# The Hassle of Wellness: Do Peers and Health Status Matter?

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**Abstract**

This paper studies the choice of health insurance following the introduction of a wellness plan packaged with health insurance by a large self-insured employer. More than half of US employers offer a wellness plan as part of benefits to employees in hopes of reducing the total cost of health insurance. Aetna Wellness was introduced in parallel to and on the basis of an existing Aetna health plan. While it was priced much lower than its non-wellness counterparts, the majority of employees actively chose away from the wellness plan. If employees consider the wellness plans as a cost, and do not use its features, the intended cost savings will not materialize. The paper looks at two factors in this puzzle: the effect of peer choices and family health status on plan choice. Using a unique dataset of health insurance plan choice and utilization, I compare two identical plans – one with and one without the wellness program, and focus on a subsample consisting of new employees. I find that peer choices affect own choice of health insurance: a 10% rise in peer enrollment in Aetna Wellness increases the probability of own enrollment in the plan by 1.4% to 3.7%. I use the Charlson index, and an index of medical resource utilization intensity generated by the ACG software developed at Johns Hopkins University to measure family health status. A 1 point rise in the Charlson index leads to up to 4% decline in probability of enrollment in Aetna Wellness. The index captures employees with more severe health conditions. A 1 point rise in the resource utilization band, which captures more routine medical utilization, results in up to 8% rise in probability of enrollment. The results suggest that an effective information campaign of the benefits of a wellness program will increase the employee participation and improve long term outcomes of the plan. The program, however, does not appeal to employees and families with severe medical conditions which might benefit most from regular outpatient care.

# Introduction

The recent RAND Employer Survey showed that approximately half of surveyed employers offer a wellness program to its employees. These programs are driven mainly by expectations of slowing growth of medical and insurance costs for the employer, as well as responding to a substantial tax incentive provided by the Affordable Care Act (ACA) of 2009. A wellness program can include a set of screening tools, such as a health risk assessment questionnaire (HRA), as well as interventions, such as nutritional and smoking-cessation counseling, a disease management program (diabetes, heart disease, chronic lung disorders, depression, cancer). The program structure can offer rewards, such as gym discounts, incentives for screening and participation in the programs, or be punitive, such as higher insurance rates for smokers. These wellness programs appear to be a benefit, but evidence suggests that there is substantial employee resistance to it.

Is the resistance to wellness programs driven by lack of experience with the program and its benefits? Or is it driven by genuine disutility from the features of the program? The RAND report cites that 72% of employers offering wellness plans offer screening and intervention based programs, and 31% administer it through their health insurance plan. However, only 46% of employees undergo the screening, and less than a fifth choose to participate in the interventions. In this paper, I study the effect of the introduction of an optional wellness plan on the health insurance plan choice by employees of a large self-insured university. The analysis will focus particularly on two factors affecting choice: peer choices and own/family health on choice of health plan with wellness features. The data used for this estimation is uniquely suited for this study. First, the data tracks the introduction of a health insurance plan with wellness plan in parallel to and on the basis of an existing plan. This allows me to compare two near identical plans to isolate the effect of the wellness features on plan choice. Second, the data allows me to limit my analysis to a subsample of new employees, eliminating the bias introduced by switching costs and simultaneity of peer choices. Finally, the availability of claims data for employees allows me to define objective measures of employee and family

health.

While on their own the wellness plans appear simply to be an under appreciated employment benefit, as part of the Affordable Care Act they are a policy tool to transform the way individuals utilize medical resources. As the managed care experience of the 1990's and 2000's suggested, patients want to remain in control of their health care. As the *New York Times* article of May 27, 2013 notes, to slow the growth of medical expenditures, employers are increasingly turning to wellness programs to make the employee an informed patient. The wellness program is intended to make the individual aware of their health risks, to improve the maintenance of existing health conditions, and to engage them in preventive care. Since the employee is the primary gatekeeper of the flow of health services, if the employee resist the wellness program, then it is unlikely to generate the expected behavioural changes. As the wellness programs become more prevalent, the success of the programs depend on overcoming this resistance. If the resistance is due to the genuine disutility from the features of the program, it can be overcome with greater financial incentives being directed at the employee. If, however, the resistance is due to perception and lack of information, it can be overcome with improved employee education about the true benefits and burdens of the program.

In 2008, a large self-insured university introduced a new plan, Aetna Wellness, as part of its health insurance benefits menu. Aetna Wellness, was derived from, and offered simultaneously with an identical Aetna plan. To encourage enrollment, the employer priced Aetna Wellness below all other plans on offer: lower premium, lower deductible, and lower annual out-of-pocket maximum. The plan had the same coinsurance rate, copay, and physician, hospital, and pharmacy networks as Aetna. Unlike Aetna, however, Aetna Wellness required its members to complete a health risk assessment questionnaire, and select a primary care physician (PCP). The PCP would review the questionnaire, schedule a physical examination, and develop a set of health goals for the employee to follow during the year. The employee and family did not need referral from the PCP for specialist care, and the PCP did not act as a gatekeeper of care in any way. Since Aetna Wellness was offered in parallel with Aetna, it was an optional choice.

Despite the large financial incentive and the increased choice set, the majority of employees

did not choose Aetna Wellness in its first year of introduction. In the years that followed, many employees continued to actively choose away from the wellness plan. Most astonishingly, however, Aetna members switched in very low numbers. That is, those who had the closest comparison and the lowest cost of switching were less likely to switch to the new plan.

The aim of this paper is to explore two factors in this choice puzzle. I will estimate the effect of peer choices on own choice of health plan. Peers can affect the choice of health plan by helping the employee to overcome the informational barriers to choice. If health insurance is a reputation good, then learning about the experiences with and perceptions of the Aetna Wellness plan by peers can motivate the employee to choose for or against it. As defined by Satterthwaite (1979), a reputation good is any product or service for which seller's products are differentiated and consumers' search among sellers consist of a series of inquiries to relatives, friends, and associates for recommendations. Instead of relying on plan menu brochure, employees rely on colleagues for evaluation of plan features and quality.

Second, I look at the role of health in the choice of health insurance. Employees and families with a greater number of health conditions may have direct disutility from a wellness plan. The disutility may stem from a lack of salience for the word "Wellness". Though the plan brochure emphasized the advisability of the plan for employees with health conditions, these employees may perceive the plan as intended for maintaining good health. Furthermore, less healthy employees and families may be averse to additional doctors' visits and testing.

Health insurance choice has become an important policy topic in recent years, as seen by the introduction of Medicare Part D and the expansion of coverage through the Affordable Care Act. The research in this field, however, has been constrained by a lack of data. As more data have become available in recent years, economists and epidemiologists alike have been able to estimate key components of choice of insurance.

The outcomes and utilization of wellness programs have been studied outside of economics. Osilla et al. (2012) conduct a systemic review of the worksite wellness program and find little to moderate gains in medical expenditure. Most of the studies they site, however, do not correct for selection into the program, or have a short follow-up period. Economic

studies of wellness programs find temporary gains of modest magnitude, such as weight loss incentives offered by an employer or gym membership incentives (Cawley and Price, 2011; Royer, Stehr, and Sydnor, 2012).

While the utilization is the main motivator for employer adoption of wellness program, employee choices are not always optimal. Choices which appear suboptimal have been studied in consumer goods (Shum 2004, Dube et al. 2008), and financial decisions (Madrian and Shea 2001, Barseghyan et al. 2011). However, most pertinent to the present project is choice inconsistencies in health insurance (Handel 2011, Abaluck and Gruber 2011, Heiss et al. 2012, Kling et al. 2012, Ketcham et al. 2012). In this context, Handel (2011) and Abaluck and Gruber (2011) have shown that switching costs and inability to compare the plan features accounts for a substantial part of choices.

Handel (2011) considers plan choices in a setting similar to the one used here. An employer introduces a new health insurance structure forcing all employees to make new choices. Identifying from the variance in choice between those forced to choose a new plan, and those who can rely on the default plan, Handel estimates switching costs of up to $2,000 for a family. The plans in the comparison differ in their coinsurance rates, making the counterfactual analysis difficult. To avoid this, Handel estimates a full structural model of plan choice, with risk aversion coefficients. The data used in this project circumvents the issue of switching costs and the counterfactual. It compares two near identical plans, which have identical coinsurance rates, removing the problem of the counterfactual. To avoid switching costs, this paper uses two subsamples: new employees and employees whose previous plan was discontinued.

Abaluck and Gruber (2011) study the choice of Medicare Part D plan choices by the elderly. As the elderly parse through sometimes up to 40 different plans, Abaluck and Gruber note that they are unable to often compare the features of the plans. As a result, the authors estimate that approximately 30% of the choices in the sample were suboptimal, the result of excessive importance placed on the premium, and insufficient importance placed on the variance reducing features of the plans. I will be using the model described by Abaluck and Gruber as the starting point for the choice model.

Health insurance choice is subject to informational asymmetries, which have been studied since Akerloff (1970) and Rotchschild and Stiglitz (1976) first formulated the market failure. In recent years, however, health insurance data has become increasingly available, allowing more accurate measurement of the magnitude of these effects. Among these, Einav, Finkelstein, Cullen (2010) and Einav et al. (2013) have used employee data from the aluminum manufacturer Alcoa to estimate the magnitudes and particularities in the effect of moral hazard and adverse selection. Einav, Finkelstein, Cullen (2010) find that the magnitude of adverse selection in their data is modest. In Einav et al. (2013), they go a step further to find evidence of selection in moral hazard in plan choice. In the present research, since Aetna and Aetna Wellness do not differ on the margin, moral hazard should be the same.

Finally, this paper relates to the literature on managed care. The introduction of primary care physician requirements and health risk questionnaires may have generated employee push-back associated with managed care. The experience and literature on managed care is summarized by Glied (2000) in a chapter of *Handbook of Health Economics*.

The contribution of this paper is threefold. First, I compare near identical plans to isolate the effect of wellness features on plan choice as it operates through peer effects and family health. This identification allows me to overcome the endogenous characteristic of choice, and attribute the difference in choice to preferences over wellness features of the plan.

Second, I am able to limit my analysis to a subsample consisting of new employees and employees whose health insurance plan was discontinued. As Handel (2011), switching costs are a significant barrier to optimal plan choice. By using this subsample, I eliminate the impact of switching costs on plan choice.

Finally, in addition to the health plan choice, the dataset includes every claim filed by the employee and family. The claims allow me to create an objective measure of health on the basis of diagnostic and pharmacy codes. To assess health status and predict future health resource utilization, I use ACG software developed by The School of Public Health at Johns Hopkins University.

The Affordable Care Act, combined with the changes to Medicaid have made health in-

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surance choices by working age adults an essential component of policy outcomes. However, much of the literature uses Medicare data to analyze plan choice and utilization. The data used in this paper was obtained from a large employer, which, though not nationally representative, allows insight into the decisions by a part of the population affected by the ACA.

The remainder of this paper will proceed as follows. In Section 2 will introduce the health plans and compare their features. In Section 3 will introduce the data. Here, I will discuss the results derived with the ACG software and definition of peer effects. Section 4 will introduce the model and discuss identification. Results will be presented and discussed in Section 5. Section 6 will conclude.

## Health Plans

In 2008, in cooperation with the local area physicians, the employer introduced Aetna Wellness to the health insurance menu on offer to its employees. Aetna Wellness was derived from and offered simultaneously with the Aetna PPO plan. The aim of the Aetna Wellness plan was to include the primary physician more actively in the preventive health care for the member, to identify and treat health risks before they evolve into costly hospitalizations. The plan was also designed to encourage healthier lifestyle by offering discounts to the gym, counseling for obesity, smoking cessation, and stress management. To achieve these goals, the enrollees were required to choose a primary care physician (PCP) and complete a health risk assessment questionnaire. On the basis of the questionnaire, the PCP would conduct an annual physical examination. Beyond the initial examination, the PCP did not act as a gatekeeper for the health plan as the member could use any specialist services without referrals.

The employer designed the financial characteristics of Aetna Wellness to be comparable with and more appealing than existing plans. Table 1 presents a side-by-side comparison of all health insurance choices for a family in 2012. Compared to the Aetna plan, Aetna Wellness had the same coinsurance rate, the same network of physicians, hospitals, and pharmacies, and no referrals were necessary for specialist visits. Aetna Wellness was better than Aetna because

it had a lower premium, deductible, and annual out of pocket maximum across the years, and it offered health services such as discounted gym membership. However, upon enrollment in Aetna Wellness, the employee was required to select a primary care physician (PCP), and complete a health risk assessment questionnaire. These features constitute the additional non-monetary cost of Aetna Wellness.

The Aetna plan offers the closest comparison to Aetna Wellness, and the analysis will focus on the trade-off between these two plans. The Third Plan, however, was offered in parallel to both and had features similar to both plans. Compared to the Third Plan, Aetna Wellness had the same in-network coinsurance rate. Aetna Wellness had a lower premium, deductible, and annual out of pocket maximum (with the exception of 2008-2009 period). The Third Plan had a different network of physicians and a different out-of-network coinsurance. The Third Plan is of interest in our comparison because in 2013 it was discontinued, forcing its members to make a new choice. As such, this group of employees is a desirable subsample to study since the absence switching costs for them removes status quo bias.

Before proceeding, I would like to discuss the remaining two plans on offer to employees: the Health Savings Account (HSA) and the Aetna 80/20 account. The HSA was a high deductible plan, though it was initially introduced at a premium comparable to Aetna Wellness, by 2012 it's premium was higher. Furthermore, the HSA account acted as a tax deferred investment mechanism, and thus was very different from the other health insurance plans on offer. As such, enrollment in the plan has been very low. The Aetna 80/20 plan was designed for retired and retiring employees, and it was intended primarily as supplemental insurance to Medicare. Enrollment in Aetna 80/20 was halted in 2013, and it is no longer in the menu of plans. When compared to Aetna Wellness, in every year both the in- and out-of-network coinsurance rates in Aetna 80/20 have been the same or worse.

Table 2 presents the enrollment in each plan across the years. As the HSA plan had very low enrollment, I drop it from all subsequent analysis. The Aetna 80/20 plan has substantial enrollment the vast majority of the enrollment is by retirees and pre-retirees. Nonetheless, I will include the Aetna 80/20 plan in some of the multinomial analysis of plan choice. From the

other columns of Table 2, the Third Plan outstrips all other plans in enrollment, while Aetna Wellness and Aetna have comparable enrollments. A closer inspection reveals that the rise in enrollment in Aetna Wellness is matched closely by a decline in the Third Plan. Over this time period, enrollment in Aetna changes by comparatively little.

To explore this further, I compare the share of enrollment between Aetna Wellness, Aetna, and the Third Plan. Figure 1 describes the share of each of the three plans across time. The Third Plan is by far the most popular plan until its closure in 2013. However, as seen in Table 2, the growth in employee share of Aetna Wellness is due to a decline in Third Plan. The Aetna share of employment remains mostly unchanged throughout the years.

Aetna Wellness was priced to be attractive to employees, and the foregone savings from choosing Aetna are substantial. Figure 2 shows the difference in cost to the employee between Aetna Wellness and Aetna over time. The bottom line represents the cost difference between the Aetna and Aetna Wellness in deductible. The middle line represents the difference in premium. The top line is the sum of premium and deductible. Since Aetna Wellness has a lower premium and deductible compared to Aetna in all years, the difference is always positive and growing over the years. Therefore, the incentive to switch from Aetna to Aetna Wellness increased over the years. By 2012, an employee choosing Aetna would see close to $1500 in foregone savings as a result of their plan choice.

Upon its introduction in 2008, and in subsequent years, the benefits brochures provided by the employer highlighted the benefits of Aetna Wellness. The extensive introduction to the plan highlighted that it is a "great plan for faculty and staff members who want to pursue a wellness track to get and stay healthy". The brochure emphasized that regardless of current health, Aetna Wellness would help improve health. The requirements of the plan were listed on the first page: "All family members who choose to enroll in this plan, including children, must pick a primary care physician (PCP). You (and your enrolled family members) will be given a Web site to access in order to fill out a health risk assessment." The benefits of the program are listed in the same section, with referred services ranging from nutrition therapy to medically supervised exercise. In later pages, the Aetna Wellness plan structure is listed in an

easy-to-read breakdown of services, allowing comparison to other plans on the menu.

Despite the favourable introduction and pricing of Aetna Wellness, enrollment increased unexpectedly slowly. Not only were employees choosing to remain with their previous plan, but Aetna members were choosing to actively again switching. Figure 3 tracks the switchers into Aetna Wellness by their plan of origin across time. Each bar represents switchers from Aetna or Third Plan as share of their original plan. Thus, in the initial year, a little over 6% of Aetna members switched into Aetna Wellness. The share declined sharply in 2009 and later years. While it appears that switchers from the Third Plan have a comparable switching behaviour to Aetna members, it helps to keep in mind that the Third Plan had many more members, and thus each bar represents a much larger number of employees. Combined with the previous figures and tables, this figure highlights that Aetna members, who have the lowest cost of switching and the closest comparison to the Aetna Wellness plan are most reluctant to switch.

Thus, while Aetna Wellness was priced and designed to be salient and accessible to all, employee choices suggest that preferences over the characteristics of the plan are not homogeneous. To some, the costs of the plans are more prominent than its benefits. In the following section, I look at the characteristics of members in the plans. Are those who enroll in Aetna Wellness different from the member of the other plans?

## Data

A large self-insured northeastern university granted me exclusive access to the health insurance plan choices and subsequent utilization of its employees between 2007 and 2013. I start with a sample of 1,554,331 person months, which includes employees and family members tracked monthly. Of these, I drop persons with a missing department. I also drop all dependents from my analysis as only the employee makes decision about plan types for the family. Furthermore, I drop all non-active employees - this includes employees who are retired, on leave, on suspension, or other form of paid or unpaid leave. This reduces the sample to ap-

proximately 519,000 person months. Aggregating months to years, I end up with a sample of 55,244 employee years. This constitutes 13,080 employees tracked over an average 4.2 years. Of these employees, 7,258 have no insurance at some point during observation period, for an average period of 2.3 years. Overall, approximately 31% of employees do not have insurance in the sample. Since I do not have any information about the spouse of the employee, I can only guess that those who choose not to enroll receive coverage through their spouse.

Each November, during the open enrollment period, the employee selected among the five health insurance plans described in the previous section. The analysis here is limited to the approximately 9,000 employees who select one of the insurance plans. These employees can choose to remain in their original plan or switch to another health plan. If the employee does not take action, their original health plan is continued into the following year. Because of this default option, any estimates using the total sample will suffer from *status quo* bias associated with to switching costs.

To circumvent the problem of switching costs, I use two subsamples of employees. The first group are new employees. During this period, approximately 4,600 new employees were hired. I designate as a new any employee who started employment in mid-year after the open enrollment period for the current period, and before the following year's enrollment period. In the first month of employment, the employee was required to select a health insurance plan. If they did not select a plan, they received no health coverage until the next open enrollment period. The combination of no previous plan and no default option makes the new employees the ideal subsample for studying the choice of plans. While many of the results will be based on this sample, the sample size is an impediment to estimate precision. To supplement these results, I use a second subsample of employees.

As mentioned above, in 2013, the Third Plan was discontinued and employees enrolled in the plan were required to select from the remaining three choices: Aetna Wellness, Aetna, and the HSA. While the letter of introduction and plan documentation stresses the requirement to choose a new plan, the Frequently Asked Questions notes that if the employee does not take action, they will be moved to the Aetna plan. Thus, like new employees, this subsample does

not suffer from *status quo* bias; however, unlike new employees, they have a default option. Employer records show, however, that very few of the Third Plan member from 2012 defaulted into Aetna in 2013. Nonetheless, though very small, the results may be affected by this small share of the defaults.

To estimate the effect of health and peers on plan choice, I need to define measures of each. To define the health status of the employee and family, I make use of the available claims data, and generate three measures of health. The first, the Charlson Comorbidity Index, is an index which predicts the 10 year mortality of a patient who may have a range of comorbid conditions from a total of 22. Each condition is assigned a score 1, 2, 3 or 6 depending on the risk of dying associated with each one. For example, a score of 1 is assigned to myocardial infarct, congestive heart failure, peripheral vascular disease, dementia, cerebrovascular disease, chronic lung disease, connective tissue disease, ulcer, chronic liver disease. A score of 2 is assigned to hemiplegia, moderate or severe kidney disease, diabetes, diabetes with complication, tumor, leukemia, lymphoma. The maximum score is 16, and a higher score is associated with greater morbidity. The score is assigned on the basis of medical claims. The family health index is the sum of the Charlson index for the employee and dependents. In this sample 84% of families have a Charlson score of 0. Since the index is heavily skewed, it measures the plan selection on the more severe range of health conditions spectrum. To capture the middle of the health distribution, I use software developed at the Johns Hopkins University School of Public Health. This software is becoming increasingly used in economic analysis of health insurance utilization, such as by Handel (2011).

The Johns Hopkins ACG® software uses diagnostic codes from claims and case-mix methodology to describe and predict population past or future health care utilization and costs. The Adjusted Clinical Groups (ACG) are a series of mutually exclusive health status categories defined by morbidity, age, and sex. They are based on the premise that the level of resources necessary for delivering appropriate healthcare to a population is correlated with the illness burden of that population. Thus, individual diseases or conditions are placed into diagnostic groups based on five clinical dimensions: duration of condition, severity of condition, diagnostic cer-

tainty, etiology of the condition (infectious, injury, other), and specialty care involvement. The software allows me to generate two measures of individual health: resource utilization band, predicted total cost band. The resource utilization band categorizes the individual according to current health services utilization:

- 0 - No diagnoses available

- 1 - Healthy Users

- 2 - Low Users

- 3 - Moderate Users

- 4 - High Users

- 5 - Very High Users

For the family, the individual resource utilization bands are summed. In the result, only 41% of the employees have a family score of 0, and the scores are well distributed in the healthy to low user range.

The software predicts individual total medical cost in the next year by generating predicted total cost bands. By taking the median of the band, and summing across family members, I generate a continuous measure of medical expenditure for the family for the next year. The average predicted annual medical expenditure in the sample is $13,000, while the median is $6,250. As expected, the distribution of this measure has a long right tail.

Since the data includes all employees, I can identify the department group for each employee. Using this grouping, I can generate the share of each health plan in the department of the employee. The share of plan $j$ in individual $i$'s department at time $t$ is defined as:

$$Peer_{ijt} = \frac{\sum_{l=1}^{D_{it}} \mathbb{1}\{Plan_{lit} = j\}}{D_{it}}$$

where $D_{it}$ is the number of employees in $i$'s department at time $t$, and $Plan_{lit}$ is the plan enrolled by employee $l$ in $i$'s department at time $t$. The peer measure could be further refined by additionally separating the peer group by job family (faculty vs. administrative). The data does not

lend itself to such refinement, since some department are entirely administrative, while others have only a handful of administrative staff, making peer groups too small for analysis.

In defining peer effects thus, I recognize that the peer group of the employee is not exogenously determined. As employees are involved in the hiring decision of the department, the composition of the department is not random. As a result, the estimates here do not identify the causation of peer choices on employee plan choice. I will interpret the coefficient as associations between the peer group and individual choices.

Table 3 provides summary statistics for the entire sample. Compared to Aetna members, more young female employees join Aetna Wellness. Consistent with the youth of Aetna Wellness members, they tend to have lower earnings compared to Aetna. The comparison of health shows that compared to other plans, Aetna Wellness members and families are healthier, and the predicted total cost for them is lower. On the other hand, the medical resource utilization does not appear to be very different between Aetna Wellness and Aetna members.

The summary statistics for new employees are presented in Table 4. The patterns are more muted among new employees. Aetna Wellness members tend to be younger compared to other plans, and they earn significantly less than Aetna members. Based on the subsequent utilization, Aetna Wellness families are healthier, though the medical resource utilization and the predicted total medical cost are not very different from Aetna members.

The summary statistics suggest that Aetna Wellness members are healthier. Furthermore, the consistency of the pattern of choice between Aetna Wellness and Aetna among all employees and new employees suggest that peer suggestions play an important role. In the next section I discuss the model of plan choice which informs the estimations which follow.

## Model

When describing the plan choice decision of the individual employee, I am constrained by similarity of Aetna Wellness and Aetna. In particular, since the co-insurance and copay are the same for both plans across the year for in-network and out-of-network visits, on the margin,

demand for medical services is the same for both plans. This lack of variability does not allow for identification of a risk aversion coefficient. As a result, a model such as the one defined by Handel (2011) cannot be estimated using the data on hand.

The model presented here will inform the reduced form analysis by describing the mechanisms through which health and peer effects operate. I will use a variation of the Abaluck and Gruber (2011) model.

The employee $i$ is choosing among plans using a constant absolute risk aversion (CARA) utility for plan $j$ at time $t$ :

$$U(C_{ijt}) = -exp(-\gamma(W_{ijt} - C_{ijt})) \text{ where } C_{ijt} \sim N(\mu, \sigma^2) \tag{1}$$

Here, $W_{ijt}$ is wealth and $C_{ijt}$ is cost of insurance. Insurance costs are characterized by $P_{jt}$, premium, and $M_{it}$, medical expenditure, and hassle associated with satisfying plan requirement and learning about plan features, $H_{ijt}$.

$$H_{ijt} = f(F_{jt}, Peers_{it}, h_{it}, \eta_t) \text{ where } \eta_t \sim N(\mathbb{H}, \sigma_\eta^2) \tag{2}$$

$$C_{ijt} = P_{jt} + \kappa M_{it} + H_{ijt} \mathbb{1}\{I_{it} \neq I_{it-1}\} \tag{3}$$

The hassle of a plan can be affected by the plan features, peer group of the employee, and their own/family health. Plan features, $F_{jt}$, include choice of primary care physician (PCP) and completion of health risk questionnaire. Deviating from usual definition of peer effect, I assume that the peers inform the employee about the real burdens and benefits of the plan features. The peer effect is captures by $Peers_{it}$, and it is a vector of shares of peers in insurance plans. $h_{it}$ is the health status of employee/family. I hypothesize that there are three avenues through which employees and families with worse health have a higher cost to learning about health plans. First, having a more regular relationship with a physician, they may be reluctant to experience changes to that relationship. Second, they may be weary of additional medical visits and testing, even if the testing will result in improved medical care. Third, they might

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perceive that a plan with emphasis on wellness is not designed with their needs in mind. I am unable to differentiate between these three avenues of effects.

Following the first order Taylor expansion of indirect utility, I derive the conditional logit model of plan choice, where the utility of individual $i$ from plan $j$ is given by:

$$u_{ijt} = \alpha + \delta_0 P_{jt} + \delta_1 E[M_{ijt}] + Peers_{it}\delta_2 + \delta_3 h_{it} + \delta_4 F_{jt} + x_{it}\lambda + \epsilon_{ijt} \tag{4}$$

where $x_{it}$ is a vector if individual characteristics, $E[M_{it}]$ is the expected medical expenditure for individual $i$. To estimate the peer and health effects on plan choice, the coefficients of interest are $\delta_2$ and $\delta_3$.

The identification of the peer and health effects has challenges. First, peer effects are recognized in literature to have two problems. Reflectivity of peer choices occurs when a causality loop exists, where friends affect each other's choice, biasing estimates upwards. By using the new employees as my preferred sample I break the causality loop. Because new employees make health insurance choices after the traditional enrollment period, the choices of existing employee cannot be affected by new employees. Another problem associated with peer effects is that peer groups tend to be endogenous to individual characteristics. While I cannot overcome this problem in the current context, compared to peer groups of friends, department peers tend to have fewer common unobservable factors.

The second challenge to identification is the endogeneity of plan choice. The endogeneity arises when the individual choice of plan is affected by the unobservable characteristics. The endogeneity results in a different pattern of utilization of health services. To overcome the endogeneity I compare near identical plans. Aetna and Aetna Wellness have the coinsurance rates and physician networks, so that I can confidently assume that the counterfactual and actual expenditure between the two plans would be identical. Since, controlling for financial attributes, the only difference between Aetna Wellness and Aetna is the wellness features, the unobservable characteristics which determine the choice between two plans reveal preferences over wellness features. Thus, peers and health affect plan choice operate through individual

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preferences on the wellness features.

# Results

Before proceeding with the estimation of the model, I need to determine the selection occurring when looking at the sample of employees who choose insurance. To do this, I will estimate the following binary choice model of insurance enrollment:

$$Pr(Insurance) = \alpha_0 + x_{it}\alpha_1 + Peer_{it}\alpha_2 + \alpha_3 h_{it} + year + \epsilon_{it} \tag{5}$$

where $x_{it}$ is a vector if individual characteristics, $Peers_t$ is a vector of shares of peers in insurance plans, $h_t$ is the health status of employee/family. The analysis will be conducted for both the entire sample, the subsample of employees with discontinued insurance, and the sample of new employees.

The regression results are presented in Table 5. The first column of the table lists the coefficient estimates for the entire sample. Overall, it appears that the total sample has substantial selection occurring. The second column are the estimates for employees whose plan was discontinued. The last column are the estimates for the new employees. Here, while some selection does occur, it is smaller and less significant. This is further evidence that the sample of new employees is best suited to estimate the model.

## Pairwise Comparison

The analysis will begin with pairwise comparisons between Aetna Wellness and Aetna, and then Aetna Wellness and the Third Plan. In the next section, a multinomial analysis will allow the integration of the entire choice set of employees. To estimate the binary choice relationship between Aetna Wellness and the other plan of comparison, I adapt the model equation (4) and define the probability of choice as:

$$Pr(AetnaWellness) = \alpha + Peers_{jt}\delta_2 + \delta_3 h_{it} + \delta_0 P_{jt} + \delta_1 E[M_{it}] + x_{it}\lambda + \epsilon_{ijt} \tag{6}$$

where $E[M_{it}]$ is the expected medical expenditure for the household. To estimate the effect of health on plan choice, I will be using $h_{it}$ and $E[M_{it}]$, as measured by the Charlson index, the resource utilization bands, and the predicted total costs. In particular, the ACG software generated predicted total costs allows me to match the expected medical expenditure component of the model closely.

Table 6 presents the results of the linear probability of choosing Aetna Wellness for the total sample. The model is estimated using the various measures of health: medical resource utilization intensity (columns (1) and (2)), predicted total cost (columns (3) and (4)), and the Charlson index of comorbidities (columns (5) and (6)). The coefficients on interest are peer effect Aetna Wellness and the measures of health. Since the peer effect is defined as the share of the department, it ranges from 0 to 1. Therefore, the coefficient in column (2) can be interpreted as a 10% rise in the Aetna Wellness enrollment in department increases own probability of enrolling in Aetna Wellness by 2.6%. The health effect differs by the measures used. The probability of enrolling in Aetna Wellness declines 1% with a point rise in the resource utilization, and declines 3% with a point rise in the Charlson index.

Table 7 repeats the analysis for the subsample of employees with discontinued insurance. Here, once again, each column represents a separate regression with one of the three measures of health. Peer effect is significant, with a 10% rise in peer enrollment increasing own enrollment in Aetna Wellness by 1.5%. As in the previous table, a one point rise in the Charlson index reduces the probability of enrollment in Aetna Wellness by 4%.

The estimates for the sample of new employees confirms the same trends in Table 9, however the sample size sharply increases the standard errors. The peer effect of Aetna Wellness enrollment is 1.7%, and a point rise in the Charlson index decreases the probability of enrollment by 5%.

The model is next estimated as a logistic regression. Table 9 has the results for the total sample. A 10% rise in peer enrollment in Aetna Wellness increases own probability of enrollment between 2.7% and 2.9%, and a point rise in the Charlson index decreases the probability by 3%. For employees with discontinued insurance, in Table 10, the peer effect is between

1.3% and 1.5%, while the Charlson index decreases the probability by 5%. The sample of new employees in Table 11 shows results of same magnitude, with, again, larger standard errors.

I next compare Aetna Wellness and the Third Plan. The comparison in this case is not as close. The Third Plan had a different network, and a different coinsurance rate on the out-of-network medical services compared to Aetna Wellness. A cursory comparison of the networks in the geographical area of the employer, however, yields only small differences between the networks. Since the Third Plan was discontinued in 2013, all analysis here is limited to pre-2013 sample, and therefore precludes the subsample used in the previous comparison.

Table 12 contains the estimates of a linear probability of choice of Aetna Wellness compared to the Third Plan. The peer effect is similar in magnitude and sign to the previous analysis, with a 10% rise in peer enrollment in Aetna Wellness increasing own probability of enrollment between 2.3% and 2.5%. A one point rise in the intensity of medical resource utilization and the Charlson index lead to a 1% decline in probability of enrollment. Table 13 present the estimates for the subsample of new employees, and the results are near identical to the comparison between Aetna Wellness and Aetna.

The results of the logit specification are in Table 14 and 15. As before, the dependent variable is the probability of choosing Aetna Wellness, when faced with the choice with the Third Plan. The peer effect has similar magnitude and sign, with a 10% rise in the peer enrollment in Aetna Wellness increasing own probability of enrollment by 3.0%. The probability declines by 2% for a one point rise in the resource utilization intensity, and declines by 1% for a point rise in the Charlson index.

**Extended Choice Set**

The pairwise comparison of the health plans, however, assumes independence among the alternatives. If this assumption does not hold, then the relevant choice set are all health plan options faced by the employee. In this section, I will re-estimate the model using a multinomial logit specification and a mixed logit specification.

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A multinomial logit model is used when the regressors are individual specific. The probability of choosing Aetna Wellness from the choice set is defined as:

$$p_{ij} = \frac{exp(x_i'\beta_j)}{\sum_{l=1}^{m} exp(x_i'\beta_l)} \tag{7}$$

where $x_i$ are the individual specific regressors, and $j$ = {plan choice set}. To ensure identification $\beta_j$ is set to zero for one of the categories, though the average marginal effect can be estimated for all categories.

In the section describing the plans, I described the Aetna 80/20 plan which was intended for pre-retirees and retirees. In the first multinomial logit, I will consider the choice set including the Aetna 80/20 plan. Thus, in Table 16, the choice set is $j$ = {Aetna Wellness, Aetna, Aetna 80/20, Third Plan}. Because of this definition of the choice set, the analysis is limited to 2007-2012 time period, and excludes the subsample of employees with discontinued plan. Aetna Wellness is the base category in all regressions, but the second, fourth, and sixth column present the marginal effects of the regressors on the probability of choosing Aetna Wellness only. The estimates for peer effect and health are quantitatively and qualitatively identical to the previous results. However, looking at the coefficient for Aetna 80/20, I see large standard errors and small coefficients, which is due to the very small sample of employees enrolled in the plan. In the following regression, presented in Table 17, I drop Aetna 80/20 from consideration and add no insurance, and my coefficients are largely unchanged for the probability of choice of Aetna Wellness.

In Table 18, I estimate the multinomial logit model for new employees. The choice set is $j$ = {Aetna Wellness, Aetna, Third Plan, and no insurance}, and the addition of no insurance to the choice set has a significant impact on both peer and health effect. Peer effects range from 1.4% to 3.1% in this estimate, depending on which measure of health is used. The measure of health is now differentiated as well. A point rise in the intensity of resource utilization increases the probability of enrollment in Aetna Wellness by 16%. A $1,000 rise in the predicted total future medical cost increases the probability of enrolling in the plan by 9%. Given that the sample used here includes all new employees who chose not to have insurance, the changes in

estimates can be attributed to this choice.

While the multinomial logit allows a comparison of a wider choice set, it makes use of the observed choices of employees. It does not incorporate the attributes of the alternatives in the choice sets, and limits regressors to the employee characteristics. In this dataset, however, I have more complete information about the characteristics of all the alternatives in the choice set. To take advantage of this information, I use a mixed logit specification, described as alternative specific conditional logit in Stata. Expanding on McFadden (1973), Cameron and Trivedi (2010) describe the alternative specific conditional logit as combining both plan characteristics and individual attributes, defining the probability of choice of plan $j$:

$$p_{ij} = \frac{exp(z_{ij}'\beta + x_i'\gamma_j)}{\sum_{l=1}^{m} exp(z_{il}'\beta + x_i'\gamma_l)} \qquad (8)$$

where

$$j = \{\text{plan choice set}\}$$

$$z_{ij} = \{\text{premium, deductible, peer effects}\}$$

$$x_i' = \{\text{demographics, family health}\}$$

I estimate the mixed logit using the alternative specific conditional logit command in Stata®.

Table 19 presents the results from the mixed logit regression with the choice set of Aetna Wellness, Aetna, Third Plan, and no plan. In this table, each section divided by a line is a separate regression specification. The columns, as before, separate the results by sample. The first two columns reflect the estimates for the total sample, while the last two columns limit the sample of new employees. Only the coefficient of interest are listed from each regression. The marginal effects are calculated manually, and the significance can be judged by the coefficient. Looking at the second and fourth column, the peer effect for Aetna Wellness is somewhat larger from the previous estimates, ranging from 3.7% for the first specification to 6.3% in the last specification. While the health measures have changed in magnitude as well, the results

are unreliable as the coefficients are not significantly different from zero. Table 20 repeats the analysis for the choice set faced by the employees with discontinued insurance, that is Aetna Wellness, Aetna, and no insurance. The coefficients are similar in magnitude and sign.

## Robustness of Results

In all of the above estimates, I estimate the contemporaneous peer effects. For new employees this is particularly appropriate since when choosing among plans, they would discuss their current experiences with their colleagues. How would the estimates change if the peer effect was introduced with a lag? Table 21 has the estimates from the regression with lagged peer effects for new employees. The lagged peer effects are not significant for in any of the specifications, confirming that the new employees indeed rely on the current experiences of their colleagues.

Does the reliance on peer experiences change in the years after the introduction of the Wellness plan? Table 22 estimates the logit model of comparison between Aetna Wellness and Aetna, including a peer and time interaction. The first two columns present the results for the entire sample, while the last two focus on the sample of new employees. In the second and fourth columns I have estimates the marginal effects of the individual peer-year interactions on the probability of enrolling in Aetna Wellness. In the total sample, the peer effect is at 7.8% in 2008, the first year of introduction, and steadily declines to 2.8% by 2012. For the sample of new employees, a similar but more moderated decline can be seen, though the large standard errors do not allow me to rely on the result. These suggest that as the Wellness plan becomes better known, the value of peer feedback or information declines.

Finally, a falsification test will allow me to rule out spurious peer effects. To check the robustness of peer effects, I have randomly assigned the peer group to the employee. The estimates of the logit model are presented in Table 23. As expected, all the coefficients are close to zero and insignificant for both total and new employee sample. This confirms that the estimates seen in the previous tables are not spurious.

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## Extensions to Research

While the primary aim of the Aetna Wellness program was to improve employee health, one of the aims of such wellness programs is to reduce medical resource utilization. A natural extension of this research is to analyze the subsequent utilization of the Aetna Wellness plan by its members to see if, indeed, the pattern of utilization has changed. Is there an increase in primary care visits, and decline in hospitalizations? Is there a decline in preventable use of emergency care and hospitalizations? To analyze utilization, I intend to use two algorithms. The first was developed at NYU Center for Health and Public Service Research to help classify ED utilization. The second was developed by the Agency for Healthcare Research and Quality to assist quality improvement efforts in acute care hospital settings. Both of these algorithms identify emergency care and hospitalizations which could be prevented with primary care.

Table 24 presents the preliminary results of an ordinary least squares regression of log medical expenditure on plan type and other covariates. The categories, by column, are total medical expenditure, emergency department expenditure, inpatient acute expenditure, and prescription pharmacy expenditure. The omitted category is Aetna, and the estimates show that Aetna Wellness members do not appear to spend less in any category, and certainly spend more in the use of emergency care. However, these estimates suffer from selection bias, as individuals who select Aetna Wellness do so because of unobserved beliefs about wellness. To overcome the selection bias, I use a difference-in-difference model for individuals who enroll in Aetna Wellness any time during my observation window, and compare their pre- and post-enrollment medical utilization to those who do not enroll. The results of this research are forthcoming.

While the analysis presented in the previous sections emphasizes the effect of peer choices on own enrollment in Aetna Wellness, it does not explore the avenues of learning. Does the effect of peer choices also reflect in the way new employees use the plan? Do they choose the same primary care physician? Are they more likely to take advantage of the other features of the plan if a peer has used any features? These questions will be addressed in a separate

extension to this analysis.

## Conclusions and Policy Implications

This paper studies the introduction of a wellness program as an optional part of health insurance. Many employers and insurers are turning to wellness programs as a means of slowing the rising costs of health insurance by making the patient more mindful of their health and medical services utilization. While many employers introduce these programs as a mandatory part of all insurance, I study the program in the voluntary context.

Aetna Wellness was introduced by a large self-insured employer to its health insurance options. Aetna Wellness was based on and introduced in parallel to an existing Aetna plan. Despite lower premium and deductible, employees actively chose plans other than Aetna Wellness. I look at two factors affecting the choice between Aetna Wellness and Aetna: peer choices and family health. To measure the effect of peer choices, I count the share of employee's department enrolled in each plan. To measure the family health status, I use three measures: the Charlson index of comorbidities uses medical claims to isolate the presence of 22 severe medical conditions, and rates them according to mortality; the Johns Hopkins ACG software allows me to generate two measures of medical service utilization on the basis of medical and pharmaceutical claims, by age and gender. The resource utilization bands measure the current intensity of medical utilization by individual. The predicted total cost range reflects the expected medical costs the individual.

Since Aetna Wellness and Aetna differ only on the wellness program, I ascribe the choice to preferences over it. I use two subsamples to avoid the choice bias introduced by switching costs: new employees, and employees whose health plan was discontinued in 2013. I find that a 10% rise in the peer enrollment in Aetna Wellness increases own probability of enrollment between 1.4% to 3.7%. Family health status has a different effect depending on the measure used. Using the resource utilization band, which has a more even distribution across employees, I find that a 1 point rise in the index increases the probability of enrollment in Aetna

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Wellness up to 16%. When using the Charlson family index, which has a skewed distribution towards the more severe medical conditions, I find that a 1 point rise in the index reduces the probability of enrollment in Aetna Wellness up to 5%. For every $1,000 increase in the predicted medical expenditure, the probability of enrollment increases by 9%.

The results suggest that lack of information and experience about the wellness features is a major impediment in the adoption of the program. As the program is increasingly implemented by employers, state and regional governments, the effectiveness will increase if employees are better informed about the true costs and benefits of the program, for example, the Virginia Wellness Is Now (WIN).

The results also suggest that those who join the program tend to be generally healthier, but heavy users of medical services. The resource utilization band, which has a wider distribution among all employees, suggests that Wellness members are not the non-users – they are light to medium users of medical services. However, as the Charlson index shows, those with more severe permanent medical conditions tend to avoid the Wellness program. A more effective program would reach those with more severe permanent medical conditions.

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Figure 1: Enrollment in Plans, 2007-2012
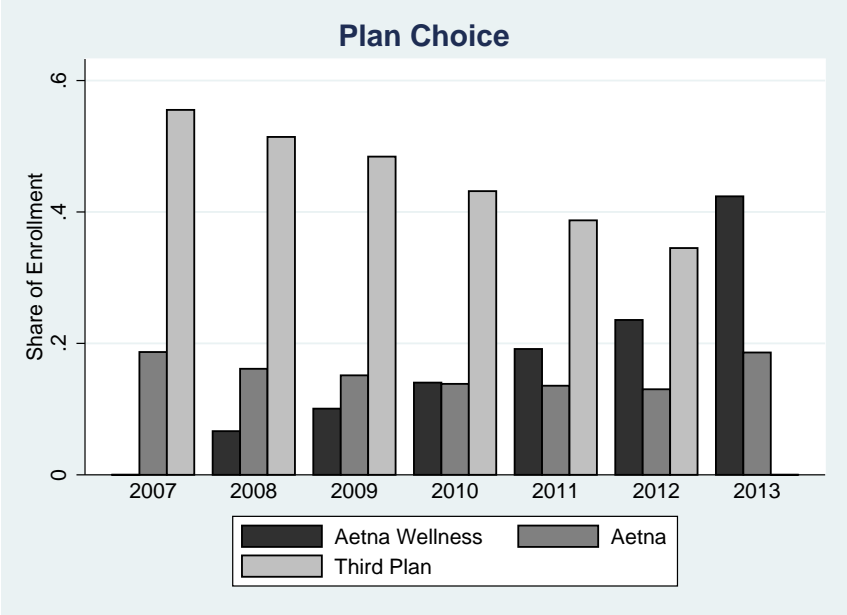
Figure 2: Aetna v. Aetna Wellness: Cost Difference
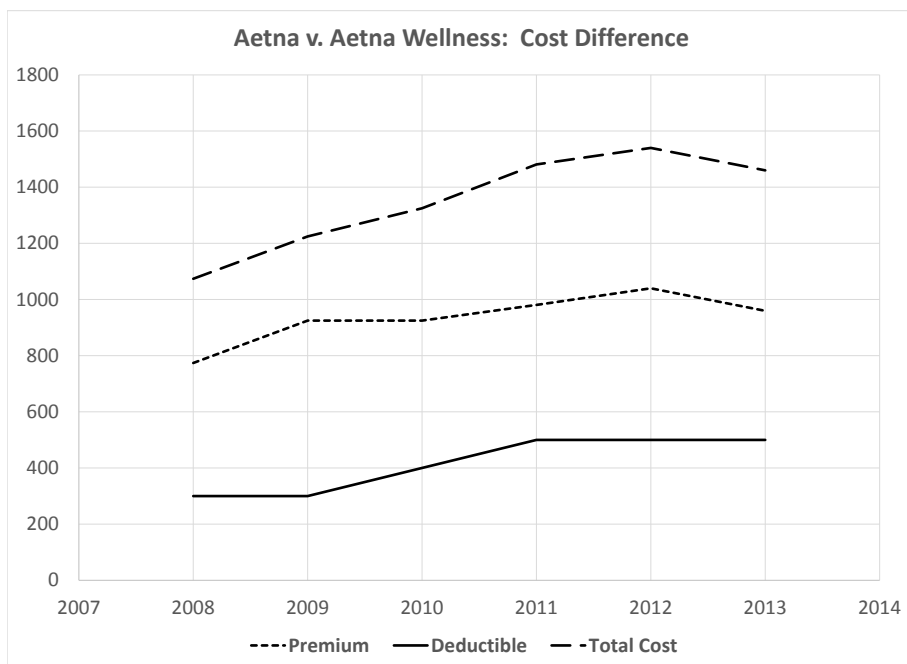
Figure 3: Switching into Aetna Wellness
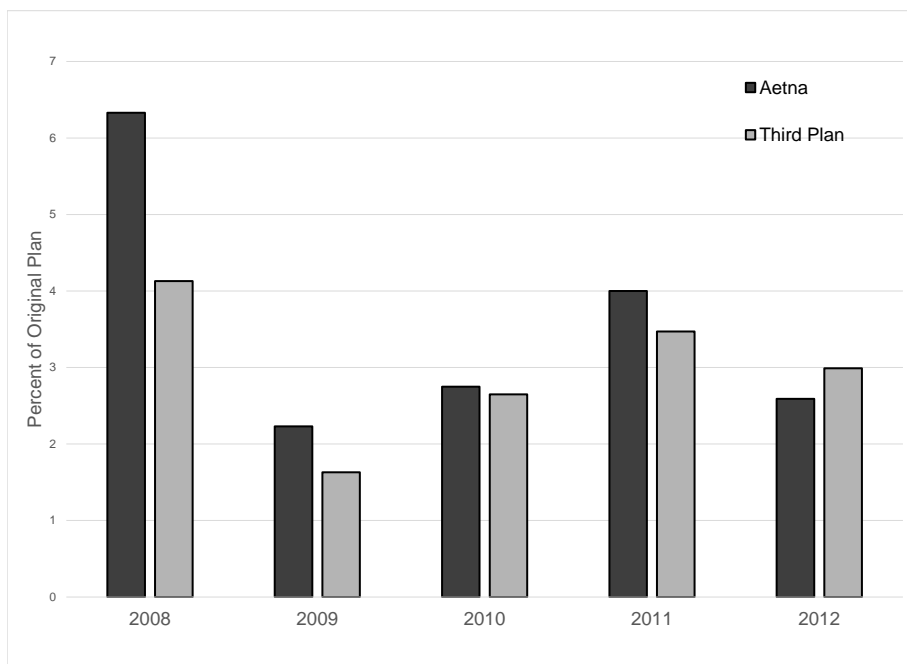
Table 1: Plan Comparison for a Family, All Plans 2012

|  | **Aetna Wellness** | **Aetna** | **Third** | **HSA** | **Aetna 80/20** |
|---|---|---|---|---|---|
| Premium | 3515 | 4555 | 3828 | 3615 | 6133 |
| Deductible |  |  |  |  |  |
| *In Network* | 0 | 500 | 300 | 2400 | 1100 |
| *Out of Network* | 800 | 900 | 900 | 4800 | 1100 |
| Out of Pocket Maximum |  |  |  |  |  |
| *In Network* | 4000 | 4100 | 4100 | 5000 | 7100 |
| *Out of Network* | 7000 | 7100 | 7100 | 7000 | 7100 |
| Coinsurance |  |  |  |  |  |
| *In Network* | 90 | 90 | 90 | 90 | 80 |
| *Out of Network* | 80 | 80 | 70 | 80 | 80 |
| Network | Aetna | Aetna | PHCS | Aetna | Aetna |
| Must choose PCP | Yes | No | No | No | No |
| Enhanced Wellness Program | Yes | No | No | No | No |

Table 2: Enrollment across years by numbers

|  | Aetna Well | Aetna | Aetna 80/20 | Third | HSA |
|---|---|---|---|---|---|
| 2007 | . | 763 | 205 | 2529 | . |
| 2008 | 402 | 982 | 287 | 3370 | 12 |
| 2009 | 619 | 920 | 265 | 3215 | 15 |
| 2010 | 857 | 819 | 241 | 2756 | 14 |
| 2011 | 1196 | 807 | 218 | 2451 | 18 |
| 2012 | 1462 | 778 | 216 | 2202 | 15 |
| 2013 | 2621 | 1017 | 152 | . | 26 |

## Table 3: Summary Statistics

|  | Aetna Wellness | Aetna | Third Plan | All |
|---|---|---|---|---|
| Age | 43.97 | 47.87 | 45.56 | 43.670 |
|  | (11.75) | (11.81) | (11.42) | (15.58) |
| Female | .58 | .46 | .52 | .51 |
|  | (.49) | (.50) | (.50) | (.50) |
| No. of dependents | 1.11 | 1.20 | 1.23 | .73 |
|  | (1.30) | (1.31) | (1.28) | (.85) |
| Salary | 65016 | 85284 | 58973 | 54096 |
|  | (45223) | (55378) | (34326) | (44663) |
| Past Medical Expenditure | 7384 | 10293 | 9087 | 5148 |
|  | (13756) | (15485) | (15231) | (8570) |
| Family Health | .15 | .23 | .19 | .22 |
|  | (.50) | (.66) | (.52) | (.58) |
| Medical Resource Utilization | 2.44 | 2.58 | 2.50 | 1.80 |
|  | (.79) | (.74) | (.77) | (1.24) |
| Predicted Total Medical Cost (1000's) | 7.55 | 9.53 | 8.65 | 7.14 |
|  | (6.42) | (8.14) | (7.31) | (6.79) |
| Gym Membership | .08 | .17 | .18 | .14 |
|  | (.26) | (.34) | (.35) | (.31) |
| Aetna Wellness Share in Dept. | .29 | .16 | .10 | .15 |
|  | (.18) | (.17) | (.08) | (.12) |
| N | 3853 | 2405 | 5183 | 26869 |

Table 4: Summary Statistics: New Employees

| | Aetna Wellness | Aetna | No Insurance | All |
|---|---|---|---|---|
| Age | 35.17 | 37.33 | 35.80 | 36.37 |
| | (9.37) | (10.15) | (9.75) | (11.18) |
| Female | .52 | .51 | .39 | .44 |
| | (.50) | (.50) | (.48) | (.49) |
| No. of dependents | .35 | 0.51 | 0.13 | .21 |
| | (.8) | (1.08) | (.52) | (.66) |
| Salary | 57738 | 75302 | 47851 | 51080 |
| | (40038) | (62997) | (31782) | (36556) |
| Medical Expenditure | 3179 | 5840 | | 1375 |
| | (9080) | (23317) | | (7699) |
| Family Health | .06 | .14 | | .10 |
| | (.36) | (.60) | | (.49) |
| Medical Resource Utilization | 1.96 | 2.00 | | .71 |
| | (.87) | (.84) | | (1.06) |
| Predicted Total Medical Cost (1000's) | 5.17 | 5.58 | | 3.24 |
| | (6.08) | (6.32) | | (4.06) |
| Gym Membership | .02 | .11 | .07 | .07 |
| | (.13) | (.32) | (.3) | (.24) |
| Aetna Wellness Share in Dept. | .20 | .12 | | .12 |
| | (.16) | (.14) | | (.14) |
| N | 630 | 236 | 3147 | 4603 |

Table 5: Linear probability model of insurance take up.

| | (1) All Employees | (2) Discontinued Plan | (3) New Employees |
|---|---|---|---|
| Age | .00*** | .00*** | −.00 |
| | (.00) | (.00) | (.00) |
| Female | .06*** | .09*** | .04*** |
| | (.01) | (.01) | (.01) |
| No. of Dependents | .04*** | .01 | −.01 |
| | (.00) | (.01) | (.01) |
| Salary | .05*** | .08*** | .02* |
| | (.00) | (.01) | (.01) |
| Peer Effect Aetna Wellness | .03 | −.06 | .02 |
| | (.02) | (.04) | (.05) |
| Peer Effect Aetna | .00 | −.14* | .03 |
| | (.02) | (.06) | (.06) |
| Peer Effect Third | .08*** | | .04 |
| | (.02) | | (.03) |
| Resource Utilization Band | .16*** | .10*** | .36*** |
| | (.00) | (.01) | (.00) |
| Const | −.15*** | −.26** | −.11 |
| | (.14) | (.06) | (.11) |
| Year Fixed Effects | Yes | No | Yes |
| mean | .76 | .85 | .42 |
| N | 44132 | 2281 | 3171 |
| $r^2$ | .29 | .15 | .66 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 6: Linear probability model of choice between Aetna Wellness and Aetna for total sample.

|  | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Peer Effect Aetna | −.27*** | −.19*** | −.27*** | −.19*** | −.24*** | −.19*** |
|  | (.05) | (.05) | (.05) | (.05) | (.05) | (.05) |
| Peer Effect Aetna Wellness | .77*** | .26*** | .78*** | .26*** | .75*** | .25*** |
|  | (.03) | (.04) | (.03) | (.04) | (.03) | (.04) |
| Resource Utilization Band | −.02*** | −.01 |  |  |  |  |
|  | (.00) | (.00) |  |  |  |  |
| Predicted Total Cost |  |  | −.00*** | −.00* |  |  |
|  |  |  | (.00) | (.00) |  |  |
| Charlson Index |  |  |  |  | −.05*** | −.03*** |
|  |  |  |  |  | (.01) | (.01) |
| Past Med Exp |  |  |  |  |  | .02*** |
|  |  |  |  |  |  | (.00) |
| ln(Cost) |  | −.25*** |  | −.25*** |  | −.25*** |
|  |  | (.01) |  | (.01) |  | (.01) |
| Age |  | −.00*** |  | −.00*** |  | −.00*** |
|  |  | (.00) |  | (.00) |  | (.00) |
| Female |  | .08*** |  | .07*** |  | .08*** |
|  |  | (.01) |  | (.01) |  | (.02) |
| No. of Dependents |  | .13*** |  | .13*** |  | .12*** |
|  |  | (.01) |  | (.01) |  | (.01) |
| Salary |  | −.04*** |  | −.04*** |  | −.04*** |
|  |  | (.01) |  | (.01) |  | (.02) |
| Const | .46*** | 2.58*** | .44*** | 2.57*** | .41*** | 2.35*** |
|  | (.02) | (.13) | (.01) | (.13) | (.02) | (.14) |
| Year Fixed Effects | No | Yes | No | Yes | No | Yes |
| mean | .54 | .57 | .54 | .57 | .55 | .56 |
| N | 14318 | 13244 | 14318 | 13244 | 12733 | 11642 |
| $r^2$ | .11 | .23 | .11 | .23 | .10 | .24 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 7: Linear probability model of choice between Aetna Wellness and Aetna for subsample of employees with discontinued insurance.

|  | (1) | (2) | (3) |
|---|---|---|---|
| Peer Effect Aetna | −.13 | −.13 | −.13 |
|  | (.11) | (.11) | (.11) |
| Peer Effect Aetna Wellness | .14 | .14* | .14* |
|  | (.07) | (.07) | (.07) |
| Resource Utilization Band | −.00 |  |  |
|  | (.01) |  |  |
| Predicted Total Cost |  | −.00 |  |
|  |  | (.00) |  |
| Charlson Index |  |  | −.04** |
|  |  |  | (.02) |
| ln(Cost) | −.21*** | −.21*** | −.21*** |
|  | (.02) | (.02) | (.02) |
| Age | .00 | .00 | .00 |
|  | (.00) | (.00) | (.00) |
| Female | .08*** | .08*** | .08*** |
|  | (.02) | (.02) | (.02) |
| No. of Dependents | .14*** | .14*** | .14*** |
|  | (.01) | (.01) | (.01) |
| Salary | −.01 | −.01 | −.01 |
|  | (.02) | (.02) | (.02) |
| Const | 2.03*** | 2.02*** | 2.02*** |
|  | (.19) | (.19) | (.19) |
| Year Fixed Effects | No | No | No |
| mean | .70 | .70 | .70 |
| N | 1719 | 1719 | 1719 |
| $r^2$ | .10 | .10 | .10 |

*** Significant at 1 percent level.

** Significant at 5 percent level.

* Significant at 10 percent level.

Table 8: Linear probability model of choice between Aetna Wellness and Aetna for new employees.

|  | (1) | (2) | (3) |
|---|---|---|---|
| Peer Effect Aetna | −.10 | −.10 | −.09 |
|  | (.12) | (.12) | (.12) |
| Peer Effect Aetna Wellness | .18 | .18 | .18 |
|  | (.10) | (.10) | (.10) |
| Resource Utilization Band | −.01 |  |  |
|  | (.02) |  |  |
| Predicted Total Cost |  | −.00 |  |
|  |  | (.00) |  |
| Charlson Index |  |  | −.04 |
|  |  |  | (.03) |
| ln(Cost) | −.38*** | −.38*** | −.38*** |
|  | (.03) | (.03) | (.03) |
| Age | −.00 | −.00 | −.00 |
|  | (.00) | (.00) | (.00) |
| Female | −.05 | −.05 | −.05 |
|  | (.03) | (.03) | (.03) |
| No. of Dependents | .29*** | .29*** | .29*** |
|  | (.03) | (.03) | (.03) |
| Salary | −.12*** | −.12*** | −.12*** |
|  | (.03) | (.03) | (.03) |
| Const | 4.47*** | 4.46*** | 4.46*** |
|  | (.35) | (.35) | (.35) |
| Year Fixed Effects | Yes | Yes | Yes |
| mean | .79 | .79 | .79 |
| N | 743 | 743 | 743 |
| $r^2$ | .24 | .24 | .24 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 9: Logit marginal effect on choice between Aetna Wellness and Aetna with total sample.

|  | (1) | | (2) | | (3) | |
|---|---|---|---|---|---|---|
|  | Coeff. | Marg. | Coeff. | Marg. | Coeff. | Marg. |
| Peer Effect Aetna | −1.06*** | −.20*** | −1.06*** | −.20*** | −1.03*** | −.19*** |
|  | (.27) | (.05) | (.27) | (.05) | (.28) | (.05) |
| Peer Effect Aetna Wellness | 1.54*** | .29*** | 1.53*** | .28*** | 1.44*** | .27*** |
|  | (.22) | (.04) | (.22) | (.04) | (.23) | (.04) |
| Resource Utilization Band | −.04 | −.01 |  |  |  |  |
|  | (.02) | (.00) |  |  |  |  |
| Predicted Total Cost |  |  | −.01* | −.00* |  |  |
|  |  |  | (.00) | (.00) |  |  |
| Charlson Index |  |  |  |  | −.16** | −.03** |
|  |  |  |  |  | (.05) | (.01) |
| Past Medical Exp. |  |  |  |  | .12*** | .02*** |
|  |  |  |  |  | (.02) | (.00) |
| ln(Cost) | −1.27*** | −.24*** | −1.27*** | −.24*** | −1.27*** | −.24*** |
|  | (.06) | (.01) | (.06) | (.01) | (.06) | (.01) |
| Age | −.02*** | −.00*** | −.02*** | −.00*** | −.02*** | −.00*** |
|  | (.00) | (.00) | (.00) | (.00) | (.00) | (.00) |
| Female | .40*** | .07*** | .40*** | .07*** | .43*** | .08*** |
|  | (.08) | (.01) | (.08) | (.01) | (.08) | (.01) |
| No. of Dependents | .66*** | .12*** | .66*** | .12*** | .62*** | .11*** |
|  | (.05) | (.01) | (.05) | (.01) | (.05) | (.01) |
| Salary | −.21*** | −.04*** | −.21*** | −.04*** | −.20*** | −.04*** |
|  | (.06) | (.01) | (.06) | (.01) | (.06) | (.01) |
| Const | 10.82*** |  | 10.75*** |  | 9.60*** |  |
|  | (.75) |  | (.75) |  | (.79) |  |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| mean |  | .57 |  | .57 |  | .56 |
| N | 13244 | 13244 | 13244 | 13244 | 11642 | 11642 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 10: Logit marginal effect on choice between Aetna Wellness and Aetna for employees with discontinued insurance.

|  | (1) | | (2) | | (3) | |
|---|---|---|---|---|---|---|
|  | Coeff. | Marg. | Coeff. | Marg. | Coeff. | Marg. |
| Peer Effect Aetna | −.72 | −.14 | −.72 | −.14 | −.81 | −.15 |
|  | (.56) | (.11) | (.56) | (.11) | (.56) | (.10) |
| Peer Effect Aetna Wellness | .77* | .15* | .78* | .15* | .70 | .13 |
|  | (.39) | (.07) | (.39) | (.07) | (.39) | (.07) |
| Resource Utilization Band | .00 | .00 |  |  |  |  |
|  | (.07) | (.01) |  |  |  |  |
| Predicted Total Cost |  |  | −.00 | −.00 |  |  |
|  |  |  | (.01) | (.00) |  |  |
| Charlson Index |  |  |  |  | −.28*** | −.05*** |
|  |  |  |  |  | (.08) | (.02) |
| Past Medical Exp. |  |  |  |  | .19*** | .04*** |
|  |  |  |  |  | (.05) | (.01) |
| ln(Cost) | −1.13*** | −.21*** | −1.13*** | −.21*** | −1.18*** | −.22*** |
|  | (.10) | (.02) | (.10) | (.02) | (.10) | (.02) |
| Age | .01 | .00 | .01 | .00 | .01 | .00 |
|  | (.01) | (.00) | (.01) | (.00) | (.01) | (.00) |
| Female | .42*** | .08*** | .42*** | .08*** | .42*** | .08*** |
|  | (.12) | (.02) | (.12) | (.02) | (.12) | (.02) |
| No. of Dependents | .79*** | .15*** | .79*** | .15*** | .73*** | .14*** |
|  | (.08) | (.01) | (.08) | (.01) | (.08) | (.01) |
| Salary | −.05 | −.01 | −.06 | −.01 | −.07 | −.01 |
|  | (.08) | (.01) | (.08) | (.01) | (.08) | (.01) |
| Const | 8.09*** |  | 8.08*** |  | 7.25*** |  |
|  | (1.04) |  | (1.04) |  | (1.06) |  |
| Year Fixed Effects | No | No | No | No | No | No |
| mean |  | .70 |  | .70 |  | .70 |
| N | 1719 | 1719 | 1719 | 1719 | 1715 | 1715 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 11: Logit marginal effect on choice between Aetna Wellness and Aetna for new employees.

| | (1) | | (2) | | (3) | |
| --- | --- | --- | --- | --- | --- | --- |
| | Coeff. | Marg. | Coeff. | Marg. | Coeff. | Marg. |
| Peer Effect Aetna | −.93 | −.11 | −.97 | −.12 | −.98 | −.12 |
| | (.90) | (.11) | (.91) | (.11) | (.92) | (.11) |
| Peer Effect Aetna Wellness | 1.61 | .20 | 1.57 | .19 | 1.42 | .17 |
| | (.93) | (.11) | (.92) | (.11) | (.93) | (.11) |
| Resource Utilization Band | −.09 | −.01 | | | | |
| | (.12) | (.02) | | | | |
| Predicted Total Cost | | | −.01 | −.00 | | |
| | | | (.02) | (.00) | | |
| Charlson Index | | | | | −.33 | −.04 |
| | | | | | (.20) | (.02) |
| Med. Expenditure | | | | | .20** | .02** |
| | | | | | (.07) | (.01) |
| ln(Cost) | −2.56*** | −.32*** | −2.56*** | −.31*** | −2.64*** | −.32*** |
| | (.27) | (.03) | (.27) | (.03) | (.27) | (.03) |
| Age | −.00 | −.00 | −.00 | −.00 | −.00 | −.00 |
| | (.01) | (.00) | (.01) | (.00) | (.01) | (.00) |
| Female | −.31 | −.04 | −.31 | −.04 | −.30 | −.04 |
| | (.22) | (.03) | (.22) | (.03) | (.22) | (.03) |
| No. of Dependents | 2.26*** | .28*** | 2.26*** | .28*** | 2.20*** | .27*** |
| | (.32) | (.04) | (.32) | (.04) | (.32) | (.04) |
| Salary | −.98*** | −.12*** | −.97*** | −.12*** | −.99*** | −.12*** |
| | (.23) | (.03) | (.23) | (.03) | (.23) | (.03) |
| Const | 27.99*** | | 27.80*** | | 27.25*** | |
| | (3.15) | | (3.13) | | (3.13) | |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| mean | | .79 | | .79 | | .79 |
| N | 743 | 743 | 743 | 743 | 743 | 743 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 12: Linear probability model of choice between Aetna Wellness and Third Plan for all employees.

|  | (1) | (2) | (3) |
|---|---|---|---|
| Peer Effect Third Plan | −.28*** | −.29*** | −.25*** |
|  | (.03) | (.03) | (.03) |
| Peer Effect Aetna Wellness | .25*** | .25*** | .26*** |
|  | (.03) | (.03) | (.03) |
| Resource Utilization Band | −.01*** |  |  |
|  | (.00) |  |  |
| Predicted Total Cost |  | −.00 |  |
|  |  | (.00) |  |
| Charlson Index |  |  | −.01* |
|  |  |  | (.01) |
| Past Med Exp |  |  | .01** |
|  |  |  | (.00) |
| ln(Cost) | −.09*** | −.09*** | −.08*** |
|  | (.01) | (.01) | (.01) |
| Age | −.00*** | −.00*** | −.00*** |
|  | (.00) | (.00) | (.00) |
| Female | .04*** | .04*** | .05*** |
|  | (.01) | (.01) | (.01) |
| No. of Dependents | .02*** | .02*** | .02*** |
|  | (.00) | (.00) | (.01) |
| Salary | .08*** | .08*** | .08*** |
|  | (.01) | (.01) | (.01) |
| Const | .19 | .19 | −.05 |
|  | (.10) | (.10) | (.10) |
| Year Fixed Effects | Yes | Yes | Yes |
| mean | .34 | .34 | .32 |
| N | 22490 | 22490 | 22490 |
| $r^2$ | .38 | .38 | .39 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 13: Linear probability model of choice between Aetna Wellness and Third Plan for new employees.

|  | (1) | (2) | (3) |
|---|---|---|---|
| Peer Effect Third Plan | −.24** | −.24** | −.24** |
|  | (.08) | (.08) | (.08) |
| Peer Effect Aetna Wellness | .17 | .17 | .17 |
|  | (.11) | (.11) | (.11) |
| Resource Utilization Band | −.00 |  |  |
|  | (.02) |  |  |
| Predicted Total Cost |  | −.00 |  |
|  |  | (.00) |  |
| Charlson Index |  |  | −.00 |
|  |  |  | (.04) |
| ln(Cost) | −.13*** | −.13*** | −.13*** |
|  | (.03) | (.03) | (.03) |
| Age | −.00 | −.00 | −.00 |
|  | (.00) | (.00) | (.00) |
| Female | −.04 | −.04 | −.04 |
|  | (.03) | (.03) | (.03) |
| No. of Dependents | .05 | .05 | .05 |
|  | (.03) | (.03) | (.03) |
| Salary | .14*** | .14*** | .14*** |
|  | (.03) | (.03) | (.03) |
| Const | −.09 | −.11 | −.10 |
|  | (.41) | (.40) | (.40) |
| Year Fixed Effects | Yes | Yes | Yes |
| mean | .73 | .73 | .73 |
| N | 809 | 809 | 809 |
| $r^2$ | .28 | .29 | .28 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 14: Logit marginal effect of choice between Aetna Wellness and Third Plan for all employees.

| | (1) | | (2) | | (3) | |
|---|---|---|---|---|---|---|
| | Coeff. | Marg. | Coeff. | Marg. | Coeff. | Marg. |
| Peer Effect Third | −1.64*** | −.25*** | −1.66*** | −.26*** | −1.47*** | −.22*** |
| | (.19) | (.03) | (.19) | (.03) | (.20) | (.03) |
| Peer Effect Aetna Wellness | 1.49*** | .23*** | 1.47*** | .23*** | 1.58*** | .23*** |
| | (.22) | (.03) | (.22) | (.03) | (.24) | (.04) |
| Resource Utilization Band | −.07*** | −.01*** | | | | |
| | (.02) | (.00) | | | | |
| Predicted Total Cost | | | −.00 | −.00 | | |
| | | | (.00) | (.00) | | |
| Charlson Index | | | | | −.10 | −.01 |
| | | | | | (.05) | (.01) |
| Past Medical Exp. | | | | | .06** | .01** |
| | | | | | (.02) | (.00) |
| ln(Cost) | −.68*** | −.11*** | −.69*** | −.11*** | −.66*** | −.10*** |
| | (.06) | (.01) | (.06) | (.01) | (.06) | (.01) |
| Age | −.03*** | −.00*** | −.03*** | −.00*** | −.03*** | −.00*** |
| | (.00) | (.00) | (.00) | (.00) | (.00) | (.00) |
| Female | .35*** | .05*** | .33*** | .05*** | .41*** | .06*** |
| | (.07) | (.01) | (.07) | (.01) | (.07) | (.01) |
| No. of Dependents | .20*** | .03*** | .20*** | .03*** | .20*** | .03*** |
| | (.04) | (.01) | (.04) | (.01) | (.04) | (.01) |
| Salary | .68*** | .11*** | .68*** | .11*** | .75*** | .11*** |
| | (.07) | (.01) | (.07) | (.01) | (.08) | (.01) |
| Const | −3.02*** | | −3.01*** | | −5.03*** | |
| | (.86) | | (.86) | | (.92) | |
| Fixed Year Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 19767 | 19767 | 19767 | 19767 | 17595 | 17595 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 15: Logit marginal effect of choice between Aetna Wellness and Third Plan for new employees.

| | (1) | | (2) | | (3) | |
|---|---|---|---|---|---|---|
| | Coeff. | Marg. | Coeff. | Marg. | Coeff. | Marg. |
| Peer Effect Third | −1.39* | −.20* | −1.34* | −.19* | −1.42* | −.20* |
| | (.57) | (.08) | (.57) | (.08) | (.57) | (.08) |
| Peer Effect Aetna Wellness | 2.08* | .30* | 2.06* | .30* | 2.01 | .29 |
| | (1.05) | (.15) | (1.04) | (.15) | (1.04) | (.15) |
| Resource Utilization Band | −.02 | −.00 | | | | |
| | (.11) | (.02) | | | | |
| Predicted Total Cost | | | −.02 | −.00 | | |
| | | | (.02) | (.00) | | |
| Charlson Index | | | | | −.06 | −.01 |
| | | | | | (.31) | (.04) |
| Medical Exp. | | | | | .04 | .01 |
| | | | | | (.06) | (.01) |
| ln(Cost) | −.81*** | −.12*** | −.81*** | −.12*** | −.83*** | −.12*** |
| | (.22) | (.03) | (.22) | (.03) | (.22) | (.03) |
| Age | −.01 | −.00 | −.01 | −.00 | −.01 | −.00 |
| | (.01) | (.00) | (.01) | (.00) | (.01) | (.00) |
| Female | −.29 | −.04 | −.29 | −.04 | −.29 | −.04 |
| | (.19) | (.03) | (.19) | (.03) | (.20) | (.03) |
| No. of Dependents | .26 | .04 | .25 | .04 | .25 | .04 |
| | (.20) | (.03) | (.20) | (.03) | (.20) | (.03) |
| Salary | 1.05*** | .15*** | 1.06*** | .15*** | 1.04*** | .15*** |
| | (.23) | (.03) | (.23) | (.03) | (.23) | (.03) |
| Const | −5.29 | | −5.49 | | −5.37 | |
| | (2.84) | | (2.83) | | (2.83) | |
| Fixed Year Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 783 | 783 | 783 | 783 | 782 | 782 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 16: Multinomial logit comparing Aetna Wellness to Aetna, Aetna 80/20, and Third Plan for all employees.

| | Resource Utilization Band | | Predicted Total Cost | | Charlson Index | |
|---|---|---|---|---|---|---|
| | Coeff. | Marg. | Coeff. | Marg. | Coeff. | Marg. |
| **Pr(Aetna Wellness) (base category)** | | | | | | |
| Peer Effect Aetna | .00 | −.08* | .00 | −.08* | .00 | −.07 |
| | (.) | (.04) | (.) | (.04) | (.) | (.04) |
| Peer Effect Aetna Wellness | .00 | .20*** | .00 | .19*** | .00 | .20*** |
| | (.) | (.03) | (.) | (.03) | (.) | (.03) |
| Peer Effect Third | .00 | −.18*** | .00 | −.19*** | .00 | −.16*** |
| | (.) | (.03) | (.) | (.03) | (.) | (.03) |
| Health Measure | .00 | −.01** | .00 | −.00 | .00 | −.01 |
| | (.) | (.00) | (.) | (.00) | (.) | (.01) |
| **Pr(Aetna)** | | | | | | |
| Peer Effect Aetna | 1.34*** | | 1.35*** | | 1.41*** | |
| | (.35) | | (.35) | | (.37) | |
| Peer Effect Aetna Wellness | −1.43*** | | −1.42*** | | −1.46*** | |
| | (.30) | | (.30) | | (.31) | |
| Peer Effect Third | .53* | | .54* | | .44 | |
| | (.26) | | (.26) | | (.27) | |
| Health Measure | .06* | | .01* | | .07 | |
| | (.03) | | (.00) | | (.06) | |
| **Pr(Aetna 80/20)** | | | | | | |
| Peer Effect Aetna | .63 | | .62 | | .58 | |
| | (.66) | | (.66) | | (.69) | |
| Peer Effect Aetna Wellness | −1.71* | | −1.72* | | −1.71* | |
| | (.76) | | (.75) | | (.79) | |
| Peer Effect Third | .43 | | .42 | | .38 | |
| | (.46) | | (.46) | | (.48) | |
| Health Measure | −.10 | | .01 | | .11 | |
| | (.06) | | (.01) | | (.09) | |
| **Pr(Third)** | | | | | | |
| Peer Effect Aetna | .35 | | .37 | | .32 | |
| | (.29) | | (.29) | | (.32) | |
| Peer Effect Aetna Wellness | −1.49*** | | −1.46*** | | −1.60*** | |
| | (.23) | | (.23) | | (.24) | |
| Peer Effect Third | 1.67*** | | 1.69*** | | 1.63*** | |
| | (.20) | | (.20) | | (.21) | |
| Health Measure | .07*** | | .00 | | .05 | |
| | (.02) | | (.00) | | (.05) | |
| Demographics | Yes | Yes | Yes | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| mean | | .51 | | .51 | | .50 |
| N | 25220 | 25220 | 25220 | 25220 | 22917 | 22917 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 17: Multinomial logit comparing Aetna Wellness to Aetna and Third Plan, and no plan for all employees

| | Resource Utilization Band | | Predicted Total Cost | | Charlson Index | |
| --- | --- | --- | --- | --- | --- | --- |
| | Coeff. | Marg. | Coeff. | Marg. | Coeff. | Marg. |
| **Pr(Aetna Wellness) (base category)** | | | | | | |
| Peer Effect Aetna | .00 | −.06 | .00 | −.06 | .00 | −.06 |
| | (.) | (.03) | (.) | (.03) | (.) | (.04) |
| Peer Effect Aetna Wellness | .00 | .17*** | .00 | .17*** | .00 | .23*** |
| | (.) | (.02) | (.) | (.02) | (.) | (.03) |
| Peer Effect Third | .00 | −.13*** | .00 | −.12*** | .00 | −.13*** |
| | (.) | (.02) | (.) | (.02) | (.) | (.03) |
| Health Measure | .00 | .02*** | .00 | .01*** | .00 | −.00 |
| | (.) | (.00) | (.) | (.00) | (.) | (.01) |
| **Pr(Aetna)** | | | | | | |
| Peer Effect Aetna | 1.21*** | | 1.20*** | | 1.23*** | |
| | (.34) | | (.35) | | (.37) | |
| Peer Effect Aetna Wellness | −1.66*** | | −1.67*** | | −1.73*** | |
| | (.29) | | (.29) | | (.30) | |
| Peer Effect Third | .38 | | .37 | | .28 | |
| | (.25) | | (.24) | | (.27) | |
| Health Measure | .10*** | | .01*** | | .11 | |
| | (.03) | | (.00) | | (.06) | |
| **Pr(Third Plan)** | | | | | | |
| Peer Effect Aetna | .36 | | .35 | | .28 | |
| | (.29) | | (.30) | | (.31) | |
| Peer Effect Aetna Wellness | −1.54*** | | −1.55*** | | −1.71*** | |
| | (.23) | | (.23) | | (.25) | |
| Peer Effect Third | 1.64*** | | 1.63*** | | 1.49*** | |
| | (.19) | | (.19) | | (.21) | |
| Health Measure | .09*** | | .00 | | .07 | |
| | (.02) | | (.00) | | (.05) | |
| **Pr(No plan)** | | | | | | |
| Peer Effect Aetna | .38 | | .28 | | .15 | |
| | (.29) | | (.29) | | (.34) | |
| Peer Effect Aetna Wellness | −1.19*** | | −1.32*** | | −1.99*** | |
| | (.22) | | (.23) | | (.29) | |
| Peer Effect Third | .47* | | .35 | | −.30 | |
| | (.20) | | (.20) | | (.24) | |
| Health Measure | −1.22*** | | −.33*** | | −.47*** | |
| | (.03) | | (.02) | | (.11) | |
| Demographics | Yes | Yes | Yes | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| mean | | .51 | | .51 | | .50 |
| N | 32022 | 32022 | 32022 | 32022 | 24287 | 24287 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 18: Multinomial logit comparing Aetna Wellness to Aetna, Third Plan, and no plan for new employees.

| | Resource Utilization Band | | Predicted Total Cost | | Charlson Index | |
|---|---|---|---|---|---|---|
| | Coeff. | Marg. | Coeff. | Marg. | Coeff. | Marg. |
| **Pr(Aetna Wellness) (base category)** | | | | | | |
| Peer Effect Aetna | .00 | −.06 | .00 | −.02 | .00 | −.10 |
| | (.) | (.07) | (.) | (.09) | (.) | (.15) |
| Peer Effect Aetna Wellness | .00 | .14* | .00 | .17* | .00 | .31** |
| | (.) | (.06) | (.) | (.07) | (.) | (.14) |
| Peer Effect Third | .00 | −.03 | .00 | −.03 | .00 | −.11 |
| | (.) | (.05) | (.) | (.06) | (.) | (.10) |
| Health Measure | .00 | .16*** | .00 | .09*** | .00 | −.01 |
| | (.) | (.00) | (.) | (.01) | (.) | (.04) |
| **Pr(Aetna)** | | | | | | |
| Peer Effect Aetna | .35 | | .44 | | .15 | |
| | (.93) | | (.93) | | (.92) | |
| Peer Effect Aetna Wellness | −1.27 | | −1.16 | | −1.46 | |
| | (.88) | | (.87) | | (.90) | |
| Peer Effect Third | −.63 | | −.60 | | −.75 | |
| | (.67) | | (.66) | | (.67) | |
| Health Measure | .02 | | .01 | | .27 | |
| | (.11) | | (.01) | | (.19) | |
| **Pr(Third Plan)** | | | | | | |
| Peer Effect Aetna | 1.04 | | .97 | | .81 | |
| | (.93) | | (.91) | | (.94) | |
| Peer Effect Aetna Wellness | −1.83 | | −1.88 | | −1.79 | |
| | (1.02) | | (1.01) | | (1.04) | |
| Peer Effect Third | 1.73** | | 1.41* | | 1.66** | |
| | (.60) | | (.58) | | (.61) | |
| Health Measure | −.01 | | .01 | | −.19 | |
| | (.10) | | (.01) | | (.32) | |
| **Pr(No plan)** | | | | | | |
| Peer Effect Aetna | .28 | | −.14 | | .61 | |
| | (1.01) | | (.64) | | (2.25) | |
| Peer Effect Aetna Wellness | −.75 | | −.92 | | .44 | |
| | (.74) | | (.50) | | (1.90) | |
| Peer Effect Third | −.28 | | .12 | | .73 | |
| | (.61) | | (.38) | | (1.58) | |
| Health Measure | −4.23*** | | −.85*** | | .14 | |
| | (.20) | | (.06) | | (.46) | |
| Demographics | Yes | Yes | Yes | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| mean | | .79 | | .79 | | .79 |
| N | 2268 | 2268 | 2268 | 2268 | 954 | 954 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 19: Alternative specific conditional logit comparing Aetna Wellness, Aetna, Third Plan, and no plan.

|  | Total Sample | | New Employees | |
|---|---|---|---|---|
|  | Coeff. | Marg. | Coeff. | Marg. |
| Peer effect Aetna Wellness | 1.64*** | .19 | 2.24*** | .37 |
|  | (.06) | (.09) | (.21) | (.20) |
| Resource Utilization Band | −.02 | .04 | .03 | .08 |
|  | (.02) | (.02) | (.08) | (.04) |
| Peer effect Aetna Wellness | 1.59*** | .19 | 1.44*** | .25 |
|  | (.06) | (.07) | (.17) | (.09) |
| Predicted Total Cost | −.01* | −.01 | .01 | .01 |
|  | (.00) | (.00) | (.01) | (.00) |
| Peer effect Aetna Wellness | 1.64*** | .23 | 3.02*** | .63 |
|  | (.07) | (.08) | (.27) | (.14) |
| Family health | −.10 | .09 | −.23 | .29 |
|  | (.06) | (.03) | (.20) | (.06) |
| Demographics | Yes | Yes | Yes | Yes |
| Year Fixed Effects | No | No | No | No |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 20: Alternative specific conditional logit comparing Aetna Wellness, Aetna, and no plan, 2013 choice set.

|  | Total Sample | | Discontinued Plan | |
|  | Coeff. | Marg. | Coeff. | Marg. |
|---|---|---|---|---|
| Peer effect Aetna Wellness | .76*** | .15 | .78*** | .17 |
|  | (.14) | (.04) | (.22) | (.02) |
| Resource Utilization Band | −.05 | .03 | −.01 | .04 |
|  | (.03) | (.01) | (.06) | (.01) |
| Peer effect Aetna Wellness | .63*** | .13 | .77*** | .18 |
|  | (.14) | (.02) | (.22) | (.01) |
| Predicted Total Cost | −.00 | .00 | −.00 | .01 |
|  | (.00) | (.00) | (.00) | (.00) |
| Peer effect Aetna Wellness | .92*** | .19 | .76*** | .16 |
|  | (.15) | (.03) | (.23) | (.02) |
| Family Health | −.07 | .09 | −.15* | .08 |
|  | (.05) | (.01) | (.07) | (.00) |
| Demographics | Yes | Yes | Yes | Yes |
| Year Fixed Effects | No | No | No | No |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 21: Logit marginal effect of choice between Aetna Wellness and Aetna with lagged peer effects for new employees.

| | (1) | | (2) | | (3) | |
|---|---|---|---|---|---|---|
| | Coeff. | Marg. | Coeff. | Marg. | Coeff. | Marg. |
| Peer Effect Aetna$_{-1}$ | −.63 | −.08 | −.62 | −.08 | −.63 | −.08 |
| | (.59) | (.07) | (.59) | (.07) | (.57) | (.07) |
| Peer Effect Aetna Wellness$_{-1}$ | −.11 | −.01 | −.10 | −.01 | −.18 | −.02 |
| | (.84) | (.10) | (.84) | (.10) | (.86) | (.10) |
| Resource Utilization Band | −.03 | −.00 | | | | |
| | (.13) | (.02) | | | | |
| Predicted Total Cost | | | −.01 | −.00 | | |
| | | | (.02) | (.00) | | |
| Charlson Index | | | | | −.30 | −.04 |
| | | | | | (.25) | (.03) |
| Med. Expenditure | | | | | .22** | .03** |
| | | | | | (.07) | (.01) |
| Demographics | Yes | Yes | Yes | Yes | Yes | Yes |
| Fixed Year Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| mean | | .79 | | .79 | | .79 |
| N | 715 | 715 | 715 | 715 | 715 | 715 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 22: Logit marginal effects of choice between Aetna Wellness and Aetna, with year and peer effect interactions.

| | Total Sample | | New Employees | |
|---|---|---|---|---|
| | Coeff. | Marg. | Coeff. | Marg. |
| Peer Effects Aetna | −1.09*** | | −1.00 | |
| | (.27) | | (.91) | |
| Peer Effect Aetna Wellness | 4.13*** | | 2.23 | |
| | (.70) | | (3.18) | |
| Resource Utilization Band | −.04 | | −.15 | |
| | (.02) | | (.13) | |
| *Peer Effect Aetna Wellness * Year* | | | | |
| 2008 | .00 | .77*** | .00 | .36 |
| | (.) | (.12) | (.) | (.47) |
| 2009 | −2.27** | .38*** | 3.01 | .67 |
| | (.64) | (.11) | (6.04) | (.55) |
| 2010 | −2.13** | .40*** | −.48 | .22 |
| | (.76) | (.09) | (3.96) | (.30) |
| 2011 | −2.39** | .34*** | −1.06 | .12 |
| | (.74) | (.07) | (3.59) | (.18) |
| 2012 | −2.63*** | .28*** | −1.40 | .08 |
| | (.74) | (.06) | (3.47) | (.15) |
| 2013 | −3.26*** | | 2.38 | |
| | (.73) | | (4.71) | |
| ln(Cost) | −1.27*** | | −2.56*** | |
| | (.06) | | (.27) | |
| Age | −.02*** | | −.00 | |
| | (.00) | | (.01) | |
| Female | .40*** | | −.31 | |
| | (.08) | | (.23) | |
| No. of Dependents | .66*** | | 2.28*** | |
| | (.05) | | (.32) | |
| Salary | −.21*** | | −.97*** | |
| | (.08) | | (.23) | |
| Const | 10.60*** | | 27.94*** | |
| | (.75) | | (3.17) | |
| Fixed Year Effects | Yes | | Yes | |
| mean | | .57 | | .79 |
| N | 13244 | 13244 | 743 | 743 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 23: Logit marginal effects of choice between Aetna Wellness and Aetna, random peer assignment.

|  | All Employees | | New Employees | |
| --- | --- | --- | --- | --- |
|  | Coeff. | Marg. | Coeff. | Marg. |
|  |  |  |  |  |
| Peer Effects Aetna | −.07 | −.01 | −.18 | −.02 |
|  | (.09) | (.02) | (.43) | (.05) |
| Peer Effect Aetna Wellness | −.03 | −.01 | .44 | .05 |
|  | (.06) | (.01) | (.38) | (.05) |
| Resource Utilization Band | −.04 | −.01 | −.11 | −.01 |
|  | (.02) | (.00) | (.13) | (.02) |
| Demographics | Yes | Yes | Yes | Yes |
| Fixed Year Effects | Yes | Yes | Yes | Yes |
| mean |  | .58 |  | .78 |
| N | 11965 | 11965 | 676 | 676 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.

Table 24: Ordinary least squares of log of medical expenditure on plan type.

|  | Total | ED | Inpatient Acute | RX |
|---|---|---|---|---|
| Aetna Wellness (omitted category: Aetna) | .05 | .28*** | .13 | −.02 |
|  | (.02) | (.06) | (.28) | (.05) |
| Third Plan | −.04 | −.27*** | −.23 | −.05 |
|  | (.02) | (.05) | (.21) | (.05) |
| Resource Utilization Band | .29*** | .03* | .09 | .22*** |
|  | (.01) | (.01) | (.07) | (.01) |
| Age | .02*** | .01*** | .01 | .01*** |
|  | (.00) | (.00) | (.01) | (.00) |
| Female | .14*** | −.09* | .05 | −.02 |
|  | (.02) | (.04) | (.17) | (.04) |
| No. of Dependents | .40*** | −.00 | −.09 | −.06*** |
|  | (.01) | (.00) | (.06) | (.01) |
| Salary | .07*** | −.07 | .32 | .14*** |
|  | (.02) | (.04) | (.07) | (.04) |
| Fixed Year Effects | Yes | Yes | Yes | Yes |
| N | 30335 | 4640 | 753 | 13135 |

*** Significant at 0.1 percent level.

** Significant at 1 percent level.

* Significant at 5 percent level.