CREATING SHARED VALUE FROM BETTER HEALTH

A Whole New Approach to Life Insurance

John Hancock | Vitality

TABLE OF CONTENTS

FOREWORD

For more than 150 years, John Hancock has been at the forefront of the life insurance industry, providing innovative financial solutions for our clients at every stage of their lives. During that time, we've experienced tremendous growth and change, alongside the very policyholders we serve. But there's one thing that has always remained constant, and that's our commitment to providing U.S. consumers with the critical life insurance protection we believe is such an important part of any solid financial strategy. It has always been, and always will be, at the heart of what we do.

Along with John Hancock, the life insurance industry has also experienced growth and change. For many decades, the industry thrived as generation after generation saw and believed in the need for life insurance.

Unfortunately, in recent years, life insurance has lost some of its relevance in the U.S. as families have struggled with difficult decisions about their limited financial resources and have been forced to navigate competing priorities. The result is that far too many American consumers are not adequately protected by life insurance, or worse, are not covered at all.

At the same time, we know that Americans are living longer, but many are also living longer in poor health and often suffering from chronic conditions. This is happening despite advancements in technology and the availability of information about the ways we can improve and protect our health, and the ways we are harming it.

Protecting people, families and businesses is a mission for all of us at John Hancock. However, it is clear to us that in order to meet that goal, we need a whole new approach to life insurance. One that makes it appealing for new generations in innovative ways that resonate with their daily lives. We believe life insurance can and should reward consumers for the positive small steps they take each day, whether it's walking those extra few blocks, getting a flu shot, or learning how to live in a more healthy way.

That's why we couldn't be more excited about our exclusive U.S. partnership with Vitality, the global leader in integrating wellness benefits with life insurance products. With Vitality, John Hancock is redefining life insurance and introducing a whole new approach with products that provide critical life insurance protection while supporting health and wellness, with the goal of helping people in their pursuit of living longer healthier lives.

As outlined in this paper, our strategic approach comes at a pivotal time in the history of our country and in the history of the life insurance industry. It's an approach rooted in science and behavioral economics, and modeled on Vitality's foundation of success in other parts of the world.

We look forward to making life insurance more relevant to U.S. consumers and rewarding them for protecting their health, wealth, and overall well-being.

Michael Doughty
President and General Manager, **John Hancock Insurance**

Over one hundred years ago, the National Conservation Commission's Committee on Health reported the results of their study on the vitality of Americans. They believed that if the best scientific knowledge available then was incorporated into new forms of life insurance, benefits would accrue to members and companies. Longer and healthier lives for the former, and greater profitability for the latter. John Hancock was on the forefront of such innovation then. For many reasons these initiatives faded after a few decades.

Today we are thrilled to join forces with John Hancock in taking a quantum leap forward to inject dynamism, excitement and the prospect of healthier and longer lives into life insurance.

We do so at a time of national need, armed with both better knowledge about how to make healthy choices the easier choices, and the technology and financial incentives to make that happen. Nobel Prize winners Daniel Kahneman and Richard Schiller have placed the importance of behavioral economics at the center of modern economic and health policy. They highlight how many of us fail to take actions in our best long-term interests when faced with today's temptations—we stay in a warm bed rather than go for a run, walk or swim; we choose the enticing sugar and fat laden food option over a pear, carrot or fish; we choose another drink at the end of day; we dismiss the importance of taking our medications daily; and we value an urgent task over a mindful period of relaxation. We are not bad people, or unaware of the consequences of our choices. We are simply wired to react without deep reflection.

Vitality's researchers understand this reality and provide solutions that fit easily into people's lives. We reward the healthy choice not as a bribe but as a means of making it the more desirable one; we design the programs to remove simple barriers that when combined, often stop people from getting screened, or vaccinated, joining a gym, or accessing healthy food. And we are supported by the rapid development of personalized devices to support better measurement of activities.

A decade of our research confirms what has been known for a century: how and when we die is strongly related to how we live our lives. The earlier healthy behaviors are established the better, and we know that prevention matters at every age. Smokers who quit or use only nicotine improve their life expectancy even until their 6th decade; people who become active after 50 years of inactivity lower their risks for heart and mental disease; 65 year olds who get vaccinated substantially lower their risks of serious disease; and as expected, 20 and 30 year olds who initiate and maintain levels of mental and physical fitness will live to enjoy the benefits well into their 8th decade and beyond.

One hundred years ago when average life expectancy was a mere 45 years, all this seemed an impossible dream. Today it is a reality. To enjoy the triumph of longevity however, we need to build innovative ways suited to our 21st century capabilities, expectations, and environment. The John Hancock Vitality partnership does just that.

Derek Yach
Executive Director, **The Vitality Institute**

INTRODUCTION

People in the U.S. are living longer than ever before.[1] In our own lifetimes, we've seen the life expectancy trend move upward. On the surface, this should be terrific news for the business of life insurance, and for policyholders.

Below the surface, however, is the unsettling truth about our statistically increasing longevity: people are living longer, but spending more years in poorer health. Chronic conditions become more complex and prevalent, and new health issues tend to emerge as people age. Medical needs demand more attention, and more resources.[2]

Alongside this overall health dynamic is another unsettling reality: a declining trend in people having adequate life insurance coverage.

Chronological longevity trends upward; healthy life expectancy isn't keeping pace.[3] The protection afforded our families is heading in the opposite direction entirely.

It's a vexing paradox, surfacing at a time when accepting the importance of health promotion is a movement that's been gathering steam. Government has taken steps to broaden proactive health and wellness initiatives. Technology has brought unprecedented levels of information access and health improvement tools to the population at large. Science and actuarial data have emerged to inform the creation of programs and services that people can use to proactively manage their health. How can it be that we're not seeing positive progress?

Perhaps the answer is: it is no coincidence that people are underinvested in both their own health and life protection. Both require a longer-term mindset—a willingness to invest, even sacrifice, in the present in order to attain a future benefit. There is very little, if any, instant gratification or reward for making the right, rational, long-term choices. As a society and as individuals, we're wired for the here and now. Industries such as ours need to find ways to embrace this, or be consigned to an ongoing struggle against the tide.

Another hard truth: the life insurance industry, as a whole, has struggled to keep pace with the rapid changes and advances in society. Consider for example, the digital revolution spawned by the emergence of the internet, and how it has changed so much of the way consumers engage with their world; then consider that our industry's approaches to product structure, underwriting, and pricing are still rooted in concepts that date to the analog age. Is it possible that a lack of relevance in product design is also feeding the downward trend in adequate coverage?

It's time to re-imagine our approach. What's needed now is a fresh vision and new ways of integrating all the momentum, evidence, and tools available to create life insurance and protection options that make sense for our times: a whole new approach to life insurance.

Science and actuarial data have emerged to inform the creation of programs and services people can use to proactively manage their health.

The life insurance industry has long been a proponent of health promotion. As early as 1903, life insurers proposed the idea that healthier living and the benefits of disease prevention could be promoted to their members. Longer, healthier lives are good for policyholders and good for the business. It is and always has been a natural alignment of interests—everyone benefits from better individual health. The question has always been: how to get there?

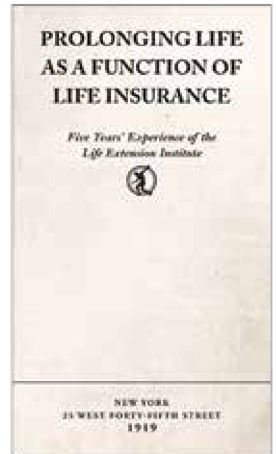
Expression of this idea has taken many forms in the decades since. Health education programs were incorporated into insurance plans. Healthy living literature has been widely created and distributed. Innovations such as payment for home nursing care were introduced as policy features. Lower cost policies were developed and offered to "preferred risk" applicants. The drive to connect health and wellness to policy features has even taken the form of allied organizations created to bring proactive health management and longevity to the business of life insurance. And that was flourishing in the 1920s!

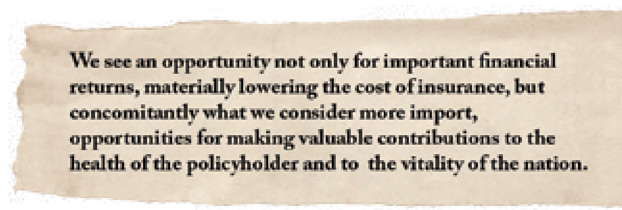
While the intentions were noble and the concept sound, the truth is, these programs only nibbled at the edges of the broader ideal. Policies then and now are for the most part still built on static individual risk information: point-in-time rating factors collected at inception, which yield averages that drive premium and payout calculations. Changes in policyholder health or risk profile—in either direction—aren't readily accommodated. Very little progress has been made in delivering life insurance products that reflect or actively incentivize the goal of improving healthy life expectancy.

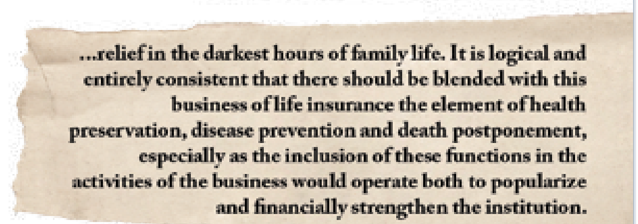
Along with this truth, we also know that recognition of the importance of life insurance isn't where we as an industry would like it to be. Most Americans don't have enough life insurance; many have none at all. In 2010, the percentage of U.S. households with individual life insurance hit a 50-year low. Why? According to research, the most common reason given is that people have competing financial priorities. The second most common: they think they can't afford it.[4]

In acknowledging all these factors, we can seize a new opportunity to change the way people think about life insurance. We can activate the natural alignment between consumer longevity and the goals of the life insurance industry, by sharing the economic value of health directly with the policyholders. The foundation for a true Shared Value[5] approach—what we're calling "a whole new approach to life insurance"—was laid more than a century ago. The tools and methods to make it a reality, however, had yet to be developed.

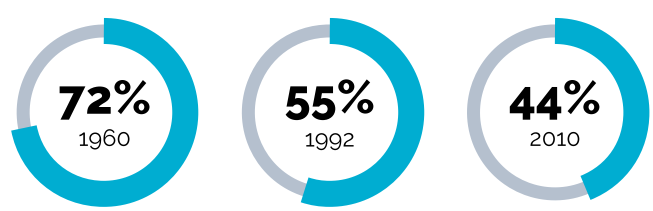
Our new approach to life insurance actually has deep historical roots. The natural alignment of life insurance and health improvement has long been recognized; as far back as the early 1900s, industry leaders were studying and outlining methods to promote health and extend healthy life expectancy.




We see an opportunity not only for important financial returns, materially lowering the cost of insurance, but concomitantly what we consider more import, opportunities for making valuable contributions to the health of the policyholder and to the vitality of the nation.


...relief in the darkest hours of family life. It is logical and entirely consistent that there should be blended with this business of life insurance the element of health preservation, disease prevention and death postponement, especially as the inclusion of these functions in the activities of the business would operate both to popularize and financially strengthen the institution.

% of U.S. households owning individual life insurance:



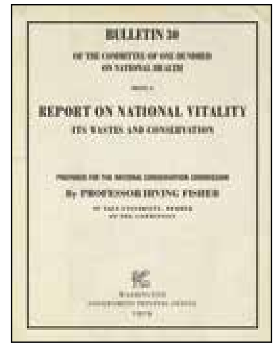
Source: LIMRA "2010 Life Insurance Ownership Study."

Of course, there have been many changes since industry pioneers began articulating and promoting the mutual benefit of health improvement initiatives. At the turn of the 20th century, life expectancy was just over 40 years of age in most developed countries, and around 45 in the U.S.[6] Life expectancy was stunted by poor hygiene and living conditions, lack of adequate nutrition, and infectious diseases.[7]

Better nutrition, hygiene, medical science and innovation, together with increased awareness and attention to essential public health functions, have since done the heavy lifting on addressing many of those factors;[8] this combination has driven dramatic increases in life expectancy over the past century. But as noted earlier, that positive data point needs to be viewed in context of its attendant consequences.

For starters, there is the issue of healthy life expectancy in the U.S. Over the past 20 years, each one-year increase in chronological life expectancy has brought with it only 0.8 years of healthy life expectancy.[9]

Next, when viewed in a global context, the life expectancy trend in the U.S. is not keeping pace with that of other wealthy nations.[10] Several countries have eclipsed the U.S., and our overall trend line appears to be flattening out.


BULLETIN 30

REPORT ON NATIONAL VITALITY

ITS WASTES AND CONSERVATION

By PROFESSOR IRVING FISHER

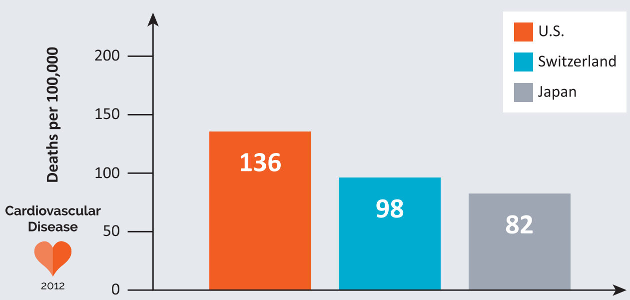
A 1909 report prepared by Professor Irving Fisher of Yale University for the National Conservation Commission described the major risk factors affecting health and longevity at the time: environmental hygiene, immoderate intake of food, drug habits (tobacco and alcohol), inadequate activity, and sexually transmitted diseases.

U.S. LIFE AND HEALTH TRENDS

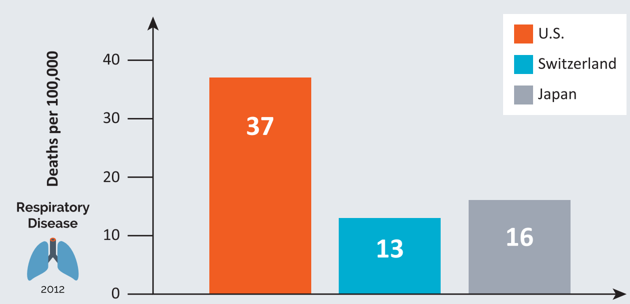
The burden of illness in the U.S. from non-communicable diseases has been steadily increasing. Our rankings vs. other countries continue to erode as well.

CHRONIC DISEASE RISK

Death rates in the United States from chronic diseases are considerably higher than in other countries, as this cardiovascular and and respiratory data show:



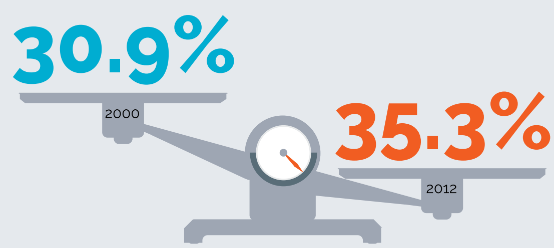
Source: *World Health Organization: Global Health Observatory Data Repository. Cardiovascular Diseases, Deaths per 100,000 Data by Country. Accessed from: http://apps.who.int/gho/data/node.main.A865CARDIOVASCULAR?lang=en.*



Source: *World Health Organization: Global Health Observatory Data Repository. Chronic Respiratory Diseases, Deaths per 100,000 Data by Country. Accessed from: http://apps.who.int/gho/data/node.main.A866?lang=en.*

OBESITY RATE—U.S.

The United States has the highest obesity rate (measured as a % of adult population) of all OECD countries, and it has grown considerably since 2000.



Source: *Organization for Economic Cooperation and Development (OECD)—OECD Health Statistics 2014: How does the United States compare?*

LIFE EXPECTANCY

78.7 United States | **80.2** OECD Average

As of 2012, life expectancy in the United States is 1.5 years less than the OECD average.

Source: *Organization for Economic Cooperation and Development (OECD)—OECD Health Statistics 2014: How does the United States compare?*

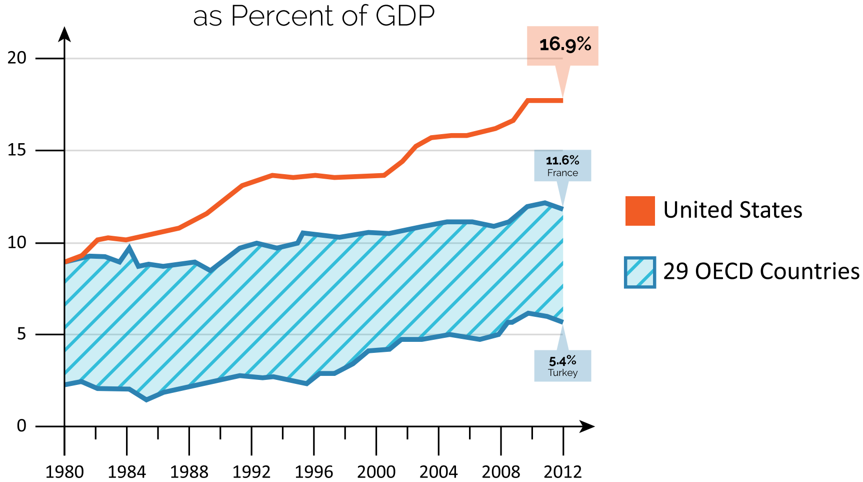
The U.S. is spending much more as a society on health care as our population ages, relative to other countries. The longer people live with a high burden of disease, the more it costs to attend to those medical needs that emerge alongside greater longevity.[11] The ripple effect of failing to attend to healthy life expectancy will be increasingly reflected in national productivity, strains on federal budget and debt, and on household wealth.[12,13]

Finally, one major factor in number and quality of healthy years has been identified: the steadily increasing burden of non-communicable diseases (NCDs). While there is and always will be room for improvement in addressing certain environmental factors (such as air pollution and understanding the health impacts of our genetic composition), the major culprit in the lagging U.S. performance is the impact of NCDs.[14,15]

A large proportion of NCDs are considered outcomes of behavior-driven choices. Leading NCDs such as heart disease, cancer, and diabetes are strongly linked to inactivity, poor diet, excess alcohol use and smoking. Significant reductions in both incidence and prevalence of NCDs are achievable by addressing preventable risk factors.[16]

Greater focus on primary prevention of NCD risks is especially critical now, as strongly age-dependent contributors to unhealthy life expectancy—particularly dementia and mobility disorders—are likely to increase over the next few decades.[17] For these health issues, primary prevention remains weak; response is left to more expensive secondary and tertiary prevention.

Healthcare Spending as Percent of GDP



Source: The Organization for Economic Co-operation and Development. OECD Health Statistics 2014: How does the United States compare? Accessed from: http://www.oecd.org/unitedstates/Briefing-Note-UNITED-STATES-2014.pdf

BEHAVIOR-DRIVEN CHOICES: HEALTH AND LONGEVITY

66.67%

IT IS ESTIMATED THAT UP TO 2/3 OF ALL DEATHS IN THE U.S. ARE SUBSTANTIALLY OR PRIMARILY DRIVEN BY **BEHAVIORAL CHOICES.**

Source: Centers for Disease Control and Prevention: Morbidity and Mortality Weekly Report. (May 2, 2014). Potentially Preventable Deaths from the Five Leading Causes of Death—United States, 2008–2010. Vol. 63. No. 17. Retrieved from http://www.cdc.gov/mmwr/pdf/wk/mm6317.pdf

Three major types of **prevention** will have the biggest impact on reducing the incidence and prevalence of chronic disease:

PRIMARY PREVENTION:

Reduce incidence of disease by addressing risk factors:
- Physical activity
- Healthy diets
- Tobacco free living
- Avoidance of excess alcohol
- Vaccines

SECONDARY PREVENTION:

Identify established diseases:
- Screenings
- Early detection
- Prompt intervention to slow or reverse
- Adherence to chronic disease medications

TERTIARY PREVENTION:

Reduce established disease complications:
- Minimize suffering
- Maximize health potential of remaining years

It's clear that reducing the incidence of non-communicable diseases can yield the next major leap in progress—improvement in healthy life expectancy. It's also clear that doing so means getting individuals to modify their personal health-related behaviors. And to do it on an ongoing, sustained basis.

That, of course, is easier said than done.

At the individual level alone, making effective and lasting change is hard. Collectively, changing the behaviors of an entire society might seem daunting.

But there is a way. New insights into the way people make decisions that affect long-term outcomes—the science of behavioral economics—has powered a new approach that's been shown to work. It's happening in other parts of the world.[18] It has major and direct implications on how life insurance companies go to market and serve policyholders. And we are uniquely positioned to apply it here in the U.S.

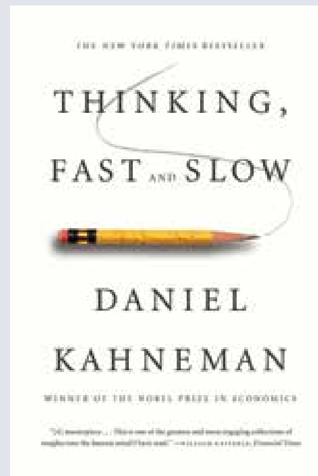
What Is Behavioral Economics?

Behavioral economics is all about understanding how people actually make decisions—what they do and why vs. what they know they should do. The underlying premise is that people will make decisions in a "predictably irrational"[19] way. For example, making a large impulse purchase when they are otherwise committed to putting money away for savings.[20]

Understanding how and why this occurs can help inform and construct ways to change these behaviors. And doing so has very specific relevance to the health promotion and life insurance industries, which are at their core all about encouraging and enabling consumers to invest now for future benefit, with little or any immediate or short-term gratification.

> **The underlying premise is that people will make decisions in a 'predictably irrational' way.**

Predictably Irrational: The Psychology of Choice



The 2011 best seller *Thinking Fast and Slow* synthesizes several decades' worth of research by Daniel Kahneman, widely considered to be one of the pioneers in the science of behavioral economics. This field of study bridges human psychology and economic theory, yielding the potential for data-informed, predictive modeling—particularly around the role of incentives in influencing decisions—a key feature of the John Hancock Vitality program.

Source: Kahneman, D. Thinking, Fast and Slow. (2011). New York: Farrar, Straus and Giroux.

The Power of "Present Bias"

Immediate gratification is an important concept in behavioral economics, where it is framed as "Present Bias."[21] This defines the human tendency to favor short-term wins over long-term gains. The prevalence of short-term rewards—for example "Buy One Get One Free"—leads us to make otherwise irrational decisions ("I don't really need that and I am trying to save money, but I can't pass this up!").

Biases that people succumb to in decision-making include:

Present Bias	Loss Aversion	Status Quo Bias	Framing Bias	Small Probability Overweighting
Favoring short-term wins over long-term gains or benefits.[22]	Attributing greater importance to losses than gains.[23]	Taking the path of least resistance/ avoiding change.[24]	The way a decision is presented can influence choices.[25]	The idea of winning the lottery despite infinitesimal odds.[26]

When viewed through the lens of behavioral economics, it's not surprising that traditional life protection education and health promotion efforts have their limits. It's one thing to learn about the benefits of a policy or a health improvement program. It's quite another to act on it in a consistent, sustained way.

Change with a "Nudge"

The principles of behavioral economics, and the powerful force of present bias in particular, leads us to a simple yet breakthrough idea: the use of short-term incentives, applied to the business of life protection and health improvement, can put consumers on the path to better health and better life decisions. A well-timed, well-framed, well-delivered, and integrated series of small steps can lead to real progress and lasting change.

Change with a "nudge" means starting the process with a suggestion in the form of an appealing incentive, then letting the consumer adopt it as a new behavioral direction by dangling equally appealing, ongoing incentives to continue. It's proving to be an effective method of addressing the reality that rational, long-term-based directives alone are not enough to motivate change across an entire population.

> **The use of short-term incentives, applied to the business of life protection and health improvement, can put consumers on the path to better health and better life decisions.**

The term “Smart Insurance”[5] has been gathering traction across the broader insurance industry, as technology advances make possible all manner of dynamic data collection and feedback relevant to policies and policyholders. What’s different about this new kind of life insurance is that it is more than just a major “smart” step forward in data collection; it is about using data and behavioral science insights together, to ignite positive, ongoing change in the health of individuals.

We will deliver on the promise of a new kind of life insurance by integrating the concept of incentives: a model that provides policyholders with attractive incentives for positive behavioral change, access to a broad range of wellness and prevention options, and value through earned premium savings and rewards.

And now it’s more than a well-intentioned ideal. Behavioral economics has made its way out of the research labs and into the market: incentive-based behavior change programs, and life insurance products tied to health promotion, are already in place around the world.

Incentive-Based Health Promotion

The use of incentives in promoting healthy change is an active idea, with real-world evidence of effectiveness. By providing immediate rewards for singular healthy behavior choices (for example, going for a run, or bypassing sugary foods in favor of healthier selections), short-term rewards are married with long-term goals.

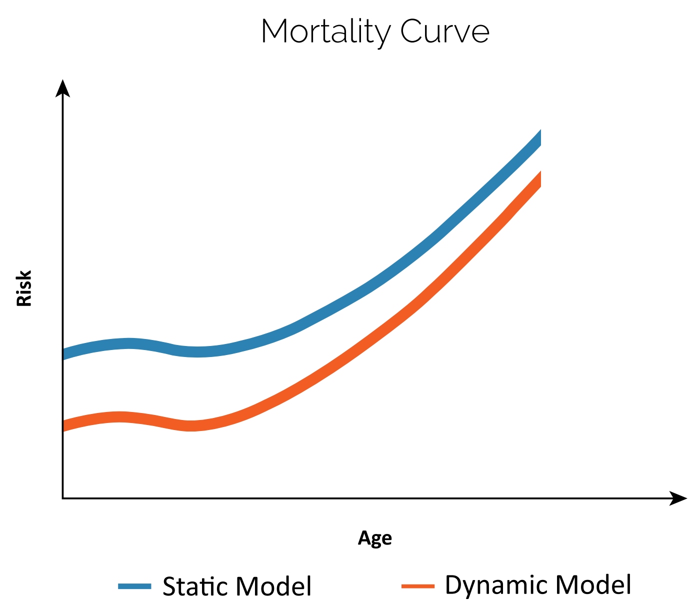
The formula for effectiveness: break down long-term health improvement goals into immediate, achievable steps, and provide rewards for many of the small accomplishments that make up the overall path. Deliver these consistently, frequently, and soon after the activity is completed, and the consumer becomes engaged; timing and framing of the rewards are also key.

The Vitality program is built to deliver this, on an individual, customized basis, no matter what the consumer’s initial state of health or activity might be. It is a dynamic, progressive model that can work for everyone regardless of their starting point. It’s highly sophisticated, data-driven, and complex in its actual design, but the consumer view of it is extraordinarily simple and engaging.

What’s important about this is that the program can be seamlessly woven into John Hancock life insurance products.

Integrating Health Promotion and Life Insurance

Internationally, the principle of incentive-based health promotion linked to life insurance products and policyholders is already in place and producing results. The global insurer Discovery LTD, originator of the Vitality program, engages policyholders and incentivizes them to manage their health and wellness, while dynamically pricing their insurance premiums based on behavior. This approach means that up-to-date health and wellness information is used throughout the policy. Risk is assessed more accurately and on an ongoing basis, in contrast to the traditional static model. The mortality curve can be plotted with greater individual relevance, and will shift downwards for policyholders who engage in healthy behavior.



Source: Discovery Life. (2013). Creation of Value Through Behavioural Life Insurance.

Discovery’s consumer-engaged model has already shown positive results in South Africa, where the company is headquartered, in both claims and persistency. There, frequency of death claims for highly engaged clients is 68% lower than for clients who are not actively engaged.[27] The model is achieving similar results in other parts of the world. Discovery has similar well-entrenched programs across several continents including Australia, Asia (Singapore), and Europe (UK). Top insurers are adopting the model and introducing similar programs in other countries as well.

Now is the time to bring this model to the U.S. This new kind of life insurance will create two fundamental changes to our business:

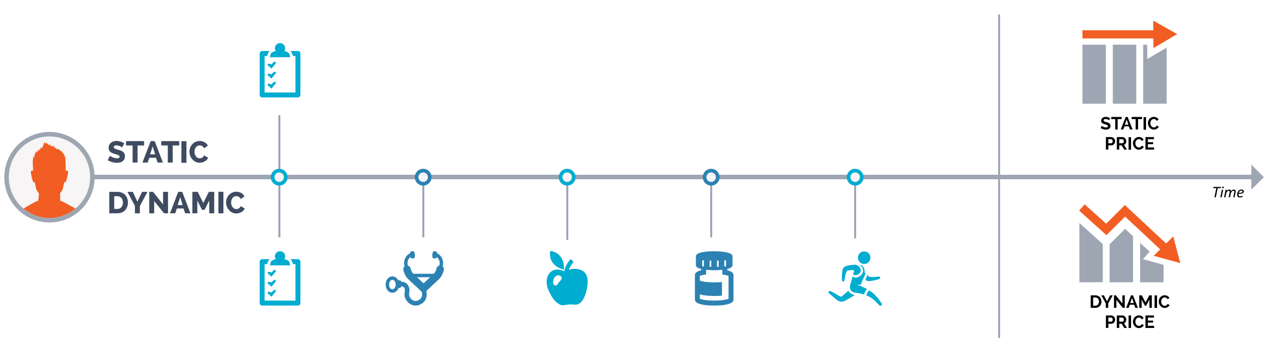
Pricing:
From Static to Dynamic: the evolution of pricing based on more frequent and individual health inputs offers the potential for more efficiently priced premiums that can result in savings for the policyholder.

Improved Mortality:
As policyholders engage in positive health and wellness management, their life expectancy improves which results in improved mortality and the opportunity for premium savings.

STATIC VS. DYNAMIC PREMIUMS

PRICING MODEL

In the traditional pricing model, risk assessment is produced at inception then essentially locked for the policy duration. In a dynamic pricing model, frequent and individual health inputs offers the potential for more efficiently priced premiums that can result in savings for the policyholder.



A move to dynamic premiums is a powerful and progressive change to life insurance. The potential for positive impact on current and prospective policyholders completes the shared value goal—the true measure and meaning of realizing the promise.

A NEW OUTLOOK FOR POLICYHOLDERS

This new kind of life insurance can empower and benefit our policyholders in unprecedented ways. Powered by incentive-driven health promotion principles, policyholders will now be able to realize benefits in both their health, and their ability to get the most out of their life insurance protection.

This new and practical method of health engagement encourages all policyholders, regardless of health status, to take steps to become aware of, monitor, and manage their health risks. Everyday activities offer an opportunity to remember and act upon healthy choices—*and earn rewards for doing so*. A well-designed incentive-driven health program cleverly and productively leverages the natural human tendency towards short-term gratification.

Policyholders also now have the opportunity to influence the premium savings and rewards derived from their policies by managing their health. Since we will now have the ability to assess risk more accurately and dynamically, health improvement progress can be directly connected to the value received from their life insurance. They can actively improve their return on premium. Here again, the natural behavioral inclination towards instant reward is leveraged to produce long-term results.

A Policyholder's Return on Premium (PROP)

Policyholders can have a direct impact on the return received on premiums by managing their health. This resulting value is defined as the Policyholder's Return on Premium (PROP). The more steps a policyholder takes to improve his/her health and wellness, the greater the PROP will be.

$$\mathrm{PROP}_t = \frac{\text{Present value of cashflows received through health and wellness management from time 0 to time } t}{\text{Present value of premiums paid until time } t \text{ (excluding the impact of health management)}}$$

Powered by incentive-driven health promotion principles, policyholders will now be able to realize benefits in both their health, and their ability to get the most out of their life insurance protection.

At John Hancock, we've always had our customers' best interests at heart. Together with Vitality, we are creating a category that represents a new way of thinking about life insurance, offering real value to our policyholders, both financially and with respect to supporting their long-term health improvement. We recognize the important role life insurance plays in protecting our customers and their loved ones, and our new solution will encourage even more customers to consider the value of a life insurance policy.

Healthy Engagement	Shared Value	Broad Reach	Dynamic Premiums	Better Insurance Outcomes
The John Hancock Vitality program actively encourages changes in behavior that have the potential to result in longer, healthier lives for customers.	The John Hancock Vitality solution aligns the interests of the individual, who wants to improve health; the family the policyholder wants to protect; John Hancock, and the life insurance industry as a whole, which can help society benefit from increased healthy engagement.	The John Hancock Vitality program is available on different life insurance policies, providing value to customers with varied needs.	The John Hancock Vitality program allows for dynamic risk assessment with more opportunity for premium savings by individual customers, based on their ongoing healthy behaviors.	The positive health impact of the John Hancock Vitality program improves mortality and morbidity, resulting in lower claims and better retention of healthier customers.

Our industry has always been an ally of the public health promotion movement, and John Hancock has always been a strong proponent. Now, with John Hancock and Vitality, the promise is realized: Life insurance products that actively promote individual progress towards better health, and directly reward the policyholder on many levels for taking positive steps.

It's more than better life insurance, and, we believe, better than "smart insurance." It leverages science and technology in a Shared Value approach that aligns all interests: the individual whose health everyone wants to improve, the families our policyholders aim to protect, the health and protection industries that serve them, and society as a whole.

The John Hancock Vitality solution will firmly position our companies alongside the growing legions of businesses that operate for profit AND provide for the greater good of customers and society as a whole.

John Hancock and the life insurance industry have long sought ways to be a positive, progressive force in American life. The John Hancock Vitality solution is a bold new step in that direction.

More than just a noble idea, this is the next generation solution—a whole new approach to life insurance—that actively engages and assists people from all walks of life, to lead longer lives in good health.

REFERENCES

Charts and graphics included in this publication cite sources where applicable. Text references are listed below:

1 U.S. Department of Health and Human Services: National Institute on Aging.
November 2007. *Living Long & Well in the 21st Century: Strategic Directions for Research on Aging.*
Accessed from http://www.nia.nih.gov/about/living-long-well-21st-century-strategic-directions-research-aging/.

2 U.S. Department of Health and Human Services: National Institute on Aging National Institutes of Health.
October 2011. *Global Health and Aging.*
Accessed from http://www.nia.nih.gov/sites/default/files/global_health_and_aging.pdf

3 World Health Organization. Global Health Observatory Data Repository. Life Expectancy Data by Country.
Accessed from http://apps.who.int/gho/data/view.main.680?lang=en.

4 LIMRA. 2012. Facts from *LIMRA: Life Insurance Awareness Month, September 2012.*
Accessed from http://www.limra.com/Posts/PR/LIAM/PDF/2012_Facts_of_Life_pdf.aspx

5 Porter, M. E. (2011-01-01). "Creating shared value." Harvard business review, 89(1/2), 62-77.
Accessed from https://hbr.org/2011/01/the-big-idea-creating-shared-value.

6 Irving Fisher, National Conservation Commission, Report on National Vitality – its Wastes and Conservation (1909) at 16. New York: Arno Press.
Accessed from https://ia700504.us.archive.org/22/items/reportonnational00fish/reportonnational00fish.pdf

7 U.S. Department of Health and Human Services: National Institute on Aging National Institutes of Health.
October 2011. *Global Health and Aging.*
Accessed from http://www.nia.nih.gov/sites/default/files/global_health_and_aging.pdf

8 U.S. Department of Health and Human Services: National Institute on Aging National Institutes of Health.
October 2011. *Global Health and Aging.*
Accessed from http://www.nia.nih.gov/sites/default/files/global_health_and_aging.pdf

9 Murray, Christopher J.L. (July 10, 2013). "The State of U.S. Health, 1990–2010: Burden of Diseases, Injuries, and Risk Factors". Journal of the American Medical Association 310 (6): 591–608.

10 The Organization for Economic Co-operation and Development.
OECD Health Statistics 2014: How does the United States compare?
Accessed from http://www.oecd.org/unitedstates/Briefing-Note-UNITED-STATES-2014.pdf

11 U.S. Department of Health and Human Services: National Institute on Aging National Institutes of Health.
October 2011. *Global Health and Aging.*
Accessed from: http://www.nia.nih.gov/sites/default/files/global_health_and_aging.pdf

12 Vitality Institute. June 2014. *Investing in Prevention: A National Imperative.*
Accessed from: http://thevitalityinstitute.org/site/wp-content/uploads/2014/06/Vitality_Recommendations2014.pdf.

13 David Bloom et al., *The Global Economic Burden of Noncommunicable Diseases* (Geneva: World Economic Forum, 2011).

14 World Health Organization. *Noncommunicable Diseases (NCD) Country Profiles, 2014: United States.*
Accessed from: http://www.who.int/nmh/countries/usa_en.pdf?ua=1

15 Centers for Disease Control and Prevention. May 2014. *Chronic Diseases and Health Promotion.*
Accessed from:http://www.cdc.gov/chronicdisease/overview/index.htm.

16 World Health Organization. January 2015. *Noncommunicable Diseases Fact Sheet.*
Accessed from: http://www.who.int/mediacentre/factsheets/fs355/en/

17 U.S. Department of Health and Human Services: National Institute on Aging National Institutes of Health.
October 2011. *Global Health and Aging.* Accessed from: http://www.nia.nih.gov/sites/default/files/global_health_and_aging.pdf

18 Discovery. (2013). Integrated Annual Report 2013.

19 Ariely, D. *Predictably Irrational: The Hidden Forces That Shape Our Decisions.* New York: Harper Collins (2008).

20 Kahneman, D. *Thinking, Fast and Slow.* (2011). New York: Farrar, Straus and Giroux.

21 Crawford, Vincent P. (October 2013) *Behavioral Decision Theory: Present-Bias and Time Inconsistency in Intertemporal Choice.*
Accessed from: http://econweb.ucsd.edu/~v2crawford/BDTIntertemporalSlides12.pdf.

22 Crawford, Vincent P. (October 2013) *Behavioral Decision Theory: Present-Bias and Time Inconsistency in Intertemporal Choice.*
Accessed from: http://econweb.ucsd.edu/~v2crawford/BDTIntertemporalSlides12.pdf.

23 Kahneman, D. and A. Tversky. *Prospect Theory: An Analysis of Decision Under Risk.* Econometrica, 47(2), pp. 263-291, March 1979.

24 Kahneman, Daniel; Knetsch, Jack L.; Thaler, Richard H. (1991).
"Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias".
The Journal of Economic Perspectives (American Economic Association) 5 (1): 193–206.

25 Tversky, Amos; Kahneman, Daniel. (1981). "The Framing of decisions and the psychology of choice". *Science* 211 (4481): 453–458.

26 Kahneman, D. and A. Tversky. *Prospect Theory: An Analysis of Decision Under Risk.* Econometrica, 47(2), pp. 263-291, March 1979.

27 Discovery. (2013). Integrated Annual Report 2013.

NOTES

Insurance products are issued by: John Hancock Life Insurance Company (U.S.A.), Boston, MA 02117 (not licensed in New York) and John Hancock Life Insurance Company of New York, Valhalla, NY 10595.

LIFE-5999 4/15 MLINY040315026