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ABSTRACT

We develop an empirical method to assess the generosity of employer-sponsored insurance across groups within the U.S. population. A key feature of this method is its simplicity – it only requires data on out-of-pocket (OOP) health care spending and total health care spending and does not require detailed knowledge of health insurance benefit design. We apply our method to assess whether households with a chronically ill member have more or less generous insurance relative to households with no chronically ill members. We find that the chronically ill have less generous insurance coverage than the non-chronically ill. Additional analyses suggest that the reason for this less generous coverage is not that households with a chronically ill member are in different, less generous plans, on average. Rather, households with a chronically ill member have higher spending on certain types of medical services (e.g., pharmaceutical drugs) that are covered less generously by insurance. Given recent work on value-based insurance design and coinsurance as an obstacle to medication adherence, our findings suggest that the current design of health plans may put the health and financial well-being of the chronically ill at risk.

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Introduction

While employer-sponsored health insurance is frequently viewed as the "gold standard" with respect to the financial protection that it provides to policyholders and their dependents, some of that protection has been eroded in recent years as employers seek ways to slow dramatic increases in premiums. Many employers have responded to rising costs by offering plans that include higher cost-sharing requirements in the form of deductibles and coinsurance, as well as higher out-of-pocket (OOP) premium requirements for employees taking up coverage (Kaiser Family Foundation, 2010). Plans have also introduced greater variation in coinsurance and copayments for different services or products. Examples include different cost-sharing for specialist versus generalist visits, or for different tiers of products, such as brand versus generic drugs. These changes are designed in some cases to provide incentives for consumers to choose lower cost options and, in other cases, simply to shift costs to those who utilize these services and thereby lower premiums.

These incremental changes in benefit design are likely to affect particular enrollees differently, not only because of different choices made in response to new incentives but also because individuals with different health care needs may require a different mix of services. For example, greater use of copayments relative to deductibles may shift OOP costs toward patients with recurring services, such as those with chronic conditions, and away from patients with acute conditions, even if total expenditures for the two patients are equal.

Additionally, it is not at all clear that the incentives of employers and insurers would ensure that such inequities are providing greater efficiency. For example, there is

ample evidence that higher cost-sharing on prescription drugs lowers the probability of adherence to treatment (Leibowitz et.al. 1985, Karaca-Mandic et al. 2011; Joyce et al. 2002; Goldman et al. 2004; Goldman et al. 2006). There is also a growing body of literature suggesting that any health care cost savings generated by lower medication adherence may be offset, and in some cases even more than offset, by higher spending on other services such as inpatient and outpatient care (Chandra et. al. 2010, Gaynor et. al. 2007, Goldman et. al. 2006). Patients with chronic conditions are among the most likely to experience adverse and expensive health events after failing to adhere to a medication program.

The ways in which benefit design affects different types of patients is also particularly important at this juncture since the Patient Protection and Affordable Care Act of 2010 authorizes the development of an essential benefits package and allows for value-based insurance designs. The specific features of benefit packages should take into account how alternative designs may differentially affect enrollees requiring different types of services, such that costs are not inadvertently shifted without corresponding efficiency gains.

Despite its importance, analysis of the coverage provisions of health plans and their potential impact on different types of enrollees is made difficult by a lack of current, nationally representative data that includes detailed information on benefit design features and enrollees' medical care consumption. This type of information would permit analysis of differences in, for example, copayments for different types of services or different types of prescription drugs. Given the lack of nationally representative data on enrollees' benefit design attributes, we propose an alternative method for measuring

insurance generosity that also permits the identification of differences in coverage generosity experienced by different populations. Using the nationally representative Medical Expenditure Panel Survey Household Component for 1997-2007, we examine how OOP medical spending varies across the distribution of total medical spending for various populations. By holding constant total spending, we are able to assess whether insurance coverage is less generous on average across various populations, rather than simply capturing differences in the distribution of total spending for these populations. To illustrate the differences, we determine the relationship between OOP and total spending using both non-parametric and parametric methods. Our method approximates a benefit design approach which explicitly compares plan features for analyzing generosity but with far fewer data requirements. In its simplest form, our method requires only data on total and OOP spending incurred by enrollees.

We apply our approach to make comparisons in coverage generosity between the population with chronic illness and the non-chronically ill. This is a particularly salient comparison for several reasons. First, the proportion of the population with a chronic condition has been growing rapidly. In 2005, about 60 percent of the adult U.S. civilian non-institutionalized population had at least one chronic condition. As the population ages, it is expected that chronic condition prevalence will also rise, given the positive association between disease onset and age (Machlin, Cohen, and Beauregard, 2008). Second, on the surface, it appears that some of the more frequent design changes to insurance plans, such as use of multiple cost-sharing tiers for prescription drugs, may differentially affect those with chronic conditions. And, third, there is evidence from

research on value-based design that treatments for chronic conditions are of particularly high value (Fendick et al. 2009, Chernew et. al. 2008, Choudhry, et. al. 2007).

Our results suggest that that the chronically ill have less generous coverage on average than the non-chronically ill, controlling for total healthcare spending. To understand what drives these differences, we examine the other characteristics of the health insurance benefits held by these groups in order to test whether the differences that we observe are due to these two populations being insured by different types of plans. We do not find evidence that the two groups are in different types of health plans. However, we do document significant differences in the type of services used by the chronically ill – most notably, prescription drugs. We also find that the type of services used more frequently by the chronically ill have higher shares of OOP to total spending, on average, than those more frequently used by households without chronic conditions. We conclude with a discussion of the possible implications of benefit designs that are less generous with respect to the services consumed by the chronically ill.

Previous Literature on Insurance Generosity

A number of previous studies have examined concepts related to insurance generosity or to underinsurance and have proposed a variety of methods to measure these concepts. Our intent is to capture a different notion of generosity than prior work but it is helpful to define and contrast these related measures. Two common measures related to the concept of generosity used in the literature are a household-level underinsurance threshold measure and a plan's actuarial value. Being underinsured is often defined in the literature as a household having out-of-pocket medical spending greater than 10% of

household income. This measure highlights the burden of health care spending by controlling for household income. Underinsurance rates for the population are useful for obtaining an overall picture of the degree of financial protection that health insurance is providing relative to income. See for example, Short and Banthin (1995), Banthin and Bernard (2006), Banthin et al. (2008), and Schoen et al. (2008), Cunningham (2010) and a discussion and critique of this measure in Abraham et al. (2010).

Actuarial values, on the other hand, are measured for specific health plans, not for individual households. The actuarial value of a plan is the average proportion of medical expenditures paid by the plan for a standard population (Peterson, 2009). Although it is possible to calculate separate actuarial values for particular groups of enrollees within a population, this is rarely done, most likely because the intended purpose is usually to rank health plans rather than the experiences of specific enrollee populations of those plans. Also, the data requirements for calculating actuarial values are quite high since detailed data on benefit designs and spending among individuals within a population are necessary (McDevitt, 2008). See for example, Gabel et al. (2006), Gabel et al. (2007), and McDevitt (2010).

Conceptual Framework

Our objective is to measure how insurance generosity compares for different groups. In the application in this paper, we compare households with and without a member with a serious chronic condition. Neither the use of threshold measures of underinsurance nor actuarial values would enable us to understand how populations with different health care needs may be differentially affected by insurance benefit designs.

The key to our approach of comparing insurance generosity between groups is to control for total medical spending.

To illustrate the importance of controlling for total spending, consider two single person households – one with a high level of expenditures and one with no expenditures – who are otherwise identical and are enrolled in the same insurance plan. The household with high expenditures could well be considered "underinsured" using a threshold measure. One would not suggest on the basis of this evidence, however, that one household had generous insurance while the other had "stingy" insurance, since the two households are not comparable in terms of spending. If the household with no expenditures had required healthcare, we do not know whether its OOP would have been higher, lower, or the same as that of the other household. Thus, while related to the concept of generosity, the underinsurance measure will not capture generosity in the way we intend.

Now again consider two otherwise identical single person households with the same insurance plan. One household incurs $10,000 of expenditure because of a hospitalization from an accident while the other incurs $10,000 of expenditure because the individual is required to take a relatively expensive pharmaceutical due to a chronic condition. If there is no cost-sharing associated with hospitalization, but a 20 percent coinsurance rate associated with drug spending, these two causes of spending – an accident versus a chronic condition – would not be insured to the same degree. We characterize the individual with the chronic illness in this example as less generously insured because he has a higher OOP cost for the same level of total spending. The underinsurance measure would not distinguish between these two situations unless the

OOP spending of the chronically ill individual exceeded the threshold level (as a percentage of income) so as to be categorized as underinsured. The plan-level actuarial value also would not distinguish between the two individuals because we have assumed the two held the same plan. These other measures capture different notions of generosity than is our intent.

Moving to comparing populations rather than individual households, we consider an analogous definition for insurance generosity. Once again, the key is to control for total spending. For example, we would consider those with chronic illness to be less generously insured if their OOP spending is, on average, higher than the OOP spending of the non-chronically ill after controlling for total spending. This could occur if, as in the example above, the types of treatments received by the chronically ill tend to have higher coinsurance rates associated with them than the types of treatments received by the non-chronically ill. In the example above, we assumed that the two individuals were enrolled in the same plan. When comparing two populations, however, we could also find differences in the share of expenses paid OOP for a given level of total spending if the two groups enroll in different plans and if those plans differ in deductible, coinsurance rates, services covered, maximum out-of-pocket spending, or in other dimensions.

Our approach to measuring the generosity of insurance is to estimate insurance curves, which neatly summarize differences in complex sets of benefits for enrollees. What we refer to as a "health insurance curve" plots the relationship between total spending (on the x-axis) and OOP spending (on the y-axis). Examining insurance curves is a useful way to empirically summarize the average plan characteristics held by a

population. This is especially useful when detailed plan characteristics are not available, but when OOP and total spending are available**.** For example, in the MEPS Household Component (HC), detailed benefit design information is not known but total and OOP spending are available.[2]

Our approach is particularly useful in that it allows us to aggregate across plans for a population. Insurance plans are often quite complex in their design. For example, there are often different deductibles for individuals within a family plan and the family as a whole. Different treatments may have different co-insurance rates (for example, inpatient care may have a lower co-insurance rate than outpatient and different prescription drugs may have different "tiers" of coverage). Finally, some services may not be covered at all, for example, out-of-network treatments. Given this level of detail, summarizing the average or typical plan characteristics across groups would be challenging; however, our method provides a simple way to do this.

Empirical Strategy

Data:

We use data from the 1997-2007 Medical Expenditure Panel Survey (MEPS) Household Component (HC), sponsored by the Agency for Healthcare Research and Quality. The Household Component contains individual and household-level information on demographics, medical conditions, income, and employment. Respondents also provide information regarding health insurance throughout the year, medical care utilization by service type, and expenditures by source of payment. The MEPS includes

[2] The exception to this is the 1996 MEPS-HC when health insurance benefits booklets were abstracted.

five rounds of survey interviews and collects information covering a two-year time period.

Our unit of analysis is a household, defined in the MEPS as a Health Insurance Eligibility Unit. An HIEU is a sub-family relationship unit constructed to include adults plus those family members who would typically be eligible for coverage under private family plans, including spouses, unmarried natural or adopted children who are age 18 or under, and children under age 24 who are full-time students. We use the household as the unit of analysis, rather than the individual, since individuals within a household typically share resources to cover expenses associated with medical care and health insurance, and because employer sponsored insurance can be conferred on all members of a household through taking up family coverage.

Our study population is restricted to households in which all members are under 65 years of age, since almost all individuals who turn 65 become eligible for Medicare. We also restrict the analysis to households in which all members are continuously insured by employer sponsored insurance during the calendar year. When household members experience coverage gaps, they are likely to alter their care-seeking behavior and costs in response. To avoid introducing this source of heterogeneity into our analysis, we exclude any households in which any member had a spell of uninsurance or moved to a public insurance plan during the year. The final sample includes 47,183 households, which represents approximately 51.4 million U.S. households.

Measures:

Medical Spending: We use information on two types of medical care spending: total and out-of-pocket. We aggregate individual-level spending across household members to get household-level, out-of-pocket and total medical care spending. We then inflate the measures to 2009 dollars. We also have data on households' total spending, and OOP spending by service category, including inpatient hospitalization, office-based provider visits, emergency department visits, outpatient, prescription drugs, dental, vision, and home health services. Descriptive analyses revealed large positive outliers in the data for both total spending and out-of-pocket spending. To address this, we first trimmed the bottom and top one-half percent of observations based on OOP spending values and then removed all observations with total spending in excess of $400,000 or OOP spending greater than $30,000 (n=18).

Chronic Illness: Using the MEPS Medical Conditions file, we extracted information on the medical conditions reported by household members. For the purpose of selecting which conditions to include, we reviewed published studies of medical care spending among those with chronic illness (e.g., Bodenheimer et al. 2009; Banthin and Bernard, 2006; Davidoff and Kenney, 2005; Anderson, 2010) to identify prevalent conditions most typically classified as "chronic." Additionally, we consulted a board-certified physician to verify our selection criteria. Based on this, we classified members as having a chronic condition if they reported having any of the following: cancer, diabetes, heart disease, asthma, and anxiety or depression. We define our chronic

household indicator as equal to one if at least one member in a household reported having at least one of these medical conditions.[3]

Human Capital and Demographic Measures: In our multivariate regression model of OOP spending, we include a set of control variables to capture demographic and human capital attributes of policyholder(s) in the household. In households with two policyholders, we use the higher valued outcome. We include the age of the policyholder (years); highest education (years); race (white, black, Asian/Pacific islander, other (reference category))[4]; Hispanic; whether any household members are married; and the number of children in the household who are 17 years of age or younger. We also include a quadratic for household's annual income ($1,000s), inflation-adjusted to $2009. Since there may be geographic differences in insurance benefits, labor market conditions, and provider prices, we also include four region dummies (Northeast, Midwest, South, West (excluded)) and an indicator for whether the household resides in a metropolitan statistical area (MSA).

Employer and Plan Characteristics: Although the MEPS-HC does not contain a great amount of detail on the specific attributes of the plan(s) held by each household, it is possible to identify some basic information about their coverage in order to test whether any differences that we observe are due to these two populations being insured by different types of plans. First, we constructed a binary measure for whether or not the household had a choice of plans. This could occur in two ways – a worker in the household being offered more than one plan through his or her workplace or a household

[3]Households that have more generous health insurance may be more likely to seek medical care in which they will be diagnosed with a chronic condition, a possibility that might lead us to understate the differences in insurance generosity between chronically ill households and non-chronically ill households.

[4] We re-coded multi-race households to reflect the less prevalent race in the population.

in which both workers have an offer of employer sponsored insurance. Second, we identified whether a household is enrolled in a plan that restricts coverage only to those providers in the plan's network (e.g., exclusive provider organization). Third, using the Person-Round-Plan file, we constructed a measure corresponding to the household's annual OOP premium ($2009) for the health insurance plan(s) held during the year.[5] Table 1 reports the descriptive statistics for our sample of households, reported separately for households with and without a chronically ill member.

We also consider a set of characteristics that correspond to the policyholder's employment that in turn, may be correlated with the characteristics of their coverage.[6] To capture the policyholder's establishment size, we define a set of binary indicator variables corresponding to whether the policyholder is employed at a small establishment ($\leq$ 50 workers) or a private organization (versus a government organization), as well as whether the policyholder is a member of a union. We use this information on plan and employment characteristics in our analysis of whether there is evidence that the chronically ill are in different types of plan than others.

Methods:

The first set of insurance curves that we present are the non-parametric and unadjusted estimates of the aggregate insurance curves for all households with a chronic illness and all households without a chronic illness depicted graphically. We plot OOP spending against total spending for households with a chronic illness and for households

[5] In the case of the household holding two plans, we sum each plan's OOP premium to arrive at the household-level measure.

[6] A small percentage of households reports having two policyholders. In this case, we defined the variable as equal to one if either of the policyholder's had the particular attribute (e.g., worked for a small establishment, private organization, or belonged to a union).

without a chronic illness. To construct these curves, we compute median OOP spending within total spending categories where the bins are defined at intervals of $250 for total spending between $0 and $5,000; $500 between $5,001 and $10,000; $2500 between $10,001 and $25,000; and one bin for $25,001-$50,000. The progressively larger intervals reflect our desire to keep sample sizes sufficiently large across the spending distribution.

Our next set of curves is comprised of predictions of OOP spending from parametric models of OOP spending as a function of total spending, chronic illness, and a set of controls. We estimate the following parametric model:

$$OOP_i = f(T_i, T_i*Chronic; X_i, Year; B) + \varepsilon_i$$

where OOP is out-of-pocket spending, T is a quadratic in total spending, Chronic is a dummy variable indicating the presence of a chronic illness (defined above), X is a set of human capital and demographic variables (defined above), and Year, which is a set of year indicator dummy variables (1997 as reference category). B represents our parameters to be estimated. We estimate this equation using median regression. All analyses are weighted to adjust for the complex design of the MEPS.[7]

Results

Insurance Curves: Households With and Without Chronic Conditions

[7] Survey commands in STATA do not allow for explicit clustering to account for repeated observations on households, which is present given the overlapping panel design. When we re-estimated the model without explicit survey commands but utilized analytic weights and allowed for clustering, the standard errors are almost identical. Median regression is not supported by the survey commands. In this case, we used analytic weights with clustering. For robustness, we also considered alternative specifications including OLS regression and a square-root transformation. These results produced qualitatively similar patterns of results and are available in an online appendix.

We present raw estimates of the insurance curves for chronically ill and non-chronically ill households in Figure 1. Each point on the curve represents the median OOP spending level for households within that total spending bin.

Median OOP spending is roughly the same for chronically ill households and for non-chronically ill households up to about $8,000 of total spending. After this level of total spending[8], OOP spending is noticeably higher among chronically ill households, suggesting that chronically ill households have less generous insurance against high levels of expenditure than do households without a chronically ill member. Using a non-parametric test of the equality of medians for each bin of total spending, we assessed whether observed differences were statistically significant. At levels above $8,000, median spending for chronic and non-chronic households are significantly different for nine out of the eleven bins.

Our estimates of equation (1) using median regression show a similar story. Using an F-test, we reject the hypothesis that the parameters on the interaction terms of chronic with total spending and chronic with total spending squared are jointly equal to zero ($p<.001$). Figure 2 plots our predicted OOP spending against total spending to illustrate these differences graphically.[9]

As the graph shows, the adjusted OOP spending of those households with chronic conditions is higher than for other households, with the difference widening at higher

[8] Approximately 18% of households in the sample have annual total spending in excess of $8,000 per year.
[9] A full set of model results are available in an online appendix.

levels of total medical spending. Thus, our findings illustrate that households with chronic conditions appear less generously insured than other households.[10]

Are the Chronically Ill Enrolled in Different, Less Generous Plans?

While our method of comparing insurance curves can distinguish between different levels of insurance generosity by group, it cannot by itself distinguish between the competing explanations for those differences. One possible explanation for generosity differences is that the two groups are enrolled in different types of plans. This could occur, for example, if firms insuring households with chronic conditions respond to higher associated premiums by offering less generous plans to their employees. Another possible explanation for these differences is that that there exist differences in how the same plans cover the types of services used by individuals with chronic versus non-chronic conditions. In this case, the two types of workers and any dependents need not be in different plans. In order to shed light on what factors may be responsible for differences in the generosity of insurance that we observe for households with and without chronic conditions, we examine some additional characteristics of the coverage held by these households.

To investigate the hypothesis that individuals with and without chronic conditions are in different types of plans, we first look at characteristics of the health plan menu offered and the health plans held by the household's policyholder(s). We observe whether the household has a choice of plans (which is likely to be positively associated

[10] The reader should keep in mind that there is substantial heterogeneity in the plans held within the two groups. Our method aggregates across these plans and cannot speak to the frequency in which the individual plans held by the chronically ill are less generous, only to the average difference.

with generosity), whether or not the plan held is an HMO, and the out-of-pocket premium paid by the household. We regressed each of these variables on the policyholder's age, education, race and ethnicity, marital status and number of children in the household, household income, an MSA dummy, region dummies, as well as the chronic condition indicator. A summary of unadjusted and adjusted values are provided in Table 2. These model results suggest that households with a chronically ill member are 1.5 percentage points more likely to have a choice of plans relative to other households. This difference is small, given that 64 percent of households overall has a choice of plans. We observe no statistically significant differences with respect to enrollment in an exclusive provider organization or with respect to the annual out-of-pocket premium for family coverage. Thus, our results do not suggest important differences in the types of plans in which the two populations are enrolled.

As a further check on the possibility that households with individuals who have a chronic condition are enrolled in different health plans than other households, we also examine whether there are differences between the policyholders of the two groups in terms of workplace or job characteristics that are known to be correlated with insurance generosity: establishments with 50 or fewer workers, private sector establishments (versus government), and whether the worker is a union member. We do this using multivariate regression and a summary of our results are also reported in Table 2.

Controlling for the same set of explanatory variables as above, we find that households covering at least one member with a chronic condition are 2 percentage points less likely to obtain their coverage through a small establishment. We also observe that households with a chronically ill member are slightly more likely to have a

policyholder that is a union member. There is no significant difference by chronic status in the probability of working for a private firm (versus a government organization). While we do not have enough data on plan characteristics to definitively rule out differences in the types of plans in which these two groups are enrolled, our results indicate no evidence to support the claim that households that insure individuals with chronic conditions obtain their coverage from sources that tend to offer health plans of substantially different generosity relative to others. If anything, the estimated relationships for the effect of chronic status on plan choice, establishment size, and union affiliation would seem to suggest that households with a chronically ill member might be covered by plans that are more generous (Gabel et al. 2006).

How Different are the Services Used by the Chronically Ill?

The alternative reason we have suggested to explain why the insurance of the chronically ill is less generous for a given level of total spending is that insurance plans are structured in ways that favor the types of services consumed episodically as compared to the types of services consumed more persistently. This explanation assumes that there are differences in the types of services consumed by these two groups. To examine this, in Figure 3, we show plots of six types of service-specific spending against total spending.

As expected, we find that service usage differs substantially for the chronically ill population as compared to the population of households not covering any chronic conditions. We find that, for any given level of total medical spending, households with chronic conditions spend substantially more on prescription drugs than other households

and that this difference is statistically significant. For example, for households with total spending between $4,750 and $5,000, households covering a chronic condition spend almost 76 percent more on prescription drugs, on average, than other households ($879 versus $1,548). For households spending $12,500-$15,000, the difference is even greater ($1,634 versus $3,202). For a given level of total spending, households not covering someone with a chronic condition spend equal or more on other services including office-based visits, outpatient care, inpatient services, emergency room charges, and dental care. While it is not surprising that the services required and demanded by households with chronic conditions differ from those demanded by other households, such differences in services consumed may, given the structure of insurance policies, produce differences in the overall level of insurance provided to these two populations.[11]

Do Differences in Services Used Explain Why Chronically Ill Households Are Less Generously Insured?

In Figure 4, we present graphs of the average coinsurance rates for various types of covered services for given levels of total spending. Average coinsurance is calculated for each total spending bin separately for each service. For example, for office based visits, we divide OOP spending on office-based visits by total spending on office based visits for each household with positive spending on office-based visits. We then average over all households within a category of overall total spending to generate our estimate.

[11] One might also want to consider longer-term or "lifetime" insurance curves that relate many years or lifetime OOP spending to total spending. The data we use (the MEPS) preclude our constructing these longer-term or lifetime measures. We suspect, however, that there is greater serial correlation in expenditures among the chronically ill than among those with acute conditions (almost by definition). Thus, a longer-term picture using our method would tend to show an even larger difference in the generosity of insurance between the chronically ill and the non-chronically ill.

Thus, our estimate of the co-insurance rate is the average of the ratio of category-specific OOP spending to category-specific total spending (as opposed to the ratio of the averages). These coinsurance rates vary with total spending, as one would expect, because they depend upon factors such as whether a household has met its deductible. These calculations also depend on the timing of services. For example, some households may have consumed outpatient services while still subject to a deductible while others have already met the deductible or did not have a deductible as part of their policy. We expect such differences to average out over the population and expect that differences in the average coinsurance rate for each service may provide a strong indication of the reason that we find that chronically ill are less generously insured than other households.

We see from Figure 4 that in most cases average coinsurance rates do not differ substantially within category for households with a chronically ill member as compared to others. The only noticeable difference in average coinsurance for the two groups occurs for prescription drugs. Average prescription drug coinsurance is higher for the non-chronic households than for those covering a chronically ill member. This lends support to our earlier conclusion that differences in plans cannot explain why non-chronic households are more generously insured on average than households covering a chronic condition since the only real difference in coinsurance rates favors the chronically ill.

Looking across the panels of Figure 4, it is apparent that average coinsurance rates for prescription drugs are high relative to other healthcare services. Figure 5 presents coinsurance rates for each service type for three levels of overall total spending, $1,750-$2,000, $9,500-$10,000, and $15,000-$17,500. The differences between prescription drug coinsurance and coinsurance for other types of services is striking. For

example, for households with total spending between $1,750 and $2,000, average coinsurance for prescription drugs is approximately 46 percent. In contrast, the average coinsurance for outpatient services is approximately 17 percent, emergency room 18-21 percent, office-based services 27 percent, and dental care 34-37 percent. With the exception of a higher coinsurance rate for dental care, the pattern is the same when we look at total spending levels of $9,500-$10,000 in panel B of Figure 5 and at spending levels of $15,000-$17,500 in panel C.

The patterns documented in Figure 4 and 5 explain how it is that chronically ill households are less generously insured despite our finding no evidence that they are in different, less generous health plans than households not covering a person with a chronic condition. For a given level of total spending, the chronically ill consume a much higher proportion of prescription drugs than do other households. Prescription drugs are insured substantially less generously than other health care services. The prevalence of insurance designs with higher coinsurance for prescription drugs results in less generous insurance for the chronically ill as compared to others with the same level of total medical expenditures.

Conclusions

This paper uses a novel approach -- what we term “insurance curves” -- to assess the relative generosity of the insurance plans held by various populations. We find evidence that households with a chronically ill member are less well insured than other households. In particular, both our raw unadjusted and parametric estimates of the insurance curves for chronically ill households and for non-chronically ill households

show that OOP spending is greater among chronically ill households at higher levels of total spending than among non-chronically ill households.

Households with a chronically ill member may have less generous insurance either because they are enrolled in less generous plans than the plans of other households or because insurance plans in general tend to have greater co-insurance or less coverage for "steady" expenditures or for expenditures on items such as prescription drugs as opposed to expenditures on acute episodes such as inpatient stays. Our analysis suggests that it is benefit design, not differences in the types of plans covering the two groups, that explains the difference we observe in insurance generosity. Specifically, we find that it is greater coinsurance for prescription drugs, controlling for total healthcare spending that appears to be responsible for the less generous coverage of the chronically ill. That is, the specific services used most by the chronically ill – prescription drugs—are, by design, reimbursed at a lower rate. This is not due to the higher overall expenditures on average of the chronically ill, since we control for total spending in all of our analyses.

Our findings have important policy and health implications. Insurance designs favoring acute care over chronic care may be based on the fact that chronic needs such as prescription drugs are more predictable and therefore the coverage of such expenses does not serve as pure insurance. However, this reasoning has some potential flaws. First, insurance design given a chronic condition ignores the insurance problem associated with provision of insurance against *developing* a chronic condition. Even ignoring that thorny problem, policymakers concerned about health outcomes as well as cost control may look to recent evidence on coinsurance as an obstacle to medication adherence and question whether it is desirable to deter those with chronic conditions from taking needed

medications. Additionally, some recent work showing that health care cost savings generated by lower medication adherence lead to higher spending on other services such as inpatient and outpatient care suggests the possibility that higher coinsurance for this group could lead to increases in overall healthcare costs. Our evidence shows that the insurance of the chronically ill is less generous insurance and suggests this is primarily due to higher coinsurance for prescription drugs than for other services. The weight of the evidence suggests that the current standard in insurance design of higher coinsurance for prescription drugs is worth reassessing.

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Table 1: Descriptive Statistics

	Non-chronically Ill Households		Chronically Ill Households	
Household characteristics	**Mean**	**Linearized SE**	**Mean**	**Linearized SE**
Household OOP spending ($2009)	814	1234	1719	21
Household total spending ($2009)	3580	7163	9300	161
Age of policyholder (years)	39.781	10.921	44.972	0.112
Education of policyholder (years)	14.052	2.371	14.054	0.030
White	0.808	0.394	0.872	0.005
Black	0.127	0.332	0.085	0.004
Asian	0.053	0.224	0.027	0.002
Other race	0.013	0.112	0.016	0.001
Hispanic	0.089	0.285	0.072	0.003
Married	0.449	0.497	0.650	0.006
Number of children	0.580	1.008	0.744	0.012
Household total income (1000s; $2009)	77.565	58.158	86.524	0.743
Metropolitan statistical area	0.852	0.355	0.838	0.009
Northeast	0.213	0.409	0.200	0.013
Midwest	0.247	0.431	0.254	0.011
South	0.332	0.471	0.327	0.012
Plan Selection and Access Variables				
Small establishment (< 50 employees)	0.380	0.485	0.364	0.005
Private organization	0.761	0.427	0.734	0.005
Union member	0.203	0.402	0.236	0.005
Household has a choice of plans	0.621	0.485	0.669	0.005
Household enrolled in an exclusive provider organization	0.194	0.395	0.212	0.006
OOP premium (singles; $2009)	502	15	478	18
OOP premium (family; $2009)	1222	24	1230	27

Source: 1997-2007 Medical Expenditure Panel Survey Household Component.
Notes: OOP premium information available only from 2007 to 2007.

Table 2: Plan Access and Selection Outcomes

Outcomes	Non-chronically ill households	Chronically ill households	Unadjusted difference	Adjusted Difference
Proportion of Households with a choice of plans	0.621	0.669	0.048**	0.0152*
Proportion of Households holding an EPO	0.194	0.212	0.018**	0.0041
Average Annual OOP Premium (Single person household)	$502	$478	-24	-54*
Average Annual OOP Premium (Multi-person household)	$1222	$1230	8	-$25
Proportion of Households in which policyholder employed at small establishment	0.38	0.364	-0.016**	-0.0214**
Proportion of Households in which policyholder employed at private organization	0.761	0.734	-0.027**	-0.0033
Proportion of Households in which policyholder is a union member	0.203	0.236	0.033**	0.01*
Notes: Adjusted estimates generated from multivariate regression model estimates of each outcome on a chronic household indicator, household demographics, geographic region, MSA, and year indicators. Statistically significant difference in means or proportions denoted by **p<.01, *p<.05				

Figure 1: Median Out-of-Pocket Spending across the Total Spending Distribution, Unadjusted Estimates

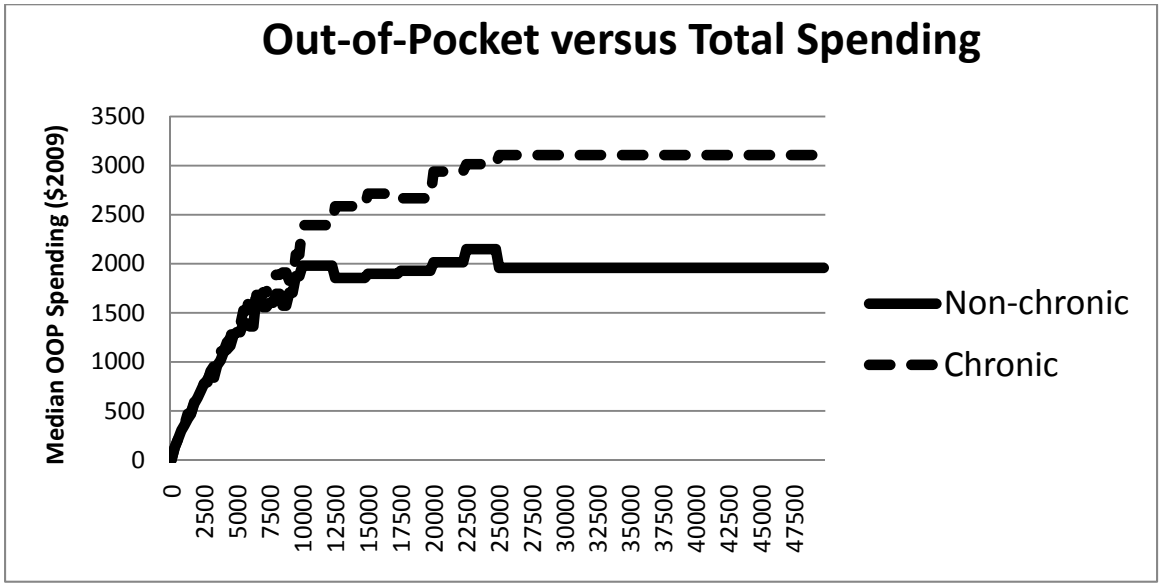


Figure 2: Predicted Out-of-Pocket Spending across the Total Spending Distribution, Adjusted Estimates

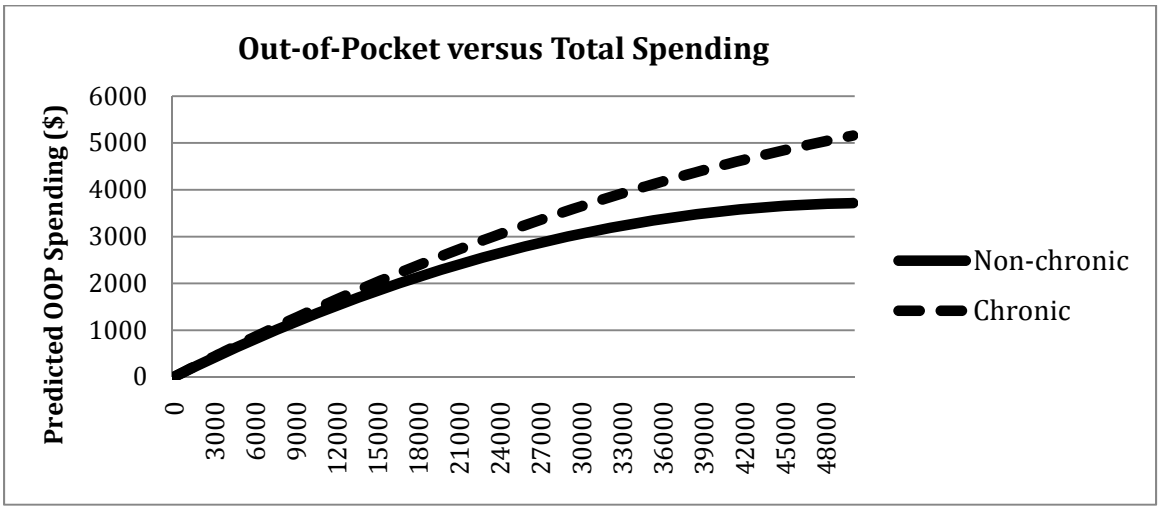
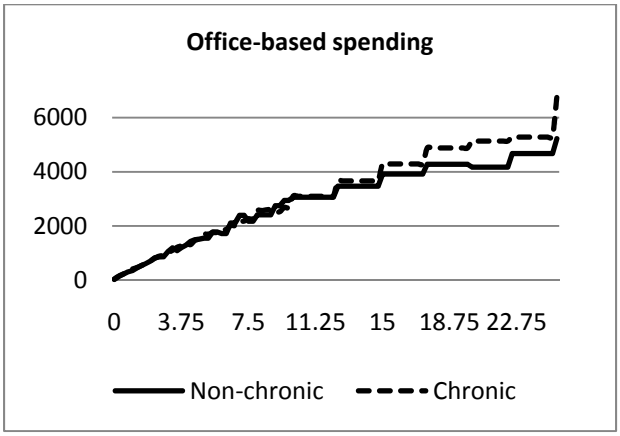
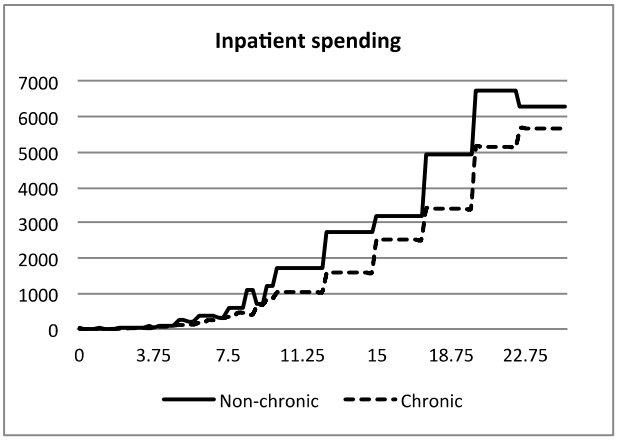
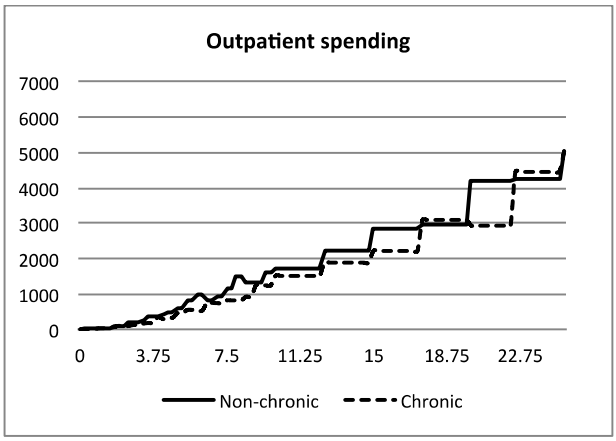
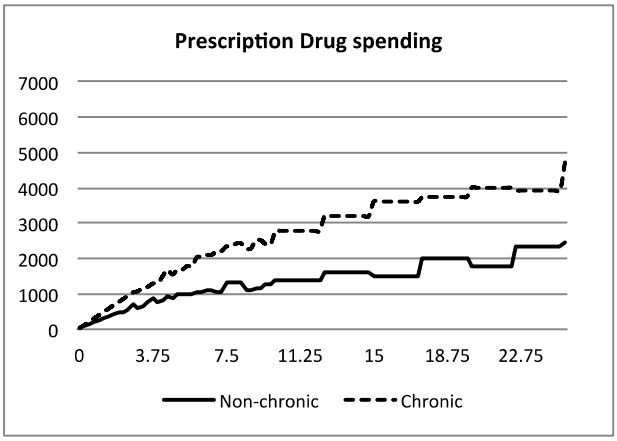


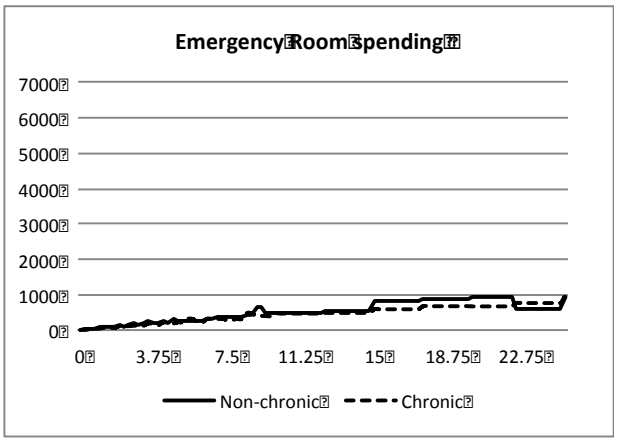
Figure 3: Average Service-Specific Total Spending by Overall Total Spending ($1000s)











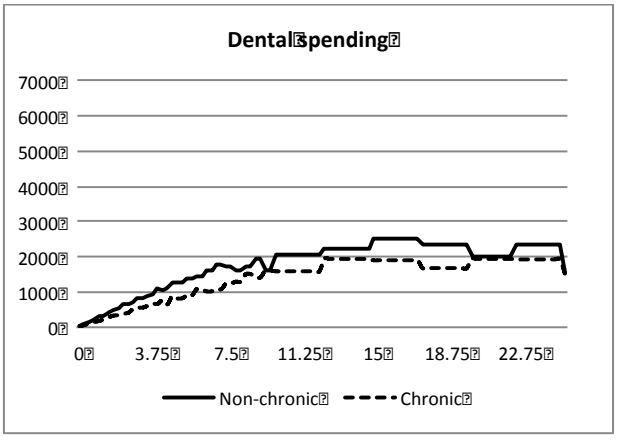


Figure 4: Average Service-Specific Coinsurance Rate by Overall Total Spending ($1000s), Conditional on Having Positive Service-Specific Spending

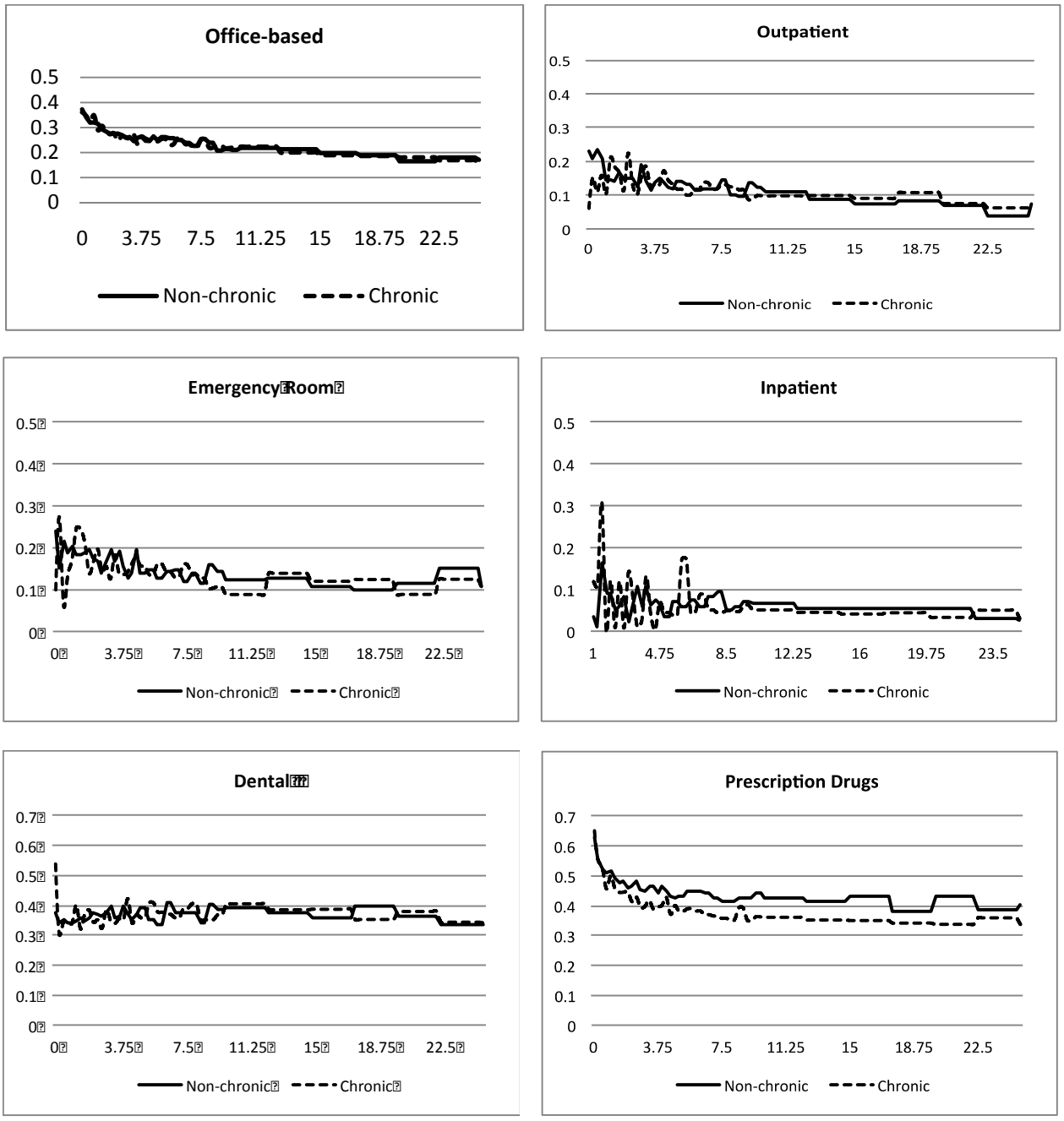


Figure 5: Average Coinsurance across Service-Specific Categories for Three Total Spending Levels