

**UK based Insurance Company  
Healthcare Study  
Results of Preliminary Data Analysis  
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**Data and Subjects**

There were 1,130 subjects who completed the AQ profile and health survey questions at least once. When someone completed it more than once, I used the earliest data.

There were absentee data on 1,132 subjects, but only 612 (54%) of these subjects also completed the AQ profile. In some instances, they may have completed the profile but failed to key their ID code correctly.

There were a total of 334 claims filed. Because some subjects filed more than one claim, these 334 claims distributed over 247 subjects. Of these 247 subjects, 31 had no other data to which they could be matched. That left 214 subjects having filed at least one claim AND having either AQ data or absentee data, or both. Of the 214 subjects having claims data, 171 had absentee data, and 144 had AQ data.

**Variables**

Measures were derived from three separate databases, (1) AQ and health study questions, (2) absenteeism, and (3) costs and types of medical claims.

***Health Study Questions***

AQ theory would predict that people who are high in AQ would also perceive themselves as healthier, taking fewer prescription medicines, feeling fitter, more energetic, happier, more optimistic, successful, luckier, engaged in more exercise, experiencing less stress, and being more satisfied with their jobs.

To test whether any of those perceptions were related to AQ, a 29-item questionnaire was designed and included with the AQ survey. The questions covered the subject's perception of specific personal health factors (digestive system, respiratory system, cardiovascular system, muscular-skeletal system, stress, fitness, energy, diet, and general health), use of prescribed medicines, exercise, perceptions of happiness, optimism, hardship, luck, success in life, job satisfaction.

Generally there were two questions, with response options on a 7-point scale, measuring each perception. For example, one question read, "In my current job, on most days I feel..... (1) completely involved >>>> (7) completely uninvolved." Another question read, "On most days I find my job..... (1) very enjoyable >>>>> (7) something I dread." Although both questions measure job satisfaction, they are directed at somewhat different aspects of satisfaction, and when combined, form a score that is more reliable than one single question would be.

## ***Absenteeism***

Absentee data consisted of the number of days each subject had been absent and the number of absentee occurrences. For example, someone who was absent four days in a row last month, three days in a row a month earlier, and one day a week earlier would have a total of eight days absent and three occurrences.

## ***Claims***

Claims data consisted of the cost of each claim along with the identification of the type of claim. There were 20 different types of claims, for example, orthopedic, gastro-intestinal, neoplasms, dermatology.

## **Analyses**

The initial rounds of analyses consisted of correlations among variables and groups of variables. Greater refinement of the analyses included an analysis of variance (ANOVA) comparing groups who obtained high versus low AQ scores on claims and absentee data. This will become clearer in the Results section.

## **Results**

### ***Health factors and AQ***

All 29 of the health study questions correlated significantly with AQ. Table 1 shows those correlations. When paired into the scales mentioned above – digestive system, diet, job satisfaction, etcetera – the correlations with AQ ranged from 0.104 for the cardiovascular system to 0.433 for optimism. The single question asking the number of days of vigorous exercise correlated 0.111 with AQ. If there had been one more write-in question similar to the question on exercise, they could have been combined, and the resulting correlation would have been higher.

Table 2 shows the correlations between each of the health scale scores and AQ score as well as with the individual CORE scores. All of the scale scores are significantly correlated with the AQ score. Cardiovascular correlates the lowest, for no obvious reason. Correlations with each of the CORE scores are generally lower than the correlation with AQ because they are shorter scales. One exception is Exercise, which seems better related to Control than to the other scales or AQ total.

### ***Absenteeism and AQ***

Overall, the total number of days absent does not correlate significantly with AQ. It is somewhat correlated with Control ( $r = .120$ ), but not with the other AQ subscales.

If, however, we compare subjects who score high on AQ with subjects who score low on AQ, we find a significant difference in the average number of days absent. Subjects scoring at or above the 75<sup>th</sup> percentile in AQ consist of those with AQ scores of 163 or higher. Subjects scoring at or below the 25% percentile in AQ consist of those with AQ scores of 137 or lower. On average, members of the high scoring group miss 6.9 days of work, whereas members of the low scoring

group miss 10.7 days of work. Therefore, on average, people scoring among the bottom 25% in AQ had 55% more days absent than did people scoring among the top 25% in AQ ( $F = 4.37$ ,  $p = 0.037$ ). See Table 5a.

Another way to look at absenteeism is to count the number of separate occasions on which a person is absent. As defined earlier, this variable was called “occurrences,” and we examined it in several different ways. Table 3 shows the correlations among number of occurrences and AQ and each of the AQ subscales. *Occurrences is significantly correlated with AQ, Control, Ownership, and Reach.*

More useful, however, may be the average AQ score for each number of occurrences. Most subjects were absent on only one occurrence, even though the number of days absent may have ranged from one day to a great many. Table 4 shows the mean AQ score for each number of occurrences. For the 214 subjects having only one occurrence, the average AQ score was 149. For the three subject having been absent on nine occurrences, the average AQ was only 127.

Subjects scoring at or above the 90% percentile in AQ consist of those with AQ scores of 175 or higher. Subjects scoring at or below the 10% percentile in AQ consist of those with AQ scores of 126 or lower. Comparing these two groups, we find that on average, people who scored in the lowest group in AQ had 34% more absentee occurrences than did people scoring in the highest group ( $F = 4.67$ ,  $p = 0.033$ ). See Table 5b. If we compare subjects scoring at or above the 75<sup>th</sup> percentile with subjects scoring at or below the 25<sup>th</sup> percentile, we find that the lower group, on average, had 37% more absentee occurrences than the higher group ( $F = 14.85$ ,  $p = 0.000$ ). See Table 5a.

### ***Medical Claims and AQ***

Medical claims were analyzed in three different ways: Total cost of claims, total number of claims, and number of different kinds of claims. None of these measures was found to be related to AQ. It is quite possible that there are just too many factors that influence claims. For example, cost is influenced not only the patient’s characteristics (AQ or otherwise) but by the nature of the condition, the cost of the technology to diagnose and treat the condition, and the individual physician’s choice of diagnosis and treatment. The number of claims filed may also depend on the physician’s choice to have the patient return for follow-up examinations or treatments. In any case, from the data in this study, we were unable to find any variables, AQ or otherwise, associated with claims.

### **Summary: A Profile of the High AQ Subject**

In this study, the high AQ subjects can be characterized as perceiving themselves as physically healthier, more fit, energetic, engaging in more physical exercise, eating a healthier diet, feeling less stressed, taking fewer prescription drugs, being happier, more optimistic, more successful, luckier, enduring less hardship, and enjoying their jobs more than low AQ subjects.

High AQ subjects have fewer days absent from work as well as fewer separate occurrences of absenteeism.

Table 1. Correlations of AQ with Each Question in the Health Study Survey<sup>1</sup>

Question	Correlation	Area Measured
1	0.175	Hardship
2	0.128	Prescription drugs
3	0.223	Fitness
4	0.343	Luck
5	0.229	Digestive system
6	0.078	Cardiovascular system
7	0.111	Exercise
8	0.166	Hardship
9	0.326	Stress
10	0.333	Job
11	0.267	Stress
12	0.352	Life quality, optimism
13	0.200	Diet
14	0.334	Happiness
15	0.242	Fitness
16	0.214	Respiratory system
17	0.381	Success
18	0.284	Overall health
19	0.351	Energy
20	0.082	Cardiovascular system
21	0.383	Happiness
22	0.137	Musculo/skeletal system
23	0.174	Diet
24	0.187	Respiratory system
25	0.384	Energy
26	0.196	Digestive system
27	0.178	Musculo/skeletal system
28	0.384	Optimism
29	0.370	Job

<sup>1</sup> Refer to the Health Study Survey for the wording of questions.

**Table 2. Correlations of Health Survey Scale Scores with AQ and Its Constituent Scales<sup>1</sup>**

		AQ	C	O	R	E
Digestive System	Correlation	<b>-.233</b>	<b>-.179</b>	<b>-.158</b>	<b>-.195</b>	<b>-.174</b>
	Sig. (2-tailed)	.000	.000	.000	.000	.000
	N	1130	1130	1130	1130	1130
Cardiovascular system	Correlation	<b>-.104</b>	<b>-.093</b>	<b>-.089</b>	-.028	<b>-.104</b>
	Sig. (2-tailed)	.000	.002	.003	.345	.000
	N	1130	1130	1130	1130	1130
Respiratory System	Correlation	<b>-.232</b>	<b>-.167</b>	<b>-.147</b>	<b>-.160</b>	<b>-.233</b>
	Sig. (2-tailed)	.000	.000	.000	.000	.000
	N	1130	1130	1130	1130	1130
Musculo-skeletal system	Correlation	<b>-.176</b>	<b>-.117</b>	<b>-.099</b>	<b>-.145</b>	<b>-.179</b>
	Sig. (2-tailed)	.000	.000	.001	.000	.000
	N	1130	1130	1130	1130	1130
Stress	Correlation	<b>-.336</b>	<b>-.232</b>	<b>-.207</b>	<b>-.270</b>	<b>-.316</b>
	Sig. (2-tailed)	.000	.000	.000	.000	.000
	N	1130	1130	1130	1130	1130
Fitness	Correlation	<b>-.247</b>	<b>-.240</b>	<b>-.221</b>	<b>-.118</b>	<b>-.154</b>
	Sig. (2-tailed)	.000	.000	.000	.000	.000
	N	1130	1130	1130	1130	1130
Energy	Correlation	<b>-.400</b>	<b>-.341</b>	<b>-.321</b>	<b>-.253</b>	<b>-.287</b>
	Sig. (2-tailed)	.000	.000	.000	.000	.000
	N	1130	1130	1130	1130	1130
Diet	Correlation	<b>-.208</b>	<b>-.192</b>	<b>-.224</b>	<b>-.093</b>	<b>-.102</b>
	Sig. (2-tailed)	.000	.000	.000	.002	.001
	N	1130	1130	1130	1130	1130
Exercise	Correlation	<b>.111</b>	<b>.121</b>	<b>.089</b>	.056	<b>.063</b>
	Sig. (2-tailed)	.000	.000	.003	.062	.033
	N	1130	1130	1130	1130	1130
Perceived health	Correlation	<b>-.284</b>	<b>-.252</b>	<b>-.236</b>	<b>-.158</b>	<b>-.204</b>
	Sig. (2-tailed)	.000	.000	.000	.000	.000
	N	1130	1130	1130	1130	1130
Happiness	Correlation	<b>-.392</b>	<b>-.298</b>	<b>-.303</b>	<b>-.268</b>	<b>-.312</b>
	Sig. (2-tailed)	.000	.000	.000	.000	.000
	N	1130	1130	1130	1130	1130
Optimism	Correlation	<b>-.433</b>	<b>-.342</b>	<b>-.325</b>	<b>-.311</b>	<b>-.327</b>
	Sig. (2-tailed)	.000	.000	.000	.000	.000
	N	1130	1130	1130	1130	1130
Hardship	Correlation	<b>-.188</b>	<b>-.132</b>	<b>-.084</b>	<b>-.196</b>	<b>-.165</b>
	Sig. (2-tailed)	.000	.000	.005	.000	.000
	N	1130	1130	1130	1130	1130
Job	Correlation	<b>-.391</b>	<b>-.295</b>	<b>-.348</b>	<b>-.252</b>	<b>-.276</b>
	Sig. (2-tailed)	.000	.000	.000	.000	.000
	N	1130	1130	1130	1130	1130
Prescription drug use	Correlation	<b>-.128</b>	<b>-.120</b>	<b>-.067</b>	<b>-.088</b>	<b>-.118</b>
	Sig. (2-tailed)	.000	.000	.025	.003	.000
	N	1130	1130	1130	1130	1130
Success & Luck	Correlation	<b>-.427</b>	<b>-.344</b>	<b>-.299</b>	<b>-.336</b>	<b>-.313</b>
	Sig. (2-tailed)	.000	.000	.000	.000	.000
	N	1130	1130	1130	1130	1130
All health factors	Correlation	<b>-.420</b>	<b>-.339</b>	<b>-.315</b>	<b>-.275</b>	<b>-.338</b>
	Sig. (2-tailed)	.000	.000	.000	.000	.000
	N	1130	1130	1130	1130	1130

<sup>1</sup> Correlations in boldface type are statistically significant, at least at the .05 level.

Table 3. Correlations between Occurrences and AQ Scales<sup>1</sup>

		AQ	C	O	R	E
AQ	Pearson Correlation	1.000	.744	.739	.762	.777
	Sig. (2-tailed)	.	.000	.000	.000	.000
	N	1130	1130	1130	1130	1130
C	Pearson Correlation	.744	1.000	.527	.333	.351
	Sig. (2-tailed)	.000	.	.000	.000	.000
	N	1130	1130	1130	1130	1130
O	Pearson Correlation	.739	.527	1.000	.290	.329
	Sig. (2-tailed)	.000	.000	.	.000	.000
	N	1130	1130	1130	1130	1130
R	Pearson Correlation	.762	.333	.290	1.000	.747
	Sig. (2-tailed)	.000	.000	.000	.	.000
	N	1130	1130	1130	1130	1130
E	Pearson Correlation	.777	.351	.329	.747	1.000
	Sig. (2-tailed)	.000	.000	.000	.000	.
	N	1130	1130	1130	1130	1130
Occurrences	Pearson Correlation	<b>-.123</b>	<b>-.118</b>	<b>-.081</b>	<b>-.088</b>	-.070
	Sig. (2-tailed)	.002	.004	.046	.029	.082
	N	612	612	612	612	612

<sup>1</sup> Correlations shown in boldface type are statistically significant (p < .05)

Table 4. Mean AQ for Each Number of Absentee Occurrences<sup>1</sup>

Occurrences		C	O	R	E	AQ
1	Mean	39.39	40.99	32.18	36.46	149.02
	N	216	216	216	216	216
	Std. Deviation	6.24	7.25	5.75	5.25	18.03
2	Mean	38.08	40.49	31.37	35.98	145.92
	N	144	144	144	144	144
	Std. Deviation	5.97	6.80	5.50	5.36	17.28
3	Mean	39.22	40.93	32.24	36.25	148.64
	N	96	96	96	96	96
	Std. Deviation	5.75	6.64	4.84	5.21	16.31
4	Mean	38.56	41.44	30.97	36.18	147.15
	N	73	73	73	73	73
	Std. Deviation	6.60	6.40	5.65	5.42	17.88
5	Mean	37.52	40.17	30.10	33.79	141.57
	N	42	42	42	42	42
	Std. Deviation	5.80	6.56	4.92	4.91	15.07
6	Mean	37.00	38.85	30.25	34.85	140.95
	N	20	20	20	20	20
	Std. Deviation	5.62	6.90	5.22	5.58	15.86
7	Mean	35.67	37.33	31.33	36.89	141.22
	N	9	9	9	9	9
	Std. Deviation	6.44	8.22	7.48	5.42	20.47
8	Mean	36.71	37.71	30.57	33.43	138.43
	N	7	7	7	7	7
	Std. Deviation	9.41	9.76	7.32	3.78	20.35
9	Mean	31.33	31.67	29.67	34.00	126.67
	N	3	3	3	3	3
	Std. Deviation	5.03	3.79	1.15	6.00	15.57

<sup>1</sup> There were only 2 cases with more than 9 occurrences, so these were omitted from the table.

Table 5a. Claims and Absentee Statistics for  
Subjects Scoring Above the 75th and Below the 25th Percentiles on AQ Score

		Number of Claims	Total cost of claims	Number of different kinds of claims	Days Absent	Occurrences
Below 25 <sup>th</sup>	Mean	1.42	162.07	.14	10.72	2.94
	N	36	293	293	188	188
	Std. Deviation	.60	725.12	.41	18.25	1.93
Above 75 <sup>th</sup>	Mean	1.38	195.85	.16	6.91	2.14
	N	40	285	285	114	114
	Std. Deviation	.54	838.88	.42	8.55	1.41

ANOVA results:

Difference in Occurrences is statistically significant ( $F = 14.85$ ,  $p = 0.000$ ).

Difference in Days Absent is statistically significant ( $F = 4.37$ ,  $p = 0.037$ ).

Table 5b. Claims and Absentee Statistics for  
Subjects Scoring Above the 90th and Below the 10th Percentiles on AQ Score

		Number of Claims	Total cost of claims	Number of different kinds of claims	Days Absent	Occurrences
Below 10 <sup>th</sup>	Mean	1.43	158.39	.14	12.11	3.05
	N	14	121	121	82	82
	Std. Deviation	.51	813.02	.41	23.72	2.13
Above 90 <sup>th</sup>	Mean	1.29	249.86	.15	7.87	2.28
	N	17	119	119	46	46
	Std. Deviation	.47	859.33	.38	10.97	1.50

ANOVA results:

Difference in Occurrences is statistically significant ( $F = 4.67$ ,  $p = 0.033$ ).