Employer-Based Insurance Markets
and Investments in Health

by

Randall Cebul
School of Medicine and Center for
Health Care Research and Policy
Case Western Reserve University

Ray Herschman
Senior Vice President and
Chief Operating Officer
Web MD

James B. Rebitzer
Department of Economics
Center for Health Care Research and
Policy,
Case Western Reserve University,
NBER, The Levy Institute, and IZA

Lowell J. Taylor
H. John Heinz III School of Public
Policy and Management
Carnegie Mellon University

Mark Votruba
Department of Economics
Center for Health Care Research and Policy
Case Western Reserve University

June 2007

PRELIMINARY

Abstract

In the United States, health insurance for those under age 65 is provided largely through employers. This paper analyzes how interactions between labor and health insurance markets lead to sub-optimal investments in future health. Our focus is on search frictions in the market for employer based health insurance. We develop a theoretical model of the health insurance market and find that insurance market frictions raise insurance premiums above marginal cost; increase insurance turnover above efficient levels; and depress private returns to investments in future health. Our empirical work examines the rate of insurance turnover using data from The Community Tracking Study and from the administrative records of an insurance company. The high rates of turnover we find are consistent with the presence of substantial market frictions in employer based insurance markets. We conclude by discussing the implications of our analysis for public policy.

Introduction

In the United States, health insurance for those under age 65 is provided largely through employers. This paper analyzes how interactions between labor and health insurance markets create inefficiencies in the delivery of health care services and lead to sub-optimal investments in the future health.

The logic and import of our study are best explained in the context of investments in programs to manage chronic diseases such as diabetes (Beulieau et. al. 2006; Gertler, 2004). The treatment of chronic disease consumes a large share of health care resources so programs to efficiently manage these diseases offer the promise of substantial cost savings.[1] Insurers would seem to be well positioned to finance the bulk of investments in chronic disease management programs because judicious investments may reduce the future health care costs for their affected clients. From an information technology perspective, health plans are also well positioned to track the interaction between laboratories, specialists, primary care providers and pharmacies that is required for effective disease management (Beulieu et. al. 2006). The returns to insurers from investments in disease management, however, are determined by the expected duration of the relationship between an insurance company and its members. Thus the efficient provision of investments in disease management depends on whether the health insurance market exhibits efficient rates of turnover in the relationship between insurers and purchasers.

High turnover rates between insurers and their policy holders are common knowledge among brokers and insurance companies, although these rates have received little systematic attention from economists and health services researchers (for exceptions see Herring, 2006; and Cunningham and Kohn, 2000). Turnover of individual employees resulting from labor market mobility is not surprising in a health care system where employees receive insurance through employer groups. What is harder to explain

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[1] On its web page the Center for Disease Control estimates that 75% of health care costs in 2001 were due to persons with a chronic disease. The fraction is smaller for the under 65 population, in the neighborhood of 40-50%.

are reports that entire employer groups frequently exit insurance relationships as well. The brokers and insurers with whom we have spoken attribute high rates of employer group cancellations to the continuous search for lower premiums. This explanation is widely shared but hard to square with competitive insurance markets. In well functioning markets the law of one price should prevail and the opportunity to leave an insurer for a better price ought to be limited. If, however, there are meaningful search frictions, insurers have some market power over employer groups and the law of one price does not hold. In this case, there will be substantial opportunities for employer groups to shop for better deals and this, in turn, can produce inefficiently high turnover rates among employer groups.

In our theoretical analysis we formalize this insight by adapting a Burdett-Mortensen (1989) style model of labor market frictions to the market for employer based health insurance. Market frictions, in this setting, give insurers some degree of market power over employer groups and this market power has three economic consequences. First, market power enables insurers to capture some fraction of the return from investments in disease management programs even when this investment serves only to increase the general human capital of insurance company policy holders. It follows that the payback from these investments will depend on the expected duration of the insurer-policy holder relationship: the longer the expected relationship, the greater the return. Secondly, the friction induced market power allows insurers to charge differing prices for identical policies. This violation of the law of one price increases turnover in the insurance relationship as individual employer groups cancel their current policy when they discover better deals offered by other insurers. The net result is an inefficiently high rate of turnover and consequently sub-optimal investments in future health. The third implication of this market power is that it enables insurers to set premiums above the marginal cost of insurance. High premiums induced by market frictions can reduce access to insurance markets and so lead to under consumption of all aspects of health insurance, including insurer financed investments in chronic disease management.

The empirical contribution of our paper concerns the rate of turnover in insurer-employer group relationships. We find that turnover in insurance membership comes primarily from two sources: (1) individual job changes (including exit from employment); and (2) employer group changes in insurance. We find average annual

insurance cancellation rates of 21% with more than a third due to employer group exits. Data attained from a private insurance company finds annual cancellation rates of 30% for companies that do not self-insure and roughly half of these cancellations are due to the exit of entire employer groups. Rough calculations indicate that the market frictions required to sustain these high rates of turnover are also large enough to create significant price dispersion. Specifically our estimates are that mean insurance prices are high enough that the insurer can capture approximately a quarter of the surplus from health insurance but minimum prices are low enough that insurers capture only 6% of the surplus. With this degree of price dispersion, one can expect quite a bit of turnover in the relationship between insurers and policy holders.

The paper proceeds as follows. In the next section we present a simple model of insurance markets with search frictions. In section two we present data on insurance turnover. In section three we discuss our results in light of the search model developed in section one and suggest directions for future qualitative and quantitative research. We conclude the paper by discussing the policy implications of our study.

1. Modeling Insurer Investments in Future Health

Employer-based insurance markets are complex because they have at least four types of players with distinct roles and interests: insurers who write, price, and market insurance policies; employers who search among available policies on behalf of their employees; health care providers whose compensation by and large comes from the insurance companies; and of course employees and their families who consume the health care services delivered by providers and financed, at least in part, by the insurer. Economic analyses of this market frequently highlight the problems that imperfect information creates in relationships between these actors. Moral hazard between the insurer and health care provider or between the insurer and consumers of health care services can lead to wasteful and inefficient expenditures. Adverse selection can distort markets as employers seek to avoid hiring workers who are expensive to insure, or insurers seek to avoid employer groups with a potentially expensive pool of employees.

In this section we analyze the consequences of search frictions resulting from the slow diffusion of information through the insurance market. We argue that these frictions distort insurance markets in two ways. First, frictions give insurers some

market-power and this results in an equilibrium in which insurance premiums exceed marginal cost.[2] Second, frictions will result in equilibrium price dispersion. This dispersion leads to inefficiently high levels of turnover and hence sub-optimal investments in the future health of employees. Both these distortions will prevail in equilibrium even in the absence of moral hazard and adverse selection.

The market for health insurance is a natural place to expect search frictions. Health insurance is a complex, multi-attribute product and this complexity makes it difficult for clients to meaningfully compare more than a handful of proposals.[3] Informal discussions with insurers suggest that they offer customers hundreds if not thousands of different policies. This complexity also makes the marketing of insurance costly so that companies can make only a limited number of appeals to employer groups in a period. Although we develop all of our key results without introducing adverse selection, we do not mean to suggest that adverse selection is unimportant in these markets. Indeed, we will argue later that adverse selection can itself be an important contributor to market frictions.

1.1. Market Frictions and Equilibrium Prices

We begin by setting up a baseline model of search frictions that leads to equilibrium dispersion of the price for insurance. We abstract from problems of moral hazard and adverse selection, so it suffices to focus on two types of agents: insurance companies that issue polices (which we assume are implemented as intended by health care providers), and clients, who are employer groups that make purchases on behalf of their employees. Insurance companies are identical; each faces a cost, c, of providing a policy. Clients are also identical; each is willing to buy insurance so long as the price of the policy does not exceed some reservation value, $p^R > c$.

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[2]   Dafney (2007) finds evidence that insurers have some market power and use this power to engage in direct price discrimination.

[3]   The complex, multi-dimensional aspect of insurance products is also likely to lead to one on one negotiation between employer groups and insurance companies. Models of frictions based on bilateral bargaining are more complex but produce qualitatively similar predictions to the Burdett Mortensen search model we use (Mortensen, p. 16).

If there were many insurance companies and many employer groups and if all employer groups were well informed about the prices offered throughout the market, the competitive price would of course pertain and premiums will be set equal to c. Outcomes change, however, when we introduce search frictions (see Mortensen (2003) for a discussion and reference to the extensive labor economics literature.). The market we have in mind is captured nicely by the well-known Burdett-Mortensen model of price dispersion, described in Burdett and Mortensen (1998). Their model is explicitly designed to evaluate labor markets in which there is a search process that matches workers to employers; our adaptation to the insurance market is straight-forward.[4]

The Burdett-Mortensen setup is multi-period. In each period new clients (employers, who act as agents on behalf of their employees) enter the market, looking to purchase policies from insurance companies. Currently-insured clients are always on the lookout for better deals. The key to the model is the mechanism whereby insurance companies strike deals with these clients. In any period each insurance company is able to contact only a limited number of randomly selected potential clients, offering an insurance policy at some chosen price, p. If an offer is accepted, the parties enter into an agreement in which the client remains with the insurance company for as long as it likes, paying in each period the agreed-upon price. The client exits the relationship in one of two ways: there is some probability of an exogenous separation (this happens at rate δ), and of course the client can voluntarily switch to another insurance company if a better deal comes along, i.e., if it is contacted by a different company offering a lower price.

It is easy to see why this mechanism generates price dispersion in price offers. Suppose we posited a candidate equilibrium in which all firms made the same price offers $p = c$ and so earned zero profit. Then one maverick firm could clearly increase profits by charging some discretely higher price (less than or equal to the reservation price p^R). This high offer would be rejected more frequently than the going price; any

[4] Details of the model are set out in a clear way in Mortensen (2003). While our notation is different, interested readers can fill in details of the model's development by examining Mortensen's presentation on pages 35-43. For an interesting related analysis of labor markets see Lang and Majumdar (2004).

potential client who fielded more than one offer in a period would obviously reject the high offer. But on occasion the contacted client would have no other offers, and a policy would be sold. This would produce positive profit for the firm. Similarly, in a candidate equilibrium in which all firms were charging the same price (a price such that $c < p < p^R$), a maverick firm could always increase profit by undercutting slightly the price charged by competitors, thereby increasing the number of clients while reducing by profit per client by only a trivial amount.

In short, an equilibrium must entail a distribution of price offers, Let this distribution be characterized by the cumulative distribution function, $F(p)$. For $F(p)$ to characterize an equilibrium, it must be that expected profit is the same at any price in the distribution. If firms are behaving such that prices offered conform to $F(p)$, no firm can improve profits by altering its own behavior (i.e., by changing the price it offers).

In the Burdett-Mortensen model $F(p)$ is found by solving for the steady state when the time periods are collapsed, i.e., when time is continuous. Let r be the interest rate, δ be the exogenous separation rate, and λ be the rate at which offers arrive to clients. As it turns out the value to an insurance company of writing an insurance contract at price p takes an intuitively sensible form,

(1.) $\quad V(c,p) = \dfrac{p - c}{r + \delta + \lambda F(p)},$

where $\lambda F(p)$ is the rate at which a policy is terminated due to a raid by a competitor.[5] It can also be established that in the steady state the probability a randomly contacted client accepts an offer of p, say $h(p)$, is

(2.) $\quad h(p) = \dfrac{\delta}{\delta + \lambda F(p)}$

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[5]   To see this note that $F(p)$ is the proportion of offers that are lower than p , and thus is the probability that a client will quit if an alternative offer arrives, while λ is the rate at which such offers arrive.

Expected profit per client contacted is simply $\pi(c, p) = h(p)V(c, p)$. In equilibrium profit must be the same for any offered price (including the highest price that can ever be charged, the reservation price p^R). So $F(p)$ must solve

(3.)
$$\pi(c, p^R) = \left(\frac{\delta}{\delta + \lambda}\right)\left(\frac{p^R - c}{r + \delta + \lambda}\right) =$$
$$\pi(c, p) = \left(\frac{\delta}{\delta + \lambda[F(p)]}\right)\left(\frac{p^R - c}{r + \delta + \lambda[F(p)]}\right).$$

It simplifies matters to set the interest rate to 0. Then it is a matter of algebra to demonstrate that the offer distribution that solves (3) is

(4.) $\quad F(p) = 1 - \frac{\delta + \lambda}{\lambda}\left[1 - \left(\frac{p - c}{p^R - c}\right)^{\frac{1}{2}}\right].$

One can also derive the distribution of prices that are actually accepted:

(5.) $\quad G(p) = 1 - \frac{\delta}{\lambda}\left[\left(\frac{p^R - c}{p - c}\right)^{\frac{1}{2}} - 1\right].$

As we have noted, the highest price that will appear in the market is p^R (obviously at $p = p^R$, $F(p^R) = G(p^R) = 1$). Setting $F(p)$ or $G(p)$ equal to 0, we see that the lowest price, p^L, is

(6.) $\quad p^L = \left[1 - \left(\frac{\delta}{\delta + \lambda}\right)^2\right]c + \left(\frac{\delta}{\delta + \lambda}\right)^2 p^R.$

Also using (5) and (6) we find that the average price is:

(7.) $\quad \bar{p} = \left(\frac{\lambda}{\delta + \lambda}\right)c + \left(\frac{\delta}{\delta + \lambda}\right)p^R.$

Equations (6) and (7) have a useful interpretation. The express respectively the minimum and average price in the distribution as a weighted sum of two values: the cost of providing insurance, c, and the clients' reservation value, p^R. The weights are simple functions of δ / λ. Mortensen (2003) refers to this ratio as the market friction

parameter. At low values markets are relatively competitive meaning that information about outside offers is arriving far faster than exogenous shocks that terminate insurer-clients relationships. As δ/λ approaches 0 the average price and minimum price in the the market approaches marginal cost, c. In other words the distribution collapses to a single point, c.

Another feature of the model that merits mention is the rate of "frictional un-insurance." Clients who enter the market are uninsured up until the time they receive their first offer. It can be shown that this rate of un-insurance is $f = \delta/(\lambda + \delta)$. There will be relatively little frictional un-insurance when the market friction parameter is low.

On the other hand, if the market friction parameter is high, price dispersion will increase, and all prices will exceed marginal cost.[6] In this equilibrium we expect to observe "churn", not merely as a consequence of exogenous factors (such as employer groups exiting the market, or workers moving from one firm to another), but also as insurance companies seek to poach clients from competitors. We also expect to see more frictional un-insurance as some clients do without insurance while they look to generate an acceptable offer.

1.2. Investments in Future Health

We turn next to the effects of market frictions on investments in the future health of employees. Suppose that at the time a client enrolls with an insurance company an investment I can be taken that reduces future health care costs. Such investments might include any number of preventative measures. In the case of diabetes, for instance, it might represent resources spent aiding patients to control hemoglobin A1c (HbA1c) and blood lipids (see Beulieu et. al. for a discussion and literature review). In particular, we let cost now be $c(I)$ with $c(0) = c$, $c'(I) < 0$ and $c''(I) > 0$.

If we are concerned only about the financial advantages of the investment (i.e., ignoring the potential improvements in patient health and welfare), the efficient level of the investment will be I^e such that $-c'(I^e) = r$, i.e., the level of investment is

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[6] Of course, profits might still be 0 for insurance companies if there are additional costs, such as marketing expenses, costs for making specialized contract arrangements with clients, client-screening costs, etc.

selected at which the marginal return equals the interest rate. Consider, though, a firm operating in the environment we outline above. Now equation (3) becomes

$$(8.) \quad \pi(I,p) = \left(\frac{\delta}{\delta + \lambda[F(p)]}\right)\left(\frac{p - c(I)}{r + \delta + \lambda[F(p)]} - I\right).$$

Optimizing over I we find that the firm will choose I^* such that

$$(9.) \quad -c'(I^e) = r + \delta + \lambda F(p).$$

The right-hand side of (9) exceeds r so the firm will choose $I^* < I^e$.

As a specific case, consider an investment such that $r < -c'(0) < r + \delta + \lambda F(p)$. A positive level of investment would be efficient in this case, but no firm will offer such an investment. If the return to the investment is high enough, i.e., if $-c'(0)$ is large enough, some investment will occur. Suppose this is the case. Then in the resulting equilibrium, all firms will choose the pair, $\left(p, I(p)\right)$, with profit given as depicted in (8), though with a potentially different equilibrium price distribution, say $H(p)$, replacing $F(p)$. It is easy to see that the level of health care investment chosen will be negatively correlated with the price of policies the firms offer. Differentiating (9), but using the c.d.f. $H(p)$ instead of $F(p)$, we have

$$(10.) \quad \frac{dI^*(p)}{dp} = \frac{-\lambda H'(p)}{c''^*(p)} < 0.$$

This makes sense. An insurance company that is near the low end of the price distribution will typically have clients whom they serve for a relatively long time because the insurance company is unlikely to be under-bid by a rival firm. This increases the expected payoff to an investment in future good health of the client.

Our key idea is that market frictions necessarily generate price dispersion, and in turn this price dispersion necessarily generates variation in insurers' policies regarding investments in future health. The variation across insurers occurs even though the

insurers are identical in every way.[7] In our example, the level of investment for all firms will be inefficiently low relative to an efficient benchmark.[8]

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1.3. Investments in Health Care Financed by the Client

One objection to the model presented above is its exclusive focus on relationship specific investments that must be made each time a client enrolls with a new insurer. Some important health care investments fit this description. For example, each time a new client enrolls with an insurer it costs the insurer time and money to accumulate valuable information about the clinical needs of the client. Many investments in health care, however, look quite different in that they reduce future health care costs not only for the current insurer but also for future insurers. A good example is when an insurer finances a successful disease management program for diabetics that lower treatment costs. The insurer who finances this investment bears the full costs but doesn't receive the full benefits if the client exits for another insurer. In this case one might expect

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[7] Our observation that equilibrium price dispersion can generate variation in other behaviors by otherwise identical market participants appears elsewhere in the literature, though in typically in labor market contexts. In Montgomery (1991), for example, and in a more general treatment by Acemoglu and Shimer (2000), employers that offer high wages (in a labor market with equilibrium wage dispersion) can also expect that their job vacancies will be filled relatively quickly. These same firms then have a greater incentive to invest in high-productivity technologies. Just as in our insurance case, otherwise identical firms vary along two dimensions---the wage offered and the technology adopted

[8] There is one exception---the exception that proves this rule. Suppose we interpret δ as a literal "death rate," with deceased clients always being replaced by young clients in the market steady state. Then the efficient level of investment would entail $-c^{'*} = r + \delta$. Notice that for the one firm in the market that posts the lowest price, $p = p^L$, we have $H(p) = 0$, and this firm will make efficient investments in future health care (refer to equation (9), replacing $F(p)$ with $H(p)$). This makes sense, since this firm (and this firm only) knows that it can never lose a client to a rival insurance company.

that a new market would then emerge in which the clients themselves purchase the health care investment. Future insurers, recognizing that the client belongs to a superior risk class, would then sell insurance at a lower price. In this way the full benefits and costs of investment accrue to the client.[9]

There are two practical difficulties with the argument that clients can make optimal investments in future health. The first issue has to do with information: it would be exceptionally difficult for insurers to verify that such investments have indeed been made, particularly in the U.S. private sector where medical record keeping is generally haphazard. The second problem is that in many instances it is hard to imagine even conceptually how one would separate investments in future health (to be paid by the client) from current medical care (to be paid by the insurer). Optimal disease management of a diabetic, for example, deals with current medical issues while simultaneously seeking to limit future complications.

Even if the practical difficulties we describe could be resolved, there is a deeper theoretical problem with the idea that clients could finance efficient levels of investment in future health. To see this, consider the following case. Suppose that when a client first enters the insurance market it can make an investment in future health whose effects last as long as the client exits.[10] All clients are identical in this market and so adopt the same level of investment. Suppose that investment reduces the cost that future insurers incur from c to $c_0 < c$.

Because of the cost-reducing impact of clients' health investments, the equilibrium distribution of policy price shifts leftward. Importantly, the average price declines from

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[9]   This is analogous to investment in general human capital. Workers pay for their own education, and are then rewarded with higher wages by a sequence of future employers.

[10]   In our exposition so far, we have treated the client as the firm who purchases insurance on behalf of employees. To make our point in this example, however, we alter this usage. We imagine that each employee purchases their own insurance so that δ should be interpreted as the instantaneous rate of permanent exit of the individual due either to death or to reaching age 65 and leaving commercial insurance for Medicare. In a steady state, for each permanent exit a new client enters the market---a client who would then want to make an appropriate health investment.

(11.) $\quad \left(\dfrac{\lambda}{\delta + \lambda}\right)c + \left(\dfrac{\delta}{\delta + \lambda}\right)p^R$

to

(12.) $\quad \left(\dfrac{\lambda}{\delta + \lambda}\right)c_0 + \left(\dfrac{\delta}{\delta + \lambda}\right)p^R$

Notice, though, that the change in the average price must be *smaller* in absolute value than the change in cost itself.[11] This reasoning establishes a general point. In a market with frictions, individual insurers have some bargaining power. As a result the benefits of health investments undertaken by a client cannot be fully realized by that client. Thus, even if we assume away the considerable practical impediments to client-based investments in future health, in markets with frictions we expect that client-based investments would still be sub-optimal.[12]

1.4. The Role of Adverse Selection

We have so far assumed that all clients are identical and thus abstract from the issue of adverse selection, but it is easy to see how adverse selection contributes to market frictions and the associated inefficiencies we have described. In our analysis, frictions result from the fact that insurance policies are costly to design and market. Anything that increases these costs is therefore likely to reduce the number of offers coming from insurers. If there is a pool of clients who will be excessively costly to insure so that insurers must design policies to discourage them, this will add to design costs and reduce the number of new offers relative to contracts terminated. This in turn means the market friction parameter (δ / λ) will tend to be high and market imperfections thereby important.[13]

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[11]   This is obvious, since $\bar{p}$ is a weighted sum of c and P^R, with weights that are between 0 and 1. Notice that if the market friction parameter δ / λ is high, the price distribution does not change much at all when c declines.

[12]   Acemoglu (1997) reasons similarly in his careful analysis of general human capital investments. He demonstrates that labor market frictions lead to underinvestment in human capital even if that human capital is fully general..

[13]   We have argued that adverse selection is likely to amplify market frictions, but the role of adverse selection in models of search frictions may be more fundamental. Indeed, Li

Secondly, there is a purely mechanical reason why client heterogeneity must lead to greater levels of market friction. To see this consider the simple case in which there are two types of clients: "type-1 clients" can be insured at cost c as described above, while "type-2 clients" are sufficiently costly that insurers never sell them policies. Suppose now that when a randomly contacted client expresses interest in a contract, the insurer must screen the client to make sure that it is a type-1 client. To keep matter simple, suppose the screening mechanism is always successful at avoiding the type-2 clients, but does sometimes mistakenly also screen out type-1 clients. Thus all clients will have an incentive to continue to field offers even if they have initially failed to acquire insurance when contacted. The outcome will be that many of the expensive-to-generate contacts will now effectively be wasted on clients who will never actually receive contracts. The effective λ, i.e. the effective rate at which offers arrive to clients who might actually take them, goes down so the market friction parameter goes up.

1.5. Can Long-Term Contracts Help?

If turnover resulting from market frictions leads to sub-optimal investments, can we expect long term contracts to emerge to mitigate this problem? As an empirical matter, long-term health insurance contracts are in fact very rare in this market and there are good reasons to see what this might be the case. Insurance contracts are complicated in part because they must detail which procedures and costs are covered and which are not. Given constantly-evolving medical technology and treatment protocols, as well as unpredictability future governmental regulation and mandates, it is difficult to see how long-term contracts might be implemented. Even if the practical difficulties of long term contracting could be resolved, our model suggests that other issues may inhibit the formation of long-term contracts. Specifically we have conjectured, but have not yet proved, that equilibria composed entirely of long-term contracts may not exist. [14]

(2006) offers a model of search frictions in which the frictions result not from the costs of designing and marketing offers but from adverse selection itself.

[14] We can show that in such an equilibrium frictional un-insurance might be quite high. After all, uninsured clients now entering the market would be cognizant that any contract they accept locks them in for life. In such a proposed equilibrium, we can

2. Data on Cancellation Rates

In this section we present data on annual turnover rates between insurers and their members. The data comes from two sources. The first is the Household Survey component of the Community Tracking Study (CTS) conducted by the Center for Health System Change. The CTS Household Survey was conducted in four waves (1996-97, 1998-99, 2000-01, and 2003). Its purpose was to assess consumer access to and use of health care services as well as insurance coverage (see CTS web site for a description). The great advantage of the CTS Household Survey for our purposes is that it collects information on insurance coverage that we can use to estimate annual cancellation rates for a representative sample of consumers.[15] The survey also collects information on the demographic characteristics of respondents and the presence of various chronic diseases.

One disadvantage of the CTS is that data on insurance changes is reported retrospectively. This raises the potential for recall errors and, more importantly, complicates our ability to identify persons who cancelled a private insurance plan in the year prior to the interview date. In practice, we identified "cancellations" as persons who reported having changed policies or becoming uninsured in the last year, and who report having a "private plan" as their previous form of insurance. We cannot know with certainty that all these subjects had private coverage one year prior to interview, though it seems a reasonable assumption. In contrast, "non-cancellations" could be cleanly identified as those reporting current private coverage with no reported change in

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imagine a maverick insurer that offers contracts that allow clients to freely leave if another better offer comes along. Such a maverick firm would fill an important and potentially profitable niche---providing short-term insurance to clients while they search for suitable long-term contracts---and imitators would be sure to follow. But then we would end up again with an equilibrium in which there are short-run contracts with the attendant inefficiencies we describe above.

[15]   In the implementation of the survey, selected communities were over-sampled but weights were provided to construct national averages.

plans over the last year. Our one-year cancellation rate therefore measures the fraction of "cancelling" subjects relative to the sum of cancelling and non-cancelling subjects.

A second disadvantage of the CTS is that, for prior insurance type, the broad category of "private plan" covers all types of private plans, including "direct purchase" plans (i.e. those obtained through the individual insurance market and not through one's employer). Moreover, even for current insurance type, the CTS does not distinguish between insurance policies provided by self-insured employer groups from insurance policies in which the insurance company caries the risk. In the parlance of the industry these non-self-insured firms are known as "fully insured". When employer groups self-insure, the duration of the relationship between the insurer and the member is determined by the length of the employment relationship.

Our second source of data comes from the enrollment records of a large regional insurer. Unlike the CTS, we can observe cancellations directly in this administrative data. Our cancellation rates are calculated as the fraction of members enrolled with the insurer on July 1st of a given year who cancelled their policy by July 1st of the subsequent year. A great benefit of these data is that they allow us to distinguish between self-insured and fully insured employer groups. Unfortunately we do not know how representative this insurer is of the entire market and we know little about the characteristics of individual policy holders aside from basic demographics (age, sex) and the number of members on a given policy.

Table 1 presents data on insurance cancellation rates. Column 1 uses data from the CTS Household Survey and defines the cancellation rate as the fraction of persons with private insurance 12 months prior to interview who report having cancelled that policy by the time of the interview. We find that 21% of respondents had private insurance within the previous 12 months and had cancelled that policy. Of this 21%, 87% had acquired a new private policy at the time of the CTS interview while 10% were uninsured.

Unfortunately, the CTS Household Survey does not have information on whether the previous policy was purchased through an employer group or on the individual market, but does collect such information for one's current insurance. We therefore calculate a second measure of insurance turnover, which we label the *Persistence Rate*, as the fraction of persons with a current private policy (at interview) who report having

the same plan for at least one year. As expected, the *Persistence Rates* presented in columns (2) and (3) are roughly equal to one minus the *Cancellation Rate.* More importantly, our measure of persistence is essentially unchanged when we exclude private policyholders in non-employer group plan. This suggests that our CTS measure of *Cancellation Rate* is not substantially affected by the inclusion of persons in non-employer group plans.

Columns 4-6 of Table 1 present cancellation rates for our regional insurer, for policyholders in employer groups containing at least 10 members. Although the method for calculating cancellations differs slightly between the CTS and the insurance company records, the annual *Cancellation Rate* we estimate for the insurer, 21%, is nearly identical to the national average reported in the CTS. This aggregate cancellation rate, however, masks important heterogeneity among employer groups. Columns 5 and 6 present *Cancellation Rate* estimates for self-insured and fully insured employer groups respectively. The fully insured account for approximately 41% of the insurance company's members, yet their cancellation rate, 0.31, is more than twice the 0.14 cancellation rate for the self-insured. Table 2 presents *Cancellation Rate* for various years. Several findings are worth noting. First, the aggregate cancellation rate for the CTS hovers between 20 and 21% for each of the four waves of the survey. In contrast, the cancellation rates for our insurer are somewhat more variable over time, with a modest spike in cancellations occurring over the 2002-03 period. Table 2 also confirms that fully insured employer groups have much higher cancellation rates than self-insured groups for each year that information is available.

In our model of insurance market frictions, we focused on two sources of turnover: endogenous search activity in which employer groups exit insurers because they find a better deal, and exogenous cancellations. Much of the exogenous cancellation is likely due to the labor market mobility of individuals. Table 3 presents two different measures of the proportion of cancellations due to the exit of entire employer groups from one insurer to another. In the Community Tracking Study we identify a cancellation by the employer group if the respondent indicated that the reason for the insurance cancellation was "my employer group changed offerings". In the data from the regional insurer, we identify employer group cancellations based on the

aggregate cancellation rate for the group and the cancellation codes present in the administrative records.[16]

The first column of Table 3 presents information on the composition of cancellation rates in the CTS Household Survey. As reported in the first row of column 1, roughly 35% of those identified as exiting a private plan over the prior year cited as their reason for cancelling a change in employer group offerings. This fraction is modestly lower than what we would expect if we could exclude persons in non-group plans, about 8% of all private policyholders based on the description of current policies. In column 2, we therefore calculate an adjusted measure of the fraction cancelling due to employer group cancellations which captures the implied fraction had non-group policyholders been excluded.[17] From Table 1 we know that the overall cancellation rate in the CTS Household survey is 0.211 so the estimated rate of cancellation due to employer group changes is 0.35*0.209 = 0.073, or 0.080 if we use the "adjusted fraction". The final two cells in column 1 of Table 3 refer to cancellations that are reported to be the result of job loss or job change. We find that job loss accounts for more than 40% of the observed insurance cancellation rate, and more than 43% after we adjust for presence of non-group policyholders. Together, these figures suggest that almost 82% of cancellations from employer group plans are due to cancellations of entire employer groups or job exits by individual members. The remaining cancellations are

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[16]   Specifically, we defined employer cancellations as occurring when at least 90% of the group's members were observed to cancel in a year or if at least 80% of members cancelled with at least one "group cancellation code" recorded in the insurance company's enrollment files. Representatives of the insurer assisted in determine our rule for identifying group cancellations. Strict reliance on the cancellation codes was prevented by the fact that the majority of codes were generated by the computer system and non-informative. We likely failed to identify some group cancellations in cases where a large fraction of a cancelling group's members took advantage of COBRA to continue their coverage.

[17]   This is done by dividing the fraction reporting cancellation due to employer group changing offerings by the fraction of all private policyholder with coverage through their employer.

due to other factors such as employees changing the insurer they select within the employer's unchanged menu of insurance options or employees switching to policies available through their spouse's or other relatives.

Column 2 of Table 3 uses data from our regional insurer to estimate the fraction of *Cancellation Rate* that is due to the entire employer group changing insurers. We estimate that roughly half of the cancellation rate is the result of entire employer groups changing insurers or dropping group coverage altogether. This number is higher than the 38% found in the CTS Household Survey. Some of this discrepancy may be due to the differences in the definition of "employer group cancellations" across the two data sets and the potential misreporting of cancellation reasons in the CTS. Some of this difference, however, might also be due to where our regional insurer sits in the distribution of insurance premiums. In our model of insurance market frictions, if the insurer offered policies with above average premiums, it would also experience higher than average employer group cancellation rates.

Columns 3 and 4 split the regional insurer's members into self-insured and fully insured groups respectively. For the self-insured, 38% of *Cancellation Rate* is the result of employer group cancellations. Since the overall cancellation rate for this group is only 0.115, the *Cancellation Rate* due to employer groups exiting insurers is only 0.115*0.38 = 0.044. In contrast to the low rates of employer group cancellations among the self-insured, the fully insured groups in column 4 have a very high proportion of employer group cancellations. Because the overall cancellation rates in this group are high, 0.307, the cancellation rate due to employer group cancellations is also high, 0.307*0.588 = 0.18.

The results in Tables 1-3 suggest that annual cancellation rates are non-trivial and, consistent with our model of insurance market frictions; a substantial fraction of this turnover is the result of entire employer groups exiting plans. We also find that the propensity for turnover is greatest among employers who do not self-insure. In Table 4 we take the analysis a step further and use the data from the insurance company to examine *Cancellation Rate* by employer size and self-insurance status. Column 1 of Table 4 demonstrates that annual cancellation rates are highest among firms with 10-200 employees. It is well known that turnover rates are higher among small employers (Brown and Medoff, 1989; and Rebitzer, 1986) but the results in column 2 indicate that

this factor is not the primary cause of the high average *Cancellation Rate.* Cancellation rates due to employer groups exiting insurers are 16% for firms with 10-50 employees and 13% for those with 50-200 employees, so more than half of all cancellations among small firms are due to employer group exits rather than labor market mobility or other factors that might shorten the relationship between an individual policy holder and their insurer.

Columns 4-8 disaggregate the cancellation rates in columns 1 and 2 by self-insured and fully insured employer groups. The general pattern from columns 1 and 2 still holds: cancellation rates fall as firm size increases and substantial portions of this turnover are due to employer group exits rather than labor market mobility. We also find that overall cancellation rates as well as cancellations due to the exit of entire employer groups are markedly higher among the non-self insured within any given firm size category. Among groups with fewer than 1000 members, the difference in *Cancellation Rate* across self-insured and fully insured group is almost entirely driven by the differences in the group cancellation rate.

Many investments in future health, especially those relating to the management of chronic disease, are best made in middle age or later so Table 5 presents cancellation rates by age. Columns (1) and (2) track annual cancellation rates using the CTS Household Survey and the data from the regional insurer respectively. We find that cancellations fall as employees age, but even in the oldest age category, turnover rates are approximately 15% per year. Columns 3 and 4 disaggregate the regional insurer's cancellation rates into self-insured and fully-insured groups. Cancellations for the regional insurer are highest among the young, fully-insured: for those aged 21-34 employed by non-self-insured firms, the *Cancellation Rate* is above 38%. Even in the oldest age category, however, the non-self-insured have annual cancellation rates of 25%.

3.   Discussion

The administrative and survey data presented above suggests that high annual rates of insurance cancellation are an important feature of the US health care system. Consistent with our model of search frictions in insurance markets, these cancellation rates are largely the result of labor market turnover and of the movement of entire employer groups from one insurer to another- presumably in search of a better deal on

health insurance. The data from the regional health insurer suggests that cancellation rates are even higher among an important subset of employer groups, those who do not self-insure.

The high annual cancellation rate for fully insured employer groups has obvious implications for incentives to invest in future health. If the insurer invested x dollars in future health today and all the returns accrued in the next year, the insurer would receive only 68 percent of the savings accruing from this investment. In the case of diabetes disease management, some observers have argued that it takes 7 to 10 years to fully recoup cost savings (Beulieu et.al. 2006). High annual cancellation rates can clearly suppress insure returns from investments in disease management.

Our model of turnover allows us to make rough inferences about the extent of market frictions from the insurance turnover data we collected. The turnover rate at any given insurer is expressed $\delta + \lambda \text{F}(p)$. Let's imagine that we know that our regional insurance company sits at the median of the distribution of premiums so that $\text{F}(p) = 0.5$. This is a conservative assumption given that the distribution of prices we derive is right-skewed and the overall cancellation rate for the regional insurer is close to the mean of the distribution found in the CTS Household Survey. If we assume that group cancellations are largely the result of endogenous search, then we can set the group cancellation rate equal to $\lambda*0.5$ and solve for λ[18]. Having solved for λ it is straightforward to solve for δ under the reasonable assumption that the remaining turnover, mostly due to labor market mobility, is exogenous to search in the insurance market.

The segment of the insurance market that most closely resembles our model is the market among fully insured groups. From Tables 1 and 3 we know that the annual cancellation rate due to group cancellations is 0.18 so $\lambda = 0.18/2 = 0.36$. The overall cancellation rate is 0.306, so it follows that $\delta = 0.306 - 0.18 = 0.116$. The market friction parameter is $\delta/\lambda = 0.32$. We can use equations (5) through (7) to give this parameter an intuitive economic interpretation. Using (5) we plug in the market friction

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[18] This assumption is likely to lead to an underestimate of the true extent of market frictions because it will attribute some exogenous causes of group cancellations (such as companies going out of business) to search processes.

parameter to calculate the fraction of surplus that accrues to the insurer at any point in the distribution. Setting $G(p) = 0.5$ and solving for $(p\text{-}c)/(p^r\text{-}c)$ we get 0.15. Thus the median accepted price in the distribution of prices is high enough that 15% of the surplus accrues to the insurer. Similar calculations using equation (6) and (7) reveal that for the lowest priced premium in the market, the insurer can capture only 6% of the surplus while the insurer offering the average premium captures 25% of the surplus. Thus our back of the envelope estimates suggest that this segment of the market is highly frictional market with a wide dispersion of prices and hence lots of opportunities for employer groups to shop around and find better deals.[19]

In our exposition of the model of job search it was convenient to assume that all purchasers of insurance had the same reservation price. One consequence of this simplification is that all un-insurance is frictional, i.e. all premiums are less than or equal to the willingness to pay for insurance.[20] In a setting with heterogeneous reservation prices, however, the high premiums resulting from market frictions will likely also cause some purchasers to be priced out of the market.

While the cancellation rates we observe are consistent with a model of search frictions, the case for these frictions would be stronger if we had evidence pertaining to other aspects of the model. We conclude this section by briefly discussing the sort of issues we hope to investigate in the near future. Important sources of search frictions in our model are the costs to insurers of designing and marketing insurance policies and the costs to purchasers of comparing alternatives. We plan to collect qualitative and quantitative evidence on these issues through interviews with insurers, brokers, and purchasers. In addition to understanding more about how policies are designed and marketed, we also hope to learn more about why insurers appear to operate with such a large variety of policies. Economists usually think of variety as value creating, but in

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[19]   If the mean premium allows insurers to capture 25% of the surplus while the minimum allows the insurer to capture 6%, it follows that the average premium available in the market is at least 4 times the minimum.

[20]   Taken literally, our estimates of δ and λ imply a e steady state level of frictional un-insurance for the fully insured segment of the market of 24%.

the context of search frictions, variety has costs that may lead to important market failures. Understanding whether in some well-defined sense insurers offer "too much" product variety will be an important focus of our work. In a series of highly visible papers, Woolhandler and Himmelstein (2003) have marshaled evidence that US insurers have far higher administrative costs than are found in the health care system of other countries. While these claims are controversial (Aaron, 2003) it is worth noting that high administrative costs are a natural outcome of insurance companies needing to keep track of a large number of differently priced insurance products and inefficiently high administrative costs are a natural consequence of inefficiently high levels of product variety.

One of the key predictions of our model is that insurers offering low-premium policies will experience less turnover and therefore make larger investments in the future health of their client's employees. It is difficult to investigate this prediction by comparing the programs offered in low and high premium policies because data on insurance premiums is hard to find. Herring (2006) offers some evidence from the Community Tracking Study (CTS) that markets with higher rates of average turnover among insurers are less likely to offer the following preventative services: office-based preventive care visits; flu shots mammograms. An alternative way to study the effect of turnover on investments in future health would be to compare investments by self-insured employer groups with the investments financed by insurers for fully insured employer groups. As we have seen, self-insured employer groups have much longer relationships with their insured population than do the insurers who "fully insure" employer groups.

<u>Conclusion</u>:

Participants in the health insurance market have long observed that employer groups regularly leave their incumbent insurers in search of lower prices. Using household survey data from the Community Tracking Survey and administrative records from a large regional insurer, we have documented annual cancellation rates as high as 30 percent a year for fully-insured employer groups. We also find that much of this turnover is the result of entire employer groups dropping insurers, a movement typically attributed to finding "better deals" elsewhere. In competitive markets where

the law of one price prevails, cancelling policies in search of better deals elsewhere would be largely a fruitless activity. In insurance markets characterized by search frictions, however, the law of one price does not hold and high rates of search-related turnover are a natural feature of market equilibrium.

Our model of market frictions in employer based insurance markets highlights two important inefficiencies. The first is that frictions lead to inefficiently high rates of turnover that in turn reduce insurer incentives to invest in the future health of their policy holders. We argue that there are good practical and theoretical reasons to expect that the inefficiencies created by these incentives may not be fully rectified by long-term insurance contracts or by having policy holders rather than insurers finance these investments.

The second inefficiency we emphasize concerns access to insurance. Search frictions naturally create frictional un-insurance as offers do not arrive with sufficient speed to ensure that all employer groups attain insurance. Search frictions also give incumbent insurers some market power over employer groups and insurers will use this market power to charge premiums in excess of marginal cost. Rough calculations suggest that insurer market power is sufficient to raise mean insurance premiums high enough that roughly 25% of the surplus is captured by the insurer. By limiting the availability of health insurance, these access issues suppress the utilization of health services and further reduce investments in future health.

Our analysis has a number of implications for health care policy. Where investments in future health are easy to monitor, the problem of insufficient investment can be resolved by government mandates. In many important instances – notably programs for managing chronic disease – investment is complex and multi-faceted so it is hard to distinguish effective from ineffective programs. Mandates involving hard to monitor interventions which are not supported by private incentives are likely to produce sham efforts and wasted resources.

The second policy implication concerns managed care organizations. The promise of the managed care movement was that insurers, if given a role in the management of care, could substantially enhance the efficiency of health care in the United States without adversely affecting quality (Dranove, 2000). To the extent that this promise was premised on insurers' incentives to invest in the future health of their members, the

efficiency gains from managed care might have been quite limited from the start. Put differently, it may be that the full potential of managed care cannot be realized until ways are found to establish longer-term relationships between insurers and policy holders.

This leads us to our third policy implication, the establishment of longer term relationships between insurers and policy holders. A sizeable fraction of the turnover observed in our data is due to labor market mobility. It follows from this that weakening the link between health insurance and employment could directly lengthen insurer-member relationships and stimulate additional investments in future health. Implementing policies that weaken the link between health insurance and employment would require fundamental changes to a health care system that has proven resistant to fundamental change.

Our model of search frictions suggests alternative possibilities for public policy: some more likely to work than others. For example, it is not hard to show in our model that some of the inefficiencies resulting from search frictions can be mitigated by price caps on insurance premiums. The basic idea is simple: limiting the ability of insurers to charge high prices will reduce price dispersion and hence turnover. The welfare improvements from such a policy depend critically, however, on finding the right price ceiling and there is at present no way to know what the right price ceiling might be.

An alternative regulatory strategy that also emerges naturally from our analysis might deliver more positive outcomes more reliably. Market frictions persist because it is costly to design and market health insurance policies and because it is difficult for employer groups to compare alternative proposals. It follows from this that much of the distortions resulting from frictions could be mitigated if there were a simple, easily understood and reasonably priced alternative insurance policy that would be available to all market participants.[21] In the context of our search models, we believe we can prove that by making this alternative insurance available on a voluntary basis to all purchasers the inefficiencies resulting from search frictions could be greatly reduced.

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[21] One such alternative would be the Federal Employees Health Benefit Program.

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Table 1: Annual Cancellation Rates for Privately Insured

	Community Tracking Study All waves (1996-2003)			Regional Private Insurer Enrollment Data 2001-2005		
	Cancellation Rate	*Persistence Rate*	*Persistence Rate*	*Cancellation Rate*		
	(1) All Privately Insured	(2) All Privately Insured	(3) All Group Insured	(4) All Group Insured	(5) Self-insured Groups	(6) Fully Insured Groups
Rate	.209 (.002)	.778 (.003)	.780 (.003)	.208 (.0003)	.139 (.0004)	.306 (.0006)
Only Employer Group Plans	NO	NO	YES	YES	YES	YES
N	60316	60770	56170	1601199	936532	664667

The CTS Household Survey sample is heads of households aged 23-65 at interview. *Cancellation Rate* is defined as the fraction of persons with private insurance 12 months prior to interview who cancelled that policy by the time of the interview. For individuals who cancelled their previous policy, we do not know if that previous policy was through their employer or was purchased on the individual market. *Persistence Rate* is defined as the fraction of persons with a currently active private policy (at interview) who enrolled within the last 12 months. Column (3) restricts the sample to private policyholders (at interview) with insurance through their employer. Individual members are potentially represented up to four times in the CTS analysis. The CTS results are weighted to be nationally representative, with standard error in parentheses.

The sample for the regional private insurer is primary policyholders aged 22-64 with an active policy at July 1st of a given year (2001-2004). The sample was limited to members of employer groups having at least 10 members. *Cancellation Rate* is defined as the fraction who cancelled their policy by July 1st of the subsequent year. Individual members are potentially represented up to four times. Standard errors are presented in parentheses.

Table 2: Annual Cancellation Rates over Time

Community Tracking Study		Regional Private Insurer			
	(1) *Cancellation Rate*		(2) *Cancellation Rate*	(3) *Cancellation Rate*	(4) *Cancellation Rate*
Period	All Privately Insured	Period	All Group Insured	Self-Insured Groups	Fully Insured Groups
2003 (wave 4)	.206 (.007)	2004-05	.189 (.0006)	.114 (.0006)	.302 (.0011)
2000-01 (wave 3)	.210 (.004)	2003-04	.194 (.0006)	.124 (.0007)	.303 (.0012)
1998-99 (wave 2)	.218 (.004)	2002-03	.240 (.0007)	.185 (.0008)	.320 (.0011)
1996-97 (wave 1)	.204 (.004)	2001-02	.210 (.0007)	.135 (.0007)	.298 (.0011)

Cancellation Rate and samples defined as in Table 1. Standard errors are presented in parentheses.

Table 3: Fraction of Annual Cancellation Rate Attributable to Employer Group Cancellations

	Community Tracking Study All waves	Regional Private Insurer 2001-2005		
	(1) All Privately Insured	(2) All Group Insured	(3) Self-Insured Groups	(4) Fully Insured groups
Fraction of *Cancellation Rate* due to employer group cancellations	.351 (.006)	.508 (.0009)	.383 (.0013)	.588 (.0011)
Adjusted Fraction	.381	n/a	n/a	n/a
Fraction of *Cancellation Rate* due to job loss/change	.401 (.007)	n/a	n/a	n/a
Adjusted Fraction	.434	n/a	n/a	n/a

Cancellation Rate and samples defined as in Table 1. Standard errors are presented in parentheses.

In the CTS results, we attribute cancellations to cancellation of the entire employer group if the respondent indicated that the reason for the cancellation was "employer group changed offerings" (for those insured at interview) or "employer stopped offering coverage" (for those uninsured at interview). We attribute cancellations to job loss/change if the respondent indicated that the reason for the cancellation was "own/spouse job change" (for those insured at interview) or "lost job/change employers," "spouse/parent lost/changed job," or "became part time/temporary" (for those uninsured at interview). In each case, the adjusted fraction provides an estimate of the fraction of cancellations attributed to each cause if the sample were restricted to those with employer group coverage, by dividing the unadjusted fraction by the (weighted) fraction of currently private-insured persons who receive insurance through their employer (.920).

For regional insurer results, we attribute cancellations to cancellation of the entire employer group if either (i) ≥90% of group members exited plan in year, or (ii) ≥80% of group members exited plan in year with at least one member having an assigned cancel code indicative of group cancellation. Strict reliance on the assigned cancellation codes was not feasible since most were system-generated and non-informative. The fraction of cancellations attributed to employer group cancellation is not comparable across samples because group cancellations resulting from an employer going out of business are attributed to job loss/change in the CTS results, but attributed to employer group cancellation in the regional insurer results. The regional insurer fraction is also inflated to the extent that members cancelled their individual policies prior to but in the same year that a group cancellation occurred.

Table 4: Annual Cancellation Rates by Employer Group Size

| Group Size (# members) | Regional Private Insurer 2001-2005 | | | | | | | | |
| | All Groups | | | Self-Insured Groups | | | Fully-Insured Groups | | |
	(1) Cancellation Rate	(2) Emp Group Cancellation Rate	(3) N	(4) Cancellation Rate	(5) Emp Group Cancellation Rate	(6) N	(7) Cancellation Rate	(8) Emp Group Cancellation Rate	(9) N
10-50	.294 (.0007)	.157 (.0006)	403218	.204 (.0013)	.075 (.0009)	92110	.321 (.0008)	.182 (.0007)	31108
50-200	.238 (.0007)	.134 (.0005)	385897	.157 (.0008)	.062 (.0005)	194787	.320 (.0011)	.207 (.0009)	191110
200-1000	.181 (.0006)	.090 (.0004)	403353	.140 (.0006)	.053 (.0004)	293367	.291 (.0014)	.187 (.0012)	109986
>1000	.123 (.0005)	.051 (.0003)	408731	.113 (.0005)	.046 (.0003)	356268	.195 (.0017)	.088 (.0012)	52463
All sizes	.160 (.0003)	.107 (.0002)	1601199	.139 (.0004)	.054 (.0002)	936532	.306 (.0006)	.183 (.0005)	664667

Data from large regional insurance company. *Cancellation Rate* and samples defined as in Table 1. Standard errors are presented in parentheses. *Employer Group Cancellation Rate* is defined as fraction of members (as of July 1st in a given year) in groups that cancelled coverage by July 1st of the subsequent year. Group cancellations identified as described in Table 3.

Table 5: Annual Cancellation Rates by Age

| | CTS Household Survey All waves | | | Regional Private Insurer 2001-2005 | | | | | |
| | All Privately Insured | | | All Groups | | Self-Insured Groups | | Fully Insured Groups | |
Age	(1) *Cancellation Rate*	(2) *Emp Group Cancellation Rate*	(3) *Job Exit Cancellation Rate*	(4) *Cancellation Rate*	(5) *Emp Group Cancellation Rate*	(6) *Cancellation Rate*	(7) *Emp Group Cancellation Rate*	(8) *Cancellation Rate*	(9) *Emp Group Cancellation Rate*
22-34	.285 (.006)	.082 (.003) [.088]	.137 (.004) [.149]	.302 (.0008)	.130 (.0006)	.222 (.0010)	.067 (.0006)	.385 (.0012)	.196 (.0010)
34-44	.212 (.005)	.073 (.003) [.078]	.083 (.003) [.089]	.223 (.0007)	.118 (.0005)	.152 (.0008)	.061 (.0005)	.310 (.0011)	.187 (.0009)
44-54	.180 (.004)	.075 (.003) [.080]	.060 (.003) [0.65]	.177 (.0005)	.103 (.0004)	.116 (.0006)	.053 (.0004)	.267 (.0010)	.177 (.0009)
54-64	.149 (.005)	.064 (.003) [.072]	.042 (.003) [.047]	.145 (.0006)	.080 (.0005)	.096 (.0006)	.040 (.0004)	.248 (.0013)	.165 (.0011)

Cancellation Rate and samples defined as in Table 1. For CTS results, age reflects person's age one year prior to interview (i.e. age at "baseline" from which cancellation rates are measured). Cause-specific cancellation rates identified as described in Table 3. For cause-specific rates, bracketed term represents an adjusted estimate of cause-specific cancellation rates under hypothetical restriction to persons with employer group, calculated by dividing unadjusted rate by fraction of private policyholders in age group with insurance through employer (at interview). For regional insurer results, group cancellations identified as described in Table 3. Standard errors are presented in parentheses.