Not Waiting for Godot: The Evolution of Health Promotion at PPG Industries

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PPG Industries is a manufacturer of coatings, chemicals, optical products, specialty materials, glass, and fiberglass. The company’s approach to healthcare combines perhaps 2 disparate concepts. The first is that employee health and behavior change relies to a large degree on employee awareness and ownership of their own health and second that “what gets measured gets done.” It is widely acknowledged that one of the best tools for employee awareness is the health risk appraisal tool. Additional components of employee awareness include knowing key individual health metrics and effectively engaging with healthcare providers. As a leading global manufacturer, PPG well understands the critical importance of cost accounting and financial metrics to drive business decisions. PPG’s perhaps unique approach comes from the strong marriage of individual health/wellness promotion and frequent, timely, and informative financial metrics on health and the cost of care. Combining capacity building through the mobilization of volunteer wellness teams with expert interventions and financial discipline is a feature of the experience here described. This approach has resulted in both management and employee engagement in the issue and has allowed PPG to bend the curve of ever-increasing healthcare costs and achieve cost increases per employee at one half the reported national average for companies of comparable size. Because this journal is dedicated to health and drug benefits, we gathered an appropriately representative team composed of a physician, an epidemiologist who resides in a pharmacy school, and a benefits manager. The team evolved from a common vision to identify ways of improving employee health and well-being. The team presented both as keynote speakers and as contributors to a breakout session at the National Symposium on Work-Life organized in 2007 by the National Institute for Occupational Safety and Health, a federal agency of the Centers for Disease Control and Prevention in the Department of Health and Human Services. This article is an account of why and how such a unique team was formed.

PPG Industries, headquartered in Pittsburgh, Pennsylvania, is a manufacturer of coatings, chemicals, optical products, specialty materials, glass, and fiberglass. PPG operates more than 125 manufacturing facilities in 23 countries, and has 32,200 employees globally, 20,000 of which are in the United States. From occupational health, PPG has been evolving toward comprehensive employee health.

The PPG Industries experience is not about being perfect, but about what is possible. Thus, we present an objectively measured experience of what an employer can envision, attempt, and accomplish to promote employee physical and mental health; how it reduces the burden of disease on health and productivity; and.
how it has mitigated rising medical care inflation. Thus, we offer ourselves as an example of learning how leaders from different worlds (medical, financial, and scientific program evaluation) can work together to make a difference.

The breadth of PPG’s locations and manufacturing specialties implies profound differences in business plans, site size, resources, environmental contexts, cultures, languages, management, and labor philosophies and expectations. This workplace diversity requires the implementation of health protection and promotional programs that exercise a degree of flexibility, while still maintaining relevant consistency.

We do know that work may affect health. What is not readily acknowledged, is that health may also affect work. Even if health may be categorized as occupational or personal, and along administrative or regulatory lines, health is at the center of a two-way system. In our work, we envision health as a whole and a key attribute of human capital that should be preserved, increased, and invested in.

In optimizing this human capital, we also need to acknowledge the individual and population dimensions of health. Efforts designed to preserve and improve health must consider how health is affected from the perspective of the individual, the population health management, and the environment in which individuals and populations exist.

In PPG’s experience, health promotion has been built on a strong foundation based on health protection, safety, and quality. Wellness does not exist in isolation but as the result of innovative applications derived from decades of health protection, safety, industrial hygiene, and ergonomic improvement programs. For instance, when prompted by the question, “Who is responsible for health?” we naturally point to the principle that all employees are responsible, similarly that safety is a line responsibility, not just the responsibility of the safety manager. When challenged by implementing a know-your-numbers campaign, most understood that this was meant to contribute to risk quantification in a way not dissimilar from industrial hygiene measurements. Finally, having had about 2 decades of experience in training and supporting ergonomics improvement teams, based on volunteer employees’ participation, no one seems to be scandalized by the idea of establishing, training, and supporting volunteer wellness teams.

As a global manufacturer, PPG has also built a strong foundation in cost accounting and financial reporting metrics. Perhaps the uniqueness of the experience here reported comes in the marriage of health promotion and financial metrics to attract management and employee attention, ultimately resulting in healthier behaviors, prevention, and care cost containment.

Yet, our numbers show us that if we compare the money spent for workers’ compensation—the correlate of occupational injury and illnesses—with the money spent for personal or nonoccupational healthcare, personal or nonoccupational healthcare costs are at least one order of magnitude higher than occupational costs.

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The impact of these workplace health and safety protection programs is one reason why the occupation-ally associated costs are relatively lower than the personal healthcare costs; however, we cannot lower our guard in implementing these workplace programs. If we did, injuries, work-related illnesses, suffering, and cost would rise again. Moreover, whereas decades of efforts in the occupational side of healthcare costs have resulted in a measurable effect, not much attention has been paid to the “nonoccupational” side of the equation. Even today most of the price of conformance is spent on the occupational side, with few resources being allocated to promoting employee health on the assumption that it is not the employer’s business. Actually, ever-increasing healthcare costs are becoming, worldwide, everybody’s business, and for the self-insured employer, healthcare costs directly affect the bottom line.

During the past 2 decades, personal healthcare costs have increased precipitously. Although the inflation rate for healthcare costs at the beginning of this decade was double (12%) of what was currently projected (6%), healthcare costs are still increasing year after year in excess of salary increases (typically an average of 2%-3%).

This dramatic (and largely unabated) rise in health-care costs has resulted in millions within the United States, where approximately 35% of the population remains uninsured or underinsured. The combined effect of these uninsured or underinsured individuals is to further elevate healthcare costs for employers who seek to
provide access to effective healthcare services. Personal health costs not only comprise direct costs associated with medical, surgical, rehabilitative, and pharmaceutical care, but also indirect costs. Although these indirect costs do not appear in any financial book, they are not any less real, and include costs associated with absenteeism, presenteeism, productivity loss, and all the ancillary costs owing to replacement, retraining, and litigation.

The disease burden on health and productivity is therefore of interest even where the direct healthcare costs are paid through taxes rather than through employer-based benefit systems. The prophetic words of Dr Gro Harlem Brundtland, former director of the World Health Organization, come to mind: “Improving health will generate vastly greater profits to society than playing the stock market or downsizing the microchip.”

How Will Progress Be Made?

We believe that both social and market forces should play a role. National and regional business alliances can offer an effective strategy that will prod policymakers to support the development of affordable, accessible, and effective healthcare; however, the realization of this goal is still a distance away. Therefore, we need to emphasize the role of self-efficacy. An alliance between the employer and employee toward this end is objectively possible. At PPG, we call this a win-win approach, a “life partnership.”

In an employer/employee self-efficacy strategy, the idea is not to develop health promotion strategies that make you a poster child for some brilliant but esoteric theory, but rather to work in a participatory manner with employees to accomplish what you can with what you have from the vantage point of where you are. Clarifying the association between prevention and cost avoidance and the burden of disease on health and productivity is essential.

Known Facts About Health and Cost

First, we know that costs increase as disease evolves downstream along a continuum from health to disability and finally death. Second, we know that reducing morbidity costs as high upstream as possible in the disease progression is associated with a more disability-free quality of life that has productivity implications. Third, we know that certain at-risk behaviors will drive healthcare costs up, and the more concomitant the risk behaviors, the greater the cost. In a seminal study by the University of Michigan demonstrated in 2000, it was concluded that the concomitant presence of 7 or more at-risk behaviors would quadruple the average healthcare costs. Fourth, we know all health costs—occupational and nonoccupational, direct and indirect—must be accounted for to fully understand the impact of health on our workplace and our employees. Fifth, we know that the best investment in time and energy is not so much focusing on the “tail of the distribution” (ie, those already in extreme trouble), but rather in shifting the entire distribution toward a healthier zone by keeping the healthy people healthy. Sixth, we have learned that to reduce healthcare costs, we should not simply manage costs, but influence its drivers by managing health.

If we were to put all these concepts in one picture, this could be summarized in a relatively unattractive but comprehensive model defining the total burden of disease on health and productivity (Figure 1). This model takes into consideration occupational direct costs, nonoccupational direct costs, and the indirect costs for both. The model expands our understanding of a final health outcome by exposing its components and some of its measurable and presumably modifiable influencers invoking the quality concept of $Y \approx f(x)$.

Let us take, for instance, the nonoccupational side of the model. Nonoccupational costs comprise healthcare costs, costs related to short-term and long-term disability, accident and illness, and salary replacement. The measurable health influencers include benefit

design, disease management strategies, and care variance. The platform from which these influencers can be identified is the employee/population health risk profile, obtained through the results of employee screenings and health risk appraisals (HRAs). The 5 areas of healthcare cost reduction are shown in Figure 2, which conveys the idea that simultaneous, rather than mutually exclusive, interventions in all 5 areas may put PPG in a better position to promote health and mitigate care costs.

At the center of our road map is the need for some degree of cost sharing of the disease burden. This is the typical domain of benefit design. But a particularly apt benefit design would not merely shift costs, but also facilitate the adoption of certain purchasing strategies that could foster preventive care versus catastrophic care and individual proactive responsibility for health maintenance versus reactive, passive sick care system responses.

At the left in Figure 2, we question the size of the burden. Rather than simply cutting the pie without thought to its size, we suggest that at-risk behavior modification may significantly contribute to shrinking the burden to be shared by the 2 partners, namely, the employer and employee. Adjacent to that we added an area dealing with early diagnosis, recognizing that upstream management of early intervention can reduce the downstream size of suffering and costs.

On the right side of Figure 2, we included an area that recognizes the economic opportunity derived from eliminating waste from the healthcare delivery system, whether from overuse, underuse, or misuse of certain procedures. Although not an easy thing to practice and far from being mature, the healthcare quality movement with its market effects, policy-making, and patient implications is being recognized as a critical feature in the improvement of healthcare quality and access. There is no market without choice, and there is no choice without information. Market forces, policy-making, and consumers cannot be indifferent toward good and bad quality of care. Although employers may object that this is beyond their purview, we may insist that at least purchasing specifications could be introduced to purchase value, and that educating our employees in quality-of-care recognition, to the extent possible, may help qualify demand.

![Figure 2 Five Areas for Healthcare Cost Reduction](image-url)

PMPM indicates per member, per month; STD, sexually transmitted disease.
Finally, the last area in the model has to do with work performance and productivity. Not only the canonic return-to-work and disability management programs find their place here, but also the entire concept of total productivity loss, namely, absenteeism and presenteeism (being at work but at subpar potential).

A third, minor but useful, model (Figure 3) is one that considers both cost and prevalence. This frame can be filled with population-based data that take into account the actual past claim experience both in terms of unit cost and prevalence of the condition. If we take the example of influenza, the unit cost of treating each individual case of flu is very modest, but the high seasonal prevalence of the condition makes it economically viable to offer a flu vaccination program. At the other extreme, there are conditions that happen rarely but are nonetheless very costly (eg, having a very low-birth-weight baby or a liver transplant procedure). Not all such events are preventable; however, even if prenatal care, hepatitis B vaccination, and problem-drinking prevention prevent only a part of these corresponding problems, these efforts are worth pursuing.

Costly and prevalent conditions include cardiovascular events, musculoskeletal disorders, and chronic conditions such as diabetes. Mental illness, which often co-occurs with many other chronic diseases, is associated with an assortment of indirect costs. In addition, the relative ranking changes when indirect costs are factored in. In the case of depression, for example, indirect costs related to productivity loss far exceed the costs of treatment. It is estimated that the total per capita costs (including direct and indirect costs) associated with depression in the workplace is $5415 per year. The stigma associated with mental illness and a typically fragmented healthcare system has served to hide the importance of addressing mental health by employers.

**Capacity Building**

Although having some models and road maps may give a sense of direction and priority, it is only half of...
the story. The other half lies in making things happen, which, to a certain degree, involves building the necessary capacity and leadership.

In phase 1 of our strategy (2000-2004), we focused on creating management awareness and obtaining commitment for funding to launch the “Lifestyle Partnership” initiative. The Lifestyle Partnership established a health information management system comprising claims data and a self-reported online HRA in 8 languages prominently embedded in a Web-based wellness resource center; disease-specific health promotion priorities (e.g., cardiovascular disease, musculoskeletal diseases, depression, diabetes, and women’s health issues); and facility-based wellness teams comprising groups of employee volunteers as an adjunct to the limited occupational health nursing staff. At the end of 2004, we counted 71 wellness teams in more than two thirds of the major manufacturing facilities, involving 28 nurses and 448 wellness volunteers.

In phase 2 of our strategy (2004-2007), we focused on developing the conceptual model—establishing metrics, targets, and reports; developing leadership and management engagement through health summits; conducting annual wellness conferences; developing an occupational nurse career ladder; and extending the HRA to family and retirees. The most prominent feature of this phase was the development of an intervention process for plants with the highest healthcare costs through a series of “health summits.” A typical “summit” would entail (1) involving plant leadership, the wellness team, and other employee health stakeholders in a participatory review of the facility HRA and claims data to develop a strategy for addressing the problems revealed by this review; (2) examining existing plant health promotion initiatives and providing input into how these can be enhanced to meet employee health risk needs; and (3) defining, empowering, and supporting the role of the local leadership team, and refocusing wellness teams to provide appropriate direction, tools, and support.

Measuring Progress
To establish baselines and measure progress, we gave ourselves the capacity of reporting both healthcare costs and health/risk assessment through a worksite-specific Healthcare Initiative Scorecard based on the following 5 measures reported quarterly:

- Gross per employee healthcare costs
- Net per employee healthcare costs (after cost sharing)
- Percent of employees who have taken the HRA at least once in the past 3-year period
- Percent of HRA takers who are at low or no risk
- Percent of HRA takers who have participated in a screening activity (“Know Your Numbers”) and at least remember and engage to the point of entering their cholesterol and blood pressure readings

In this dynamic process, our understanding about our employees’ health risks as well as the HRA process increased. For example, our analyses reinforced the importance of the Prochaska model based on both risk prevalence and on readiness to change for a given at-risk behavior. We learned, for example, that stress risk is self-reported by about 60% of participants, but readiness to change in this area is less than 10%. In contrast, although self-reported weight risk is more than 50%, only 30% of respondents are willing to take action in this area. This comparison permits an understanding of which risk-specific health promotion programs are mature for action and which may require the application of initiatives to increase employee awareness and knowledge and ultimately change attitudes. We also learned that HRAs change over time can be multidirectional and dynamic and static.17

Following health promotion advice in the course of time, some individuals may take action for better, some may worsen because of at-risk behaviors, and some may simply increase their risk through aging. Doing nothing to address employee health at a minimum will carry the burden of aging and increase the underlying risk burden that comes with it. If upon comparing health risk (and outcomes) at Time1 and Time2, the number of individuals who improved is not substantially higher than the number of those who worsened, our attempts at health promotion will have accomplished little.

SMART Goals
We have also learned the importance of establishing “SMART” health promotion goals (Specific, Measurable, Agreed, Reasonable, and Time-bound). Our overarching goal has been to reduce the burden of disease on health and productivity to half of the prevailing national average change over 5 years, compared

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with companies of like size. Other goals have included realizing an HRA participation rate of 80% of the employee population on a 3-year rolling period, maintaining the employee population at low or no risk at 70%, and having at least 80% of the employee population know their key health metrics (ie, body mass index, cholesterol level, blood pressure).

Lifestyle behavior modification may be a key component of the strategy to improve the future health of our associates and to avoid suffering and economic loss.

Although we succeeded from 2002 to 2006 in achieving our overarching goal, and although we are still less than the national average with respect to healthcare costs, our costs are bouncing back. The favorable economics we realized during this 5-year period were mainly influenced by benefit design, employee attrition, and health promotion effects that, at least in part, offset the inevitable aging effect. We realize that much remains to be done to improve the health of our employees who are several years older than the average age of employees in similar industries. We do have reason to be encouraged: As the HRA participation rate has increased from 20% to 71%, the proportion of employees at low or no risk has increased from 29% to 35%, and the employees “who know their numbers” have increased from 38% to 51%.

We believe that, although benefit design may have a faster impact, it has also consumed most of its available options. Whereas health promotion has a slower rate of impact, lifestyle behavior modification may actually be a key component of the strategy to improve the future health of our associates and to avoid suffering and economic loss; however, given health promotions’ lag time, the time for employers to use this strategy to affect workers’ health is now.

Through this process, we have also learned to appreciate the differences and complementary nature of “data.” HRA data provide the opportunity to project our employees’ health currently and in the future, even in the absence of claims data. HRA data are immediately available and permit both individual and population-based risk management “before the fact.” On the other hand, claims data afford a look backwards, after healthcare has been provided. Even though PPG has access to 100% of the financial side of its self-insured claims data, and 80% of de-identified clinical information thereof, these data tell little about employees who do not have claims. Moreover, healthcare claims data take months to collect, clean, and verify before they can be used to analyze utilization, cost, and disease management priorities. Thus, by definition, this is “after the fact” information. In the process of organizing system changes and health promotion interventions, we focus on several priorities for which we call on both wellness teams’ mobilization and expert intervention, which we do not have time here to describe (nutrition, exercise, obesity, modifiable cardiovascular risk factors, etc). Rather than describing the obvious, we want here to attract the attention to the fact that one major lesson that we learned is that an important focus of our health promotion activities is missing—mental health. This is even more relevant when considering not just the direct healthcare costs, but also the more relevant impact on loss of function and its productivity correlate.

As mentioned above, stress is the most frequently reported health complaint by our employees. As part of our HRA experience, we offer, on a voluntary basis, a validated depression screening tool, Patient Health Questionnaire-9 (PHQ-9), and a self-reported evaluation of absenteeism and presenteeism, the Work Limitation Questionnaire (WLQ). The addition of these 2 instruments to our HRA helped us to further evaluate the attendant risk factors and work consequences associated with reported “stress.”

Provokingly, HRA, PHQ-9, and WLQ have brought to light areas we expected to be unprepared for, but in such a compelling way that they are impossible to ignore. Although we still do not quite understand the meaning of the findings, we see the relevance of stress, depression, and even moderate alcohol use* as an association that is impossible to ignore. The results of our preliminary analyses indicate that employees who reported higher stress were more likely to report a higher alcohol risk. Moreover, female employees who reported moderate to high alcohol use also were more likely to report greater weight/obesity, increased blood pressure and cholesterol, increased number of health risks overall, and increased number of chronic conditions. As indicated in Table 1, when the results of the

*According to the National Institute on Alcohol Abuse and Alcoholism, moderate drinking is no more than 1 drink per day for most women and no more than 2 drinks per day for most men. http://www.niaaa.nih.gov/FAQs/General-English/.
WLQ were applied to HRA data, we imputed that employees who reported moderate to high alcohol use also reported greater productivity losses than workers who reported moderate to high stress.

In addition, employees who reported moderate to high alcohol use also had a higher imputed financial impact per employee ($6244) owing to self-reported productivity loss (absenteeism + presenteeism) than workers who reported moderate to high stress ($4550), and a higher productivity loss per 1000 employees ($598,264) than those with known heart disease ($236,323) (Table 2). The results of these analyses suggest that addressing employee stress should also involve addressing employee alcohol use, as the association between stress and alcohol use may be bidirectional. People may drink to relieve stress, but drinking may generate stress.

Regardless of whether employee stress is experienced at home and/or at work, stress provides a frame of reference that should include a focus on work-life balance and “organizational ergonomics.” Although the self-reported absenteeism and presenteeism cost of heart disease is higher than the corresponding indirect cost for high stress on an individual employee basis, the much higher prevalence of reported stress makes the associated indirect costs ($2,770,042) 10 times higher than those associated with heart disease ($236,323).

### Where to Go From Here?

We need to work rapidly and simultaneously in several directions. First, we need to further analyze HRA data to ascertain specific risk areas to target via health promotions that will produce the best outcomes. Second, we need to make better use of HRA data. We would like to make the HRA easier to access and improve employee response rates, so that employees will take the HRA multiple times and thus compare their results over time. We would like to expand the use of HRA to spouses and retirees, and we need a strong continued protected health information focus to avoid jeopardizing the trust upon which the integrity of self-reported data are founded. We would like to allow individuals to opt to link their HRA data to manage their own benefits, including the possibility of receiving individually-tailored preventive prompts, before-the-fact risk coaching, and after-the-fact disease management, as indicated. Third, we need to expand collection and include disability and absence metrics for active employees in our measuring system.

Most important of all—and most difficult—will be to give equal status to mental wellness as it is given to physical well-being. This would require further destigmatizing mental health, increasing familiarity with screening devices for depression, alcohol problems (as people are now familiar with cholesterol and blood pressure and glucose screenings), facilitation of access to care and employee assistance programs, and overcoming the fragmentation of mental healthcare.

### References


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### Table 1 Self-Reported Productivity Loss (Absenteeism + Presenteeism) by Job Tasks

<table>
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<th>Time management (%)</th>
<th>Output demands (%)</th>
<th>Physical demands (%)</th>
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<tr>
<td>No at-risk or chronic conditions</td>
<td>1.8</td>
<td>3.4</td>
<td>2.2</td>
<td>3.8</td>
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<tr>
<td>Known heart disease</td>
<td>13.5</td>
<td>15.4</td>
<td>12.9</td>
<td>21.4</td>
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<td>Moderate to high alcohol risk</td>
<td>15.9</td>
<td>18.9</td>
<td>11.6</td>
<td>18.2</td>
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<tr>
<td>Moderate to high stress risk</td>
<td>13.2</td>
<td>13.8</td>
<td>11.4</td>
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### Table 2 Self-Reported Productivity Loss: Financial Impact, Based on Average Salary

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<th>Per employee ($)</th>
<th>Per 1000 employees ($)</th>
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<td>No at-risk or chronic conditions</td>
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<td>Moderate to high alcohol risk</td>
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<td>598,264</td>
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<td>Moderate to high stress risk</td>
<td>4550</td>
<td>2,770,042</td>
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AHDB Stakeholder Perspective
The Evolution of Health Promotion by Employers

Many initiatives and changes we are seeing in the commercial healthcare delivery or payment system have their roots in the employer segment. As illustrated in the article by Colombi and colleagues, employers have implemented various initiatives to change how healthcare benefits are developed, offered, and evaluated in the context of corporate goals related to health.

The market has seen differing, successful health benefit innovations through Pitney Bowes, Dow Chemical, Marriott, City of Asheville, SCANA, University of Michigan, and now PPG Industries. Each has been innovated in response to the individual organization’s needs and priorities for employee health status, along with employee performance and return on investment for the organization. This illustrates the difficulty in replicating a single success combined with the recognition that each organization does differ from one another and responds to financial constraints individually or at most by industry sector.

In the approach to wellness at PPG, the authors have clearly established a how-to tactic from which most organizations can begin to implement improvement in team strategies that will diminish the disease burden on employer health and productivity.

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