

The Science of Vitality

Dr Deepak N Patel





South Africa's Quadruple Burden of Disease

**Diseases of
Poverty**

HIV and AIDS

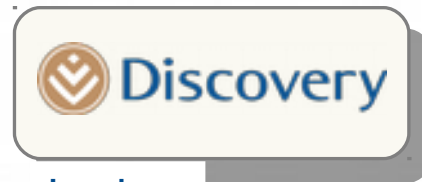
**Accidents
and Violence**

**Chronic
Diseases**

Healthcare

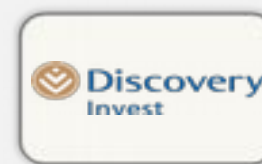
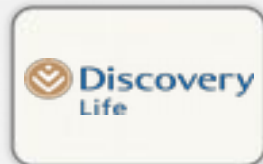
- In 2012 the total health spending in SA was R248.6 billion, which represented 8.3% of GDP.
- Approximately half of this is spent in the private sector and includes contributions made by individuals to medical plans.
- Discovery Health is the largest private health insurer with > 2.8 million members – about a third of all privately insured members
- Vitality has more than 1.6 million members in South Africa

The Discovery Group



Local

PRIMARY MARKET



International

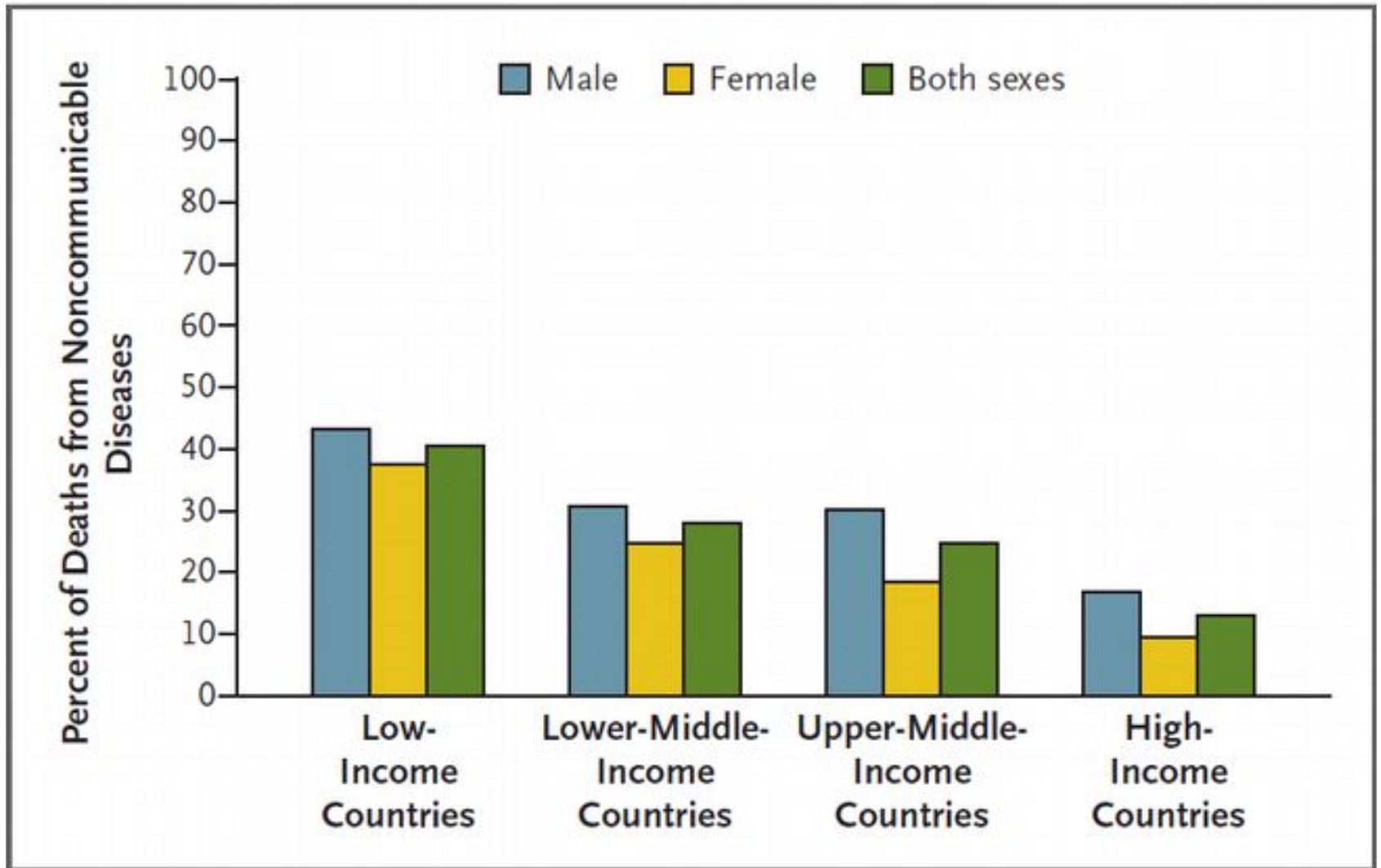
2ND PRIMARY MARKET



PARTNER MARKETS

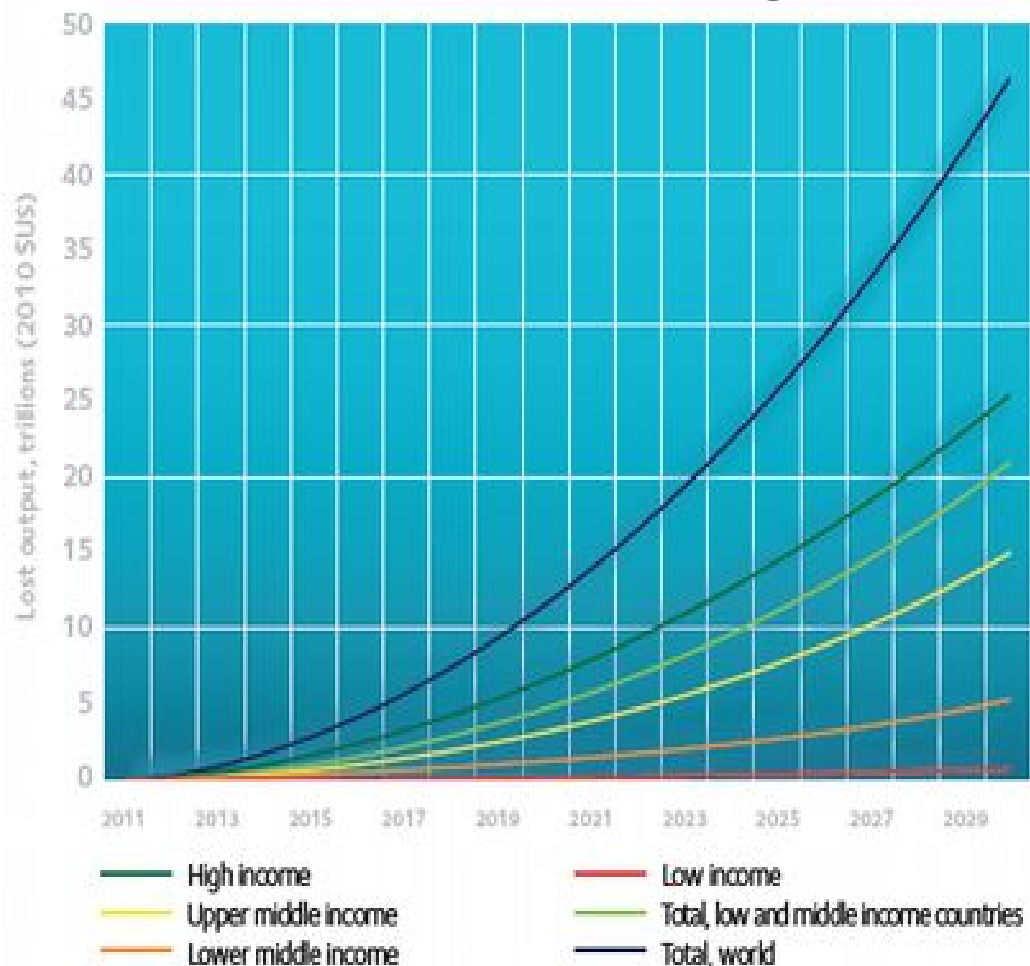


Global Deaths According to Cause



The economic impact of NCDs

Projected non-communicable diseases cost by income level based on economic growth forecasts.



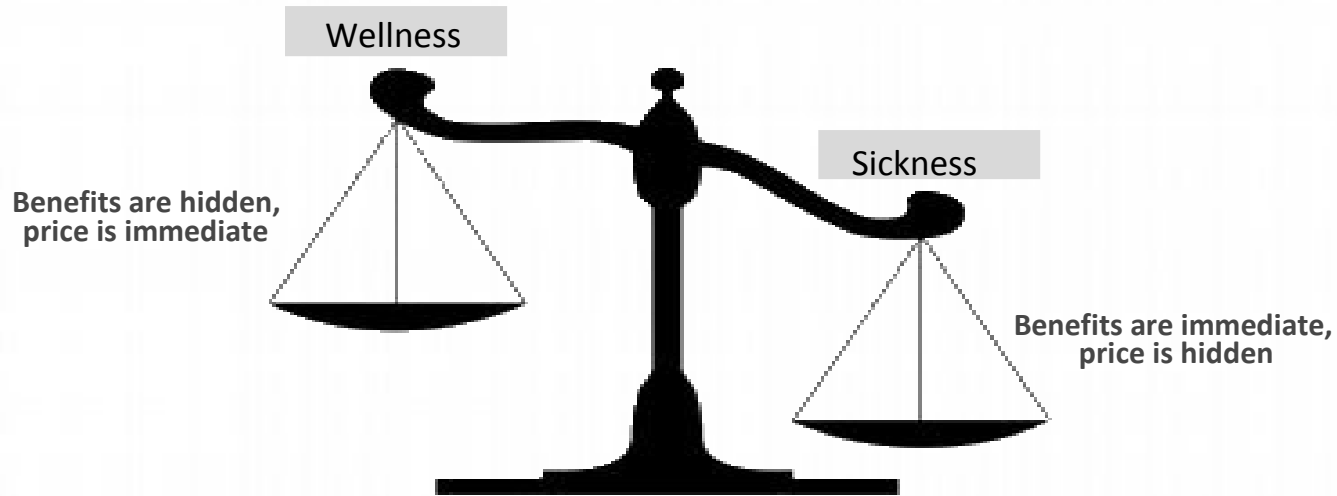
The **cost of treatment** for NCD's over the next two decades is estimated at **USD \$30 trillion**.

Every **10% rise in NCD's** is associated with a **0.5% decline in economic growth rate**.

Disease Development is Complex



The healthcare consumption paradox



Under
consumption
of preventative
care

Lack of information

Over-optimism

Discount the future

The true efficacy of different health & wellness approaches is not well understood

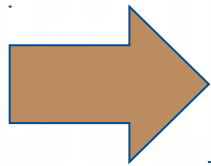
People tend to overestimate their abilities and health status

The future rewards of a healthy lifestyle are significantly undervalued relative to the cost today

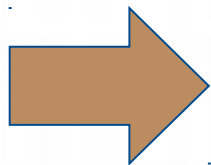
Traditional economics and personal medicine can only partly help address these problems

- Traditional economics premised on a rational choice perspective

1. Humans make perfectly rational decisions if given sufficient information.
2. Those decisions are intended to maximise their utility or self-interest.
3. Humans exercise maximum self-control in achieving their aims.



Little or no need for intervention



Focus on prices and/or information as main tools for policy

Behavioral economics allows for mistakes

- Overweighting of the present
- Insensitivity to probabilities
- Framing
- Loss aversion
- Status quo / default bias

Intervention - asymmetric or libertarian paternalism

Two general approaches:

- Subtle changes in environment to 'nudge' people in beneficial directions
- Ways to 'supercharge' incentive programs.

Employers are increasingly using incentives to drive better health behaviors



- Many employers and insurers are implementing incentives for wellness in bid to reduce costs, but...
 - Many such programs poorly designed (e.g., \$500 off premium at end of year for attending gym 100 times)
 - Many are implemented in ways that are difficult to evaluate (e.g., roll out for everybody at once with no pre-data)

An overview of the Vitality programme

The programme structure



1 KNOW YOUR HEALTH

Health risk identification

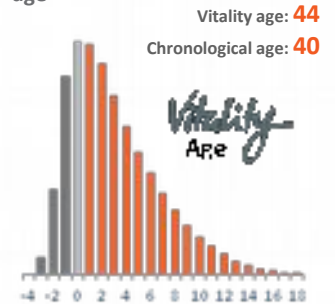


237 800
Health Checks



265 800
Health Reviews

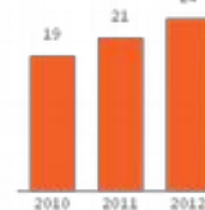
Member signalling through Vitality age



2 IMPROVE YOUR HEALTH

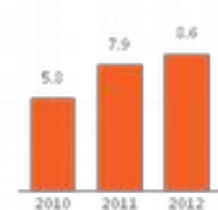
Access benefits drive health engagement

Gym workouts (millions)



24m gym visits a year

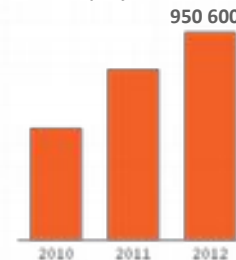
Healthyfood trolleys (million)



8.6m trolleys p.a
R3.5 bn spend p.a

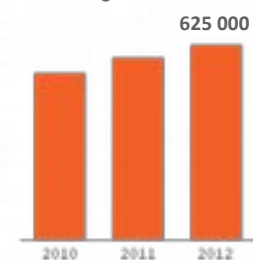
3 ENJOY THE REWARDS

Domestic flights per year



Fill 19 domestic flights per day

Movie registrations



8 500 movies watched each day

Vitality's model of making members healthier

Know your health

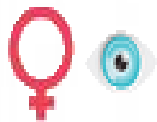
Improve your health

Enjoy the rewards

Complete the Vitality assessments

Engage in activities and earn points

Achieve a Vitality Status and enjoy the rewards



Know your health

Vitality Health Review

Medical and family history



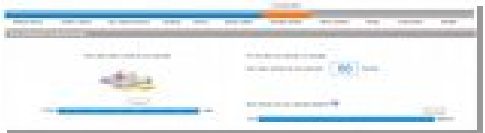
Key measurements



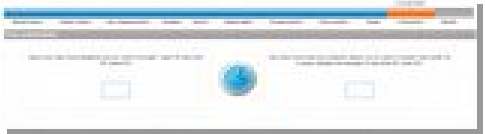
Smoking, alcohol and nutrition



Physical activity



Stress and productivity



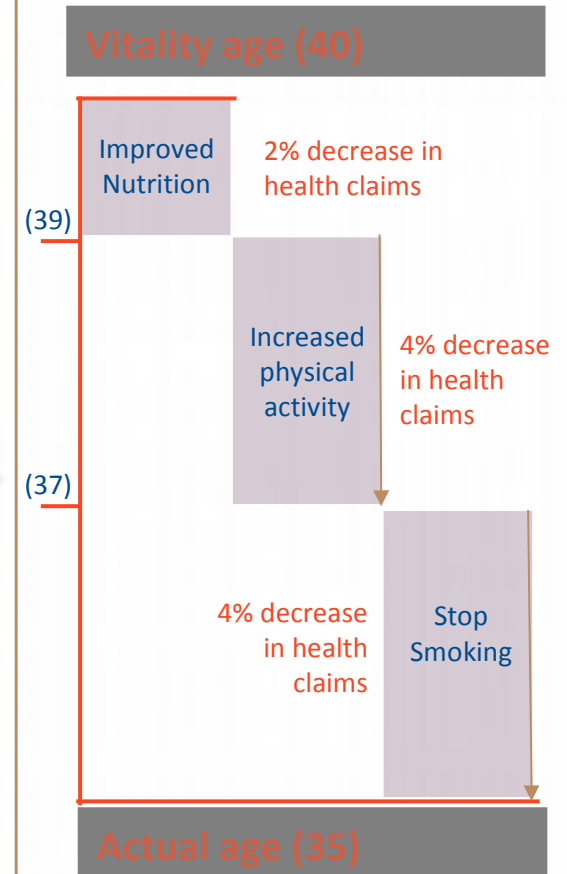
Clinically sound assessment of individual risk factors

Identify risk factors and Vitality age



A meta-analysis of over **5000 published studies** (75m life years data from developed-world studies)

Link to clinical outcomes



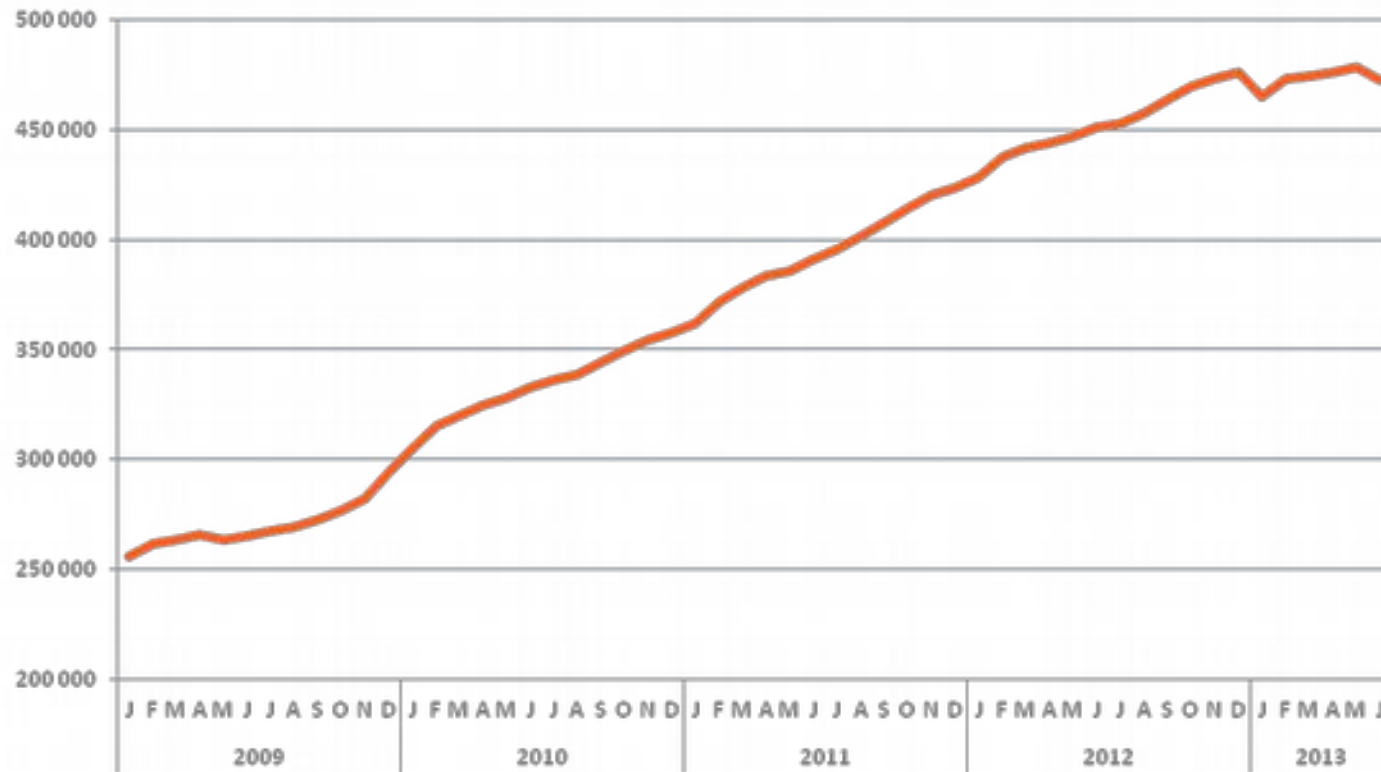
A 1-year decrease in Vitality age results, on average, in a 2% lower health claims

Access to health partners

Up to 80% off at Gym partners



Getting people active



Virgin ACTIVE gym members



Vitality inducing behaviour change: Vitality HealthyFood™



HealthyFood built on strong clinical foundation

Save 25% on more than 10,000 HealthyFood™ items



Vegetables and fruit



Protein-rich foods



High grain carbohydrate



Lentils and legumes



Dairy and dairy alternatives



Oils, Nuts and seeds

Note : Only certain foods in each category qualify for the HealthyFood saving

The HealthyFood™ benefit in action



2 X JUNGLE CATS	VIT	35.58
2 X FAT FREE MILK	VIT	14.98
2 X FAT FREE YOGHURT	VIT	37.98
BAG OF FRUIT SPECIAL	VIT	79.94
3 X PLAIN CASHEW NUT	VIT	43.47
2 X SKINLESS CHICKEN BREASTS	VIT	87.90
OLIVE OIL	VIT	50.99
3 X TIN PEACHES NATURAL JUICE	VIT	38.85
WASHING POWDER		32.79
SHAMPOO		15.39
TOOTHPASTE		10.49
ITEMS	25 TOTAL	454.36

Pick 'n Pay Family Store

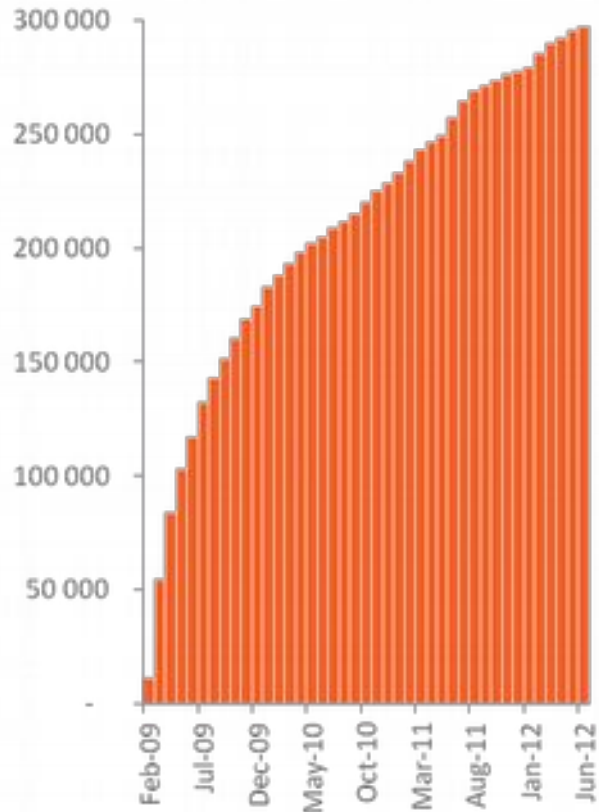
HealthyFood total:
R395.69

Vitality saving:
R98.92

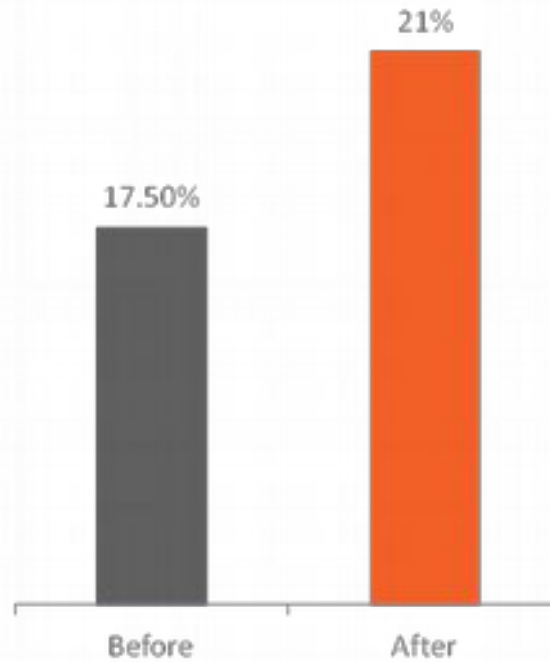
Vitality points:
240

Clinical impact of HealthyFood: Improved nutritional choices and health awareness

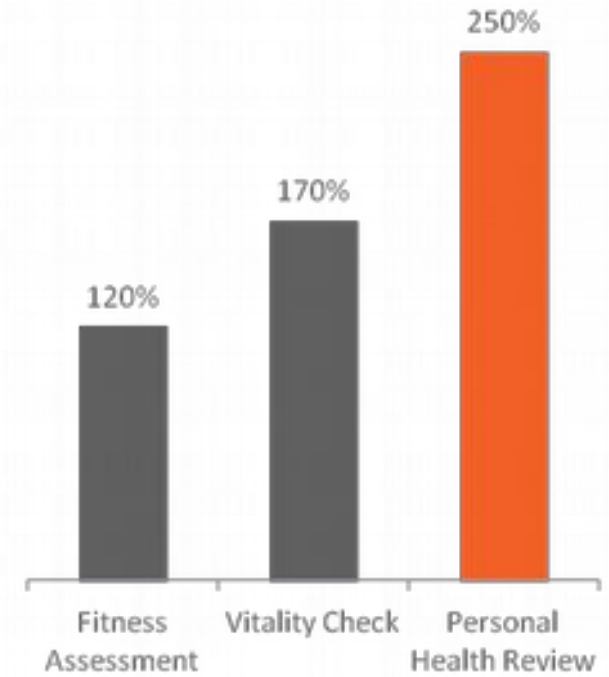
Cumulative take-up
(Policies since inception)



Increase in proportion of basket
made up of HealthyFood items



Increase in health awareness since
inception of HealthyFood™



Vitality's research foundations

Incentive study



Kevin
Volpp

George
Loewenstein

To examine the role of various incentives to increase physical activity

HealthyFood benefit study



Roland Sturm

NIH Grant for HealthyFood benefit evaluation – paper to be published by the American Journal of Health Behavior

Behavioural economics



Dan Ariely

Janet Schwartz

Vitality Drive; Social media and behaviour change

Discovery Healthy Company Index



To explore burden of disease and wellness behaviour & activity in the workplace

Evolution of the research agenda

- The quality of research and the range of international collaboration has improved over time
- 2007 Cross sectional studies
- 2008 -2009 Retrospective Longitudinal studies
- 2010 Prospective randomized studies

Publication of Vitality studies

Cross-sectional

Longitudinal

THE SCIENCE OF HEALTH PROMOTION

Financial Analysis

The Association Between Medical Costs and Participation in the Vitality Health Promotion Program Among 948,974 Members of a South African Health Insurance Company

Dougal N. Patel, MD, MSc; Emily F. Lambert, PhD; Rosamund de Silwa, BS; Hans, MSc; Craig Young, MBBCh; Adam South, BS; Wayne Swann, PhD; Thomas Gorman, PhD

Abstract

Objective: To assess the association between participation in a health promotion program and medical costs among members of a South African health insurance company. **Design:** Cross-sectional study using administrative data. **Setting:** A large, multi-ethnic health insurance company in South Africa. **Participants:** 948,974 members of the health insurance company. **Measures and Main Results:** Members who participated in the health promotion program had lower medical costs than those who did not. The association was stronger for those who participated in the program for a longer duration. **Conclusion:** Participation in the health promotion program is associated with lower medical costs. **Keywords:** Health promotion, medical costs, health insurance.

INTRODUCTION

Health care costs are increasing globally.^{1,2} Among the many reasons for increasing costs are increases in health care delivery, costs and costs of technology, and the increasing burden of chronic diseases among older populations.^{3,4} The increase in chronic diseases has been particularly marked in so-called "developing countries," where the burden of disease is increasing rapidly. **Objective:** To assess the association between participation in a health promotion program and medical costs among members of a South African health insurance company.

PREVENTING CHRONIC DISEASE PUBLIC HEALTH RESEARCH, PRACTICE, AND POLICY

VOLUME 6, NO 4

OCTOBER 2008

ORIGINAL RESEARCH

Fitness-Related Activities and Medical Claims Related to Hospital Admissions — South Africa, 2006

Scott E. Linnard, PhD; Rosamund de Silwa, Dougal Patel, MD, MSc; Adam South, PhD; Tracy Koller-Wanderski, PhD; Adam South, Craig Young, MBBCh, MSc; Wayne Swann, MBBCh, PhD; Thomas Gorman, MD, MSc

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THE SCIENCE OF HEALTH PROMOTION

Financial Analysis

Participation in Fitness-Related Activities of an Incentive-Based Health Promotion Program and Hospital Costs: A Retrospective Longitudinal Study

Dougal N. Patel, MD, MSc; Emily F. Lambert, PhD; Rosamund de Silwa, BS; Hans, MSc; Craig Young, MBBCh; Adam South, BS; Wayne Swann, PhD; Thomas Gorman, PhD

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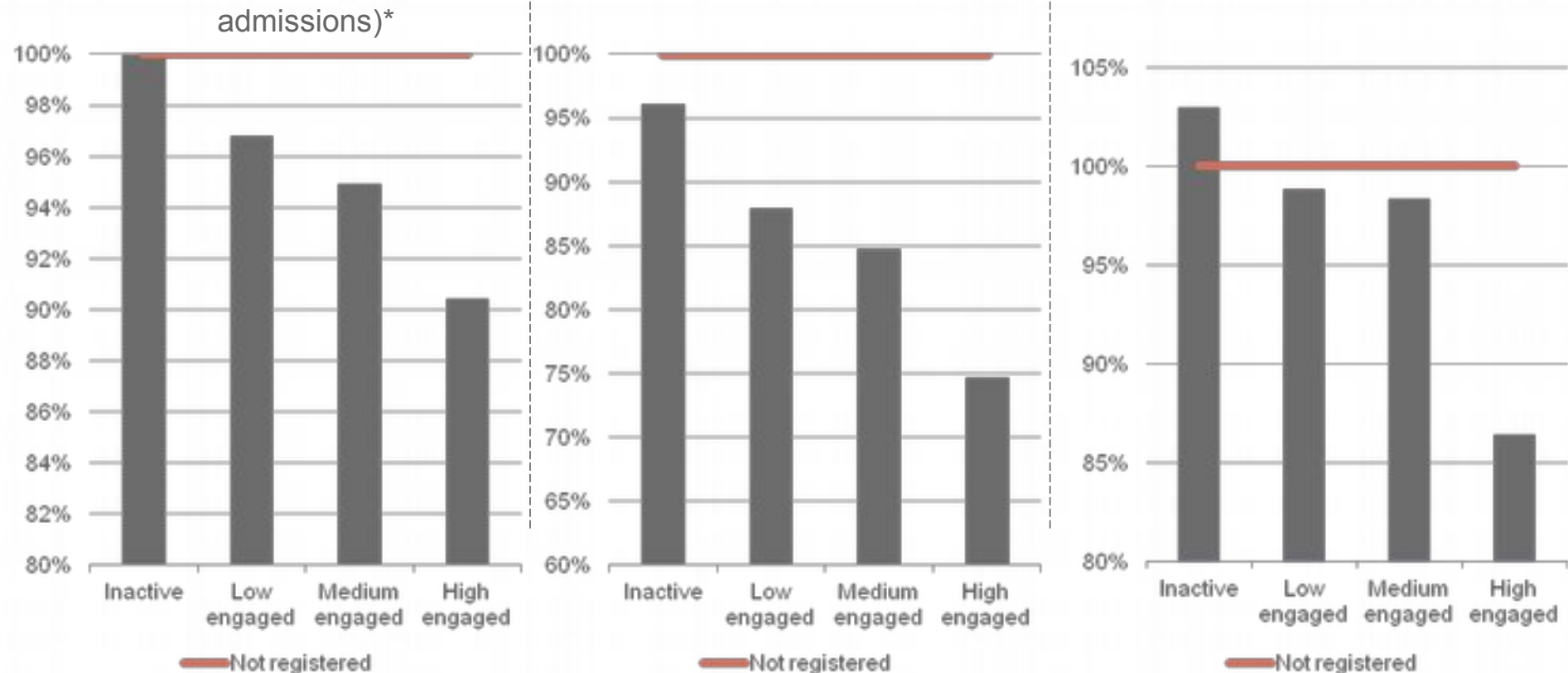
Engaged members experienced lower costs per patient, shorter stays in hospital, and fewer admissions compared to all other groups

Impact of fitness engagement on hospital admissions and costs

Admit rate (number of admissions)*

Length of stay in hospital (days)

Cost per patient

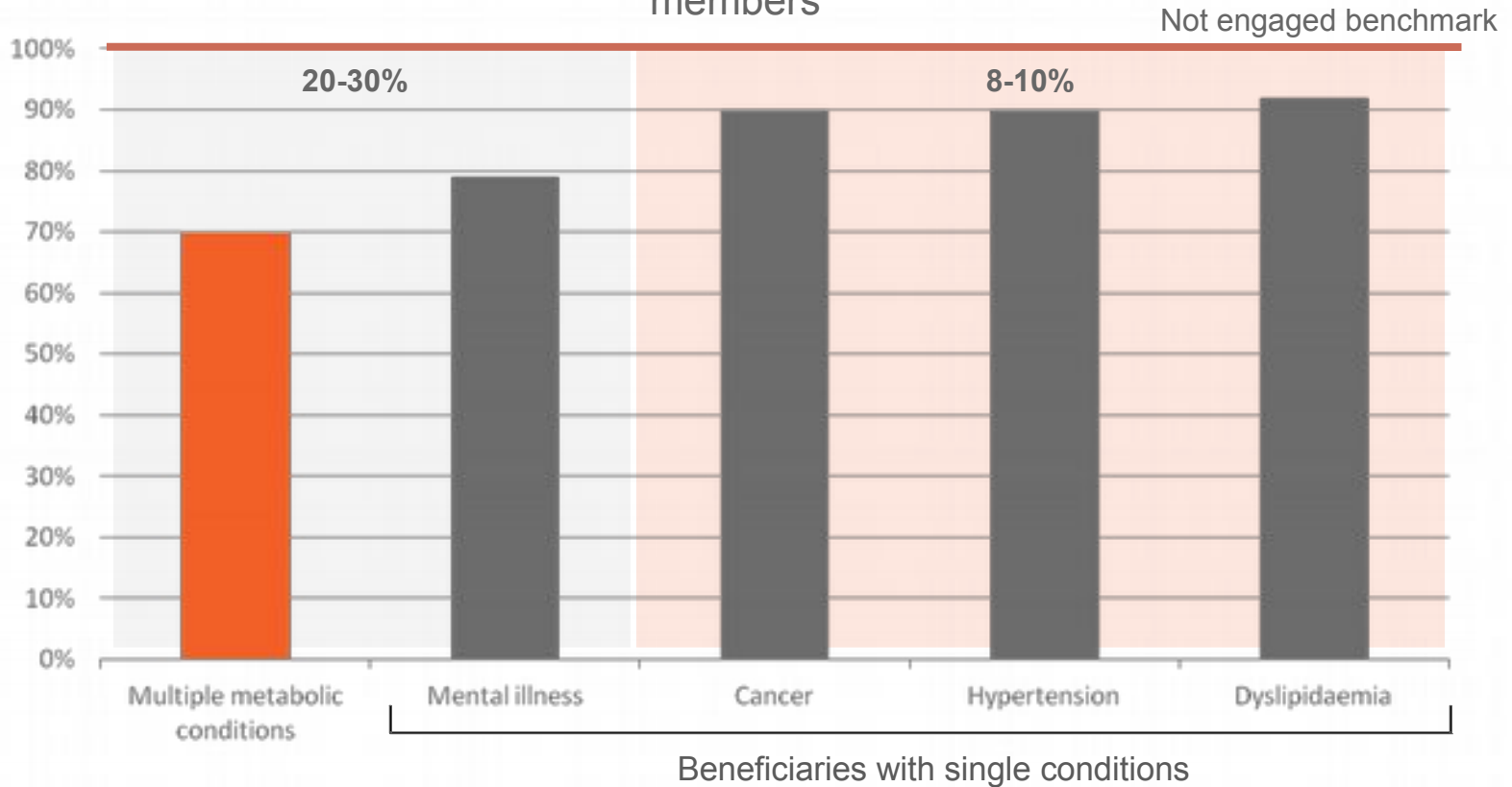


Fit people make better patients on a risk-adjusted basis

*Patients with at least one admission event

Engaged chronic members experienced lower costs per patient compared to other groups

Risk-adjusted hospital cost for chronic members: engaged vs. not engaged Vitality members



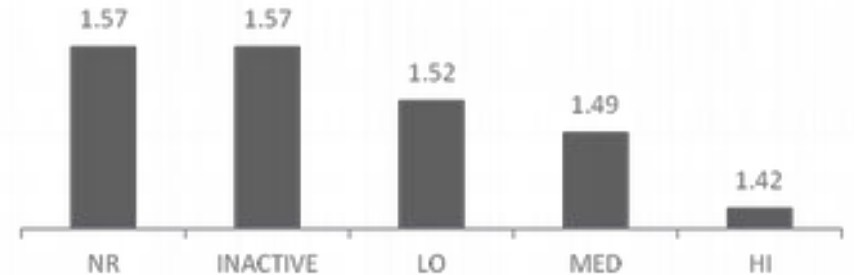
P = 0.001 for multiple metabolic conditions, all single conditions are not statistically significant

Fitter people spend less time in hospital and incur lower healthcare costs

Impact of Vitality engagement on hospital experience

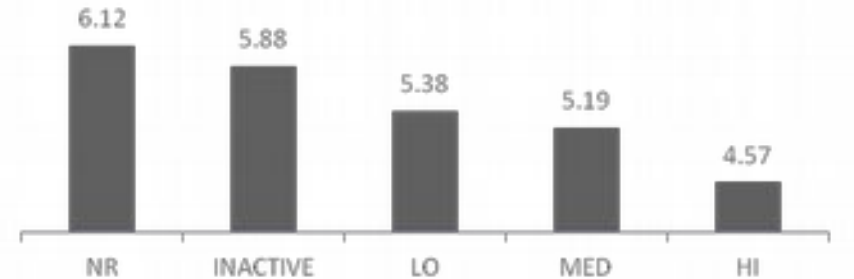
1. Admissions per patient*

- 9.6% lower in highly active individuals vs inactive



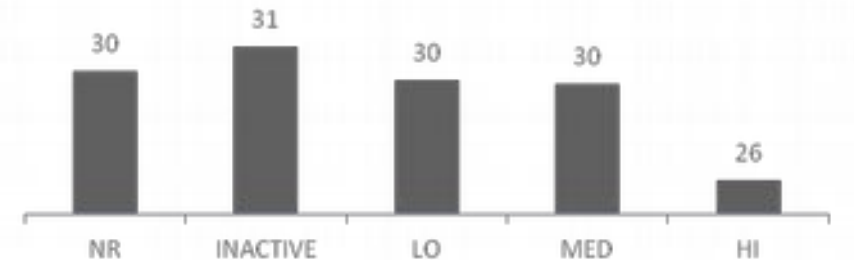
2. Length of stay in hospital

- On average 0.57 days shorter for highly active individuals vs inactive



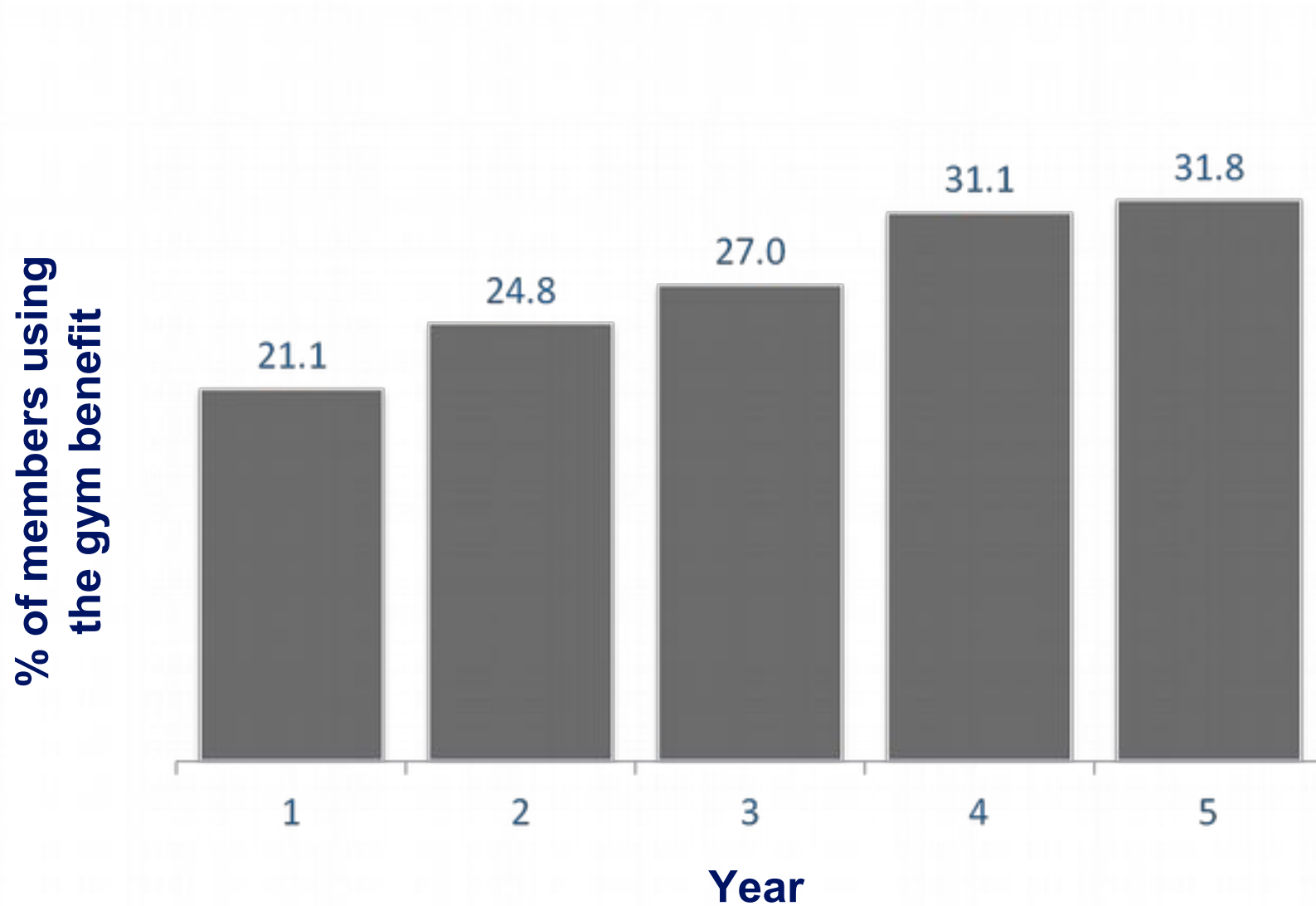
3. Cost per patient (R'000)

- Medical costs once hospitalised R5,052 lower for highly active individuals vs inactive



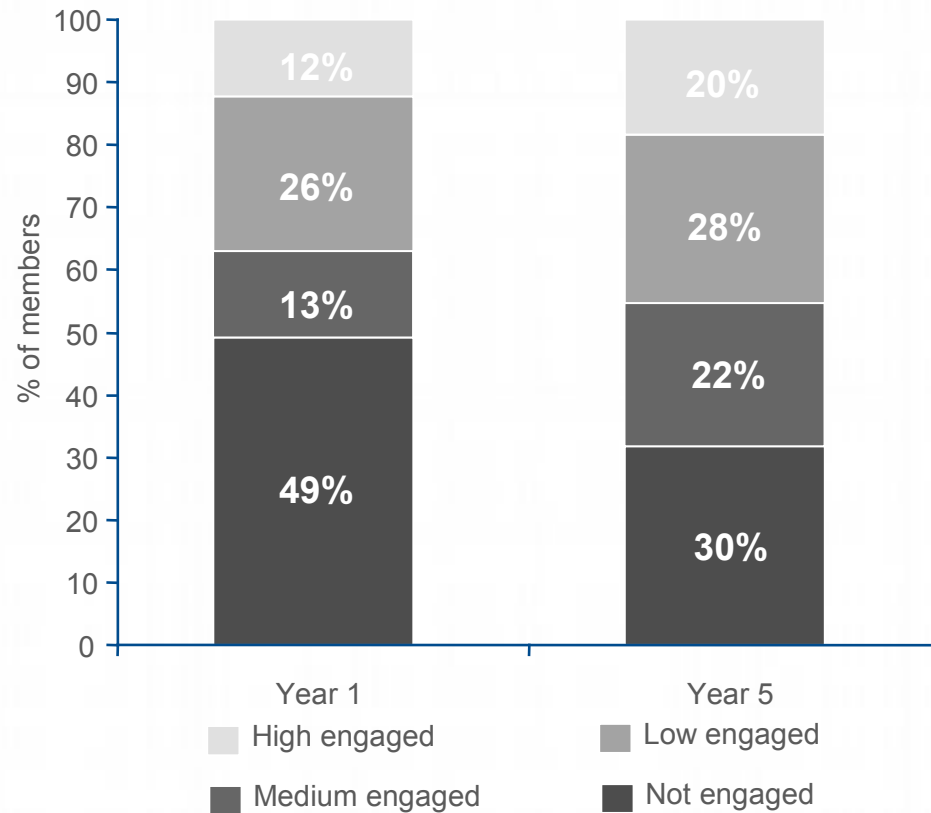
Fit people make better patients – admissions, length of stay and costs are risk-adjusted

Increase in Fitness Engagement over time

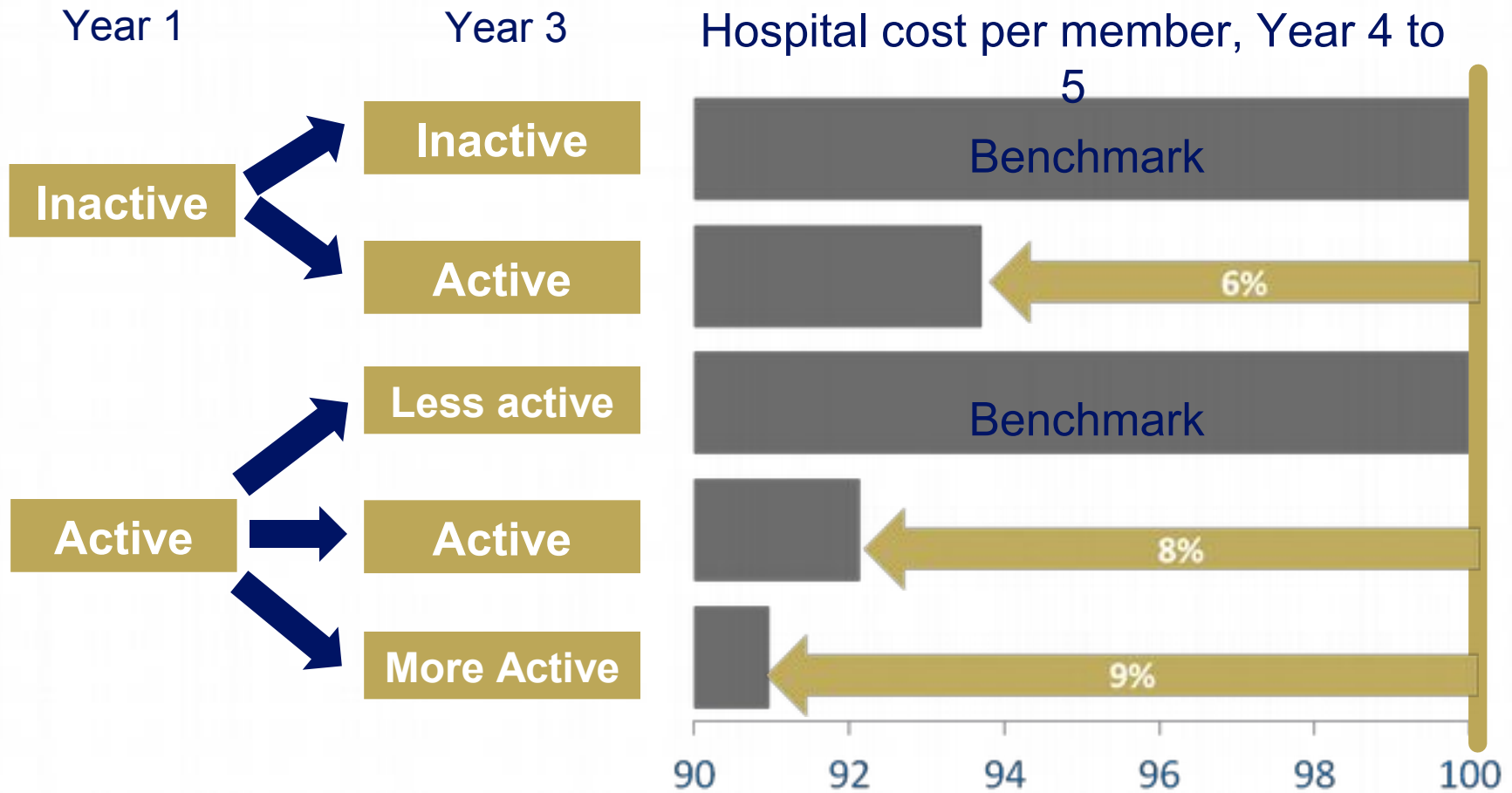


Data shows increasing engagement in the programme over time

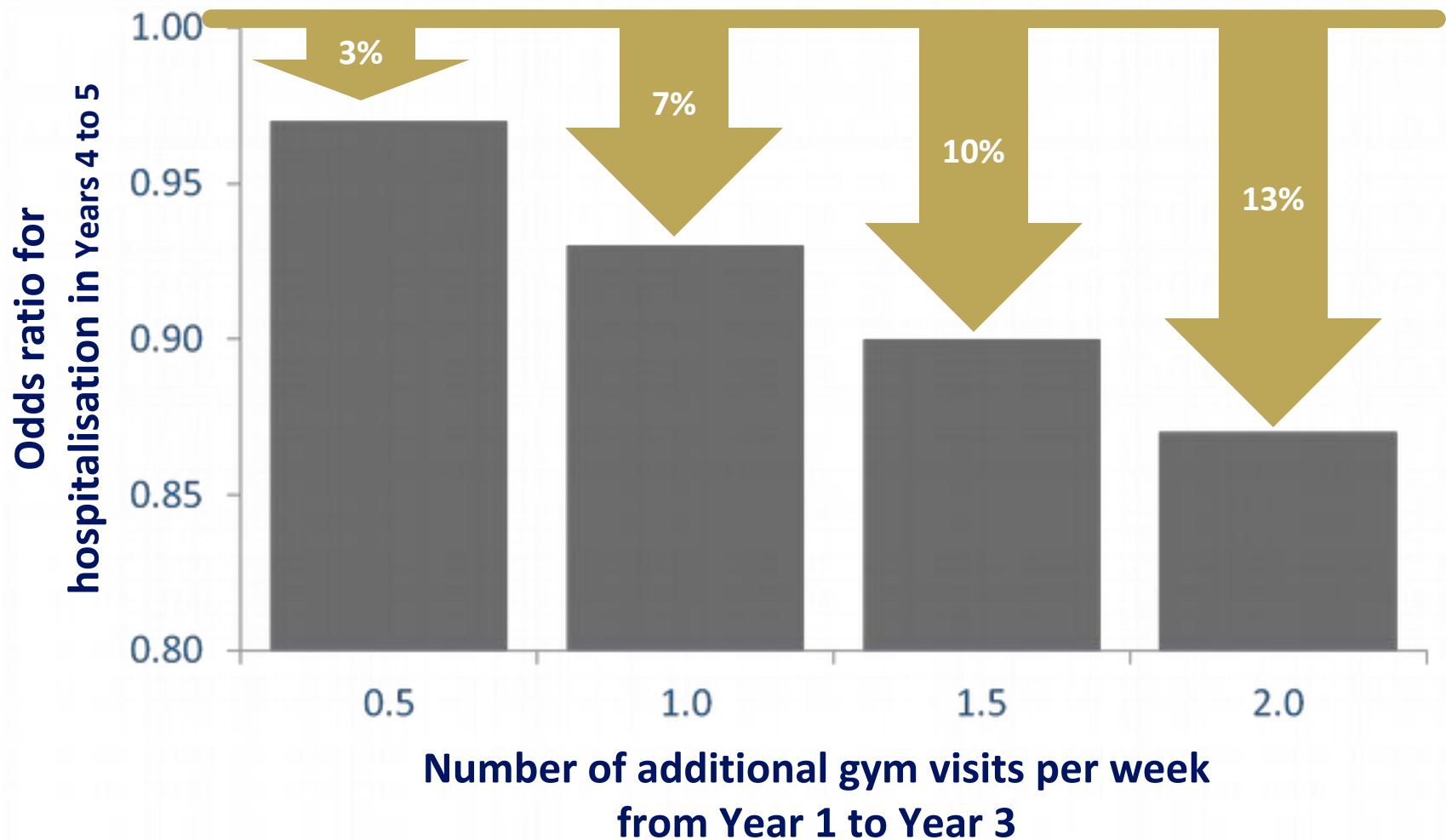
Engagement levels amongst longitudinal study test participants over the investigation period



Outcomes associated with transitions between engagement levels



Relationship between increasing activity and the odds of hospitalisation



RAND Collaboration – HealthyFood

Eating Better for Less: A National Discount Program for Healthy Food Purchases in South Africa

Ruopeng An, MPP, MPhil; Deepak Patel, MD, MPhil; Darren Segal, BSc; Roland Sturm, PhD

Objectives: To examine whether reducing prices for healthy food purchases leads to changes in self-reported measures of food consumption and weight status. **Methods:** Repeated surveys of about 350,000 HealthyFood participants and nonparticipants. **Results:** Program participation is associated with more consumption of fruits/vegetables and whole-grain foods and less consumption

of high sugar/salt foods, fried foods, processed meats, and fast food. There is no strong evidence that participation reduces obesity. **Conclusions:** A substantial price intervention might be effective in improving diets.

Key words: financial incentive, discount, diet, obesity

Am J Health Behav. 2012;37(1):56-61

DOI: <http://dx.doi.org/10.5992/AJHB.37.1.6>

Improving diet quality is a key health promotion strategy. Released in June 2011, the *National Prevention Strategy: America's Plan for Better Health* and *Let's Move!* considers healthy eating a priority area and calls for increased access to affordable healthy foods in communities.¹ A hotly debated topic is the role of food prices: nutrient-rich foods including fruits and vegetables, have become more expensive relative to calorie-dense, nutrient-poor foods, and some researchers believe that the increasing price differential contributes to obesity and socio-demographic health disparities.²⁻⁴

It is not known whether a price discount on fruits, vegetables, or other healthy foods can meaningfully change dietary behaviors in the population, let alone reduce the prevalence of obesity.

However, a much larger discount program has been operating nationwide since 2009 – but in South Africa. The program is known as the HealthyFood benefit and is available to members of Discovery, South Africa's largest private health insurance company. Under the HealthyFood benefit, members receive up to 25% cash back on healthy food purchases. To our knowledge, Discovery's HealthyFood program is the only price intervention to promote healthy diet that is fully funded by a private firm on an ongoing basis, rather than as a short-term study project. The program may also be unique worldwide due to its size (about 200,000 households are enrolled) and geographic scope (nationwide across South Africa with about 800 participating supermarkets). This paper reports

A Cash-Back Rebate Program for Healthy Food Purchases in South Africa Results from Scanner Data

Roland Sturm, PhD, Ruopeng An, MPP, MPhil, Darren Segal, BSc, Deepak Patel, MD, MPhil

This activity is available for CME credit. See page A3 for information.

Background: Improving diet quality is a key health promotion strategy. There is much interest in the role of prices and financial incentives to encourage healthy diet, but no data from large population interventions.

Purpose: This study examines the effect of a price reduction for healthy food items on household grocery shopping behavior among members of South Africa's largest health plan.

Methods: The HealthyFood program provides a cash-back rebate of up to 25% for healthy food purchases in over 400 designated supermarkets across all provinces in South Africa. Monthly household supermarket food purchase scanner data between 2009 and 2012 are linked to 170,000 households (60% eligible for the rebate) with Visa credit cards. Two approaches were used to control for selective participation using these panel data: a household fixed-effect model and a case-control differences-in-differences model.

Results: Rebates of 10% and 25% for healthy foods are associated with an increase in the ratio of healthy to total food expenditure by 6.0% (95% CI=5.3, 6.8) and 9.3% (95% CI=8.5, 10.0); an increase in the ratio of fruit and vegetables to total food expenditure by 5.7% (95% CI=4.5, 6.9) and 8.5% (95% CI=7.3, 9.7); and a decrease in the ratio of less desirable to total food expenditure by 5.6% (95% CI=4.7, 6.5) and 7.2% (95% CI=6.3, 8.1).

Conclusions: Participation in a rebate program for healthy foods led to increases in purchases of healthy foods and to decreases in purchases of less-desirable foods, with magnitudes similar to

Based on Health Risk Assessment

25% discount is associated with a

fruits and
vegetables

high-sugar
food

high-salt
foods

fried foods

processed
meat

fast-food

21%



29%

24%

27%

15%

17%

Based on supermarket spend data

25% discount is associated with a

ratio of healthy to
total food
expenditure

12%



ratio fruit/vegetable
to total food
expenditure

10%



ratio of less desirable
to total food
expenditure

6%



Rand Collaboration – Preventive Screening

POLICY

Impact of a Patient Incentive Program on Receipt of Preventive Care

Ateev Mehrotra, MD; Ruopeng An, PhD; Deepak N. Patel, MBBS; and Roland Sturm, PhD

Despite widespread efforts to encourage prevention, rates of preventive care use fall well short of recommendations.^{1,2} Much of the focus on improving preventive care has been on decreasing financial barriers. For example, new laws in the United States have eliminated patient out-of-pocket costs for preventive health services.³ While removing out-of-pocket costs will increase the number of people who receive preventive care, the increase is likely to be modest.^{4,5} Employers and health plans are exploring whether patient incentive programs can spur greater use of preventive care.^{6,7}

In a patient incentive program, a patient receives money or some other financial reward for healthy behavior.⁸ In theory, these programs address a fundamental problem with preventive care—when making the choice to receive preventive care, patients balance the inconvenience of receiving preventive care with distant and often intangible benefits. Humans generally discount such future benefits^{9,10} and therefore it may not be surprising that many patients do not seek preventive care. Incentive programs might help address this discrepancy between immediate inconvenience and future benefit by increasing the perceived immediate benefits of prevention.

There have been several randomized trials focusing on patient incentives to promote healthy behavior.^{10,11} For example, Volpp and colleagues found that a \$750 incentive led

ABSTRACT

Objectives

Patient financial incentives are being promoted as a mechanism to increase receipt of preventive care, encourage healthy behavior, and improve chronic disease management. However, few empirical evaluations have assessed such incentive programs.

Study Design

In South Africa, a private health plan has introduced a voluntary incentive program which costs enrollees approximately \$20 per month. In the program, enrollees earn points when they receive preventive care. These points translate into discounts on retail goods such as airline tickets, movie tickets, or cell phones.

Methods

We chose 8 preventive care services over the years 2005 to 2011 and compared the change between those who entered the incentive program and those that did not. We used multivariate regression models with individual random effects to try to address selection bias.

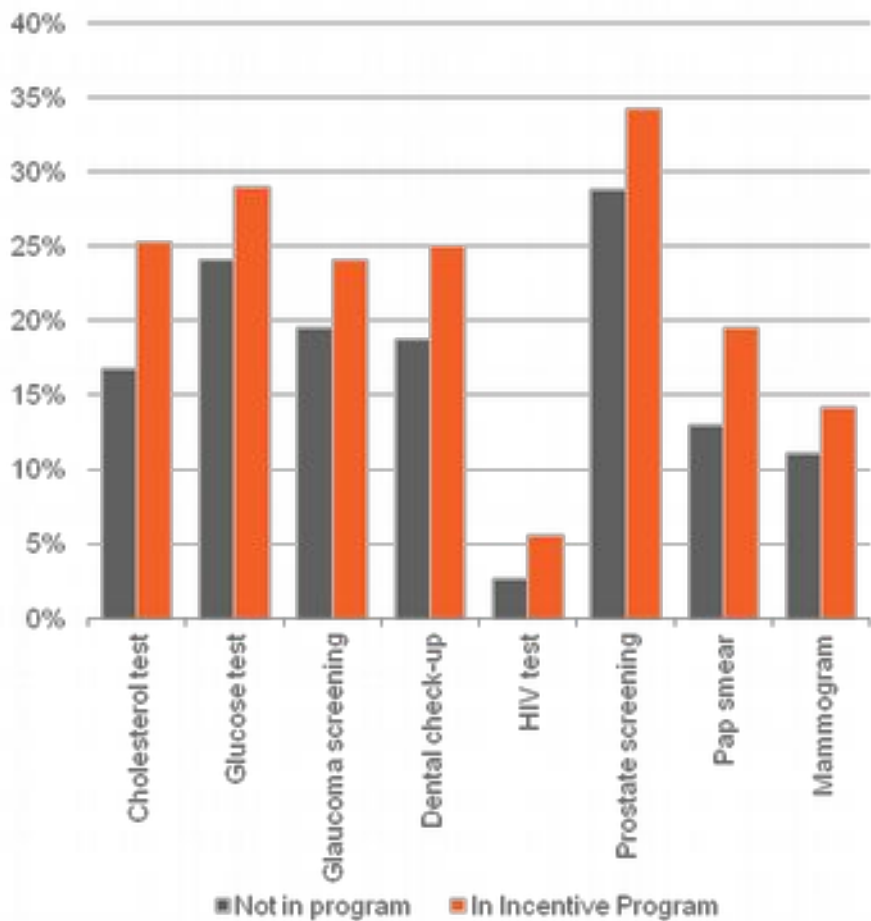
Results

Of the 4,186,047 unique individuals enrolled in the health plan, 65.5% (2,742,268) voluntarily enrolled in the incentive program. Joining the incentive program was associated with statistically higher odds of receiving all 8 preventive care services. The odds ratio (and estimated percentage point increase) for receipt of cholesterol testing was 2.70 (8.9%); glucose testing 1.51 (4.7%); glaucoma screening 1.34 (3.9%); dental exam 1.64 (6.3%); HIV test 3.47 (2.6%); prostate specific antigen testing 1.29 (5.6%); Papnicolaou screening 2.17 (7.0%); and mammogram 1.90 (3.1%) ($P < .001$ for all 8 services). However, preventive care rates among those in the incentive program was still low.

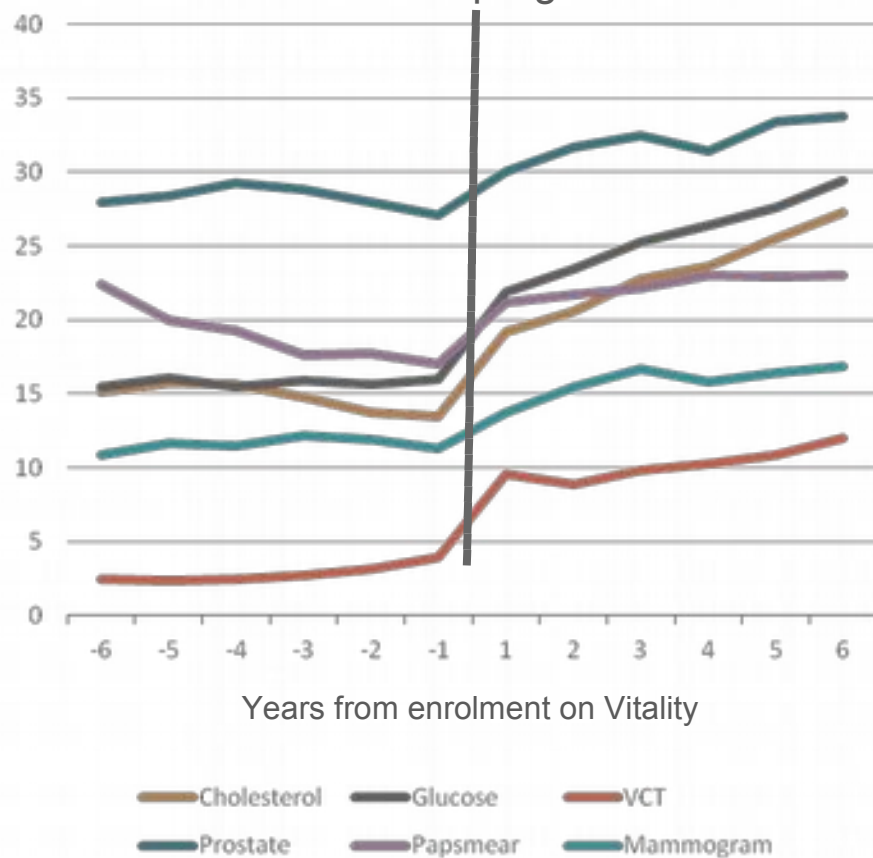
Preventative screening

Comparison of the receipt of 8 preventive care services between members in the incentive program and those not in the incentive program over the years 2005-11. We assessed the change in an individual's likelihood of receiving preventive care services after they enter the program.

Take-up of screening tests



Impact on individual behaviour following entry into incentive programme



Healthier by Precommitment - Duke Collaboration

Psychological Science OnlineFirst, published on January 3, 2014 as doi:10.1177/0956797613510950



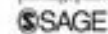
Research Article

Healthier by Precommitment

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Abstract

We tested a voluntary self-control commitment device to help grocery shoppers make healthier food purchases. Participants, who were already enrolled in a large-scale incentive program that discounts the price of eligible groceries by 25%, were offered the chance to put their discount on the line. Agreeing households pledged that they would increase their purchases of healthy food by 5 percentage points above their household baseline for each of 6 months. If they reached that goal, their discount was awarded as usual; otherwise, their discount was forfeited for that month. Thirty-six percent of households that were offered the binding commitment agreed; they subsequently showed an average 3.5-percentage-point increase in healthy grocery items purchased in each of the 6 months; households that declined the commitment and control-group households that were given a hypothetical option to precommit did not show such an increase. These results suggest that self-aware consumers will seize opportunities to create restrictive choice environments for themselves, even at some risk of financial loss.

Keywords

self-control, health, rewards

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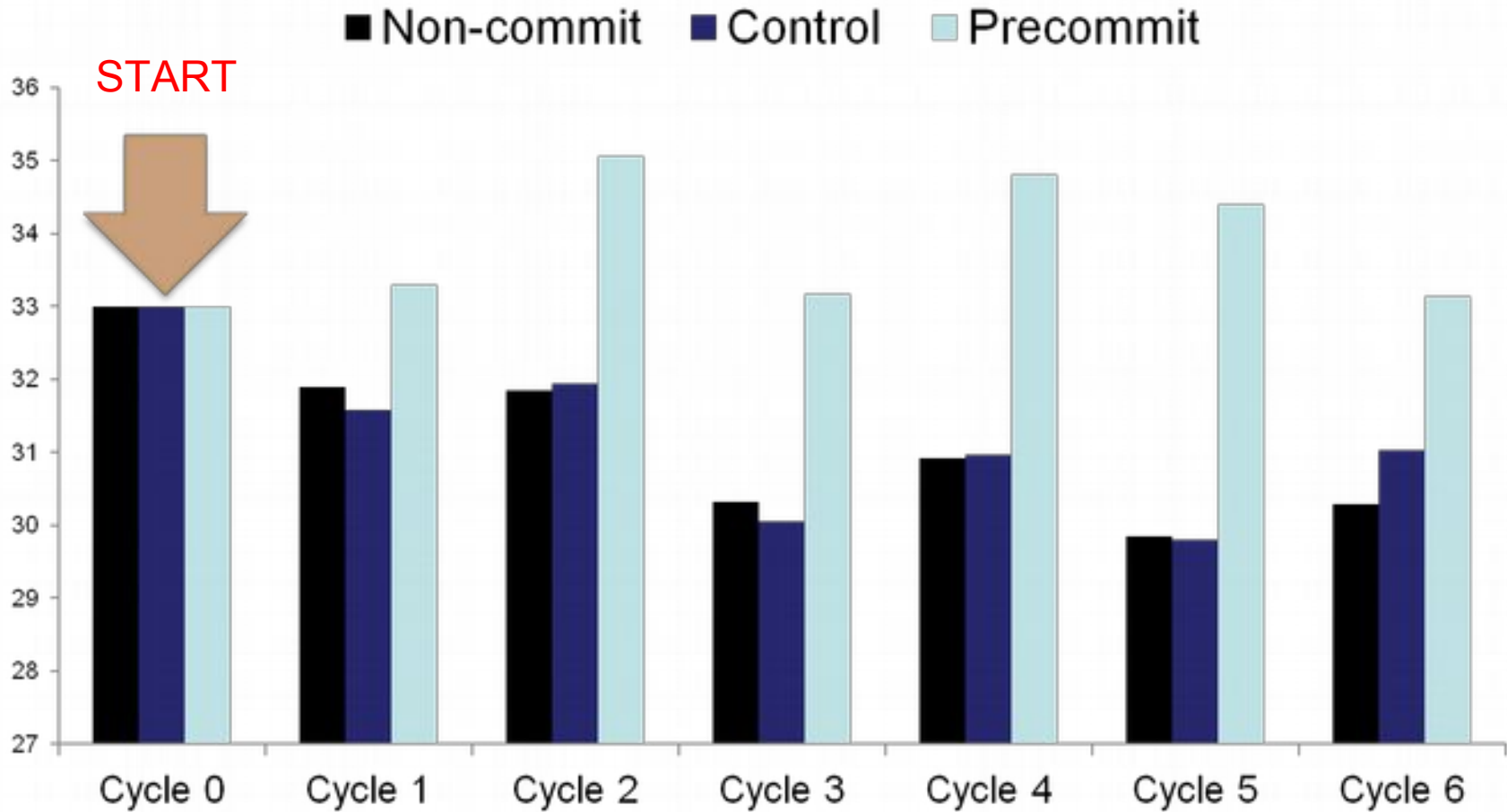
Methods:

Aim

- Study the effect of pre-committing to buying healthy food on food purchasing behaviour
- Participants who accepted pre-committed to increasing the percentage of HealthyFood™ items in their baskets by 5% for six DiscoveryCard statement cycles.
- If they don't achieve their commitment, they forfeit their HealthyFood cash back

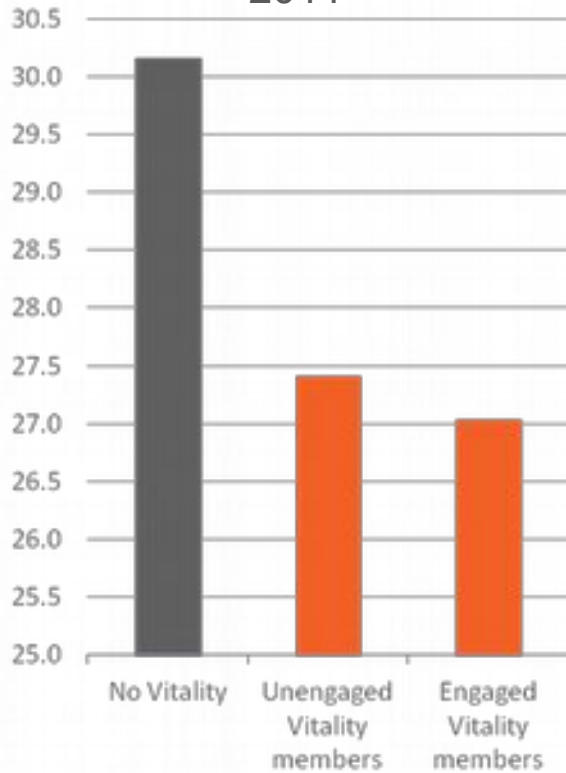
Study Results: Healthy %

40



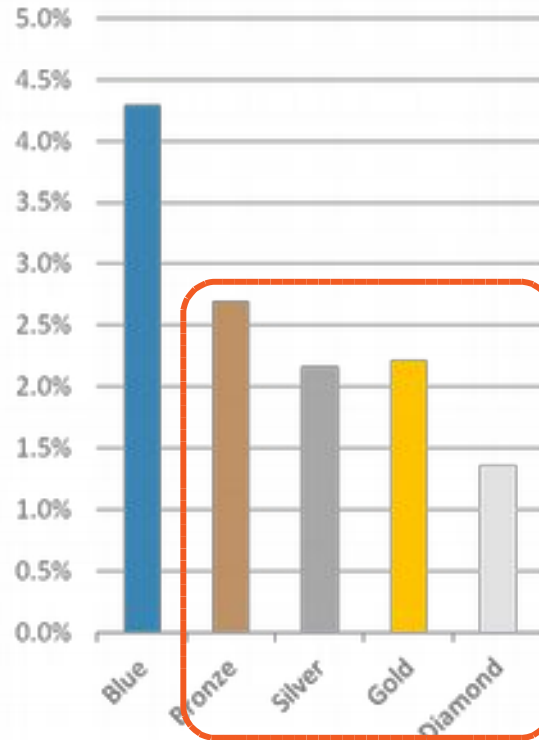
Impact of Vitality on DHMS: Positive selection and retention of better risk lives

Average age of new members joining DHMS in 2011



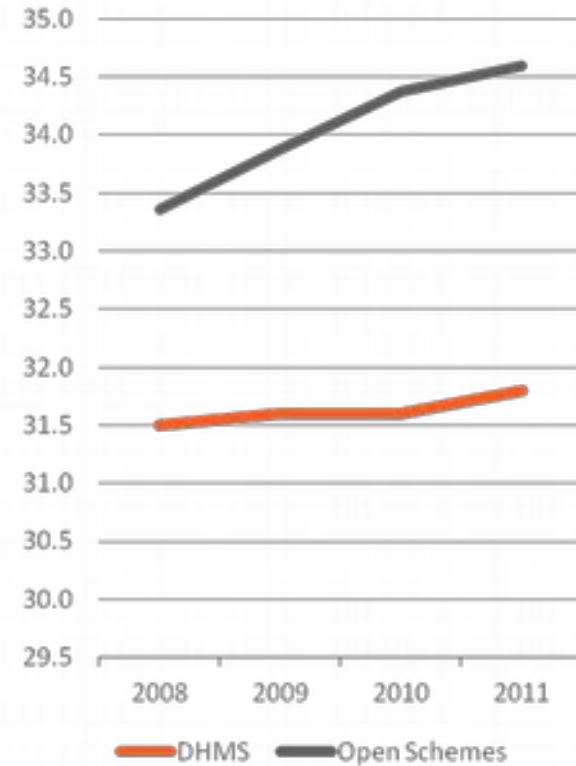
Vitality engagement after joining DHMS

Lapse rates by Vitality status



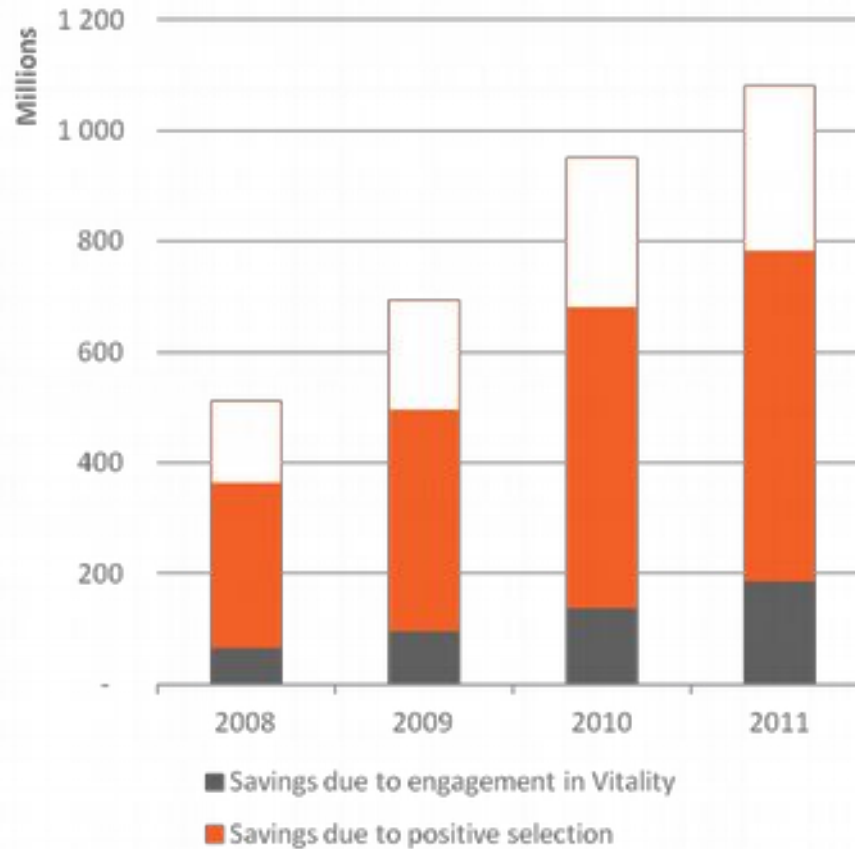
Source: 2011 Discovery Health Medical Scheme data

Age differential of DHMS relative to market



Estimating the financial impact of Vitality on DHMS

Annual savings to DHMS through
behaviour change
(Risk adjusted savings per annum)



Notes:

Relative healthcare costs by Vitality engagement

Adjusted for age, gender, RUB, chronic conditions, province and plan

Vitality School Programme



Creating a new national Culture of Health

