



International Actuarial Association
Association Actuarielle Internationale



Embedding Wearable Health Tech into Insurance

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- Actuarial Pricing Consultant, Bupa UK
- Independent research on wearable health tech forms the basis of this presentation:
 - “Physical Activity Tracking in Private Health Insurance” research paper for IFoA, July 2017
 - International Health Policy MSC Dissertation at London School of Economics on “The policy challenges of the use of wearables by private health insurers”, 2016
- Member of IFoA’s “Impact of Wearables and Internet of Things” Working Party, 2018
- The views expressed in this presentation are those of the presenter

The wearables market is growing

- Wearables market set to grow from \$10.8bn in 2017 to \$16.9bn by 2021.
- Activity tracking devices comprise the majority of wearables sales, with smartwatch sales forecast to double by 2021.
- Provides an opportunity for wearables to become embedded into insurance.





Embedding wearables into insurance

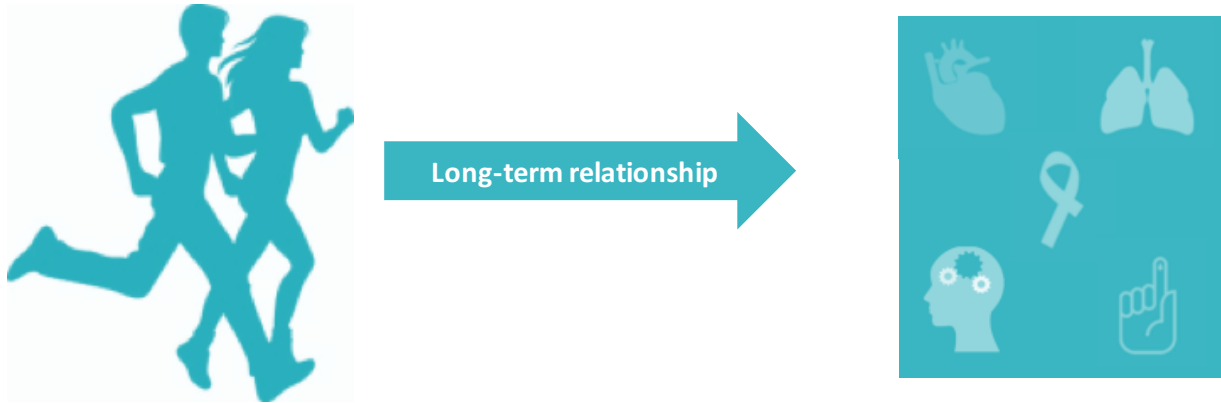
- Short-term: increasing uptake
- Medium-term: classing policyholders
- Long-term: encouraging behavioural change

Short-term



Does increased physical activity reduce risk of chronic diseases?

Systematic literature review screened >1,000 articles



77 studies met inclusion criteria



Limitations need to be overcome

Limitations	Potential solutions
<ul style="list-style-type: none">• Studies use self-reported measures of physical activity• Studies not representative of insurance pool• Limited number of studies for certain NCDs• Contradictions between subgroups	<ul style="list-style-type: none">• Insurers could encourage uptake through discounts and rewards• Broaden appeal to wide range of policyholders not just most physically active
<ul style="list-style-type: none">• Accuracy of devices can differ by up to 20%• Fraudulent use of devices	<ul style="list-style-type: none">• Medical grade wearables could improve accuracy and allow use of biometrics to help prevent fraudulent use

Medium-term

Classing policyholders according to health risks



- 84% of included studies found evidence of long-term association between increased physical activity and reduced risk of chronic disease even when controlling for other variables.
- Once relationships have been refined there may be the opportunity to use data from physical activity trackers to class insurees to help adjust premiums in line with risk.
- Physical activity trackers may set a precedent for how other health data is used by insurers going forwards.
 - ECG, core body temperature, respiration, blood sugar



Balancing classing with risk-smoothing

Insurers may want to use data from wearables to charge premiums according health risks:

- Cheaper premiums for the more physically active
- More expensive premiums for the less physically active

Regulators may want to prevent prohibitively high premiums for those who:

- lead less healthy lifestyles
- can't afford wearables
- choose not to share their data with insurers

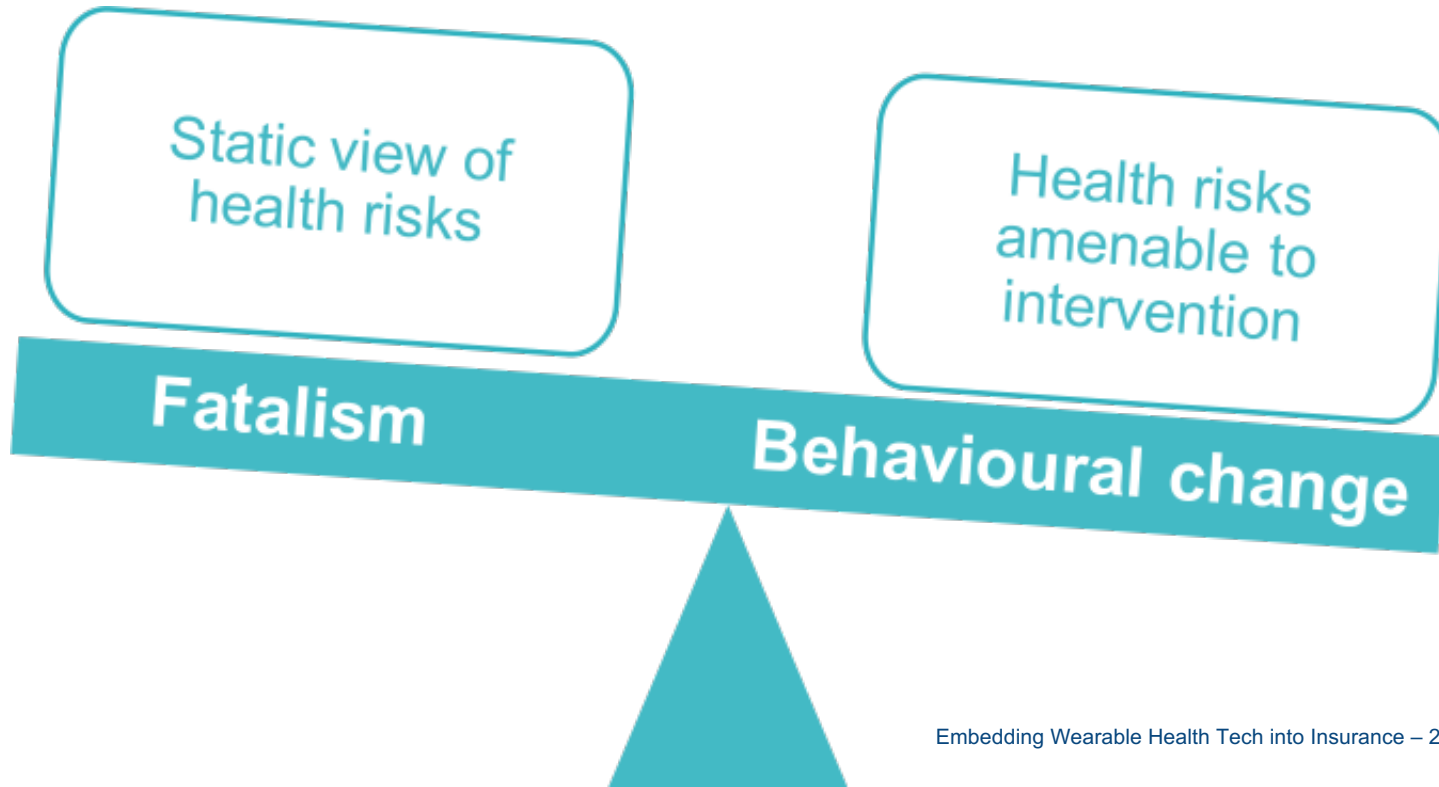
Classing

Risk-smoothing

Long-term



Moving towards a behavioural change approach





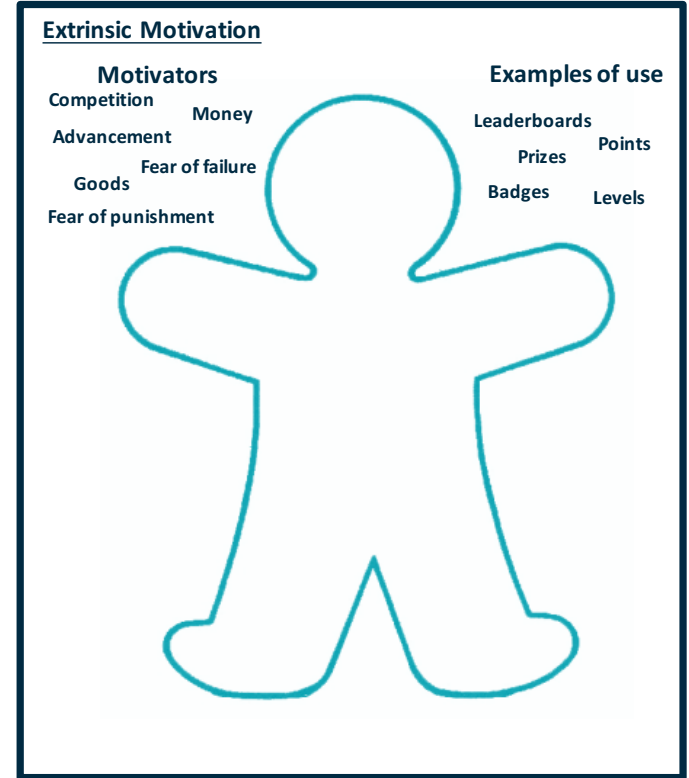
How effective are wearables for behavioural change?

Insurer's findings	Peer-reviewed published research
<p>Wearables-based incentive programs have lead to:</p> <ul style="list-style-type: none">• Better health engagement• Reduced medical costs	<p>Evidence on wearables-based behavioural change less conclusive:</p> <ul style="list-style-type: none">• Few studies to date• Recent meta-analysis of 16 RCTs looking at the effectiveness of wearable biosensors.<ul style="list-style-type: none">- No statistically significant impact on health outcomes



Extrinsic motivators unlikely to sustain lifestyle changes

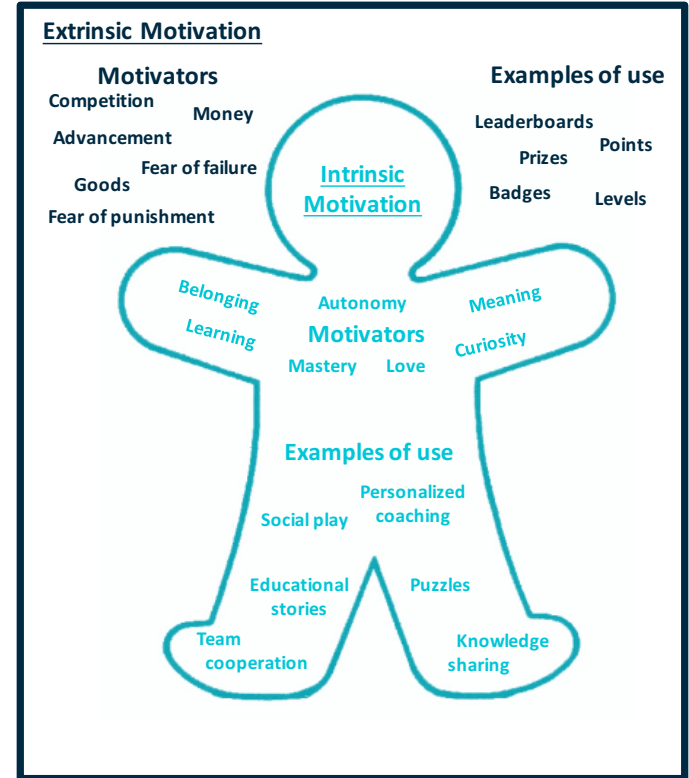
- Self determination theory suggests that extrinsic motivators aren't effective in bringing about long-term sustained changes in behaviour.
- Money is not an effective long term motivator.
- Currently companion apps with physical activity activity trackers appeal predominately to extrinsic motivation through the use of free gifts, leaderboards and digital rewards.





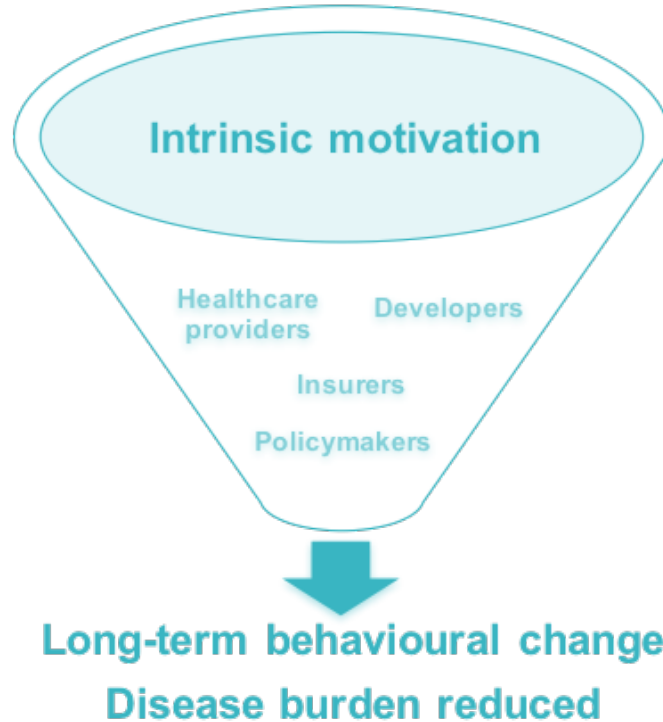
Could intrinsic motivators sustain behavioural change?

- Self-determination theory suggests intrinsically motivating stimuli are more effective at bringing about long-term behavioural change.
- Intrinsic motivators explain the virtues of the underlying behavioural change.
- Insurers could pioneer internally motivating strategies to improve health:
 - Personalized goal setting
 - Health coaching
 - Real-life simulation with VR
 - Real-time education with AR





Collaboration with other stakeholders in the ecosystem



Thank you



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