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The effect of in-office waiting time on physician visit frequency among working-age adults

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ABSTRACT

Disparities in unmet health care demand resulting from socioeconomic, racial, and financial factors have received a great deal of attention in the United States. However, out-of-pocket costs alone do not fully reflect the total opportunity cost that patients must consider as they seek medical attention. While there is an extensive literature on the price elasticity of demand for health care, empirical evidence regarding the effect of waiting time on utilization is sparse. Using the nationally representative 2003 Community Tracking Study Household Survey, the most recent iteration containing respondents' physician office visit frequency and estimated in-office waiting time in the United States ($N = 23{,}484$), we investigated the association between waiting time and calculated time cost with the number of physician visits among a sample of working-age adults. To avoid the bias that literature suggests would result from excluding respondents with zero physician visits, we imputed waiting time for the essential inclusion of such individuals. On average, respondents visited physician offices 3.55 times, during which time they waited 28.7 min. The estimates from a negative binomial model indicated that a doubling of waiting time was associated with a 7.7 percent decrease (p-value < 0.001) in physician visit frequency. For women and unemployed respondents, who visited physicians more frequently, the decrease was even larger, suggesting a stronger response to greater waiting times. We believe this finding reflects the discretionary nature of incremental visits in these groups, and a consequent lower perceived marginal benefit of additional visits. The results suggest that in-office waiting time may have a substantial influence on patients' propensity to seek medical attention. Although there is a belief that expansions in health insurance coverage increase health care utilization by reducing financial barriers to access, our results suggest that unintended consequences may arise if in-office waiting time increases.

1. Introduction

Researchers and policy makers have paid great attention to unmet demand for health care services, as well as disparities in utilization that may result from substantial out-of-pocket costs. In the United States, interest in these areas has arisen in part due to the large number of uninsured and underinsured individuals. However, literature suggests that monetary cost alone does not capture the total opportunity cost that patients face when they seek medical attention, as many individuals value time as they do money (Acton, 1975). Various individual characteristics and social barriers impact the relationship between health care needs and help-seeking behaviors, despite the fact that receiving care from medical professionals at early stages of illness may promote health and reduce long-term medical care costs (Anderson and Newman, 1973; Rickwood and Brathwaite, 1994).

Time is an important factor in patients' decision making. Accessing medical care often requires a substantial time investment, including travel and waiting time. This investment has important opportunity costs, including vocational, social, and leisure activities. Furthermore, time may play a larger role in health service utilization decisions relative to other sectors. First, while consumers pay full market price for most goods and services, insured patients pay only a small proportion of costs for health

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services at the point of utilization. This may increase the importance of time costs relative to financial costs, assuming that the full patient burden may be accounted for by a combination of monetary and non-monetary costs (Acton, 1975). Second, there are dual benefits of health services received at present – improvement in health today and an investment toward improved health in the future (Grossman, 2000). Potential future health benefits may vitiate the impact of higher costs on utilization, assuming that the discounted expected value of future time in good health is greater than the present cost of consuming health care. This decreases the elasticity of demand for health services, which may make consumption more resistant to utilization costs, including lost wages. As a result, market price, which is generally a central determinant of demand, may be less critical in health care, thereby rendering time cost a more significant influence.

Given the substantial time investment required, individuals must carefully allocate their resources optimally between health care and other products to maximize total utility (Acton, 1975; Cauley, 1987; Grossman, 2000). In addition, although lengthy appointment waiting times (i.e., the interval between request and actual physician visit) do not always pose direct opportunity costs, they may result in lost productivity due to delays in diagnosis and treatment (Cullis et al., 2000), patient absenteeism (McCarthy et al., 2000), and serve as an incentive to search for alternative sources of care, perhaps with higher costs (Cullis et al., 2000). For example, to reduce waiting time for appointments, a sample of patients in Sweden were willing to purchase supplementary insurance (Johannesson et al., 1998) and patients in the UK were willing to travel long distances involving substantial travel costs (Ryan et al., 2000).

However, quality is of critical importance – a sample of dermatology patients in the UK were willing to wait longer than the 3 months maximum specified by guidelines to receive thorough care (Coast et al., 2006). Further emphasizing the lack of uniformity in this literature, service price and quality have been positively correlated, yet lower quality is associated with reduced in-office waiting time (Whitney et al., 1997). A number of empirical studies have examined the relationship between health care utilization and waiting time in physicians' offices (Acton, 1975; Coffey, 1983; Cauley, 1987; Vistnes and Hamilton, 1995; Whitney et al., 1997). Longer travel times significantly decrease the demand for medical care, even in the absence of out-of-pocket costs (Acton, 1975) and children's medical care is influenced by their parents' time flexibility, especially when their mother is employed full time (Vistnes and Hamilton, 1995).

Several studies have also investigated the effect of in-office waiting time on patient-centered outcomes (Leddy et al., 2003). Long waiting time is considered an indicator of poorly organized processes and a lack of respect for patients (Institute of Medicine, 2001). A large national survey suggested that up to 40 percent of the variance in patient satisfaction can be explained solely by in-office waiting time (Leddy et al., 2003). Higher time cost influences medical provider choice, increases patients' threshold to initiate physician visits (Coffey, 1983), impacts patient expectations (Feddock et al., 2005), and decreases the number of physician visits (Cauley, 1987). Despite this, in-office waiting time has received little attention as a barrier to access or a policy tool to optimize access.

This study has several features that we believe make its contributions novel. First, we used the 2003 Community Tracking Study Household Survey (CTS-HS), a nationally-representative dataset whose sampling frame makes our results generalizable to the behaviors of working-age adults across the U.S. and other developed nations. Prior studies have been based on small samples, specific populations (e.g., children) from limited geographic areas, and mostly data from the 1970s or 1980s. Little is known about how attitudes toward the value of time have evolved along with other sociological and economic changes. Such changes include increased wages, expanded coverage of health care services, a greater supply of physicians, particularly subspecialists, and more advanced modes of communication and transportation.

Secondly, our stratified analyses offer insights specific to gender and employment status. Patterns of health care utilization differ by gender (Sindelar, 1982; Owens, 2008) and employment status (Economou et al., 2007). There are few empirical studies on how utilization patterns and variation in time valuation affect the response to in-office waiting time. While men and employed individuals have a higher wage rate and therefore a greater present time cost, the benefits of time in good health may also be greater in both the present and the future, assuming temporal stability of wages and attitudes toward time. On the other hand, women visit physicians more frequently than men, even after controlling for pregnancy-related care and self-reported health status, due to the potential influence of their health on other family members' productivity (Sindelar, 1982). Given that men and employed individuals visit physicians less frequently and that critical health care needs must be consolidated into a limited number of "essential" visits (Landrum et al., 2008), the incremental benefit of physician visits may be higher. Assuming that a rational individual visits a doctor only when the expected benefit exceeds the cost, patients who visit physicians more frequently (and perhaps a lower perceived marginal benefit) may be more sensitive to waiting time.

Thirdly, our analysis accounts for an important selection factor, as a significant proportion of individuals had no physician visits. One theoretical study suggested that certain rational individuals choose 'zero physician visits' as an optimal choice because they judge the expected aggregate costs to exceed returns to health (Zweifel and Manning, 2000). The authors concluded that excluding the decisions of such individuals would lead to systematically biased estimates of the impact of costs on visit frequency, in the same way that assuming a zero value of time for non-working individuals would create critical bias. We know of no empirical studies that account for the bias that might result from omission of such persons. We expanded our analytic sample to these zero-physician-visit respondents using multiple imputations methods to estimate their waiting time. Avoiding this potentially critical exclusion, our study investigates the impact of waiting time on physician visit frequency across diverse patient subgroups using a nationally-representative sample.

2. Data and methods

2.1. Data source and sample

We analyzed the association between waiting time and time cost with frequency of physician visits using the 2003 CTS-HS, which provides individual-level data for a nationally-representative sample. The data were collected by interview from randomly-selected individuals residing in 60 communities across the U.S. The data elements available for each individual include: demographic characteristics, self-reported health status, employment status, family income, individual pre-tax hourly wage for working respondents (constructed from the time span [i.e., weekly, monthly, etc.] over which the respondent could most accurately measure their earnings), and health insurance coverage. The self-reported number of outpatient physician visits during the prior 12 months excludes (1) hospitalizations, ER visits, and outpatient surgical procedures, and (2) visits in which the respondent was not the patient (e.g., taking a child to the doctor). In-office waiting time was defined as the number of minutes spent waiting in the doctor's office until seen by a medical professional. It is the self-reported