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AGGREGATED CLAIMS SERIES

Volume 5: CODEBOOK FOR HEALTH MAINTENANCE ORGANIZATION AND SEATTLE FEE-FOR-SERVICE ANNUAL EXPENDITURES AND VISIT COUNTS

C. E. Peterson, M. Nelsen, D. L. Wesley, A. M. Bell

December 1986

HEALTH INSURANCE EXPERIMENT

THE RAND CORPORATION

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PREFACE

The codebooks presented in this Note describe the contents of data files from the Health Insurance Experiment (HIE), a large social experiment conducted by The RAND Corporation from 1974 to 1982 under a grant from the U.S. Department of Health and Human Services, Washington, D.C. RAND is issuing a number of tape data files containing data collected from the experiment, grouped in series, with associated documentation.

This volume is the fifth of five volumes in the aggregated claims series, a series of derived-variable files that present aggregations of primary-variable data taken from the fee-for-service (FFS) and health maintenance organization (HMO) claims line-item files of the HIE. The HMO and Seattle FFS annual expenditures and visit counts file documented herein contains the annual sums of imputed expenditures and types of visits for Seattle FFS participants and participants enrolled in Group Health Cooperative (GHC) of Puget Sound, a large prepaid group practice in Seattle.

The yearly expenditure totals presented are not itemized by services. To ensure the comparability of the expenditure totals presented here, the costs of FFS and HMO physicians and nonphysician health professionals have been imputed using the same process. This file contains no information regarding drug, supply, and outpatient institutional charges (e.g., hospital clinic fees), and no information regarding dental care.

The codes used in the present volume (and in all claims files) are listed and defined in *HIE References, Vol. 1: Codes Used in HIE Claims--Diagnoses, Symptoms, Procedures, Drugs, and Supplies*, The RAND Corporation, N-2349/1-HHS, May 1986.

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The authors would like to thank George Goldberg, M.D. for his expert and invaluable assistance in preparing this documentation. We also thank Willard Manning and Bernadette Benjamin, who guided us through the intricacies of the data. Grateful acknowledgment is given to Betty Amo and Joice Polin for their indispensable help in preparing the documents for publication. Suzanne Polich gave us helpful comments during the early stages of the document's development. Ellyn Bloomfield provided a thoughtful and incisive review. Thanks are also extended to Christine d'Arc Taylor for writing the introduction to the Health Insurance Experiment that appears as the first section of this volume. Final production of the Note was supervised by Patricia Bedrosian. Finally, we want to thank Joseph Newhouse for his guidance and support.

CONTENTS

TABLES

I. INTRODUCTION

This section presents an overview of the Health Insurance Experiment (HIE) and its data collection and file development efforts. It provides essential background for understanding the contents of this codebook. Section II describes the distinctive features of the HMO and Seattle FFS annual expenditures and visit counts file; Sec. III presents the codebook.

EXPERIMENTAL DESIGN

The RAND Corporation conducted the Health Insurance Experiment from 1974 to 1982 in six sites across the United States: Dayton, Ohio; Seattle, Washington; Franklin County and Fitchburg, Massachusetts; and Georgetown County and Charleston, South Carolina.[1] The main purpose of the experiment was to assess how varying patients' cost of health services affected their use of services, their satisfaction with health care, the quality of their care, and the state of their health. A related purpose was to study how those outcomes were affected by the mode of delivery--fee for service or health maintenance organization (HMO).[2]

Over the course of the experiment, information of some kind was obtained for 26,148 persons. A total of 24,340 persons were administered a baseline interview (*baseline participants*[3]), of which

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[1]The sites were chosen to represent the four census regions of the country and both urban and rural areas. They also differed in the amount of delay to obtain an appointment, reflecting different degrees of stress on the ambulatory medical care system. Site selection is described in Philip J. Held, *Site Selection Criteria for the Health Insurance Study,* The RAND Corporation, N-2266-HHS, May 1985.

[2]For a discussion of the purposes and design of the HIE, see Joseph P. Newhouse, "A Design for a Health Insurance Experiment," *Inquiry,* Vol. 11, 1974, pp. 5-27. HIE is also called HIS, Health Insurance Study. The terms are synonymous.

[3]This and other distinctive HIE terms are defined in the Glossary at the end of this document.

7,700 were ultimately enrolled.[4] An additional 554 persons were enrolled later, all but a few of them newborns or adopted children under one year of age. Those 8,254 *insured enrollees* were assigned to an *experimental insurance treatment*, and data on their use of health services were collected throughout their period of participation.[5] Another 2,483 *adjunct enrollees* were not assigned to an insurance treatment but resided with insured enrollees or were members of a short-lived control group in Dayton.

Selection of Enrollees

Persons offered enrollment in the experiment represent a random sample from each site, subject to certain eligibility restrictions.[6] They were chosen by a two-stage baseline selection process. In each site an areawide probability sample of dwelling units was drawn. Their occupants were interviewed for eligibility, and those found eligible were questioned in depth about their socioeconomic characteristics and experience with health care (baseline interview).

Eligibility criteria excluded those whose health care delivery systems differed from options available to the general population. The following groups were excluded:

- Those who were eligible for Medicare or would become so during the experiment, i.e., those 62 years of age and older, or younger than 62 but with a Medicare-eligible condition such as end-stage renal disease.
- Those with family incomes over $25,000 (1973 dollars).

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[4]Of the remaining 16,640 persons, the 15,411 who did not enroll are called *baseline-only participants*; the other 1,229 are part of the adjunct enrollee group defined below.

[5]Note that "insured" in HIE terminology only means "assigned to an experimental treatment." By the same token, "uninsured" applies only to a participant not so assigned, not necessarily someone lacking health insurance altogether.

[6]Subject also to slight oversampling of low-income families in Dayton, Massachusetts, and South Carolina.

- Those institutionalized (jail, long-term hospital).
- Veterans with service-connected disabilities.
- Those in the military and their dependents.[7]

Project staff verified the accuracy of the information given by baseline participants with employers and insurance companies.

In the second selection stage, HIE staff drew a representative sample of eligible persons to be offered enrollment and assigned each family to one of the insurance plans described below. A sophisticated technique assured that, across plans, families closely resembled each other in 24 health and socioeconomic characteristics.[8]

Experimental Treatments

Sixteen experimental treatments distinguished between coinsurance rates, delivery systems, and maximum out-of-pocket expenditures. All but one of the treatments were health insurance plans, listed below as A-O. Enrollees who had gone through the baseline selection process were assigned to one of the plans. The remaining treatment involved a control group in Seattle, chosen separately.

Insurance Plans. Plans A-N entailed different degrees of cost sharing under the fee-for-service system. Within each cost-sharing group, listed below, plans also differed by the ceiling placed on maximum expenditure. Plan O involved participation in a prepaid group practice, a traditional type of HMO:

A. Free care (0% coinsurance) (one plan).
B-D. Family pays 25% of its medical bills (25% coinsurance) (three plans).

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[7]Details of HIE eligibility requirements are in Lorraine Clasquin and Marie E. Brown, *Rules of Operation for the Rand Health Insurance Study*, The RAND Corporation, R-1602-HEW, May 1977, Sec. II.

[8]The logic and techniques used to determine optimal sample sizes and assign individual families to experimental plans are described in Carl N. Morris, "A Finite Selection Model for Experimental Design of the Health Insurance Study," *Journal of Econometrics*, Vol. 11, 1979, pp. 43-61.

E-G. 50% coinsurance (three plans).

H-J. 50% coinsurance for dental and outpatient mental health services and 25% coinsurance for all other services (three plans).

K-M. 95% coinsurance (three plans).

N. 95% coinsurance on outpatient services; 0% on hospital care (one plan).[9]

O. 0% coinsurance if care was received at a Seattle HMO, Group Health Cooperative of Puget Sound; 95% if care was received outside the HMO (one plan).

Plans requiring coinsurance (B-N) placed a ceiling on annual out-of-pocket expenditures, above which care was free.[10] In all but one plan (N), the ceiling was a specified percentage of the family's income or a dollar limit, whichever was less. The percentage varied with family income and the dollar limit varied with the plan, as indicated below:

Plan	*Percentage of Family Income*	*Dollar Limit*
B-D	5, 10, or 15	1000/750[11]
E-G	5, 10, or 15	1000
H-J	5, 10, or 15	1000/750
K-M	5, 10, or 15	1000
N	--	150 per individual; 450 per family

[9]During the experiment's first year in Dayton, the provisions of plans A-N differed in two ways: Only plan A covered dental services for adults; and the coinsurance rate on plans K-N was 100 percent instead of 95 percent.

[10]During the experiment's first year in Dayton, expenditures for outpatient mental health care did not apply toward the ceiling.

[11]In plans B-D and H-J the $1000 limit applied during the first two years of enrollment for Dayton families who enrolled from November 1974 to February 1975; and during the first year of enrollment for Seattle families who enrolled from January to September 1976. The $750 limit applied during subsequent enrollment years for the aforementioned families, and during the entire enrollment period for all other families.

HMO Control Group. A random sample of existing members of the Group Health Cooperative (subject to HIE eligibility requirements) was drawn as a control group for the HMO experimental group assigned to plan 0. The control group was formed to compare HMO use by those who had *chosen* that delivery mode (i.e., members of the control group) with use by those experimentally *transferred* to an HMO from the fee-for-service system (i.e., members of the experimental group). Enrollees in the HMO control group continued with the Group Health Cooperative under their prior arrangements but provided the same data as HMO experimental members. With respect to the insurance provider, enrollees assigned to plans A-0 (including the HMO experimental group) were said to be HIE-insured; the HMO control group was termed HMO-insured.

Services Provided

Plans A-0 provided the same comprehensive benefits, including hospital, physician, dental, mental health, visual, and auditory services, drugs (including over-the-counter drugs for certain chronic conditions), and supplies. Services of nonphysician providers, such as audiologists, chiropractors, clinical psychologists, optometrists, physical therapists, and speech therapists, were also covered. The only noteworthy exclusions were nonpreventive orthodontic services, cosmetic surgery for preexisting conditions, and outpatient mental health visits exceeding 52 per year.

Enrollees were able to choose the physicians and other persons who provided their health care. However, if those in the HMO experimental group sought care outside the HMO that was available within, they were responsible for 95 percent of the cost. (For covered services, such as dental or chiropractic, that were unavailable at the HMO, members of the experimental HMO group were fully reimbursed.)

Enrollees in the HMO control group retained whatever benefit package they or their employer had purchased from the HMO. Members of both control and experimental groups were reimbursed 5 percent of the cost of care obtained outside the HMO to encourage the reporting of non-HMO care.

Terms of Enrollment

Families who accepted the insurance plan offered from plans A-O were enrolled in the experiment for either three or five years, the term randomly assigned. All members of the HMO control group were enrolled for five years.

Enrollees assigned any benefits from their existing health insurance policies to the HIE during the time they participated. No family was financially penalized by HIE enrollment. Enrollees were reimbursed for the cost of maintaining their policies, and if their HIE plan could, under any conceivable set of circumstances, provide less coverage than their private policies, they were paid the maximum difference.[12]

Table 1 indicates the timing of enrollment in the experiment and number of enrollees insured immediately after the baseline selection process in each site.

DATA COLLECTION

Over the course of the experiment, extensive data were collected on participants' demographic and economic characteristics, health status, and use of health services. Background information was obtained on local health care costs, providers, and types of services rendered. The data collection instruments are described in Table 2.

Table 2 shows the amount and types of data gathered from the various participant groups. The most extensive data, especially longitudinal data on the use of health services, are available from the 8,254 insured enrollees, who participated in the experiment longest. The 15,411 baseline-only participants provided much demographic and socioeconomic data, as well as information on health status, experience with health care, and health-related attitudes. Limited data were obtained for the 2,483 adjunct enrollees.

Several subcontractors to RAND participated in the data collection effort. Until March 1975, Mathematica, Inc., supervised data collection, administered the insurance plans, and processed claim forms.

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[12]Calculation of the maximum difference is described in Appendix A.

Table 1

HIE ENROLLMENT PERIODS

Site	Number of Enrollees[1]	1974	1975	1976	1977	1978	1979	1980	1981	1982
Dayton	1137	Nov.						Feb.		
3-year	533						Feb.			
5-year	604									
Seattle	3112			Jan.				Sept.		
3-year	1500						Sept.			
5-year	1612									
Fitchburg	723			July				Oct.		
3-year	547						Oct.			
5-year	176									
Franklin Co.	889			July				Oct.		
3-year	649						Oct.			
5-year	240									
Charleston	779			Nov.						Feb.
3-year[2]	571					Nov.				
5-year	208									
Georgetown Co.	1060			Nov.						Feb.
3-year[3]	800					Nov.				
5-year	260									
Total	7700									

NOTE: Timelines mark the month and year in which the first person enrolled in the experiment and the month and year in which the last person left the experiment. Data on use of health services continued to be collected from several groups after the end dates shown here: one year afterward for the Dayton 5-year group and Seattle, Fitchburg, and Franklin County 3-year groups; six months afterward for the Dayton 3-year group.

[1]Numbers refer to enrollees insured immediately after the baseline selection process. An additional 554 persons were enrolled and insured later, nearly all of them newborns or adopted children under 1 year of age. Figures for Seattle include the HMO control group.

[2]Some of these enrollees were also members of a preenrollment group between November 1976 and February 1979. An additional 339 persons participated in the preenrollment phase but did not formally enroll in the experiment.

[3]Some of these enrollees were also members of a preenrollment group between November 1976 and February 1979. An additional 213 persons participated in the preenrollment phase but did not formally enroll in the experiment.

Table 2

PRINCIPAL HIE DATA COLLECTION INSTRUMENTS

Instrument	Topics Covered	Data Collected		
		How	When	From
1. Screening questionnaire [1]	Demographic information to establish basic eligibility	Interview	Beginning of HIE operation in site	Occupants of representative sample of dwelling units on geographic clusters in site
2. Baseline questionnaire, 2 parts	Income, employment Family composition	Interview	4-6 months before enrollment	Baseline participants
	Health status Health care experience and insurance coverage Satisfaction with medical care	Self-administered	4-6 months before enrollment	Baseline participants
3. Enrollment verification form	Changes in family composition, economics, or insurance coverage since baseline questionnaire	Interview	Between administration of baseline questionnaire and enrollment date	Baseline participants determined eligible
4. Medical history questionnaire (MHQ), 3 versions by age group: 0-4 years 5-13 years 14+ years	Form A: health status, attitudes, habits Form B: specific medical disorders	Administered by self or parent [2]	Just before enrollment and exit [3]	Insured enrollees
5. Medical screening examination, 3 versions by age group: 0-2 years 3-13 years 14+ years	Physiologic tests	Paramedical personnel	Just before enrollment and exit	Sample of insured enrollees at enrollment; all exiting enrollees
6. Health report	Use of medical or dental services and time spent obtaining them; any restricted activity or bed disability	Administered by self or parent	Biweekly during period of participation	Insured enrollees [4]

1. Administered as a separate questionnaire only in Dayton; part of baseline questionnaire in the other sites.
2. When "parent" appears in this column, a parent was asked to provide data for children 13 and younger.
3. "Exit" refers to normal departure from the experiment after completing the assigned enrollment period, three or five years. Those who "attrited," or voluntarily left the experiment early, received an "attrition" MHQ that was identical to the exit MHQ.
4. In the first year of the experiment in Dayton, the health report was administered weekly to a random half of Dayton enrollees. In the first year of the experiment in Massachusetts and South Carolina, 25 percent of enrollees were exempted to measure the reporting requirement's effect on the use of health services. Also at one point virtually all participants stopped filling out health reports, for budgetary reasons.

Table 2 (cont.)

Instrument	Topics Covered	Data Collected		
		How	When	From
7. Health care questionnaire, 3 versions by age group: 0-4 years 5-13 years 14+ years	Health status, attitudes, habits (subset of MHQ)	Administered by self or parent	Each anniversary of enrollment except at exit	Insured enrollees
8. Annual income report	Amount and sources of family income, taxes paid	Self-administered	Annually (April)	Head of insured family
9. Periodic employment report	Wages, hours worked, family payments for care of children or elderly, government program benefits received	Self-administered	Semiannually	Enrollees (head and family members 16 and older)
10. Assets and debts questionnaire	Family assets and liabilities	Self-administered	Exit	Head of insured family
11. Knowledge of coverage questionnaire	Details of HIE insurance plan	Self-administered	Specified intervals [5]	Insured enrollees
12. Insurance abstraction	Details of selected insurance policies	Abstraction	At time of knowledge of coverage questionnaire	Insurance company brochures
13. Chronic condition questionnaire	Status of condition, correctness of diagnosis, adequacy of treatment	Physician interview	At exit medical screening examination	Sample of insured enrollees found to have certain chronic conditions [6]
14. Evaluation questionnaire	Perceptions and attitudes about HIE and health care system	Self-administered	Exit	Head of insured family
15. Health notice	Use of medical or dental services	Administered by self or parent	Biweekly during preenrollment phase (South Carolina); 6 months-1 year after exit (other sites)	Preenrollees (South Carolina), insured enrollees who have exited (other sites)

5. Intended intervals were enrollment, 18 months, 3 years, and 5 years after enrollment (the last only for the 5-year participants). Actual mailings approximated those intervals in Massachusetts and South Carolina; the first mailing was 2-1/2 years and 1 year after enrollment in Dayton and Seattle, respectively.
6. Hypertension, diabetes, thyroid diseases, chronic heart diseases, chronic lung diseases, joint diseases, ulcers, cerebrovascular disease.

Table 2 (cont.)

Instrument	Topics Covered	Data Collected		
		How	When	From
16. Medical expense report (MER)--fee-for-service claim form, 4 types: Doctors' services and supplies Dental care Hospital and extended care Pharmacy	Each use of medical or dental service, drugs, and equipment; reason or diagnosis; treatment	Administered by self or parent	Time of occurrence	Insured enrollees and providers/suppliers
17. Services rendered report (SERR)--HMO equivalent of MER [7], 2 types: Doctors' services and supplies Hospital and extended care	Each use of medical service provided by HMO; reason or diagnosis; treatment	Abstraction	Annually to cover entire previous year	HMO records for insured enrollees in HMO experimental and control groups
18. Factor price survey	Wages and benefits of selected hospital personnel [8], average daily inpatient population	Phone and mail	Semiannually	Sample of local hospitals
19. Consumer price index	Prices of selected nonmedical products in the six HIE sites	Phone and inspection	Semiannually	Sample of local retailers
20. Physician capacity utilization survey (PCUTS)	Availability of services [9]	Phone	Annually	Sample of local physicians [10]
21. Dentist capacity utilization survey (DCUTS)	Similar to PCUTS	Phone	Annually	Sample of local dentists [11]
22. Insurance preference questionnaire	Willingness to pay higher premium to reduce out-of-pocket expense limit	Self-administered	Exit	Head of insured family

7. Pharmacy data were obtained directly from an HMO-supplied computer tape. Dental care was not available through the HMO; HMO participants reported claims for dental care and other non-HMO services on the MER.
8. Categories of personnel: registered nurses (general-duty), medical technicians, licensed professional nurses, nursing aides, kitchen helpers, general stenographers, and maids or porters.
9. Waiting time for appointments; appointments per hour; patients seen in office, home, and hospital; weekend office hours; office staffing; cost of office visit; whether new patients accepted.
10. Physicians (M.D. or D.O.) specializing in general practice, internal medicine, and pediatrics.
11. Except in Fitchburg, Franklin County, and Georgetown County, where all dentists were surveyed.

Thereafter, National Opinion Research Center managed data collection and Glen Slaughter and Associates handled insurance administration and claim processing. American Health Profiles, Inc., conducted the medical screening examinations at enrollment (October 1974 through January 1977); CompuHealth administered those examinations at exit (October 1977 through December 1981).

FILE DEVELOPMENT

Subcontractors sent the collected data to RAND, either in hardcopy form or as cleaned data tapes. At RAND the hardcopy data were encoded for machine readability and subjected to computerized checks for logical consistency and adherence to specified response ranges; outliers were checked only for fidelity to the original response and otherwise left unchanged. Limited cross-checking was done to assess logical consistency among a respondent's answers. All identifiers permitting information to be linked to a specific respondent were replaced twice to protect respondents' privacy.[13] The cleaned records were then arranged in the HIE version of standard computer file format, and the resulting files of *primary variables* made available for HIE analyses.

When an analyst needed information that required manipulation of primary data, *derived variables* were constructed. The analyst and a programmer determined a suitable way of obtaining the information by extracting, aggregating, or transforming primary data, and the programmer wrote the appropriate logic. With the analyst's approval, the new variable was entered on the master file.

Both primary and derived variable files are being issued to the public in a number of topical series. Appendix B provides a complete list of the files to be issued.

[13]The first conversion was known only to the subcontractor, the second only to RAND. Neither institution could make the full link from the respondent's name to his or her identifier on the analytic files.

The machine-readable tape for each file includes data in both SAS[14] (Statistical Analysis System) and character formats, and an index of character-format variables.[15]

A codebook containing descriptions of the variables on each file is also provided. This volume contains the codebook for the HMO and Seattle FFS annual expenditures and visit counts file, a file in the aggregated claims series. Section II describes the file in detail; Sec. III presents the codebook.

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[14]A registered trademark of the SAS Institute Inc.

[15]These are the components of all files issued by RAND. Other institutions (e.g., National Archives) will distribute these files and may alter their contents.

II. HMO AND SEATTLE FFS ANNUAL EXPENDITURES AND VISIT COUNTS FILE

INTRODUCTION

The HMO and Seattle FFS annual expenditures and visit counts file presents yearly totals of covered imputed expenditures and yearly counts of covered visits for health care for each Seattle HIE participant enrolled in one of the following: (1) an FFS health plan; (2) the HMO experimental group; or (3) the HMO control group. The participating HMO was Group Health Cooperative (GHC), a large prepaid group practice in Seattle. FFS participants used only FFS services; however, some GHC participants used FFS services by choice, in emergencies, or by referral. A record exists for each contract year[1] that a Seattle participant was eligible for HMO-FFS comparison.[2]

The HMO and Seattle FFS annual expenditures and visit counts file was created to facilitate comparison of health care use between comparable HMO and FFS populations by aggregating such use to a yearly level for each participant. Using these yearly totals, analysts can quickly and economically identify participants of interest for comparison or further study. The HMO and FFS populations used in the experiment are comparable because both populations were selected from the same urban area using the same randomized selection process.

Each record found in this file indicates a participant's imputed[3] covered annual expenditures for health care by type of health care, and the annual number of covered health care visits for a given year by type

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[1] In most cases, a contract year spanned two calendar years.

[2] Participants who moved away from Seattle or switched from HMO to FFS plans were considered ineligible for comparison and have no records for contract years after the date of the move or plan change.

[3] Because there are no charges in the HMO system, charges had to be imputed for the services of HMO physicians/health professionals. To ensure comparability of cost structures, FFS physician/health professional charges have been imputed using the same calculation method used for such HMO services, and thus imputed charges are presented for all participants in this file.

of visit. If a participant did not use health care services during a given contract year, the expenditure and visit count variable values for that participant and year equal zero. Expenditures and visits are presented as yearly totals; they are not itemized by services.

The totals shown in this file include those pertaining to total covered inpatient care (including physician/health professional services, laboratory services, and hospital expenses); total covered outpatient psychotherapy expenses; and total covered outpatient health care services rendered by physicians or other nondental health professionals (e.g., chiropractors and speech therapists) as well as the outpatient services of laboratories. However, because charges for drugs, supplies, and institutional outpatient services[4] could not be imputed, this file contains no information regarding participants' uses of drugs, supplies, or institutional outpatient services. It also contains no information regarding dental care. Data regarding annual dental usage of all participants are available in the FFS annual expenditures and visit counts file.[5]

HIE-COVERED EXPENDITURES AND VISITS

For all participants, the annual expenditure and visit count totals found here include only those expenditures and visits that were covered by the HIE. Services rendered by GHC, or FFS services that were paid for by GHC, are considered HIE-covered; thus, GHC-covered expenditures and visits are a *subset* of HIE-covered expenditures and visits in this file.

An HIE-covered visit or hospitalization is one in which *any part* of a participant's expenditure for services was covered by the HIE.[6] Noncovered visits, i.e., those in which *only* noncovered services were rendered, are not counted. Such noncovered visits may include those

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[4]Outpatient institutional services consist mainly of nonphysician emergency room and clinic services.

[5]C. E. Peterson et al., *Aggregated Claims Series, Vol. 1: Codebook for Fee-for-Service Annual Expenditures and Visit Counts*, The RAND Corporation, N-2360/1-HHS, May 1986.

[6]Appendix F lists the possible reasons for noncoverage of a service by the HIE.

related to accident injuries that were paid for by other insurance companies.

HIE-covered expenditures represent those portions of expenditures for health services that were considered covered by the HIE. Services covered for FFS[7] and HMO participants are defined in Appendix G.

HIE Supplemental Coverage for the HMO Experimental Group

The GHC experimental group was provided a package of benefits within GHC that matched as closely as possible the benefits available to the FFS enrollees. In other words, the HMO experimental group had "free" care that was comparable to that offered to FFS participants, *subject to the restriction that care had to be obtained at GHC if GHC provided the service.*

However, some HIE-insured services were not available at GHC (for example, dental and chiropractic services). These services were not GHC-covered because they were not available, but were fully HIE-covered (i.e., reimbursed 100 percent by the HIE) for experimental group members to obtain them in the FFS sector. Thus, such cases are not considered GHC-covered in this file but *are* considered HIE-covered.

HIE Incentive Coverage for HMO Participants

If a GHC experimental or control group participant chose to go to the FFS system for services that *were* available at GHC, the HIE reimbursed 5 percent of such charges as an incentive for these people to file a claim so that out-of-GHC utilization could be measured. In addition, if a GHC control participant went to an FFS provider for services not available at GHC, such charges were also remimbursed 5 percent. Such cases, though not GHC-covered, are, because of the partial HIE reimbursement by the HIE, considered to be HIE-covered.

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[7]For FFS participants, the covered imputed expenditure totals presented in this file *include the portion of costs that the participant would have paid toward his/her deductible or coinsurance rate.*

IN-PLAN AND OUT-OF-PLAN EXPENDITURES

To enable users to identify and separate *GHC-covered* expenditures and visits of GHC participants from *non-GHC-covered* expenditures and visits, "in-plan" and "out-of-plan" expenditure and visit counts categories were created. These categories allow users to examine a GHC participant's total use of HIE-covered services by combining the totals from that person's "in-plan" and "out-of-plan" expenditures and visit count variables, or allow them to examine the participant's GHC-covered or non-GHC-covered totals separately. Although for practical purposes these categories apply only to GHC participants, the in-plan and out-of-plan designations for expenditures and visit counts were applied to FFS participants as well. **In-plan** expenditures and visits are defined as follows:

- For FFS participants, "in-plan" expenditure and visit count variables present the annual totals of a participant's HIE-covered expenditures and visits; because only covered expenditures and visits are shown on this file, *all* the expenditures and visit counts of FFS participants in this file are in-plan.
- For HMO participants, "in-plan" expenditure and visit count variables present the annual expenditure and visit count totals associated with a participant's GHC-rendered services *and* any FFS-rendered services that were reimbursed 100 percent by GHC.

Out-of-plan expenditures and visits *apply only to GHC participants* and present the yearly totals of their FFS expenditures and visits that were *not* reimbursed by GHC but *were* covered (either fully, in the case of supplementary coverage, or partially, in the case of incentive coverage) by the HIE. In essence, the out-of-plan expenditure and visit count variables in this file indicate the expenditures and visits that the HIE covered but that GHC did not.[8]

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[8]A more restrictive definition of "out-of-plan" is used in the HMO visits files. There, "out-of-plan" refers to an experimental group participant's expenditures or visits that were not covered by GHC *nor 100 percent by the HIE's supplemental coverage*.

The names of variables that present yearly out-of-plan expenditures and visits in this file begin with an "X" (e.g., XINPDOL) and have positive values only for GHC participants. These variables will not be inclusive of all out-of-plan FFS use by GHC participants if there were visits for which no claims were submitted by such participants (e.g., if the 5 percent incentive was not enough to motivate a participant to file a claim in a particular instance). Thus, out-of-plan use may be underreported in this file.

The expenditure variables in this file are presented in Table 3 and the visit counts variables are listed in Table 4. Below we discuss the sample population, the derivation of file variables, and the use of the codebook. The codebook, found in Sec. III, presents specific descriptions for each variable in the file and constructions, if necessary. A file dictionary with a technical description of the file, including the location and format of each variable, is provided in Appendix C.

SAMPLE POPULATION

The HMO and Seattle FFS annual expenditures and visit counts file includes all Seattle participants who were ever insured by the HIE (3,312 individuals). They were enrolled as follows:

FFS insurance group	1290
HMO experimental group	1215
HMO control group	807
Total	3312[9]

A participant's insurance status (FFS or HMO) in this file is based on the plan in which the participant's *family* was enrolled at the beginning of the study. Seattle FFS participants and HMO experimental group participants who left the Seattle area remained in the experiment and continued their insurance plans in new locations; relocated HMO experimental group participants were generally switched to the "free"

[9]These numbers fluctuated throughout the experiment as a result of births, attrition, and deaths.

Table 3

EXPENDITURE VARIABLES ON THE HMO-SEATTLE FFS
ANNUAL EXPENDITURES AND VISIT COUNTS FILE

Variable	Charges Summed	Charges Excluded
INPDOL In-Plan Inpatient Expenses	Annual imputed inpatient expenses covered by participant's FFS plan or by GHC	Outpatient care, renal dialysis
XINPDOL Out-of-Plan Inpatient Expenses	Annual imputed inpatient expenses not covered by GHC but covered by the HIE (GHC participants only)	Same as INPDOL
MENTDOL In-Plan Psychotherapy Expenses	Annual imputed outpatient psychotherapy expenses covered by participant's FFS plan or by GHC, including injections	Charges for visits in excess of 52 per year, prescription drugs, inpatient care
XMENTDOL Out-of-Plan Psychotherapy Expenses	Annual imputed outpatient psychotherapy expenses not covered by GHC but covered by the HIE (GHC participants only)	Same as MENTDOL
OUTPDOL In-Plan Outpatient Expenses	Annual imputed outpatient health expenses covered by participant's FFS plan or by GHC	Dental care, outpatient psychotherapy, outpatient drugs or supplies, outpatient institutional services
XOUTPDOL Out-of-Plan Outpatient Expenses	Annual imputed outpatient health expenses not covered by GHC but covered by the HIE (GHC participants only)	Same as OUTPDOL
MEDDOL In-Plan Medical Expenses	Sum of annual inpatient and outpatient health expenses covered by participant's FFS plan or by GHC	Dental care, outpatient psychotherapy, outpatient drugs and supplies, institutional outpatient services
XMEDDOL Out-of-Plan Medical Expenses	Sum of annual inpatient and outpatient health expenses not covered by GHC but covered by HIE (GHC participants only)	Same as MEDDOL

Table 4

VISIT COUNTS VARIABLES ON THE HMO-SEATTLE FFS
ANNUAL EXPENDITURES AND VISIT COUNTS FILE

Variable	Summary
MENTVIS In-Plan Psychotherapy Visits	Annual number of covered outpatient visits for psychotherapy covered by participant's FFS plan or GHC
XMENTVIS Out-of-Plan Psychotherapy Visits	Annual number of outpatient visits for psychotherapy not covered by GHC but covered by HIE (GHC participants only)
MDVIS In-Plan Face-to-Face Visits to Physicians	Annual covered outpatient visits with physician providers (excludes dental, psychotherapy, and radiology/anesthesiology/pathology-only visits) covered by participant's FFS plan or GHC
XMDVIS Out-of-Plan Face-to-Face Visits to Physicians	Annual number of outpatient visits with physician providers (same exclusions as MDVIS) not covered by GHC but covered by HIE (GHC participants only)
NONMDVIS In-Plan Face-to-Face Visits to Nonphysicians	Annual covered outpatient visits with nonphysician providers such as speech and physical therapists, chiropractors, podiatrists, acupuncturists, Christian Science healers, etc. (excludes dental, psychotherapy, and radiology/anesthesiology/pathology-only visits); covered by participant's FFS plan or GHC
XNMDVIS Out-of-Plan Face-to-Face Visits to Nonphysicians	Annual number of outpatient visits with nonphysician providers (same as those in NONMDVIS) that were not covered by GHC but covered by the HIE (GHC participants only)

Table 4 (cont.)

VISIT COUNTS VARIABLES ON THE HMO-SEATTLE FFS
ANNUAL EXPENDITURES AND VISIT COUNTS FILE

Variable	Summary
TOTADM In-Plan Hospital Admissions	Annual number of covered hospitalizations covered by participant's FFS plan or GHC
XTOTADM Out-of-Plan Hospital Admissions	Annual number of hospitalizations that were not covered by GHC but were covered by the HIE (GHC participants only)
MATADM In-Plan Maternity Hospital Admissions	Annual covered hospitalizations for delivery-related maternity care; covered by participant's FFS plan or GHC
XMATADM Out-of-Plan Maternity Hospital Admissions	Annual covered hospitalizations for delivery-related maternity care that were not covered by GHC but were covered by the HIE (GHC participants only)
PREGADM In-Plan Pregnancy-Related Hospital Admissions	Annual covered hospitalizations in which pregnancy was a factor (includes maternity) that were covered by participant's FFS plan or GHC
XPREGADM Out-of-Plan Pregnancy-Related Hospital Admissions	Annual covered hospitalizations in which pregnancy was a factor (includes maternity) that were not covered by GHC but were covered by the HIE (GHC participants only)

FFS plan. HMO *control group* members who moved were dropped from the experiment after they moved.

Below we discuss some specific characteristics of the Seattle FFS and HMO populations.

FFS Participants

Seventy-five percent of Seattle FFS participants were enrolled for three years and the remainder for five years. Assignment to three- or five-year participation was made at random. Approximately one-third of the FFS participants were assigned to a plan that provided virtually all health care free, including ancillary personnel such as speech therapists. The other two-thirds were enrolled in cost-sharing insurance plans.

HMO Participants

The HMO experimental and control groups together constituted slightly more than 2,000 people, which was approximately 60 percent of the total Seattle sample of about 3,300 people, and slightly less than 24 percent of all HIE participants. Half of the HMO experimental group remained in the HIE for three years and the remaining half for five years, whereas all the control group members were enrolled for five years.

Comparison Eligibility

In addition to individuals who died, attrited, or were terminated from the study, participants who moved from Seattle and HMO participants who changed to FFS plans were considered no longer eligible for the comparison of FFS and HMO medical usage, and there are no records for them in this file for contract years after the date of the move or plan change. However, a record exists in this file for the year in which the participant lost eligibility. Users may wish to treat these "partial year" records differently because only a portion of the individual's medical usage is observed for that year.

To identify Seattle participants who lost eligibility for comparison purposes, users must refer to the supplemental data file[10] of the master sample series and check the variable called TIMET for a given person and year. TIMET reflects the proportion of the year during which a participant was eligible for comparison; a value of 1 indicates the person was eligible for comparison for the entire year.[11] The individual's term of enrollment represents the maximum number of years he could have been eligible for comparison.[12] The reason for the participant's loss of eligibility can be determined as follows:

- Participants who moved or changed plans are identified in the supplemental data file.
- Participants who died, attrited, or were terminated from the experiment can be found in the eligibility-family changes file of the master sample series.[13]

Moves and plan changes take precedence over deaths, attritions, and terminations in establishing noneligibility for comparison. For example, if a person moved and then attrited, the date of ineligibility is the date of the move. Such an individual would be listed as a mover in the supplemental data file and as an attriter in the eligibility-family changes file. Thus, users may wish to cross-check between these files to track selected individuals.

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[10]To be issued as part of HIE documentation. See Appendix B for order information.

[11]Newborns will have a value of TIMET < 1 for the contract year in which they were born. Newborns are identified in the supplemental data file of the master sample series.

[12]The participant's term of enrollment (three years or five years) can be found in the full sample demographic file of the master sample series. S. M. Polich et al., *Master Sample Series, Vol. 2: Codebook for Full Sample Demographic File*, The RAND Corporation, N-2264/2-HHS, May 1986.

[13]S. M. Polich and C. d'Arc Taylor, *Master Sample Series, Vol. 1: Codebook for Eligibility-Family Changes File*, The RAND Corporation, N-2264/1-HHS, May 1986.

DATA SOURCES

Data used in the HMO-Seattle FFS annual expenditures and visit counts file are taken from two sets of source files:

1. The HMO claims line-item files[14] contain data abstracted from GHC medical records for HMO participants and contain any claim records of FFS health services rendered to GHC participants *that were reimbursed 100 percent by GHC*. Imputed hospital charges in the HMO claims line-item files were provided by GHC, and charges for physician/health professional services were imputed by HIE analysts. Appendix D lists the HMO claims line-item files and includes a sample of the types of variables found in each file.
2. The Seattle FFS files for HMO comparison[15] (called the FFSCOMP files) contain claims data concerning all Seattle participants who used FFS health care; these files include GHC participants who obtained FFS health services that were *not* reimbursed fully by GHC. The FFSCOMP files were created to facilitate comparison of FFS and HMO use at the services (line-item) level by imputing the charges for the services of Seattle FFS physicians and other health professionals using the same charge imputation process as was used in the HMO claims line-item files. Appendix E lists the FFSCOMP files and presents a sample of the types of variables found in each file.

The units of observation within the HMO and FFS claims line-item files are the "line items"--the charged services, drugs, or supplies rendered to HIE participants. The files in each series were divided

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[14]C. E. Peterson et al., *Claims Line-Item Series, Vol. 2: Codebooks for Health Maintenance Organization Claims*, The RAND Corporation, N-2347/2-HHS, August 1986.

[15]C. E. Peterson et al., *Claims Line-Item Series, Vol. 3: Codebooks for Seattle Fee-for-Service Claims for Comparison with Health Maintenance Organization Claims*, The RAND Corporation, N-2347/3-HHS, October 1986.

according to the type of health service provided. Below we list the specific line-item files that were used to create the HMO and Seattle annual expenditures and visit counts file:

HMO File 01	Inpatient Services Rendered by Institutions
HMO File 03	Inpatient Services Rendered by Physicians
HMO File 06	Outpatient Services Rendered by Physicians
HMO File 10	Injections Administered by Physicians
FFSCOMP File 01	Inpatient Services Billed by Institutions
FFSCOMP File 03	Inpatient Physician Procedures Billed by Institutions
FFSCOMP File 06	Services Rendered by Physicians
FFSCOMP File 10	Injections Administered by Physicians

Data were aggregated by person and contract year for each participant from the above source files. HMO and FFSCOMP data were aggregated separately for each person/year and then pooled together. Only GHC participants can have records in both the HMO and FFSCOMP data for the same year. For GHC participants, the records have been combined in this file and their counts and expenditures from the FFSCOMP data comprise the out-of-plan variables.

In the creation of the HMO-FFS Seattle annual expenditures and visit counts file, any data inconsistencies found in the line-item files were resolved by HIE analysts according to their own analytic needs. These minor adjustments are not documented, and thus other analysts will not be able to exactly replicate from the line-item files all of the data found in this file.

ANNUAL EXPENDITURE VARIABLES

All charges in this file are adjusted for inflation and expressed in 1967 dollars.[16] This was done to enable users to avoid biases resulting from inflation when comparing covered expenditures of five-year enrollees, which predominate among HMO participants, with the covered expenditures of three-year enrollees, which predominate among the FFS participants. Below we summarize the derivation of charges found in this file.

[16]The consumer price index figures used in these adjustments are given in the *User's Guide to HIE Data*, to be published by the HIE. See Appendix B for order information.

Hospital Inpatient Charges

Inpatient hospital charges for both HMO and FFS services were not imputed by HIE analysts because such charges are directly comparable. GHC provided "mock bills" to the HIE for hospital inpatient services rendered to participants; these bills were the actual prices GHC would have charged participants had they not been covered for care. GHC occasionally has reason to charge non-GHC people whom it treats for emergencies and periodically surveys the Seattle market to determine the charges for such services. Thus, this file contains the *actual* FFS charges for FFS inpatient hospital services incurred by participants, and the "mock bill" charges assessed by GHC for its inpatient hospital services.

Imputing Physician/Health Professional Charges

The imputation of physician and other health professional charges was made necessary by the lack of charges in the HMO system. To impute such charges using consistent guidelines, a uniform standard for defining and valuing such services was applied: the *California Relative Value Studies* (CRVS) coding system.[17] The CRVS coding system defines the procedures and services of physicians and other health professionals and assigns standard unit values to those services for use in computing medical charges.

In the HMO claims line-item files, which list only services that were covered by GHC, the calculation formula for the value of each covered physician/health professional service was based on the assigned CRVS units for that service and a dollar-amount-per-CRVS unit provided annually by GHC. Different dollars/unit values were used for different types of services.

The same imputation method was applied to the FFS physician/health professional charges found in the FFSCOMP files. This was made necessary by the fact that if FFS charges had been used as the values for FFS services, the weighting or "valuing" of such services would have

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[17]California Medical Association, *California Relative Value Studies*, San Francisco, 1975.

been different between the FFS and HMO systems: The FFS weighting would be based on the varying charges for a given physician/health professional service across the FFS system, whereas the HMO weighting would be based on a fixed dollars-per-CRVS unit price structure. Thus, to value such services consistently in both systems and allow analysts to observe the *use* of health care services through a summary measure of expenditure, HIE analysts imputed the charges of Seattle FFS physicians and other health professionals using the HMO method described above. For this reason, imputed charges for physician/health professional services appear in both the HMO claims line-item and FFSCOMP files and were used to create the visit expenditure totals found in the Seattle visits files.

Because all GHC services were covered services, they could be compared only to covered services in the FFS sector. However, when the FFSCOMP files were created from the FFS claims line-item files, some of the claimed physician/health professional services listed in the FFS claims line-item files were only partially covered by the HIE. The "values" of such services, expressed in CRVS units, had to be adjusted to reflect only the proportions of those services that had been paid for by the HIE. Thus, in creating the FFSCOMP files, the CRVS units for each physician/health professional service listed in the FFS claims line-item files were first converted to *covered units* using the formula below.

$$\text{Covered CRVS units} = \frac{\text{Line-item charge - noncovered portion of charge}^{18}}{\text{Line-item charge}} * \text{CRVS units for the procedure}$$

Covered CRVS units were then converted into imputed charges using the same dollars-per-CRVS units used to calculate HMO charges. If the CRVS units (DEI5609) for an FFS procedure or service were missing and

[18]Deductibles or coinsurance payments, which are treated as *noncovered* charges in the FFS claims line-item files for the purpose of reimbursements, are included in the *covered* total charges presented in this file. Thus, in this equation, the noncovered portion of the line-item charge was set to zero if it represented a deductible or coinsurance payment.

could not be determined, the imputed charge for that service was set equal to the actual covered FFS charge for the service. If no portion of the service was covered, then the imputed charge for the service was zero, effectively dropping the service from yearly expenditure and visit count summations.

CRVS modifier codes were used to indicate special circumstances involved in certain physician services or procedures. A CRVS modifier of 1 was created to denote an unknown auxiliary service that was part of a lump-sum fee, i.e, part of a package of services such as those provided in pre- and postsurgical procedures. The physician did not specify these procedures but listed them only as related to another major service (e.g., listing removal of stitches only as a "postoperative service"). Thus, these unspecified auxiliary services were assigned the CRVS code of the primary service to which they were related and given a modifier code of 1. However, it is the CRVS code of the service, not the modifier code, that is used in assigning CRVS units to a given procedure for the imputation of charges; thus, each auxiliary service having a CRVS modifier code of 1 would be imputed as a primary service unless the charge was adjusted. For this reason, RAND analysts used appropriate deflation factors in this file to compensate for overassignments of CRVS units in cases involving CRVS modifier codes of 1.

As a check on the imputation process, the actual and imputed charges for Seattle FFS participants were compared. Though the correlation between actual and imputed charges was found to be in excess of 0.92 in each year,[19] the annual imputed total charges for the FFS system were greater than the annual actual total charges. Therefore, HIE analysts created yearly factors of proportionality for use as correction factors. The correction factors were the ratios of total *actual* FFS charges to total FFS *imputed* charges (charges were first adjusted for inflation) for a given type of service for each desired contract year. These correction factors were applied to both HMO and Seattle FFS imputed charges in this file. The factors used are shown in Table 5.

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[19]W. G. Manning et al., *A Controlled Trial of the Effect of a Prepaid Group Practice on the Utilization of Medical Services*, The RAND Corporation, R-3029-HHS, September 1985.

Table 5

IMPUTATION ADJUSTMENT FACTORS

Type of Service	Contract Year 1	2	3	4	5
Inpatient physician	0.8846	0.7991	0.8748	0.7568	0.8292
Outpatient physician	0.7102	0.6846	0.6988	0.7089	0.7580

Comparison Considerations Involving Lump-Sum Billing

Researchers should note that visits to HMO providers involving procedures that would have been billed as part of a lump-sum "package" of procedures in the FFS system (e.g., pre- and postsurgical services, and pre- and postnatal care) tend to show up much more frequently in the HMO files than in the FFS files. This is because such FFS lump-sum package visits were, as the name implies, billed as part of a single inpatient charge, and this single charge is found in the FFS inpatient visits file attached to the major inpatient service of the package (e.g., a surgery).

However, because HMO visits were abstracted from HMO medical records, all outpatient visits related to pre- or postnatal maternity services and pre- or postoperative services were reported in the HMO claims line-item files. Thus, visits involving "lump-sum" types of outpatient services appear much more frequently among HMO outpatient visits than among FFS outpatient visits because such HMO services and visits were counted and included whereas such FFS visits were unbilled and therefore do not appear.

During the charge imputation process in the HMO claims line-item files, the HIE attempted to compensate for the imbalance in "lump-sum" types of visits by using GHC-provided codes to identify pre- and postoperative or pre- and postnatal office visits and impute their

charges as zero. This would cause them to be dropped from the comparison, thus making them "invisible," like the unbilled FFS lump-sum outpatient services. However, the CRVS codes of the laboratory tests associated with such HMO visits were *also* entered in the data and had charges imputed for them. Thus, when HMO line-item services were aggregated to the visit level by person, provider, and date of service, these visits remained in the comparison data because the imputed charges of the lab tests gave the visit an overall positive charge instead of the intended zero charge. Therefore, the problem of comparing the number of lump-sum HMO and FFS pre- and postoperative or pre- and postnatal visits still existed after aggregation and was handled differently for the two cases as follows:

1. Annual charges and counts of pre- and postoperative outpatient visits are included in the outpatient expenditure and visit totals in this file and have not been adjusted. The treatment of such cases is left to the user. In the FFS system, the number of pre- and postsurgical outpatient visits that are included in the charge for a surgery can vary greatly depending upon the type of surgery and the discretion of the physician. Thus, it is difficult to isolate which pre- and postsurgical visits in the HMO data would be comparably lump-sum billed.

2. Visits for pre- and postnatal maternity services to *mothers*, because of the comparison problems cited above, were dropped after the aggregation process, and thus these charges and visit counts are not found in the outpatient expenditure and visit file.[20] However, postnatal charges and visit counts concerning *infants*, and hence appearing on the infant's record, were kept. A visit was defined as prenatal and dropped after aggregation if any of the diagnosis codes for the visit were among those listed in Table 6 or if any of the CRVS codes were among those found in Table 7.

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[20] If users wish to examine prenatal outpatient care for mothers, they must refer to the HMO and FFSCOMP line-item files.

Table 6

DIAGNOSIS CODES DEFINING MATERNITY-RELATED VISITS

Codes	Diagnoses
72.0 - 74.9	Obstetrical procedures
650.0 - 664.9	Delivery
Y06.0 - Y06.1	Prenatal care
Y06.3	Failed induction of labor
Y06.4	Failed trial of labor for vaginal delivery
Y06.9	Pregnancy associated with nonobstetric condition
Y07.0 - Y07.1	Postpartum observation
Y20.0 - Y29.9	Liveborn infant births
Y30.0 - Y32.9	Fetal death

Table 7

CRVS CODES DEFINING MATERNITY-RELATED VISITS

CRVS Codes	Services
59400 - 59446	Delivery care
59481	Observation of labor without delivery
59500 - 59561	Caesarean section
59889	Unlisted maternity care and delivery procedure

Expenditure Indicators

Associated with the expenditure variables shown in Table 3 are six "indicator variables," listed in Table 8. Two of these variables, POSINP and POSMED, serve to quickly indicate whether a participant had any in-plan inpatient expenditures or in-plan medical (the sum of inpatient and outpatient) expenditures for a given contract year. Similarly, XPOSINP and XPOSMED indicate whether a participant had any out-of-plan inpatient or medical expenditures. This information is useful in enabling users to drop participants with zero expenditures from the file if they so desire.

The variables INPMIS and XINPMIS indicate participants with incomplete in-plan or out-of-plan inpatient records because of missing inpatient hospital or physician bills. Thus, INPMIS and XINPMIS flag participants whose true expenditures for inpatient and overall medical services are known to be somewhat higher than the expenditure totals shown for those participants in INPDOL, XINPDOL, MEDDOL, and XMEDDOL. Users may wish to drop these person/years from their analyses or use their own methods to account for this bias in total expenditures.

VISIT COUNTS VARIABLES

The visit counts variables described in Table 4 provide the annual totals of covered in-plan and out-of-plan visits. Not reflected in these counts are visits to FFS providers that were either not billed or for which no claims were submitted. Some unbilled visits were part of other "lump-sum" billings, as described above, and thus do not show up in the visit counts.

Outpatient Visit Counts

Annual in-plan outpatient visits to physicians or nonphysician medical providers (therapists, acupuncturists, etc.) are presented in the variables MDVIS and NONMDVIS. Annual totals of out-of-plan outpatient visits are shown in XMDVIS and XNMDVIS. Again, note that outpatient pre- and postnatal visits of mothers are *not* counted in these variables.

Table 8

EXPENDITURE INDICATOR VARIABLES

Variable	Indication Given
POSINP Positive In-Plan Inpatient Expenditures	Presence of GHC-covered inpatient expenses for GHC participants or HIE-covered inpatient expenses for FFS participants
XPOSINP Positive Out-of-Plan Inpatient Expenditures	Presence of non-GHC-covered inpatient expenses that were covered by the HIE (GHC participants only)
POSMED Positive In-Plan Medical Expenditures	Presence of GHC-covered inpatient or outpatient expenses for GHC participants or HIE-covered inpatient or outpatient expenses for FFS participants
XPOSMED Positive Out-of-Plan Medical Expenditures	Presence of non-GHC-covered inpatient or outpatient expenses that were covered by the HIE (GHC participants only)
INPMIS Incomplete In-Plan Hospital Records	Missing records of GHC hospital services for GHC participants or missing hospital bills for FFS participants
XINPMIS Incomplete Out-of-Plan Hospital Records	Missing FFS inpatient bills that were not covered by GHC but were covered by the HIE (GHC participants only)

Visits to health professionals were counted *only* if they were "face-to-face" visits. A visit is defined as face-to-face if there was an element of direct evaluation or treatment.[21] Visits in which only radiology, pathology, or anesthesiology services were rendered may have occurred separately but are *not* included in the visit counts because they are considered to be extensions of the face-to-face visits in which they were ordered. Although some service-only visits may have been unrelated to physician visits, the vast majority were related, and HIE analysts chose to exclude service-only visits to avoid double-counting visits.

Inpatient Visit Counts

Each covered in-plan or out-of-plan hospitalization is counted as an inpatient visit. Single hospitalizations that span two or more accounting years are called "continued hospitalizations" and are counted in the year of admission, reflecting their treatment for insurance purposes in the HIE. However, a participant's inpatient expenses will appear in both years of the hospitalization with the annual totals reflecting the expenses incurred in each year. Thus, if there were no other admissions in the second year, the visit count variable TOTADM would equal zero for that year and the expenditure variable INPDOL would be greater than zero.

Back-to-back hospitalizations were merged into a single hospitalization.[22] Back-to-back hospitalizations are defined as those in which the second admission (1) was within one day of discharge from the first admission, and (2) was for the same condition (i.e., diagnosis codes were the same for the two hospitalizations). This definition differs slightly from that used in the FFS annual expenditures and visit counts file. There, a third requirement was that the two

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[21] See Table 12 in the codebook section of this documentation for the list of procedures that define a visit as face-to-face.

[22] An exception was made for maternity hospitalizations. If a patient was admitted for false labor, considered a pregnancy-related hospitalization, and was subsequently admitted for delivery of the infant, the admissions were not merged.

hospitalizations must have been at the same hospital. That requirement is dropped here because in the HMO system it is not unusual for patients to transfer to an FFS hospital for specific medical care (e.g., a necessary surgery). This less restrictive HMO definition of back-to-back hospitalizations was applied to the FFS hospitalizations found herein to render them comparable to hospitalizations in the HMO system.

Note that maternity admissions are counted only for the mother, and all expenses related to the delivery are included in the inpatient expenses on the mother's record. Thus, babies will have no hospital admission nor any inpatient expenditures listed in the year they were born unless the baby was admitted for postdelivery complications. However, there are six FFS births in this file for which there are no corresponding maternity admissions for mothers. This situation arose because the mothers were ineligible for HIE coverage and had no records in any of the HIE claims files. Examples of ineligible mothers are women who married enrollees after enrollment and thus were not themselves enrolled; however, their babies are considered as enrollees.

FFS births were billed by hospitals to either the mother or the baby, depending on hospital practice. Claims charged to the infant were always transferred by HIE analysts to the mother's record. However, the above six claim records could not be transferred because the mother was ineligible and had no HIE record. In addition, the first-year records of these six babies also reflected incomplete birth expenditure information because they did not include any charges to the mother. For these reasons, the maternity charges associated with these six infants were set to zero and do not appear in the inpatient expenditures for the year of their birth. The six births are identified by the following person and contract year identifiers:

PERSON	CONTYR
MB321424	01
MB322097	02
MB32412A	03
MB324678	03
MB326605	05
MB327452	05

LIMITATIONS

There are several key limitations associated with the HMO and Seattle FFS annual expenditures and visit counts file. Although some have already been mentioned, they are important enough to warrant reiteration.

- There is no direct correspondence between outpatient visit counts and imputed expenditures on this file, and thus the variables cannot be used to calculate an average expenditure per visit type. The reasons for this are: (1) outpatient visit counts variables sum only face-to-face visits but the outpatient expenditure variables sum imputed charges from face-to-face *and* non-face-to-face visits; (2) psychotherapy visit counts include initial office visits to mental health providers that may not have involved psychotherapy procedures, whereas the psychotherapy expenditure variables sum *only* imputed expenses associated with psychotherapy procedures.
- Visit count totals do not include noncovered or unbilled visits and thus, may not represent the individual's entire health care use in a given year.
- Expenditure variables represent only covered expenses and thus may not reflect the individual's actual level of health care expenses.
- Because scales for standardizing the relative values of drugs, supplies, or institutional outpatient services were not available, charges could not be imputed for them, and this file contains no information on the use of such services.

RELATED FILES

Master Sample Series

To select analytic subsamples using particular demographic and eligibility criteria, reference to the master sample series will be necessary. Volume 1 provides data concerning eligibility and family changes among enrollees.[23] Volume 2, the full sample demographic file,

[23]Polich and Taylor, op. cit.

presents demographic data for all enrollees and anyone considered for enrollment.[24] Volume 3, the supplemental data file, contains supplemental data including information about eligible people who refused to enroll and Seattle HMO participants who moved away from Seattle or changed from an HMO to an FFS plan. It also contains the code identifiers that link newborns to their mothers.[25]

HMO Claims Line-Item Files

The HMO claims line-item files[26] contain data abstracted from GHC medical records for HMO participants and also contain any claim records of FFS health services rendered to GHC participants *that were covered by GHC*. Appendix D lists the HMO claims line-item files and includes a sample of the types of variables found in each file.

Seattle FFS Files for HMO Comparison

The Seattle FFS files for HMO comparison[27] (FFSCOMP files) contain line-item information pertaining to the use of FFS health services by Seattle FFS and HMO participants. Data in this file were extracted from the FFS claims line-item files, which contain data concerning use of FFS health services in all six sites of the HIE. These line-item data were specifically treated to render them comparable to the data found in the HMO claims line-item files. Appendix E lists the FFSCOMP line-item files, and includes a sample of the types of variables found in each file.

Aggregated Claims Series

The HMO and Seattle FFS annual expenditures and visit counts file is a part of the aggregated claims series. In the aggregated claims series, primary variable data from the claims line-item files have been aggregated in different ways. Table 9 lists the files found in the aggregated claims series and gives a brief description of some of the important variables in each.

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[24]Polich et al., op. cit.

[25]To be issued as part of HIE documentation. The contents of this volume have not been finalized. See Appendix B for order information.

[26]Peterson et al., August 1986, op. cit.

[27]Peterson et al., October 1986, op. cit.

Table 9

AGGREGATED CLAIMS SERIES

File	Sample	Variables
FFS annual expenditures and visit counts	All insured FFS participants; one record per person per year	Annual totals for inpatient, outpatient, mental health, and dental expenditures; annual counts of hospitalizations, physician visits, nonphysician visits, mental health visits, and dental visits
HMO annual expenditures and visit counts (includes Seattle FFS)	All insured Seattle FFS and HMO participants and HMO control group in Seattle; one record per person per year	Annual totals for inpatient, outpatient, and mental health imputed expenditures; annual counts of hospitalizations, physician visits, nonphysician visits, and mental health visits
FFS visits -inpatient -outpatient -dental	Claims for health services for FFS-insured persons only; dental file includes claims for all insured persons; one record per person-provider-date of service	Covered expenses summed by visit; visit type, diagnosis, procedure codes
HMO and Seattle FFS visits -inpatient -outpatient	Claims for health services for insured Seattle FFS and HMO participants; one record per person-provider-date of service	Imputed expenses summed by visit; visit type, diagnosis, procedure codes
FFS -treatment episodes	Episode of treatment for insured FFS participants; one record per episode	Covered expenses summed by episode of treatment, diagnosis, episode type, amount of maximum dollar expenditure (MDE) remaining at beginning and end of episode.
-annual episode counts	Episode counts and expenditures for insured FFS participants; one record per person per year	Annual episode counts and expenditures summed by type: acute, chronic, well care, outpatient, dental, and hospital.

CODEBOOK DESCRIPTION

Header Variables

Five header variables are placed at the front of the file codebook. They are FILENAME, PERSON, SITE, INSTAT, and CONTYR.

FILENAME denotes the particular file. PERSON identifies each respondent by person number, permitting data to be gathered for a certain person across all files. SITE contains codes to identify each site.[28] INSTAT indicates a participant's insured status:

- INSTAT = 1 indicates participants who were ever insured under the HIE, including the HMO experimental group.
- INSTAT = 2 identifies members of the Seattle HMO control group who were enrolled in the study but not insured under the HIE.
- INSTAT = 3 indicates participants who were never insured under the HIE.
- In this file, INSTAT = 1 or 2 for all records.

CONTYR indicates the contract year of coverage for which data are aggregated.[29]

Variable Descriptions and Constructions

The variable descriptions in the codebook are arranged in boxes. Any unusual variations in a variable's data, or warnings concerning its use, are noted directly beneath the box. The subheading "SOURCE" beneath the box shows the source files and variables used in constructing the derived variable.

Variable constructions are written in pseudo-code, a summarized and compacted version of the actual SAS programming code used to create each variable. All derived variables in pseudo-code are assumed to be initialized to zero. The subheading "VARIABLE VALUES" defines the variable values used in the construction of the SAS pseudo-code. Below we provide examples of the expenditures variable INPDOL and the visit

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[28]Only the Seattle site code appears in this file.

[29]Each contract year may span two calendar years; the calendar years for the sites are described in Sec. I.

counts variable MENTVIS. Explanations are offered in italics and do not appear in the codebook.

Codebook Example #1

VARIABLE INPDOL (*Variable name*) HMO-FFS ANNUAL EXPENDITURES/COUNTS

In-plan inpatient expenses (*Variable label*)

(*Variable explanation:*)
INPDOL indicates the sum of a participant's annual in-plan covered expenses for inpatient hospital or nursing home services. Renal dialysis is excluded. For women with maternity admissions, the sum includes the newborn's inpatient expenses for the birth hospitalization. Thus, inpatient expenses of the birth hospitalization are excluded from a newborn's record.

SOURCE

Files	(HMO and FFSCOMP)	Variables	
FILE01	Hospital inpatient charges	IMPCHRG	Imputed line-item charge
FILE03	Hospital inpatient physician services	DEI5584	Place of service
FILE06	Services rendered by doctor	DEI5557	Category of hospital services
FILE10	Injections given by doctor		
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

Definition of construction below: For all line items in HMO and FFSCOMP Files 01 and 03 (hospital services), sum all imputed in-plan covered expenses for a given person and contract year except those expenses involving renal dialysis (DEI5557 not equal to 13). In-plan expenses in the FFSCOMP files are defined as the expenses of FFS participants only; in the HMO files, all expenses are in-plan. For all line items in HMO and FFSCOMP Files 06 and 10 (physician services), sum all imputed in-plan covered expenses for a given person and contract year that occurred in a hospital or nursing home (DEI5584 = 4 or 5).

CONSTRUCTION

For FILE01 and FILE03:

```
DO OVER PERSON AND CONTYR;

   IF (FILE03 line item)
      THEN IMPCHRG = IMPCHRG * (inflation adjustment) *
                               (imputation correction factor);

      ELSE IMPCHRG = IMPCHRG * (inflation adjustment);

   IF ((HMO line-item) OR (FFSCOMP line-item AND
      1 <= PLAN <= 19)) AND DEI5557 NE 13
      THEN INPDOL = INPDOL + IMPCHRG;

END;
```

For FILE06 and FILE10:

```
DO OVER PERSON AND CONTYR;

   IMPCHRG = IMPCHRG * (inflation adjustment) *
                       (imputation correction factor);

   IF ((HMO line-item) OR (FFSCOMP line-item AND
      1 <= PLAN <= 19)) AND (DEI5584 = 4 OR DEI5584 = 5)
      THEN INPDOL = INPDOL + IMPCHRG;

END;
```

NOTE: Inflation adjustment depends on the month and calendar year in which the visit occurred. The imputation correction factor depends on the type of expenditure (inpatient or outpatient) and the contract year.

VARIABLE VALUES

DEI5584

4 = hospital
5 = nursing home

DEI5557

13 = renal dialysis

PLAN

1-19 = FFS insurance plans

Codebook Example #2

VARIABLE MENTVIS (*Variable name*) HMO-FFS ANNUAL EXPENDITURES/COUNTS

In-plan psychotherapy visits (*Variable label*)

(*Variable explanation:*)
MENTVIS indicates the annual number of in-plan outpatient visits for psychotherapy. It includes billed visits only. The limit was 52 covered visits per person per year. The count includes an initial visit to a psychiatrist or psychologist.

NOTE: A few cases of more than 52 visits appear on the records. At the beginning of the experiment, family visits for psychotherapy were covered as fractional visits for the individuals involved; however, this practice was discontinued in the first year of the experiment and family visits were counted as one visit for each person. For this file, each participant visit to a psychotherapy provider on a given date is also counted as one visit, regardless of earlier counts. Thus, any covered "partial visits" are now counted as single visits, adjusting the number of covered visits upward. Users are reminded that psychotherapy visit counts and expenditure totals are not based on equivalent definitions of psychotherapy.

SOURCE

Files (HMO and FFSCOMP)		Variables	
FILE06	Services rendered by doctor	DEI5502	Provider number
FILE10	Injections given by doctor	DEI5555	Date of service
		DEI5584	Place of service
		DEI5606	CRVS code
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

Definition of construction below: Within the HMO and FFSCOMP files, for a given person and contract year, sum the number of in-plan outpatient psychotherapy visits. A visit is defined by a provider number (DEI5502) and date of service (DEI5555). A visit is considered to be outpatient

if the place of service is neither a hospital nor a nursing home (DEI5584 NE 4 OR 5). An outpatient visit is considered psychotherapy if at least one of the procedures rendered (defined by CRVS codes, DEI5606) by the provider is classed as psychotherapy (DEI5606 = 90800-90899) or if the visit was an initial office visit (DEI5606 = code in Table 10) to a psychotherapy provider (DEI5502 = provider code in Table 11). Within the HMO line-item files, all therapy visits were considered in-plan; within the FFSCOMP files, out-of-plan psychotherapy visits apply only to FFS participants.

```
CONSTRUCTION

  DO OVER PERSON AND CONTYR;

    DO OVER (FILE TYPE - HMO OR FFSCOMP) AND DEI5502 AND DEI5555;

      IF (HMO line-item) OR (FFSCOMP line-item AND
         1 <= PLAN <= 19) AND (DEI5584 < 4 OR DEI5584 > 5)
         THEN DO;

              IF (90800 <= DEI5606 <= 90899) OR
                 ((DEI5606 = CRVS code in Table 10) AND
                 (DEI5502 classed as type of provider in Table 11))
                 THEN MENTAL = 1;

              END;
    END;


    IF (last line item for given FILE TYPE AND
       DEI5502 AND DEI5555)
       THEN MENTVIS = MENTVIS + MENTAL;

  END;


VARIABLE VALUES

  DEI5584              DEI5606

    4 = hospital       90800-90813 = psychotherapy, adult and child
    5 = nursing home   90814-90833 = group or family therapy
                       90834-90838 = shock therapy
                       90839-90899 = other therapy or testing

  PLAN

   1-19 = FFS insurance plans
```

Variable Frequencies and Statistics

At the right of each box is a table of statistics or frequencies (not shown in the example). Expenditure variables each have a table of statistics that indicates (1) number of observations, (2) number of observations with missing values, (3) the mean, (4) the median, (5) the minimum value, (6) the maximum value, (7) standard deviation, (8) coefficient of variation, (9) skewness, and (10) kurtosis. The remaining variables have tables of frequencies that indicate each response code and its (1) frequency, (2) cumulative frequency, (3) percentage of the frequency, and (4) cumulative percentage of the frequency. Tables of frequencies are not provided for variables having too many response codes for concise presentation (e.g., diagnosis variables).

III. CODEBOOK FOR HMO AND SEATTLE FFS ANNUAL EXPENDITURES AND VISIT COUNTS FILE

VARIABLE FILENAME — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Name of file

FILENAME is a 6-digit code that uniquely identifies the file. This file name is DEAH2A.

FILENAME

VALUE	FREQ	CUM FREQ	%	CUM %
DEAH2A	11221	11221	100.00	100.00

VARIABLE PERSON — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Person identifier

PERSON is an 8-character alphanumeric code that uniquely identifies the HIE participant to whom the following data refer. The second character of PERSON designates the site where the participant resided when enrolled. A=Dayton; B=Seattle; E=Fitchburg; F=Franklin County; G=Charleston; H=Georgetown County.

VARIABLE SITE — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Site

CODES

2 - Seattle, Washington

SITE identifies the participant's place of residence when the participant enrolled.

SITE

VALUE	FREQ	CUM FREQ	%	CUM %
2	11221	11221	100.00	100.00

VARIABLE INSTAT — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Insurance status

CODES

1 - Ever insured (includes HMO experimental group)
2 - Ever assigned to HMO control group
3 - Never insured

INSTAT describes the participant's insurance status in the Health Insurance Experiment.

INSTAT

VALUE	FREQ	CUM FREQ	%	CUM %
1	8096	8096	72.15	72.15
2	3125	11221	27.85	100.00

VARIABLE CONTYR — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Contract year

CODES

01 - First year
02 - Second year
03 - Third year
04 - Fourth year
05 - Fifth year

CONTYR identifies the contract years of coverage for participants who were eligible for HMO-FFS comparison.

CONTYR

VALUE	FREQ	CUM FREQ	%	CUM %
01	3156	3156	28.13	28.13
02	2901	6057	25.85	53.98
03	2650	8707	23.62	77.60
04	1317	10024	11.74	89.33
05	1197	11221	10.67	100.00

VARIABLE HMO — HMO-FFS ANNUAL EXPENDITURES/COUNTS

HMO group

CODES

0 - FFS insurance group
1 - HMO experimental group
2 - HMO control group

HMO identifies whether the participant was enrolled in a fee-for-service insurance group, the HMO experimental group, or the HMO control group.

HMO

VALUE	FREQ	CUM FREQ	%	CUM %
0	3908	3908	34.83	34.83
1	4188	8096	37.32	72.15
2	3125	11221	27.85	100.00

VARIABLE INPDOL — HMO-FFS ANNUAL EXPENDITURES/COUNTS

In-plan inpatient expenses

INPDOL indicates the sum of a participant's annual in-plan covered expenses for inpatient hospital or nursing home services. Renal dialysis is excluded. For women with maternity admissions, the sum includes the newborn's inpatient expenses for the birth hospitalization. Thus, inpatient expenses of the birth hospitalization are excluded from the newborn's record.

INPDOL

NUMBER OF OBSERVATIONS	11221
NUMBER OF MISSING	0
MEAN	63.47
MEDIAN	0.00
MINIMUM VALUE	0.00
MAXIMUM VALUE	18580.37
STANDARD DEVIATION	387.49
COEFFICIENT OF VARIATION	610.47
SKEWNESS	18.53
KURTOSIS	616.73

SOURCE

Files	(HMO and FFSCOMP)	Variables	
FILE01	Hospital inpatient charges	IMPCHRG	Imputed line-item charge
FILE03	Hospital inpatient physician services	DEI5584	Place of service
FILE06	Services rendered by doctor	DEI5557	Category of hospital services
FILE10	Injections given by doctor		
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files) (cont.)

VARIABLE INPDOL (cont.)

CONSTRUCTION

For FILE01 and FILE03:

```
DO OVER PERSON AND CONTYR;

   IF (FILE03 line item)
      THEN IMPCHRG = IMPCHRG * (inflation adjustment) *
                               (imputation correction factor);

      ELSE IMPCHRG = IMPCHRG * (inflation adjustment);

   IF ((HMO line-item) OR (FFSCOMP line-item AND
      1 <= PLAN <= 19)) AND DE15557 NE 13
      THEN INPDOL = INPDOL + IMPCHRG;

END;
```

For FILE06 and FILE10:

```
DO OVER PERSON AND CONTYR;

   IMPCHRG = IMPCHRG * (inflation adjustment) *
                       (imputation correction factor);

   IF ((HMO line-item) OR (FFSCOMP line-item AND
      1 <= PLAN <= 19)) AND (DE15584 = 4 OR DE15584 = 5)
      THEN INPDOL = INPDOL + IMPCHRG;

END;
```

NOTE: Inflation adjustment depends on the month and calendar year in which the visit occurred. The imputation correction factor depends on the type of expenditure (inpatient or outpatient) and the contract year.

(cont.)

VARIABLE INPDOL (cont.)

VARIABLE VALUES

DEI5584

4 = hospital
5 = nursing home

DEI5557

13 = renal dialysis

PLAN

1-19 = FFS insurance plans

VARIABLE XINPDOL — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Out-of-plan inpatient expenses

XINPDOL indicates the sum of an HMO participant's annual out-of-plan covered expenses for inpatient hospital or nursing home services. Renal dialysis is excluded. For women with maternity admissions, the sum includes the newborn's inpatient expenses for the birth hospitalization. Thus, inpatient expenses of the birth hospitalization are excluded from the newborn's record.

SOURCE

Files (FFSCOMP)		Variables	
FILE01	Hospital inpatient charges	IMPCHRG	Imputed line-item charge
FILE03	Hospital inpatient physician services	DEI5584	Place of service
FILE06	Services rendered by doctor	DEI5557	Category of hospital service
FILE10	Injections given by doctor		
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

(cont.)

XINPDOL

NUMBER OF OBSERVATIONS	11221
NUMBER OF MISSING	0
MEAN	3.62
MEDIAN	0.00
MINIMUM VALUE	0.00
MAXIMUM VALUE	6224.86
STANDARD DEVIATION	99.66
COEFFICIENT OF VARIATION	2749.50
SKEWNESS	42.09
KURTOSIS	2120.25

VARIABLE XINPDOL (cont.)

CONSTRUCTION

For FILE01 and FILE03:

```
DO OVER PERSON AND CONTYR;

   IF (FILE03 line item)
      THEN IMPCHRG = IMPCHRG * (inflation adjustment) *
                               (imputation correction factor);

      ELSE IMPCHRG = IMPCHRG * (inflation adjustment);

   IF DE15557 NE 13 AND (PLAN = 30 OR PLAN = 98)
      THEN XINPDOL = XINPDOL + IMPCHRG;

END;
```

For FILE06 and FILE10:

```
DO OVER PERSON AND CONTYR;

   IMPCHRG = IMPCHRG * (inflation adjustment) *
                       (imputation correction factor);

   IF (DE15584 = 4 OR DE15584 = 5) AND (PLAN = 30 OR PLAN = 98)
      THEN XINPDOL = XINPDOL + IMPCHRG;

END;
```

NOTE: Inflation adjustment depends on the month and calendar year in which the visit occurred. The imputation correction factor depends on the type of expenditure (inpatient or outpatient) and the contract year.

VARIABLES VALUES

DE15584

4 = hospital
5 = nursing home

DE15557

13 = renal dialysis

PLAN

30 = GHC experimental group
98 = GHC control group

VARIABLE MENTDOL — HMO-FFS ANNUAL EXPENDITURES/COUNTS

In-plan psychotherapy expenses

MENTDOL indicates the sum of a participant's annual in-plan covered expenses for outpatient psychotherapy services, including injected drugs. The limit was 52 covered visits per person per year.

NOTE: A few cases of more than 52 visits appear on the records. At the beginning of the experiment, family visits for psychotherapy were covered as fractional visits for the individuals involved; however, this practice was discontinued early in the experiment and family visits were counted as one visit for each person. For these files, each participant visit to a psychotherapy provider on a given date is counted as one visit; thus, any previously covered "partial visits" are now counted as single visits, adjusting the covered visits upward.

SOURCE

Files	(HMO and FFSCOMP)	Variables	
FILE06	Services rendered by doctor	IMPCHRG	Imputed line-item charge
FILE10	Injections given by doctor	DEI5584	Place of service
		DEI5606	CRVS code
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

(cont.)

MENTDOL

NUMBER OF OBSERVATIONS	11221
NUMBER OF MISSING	0
MEAN	7.16
MEDIAN	0.00
MINIMUM VALUE	0.00
MAXIMUM VALUE	1449.32
STANDARD DEVIATION	59.46
COEFFICIENT OF VARIATION	830.89
SKEWNESS	12.73
KURTOSIS	187.57

VARIABLE MENTDOL (cont.)

CONSTRUCTION

```
DO OVER PERSON AND CONTYR;

   IMPCHRG = IMPCHRG * (inflation adjustment) *
                       (imputation correction factor);

   IF (DE15584 NE 4 AND DE15584 NE 5) AND
      (90800 <= DE15606 <= 90899)
      THEN DO;

           IF (HMO line-item) OR (FFSCOMP line-item AND
              1 <= PLAN <= 19)
              THEN MENTDOL = MENTDOL + IMPCHRG;

           END;
END;
```

NOTE: Inflation adjustment depends on the month and calendar year in which the visit occurred. The imputation correction factor depends on the type of expenditure (inpatient or outpatient) and the contract year.

VARIABLE VALUES

DE15584

4 = hospital
5 = nursing home

DE15606

90800-90813 = psychotherapy, adult and child
90814-90833 = group or family therapy
90834-90838 = shock therapy
90839-90899 = other therapy or testing

PLAN

1-19 FFS insurance plans

VARIABLE XMENTDOL — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Out-of-plan psychotherapy expenses

XMENTDOL indicates the sum of an HMO participant's annual out-of-plan covered expenses for outpatient psychotherapy services, including injected drugs. The limit was 52 covered visits per person per year.

See NOTE under MENTDOL.

SOURCE

Files	(FFSCOMP)	Variables	
FILE06	Services rendered by doctor	IMPCHRG	Imputed line-item charge
FILE10	Injections given by doctor	DE15584	Place of service
		DE15606	CRVS code
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

CONSTRUCTION

```
DO OVER PERSON AND CONTYR;

   IMPCHRG = IMPCHRG * (inflation adjustment) *
                       (imputation correction factor);

   IF (DE15584 NE 4 AND DE15584 NE 5) AND
      (90800 <= DE15606 <= 90899) AND (PLAN = 30 OR PLAN = 98)
      THEN XMENTDOL = XMENTDOL + IMPCHRG;

END;
```

NOTE: Inflation adjustment depends on the month and calendar year in which the visit occurred. The imputation correction factor depends on the type of expenditure (inpatient or outpatient) and the contract year.

(cont.)

XMENTDOL

NUMBER OF OBSERVATIONS	11221
NUMBER OF MISSING	0
MEAN	0.56
MEDIAN	0.00
MINIMUM VALUE	0.00
MAXIMUM VALUE	1670.21
STANDARD DEVIATION	20.43
COEFFICIENT OF VARIATION	3638.51
SKEWNESS	61.55
KURTOSIS	4482.17

VARIABLE XMENTDOL (cont.)

VARIABLE VALUES

DE15584	DE15606
4 = hospital	90800-90813 = psychotherapy, adult and child
5 = nursing home	90814-90833 = group or family therapy
	90834-90838 = shock therapy
	90839-90899 = other therapy or testing

PLAN

30 = GHC experimental group
98 = GHC control group

VARIABLE OUTPDOL — HMO-FFS ANNUAL EXPENDITURES/COUNTS

In-plan oupatient expenses

OUTPDOL indicates the sum of a participant's annual in-plan covered expenses for outpatient medical services. Excluded are charges for dental care, outpatient drugs and supplies, outpatient psychotherapy, outpatient institutional services, and outpatient prenatal care.

NOTE: Expenditures associated with an outpatient prenatal visit are not included in the final total for the person/year. Such visits are defined as those having any CRVS code (DE15606) listed in Table 16 or any diagnosis code in Table 15.

SOURCE

Files	(HMO and FFSCOMP)	Variables	
FILE06	Services rendered by doctor	IMPCHRG	Imputed line-item charge
FILE10	Injections given by doctor	DE15584	Place of service
		DE15606	CRVS code
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files) (cont.)

OUTPDOL

NUMBER OF OBSERVATIONS	11221
NUMBER OF MISSING	0
MEAN	55.54
MEDIAN	32.57
MINIMUM VALUE	0.00
MAXIMUM VALUE	2879.56
STANDARD DEVIATION	80.10
COEFFICIENT OF VARIATION	144.21
SKEWNESS	7.50
KURTOSIS	166.64

VARIABLE OUTPDOL (cont.)

CONSTRUCTION

```
DO OVER PERSON AND CONTYR;

   IMPCHRG = IMPCHRG * (inflation adjustment) *
                       (imputation correction factor);

   IF (DE15584 NE 4 AND DE15584 NE 5) AND
      (DE15606 < 90800 OR DE15606 > 90899)
      THEN DO;

           IF (HMO line-item) OR (FFSCOMP line-item AND
              1 <= PLAN <= 19)
              THEN OUTPDOL = OUTPDOL + IMPCHRG;

           END;

END;
```

NOTE: Inflation adjustment depends on the month and calendar year in which the visit occurred. The imputation correction factor depends on the type of expenditure (inpatient or outpatient) and the contract year.

VARIABLE VALUES

DE15584

4 = hospital
5 = nursing home

DE15606

90800-90899 = psychotherapy services

PLAN

1-19 = FFS insurance plans

VARIABLE XOUTPDOL — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Out-of-plan oupatient expenses

XOUTPDOL indicates the sum of an HMO participant's annual out-of-plan covered expenses for outpatient medical services. Excluded are charges for dental care, outpatient drugs and supplies, outpatient psychotherapy, outpatient institutional services, and outpatient prenatal care.

NOTE: Expenditures associated with an outpatient prenatal visit are not included in the final total for the person/year. Such visits are defined as those having any CRVS code (DEI5606) listed in Table 16 or any diagnosis code in Table 15.

SOURCE

Files	(FFSCOMP)	Variables	
FILE06	Services rendered by doctor	IMPCHRG	Imputed line-item charge
FILE10	Injections given by doctor	DEI5584	Place of service
		DEI5606	CRVS code
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

CONSTRUCTION

```
DO OVER PERSON AND CONTYR;

   IMPCHRG = IMPCHRG * (inflation adjustment) *
                       (imputation correction factor);

   IF (DEI5584 NE 4 AND DEI5584 NE 5) AND
      (DEI5606 < 90800 OR DEI5606 > 90899) AND
      (PLAN = 30 OR PLAN = 98)
      THEN XOUTPDOL = XOUTPDOL + IMPCHRG;

END;
```

(cont.)

XOUTPDOL

NUMBER OF OBSERVATIONS	11221
NUMBER OF MISSING	0
MEAN	3.20
MEDIAN	0.00
MINIMUM VALUE	0.00
MAXIMUM VALUE	516.18
STANDARD DEVIATION	20.77
COEFFICIENT OF VARIATION	648.48
SKEWNESS	10.54
KURTOSIS	146.45

VARIABLE XOUTPDOL (cont.)

NOTE: Inflation adjustment depends on the month and calendar year in which the visit occurred. The imputation correction factor depends on the type of expenditure (inpatient or outpatient) and the contract year.

VARIABLE VALUES

DEI5584

4 = hospital
5 = nursing home

DEI5606

90800-90899 = psychotherapy services

PLAN

30 = GHC experimental group
98 = GHC control group

VARIABLE MEDDOL — HMO-FFS ANNUAL EXPENDITURES/COUNTS

In-plan medical expenses

MEDDOL indicates the sum of a participant's annual in-plan covered expenses for inpatient and outpatient medical services, excluding drugs, supplies, dental services, outpatient psychotherapy, outpatient institutional services, and outpatient prenatal care. For women with maternity admissions, the sum includes the newborn's inpatient expenses for the birth hospitalization. Thus, for newborns, the sum excludes inpatient expenses for the birth hospitalization.

NOTE: Expenditures associated with an outpatient prenatal visit are not included in the final total for the person/year. Such visits are defined as those having any CRVS code (DEI5606) listed in Table 16 or any diagnosis code in Table 15.

(cont.)

MEDDOL

NUMBER OF OBSERVATIONS	11221
NUMBER OF MISSING	0
MEAN	119.02
MEDIAN	34.42
MINIMUM VALUE	0.00
MAXIMUM VALUE	18697.14
STANDARD DEVIATION	415.49
COEFFICIENT OF VARIATION	349.10
SKEWNESS	16.44
KURTOSIS	495.85

VARIABLE MEDDOL (cont.)

SOURCE

Files	(HMO and FFSCOMP)	Variables	
FILE01	Hospital inpatient charges	IMPCHRG	Imputed line-item charge
FILE03	Hospital inpatient physician services	DEI5606	CRVS code
FILE06	Services rendered by doctor		
FILE10	Injections given by doctor		
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

CONSTRUCTION

For FILE01 and FILE03:

```
DO OVER PERSON AND CONTYR;

   IF (FILE03 line item)
      THEN IMPCHRG = IMPCHRG * (inflation adjustment) *
                               (imputation correction factor);

      ELSE IMPCHRG = IMPCHRG * (inflation adjustment);

   IF (HMO line-item) OR (FFSCOMP line-item AND
      1 <= PLAN <= 19)
      THEN MEDDOL = MEDDOL + IMPCHRG;

END;
```

(cont.)

VARIABLE MEDDOL (cont.)

CONSTRUCTION (cont.)

For FILE06 and FILE10:

```
DO OVER PERSON AND CONTYR;

   IMPCHRG = IMPCHRG * (inflation adjustment) *
                       (imputation correction factor);

   IF (DEI5606 < 90800 OR DEI5606 > 90899) AND
      (HMO line-item) OR (FFSCOMP line-item AND
      1 <= PLAN <= 19)
      THEN MEDDOL = MEDDOL + IMPCHRG;

END;
```

NOTE: Inflation adjustment depends on the month and calendar year in which the visit occurred. The imputation correction factor depends on the type of expenditure (inpatient or outpatient) and the contract year.

VARIABLE VALUES

DEI5606

90800-90899 = psychotherapy services

PLAN

1-19 = FFS insurance plans

VARIABLE XMEDDOL — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Out-of-plan medical expenses

XMEDDOL indicates the sum of a participant's annual out-of-plan covered expenses for inpatient and outpatient medical services, excluding drugs, supplies, dental services, outpatient psychotherapy, outpatient institutional services, and outpatient prenatal care. For women with maternity admissions, the sum includes the newborn's inpatient expenses for the birth hospitalization. Thus, for newborns, the sum excludes inpatient expenses for the birth hospitalization.

NOTE: Expenditures associated with an outpatient prenatal visit are not included in the final total for the person/year. Such visits are defined as those having any CRVS code (DEI5606) listed in Table 16 or any diagnosis code in Table 15.

SOURCE

Files	(FFSCOMP)	Variables	
FILE01	Hospital inpatient charges	IMPCHRG	Imputed line-item charge
FILE03	Hospital inpatient physician services	DEI5606	CRVS code
FILE06	Services rendered by doctor		
FILE10	Injections given by doctor		
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

(cont.)

XMEDDOL

NUMBER OF OBSERVATIONS	11221
NUMBER OF MISSING	0
MEAN	6.83
MEDIAN	0.00
MINIMUM VALUE	0.00
MAXIMUM VALUE	6349.70
STANDARD DEVIATION	103.93
COEFFICIENT OF VARIATION	1522.34
SKEWNESS	39.19
KURTOSIS	1915.03

VARIABLE XMEDDOL (cont.)

CONSTRUCTION

For FILE01 and FILE03:

```
DO OVER PERSON AND CONTYR;

   IF (FILE03 line item)
      THEN IMPCHRG = IMPCHRG * (inflation adjustment) *
                               (imputation correction factor);

      ELSE IMPCHRG = IMPCHRG * (inflation adjustment);

   IF (PLAN = 30 OR PLAN = 98)
      THEN XMEDDOL = XMEDDOL + IMPCHRG;

END;
```

For FILE06 and FILE10:

```
DO OVER PERSON AND CONTYR;

   IMPCHRG = IMPCHRG * (inflation adjustment) *
                       (imputation correction factor);

   IF (DEI5606 < 90800 OR DEI5606 > 90899) AND
      (PLAN = 30 OR PLAN = 98)
      THEN XMEDDOL = XMEDDOL + IMPCHRG;

END;
```

NOTE: Inflation adjustment depends on the month and calendar year in which the visit occurred. The imputation correction factor depends on the type of expenditure (inpatient or outpatient) and the contract year.

VARIABLE VALUES

DEI5606

90800-90899 = psychotherapy services

PLAN

30 = GHC experimental group
98 = GHC control group

VARIABLE INPMIS — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Incomplete in-plan hospital records

CODES

0 - Had no incomplete in-plan hospital records or had no in-plan hospitalizations
1 - Had incomplete in-plan hospital records

INPMIS indicates whether the individual's in-plan hospital admissions are believed to have incomplete inpatient records. This category includes women with births but no recorded inpatient maternity expenses near the time of birth. It also includes individuals with missing hospital or physician bills. If the hospitalization was psychiatric or the problem could have been handled by interns or residents (who typically do not submit separate bills), the case is treated as complete.

INPMIS

VALUE	FREQ	CUM FREQ	%	CUM %
0	11211	11211	99.91	99.91
1	10	11221	0.09	100.00

VARIABLE XINPMIS — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Incomplete out-of-plan hospital records

CODES

0 - Had no incomplete out-of-plan hospital records or had no out-of-plan hospitalizations
1 - Had incomplete out-of-plan hospital records

XINPMIS indicates whether the HMO individual's out-of-plan hospital admissions are believed to have incomplete inpatient records. This category includes women with births but no recorded inpatient maternity expenses near the time of birth. It also includes individuals with missing hospital or physician bills. If the hospitalization was psychiatric or the problem could have been handled by interns or residents (who typically do not submit separate bills), the case is treated as complete.

XINPMIS

VALUE	FREQ	CUM FREQ	%	CUM %
0	11218	11218	99.97	99.97
1	3	11221	0.03	100.00

VARIABLE POSMED — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Positive in-plan medical expenditures

CODES

0 - Had no in-plan medical expenditures
1 - Had in-plan medical expenditures

POSMED indicates whether a participant had any positive in-plan medical expenditures (i.e., MEDDOL > 0 or INPMIS > 0) during the contract year or portion thereof.

NOTE: An individual could have MEDDOL=0 but have missing inpatient bills (INPMIS > 0). Such an individual is considered to have positive in-plan medical expenditures, but those expenditures are not reflected in the data because of missing records.

POSMED

VALUE	FREQ	CUM FREQ	%	CUM %
0	2041	2041	18.19	18.19
1	9180	11221	81.81	100.00

VARIABLE XPOSMED — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Positive out-of-plan medical expenditures

CODES

0 - Had no out-of-plan medical expenditures
1 - Had out-of-plan medical expenditures

XPOSMED indicates whether an HMO participant had any positive out-of-plan medical expenditures (i.e., XMEDDOL > 0 or XINPMIS > 0) during the contract year or portion thereof.

NOTE: An individual could have XMEDDOL=0 but have missing inpatient bills (XINPMIS > 0). Such an individual is considered to have positive out-of-plan medical expenditures, but those expenditures are not reflected in the data because of missing records.

XPOSMED

VALUE	FREQ	CUM FREQ	%	CUM %
0	10559	10559	94.10	94.10
1	662	11221	5.90	100.00

VARIABLE POSINP — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Positive in-plan inpatient expenditures

CODES

0 - Had no in-plan inpatient expenditures
1 - Had in-plan inpatient expenditures

POSMED indicates whether a participant had any positive in-plan inpatient expenditures (i.e., INPDOL > 0 or INPMIS > 0) during the contract year or portion thereof.

NOTE: An individual could have INPDOL = 0 but have missing inpatient bills (INPMIS > 0). Such an individual is considered to have positive in-plan inpatient expenditures, but those expenditures are not reflected in the data because of missing records.

POSINP

VALUE	FREQ	CUM FREQ	%	CUM %
0	10424	10424	92.90	92.90
1	797	11221	7.10	100.00

VARIABLE XPOSINP — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Positive out-of-plan inpatient expenditures

CODES

0 - Had no out-of-plan inpatient expenditures
1 - Had out-of-plan inpatient expenditures

XPOSMED indicates whether an HMO participant had any positive out-of-plan inpatient expenditures (i.e., XINPDOL > 0 or XINPMIS > 0) during the contract year or portion thereof.

NOTE: An individual could have XINPDOL = 0 but have missing inpatient bills (XINPMIS > 0). Such an individual is considered to have positive out-of-plan inpatient expenditures, but those expenditures are not reflected in the data because of missing records.

XPOSINP

VALUE	FREQ	CUM FREQ	%	CUM %
0	11186	11186	99.69	99.69
1	35	11221	0.31	100.00

VARIABLE MENTVIS — HMO-FFS ANNUAL EXPENDITURES/COUNTS

In-plan psychotherapy visits

MENTVIS indicates the annual number of in-plan outpatient visits for psychotherapy. It includes billed visits only. The limit was 52 covered visits per person per year. The count includes an initial visit to a psychiatrist or psychologist.

NOTE: A few cases of more than 52 visits appear on the records. At the beginning of the experiment, family visits for psychotherapy were covered as fractional visits for the individuals involved; however, this practice was discontinued in the first year of the experiment and family visits were counted as one visit for each person. For these files, each participant visit to a psychotherapy provider on a given date is also counted as one visit, regardless of earlier counts. Thus, any covered "partial visits" are now counted as single visits, adjusting the

(cont.)

MENTVIS

VALUE	FREQ	CUM FREQ	%	CUM %
0	10584	10584	94.32	94.32
1	188	10772	1.68	96.00
2	103	10875	0.92	96.92
3	74	10949	0.66	97.58
4	48	10997	0.43	98.00
5	31	11028	0.28	98.28
6	24	11052	0.21	98.49
7	17	11069	0.15	98.65
8	10	11079	0.09	98.74
9	11	11090	0.10	98.83
10	10	11100	0.09	98.92
11	11	11111	0.10	99.02
12	10	11121	0.09	99.11
13	5	11126	0.05	99.15
14	7	11133	0.06	99.22
15	1	11134	0.01	99.23
16	4	11138	0.04	99.26
17	2	11140	0.02	99.28
18	4	11144	0.04	99.31
19	1	11145	0.01	99.32

(cont.)

VARIABLE MENTVIS (cont.)

NOTE (cont.)

number of covered visits upward. Users are reminded that psychotherapy visit counts and expenditure totals are not based on equivalent definitions of psychotherapy.

SOURCE

Files (HMO and FFSCOMP)		Variables	
FILE06	Services rendered by doctor	DEI5502	Provider number
FILE10	Injections given by doctor	DEI5555	Date of service
		DEI5584	Place of service
		DEI5606	CRVS code
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

CONSTRUCTION

```
DO OVER PERSON AND CONTYR;

  DO OVER (FILE TYPE - HMO OR FFSCOMP) AND DEI5502 AND DEI5555;

    IF (HMO line-item) OR (FFSCOMP line-item AND
       1 <= PLAN <= 19) AND (DEI5584 < 4 OR DEI5584 > 5)
       THEN DO;

          IF (90800 <= DEI5606 <= 90899) OR
             ((DEI5606 = CRVS code in Table 10) AND
             (DEI5502 classed as type of provider in Table 11))
             THEN MENTAL = 1;

          END;
  END;

  IF (last line item for given FILE TYPE AND
     DEI5502 AND DEI5555)
     THEN MENTVIS = MENTVIS + MENTAL;

END;
```

(cont.)

VALUE	FREQ	CUM FREQ	%	CUM %
20	5	11150	0.05	99.37
21	1	11151	0.01	99.38
22	3	11154	0.03	99.40
23	2	11156	0.02	99.42
24	3	11159	0.03	99.45
25	5	11164	0.05	99.49
26	1	11165	0.01	99.50
27	2	11167	0.02	99.52
28	1	11168	0.01	99.53
29	1	11169	0.01	99.54
30	2	11171	0.02	99.55
31	2	11173	0.02	99.57
32	4	11177	0.04	99.61
33	2	11179	0.02	99.63
34	2	11181	0.02	99.64
35	2	11183	0.02	99.66
36	2	11185	0.02	99.68
37	1	11186	0.01	99.69
38	1	11187	0.01	99.70
39	3	11190	0.03	99.72
40	2	11192	0.02	99.74
41	4	11196	0.04	99.78
42	2	11198	0.02	99.80
44	2	11200	0.02	99.81
45	5	11205	0.05	99.86
47	4	11209	0.04	99.89
49	2	11211	0.02	99.91
50	1	11212	0.01	99.92
51	2	11214	0.02	99.94
52	2	11216	0.02	99.96
53	2	11218	0.02	99.97
56	2	11220	0.02	99.99
58	1	11221	0.01	100.00

VARIABLE MENTVIS (cont.)

VARIABLE VALUES

DE15584

4 = hospital
5 = nursing home

DE15606

90800-90813 = psychotherapy, adult and child
90814-90833 = group or family therapy
90834-90838 = shock therapy
90839-90899 = other therapy or testing

PLAN

1-19 = FFS insurance plans

TABLE 10

CRVS Codes of Initial Visits

90010	Limited office visit
90011	Unspecified level office visit
90015	Intermediate office visit
90020	Comprehensive office visit
90026	Unusually complex office visit
90510	Limited visit: emergency care facility
90511	Unspecified level visit: emergency care facility
90515	Intermedicate visit: emergency care facility
90600-90645	Consultations
99032-99034	Counseling

TABLE 11

Psychotherapy Providers

Psychiatrist (M.D.)
Child psychiatrist (M.D.)
Psychiatrist (D.O.)
Child psychiatrist (D.O.)
Psychiatric medical clinic
Child psychiatric medical clinic
Mental health clinic
Alcoholism and/or drug treatment clinic
Psychiatric osteopathic clinic
Child psychiatric osteopathic clinic
Mental health osteopathic clinic
Alcoholism and/or drug treatment osteopathic clinic
Psychiatric hospital outpatient clinic
Child psychiatric hospital outpatient clinic
Mental health hospital outpatient clinic
Alcoholism and/or drug treatment hospital outpatient clinic
Psychologist
Psychiatric nurse, MSW, counselor
Alcohol-drug abuse counselor
Psychologically-oriented providers

VARIABLE XMENTVIS — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Out-of-plan psychotherapy visits

XMENTVIS indicates the annual number of out-of-plan outpatient visits for psychotherapy. It includes billed visits only. The limit was 52 covered visits per person per year. The count includes an initial visit to a psychiatrist or psychologist.

SOURCE

Files (FFSCOMP)		Variables	
FILE06	Services rendered by doctor	DEI5502	Provider number
FILE10	Injections given by doctor	DEI5555	Date of service
		DEI5584	Place of service
		DEI5606	CRVS code
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

CONSTRUCTION

```
DO OVER PERSON AND CONTYR;

   DO OVER DEI5502 AND DEI5555;

      IF (DEI5584 < 4 OR DEI5584 > 5) AND (PLAN = 30 OR PLAN = 98)
         THEN DO;

              IF (90800 <= DEI5606 <= 90899) OR
                 ((DEI5606 = CRVS code in Table 10 AND
                 (DEI5502 classed as type of provider in Table 11))
                 THEN XMENTAL = 1;

              END;
   END;

   IF (last line item for given DEI5502 and DEI5555)
      THEN XMENTVIS = XMENTVIS + XMENTAL;

END;
```

(cont.)

XMENTVIS

VALUE	FREQ	CUM FREQ	%	CUM %
0	11183	11183	99.66	99.66
1	14	11197	0.13	99.79
2	5	11202	0.05	99.83
3	3	11205	0.03	99.86
4	2	11207	0.02	99.88
5	1	11208	0.01	99.88
6	1	11209	0.01	99.89
7	1	11210	0.01	99.90
12	1	11211	0.01	99.91
18	1	11212	0.01	99.92
19	2	11214	0.02	99.94
20	1	11215	0.01	99.95
22	1	11216	0.01	99.96
29	1	11217	0.01	99.96
32	1	11218	0.01	99.97
51	1	11219	0.01	99.98
52	1	11220	0.01	99.99
127	1	11221	0.01	100.00

VARIABLE XMENTVIS (cont.)

VARIABLE VALUES

DEI5584	DEI5606
4 = hospital	90800-90813 = psychotherapy, adult and child
5 = nursing home	90814-90833 = group or family therapy
	90834-90838 = shock therapy
	90839-90899 = other therapy or testing

PLAN

30 = GHC experimental group
98 = GHC control group

VARIABLE MDVIS — HMO-FFS ANNUAL EXPENDITURES/COUNTS

In-plan physician face-to-face visits (outpatient)

MDVIS indicates the annual number of in-plan outpatient face-to-face visits with physician providers, including doctors of osteopathy. The total excludes visits to dental and outpatient psychiatric providers, visits where only radiology, pathology, or anesthesiology services were provided, and outpatient prenatal visits.

NOTE: If any portion of a visit is a psychotherapy visit (MENTVIS), the visit is excluded from MDVIS. This variable cannot be used to obtain the average expenditure per visit. Visit counts represent face-to-face (FTF) visits only, while expenditure totals include both FTF and non-FTF visits.

SOURCE

Files (HMO and FFSCOMP)		Variables	
FILE06	Services rendered by doctor	DEI5502	Provider
FILE10	Injections given by doctor	DEI5555	Date of service
		DEI5584	Place of service
		DEI5606	CRVS code
		DEI5522	1st diagnosis code

(cont.)

MDVIS

VALUE	FREQ	CUM FREQ	%	CUM %
0	2999	2999	26.73	26.73
1	2164	5163	19.29	46.01
2	1575	6738	14.04	60.05
3	1224	7962	10.91	70.96
4	829	8791	7.39	78.34
5	595	9386	5.30	83.65
6	438	9824	3.90	87.55
7	340	10164	3.03	90.58
8	249	10413	2.22	92.80
9	177	10590	1.58	94.38
10	130	10720	1.16	95.54
11	116	10836	1.03	96.57
12	66	10902	0.59	97.16
13	57	10959	0.51	97.67
14	45	11004	0.40	98.07
15	36	11040	0.32	98.39
16	25	11065	0.22	98.61
17	15	11080	0.13	98.74
18	13	11093	0.12	98.86
19	22	11115	0.20	99.06
20	16	11131	0.14	99.20
21	12	11143	0.11	99.31
22	1	11144	0.01	99.31
23	9	11153	0.08	99.39
24	6	11159	0.05	99.45
25	4	11163	0.04	99.48
26	5	11168	0.05	99.53
27	3	11171	0.03	99.55
28	1	11172	0.01	99.56

(cont.)

VARIABLE MDVIS (cont.)

SOURCE (cont.)

	DEI5524	1st associated diagnosis code
	DEI5525	2nd diagnosis code
	DEI5527	2nd associated diagnosis code
	DEI5528	3rd diagnosis code
	DEI5530	3rd associated diagnosis code
	DEI5531	4th diagnosis code
	DEI5533	4th associated diagnosis code
	MENTAL	Mental health visit (see MENTVIS)
FSD Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

CONSTRUCTION

```
DO OVER PERSON AND CONTYR;

   DO OVER (FILE TYPE = HMO OR FFSCOMP) AND DEI5502 AND DEI5555;

      IF (HMO line item) OR (FFSCOMP line item AND
         1 <= PLAN <= 19) AND (DEI5584 < 4 OR DEI5584 > 5) AND
         MENTAL NE 1
         THEN DO;

              IF (DEI5606 = any CRVS code in Table 12)
                 THEN DO;

                      IF (90100 <= DEI5606 <= 90199 OR
                          97000 <= DEI5606 <= 97799) AND
                         (DEI5502 = a hospital)
                         THEN NOTMD=1;
                      IF NOTMD NE 1 AND (DEI5502 is classified
                         among those in Table 13)
                         THEN MD = 1;
                      IF (DEI5606 = any CRVS code in Table 16) OR
                         (diagnosis codes = any value in Table 15)
                         THEN PRENATAL = 1;

                      END;
              END;
   END;
```

(cont.)

VALUE	FREQ	CUM FREQ	%	CUM %
29	3	11175	0.03	99.59
30	5	11180	0.05	99.64
31	4	11184	0.04	99.67
32	3	11187	0.03	99.70
33	2	11189	0.02	99.72
34	3	11192	0.03	99.74
35	2	11194	0.02	99.76
37	5	11199	0.05	99.80
38	4	11203	0.04	99.84
39	1	11204	0.01	99.85
40	1	11205	0.01	99.86
41	2	11207	0.02	99.88
42	2	11209	0.02	99.89
43	1	11210	0.01	99.90
44	1	11211	0.01	99.91
45	1	11212	0.01	99.92
47	1	11213	0.01	99.93
49	1	11214	0.01	99.94
50	1	11215	0.01	99.95
51	1	11216	0.01	99.96
52	1	11217	0.01	99.96
55	1	11218	0.01	99.97
57	1	11219	0.01	99.98
62	1	11220	0.01	99.99
74	1	11221	0.01	100.00

```
VARIABLE MDVIS (cont.)

  CONSTRUCTION (cont.)

     IF (last line item for given FILE TYPE AND
        DE15502 AND DE15555)
        THEN DO;

             IF PRENATAL NE 1 THEN MDVIS = MDVIS + MD;

             END;
  END;


  VARIABLE VALUES

    DE15584                DE15606

      4 = hospital           90100-90199 = home visits
      5 = nursing home       97000-97799 = physical therapy

    PLAN

      1-19 = FFS insurance plans
```

TABLE 12

CRVS Codes for Face-to-Face Visits

CRVS codes	Services
10000-62273	Surgery
62280-64099	Surgery
64531-69999	Surgery
79000-79499	Therapeutic radiation
90000-90099	Office visit
*90100-90199	Home visits
90200-90499	Hospital and nursing home visits
90500-90599	Emergency care services
90600-90645	Consultations
90700-90749	Immunizations, therapeutic injections
90750-90799	Pediatric office visits
90962-90999	Dialysis services
91000-91299	GI diagnostic services
92000-92499	Eye services
92504-92549	Selected ENT services
93015-93017	Selected cardiovascular services
93019-93022	Selected cardiovascular services
93046	Selected cardiovascular services
93500-93599	Cardiac catheterizations
95000-95199	Allergy testing
96000-96300	Specific therapeutic procedures
96450-96499	Specific therapeutic procedures
96900-96920	Specific therapeutic procedures
*97000-97261	Physical medicine visits
*97500-97799	Miscellaneous physical medicine
99032-99034	Counseling, conference

*These CRVS codes are excluded from MDVIS for face-to-face outpatient visits at a hospital.

TABLE 13

Types of Physician Providers

Physicians (M.D.)
Physicians (D.O.)
Medical (health care) clinics and group practices
Osteopathic clinics and group practices
Hospital medical outpatient clinics
Hospital emergency rooms/departments

VARIABLE XMDVIS — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Out-of-plan physician face-to-face visits (outpatient)

XMDVIS indicates the annual number of out-of-plan outpatient face-to-face visits with physician providers, including doctors of osteopathy. The total excludes visits to dental and outpatient psychiatric providers, visits where only radiology, pathology, or anesthesiology services were provided, and outpatient prenatal visits.

See NOTE under MDVIS.

SOURCE

Files (FFSCOMP)		Variables	
FILE06	Services rendered by doctor	DEI5502	Provider
FILE10	Injections given by doctor	DEI5555	Date of service
		DEI5584	Place of service
		DEI5606	CRVS code
		DEI5522	1st diagnosis code
		DEI5524	1st associated diagnosis code
		DEI5525	2nd diagnosis code
		DEI5527	2nd associated diagnosis code
		DEI5528	3rd diagnosis code
		DEI5530	3rd associated diagnosis code
		DEI5531	4th diagnosis code
		DEI5533	4th associated diagnosis code
		XMENTAL	Mental health visit indicator (see XMENTVIS)
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

(cont.)

XMDVIS

VALUE	FREQ	CUM FREQ	%	CUM %
0	10886	10886	97.02	97.02
1	209	11095	1.86	98.88
2	47	11142	0.42	99.30
3	26	11168	0.23	99.53
4	12	11180	0.11	99.64
5	8	11188	0.07	99.71
6	7	11195	0.06	99.77
7	7	11202	0.06	99.83
8	4	11206	0.04	99.87
9	3	11209	0.03	99.89
10	4	11213	0.04	99.93
11	1	11214	0.01	99.94
12	1	11215	0.01	99.95
13	1	11216	0.01	99.96
14	1	11217	0.01	99.96
17	1	11218	0.01	99.97
18	2	11220	0.02	99.99
22	1	11221	0.01	100.00

```
VARIABLE XMDVIS (cont.)

  CONSTRUCTION

  DO OVER PERSON AND CONTYR;

     DO OVER DEI5502 AND DEI5555;

        IF (DEI5584 < 4 OR DEI5584 > 5) AND
           (PLAN = 30 OR PLAN = 98) AND XMENTAL NE 1
           THEN DO;

                IF (DEI5606 = any CRVS code in Table 12)
                   THEN DO;

                        IF (90100 <= DEI5606 <= 90199 OR
                            97000 <= DEI5606 <= 97799) AND
                           (DEI5502 = a hospital)
                           THEN XNOTMD = 1;
                        IF XNOTMD NE 1 AND
                           (DEI5502 is classified among those
                           in Table 13)
                           THEN XMD = 1;
                        IF (DEI5606 = any CRVS code in Table 16) OR
                           (diagnosis codes = any value in Table 15)
                           THEN PRENATAL = 1;

                        END;
                END;
     END;

     IF (last line item for given DEI5502 and DEI5555)
        THEN DO;

             IF PRENATAL NE 1
                THEN XMDVIS = XMDVIS + XMD;

             END;
  END;


  VARIABLE VALUES

    DEI5584                DEI5606

      4 = hospital           90100-90199 = home visits
      5 = nursing home       97000-97799 = physical therapy
                                                  (cont.)
```

VARIABLE XMDVIS (cont.)

VARIABLE VALUES (cont.)

PLAN

30 = GHC experimental group
98 = GHC control group

VARIABLE NONMDVIS — HMO-FFS ANNUAL EXPENDITURES/COUNTS

In-plan nonphysician face-to-face visits (outpatient)

NONMDVIS indicates the number of in-plan outpatient face-to-face contacts with nonphysician providers such as speech and physical therapists, chiropractors, podiatrists, acupuncturists, Christian Science healers, etc., during a contract year or applicable portion thereof. The total excludes dental or mental health visits, visits where only radiology, anesthesiology, or pathology services were provided, and visits for outpatient prenatal care.

NOTE: If any portion of a visit is a psychotherapy visit (MENTVIS), the visit is excluded from NONMDVIS. Thus, if a given visit meets the definition for both NONMDVIS and MENTVIS, the visit is considered psychotherapy and is not counted.

SOURCE

Files (HMO and FFSCOMP)		Variables	
FILE06	Services rendered by doctor	DEI5502	Provider
FILE10	Injections given by doctor	DEI5555	Date of service
		DEI5584	Place of service
		DEI5606	CRVS code
		DEI5522	1st diagnosis code

(cont.)

NONMDVIS

VALUE	FREQ	CUM FREQ	%	CUM %
0	6602	6602	58.84	58.84
1	2373	8975	21.15	79.98
2	983	9958	8.76	88.74
3	486	10444	4.33	93.08
4	210	10654	1.87	94.95
5	152	10806	1.36	96.30
6	95	10901	0.85	97.15
7	63	10964	0.56	97.71
8	42	11006	0.37	98.08
9	43	11049	0.38	98.47
10	23	11072	0.21	98.67
11	24	11096	0.21	98.89
12	14	11110	0.13	99.01
13	15	11125	0.13	99.14
14	11	11136	0.10	99.24
15	7	11143	0.06	99.31
16	11	11154	0.10	99.40
17	4	11158	0.04	99.44
18	5	11163	0.05	99.48
19	10	11173	0.09	99.57
20	6	11179	0.05	99.63
22	6	11185	0.05	99.68
23	1	11186	0.01	99.69
24	4	11190	0.04	99.72
25	2	11192	0.02	99.74
26	2	11194	0.02	99.76
27	5	11199	0.05	99.80
28	1	11200	0.01	99.81
29	3	11203	0.03	99.84
31	2	11205	0.02	99.86
32	3	11208	0.03	99.88
33	2	11210	0.02	99.90

(cont.)

VARIABLE NONMDVIS (cont.)

SOURCE (cont.)

DEI5524	1st associated diagnosis code
DEI5525	2nd diagnosis code
DEI5527	2nd associated diagnosis code
DEI5528	3rd diagnosis code
DEI5530	3rd associated diagnosis code
DEI5531	4th diagnosis code
DEI5533	4th associated diagnosis code
MENTAL	Mental health visit indicator (see MENTVIS)

FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

CONSTRUCTION

```
DO OVER PERSON AND CONTYR;

   DO OVER (FILE TYPE - HMO or FFS) AND DEI5502 AND DEI5555;

      IF ((HMO line item) OR (FFSCOMP line item AND
         1 <= PLAN <= 19)) AND (DEI5584 < 4 OR DEI5584 > 5) AND
         MENTAL NE 1
         THEN DO;

            IF (DEI5606 = any CRVS code in Table 12)
               THEN DO;

                  IF (90100 <= DEI5606 <= 90199  OR
                      97000 <= DEI5606 <= 97799) AND
                     (DEI5502 = a hospital)
                     THEN NOTMD = 1;
                  IF NOTMD = 1 OR (DEI5502 is classified
                     among those in Table 14)
                     THEN NONMD = 1;
                  IF (DEI5606 = any CRVS code in Table 16) OR
                     (diagnosis codes = any value in Table 15)
                     THEN PRENATAL = 1;

                  END;
            END;
   END;
```

(cont.)

VALUE	FREQ	CUM FREQ	%	CUM %
34	2	11212	0.02	99.92
38	1	11213	0.01	99.93
40	2	11215	0.02	99.95
42	1	11216	0.01	99.96
44	1	11217	0.01	99.96
52	1	11218	0.01	99.97
56	1	11219	0.01	99.98
70	1	11220	0.01	99.99
109	1	11221	0.01	100.00

VARIABLE NONMDVIS (cont.)

CONSTRUCTION (cont.)

```
IF (last line item for given FILE TYPE AND
   DE15502 AND DE15555)
   THEN DO;

        IF PRENATAL NE 1
           THEN NONMDVIS = NONMDVIS + NONMD;

        END;
```

END;

VARIABLE VALUES

DE15584	DE15606
4 = hospital	90100-90199 = home visits
5 = nursing home	97000-97799 = physical therapy

PLAN

1-19 = FFS insurance plans

TABLE 14

Types of Nonphysician Providers

Audiologist	Podiatrist
Chiropractor	Christian Science practitioner
Optometrist	Physician's assistant
Optician	Midwife
Paramedic	Therapist
Private duty nurse	Nurse practitioner
Ambulance	Screening/health association

VARIABLE XNMDVIS — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Out-of-plan nonphysician face-to-face visits (outpatient)

XNMDVIS indicates the number of out-of-plan outpatient face-to-face contacts with nonphysician medical providers such as speech and physical therapists, chiropractors, podiatrists, acupuncturists, Christian Science healers, etc., during a contract year or applicable portion thereof. The total excludes dental or mental health visits, visits where only radiology, anesthesiology, or pathology services were provided, and visits for outpatient prenatal care.

See NOTE under NONMDVIS.

SOURCE

Files (FFSCOMP)		Variables	
FILE06	Services rendered by doctor	DEI5502	Provider
FILE10	Injections given by doctor	DEI5555	Date of service
		DEI5584	Place of service
		DEI5606	CRVS code
		DEI5522	1st diagnosis code
		DEI5524	1st associated diagnosis code
		DEI5525	2nd diagnosis code
		DEI5527	2nd associated diagnosis code
		DEI5528	3rd diagnosis code
		DEI5530	3rd associated diagnosis code
		DEI5531	4th diagnosis code
		DEI5533	4th associated diagnosis code
		XMENTAL	Mental health visit indicator (see XMENTVIS)
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files) (cont.)

XNMDVIS

VALUE	FREQ	CUM FREQ	%	CUM %
0	10871	10871	96.88	96.88
1	96	10967	0.86	97.74
2	32	10999	0.29	98.02
3	23	11022	0.21	98.23
4	33	11055	0.29	98.52
5	17	11072	0.15	98.67
6	11	11083	0.10	98.77
7	8	11091	0.07	98.84
8	7	11098	0.06	98.90
9	12	11110	0.11	99.01
10	9	11119	0.08	99.09
11	4	11123	0.04	99.13
12	13	11136	0.12	99.24
13	6	11142	0.05	99.30
14	6	11148	0.05	99.35
15	5	11153	0.05	99.39
16	6	11159	0.05	99.45
17	8	11167	0.07	99.52
18	5	11172	0.05	99.56
19	5	11177	0.05	99.61
20	2	11179	0.02	99.63
21	6	11185	0.05	99.68
23	4	11189	0.04	99.72
24	3	11192	0.03	99.74
25	3	11195	0.03	99.77
26	5	11200	0.05	99.81
28	3	11203	0.03	99.84
29	2	11205	0.02	99.86
30	3	11208	0.03	99.88
31	3	11211	0.03	99.91
33	1	11212	0.01	99.92
34	1	11213	0.01	99.93
35	1	11214	0.01	99.94
41	1	11215	0.01	99.95
44	1	11216	0.01	99.96
45	1	11217	0.01	99.96
50	1	11218	0.01	99.97
52	1	11219	0.01	99.98
57	1	11220	0.01	99.99
93	1	11221	0.01	100.00

```
VARIABLE XNMDVIS (cont.)

  CONSTRUCTION

  DO OVER PERSON AND CONTYR;

     DO OVER DEI5502 AND DEI5555;

        IF (DEI5584 < 4 OR DEI5584 > 5) AND
           (PLAN = 30 OR PLAN = 98) AND XMENTAL NE 1
           THEN DO;

                IF (DEI5606 = any CRVS code in Table 12)
                   THEN DO;

                        IF (90100 <= DEI5606 <= 90199 OR
                            97000 <= DEI5606 <= 97799) AND
                           (DEI5502 = a hospital)
                           THEN XNOTMD = 1;
                        IF XNOTMD = 1 OR (DEI5502 is classified
                           among those in Table 14)
                           THEN XNONMD = 1;
                        IF (DEI5606 = any CRVS code in Table 16) OR
                           (diagnosis codes = any value in Table 15)
                           THEN PRENATAL = 1;

                        END;
                END;
     END;

     IF (last line item for given DEI5502 and DEI5555)
        THEN DO;

             IF PRENATAL NE 1
                THEN XNMDVIS = XNMDVIS + XNONMD;

             END;
  END;


  VARIABLE VALUES

    DEI5584                DEI5606

      4 = hospital           90100-90199 = home visits
      5 = nursing home       97000-97799 = physical therapy
```

(cont.)

VARIABLE XNMDVIS (cont.)

VARIABLE VALUES (cont.)

PLAN

30 = GHC experimental group
98 = GHC control group

VARIABLE TOTADM — HMO-FFS ANNUAL EXPENDITURES/COUNTS

In-plan hospital admissions

TOTADM indicates the annual number of in-plan covered participant hospitalizations, including admissions for reasons of mental health.

NOTE: Hospital admissions were assigned to (1) women with births but no hospital and/or inpatient physician claims, and (2) cases with an inpatient physician claim but no hospital bill.

SOURCE

Files	(HMO and FFSCOMP)	Variables	
FILE01	Hospital inpatient charges	DEI5502	Provider number
FILE03	Hospital inpatient physician services	DEI5513	Admission date
FILE06	Physician services (inpatient)*		
FILE10	Physician injections (inpatient)*		
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

(cont.)

TOTADM

VALUE	FREQ	CUM FREQ	%	CUM %
0	10427	10427	92.92	92.92
1	688	11115	6.13	99.06
2	80	11195	0.71	99.77
3	17	11212	0.15	99.92
4	4	11216	0.04	99.96
5	2	11218	0.02	99.97
6	2	11220	0.02	99.99
7	1	11221	0.01	100.00

VARIABLE TOTADM (cont.)

CONSTRUCTION

```
DO OVER PERSON AND CONTYR;

   DO OVER (FILE TYPE - HMO or FFSCOMP) AND DEI5502 AND DEI5513;

      IF (HMO line item) OR (FFSCOMP line item AND
         1 <= PLAN <= 19)
         THEN HOSPADM = 1;

   END;

   IF (last line item for given FILE TYPE AND
      DEI5502 AND DEI5513)
      THEN TOTADM = TOTADM + HOSPADM;

END;
```

VARIABLE VALUES

PLAN

1-19 = FFS insurance plans

*NOTE: For TOTADM and the hospital visit count variables MATADM and PREGADM plus their out-of-plan counterparts, inpatient physician records (DEI5584 = 4 or 5) from files 06 and 10 were linked to hospital service records in file 01 by comparing dates of service in files 06 and 10 to the admission and discharge dates on file 01. A file 06 or 10 record was linked with a file 01 record if (a) the date of service fell within the admission and discharge dates or (b) the date of service was within 7 days of admission or 7 days after discharge. The latter matches were checked by hand to verify that a correct link had been made. If a file 06 or 10 record could not be linked to a file 01 record, the linking process was repeated to see if the date of service in files 06 or 10 could be matched to a file 03 record. If a match was not found, the file 06 or 10 record was treated as part of a unique hospitalization with a missing hospital bill. Unmatched file 06 and 10 records were grouped together into unique hospitalizations by examining providers and dates of service. An admission date (DEI5513) and discharge date (DEI5514) were assigned to the file 06 and 10 records using the earliest date of service in the group for the admission date, and the latest date of service for the date of discharge.

VARIABLE XTOTADM — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Out-of-plan hospital admissions

XTOTADM indicates the annual number of covered out-of-plan participant hospitalizations, including admissions for reasons of mental health.

NOTE: Hospital admissions were assigned to (1) women with births but no hospital and/or inpatient physician claims, and (2) cases with an inpatient physician claim but no hospital bill.

SOURCE

Files	(FFSCOMP)	Variables	
FILE01	Hospital inpatient charges	DEI5502	Provider number
FILE03	Hospital inpatient physician services	DEI5513	Admission date
FILE06	Physician services (inpatient)*		
FILE10	Physician injections (inpatient)*		
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

*NOTE: See note concerning file linkage under TOTADM.

CONSTRUCTION

```
DO OVER PERSON AND CONTYR;

   DO OVER DEI5502 AND DEI5513;

      IF (PLAN = 30 OR PLAN = 98) THEN XHOSPADM = 1;

   END;

   IF (last line item for given DEI5502 and DEI5513)
      THEN XTOTADM = XTOTADM + XHOSPADM;

END;
```

(cont.)

XTOTADM

VALUE	FREQ	CUM FREQ	%	CUM %
0	11196	11196	99.78	99.78
1	21	11217	0.19	99.96
2	3	11220	0.03	99.99
3	1	11221	0.01	100.00

VARIABLE XTOTADM (cont.)

VARIABLE VALUES

PLAN

30 = GHC experimental group
98 = GHC control group

VARIABLE MATADM — HMO-FFS ANNUAL EXPENDITURES/COUNTS

In-plan maternity hospital admissions

MATADM indicates the annual number of in-plan covered hospital admissions for delivery-related maternity care. It includes cases where births were reported from other HIE records, but hospital and/or inpatient physician claims were missing. Only mothers will have MATADM>0.

NOTE: Maternity hospital admissions were assigned to (1) women with births but no hospital claims and/or inpatient physician (or midwife) claims, and (2) cases with an inpatient physician (or midwife) claim for maternity but no hospital bill.

SOURCE

Files	(HMO and FFSCOMP)	Variables	
FILE01	Hospital inpatient charges	DEI5502	Provider number
FILE03	Hospital inpatient physician services	DEI5513	Admission date
		DEI5522	1st diagnosis code
FILE06	Physician services (inpatient only)*	DEI5524	1st associated diagnosis code (cont.)

MATADM

VALUE	FREQ	CUM FREQ	%	CUM %
0	11060	11060	98.57	98.57
1	161	11221	1.44	100.00

VARIABLE MATADM (cont.)

SOURCE (cont.)

FILE10	Physician injections (inpatient only)*	DEI5525	2nd diagnosis code
		DEI5527	2nd associated diagnosis code
		DEI5528	3rd diagnosis code
		DEI5530	3rd associated diagnosis code
		DEI5531	4th diagnosis code
		DEI5533	4th associated diagnosis code
		DEI5606	CRVS code
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

*NOTE: See note concerning file linkage under TOTADM.

CONSTRUCTION

```
DO OVER PERSON AND CONTYR;

   DO OVER (FILE TYPE - HMO or FFSCOMP) AND DEI5502 AND DEI5513;

      IF (HMO line-item) OR (FFSCOMP line-item AND
         1 <= PLAN <= 19)
         THEN DO;

              IF (any diagnosis code = code in Table 15) OR
                 (DEI5606 = code in Table 16) THEN MAT = 1;

              END;
   END;

   IF (last line item for given FILE TYPE AND
      DEI5502 and DEI5513)
      THEN MATADM = MATADM + MAT;

END;
```

(cont.)

VARIABLE MATADM (cont.)

(NOTE: The associated diagnosis was not used in the construction if the diagnosis qualifier indicated that the condition was definitely ruled out by the physician).

VARIABLE VALUES

PLAN

1-19 = FFS insurance plans

TABLE 15

Diagnosis Codes Defining Maternity-Related Hospitalizations

72.0-74.9	Obstetrical procedures
650.0-664.9	Delivery
Y06.0-Y06.1	Prenatal care
Y06.3	Failed induction of labor
Y06.4	Failed trial of labor for vaginal delivery
Y06.9	Pregnancy associated with nonobstetric condition
Y07.0-Y07.1	Postpartum observation
Y20.0-Y29.9	Liveborn infant births
Y30.0-Y32.9	Fetal death

TABLE 16

CRVS Codes Defining Maternity-Related Hospitalizations

59400-59446	Delivery care
59481	Observation of labor without delivery
59500-59561	Caesarean section
59889	Unlisted maternity care and delivery procedure

VARIABLE XMATADM — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Out-of-plan maternity hospital admissions

XMATADM indicates the annual number of out-of-plan covered hospital admissions for delivery-related maternity care. It included cases where births were reported from other HIE records, but hospital and/or inpatient physician claims were missing. Only mothers will have XMATADM>0.

See NOTE under MATADM.

SOURCE

Files	(FFSCOMP)	Variables	
FILE01	Hospital inpatient charges	DEI5502	Provider number
FILE03	Hospital inpatient physician services	DEI5513	Admission date
		DEI5522	1st diagnosis code
FILE06	Physician services (inpatient only)*	DEI5524	1st associated diagnosis code
FILE10	Physician injections (inpatient only)*	DEI5525	2nd diagnosis code
		DEI5527	2nd associated diagnosis code
		DEI5528	3rd diagnosis code
		DEI5530	3rd associated diagnosis code
		DEI5531	4th diagnosis code
		DEI5533	4th associated diagnosis code
		DEI5606	CRVS code
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

*NOTE: See note concerning file linkage under TOTADM.

(cont.)

XMATADM

VALUE	FREQ	CUM FREQ	%	CUM %
0	11219	11219	99.98	99.98
1	2	11221	0.02	100.00

VARIABLE XMATADM (cont.)

CONSTRUCTION

```
DO OVER PERSON AND CONTYR;

   DO OVER DEI5502 AND DEI5513;

      IF ((any diagnosis code = code in Table 15) OR
         (DEI5606 = code in Table 16)) AND
         (PLAN = 30 OR PLAN = 98)
         THEN XMAT = 1;
   END;

   IF (last line item for given DEI5502 AND DEI5513)
      THEN XMATADM = XMATADM + XMAT;

END;
```

(NOTE: The associated diagnosis was not used in the construction if the diagnosis qualifier indicated that the condition was definitely ruled out by the physician).

VARIABLE VALUES

PLAN

30 = GHC experimental group
98 = GHC control group

VARIABLE PREGADM — HMO-FFS ANNUAL EXPENDITURES/COUNTS

In-plan pregnancy-related hospital admissions

PREGADM indicates the annual number of in-plan covered hospital admissions in which pregnancy was a factor. It includes cases where births were reported from other HIE records, but hospital and/or inpatient physician claims were missing. Maternity hospital admissions are included, thus PREGADM >= MATADM.

NOTE: Pregnancy-related hospitalizations were created for (1) women with births but no hospital and/or inpatient physician claims, and (2) cases with an inpatient physician claim for pregnancy but no hospital bill.

SOURCE

Files	(HMO and FFSCOMP)	Variables	
FILE01	Hospital inpatient charges	DEI5502	Provider number
FILE03	Hospital inpatient physician services	DEI5513	Admission date
		DEI5522	1st diagnosis code
FILE06	Physician services (inpatient only)*	DEI5524	1st associated diagnosis code
FILE10	Physician injections (inpatient only)*	DEI5525	2nd diagnosis code
		DEI5527	2nd associated diagnosis code
		DEI5528	3rd diagnosis code
		DEI5530	3rd associated diagnosis code
		DEI5531	4th diagnosis code
		DEI5533	4th associated diagnosis code
		DEI5606	CRVS code
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

*NOTE: See note concerning file linkage under TOTADM.

(cont.)

PREGADM

VALUE	FREQ	CUM FREQ	%	CUM %
0	11040	11040	98.39	98.39
1	173	11213	1.54	99.93
2	7	11220	0.06	99.99
3	1	11221	0.01	100.00

VARIABLE PREGADM (cont.)

```
CONSTRUCTION

   DO OVER PERSON AND CONTYR;

      DO OVER (FILE TYPE - HMO or FFSCOMP) AND DEI5502 AND DEI5513;

         IF (HMO line item) OR (FFSCOMP line item AND
            1 <= PLAN <= 19)
            THEN DO;

                 IF (any diagnosis code = code in Table 17) OR
                    (59000 <= DEI5606 <= 59889)
                    THEN PREG = 1;

                 END;
      END;

      IF (last line item for given FILE TYPE AND
         DEI5502 and DEI5513)
         THEN PREGADM = PREGADM + PREG;

   END;
```

(NOTE: The associated diagnosis was not used in the construction if the diagnosis qualifier indicated that the condition was definitely ruled out by the physician).

VARIABLE VALUES

DEI5606

59000-59889 = maternity care and delivery

PLAN

1-19 = FFS insurance plans

TABLE 17

Diagnosis Codes Defining Pregnancy-Related Hospitalizations

72.0-75.9	Obstetrical procedures
631.0-678.9	Delivery and complications of pregnancy, childbirth, and the puerperium
Y06.0-Y07.1	Maternal care
Y20.0-Y29.9	Liveborn infant births
Y30.0-Y32.9	Fetal death
Y40.0-Y48.9	Causes of perinatal morbidity and mortality

VARIABLE XPREGADM — HMO-FFS ANNUAL EXPENDITURES/COUNTS

Out-of-plan pregnancy-related hospital admissions

XPREGADM indicates the annual number of out-of-plan covered hospital admissions in which pregnancy was a factor. It includes cases where births were reported from other HIE records, but hospital and/or inpatient physician claims were missing. Maternity hospital admissions are included, thus XPREGADM >= XMATADM.

See NOTE under PREGADM.

SOURCE

Files	(FFSCOMP)	Variables	
FILE01	Hospital inpatient charges	DEI5502	Provider number
FILE03	Hospital inpatient physician services	DEI5513	Admission date
		DEI5522	1st diagnosis code
FILE06	Physician services (inpatient only)*	DEI5522	1st diagnosis code

(cont.)

XPREGADM

VALUE	FREQ	CUM FREQ	%	CUM %
0	11219	11219	99.98	99.98
1	2	11221	0.02	100.00

VARIABLE XPREGADM (cont.)

SOURCE (cont.)

FILE10	Physician injections (inpatient only)*	DE15524	1st associated diagnosis code
		DE15525	2nd diagnosis code
		DE15527	2nd associated diagnosis code
		DE15528	3rd diagnosis code
		DE15530	3rd associated diagnosis code
		DE15531	4th diagnosis code
		DE15533	4th associated diagnosis code
		DE15606	CRVS code
FSD	Full sample demographic file	PLAN	Assigned insurance plan (merged onto all line-item files)

*NOTE: See note concerning file linkage under TOTADM.

CONSTRUCTION

```
DO OVER PERSON AND CONTYR;

   DO OVER DE15502 AND DE15513;

      IF ((any diagnosis code = code in Table 17) OR
         (59000 <= DE15606 <= 59889)) AND
         (PLAN = 30 OR PLAN = 98)
         THEN XPREG = 1;
   END;

   IF (last line item for given DE15502 and DE15513)
      THEN XPREGADM = XPREGADM + XPREG;

END;
```

(NOTE: The associated diagnosis was not used in the construction if the diagnosis qualifier indicated that the condition was definitely ruled out by the physician).

(cont.)

VARIABLE XPREGADM (cont.)

VARIABLE VALUES

DE15606

59000-59889 = maternity care and delivery

PLAN

30 = GHC experimental group
98 = GHC control group

Appendix A
PARTICIPATION INCENTIVE PAYMENTS

HIE-insured families were paid a participation incentive (PI) if their HIE plans could conceivably impose a greater financial burden than their existing health insurance policies.[1] Calculated yearly, the PI consisted of (1) an amount calculated to be the *maximum* difference between what the family would have to pay for health care under its HIE insurance plan and what it would have paid under its existing insurance plan, unless (2) the premium a family paid to maintain its existing insurance exceeded the maximum difference. In that case, the family was paid an amount equal to the premium payment.

The calculation of item 1 ignored the family's actual medical expenses. To illustrate, consider family X whose HIE plan specified 95 percent coinsurance up to a maximum out-of-pocket expenditure of $450, above which care was free.[2] Family X's existing insurance specified a $100 deductible, above which the family had to pay 20 percent coinsurance. Under its HIE policy, the family had to spend $473.68 for medical services (with the 5 percent reimbursement) to reach the $450 out-of-pocket maximum. For the same charge under its existing insurance, the family would have paid $100 (the deductible) plus 20 percent of the amount between $100 and $473.68. The maximum difference was thus 473.68 - 100 - 0.2 (473.68 - 100) = 298.94. Family X was entitled to $298.94 per year for that portion of its participation incentive.

The total PI could not exceed the MDE specified in the family's HIE plan unless the family's share of its insurance premium exceeded the MDE. For example, if family X paid an insurance premium of $300, its

---

[1]Participation incentive payments were not offered to families receiving free care (plan A, described on p. 3) who had no premium to pay, families who had no health insurance before the experiment, and families whose other policies had equal or less generous terms, under all circumstances, than their HIE plan.

[2]In HIE terminology, maximum out-of-pocket expenditure is called "maximum dollar expenditure," or MDE.

total PI entitlement was $450, not $598.94 (300 + 298.94). If the family paid a premium of $600, its PI was $600 because the premium exceeded the MDE of $450. On the other hand, a family who had a high MDE in its HIE plan and an existing insurance policy with 0 percent coinsurance, no deductible, and an employer-paid premium was entitled to the full MDE amount. The purpose of PI payments was to ensure that a family was no worse off financially by participating in the experiment--whether because of the cost of its insurance premium or the "worse" terms of its HIE insurance plan compared with its existing policy.[3]

As encouragement for families to complete their assigned enrollment terms, a portion of the family's annual PI was withheld until the last year of the term.[4] The family received its full annual PI that last year, and the amount previously withheld was paid as part of a completion bonus when the family completed the physical screening examination and medical health questionnaire at exit.[5]

To measure enrollees' responsiveness to PI payments, a subset of families received their full annual PI in the next-to-last, as well as the last, year of their term. That "super PI bonus" was offered to 44.4 percent of the families assigned to insurance plans requiring 95 percent coinsurance, the highest rate (plans K-N, described on pp. 3-4). Super PI

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[3]Calculation of PI is further described in Clasquin and Brown, op. cit. The formula on p. 20 of that report should read PI = max[K x PG, PR].

[4]The percentage of PI withheld depended on the site and assigned enrollment term, as follows:

	3-yr Term	*5-yr Term*
Dayton	25	15
Seattle	25	15
Fitchburg	33.3	25
Franklin Co.	33.3	25
Charleston	33.3	20
Georgetown Co.	33.3	20

If the discounted PI was not enough to reimburse the cost of the family's insurance premium, however, the family received the full amount of its premium. The difference between the premium and the discounted PI was then subtracted from the withheld amount.

[5]The rest of the completion bonus was the largest annual PI to which the family had been entitled during its enrollment (minus the withheld amount) or $120, whichever was greater.

recipients represented all sites and both terms of enrollment except Dayton enrollees assigned to three-year terms, who had already begun their next-to-last year when super PI was instituted. Within the 95 percent coinsurance plans, super PI recipients were chosen using the "finite selection model." That model was developed by RAND to assign enrollees to experimental insurance plans so that, across plans, families resembled each other in 24 health and socioeconomic characteristics.[6]

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[6]The finite selection model is described in Carl N. Morris, "A Finite Selection Model for Experimental Design of the Health Insurance Study," *Journal of Econometrics*, Vol. 11, 1979, pp. 43-61.

Appendix B
HIE DATA FILES

This appendix identifies the data files that the HIE has either issued or expects to issue, grouped in topical series. As a tape of each file is issued, a companion codebook is published as a RAND Note. One Note may contain the codebooks for several files. In addition to issuing files and codebooks, HIE staff will prepare a user's guide to provide assistance in understanding and using the HIE database for analysis.

The list below cites codebooks for the files that have been issued, and file names for those not yet issued. At this time it is impossible to predict exact issue dates for future files and codebooks. This preliminary list is to alert prospective users to the variety of subject matter covered by the HIE database and to the existence of related files that should be used together.

Before ordering a file or codebook, be sure to verify its availability with the RAND Publications Department, using the reference numbers cited below (e.g., MS3).

ISSUED TO DATE

Master Sample Series

MS1. *Vol. 1: Codebook for Eligibility-Family Changes File*, by S. M. Polich and C. d'Arc Taylor, The RAND Corporation, N-2264/1-HHS, May 1986.

MS2. *Vol. 2: Codebook for Full Sample Demographic File*, by S. M. Polich, N. F. Campbell, C. d'Arc Taylor, D. L. Wesley, J. W. Keesey, and E. S. Bloomfield, The RAND Corporation, N-2264/2-HHS, May 1986.

Aggregated Claims Series

AC1. *Vol. 1: Codebook for Fee-for-Service Annual Expenditures and Visit Counts*, by C. E. Peterson, M. Nelsen, and E. S. Bloomfield, The RAND Corporation, N-2360/1-HHS, May 1986.

ISSUED TO DATE (cont.)

AC2-AC4. *Vol. 2: Codebooks for Fee-for-Service Visits--Outpatient, Inpatient, and Dental*, by C. E. Peterson, M. Nelsen, D. L. Wesley, and E. S. Bloomfield, The RAND Corporation, N-2360/2-HHS, June 1986.

AC2. FFS outpatient visits
AC3. FFS inpatient visits
AC4. FFS dental visits

AC5-AC6. *Vol. 3: Codebooks for Fee-for-Service Treatment Episodes and Annual Episode Counts*, by C. E. Peterson, C. d'Arc Taylor, and E. S. Bloomfield, The RAND Corporation, N-2360/3-HHS, June 1986.

AC5. FFS treatment episodes
AC6. FFS annual episode counts

AC8-AC9. *Vol. 4: Codebooks for Health Maintenance Organization and Seattle Fee-for-Service Visits--Outpatient and Inpatient*, by C. E. Peterson, M. Nelsen, and D. L. Wesley, The RAND Corporation, N-2360/4-HHS, December 1986.

AC8. HMO and Seattle FFS outpatient visits
AC9. HMO and Seattle FFS inpatient visits

AC7. *Vol. 5: Codebook for Health Maintenance Organization and Seattle Fee-for-Service Annual Expenditures and Visit Counts*, by C. E. Peterson, M. Nelsen, D. L. Wesley, and A. M. Bell, The RAND Corporation, N-2360/5-HHS, December 1986.

Claims Line-Item Series

LI1-LI14. *Vol. 1: Codebooks for Fee-for-Service Claims*, by C. E. Peterson, M. Nelsen, D. L. Wesley, E. S. Bloomfield, and S. M. Polich, The RAND Corporation, N-2347/1-HHS, June 1986.

LI1. FFS data: hospital inpatient services
LI2. FFS data: inpatient physician procedures billed by institutions
LI3. FFS data: drugs prescribed by physicians
LI4. FFS data: supplies prescribed by physicians
LI5. FFS data: services rendered by physicians
LI6. FFS data: drugs sold by physicians
LI7. FFS data: supplies sold by physicians
LI8. FFS data: injections administered by physicians
LI9. FFS data: outpatient services billed by institutions
LI10. FFS data: services rendered by dentists
LI11. FFS data: drugs prescribed by dentists
LI12. FFS data: drugs purchased
LI13. FFS data: supplies purchased from pharmacies
LI14. FFS data: supplies purchased from nonpharmacy suppliers

ISSUED TO DATE (cont.)

LI15-LI25. *Vol. 2: Codebooks for Health Maintenance Organization Claims*, by C. E. Peterson, M. Nelsen, E. S. Bloomfield, D. L. Wesley, and A. M. Bell, The RAND Corporation, N-2347/2-HHS, August 1986.

- LI15. Seattle HMO data: hospital inpatient services
- LI16. Seattle HMO data: inpatient physician services
- LI17. Seattle HMO data: drugs prescribed by physicians
- LI18. Seattle HMO data: supplies prescribed by physicians
- LI19. Seattle HMO data: services rendered by physicians
- LI20. Seattle HMO data: drugs dispensed by physicians
- LI21. Seattle HMO data: supplies dispensed by physicians
- LI22. Seattle HMO data: injections administered by physicians
- LI23. Seattle HMO data: outpatient services provided by institutions
- LI24. Seattle HMO data: drugs dispensed
- LI25. Seattle HMO data: supplies dispensed

LI26-LI29. *Vol. 3: Codebooks for Seattle Fee-for-Service Claims for Comparison with Health Maintenance Organization Claims*, by C. E. Peterson, M. Nelsen, and D. L. Wesley, The RAND Corporation, N-2347/3-HHS, October 1986.

- LI26. Seattle FFS data for HMO comparison: hospital inpatient services
- LI27. Seattle FFS data for HMO comparison: inpatient physician procedures billed by institutions
- LI28. Seattle FFS data for HMO comparison: outpatient services rendered by physicians
- LI29. Seattle FFS data for HMO comparison: injections administered by physicians

HIE Reference Series

RF1. *Vol. 1: Codes Used in HIE Claims--Diagnoses, Symptoms, Procedures, Drugs, and Supplies*, by M. Nelsen and C. A. Edwards, The RAND Corporation, N-2349/1-HHS, May 1986.

Health Status and Attitude Series

HS1-HS2. *Vol. 1: Codebooks for Adults and Children at Enrollment and Exit*, by E. M. Sloss, L. L. Colbert, D. L. Wesley, A. M. Bell, and A. B. Holland, The RAND Corporation, N-2447/1-HHS, November 1986.

- HS1. Adults at enrollment and exit
- HS2. Children at enrollment and exit

ISSUED TO DATE (cont.)

Medical History Questionnaire Series

MH1A-MH3A. *Vol. 1: Codebooks for Adults at Enrollment and Exit, Form A*, by C. A. Edwards, A. B. Holland, L. Y. Weissler, and M. Nelsen, The RAND Corporation, N-2485/1-HHS, August 1986.

MH1A. Dayton adults at enrollment, Form A
MH2A. NonDayton adults at enrollment, Form A
MH3A. Adults at exit, Form A

MH1B-MH3B. *Vol. 2: Codebooks for Adults at Enrollment and Exit, Form B*, by C. A. Edwards, A. B. Holland, L. Y. Weissler, and M. Nelsen, The RAND Corporation, N-2485/2-HHS, October 1986.

MH1B. Dayton adults at enrollment, Form B
MH2B. NonDayton adults at enrollment, Form B
MH3B. Adults at exit, Form B

MH4A-MH6B. *Vol. 3: Codebooks for Children at Enrollment and Exit*, by C. A. Edwards, A. M. Bell, D. L. Wesley, L. Y. Weissler, and M. Nelsen, The RAND Corporation, N-2485/3-HHS, November 1986.

MH4A. Dayton children at enrollment, Form A
MH4B. Dayton children at enrollment, Form B
MH5A. NonDayton children at enrollment, Form A
MH5B. NonDayton children at enrollment, Form B
MH6A. Children at exit, Form A
MH6B. Children at exit, Form B

MH7A-MH9B. *Vol. 4: Codebooks for Infants at Enrollment and Exit*, by C. A. Edwards, A. B. Holland, D. L. Wesley, A. M. Bell, L. Y. Weissler, and M. Nelsen, The RAND Corporation, N-2485/4-HHS, November 1986.

MH7A. Dayton infants at enrollment, Form A
MH7B. Dayton infants at enrollment, Form B
MH8A. NonDayton infants at enrollment, Form A
MH8B. NonDayton infants at enrollment, Form B
MH9A. Infants at exit, Form A
MH9B. Infants at exit, Form B

Insurance Preference

IP1. *Codebooks for Insurance Preference Files: Relation between Expense Limit and Premium*, by E. S. Bloomfield, L. Y. Weissler, and A. B. Holland, The RAND Corporation, N-2508-HHS, October 1986.

Medical Disorder Series

MD1. *Medical Disorder Series, Vol. 1: Codebook for Adults at Enrollment and Exit*, by B. H. Operskalski, L. L. Colbert, D. L. Wesley, E. S. Bloomfield, A. M. Bell, N. F. Campbell, and S. M. Polich, The RAND Corporation, N-2446/1-HHS, January 1987.

TO BE ISSUED

Master Sample Series

MS3. Supplemental data file

HIE Reference Series

RF2. Providers cited in HIE data

RF3. User's guide to HIE data

Medical Disorder Series

MD2. Infant and child medical disorders at enrollment and exit

Dental Examinations

DE1. Adults and children at enrollment and exit

Appendix C
FILE DICTIONARY

This appendix contains the file dictionary for the character version of the HMO and Seattle FFS annual expenditures and visit counts file. Each dictionary has three parts: basic identifying data, alphabetic listing of variables, and listing by location.

Table C.1

BASIC IDENTIFYING DATA

Data file name	DEAH2A01.PUF.DATA
Creation Date	January 7, 1987
Variable format	Character
Total number of data elements	33
Header length (bytes)	20
Derived data length (bytes)	216
Record length (bytes)	236

Table C.2

LISTING BY ALPHABETIC ORDER

Name	Location	Length	Type
CONTYR	17	2	A
FILENAME	1	6	A
FILLER	19	2	A
HMO	21	8	I
INPDOL	29	8	F
INPMIS	93	8	I
INSTAT	16	1	A
MATADM	205	8	I
MDVIS	157	8	I
MEDDOL	77	8	F
MENTDOL	45	8	F
MENTVIS	141	8	I
NONMDVIS	173	8	I
OUTPDOL	61	8	F
PERSON	7	8	A
POSINP	125	8	I
POSMED	109	8	I
PREGADM	221	8	I
SITE	15	1	A
TOTADM	189	8	I
XINPDOL	37	8	F
XINPMIS	101	8	I
XMATADM	213	8	I
XMDVIS	165	8	I
XMEDDOL	85	8	F
XMENTDOL	53	8	F
XMENTVIS	149	8	I
XNMDVIS	181	8	I
XOUTPDOL	69	8	F
XPOSINP	133	8	I
XPOSMED	117	8	I
XPREGADM	229	8	I
XTOTADM	197	8	I

Table C.3

LISTING BY LOCATION

Name	Location	Length	Type
FILENAME	1	6	A
PERSON	7	8	A
SITE	15	1	A
INSTAT	16	1	A
CONTYR	17	2	A
FILLER	19	2	A
HMO	21	8	I
INPDOL	29	8	F
XINPDOL	37	8	F
MENTDOL	45	8	F
XMENTDOL	53	8	F
OUTPDOL	61	8	F
XOUTPDOL	69	8	F
MEDDOL	77	8	F
XMEDDOL	85	8	F
INPMIS	93	8	I
XINPMIS	101	8	I
POSMED	109	8	I
XPOSMED	117	8	I
POSINP	125	8	I
XPOSINP	133	8	I
MENTVIS	141	8	I
XMENTVIS	149	8	I
MDVIS	157	8	I
XMDVIS	165	8	I
NONMDVIS	173	8	I
XNMDVIS	181	8	I
TOTADM	189	8	I
XTOTADM	197	8	I
MATADM	205	8	I
XMATADM	213	8	I
PREGADM	221	8	I
XPREGADM	229	8	I

NOTE: "Type" refers to whether the variable values are alphanumeric (A), integer (I), or fixed-decimal in 8.2 format (F). Missing values are represented differently for each type: A = bbbbbbbb, I = bbbbbbb., and F = bbbbb.bb ("b" meaning blank). To obtain the appropriate positive and missing values, read all values as alphanumeric, then convert "I" data to integers and "F" data to 8.2 format.

Appendix D

HMO CLAIMS LINE-ITEM FILES

File		Sample	Examples of Variables
(01)	Hospital Inpatient Services	Records concerning inpatient hospital services provided to HMO participants	Diagnoses, categories of hospital service, imputed charges
(03)	Inpatient Services Rendered by Physicians	Records concerning inpatient procedures and services provided by physicians to HMO participants	Physician services, diagnoses, admitting and attending physicians, imputed charges
(04)	Drugs Prescribed by Physicians	Drug prescriptions or suggestions written by HMO physicians for HMO participants	Drugs, dosages, drug generic codes, symptoms, diagnoses, treatment history, referral physicians (no imputed charges)
(05)	Supplies Prescribed by Physicians	Supply prescriptions or suggestions written by HMO physicians for HMO participants	Supplies, symptoms, diagnoses, treatment history, referral physicians (no imputed charges)
(06)	Outpatient Services Rendered by Physicians	Records of outpatient services provided by physicians to HMO participants	Physician services, diagnoses, symptoms, referral physicians, treatment history, imputed charges
(08)	Drugs Provided by Physicians	Records of drugs provided directly by physicians to HMO participants	Drugs, symptoms, diagnoses, NDC and generic codes, dosage instructions (no imputed charges)
(09)	Supplies Provided by Physicians	Records of supplies provided by physicians to HMO participants	Supplies, symptoms, diagnoses, treatment history (no imputed charges)

Appendix D (cont.)

HMO CLAIMS LINE-ITEM FILES

	File	Sample	Examples of Variables
(10)	Injections Administered by Physicians	Records of injections given by physicians to HMO participants	Injected drugs, symptoms, diagnoses, drug generic codes, drug therapeutic codes, treatment history, imputed charges
(11)	Outpatient Services Provided by Institutions	Hospital/clinic records of outpatient services provided to HMO participants	Physician services, diagnoses, symptoms, referral physicians, treatment history (no imputed charges)
(15)	Drugs Dispensed	Records of drugs dispensed at HMO pharmacies to HMO participants	Drugs, dosages, drug regimen, drug generic codes, drug therapeutic codes (no imputed charges)
(18)	Supplies Dispensed	Records of supplies (primarily eyewear) dispensed to HMO participants	Supplies dispensed, primary diagnoses, prescribers (no imputed charges)

Appendix E

SEATTLE FEE-FOR-SERVICE CLAIMS FILES FOR HMO COMPARISON

File		Sample	Variables
(01)	Inpatient Services Billed by Institutions	Hospital claims related to an inpatient stay in a hospital or nursing facility	Diagnoses, category of hospital service, actual FFS covered charges
(03)	Inpatient Physician Procedures Billed by Institutions	Hospital claims for hospital-employed physician procedures and services	Physician services, diagnoses, referral physicians, imputed covered charges
(06)	Services Rendered by Physicians	Claims by independent physicians and nonphysician health specialists for inpatient and outpatient services	Physician services, diagnoses, symptoms, referral physicians, imputed covered charges
(10)	Injections Administered by Physicians	Physician or health specialist claims for injections administered	Injected drugs, symptoms, diagnoses, referral physicians, imputed covered charges

Appendix F

CODES AND EXPLANATIONS FOR MEDICAL EXPENSES NOT COVERED BY THE HIE

1 - Inpatient hospital accommodations in a private room
2 - Inpatient hospital comfort items
3 - Inpatient hospital custodial care
4 - Cosmetic surgery not resulting from an accidental injury
5 - Psychiatric outpatient services in excess of 52 consultations per year
6 - Outpatient psychiatric services
7 - Outpatient personal care services
8 - Orthodontia not resulting from accidental injury
9 - Christian Science practitioner or sanitorium not listed in the *Christian Science Journal*
10 - Nonemergency transportation
11 - More than one eye or hearing examination during the accounting year
12 - More than one pair of eyeglass frames every two accounting years
13 - More than one set of eyeglass lenses during the accounting year
14 - More than one hearing aid during accounting year
15 - Exceeds limit on eyeglass frames or hearing aids
16 - Repairs to eyeglass frames and hearing aids
17 - Diagnostic, screening, preventive, or rehabilitation services not otherwise specified in the scope of coverage
18 - More than one piece of medical equipment, appliance, or supply
19 - Equipment, appliances, or supplies costing more than $25
20 - Not medically necessary
21 - Duplicate line item
22 - Amount paid on another Explanation of Benefits
23 - Service before enrollment (SAME AS 64)
24 - Procedure done twice
25 - Certificate of benefits stipulations on service not met
26 - Prior authorization not approved
27 - Participant not eligible for dental care
28 - Blood credit
29 - Over-the-counter drugs
32 - Services covered by Workers' Compensation or employer's liability laws
33 - Pass through (covered by other insurance; payment from other company was "passed through")
35 - Services covered by accident insurance policies

36 - Medicare paid
42 - Paid by other insurance carrier
43 - Paid by agency other than insurance company
46 - Services obtained at Group Health Cooperative
47 - Allowance on over-the-counter drugs per illness per accounting year has been met
48 - Services paid for by Group Health Cooperative
53 - Part paid by Group Health Cooperative; plan benefit = 5% of balance
54 - Charge information unavailable--charge coded as one cent
55 - Discount plus plan benefit is 5%
56 - Medicaid paid
57 - Company physical provided as fringe benefit--charge coded as one cent, but true charge unknown
58 Workers' Compensation--charge coded as one cent, but true charge unknown
59 - Services rendered after termination date
60 - Claim is duplicate
61 - Participant not eligible
62 - Suspended
63 - No service
64 - Before enrollment date (SAME AS 23)
65 - Claim filed after time limit
67 - Underpayment
68 - Overpayment, deducted on another claim
69 - Overpayment, returned
70 - Overpayment, deducted on this claim, overpaid on another claim
71 - Billed in error--patient not seen
73 - Duplicate payment recovered
74 - Duplicate payment not recovered
80 - Prepayment for future services--no Maximum Dollar Expenditure involved
81 - Prepayment--part applied to the Maximum Dollar Expenditure

Appendix G
HIE BENEFIT COVERAGE

The lists below distinguish the services covered and excluded by insurance plans A-0 of the HIE.[1] These plans represent 15 of the 16 experimental treatments described in Sec. I. Benefit coverage for the HMO control group, the remaining treatment, cannot be summarized because HMO control families retained whatever benefit package their employer had purchased from the HMO.

The same services were covered and excluded for all participants assigned to plans A-0. The covered services list provided below is subdivided because the location of service differed for members of the HMO experimental group (plan 0). For enrollees in FFS plans (A-N), the charges for covered services (groups 1 and 2) applied toward meeting a family's annual out-of-pocket expense limit or, when that limit was reached, were completely reimbursed by the HIE. For those in the HMO experimental group (plan 0), covered services in group 1 were available at GHC; covered services in group 2 were available outside GHC and completely reimbursed by the HIE.[2]

To encourage the reporting of non-HMO care, the HIE reimbursed all HMO participants 5 percent of the cost of certain services obtained in the fee-for-service sector. For the HMO experimental group, these services included any service in group 1 that the enrollee chose to obtain outside GHC. For the HMO control group, they included any service in either group 1 or 2 that was obtained in the fee-for-service sector.

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[1]The lists paraphrase the formal certificate of benefits presented to each insured family at enrollment. These rules of coverage were subject to individual appeal.

[2]Benefit coverage for the HMO control group cannot be summarized because HMO control families retained whatever benefit package their employer had purchased from the HMO.

Covered Services: Group 1

Medical diagnosis and treatment
Surgery and anesthesia
X-ray and laboratory services
Prescribed medicines
Semiprivate hospital accommodations
Outpatient hospital care
Maternity care (prenatal and delivery)
Pediatric care
Vision care:
  Refractive examinations by an optometrist
  Eyeglasses (limit one pair every two years)
  Contact lenses (limit one pair per year)
Hearing diagnostic examinations by an audiologist
Mental health care (limit 10 visits per year)
Physical therapy
Occupational therapy
Private-duty nursing care
Home health care:
  Part-time or intermittent nursing care
  Physical, occupational therapy
  Medical social services
  Part-time or intermittent care by health aide
Medically necessary equipment, appliances, and supplies needed for treatment lasting less than six months
Ambulance transportation

Covered Services: Group 2

Dental care
Other health care (e.g., chiropractic, acupuncture, services by Christian Science practitioners)
Semiprivate accommodations in skilled nursing facility
Prosthetic devices medically prescribed to replace body organ
Speech therapy (medically necessary)
Care for drug addiction and alcoholism
Hearing aids
Mental health care (11th through 52nd visit per year)
Medically necessary equipment, appliances, and supplies needed for treatment lasting longer than six months
Emergency treatment outside GHC service area (and outside United States)

Excluded Services

Services covered by other insurance (e.g., Workers' Compensation) or provided free
Medically unnecessary "custodial or personal care"
Repairs and adjustments of eyeglasses or hearing aids

Excluded Services (cont.)

Personal convenience items while an inpatient (e.g., television, hairdressing)
Excluded dental services:
- Crowns and jackets made of gold or platinum
- Nonpreventive orthodontia
- Fixed bridge with more than seven units (unless patient is eligible for dentures but prefers bridge)
- Replacement of satisfactory dentures and bridges
- Medically unnecessary cosmetic dental surgery

Sterilization for persons younger than 21 or persons declared incompetent by a judge
Cosmetic surgery for preexisting condition
Nonprescribed drugs
More than 52 outpatient mental health visits per year

GLOSSARY

Attrition	Departure from the experiment by voluntary withdrawal before completion of assigned enrollment term.
Baseline participant	Person considered for enrollment at the beginning of the experiment in the site. May or may not have enrolled.
Baseline-only participant	Person considered for enrollment at the beginning of the experiment in the site who did not enroll.
Codes Used	Shorthand term for the HIE reference series volume containing the code definitions for the codes used to designate diagnoses, symptoms, health procedures, drugs, and supplies in the HIE claims files. See the explanation and reference in Sec. II, p. 43.
Contract year	Administrative unit of time for enrollees; year period(s) reckoned from date family signed enrollment contract. First contract year began on enrollment date, second contract year began on first anniversary of enrollment, and so on.
CRVS code	*California Relative Value Studies* code, a five-digit code created by the California Medical Association to define procedures and services performed by physicians and other health professionals.
DEI	A variable prefix for primary variables that stands for "data element indicator."
Exit	Departure from the experiment after completion of assigned enrollment term, three or five years.
FFS	Fee-for-service, the private economic sector in which fees are charged.
GHC	Group Health Cooperative of Puget Sound, the Seattle HMO that participated in the experiment.
GHC-covered services	Services either obtained at GHC or, if rendered by non-GHC providers, paid for by GHC.
HICDA codes	Codes that define the diagnoses of physicians and health professionals. HICDA codes were taken from the *Hospital Adaptation of the ICDA (International Classification of Disease Adapted for Use in the United States)*, 2nd edition, p. 73.

HIE	Health Insurance Experiment.
HIE-covered services	Services subject to reimbursement by the HIE. See Appendix G for a description of HIE-covered services.
HIE-insured	Enrollee assigned to an experimental health insurance plan paid by the HIE (plans A-O, described on pp. 3-4). Includes members of HMO experimental group. Compare "HMO-insured."
HMO	Health maintenance organization; Group Health Cooperative of Puget Sound, the HMO that participated in the HIE.
HMO control group	Seattle enrollees drawn at random from existing HMO members who met HIE eligibility criteria. The HIE did not pay their insurance premiums.
HMO experimental group	Seattle enrollees experimentally transferred to an HMO from the fee-for-service system. The HIE paid their insurance premiums.
HMO-insured	Member of HMO control group.
Imputed line-item charge	A charge calculated by HIE analysts for a physician or health professional service covered by GHC; also used for FFS professional services presented for GHC comparison.
In-plan	Charges that were covered by the participant's HIE or HMO insurance plan. For GHC participants, this includes any FFS services that were fully reimbursed by GHC.
Line item	An itemized claim for service, i.e., an item on a Medical Expense Report recording one instance of a provided service, drug, or supply.
MDE	Maximum dollar expenditure. The maximum out-of-pocket expense to be paid by an HIE-insured family before health care was free. The amount depended on the family's assigned insurance plan and family income.
NAMCS codes	Codes that define a participant's reasons or symptoms for a health care visit. NAMCS codes were taken from the *National Ambulatory Medical Care Survey: Symptom Classification*.
NDC	National Drug Code
Out-of-plan	A category of services and charges that apply only to GHC participants. They consist of FFS services that were not paid for by GHC but were reimbursed (fully or partially) by the HIE.

Participant	Anyone with a record in the HIE database; includes baseline-only participants and enrollees.
Provider	Any person, institution, or organization who provided health services, drugs, or supplies to an HIE participant.
SAS	Statistical Analysis System. HIE files contain data in both SAS and character formats.