U.S. Individual Health Insurance Exchange

Healthy Behavior Incentive ("HBI") Plans

Eric N. Unger, FSA, MAAA, MS

Team Name: Eric Unger

2016 Actuarial Challenge

April 25, 2017

HBI Plan Proposal

Table of Contents

I. Executive Summary of Healthy Behavior Incentive Plans: The Solution

Imagine a health plan that does more than just indemnify its owner against future financial losses. Imagine a plan that leaves the policyholder in better health and with a longer expected future lifespan than before. Such a plan represents more than just "insurance", but a partnership between the provider, the insurer, and the member in their journey to well-being. It is not a zero-sum transaction. Healthier and stronger *Americans* make for a healthier and stronger *America* – and that's what Healthy Behavior Incentive Plans (HBIPs) are designed to do.

From section G on page 33167 in the Federal Register volume 78, as it relates to the Patient Protection and Affordable Care Act (PPACA) of 2010:

> *It is HHS's belief that participatory wellness programs in the individual market do not violate the nondiscrimination provisions provided that such programs are consistent with State law and available to all similarly situated individuals enrolled in the individual health insurance coverage. This is because participatory wellness programs do not base rewards on achieving a standard related to* ***a health factor****, and thus do not discriminate based upon health status.*

Generally speaking, health factors are outside of a person's control. The definition of a health factor is found in the Federal Register page 75014, volume 71:

> *The statute and its implementing regulations set forth eight health status-related factors, which the 2006 regulations refer to as "health factors" for simplicity. Under the statute and the regulations, the eight health factors are health status, medical condition (including both physical and mental illnesses), claims experience, receipt of health care, medical history, genetic information, evidence of insurability (including conditions arising out of acts of domestic violence), and disability.*

Fundamentally, Healthy Behaviors Incentive Plans are about giving a measure of freedom, incentives, and deregulation to the public healthcare exchanges established in each state by the PPACA. Americans are given freedom to choose an incentive-based policy that they wish (or not), and insurers are given de-regulatory freedom to place specific incentives in the approved list of rate-setting factors (or not). HBI Plans allow insurers to set rates based on the attainment of age-specific and location-specific health incentives, including smoking cessation programs.

This stabilizes the individual marketplace by encouraging competition among health insurers to incorporate the most effective, evidence-based medical research into healthcare pricing – yet still without regard for medical history. No health insurer would be required to offer these incentive-based policies and no member would be required to buy one. Furthermore, no additional personal policyholder information would be required to determine the most appropriate incentive, since age and geography are already part of the member's application for insurance on the exchange. And as is the case with current insurance rate filings, each state's Department of Insurance (DOI) could reject the proposed incentive program annually on any grounds.

Instead of rewarding members for their current health factors or health ***status*** (often the result of a genetic lottery), it allows insurers to reward members for positive ***changes*** in their health status. This is done with a discount on their premium in the following year – but only if the member chooses to renew their policy with the same insurance provider. Changes must be verified annually by a medical provider (medical doctor, nurse practitioner, physician's assistant, or other approved provider) who has the authority to grant exceptions based on individual, medically-relevant circumstances. Gender may also be taken into account *by the provider*, but without disclosing it to the insurance company.

II. Goals of HBI Plans

If you Google "obesity in the United States" you will find a multitude of articles by the U.S. Centers for Disease Control (CDC), National Institutes of Health (NIH), Wikipedia, the Journal of the American Medical Association (JAMA), and a plethora of other academic and non-academic medical journals. By and large, these sources all have the same message: Americans are getting less healthy each year. This is due to many factors, but most of those factors – like diet, exercise, and eating habits – are the result of small choices that we all make each and every day.

If those who make these choices were the only ones affected by them, there would be no need for this proposal. But the collective result of these choices affects our nation's chances of survival and prosperity in the global marketplace. For example, obesity – while not always preventable – is a co-morbidity of many other health issues, like joint disease, depression, and diabetes, as well as a growing cause of infertility in America (Pandey et al 2010, 1). And it's also started to affect our military readiness. The CBS News article "Are U.S. Troops Too Fat to Fight?" (Jaslow 2012, 1) points out that in 2012 almost 20% of American males and 40% of females were too heavy to be eligible for military service.

The health of America depends on the health of its individual policyholders. And is health care in America really sustainable if it does not address these issues? The PPACA of 2010 makes healthcare available to all, without any regard to their prior health history and – given financial subsidies for individuals and families – with little regard for their income. But what PPACA does *not* address is why and how Americans should be healthy in the first place, nor does it provide an incentive for sustainable

improvements in health. The objective of behavior-based plans is to encourage evidence-based healthy behaviors for all Americans, which can:

1) Reduce claims costs and medical spending nationwide
2) Increase worker productivity and decrease absenteeism
3) Improve length and quality of life, continuing into Medicare and/or Medicaid eligibility
4) Motivate practical medical research
5) Make the individual health insurance market more sustainable

Changes in claims costs per policyholder are not difficult to measure under HBI Plans, especially since they need not be risk-adjusted. In fact, concurrently risk-adjusting claim costs for financial measurements would *mask* the cost reductions since the risk scores themselves will be decreasing (see section on Evaluation). This is true for both the individuals who achieve the recommended healthy behavior incentives and – to a lesser extent – those who do not. That's because policyholders who enroll in HBI plans will presumably make an attempt to adopt the healthy behavior, even if that attempt falls short of full achievement and validation by a provider. Half-hearted or incomplete achievements still result in healthier individuals and, therefore, lower risk scores than in non-HBI plans.

Besides lower risk scores, higher expected future lifespans, and reduced worker absenteeism, quality of life can also be measured in quality-adjusted life years (QALYs). And while any improvements in length and quality of life may merely be a consequence of the overt goal of reducing claims costs, it's not difficult to see an inverse correlation between claims and overall health. Moreover, the provider visits necessary to establish baseline health and validate the achievement of the healthy behavior goals can themselves be beneficial to the health of the policyholders. Periodic provider visits can benefit patients

by alerting them to dangerous medical conditions that may result in higher costs if left unexamined and undiagnosed. This can also lead to lower long-term medical costs and greater population health.

In order for health insurance companies to identify the age-, gender-, and location-specific healthy behaviors that are most effective at reducing claims costs, they must rely on scientific evidence showing the financial effect of health interventions. And once identified, they must calculate a premium discount associated with the achievement of each healthy behavior. These efforts will require analysis that may be drawn from prior research into healthcare and behavioral economics. This can come from internal staff, consultants, academic sources, papers, conferences, and industry collaboration (Volpp and Das, 2009; Gneezy and Rustichini, 2000).

But unlike academia, the end to which they aspire (a) need not be funded by federal grants or taxpayer money, and (b) must be easily measurable once the difference in claims costs are seen at the end of the following policy year. Therefore, the medical cost research that leads to the recommended behaviors and premium discounts will help inform new medical research for the next generation of healthy behaviors, and so on. This feedback loop will more quickly advance the frontier of medical knowledge than academia could because its findings would be simultaneously put into practice and monitored.

Spiraling medical costs and the current trend of health insurers withdrawing from the individual insurance exchange marketplace underscores the need for such a change in policy. If the individual market is to survive, that policy change must create sustainability, affordability, and an incentive for policyholders to be healthier.

III. Consumer/Provider/Insurer/Government Impacts

The five primary stakeholders in HBI Plans are consumers, providers, insurers, regulators (state Departments of Insurance, or DOIs), and taxpayers. Engaging consumers is not only about promising them lower health insurance premiums – although this strategy may prove very effective. The additional benefits to patients include greater overall health, a stronger relationship with their providers, and the availability of evidence-based recommendations that are customized to their age, gender, geographic location, smoking status, and family composition.

Secondary stakeholders include trade associations like America's Health Insurance Plans (AHIP), the American Academy of Actuaries (AAA), and the American Medical Association (AMA). Smaller insurers may not initially embrace this idea because they lack the volume of member health data that allows them to draw meaningful conclusions about the age- and geography-specific incentives that reduce claims costs. However, the incentives they do propose can be thought of as the regional "special sauce" that gives them a chance to compete with the largest insurers in their local markets.

Under HBI Plans, insurance companies would release their healthy behavior incentive requirements to the general public upon approval of their annual premium rate filings by each state's DOI. Market competition – which is currently limited to prices, network adequacy, and local brand or reputation – would then also be based on each participating insurer's "behavior/discount pairs" that potential policyholders think are both achievable and worth the effort.

Under the PPACA, the cost of routine physical examinations with sufficient preventive value is included in the premiums of Qualifying Health Plans. But under HBI Plans, a provider must validate the achievement of specified healthy behaviors by recording an initial baseline level of some measure of health and then – at a subsequent date – measure the change in that level. If the change is large

enough, then the provider will verify the achievement of a patient's healthy behavior goal and eligibility for a future premium discount. In the same visit, a baseline level of a new measure of health may also be taken for the next year, either for the same insurer or a different one that the patient has chosen.

The need for annual visits to a provider for baseline measurements alone are expected to drive demand for an increase in provider services. This would engage the provider community and possibly be sufficient for their support. But a more fundamental reason to expect provider engagement is that HBI Plans have the potential to change the role of providers from health *maintainers* (like mechanics are for cars) to health *partners* (like coaches are for athletes). In other words, they will change from merely *re*-acting to adverse health – like fixing broken bones – to actually *pro*-acting to help a patient achieve his or her healthy behavior goals. This new and more appealing role for providers may make the profession more attractive and increase their supply.

When a provider takes a baseline measurement of a health metric specified by an HBI Plan, the provider is not just acting as a passive observer. That interaction with the patient is also an opportunity to advise him or her on the best way to achieve their HBI plan goal – given their unique health circumstances and motivation. And if those unique circumstances require a special accommodation or waiver that the provider thinks is necessary (and supports with a professional opinion), then the insurance company would be obligated to grant it. Together, the patient and provider chart a course to better health.

The Cost-Effectiveness Analysis section of this paper will show the financial interests at stake for the health insurers. Their strategy is to file healthy behavior incentive targets and associated discounts with their state DOI at the same time as their premium rates. If base premiums for their HBI Plans *with the un-achieved discount* are *lower* than their non-HBI plans (with otherwise-equal cost sharing, benefits,

and provider networks) then potential policyholders would have no incentive to enroll in the non-HBI plans. Conversely though, if premiums for their HBI plans *with the discount achieved* are *higher* than their non-HBI plans (all other things equal) then those policyholders would have no incentive to enroll in the HBI plans. So the economic relationship between HBI and non-HBI premiums with the same cost-sharing, benefits, and providers would need to be:

HBI Plan premiums with discount achieved < non-HBI premiums < HBI premiums w/out discount

Since the eligibility and amount of income-based premium subsidies would be the same for both HBI and non-HBI Plans, a policyholder's income should not change this relationship. However, the flat premium offsets from the subsidies would tend to magnify the discounts (and the incentives) as a percentage of the remaining premium dollars that the subsidy-eligible members would actually pay. (For example, a 15% discount may turn into a 30% discount once income-based subsidies are subtracted.) But the DOI must also approve of the appropriateness of the incentive behaviors and their associated premium discounts. This would introduce competition among insurers for the most attractive combination of evidence-based behaviors and supportable premium discounts. Potential policyholders would go for the ones that offer the best combination of achievability and savings.

This new class of DOI filings for HBI Plans also widens the scope of the state insurance regulators. Traditionally, state DOIs have been charged with a dual mandate of consumer protection against (a) excessive premiums and (b) the risk of insurer insolvency. That translates to a rejection of premium rates that the DOI deems as either too high *or too low*. So when examining premiums, discounts, and behaviors in HBI plans, the regulator must also take into account whether the insurer has correctly priced the discount to financially offset the premium reduction. If the reduction in claims costs due to

the healthy behaviors is insufficient to offset the promised discounts in premium, then the financial solvency of the insurer may be at risk. This additional scope may require the DOI to employ health research analysts as well – or borrow their expertise from existing resources at the NIH, CDC, or other governmental health research agencies.

IV. Cost-Effectiveness Analysis

The income statement shown below is for a mature health insurance company *in the policy year following* their original Healthy Behavior-Based Incentive Plan (HBIP) offering. All numbers shown are hypothetical. A sample balance statement is not shown here since the new HBI product should not materially affect the mix of assets and liabilities held by such a company. See further explanation of numerical assumptions in red font below. ("PHers" refers to Policyholders, or members.)

		W/out HBIPs	W/HBIPs
Premiums			
	Before Credits	100	100
	Credits		(7)
Investment Income		5	5
Total Income (I)		105	98
Policy Benefits (Claim Costs)			
	Regular PHers	90	
	Healthy PHers		79
Expenses		9	9
	Extra Staff		1
Total Benefits & Expenses (E)		99	89
Income Before Taxes (I – E)		6	9
Taxes (@33%)		2	3
Net Income		4	6
Difference w/HBIP ($Ms):			+$2M

Line items affected by the HBI product are shown above in red font. Note the $7M decrease in premiums due to the credits for achievement and verification of healthy behaviors (e.g., around 50% of

original members renew and receive a 15% discount). Also note the expense increase needed to hire additional staff ($1M), both for plan administration and for the data mining necessary to develop the most effective recommendations specific to each geographic area, age band, and family composition. Both of those items result in lower income, but this is more than made up for by the extra $11M (= $90M - $79M) in lower claims due to the healthier policyholders under the HBI product.

The difference in claims costs from $90M to $79M for the HBI Plan participants (assuming the same number of members in both plans) equates to a 12% reduction. This is a critical assumption related to the key question in this analysis, which is whether the financial incentive offered to the policyholders is sufficient to achieve that reduction. The issue is similar to the goals of corporate Health and Wellness incentives, but the H&W population under study is 100% employed and the criteria to achieve those goals are generally more stringent than in HBI Plans.

For employees of a certain nationwide health insurer, costs of members meeting the goals of "behavioral accountability" (BA) fell by $230 per member per year over a two-year period – relative to the costs of non-BA members (Wellness Overview 2015, 12). The investment return (ROI) on the costs necessary to set up and administer the Wellness program was not disclosed, but the study included over 20,000 members (64% of all employees) and the differences in claims costs were statistically significant. Members meeting the accountability criteria:

- Participated in at least one wellness program (fitness challenge, weight challenge, onsite wellness center, health club reimbursement, nutrition online, or tobacco cessation/free)
- Obtained preventive screenings recommended for their age and gender
- Had zero or one clinically significant gaps in care
- Were engaged in programs based on individual's condition

Interestingly, the authors observed that "BA members had a lower (worse) *initial* health status and a lower 2-year trend in claims costs than non-participants" (Wellness Overview 2015, 11).

Looking at the broader picture, a meta-analysis of 22 studies of H&W plans found that medical costs fell by $3.27 for every dollar invested after three years (ROI = 227%). But the ROI varied greatly by company and was sensitively dependent on the program's design and eligibility criteria (Lykens 2014, 13). A Survey of Workplace Wellness among 103 companies in the U.S. and Canada found a similar Return on Investment of $3 for every dollar spent on the programs (Mrkvicka, Stich, and Held 2015, 31).

As it relates to HBI Plans, these estimates assume that the marketing and distribution channels needed for promoting and advertising the new HBIPs product will remain essentially unchanged from the insurers' pre-HBIP product line. When also assuming a 33% corporate tax rate on income, the difference to bottom-line net income in the financial statement illustrated above is $2 million (= $6M - $4M). This additional $2M can be distributed to shareholders or retained for further investment. Additionally though, the participants may be more loyal to the company and more likely to re-enroll in its HBI plans, producing greater revenue in future policy years.

In the previous section, a total of $8M was invested into the HBIPs in the form of salary for additional staff (+$1M) and premium credits for achieving healthy behavior recommendations (+$7M). In exchange though, a reduction in claims of $11M was realized (= $90M - $79M). So the return on this investment is a conservative 37% (= ($11M / $8M) - 1), which is much less than the 200-227% implied by the corporate Health and Wellness programs cited above.

Some circumstances that could cause this return on investment to increase or decrease are:

- The incentive for achieving the behavior goals may not be high enough to encourage people to sign up. This would reduce the need to pay out the discounts, but the additional staff would still need to be paid.
- The plans could take healthy members from other plans, which would increase the discount payout for achievement incentives, but may disproportionately decrease the claim costs since the healthy members would already have fewer claims. If these healthy people came from a different plan offered by the same company, the total profits might not be materially affected. But if they came at the expense of other health insurers, those insurers may need to pull out of that state's market, affecting the stability of the market and reducing overall competition.
- If the incentive requirements are not sufficiently objective, providers who have more sympathy and/or loyalty to their patients than the insurers may falsely validate their incentive achievements, leading to a higher reduction in premiums than would be supported by the reduction in claims.
- The desired reduction in claims may actually occur, but outside of the timeframe that the members are insured with the company. In other words, a different health insurer may reap the rewards of the "investment" made by the company that originally offers the premium incentive. Of course the members' recognition of their increased health may inspire loyalty to that insurer; and members moving in and out of incentive plans each year may effectively cross-subsidize all insurers to some degree.

In view of all these benefits, the government may decide to offer temporary or permanent tax incentives to health insurers offering HBIPs. These could be in the form of favorable adjustments to the numerator and/or denominator of the Minimum Loss Ratio (MLR) under the 2010 PPACA, additional tax

deductibility of HBIP administration expenses, and formal CMS gold-star recognition on states' individual exchange websites, which is similar to Medicare Advantage plans.

In the sample income statement shown above, the simplified medical loss ratio (MLR) is 79% before the premium discount is taken into account ($79M in claims over $100M in premiums). Because that is less than the MLR threshold of 80% for individual health plans, it appears that this company would be required to return premium dollars to its policyholders. But after the premium discount of $7M is taken into account, the new MLR increases to 85% ($79M over $93M, which is the $100M in premiums less the $7M in discounts). Therefore, the HBI plan discount may help the insurer avoid the regulatory penalty from a low loss ratio (Kaiser Family Foundation 2012, 1).

V. Evaluation Tools

Outside of cost effectiveness analysis, the value of HBI Plans on individual health should also be measured. This can be done using evaluation tools that have already been established for insurers who participate in the individual exchange marketplaces under the PPACA. Beginning on 1/1/2014, all insurers selling qualified health plans on the individual exchange were required to report anonymized premiums, claims, and risk scores for each individual health plan member. This reporting mechanism was originally created to ensure compliance and ease of administration for PPACA laws intended to smooth the transition to policies that – for the first time – prohibited underwriting on the basis of pre-existing health conditions.

Without the ability to consider an applicant's pre-existing conditions, it was feared that a large influx of uninsured or underinsured people (some of whom never had health insurance) would be disproportionately borne by certain insurers. This concentration of unhealthy members would threaten

the insolvency of those insurers – and, by extension, the stability of the health insurance markets that they operated in. Therefore, the U.S. Department of Health and Human Services (HHS) required each participating insurer to purchase and initialize a secure data server for the purpose of transmitting anonymous member data. Those servers were initially called "External Data-Gathering Environments", or EDGE servers (Sullivan 2013, 1), but were later extended to cloud-based Amazon Web Services (AWS).

With a year-on-year comparison of risk scores from the now-operational EDGE or AWS servers, the financial effectiveness of HBI Plans could be risk-adjusted as well. For such an analysis, the difference between risk scores in consecutive years can be measured and translated into a "savings" in claims dollars attributable to members that either:

(a) attain the Healthy Behaviors Incentives, or

(b) merely participate in the HBI Plans

The reason for measuring differences in costs and risk scores in the second category is that it's reasonable to assume that even members who did not fully achieve the incentives still benefited from their efforts to do so. In this analysis it's important to use ***prospective*** risk scores (used to predict future claims costs) instead of ***concurrent*** scores (to predict claims costs in the current year) since most of the members' health benefits could accrue in the year following the year of incentive achievement (American Academy of Actuaries 2010, 6). Verisk™ or ImpactPro™ produce common risk score methodologies that may be used for this purpose.

A quasi-experimental study designed to include a pre- and post-period could be used to statistically evaluate the plans' effectiveness. It would compare HBIP and non-HBIP populations with similar initial characteristics (Gribbons and Herman, 1997). Using advanced statistical techniques, these two populations would be matched on the basis of age, gender, geography, smoking status, family

composition, and possibly diagnosis or procedure codes coming from claims data. With that done, the claims costs and risk scores of the HBI group could be compared with the non-HBI group – both before and after participation in HBI Plans.

Timing of the evaluations could vary from company to company, but would generally follow the DOI's approval of the HBI Plans and the members' selections from the exchange marketplace websites. Once a specific HBI Plan is chosen (with an age- and geographic-specific incentive), then the member would schedule a visit with a provider in order to take an initial baseline measurement of the health metric related to the incentive. If the HBI Plans were based on a calendar year – like most other plans now available on the individual exchange – then the initial visit would be in the first few months of the new plan year. Following that, the member would have from seven to ten months to achieve the designated improvement in his or her baseline measurement before the opportunity to re-enroll in the same plan for the next year – and if successful, with the premium discount.

VI. Conclusions

Outside the United States, there are precedents for incentive-based health plans. In South Africa and the United Kingdom, members can earn "vitality points" for uploading personal fitness data captured by a wearable tracker like a FitBit™. As a subsidiary of Discovery Health, Vitality launched incentive-based programs in South Africa in 1997 and expanded them to include life insurance rewards in 1999. In 2004 they partnered with insurance giant Prudential to begin operations in the United Kingdom under the name PruHealth, and in 2005 they integrated with one of the first USB-linked pedometers to award Vitality Points for reaching 10,000 steps per day (Vitality Group, company website, 2016).

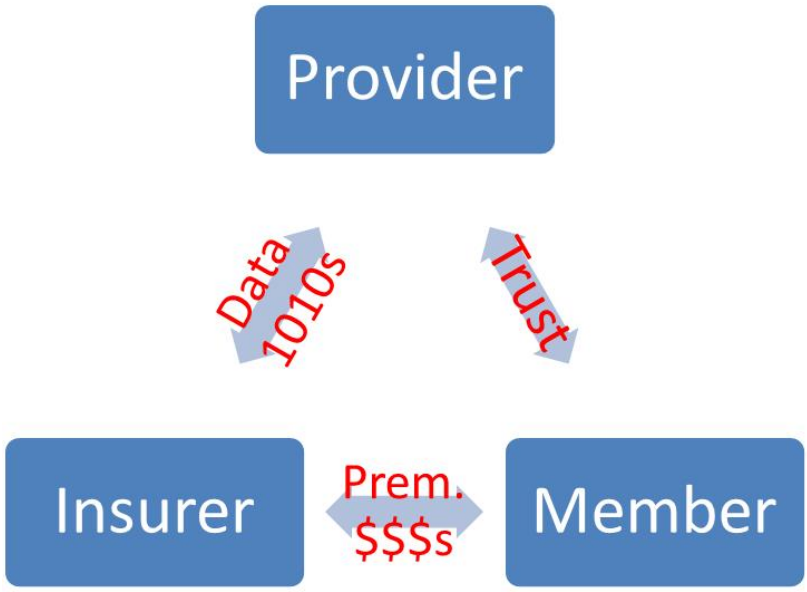
A five-year longitudinal study of over 300,000 participants in the program, recently conducted by the Institute for Healthcare Consumerism (Patel et al, 2010), concluded that:

- Hospital costs were six percent lower in those members who were inactive and became active,
- Costs were 16 percent lower in those members who were active throughout the study,
- Two additional gym visits per week reduced the probability of hospital admission by 13 percent,
- There was an increase in the percentage of participants classified as "medium- and high-engaged" in fitness related activities throughout the study.

And in April 2015, the U.S.-based life insurer John Hancock launched Vitality Life Insurance (www.JHRewardsLife.com) with Term, Universal Life, and Indexed U.L. products. Policyholders receive a free FitBit™ upon payment of their first premium and may qualify for a discount on premiums of up to 15% based on the data they upload with it. Although it is too early to track the program's effect on longevity and death claims, the company has more recently announced the launch of Vitality Active Rewards that can be tracked with an Apple Watch.

But the Vitality Program differs from the proposed HBI Plans in a few ways. First of all, the comparable "vitality points" in HBI Plans come in the form of a cash discount on insurance premiums *for the following year*. Secondly, the definition of incentive behaviors under HBI Plans is left to the state DOIs and the insurance companies they regulate. This state-based regulatory discretion leaves room for future improvements in measurement technology, like wearables that monitor exercise, heart rate, blood pressure, cholesterol, glucose levels for diabetics, or other physiological markers of incentivized behaviors.

It's important to remember that the provider – not the insurance company – validates the achievement of incentives. That's because of (a) the trusted patient-provider relationship that underpins each member's journey to better health, and (b) the ability of the provider to grant accommodations or exceptions based on his or her specialized knowledge of medicine and the member's unique personal and medical history. The transactions in the three-way relationship between the provider, the member, and the insurer can be illustrated as such:



Insurers would have options for positioning their HBI products relative to their non-HBI products, and relative to their competitor's. They could be offered alongside their regular (non-HBI) products and the incentive credits could be set to exactly match the insurer's financial savings for those extra-healthy individuals. That way, the net revenue for the HBI products would match that of the non-HBI products and the insurer would be economically indifferent to which product is selected. In that situation, the ultimate purpose for offering HBI products in the first place would be to draw new customers who were previously insured by a different carrier. Hence the importance of differentiating the insurer's HBI incentivized behaviors and the associated discounts from those of competing carriers.

One important side effect of offering new HBI products might be to divert the insurer's most healthy existing customers away from their regular products and into the new HBI products. In the short-term, this could leave the least healthy customers in the non-HBI products and thereby increase their average claims costs. If the insurer wishes to remain profitable for those non-HBI products, they may need to raise their rates on them to account for this change in population. While the net effect of this rate change could be perceived as an inequitable "penalty" for the unhealthy, it could also be perceived as an additional benefit of engagement in incentive behaviors.

Another option to avoid the accumulation of unhealthy and expensive lives in the non-HBI products would be to add an HBI incentive option *to every plan of insurance* that the insurer sells. This would include products that previously did not have such an option. If this is done, there would no reason for any members to switch plans simply to take advantage of the HBI option. That way, the mix of healthy and non-healthy lives (when combining the HBI and non-HBI option) should remain relatively unchanged in all products. In other words, whichever plan a consumer would have picked before considering the HBI option might be the same one they end up with when the HBI is added.

That said though, companies will still have the option of choosing larger and more aggressive premium credits than their competitors for common behaviors like weight loss. To do so is effectively a gamble by the insurer that the long-term savings from those customers will be enough to pay for the premium credits given. However, as the claims experience of these new HBI products emerges, companies may tend to offer similar premium credits for similar behaviors – reflecting the true economic value of those behaviors.

References

Blumenthal KJ, Saulsgiver KA, Norton L, Troxel AB, Anarella JP, Gesten FC, Chernew ME, and Volpp KG. 2013. "Medicaid Incentive Programs To Encourage Healthy Behavior Show Mixed Results To Date And Should Be Studied And Improved". *Health Affairs*, 32(3), 497-507. Accessed 9/24/2016. http://content.healthaffairs.org/content/32/3/497.full

Cox C, Semanskee A, Claxton G, Levitt L. 2016. "Explaining Health Care Reform: Risk Adjustment, Reinsurance, and Risk Corridors". Kaiser Family Foundation. Accessed 11/17/2016. http://kff.org/health-reform/issue-brief/explaining-health-care-reform-risk-adjustment-reinsurance-and-risk-corridors/

Gneezy U, and Rustichini A. 2000. "PAY ENOUGH OR DON'T PAY AT ALL". *The Quarterly Journal of Economics*, 115(3), 791-810. Accessed 9/24/2016. http://qje.oxfordjournals.org/content/115/3/791.full.pdf+html

Gribbons B, and Herman, J. 1997. "True and quasi-experimental designs". *Practical Assessment, Research & Evaluation*, 5 (14). Accessed 11/12/2016. http://pareonline.net/getvn.asp?v=5&n=14

Jaslow, Ryan. 2012. "Retired military leaders say this generation is "too fat to fight"". *CBS News* September 27, 2012. Accessed 11/21/2015. http://www.cbsnews.com/news/retired-military-leaders-say-this-generation-is-too-fat-to-fight/

Kaiser Family Foundation. 2012. "Explaining Health Care Reform: Medical Loss Ratio (MLR)". KFF Health Reform, Feb 2012. Accessed 11/17/2016. http://kff.org/health-reform/fact-sheet/explaining-health-care-reform-medical-loss-ratio-mlr/

Kane RL, Johnson PE, Town RJ, and Butler M. 2004. "A structured review of the effect of economic incentives on consumers' preventive behavior". *American Journal of Preventive Medicine,* 27(4),

327–352. Accessed 9/24/2016. http://www.ajpmonline.org/article/S0749-3797(04)00178-3/full

Lodh M, Raleigh ML, Uccello CE, and Winkelman RE. "Issue Brief: Risk Assessment and Risk Adjustment". American Academy of Actuaries, May 2010. Accessed 11/17/2016. https://www.actuary.org/pdf/health/Risk_Adjustment_Issue_Brief_Final_5-26-10.pdf

Lussier JP, Heil SH, Mongeon JA, Badger GJ, and Higgins ST. 2006. "A meta-analysis of voucher-based reinforcement therapy for substance use disorders". *Addiction*, 101(2), 192–203. Accessed 9/24/2016. http://onlinelibrary.wiley.com/wol1/doi/10.1111/j.1360-0443.2006.01311.x/full

Lykens, C. 2014. "Value of Investment in Employee Health, Productivity and Well-being". May 2014. Washington, D.C.: Institute on Health, Productivity, and Human Capital.

Mrkvicka N, Stich J, and Held J. 2015. "Workplace Wellness Trends: 2015 Survey Results". National Business Group on Health. Accessed on 11/3/2015. (Membership required.) https://www.ifebp.org/bookstore/workplacewellness/Pages/default.aspx

Patel N, Lambert E, Da Silva R, Greyling M, Nossel C, Noach A, Derman W, and Gaziano T. May/June 2010. The Association between Medical Costs and Participation in the Vitality Health Promotion Program among 948,974 Members of a South African Health Insurance Company. American Journal of Health Promotion: January 2010, 24(3):199-204. Accessed 11/21/2015. http://www.ajhpcontents.com/doi/full/10.4278/090217-QUAN-68R2.1

Sullivan, E. 2013. "HHS Pushes Health Plans to the Edge (Server)". *Health Data Management*, September 2013. Accessed 11/17/2016. http://www.healthdatamanagement.com/news/hhs-pushes-health-plans-to-the-edge-server

U.S. Department of Health and Human Services (HHS). Federal Register v.78, Section G, p.33167. June 2013. http://www.gpo.gov/fdsys/pkg/FR-2013-06-03/html/2013-12916.htm

Unknown. Company "Wellness Overview". 2015. Obtained 11/4/2015.

Vitality Group (company website). 2016. "Vitality History". Accessed 11/12/2016. http://www.thevitalitygroup.com/company/

Volpp KG, Asch DA, Galvin R, and Loewenstein G. 2011. "Redesigning Employee Health Incentives — Lessons from Behavioral Economics". *New England Journal of Medicine*, v.365, 388-390. Accessed 9/24/2016. http://www.nejm.org/doi/full/10.1056/NEJMp1105966#t=article

Volpp KG, and Das A. 2009. "Comparative Effectiveness — Thinking beyond Medication A versus Medication B". *New England Journal of Medicine*, v.361, 331-333. Accessed 9/24/2016. http://www.nejm.org/doi/full/10.1056/NEJMp0903496#t=article