



**KING COUNTY**

1200 King County Courthouse  
516 Third Avenue  
Seattle, WA 98104

**Signature Report**

**September 23, 2008**

**Motion 12851**

**Proposed No.** 2008-0474.1

**Sponsors** Hague and Phillips

1                   A MOTION approving the Third Annual King County  
2                   Health Reform Initiative Measurement and Evaluation  
3                   Report.  
4

5                   WHEREAS, the goals of the King County Health Reform Initiative are to  
6                   improve the long-term health of King County's employees and reduce the rate of growth  
7                   in King County's health care costs over 2007-2009, and

8                   WHEREAS, Motion 12131 approved in May 2005 adopted a business case to  
9                   estimate the costs and benefits of various interventions to be provided through the  
10                  county's Healthy Incentives<sup>SM</sup> program, and

11                  WHEREAS, Motion 12131 requested the executive to provide a program  
12                  evaluation plan developed by a consultant to assess the effectiveness of each internal  
13                  Health Reform Initiative program and strategy, and

14                  WHEREAS, Motion 12353 adopted in September 2006 established the production  
15                  and transmittal to council by motion of an annual measurement and evaluation report by  
16                  August 15 of each year of the Health Reform Initiative Program, and

17 WHEREAS, Motion 12479 approved in March 2007 adopted the King County  
18 Health Reform Initiative Cost Benefit Analysis Plan containing three levels of  
19 measurement: Level I—Original Business Case Programs; Level II—Programs to  
20 Develop a Supportive Environment for Health; and Level III—Programs to Improve  
21 Health Care Provider Quality and Accountability, and

22 WHEREAS, Motion 12479 requested seventeen specific measures for evaluating  
23 the progress of the Health Reform Initiative, and

24 WHEREAS, in his 2008 evaluation of the Health Reform Initiative program,  
25 consultant Ron Z.Goetzel, Ph. D., Director of the Emory Institute for Health and  
26 Productivity Studies and Vice President of Consulting and Applied Research at Thomson  
27 Reuters Healthcare, has created a cost-benefit ledger that measures the whole Health  
28 Reform Initiative program, provides intermediate outcome performance measures and  
29 includes the impact of health on employee productivity. This cost-benefit analysis is  
30 incorporated into the Third Annual King County Health Reform Initiative Measurement  
31 and Evaluation Report to show progress in 2007. Also, this analysis will be incorporated  
32 into future Third Annual King County Health Reform Initiative Measurement and  
33 Evaluation Reports to show year-over-year progress in the Health Reform Initiative, as  
34 well as to summarize the final Health Reform Initiative, and

35 WHEREAS, the Third Annual King County Health Reform Initiative  
36 Measurement and Evaluation Report, for the 2007 reporting period, has been transmitted  
37 to the council in conformance with all applicable motions and direction;

38 NOW, THEREFORE, BE IT MOVED by the Council of King County:

39                   The Third Annual King County Health Reform Initiative Measurement and  
40                   Evaluation Report, Attachment A to this motion, is hereby approved.

41

Motion 12851 was introduced on 9/2/2008 and passed by the Metropolitan King County Council on 9/22/2008, by the following vote:

Yes: 9 - Ms. Patterson, Mr. Dunn, Mr. Constantine, Ms. Lambert, Mr. von Reichbauer, Mr. Ferguson, Mr. Gossett, Mr. Phillips and Ms. Hague


No: 0

Excused: 0

KING COUNTY COUNCIL  
KING COUNTY, WASHINGTON

  
\_\_\_\_\_  
Julia Patterson, Chair

ATTEST:

  
\_\_\_\_\_

Anne Noris, Clerk of the Council

**Attachments**       A. Third Annual Measurement and Evaluation Report dated August 2008

12851



**King County**

**Third Annual  
Measurement & Evaluation Report**

**Health Reform Initiative**

**Department of Executive Services  
Human Resources Division**

**August 2008**





# King County

## Health Reform Initiative Policy Committee

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Alternative formats available: 206-684-1208

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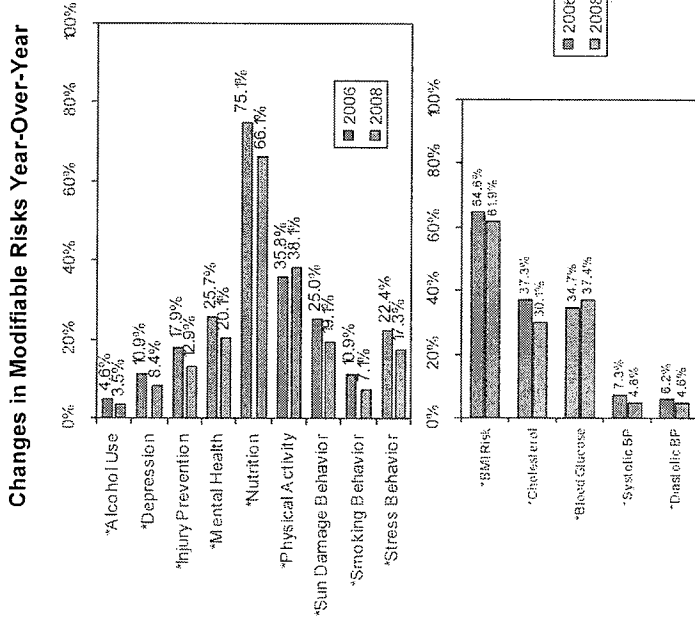
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# Health Reform Initiative Measurement and Evaluation Dashboard

## Four Key Measures

### I. Change in Self-Reported Risk Profile

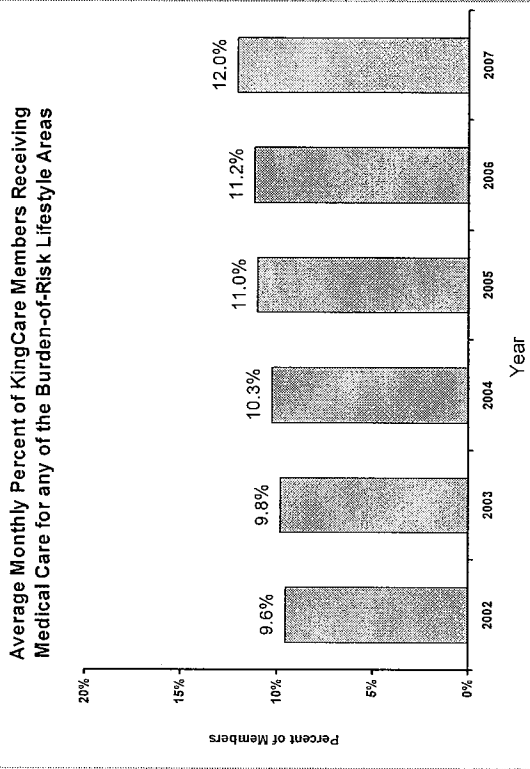


Source: Thomson Reuters

Change in self-reported risk profile: King County employees and their spouses/domestic partners reported significant improvement in 12 of 14 "at-risk" health indicators measured from 2006 – 2008. The measures showing risk reduction were alcohol use, depression, injury prevention, mental health, nutrition, sun damage behavior, tobacco use, stress, weight (Body Mass Index), cholesterol, and systolic and diastolic blood pressure. The two that increased were physical activity and blood glucose. According to Dr. Goetzel these improvements represent "a significant achievement," especially when considering that our aggregate population continues to age.

### II. Change in Burden of Risk

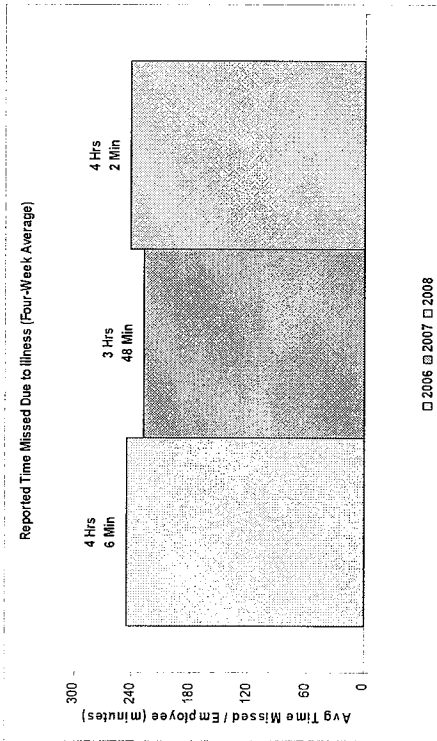
Utilization of Health Care for Conditions Affected by Behavior



There has been a slow, small, but steady growth in the number of members who had medical claims for health conditions directly affected by one or more lifestyle factors (e.g. lack of exercise, poor nutrition) from 2002 (before the start of the HRI) through 2007. It is not clear as to whether changes in health behavior affected the utilization of health care for conditions directly affected by that behavior. One possible explanation for the increase use of health care starting in 2005 is the introduction of disease management programs to identify members with chronic conditions and encourage them to become active participants in treatment and management of their conditions.

### III. Change in Healthy Hours Worked

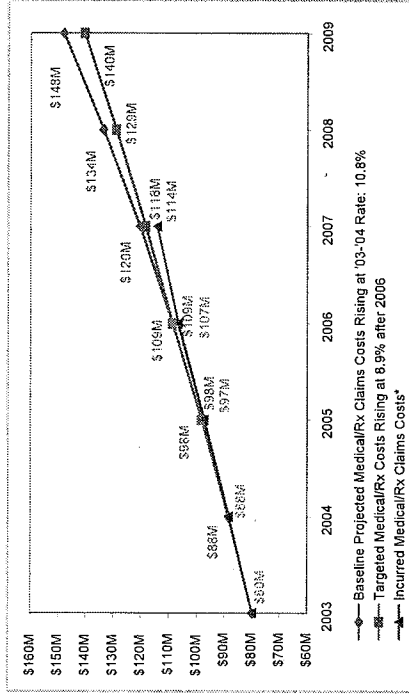
Self-Reported Time Missed Due to Illness in the Past Four Weeks



The results from self-reported absenteeism in the past 30 days showed a drop in average number of hours absent from 2006 to 2007, and an increase from 2007 to 2008. The net change from 2006 to 2008 is a small, not statistically significant decrease in time loss. Results from another question about absence in the past 12 months showed an average drop of half a day, which would translate into a sick leave cost savings of \$131.94 per employee per year. The HRI will need to wait for another year of data to determine whether there is a positive or negative pattern observed.

### IV. Financial Analysis of Costs and Return on Investment

Revised HRI Business Case and Actual Incurred Claims for 2003-2007 (Medical/Rx, KingCare<sup>SM</sup>, Full-Time, Active Employees and their Dependents)



\*Note: 2007 incurred claims are adjusted by a completion factor method for claims that will be reported in coming months.

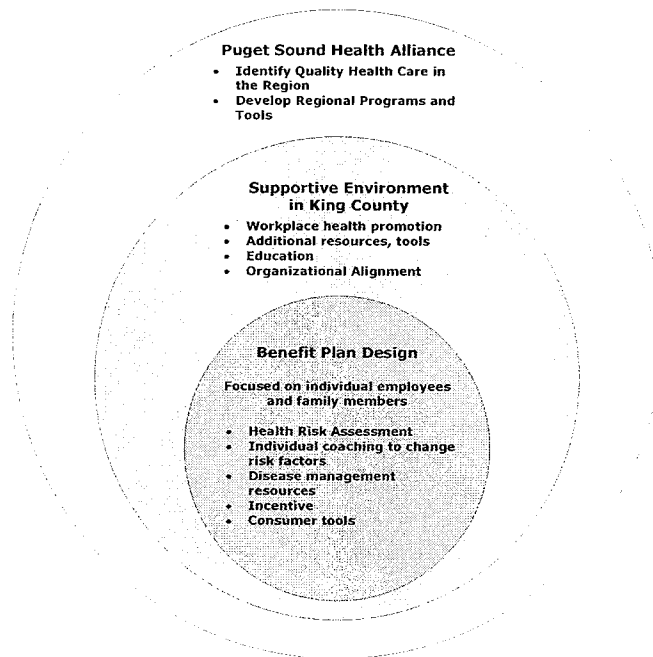
Year-over-year cost growth for the county for medical and prescription drug claims for 2007 was 6.4 percent, a significant decrease from the over ten percent year-over-year increase seen in 2004 – 2006. One important factor contributing to the lower overall cost growth is a steady increase in the number of members choosing generics over brand name drugs. It is still too early to say whether the 6.4 percent year-over-year cost growth seen in 2007 is a one-time event or the beginning of a moderation in the long term cost trend.

# Executive Summary

## Background

This is the Third Annual Report for King County’s Health Reform Initiative (HRI). The HRI is a comprehensive, integrated effort to tackle both the problems in the health care system and the ever-increasing utilization of health services by county employees and their families. At its inception, the two key goals of the HRI were to 1) improve the health of employees and their families, and 2) reduce the rate of cost increase for health care. A third goal was added in 2007—measure the improvement in productivity (“healthy hours at work”) resulting from the improved health of employees.

Figure 1  
**King County Health Reform Initiative**



The HRI provides resources and programs at three levels. At the center is the Healthy Incentives<sup>SM</sup> benefits plan that is focused on helping employees and their families build good health behaviors and manage chronic conditions more effectively. Supporting the benefits plan is an organizational philosophy based on creating a healthy workplace including a set of programs to educate employees about health and the wise use of health care resources, as well as workplace activities to support physical wellness, healthy eating and preventive care (like annual flu shots). The third level of the HRI is the Puget Sound Health Alliance, created largely through the leadership of King County to address the cost and quality issues in health care across the Puget Sound region. Key programs of the Alliance focus on changes needed in the external marketplace to

improve the quality of care and reduce health care costs. The Alliance promotes coordinating care across providers, encouraging the use of evidence-based treatment guidelines and creating a system of quality measurement used by all providers, health plans and health plan sponsors in the region.

Start up of the HRI has been gradual, with specific program elements coming “on line” at different dates. In 2005 five “care management” programs were added to the benefits plan design—nurse line, disease management, an enhanced case management outreach, provider best practice, and a performance provider network. 2005 also marked the start of the supportive environment level with the implementation of the Health Promotion Leadership Committee, the annual Health Leadership Forum, and an intensive education and outreach campaign to prepare employees and their families to participate in the wellness assessment and individual action plans. Finally, in 2005 the Puget Sound Health Alliance partnership was formed.

By 2006 employees and their spouse/domestic partners were fully engaged in the wellness assessment and individual action plans; the Live Well Challenge, Weight Watchers at Work<sup>®</sup>, gym discounts, and other supportive environment programs were in full swing; and the Puget Sound Health Alliance produced clinical improvement reports on diabetes, heart disease, back pain and prescription drugs, and developed the framework for the integrated, region-wide medical and prescription drug database needed to create comparison reports on the quality of care provided by local clinics and hospitals.

In 2007 the bronze, silver and gold out-of-pocket expense levels of the health plans went into effect, and participation in the worksite health promotion programs intensified. The key elements of the HRI are now in place.

## Key Findings

**Healthy Incentives<sup>SM</sup> Plan Design:** Following the completion of the Second Annual Measurement and Evaluation report the HRI staff consulted with Ron Z Goetzel, Ph. D., founding Director of the Emory Institute for Health and Productivity Studies, and Vice President of Consulting and Applied Research at Thomson Reuters, to create a more effective cost/benefit ledger that measures the whole program, provides intermediate outcome measures and includes the impact of health on productivity. Using Dr. Goetzel’s input the HRI has developed the following key measures: 1) change in self-reported risk profile; 2) change in burden of risk related to conditions affected by behavior; 3) change in healthy hours worked (change in productivity as measured through absenteeism and presenteeism<sup>1</sup>); and 4) financial analysis of costs and return on investment.

No program can be successful if participation does not reach a critical mass. The HRI has achieved participation rates that approach “best in class” as defined by D.W. Edington, Ph.D., Director of the Health Management Research Center at the University of Michigan. “Best in class” programs achieve participation in at least one program activity by 95 percent of all eligible people<sup>2</sup>. As noted in Figure 2 below, the HRI is

seeing participation rates of 90 percent in the Healthy Incentives<sup>SM</sup> program alone; this does not include people who may be choosing to do only the worksite health promotion programs.

Figure 2  
Participation in the Wellness Assessment and Individual Action Plan

Year	Number Eligible	Number Completing Wellness Assessment	Percent of Eligible Completing WA	Number Completing Individual Action Plan	% WA Takers Completing Action Plans
2006	19,702	17,844	90.56%	15,703	88.01%
2007	19,377	17,772	91.72%	15,913	89.53%
2008	19,495	17,401	89.26%	16,074	92.37%

**Change in Self-Reported Risk Profile:** The risk profile for the King County population is a roll-up of the individual self-reported information from the wellness assessment. Answers to the questionnaire provide self reported information on modifiable health risk factors, lifestyle behaviors, and biometric measures that potentially may endanger health. These include nine behavioral measures—alcohol use, depression, injury prevention, mental health, nutrition, sun damage behavior, stress behavior, and five biometric measures—body mass index (BMI), blood glucose, cholesterol, systolic blood pressure and diastolic blood pressure.

Participants in King County’s HRI reported significant improvements 12 of 14 modifiable health risk factors over the three year study period, as shown in Figure 3.

Figure 3  
At-Risk Prevalence for Health Behaviors & Biometrics 2006-2008 Aggregate (Employees and Spouses/Partners)

Aggregate All Respondents Risk Factor	2006			2008			% Change (2006-2008)
	N	%^	Missing (%)	N	%^	Missing (%)	
Alcohol Use	767	4.6	228 (1.4)	603	3.5	156 (0.9)	-1.1*
Depression	1,611	10.9	2,164 (12.8)	1,303	8.4	1,864 (10.8)	-2.5*
Injury Prevention	2,924	17.9	568 (3.4)	2,172	12.9	431 (2.5)	-5.0*
Mental Health	4,119	25.7	881 (5.2)	3,328	20.1	787 (4.5)	-5.6*
Nutrition	12,393	75.1	395 (2.3)	11,218	66.1	366 (2.1)	-9.0*
Physical Activity	4,843	35.8	3,384 (20.0)	6,168	38.1	1,145 (6.6)	2.8*
Sun Damage Behavior	4,005	25.0	872 (5.2)	3,282	19.1	118 (0.7)	-5.9*
Smoke Behavior	1,735	10.9	961 (5.7)	1,167	7.1	978 (5.6)	-3.8*
Stress Behavior	3,713	22.4	350 (2.1)	2,938	17.3	338 (2.0)	-5.1*
BMI Risk	10,694	64.6	338 (2.0)	10,485	61.9	392 (2.3)	-2.7*
Cholesterol	2,306	37.3	10,720 (63.4)	1,561	30.1	12,142 (70.0)	-7.2*
Blood Glucose	1,426	34.7	12,787 (75.7)	1,237	37.4	14,024 (80.9)	2.7*
Systolic BP	706	7.3	7,200 (42.6)	453	4.8	7,841 (45.2)	-2.5*
Diastolic BP	610	6.2	7,031 (41.6)	448	4.6	7,684 (44.3)	-1.6*

Source: Thomson Reuters

\*p-value <0.05, using McNemar’s chi square test

As discussed in detail in Chapter 2, the greatest reductions in health risks occurred between the first and second years of the program (2006-2007). Additional, though less



dramatic, improvements in health risks occurred between the second and third years (2007-2008). Health risk results for the subgroups of employees-only and spouses/partners-only tended to parallel the findings from the broader population (see Technical Appendix for details.) This pattern of immediate risk reduction followed by a regression to previous levels is typical for many health promotion programs whereby initial improvements in health risks are achieved in the first year and additional effort is required to sustain and maintain these improvements over time. According to consultant Ron Goetzel, PhD., the results presented here are very positive and promising in terms of demonstrating positive program effects on the health risk profile of King County employees and spouses/partners over the past three years.

**Changes in Burden of Risk Related to Conditions Affected by Behavior.** Burden of risk is a measure of the degree to which specific conditions increase the likelihood of diseases that require health care. In this measure the HRI is looking at changes in the utilization (numbers of office visits, hospitalizations, emergency room visits and prescription drugs) for conditions that are directly affected by health behavior to see the extent to which improvements in health conditions lead to lower use of health care services. Utilization changes, along with medical cost inflation (change in the unit price of medical products and services) drive health care cost trends.

Figure 4  
**Utilization of Health Care for Conditions Affected by Behavior**

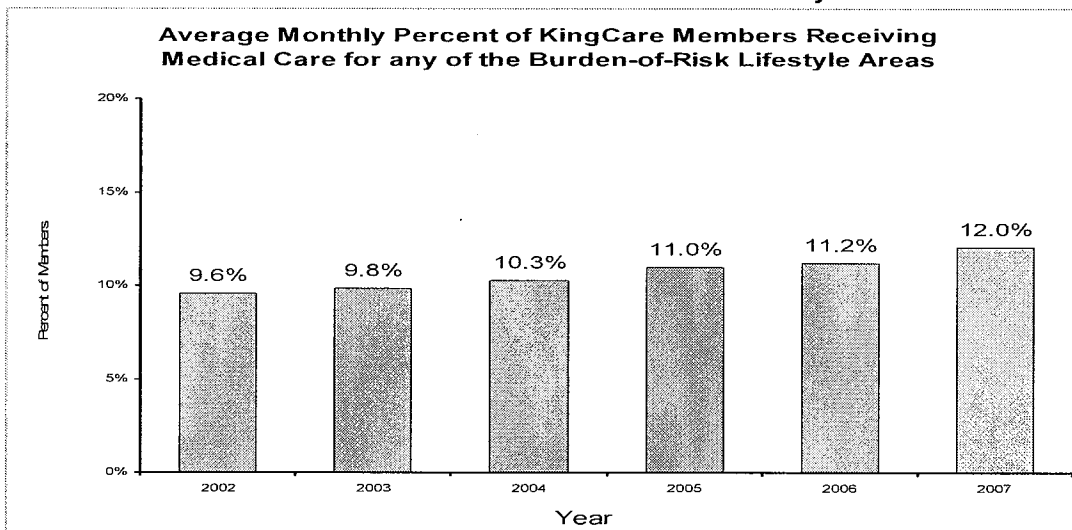


Figure 4 above shows there has also been a steady growth in percent of employees and family members who had claims for health conditions directly related in full or in part to lifestyle factors. In 2007, 2,946 KingCare<sup>SM</sup> members out of 24,494 total received care for a condition related to one or more lifestyle factor (see page 38 for list of conditions and lifestyle risks). Both cost and the numbers of members seeking health care for lifestyle-related conditions increased in 2005 when the county introduced the four Aetna care management pilot programs to identify members with chronic conditions and encourage them to become more active participants in managing their conditions. Although these programs are intended to reduce health care costs in the long term, it is

conceivable that in the short term they may cause an increase in health care utilization by encouraging members who were unaware of, or were ignoring a health condition to seek medical attention. The HRI does not yet have data to indicate if there is any actual correlation between this increase and the introduction of any of the care management program.

***Changes in Healthy Hours Worked*** (change in productivity as measured through absenteeism and presenteeism<sup>3</sup>). Health conditions not only affect health care claims costs, they also affect an employee's absence from work and ability to perform at full capacity when at work. Like many employer the county's leave tracking systems do not provide adequate data to know exactly how much time is taken off specifically for employee (as opposed to family) illness. Following the recommendations of the Peer Review Panel, the HRI has added two self-reported measures to determine the annual number of hours employees are absent due their own personal health conditions, and the number of hours annually they come to work but work at less than full capacity due to a health condition (presenteeism).

- **Absenteeism:** From 2006 to 2008, the average number of self-reported hours of absenteeism in the past four weeks decreased, although the reduction was not statistically significant. However, the average days of absenteeism for the past year fell significantly by about half a day, resulting in a \$131.94 per employee per year cost savings for the aggregate sample of all employees. Conversely, the cohort employee sample experienced a 0.4 statistically significant increase in absenteeism hours in the past four weeks and there were no statistically significant changes in the number of absenteeism days in the previous year. This translated to an increased cost of \$12.43 per employee per month.
- **Presenteeism:** For King County employees in 2008 who completed the wellness assessment, the average percent productivity lost in one hour was 1.4 percent compared to their healthier counterparts. Using the average 2008 annual salary of King County employees (\$64,625.60), this loss in productivity translates to an annual cost of \$904.76 per employee.

***Financial Analysis of Costs and Return on Investment:*** The financial analysis measures the effect of the HRI on actual health care costs paid by the county. Changes in health care costs are driven by two factors: medical cost inflation (change in the unit price of medical products and services) and utilization changes in the volume of medical products and services used, which may be influenced by demographic changes, advertising and the use of new technology, among other things.

Figure 5  
**Claims (King County's Share Alone) Per Employee Per Month for KingCare<sup>SM</sup> Plan**

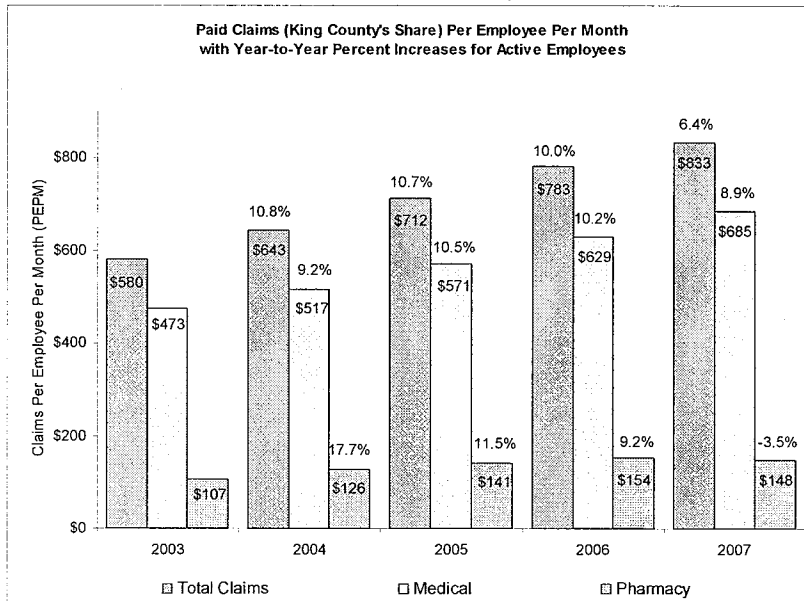
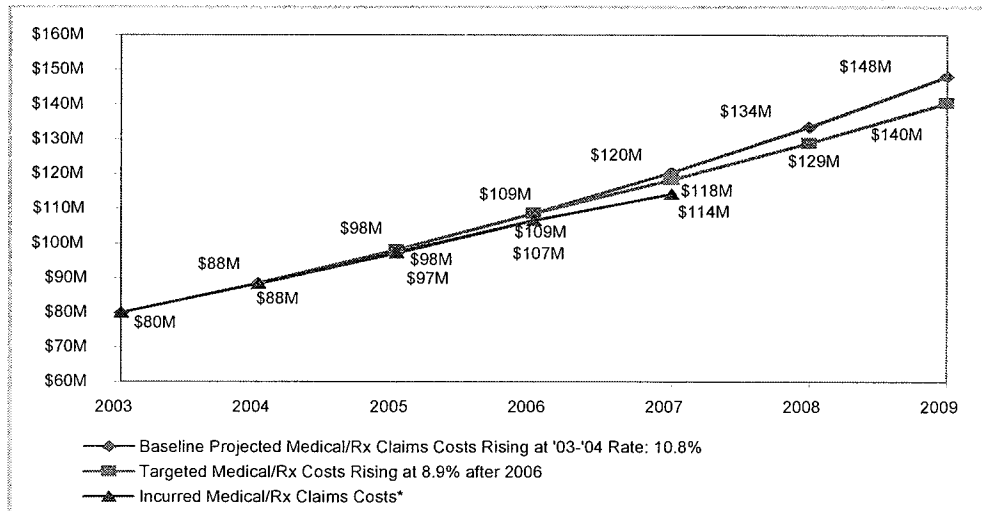


Figure 5 shows the year-over-year cost growth rate experienced by the county on a Per Employee Per Month basis. There was a significant reduction from the year-over-year growth pattern of more than ten percent 2004 – 2006. Overall health care costs for 2007 over 2006 were just 6.4 percent higher than 2006. The cost growth for medical claims was just 8.9 percent, while the rate of cost growth for pharmacy was down 3.5 percent. These numbers are well below the year-over-year target increase of 8.9 percent overall.

Figure 6  
**Revised HRI Business Case and Actual Incurred Claims for 2003-2007 (Medical/Rx, KingCare<sup>SM</sup>, Full-Time, Active Employees and their Dependents)**



\*Note: 2007 incurred claims are adjusted by a completion factor method for claims that will be reported in coming months.

Figure 6, like the year-over-year analyses in Figure 5, shows total claims coming in below the projected target for 2007.

**Supportive Environment:** The campaign to increase use of generic drugs instead of brand name drugs has contributed to a 10 percentage point increase in use of generics 2005 through first quarter 2008. Weight Watchers at Work<sup>®</sup> has established regular sessions at workplace locations throughout King County. Since the program began in 2006, 1,175 participants have together shed more than 8,800 pounds, an average drop of eight pounds per 13-week session. There was a nine percent increase in the number of employees who got a flu shot in the worksite in 2007 compared to 2006, and an overall three percent increase in the number of employees and their spouses/domestic partners who reported in the wellness assessment they received a flu shot from any source (worksite, doctor's office, public flu shot clinic, etc.) The results from surveys of employees, managers and supervisors demonstrate that the tools and resources are well-known and regularly used (including a significant increase in the utilization of the Healthy Workplace Funding Initiative). While the county is making progress towards creating a truly healthy workplace, the perception of the usefulness of some of these efforts (newsletter, email etc.) appears to have leveled off or slightly declined.

**Puget Sound Health Alliance:** With the release of the Community Checkup, initiation of the eValue8 process, and the publishing of more clinical guidelines in support of improving the quality and efficacy of care, the Puget Sound Health Alliance has reached a new level of engagement and influence on the "supply side" of the health care equation.

## Conclusions, Opportunities, Challenges and Next Steps for the Healthy Incentives<sup>SM</sup> Plan

In 2007, all planned components for the Healthy Incentives<sup>SM</sup> benefit plan design were in place—wellness assessment, individual action plans, and bronze, silver and gold out-of-pocket expense level plans.

**Healthy Incentives<sup>SM</sup> plan design:** Participation in the Healthy Incentives<sup>SM</sup> program continues to be strong with around 90 percent of eligible employees and spouses/domestic partners taking the wellness assessment and completing individual action plans each year 2006 through 2008.

The HRI is having a positive impact on 12 of the 14 risk factors measured self-reported risks in 2008 over those reported in 2006. The two risk factors that did not see improvement in this look at the data are physical activity and level of blood glucose. Looking at year-over-year changes, however, participants reported improvement in 13 risk factors in 2007 over 2006, and improvement in only eight risk factors in 2008 over 2007.

It is not clear as to whether changes in health behavior affected the utilization of health care for conditions directly affected by that behavior. Obesity, lack of exercise, and

poor nutrition have consistently been the greatest lifestyle contributors to health care costs and utilization over time. Claims costs and utilization of health care services for lifestyle-related conditions remained almost unchanged 2002 – 2004. In 2005 the county introduced the four Aetna care management pilot programs to identify members with chronic conditions and encourage them to become more active participants in treatment and management of their conditions. Although these programs are intended to reduce health care costs in the long term, it is conceivable that in the short term they may cause an increase in health care utilization by encouraging members who have been unaware of, or were ignoring a health condition to seek medical attention. There is at least an apparent increase in both the costs and numbers of members getting treatment for lifestyle-related conditions in 2005. However, the HRI does not yet have data to indicate if there is any actual correlation between this increase and the introduction of any of the care management program.

The results from the absence reported for the prior 30 days and the results reported for the prior 12 months are inconsistent. The HRI will need to wait for another year of data to determine whether there is a positive or negative pattern observed. It would have been helpful to have a normative reference group to see what absenteeism patterns have been over the past three years for other employers in the Puget Sound region. However, the HRI has been unsuccessful in locating another employer willing to share data for such a study. Therefore the absenteeism results have been analyzed on a pre-test/post-test basis without a comparison group, and no conclusions about absenteeism can yet be drawn. The presenteeism results provide a baseline for future study about the effect of the HRI on reducing the effects of poor health on productivity.

Year-over-year cost growth for the county for medical and prescription drug claims in the KingCare<sup>SM</sup> plan for 2007 was 6.4 percent, a significant decrease from the over ten percent year-over-year increase seen in 2004 – 2006. (A similar analysis for the Group Health plan has not been completed.) One factor contributing significantly to the lower overall cost growth is a steady increase in the numbers of members in the KingCare<sup>SM</sup> plan that choose generics over brand name drugs. The numbers of employees achieving the bronze and silver level plans (with higher out-of-pocket expenses) were far below projections because a very large majority chose to complete the wellness assessment and individual action plan. The HRI needs to more fully analyze the actual amount of cost shifted to members who are in the silver and bronze level plans as compared to members in the gold level plan. Not shown in the numbers reported in this section is the approximately \$1.6 million that came into the benefits fund as revenue from the benefit access fee. It is still too early to say whether the 6.4 percent year-over-year cost growth seen in the 2007 KingCare<sup>SM</sup> is a one-time event or the beginning of a moderation in the long term cost trend.

As a result of the analysis conducted for the Second Annual HRI report, the county made a number of changes in the five pilot programs added to the KingCare<sup>SM</sup> plan in 2005 (Informed Health Line<sup>®</sup>, disease management, MedQuery<sup>®</sup>, Enhanced Member Outreach<sup>SM</sup> and Aexcel<sup>®</sup>) purchased from Aetna. Because these changes occurred mid-year in 2007, it is not yet possible to determine a return on investment for 2007.

Finally, the cost of the HRI continues to be in the appropriate range for effective employer health and productivity management programs according to studies conducted by DW Edington<sup>4</sup>.

**Supportive Environment:** In terms of creating a supportive environment, both internal and independent evaluations of the HRI demonstrate that the program is in compliance with the accepted best practices. The extremely high participation rates in both the wellness assessment and individual action plan features of the Healthy Incentives<sup>SM</sup> benefit program are intricately linked to the education and outreach aspects of the Supportive Environment program. The results from surveys of employees, managers and supervisors demonstrate that the tools and resources are well-known and regularly used (including a dramatic increase in the utilization of the Healthy Workplace Funding Initiative). While the county is making progress towards creating a truly healthy workplace, the perception of the usefulness of some these efforts (newsletter, email etc.) appears to have leveled off or slightly declined.

**Puget Sound Health Alliance:** With the release of the Community Checkup, initiation of the eValue8 process, and the publishing of clinical guidelines in support of improving the quality and efficacy of care, the Puget Sound Health Alliance has reached a new level of engagement and influence on the “supply side” of the health care equation. The Puget Sound Health Alliance as a leader in fostering these systemic changes is critical in advancing this agenda.

## Challenges and Opportunities

It is very hard to make lasting lifestyle changes, and even harder to add new gains onto earlier gains. HRI staff will need to work with vendors to keep the wellness assessment and individual action plan programs fresh, inviting and effective for members over time. Outreach to spouses/domestic partner will be especially critical. Two risk factors that will need special attention are increasing physical activity and encouraging members to actively monitor and blood glucose levels as appropriate. Another challenge is making sure employees and their families “know their numbers”—that is, know their percentage of body fat, total cholesterol, blood glucose measurement and their systolic and diastolic blood pressure. Results from the self reported data indicate that 40 percent to 80 percent do not know their level of risk on these important indicators of overall health.

While most of the measured indicators show that the resources and tools provided employees and managers are very useful and appropriate, challenges and opportunities remain. Continued emphasis to “Choose Generics” is critical—increase in use of generics has been a key moderating factor in the apparent slowing of health care cost trends seen so far. Our Pharmacy Benefit Manager, Express Scripts, says that 80 percent generic utilization is optimal. The county is currently at 63.9 percent. Members are already choosing *chemically* equivalent generics more than 98 percent of the time when they are available. Increase in generic fill rate will only come when more members are using *therapeutically* equivalent drugs (drugs in the same therapy class—e.g. cholesterol-lowering drugs—that have similar effects but are not chemically identical). This will require extensive education to help members and their providers feel

comfortable with this next level of change. Visiting providers to educate them about use of therapeutically equivalent generics by health plans and “wise consumer” tools for members will help.

Finally, as spelled out in the initial report from the Health Advisory Task Force sustaining health reform for the long-term requires systemic changes across the spectrum of the health care industry in our region; from changing behaviors with the individual to reforming the way medicine is practiced and administered to the entirety of the region’s population.

## **Next Steps**

The HRI is already working on gathering feedback from employees and their spouses/domestic partners about changes in the Healthy Incentives<sup>SM</sup> program that will keep members interested and engaged. Efforts are underway to add more diversity to the kinds of activities that are available for individual action plans and to tailor options to better meet individual member needs. The HRI is also looking into making better use of on-line tools to support and reinforce member efforts to build and sustain better health-related habits, and to guide members through successful program completion. Because small hassles often equal big barriers to action, HRI staff is looking for ways that keep program administrative processes for members at a minimum. Beyond supporting members to make lifestyle behavior changes, the HRI will need to add more features that will 1) actively use data warehouse and data mining to look for patterns and opportunities to improve health and health care; 2) make optimal use of technology—personal health records, tailored disease management information, home monitoring of conditions, e-consulting, leverage banking transaction model for provider transactions; and 3) provide consumer-friendly cost and quality data from a trusted outside source.

In order to support these plan design changes, the HRI will conduct a major education campaign for employees and their families aimed at increasing the use of powerful new consumer tools provided through Aetna’s “Navigator” and “SmartSource” websites, and Group Health’s “MyGroupHealth” site. Employees will be encouraged to “Logon and Learn” via a high-visibility, collaborative outreach strategy with our vendors that includes e-mail, newsletters, posters and live demonstrations at key health-related events. The HRI will also expand the county’s on-site flu shot program and will seek a grant to provide on-site screening for blood pressure, cholesterol, and blood glucose risk. The HRI, in conjunction with the Health Promotion Leadership Committee, will assist departments and worksites to provide access for all employees to on-line consumer tools, and encourage increased participation in on-site health promotion and wellness activities.

In 2008/2009 King County will actively support new Puget Sound Health Alliance initiatives in several areas identified by independent studies as critical to improving the overall quality of care in our region. These initiatives include: 1) curbing avoidable hospital readmissions; 2) reducing hospital acquired infections; 3) increasing the use of generic prescription drugs; and 4) testing new approaches to pay providers based on quality of care and efficient of use of resources.

## Chapter 1—Background

When King County prepared to negotiate a three-year health benefits package with its ninety-two union bargaining units in 2004, the picture was dismal. Health care costs were rising at rates three times the Consumer Price Index (CPI), threatening to double the cost of the benefits plan in less than seven years. The county recognized that efforts to control sharply increasing costs by limiting access to providers and health services through “gate-keeper” managed care plans, contracting with providers for reduced fees, and after-the-fact claims review were not enough. A more comprehensive approach was needed that 1) moderates the demand for health care services by making employees and their families healthier and more thoughtful consumers of health care services, and 2) controls costs on the supply side of health care by increasing the quality and efficiency of health care delivery by providers.

An analysis of our employee health care expenditures showed that five percent of all people covered on the county’s health plans accounted for over 58 percent of our total costs. Low back pain, cancer, depression, diabetes, coronary artery disease and asthma were the most costly conditions in the county’s population; high cholesterol and high blood pressure were the most common risks. For each chronic condition a person had, the cost of claims approximately doubled; 14 percent of the people covered on the plan had five or more chronic conditions.

A survey and focus groups of our employees showed that they were 1) aware of the cost issues in national health care crisis but unaware of the findings of the Institute of Medicine report on the high rate of patients receiving inappropriate, poor quality or unsafe care; 2) interested in having and using tools that would help them be more informed users of health care; 3) interested in preventive care and open to using disease management resources if they had a chronic health condition; and 4) motivated to maintain their health so that they could “be there” for their families and enjoy their retirement years.

### Health Reform Initiative Mission Statement

The Health Reform Initiative seeks to reduce King County’s rising health care cost trend through improved health of its employees and better quality health care in the region. We will do this by using market forces to change both the supply and demand side of the health care equation. King County will:

- Reduce by one-third the escalating trend of health care costs by easing demand for health care services through the **Healthy Incentives<sup>SM</sup> benefits program** and supportive services, which provides employees and their families with effective tools for improving their health and accessing quality care.
- Work to reduce the cost of health care supplied in the region by collaborating with regional stakeholders through the **Puget Sound Health Alliance** to improve the quality of care available thereby reducing redundancies that drive up costs.

In late 2004 King County launched the Health Reform Initiative (HRI), a comprehensive, integrated effort to tackle both the problems in the health care system itself and the ever-increasing utilization of health services by county employees and their families. At its inception, the two key goals of the HRI were to 1) improve the health of employees

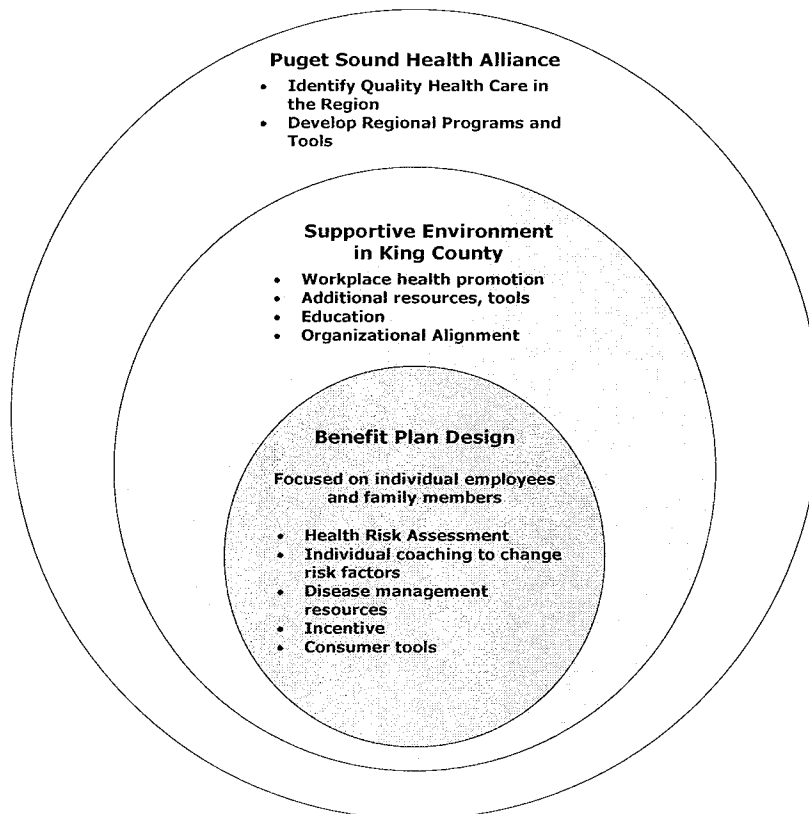


and their families, and 2) reduce the rate of cost increase for health care. A third goal was added in 2007—measure the improvement in productivity (“healthy hours at work”) resulting for the improved health of employees.

The HRI provides programs at three levels. At the center is the Healthy Incentives<sup>SM</sup> benefits plan that is focused on helping employees and their families build good health behaviors and manage chronic conditions more effectively. The benefits plan is supported by the programs at the second level, which include 1) an organizational philosophy of creating a healthy workplace, 2) a set of programs to educate employees about health and the wise use of health care resources, and 3) workplace activities to support physical activity, healthy eating and preventive care (such as annual flu shots). The third level of the HRI is the Puget Sound Health Alliance, created largely through the leadership of King County to address the cost and quality issues in health care regionally. Key programs of the Alliance are focused on changes needed in the external marketplace to improve the quality of care and reduce health care costs through coordination of care across providers, encouraging the use of evidence-based treatment guidelines, and creating a system of quality measurement used by all providers, health plans and health plan sponsors in the region.

The conceptual framework of the HRI is presented in Figure 7. A detailed description of each of these three levels is provided in Chapters 2 through 4 of this report.

Figure 7  
**Conceptual Framework of the Health Reform Initiative**



## Measurement and Evaluation

An essential component of the HRI is the design and implementation of a comprehensive measurement and evaluation system. The process began with the development of a business case for the HRI in response to a 2005 budget proviso that directed the Executive to prepare “... a business case for the disease management, case management and health promotion programs. The disease management case shall include cost-benefit analysis and performance measures for each program and a description of their impacts on the flexible benefits rate. The business case for the disease management programs shall also include performance guarantees for the disease management vendors...” Thus the business case is focused entirely on the benefits plan design that is at the center of the HRI. The only measurements addressed are 1) a financial target—to reduce the increase in medical and prescription drug costs by one third from the and 2) a demonstration of a positive return on investment for each of the programs implemented as a part of the benefits plan design.

Following the first Measurement and Evaluation Report describing the results achieved in 2005, the Executive convened a panel of five distinguished health care experts to review the strategies, policies and programs of the HRI and to make recommendations on program design, implementation, and adjustments needed to maximize results and sustainability of the program. Their report, *King County Health Reform Initiative Check-up: Report of the Peer Review Panel*, was delivered to the Council in October 2006.

The panel made five general recommendations on the HRI<sup>5</sup>:

- 1. Focus on Whole Program:** The Panel noted that in these early stages it will be difficult to determine which strategies are causing changes to cost and quality within the multi-pronged HRI approach. They recommended that the county focus on assessing the HRI as a comprehensive set of strategies while continuing to measure the specific programs individually.
- 2. Develop a Cost/Benefit Ledger:** The Panel strongly cautioned against reducing the program to one measure of cost/benefit. They suggested that the county consider developing a cost/benefit ledger that will recognize both quantifiable and non-quantifiable costs and benefits.
- 3. Include Intermediate Outcome Measures:** The Panel advocated development of a set of “intermediate outcome measures” that indicate improvement in healthy behaviors such as physical activity, flu shots and tobacco cessation. They suggested that the county evaluate success based on changes in the health risk levels of employees and their families.
- 4. Use a Comparison Group:** The Panel recommended that because there is no control group, the county should seek to identify a peer group that could be used for comparing rates of increasing costs.
- 5. Measure the Impact of Health on Productivity:** Finally, the Panel strongly recommended that the county implement a validated survey of employee absence

and lowered self-reported productivity due to illness in order to capture the effect of improved health on staff capacity in the workplace.

As a result of the Peer Review Panel report, the Executive proposed that the measurement and evaluation plan be expanded to cover all three levels of the HRI (Benefits Plan Design, Supportive Environment and Puget Sound Health Alliance) and address two categories of costs (financial and organizational) and three categories of benefits (financial, organizational and health status). In January 2007, the Executive transmitted and the Council adopted Motion 12479 that included seventeen specific measures and a new, comprehensive cost-benefits matrix to be included in the Second Annual Measurement & Evaluation Report. Figure 8 is the cost-benefit matrix described in Motion 12479:

Figure 8

### Cost-Benefit Measurement Approach (Motion 12479) Final Results August, 2010

Level	Expected Benefits			Costs	
	Financial	Organizational	Health Status	Financial	Organizational
<b>Level 1</b>  Benefit Plan Design  2005-2009	Less than expected medical and prescription drug costs  Positive return on investment for individual programs included in the benefit design	Better informed, more involved health care consumers	Reduced number of individual member risk factors  Increased member control of chronic conditions	Program costs and vendor fees	County management and labor partnership commitment
<b>Level 2</b>  Supportive Workplace Environment  2006-2009	Increased productivity (reduced absenteeism /presenteeism due to illness and injury)	Increased manager and supervisor support of healthy workplace	Increased percentage of employees and s/partners who are low risk  Increased use of evidence-based preventive health screenings	Program costs and vendor fees	County management and labor partnership commitment
<b>Level 3</b>  Puget Sound Health Alliance  2008-2009	Decreased total cost for treatment of a condition	Increased quality and efficiency of health care in the region  Development of appropriate external benchmarks	Increased use of appropriate preventive care  Increased use of evidence-based treatment  Reduction in number of avoidable adverse events	Alliance dues  Database start up costs	County management and labor partnership commitment

Figure 9 shows the 17 specific measures included in Motion 12479:

Figure 9

**Measurement and Evaluation Report Key Performance Measures  
Second Annual Health Reform Initiative  
Council-Adopted Measures**

Measure	Outcome/Target
1. Change in trend in King County's overall incurred medical and Rx costs compared to costs forecast from 2002-2004 trends.	Reduce the rate of increase in total claims costs over several years Target: $\leq 8.9\%$
2. Year-over-year progress in achieving targeted reduction of 1/3 off trend in King County's medical and Rx cost per employee per month on an incurred basis.	Reduce the rate of increase in total claims costs over several years Target: $\leq 8.9\%$
3. Cost-benefit for each of the six program interventions in the business case: <ul style="list-style-type: none"> <li>• Nurse advice line</li> <li>• Disease management</li> <li>• Case management</li> <li>• Provider best practice</li> <li>• High performance specialty network</li> <li>• Wellness assessment and individual action plan.</li> </ul>	Positive return on vendor programs
4. Change in group risk profile for employees and spouse/domestic partners from 2006 to 2007 as measured by the wellness assessment.	Increase the number of low risk members; reduce the number of high and moderate risk members <i>Target: <math>\geq 75\%</math> of members at low risk</i>
5. Change in the number of coaching participants reporting improvement in or eliminating one or more risks.	Increase the number of low risk members; reduce the number of high and moderate risk members <i>Target: <math>\geq 75\%</math> of members at low risk</i>
6. Change in self-reported body mass index 2006 to 2007 for employees and spouse/domestic partners as measured by the wellness assessment.	Increase the number of low risk members; reduce the number of high and moderate risk members <i>Target: <math>\geq 50\%</math> of members with BMI of 18.5 to 25</i>
7. Change in self-reported nutrition patterns 2006 to 2007 for employees and spouse/domestic partners as measured by the wellness assessment.	Increase the number of low risk members; reduce the number of high and moderate risk members <i>Target: <math>\geq 50\%</math> of members achieve recommended standards for healthy eating</i>
8. Change in self-reported amount of exercise 2006 to 2007 for employees and spouse/domestic partners as measured by the wellness assessment.	Increase the number of low risk members; reduce the number of high and moderate risk members <i>Target: <math>\geq 75\%</math> of members exercise <math>\geq 30</math> minutes 3 times per week</i>

Measure	Outcome/Target
9. Change in self-reported absence for employees due to illness 2006 to 2007 as measured by the wellness assessment.	TBD
10. Change in generic prescription rate 2006 to 2007.	Reduce cost for prescription drugs <i>Target: ≥70% generic fill rate</i>
11. Number and total of pounds lost by employees through Weight Watchers at Work <sup>®</sup> program 2006 and 2007.	TBD
12. Number and percent of employees receiving flu shots at work 2005 and 2006.	TBD
13. Self reported employee perception of usefulness and effectiveness of HRI communication tools in 2006.	Provide feedback to HRI staff about success in reaching employees with HRI messages so that adjustments can be made to maximize levels of awareness
14. Self-reported levels of employee awareness of resources available through King County to reduce personal health risks and maintain or increase health behaviors in 2006.	Provide feedback to HRI staff about success in reaching employees with HRI messages so that adjustments can be made to maximize levels of awareness
15. Self-reported levels of employee agreement that supervisor supports health and maintaining health behaviors.	Provide feedback to HRI staff about degree to which the HRI is changing manager behavior
16. Summary of regional and national recognition for King County and the Puget Sound Health Alliance (measure starts in 2008)	Improved opportunity for major grants to support continuation of the Alliance; support for achieving desired improvements in the health care system
17. Puget Sound Health Alliance Provider Quality Comparison Reports (measure starts in 2008)	Develop information that will help health plans and consumers select high quality, cost effective health care

Results for 2007 for each of these 17 measures can be found in Appendix A.

Following the completion of the Second Annual Measurement and Evaluation report the HRI staff consulted with Ron Z Goetzl, Ph. D., founding Director of the Emory Institute for Health and Productivity Studies, and Vice President of Consulting and Applied Research at Thomson Reuters, to create an even better cost/benefit ledger that measures the whole program, provides intermediate outcome measures, includes the impact of health on productivity and can be used in 2007, 2008 and 2009 to show year-over-year progress in the HRI as well as summarize the final results in 2010.

Using Dr. Goetzel's input the HRI has developed the following key measures:

- Change in self-reported risk profile
- Change in burden of risk related to conditions affected by behavior
- Change in healthy hours worked (change in productivity as measured through absenteeism and presenteeism<sup>6</sup>)
- Financial analysis of costs and return on investment

These measures are discussed in detail in Chapter 2 and will be used every year from now until the final report is produced in 2010.

## Evaluation Timeline

The steps used in implementing the HRI follow well established processes for quality and process improvement initiatives. The first step is diagnosing where the organization is at greatest risk—people-wise, program-wise, or expense-wise. The county conducted its initial analysis of these issues in 2004. The second step is to discuss and evaluate alternative intervention options and to develop strategic and tactical plans to implement a health, safety and productivity management solution. The third phase involves the actual implementation of a package or set of solutions that fall into four broad categories—care and disease management, health promotion and health management, workplace environment, and organizational climate and culture. Finally, the fourth phase requires measuring and evaluating whether the interventions worked or not, and determining why they worked or failed.<sup>7</sup>

The county ramped-up its intervention strategies over a period of three years. In 2005, the five “care intervention” programs (nurse advice line, disease management programs, case management, provider best practice and performance provider network) were implemented on a *pilot* basis. The HRI also started education programs (using Focus on Employees website, monthly mailing of the *Health Matters* newsletter to employees' homes, and live presentations in the workplace) showing how employees' health behavior and health care choices have a direct effect on both their and the County's costs. In 2006, employees and their spouses/domestic partners participated in the first annual wellness assessment and individual action plan. A large number of healthy workplace programs were also launched or expanded, including the “Eat Smart, Move More” campaign, Live Well Challenge, Weight Watchers at Work<sup>®</sup>, Choose Generics campaign, and Health Workplace Funding Initiative, among others. In 2007 the bronze, silver and gold out-of-pocket expense levels of the health plans went into effect, and participation in the worksite health promotion programs intensified. The key elements of the HRI are now in place. In spite of the programs' varying start dates, the general timeline for measurement and evaluation for the HRI is described as shown in Figure 10.

Figure 10

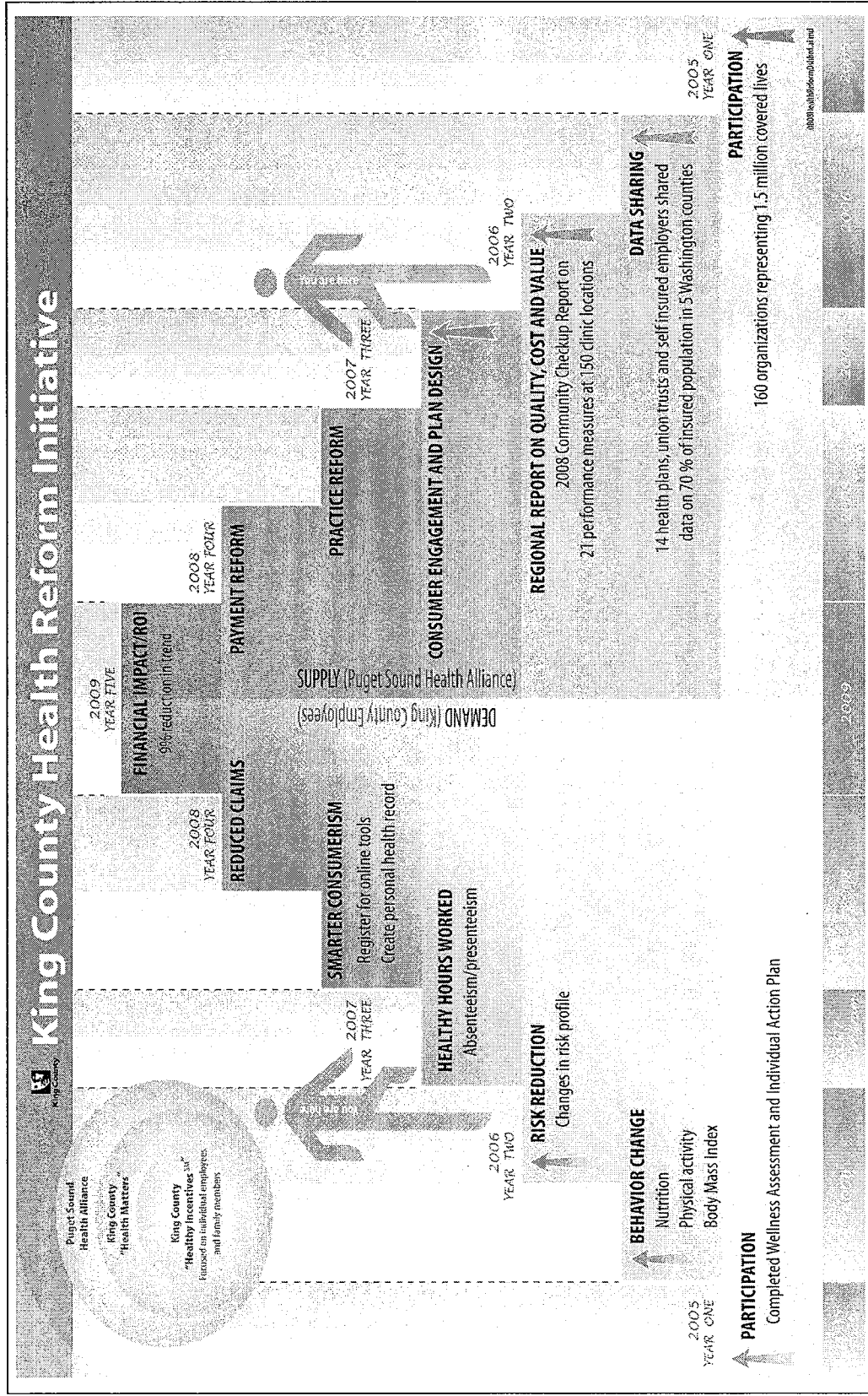
**Evaluation Timeline**

<b>Results</b>	<b>Period</b>	<b>Comment</b>	<b>Report</b>
Baseline	2005	Establishes reference point for measuring changes	August 2006
Indicative Findings	2006	Early point estimates too preliminary to signal directional change	August 2007
Directional Guidance	2007	Initial indications of serial results that could represent emerging trends	August 2008
Early Trends	2008	Likely emerging trends	August 2009
Program Trends	2009-2010	Statements of cumulative change, 2005-2009	August 2010

Figure 11 below shows another way of looking at the projected timeline for results in the HRI. This “At A Glance” diagram is a graphic illustration of the progress made so far by the HRI in reaching its three goals. The left hand side of the chart shows the progress made by the internal programs (Healthy Incentives<sup>SM</sup> benefit plan design and the worksite Supportive Environment) in helping employees and their families take responsibility for improving their health (moderating the demand for health care). The full HRI program—wellness assessments, individual action plans and bronze, silver and gold out-of-pocket expense level plans—was fully implemented in 2007. The right hand side of the chart shows the progress at the regional level in creating consumer tools that report on the cost and quality of health care delivered in the region, and in using those tools to improve provider quality (moderating costs on the supply side of health care). In both areas the HRI is on course to meet its goals by the end of 2009.



Figure 11  
Healthy Reform Initiative at a Glance



## Chapter 2—Healthy Incentives<sup>SM</sup> Benefits Design

### Description of the Healthy Incentives<sup>SM</sup> Benefit Design

The Healthy Incentives<sup>SM</sup> program encourages employees and their covered spouses/domestic partners to take ownership of their health by rewarding participants with lower out-of-pocket expenses for their health care when they work to manage their potential health risks, and by providing additional resources for managing existing health conditions.

Participation in the wellness and prevention aspects of the program begins with taking a voluntary, confidential wellness assessment that identifies behaviors that put a person at risk for developing chronic conditions such as high blood pressure, obesity, diabetes and heart disease. An outside vendor (HealthMedia, Inc.) administers the wellness assessment, and a second vendor (Healthways) determines the participant's level of risk (low, moderate or high<sup>8</sup>) and provides the participant with a confidential personal report. After taking the wellness assessment, employees and their spouses/domestic partner are given the opportunity to participate in an individual action plan tailored to their risk of developing a chronic health condition.

Participants who are identified as “low risk” are already engaging in health-related behaviors that are shown to reduce risk of chronic disease—such as eating right, exercising regularly, avoiding tobacco use and managing stress. These participants complete eight weeks of logging activities related to nutrition or physical activity.

Participants who are identified as being at “moderate” or “high risk” enroll in a telephone-based coaching program provided

by Healthways for at least 90 days during which they participate in at least three coaching sessions with follow-up activities between sessions. Participants are encouraged to continue for up to six months for members at moderate risk and 12 months for members at high risk.

Participation in the wellness assessment and individual action plans is voluntary, however there are financial incentives attached to participation. Participants who take the assessment and participate in an individual action plan by the end of June in one year will be eligible for the gold out-of-pocket expense level in the health plan in January of the following year. Participants who take the wellness assessment but do not participate in an individual action plan will be eligible for the silver level, and employees or spouses/domestic partners who do not take the wellness assessment will only be eligible for the bronze of out-of-pocket expense level. The benefits covered by each out-of-pocket expense level are the same; the only difference is amount the member pays for services. (King County pays the entire health plan premium for the employee

Laura McCollum Wallace took up belly dancing. She has lost 73 pounds, going from high risk to low risk. Laura credits much of her success to her Healthways coach and a supportive environment at DDES.

*“My health coach really made me think and held me accountable.”*



and family). *It is essential to note that earning the lowest out-of-pocket expense levels is based on participation, not the achievement of a specific health status or outcome.* The goal is to foster success in making significant, life-long changes in health-related behavior.

In addition to the wellness assessment and individual action plan that focus on prevention, the Healthy Incentives<sup>SM</sup> plan design also includes five “care intervention” programs—24/7 nurse advice line, disease management programs, case management, provider best practice and performance provider network—that are designed to provide additional resources to members who already have chronic conditions.

More information on the Healthy Incentives<sup>SM</sup> plan design can be found at [http://metrokc.gov/employees/hri\\_toolkit/benefitplandesign.htm](http://metrokc.gov/employees/hri_toolkit/benefitplandesign.htm).

## Data Sources and Confidentiality

**Data Sources/ King County Healthcare Database:** In order to accurately measure the results of the HRI, King County is collecting and storing insurance claims for medical and pharmacy in both the KingCare<sup>SM</sup> and Group Health plans. Slightly more than 80 percent of all employees (and their families) are covered by the KingCare<sup>SM</sup> plan, with the remaining 20 percent being covered by the Group Health plan.

In addition to claims data, the county is collecting de-identified individual responses for each question in the wellness assessment. Participants were aware that their answers on the wellness assessment would be treated as confidential medical information so that staff at HealthMedia and Healthways would be able to see how they answered, however the staff at King County would not be able to see how any specific person answered the questions. Participants were also aware that their individual action plan and coaching would be determined by their answers on the wellness assessment.

The claims data and responses to the wellness assessment are de-identified by an outside vendor and integrated as described in the next section. This data collection is the foundation of the analyses reported here, and will support future analyses to determine which current and future interventions can improve employee health and health care, and provide savings.

Other data sources for the HRI include summary information from Healthways (the vendor providing individual action plan services) about progress in reducing or eliminating risk factors reported by participants during the course of their individual action plan activities and results of an employee survey conducted in August, 2007. A total of 439 employees were surveyed online or through interoffice mail. As in the wellness assessment, not every person who was surveyed answered every question.

**De-identification and Integration:** The county strictly adheres to the Health Insurance Portability and Accountability Act of 1996 (HIPAA) to ensure confidentiality of individual employee and dependent information. The county uses an external data integrator service to de-identify individual records and assign a new, random identifier that cannot be traced back to the original employee/dependent. This process allows all of an

employee's household's medical and pharmacy claims to be summed without identifying which employee or dependent is involved.

Some analyses are not possible with HIPAA de-identified data. For this reason, some of the data used in this report were collected from online reports of aggregated data from the external third party claims administrators for the county's medical and prescription drug benefits.

## Technical Appendices

Detailed Technical Appendices have been prepared by Thomson Reuters and the HRI Health Care Statistician. These are available for review by contacting the HRI at [http://metrokc.gov/employees/hri\\_toolkit/contact.htm](http://metrokc.gov/employees/hri_toolkit/contact.htm).

## Program Participation

No program can be successful if participation does not reach a critical mass. The HRI has achieved participation rates that approach "best in class" as defined by D.W. Edington, Ph.D., Director of the Health Management Research Center at the University of Michigan. Dr. Edington has been conducting longitudinal studies of twenty corporate health promotion and wellness programs covering over two million persons for more than 30 years. "Best in class" programs achieve participation in at least one program activity by 95 percent of all eligible people<sup>9</sup>. As noted below, the HRI is seeing participation rates of 90 percent in the Healthy Incentives<sup>SM</sup> program alone; this does not include people who may choose to do only the worksite health promotion programs.

In 2006 there were 17,844 employees and spouses/domestic partners who completed the wellness assessment out of 19,702 eligible to participate for a 90.56 percent response rate. In 2007, 17,772 employees and spouses/domestic partners out of 19,377 eligible completed the assessment for a 91.72 percent response rate, and in 2008, 17,401 employees and spouses/domestic partners out of 19,495 eligible for an 89.26 percent response rate. Individuals were able to complete the assessment online or on paper. Not every participant answered every question; therefore counts of respondents vary by assessment question.

Equally important are the numbers of participants who also completed an individual action plan. Again the HRI has achieved very high rates of participation and completion. These rates are summarized in Figure 12 below.

Figure 12  
**Participation in the Wellness Assessment and Individual Action Plan**

Year	Number Eligible	Number Completing Wellness Assessment	Percent of Eligible Completing WA	Number Completing Individual Action Plan	Percent of WA Takers Completing Action Plans
2006	19,702	17,844	90.56%	15,703	88.01%
2007	19,377	17,772	91.72%	15,913	89.53%
2008	19,495	17,401	89.26%	16,074	92.37%

## Four Key Outcomes Measures

As noted in Chapter 1, the HRI has developed a set of four key measures that better track the behavior change that must occur before the HRI can achieve a significant impact on direct expenses for health care claims. These four sets of measures—change in risk profile, change in risk burden for conditions affected by behavior, change in healthy hours worked, and financial analysis—are discussed in detail in the rest of Chapter 2.

### I. Change in Self-Reported Risk Profile

#### What Is This Measuring?

The risk profile for the King County population is a roll-up of the individual self-reported information from the wellness assessment. Answers to the questionnaire provide self-reported information on modifiable health risk factors, lifestyle behaviors, and biometric measures that potentially may endanger health. These include nine behavioral measures—alcohol use, depression, injury prevention, mental health, nutrition, sun damage behavior, stress behavior, and five biometric measures—body mass index (BMI) risk, blood glucose, cholesterol, systolic blood pressure and diastolic blood pressure.

#### Why Is It important?

Evaluation of these risk factors provides important indicators of a program's success because sustained improvements in employees' health and risk profile can prevent disease, boost productivity and curtail unnecessary health care utilization and medical expenditures.

#### Data Sources

King County administered an annual health risk assessment (called the wellness assessment in the HRI) to its employees and spouses/domestic partners who are covered under the County's health plans in each of three years (2006, 2007 and 2008). An outside consultant, Thomson Reuters, analyzed the data from the wellness assessment provided by HealthMedia, Inc., the external vendor that administers the wellness assessment, and Healthways, the external vendor that creates the risk

stratification for each participant and provides the programs and coaching services for the individual action plans.

## **Methodology**

Participants in the wellness assessment were tracked over the three-year period via a unique, encrypted identifier and their relationship code (*i.e.*, employee, spouse/domestic partner). Some participants were missing an encrypted identifier and were tracked using a combination of other variables.

Risk definitions for each of the nine behavioral risk factors were developed by the wellness assessment vendor, HealthMedia. Stratification into an overall evaluation of high, moderate or low risk for each participant was determined by Healthways<sup>10</sup>. High and moderate risk prevalence rates were combined by Thomson Reuters to create an “at risk” group. Thomson Reuters also applied clinical cut-offs for each of the five self-reported biometric measures.

Thomson Reuters analyzed participants’ health risks over time for two different populations: 1) an aggregate group (including anyone who completed a wellness assessment in one or more of the study years), and 2) a cohort group (including only those who completed a wellness assessment in all of the years of interest). Within these two populations, Thomson Reuters measured the percent of ‘at risk’ respondents among the following three samples: 1) employees and spouses/partners combined, 2) employees-only, and 3) spouses/partners-only. For each population and for each sample within population groups, Thomson Reuters conducted two sets of analyses—changes in health risks over the three-year period (2006 to 2008) and incremental changes year-over-year (2006 to 2007 and 2007 to 2008).

Thomson Reuters also tested whether the changes in the ‘at risk’ populations were statistically significant using McNemar’s Chi-square Tests. A Generalized Estimating Equations (GEE) regression model was used to predict the adjusted change in aggregate participants’<sup>11</sup> health risk status over time while controlling for the potential confounding effects of age, gender, race, marital status, and education.

Respondents who indicated on the wellness assessment that they were pregnant (2006: n=157; 2007: n=164; 2008: n=145) were removed from the dataset.

## **Results**

On average, 17,292 people (approximately 90 percent off all those eligible) participated in the wellness assessment during each year of the three-year study period. Results from the aggregate population indicate that King County participants’ risks generally declined over the three-year period. Results were consistent when analyzing both aggregate and cohort groups. Participants in King County’s HRI significantly improved 12 of 14 modifiable health risks over the three year study period as shown in Figures 13 and 14. The two risks that did not improve were physical activity and blood glucose.

Figure 13  
**At-Risk Prevalence for Health Behaviors & Biometrics 2006-2008 Aggregate  
 (Employees and Spouses/Partners)**

Aggregate All Respondents Risk Factor	2006			2008			% Change (2006-2008)
	N	%^	Missing (%)	N	%^	Missing (%)	
Alcohol Use	767	4.6	228 (1.4)	603	3.5	156 (0.9)	-1.1*
Depression	1,611	10.9	2,164 (12.8)	1,303	8.4	1,864 (10.8)	-2.5*
Injury Prevention	2,924	17.9	568 (3.4)	2,172	12.9	431 (2.5)	-5.0*
Mental Health	4,119	25.7	881 (5.2)	3,328	20.1	787 (4.5)	-5.6*
Nutrition	12,393	75.1	395 (2.3)	11,218	66.1	366 (2.1)	-9.0*
Physical Activity	4,843	35.8	3,384 (20.0)	6,168	38.1	1,145 (6.6)	2.8*
Sun Damage Behavior	4,005	25.0	872 (5.2)	3,282	19.1	118 (0.7)	-5.9*
Smoke Behavior	1,735	10.9	961 (5.7)	1,167	7.1	978 (5.6)	-3.8*
Stress Behavior	3,713	22.4	350 (2.1)	2,938	17.3	338 (2.0)	-5.1*
BMI Risk	10,694	64.6	338 (2.0)	10,485	61.9	392 (2.3)	-2.7*
Cholesterol	2,306	37.3	10,720 (63.4)	1,561	30.1	12,142 (70.0)	-7.2*
Blood Glucose	1,426	34.7	12,787 (75.7)	1,237	37.4	14,024 (80.9)	2.7*
Systolic BP	706	7.3	7,200 (42.6)	453	4.8	7,841 (45.2)	-2.5*
Diastolic BP	610	6.2	7,031 (41.6)	448	4.6	7,684 (44.3)	-1.6*

Source: Thomson Reuters

\*p-value <0.05, using McNemar's chi square test

Figure 14  
**At-Risk Prevalence for Health Behaviors & Biometrics 2006-2008 Aggregate  
 (Employees and Spouses/Partners)**

Cohort Respondents Employees & Spouses/Partners Risk Factor	2006			2008			% Change (2006, 2008)
	N	%	Missing (%)	N	%	Missing (%)	
Alcohol Use	514	4.3	131 (1.1)	377	3.1	66 (0.6)	-1.2*
Depression	1,108	10.4	1,443 (12.0)	890	8.2	1,178 (9.8)	-2.2*
Injury Prevention	2,146	18.3	375 (3.1)	1,529	13.0	274 (2.3)	-5.3*
Mental Health	2,902	25.3	590 (4.9)	2,265	19.6	503 (4.2)	-5.7*
Nutrition	8,905	75.4	262 (2.2)	7,867	66.5	238 (2.0)	-8.9*
Physical Activity	3,559	36.3	2,268 (18.8)	4,298	38.0	757 (6.3)	1.7*
Sun Damage Behavior	2,915	25.4	570 (4.7)	2,169	18.1	68 (0.6)	-7.3*
Smoking Behavior	1,178	10.2	550 (4.6)	772	6.7	519 (4.3)	-3.5*
Stress Behavior	2,617	22.1	224 (1.9)	1,988	16.8	216 (1.8)	-5.3*
Alcohol Use	514	4.3	131 (1.1)	377	3.1	66 (0.6)	-1.2*
Depression	1,108	10.4	1,443 (12.0)	890	8.2	1,178 (9.8)	-2.2*
Injury Prevention	2,146	18.3	375 (3.1)	1,529	13.0	274 (2.3)	-5.3*
Mental Health	2,902	25.3	590 (4.9)	2,265	19.6	503 (4.2)	-5.7*
Nutrition	8,905	75.4	262 (2.2)	7,867	66.5	238 (2.0)	-8.9*
Physical Activity	3,559	36.3	2,268 (18.8)	4,298	38.0	757 (6.3)	1.7*
Sun Damage Behavior	2,915	25.4	570 (4.7)	2,169	18.1	68 (0.6)	-7.3*
Smoking Behavior	1,178	10.2	550 (4.6)	772	6.7	519 (4.3)	-3.5*
Stress Behavior	2,617	22.1	224 (1.9)	1,988	16.8	216 (1.8)	-5.3*

Source: Thomson Reuters

\*p-value <0.05, using McNemar's chi square test

The greatest reductions in health risks occurred between the first and second years of the program (2006-2007). Additional, though less dramatic, improvements in health risks occurred between the second and third years (2007-2008). See Figures 15 and 16 below. Health risk results for the subgroups of employees-only and spouses/partners-only tended to parallel the findings from the broader population. This pattern of immediate risk reduction, followed by a regression to previous levels, is typical for many health promotion programs whereby initial improvements in health risks are achieved in the first year and additional effort is required to sustain and maintain these improvements over time.



Figure 15  
**At-Risk Prevalence for Health Behaviors & Biometrics  
 2006-2007-2008 Aggregate (Employees and Spouses/Partners)**

Aggregate All Respondents Risk Factor	2006			2007			2008			% Change (2006-2007)	% Change (2007-2008)	% Change (2006-2008)
	N	% <sup>^</sup>	Missing (%)	N	% <sup>^</sup>	Missing (%)	N	% <sup>^</sup>	Missing (%)			
Alcohol Use	767	4.6	228 (1.4)	584	3.4	207 (1.2)	603	3.5	156 (0.9)	-1.2*	0.1	-1.1*
Depression	1,611	10.9	2,164 (12.8)	1,293	8.3	2,015 (11.4)	1,303	8.4	1,864 (10.8)	-2.6*	0.1	-2.5*
Injury Prevention	2,924	17.9	568 (3.4)	2,381	13.9	503 (2.9)	2,172	12.9	431 (2.5)	-4.0*	-1.0*	-5.0*
Mental Health	4,119	25.7	881 (5.2)	3,463	20.6	834 (4.7)	3,328	20.1	787 (4.5)	-5.1*	-0.5	-5.6*
Nutrition	12,393	75.1	395 (2.3)	10,704	62.2	447 (2.5)	11,218	66.1	366 (2.1)	-12.9*	3.9*	-9.0*
Physical Activity	4,843	35.8	3,384 (20.0)	4,860	32.3	2,592 (14.7)	6,168	38.1	1,145 (6.6)	-3.5*	5.8*	2.8*
Sun Damage Behavior	4,005	25.0	872 (5.2)	3,145	18.4	569 (3.2)	3,282	19.1	118 (0.7)	-6.6*	0.7	-5.9*
Smoke Behavior	1,735	10.9	961 (5.7)	1,430	8.6	957 (5.4)	1,167	7.1	978 (5.6)	-2.3*	-1.5*	-3.8*
Stress Behavior	3,713	22.4	350 (2.1)	3,088	17.8	332 (1.9)	2,938	17.3	338 (2.0)	-4.6*	-0.5	-5.1*
BMI Risk	10,694	64.6	338 (2.0)	10,739	62.3	402 (2.3)	10,485	61.9	392 (2.3)	-2.3*	-0.4	-2.7*
Cholesterol	2,306	37.3	10,720 (63.4)	1,606	32.0	12,626 (71.5)	1,591	30.1	12,142 (70.0)	-5.3*	-1.9*	-7.2*
Blood Glucose	1,426	34.7	12,787 (75.7)	1,204	39.0	14,560 (82.5)	1,237	37.4	14,024 (80.9)	4.3*	-1.6	2.7*
Systolic BP	706	7.3	7,200 (42.6)	442	5.1	8,996 (51.0)	453	4.8	7,841 (45.2)	-2.2*	-0.3	-2.5*
Diastolic BP	610	6.2	7,031 (41.6)	401	4.6	8,829 (50.0)	448	4.6	7,684 (44.3)	-1.6*	0.0	-1.6*

Source: Thomson Reuters

\* p-value <0.05, using McNemar's chi square test; ^ Excluding missings

Figure 16  
**At-Risk Prevalence for Health Behaviors & Biometrics  
 2006-2007-2008 Cohort (Employees and Spouses/Partners)**

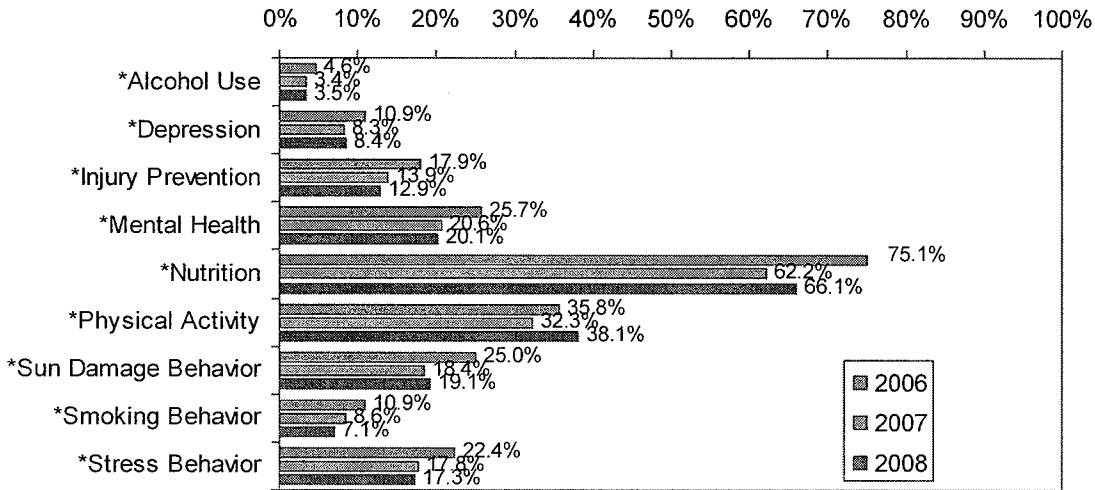
2006-2007-2008 Employees and Spouses/ Partners Risk Factor	2006			2007			2008			% Change (2006-2007)	% Change (2007-2008)
	N	%	Missing (%)	N	%	Missing (%)	N	%	Missing (%)		
Alcohol Use	500	4.4	123 (1.1)	346	3.0	108 (0.9)	360	3.1	63 (0.5)	-1.4*	0.1*
Depression	1,042	10.2	1,379 (11.9)	788	7.6	1,200 (10.4)	845	8.1	1,130 (9.8)	-2.6*	0.5*
Injury Prevention	2,072	18.5	360 (3.1)	1,611	14.3	303 (2.6)	1,479	13.0	266 (2.3)	-4.2*	-1.3*
Mental Health	2,750	25.0	565 (4.9)	2,229	20.3	542 (4.7)	2,169	19.6	474 (4.1)	-4.7*	-0.7*
Nutrition	8,533	75.5	246 (2.1)	6,967	61.7	253 (2.2)	7,554	66.7	230 (2.0)	-13.8*	5.0*
Physical Activity	3,388	36.1	2,169 (18.8)	3,233	32.6	1,612 (14.0)	4,104	37.9	718 (6.2)	-3.5*	5.3*
Sun damage Behavior	2,789	25.3	538 (4.7)	2,042	18.2	342 (3.0)	2,065	18.0	63 (0.5)	-7.1*	-0.2*
Smoking Behavior	1,131	10.2	510 (4.4)	885	8.1	557 (4.8)	738	6.7	485 (4.2)	-2.1*	-1.4*
Stress Behavior	2,480	21.9	212 (1.8)	1,995	17.6	212 (1.8)	1,905	16.8	205 (1.8)	-4.3*	-0.8*
BMI Risk	7420	65.3	183 (1.6)	7157	63.3	239 (2.1)	7109	62.7	222 (1.9)	-2.0*	-0.6*
Cholesterol	1696	38.0	7,083 (61.3)	1129	32.5	8,070 (69.9)	1133	30.0	7,788 (67.4)	-5.5*	-2.5*
Blood Glucose	996	33.6	8,586 (74.3)	777	37.7	9,484 (82.2)	895	38.3	9,925 (79.8)	4.1*	0.6*
Systolic BP	482	7.1	4,775 (41.3)	284	4.9	5,788 (50.1)	320	4.9	5,036 (43.6)	-2.2*	0.0*
Diastolic BP	430	6.3	4,676 (40.5)	254	4.3	5,679 (49.2)	317	4.8	4,931 (42.7)	-2.0*	0.5*

Source: Thomson Reuters  
 \*p-value <0.05, using McNemar's chi square test

In the first year for the 2006-2007-2008 cohort, 13 of the 14 health risks significantly improved over time. Nutrition risk showed the largest decrease (75.5 percent to 61.7 percent) while blood glucose significantly increased by 4.2 percent. In the second year (2007-2008), only eight out of the 14 risks decreased once more while six increased (blood glucose, alcohol use, depression, nutrition, physical activity and diastolic blood pressure.)

Figures 17 and 18 show the year-over-year (2006-2007-2008) change for each risk factor as bar charts.

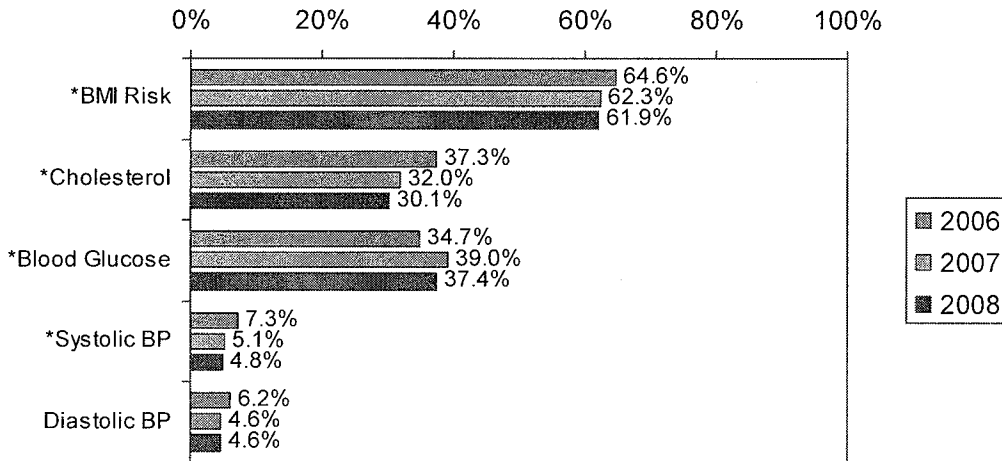
Figure 17  
**At-Risk Prevalence for Health Behaviors**  
**2006-2007-2008 Aggregate (Employees and Spouses/Partners)**



Source: Thomson Reuters

\*p-value <0.05, using McNemar's chi square test

Figure 18  
**At-Risk Prevalence for Biometrics**  
**2006-2007-2008 Aggregate (Employees and Spouse/Partners)**



Source: Thomson Reuters

\*p-value <0.05, using McNemar's chi square test

## Summary and Conclusions

Twelve risk factors (alcohol use, depression, injury prevention, mental health, nutrition, sun damage behavior, smoking behavior, stress behavior, BMI risk, cholesterol, systolic blood pressure, and diastolic blood pressure) improved over the 2006 to 2008 period, and two risk factors (blood glucose and physical activity) worsened over time when considering the unadjusted results. Analysis by both aggregate and cohort groups support one another on these results. However, after controlling for potential confounding factors, the adjusted results indicated that the increases in the percent of participants 'at risk' for these two factors were not significant (see Technical Appendix for details). At best, these two risk factors remained stable during the three-year study period, which is unusual because most often health risks worsen over time as people age. In fact, most corporate studies see a rise in obesity and blood glucose levels over time as populations age.<sup>12,13,14,15,16,17,18,19,20</sup> Nonetheless, King County may need to focus additional effort on reducing participants' blood glucose and physical activity risks.

At the same time, the significant results presented here need to be interpreted with caution. Due to the large sample size, even small changes, such as a 0.1 percent increase or decrease in health risks, were shown to be statistically significant. At an individual level, such changes are not very meaningful but at the population level they may be.

Other limitations to the data include the self-reporting of behaviors and biometric risks which may be prone to subjective interpretation by respondents. Furthermore, in the case of reporting biometric values, a large percentage of respondents (from 40 percent to 80 percent) could not recall their values for blood glucose, blood pressure and cholesterol. Finally, it should be noted that the results presented here are for trends across the entire population and there were no control or comparison groups available from which similar data could be collected. Even so, the results presented here are very positive and promising in terms of demonstrating real and significant positive program effects on the health risk profile of King County employees and spouses/partners over the past three years.

## II. Change in Burden of Risk Related to Conditions Affected by Behavior

### What Is This Measuring?

Burden of risk is a measure of the degree to which specific conditions increase the likelihood of diseases that require health care. In this measure the HRI is looking at changes in the utilization (numbers of office visits, hospitalizations, emergency room visits and prescription drugs) for conditions that are directly affected by health behavior to see the extent to which improvements in health conditions lead to lower use of health care services related to those conditions. Utilization changes, along with medical cost inflation (change in the unit price of medical products and services) drive health care cost trends.

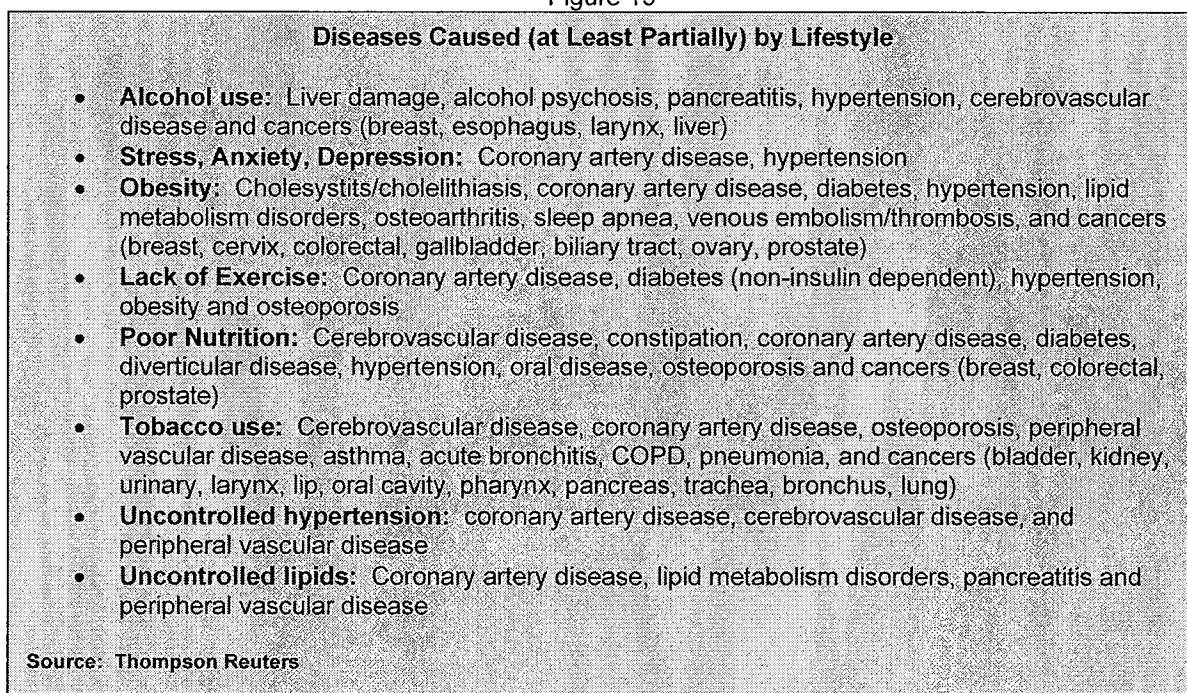
## Why Is It Important?

By counting the actual numbers of health care services used for conditions directly targeted by HRI programs, the HRI will be able to detect important early changes in the effect of improved health on health care costs before the effect is large enough to be seen in overall health care costs. It is important to look at numbers of claims both with and without associated costs for these procedures because changes in cost per procedure over time may mask the changes in actual utilization.

## Data sources

Thomson Reuters has developed a comprehensive list of ICD-9 diagnostic codes that can be used to identify medical conditions in the health plan claims that are related to eight unhealthy lifestyle areas that can be altered through behavioral intervention, potentially preventing disease. For example, many medical conditions stem from obesity. Using the Thomson codes, this analysis examines healthcare claims, costs and utilization for conditions related to obesity as well as seven other unhealthy lifestyle areas to understand their burden on King County's healthcare system. A list of the conditions related to these eight health behaviors is listed in Figure 19 below.

Figure 19



**KingCare<sup>SM</sup> Medical Claims:** Using the Thomson diagnostic codes, medical conditions associated with any of the eight lifestyle areas listed in Figure 19 were flagged and the corresponding KingCare<sup>SM</sup> claims were pulled from the King County healthcare database. Cost and utilization for those medical conditions were then calculated from the data extract.

**Aetna Enrollment Records for KingCare<sup>SM</sup>:** KingCare<sup>SM</sup> utilization statistics are reported below as proportions of the number of members covered in KingCare<sup>SM</sup>. This analysis includes all KingCare<sup>SM</sup> members (including active employees and their families, COBRA beneficiaries and early retirees). Because KingCare<sup>SM</sup> COBRA and early retiree enrollment counts have only recently been recorded at King County, this analysis relies on member counts recorded in Aetna EPSM reports from 2005 to the present.

## Methodology

Claims whose primary diagnoses appear on the list of lifestyle diseases (Figure 19) were extracted from the King County healthcare database. The amount King County paid for those claims was summed and the number of KingCare<sup>SM</sup> members receiving care for those claims was counted. Using this methodology, King County's costs associated with medical conditions related to lifestyle were summarized.

Costs and utilization are summarized by the date of care (on an "incurred" basis). That means that costs in a given timeframe are the combination of what King County actually paid for medical care and what needed to be set aside to cover incoming claims that occurred during that timeframe, but were not yet reported. Because some claims for 2007 will not appear at King County until later in 2008, potential claims and utilization for 2007 and 2006 were estimated using a common actuarial technique—a completion factor method.

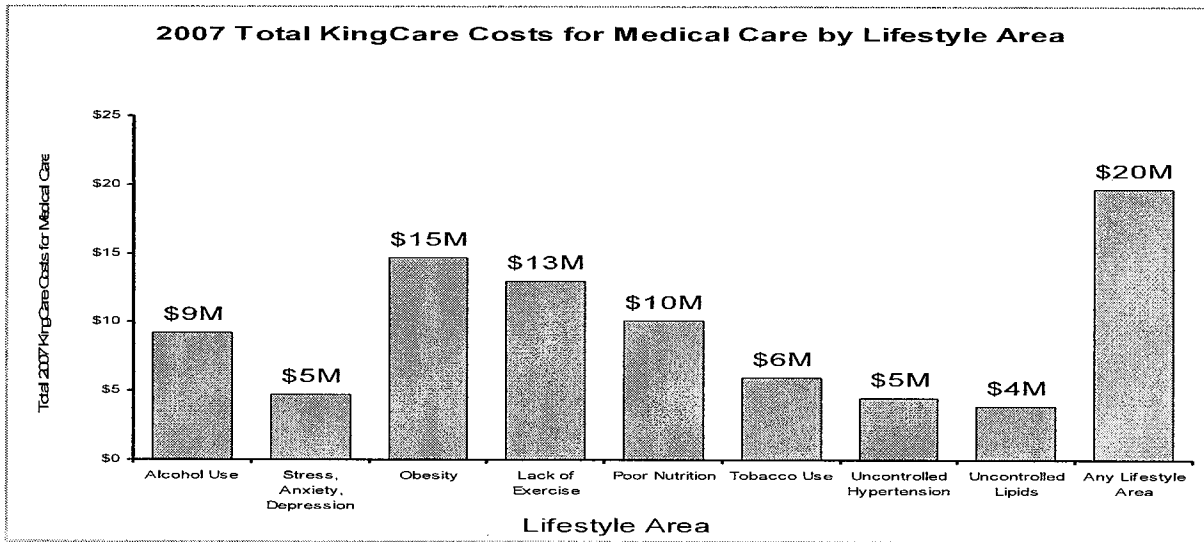
Total dollars spent and the number of members receiving care does not provide an accurate measure of cost and utilization changes for King County. A better representation of cost and use fluctuations is to report costs as a portion of King County's total costs for medical care and report utilization as a portion of the number of members.

Total costs for each lifestyle area are calculated per year and are shown as a proportion of total costs for all medical care paid by King County for that year. Utilization rates reflect the number of enrolled members who received care as a proportion of total enrollment in an average month.

## Results

**2007 Costs & Usage by Lifestyle:** Figure 20 shows how King County's costs vary across lifestyle area. Each bar in Figure 20 indicates what King County paid in 2007 for medical care for KingCare<sup>SM</sup> members with medical conditions related to each of the eight unhealthy lifestyle areas. For example, KingCare<sup>SM</sup> paid \$15 million for treatment of medical conditions related to obesity, and \$4 million for conditions related to uncontrolled lipids in 2007.

Figure 20  
**2007 KingCare<sup>SM</sup> Claims by Lifestyle Factor**



Dollar amounts in Figure 20 can and do appear in multiple bars. For example, many costs captured under obesity also show up in lack of exercise according to the Thomson system, as lack of exercise and obesity are related. The right-most bar in Figure 20 summarizes the costs related to any of the lifestyle areas. The key difference is that costs appear only once in the “any lifestyle area” bar.

Figure 21 below shows how the proportion of lifestyle area-related medical care costs have changed each year from 2002 to 2007. In 2007, of the \$88 million of KingCare<sup>SM</sup> claims total, \$19.6 million (22.3 percent) was for conditions directly affected by one of more of the eight lifestyle factors shown in Figure 21.

Figure 21  
**Percent of Claims Cost Directly Related to Designated Lifestyle Factors**

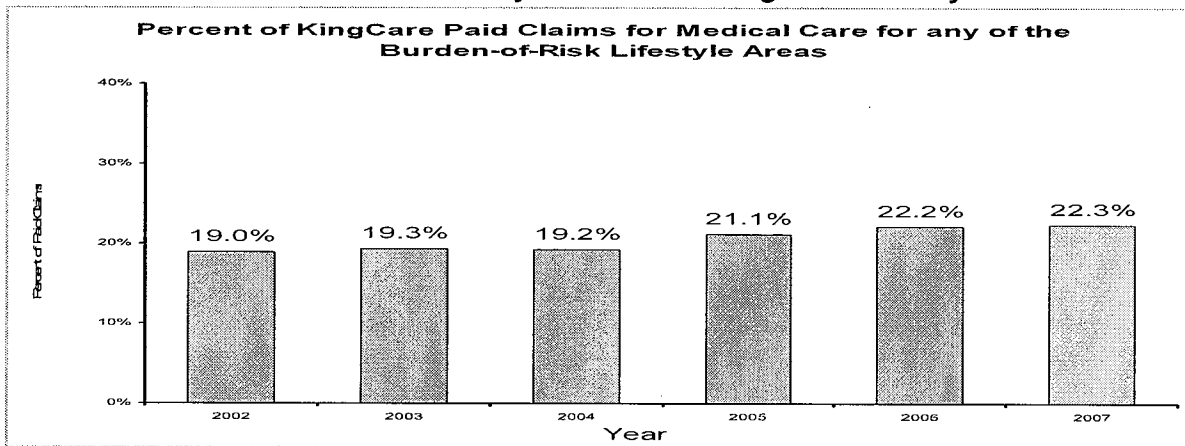
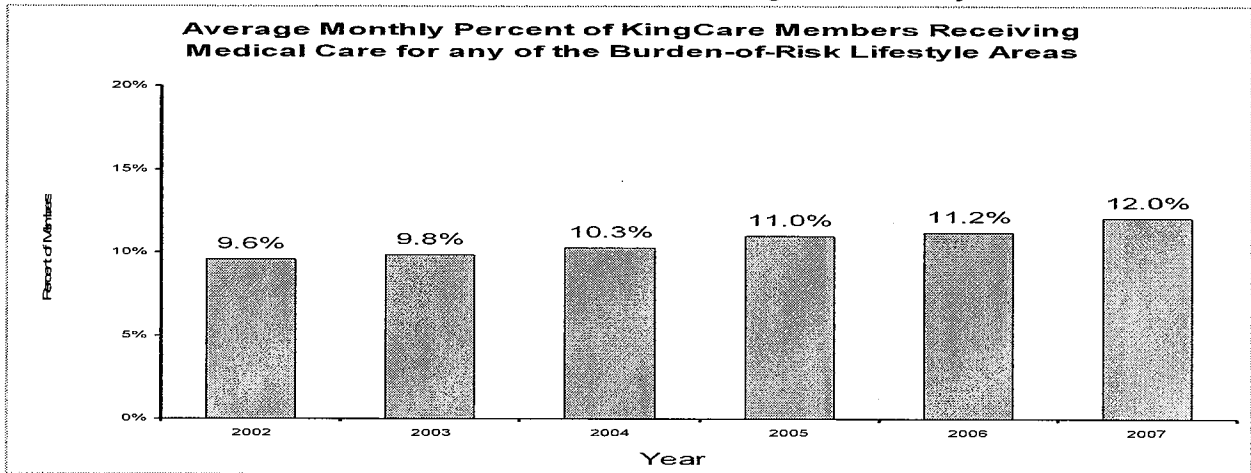


Figure 22 below shows there has also been a steady growth in the percent of employees and family members who had claims for health conditions directly related in full or in part to the eight lifestyle factors shown in Figure 19. In 2007, 2,946 KingCare<sup>SM</sup> members out of 24,494 total received care for a condition related to one or more lifestyle factor.

Figure 22

**Percent of Members with Claims Related to Designated Lifestyle Factors**



**Summary and Conclusions**

As illustrated graphically above, cost and utilization of medical care for unhealthy lifestyle areas in the KingCare<sup>SM</sup> plan has risen slightly since the inception of the HRI in 2005. Obesity, lack of exercise, and poor nutrition have consistently been the greatest lifestyle contributors to health care costs and utilization over time. Claims costs and utilization for lifestyle-related conditions remained almost unchanged 2002 – 2004. In 2005 the county introduced the four Aetna care management pilot programs (Informed Health Line<sup>®</sup>, disease management, MedQuery<sup>®</sup>, and Enhanced Member Outreach<sup>SM</sup>) to identify members with chronic conditions and encourage them to become more active participants in treatment and management of their conditions. Although these programs are intended to reduce health care costs in the long term, it is conceivable that in the short term they may cause an increase in health care utilization by encouraging members who have been unaware of or were ignoring a health condition to seek medical attention. There is at least an apparent increase in both the costs and numbers of members getting treatment for lifestyle-related conditions in 2005. However, the HRI does not yet have data to indicate if there is any actual correlation between this increase and the introduction of any of the care management programs, or to attribute this change to any other cause. The HRI will explore (to the extent measurement and evaluation resources in the future permit) the option of analyzing the rate of increase for this subset of lifestyle-related conditions compared to overall cost trends to see whether the rate of increase here parallels the overall rate.



### **III. Change in Healthy Hours Worked**

#### **What Is This Measuring?**

Health conditions not only affect health care claims costs, they also affect an employee's absence from work and ability to perform at full capacity when at work. Following the recommendations of the Peer Review Panel, the HRI has added two self-reported measures to determine the annual number of hours employees are absent due to their own personal health conditions, and the number of hours annually they come to work but work at less than full capacity due to a health condition (presenteeism).

#### **Why Is It Important?**

The HRI is measuring healthy hours worked in order to gauge the indirect costs of poor employee health. A number of studies indicate that employees who are suffering from chronic diseases and health conditions experience more absence from work and more limitations on their ability to work at full capacity. Edington, Goetzel and others have found that the cost of absence, short- and long-term disability and presenteeism exceed direct medical costs<sup>21, 22</sup>. Edington further notes that although disease status is often the metric of choice as the "driver" of health care and lost productivity costs, the more important factor is actually health status. Monitoring the health status for a population of employees is the preferred metric to document improved health and productivity<sup>23</sup>. Pelletier and others found that reducing one health risk can reduce absenteeism by two percent and improve productivity by nine percent<sup>24</sup>.

#### **Data sources**

Like many employers, the county's leave tracking systems do not provide adequate data to know exactly how much time is taken off specifically for employee (as opposed to family) illness. A study conducted at Johnson & Johnson indicates that responses to absenteeism questions produced data that had a "reasonable degree of correspondence" between formal payroll time records and self reported absence<sup>25</sup>. This opens the opportunity for employers to use self reported absence data to estimate the effects of health on absenteeism and presenteeism.

King County administered an annual wellness assessment to its employees and spouses/domestic partners who are covered under the county's health plans in each of three years (2006, 2007 and 2008). In 2006, 2007 and 2008 the assessment asked about absenteeism in two ways (within the past 12 months and the past 30 days.) An outside consultant, Thomson Reuters, analyzed the data from the absence questions. Starting in 2008, the eight-item version of the Work Limitations Questionnaire (WLQ) was added to the wellness assessment in order to gather information about the impact of health conditions on the employee's ability to perform at full capacity when they are at work. The results from the WLQ were calculated and compared to normative data by Debra Lerner, PhD.

## Methodology--Absenteeism

The absenteeism analyses were restricted to King County employees-only because spouses/partner absenteeism does not directly impact the County. Further, the absenteeism analyses only included participants who completed the online HRA (93-95 percent of the total participants in each year) because the paper version of the HRA underwent multiple revisions over time. The absenteeism findings were monetized using the 2008 average hourly and yearly salary figures provided by King County for its employees. The 2008 salary figures were used for 2006, 2007, and 2008 to control for inflation. The statistical significance of the changes over time was assessed using independent sample t-tests. A Generalized Estimating Equations (GEE) model was also applied to predict changes in absenteeism over time, adjusting for the potential confounding effects of age, gender, race marital status, and education.

To assess absenteeism, employees were asked to indicate the number of hours they were absent from work because of health problems "in the past 4 weeks" and the number of days they were absent "in the past year."

Respondents who indicated on the wellness assessment that they were pregnant (2006: n=157; 2007: n=164; 2008: n=145) were removed from the dataset.

## Results—Absenteeism

From 2006 to 2008, the average number of self-reported hours of absenteeism in the past four weeks decreased, although the reduction was not statistically significant. However, the average days of absenteeism for the past year fell significantly by about half a day, resulting in a \$131.94 per employee per year cost savings for the aggregate sample of all employees (Figure 23A).

Figure 23 A  
Absenteeism: 2006-2008 Aggregate Employees Only

2006-2008 Aggregate Respondents	2006	2008	Change (T3-T1)
<i>Absenteeism Hours in the past 30 days</i>	4.03 (N=9,134)	3.93 (N=10,168)	-0.10
<i>Monetized Value</i>	\$119.96	\$122.11	\$2.14
<i>Absenteeism Days in the past 12 months</i>	4.88 (N=9,104)	4.39 (N=10,204)	-0.49*
<i>Monetized Value</i>	\$1,258.98	\$1,182.11	-\$131.94

\*p-value<0.05, using t test. Results based only on data from employees who completed the wellness online.

Source: Thomson Reuters

Conversely, the cohort employee sample experienced a 0.4 statistically significant increase in absenteeism hours in the past four weeks and there were no statistically significant changes in the number of absenteeism days in the previous year. This translated to an increased cost of \$12.43 per employee per month (Figure 23B).

Figure 23B  
**Absenteeism: 2006-2008 Cohort Employees Only**

2006-2008 Cohort of Respondents	2006	2008	Change (T3-T1)
Absenteeism Hours in the past 30 days	3.8 (N=7390)	4.2 (N=7902)	0.4*
Monetized Value	\$118.07	\$130.49	\$12.43
Absenteeism Days in the past 12 months	4.7 (N=7368)	4.7 (N=7921)	No change
Monetized Value	\$1,265.58	\$1,265.58	\$0.00

\*p-value<0.05, using t test. Results based only on data from employees who completed the wellness online.

Source: Thomson Reuters

### Methods—Presenteeism

Presenteeism (on-the-job productivity loss) data were collected for the first time in 2008, therefore only descriptive analyses were conducted. As with the absenteeism analyses, the presenteeism analyses were performed on just the employee-only sample.

The Work Limitations Questionnaire (WLQ) is an instrument developed by Dr. Debra Lerner at Tufts University & the New England Medical Center which has proven to be a valid and reliable tool in measuring presenteeism, or on-the-job productivity losses<sup>26</sup>. For the first time in 2008, the King County Health Reform Initiative included the eight item WLQ in its HRA. The raw data were sent to Dr. Lerner's team for scoring.

### Results—Presenteeism

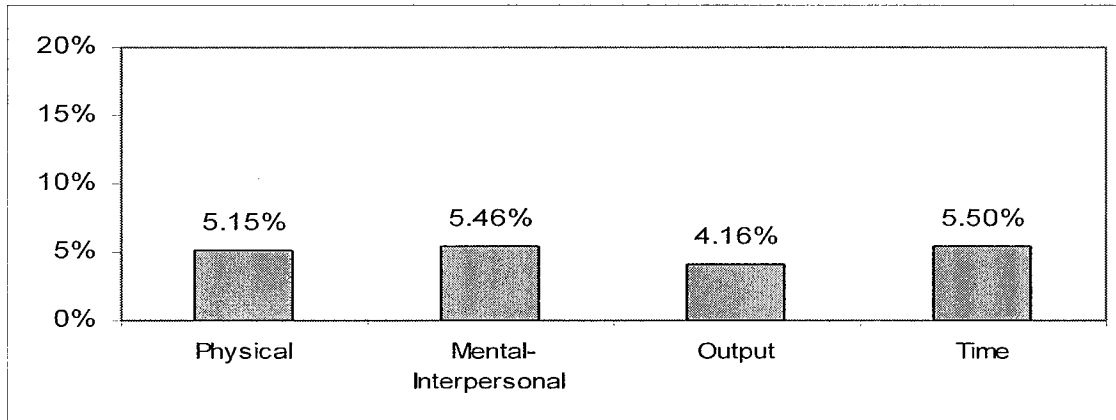
The results produced five outcomes: an overall percent of productivity lost per employee per hour due to poor health and four subscales of productivity. The four subscales of productivity loss correspond to different aspects of productivity loss that together comprises the overall concept of presenteeism. These components are time, physical, mental-interpersonal and output. The first questions on the WLQ correspond to time, which asks employees how difficult it is to get started on their work at the beginning of the day. Following that, participants are asked about their physical abilities, through questions that determine their ability to sit or stand in one position and perform repeated tasks. The mental-interpersonal score is based on questions that ask employees to rate their difficulty in concentration on work and contact with other people. Finally, an employee's ability to complete their work tasks is reflected in the output score. The results show that approximately 5.5 percent of King County employees have difficulty getting started at the beginning of the workday (time) and concentrating on their work (mental-interpersonal). Additionally, 5.2 percent of King County employees have difficulty standing or sitting for long periods of time (physical) and only 4.2 percent of employees have a difficult time finishing their work (output).

The presenteeism score is a weighted sum of the four sub-components. For King County employees in 2008 who completed the HRA, the average percent of productivity lost in one hour was 1.4 percent. Using the average 2008 annual salary of King County employees (\$64,625.60), this loss in productivity translates to an annual cost of \$904.76 per employee. Comparatively, previous studies with other Thomson Reuters clients have shown much higher rates of presenteeism (around 2.5%, with sub-scale scores

around 10 percent), meaning that King County has a much lower rate of presenteeism for the first-year of data collection.

Figure 24

**First-year results of the presenteeism sub-components for employees in 2008**



Source: Dr. Debra Learner/New England Medical Center/Tufts University

**Summary and Conclusions**

The results from the absence reported for the prior 30 days and the results reported for the prior 12 months are inconsistent. The HRI will need to wait for another year of data to determine whether there is a positive or negative pattern observed. It would have been helpful to have a normative reference group to see what absenteeism patterns have been over the past three years for other employers in the Puget Sound region. However, the HRI has been unsuccessful in locating another employer willing to share data for such a study. Therefore the absenteeism results have been analyzed on a pre-test/post-test basis without a comparison group, and no conclusions about absenteeism can yet be drawn. The presenteeism results provide a baseline for future study about the effect of the HRI on reducing the effects of poor health on productivity. For King County employees in 2008 who completed the HRA, the average percent productivity lost in one hour was 1.4 percent. Using the average 2008 annual salary of King County employees (\$64,625.60), this loss in productivity translates to an annual cost of \$904.76 per employee.

**IV. Financial Analysis**

**What Is This Measuring?**

The financial analysis is measuring the effect of the HRI on actual health care costs paid by the County. Changes in health care costs are driven by two factors: medical cost inflation (change in the unit price of medical products and services) and utilization increases (changes in the volume of medical products and services used, which may be influenced by demographic changes, advertising and the use of new technology.)

## **Why Is It Important?**

From its inception a primary purpose of the HRI has been to reduce the rate of cost growth for health care for employees and their families. The county cannot sustain cost increases that are three times the growth in the Consumer Price Index (CPI), and as much as two times higher than the county's projected overall revenue growth. Although improved risk profile and an increase in healthy hours worked are important health goals, the direct cost of health care is a major expense in the county's budget and must be brought under control if the county is to be able to provide benefits that will attract and retain an efficient, effective, qualified workforce.

## **Data sources**

The financial analyses draw upon several data sources: medical care claims processed by Aetna; pharmacy claims processed by Caremark (2002 – 2006) and Express Scripts, Inc. (2007); enrollment lists maintained by King County's Benefits & Retirement Operations & Section (BROS); enrollment counts maintained by Aetna; and claims and enrollment counts provided by Group Health. All data are de-identified before they are sent to King County for inclusion in the HRI data warehouse.

The number of people covered under KingCare<sup>SM</sup> and Group Health plans changes over time. This produces fluctuations in total costs. It is important to note that total cost variances are not necessarily an indication that employee health or health care has changed. For this reason, the impact of HRI programs on employee health and healthcare are measured in terms of changes in cost per covered employee and cost per covered member. BROS provides data on the number of covered employees and dependents needed to calculate per employee statistics.

## **Methodology**

King County's HRI measurement and evaluation compares costs and utilization over time in order to track trends projected from pre-program baselines. The individual impact of specific programs can only be estimated by considering the timing of deviations from baseline and where the deviations occur.

For example, the \$100 emergency room copay that began in January 2007 would be expected to change costs related to emergency room visits starting in 2007 and thereafter. Any changes to the cost or utilization of emergency room visits appearing before 2007 would not stem from the \$100 emergency room copay, because the program did not exist at that point. Furthermore, it's not expected that the \$100 emergency room copay would impact unrelated outcomes. For this reason, the baseline period for the \$100 emergency room copay will be before 2007 and the timeframe used to compare cost and utilization trends with that baseline is 2007.

Using this methodology, each program has a baseline period from which trends are calculated, a timeframe during which the program is expected to have an effect, and specific types of costs and utilization that are related to the program.

The results reported here are primarily focused on the total HRI program, comparing 2004-2007 outcomes to overall trends seen in the 2002-2004 baseline.

**Results**

The HRI financial targets, as described in previous HRI Measurement and Evaluation reports, are to achieve an 8.9 percent average annual growth in total costs with 8.0 percent growth for medical-only costs and 10.7 percent for pharmacy-only costs. The HRI targets are for average year-over-year growth rates, allowing that some years will experience above average growth and some below average growth.

Figure 25 shows growth in the county’s portion of KingCare<sup>SM</sup> medical and pharmacy claims during the HRI as compared with the target growth. This graph includes claims for all active members in KingCare<sup>SM</sup> (excluding COBRA beneficiaries and early retirees) but does not include Group Health claims. This is the same information reported in Figure 8 (on page 41) of the Second Annual HRI Measurement and Evaluation Report. Figure 8 in the previous report included growth from 2004 to 2006 and targets. Figure 25 updates the chart by adding growth from 2004 to 2007 (shown in the center bar).

Figure 25  
**Cost Increase in King County’s Portion of KingCare<sup>SM</sup> Claims**

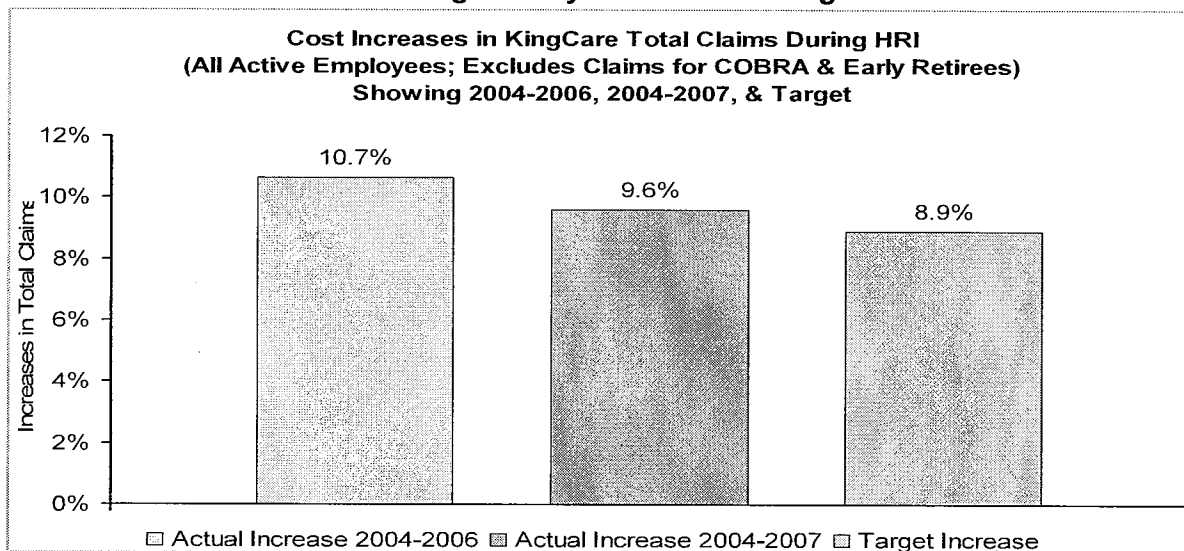
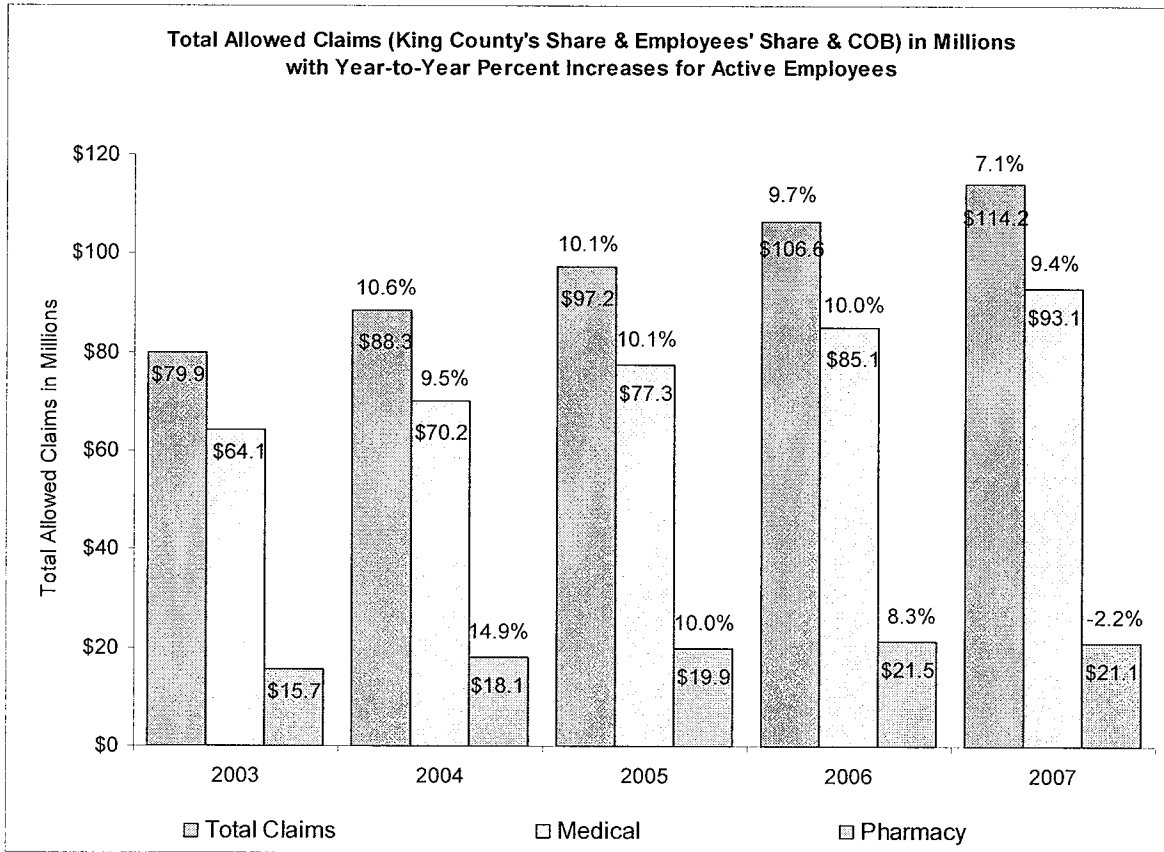


Figure 26 below shows year-by-year detail in the KingCare<sup>SM</sup> claims growth for both county and employee-paid portions of claims and further breaks out the medical and pharmacy components of cost.

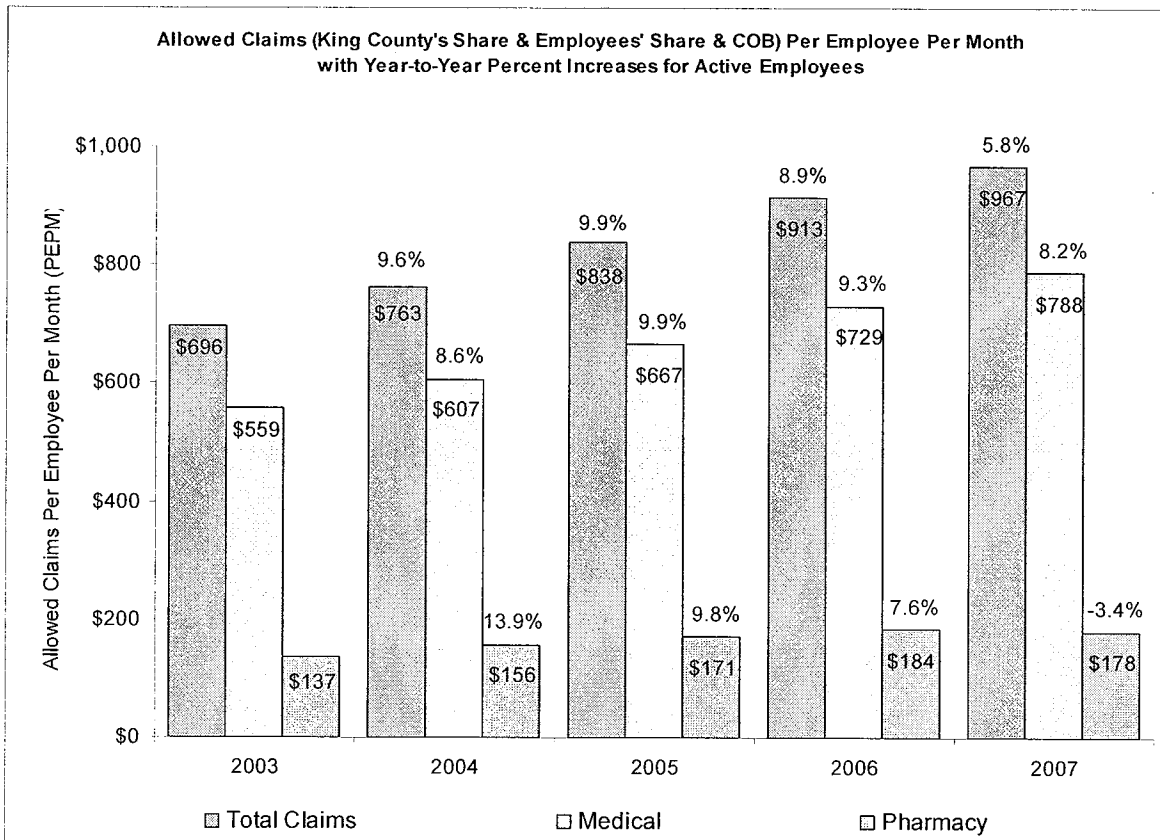
Figure 26  
**Year-Over-Year Cost Increase for County Plus Employee Portion of KingCare<sup>SM</sup> Claims Costs**



It is clear in Figure 26 that the year-over-year rate of cost growth since 2004 has been decreasing, with the growth in 2007 over 2006 coming in at 7.1 percent. The growth in medical claims was 9.4 percent, and the growth in prescription drugs was a negative 2.2 percent.

Each year there are slight changes in the number of employees covered under the plan. A more precise measure of year-over-year changes in costs is to divide the total claims cost by the number of covered employees and then by 12 to develop a Per Employee Per Month (PEPM) cost. Figure 21 changes the cost shown in Figure 26 above into PEPM.

Figure 27  
**Year-Over-Year Cost Increase for County plus Employee Portion of KingCare<sup>SM</sup> Claims Costs PEPM**

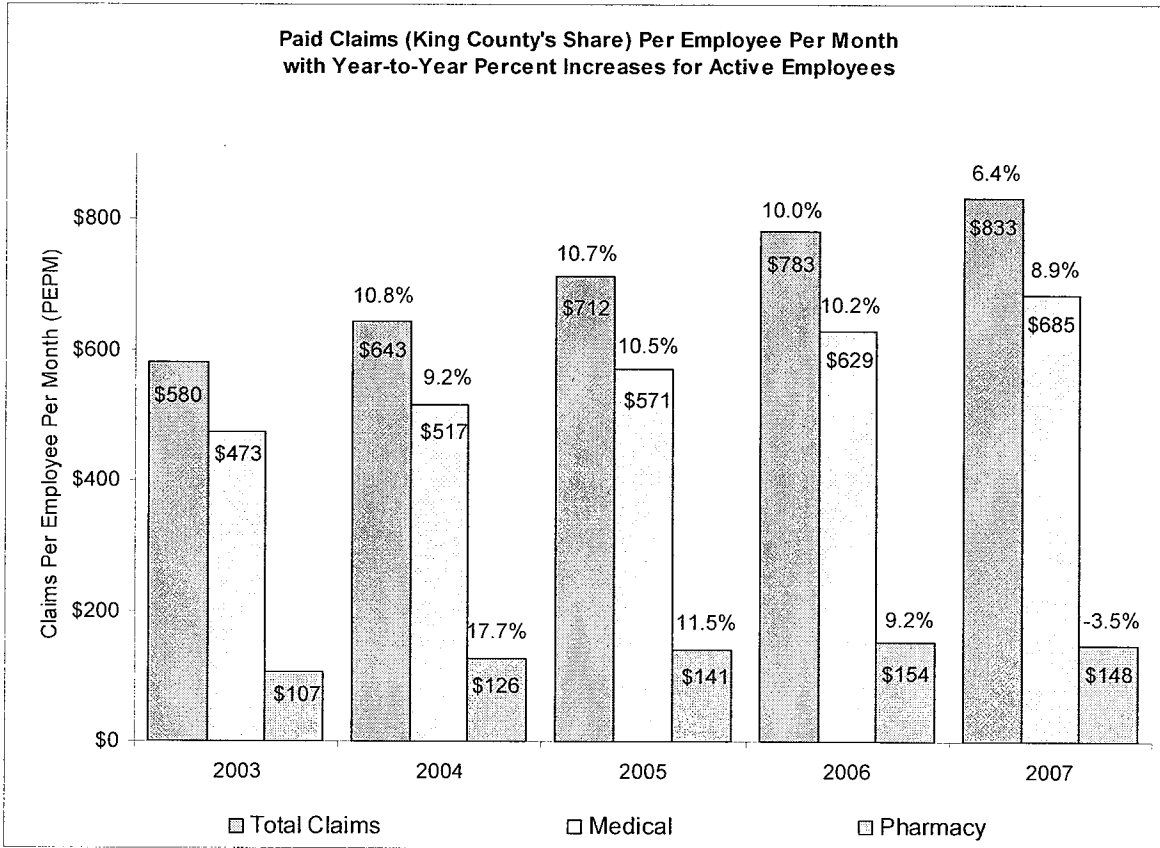


The decline in the rate of cost growth becomes even more apparent when accounting for change in the number of employees each year. The growth in costs PEPM for 2007 over 2006 is 5.8 percent, with an 8.2 percent increase in medical and a negative 3.4 percent trend for pharmacy.

The county's benefits budget, however, will not see the all of the moderation in costs shown in the county plus employee-paid PEPM numbers. This is because the employee share of costs is derived through deductibles and copays, and is limited by the annual out-of-pocket maximum in the plan. Although copay is a percentage of the total claim, the deductibles and annual out-of-pocket maximums are set dollar amounts. Thus, as claims cost rise each year though inflation, the total percentage of costs paid by employees is less while the amount paid by the county is greater. For example, in 2004, employees paid 10.5 percent of allowed medical costs; by 2007 they paid 8.8 percent. Figure 28 below shows the history of the of the county's portion of allowed claims in the KingCare<sup>SM</sup> plan.



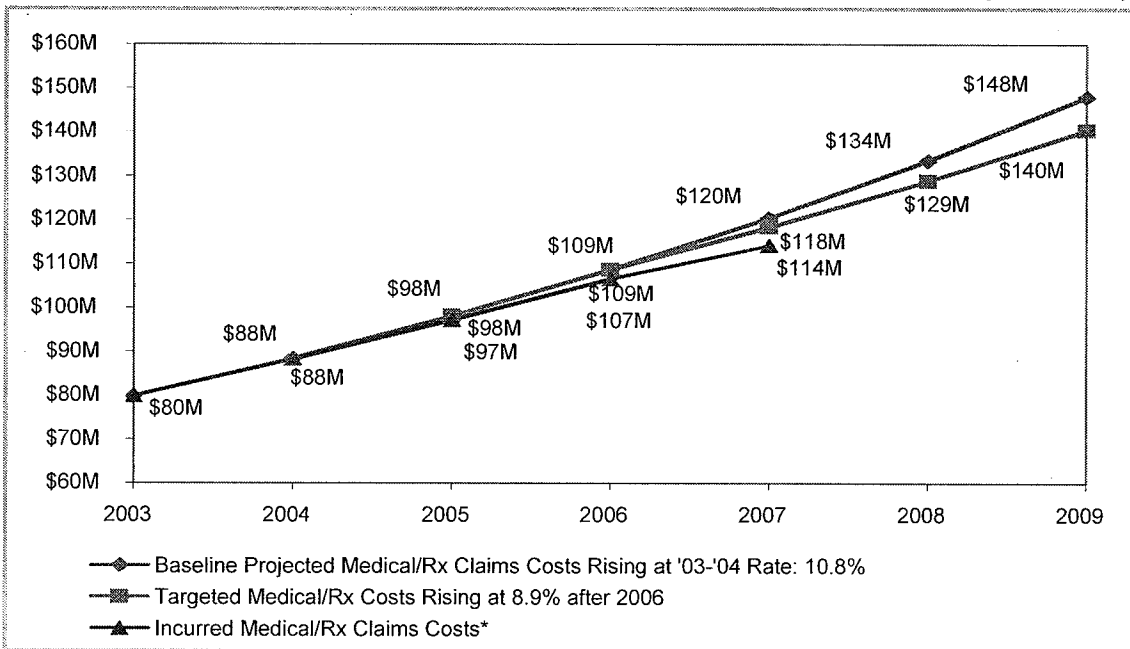
Figure 28  
**Year-Over-Year Increases in Claims (King County's Share Alone) PEPM**



The year-over-year cost growth rate experienced by the county on a PEMP basis is slightly higher than the total cost rates shown in Figure 27, however they still show a significant reduction from previous year's growth at 6.4 percent overall, and 8.9 percent for medical and a negative 3.5 percent for pharmacy. These numbers are well below the year-over-year target increase of 8.9 percent overall.

Finally, statistics reported in Figure 29 match statistics reported in Figure 7 of the second annual HRI Measurement and Evaluation report. Unlike the statistics reported above in Figures 26-28 the statistics in Figure 29 do not include members of ATU Local 587 who receive partial benefits.

Figure 29  
**Revised HRI Business Case and Actual Incurred Claims for 2003-2007**  
**(Medical/Rx, KingCare<sup>SM</sup>, Full-Time, Active Employees and their Dependents)**



\*Note: 2007 incurred claims are adjusted by a completion factor method for claims that will be reported in coming months.

In Figure 29 above, actual allowed claims in 2006 are reported as \$107 million. Figure 7 in the Second Annual HRI Measurement and Evaluation report shows actual allowed claims in 2006 at \$108 million. The difference is due to more complete data on 2006 claims available for this report. Claims for 2006 continue to arrive at King County. The totals reported here and in Figure 7 of the Second Annual Measurement and Evaluation report are estimates based on what claims have appeared at the time of the analysis. In this case, the revised estimate for 2006 is one percent lower.

Figure 29, like the year-over-year analyses in Figures 26 – 28 show total claims coming in below the projected target for 2007.

**Factors affecting overall claims costs in 2007**

There are three categories of factors that affect the claims costs in 2007. They are: 1) shifting some costs to employees through the bronze and silver out-of-pocket expense level plans, increasing the emergency room copay to \$100 in both KingCare<sup>SM</sup> and Group Health, and charging a \$35 per month “benefit access fee” to cover spouses/domestic partners who have other group coverage; 2) actual reduction in paid claims for members in the gold out-of-pocket expense level; and 3) reduction in pharmacy costs due to greater use of generics. These three factors are discussed below.

**Shifting some costs to employees:** In the original business case developed for the HRI, it was estimated that some cost savings would be achieved starting in 2007 due to the implementation of the bronze, silver and gold out-of-pocket expense levels because

members who achieve the silver or bronze out-of-pocket expense level plans would pay more of the claims costs than members in the gold plans. Savings for the county from bronze or silver level plans would be due entirely to cost shifting.

It was projected that 60 percent of employees and their spouses/domestic partners would participate in both the wellness assessment and individual action plan and earn the gold level; 10 percent would participate in only the wellness assessment and earn the silver level; and 30 percent would not participate at all and earn the bronze level. Larger numbers of members at silver and bronze levels represent immediate cost savings to the county because of higher deductibles, copays and annual maximum costs at these levels that are paid by employees rather than the county. However, the HRI was very successful in making sure members understood the Healthy Incentives<sup>SM</sup> plan design, its goals in helping people become healthier, and the effect of the bronze and silver levels on members' pocketbooks. As a result 83.0 percent of members achieved the gold level, 9.9 percent achieved silver, and only 7.1 percent achieved bronze, as shown in Figure 30. Therefore, because more members achieved gold and silver levels than projected, there was less cost shifting to employees than anticipated in the original business case. However, long term this is a better result because it is expected that as more people improve their health risks they will ultimately have lower claims costs. The HRI needs to more fully analyze the actual amount of cost shifted to members who are in the silver and bronze level plans as compared to the amount paid by members in the gold plan.

Figure 30  
**Projected and Actual Percent of Members at Bronze, Silver and Gold Out-of-Pocket Expense Levels in 2007**

Out-of-pocket Expense Level	Projected % of Members	Actual % of Members in 2007
Gold	60 %	83.0%
Silver	10%	9.9%
Bronze	30%	7.1%

Another change from the 2006 to 2007 plans was the increase in the emergency room copay for all plans (bronze, silver and gold KingCare<sup>SM</sup> and Group Health). The gold KingCare<sup>SM</sup> and Group Health out-of-pocket expense plans are identical to the 2006 KingCare<sup>SM</sup> Preferred and Group Health plan respectively with the addition of a \$100 emergency room copay. The increased emergency room copay was designed to discourage members from using the emergency room for conditions that can be appropriately treated in an office visit during normal office hours. The HRI is still assessing the impact of the \$100 emergency room copay on changing utilization by members.

The third change in the 2007 benefits plans was the introduction of a "benefit access fee"—a \$35 per month charge to employees who cover their spouse/domestic partner on a King County plan when that spouse/domestic partner is employed elsewhere and has access to their own employer-sponsored health plan. In 2007 3,868 employees paid the benefit access fee to keep their spouse/domestic partner on a county plan. This fee generated 1.62 million in revenue that helped to offset county's health care costs. This cost savings is *not* shown in the claims costs reported in this chapter.

**Actual reduction in paid claims:** Although the HRI can determine that 2007 year-over-year change in costs to the county for the KingCare<sup>SM</sup> plan was a 6.4 percent increase, it cannot yet attribute that change to changes in risks. In order to determine whether there is a relationship between reduction in risks and reduction in costs, the HRI would need to compare health care expenditures for program participants whose risks have improved over time against those for participants whose risk factors have remained stable or deteriorated over time. This analysis was not performed as a part of the current study.

**Generic Fill Rate and Pharmacy Savings:** As shown above in Figures 26 - 28, King County's cost trends for pharmacy prescriptions have been improving substantially. It is worth noting the importance of an increased use of generics in that improvement. Figure 31 shows the portion of KingCare<sup>SM</sup> prescriptions that were for generic drugs.

Figure 31  
**Generic Fill Rates for Active Employees Enrolled in KingCare<sup>SM</sup>**

Year	Number of Prescriptions Filled for Active Full Time Employees and Their Dependents	Proportion of Prescriptions That Were for Generic Drugs
2003	254,332	47%
2004	240,297	50%
2005	253,241	54%
2006	261,233	58%
2007	270,583	61%

A similar trend in increased use of generics has been seen in the general market place. Starting in 2005, a number of "block buster" brand name drugs have lost their patents, thus allowing for the introduction new generic drugs. Uptake of the new generics has been a predominate feature in the pharmacy benefit arena, creating a larger ratio of generic to brand drugs and significantly lower cost overall.

The average generic drug is significantly less expensive for KingCare<sup>SM</sup> than the average brand-name drug—Express Scripts reports that in 2007 the average cost in the KingCare<sup>SM</sup> plan per generic prescription was \$10.00 at retail and the average cost of brand name drug per prescription was \$114.25. Every 1.0 percent increased in generic utilization saves 1.25 percent on the total plan cost.

## Summary and Conclusions

Year-over-year cost growth for the county for medical and prescription drug claims for 2007 was 6.4 percent, a significant decrease from the over ten percent year-over-year increase seen in 2004 – 2006. One factor contributing significantly to the lower overall cost growth is a steady increase in the number of members choosing generics over brand name drugs. The HRI does not appear to be seeing savings as a result of cost shifting to employees. The numbers of employees achieving the bronze and silver level plans were far below projections because a very large majority chose to complete the wellness assessment and individual action plan. Not shown in the numbers reported in this section is the approximately \$1.6 million that came into the benefits fund as revenue from the benefit access fee.

It is still too early to say whether the 6.4 percent year-over-year cost growth seen in 2007 is a one time event or the beginning of a moderation in the long term cost trend.

## Evaluation of Contribution of Program Components

As a result of the analysis conducted for the Second Annual HRI Measurement and Evaluation Report, the county made a number of changes mid-2007 in the five pilot programs purchased from Aetna. Because these changes occurred mid-year, it is not yet possible to determine a return on investment for 2007. These changes included:

***Informed Health Line® (Nurse Line):*** Although the Informed Health Line is very popular with members (and therefore deemed important to continue) it did not appear to directly contribute to overall plans savings. Thus effective September 1, 2007 the county changed its contract to pay only for the nurse line services and to discontinue purchasing the member survey and quarterly member communications from Aetna. The county has taken over these aspects of the program in its own in-house communications efforts and employee surveys.

***Disease Management:*** The county determined that the focus of the original Aetna disease management program was too narrow to produce discernable results. In 2006 Aetna acquired a more robust disease management program, the Aetna Health Connections program that appeared to better meet the county's needs. Effective September 1, 2007, the county was transitioned to this new disease management program.

***MedQuery®:*** This is a patient-safety program that uses evidence-based clinical rules to identify gaps in care and sends information to the provider. Effective September 1, 2007, Aetna added a member messaging feature to this program that sends information about care gaps first to the provider and then also sends a message to the members about the potential issue regarding their health and encourages the member to speak with their provider about the care consideration.

***Enhanced Member Outreach<sup>SM</sup>:*** This program identifies members who are at greater risk because they are scheduled for in-patient hospital care, are preparing for discharge from in-patient care, or have a claims history that indicates presence of an uncontrolled chronic condition or other risk factors. A specially trained nurse calls these members to

encourage them to work closely with their health care providers and to follow up on treatment plans. Member response to this program has been very positive. Effective September 1, 2007, Aetna expanded this program to include nurse outreach calls to members who are 1) frequent users of emergency room services in order to help them find more appropriate alternatives, 2) using multiple providers (primary care and specialist physicians) to help members make sure they are coordinating information and care; or 3) not following up on prescription drug regimens for chronic conditions (e.g. maintenance prescriptions for chronic conditions that are not regularly refilled on time.)

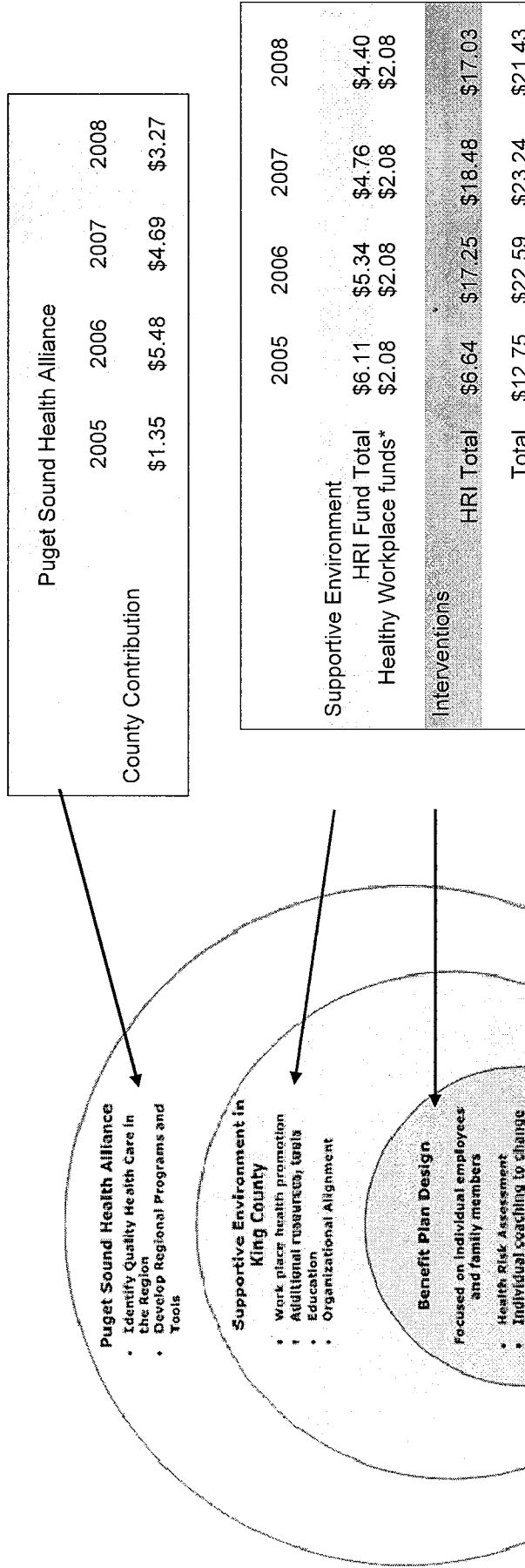
***Aexcel® Specialist Network:*** Aexcel® is a designation within Aetna's preferred provider network that includes specialists who have demonstrated effectiveness in the delivery of care based on a balance of measures of clinical performance and cost-efficiency. There are significant savings to the plan when members choose Aexcel®-designated over non-Aexcel® designated specialists. However Aexcel® was designed to be used in a three-tier network plan that has, for instance, a 30 percent member copay for using a specialist who is not in any Aetna network, a 20 percent copay for using a specialist who is in the regular Preferred Provider Network, and a 10 percent copay for using an Aexcel®-designated specialist. Because the county's plan does not have this structure, there is no motivation for members to select the Aexcel® specialist, and thus it is impossible to attribute to the Aexcel® program any positive changes in utilization. The county discontinued participation in the Aexcel® effective January 1, 2008.

## **Cost of the HRI**

The typical investment in "best practice" health promotion and wellness programs is approximately \$33 per employee per month<sup>27</sup>. According to discussion with staff at Thomson Reuters, most employers only count the cost of external vendor programs in their overall health promotion and wellness program costs, and use only those costs in calculating return on investment. In comparison, as Figure 32 shows, the HRI counts external vendor costs for the Healthy Incentives<sup>SM</sup> program, internal staff costs and monies dedicated to the Health Workplace Funding Initiative (Level 1 and Level 2) for a total \$23.24 per employee per month in 2007 and \$21.43 per employee per month in 2008. These numbers compare favorably with the \$33 per employee per month reported by Edington.

It is also important to note that few, if any, other employer-sponsored health promotion and wellness programs have programs that address improving the quality and efficiency of health care delivery in the market place, and thus the county's contributions to the Puget Sound Health Alliance are not included in the comparison to "best practice" program costs.

Figure 32  
**King County Health Reform Initiative**  
**Annual Budgeted Costs of the Health Reform Initiative per Employee per Month (PEPM)**  
**2005-2008**



Note:

1. These costs do not include the baseline administrative costs of providing the general benefits programs.
2. \*Healthy Workplace Funding Initiative. Under this program, work groups (manager and employees in a collaborative process) can use an amount from their regular department budget equal to \$25 per year for each benefits-eligible employee to purchase goods and services (e.g. yoga classes, exercise equipment, stress management classes) to improve healthy behavior in their workplace. The Healthy Workplace Funding Initiative is not included in the benefits internal service fund.

## Conclusions, Opportunities, Challenges and Next Steps for the Healthy Incentives<sup>SM</sup> Plan

### Conclusions

In 2007, all planned components for the Healthy Incentives<sup>SM</sup> benefit plan design were in place—wellness assessment, individual action plans, and bronze, silver and gold out-of-pocket expense level plans.

Participation in the Healthy Incentives<sup>SM</sup> program continues to be strong with around 90 percent of eligible employees and spouses/domestic partners taking the wellness assessment and completing individual action plans each year 2006 through 2008. Drop off in participation is a common problem in health promotion and wellness programs. The continued high participation indicates that incentives and program support are at appropriate levels and that personal responsibility for health is becoming a cultural norm in the King County workforce.

The HRI is having a positive impact on almost all measured self-reported risks for the period 2006 – 2008 for all subgroups in the population as determined by the analysis for confounding factors noted earlier in this chapter. However, more effort is needed to increase physical activity and reduce blood glucose levels. Also, the rate of improvement in risks was less in 2007 to 2008 than it was in 2006 to 2007. This is a natural result of the amount of effort it takes to not only sustain improvements but to also make further gains. The HRI will need to continue to gather input from participants and work with its vendors to find ways to sustain health improvements and behavior change over the long run.

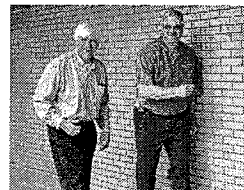
It is not clear whether changes in health behavior affected the utilization of health care for conditions directly affected by that behavior. Obesity, lack of exercise, and poor nutrition have consistently been the greatest lifestyle contributors to health care costs and utilization over time. Claims costs and utilization of health care services for

lifestyle-related conditions remained almost unchanged 2002 – 2004. In 2005 the county introduced the four Aetna care management pilot programs to identify members with chronic conditions and encourage them to become more active

participants in treatment and management of their conditions. Although these programs are intended to reduce health care costs in the long term, it is conceivable that in the short term they may cause an increase in health care utilization by encouraging members who have been unaware of, or were ignoring a health condition to seek medical attention. There is at least an apparent increase in both the costs and numbers of members getting treatment for lifestyle-related conditions in 2005. However, the HRI

Jim Pitts and Steve Witkowski inspire each other to walk daily at the South Point Treatment plant, after their wellness assessments raised awareness about diabetes. Both lowered weight and cholesterol.

*"You need to do it with someone else ... for inspiration"*





does not yet have data to indicate if there is any actual correlation between this increase and the introduction of any of the care management programs.

The results from the absence reported for the prior 30 days and the results reported for the prior 12 months are inconsistent. The HRI will need to wait for another year of data to determine whether there is a positive or negative pattern observed. It would have been helpful to have a normative reference group to see what absenteeism patterns have been over the past three years for other employers in the Puget Sound region. However, the HRI has been unsuccessful in locating another employer willing to share data for such a study. Therefore the absenteeism results have been analyzed on a pretest/posttest basis without a comparison group, and no conclusions about absenteeism can yet be drawn. The presenteeism results provide a baseline for future study about the effect of the HRI on reducing the effects of poor health on productivity.

Year-over-year cost growth for the county for medical and prescription drug claims in the KingCare<sup>SM</sup> plan for 2007 was 6.4 percent, a significant decrease from the over ten percent year-over-year increase seen in 2004 – 2006. (A similar analysis for the Group Health plan has not been completed.) One factor contributing significantly to the lower overall cost growth is a steady increase in the numbers of members in the KingCare<sup>SM</sup> plan that choose generics over brand name drugs. The numbers of employees achieving the bronze and silver level plans (with higher out-of-pocket expenses) were far below projections because a very large majority chose to complete the wellness assessment and individual action plan. The HRI needs to more fully analyze the actual amount of cost shifted to members who are in the silver and bronze level plans as compared to members in the gold level plan. Not shown in the numbers reported in this section is the approximately \$1.6 million that came into the benefits fund as revenue from the benefit access fee.

It is still too early to say whether the 6.4 percent year-over-year cost growth seen in the 2007 KingCare<sup>SM</sup> is a one-time event or the beginning of a moderation in the long term cost trend.

As a result of the analysis conducted for the Second Annual HRI report, the county made a number of changes in the five pilot programs (Informed Health Line®, disease management, MedQuery®, Enhanced Member Outreach<sup>SM</sup> and Aexcel®) purchased from Aetna. Because these changes occurred mid-year in 2007, it is not yet possible to determine a return on investment for 2007.

Finally, the cost of the HRI continues to be in the appropriate range for effective employer health and productively management programs.

## **Challenges and Opportunities**

It is very hard to make lasting lifestyle changes, and even harder to add new gains onto earlier gains. As the detailed analysis of the cohort group that completed the wellness assessment in all three years shows, although there was an overall improvement in 12 risk factors from 2006 to 2008, the actual year-to-year changes show a little more complex story. In the first year (2006 to 2007) participants improved in 13 out of 14 risk

factors, but in the second year (2007 – 2008) progress not only halted but actually declined a little for six risk factors. HRI staff will need to work with vendors to keep the wellness assessment and individual action plan programs fresh, inviting and effective for members over time. Outreach to spouses/domestic partners will be especially critical—decrements to risk improvements were even larger for the spouse/domestic partner group than for employees.

Two risk factors that will need special attention are physical activity and managing blood glucose. Management of both of these risks falls squarely into the county's overarching "Eat Smart, Move More" education themes. The HRI needs to continue its efforts to create cultural norms both at work and in life outside of work around increased physical activity and prudent nutritional choices in daily living.

Another challenge is making sure employees and their families "know their numbers"—that is, know their percentage of body fat, total cholesterol, blood glucose measurement and their systolic and diastolic blood pressure. Results from the self reported data indicate that 40 percent to 80 percent do not know their level of risk on these important indicators of overall health. The HRI will need to find easy, cost effective ways to help more members learn and actively track "their numbers", understand the implication of these numbers on their current and long term health and quality of life, and be motivated to do what they can to manage any existing or developing risks.

## **Next Steps**

The HRI is already working on gathering feedback from employees and their spouses/domestic partners about changes in the Healthy Incentives<sup>SM</sup> program that will keep members interested and engaged. Efforts are underway to add more diversity to the kinds of activities that are available for individual action plans and to tailor options to better meet individual member needs. The HRI is also considering making better use of on-line tools to support and reinforce member efforts to build and sustain better health-related habits, and to guide members through successful program completion. Because small hassles often equal big barriers to action, HRI staff is looking for ways that keep program administrative processes for members at a minimum. Beyond helping members make lifestyle behavior changes, the HRI will need to add more features that will 1) actively use data warehouse and data mining to look for patterns and opportunities to improve health and health care; 2) make optimal use of technology—personal health records, tailored disease management information, home monitoring of conditions, e-consulting, leverage banking transaction model for provider transactions; and 3) provide consumer-friendly cost and quality data from a trusted outside source.

## Chapter 3—Supportive Environment

### Health is a Shared Responsibility

In the workplace, the road to better health, longer lifespan and reduced cost is a two-way street. Both employee and manager/supervisor play an important and interdependent role in bringing about the desired outcome of a healthier, vibrant, and optimally productive workplace. The preponderance of research shows that the behavior change required to produce lasting savings and improved health cannot happen without a comprehensive organizational realignment in support of a workplace that fosters and supports healthy actions on an ongoing basis.<sup>28,29,30</sup> Through its programs and services, the HRI provides the tools integral for both management and employees to make the necessary environmental and behavioral changes.

#### The role of the employee

Central to the HRI is the concept that employees are responsible for their own health and the wise use of health care services. Employees and their families are provided resources and information for their role through the Healthy Incentives<sup>SM</sup> benefits plan that supports healthy behavior, and a comprehensive communications effort that provides a wide array of worksite health promotion activities, stories from “health heroes” who have made changes in their own health status, tools for creating a personal health record, personalized information about managing health conditions, and resources for finding high quality, efficient health care providers.

#### The role of manager and supervisor

As leaders of a major employer focused on improving employee health and health care in the region, King County managers and supervisors are responsible for removing barriers to participation in worksite health promotions. More important, they are responsible for using their skills to create a healthy workplace environment—one that is participative, engaging, allows for work-life balance, and is built on appropriate job design. The result of this shared responsibility is improved employee health, which becomes improved organizational vitality, which in turn becomes improved productivity and delivery of more, higher quality services to the community. Figure 33 illustrates the county’s view of how improved employee health is connected to the quality of the services the county provides to the community at large.

Superior Court Judge Mary Roberts has changed work rules and courtroom protocol to engage her staff in an ongoing friendly fitness competition.

*“We are like a family.  
We encourage each other.”*



Figure 33

**Health is Connected to Service Delivery in the Community**



**Health→Vitality→Productivity→Performance→High Quality/Cost Service**

**The role of the Health Reform Initiative**

The HRI is responsible for creating a comprehensive infrastructure (including health plan design, programs and communications) that 1) supports and enables the adoption of healthy practices by county employees and their families, and 2) works with managers and supervisors to foster awareness of, and action towards a healthier workplace. Figure 34 lists tools and resources provided by the HRI.

Figure 34

<b>HRI Tools and Resources</b>			
<b>Health Promotion</b>	<b>Education</b>	<b>Outreach</b>	<b>Organizational Alignment</b>
Healthy Workplace Funding Initiative	Eat Smart Campaign	Focus on Employees website—and specialized web pages for	Health Promotion Leadership Committee
Gym Discounts	Move More Campaign	Posters	Manager Training
Healthy Vending Machine Pilot Program	Quit Tobacco Campaign	Healthy Workplace Funding Initiative	Health Leadership Forum
Weight Watchers at	Choose Well—Choose Generics	Managers	
Worksite Flu Shot	Health & Benefits Fair	Joint Labor Management Insurance Committee	
Live Well Challenge		<i>Health Matters</i> Newsletter	

**Health Promotion Leadership Committee**

Maintaining clear lines of communication between lead managers and the Health Reform Initiative is the purpose behind the creation of the King County Health Promotion Leadership Committee (HPLC), made up of key deputy directors, administrators and managers from each of the county’s departments and separately elected offices. The Health Promotion Leadership Committee promotes involvement in healthy initiatives to their employees.

One of the HPLC’s most significant contributions in the past year as been raising the profile of the Healthy Workplace Funding Initiative, which provides the equivalent of \$25 per employee in credits towards purchases of health related goods and services in the workplace. The HPLC outreach efforts yielded a 39-point increase in recorded utilization

as every department and workgroup increased their use of the funds. Other important roles for the Health Promotion Leadership Committee include setting departmental goals for engagement in health promotion activities and assisting in the planning of the Fourth Annual Health Leadership Forum where more than 200 lead managers came together to review the progress of the Health Reform Initiative, and to brainstorm additions and revisions to programs for the coming year.

## **HRI Accomplishments 2007-2008**

***Healthy Workplace Funding Initiative:*** Using a \$25 per employee credit, 84 percent of county employee workgroups self-organized to purchase yoga instruction, fitness training, stress-buster seminars, exercise videos, nutritional information and more -- a 39-point increase over 2006.

***Gym Discount Program:*** Twenty-three fitness organizations today offer county employees an average 20 percent discount at more than 120 facilities throughout the Puget Sound region.

***Live Well Challenge:*** For two years running, an average of 1,000 participants on scores of teams competed for points and prizes in the annual Live Well Challenge. Over 75 percent of participants say they improve nutrition and physical activity behaviors as a result of their participation.

***Healthy Vending Machine Program:*** Partnerships with vendors now stock 60 percent of county building vending machines with healthy snack options – with special labeling. Sales of healthy choices are on the rise. A 90-day pilot project that tested the price differential between healthy and less health snacks showed a seven percent increase in the volume of healthy items purchased, with a four percent decrease in unhealthy items, with no significant change in vendor profit.

***Public Health Week:*** 1,300 employees from every department and office took 11.4 million steps during the last annual event -- the same distance as walking from Seattle to La Paz, Bolivia.

## **Awards and Honors**

The King County Health Reform Initiative is being recognized nationally for its innovative approach and positive affect on employee health including:

***NCQA Health Quality Award:*** In early 2008, the National Committee for Quality Assurance (NCQA) recognized Executive Sims with its prestigious Health Quality Award for his founding the Puget Sound Health Alliance and pioneering of the county's employee wellness initiative. Sims joined Senator Ted Kennedy and Governor Arnold Schwarzenegger for this year's national honor. Past awardees include such luminaries as former Speaker Newt Gingrich and Sen. Hillary Clinton.

**County Leader of the Year 2008:** Calling the King County Executive's collaborative approach to problem solving "the genius" in his leadership style, American City & County Magazine noted Sims' innovations in health care reform, climate change, transportation and coverage for uninsured children in bestowing its highest honor.

**American Heart Association "Start!" fit-friendly employer:** 2008 marks the second year in a row King County received the platinum-level designation as a fit-friendly work environment "for employers who champion the health of their employees and work to create a culture of physical activity."

**Best Place to Work:** In June King County government was named one of the region's "Best Places to Work" by *Seattle Business Monthly* due in part to the supportive environment fostered by the Healthy Incentives<sup>SM</sup> program.

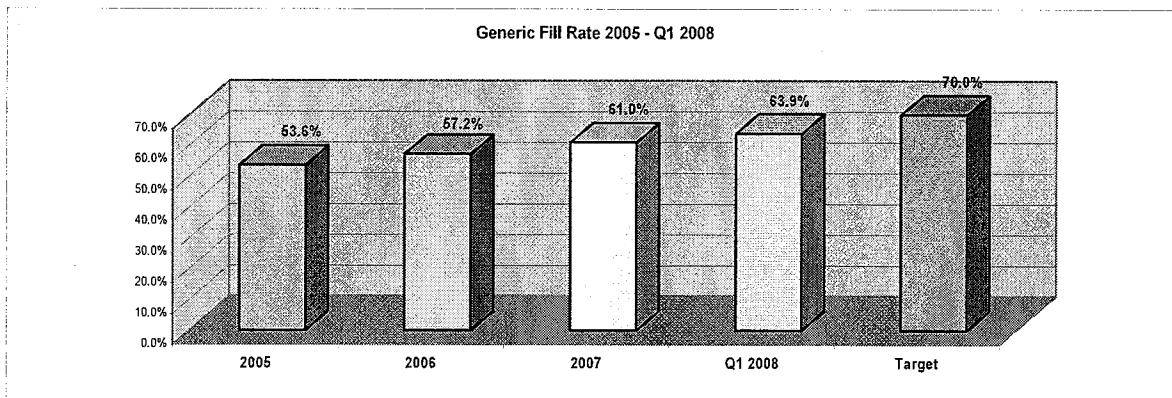
**Health Matters newsletter:** The popular monthly newsletter captured a 2007 Inspire Award from the League of American Communications professionals. "One of the best two-color publications reviewed."

## Key Findings

### Prescription drugs—generic fill rate

Since 2005 our "Choose Generics" campaign for prescription drugs reflects a 10-point increase (from 54 percent to 64 percent by the end of first quarter, 2008) in the rate of employees and family members choose the lower cost – but equally effective—generic prescriptions, saving millions annually. The goal, recommended by the county's pharmacy benefit manager vendor, is to achieve at least 70 percent generic fill rate.

Figure 35



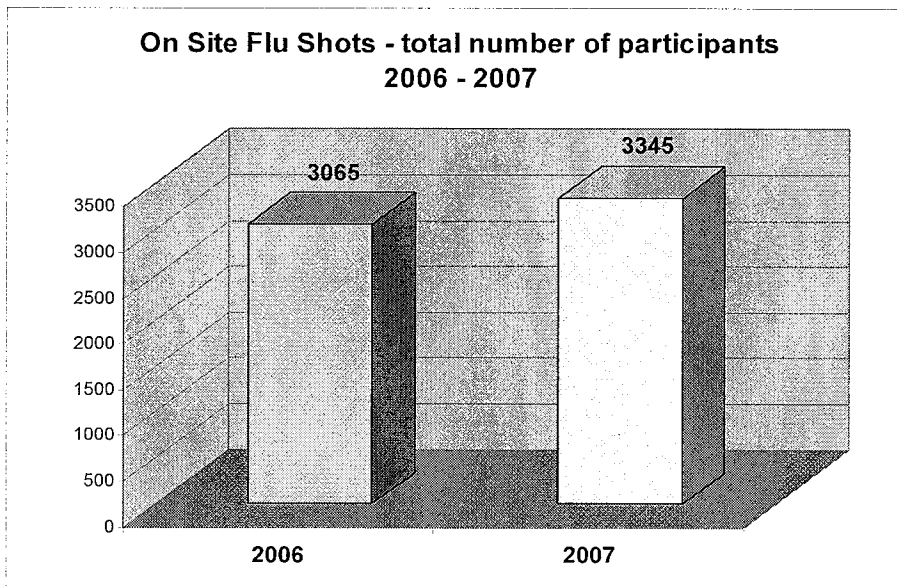
The average generic drug is significantly less expensive than the average brand-name drug—Express Scripts reports that in 2007 the average cost per generic prescription was \$10.00 at retail and the average cost of brand name drug per prescription was \$114.25.

Every 1.0 percent increase in generic utilization saves 1.25 percent on the total plan cost. In 2007, prescription costs (KingCare<sup>SM</sup>) were \$5.2 million less than what would have been charged had the generic fill rate stayed at the 2003 level of 47 percent (baseline).

**Flu shots at work**

The benefits of flu shots to both the individual and the employer are well documented and include substantial reduction in respiratory infection, doctor visits and absenteeism rates. For these reasons the county actively encourages members to get annual flu shots, which are covered in full by the health plans. Last year 3,345 employees—33 percent of our targeted workforce—turned out at worksites across King County to receive no-charge flu shots (a 3 percent increase over 2006).

Figure 36  
**On-site Flu Shots**



Looking at flu shots for the entire population, more than 56 percent of employees and their spouses/domestic partners reported in the wellness assessment that they received a flu shot in 2007, up from 53 percent in 2006 and 48 percent in 2005. Despite the sustained improvement, a question remains: why aren't more people getting no-charge flu shots at the worksite? This question is especially important as the cost of flu shots is fully covered by our health plans, and as employees rate on-site flu shots as highest in usefulness of all HRI workplace programs (see below).

One limitation to increasing participation in annual flu shot is the difficulty of holding on-site clinics at over 156 separate county worksites at times to accommodate 24-hour shifts. Another hurdle may be more telling: the persistent misconceptions held throughout the general population about the effectiveness and safety of the shots. A recent study of healthcare workers in the U.S. – a group presumably pre-disposed to understanding the importance and benefits of immunization for themselves and their patients – shows a national vaccination rate of only about 40 percent. Among the most

common barriers cited to acceptance of the shots were: fear of side affects, fear of getting the flu, and convenience.<sup>31</sup>

### **Weight Watchers at Work<sup>®</sup>**

Weight Watchers at Work<sup>®</sup> has established regular sessions at workplace locations throughout King County. Since the program began in 2006, 1,175 participants have together shed more than 10,300 pounds, an average drop of 8 pounds per 13-week

session. According to several prominent studies, a weight loss of five to 10 percent can measurably improve health outcomes.<sup>3233</sup>

Sherriff's Office detective Jessica Cline relied on her family, her co-workers and Weight Watchers at Work<sup>®</sup> to build a community of wellness that has helped her shed 68 pounds.

*"We're all on the same path"*



### **Surveys of employees and their managers**

Each year the HRI conducts a survey of employees to gather their opinions about the current state of the HRI. The survey is conducted by a third party consultant and is conducted on-line, with an option to complete the questionnaire on paper. A sample group of 1,069 participants was selected through a stratified random sample containing at least one randomly selected employee from each bargaining unit and a random sample of non-represented employee. A total of 439 surveys were completed. A summary of notable results and analysis follows:

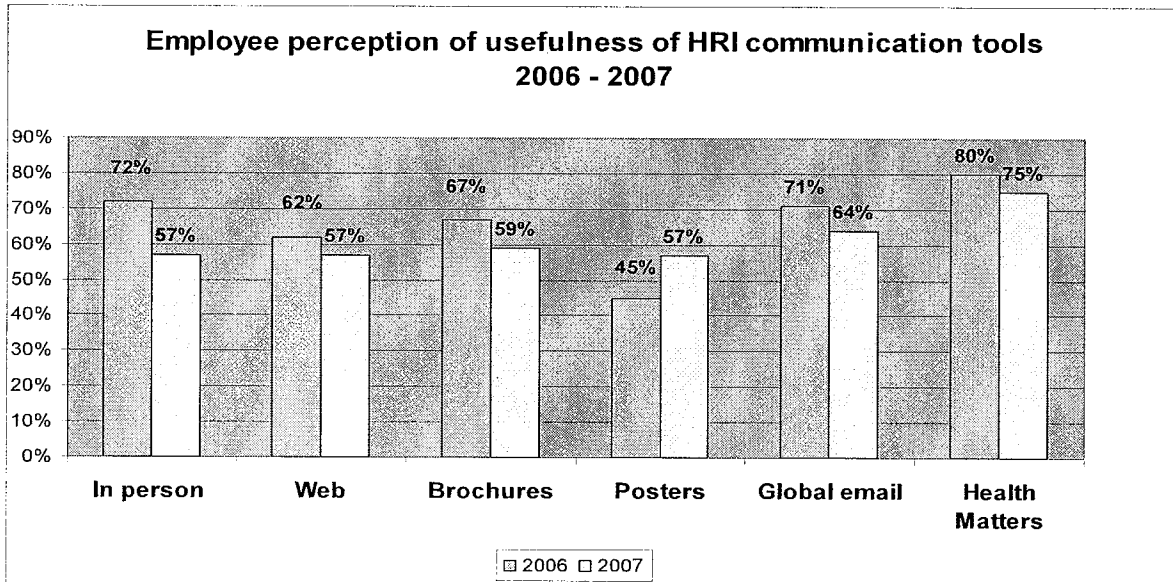
#### ***Employee perception of usefulness and effectiveness of HRI communication tools:***

An important factor in the success of the HRI is effective communication with employees. Annual communications plans are developed to ensure messages are timed and coordinated to support all three levels of the HRI effort.

Employees responding to the HRI survey found all six HRI communication vehicles (in-person presentations, HRI webpage, brochures, posters, global email, and *Health Matters* newsletter) useful or extremely useful (on a scale from 1 to 5, 1 being "not useful at all" and 5 meaning "extremely useful," the respondent scored the item 3, 4 or 5) These survey findings are similar to the survey results from 2006, though they do show a small drop in the perceived usefulness of the most popular communication methods (email and newsletter), while posters showed an increase.



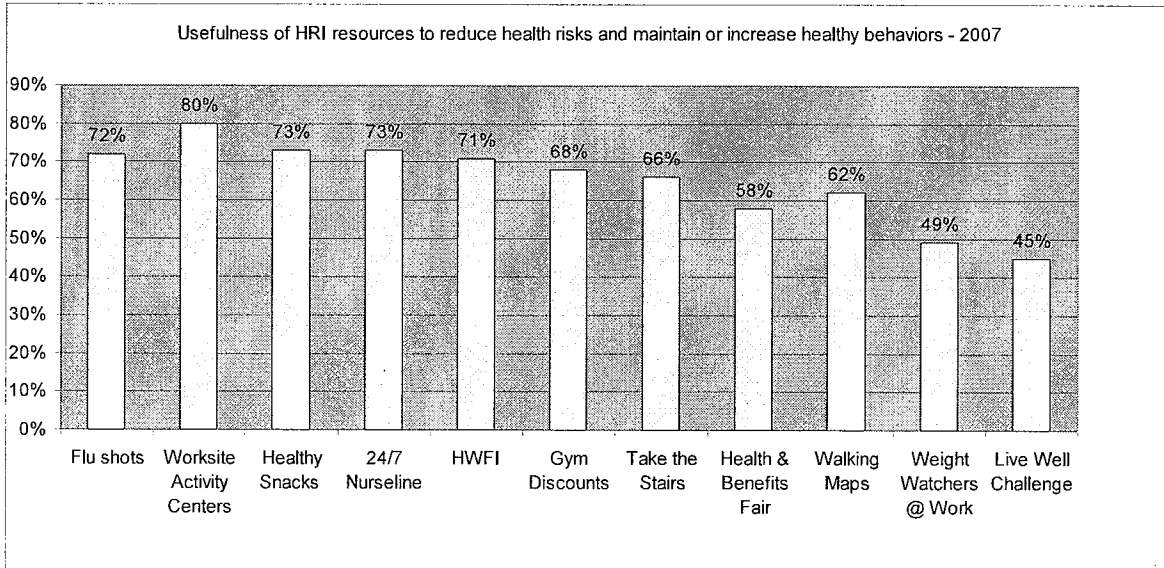
Figure 37  
**Employee Perception of HRI Communication Tools**



The ways of receiving information about the HRI that employees rated most effective were (1) US Mail to home and (2) email at work. All information vehicles about the HRI were rated “extremely useful” or “extremely effective” by some, and “not at all” by others. For instance: employees who do not have Internet access at work rated bulletin boards at work as significantly more effective than did employees with Internet access.

**Employee awareness of workplace programs to reduce health risks and encourage healthy behavior:** All eleven of the major programs offered by KCHRI were rated in the 2007 employee survey – the first time employees were asked to rate each program. “Flu shots at work” and “Worksite Activity Centers (gyms)” were rated highest (70 + percent scoring each a “4 or “5”). Healthy snacks in vending machines, 24/7Nurse line, the Healthy Workplace Funding Initiative and gym discounts were rated “useful” or “extremely useful” by over 50 percent of employees. Figure 38 shows the results for each program, sorted to reflect scores of “3” or above.

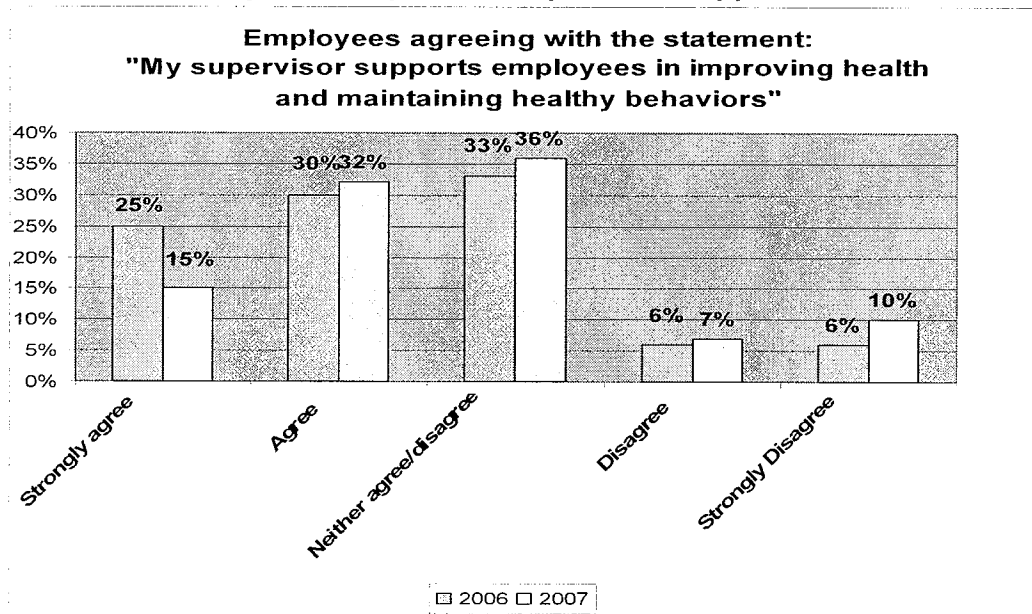
Figure 38  
**Employee Perception of Usefulness of HRI Resources**



Even the lowest-rated resource -- Live Well Challenge -- was rated "4" or "5" by over one fourth of the employees.

**Employee agreement that their supervisor supports health and maintaining health behaviors in the workplace:** Forty-seven percent – less than half of the employees surveyed -- indicated their supervisor supports employees in improving health and maintaining healthy behaviors; a seven-point drop from the 2006 survey.

Figure 39  
**Employee Perception of Supervisor Support for HRI**



***Employees want access to more information on health and quality of care:***

Although employees indicated that the most helpful source of information about medical and health-related topics is “your doctor or other health care provider” (80 percent), they also expressed strong interest in receiving information about “ratings of the quality of local hospitals” (68 percent) and “ratings of the quality of local health care providers” (67 percent). Sixty percent of the employees said they “definitely” or “probably” would use “Reminders about medical tests recommended for people your age/gender if the HRI were to make them available.”

## Conclusions

Both internal and independent evaluations of the HRI program confirm that the HRI uses accepted best practices in creating and sustaining a supportive environment for the promotion of healthy behaviors and smarter health care choices. The high participation rates in both the wellness assessment and individual action plan functions of the Healthy Incentives<sup>SM</sup> benefit program are intricately linked to the education and outreach aspects of the Supportive Environment program. The results from surveys of employees, managers and supervisors demonstrate that the tools and resources are well-known and regularly used (including a dramatic increase in the utilization of the Healthy Workplace Funding Initiative). While the county is making progress towards creating a truly healthy workplace, the perception of the usefulness of some these efforts (newsletter, email etc.) appears to have leveled off or slightly declined. The drop to less than 50 percent of employees reporting that their supervisors are supportive of the HRI is troubling, requiring further investigation and corrective action.

## Challenges and Opportunities

While most of the measured indicators show that the resources and tools provided employees and managers are very useful and appropriate, challenges and opportunities remain.

***Choose Generics:*** By first quarter of 2008, the HRI had achieved a 63.9 percent generic fill rate, representing a substantial positive shift in employees choosing chemically equivalent generics over brand name since program inception. However, our ability to attain the 70 percent goal appears out of reach without substantive changes in plan design. Devising a strategy for encouraging employees and their families to examine the benefits of *therapeutically* equivalent generics (as opposed to *chemically* equivalent generics) will be essential to meeting the target generic fill rate.

***Improved consumer tools:*** King County’s high level of participation, our strong interest in getting more information on the quality of care, combined with the introduction of new health information resources, presents the HRI with a new opportunity to implement a new set of “wise consumer” tools. Some of these tools include the ongoing medical comparison reports now available from the Puget Sound Health Alliance (see following section); as well as powerful online search and personal

health record (PHR) functionality being offered by our plan providers. All of which holds the promise of elevating the engagement of our employees and their families, thereby improving health outcomes and controlling costs.

**Organizational alignment:** The Health Promotion Leadership Committee's success in helping to raise significantly the participation rate for the Health Workplace Funding Initiative and the Health Leadership Forum demonstrates an opportunity for enhancing participation in other aspects of the supportive environment including the flu shot campaign, Live Well Challenge, Weight Watchers at Work®, encouraging the uses of online health tools and other established best practices for the workplace.

## Next Steps for Supportive Environment

**Online consumer tools campaign:** Beginning in 2008 HRI has implemented an online tools communication plan in conjunction with our plan providers with the goal of increasing the use of powerful new consumer tools provided through Aetna's "Navigator" and "SmartSource" websites, Group Health's "MyGroupHealth" site, ESI's website and the Community Checkup Report from the Puget Sound Health Alliance. Employees will be encouraged to "Logon and Learn" via a high-visibility, collaborative outreach strategy with our vendors that includes e-mail, newsletters, posters and live demonstrations at key health-related events (see next item).

**Enhanced flu shot/preventative screening/online tools campaign:** In the fall of 2008, King County's on site flu shot program will be expanded to cover more employees (3,500) and enhanced (depending on grant funds) to provide screening for at-risk conditions (i.e. blood pressure, blood glucose, cholesterol, etc.); general health and benefits information (BROS); and access to online health tools (Aetna, Group Health and others).

**Adoption of department-wide and worksite health participation goals:** The Health Promotion Leadership Committee in 2008 begins encouraging department-wide and worksite-specific health awareness activities and policies including encouraging participation in the flu shot campaign, Live Well Challenge, Weight Watchers at Work®, online health tools and other established workplace best practices.

**Expand and enhance Healthy Vending Machine Program:** Keying off the success of the pilot testing price differentials between healthy and less healthy snacks, the vendor (Local Vending Services, Inc.) will expand this concept to all dry goods machines they manage at King County facilities. HRI staff will continue to work with all vendors to expand healthy choices to more King County worksite locations.

## Chapter 4—Puget Sound Health Alliance



Co-founded by King County in late 2004, the non-profit Puget Sound Health Alliance (Alliance) seeks to influence the external (supply side) factors affecting the health care economy of Puget Sound region. Alliance membership today includes more than 170 organizations and professionals (business, government, unions, hospitals, physicians, health plans and administrators, non-profits, etc.) representing more than 1.6 million insured people across a five-county region. Member organizations range in size from single-practice physician offices to major hospitals and clinics, Starbucks, REI, WaMu, Boeing, the State of Washington and many more.

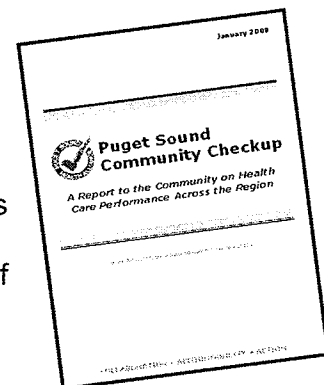
Alliance areas of concentration include:

- **Producing comparison reports** (“Community Checkup”) on the quality of care provided by local clinics and hospitals.
- **Promoting the use of evidence-based medicine and treatment guidelines** for health care professionals to use in treating patients.
- **Providing useful information to help guide health care decision-making** for patients, employers and the medical community.
- **Encouraging collaboration to align incentives** that break down barriers and promote value, which rewards cost effectiveness and quality.

Using an evidence-based clinical improvement framework developed by teams of local medical experts and other community leaders, the Alliance in 2007 implemented the major pieces of their broad-based strategy to improve the quality and value of health care provided in this region.

### Community Checkup

After creating the most comprehensive database ever amassed for the region, the Alliance published the first Community Checkup report measuring care provided at 14 major clinics systems (more than 80 clinic locations) in the region. Published in early 2008 the Checkup measured 21 types of care provided to patients in the areas of diabetes, heart disease, depression, low back pain, use of generic drugs, use of antibiotics and prevention. The report creates a baseline for understanding aspects of local health care; the kind of information that patients and their doctors need to make better



informed health care choices and to drive a higher-quality, more affordable health care system.

The results demonstrate that everyone has room to improve, more in some areas of care than in others. For example:

- Across the region, about 20 percent of patients diagnosed with heart disease or diabetes did not have their cholesterol checked at least once.
- Only about 40 percent of patients taking a drug to lower cholesterol filled the prescription with a generic drug that, for most patients, offers the same therapeutic effect at a lower cost.
- On the upside, more than 90 percent of children seen for the common cold were *not* given an unnecessary antibiotic.

Subsequent Community Checkup reports (the next is due in the fall) will be expanded to include more clinics, as well as comparisons of hospital care. New areas of focus include heart care, pneumonia, and surgical care. Eventually the vision is to also address hospital acquired infections, patient safety, and patient experience. As well, future Community Checkup reports, starting in 2009, will include measures on efficiency.

## **eValue8**

eValue8 is a program of the National Business Coalition on Health (NBCH) that allows employers and other health care purchasers to evaluate and compare health plans based on national guidelines and standards.

This year the Alliance brought together 10 major purchasers in our region -- including King County, Boeing, WaMu, and the Washington State Health Care Authority -- to conduct site visits with six major health plans in this state. Based on the comparison data, purchasers selected targeted areas for health plans to improve including benefit design and reimbursement to promote value, and using information from claims to identify and act upon gaps in care for chronic disease and preventive screening.

## **Other Studies and Reports**

- Since 2005, the Alliance has published comprehensive Clinical Improvement Team reports with focused recommendations for providers, patients, purchasers and health plans to align incentives and promote evidence-based activities. In 2007 the Alliance published a Clinical Improvement Team report on prevention. Areas of emphasis include physical activity and nutrition, tobacco use, the use of aspirin to reduce the risk of cardiovascular problems, colorectal cancer screening, influenza immunizations, and childhood immunizations.

- This year, the Alliance conducted a baseline survey on health benefits and workplace wellness practices among employer members of the Alliance to enable assessment of whether recommendations are being adopted and incentives are being aligned to produce results.
- The Alliance has created an action plan for short-term and long-term ways to improve health care affordability, which will drive key focus areas of the Alliance in the latter half of 2008 and 2009. The cost control strategies were developed by a work group consisting of decision-makers from major employers, doctors, hospitals and health plans.
- Resources have been added to the Alliance website to help patients find high quality, user-friendly health information, and to help doctors and other health care providers talk with patients.

## **Challenges and Opportunities**

As spelled out in the initial report from the Health Advisory Task Force, sustaining health reform for the long-term requires systemic changes across the spectrum of the health care industry in our region; from changing behaviors with the individual to reforming the way medicine is practiced and administered to the entirety of the region's population

## **Next steps**

Over the next two years, King County will actively support new Alliance initiatives in several areas identified by independent studies as critical to improving the overall quality and value of care in our region:

- Curbing avoidable hospital readmissions.
- Reducing hospital acquired infections.
- Increasing the use of generic prescription drugs.
- Collaborating with purchasers, payers and providers to produce comparative reporting on efficiency across episodes of care and greater price transparency.
- Investigating new approaches to pay providers (payment reform) based on strategies that promote prevention, wellness, proactive care for patients with chronic conditions like diabetes and heart disease, and better health outcomes, as opposed to the current "fee-for-service" model which financially rewards providing more diagnostic and procedural services (sometimes irrespective of efficacy or outcomes).

## Chapter 5—Summary

### Conclusions

In 2007, all planned components for the Healthy Incentives<sup>SM</sup> benefit plan design were in place—wellness assessment, individual action plans, and bronze, silver and gold out-of-pocket expense level plans.

**Healthy Incentives<sup>SM</sup> plan design:** Participation in the Healthy Incentives<sup>SM</sup> program continues to be strong with around 90 percent of eligible employees and spouses/domestic partners taking the wellness assessment and completing individual action plans each year 2006 through 2008.

The HRI is having a positive impact on almost all measured self-reported risks for the period 2006 – 2008. However the rate of improvement of risks was less in 2007 to 2008 than it was in 2006 to 2007. Special effort will be needed to increase physical activity and reduce the level of blood glucose in the population.

It is not clear as to whether changes in health behavior affected the utilization of health care for conditions directly affected by that behavior. Obesity, lack of exercise, and poor nutrition have consistently been the greatest lifestyle contributors to health care costs and utilization over time. Claims costs and utilization of health care services for lifestyle-related conditions remained almost unchanged 2002 – 2004. In 2005 the county introduced the four Aetna care management pilot programs to identify members with chronic conditions and encourage them to become more active participants in treatment and management of their conditions. Although these programs are intended to reduce health care costs in the long term, it is conceivable that in the short term they may cause an increase in health care utilization by encouraging members who have been unaware of or were ignoring a health condition to seek medical attention. There is at least an apparent increase in both the costs and numbers of members getting treatment for lifestyle-related conditions in 2005. However, the HRI does not yet have data to indicate if there is any actual correlation between this increase and the introduction of any of the care management programs.

The results from the absenteeism reported for the prior 30 days and the results reported for the prior 12 months are inconsistent. The HRI will need to wait for another year of data to determine whether there is a positive or negative pattern observed. It would have been helpful to have a normative reference group to see what absenteeism patterns have been over the past three years for other employers in the Puget Sound region. However, the HRI has been unsuccessful in locating another employer willing to share data for such a study. Therefore the absenteeism results have been analyzed on a pretest/posttest basis without a comparison group, and no conclusions about absenteeism can yet be drawn. The presenteeism results provide a baseline for future study about the effect of the HRI on reducing the effects of poor health on productivity.

Year-over-year cost growth for the county for medical and prescription drug claims in the KingCare<sup>SM</sup> plan for 2007 was 6.4 percent, a significant decrease from the over ten



percent year-over-year increase seen in 2004 – 2006. (A similar analysis for the Group Health plan has not been completed.) One factor contributing significantly to the lower overall cost growth is a steady increase in the numbers of members in the KingCare<sup>SM</sup> plan that choose generics over brand name drugs. The numbers of employees achieving the bronze and silver level plans (with higher out-of-pocket expenses) were far below projections because a very large majority chose to complete the wellness assessment and individual action plan. The HRI needs to more fully analyze the actual amount of cost shifted to members who are in the silver and bronze level plans as compared to members in the gold level plan. Not shown in the numbers reported in this section is the approximately \$1.6 million that came into the benefits fund as revenue from the benefit access fee. It is still too early to say whether the 6.4 percent year-over-year cost growth seen in the 2007 KingCare<sup>SM</sup> is a one-time event or the beginning of a moderation in the long term cost trend.

As a result of the analysis conducted for the Second Annual HRI report, the county made a number of changes in the five pilot programs (Informed Health Line®, disease management, MedQuery®, Enhanced Member Outreach<sup>SM</sup> and Aexcel®) purchased from Aetna. Because these changes occurred mid-year in 2007, it is not yet possible to determine a return on investment for 2007.

Finally, the cost of the HRI continues to be in the appropriate range for effective employer health and productivity management programs.

**Supportive Environment:** In terms of creating a supportive environment, both internal and independent evaluations of the HRI demonstrate that the program is in compliance with the accepted best practices. The extremely high participation rates in both the wellness assessment and individual action plan functions of the Healthy Incentives<sup>SM</sup> benefit program are intricately linked to the education and outreach aspects of the Supportive Environment program. The results from surveys of employees, managers and supervisors demonstrate that the tools and resources are well-known and regularly used (including a dramatic increase in the utilization of the Healthy Workplace Funding Initiative). While the county is making progress towards creating a truly healthy workplace, the perception of the usefulness of some these efforts (newsletter, email etc.) appears to have leveled off or slightly declined.

**Puget Sound Health Alliance:** With the release of the Community Checkup, initiation of the eValue8 process, and the publishing of clinical guidelines in support of improving the quality and efficacy of care, the Puget Sound Health Alliance has reached a new level of engagement and influence on the “supply side” of the health care equation.

## Challenges and Opportunities

It is very hard to make lasting lifestyle changes, and even harder to add new gains onto earlier gains. HRI staff will need to work with vendors to keep the wellness assessment and individual action plan programs fresh, inviting and effective for members over time. Outreach to spouses/domestic partners will be especially critical. Two risk factors that will need special attention are physical activity and managing blood glucose. Another challenge is making sure employees and their families “know their numbers”—that is, know their percentage of body fat, total cholesterol, blood glucose measurement and their systolic and diastolic blood pressure. Results from the self reported data indicate that 40 percent to 80 percent do not know their level of risk on these important indicators of overall health.

While most of the measured indicators show that the resources and tools provided employees and managers are very useful and appropriate, challenges and opportunities remain. Continued emphasis to “Choose Generics” is critical—increase in use of generics has been a key moderating factor in the apparent slowing of health care cost trends seen so far. Our Pharmacy Benefit Manager, Express Scripts, says that 80 percent generic utilization is optimal. The county is currently at 63.9 percent. Members are already choosing *chemically* equivalent generics more than 98 percent of the time when they are available. Increase in generic fill rate will only come when more members are using *therapeutically* equivalent drugs (drugs in the same therapy class—e.g. antidepressants—that have similar effects but are not chemically identical). This will require extensive education to help members and their providers feel comfortable with this next level of change. Visiting providers to educate them about use of therapeutically equivalent generics by health plans and “wise consumer” tools for members will help.

Finally, as spelled out in the initial report from the Health Advisory Task Force sustaining health reform for the long-term requires systemic changes across the spectrum of the health care industry in our region; from changing behaviors with the individual to reforming the way medicine is practiced and administered to the entirety of the region’s population.

## Next Steps

The HRI is already working on gathering feedback from employees and their spouses/domestic partners about changes in the Healthy Incentives<sup>SM</sup> program that will keep members interested and engaged. Efforts are underway to add more diversity to the kinds of activities available for individual action plans and to tailor options to better meet individual member needs. The HRI is also looking to making better use of on-line tools to support and reinforce member efforts to build and sustain better health-related habits, and to guide members through successful program completion. Because small hassles often equal big barriers to action, HRI staff is looking for ways that keep program administrative processes for members at a minimum. Beyond helping members make lifestyle behavior changes, the HRI will need to add more features that will 1) actively use data warehouse and data mining techniques to look for patterns and

opportunities to improve health and health care; 2) make optimal use of technology—personal health records, tailored disease management information, home monitoring of conditions, e-consulting, leveraging bank transaction models for provider transactions; and 3) provide consumer-friendly cost and quality data from a trusted outside source.

In order to support these plan design changes, the HRI will need to conduct a major education campaign for employees and their families aimed at increasing the use of powerful new consumer tools provided through Aetna's "Navigator" and "SmartSource" websites, and Group Health's "MyGroupHealth" site. Employees will be encouraged to "Logon and Learn" via a high-visibility, collaborative outreach strategy with our vendors that includes e-mail, newsletters, posters and live demonstrations at key health-related events. The HRI will also expand the county's on-site flu shot program and will seek a grant to provide on-site screening for blood pressure, cholesterol, and blood glucose risk. The HRI, in conjunction with the Health Promotion Leadership Committee, will assist departments and worksites to provide access for all employees to on-line consumer tools, and encourage increased participation in on-site health promotion and wellness activities.

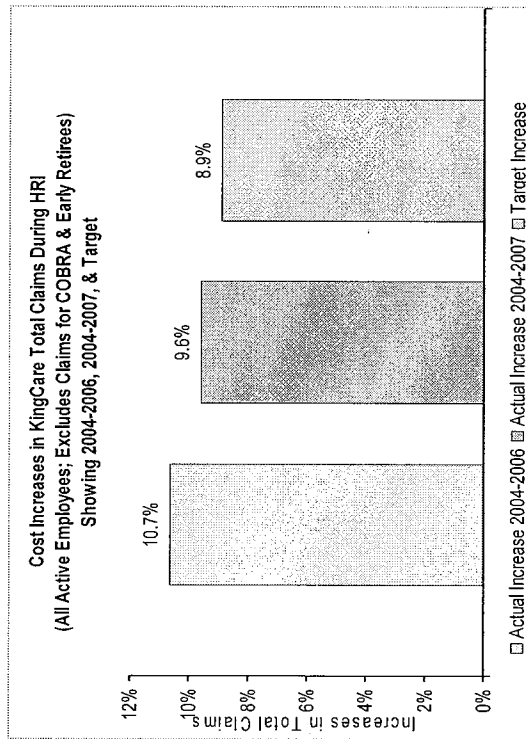
In 2008/2009 King County will actively support new Alliance initiatives in several areas identified by independent studies as critical to improving the overall quality of care in our region. These initiatives include: 1) curbing avoidable hospital readmissions; 2) reducing hospital acquired infections, and 3) increasing the use of generic prescription drugs; 4) piloting new approaches to pay providers based on quality of care and efficient use of resources.

# Appendix A

## 2007 Results for Measures Adopted in Council Motion 12479

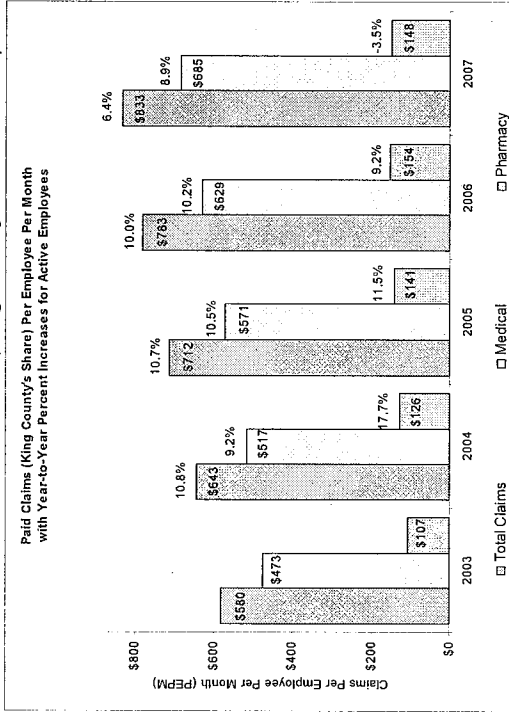
Change in trend in King County's overall incurred medical and Rx drug costs compared to forecast from 2002-2004 trends.

Cost Increase in King County's Portion of KingCare<sup>SM</sup> Claims



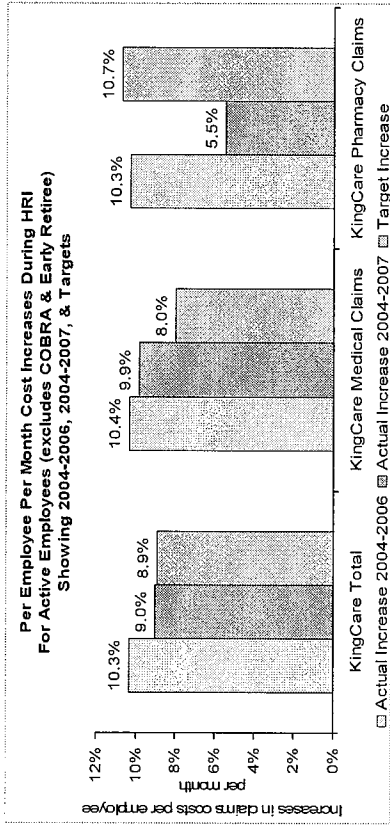
Looking at this same information on a year-over-year basis shows a 6.4 percent increase in 2007, down from the average 10+ percent increase in 2004 through 2006.

Year-Over-Year Increases in Claims (King County's Share Alone) PEPM



The HRI financial targets, as described in previous HRI Measurement and Evaluation reports, are to achieve an 8.9 percent average annual growth in total costs with 8.0 percent growth for medical only and 10.7 percent for pharmacy only. The HRI targets are for average year-over-year growth rates, allowing that some years will experience above average growth and some below average growth. This chart shows that the 2004-2007 trend appears to be moderating.

Year over year progress in achieving 1/3 off trend in King County's medical and Rx cost per employee per month on an incurred basis.



Average annual cost growth per employee per month (PEPM) in 2004-2006 was 10.3 percent. 2004-2007 growth (9.0 percent) is very close to the target (8.9 percent). The average for 2004-2007 is brought down from previous experience to 9.0 percent by a 6.4 percent growth from 2006 to 2007.

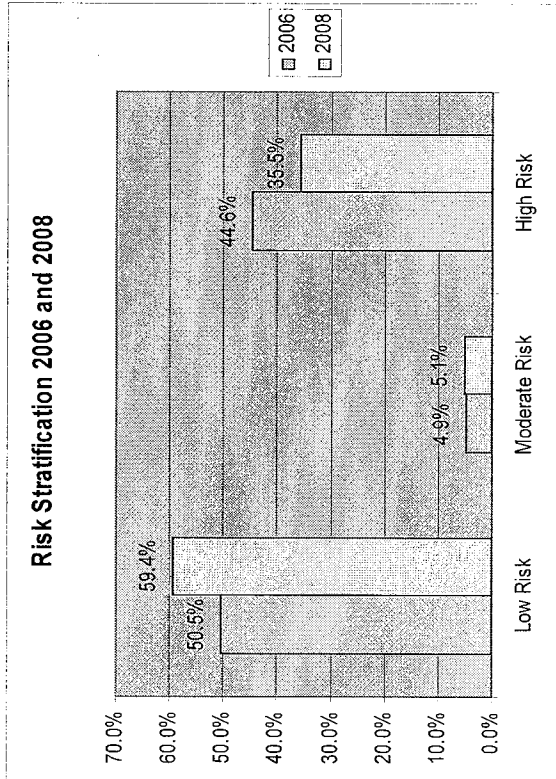
Cost-benefit for each of the six program interventions in the business case:

- Nurse advice line
- Disease management
- Case management
- Provider best practice
- High performance specialty network
- Wellness assessment and individual action plan.

As a result of the analysis conducted for the Second Annual HRI Measurement and Evaluation Report, the county made a number of changes mid-2007 in the five pilot programs purchased from Aetna. Because these changes occurred mid-year, it is not yet possible to determine a return on investment for 2007.

Change in group risk profile for employees and spouses/domestic partner from 2006 to 2008 as measured by the wellness assessment.

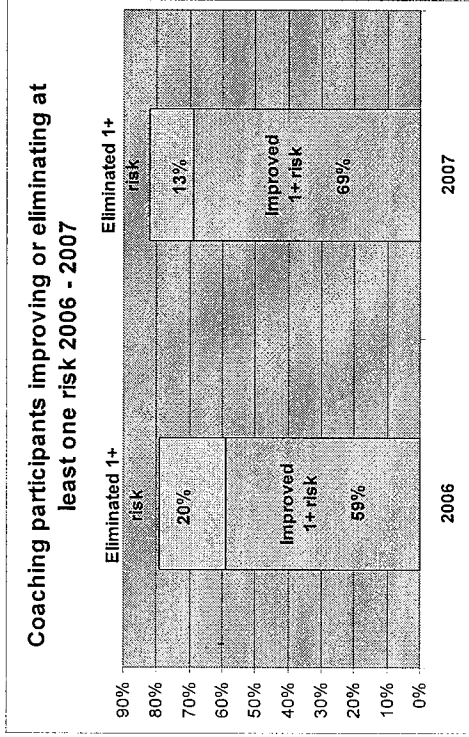
Changes in Percent of Members Achieving Low Risk



The percentage of members at low risk in 2008 has increased just under nine percentage points over 2006 (59.4 percent in 2006 compared to 50.5 percent in 2006.) The number at moderate risk increased slightly, and likewise the number at higher risk decreased by just under nine percent (44.8 percent in 2006 compared to 35.5 percent in 2008.)

Change in the number of coaching participants reporting improvement in or elimination of one or more risks.

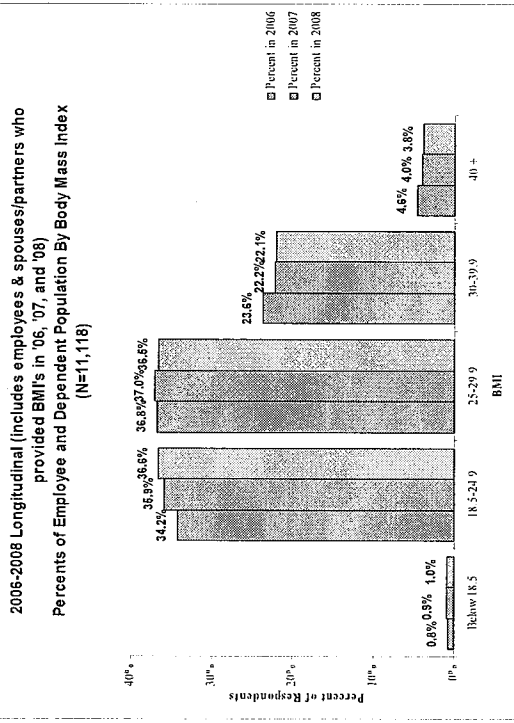
Year-Over-Year Improvement of Risks for Coaching Participants



In 2006, 59 percent of members with moderate and high levels of risk reported to their coaches that they improved at least one risk, and an additional 20 percent reported they eliminated one or more risks. In 2007, 69 percent reported to their coaches they improved at least one risk, and an additional 13 percent reported they eliminated one or more risks.

Change in self-reported body mass index 2006 to 2008 for employees and spouse/domestic partners as measured by the wellness assessment.

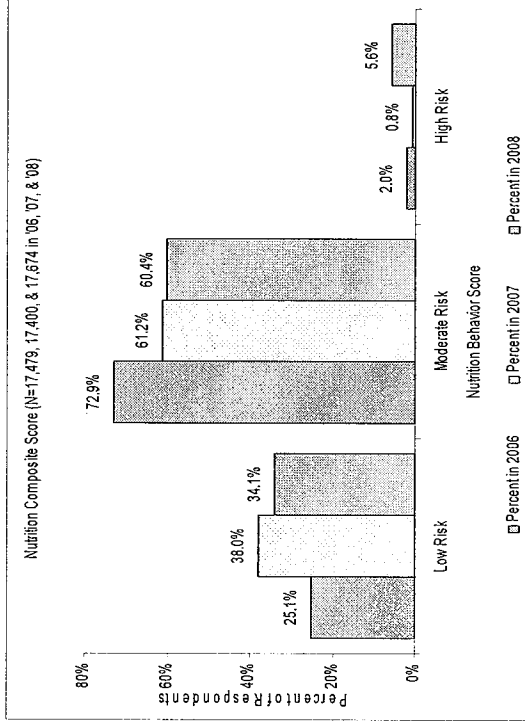
**Year-Over-Year Change in BMI 2006-2008**



The recommended standard for body mass index (BMI) is between 18.5 and 25. In 2006, 34.2 percent of people who took the wellness assessment were in this range. The portion in the range rose to 35.9 percent in 2007 and 36.6 percent in 2008.

Change in self-reported nutrition patterns 2006 to 2008 for employees and spouse/domestic partners as measured by the wellness assessment.

**Year-Over-Year change in Nutrition Behavior 2006-2008**



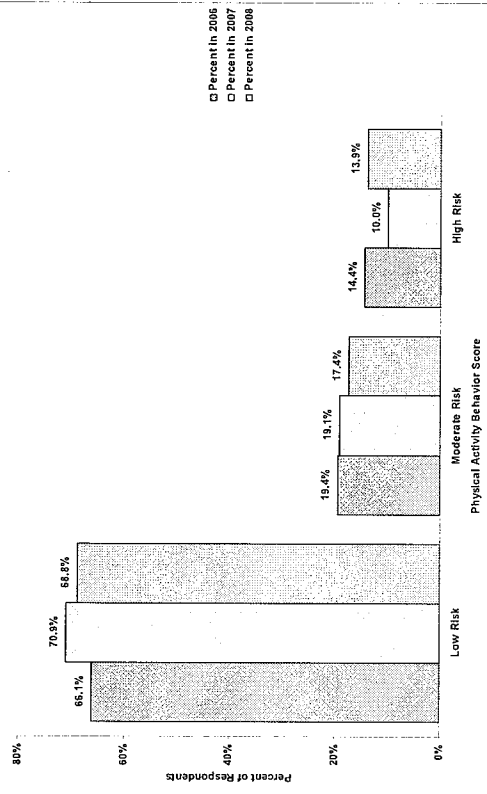
Between 2006 and 2007 the percent of people who took the wellness assessment reporting low risk for nutrition rose from 25.0 percent to 39.0 percent. In 2008, 34.3 percent reported low risk nutrition behaviors.

**Change in self-reported amount of exercise 2006 to 2008 for employees and spouses/domestic partners as measured by the wellness assessment.**

**Year-Over-Year Change in Physical Activity Behavior**

2006-2008 Longitudinal (includes all employees & spouses/partners who provided full nutrition answers in all three wellness assessments ~ 2006, 2007, and 2008)

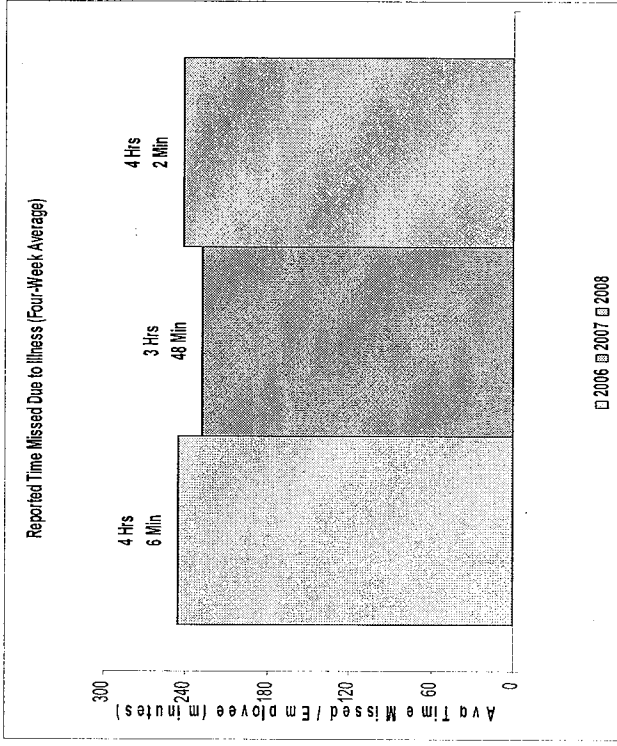
Physical Activity Behavior Composite Score (N=8,448)



Between 2006 and 2007 the percent of people who took the wellness assessment reporting a level of physical activity that puts them at low risk for exercise rose from 66.1 percent to 70.9 percent. In 2008 the portion dropped slightly to 68.8 percent.

**Change in self-reported absence for employees due to illness 2006 to 2008 as measured by the wellness assessment.**

**Self-Reported Time Missed Due to Illness in the Past Four Weeks**

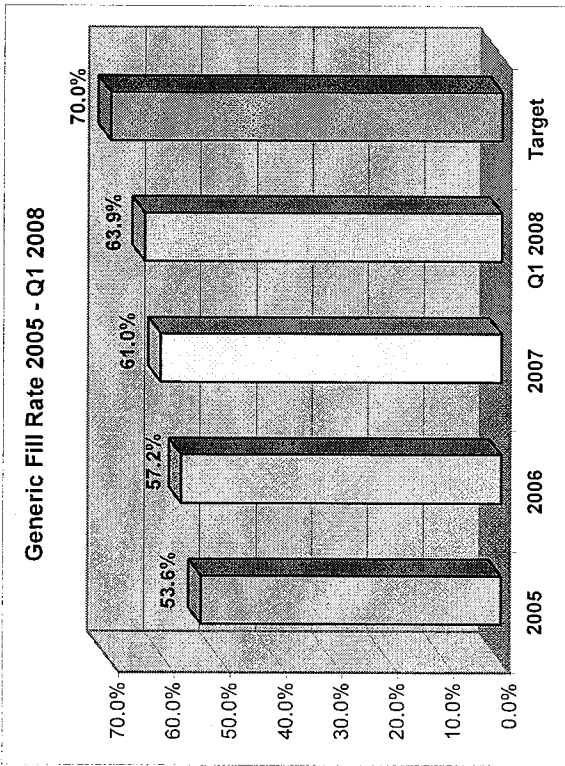


Among employees who reported health-related absences occurring in the 30 days immediately prior to taking the wellness assessment there was on average a 20-minute drop in reported absences between 2006 and 2007 and a 14-minute rise from 2007 to 2008.



**Change in generic prescription rate in 2005 to 2007.**

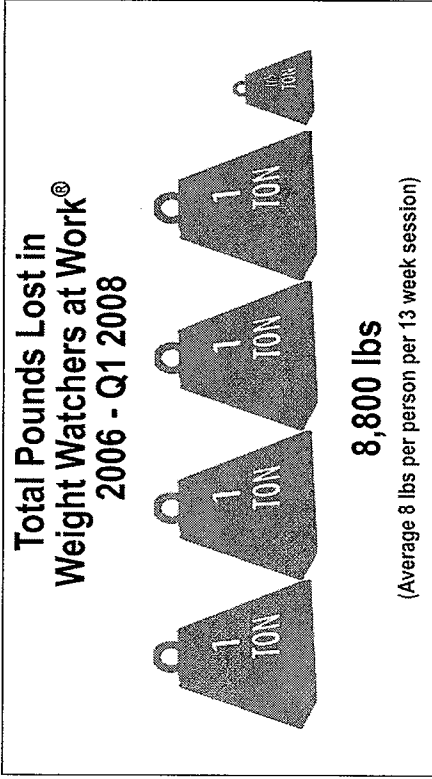
**Year-Over-Year Change in Generic Fill Rate**



Since 2005 our "Choose Generics" campaign for prescription drugs reflects a 10-point increase (from 54 percent to 64 percent by the end of first quarter, 2008) in the rate employees and family members choose the lower cost – but equally effective—generic prescriptions, saving millions annually. The goal, recommended by the county's pharmacy benefit manager vendor, is to achieve at least 70 percent generic fill rate.

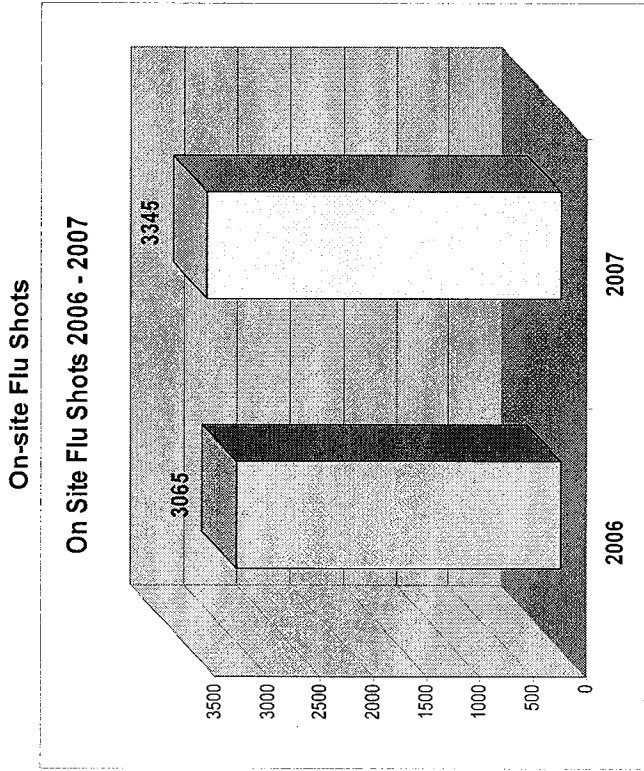
**Number of and total pounds lost by employees through Weight Watchers at Work® program 2006 to 2008.**

**Pounds Lost**



Weight Watchers at Work® has established regular sessions at workplace locations throughout King County. Since the program began in 2006, 1,175 participants have together shed more than 8,800 pounds, an average drop of 8 pounds per 13-week session. According to several prominent studies, a weight loss of five to 10 percent can measurably improve health outcomes.

Number and percent of employees receiving flu shots at work 2005 to 2007.

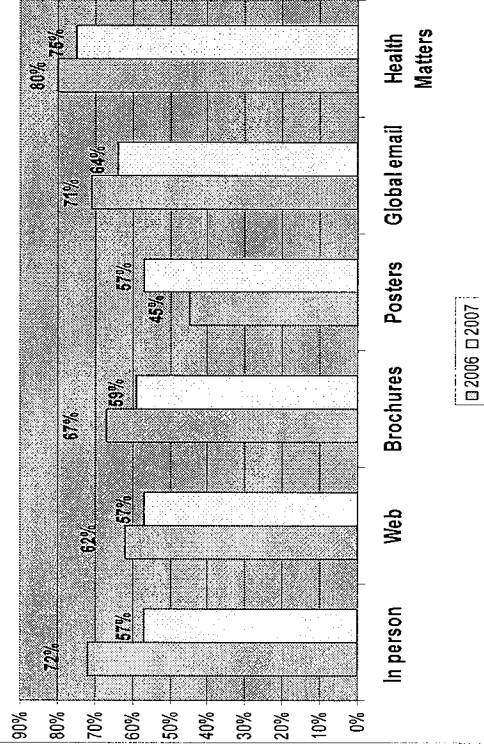


The benefits of flu shots to both the individual and the employer are well documented and include substantial reduction in respiratory infection, doctor visits and absenteeism rates. For these reasons the county actively encourages members to get annual flu shots, which are covered in full by the health plans. Last year 3,345 employees—33 percent of our targeted workforce—turned out at worksites across King County to receive no-charge flu shots (a 3 percent increase over 2006).

Self reported employee perception of usefulness and effectiveness of HRI communication tools in 2007.

Employee Perception of HRI Communication Tools

Employee perception of usefulness of HRI communication tools 2006 - 2007

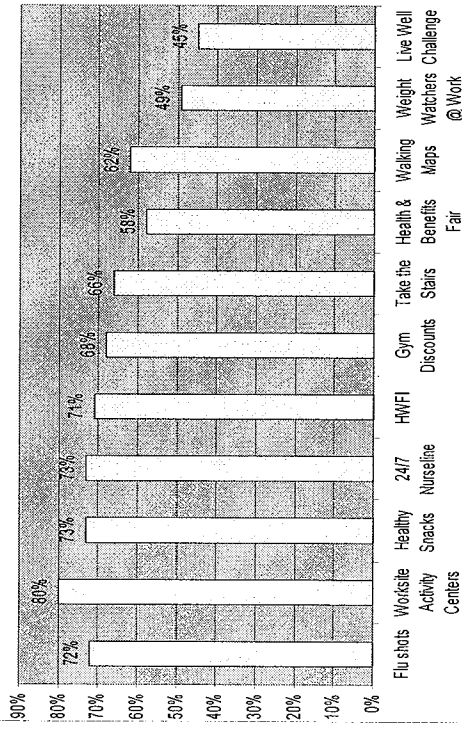


Employees responding to the HRI survey found all six HRI communication vehicles (in-person presentations, HRI webpage, brochures, posters, global email, and *Health Matters* newsletter) useful or extremely useful (on a scale from 1 to 5, 1 being "not useful at all" and 5 meaning "extremely useful," the respondent scored the item 3, 4 or 5). These survey findings are similar to the survey results from 2006, though they do show a small drop in the perceived usefulness of the most popular communication methods (email and newsletter), while posters showed an increase.

Self-reported levels of employee awareness of resources available through King County to reduce personal health risks and maintain or increase health behaviors in 2007.

**Employee Perception of Usefulness of HRI Resources**

Usefulness of HRI resources to reduce health risks and maintain or increase healthy behaviors - 2007

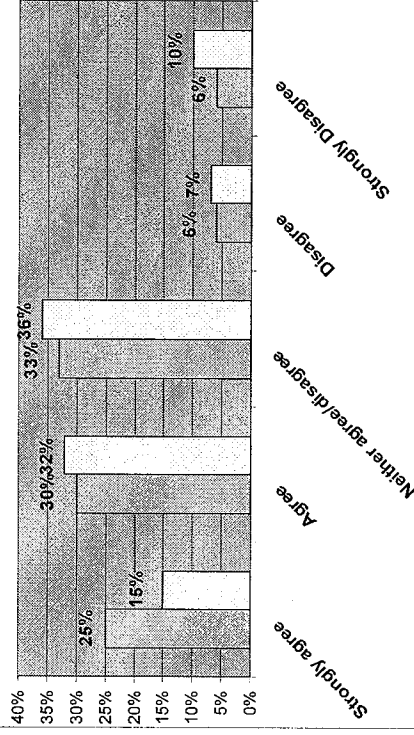


All eleven of the major programs offered by KCHRI were rated in the 2007 employee survey – the first time employees were asked to rate each program. “Flu shots at work” and “Worksite Activity Centers (gyms)” were rated highest (70 + percent scoring each a “4” or “5”). Healthy snacks in vending machines, 24/7 Nurse line, the Healthy Workplace Funding Initiative and gym discounts were rated “useful” or “extremely useful” by over 50 percent of employees. This chart shows the results for each program, sorted to reflect scores of “3” or above.

Self-reported levels of employee agreement that supervisor support health and maintaining health behaviors.

**Employee Perception of Supervisor Support for HRI**

Employees agreeing with the statement: “My supervisor supports employees in improving health and maintaining healthy behaviors”



Forty-seven percent – less than half of the employees surveyed -- indicated their supervisor supports employees in improving health and maintaining healthy behaviors; a seven-point drop from the 2006 survey.

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## ENDNOTES

<sup>1</sup> Presenteeism is defined as lost productivity that occurs when employees come to work but perform below par due to any kind of illness.

<sup>2</sup> Edington, DW. 2006. *Towards Champion Worksites* checklist sent to the County by the author in May, 2007. Dr. Edington also covered these points in two presentations at the county—the Health Leadership Forum, May 17, 2007, and the Labor Summit, June 11, 2007.

<sup>3</sup> Presenteeism is defined as lost productivity that occurs when employees come to work but perform below par due to any kind of illness.

<sup>4</sup> Edington, DW. 2006. *Towards Champion Worksites* checklist sent to the County by the author in May, 2007. Dr. Edington also covered these points in two presentations at the County—the Health Leadership Forum, May 17, 2007, and the Labor Summit June 11, 2007.

<sup>5</sup> King County Health Reform Initiative Check-Up: Peer Review Panel Findings, Oct 2006.

<sup>6</sup> Presenteeism is defined as lost productivity that occurs when employees come to work but perform below par due to any kind of illness.

<sup>7</sup> Goetzel RZ. 2005. *Examining the Value of Integrating Occupational Health and Safety and Health Promotion Programs in the Workplace*. Paper presented at the National Symposium (2004), Washington D.C. [Online] Available: <http://0-www.cdc.gov.mill1.sjlibrary.org/niosh/worklife/steps/pdfs/BackgroundPaperGoetzelJan2005.pdf> [accessed May, 2007.]

<sup>8</sup> High risk is defined by Healthways as self-reporting any current tobacco use or three or more of the following conditions: high blood pressure, high cholesterol, physical activity less than 3 times per week, poor nutrition, high stress/poor well-being, high alcohol use or a body mass index greater than 26. Moderate risk is defined as self-reporting two of these factors, and low risk is defined as reporting zero or one risk factor.

<sup>9</sup> Edington, DW. 2006. *Towards Champion Worksites* checklist sent to the County by the author in May, 2007. Dr. Edington also covered these points in two presentations at the county—the Health Leadership Forum, May 17, 2007, and the Labor Summit, June 11, 2007.

<sup>10</sup> High risk is defined by Healthways as self-reporting any current tobacco use or three or more of the following conditions: high blood pressure, high cholesterol, physical activity less than 3 times per week, poor nutrition, high stress/poor well-being, high alcohol use or a body mass index greater than 26. Moderate risk is defined as self-reporting two of these factors, and low risk is defined as reporting zero or one risk factor.

<sup>11</sup> The GEE model was only applied to the aggregate population since this group potentially included responses from different individuals in each year. The GEE model was not applied to the cohort populations since for this group, the same employees participated over time and their demographics remained constant.

<sup>12</sup> Presenteeism is defined as lost productivity that occurs when employees come to work but perform below par due to any kind of illness

<sup>13</sup> Breslow L, Fielding, J., Herman, A.A., et al. Worksite health promotion: its evolution and the Johnson and Johnson experience. *Prev Med.* 1994;9:13-21.

<sup>14</sup> Centers for Disease Control and Prevention's Task Force on Community Preventive Services. The Community Guide. *Centers for Disease Control and Prevention*. Last updated February 28, 2007. Available at: <http://thecommunityguide.org>. Accessed March 15, 2007.

<sup>15</sup> Goetzel RZ, DeJoy DM, Wilson MG, Ozminkowski RJ, Roemer EC, White JM, Tully KJ, Billotti GM, Baase CM, Bowen H, Mitchell SG, Wang S, Tabrizi MJ, Bowen JD, Short M, Liss-Levinson RC, Christaldi J, Baker K. (2007). Environmental approaches to obesity prevention and management at The Dow Chemical Company: second year results. American Heart Association Annual Scientific Sessions, Orlando, FL, November 2007.

- <sup>16</sup> Goetzel RZ, Ozminkowski, R.J., Baase, C.M., Billotti, G.M. Estimating the return-on-investment from changes in employee health risks on the Dow Chemical Company's health care costs. *J Occup Environ Med.* 2005;47(8):759-768.
- <sup>17</sup> Ostbye T, Dement JM, Krause KM. Obesity and workers' compensation: results from the Duke Health and Safety Surveillance System. *Arch Intern Med.* 2007 Apr 23;167(8):766-73.
- <sup>18</sup> Ozminkowski, R.J., Dunn, R.L., Goetzel, R.Z., Cantor, R.I., Murnane, J., & Harrison, M. (1999). A return on investment evaluation of the Citibank, N.A., Health Management Program. *Am J Pub Health, 44*(1), 31-43.
- <sup>19</sup> Ozminkowski, R.J., Goetzel, R.Z., Smith, M.W., Cantor, R.I., Shaughnessy, A., & Harrison, M. (2000). The impact of the Citibank, N.A., Health Management Program on changes in employee health risks over time. *J Occup Environ Med, 42*(5), 502-511.
- <sup>20</sup> Wang F, McDonald T, Bender J, Reffitt B, Miller A, Edington DW. Association of healthcare costs with per unit body mass index increase. *J Occup Environ Med.* 2006 Jul;48(7):668-74.
- <sup>21</sup> Edington DW, Burton WN. *A Practical Approach to Occupational and Environmental Medicine* (McCunney). 140-152. 2003.
- <sup>22</sup> Goetzel RZ, Guindon AM, Turshen IJ, Ozminkowski RJ. 2001. Health and productivity management: Establishing key performance measures, benchmarks and best practices. *Journal of Occupational and Environmental Medicine* 43(1):10-17
- <sup>23</sup> Edington DW. 2001. Emerging research: A view from one research center. *American Journal of Health Promotion* 15(5):341-349.
- <sup>24</sup> Pelletier B, Boles M, Lynch W. 2004. Change in health risks and work productivity over time. *Journal of Occupational and Environmental Medicine.*
- <sup>25</sup> Jones RC, Bly JL, Richardson JE. A study of a worksite health promotion program and absenteeism. *J Occup Med.* 1990 Feb; 32(2):95-9.
- <sup>26</sup> Lerner D., Amick III, B.C., Rogers, W.H., Malspeis, S., Bungay, K., and Cynn, D (2001). The Work Limitations Questionnaire. *Medical Care, 39*(1): 72-85.
- <sup>27</sup> Edington, DW. 2006. *Towards Champion Worksites* checklist sent to the County by the author in May, 2007. Dr. Edington also covered these points in two presentations at the County—the Health Leadership Forum, May 17, 2007, and the Labor Summit June 11, 2007.
- <sup>28</sup> Goetzel RZ, Ozminkowski RJ, Bruno JA, Rutter KR, Isaac F, Wang S. 2002. Long-term impact of Johnson & Johnson's Health & Wellness Program on health care utilization and expenditures, *Journal of Occupational and Environmental Medicine* 4(5):417-424
- <sup>29</sup> Edington DW. 2001. Emerging research: A view from one research center. *American Journal of Health Promotion* 15(5):341-349
- <sup>30</sup> Lowe, Graham S. "Healthy Workplace Strategies: Creating Change and Achieving Results," Report prepared for the Workplace Health Strategy Bureau, Health Canada, 2004 ([www.grahamlowe.ca](http://www.grahamlowe.ca))
- <sup>31</sup> Pritish K. Tosh, MD; Gregory A. Poland, MD, "Healthcare Worker Influenza Immunization", *Medscape*, posted 12/21/07 [www.medscape.com/viewarticle/567336](http://www.medscape.com/viewarticle/567336)
- <sup>32</sup> Gerry Oster PhD, "Lifetime Health and Economic Benefits of Weight Loss Among Obese Persons," *American Journal of Public Health*, October 1999, Vol. 89, No. 10 <http://www.ajph.org/cgi/reprint/89/10/1536>
- <sup>33</sup> Burton WN, et al. "The Economic Costs Associated with Body Mass Index in a Workplace," *J Occup Environ Med.* Sept 1998; 40(9):786-789