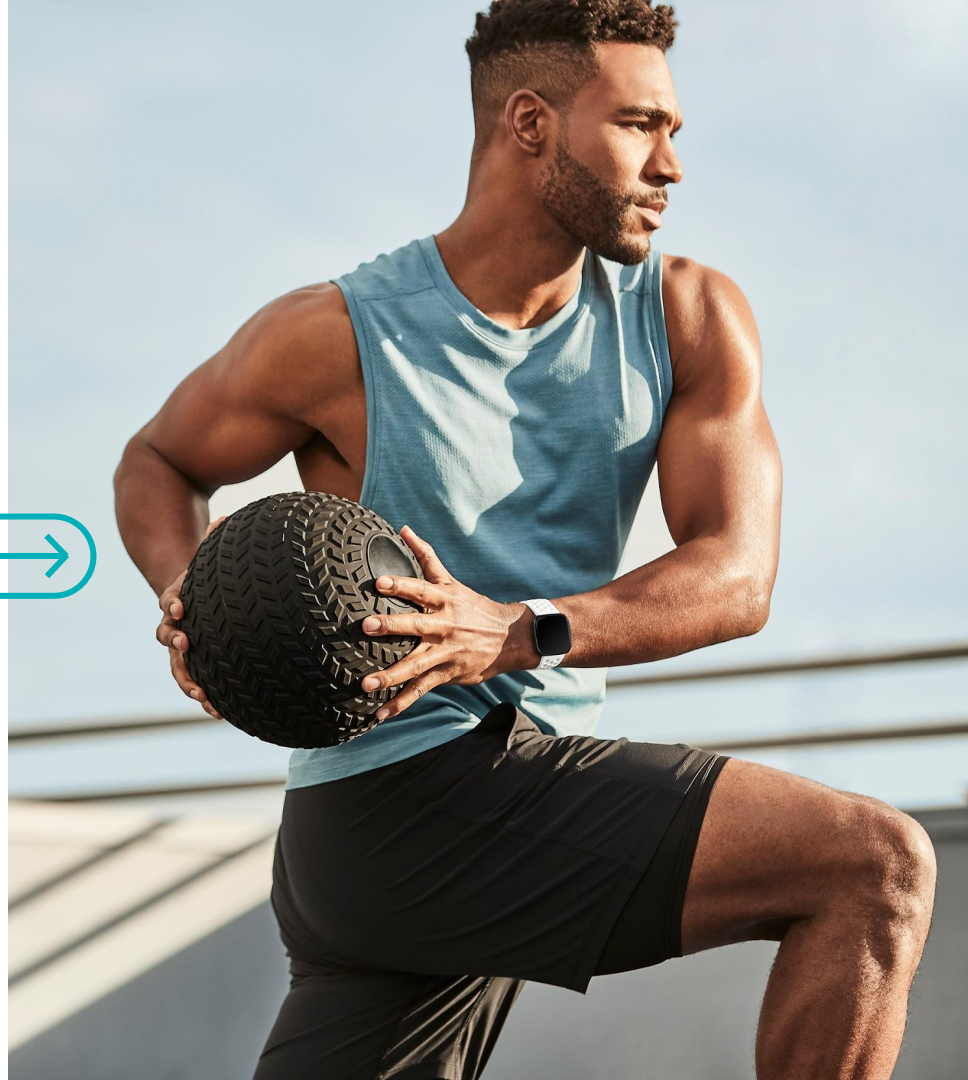


Impact of Foundational Behaviors on Health Outcomes and Cost





Physical Activity

Physical Activity: Impact on whole health & recommended actions

People who meet physical activity requirements have:

 **40%**
Type 2 Diabetes

 **35%**
Heart Disease

 **25%**
Falls, Depression & Dementia

 **20%**
Colon Cancer & Breast Cancer

Three main recommendations for physical activity¹:

Reduce sedentary time

Increase physical activity
(>150 mins/week of moderate to vigorous PA)

Muscle-strengthening activity
(moderate or greater intensity, involving all major muscle groups, 2 or more days a week)

How Fitbit promotes physical activity:

 Increase steps

 Increase Active Zone Mins

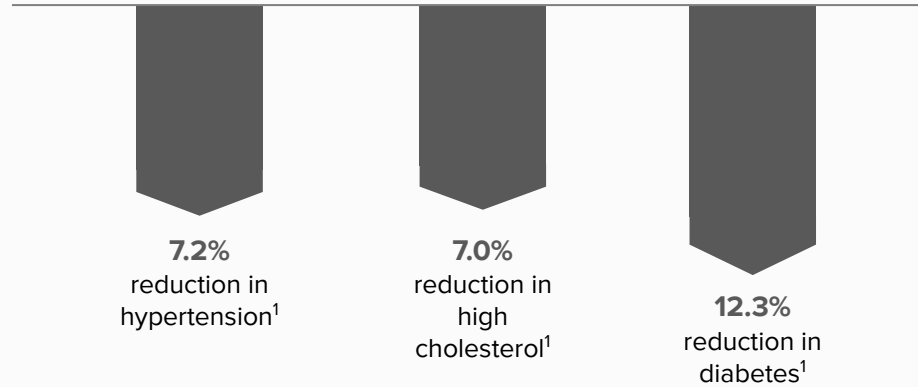
 On-Demand Workout Videos



Walking is Powerful

- Scientifically proven effectiveness
- Improves multiple conditions & overall wellbeing
- Accessible
- Cost-effective

Every 17 minutes of daily walking is associated with:



Findings from the All of Us Research Program, a National Institute of Health initiative: **Each increase of 1,000 steps** in participants' average daily step count **reduced risk of Type 2 diabetes by 25%.³**

1. Williams PT, Thompson PD. Walking Versus Running for Hypertension, Cholesterol, and Diabetes Mellitus Risk Reduction. *Arteriosclerosis, Thrombosis, and Vascular Biology*. 2013;33:1085-1091. April 2013
2. Qiu S, Cai X, Schumann U, Velders M, Sun Z, et al. (2014) Impact of Walking on Glycemic Control and Other Cardiovascular Risk Factors in Type 2 Diabetes: A Meta-Analysis. *PLoS ONE* 9(10): e109767
3. Master, H., Annis, J., Huang, S. et al. Association of step counts over time with the risk of chronic disease in the All of Us Research Program. *Nat Med* 28, 2301–2308 (2022). <https://doi.org/10.1038/s41591-022-02012-w>

Lack of physical activity is linked to approximately \$117 billion in annual healthcare costs in the US¹



An **increase in physical activity** across members



Can help **reduce costs** for members and their health plan



In a study with 3,924 veterans, participants with the **highest fitness** versus the lowest were associated with **57% lower annual healthcare costs.**²



Regular, moderate to vigorous **physical activity (PA)** is associated with **significantly lower health care spending** for individuals with and without established cardiovascular disease (CVD). Among those without CVD, those with optimal cardiovascular risk factors (CRF) and PA had a mean annual expenditure of \$2328, compared to \$5475 of those with poor CRF and PA³



Health care costs later in life were significantly lower for adults who maintained moderate or high physical activity levels⁴

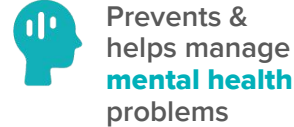
1. https://health.gov/sites/default/files/2019-09/Physical_Activity_Guidelines_2nd_edition.pdf
2. <https://www.sciencedirect.com/science/article/abs/pii/S0002934319303444>
3. <https://www.ahajournals.org/doi/full/10.1161/jaha.116.003614>
4. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7938970/>

 **Sleep**

Sleep:

Impact on whole health & recommended actions

According to the American Academy of Sleep Medicine (AASM), healthy sleep¹



Healthy sleep can be achieved by:²

Sufficient Duration
(AASM recommends at least 7 hours)

Good Quality

Appropriate Timing & Regularity

Absence of Disturbances or Disorders

How Fitbit can help enable healthy sleep:

Nightly Tracking

Identify Areas for Improvement

Monitor Goal Progress

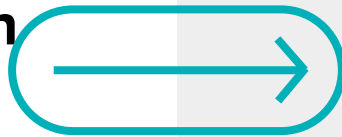
Achieve Healthier Patterns

1. <https://aasm.org/seven-or-more-hours-of-sleep-per-night-a-health-necessity-for-adults/>

2. Watson NF, Badr MS, Belenky G, Bliwise DL, Buxton OM, Buysse D, Dinges DF, Gangwisch J, Grandner MA, Kushida C, Malhotra RK, Martin JL, Patel SR, Quan SF, Tasali E. Recommended amount of sleep for a healthy adult: a joint consensus statement of the American Academy of Sleep Medicine and Sleep Research Society. *SLEEP* 2015;38(6):843–844.



Poor sleep is associated with significantly higher rates of healthcare utilization, placing an additional \$94.9 billion in costs each year to the United States healthcare system.¹



8

additional office visits



18

additional prescriptions



~\$7,000

greater total cost per year

Source: Incremental health care utilization and expenditures for sleep disorders in the United States. Phillip Huyett, MD, Neil Bhattacharyya, MD, MA, FACS October 1, 2021 <https://jcsma.aasm.org/doi/10.5664/jcsma.9392>

The Broad Value of Sleep

Weight Loss

Among 245 women enrolled in a 6-month weight-loss program, better subjective sleep quality was associated with a 49% increased chance of weight loss.¹

Diabetes

Studies show decreased insulin sensitivity in the range of 25% to 30% after as little as 4 to 5 days of insufficient sleep.²

Heart Health

The American Heart Association recently added sufficient sleep to their checklist as essential for optimal cardiovascular health.³

1. Thomson CA, Morrow KL, Flatt SW, et al. Relationship between sleep quality and quantity and weight loss in women participating in a weight-loss intervention trial. *Obesity (Silver Spring)* 2012;20:1419–25
2. <https://www.niddk.nih.gov/health-information/professionals/diabetes-discoveries-practice/the-impact-of-poor-sleep-on-type-2-diabetes>
3. <https://newsroom.heart.org/news/american-heart-association-adds-sleep-to-cardiovascular-health-checklist>

Why Invest in Sleep



A study which focused on individual productivity and health care expenditures, found that individuals who reported sleep trouble, at least sometimes, carried higher health care costs: approximately \$1,000 to \$3,500 additional dollars spent per person annually.¹



Preliminary study data indicated an increased risk of falls associated with decreased sleep efficiency and sleep time in a large group of older women, with effects persisting after adjustment of health status and mood and other confounders²



If your members consistently have **healthy sleep**,



this can help **reduce costs** for members and their health plan.



1. <https://www.benefitspro.com/2022/04/05/america-cant-afford-its-sleep-problem/?slreturn=20220926122612>
2. Stone KL, Schneider JL, Blackwell T, Ancoli-Israel S, Redline S, Claman D, Cauley JA, Ensrud KE, Hillier TA, Cummings SR. Impaired sleep increases the risk of falls in older women: A prospective actigraphy study. Sleep. 2004;27(276 abstract supplement):A125. <https://pubmed.ncbi.nlm.nih.gov/18779464/>



Heart Health: AFib



Heart Health: AFib

The Significance of Atrial Fibrillation (Afib)

The incidence and prevalence of **AFib** are **increasing globally**.¹

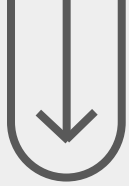
AFib currently affects more than **33.5 million people** globally.²

AFib is associated with an approximately **5x increased risk of stroke**.³

1. <https://www.cms.gov/files/document/datasnapshot-atrialfibrillation-ian2020.pdf>

2. Sumeet S. Chugh, Rasmus Havmoeller, Kumar Narayanan, David Singh, Michiel Rienstra, Emelia J. Benjamin, Richard F. Gillum, Young-Hoon Kim, John H. McAnulty Jr, Zhi-Jie Zheng, Mohammad H. Forouzanfar, Mohsen Naghavi, George A. Mensah, Majid Ezzati and Christopher J.L. Murray. *Worldwide Epidemiology of Atrial Fibrillation*. 17 Dec 2013 <https://doi.org/10.1161/CIRCULATIONAHA.113.005119> *Circulation*. 2014;129:837–847

3. https://www.cdc.gov/heartdisease/atrial_fibrillation.htm



Heart Health: AFib and Early Detection

Utilizing wearable devices to screen for Afib:

- Can be cost effective, due to treatment to reduce stroke risk¹
- May result in additional revenue and resources for health plans¹
- Reaches more people, addressing disparities in detection²

The cost effectiveness of screening for AFib that includes using a \$150 wearable was \$34,583 per QALY, well below the \$100,000/QALY threshold¹

“On the basis of current US age and sex-specific prevalence data, the national incremental AF cost is estimated to range from \$6 to \$26 billion.”²

It is estimated that wrist-worn wearables may be associated with reduction in stroke incidence by 20 to 23 stroke events / 100 000 person-years¹

1. Chen W, Khurshid S, Singer DE, et al. Cost-effectiveness of Screening for Atrial Fibrillation Using Wearable Devices. JAMA Health Forum. 2022;3(8):e222419. doi:10.1001/jamahealthforum.2022.2419 <https://jamanetwork.com/journals/jama-health-forum/fullarticle/2794835>
2. Estimation of Total Incremental Health Care Costs in Patients With Atrial Fibrillation in the United States, Kim MH, Johnston SS, Chu BC, Dalal MR, Schulman KL *Circ Cardiovasc Qual Outcomes*. 2011;4:313-320

The Fitbit Heart Study

>455k

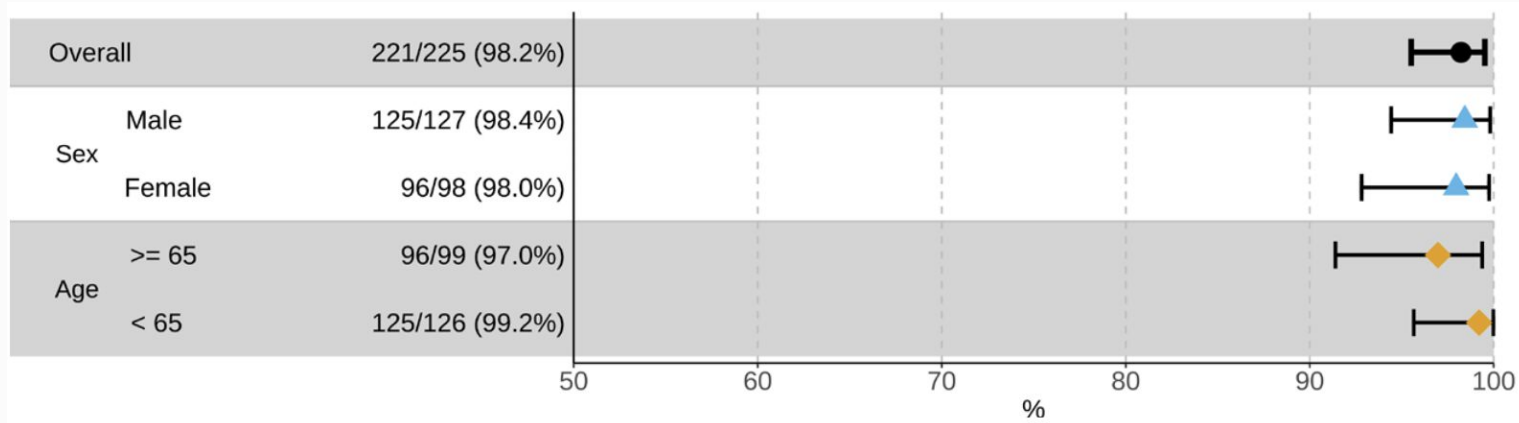
Study Enrollees

98.2%

Positive Predictive Value (similar across males and females)

97%

Positive Predictive Value, for participants aged >65 years.



Steven A. Lubitz, Anthony Z. Faranesh, Caitlin Selvaggi, Steven J. Atlas, David D. McManus, Daniel E. Singer, Sherry Pagoto, Michael V. McConnell, Alexandros Pantelopoulos and Andrea S. Foulkes. Detection of Atrial Fibrillation in a Large Population Using Wearable Devices: The Fitbit Heart Study. 23 Sep 2022. <https://doi.org/10.1161/CIRCULATIONAHA.122.060291>Circulation. 2022;146:1415–1424



Program Successes: 'Real Results'



FITBIT AND SOLERA POWER DIABETES PREVENTION ¹



Solera's model **coupled** with Fitbit's innovative devices, motivating platform and proven behavior change principles, is an **effective combination** for helping to prevent type 2 diabetes.

1.4x

Fitbit users more likely to achieve 5% weight loss²

60

Extra minutes of activity Fitbit users achieved by weeks 10-16⁴



1 yr

Fitbit users were still outperforming on weight loss vs. non-Fitbit users³



¹Analysis conducted by Solera Health; based on more than 1,700 people enrolled in a DPP from January 1, 2017-March 31, 2017

²(51% vs 36%, p=<0.001)

³(-3.38% vs -2.27%, p=0.013)

⁴(195 vs 129 minutes/week, p=<0.001)



Pilot Program Suggests Benefits from Adding Fitbit to a Dedicated Diabetes Program

**Integrating Fitbit Wearable Devices into Diabetes Care Leads to Significant Improvements in Blood Glucose and HbA1c, Finds Health2Sync Clinical Study in Taiwan, <https://markets.businessinsider.com/news/stocks/integrating-fitbit-wearable-devices-into-diabetes-care-leads-to-significant-improvements-in-blood-glucose-and-hba1c-finds-health2sync-clinical-study-in-taiwan-1029799437>*



95

Participants
using leading diabetes
app in Japan & Taiwan*

Blood glucose, hemoglobin A1c (HbA1c), and LDL cholesterol were established as a baseline prior to the Fitbit intervention

Outcomes
after 3 months using Fitbit:

11mg/dL

average
decrease in
blood glucose



0.3pt

average
decrease in
HbA1c



12mg/dL

average
decrease in
LDL cholesterol

