

Do Health Screenings Reduce Costs?

Analysis of Immediate and Cumulative

Cost Impacts of Health Screening

Objective: Our client has engaged in an effort to increase participation in a wellness program known as “Know Your Numbers” (KYN). This program provides yearly screening for biometric markers. It is assumed that, through these screenings, an increased personal awareness of one’s health status would provide an incentive for employees to seek medical attention before borderline health problems became catastrophic in nature. **Methods:** In consultation with the company Wellness Committee and Truven Analytics, KYN participation was correlated to annual claims costs over 5 years to determine the immediate cost impact, and the cumulative cost impact on employees from U.S. based site locations. **Results:** KYN participation has increased yearly. This increase is inversely correlated with the number of catastrophic claims (\$50k+). The immediate effect analysis showed reduced average annual claims cost of just over \$1,000 per employee. The cumulative effect analysis showed reduced claims by ~\$1,000 for those who participated the most consistently, compared to those who participate the least frequently. **Conclusions:** The KYN program has successfully increased the participation of screenings for company employees over the past 5 years. This increase has accompanied a decrease in both the number and severity of high cost claims. With this foundation of data, prospective projections are able to be made to test the trend moving forward.

Introduction

The impact of annual health care costs escalates yearly. However, an estimated 75% to 80% of those costs are attributable to preventable conditions that stem from lifestyle choices. Mitigating even a portion of annual claims costs provides a substantial financial incentive to provide wellness programming geared toward these factors.

The premise that comprehensive worksite wellness programming can help reduce annual claims cost is foundational to the implementation of screening programs such as KYN.

Over the past 7 years, the company has provided on-site screening for its employees. There are two ways in which this program may be beneficial to wellness at the company.

First, KYN may increase the probability that participants become aware of biometric readings that indicate a possible catastrophic condition, such as high blood pressure, cholesterol, triglycerides, etc. The increased awareness could then lead some proportion of employees to head off the condition before a medical event occurs.

Second, those employees with known conditions such as overweight, obesity, etc., can be reminded to take action to prevent the chronic disease consequences of these conditions.

In either of these cases, the logical outcome would be that participation in KYN should decrease annual claims costs in two ways. By decreasing the average annual spend per employee, and also by decreasing the number of catastrophic health events.

Study Design

We set out to test these hypotheses by working with the company's data warehouse partner, Truven Health Analytics, and the company Wellness Committee.

Two primary questions to answer from this comparison:

1. How does the KYN screening program impact annual claims costs in the near term, and is there a cumulative effect of this program over time.
 - a. Immediate effect – 1) Does participation in the KYN screening program reduce average yearly costs in the short term (in the current year), AND 2) do the people who get screenings cost less than those who do not?
 - i. For each of the past 5 years (2008 - 2012), if an employee participated in KYN within that year, does that same employees' average claims cost at the end of that year increase or decrease, compared to the PRIOR year's claims cost.

- ii. Run the same analysis for employees who did not engage in KYN within each of the past 5 years (2008 – 2012). We will compare the average difference in claims costs between these two groups (those who engaged and those who did not) in each of the past 5 years.
 - b. Cumulative effect -- Does MORE participation in the KYN program lead to GREATER impact over time?
 - i. For an employee who *participated in KYN only 1 time* over a 5 year span (from 2008 – 2012), assess the annual claims cost in 2012. Also, what is the average claims cost across that entire 5 year span.
 - ii. This same analysis was assessed for those who participated in the program 2 times over the 5 year span, as well as 3, 4, and 5 times over that 5 year span.
- 2. Is KYN screening participation correlated to a reduction in catastrophic claims cost?
 - a. To assess the impact of screening participation on high cost claims, we performed two iterations of the above analysis.
 - i. With the entire U.S. employee population
 - ii. With the entire U.S. employee population, but this time without including those who have high cost claims (individual claims greater than \$50,000).
 - b. By subtracting condition (ii) from condition (i), we were able to determine the following:
 - i. The number of catastrophic claims, the cost of catastrophic claims, the percent of the total claims cost due to catastrophic events.
 - ii. Catastrophic claims were correlated with KYN screening participation to determine the relationship that exists between them.

INCLUSION/EXCLUSION CRITERIA:

The database for these comparisons includes North American employees over the past 5 years, with the exception of those who are fully insured. For all possible categories, no analysis was performed for any grouping that contained less than at least 100 persons.

RESULTS

Table 1.

Immediate Effect Comparison: Employees who participate in KYN versus those who do not, 2008 - 2012.

(Data on this page includes high cost claimants as well as non-high cost claimants)

Employees Who Got Screenings			
Year	"n"	Cost In Year Prior to Participation	Cost In Year of Participation
2008	1,615	\$3,059	\$2,858
2009	1,755	\$2,996	\$2,939
2010	2,136	\$3,168	\$3,355
2011	2,542	\$3,209	\$3,098
2012	2,418	\$3,301	\$3,566
5 Year Average	2,093	\$3,147	\$3,163
Employees Who Did Not Get Screenings			
Year	"n"	Cost In Year Prior to Participation	Cost In Year of Participation
2008	14,051	\$3,956	\$4,071
2009	13,169	\$4,058	\$3,862
2010	9,485	\$3,849	\$4,725
2011	9,342	\$4,802	\$4,167
2012	9,005	\$4,091	\$4,219
5 Year Average	11,010	\$4,151	\$4,209

Table 1 shows the number of employees participating in the KYN screening program, by year, followed by an average participation over the past 5 years. These data include all claims, catastrophic and non-catastrophic. Those who got KYN screenings had lower annual claims costs than those who did not, by an average of \$1,046 per employee. Note that, in each year, those who participated cost more than those who did not. However, the within-year comparison did not show a consistent trend.

Table 2.

Cumulative Effect Comparison:

Does more participation lead to lower costs?

(Data on this page includes high cost claimants as well as non-high cost claimants)

Number of Times Participating in Program Over 5 Years					
	1 yr (n=2,575)	2 yrs (n=1,400)	3 yrs (n=874)	4 yrs (n=575)	5 yrs (n=173)
Claims Cost in 2012	\$3,897	\$4,268	\$4,132	\$3,707	\$3,207
Avg. Cost from 2008-2012	\$3,628	\$3,707	\$3,248	\$3,440	\$2,594

Table 2 shows that over time, the people who participate the most in screenings over 5 years averaged \$1,034 less than those who got screenings the least. In addition, this table indicates a general trend toward decreased claims as screening participation increases.

Table 3.**Immediate Effect Comparison – EXCLUDING HIGH COST CLAIMANTS:**

Employees who participate in KYN versus those who do not.

Data on this page EXCLUDES High Cost Claimants, showing only data from non-High Cost Claimants

Employees Who Got Screenings			
Year	"n"	Cost In Year Prior to Participation	Cost In Year of Participation
2008	1,611	\$3,016	\$2,645
2009	1,748	\$2,899	\$2,593
2010	2,123	\$3,094	\$2,872
2011	2,523	\$3,058	\$2,573
2012	2,397	\$3,185	\$2,833
5 Year Average	2,080	\$3,050	\$2,703
Employees Who Did Not Get Screenings			
Year	"n"	Cost In Year Prior to Participation	Cost In Year of Participation
2008	13,915	\$3,715	\$2,972
2009	13,046	\$3,876	\$2,939
2010	9,380	\$3,682	\$3,084
2011	9,247	\$4,445	\$3,074
2012	8,904	\$3,833	\$3,127
5 Year Average	10,898	\$3,910	\$3,039

Table 3 shows the cost comparison of those employees who participated in KYN screenings over 5 years, compared to those who did not. Those who participated cost an average of \$336 less, per employee.

When comparing the difference between Table 1 (High Cost Claims (HCC) included) and Table 3 (HCC not included), the average cost difference is ~\$700.

Table 4.

Cumulative Effect Comparison:

Does more participation lead to lower costs?

Data on this page EXCLUDES High Cost Claimants, showing only data from non-High Cost Claimants

Number of Times Participating in Program Over 5 Years					
	1 yr (n=2,322)	2 yrs (n=1,270)	3 yrs (n=791)	4 yrs (n=519)	5 yrs (n=164)
Claims Cost in 2012	\$2,557	\$3,295	\$2,852	\$2,600	\$2,396
Avg. Cost from 2008-2012	\$2,686	\$2,853	\$2,598	\$2,754	\$2,372

Table 4 shows the cumulative effect comparison for employees, without including the HCC. Those who participated the most in screenings cost less, in this case by \$314 per employee, on average.

Impact of KYN screening on high cost claims

Figure 1.

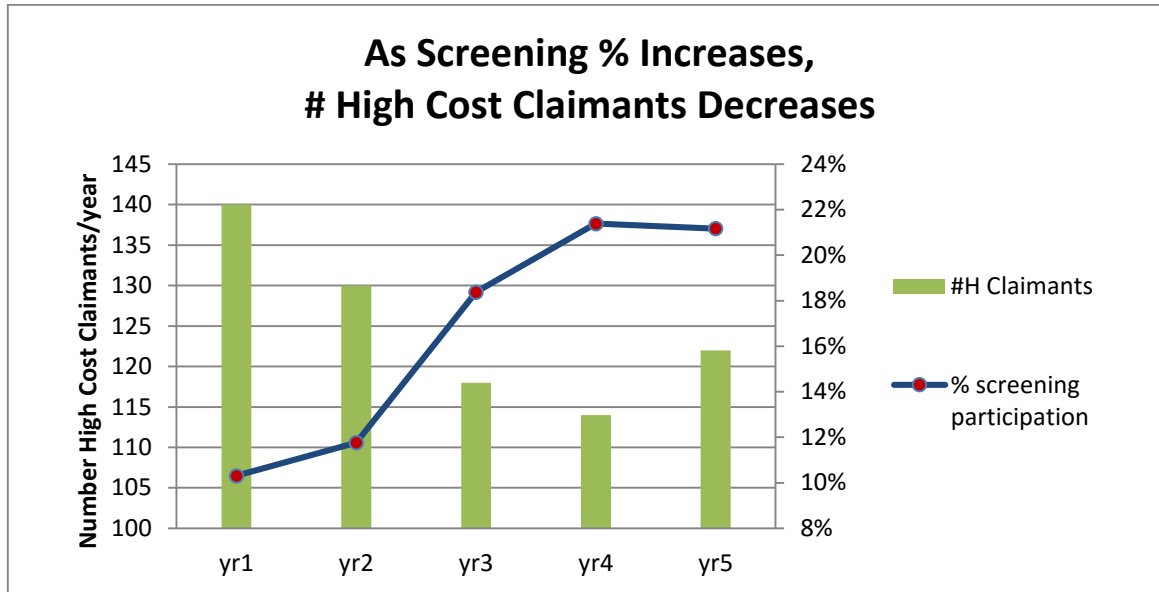


Figure 1 shows the relationship between the number of HCC and the percentage of screening participation. In this case, that relationship is inversely correlated, such that the percentage of those screened increased from 10% to 21%, as the number of HCC decreased from 140 to 122.

Table 5.

Impact of HCCs as a function of participation.

Number of Times Participating in Program					
08 - '12	1 yr	2 yrs	3 yrs	4 yrs	5 yrs
Avg. Cost over 5 years w HCC	\$3,628	\$3,707	\$3,248	\$3,440	\$2,594
Avg. Cost over 5 years w NO HCC	\$2,686	\$2,853	\$2,598	\$2,754	\$2,372
\$ Diff Attrib to HCC	\$942	\$853	\$650	\$687	\$222
Percent Attrib to HCC	26%	23%	20%	20%	9%

Table 5 compares both analytical groups (those with HCC, and those without) in order to show the cumulative impact of HCC over time.

The impact of HCCs is reduced as employees get screenings more consistently over the 5 year window (\$942 for 1 time/5 years versus \$222 for 5 times/5 years).

On a percentage basis, HCCs contribute to 26% of the total costs for those participating the least, to only 9% of the total costs for those contributing the most.

Table 6.

Impact of HC Claims as a function of participation

5 yr average	Ave % partic	Ave % w HCC	Ave \$HCC	Total \$
Participant	16%	0.57%	\$77,868	\$935,933
Non-partic	84%	1.03%	\$118,031	\$13,378,882
			Average Diff \$40,163	\$14,314,815

Table 6 compares the employees who participate in screenings compared to those who do not as a 5 year average. In this time range, an average of 16% of employees engaged in KYN screenings. By contrast, 84% did not.

- Of those employees who got KYN screenings, the percentage of those who suffered HCCs was 0.57%.
- Of those who did not get screenings, the percentage who suffered HCCs was 1.03%.

For those individuals who did have HCCs, the average cost per person of HCCs for those who had gotten screenings is \$40,163 less than the average per person cost of HCCs for those who did not get their screenings.

Table 7.

Projections based on existing data

5 yr average	% particip	Avg % w HCC	Ave \$HCC	Total
Participant	25%	0.57%	\$ 77,868	\$1,464,754
Non-partic	75%	1.03%	\$ 118,031	\$11,941,768
				\$13,406,522
				Saved \$908,293

Table 7 shows a prospective cost model projected from the prior table (Table 6). As of 2012, the percentage of employees who get their screening is 21%. If the average can be increased to 25%, the cost savings will be \$908,293.

Discussion

An assumption of the KYN screening program has always been that increased screening will create increased awareness of chronic health issues. This, in theory, would lead employees to address their poor screening results before those readings become catastrophic health consequences. We can assess this idea by correlating screening trends with cost trends over a 5 year window.

This assumption is supported by the data showing that the percentage of employees who participate in KYN screenings has more than doubled from 10% to 21% over this time period. This trend is inversely correlated to the number and severity of high cost claims. As the percentage of participating employees has increased, the number of high cost incidents have decreased.

Also supporting this assumption is the fact that those employees who got their screenings were half as likely to have HCC incidents (0.57% versus 1.03%). Moreover, for those who got their screenings, each HCC amounted to ~\$40,000 less (on average) than the HCCs for those who did not get their screenings.

On average, those who got screenings cost ~\$1,000 less than those who did not. The largest part of this cost savings is from High Cost Claimants (~\$700 of it).

With this level of baseline data, we can prospectively test the primary assumption (above) by setting performance benchmarks and process goals. For example, if it is true that those who get their screenings cost less than those who don't, then a change in our current participation level (21%) should accompany a predictive decrease in cost if we achieve a target level of participation (say, 25%). It is the current and prospective screening participation levels that allow us to test the model.

Limitations

One concern from these data is the potential for selection bias. In other words, the employees who got KYN screenings may be more likely to be health-aware, and may therefore be less susceptible to high health care costs in the first place. If this were the case, the lower costs we observe for participants versus non-participants would not indicate that screenings cause lower health care costs, but that they reflect them.

That said, the 5 year trend analysis showing increasing participation correlating strongly to decreasing numbers of HCCs mitigates this concern to some degree. As the percentage of employees who got their screenings increased (from 10% to 21% from 2008 - 2012), the average cost savings has remained steady (~\$1,000 for the entire group, and ~\$300 if you exclude the HCCs).

In addition, the company has more than one wellness program going on at one time. The cost impact of these programs that contribute to the company's overall Culture of Health platform, now being deployed for employees, remains undefined.

Next Steps

Moving forward, the data trends in this report suggest that increased participation in the KYN screening program will create further cost savings, largely by reducing the impact of catastrophic HCCs.

1. Increase KYN participation through an updated messaging campaign
 - a. To test this model, we are creating custom messaging campaigns designed to increase KYN participation, and then correlate this updated participation level with subsequent annual claims costs.
2. Take a more active approach
 - a. To simply make screenings available and hope individuals address their unhealthy biometric readings is a passive approach. An active approach would be to address chronic health conditions directly: diabetes, cardiovascular, cancer, etc. This can occur through messaging and through directed coaching.
3. Program-level analysis
 - a. Apply this approach to other of the company's wellness programs to determine which, if any, also contribute to controlled costs.
4. System-level analysis
 - a. Assess claims costs of individual site locations of the company, as a function of wellness programming, participation, and leadership support.