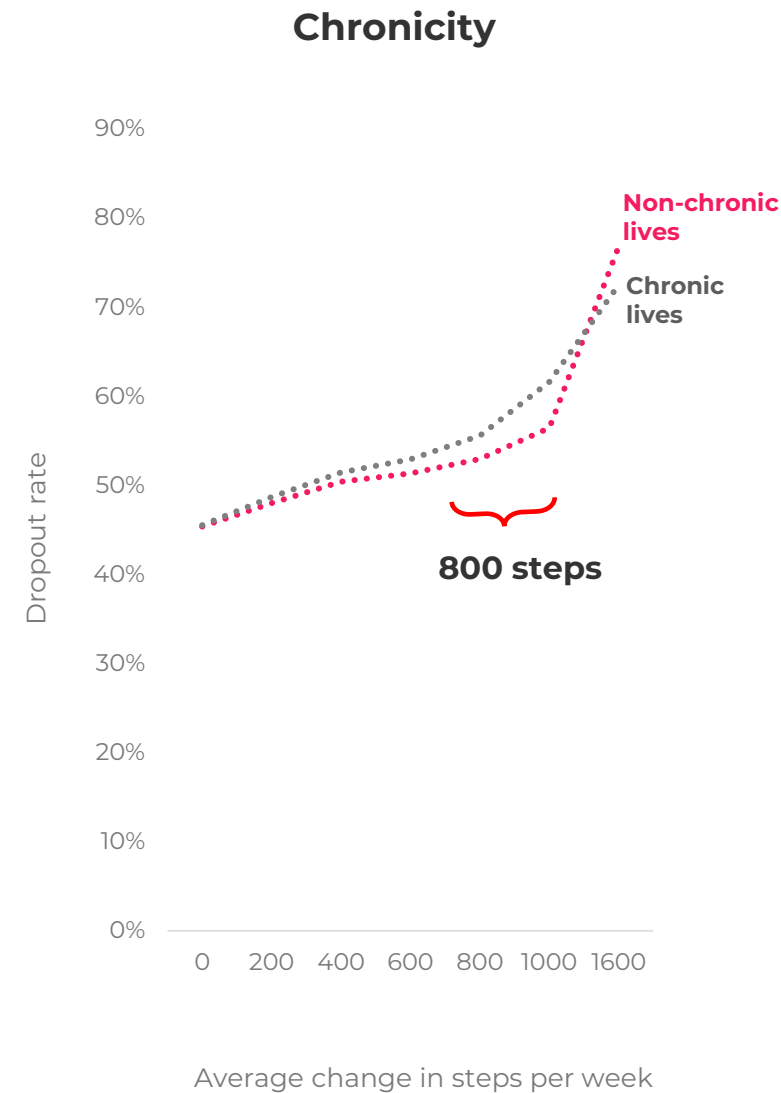
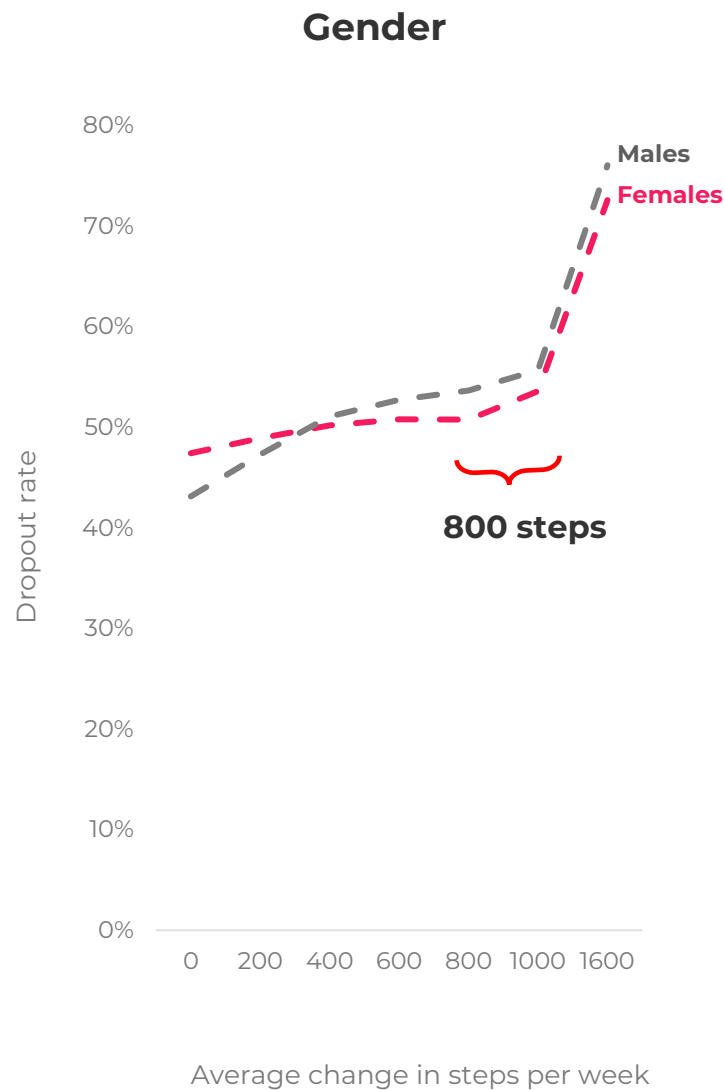
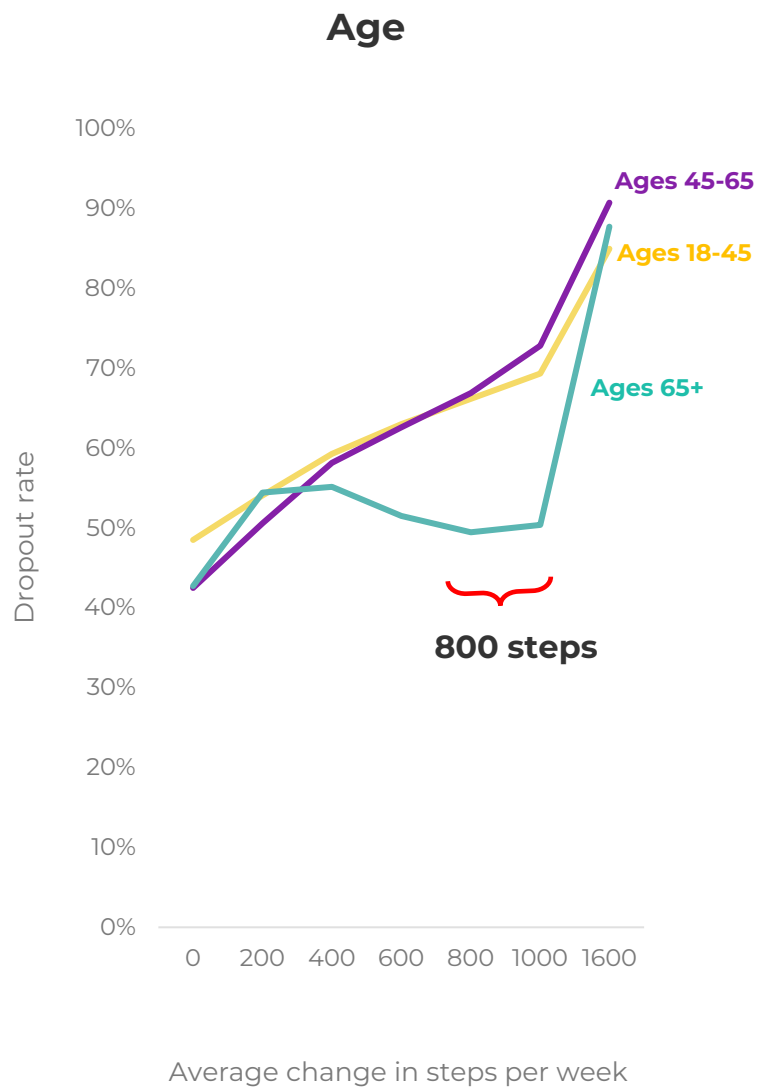
# It only takes 7-15 weeks to form a habit



# Don't increase your daily steps by more than 800 per week



# Don't increase your daily steps by more than 800 per week



# Habit laddering gives a scientific approach to the formation of habits

01

Takes up to 10 weeks to build a habit

02

Don't increase your daily steps by more than 800 per week

03

Reach 5K or 7.5K daily steps depending on where you are

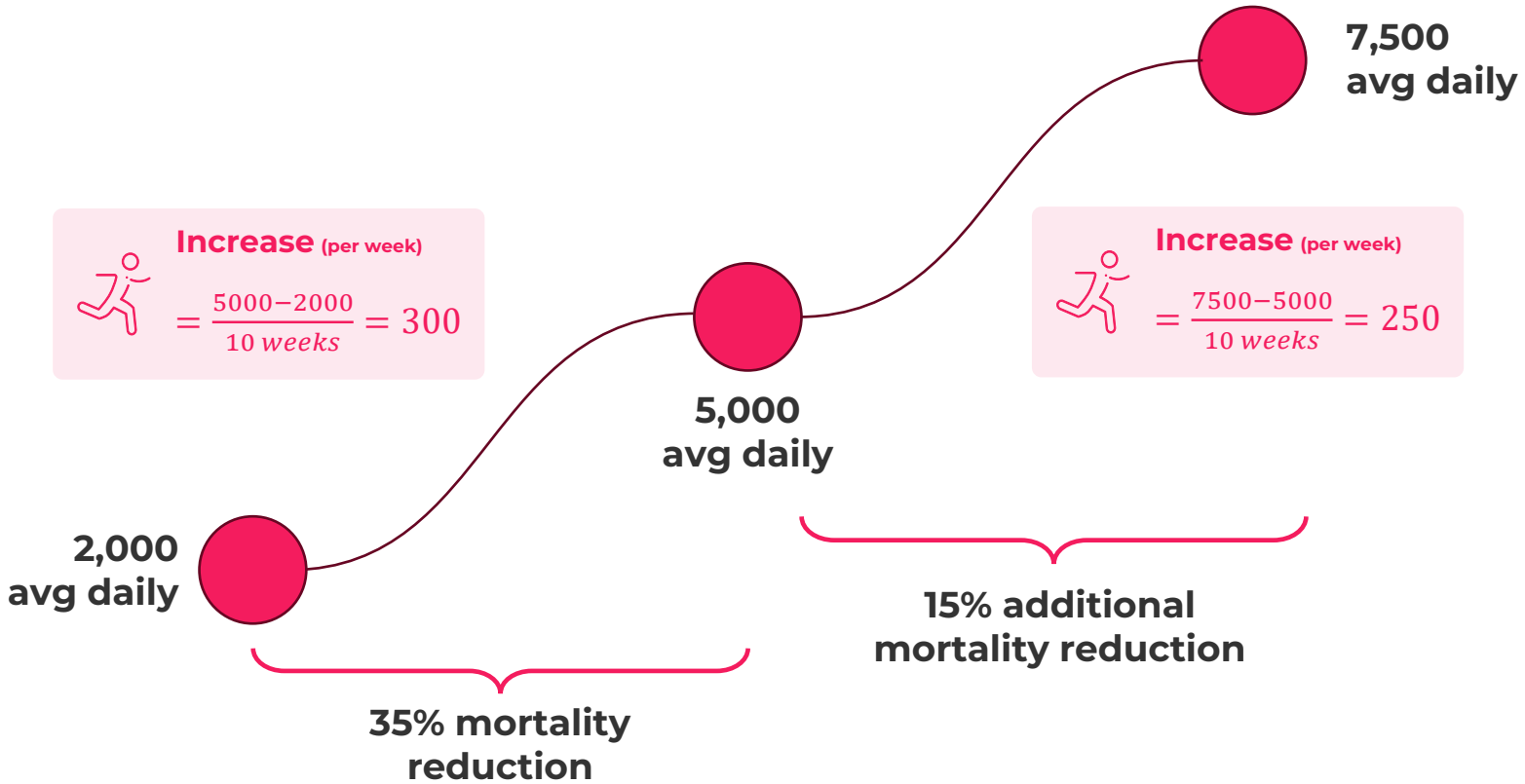
## Pick your target

| Current        | Target           |
|----------------|------------------|
| Less than 5K   | → 5K avg daily   |
| Less than 7.5K | → 7.5K avg daily |

## Calculate how to get there

How many steps on average to increase each week

$$\text{Increase (per week)} = \frac{\text{Target} - \text{Current}}{10 \text{ weeks}}$$



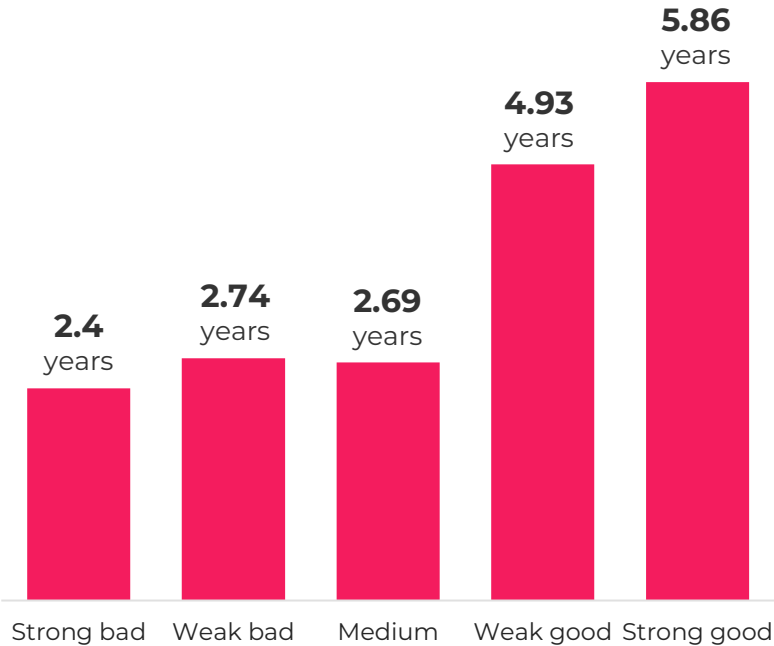
**Strong good habits have  
powerful properties**

# Good habits are durable and tend to last longer than bad habits



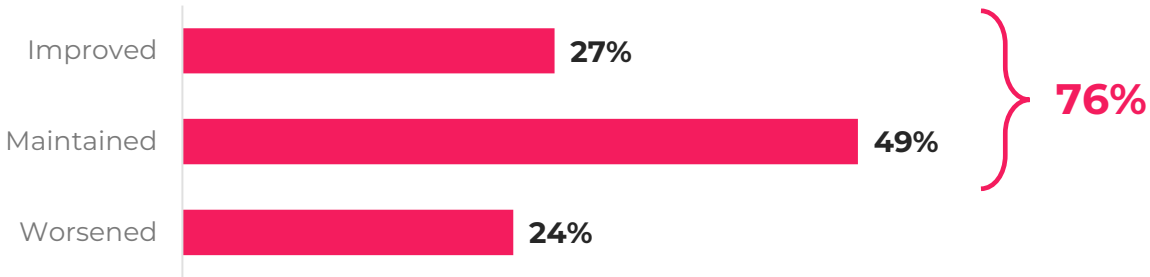
## The half-life of a habit

*Bad habits are more malleable, good habits last longer*

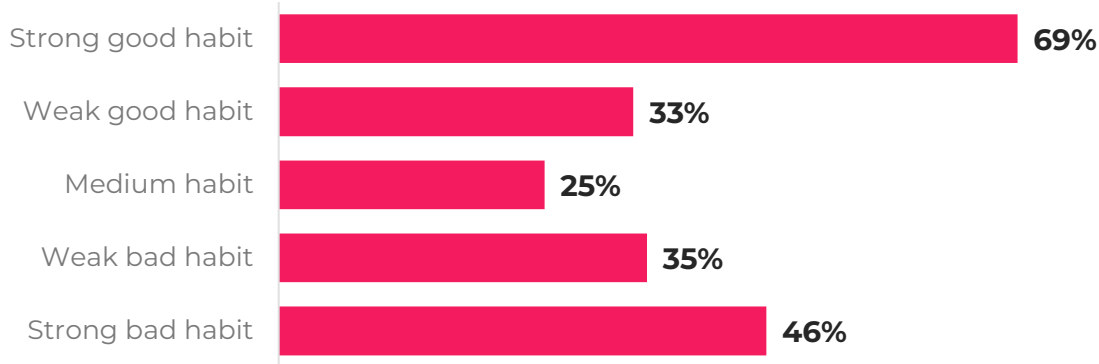


## Good habits are resilient and sustain post shock

Change in member habits post-pandemic compared to pre-pandemic



Percentage maintaining habit post-pandemic for different habit types

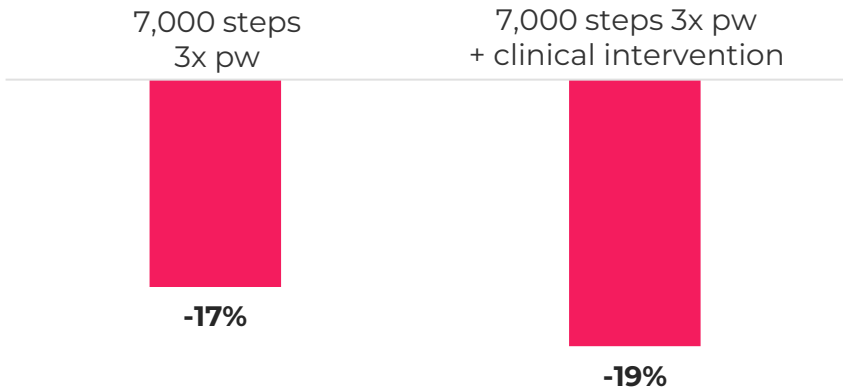




# Good habits are protective in lowering disease risk

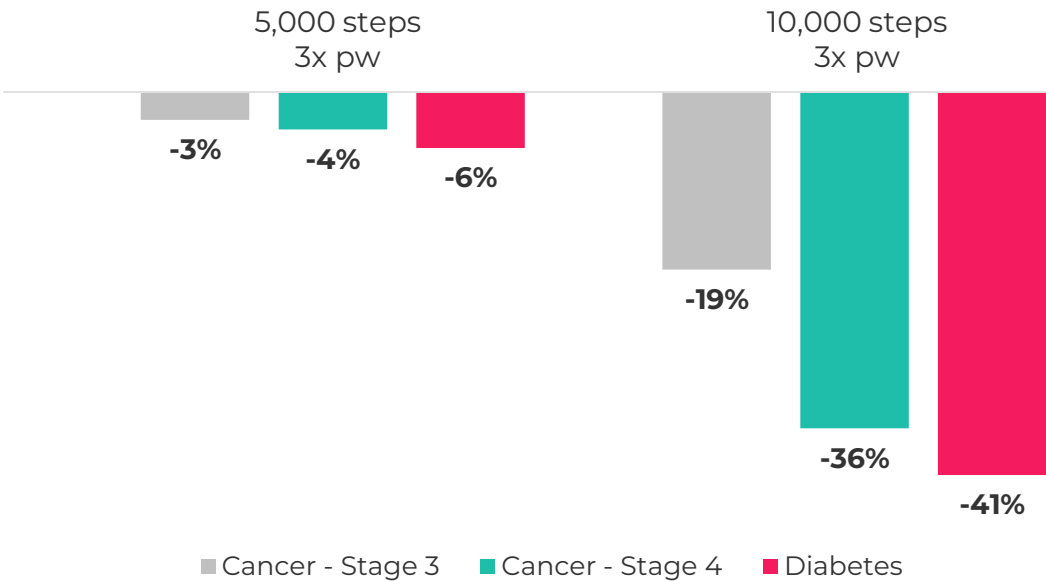
## Psychiatric claims risk

Relative psychiatric claims risk for different groups of individuals (%)

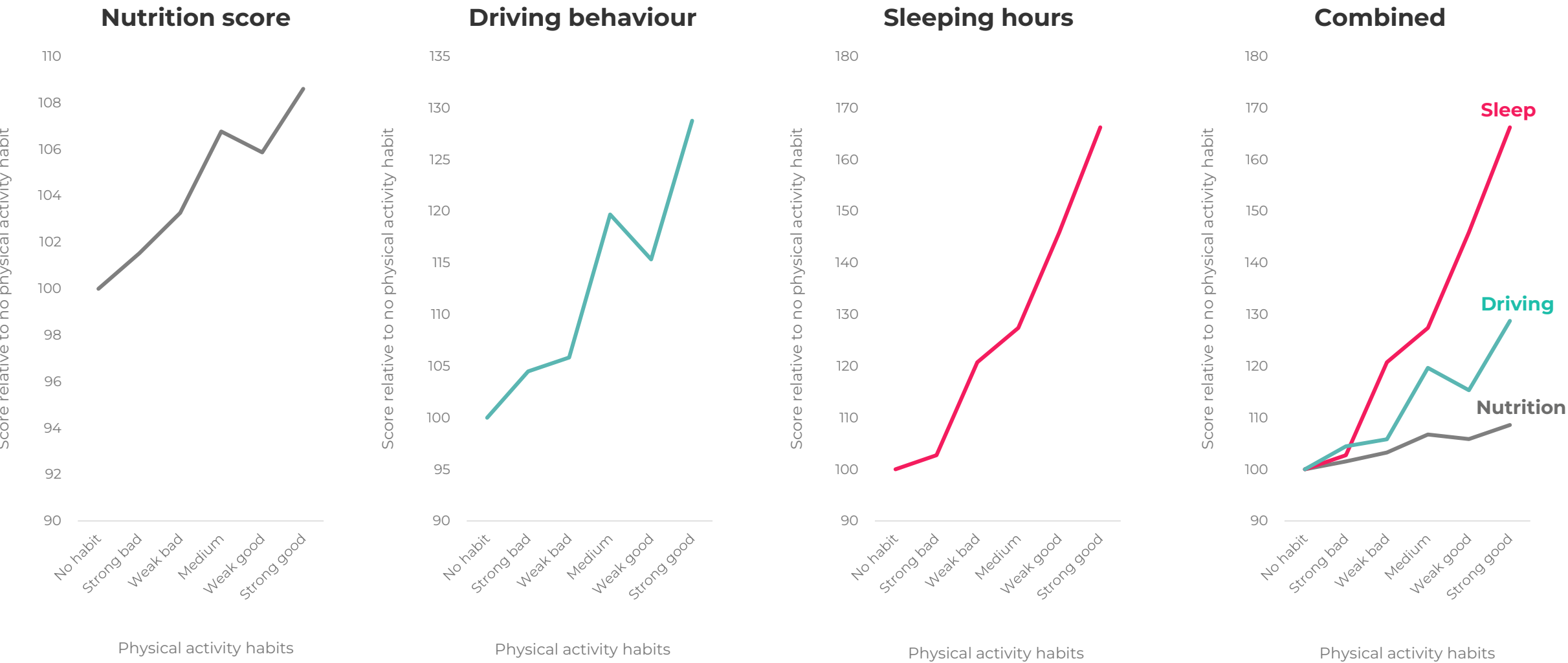


## Cancer & Diabetes risk

Relative cancer risk and diabetes risk for different groups of individuals (%)



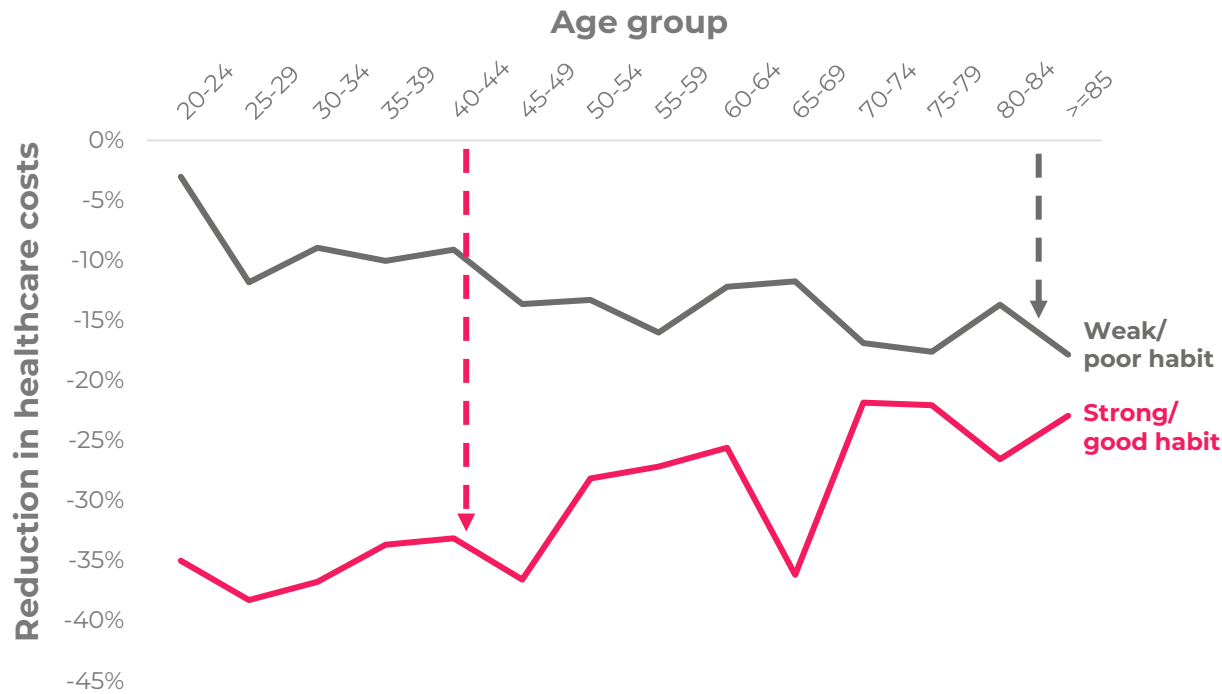
# Good habits are expansive and associated with other good habits



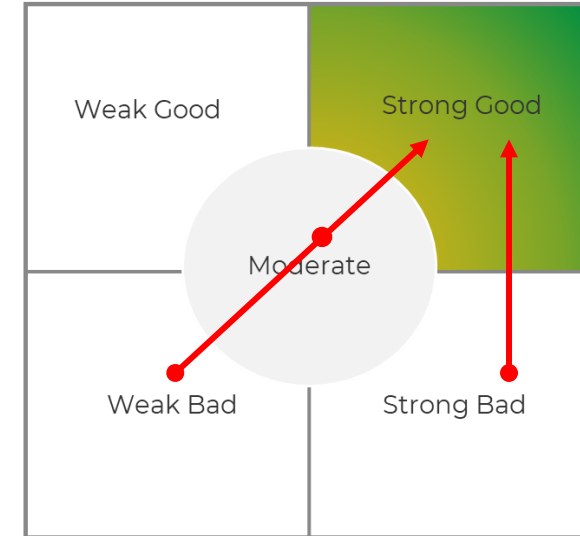
**Good habits have a profound  
impact on society**

# NHS in-hospital costs could be reduced by £15 billion

Change in healthcare costs for individuals who form weak and strong exercise habits (vs no habit)



Significant impact on society



**£15 billion**  
reduction in NHS  
in-hospital costs

**16% reduction if:**

If **50% of the inactive UK population<sup>1</sup>** forms a consistent habit of **walking at least 5 000 steps once a week;**

**and**

**All of the insufficiently active UK population<sup>1</sup>** forms a consistent habit of **walking at least 5 000 steps 3x a week**

<sup>1</sup> 35% of the UK population are assumed to be inactive and 49% insufficiently active

# Takeouts



The Vitality dataset stands alone in its uniqueness

Due to our unique data set, we have distinctive insight into the impact of behaviour change; and how to make healthy habits habitual – in terms of how long healthy habits take to form, and the best approach to build sustainable habits



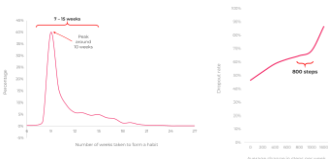
The effect of behaviour change exceeds expectation

Physical activity reduces healthcare costs by up to 25% and lowers the risk of death by up to 60%. The effects also increase with chronicity, and massively so at older ages – it’s never too late to start!



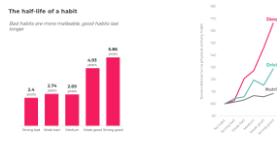
The paradox of 10,000 steps

While every step counts towards a better life, the ten thousand step target is a myth: it turns out mortality impacts are greatest at 7,500 steps (plateauing thereafter) – and this holds true across age, gender and chronicity



Habits are quicker and easier to form than we think

Habits take only 7-10 weeks to form irrespective of age, gender and chronicity. You also don’t need to make massive changes: a gradual approach is more sustainable - not exceeding 800 average steps per week in increments is key (habit laddering)



Good habits are durable, protective and expansive

They are resilient and long lasting, lower disease risk, and are associated with other good habits



Increasing steps has notable social implications

This profoundly expands healthy life years and hence, significantly reduces healthcare costs at a societal level. In the case of the NHS, a 16% reduction in in-hospital costs can be achieved by getting a portion of inactive population to build a consistent habit of walking

# THANK YOU

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