The Dynamic Relationship Between the Health Sector, Health Information and Health

This paper will broadly attempt to shed light on the causal relationship between health sector services and health status. Specifically, we will exploit exogenous variation from the availability of a randomized intervention that provided parents of these children with information on the benefits and availability of medical, dental, and social services in their community to answer two main questions. First, does the additional information from this intervention increase the use of health sector services? If so, which type of services? Second, do visits to the health sector affect a variety of physical and mental health outcomes? Does this depend on whether the encounters with the health sector were of a preventive or an emergency care nature? We will examine the heterogeneity in the impacts both within and across periods to determine if the relationship grows steeper as a child ages.

From a policy perspective the findings from this study are likely to be of importance since health is viewed as potential mechanisms through which intergenerational transmission of poverty takes place. Recent studies using Canadian and U.S. data report the positive relationship between socioeconomic status and health that exists in childhood grows more pronounced with age.[1] Currie and Stabile (2003) find that the relationship between SES and health grows stronger over time since low-SES children receive more negative health shocks.[2]

Specifically we will attempt to assess the importance of parental knowledge regarding the benefits and availability of health sector services at explaining health disparities and health sector use. Recent years have seen substantial investments in public programs designed to reduce the number of uninsured children in the US. Yet, take-up of these programs is still substantially less than 100% which some argue is a result of limited parental information regarding the availability and benefits of these programs. Yet, even among parents who join these programs, empirical evidence from Florida suggests that children on SCHIP have fewer preventive care encounters and a greater number of encounters in emergency care compared to similar children with private insurance. It is important to understand to what extent are the disparities in health a result of parental information particularly as Currie (2005) reports a strong association between health disparities and delayed school readiness.

This study is that we can overcome various conceptual and data problems that plagues earlier work. Many commonly used data sets lack information on important factors such as initial stock of health capital, type of health sector visit (preventive vs. emergency) and accurate measures of both the diagnosis and treatment provided during the encounter with the health sector.[3] The major conceptual challenge facing empirical researchers in this area relates to the inherent endogeneity when considering health investments.

This paper makes use of a unique matched panel data set from French Canada that provides detailed data on health status and interactions with the health sector. The primary data

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[1] See Case, Lubotsky and Paxson (2002) or Currie and Stabile (2003) for recent evidence.

[2] Further, they find these health shocks negatively affect math and reading achievement measures. It is unclear from this study whether the effects of health shocks are temporary, permanent or decline over time.

[3] Some of the strongest evidence is obtained in studies of the developing world. See Alderman et al. (2003) and the survey by Strauss and Thomas (1998). Within North America, the data limitations are severe. In addition US studies must account for selection of health insurance. See Grossman and Kaestner (1997) for a recent survey of the literature on the effects of education on health using U.S. data.

set is the Montreal Boys longitudinal study, which has tracked a cohort of boys since 1984. That spring kindergarten teachers in 53 schools of the lowest socioeconomic areas in Montreal were asked to rate the behavior of each boy in their classroom. Eighty-seven percent of the kindergarten teachers agreed to participate and 1161 boys were rated. The sample was reduced to 1037 boys by including only those boys born from Caucasian, French-speaking parents born in Canada, to preclude cultural and socioeconomic biases.[4] Informed consent was regularly obtained from mothers and children throughout the study.

Parents and homeroom teachers were continually interviewed on approximately a biannual basis until the subject was 16 years old, providing information on the subjects' activities, classroom behavior (including energy level and attendance), changes in family structure and the family environment. Participation rates in follow-up interviews were high ranging between 70 - 85%.

The data also contains a rich body of information on health status. These include annual self-reports of general health and physical health limitations. At the ages of 14 to 16, mental health diagnoses were obtained from the Diagnostic Interview Schedule for Children (DISC-2 Shaffer et al. (1991)). The DISC-2 is a structured interview designed to assess symptoms over the past six months. The DISC-2 was administered to both the subject and one parent. Using the DISC-2 scoring algorithm, DSM-III-R diagnoses were computed using the number of symptoms from the child and mother. From these interviews we obtain diagnoses for numerous mental health conditions including depression, dysthemia and anxiety. To proxy for initial health status, we obtained information on the birth delivery from hospital records. This information includes anthropometric measures of health at birth (including weight, height, circumference of the head), initial health status as measured by both the 1 minute and 5 minute Apgar scores, as well as detailed information on any sort of complication or medical intervention during the delivery.

Data on health sector usage has been obtained from numerous sources including administrative records. This information was obtained from Quebec's Ministry of Health. During the interview at age 15, the boys were asked to provide their medical insurance card number (RAMQ id). The RAMQ card is presented at the time of each encounter with the health sector, as the provincial health system during this period was a single payer system with government revenues providing all of the health insurance. It is important to stress that the possible selection of patients into different treatment plans with varying coverage does not occur in this system which grants equal access to health care services. This is particularly important, as the results will be substantially easier to interpret and lay out for policymakers. Of the 711 boys who completed the survey in 1994, 706 subjects provided their Medicare card (RAMQ) number. For each encounter these subjects had with the health sector between January 1, 1980 (when the boys were approximately three years of age) to the date of the interview (in December 1993) we were provided with the date of service, type of medical provider, provider setting, diagnosis code, treatment or service received code and provider reimbursement.

In addition, annual interviews with parents provided additional information on health sector usage, particularly on services such as speech therapy that are not publicly provided.

[4] In addition, this elimination includes a handful of families that refused to participate or could not be located.

Parents provided information on the number of encounters the subjects as well as their siblings had with the health sector in the following eight categories; (a) dentist, (b) doctor or pediatrician, (c) speech therapist, (d) psychologist, (e) psychiatrist, (f) learning specialist, (g) physical therapist and (h) other health sector professional. Finally information on chronic diseases (i.e. diabetes, cancer, etc.) that both parents and up to four additional family members may suffer is included in a parental survey when the boys were 10 years old. This information provides controls for parental and family health.

Overall, this matched panel provides accurate measures of types of health sector interactions, mental health diagnoses and initial health status which reduce concerns that data limitations may plague the interpretation of the findings. To deal with the conceptual problems we will exploit exogenous variation from the availability of a randomized intervention to estimate parameters that are consistent with an underlying economic model of household production described below.

To address the first question of whether additional information from this intervention increased the use of health sector services and if so, which type of services?, we consider a variety of approaches from the causal inference literature such as pre-post designs with a control group and instrumental variables strategies. We examine both preventive medical and dental services separately. We focus on how the magnitude of the impact declines as a child ages. Since the intervention only suffered from dropout bias where individuals who were assigned treatment may not have taken it, the resulting estimate from the difference of means can be interpreted as an average treatment effect for the treated.[5] In total, these alternative estimation strategies will allow us to estimate different treatment effect parameters (not just an intent to treat) that are robust to issues of non-compliance with the experimental protocol to assess the impact of information for different sub-populations which is of primary policy interest. We our currently conducting some regression analyses over several sub-populations to see how the impacts vary across parental education and family income dimensions.

In addition, we will subsequently use this intervention as a source of exogenous variation in estimates of Frisch demand curves for health inputs obtained from solving a standard economic model of health investments. Estimates of these demand equations will allow us to disentangle the policy relevant question of whether poorly educated parents are less likely to purchase health inputs since they are poorly educated or poorly informed about these inputs.

To determine whether encounters with the health sector have a causal impact on a variety of physical and mental health outcomes, we estimate health production functions. In our analysis, we use data from the birth records to proxy for initial health conditions. Since the selection of health inputs in the production function reflects behavioral choices and is endogenous, we will use exogenous variation from being assigned to the randomized parental education intervention to identify the impact of health sector visits on a variety of health outcomes. We are currently examining the impacts of alternative sources of health sector visits to try and disentangle the importance of preventive and emergency care. Finally, we report the heterogeneity of impacts of different types of health sector visits (i.e. preventive versus

[5] Dropout bias occurred since attendance was voluntary. The experimental estimate from a study that only experiences dropout bias is equivalent to (Heckman st al., 1999) the average treatment effect for the treated.

emergency care) on health to discuss whether the relationship between the health sector and health outcomes grows steeper as a child ages.