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ambulatory use of physicians' services in response to illness episodes in a low-income neighborhood

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FOREWORD

This study represents a major effort at investigating multiple influences on patient behavior and the implications of altering a community's health services delivery system. As such, and given the methodological precision, it forms an important contribution to the contemporary analysis of medical care utilization.

The author has accomplished another valuable demonstration by studying a segment of the major social change experimentation which has characterized the thrust of national domestic policy of the mid and late 1960's. To investigate the potential effects of such experimentation is not easy, a fact recognizable by those involved in parallel studies. To investigate without direct involvement in the development and operations of the experiment under study is likewise important as this approach represents the strongest research position. At the same time it requires skill in the analysis and interpretation of data derived from social change programming and not primarily designed to aid an investigation.

Beyond the valuable substantive results of this study, attention should be called to the methodological contribution. By studying patient behavior over the course of an illness episode, a more refined understanding of the relative importance of individual characteristics compared to system characteristics is made possible.

Coming from the Center for Health Administration Studies at the University of Chicago this study gives further evidence of the timeliness and resources of that Center, and the facility of the group of investigators associated with the Center in examining issues pertinent to the emerging range of concerns in health care policy, management, and planning.

As the 1970's promise major changes in health care delivery in this country, the sound basis for their development lies in careful analysis through application of medical care research to what have been to the present a series of complex and relatively unstudied social experiments. Consider how little has been gleaned from Title XIX, as an example. This study provides a standard of investigation and analysis which can guide policy decisions over this next decade.

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I wish to express my thanks also to the many persons involved in the conduct of the survey which forms the basis for this report. I received a great deal of assistance from Gerald Sparer, Chief, Program Planning and Evaluation, Office of Health Affairs, Office of Economic Opportunity; Elijah L. White, Director, Division of Health Interview Statistics, National Center for Health Statistics; the staff of the Red Hook Neighborhood Health Center, and particularly, of course, the interviewers drawn from the Red Hook area. In addition, I received guidance and assistance from many persons at the National Opinion Research Center, including Paul Sheatsley, Pearl Zinner, Eva Weinberg, Mirium Clarke, and Frank Schilling.

There is, in addition, a third and quite essential category of individuals who provided important moral support. Among these I would like to mention in particular my wife, Nancy; and my colleagues at the University of Chicago, Joel May and, once again, Harry Davis.

The survey was conducted with funds provided by the Office of Economic Opportunity—Grant Number: CAP-8911; and this investigation was supported by PHS Grant Number *HS 00080* from the National Center for Health Services Research and Development.

Finally, I would like to emphasize the importance of having a supportive setting in which to learn and work. The Center for Health Administration Studies provided such an environment in full measure.

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CHAPTER I

INTRODUCTION

This monograph reports a study of ambulatory use of physicians' services in response to sickness in a low-income urban area. When a person defines himself as sick, he initiates a behavioral response for the purpose of defining, adapting to or alleviating the underlying medical condition. The study is intended to provide a better understanding of the way that a person's (1) illness, (2) individual characteristics such as education, race, and economic resources, and (3) source of medical care influence this therapeutic process.

Sickness and its treatment are important social phenomena in terms of the functioning of both the family unit and the larger community. Sickness disrupts normal interpersonal relationships and normal economic functioning, while its treatment provides an important mechanism for social control of this disruptive phenomenon. As a result, one finds a widely held belief that a person should see a physician if he has a condition for which the medical profession can provide effective management or relief. However, it is also generally believed that the individual characteristics mentioned above may interfere with the receipt of prompt medical attention in the face of symptoms and that sources of medical care differ systematically in the degree to which they encourage use of physicians' services.

Previous work has indicated that the poor have as many or more symptoms and medical conditions when compared to the non-poor, and consistently report being sicker. On the other hand, the poor tend to have fewer physician visits per year than the rest of the population. Using this evidence, people often draw the conclusion that when a low-income person gets sick, he tends to be less likely than a higher-income individual to seek and obtain physicians' services. There are two problems with drawing such an inference, however. First, reports of sickness do not necessarily indicate the need for a physician and furthermore all physician visits are not made in response to illness. The second problem is the conceptual one of representing medical care in terms of numbers of visits.

With respect to the first problem, it may be that the greater sickness reported by the poor does not reflect sickness situations in which the doctor is perceived as an appropriate therapeutic agent. For example, if the poor are more inclined to report feeling sick because of the demoralizing circumstances associated with poverty, rather than because of the existence

of greater illness per se, one would not necessarily expect to observe greater use of the physician. It may also be the case that the additional visits reported by the non-poor are made for preventive purposes. If this is the case, it would be more appropriate to compare numbers of visits made for therapeutic purposes rather than all visits.

Turning to the second problem, the use of sickness related physicians' services occurs as part of a therapeutic process which varies in complexity. Behavioral differences between the poor and non-poor may occur at any one or all of the stages in the process. For example, there may be differences in length of delay before care is sought, differences in the likelihood of returning to the doctor after an initial consultation, or differences in the amount of care received. Differential behavior of this sort cannot be inferred from observed differences in the total number of visits accumulated over a period of time.

There are two bodies of literature that bear on the issue of use of physicians' services by the poor. The first we will call "utilization studies" and the second "illness behavior studies." Utilization studies typically have related volume of visits over time to variables such as income, controlling on some measure of illness over a similar period. Studies of this sort are valuable in suggesting factors that may influence an individual's behavior when he is sick, but as we have argued, they do not provide very good tests of assertions commonly put forth with respect to variation in response to sickness. The concept of "illness behavior," proposed by Mechanic and Volkart, "refer[s] to the ways in which given symptoms may be differentially perceived, evaluated, and acted upon by different kinds of persons."[1] The phenomena included under the label "illness behavior" may be seen from the following observations by Mechanic and Volkart:

> Whether by reason of education, religion, class membership, occupational status, or whatever, some persons will make light of symptoms, shrug them off, and avoid seeking medical care; others will respond to the slightest twinges of pain or discomfort by quickly seeking such medical care as is available. In short, the realm of illness behavior falls, logically and chronologically, between two major traditional concerns of medical science: etiology and therapy. Variables affecting illness behavior come into play prior to formal medical scrutiny and treatment, but after etiological processes have been initiated. In this sense, illness behavior even determines whether diagnosis and treatment will begin at all.[2]

Illness behavior research brings us closer to understanding differences between the poor and others in use of physicians' services than utilization studies do. However, illness behavior research has a serious drawback.

[1] David Mechanic and Edmund H. Volkart, "Illness Behavior and Medical Diagnosis," *Journal of Health and Human Behavior*, I (Summer, 1960), 87.

[2] *Ibid.*

Although they are focused on response to sickness, as distinguished from other medical-care behavior, and although they treat the response as a process varying in complexity, virtually all illness behavior studies end with the initial contact with a healer. This is a problem in two senses. By definition, use of services begins just where these studies leave off. Secondly, despite the fact that a great deal of use is determined not by the individual but rather his physician, the behavior studied is that which is subject primarily to the decisions of the individual or his family since he has not yet entered the medical-care system.

To summarize, when an individual gets sick, he initiates a therapeutic process which may involve self-evaluation of the illness, consultation with relatives, procrastination, contacting a physician, additional physician visits, and a variety of tests and treatments. The stages of the process may differ in kind or amount as a function of the characteristics of the illness, and factors related to poverty such as race, education, income or the nature of the individual's source of medical care. Utilization studies have neither focused on sickness related visits exclusively nor have they approached use as a process. Illness behavior studies have been more process oriented, but have explored only those stages in the process leading up to contact with the physician.

The central problem to which the present study is addressed is the identification of factors that are related to the individual and his environment, poverty among them, which influence his response behavior when he becomes sick. The approach used is to study differences in the behavior that results from episodes of illness. By studying medical-care behavior throughout an illness episode, we combine the advantages of utilization studies (inclusiveness) and illness behavior studies (a process orientation), while avoiding the weaknesses discussed above.

The model on which our approach to studying use of physicians' services is based involves an underlying level of physically and psychologically defined illness, a socially specified status—"sick," and a behavioral response —going to the doctor. This may be represented in the simple way shown in Figure 1:

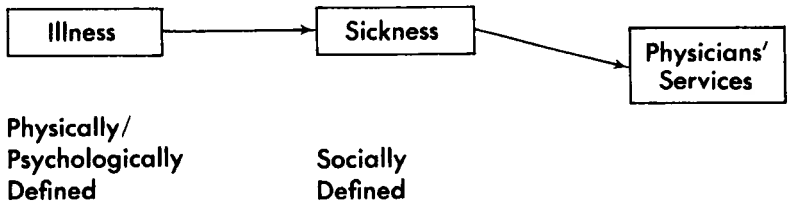

FIGURE 1

We have noted, however, that all vists to a physician are not the result of sickness. Further, sickness encompasses not only acute episodes but also long-term conditions. Making these further distinctions, the focus of the study may be seen diagrammatically in Figure 2, where the behavior under

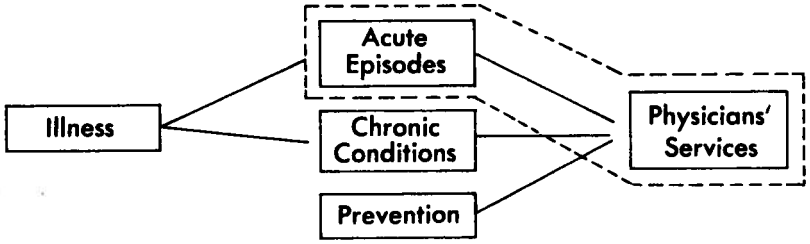

FIGURE 2

study falls within the dotted lines. Here we assume that from the individual's point of view, the *initial onset* of a chronic condition cannot be readily distinguished from an acute condition and therefore we will include the initial onset of a chronic condition in the acute episode category.

The link between acute episodes and physicians' services may be further elaborated (as shown in Figure 3, p. 5) by considering: (1) the means of identifying such episodes, (2) the elements of use of physicians' services, (3) the factors influencing these elements, and (4) the existence, form, and relative strengths of the associations between the factors (such as income) and the elements of use (such as initial physician visit).

Chapter II will provide such an elaboration, concluding with a set of hypotheses that are used to test the model derived.

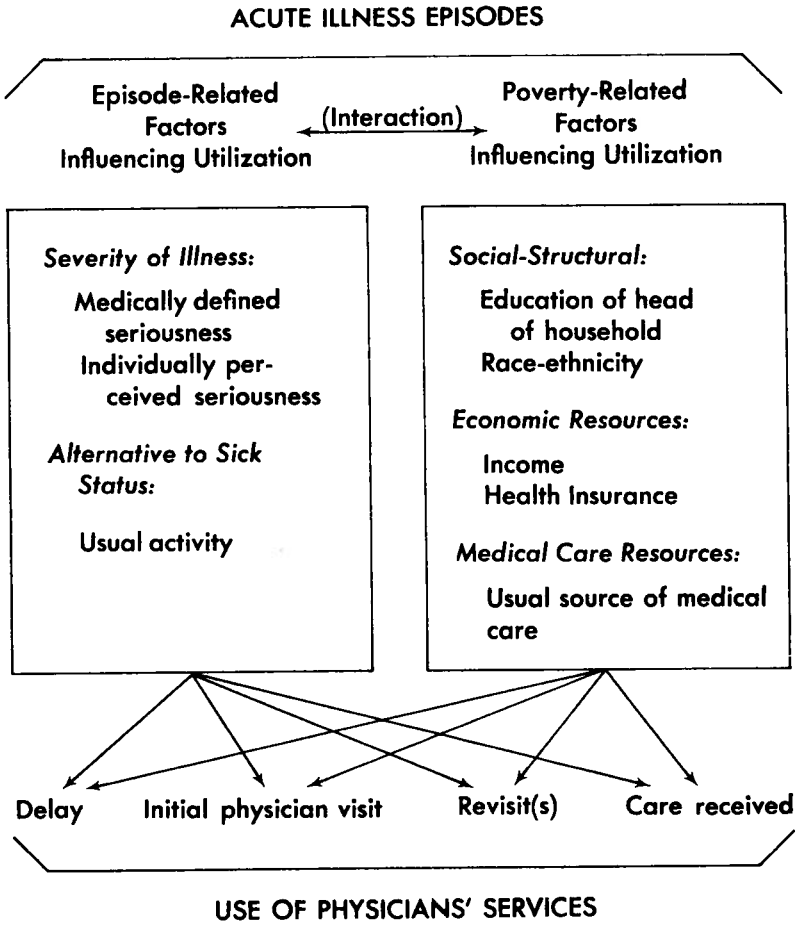

FIGURE 3

CHAPTER II

FACTORS AFFECTING UTILIZATION BEHAVIOR—MODEL AND HYPOTHESES

IDENTIFYING ILLNESS EPISODES

It was seen in the introduction that behavior related to sickness can be divided logically into two stages—first, the determination that one is sick and, second, having adopted the sick status, the process of seeking help. While our concern will be with the factors influencing behavior in the second stage, it is nonetheless necessary to consider explicitly the way we are conceptualizing the first. If we want to describe what people do when they get sick, then we must define what is meant by getting sick. In the following section we will briefly review three conceptual models of ill health—disease, illness, and sickness.

Models of Ill Health

Disease

A logical starting point for the discussion is consideration of the disease model that underlies scientific medicine. The modern physician has been trained to observe deviations from the normal ranges of physiological structure or functioning. These deviations may come to the doctor's attention through patient reports (symptoms) or, increasingly, through direct chemical, bacteriological, physiological, or other measurements (signs). Having observed deviations from the norm, the physician develops a diagnosis (or hypothesis) derived from an underlying (usually biological) theory. If the diagnosis is correct, if the theory is a good one in the sense that it is able to predict accurately the course of the disease, and if effective remedial measures are known, the doctor is in a position to "cure" the patient.

Disease, in this sense, is in no way dependent on the individual's awareness of it; indeed, the most satisfactory methodology for assessing the extent of disease is the post mortem examination. It is not difficult to imagine a person having a disease, but neither feeling nor reporting being sick. Nor, for that matter, would the condition necessarily be detected on clinical examination.

The disease model is based on deviation from physical norms. The changes from normal that may be observed by the individual—e.g., blurred

vision, a rash, pain—are considered symptoms, which are of importance to the degree that, taken together, they give clues to the underlying disease. This of course is an oversimplification because symptoms also serve the important psychological function of motivating the individual to see a doctor in the first place. But understanding the former function of symptoms, that is, from the professional's perspective, is crucial to an understanding of the difference between the sociological model of illness and medical model of disease.

Illness

Disease, as we have seen, is abnormal physiological structure or functioning.[1] Illness, on the other hand, may be defined as the feeling of discomfort which arises out of disease.[2] Yet, while illness may arise out of disease, disease is not its only determinant. Rather, illness is determined by the combination of the symptoms of disease and the meaning of those symptoms to the individual. For example, there are systematic differences across ethnic groups with respect to the interpretation of pain. Zborowski's study of hospitalized patients in New York having similar medically defined conditions (i.e., diseases) indicated that Italians and Jews tend to freely express pain; however, the meaning of the pain experience was quite different. Italians tended to be concerned with the *actual experience* of pain while those of Jewish origin "focused mainly upon the *symptomatic meaning* of pain and upon the significance of pain in relation to their health, welfare and, eventually, for the welfare of their families."[3] [Emphasis added.]

Illness, like disease, is determined by some deviation from a normal state. In the case of illness, however, the normal range is determined not by physiological standards but rather by cultural norms, the implications of symptoms for the individual, and other psychological and social factors.

The difference between disease and illness then is not simply a conceptual one nor just two sides of the same coin. That is, it is not simply a matter of the doctor applying a label to a set of symptoms which are simultaneously

[1] The clinical usefulness of the disease model lies in its predictive power and the efficacy of the therapeutic measures implied by the prediction. It is also used, however, in situations where to do so may legitimate behavior or ease interpersonal tensions or relieve feelings of guilt. For example, much mental illness has no basis in abnormal physiological structure or functioning, nor does a diagnosis serve the same purpose in terms of therapy as in somatic illness. Nevertheless, by applying a diagnostic label and assuming responsibility for treatment, the psychiatrist may ease an otherwise intolerable emotional strain on the patient's family. The role of the physician in legitimating patient behavior is discussed below.

[2] See, for example, Ray E. Trussell and Jack Elinson, *Chronic Illness in a Rural Area: The Hunterdon Study* (Cambridge, Mass.: Harvard University Press, 1959).

[3] Mark Zborowski, "Cultural Components in Response to Pain," in E. Gartly Jaco, *Patients, Physicians and Illness* (Glencoe, Ill.: The Free Press, 1958), p. 261.

classified as illness by the lay individual. It has been argued, in fact, that the empirical reality is that disease is almost universally present in the population, while the inclination to consider the resulting symptoms as illness is quite limited.[4] Finally, not only is there a substantial discrepancy between the presence of disease and awareness of illness empirically, but this discrepancy appears to be related to factors such as the individual's position in the social structure.[5]

Sickness

The third model of ill health is the sociological concept of the sick status and its associated role. First, it should be noted that the concept of "getting sick" implies a change from a state in which the individual is considered not sick to one in which he considers himself sick and is so considered by those around him. Although the appearance of a symptom, such as a rash, or a change in feeling state such as pain, or finally a specific incapacity such as temporary loss of sight strongly influences defining oneself as sick, it is not a sufficient condition. The individual, usually in consultation with others, must attach a social meaning to the change. A common way of attaching meaning is by self diagnosis, and then lay consultation and diagnosis. The point here is that an instance of "getting sick" involves not only some change observable to the individual, but also a decision on his part that this change constitutes sickness and at least provisional concurrence by those around him. To be sick, then, is a socially defined status and there is evidence that the definition of one's health status is often subject to a process of bargaining with family members and others.[6]

Persons who have been labeled as sick then occupy, temporarily, a special position in the family and the wider community. The notion of the "special position of the sick," first introduced into the literature by Sigerist,[7] has been elaborated by Parsons.[8] While it is not appropriate here to fully describe Parsons' theory of the sick role, two features are particularly

[4] Irving Kenneth Zola, "Culture and Symptoms: An Analysis of Patients' Presenting Complaints," *American Sociological Review*, XXXI (October, 1966), 615–30.

[5] Sydney H. Croog and Sol Levine, "Social Status and Subjective Perception of 250 Men After Myocardial Infarction," *Public Health Reports*, LXXXIV (November, 1969), 989–97.

[6] Andrew C. Twaddle, "Health Decisions and Sick Role Variations: An Exploration," *Journal of Health and Social Behavior*, X (Spring, 1969), 105–15.

[7] Henry E. Sigerist, "The Special Position of the Sick," in *Henry E. Sigerist on the Sociology of Medicine*, ed. by Milton I. Roemer (New York: MD Publications, 1960).

[8] Talcott Parsons, *The Social System* (Glencoe, Ill.: The Free Press, 1951); Talcott Parsons and Renee Fox, "Illness, Therapy and the Modern Urban American Family," *Journal of Social Issues*, VIII, No. 4 (1952), 31–44; Talcott Parsons, "Definitions of Health and Illness in the Light of American Values and Social Structure," in *Patients, Physicians, and Illness*, ed. by E. Gartly Jaco (Glencoe, Ill.: The Free Press, 1958), 165–87.

relevant for the development of the concept of illness episodes. Parsons theorized that one of the *rights* associated with being sick is to be excused from normal role obligations, whereas one of the sick role *obligations* is to seek professionally competent help to the degree that spontaneous recovery cannot be expected quickly. The importance of the second feature, that is, the obligation to seek help, in terms of predicting behavior will be discussed below. First, however, we will address ourselves to the question of employing withdrawal from usual activities as an *indicator* of sickness.

A number of criteria people may use for defining sickness have been suggested in the literature. For example, a comparison of the relative importance for the sick-not-sick decision of (1) interference with usual activity, (2) recency of onset, and (3) ambiguity with respect to diagnosis found that interference with usual activity was the most important factor.[9] The sample, however, was made up almost entirely of middle-class respondents. There is conflicting evidence on the question of class differences with respect to what constitutes sickness. Baumann, comparing clinic patients having chronic conditions and medical students with regard to their orientations toward what constitutes good health, observed that, "A tendency to conceive of health in terms of ability to perform social roles was characteristic not only of persons of low socio-economic status, but was nearly as prevalent among medical students as among clinic patients."[10]

Gordon,[11] on the other hand, did find class differences. He asked respondents, given twelve varying descriptions involving ill-health, to state whether or not a person was "sick." Most often classified as sick were cases with serious (uncertain or worsening) prognoses. Short-term incapacity was a second factor which seems to lead to definition of a person as sick, but it was less important than prognosis.

Gordon found little difference across income groups with respect to the proportion classifying cases as sick for those descriptions indicating unfavorable prognosis; however, inability to work was found to be more of an important discriminator for higher-income persons than for those with lower incomes.

THE ILLNESS EPISODE

Gordon's findings pose a dilemma when one must define the illness episode construct in operational terms. Ideally, one would like an indicator that is invariant across social class, easy to recall, and that picks up illness

[9] Dorrian Apple, "How Laymen Define Illness," *Journal of Health and Human Behavior*, I (Fall, 1960), 219–25.

[10] Barbara Baumann, "Diversities in Conceptions of Health and Physical Fitness," *Journal of Health and Human Behavior*, II (Spring, 1961), 39.

[11] Gerald Gordon, *Role Therapy and Illness: A Sociological Perspective* (New Haven, Conn.: College and University Press, 1966).

that (1) was identified as sickness at the time, *but* (2) was not so serious as to preclude variation in response.

The most suitable mechanism for these criteria is withdrawal from usual activity—and more specifically, withdrawal from one's usual economic role (if any)—namely, work, keeping house, or going to school—or other usual activity for preschool, disabled, or retired persons. The dilemma exists because in using such an indicator, the resulting sample of episodes may contain a group of higher-status persons for whom the episode does not represent socially defined sickness. This problem is resolved, as will be seen below, by using measures of perceived seriousness within the episode.

The essential characteristic of the episode then which differentiates those with episodes from those without is the individual's decision to withdraw from his usual activity for at least two consecutive days. This criterion, however, only identifies the *existence* of an episode. *It defines, neither the onset nor the end point* of the episode. Having established the fact that illness or accident has resulted in a failure to perform usual activities, our strategy is to inquire about the illness itself. Behavior related to the episode is tied then to the illness.

The episode definition, it will be noted, is independent of the use of medical services. This is obviously necessary if we are to differentiate between those persons who seek medical care and those who do not. Suchman[12] in a study of the stages of illness with a focus similar to the one employed here drew a sub-sample of respondents from a larger study who had reported three or more doctor visits *and* five or more disability days; or had required hospitalization for an illness condition. He observes that this approach eliminates several groups that are worthy of additional research; particularly those with less serious illness and those who decided not to seek medical care.

BEHAVIORAL RESPONSE TO THE ILLNESS EPISODE

Returning to the central problem to which the research is addressed, how might we characterize the use of physicians' services over the course of an illness episode? The individual, on noticing the first signs of illness, may contact a doctor within a very short time. On the other hand, he may delay. If he delays, the condition may turn out to be self-limiting, with the result that a doctor is never contacted.

If a doctor is contacted, an additional dimension is added to subsequent use behavior. Whereas the initial decisions involved patient perceptions and attitudes, and probably the influence of socially relevant others; once

[12] Edward A. Suchman, "Stages of Illness and Medical Care," *Journal of Health and Human Behavior*, VI (Fall, 1965), 114–28.

contact has been made with a medical-care provider, additional use is likely to be determined jointly by the doctor and patient or perhaps almost exclusively by the doctor. The degree to which the doctor controls subsequent behavior would be dependent on the patient's ability to influence the doctor's decisions and the degree of patient compliance. In terms of doctor visits, then, there is a qualitative difference between the initial contact and subsequent visits.

A third dimension of use of physician's services involves the amount of the care rendered. One patient may receive complex diagnostic and therapeutic services or even be hospitalized, while another, with a similar complaint and with multiple visits may nevertheless receive little beyond medication. The variation in medical practice is well documented.[13] What is of particular interest to us, however, is the relative importance of factors associated with the individual, such as his position within the social structure, compared to the characteristics of the medical-care provider, in influencing variation in the amount of care received.

FACTORS INFLUENCING ILLNESS-RELATED BEHAVIOR

There are two principal reasons for conceptualizing use of physicians' services in terms of the four elements introduced above—namely: delay, initial contact, revisits, and amount of care. The first is to allow us to measure the influence of factors such as education and regular source of care on a particular category of use, that is, acute care and care for the initial onset of chronic conditions, as differentiated from preventive services and the management of chronic illness over time. The second reason is that we see use of physicians' services as a process involving sequential decisions that vary systematically with respect to the amount of discretion exercised by the sick person. We will hypothesize below that discretion varies systematically across the four elements.

In the chapters that follow, we will show how a set of independent variables relates to each of the four elements of the response process. In reviewing existing literature on the relationships between these variables and use of the physician, however, we are unable, for the most part, to distinguish between the elements of the process. Nevertheless, many of the findings suggest the form our model should take. The variables to be included, it will be recalled, are the following:

[13] Osler L. Peterson, *et al.*, "An Analytical Study of North Carolina General Practice: 1953–1954," *The Journal of Medical Education*, XXXI (December, 1956), Part II; Kenneth F. Clute, *The General Practitioner: A Study of Medical Education and Practice in Ontario and Nova Scotia* (Toronto: University of Toronto Press, 1963); Mildred A. Morehead, *et al.*, *A Study of the Quality of Hospital Care Secured by a Sample of Teamster Family Members in New York City* (New York: Columbia University, School of Public Health and Administrative Medicine, 1964).

A. Characteristics of the Illness
   1. Condition severity
   2. Perceived severity
      a) Initial perception
      b) Incapacitation
B. Usual Activity
C. Social-Structural
   1. Education of head of household
   2. Race-ethnicity
D. Adjusted Current Income
E. Third-Party Coverage
F. Usual Source of Medical Care

For each of these variables, we will briefly discuss previous findings and, where appropriate, the formulation of the variable as used in this study.

CHARACTERISTICS OF THE ILLNESS

Three dimensions of the nature of the illness condition, analogous to the three models of ill health presented earlier, must be considered. An illness may motivate an individual to seek care (1) because of the nature of the underlying disease entity, (2) because he interprets the symptoms as having more or less serious consequences, or (3) because of the influence of role expectations.

The way in which we are defining an episode of illness precludes the incorporation of minor symptoms and conditions having little effect on the individual's normal routine. On the other hand, the episodes, while requiring disruption of usual activity, are by no means all of such a serious nature that we would expect to see no variation in the use of physicians' services. The basis for differentiation between serious and non-serious conditions might be thought of either in terms of medical severity or in terms of implications for the individual. While these are certainly not independent of one another, they nevertheless can be distinguished.

The nature of the condition may so strongly indicate medical attention without delay as to obviate other considerations. This would be most evident in the case of major trauma or onset of a totally incapacitating illness such as massive heart failure. For example, Suchman[14] found in his sample of individuals with serious conditions that 73 per cent "immediately saw the symptoms as indicative of illness." Seventy-five per cent "thought of contacting a doctor immediately." On the other hand, an upper respiratory infection would generally not be expected to evoke an immediate or dramatic response.

[14] Suchman, "Stages of Illness and Medical Care."

Symptoms or conditions might be thought of as more or less serious without regard to the situation in which they occur or the way they are perceived by the individual in a particular instance. Very loosely speaking we might consider this the condition's "objective" or medical severity. But this, of course, immediately raises the question, "serious in whose judgment and judged by what criterion?" To translate the idea of medical severity into operational terms, we have employed physician ratings of the illness descriptions using as a criterion whether or not a condition or symptoms indicated[15] a physician visit. The ratings were to be made without regard to the circumstances surrounding the condition (for example the *respondent's* perception of its seriousness or whether a doctor was, in fact, contacted).

It is important to note that we are considering conditions or unlabeled configurations of symptoms on which the judgment as to severity is made without regard to the situational factors surrounding a particular instance of the condition nor with regard to the individual's perception of the situation. Rather, we are saying if one compares people who experience the symptoms of an acute eye disease which physicians consider serious with those experiencing the symptoms of a routine upper respiratory infection it should be possible to predict with some confidence which group more often sought care.

The symptoms or conditions causing the episode are expected to influence the response process in two ways. Most obviously, the more serious conditions (medically judged) will be associated with greater use of physicians' services. In addition, however, the seriousness of a condition is expected to *interact* with other factors influencing use. When a condition is not serious, the response process will be influenced by not only the nature of the condition but also social-structural and other variables. On the other hand, when the condition is serious, the influence of other factors on the response is minimized.

Most research on use of physicians' services, as we have noted, has aggregated units of use and illness over time and the findings, therefore, may not be consistent with observed episode behavior. Nevertheless, the general conclusion of these studies is that patient behavior is primarily determined by illness.[16]

Results of the 1963 CHAS-NORC national study reported by Andersen[17]

[15] See page 35.

[16] See, for example, Ronald Andersen, *A Behavioral Model of Families' Use of Health Services* (Chicago: University of Chicago, Center for Health Administration Studies, Research Series No. 25, 1968).

[17] Ronald Andersen and Odin W. Anderson, "Family Life Cycle and Use of Health Services," paper presented at the meetings of the American Sociological Association, September 2, 1965, pp. 14–15.

indicate that apart from family size, illness explains the most variance in *families'* use of physicians' services. Of greater interest, however, was the finding that illness interacts with other predictors. Andersen concludes:

> Very sick people in our society apparently receive care regardless of family structure or socio-economic conditions. However, when there is less illness, stage of family resources, and other social characteristics become more important determinants of care patterns. The proportion of family health care that is socially defined as "discretionary" as opposed to "necessary" varies inversely with degree of illness. It is in understanding this portion of care that the tools of the sociologist prove most effective.[18]

One of the weaknesses of utilization studies using annual measures is that the measures of illness used combine the effects of the underlying medical condition and the individual's response to that condition (e.g., number of disability days). By studying episodes, we can make the distinction between the general characteristics of a condition and the response to a particular instance of a condition. Having differentiated between those with conditions medically defined as serious and not serious, we can then examine the influence of differences in perceived seriousness within the two groups. The perceived seriousness dimension is analogous to our earlier definition of illness as opposed to medically defined disease.

A person may perceive a particular instance of illness as more or less serious depending on a variety of factors. Within medically defined serious and not serious categories, early symptoms may vary in terms of visibility, familiarity, and intensity. Individuals' tolerance levels vary depending on both psychological and situational factors. Even the mechanisms which precipitate a response are subject to systematic variation. For example, Zola has identified five triggering mechanisms which show the variety of ways illness can precipitate contact with a physician. He observes that, "most impressive in the study of the decision to seek medical aid was the relative lack of importance of the symptoms themselves in this process."[19] Rather, he found that interference with interpersonal relations, valued social activities, or vocational or avocational activities often triggered seeking medical care. The two other "triggers" were "the presence of sanctioning," that is, being told to go, and finally, "the nature and quality of the symptoms."

As we are examining use of services for an entire episode, we must think of perceived seriousness in two senses: the initial perception, which we

[18] *Ibid.* See also Esko Kalimo, *Determinants of Medical Care Utilization* (Helsinki: Research Institute for Social Security, National Pensions Institute, Finland, 1969).

[19] Irving Kenneth Zola, "Illness Behavior of the Working Class: Implications and Recommendations," in *Blue Collar World*, ed. by Arthur Shastak and William Gomberg (Englewood Cliffs, N.J.: Prentice Hall, 1964), p. 353.

would expect to influence behavior in the early stages of the episode, and perception, or judgment, of the seriousness as the illness progressed. The initial perception of severity will be measured by the respondent's recollection of how serious he thought the illness was when it was first noticed. Subsequent perception of severity will be inferred from the person's behavioral response in terms of activity restrictions. Specifically, we will use as the measure of seriousness from the individual's perspective the number of days spent in bed as a result of the illness.

As we stated above, three dimensions of the nature of the illness must be considered as potential influences on seeking medical care. We have introduced two dimensions—general condition severity as medically rated and the severity of a particular instance of illness as perceived by the individual. The third dimension is the influence of social expectations regarding the "appropriate" response. Particularly when the study population tends to be lower class as in this study, it is important to consider differential expectations with respect to the appropriate response to illness. We noted earlier that an important element of the sick role, in Parsons' view, is the obligation of the sick person, or those responsible for his care, to seek the care of a physician to the degree that spontaneous forces cannot be expected to operate adequately and quickly. "The urgency of the need for help will vary with the severity of the disability, suffering, and risk of death or serious, lengthy or permanent disablement."[20]

The underlying assumption of the obligation to seek care is that responses can be ordered along a unidimensional scale of severity. On the other hand there is evidence that responses on behavioral expectations toward sickness in fact divide into two clusters; one when prognosis is serious and uncertain, the other when health is impaired but the prognosis appears non-serious.[21] With respect to the former, there is a consistent tendency to treat the individual as dependent, while in the other case there is "a tendency to encourage the ill person to be independent in regard to personal care and social responsibility and at the same time a *tendency to encourage him to seek medical care*" [emphasis added].[22] Thus, even though for two of the three role relationships the behavioral expectation is quite different for persons occupying what Gordon calls the impaired role than in the sick role, there does not seem to be a difference with respect to seeking physicians' services. The expectation with regard to seeking care, it should be added, is a function of the seriousness of the prognosis. No difference was found between low-income and higher-income persons with respect to behavioral expectations toward seeking care.

[20] Parsons, *The Social System*, p. 440.

[21] Gordon, *Role Theory and Illness: A Sociological Perspective*, chapter v, pp. 71–96.

[22] *Ibid.*, p. 77.

Gordon described hypothetical sickness situations in his study. Another approach is to ask respondents whether or not a doctor should be seen for each of a list of symptoms. This approach has yielded conclusions similar those of Gordon—namely, that there is substantial agreement across various groups in the society (professional-lay, higher-lower income, welfare mothers-national sample) whether or not a doctor *should* be seen given certain symptoms.[23] Virtually universal agreement on the desirability of preventive measures for children has also been found across the social-structural variables of mother's education and racial ethnic group.[24] Finally, Andersen found that the individual differences in attitudes toward the appropriate response to symptoms that do exist do not seem to explain variation in use of physicians' services at least in the United States.[25]

The findings on the effect of illness on use of physicians' services suggest the following formulation. A medically defined condition may be classified (by a physician) as more or less serious using as a criterion whether or not it generally warrants a doctor's attention. The condition's seriousness interacts with other predictors of use in such a way that seriousness becomes of almost singular importance when the condition is very serious. Given a medically defined condition, situational and attitudinal factors will result in a particular episode of the condition being perceived as more or less serious by the individual and resulting in more or less restriction of activity (for example, staying in bed). These perceived seriousness indicators may also interact with other factors influencing use of services. Finally, the sick role expectation that a person seek professionally competent help is so widely accepted that its usefulness in explaining differences in behavior is limited.

USUAL ACTIVITY

The alternatives to being sick are closely related to the influence of illness characteristics on response behavior. Just as we considered the general seriousness of illness conditions, we can also identify a set of mutually exclusive usual activities which characterize the individual's principal economic function when he is not sick. The major categories would be work, housekeeping, school, and pre-school.

The influence of a medically defined serious condition (that is, one "requiring" the attention of a doctor) on actual medical care behavior probably varies depending on the cost to the family of the person remaining

[23] Jacob J. Feldman, *The Dissemination of Health Information* (Chicago: Aldine Publishing Company, 1966), p. 61; and unpublished cross-tabulations, see Robert Lejeune, "Illness Behavior among the Urban Poor" (unpublished Ph.D. dissertation, Columbia University [Sociology], 1968), p. 142.

[24] Warren F. Dodge, *et al.*, "Patterns of Maternal Desires for Child Health Care," *American Journal of Public Health*, LX (August, 1970), 1421–29.

[25] Ronald Andersen, *A Behavioral Model of Families' Use of Health Services*, p. 49.

sick. Nagi has pointed out that ". . . [it] would seem conceptually unsound and empirically fruitless to approach sickness, illness, and disability as roles in themselves. They may be better defined as conditions, and analyzed in terms of their impacts on the performance of normal roles characteristic of the system"[26] (e.g., family roles).

While there is no clear evidence suggesting the relative importance of sickness in motivating individuals to seek care given different usual activities, it seems reasonable to expect that differences exist. Short of total disability, the consequences of having the husband and main earner unable to carry on his usual activity would probably be seen as more detrimental to the family than similar disability of the wife and mother when she does not work. The mother can carry on some functions as long as she is in the home. Both would probably be considered more consequential, instrumentally at any rate, than inability of a child to carry on his usual activity.[27]

The way usual activity fits into our model will be discussed in more detail below, but briefly, we will estimate the relationships between perceived severity, social structural characteristics, economic resources, and regular source of care on the one hand and the elements of episode behavior on the other for *each* of eight sub-groups of the population. These sub-groups are defined in terms of combinations of medically defined seriousness and usual activity. Before describing the model, however, we will introduce the poverty-related independent variables.

SOCIAL STRUCTURAL CHARACTERISTICS

The poor in this country are not a homogeneous group. Nevertheless, there are characteristics of social structure that are strongly associated with poverty. Two such characteristics, race-ethnicity and education, have also been associated in the literature with under-utilization of medical care.

The reactions of the individual to evidence of illness as we have noted are ordered by his particular understanding of the symptoms as well as

[26] Saad Z. Nagi, "Some Conceptual Issues in Disability and Rehabilitation," in *Sociology and Rehabilitation*, ed. by Marvin B. Sussman (Albany, N.Y.: American Sociological Association, 1965), p. 105.

[27] We see some evidence for this ranking in Koos' study of illness behavior in Regionville. Koos (Earl L. Koos, *The Health of Regionville* [New York: Columbia University Press, 1954], p. 35) quotes a respondent who observed, "If something was wrong with my husband, we'd get it fixed right away. He earns the money, and we can't have him stop work. I can drag around with housework, but he can't drag around and still earn a living." With respect to children, Freeman and Simmons (Howard E. Freeman and Ozzie G. Simmons, *The Mental Patient Comes Home* [New York: John Wiley and Sons, 1963]) found in a study of successfully released mental patients that low levels of interpersonal performance are tolerated most successfully in parental families in which the released patient occupies the "child" status (although he may be an adult). They note that the role of the child is the only social-biological role without expectations of instrumental performance. Rather, the role consists largely of affective relations with parents.

meaning attributed to them by virtue of his membership in various social groups. Similarly with respect to seeking and obtaining care, identification with a group of similar racial or ethnic background can be expected to influence the individual's behavior. There are a variety of mechanisms by which such constraint or influence might be effected.

For example, social group factors such as ethnic exclusivity have been found to be associated with medical orientation such as skepticism of medical care.[28] Similarity, mechanisms which "trigger" help-seeking behavior vary among ethnic groups as does the meaning of pain, but these facts do not directly answer the question of differential use of physicians' services by racial-ethnic groups.

In this study, we will distinguish among Negroes, Puerto Ricans, and "other" whites (predominantly Italians). There is no sound basis for expecting "other" whites to seek care more readily than Negroes despite what the popular literature would lead one to believe.[29] While it is true that non-whites use considerably fewer services nationally, controlling on income, these data are heavily influenced by non-urban and particularly southern populations.[30] In addition, differences even within an urban area are probably heavily influenced by differential use of preventive services. A study of pediatric users of a prepaid group practice unit, for example, found that white patients had slightly more visits for health supervision than for acute conditions, while for Negroes, there were two acute condition visits for every preventive visit.[31]

On the other hand there is some basis in predicting greater use by both "other" whites and Negroes than by Puerto Ricans. In a sample of welfare recipients in New York City, at every level of reported health, Puerto Ricans had substantially fewer visits over the course of a year than Negroes.[32] Further, Negroes who defined themselves as being in poor health and having eight or fewer years of formal education had as many visits

[28] Edward A. Suchman, "Socio-Medical Variation among Ethnic Groups," *American Journal of Sociology*, LXX (November, 1964), 319–31.

[29] This is not to say that we would not expect to find differences in the nature of the medical care process comparing "other" whites and blacks. See for example Leon S. Robertson, *et al.*, "Race, Status and Medical Care," paper presented at the annual meeting of the Society for the Study of Social Problems, San Francisco, August, 1967.

[30] National Center for Health Statistics, Series 10, No. 49: *Volume of Physician Visits, United States: July, 1966–June, 1967*, U.S. Department of Health, Education, and Welfare, 1969; William C. Richardson, "Poverty, Illness, and Use of Health Services in the United States," *Hospitals: Journal of the American Hospital Association*, XLIII (July 1, 1969), 34–40.

[31] Robert L. Nolan, Jerome L. Schwartz, and Kenneth Simonian, "Social Class Differences in Utilization of Pediatric Services in a Prepaid Direct Service Medical Care Program," *American Journal of Public Health*, LVII (January, 1967), 34–47.

[32] Lejeune, *Illness Behavior Among the Urban Poor*, p. 192.

as Puerto Ricans who had completed high school. Thus, sub-cultural factors were apparently operating.

Apart from sub-cultural norms, although not unrelated, is level of sophistication. Acceptance of the utilization norm, as we saw above, is very widespread in the United States. When people are asked what ought to be done in light of various symptoms, there is a strong tendency among all classes to respond in favor of seeing a doctor. On the other hand, knowledge about illness is strongly influenced by level of formal education as is the likelihood of actually behaving in a fashion consistent with beliefs. Knowledge about illness appears to be related to intellectual curiosity about medicine (as opposed to simply concern over one's health).[33] Although education is but one of the components that usually make up measures of socio-economic status, it is important to note education's major contribution to medical sophistication. Feldman found that "in the relatively rare instances in which occupation, income, and education are not congruent with each other, education is by far the strongest correlate of knowledge."[34]

It has been argued that the ignorance of those with low socio-economic status is a major factor in their under-utilization of medical services.[35] (Lejeune, on the other hand, found it to be a quite minor factor among welfare mothers.)[36] A study of socio-economic status and participation in a polio vaccine trial found substantial class differences which appear to be largely related to level of medical sophistication resulting in turn from the formal education level of parents.[37] The polio vaccine program studied is particularly interesting because cost was not a factor. However, it involved *preventive utilization* rather than the use of physicians' services in response to sickness.

The central questions to be answered here are: is membership in a particular racial-ethnic group and level of formal education associated with likelihood of seeking medical care? If so, are these associations attenuated with respect to subsequent care because of the individual's incorporation into the medical-care system once contact has been made? Before discussing the nature of medical-care providers, however, we will introduce the factor of economic resources.

[33] Feldman, *The Dissemination of Health Information.*

[34] *Ibid.*, p. 109.

[35] See for example Eliot Freidson, *Patients' View of Medical Practice* (New York: Russell Sage Foundation, 1961), p. 148.

[36] Lejeune, *Illness Behavior among the Urban Poor.*

[37] Leila C. Deasy, "Socio-Economic Status and Participation in the Poliomyelitis Vaccine Trial," *American Sociological Review*, XXI (April, 1956), 185–91.

Here, practice is dependent upon organizational auspices and equipment. The client's efforts at control are most likely to take the form of evasion. The events of the referral process being systematically recorded and scrutinized, and ordered by hierarchical supervision, the practitioner is highly vulnerable to his colleagues evaluations: we should expect him to be most sensitive to professional standards and controls and least sensitive to the expectations of his patient.[43]

In looking at the process involved in care-seeking behavior one would suspect from Freidson's work that a person's usual source of care would be an important factor. A large, complex, impersonal outpatient clinic at one extreme (compared to the neighborhood general practitioner) is likely to repel the potential patient. On the other hand, once contact has been made it might be predicted that lack of dependency on the patient's good will, which is characteristic of clinics and to a lesser degree specialists, will lead to care based more on professional standards than client desires. The implicit assumption is that the patient wants fewer visits and less complexity other things being equal.

If our measure of use of physician services were volume over a period of time, it is not clear how we could sort out the conflicting effects of usual source of care. To what degree would the retarding effects of the clinics in terms of delay and initial contact be offset by the increased visits and complexity of care received once a person is within the professional referral structure? By studying utilization as a process, we are able to make such distinctions.

MODEL AND HYPOTHESES

In this section we will integrate the findings and interpretations that have been presented into a model that can be tested. It is a less parsimonious model than one might wish, but this seems to be accounted for primarily by the complex nature of the problem under study. The elements of the response process—*delay*, *initial physician contact*, *revisits*, and *amount of care received* are considered as four dependent variables. For each dependent variable, we will consider the effects of (1) perceived seriousness, (2) race-ethnicity, head's education and adjusted current income,[44] and (3) regular source of medical care, for each of eight groups defined in terms of the physician rated seriousness of the condition and the person's usual activity.

Considering first the response process, when a person observes symptoms of illness one way of handling the situation is to do nothing. More often

[43] Freidson, "Client Control and Medical Practice," *American Journal of Sociology*, LXV (January, 1960), p. 380.

[44] This measure (and the others) will be discussed in Chapter III, but briefly it is current family income adjusted for family size.

than not, the problem will be self-limiting.[45] For conditions more obviously of a serious nature and for persistent symptoms, he may seek care fairly promptly or may delay and then contact a doctor.[46] The amount of discretion enjoyed by the individual is probably greatest with respect to delay, while being somewhat less in terms of ultimately seeing a doctor.

Having made the initial contact, the patient in a sense loses the decision-making autonomy which characterizes the early stages of the process. He has placed himself in the position of receiving authoritative advice as to whether the initial visit is sufficient or whether, on the other hand, additional visits are indicated. Of course, he retains some discretion in that, even if told to do so, he can fail to return to any doctor or can contact another one. (This aspect of compliance will be considered in the analysis.) But generally speaking, the patient has moved into the "professional referral structure."

Finally, the patient may receive nothing more than examination, management, or advice, on the first or subsequent visits, or he may be given medication or a complex assortment of tests and X-rays extending over several visits. His discretion is at low ebb in terms of this element of the therapeutic process. Particularly in the highly bureaucratized outpatient clinic, but even in the case of the general practitioner or other primary physician in solo practice, use of medical services such as prescriptions are at the discretion of the physician who makes his judgment largely in the context of the disease model.

Next we turn to a consideration of the factors influencing the response process, starting with the condition causing the episode and the individual's principal alternative to being sick—namely, his usual activity. The combination of condition and usual activity influences the response process in two ways. First, it sets some general boundaries on the level of response. At the extremes we might compare a school child's cold with a wage earner's coronary. But second, these combinations interact with the social and economic factors in such a way as to substantially attenuate their effects moving from less severe conditions experienced by less instrumentally important family members to serious conditions of the main earner.

The rationale for considering these groups separately in terms of analyzing the effects of the other variables is two-fold. First, it permits us to

[45] Alpert *et al.* (Joel J. Alpert, John Kosa, and Robert J. Haggerty, "A Month of Illness and Health Care among Low Income Families," *Public Health Reports*, LXXXII [August, 1967], 705–13) analyzed data taken from health diaries kept by a sample of 78 lower-income urban families, and found that over half the individuals (410 persons lived in these 78 families) had symptoms during the month. For only 10 per cent of the symptoms was a physician contacted.

[46] It will be recalled that in the case of Suchman's sample of persons with serious conditions, three-fourths immediately thought of contacting a doctor.

assess the importance of perceived seriousness in a particular instance of a condition independent of the effects of "objective" severity. Second, it takes account of the interaction anticipated on the basis of earlier findings.

The degree to which this approach reflects reality is not necessarily congruent with its analytical usefulness, of course. On the other hand, in many instances it is probably not a bad reflection. The distinction between the general severity of a condition and its perceived seriousness given a particular episode is often made. Consider, for example, the following kinds of hypothetical statements: "It was just a cold, but was I sick," or alternatively, "I sprained my back, but it didn't bother me too much and, anyway, the kids were home from school."

Within the context of a condition and usual activity, the most important predictor of use is this factor of perceived severity. In the early stages of illness it takes the form of thinking the problem is serious or not serious, while later it may be reflected in the form of remaining in bed or remaining away from one's customary activities. Initial perceived seriousness, it is suggested, will be a strong predictor of delay and initial contact, while restriction of activities (in general as opposed to usual activity) will be a strong predictor of revisits and the amount of care received.

Certain characteristics of an individual may inhibit use of physicians' services. Four such factors that have been given considerable attention formally and are more or less taken for granted in popular writings are little formal education, membership in certain racial-ethnic groups, low income and less comprehensive third-party coverage. We might substitute for at least education and income some single predictor of social class such as occupation; however, because of education's unique importance in the medical-care decision and economic poverty's wide use as an indicator of medical deprivation, it has been decided to approach social class by examining the influence of these predictors separately.

If, in fact, these characteristics influence use of services in a situation in which the financial barriers have been largely removed through third-party coverage, one of the most interesting questions is will they exert their influence uniformly across sickness situations (that is condition and usual activity combinations) and across all stages of the response process? Our model would suggest not. Rather, we will more often observe associations between these variables and the elements of use for non-serious than serious conditions and for more instrumentally than less instrumentally important family members. In addition, it is suggested, as a person moves from the earliest stage in the episode to the later stages his discretion is diminished and, therefore, the importance of these characteristics is attenuated. As an example, the difference in behavior between a person having little formal

education and one having more will be greatest with respect to initial delay and least in terms of amount of care received.

Usual source of care differs from the preceding variables in two important respects. First the direction of the association with the elements of the response process is not expected to be uniform. In the case of education, for example, lower education is thought always to act as an inhibitor of use (greater delay, less likelihood of initial contact, less likelihood of revisits, and perhaps less care). The effects of regular source on the other hand will be in opposite directions comparing behavior leading up to initial contact and subsequent use of services. If we rank sources according to lack of congruence with lay conceptions (or, conversely, congruence with the professional culture), we would place the public clinic at one extreme and the solo general practitioner at the other. Having a clinic as one's usual sources, then, it is predicted, would tend to cause greater delay and less likelihood of initial contact (relative to other sources), but it would also tend to increase the likelihood of revisits and complex care.

This model of use of physicians' services in response to sickness can be thought of in the form of a set of testable hypotheses. These are presented below. Some factors which seem to be at a somewhat different level of abstraction have been ignored in this chapter. This has been done primarily for conceptual clarity rather than their lack of importance. Examples of such factors are lay consultation and influence, and compliance with the physician's instructions. We will introduce variables such as these at various stages in the analysis as they are seen as either mechanisms by which central variables operate (e.g., compliance) or are already incorporated to some degree into the major variables (e.g., age).

The following hypotheses will be tested:

I

A. The severity of the condition(s) causing the episode as measured by physician rating will be related to each element of the response process. Severity will be directly related to the probability and number of physician visits, and the amount of care received; and inversely related to the number of days of delay preceding initial contact.

B. The severity of the condition(s) causing the episode as measured by physician rating will be more strongly related to amount of care than to delay.

II

The instrumental importance of the individual's usual activity will be inversely related to number of days of delay, directly related to probability of initial visit, but not related to revisits and amount of care.

III

A. Level of household head's education will be related to each element of the response process; directly with the probability of initial contact, revisits, and amount of care received; and inversely with number of days of delay preceding initial contact. Level of education, however, will be more strongly related to the probability of initial contact and number of days of delay than to revisits and amount of care received.

B. Race-ethnicity will be related to each element of the response process. Puerto Ricans will be less likely than Negroes who in turn will be less likely than other whites to have an initial visit or revisits, or complex care and will be more likely to delay before making initial contact with a physician. The relationships with initial contact and delay, however, will be stronger than those with revisits and amount of care received.

C. Level of adjusted income will be related to each element of the response process; directly with the probability of initial contact, revisits and amount of care received; inversely with number of days of delay preceding initial contact. Level of adjusted income, however, will be more strongly related to the probability of days of delay than revisit and amount of care received.

D. Third-party coverage will be related to each element of the response process. Ordered by comprehensiveness of coverage for ambulatory services (no coverage, voluntary health insurance, governmental programs [Medicaid and Medicare, Part B]), third-party coverage will be related directly with initial contact, revisits, and amount of care received; and inversely with number of days of delay.

E. Usual source of care, ordered from least to most institutionalized, will be inversely related to the probability of initial contact and directly related to number of days of delay; but directly related to number of revisits and amount of care received.

IV

Association between perceived seriousness, bed disability days, race, education, third-party coverage, income, and usual source of care on the one hand and delay, physician visits and amount of care on the other, will be observed more often when the condition causing the episode is less serious; and when the usual activity is less instrumental.

CHAPTER III

RESEARCH SETTING AND SAMPLING METHOD

In this chapter we will describe the neighborhood in which the study was conducted and its population. In addition, we will consider some methodological questions and provide operational definitions of the independent variables.

THE AREA AND POPULATION

The neighborhood selected for study is a section of Brooklyn, New York, called Red Hook.[1] Red Hook is one of several "target areas" of neighborhood health centers sponsored by the Office of Economic Opportunity (OEO) which were surveyed prior to the centers' opening. The reasons for choosing the data from this particular neighborhood are elaborated below. Briefly, however, Red Hook offers a variety of providers of health services, has a relatively stable population with sizable proportions of three major racial-ethnic groups, and has a fairly broad range of family incomes and educational levels. In addition, being located in New York, health insurance coverage (including governmental programs) is prevalent.

The Red Hook neighborhood is comprised of three identifiable geographic areas. The first is a large concentration of public housing, called the Red Hook Homes. It is one of the oldest Housing Authority projects in the city of New York having been built in the late 1930's. Slightly over 40 per cent of the families in the target area live in this public housing.The second area, separated from the remainder by an expressway, is an ethnic neighborhood which is predominantly Italian working class. The second area is characterized by neat rows of single-family dwellings and contains about 35 per cent of all families. The remainder of the Red Hook target area is made up primarily of dwellings originally intended for single- or two-family occupancy many of which now are multiple-family dwellings. Socio-economically, this area is similar to the housing project, but has a much higher concentration of Puerto Rican families.

The Red Hook population of approximately 25,000 persons is divided among three broadly defined racial-ethnic groups. Twenty-six per cent of the population is Puerto Rican,[2] 43 per cent is "other white," while 30 per cent of the population is Negro. The relative stability of the population is

[1] The area is coterminous with Census Tracts: 55, 57, 59, 65, 85, and 93.

[2] Actually, the group called Puerto Rican in this study is made up of 97 per cent Puerto Rican and 3 per cent other Latin.

seen by the fact that more than three-quarters of the population (77 per cent) have lived in the area for longer than five years and close to two-thirds (62 per cent) have lived in Red Hook for more than ten years (reference, Table 1).

Five per cent of the population had moved into the neighborhood within the year preceding the interview. Nine per cent had moved into the neighborhood in each of the two-year periods from one to less than three, and three to less than five years before the interview. These figures *suggest* not only considerable stability, but also a relatively small change in the rate of movement into the neighborhood over the last five years. About 5 per cent

TABLE 1

LENGTH OF RESIDENCE IN NEIGHBORHOOD OF HOUSEHOLDS BY RACIAL-ETHNIC GROUP

(Per Cent)

Length of Residence	Puerto Rican	Other White	Negro	Total
Under 1 Year ..	9	2	6	5
1-<3 Years	17	3	11	9
3-<5 Years	12	5	14	9
5-<10 Years ...	16	9	24	15
10+ Years	46	81	46	62
Total	100	100	101	100
N	(329)	(712)	(455)	(1,506)

Table N 1,506
Total N 1,506

of the families seem to have moved into the neighborhood in each of the five years. Considering the racial-ethnic groups separately, we see that recent in-migration is most characteristic of Puerto Ricans and least characteristic of "other" whites. Even Puerto Rican families, however, tend not to be very recent arrivals. Almost half of both Puerto Rican and Negro families (46 per cent in both cases) had lived in Red Hook for at least ten years.

The target area has been classified by the Office of Economic Opportunity as "low-income." "Low-income area" is a term with many connotations. It may be used euphemistically to refer to black ghettoes, but it is also used to identify neighborhoods comprised of working class whites. If nothing else, one would expect that at least all such areas would contain a predominance of families with incomes below the official poverty line. In fact, even this criterion is probably not often met.[3]

[3] In another survey in the series, for example, a black area in a Southern city was thought by those responsible for the medical care program to contain a population with at least 75 to 80 per cent below the poverty line. The proportion turned out to be 35 to 40 per cent. See William C. Richardson, *Neighborhood Health Center Survey: Atlanta, Georgia* (Chicago: University of Chicago, National Opinion Research Center, 1969).

Twenty-three per cent of the Red Hook population are in families with incomes below the poverty line.[4] This figure is approximately twice the proportion of the United States population classified as poor. Table 2 shows the distribution of families in the United States by 1967 annual income compared to a similar distribution for Red Hook families. About two-thirds (66 per cent) of the families in the United States had incomes below $10,000 in 1967 in contrast to 95 per cent of the families in Red Hook. While approximately the same proportion in the two populations had incomes between $5,000 and $10,000, a disproportionately large

TABLE 2

DISTRIBUTION OF FAMILIES BY 1967 INCOME UNITED STATES AND RED HOOK

(Per Cent)

1967 Income	United States[a]	Red Hook[b]
Under $999	2.1	2.8
$1,000–1,999	4.4	16.3
$2,000–2,999	6.0	12.3
$3,000–3,999	6.3	10.8
$4,000–4,999	6.5	13.2
$5,000–9,999	40.4	39.3
$10,000+	34.4	5.3
Total	100.1	100.0
N		(1,484)

[a] SOURCE: U.S. Department of Commerce, Bureau of Census, *Current Population Reports*, Series P-60.

[b] Excludes 22 indeterminate cases after estimation of refusals and Don't Know cases. See Appendix I for a description of the estimation procedure used.

percentage of Red Hook families had annual incomes between $1,000 and $5,000 compared to the United States population as a whole.

Red Hook then may be classified as a low-income area. On the other hand, there is sufficient variation in family incomes to permit us to compare the behavior of the poor (using the usually accepted income criteria) with higher-income persons. While the income distribution tends to be truncated at the $10,000 level, our interest, as will be discussed below, is not so much in comparing the behavior of the affluent with that of the poor, but

[4] See page 132 below for a description of the official poverty line used in this study.

rather it is in the effect of poverty-related variables within a low-income area.

We have seen that the Red Hook population is a fairly stable one with three racial-ethnic groups and a reasonable range of family incomes. As we are also interested in the effects of usual source of medical care, it is important that the study population use both hospital clinics and private practitioners. Table 3 shows the proportion of the population reporting each of these alternatives by adjusted current income.[5] Adjusted current income is the distance of a family's current income from the poverty line

TABLE 3

USUAL SOURCE OF CARE BY ADJUSTED CURRENT INCOME
(Per Cent)

USUAL SOURCE OF CARE	INCOME					
	Deficit $1,000+	Deficit $1,000–Surplus <$1,000	Surplus $1,000–Surplus <$3,000	Surplus $3,000–Surplus <$5,000	Surplus $5,000+	All Incomes
Private Practitioner	55	60	69	80	90	71
Hospital Clinic	35	33	21	13	6	22
None	10	7	9	6	4	7
Total	100	100	99	99	100	100
N	(344)	(1,561)	(1,495)	(919)	(945)	(5,264)

Table N	5,264
Don't Know Source	5
Total N	5,269

for a family its size. "Deficit" indicates an income below the poverty line and "surplus" indicates an income above the line.

As may be seen in Table 3, 71 per cent of all individuals reported a private practitioner as their usual source of medical care, while 22 per cent reported a hospital clinic as their source. Seven per cent had no usual source or reported a non-physician source.

Relying on a hospital clinic is clearly related to income with persons in low-income families much more likely to report this source. However, even among the lowest income group, more than half indicated a private practitioner as their usual source of medical care. Considering the upper end of the income distribution, nine out of ten individuals reported using

[5] For a description of this measure, see Appendix I.

a private practitioner as their usual source but a small proportion even in this relatively high-income group indicated use of a hospital clinic.

Finally, for this brief description of key population characteristics, mention should be made of the availability of third-party coverage including voluntary health insurance, Medicare (Part B), and Medicaid. In order to determine the effects of social-structural variables such as head's education and race, and the effects of usual source of medical care on the use of physicians' services, one would ideally seek a population for which the price of medical care at the point of delivery was close to zero. In low-

TABLE 4

THIRD-PARTY INSURANCE COVERAGE BY ADJUSTED CURRENT INCOME
(Per Cent)

THIRD-PARTY COVERAGE	ADJUSTED CURRENT INCOME					
	Deficit $1,000+	Deficit $1,000–Surplus <$1,000	Surplus $1,000–Surplus <$3,000	Surplus $3,000–Surplus <$5,000	Surplus $5,000+	All Incomes
Medicare (Part B)	3	13	3	2	2	6
Medicaid	78	52	31	12	4	32
Voluntary Insurance	8	16	43	65	69	40
No Coverage	11	19	24	20	24	21
Total	100	100	101	99	99	99
N	(344)	(1,558)	(1,485)	(915)	(945)	(5,247)

Table N	5,247
Indeterminate Coverage	18
Indeterminate Coverage and Income	4
Total N	5,269

income areas, however, one generally finds a disproportionately large segment of the population (compared to the United States population) with no form of third-party coverage. Two states, New York and California, on the other hand, provide comprehensive Medicaid coverage to a substantial proportion of the low-income populations in their states. As a result, low-income areas in these two states are most likely to approach the ideal of zero price at point of delivery.

Table 4 shows the distribution of third-party coverage by adjusted current income. Considering the Red Hook population as a whole, 21 per cent report no form of third-party coverage. Thus, even with a pervasive Medicaid program, there is still a sizable segment of the population

which does not have the benefit of any health-insurance type of mechanism. Approximately equal proportions of the population are covered under government programs (Medicare and Medicaid) and voluntary health insurance with each accounting for about 40 per cent of the Red Hook residents. Persons whose families' incomes are below the poverty line are much more likely to be covered by governmental programs (78 per cent compared to 27 per cent of those in higher income families), while half of those persons who are above the poverty line reported coverage under voluntary health insurance compared to only 8 per cent of "poor" individuals. (Summary figures are not shown in the table.) Finally, persons in poor families are only half as likely to report no coverage of any kind.

To summarize this section, the Red Hook population may be characterized as quite heterogeneous considering that it is concentrated in one relatively small "low-income area." The population is a fairly stable one with a mix of three racial-ethnic groups—Ethnic (predominantly Italian) whites, blacks, and Puerto Ricans. Family incomes tend to be low relative to national figures, but range above $10,000. There are available in the area both private practitioners and hospital clinics. A majority of the population report dependence on a private practitioner as their usual source of medical care, although even in the highest income group a small proportion report the use of hospital clinics. Finally, four-fifths of the population has some form of third-party health insurance coverage with persons in poor families somewhat more likely than the remainder of the population to be covered.

SAMPLING METHOD

The data to be used to test the hypotheses in this study come from a household interview survey of the non-institutionalized, civilian population of Red Hook. As noted earlier, the survey was one of several health surveys conducted by the National Opinion Research Center as part of the program planning and evaluation efforts of the Office of Health Affairs, Office of Economic Opportunity. The author in designing the questionnaire for these surveys was naturally constrained in some measure by the objectives of the government in sponsoring them. At the same time, however, much of the questionnaire was consistent with the data requirements for this monograph, and parts of the questionnaire were designed with this research specifically in mind.

There are both advantages and problems associated with using data from a population living in a relatively small geographic area. The two principal advantages are that first, the researcher can gain some first-hand knowledge of and one would hope insights into the population and their medical care resources. This opportunity is lost when, for example, a

national sample is employed. Second, we are able to study a population having essentially the *same set of health service resources.*

The Red Hook area like others surveyed in this program had been selected for the operation (subsequent to the surveys) of experimental neighborhood health centers. This is but one approach to the solution of the problems of providing medical care to the urban poor. The direction that public policy will move is to some degree dependent on the assumptions made regarding the factors influencing illness behavior, not in the population as a whole, but in the populations within circumscribed areas classified as having low income.

The most obvious problems associated with testing propositions using data on a population living in a small geographic area are lack of heterogeneity and the generalizability of the findings. Lack of heterogeneity can be thought of in the following way. The range of the variables which we think are important in explaining variation in use of physicians' services can be no greater and are probably less than that which would be observed for any larger population.[6] Further, one would expect to observe a tendency for observations to cluster. Consider, for example, the income distribution shown above. If we are interested in the association between income and use of services in a limited geographic area, selected because it has been categorized as low-income, then we must accept the fact that most individuals will fall at the lower end of the scale and whatever association we observe will most likely be smaller than the association obtaining for, let us say, the United States population as a whole.

A second problem which arises when data are drawn from a circumscribed geographic area is that of generalizability. The characteristics of other urban populations and the configurations of health services available to them clearly do not mirror those found in Red Hook and the findings in one community cannot be directly applied to others. It might seem that a national sample would be more suitable. It would certainly resolve the first problem mentioned above; however, it can be argued that findings from a national sample cannot be applied to a local situation. The findings of this study based on the Red Hook sample will provide a base for subsequent analysis of other OEO target area data collected in the series of studies that is underway.

The sample drawn for this survey was a full probability sample of the non-institutionalized, civilian population. We followed standard area probability sampling methods. The method used was two-stage cluster sampling with selection probabilities proportional to the size of the units. Blocks within the area were selected in a systematic selection scheme with probabilities proportionate to their 1960 population, using Census Block

[6] We assume here that the first population is a subset of the second.

Statistics. An average cluster size of five cases per block was used, reflecting a balance between variance reduction and costs of listing.

The selected blocks were listed completely and dwelling units were then selected using a random starting point and an interval based on the per cent of expected Dwelling Units (given 1960 block statistics) that was actually observed from the listing. The sampling rate within a block was inversely proportional to the probability of the block's selection. Hence, the overall selection rate was constant for all households in the sample, and clusters within blocks tend to be approximately the same size, leading to greater precision of estimation. In summary, the sample is self-weighting.

TABLE 5

RESPONDENT CHARACTERISTICS

(Per Cent)

AGE	MALE		FEMALE		TOTAL
	Head	Other	Head or Spouse of Head	Other	
Under 24	1	1	7	2	11
25–44	4	(b)	37	1	42
45 or older	9	(b)	36	2	45
All[a] ages	14	1	80	5	100
N					(1,506)

[a] Includes Don't Know age (ten cases).
[b] Less than 0.5 per cent.

All persons living in the dwelling unit, whether related to the head or not, were considered part of the household and were included in the sample.[7] Within the household, any knowledgeable family member was eligible to respond, giving information for the entire family. However, proxy responses were not accepted for persons unrelated to the head. In four out of five cases, the respondent was the female head or spouse of head, and in 94 per cent of the cases the respondent was either the head or spouse of head (Table 5).

The completion rate for the survey was 82.3 per cent or 1,506 completed household cases. The refusal rate was 12 per cent. One out of every four interviews was selected for validation. Where possible validations were completed by phone, but when necessary, personal home-visit follow-ups

[7] See Appendix II for a discussion of the effects of intrafamily correlation on the results of the analysis.

were made by survey office personnel. As a result of these second contacts, sixty-five interviews were redone.

OPERATIONAL DEFINITION OF INDEPENDENT VARIABLES

Before turning to the results, we will describe the operational definitions of all the independent variables. For some that are self-explanatory we will simply provide the categories used, while for others we will give a brief commentary on the measure. A more detailed discussion of condition seriousness and adjusted current income can be found in Appendix I.

EPISODE-RELATED FACTORS

Condition Seriousness

Each respondent was asked to give a description of the condition or health problems causing the episode. Using this description and no other questionnaire information, an internist coded the case as serious or not serious using as a criterion whether or not the person should have seen a physician for such a condition (or symptoms) to prevent a worsening of the situation, to speed recovery if the condition is usually debilitating for more than a few days, or to relieve pain if there is usually severe or persistent pain associated with the condition or symptoms. A condition was rated not serious if the above factors did not apply or if the individual might have been helped, but the decision would normally be at the option of the patient.

A second internist and a pediatrician independently rated a randomly ordered sample of condition descriptions. There was substantial agreement among raters. The second internist agreed with the first in 86 per cent of the cases, and the pediatrician agreed with the original internist in 90 per cent of the cases.[8]

The categories of condition seriousness then are (1) serious and (2) not serious.

Perceived Seriousness

The first question in the episode series (after establishing the condition) was, "When you *first* (noticed condition/had the accident), at the very beginning, how serious did you think it was—very serious, fairly serious, not serious at all?" *Perceived Seriousness* is the response to this question.

Bed Disability Days

Bed disability days are the number of days the individual had to stay in bed, all or most of the day because of this particular (condition/accident).

We have combined "bed days" into the following categories: none, 1–2 days, 3–4 days, 5–9 days, and 10+ days.

[8] See Appendix I for a more detailed description of the measure of agreement.

Usual Activity

This variable measures what the person was doing "*most* of the past 12 months." The categories are: Work (wage earners), Keeping House (housewives), School (school children), and Under Age Six (preschool children).[9] The individuals occupying these usual activities are sometimes referred to in the text by the labels in parentheses.

POVERTY-RELATED FACTORS

Education of Head of Household

The categories of head's education are: 0–4 years, 5–8 years, 9–11 years, High School complete, and (any) College.

Racial-Ethnic Group

The categories are Puerto Rican, other White and Black. The variable will generally be called race, and the categories: Puerto Rican, White, and Black.

Adjusted Current Income

Adjusted current income is the difference between the family's current rate of income and the (1968) federal poverty line for a family its size. (For a family of four, the line would be $3,300.) For example, a family of four with an income of $7,000 would have an adjusted current income of +$3,700. Positive amounts are referred to as surpluses (relative to the poverty level) and negative amounts as deficits. The categories are: Deficit $1,000+; Deficit $999–Surplus $999; Surplus $1,000–$2,999; Surplus $3,000–$4,999; and Surplus $5,000+. An individual is assigned his family's income. Unrelated individuals living in families are assigned only their own income.

Third-Party Coverage

Third-party coverage is an individual characteristic as coverage may vary within a family. The categories are: No Coverage, Voluntary Health Insurance, Medicaid (Title XIX), and, for those over age 65, Medicare, Part B (Title XVIII).

Usual Source of Care

An individual's usual source of care is the doctor or place whom the person sees or where the person goes "most of the time when [he] want[s] to see a doctor for himself." Sources are categorized as follows: None, Private Practitioner (Non-Group), Private Practitioner (Group), and Hospital Clinic.

[9] The small group of retired, disabled, and unemployed individuals are usually excluded from our analysis. When included, they are referred to as "other."

CHAPTER IV

ILLNESS EPISODES—FINDINGS

In chapter II, we developed the concept of an illness episode as the means of identifying behavior related to an instance of getting sick. The essential characteristic of the episode, it was stated, which differentiates persons with episodes from persons without episodes is the individual's decision to withdraw from his usual activity for at least two consecutive days. This criterion identifies the existence of an episode but defines neither the onset nor the endpoint of an episode. Having established such activity limitation, it is the illness indicated as causing it that becomes of interest.

In this section, we will provide a more specific definition of the episode by describing the procedure used in the interview itself, and will then indicate the results obtained.

Respondents were asked for each individual if, in the twelve months preceding the interview, the person was kept from going to work (or school or other usual activity) for at least two days in a row because of illness or accident. If so, the interviewer determined how many different times this had occurred. The condition, symptoms, or health problem for each occurrence was then elicited. Attention was next focused on the conditions or symptoms themselves, and the respondent was asked the month and year that each was first noticed. Finally, if there was a *date of onset* within the twelve months preceding the date of interview, the interviewer selected the condition or set of symptoms of most recent origin. All subsequent questions concerning episode-related behavior were in reference to this particular medical condition or set of symptoms.

Thirty-four per cent of the Red Hook sample (or 1,795 individuals) were reported to have had an episode satisfying the criteria outlined above. Approximately half (51 per cent) of the conditions causing withdrawal from the person's usual activity were classified as common colds, ill-defined virus, or influenza. Another 10 per cent were chronic conditions for which the onset of the condition had occurred within the year. The remaining 39 per cent were other acute conditions. The distribution of these other acute conditions is shown in Table 6.[1]

[1] Because of the well-known seasonal variation in the incidence of acute conditions, a larger proportion of Red Hook (most recent) episodes in contrast to episodes in two earlier surveys conducted in another section of Brooklyn (Bedford-Crown) and in Atlanta, Georgia, were "colds and flu." The field work in Red Hook was conducted in the autumn and early winter compared to summer for the earlier two surveys. Consider-

The recording and classifying of symptoms and conditions reflected by Table 6 is useful in two senses. First, such a classification provides an indication of the diversity of illnesses which underlie the response behavior to be subsequently analyzed. Secondly, by recording the respondent's description of what was wrong with the individual, we were later able to obtain a medical judgment as to the seriousness of the illness. On the other hand, two cautions must be emphasized in the interpretation of these

TABLE 6

DISTRIBUTION OF "OTHER ACUTE" CONDITIONS

(Per Cent)

Diagnostic Category		Diagnostic Category	
Measles and rubella	2.0	Acute diseases of the skin	2.6
Whooping cough, chicken pox, mumps	4.3	Lumbago, fibrositis, myositis	0.3
Other acute infective and parasitic diseases	2.0	Other acute musculoskeletal disorders	3.6
Acute diseases of the eye	1.9	Fractures and dislocations	3.9
Acute diseases of the ear	3.3	Sprains and strains	2.2
Other acute upper respiratory conditions	13.1	Open wounds and lacerations	2.7
Tonsillitis	8.6	Contusions and superficial injuries	0.9
Pneumonia	3.2	Reactions and complications due to medical and surgical procedures	0.3
Acute bronchitis	1.9		
Other acute respiratory conditions excluding influenza	3.6	Other injuries, less than three months	12.4
Acute dental conditions	1.6	Acute circulatory conditions	0.1
Functional and symptomatic upper G.I.	1.3	Other acute conditions	4.6
Other acute digestive	8.9	Observations, Diagnosis Tests, but no findings	0.3
Headache, less than three months	1.4		
Acute G.U.	7.2	Total	100.1
Abortions and complications of pregnancy and puerperium	1.9	N	(695)

data, and their rather limited purpose must be kept in mind. First, the illness episodes used as the means to identify differential behavior in the face of "getting sick" are not representative of all illness episodes occurring in the course of a year. Secondly, and even if they were representative, one cannot infer from these data the incidence of *disease* in the sample.

Considering first the issue of the degree to which the sample of episodes are representative, by selecting for detailed analysis the condition of *most*

ing the "other acute" category, however, there is a moderately high rank order correlation with respect to the categories shown in Table 6 between the three areas:

r_rAtl, B-C = .67, r_rAtl, R.H. = .68, r_rB-C, R.H. = .78.

recent onset, the method favors inclusion of acute, high incidence, and generally less serious disorders. Since we are primarily interested in behavior associated with such episodes as opposed to the management of long-term illness and since we would expect from the Andersen findings discussed in chapter II that variation in behavior would be greater in the case of less rather than more serious illness, these biases are not undesirable. Nevertheless, they must be kept in mind. The degree to which the episodes caused by the illnesses of most recent onset differ from all other episodes experienced in the course of a year (whether or not the onset occurred within the year) may be inferred from Table 7. While half of the

TABLE 7

TYPES OF CONDITIONS BY RECENCY OF ILLNESS EPISODE

(Per Cent)

Type of Condition	Most Recent Episode	Second Most Recent Episode	Third Most Recent Episode	Fourth Most Recent Episode
Cold, Flu, Ill-Defined Virus	52	27	21	14
Other Acute	38	22	17	17
Chronic	10	51	62	70
Total	100	100	100	101
N	(1,787)[a]	(1,051)	(501)	(456)

[a] Eight cases not classified by diagnostic category.

most recent episodes were caused by "colds and flu," this is true of only one-quarter of the second most recent episodes, one-fifth of the third most recent, and one-seventh of the fourth most recent.[2] "Other acute" conditions also account for a smaller and smaller proportion of episodes moving from the most recent to those that are less recent. Conversely, the proportion of episodes due to chronic conditions is much greater for less recent episodes.[3]

In addition to differences in the type of conditions observed in the most recent episode compared to all other episodes, the mix with respect to physician-rated seriousness differs. Sixty-three per cent of the 1,795 episodes caused by conditions of most recent onset were rated as not serious whereas this was true of only half (52 per cent) of the 1,797 less recent episodes. Interestingly, however, the existence of one or more other (on

[2] In the few instances where there were five or more episodes, the underlying condition was almost always the same.

[3] In addition to the factors of seasonality and the effects of the methodology, these results are probably due also in part to memory distortion. Chronic episodes may be better remembered than non-serious acute episodes, hence we would expect proportionately more chronic episodes to be remembered among less recent episodes.

average more serious) episodes during the year does not seem to have materially influenced the chances of the most recent episode being serious. Of those reporting one episode only, 64 per cent had a non-serious condition. The proportion having a non-serious condition was the same for persons with two episodes, and was not much less (60 and 59 per cent) for those with three or four or more episodes.

The second caution mentioned above is that the limitations of the household interview survey in assessing either the incidence or prevalence of disease in a population preclude drawing any such inferences from Table 6. Comparison of various methods of estimating the prevalence of chronic disease has shown that household surveys are not very satisfactory.[4] Trussell *et al.*, for example, found that while 85 per cent of the cases of diabetes reported in interviews were confirmed in clinical examination, one out of three cases found in clinical evaluation was not reported in the family interview. Further, diabetes was one of the best matched conditions. On the other hand, when the research problem involves the relationship between illness and subsequent illness behavior rather than estimation of morbidity per se, the illness reported is more relevant than the underlying disease. When the problem involves differences with respect to illness among classes of individuals, the assumption is made that differences in physical illness may be attenuated due to the tendency of under-report clinically defined disease, but the results will not be biased by differential tendencies to underreport. Mechanic,[5] in a review of the relationship between clinical findings and survey reports, concludes that this assumption is a plausible one since the studies done have not found consistently different reporting tendencies. He cites, for example, the conclusion of a study comparing health interview responses and medical records from the Health Insurance Plan of Greater New York that "age, sex, socioeconomic status, respondent status, ethnic background, and other conventional demographic attributes exert surprisingly little influence on the degree to which the knowledge that a physician has about the existence of illness is reflected in a household interview."[6]

To summarize, approximately one-third of the sample experienced at least one medical condition which was first noticed within the year preceding the interview and which resulted in at least two consecutive days of withdrawal from the person's usual activity. These conditions tend to be

[4] Ray E. Trussell, Jack Elinson, and Morton L. Levin, "Comparisons of Various Methods of Estimating the Prevalence of Chronic Disease in a Community—The Hunterdon County Study," *American Journal of Public Health*, XLVI (February, 1956), 173–82.

[5] David Mechanic, *Medical Sociology: A Selected Review* (New York: Free Press, 1968), pp. 229–35.

[6] *Ibid.*, p. 233.

acute and rated as not serious, and are on the average somewhat less serious than all activity limiting conditions experienced during the year.

CHARACTERISTICS OF INDIVIDUALS WITH EPISODES

Before turning to the question of the behavior resulting from these illness episodes, we might logically inquire as to the differences between persons having experienced an episode and those who were free of episodes in the course of the year. In particular, we are interested in whether or not groups of persons differing from each other along the dimensions of age, social structure, economic status, or medical-care resources show any systematic differences with respect to the proportion reporting an episode. The conclusion based on Tables 8–14 is that, generally speaking, the systematic

TABLE 8

PROPORTION ON INDIVIDUALS REPORTING ILLNESS EPISODES BY AGE

Age (years)	Proportion
Less than 1	.30 (97)
1–4	.42 (517)
5–14	.37 (1,309)
15–24	.32 (907)
25–44	.32 (1,207)
45–64	.33 (836)
65 and over	.28 (378)
Table N	5,251
Don't know, No answer	18
Total N	5,269

differences found along these dimensions are fairly small and that the most consequential differences occur with respect to age and race.

As is well known, the incidence of acute disease is markedly higher among younger age groups while chronic (and most particularly degenerative) disease is more prevalent among older age groups.[7] Given the nature of the illness episodes used as the basis for this study, therefore, it is not surprising to find some difference in the proportions of individuals reporting episodes across age groups (Table 8). That the differences are relatively modest is in some part at least a function of the inclusion of only the most recent episode. One might expect that a comparison of all

[7] National Center for Health Statistics, Series 10, No. 52: *Current Estimates from the Health Interview Survey, United States—1967*, U.S. Department of Health, Education, and Welfare, 1969.

episodes for the year by age would show a more pronounced difference between the age groups of 1–14 years (with the highest incidence of acute conditions) and the remainder of the population.

The proportions of individuals reporting episodes by usual activity suggest that, except for the effect of age noted above, there is no tendency for particular activities to be over- or under-represented among persons with illness episodes (Table 9).

Similarly, with the exception of the small group whose household heads had been to college, there are no systematic differences between persons with and without episodes in terms of head's education or adjusted current income (Tables 10 and 11). While we may reasonably assume no differential bias in reporting episodes along these two dimensions, nevertheless, we cannot infer from these data that either the incidence or prevalence of disease, illness, or sickness do not vary by social class. On the other hand, we can infer that some minimal level of temporarily disabling illness is common to all social classes in fairly equal proportion, and therefore the heterogeneity which was shown at the beginning of the chapter to characterize the population is similarly reflected in the episode data.

Puerto Ricans, persons with Medicaid or voluntary health insurance coverage, and those reporting some regular source of medical care are relatively more likely to report episodes (Tables 12–14). The interpretation of this over-representation is different for each of the three characteristics.

Puerto Ricans were found by Lejeune to be *somewhat more likely* than blacks and other whites to have been ill three or more times during a

TABLE 9

PROPORTION OF INDIVIDUALS REPORTING ILLNESS EPISODES BY USUAL ACTIVITY

Usual Activity	Proportion
Work	.33 (1,414)
Keeping House	.32 (1,144)
School	.35 (1,602)
Pre-School	.39 (753)
Other	.29 (329)
Table N	5,242
No answer	27
Total N	5,269

TABLE 10

PROPORTION OF INDIVIDUALS REPORTING ILLNESS EPISODES BY HEAD'S EDUCATION

Head's Education (years)	Proportion
Less than 5	.34 (672)
5–8	.32 (1,396)
9–11	.36 (1,655)
12	.34 (1,190)
More than 12	.42 (259)
Table N	5,172
Don't know, No answer	97
Total N	5,269

TABLE 11

PROPORTION OF INDIVIDUALS REPORTING ILLNESS EPISODES BY ADJUSTED CURRENT INCOME

Income	Proportion
Deficit $1,000 or more	.32 (344)
Deficit $1,000–Surplus $1,000	.35 (1,562)
Surplus $1,000–$3,000	.34 (1,495)
Surplus $3,000–$5,000	.32 (919)
Surplus $5,000 or more	.35 (945)
Table N	5,265
No answer	4
Total N	5,269

TABLE 12

PROPORTION OF INDIVIDUALS REPORTING ILLNESS EPISODES BY RACE-ETHNICITY

Race-ethnicity	Proportion
Puerto Rican	.38 (1,388)
Other White	.33 (2,280)
Black	.33 (1,597)
Table N	5,265
No answer	4
Total N	5,269

one-year period (including chronic conditions). On the other hand, despite a tendency to highly value good health, this group was *much more likely* than blacks and other whites to report their health "in general" to be only fair or poor. In addition, there is evidence that when sick, Puerto Ricans are more reluctant than other groups to adopt the sick role.[8] The finding in Table 12 might be interpreted as reflecting a greater tendency to report sickness *or* to have more underlying illness either of which more than compensates for an actual reluctance to withdraw from usual activity. On the other hand, a third possibility is that the difference between Puerto Ricans and the other two racial-ethnic groups should be interpreted as a true difference in illness episodes quite closely replicating the Lejeune

TABLE 13

PROPORTION OF INDIVIDUALS REPORTING ILLNESS EPISODES BY THIRD-PARTY COVERAGE

Coverage	Proportion
Medicare (Part B)	.28 (299)
Medicaid	.37 (1,729)
Voluntary Insurance	.34 (2,146)
No Coverage	.31 (1,095)
Table N	5,265
No answer	4
Total N	5,269

TABLE 14

PROPORTION BY INDIVIDUALS REPORTING ILLNESS EPISODES BY USUAL SOURCE OF MEDICAL CARE

Source of Care	Proportion
None	.12 (250)
Non-Group Practitioner	.35 (3,156)
Group Practitioner	.32 (727)
Hospital Clinic	.36 (1,134)
Table N	5,268
No answer	1
Total N	5,269

[8] Edward A. Suchman, "Sociomedical Variations Among Ethnic Groups," *American Journal of Sociology*, LXX (November, 1964), 322.

findings. The illness conditions causing episodes among Puerto Ricans tend to be rated more serious than those of other groups suggesting that at least the second explanation is a contributing factor. However, the problem of determining whether greater illness is the sole compensating factor or whether, in addition, we are also observing a reporting bias is not easily resolved.[9] We will return to this question later in the analysis.

Finally, the tendency for persons with some form of health insurance coverage and a regular source of medical care to be over-represented among those with episodes is also open to alternative interpretations, although of a less difficult sort to resolve. One might argue that these groups are somehow predisposed to better health and in a sense this is probably true. The effects observable in Tables 13 and 14, however, are more likely due to a tendency for persons experiencing an illness episode to self-select out of these two categories during the year and move into one of the other coverage or source categories. For example, a person in good health, but eligible for Medicaid may in fact never have applied for such coverage. On becoming sick, however, he might then apply for and obtain coverage The aggressiveness of the Social Security Administration in encouraging those over age 65 to purchase Part B Medicare coverage, and the limitations of voluntary health insurance on pre-existing conditions would reduce the chances of movement into these categories. Table 13 supports this interpretation in that those with Medicaid are most likely to report episodes.

Similarly with respect to regular source of care, a person with no regular source on getting sick might then find a source. In this case, however, he might choose either a hospital clinic or a practitioner in solo practice. The only source he would be unable to select simply on the basis of being sick would be a prepaid group practice. The findings also support this interpretation. Not only are persons with non-group private practitioners and hospital clinics over-represented in the episode group relative to those reporting group practice, but also, there is a marked association between recency of acquiring a regular source of medical care and reporting an illness episode (not shown in Table).

The effect of these methodological problems on the interpretation of the results reported in later chapters are not serious and will be discussed there.

[9] We are assuming that reporting an event such as withdrawal from usual activity is less subject to systematic over-reporting than, for example, numbers of symptoms. In the latter case, there is evidence that Puerto Ricans are both more willing than other racial-ethnic groups to report symptoms when present and more inclined to develop larger numbers of symptoms to express a given level of underlying disorder. See, for example, Bruce P. Dohrenwend and Barbara Snell Dohrenwend, *Social Status and Psychological Disorder: A Causal Inquiry* (New York: John Wiley and Sons, 1969), p. 85.

SERIOUSNESS OF THE EPISODES AND RESULTING BEHAVIOR

The key elements of episode behavior in which we are interested are delay before seeking care, initial contact with a physician, return visits to a physician and amount of medical care received. In addition to these basic factors, however, we also obtained information on the perceived seriousness of the illness, lay consultation, place of first visit, referral and hospitalization. As background for the analysis that follows, we will describe episode behavior in chronological order including these latter factors and then conclude this chapter with a table showing the distributions of the four key dependent variables.

SERIOUSNESS

It will be recalled that 37 per cent of the episode causing illness conditions were physician rated as being sufficiently serious to warrant the attention of a doctor, while 63 per cent were rated as nonserious. When the respondents were asked how serious *they* thought their condition was when they "first noticed it, at the very beginning," 27 per cent reported very serious, 35 per cent fairly serious, and 38 per cent not serious at all. Within the limitations of respondent recall, this initial judgment of seriousness is expected to be strongly related to behavior leading up to contact with the medical-care system. However, subsequent behavior should be influenced by initial perception of seriousness only to the degree that the seriousness of the condition turns out to be congruent with it. Therefore, an additional measure was employed to assess the respondent's judgment of seriousness over the course of the episode—namely, the number of days spent in bed as a result of the condition. The great majority of persons with episodes (84 per cent) spent at least one day confined to bed. On the other hand, relatively few (13 per cent) were in bed for ten or more days. Thirty-five per cent were in bed for one or two days, 22 per cent for three or four days, and the remaining 15 per cent were in the interval of five to nine days.

As we would expect, the three measures of seriousness are positively associated. This association, however, is by no means perfect. For example, considering persons whose condition was physician rated as non-serious, 18 per cent initially thought their condition was "very serious" while 45 per cent thought it was "not serious at all." In contrast, the initial perception of those with conditions rated as serious was "very serious" in 43 per cent of the cases, while 24 per cent considered the condition "not serious at all" (Table 15). An association of similar magnitude (using the rather crude criterion of percentage difference) is found between physician rated seriousness and days in bed for those who had at least one bed disability day (Table 16). Essentially the same proportions of individuals

TABLE 15

DISTRIBUTION OF INDIVIDUALS BY PERCEIVED SERIOUSNESS AND PHYSICIAN RATED SERIOUSNESS

(Per Cent)

PERCEIVED SERIOUSNESS	PHYSICIAN RATED SERIOUSNESS		
	Serious	Not Serious	Total
Very Serious	43	18	27
Fairly Serious	33	37	35
Not Serious at All	24	45	39
Total	100	100	101
N	(659)	(1,122)	(1,781)

Table N	1,781
Don't Know Perceived Seriousness	14
No Episode	3,474
Total N	5,269

TABLE 16

DISTRIBUTION OF INDIVIDUALS BY DAYS IN BED AND PHYSICIAN RATED SEVERITY

(Per Cent)

DAYS IN BED	PHYSICIAN RATED SERIOUSNESS		
	Serious	Not Serious	Total
None	15	16	16
1–2	23	41	35
3–4	18	24	21
5–9	18	14	15
10+	26	5	13
Total	100	100	100
N	(658)	(1,121)	(1,779)

Table N	1,779
Don't Know Days in Bed	16
No Episode	3,474
Total N	5,269

in the two physician rated seriousness categories had no days in bed. This is undoubtedly due at least in part to the fact that for some conditions, whether requiring the attention of a doctor or not, bed rest is not indicated. This is a weakness, although seemingly not a serious one, of using bed disability days as a measure of an individual's assessment of the seriousness of his illness. Finally, Table 17 shows that the initial perception of seriousness and bed disability days are moderately associated for both serious and

TABLE 17

DISTRIBUTION OF INDIVIDUALS BY DAYS IN BED, PERCEIVED SERIOUSNESS, AND PHYSICIAN RATED SERIOUSNESS

(Per Cent)

DAYS IN BED	PHYSICIAN RATED SERIOUSNESS					
	Serious			Not Serious		
	Very	Fairly	Not	Very	Fairly	Not
None	14	15	18	7	13	22
1–2	17	25	31	28	40	47
3–4	14	22	19	25	29	18
5–9	18	19	14	28	13	10
10+	37	19	18	12	4	2
Total	100	100	100	100	99	99
N	(282)	(215)	(161)	(204)	(412)	(502)

Table N	1,779
Don't Know Days in Bed	2
Don't Know Days in Bed or Perceived Seriousness	14
No Episode	3,474
Total N	5,269

non-serious conditions as rated by the physician. This association is stronger however under the latter condition. It should be noted that some of the association between initial perception and days in bed may be an artifact due to respondents' inclinations to be consistent. An effort was made to minimize this effect by asking about initial perception in the very first question about the illness episode and inquiring about days in bed in one of the last items in the series.

LAY CONSULTATION

As was noted in Chapter II, the process of *defining oneself as sick* often involves consultation and sometimes negotiation with others. A closely

related phenomenon is *seeking advice on what to do* about the condition. When asked if they had sought such advice from anyone living in the household, 43 per cent of persons with illness episodes indicated that they had.[10] In seven out of ten cases, the person consulted was a spouse. Overall, the advice given in 80 per cent of the cases was to see a doctor, while 18 per cent suggested self-treatment or postponement of a decision. (The advice in the remaining 2 per cent of cases was either indeterminant or irrelevant to our interests—e.g., in the case of a woman who had fallen, the advice was to "sue the landlord.") Spouses were about half again as likely as other persons consulted in the household to advise seeing a doctor.

Lay consultation outside the household was a much less common phenomenon. Only 17 per cent of the sample sought advice from relatives, friends, and others not living with them. The overwhelming majority of these consultations (94 per cent) were with relatives and friends. Of the remaining 6 per cent, half involved seeking advice from a druggist and half from a nurse. The fact that only 3 per cent of all outside consultations (and therefore applying to only one-half of one per cent of those with episodes) were with a druggist casts doubt on the widely held belief that the druggist is an important substitute for the doctor in low-income neighborhoods. As was the case for advice within the household, most (73 per cent) outsiders consulted suggested seeing a doctor, while 23 per cent advised self-treatment or delay. Eight out of the nine nurses consulted advised going to the doctor, while five of the nine druggists suggested self-treatment.

Combining lay consultations, whether with those living in the household or not, just over half (51 per cent) of the sample sought advice concerning what to do about the episode condition. In 3 per cent of the cases involving consultations, conflicting advice was given by household members versus others. (In 21 of 25 such cases, household members favored seeing a doctor while those outside suggested self-treatment.) For 77 per cent of those with lay consultations the advice was to go to the doctor, compared to 18 per cent receiving the suggestion to wait or treat the condition without medical assistance.

PHYSICIAN VISITS

Seventy-four per cent of persons with illness episodes contacted a physician. The site or method of consultation was quite diverse with 38 per cent going to a doctor's office, 26 per cent to a hospital emergency room, 16 per cent receiving a home visit from a physician, 8 per cent consulting the doctor on the telephone,[11] and 6 per cent using a hospital outpatient clinic.

[10] For children under age 14, the question referred to the mothers' inquiries.

[11] A distinction was made by interviewers between a telephone contact for purposes of scheduling an appointment and an actual medical consultation by telephone. Only

A substantial proportion (43 per cent) of those seeing or talking to a physician did so on the day that they first noticed the illness condition (or, in the case of trauma, the day that they had the accident). At the other extreme, only 7 per cent of the sample reported delaying more than a week.

Slightly over half (52 per cent) of those persons seeing a physician were advised to have a second visit. Eighty-four per cent of these complied. The most common reason for failing to return was recovery. Considering persons with more than one physician visit, most saw the same doctor each time. One out of four (24 per cent), however, consulted more than one. The decision to go to another doctor, was attributed to the first physician in 49 per cent of the cases, to the individual or his family in 41 per cent, and to other factors (such as clinic staffing changes) in 10 per cent of the cases.

CARE RECEIVED

Most of those seeing a doctor had something tangible done for or to them on the first visit. For example, 88 per cent reported having received either a prescription for medicine or an injection. Nineteen per cent of those literally seeing a doctor (that is, excluding telephone consultations) reported other treatments, tests, or X-rays in the course of the initial physician visit. Almost one-third (31 per cent) of those with return visits indicated treatments, tests, or X-rays during one or more subsequent consultations.

Finally, at least in terms of amount of care, the ultimate might be considered hospitalization. Thirteen per cent of those with episodes were admitted to the hospital. Hospitalization poses a problem in the analysis of episode behavior, particularly in the interpretation of physician visits and amount of care received. The difficulty is that a person may be hospitalized at any one of several stages in the course of an episode. In the case of a very serious illness such as a coronary or in the case of serious trauma, a person may be admitted directly to a hospital. On the other hand, for other conditions, admission may come only after several out-of-hospital physician visits and complex ambulatory medical management. For the next chapter's analysis of the relationship between perceived severity, social-structural and economic factors, and usual source of medical care on the one hand and delay, physician visits, and amount of care received on the other, persons who were hospitalized at any point during the episode will be treated separately.

DEPENDENT VARIABLES

Finally, Table 18 shows the marginal distributions of the four key dependent variables: delay, initial physician contact, revisits, and amount of

the latter is included here. When reference is made to "seeing" a physician, this latter group is also included.

TABLE 18

DISTRIBUTIONS OF DELAY, INITIAL CONTACT, REVISITS, AND AMOUNT OF CARE
(Per Cent)

Delay (in days)		Initial Contact		Revisits		Amount of Care	
Same day	43	Yes	74	None	49	None	7
1–2	39	No	26	1	23	Medication	68
3–6	11			2	11	Initial Services	10
7–13	4			3	6	Subsequent Services	15
14+	3			4	3		
				5	2		
				6+	6		
Total	100		100		100		100
N	(1,320)		(1,780)		(1,213)		(1,195)
Table N	1,320	Table N	1,780	Table N	1,213	Table N	1,195
Don't Know Delay	5	Don't know Visits	15	Don't Know Visits	16	Don't Know Care	34
No Visits	455	No Episode	3,474	Admitted directly to hospital	111	Admitted directly to hospital	111
Don't Know Visits	15			No Visits	455	No Visits	455
No Episode	3,474			No Episode	3,474	No Episode	3,474
Total N	5,269	Total N	5,269	Total N	5,269	Total N	5,269

care. The first three measures are self-explanatory. The final variable, however, is an index based on responses to the three questions concerning care received during the first and subsequent visits and requires some discussion.

The purpose of the amount of care measure, it will be recalled, is to further refine the information obtained from differences in number of physician visits. With this measure we will attempt to determine whether after taking into account the seriousness of the illness there are systematic differences in the medical services provided the patient. Such differences are difficult to conceptualize and measure; however, even a rather crude effort seems justified.

In constructing the amount of care variable, we are considering only those individuals who saw a doctor at least once. As was noted above, most such persons received either a prescription or injection. It is also the case that for a majority (68 per cent) this constituted the extent of their care in terms of observable medical acts beyond the activities of the physician himself. Another 10 per cent received either in addition or alternatively treatments (other than medication), tests (such as blood work, electrocardiograms, or urine analysis), or diagnostic X-rays, but did not receive such care on any subsequent visits to the doctor. Finally, 15 per cent of those seeing a doctor underwent one or more of these medical procedures after his initial contact with the doctor. The amount of care index, then, takes the form of a unidimensional, equal interval scale ranging from no medical acts beyond the personal attention of the physician to medication to initial tests or treatment to medical services beyond those received on the initial visit.

CHAPTER V

METHOD OF ANALYSIS

In this chapter we will describe our method of analysis, as guided by the model and hypotheses presented at the end of Chapter II. As might be expected, in moving from the theoretical to the statistical model certain modifications become necessary. These are discussed in the section on statistical method that follows. Second, we will describe more specifically our approach to the analysis of the relationships between delay, physician visits, and amount of care received on the one hand and the several independent variables on the other, including the analysis of the distinction between initial physician contact and revisits.

STATISTICAL METHOD

In simplest terms, the problem of analysis to be dealt with in the next three chapters is the development of a statistical model which most closely reflects the conceptual formulation of the second chapter while at the same time taking into account the characteristics of the variables involved, the state of the art in statistics, and the limitations of cost.

Several alternative formulations have been considered or tried,[1] using a 20 per cent subsample of the data, with the objective of correctly specifying what would seem to be essentially a multivariate model of the following form:

$$Y_1 = f(X_1, X_2, \ldots X_m) + e_1$$
$$Y_2 = f(X_1, X_2, \ldots X_m) + e_2$$
$$Y_3 = f(X_1, X_2, \ldots X_m) + e_3$$
$$Y_4 = f(X_1, X_2, \ldots X_m) + e_4$$

where Y_1 = Number of days of delay for persons contacting a physician;
Y_2 = Whether or not a physician was contacted;
Y_3 = Number of revisits for persons contacting a physician at least once;
Y_4 = Index of amount of care received for persons contacting a physician at least once;
and X_1 = Condition seriousness;
X_2 = Usual activity;

[1] These have included contingency tables, multiple classification analysis, the automatic interaction detection algorithm, and consideration of multivariate analysis of variance. A brief discussion and comparison of preliminary results with the final analysis is given in Appendix II.

X_3 = Perceived seriousness;
X_4 = Bed disability days;
X_5 = Level of education of head of household;
X_6 = Race;
X_7 = Adjusted current income;
X_8 = Insurance coverage;
X_9 = Usual source of care;
and X_{10} = (First order interactions);
.
.
.
X_k = (Second order interactions);
.
. (etc.)
.
X_m
and $e_1 \ldots e_4$ are correlated disturbances.

Several difficulties are immediately apparent in this idealized formulation. They may be briefly stated as follows:

1. The distributions of the four dependent variables, as seen at the end of the last chapter, are not of the same form and, further, none meet the usual assumptions of regression models. Y_2 (whether or not a physician was contacted) is naturally dichotomous, while the other three variables are continuous but with a lower limit (zero in each case) at which a substantial proportion of observations cluster.

2. The four equations do not apply to the same set of observations in the sense that initial contact is applicable to the entire sample, whereas delay, revisits, and amount of care are applicable only to persons who have had at least one physician contact. Multivariate analysis is customarily used in cases involving multiple dependent variables arising from a single and identical set of observations.

3. The independent (explanatory) variables are categorical rather than continuous. Some of these variables have no "natural" order (e.g., usual activity and race) while others such as education of the head of household may be logically ordered from least to most, but may be curvilinearly related to one or more of the dependent variables.

4. The relatively large number of independent variables gives rise to an unmanageable number of interaction terms. On the other hand, there is substantial evidence to suggest that interaction will be present in the data, and indeed we have so hypothesized.

The statistical model which best takes account of these difficulties while

at the same time answering most of the research questions implied by the theoretical model and hypotheses is *limited dependent variable regression*, sometimes called Tobit analysis.[2] We will briefly describe the Tobin model and then consider the resolution of the four difficulties listed above in light of this model.

The Tobin model was developed for cases in which a dependent variable has a lower or upper limit and takes on the limiting value for a substantial number of respondents, with the remainder ranging above or below the limit. For example, in this study there is a lower limit on the number of days a person could have delayed before contacting a physician (zero) but theoretically, having delayed at all, the number of days of delay may take on a wide range of values. In this case, conventional regression is inappropriate since it is not possible to have negative as well as positive deviations from the expected value of the dependent variable when, given certain values of the explanatory variables, the expected value of the dependent variable is at the limit. Rather what is wanted is a statistical model with which in estimating the relationship between a limited variable and other variables, "an explanatory variable in such a relationship may be expected to influence both the probability of limit responses [e.g., no delay] and the size of nonlimit responses [e.g., number of days of delay]."[3]

The Tobin model, satisfying this criterion, is as follows:[4]

Let an index, I, be a linear combination of the independent variables $(X_1, X_2 \ldots X_m)$:

$$I = \beta_0 + \beta_1 X_1 + \beta_2 X_2 \ldots \beta_m X_m$$

Individual behavior with respect to the limited dependent variable, Y_i, is determined as follows:

$$Y_i = 0 \qquad \text{if} \quad I_i < I_i^*$$

and

$$Y_i = I_i - I_i^* \qquad \text{if} \quad I_i \geq I_i^*$$

where I^* is a random variable representing individual differences in behavior not accounted for by the X's and the lower limit. This disturbance term is assumed to be normally distributed across the population with zero mean and standard deviation σ.

For any value of the linear combination, I, observations observed at the limit are interpreted as arising from individuals whose values of the index,

[2] A detailed development of this model will be found in James Tobin's article, "Estimation of Relationships for Limited Dependent Variables," *Econometrica*, XXVI, No. 1 (1958), 26–36.

[3] *Ibid.*

[4] For a more complete exposition see Appendix II. The notation and explanation used here follows that of Goldberger. See Arthur S. Goldberger, *Econometric Theory* (New York: John Wiley and Sons, 1964), p. 253.

I*, are so high as to exceed I. In addition there will be a distribution of positive (non-limit) Y's for observations for which I exceeds I*. Continuing the Goldberger[5] notation and letting F(z) equal the value of the standard normal cumulative distribution at z:

$$\text{Prob}\{y = 0 \mid I\} = \text{Prob}\{I^* > I \mid I\} = 1 - F\left(\frac{I}{\sigma}\right)$$

$$\text{Prob}\{y > y^* \geq 0 \mid I\} = \text{Prob}\{I^* < I - y^* \mid I\}$$

$$= F\left(\frac{I - y^*}{\sigma}\right)$$

These probabilities are a function of the β's. The maximum likelihood solution to the estimation of the β's and σ, developed by Tobin, involves a system of m + 2 non-linear normal equations. This solution is indicated in Appendix II.

This model is particularly appropriate for estimating the relationships between delay, revisits, and amount of care received as in each instance there is a lower limit with a concentration of observations. The problem raised above, however, concerning the dichotomous variable of whether or not an initial physician contact was made remains unresolved. The decision was made to abandon the distinction between initial contact and revisits in the formal analysis but to provide a separate and less formal contingency table analysis subsequent to the Tobin analysis. Thus, in the chapters that follow, we will estimate the relationships between the independent variables and number of days of delay, number of physician visits, and amount of care received, taking account of the concentration of observations at a lower limit (zero).

Turning to the second difficulty listed earlier, the preferred method of comparing the relative effects of the independent variables on more than one dependent variable is to use a (multivariate) statistical model which considers the several disturbances simultaneously. The limited dependent variable model, however, has not been extended to the multivariate case. As a result, we will consider delay, physician visits, and amount of care separately, and make a less formal comparison of the relative importance of the explanatory variables in the three resulting equations than would be the case were we to apply a multivariate model.

The third consideration listed above, namely that the independent variables not categorical not necessarily having natural order is more easily dealt with. Nominal scale measurement on the independent variables, correlated independent variables, and curvilinear relationships between dependent and independent variables are all handled appropriately by

[5] *Ibid.*, pp. 251–58.

dummy variable multiple regression in which one level or class of each independent variable is constrained to zero. Given this constraint, the coefficients obtained for the remaining levels or classes represent deviations from the one constrained to zero, having taken into account the effects of other variables.

Finally, with respect to the problem of interaction, there are two approaches possible. On the one hand we might calculate separate regressions under circumstances in which we expect to observe interaction. For example, we might estimate the relationship between delay and usual activity for persons with physician rated serious conditions and separately estimate the relationship for persons with non-serious conditions. One would then compare the two sets of relationships. Alternatively, we could enter seriousness, usual activity, and interaction terms into a single regression allowing a more formal evaluation of the presence of interaction. Limitations of the computer program used for limited dependent variable regression, specifically a limit of forty independent variables, have resulted in our not being able to use the second approach in many instances. As will be seen in the chapters that follow, where possible we have used interaction terms after preliminary screening. However, we have also considered the relationships between the dependent variables and perceived severity, education, race, income, insurance coverage, and usual source of care for each eight subsets of the sample defined by condition seriousness and usual activity.

GENERAL DESCRIPTION OF THE ANALYSES OF DELAY, PHYSICIAN VISITS, AND AMOUNT OF CARE

In the next three chapters, we will present the results of essentially parallel analyses of the factors affecting variation in delay, physician visits, and amount of care received. In each case, we start with the relationships between the dependent variable on the one hand and condition seriousness and usual activity on the other. Then secondly, given these effects, we consider the net effects of perceived seriousness and the social-structural, economic and usual source variables. Finally, for combinations of condition seriousness and usual activity we analyze the contribution of each of these poverty-related factors in explaining variation in the dependent variable.

In each of the three steps mentioned, we will employ limited dependent variable multiple regression. The strategy of analysis differs somewhat among the three, however. In the case of condition seriousness and usual activity, we will employ the likelihood ratio criterion[6] to assess the sta-

[6] The likelihood ratio test rests on the increase in the value of the likelihood function evaluated at its maximum when an independent variable or set of variables are added

tistical significance of the simple relationship between condition seriousness and, for example, delay, and next the relationship between usual activity and a delay given condition seriousness. We then consider interaction effects in similar fashion. At the second step, we examine the net effects of the perceived seriousness and poverty-related variables. These are net effects in the sense that all other variables are included in the regression. At this stage we will use a somewhat less formal and less restrictive criterion of significance, namely t tests. Finally, our analysis of the effects of the social-structural, economic and usual source variables within groups defined in terms of condition seriousness and usual activity proceeds by adding these variables one at a time to the regression of the dependent variable on the episode-related factors of perceived seriousness and bed disability days, determining for each addition whether or not it improves our ability to predict the dependent variable, once again using as a criterion the significance indicated by the likelihood ratio.

It is readily seen that by proceeding as we do at the third step of the analysis, our tests of the effects of all but the last variable entered (namely, usual source of care) are less stringent than would be the case if we followed the more common procedure of comparing the results of a regression which included all variables with one which omitted only the variables in question. The rationale for our approach stems from both the basic question to which the research is directed—do the poverty-related factors influence the elements of response behavior given the episode-related factors of seriousness and usual activity?—and also certain assumptions about the poverty-related factors themselves. These assumptions concern the logical priority of the factors and the degree to which they can be modified. Following the lead of Andersen,[7] the social-structural variables of head's education and race may be thought of as predisposing variables logically prior to income, insurance, and usual source of care, all of which Andersen would classify as enabling characteristics.[8] The questions to be answered then are of the following sort, "over and above the episode-related factors, do the social-structural factors improve our ability to predict delay before seeking care?" or in the more restrictive case, "after taking account of seriousness, usual activity, race, and head's education, are differences in delay related to differences in adjusted current income?"

As we indicated in the previous section, the regression analyses which follow are restricted to the 87 per cent of the episode sample who were not hospitalized as a result of their condition.[9] We have also eliminated the "other" usual activity group because of their small numbers, and forty-four incomplete cases.[10] Finally, the analysis of physician visits is supplemented by contingency tables to examine the question of differential effects on initial contact compared to revisits.

to the regression. The statistical significance of an increase in the value of the likelihood function by virtue of the addition of a variable may be determined by use of the fact that -2 in λ (where λ is the likelihood ratio) is approximately Chi-square distributed for large samples with the number of degrees of freedom determined by the number of variables added. An example of this test will be given at the beginning of Chapter VI.

[7] Ronald Andersen, *A Behavioral Model of Families' Use of Health Services* (Chicago: University of Chicago, Center for Health Administration Studies, Research Series No. 25, 1968), p. 17.

[8] Unlike Andersen, however, we do not enter "need" as the final component. He reasons that need "represents the most immediate cause of health service use" (*Ibid.*), and so it is. However, Andersen's model was designed to answer to a different question—namely, the explanation of use over the period of a year—rather than the question raised here: differential behavior—given an instance of "getting sick."

[9] We have done an analysis of the relationship bstween delay and all independent variables for persons who were hospitalized, using the same regression model found in Chapter VI for persons whose episode conditions did not result in hospitalization. Delay before seeking care in the case of persons who were subsequently hospitalized was not found to be associated with any of the poverty-related factors ($p = .05$). Because of the different points in the course of diagnosis and treatment at which a person might be hospitalized (fewer than half of those hospitalized were admitted directly to the hospital), no meaningful comparison between hospitalized and non-hospitalized patients can be made with respect to number of ambulatory physician visits and amount of care received.

[10] The 44 cases dropped from the analysis involved the following missing information: Head's education ($n = 25$); Usual source of care ($n = 1$); Usual activity ($n = 2$); Delay, visits, and care ($n = 5$); Visits and care ($n = 11$).

CHAPTER VI

FACTORS RELATED TO VARIATION IN DELAY

We have seen that when a person gets sick and seeks the attention of a physician, he may do so right away or he may delay. In the Red Hook population as a whole, we have found that delay of more than a few days is the exception rather than the rule. Previous studies of delay have focused on illness situations quite different from those under study here. Most of the literature has been concerned with chronic conditions and particularly cancer. The standard of delay in these studies is a relatively long period such as thirty days or more.[1] Delay in this sense is heavily influenced by the recognizability of symptoms as indicative of, for example, cancer and, once recognized, the fear aroused by the seriousness of the diagnosis. The delay reported for acute illness episodes in this study would seem to be of a different kind. Our sample consists of individuals who were unable to carry on their usual activities due to the episode causing illness. The symptoms themselves (as opposed to the implications of the diagnosis) therefore were not obscure as would be the case with cancer symptoms, and because we have separated out episodes involving hospitalization, we can assume that the conditions were not of the same magnitude of seriousness as cancer.

We interpret delay then as variation in people's tendency to hesitate before calling or seeing the doctor. This tendency to hesitate may be randomly distributed throughout the population or it may, as hypothesized, be related to factors which are themselves associated with the episode or with poverty.

Before proceeding to the results of our analysis, we will describe our use of limited dependent variable regression in more detail using Table 19 as an example. In the left-hand column we list eight estimated coefficients: $\hat{\beta}_0$ through $\hat{\beta}_4$, and $\hat{\beta}_6$ through $\hat{\beta}_8$.[2] These eight coefficients represent a constant ($\hat{\beta}_0$) and the (non-zero) levels of three conceptual variables: Condition seriousness ($\hat{\beta}_1$), Usual activity ($\hat{\beta}_2$ through $\hat{\beta}_4$), and the first order interaction between Condition seriousness and Usual activity (β_6 through β_8).

[1] Bernard Kutner, *et al.*, "Delay in the Diagnosis and Treatment of Cancer: A Critical Analysis of the Literature," *Journal of Chronic Disease*, VII (February, 1958), 95–120; Barbara Blackwell, *The Literature of Delay in Seeking Medical Care for Chronic Illnesses* (Rye, N.Y.: Society of Public Health Educators, Health Education Monographs, No. 16, 1963).

[2] $\hat{\beta}_5$, representing persons with other than the four main usual activities is excluded as indicated earlier.

Columns (1) through (4) give the estimated coefficients of four different regressions. The first regression (1) includes only a constant term, with β_1 through β_9 constrained to zero (that is excluded from the regression). In column (2) we see the results with Condition seriousness (β_1) entered, but Usual activity and the interaction terms still constrained to zero.

TABLE 19

ESTIMATED PARAMETERS REGRESSING DELAY ON CONDITION SERIOUSNESS AND USUAL ACTIVITY

(N = 1,032)

INDEPENDENT VARIABLES	REGRESSIONS ASSUMING . . .			
	$\beta_1 = \beta_2 \ldots \beta_9 = 0$ (1)	$\beta_2 = \beta_3 \ldots \beta_9 = 0$ (2)	$\beta_6 = \beta_7 \ldots \beta_9 = 0$ (3)	No Constraints (4)
$\hat{\beta}_0$ Constant	.320	.330	.350	.352
	(.040)	(.046)	(.074)	(.084)
$\hat{\beta}_1$ Condition serious		−.028	−,039	−.043
		(.070)	(,070)	(.139)
$\hat{\beta}_2$ Keeping House			.236	.197
			(.098)	(.123)
$\hat{\beta}_3$ School			−.050	−,047
			(.088)	.110)
$\hat{\beta}_4$ Under Age Six			−.213	−.186
			(.100)	(.122)
$\hat{\beta}_6$ Serious x Keeping House				.103
				(.202)
$\hat{\beta}_7$ Serious x School				−.010
				(.185)
$\hat{\beta}_8$ Serious x < Age Six				−.081
				(.210)

As may be seen in column (2), the simple regression coefficient representing illness conditions rated as serious is −.028. The standard error of the estimated coefficient is shown in parentheses (.070). It will be recalled that −.028 should be interpreted as a deviation from conditions rated as non-serious. (One level of each variable is always constrained to zero. In the case of Condition seriousness, which is dichotomous, it is the "not serious" level that is so constrained.) The negative sign on the Condition

seriousness coefficient indicates that more serious conditions result in less delay. At the same time, however, the size of $\hat{\beta}_1$ (−.028) relative to its standard error (.070) (i.e., the t value) suggests that the null hypothesis $\beta_1 = 0$ cannot be rejected at some arbitrary but common level such as $p = .05$.

In most instances, we will be interested in testing the significance of several levels of a variable simultaneously rather than just one level as in the case of the dichotomous Condition seriousness variable. For example, Usual activity has in addition to "work" which is the level constrained to zero, three other levels. To test the significance of a usual activity "effect" we will employ the likelihood ratio criterion described in Chapter V.

Continuing to use the results shown in Table 19 as an example, we consider the ratio of the likelihood function evaluated at its maximum under two conditions, with and without the usual activity coefficients (β_2–β_4) included in the regression. We are able to test the significance of the relationship between usual activity and delay given condition seriousness by virtue of the fact that the negative of twice the natural logarithm of this ratio is approximately Chi-square distributed with m degrees of freedom, where m is the difference in the number of constrained variables in the two equations. Comparing column (2) and column (3), for example, we see that $m = 3$.

The natural logarithm of the likelihood ratio (2) is the difference between the logarithms of the likelihood function evaluated at its maximum before and after adding the usual activity coefficients (e.g., the results from columns [2] and [3]). This difference turns out to be −9.7726. The statistic $-2 \ln \lambda$ therefore takes the value 19.5452, which with three degrees of freedom, indicates that the relationship between usual activity and delay is significant at the $p = .001$ level.

To complete the example, we proceed in similar fashion in column (4) adding the interaction terms to the regression. We will see shortly, however, that it is more convenient to consider expected values than the net coefficients when we are dealing with interaction terms.

Turning specifically to the results shown in Table 19, there is no evidence that condition seriousness is a predictor of number of days of delay. While the sign of $\hat{\beta}_1$ is in the direction hypothesized considered both alone and given usual activity, the coefficient's magnitude relative to its standard error is quite small. The likelihood ratio test leads us to the same conclusion, namely that no significant relationship exists between delay and condition seriousness.

In column (3) of Table 19, we consider seriousness and usual activity together but without regard to possible interaction. Contrary to expectations, both those who work and those who keep house delay more than others. The effect of usual activity on delay is significant at $p = .001$. Referring again to Table 19, the sign of the coefficient in column (3) for those whose usual activity is keeping house is positive indicating greater delay than for those who work. Persons in the remaining usual activity categories (school and preschool children) experienced less delay than those who work.

In column (4), we enter the three interaction terms associated with a person both having a serious condition and, for example, keeping house. The interpretation of the coefficients becomes more difficult with the introduction of interaction terms, and therefore we will consider instead the following summary table of expected values.[3]

It is evident from Table 20 that there is little interaction. For both serious and non-serious conditions, housewives are most inclined to delay before seeking medical care followed in descending order by those who work, go to school and finally, children under six years of age. Within usual activity categories, there is little difference in delay comparing persons with serious versus non-serious conditions. The impression of little interaction is supported by consideration of the likelihood ratio criterion introduced earlier ($p < .50$).

TABLE 20

EXPECTED VALUES OF DELAY FOR COMBINATIONS OF SERIOUSNESS AND USUAL ACTIVITY
(N = 1,032)

CONDITION SERIOUSNESS	USUAL ACTIVITY			
	Work	Keep House	School	Under Age Six
Serious	.798	1.080	.749	.586
Not Serious	.835	1.020	.794	.679

Condition seriousness is not related to delay, although the sign of the condition seriousness coefficient is in the expected direction.[4] We will see in the next chapters, however, that condition seriousness is strongly re-

[3] For the calculation of the expected value given the value of the linear combination, I, and the standard error of the regression, see Appendix II.

[4] We also ran the regression including persons who were ultimately hospitalized. With this group included, we found a barely significant relationship between condition seriousness and delay. The effect of usual activity was essentially the same as reported in Tables 19 and 20.

lated to visits and amount of care, indicating the discretionary nature of the early stages relative to the later stages of the medical care process. Nor does the evidence presented in Table 20 support the proposition that because of their instrumental importance wage earners and housewives delay less for themselves than for their children. Rather, the reverse is true. One explanation for this finding might be that the illness conditions themselves differ systematically (beyond differences in condition seriousness), with the symptoms of children's conditions being more compelling than those of adults. This argument would be more persuasive if we had observed greater delay among adults for serious conditions, but little difference between adults and children for non-serious conditions. This latter circumstance could be explained by the fact that serious conditions for adults are less likely to involve trauma and more likely to be the onset of a chronic condition with ambiguous initial symptoms. Such findings are not the case, however. The differences in delay obtain for both serious and the more homogeneous non-serious conditions and further are not changed appreciably when all other independent variables are entered in the regression.[5] The implication is that factors other than instrumental importance are involved in usual activity. For example, emotional concern for the child's welfare may lead to prompter attention than is the case for adults.

Considering the differences between wage earners and housewives, the findings are consistent with our original hypothesis. For both types of conditions those who work delay less before obtaining care. This finding is also consistent with Koos's[6] conclusion that the instrumental importance of the wage earner results in greater attention being paid to his sickness than to that of the housewife. The argument cannot be extended to children, however. The more instrumentally important school child tends to delay somewhat more than the preschooler. In addition to the emotional concern for young children mentioned above, we may be observing the effects of "costs" other than instrumental importance.

We turn next to an overview of the effects of the poverty-related factors on number of days of delay. Given the episode-related factors of condition seriousness, usual activity and the individual's initial judgment of the seriousness of the illness, our expectation was that Puerto Ricans and blacks would tend to delay more than whites with Puerto Ricans having the greatest delay; those persons in families with low head's education and low income would delay more than persons in families with higher levels

[5] This may be seen by comparing Tables 19 and 21.

[6] Koos, *The Health of Regionville*, p. 35.

of education and income; individuals with broader insurance benefits would delay less; and finally that hospital clinic users would delay more than persons with a private practitioner as their usual source (with the least delay being among those using non-group practitioners).

The basic findings are presented in Table 21. Two comments on this table are appropriate before reporting the results. The first is that the sample excludes the "other" usual activity category. The number of individuals in this category as noted earlier is too small to allow meaningful analysis. The second point concerns interaction. Unlike physician visits which are the subject of the next chapter, there does not appear to be significant interaction considering the effects of perceived seriousness and the several independent variables on delay. We noted above the lack of interaction with respect to condition seriousness. In addition to this

TABLE 21

ESTIMATED PARAMETERS REGRESSING DELAY ON ALL INDEPENDENT VARIABLES (N = 1,032)

CONSTANT, CONDITION SERIOUSNESS, USUAL ACTIVITY, INTERACTIONS, PERCEIVED SERIOUSNESS, EDUCATION OF HEAD		RACE, ADJUSTED CURRENT INCOME, THIRD-PARTY COVERAGE, USUAL SOURCE	
Variable	Coefficient (Standard Error)	Variable	Coefficient (Standard Error)
$\hat{\beta}_0$ Constant	.345 (.131)	*Racial-Ethnic Groups:*	
$\hat{\beta}_1$ Condition Serious	.019 (.141)	$\hat{\beta}_{16}$ Puerto Rican	.360 (.098)
$\hat{\beta}_2$ Keeping House	.119 (.128)	$\hat{\beta}_{17}$ Black	.364 (.087)
$\hat{\beta}_3$ School	−.145 (.114)	—White	-0-
$\hat{\beta}_4$ Under Age Six	−.192 (.129)		
$\hat{\beta}_6$ Serious x Keeping House	.145 (.205)	*Adjusted Current Income:*	
$\hat{\beta}_7$ Serious x School	.007 (.187)	$\hat{\beta}_{18}$ Deficit $1,000+	−.045 (.156)
$\hat{\beta}_8$ Under Age Six	−.172 (.213)	$\hat{\beta}_{19}$ Def. $999-Surp. $999	−.148 (.095)
		—Surp. $1,000–$2,999	-0-
Perceived Seriousness:		$\hat{\beta}_{20}$ Surp. $3,000–$4,999	.109 (.106)
—Not Serious	-0-	$\hat{\beta}_{21}$ Surplus $5,000	.022 (.107)
$\hat{\beta}_{10}$ Fairly Serious	−.203 (.081)		
$\hat{\beta}_{11}$ Very Serious	−.432 (.090)	*Third-Party Coverage:*	
		$\hat{\beta}_{22}$ None	.196 (.106)
Head's Education:		$\hat{\beta}_{23}$ Medicaid	.176 (.102)
$\hat{\beta}_{12}$ <5 years	−.065 (.125)	$\hat{\beta}_{24}$ Medicare	.525 (.237)
$\hat{\beta}_{13}$ 5–8 years	.083 (.091)	—Voluntary	-0-
— 8–11 years	-0-		
$\hat{\beta}_{14}$ High School	−.072 (.091)	*Usual Source of Care:*	
$\hat{\beta}_{15}$ College	−.270 (.152)	$\hat{\beta}_{25}$ None	Excl.
		$\hat{\beta}_{26}$ Group	.178 (.103)
		$\hat{\beta}_{27}$ Clinic	.009 (.090)
		— Private Practitioner	-0-

evidence, we tested for first-order interaction effects between each of the independent variables and perceived seriousness with respect to delay. No significant effects were found.

As may be seen in Table 21, beyond the effect of perceived seriousness, notable differences in length of delay between levels occur in the case of four out of the five independent variables: head's education, racial-ethnic group, third-party coverage, and usual source of care.

Considering perceived seriousness first, persons who perceived their condition, when it was first noticed, as being fairly serious delayed less than the not serious group ($\hat{\beta}_{10} = -.203$), while those who considered their condition as very serious delayed least of all ($\hat{\beta}_{11} = -.432$). The coefficients in both of these cases are large relative to their standard errors ($t = 2.50$ and $t = 4.80$ respectively). In the case of the effect of head's education, we see that, other things being equal, persons in families whose heads have had at least some college, delayed less than others. The t value in this case, however, is more modest (1.71). With the exception of the group whose heads of household had the least education, the ordering of delay is consistent with our hypothesis. That is, those persons in families whose head had 5–8 years of schooling delayed somewhat more than the next higher group (8–11 years, the level constrained to zero), while persons in families whose head had completed high school delayed somewhat less.

Turning to race, both Puerto Ricans and blacks show significantly more delay than whites. Their (positive) deviations from the white group are virtually the same ($\beta_{16} = .360$, $\beta_{17} = .364$). On the other hand, we find no significant difference across levels of income. Other things equal, the most common indicator of poverty, current income adjusted for family size, seems to have no effect on tendency to delay before seeking care. This finding is not as surprising as it might at first seem since we are controlling for three distinctly different, but correlated factors, educational level of the household head, race, and, as we see next, health insurance coverage.

The effects, relative to voluntary health insurance coverage, of no coverage, Medicaid, and Medicare are similar with all indicating greater delay. We will return to this surprising finding shortly.

Finally, the distinction between usual sources of care does not appear to be as useful as anticipated in terms of predicting delay. There is virtually no difference between those persons who report a hospital clinic as their source and those who usually see a solo practitioner. There is some indication, however, that persons who consider a group practice as their usual source delay longer than those with solo practitioners.

Each of these results warrants further examination. We will, for each (poverty-related) independent variable, be considering two things; first, are the results consistent with what we might expect from the literature,

and, if not, what other factors might be operating; and second, when we move to the last step in the analysis, are there differential effects between groups with different usual activities and condition severity levels.

EDUCATION OF HEAD OF HOUSEHOLD

Recalling the second chapter, there is evidence that when people are asked what "ought to be done" given certain symptoms, there is a strong tendency for all classes to respond in favor of seeing a doctor. This does not mean, however, that actual behavior is necessarily congruent with this expressed norm. Further, even if we observe a strong tendency to see a doctor, uniform across classes, there may be a differential tendency to hesitate before doing so.

TABLE 22

DELAY-EFFECT OF LEVEL OF HEAD'S EDUCATION WITH AND WITHOUT CONTROL FOR SERIOUSNESS[a]

Head's Education	Seriousness Constrained to Zero	No Contraints
5 years	−.022	−.065
5–8 years	−.090	.083
9–11 years	-0-	-0-
High School	−.058	−.072
College	−.244	−.270

[a] All variables are included in regression although not shown in table.

The evidence from Table 21, however, suggests that there is little difference among educational levels below college, but that persons with at least some college hesitate less. It could be argued that once having controlled for perceived seriousness, differences across educational levels are bound to be small. If people with less formal education tend to minimize the seriousness of their illnesses, we would expect to observe greater differences in the absence of a control on seriousness. It turns out, however, that the coefficients for educational levels are very similar under the two conditions (Table 22).

A second potential difficulty is the effect of age. Earlier, when we compared children with adults, we found the latter were more likely to delay. Failure to take adequate account of age in the present analysis might lead us to false conclusions since the college-educated household heads are both more likely to be younger adults and also, therefore, are more likely to have young children. We have taken age into account to some degree through usual activity. Essentially we have considered those under age six,

those between six and late adolescence (usual activity is school) and all adults. The all-adults category, however, is a quite loose control covering as it does everyone from about 18 to 65 or older. To further refine the control of age, we differentiated for both wage earners and those who keep house, between persons below age 45 and those 45 or older. As was the case with perceived seriousness, the coefficients changed very little (Table 23).

TABLE 23

DELAY-EFFECT OF LEVEL OF HEAD'S EDUCATION WITH AND WITHOUT ADDITIONAL CONTROL FOR AGE[a]

Head's Education	Controlling for Adult's Age	No Additional Control
<5 years	−.034	−.065
5–8 years	.108	.083
8–11 years	-0-	-0-
High School	−.078	−.072
College	−.288	−.270

[a] All variables are included in regression although not shown in table.

RACE

We saw in Table 21 that Puerto Ricans and blacks delayed significantly more than whites and to a similar degree. This finding turns out to be quite stable in the sense that it holds up under various attempts to account for the effect through the introduction of other variables and, as we shall see later, tends to hold true within usual-activity-condition seriousness combinations.

The estimate of the relative tendency to delay among Puerto Ricans, however, probably understates the true differences. We saw in Chapter IV that Puerto Ricans were somewhat over-represented in the group reporting illness episodes and further that the illnesses reported by this group were more often rated as serious. In the absence of controls on seriousness then we would expect to observe the coefficient (β_{16}) representing delay among Puerto Ricans relative to whites to be smaller and that this coefficient would drop off more than β_{17} representing the difference between blacks and whites. This is in fact the case. In Table 21, the coefficients are $\hat{\beta}_{16} = .360$ and $\hat{\beta}_{17} = .364$. In the absence of controls for seriousness, $\hat{\beta}_{16} = .284$ and $\hat{\beta}_{17} = .326$. This suggests that under a less restrictive definition of "getting sick" (that is, less restrictive than withdrawal from usual activity for at

least two days), we would expect to observe even more delay among Puerto Ricans.

Lejeune,[7] it will be recalled, concluded that socio-cultural factors were operating with respect to use of medical services. He found racial-ethnic differences in number of physician visits that were not accounted for by educational differences. Our findings indicate that these factors also operate on delay.

THIRD-PARTY COVERAGE

We have established four categories of insurance coverage: no coverage at all, voluntary health insurance, Medicaid, and Medicare (Part B). The first three are ranked in order of assumed degree of protection against the costs of ambulatory services. The fourth category, Medicare, however, presents two difficulties in interpretation. First, and less serious, is that the annual deductible (fifty dollars at the time of the study) may in some cases exert an influence on use of physicians' services similar to that of having no coverage at all since we are dealing with episodes of limited seriousness. The ambiguity arises in part from our not knowing whether the individual had already exceeded this deductible by the time of the episode. A much more serious difficulty, however, is that anyone with Medicare coverage is also at least age sixty-five and a great majority of persons sixty-five or over have Medicare.[8] It is not possible, then, to distinguish between the effects of age versus coverage.

Turning to the findings reported in Table 21, the effect of no coverage relative to voluntary health insurance is, as expected, a greater tendency to delay. Medicare has a similar effect which might be interpreted as an age effect or a benefit structure effect or both. There is evidence to support the notion that both kinds of effects are present. The coefficient in Table 21 representing the effect of Medicare relative to voluntary health insurance, it will be recalled, was $\hat{\beta}_{24} = .525$. When we introduce a tighter control for age by differentiating between persons above and below age 45, $\hat{\beta}_{24}$ increases to .680 with virtually no change in standard error. This supports the age effect interpretation. On the other hand, we find support for the benefit structure interpretation when we compare persons who have their deductible also paid by a third party (namely, individuals on welfare) with persons who are more likely to be paying the deductible themselves, when we exclude from the sample persons on welfare, considering, therefore, only this latter group, $\hat{\beta}_{24}$ becomes .844 with only a very slight increase in standard error.

[7] Lejeune, *Illness Behavior Among the Urban Poor.*

[8] It will be recalled that "Medicare" refers to Part B, which is coverage for physicians' services.

The most surprising finding in Table 21 is the positive association between delay and Medicaid coverage. Since Medicaid results in essentially a zero price at the time of service and includes all ambulatory services, our expectation was that those with this form of coverage would, other things being equal, have the least delay. Instead, we observe delay almost as great as we found for individuals with no coverage at all.

We have considered several factors which might account for or at least help explain this result. First it should be noted that age, in the additive model shown in Table 21, cannot logically be obscuring a true negative relationship. Medicaid is more characteristic of younger groups who we found earlier tend to delay less rather than more. Thus, a tighter control on age should not weaken or reverse the anomalous finding. (In testing this proposition we found, although it is not shown in the tables, that tightening our control for age in fact made no difference, while eliminating age from the regression tended to reduce the effect of Medicaid as would be logically expected.)

A second factor more likely to be influencing the relationship between Medicaid and delay is perceived seriousness. If persons with Medicaid were more inclined to discount the seriousness of early symptoms relative to those with voluntary health insurance, we might observe the results in Table 21 despite the broad coverage that Medicaid offers. This turns out not to be the case, however. When perceived seriousness is included in the regression (as in Table 21) $\hat{\beta}_{23}$ is .176. In the absence of the seriousness measure, $\hat{\beta}_{23}$ is almost the same, $\hat{\beta}_{23} = .182$.

In looking more closely at the possible effects of age and perceived seriousness, we have been allowing for the possibility of inadequate measurement. Two other alternatives must be considered. First, that Medicaid coverage has inherent in it something which causes people to delay and, second, that people who report such coverage tend also to delay because of some unmeasured factor (thus resulting in a spurious relationship between Medicaid and delay).

We suggested in the last chapter that some persons experiencing an illness episode appear to self-select out of the no coverage and into the Medicaid category. If a person obtains Medicaid coverage only after receiving medical care, one might anticipate little difference in his tendency to delay relative to someone never receiving coverage. But, in New York State, unlike many others, an individual is normally "precertified." That is, coverage is not dependent on his using services. To test the potential influence of the absence of precertification, we consider again only those persons not in families receiving welfare. (Welfare families are automatically covered, and receive a Medicaid card through the welfare payment mechanism). If the tendency for persons with Medicaid coverage to delay

is due to an absence of coverage at the time of getting sick, we should find the coefficient larger for the subsample excluding welfare recipients than that observed in Table 21. The reverse, however, is true as the new coefficient is $\hat{\beta}_{23} = .111$ compared to the original $\hat{\beta}_{23} = .176$.

We are left with the second alternative, namely a spurious association. What evidence can we marshall to speculate on the nature of the underlying factor? Lejeune found that in general and for persons in poor health particularly, there was a strong relationship between his index of acceptance of dependency and number of physician contacts. Welfare mothers indicating a high acceptance of dependency had only about half as many visits as the low acceptance group. He found, in fact, that this index was second only to reported level of health, as a predictor of utilization. Lejeune concludes that, "both the presentation of ill health and the reluctance to see a doctor have as a common factor a retreatist orientation."[9] The same might be said for Medicaid coverage and delay before seeking medical care, since those who not only are covered by Medicaid but also receive welfare have the greatest delay. If the underlying factor influencing both Medicaid coverage and delay is of a psychological or social-psychological sort, however, we must assume that it would be tempered by the more immediate realities of the sickness situation. That is, we would expect to find the spurious association strongest in situations where discretion with respect to delay was at its greatest.

In our original theoretical formulation we hypothesized that children would be more likely to delay than adults because sickness among children is less disruptive to the family and involves a greater range of discretion for the parents than would be the case if an adult were sick. On the basis of the data, however, we concluded that the additive effect of usual activity was just the opposite; namely, that, probably due to emotional concern for the child's welfare, prompter attention is sought for children than is the case for adults. There remains the possibility, however, that usual activity influences delay as we had originally predicted, but not in a direct fashion. Rather, it may condition the influence of some unmeasured factor such as the retreatist orientation suggested by Lejeune. To assess this interaction effect, we compare the coefficients of the regression shown in Table 21 repeated for each subsample defined by condition seriousness and usual activity. As may be seen in Table 24, it is only among school children and preschool children that we observe positive relationships between Medicaid coverage and delay. The signs of the coefficients for adults and their magnitudes in the case of adults with more serious conditions are consistent with our original hypothesis. The anomalous result observed in

[9] Lejeune, *Illness Behavior Among the Urban Poor*, p. 199.

Table 21, then, may be attributed to behavior with respect to children, and the findings suggest an unmeasured factor underlying both Medicaid coverage and a tendency to hesitate before seeking care.

TABLE 24

MEDICAID COEFFICIENTS ($\hat{\beta}_{23}$) IN REGRESSIONS OF DELAY ON ALL INDEPENDENT VARIABLES FOR EIGHT CONDITION SERIOUSNESS-USUAL ACTIVITY SUBSAMPLES[a]

CONDITION SERIOUSNESS	USUAL ACTIVITY			
	Work	Keep House	School	Under Age Six
Serious	−.829 (.481) N=98	−.469 (.472) N=83	.368 (.326) N=119	.482 (.384) N=74
Not Serious	−.065 (.303) N=168	−.032 (.294) N=128	.526 (.216) N=227	.256 (.316) N=142

[a] All variables are included in each of the eight regressions although not shown in table.

USUAL SOURCE OF CARE

We have grouped usual sources of care into three classes for purposes of our analysis: private practitioner (non-group), private practitioner (group), and hospital clinic. For convenience, we will refer to the first as solo practice (this class would include partnerships as well), and the second as group practice. Less than one-half of one per cent of those reporting a physician visit (five cases) reported no usual source of care, and these have been dropped from the analysis of delay.

The private practitioner is assumed to be the least institutionalized source of care and the hospital clinic the most institutionalized source. The non-hospital clinic or group practice is seen as falling between these two. On the basis of this ordering of sources, our expectation was that persons reporting group practice as their usual source would delay somewhat more than those reporting the more client-oriented solo practitioner, while clinic users would report the greatest delay. The first expectation is confirmed by the results in Table 21. The coefficient for group practice users relative to solo practice users is $\hat{\beta}_{26} = .178$, a difference which is nearly significant ($t = 1.72$). On the other hand, there is no difference in delay comparing hospital clinic users with those reporting a solo practitioner as their usual source ($\hat{\beta}_{27} = .009$).

Two factors are assumed to be influencing the length of time between the first awareness of the condition and contact with a doctor. The first, discussed in Chapter II, is the relative acceptability of the three types of sources. It was on this basis that we developed our hypothesis regarding the relationship between usual source and delay. The second factor is the relative accessibility of the sources.

The results of the regression shown in Table 21 suggest that accessibility is an important countervailing influence at least in the case of the hospital clinic. Although this latter source may be less acceptable, one need only present himself for care. In contrast, a person must generally arrange for an appointment with a solo practitioner. The net result in terms of delay at any rate, is the same for the two sources. Group practice combines a somewhat more institutionalized setting than solo practice with less ready access than is found with a hospital clinic with apparent result that delay is greater than for either of the alternative sources.

FACTORS AFFECTING DELAY WITHIN USUAL ACTIVITY AND CONDITION SERIOUSNESS GROUPS

To conclude our analysis of variation in delay before seeking care, we consider the regressions of the poverty-related variables, given perceived seriousness, for each of the eight subsamples defined by condition seriousness and usual activity. We start by showing the net effects of perceived seriousness for the eight groups, then report the additional significant effects observed using as our criterion the likelihood ratio test.

Table 25 shows the coefficients $\hat{\beta}_{10}$ and $\hat{\beta}_{11}$ representing the deviation in delay from the not serious group of those who perceived their conditions as fairly serious and very serious respectively. Generally speaking, the results are as we would expect and are similar to the summary effects reported in Table 21. For example, there are no significant results for which the sign of the coefficient is not consistent with our expectations. On the other hand, among those with conditions rated as serious, there is a peculiar reversal in the size of the two coefficients for wage earners and persons whose normal activity is keeping house. Among these two groups, persons who thought their condition was fairly serious delayed less than those who thought their condition was not serious at all. We find no difference,however, between the latter group and those who considered their conditions very serious. A likely explanation for these results is that most of the individuals who were hospitalized as a result of their episode condition come from these two adult groups whose conditions were serious. As these cases have been eliminated from the analysis, the remainder of the sample probably contains a disproportionate number whose conviction that their illness was "very serious" was not very strong.

Given perceived seriousness, the next question is which of the poverty-related factors of head's education, race, income, insurance, and usual source are related to delay within the subsamples. It will be recalled that we would expect to observe more significant associations among those whose illness conditions are rated as not serious and among children rather than adults.

Table 26 summarizes the instances in which levels of the independent variable differed significantly from the level constrained to zero, thus indicating a relationship with delay. The level of significance is shown by the number of asterisks.

The fact that levels of an independent variable differ significantly from the one constrained to zero, as indicated in this table, does not imply that the association is of the sort predicted by our hypotheses nor even that the ordering of levels is congruent with the overall results presented above. In most instances, however, at least the second of these conditions does obtain.

We will summarize the results for each of the five poverty-related factors.

Head's Education.—Significant results were observed for pre-school children with conditions rated as not serious and for wage earners and school children with serious conditions (Table 26). In the case of the first two groups, the relationships parallel the overall findings seen earlier in Table 21 except that persons in families whose head had the least education experienced the least delay contrary to expectations.[10] As for the third group, school children, no interpretable association is observed.

Race.—In all four usual activity groups whose conditions were rated as not serious we see a significant race effect, as well as one for wage earners with serious conditions. In each of the five cases, both Puerto Ricans and blacks delayed more than whites. Puerto Rican wage earners tend to delay more than their black counterparts, while the reverse is true for those whose usual activity is keeping house. Children in the two racial-ethnic groups are similar in their tendency to delay relative to whites.

Income.—There is only one group for which adjusted current income is a significant factor with respect to delay—those with nonserious conditions whose usual activity is keeping house. In this case, income orders length of delay in the way predicted, with the lowest income group delaying more and the highest income group delaying less than the three middle income groups (which do not differ significantly from each other).

Third-Party Coverage.—We have already seen the coefficients for Medicaid coverage for each of the eight groups (Table 24). Considering insurance coverage as a whole, there are four groups which show significant relationships. In the first three cases, where the condition was rated as not serious, persons with no coverage delay longer than those with voluntary health insurance. In the case of wage earners with serious conditions,

TABLE 25

PERCEIVED SERIOUSNESS COEFFICIENTS ($\hat{\beta}_{10}$ AND $\hat{\beta}_{11}$) IN REGRESSIONS OF DELAY ON ALL INDEPENDENT VARIABLES FOR EIGHT CONDITION SERIOUSNESS-USUAL ACTIVITY SUBSAMPLES[a]

CONDITION SERIOUSNESS	USUAL ACTIVITY			
	Work	Keep House	School	Under Age Six
Serious	$\hat{\beta}_{10}=-.883$ (.335) $\hat{\beta}_{11}=-.220$ (.347) N=98	$\hat{\beta}_{10}=-.429$ (.384) $\hat{\beta}_{11}=-.036$ (.362) N=83	$\hat{\beta}_{10}=-.431$ (.282) $\hat{\beta}_{11}=-.498$ (.268) N=119	$\hat{\beta}_{10}=.306$ (.403) $\hat{\beta}_{11}=-.633$ (.444) N=74
Not Serious	$\hat{\beta}_{10}=-.418$ (.190) $\hat{\beta}_{11}=-.833$ (.253) N=168	$\hat{\beta}_{10}=-.247$ (.233) $\hat{\beta}_{11}=-.471$ (.264) N=128	$\hat{\beta}_{10}=-.004$ (.161) $\hat{\beta}_{11}=-.513$ (.208) N=227	$\hat{\beta}_{10}=.009$ (.245) $\hat{\beta}_{11}=-.456$ (.277) N=142

[a] All variables are included in each of the eight regressions although not shown in table.

TABLE 26

SUMMARY OF SIGNIFICANT[a] RELATIONSHIPS BETWEEN POVERTY-RELATED FACTORS AND DELAY FOR EIGHT CONDITION SERIOUSNESS-USUAL ACTIVITY SUBSAMPLES

INDEPENDENT VARIABLE	CONDITION SERIOUSNESS AND USUAL ACTIVITY							
	Not Serious				Serious			
	Work	Keep House	School	Under Age Six	Work	Keep House	School	Under Age Six
Head's Education				*	**		**	
Race	***	***	*	***	**			
Income		**						
Insurance	*	**	**					**
Usual Source			**		**			

[a] *—p = .10, ** —p = .05, *** —p = .01.

[10] Although the curvilinear relationship described was unexpected for delay in acute illness, the finding is consistent with Roberts' work on delay in seeking care for breast cancer. She found that persons with low or high knowledge scores were more likely to have little delay than were the intermediate groups. Beryl J. Roberts, "A Study of Selected Factors and their Association with Action for Medical Care," (unpublished Ph.D. dissertation, Harvard University, 1956).

however, we observe the opposite effect. Adults with Medicaid coverage do not differ in delay from those with voluntary health insurance, while among children we see the effect discussed at length earlier, namely a tendency for those with Medicaid to delay longer. Those with Medicare coverage delay longer relative to persons with voluntary health insurance.

Usual Source of Care.—Finally, the effect of having a group practitioner as a usual source of care for both school children with nonserious conditions and wage earners with serious conditions is consistent with the overall findings. We also find some tendency to delay among the school children for whom a hospital clinic is the usual source.

To summarize, the significant effects found when we regressed delay on the poverty-related factors, given perceived seriousness, for each of the eight groups tend to conform to the overall effects discussed earlier. This is hardly surprising since they are important components of the overall effects. Head's education is related to delay but not linearly as expected. Rather, there is a tendency for those in families whose head has very little formal education to delay less than the middle-education groups. Both Puerto Ricans and blacks tend to delay more than whites. Income is a minor factor but the one instance in which it does enter, the relationship is as predicted. Health insurance is relatively important but with children covered by Medicaid delaying more than those with voluntary health insurance. Finally, we found a tendency for those using a group practice to have more delay than those using either a solo practitioner or a hospital clinic.

To conclude our analysis of delay, we consider the relative importance of these poverty-related factors across the condition seriousness and usual activity dimensions. We originally hypothesized that associations would more often be observed when the episode causing condition was less serious and when the person's usual activity was less instrumental to the family. The results for delay shown in Table 26 confirm the first part of this hypothesis but not the second. Out of the twenty possible relationships in each case, we find ten that are significant for non-serious conditions, but only five for serious conditions. On the other hand, of a possible ten relationships for each usual activity, we find five significant relationships for wage earners, three for those whose activity is keeping house, four for school children, and only three in the case of children under age six.

Another way of approaching the question of the relative importance of the poverty-related variables in explaining delay is to examine the degree to which they increase the value of the likelihood ratio for different seriousness and usual activity categories. Given the same number of degrees of freedom, it makes intuitive sense to argue that, comparing groups, the one for which the value is greater is the one for which poverty-related

factors are the more important in predicting to or explaining delay. In fact, we do not have a situation in which the number of degrees of freedom is exactly the same. There is no variable representing Medicare for children, for example. However, the numbers are close to the same, and large enough that discrepancies should make no appreciable difference.

We see in Table 27 that only for the three usual activity categories other than "work" is it the case that the poverty-related factors are more important in predicting delay when the condition is not serious rather than serious. For wage earners, it is when the condition is serious that the value of the likelihood function is increased the most by the addition of these factors. This is a puzzling finding which we see later obtains as well for physician visits and amount of care received.

TABLE 27

VALUES OF THE STATISTIC $-2 \ln \lambda$ COMPARING REGRESSIONS WITH POVERTY-RELATED VARIABLES ENTERED WITH REGRESSIONS EXCLUDING POVERTY-RELATED VARIABLES FOR EIGHT CONDITION SERIOUSNESS-USUAL ACTIVITY SUBSAMPLES-DELAY

CONDITION SERIOUSNESS	USUAL ACTIVITY			
	Work	Keep House	School	Under Age Six
Serious.....	41.384 df= 17 N= 98	16.334 df= 17 N= 83	14.833 df= 15 N=119	18.168 df- 15 N= 74
Not Serious.....	30.996 df= 17 N=168	32.242 df= 17 N=128	26.580 df= 16 N=227	24.430 df= 16 N=142

As we have done previously, we considered the possibility that the age distributions in the four adult categories differed substantially. Since the values shown in Table 27 differ somewhat between children and adults, an age effect might account for the puzzling reversal. We found, however, that the four age distributions (serious-not serious x work-keeping house) do not differ appreciably (table not shown).

A second possible explanation for the poverty-related factors being more important among wage earners with serious conditions compared to those with non-serious conditions might be that, relative to housewives, there happens to be less variation in the dependent variable in the non-serious case. Such an explanation, of course, runs contrary to common sense, but was considered nevertheless. For each of the four distributions of delay we calculated V the estimated coefficient of variation. As would be expected, we find greater variation in delay for non-serious conditions

than for serious conditions for both usual activities. In the case of non-serious conditions, V = 1.01 for wage earners and V = .92 for those keeping house. For serious conditions the coefficients are .69 and .61 respectively indicating less variation in the dependent variable.

We are left then with the following conclusions based on Table 27. The importance of the poverty-related variables in predicting delay does not vary much across usual activities except for wage earners with serious conditions for whom these factors are relatively more important. Our original hypothesis comparing the importance of the poverty-related factors across seriousness is supported for activities other than work, but for wage earners, these factors are more important when the condition is serious for unknown reasons.

CHAPTER VII

FACTORS RELATED TO VARIATION IN PHYSICIAN VISITS

As we saw at the end of Chapter IV, about three-quarters (74 per cent) of those persons with illness episodes contacted a doctor. Of those who did, approximately one-half (51 per cent) returned to the doctor for a second visit or (in one case out of four) saw a second doctor. In this section, we will examine variation in the number of physician visits (including zero) using limited dependent variable regression. In addition, however, using less formal contingency table analysis, we will distinguish between initial contact and revisits. Apart from this added dimension, the analysis will parallel our consideration of variation in delay presented above.

Table 28 shows the regression of physician visits on condition seriousness, usual activity, and their interaction. $\hat{\beta}_1$, representing the deviation of those with serious compared to non-serious conditions, is positive and large relative to its standard error both by itself (column [2] where $\hat{\beta}_1 = .918$) and in terms of net effect allowing for usual activity and interactions. The improvement in our ability to predict physician visits by knowing condition seriousness is indicated by the significance of the likelihood ratio criterion ($p = .001$).

The addition of usual activity ($\hat{\beta}_2 \ldots \hat{\beta}_4$) to the regression further refines the prediction. On the basis of column (3) it appears that the significance ($p = .005$) of the usual activity effect is due largely to the tendency for persons in school to have fewer visits than those who work, controlling for seriousness. Neither housewives nor children under age six differ substantially from working people. Unlike the case of delay, however, the simple additive model implied by column (3) obscures the true effects of seriousness and usual activity. The interaction effect in the case of physician visits is significant at the $p = .001$ level. Once again the interpretation of the coefficients becomes more difficult with the introduction of interaction terms. Therefore, in Table 29, we show a cross-tabulation of the expected values, which includes interaction effects.

When the condition is rated as serious, those who work have the greatest number of visits, while children have the least. On the other hand, when the condition is rated as non-serious, we find that working people have the fewest visits, while children under age six have more than either housewives or school children. These results are not changed when we enter all

other independent variables. (This may be seen by comparing Tables 28 and 31.) Two difficulties are present in interpreting the results, however. First, the expected values are influenced by the inclusion of all visits (as distinct from initial contact) and, second, as with delay, we must consider the factor of differences in types of illness conditions not accounted for by physician-rated seriousness.

The instrumental importance argument, which was supported in the comparison of delay for wage earners versus those keeping house, is strengthened when we consider the proportions of the four usual activity groups reporting an initial contact (and thus disregarding number of revisits, if any). As may be seen in Table 30, when the condition is serious, the proportion of adults who sought care is higher than the proportion of children. Although these differences are not great, perhaps due to a ceiling effect, they do suggest that adults are more inclined to take a "wait and see" position for their children than for themselves.[1] What is more striking, however, is the tendency for the reverse to be true in the case of non-serious conditions. The smallest proportion seeking care (58 per cent) are wage earners, while 76 per cent of children under age six saw a doctor. A logical interpretation of these findings is that for adults (particularly wage earners) and children in school it is more difficult to interrupt their usual activity (or a return to it) than for preschool children. In a sense, a person's usual activity operates in two ways, depending on the condition's seriousness. Both are consistent with the instrumental importance interpretation.

The next step in the analysis is a summary of the net effects of (1) the remaining episode-related factors of perceived seriousness and bed disability days and (2) the five poverty-related factors. The basic results are shown in Table 31 where we see the coefficients representing all the independent variables defined in Chapter III. As was done in the case of delay,

[1] The outcome of this position apparently tends to be spontaneous recovery as we found less delay on average for children in the previous chapter.

TABLE 28

ESTIMATED PARAMETERS REGRESSING PHYSICIAN VISITS ON CONDITION SERIOUSNESS AND USUAL ACTIVITY

(N=1,443)

INDEPENDENT VARIABLES	REGRESSION ASSUMING . . .			
	$\beta_1=\beta_2\ldots=\beta_9=0$ (1)	$\beta_2=\beta_3\ldots=\beta_9=0$ (2)	$\beta_6=\beta_7\ldots=\beta_9=0$ (3)	No Constraints (4)
$\hat{\beta}_0$ Constant	.257	.028	.085	−.087
	(.030)	(.034)	(.057)	(.064)
$\hat{\beta}_1$ Condition Serious		.918	.916	1.577
		(.062)	(.062)	(.123)
$\hat{\beta}_2$ Keeping House			.048	.164
			(.082)	(.099)
$\hat{\beta}_3$ School			−.202	.056
			(.072)	(.085)
$\hat{\beta}_4$ Under Age Six			.041	.400
			(.083)	(.099)
$\hat{\beta}_6$ Serious x Keeping House				−.442
				(.178)
$\hat{\beta}_7$ Serious x School				−.924
				(.160)
$\hat{\beta}_8$ Serious x <Age Six				−1.210
				(.182)

TABLE 29

EXPECTED VALUES OF PHYSICIAN VISITS FOR COMBINATIONS OF SERIOUSNESS AND USUAL ACTIVITY

(N=1,443)

CONDITION SERIOUSNESS	USUAL ACTIVITY			
	Work	Keep House	School	Under Age Six
Serious	4.502	3.751	2.325	2.452
Not Serious	1.057	1.298	1.137	1.703

TABLE 30

PROPORTION OF INDIVIDUALS WITH AT LEAST ONE PHYSICIAN CONTACT BY CONDITION SERIOUSNESS AND USUAL ACTIVITY

CONDITION SERIOUSNESS	USUAL ACTIVITY			
	Work	Keep House	School	Under Age Six
Serious	.96	.97	.89	.91
	(155)	(153)	(177)	(103)
Not Serious	.58	.63	.60	.76
	(304)	(213)	(386)	(196)

Table N	1,687
Don't know visits	15
Other Usual Activity	93
No episode	3,474
Total N	5,269

we tested for first-order interaction effects between perceived seriousness and all poverty-related variables. A significant (p = .05) interaction effect was found with respect to racial-ethnic groups. This effect will be discussed below.

Considering first the effects of perceived seriousness and bed disability days, with a minor exception both are consistent with our expectations. Persons who consider their condition to be fairly serious had more visits than those who perceived their illness as not serious ($\hat{\beta}_{10}$ = .328), while

TABLE 31

ESTIMATED PARAMETERS REGRESSING PHYSICIAN VISITS ON ALL INDEPENDENT VARIABLES (N = 1,443)

CONSTANT, CONDITION SERIOUSNESS, USUAL ACTIVITY, PERCEIVED SERIOUSNESS, BED DISABILITY DAYS		EDUCATION OF HOUSEHOLD HEAD, RACE-ETHNICITY, ADJUSTED CURRENT INCOME, THIRD-PARTY COVERAGE, USUAL SOURCE OF CARE	
Variable	Coefficient (Standard Error)	Variable	Coefficient (Standard Error)
$\hat{\beta}_0$ Constant	.082 (.101)	*Head's Education:*	
Condition Seriousness:		$\hat{\beta}_{12}$ <5 years	.165 (.104)
—Not Serious	—0—	$\hat{\beta}_{13}$ 5–8 years	.192 (.076)
$\hat{\beta}_1$ Serious	1.459 (.125)	—9–11 years	—0—
Usual Activity:		$\hat{\beta}_{14}$ High School	.114 (.075)
—Work	—0—	$\hat{\beta}_{15}$ College	.046 (.121)
$\hat{\beta}_2$ Keeping House	.188 (.104)	*Racial-Ethnic Group:*	
$\hat{\beta}_3$ School	.090 (.090)	$\hat{\beta}_{16}$ Puerto Rican	—.234 (.081)
$\hat{\beta}_4$ Under Age Six	.386 (.106)	$\hat{\beta}_{17}$ Black	—.080 (.072)
Interaction:		—White	—0—
—Work x Serious	—0—	*Adjusted Current Income:*	
$\hat{\beta}_6$ Keeping House x Serious	— .521 (.180)	$\hat{\beta}_{18}$ Deficit $1,000+	—.137 (.133)
$\hat{\beta}_7$ School x Serious	— .965 (.160)	$\hat{\beta}_{19}$ Def. $999–Sur. $999	—.050 (.079)
$\hat{\beta}_8$ Under Age Six x Serious	—1.127 (.184)	—Sur. $1,000–$2,999	—0—
Perceived Seriousness:		$\hat{\beta}_{20}$ Sur. $3,000–$4,999	.030 (.087)
—Not Serious	—0—	$\hat{\beta}_{21}$ Surplus $5,000+	—.014 (.088)
$\hat{\beta}_{10}$ Fairly Serious	.328 (.066)	*Third-Party Coverage:*	
$\hat{\beta}_{11}$ Very Serious	.654 (.077)	$\hat{\beta}_{22}$ None	—.026 (.086)
Bed Disability Days:		$\hat{\beta}_{23}$ Medicaid	.065 (.082)
$\hat{\beta}_{28}$ None	— .096 (.089)	$\hat{\beta}_{24}$ Medicare	—.529 (.206)
$\hat{\beta}_{29}$ 1–2 Days	— .205 (.073)	—Voluntary	—0—
—3–4 Days	—0—	*Usual Source of Care:*	
$\hat{\beta}_{30}$ 5–9 Days	.029 (.092)	$\hat{\beta}_{25}$ None	Excluded
$\hat{\beta}_{31}$ 10+ Days	.516 (.132)	$\hat{\beta}_{26}$ Group	—.052 (.086)
		$\hat{\beta}_{27}$ Clinic	—.019 (.075)
		—Solo Pract.	—0—

the "very serious" group had the most visits ($\hat{\beta}_{11}$ = .654). Both coefficients are large relative to their standard errors (t = 4.97 and t = 8.49).

The minor exception referred to above appears in the effect of bed disability days. A linear relationship between bed days and physician visits would suggest a larger negative coefficient for those persons with no bed disability days than the one we observe. This discontinuity may be attributed to illness which, although requiring the attention of a doctor in the mind of the sick person, does not suggest bed rest. This phenomenon, it will be recalled, was discussed in Chapter IV.

Persons with one or two days of confinement to bed had fewer visits than the middle two bed disability groups (3–4 days and 5–9 days). $\hat{\beta}_{29}$ representing the deviation of the 1–2 day group from the 3–4 day group is —.205 with a standard error of (.073). At the other extreme, $\hat{\beta}_{31}$ representing those with ten or more days spent in bed is .516 (.132).

Turning to the poverty-related factors, we find fewer apparent effects, using t values as the criterion, than was the case for delay. We note differences across levels of the independent variable which approach or exceed a t value of 2 for only three of the five poverty-related factors: head's education, race, and third-party coverage. As was true for delay, number of visits does not vary as a function of income, but unlike the case of delay, usual source of care does not appear to influence number of visits either. It will be recalled that we originally hypothesized that usual source of care would exert effects of opposite sign on initial contact on the one hand and revisits on the other. As our dependent variable in the regression analysis combines these two elements, we will consider below the possibility that the absence of a usual source of care effect in the regression arises from two offsetting effects with respect to initial contact and revisits.

Considering the "positive" findings in Table 31, the effect of head's education on visits is the opposite of the one expected. Individuals in households whose heads had little formal education experienced more physician visits than those with higher levels of education, although the relationship is not perfectly linear. Both Puerto Ricans and blacks had fewer visits than whites, but only in the case of Puerto Ricans ($\hat{\beta}_{16}$ = —.234 [.081]) is the difference substantial relative to its standard error. Finally, persons with Medicare coverage had fewer visits than those with voluntary health insurance coverage. No difference is observed, however, comparing voluntary insurance coverage with no coverage or coverage under Medicaid.

We will consider each of these findings in more detail, introducing the distinction between initial contact and revisits as we go along.

EDUCATION OF HEAD OF HOUSEHOLD

Our hypothesis about head's education was that for each element of the response process—delay, initial contact, revisits, and amount of care—we would find associations of the following type: persons in families whose heads had lower education would be more inclined to delay and would have fewer visits and less care. We found weak support for that part of the hypothesis dealing with delay. In the case of physician visits, however, the signs of the coefficients representing the two lowest levels of education are opposite the ones that we expected, $\hat{\beta}_{12}$ (less than 5 years) is .165 and $\hat{\beta}_{13}$ (5–8 years) is .192 indicating more visits than the 9–11 years group. Individuals in families whose head completed High School did have more visits than the High School incomplete (9–11 years) group ($\hat{\beta}_{14}$ = .114)

TABLE 32

PHYSICIAN VISITS-EFFECT OF LEVEL OF HEAD'S EDUCATION WITH AND WITHOUT ADDITIONAL CONTROL FOR AGE[a]

Head's Education	Controlling for Adult's Age	No Additional Control
<5 years	.139 (.105)	.165 (.104)
5–8 years	.181 (.077)	.192 (.076)
9–11 years	—0—	—0—
High School	.114 (.075)	.114 (.075)
College	.080 (.121)	.046 (.121)

[a] All variables are included in regression although not shown in table.

but the highest educational level coefficient ($\hat{\beta}_{15}$) differs very little from this central group coefficient ($\hat{\beta}_{15}$ = .046).

We have seen that age, as indicated by usual activity, is related to the number of physician visits a person makes. The effect, it will be recalled, differs depending on condition seriousness. As we did with delay, we must consider the possibility that the effect of head's education on physician visits is due to an inadequate control for age among adults. When we differentiate between those under and over age forty-five, we do observe a change in the coefficients $\hat{\beta}_{12}$ through $\hat{\beta}_{15}$ in a direction consistent with our hypothesis. This change, however, is not very substantial (Table 32).

Our analysis up to this point has dealt with physician visits as a whole. When we employ a statistical model which estimates the effect of education on the combined probability of seeing a doctor at all and, conditional on having seen a doctor, the number of visits, we may be obscuring relationships with one or the other of the original two elements in which we were

interested (initial contact and revisits). By looking at these elements separately, we may conclude that our original hypothesis is at least partially supported.

Table 33 shows for serious and non-serious conditions the proportion of individuals in each of the five education groups who contacted a doctor, and the proportion who, having done so, had additional physician visits.

TABLE 33

PROPORTIONS WITH INITIAL PHYSICIAN CONTACT AND REVISITS GIVEN INITIAL CONTACT BY EDUCATION OF HEAD OF HOUSEHOLD AND CONDITION SERIOUSNESS

Head's Education	Condition Seriousness			
	Not Serious		Serious	
	Initial Contact	Revisit	Initial Contact	Revisit
0–4 years	.58 (110)	.45 (64)	.94 (51)	.65 (48)
5–8 years	.64 (256)	.30 (164)	.91 (102)	.67 (93)
9–11 years	.60 (356)	.32 (214)	.89 (151)	.66 (134)
High School	.66 (258)	.41 (170)	.91 (91)	.71 (83)
College	.64 (84)	.30 (54)	[.84] (19)	[.69] (16)

Table N	1,478
Other Usual Activity	49
Hospitalized	183
Other Usual Activity and Hospitalized	41
Incomplete Cases[a]	44
Total Episode N	1,795

[a] See footnote 10 on page 59.

The results shown in Table 33 do not indicate any strong linear relationships between head's education and initial contact on the one hand or revisits on the other for either the not serious or the serious condition groups. However, in light of the regression analysis in which we found lower education associated with more visits, there are some suggestive differences in the ordering of the four sets of proportions. First, considering initial contact, for those with non-serious conditions there is no indication that persons in families whose heads have less education are more likely to see a doctor. If anything, there is some indication that the opposite is true. In contrast, for persons with serious conditions we see a slight tendency for the lower education group to be associated with a higher probability of initial contact.

As with initial contact, revisits among those with non-serious conditions

are not ordered by head's education. For those persons who had serious conditions, however, there is a slight tendency for those in families with higher head's education to be more likely to have one or more revisits.

When we distinguish between initial contact and revisits, then, we do not find a pattern consistent with the regression results. Rather, we find that when the condition is non-serious there is no clear relationship between either element and head's education, and when the condition is serious there is a tendency for the low education groups to be more likely to seek care, but not necessarily to be more likely to return.

What this suggests is that for illnesses that are less serious, the regression results do not give an adequate picture of education's effect. To carry this argument a step further, we will differentiate, for those within the non-serious condition category, between individuals whose illnesses resulted in little bed disability and those who had more disruptive illnesses and then observe the proportions with initial contact. What we are arguing is that although the overall results show that low education is associated with more visits, if we focus on that element of use in which we assume that the individual has the most discretion (initial contact) and under that circumstance where we expect social-structural factors to make the most difference (non-serious conditions causing little disruption) we should at least here find that low education is associated with a relatively lower probability of seeking care. The results in Table 34 indicate that, in fact, this is the case.

There are only two instances of an apparent relationship in Table 34. The first is the one to which we have already referred. For those with non-serious conditions and fewer than three bed disability days, the proportion of the lowest education group seeking care is .50. At the other end of the education distribution, those in families whose heads completed High School 64 per cent had an initial doctor visit, while for the highest education group the proportion was .61.

The other relationship occurs with respect to revisits when the condition is serious and three or more bed disability days were experienced. Here again more education is associated with a greater likelihood of revisits. The probable explanation for this finding is greater noncompliance with the physicians' instruction to return among those in families with lower head's education as will be seen shortly.

Before concluding our discussion of the effect of head's education, we will reconsider age. It will be recalled that when we tightened the control for age in the regression (Table 32) the coefficients representing levels of head's education changed in a direction consistent with our original hypothesis. In light of this result and the observed interaction between measures of seriousness (which are also related to age) and both initial contact and revisits, we recomputed Table 33 for each of three age groups: under age 17, 17–44, and age 45 or over.

The slight positive association that we noted in Table 33 between head's education and initial contact for non-serious conditions holds for the middle age range in Table 35 (ages 17–44). For the younger age group (under 17 years) this association is stronger with 56 per cent of the lowest

TABLE 34

PROPORTIONS WITH INITIAL PHYSICIAN CONTACT AND REVISITS GIVEN INITIAL CONTACT BY EDUCATION OF HEAD OF HOUSEHOLD, BED DISABILITY DAYS AND CONDITION SERIOUSNESS

BED DISABILITY DAYS	HEAD'S EDUCATION	CONDITION SERIOUSNESS			
		Not Serious		Serious	
		Initial Contact	Revisit	Initial Contact	Revisit
0–2 Days	0–4 years	.50 (62)	.39 (31)	.96 (24)	.70 (23)
	5–8 years	.54 (145)	.23 (78)	.88 (59)	.60 (52)
	9–11 years	.52 (215)	.23 (112)	.87 (69)	.53 (60)
	High School	.64 (149)	.33 (96)	.85 (48)	.68 (41)
	College	.61 (54)	.27 (33)	[.92] (12)	[.64] (11)
3+ Days	0–4 years	.69 (48)	.52 (33)	.93 (27)	.60 (25)
	5–8 years	.78 (111)	.36 (86)	.95 (43)	.76 (41)
	9–11 years	.72 (141)	.41 (102)	.90 (82)	.76 (74)
	High School	.68 (109)	.51 (74)	.98 (43)	.74 (42)
	College	.70 (30)	.32 (21)	[.71] (7)	[.80] (5)

Table N	1,478
Other Usual Activity	49
Hospitalized	183
Other Usual Activity and Hospitalized	41
Incomplete Cases	44
Total Episode N	1,795

education group seeking care compared to 74 per cent of the college group. On the other hand we observe no relationship for the oldest age category (ages 45+). Once again, there is no apparent association between head's education and revisits for non-serious conditions.

Turning to serious conditions, the tendency for lower education to be associated with a slightly higher probability of initial contact that we saw in Table 33 is not contradicted in any of the three age classifications. (The cell sizes are so small and the proportions so close to 1.00 that one cannot

make a stronger statement than this.) At the same time, however, the positive association between head's education and revisits for serious conditions is apparent only in the youngest age group. The proportions range from .45 for children in families with heads who had no more than four years of school to .64 for the High School group (and two of the three individuals in families whose heads had attended college).

The rationale for our original hypothesis that the effect of social-structural variables would be greater in the case of initial contact than for revisits was that once an individual enters the medical care system, his care will be based on medical standards with little regard for his social or economic situation. If this were the case, however, we would not expect to see

TABLE 35

PROPORTIONS WITH INITIAL PHYSICIAN CONTACT AND REVISITS GIVEN INITIAL CONTACT BY EDUCATION OF HEAD OF HOUSEHOLD, AGE AND CONDITION SERIOUSNESS

AGE HEAD'S EDUCATION		CONDITION SERIOUSNESS			
		Not Serious		Serious	
		Initial Contact	Revisit	Initial Contact	Revisit
Under Age 17	0–4 years	.56 (39)	.54 (22)	.95 (21)	.45 (20)
	5–8 years	.67 (121)	.30 (81)	.88 (50)	.50 (44)
	9–11 years	.64 (189)	.33 (121)	.84 (86)	.58 (72)
	High School	.65 (140)	.45 (91)	.91 (46)	.64 (42)
	College	.74 (34)	.40 (25)	[.50] (6)	[.67] (3)
17–44	0–4 years	.54 (39)	.33 (21)	[1.00] (12)	[.67] (12)
	5–8 years	.58 (65)	.24 (38)	.96 (25)	.79 (24)
	9–11 years	.56 (127)	.31 (71)	.93 (44)	.73 (41)
	High School	.66 (96)	.35 (63)	.91 (33)	.77 (30)
	College	.62 (39)	.12 (24)	[1.00] (11)	[.64] (11)
Age 45 or above	0–4 years	.66 (32)	.48 (21)	[.94] (17)	[.88] (16)
	5–8 years	.64 (69)	.34 (44)	.93 (27)	.84 (25)
	9–11 years	.54 (39)	.24 (21)	1.00 (21)	.76 (21)
	High School	.76 (21)	[.44] (16)	[.92] (12)	[.82] (11)
	College	[.45] (11)	[.60] (5)	[1.00] (1)	[1.00] (1)

Table N	1,474
Don't Know Age	4
Other Usual Activity	49
Hospitalized	183
Other Usual Activity and Hospitalized	41
Incomplete Cases	44
Total Episode N	1,795

a smaller proportion of lower class individuals with serious conditions having return visits to the doctor. Such an expectation assumes, however, that compliance with the physician's instructions is not associated with head's education. If for serious conditions, at least, physicians were equally likely to suggest a return visit regardless of social class, but lower class individuals were less likely in fact to return, we might observe the findings in Table 35. To test the possibility, we calculated the proportion of individuals under age 17 with serious conditions who were instructed to return but did not do so. The results are shown in Table 36.

TABLE 36

COMPLIANCE WITH PHYSICIAN'S INSTRUCTION TO RETURN FOR REVISIT—CONDITION RATED SERIOUS, UNDER AGE >17 BY HEAD'S EDUCATION

Head's Education	Proportion Instructed to Return	Proportion Returning[a]	Proportion Failing to Comply
0–4 years	.65 (20)	.45 (20)	.20 (20)
5–8 years	.59 (44)	.50 (44)	.09 (44)
9–11 years	.66 (72)	.58 (72)	.08 (72)
High School	.69 (42)	.64 (42)	.05 (42)
College	[.67] (3)	[.67] (3)	[.00] (3)

Table N	181
Age 17 years or Condition Serious	1,293
Don't Know Age	4
Other Usual Activity	49
Hospitalized	183
Other Usual Activity and Hospitalized	41
Incomplete Cases	44
Total Episode N	1,795

[a] From Table 35.

Once again the cell sizes are so small that we can consider the results only suggestive at best. Nevertheless, it is legitimate to note that had there been universal compliance with the doctor's instruction to return, we would have observed no association between revisits and head's education in Table 35.

RACE

In Table 31 we saw that in the absence of interaction terms, $\hat{\beta}_{1r}$ representing the deviation of Puerto Ricans from other whites was −.234 indicating relatively fewer physician visits. Blacks also had fewer visits than whites on average, but the difference ($\hat{\beta}_{17} = -.080$) relative to its

standard error (.072) is quite modest and may be attributable to sampling error.

When we tested for first-order interaction between perceived seriousness and the several poverty-related factors, however, we found that the interaction with race was significant at p = .05. Entering interaction terms into the regression results in the coefficients presented in Table 37.

We find the same difficulty in interpretation that was evident earlier when we introduced interaction terms. In the case of condition seriousness

TABLE 37

ESTIMATED PARAMETERS FOR RACE, PERCEIVED SERIOUSNESS, AND INTERACTION IN REGRESSION OF PHYSICIAN VISITS ON ALL INDEPENDENT VARIABLES (N = 1,443)

Variable	Coefficient (Standard Error)
Racial-Ethnic Group:	
Puerto Rican	−.012 (.123)
Black	.075 (.114)
Interaction:	
Puerto Rican x Not serious	−.311 (.168)
Black x Not Serious	−.211 (.156)
Puerto Rican x Very serious	−.320 (.175)
Black x Very Serious	−.289 (.180)
Perceived Seriousness:	
Fairly serious	.193 (.099)
Very serious	.704 (.121)

and usual activity, however, we were able to go directly to a table of expected values since they were the only variables in the regression. As we are considering here the net effects of race given many other variables, this conversion is not possible.[2] Instead, we will show a table of I′, the linear combinations of the coefficients listed below (Table 38). Each linear combination bears approximately the same relationship to the other eight as would the weighted average of the expected values.

For both those illnesses which were initially perceived as being not at all serious and those considered very serious, the number of physician

[2] Mathematically it would be possible, of course, but the results would be uninterpretable.

visits made by Puerto Ricans is less than the number for blacks which in turn is less than the number made by whites. This finding is consistent with our original hypothesis. On the other hand, when the illness was perceived as fairly serious, we find little difference between Puerto Ricans and other whites, but somewhat more visits for blacks.

When we distinguish between initial contact and revisits for conditions rated as not serious and those rated as serious, we also observe an interaction effect but only with respect to revisits. As may be seen in Table 39, there is little difference between the three racial-ethnic groups in terms of

TABLE 38

LINEAR COMBINATIONS OF RACE, PERCEIVED SERIOUSNESS AND INTERACTION (RACE x PERCEIVED SERIOUSNESS) NET EFFECTS FROM REGRESSION OF PHYSICIAN VISITS ON ALL VARIABLES (N = 1,443)

PERCEIVED SERIOUSNESS	RACIAL-ETHNIC GROUP		
	Puerto Rican	Black	White
Not Serious	−.323	−.136	−0−
Fairly Serious	.181	.268	.193
Very Serious	.372	.490	.704

TABLE 39

PROPORTIONS OF INDIVIDUALS WITH INITIAL PHYSICIAN CONTACT AND REVISITS GIVEN INITIAL CONTACT BY RACE AND CONDITION SERIOUSNESS

RACE	CONDITION SERIOUSNESS			
	Not Serious		Serious	
	Initial Contact	Revisit	Initial Contact	Revisit
Puerto Rican	.60 (294)	.38 (177)	.90 (131)	.59 (118)
Black	.63 (301)	.44 (190)	.91 (142)	.74 (129)
White	.64 (469)	.27 (299)	.90 (141)	.67 (127)

Table N	1,478
Other Usual Activity	49
Hospitalized	183
Other Usual Activity and Hospitalized	41
Incomplete Cases	44
Total Episode N	1,795

the proportions initially contacting a doctor for either serious or not serious conditions. In contrast, however, for non-serious conditions other whites were less likely than Puerto Ricans to have a revisit, while for serious conditions the reverse is true. In the first case the proportions are .27 for other whites compared to .38 for Puerto Ricans, while in the second they are .67 and .59 respectively. For both serious and non-serious conditions blacks were the most likely to have had a revisit.

As will be seen below, for individuals whose conditions were rated as not serious, there is a tendency for the proportion of revisits to be smaller for persons whose usual source is a group practice compared to those using a hospital clinic. Since group practice is a more common source of care for whites compared to Puerto Ricans and the reverse is true of hospital clinics as a usual source, the different distributions of usual sources may account for the higher proportion of Puerto Ricans with revists relative to whites. The results shown in Table 40, however, suggest that this latter relationship holds for each source of care.

TABLE 40

PROPORTION OF INDIVIDUALS WITH INITIAL PHYSICIAN CONTACT AND REVISITS GIVEN INITIAL CONTACT BY RACE, USUAL SOURCE OF CARE, AND CONDITION SERIOUSNESS

RACE, USUAL SOURCE OF CARE		CONDITION SERIOUSNESS			
		Not Serious		Serious	
		Initial Contact	Revisit	Initial Contact	Revisit
Solo Practice	Puerto Rican	.64 (152)	.30 (97)	.90 (73)	.53 (66)
	Black	.67 (178)	.44 (119)	.87 (62)	.68 (54)
	White	.64 (360)	.28 (232)	.90 (119)	.64 (107)
Group Practice	Puerto Rican	[.56] (18)	[.60] (10)	[.75] (8)	[.33] (6)
	Black	.67 (54)	.39 (36)	.92 (24)	.82 (22)
	White	.65 (74)	.17 (48)	[.92] (13)	[.83] (12)
Hospital Clinic	Puerto Rican	.59 (117)	.45 (69)	.92 (47)	.72 (43)
	Black	.54 (66)	.47 (36)	.96 (53)	.78 (51)
	White	.72 (25)	[.39] (18)	[.89] (9)	[.75] (8)

Table N	1,452
No Usual Source	26
Other Usual Activity	49
Hospitalized	183
Other Usual Activity and Hospitalized	41
Incomplete Cases	44
Total Episode N	1,795

For individuals using a solo practitioner as their usual source of care, the difference between the proportion of whites and Puerto Ricans having revisits for non-serious conditions is trivial (.28 compared to .30), and for those using group practices, the cell size for Puerto Ricans is only 10. On the other hand, the proportion of whites with revisits in the group practice case is surprisingly small.

In addition to the possible effect of usual source, we also examined the role of non-compliance as an explanation for the tendency for whites to have revisits proportionately less often. We found, however, that if there had been universal compliance with the doctors instruction to return, the difference between whites on the one hand and Puerto Ricans and blacks on the other would have been larger rather than smaller.

Finally, we considered the influence of the way individuals initially perceived the seriousness of their illness. A tendency for whites to play down their illness within the non-serious condition category might yield results for revisits seen in Table 39, although we would not a priori anticipate that initial perception would influence revisits, there might have been some carry over to later stages of the episode. Examination of the relationships between both initial visit and revisit on the one hand and race on the other controlling for perceived serious and condition seriousness indicates that the findings in Table 39 hold generally for all three levels of perceived seriousness (table not shown).

ADJUSTED CURRENT INCOME

In Table 31, we observed no significant difference in number of physician visits across levels of adjusted current income. The coefficients representing levels of income, ranked from low to high, were:

$$\hat{\beta}_{18} = -.137\ (.133)$$
$$\hat{\beta}_{19} = -.050\ (.079)$$
$$= \text{-0-}$$
$$\hat{\beta}_{20} = .030\ (.087)$$
$$\hat{\beta}_{21} = -.014\ (.088)$$

The sign and magnitude of $\hat{\beta}_{18}$, representing the group of individuals who were in families whose current income and size placed them at least $1,000 below the poverty line, suggests a tendency for the very poor to use fewer services. As we will indicate below, this tendency appears to result from differences in the likelihood of having a revisit.

Table 41 shows the proportions of individuals with non-serious and serious conditions who made an initial contact with a doctor and who had revisits by current income. The impression of an absence of association

between income and physician visits holds for both initial contact and revisits when the condition was rated as not serious and for initial contact resulting from serious conditions. Only in the case of return visits for serious conditions can we see a slight indication that persons in families with higher incomes are more likely to have a visit than those in families with lower incomes and even here we do not observe a perfectly monotonic relationship.

TABLE 41

PROPORTIONS OF INDIVIDUALS WITH INITIAL PHYSICIAN CONTACT AND REVISITS GIVEN INITIAL CONTACT BY ADJUSTED CURRENT INCOME AND CONDITION SERIOUSNESS

ADJUSTED CURRENT INCOME	Condition Seriousness			
	Not Serious		Serious	
	Initial Contact	Revisit	Initial Contact	Revisit
Def. $1,000+	.70 (60)	.26 (42)	.95 (22)	.52 (21)
Def. $999–Surp. $999	.60 (285)	.39 (170)	.90 (139)	.69 (125)
Surplus $1,000–$2,999	.66 (313)	.38 (207)	.87 (126)	.63 (110)
Surplus $3,000–$4,999	.60 (189)	.29 (115)	.92 (67)	.71 (62)
Sutplus $5,000+	.61 (217)	.33 (132)	.93 (60)	.73 (56)

Table N	1,478
Other Usual Activity	49
Hospitalized	183
Other Usual Activity and Hospitalized	41
Incomplete Cases	44
Total Episode N	1,795

THIRD-PARTY COVERAGE

Unlike the findings in our analysis of delay, neither persons without health insurance coverage nor persons covered by Medicaid differ from those with voluntary health insurance in terms of number of physician visits. On the other hand, the aged covered under Part B of Medicare had fewer visits which is consistent with the earlier finding that this group also experienced the greatest delay. Again, however, we are unable to determine whether the relatively large coefficient ($\hat{\beta}_{24} = -.529$ [.206]) representing persons with Medicare coverage indicates an age effect or alternatively indicates the influence of the deductible feature of this coverage.

The absence of an insurance effect, with the exception of Medicare, in the overall regression of visits is surprising. On the other hand, when we

distinguish between initial visits and revisits, and later when we allow for interaction by considering the regression results within condition seriousness and usual activity groups we will find that third-party coverage does seem to affect utilization under certain circumstances.

Table 42 shows the proportions of individuals with initial contact and revisits by types of coverage.

TABLE 42

PROPORTIONS OF INDIVIDUALS WITH INITIAL PHYSICIAN CONTACT AND REVISITS GIVEN INITIAL CONTACT BY THIRD-PARTY COVERAGE AND CONDITION SERIOUSNESS

THIRD-PARTY COVERAGE	Condition Seriousness			
	Not Serious		Serious	
	Initial Contact	Revisit	Initial Contact	Revisit
None	.52 (175)	.32 (91)	.94 (68)	.72 (64)
Voluntary Insurance	.64 (489)	.29 (311)	.91 (160)	.67 (145)
Medicaid	.66 (379)	.44 (252)	.88 (174)	.65 (154)
Medicare	.57 (21)	[.25] (12)	[.92] (12)	[.73] (11)

Table N	1,478
Other Usual Activity	49
Hospitalized	183
Other Usual Activity and Hospitalized	41
Incomplete Cases	44
Total Episode N	1,795

When the condition causing the illness episode is rated as not serious, we find essentially no difference between the proportions of persons with voluntary health insurance and those with Medicaid coverage who contacted a doctor. However, the proportion of individuals who had no third-party coverage that sought care was smaller than either of the former groups. Having contacted a physician, the proportions returning to the doctor are about the same comparing the no coverage group with the voluntary health insurance group, but those with Medicaid coverage were more likely to return.

On the other hand, when the condition is rated as serious, we observe little difference between groups with respect to either the proportions seeking care initially or having revisits. This pattern of differences in the proportions seeking care and having revisits across groups for non-serious

conditions but little or no difference for serious conditions is the one that we expected to observe for all of the poverty-related factors.

The findings for non-serious conditions in part reflect the differences in typical benefit structures for voluntary health insurance and Medicaid. Having Medicaid as opposed to voluntary insurance coverage, for example, tends to assure coverage of ambulatory physicians' services beyond the initial visit and therefore we would expect to find a higher proportion

TABLE 43

PROPORTIONS OF INDIVIDUALS WITH INITIAL PHYSICIAN CONTACT AND REVISITS GIVEN INITIAL CONTACT FOR CONDITIONS RATED NOT SERIOUS BY THIRD-PARTY COVERAGE AND USUAL SOURCE OF CARE[a]

Usual Source of Care	Third-Party Coverage	Initial Contact	Revisit
Solo Practitioner	None	.56 (117)	.32 (65)
	Medicaid	.68 (213)	.42 (146)
	Voluntary Insurance	.66 (346)	.28 (228)
Group Practice	None	[.60] (10)	[.33] (6)
	Medicaid	.73 (30)	.36 (22)
	Voluntary Insurance	.62 (103)	.26 (64)
Hospital Clinic	None	.48 (40)	[.26] (19)
	Medicaid	.64 (130)	.47 (83)
	Voluntary Insurance	.56 (34)	[.53] (19)

Table N	1,023
No Usual Source	20
Medicare (Part B)	21
Serious Condition	414
Other Usual Activity	49
Hospitalized	183
Other Usual Activity and Hospitalized	41
Incomplete Cases	44
Total Episode N	1,795

[a] The 20 cases having no usual source of care omitted from this table were evenly distributed across the three major insurance categories, and 18 of the 20 individuals made no contact with a physician.

of persons with Medicaid having a revisit. Such a relationship should be particularly strong in the case of persons who use a solo practitioner as our hypothesis concerning usual source of care suggests that more client-oriented practitioners tend to be more sensitive to the patient's desire to minimize the cost of illness, than do the peer-oriented physicians practicing in an organized setting.[3] Table 43 shows the proportions of individuals having non-serious conditions who made initial contact with a physician

[3] See above, pp. 21–22.

and who had revisits by third-party coverage and usual source of care. The findings indicate that the difference in revisits between persons with Medicaid versus voluntary health insurance are indeed greatest in the solo practice group and least in the case of persons using a hospital clinic as their usual source of care.

The findings in Table 42 reflect differences in benefit structures only in part in the sense that the absence of a difference in the proportion of persons covered by Medicaid compared to voluntary insurance who contacted a physician does not reflect equal likelihood of coverage for the first doctor visit. Persons with voluntary health insurance are much less likely to have "first dollar" coverage for ambulatory services. The absence of a difference may to some degree result from social-structural and economic factors that are not taken into account in Table 42. We can see from Table 43 that the lack of any marked association holds for all usual source of care groups, although we do find a slight tendency for the "first dollar" coverage of Medicaid to result in higher proportions of persons with Medicaid seeking care in the group practice and hospital clinic groups. It is also the case that among Puerto Ricans there is a substantial difference with persons covered by Medicaid more likely to seek care. Sixty-eight per cent of Puerto Ricans with non-serious conditions who were covered under Medicaid saw a physician compared to 46 per cent of those with similar conditions but had voluntary insurance coverage. The differences among other whites and blacks were much smaller as in Table 42 (table not shown).

USUAL SOURCE OF CARE

Finally, we consider the effect of usual source of care on physician visits. The coefficients in Table 31, it will be recalled, were:

$$\text{Solo Practitioner} — -0-$$
$$\hat{\beta}_{26}\ \text{Group Practice} = -.052\ (.086)$$
$$\hat{\beta}_{27}\ \text{Hospital Clinic} = -.019\ (.075).$$

We suggested in the summary of the overall results presented earlier that since our dependent variable in the regression analysis combines initial contact and revisits and since we originally hypothesized that usual source of care would exert effects of opposite sign on initial contact on the one hand and revisits on the other, the absence of a usual source of care effect in the regression might arise from two offsetting influences. To investigate this possibility, we once again consider the proportions of individuals seeking care and, given an initial contact, having revisits (Table 44).

Before turning to the findings on the differences across the three major classes of usual source of care, we will briefly discuss the no source cate-

gory. For non-serious conditions, only two persons out of a total of twenty sought care. The low proportion (.10) could be the result of persons with no usual source tending not to seek care. More likely, however, is that some people who at the time of the episode, as in the past, have not sought care for instances of (probably minor) illness, do not as a result have a source of care to report.[4] On the other hand, when the condition is serious, we would interpret the no source category as containing persons who go to a variety of sources and to no particular one "most of the time." Persons in this category (no source but a serious condition) apparently (we have only six such cases) seek care as readily and are as likely to return as other usual source of care groups.

TABLE 44

PROPORTIONS OF INDIVIDUALS WITH INITIAL PHYSICIAN CONTACT AND REVISITS GIVEN INITIAL CONTACT BY USUAL SOURCE OF CARE AND CONDITION SERIOUSNESS

USUAL SOURCE OF CARE	CONDITION SERIOUSNESS			
	Not Serious		Serious	
	Initial Contact	Revisits	Initial Contact	Revisits
None	.10 (20)	[1.00] (2)	[.83] (6)	[.60] (5)
Solo Practitioner	.65 (690)	.33 (447)	.89 (254)	.62 (227)
Group Practice	.64 (146)	.30 (94)	.89 (45)	.75 (40)
Hospital Clinic	.59 (208)	.45 (123)	.94 (109)	.76 (102)

Table N	1,478
Other Usual Activity	49
Hospitalized	183
Other Usual Activity and Hospitalized	41
Incomplete Cases	44
Total Episode N	1,795

Turning to the major source of care groups, there is little difference between the three with respect to initial contact when the condition causing the episode is rated as not serious. The tendency for persons using hospital clinics to be somewhat less likely to seek care, however, is consistent with our hypothesis. Also consistent is the larger proportion of clinic users having revisits compared to those whose source is a solo practitioner. Rather than finding proportions for the group practice category falling between those observed for the other two usual sources, we see in Table 44 that individuals whose source is a group practice resemble those using a solo practitioner in terms of both initial contact and revisits.

When we consider behavior when the condition was rated as serious, the proportions with initial contact are again similar across usual activity groups (but with slight tendency for hospital clinic users to be more likely to go to the doctor). Also we find that, as for non-serious conditions, hospital clinic users have a higher proportion experiencing revisits as hypothesized. In this case, those using a group practice behave more like clinic users than persons whose source is a solo practitioner. The cell size, however, is only 40 for this latter group.

To summarize the findings reported in Table 44, the effect of usual source of care on behavior leading up to contact with the medical care system is much less than we had anticipated. Although the hospital clinic may have some repelling influence when the condition is non-serious (relative to the other sources), this effect is slight. On the other hand, the hospital clinic does have the anticipated effect on revisits for both serious and non-serious conditions.

FACTORS AFFECTING PHYSICIAN VISITS WITHIN USUAL ACTIVITY AND CONDITION SERIOUSNESS GROUPS

We turn now to the third and final stage of our analysis of variation in number of physician visits. We will consider the regressions of physician visits on the poverty-related variables given perceived seriousness and bed disability days for each of the eight subsamples defined by condition seriousness and usual activity.

Before turning to the poverty-related factors, we show in Table 45 the coefficients representing the two seriousness variables. $\hat{\beta}_{10}$ and $\hat{\beta}_{11}$ represent the deviations of the "fairly serious" and "very serious" groups from the "not serious at all" group, while $\hat{\beta}_{28}$–$\hat{\beta}_{31}$ represent levels of bed disability days in ascending order ($\hat{\beta}_{28}$ being no days) with the middle category (3–4 days) the one constrained to zero.

The coefficients are, for the most part, consistent with the summary results that we observed in Table 31, although there does appear to be some systematic interaction. For example, perceived seriousness coefficients tend to be smaller both absolutely and relative to their standard errors for adults compared to children. In the case of bed disability days, the results are consistent with the overall findings, except that we find an interaction between the bed disability days and condition seriousness. We noted earlier that the magnitude of $\hat{\beta}_{28}$ (no bed disability days) for the whole sample was much smaller than we might expect. We concluded that

[4] The definition of usual source of care, it will be recalled, is the doctor or place the person goes to "most of the time."

this resulted from a qualitative difference between no days and the other levels of bed days in the sense that some conditions which would be judged quite serious by either physician or patient would, nevertheless, typically not involve going to bed. We would obviously expect to find such conditions falling largely in the "serious condition" category. We see in Table 45 that for non-serious conditions the no bed disability day coefficient ($\hat{\beta}_{28}$) is negative for all usual activities and tends to fit into a monotonic relationship between bed disability days and physician visits. In contrast, when

TABLE 45

PERCEIVED SERIOUSNESS COEFFICIENTS ($\hat{\beta}_{10}$ AND $\hat{\beta}_{11}$) AND BED DISABILITY DAYS COEFFICIENTS ($\hat{\beta}_{28}$–$\hat{\beta}_{31}$) IN REGRESSIONS OF PHYSICIAN VISITS ON ALL INDEPENDENT VARIABLES FOR EIGHT CONDITION SERIOUSNESS–USUAL ACTIVITY SUBSAMPLES[a]

CONDITION SERIOUSNESS	USUAL ACTIVITY			
	Work	Keep House	School	Under Age Six
Serious	—0—	—0—	—0—	—0—
	$\hat{\beta}_{10}$ = −.375	$\hat{\beta}_{10}$ = .440	$\hat{\beta}_{10}$ = .361	$\hat{\beta}_{10}$ = 1.260
	(.412)	(.691)	(.429)	(.553)
	$\hat{\beta}_{11}$ = .603	$\hat{\beta}_{11}$ = .453	$\hat{\beta}_{11}$ = .958	$\hat{\beta}_{11}$ = .898
	(.453)	(.661)	(.416)	(.667)
	$\hat{\beta}_{28}$ = −.252	$\hat{\beta}_{28}$ = .919	$\hat{\beta}_{28}$ = .256	$\hat{\beta}_{28}$ = .841
	(.372)	(.427)	(.296)	(.419)
	$\hat{\beta}_{29}$ = −.388	$\hat{\beta}_{29}$ = −.245	$\hat{\beta}_{29}$ = .187	$\hat{\beta}_{29}$ = − .090
	(.347)	(.425)	(.265)	(.309)
	—0—	—0—	—0—	—0—
	$\hat{\beta}_{30}$ = .656	$\hat{\beta}_{30}$ = −.094	$\hat{\beta}_{30}$ = .693	$\hat{\beta}_{30}$ = .304
	(.400)	(.404)	(.333)	(.468)
	$\hat{\beta}_{31}$ = .361	$\hat{\beta}_{31}$ = .498	$\hat{\beta}_{31}$ = 1.387	$\hat{\beta}_{31}$ = 2.750
	(.404)	(.416)	(.374)	(.916)
	N = 99	N = 88	N = 139	N = 83
Not Serious	—0—	—0—	—0—	—0—
	$\hat{\beta}_{10}$ = .288	$\hat{\beta}_{10}$ = .224	$\hat{\beta}_{10}$ = .032	$\hat{\beta}_{10}$ = .422
	(.201)	(.326)	(.218)	(.282)
	$\hat{\beta}_{11}$ = .195	$\hat{\beta}_{11}$ = .174	$\hat{\beta}_{11}$ = .624	$\hat{\beta}_{11}$ = .812
	(.304)	(.421)	(.305)	(.354)
	$\hat{\beta}_{28}$ = −.539	$\hat{\beta}_{28}$ = −.946	$\hat{\beta}_{28}$ = − .397	$\hat{\beta}_{28}$ = − .335
	(.253)	(.320)	(.189)	(.250)
	$\hat{\beta}_{29}$ = −.221	$\hat{\beta}_{29}$ = −.715	$\hat{\beta}_{29}$ = − .485	$\hat{\beta}_{29}$ = − .222
	(.168)	(.204)	(.147)	(.246)
	—0—	—0—	—0—	—0—
	$\hat{\beta}_{30}$ = −.001	$\hat{\beta}_{30}$ = −.227	$\hat{\beta}_{30}$ = − .206	$\hat{\beta}_{30}$ = .080
	(.204)	(.242)	(.229)	(.282)
	$\hat{\beta}_{31}$ = .738	$\hat{\beta}_{31}$ .117	$\hat{\beta}_{31}$ = .482	$\hat{\beta}_{31}$ = 1.769
	(.339)	(.402)	(.412)	(.570)
	N = 292	N = 203	N = 381	N = 188

[a] All variables are included in each of the eight regressions although not shown in table.

the condition is serious we find that for three of the four usual activities the sign of the coefficient is positive.

Given perceived seriousness and bed disability days within each of the eight subsamples, we turn next to the significant effects of the five poverty-related variables. As with delay, our hypothesis is that we will observe more significant associations among subgroups for which the condition was rated not serious and among children compared to adults. The significant relationships are summarized in Table 46.

Following the pattern of analysis established earlier with delay, we will summarize the nature of the effects indicated in Table 46 as being significant.

TABLE 46

SUMMARY OF SIGNIFICANT[a] RELATIONSHIPS BETWEEN POVERTY-RELATED FACTORS AND PHYSICIAN VISITS FOR EIGHT CONDITION SERIOUS–USUAL ACTIVITY SUBSAMPLES

INDEPENDENT VARIABLE	CONDITION SERIOUSNESS AND USUAL ACTIVITY							
	Not Serious				Serious			
	Work	Keep House	School	Under Age Six	Work	Keep House	School	Under Age Six
Head's Education	*				***			
Race					**		**	
Income					*			
Insurance		*	**				**	
Usual Source			**					**

[a] * − p = .10, ** − p = .05, *** − p = .01.

Head's Education.—The educational level of the head of household had a significant effect only in the two wage earner subsamples (that is for both serious and non-serious conditions). The direction of the relationship in the serious group is consistent with the overall findings—those with lower education having more physician visits. The relationship for wage earners with non-serious conditions, on the other hand, is uninterpretable.

Race.—The two significant social-ethnic effects both occur when the condition is rated as serious. Because of the interaction terms, our comparison of the subsamples to the overall results will be based on the linear combinations I′ (shown originally in Table 38 for the total sample, and reproduced in Table 47). For illnesses perceived as not serious and those perceived as very serious, the relative effects of the racial-ethnic traits are the same for the subsamples as for the total sample, and are consistent

with our original hypothesis. Puerto Ricans had the fewest visits and other whites the most. For school children with serious conditions, a similar ordering is observed for those children with illnesses perceived as fairly serious. This ordering is not consistent with the total sample findings. For the total sample, under the fairly serious condition blacks had the most visits. We also find an inconsistency for the wage earner subsample, but of a different sort. In this case, blacks have the fewest visits rather than the most.

Income.—Only for wage earners with serious conditions do we find a significant income effect. Further, unlike the income effects seen earlier in

TABLE 47

LINEAR COMBINATIONS OF RACE, PERCEIVED SERIOUSNESS AND INTERACTION (RACE x PERCEIVED SERIOUSNESS) NET EFFECTS FROM REGRESSIONS OF PHYSICIAN VISITS ON ALL VARIABLES: TOTAL SAMPLE (N = 1,443); WAGE EARNERS, CONDITION RATED SERIOUS (N = 99); SCHOOL CHILDREN, CONDITION RATED SERIOUS (N = 139)

PERCEIVED SERIOUSNESS	TOTAL SAMPLE		
	Racial-Ethnic Group		
	Puerto Rican	Black	White
Not Serious	− .323	.136	−0−
Fairly Serious	.181	.268	.193
Very Serious	.372	.490	.704
	Wage Earners, Condition Rated Serious		
	Puerto Rican	Black	White
Not Serious	− .963	− .759	−0−
Fairly Serious	− .282	−1.083	−.375
Very Serious	−1.081	.047	.603
	School Children, Condition Rated Serious		
	Puerto Rican	Black	White
Not Serious	− .900	− .114	−0−
Fairly Serious	− .767	.062	.361
Very Serious	.005	.482	.958

our analysis of delay, the one observed here is consistent with neither our hypothesis, nor the overall results for physician visits. Rather, the second lowest income group experienced the most visits, while the lowest income group had the least. The results, therefore, do not lend themselves to sensible interpretation.

Third-Party Coverage.—In three of the eight condition seriousness-usual activity subsamples, we find a significant health insurance effect. Women whose usual activity is keeping house and school children who in each instance experienced non-serious conditions, and also school children with serious conditions appear to have been influenced by coverage in their use of the physician.

The adult group (keeping house) results are essentially the same as those found for the total sample. On the other hand, the coefficients for the two school children groups, with no Medicare coefficient (the only one in the main results differing from zero), do not coincide with the overall results. They are, however, consistent with our hypothesis. When the condition was rated as not serious, children with no coverage had fewer visits (relative to the voluntary insurance group), while when the condition was serious, school children covered by Medicaid had more visits.

Usual Source of Care.—Since we found no relationship between usual source of care and physician visits in the total sample, the significant effects found for school children with non-serious conditions and children under six with serious conditions obviously depart from the general results. In addition, we used an additive model used in the general case having found no significant interaction between perceived seriousness and usual source of care. In contrast, we included interaction terms for the subsamples having found some evidence of interaction in a prior test for subsample interaction.

For school children with non-serious conditions, the major departure from the "no-effect" overall results is a tendency when the illness is perceived as serious for those with a group practice as their usual source to have more visits than the solo practitioner group which in turn has more visits than the hospital clinic group. For children under age six with serious conditions, on the other hand, when the illness was perceived as either not serious or very serious, children using a group practice had fewer visits than children using either of the other two sources of care.

To summarize the regression results for the eight subsamples, we found significant effects for each of the poverty-related factors. The effects of social-structural factors of head's education and race *tend* to be consistent with the overall results. The income effect is uninterpretable, while the insurance results for adults are consistent with our earlier findings and the results for children support the original hypothesis. Finally, the usual

source effect differs from the general conclusion of no effect because of interaction between perceived seriousness and usual source of care.

Lastly, we turn to the question of the relative importance of the poverty-related factors across condition seriousness and usual activity groups. As with delay, our hypothesis is that significant associations would more often be found among non-serious conditions and less instrumental usual activities. Unlike our findings for delay, the results shown in Table 46 support neither of these elements of the hypothesis.

There are four significant effects out of a possible twenty when the condition was not serious, and six out of twenty when the condition was serious. Of this total of ten significant effects, five were in adult groups and five were in the school or preschool groups.

TABLE 48

VALUES OF THE STATISTIC $-2 \ln \lambda$ COMPARING REGRESSIONS WITH POVERTY-RELATED VARIABLES ENTERED WITH REGRESSIONS EXCLUDING POVERTY-RELATED VARIABLES FOR EIGHT CONDITION SERIOUSNESS–USUAL ACTIVITY SUBSAMPLES—PHYSICIAN VISITS

CONDITION SERIOUSNESS	USUAL ACTIVITY			
	Work	Keep House	School	Under Age Six
Serious	49.518 df= 25 N= 99	14.802 df= 25 N= 88	24.946 df= 23 N=139	27.189 df= 23 N= 83
Not Serious	28.026 df= 25 N=292	22.922 df= 25 N=203	37.115 df= 24 N=381	32.254 df= 24 N=188

Using the other approach to the question of relative importance that we introduced earlier, Table 48 shows the increases in the values of the likelihood function evaluated at the maximum for the eight subsamples.

Looked at from this perspective, our conclusions about relative importance are somewhat different than those based on number of significant effects. Our conclusion with respect to the serious not-serious comparison becomes the same as for delay. With the exception of the wage earner group, the poverty-related variables are more important for non-serious than for serious conditions.

When we compare across usual activities, however, we find results which differ from both those found in the delay and those in Table 46. Again, if we exclude the anomalous results obtained for wage earners, we find that the poverty variables are more important for children than adults keeping house. This finding holds for both levels of condition seriousness.

CHAPTER VIII

FACTORS RELATED TO VARIATION IN AMOUNT OF CARE RECEIVED

Reviewing briefly the discussion at the end of Chapter IV of our index of the amount of care received, the purpose of this measure is twofold. First, we will be addressing the question of whether the factors affecting variation in the amount of care differ from those affecting variation in physician visits. The second purpose is to determine whether once a person enters the medical care system the poverty-related factors become less important compared to their effect on behavior leading up to entry into the system.

The measure of amount of care is quite crude, ignoring most of the complexity of variation in diagnosis and treatment which is revealed in the quality of care literature. As stated earlier, the amount of care index takes the form of an equal interval scale ranging from no medical acts beyond the personal attention of a physician to medication to initial tests or treatment to medical services beyond those received on the initial visit. Despite the simplicity of the measure, it should be adequate both to refine the findings on physician visits and to answer the second question raised concerning the relative importance of the poverty-related factors as one moves through the medical care process.

Table 49 shows the regressions of amount of care on condition seriousness, usual activity and their interaction. As was the case for physician visits, $\hat{\beta}_1$ is large relative to its standard error indicating a tendency for persons with serious conditions to have more care than those with non-serious conditions. The coefficient is significantly different from zero at the $p = .001$ level using the likelihood ratio criterion, and as may be seen in column (3) of Table 49, changes very little with the addition of usual activity to the regression.

The effect of usual activity is also significant ($p = .001$), largely due to the tendency for both school and preschool children to receive less care than adults. We found in the previous section that children under age six did not have fewer visits than adults. This difference in results between visits and amount of care is seen more clearly when we consider the table of expected values resulting from column (4) in which we enter the interaction terms (which are significant at $p = .001$).[1]

[1] The coefficients in column (4) do not change appreciably when all other variables are entered in the regression. This may be seen by comparing column (4) of Table 49 with the left-hand column of Table 51.

The pattern of the expected values for serious conditions, seen in Table 50, is very similar to that found for physician visits. Wage earners have the most care followed by persons keeping house and finally school and preschool children. This ordering is consistent with the instrumental importance hypothesis; however, it will be recalled that we did not expect to find differences in amount of care as the care decision is largely in the hands of the physician. On the other hand, for serious illnesses it is quite likely that adults and children tend to present systematically different kinds of

TABLE 49

ESTIMATED PARAMETERS REGRESSING AMOUNT OF CARE ON CONDITION SERIOUSNESS AND USUAL ACTIVITY (N = 1,033)

INDEPENDENT VARIABLES	REGRESSION ASSUMING . . .			
	$\beta_1=\beta_2 \ldots \beta_9=0$ (1)	$\beta_2=\beta_3 \ldots \beta_9=0$ (2)	$\beta_6=\beta_7 \ldots \beta_9=0$ (3)	No Constants (4)
$\hat{\beta}_0$ Constant	1.634 (.050)	1.484 (.052)	1.643 (.077)	1.529 (.086)
$\hat{\beta}_1$ Condition Serious		.756 (.068)	.752 (.068)	1.132 (.132)
$\hat{\beta}_2$ Keeping House			− .022 (.093)	.006 (.118)
$\hat{\beta}_3$ School			− .276 (.083)	− .087 (.102)
$\hat{\beta}_4$ Under Age Six			− .223 (.092)	.063 (.114)
$\hat{\beta}_6$ Serious x Keeping House				− .106 (.192)
$\hat{\beta}_7$ Serious x School				− .545 (.174)
$\hat{\beta}_8$ Serious x Age Six				− .836 (.195)

conditions (for example, chronic illness versus trauma) requiring different levels of medical diagnosis and treatment.

These differences should be minimized, however, for non-serious conditions which are in large part such relatively homogeneous diagnoses as "colds and flu." We see in Table 50 that, in fact, usual activity does not seem to affect amount of care when the condition is non-serious. This finding supports the notion that once in the system, factors such as activity become less important. It will be recalled that in contrast to amount of care, physician visits increased moving from wage earners to preschool children in the regression results, and the proportion of wage earners with

an initial contact was the lowest of the four major usual activity groups while preschool children had the highest proportion. We also found that children delay somewhat less than adults for non-serious conditions.

The next step in the analysis is to consider the overall results of the regression of amount of care on perceived seriousness and bed disability days on the one hand and the poverty-related factors on the other, given condition seriousness and usual activity. Table 51 parallels the overview of delay found in Table 21 and of physician visits reported in Table 31. As with the other two analyses, we tested for interaction between perceived seriousness and each of the poverty-related factors. Only the interaction between perceived seriousness and income was found to be significant ($p = .05$), and these interaction terms have been included in Table 51.

The perceived seriousness coefficients are ordered in magnitude and have signs consistent with our expectations. $\hat{\beta}_{10} = .150$ (.144) and $\hat{\beta}_{11} = .346$

TABLE 50

EXPECTED VALUES OF AMOUNT OF CARE FOR COMBINATIONS OF SERIOUSNESS AND USUAL ACTIVITY (N = 1,033)

CONDITION SERIOUSNESS	USUAL ACTIVITY			
	Work	Keep House	School	Under Age Six
Serious	1.865	1.795	1.426	1.331
Not Serious	1.090	1.092	1.033	1.132

(.150). The size of these coefficients relative to their standard errors are much smaller than those obtaining for either delay or physician visits, however, it must be remembered that we have included interaction terms which affect their size.

The number of bed disability days is also related to the amount of care received and, with the exception again of the no days category discussed earlier, in the expected direction. Unlike its effect with respect to physician visits which was the result of a relatively large negative coefficient for the 1–2 days level and a relatively large one for the 10+ days level, we see little difference in amount of care up to five days, but then a somewhat greater amount for the 5–9 day level ($\hat{\beta}_{30} = .201$ [.102]) and the greatest amount experienced by individuals with the greatest number of bed disability days ($\hat{\beta}_{31} = .427$ [.142]).

Turning to the poverty-related factors, we find differences across levels of these variables which approach or exceed a t value of 2 for both of the social-structural variables (head's education and race) and for usual source

of care. The income coefficients must be interpreted in the context of the interaction between income and perceived seriousness. We will present a table of linear combinations (I') below. Neither the main effect coefficients nor the interaction coefficients, however, are large relative to their standard errors. Finally, third-party coverage apparently has no significant effect on amount of care, although the signs of the no coverage and Medicare categories are consistent with the hypothesized relationship. We will consider the "positive" findings in more detail.

TABLE 51

ESTIMATED PARAMETERS REGRESSING AMOUNT OF CARE ON ALL INDEPENDENT VARIABLES (N = 1,033)

CONSTANT, CONDITION SERIOUSNESS, USUAL ACTIVITY, PERCEIVED SERIOUSNESS, BED DISABILITY DAYS		EDUCATION OF HOUSEHOLD HEAD, RACE-ETHNICITY, ADJUSTED CURRENT INCOME, THIRD-PARTY COVERAGE, USUAL SOURCE OF CARE	
Variable	Coefficient (Standard Error)	Variable	Coefficient (Standard Error)
$\hat{\beta}_0$ Constant	1.286 (.156)	*Head's Education:*	
Condition Seriousness:		$\hat{\beta}_{12}$ <5 years	.212 (.119)
—Not Serious	—0—	$\hat{\beta}_{13}$ 5–8 years	.190 (.087)
$\hat{\beta}_1$ Serious	1.066 (.136)	—9–11 years	—0—
Usual Activity:		$\hat{\beta}_{14}$ High School	.181 (.085)
—Work	—0—	$\hat{\beta}_{15}$ College	—.157 (.140)
$\hat{\beta}_2$ Keeping House	—.074 (.123)	*Racial-Ethnic Group:*	
$\hat{\beta}_3$ School	.093 (.108)	$\hat{\beta}_{16}$ Puerto Rican	.047 (.093)
$\hat{\beta}_4$ Under Age Six	.018 (.122)	$\hat{\beta}_{17}$ Black	.153 (.083)
Interaction:		—White	—0—
—Work x Serious	—0—	*Adjusted Current Income:*	
$\hat{\beta}_6$ Keeping House x Serious	—.209 (.195)	$\hat{\beta}_{18}$ Deficit $1,000+	—.081 (.208)
$\hat{\beta}_7$ School x Serious	—.689 (.176)	$\hat{\beta}_{19}$ Def. $999–Sur. $999	.028 (.136)
$\hat{\beta}_8$ Under Age Six x Serious	—.809 (.198)	—Sur. $1,000–$2,999	—0—
Perceived Seriousness:		$\hat{\beta}_{20}$ Sur. $3,000–$4,999	—.240 (.165)
—Not Serious	—0—	$\hat{\beta}_{21}$ Surplus $5,000+	.001 (.153)
$\hat{\beta}_{10}$ Fairly Serious	.150 (.144)	*Third-Party Coverage:*	
$\hat{\beta}_{11}$ Very Serious	.346 (.150)	$\hat{\beta}_{22}$ None	—.041 (.101)
Bed Disability Days:		$\hat{\beta}_{23}$ Medicaid	.005 (.096)
$\hat{\beta}_{28}$ None	.094 (.101)	$\hat{\beta}_{24}$ Medicare	.103 (.231)
$\hat{\beta}_{29}$ 1–2 Days	—.034 (.083)	—Voluntary	—0—
—3–4 Days	—0—	*Usual Source of Care:*	
$\hat{\beta}_{30}$ 5–9 Days	.201 (.102)	$\hat{\beta}_{25}$ None	Excluded
$\hat{\beta}_{31}$ 10+ Days	.427 (.142)	$\hat{\beta}_{26}$ Group	—.199 (.098)
		$\hat{\beta}_{27}$ Clinic	.349 (.086)
		—Solo Practice	—0—

TABLE 51—*Continued*

Variable		Coefficient (Standard Error)
Interaction (Perceived Seriousness x Adjusted Current Income)		
Not Serious x	Deficit $1,000+	—.100 (.349)
	Deficit $999–Surplus $999	—.990 (.207)
	Surplus $1,000–$2,999	—0—
	Surplus $3,000–$4,999	.159 (.231)
	Surplus $5,000+	.121 (.220)
Very Serious x	Deficit $1,000+	—.365 (.334)
	Deficit $999–Surplus $999	—.083 (.194)
	Surplus $1,000–$2,999	—0—
	Surplus $3,000–$4,999	.098 (.242)
	Surplus $5,000+	—.082 (.240)

EDUCATION OF HEAD OF HOUSEHOLD

The relative magnitude of the coefficients for head's education are similar to those found in the case of physician visits except that in the physician visit regression we observed a small positive coefficient representing the highest level of head's education ($\hat{\beta}_{15}$ = .046 [.121] for physician visits) compared to a larger and negative coefficient in the case of amount of care ($\hat{\beta}_{15}$ = —.157 [.140]).

As we did with physician visits, we considered the possibility that an inadequate control for age might account for those with higher education receiving less care. When we differentiate between adults under and over age 45, however, the resulting coefficients representing levels of head's education remain essentially the same (table not shown).

The findings that persons with the highest level of head's education received the least care beyond the personal attention of a physician, while not statistically significant, is of interest because it differs somewhat from the earlier results with respect to physician visits. One explanation of this result would be the physician's differential expectations regarding compliance. The tendency for individuals in the most highly educated families to receive less care may stem from either more complex care on the initial visit or greater likelihood of additional services on subsequent visits. We found little difference in the proportions of those with revisits having additional X-rays, tests, or treatments comparing the (small) college group (N = 26) with others. For non-serious conditions 12 per cent of those in families whose head went to college had additional services compared to 9 per cent of the remainder. For serious conditions, the proportions are .30 and .39.

We may assume then that physicians tended to handle the initial visit differently for the more highly educated group in the sense of providing fewer services. We have insufficient data to determine why this is the case; however, one underlying factor may be the differential expectations mentioned above. If physicians tend to feel that lower class individuals cannot be "trusted" to follow a regimen or return for subsequent care, they may be inclined to do more themselves on the first visit.

RACE

Other things being equal, blacks receive more care than whites ($\hat{\beta}_{17}$ = .153 [.083]). The sign of the coefficient representing Puerto Ricans is also positive, but relatively small ($\hat{\beta}_{16}$ = .047 [.093]). These results are, in a sense, inconsistent with the findings for both delay and physician visits. In the former case, both blacks and Puerto Ricans delayed significantly more than whites, while in the latter case, Puerto Ricans had significantly fewer visits than blacks also had fewer visits although the coefficient did not approach significance ($\hat{\beta}_{17}$ for physician visits was −.080 [.072]). We originally hypothesized that in addition to more delay and fewer visits than whites, the other two racial-ethnic groups would have somewhat less care (it will be recalled, however, that we expected smaller differences at this later stage of the medical care process).

As with our previous finding that the college group received less care than others, we are not able, given the information at hand, to do more than suggest reasons for the positive coefficients for blacks and Puerto Ricans with respect to amount of care. Two possibilities are consistent with the findings. First, as we suggested might be the case for head's education, physicians may vary their approach to treatment due to different expectations about the black or Puerto Rican patients' ability or inclination to comply with instructions. Second, although we found no differences across race in the proportions ultimately seeking care, the tendency for both blacks and Puerto Ricans to delay more than whites may result in more difficult cases than there would be if care had been obtained sooner. This argument is less plausible than it seems on the surface since the illnesses causing these episodes tend to be acute and of limited severity.

ADJUSTED CURRENT INCOME

Table 52 shows the linear combinations, I′, of perceived seriousness, adjusted current income, and their interaction. For illnesses that were initially perceived as being fairly serious or very serious, we do not find evidence for a linear relationship between income and amount of care, although for "very serious" illnesses, there is evidence that the lowest

income group received less care than the others. On the other hand, for illnesses that were initially perceived as being not at all serious, we observe a tendency for amount of care to be ordered by level of income and in a direction consistent with our hypothesis.

If we assume that when the illness is perceived as not at all serious *both* the patient and his physician have considerable discretion in deciding on the "appropriate" amount of care (that is to say, the decision does not rest solely on the professional judgment of the physician), an interesting question becomes then—how do the two (client and professional) arrive at the decision. It is not surprising that at least one of the factors taken into consideration is the level of per capita current income. As we shall see

TABLE 52

LINEAR COMBINATIONS OF ADJUSTED CURRENT INCOME, PERCEIVED SERIOUSNESS AND INTERACTION (INCOME X PERCEIVED SERIOUSNESS) NET EFFECTS FROM REGRESSION OF AMOUNT OF CARE ON ALL VARIABLES
(N = 1,033)

ADJUSTED CURRENT INCOME	PERCEIVED SERIOUSNESS		
	Not Serious	Fairly Serious	Very Serious
Deficit $1,000+	−.181	.069	−.100
Deficit $999–Surplus $999	−.071	.178	.291
Surplus $1,000–$2,999	−0−	.150	.346
Surplus $3,000–$4,999	−.081	−.090	.204
Surplus $5,000+	.122	.151	.265

below, however, the setting in which the physician practices has an important bearing on the decision.

USUAL SOURCE OF CARE

Physicians practicing in a highly organized setting such as a hospital clinic are, as Friedson has put it, "highly vulnerable" to evaluation by colleagues and therefore sensitive to professional standards. In contrast the solo practitioner is under virtually no scrutiny and the success of his practice depends on meeting the expectations of his patients. On this basis, we hypothesized that, other things being equal, individuals reporting a hospital clinic as their usual source of care would have a significantly greater amount of care than persons using a solo practitioner. The results in Table 51 confirm this hypothesis. $\hat{\beta}_{27}$, representing the deviation of the hospital clinic group from the solo practitioner group is large both relative to other coefficients and to its standard error ($\hat{\beta}_{27}$ = .349 [.086]).

On the other hand, we anticipated that persons reporting a group prac-

tice as their usual source would fall between the solo practitioner and the hospital clinic with respect to amount of care. Instead, we find that these individuals had the least amount of care ($\hat{\beta}_{26} = -.199$ [.098]). We will return to this finding in subsequent discussion.

FACTORS AFFECTING AMOUNT OF CARE WITHIN USUAL ACTIVITY AND CONDITION SERIOUSNESS GROUPS

The third stage of our analysis involves examining the effects of the poverty-related factors within condition seriousness-usual activity subsamples given the effects of perceived seriousness and bed disability days.

TABLE 53

PERCEIVED SERIOUSNESS COEFFICIENTS ($\hat{\beta}_{10}$ AND $\hat{\beta}_{11}$) AND BED DISABILITY DAYS COEFFICIENTS ($\hat{\beta}_{28}$–$\hat{\beta}_{31}$) IN REGRESSIONS OF AMOUNT OF CARE ON ALL INDEPENDENT VARIABLES FOR EIGHT CONDITION SERIOUSNESS-USUAL ACTIVITY SUBSAMPLES[a]

CONDITION SERIOUSNESS	USUAL ACTIVITY			
	Work	Keep House	School	Under Age Six
Serious	—0—	—0—	—0—	—0—
	$\hat{\beta}_{10}$ = .251 (.300)	$\hat{\beta}_{10}$ = −.232 (.370)	$\hat{\beta}_{10}$ = .459 (.280)	$\hat{\beta}_{10}$ = .345 (.368)
	$\hat{\beta}_{11}$ = .500 (.320)	$\hat{\beta}_{11}$ = −.162 (.359)	$\hat{\beta}_{11}$ = .843 (.264)	$\hat{\beta}_{11}$ = .586 (.418)
	$\hat{\beta}_{28}$ = .109 (.358)	$\hat{\beta}_{28}$ = .083 (.403)	$\hat{\beta}_{29}$ = .684 (.322)	$\hat{\beta}_{28}$ = −.090 (.400)
	$\hat{\beta}_{29}$ = .122 (.353)	$\hat{\beta}_{29}$ = −.049 (.411)	$\hat{\beta}_{29}$ = .527 (.299)	$\hat{\beta}_{29}$ = −.742 (.325)
	—0—	—0—	—0—	—0—
	$\hat{\beta}_{30}$ = .823 (.400)	$\hat{\beta}_{30}$ = .172 (.372)	$\hat{\beta}_{30}$ = .817 (.347)	$\hat{\beta}_{30}$ = .224 (.450)
	$\hat{\beta}_{31}$ = .058 (.401)	$\hat{\beta}_{31}$ = .902 (.405)	$\hat{\beta}_{31}$ = 1.012 (.382)	$\hat{\beta}_{31}$ = −.684 (.865)
Not Serious	—0—	—0—	—0—	—0—
	$\hat{\beta}_{10}$ = −.276 (.186)	$\hat{\beta}_{10}$ = .426 (.232)	$\hat{\beta}_{10}$ = .123 (.157)	$\hat{\beta}_{10}$ = −.103 (.231)
	$\hat{\beta}_{11}$ = .283 (.236)	$\hat{\beta}_{11}$ = .213 (.264)	$\hat{\beta}_{11}$ = − .115 (.198)	$\hat{\beta}_{11}$ = .026 (.262)
	$\hat{\beta}_{28}$ = .364 (.327)	$\hat{\beta}_{28}$ = .346 (.422)	$\hat{\beta}_{28}$ = .060 (.220)	$\hat{\beta}_{28}$ = −.090 (.282)
	$\hat{\beta}_{29}$ = −.040 (.209)	$\hat{\beta}_{29}$ = .040 (.238)	$\hat{\beta}_{29}$ = .001 (.162)	$\hat{\beta}_{29}$ = −.349 (.268)
	—0—	—0—	—0—	—0—
	$\hat{\beta}_{30}$ = .144 (.235)	$\hat{\beta}_{30}$ = −.175 (.284)	$\hat{\beta}_{30}$ = .214 (.246)	$\hat{\beta}_{30}$ = .584 (.314)
	$\hat{\beta}_{31}$ = .288 (.401)	$\hat{\beta}_{31}$ = .695 (.460)	$\hat{\beta}_{31}$ = 1.249 (.497)	$\hat{\beta}_{31}$ = −.513 (.524)

[a] All variables are included in each of the eight regressions although not shown in table.

Following the pattern set in the two previous sections, we will take up these latter variables first.

Table 53 shows the coefficients for perceived seriousness and bed disability days. Perceived seriousness tends to be related to amount of care only when the condition is rated as serious. Even under these circumstances, however, we observe no relationship when the usual activity is keeping house. For non-serious conditions, we find no significant relationship between the levels of perceived seriousness and amount of care.

Bed disability days are not linearly related to amount of care as often as it was to number of physician visits. Although we found in the overall results (Table 51) that, excluding the "no bed days" category, more days

TABLE 54

SUMMARY OF SIGNIFICANT[a] RELATIONSHIPS BETWEEN POVERTY-RELATED FACTORS AND AMOUNT OF CARE FOR EIGHT CONDITION SERIOUSNESS-USUAL ACTIVITY SUBSAMPLES

INDEPENDENT VARIABLES	CONDITION SERIOUSNESS AND USUAL ACTIVITY							
	Not Serious				Serious			
	Work	Keep House	School	Under Age Six	Work	Keep House	School	Under Age Six
Head's Education			*	**	*			
Race		**		**				
Income			***					
Insurance				***	*		***	*
Usual Source								

[a] * − p = .10, ** − p = .05, *** − p = .01.

in bed were associated with greater care, it is difficult to see a consistent relationship within the subsamples.

Given perceived seriousness and bed disability days, we move next to the significant relationships between the poverty-related factors and amount of care within the eight subsamples. Table 54 summarizes the findings. Of the ten significant associations, only three involve the social-structural variables of head's education and race. In contrast, we found eight such associations in our analysis of delay. There are three relationships involving the economic variables (compared to five for delay), and, lastly, we observe four usual source of care effects compared to two in the earlier analysis. Before considering the relative importance of the poverty-related factors across usual activities and levels of seriousness, we will summarize the nature of these relationships.

Education of Head of Household.—We find an education effect for school children with non-serious conditions. The relationship parallels the overall education effect with children in families whose head had the least education having the most care and those in families whose heads had the most education having the least amount of care.

Race.—Of the two race effects, one occurs among preschool children with non-serious conditions and the other among wage earners with serious conditions. In the former case both Puerto Rican and black school children had more care than their white counterparts. In the wage earner subsample we find no difference between blacks and whites, but much less care for Puerto Ricans relative to whites.

Income.—Both income effects occur in groups with non-serious conditions: one among housewives, the other among preschool children. In the overall results we found little difference in amount of care across levels of income except when the condition was perceived as non-serious. The effects observed within subgroups, both of which are for conditions rated as non-serious, are not consistent with each other. For the adults less income is associated with more care, while for the children the reverse is true.

Third-Party Coverage.—Although we did not find any insurance effect in the total sample, we do observe a relationship among school children with non-serious conditions consistent with our hypothesis, children covered by Medicaid have more care than those with voluntary health insurance.

Usual Source of Care.—The four significant relationships between usual source of care and amount of care are all consistent with the overall results. For children under age six, with serious and non-serious conditions, and for school children with serious conditions, the use of a hospital clinic as a usual source of care is associated with more care. For wage earners with serious conditions, individuals using a hospital clinic also have more care, but the coefficient is not large relative to its standard error ($\hat{\beta}_{27} = .261$ [.386] in this case). At the same time, serious conditions who used a group practice as their source had less care ($\hat{\beta}_{26} = -.633$ [.341]).

To summarize these results, the effects of the social-structural variables within subgroups are consistent with the overall results in two out of three cases—the exceptions being Puerto Rican wage earners who had less care than the other two groups. The findings on income are mixed with lower income housewives having more care, but lower income preschool children having less. The one instance in which third-party coverage was related to amount of care, school children covered by Medicaid received more-care than those with other forms of coverage or no coverage. Finally, in the four groups in which we found differences across different sources of care, the relationships were consistent with the overall findings.

To conclude this section, we consider the relative importance of the poverty-related factors across usual activities and levels of condition seriousness. The results summarized in Table 54 support both elements of our original hypothesis. That is, we find more significant association when the condition is rated as non-serious than when it is rated as serious (six versus four), and more associations among children (seven) than among the more instrumentally important adults (three).

TABLE 55

VALUES OF THE STATISTIC $-2 \ln \lambda$ COMPARING REGRESSIONS WITH POVERTY-RELATED VARIABLES ENTERED WITH REGRESSIONS EXCLUDING POVERTY-RELATED VARIABLES FOR EIGHT CONDITION SERIOUS-USUAL ACTIVITY SUBSAMPLES—AMOUNT OF CARE

CONDITION SERIOUSNESS	USUAL ACTIVITY			
	Work	Keep House	School	Under Age Six
Serious	24.622 df= 20 N= 93	13.287 df= 21 N= 83	21.468 df= 19 N=115	20.306 df= 19 N= 73
Not Serious	13.111 df= 21 N=167	26.749 df= 21 N=127	21.419 df= 20 N=228	59.581 df= 20 N=142

Using our alternative approach to relative importance, the increases in the values of the likelihood functions, the results are not quite so clear (Table 55). As was the case for both delay and physician visits, for wage earners the poverty-related factors are more important when the condition is serious. In addition, however, we find no difference across the levels of seriousness for school children. Comparing across usual activities, for serious conditions, the increase in the value of the likelihood function is about the same for wage earners, school children, and children under age six, but less for housewives. When the condition is not serious, we find a substantial difference between wage earners (13.111) and children under age six (59.581) with housewives and school children falling in between.

CHAPTER IX

SUMMARY AND CONCLUSIONS

In presenting the results of the three parallel analyses of variation in delay, physician visits, and amount of care received, we have frequently alluded to their consistency with our hypotheses. In this section we will summarize the findings, organizing the discussion along the lines of these original hypotheses.

HYPOTHESIS I-A

The severity of the condition(s) causing the episode as measured by physician rating will be related to each element of the response process. Severity will be directly related to the probability and number of physician visits, and the amount of care received; and inversely related to the number of days of delay preceding initial contact.

HYPOTHESIS I-B

The severity of the condition(s) causing the episode as measured by physician rating will be more strongly related to amount of care than to delay.

Condition seriousness, it will be recalled, is the dimension of the episode illness which most closely approximates the physician's concept of disease. In classifying a condition as serious or not serious, the physician raters made their decisions solely on the basis of the description of the condition or symptoms. The situational factors surrounding that particular instance of the condition such as the individual's reaction to it or what was subsequently done about it were not taken into consideration.

As expected, condition seriousness is directly related to the probability and number of physician visits and the amount of care received. However, condition seriousness is not related to the number of days of delay before seeking care.

These findings confirm the second part of the hypothesis. While the relationship between condition seriousness and delay, given usual activity, is not significant (at the .05 level), the condition seriousness coefficient is quite large relative to its standard error in the regression of amount of care on condition seriousness and usual activity. These results indicate that, in terms of behavior leading up to contact with the medical-care establishment in contrast to behavior in the later stages of the process, the

patient's response is more subject to the potential influence of social and economic factors due to the absence of a patterning by the medical condition.

HYPOTHESIS II

The instrumental importance of the individual's usual activity will be inversely related to number of days of delay, directly related to probability of initial visit, but not related to revisits and amount of care.

In addition to the anticipated interaction effect between usual activity and the poverty-related variables with respect to medical care behavior (Hypothesis IV), we have considered the more obvious direct role of usual activity. Usual activity is conceptually important in two senses. First, it represents a person's alternative to being sick. Viewed from this perspective, we have suggested that the individual's instrumental importance to the family will influence the chances of his seeing a doctor and his tendency to delay if he does so. Once having entered the medical care system, however, we hypothesized that there would be no differences across usual activities.

Usual activity is important in a second sense as well, because it differentiates children from adults serving to some degree as a proxy for age. Apart from the measures of seriousness, we have not explicitly attempted to distinguish between the instrumental dimension of age differences and other dimensions such as personal adjustment as they relate to health and illness behavior. Where it has seemed warranted, we have introduced additional controls for age.

The results of the analyses of delay, physician visits, and amount of care only partially confirm Hypothesis II. We did not find a consistent effect across the four original elements of the medical care process, in the sense of greater instrumental importance being associated with less delay, more visits, and, to a lesser degree, more care. Rather, we found for delay that, although the more instrumentally important wage earner delayed less than the housewife, both delayed more than children, whom we would assume to be less important to the families functioning. We concluded that since this ordering obtained for both serious and the more homogeneous non-serious conditions, other costs to the family including factors such as emotional concern for the child's welfare over-balance whatever instrumental importance effect may be operating.

When we considered the relationship between usual activity and physician visits, we found a marked interaction between condition seriousness and usual activity with respect to visits. The instrumental importance argument is strengthened although the original hypothesis is not fully

supported. For serious conditions, wage earners had the greatest number of visits, followed by housewives and finally, children. Adults also had a higher proportion of persons with initial physician contact than children. On the other hand, contrary to Hypothesis II, when the condition was not serious, wage earners had the least visits and lowest proportion with an initial contact while preschool children experienced the greatest number of visits and had the highest proportion making initial contact with a doctor. If we assume that for non-serious conditions the doctor's role is less one of speeding the return to one's usual activity and more one of providing reassurance, these results can be interpreted as consistent with the instrumental importance argument. Making the further assumption that seeing a doctor for a non-serious illness would, *ceteris paribus*, prolong withdrawal from usual activity, we interpret the findings for non-serious conditions as a refinement of the hypothesis rather than a rejection.

We did not expect to find differences in amount of care across usual activities, and for non-serious conditions, our hypothesis is confirmed. For serious conditions, however, we find a pattern of care which parallels our results for number of physician visits, more instrumentally important family members having more care. We cannot, however, rule out the possible effects of systematic differences, beyond those accounted for by our seriousness measures, in kinds of conditions. Different conditions require different levels of medical diagnosis and treatment.

HYPOTHESIS III-A

Level of household head's education will be related to each element of the response process; directly with the probability of initial contact, revisits, and amount of care received; and inversely with number of days of delay preceding initial contact. Level of education, however, will be more strongly related to the probability of initial contact and number of days of delay than to revisits and amount of care received.

In the discussion of the social-structural variables in Chapter II we pointed out that previous research indicates that the "utilization norm" is widely accepted in the United States. When asked what ought to be done given a sickness situation, there is a strong tendency among all classes to respond in favor of seeing a doctor. Nevertheless, knowledge about illness is influenced by level of formal education, and it has been argued that the ignorance of those with low socio-economic status is a major factor in their under-utilization of medical services. Hypothesis III-A is intended to test the validity of this proposition when a person is sick.

The results provide weak confirmation of the hypothesis, and at the

same time indicate the circumstances under which it holds. For delay, we found no differences between groups for whom head's education was high school level or below. Only persons in "college families" delayed less than others.

We found that when we considered volume of physician visits, contrary to our hypothesis persons in families whose heads had less education had more rather than fewer visits. However, by making the distinction between initial contact and revisits we discovered that this overall result is somewhat misleading.[1]

We found little difference across levels of education for either initial contact or revisits, but with two important exceptions. A lower level of head's education is associated with a smaller probability of initial contact, as hypothesized, when the condition is rated as non-serious *and* resulted in two or fewer days in bed. The hypothesis is valid then when the individual has the most discretion (initial contact) for a non-serious condition causing relatively little disruption. As would be expected, the direct relationship between level of education and initial contact for non-serious conditions is strongest for children, weaker for persons between ages 17–44, and non-existent for older persons.

The other exception to the findings of little difference with respect to initial contact or revisits was the finding that a direct relationship between education and revisits was obtained for serious conditions among children. This relationship was due largely to a failure to comply with the physician's instruction to return.

The overall findings for amount of care are similar to those for volume of physician visits. As we have noted previously, amount of care is of additional interest only to the degree that the effects of the poverty-related variables differ from those observed for physician visits. We found such a difference in the negative coefficient for the highest level of head's education. Apparently, physicians tended to provide this group fewer services on the initial visit. We suggested that this behavior may arise from relatively greater confidence that the patient will follow the suggested regimen and, when so instructed, return for additional care.

Finally, we found no support for the notion that as a person moves into the medical care system, level of head's education becomes less consequential factor in predicting the use of physicians' services. Head's education is of surprisingly little importance in predicting variation in delay, has the hypothesized effect as initial contact and revisits only under certain circumstances, and tends to influence amount of care.

[1] The regression results, in contrast to proportions with initial contact and revisits, are influenced by multiple visits.

HYPOTHESIS III-B

Race-ethnicity will be related to each element of the response process. Puerto Ricans will be less likely than Negroes who in turn will be less likely than other whites to have an initial visit or revisits, or complex care and will be more likely to delay before making initial contact with a physician. The relationships with initial contact and delay, however, will be stronger than those with revisits and amount of care received.

Hypothesis III-B is largely confirmed by the findings. We found a race-ethnicity effect for each of the three dependent variables. Puerto Ricans and blacks delayed significantly more than whites, although they did not differ from each other. We found interaction between race and perceived seriousness in the regression of physician visits. For "not serious" and "very serious" illnesses as hypothesized whites had more visits than blacks, who in turn, had more visits than Puerto Ricans. When the condition was perceived as fairly serious, however, blacks had the largest number of visits and Puerto Ricans the least. Blacks were found to have the greatest amount of care followed by Puerto Ricans.

The relationship between race and physician visits when the illness was perceived as only fairly serious has no evident explanation. On the other hand, we suggested that the tendency for blacks and Puerto Ricans to have more care may arise either from differential expectations in the part of physicians or from more difficult cases as a result of the tendency to delay more than whites.

Comparing effects across stages of the medical care process, those on delay seem to be the most pronounced, while those on amount of care are least pronounced using the rather informal criterion of the magnitudes of the coefficients relative to their standard errors. On the other hand, distinguishing between initial contact and revisits, we find little difference across racial groups in terms of initial contact, but marked differences with respect to revisits.

HYPOTHESIS III-C

Level of adjusted income will be related to each element of the response process; directly with the probability of initial contact, revisits, and amount of care received; inversely with number of days of delay preceding initial contact. Level of adjusted income, however, will be more strongly related to the probability of days of delay than revisit and amount of care received.

Adjusted current income is the most widely used indicator of poverty in administering governmental programs. It has not been clear in the literature, however, that lower income is associated with lower utilization of

medical services in the face of sickness. Our results suggest that, with the exception of the amount of care received for illnesses considered "not serious at all," there is no income effect. We cannot determine the degree to which the individual influences the amount of care decision. However, there is no evidence of reluctance by lower income persons to contact a physician initially, controlling for other factors.[2] Nor do we find any ordering of the proportions of individuals having revisits comparing across levels of adjusted current income.

HYPOTHESIS III-D

Third-party coverage will be related to each element of the response process. Ordered by comprehensiveness of coverage for ambulatory services (no coverage, voluntary health insurance, governmental programs [Medicaid and Medicare, Part B]), third-party coverage will be related directly with initial contact, revisits, and amount of care received; and inversely with number of days of delay.

This hypothesis is partially confirmed. We found that persons with no coverage tended to delay more than those with voluntary health insurance, but, at the same time, so did persons covered under the two governmental programs (Medicare and Medicaid). In the case of Medicare, we found support for both an age interpretation of the tendency for those with Medicare to delay more as well as a benefit structure interpretation. The tendency towards greater delay among persons covered by Medicaid was found to obtain only for children. We suggested that some unmeasured factor such as a retreatist orientation of the dependent poor underlay both Medicaid coverage and greater delay thus causing a spurious association.

With one exception, no difference in number of physician visits or amount of care was observed comparing types of coverage. The exception was that persons covered by Medicare not only delayed more, but also had fewer visits than the other groups.

Although we found no other differences in the regression of physician visits on third-party coverage (given the other poverty-related variables and the episode-related variables), and found no linear relationship between third-party coverage and either initial contact or revisits when the condition was serious, the results of our analysis of initial contact and revisits in the non-serious case are consistent with the hypothesis. Considering the three major insurance categories, we found that for each type of usual source of care, individuals covered under Medicaid were most likely to have an initial contact, while those with no coverage were least likely to have contacted a physician. Turning to revisits, we found that in the private

[2] We could not detect even a simple income effect.

practice setting, persons with the more comprehensive Medicaid coverage were more likely to return to a doctor than those with voluntary insurance or no coverage. For those using hospital clinics, on the other hand, what small difference we observe between Medicaid and voluntary insurance groups indicates greater likelihood of revisits for the latter group. The finding of smaller differences in the case of patients using a hospital clinic suggests that the more client oriented private practitioners are more sensitive to the patient's desire to minimize the out-of-pocket cost of illness.

HYPOTHESIS III-E

Usual source of care, ordered from least to most institutionalized, will be inversely related to the probability of initial contact and directly related to number of days of delay; but directly related to number of revisits and amount of care received.

We have assumed that the solo private practitioner is the least institutionalized source of care and the hospital clinic the most institutionalized. Between these two falls the non-hospital clinic or group practice. Our findings only partially support Hypothesis III-E.

Relative to those persons using a solo practitioner, persons reporting a group practice as their source of care delay more as expected. However, we found no difference in delay comparing hospital clinic users with the solo practitioner category. We suggested that ready accessibility to the hospital clinic might account for the absence of a difference. Group practice combines a somewhat more institutionalized setting than solo practice with more difficult access than is typical of a hospital clinic.

Although we found no usual source of care effect in physician visit regression, the results of the analysis of initial contact and revisits were generally consistent with our hypothesis. For non-serious conditions hospital clinic users were less likely than others to contact a physician, but having done so, were more likely to return. (No differences were found between those using solo versus group practice.) When the condition was rated as serious, we found contrary to expectations, that the hospital clinic group were more likely to have an initial visit. On the other hand, they were also more likely than persons using a solo practitioner to have a revisit. The group practice patients resembled hospital clinic users in terms of revisits.

Finally, we found that persons reporting a hospital's clinic as their usual source had significantly more care than those using solo practitioners. This finding is consistent with our hypothesis. However, inconsistent with our hypothesis is the finding that group practice patients had significantly less care than the solo practitioner category.

HYPOTHESIS IV

Association between perceived seriousness, bed disability days, race, education, third-party coverage, income, and usual source of care on the one hand and delay, physician visits, and amount of care on the other, will be observed more often when the condition causing the episode is less serious; and when the usual activity is less instrumental.

Finally, we summarize our findings on the interaction between condition seriousness, usual activity, and the poverty-related variables with respect to delay, physician visits and amount of care.

The element of our hypothesis involving the interaction effect of condition seriousness is confirmed for delay and amount of care, but not for physician visits. The second element (usual activity's interaction effect) holds only for amount of care.

Using our alternative approach to the question of relative importance of differences in the poverty-related factors across levels of condition seriousness and usual activity groups, namely relative changes in the value of the likelihood function, our conclusions were somewhat different. For all three dependent variables, the poverty-related variables among wage earners are more important when the condition is serious, while for the remaining usual activity categories, with minor exception, this element of our hypothesis is supported.

The poverty-related factors tend to be more important for adults than children in the case of delay. Our expectation, of course, was the reverse and is met only in the case of physician visits and amount of care, when the condition was non-serious.

In this section we have provided a brief summary of the findings. These results are quite mixed in their tendency to confirm our hypotheses. Nevertheless, several conclusions can be drawn from them.

CONCLUSIONS

We will conclude this report by considering how the findings bear on the assertions commonly found in the literature on utilization of physicians' services particularly with regard to utilization by the poor. The basic question raised at the beginning of Chapter I was, "Do the poverty-related characteristics of education, race-ethnicity, income, and third-party coverage interfere with the receipt of prompt and continuing medical attention in the face of sickness, and do different sources of medical care differ systematically in the degree to which they encourage use of services?"

The basic question can be approached and expanded upon in several ways. First, recognizing the limits of this research we will suggest a general

impression, comparing it with other recent findings. Second, we will consider the relationship between our findings and another component of health services utilization, namely preventive care. Third, we take up the implications of the relative importance of the various poverty-related factors in discriminating between persons who tend to be reluctant in using physicians' services or whose use is restricted and those not so reluctant or restricted. Lastly, we will consider the evidence in terms of two plausible but quite contradictory basic assumptions about the orientation of the poor in terms of utilization of services.

In drawing conclusions based on the findings reported in this study we must keep in mind several factors. These factors include: the characteristics of the population under study, the nature of the illness episodes analyzed, and finally, the overall response of the sample to the illness situation. Within the context of these factors, we can consider the circumstances under which elements of the medical care process appear to be influenced by the poverty-related variables of head's education, race, income, third-party coverage, and usual source of care.

The population of Red Hook can reasonably be characterized as poor in terms of family income. At the same time, unlike the populations of many other areas designated as poor, the residents of Red Hook had available even before the introduction of a neighborhood health care center[3] a liberal Medicaid program and multiple sources of care. Neither of these facts, of course, suggest a coherent or attractive delivery system. In fact, the hospital clinic which accounted for most of the care provided to those using hospital clinics was the most antiquated and unappealing that the author has seen. Nevertheless, we did not study a "medically deprived" area.

The episodes of illness that we analyzed tended to be acute and not very serious. The symptoms or conditions included in the study were at least serious enough from the individual's point of view to have resulted in disruption of his usual activity; however, they were not so serious as to have resulted in hospitalization. It will be recalled that a majority of the illnesses were subsequently rated by a physician as not necessarily requiring a doctor's attention.

Given an economically poor population with fragmented and in many instances unpleasant, but nevertheless available, medical services; and given a sample of relatively minor illness episodes what behavior do we observe? Approximately half of those with illness episodes consulted relatives, friends, or neighbors about the illness. The advice given in almost four out of five cases was to see a doctor. Only a few individuals consulted

[3] As noted earlier, the survey on which this research is based was conducted prior to the introduction of a health center.

a nurse or pharmacist. On the other hand, three-fourths of the sample contacted a physician as a result of the illness, and for conditions rated as serious, 93 per cent saw a physician. These results indicate a population that is oriented toward using formal health services when faced with illness.

This general impression is quite consistent with the results of a recently reported comparison by Greenlick *et al.* of an OEO sample enrolled in a large prepaid group with a sample of "regular" enrollees. Their report included the following observation:

> More significantly, on the other hand, are the findings that many aspects of care are similar when evaluated in a system where poverty groups have effective access to care, without financial and other barriers. The similarities are quite striking, for example, in the pattern of care for children and in the proportion of the population that receive any service during the year. It appears that much of the reported difference in the behavior of poverty populations relates to differential access to medical care.[4]

Our study of Red Hook indicates that even in the absence of completely effective access to care, the poor exhibit a strong tendency to use medical care. Nevertheless, we have noted throughout the analysis qualifications of this general conclusion. We will return to these qualifications shortly.

The impression of a population oriented to use of physician's services may be refined by considering differences in behavior comparing adults and children. When a condition is serious and therefore medical care is indicated either to validate the sick role or to accelerate the return to one's usual activity, we find that adults are more likely to seek care for themselves than for children. On the other hand, for non-serious conditions, the adult or school child is considerably less likely to see a doctor than a pre-schooler. These findings suggest that care-seeking behavior is conditioned by the demands of a person's alternative to being sick.

We also found, however, that this population was not inclined to delay in seeking care for children. This finding highlights the difference between medical care behavior in the face of illness and preventive behavior. On the one hand we found a tendency to seek medical care relatively more often for pre-school children than for adults given a non-serious condition, on the other we failed to find any indication that higher income persons were more likely to seek care for such conditions. In contrast, considering both preventive medical care (vaccinations), and preventive dental care (prophylaxis and cavities filled) for children in the year preceding the interview, there were marked differences by adjusted current income (Table 56).

[4] Merwyn R. Greenlick *et al.*, "Comparing the Use of Medical Care Services by a Medically Indigent and a General Membership Population in a Comprehensive Prepaid Group Practice Program," paper presented at the Annual Meeting of the American Public Health Association, Houston, Texas, October, 1970, p. 21.

We turn next to our conclusions regarding the central problem to which the research is addressed—the degree to which and the circumstances under which the poverty-related variables influence medical care behavior. Our conclusions may be summarized as follows. Race-ethnicity is a consistent influence both in terms of behavior leading up to contact with a physician and behavior once an individual is within the medical-care establishment. At the other extreme, adjusted current income is a consistently poor predictor of differential behavior. Between these extremes, head's education and third-party coverage are related to medical-care behavior to a limited degree. The relative effect of hospital clinics is, as expected, to inhibit initial contact, while providing more care than solo practitioners. Apparently, however, individuals using hospital clinics are no more likely to delay before seeking care than those using private practitioners.

TABLE 56

USE OF PREVENTIVE SERVICES BY ADJUSTED CURRENT INCOME

PREVENTIVE SERVICE	Deficit	ADJUSTED CURRENT INCOME[a]	
		Surplus of up to twice poverty line	Surplus of more than twice poverty line
Vaccinations—Proportion of Children Under Age 5 With:			
Polio Vaccination	.81 (161)	.90 (278)	.90 (159)
Measles Vaccination	.65 (161)	.68 (278)	.74 (159)
Any or all DPT	.81 (161)	.85 (278)	.88 (159)
Dental Care[b]—Proportion of Children Ages 5–14 with:			
Prophylaxis	.51 (374)	.57 (562)	.70 (368)
Cavities Filled	.36 (374)	.40 (562)	.51 (368)

[a] These three categories are based on the relative distance from the poverty line.

[b] Dental care in the twelve months preceding the interview.

In recent years, substantial efforts have been made to increase the volume and to a lesser degree improve the quality of ambulatory physicians' services used by the poor in this country. Given the limitations on resources allocated for this purpose, both programs designed to provide third-party *financing* such as Medicaid and programs more oriented to the *delivery* of services such as OEO neighborhood health centers have employed an income test to differentiate between "eligibles" and the rest of the population. Our findings indicate that income, even adjusted for family size, is a poor indicator if the objective is to identify "under utilizers." Differential utilization is most strongly related to race-ethnicity; however, obvious pitfalls are associated with approaching the problem using this indicator as a means of defining high priority groups.

The findings of this study highlight a public policy dilemma with respect to medical care for the poor. There are essentially three current approaches to the problem. The first is to provide financing and depend on existing providers, the second is to provide services through local health centers intended for the poor, and the third is to provide financing, but encourage the development of provider organizations to serve both poor and nonpoor alike.

Considering the first alternative, we found only limited effects with respect to third-party coverage. However, this observation must be put in context. While the effect of third-party coverage on individual behavior is not as great as we had expected, the fact that such coverage, whether through government or voluntary programs, was widely held, considering that Red Hook is a poor area, undoubtedly influenced the availability of services for all residents. Anecdotal evidence gathered by the author suggests that many physicians and some clinics were willing to serve the community because of the availability of satisfactory reimbursement for most of the residents.[5]

The first element of the dilemma, however, is not the effectiveness of third-party financing in increasing utilization, but rather the apparent behavior of the providers. At every level of perceived seriousness, Puerto Ricans had the fewest visits. This result is largely attributable to the tendency for Puerto Ricans to have no physician visits beyond the initial contact. While we found some evidence of noncompliance, for the most part the absence of revisits was due to physicians in private practice not suggesting a return visit.

A similar indication of differential treatment is found in the case of blacks. Although, other things being equal, this group had fewer physician visits than whites, it also had more care. While it is possible that the tendency for blacks to delay more results in more difficult cases than would obtain had earlier treatment been sought, the acute nature of the illnesses involved makes this an unlikely explanation. An alternative possibility is

[5] In the period 1967–68.

that physicians vary their approach to treatment because of differential expectations about black patients' inclination to comply with instructions.

The second alternative mentioned above is the delivery of care through health centers, or other forms of organization, restricted to the poor. This alternative provides, through organization, the means of more easily identifying and correcting inadequacies observed in the traditional ("mainstream") organization of physicians' services. On the other hand, since health centers are "separate," even if equal or better, this alternative is extremely dependent on the good intent of the professionals involved. The potential for deterioration of services or dissolution of the staff is probably much greater than in a provider organization oriented to a broader population base.

The third alternative is to provide not only third-party financing, but also to encourage the development of various types of Health Maintenance Organizations, which would be expected to serve both poor and non-poor patients. This approach would seem to be an improvement over either of the first two alternatives in terms of both homogenizing patterns of care and providing long-run stability. On the other hand, it will be recalled that while we found no difference in tendency to hesitate contrasting persons who use a solo practitioner with those whose usual source is a hospital clinic (the ready accessibility of the hospital clinic apparently offsets whatever other inhibiting features it may have relative to the solo practitioner), persons using prepaid group practice (which is both more institutional than a solor practitioner and often less immediately accessible than a hospital clinic) delayed more than persons using the other two kinds of practice organization.

Looked at from the perspective of utilization behavior (and thus putting aside several important economic and political considerations) each of the public policy alternatives mentioned has strengths and weaknesses. While the debate over alternatives involves many issues, one or another of two basic and quite opposite assumptions about the illness behavior of the poor can usually be detected. The first assumption is that the poor seek care only as a last resort even when care is free. A good example of an elaboration of this position has been recently provided by Anselm Strauss.[6] He argues that not only are the poor inclined to ignore all but the most obvious and serious illnesses, but also:

> Once illness is perceived and once it is believed that something should be done about it, these people are less inclined to use specifically medical institutions that are for higher income people. They are inclined to treat themselves with folk medicine or patent medicine. And they are likely to seek out health advisors

[6] Anselm Strauss, "Medical Organization, Medical Care and Lower Income Groups," *Social Science and Medicine*, III (August, 1969), 157.

not only from kin and acquaintances (as do also the higher income people), but also the neighborhood pharmacist, the chiropractor, and, on occasion, folk-practitioners—like the curenderos among Spanish-speaking people or the sellers of charms in Negro ghettos.

The alternative assumption is that while a number of barriers to the receipt of care exist for the poor in terms of financing and availability of services, the poor, like the remainder of the population, value good health and medical care and are not reluctant to use it. Anne R. Somers, for example, supports this position by citing findings in a report by the Division of Regional Medical Programs based on student surveys in a number of poverty communities:

> The community residents (both urban and rural) seemed surprisingly sophisticated (i.e., above students' expectations) about the use of health services. This was particularly true of urban mothers using hospital clinics for their children It might be described as "utilization savvy."[7]

On the basis of our findings, which one of these characterizations of the poor seems likely to be the more correct? One can only conclude that it is the second alternative that tends to be consistent with the data. Despite the racial-ethnic effects that we have noted, the general orientation of the Red Hook population is toward use of formal medical services. Even in the case of the racial-ethnic effect, we found an equal likelihood of initial contact with a physician. Further, there was no evidence to support the assertion that the use of non-physician alternatives is commonplace.

The evidence on the effects of head's education is particularly supportive of the second assumption. It will be recalled that with respect to annual volume of physicians' services, Andersen concluded that, "very sick people in our society apparently receive care regardless of family structure or socio-economic conditions. However, when there is less illness, stage of family resources, and other social characteristics become more important determinants of care patterns."[8] We are able to add some precision to this conclusion by noting the degree to which and circumstances under which head's education has an effect.

In terms of delay only the college educated group stands apart from the others, delaying less as expected. Considering the relationship between head's education and physician visits, we can only conclude that the act of contacting a physician is influenced by level of head's education only under conditions when patient discretion is very high—that is, for non-serious conditions causing little disruption.

[7] Anne R. Somers, *Health Care in Transition: Directions for the Future* (Chicago: Hospital Research and Educational Trust, 1971), p. 24.

[8] Andersen and Anderson, "Family Life Cycle and Use of Health Services," pp. 14–15.

Our findings and conclusions seem to contradict much of the literature on poverty and medical care. The seeming contradiction is in many instances, however, more apparent than real. First, we have studied a population that has health services available, although not well organized. Our next step will be to conduct a similar analysis of an area that is relatively scarce in services and third-party coverage. Second, we have considered primarily acute illness. The effects of the social-structural variables that we found under certain circumstances suggest that greater differences would be found in the areas of use of preventive services (which depends on a belief in their value that is not as pervasive as in the acute area) and management of chronic conditions (which depends on a higher level of medical sophistication). And finally, as noted earlier, results of other research are beginning to appear which tend to confirm the conclusions of this study.

APPENDIX I

NOTES ON THE VARIABLES USED

This appendix includes a more detailed description of two of the measures used for the study: Condition seriousness and Adjusted current income. The nature of the remaining measures may be obtained from an examination of the questionnaire (Appendix III) or were described in detail in the text.

Condition seriousness.—Each respondent was asked to give a description of the condition or health problem causing the episode. Using this description and no other questionnaire information, an internist coded the case as serious or not serious using the following criteria:

Not serious.—Cases in which the patient either did not need to *see* a doctor for treatment to prevent a worsening of the situation, to speed recovery, or to relieve pain; OR might have been helped, but the decision would normally be at the option of the patient.

Serious.—Cases in which a doctor should have been consulted to prevent a worsening of the condition, or to speed recovery if the condition is usually debilitating for more than a few days, or to relieve pain if there is usually severe or persistent pain associated with the condition or symptoms.

A second internist and a pediatrician were asked to rate the categories and the 97 sets of symptoms or illness descriptions most often mentioned. (For example, one such description was, "bad case of tonsilitis—had a very high fever and vomiting." Another was, "something wrong with spine—something pops in back when he lifts something.") The sets of symptoms were arranged in random order within disease categories. The proportion of ratings which agreed with the initial internist's rating were then adjusted for the overall distribution reported in Table 6.

The adjusted proportions of ratings which agreed with the initial rating were .86 for the second internist and .90 for the pediatrician.

Adjusted current income.—The current family income rate was defined as the sum of 52 times current weekly earnings and 12 times other monthly sources (Social Security, welfare, rental payments, gifts, etc.). When the current family income rate was *less than or equal to* the 1968 poverty income cut-off level for a family its size, all related persons were defined as having a deficit adjusted current income. The cut-off levels shown in Table 57 were used.

For persons in the Red Hook sample who were not related to the head, the same procedure was applied, with incomes of persons related to each other but not to the head pooled. These combinations of persons were also employed to determine the number of persons to be used for the income cut-off level.

Level of Adjusted Current Income.—The level of adjusted current income was then determined by calculating the difference between current rate and the family's cut-off level. For example, a family of five with an income of $7,000 would have a *surplus* of $3,100 or the difference between $7,000 and $3,900. If its income had been $2,000, it would have had a *deficit* of $1,900.

TABLE 57

1968 OEO POVERTY INCOME LEVELS

Family Size	Income Cut-off
1	$1,600
2	2,100
3	2,600
4	3,300
5	3,900
6	4,400
7	4,900
8	5,400
9	5,900
10	6,400
11	6,900
12	7,400
13	7,900

Estimation of Missing Information on Adjusted Current Income.—We were unable to obtain current income information for 18 per cent of the individuals. In contrast, the number of wage earners in each household was known, the attained education of the head of household was known for all but six households out of 1,506, and the index of occupational prestige, based on head's occupation, was known for all but 24 "No answer" cases and 325 cases in which the head kept house or went to school. It was decided to estimate current income where possible on the basis of this other information.

All families with known income were cross-classified by number of wage earners (None, one, or more than one); education of head (Grades 0–4, 5–8, High School incomplete, High School complete, Some College); and the Duncan-Reiss occupational prestige index for head's occupation (00–09, 10–19, . . . , 90–99). Families with unknown income were assigned the median income category of those families having the same level of

education, occupational prestige, and number of wage earners. If there was insufficient income information for a particular combination of education, occupational prestige and number of wage earners; the median of adjacent occupational prestige categories was used. For example, if there were no cases of known adjusted current income associated with the characteristics: one wage earner, High School incomplete, and occupational prestige score of 10–19; the median income category for those cases with one wage earner, High School incomplete and occupational prestige scores of 00–09 and 20–29 was assigned. The only exception to this rule occurred in two cases for which neither occupational prestige nor education was known. For these two cases, the median income category for all one wage earner families was assigned.

TABLE 58

ADJUSTED CURRENT INCOME DISTRIBUTIONS BEFORE AND AFTER ESTIMATION

Eligibility Degree	Per Cent Distribution of Income as Reported	Per Cent Distribution of Adjusted Current Income Including Estimates
Deficit of $2,000 or more	3.4	3.0
Deficit of $1,000–$1,999	4.2	3.5
Deficit of $000–$999	17.7	16.1
Surplus of $000–$999	15.1	13.6
Surplus of $1,000–$1,999	16.2	16.0
Surplus of $2,000–$2,999	10.3	12.3
Surplus of $3,000–$3,999	10.5	10.8
Surplus of $4,000–$4,999	5.9	6.6
Surplus of $5,000–$5,999	4.3	6.0
Surplus of $6,000 or more	12.4	12.0
Total	100.0	99.9

Table 58 shows the income distribution for individuals in families with known eligibility degree, excluding the indeterminates and the distribution for the entire sample combining known and estimated income levels.

In an earlier test of the value of the estimating procedure in predicting annual income, a simple random sub-sample of seventy families was drawn.[1] Of these seventy, 1967 income was either unknown or had been refused in 30 per cent of the cases (which compares to the 27 per cent of the full sample). There was sufficient information on education of head, occupational prestige, and number of wage earners to estimate income in thirty-two of the remaining cases. Assigning the value $15,000 to three of the

[1] This test was performed for use in the original survey report.

thirty-two cases falling in the open-ended category of $15,000 or more, the mean absolute error in prediction was $1,600. Taking sign into account, the mean error was −$200. A more useful way of looking at the accuracy of the predictions, however, is as follows: in 47 per cent of the cases, the income category predicted from the three variables mentioned earlier was within $1,000 of the income category actually reported in the interview. In 66 per cent of the cases, the predicted category was within $2,000 of the reported category. In 91 per cent of the cases, the predicted category was within $3,000 of reported, and in no case was the discrepancy greater than $5,000.

APPENDIX II

STATISTICAL METHOD

In this appendix, we will describe in somewhat more detail the statistical model (limited dependent variable regression) introduced in Chapter V, including the calculation of expected values. In addition, we will compare some preliminary results obtained using simple contingency tables and the Automatic Interaction Detector (AID) algorithm developed by Songuist and Morgan[1] with results reported in Chapter VI. We will also compare some of the results obtained in Chapter VI with the results obtained for the same data using least squares regression. Finally, we will consider the effect of intra-class correlation (resulting from the sampling design) on the regression coefficients.

STATISTICAL MODEL

The model used for the analysis reported in this monograph was developed by James Tobin,[2] and is intended for situations in which, for a substantial number of observations, the dependent variable takes on a limiting value. The model is as follows:

Let an index, I, be a linear combination of the independent variables $(X_1, X_2 \ldots X_m)$:

$$I = \beta_0 + \beta_1 X_1 + \beta_2 X_2 \ldots \beta_m X_m .$$

Individual behavior with respect to the limited dependent variable, Y_i, is determined as follows:

$$Y_i = 0 \quad \text{if} \quad I_i < I_i^*$$

and

$$Y_i = I_i - I_i^* \quad \text{if} \quad I_i \geq I_i^*$$

where I^* is a random variable representing individual differences in behavior not accounted for by the X's and the lower limit. This disturbance term is assumed to be normally distributed across the population with zero mean and standard deviation σ.

For any value of the linear combination, I, observations observed at the limit are interpreted as arising from individuals whose values of the index,

[1] John A. Songuist and James N. Morgan, *The Detection of Interaction Effects* (Ann Arbor, Mich.: University of Michigan, Survey Research Center, Institute for Social Research, Monograph No. 35, 1964).

[2] Tobin, "Estimation of Relationships for Limited Dependent Variables," pp. 26–36.

I*, are so high as to exceed I. In addition there will be a distribution of positive (non-limit) Y's for observations for which I exceeds I*. Letting F(z) equal the value of the unit normal cumulative distribution at z:

$$\text{Prob}\{y = 0|I\} = \text{Prob}\{I^* > I|I\} = 1 - F\left(\frac{I}{\sigma}\right)$$

$$\text{Prob}\{y > y^* \geq 0|I\} = \text{Prob}\{I^* < I - y^*|I\}$$

$$= F\left(\frac{I - y^*}{\sigma}\right)$$

These probabilities are a function of the β's. The maximum likelihood solution for the estimation of the β's and σ involves a system of m + 2 non-linear normal equations.

The sample of observations includes a subset of (q) observations for which y, the dependent variable, takes on the limit value (zero in our case). We will denote the values of the independent variables of this subset of observations by the subscript i (e.g., $X_{1i}, X_{2i}, \ldots, X_{mi}$). For the remaining (r) observations y takes on a value larger than the limit value, or is non-zero in our case. The latter observations will be designated by the subscript j (e.g., $Y_j, X_{1j}, X_{2j}, \ldots, X_{mj}$.

Letting $(a_0, a_1, a_2, \ldots, a_m, a)$ be estimates[3] of $(\beta_0/\sigma, \beta_1/\sigma, \beta_2/\sigma, \ldots, \beta_m/\sigma, 1/\sigma)$, and letting

$$I_i = a_0 + a_1X_{1i} + a_2X_{2i} + \ldots a_mX_{mi},$$

and similarly,

$$I_j = a_0 + a_1X_{1j} + a_2X_{2j} + \ldots a_mX_{mj},$$

the natural logarithm of the likelihood (ϕ) of the sample is:

$$\ln \phi = \sum_{i=1}^{\alpha} \ln Q(I_i - a_{yi}) + r \ln a - \frac{r}{2} \ln 2\pi - \frac{1}{2}\sum_{i=1}^{r}(I_j - a_{yj})^2.$$

Where Q(x) is one minus the value of the cumulative unit-normal distribution function at x.

Setting the derivatives of ln ϕ with respect to the a's equal to zero yields the set of normal equations which determine the maximum likelihood estimators.

The expected value of the dependent variable given a combination of values of the independent variables is:

$$E(y|I) = I F\left(\frac{I}{\sigma}\right) + \sigma f\left(\frac{I}{\sigma}\right).$$

[3] In the text these estimates are designated by "$\hat{\beta}$" rather than "a."

COMPARISON OF METHOD WITH OTHER APPROACHES

During the preliminary stages of the analysis of the Red Hook data, we drew a 20 per cent simple random subsample of individuals reporting episodes for exploratory purposes. These data were examined using two approaches: first, we used simple three-way contingency tables with the dependent variable dichotomized (e.g., delay versus no delay or revisit versus no revisit); and second, we used the AID algorithm referred to above. We will briefly consider the results of these analyses with respect to the relationships between delay on the one hand and two apparently important "effects," usual activity and race, on the other. The effects of these two independent variables on delay as reported in Chapter VI are summarized in Table 59.

TABLE 59

ESTIMATED PARAMETERS FOR CATEGORIES OF USUAL ACTIVITY REGRESSING DELAY ON CONDITION SERIOUSNESS AND USUAL ACTIVITY AND FOR CATEGORIES OF RACIAL ETHNIC GROUP REGRESSING DELAY ON ALL INDEPENDENT VARIABLES[a]
(N = 1,032)

Usual Activity	Coefficient (Standard Error)	Racial-Ethnic Group	Coefficient (Standard Error)
Work	—0—	White	—0—
Keeping House	.236 (.098)	Puerto Rican	.360 (.098)
School	—.050 (.088)	Black	.364 (.087)
Under Age Six	—.213 (.100)		

[a] Because of the difficulty in interpreting comparisons which include interaction terms, we are using the results of the regression shown in Table 19 column (3) for the usual activity coefficients. It will be recalled that we found no interaction between usual activity and condition seriousness, and that the coefficients in Table 19 are essentially the same as those in Table 21 where we enter all variables in the regression.

We consider first the proportion of individuals with at least one physician visit who reported some delay. Table 60 shows the proportion with at least some delay by condition seriousness and usual activity.

The proportions shown in Table 60 are almost perfectly consistent with the limited dependent variable regression coefficients in terms of relative magnitudes and therefore also an absence of interaction.

The AID algorithm was also applied to the subsample. "The [AID] program subdivides the original sample through a series of dichotomous splits with respect to the predictors [independent variables] into a number of mutually exclusive subgroups. This is achieved through a stepwise procedure. In the first step that predictor and division of categories of that

predictor are chosen from all potential dichotomies which maximizes between group variance. In the second step the subgroup with the largest within group variance is likewise divided to maximize the variance explained. The analysis goes on with successive splits until minimum requirements concerning size and variance are no longer met by any of the subgroups of the sample."[4]

For this brief comparison of results we will not show the entire AID analysis, but rather those "splits" involving usual activity and a little further on those involving race. We arbitrarily divided the 20 per cent subsamples into two groups: condition rated serious and condition rated not serious. In the case of delay, the first dichotomous split made by the program for both of these groups was on perceived seriousness. For each of the four condition seriousness x perceived seriousness subgroups we observed splits on usual activity. When the condition was rated serious, but perceived as not serious and when the condition was rated not serious but perceived as serious, usual activity was the next split. For the other condition serious subgroup there was one intervening split, while for the final subgroup (condition rated not serious and perceived as fairly serious or not serious) we found three intervening splits.

TABLE 60

PROPORTION OF INDIVIDUALS WITH AT LEAST ONE PHYSICIAN VISIT WHO REPORTED SOME DELAY BY CONDITION SERIOUSNESS AND USUAL ACTIVITY
(20 per cent simple random subsample)[a]
(N = 242)

CONDITION SERIOUSNESS	USUAL ACTIVITY			
	Work	Keep House	School	Under Age Six
Serious.....	.51 (35)	.59 (32)	.48 (27)	.44 (16)
Not Serious.....	.66 (29)	.75 (28)	.65 (49)	.50 (26)

[a] Includes persons subsequently hospitalized.

The four usual activity dichotomies are summarized in Table 61 where p is the proportion of individuals with some delay.

The results for adults are consistent with our earlier findings. That is, housewives consistently fall in the greater delay category and wage earners tend to do the same. The results for school children, however, are quite inconsistent with our earlier analyses. In three out of the four splits, school children are singled out by the AID analysis as having a relatively small proportion of persons with delay, while preschool children tend to be grouped with adults.

[4] Ronald Andersen, Bjorn Smedby, and Gunnar Eklund, "Uses of the Automatic Interaction Detector (AID) Program for Analyzing Health Survey Data," paper presented at the Annual Meeting of the American Public Health Association, Houston, Texas, October 28, 1970, p. 2.

TABLE 61

USUAL ACTIVITY "SPLITS" IN AID ANALYSIS OF DELAY
(20 per cent simple random subsample)[a]
(N = 266)

Preceding Splits	Usual Activity Split	p	Number of Observations
1. Condition serious 2. Perceived very serious or fairly serious 3. Source or care solo practitioner or group	Work, Keep House, Under Age Six, Other	.52	44
	School	.33	15
1. Condition serious 2. Perceived not serious	Keep House, School	.93	14
	Work, Under Age Six, Other	.68	19
1. Condition not serious 2. Perceived very serious	Work, Keep House, Under Age Six	.52	25
	School, Other	.20	10
1. Condition not serious 2. Perceived fairly serious or not serious 3. Head's education less than High School 4. Some Third-Party Coverage 5. Income—Surplus of $1,000 or more	Work, Keep House, Under Age Six	.70	17
	School, Other	.50	14

[a] Includes persons subsequently hospitalized and persons whose usual activity is "other."

It is not clear why these inconsistent results appear, but two factors may be influencing the results. The most important is that the number of observations is very small and therefore the results are subject to substantial sampling error. The second factor is the sequential rather than simultaneous nature of the AID approach to handling multiple independent variables. This latter factor is hard to assess because, given the small sample size, we are unable to observe the usual activity effect in other branches of the analysis.

Turning to the racial-ethnic effects, Table 62 shows the proportions of individuals with at least some delay by condition seriousness and race in the 20 per cent subsample.

The coefficients for race shown in Table 59 are net effects with all other independent variables entered in the regression. The proportions shown in Table 62 are, in contrast, zero order relationships within the two condition seriousness categories. For non-serious conditions whites have the lowest proportion reporting delay which is consistent with the regression results. However, blacks have a higher proportion than Puerto Ricans rather than equal proportions. For serious conditions, whites reported delay proportionately more often than the other two groups. This latter inconsistency with the regression results may be a result of including individuals who

TABLE 62

PROPORTION OF INDIVIDUALS WITH AT LEAST ONE PHYSICIAN VISIT WHO REPORTED SOME DELAY BY CONDITION SERIOUSNESS AND RACIAL-ETHNIC GROUP
(20 per cent simple random subsample)[a]
(N = 266)

CONDITION SERIOUSNESS	RACIAL-ETHNIC GROUP		
	White	Puerto Rican	Black
Serious.....	.56 (48)	.48 (42)	.49 (37)
Not Serious.....	.58 (64)	.64 (33)	.71 (42)

[a] Includes persons subsequently hospitalized and persons whose usual activity is "other."

were subsequently hospitalized. Whites among the hospitalized group had relatively more chronic conditions and therefore greater delay. Another important consideration, however, is the absence of a control for usual source of care. This may be seen by considering the results of the AID analysis.

Three splits on race were observed in the AID analysis: two when the condition was both rated and perceived as serious or fairly serious and one when the condition was rated as not serious and was perceived as fairly serious or not serious. In the non-serious case, 36 per cent of whites in families whose heads had at least a high school education reported some delay compared to 75 per cent among the analogous non-white group (Table 63). In contrast to the proportions shown in Table 62, the racial-ethnic splits when the condition was rated serious and perceived as serious or fairly serious are also consistent with the limited dependent variable

regression results. This consistency appears to be due to the control for usual source of care which enters the AID analysis before the racial-ethnic splits.

To summarize, we have compared simple contingency tables and an AID analysis based on a subsample of data with the final regression results for delay using the two independent variables which accounted for the largest "effects" in the regression analysis presented in Chapter VI. The inconsistencies that we found comparing the three sets of results are with one exception either minor or may be explained in terms of inade-

TABLE 63

RACIAL-ETHNIC "SPLITS" IN AID ANALYSIS OF DELAY
(20 per cent simple random subsample)[a]
(N = 266)

Preceding Splits	Racial-Ethnic Split	p	Number of Observations
1. Condition not serious 2. Perceived fairly serious or not serious 3. Head's education is high school or more	White	.36	14
	Puerto Rican, Black	.75	16
1. Condition serious 2. Perceived very serious 3. Usual source is hospital clinic	White, Black	.10	10
	Puerto Rican	.30	10
1. Condition serious 2. Perceived very serious or fairly serious 3. Usual source is solo or group practictioner	White	.36	14
	Puerto Rican, Black	.57	14

[a] Includes persons subsequently hospitalized and persons whose usual activity is "other."

quate controls (e.g., in the case of the simple tables). The exception to this statement is the AID finding that the proportion of school children with delay tended to be smaller than that found for preschool children and adults. This finding was inconsistent with both the corresponding contingency table and the regression.

COMPARISON OF LIMITED DEPENDENT VARIABLE AND LEAST SQUARE REGRESSION

As in the previous section, we have selected the regression of delay on condition seriousness and usual activity, whose coefficients were given in Table 19, column (3), (LDV) to compare with the results of an ordinary

least squares regression (LS) of the same specification and using the same data.[5] The four relevant coefficients are shown in Table 64.

We note first that conclusions based on the two different regressions would be the same: condition seriousness is not related to delay, while usual activity is related with housewives delaying most and preschool children least. Beyond this similarity of conclusions, however, we observe two notable differences. First, the signs of the condition seriousness coefficients are opposite. Since both coefficients are close to zero, this fact does not alter the conclusions. Second, the standard errors of the LDV coefficients are consistently larger than the corresponding LS standard

TABLE 64

ESTIMATED PARAMETERS IN REGRESSIONS OF DELAY ON LEVELS OF CONDITION SERIOUSNESS AND USUAL ACTIVITY USING TWO TYPES OF REGRESSION

Independent Variable	Limited Dependent Variable Regression Coefficients (Standard Errors)	Least Squares Regression Coefficients (Standard Errors)
$\hat{\beta}_1$ Condition Serious	−.039 (.070) t= .56	.058 (.059) t= .99
$\hat{\beta}_2$ Keeping House	.236 (.098) t=2.41	.191 (.084) t=2.28
$\hat{\beta}_3$ School	−.050 (.088) t= .56	−.060 (.074) t= .81
β_4 Under Age Six	−.213 (.100) t=2.13	−.173 (.083) t=2.08

errors. The LDV coefficients that are not close to zero, however, are larger than the corresponding LS coefficients with the net result that close to zero the LS t values exceed the LDV t values, while the opposite is true when the coefficients are not close to zero.

As would be expected, given the similarities in Table 64, the expected values for various combinations of seriousness and usual activity are very similar comparing the two methods.

INTRAFAMILY CORRELATION

The analysis presented in this monograph has used individuals as the unit of analysis. The tests of significance that we have used require the

[5] Due to a data processing error, there were actually six more cases used in the least squares regression analysis, yielding an N of 1,038 compared to an N of 1,032 in Table 19. The program used for the least squares regression was BIMED 34T, University of Chicago.

assumption that these individuals have been drawn independently. We know, however, that at the final stage of sampling, households rather than individuals were the unit and that all individuals within a selected household fell into the sample. To the degree that we observe homogeneity within a household, we would expect our estimates of the regression coefficients to overestimate the true effects. (This expectation is not a logical necessity, but generally seems a reasonable one.)

TABLE 65

EFFECT OF INTRAFAMILY CORRELATION—REGRESSIONS OF DELAY ON CONDITION SERIOUSNESS, PERCEIVED SERIOUSNESS, AND USUAL ACTIVITY FOR TWO SUBSAMPLES

Independent Variable	Sample of One Individual From Each Household (N=528)	Fifty Per Cent Simple Random Subsample of Individuals (N=516)
$\hat{\beta}_1$ Condition Serious	.010 (.101)	.038 (.101)
$\hat{\beta}_2$ Keep House	.318 (.128)	.264 (.139)
$\hat{\beta}_3$ School	−.109 (.122)	−.123 (.125)
$\hat{\beta}_4$ Under Age Six	−.211 (.143)	−.219 (.146)
$\hat{\beta}_5$ Fairly Serious	−.075 (.111)	−.080 (.113)
$\hat{\beta}_6$ Very Serious	−.247 (.124)	−.276 (.127)

To get some indication of the effect of intrafamily correlations, we randomly selected one individual from each household (each individual in a particular household had an equal probability of being selected), and compared the results of two limited dependent variable regressions for delay run on each of two samples. The first sample was comprised of the 528 individuals selected as indicated above. The second sample was a 50 per cent simple random sample of all individuals having had at least one physician visit. The size of the second sample was 516 individuals. (The purpose of the second sample was to obtain a comparison group of a size approximately equal to the first group.)

The first regression was of delay on condition seriousness, perceived seriousness, and usual activity. We would expect to observe the least

homogeneity within a family with respect to usual activity contrasting this individual trait to all other variables. The seriousness variable would be expected to exhibit some homogeneity because of the communicability of disease, similar responses to illness learned within the family, and the results of a response set. The greatest homogeneity, almost by definition, would be observed in the case of racial-ethnic group. Consequently, we ran a second regression of delay on race, controlling for condition seriousness and usual activity.

The results of the first regression are shown in Table 65.

None of the differences between the coefficients for the two samples are very large. The greatest difference is observed in the case of the usual activity coefficient representing keeping house ($\hat{\beta}_2$), and the difference even here is not appreciable.

Finally, we consider the comparison of coefficients for which the greatest difference would be expected, namely race. For the sample of one individual per household, the coefficients are $\hat{\beta}_{16}$ (Puerto Rican) = .262 (.120) and $\hat{\beta}_{17}$ (Black) = .225 (.111). The corresponding coefficients for the simple random sample are $\hat{\beta}_{16}$ = .371 (.124) and $\hat{\beta}_{17}$ = .341 (.111). We see then that in the case where we assumed the greatest homogeneity to be found, we still find a significant race effect, although it is diminished when we take account of intrafamily correlation.

APPENDIX III

THE QUESTIONNAIRE

DECK 06

TIME INTERVIEW BEGAN:	AM PM

1. How long have you and the others in *this household* lived here, at this address?
RECORD LONGEST TIME ANY HOUSEHOLD MEMBER HAS LIVED HERE. PROBE FOR BEST GUESS.

Less than 6 months	1	14/y
6 months to less than one year	2	
One year to less than three	3	
Three years to less than five	4	
Five years to less than ten	5	
Ten years or more (SKIP TO Q. 4)	6	

---

2. How long have you and the others in *this household* lived in this neighborhood?
RECORD LONGEST TIME ANY HOUSEHOLD MEMBER HAS LIVED HERE. PROBE FOR BEST GUESS.

Less than one year	1	15/y
One year to less than three	2	
Three years to less than five	3	
Five years to less than ten	4	
Ten years or more (SKIP TO Q. 4)	5	

---

3. And how long have you and the others in *this household* lived in New York City?
RECORD LONGEST TIME ANY HOUSEHOLD MEMBER HAS LIVED IN NEW YORK. PROBE FOR BEST GUESS.

Less than one year	6	16/y
One year to less than three	7	
Three years to less than five	8	
Five years to less than ten	9	
Ten years or more	0	

17–18

Now I'm going to ask about the health of all the members of this household, so I have to find out who lives here. Let's start with you, and your family, and then anyone else who lives here.

PERSON NUMBER	A. What is your name? ENTER R'S NAME ON LINE 00. Who else lives here? ENTER NAME(S) ON FOLLOWING LINE(S). PROBE BEFORE ASKING B-E: Have we missed anyone—persons who usually live here but who are away from home now—travelling, on vacation, in a hospital or somewhere else? Have we missed any babies or small children?	B. What was (PERSON'S) age on (his/her) last birthday? ENTER AGE	C. RECORD RELATIONSHIP TO RESPONDENT FOR EACH PERSON. (ASK, IF NECESSARY)	D. CODE SEX. M	D. CODE SEX. F	E. RECORD "HEAD" ON HEAD OF HOUSEHOLD'S LINE. (IF NECESSARY ASK: Who is the head of the household?) ENTER A CHECK ( ) ON LINES OF ANY PERSONS WHO ARE *NOT* RELATED TO HEAD OR WIFE OF HEAD.
00	19–20		21 RESPONDENT	1	2	22
01	23–24		25	1	2	26
02	27–28		29	1	2	30
03	31–32		33	1	2	34
04	35–36		37	1	2	38
05	39–40		41	1	2	42
06	43–44		45	1	2	46
07	47–48		49	1	2	50
08	51–52		53	1	2	54
09	55–56		57	1	2	58
10	59–60		61	1	2	62
11	63–65		65	1	2	66

LAST LINE NUMBER USED IS: ☐

Now to health matters. I'll be asking these questions about each member of the household. We'll start with you.

5. In general, would you say your own health is excellent, good, fair, or poor?

Excellent	1	07/y
Good	2	
Fair	3	
Poor	4	
Don't know	5	

6. Who do you see, or where do you go, most of the time when you want to see a doctor for yourself—to what doctor or place?

NAME OF DOCTOR OR PLACE: 08/

ADDRESS OR DESCRIPTION:

CODE LOCATION: In community	6	09/y
Out of community	7	
Never goes anywhere....(SKIP TO Q. 12)	8	

7. *IF OBVIOUS, CODE WITHOUT ASKING:* Is that a private doctor, a hospital clinic or emergency room, a chiropractor, a union or H.I.P. doctor or what?

Private doctor.....(ASK A)	1	10/
Hospital clinic or emergency room	2	
Chiropractor	3	
Union or H.I.P. doctor.....(ASK A)	4	
Other (SPECIFY)	5	

A. *IF PRIVATE, UNION, OR H.I.P. DOCTOR:* Is he a general practitioner or some kind of specialist?

General practitioner	7	11/y
Specialist.....(ASK [1])	8	
Don't know	9	

[1] *IF SPECIALIST:* What kind of a specialist is he?..... 12/

8. When did you first start going to (DOCTOR OR PLACE NAMED IN Q. 6)—within the last 12 months or longer ago than that?

Within last 12 months	1	13/y
Longer ago than that	2	

9. OMITTED 14/R

10. How long does it usually take you to get there (the way you usually go)?

0–9 minutes	1	15/y
10–19 minutes	2	
20–29 minutes	3	
30–39 minutes	4	
40–49 minutes	5	
50–59 minutes	6	
1 hour or more	7	
Never went from this address	8	
Never went.....(SKIP TO Q. 12)	9	

DECK 01

11. Once you get there, about how long do you usually have to wait to see the doctor?

Less than 1/2 hour	1	16/y
1/2 to less than one hour	2	
One to less than 1–1/2 hours	3	
More than 1–1/2 hours	4	

12. Of all the doctors and places you know of, when something worries you about your own health, is there any *one doctor or place* that you trust more than any other, to get medical help or advice? (DO NOT PROBE.)

Yes.....(ASK A)	1	17/y
No.....(SKIP TO Q. 17)	2	

A. *IF YES:* What doctor or place?

NAME OF DOCTOR OR PLACE:..... 18/

ADDRESS OR DESCRIPTION.....

CODE LOCATION: In community	6	19/y
Out of community	7	

SAME DOCTOR OR PLACE AS NAMED IN Q. 6 (SKIP TO Q. 17)	X

13. *IF OBVIOUS, CODE WITHOUT ASKING:* Is that a private doctor, a hospital clinic or emergency room, a chiropractor, a union or H.I.P. doctor, or what?

Private doctor.....(ASK A)	1	20/
Hospital clinic or emergency room	2	
Chiropractor	3	
Union or H.I.P. doctor.....(ASK A)	4	
Other.....(SPECIFY)	5	

A. *IF PRIVATE, UNION, OR H.I.P. DOCTOR:* Is he a general practitioner or some kind of specialist?

General practitioner	7	21/y
Specialist.....(ASK [1])	8	
Don't know	9	

[1] *IF SPECIALIST:* What kind of specialist is he?..... 22/

14. When you get medical help or advice for yourself, how often do you get it from (DOCTOR OR PLACE NAMED IN Q. 12)—some of the time, hardly ever, or never?

Some of the time	1	23/y
Hardly ever	2	
Never.....(SKIP TO Q. 17)	3	

DECK 01

15. How long does it usually take you to get there (the way you usually go)?

0–9 minutes	1	24/y
10–19 minutes	2	
20–29 minutes	3	
30–39 minutes	4	
40–49 minutes	5	
50–59 minutes	6	
1 hour or more	7	

16. Once you get there, about how long do you usually have to wait to see the doctor?

Less than 1/2 hour	1	25/y
1/2 to less than one hour	2	
One hour to less than 1–1/2 hours	3	
More than 1–1/2 hours	4	
Don't know	5	

IF RESPONDENT IS 17 YEARS OR OVER, ASK Q. 17.

17. What were you doing *most* of the past 12 months—
FOR FEMALES.....keeping house, working or doing something else?
FOR MALES.....working, or doing something else?

CIRCLE ONE CODE ONLY.

IF "SOMETHING ELSE," PROBE: What were you doing?

Working.....(SKIP TO Q. 19)	1	26/y
Keeping house.....(SKIP TO Q. 19)	2	
Going to school.....(SKIP TO Q. 21)	3	
Retired.....(SKIP TO Q. 20)	4	
Other.....(SPECIFY AND SKIP to Q. 20)	5	

IF RESPONDENT IS 14 THROUGH 16 YEARS OLD, ASK Q. 18.

18. What were you doing *most* of the past 12 months—going to school or doing something else?

CIRCLE ONE CODE ONLY.

IF "SOMETHING ELSE," PROBE: What were you doing?

Going to school.....(SKIP TO Q. 21)	1	27/y
Working.....(GO TO Q. 19)	2	
Keeping house.....(GO TO Q. 19)	2	
Other.....(SPECIFY AND SKIP TO Q. 22)	4	

IF "WORKING" OR "KEEPING HOUSE," ASK Q. 19.

19. In terms of health, are you *presently* able to (work/keep house) at all?

Yes.....(ASK A)	1	28/y
No.....(SKIP TO Q. 23)	2	

A. *IF YES:* Are you limited in the *kind* of (work/housework) you can do, because of your health?

Yes.....(SKIP TO Q. 23)..... 3 29/y
No.....(ASK [1])..... 4

[1] *IF NO TO A:* Are you limited in the *amount* of (work/housework) you can do, because of your health?

Yes.....(SKIP TO Q. 23)..... 5 30/y
No.....(ASK [2])..... 6

[2] *IF NO TO [1]:* Are you limited in the kind or amount of *other* activities you can do, because of your health?

Yes.....(SKIP TO Q. 23)..... 7 31/y
No.....(SKIP TO Q. 24)..... 8

IF "RETIRED," OR "OTHER" IN Q. 17, ASK Q. 20.

20. Does your health keep you from working?

Yes.....(SKIP TO Q. 23)..... 1 32/y
No.....(ASK A)..... 2

A. *IF NO:* Are you limited in the *kind* of work you *could* do, because of your health?

Yes.....(SKIP TO Q. 23)..... 3 33/y
No.....(ASK [1])..... 4

[1] *IF NO TO A:* Are you limited in the *amount* of work you *could* do, because of your health?

Yes.....(SKIP TO Q. 23)..... 5 34/y
No.....(ASK [2])..... 6

[2] *IF NO TO [1]:* Are you limited in the kind or amount of *other* activities you can do, because of your health?

Yes.....(SKIP TO Q. 23)..... 7 35/y
No.....(SKIP TO Q. 24)..... 9

36–41/R

IF "GOING TO SCHOOL," ASK Q. 21.

21. Do you have to go to a certain type of school, because of your health?

Yes.....(SKIP TO Q. 23)..... 1 42/y
No.....(ASK A)..... 2

A. *IF NO:* Are you limited in school attendance, because of your health?

Yes.....(SKIP TO Q. 23)..... 3 43/y
No.....(ASK [1])..... 4

[1] *IF NO TO A:* Are you limited in the kind or amount of *other* activities you can do, because of your health?

Yes.....(SKIP TO Q. 23)..... 5 44/y
No.....(SKIP TO Q. 24)..... 6

IF "OTHER" IN Q. 18, ASK Q. 22.

22. Does your health keep you from going to school?

Yes.....(SKIP TO Q. 23)..... 1 45/y
No.....(ASK A)..... 2

A. *IF NO:* Would you have to go to a certain type of school, because of your health?

Yes.....(GO TO Q. 23)..... 3 46/y
No.....(ASK [1])..... 4

[1] *IF NO TO A:* Would you be limited in school attendance, because of your health?

Yes.....(GO TO Q. 23)..... 5 47/y
No.....(ASK [2])..... 6

[2] *IF NO TO [1]:* Are you limited in the kind or amount of *other* activities you can do, because of your health?

Yes.....(GO TO Q. 23)..... 7 48/y
No.....(SKIP TO Q. 24)..... 8

---

23. ASK IF ANY LIMITATION BECAUSE OF HEALTH (FROM Q'S. 19, 20, 21, OR 22).

A. What condition causes this? RECORD BELOW NAME OF CONDITION OR SYMPTOMS, CAUSES, AND/OR PARTS OF BODY AFFECTED. (IF ANSWER IS "OLD AGE," RECORD VERBATIM AND PROBE: What *specific* condition causes this limitation?) PROBE, BEFORE GOING ON TO B: Is this limitation caused by any *other* conditions? (What are they?) PROBE AS ABOVE FOR NAME OR DESCRIPTION OF CONDITION IN *SEPARATE* SPACE BELOW AND REPEAT PROBE.	B. *ASK FOR EACH CONDITION IN A:* Have you had (CONDITION) for more than three months?	C. *IF TWO OR MORE CONDITIONS IN A, ASK:* Which of these conditions would you say is the *main* cause of your limitation? CODE ONE CONDITION ONLY.
(1) 49–50/	Yes.... 1 No.... 2 51/y	Main cause... 1 52/
(2) 53–54/	Yes.... 1 No.... 2 55/y	Main cause... 1 56/
(3) 57–58/	Yes.... 1 No.... 2 59/y	Main cause... 1 60/
(4) 61–62/	Yes.... 1 No.... 2 63/y	Main cause... 1 64/
(5) 65–66/	Yes.... 1 No.... 2 67/y	Main cause... 1 68/ 69/

BEGIN DECK 02

05–06/00

ASK EVERYONE:

24. Thinking back over the last 12 months, that is, since (MONTH), 1967, were you

kept from { going to work, / going to school, / doing your usual activity, } for at least two days in a row, because of an illness or accident?

Yes 1 07/y
No .....(SKIP TO INSTRUCTIONS BEFORE Q. 47) 2

25. How many *different* times in the last 12 months were you kept from (work/school/your usual activity) for at least 2 days in a row because of an illness or accident?

.....times 08/

26. ASK Q. 26 FOR EACH TIME MENTIONED IN Q. 25, STARTING WITH THE MOST RECENT TIME. AFTER ASKING Q. 26 FOR ALL THE TIMES, THEN ASK Q. 26–A FOR EACH CONDITION.

(1) *The last time this happened*, what condition or health problems kept you from (work/school/your usual activity)? RECORD NAME OF CONDITION, OR SYMPTOMS, CAUSES AND/OR PARTS OF BODY AFFECTED. IF MORE THAN ONE CONDITION AT *SAME* TIME, RECORD ALL IN SAME SPACE.

09/
10/
11/
12/

(2) *The time before that*, what condition or health problems kept you from (work/school/your usual activity)?

16/
17/
18/
19/

(3) *The time before that*, what condition of health problems kept you from (work/school/your usual activity)?

23/
24/
25/
26/

(4) *The time before that*, what condition or health problems kept you from (work/school/your usual activity)?

30/
31/
32/
33/

DECK 02

(5) *The time before that*, what condition or health problems kept you from (work/school/your usual activity)?

37/
38/
39/
40/

When did you first (notice the CONDITION/have the accident)—aside from this particular attack of it)? RECORD BEGINNING DATE FOR *EACH* CONDITION. *Month* *Year* 13–14/	*IF NO DATES IN Q. 26-A ARE WITHIN LAST 12 MONTHS*, SKIP TO INSTRUCTIONS BEFORE Q. 47. *IF ANY DATES ARE WITHIN LAST 12 MONTHS*, CIRCLE "X" IN BOX ALONGSIDE *MOST RECENT* DATE. [X] 15/
26-A When did you first (notice the CONDITION/have the accident)—(aside from this particular attack of it)? *Month* *Year* 20–21/	[X] 22/
When did you first (notice the CONDITION/have the accident)—(aside from this particular attack of it)? *Month* *Year* 27–28/	[X] 29/
When did you first (notice the CONDITION/have the accident)—(aside from this particular attack of it)? *Month* *Year* 34–35/	[X] 36/
When did you first (notice the CONDITION/have the accident)—(aside from this particular attack of it)? *Month* *Year* 41–42/	[X] 43/

DECK 02

ASK FOR THE CONDITION CODED "X": Now, let's make sure I have this right—you were kept from (ACTIVITY) for at least two days during the last 12 months because of (CONDITION X); is that correct?

IF CORRECT, GO ON TO Q. 27. IF INCORRECT, GO BACK AND CORRECT.

---

27. Now I'm going to ask you a few questions about (CONDITION "X" FROM Q. 26). When you *first* (noticed CONDITION/had the accident), at the very beginning, how serious did you think it was—very serious, fairly serious, or not serious at all?

Very serious	1	44/y
Fairly serious	2	
Not serious at all	3	

---

28. When you first (noticed CONDITION/had the accident) did you talk to anyone living in the household about *what to do about it?*

Yes.....(ASK A & B)	4	45/y
No	5	

IF YES, ASK A & B:

A. (IF OBVIOUS, CODE WITHOUT ASKING.) Who did you talk to? CODE AS MANY AS APPLY.	B. ASK FOR EACH. What did (PERSON) think you should do?

Spouse	1	46/
Other person	2	47/
Other person	3	48/

---

29. When you first (noticed CONDITION/had the accident), did you, or anyone in the household, talk with someone who *doesn't* live here about *what to do about it*—a relative; friend or neighbor; a nurse; a druggist; or someone else, not counting a doctor?

Yes.....(ASK A & B)	1	49/y
No	2	

IF YES, ASK A & B:

A. Who was that? CODE AS MANY AS APPLY. READ CATEGORIES, IF NECESSARY.	B. ASK FOR EACH. What did (PERSON) think you should do?

Relative, friend, or neighbor	3	50/
Nurse	4	51/
Druggist	5	52/
Other person	6	53/
Other person	7	54/

---

30. Did you, or anyone in the household, see or talk to a *doctor* about your (CONDITION/accident).

Yes	1	55/y
No.....(SKIP TO Q. 42)	2	

---

31. Was the doctor you saw or spoke to the *first* time, the doctor you usually go to?

Yes	3	56/y
No	4	

---

32. How soon was it after you first (noticed CONDITION/had the accident) that the doctor was seen, or talked to on the phone? About how many days?

(RECORD NUMBER OF DAYS OR CODE "SAME DAY.")

.....days 57–58/

Same day as first (noticed condition/had accident)..... 00

---

33. Please look at this card and tell me where that *first* call or visit was.

HAND CARD A

First saw a doctor at:

Hospital emergency room	1	59/
Hospital clinic	2	
Clinic not connected with a hospital (including a union or H.I.P. clinic)	3	
Private doctor, in his office	4	
Private doctor, in your home	5	

First talked on the phone, to a:

Private doctor	6	
Union or H.I.P. doctor	7	
First saw or talked to a doctor somewhere else (SPECIFY)	8	

IF INFORMATION VOLUNTEERED THAT PERSON WAS KEPT, OR SENT, TO STAY OVERNIGHT IN HOSPITAL AT FIRST CALL OR VISIT, CIRCLE CODE X BELOW.

Went directly to hospital....(SKIP TO Q. 41)..... X 60/

DECK 02

34. Did the doctor prescribe, or give you, any medicine or shots that *first* time?

Yes	6	61/y
No	7	

IF FIRST CONTACT WITH DOCTOR WAS A PHONE CALL, SKIP TO Q. 36.

35. Did you have any tests or X-rays during that first visit?

Yes	8	62/y
No	9	

---

36. When you talked to the doctor that first time for (CONDITION), did he tell you to (come back/come in)?

Yes.....(ASK A)	1	63/y
No	2	

A. *IF YES:* Did you?

Yes	3	64/y
No.....(ASK [1])	4	

[1] *IF NO TO A:* Why didn't you?

Not time yet	5	65/
Other (SPECIFY)	6	

---

37. How many times *altogether*, including that first time, was any doctor seen or talked to about this (condition/accident)?

.....times		66–67/
First time only.....(SKIP TO Q. 40)	01	

---

38. Was it the same (doctor/place) every time?

Yes	1	68/y
No.....(ASK A)	2	

A. *IF NO:* How did you decide to go to a different (doctor/place) —did the first (doctor/place) send you to the second one, or did you or your family decide to see another doctor, or what?

Sent by first doctor	3	69/
Own or family decision	4	
Other (SPECIFY)	5	

---

39. Did you have any (other) tests or X-rays during any visit *after* the first time for this (condition/accident)?

Yes	6	70/y
No	7	

DECK 02

40. Did any doctor you saw or talked to suggest that you should stay overnight in a hospital for (CONDITION)?

Yes.....(ASK A)	1	71/y
No	2	

A. *IF YES:* Did you?

Yes	3	72/y
No.....(ASK [1])	4	

[1] *IF NO TO A:* Why didn't you?

73/
74/

BEGIN DECK 03
05–06/00

41. Do you expect to see or talk to a doctor again about this particular condition?

Yes	5	07/y
No	6	
Depends	7	

---

42. Did you take any kind of medicine for (CONDITION)?

Yes.....(ASK A)	1	08/y
No	2	

A. *IF YES:* Was (any of) this medicine prescribed by a doctor?

Yes	3	09/y
No.....(ASK [1])	4	

[1] *IF NO TO A:* Was (any of) this medicine bought in a drugstore?

Yes	5	10/y
No	6	

---

43. Thinking about this time when you had (CONDITION), how many days *altogether* was it that you couldn't (go to work) (go to school) (do your usual activity)? PROBE FOR BEST GUESS.

.....days	11–13/

---

44. About how many of those days did you have to *stay in bed*, all or most of the day, because of this (condition/accident)? PROBE FOR BEST GUESS.

.....days	14–16/

---

45. Was this the first time you have had (CONDITION)?

Yes	1	17/y
No	2	

DECK 03

46. Are you limited in any way in what you can do *now*, because of this (condition/accident)?

Yes	1	17/y
No	2	

IF RESPONDENT IS MALE, SKIP TO Q. 50.
IF RESPONDENT IS FEMALE OVER 50 YEARS, SKIP TO Q. 50.

And now a few questions about pregnancy.

47. Are you pregnant now?

Yes	1	19/y
No	2	

48. (Besides this pregnancy . . .) Have you been pregnant in the last 12 months—that is, since (MONTH), 1967? I'm interested in any pregnancy, even if it ended in a miscarriage.

Yes.....(ASK A–E)	3	20/y
No.....(GO TO Q. 49)	4	

If YES:

A. How did the pregnancy end—was it a live birth, a miscarriage, or what?

Live birth	5	21/y
Miscarriage	6	
Stillbirth	7	

B. How many months along were you when the pregnancy ended?

Less than three months	1	22/y
3, 4, or 5 months	2	
6 months	3	
7 months	4	
8 months	5	
9 months	6	
10 months	7	

C. Did you see a doctor about your pregnancy at any time *before* (the baby was born/the miscarriage)?

Yes.....(ASK [1] & [2])	1	23/y
No.....(GO TO D)	2	

IF YES TO C:

[1] How many times? .....visits 24–25/

[2] How many months pregnant were you when you first saw a doctor? .....months 26/

D. Did you have a check-up for this pregnancy a month or two *after* (the baby was born/the miscarriage)?

Yes	1	27/y
No	2	

E. *IF MISCARRIAGE, DO NOT ASK E:* Was the baby delivered by a doctor?

Yes	3	28/y
No	4	

IF RESPONDENT IS *NOT* FEMALE HEAD OF HOUSE, OR WIFE OF HEAD, SKIP TO Q. 50.

49. IF RESPONDENT IS PREGNANT NOW, USE PHRASE (1). IF SHE IS NOT PREGNANT NOW, USE PHRASE (2).

(1) Before you became pregnant this time, had you (or your husband) been ..... } using anything or doing anything to keep (you) from getting pregnant?

(2) Are you (or your husband) .. }

Yes.....(ASK A)	1	29/y
No	2	
IF VOLUNTEERED: Don't need to; not having sexual relations, past menopause, or had operation	3	

A. *IF YES:* (Are/Were) you using the birth control pill, the intrauterine device—that is, loop, coil, spring or bow—or something else?

Birth control pill.....(ASK [1])	4	30/y
Intrauterine device (loop, coil, spring, or bow) (ASK [1])	5	
Something else	6	

[1] *IF USES PILL OR DEVICE:* Where do you get (them/it)? IF MORE THAN ONE PLACE, PROBE: Where did you get [them/it] the last time? CIRCLE ONE CODE ONLY.

Hospital clinic	1	31/
Other clinic	2	
Private doctor	3	
Drugstore	4	
Other (SPECIFY)	5	

DECK 03

ASK EVERYONE:

50. (IF HOSPITALIZATION IN LAST 12 MONTHS *ALREADY* MENTIONED, CODE "YES" TO Q. 50 WITHOUT ASKING, AND GO ON TO 50-A.)

Have you been a patient in a hospital at any time in the last 12 months—since (MONTH), 1967?

Yes.....(ASK A)..... 1 32/y
No..... 2

A. *IF YES:* Altogether, how many different times were you a a hospital patient, since (MONTH), 1967?

.....times 33/

---

51. Have you been a patient in a nursing home, convalescent home, or any place like that, in the last 12 months—since (MONTH), 1967?

Yes.....(ASK A)..... 1 34/y
No.....(SKIP TO INSTRUCTIONS BELOW)..... 2

A. *IF YES:* Altogether, how many different times were you a patient in a nursing home, or any place like that, since (MONTH), 1967?

.....times 35/

IF RESPONDENT WAS IN A HOSPITAL, NURSING HOME, OR SIMILAR PLACE IN LAST 12 MONTHS (YES TO Q'S. 50 OR 51), ASK Q. 52. IF NO TO BOTH Q'S. 50 AND 51, SKIP TO Q. 53, ON PAGE 163

52. ASK A-F ABOUT EACH DIFFERENT STAY IN A HOSPITAL OR NURSING HOME (OR SIMILAR PLACE) IN THE LAST 12 MONTHS. START WITH THE MOST RECENT STAY. ASK A–F FOR EACH STAY BEFORE GOING ON TO THE STAY BEFORE THAT.

I'm going to ask a few questions about the time(s) you were in the hospital (nursing home). (Let's start with the last time.)

	Most recent stay	Stay before that
A. When did you enter the (hospital/nursing home) (that time)? PROBE FOR MONTH AND YEAR.	..... Month Year 36–37	..... Month Year 52–53
B. How many nights were you in the (hospital/nursing home) (that time)?	.....Nights 38–39	.....Nights 54–55
C. What is the name and address of this (hospital/nursing home)? RECORD NAME, ADDRESS OR DESCRIPTION, AND CITY.	Name:..... Add.:..... City:..... 40–41	Name:..... Add.:..... City:..... 56–57
D. For what condition did you enter the (hospital/nursing home)—do you know the medical name? IF NAME NOT KNOWN, PROBE FOR SYMPTOMS, CAUSES, AND/OR PARTS OF BODY AFFECTED.	42 43 44 45	58 59 60 61
E. Did you have any operations during this stay at the (hospital/nursing home)?	Yes (ASK [1] & [2])... 1 No..... 2 46/y	Yes (ASK [1] & [2])... 1 No..... 2 62/y
IF YES TO E: [1] Can you tell me the name, or what *kind* of operation that was? IF NAME NOT KNOWN, PROBE FOR DESCRIPTION OF WHAT WAS DONE.	47 48	63 64
[2] Any other operation (that time)? (*IF YES:* DESCRIBE.)	One operation only.... 1 Yes, other operation.. 2 49 50	One operation only.... 1 Yes, other operation... 2 65 66

DECK 03

IF HOSPITALIZATION WAS FOR CHILDBIRTH, DO NOT ASK F.

F. Did you see a doctor about (CONDITION) after you got out of the hospital?	Yes.... 3 51/y No..... 4	Yes..... 3 67/y No..... 4

BEGIN DECK 04
05–06/00

Stay before that	Stay before that	Stay before that
Month Year 07–08	*Month Year* 23–24	*Month Year* 39–40
.....Nights 09–10	.....Nights 25–26	.....Nights 41–42
Name:..... Add.:..... City:..... 11–12	Name:..... Add.:..... City:..... 27–28	Name:..... Add.:..... City:..... 43–44
13 14 15 16	29 30 31 32	45 46 47 48
Yes (ASK [1] & [2]).... 1 17/y No..... 2	Yes (ASK [1] & [2]).... 1 33/y No..... 2	Yes (ASK [1] & [2]).... 1 49/y No..... 2
18 19	34 35	50 51
One operation only..... 1 Yes, other operation... 2 20 21	One operation only..... 1 Yes, other operation... 2 36 37	One operation only..... 1 Yes, other operation... 2 52 53
Yes..... 3 22/y No..... 4	Yes..... 3 38/y No..... 4	Yes..... 3 54/y No..... 4

DECK 04

ASK EVERYONE:

53. When was the last time you had a general physical check-up? (just your best guess.)

.....
(MONTH) (YEAR) 55–58/

Never had one.....(SKIP TO Q. 55)..... 0

IF HAD PHYSICAL CHECK-UP WITHIN LAST 12 MONTHS, ASK Q. 54.

54. The last time you had a check-up.....READ EACH ITEM, AND CIRCLE ONE CODE FOR EACH.

	Yes	No	Don't know	
A. Did anyone take your blood pressure?..	4	5	6	59/y
B. Did the doctor have you undress so he could examine your chest and stomach?	7	8	9	60/y
C. Did he test your knee jerk by striking your knee?.....	1	2	3	61/y
D. Did he examine your rectum?.....	4	5	1	62/y
E. Did he give you a cardiogram or heart test?.....	1	2	3	63/y
F. *IF RESPONDENT IS FEMALE, ASK:* Did he give you an internal or vaginal exam?.....	4	5	6	64/y

BEGIN DECK 05
05–06/00

ASK EVERYONE:

55. About how long has it been since you saw or talked to a medical doctor about your own health—for any kind of condition, even for a few minutes?

.....months OR .....years 07–08/

IF MORE THAN 12 MONTHS, SKIP TO Q. 57.

56. Altogether (including the visits we have already talked about), how many times in the last 12 months did you see or talk to a doctor, or go to any of these places, about your own health? First, to a hospital emergency room? . . .

DECK 05

READ EACH CODE CATEGORY, AND RECORD NUMBER OF VISITS TO EACH. RECORD "0" IF NONE.

	# OF CONTACTS	
A. Hospital emergency room		09–10/
B. Hospital out-patient clinic		11–12/
C. Clinic not connected with a hospital		13–14/
D. Private doctor, in his office		15–16/
E. Talk to a private doctor, over the telephone		17–18/
F. See a private doctor, in your home		19–20/
G. Did you go *anywhere else* to see a doctor (not counting visits by a doctor while you were a patient in a hospital)? (IF YES, SPECIFY.)		21–22/
Total Contacts:		23–25/

That's a total of.....visits and calls in the last 12 months—does that sound right? (IF NOT RIGHT, GO OVER CATEGORIES WITH RESPONDENT.)

57. Altogether during the last 12 months, how many days did you have to *stay in bed*, all or most of the day, because of illness or injury?

.....days 26–28/

IF RESPONDENT IS 65 OR OVER, ASK Q. 58.

58. Do you have a Medicare card?

Yes.....(ASK A)..... 1 29/y
No..... 2

A. *IF YES:* It would be helpful if I could see your Medicare card to find out about the coverage—may I see it?

CODE TYPE(S) OF COVERAGE FROM CARD, OR CIRCLE APPROPRIATE "NO CARD SHOWN" CODE.

From Card:
Hospital coverage..... 3 30/y
Doctor (Medical) coverage..... 4
No coverage shown.....(ASK [1])..... 5
"No Card Shown":
Can't locate card.....(ASK [1])..... 6
Refused.....(ASK [1])..... 7

[1] *IF NO COVERAGE SHOWN, OR "NO CARD SHOWN" (CODES 5, 6, OR 7 CIRCLED IN A):*

Are you covered by that part of Medicare that pays for doctor's bills—that is, the Medicare plan for which you (or some agency) must pay $4.00 a month?

Yes..... 4 31/y
No..... 5
Don't know..... 6

IF RESPONDENT IS MALE, 17 YEARS OR OVER, ASK Q. 59.

59. I'm going to read a list of reasons people sometimes give for not seeing a medical doctor when perhaps they should. Please tell me, for each of these reasons, whether or not it has *ever* kept *you* from seeing a doctor.... READ ITEMS, AND CIRCLE ONE CODE FOR EACH.

	Yes	No	Don't Know	Doesn't Apply; Never Worked	
A. You didn't want to lose time or pay from work? (Did that ever keep you from seeing a doctor when perhaps you should have?).....	1	2	3	4	32/y
B. You were worried that your boss might think you were too sick to work?.....	5	6	7	8	33/y
C. You didn't think a doctor could help you? (Did that ever keep you from seeing a doctor when perhaps you should have?).....	1	2	3	–	34/y
D. The doctor or place didn't have office hours that were convenient for you?.....	4	5	6	–	35/y

ASK EVERYONE:

60. About how long has it been since you were last *treated or examined* by a dentist?

.....months or .....years 36–37/
Never.....X

IF WITHIN LAST 12 MONTHS, ASK A–D:

A. How many times have you been to a dentist in the last 12 months?

.....visits 38–39/

DECK 05

B. When you *last* saw a dentist, was it for an emergency visit?

Yes	7	40/y
No	8	

C. What have you had done by a dentist or assistant during the last 12 months? First, have you had your teeth checked, X-rayed or cleaned?

READ EACH ITEM, AND CODE "YES" OR "NO" FOR EACH.

	Yes	*No*	
(1) Teeth checked, X-rayed, or cleaned	1	2	41/y
(2) Teeth fixed or filled	3	4	42/y
(3) Bridgework repaired	5	6	43/y
(4) Teeth or bridgework replaced	7	8	44/y
(5) Tooth or teeth pulled	1	2	45/y
(6) Any other work? (SPECIFY)	3	4	46/y

D. How long does it usually take you to get to the dentist? (The way you usually go.)

0–9 minutes	1	47/y
10–19 minutes	2	
20–29 minutes	3	
30–39 minutes	4	
40–49 minutes	5	
50–59 minutes	6	
1 hour or more	7	
Sees school dentist	8	

Now just a few background questions.

61. What is the highest grade or year you completed in school?

No schooling	01	48–49/yy
1st to 2nd grade	02	
3rd to 4th grade	03	
5th to 7th grade	04	
8th grade	05	
9th grade	06	
High school, incomplete (grades 10 or 11)	07	
High school, incomplete—plus vocational or business school	08	
High school, complete (12th grade)	09	
Vocational or business school, in addition to completing high school	10	
College, incomplete	11	
College, complete	12	
Don't know	13	

---

62. *IF OBVIOUS, CODE WITHOUT ASKING.* Are you currently married, widowed, divorced, separated, or have you never been married?

DECK 05

Married	1	50/y
Widowed	2	
Divorced	3	
Separated	4	
Never married	5	

IF RESPONDENT WAS "KEEPING HOUSE" OR "GOING TO SCHOOL" FOR MOST OF LAST 12 MONTHS (FROM Q'S. 17 OR 18), SKIP TO Q. 64.

ALL OTHERS, ASK Q. 63.

63. A. What kind of work do you (did you normally) do? 51–53/

(PROBE, IF VAGUE: What do (did) you actually do on that job?)

B. What kind of business or industry is that? 54–55/

(PROBE, IF VAGUE: What does that (firm/organization/agency) make or do?)

END OF INDIVIDUAL SECTION 56–57/R

BEGIN DECK 07
05–06/RR

64. A. In what state (or country, if outside the U.S.) was (HEAD) born?

STATE: 07–08/

OR

COUNTRY: 09/

IF WIFE OF HEAD LIVING IN HOUSEHOLD, ASK:

B. In what state (or country, if outside the U.S.) was (WIFE OF HEAD) born?

STATE: 10–11/

OR

COUNTRY: 12/

---

65. A. Up to the age of 16, did (HEAD) live mostly on a farm or out in the country, in a village or small town, or in a city, or its suburbs?

DECK 07

Farm or country	1	13/y
Village or small town	2	
City	3	
Suburb of city	4	

IF WIFE OF HEAD LIVING IN HOUSEHOLD, ASK:

B. Up to the age of 16, did (WIFE OF HEAD) live mostly on a farm or out in the country, in a village or small town, or in a city, or its suburbs?

Farm or country	5	14/y
Village or small town	6	
City	7	
Suburb of city	8	

Now a few more questions about health matters, this time about the whole family.

66. In the last 12 months, has any kind of nurse or health aide come to visit anyone in the household, for any reason? For example, a public health or school nurse, a visiting or home nurse, or some other kind of nurse or health aide?

Yes.....(ASK A–C)	1	15/y
No	2	

IF YES:

A. How many times altogether did a nurse or health aide come here, in the last 12 months?

.....times 16–17/

B. What kind of nurse (was she/were they)—visiting or home nurse, public health or school nurse, health aide, or what? PROBE FOR BEST GUESS. CODE AS MANY AS APPLY.

Visiting or home nurse	5	18/y
Public health or school nurse	6	19/y
		20/R
Health aide	8	
Other (SPECIFY)	9	

C. Who did the nurse(s) or health aide(s) come to see? CIRCLE ONE CODE.

One or more adults in household	1	23/y
One or more children in household	2	
Both adult(s) and child(ren)	3	

---

67. Thinking back over the last 12 months, have you—or anyone in the household—seen or talked to a spiritualist, faith healer, or anyone like that, about your—or their—health?

DECK 07

Yes.....(ASK A)	5	24/y
No	6	

A. *IF YES:* How many times?

.....times 25/

---

68. Have you, or anyone in the household, been enrolled in Medicaid any time in the last 12 months? (Medicaid is a medical assistance program, which is handled through the New York City City Department of Social Services.)

Yes	1	26/y
No.....(SKIP TO Q. 72)	2	

---

69. Who has been covered by Medicaid in the last 12 months? (CODE AS MANY AS APPLY.)

Head of household	3	27/y
Spouse of Head	4	28/y
All children of Head in household	5	29/y
Some children of Head in household (SPECIFY WHO)	6	30/y
Other persons in household, *related* to Head (SPECIFY WHO)	7	31/y
Other persons in household, *not* related to Head (SPECIFY WHO)	8	32/y

---

70. Is there anyone who *has been* covered by Medicaid in the last 12 months who is *not* covered now?

Yes.....(ASK A)	1	33/y
No	2	

A. *IF YES:* Who is that? (CODE AS MANY AS APPLY.)

Head of household	3	34/y
Spouse of Head	4	35/y
All children of Head in household	5	36/y
Some children of Head in household (SPECIFY WHO)	6	37/y
Other persons in household, *related* to Head (SPECIFY WHO)	7	38/y
Other persons in household, *not* related to Head (SPECIFY WHO)	8	39/y

---

71. Who has *used* Medicaid in the last 12 months? (CODE AS MANY AS APPLY.)

Head of household	3	40/y
Spouse of Head	4	41/y
All children of Head in household	5	42/y
Some children of Head in household (SPECIFY WHO)	6	43/y
Other persons in household, *related* to Head (SPECIFY WHO)	7	44/y
Other persons in household, *not* related to Head (SPECIFY WHO)	8	45/y
No one	9	46/y

DECK 07

ASK EVERYONE:

72. (Not counting Medicare or Medicaid) . . . Does any member of this household have any insurance that pays all or part of the the medical bills when they go to the hospital or doctor—such as Blue Cross/Blue Shield, a commercial plan, a union plan, or some other plan?

Yes	1	47/y
No.....(SKIP TO Q. 80)	2	

48/R

73. Does this insurance pay for just hospital bills, just doctor bills, or both hospital and doctor bills?

Hospital only	1	49/y
Doctor only	2	
Both	3	

74. What is the name of the insurance plan? (Any others?)

50/
51/
52/
53/
54/

75. Who is covered by the plan(s)? (CODE AS MANY AS APPLY.)

Head of household	3	55/y
Spouse of Head	4	56/y
All children of Head in household	5	57/y
Some children of Head in household (SPECIFY WHO)	6	58/y
Other persons in household, *related* to Head (SPECIFY WHO)	7	59/y
Other persons in household, *not* related to Head (SPECIFY WHO)	8	60/y

76. (Was this insurance plan) (Were these insurance plans) gotten through an employer, a union, directly from a salesman, or what? (CODE AS MANY AS APPLY.)

Employer	1	61/y
Union	3	
Salesman	5	
Other (SPECIFY)	6	

Q's 77–79 OMITTED 62–66/R

BEGIN DECK 08
05–06/RR

ASK EVERYONE:

Now I would like to ask you a few questions about this (apartment/house).

80. A. How many rooms are there in this (apartment/house)?—Count the kitchen, but not the bathrooms (or unlived in attics and basements).

.....rooms 07–08/

B. And how many of these rooms do people sleep in?

.....sleeping rooms 09/

IF OBVIOUS, CODE C WITHOUT ASKING:

C. Do you own or rent this (apartment/house)?

Own (including still buying)	1	10/y
Rent	2	

81. *IF THIS D.U. IS AN APARTMENT, ASK Q. 81.* IF IT IS A PRIVATE HOUSE, SKIP TO Q. 82.

	Yes	*No*	
A. Do you have a bathroom, with toilet *and* bath, in this apartment?	3	4	11/y
B. Do you have any roaches in the apartment?	5	6	12/y
C. Do you have any rats in this building?	7	8	13/y

82. We would like to get an idea of how much money people get from different places.

IF ANY PERSONS IN HOUSEHOLD, AGE 17 OR OVER, ARE *NOT RELATED* TO THE HEAD OR HEAD'S WIFE, READ THIS:

These questions are just for the family members, so do not include any income that (UNRELATED PERSON[S]) get(s). 14–18/R

A. How much is being earned, altogether, *each week*, by everyone in the household, from jobs—wages or salary—before taxes? (ENTER TOTAL *WEEKLY* WAGES, OR CIRCLE "0"; THEN ASK [1].)

$ ..... Weekly
None..... 0

19–22/

[1] Would you say this figure is higher, about the same, or lower than your *usual* weekly income over the last 12 months?

Higher	1	23/y
About same	2	
Lower	3	

DECK 08

B. Does anyone in the household get any income from Welfare? (IF YES: How much money does that come to altogether, *each month?*) (ENTER TOTAL *MONTHLY* AMOUNT, OR CIRCLE "0.") $..... Monthly None..... 0 24–27/

C. How much money, if any, does everyone in the household get, *altogether, each month,* from the following sources:

[1] Social Security or other retirement payments or pensions? (ENTER TOTAL *MONTHLY* AMOUNT, OR CIRCLE "0") $..... Monthly None..... 0 28–31/

[2] V.A. payments or Armed Forces allotments? (ENTER TOTAL *MONTHLY* AMOUNT, OR CIRCLE "0") $..... Monthly None..... 0 32–35/

[3] Interest, or rental payments? IF "UNRELATED ADULTS" IN HOUSEHOLD: Including any money that (UNRELATED PERSON[S]) may pay to the family? (ENTER TOTAL *MONTHLY* AMOUNT, OR CIRCLE "0") $..... Monthly None..... 0 36–39/

[4] Any other sources, such as child support payments, gifts from outside the household, or anything else? (ENTER TOTAL *MONTHLY* AMOUNT, OR CIRCLE "0") $..... Monthly None..... 0 40–43/

---

83. Which of these groups on this card includes your total household income during *last year*—1967? That is, all income, from any sources, before taxes. Just tell me the letter for the amount that fits.

HAND CARD B

A.	$ 0– $ 499	00	45/yy
B.	500– 999	01	
C.	1,000– 1,499	02	
D.	1,500– 1,999	03	
E.	2,000– 2,499	04	
F.	2,500– 2,999	05	
G.	3,000– 3,499	06	
H.	3,500– 3,999	07	
I.	4,000– 4,499	08	
J.	4,500– 4,999	09	
K.	5,000– 5,999	10	
L.	6,000– 6,999	11	
M.	7,000– 7,999	12	
N.	8,000– 8,999	13	
O.	9,000– 9,999	14	
P.	10,000 and over	15	
	Don't know	99	
	Refused	xx	

DECK 08

Q. 84. OMITTED 46/R

---

85. May I have your telephone number, in case my office wants to verify this interview?
(IF NO PHONE, ASK IF THERE IS A PHONE RESPONDENT CAN BE REACHED AT.)

Telephone number:	4	47/y
No phone.....	5	
Refused.....	6	

IF PHONE NUMBER GIVEN, CODE: PHONE LOCATED IN . . .

Respondent's home.....	7	48/
Home of neighbor.....	8	
Other (SPECIFY).....	9	

---

86. Had you heard of the Red Hook Neighborhood Health Center, before this survey?

Yes.....	1	49/y
No.....	2	

→ NOW GO TO BLUE OR PINK BOOKLET FOR NEXT PERSON LISTED (IF ANY).

IF NO OTHER PERSONS IN HOUSEHOLD, ASK QUESTION ON YELLOW SHEET. ←

RECORD ..... AM
TIME: PM

(Thank you very much for your time and cooperation. You have been very helpful.)

INTERVIEWER: FILL IN ITEMS ON NEXT PAGES, *AFTER* YOU LEAVE THE HOUSEHOLD.

BEGIN DECK 09
05–06/RR

INTERVIEWER REMARKS

A. Total length of interview (including supplements done at time of main questionnaire).

.....Minutes 07–09/

B. Respondent's race:

White	1	10/y
Negro	2	
Oriental	3	
Other (SPECIFY)	4	

C. CODE ALL LANGUAGES SPOKEN IN HOUSEHOLD:

English only	5	11/y
English and other (ANSWER [1])	6	
Other only (ANSWER [1])	7	

[1] *IF OTHER:* What other language(s)? 12/ 13/ 14/

D. Is respondent Cuban, Puerto Rican, Mexican-American, or American Indian?

Yes, Cuban	1	15/y
Yes, Puerto Rican	2	
Yes, Mexican-American	3	
Yes, American Indian	4	
No	6	

E. Is this household in public housing?

Yes	5	16/y
No	6	

F. CODE TYPE OF STRUCTURE IN WHICH HOUSEHOLD IS LOCATED:

Single-family house, detached	1	17/
Two-family house, semi-attached, or attached (row) house	2	
Apartment in apartment building	3	
Apartment in partly business building	4	
Rooming house	5	
Non-transient hotel/ motel, etc	6	
Mobile home (trailer)	7	
Other (SPECIFY)	8	

G. RATE THE CONDITION OF THE WALLS IN THIS DWELLING UNIT:

Clean, painted	1	18/y
Dirty but intact	2	
Fairly large cracks	3	
Holes in the walls or ceilings	4	

H, I, J OMITTED 19–29/R

DECK 09

K. In what room(s) of the house was the interview conducted? 30/ 31/

L. Everything considered, do you think the respondent enjoyed the interview a great deal, somewhat, not very much, or not at all?

A great deal	1	32/y
Somewhat	2	
Not very much	3	
Not at all	4	

M. Date of interview:

[ ][ ] Month [ ][ ] Date 33–36/

N. Interviewer Number:

[ ][ ][ ] 37–39/

O. Interviewer Signature:

.....

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