ADULT AMBULATORY CARE VISITS FOR ILLNESS-RELATED COMPLAINTS IN THE UNITED STATES 1995/1996

by

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DISSERTATION

Submitted in partial satisfaction of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

NURSING

in the

GRADUATE DIVISION

of the

UNIVERSITY OF CALIFORNIA SAN FRANCISCO

In memory of my brother

Tommie B. Williamson

August 3, 1948 – June 15, 1992

Acknowledgements

I was nurtured during this project by my faculty, family, and friends and am grateful for all the support I received. First, to my committee chairperson, Dr. Suzanne Henry, your brilliance and responsiveness far exceeded my expectations. To my other committee members, Dr. William Holzemer and Dr. Robert Newcomer, thank you for your helpful comments and encouragement. To my boss at UCSF Medical Center, Jane Hirsch, RN, MS, you are an excellent role model and the best boss imaginable. To my family in North Carolina, you loved me and nudged me appropriately when needed. To my second family here in the Bay Area—all my wonderful colleagues and friends—your belief in me was and is sustaining. And lastly, to my partner Bern Shen, your editorial expertise, your unfailing sense of humor and your ability to make a celebration out of the completion of sometimes just one page will always be remembered.

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The purpose of this study was to describe the characteristics of a subset (illness-related complaints) of adult ambulatory care visits during 1995 and 1996 to physician offices (MDO), emergency departments (ED), and outpatient departments (OPD), using a nationally representative sample. Additionally, visits for selected illness conditions (chest pain, abdominal pain, asthma, and depression), visits resulting in hospital admission, and visits occurring in the ED were analyzed using logistic regression to construct utilization profiles. Approximately 701 million visits were made nationwide to physician offices, hospital outpatient departments and emergency departments by adults (≥ 25 years) for illness-related complaints during 1995 and 1996. The vast majority of visits (85%) were to MDOs, followed by EDs (9%) and OPDs (6%). The annual visit rate to all settings combined was 2.1 per person with higher rates for females (2.4 per person) compared to males (1.7 per person). Gender differences in utilization were consistent across all settings. Visit rates increased with age in all settings except the ED where the rate for the youngest age group (25-44 years) exceeded that for those 45-64 years of age. Visit rates for all races were highest in the MDO setting compared to the OPD and ED. Blacks had the highest rate of ED utilization (twice that of whites). Hispanics also used EDs at a 20% higher rate than non-Hispanics. Some form of health insurance covered the majority of visits (85%). The west, with the highest percentage of managed care

enrollees, had the lowest ED visit rate (16 per 100 persons per year) compared to all other regions. Depression was among the top five reasons for visit in the MDO and OPD settings and was more prevalent in the youngest age category and in the northeast geographic region. Approximately 3% of visits resulted in hospital admission, the majority of which came from the ED (69%). ED reasons for visit and diagnoses were more acute than those in MDOs and OPDs, suggesting appropriate utilization of services. Future research linking utilization patterns to data about perceived access and health status are needed.

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CHAPTER 1

Introduction

Use of health care services is a complex phenomenon frequently studied by social scientists and public health scholars. Clinicians, administrators, the insurance industry, policymakers, and the public are all keenly interested in patterns of health care use. Attempts to quantify and understand these patterns are important for directing, managing, marketing, funding, and evaluating health care services. Equity in distribution and access to services is a driving force behind policy efforts aimed at improving health care quality. What services are being used? Who is using them? How much utilization is too much? What is not enough? All these questions are worthy, if difficult to study, given the complexity of the answers and the multiplicity of contributing factors.

Shifts in Health Care Service Use and Funding

In the 1960's and 1970's attempts to increase equity in the United States health care system were achieved by improved financing mechanisms and increasing the number of providers (physicians and mid-level practitioners). Service use increased through federal programs like Medicare and Medicaid (both established in 1966) and continued to increase with the extension of Medicare coverage to those with certain disabilities in 1973 (Hulka & Wheat, 1985; Vladeck, 1981; Waid, 1998). Care was provided primarily in physician offices and inpatient settings. Health care expenditures as measured by percent of gross domestic product (GDP) increased from 5.3% in 1960 to 10.5% by early 1980 (Hulka & Wheat, 1985; Schieber, Poullier, & Greenwald, 1993). More

recently health care related expenditures have stabilized at 13.5% GDP from 1993 to 1996 (Waid, 1998).

For the last couple of decades, while most care continues to be provided in physician offices, inpatient hospital service use has decreased substantially. This decline in hospital service use was brought about primarily by the implementation of the Medicare prospective payment system in 1983 which created funding changes for inpatients in an effort to control rising costs. Hospital reimbursements were more or less fixed by diagnosis group (DRG) and sometimes did not cover costs of care. Under this system (which ultimately was adopted by other payers), many hospitals have struggled to survive, a substantial number have merged or closed, and most have extended their services beyond the acute inpatient setting to include outpatient, home health, and sub-acute care (Matson, 1992; Robinson, 1994). The number of hospitals with outpatient departments doubled between 1982 and 1990 from 42 to 85 percent of all non-federal acute care facilities (Robinson, 1994). Some of the care that had been provided on an inpatient basis was shifted to the outpatient setting (Heffler, Donham, Won, & Sensenig, 1996).

In recent years, employers and insurers (including states and the federal government) have attempted to further control utilization and costs by increasing enrollments in managed care plans. Between 1990 and 1994 there was a 45% increase in the number of health maintenance organization (HMO) enrollees nationwide (Corrigan, Eden, Gold, & Pickreign, 1997). An estimated three to five

million Medicare and Medicaid beneficiaries were enrolled in managed care plans in 1995 (Freund & Hurley, 1995; Gaskin & Hadley, 1997; Wolf, 1998)

As we approach the year 2,000, there is a growing backlash against managed care and its gate-keeping functions. Federal legislation such as the Emergency Medical Treatment and Active Labor Act (EMTALA) mandates access to emergency care and there is a growing debate about whether or not such services contribute substantially to rising health care costs as has been suggested by some payers and policymakers (Cunningham, Clancy, Cohen, & Wilets, 1995; Williams, 1996).

Statement of the Problem

Much is known about the use of health care services in the United States and much is yet to know. More individuals are living with chronic disease. Health care insurance coverage has become an episodic benefit for many Americans (Brown, Bindman, & Lurie, 1998; Vistnes & Monheit, 1997). Access to care issues arise from many levels including employers, the insurance industry, governmental cost-control mandates, and within the health care system itself. In order to assess the efficiency of health care services and the impacts of funding or policy changes on ambulatory care use it is first necessary to understand current utilization patterns and how they vary across the country. Who are using ambulatory care services, what are they using them for and where are individuals going for care (physician offices, emergency departments, or hospital outpatient departments)? Are more costly services (presumed to be emergency and hospital services) appropriately utilized?

The federal government expanded data collection efforts in ambulatory care beginning in 1992 (McCaig & McLemore, 1994). Data on outpatient and emergency department visits, in addition to those occurring in physician office settings, began being published in 1994. Within the last five years, the time from data collection to analysis and publication has shortened as technology has improved and become more readily available.

Published studies using national ambulatory care data have focused on visits by children and/or those for injuries and have primarily been limited to one service location, e.g. the outpatient setting or the emergency department (Freid, Makuc, & Rooks, 1998; McCaig, Hooker, Sekscenski, & Woodwell, 1998; Weiss, Mathers, Forjuoh, & Kinnane, 1997). While ambulatory care use in adults has been studied in selected populations, e.g., Medicare or HMO enrollees or those with specific illnesses, a comprehensive analysis using a nationally representative sample has not been published.

Purpose of the Study

The purpose of this study was to describe the characteristics of a subset of ambulatory care visits (those for illness-related complaints) by adults during 1995 and 1996 to three service locations, the emergency department (ED), the hospital outpatient department (OPD), and physician offices (MDO), using a nationally representative sample. A secondary aim was to develop profiles for selected illness-conditions, for visits resulting in hospital admission and for visits occurring in the emergency department.

Research Questions

1. Are there differences among sites (n=3) by patient demographics, illness condition, visit characteristics, and environmental characteristics?
2. Which characteristics are associated with visits for selected illness-conditions (chest pain, abdominal pain, depression, and asthma), admission to the hospital, and use of ED services?

Significance

In 1995 and 1996 more than 1.7 billion visits were made to MD offices, hospital outpatient departments, and emergency departments nationwide. Visits by adults (25 and older) for illness-related complaints accounted for 40% of these encounters (approximately 701 million visits for the two years combined). In-depth analyses of ambulatory care utilization have focused primarily on children, patients with injuries, primary care or preventive services, or visits by the elderly. Visits by young and middle-aged adults are seldom studied yet these years represent times of maximal societal productivity. A focused analysis of illness-related visits, the symptoms and problems they are for, how they are distributed, and how they vary across the country, will provide a clearer picture of service use driven by medical need and will make an important contribution to the body of knowledge about ambulatory care utilization in the United States.

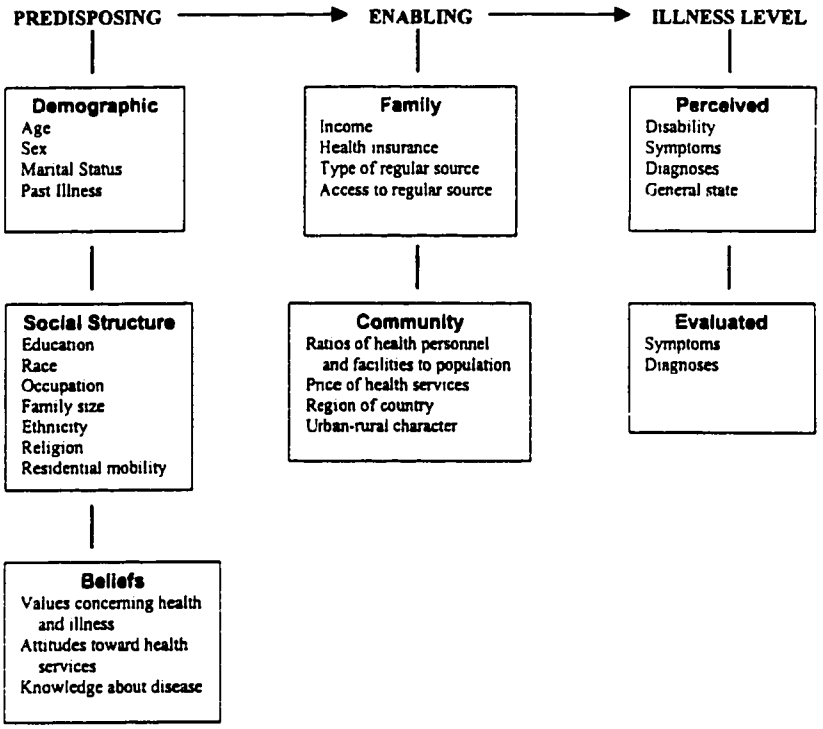
CHAPTER 2

Conceptual Framework and Literature Review

Andersen's Behavioral Model of Healthcare Utilization

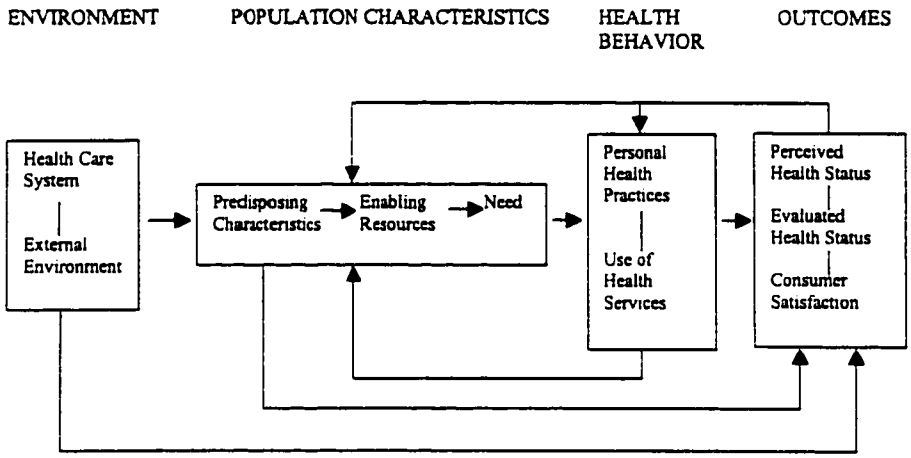
One of the most widely used conceptual frameworks for studying the utilization of healthcare services is the behavioral model developed by Andersen in the 1960s and refined over the last several decades (Andersen & Newman, 1973; Andersen, 1995; Phillips, Morrison, Andersen, & Aday, 1998). This model was first used as an organizing framework for analyzing national survey data at one of the academic institutions where Andersen, a medical sociologist, worked and studied (Andersen, 1995). Additionally, the model was initially applied in studies where the family was the unit of analysis. Over the years the focus shifted to the individual as the unit of analysis and most recently has been updated to include a population perspective (Andersen, 1995). The models (the individual determinants of health service utilization) and its updated version (an emerging model of health service utilization) served as the conceptual framework for this secondary analysis and are depicted in Figures 1 and 2.

Figure 1. Individual Determinants of Health Service Utilization



Andersen, R. & Newman, JF (1973). Societal and individual determinants of medical care utilization in the United States. Milbank Memorial Fund Quarterly. 51, p. 107.

Figure 2. An Emerging Model of Health Service Utilization



Andersen, R. (1995). Revisiting the behavioral model and access to care: does it matter?. J Health Social Behavior. 36, p. 8.

As presented in the models, correlates of utiiization are clustered into several broad categories: predisposing characteristics, enabling resources, illness level (or need factors), and the external environment or the way the health care system is organized (Andersen & Newman, 1973; Andersen, 1995). Predisposing characteristics include such variables as age, sex, race, and ethnicity. Enabling resources are things like income, health insurance, and regular source of care. Need factors include symptoms, diagnoses and other indicators of health status. Environmental or contextual considerations include how health care is financed and organized within a nation or community.

It has been widely debated whether the model's intended use was to predict health service utilization or to explain it. Andersen, in his recent article about the model's evolution, stated that he had intended it to be used for both purposes and that one of the primary goals was to provide measures of access to medical care (Andersen, 1995). Potential access was conceptualized as the presence of enabling resources (health insurance, proximity to services, etc). These enabling resources were thought to be more amenable to health policy intervention or more mutable. In measuring access, Andersen and his colleagues suggested that the methods might change depending on the reasons or purposes for care—preventive, illness-related, and/or custodial (Aday & Andersen, 1974).

The model has been criticized for failing to adequately account for cultural and societal influences. Andersen explains that these aspects are covered under social structure and represent predisposing characteristics for health service utilization (Andersen, 1995). The expanded model implies influences on

utilization of factors such as health policy, funding mechanisms, and the structural components of the health care system. It also shows feedback loops throughout the utilization process.

Studies using the model as an organizing framework generally have found that "need" factors explain much of the variation in health service utilization though they are more difficult to measure and are less often available in public use data sets (Hulka & Wheat, 1985). The data sets used for this secondary analysis were cross-sectional surveys of visits rather than longitudinal information about individual service use and thus were weakest in illness-related factors. There were no health status measures available in the data sets. Nevertheless, as is obvious from the amount of literature published about the effects of predisposing and enabling characteristics, this study, as one shall see, reinforces the value of understanding the relationships of these factors to service use in different populations.

Healthcare Utilization and Related Literature

Many of the healthcare utilization studies published in the literature have focused on selected populations of patients (e.g., Medicare or Medicaid beneficiaries or those with certain diagnoses) and/or on one site of care (e.g., MDO or ED). The ED figures prominently among utilization studies because its use is thought to be symptomatic of access barriers elsewhere in the system. Additionally, ED use is thought to be more costly, more episodic (lacking continuity), and more amenable to policy intervention. This literature review covers some of these ED studies and more broad-based utilization studies and is

organized by categories within Andersen's model. A chronological overview of recent relevant studies including the sample (or data sets), methods, and findings are displayed in Table 1. This chapter concludes with a brief overview of methodological issues and threats to validity in utilization studies.

Predisposing characteristics. The easiest variables to study are the predisposing ones since demographics are part of almost all administrative data sets. Factors such as educational level, occupation and religious affiliation are less commonly included in large databases, though they are also conceived in the model as having predisposing influences on service use. In the studies reviewed, gender was more consistently associated with differences in service use than other characteristics such as race, age or ethnicity. Reported differences by gender ranged from men using two-thirds to only half as much health services as women (Cleary, Mechanic, & Greenley, 1982; Mueller, Patil, & Boilesen, 1998). Petersen (1998) reported a 1.3 higher adjusted odds ratio for females compared to males in the use of the ED for non-urgent problems. In their study of the reasons for gender differences in utilization, Cleary and colleagues (1982) found that women used more services because of differences in reported health (or health status) and not because of differences in help-seeking tendencies. The one exception among the studies reviewed was among the HIV/AIDS population where females and males used roughly the same amount of services (Fleishman, Hsia, & Hellinger, 1994).

Table 1.
Selected Utilization Studies

STUDY	SAMPLE	METHODS	FINDINGS
McCaig, Hooker, Sekscenski, & Woodwell 1998	NHAMCS Outpatient Dept Data for 1993/1994	A descriptive and comparative analysis of PA/NP visits to all OPD visits during 1993 and 1994 The two-tailed t-test was used to determine statistical significance of the comparisons	PA/NP visits accounted for 8% of total outpatient encounters and were more likely to occur in the Midwest, rural areas, OB-GYN clinics, and to involve visits by children and adults less than 25 years of age.
Glied 1998	NAMCS Data for 1991 – 1994 Patients 18-64 yrs of age	Descriptive statistics and logistic regression analysis of visit characteristics and practice characteristics affecting the rates of mental health diagnoses, referrals, and use of psychotropic medications	Four per cent of visits were for mental health reasons. An additional 2.7% of visits were for reasons that could mask a mental health problem. Approximately 7% of visits included a mental health diagnosis. On average, 8.1% of patients received a mental health treatment during the course of their visit. Almost half of the mental health diagnoses were not associated with mental health reasons for visit. MD's appeared to be less likely to make a mental health diagnosis for an older patient and were slightly more likely to make a diagnosis for women and whites. Patients with Medicaid were also more likely to be diagnosed with a mental health problem. Physician practice style and specialty were related to mental health diagnoses and treatment. Family practitioners made such diagnoses more frequently than internists. MDs with higher HMO caseloads were also more likely to make a mental health diagnosis.
Freid, Makuc, & Rooks 1998	NAMCS & NHAMCS Data for 1993 – 1995 Children under 15 years of age	A descriptive and comparative analysis of visits by children under 15 yrs of age to MD offices, OPDs, and EDs during 1993, 1994 & 1995. The two-sided t-test was used to determine statistical significance of differences	Three quarters of ambulatory care visits by children occurred in MD offices. The annual visit rate for children less than 15 years was 289 visits per 100 children. Visit rates were 43% higher among white children than black children.

STUDY	SAMPLE	METHODS	FINDINGS
Weiss, Mathers, Forjuoh, & Kinnane 1997	NHAMCS Emergency Department Data for 1992 – 1994 Children & adolescents less than 21 yrs of age	A descriptive analysis of ED visits by children and adolescents across the country. Payments for services were calculated and added to the database using information from the 1987 National Medical Expenditure Survey	Annual visit rates to emergency departments by children and adolescents were 41.2 visits per 100 persons. 43% of visits were injury related. Otitis media was the leading principal diagnosis among medically related visits (15%). Estimated costs of ED services for medically-related problems were 4.6 billion dollars annually.
Miller et al. 1997	1984 data from three national surveys--Supplement on Aging; National Long-term Care Survey; and, The National Medical Expenditure Survey in adults 70 years and older	A comparative analysis of utilization between White and African American elders. Logistic and negative binomial regression were used to develop a model for predictors of physician contacts and hospital use and amount of service use.	Older African Americans were less likely to use health care services than Whites, especially hospitalization. No race differences were detected in physician use in two of the data sets. The two predictor variables accounting for most of the variance in service use for this population were health status and insurance status.
Butler 1998	Medicaid enrollees in one Colorado HMO.	Logistic Regression was used to determine predictors of non-emergent ED use.	Factors associated with a higher likelihood of non-emergent ED use were: weekends, living farther away from their PMD, people with more inpatient admissions. Factors associated with a lesser likelihood of using the ED for nonemergent care were: female, older, more satisfied with the HMO and their doctor, and enrolled longer in the HMO.
Petersen, et al. 1998	Survey data from five urban nonfederal teaching hospital emergency departments during a one month period in 1993. Only adult patients with asthma, chest pain, or abdominal pain were studied (n=1696).	Logistic regression of characteristics associated with urgent and non-urgent visits to the emergency department for this population of patients. Variables included in the analysis were: age, sex, race, insurance status, income, marital status, employment status, physician relationship (regular physician), comorbidities, and two measures of self-reported health status.	Absence of a regular doctor was an independent correlate of using the ED for a non-urgent complaint (adjusted odds ratio 1.6). The highest odds for a non-urgent visit was for those 31-40 years of age compared to those over 60 years (6.5) and for females compared to males (1.3). Being black and lacking insurance were not associated with a higher likelihood of a non-urgent visit.

STUDY	SAMPLE	METHODS	FINDINGS
Mueller, Patil, & Boilesen 1998	Data from the 1992 National Health Interview Survey for those under age 65	Descriptive statistics and logistic regression were used to analyze characteristics associated with utilization of health care services (MD visit within the previous 12 months).	The major determinant of utilization was insurance status, regardless of race/ethnicity or place of residence (rural/urban). Men were half as likely as females (adjusted odds=0.52) to use services. When compared to the west geographic region, those from the northeast had a higher adjusted odds ratio for having an MD visit within the past 12 months (1.2). Odds were slightly lower for those from the midwest (0.99) and lowest for those from the south (0.92).
O'Brien, et al. 1997	892 adult patients surveyed in an urban teaching hospital emergency department during 3 months in 1994	Logistic regression of characteristics associated with using the ED as a usual source of care.	Patients reporting the ED as their usual source of care were more likely black (adjusted odds=2.7), uninsured (adjusted odds=1.7) or covered by Medicaid (adjusted odds=1.5), reported being refused care elsewhere (adjusted odds=1.7), perceived the cost of an ED visit as less than an MD visit (adjusted odds=1.7), and to have had an annual income of less than 30,000 dollars (adjusted odds=2.5).
Williams 1996	ED claims data from a billing company during 1991 – 1993 for six community hospitals in Michigan	Least squares regression was used to determine the ratio of marginal to average costs. The unit of analysis was an individual patient visit. Costs were determined for all levels of urgency.	In this visit sample, 32% of patients were categorized as non-urgent, 26% as semi-urgent, and 42 percent as urgent. The average ED charge was $383. The marginal calculated cost was $88. For nonurgent visits, the average charge was $124 and the marginal calculated cost was only $24. The investigator contended that savings achieved by diverting non-urgent care from the ED may be much smaller than expected by policymakers and economists.
Selby, Fireman, & Swain 1996	Administrative data of emergency department use among 30,276 Kaiser enrollees ranging in age from 1 to 63 yrs during 1992 and 1993	Descriptive comparative analysis of ED use before and after implementing a $25 co-pay policy. Control groups were used to measure changes in use not associated with the co-payment practice. Logistic regression was used to model the independent effects of age, sex, SES, and co-pay status.	There was a 15% reduction in ED use among the co-pay group. Most of the decline was among patients with "non-urgent" problems. The number of claims for outside ED use did not change.

STUDY	SAMPLE	METHODS	FINDINGS
Young, et al. 1996	A sample of 6,187 ambulatory patients in emergency departments of 56 different hospitals across the nation during a 24-hour period	Interview data including demographics, financial information, insurance status, clinical access questions, and symptoms associated with choosing the ED for care were analyzed using t-tests and chi-square statistics.	Demographic characteristics of the study sample were 51% female, 49% male, 38% white, 36% African American, 22% Hispanic, and mean age 30 years of age. Almost 76% of patients had some form of insurance (37% from private sources and 46% from public sources). Approximately 24% were uninsured. Forty nine percent were rated by the triage nurse as "non-urgent" on intake. The chief complaints of these patients were not significantly different from those of patients who were initially rated urgent by the triage nurse. Patients without a regular source of care were more likely to be rated "non-urgent" than those who reported a regular provider. A total of 1,271 patients (21%) were admitted to the hospital. The admission rate for those with non-urgent complaints was 5.5%. Non-urgent patients who were admitted were likely to be older, white, and to have private insurance or a regular source of care.
Cunningham, Clancy, Cohen, & Wilets 1995	1987 National Medical Expenditure Survey Data (Household Component)	Descriptive and multivariate analyses (logistic regression) of patient reports of ED/outpatient service use—focused primarily on the use of the ED for non-urgent health problems.	6.3% of the U.S. population had an ED visit for a non-urgent health problem in 1987. Medicare beneficiaries and others with public insurance (Medicaid) had the highest probability of non-urgent ED use (13.5 and 15% respectively). In the multivariate analysis, insurance coverage increased the likelihood of ANY outpatient visit. There were no statistically significant differences in ED use for non-urgent care among insured-vs-uninsured patients.
Miller, Holahan, & Welch 1995	Medicare B claims data for 1990	Descriptive comparative analysis of variations in service use by geographic region of the country and rural-vs-urban settings for Medicare B beneficiaries during 1990.	Residents of urban areas had higher age-sex-race adjusted utilization rates than those in rural areas. Utilization rates in Florida exceeded the U. S. mean by 38% while those of Vermont and Montana were 29% below the national mean. The mean number of evaluation and management services per beneficiary (inpatient and outpatient combined) was 14.7 for urban residents and 11.9 for rural residents.

STUDY	SAMPLE	METHODS	FINDINGS
Baker, Stevens, & Brook 1994	Adult ambulatory patients admitted to the ED of a public hospital in Los Angeles during a two week time frame (n=1190)	Univariate and multivariate analyses of the regular source of care for emergency department patients, their health status (as measured by a global rating and MOS-14 items), and utilization history (having seen a physician at least once in the preceding 3 months).	After adjusting for age, sex, race, health status, and insurance status, those patients with a regular source of care were almost 4 times more likely to have visited a physician in the previous 3 months. Only 32% of patients had an emergent or urgent complaint. The majority of patients used the ED for a non-urgent problem. Approximately 82% of the sample stated they were uninsured at intake. On univariate analysis, blacks and Hispanics were almost twice as likely as whites to identify the ED as their usual source of care. Additionally, those with Medicaid insurance, those who had to travel more than 1 hour to get care, and the less educated were more likely to have identified the ED as a usual source of care. In the multivariate model, only race (adjusted odds 2.0 for Blacks and Latinos compared to whites) remained as an independent predictor of identifying the ED as a usual source of care.
Fleishman, Hsia, & Hellinger 1994	Interview data from the AIDS Costs and Service Utilization Survey (ACSUS) during an 18 month period (March 1, 1991 and August 31, 1992). A three-stage sampling design of communities, providers, and patients was used to approach a nationally representative sample. Patients were over 13 years and at various stages of disease progression.	Andersen's behavioral model was used to identify variables for inclusion in this study. Linear and Poisson regression were used to determine the effects of need (AZT use, physical functioning, pain, and mood), enabling (insurance, usual source of care, income, education level, living arrangements) and predisposing (gender, ethnicity, intravenous drug use or IDU, and race) factors on service use (defined as ambulatory visits, ED visits, inpatient admissions, and length of inpatient stay).	The majority of the sample used a clinic as their usual source of care (76%). Forty one percent of patients were symptomatic but did not have AIDS. For each type of service, patients with AIDS had higher levels of use. In the multivariate model, education was the strongest predictor of ambulatory use (college education and higher used more outpatient services). Those without a usual source of care had fewer visits than those with a regular provider. Patients covered by public insurance had fewer visits than those covered by private insurance. The uninsured had the lowest number of visits. Greater need (functional impairments, symptoms, taking AZT) was associated with higher service use. Hospitalization was more common among minorities who also had an average length of stay that was longer than whites. In the ED, race (black) and education (high school or less) were independent predictors of use.

STUDY	SAMPLE	METHODS	FINDINGS
Ahern & McCoy 1992	Discharge data on 18,352 patients for 1983 and 17,590 patients for 1987 in California	Descriptive comparative and multivariate analysis of predictors of admission through the ED-vs-other pathways for all patients and then for those with emergent/urgent or non-urgent admission. Changes between the two years were analyzed. Predictors were age, sex race and payer source for patients and teaching status, location (urban-vs-rural), and ownership for hospitals.	All hospitals showed changes in ED-vs- other sources of admission between 1983 and 1987. Higher proportions of patients were admitted from the ED in 1987 compared to 1983. A disproportionately high number of admissions through the ED were among Medicaid beneficiaries, the uninsured, or minorities. Fewer admissions were rated "emergent" in 1987 compared to 1983. This finding was attributed to changes in access to care for uninsured patients. Lack of access for the poor resulted in deaths and emergencies associated with illnesses that could have been prevented or would have been routine if treated early.
de Alteriis & Fanning 1991	Data from New York State's Medicaid Management Information System from 1985 to 1987 (data exclude New York City)	Multiple regression was used to determine the relationship between supply factors (availability of services), demographics, and ED use by Medicaid beneficiaries.	Medicaid ED use was negatively associated with primary care use (i.e. higher use of the ED was associated with fewer primary care visits and vice versa). There was lower use of ED services in the small rural counties owing to difficulties in geographic access. ED use also seemed related to the type of facility. Hospitals "under pressure" to decompress their EDs had lower levels of use by Medicaid patients.
Fossett, Choi, & Peterson 1991	Illinois county level Medicaid claims data for 1985	LISREL (a path analysis technique) was used to determine the relationships between the use of hospital outpatient services by Medicaid patients, Medicaid physician fees, and the use of office-based physician's services.	Outpatient care did not displace office-based primary care. Physician behavior was not substantially influenced by differences in relative fees between Medicaid and private payers. Areas with high outpatient usage also had high physician office use.

STUDY	SAMPLE	METHODS	FINDINGS
Hayward, Bernard, Freeman, & Corey 1991	Robert Wood Johnson Foundation's access to health care telephone survey data for 1986 (n=5,748).	Descriptive statistics and logistic regression analysis of characteristics associated with not having a regular source of ambulatory care (RSAC)	Approximately 16.4% of respondents did not have a RSAC. The proportions were highest among those 23-44 years of age, males, the uninsured, and minorities. Sixty one per cent said they did not want a regular source of care. The poor were not less likely than the non-poor to lack a RSAC, but they were less likely to lack one for financial reasons. The investigators concluded that RSAC was not a reliable measure of access for population sub-groups.
Shesser 1991	Interview data from 325 adult (non-elderly) patients in an urban ED (Washington, D. C.) and a randomly selected comparison group of 224 patients.	Descriptive comparative analysis of the demographic characteristics of ED users for minor illnesses and their reasons for choosing the ED as their site of care. T-tests, chi-squares and ANOVA statistical procedures were used for data analysis.	There were no major differences in racial, educational, or economic characteristics among users of the ED for minor illness and the comparison group. Those who used the ED for minor illness tended to be male, self-pay patients, or not covered by Medicare. The major reasons given for using the ED for minor illness were convenience, absence of other provider relationships, and the inability to get a prompt appointment with their regular provider.
Wells, et al. 1989	Baseline data from the Medical Outcomes Study (MOS) for 1986 of patients (n=11,242) who completed a questionnaire on well-being, functioning, and chronic medical conditions. Follow-up data by telephone interview for those with depressive symptoms	Least squares multiple regression was used to analyze the relationships between functional status and depressive symptoms and functional status and other chronic medical conditions. Independent variables were age, sex, education, income, physician specialty, presence or absence of selected chronic conditions, and interactions. The dependent variables were scores on measures of functioning and well-being.	Depressive symptoms (with or without a depressive disorder) were associated with limitations in multiple dimensions of patient well-being and functioning compared to that of patients with no chronic conditions. The functioning of depressed patients was comparable to or worse than that of patients with other major chronic conditions. The effects of depressive symptoms and other chronic medical conditions on well-being and functioning were additive.

STUDY	SAMPLE	METHODS	FINDINGS
Jencks 1985	Data from the 1980 NAMCS of visits to internists, family practitioners, and general practitioners by patients over 15 years of age	Descriptive statistics of the four indicators of mental health "problems" covered in NAMCS data: mental health reason for visit; mental health diagnosis; psychotropic drugs ordered; and, psychotherapeutic treatment rendered. Multiple regression analysis of the predictors of a mental health diagnosis.	Weighted data showed that mental health reasons for visit were present in 3.3% of visits, 5.6% of patients received a mental health diagnosis, 6.8% received psychotropic medications, and 3.2% received a psychotherapeutic treatment. Mental health reasons for visit and the number of psychotropic drugs accounted for 29.7% of the variance in mental health diagnoses. When psychotherapeutic treatment was added to the model the amount of explained variance in diagnosis increased to 34.7%. Diagnoses were made less frequently for older more established patients.
Gold 1984	Multiple national data sets were merged to obtain variables of interest. Data sources included the AHA's annual survey of hospitals, AMA's master file of physicians, and U. S. Census survey of income and education	Demand equation modeling were used to identify factors that influenced the demand for hospital outpatient services and to determine the relationship between outpatient service volume and the availability and price of alternative sources of care (primarily MD offices and hospital inpatient).	Medicaid coverage increased the demand for hospital outpatient services. The demand for non-emergency room care was more price-sensitive than the demand for emergency room care. There was no overall relationship between income and demand for outpatient services of all types. The structure of hospital outpatient services differed between urban and rural health service areas.
Yelin, Kramer, & Epstein 1983	A secondary analysis of data from the 1976 National Health Interview Survey	Data were analyzed using linear and logistic regression to identify the impact of medical need on utilization. Characteristics and utilization patterns for patients with 9 discrete chronic conditions were compared to those without chronic health problems.	When medical need was held constant, there were no differences in utilization based on race, income, education, insurance coverage, or region. Among all persons, those with lower family incomes, poor education, and from urban settings had more physician visits after controlling for symptoms. Among those with one of 9 chronic conditions, there were no differences in the number of physician visits by race, income, or education. Hospitalizations were fewer among those who lacked insurance coverage and for two chronic conditions by race.

STUDY	SAMPLE	METHODS	FINDINGS
Cleary, et al. 1982	A probability sample of 1,026 adults (18-89 years of age) in rural Wisconsin	Interview data and multiple regression analysis of sex differences in the utilization of medical services.	Rates of service use by sex (based on self-report and confirmed by medical record review) were approximately 2.9 ambulatory care visits per year for females compared to 1.9 ambulatory care visits per year for males. Sex differences in utilization of health services were related to differences in "reported health" and not to differences in help-seeking tendencies.

Race has been found to influence utilization in several ways though some of the findings conflict. Being black or Hispanic is associated with less service use in general but higher ED use in several studies while two studies reported no differences in utilization by race (Baker, Stevens, & Brook, 1994; Fleishman et al., 1994; Miller et al., 1997; Shesser, Kirsch, Smith, & Hirsch, 1991; Yelin, Kramer, & Epstein, 1983). Use of the ED as the usual source of care was found to be higher among blacks (adjusted odds ratios ranged from 2.0 to 2.7) compared to whites in two studies (Baker et al., 1994; O'Brien et al., 1997). Finally, several studies found hospitalization rates lower among blacks compared to whites(Fleishman et al., 1994; Miller et al., 1997).

Age related differences in services use are as one might expect. In general, service use has been found to be higher at both ends of the life cycle with the very old and very young using more care (Freid et al., 1998; Woodwell, 1997b). These age related differences are especially prominent in the ED setting and are thought to be related to medical need (McCaig & Stussman, 1997).

Enabling influences. Trends from the literature, though at times conflicting, suggest that insurance plays a big role in the use of health services (Cunningham et al., 1995; Fleishman et al., 1994; Miller et al., 1997; Yelin et al., 1983). Insurance status affects utilization through several mechanisms including the patient's ability to obtain and to use a regular provider. Insurance also influences the types of services used (e.g. Medicaid beneficiaries use the ED more often for non-urgent complaints and the uninsured have fewer hospitalizations), and may simply affect whether any service at all is used.

There are also reported differences in utilization rates by region of the country and urban versus rural locations. Mueller and colleagues (1998) found that residents of the northeast had 1.2 higher odds of an MD visit within the past twelve months when compared to those in the west. Odds were lower for the mid-west (0.99) and lowest for the south (0.92). Miller and colleagues (1995) reported higher service use by Medicare beneficiaries in Florida compared to all other states while those in Vermont and Montana consumed almost 30% fewer services than the national average. Urban dwellers have been shown to consistently use more services than rural residents though the exact reason for this finding is not clear (Miller, Holahan, & Welch, 1995; Mueller et al., 1998; Yelin et al., 1983). One possible reason is the availability of providers and services in cities compared to rural communities (de Alteriis & Fanning, 1991).

The price of health services and the availability/type of regular source of care are some of the other enabling characteristics in Andersen's model. Gold (1984) in her study analyzing multiple national data sets found that Medicaid coverage increased the demand for hospital outpatient services. She also found that the demand for non-emergency services was more price-sensitive than the demand for emergency room care (Gold, 1984). Selby and colleagues reinforced this finding in their study of ED visits after implementing a $25.00 co-payment policy (Selby, Fireman, & Swain, 1996). They found that the co-pay decreased ED use by 15% primarily among patients with non-urgent complaints.

As to regular source of care, a study by Hayward, et al. (1991) found that approximately 16% of the 5,748 patients they surveyed did not have a regular

source of care. Sixty one percent stated they did not want one thus calling into question the value of this variable as a reliable measure of access (Hayward, Bernard, Freeman, & Corey, 1991). In another study, Petersen and colleagues (1998) found that not having a regular doctor was associated with higher odds (1.6) of having a non-urgent ED visit. Likewise, Young, et al. (1996) reported that patients without a usual source of care were more likely to be rated as non-urgent on intake assessment. Finally, Baker, Stevens & Brook (1994) found that those patients who reported a regular source of care were almost 4 times more likely to have used health services (MD visit) within a three month time-frame.

Illness level or "need" factors. One of the few "need-related" characteristics used in the studies reviewed was urgency (both perceived and evaluated) of emergency department patients. Because the definition of urgency is inconsistent it is difficult to compare findings across studies. Varying proportions of ED visits are deemed non-urgent ranging from 6.3% to 50% of ambulatory encounters in some studies (Cunningham et al., 1995; Petersen, Burstin, O'Neil, Orav, & Brennan, 1998; Young, Wagner, Kellermann, Ellis, & Bouley, 1996). Cunningham argues that the proportion of non-urgent ED visits and the costs associated with them is miniscule when compared to all ambulatory care use. Butler (1998) found that reasons for non-urgent ED use were often appropriate (e.g. weekends and "need" as evidenced by having more inpatient admissions compared to those who did not use the ED for non-urgent problems, etc).

Environmental or health system factors. Several studies looked at the impact of health care system organization on utilization. At least one study found that

ED utilization by Medicaid patients was negatively associated with primary care use and that hospitals "under pressure" either to increase revenues or decrease overcrowding in their EDs had varying levels of ED use by the Medicaid population (de Alteriis & Fanning, 1991). Another study suggested that there is a synergistic effect in the use of different types of services and there are no competitive effects (Fossett, Choi, & Peterson, 1991). For example, areas with high out-patient use also had high use of other types of ambulatory care.

One other aspect of environmental or health system impacts on care is provider practice style. The number of visits resulting in mental health diagnoses was found to be influenced by physician practice style, specialty, and HMO affiliation (Glied, 1998). Another study found that older more established patients were also less likely to be labeled with a mental health diagnosis (Jencks, 1985). There are also provider effects on utilization of diagnostic tests and other services (McCaig et al., 1998).

Phillips and colleagues (1998) used characteristics from Andersen's model to organize their overview of utilization research. They found that less than half of the studies reviewed included measures of environmental or provider-based impact (Phillips et al., 1998). One of the major reasons for not including environmental variables in utilization studies is that they often are not available in data sets. Additionally, environmental variables are often measured in the aggregate while utilization is usually measured at the individual level.

Studies Using NAMCS and NHAMCS Data

This secondary analysis uses two national ambulatory care data sets. Much of what has been published using NAMCS and NHAMCS data are technical reports written by analysts from the National Center for Health Statistics (NCHS). These reports were reviewed in detail prior to beginning this investigation and were used to verify the figures and trends obtained in this visit sample. Utilization rates for major variables of interest for the entire NAMCS and NHAMCS sample for 1995 are summarized in Table 2. In recent months, studies using these data have begun to appear in professional journals. Visits by children have been the primary focus of these investigations and none have involved multivariate methods (Freid et al., 1998; Weiss et al., 1997). A closer look at adult utilization will fill a gap in the literature. Focusing on illness-related visits is also appropriate and in keeping with the conceptual framework.

Table 2
1995 NAMCS & NHAMCS Utilization Rates

Characteristic	Number of Visits per Person
Age	2.8
Under 15 years	
15-24 years	2.2
25-44 years	2.8
45-64 years	3.6
65-74 years	5.6
75 years and older	6.8
Sex	
Male	2.8
Female	3.8
Race	
White	3.4
Black	2.8
Other	2.9
Region	
Northeast	3.5
Midwest	3.2
South	3.0
West	3.8

Methodological Issues

Health service use is a complex phenomenon as evidenced by the often conflicting and contradictory findings between studies. Among the studies reviewed, several methodological issues emerge. First, some use interview data or self-report to capture information on utilization. These studies include more detailed information about reasons for use and often include additional variables such as usual source of care. Do individuals, though, recall all of their visits and are they willing to disclose reasons and diagnoses without censoring information? Some of the studies using interviews were conducted over short time periods in one service setting. Are these study findings biased either by the short time frames for data collection or the types of patients using that facility? Second, those studies that use records based data may be subject to bias by provider charting practices, gaming or "up-coding" to maximize reimbursement, or other threats to validity such as errors in abstracting from the chart to the data collection tool (Aaronson & Burman, 1994). A few studies used both interviews and records or claims review to validate utilization. For example, in their study of gender differences in service use, Cleary and colleagues performed in-person interviews and reviewed charts in physician's offices for the 1026 study subjects. Using data from more than one source may help avoid some of the threats to validity encountered when only one method is used. Third, concepts are not always clearly defined, such as "urgency" in the ED setting, making it difficult to interpret the findings of a single study or to compare results across multiple investigations.

Using large data sets has been one approach to studying utilization. With extremely large sample sizes, some of the threats to validity are avoided but others are more pronounced. Typically, large databases lack health status variables that are necessary to determine the influence of this important "need" factor on service use. Are the differences attributed to sex or age really a function of health status? Investigations using claims or discharge data have attempted to address this problem by using proxies for health status such as number of past hospitalizations or total amount of utilization in the previous year (Butler, 1998). While better than nothing these proxy measures are less than perfect. In future years some of these methodological issues may be alleviated since the sampling frames for both the national population-based and records-based surveys will be identical. This change will make it possible to link across surveys and to look at both self-report and records-based data to verify utilization.

All of the studies used descriptive statistics and most used multivariate techniques to more clearly identify independent contributions of selected characteristics. Logistic regression was commonly used and sometimes in a two-step process. For example, in studies predicting ED use, the probability of any visit was modeled first, followed by the probability of an ED visit [Cunningham1995 #435]. Additionally, studies using large data sets with a multi-stage sampling design often used special software to correct for the design effect (Cunningham et al., 1995; Miller et al., 1997).

This secondary analysis used large national ambulatory care data sets. Descriptions of the methods employed in this study are described in detail in the subsequent chapter.

CHAPTER 3

Methods

This chapter provides an overview of the research design, a description of the national surveys from which the study sample was drawn, and detailed information about sample characteristics, study variables, and procedures used to prepare the data files for analysis. Analytic methods are also described.

Research Design

Secondary analyses were performed on a subset of visits from two large national administrative data sets. Data from the 1995 and 1996 NAMCS and NHAMCS were used for this descriptive comparative study of adult ambulatory care visits in the United States. Both surveys are national probability record-based surveys. The unit of analysis for this study was the patient visit.

Human Subjects Assurance

The University of California, San Francisco Committee on Human Research granted exempt certification for this study since publicly released data with no patient identifiers were used for this secondary analysis.

Data Sets

The National Health Care Survey (National Center for Health Statistics: Organization and Activities, 1996)is conducted annually by the Division of Health Care Statistics of the National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention. The ambulatory care component used for this study consists of two surveys covering three service settings. First, the National Ambulatory Medical Care Survey (NAMCS) includes data on visits to physician

offices. Second, the National Hospital Ambulatory Care Survey (NHAMCS) covers hospital-based ambulatory care visits provided in two service locations: outpatient departments (OPD) and emergency departments (ED). Both surveys employ a multi-stage probability sampling design to identify data collection sites within primary sampling units (PSUs), physician offices or hospitals within PSUs, clinics within hospitals (NHAMCS only), and visits within each practice, clinic, or ED. This design produces a national sample that can be used to make estimates about the entire United States population. Each visit in the sample is assigned a weighting factor for use in making these national estimates.

For the purposes of both surveys, a visit is defined as an in-person encounter with a health care provider. Visits by patients of all ages and diagnoses types are considered appropriate for inclusion, while those without provider interaction (e.g., to pick up a prescription) are excluded. Providers and office staff abstract visit information onto Patient Data Forms (see Appendices A, B, and C). Visit information includes demographics, reason(s) for visit, final diagnoses, and co-morbidities, in addition to other variables such as procedures performed. Data collection efforts are managed by field representatives from the Census Bureau who train staff, answer questions about using the Patient Data Form, review all forms for completion, and monitor sampling methods for adherence to protocol (Schappert, 1997).

Data processing is performed by trained personnel under contract with NCHS and is subjected to rigorous quality control procedures. Detailed editing procedures are used to check for inconsistencies in the data and to re-code or

correct entries, as appropriate. Item non-response was 3% or less for all variables in the NAMCS survey except for race (8%), ethnicity (10%), and principal diagnosis (6%). Item non-response rates for the NHAMCS were 5% or less except for race (8% OPD; 9% ED), ethnicity (14% OPD; 18% ED), and urgency (a variable in the ED data set only, 6%). Incomplete data items were imputed using an explicit process to randomly match the visit with missing data to one with similar characteristics in the data set.

Selected data elements (e.g., drugs, procedures, injury type) are translated into numerical codes for entry into the data file using medical classification systems. Two of these classification systems are relevant for this study. First, the "Reason for Visit Classification" (RVC) system, recently revised in 1994, was developed by NCHS in the 1970's. Expressed reasons for visit are assigned a four-digit code number according to type. Within this classification scheme there are eight modules: a) symptoms (1001-1999); b) diseases (2001-2999); c) diagnostic, screening, and preventive (3100-3599); d) treatments (4100-4899); e) injuries and adverse effects (5001-5999); f) test results (6100-6700); g) administrative (7100-7140); and, h) uncodable entries (8990-8999). Up to three reason codes may be assigned to each visit. Second, diagnosis and procedure codes are derived from the "International Classification for Diseases, Ninth Revision, Clinical Modification" (ICD-9-CM). This coding system is used throughout the health care industry and is widely accepted. Complete documentation of the coding systems, the data files, and other procedures are available on the NCHS web site at http://www.cdc.gov/nchswww.

NAMCS. The first NAMCS survey was conducted in 1974 and repeated annually until 1981. It was again conducted in 1985 with annual collection resuming in 1989. The multi-stage probability sampling design for both the 1995 and 1996 surveys began with 112 identified geographic regions (PSUs) covering the 50 states and the District of Columbia. Physician practices were drawn from within each PSU using master files maintained by the American Medical Association (AMA) and the American Osteopathic Association (AOA). Inclusion criteria were non-federally employed, office-based physicians principally engaged in patient care activities. Anesthesiologists, pathologists, and radiologists were excluded. In 1995, 73% of eligible physicians (1883 total) participated in the survey, followed by 1500 participants in 1996 (a 70% response rate) (Woodwell, 1997a; Woodwell, 1997b). Patient visits were systematically selected during a randomly assigned week of the year. All visits during a week were included for small practices. A total of 36,875 patient data forms were collected in 1995 followed by 29,805 in 1996.

NHAMCS. In 1992 the federal government added hospital outpatient and emergency departments to the National Health Care Survey. This addition was necessary to capture a substantial and growing part of ambulatory health care services that potentially differed from those delivered in physician offices (Description of the National Hospital Ambulatory Medical Care Survey, 1996). The multi-stage sampling design for the 1995 and 1996 surveys began, like the NAMCS, with 112 PSUs. Population density was used to prioritize PSUs for inclusion in the survey. The 26 most heavily populated PSUs were included with

certainty, followed by half of the next 26 largest PSUs and so on. Stratification was done within four basic geographic regions and by standard metropolitan statistical area (SMSA-vs-non-SMSA) . The facility sampling frame, drawn from the 1991 SMG Hospital Market Data Base, was limited to non-federal, short-stay (average length of stay less than 30 days) acute care hospitals with six beds or more staffed for patient care (Description of the National Hospital Ambulatory Medical Care Survey, 1996). Data collection sites within hospitals were selected with certainty or at random depending on the number of clinics and/or EDs. A total of 50 ED data forms were targeted for completion over a randomly assigned four-week time period. Outpatient data collection targets were set at 150 visits over the same time frame. If the total number of visits seen during the four-week period exceeded the target, then visits were systematically selected using a randomly assigned starting point.

The number of hospitals eligible to participate for the two survey years was almost identical: 437 in 1995 and 438 in 1996. Participation rates for the two years were 94% (1995) and 95% (1996). Data were collected from 391 EDs and 230 OPDs in 1995 compared to 392 EDs and 235 OPDs in 1996 (McCaig, 1997a; McCaig, 1997b; McCaig & Stussman, 1997; Stussman, 1997). Patient data forms collected for the two years combined were 43,813 from EDs and 58,199 from OPDs.

Study Sample

Visits by adults (25 years and older) for illness-related complaints to three service locations (MDOs, OPDs, and EDs) during 1995 and 1996 comprised the

sub-set of visits used for this secondary analysis. Illness-related visits were for reasons such as: general symptoms, respiratory symptoms, digestive symptoms, endocrine diseases, and circulatory system diseases. These cases were chosen for analysis because there are no published studies looking at this sub-set and because limiting the sample in this way theoretically controls for some of the differences in utilization among the three service locations. For example, patients do not typically go to the ED for preventive services, nor do critical, multi-system trauma patients use physician office services. Injuries comprise a subset of visits with their own etiology and epidemiology and were excluded from this analysis. Injury visits have been analyzed as a subset by NCHS each year and have been the subject of other investigations (Schappert, 1997; Weiss et al., 1997).

This sample was limited to adult visits since children and adolescents are a special population with a unique set of characteristics, needs, and utilization patterns. Including this population would have expanded the scope of this project beyond what would have been manageable. Additionally, there are published reports of secondary analyses of NHAMCS data for pediatric populations (Freid et al., 1998; Weiss et al., 1997).

The definition of adult used for this sample was 25 years and older. According to U. S. Census Bureau estimates, more than half of all young adults ages 18 to 24 years were living with parents and/or attending college between 1990 and 1995 (Census Bureau, 1995). These living arrangements make this age group subject to parental involvement in service use and provider choice.

Furthermore, since school infirmaries were out of scope for the surveys, the full spectrum of utilization could not be obtained for 18 to 24 year olds.

Given these inclusion/exclusion criteria, the total un-weighted sample size for this study was 64,884 visits for the two years combined, representing 38.5% of the 168,692 cases in the data files. Visits within the study sample were distributed as follows: 30,567 (47%) physician office visits; 18,510 (29%) outpatient department visits; and, 15,807 (24%) emergency department visits. When weighted to produce national estimates, the sample size was 701,838,192 visits for the two years combined, representing 40% of the estimated total number of visits for all ages and all reasons. Most of the visits in the study subset were to MDOs (594,342,046 or 84.7%), followed by EDs (66,456,941 or 9.5%) and OPDs (41,039,205 or 5.8%). A comparison of the weighted study sample with weighted data from the entire survey are shown in Table 3.

Table 3

1995/1996 NAMCS & NHAMCS Adult Illness Visit Distributions

Service Setting	Adult Illness Visits	Adult Visits (% of which were adult illness visits)	All Visits (% of which were adult illness visits)
ED	66,457	113,262 (59%)	186,892 (36%)
OPD	41,039	87,564 (47%)	134,418 (31%)
MDO	594,342	1,043,812 (57%)	1,431,575 (42%)
Combined	701,838	1,244,639 (57%)	1,752,885 (40%)

All figures based on weighted sample and are in thousands

Study Variables

Variables common to all three settings and those most relevant to illness-related problems were selected for this analysis from the total number of data elements abstracted from the chart at the time of the visit and entered into the data file. Study variables were clustered into four categories for analytic purposes: demographics, illness-condition, visit characteristics, and environmental characteristics.

Demographics. Demographics included: patient age (in years), sex (male/female), ethnicity (Hispanic/non-Hispanic), race (white, black, Asian/Pacific Islander, American Indian/Eskimo/Aleutian), method of payment (preferred provider, fee-for-service, health maintenance organization (HMO),self-pay, no-charge, and other), and source of insurance (Blue Cross/Blue Shield, other private insurance, Medicare, Medicaid, worker's compensation, other insurance, and unknown).

Illness-condition. Illness-condition variables included: reason for visit, diagnoses, and co-morbidities. Reason for visit was the patient's expressed reason (in his/her own words) for seeking care or the chief complaint and was coded for entry into the data file using the RVC system. The final diagnosis was the physician's best assessment or diagnosis associated with the patient's chief complaint and was entered into the data file as an ICD-9 code. The data file contained up to three reasons and diagnoses codes for each patient visit. Only the principal reason for visit and the primary diagnosis were analyzed. Less than half of the visits (40-45%) had secondary reasons and diagnoses listed. Less

than 15% of visits had a third reason or diagnosis recorded. Other studies using NAMCS and NHAMCS data analyzed only principal reasons and diagnoses for practical purposes (Schappert, 1997; Weiss et al., 1997).

Co-morbidities were those conditions/diagnoses known to exist for the patient at the time of the visit and might or might not have been related to the principal reason for visit. The MDO and OPD data included numerous co-morbidities (diabetes, obesity, etc.). Information about only two co-morbidities were collected in the ED, human immunodeficiency virus infection (HIV)/adult immunodeficiency syndrome (AIDS) and depression. Results are reported for these two co-morbidities only since they are common to all three service locations.

Visit characteristics. Those visit characteristics of interest for this secondary analysis were provider seen (nurse practitioner), disposition of the visit (admitted/not-admitted to the hospital), diagnostic and screening services provided (blood tests, radiographic studies, blood pressure, urinalysis, and mental status exam), and procedures performed. By definition, diagnostic and screening services were those services ordered or provided during the patient visit. Diagnostic test variables differed somewhat between the ED data set and the other two files (MDO and OPD). Variables were merged in some cases as discussed later in this chapter. There was a variable in each of the data files that was a grand total of the number of diagnostic and screening services recorded for the visit. This variable was used to compute mean number of services for each location.

Procedures performed were entered into the data file as ICD-9 codes. Unfortunately there were several variations of these codes (3 digit and 4 digit). Three digit codes were imported into SPSS for the OPD and MDO files, while 4 digit codes were imported for the ED file. The total number of codes that could be entered varied among the data sets from two in the ED file to six in the OPD file. Only the first two procedure codes were analyzed.

Environmental characteristics. Environmental characteristics analyzed were geographic region (northeast, midwest, south, and west), urban status (standard metropolitan statistical area or SMSA/non-SMSA), and hospital ownership (for OPD and ED visits only). U.S. Census Bureau designations for assigning states to geographic region were used for both surveys and are displayed in Table 4.

Table 4
U. S. Census Bureau Designations for Assigning States to Regions

Region	States Included
Northeast	Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhodes Island, and Vermont
Midwest	Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin
South	Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia
West	Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming

Procedures

1995 and 1996 NAMCS and NHAMCS data used in this study were obtained on CD-ROM from NCHS. The CD-ROMs contain raw data on individual visits, documentation text files, and a software program written by programmers at NCHS called Statistical Export and Tabulation System (SETS). The SETS program allows the researcher to browse data files, perform queries, and select records and variables for export. As part of the export command, the program will produce input statements for SAS or SPSS. Data management procedures were complicated slightly between the two years since the SETS program was upgraded from an MS-DOS based platform to be Windows-95 compatible. This platform change required learning new methods and commands for selecting cases and exporting data, however data elements and variable names for the two years were identical.

Preparation of data files. Data files on the CD-ROMs were opened using the SETS program. Study visits were selected by entering the desired age range (greater than or equal to 25 years) and reason for visit codes within the symptom and disease modules (1001-2999). Injury visits were excluded by selecting those cases with an answer of "no" to the question, "was this visit injury related?" In addition to selecting visits, only variables of interest were exported. For example, drugs prescribed or administered and preventive services performed were not exported since they were not a focus of the study. A codebook and SPSS input statements were generated on export by selecting those options in SETS.

Data were imported into SPSS using the input statements generated by SETS. These input statements entered all of the variables into SPSS as "string" or text variables. String variables posed problems for some data management activities and analyses. For example, SPSS would not calculate means for string variables and re-coding a string variable required additional steps and characters when writing SPSS syntax statements. All variables (except "date") ultimately were converted to numeric variables to prevent complications with variable merges and data analysis.

Each data file was imported into SPSS separately (ED, OPD, MDO) and later merged into one data set for each year. The two years were ultimately merged into one larger data set. Setting variables and year variables were added to the merged data set for analytic purposes.

Data cleaning. Each file had to be checked to insure that the input statements worked properly. The input statements for the 1996 data file had overlapping characters making the entire file unusable without correcting the field lengths and rerunning the import. NCHS was notified of this problem. Frequency distributions were run on each variable to check for missing data and import problems. During this step in the process, it was discovered that selected variable names differed among data sets. This problem affected the following variables: number of diagnostic and screening services, certain specific procedures, and disposition. These variables were merged and renamed as necessary.

Creation of new variables. In addition to creating setting and year variables when all the data files were merged, other new variables were created for one or more of the following reasons: a) to consolidate variables between data sets (same information but named differently between data sets); b) to merge information for descriptive and comparative analysis; and, c) to dummy-code or dichotomize variables for the logistic regressions. For analytic purposes, a new variable called "age category" was created from patient age in years. The standard age categories for reporting census population data were used to create this new variable (25-44 years, 45-64 years, 65-74 years, and 75 and older). Insurance and payor information were merged/consolidated from seven to four categories in a new variable named "payor category" as follows: Medicare and Medicaid were merged into one category called "public insurance," Blue Cross/Blue Shield and "other private" insurance were merged into one category called "private insurance," worker's compensation and other insurance were merged into one category, and unknown insurance remained unchanged. A variable was created to capture those visits covered by HMO or PPO insurance.

Diagnostic service variables also had to be merged. Two specific blood test variables existed in the ED files, HIV serology and blood alcohol. In the MDO and OPD settings, data on HIV serology testing was collected as well as blood lead, serum cholesterol, and PSA antigen. All three data files had a variable named "other blood test." A new variable was created called "blood test" which was given a value of "1" if any of the aforementioned blood tests were ordered or

performed during the patient visit. In the ED data set, radiographic studies were separated into chest x-ray, extremity x-ray and other x-ray. These were merged into the one radiographic test variable from the other two data sets, "x-ray." There was a variable in each data set that was a total of the number of diagnostic and screening procedures for each visit but it was named something different between the ED file and the MDO file. In the ED data file, the total number of diagnostic and screening services rendered was named "numserv," while in the OPD and MDO file this same variable was named "numdxsrv." A new variable "numbserv" was created to combine data from "numserv" and "numdxsrv."

The variable name for a visit disposition of admission to the hospital was different in each data file. In the ED file the admission variable was "hosadmit" or "icuadmit". In the OPD file it was named "dispath" and in the MDO file it was named "disadmit." These four variables were merged into one variable "admit." Finally, new variables were created for selected reasons for visit so that they could be analyzed by logistic regression.

Analysis

Data were analyzed (unless otherwise stated) using the two years combined. Annual visit rates were calculated for various age groups and other variables using U. S. Census Bureau estimates of the civilian noninstitutionalized population as of July 1, 1995 (Census Bureau, 1995). Crosstabs with chi-square analyses were used to describe the characteristics of adult visits for illness-related complaints and to compare and contrast characteristics across three service locations: physician offices (MDO), outpatient departments (OPD), and

emergency departments (ED). Logistic regression was used to analyze characteristics associated with selected illness-related conditions, use of hospital services, and use of the emergency department.

Crosstabs were computed using weighted and unweighted data. SPSS allows the researcher to select the weighting factor and to turn it on or off. The weighting factor is a variable in the data file provided by NCHS. It inflates the individual visit in order for national estimates to be made. The proportions obtained for many variables differed significantly when the weighting factor was used. For example, the proportion of visits by 25 to 44 year olds was 38% (unweighted) compared to 34% (weighted). Male/Female proportions, in contrast, were not significantly different when the data were weighted (60.7% female) versus unweighted (60.2% female). Nevertheless, to make national estimates using the sample, the weighting factor must be used. All descriptive statistics were calculated using weighted data. Visit rates were calculated by dividing the population estimates for the two years combined by two to get an annual projection and then by the appropriate Census Bureau statistic for the total population. For example, the estimated number of visits to all service locations by 25-44 year olds for 1995 & 1996 combined were 236,427,051. This figure was divided by two to get the approximate number of visits per year (118,213,525 annually). The annual estimate was divided by the 1995 Census Bureau population estimate for 25 to 44 year olds (83,073,577) to obtain a visit rate of 1.42 per person per year. Selected Census Bureau statistics were

provided with the data set. Others were obtained from the Census Bureau web site at http://www.census.gov.

Chi-squares and logistic regressions were run in SPSS using weighted data. Interpretation of the results was difficult owing to the large sample size. To manage this problem, there are special statistical packages, such as SUDAAN, that can be used with large data sets having a multi-stage sampling design where observations are not independent nor identically distributed. In order to use SUDAAN with these data files, a PSU variable is needed (Catherine Burt, Director of the Ambulatory Care Branch, NCHS, personal communication, September 24, 1998). This variable was not available for public release with the 1995 and 1996 NAMCS or NHAMCS files, though NCHS is working to include it in future survey years. After consultation with NCHS and a statistician, a decision was made to correct for the design effect in SPSS by adjusting the sampling weight to achieve an "equivalent" or "effective" sample size (Alecxih, Corea, & Marker, 1998; Potthoff, Woodbury, & Manton, 1992). Adjusting the sampling weights in this manner produced more accurate p-values and confidence intervals and is discussed in more detail in subsequent chapters.

CHAPTER 4

Results

Results of the crosstabs and chi-square analyses are presented in this chapter followed by the logistic regressions. Ambulatory care visits by adults (25 years and older) for illness-related complaints during 1995 and 1996 combined are first described in general and then more specifically. Variable clusters (demographics, illness-condition, visit characteristics, and environmental characteristics) are used to organize descriptive results. Descriptive data, numbers of visits and proportions, are reported using the weighted sample which produces national estimates for the U. S. population. The unit of analysis was the patient visit. Reported sample sizes (N's) are population estimates of the number of visits and not the number of individuals or patients. Where appropriate, raw figures were converted to visit rates.

In addition to descriptive data for all ambulatory care service locations combined, visit statistics for each of the three settings (MDO, OPD, and ED) are reported. Chi-square analyses were run to test for differences in visit proportions among sites. Using adjusted sample weights, Pearson chi-square statistics for all variables except sex were significant at the p=0.00 level. For that reason, actual chi-square statistics are not reported.

Profiles for selected illness conditions (chest pain, abdominal pain, asthma, and depression) and outcomes (admission to the hospital and use of ED services) were developed using logistic regression. These illness conditions were chosen because they were among the most common physical and

psychosocial reasons for seeking care. The following characteristics were used to develop the model(s): age category, sex, race, geographic region, payor type, and setting or service location. In order to correct for the survey design effect and to improve the interpretation of the results, equivalent sample weights were used for all of the logistic regressions.

Visit Statistics

An estimated 350 million visits were made annually by adults with illness-related complaints to physician offices, hospital outpatient departments, and emergency departments in the United States during 1995 and 1996, representing an overall rate of approximately 2.1 visits per person. The vast majority of visits (297 million or 85%) were made to physician offices, followed by emergency departments (33 million or 9%) and hospital outpatient departments (20 million or 6%). While this distribution is similar to that of visits by patients of all ages and all reasons and diagnoses, it represents more MDO visits (4%), and less ED and OPD volume (approximately 2% each). There was little difference in visit rates by service location between the two years, although there was an overall trend toward the MDO setting (see Table 5).

Table 5
Visit Rates per 100 Population by Setting

	Year	
Setting	1995 N=352,277,267	1996 N=349,560,925
MDO	178	210
OPD	13	12
ED	20	19

Demographics

Age. Patient age ranged from 25 to 105 years with a mean of 54.8 ± 17.56 and a mode of 47. Mean age of patients in the MDO setting was 55.5 ± 17.36, in the OPD setting 51.45 ± 16.7, and in the ED 50.83 ± 19.01. Visit rates per person per year by age category to all service locations combined were: 1.42 for those 25-44 years; 2.15 for those 45-64 years; 3.46 for those 65-74 years; and, 4.40 for those 75 and older. Visit rates by age category by service setting are displayed in Table 6.

Table 6
Visit Rates per 100 Population by Setting by Age Category

	Age Category			
	25 to 44 years	45-64 years	65-74 years	75 and older
Setting	N=236,427,051	N=222,451,297	N=126,818,637	N=116,141,207
MDO	113	184	307	384
OPD	9	13	15	17
ED	18	16	22	38

Sex. Visits by females accounted for 61% of utilization across all service locations. There were no significant differences by sex in the proportion of visits to each service location (Pearson Chi-Square=5.77, df=2, p=0.056). The proportion of MDO visits was approximately 85% while the percentage of OPD and ED visits was approximately 6% and 10% respectively for both sexes. Annual visit rates were higher for females compared to males, 2.4 visits per person for females compared to 1.7 visits per person for males for all settings combined. Annual visit rates by sex for each setting are shown in Table 7.

Table 7
Visit Rates per 100 Population by Setting by Sex

Setting	Sex	
	Female N=426,089,062	Male N=349,560,925
MDO	206	146
OPD	14	9
ED	22	17

Ethnicity. Visits by Hispanics accounted for 7% of overall ambulatory care service use in this sample. The majority of Hispanic visits were concentrated in MDOs (77%), followed by the ED (13%) and the OPD (10%). Overall, annual visit rates for Hispanics were less than those of non-Hispanics: 1.8 visits per person per year compared to 2.1 visits per person per year. This difference is accounted for by fewer visits than non-Hispanics (1.4 per person compared to 1.8 per person). Hispanic rates of OPD and ED use were heavier than that of non-Hispanics: 18 visits per 100 population to OPDs and 22 visits per 100 population to the ED compared to 11 visits per 100 population to OPDs and 18 visits per 100 population to the ED for non-Hispanics.

Race. Visits by race were distributed as follows: white 85.1%, black 11.1%, Asian/Pacific Islander 3.4%, and American Indian/Eskimo/Aleutians 0.3%. Again, the vast majority of visits by all races were to MDOs: 86% for whites, 72% for blacks, 90% for Asian/Pacific Islanders, and 79% for American Indians/Eskimos/Aleutians. Visit rates for blacks to the ED were more than twice that for whites, 37 per 100 persons compared to 18 per 100 persons. The same was true in the OPD setting with blacks making 21 visits per 100 persons compared to 11 visits per 100 persons by whites.

Insurance status. The vast majority of visits were covered by insurance (597,810,646 or 85% of the total number of visits), approximately 57% from private sources and 43% from public sources. While the publicly insured represent only 14% of the population 25 years and older they accounted for 36.7% of all ambulatory care visits for this age group. The annual visit rate for the publicly insured was 5.6 visits per person almost four times that of the privately insured (1.4 visits per person). In contrast to visits paid for by private insurance, which were evenly distributed across all settings, those paid for with public insurance (Medicare or Medicaid) were proportionally higher in the ED (42% of all ED visits) compared to the OPD (39% of all OPD visits) and MDO settings (36% of all MDO visits). HMO/preferred provider (PPO) visits were more prevalent in the MDO (34%) and OPD (25%) settings compared to the ED setting (22%). The service location with the highest proportion of visits with an expected source of payment designated as "self-pay" was the ED (14%) followed by OPD (11%) MDO (10%).

Illness Conditions

Reasons for visit. Frequency distributions of the primary reason for visit were run for all service locations combined and for each site individually. More than three fourths (80%) of all primary reasons for visit were within the symptom module of the RVC system. The ten most common reasons for visit across all service locations combined were: abdominal pain (26,609,507 visits or 3.8%), cough (24,041,163 visits or 3.4%), chest pain (22,787,493 visits or 3.2%), hypertension (20,502,245 visits or 2.9%), vision dysfunctions (19,530,517 visits

or 2.8%), symptoms referable to the throat (17,237,591 visits or 2.5%), depression (16,414,725 or 2.3%), headache (15,469,756 visits or 2.2%), back symptoms (13,551,612 visits or 1.9%), and diabetes (13,101,709 visits or 1.9%). Roughly 27% of all visits involved one of these chief complaints. The top-ten reasons varied little from 1995 to 1996. In 1995 shortness of breath displaced diabetes. In 1996 skin rash displaced back symptoms.

There were differences in the top ten reasons for visit among the three service locations (see Table 8), by age category, and geographic region. ED reasons for visit were less dispersed with the top-ten chief complaints accounting for 47% of the total. When the top ten reasons for visit were segregated by age category, vision problems, hypertension, chest pain, cough and shortness of breath were more common among those over 65. Abdominal pain, chest pain, hypertension, cough, and depression were prevalent among the 45-64 year olds and abdominal pain, throat symptoms, headache, cough and depression were prevalent among those 25-44 years old. Differences in reasons for visit by geographic region are discussed later in this chapter.

Co-morbidities. HIV/AIDS as a co-morbidity was associated with 3,539,474 visits (0.5% of total) and had the following distribution: 2,311,019 (65%) MDOs, 760,820 (21.5%) in OPDs, and 467,635 (13.2%) in EDs. Visits with HIV/AIDS co-morbidity were proportionally higher in the OPD service location (2% of all OPD visits) compared to the ED (0.7% of all ED visits) and MDOs (0.4% of all

Table 8
Top 10 Visit Reasons: Population Estimates for 1995 and 1996 by Service Setting

Location					
MD Office (N=594,342)		OPD (N=41,039)		ED (N=66,457)	
Reason	Frequency (%)	Reason	Frequency (%)	Reason	Frequency (%)
Cough	21,060 (3.5)	Abdominal pain	1,667 (4.1)	Chest pain	7,797 (11.7)
Vision dysfunctions	18,798 (3.2)	Hypertension	1,521 (3.7)	Abdominal pain	6,727 (10.1)
Hypertension	18,570 (3.1)	Cough	1,268 (3.1)	Shortness of breath	3,670 (5.5)
Abdominal pain	18,215 (3.1)	Depression	1,191 (2.9)	Headache	2,728 (4.1)
Depression	14,941(2.5)	Diabetes	1,107 (2.7)	Pain (not referable to a body system)	1,856 (2.8)
Symptoms referable to the throat	14,549 (2.4)	Chest pain	953 (2.7)	Dyspnea	1,832 (2.8)
Chest pain	14,037 (2.4)	Symptoms referable to the throat	892 (2.2)	Vertigo	1,797 (2.7)
Headache	11,925 (2.0)	Headache	816 (2.0)	Symptoms referable to the throat	1,796 (2.7)
Diabetes	11,869 (2.0)	Back symptoms	815 (2.0)	Cough	1,713 (2.6)
Back symptoms	11,407 (1.9)	Skin rash	695 (1.7)	Fever	1,581 (2.4)

Sample sizes and frequencies are in thousands

MDO visits). The co-morbidity depression was associated with 57,627,988 visits (8% of total). The majority of these visits occurred in the MDO location (50,764,820 or 88%) followed by the OPD setting (4,270,063 or 7.4%) and the ED (2,594,105 or 4.5%). Within service settings, the co-morbidity depression was proportionally higher in OPDs (10.4% of OPD visits) compared to the MDO setting (8.5% of MDO visits) and EDs (3.9% of ED visits).

Final diagnosis. The most common diagnosis for all settings combined was essential hypertension (266,819,189 visits or 3.8%). Other top-ten diagnoses were: diabetes mellitus (17,904,556 visits or 2.6%), chronic sinusitis (16,839,201 visits or 2.4%), acute upper respiratory infection (14,995,402 visits or 2.1%), general symptoms (13,510,910 visits or 1.9%), bronchitis (13,210,634 visits or 1.9%), symptoms involving the respiratory system or other chest symptoms (12,665,650 visits or 1.8%), neurotic disorders (12,323,106 or 1.8%), other disorders of urethra and urinary tract (10,796,994 visits or 1.5%), and affective psychoses (10,708,265 visits or 1.5%). In 1996 asthma displaced affective psychoses as a top-ten diagnosis. Otherwise, the top-ten diagnoses for 1995, 1996 and the two years combined were identical.

There was general agreement between the final diagnosis and the reason for visit. For example, 97% of those visits with a chief complaint of depression had a final diagnosis classified by ICD-9 code as a mental disorder. There were differences among top-ten diagnoses among service locations (see Table 9). In the ED setting, the top-ten diagnoses accounted for 34% of all diagnoses while in the OPD and MDO service locations they accounted for 24 and 21%.

Table 9
Top 10 Diagnoses by Service Setting

Service Setting					
MD Office (N=594,342)		OPD (N=41,039)		ED (N=66,457)	
Diagnosis	Frequency (%)	Diagnosis	Frequency (%)	Diagnosis	Frequency (%)
Essential hypertension	24,079 (4.1)	Essential hypertension	1,906 (4.6)	Symptoms involving the respiratory system/other chest symptoms	5,140 (7.7)
Diabetes mellitus	15,971 (2.7)	Diabetes mellitus	1,582 (3.9)	Other symptoms involving the abdomen and pelvis	3,409 (5.1)
Chronic sinusitis	15,271 (2.6)	Affective psychoses	991 (2.4)	General symptoms	2,907 (4.4)
Acute upper respiratory infection	12,947 (2.2)	Acute upper respiratory infection	935 (2.3)	Other disorders of the urethra and urinary tract	1,938 (2.9)
Neurotic disorders	11,001 (1.9)	Chronic sinusitis	891 (2.2)	Symptoms involving the head and neck	1,879 (2.8)
Bronchitis	10,898 (1.8)	Asthma	857 (2.1)	Asthma	1,808 (2.7)
General symptoms	10,017 (1.7)	Other disorders of the urethra and urinary tract	726 (1.8)	Bronchitis	1,662 (2.5)
Affective psychoses	9,418 (1.6)	Osteoarthritis and allied disorders	693 (1.7)	Pneumonia	1,493 (2.2)
Cataract	8,918 (1.5)	Other symptoms involving the abdomen and pelvis	684 (1.7)	Other & unspecified disorders of the back	1,324 (2.0)
Allergic rhinitis	8,655 (1.5)	Other and unspecified disorders of the back	681 (1.7)	Migraine	1,280 (1.9)

Sample sizes and frequencies in thousands

respectively. The most common diagnoses among those over 65 years of age were hypertension, diabetes, cataract, heart faiiure, osteoarthritis and ischemic heart disease. Within the age category 45-64 common diagnoses were hypertension, diabetes, sinusitis, general symptoms, and respiratory/chest symptoms. The most common diagnoses made in visits by the youngest age group (25-44 years) were sinusitis, acute upper respiratory infection, neurotic disorders, bronchitis, and acute pharyngitis. Common diagnoses by geographic region are discussed later in this chapter.

Visit Characteristics

Provider. Nurse practitioners (NP) provided services in approximately 6,747,022 encounters (1%). While the largest number of NP visits occurred in MDO, they were proportionally higher in the OPD setting (3.2%). Fifty percent of NP visits were from the south geographic region, followed by the west (22%), midwest (16%), and northeast (12%) and were primarily from urban settings (89%). Male/female proportions were both approximately 1% of total visits, while blacks had a higher proportion of NP visits (2.5%) compared to other races. Visits by NPs clustered in the younger age categories with 50% in the 25 to 44 year old age group and 33% in the 45 to 64 year old age group. Mean age for those visits involving NP services was 48 years (±16) compared to 55 years (±18) for all other visits.

Diagnostic and screening services. The total number of diagnostic and screening services rendered per visit ranged from 1 to 13 with a mean of 1.62 (±1.53) for all service locations combined. The mean for the ED was 3.0

(±2.03), compared to the MDO setting 1.47 (±1.4) and the OPD service location 1.47 (±1.26). The mean number of services rendered increased with age ranging from 1.49 (±1.45) in the 25 to 44 age category to 1.80 (±1.60) in those 75 and over. Blacks, the publicly insured, and NP visits had higher means for diagnostic and screening services when compared to other races, other insurers, and those not seen by an NP (1.90 ± 1.65, 1.78 ±1.57, and 1.85 ±1.64, respectively). There were no geographic differences. By far the most common diagnostic service provided was blood pressure measurement, followed by blood test, urinalysis, x-ray, mental status exam, ultrasound, CT scan, "other imaging," and MRI (see Table 10).

Procedures. Analyzing the types of procedures performed was difficult since they were widely dispersed and were exported differently among the three data files. ED procedure codes were exported as four digit codes. OPD and MDO procedure codes were exported as three digit codes. The vast majority of procedures were not recorded specifically in the data sets. A value of "000" was the most common code (86% MDO/OPD, 97% ED) which means that an unspecified procedure was performed. Among those procedures coded, one of the more popular was "999" or miscellaneous procedure. In the MDO and OPD settings the top-ten procedures (in addition to unspecified and miscellaneous) were: local incision and drainage, diagnostic procedures of the large intestine, irrigation and cleaning, diagnostic procedures of the small intestine, incision of the skin, diagnostic procedures of the bladder, excision/destruction of lesion or subcutaneous tissue, "other" operative procedures on joints, diagnostic

Table 10
Diagnostic and Therapeutic Services Rendered by Service Location in 1995 and 1996 Combined

	Diagnostic and Therapeutic Services – in thousands (%)								
Service Setting	Blood pressure	Blood test	Urinalysis	X-ray	Mental status exam	Ultrasound	CT scan	Other imaging	MRI
MD (N = 594,342)	303,160 (51)	101,180 (17)	65,519 (11)	43,001 (7)	21,400 (4)	14,730 (3)	5,519 (1)	4,784 (1)	3,941 (1)
OPD (N = 41,039)	24,760 (60)	8,7836 (21)	3,766 (9)	3,974 (10)	1,134 (3)	1,033 (3)	568 (1)	325 (1)	3,043 (1)
ED (N= 66,457)	56,140 (85)	31,400 (47)	15,548 (23)	24,724 (37)	9,752 (15)	1,609 (2)	2,673 (4)	1,300 (2)	214 (<1)
All Locations Combined (N= 701,838)	384,061 (55)	141,316 (20)	84,834 (12)	71,699 (10)	32,286 (5)	1,732 (3)	8,760 (1)	6,408 (1)	4,459 (1)

Number of visits and percent of all visits with that diagnostic/therapeutic services

procedures of the rectum, and diagnostic procedures on the orbit and eyeball. The most common ED procedures besides unspecified and miscellaneous were: miscellaneous respiratory procedures, other non-operative measurements and procedures, enema, blood transfusion, incision and drainage, other diagnostic procedures on blood vessels, rectal exam, vital capacity of the lungs, chest tube insertion, and arterial blood gases.

Disposition. Approximately 3% of visits across all service locations combined resulted in admission to the hospital (22,768,139 admissions), the majority of which were from the ED (15,730,296 or 69%). Admissions increased proportionally with each age category from 2% of visits for 25 to 44 year olds to 5.6% of visits for those 75 and older. An admit disposition was proportionally higher among visits covered by public insurance (4.9% of all publicly insured visits) compared to those covered by private insurance (2.4% of all privately insured visits). Blacks, males, and visits occurring in the midwest geographic region also had higher percentages of admissions compared to other races, females, and those from other parts of the country. The west geographic region had both the lowest number and proportion of visits resulting in admission (4,097,419 or 18% of all admissions and 2.4% of visits within that region). The top ten visit reasons and diagnoses for those visits resulting in hospital admission are displayed in Table 11.

Table 11
Top-Ten Visit Reasons and Diagnoses for Visits Resulting in Hospital Admission

Visit Reason	Frequency (%)	Diagnosis	Frequency (%)
Chest Pain	3,695,665 (16.2)	Symptoms Involving the Respiratory System and Other Chest Symptoms	2,014,317 (8.8)
Shortness of Breath	2,329,679 (10.2)	Pneumonia	1,284,595 (5.6)
Abdominal Pain	1,977,603 (8.7)	Heart Failure	1,128,070 (5.0)
Dyspnea	898,245 (3.9)	General Symptoms	848,415 (3.7)
General Weakness	676,400 (3.0)	Other Symptoms Involving the Abdomen and Pelvis	795,425 (3.5)
Fever	606,699 (2.7)	Other Acute Ischemic Heart Disease	669,764 (2.9)
Nausea	572,138 (2.5)	Acute Myocardial Infarction	643,130 (2.8)
Vomiting	572,064 (2.5)	Acute but Ill-defined Cerbrovascular Disorders	643,072 (2.8)
Cough	474,883 (2.1)	Gastrointestinal Bleeding	578,362 (2.5)
Other psychological & mental disorders	455,432 (2.0)	Fluid and Electrolyte Disorders	475,156 (2.1)

Environmental Characteristics

Region. The number of visits per region was similar to the population distribution by region for individuals 25 years and older: 224,432,482 visits or 32% in the south, 168,602,338 visits or 24% in the west, 156,840,150 visits or 22% in the midwest, and 127,255,489 visits or 22% in the northeast. The one exception was the west region. While it ranked third in population density, it ranked second in the number of ambulatory care visits to all service locations combined. Visits in the west were even more predominant in the MDO setting and the proportion of ED visits was smaller than in the other three geographic regions. See Table 12 for a summary of visit rates by service location by geographic region.

Table 12
Visit Rates per 100 Population by Geographic Region by Setting

Setting	Geographic Region Northeast	Midwest	South	West
MDO	185	155	163	209
OPD	14	20	8	7
ED	22	21	19	16
All Combined	221	196	190	232

There were a few geographic differences in the top-ten reasons for visit and final diagnoses. Psychosocial reasons (depression and anxiety) were recorded twice as often in the northeast region compared to the midwest and south. Vertigo appeared as one of the top-ten reasons for visit in the south while drug dependence was one of the more frequently documented diagnoses. In the midwest, knee symptoms made the top-ten reasons for visit list and osteoarthritis appeared as a frequent diagnosis. In the west, skin rash was among the top-ten reasons for visit along with dermatosis as a frequent diagnosis.

Urban versus rural. Eighty-one percent of visits occurred in a standard metropolitan statistical area (SMSA). When compared to non-SMSAs, the proportion of MDO visits was similar (85%), but ED visits were proportionally smaller (9% SMSA, 11% non-SMSA) and OPD visits were proportionally larger (6% SMSA, 4% non-SMSA).

Hospital ownership. ED and OPD visits were concentrated primarily in voluntary, non-profit facilities (58%), followed by proprietary settings (22%) and non-federal government facilities (19%). OPD visits were proportionally higher in government non-federal facilities while ED visits were more predominant in proprietary facilities and voluntary, non-profit settings.

Illness Condition and Outcome Profiles

Abdominal pain. Visits for abdominal pain were more common in the younger age category (25-44) and in females and were proportionally higher among blacks and Asian/pacific islanders (when compared to whites). Compared to other settings, the ED had a higher proportion of visits for abdominal pain. The results of the logistic regression for visits with the illness condition abdominal pain are shown in Table 13.

Chest pain. As might be expected, chest pain as a reason for visit was proportionally higher among males and patients over 45 years of age. There were fewer visits for chest pain from the west geographic region when compared to other areas of the country. The proportion of visits for chest pain was higher in the ED compared to the other two settings. Table 14 displays the logistic regression model for the illness condition chest pain.

Table 13
Logistic Regression of Abdominal Pain Visits

Variable	Odds Ratio	95% Confidence Interval	
		Lower	Upper
25-44 years	2.38	1.71	3.30
45-64 years	2.00	1.43	2.80
65-75 years	1.51	1.08	2.13
75 years and older	1.00	Reference Category	
Female	1.15	0.97	1.36
Male	1.00	Reference Category	
Northeast	0.96	0.75	1.22
Midwest	1.01	0.80	1.29
South	0.86	0.68	1.08
West	1.00	Reference Category	
Private Insurance	0.91	0.73	1.13
Other Insurance	0.68	0.47	0.97
Unknown Insurance	0.95	0.65	1.38
Public Insurance	1.00	Reference Category	
Black	1.18	0.93	1.50
Asian/Pacific Islander	2.84	2.06	3.90
American Indian/ Eskimo/Aleutian	0.83	0.18	3.75
White	1.00	Reference Category	
OPD	0.36	0.25	0.52
MDO	0.29	0.24	0.36
ED	1.00	Reference Category	

Table 14
Logistic Regression of Chest Pain Visits

Variable	Odds Ratio	95% Confidence Interval	
		Lower	Upper
25-44 years	0.82	0.60	1.12
45-64 years	1.28	0.95	1.74
65-75 years	1.19	0.89	1.60
75 years and older	1.00	Reference Category	
Female	0.79	0.66	0.95
Male	1.00	Reference Category	
Northeast	1.18	0.90	1.56
Midwest	1.32	1.01	1.72
South	1.11	0.86	1.44
West	1.00	Reference Category	
Private Insurance	0.86	0.68	1.09
Other Insurance	0.92	0.64	1.32
Unknown Insurance	1.00	0.65	1.53
Public Insurance	1.00	Reference Category	
Black	0.96	0.73	1.26
Asian/Pacific Islander	0.99	0.58	1.71
American Indian/ Eskimo/Aleutian	0.61	0.09	3.96
White	1.00	Reference Category	
OPD	0.17	0.11	0.26
MDO	0.17	0.14	0.21
ED	1.00	Reference Category	

Depression. Depression as a reason for visit was more common among the younger age categories, women, whites or American Indians/Eskimos/Aleutians, and those living in the northeast geographic region. The vast majority of visits for depression were seen in MDOs or OPDs. See Table 15 for the results of the logistic regression for depression as a reason for visit.

Table 15
Logistic Regression of Visits for Depression

Variable	Odds Ratio	95% Confidence Interval	
		Lower	Upper
25-44 years	4.24	2.65	6.80
45-64 years	3.23	2.01	5.19
65-75 years	1.68	1.03	2.74
75 years and older	1.00	Reference Category	
Female	1.34	1.07	1.66
Male	1.00	Reference Category	
Northeast	1.52	1.15	1.99
Midwest	0.67	0.48	0.93
South	0.75	0.56	1.00
West	1.00	Reference Category	
Private Insurance	0.93	0.69	1.24
Other Insurance	0.32	0.18	0.56
Unknown Insurance	0.71	0.43	1.18
Public Insurance	1.00	Reference Category	
Black	0.54	0.36	0.83
Asian/Pacific Islander	0.35	0.16	0.80
American Indian/ Eskimo/Aleutian	0.98	0.17	5.73
White	1.00	Reference Category	
OPD	6.95	2.96	16.30
MDO	6.48	2.99	14.01
ED	1.00	Reference Category	

Asthma. Visits for asthma were more prevalent in the younger age categories, among women, and in the northeast. They were also proportionally higher in blacks and American Indian/Eskimo/Aleutians compared to whites. The logistic regression model for asthma visits is displayed in Table 16.

Table 16
Logistic Regression of Visits for Asthma

Variable	Odds Ratio	95% Confidence Interval	
		Lower	Upper
25-44 years	2.74	1.58	4.76
45-64 years	2.54	1.46	4.44
65-75 years	1.72	0.96	3.06
75 years and older	1.00	Reference Category	
Female	1.92	1.43	2.57
Male	1.00	Reference Category	
Northeast	1.43	1.01	2.04
Midwest	0.92	0.63	1.36
South	0.72	0.49	1.04
West	1.00	Reference Category	
Private Insurance	0.95	0.67	1.35
Other Insurance	1.18	0.73	1.91
Unknown Insurance	1.38	0.81	2.38
Public Insurance	1.00	Reference Category	
Black	1.40	0.98	2.00
Asian/Pacific Islander	0.82	0.37	1.78
American Indian/ Eskimo/Aleutian	1.48	0.24	9.17
White	1.00	Reference Category	
OPD	0.71	0.41	1.23
MDO	0.51	0.36	0.73
ED	1.00	Reference Category	

Admission. Those visits resulting in the subsequent use of inpatient services were primarily from the ED setting, 15,730,296 or 69% of the total number of admissions from ambulatory care service locations. Admissions were proportionally higher among the elderly, the publicly insured, blacks, males, and those from the Midwest geographic region. The profile for visits resulting in admission to the hospital are displayed in the logistic regression Table 17. With other variables controlled for, the odds of admission for blacks were diminished while that of Asian/Pacific Islanders increased.

Table 17
Logistic Regression of Visits Resulting in Hospital Admission

Variable	Odds Ratio	95% Confidence Interval	
		Lower	Upper
25-44 years	0.24	0.18	0.33
45-64 years	0.58	0.43	0.78
65-75 years	0.78	0.59	1.04
75 years and older	1.00	Reference Category	
Female	0.79	0.65	0.96
Male	1.00	Reference Category	
Northeast	1.13	0.83	1.53
Midwest	1.44	1.08	1.93
South	1.05	0.79	1.40
West	1.00	Reference Category	
Private Insurance	0.78	0.61	1.01
Other Insurance	0.77	0.50	1.20
Unknown Insurance	0.61	0.34	1.09
Public Insurance	1.00	Reference Category	
Black	0.82	0.61	1.08
Asian/Pacific Islander	1.13	0.59	2.13
American Indian/ Eskimo/Aleutian	0.98	0.19	4.91
White	1.00	Reference Category	
OPD	0.05	0.03	0.08
MDO	0.02	0.02	0.03
ED	1.00	Reference Category	

ED use. Visits to the ED compared to all other visits were more likely among blacks and American Indian/Eskimo/Aleutians and the younger age categories. ED visits were proportionally higher among men and those from the midwest geographic region. Visits covered by HMO/PPO insurance were half as likely to have occurred in the ED when compared to those covered by other payers or self-pay. The odds of a non-urgent ED visit were even lower for HMO/PPO patients. Three logistic regression models were run for ED service use and are displayed in Tables 18-20. The first two models were for all ED visits. The last model is for non-urgent ED visits only.

Table 18
Logistic Regression of Emergency Department Visits

Variable	Odds Ratio	95% Confidence Interval	
		Lower	Upper
25-44 years	2.22	1.85	2.67
45-64 years	1.24	1.02	1.50
65-75 years	0.73	0.60	0.89
75 years and older	1.00	Reference Category	
Female	0.84	0.75	0.94
Male	1.00	Reference Category	
Northeast	1.31	1.11	1.55
Midwest	1.40	1.19	1.65
South	1.19	1.02	1.39
West	1.00	Reference Category	
Private Insurance	0.58	0.50	0.67
Other Insurance	0.33	0.25	0.42
Unknown Insurance	0.38	0.28	0.51
Public Insurance	1.00	Reference Category	
Black	2.05	1.78	2.37
Asian/Pacific Islander	0.62	0.42	0.91
American Indian/ Eskimo/Aleutian	1.55	0.69	3.49
White	1.00	Reference Category	

Table 19
Logistic Regression of ED Visits with HMO/PPO Variable

Variable	Odds Ratio	95% Confidence Interval	
		Lower	Upper
25-44 years	1.64	1.40	1.92
45-64 years	0.90	0.76	1.07
65-75 years	0.71	0.58	0.87
75 years and older	1.00	Reference Category	
Female	0.86	0.77	0.96
Male	1.00	Reference Category	
Northeast	1.26	1.07	1.49
Midwest	1.34	1.13	1.58
South	1.17	1.00	1.37
West	1.00	Reference Category	
HMO/PPO	0.52	0.46	0.60
Non-HMO/PPO	1.00	Reference Category	
Black	2.30	2.00	2.64
Asian/Pacific Islander	0.61	0.41	0.90
American Indian/ Eskimo/Aleutian	1.49	0.66	3.35
White	1.00	Reference Category	

Table 20
Logistic Regression of Non-urgent ED Visits

Variable	Odds Ratio	95% Confidence Interval	
		Lower	Upper
25-44 years	3.07	2.37	3.98
45-64 years	1.44	1.09	1.91
65-75 years	0.83	0.59	1.16
75 years and older	1.00	Reference Category	
Female	0.95	0.81	1.10
Male	1.00	Reference Category	
Northeast	1.16	0.90	1.50
Midwest	1.44	1.13	1.84
South	1.45	1.15	1.82
West	1.00	Reference Category	
HMO/PPO	0.48	0.40	0.58
Non-HMO/PPO	1.00	Reference Category	
Black	2.24	1.86	2.70
Asian/Pacific Islander	0.61	0.35	1.09
American Indian/ Eskimo/Aleutian	1.19	0.36	3.99
White	1.00	Reference Category	

CHAPTER 5

Discussion

The meaning of the findings from this secondary analysis of ambulatory care visits by adults for illness-related complaints are discussed in this chapter. The differences in utilization among the three service locations are outlined by variable clusters. Possible explanations for some of the differences are posed. Interesting aspects of the visit profiles for selected illness conditions, patients admitted to the hospital and users of emergency services are explored. Limitations of the data and findings are included in this discussion. Finally, implications for administrative and public policy, payment practices, and future utilization research are presented.

Demographic Differences

Of the demographic variables included in the analysis (sex, age, ethnicity, race, and insurance status), there were significant differences among settings for all except sex. While visit rates were higher across all settings for females compared to males, there were no significant differences in the proportion of visits by sex by service location. Other studies corroborate gender differences in utilization of health services, though none have looked specifically at all three ambulatory care settings (Cleary et al., 1982).

Age. In general, service use was associated with advancing age in all locations. Except for the ED setting, where utilization rates were higher for those 25 to 44 years than for those 45 to 64 years, there was a steady increase in service use with each category age increase. One explanation for this finding is

that older people are less healthy and have more need for medical care. Another explanation may be that older Americans are more likely to have health insurance coverage which enables them to access services more readily. According to Agency for Health Care Policy and Research (AHCPR) data, the percentage of insured individuals increases for every increase in age category from 25 to 65 years (Vistnes & Monheit, 1997). Thanks to Medicare, less than 1% of those 65 and older are uninsured compared to 27% of those 25 to 29 years of age (Vistnes & Monheit, 1997). This interplay between service use and insurance status may partially explain why the mean age for ED and OPD patients was younger than that for MDOs. Additionally, working adults may use the ED for convenience or because they do not have a regular provider (Petersen et al., 1998; Shesser et al., 1991).

Race/ethnicity. There were differences among settings in the proportion of visits by race and ethnicity. Asian/Pacific Islanders and whites had proportionally higher visit rates to MDO settings, while blacks visited the ED twice as often as whites. This finding is slightly higher than that reported in other studies using visits for all reasons and ages or visits by children only, though it follows the same general trend (Stussman, 1997; Weiss et al., 1997). Hispanics also used EDs at a 20 % higher rate than whites non-Hispanics. Overall, ambulatory care use by Hispanics was 15% lower than that of whites or blacks. These findings are in line with other reports in the literature that Hispanics are a vulnerable population in our health care system (Davis, 1991). One of the reasons for the vulnerable status of Hispanics is their lack of insurance coverage. A 1996 report

on the health insurance status of Americans revealed that the proportion of uninsured was highest for Hispanic males (37.2%) among all racial and ethnic groups (Vistnes & Monheit, 1997). Additional explanations for race/ethnicity utilization differences may be access problems other than insurance status, such as lack of a regular health care provider or inconvenience factors such as distance and location of services (Baker et al., 1994). The lower visit rates by blacks and Hispanics to MDO may in fact cause their higher need for ED services.

Insurance status. Service use appeared to be associated with insurance status across all service locations. Some form of health insurance covered the majority of visits (85%). This statistic mirrors the distribution of health insurance coverage in the general U. S. population, approximately 83% insured and17% uninsured according to 1996 data (Vistnes & Monheit, 1997).

Patients categorized as publicly insured had visit rates four times higher than those categorized as privately insured using 1996 population figures for each category. This large disparity between service use based on insurance coverage held true in all settings and increased with age. Visit rates for those 65 and over who were publicly insured were ten times that of the privately insured (owing to the large number of Medicare enrollees in this age group). Visit rates for the publicly insured 25 to 64 years of age (which removes much of the Medicare bias) were three times that for the privately insured in the MDO and OPD settings and four times that for the privately insured in the ED setting. It is tempting to ascribe these differences to overuse or inappropriate use by those who are

publicly insured, but such a conclusion cannot be proven since this was not a population-based sample and there were no health status measures in the data set to allow for risk adjustment or to control for individual variances in service use.

It was not possible to determine the patterns of service use by the uninsured because of the way survey data were collected and categorized. Insurance information is collected in two parts, expected type of payment and source of insurance, neither of which has a category named "uninsured". There is a "self-pay" category (10% of all visits), but practical experience cautions against using this designation as a substitute for uninsured. For example, in the ED setting patients arriving without an insurance card or other definitive evidence of a payment source usually are registered as "self pay". This group of "self-pay" patients might skew data making it impossible to make reliable inferences about service use by the uninsured. NCHS might consider revising the categorization of these variables to more reliably capture data on the uninsured. Data on self-pay visits are presented in the Results section of this paper, with the ED having the largest proportion of such encounters (14%). Again, this proportion may be overstated owing to the intake process in most EDs.

Differences In Illness Conditions

Some of the more interesting findings of the analyses relate to the types of illness conditions and diagnoses that were seen across service locations, including the co-morbidities depression and HIV/AIDS. One of the most striking findings was that the leading reasons for visit and leading diagnoses each

accounted for only a small fraction of total visits in the OPD and MDO settings. For example, each of the top five reasons for visit accounted for only 2.5 to 3.5% of all visits to MDOs, and each of the top five diagnoses made in MDOs accounted for only 1.9 to 4.1% of total visits.

Not unexpectedly, ED reasons for visit were less dispersed and generally appeared more acute than those reported for the MDO and OPD settings. More than 25% of all ED visits were for chest pain, abdominal pain, or shortness of breath. This finding might be evidence that ED visits were truly more acute and for appropriate reasons or it may be biased by documentation conventions of ED providers. As with reasons for visit, ED diagnoses were also less dispersed than in other settings and generally were more tentative, referring to symptom clusters rather than specific disease processes in most instances. This finding may be explained by ED documentation conventions which are to chart a working diagnosis instead of a final diagnosis in some cases in order to justify the diagnostic tests that were ordered.

Depression, as a common complaint among users of ambulatory care, deserves special attention for three reasons. First, though barely making the top 20 reasons for visit by patients of all ages and complaints, depression rose to among the top five reasons for visit by adults with illness-related complaints to MDOs and OPDs. Second, it has a global impact on functional status and well-being (Wells et al., 1989). Finally, visits for depression in this sample were highest among the younger age categories (25-44 and 45-64 years) potentially indicating a higher disability-adjusted life year burden than would be the case if

the incidence were higher among older people (Murray & Lopez, 1997). In MDOs and OPD settings depression was mentioned as a principal reason for visit in approximately 2.7% of all visits and was most common in the northeast geographic region (3.6% of all visits). The ranking dropped to seventh when all service locations were combined since depression was an infrequent reason for seeking ED services.

Of those visits with depression as a reason for visit, approximately 92% ended up with a mental health diagnosis documented by the physician (93% for women and 91% for men). This finding represents improved agreement between reason for visit and diagnosis for mental health problems than the 69% reported in an earlier study using 1980 NAMCS data (Jencks, 1985).

In total, approximately 6.6% of all ambulatory care visits involved a psychiatric diagnosis (ICD9 codes 290-319). This is slightly less than the 7.2% reported by Glied (1998) who analyzed NAMCS data for 1991 through 1994. The Glied study looked at visits by adults 18 to 64 years of age to MDOs only, which may account for some of the difference (Glied, 1998).

To determine the effect of all mental health reasons combined, a post-hoc analysis was performed for RVC codes 1100-1199, which increased the percentage of ambulatory care visits for psychosocial problems to 5.6%. This figure represents more than a two-fold increase from the 2.5% reported in the 1985 NAMCS (Mechanic, 1990). In the northeast geographic region, all mental health reasons combined represented 8% of the total number of visits. The

number of visits for psychosocial reasons was lowest in the midwest (4% of all ambulatory care encounters).

These findings cannot be used as prevalence estimates of mental health problems since the sample was not population based. They do, however, indicate that mental health problems, specifically depression, are a relatively common complaint among users of service. The known morbidity associated with mental health symptoms makes this finding an important reminder of the need for recognition and attention to this problem in spite of the social stigma attached to it by both patients and practitioners (Murray & Lopez, 1997).

Turning to the co-morbidities associated with ambulatory care visits, in contrast to its prevalence among reasons for visit and diagnoses, depression was present in 8% of visits. The other co-morbidity studied across all three settings was HIV/AIDS, which was reported in 0.5% of visits. The highest proportion of both co-morbidities was reported in the OPD clinic (10.4% for depression and 2% for HIV/AIDS). This finding could be related to differences in charting in the OPD setting or the urban, public ownership of many hospital-based outpatient departments.

Visit Characteristic Differences

The cluster of visit variables analyzed were: provider seen, diagnostic and screening services provided, procedures performed, and disposition. Regarding provider, only 1% of adult visits for illness-related complaints were managed by nurse practitioners. This finding is not surprising given that an earlier study showed that NP visits were more prevalent among those less than 25 years of

age who were excluded from this analysis, however there are obvious opportunities for NPs to expand services to the geriatric population (McCaig et al., 1998). The greatest number of NP visits were provided in MDOs, though the highest proportion occurred in outpatient departments of urban public hospitals.

Visits to NPs involved more diagnostic and screening services than those to MDs, including blood pressure measurement, urinalysis, HIV serology, "other" blood tests, chest x-rays, and ultrasounds. This finding is puzzling since one would expect NPs to see patients of generally lower acuity than those seen by MDs. However, in this sample, NP visits were proportionally higher in urban, government-owned hospital outpatient departments which may potentially be biased toward more high risk patient populations. Additionally, NPs may be operating under strict protocols requiring them to order tests when MDs could use discretion.

The number of diagnostic services provided in the ED was twice that for the other two service locations, which is not surprising given the episodic nature of ED services and the higher acuity of diagnoses treated there. It is also likely that ED provider practice patterns promote the use of more diagnostic services to minimize legal liability.

The analysis of procedures performed by setting was hampered by poor data. Most procedures were not recorded specifically. Those that were recorded were highly dispersed. The top ten procedures performed in the ED were more acute than those recorded for the other two settings, including such interventions as chest tube insertion and arterial blood gases. In contrast, gastrointestinal

procedures were among those most commonly performed in MDOs and OPDs. Perhaps NCHS should look at how the quality and quantity of procedure data can be improved in future survey years. One way to do this would be to standardize the method of collecting this information among all sites and to require data abstractors to record other procedures specifically rather than simply check a box that "other procedures" were performed. To further facilitate the quality of procedural information that is documented, additional check-boxes for specific procedures could be added to the data collection form.

As for disposition, a small proportion of all ambulatory care visits resulted in hospital admission (3%). Of these, 70% percent were from the ED setting, representing 24% of all ED visits. Reasons for visit and diagnoses for patients admitted to the hospital were less dispersed and more acute than for patients who were not admitted. The top ten reasons accounted for 54% of all reasons for visits resulting in admission. Likewise, 40% of admissions were covered by the top ten diagnoses for all admissions. The percentage of publicly insured patients that were admitted was twice that of those who were privately insured. One possible reason for this finding is that publicly insured patients may have poorer health status. However, health status measures are not included in the survey so they cannot be evaluated. Other possible reasons are variations in admission practices, compliance issues and/or follow-up care opportunities for patients with public versus private insurance.

Differences In Environmental Characteristics

Of the environmental characteristics included in this descriptive analysis, differences by geographic region were of greatest interest. When adjusted for population differences, ED visits were highest in the northeast (22 per 100 persons per year) and lowest in the west (16 per 100 persons per year). MDO visit rates were highest in the west (2 per person per year) and lowest in the midwest (1.5 per person per year).

One of the reasons for some of these differences may be the influence of managed care since HMO/PPO market penetration is highest in the west geographic region (Corrigan et al., 1997). Lower utilization of the ED in the west lends support to the contention that managed care plans may be able to influence where patients seek service (Hurley, Freund, & Taylor, 1989). However, the fact that ED utilization was highest in the northeast contradicts this contention since HMO market penetration is higher there than in the midwest or south. One possible reason for higher overall visit rates in the west may be a larger proportion of patients who are underrepresented in the census count (e.g., undocumented aliens) such that the population denominator is understated. OPD visit rates in the northeast and midwest were almost twice that of the south and west geographic regions. Since the majority of OPD visits occurred in SMSAs rather than in rural areas, this finding could be confounding what appears to be geographic differences in utilization.

Visit Profiles

The logistic regressions run for selected illness conditions and outcomes mostly reinforced and extended findings from the univariate analyses. They showed that in a few cases variables significant in the univariate analysis were not independent predictors in the multivariate analysis.

Abdominal pain. When age, sex, geographic region, insurance status, race, and setting were entered into the logistic regression model for abdominal pain, the characteristics most predictive of such visits were being younger (25 to 44 years of age), female, Asian or Pacific Islander and using the ED for care. This profile is in keeping with the proportional differences found in the univariate analysis. Why the relative risk for an abdominal pain visit by Asian/Pacific Islanders would be 2.8 times that of whites is a matter for speculation.

Chest pain. With other variables controlled for, visits for chest pain were six times more likely to have occurred in the ED setting. Adjusted odds ratios for males 45 and older from the midwest were higher than those for females, persons younger than 44 or older than 75 years, and persons from the west geographic region. It is unclear why individuals from the midwest would be 1.3 times as likely to have a chest pain visit as those from the west geographic region. The other predictive characteristics are in keeping with what is known about the epidemiology of chest pain in the U.S.

Depression. Characteristics associated with visits for depression in the multivariate analysis were: being young (relative risk for those 25 to 44 years was 4.2 times that for those 75 and older), white (relative risk for whites twice

that of blacks), female (relative risk 1.3 times that for males), from the northeast geographic region (relative risk 1.5 times that for the west), and occurring in either the OPD or MDO setting (relative risk 6 times that for the ED). It was not possible to determine the reason for the geographic variation in visits for depression, though one can speculate that climate might be a factor. These findings underscore those from the univariate analysis, especially the association of depression with younger age. Again, this finding is of concern given the effects depression can have on functional status during life's most productive years (Murray & Lopez, 1997).

Asthma. Results of the multivariate analysis for asthma visits revealed a relative risk for females twice that for males. With other characteristics controlled for, asthma visits were approximately 1.4 times as likely to be made by blacks or Native Americans/Eskimos/Aleutians than whites. The relative risk for 25 to 44 year olds was 2.7 times that for those 75 and older. Patients 45 to 64 years old were 2.5 times as likely as those 75 and older to have an asthma visit. The odds of the visit occurring in the ED were twice that for MDO offices and 1.4 times that for OPDs. Those with questionable insurance status (other or unknown) had 1.2 and 1.4 higher odds of having a visit for asthma than did those with public or private insurance. Additionally, the relative risk for patients in the Northeast was 1.4 times that for those from the west, whose risk in turn was 1.4 times that of someone from the south. These findings show that asthma visits are relatively more frequent among vulnerable groups (minorities and those without insurance), raising questions about compliance, access to care, and other issues

potentially associated with increased morbidity and mortality for this patient population.

Admission. Visits resulting in admission to the hospital were more than 30 times as likely to have come from the ED setting. The relative risk of admission was 1.3 times higher for males compared to females, four times higher for patients 75 and over compared to patients 25 to 44 years of age, 1.4 times higher for visits in the midwest compared to the west, and 1.3 times higher for those with public insurance compared to those with private insurance or other insurance. The univariate analysis showed that admissions were proportionally higher among blacks, but with other variables in the model, the relative risk of admission for blacks dropped to 0.8 that for whites. In contrast, the relative risk for Asian/Pacific Islanders increased to 1.1 times that for whites. Finally, these findings suggest that there is an independent contribution of public insurance status to the relative risk for admission. This finding must be interpreted cautiously since health status variables were not included in the model. Nevertheless, after controlling for age, sex and race there was still an increased relative risk of admission for those publicly insured when compared to those privately insured in this visit sample.

A post hoc analysis of ED visits resulting in admission to the hospital showed that 1,259,806 (14%) were classified as non-urgent on intake. Using data available in the survey, it is not possible to explain this finding. One explanation may be that the visit classification system is flawed (i.e., imprecisely ranking patients who are urgent as non-urgent on initial presentation). Whatever the

reason, the percentage of non-urgent ED visits resulting in admission found in this study is identical to that found by Petersen and colleagues in their study of nonurgent ED visits by adults (Petersen et al., 1998). Young and colleagues reported only 5.5% of visits resulting in admission, but their study included patients of all ages (Young et al., 1996).

ED service use. The relative risk of an ED visit was 2.2 times higher for those 25 to 44 years old compared to those 75 and older and 2 times higher for blacks compared to whites. Males were 1.2 times as likely to have an ED visit and the relative risk for an ED visit was lowest in the west. Patients in the midwest were 1.4 times as likely as those in the west to have an ED visit. Finally, visits covered by public insurance were 1.7 times as likely to have been an ED visit when compared to those covered by private insurance.

When the dichotomized HMO/PPO variable was added to the model instead of the four-category (private, public, other, and unknown) insurance variable, the independent effects of age were reduced. Rather than 2.2 higher adjusted odds of ED use, visits by younger adults dropped to 1.6 higher adjusted odds. This finding suggests that managed care may have an influence over ED usage by younger adults. ED visits covered by HMO/PPO insurance (including Medicare and Medicaid managed care) were half as frequent as those covered by other types of plans or no insurance.

When the dependent variable was changed to non-urgent ED visits instead of all ED visits, the independent effects of age almost doubled that of the earlier model. The relative risk of a non-urgent ED visit by 25 to 44 year olds was three

times that of patients 75 and older. This disparity in relative risk of a nonurgent ED visit appears age related. In terms of managed care influence, these findings appear contradictory and point to an area for future research or improved data collection methods.

In all three ED service use models there were major independent effects for race. Visits by blacks were at least two times as likely as those by whites to have occurred in the ED. The largest geographic effects were among non-urgent ED visits where the relative risk for the midwest and south were 1.4 times higher than the west. This finding calls into question the assumption that all of the geographic differences in ED use can be explained by market penetration of managed care plans and is an area for future research.

Significance

This study makes an important contribution to the body of knowledge about ambulatory care utilization in the U. S. It provides a focused overview of utilization by adults for illness-related complaints to three service locations. Many of the findings corroborate those reported in other studies using more inclusive samples, but there are several that deserve special mention. First, in this visit sample, as others, the vast majority of visits occurred in MDOs. Second, the types of reasons for visit and diagnoses reflect the apparent major impact of symptoms on care-seeking among adult users of ambulatory services. Third, reasons for visit and diagnoses made in EDs appear to be more acute than those found in other settings, suggesting that much of its use may be appropriate. Fourth, measures of urgency in the ED setting appear to be

imperfect, with a small but significant proportion of those visits resulting in hospitalization. Fifth, the amount of service use for psychosocial reasons was somewhat surprising, especially since it involved younger patients. This is an important finding because it has been under recognized in studies involving all ages and all reasons for visit. Sixth, the fact that NPs perform more diagnostic screening services than MDs in this sample is worth further exploration. Finally, the disproportionate use of safety net providers by blacks and other minorities found in this study supports that found in other studies and suggests the need to explore linkages with access to care.

Limitations

Many of the limitations of this study are inherent in the survey methods and data sets used for this secondary analysis. Others are related to sample size. Still others are related to the types of variables included in the survey and decisions that were made about how to use them in this analysis. First, since it is not a population-based survey, findings may not be used to make incidence or prevalence estimates. These data may only be used to describe the total use of ambulatory care by adults with illness-related complaints in a given year (Freid et al., 1998).

Second, sampling design and size are both a limitation and a strength of the study. While the large sample size and the design make it possible to estimate visits for the entire U.S. population, they make it difficult to use and interpret statistical tests. For example, almost all of the chi-squares were significant.

Even after adjusting the sampling weights, it was difficult to interpret the magnitude of the differences among settings.

Third, since survey data are from retrospective abstracts of patient records, measures of health status, patient satisfaction, and other outcome variables are not available. This limitation made it impossible to adequately investigate the reasons for some of the descriptive findings. Another potential problem with retrospective abstracting is that data may be subject to provider coding biases. For example, one explanation for ED reasons for visit appearing more acute is that it reflects charting conventions in that setting rather than a true difference in acuity.

Fourth, the way data were distributed made it possible that MDO visits could have a disproportionate impact on some findings, specifically, reasons for visit and diagnoses made. Because of the large numbers of categories within each of these variables, it was not possible to perform anything other than frequencies on them. Additionally, the cut-off points for some of the results that were reported were somewhat arbitrary. These results should be viewed cautiously since one cannot say with certainty that there is a meaningful reason for excluding the eleventh most frequent illness condition from the results and discussion. Given the large sample size and the widely dispersed nature of these variables, there may be no significant difference between a condition accounting for 2.6% of visits compared to one accounting for 2.5% of visits. Attempts were made to achieve a logical cut-off point where there was more than a 0.2% difference between conditions, but this was not always possible.

Fifth, variable and category definitions are, at best, imperfect in some cases. For example, the insurance variables were categorized without a clear picture of the impact of public-vs-private, HMO/PPO, or no insurance. These categories were collapsed for the analysis and were checked against findings from other studies, but should be interpreted with caution. Another example is the age categories. The categories used in this study are those used by the Census Bureau for population statistics and have been widely used in other studies. Nevertheless, it is difficult to judge how these somewhat arbitrary cut-off points might affect results interpretation.

Finally, some of the choices that were made about which variables to include in this analysis may interject bias. For example, only principal reasons for visit were analyzed. If secondary and tertiary reasons had been analyzed, they might have changed some of the results interpretations. This limitation was accepted in order to keep the study size manageable and because relatively few of the visits had both secondary and tertiary reasons or diagnoses reported. Restricting the analysis to principal reasons is common among other studies using these data sets.

Implications

Administrative and public policy. By far, most ambulatory care services for adults with illness-related complaints are provided in MDOs regardless of age, sex, race, ethnicity, geographic region or insurance status (85%). While inferences cannot be made about patterns of use (or lack of use) by individuals, since survey data were not population based, these findings demonstrate that

most ambulatory care services are office-based. If the contention that care by private physicians in their offices is the "best" kind, then this finding suggests that the organization of ambulatory care services in the U. S. is not so bad. Of those visits occurring in other settings, a disproportionate number are by blacks, Hispanics, and those with public, "unknown", or "other insurance". These findings reinforce that the ED and OPD settings may be considered "safety net" providers for less advantaged adults with illness-related complaints (Freund & Hurley, 1995). Policy decisions restricting access to care in these settings might negatively impact vulnerable groups.

This study suggests that insurance status plays an important role in service utilization across the country. There will continue to be debate about how to appropriately fund health care for the uninsured. As insurance coverage becomes a more episodic benefit it will be important to consider many factors in how to best insure equity and access to services.

Payment. Recent trends in payment practices involve retrospective denial of some ED claims based on final diagnosis. For obvious reasons this does not make sense (Steinbrook, 1996). In the ED setting, diagnostic tests often must be performed based on the presenting complaint in order to "rule out" potentially serious health problems. Additionally, other payment practices affecting either the availability or utilization of ED and other services should be carefully evaluated. Other studies have shown that the marginal costs of ED visits and their overall impact on health care costs do not warrant over reaction by payers

and policymakers to severely restrict access to these services (Cunningham et al., 1995; Williams, 1996).

Given the relatively small but significant number of ambulatory care visits for psychosocial problems, payment practices for mental health services deserve attention. Studies have shown that the way mental health care is funded may lead to under treatment and ineffective treatment of many disorders (Feinson, Lerner, Levinson, & Popper, 1997; Glied, 1998; Klerman, Olfson, Leon, & Weissman, 1992; Mechanic, 1990). Unfavorable payment practices in this area may contribute significantly to lost productivity in our society.

Future Research. Continued research on service use by vulnerable populations is warranted. In one study of ambulatory care use across all service locations and for all ages, blacks were reported to use MDOs less than two thirds of the time (Schappert, 1997). In this study, close to three fourths of ambulatory care visits by blacks were to MDOs. There is still much to know and understand about how and why blacks use ambulatory care services.

Investigations of the impact of insurance status on service use are needed. Findings from this study suggest that insurance is an enabling factor for illness-related services. Additionally, there is much to discover about the impact of managed care on types and amount of services used. These data show that managed care has an effect on the use of ED services, though some of the findings are contradictory.

Further study of the NP's role in ambulatory care for this patient population, including their ordering practices for diagnostic tests, would be an important

addition to the literature. In this study sample, NPs ordered a higher number of diagnostic tests compared to MDs , not all of which were "low-tech." In a study done in outpatient departments only and looking at visits by NPs and physician's assistants, there were similar findings but no suggested reasons for these differences (McCaig et al., 1998).

Studies of the impact of psychosocial symptoms and problems on the adult population are needed. This study shows a surprising number of ambulatory care visits for these problems. More information is needed about the specific types of services used, what is needed by those using services, and how much service is not being provided, e.g., what is the prevalence of mental health symptoms and problems in those who don't use services?

In general, there is still much to learn about the need for ambulatory care services in the adult population, how decisions are made to seek care, and how they determine where to go for care. It is widely accepted that real and perceived need for health care services is the largest single predictor of service use (Hulka & Wheat, 1985) (Andersen, 1995). Future studies using record-based surveys as well as ones using population-based surveys are needed. Linking these data sets would allow for a clearer understanding of how utilization patterns are related to access and health status variables. The first population-based comprehensive survey of health care costs, access, and utilization since 1987 recently has been released for public use (Medical Expenditure Panel Survey or MEPS). NCHS has begun to perform the National Health Interview Survey (NHIS) using laptop computers so that data are available more rapidly for

research purposes. They have revised extensively the NHIS survey questionnaires (as of the 1997 survey) to include contemporary health care issues such as HIV/AIDS and managed care. Additionally, all of these national surveys, NAMCS, NHAMCS, MEPS, and the NHIS are now using the same general sampling frames making data across surveys comparable (Eden, 1998). These are exciting times in health services research and it is critical that the interests and expertise of nurses are brought to bear on our nation's health care policy research and decision making.

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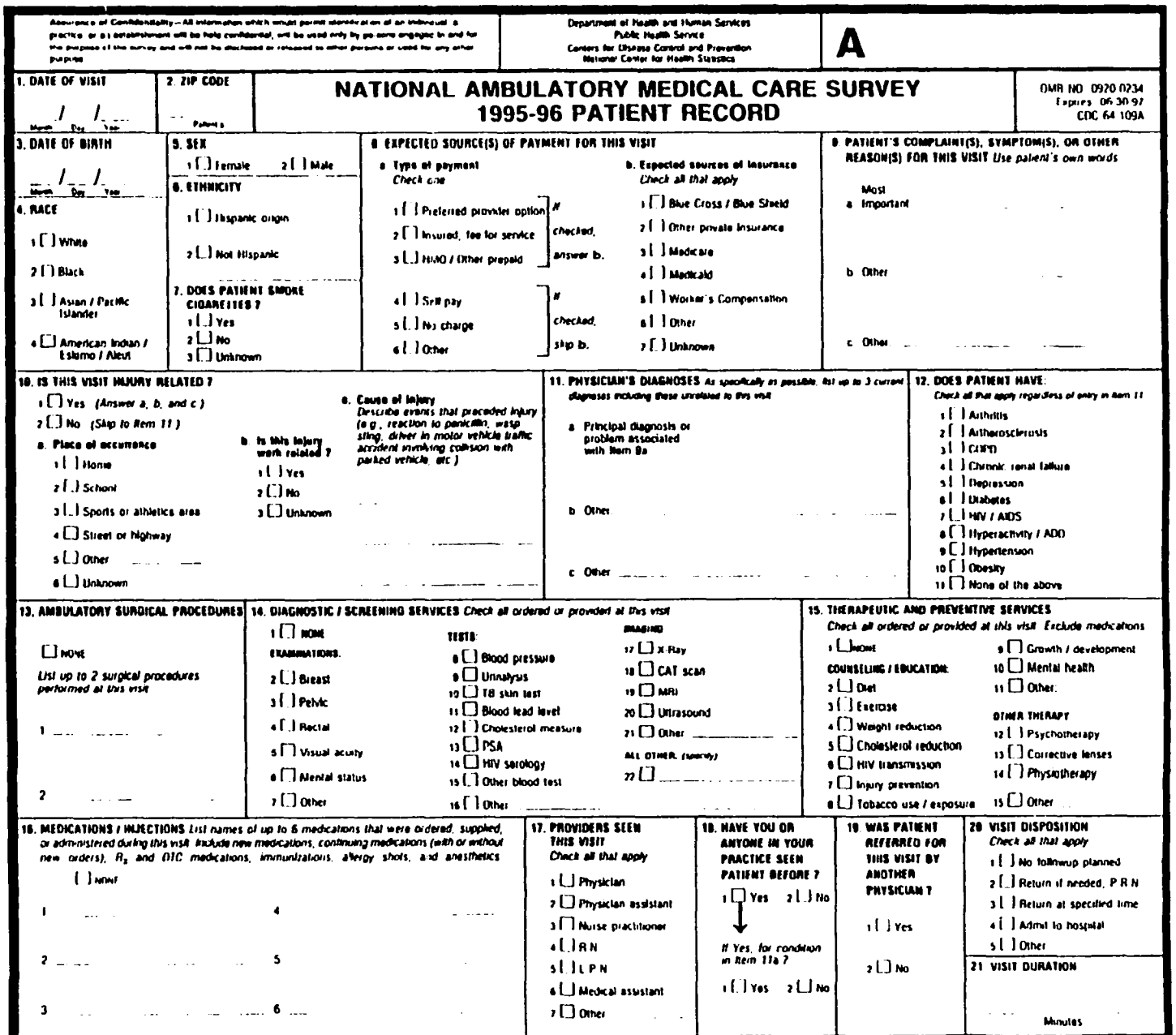


Assurance of Confidentiality – All information which would permit identification of an individual, a practice or an establishment will be held confidential, will be used only by persons engaged in and for the purpose of the survey and will not be disclosed or released to other persons or used for any other purpose.

Department of Health and Human Services
Public Health Service
Centers for Disease Control and Prevention
National Center for Health Statistics

A

NATIONAL AMBULATORY MEDICAL CARE SURVEY
1995-96 PATIENT RECORD

OMB NO. 0920-0234
Expires: 06-30-97
CDC 64.109A

1. DATE OF VISIT Month / Day / Year

2. ZIP CODE Patient's

3. DATE OF BIRTH Month / Day / Year

4. RACE
1 [ ] White
2 [ ] Black
3 [ ] Asian / Pacific Islander
4 [ ] American Indian / Eskimo / Aleut

5. SEX
1 [ ] Female 2 [ ] Male

6. ETHNICITY
1 [ ] Hispanic origin
2 [ ] Not Hispanic

7. DOES PATIENT SMOKE CIGARETTES ?
1 [ ] Yes
2 [ ] No
3 [ ] Unknown

8 EXPECTED SOURCE(S) OF PAYMENT FOR THIS VISIT

a. Type of payment *Check one*
1 [ ] Preferred provider option
2 [ ] Insured, fee for service
3 [ ] HMO / Other prepaid
(# checked, answer b.)
4 [ ] Self pay
5 [ ] No charge
6 [ ] Other
(# checked, skip b.)

b. Expected sources of insurance *Check all that apply*
1 [ ] Blue Cross / Blue Shield
2 [ ] Other private insurance
3 [ ] Medicare
4 [ ] Medicaid
5 [ ] Worker's Compensation
6 [ ] Other
7 [ ] Unknown

9 PATIENT'S COMPLAINT(S), SYMPTOM(S), OR OTHER REASON(S) FOR THIS VISIT *Use patient's own words*
Most Important
a
b Other
c Other

10. IS THIS VISIT INJURY RELATED ?
1 [ ] Yes *(Answer a, b, and c)*
2 [ ] No *(Skip to Item 11)*
a. Place of occurrence
1 [ ] Home
2 [ ] School
3 [ ] Sports or athletics area
4 [ ] Street or highway
5 [ ] Other
6 [ ] Unknown
b. Is this injury work related ?
1 [ ] Yes
2 [ ] No
3 [ ] Unknown
c. Cause of injury *Describe events that preceded injury (e.g., reaction to penicillin, wasp sting, driver in motor vehicle traffic accident involving collision with parked vehicle, etc.)*

11. PHYSICIAN'S DIAGNOSES *As specifically as possible, list up to 3 current diagnoses including those unrelated to this visit*
a Principal diagnosis or problem associated with Item 9a
b Other
c Other

12. DOES PATIENT HAVE: *Check all that apply regardless of entry in Item 11*
1 [ ] Arthritis
2 [ ] Atherosclerosis
3 [ ] CHF
4 [ ] Chronic renal failure
5 [ ] Depression
6 [ ] Diabetes
7 [ ] HIV / AIDS
8 [ ] Hyperactivity / ADD
9 [ ] Hypertension
10 [ ] Obesity
11 [ ] None of the above

13. AMBULATORY SURGICAL PROCEDURES
[ ] NONE
List up to 2 surgical procedures performed at this visit
1
2

14. DIAGNOSTIC / SCREENING SERVICES *Check all ordered or provided at this visit*
1 [ ] NONE
EXAMINATIONS:
2 [ ] Breast
3 [ ] Pelvic
4 [ ] Rectal
5 [ ] Visual acuity
6 [ ] Mental status
7 [ ] Other
TESTS:
8 [ ] Blood pressure
9 [ ] Urinalysis
10 [ ] TB skin test
11 [ ] Blood lead level
12 [ ] Cholesterol measure
13 [ ] PSA
14 [ ] HIV serology
15 [ ] Other blood test
16 [ ] Other
IMAGING
17 [ ] X-Ray
18 [ ] CAT scan
19 [ ] MRI
20 [ ] Ultrasound
21 [ ] Other
ALL OTHER *(specify)*
22 [ ]

15. THERAPEUTIC AND PREVENTIVE SERVICES *Check all ordered or provided at this visit. Exclude medications*
1 [ ] NONE
COUNSELING / EDUCATION:
2 [ ] Diet
3 [ ] Exercise
4 [ ] Weight reduction
5 [ ] Cholesterol reduction
6 [ ] HIV transmission
7 [ ] Injury prevention
8 [ ] Tobacco use / exposure
9 [ ] Growth / development
10 [ ] Mental health
11 [ ] Other:
OTHER THERAPY
12 [ ] Psychotherapy
13 [ ] Corrective lenses
14 [ ] Physiotherapy
15 [ ] Other

16. MEDICATIONS / INJECTIONS *List names of up to 6 medications that were ordered, supplied, or administered during this visit. Include new medications, continuing medications (with or without new orders), R_x and OTC medications, immunizations, allergy shots, and anesthetics*
[ ] NONE
1
2
3
4
5
6

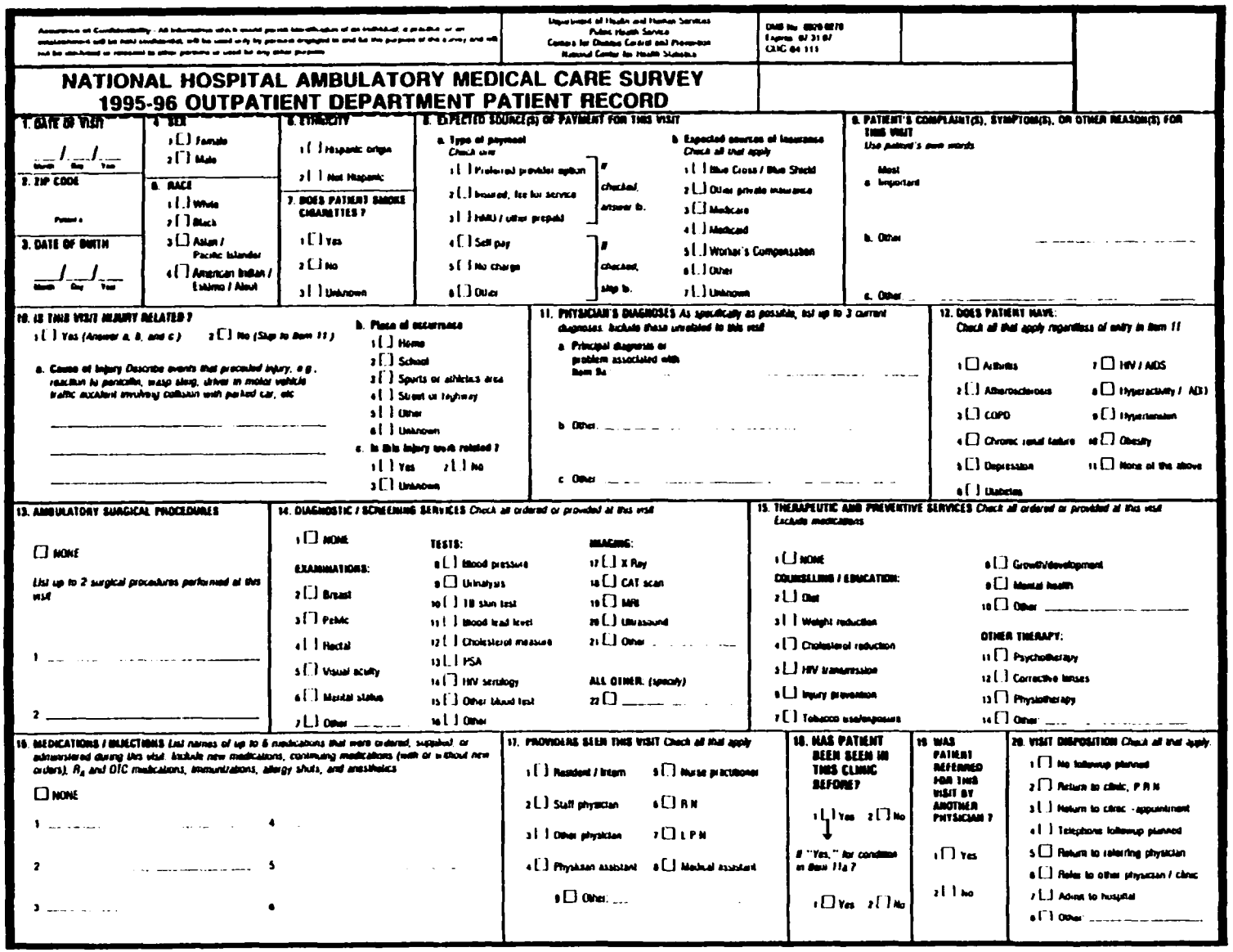
17. PROVIDERS SEEN THIS VISIT *Check all that apply*
1 [ ] Physician
2 [ ] Physician assistant
3 [ ] Nurse practitioner
4 [ ] R N
5 [ ] L P N
6 [ ] Medical assistant
7 [ ] Other

18. HAVE YOU OR ANYONE IN YOUR PRACTICE SEEN PATIENT BEFORE ?
1 [ ] Yes 2 [ ] No
If Yes, for condition in Item 11a ?
1 [ ] Yes 2 [ ] No

19. WAS PATIENT REFERRED FOR THIS VISIT BY ANOTHER PHYSICIAN ?
1 [ ] Yes
2 [ ] No

20 VISIT DISPOSITION *Check all that apply*
1 [ ] No follow-up planned
2 [ ] Return if needed, P R N
3 [ ] Return at specified time
4 [ ] Admit to hospital
5 [ ] Other

21 VISIT DURATION
Minutes



Assurance of Confidentiality - All information which would permit identification of an individual, a practice, or an establishment will be held confidential, will be used only by persons engaged in and for the purpose of the survey, and will not be disclosed or released to other persons or used for any other purpose.

Department of Health and Human Services
Public Health Service
Centers for Disease Control and Prevention
National Center for Health Statistics

OMB No. 0920-0278
Expires: 07/31/97
CLEC 04 111

NATIONAL HOSPITAL AMBULATORY MEDICAL CARE SURVEY
1995-96 OUTPATIENT DEPARTMENT PATIENT RECORD

1. DATE OF VISIT ___/___/___ (Month Day Year)

2. ZIP CODE (Patient's)

3. DATE OF BIRTH ___/___/___ (Month Day Year)

4. SEX
1 ☐ Female
2 ☐ Male

5. RACE
1 ☐ White
2 ☐ Black
3 ☐ Asian / Pacific Islander
4 ☐ American Indian / Eskimo / Aleut

6. ETHNICITY
1 ☐ Hispanic origin
2 ☐ Not Hispanic

7. DOES PATIENT SMOKE CIGARETTES?
1 ☐ Yes
2 ☐ No
3 ☐ Unknown

8. EXPECTED SOURCE(S) OF PAYMENT FOR THIS VISIT

a. Type of payment *Check one*
1 ☐ Preferred provider option
2 ☐ Insured, fee for service
3 ☐ HMO / other prepaid
4 ☐ Self pay
5 ☐ No charge
6 ☐ Other

If checked, answer b.
If checked, skip b.

b. Expected sources of insurance *Check all that apply*
1 ☐ Blue Cross / Blue Shield
2 ☐ Other private insurance
3 ☐ Medicare
4 ☐ Medicaid
5 ☐ Worker's Compensation
6 ☐ Other
7 ☐ Unknown

9. PATIENT'S COMPLAINT(S), SYMPTOM(S), OR OTHER REASON(S) FOR THIS VISIT *Use patient's own words*

Most
a. Important

b. Other

c. Other

10. IS THIS VISIT INJURY RELATED?
1 ☐ Yes *(Answer a, b, and c)* 2 ☐ No *(Skip to Item 11)*

a. Cause of injury *Describe events that precipitated injury, e.g., reaction to penicillin, wasp sting, driver in motor vehicle traffic accident involving collision with parked car, etc*

b. Place of occurrence
1 ☐ Home
2 ☐ School
3 ☐ Sports or athletics area
4 ☐ Street or highway
5 ☐ Other
6 ☐ Unknown

c. Is this injury work related?
1 ☐ Yes 2 ☐ No
3 ☐ Unknown

11. PHYSICIAN'S DIAGNOSES *As specifically as possible, list up to 3 current diagnoses. Include those unrelated to this visit*

a. Principal diagnosis or problem associated with Item 9a

b. Other

c. Other

12. DOES PATIENT HAVE: *Check all that apply regardless of entry in Item 11*
1 ☐ Arthritis
2 ☐ Atherosclerosis
3 ☐ COPD
4 ☐ Chronic renal failure
5 ☐ Depression
6 ☐ Diabetes
7 ☐ HIV / AIDS
8 ☐ Hyperactivity / ADD
9 ☐ Hypertension
10 ☐ Obesity
11 ☐ None of the above

13. AMBULATORY SURGICAL PROCEDURES

☐ NONE

List up to 2 surgical procedures performed at this visit

1

2

14. DIAGNOSTIC / SCREENING SERVICES *Check all ordered or provided at this visit*

1 ☐ NONE

EXAMINATIONS:
2 ☐ Breast
3 ☐ PelMc
4 ☐ Rectal
5 ☐ Visual acuity
6 ☐ Marital status
7 ☐ Other

TESTS:
8 ☐ Blood pressure
9 ☐ Urinalysis
10 ☐ TB skin test
11 ☐ Blood lead level
12 ☐ Cholesterol measure
13 ☐ PSA
14 ☐ HIV serology
15 ☐ Other blood test
16 ☐ Other

IMAGING:
17 ☐ X Ray
18 ☐ CAT scan
19 ☐ MRI
20 ☐ Ultrasound
21 ☐ Other

ALL OTHER. (specify)
22 ☐

15. THERAPEUTIC AND PREVENTIVE SERVICES *Check all ordered or provided at this visit. Exclude medications*

1 ☐ NONE

COUNSELLING / EDUCATION:
2 ☐ Diet
3 ☐ Weight reduction
4 ☐ Cholesterol reduction
5 ☐ HIV transmission
6 ☐ Injury prevention
7 ☐ Tobacco use/exposure
8 ☐ Growth/development
9 ☐ Mental health
10 ☐ Other

OTHER THERAPY:
11 ☐ Psychotherapy
12 ☐ Corrective lenses
13 ☐ Physiotherapy
14 ☐ Other

16. MEDICATIONS / INJECTIONS *List names of up to 6 medications that were ordered, supplied or administered during this visit. Include new medications, continuing medications (with or without new orders), R_x and OTC medications, immunizations, allergy shots, and anesthetics*

☐ NONE

1 4

2 5

3 6

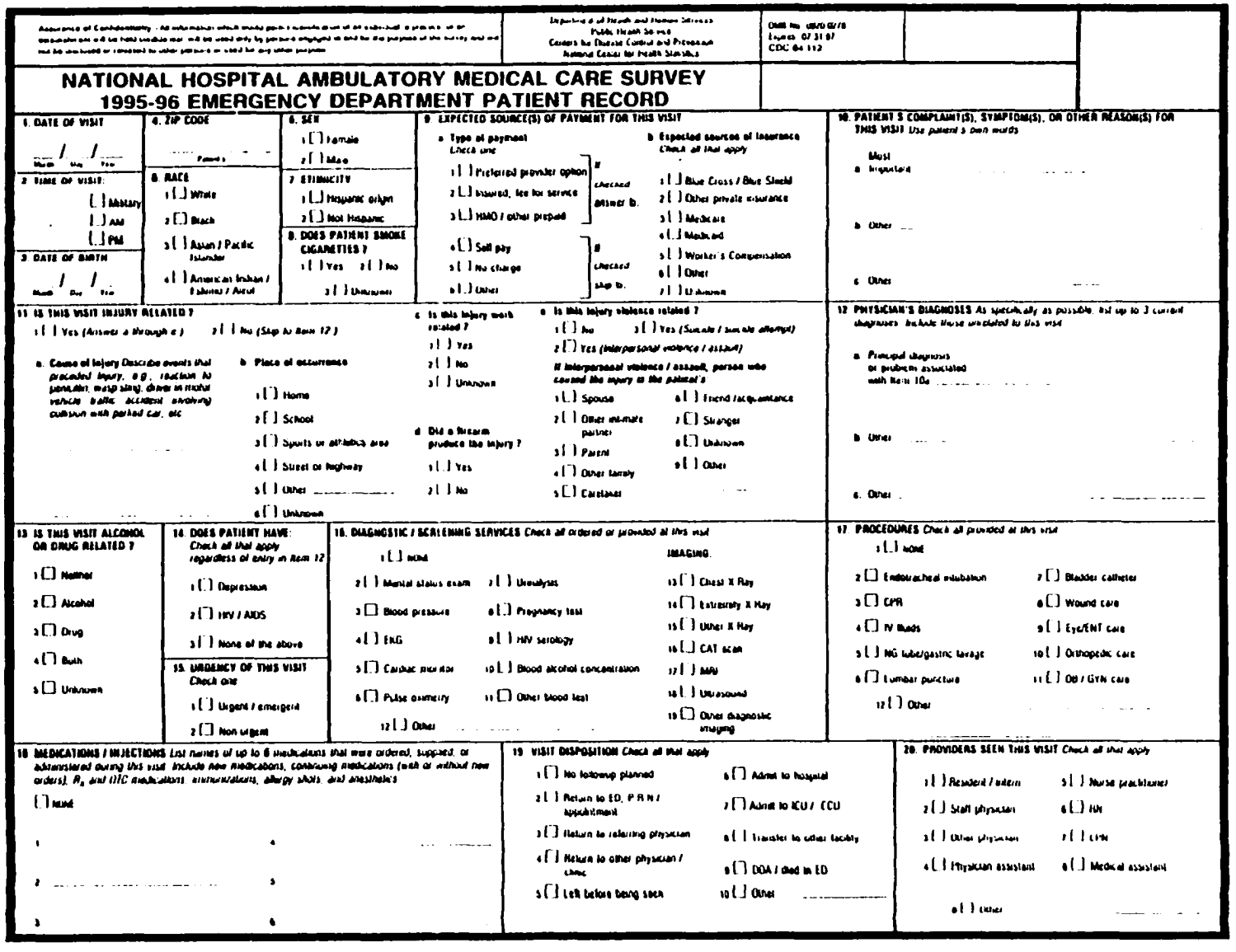
17. PROVIDERS SEEN THIS VISIT *Check all that apply*
1 ☐ Resident / Intern
2 ☐ Staff physician
3 ☐ Other physician
4 ☐ Physician assistant
5 ☐ Nurse practitioner
6 ☐ R N
7 ☐ L P N
8 ☐ Medical assistant
9 ☐ Other:

18. HAS PATIENT BEEN SEEN IN THIS CLINIC BEFORE?
1 ☐ Yes 2 ☐ No

If "Yes," for condition in Item 11a?
1 ☐ Yes 2 ☐ No

19. WAS PATIENT REFERRED FOR THIS VISIT BY ANOTHER PHYSICIAN?
1 ☐ Yes
2 ☐ No

20. VISIT DISPOSITION *Check all that apply*
1 ☐ No followup planned
2 ☐ Return to clinic, P R N
3 ☐ Return to clinic - appointment
4 ☐ Telephone followup planned
5 ☐ Return to referring physician
6 ☐ Refer to other physician / clinic
7 ☐ Admit to hospital
8 ☐ Other



Assurance of Confidentiality: All information which would permit identification of an individual or a provider will be held confidential, will be used only by persons engaged in and for the purposes of the survey, and will not be disclosed or released to other persons or used for any other purpose.

Department of Health and Human Services
Public Health Service
Centers for Disease Control and Prevention
National Center for Health Statistics

OMB No. 0920-0278
Expires: 07/31/97
CDC 84.112

NATIONAL HOSPITAL AMBULATORY MEDICAL CARE SURVEY
1995-96 EMERGENCY DEPARTMENT PATIENT RECORD

1. DATE OF VISIT ___ / ___ / ___ (Month / Day / Year)

2. TIME OF VISIT: [ ] Military ___ [ ] AM [ ] PM

3. DATE OF BIRTH ___ / ___ / ___ (Month / Day / Year)

4. ZIP CODE _____ (Patient's)

5. RACE
1 [ ] White
2 [ ] Black
3 [ ] Asian / Pacific Islander
4 [ ] American Indian / Alaskan / Aleut

6. SEX
1 [ ] Female
2 [ ] Male

7. ETHNICITY
1 [ ] Hispanic origin
2 [ ] Not Hispanic

8. DOES PATIENT SMOKE CIGARETTES?
1 [ ] Yes 2 [ ] No 3 [ ] Unknown

9. EXPECTED SOURCE(S) OF PAYMENT FOR THIS VISIT

a. Type of payment *Check one*
1 [ ] Preferred provider option
2 [ ] Insured, fee for service
3 [ ] HMO / other prepaid
4 [ ] Self pay
5 [ ] No charge
6 [ ] Other
(If checked, answer b. If checked, skip to b.)

b. Expected sources of insurance *Check all that apply*
1 [ ] Blue Cross / Blue Shield
2 [ ] Other private insurance
3 [ ] Medicare
4 [ ] Medicaid
5 [ ] Worker's Compensation
6 [ ] Other
7 [ ] Unknown

10. PATIENT'S COMPLAINT(S), SYMPTOM(S), OR OTHER REASON(S) FOR THIS VISIT *Use patient's own words*

Most
a. Important _____
b. Other _____
c. Other _____

11. IS THIS VISIT INJURY RELATED?
1 [ ] Yes *(Answer a through e.)* 2 [ ] No *(Skip to Item 12.)*

a. Cause of injury *Describe events that precipitated injury, e.g., reaction to penicillin, wasp sting, driver in motor vehicle traffic accident involving collision with parked car, etc.*

b. Place of occurrence
1 [ ] Home
2 [ ] School
3 [ ] Sports or athletics area
4 [ ] Street or highway
5 [ ] Other _____
6 [ ] Unknown

c. Is this injury work related?
1 [ ] Yes
2 [ ] No
3 [ ] Unknown

d. Did a firearm produce the injury?
1 [ ] Yes
2 [ ] No

e. Is this injury violence related?
1 [ ] No 3 [ ] Yes *(Suicide / suicide attempt)*
2 [ ] Yes *(Interpersonal violence / assault)*
If interpersonal violence / assault, person who caused the injury to the patient is
1 [ ] Spouse
2 [ ] Other unmarried partner
3 [ ] Parent
4 [ ] Other family
5 [ ] Caretaker
6 [ ] Friend / acquaintance
7 [ ] Stranger
8 [ ] Unknown
9 [ ] Other

12. PHYSICIAN'S DIAGNOSES *As specifically as possible, list up to 3 current diagnoses. Include those unrelated to this visit.*

a. Principal diagnosis or problem associated with Item 10a _____
b. Other _____
c. Other _____

13. IS THIS VISIT ALCOHOL OR DRUG RELATED?
1 [ ] Neither
2 [ ] Alcohol
3 [ ] Drug
4 [ ] Both
5 [ ] Unknown

14. DOES PATIENT HAVE: *Check all that apply regardless of entry in Item 12*
1 [ ] Depression
2 [ ] HIV / AIDS
3 [ ] None of the above

15. URGENCY OF THIS VISIT *Check one*
1 [ ] Urgent / emergent
2 [ ] Non-urgent

16. DIAGNOSTIC / SCREENING SERVICES *Check all ordered or provided at this visit*
1 [ ] None
2 [ ] Mental status exam
3 [ ] Blood pressure
4 [ ] EKG
5 [ ] Cardiac monitor
6 [ ] Pulse oximetry
7 [ ] Urinalysis
8 [ ] Pregnancy test
9 [ ] HIV serology
10 [ ] Blood alcohol concentration
11 [ ] Other blood test
12 [ ] Other

IMAGING
13 [ ] Chest X-Ray
14 [ ] Extremity X-Ray
15 [ ] Other X-Ray
16 [ ] CAT scan
17 [ ] MRI
18 [ ] Ultrasound
19 [ ] Other diagnostic imaging

17. PROCEDURES *Check all provided at this visit*
1 [ ] None
2 [ ] Endotracheal intubation
3 [ ] CPR
4 [ ] IV fluids
5 [ ] NG tube/gastric lavage
6 [ ] Lumbar puncture
7 [ ] Bladder catheter
8 [ ] Wound care
9 [ ] Eye/ENT care
10 [ ] Orthopedic care
11 [ ] OB / GYN care
12 [ ] Other

18. MEDICATIONS / INJECTIONS *List names of up to 6 medications that were ordered, supplied, or administered during this visit. Include new medications, continuing medications (with or without new orders), R_x and OTC medications, immunizations, allergy shots, and anesthetics*

[ ] None
1 _____
2 _____
3 _____
4 _____
5 _____
6 _____

19. VISIT DISPOSITION *Check all that apply*
1 [ ] No follow-up planned
2 [ ] Return to ED, PRN / appointment
3 [ ] Return to referring physician
4 [ ] Return to other physician / clinic
5 [ ] Left before being seen
6 [ ] Admit to hospital
7 [ ] Admit to ICU / CCU
8 [ ] Transfer to other facility
9 [ ] DOA / died in ED
10 [ ] Other

20. PROVIDERS SEEN THIS VISIT *Check all that apply*
1 [ ] Resident / intern
2 [ ] Staff physician
3 [ ] Other physician
4 [ ] Physician assistant
5 [ ] Nurse practitioner
6 [ ] RN
7 [ ] LPN
8 [ ] Medical assistant
9 [ ] Other