The Impact of Medical Debt on Access to Care: Data from a Low-income Cohort

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Abstract

Medical debt is a growing problem burdening a large number of families today. In 2003, seventy million Americans reported that they had accumulated, or were presently paying off, some level of medical debt. Single women, the elderly, minorities, those in poor health and those living in poverty are especially susceptible to this burden. The rising costs of medical care, and the instability and inaccessibility of health insurance coverage contribute to the costs incurred by patients, creating higher and higher levels of debt. In addition, the economic downturn created by the recent recession has forced many state governments to make cuts to some social programs including Medicaid. Legislative changes to the Oregon Health Plan in February 2003 included higher cost sharing and cuts in benefits for the adult expansion (Standard) population, consisting of single adults and couples that were below 100% of the federal poverty level (approximately 90,000 Medicaid beneficiaries).

A prospective cohort study, organized by a collaboration of researchers from the Office for Oregon Health Policy and Research, Portland State University, Providence's Center for Outcomes Research and Education, and the Office of Medical Assistance Programs, studied the health effects of these changes on OHP beneficiaries. Analysis of the baseline data found that medical debt was acting as an impeding factor, preventing regular access to care. In this population, those with medical debt had a greater difficulty accessing needed medical care than those without any debt. Respondents with $1-$1,000 of medical debt were 2.5 [95% CI (1.81, 3.33)] times, those with $1,001-$5,000 of debt were 3.9 [95% CI (2.52, 6.01)] times, those with greater than $5,000 of debt 2.4 [95% CI (1.45, 3.82)] times, and those with an unknown amount of debt 3.6 [95% CI (2.27, 5.58)]

times more likely to have had an unmet need for general care than those without any debt. When access to prescriptions was examined, respondents with low levels of medical debt were 2.0 [95% CI (1.48, 2.70)] times, those with moderate levels of debt were 2.5 [95% CI (1.61, 4.00)] times, those with high levels of debt 3.2 [95% CI (1.93, 5.43)] times, and those with an unknown amount of debt 2.3 [95% CI (1.44, 3.61)] times more likely to have had an unmet need than those without any debt. Access to urgent care was also investigated, and respondents with low debt were 1.4 [95% CI (0.87, 2.20)] times, those with moderate debt were 2.2 [95% CI (1.23, 4.02)] times, those with high debt 1.7 [95% CI (0.90, 3.32)] times, and those with an unknown amount of debt 2.6 [95% CI (1.38, 5.00)] times more likely to have had an unmet need than those without any debt. The increasing trends found here were not significant; however, they do warrant further investigation of the association between various levels of debt and access to health care.

Introduction

In a country with rising medical costs, no national health care and a large, increasing gap in medical insurance coverage, medical debt, or debt accumulated by an individual from their financial share of medical treatment, care or supplies, has become a pertinent issue. Almost 13% of all American families have problems paying their medical bills.[7] This means approximately 20 million families, or 43 million people experienced problems due to mounting levels of medical debt in 2003 alone. Further, the Commonwealth Fund's 2003 quarterly report found that two out of every five working age adults 19 to 64, or more than 70 million people, had accrued or were paying off some form of medical debt.[6] Of the families with debt, somewhere between 8 and 21% are contacted by collection agencies annually about their medical bills.[4] The Access Project, a collaboration of community partners working to "improve health and healthcare access",[5] found that health care problems and medical debt factor into one-half of all consumer bankruptcy filings in the United States.[3] This problem, which the medical literature is primarily silent about, is an important yet almost unseen and unacknowledged problem facing a large number of Americans today.

Medical debt not only creates a stressful, possibly destructive financial burden on American families, but it can also prevent individuals from receiving the medical care that they may need.[3,4,6,7,15,17,37] The Access Project looked at a population of subjects with medical debt and found that many of the respondents didn't seek care when needed, fill prescriptions, or comply with treatment regimens due to pre-existing debt and an inability to pay for medical care.[3,22,24] The Center for Studying Health System Change (HSC) found that one in three families with problems paying medical bills did not get a

prescription filled, one in four delayed care, and one in eight went without needed care altogether.[7,33] Problems accessing health care are particularly common for specialty health services, as well as mental health and dental services.[28,32] Additionally, uninsured people are three times more likely to go without care than those with health insurance.[25] This may be because many providers make it harder for individuals with debt by requiring these individuals to pay cash upfront, flatly refusing care or referrals, or suggesting that individuals with high levels of debt use other sources of medical care.[3,15] Many individuals also reported avoiding their place of regular care due to feelings of embarrassment and shame over even small amounts of money owed. When individuals do not receive adequate and timely preventive care, their health conditions can worsen, leading to greater health care costs, and more debt. Medical debt can also lead to an inability to pay for other bills, food, and rent, and cause an individual to obtain bad credit, limiting their ability to secure reliable housing and further aggravating the situation.[3,4,7,8,15,16,17] The inability to receive timely, necessary preventive care can "disrupt the [overall] continuity and...quality of care" creating a self-perpetuating cycle of poor health and debt.[15]

When individuals continue to seek care, they often look to friends and families for help, increasing the burden on the community.[15,17,37] Furthermore, when an individual's place for primary care is lost, they often turn to emergency rooms for needed care. Emergency room care can be unaffordable and go completely uncompensated; therefore, hospitals are forced to bear these costs, or pass them on to other paying patients. The Commonwealth Fund estimated that private and public health care providers spend $35 billion annually subsidizing emergency room care.[15] The Institute of Medicine estimated

that the cost of care for the uninsured to the US economy can reach as high as $65 to $130 billion annually.

Overview of Issue of Medical Debt

Medical debt is different from other forms of consumer debt in that it is often completely involuntary.[3,21] Medical debt is linked to services that may be required for survival, thereby making the consumer more vulnerable. The Access Project suggests that the populations particularly burdened with medical debt are single women, the elderly, people with disabilities or chronic conditions, and the very poor.[3,21,23,24,26] Although the uninsured and the working poor often experience the most medical debt, even those with medical coverage are not exempt from the threat of financial ruin.[3,4,7,15,17] For example, two-thirds of all families reporting a problem paying their medical bills have health insurance.[7,33] Depending upon the type of illness with which an individual is stricken, as well as the varying degrees of medical coverage, unaffordable out-of-pocket costs, deductibles, and co-pays create a huge financial burden.[3,4,24] For example, just one serious accident or illness (i.e., car accident or cancer) easily costs over $10,000, an amount that could put "ordinary people suddenly into deep debt."[34] Further, unexpected medical debt causes other life-changing events to occur when individuals and families find it difficult to pay other bills, are unable to save money, lose their property to collectors, or generally lose their ability to be financially self-sufficient. A study of the contributors to American bankruptcy by Himmelstein et al found that 15% of all homeowners took out second or third mortgages, often at high interest rates, in order to pay off medical expenses.[4] In addition, there is often a "co-occurrence of medical and job problems" if an illness or injury causes an individual to miss work or lose their job.

Lapses in medical coverage may occur due to the loss of employer provided insurance. However, when new employment is obtained, the worker is often surprised to find that their new insurance won't cover any of their pre-existing conditions. Therefore, greater amounts of out-of-pocket costs would be required.

Bankruptcy is another result of medical debt that often goes virtually unnoticed and overlooked in the health policy literature. According to Himmelstein et al, the average debtor is a 41-year-old female with children and some college education.[4] Additionally, they were often middle or working class and owned homes. A number of studies have found that healthcare problems factored in half of all U.S. consumer bankruptcy filings.[3,4,17,34] The number of medical bankruptcies filed each year is also increasing. In 1981, eight percent of all bankruptcies filed cited medical debt as a reason, a total of 25,000 out of 312,000 families; by 2001 this number had increased at least 20 fold.[4,21] Due to health insurance policies with less coverage and high deductibles, many families find themselves being bankrupted by medical expenses below "catastrophic" levels, especially if finances are already limited.

Provider bill collection practices also lead to burgeoning debt. Many providers are adopting more aggressive and inflexible collection procedures and turning to collection agencies sooner, possibly after just a single missed payment.[3,4] Hospitals and medical centers can avoid bad reputations by outsourcing bill collection to professional services. They even often sell their outstanding accounts to collection agencies for ten to seventeen cents on the dollar just 30 to 60 days after a missed payment, rather than the standard 150 to 210 days.[17,21,34] Some providers resort to these methods even when individuals are making an effort to pay their debt, or demand unreasonable payment plans

that patients are unable to afford; some encourage the use of credit cards for immediate repayment.[21] Due to the fact that many low-income patients already have bad credit because of the medical debt on their credit report, they may have to resort to "sub prime loans" or high interest credit cards, in an effort to pay off their debt immediately, increasing their burden.

Overview of the Issues of Insurance and Cost

Two trends in the US healthcare system underlie the growing burden of medical debt: a "growing instability in insurance coverage and rapid growth in the costs of care."[6] Nationally in 2002, 43.6 million people were without health insurance; this is an increase of 4 million from 2000.[15] This number, however, may not include a large number of people for which the "interval in which they lacked insurance did not match the particular window asked about;" therefore, the actual number of uninsured is unknown.[29] During the same time period in 2002, health care spending grew at a rate of 9.3% (the highest annual increase in a decade), and insurance premiums rose 13.9% (the third consecutive double digit annual increase). To respond to these increases, employers have increased the amount of cost-sharing, "shifting more of the financial risk to their workers."[15, 7] Public programs provided by the state are reacting by reducing coverage and restricting the eligibility criteria for many of their health programs including CHIP (Children's Health Insurance Program), and here in Oregon, OHP. The proportion of states implementing benefit limits increased from 20% in 2000 to 33% in 2003; the proportion implementing cost-sharing increased from 66% to 81%.[27] Furthermore, there has been an erosion in the quality of benefit packages and amount of health coverage received by the people who actually have a stable source of health insurance.[22] For instance, a number of

health care services, such as mental health, are no longer covered by many insurance plans; also, the services that are covered often come with high deductibles. In addition, beneficiaries can be limited to certain types of treatments and providers, as many plans do not allow for homeopathic or alternative medical care. Moreover, there has been a decrease in the number of employers offering any affordable benefits at all.[22]

Not only are the uninsured burdened, but even short term lapses in insurance coverage have been shown to be a predictor of the accrual of medical debt.[24] According to the Commonwealth Fund's 2003 Biennial Health Insurance Survey, 26% of working-age adults experienced some sort of coverage lapse, with 17% uninsured at the time of the survey.[15] The Center for Studying Health System Change (HSC) also found that there were 8.9 million fewer people covered by employer-sponsored insurance that year, and an increase in the Medicaid and CHIP populations.[30] Insurance coverage was the most unstable among minorities and the poor.[15,31] More than half of the adults in households that earned less than $20,000 annually were uninsured for at least some time in 2003, while 35% of families earning between $20,000 and $35,000 annually went without coverage for some time during that period (up 7% from 2001). Of these individuals that went without coverage at some time in 2003, 47% were Hispanic, and 38% were African American. Lack of health insurance coverage is also becoming a problem among the growing population of young adults (aged 19-29 years). Forty percent of this age group was without coverage during the same time period. Age nineteen is an especially critical age because (1) most (60%) employers who cover dependents stop at age 19 if they are not in college, (2) Medicaid and CHIP programs

reclassify all children as adults at age 19, and (3) the jobs that are readily available to this population often do not offer benefits and are low-paying.[15,17]

These trends are expected to continue in the future. Researchers predict that health care costs will grow at a rate outpacing the growth rate in the economy "by a wide margin."[15,22] As costs rise, the number of uninsured families continues to increase, especially among the low-income, working-class population. These individuals have a particularly difficult time acquiring health insurance. Many make too much to be eligible for public programs, yet too little to afford private insurance.[19] Low-income people are "willing to spend only a small share of [their] income on health insurance coverage."[16,29] Participation drops quickly when costs start to rise. Americans pay more out of pocket for their medical care than people in any other industrialized country.[15, 24] In 2004, at least 16% of American families spent more than 5% of their total income on health care; this proportion rises to 42% in the chronically ill population.[26] Two-thirds of adults that pay at least 10% of their income on insurance premiums report that they still have medical debt or problems paying their medical bills.[24] Even 35% of those continuously enrolled in public assistance programs report costs greater than $500 per year. A study performed in Baltimore found that almost half of the low-income population surveyed spent nearly half of their annual income on medical bills.[36]

Contributing to the medical debt problem is the fact that many physicians and hospitals, feeling the economic pinch from uncompensated care and budget cuts, have cut back on the amount of charity care they provide.[28] There is also a practice of charging the uninsured significantly more than the insured for the same procedures (sometimes 2 to 3 times more).[5,17,34] A lawsuit was filed in 2004 claiming that nonprofit hospitals are

violating "their obligation as charities by overcharging" the uninsured. The hospitals responded by stating that those without insurance simply do not have large companies to negotiate discounts for them or a large pool of people with whom to share the risk.[5,21] Many hospitals have claimed that they are struggling financially and cannot afford to finance free health care. Also, an investigation of "unintended consequences" of federal regulations and hospital policies by the Commonwealth Fund found that certain regulations may actually cause, or at least encourage these practices.[35,38] For instance, federal laws prohibit providers from billing Medicare patients different rates for services than other patients. Therefore, these institutions must establish list prices to use as guidelines for billing. Unfortunately, the only patients that actually pay these prices are those who are uninsured, those who have no one to negotiate or impose discounts for them. The Commonwealth Fund also found the federal rules that the providers must abide by to be fairly complex, possibly creating confusion in their interpretation.[38]

Background of the Oregon Health Plan

The Oregon Health Plan was created in 1989 in an attempt to reform health insurance and fill in the gap of coverage for high-risk individuals and the working poor. The idea for this plan grew out of the creation of the Insurance Pool Governing Board (IPGB) by the Oregon legislature in 1987.[1] This board was organized to fix a premium insurance package for small businesses, an "Employer Mandate". This mandate required small business owners to either pay into a state fund or make insurance more available to their employees, offering them tax credits in return.[2] A second legislative session in 1989 started what is known as "Phase I" of the plan. It established the Health Services Commission, which created a "Prioritized List" of benefits aimed at those without

insurance. This list ranked conditions and treatments according to cost, duration of benefit, physician estimates of the effectiveness of treatment, and the citizens' views on illnesses and disabilities.

In 1990, the creation of the Oregon Medical Insurance Pool (OMIP) extended "access to health insurance for persons with preexisting medical conditions who were unable to obtain affordable insurance."[1] It also expanded Medicaid to cover all families and individuals with an annual income at or below the federal poverty level. The theory underlying these actions was that the eligibility for health care coverage could be expanded if cost-containment mechanisms, including managed care and benefit limitations, were built into the system. The 1991 legislative session brought about the framework for "Phase II" of the project to be implemented in 1995. Phase II extended the Prioritized List to include mental health and chemical dependency services. It also expanded the benefits package to other at-risk populations within Oregon. Premiums were limited to 150% of private insurance rates, and all active health insurers in the state were required to help fund the program.[2] The Office of Medical Assistance Programs (OMAP), putting all of these reforms into action, officially implemented the Oregon Health Plan (OHP) in 1994. In its first year, it enrolled almost 120,000 members, much more than was expected; after that, an average of 365,000 individuals were covered by the program at any given time.[1]

By the late 1990's, the Prioritized list was expanded to include pregnant women and their unborn children with incomes below 170% of the federal poverty level.[1] It also added uninsured full-time college students who were eligible for Pell Grants. In addition, two new programs were created to reduce uninsurance levels: the Family Health

Insurance Assistance Program (FHIAP) and the Children's Health Insurance Program (CHIP). More insurance reforms were implemented targeted at small employers throughout the 1990's; however, by 1997 the Employer Mandate was invalidated, lacking essential support from the US Congress.[2] Further, as the number of OHP clients increased, the funding decreased[1]. Initially, as expected by the Oregon legislature, OHP reduced the utilization of high cost emergency rooms due to an increase in the use of low-cost primary care.[2] In 1994 ER visits declined 5.3%, and another 2.1% in 1995 according to the Oregon Association of Hospitals and Health Systems. Hospitals not only saved money as the amount of charity care statewide decreased by 18.7% in 1994, and 32.5% by 1995, but "bad debts," or debts that have not been repaid by patients for services rendered, were also down as much as 10.6%.[2] The general economy benefited from OHP as well due to the fact that families living at or below the federal poverty level could give up their welfare status and seek work without losing health care benefits. There was still a small gap in coverage, especially amongst the working poor due to the failure of the Employer Mandate; however, by 1995 the number of uninsured in Oregon was the lowest it had been since the eighties, and it remained fairly low until the downturn in the economy around 2001. At its height, OHP resulted in a decline in the rate of the uninsured to 10% within the state (from 18%); but by 2002, this rate jumped to 14%, despite membership being at its highest level since 1995.

Unfortunately, the recession forced state governments across the country to develop money saving measures. Many of these states, including Oregon, looked to their Medicaid programs to reduce costs and spending.[6] By 2001, with rising membership and costs, OHP took a few actions to sustain itself. The drafting of OHP2 waivers began,

which created two Medicaid packages in an effort to establish more flexibility in the program, and reduce the funding level of the prioritized list. The first was a comprehensive package, OHP Plus, which covered the traditional populations (i.e. children, pregnant women, and the elderly, blind and disabled). The second was a reduced package, OHP Standard, or the expansion group that included single adults and couple living below 100% of the federal poverty level. This group would experience higher cost sharing for the "non-categorically eligible populations," and less extensive coverage. At the end of 2002, the OHP2 waivers were approved, and in February of 2003, the OHP Plus and Standard programs were implemented as one of Oregon's cost containment strategies. This meant that approximately 90,000 existing OHP members experienced the elimination of non-emergent transportation, vision services, and dental services, as well as the loss of coverage for durable medical equipment. Along with these cuts came higher mandatory co-pays, and in March 2003, the further loss of prescription drug and outpatient mental health and chemical dependency coverage.[1,9] In addition, they implemented a "six-month lockout for non-payment of premiums."[9] Due to these changes, the OHP standard population decreased 46%, to 47,957, by the end of 2003.

A Picture of Oregon's Uninsured

Starting in 2002, the country as a whole started to experience an economic downturn that caused a decline in wages and high levels of unemployment. Unable to raise enough tax revenue to fund its programs, the downturn also caused a state budget crisis in Oregon. To cope with this crisis, legislatures "severely constricted the state's primary health care subsidy program," resulting in a sharp rise in insurance deductibles and co-payments.[10] This rise in health insurance costs also affected the ability of Oregon

businesses to provide benefits for their employees. Increasing numbers of Oregon businesses are requiring a waiting period for new employees to qualify for health insurance benefits. In 1996 only 65% of businesses were requiring this waiting period; by 2002, this proportion rose to 82%, with a national average of 74%. Low wage employees are especially affected by these changes. In 2002, less than half of the employees in low or minimum-wage jobs were eligible to receive health coverage through their employers. Further, low-wage workers who are eligible for coverage often experience longer waiting periods than higher wage workers.

The increasing cost of health care for workers, combined with the rising unemployment levels, and cuts to the Oregon Health Plan during the economic downturn have resulted in an increase in the percentage of working-age Oregonians without any health insurance. According to census data, during the years of 2002 and 2003 approximately 33% of Oregonians had a lapse in their health insurance coverage.[10] This means that nearly one million (968,000) people went without coverage for some period of time during those two years. Of those individuals, almost two-thirds didn't have insurance for greater than six months. Non-white Hispanic individuals were particularly likely to go without health insurance during this period of time, with two-thirds of the Hispanic population under 65 years of age lacking coverage at some point.

Prior to the economic downturn in 2001, the rate of uninsured in Oregon was at a low of 10% (1998), even lower than the level experienced directly after the implementation of OHP in 1994; however, by 2003 the percent of uninsured Oregonians increased to almost 20%. The majority of those without insurance were working-age Oregonians (age 18-64). From 2002 to 2003, a total of 456,500 working-age adults

lacked insurance, an increase of 104,000 from the year 2000. If children and the elderly are included in this figure, the number of Oregonians without insurance rises to 562,000 for the year. Before 1994, 57.6% of working-age Oregonians below the federal poverty level lacked health insurance. With the broadening of Medicaid eligibility after the implementation of OHP, this rate was cut by more than half. By 1996, only 25% were uninsured, but by 2002 the rate was back up to 35% in this group. Additionally, in 2004, 18.2% of employed Oregonians reported that they were without health insurance coverage.[14]

After all of the cuts in health care funding, Oregon hospitals experienced a "flood of uninsured patients."[10] From March 2002 to March 2003, the number of uninsured patients admitted to Oregon hospitals increased 39%, while the overall admissions increased by only 2%. There was also a sharp increase in the number of Oregonians who needed medical care but couldn't pay for it. Therefore, the cost of "charity care shot up 70% in 2003 alone, after rising 39% in 2002."[10] Further, the amount of bad debt reported by Oregon hospitals nearly doubled during the economic downturn from $129 million in 2000 to $222 million in 2003. Many individuals who are paying off medical debts have been forced into bankruptcy as a result. In 2002, more Oregonians filed for bankruptcy than graduated with a college degree. There were 23,000 bankruptcies in the state of Oregon in 2002 and only 15,300 bachelor degrees awarded. During the 1980's recession, the rate of bankruptcy was only 2/1000 individuals; this rate rose to 6/1000 individuals in the 1990's and 9/1000 during the three years between 2001 and 2003. While accurate data on why Oregonians file for bankruptcy is not readily available, nation-wide data has

suggested that the vast majority of individual bankruptcies occur for one of three main reasons: loss of a job, sickness, or divorce.

After the Oregon Health Plan legislative changes took place in February 2003, a team of researchers from the Office for Oregon Health Policy and Research (OHPR), Portland State University, the Providence Health System's Center for Outcomes Research and Education (CORE), and the Office of Medical Assistance Programs designed a prospective cohort study to understand the effects of these changes on the recipients of OHP.[11] The purpose of this study was "to follow a cohort of individuals who were enrolled in the OHP in February of 2003, just prior to the implementation of program changes," for the purpose of assessing "the effects of [legislative] changes on enrollment, access to care, service utilization, and financial and health outcomes of OHP beneficiaries." The proposal was funded by the Robert Wood Johnson Foundation and the Oregon Office of Medical Assistance Programs (OMAP). The results collected after 18 months of this study found that 45% of the Standard plan members lost their insurance coverage after the "redesign," and 67% of this subset went without coverage for six or more of the 18 months following the redesign.[20]

Gaps in the Current Literature and Research

In the current literature, the amount of medical debt individuals have amassed is often not mentioned or addressed. This may be because it can be difficult to discern medical debt from other self-imposed debt, thereby making quantification of medical debt difficult. The Access Project's study noted that some of the respondent's medical debt was probably hidden in their overall credit card debt, "thus making it difficult to accurately assess [its] full influence."[3,21,34] Many debtors consolidate all of their debt,

both consumer and medical, to make payment easier or more convenient. This fact may lead to ignorance on the part of the debtor to the actual amount of money owed for medical care. In addition, although it has been acknowledged that having medical debt does have a detrimental affect on access to care, the question of whether varying levels of medical debt differentially affect an individual's access to needed health care has not been examined.[3,15,21] This analysis strives not only to quantify a more accurate range of medical debt owed directly to care providers as well as to other creditors, but it also aims to evaluate the possible affects of varying levels of debt on access to care.

Specific Aim

The main aim of this analysis is to determine the association between medical debt and access to care in a cohort of low-income individuals.

Hypothesis: Total medical debt in the OHP standard group is negatively associated with access to regular medical care and treatment.

The Health Behavior Model

The theoretical model underlying this hypothesis and investigation was based on Ronald M. Andersen's adapted Health Behavior Model (HBM).[18] This model was used to determine what factors are related to an individual's use of health services and, therefore, which measures would be important in this analysis. Andersen modified the HBM to include modern issues that affect the use of health services, thereby creating the Behavioral Model of Health Care Utilization. This model interprets an individual's use of health services as a "function of their predisposition to use services, [the] factors which enable use, and their need for care." There is, however, a shortcoming to Andersen's model, for it only includes one's enabling resources and not those factors that

may impede one's use of health care services, or factors that oppose one's enabling resources. Logically, if one has resources that enable them to utilize medical care, there must also be factors that prevent them from such utilization. However, Andersen's model appears to exclude impeding factors, such as one's level of medical debt, which would definitely have an impact on an individual's health care utilization.

For this analysis, Andersen's Health Behavior Model was further adapted to include factors that may prevent an individual from seeking or receiving needed care, alongside any possible enabling factors they may possess. Figure one, above, outlines the adapted Behavioral Model of Health Care Utilization used in this analysis. An individual's predisposition to use services was represented by their demographic characteristics. These demographic characteristics may correlate or interact with the factors that enable or impede use of medical services: medical debt, insurance coverage, level of income, out-of-pocket costs, and having a regular place for care.[11] Individuals determined their own need for medical care through their self-perceived health status and the presence of a chronic condition. The outcomes in this scenario were the respondent's ability to access three different kinds of medical care. One's ER usage was also considered as a usage variable; however, in our model, it was controlled for along with the other covariates because it may have been related to the other kinds of health care utilization and one's level of medical debt.

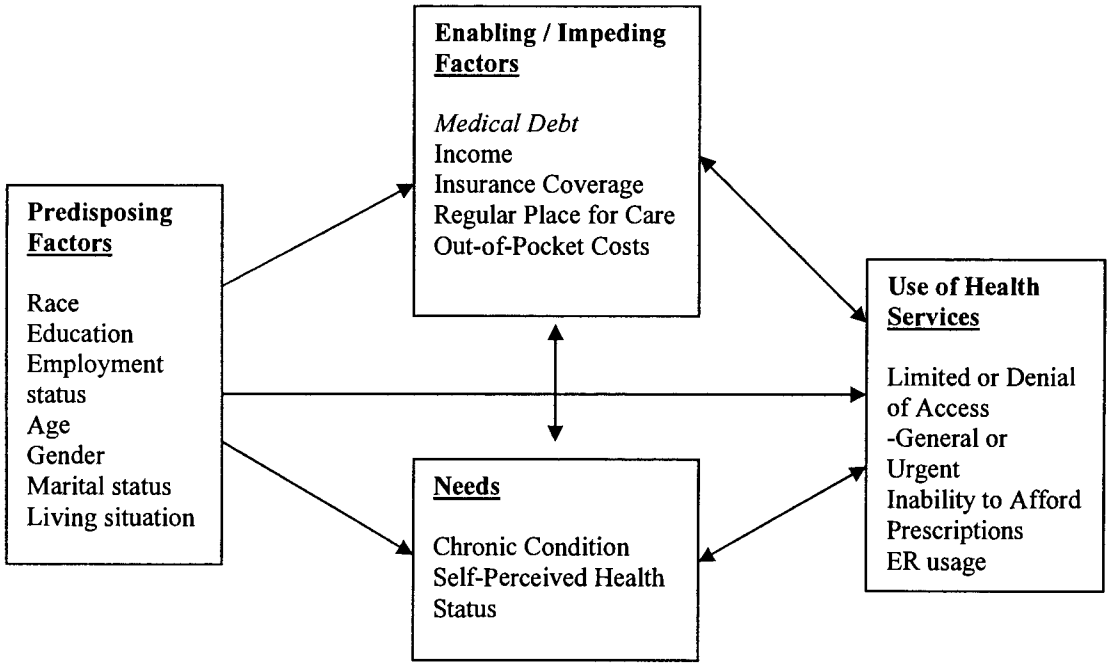

Figure 1. The Adapted Health Behavior Model

Methods

Oregon Health Care Survey

Study Population

The research team obtained a stratified random sample of 10,819 members from the OHP Medicaid eligibility files, half from the standard and half from the plus populations.[11] To ensure that the sample adequately represented the racial and ethnic composition of the OHP population, over-sampling was used. Five hundred people from African-American, Native American, and Spanish-speaking backgrounds were randomly chosen in the selection process. Of the initial random sample, 8,487 were eligible for the study; the other 2,332 were either deceased or did not meet the inclusion criteria. Information about each individual's eligibility group (Standard or Plus), income category, and primary language were obtained from OMAP eligibility files.[11]

Inclusion Criteria: All study participants were required to be adults, 18 years of age and older, who were enrolled in the OHP at least 30 days prior to February 15, 2003. This is when the initial program changes were implemented. Participants also had to live in the state of Oregon, have a current address, and speak either English or Spanish.

Exclusion Criteria: Selected individuals who were under 18 years old, moved out of the state of Oregon, did not have a current address at the time of the study recruitment, deceased, or were not eligible for OHP 30 days prior to February 15, 2003 were excluded from this study. Individuals with cognitive impairments preventing them from understanding the content of the survey were also excluded from the study.

Study Design

The research team developed a survey to obtain information concerning the interaction of OHP members with their health care system. They drew from a variety of accepted data collection tools including the Consumer Assessment of Health Plans (CAHPS), the Community tracking study, and the Access Project survey to develop the Oregon Health Care survey.[12] Additionally, the survey tool was assessed and validated using cognitive testing with a sample of representative OHP members "who agreed to participate in a validation interview."[12]

The eligible study participants were mailed a baseline survey, an addressed postage-paid envelope, a consent form, and a letter explaining the study in October 2003. Each individual was given a telephone number that they could call if they had any questions or concerns. They were also assured that their participation was completely voluntary, and any subject opting out was immediately removed from the mailing list. Surveys translated in Spanish were sent to all Spanish-speaking individuals.[9] All

members who returned a completed survey and signed the consent form were enrolled in the study. To maximize the number of respondents, reminder cards were sent out a short period of time after the initial survey.[12] A second survey was sent out to all non-responders. By January 2004 the final cohort was collected, and consisted of 2,783 responders, a response rate of 34%. Demographic analysis of responders and non-responders revealed that the two groups were similar with respect to race, gender, language, and OHP policy group.[9] Each respondent was asked to provide present contact information as well as friends or family members who would always know where to find them. This extra information reduced the number of respondents lost to follow-up during the second wave of surveys one year later.

A similar survey was mailed out in the second wave of follow-up starting in October of 2004. If the existing address for the respondent was incorrect, the surveys were returned. A variety of techniques were employed to retain a maximum number of cohort participants. Financial incentives were used to encourage further participation in the study. Each respondent was paid $5 per returned survey and a "drawing was conducted for a large ($200) prize."[9] In addition, project staff worked to find the individuals who didn't return their surveys or were lost to follow-up. They used telephone tracking, calling individuals from the given contacts lists, trying all alternate phone numbers, and searching public records and internet databases to update any disconnected or incorrect phone numbers and addresses. State database searches including OHP, food stamp records, Department of Justice, and death records were also used to locate individuals. There were also "multiple attempts at telephone completion

for those who failed to respond to the mail survey."[9] Months of follow-up, ending February of 2005, resulted in a 72% response rate for the second wave of surveys.

Data collection and management

The collection and management of all respondent information was handled according to HIPAA regulations.[9] The study was also approved by the Portland State University Institutional Review Board (IRB). A mailing database was created containing only the names and contact information of each respondent along with a unique ID number for later use and referral in the data analysis and tracking stages. Completed surveys from both waves were mailed to Providence CORE where the data entry was managed. All survey data was input into a SPSS statistical software package along with the corresponding study ID numbers. The data entry staff had no access to any personal identifiers, only the unique ID numbers and self-reported respondent information. Databases with coded survey information were kept at CORE and Portland State University for analytical purposes. Personal identifiers for study subjects were also input into a password protected Access database for tracking purposes. The principal investigator at PSU managed this database, where only trained respondent trackers had access during the follow-up stages. A record of all of the participating individuals in this study is kept at CORE for at least three years following the end of the study. The principal investigators will destroy all of the paper files within one year following the last survey mailing period. Likewise, all computer files containing any personal information will be maintained for one year following the last survey mailing period to ensure data integrity and cleaning. At that time, these files are to be de-identified and any data files containing personal identifiers will also be destroyed.

Current Analysis

Study Design

This was a cross-sectional secondary data analysis of the baseline information obtained from the Oregon Health Plan Study.

Study Population

To limit possible biases due to demographic differences between the OHP Plus and Standard populations, including differences in the prevalence of chronic illness, age, income and insurance coverage, this analysis was limited to the information collected from the OHP recipients in the Standard population after the enactment of legislation in February 2003. These legislative changes had a greater impact on the lives of this group, thereby making their data more relevant in the present analysis. Consisting of the non-traditional Medicaid population, this group would experience greater cost sharing, an increase in premiums, and more gaps in, or loss of, health insurance coverage. At the time of the baseline survey, this population consisted of 1,378 individuals (49.5% of the study population) who were enrolled in OHP prior to the enactment of the legislative changes.

Exclusion Criteria: Any respondents who did not report a value for the main variable of interest, level of medical debt, were excluded from analysis. This created a cohort of 1,364 respondents that were available for this analysis. Respondents with missing access and/or covariate measures were also excluded from the individual analyses.

Study Variables

Table 1. Summary of Outcomes, Associations of Interest, and Possible Covariates

Outcomes	Debt Variables	Other Covariates
Primary Unable to receive general medical care when needed **Secondary** Unable to afford prescription medications Unable to receive urgent care for an injury or illness	Total medical debt Medical debt owed to a health care provider Medical debt owed to a creditor and/or lender	Race Gender Age Income Level of education Employment status Marital status Living situation Lapse in insurance coverage ER usage Having a regular place for care Out-of-pocket RX costs (monthly) Out-of-pocket costs for medical care Presence of a chronic condition Self-perceived health status

Table one, above, summarizes the outcomes and variables used in this analysis.

Outcome: Limited Access to Care

There were three measures of limited access, each referring to the respondents' experiences in the six months preceding the survey. The primary outcome of interest was based on a question that asked, "was there any time in the last six months when you needed medical care but did not get it" (unmet need for general care). An answer of 'yes' was considered an unmet need. Two secondary measures of access were also considered. A respondent's ability to afford prescription medications was assessed through this question: "in the last six months was there ever a time you needed prescription medicines but did not get them because you couldn't afford it" (unmet need for prescriptions). Also, the ability of respondents to receive immediate necessary care for

an urgent illness, injury or condition, if needed, was recorded. The following question asked: "in the last six months when you needed care right away for an illness, injury or condition, how often did you get care as soon as you wanted" (unmet need for urgent care). Possible answers were: never, sometimes, usually, always, and not applicable. Those who responded to the question with answers of never or sometimes were considered to have limited or impaired access, and, therefore, an unmet need. Subjects who answered "not applicable" were excluded from the analysis of this outcome. Approximately 48% (N=659, 41 respondents missing) of the Standard population reported having an illness, injury or condition that needed immediate care.

Main Factor of Interest: Medical Debt

The survey estimated the amount of money each respondent owed to both their health care provider and other creditors/lenders for their own medical bills by asking the respondents to select two separate monetary ranges, one for each type of debt value. The respondents chose from the following ranges: $0, $1-$25, $26-$50, $51-$75, $76-$100, $101-$300, $301-$500, $501-$1000, $1001-$5000, $5001-$10,000, $10,001-$15,000, more than $15,000, or don't know. The ranges for money owed to other creditors/lenders was: $0, $1-$100, $101-$300, $301-$500, $501-$1000, $1,001-$5,000, $5,005-$10,000, $10,001-$15,000, more than $15,000, or don't know. To obtain an estimate of each individual's total medical debt, the midpoint of each range was calculated, producing an approximate debt value for each question. These midpoints were added together to obtain a total medical debt value. Respondents who had an answer of 'don't know' to either question were considered to have an unknown quantity of total debt. All summed values were divided back into the following new ranges: $0, $1-$1000, $1001-$5000,

greater than $5000 and unknown. Each individual debt value was also recoded into the above ranges for separate analyses. Less than 2% of respondents did not provide answers to either of the above questions.

Covariates

Ronald M. Andersen's Behavioral Model of Health Care Utilization suggests that an individual's predisposing factors, enabling resources, and needs all interact in some way to predict their use of health care services.[18] Factors in Andersen's model that are associated with access and medical debt could possibly confound the relationship between medical debt and access to care. In order to obtain odds ratios reflecting the unbiased association between medical debt and access to care, the following were controlled for in the statistical models.

Use Factors

In this analysis we chose to adjust for emergency room use, which is one type of access to care, because it is a possible confounder of the other debt-access associations. Those who have health care access barriers are more likely to use emergency rooms when they need care; further, over-use of the ER can create a large financial burden in the form of greater levels of medical debt.[15,17,38] Therefore, if an individual's ER usage is ignored, the true relationship between medical debt and access could be inaccurate. This utilization was measured by asking respondents how many times they went to an emergency room to get care for themselves in the last six months. The options included: none, 1, 2, 3, 4, 5, 6, or 7 times or more. The categories were collapsed to reflect the difference between those that don't use the ER, those that occasionally use the ER, and those that excessively use the ER (especially for primary care). Categories of 0 visits, 1

or 2 visits, and 3 or more visits were created. In addition, if an individual has a usual place for health care, they may be less likely to experience difficulty in accessing care when needed; therefore, this variable, consisting of a yes or no answer, was controlled for in the analysis.

Predisposing Factors

Analysis by the Oregon Center for Public Policy determined that the Hispanic population in Oregon is more likely to be uninsured, thereby possibly causing greater debt problems and difficulty obtaining care.[10] Further, the Access Project found that across the U.S., single women, the elderly, the uneducated, and the very poor are particularly burdened by debt. Also, because one's insurance coverage is often dependent on their employment status, those that are unemployed can have difficulty receiving care.[3,21] Age, level of education, employment status, marital status, living situation, gender and race were considered as possible confounders or effect modifiers due to their possible connections to one's ability to obtain access to care and their accrual of medical debt.[3,10,14,15,21]

All variable categories were collapsed and recoded, described below, based on their statistical distributions or pragmatic considerations. The approximate age of respondents was acquired through their self-reported year of birth. Age was recoded into four groups of relatively equal proportions: 18-30, 31-40, 41-50, and 50-73 years of age. Age was also evaluated as a continuous variable. Employment status was self-reported. Respondents chose from options of: employed, self-employed, retired, or unemployed. These options were collapsed into categories of employed, unemployed, or retired. The categorization for level of education were: less than high school, high school

diploma/GED, some college, completed vocational or two-year degree program, complete a four-year degree program, and graduate school. Due to the fact that few respondents had more than some college, individuals reporting any level of college education were collapsed into one group. Marital status, also obtained through self-report, was reduced to two groups of married or not married. Further, the respondent's self-reported living situation was collapsed into two categories: lives alone or does not live alone. Each respondent's race and gender were acquired through OMAP and verified by self-report in the survey by the study researchers.

Enabling Factors

There are a number of variables that can interact with, or contribute to medical debt further enabling or preventing an individual from seeking or receiving care. One's insurance coverage plays a critical role, both in their accrual of medical debt, as well as in one's ability to obtain medical care.[24] Therefore, the respondents' degree of insurance coverage was adjusted for in the analysis. The degree of any lapse in coverage in each population was measured by asking respondents how many of the last 6 months they were covered by some kind of health insurance: 0 months, 1 month or less, 2 months, 3 months, 4 months, 5 months, or 6 months. These possible answers were recoded into categories of: no coverage in the last 6 months, less than 6 months coverage, or covered all 6 months. Ten percent of the respondents did not respond to this question; therefore, to address possible bias with missing data, a fourth category of missing data was also created.

The amount of money that an individual has to spend on their healthcare may determine their ability to afford or access needed healthcare. Therefore, self-reported

gross household income was examined. Although responses ranged from $0 to greater than $50,000, the majority of respondents reported incomes at the lower end, below the federal poverty level. To form categories of sufficient size that still reflected some of the economic variability within the population, three groups were created consisting of: $0-$10,000, $10,001-$20,000, and greater than $20,000. An individual's out-of-pocket costs for prescriptions and medical care may correlate with the amount of medical debt the individual is burdened with as well as their ability or desire to seek care. Therefore, two covariates were evaluated in the analysis to adjust for additional spending. Each respondent was asked to estimate their monthly out-of-pocket costs for prescription medications by choosing from a list of monetary ranges. They were also asked to estimate their out-of-pocket costs for medical care in the preceding 6 months. The range values for each question were collapsed into five categories for analysis, based on the distribution of responses: $0, $1-$100, $101-$2000, greater than $2000, and don't know.

Needs

If an individual has a condition that requires more care, they may not only accrue more medical debt, but they may also experience greater difficulties in obtaining the care that they need. Further, the more times an individual seeks care, the greater the chance that they may encounter problems receiving care. A respondent's self-perceived health status may affect the amount of care that is sought; therefore, this characteristic was controlled for in analysis. This information was obtained through self-report, with possible responses of excellent, very good, good, fair and poor. Because those who reported their health as fair or better were not statistically different from each other in regards to access, the health status was recoded into two categories: poor, and fair or

better. In addition, three questions were asked regarding the presence of chronic conditions, diagnosed by a doctor, including diabetes, asthma, high blood pressure, emphysema or chronic bronchitis, and congestive heart failure. Respondents who answered yes to any of these questions were considered to have at least one chronic condition.

Missing data

If 10% of the respondents did not supply a value for any covariate, an additional category was created for that variable to limit bias and reflect the characteristics of the missing population. This only occurred for the respondents' measurement of lapse in insurance coverage during the six months preceding the survey. In the total case analyses of access to general care and prescriptions, only 8.7% and 0.8% of the data were missing respectively. For access to urgent care, 11.5% of the data were missing in the total case analysis.

Statistical Analysis

Both SPSS 13.0 and SAS 9.1 programs were used for data analysis. Frequency tables were produced for the descriptive analysis of the study population. In addition, graphical representations were used to understand the distribution of the population's characteristics. Previous analyses of this dataset found that the addition of weights to the sample to account for any racial and ethnic over-sampling had no affect on the data; therefore, weights were not included in this analysis.[9] Chi-square tests were implemented to determine which variables were significantly associated with each outcome and would be carried into a multivariable regression analysis; fisher's exact test was used for any measures with expected cell values less than five. The association between each variable

and medical debt was also assessed using chi-square tests. Variables found to be associated at a p-value less than or equal to 0.25 with any particular access variable were evaluated as possible covariates; variables that were associated with both an outcome and medical debt were noted as possible confounders and evaluated in the modeling.

Three sets of logistic regression models were created to assess the impact of medical debt, one for each measure of access to care. Univariate analyses of each outcome with total categorical medical debt were performed to obtain crude odds ratios. Next, each covariate of interest was assessed with medical debt in a bivariate analysis to evaluate any possible confounding. Effect modification was evaluated at this step by running a second bivariate model with an interaction term. Any covariate, or interaction term, that was associated with an access outcome at a p-value of less than 0.25 in the presence of medical debt was considered for the final model, with the exception of the basic demographic characteristics of race and gender. These were controlled for in every model regardless of statistical significance. In addition, any covariate that was hypothesized not to be in the causal pathway between medical debt and unmet need for care, was significantly associated with both of these variables (p-value less than or equal to 0.10), and was found to change the medical debt odds ratios by 10% or more in the bivariate analysis was considered a confounder and retained in the final multivariable model.

For all access outcomes, multivariable models were created using all of the covariates from the bivariate analysis that were significant at a 0.25 level. Wald scores were evaluated, and their corresponding p-values used to eliminate covariates in a stepwise fashion. Covariates with p-values greater than 0.10 were

removed from the model, starting with the variable with the least significant p-value. If a covariate of particular interest had a p-value that was borderline significant, the change in deviance or likelihood ratio test was used to determine its relevance in the model. If the p-value corresponding to its removal was greater than 0.10, then it was removed from the final model. Automated backwards stepwise selection was used to confirm the final main effects model.

Once a model containing the main effects and any significant interactions found in bivariate analyses was created for each of the three measures of access, additional interactions of interest within the models were evaluated. The interactions of interest included interactions between demographic variables such as race and gender, and some of the significant covariates. Interaction terms were added, one at a time, to each model. Interactions with p-values above 0.10 were considered insignificant and removed. Interactions with borderline significance were evaluated using the likelihood ratio test as stated above, and on the basis of the value of the information they contributed to the model.

The two different types of medical debt, the respondents' debt owed to their provider and the debt owed to other creditors and/or lenders, were also analyzed as separate variables in a single multivariable model to evaluate their independent associations with each access outcome. Univariate analyses were performed to determine the crude associations between each of the debt variables and the three outcomes. Next, the modeling process explained above was repeated, with the two separate debt variables included together in the three new models of each outcome. To determine and evaluate any possible predictors of medical debt among the available covariates, and to understand

who in the cohort was more likely to acquire medical debt, the above process was repeated a third time with a dichotomous debt/no debt variable as the outcome.

Results

Descriptive Analysis

Table two contains a summary of the descriptive analysis. This population ranged in age from 18 to 73 years old, with a mean age of 40. The gender and racial composition was similar to the overall OHP population in Oregon, with a small overrepresentation of other racial/ethnic groups and under-representation of Hispanics. The Oregon OHP population, prior to the legislative changes, was comprised of 73% Caucasian, 4% African American, 17% Hispanic, and 6% other racial/ethnic groups.[9] This cohort was also fairly well educated, with almost 43% having at least some college education; 6% of the population had a bachelor's degree, and another 2% attended graduate school. Despite the high level of education, 69% of the respondents earned less than $10,000 per year, with 17% of those having no income whatsoever.

Table 2. Summary of Descriptive Analysis of Variables (N = 1364)

Variable	Percent with Debt N=821	Percent without Debt N=543
Race		
Caucasian	70.4	68.7
African American	8.2	5.3
Hispanic	11.6	12.5
Other	9.9	13.4
Gender		
Male	36.9	37.4
Female	63.1	62.6
Age†		
18-30 years old	26.2	24.9
31-40 years old	26.1	19.7
41-50 years old	28.7	26.9
>50 years old	19.0	28.5
Marital Status		
Married	27.3	31.7
Not married	70.5	66.9
Lives Alone		
Yes	17.1	16.9
No	82.9	83.1
Level of Education		
Less than high school	19.7	19.3
High School	33.9	35.0
At least some college	39.6	41.6
Income		
$0-$10,000	67.2	64.8
$10,001-$20,000	19.7	23.3
>$20,000	9.4	7.7
Employment Status		
Employed	56.3	51.6
Unemployed	36.3	40.3
Retired	4.1	5.7
Self-perceived Health Status†		
Poor	16.7	7.0
Fair or Better	81.9	91.7
Presence of at least one Chronic Illness†	53.5	42.2
Diabetes	13.8	9.6
Asthma	23.8	18.4
High blood pressure	33.3	26.0
Emphysema or chronic bronchitis	12.5	8.8
Congestive heart failure	3.5	2.6
Monthly Out-of-Pocket Rx Costs†		
$0	23.0	37.6
$1-$100	49.8	50.8
$101-$2000	19.9	7.7
>$2000	0.0	0.0
Unknown	5.6	2.2

Out-of-Pocket Costs for medical Care†		
$0	19.2	32.0
$1-$100	28.9	38.3
$101-$2000	41.5	28.2
>$2000	2.8	0.2
Unknown	5.3	0.9
Has a Usual Place for Medical Care†		
Yes	82.3	85.8
No	16.4	12.7
Emergency Room Usage in Preceding 6 months†		
None	59.8	84.3
1 or 2 times	29.5	13.4
3 or more times	9.5	1.8
Lapse in Insurance Coverage in Preceding 6 months†		
None	46.5	60.4
Less than 6 months	13.9	11.4
6 months	28.7	20.3
Declared Bankruptcy in Preceding Year Due to Medical Bills		
No	96.3	98.5
Yes	2.8	1.3

†Indicates a p-value less than 0.05
*Some percentages do not add up to 100 due to missing data

Eighty-five percent of the respondents reported having a usual place for medical care. Almost 10% of these individuals listed a hospital-based ER or urgent care clinic as their usual place for care. At the time of the survey, only 66% had some kind of medical insurance coverage, leaving 34% of the population uninsured. At least 50% of the cohort reported that they had some level of medical debt; another 10% of respondents reported that they did not know their level of debt (Table 3). Within the debtor group, at least 47% of the individuals owed some money to their health care provider and 21% were in debt to another creditor or lender for their medical bills. While only two percent of the population declared bankruptcy in the preceding year due to their medical bills, 35% reported cutting back on their food budget, and 34% skipped, delayed or underpaid other bills.

Table 3. Descriptive Analysis of Debt Variables (N=1364)

Main Factor of Interest	Frequency	Percent
Medical Debt Owed to a Provider		
$0	630	46.2
$1-$1000	464	34.0
$1001-$5000	119	8.7
>$5000	64	4.7
Unknown	78	5.7
Missing	9	0.7
Medical Debt Owed to Other Creditor or Lender		
$0	980	71.8
$1-$1000	142	10.4
$1001-$5000	78	5.7
>$5000	69	5.1
Unknown	83	6.1
Missing	12	0.9
Total Medical Debt		
$0	543	39.8
$1-$1000	416	30.5
$1001-$5000	142	10.4
>$5000	126	9.2
Unknown	137	10.1

As one can see in table four, over 40% of the respondents were unable to receive needed medical care at some time during the six months preceding the survey. When the respondents were asked why they thought they were unable to receive the care they needed, almost 25% cited the high cost of care as a reason. Seven percent of the study population said that they didn't receive needed care because they owed money to their health care provider, and another 7.5% said that they didn't have the required co-pay. Approximately 10% of the population said that they were refused care because of a debt owed for past treatment.

Table 4. Descriptive Analysis of Outcomes (N=1364)

Outcomes	Percent with Debt	Percent without Debt
Unable to Receive Medical Care at Some time		
Yes	52.0	26.9
No	46.5	72.7
Unable to Afford Rx Medications in Preceding 6 months		
Yes	61.9	33.0
No	37.3	66.3
Needed Urgent Care in Preceding 6 months (yes)	61.5	35.2
Unable to receive access when needed*	49.4	35.3
Able to receive access when needed*	46.4	62.0
* N=686		

**Some percentages do not add up to 100 due to missing data

Predictors of Medical Debt

A summary of the predictors of total medical debt, obtained from the multivariable analysis, can be found in table five. The following variables were found to be significantly associated with having medical debt: the presence of a chronic condition, a respondent's self-perceived health status, out-of-pocket costs for both prescriptions and medical care, having a regular place for care, lapse in insurance coverage, number of ER visits, and age. After adjusting for the above factors, respondents that reported any lapse in insurance coverage in the six months preceding the survey were at least 1.6 times [95% CI (1.11, 2.37)] more likely to have medical debt than respondents who did not experience a disruption in their insurance coverage. Those who reported monthly costs for prescriptions of $101-$2,000 were 2.1 times [95% CI (1.20, 3.54)] more likely to have medical debt than those with no monthly out-of-pocket costs for their prescription medications. Respondents that didn't know their out-of-pocket costs for prescriptions, and those who had low costs somewhere between $1 and $100 were no more likely than those that had no costs to have medical debt (p-values 0.77 and 0.42 respectively). Those who had out-of-pocket medical costs of $101-$2000 were 2 times [95% CI (1.28, 3.07)]

more likely, and those with greater than $2000 of out-of-pocket costs almost 8.9 times [95% CI (1.10, 71.16)] more likely to have medical debt than those with no costs in the preceding six months. Individuals with an unknown amount of out-of-pocket costs for medical care in the preceding six months were 5.1 times [95% CI (1.63, 15.66)] more likely to have debt, placing them somewhere in between the other two groups.

The respondents' health was also significantly associated with the odds of accumulation of medical debt. Those with at least one chronic illness were 1.5 times [95% CI (1.17, 2.04)] more likely to have medical debt than those without any chronic illnesses, and those with a poor self-perceived health status were 2 times [95% CI (1.29, 3.22)] more likely to have medical debt than respondents who reported their health as fair or better. Respondents who reported that they did not have a regular place for care were 1.6 times [95% CI (1.08, 2.38)] more likely to have debt than those with a regular place that they go to for health care. In addition, those who reported 1 or 2 visits to a hospital emergency room in the six months preceding the survey were 2.4 times [95% CI (1.75, 3.34)] more likely, and those reporting 3 or more visits 7.2 [95% CI (2.96, 17.32)] times more likely to have medical debt than respondents who did not visit the ER at all. Respondents 18-30 years old at the time of the survey were 2.3 times [95% CI (1.54, 3.32)] more likely to have medical debt than respondents 50 years and older. Those who were between the ages of 30 and 50 years old were not any more likely to have medical debt than those between 18 and 30 years of age.

Table 5. Predictors of Medical Debt

Variable	Odds Ratio	95% CI
Presence of a Chronic Condition vs. No Chronic Condition*	1.54	(1.17, 2.04)
Out-of-pocket costs for Prescriptions $0*	1.00	
Out-of-pocket costs for Prescriptions $1-$100	1.18	(0.81, 1.72)
Out-of-pocket costs for Prescriptions $101-$2000	2.06	(1.20, 3.54)
Out-of-pocket costs for Prescriptions, Unknown	1.13	(0.46, 2.81)
Out-of-pocket costs for Medical Care $0	1.00	
Out-of-pocket costs for Medical Care $1-$100	1.26	(0.83, 1.91)
Out-of-pocket costs for Medical Care $101-$2000	1.98	(1.28, 3.07)
Out-of-pocket costs for Medical Care >$2000	8.85	(1.10, 71.16)
Out-of-pocket costs for Medical Care, Unknown	5.05	(1.63, 15.66)
Has no regular place for care vs. Has a regular place for care*	1.60	(1.08, 2.38)
Poor self-perceived health status vs. Fair or better health status*	2.04	(1.29, 3.22)
Age 18-30 years old*	1.00	
Age 31-40 years old	1.14	(0.79, 1.65)
Age 41-50 years old	0.88	(0.62, 1.25)
Age >50 years old	0.44	(0.30, 0.65)
No lapse in Insurance Coverage*	1.00	
Lapse in Insurance of 6 months	1.73	(1.23, 2.42)
Lapse in Insurance, less than 6 months	1.63	(1.11, 2.37)
No ER visits*	1.00	
1 or 2 ER visits	2.42	(1.75, 3.34)
3 or more ER visits	7.16	(2.96, 17.32)

*Referent Category

Unmet need for general medical care

Total medical debt was associated with an unmet need for general medical care ($p<0.0001$). Prior to adjustment for other explanatory factors, confounders and effect modifiers, respondents with $1-$1,000 of medical debt were 2.4 [95% CI (1.85, 3.19)] times more likely to have a general unmet need for care at some time during the six months preceding the survey, compared to those with no debt. Those with $1,001-$5,000 of medical debt were 4.3 [95% CI (2.92, 6.36)] times, those with greater than $5,000 of debt 3.5 [95% CI (2.35, 5.25)] times, and those with an unknown amount of debt 3.6 [95% CI (2.44, 5.34)] times more likely to have had a general unmet need for care than those with no debt. Table six, below, displays the odds of an unmet need for general care for the various levels of total medical debt.

Table 6. Unmet Need for General Care

Variable	Crude OR	95% CI	Adjusted OR	95% CI
Medical Debt $0*	1.00		1.00	
Medical debt $1-$1,000	2.43	(1.85, 3.19)	2.45	(1.81, 3.33)
Medical debt $1,001-$5,000	4.31	(2.92, 6.36)	3.89	(2.52, 6.01)
Medical debt >$5,000	3.51	(2.35, 5.25)	2.39	(1.50, 3.82)
Medical debt Unknown	3.61	(2.44, 5.34)	3.56	(2.27, 5.58)

*Referent category
Covariates adjusted for in model: lapse in insurance, self-perceived health status, living alone, level of education, gender and race

Table twelve in the appendix displays the odds of an unmet need for each of the significant explanatory variables. After adjusting for lapse in insurance, self-perceived health status, level of education, living alone, current insurance status, and gender, respondents with $1-$1000 of medical debt were 2.5 [95% CI (1.81, 3.33)] times more likely, those with $1,001 to $5,000 of debt were 3.9 [95% CI (2.52, 6.01)] times, and those with greater than $5,000 of debt 2.4 [95% CI (1.45, 3.82)] times more likely than those without any debt to have had an unmet need for general care. Respondents with an unknown amount of debt were 3.6 [95% CI (2.27, 5.58)] times more likely to have had this experience. Although there appeared to be somewhat of a positive trend in the data, with a threshold at $5,000 of debt, the odds of a respondent having an unmet need only differed significantly between those with low ($1-$1,000) and moderate ($1,001-$5,000) amounts of debt (p-value 0.037). The odds for those with greater than $5,000 of debt did not significantly differ from any of the groups, and at this debt level, the likelihood of having an unmet need decreased.

Note that the odds ratios in the adjusted model were attenuated in relation to those in the unadjusted model. This is because the respondent's lapse in insurance coverage in the preceding six months was a confounder of the association between medical debt and an unmet need for general medical care. After adjustment, all the associations were

slightly attenuated; the odds for those with $1,001-$5,000 of debt decreased approximately 10%, and the odds for those with greater than $5,000 of debt decreased more than 30%. There were no significant interactions with total medical debt.

Table 7. Unmet Need for General Care, Separate Debt Variables

Variable	Crude OR	95% CI	Adjusted OR	95% CI
Debt to Provider $0*	1.00		1.00	
Debt to Provider $1-$1,000	2.60	(2.02, 3.35)	2.41	(1.80, 3.22)
Debt to Provider $1,001-$5,000	5.18	(3.39, 7.92)	3.52	(2.15, 5.76)
Debt to Provider >$5,000	4.81	(2.76, 8.38)	1.97	(1.01, 3.83)
Debt to Provider Unknown	2.96	(1.82, 4.79)	3.32	(1.87, 5.87)
Debt to creditor/lender $0*	1.00		1.00	
Debt to creditor/lender $1-$1,000	1.37	(0.96, 1.96)	1.02	(0.67, 1.54)
Debt to creditor/lender $1,001-$5,000	2.08	(1.30, 3.33)	1.61	(0.93, 2.77)
Debt to creditor/lender >$5,000	1.39	(0.85, 2.27)	0.98	(0.53, 1.81)
Debt to creditor/lender Unknown	2.29	(1.44, 3.66)	1.20	(0.68, 2.12)

*Referent category
Covariates adjusted for in analysis: lapse in insurance, self-perceived health status, level of education, living alone, gender and race

Multivariable analysis with the two separate debt variables found a significant association between an unmet need for general care and one's debt to their health care provider; however, the association with a respondents' debts to other creditors or lenders was insignificant (p-values <0.0001 and 0.52 respectively). The final model reduced to a model similar to that produced with the total debt variable. Table seven displays the crude and adjusted odds ratios for each type of medical debt; the covariates and their odds ratios can be found in table thirteen in the appendix. The positive association pattern continued here, with a threshold at $5,000 of debt. After adjustment, respondents who owed $1-$1,000 to their provider were 2.3 [95% CI (1.73, 3.13)] times more likely, those who owed $1,001-$5,000 were 3.5 [95% CI (2.08, 5.81)] times, and those who owed more than $5,000 were 2.2 [95% CI (1.12, 4.38)] times more likely to have had an unmet need for general care than those who didn't owe any money to their provider. Those with an unknown amount of debt were 3 times [95% CI (1.63, 5.35)] more likely

to have this experience. Lapse in insurance coverage remained a significant confounder of both of the debt variables, and there were no significant interactions.

Unmet need for prescription medications

Total medical debt was associated with a respondent's inability to afford prescription medications with a p-value less than 0.0001. Prior to adjustment, as total medical debt increased the odds of an unmet need for prescription medications also increased. Respondents with $1-$1,000 of debt were 2.82 [95% CI (2.16, 3.67)] times more likely, those with $1,001-$5,000 of debt were 4.20 [95% CI (2.83, 6.23)] times, those with greater than $5,000 of debt 5.27 [95% CI (3.41, 8.13)] times, and those with an unknown amount of debt 3.05 [95% CI (2.07, 4.50)] times more likely to have had an unmet need for prescriptions than those without any medical debt (see table 8).

Table 8. Unmet Need for Prescription Medications

Variable	Crude OR	95% CI	Adjusted OR	95% CI
Medical Debt $0*	1.00		1.00	
Medical debt $1-$1,000	2.82	(2.16, 3.64)	2.00	(1.48, 2.70)
Medical debt $1,001-$5,000	4.20	(2.83, 6.23)	2.53	(1.61, 4.00)
Medical debt >$5,000	5.27	(3.41, 8.13)	3.23	(1.93, 5.43)
Medical debt Unknown	3.05	(2.07, 4.50)	2.28	(1.44, 3.61)

*Referent Category

Covariates adjusted for in model: Lapse in insurance, presence of a chronic condition, monthly out-of-pocket prescription costs, employment status, self-perceived health status, number of ER visits, gender and race

Monthly out-of-pocket costs for prescriptions, out-of-pocket costs for medical care, number of visits to the ER, and lapse in insurance coverage were significant confounders of the association between total medical debt and an unmet need for prescription medications. Out-of-pocket medical cost was not significantly associated with the outcome in the presence of the prescription cost variable. It was also highly correlated with this variable, with a Spearman correlation of 0.605. There were no significant interactions with total medical debt. After controlling for the above factors,

the odds ratios for those with $1-$1,000 of debt and those with an unknown amount of debt were attenuated by approximately ten percent. The odds ratios for those with moderate and high levels of debt were attenuated by approximately forty percent. The positive trend of association remained, without a threshold, for this outcome.

Table 9. Unmet Need for Prescription Medications, Separate Debt Variables

Variable	Crude OR	95% CI	Adjusted OR	95% CI
Debt to Provider $0*	1.00		1.00	
Debt to Provider $1-$1,000	3.07	(2.39, 3.95)	2.05	(1.53, 2.75)
Debt to Provider $1,001-$5,000	6.15	(3.90, 9.69)	3.28	(1.91, 5.61)
Debt to Provider >$5,000	13.14	(6.15, 28.10)	5.22	(2.19, 12.44)
Debt to Provider Unknown	1.91	(1.19, 3.07)	2.10	(1.19, 3.72)
Debt to creditor/lender $0*	1.00		1.00	
Debt to creditor/lender $1-$1,000	1.56	(1.09, 2.23)	1.51	(0.75, 1.76)
Debt to creditor/lender $1,001-$5,000	1.83	(1.14, 2.94)	1.22	(0.69, 2.15)
Debt to creditor/lender >$5,000	2.00	(1.19, 3.36)	1.52	(0.79, 2.96)
Debt to creditor/lender Unknown	2.21	(1.37, 3.54)	0.97	(0.53, 1.75)

*Referent category
Covariates adjusted for in model: lapse in insurance, presence of a chronic condition, monthly out-of-pocket costs for prescriptions, number of ER visits, self-perceived health status, employment status, race and gender

In addition to medical debt and the confounders mentioned above, these variables were significantly associated with an unmet need for prescription medications: presence of a chronic illness, self-perceived health status, employment status, and gender (the odds ratios are defined in table fourteen in the appendix). After adjusting for the above variables, a respondent with $1-$1000 of medical debt was 2.00 [95% CI (1.48, 2.70)] times, those with $1,001 to $5,000 of debt were 2.53 [95% CI (1.61, 4.00)] times, and those with greater than $5,000 of debt 3.23 [95% CI (1.93, 5.43)] times more likely to have had an unmet need for prescription medications than those without any debt. Respondents with an unknown amount of debt were 2.28 [95% CI (1.44, 3.61)] times more likely to have had this experience. While individuals with any amount of medical debt were more likely to experience an inability to afford prescription medications than those without any debt, there was no significant difference between the likelihood of an

unmet need for prescriptions among the various levels of debt. None of the odds ratios for total medical debt differed from one another at a significance level of 0.05 (all p-values >0.106).

The analysis of the two distinct types of medical debt found that an unmet need for prescriptions was significantly associated with one's medical debt to a health care provider, but not one's medical debt to other creditors or lenders (p-values <0.0001 and 0.691 respectively). The multivariable model produced was the same as that found with the total debt variable. Table nine displays the association between each type of medical debt and an unmet need for prescriptions; the odds ratios for the covariates from the multivariable model can be found in table fifteen in the appendix. Lapse in insurance coverage, number of ER visits and out-of-pocket costs for prescriptions remained as significant confounders of the association. There were no significant interactions, and after adjustment, the positive trend remained. Respondents who owed $1-$1,000 to their provider were 2.05 times [95% CI (1.53, 2.75)], those who owed $1,001-$5,000 were 3.28 times [95% CI (1.91, 5.61)], and those who owed more than $5,000 were 5.22 times more likely [95% CI (2.19, 12.44)] to have had an unmet need for prescriptions than those who didn't owe any money to their provider. Those with an unknown amount of debt to their provider were 2.10 times [95% CI (1.19, 3.72)] more likely to have had this experience.

Unmet need for urgent care

Total medical debt was associated with an unmet need for urgent care (p-value = 0.017). Prior to adjustment for any confounders, the odds of an unmet need for urgent care increased with a respondent's total medical debt until a threshold was reached at

approximately $5,000 of debt. Respondents with $1-$1,000 of debt were 1.44 [95% CI (0.97, 2.16)] times more likely, those with $1,001-$5,000 of debt were 2.28 [95% CI (1.37, 3.81)] times, those with greater than $5,000 of debt 2.09 [95% CI (1.22, 3.55)] times, and those with an unknown amount of debt 2.81 [95% CI (1.62, 4.86)] times more likely to have an unmet need for urgent care than those without any medical debt. Despite the positive trend, the odds of a respondent having had an unmet need for urgent care did not significantly differ among all of the various levels of debt.

Table 10. Unmet Need for Urgent Care

Variable	Crude OR	95% CI	Adjusted OR	95% CI
Medical Debt $0*	1.00		1.00	
Medical debt $1-$1,000	1.44	(0.97, 2.16)	1.38	(0.87, 2.20)
Medical debt $1,001-$5,000	2.28	(1.37, 3.81)	2.22	(1.23, 4.02)
Medical debt >$5,000	2.09	(1.22, 3.55)	1.73	(0.90, 3.32)
Medical debt Unknown	2.81	(1.62, 4.86)	2.62	(1.38, 5.00)

*Referent Category
Covariates adjusted for in model: lapse in insurance, having a regular place for care, number of ER visits, level of education, gender and race.

Table ten, above, displays the association between total medical debt and an unmet need for urgent care; table sixteen in the appendix displays the odds ratios for all of the covariates included in the multivariable analysis. An individual's lapse in insurance coverage and number of visits to the ER were found to be significant confounders of the association between medical debt and an unmet need for urgent care. After adjusting for these variables, the odds ratio for those with a high level of debt was attenuated by approximately 17%. The other odds ratios remained relatively stable. No significant interactions with medical debt or between any of the covariates were found.

In the multivariable analysis, the following variables were associated with an unmet need for urgent care in addition to total medical debt: lapse in insurance coverage, having a regular place for care, number of ER visits, and level of education. After adjustment, respondents with $1-$1000 of medical debt were 1.38 [95% CI (0.87, 2.20)]

times more likely, those with $1,001 to $5,000 of debt were 2.22 [95% CI (1.23, 4.02)] times, and those with greater than $5,000 of debt 1.73 [95% CI (0.90, 3.32)] times more likely to have had an unmet need for urgent care than those without any debt. Respondents with an unknown amount of debt were 2.62 [95% CI (1.38, 5.00)] times more likely to have had this experience. The positive trend between total medical debt and an unmet need remained, and the various debt level odds ratios did not differ from one another.

Analysis of the two distinct types of medical debt again showed that the affect of debt owed to a health care provider was more significantly associated with an unmet need for urgent care than the respondents' medical debts to other creditors or lenders (p-values 0.025 and 0.817 respectively). The multivariable model produced was the same as that found with the total debt variable (see table seventeen in the appendix). Note, from the odds ratios in table eleven, that a respondent's lapse in insurance coverage and number of ER visits continued to act as confounders in the association, yet there were no interactions with either type of medical debt. After adjustment, only the moderate and unknown debt levels were significantly associated with an unmet need for urgent care. Respondents who owed $1,000-$5,000 to their provider were 2.35 [95% CI (1.26, 4.39)] times more likely, and those with an unknown amount of debt were 2.83 [95% CI (1.19, 6.71)] times more likely to have had an unmet need for urgent care than those without any debt to their provider. The odds ratios for those with low and high levels of debt were insignificant and almost equivalent to one another.

Table 11. Unmet Need for Urgent Care, Separate Debt Variables

Variable	Crude OR	95% CI	Adjusted OR	95% CI
Debt to Provider $0*	1.00		1.00	
Debt to Provider $1-$1,000	1.40	(0.92, 2.03)	1.20	(0.78, 1.86)
Debt to Provider $1,001-$5,000	2.63	(1.58, 4.40)	2.35	(1.26, 4.39)
Debt to Provider >$5,000	1.89	(1.02, 3.52)	1.21	(0.54, 2.75)
Debt to Provider Unknown	2.76	(1.35, 5.64)	2.83	(1.19, 6.71)
Debt to creditor/lender $0*	1.00		1.00	
Debt to creditor/lender $1-$1,000	1.06	(0.66, 1.73)	0.93	(0.52, 1.66)
Debt to creditor/lender $1,001-$5,000	1.24	(0.67, 2.31)	1.13	(0.55, 2.33)
Debt to creditor/lender >$5,000	1.61	(0.83, 3.11)	1.51	(0.65, 3.50)
Debt to creditor/lender Unknown	1.92	(1.09, 3.39)	1.30	(0.64, 2.66)

*Referent category
Covariates adjusted for in model: lapse in insurance, having a regular place for care, number of ER visits, level of education, gender and race.

Discussion:

Total Medical Debt

Following our adapted version of Andersen's Behavioral Model of Health Care Utilization, the results of this analysis show that medical debt impedes access to health care services. We isolated the influence of medical debt by adjusting for factors as suggested by Andersen's model and accounting for different levels of medical debt. We were the first to separate the effects of medical debt from the association of other factors with access, especially lapse in insurance coverage. Further, to our knowledge, no one has examined the different associations that various levels of medical debt can have with access to health care.

Although not statistically significant, there appeared to be a positive association between level of total medical debt and access to general and urgent care. Individuals with any amount of medical debt were significantly more likely to report an unmet need than those without any debt; however, there was a peak in the increasing trend at a debt level of approximately $5,000. Our lack of ability to detect different associations among the various levels of debt was likely due to the limited number of respondents with higher

levels of debt. The majority of this cohort had either no medical debt (40%), or a low level of debt (30%), however, the trend was consistent across both measures of access to medical care. The observed peak is consistent with current literature suggesting that individuals with high debt levels often delay or forgo care in an effort to avoid the further accumulation of debt.[22,24,25] The wording of our question was such that, those who were not seeking care because of high debt levels would appear to have fewer problems with access simply because they were not seeking care. An alternate explanation, not discussed in the literature, is that high debt was incurred as a result of a single illness or injury, where ongoing care was not needed.

The association between debt and access to prescription medications did not exhibit a peak, but rather increased consistently from the no debt group, i.e., was highest for those with greater than $5,000 of debt. One's access to prescription medications is often more directly related to the amount of money readily available each month because they must be paid for at the time of purchase. The Center for Study Health System Change found that low-income Americans are approximately twice as likely to go without prescriptions than those with higher incomes; low-income Medicare beneficiaries were three times more likely to go without a prescription than beneficiaries with higher incomes.[45] Therefore, it is reasonable that the relationship between debt and an unmet need for prescriptions did not exhibit a peak. In addition, a high level of debt may be correlated with greater health care needs, resulting in numerous medications and more medical attention. While individuals must usually pay upfront for prescriptions, this is often not the case for other types of care. In addition, those with critical conditions usually cannot be denied medical treatment; however, no one guarantees regular access to

prescriptions. Since the majority of this cohort earned less than $10,000 annually, the resources available for prescriptions would be limited. Medical debt may complicate the situation, with greater debt levels correlating with a reduced availability of funds, thereby leaving individuals with less money for needed medications.

Types of Medical Debt

Unique to this analysis was our ability to classify those with an unknown level of debt. The odds ratios were significantly higher than those reporting no debt, indicating that even those with an unknown amount of total medical debt were more likely to experience an unmet need than those without any debt. However, in most cases, the unknown total debt association was closest in magnitude to that of a moderate level of total debt than any of the others. This pattern continued when looking at provider debt separately. Only the moderate and unknown debt levels were significantly associated with an unmet need; they were also almost equivalent in magnitude. The unknown group probably represented a proportion of those with a moderate amount of debt that would otherwise have been lost to analysis. Therefore, to obtain a more accurate picture of the association between medical debt and access, it was integral that the unknown group of respondents was included and not simply discarded.

In our analysis, total medical debt reflected the association between the respondents' debts to their health care providers and their abilities to obtain needed care. There was not a significant association between medical debt owed to a creditor and/or lender and access to care in the presence of debt owed to a provider. This is consistent with research showing that those with even small amounts of debt to their provider are too embarrassed or ashamed to face their provider when they need care.[25] The lack of an

independent association with debt to another creditor/lender may be unique to a low-income population because many of the respondents may not have had access to credit given their income. Historically, low-income populations have had limited access to credit compared to higher income populations; therefore, these individuals would not be able to accrue this type of medical debt.[41,42] Further investigation in other populations (such as middle-class) would be useful to elucidate whether credit card debt is a predictor of limited health care access.

Confounders

The significant confounders of the medical debt-access association were part of the same factor group in Andersen's theoretical model: enabling factors. A respondent's lapse in insurance coverage was the common confounder of medical debt for all measures of limited access. The odds of an unmet need for general and urgent care for those with greater than $5,000 of debt was attenuated by approximately 30% in the crude analysis, suggesting that the associations between medical debt and unmet needs for care were partially explained by health care coverage differences between the different debt groups. This illustrates the importance of controlling for health insurance coverage when the relationship between medical debt and access to care is being examined; this is emphasized by the Center for Studying Health System Change.[25] The confounding effect of health insurance coverage on access to prescriptions was smaller when compared to access to care. This may be due to the fact that many insurance programs do not include prescription drug benefits; therefore, a lapse in coverage would not have a large effect.[45]

An additional confounder of the associations between medical debt and access to prescription medications and urgent care was the respondents' number of visits to a hospital emergency room (ER) in the six months preceding the survey. After controlling for the respondents' number of ER visits, the magnitude of the association with total medical debt and an unmet need for prescriptions was attenuated, while the magnitude of the association with an unmet need for urgent care increased. In addition, respondents who reported that they didn't have a regular place for care were more likely to report an unmet need for urgent care and more likely to have medical debt. This may be due to lack of adequate preventive care, resulting in a worse overall health status.

The final enabling factor, respondents' out-of-pocket costs, was only a mildly significant confounder in the association between medical debt and access to prescription medications, attenuating the association by approximately 10%. After controlling for total medical debt, out-of-pocket costs were not associated with an unmet need for general and urgent care. This was consistent with the fact that both a respondent's out-of-pocket costs for medical care and prescriptions were significant predictors of having medical debt in this cohort. Out-of-pocket costs for prescriptions were significantly associated with access to medications in the presence of medical debt because, regardless of an individual's level of debt, the higher a respondent's prescription costs, the more difficult it would be to afford all of their medications each month. Further, as mentioned above, prescriptions must be paid for at the time of purchase, and the greater the cost, the more difficult they can be to afford.

Other Correlates of Access

In Andersen's model, one's differing needs for care also affect their utilization of health services, and therefore, were controlled for in this analysis. The Access project found that those with disabilities or chronic conditions are particularly burdened with medical debt; this analysis confirms this result.[3] The presence of a chronic condition and one's self-perceived health status were significant predictors of medical debt. Further, in this analysis, those who perceived their health as poor were about two times more likely to have had an unmet need for general care than those with a health status of fair or better. The Center for Disease Control reports that one's care-seeking behavior is directly related to their "perceptions with respect to general health."[43] Individuals that believe their health is poor may attempt to access care more frequently, thereby having more contact with the system and a greater opportunity for difficulty. Alternatively, the presence of a chronic condition was not associated with an unmet need for care. Seventy-five percent of those with a chronic condition in this sample reported their current health status as fair or better; therefore, respondents' perceived health statuses appeared to better reflect their general health and care seeking behavior.

The final factor influencing an individual's utilization of health services is one's predisposing (demographic) factors. Again, the Access Project, among others, found that single women, the very poor, minorities, and the elderly are at the greatest risk of medical debt, and therefore, would have more problems with access.[3,4,21,23,24,26] In this cohort, women were also more likely to have had unmet needs for general care and prescription medications than men.[3,4] Studies performed by the American Medical Association and the Commonwealth fund, found that women in this country have a greater tendency to

seek care than men, and go to the doctor when they perceive a need.[39, 40] Therefore, men would not be experiencing as many problems with access merely because they do not encounter the system as much as women. Income, race and age were not associated with access, contrary to the literature. This is not unreasonable because this cohort was compiled from a predominantly Caucasian (83.7%), low-income population, with almost 70% of the respondents earning $10,000 or less annually. Since almost everyone in this cohort had an income below the federal poverty level, and race and age are often highly correlated with socio-economic status, none of these variables had a significant impact on the outcomes due to a lack of variation in the data.

Biases and Limitations

There are a few possible biases that must be considered when evaluating these data. The first of these are self-selection and non-response bias. The initial surveys were sent out to a stratified, random, representative sample of OHP members consisting of 8,487 individuals; however, only 2,783 individuals responded to the survey, creating the cohort used for analysis. While this was a response rate of 34%, analysis of the cohort found that the sample was demographically similar to the original population.[9] Unfortunately, we are unable to determine whether those who did not respond differed from the study cohort in the amount of medical debt they have accumulated, or their access to needed medical care. It is possible that those who chose to respond were more interested in participating in the study due to access or other problems. This would not affect the internal validity of the data unless respondents also had either a greater or lesser level of debt than the original cohort.

Missing data was not an issue in this analysis due to the fact that for all but one of the variables used in analysis, less than 2% of the data were missing, and we lost less than 10% of the total sample in each complete case analysis. For the variable with more than 10% of the data missing (lapse in insurance coverage), we included the missing data as an additional category. Therefore, missing data should not have biased the results.

In a study on medical debt, there is no way to verify that the answers given are correct. Even though the parent study was designed to reduce the amount of recall error, limiting the relevant time period to the six months preceding the survey, there could still be some failure to correctly report medical debt. If the misclassification of debt was equal for those with and without an unmet need, or completely random, then the magnitude of the impact of medical debt found in this analysis would be unaffected. However, those with access problems may have been more aware of their medical debt. In this case, there could be some differential misclassification, with those that have access problems reporting higher levels of debt than those with no access problems. In this situation, the odds ratios obtained in this analysis would be inflated.

One last issue that could lead to problems with the data is unmeasured confounders. While many factors were controlled for, including demographic information and other issues that may have an affect on one's access to care, it is possible that there are still some unmeasured confounders, due to unmeasured variation within the study group, that are masking the relationship between medical debt and the access outcomes investigated. During analysis, Andersen's model was used as a guideline to determine what variables may be important in this analysis, and many of the known confounders were addressed. Very few variables were found to significantly confound or

alter the medical debt odds ratios, and no significant effect modification was found. Further, there is consistency in the trends of association among all of the outcomes.

There are a few limitations present within this study. Lack of diversity within the cohort reduced the external validity and should be considered when generalizing the results. The results found here can be generalized to other Medicaid or low-income populations, but care must be taken when broadening the conclusions. There is not a large cross-section of individuals to reflect the economic and racial diversity within the general U.S. population. Another limitation of this study is the number of participants available at various debt levels for this specific analysis. The small sample may mean that our power was limited to establish the different associations of the various levels of medical debt. For all of the access outcomes, those who had some level of medical debt had a greater likelihood of having an unmet need for care than those without debt; however, most of the various debt levels were not significantly different from one another relative to a respondent's ability to access needed care. However, non-significant trends were apparent in the data and should be investigated in future studies.

Future Research

A prospective cohort study design that provided a larger proportion of individuals with higher levels of medical debt than those found in this analysis would be better suited for this type of analysis. Collecting data from comparable numbers of people representing all debt groups would allow us to better understand the different associations between the various levels of medical debt and health care access. It would also be helpful to have some type of method of data verification, such as researcher examination of financial records, built into the study so that the data isn't based solely on self-report.

To continue to understand the association between medical debt and the general population's access to care, a study focused on obtaining a large, diverse sample of individuals would allow for assessment of the trends detected in this analysis. A cross-section of the U.S., containing people from a variety of geographic regions, racial and ethnic backgrounds and economic levels, would have to be acquired in order to produce data that can be applied to the general population. A more diverse cohort of individuals would hopefully supply the study with a broader spectrum of medical debt that could be used to better evaluate the impact of the various levels.

Additionally, medical debt can often be difficult to distinguish from other types of debt, especially if these debts are paid to an independent lender or creditor. Therefore, it would be helpful to study different types of debt from a variety of working and middle class populations to understand the role of medical debt to other creditors in access to needed health care. Also, as found in this analysis, many individuals do not actually know the exact amount of medical debt they have accumulated. In addition, to really understand the relationship, it would be ideal if the number of unmet needs could be calculated in a time period greater than six months.

Conclusion

This analysis contributes to the current literature on health care access by demonstrating that medical debt is an important predictor of access in low-income populations. We separated the association between debt and access from that of a lack of insurance, determining the independent association between medical debt and access. It also illustrates the positive association of medical debt with an individual's unmet need for care. For general and urgent care, the magnitude of the association increases until a

value of approximately $5,000 of debt is reached; at this point, the magnitude decreases slightly, possibly due to a change in care seeking behavior. There are many similarities to recent studies published on the topic of medical debt. In our analysis, the average debtor is more likely to be female, have a chronic condition or poor health status, with high costs for prescriptions and treatment, and no regular place for health care. This cohort was predominantly low-income, further supporting the literature on the individuals most burdened by medical debt.

Lapses in insurance coverage add to one's difficulty accessing care in at least two ways. These lapses are not only associated with greater levels of medical debt, but they are also related to individuals' hindrance in seeking or receiving care. Without insurance coverage, one is left to bear the costs of their medical care alone, often paying prices much higher than those with insurance companies to negotiate discounts for them. If an individual has a lapse in their coverage, they may wait to seek needed care until their coverage is reinstated. Those without any coverage at all may be too daunted by the prospect of paying for the expensive care, and avoid it altogether. Both of these scenarios can lead to a worsening of their condition and even greater costs.

The number one reason why respondents were unable to access needed care, reported in this study, was the high cost of such medical care. These costs are only expected to increase in the future, leading to larger levels of debt. One can reason that as medical costs and debt levels increase, the size of the population with limited access to care will also increase, contributing to the number of "bad debts" that are passed on to the rest of the public. Problems with access to care can lead to a decay of the general health of society. If people are prevented from seeking regular preventive care due to

outstanding debts, some health issues that may have been easily solved could be allowed to grow into previously preventable, incredibly expensive, life-threatening conditions.

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Appendix

Table 12: Unmet need at some time during preceding six months

Variable	Crude OR	95% CI	Adjusted OR	95% CI
Medical Debt $0*	1.00		1.00	
Medical debt $1-$1,000	2.43	(1.85, 3.19)	2.45	(1.81, 3.33)
Medical debt $1,000-$5,000	4.31	(2.92, 6.36)	3.89	(2.52, 6.01)
Medical debt >$5,000	3.51	(2.35, 5.25)	2.39	(1.50, 3.82)
Medical debt Unknown	3.61	(2.44, 5.34)	3.56	(2.27, 5.58)
No Lapse in Insurance*	1.00		1.00	
Lapse in Insurance, missing data	2.10	(1.44, 3.07)	2.73	(1.75, 4.27)
Lapse in Insurance of 6 months	4.89	(3.71, 6.44)	5.54	(4.05, 7.58)
Lapse in Insurance, less than 6 months	3.61	(2.56, 5.09)	3.55	(2.44, 5.16)
Poor health status	2.19	(1.59, 3.04)	2.20	(1.50, 3.21)
Lives alone	0.83	(0.62, 1.10)	0.73	(0.52, 1.04)
Race, Caucasian*	1.00		1.00	
Race, African American	0.87	(0.57, 1.33)	0.78	(0.47, 1.30)
Race, Hispanic	0.60	(0.43, 0.86)	0.73	(0.47, 1.13)
Race, Other	0.54	(0.38, 0.78)	0.79	(0.52, 1.20)
Women with less than high school education*	1.00		1.00	
Women with high school education or GED	1.52	(0.62, 2.42)	2.03	(1.00, 3.06)
Women with at least some college	2.07	(1.17, 2.97)	2.82	(1.79, 3.85)
Men with less than high school education*	1.00		1.00	
Men with high school education or GED	1.11	(0.68, 1.82)	0.91	(0.51, 1.61)
Men with at least some college	1.11	(0.68, 1.81)	1.10	(0.62, 1.94)

*Referent category

Table 13: Unmet need
Separate debt variables

Variable	Crude OR	95% CI	Adjusted OR	95% CI
Debt to Provider $0*	1.00		1.00	
Debt to Provider $1-$1,000	2.60	(2.02, 3.35)	2.41	(1.80, 3.22)
Debt to Provider $1,000-$5,000	5.18	(3.39, 7.92)	3.52	(2.15, 5.76)
Debt to Provider >$5,000	4.81	(2.76, 8.38)	1.97	(1.01, 3.83)
Debt to Provider Unknown	2.96	(1.82, 4.79)	3.32	(1.87, 5.87)
Debt to creditor/lender $0*	1.00		1.00	
Debt to creditor/lender $1-$1,000	1.37	(0.96, 1.96)	1.02	(0.67, 1.54)
Debt to creditor/lender $1,000-$5,000	2.08	(1.30, 3.33)	1.61	(0.93, 2.77)
Debt to creditor/lender >$5,000	1.39	(0.85, 2.27)	0.98	(0.53, 1.81)
Debt to creditor/lender Unknown	2.29	(1.44, 3.66)	1.20	(0.68, 2.12)
No Lapse in Insurance*	1.00		1.00	
Lapse in Insurance, missing data	2.10	(1.44, 3.07)	2.80	(1.77, 4.41)
Lapse in Insurance of 6 months	4.89	(3.71, 6.44)	5.50	(3.99, 7.56)
Lapse in Insurance, less than 6 months	3.61	(2.56, 5.09)	3.39	(2.31, 4.96)
Poor health status	2.19	(1.59, 3.04)	2.22	(1.50, 3.27)
Men with less than high school education*	1.00		1.00	
Men with high school education	1.11	(0.68, 1.82)	0.94	(0.53, 1.66)
Men with at least some college	1.11	(0.68, 1.81)	1.15	(0.65, 2.04)
Women with less than high school education*	1.00		1.00	(1.00, 3.06)
Women with high school education	1.52	(0.62, 2.42)	2.03	(1.79, 3.85)
Women with at least some college	2.07	(1.17, 2.97)	2.82	
Lives alone	0.83	(0.62, 1.10)	0.71	(0.50, 1.01)
Race, Caucasian*	1.00		1.00	
Race, African American	0.87	(0.57, 1.33)	0.74	(0.44, 1.24)
Race, Hispanic	0.60	(0.43, 0.86)	0.72	(0.47, 1.13)
Race, Other	0.54	(0.38, 0.78)	0.81	(0.53, 1.24)

*Referent category

Table 14: Unmet need: Prescription medications

Variable	Crude OR	95% CI	Adjusted OR	95% CI
Medical Debt $0*	1.00		1.00	
Medical debt $1-$1,000	2.82	(2.16, 3.64)	2.00	(1.48, 2.70)
Medical debt $1,000-$5,000	4.20	(2.83, 6.23)	2.53	(1.61, 4.00)
Medical debt >$5,000	5.27	(3.41, 8.13)	3.23	(1.93, 5.43)
Medical debt Unknown	3.05	(2.07, 4.50)	2.28	(1.44, 3.61)
Prescription costs $0*	1.00		1.00	
Prescription costs $1-$100	3.14	(2.41, 4.09)	2.83	(2.06, 3.91)
Prescription costs $101-$2,000	5.04	(3.50, 7.26)	2.82	(1.82, 4.35)
Prescription costs, Unknown	4.05	(2.29, 7.19)	2.12	(1.06, 4.25)
Has a Chronic condition	2.46	(1.98, 3.06)	2.02	(1.55, 2.63)
Poor health status	3.26	(2.28, 4.67)	2.19	(1.43, 3.36)
Unemployed*	1.00		1.00	
Employed	0.71	(0.57, 0.89)	0.79	(0.60, 1.03)
Retired	0.70	(0.42, 1.17)	0.57	(0.31, 1.03)
No Lapse in Insurance *	1.00		1.00	
Lapse in Insurance (missing data)	1.72	(1.18, 2.50)	1.97	(1.23, 3.17)
Lapse in Insurance of 6 months	2.04	(1.57, 2.65)	2.65	(1.89, 3.70)
Lapse in Insurance of less than 6 months	1.77	(1.27, 2.47)	1.94	(1.31, 2.85)
No ER visits*	1.00		1.00	
1 or 2 ER visits	2.75	(2.10, 3.60)	2.04	(1.49, 2.79)
3 or more ER visits	3.55	(2.18, 5.77)	1.76	(0.98, 3.17)
Women	1.39	(1.11, 1.73)	1.64	(1.25, 2.15)
Race, Caucasian*	1.00		1.00	
Race, African American	0.87	(0.57, 1.33)	0.77	(0.46, 1.29)
Race, Hispanic	0.57	(0.41, 0.80)	0.64	(0.42, 0.96)
Race, Other	0.49	(0.35, 0.70)	0.81	(0.53, 1.25)

*Referent category

Table 15: Unmet need: Prescription medications
Separate debt variables

Variable	Crude OR	95% CI	Adjusted OR	95% CI
Debt to Provider $0*	1.00		1.00	
Debt to Provider $1-$1,000	3.07	(2.39, 3.95)	2.05	(1.53, 2.75)
Debt to Provider $1,000-$5,000	6.15	(3.90, 9.69)	3.28	(1.91, 5.61)
Debt to Provider >$5,000	13.14	(6.15, 28.10)	5.22	(2.19, 12.44)
Debt to Provider Unknown	1.91	(1.19, 3.07)	2.10	(1.19, 3.72)
Debt to creditor/lender $0*	1.00		1.00	
Debt to creditor/lender $1-$1,000	1.56	(1.09, 2.23)	1.51	(0.75, 1.76)
Debt to creditor/lender $1,000-$5,000	1.83	(1.14, 2.94)	1.22	(0.69, 2.15)
Debt to creditor/lender >$5,000	2.00	(1.19, 3.36)	1.52	(0.79, 2.96)
Debt to creditor/lender Unknown	2.21	(1.37, 3.54)	0.97	(0.53, 1.75)
No lapse in insurance*	1.00		1.00	
Lapse in insurance, missing data	1.72	(1.18, 2.50)	1.89	(1.16, 3.06)
Lapse in insurance of 6 months	2.04	(1.57, 2.65)	2.48	(1.76, 3.48)
Lapse in insurance, less than 6 months	1.77	(1.27, 2.47)	1.78	(1.19, 2.64)
Presence of a chronic condition	2.46	(1.98, 3.06)	2.03	(1.56, 2.64)
Monthly costs of Rx $0*	1.00		1.00	
Monthly costs of Rx $1-$100	3.14	(2.41, 4.09)	2.90	(2.10, 4.00)
Monthly costs of Rx $100-$2000	5.04	(3.50, 7.26)	2.93	(1.89, 4.56)
Monthly costs of Rx Unknown	4.05	(2.29, 7.17)	2.09	(1.04, 4.18)
No ER visits*	1.00		1.00	
1 or 2 ER visits	2.75	(2.10, 3.60)	1.83	(1.32, 2.52)
3 or more ER visits	3.55	(2.18, 5.77)	1.49	(0.80, 2.74)
Poor health status	3.26	(2.28, 4.67)	2.02	(1.31, 3.11)
Unemployed*	1.00		1.00	
Employed	0.71	(0.57, 0.89)	0.80	(0.61, 1.05)
Retired	0.70	(0.42, 1.17)	0.51	(0.28, 0.95)
Race, Caucasian*	1.00		1.00	
Race, African American	0.87	(0.57, 1.33)	0.83	(0.50, 1.38)
Race, Hispanic	0.57	(0.41, 0.80)	0.61	(0.40, 0.92)
Race, Other	0.49	(0.35, 0.70)	0.83	(0.54, 1.29)
Female vs. Male	1.39	(1.11, 1.73)	1.57	(1.20, 2.06)

*Referent Category

Table 16: Unmet need: Urgent care for injury or illness

Variable	Crude OR	95% CI	Adjusted OR	95% CI
Medical Debt $0*	1.00		1.00	
Medical debt $1-$1,000	1.44	(0.97, 2.16)	1.38	(0.87, 2.20)
Medical debt $1,000-$5,000	2.28	(1.37, 3.81)	2.22	(1.23, 4.02)
Medical debt >$5,000	2.09	(1.22, 3.55)	1.73	(0.90, 3.32)
Medical debt Unknown	2.81	(1.62, 4.86)	2.62	(1.38, 5.00)
No Lapse in Insurance*	1.00		1.00	
Lapse in Insurance, missing data	1.34	(0.76, 2.38)	1.13	(0.58, 2.19)
Lapse in Insurance of 6 months	5.22	(3.48, 7.84)	3.84	(2.41, 6.12)
Lapse in Insurance, less than 6 months	3.26	(2.04, 5.22)	2.99	(1.80, 4.95)
Has no regular place for care	4.78	(2.73, 8.38)	3.06	(1.57, 5.96)
No ER Visits*	1.00		1.00	
1 or 2 ER visits	0.66	(0.47, 0.91)	0.56	(0.38, 0.83)
3 or more ER visits	0.69	(0.41, 1.16)	0.43	(0.23, 0.82)
Level of Education, less than high school*	1.00		1.00	
Level of Education, high school	1.55	(0.98, 2.46)	1.78	(1.05, 3.00)
Level of Education, at least some college	1.25	(0.80, 1.94)	1.34	(0.80, 2.25)
Female vs. Male	0.63	(0.46, 0.87)	0.76	(0.52, 1.12)
Race, Caucasian*	1.00		1.00	
Race, African American	1.51	(0.82, 2.76)	1.12	(0.54, 2.29)
Race, Hispanic	1.17	(0.63, 2.15)	1.83	(0.87, 3.83)
Race, Other	0.76	(0.46, 1.25)	1.14	(0.64, 2.02)

*Referent Category

Table 17: Unmet need: Urgent care for illness or injury
Separate debt variables

Variable	Crude OR	95% CI	Adjusted OR	95% CI
Debt to Provider $0*	1.00		1.00	
Debt to Provider $1-$1,000	1.40	(0.92, 2.03)	1.20	(0.78, 1.86)
Debt to Provider $1,000-$5,000	2.63	(1.58, 4.40)	2.35	(1.26, 4.39)
Debt to Provider >$5,000	1.89	(1.02, 3.52)	1.21	(0.54, 2.75)
Debt to Provider Unknown	2.76	(1.35, 5.64)	2.83	(1.19, 6.71)
Debt to creditor/lender $0*	1.00		1.00	
Debt to creditor/lender $1-$1,000	1.06	(0.66, 1.73)	0.93	(0.52, 1.66)
Debt to creditor/lender $1,000-$5,000	1.24	(0.67, 2.31)	1.13	(0.55, 2.33)
Debt to creditor/lender >$5,000	1.61	(0.83, 3.11)	1.51	(0.65, 3.50)
Debt to creditor/lender Unknown	1.92	(1.09, 3.39)	1.30	(0.64, 2.66)
No lapse in insurance*	1.00		1.00	
Lapse in insurance, missing data	1.34	(0.76, 2.38)	1.09	(0.56, 2.15)
Lapse in insurance of 6 months	5.22	(3.48, 7.84)	3.79	(2.35, 6.12)
Lapse in insurance, less than 6 months	3.26	(2.04, 5.22)	2.93	(1.74, 4.93)
Has no regular place for care	4.78	(2.73, 8.38)	3.12	(1.60, 6.12)
No ER visits*	1.00		1.00	
1 or 2 ER visits	0.66	(0.47, 0.91)	0.55	(0.36, 0.82)
3 or more ER visits	0.69	(0.41, 1.16)	0.44	(0.22, 0.85)
Less than high school education*	1.00		1.00	
High school education	1.55	(0.98, 2.46)	1.82	(1.07, 3.07)
At least some college	1.25	(0.80, 1.94)	1.35	(0.80, 2.27)
Female vs. Male	0.63	(0.47, 0.87)	0.76	(0.52, 1.12)
Race, Caucasian*	1.00		1.00	
Race, African American	1.51	(0.82, 2.76)	1.09	(0.53, 2.30)
Race, Hispanic	1.17	(0.63, 2.15)	1.71	(0.81, 3.62)
Race, Other	0.76	(0.46, 1.25)	1.08	(0.60, 1.93)

*Referent Category

PSU Oregon Health Study

1. Our records show that you were in Medicaid, or the Oregon Health Plan, in February of 2003. Have you been continuously enrolled in the Oregon Health Plan since then?
☐Yes [GO TO QUESTION 5]
☐ No [GO TO QUESTION 2]

2. What are the main reasons you have NOT been continuously enrolled in the Oregon Health Plan since February 2003? *Mark all that apply.*
☐ My income increased.
☐ I get health care coverage through my employer or a family member.
☐ I could not afford the co-pays.
☐ My mental health benefits were cut.
☐ My chemical dependency benefits were cut.
☐ I did not return the application in time.
☐ I became eligible for Medicare.
☐ I owed premium payments from my last eligibility period.
☐ I could not afford the premiums.
☐ Don't know.
☐ Some other reason.

3. If Oregon Health Plan premium payments were decreased by $3 a month, would you continue to go without coverage or would you reapply for the Oregon Health Plan?
☐ I would continue without coverage.
☐ I would reapply.
☐ Does not apply. I didn't have any premium payments.
☐ Does not apply. I don't qualify for the Oregon Health Plan right now.
☐ Don't know

4. For how many of the last 6 months did you have health insurance? *Mark only one.*
☐ No health insurance during the last 6 months.
☐ 1 month or less
☐ 2 months
☐ 3 months
☐ 4 months
☐ 5 months
☐ 6 months

5. Do you currently have health insurance coverage through any of the following: *Mark as many as apply.*
☐ Oregon Health Plan (OHP) or Medicaid (OMAP)
☐ Employer or a family member's employer
☐ Medicare
☐ Indian Health Service
☐ Self-paid private plan (health coverage I pay for)
☐ Family Health Insurance Assistance Program (FHIAP)
☐ Another kind of insurance not listed here.
☐ No health insurance coverage.
☐ Don't know.
Continue

The Financial Impacts of Health Care

6. If you were covered at any time in the last 6 months by the Oregon Health Plan (OHP), were you supposed to pay a monthly premium for Oregon Health Plan coverage? *Mark only one.*
□Yes [GO TO QUESTION 7]
□ No [GO TO QUESTION 10]
□ Don't know [GO TO QUESTION 10]
□ I wasn't covered by OHP in the last 6 months. [GO TO QUESTION 14]

7. Would you say the Oregon Health Plan monthly premium is...? *Mark only one.*
□ Never difficult to pay
□ Sometimes difficult to pay
□ Usually difficult to pay
□ Always difficult to pay
□ Doesn't apply. I don't have premium payments.

8. Do you agree or disagree with the following: Oregon Health Plan premiums are worth paying because otherwise my health care costs might be higher. *Mark only one.*
□ Strongly agree
□ Somewhat agree
□ Somewhat disagree
□ Strongly disagree
□ Doesn't apply. I don't have premium payments.

9. If premiums for the Oregon Health Plan increased next month by $3 per person, would you continue coverage or drop the Oregon Health Plan?
□ I would continue coverage.
□ I would drop coverage.
□ Don't know
□ Does not apply. I am not covered by the Oregon Health Plan.

10. Are you supposed to pay a co-pay for visits to a doctor or other health care provider? *A co-pay is the amount you are supposed to pay to your doctor at the time of your visit, usually $3 to $5 for a doctor's office visit. Mark only one.*
□ Yes [GO TO QUESTION 11]
□ No [GO TO QUESTION 14]
□ Don't know [GO TO QUESTION 14]
□ Does not apply [GO TO QUESTION 14]

11. In the last 6 months, how often did your doctor's office staff, or other health care provider, ask you to pay the co-pay at the time of your visit? *Mark only one.*
□ Always
□ Usually
□ Sometimes
□ Never
□ Does not apply. No co-pay.□ [GO TO QUESTION 14]

12. In the last 6 months, how often did you pay the co-pay for your doctor or health care provider visit, either at the time of your visit or when billed later? *Mark only one.*
□ Always
□ Usually
□ Sometimes
□ Never
□ Doesn't apply. No co-pay or I haven't visited a doctor in the last 6 months. [GO TO QUESTION 14]

13. Would you say the co-pay for doctor or health care provider visit is...? *Mark only one.*
☐ Never difficult to pay
☐ Sometimes difficult to pay
☐ Usually difficult to pay
☐ Always difficult to pay
☐ Doesn't apply. No co-pay or I have not visited a doctor in the last 6 months.

14. During the last 6 months, what were your average, MONTHLY out-of-pocket costs for your prescription medicines? *Do NOT include vitamins or any medicines you can buy without a prescription. Out-of-pocket costs are costs you pay yourself. Mark only one.*
☐ $0
☐ $1 to $25
☐ $26 to $50
☐ $51 to $75
☐ $76 to $100
☐ $101 to $200
☐ $201 to $400
☐ $401 to $600
☐ $601 to $800
☐ $801 to $1,000
☐ $1,001 to $2,000
☐ More than $2,000
☐ Don't know

15. In the last 6 months, how much money did you spend on all medical care for yourself? Include anything you pay for your health care, including premiums and co-pays. Do NOT include dental. Your best estimate is fine. *Mark only one.*
☐ $0
☐ $1 to $25
☐ $26 to $50
☐ $51 to $75
☐ $76 to $100
☐ $101 to $200
☐ $201 to $400
☐ $401 to $600
☐ $601 to $800
☐ $801 to $1,000
☐ $1,001 to $1,500
☐ $1,501 to $2,000
☐ More than $2,000
☐ Don't know

For the following questions, please answer for yourself only.
Do not include any other members of your family.

16. About how much money do you currently owe to a doctor, clinic or hospital for your own medical bills? *Your best estimate is fine. Mark only one.*
☐ $0
☐ $1 to $25
☐ $26 to $50
☐ $51 to $75
☐ $76 to $100
☐ $101 to $300
☐ $301 to $500
☐ $501 to $1,000
☐ $1,001 to $5,000

☐ $5,001 to $10,000
☐ $10,001 to $15,000
☐ More than $15,000
☐ Don't know

17. About how much money do you currently owe to a credit card company, bank, or private loan company (like American General, Household Finance (HFC) etc.) for your own medical bills? *Your best estimate is fine. Mark only one.*
☐ $0
☐ $1 to $100
☐ $101 to $300
☐ $301 to $500
☐ $501 to $1,000
☐ $1,001 to $5,000
☐ $5,001 to $10,000
☐ $10,001 to $15,000
☐ More than $15,000
☐ Don't know

18. In the last 6 months, have family and/or friends loaned or given you money so you could pay your medical bills?
☐ Yes
☐ No

19. In the last 6 months, has a doctor, clinic, or other medical service refused to treat you or a member of your family or delayed care because you owed money to them for your past treatment? *Mark only one.*
☐ Yes
☐ No
☐ Don't know

20. In the last 6 months, have you cut back on your food budget to cover health care costs or to pay medical bills?
☐ Yes
☐ No

21. In the last 6 months, have you skipped paying other bills, paid bills late or paid less then the minimum payment to cover health care costs or to pay medical bills?
☐ Yes
☐ No

22. In the last 12 months, have you filed for bankruptcy because of your medical bills?
☐ Yes
☐ No

Your Health Care

23. Is there a place that you usually go to when you need medical care?
☐ Yes
☐ No [GO TO QUESTION 25]

24. Where do you usually go to receive medical care? *Mark only one.*
☐ A private doctor's office or clinic
☐ A public health clinic, community health center or tribal health clinic
☐ A hospital-based clinic
☐ A hospital emergency room
☐ An urgent care clinic

☐ Some other place not listed here
☐ I don't have a usual place
☐ Don't know

25. Was there any time in the last 6 months when you needed medical care, but did NOT get it?
☐ Yes
☐ No [GO TO QUESTION 27]

26. What are the main reasons you did not get the medical care you needed? *(If you have gone without medical care more than once in the last 6 months, tell us about the most recent time.) Mark as many as apply.*
☐ It cost too much.
☐ I owed money to my doctor, the clinic, or hospital.
☐ I couldn't get an appointment as soon as I wanted.
☐ Doctor or hospital would not accept my insurance.
☐ I didn't have the co-pay.
☐ I don't have a doctor.
☐ It takes too long to travel to the doctor's office or clinic.
☐ The office wasn't open when I could get there.
☐ I did not have childcare.
☐ I did not have transportation.
☐ Some other reason (*please tell us*_____)
☐ Don't know

27. In the last 6 months, was there ever a time you needed prescription medicines but did not get them because you couldn't afford it? *(Do not count samples as having a prescription filled.)*
☐ Yes
☐ No

28. In the last 6 months, was there ever a time you skipped doses or took less of a prescription medicine to save money?
☐ Yes
☐ No

29. In the last 6 months, did you have an illness, injury, or condition that needed care right away?
☐ Yes
☐ No [GO TO QUESTION 31]

30. In the last 6 months, when you needed care right away for an illness, injury, or condition, how often did you get care as soon as you wanted? *Mark only one.*
☐ Never
☐ Sometimes
☐ Usually
☐ Always
☐ I didn't need care right away in the last 6 months.

31. In the last 6 months, NOT counting the times you needed health care right away, did you make any appointments with a doctor or other health provider for health care?
(For example, for routine or regular care like an annual exam or regular check-ups.)
☐ Yes
☐ No [GO TO QUESTION 33]

32. In the last 6 months, NOT counting times you needed health care right away, how often did you get an appointment for health care as soon as you wanted? *Mark only one.*
☐ Never
☐ Sometimes

□ Usually
□ Always
□ I didn't make any appointments for routine or regular care in the last 6 months.

33. In the last 6 months, how many times did you go to an emergency room to get care for yourself? Your best estimate is fine. *Mark only one.*
□ None
□ 1
□ 2
□ 3
□ 4
□ 5
□6
□ 7 or more

34. In the last 6 months, how many times did you go to a doctor's office, clinic, or other health care provider to get care for yourself? *Do NOT include emergency room visits or hospital stays.* Your best estimate is fine. *Mark only one.*
□ None
□ 1
□2
□3
□ 4
□ 5
□ 6
□ 7 or more

35. In the last 6 months, how many different times were you a patient in a hospital at least overnight? *Do NOT include hospital stays to deliver a baby. Mark only one.*
□ None
□ 1 time
□ 2 times
□ 3 times
□ 4 times
□ 5 times
□ 6 times
□ 7 times or more

36. Have you ever been told by a doctor or other health professional that you have diabetes or sugar diabetes? *Do NOT include diabetes during pregnancy.*
□ Yes [GO TO QUESTION 37]
□ No [GO TO QUESTION 38]
□ Don't know [GO TO QUESTION 38]

37. Which of the following best describes how you manage your diabetes? *Mark as many as apply.*
□ I manage my diabetes with diet and exercise.
□ I use injections.
□ I take a diabetes medication by mouth.
□ Don't know

38. Have you ever been told by a doctor or other health professional that you have asthma? *Mark only one.*
□ Yes [GO TO QUESTION 39]
□ No [GO TO QUESTION 40]
□ Don't know [GO TO QUESTION 40]

39. Do you still have asthma? *Mark only one.*
☐ Yes
☐ No
☐ Don't know

40. Have you ever been told by a doctor or other health professional that you have any of the following? *Mark all that apply.*
☐ High blood pressure
☐ Emphysema or chronic bronchitis (Chronic Obstructive Pulmonary Disease)
☐ Congestive Heart Failure

Mental Health and Chemical Dependency Services

The following questions are important for us to understand your total health care needs. Please remember that all of your answers will be kept private.

41. In the last 6 months, have you been told by a doctor or other health professional that you have depression or anxiety? *Mark only one.*
☐ Yes
☐ No
☐ Don't know

42. In the last 6 months, have you needed treatment or counseling for a mental health condition or personal or family problem?
☐ Yes
☐ No [GO TO QUESTION 44]

43. In the last 6 months, how often were you able to get treatment or counseling for a mental health condition or personal or family problem? *Mark only one.*
☐ Never
☐ Sometimes
☐ Usually
☐ Always
☐ I didn't need treatment or counseling for mental health or other personal problems.

44. In the last 6 months, have you needed treatment or counseling for alcohol abuse?
☐ Yes
☐ No [GO TO QUESTION 46]

45. In the last 6 months, how often were you able to get treatment or counseling for alcohol abuse? *Mark only one.*
☐ Never
☐ Sometimes
☐ Usually
☐ Always
☐ I didn't need treatment or counseling for alcohol abuse

46. In the last 6 months, have you needed treatment or counseling for drug abuse? *Mark only one.*
☐ Yes
☐ No [GO TO QUESTION 48]

47. In the last 6 months, how often were you able to get treatment or counseling for drug abuse? *Mark only one.*
☐ Never
☐ Sometimes
☐ Usually

□ Always
□ I didn't need treatment or counseling for drug use.

Your Health

48. In general, would you say your health is: *Mark only one.*
□ Excellent
□ Very good
□ Good
□ Fair
□ Poor

49. The following questions are about activities you might do during a typical day. Does your health *now* limit you in these activities? If so, how much?
Yes, limited a lot (1)
Yes, limited a little (2)
No, not limited at all (3)

a. Moderate activities, such as moving a table, pushing a vacuum cleaner or grocery shopping
1□ 2□ 3□

b. Climbing several flights of stairs
1□ 2□ 3□

50. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

a. Accomplished less than you would like
Yes□ No□

b. Were limited in the kind of work or other activities.
Yes □ No □

51. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems?

a. Accomplished less than you would like
Yes□ No□

b. Didn't do work or other activities as carefully as usual.
Yes □ No □

52. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)? *Mark only one.*
□ Not at all
□ A little bit
□ Moderately
□ Quite a bit
□ Extremely

53. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks....
(1) All of the Time
(2) Most of the Time
(3) A Good Bit of the Time
(4) Some of the Time
(5) A Little Bit of the Time
(6) None of the Time

a. Have you felt calm and peaceful? 1□ 2□ 3□ 4□ 5□ 6□

b. Did you have a lot of energy? 1□ 2□ 3□ 4□ 5□ 6□

c. Have you felt downhearted and blue? 1□ 2□ 3□ 4□ 5□ 6□

54. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)? *Mark only one*
□ All of the time
□ Most of the time
□ A good bit of the time
□ Some of the time
□ A little bit of the time
□ None of the time

About You

55. Are you male or female?
□ Male
□ Female

56. What is the YEAR of your birth? _____

57. Are you currently employed or self-employed? *Mark only one.*
□ Yes, employed [GO TO QUESTION 58]
□ Yes, self-employed [GO TO QUESTION 58]
□ Not currently employed, retired [GO TO QUESTION 59]
□ Not currently employed [GO TO QUESTION 59]

58. About how many hours a week, on average, do you work at your current job? *Mark only one.*
□ Less than 20 hours per week (part-time)
□ 20 to 29 hours per week (half-time or more)
□ 30 or more hours per week (full-time)

59. What is the highest grade or level of school you have completed? *Mark only one.*
□ Less than high school
□ High school diploma or GED
□ Some college
□ Completed vocational/technical training or a 2-year degree program (e.g., Associates degree or AA degree)
□ Completed a 4-year degree program
□ Graduate school

60. What is your current marital status? *Mark only one.*
☐ Now married
☐ Divorced
☐ Separated
☐ Widowed
☐ Never married

61. What is your current living arrangement? *Mark all that apply.*
☐ Live alone
☐ Live with partner or spouse
☐ Live with parents
☐ Live with other relatives (including children)
☐ Live with friends
☐ Live with paid attendant/companion
☐ Other

62. Would you describe yourself as Spanish, Hispanic, or Latino(a)?
☐ Yes
☐ No

63. How would you describe your race? *Mark all that apply.*
☐ White
☐ Black or African-American
☐ American Indian or Alaska Native
☐ Asian
☐ Native Hawaiian or other Pacific Islander
☐ Some other race *Print race:*_____

64. What was your gross household income (before taxes and deductions are taken out) for last year (2002)? *Mark only one.*
☐ $0
☐ $1 to $2,500
☐ $2,501 to $5,000
☐ $5,001 to $7,500
☐ $7,501 to $10,000
☐ $10,001 to $12,500
☐ $12,501 to $15,000
☐ $15,001 to $17,500
☐ $17,501 to $20,000
☐ $20,001 to $22,500
☐ $22,501 to $25,000
☐ $25,001 to $27,500
☐ $27,501 to $30,000
☐ $30,001 to $32,500
☐ $32,501 to $35,000
☐ $35,001 to $37,500
☐ $37,501 to $40,000
☐ $40,001 to $42,500
☐ $42,501 to $45,000
☐ $45,001 to $47,500
☐ $47,501 to $50,000
☐ $50,000 or more

65. How many family members, including yourself, counting adults and children, are living in your home? *Please include anyone who is in the hospital and expected to return home, in a nursing home and expected to return home, or away at school. Mark only one.*

☐ 1
☐ 2
☐ 3
☐ 4
☐ 5
☐ 6
☐ 7
☐ 8 or more

66. Of the family members living in your house, how many are under 19 years of age?
Mark only one.

☐ None [GO TO QUESTION 68]
☐ 1
☐ 2
☐ 3
☐ 4
☐ 5
☐ 6
☐ 7
☐ 8 or more

67. In the table below, please list your child(ren), or the child(ren) you are responsible for, who is/are under the age of 19 and who is/are currently living with you:

First Name _____

Gender (Circle Male or Female)
Age
Does this child currently have health insurance coverage? (Circle Yes or No)
Is this child covered by the Oregon Health Plan (Medicaid or OMAP)? (Circle Yes or No)

Child 1 1M 2F 1Yes 2No 1Yes 2No
Child 2 1M 2F 1Yes 2No 1Yes 2No
Child 3 1M 2F 1Yes 2No 1Yes 2No
Child 4 1M 2F 1Yes 2No 1Yes 2No
Child 5 1M 2F 1Yes 2No 1Yes 2No
Child 6 1M 2F 1Yes 2No 1Yes 2No

68. Is there anything else you would like to tell us? (Please attach additional pages if more space is needed)

When you have finished your survey please place it in the postage-paid envelope and mail!

Thank you for your time!