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AN ANALYSIS OF CHARGES INCURRED FOR IN-PATIENT CARE IN GENERAL HOSPITALS; IMPLICATIONS FOR PROTECTION AGAINST THE COST OF HOSPITAL CARE

by
Howard Lee Bost

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AN ANALYSIS OF CHARGES INCURRED FOR IN-PATIENT CARE IN GENERAL HOSPITALS; IMPLICATIONS FOR PROTECTION AGAINST THE COST OF HOSPITAL CARE

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The purpose of this study is to find what expenses hospitalization entails for bed patients in general hospitals; and from analysis of the amount, composition, and distribution of these costs, to ascertain the implications on consumer financing of hospital care. Such information and its implications bear particularly on the provision of prepaid protection for individuals and families against the risk attributable to the cost of the hospital services they may require in the event of hospitalized illness.

To provide perspective in viewing the problem of financing hospital care, the current trend of consumer expenditures for hospital services is analysed with attention focused on factors affecting the magnitude of expenditures and the burden these costs impose on consumers. For study of hospital charges incurred by bed patients, a sample was obtained consisting of 7,669 patients drawn with a variable rate of sampling from a frame of 62,246 patients discharged from nonfederal general and special short-term hospitals in Michigan during 1951 and 1952. The data utilized consisted of detailed information on charges to patients reported to Michigan Hospital Service by the hospitals participating in this Blue Cross Plan, which covers almost half of the population of the state of Michigan. These data were initially provided by the Plan to the Commission on Financing of Hospital Care.

In the study, the distributions of charges for hospital care are analysed, for maternity and nonmaternity patients separately, by length of hospital stay and amount of expense incurred for the various items and classifications of services comprising hospital care. The extent of variations among patients is deter-

mined and the characteristics of the distributions are examined and interpreted. The principal factor related to the amount of charges incurred by patients is found to be the length of hospital stay, but there are wide variations among patients with the same length of stay. Although it is found that charges for room and board service represent more than half of the total cost incurred for hospitalization, combined charges for all ancillary services are the major component of hospital expense for patients hospitalized for stays of relatively short duration.

The findings of the study point to the conclusion that the magnitude and distribution of hospitalization costs are such that payment by patients at the time services are provided is an unsatisfactory if not unworkable method of financing hospital care. To effectively meet the problem of payment for the increasingly important and costly services rendered by general hospitals, prepayment is seen to be essential both for the security of individuals and families against the cost of hospitalization and for the assurance of adequate financing of the provision of services.

An important factor in the effectiveness of prepayment for hospital care is seen to be the design of benefit provisions under arrangements for prepaid protection. The conclusion from the study is that among the principal existing approaches to the design of benefit standards, the indemnity-benefit approach is the least suitable and the service-benefit approach the most suitable for accomplishing the purposes of prepayment arrangements.

Use of information derived from the study to acquaint individuals and families with the financial risk to which they are exposed with respect to hospitalization is seen to be a much needed application of the findings. The results have further practical application as a guide to purchasers of prepaid protection.

A method for appraisal of the effectiveness of benefit provisions is developed and the findings of the study are converted to a basis designed to assist consumers in making informed choices when selecting prepaid hospitalization provisions for purchase from the numerous kinds and levels of benefits currently offered by the wide variety of prepayment and insurance organizations.

TABLE OF CONTENTS

CHAPTER		Page
I.	INTRODUCTION	1
	Subject of Study	1
	Reason for Concern with Subject	2
	Need for Study	3
	Method of Study	6
	Source of Data	8
	General Description of Data	11
	Period Covered by Study	14
	Tabulation of Data	16
	Limits on Scope of Study	17
	Adequacy of Data	19
	Representativeness of Data	24
II.	THE INCREASING IMPORTANCE OF THE COST OF HOSPITAL CARE	35
	Total Expenditures for Hospital Care	35
	Magnitude of Consumer Expenditures for Hospital Care	38
	Current Trend in Consumer Expenditures	40
	Analysis of the Trend in Consumer Expenditures	43

CHAPTER

Page

Increase in Hospital Prices 45

Increase in Quantity of Hospital Services 48

Conclusions from Analysis of Changes in Prices and Quantity 52

Basic Factors Underlying Rise in Consumer Expenditures: Increased Demand 53

Population Increase 54

Scientific and Technical Advances 56

Improved Ability of Consumers to Pay for Care 57

Basic Factors Underlying Rise in Consumer Expenditures: Increased Supply 58

Increase in Hospital Beds 59

Expansion in Capacity to Provide Ancillary Services 60

Level of Utilization 61

Change in the Burden Created by the Cost of Hospital Care 61

Population Change 63

Increase in the Number of Employed Persons 64

Consumers' Rising Incomes 65

Wider Distribution of the Costs of Hospital Care 66

Net Change in the Burden of Hospital Costs on Consumers 76

CHAPTER Page

III. CHARGES INCURRED FOR IN-PATIENT CARE IN GENERAL AND SPECIAL SHORT-TERM HOSPITALS 81

Description of Sample 81

Distribution of Total Charges for Hospital Care 85

Distribution of Total Charges by Size of Patients' Bills 88

Distribution of Total Charges by Length of Patients' Stays 90

Relationship of Size of Patients' Bills to Length of Stay 94

Variation in amount of charges for given lengths of stay 96

Composition of Patients' Total Hospital Bills 99

Variation in Composition of Total Charges by Length of Stay 101

Distribution of Charges Incurred for the Two Major Classifications of Services: Room and Board, and Ancillary Services 104

Charges for Room and Board 104

Charges for Ancillary Services 108

Relationship of Amount of Ancillary Service Charges to Length of Stay 109

Distribution of Charges for the Various Specific Ancillary Services 115

Charges for Drugs and Dressings 116

CHAPTER Page

Charges for Operating Room 117

Charges for Laboratory Services 122

Charges for X Ray 124

Charges for Anesthesia 128

Charges for Nursery Care 131

Charges for Oxygen 133

Charges for Electrocardiograms 135

Charges for Physical Therapy 137

Charges for Basal Metabolism Tests 140

Charges for Miscellaneous Services 141

Summary of Findings on Charges for Specific Ancillary Services 143

IV. PROTECTION AGAINST THE COSTS OF HOSPITAL CARE 151

General Considerations 151

The Significance of Prepaid Protection 152

The Effectiveness of Prepayment 154

Implications of Findings on Major Approaches to Prepaid Protection 158

Cash Indemnity Benefit Approach 158

Service Benefit Approach 162

Deductible Benefit Approach 166

CHAPTER Page

Implications on Other Aspects of Prepaid Protection 172

Use of the Findings as a Basis for Appraisal of Benefit Provisions 176

APPENDIX 188

LITERATURE CITED 191

LIST OF TABLES

TABLE		Page
I.	Mean and Median Amounts of Patients' Hospital Bills, by Type of Patient	87
II.	Percentage Distribution of All Patients and of Total Charges, by Amount of Hospital Bill	89
III.	Percentage Distribution of All Patients and of Total Charges, by Length of Hospital Stay	93
IV.	Mean Amount of the Hospital Bills of All Patients, by Length of Stay	95
V.	Variation in the Median Amounts of Nonmaternity Patients' Hospital Bills, by Length of Stay in Hospital	97
VI.	Percentage of Total Hospital Charges Incurred for the Various Types of Services	100
VII.	Percentage of Total Hospital Charges Incurred by Nonmaternity Patients for Ancillary Services and for Room and Board, by Length of Stay	103
VIII.	Percentage Distribution of Nonmaternity Patients and of Charges They Incurred for Room and Board, by Amount of Room and Board Charges	106
IX.	Percentage Distribution of Maternity Patients and of Charges They Incurred for Room and Board, by Amount of Charge for Room and Board Service	107

TABLE Page

X. Percentage Distribution of Maternity Patients and of Charges they Incurred for Ancillary Services, by Amount of Charges for Ancillary Services 110

XI. Percentage Distribution of Nonmaternity Patients and of Charges They Incurred for Ancillary Services, by Amount of Charges for Ancillary Services 111

XII. Variation in Mean Amounts of Charges Incurred per Day by Nonmaternity Patients for Room and Board, Ancillary Services, and All Services, by Length of Stay 112

XIII. Variation in Median Amounts of Charges for Ancillary Services and for All Services Among Highest and Lowest Tenths of Nonmaternity Patients, by Length of Stay 114

XIV. Percentage Distribution of Nonmaternity Patients and of the Charges They Incurred for Drugs and Dressings, by Amount of Charge for This Item 118

XV. Percentage of Nonmaternity Patients Incurring Charges for Drugs and Dressings and Mean Charge for Those Using Drugs and Dressings, by Length of Stay 119

XVI. Percentage Distribution of Nonmaternity Patients and of the Charges They Incurred for Operating Room, by Amount of Charge for This Item 121

XVII. Percentage of Nonmaternity Patients Incurring Charges for Operating Room and Mean Charge for Those Using Operating Room, by Length of Stay 122

TABLE Page

XVIII. Percentage Distribution of Nonmaternity Patients and of the Charges They Incurred for Laboratory Services, by Amount of Charge for This Item 123

XIX. Percentage of Nonmaternity Patients Incurring Charges for Laboratory Services and Mean Charge for Those Using Laboratory Service, by Length of Stay 124

XX. Percentage Distribution of Nonmaternity Patients and of the Charges They Incurred for X Ray, by Amount of Charge for This Item 126

XXI. Percentage of Nonmaternity Patients Incurring Charges for X Ray and Mean Charge for Those Using X Ray, by Length of Stay 128

XXII. Percentage Distribution of Nonmaternity Patients and of the Charges They Incurred for Anesthesia, by Amount of Charge for This Item 131

XXIII. Percentage of Nonmaternity Patients Incurring Charges for Anesthesia and Mean Charge for Those Using Anesthesia, by Length of Stay 132

XXIV. Percentage Distribution of Nonmaternity Patients and of the Charges They Incurred for Oxygen, by Amount of Charge for This Item 134

XXV. Percentage of Nonmaternity Patients Incurring Charges for Oxygen and Mean Charge for Those Using Oxygen, by Length of Stay 135

TABLE Page

XXVI. Percentage Distribution of Nonmaternity Patients and of the Charges They Incurred for Electrocardiograms, by Amount of Charge for This Item 136

XXVII. Percentage of Nonmaternity Patients Incurring Charges for Electrocardiograms and Mean Charge for Those Using Electrocardiograms, by Length of Stay 137

XXVIII. Percentage Distribution of Nonmaternity Patients and of the Charges They Incurred for Physical Therapy, by Amount of Charge for This Item 138

XXIX. Percentage of Nonmaternity Patients Incurring Charges for Physical Therapy and Mean Charge for Those Using Physical Therapy, by Length of Stay 139

XXX. Percentage Distribution of Nonmaternity Patients and of the Charges They Incurred for Basal Metabolism Tests, by Amount of Charge for This Item 140

XXXI. Percentage of Nonmaternity Patients Incurring Charges for Basal Metabolism Tests and Mean Charge for Those Using This Service, by Length of Stay 141

XXXII. Percentage Distribution of Nonmaternity Patients and of the Charges They Incurred for Miscellaneous Services, by Total Amount of Charge for These Services 143

XXXIII. Percentage of Nonmaternity Patients Incurring Charges for Miscellaneous Services and Mean Charge for Those Using Such Services, by Length of Stay 144

TABLE | Page

XXXIV. Percentage of Maternity and Nonmaternity Patients Incurring Charges for the Various Classifications of Ancillary Services and Rank of Services, by Percentage Incurring Charges 145

XXXV. Percentage of Total Charges for Ancillary Services and Amount of Mean and Median Charges for Patients Incurring Expense, by Specific Classifications of Services 141

XXXVI. Bench Marks for Estimation of Effectiveness of Hospitalization Benefit Provisions 180

XXXVII. Percentage Distribution of Maternity and Nonmaternity Patients and of Total Charges for Each, by Amount of Hospital Bill 189

XXXVIII. Percentage Distribution of Maternity and Nonmaternity Patients, of Days of Care and of Total Charges for Each, by Length of Hospital Stay 190

TABLE

Page

XXXIV. Percentage of Maternity and Nonmaternity Patients Incurring Charges for the Various Classifications of Ancillary Services and Rank of Services, by Percentage Incurring Charges 145

XXXV. Percentage of Total Charges for Ancillary Services and Amount of Mean and Median Charges for Patients Incurring Expense, by Specific Classifications of Services 141

XXXVI. Bench Marks for Estimation of Effectiveness of Hospitalization Benefit Provisions 180

XXXVII. Percentage Distribution of Maternity and Nonmaternity Patients and of Total Charges for Each, by Amount of Hospital Bill 189

XXXVIII. Percentage Distribution of Maternity and Nonmaternity Patients, of Days of Care and of Total Charges for Each, by Length of Hospital Stay 190

CHAPTER I

INTRODUCTION

Subject of Study

The focus of this study is the problem arising from the costs of hospital care incurred by persons who are bed patients in general hospitals. In investigating this problem, data on the composition and distribution of patients' hospital charges have been compiled and analyzed. Also, current trends in expenditures for hospital care have been examined with attention given to factors affecting consumers' expenditures and the burden that these expenses impose. The analysis of charges incurred for hospital care has been confined to those incurred by patients in nonfederal general and special short-term hospitals, since the costs of care in other types of hospitals tend to be financed by taxation rather than borne by patients.[1] The implications of this investigation on the provision of protection against the costs of hospital care have been traced, including the possible uses of the findings in the evaluation of benefit provisions of hospitalization prepayment programs.

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[1] Nonfederal general and special short-term hospitals, although accounting for somewhat less than a third of the total days of hospital care, admit almost nine-tenths of all persons hospitalized in the nation and provide all but a relatively small part of the hospital services that are patient-financed.

Reason for Concern with Subject

The reason for concern with this subject is not only the magnitude of hospital costs and their growing importance to consumers; patient-financing of hospital care is characterized by recognized anomalies and it entails a distribution of costs that is exceptionally burdensome. Generally, costs are incurred during acute illness and for services necessary to recover health or to save life itself. Under such circumstances, what the purchaser can afford, normally a guiding consideration in consumer spending, is not an acceptable criterion for decisions regarding the kind, the quality, or the quantity of hospital services to be purchased--or rather, provided and charged to the patient. Consequently, neither price nor purchaser's ability to pay effectively serves in its usual capacity as a rationing factor and a determinant of the kind and quantity of services to be consumed and of the amount of expense to be incurred. In the purchase of hospital services, the consumer's usual freedom in determining the purposes and extent of his spending is reduced to little more than volition under duress. Both the amount of the costs and the timing of their occurrence are largely unpredictable and beyond the control of the persons on whom they fall.

Because of these exceptional conditions and the wide variation in the costs of the services which patients require, hospitalization is notorious for imposing unexpected financial burdens which often are very heavy in relation to patients' resources. The significance of this is not limited only to those persons who are hospitalized; it constitutes a threat to the security of all individuals and families who might be similarly affected and thus is a matter of concern to all. Moreover, since difficulty in financing hospital services tends to retard development of higher standards of care, and may be an

important factor restricing expansion of facilities and personnel to meet recognized need, the problem is of concern, as well, to hospitals and to the community itself.

The problem posed by hospitalization costs is not new, although rising hospital costs and increased utilization have tended to make it more acute. In fact, the desirability, indeed the necessity, of reducing the financial impact by pooling the costs, and of relieving the insecurity by spreading the risks, has been quite widely accepted. But despite the fact that the basic principles for meeting the problem have been known for many years, their application is far from complete. This, it appears, is due less to inadequacies or incompleteness of theory than to difficulties that have been encountered in the formulation and adoption of specific measures to provide protection against the cost of care. One of these difficulties can be reduced, it is believed, by investigation of the composition and distribution of hospital charges and exploration of the possible uses of findings in evaluating the benefit provisions of prepayment programs.

Need for Study

The need for such investigations and studies arises principally in two connections:

1. Knowledge of the amounts of hospitalization costs and their composition and distribution is essential to the proper planning of benefit structures of programs designed to provide the protection needed by families and individuals. Such knowledge is equally essential in the continuing operation of these programs. Without it, an adequate factual basis for program evaluation is lacking and possible

modifications in benefit provisions cannot be fully and objectively considered.

2. Knowledge of the extent and form of the risk created by hospital costs is needed by individuals and groups comprising virtually the entire civilian population as a basis for the selection and purchase of prepaid hospitalization protection. To make informed decisions, consumers must have available information about the hospital costs that people encounter when the contingency of hospitalization occurs.

Although the needs and uses which the providers of prepaid protection have for detailed information on the risk represented by hospital costs are rather obvious, it is noteworthy that the data which have been compiled on this risk by public and private organizations are far less extensive than, for example, data on the risk of mortality. Statistics on population mortality and mortality among insured lives are compiled and analyzed in considerable detail and are available from numerous sources, but this is not the case with respect to data on the financial risk of hospitalization. In part, this is because the latter risk is more complex. While mortality rates suffice as an index of the risk of death, rates on the incidence of hospitalization serve to measure only one of several dimensions that are equally important in portraying the risk created by the cost of hospital care. Such other dimensions of the latter risk include the type and amount of services required and their cost.

Moreover, data which are the by-product of the operation of hospitalization prepayment programs are generally inadequate to fully reflect or describe the costs of hospital care incurred by patients. One reason for this is that the data compiled on claim payments often are not comparable as a result of the prevailing wide variation

in benefit structures. A more important reason is that data which are compiled on the frequency, nature, and amount of claims relate only to that portion of the costs which is covered by benefit provisions, while the portion not covered lies beyond the scope of such data. The difficulty of compiling data on the risk of hospitalization costs is further complicated by factors such as the wide variation in costs among hospitals by type, size, scope and definition of services, location, and other important points of difference. For these reasons, the needs of prepayment organizations for data on the costs encountered by people when they are hospitalized are not adequately met by available information.

A need for information which appears to be even more acute exists on the part of purchasers of prepaid hospitalization protection. Under voluntary prepayment, reliance is placed on consumer choice not only with respect to the decision to participate in arrangements to spread the risk, but also for the selection, from among available benefit provisions and programs, of the protection that is to be purchased. Consumer decisions, consequently, are a major determinant of the effectiveness of voluntary prepayment in meeting individual and community needs.

These decisions, however, are often, if not generally, made without adequate information and understanding of their possible consequences. In few areas of the economy, perhaps, is the theoretical economic assumption of complete knowledge on the part of all buyers so imperfectly realized. While the difficulty of understanding the language of the formal provisions of hospitalization prepayment contracts and policies may be no greater than that encountered in connection with life insurance policies, for example, or legal documents generally, even when the terms of benefit provisions are clearly understood, the problem of assessing their significance remains.

The multiplicity of benefit items and the almost limitless combinations and permutations of hospitalization prepayment provisions add greatly to the difficulty. And the consumer, in exercising choice in the selection of protection, either for himself and family or for a group on whose behalf he is acting, rarely is able to make valid comparisons among the multitude of benefit provisions and combinations thereof which are available. This is impossible in the absence of knowledge about hospitalization costs as a guide to comparison and selection. And, unfortunately, the consumer's own experiences and those of his acquaintances on which he may draw seldom provide adequate criteria for judging the relative value of alternative choices.

The effect of lack of information about the risk of hospitalization, however, is not merely that the consumer may fail to receive full value for his expenditures for protection. Of greater concern are the problems created when the consumer does not know the extent that his decision relieves him of risk and, consequently, does not recognize the extent to which he is left unprotected. When this is the case, awareness is deferred until the time of hospitalized illness. Then, because the protection is very often found to be inadequate, severe hardship is not infrequently the result. Whether or not the contingency of hospitalization occurs, however, uninformed purchase of prepaid protection is likely to create a false sense of security on the part of covered individuals and families.

Method of Study

The approach employed in this study and the way in which the investigation was pursued are indicated by the major topical divisions which constitute an outline of the plan that was followed. In the order of presentation these are:

1. Examination of the magnitude of aggregate expenditures for hospital care and analysis of factors affecting consumer expenditures and the burden of these costs on consumers. The purpose of this part of the study is to provide the general setting and a background for the results of the intensive investigation of hospital costs in detail as incurred by in-patients. Selected data from sources other than this study are utilized to provide broader perspective for the findings presented subsequently.
2. Investigation of the composition and distribution of charges incurred for in-patient care in nonfederal general and special short-term hospitals. The quantitative results of the investigation which constitutes the basis of this study are presented and analyzed.
3. Analysis of the implications of the study's findings on measures designed to provide protection against the costs of hospital care. The findings obtained from the investigation are related to the general problem of spreading the costs and risks arising from hospitalization expenses. The bearings that the findings have on approaches and specific measures to provide protection against the risks are developed and assessed.
4. Illustration of the practical application of the findings of the study as guides to the evaluation of the effectiveness of specific benefit provisions in relieving the risk of hospitalization costs. The results obtained from the investigation of hospitalization costs are related to the problem confronting purchasers of prepaid protection. To illustrate the use of a method which is developed for the application of the findings to the problem of appraising

benefit provisions, the method is applied to several types of benefits.

The detailed methods employed in the study reflect the underlying purpose of obtaining information of a type and in a form useful in meeting the needs that were discussed earlier. In many aspects of the planning and execution of the investigation, this purpose was the basis for decisions as to approach, design, and emphasis. Concern with the end use of the findings guided the selection of the type and form of data to be employed as well as the manner in which the data were handled. For example, at the outset, these considerations dictated the choice as to the type of hospitalization costs on which attention should be concentrated. Since charges incurred by inpatients in nonfederal general and special short-term hospitals account for the great bulk of total consumer expenditures for hospital care, such costs were selected for intensive analysis.

Source of Data

The basic undertaking of the study, the detailed analysis of patients' hospital bills, called for the collection of an extensive body of data on charges incurred by hospitalized persons. Theoretically, there are two possible primary sources for information of the kind needed: either the providers or the recipients of hospital services. The latter source was not considered to be feasible for several reasons. A sample survey of the general population for this purpose, for example, would involve asking questions about the detailed breakdown of hospital bills which very likely would exceed the information level of respondents. Also, serious error due to the memory factor might be expected, especially since only a minor fraction of the general population would have had a recent experience of hospitalized

illness. For these reasons, the preferable source of data seemed to be the hospitals, who as providers of the services routinely maintain detailed and accurate records of charges to patients.

Because of the known wide variation among hospitals in scope of services provided, level of costs, and in other important respects, it was recognized that data on patients' charges in a single institution would permit little if any generalization from the findings. It was obviously desirable to obtain data from as broad a cross section of general hospitals as possible, to represent existing variation in such factors as size of institution, population and type of locality served, extent of development and complexity of service program, pricing policy, and other practices.

The difficulty and expense of developing a special sample of hospitals for the purpose of study and of obtaining the required information from them led to consideration of the possible alternative of utilizing data collected by a central agency from hospitals in a broad geographical area. It was found, however, that information of the sort needed was not collected by governmental statistical agencies or by hospital associations or councils. The most likely source appeared to be organizations functioning as "third-party purchasers" of hospital care; i.e., agencies providing care to their beneficiaries by utilizing community hospitals and making payment directly to hospitals on behalf of such patients.

Most "third-party purchasers," however, are concerned with patients drawn from narrowly limited groups of beneficiaries or patients in specific diagnostic or other classifications whose hospital bills might be expected to be atypical in composition or amount.[1]

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[1] This would seem to be the case, for example, with respect to care purchased by public welfare agencies, Red Cross, National Foundation for Infantile Paralysis, and by many fraternal and religious organizations.

Among the large number and variety of "third-party purchasers," it appeared that prepayment organizations which cover a substantial portion of the population in a wide area would be the best available source of detailed information suitable to the purpose of the study. But, upon investigation, it was found that while prepayment organizations routinely compile extensive data on the frequency, nature, and amount of claims or benefits paid, data inclusive of that portion of the costs incurred by patients which is not covered by benefit provisions are rarely compiled.

The nearest approach by prepayment plans to compilation of data on the complete hospital bills of covered persons, it was found, was by Blue Cross Plans. To determine and confirm compliance with the approval standards of the Blue Cross Commission of the American Hospital Association, it is necessary that a Plan collect information on the total amount of charges that patients covered under the Plan incur, in the Plan's member hospitals, during their benefit periods. The ratio between these charges in aggregate amount and the total amount credited to covered patients by virtue of their participation in the Plan must be reported to the Commission by each Plan for its most widely held subscriber contract. As a condition of approval, this ratio must equal or exceed a specified minimum percentage.

Since the statistical information on patients' charges that Blue Cross Plans are required to collect is limited to services provided during patients' benefit periods, it was apparent that data compiled by Plans having the longest benefit periods under their most widely held subscriber contracts would most nearly include all costs incurred by patients during the entire time they were hospitalized. Also, the completeness of detail on patients' hospital charges in the data collected, as well as the inclusiveness of the total charges recorded,

was an important factor to be considered in the selection of a source of information for study.

After extensive exploration, it appeared that among possible sources of existing data, a Blue Cross Plan, the Michigan Hospital Service, had data that would be most useful in terms of fitness for the purpose of the study. At the time, Michigan Hospital Service covered approximately 40 percent of the total population in a statewide area and was one of the two Blue Cross Plans in the nation providing a basic benefit period as long as 120 days under its most widely held subscriber contract. Moreover, the information collected by the Michigan Plan included the same detail on patients' charges as usually appears on hospitals' itemized bills to patients. Regarded as especially significant was the fact that the Plan's data were taken directly from the reports of the almost 200 hospitals participating in the Plan which were located throughout the entire state and accounted for more than 95 percent of all the beds in general and special short-term hospitals open to the general public in the statewide area. In the data, of course, the representation of these hospitals by size, locality, and other variables was proportionate to their use by the some 2,500,000 persons covered by the Plan.

General Description of Data

The data employed for analysis of hospital charges in this study were a sample, described in Chapter III, derived from the information compiled by the Michigan Hospital Service. These data were initially provided by the Plan to the Commission on the Financing of Hospital Care for the Commission's use in studying the cost of closing gaps in benefit provisions under voluntary prepayment program. The sample data were mechanically tabulated by the Commission

and selected results in partial detail were presented in various parts of the Commission's reports, but the analysis of the data was incomplete and the potentiality of the statistical material as a basis for a particular and intensive study of hospitalization costs was not exploited by the Commission.

The basis for the data was detailed hospital reports on charges incurred by hospitalized patients covered under the Michigan Blue Cross Plan's group semiprivate subscriber contracts, which was the type of contract held by approximately four-fifths of all persons covered under the Plan during the period of the study. Although the reason for confining the sample to patients covered by this type of contract was in part expediency, the selection was supported by indications that the distribution of such patients might be more representative of all hospital admissions with respect to sex and family composition than patients from the Plan's membership as a whole. This was based on general information to the effect that the semiprivate contract was most prevalent in areas and among groups where coverage most closely approached inclusion of all eligible persons including family dependents of subscribers. Also it should be pointed out that the selection of the semiprivate class of coverage does not mean that the sample reflects the cost of hospitalization exclusively in semiprivate accommodations. The period of the study was a period in which Michigan hospitals had a relatively high rate of bed occupancy, and because of the scarcity of beds, patients often did not have choice as to type of accommodation. Consequently, patients with semiprivate contracts were sometimes hospitalized in ward accommodations. Likewise, although the reason may have been patient choice in most instances, some of these patients utilized private rooms in hospitals.

As a result of confining the sample to patients with semiprivate coverage, however, the sample data probably reflect slightly higher

daily room and board costs than were incurred on the average by all hospital patients and, therefore, tend to overstate the relative importance of this item of service. But because the average length of stay of patients in Michigan hospitals is low compared to that in many other areas, the effect of this overstatement may be to improve rather than to diminish the general applicability of the findings to areas other than the state of Michigan.

Since hospitalization prepayment programs so often differentiate in the benefits allowed for maternity admissions as contrasted with admissions for other reasons, it was considered essential that data be obtained and processed in a manner that would permit findings on the costs incurred by obstetrical patients apart from medical and surgical patients. This was accomplished by taking what was in effect two separate samples, one for maternity patients and another for nonmaternity. In the segregation of cases, all admissions due to pregnancy except ectopic pregnancy were classified as maternity.

The weighting used in consolidating the data on the two types of cases, to obtain combined results, was 20.5 percent for maternity and 79.5 percent for nonmaternity, based on the relative incidence of the two types of cases among persons covered by the Plan during the year ended June 30, 1952. These weights, it should be noted, give somewhat greater emphasis to maternity cases than would be indicated by the current one-out-of-six relationship between births and admissions in all general hospitals in the nation.[1] In the East North Central region of the nation, however, births reported by hospitals accounted for almost 19 percent of estimated total admissions in all

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[1] Hospital Service in the United States: The 1953 Census of Hospitals; reprinted from the Journal of the American Medical Association, Hospital Number (May 15, 1954), 3.

nonfederal general and special short-term institutions during the period of the study.[1] And if appropriate allowance were made in these regional data for hospitals not reporting the number of births, the result would be still closer to the weight given maternity cases in the consolidation of the data.

Period Covered by Study

The data from which the sample of medical and surgical patients was taken covered four calendar quarters: the third and fourth quarters of 1951 and the first and second quarters of 1952. For reasons of accessibility of records, the sample of obstetrical patients was taken from a different quarter: the third quarter of 1952. The inclusion of four quarters for nonmaternity patients was necessary to avoid biases arising from seasonal variation in the distribution of cases by diagnostic classification and the possible effects of this factor on length of stay and utilization of ancillary services. The same problem was not present in connection with maternity cases, since all these patients were in the same general diagnostic grouping. Also, the known greater homogeneity of maternity cases permitted less extensive sampling than for nonmaternity cases where variation in costs incurred is greater.

In the consolidation of the sample data for maternity and nonmaternity cases, no adjustment was made to allow for the general increase that occurred in the costs of providing hospital services during the interval between the mid-points in the periods covered by data on the two types of cases. Because of the inexactness of the

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[1] Hospitals, Administrators Guide Issue, Vol. 26, Part 2 (June, 1952), p. 12; and Vol. 27, Part 2 (June, 1953), p. 20.

relationship between changes in hospital costs and changes in charges to patients, particularly over a short period of time, it was not considered feasible to attempt an adjustment to make the total charges in maternity cases comparable to nonmaternity with respect to the price level prevailing for hospital services. Moreover, the problem of allocating such an adjustment among the various items of service could not have been satisfactorily resolved. Had this been possible, however, the effect would have been to decrease slightly the average amount of charges, but the magnitude of the change would not have materially affected the combined results.

It should be pointed out that the hospital reports from which the data were initially taken were submitted to the Plan after patients were discharged. The data, therefore, reflect charges to patients discharged as distinct from patients admitted during the stated period of the study. Consequently, while some patients whose bills were included in the study were admitted prior to the beginning of the period, others who were admitted during the time covered by the study were excluded if they were still hospitalized at the end of the period. The extent to which this occurred would have been increased by whatever lag existed in the reporting of cases by hospitals to the Plan. But it is believed that reports were generally prompt and complete for they were utilized as the basis for determining the amount of preliminary payments by the Plan to the hospitals for care rendered

Had the prepayment coverage of the Plan not been in effect prior to the study period, data on cases discharged might be expected to produce materially different results from data on cases admitted because of the tendency to exclude long-stay cases. However, in this instance, there seems to be no reason to believe that the selection of cases for study was affected by the compilation of data on the basis of discharges rather than admissions.

Tabulation of Data

Some grouping of the sample data into length of stay intervals was necessary to simplify tabulation and analysis. Since it was known that a very high percentage of all patients remained in the hospital for less than 15 days, data on such cases were tabulated by single days. Other length-of-stay intervals established were 15 to 20, 21, 22 to 30, 31, 32 to 60, 61 to 70, 71 to 90, and 91 to 120 days. In the selection of these intervals, the primary consideration was that of obtaining tabulations to coincide with commonly encountered limitations on benefit periods in hospitalization prepayment programs.

Patients whose length of stay exceeded 120 days were included in the last interval, for reasons stated previously. However, because it was found that only 0.1 percent of all patients fell into this interval, and, further, because the data reflected all charges incurred during the first 120 days of the care received by patients staying beyond that time, it would appear that the exclusion from the tabulations of charges after 120 days could not have materially affected the findings.

For the tabulation of cases by the total amount of charges, $20 intervals were established through $200, and beyond this amount $50 intervals were used. In the corresponding tabulation by total amount of charges for all ancillary services combined, the same intervals were used with additional provision for obtaining a count of cases where there was no charge. For room and board and the various particular ancillary services, the intervals adopted for use in tabulations were $10 through $100, $20 where the amount was between $100 and $300, and $50 for amounts over $300. As in connection with total ancillary services, a count was obtained of cases having no charge for the various specific items. Where there was no charge for X ray,

provision was made to permit segregation of patients by hospitals according to the practice followed with respect to inclusion or exclusion of such charges in the hospital bill. Although similar variation existed in the handling of charges for anesthesia, it was not possible to make provision for this in the tabulations because differences in billing practices were to be found within as well as among hospitals.

Limits on Scope of Study

The delineation of the area and subject of this study confines it to but one aspect of a large and complex problem. The many facets of this problem of reducing the burden of illness are so interlaced that study of a single aspect tends to exclude many considerations that have a bearing on conclusions. While findings derived from an investigation of one dimension or segment of this problem may have great value, conclusions based on such findings are generally subject to modification, and sometimes may be overridden, by opposing considerations arising in areas beyond the scope of the investigation. This is especially applicable to a study delimited to financial aspects of health care.

In the attainment of the ultimate social objective of the right care at the right time for all people, the financing of services, although essential, is a subordinate matter. That financial considerations be overshadowed by medical considerations is dictated both by social traditions and attitudes and by the fundamental nature of health care. Even though meeting the costs of care seems to be the major point of popular concern, and has been emphasized by those who consider methods of payment to be the handle to the larger problem, nevertheless, the financing of services viewed in proper perspective should be

considered as a means rather than an end in itself, for payment for care does not assure that people receive the care they need. Moreover, the weight of the burden created by illness is not fixed, and not only can the burden be mitigated and made more tolerable, but also it is capable of being reduced, and, in fact, avoided in part. Furthermore, minimizing the burden of illness is seen to depend more on realizing the potentialities of medical care in promoting health and curtailing illness than on achieving the most satisfactory arrangements in paying for care.

In this context, it is apparent that a study confined to the composition and distribution of costs incurred by patients can, at best, measure and assess only one of many dimensions that must be taken into account in formulating broad conclusions. And the fact that such matters as quality of care, organization of services, adequacy of facilities and personnel, and efficiency in the utilization of resources were beyond the scope of this study should not be construed as indicating lack of recognition of their fundamental importance.

Inherent in the limits of the scope of this study is its exclusive concern with the costs of hospital services, apart from other costs of hospitalized illness. This involves a line of demarcation which lacks not only consistency, but also, from some points of view, meaningfulness as well. Almost invariably, hospitalized illness entails medical care expenses over and above the costs of hospital care to which this study is restricted. In this category, the principal expense is usually the charge of the attending physician or surgeon. Other similar expenses, however, are not uncommon. Agreement on the definition of hospital care (i.e., what constitutes hospital as distinguished from physician care) is not complete, and charges for certain services rendered to a patient while hospitalized may or may not be included in his hospital bill. Whether charges for services rendered

by specialists in radiology, anesthesiology, and pathology, and other fields should be billed to the patient by the hospital or by the specialists is a contentious current issue. At the present time practices vary widely.

Furthermore, there are other important costs connected with hospitalized illness that are outside the scope of this study. In the case of employed persons, for example, loss of earnings may be a substantial cost. And since disability often commences before admission to the hospital and usually extends beyond the point of discharge, the cost of disability is not confined to the period of hospitalization. This is also true of the expenses incurred for physicians' care, drugs, and sometimes of nursing and other items.

In terms of the financial impact on the patient and the attendant risk to which families and individuals are exposed, it is the total cost of hospitalized illness rather than either the costs of hospital services or other particular items of expense that is most significant. Study of patients' hospital costs in isolation, although consistent with existing practices in financing care and providing protection against costs, and, consequently, essential for the purposes of this investigation, represents a fragmentation that for broader purposes might be unwarranted. Irrespective of these considerations, limitation of the scope of the study was necessary to permit intensive investigation of the topic selected for study.

Adequacy of Data

In several respects the data on which the study is based were incomplete. Days of care and charges incurred after exhaustion of benefit periods were not included in the data from which the sample was drawn. The benefit provisions of the Plan, as previously

mentioned, resulted in the exclusion, from the hospital reports underlying the data, of charges incurred after 120 days of hospitalization by patients whose length of stay extended beyond that time. Also, where a patient had successive hospitalizations separated by an interval of less than three months between discharge and admission dates, charges incurred after a total of 120 days of care were not included in reports to the Plan. Furthermore, the Plan's benefit period was limited to 30 days for hospitalization primarily due to tuberculosis or mental conditions. And, in the event of successive admissions for these reasons, the interval between discharge and admission required to renew the benefit period was six months rather than three months as for other types of cases.

It should also be pointed out that according to the terms of the Plan's subscriber contract, hospital admissions solely for diagnostic purposes and admissions for industrial injuries or diseases, where employer liability for hospitalization existed, were not covered. The extent to which patients admitted for these reasons were, nevertheless, included in the data cannot be ascertained, but, because of difficulties in enforcement of these exclusions, many undoubtedly were.

Another important respect in which the information available for study was incomplete is in connection with demographic characteristics of patients. Such information would have permitted analysis of the charges incurred by patients classified according to these characteristics. Variation among such classes of patients in length of stay, type of services used, and amounts of cost incurred for various items, as well as for all services combined, could then have been ascertained. Such findings would have been very useful in applying the results of the study to groups of known composition. Their use in checking the representativeness of the sample, however, would have been quite limited, since demographic statistics on hospital patients

are not available either for the group of hospital providing the study data or on a national, regional, or state basis. Practices of hospitals in obtaining such information for their records are known to be far from uniform, and even greater differences likely exist in the manner and extent of tabulation. In the annual census of hospitals conducted by the American Medical Association, a limited amount of information was obtained for the first time in 1953 on the age and sex of patients in the hospital on the day of reporting. This, however, would hardly have sufficed for the purposes of comparison with the sample.

Although the information available in the study did permit the segregation of obstetrical from other cases, which was the type of classification most essential to the study's purposes, it was not sufficiently complete to permit diagnostic classification of medical and surgical patients. Had it been possible to analyze patients in the sample by disease categories and type of surgical procedures, that would have been both appropriate and worth while in this study. The findings would have had uses similar to those obtained from analysis by demographic characteristics. Also, the results of analysis by diagnosis would have been very useful in the evaluation of provisions, commonly encountered in prepayment policies and contracts, excluding or limiting benefits for hospitalization due to specific disease conditions. Because of incompleteness of the information available, the findings of the study do not provide a basis for evaluating the effect of exclusions or waiting periods relating either to specific diseases or pre-existing conditions.

The information available to the study might also be considered incomplete in that it did not include demographic data on the population covered by the Plan, or, more precisely, on the persons covered during the study period under group semiprivate contracts. With such information, the nature and extent of differences in the

composition of the exposed group and the general population, as well as of other groups, could have been determined. And had the demographic characteristics been known both for the exposed population and the patients included in the sample, specific admission rates by age, sex, and other characteristics could have been derived. Similarly detailed analysis of the utilization of specific ancillary services would have been possible.

The validity of such analysis, however, would have been jeopardized by serious difficulties involved in matching data in the sample with data on the population exposed during the period of the study. Although the data from which the sample was taken included, with minor exceptions, all care received by the exposed population in the hospitals participating in the Plan, it could not be correctly assumed that this was the full extent of the hospital care utilized by persons in the group. It is known that some of the covered persons were hospitalized in nonparticipating institutions in the state. Perhaps more important quantitatively, many received care in hospitals outside the state. This care in hospitals not members of the Plan and so not included in the group reporting to the Plan could be expected to have a material effect on incidence and utilization rates.

Another problem having a similar, although probably lesser, effect would have arisen because of a nine-month waiting period in the Plan's benefit provisions for maternity admissions. As a result of this provision, the data sampled excluded an undeterminable number of maternity cases that occurred among persons in the exposed group. Incidence and utilization rates derived from the sample would have been further affected by the extent to which admissions for diagnostic purposes and industrial injuries and disease were excluded from the basic data.

Also, the previously mentioned fact that the reports underlying the data showed cases discharged rather than admissions means that the sample data would not have precisely reflected incidence and utilization among the population exposed during the study period. However, the effect of the overlapping at the beginning and at the end of the period would, as implied earlier, have tended to cancel out and this difficulty would have been much less serious than the others.

In the use of data on the exposed population to ascertain the distribution of hospitalization costs among covered persons, a further problem would have been encountered. It would not have been valid to assume that each admission was attributable to a different person, or, in other words, that no person was hospitalized more than once during the period of the study. Repeated or successive admissions would have a pronounced effect on the distribution of the total annual cost of hospital care, it is believed, and in the absence of information on this point the findings would be distorted.

Because of these problems and the unavailability of data on the population exposed, the basic unit employed in the study is the hospitalized patient on a per admission basis. The question investigated is what charges did people incur when they were hospitalized, as distinct from the questions of how frequently persons in the exposed population were hospitalized and what charges they incurred during a base period. In the evaluation of hospitalization prepayment benefit provisions, it is the answer to the first rather than the latter questions that is most germane, since in almost all instances the total amount of benefits allowable are available when hospitalization occurs.

Representativeness of Data

At the outset it should be stated that the data employed in this study and the results derived from them do not purport to apply with mathematical rigor to other populations. From place to place and from group to group a notable lack of uniformity is evident in the factors that are determinants of the amount, distribution, and composition of the expenses incurred by hospitalized patients. Furthermore, these factors are not static but are subject to continuous and often rapid changes, as will be discussed in Chapter II. Aside from these considerations there are others of importance relating to the representativeness of the data studied, some of the more specific and pertinent of which will be examined.

The fact that the sample consisted of patients with prepaid protection, for example, raises a question as to whether the various segments of the general population are proportionately represented in the data. General evidence available on the characteristics of persons covered under voluntary prepayment programs clearly indicates that persons covered under such programs do not constitute a representative cross section of the general population. Certain segments of the general population, such as persons living in rural areas, particularly farm areas, the aged, and low-income families, are underrepresented in the prepaid population. This was found in a nationwide sample survey conducted in 1953 by the National Opinion Research Center, University of Chicago. This survey found that 38 percent of persons residing in rural farm areas and 52 percent in rural nonfarm areas were covered under hospitalization insurance, as contrasted with 57 percent of the civilian noninstitutional population.[1] Moreover, the survey showed that 63 percent of all

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[1] Odin W. Anderson, National Family Survey of Medical Costs and Voluntary Health Insurance (New York: Health Information Foundation, 1954), pp. 20-22. The percentage for all families with family

families had health insurance coverage of some type, but among families in the lowest third, according to income level, coverage was 41 percent.[1] The extent of coverage under health insurance among families where the head of the family was age 65 or older was also found to be 41 percent.[2]

Similar disparities have been found in Michigan, where the data studied were compiled. A sample survey of the state of Michigan, exclusive of Wayne County, found that in 1948 the percentage of families with hospitalization insurance was 48 percent in rural areas, as compared to 59 percent in all areas.[3] If appropriate allowance were made for the exclusion from the survey of Wayne County, which contains the metropolitan area of the city of Detroit, and for changes occurring after 1948, the difference between the levels of coverage prevailing in rural areas and in the state as a whole undoubtedly would be greater than that found by the survey.

The underrepresentation of these population segments is probably greater in the data than would be inferred from the surveys cited. This would be expected because the data studied relate only to group prepayment contracts, whereas the findings of the surveys reflect all

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head age 65 or older was computed from data appearing in Table 6 on page 21. The close similarity found in the level of coverage in the low-income, aged, and farm populations reflects, in part, the tendency of these groups to overlap.

[1] Loc. cit.

[2] Loc. cit.

[3] Charles R. Hoffer, Duane L. Gibson, Charles P. Loomis, Paul A. Miller, Edgar A. Schuler, and John F. Thaden, Health Needs and Health Care in Michigan, Agricultural Experiment Station, Section of Sociology and Anthropology, Special Bulletin 365 (East Lansing: Michigan State College), p. 55.

types of coverage. Generally, group coverage is available only to persons in families where the family head is employed in a group having a common employer, and it is not available to persons who are self-employed, retired, unemployed, or in other residual categories. On the other hand, individual coverage, although typically less advantageous, is available without restrictions relating to employment and, consequently, tends to be most prevalent among persons who do not have access to protection as members of a group. Under the Plan providing the data, however, members of farm organizations and retired aged, under certain conditions, were covered by group contracts. But these practices of the Plan only partly reduce the effect of the restrictions on availability of group coverage.

Another question, however, seems to be more significant to the representativeness of the data than that of how the composition of the prepaid population compares with the general population. This question is to what extent the hospital charges incurred by prepayment patients differ from those incurred by patients without prepaid protection. The evidence seems to indicate that the differences in utilization of hospital care by the two groups of patients are much more pronounced with respect to admission rates than to the amount of service used per admission. From the National Opinion Research Center's national survey, to which reference was previously made, Anderson found that the admission rate was almost a third higher for persons with hospitalization insurance than for those without. But in average length of hospital stay per admission, the findings show only a slight difference between patients in the two groups.[1]

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[1] Odin W. Anderson, op. cit., pp. 55, 58, 59. The admission rate was found to be 13 per 100 persons covered by hospitalization insurance at the end of the survey year; for persons not covered it was 10 per 100. Although the report states, "The average length of

Some testing of the representativeness of the sample data with respect to charges incurred by patients is possible by making comparisons at several significant points between the results derived from the sample and the independent data that are available for the same geographical area. The most comprehensive independent data available are those reported by Michigan hospitals to the American Hospital Association in its annual census of registered hospitals.

For nonfederal general and special short-term hospitals, data from the census show that the average length of stay of patients was 7.0 days in 1951 and 7.7 days in 1952.[1] The average length of stay

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stay for all persons hospitalized is 9.7 days and there is virtually no overall difference between those insured and not insured,'' in the accompanying tables it is seen that the figure of 9.7 days relates to the average number of hospital days per person hospitalized during the survey year, whereas the average length of stay per admission is shown to be 8.5 days. Figures computed from the data in the tables, however, indicate that the average length of stay per admission was only slightly lower for persons without insurance than for those with prepaid protection.

[1] Hospitals, Administrators Guide Issue, Vol. 26, Part 2 (June, 1952), p. 59; and Vol. 27, Part 2 (June, 1953), p. 110. The average for the various types of hospitals combined was included in the published tabulations for 1951, but not for 1952. The figure for the combined average for 1952 was computed from the published averages for nonprofit, proprietary, and nonfederal governmental hospitals. In this calculation, weights were given to each of the classifications based on the total bed complement times the occupancy rate shown for the classification. The figure for 1951 obtained by this method of calculation checks with the published figure for that year. The reason for the omission in 1952 of combined averages by individual states was that less than 100 percent reporting by hospitals created difficulties in computing such averages and in some states this factor had a material effect on the results. It is believed, however, that reporting by Michigan hospitals was sufficiently complete to permit significant comparison between the average computed from the census data and that derived from the sample.

of patients in the sample was 7.16 days. With allowance for the fact that the patients in the sample were hospitalized during the last half of 1951 and the first half of 1952, except for maternity admissions which were in the third quarter of 1952, the result derived from the data studied appears to be very slightly under that indicated by interpolation of the census figures.

As derived from the hospital census the average amount of total hospital expenses per patient day in nonfederal general and special short-term hospitals in Michigan was $22.18 in 1951 and $23.44 in 1952.[1] From the sample, the average amount of charges incurred per day by patients was found to be $23.58. It is important to point out, however, that the figures reported in the census relate to costs incurred by hospitals in providing care rather than charges billed to patients. Generally, it is to be expected that average total charges to patients would be higher than average total costs of providing care, since the level of charges to paying patients customarily is designed to produce some revenue in excess of costs to be used by the hospital to subsidize nonpaying and part-paying patients. In Michigan, however, this practice is a less important factor than in certain other areas of the nation. Also pertinent to comparison of the per patient day figures from the census and the sample is the method used in computing hospital per diem costs. This tends to offset the effect of the mark-up of charges over costs and tends to make figures on the two bases more comparable. To arrive at per diem costs as reported in the census, total expenditures are divided by total days of care. This has the effect of allocating all costs to in-patient care, although a portion of these costs are attributable to out-patient services

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[1] Ibid. Discussion in the preceding footnote is also applicable here.

and to other activities of the hospital. These activities and services usually bring sufficient income to the hospital partly or fully to cover their cost. If allowance were made for this in the calculation of hospital expenses per patient day, the result obtained would be a lower figure. This means that average charges per day to paying in-patients need not necessarily exceed average per diem costs, as computed, in order for hospitals to obtain revenue in excess of their costs. Although it is not correct to assume that hospital income from patients is equal to the full amount of total charges, since not all charges to patients are collected, hospitals receive income from nonpatient sources, such as endowments, gifts, and grants, which is used to finance charity and other care for which the hospital does not receive payment. For these reasons, the data on average hospital expenses per patient day, as derived from the census, can be expected to more nearly approximate average total charges per day to in-patients than would otherwise be assumed.

Because the average length of stay and the costs per day derived from the sample and the hospital census data are closely similar, the difference in the average cost per admission derived from the two sources is small. Based on the census data, the average total hospital cost per admission was $155.26 in 1951 and $180.49 in 1952. The average total hospital bill of patients included in the sample was $168.88. Allowing for the fact that approximately 60 percent of the patients included in the sample were hospitalized in the year 1952, there is very little difference in the average amount of charges per admission derived from the sample and the average hospital cost per admission derived from the census data and adjusted to the base period of the study.

Another source of independent data against which the representativeness of the sample may be tested is a survey of hospital costs

in Michigan sponsored by the Michigan Hospital Association and made at the request of the State Commissioner of Insurance. The survey was conducted in 1952 by Arthur Anderson & Co., a firm of public accountants and auditors, in ten selected hospitals. The report stated that the ten hospitals, "because of their nature, size and location can be considered as representative of all hospitals in Michigan."[1] All ten were Blue Cross participating hospitals.

Based on analysis of charges incurred by approximately 1,200 of the patients hospitalized in these institutions during the year 1951, the survey found that in the hospitals studied the average total hospital bill was $166.92 for Blue Cross patients and $164.50 for non-Blue Cross patients. The average length of stay for Blue Cross patients was 6.7 days as compared to 6.9 days for other patients. In the amount of average charges incurred per day, Blue Cross patients exceeded other patients. The figures were, respectively, $24.84 and $23.91 per patient day. The weighted average net cost to the hospitals per adult in-patient day was found to be $22.22.[2]

In comparison to the average total hospital bill of $166.92 for Blue Cross patients in 1951, the average derived from the sample was $168.88, as stated earlier. Considering that the sample reflects more hospitalization in 1952 than in 1951, and also the rapid advance which was occurring in hospital costs, the result from the sample would appear to be slightly lower than that indicated by the survey.

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[1] Survey of Hospital Costs in Michigan, Michigan Hospital Association, report to the Board of Trustees by Kenneth Babcock, M.D., President, May, 1953. Since the report does not identify the hospitals studied nor describe the method used in their selection, the statement as to their representativeness cannot be evaluated.

[2] Ibid., Appendix exhibit 1,3.

A greater discrepancy is seen when patients' costs as derived from the two sources are compared on a per day basis. On this basis, the average total amount of charges incurred by both Blue Cross and other patients as found by the survey is higher than the figure obtained from the sample despite the fact that the sample relates to a period several months later in point of time.

The finding of the Michigan Hospital Association survey that in ten hospitals the average length of stay in 1951 for Blue Cross patients was 6.7 days compares with a findings of 7.16 days for 1951-52 from the sample These results appear reasonably consistent when viewed along with the hospital census data showing that the average length of stay in Michigan hospitals was somewhat lower in 1951 than 1952.

The survey found that in these ten hospitals average total charges to patients per day exceeded the hospitals' cost of providing care by some 10 percent. However, it should be noted that the cost per patient day to the hospital was computed in a different manner from the figures on expenses per patient day reported for hospitals by the census.

The close similarity found in the Michigan Hospital Association survey between the average amount of charges incurred by Blue Cross patients and other patients, a variation of less than 1.5 percent in the total amount of the average hospital bill, would seem to have some bearing on the question previously raised about the extent to which charges incurred by prepaid patients are representative of those by patients without protection. Although the findings of the survey do not permit precise comparison between patients with and without prepayment coverage, since the category "non-Blue Cross patients" used in the survey tabulations includes those with commercial insurance coverage along with those having no protection, nevertheless, the closeness of the results for the two classifications seems significant.

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Despite consistency in average total charges and average length of stay, however, the distributions producing such averages could be quite dissimilar for prepaid and nonprepaid patients. Also, the relative importance of charges for various types of services could differ considerably for the two groups of patients even though the average total amounts of their hospital bills was virtually the same. These would seem to be more than remote possibilities, in view of the sizable difference in the hospital admission rates for the covered population and the group without prepaid protection.[1] The extent of the disparity in the frequency of hospital use suggests that the distribution by diagnosis of patients from these two groups might not be similar.

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[1] As previously noted, Anderson found that in the United States civilian noninstitutional population the admission rate for persons with hospitalization insurance was 13 per 100, while for those without, the rate was 10 per 100 persons (Anderson, op. cit., p. 57). The admission rate during the study period for members of the Michigan Plan was not far different from his findings for persons with hospitalization insurance. In 1951, the admission rate for persons under the Plan was 132.6 per 1,000 persons; in 1952, it was 141.3 per 1,000 (Fourteenth Annual Report to the Board of Trustees of Michigan Hospital Service, March 26, 1953, p. 38). That a discrepancy exists in Michigan between admission rates for persons with and those without protection can be inferred from comparison of these latter figures with data on admissions among all persons in the state's civilian population. For this population the admission rate to all civilian general hospitals in 1951 was 114.8 per 1,000 persons (Louis S. Reed and Helen Hollingsworth, How Many General Hospital Beds Are Needed?: A Reappraisal of Bed Needs in Relation to Population, Public Health Service Publication No. 309 [Washington: Government Printing Office, 1953], pp. 28, 29) This rate, however, includes admissions to Veterans Administration and long-term general hospitals, which are not reflected in the rates for members of the Plan. In view of this, and the fact that a majority of the civilian population in the state were covered under prepayment programs, it would appear that the difference in the frequency of hospital use by persons with and without protection was even greater in Michigan than Anderson found in the nation as a whole.

In summary, checking of the results obtained from the sample with available independent data indicates that on the essential points of comparison, length of stay and total amount of charges, the patients included in the sample closely resemble all hospitalized patients. However, checking has been possible only with respect to averages. And it should be recognized that the generally high degree of consistency seen in the averages obtained from the sample and from independent data does not assure that the distributions underlying these averages are similar. The effect that the much higher admission rate, for persons with prepaid protection than for those without, has on these distributions can only be surmised. The most reasonable hypothesis seems to be, however, that the distribution would be affected. Since the sample includes only prepaid patients, some reservation seems appropriate, therefore, regarding the extent to which the sample data are representative of the services used and charges incurred by patients without prepaid protection.

However, in view of the contemplated uses of the study findings to evaluate prepayment benefit provisions, the extent to which the sample represents all persons hospitalized would seem to be secondary in importance to its representativeness of patients with prepaid protection. Clearly it is findings on charges incurred by patients who do not have financial barriers to the use of services that are relevant to the consideration of possible modifications and improvements in existing benefit standards. And, if differences as to distribution or composition of hospital charges do exist between patients with prepaid protection and those without, it is information on the experiences of prepaid patients that would seem most pertinent to the problem of selection confronting purchasers of protection. It seems reasonable to expect that after persons have acquired prepaid protection, their use of hospital services will tend to more nearly

correspond to that of the previously covered population rather than to follow the pattern of use prevailing for persons without protection. This might result in part from greater resemblance, in terms of social and economic status and demographic characteristics, between persons purchasing protection and those composing the previously covered population than is found between the covered population and groups without protection.

The applicability of the findings derived from the sample to areas other than Michigan raises numerous considerations. In relating the findings to other areas, differences in patterns of medical practice and in habits regarding the use of hospitals are especially important. Such differences are manifested in, and in part may be attributable to, the variation which exists among areas in hospital facilities in relation to population and in the scope of hospital service programs. Another major factor to be considered is that, with respect to hospitalization costs Michigan is a high cost area. With recognition of such differences, however, the broad findings of this investigation perhaps do have sufficient applicability to other areas to indicate, within more or less wide limits, the general outline of the distribution and composition of the cost of hospital care incurred by patients.

CHAPTER II

THE INCREASING IMPORTANCE OF THE COST OF HOSPITAL CARE

Total Expenditures for Hospital Care

Among the various components of the total cost of personal health services in the United States, hospital care of all types ranks first in terms of financial outlay. Excluding the large-scale public and private expenditures for construction of hospital facilities, the estimated total expenses of the nation's hospitals in 1953 amounted to more than four and three-quarters billion dollars.[1] This is roughly one-third of the estimated amount spent from all sources for personal health services and goods.[2]

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[1] Hospitals, Administrators Guide Issue, Vol. 28, Part 2 (June, 1954), p. 24. For the year ended Sept. 30, 1953, estimated total expenses of all hospitals were $4,765,063,000. Nonregistered institutions were not considered in this estimate.

[2] Although available data do not permit close estimation of total expenditures for personal health services, a general estimate for 1953 of 12 to 13 billion dollars would seem reasonable in view of the following data: Estimated total private expenditures for medical care in 1953 of $9,866 million (Social Security Administration, Social Security Bulletin, 17 [December, 1954], Table 4, p. 5) and estimated total expenditures from public funds and under public law of $2,481 million in fiscal year 1952-53, for items construed to represent personal health services. These items are (in millions): Hospital and medical care (includes items such as care provided in public institutions; e.g., state and local tuberculosis hospitals and Veterans Administration hospitals), $2,040.6; hospital and medical benefits under workmen's compensation, $270.0; and vendor payments

And since many hospitals do not make appropriate allowance for depreciation and obsolescence of facilities in their reported expenses,[1] this figure is probably an understatement of the costs of providing hospital care. These costs, if calculated on a basis consistent with that used for goods and services in other sectors of the economy, very likely exceeded five billion dollars in the calendar year 1953.

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for medical care under public aid programs, $154.4. (Estimates for the amount of these items derived from Social Security Administration, Annual Statistical Supplement, Social Security Bulletin, 17 [September, 1954], Table 3, p. 35.) The total of these estimates of private and public expenditures is $12,077 million, after deducting the amount for workmen's compensation benefits which is included in the estimates for both categories. Not included in the total, however, are the amounts expended in the United States for health services by the Military Establishment and the Atomic Energy Commission as well as a number of other relatively small items which probably should be included.

[1] Of hospitals replying to a special question included in the 1953 census of hospitals conducted by the American Hospital Association, 68 percent reported that they "calculate depreciation." (Hospitals, Administrators Guide Issue, Vol. 28, Part 2 [June, 1954], p. 52.) Among the various classifications of hospitals, however, the percentages varied widely, and if the findings are weighted by the estimated book value of plant assets in the classifications, the results indicate that hospitals not calculating depreciation have approximately half of the total plant assets. No information was reported as to the adequacy of charges where depreciation is calculated or the extent of their inclusion in reported expenses.

Failure to include depreciation as a part of product cost, in line with accepted practice for the accounting of costs, can be attributed to the nonprofit or governmental status of the vast majority of hospitals and hence their exemption from income tax reporting requirements. Also the traditional practice of financing facilities from sources other than charges to patients is important in this connection.

The effect of inadequate provision for depreciation of facilities is reduced to some extent by the frequent practice of charging the full cost of the addition or replacement of equipment and apparatus to operating expenses in the year purchased.

Much of the cost of hospital care is financed through taxation. In fact, about half of the total cost of hospital services is attributable to institutions operated by various units of government.[1] Although not all care provided in governmental hospitals is financed by tax funds, income from patients is generally a very minor source of revenue, except in general short-term hospitals operated by units of local government. Moreover, the use of tax funds for hospital care is not limited to the support of public hospitals. Numerous public agencies utilize nongovernmental hospitals in providing care, the cost of which is small only in relation to total public expenditures for hospitalization.

For the most part, however, the role of government in financing hospital care is confined to two major disease categories, mental disorders and tuberculosis. Beyond this, government's role is limited to responsibility assumed for the hospitalization of designated classes of beneficiaries and special groups such as the armed forces, eligible veterans, recipients of workmen's compensation benefits, and persons receiving public aid. And, despite the substantial proportion of the total cost of all hospital care that is assumed at the various levels of government, the cost of care in general short-term hospitals characteristically is born directly by people as consumers rather than as taxpayers.

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[1] Hospitals, Administrators Guide Issue, Vol. 28, Part 2 (June, 1954), p. 26. Based on data contained in Table 5, the expenses of governmental hospitals represented 49.5 percent of the total expenses of all hospitals in the nation. Because the data do not reflect nonregistered hospitals, the percentage is probably a slight overstatement, on the assumption that nonregistered institutions as a group are predominantly nongovernmental.

Magnitude of Consumer Expenditures for Hospital Care

The amount of total hospital costs borne by consumers is difficult to estimate closely and the several estimates that are available vary in method of estimation and, to some extent, in result. In the official economic accounting of the gross national product, the provision made by the United States Department of Commerce to represent the market value of purchases of hospital care by individuals and families was $2.6 billion for 1953.[1] For purposes of comparison, the estimate for this item of personal consumption expenditures is almost identical in amount to those for home telephone service and for household electricity.[2] Data from this source also indicate that consumers spent almost as much for hospital care as they did for physicians' services. Furthermore, it is seen that the amount expended for hospital care in 1953 comprised more than a fourth of the total amount spent by consumers for all services and commodities in the broad category of medical care, exclusive of funeral and burial

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[1] U. S. Department of Commerce, National Income, 1954 Edition: A Supplement to the Survey of Current Business (Washington: Government Printing Office, 1954), Table 30, pp. 206-8. This estimate, which is based on data from the American Hospital Association's annual census of hospitals, comprises current expenditures of nonprofit hospitals and payments by patients to proprietary hospitals. Census data for the year ended September 30 are projected to a calendar year basis and apparently an allowance is added for depreciation.

[2] Loc. cit. The amount of personal consumption expenditures under the heading "Household operation" for the item "Telephone, telegraph, cable, and wireless" is $2.6 billion for 1953. Among the items of household utilities, under the same heading, expenditures for "Electricity" are $2.7 billion for that year.

expenses.[1] In relation to estimated total personal consumption expenditures for the year, however, the estimate for hospital care amounted to only 1.1 percent.[2]

According to the Social Security Administration's estimates of private expenditures for medical care, the amount spent for hospital services amounted to $2.8 billion in 1953.[3] In these estimates, hospital services assume greater importance relative to other medical care items and constitute 30 percent of total private expenditures for all medical care, if administrative and other net costs of medical care insurance, as well as funeral and burial expenses, are disregarded.[4]

A somewhat different picture of the composition of consumers' medical care costs appears from the results of the previously mentioned nationwide sample survey conducted by the National Opinion Research Center. This survey found that total gross hospital charges amounting to $2.0 billion were incurred during the year ending June, 1953, by families in the civilian noninstitutional population.[5] The

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[1] Loc. cit.

[2] Loc. cit.

[3] Social Security Bulletin, 17 (December, 1954), Table 4, p. 5. This estimate appears to be the better of the two official estimates available. Although the source of the data on which it is based is the same as for the Department of Commerce figure, it is constructed from estimates of income received from patients in all types of general and special short-term hospitals. The hospital census data are projected to a calendar year basis and adjustments or allowances are added to reflect income from patients received by nonregistered, general and special long-term, tuberculosis and mental hospitals.

[4] Loc. cit.

[5] Odin W. Anderson, op. cit., pp. 32, 33. In several important respects, however, this estimate is not comparable to those of

findings showed that of the total costs of all personal health services and goods purchased by consumers, hospital costs constituted 20 percent. Moreover, it was found that charges incurred for hospital care in total as compared with total charges for physicians' care were only three-fifths as much.[1]

Current Trend in Consumer Expenditures

For the purpose of general perspective, however, the differences in these estimates of the amount of expenditures are much less significant than the direction and rate of change in the level of hospital costs borne by consumers. In fact, the most striking aspect of consumers' hospital costs is seen to be the remarkable increase that is occurring. Although consumer expenditures for virtually all commodities and services have risen sharply in recent years, the rapidity of the increase in spending for hospital care has far outstripped that for all items of expenditure combined.

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the Department of Commerce and the Social Security Administration. Payments made to all hospitals for out-patient services and to governmental hospitals for services rendered by salaried physicians, considered as expenditures for hospital care in the conventional classification of costs and so treated in the official estimates, are excluded from the N.O.R.C. estimate of hospital charges and, instead, are classified under physicians' charges. Also it should be pointed out that the survey findings do not purport to reflect costs incurred by persons in the institutional population and that the survey relates to a period six months earlier in time than the other estimates. Moreover, the survey data exclude the hospital expenses of deceased persons who prior to death had been living alone or with nonrelatives and those who lived in households that were dissolved following the death. The effect of each of these factors is to reduce the figure for hospital charges obtained from the survey as compared to the other estimates.

[1] Loc. cit.

Available evidence indicates that during the postwar period the level of spending for hospital care has risen fully twice as fast as total consumer spending. While personal consumption expenditures in total increased 89 percent from 1945 to 1953, based on estimates of the Department of Commerce, the hospital care item rose 181 percent.[1] Further analysis of estimates from this source reveals that in every year during this period the percentage increase in the amount representing hospital care exceeded the rate of increase for over-all personal consumption expenditures. Although not available for years before 1948, Social Security Administration estimates of private expenditures for hospital services show a steep upward movement for the period since 1948 at a rate of climb that is, in fact, somewhat greater than that indicated by the Department of Commerce data.[2]

The current upward trend in the financial outlays of families and individuals for hospital services is equally conspicuous when compared to the trend in consumer spending for all medical care services and goods, which, of course, includes hospital care. Referring again to the period since the close of World War II and to estimates of the Department of Commerce, it is seen that personal consumption expenditures for all medical care items combined have little more than kept pace with the rate of increase in total consumer spending.[3]

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[1] National Income, 1954 Edition: A Supplement to the Survey of Current Business, loc. cit.

[2] Social Security Bulletin, 17 (December, 1954), Table 4, p. 5. The increase from 1948 to 1953 was 70 percent as compared to 64 percent in the Department of Commerce estimates for the same period.

[3] National Income, 1954 Edition: A Supplement to the Survey of Current Business, loc. cit. The total amount for 1953 of all items, except funeral and burial expenses, which are included under the heading

Consumer spending for hospital care, on the other hand, has been rising at approximately twice this rate, as was previously pointed out.

This comparison between the rate of increase in expenditures for hospital care and all medical care indicates that a significant shift in the pattern of consumer spending for health care is taking place. This shift is clearly seen in the changing distribution of the consumer's medical care dollar. The share allocated to hospital services, which was 18 cents in 1945, has continuously expanded until in 1953 it was 26 cents--almost half again as large as at the beginning of the postwar period.[1] As would be expected, the Social Security Administration series of estimates of private expenditures for medical care items show a very similar upward trend in the share of the consumer's medical care dollar devoted to hospital services. In this series, the proportion of total medical care expenditures represented by hospital services climbed from 23 percent in 1948 to almost 29 percent in 1953.[2]

These data on consumer expenditures for hospital services reflect the expanding role of the hospital in the provision of modern medical care. And examination of the current trend in the level of consumer expenditures points up the fact that the importance of the costs of hospital care to families and individuals is increasing rapidly.

"Medical Care and Death" is 98 percent greater than the total of the same items for 1945.

The stability of medical care expenditures as a percentage of total consumer spending is a well-known phenomenon. For the years 1945 through 1953, this percentage was virtually constant. The high was 4.3 percent; the low, 4.1 percent.

[1] Loc. cit.

[2] Social Security Bulletin, 17 (December, 1954), Table 4, p. 5.

Analysis of the Trend in Consumer Expenditures

Obviously, the upward trend in consumer expenditures for hospital care results either from higher average prices paid by consumers per unit of service or from the purchase by consumers of larger quantities of service, or from a combination of increases in both prices and quantities. As might be expected for the postwar period, the latter is found to be the case.

The extent, however, to which these two factors, respectively, account for the rise in the expense of hospital care has been, and continues to be, a matter of importance not only to providers of hospital services and of prepaid protection, but also to consumers generally. For the most part, its importance grows out of public resistance to increased outlays for hospital care which is manifested in the widespread concern with the rising cost of hospital care and with efficiency in the operation of hospitals. This concern with the rising cost of hospital care generally tends to incorporate both the increase in costs, in terms of price changes, and the increased expense arising from the expanded volume of services consumed. Commonly, the two factors are not distinguished. It appears, however, that popular concern focuses on higher prices as the "villain of the piece," while the importance of nonprice factors is little recognized. And this is often reflected in opinions that are held as to the justification of the increased outlays required for hospital care. More important, it is reflected in views regarding actions that are appropriate to meet the problem arising from higher expenditures for hospital care.

Furthermore, the relative importance of these two factors in the current upward trend in consumer outlays for hospital services would seem to have considerable bearing on expectations regarding

the continuation of the trend. On the one hand, to the extent that price increases are a factor underlying the trend, it might be anticipated that abatement of inflationary pressures in the economy would tend to check the advance in the aggregate amount of expense incurred by consumers for hospital care. On the other hand, to the extent that the trend reflects more than price changes, it might be expected that the upward trend in the outlays of consumers would not be affected by a leveling off in the cost of living or prices generally.[1] For this reason, the matter seems to be significant both to dynamic analysis and perspective of the cost of hospital care.[2]

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[1] It should be recognized that it is the prices of specific commodities and services purchased by hospitals as distinguished from the cost of living and the general price level that directly affect the cost of providing hospital care, and, consequently, the prices of hospital services. Although it is possible that the level of prices for these specific commodities and services might move in a divergent direction from the general price level or the cost of living, this would seem highly improbable over any extended period of time, especially in view of the fact that wages and salaries typically represent more than half of the cost of providing hospital care. However, a lag between changes in prices and wage levels generally and those paid by hospitals could be an important factor in this connection.

[2] This does not imply that determination of the effect that price and quantity changes, respectively, have on total expenditures serves to establish their relative importance as causal factors. Theoretically, for example, an increase in the quantity taken by purchasers may necessitate marginal output that exceeds the point of diminishing returns and, therefore, increases average unit costs. If hospitals raised prices on services to cover such an increase in average costs, as they would normally tend to do, the cause of the increase in price might be said to be the increase in quantity or output. The reverse might more likely be the case, or in other words, the increased output of services might permit utilization of personnel and facilities at a level that is nearer to the point of maximum efficiency, with the effect of reducing average costs per unit of service. Because of such interaction between quantity, unit cost and price, the changes due to the two entities, quantity and price, cannot be so simply segregated.

Increase in Hospital Prices

Data on changes in the prices of hospital care are included as a component of the Consumers' Price Index compiled by the United States Bureau of Labor Statistics. The items selected to represent hospital care in this index were the daily rates charged by hospitals for three types of accommodation, men's pay ward, semiprivate room, and private room.[1] The combined index for these rates shows a sharp and persistent advance throughout the postwar period. From 1945 to 1952, the last year for which data were published in the "adjusted series," this increase amounted to 116 percent.[2] The rise in the index for the hospital rates was almost two and a half times as great as occurred in the over-all index for all items.[3] And among medical care items the increase in hospital prices is even more conspicuous, since the combined index for medical care, despite the inclusion of the fast rising hospital component, rose

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[1] Beginning in 1951, another item, "Group hospitalization," was added to those priced to represent hospital care.

[2] U. S. Department of Labor, Bureau of Labor Statistics, Consumer Prices in the United States, 1949-52, Bulletin No. 1165 (Washington: Government Printing Office, 1954), p. 63. Percentage computed from index numbers for "Hospital rates" in the detailed indexes of retail prices supporting the Consumers' Price Index (adjusted series). This series was designed to measure changes in the cost of living, in a nonrigorous sense, for moderate income families in 34 large cities. (Data on the hospital item of the medical care component of the "revised series," introduced in 1953, have not been included in the publication of the index.)

[3] Loc. cit.; ibid., p. 34. Based on percentages computed from index numbers for "All items" and for "Hospital rates" in the Consumers' Price Index (adjusted series). The percentage increase for all items was 47.5 from 1945 to 1952.

somewhat less over this period than the over-all index for all items.[1]

The adequacy of these data to show the extent that price changes have affected total consumer expenditures for hospital services, however, is subject to several qualifications. In the first place, the adjusted series of the Consumers' Price Index, from which the data are taken, was not designed to be representative of all consumers in the nation and the sampling of prices from which the indexes were constructed was limited to large cities. Although it is well known that hospital rates are generally much higher in large cities than in smaller communities and rural areas, reflecting differences in standards of service as well as in labor costs and other factors, it is not known whether the differences in rates have tended to become narrower or have widened.

A more significant qualification would seem to be whether changes in room and board rates are representative of price changes for all hospital services. Although room and board charges account for slightly over half of total hospital charges, relatively less price change for the residual items could, of course, reduce materially the average change for all items of service. And general observation, supported by available evidence, indicates that unit prices charged for ancillary services have, in fact, advanced much less rapidly than daily room and board rates.

From data available for the period 1947-52 from the annual survey of general hospital rates conducted by the American Hospital

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[1] Ibid., pp. 34, 63. Based on percentages computed from index numbers for "All items" and for "Medical care and drugs" in the Consumers' Price Index (adjusted series). The percentage increase from 1945 to 1952 for medical care and drugs was 41.6.

Association it appears that the increase in the amounts most frequently charged for ten specified and relatively standard ancillary services, or procedures, commonly used by patients, has been far less than the increase in the average of the most common room and board rates charged paying patients. For six of the ten ancillary services priced in the survey the prices most frequently charged remained unchanged throughout the period. The remainder showed advances of 33 percent to 50 percent.[1] The increase over the period in the average of the most common room and board rates charged ranged from 58 percent to 67 percent, depending on type of accommodation.[2]

A further qualification regarding the adequacy of the data on changes in room and board rates, for measuring increases in hospital prices, relates to changes over the postwar period in the content and quality of room and board services. Hospital room and board service represents more than food and lodging in the ordinary sense. It includes such items as general nursing care, special diets, and often "floor drugs" and routine medications as well as numerous minor services provided to patients. In view of the advances and improvements that have occurred in general hospitals during the postwar period, particularly with respect to dietetics and standards

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[1] American Hospital Association, Hospital Rates, 1954 (Chicago: American Hospital Association, 1954), p. 17. Since the data on prices reported by hospitals are not weighted by size of hospital, the results are not conclusive as to price change. A weighted average for the price change in the ten items cannot be derived due to lack of information on relative importance.

[2] Ibid., p. 12. Discussion in preceding footnote is also applicable here. Strict comparison between the findings for room and board and for ancillary service rates cannot be made because the results for the two are not presented on a comparable basis.

of nursing care, it would appear obvious that the unit of a day of room and board service lacks the degree of specificity necessary to exclude the effects of quality-quantity factors. Since data on changes in room and board rates do not differentiate between changes in these factors and price changes, they tend to be inadequate for measurement purposes. And, as a result, the percentage increase shown in these rates would tend to overstate the extent of the advance in prices.

Whether or not the price increase in consumer-financed hospital services is, in fact, materially less than shown by the price index for hospital rates can be roughly checked by examining the reasonableness of the results obtained through deflation of data on consumer expenditures by the price index figures. The volume of hospital care, as derived from deflating the Department of Commerce data on personal consumption expenditures for hospital care by the Bureau of Labor Statistics price index for hospital rates, shows an increase of only 8.5 percent over the period 1946-52. The results obtained by this process show further that no increase occurred in the volume of hospital care purchased by consumers during the two-year period 1950-52 and that there was an actual decrease in the quantity of hospital services from 1946 to 1949. In view of the sizable expansion during these periods both in hospital facilities and in the number of hospital employees it would seem highly probable if not evident that the extent of the increase in hospital prices is substantially overstated by the price index used in the calculation.

Increase in Quantity of Hospital Services

Turning to the question of how much increase has occurred during the postwar period in the quantity of hospital services received by consumers, it is found that even greater difficulties are encountered

in measurement. The traditional quantitative unit employed for measuring the volume of hospital output is a patient day of care. Although data on this basis were perhaps satisfactory when hospital care was predominantly custodial in character, they are quite inadequate as a quantitative index of the volume of services rendered in present-day hospitals for acute illness. With the rapid advance of medical science, general hospital care has become more and more complex and involves a growing number and greatly increased use of ancillary services. And as this occurs, the custodial or food and shelter component of hospital care continuously diminishes in relative importance.

Data on changes in the number of patient days of care, therefore, reflect solely changes in the volume of custodial care and, consequently, tend to conceal expansion in the content of the services rendered per average patient day. As a result, over a span of even a few years time, it is very likely that the amount of change in the total number of days of care provided materially understates the actual change in the quantity of services provided in general short-term hospitals. Nevertheless, because data on the quantity of care are customarily compiled on the basis of patient days, it is necessary to refer to these data for evidence of changes in the quantity of hospital care received by consumers.

Based on data from the annual census of the American Hospital Association, the estimated total number of days of care provided by all nonfederal general and special short-term hospitals increased 15.5 percent from 1946 to 1953.[1] Further analysis of these data shows

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[1] Hospitals, Administrators Guide Issue, Vol. 28, Part 2 (June, 1954), p. 16. Period 1946-53 is for years ended September 30. Data were not published for years prior to 1946. Percentage figure is derived from data on estimated average daily census in hospitals. These data do not reflect all days of care financed by consumers, since they

that for each successive year the total rose, with the exception of 1949, which was followed by a sufficiently large increase in 1950 to maintain a reasonably smooth slope in the upward trend over the period. During the same period, 1946-53, the estimated total number of admissions to these hospitals rose 32.5 percent[1]--slightly over twice as much as total days of care.

The much greater increase in admissions than in patient days is a strong indication that the amount of hospital services per patient day of care increased appreciably over the period. The basis for this is that the greater increase in admissions than in patient days reflects a shortened period of convelescence and an increasing percentage of admissions for diagnostic purposes, both of which have the effect of raising the proportion of hospital days involving intensive use of specialized services. Although comprehensive data are not compiled which would measure or show the increase in the volume of ancillary services, available evidence indicates that it is in connection with these services that the major expansion in the quantity of hospital services has occurred.[2]

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include some care provided by hospitals in the specified classification that was financed by government and exclude patient-financed care in other types of hospitals. Adjustments for this, however, would involve only a relatively small proportion of the total and would be largely offsetting and would probably have little or no effect on the percentage increase.

[1] Loc. cit. See preceding footnote for discussion of relationship between data on hospitals in this classification and care financed by consumers.

[2] An example of such evidence is data obtained by the Commission on Financing of Hospital Care showing the following increases in the number of X-ray films per in-patient: 74 percent in 29 hospitals in New York City over the period 1942-51; 24 percent in 14 Philadelphia hospitals for 1942-52; and 403 percent in 15 Cleveland

Two additional types of hospital care that are not reflected in the statistics on patient days of care are care of newborn and out-patient services. Although the two combined constitute only a minor fraction of all care, it is significant that they show increases far in excess of the 15.5 percent rise in the number of patient days. The number of births reported in the hospital census by nonfederal general and special short-term hospitals was 50 percent greater in 1953 than in 1946.[1] Particularly because of more extensive provisions for care of premature infants, the quantity of services rendered to the newborn may have increased even more than this 50 percent. The number of out-patient visits reported by hospitals in the same classification rose 46 percent over the period 1946-53, and again this does not take into account possible changes in amount of services rendered per visit.[2]

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hospitals for 1936-52. Data on increases in the number of laboratory tests per in-patient were: 23 percent in 37 New York City hospitals for the period 1942-52; 36 percent in the 14 Philadelphia hospitals from 1942 to 1952; and 163 percent in the 15 Cleveland hospitals for 1936-52 (Commission on Financing of Hospital Care, Financing Hospital Care in the United States, Vol. 1, Factors Affecting the Cost of Hospital Care, ed. by John H. Hayes [New York: The Blakiston Company, Inc., 1954], Table II-13, p. 46.) If these figures were on a patient day basis the percentages of increase in the quantities of these services would be much higher because of the increased number of admissions.

[1] Hospitals, Administrators Guide Issue, Vol. 28, Part 2 (June, 1954), p. 16. Percentage computed from data for years ended September 30, not adjusted to calendar year basis. Since a slightly higher proportion of hospitals in this classification reported data on births in 1946 than in 1953, the percentage increase is understated to some extent.

[2] Ibid., p. 18; and Vol. 21, Part 2 (June, 1947), p. C-4. Percentage computed from data for years ended September 30, not adjusted to calendar year basis. The increase is probably substantially understated since the percentage of hospitals in this classification reporting on out-patient visits declined from 88 percent in 1946 to 63 percent in 1953. No adjustment was made for nonreporting hospitals.

Conclusions from Analysis of Changes in Prices and Quantity

As has been seen, measurement of the changes that have occurred in the prices paid by consumers for hospital services and in the quantities of services they have received is beset with difficulties. In addition to incompleteness of available data on aggregate changes, the units that are employed in the compilation of pertinent data are lacking in similarity, essential to measurement, and are unsuited for analytical purposes. A conclusion based strictly on these data, however, would be that the steep upward movement of the current trend in consumer expenditures for hospital care has resulted almost entirely, or at least very largely, from increases in the prices of hospital services. During the period 1946-52, when the United States Department of Commerce estimates of personal consumption expenditures for hospital care rose by 106 percent,[1] the United States Bureau of Labor Statistics price index for hospital rates advanced 90 percent[2] and hospital census data on number of patient days of care increased by only 13 percent.[3,4]

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[1] National Income, 1954 Edition: A Supplement to the Survey of Current Business, loc. cit. Percentage computed.

[2] Consumer Prices in the United States, 1949-52, loc. cit. Percentage computed.

[3] Hospitals, Administrators Guide Issue, Vol. 28, Part 2 (June, 1954), p. 16. Percentage computed from data on estimated average daily census in nonfederal general and special short-term hospitals for years ended September 30, not adjusted to calendar year basis.

[4] Although these data are not entirely comparable, for reasons noted elsewhere, this would seem to be a relatively minor objection to their comparison for the purpose in point.

But in view of the pronounced tendency of these data to overstate price increases and conceal quantity increases, it would not seem unreasonable to believe that quantity changes have been as large a factor as price changes in the upward trend in consumer expenditures for hospital services over the postwar period. Equal weight for the two factors would mean an increase over the period 1946-52 of about 44 percent in both the prices and the quantities of hospital services purchased by consumers, in order to account for the 106 percent rise in consumer expenditures for hospital care shown by the Department of Commerce estimates. This would signify that the rise in the prices of hospital services was some 20 percent greater than occurred over the same period in the price level for all other consumer goods and services as measured by the Consumers' Price Index.[1] It would also denote that the volume of services consumed by patients in general and special short-term hospitals per average patient day was about one-fourth greater at the end of the period than at the beginning. More important, however, it would suggest that a significant upward trend in consumer expenditures for hospital care might be expected even though the rise in prices is checked and the economic outlook is for price stability in the economy generally.

Basic Factors Underlying Rise in Consumer Expenditures: Increased Demand

The fact that consumers are purchasing hospital services in increasing quantities despite higher prices is proof that the demand for these services is becoming greater. This growing demand is, of

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[1] Consumer Prices in the United States, 1949-52, loc. cit. The Consumers' Price Index (adjusted series), representing all items, rose by 36 percent from 1946 to 1952.

course, attributable to numerous factors. In many instances, the effect of these factors is magnified because they are mutually reinforcing. And the influence that each has on consumer demand cannot be definitely ascertained or neatly segregated.

Fundamentally, increased consumer demand for hospital services reflects expanding concepts of need coupled with improved ability and willingness of consumers to finance care. Also it reflects changes in social viewpoint and in the efficacy and organization of medical services which attach greater importance to hospital care. Many of the factors contributing to increased demand are broad forces that are concomitant aspects of social-economic change and progress. Since the existence of such factors tends to be common knowledge, a brief general discussion of how several of the more important and directly relevant of these is affecting consumer demand for hospital services suffices for the immediate purpose of providing general perspective.

Population Increase

The rapid growth in the nation's population is perhaps the most familiar factor feeding the demand for hospital care. Other things being equal, a larger population would be expected to require a greater amount of hospital services. Less obvious, however, is the fact that the expansion in population is affecting consumer utilization of hospitals more than proportionately to the increase in the number of people. Since immigration is no longer a source of relatively sizable gains, the acceleration in the rate of population growth in the postwar period is almost entirely attributable to a higher birth rate and increased longevity. Both of these have particular significance to the demand for hospital care.

More births mean additional maternity admissions to hospitals. In fact, maternity admissions have tended to rise faster than total births because the number of births in hospitals is approaching closer to the total of all births. Noteworthy, too, is the fact that almost all births in hospitals occur in institutions where care is characteristically consumer-financed. Furthermore, the higher birth rate in the postwar period has increased not only the number of infants but also the percentage of the total population in the youngest age group where hospital use tends to be considerably higher than the average for all groups. Whether this aspect of population growth continues to have a greater than proportionate effect on consumer demand for hospital care depends on assumptions about the birth rate. The consensus of population experts seems to be that the currently high birth rate will probably decline in the years ahead. But so long as there is an absolute increase in the number of births, even though the birth rate declines, the volume of maternity care in hospitals may be expected to continue to rise.

Similarly, the aging of the population is tending to intensify the demand for hospital services. Of all age groups, it is the group age 65 and over that requires relatively the greatest amount of hospital care. And the continuing increase of the aged, both in number and relative to the total population, adds to the demand for hospital care.[1]

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[1] Although domiciliary care of the aged or others who are chronically ill may not be considered to be a proper function of the acute general hospital, facilities for such care are greatly inadequate. This shortage is reflected to some extent in the use of hospital beds by patients who do not require the intensive and costly care provided by the general hospital but who have no place else to go for the attention they need. Even with adequate development of nursing homes and home-care programs, however, appropriate provisions for medical

Scientific and Technical Advances

The accelerating advance of medical knowledge and techniques has its greatest impact and is seen in its fullest expression in the hospital. The impetus of this advance largely accounts for the radical transformation over a period of only a few decades in the functions and role of the hospital in the field of health--from an institution providing simple custodial services and occupying a position on the periphery of the health field to a basic institution which provides highly complex and specialized services and is the hub of the modern system of medical care. Up to the present this development has meant that hospitals provide the organization and technical facilities required for the training of health personnel and for the diagnosis and treatment of disease. The continuing transition, however, steadily is adding to the functions of the hospital particularly with respect to promotion of health and rehabilitation of the disabled, and the general hospital is rapidly emerging in the role of the community health center with increasing responsibilities for the flow of health services.

The expansion in the role of the hospital accompanying scientific and technical advances is in large part merely a reflection of the changes in the pattern of medical practice brought about by these advances. Methods of training physicians, the trend toward specialization, the increasing dependence of the physician on his colleagues and on auxiliary personnel and services, all profoundly influenced if not dictated by the advance of science, are having a great effect on

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care would undoubtedly result in increased use of hospital services. But the extent to which the attainment of this would involve expansion of consumer demand is uncertain. Probably it would primarily involve expansion or development of methods of financing other than patient-payment for care.

physicians' habits regarding the use of hospitals as the site for the provision of medical services. In this setting both the effectiveness and the productivity of the physician are greater. Changes in social viewpoint and in consumer habits regarding the use of hospital services also underlie the alteration in the pattern of medical practice that is occurring. Growing public awareness of the increasing efficacy and potentialities of modern medical care centering in the hospital is having a pronounced effect on consumer attitudes relating to hospital care.

Although scientific developments frequently have the effect of curtailing hospitalization, as for example the discovery of antibiotics, these effects have in the past been far overshadowed by the development of new techniques and procedures for treating conditions previously beyond the range of effective treatment. The net effect of advancing knowledge is increased importance of the general hospital and greater consumer demand for the services it provides.

Improved Ability of Consumers to Pay for Care

The familiar facts of rising consumer income and living standards and the increasing productivity of our economy indicate that consumers generally are financially able to support larger outlays for hospital care. However, the increasing acceptance of prepayment by consumers as the method of financing hospitalization is improving their ability to pay for care far more rapidly than would otherwise be the case.

In the absence of such protection, the ability of consumers as a group to finance hospital care tends to be irrelevant since the cost of care in any one year falls only on those persons who are hospitalized--a small proportion of the total group. By spreading the costs

of care over persons who are not hospitalized as well as those who are, prepayment greatly broadens the base of financing with the consequent improvement in the ability of consumers to pay for services. This has a pronounced effect on the demand for hospital care. It removes or reduces the financial barrier to the use of services for persons covered and the hospital admission rate for such persons is substantially higher than for persons without protection.

In the postwar period the number of persons covered under voluntary prepayment programs for hospitalization somewhat more than doubled and coverage is continuing to rise at a much faster rate than the increase in the total population.

Basic Factors Underlying Rise in Consumer Expenditures: Increased Supply[1]

The shortage in the supply of hospital facilities and personnel is a subject that has received widespread attention in recent years. Elaborate standards and surveys have been employed to ascertain the extent of the insufficiency in hospital beds in relation to population in the various areas of the nation and to assign priorities in the location of new hospitals. Although the criteria commonly used in determining shortages are based on need rather than effective demand, the implicit assumption has been that expansion in the number of hospital beds would be accompanied by increased consumer allocations for hospital care. Increasing recognition, however, is now being given

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[1] "Supply" as used here refers to increased availability, which would be considered as an aspect of demand in the technical economic definition of the latter term. In a strict economic sense, an increase in supply would mean that a larger quantity was offered with no increase in price, or at a lower price, which clearly has not been the general case with respect to hospital services.

to the fact that an important distinction exists between need and effective demand and that consumer demand for hospital care is not solely a function of the supply of hospital beds.[1]

But this does not mean that the factor of availability of services has no effect on consumer spending for hospital care. To the contrary, much of the rise in consumer expenditures is supported by more extensive use of services which would not be possible without greater availability of services and an advancing level of output. The factors contributing to this increasing supply of services have been and will continue to be a major influence on the trend of consumer expenditures for hospital care. For the purpose of providing perspective, three of the primary factors will be examined briefly.

Increase in Hospital Beds

In the postwar period the number of nonfederal general hospital beds has steadily increased. This expansion has been financed primarily by local sources: philanthropy and local government. But federal aid to the states for hospital construction, under the program known as Hill-Burton, has provided important stimulus to investment in hospital facilities, particularly in relatively small communities, and has met a portion of the costs. Despite the fact that the rate of investment in hospital facilities during the postwar years has far exceeded that for any previous period, the increase in the number of beds has barely kept pace with population increase.

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[1] In large part this recognition has resulted from experience under the Hospital Survey and Construction Act, more commonly referred to as the Hill-Burton program. Some of the hospitals located on the basis of need as determined under this program have had low occupancy rates and serious operating deficits due to insufficient patient-income.

Historically, the volume of capital investment in hospital facilities has been higly cyclical, showing the characteristic fluctuations of capital expenditures generally. But in the future it would seem likely that such fluctuations might be less pronounced as a result either of greater stability in the economy or of inclusion of hospital construction in governmental measures for maintaining a high level of economic activity. The effect of changes in rate of hospital facility expansion on consumer expenditures for care, however, may be expected to be quite gradual, particularly since such changes may, to some extent, affect average occupancy rates in previously existing facilities.

Expansion in Capacity to Provide Ancillary Services

Although number of beds is the traditional measure of hospital plant capacity and virtually all data are compiled on this basis, such data do not fully indicate the extent of changes in the aggregate capacity of hospital facilities in terms of combined volume of custodial and complementary services that can be provided.[1] The rapid expansion both in the range of specialized services and the amount of space and personnel used in provision of such services may well be as significant to the trend in consumer expenditures for hospital care as net changes in the number of beds. With greater emphasis on care of ambulatory patients and general extension of hospital functions and role, this aspect of expansion in hospital capacity

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[1] In fact, increases in capacity to provide ancillary services are to some extent reflected negatively by data on the aggregate number of beds. Space requirements for additions and expansions of hospital service departments in existing institutions frequently necessitate contraction in the bed complement.

could be of even greater importance in coming years than it has been throughout the postwar period.

Level of Utilization

The third principal factor determining the supply of hospital services is the level of utilization of facilities--the relationship between the output and the capacity of facilities. Although there are practical reasons why rates of hospital bed occupancy cannot be maintained at or near 100 percent, substantial changes, increases as well as decreases, in volume of hospital care can result from changes in occupancy. In the early part of the postwar period a higher average occupancy rate contributed significantly to the increase in the volume of hospital care. More recently a decline in average rate of occupancy has tended to offset the effect of the increasing number of beds.

The degree of expansion in the volume of care that could result from fuller utilization of facilities makes this factor of greater potential importance in the short-run than changes in hospital capacity. It is especially significant that wide increases in the aggregate output of services could occur even though there was relatively little change in the total number of beds.

Change in the Burden Created by the Cost of Hospital Care

The burden on individuals and families imposed by the costs of hospital care is only grossly denoted by the aggregate amount of expenditures for this care. As has long been recognized, a distinguishing characteristic of these costs is that their impact is magnified by the manner in which they are distributed. For this reason,

the intensity of the problem created by financial obligations incurred for hospital care is not a direct function of the aggregate cost involved. The weight of the burden is greatly affected by the method in which the costs are borne. For example, change in the extent to which the total costs of hospital care are met through taxation is a factor that could have an important effect on the financial impact on individuals and families. Although this factor does not appear to have been important over the postwar period,[1] certain other factors have had an appreciable effect. The most important of these are changes in population, employment, incomes, and the extent of hospitalization protection.

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[1] Comparison of data on estimated total expenses of all registered hospitals, as reported in the annual census of the American Hospital Association, with the Department of Commerce estimates of personal consumption expenditures for hospital care shows that consumer expenditures were 54.5 percent of total hospital expenses in 1953, and that for other postwar years the percentage varied less than one point except in 1949, when it was 49.6 and in 1946 and 1947 when it was 59.2 and 57.6, respectively. Substitution of the Social Security Administration estimates of private expenditures for hospital care, available since 1948, for the Department of Commerce estimates shows that private expenditures were 59.3 percent of total hospital expenses in 1953 and that for other years the ratio hovered within one-half point of 58.0 percent, except in 1949, when it dipped to 53.3 percent.

The stability of these ratios would seem to indicate that there has not been a significant trend during the postwar period either for increase or decrease in the proportion of the total cost of hospital care assumed by government. (Constancy in the share of hospital costs met by government, however, would mean that government is bearing an increasing proportion of all medical care costs, since not only have hospital costs been rising much faster than total medical care costs but also the participation of government in the cost of hospital care is substantially greater than with respect to other items of medical care.)

Population Change

Since population growth contributes to the rise in total expenditures, it would seem that data on a per capita basis rather than an aggregate basis are more pertinent to consideration of change in the burden of the cost on consumers. Converting total personal consumption expenditures for hospital care to a per capita basis, it is found that the increase was from $7.25 in 1945 to $16.67 in 1953.[1] Percentage-wise this increase is somewhat less than occurred in total consumer spending for hospital services. But more significant is the fact that the results show that the per capita outlay required for hospital care considerably more than doubled during the period.

Viewing expenditure data on a per capita basis, however, does not serve to show the effect that population change is having on the burdensomeness of hospital costs. On the one hand, population growth leads to larger total expenditures; on the other, it tends to increase the number of persons bearing these costs. These effects, however, may not be entirely offsetting. During the postwar period, it would appear that they have not been. As previously pointed out, the youngest and the oldest age groups, which use proportionately more hospital services, have increased relatively more in size than the total population. Generally, persons in these age groups are characterized by dependency. Either they are beyond the productive period of their lives or they have not attained working age. The effect of this shift

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[1] Computed from estimates of civilian population of the continental United States (U. S. Department of Commerce, Statistical Abstract of the United States, 1954 [Washington: Government Printing Office, 1954], Table No. 7, p. 13) and of personal consumption expenditures for hospital care (National Income, 1954 Edition: A Supplement to the Survey of Current Business, loc. cit.).

in the age distribution of the population, therefore, is to increase the number of dependents in relation to the number of persons of working age. From this it would appear that the expansion in population is tending to increase the use and total cost of hospital care more than it is adding to the number of persons who are in position to bear a share of this cost.

Increase in the Number of Employed Persons

As an indicator of change in the burden of hospital costs, the extent of increase in hospital expenses per employed person would seem to be more meaningful than changes in per capita costs. The level and trend of the total number of employed persons is related to the factor of population growth, but it also reflects variations in the rate of labor market participation, in the amount of unemployment, and the general level of economic activity. Consequently, it should indicate changes in the number of persons who are in position to bear a share of the cost of care better than crude population change.

Based on official estimates of employment and personal consumption expenditures for hospital care, such expenditures per employed person rose from $17.51 in 1954 to $42.04 in 1953[1]--an increase of 140 percent, as compared to a 130 percent increase on a per capita basis.[2] From these data the general conclusion suggested

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[1] Computed from data on the number of persons in the civilian labor force (Statistical Abstract of the United States, 1945, op. cit., Table No. 218, p. 195) and data on personal consumption expenditures for hospital care (National Income, 1954 Edition: A Supplement to the Survey of Current Business, loc. cit.).

[2] The difference would have been greater if the decline in the percentage of the population age 14 to 65 had not been partially offset by a rise in the rate of labor market participation for persons within these ages, particularly for married women.

is that the average outlay per employed person necessary to cover hospital expenses was almost two and a half times as large in 1953 as in 1945.

Consumers' Rising Incomes

Because of the substantial rise in consumers' incomes during the postwar years, the financial burden of the cost of hospital services has not been as great for families and individuals as data on consumer expenditures for these services would alone indicate. The level of total disposable personal income rose 66 percent from 1945 to 1953,[1] and after allowing for population change this meant an average gain per individual amounting to 39 percent.[2] From this it would seem evident that higher consumer incomes materially reduced the impact of the rising costs of hospital care. Nevertheless, when the 39 percent gain in income is compared to the increase in per capita expenditures required for hospital care, it can clearly be seen, in the over-all picture at least, that payments for hospital care are taking a relatively larger bite out of consumers' incomes.

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[1] National Income, 1954 Edition: A Supplement to the Survey of Current Business, op. cit., Table 3, pp. 164-6. Percentage computed. Since consumer-financed hospital care is paid for out of income after taxes rather than income before taxes, it would seem that disposable personal income is more relevant here than personal income. Although there is a significant difference between the level of the two throughout the period 1945-53, the percentage increase in the two over the period is virtually the same. Disposable personal income rose 66.3 percent while personal income rose 67.1 percent.

[2] Data on estimated total population residing in continental United States was used in making this adjustment (Statistical Abstract of the United States, 1954, op. cit., Table No. 7, p. 13).

Comparison between the increase in income per person and expenditures per person, however, does not conclusively show the effect that variation in incomes may have on the burden created by hospital costs. The over-all comparison does not reflect possible changes in the income distribution among families and individuals alongside the distribution of amounts paid for hospital care. From available data the degree to which such changes underlying the per capita data have had an effect cannot be ascertained. But the consensus of evidence suggests that rising incomes have reduced the burden of hospital costs borne by individuals and families at least as much and probably more than is indicated by the comparison of per capita income and expenditure figures.[1]

Wider Distribution of the Costs of Hospital Care

The higher incidence of hospitalization can be considered as a factor that is broadening the distribution of consumers' hospital costs. Although, like population growth, it contributes to the increase in total costs, the admission of more patients means that the higher total costs are divided among a larger patient population. However,

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[1] Both the trend toward greater equality in the distribution of income and the wider distribution of hospital costs, resulting particularly from prepayment (see p. 68 ff) would tend to have effects in this direction. Also it can be contended that when real income is rising, families and individuals can more easily afford to allocate relatively larger amounts to hospital care than if real income were not rising. Relatively greater expenditures for hospital services mean that consumers must forego other uses of their funds irrespective of changes in their real income. But if real income is rising, the relative increase in such expenditures does not necessitate a reduction in their standard of living with respect to their consumption of other goods and services, as would tend to be the case if real income is declining or remaining constant.

if the number of patients increased only proportionately to the gain in population, the factor of increased admissions could not be said to have an effect on the burden of costs on individuals and families by virtue of spreading the costs over more patients. But the evidence shows that rate of hospital admissions has risen, or, in other words, the increase in the number of admissions has been relatively greater than the expansion of the population. The estimated number of admissions to nonfederal general and special short-term hospitals, which provide almost all of the care that is patient-financed, was 32.5 percent greater in 1953 than in 1946.[1] In comparison with this, the increase in the estimated civilian population of the continental United States over the same period was 12.8 percent.[2]

The contrast between these two figures roughly indicates the extent of broader distribution of costs that might be attributed to the higher incidence of hospitalization. This conclusion, however, is subject to important qualifications. If the instances of repeated admissions, the same individual is hospitalized more than once during the year, are more frequent, as may well be the case, then the factor of more admissions would affect the distribution of cost less than the data suggest. Also, and much more significant, the increase in the incidence of hospitalization would not result in any broader spreading of costs than would otherwise exist where the cost is being financed through prepayment. Therefore, the effect of the factor of higher admission rates on the distribution of costs is limited very largely to the portion of the population without prepaid protection.

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[1] Hospitals, Administrators Guide Issue, Vol. 28, Part 2 (June, 1954), p. 16. Percentage computed.

[2] Statistical Abstract of the United States, 1954, loc. cit. Percentage computed.

With respect to the population with prepaid protection, the factor would be operative only to the extent that patients from this population are required to supplement their benefits by payments to the hospital when they receive services.

By far the most important factor that is making for wider distribution of the costs of hospital care, and therefore reducing their impact on individuals and families, is the rapid expansion of hospitalization prepayment arrangements. The burden imposed by outlays for hospital care is significantly affected by prepayment in several ways. This is apparent from both the theory and the practical results of prepayment.

First of all, prepayment spreads the hospital costs that are incurred during an interval of time over an entire group of consumers. Instead of being divided into few but relatively large shares, which fall only on those who are hospitalized in the interval, the group's total hospitalization expense is divided into many relatively small shares, which are distributed over all members of the group. As a result, the distribution of the cost of hospital care among families and individuals is leveled and tends to be equalized. A corollary to this is the equally basic concept that prepayment spreads the cost over time. Thereby, the outlays required of consumers for hospital care are regularized and become predictable both as to amount and time of occurrence. This immeasurably facilitates the financing of care by consumers. Of less consequence, but nevertheless not insignificant, prepayment increases the total expense, to be spread over the covered population, by the amount of the overhead required for the operation and functioning of the prepayment arrangements themselves.

For all of these reasons, application of the concepts of prepayment tends greatly to affect the impact of hospital costs on individuals and families. But it is clear that the effectiveness of

prepayment in improving the distribution of the aggregate amount of hospital expense financed by consumers depends on such factors as the level of population coverage, the relationship of benefits to the costs of care, and the degree to which consumers' outlays for hospital care are increased by the overhead costs of prepayment arrangements.

In the postwar period the expansion of voluntary prepayment for hospital care has been remarkable. From 1945 to 1953, the estimated number of persons covered more than tripled[1]--an increase that far outstripped the gain in total civilian population. This is vividly seen when the pertinent data are converted to show the proportion of the population covered under prepayment. In 1945, one person out of five was covered while by 1953 three persons out of five were covered.[2]

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[1] The increase was 208 percent based on estimated total coverage, adjusted for duplication, of 32.1 million as of Jan. 1, 1946 (Commission on Financing Hospital Care, Financing Hospital Care in the United States, Vol. 2, Prepayment and the Community, ed. by Harry Becker [New York: McGraw Hill Book Co., 1955], p. 11), and 98,793,000 as of the end of 1953 (Health Insurance Council, The Extent of Voluntary Health Insurance Coverage in the United States, prepared by the Health Insurance Council, 1954, p. 2). The increase is found to be somewhat greater on a mid-year rather than a year-end basis. The figure for 1945, derived by interpolation from the Commission data, is then 26 million, and for 1953 it is 95 million, similarly derived from Health Insurance Council data, and the increase is 265 percent. It should be noted that the estimates from these two sources were developed by similar methods from the same basic data and are considered to be comparable. An estimate developed by the method of household survey is available for 1953 but not for any other year in the postwar period. This survey, conducted by the National Opinion Research Center, found that coverage was 87.4 million in mid-1953 (Odin W. Anderson, op. cit., p. 16). Using this figure in apposition to estimate obtained by another method for mid-year 1945, the increase amounts to 236 percent.

[2] Ibid.; and Statistical Abstract of the United States, 1954, op. cit. Proportions computed.

The total amount of hospital costs met through prepayment has been rising much faster than the number of persons with prepaid protection. From 1948 to 1953, while the estimated number of persons covered increased 68 percent, the estimated total amount of benefits rose 183 percent.[1] On a per person covered basis, which eliminates the effect of the expansion of population coverage, benefit payments were 69 percent greater in 1953 than in 1948.[2] It is important to point out, however, that during this period consumers' hospital expenses were climbing rapidly. Estimated consumer expenditures per capita for hospital care rose 58 percent.[3] Nevertheless, from these figures it is apparent that the total amount of benefits per covered person has been increasing faster than per capita hospital care expenditures for the population as a whole. But because of known differences in the frequency of hospital use for persons with prepaid protection as compared to that for persons without, the findings are not conclusive that the level of benefits--the ratio between benefits

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[1] Based on estimated coverage for mid-years as interpolated from data as of the beginning of years 1948-49 (Financing Hospital Care in the United States, Vol. 2, Prepayment and the Community, op. cit.) and as of the end of 1952 and 1953 (The Extent of Voluntary Health Insurance Coverage in the United States, op. cit.) and on estimated total amounts of benefits for calendar years (Social Security Bulletin, 17 [December, 1954], Table 5, p. 6). Percentages computed. Data on amount of benefits not available for years prior to 1948.

[2] Ibid.

[3] Percentages computed from data on estimated total private expenditures for hospital care (Social Security Bulletin, 17 [December, 1954], Table 5, p. 6) and on estimated civilian population of the continental United States (Statistical Abstract of the United States, 1954, op. cit.). Use of the Department of Commerce estimates of personal consumption expenditures for hospital care in this computation would show the increase to be 52 percent rather than 58 percent.

received by persons with prepaid protection and their hospital expenses--has been rising. In fact, available data do not provide the basis for firm conclusions about the trend in average benefit levels for all persons covered under the various types of prepayment. It appears probable, however, that the increase in average benefit payments per covered person has been very largely, if not entirely, offset by the rise in hospital expense incurred per covered person.[1]

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[1] The rate of increase in number of persons covered under individual policies, which typically provide relatively low benefits, has been exceeding that for group types of coverage. This tends to bring down the average level of benefits under prepayment. On the other hand, the weight of evidence suggests that benefit levels under group contracts and policies have tended to rise over most of the postwar period.

Prepayment benefit levels are characterized by wide variation both between and within types of coverage. The variation between types of coverage is indicated by the contrast between the average amount of benefits received per person covered. For 1953, benefits per person averaged about $14.25 under Blue Cross, which largely represents group coverage; $12.20 under commercial insurance group policies; and $6.80 under commercial insurance individual coverage. (Computed from Health Insurance Council data on estimated coverage and Social Security Administration data on estimated amount of benefits.)

It is of interest to compare these figures with estimated consumer expenditures for hospital care on a per capita basis for the entire civilian population, although the comparison cannot be taken to show the level of benefits under prepayment, for the reason previously pointed out. As presented in the text (p. 63), per capita personal consumption expenditures for hospital care were $16.67 in 1953, based on the Department of Commerce estimates. A per capita figure of $18.10 for 1953 is obtained from the Social Security Administration estimate of private expenditures for hospital services. (The same population figure, estimated civilian population of continental United States, was used in both cases.)

The amount of overhead cost[1] superimposed on the cost of benefits under prepayment added an estimated $285 million in 1953 to the cost of hospital care for the prepaid population.[2] While in the aggregate the amount of overhead cost increased by almost 50 percent from 1948 to 1953,[3] on a per person covered basis they declined by somewhat more than 10 percent over this period.[4] Even more striking is the decline that occurred in overhead costs relative to the amount of hospital care financed through prepayment. As a percentage of benefits received by the covered population, overhead costs were almost cut in half from 1948 to 1953.[5] However, these

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[1] "Overhead cost" is used here to mean the difference between the amount of consumers' outlays for prepaid protection and the amount of benefits paid (or cost of care provided) under prepayment programs. It includes costs of operation and amounts allocated to reserves or to any other purpose than benefit payments. In the context of the effect of prepayment on the financing of hospital care by consumers, this seems to be the most significant breakdown of consumers' prepayment dollar. For other purposes, however, its usefulness is limited and a breakdown along other lines is usually more appropriate.

[2] Social Security Bulletin, 17 (December, 1954), Table 5, p. 6. Figure used was derived.

[3] Ibid. Percentage computed from derived figures. The increase was 48 percent.

[4] Ibid. In converting overhead costs to a per person basis, figures on estimated coverage for mid-years were obtained by interpolation from data as of the beginning of years 1948-49 (Financing Hospital Care in the United States, Vol. 2, Prepayment and the Community, op. cit.) and as of the end of 1952 and 1953 (The Extent of Voluntary Health Insurance Coverage in the United States, op. cit.). The decrease was found to be 11.5 percent.

[5] Social Security Bulletin, 17 (December, 1954), Table 5, p. 6. From derived figures, the reduction was found to be 46 percent. Although overhead is customarily considered as a percentage of the total amount spent for prepaid protection, the ratio between overhead and benefits seems more appropriate and meaningful in the context of the presentation here.

costs continue to be a significant addition to the cost of hospital care for covered individuals and families. In 1953 this added cost amounted to 22 percent of the benefits received,[1] which means that the cost to consumers of the care received was increased by more than one-fifth.

In the over-all picture, the extent to which the growth of voluntary prepayment has reduced the impact of the aggregate cost of consumer-financed hospital care is roughly indicated by comparison of the total amount of these costs with the total amount of benefit payments. Reflecting the combined effects of the coverage of more people and the rising amounts of benefit payments per person covered, as well as the partially offsetting factor of consumers' higher total hospital costs, the proportion of the total costs being met through prepayment increased several fold during the postwar period. Based on official estimates, the proportion expanded from somewhat more than one-fourth to almost one-half from 1948 to 1953.[2] And it

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[1] A striking variation in overhead costs is found to exist by types of prepayment coverage. Analysis of the Social Security Administration data for 1953 shows that for group coverage (Blue Cross and insurance companies combined), overhead costs were slightly less than 13 percent of the amount of benefits, whereas under commercial insurance individual coverage, overhead costs were 91 percent as large as benefit payments. Further analysis of these data shows that while commercial insurance company individual coverage accounted for 12.5 percent of the total benefits paid, it accounted for over 51 percent of the total overhead costs under all voluntary prepayment for hospital care. There are a number of reasons for this difference in costs, the principal of which is that individual coverage involves higher acquisition costs than group coverage and represents, in other respects, a relatively inefficient method of providing prepaid protection. It should further be noted that overhead costs vary widely among the numerous plans and programs within the major types of coverage.

[2] Based on the Social Security Administration estimates of total benefit payments for hospital services and of total private expenditures for hospital services (Social Security Bulletin, 17 [December, 1954], Tables 4-5, pp. 5-6), the percentage was found to be 27.4

would appear from available estimates that the proportion in 1945 was probably about half as large as in 1948.[1] This would indicate that in 1953 the proportion was from three to four times as great as it had been in 1945.

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in 1948 and 45.6 in 1953. Based on these estimates of total benefits and the Department of Commerce estimates of total personal consumption expenditures (National Income, 1954 Edition: A Supplement to the Survey of Current Business, op. cit., Table 30, pp. 206-8), the percentages are slightly higher for both years: 28.6 percent in 1948 and 49.5 percent in 1953. An independent estimate based on the findings of the nationwide sample survey of the civilian noninstitutional population, conducted by the National Opinion Research Center, found that for the year ended with June, 1953, insurance benefits covered 50 percent of total gross hospital charges incurred (Odin W. Anderson, op. cit., p. 34). As previously noted (p. 39), in the findings of this survey, hospital charges are understated in comparison to the official estimates.

[1] Although estimates of total benefit payments for hospital care under all prepayment arrangements are not available for years earlier than 1948, the ratio of total consumer expenditures for hospital care to total benefit payments can be estimated in the following manner: For the year 1948, prepayment covered 39 percent of the population, based on data on estimated civilian population of continental United States (Statistical Abstract of the United States, 1954, op. cit., Table No. 7, p. 13) and on estimated total number of persons covered under prepayment (Financing Hospital Care in the United States, Vol. 2, Prepayment and the Community, op. cit., Table 1, p. 11) interpolated to mid-year, and, as previously stated, prepayment covered 27.4 percent total private expenditures for hospital services, according to the estimates of the Social Security Administration. The ratio between these figures is 70 percent. Assuming the same relationship between the proportion of population and the proportion of total costs covered under prepayment in 1945 as was found for 1948, coverage of 20 percent of the population in 1945 (determined in the same manner and from data from the same sources as the figure for coverage in 1948), would mean that prepayment covered about 14 percent of consumers' total hospital costs in 1945. A similar computation using the Department of Commerce estimates of expenditures rather than the Social Security Administration estimates shows that

By 1953, with prepayment benefits representing approximately half of the total cost of all consumer-financed hospital care, prepayment had come to be the predominant method by which consumers finance their hospital expenses. This means that consumers were financing roughly as much of their hospital costs through prepayment as through all other methods combined; e.g., payment of hospital bills out of current earnings, out of savings, from the proceeds of borrowing, with financial assistance from relatives, and by private charity.

As the share of consumers' total hospital expenses that is financed through prepayment expands, the proportion of these expenses against which consumers are not protected obviously declines. It is noteworthy, however, that the absolute amount of hospital costs against which consumers do not have prepaid protection has been increasing.[1] On a per capita basis, the unprotected portion of consumers' hospital

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about 15 percent of consumers' hospital costs were met by prepayment in 1945.

Since the proportion of consumers' total hospital costs covered under prepayment has been increasing faster than the proportion of the population covered under prepayment (from 1948 to 1953, the ratio of the proportion of costs covered to the proportion of population covered rose from 70 percent to 75 percent, using the Social Security Administration estimates, and from 73 percent to 79 percent, using the Department of Commerce expenditure estimates), the above computations may overstate slightly the percent of consumers' costs met in 1945. In any event, it seems reasonable to believe that the proportion of consumers' total hospital costs met by prepayment benefits was somewhat over three times as great in 1953 as in 1945.

[1] Subtraction of the estimated amount of benefit payments for hospital services from the estimated total amount of private expenditures for hospital services (Social Security Bulletin, 17 [December, 1954], Table 5, p. 6) shows that the unprotected balance increased by $330 million from 1945 to 1953. An increase is also seen when Department of Commerce estimates of expenditures are used in this calculation, although the increase is $51 million less in amount.

costs increased from $8.25 in 1948 to $9.85 in 1953, an increase of 19 percent, according to the Social Security Administration estimates.[1] Using a crude estimate of the unprotected portion of costs for 1945, an increase of slightly over one-third is found for the postwar period, 1945-53.[2]

Net Change in the Burden of Hospital Costs on Consumers

As has been seen, changes occurring during the postwar period in population, employment, consumers' incomes, and the extent of prepayment arrangements have all had an important effect on the financial impact of the total cost of consumer-financed hospital care. Because of the changes in these factors, the great increase in the total amount of hospital expenses incurred by consumers has not meant a commensurate increase in the burden of hospital costs borne by individuals and families. Each of the factors which have been examined, with the exception of the changing age distribution of the population, has tended during the postwar period to reduce this

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[1] Ibid.; and data on estimated civilian population of the continental United States (Statistical Abstract of the United States, 1954, loc. cit.). Amounts and percentage computed.

[2] Computed from estimated personal consumption expenditures for hospital care in 1945 and 1953 (National Income, 1954 Edition: A Supplement to the Survey of Current Business, loc. cit.), estimated total benefit payments for hospital services for 1953 (Social Security Bulletin, 17 [December, 1954], Table 5, p. 6), and estimated civilian population of the continental United States (Statistical Abstract of the United States, 1954, loc. cit.). The amount of benefit payments for 1945 used in this computation was $790 million determined in accordance with a method of estimation previously described (see footnote 1, p. 74).

burden and to offset the effect of the rising outlays required for hospital services. Although the aggregate data that have been utilized to show the direction and extent of these effects are far from adequate for the purpose of measuring changes in the financial impact of hospital costs, they do permit a gross over-all evaluation of the extent to which the factors in combination have tended to offset the rise in consumers' hospital expenses.

During the postwar period, from 1945 through 1953, it was found that total expenditures by consumers for hospital care rose by 181 percent.[1] In terms of the effect on individuals and families, however, this rise in the amount of costs incurred was diluted by the increase in population. On a per capita basis, consumers' hospital expenses advanced from $7.25 in 1945 to $16.67 in 1953, which amounts to an increase of 130 percent. Therefore, the increase in the average monetary outlay required of families and individuals for hospital care was 130 percent rather than 181 percent.

But the impact of this increase in the amount of money required to cover hospital expenses was reduced by the fact that consumers had larger incomes out of which to meet their expenses. Per capita disposable income in 1953 was 39 percent greater than in 1945. This means that without requiring a greater proportion of individual and family income consumers' hospital expenses per person

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[1] In this recapitulation, data relating to consumer expenditures for hospital care are based solely on the Department of Commerce series of estimates since only in this series are data available for the entire period being considered.

Because it is based on changes in aggregate data, the analysis deals entirely with averages, which do not reflect the possible effects of changes in distribution that may have occurred during the period. This represents a significant qualification of the conclusions that can be drawn from the recapitulation.

could have risen from $7.25 in 1945 to $10.08 in 1953. From this it can be reasoned that the increased financial impact of hospital costs is indicated by the extent that the actual per capita outlay of $16.67 in 1953 exceeded $10.08. Thus it is seen that the actual amount of consumers' outlays per capita for hospital care was $6.59, or 65 percent, greater than the amount of costs that would have been incurred for hospital care had it merely continued to require the same share of consumers' disposable incomes.

Although it may be concluded from these data that, relative to other demands on income, payment of hospital expenses took, on the average, 65 percent more from the pockets of individuals and families in 1953 than in 1945, it does not follow that the burden of paying for care increased to this extent. As discussed earlier, the weight of the load that is carried by consumers can be greatly affected by the manner in which the costs are distributed. And in this connection the postwar period has seen significant changes.

In the context of the problem of financing hospital care, the most striking development that has occurred since the close of World War II, aside from the precipitous rise in the magnitude of total expenditures for care, has been the broadening of the distribution of the costs of patient-financed care. In the main, this wider distribution has resulted from the emergence of prepayment as the predominant method by which consumers finance their hospital care.

Reflecting primarily the rapid growth in the population coverage under prepayment arrangements, the proportion of consumers' total hospital expenses that is financed on a prepaid basis rose from roughly 15 percent in 1945 to almost 50 percent in 1953. Thus, in this eight-year period, the burden of over a third (the increase from 15 to 50 percent or 35 percent) of the total cost of consumer-financed hospital services was lifted from patients at the time of illness and

spread over all members of covered groups in a manner that regularized payments and made the cost predictable both as to amount and time of occurrence. Of the actual amount of consumers' per capita outlays for hospital care in 1953, $16.67, only $2.50 would have been so distributed had there been no expansion since 1945 in the proportion financed through prepayment. Instead of $2.50, however, the amount financed in this manner was $8.25 in 1953.

Without question, the increased share of total cost met by prepayment means that the financial impact on families and individuals of hospital expenses was much less than it otherwise would have been, but how much the burden was reduced cannot from these data alone be ascertained. It is clear that although prepayment greatly reduces the intensity of the problem created by the costs of hospital services, it cannot eliminate the burden, for the costs must still be borne. In fact, the aggregate amount of consumers' outlays for this purpose are increased because of the overhead costs involved in prepaying for hospital care. Because these overhead costs were at a level of 22 percent in 1953, a per capita outlay of $10.07 was required of consumers in order to finance the $8.25 per capita amount of hospital costs covered by prepayment.

The portion of the $16.67 per capita hospital expenses incurred in 1953 by consumers which was not met on a prepaid basis amounted to $8.42. Although this was about a third higher than the amount of hospital costs that fell on consumers at the time of illness in 1945, the average weight of these costs on families and individuals was somewhat less in 1953 than in 1945 because of the 39 percent rise in consumers' incomes out of which the costs are met. Furthermore, the amount of costs against which consumers did not have prepaid protection was more widely distributed in 1953 than in 1945. Because of a higher hospital admission rate the cost of hospital care tended

to be spread over relatively more patients. From 1946 to 1953, while population increased 12.8 percent, the number of admissions increased 32.5 percent in hospitals in the classification providing almost all consumer-financed care. This would indicate a relative increase of from 15 to 20 percent in the number of patients among whom total expenses are divided, which points to the conclusion that a considerable broadening occurred in the distribution of the hospital costs paid by patients at the time of illness.

In summary, from 1945 to 1953, the magnitude of the hospital expenses borne by individuals and families increased about 65 percent, relative to demands on their incomes. However, a third more of total consumer hospital costs were distributed through prepayment at the end of the period than at the beginning. Also, the total amount of the costs falling on patients at the time of illness was spread over something like one-sixth more patients. But since these improvements in the distribution of costs cannot be quantitatively compared with the 65 percent increase in costs, an arithmetic conclusion as to the change in the burden of hospital costs over the postwar period is not possible. Furthermore, to arrive at valid conclusions about the financial impact on individuals and families would require more extensive information than is now available on the detailed distribution of hospital expenses. One of the essential steps in acquiring such information, it is believed, is the analysis of charges incurred for in-patient care in general hospitals.

CHAPTER III

CHARGES INCURRED FOR IN-PATIENT CARE IN GENERAL AND SPECIAL SHORT-TERM HOSPITALS

Description of Sample

For the investigation of the detailed composition and distribution of charges incurred by patients in nonfederal general and special short-term hospitals, the data employed are those provided by the Michigan Hospital Service to the Commission on Financing of Hospital Care, which were described generally in Chapter I.[1] These data consisted of two samples--one of nonmaternity, and the other of maternity patients. For nonmaternity cases, the sample consisted of 7,412 patients drawn from a frame[2] comprising 49,486 medical and surgical patients who were discharged throughout the year ended June 30, 1952. For maternity patients, a sample of 257 patients was taken from a frame composed of 2,543 maternity cases discharged during the calendar quarter ended September 30, 1952.

The method of sampling employed was systematic disproportionate sampling. Selection of this method seemed to be indicated

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[1] For general description of data, see Chapter I, p. 11 ff.

[2] The use of the term "frame" to denote the materials from which sample units are selected was proposed and given official sanction by the Sub-Commission on Statistical Sampling of the Statistical Commission of the United Nations. (The Preparation of Sampling Survey Reports, Statistical Office of the United Nations, Statistical Papers Series C, No. 1 [Lake Success: United Nations, 1949].)

by the characteristics of the data and, too, it permitted effective use of the resources available. By its use important advantages were realized, as will be pointed out.

The systematic method of drawing the sample not only made this step much easier, but also contributed somewhat to the reliability of results. In the frames, listings that were available from the Plan, patients were arranged by hospital from which they had been discharged. Under each of the hospitals the arrangement was alphabetical. With systematic sampling it was assured that the cases included in the sample would be spread evenly throughout the lists, and, to the extent that variation existed among hospitals with respect to charges incurred by patients, a gain in the efficiency of the sample design was thereby introduced.

Stratification also offered important advantages. It was expected that the distribution of charges among patients would be highly skewed--a small proportion of persons hospitalized typically incur a relatively large share of the total amount of charges--and information that was available on length of hospital stay permitted effective identification of patients who tended to have relatively large hospital bills. By segregation of these patients into a group that could be treated as a separate stratum, an important increase in sampling efficiency was realized through disproportionate sampling; i.e., use of a higher rate of sampling for the stratum which contained most of the patients with the largest hospital bills and which had the greatest variance within it.

Although stratification and disproportionate sampling were not employed to theoretical maximum advantage,[1] as used the technique

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[1] Because cases where the amount of charges substantially exceeded the average were considered to be of special significance

improved reliability relative to the cost and time required for the execution of the sampling. In the procedure that was followed, patients were divided into two strata according to length of hospital stay, with 21 days of hospitalization as the line of demarcation between the strata. Among patients whose length of stay was less than 21 days, one out of ten was included in the samples. Patients whose length of stay was 21 days or more were all selected for inclusion. The procedure was to go through the listing of patients twice, first taking all those with a length of stay of 21 days or longer and, second, selecting every tenth remaining patient. In the tabulation of results, the two strata were combined with weights assigned in inverse proportion to the sampling rate--in other words, data on patients in the sample who stayed in the hospital 20 days or less were given a weight of 10, while a weight of 1 was given to data on those with a length of stay of 21 days or more. After expansion and summation, the total weight was 62,246.[1] Although this total is distinct from the

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in the analysis of the data, relatively more patients were taken from the upper stratum than would probably be required for optimum estimation of patient characteristics. For discussion of determination of optimum allocation, see: Jerzy Neyman, "On the Two Different Aspects of the Representative Method: The Method of Stratified Sampling and the Method of Purposive Selection," Journal of the Royal Statistical Society, XCVII (Part IV, 1934), 558-625.

[1] The total of 62,246 patients is comprised of 49,486 nonmaternity and 12,760 maternity patients. The latter figure represents an expansion of the sample of maternity patients to attain the appropriate proportion of total patients based on weights of 20.5 and 79.5 for maternity and nonmaternity patients, respectively. As previously stated, the sample of maternity patients was confined to one calendar quarter rather than a full year as was the case for medical and surgical patients. For discussion of the basis of the relative weights assigned in combining data on the two types of cases and the differential in the periods covered by the samples, see Chapter I, pp. 13-15.

number of patients on whom data were recorded in the study, these 62,246 and subtotals thereof are referred to as patients in the report.

A sacrifice in the precision of measurement attainable was involved in the use of the listings of patients available from the Plan as the frame from which the samples were taken. These listings reproduced in complete detail the data on patients' charges, as reported to the Plan by each of its member hospitals, for one of the six semimonthly reporting periods during the calendar quarters covered by the study. The reporting periods, for which data from the various hospitals were transposed to the list, were not the same for all hospitals, but were intentionally diversified so that all periods would be included to a roughly equal extent in the quarterly list. For each reporting period during a quarter, therefore, data were incorporated into the list from the reports of a portion of the total number of hospitals. Which of the six periods in the quarter was covered by data added to the list from any particular hospital depended primarily on the sequence in which hospitals were taken for listing. To some extent, however, it would also depend on the flow of the clerical work of transposing data to the list--an operation carried on throughout the entire quarter. Although the order in which reports from the various hospitals were taken for listing was varied systematically from quarter to quarter, it is apparent that the distribution of patients over time within each quarter was not a random distribution.

For this reason, the listings available did not constitute an optimum frame for sampling patients' charges. Their use, however, had advantages in addition to facilitating the drawing of the samples. One consideration was that a high degree of accuracy in the lists could be expected since the data they contained were taken from accounting records, and the worksheets comprising the lists were

themselves extended, footed, and cross-footed. Furthermore, because it would have been necessary to transpose a great volume of data from hospital reports as an intermediate step before the data could have been recorded on punch cards, the use of the list was dictated by considerations of cost and time. More important, in view of the fact that purposes for which the results were to be used were general in nature, it was believed the degree of procedural bias involved in the use of the lists did not violate appropriate tolerances for accuracy in the findings. Although the use of the lists meant that the sample itself would not provide a meaningful measure of the margin of sampling inaccuracy, it was believed that total error would not be excessive, especially since other sources of bias commonly encountered in surveys, such as those arising from questionnaire construction, interviewing, response, and coding would be absent or minimal in this project.

Distribution of Total Charges for Hospital Care

The total amount of the hospital charges incurred by the 62,246 patients included in this study was $10,511,902. The mean hospital bill of these patients was $168.88. Maternity patients, who incurred 17 percent of the total amount of charges, had a mean bill of $140.92. As would be expected, the mean bill of medical and surgical patients, who accounted for 83 percent of total charges, was somewhat higher in amount. For these nonmaternity patients, the mean amount of hospital expense incurred was $176.09, one-fourth more than for maternity

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[1] In this instance and subsequently, "mean" is used to refer to the arithmetic mean.

patients. But, as is often the case with over-all averages, these averages would seem to conceal more than they reveal about the problem for families and individuals arising from the cost of hospital services. As will be seen from examination of the actual distribution of charges to patients, over-all average cost is quite unsatisfactory as an index of the financial impact of hospitalization expenses.

Some indication of the character of the distributions lying behind these averages is given by the figures presented in Table I. In the upper tenth of all patients, by amount of charges incurred, as many patients had hospital bills of over $492 as had bills of less than that amount. Among those at the other end of the scale, in the lowest tenth of patients by amount of charges, as many had expenses of less than $30 as had more than that amount of expense.

A significant contrast in the characteristics of the distribution of charges among maternity and among nonmaternity patients is apparent from the data in this table. While the mean cost for nonmaternity patients is seen to be considerably higher than for persons hospitalized for reason of maternity, the median charges for nonmaternity patients is somewhat lower than for maternity cases. This finding bears out the expectation of greater homogeneity among maternity patients.[1] But the finding that a majority of medical and surgical patients had hospital bills lower in amount than a majority of the maternity patients might be considered as surprising. Table I shows a strikingly wide variation among medical and surgical patients in the level of hospital expenses incurred--from over $500 for a majority in the upper 10 percent to less than $28 for most of the patients in the lowest 10 percent. Compared to this, the degree of

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[1] This expectation was the basis for the less extensive sampling of maternity cases as compared to medical and surgical patients.

TABLE I

MEAN AND MEDIAN AMOUNTS OF PATIENTS' HOSPITAL BILLS, BY TYPE OF PATIENT

Type of Patient	No. of Patients	Mean Charges	Median Charges	Median Charges in Lowest Tenth of Patients[a]	Median Charges in Highest Tenth of Patients[b]
All patients . .	62,246	$168.88	$125.03	$29.81	$492.20
Maternity patients . .	12,760	140.92	131.50	73.26	252.00
Medical and surgical patients (nonmaternity).	49,486	176.09	120.86	27.08	501.73

[a] Equivalent to fifth percentile.

[b] Equivalent to ninety-fifth percentile.

variation in level of costs incurred by maternity patients is relatively narrow, although, in fact, the median patient in the top tenth of maternity patients had a hospital bill over three more in amount than the median in the bottom tenth.

Distribution of Total Charges by Size of Patients' Bills

The relative dispersion of patients and hospitalization expenses by the amount of patients' hospital bills is shown in Table II. From these data it is seen that only about 6 percent of all patients incurred charges in the interval of $160 to $179 in which the mean hospital bill of $168.88 falls. Also it is apparent that almost a third of the patients had expenses of greater than the mean amount. Slightly more than two-thirds had less than this amount of charges. Some measure of the inadequacy of the mean hospital bill as an index of the hospital costs patients actually encounter when hospitalized is the fact that somewhat more than a third of all patients incurred charges of half the amount of the mean bill, or less, or of twice the amount of the mean, or more. It is of interest to add to the information in Table II that for those patients in the class interval of "over $1,000" the mean hospital bill was $1,459.97. At the other end of the distribution, the mean bill of those in the "under $20" interval was $15.16. In all other classes, the mean amount of charges closely approximated the mid-point of the interval.

The most significant aspect of the distributions shown in Table II is the rapidly widening differences between the percentage of patients and the percentage of charges for class intervals as one moves in either direction away from the "$160 to $179" class. This phenomenon points up the principal characteristic of the distribution of

TABLE II

PERCENTAGE DISTRIBUTION OF ALL PATIENTS AND OF TOTAL CHARGES, BY AMOUNT OF HOSPITAL BILL

Amount of Hospital Bill	Percentage of		Cumulative Percentage of	
	Patients	Charges	Patients	Charges
Under $20	1.12	0.10	1.12	0.10
$20 to $39	7.52	1.38	8.64	1.48
$40 to $59	9.54	2.81	18.18	4.29
$60 to $79	9.40	3.86	27.58	8.15
$80 to $99	9.78	5.19	37.36	13.34
$100 to $119	9.96	6.50	47.32	19.84
$120 to $139	9.64	7.38	56.96	27.22
$140 to $159	8.44	7.39	65.40	34.61
$160 to $179	6.20	6.20	71.60	40.81
$180 to $199	4.22	4.72	75.82	45.53
$200 to $249	7.47	9.78	83.29	55.31
$250 to $299	4.70	7.62	87.99	62.93
$300 to $399	5.35	10.84	93.34	73.77
$400 to $499	2.60	6.84	95.94	80.61
$500 to $599	1.33	4.30	97.27	84.91
$600 to $699	0.90	3.45	98.17	88.36
$700 to $799	0.53	2.34	98.70	90.70
$800 to $899	0.34	1.67	99.04	92.37
$900 to $999	0.21	1.17	99.25	93.54
$1,000 and over . . .	0.75	6.46	100.00	100.00

hospitalization costs--a small percentage of patients incur a relatively large part of the total amount of expenses, while, conversely, a large percentage of patients incur a relatively small part.

The cumulative effect of this highly skewed distribution can be seen more vividly in Figure 1, in which the cumulative percentages of patients and charges have been plotted on both a more than and less than basis to show clearly both ends of the distribution.[1] From this chart it is seen that the 20 percent of all patients with the lowest hospital expenses incurred only 5 percent of total charges. On the other hand, the 20 percent of patients with the highest bills had 50 percent of total costs, or ten times as much as the same proportion of patients at the other end of the distribution. Figure 1 also shows that charges were distributed much more evenly among maternity patients than among medical and surgical patients. As seen in the chart, a third of the total charges incurred by medical and surgical patients fell on less than 10 percent of these patients, whereas a third of the total cost of maternity admissions was spread over at least 20 percent of the patients admitted for reason of maternity. Among those with the lowest hospital bills, a third of the maternity patients bore over 20 percent of the costs incurred by such patients, but the bottom third of the medical and surgical patients had less than 10 percent of the costs of medical and surgical admissions.

Distribution of Total Charges by Length of Patients' Stays

Since the number of days of care received by a patient affects the amount of charges he incurs, at least for room and board service, the distribution of patients and charges by length of stay tends to resemble the distribution by size of bill. The mean length of

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[1] Data plotted in Figure 1 are based on Tables II and XXXVII.

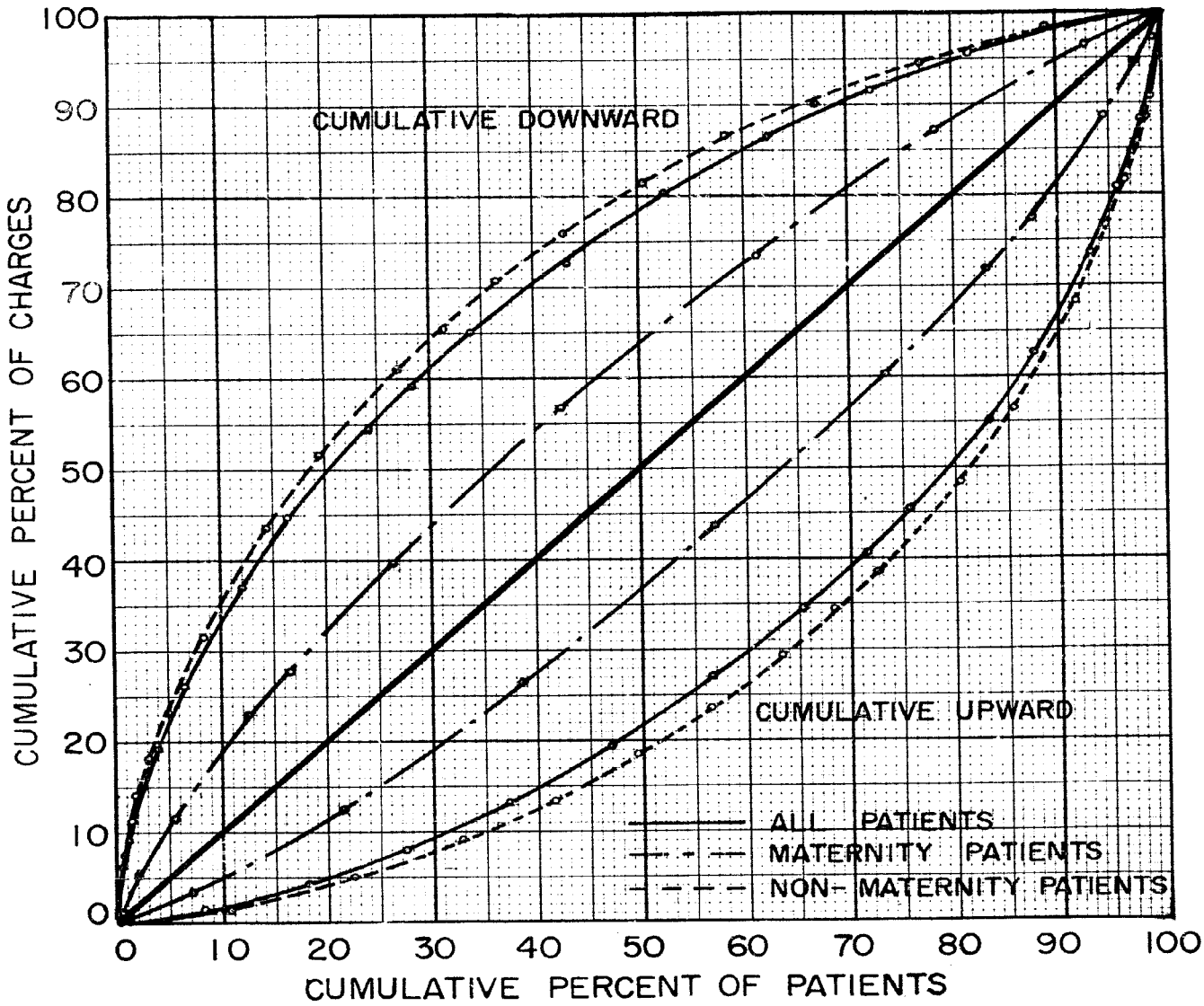


Figure 1. Distribution of Hospital Charges Among Maternity, Non-Maternity, and All Patients Shown by Lorenz Curves.

stay for all patients was found to be 7.16 days and, as in the distribution by size of bill, almost two-thirds of the patients were below the mean while many of those in the remainder substantially exceeded the mean. Also the notable contrast between maternity and nonmaternity patients appears in the distribution by length of stay. For maternity patients, the mean is 5.41 days and the distribution is highly concentrated in a narrow range around this mean. However, for medical and surgical patients, not only was the mean length of stay of 7.61 days appreciably higher, but also far greater dispersion was found in both directions away from the mean, especially toward longer periods of stay.

Table III, showing the distribution for all patients, indicates the striking extent to which short periods of care are characteristic of the utilization of general hospitals.[1] Perhaps the most remarkable aspect of this distribution is the relatively high frequency of very short stays, especially one-day stays which are seen to be the most numerous of all. This phenomenon most likely reflects extensive use of hospitals for minor surgery and diagnostic work-ups--a supposition that is supported by the relatively high utilization of ancillary services by these short-stay patients, as will later be shown.

Patients having short stays, although relatively numerous, bear a proportionately small part of the total amount of the cost of hospitalization. From Table III it can be shown that the one-sixth of patients having the longest periods of hospitalization incurred over twelve times as much expense as the one-sixth with the shortest stays.

Since the data used in the study showed that all patients were discharged by the one hundred twentieth day, as was previously discussed, the proportion of patients whose stay in fact extended beyond that point is not shown. However, it seems reasonable to conclude

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[1] Data on length of stay of maternity and nonmaternity patients as separate categories are included in Table XXXVIII.

TABLE III

PERCENTAGE DISTRIBUTION OF ALL PATIENTS AND OF TOTAL CHARGES, BY LENGTH OF HOSPITAL STAY

Length of Stay (days)	Percentage of		Cumulative Percentage of	
	Patients	Charges	Patients	Charges
1	12.45	2.87	12.45	2.87
2	9.83	3.73	22.28	6.60
3	8.20	4.02	30.48	10.62
4	11.33	7.16	41.81	17.78
5	12.24	9.04	54.05	26.82
6	10.35	8.80	64.40	35.62
7	7.16	7.18	71.56	42.80
8	4.53	5.06	76.09	47.86
9	3.57	4.51	79.66	52.37
10	3.55	5.10	83.21	57.47
11	2.68	4.16	85.89	61.63
12	1.72	2.88	87.61	64.51
13	1.80	3.30	89.41	67.81
14	1.41	2.71	90.82	70.52
15 to 20	4.76	10.78	95.58	81.30
21	0.40	1.12	95.98	82.42
22 to 30	2.18	7.01	98.16	89.43
31	0.13	0.49	98.29	89.92
32 to 60	1.37	6.97	99.66	96.89
61 to 70	0.11	0.86	99.77	97.75
71 to 90	0.11	0.90	99.88	98.65
91 to 120	0.12	1.35	100.00	100.00

from the data in Table III that the percentage was considerably less than 0.1 percent and that the exclusion of these patients, and the costs which they incurred from the one hundred twenty-first day of hospitalization forward, would not materially affect the analysis of the distribution of costs.

Relationship of Size of Patients' Bills to Length of Stay

Length of stay in the hospital is without doubt the most widely recognized factor related to the distribution of charges among patients. In an earlier period, when hospital services were almost entirely custodial in nature, the amount of costs incurred by patients presumably was a direct function of the number of days of care. In fact, the traditional basis employed by hospitals in quoting rates and computing charges for custodial service, of so much per period of time, usually per day, would have produced this kind of direct relationship between a patient's length of stay and his total bill. As hospitals have developed additional services whose utilization varies widely not only among patients, but also within their periods of stay, days of care tend to become much less homogeneous in terms of the amount of services and charges incurred. Consequently, the relationship between length of stay and amount of charges becomes less direct and consistent. As is seen in Table IV, however, a significant degree of relationship between the two persists. This, no doubt, reflects the fact that length of stay often is related to the severity of illness and the intensity of treatment required, as well as the fact that length of stay is a determinant of the amount of room and board charges.

TABLE IV

MEAN AMOUNT OF THE HOSPITAL BILLS OF ALL PATIENTS, BY LENGTH OF STAY

Length of Stay (days)	Mean Hospital Bill	Mean Charges per Day
1	$ 38.95	$38.95
2	64.09	32.05
3	82.78	27.59
4	106.77	26.69
5	124.68	24.94
6	143.71	23.95
7	169.41	24.20
8	188.64	23.58
9	213.43	23.71
10	242.48	24.25
11	261.51	23.77
12	282.76	23.56
13	309.75	23.83
14	323.20	23.09
15 to 20	382.87	21.88
21	465.35	22.16
22 to 30	541.88	20.84
31	638.19	20.59
32 to 60	860.33	18.70
61 to 70	1,334.99	20.38
71 to 90	1,437.44	17.86
91 to 120	1,938.04	18.37
All	168.88	23.58

As shown in Table IV, the mean amount of patients' hospital bills consistently rises with increases in the number of days of care they have received up to the time of their discharge. But the rise in the amount of total charges per patient is not an arithmetic progression, since the mean amount of charges per day tends to decline among patients who were hospitalized longer. It is important to point out, however, that these data on mean charges per day should not be construed to reflect the day-by-day accumulation of charges throughout the duration of a patient's hospitalization. Undoubtedly, the daily increments of expense within a patient's length of stay would tend to show, as do these data, a decline as length of stay increases. But, very likely, the cost incurred during the initial few days would generally be greater than shown here, after which time daily charges would tend to decline more sharply than shown, and to a somewhat lower level. The effect of the utilization of operating or delivery room and anesthesia in the early days of hospitalization, which is almost routine for surgical and maternity patients, for example, is not brought out by these data. Instead, in the computation of mean expense per day the amount of such charges is spread over the entire period of hospitalization. The data in Table IV definitely indicate, but do not factually establish, that the first days of hospitalization are the expensive days for the patient.

Variation in amount of charges for given lengths of stay.--The consistency of the relationship between the amount of patients' hospital bills and their lengths of stay is not as close, however, as is generally believed--or as might be supposed from data in Table IV. A significant degree of dispersion was found to exist in the amount of charges incurred by patients having any given length of stay. This is shown for nonmaternity patients in Table V.

TABLE V

VARIATION IN THE MEDIAN AMOUNTS OF NONMATERNITY PATIENTS' HOSPITAL BILLS, BY LENGTH OF STAY IN HOSPITAL

Length of Stay (days)	Median Amount of Hospital Charges			Difference from Lowest to Highest Tenth
	All Patients	Patients in Lowest Tenth[a]	Patients in Highest Tenth[b]	
1	$ 36.33	$ 11.43	$ 68.54	$ 57.11
2	60.50	27.41	104.40	76.99
3	79.45	41.25	132.21	90.96
4	101.31	51.65	158.77	107.12
5	119.40	65.83	189.50	123.67
6	138.76	72.89	223.25	150.36
7	158.09	99.94	256.68	156.74
8	179.79	101.67	286.87	185.20
9	199.50	120.42	352.83	232.41
10	222.00	122.00	399.50	277.50
11	250.93	144.83	402.83	258.00
12	263.25	160.36	477.83	317.47
13	290.50	168.17	466.50	298.33
14	318.54	182.17	489.50	307.33
15 to 20	361.00	196.17	645.93	449.76
21	449.88	239.50	705.75	466.25
22 to 30	523.88	273.82	867.15	593.33
31	599.50	386.00	1,157.50	771.50
32 to 60	806.33	421.55	1,487.50	1,065.95
61 to 70	1,283.50	574.50	2,437.50	1,863.00
71 to 90	1,407.50	749.50	2,317.50	1,668.00
91 to 120	1,791.50	949.50	3,681.50	2,532.00
All	120.86	27.08	501.73	474.65

[a] Equivalent to fifth percentile.

[b] Equivalent to ninety-fifth percentile.

Among medical and surgical patients having the same length of stay and ranked by amount of their bills, it would appear that the median patient in the highest tenth typically bears about three times as much expense as the median patient in the lowest tenth. For virtually all lengths of stay, it is seen that the amount of the difference between the mid-points in the top and in the bottom tenths of patients exceeds the median hospital bill for all patients. A number of striking comparisons can be made from these data. For example, the median patient in the upper 10 percent of those with a five-day stay had a larger hospital bill than a majority of the patients in the bottom tenth of those with a two weeks long period of hospitalization. And the amount of expense incurred by a majority of the patients in the top tenth of those receiving seven days of care was greater than the expenses of most of the patients hospitalized for twenty-one days and who were in the lower 10 percent of medical and surgical patients with that length of stay.

Among maternity patients receiving the same number of days of care, the spread between the amount of charges incurred by the median patients in the upper and the lower tenths is not as wide. But even for these patients it is sufficient to make length of stay an unstable and unreliable indicator of the amount of a patient's hospital bill. For example, among maternity patients having the most common length of stay, five days, the median amount of charges was, for all such patients, $128.50; for the lowest tenth, $80.41; and for the highest tenth, $167.00. The spread between the median in the lowest and highest tenths was $86.59, which is relatively only about half as wide as the typical variation seen among medical and surgical patients.

The extent of the variation among the hospital bills of patients with the same length of stay probably reflects two principal factors:

differences between the hospitals in which the patients were admitted and differences in the kind and amount of ancillary services required by patients. Quite a variation is known to exist among hospitals in the level of their per diem costs and this would tend to produce differences in the bills of patients hospitalized for any given number of days in different institutions. But the more important factor, it is believed, is variation among patients in the utilization of ancillary services. In the first place, the variation that is found is far too great to be explained by cost differentials between hospitals. And secondly, cost differentials between hospitals are attributable in large measure to the kind and amount of ancillary services provided to patients.[1] Small hospitals in isolated locations tend to have relatively low per diem costs, but a major reason is that they are able to provide only limited services to their patients. Although these considerations have an important bearing on virtually all aspects of variation found among patients in this study, they are especially pertinent to differences among patients with identical lengths of stay.

Composition of Patients' Total Hospital Bills

The components of patients' itemized hospital bills are shown in Table VI with the percentage of total charges attributable to each

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[1] A joint study by the Commission on Financing of Hospital Care and the U. S. Public Health Service of the variation in income and expense ratios among nonprofit general short-term hospitals, including but not confined to Michigan institutions, concluded that, "The scope of program is obviously the most important factor affecting the level of per diem costs." Maryland Y. Pennell, Robert M. Sigmond, Isidore Altman, and Marion E. Altenderfer, Income and Expense Ratios of General Hospitals, 1951, U. S. Department of Health, Education, and Welfare, Public Health Service Publication No. 407 (Washington: Government Printing Office, 1954), p. 25.

TABLE VI

PERCENTAGE OF TOTAL HOSPITAL CHARGES INCURRED FOR THE VARIOUS TYPES OF SERVICES

Type of Service	Percentage of Total Charges Incurred by		
	All Patients	Maternity Patients	Nonmaternity Patients
Ancillary services:			
Drugs and dressings . . .	13.46	6.91	14.82
Operating room	9.15	15.00	7.94
Laboratory	8.94	5.29	9.70
X ray	4.55	1.42	5.20
Anesthesia	4.09	6.14	3.68
Nursery	2.11	12.26	0.00
Oxygen	0.84	0.38	0.93
Electrocardiogram	0.43	0.04	0.51
Physical therapy	0.21	0.00	0.25
Basal metabolism	0.03	a	0.04
Miscellaneous	2.11	1.85	2.16
Total	45.92	49.29	45.23
Room and board	54.08	50.71	54.77
Total	100.00	100.00	100.00

[a] Less than 0.01 percent.

of the several classifications of services. From this table it is apparent that room and board services are the major item of patients' hospital expenses. But all ancillary services combined account for almost as large a part of total charges as room and board, particularly for maternity patients.

Although among the specific types of ancillary services the amount of expense incurred varies widely, the variation is seen to be somewhat less pronounced for all patients than for maternity and non-maternity patients considered separately. Nevertheless, for all patients more than two-thirds of the total charges for ancillary services are attributable to only three of the eleven such services--drugs and dressings, operating room, and laboratory.

Also, it should be noted that among the ancillary services the two classifications accounting for the greatest amount of cost are not the same for maternity and nonmaternity patients. For maternity patients, the charges incurred for operating room and nursery represent more than half of all ancillary service costs. For medical and surgical patients, on the other hand, a majority of the cost for ancillary services arises from the use of services in two other classifications: drugs and dressings, and laboratory services.

Variation in Composition of Total Charges by Length of Stay

A significant degree of variation was found in the composition of the total amount of hospital charges incurred by patients with different lengths of stay. As between the two major categories of charges, ancillary services and room and board, the respective proportion of total charges tends to shift in a pattern definitely related to differences in patients' hospital stays. The longer the length of

stay, the greater the importance of room and board service tends to be as a component of total charges incurred. This is seen for medical and surgical patients in Table VII. In this table, it should be noticed that charges for ancillary services tend to exceed those for room and board where patients are hospitalized for comparatively short periods of time.

For maternity patients, whose lengths of stay are concentrated over a much more narrow range, a similar pattern is found. Almost three-fourths of all maternity patients were hospitalized for a period of four, five, or six days, and the percentage of the charges attributable to ancillary services for these lengths of stay were 53.8, 49.4, and 46.4, respectively.

Since these data, on both maternity and nonmaternity patients, represent the average composition of charges incurred by patients in the various length-of-stay classes, they do not show the extent of variation in composition of the hospital bills of individual patients within these classes. Undoubtedly, room and board charges were greater than ancillary charges for a sizable portion of the short-stay patients, and, conversely, expenses incurred for ancillary services exceeded the cost of room and board for a significant proportion of patients with average and longer lengths of stay. Although the data do not permit a firm conclusion, in view of the finding that over half of all patients were hospitalized for five days or less, as was seen in Table III, it would not appear improbable that ancillary services accounted for half or more of the hospitalization expenses of a majority of all patients.

The relatively high proportion of total charges attributable to ancillary services for patients with short periods of stay, as shown in Table VII, would seem to point to a high incidence of admissions for minor surgery and for diagnostic purposes, a factor previously

TABLE VII

PERCENTAGE OF TOTAL HOSPITAL CHARGES INCURRED BY NONMATERNITY PATIENTS FOR ANCILLARY SERVICES AND FOR ROOM AND BOARD, BY LENGTH OF STAY

Length of Stay (days)	Percentage of Charges for		
	Ancillary Services	Room and Board	All Services
1	68.4	31.6	100.0
2	60.4	39.6	100.0
3	53.6	46.4	100.0
4	51.3	48.7	100.0
5	48.7	51.3	100.0
6	47.1	52.9	100.0
7	46.2	53.8	100.0
8	46.2	53.8	100.0
9	47.0	53.0	100.0
10	44.8	55.2	100.0
11	44.6	55.4	100.0
12	44.8	55.2	100.0
13	41.5	58.5	100.0
14	40.9	59.1	100.0
15 to 20	42.4	57.6	100.0
21	40.5	59.5	100.0
22 to 30	38.6	61.4	100.0
31	36.9	63.1	100.0
32 to 60	36.8	63.2	100.0
61 to 70	38.4	61.6	100.0
71 to 90	27.4	72.6	100.0
91 to 120	31.0	69.0	100.0
All	45.2	54.8	100.0

mentioned. It is also some indication that the first few days of hospital care typically involve intensive treatment involving high utilization of ancillary services. During the period of convalescence prior to discharge, the use of ancillary services normally would be expected to be lower, and board and room charges would tend to represent a larger proportion of total charges. Again, however, it should be pointed out that the data presented do not portray the distribution of charges by day during the course of patients' hospital stays.

Distribution of Charges Incurred for the Two Major Classifications of Services: Room and Board, and Ancillary Services

Charges for Room and Board

From one point of view, charges incurred for room and board service[1] may be regarded as the most stable component of patients' hospital bills. All patients incurred charges for room and board services, and the amount of such charges was characteristically a direct function of the length of stay. The mean daily cost for medical and surgical patients was $12.66. For maternity patients, it was

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[1] Room and board service, as was stated earlier, represents much more than food and lodging, which the term "room and board" connotes outside the hospital field. Room and board service, as a component of hospital care, embraces all services to patients for which separately itemized charges are not made. The number and extent of such services varies considerably from hospital to hospital depending on facilities available and the scope of a hospital's program. Also there is some variation in practices with respect to itemization of charges. Customarily, however, room and board service includes general nursing care, special diets, and laundry. Frequently, if not usually, it includes "floor drugs" and routine medications, as well as numerous minor services.

slightly higher, $13.21. The mean cost per day for patients with various lengths of stay fluctuated within a very narrow range around these figures. In only one of the twenty-two length of stay classes in the tabulations did the mean daily charges incurred by nonmaternity patients vary from the figure of $12.66 by more than $1.00, and most classes were within a few cents of this figure.[1] Although the variation on this basis was some greater for maternity patients, still it was not pronounced.

These findings do not suggest, however, that the total amount of room and board charges is distributed evenly among patients. Nor do they mean that costs incurred for this item of service tend to be spread more evenly than the total costs of care. In fact, the contrary is the case; for the reason that room and board charges tend to constitute a higher percentage of the hospital bills of longer-stay patients and a lower percentage of the bills for shorter stays, which was seen in Table VII. And since long-stay patients bear a disproportionately large share of total costs, as was shown in Table III, it follows that room and board charges tend to represent a relatively high percentage of large hospital bills and a comparatively low percentage of smaller bills. Consequently, room and board charges tend to be distributed with somewhat greater unevenness than the charges for all services combined.

The highly skewed distribution of room and board charges among medical and surgical patients is shown in Table VIII. Among maternity patients, the distribution was distinctly less skewed. Data on the latter distribution are presented in Table IX. From these two

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[1] Data on daily charges for room and board are included in Table XII on page 112, where they are shown in comparison with mean charges per day for ancillary services.

TABLE VIII

PERCENTAGE DISTRIBUTION OF NONMATERNITY PATIENTS AND OF CHARGES THEY INCURRED FOR ROOM AND BOARD, BY AMOUNT OF ROOM AND BOARD CHARGES

Amount of Charge	Percentage of		Cumulative Percentage of	
	Patients	Charges	Patients	Charges
Under $10	2.9	0.2	2.9	0.2
$10 to $19	14.5	2.0	17.4	2.2
$20 to $29	9.9	2.5	27.3	4.7
$30 to $39	6.5	2.3	33.8	7.0
$40 to $49	7.0	3.2	40.8	10.2
$50 to $59	6.4	3.6	47.2	13.8
$60 to $69	6.4	4.2	53.6	18.0
$70 to $79	6.0	4.5	59.6	22.5
$80 to $89	4.8	4.2	64.4	26.7
$90 to $99	4.9	4.8	69.3	31.5
$100 to $119	5.8	6.6	75.1	38.1
$120 to $139	5.2	7.1	80.3	45.2
$140 to $159	3.6	5.5	83.9	50.7
$160 to $179	2.4	4.2	86.3	54.9
$180 to $199	2.9	5.7	89.2	60.6
$200 to $249	3.8	8.7	93.0	69.3
$250 to $299	2.0	5.8	95.0	75.1
$300 to $399	2.2	7.6	97.2	82.7
$400 to $499	1.1	4.6	98.3	87.3
$500 and over	1.7	12.7	100.0	100.0

TABLE IX

PERCENTAGE DISTRIBUTION OF MATERNITY PATIENTS AND OF CHARGES THEY INCURRED FOR ROOM AND BOARD, BY AMOUNT OF CHARGE FOR ROOM AND BOARD SERVICE

Amount of Charge	Percentage of		Cumulative Percentage of	
	Patients	Charges	Patients	Charges
Under $10	0.0	0.0	0.0	0.0
$10 to $19	0.4	0.1	0.4	0.1
$20 to $29	2.4	0.8	2.8	0.9
$30 to $39	5.9	2.9	8.7	3.8
$40 to $49	13.7	8.6	22.4	12.4
$50 to $59	14.9	11.3	37.3	23.7
$60 to $69	18.1	16.1	55.4	39.8
$70 to $79	13.0	13.5	68.4	53.3
$80 to $89	9.8	11.6	78.2	64.9
$90 to $99	10.2	13.4	88.4	78.3
$100 to $119	5.5	8.2	93.9	86.5
$120 to $139	1.2	2.1	95.1	88.6
$140 to $159	2.4	4.8	97.5	93.4
$160 to $179	1.6	3.7	99.1	97.1
$180 to $199	0.4	1.1	99.5	98.2
$200 to $249	0.4	1.2	99.9	99.4
$250 to $299	0.0	0.0	99.9	99.4
$300 to $399	0.1	0.6	100.0	100.0

tables it can be shown that the 10 percent of nonmaternity patients with the highest expense for room and board incurred almost 40 percent of total charges incurred by such patients for this service, as compared to less than 20 percent of total room and board charges incurred by the correspondingly highest 10 percent of maternity patients. It is significant to add to these data the fact that the mean amount of expense incurred by nonmaternity patients for room and board service was $96.42, while the median charge was $63.70. For maternity patients, on the other hand, the mean was found to be $71.43 and the median charge, $66.48. As was the case with total charges, it is seen for room and board charges, too, that a majority of the maternity patients had a higher bill than a majority of the medical and surgical patients, although mean charge for the latter was substantially higher.

Charges for Ancillary Services

All maternity patients and virtually all medical and surgical patients, almost 99 percent, incurred some expense for ancillary services. For maternity patients, a distribution of charges for these services was found that was comparatively symmetrical. The mean cost, $69.43,[1] was only about 5 percent more than the median, $65.83.

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[1] The mean charge incurred for ancillary services, shown here, added to the mean charge for room and board, shown in the preceding section of this chapter, amounts to $140.86, which is $0.06 less than the average total cost of $140.92 found for maternity patients in this study. The discrepancy is due to the rounding of the amounts of patients' charges. The totals for these bills were tabulated separately from the amounts of charges for room and board and ancillary services. A similar discrepancy, amounting to $0.05, occurs in connection with nonmaternity patients.

From the results of the tabulation by amount of charges for these services, shown in Table X, it can be seen that slightly over three-fourths of maternity patients had ancillary service charges within the range of from $40 to $100. And the total of these charges in this range amounted to just under three-fourths of all charges incurred by maternity patients for ancillary services. Thus, in large part, the cost of ancillary services are spread in a fairly uniform fashion over all patients in this classification.

Again, however, in Table XI, which shows the distribution of ancillary service charges among medical and surgical patients, is seen the disproportionate division of expense among patients, which is characteristic for nonmaternity patients. The mean ancillary service charge in this distribution, $79.62, exceeds by almost 50 percent the amount of the median charge, which was $54.68. Although the most common amount of charges incurred was in the neighborhood of $40, virtually half of the total cost of all ancillary services was divided into much larger shares, ranging in size from $100 to over $3,000. Forty-six patients were found to have incurred ancillary service expenses of over $1,000.

Relationship of Amount of Ancillary Service Charges to Length of Stay

It was previously pointed out that the total amount of charges incurred by patients tends to be directly related to the duration of their hospitalization, but that the amount of patients' bills tends to rise less than proportionate to increases in length of stay, because of a decline in the mean amount of charges per day. This decline in mean charges per day, for patients with progressively longer periods of stay, shown in Table XII, is seen to be attributable almost

TABLE X

PERCENTAGE DISTRIBUTION OF MATERNITY PATIENTS AND OF CHARGES THEY INCURRED FOR ANCILLARY SERVICES, BY AMOUNT OF CHARGES FOR ANCILLARY SERVICES

Amount of Charge	Percentage of		Cumulative Percentage of	
	Patients	Charges	Patients	Charges
Under $20	0.0	0.0	0.0	0.0
$20 to $39	10.2	5.3	10.2	5.3
$40 to $59	29.5	21.2	39.7	26.5
$60 to $79	38.5	38.0	78.2	64.5
$80 to $99	10.2	12.8	88.4	77.3
$100 to $119	4.0	6.2	92.4	83.5
$120 to $139	3.5	6.6	95.9	90.1
$140 to $159	1.6	3.4	97.5	93.5
$160 to $179	1.6	3.9	99.1	97.4
$180 to $199	0.8	2.2	99.9	99.6
$200 and over	0.1	0.4	100.0	100.0

TABLE XI

PERCENTAGE DISTRIBUTION OF NONMATERNITY PATIENTS AND OF CHARGES THEY INCURRED FOR ANCILLARY SERVICES, BY AMOUNT OF CHARGES FOR ANCILLARY SERVICES

Amount of Charge	Percentage of		Cumulative Percentage of	
	Patients	Charges	Patients	Charges
No charge	1.2	0.0	1.2	0.0
Under $20	10.3	1.6	11.5	1.6
$20 to $39	22.5	8.4	34.0	10.0
$40 to $59	21.0	12.8	55.0	22.8
$60 to $79	13.7	11.8	68.7	34.6
$80 to $99	8.8	9.8	77.5	44.4
$100 to $119	5.4	7.4	82.9	51.8
$120 to $139	3.8	6.2	86.7	58.0
$140 to $159	2.9	5.4	89.6	63.4
$160 to $179	1.9	4.1	91.5	67.5
$180 to $199	1.3	3.1	92.8	70.6
$200 to $249	2.8	7.8	95.6	78.4
$250 to $299	1.5	5.2	97.1	83.6
$300 to $399	1.5	6.3	98.6	89.9
$400 to $499	0.6	3.4	99.2	93.3
$500 to $749	0.5	3.6	99.7	96.9
$750 and over	0.3	3.1	100.0	100.0

TABLE XII

VARIATION IN MEAN AMOUNTS OF CHARGES INCURRED PER DAY BY NONMATERNITY PATIENTS FOR ROOM AND BOARD, ANCILLARY SERVICES, AND ALL SERVICES, BY LENGTH OF STAY

Length of Stay (days)	Mean Amount of Charges per Day for		
	Room and Board	Ancillary Services	All Services
1	$12.26	$26.53	$38.79
2	12.65	19.27	31.92
3	12.65	14.60	27.25
4	12.46	13.14	25.60
5	12.56	11.93	24.49
6	12.40	11.05	23.45
7	12.56	10.78	23.34
8	12.51	10.76	23.27
9	12.59	11.15	23.74
10	13.12	10.65	23.77
11	13.07	10.50	23.57
12	13.00	10.56	23.56
13	13.80	9.81	23.61
14	13.63	9.45	23.08
15 to 20	12.63	9.30	21.93
21	13.08	8.92	22.00
22 to 30	12.79	8.03	20.82
31	12.99	7.60	20.59
32 to 60	11.80	6.87	18.67
61 to 70	12.75	7.82	20.57
71 to 90	12.96	4.90	17.86
91 to 120	12.67	5.70	18.37
All	12.66	10.46	23.12

entirely to variation in mean charges per day for ancillary services. The table presents data for nonmaternity patients, the classification that displayed the greatest tendency for variation.

Although mean daily room and board charges for patients with different lengths of stay very only slightly, as previously pointed out, mean charges for ancillary services show a sharp and continuous decline for patients with greater lengths of stay. And, from Table XII, it is readily apparent that almost all the variation in the mean total charges per day is due to the downward trend in mean daily charges for ancillary services.

The variation that was previously shown to exist in the amount of charges incurred by patients with the same lengths of stay appears also to be attributable in large part to the portion of patients' hospital bills arising from the use of ancillary services. Table XIII indicates the magnitude of the variation among patients with the same lengths of stay in the amount of charges they incur for ancillary services. For the various specific lengths of stay, the differences are shown between the median ancillary service charge for the highest and lowest tenths of patients, by amount of charge. These differences, in Column 4, may be compared with those in Column 5, which represent the amount of variation in patients' total hospital bills on a comparable basis. (The data in Column 5 were taken from the last column of Table V.) The high degree of relationship of the differences in ancillary service charges (Column 4) to the differences in the amount of patients' bills (Column 5) is seen in Column 6. The inference from this comparison is that variation in the ancillary service component of patients' bills largely accounts for the variation in amount of total charges that was found among patients with the same lengths of stay.

TABLE XIII

VARIATION IN MEDIAN AMOUNTS OF CHARGES FOR ANCILLARY SERVICES AND FOR ALL SERVICES AMONG HIGHEST AND LOWEST TENTHS OF NONMATERNITY PATIENTS, BY LENGTH OF STAY[a]

Length of Stay (days)	Median Charges for Ancillary Services		Difference in Median Charges for Lowest and Highest Tenths[b]		Ratio of Column 5 to Column 4 (%)
	Lowest Tenth	Highest Tenth	Ancillary Services	All Services	
(1)	(2)	(3)	(4)	(5)	(6)
1	$ 1.89	$ 59.07	$ 57.18	$ 57.11	100
2	5.46	77.83	72.37	76.99	94
3	4.42	91.50	87.08	90.96	96
4	8.34	104.28	95.94	107.12	90
5	14.63	117.50	102.87	123.67	83
6	13.43	134.70	121.27	150.36	81
7	24.12	153.81	129.69	156.74	83
8	23.78	168.64	144.86	185.20	78
9	26.50	223.89	197.39	232.41	85
10	22.58	259.50	236.92	277.50	85
11	24.70	246.50	221.80	258.00	87
12	10.73	294.50	283.47	317.47	89
13	20.36	292.00	271.64	298.33	91
14	21.10	296.17	275.07	307.33	90
21	28.07	418.25	390.18	466.25	84
31	32.83	674.50	641.67	771.50	83

[a] All lengths of stay are not shown since variation in charges for a span of days (for example, 22 to 30) reflects in part the effect of a varying number of days of care.

[b] Equivalent to fifth and ninety-fifth percentiles, respectively.

Distribution of Charges for the Various Specific Ancillary Services

Although in the preceding sections of this report ancillary services have for the most part been treated as a single unit or classification and the analysis of the distribution of patients' charges has been on this basis, it is essential to recognize that this classification is composed of a large variety of separate and identifiable services treated as such in patients' hospital bills. The component services making up the ancillary service classification and the findings of the study as to the relative importance of the charges for each one, have previously been presented in Table VI. Not only are these services quite unlike in nature and function, but also their utilization varies widely among patients, and even among hospitals. Rarely does a patient incur charges for all the specified ancillary services, and even among the most commonly used of these services the extent of use is anything but uniform. Generally speaking, the condition of the patient and the pattern of medical practice are the principal factors affecting the use of these services. However, the extent to which hospitals are equipped to provide the services is an overriding determinant, since specialized technical services cannot be provided if the requisite facilities or apparatus and personnel are not provided by the hospital. Generally, the smaller the hospital, the fewer the ancillary services available.[1]

Charges for specific ancillary services are customarily listed as separate items on the bills that hospitals render to patients, and, frequently, hospitalization prepayment benfit provisions relate specifically to these items and treat them in a differential fashion. For

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[1] Pennell et al., op. cit., pp. 18, 25.

these reasons, as well as the general importance of how the costs of these services are distributed among patients, the distribution of charges incurred for the various specific ancillary services have been analyzed separately. The order of presentation will be in terms of the relative magnitude of charges to all patients for the specific services which was seen in Table VI.

Charges for Drugs and Dressings

Of all the ancillary services, drugs and dressings have first rank in term of financial impact on patients. This is the case not only because the aggregate cost incurred for drugs and dressings exceeds that of any of the other ancillary services but also because the contour of the distribution of the costs for this item is so warped.[1]

A relatively high percentage of patients incurred charges for drugs and dressings. For medical and surgical cases the proportion was 81.9 percent; and for maternity patients, 94.5 percent. The mean cost per maternity patient using drugs and dressings was $10.26, but in a majority of cases the amount was $7.56 or less. Among maternity patients, the spread in the amount of cost incurred was not great --the expense was less than $60.00 for 99 percent of these patients. However, a striking contrast from this is seen for the medical and surgical patients incurring some cost for this item. Although among the latter as many had a bill for drugs and dressings of $13.27 as

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[1] That the expense arising from this item of service alone could mean a crushing financial burden is indicated by the fact that, among patients in the sample, charges for drugs and dressings of more than $2,000 were found to have been incurred by a few individuals--a greater cost than was found among the patients for any other single service, including room and board.

incurred more than this amount of expense, the mean cost for non-maternity patients was $31.63, and the range in the amount of charges was found to be extremely wide. The distribution of charges incurred among medical and surgical patients is shown in Table XIV. From this table it can be seen that almost 25 percent of the total cost for drugs and dressings fell on only 2 percent of the patients. It is of some significance to add that the mean amount of charges for drugs and dressings among patients with a bill of $500 or more for this item was $751.06.

The mean amount of expense incurred for drugs and dressings shows a definite relationship to the length of hospital stay of non-maternity patients. This is apparent from Table XV. Among patients classified by length of stay, the mean amount of charges is seen to rise proportionately to the increase in the duration of hospitalization. For no other hospital service was this found as a persistent characteristic of the distribution of charges. The costs to patients of all other services displayed a tendency to decline on a per day basis for hospitalized persons with progressively longer periods of stay. The proportion of patients using drugs and dressings, however, does not increase noticeably among those with greater lengths of stay. As shown in Table XV, the percentage incurring charges tends to be constant except for patients with relatively short stays.

Charges for Operating Room

Almost all maternity patients, 96.6 percent, incurred charges for operating room, which signifies delivery room for these cases. The reason why the percentage is not 100, as might be expected, does not appear from the data, although it might be surmised that birth occurred in a few instances prior to admission to the hospital.

TABLE XIV

PERCENTAGE DISTRIBUTION OF NONMATERNITY PATIENTS AND OF THE CHARGES THEY INCURRED FOR DRUGS AND DRESSINGS, BY AMOUNT OF CHARGE FOR THIS ITEM

Amount of Charge	Percentage of		Cumulative Percentage of	
	Patients	Charges	Patients	Charges
No charge	18.1	0.0	18.1	0.0
Under $10	35.2	5.4	53.3	5.4
$10 to $19	14.9	7.9	68.2	13.3
$20 to $39	13.6	14.8	81.8	28.1
$40 to $59	7.2	13.5	89.0	41.6
$60 to $79	3.6	9.4	92.6	51.0
$80 to $99	1.7	6.1	94.3	57.1
$100 to $119	1.3	5.5	95.6	62.6
$120 to $139	0.9	4.6	96.5	67.2
$140 to $159	0.6	3.4	97.1	70.6
$160 to $199	1.0	6.5	98.1	77.1
$200 to $239	0.6	5.0	98.7	82.1
$240 to $299	0.5	5.6	99.2	87.7
$300 to $499	0.5	7.4	99.7	95.1
$500 and over	0.3	4.9	100.0	100.0

TABLE XV

PERCENTAGE OF NONMATERNITY PATIENTS INCURRING CHARGES FOR DRUGS AND DRESSINGS AND MEAN CHARGE FOR THOSE USING DRUGS AND DRESSINGS, BY LENGTH OF STAY

Length of Stay (days)	Percentage Incurring Charges	Mean Charge for Patients Incurring Charge
1 to 7	74.6	$ 12.92
8 to 14	96.4	39.74
15 to 21	97.8	74.30
22 to 30	94.5	97.74
31 to 60	97.0	149.04
61 to 90	94.0	260.57
91 to 120	97.3	385.71
All	81.9	31.63

For maternity patients, operating room charges characteristically were the largest single item of hospital expense aside from room and board. The mean charge among those using operating room was $21.17, although a majority of these patients incurred slightly higher cost, $21.95 or more. The range in the amount of the charges was quite narrow. Over 95 percent of maternity patients incurred charges between $10 and $40 for this ancillary service.

Among nonmaternity patients, 58.3 percent utilized operating rooms.[1] As would be expected, because of the variation in time

[1] That nonmaternity patients using this service were, with few exceptions, surgical patients seems a reasonable assumption. This would denote that 58.3 percent of nonmaternity and 46.3 percent

required for the performance of the wide variety of surgical procedures in the range from minor to major surgery, the distribution of charges for operating room was not as even among nonmaternity patients using this service as was found among maternity patients. Nevertheless, charges for operating room show a more pronounced tendency toward uniformity than most of the other hospital services. In fact, over 97 percent of the nonmaternity patients who utilized an operating room incurred a charge of less than $40, and the great majority of charges were in the range of from $10 to $30. The mean amount was $23.81 and the median was $22.87, for those using the service. Greater detail on the distribution among all nonmaternity patients by amount of charge is shown in Table XVI. In the few cases where charges were several times the mean, operating room was probably used more than once during the course of the patient's hospitalization.

Among patients with different lengths of stay, there was some variation in the proportion incurring a charge for operating room. From Table XVII it is apparent that the proportion becomes smaller among those with progressively longer periods of hospitalization. From this it can be inferred that surgical patients tend to have shorter lengths of stay than medical cases--a phenomenon that is no doubt attributable to antibiotics and the practice of early

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of all patients in the study fall into the surgical classification, as distinct from medical and maternity categories. It is of interest to point out that the mean length of stay of surgical patients (i.e., patients using operating room) was 7.06 days. On the basis that the residual of the nonmaternity patients were medical patients, the mean length of stay for medical patients was 8.39 days. These figures may be compared with the findings as to mean length of stays as previously set forth in this chapter: all patients, 7.16 days; nonmaternity patients, 7.61 days; and maternity patients, 5.41 days.

TABLE XVI

PERCENTAGE DISTRIBUTION OF NONMATERNITY PATIENTS AND OF THE CHARGES THEY INCURRED FOR OPERATING ROOM, BY AMOUNT OF CHARGE FOR THIS ITEM

Amount of Charge	Percentage of		Cumulative Percentage of	
	Patients	Charges	Patients	Charges
No charge	41.7	0.0	41.7	0.0
Under $10	3.4	1.5	45.1	1.5
$10 to $19	19.1	19.1	64.2	20.6
$20 to $29	19.5	31.3	83.7	51.9
$30 to $39	8.7	20.1	92.4	72.0
$40 to $59	5.7	18.8	98.1	90.8
$60 to $79	1.2	5.9	99.3	96.7
$80 to $99	0.4	2.1	99.7	98.8
$100 and over	0.3	1.2	100.0	100.0

ambulation of surgical patients. The proportion of patients with a length of stay of only one day who incurred expense for operating room, not shown in the table, was 67.1 percent, the highest for any period of stay. This indicates numerous instances of hospitalization for minor surgery.

Patients hospitalized for longer periods have higher mean charges for operating room, as shown in Table XVII. Since persons undergoing major surgery normally would have larger expense for operating room and would remain in the hospital for a longer period of time, progressively higher mean charges for patients with increased lengths of stay would be expected.

TABLE XVII

PERCENTAGE OF NONMATERNITY PATIENTS INCURRING CHARGES FOR OPERATING ROOM AND MEAN CHARGE FOR THOSE USING OPERATING ROOM, BY LENGTH OF STAY

Length of Stay (days)	Percentage Incurring Charges	Mean Charge for Patients Incurring Charge
1 to 7	59.4	$19.37
8 to 14	60.3	30.67
15 to 21	49.0	37.51
22 to 30	46.0	37.06
31 to 60	47.0	45.40
61 to 90	44.0	58.29
91 to 120	43.8	68.50
All	58.3	23.81

Charges for Laboratory Services

A higher percentage of patients use laboratory services than any other hospital ancillary service. Among both maternity and nonmaternity patients, over 94 percent incurred laboratory charges. Although certain laboratory tests, such as blood tests, are generally routine procedures in many hospitals for all persons admitted, the extent to which many of the other services of the hospital laboratory are utilized varies widely among patients, except in maternity cases. The mean amount of expenses encountered by the maternity patients utilizing laboratory service was $7.87 and the cost to the median patient was $6.67. Less than 0.5 percent of the total laboratory

charges incurred by maternity patients was borne by those with more than $50 expense for this service. The cost was both higher and less uniform for medical and surgical patients. For these patients who used laboratory services, the average was $18.02, although in a majority of cases the amount was $11.66 or less. The distribution of all nonmaternity patients by the amount of expense incurred for this item may be seen in Table XVIII. It is significant to add to the information in the table that the mean charge for patients with laboratory bills of $200 or more was $373 and that the range of charges extended upward to well over $600.

TABLE XVIII

PERCENTAGE DISTRIBUTION OF NONMATERNITY PATIENTS AND OF THE CHARGES THEY INCURRED FOR LABORATORY SERVICES, BY AMOUNT OF CHARGE FOR THIS ITEM

Amount of Charge	Percentage of		Cumulative Percentage of	
	Patients	Charges	Patients	Charges
No charge	5.9	0.0	5.9	0.0
Under $10	33.7	11.5	39.6	11.5
$10 to $19	34.6	27.9	74.2	39.4
$20 to $29	12.9	17.6	87.1	57.0
$30 to $39	5.4	10.6	92.5	67.6
$40 to $59	3.9	11.0	96.4	78.6
$60 to $99	2.3	10.1	98.7	88.7
$100 to $199	1.1	8.4	99.8	97.1
$200 and over	0.2	2.9	100.0	100.0

As seen in Table XIX, length of stay does not seem to be a factor influencing the proportion of medical and surgical patients utilizing laboratory service but it does appear to have some bearing on the amount of laboratory services required by patients. The amount of mean charges incurred tends to vary directly with the duration of hospitalization, although much less dramatically than was seen for drugs and dressings.

TABLE XIX

PERCENTAGE OF NONMATERNITY PATIENTS INCURRING CHARGES FOR LABORATORY SERVICES AND MEAN CHARGE FOR THOSE USING LABORATORY SERVICE, BY LENGTH OF STAY

Length of Stay (days)	Percentage Incurring Charges	Mean Charge for Patients Incurring Charge
1 to 7	92.9	$12.45
8 to 14	96.1	21.50
15 to 21	96.8	34.18
22 to 30	94.0	46.21
31 to 60	96.0	59.67
61 to 90	91.8	82.76
91 to 120	93.2	72.78
All	94.1	18.02

Charges for X Ray

Forty-four percent of the nonmaternity and 23.6 percent of the maternity patients included in the study incurred hospital charges

for X ray. However, it is important to point out that these figures do not fully reflect the use of X ray by hospitalized persons, since in some hospitals patients are billed separately by radiologists when expenses are incurred for this service. Where this practice is followed, charges do not appear on patients' hospital bills even through X ray is used.

In anticipation of understatement of X-ray utilization in the data, the practices of the Plan's member hospitals were determined with respect to inclusion or exclusion of X-ray charges in bills rendered to patients. And in the tabulation of the data, provision was made for the segregation of patients by hospital according to the practice followed. As a result it was found that 86 percent of the nonmaternity and 81 percent of the maternity patients in the study were hospitalized in institutions where charges for X ray were handled as hospital charges.[1] And among patients from these hospitals, 51.3 percent of the nonmaternity and 29.1 percent of maternity cases utilized X-ray service.

For maternity patients using X ray the mean expense incurred was $8.45 and the median cost was only slightly less, $7.70. As would be expected, medical and surgical patients incurred higher charges. The mean charge for nonmaternity patients using X ray was $20.66. A majority of these patients, however, incurred a charge of $15.20 or less.

Table XX shows the distribution of all medical and surgical patients by the size of their bills for X-ray service. In this table,

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[1] The higher proportion of maternity cases as compared to the medical and surgical cases who were hospitalized in institutions excluding X ray on their bills might be explained by the fact that these institutions tended to be relatively small in size. In small hospitals the number of maternity admissions is probably higher as a percentage of all admissions than it is in larger institutions.

TABLE XX

PERCENTAGE DISTRIBUTION OF NONMATERNITY PATIENTS AND OF THE CHARGES THEY INCURRED FOR X RAY, BY AMOUNT OF CHARGE FOR THIS ITEM

Amount of Charge	Percentage of			Cumulative Percentage of		
	Patients in Hospitals Billing for X Ray	Patients in All Hospitals	Charges	Patients in Hospitals Billing for X Ray	Patients in All Hospitals	Charges
(1)	(2)	(3)	(4)	(5)	(6)	(7)
No charge .	48.7	56.0	0.0	48.7	56.0	0.0
Under $10 . . .	15.1	13.0	5.8	63.8	69.0	5.8
$10 to $19 . . .	15.7	13.4	19.4	79.5	82.4	25.2
$20 to $29 . . .	7.5	6.4	16.2	87.0	88.8	41.4
$30 to $39 . . .	5.3	4.5	16.7	92.3	93.3	58.1
$40 to $49 . . .	3.0	2.6	12.6	95.3	95.9	70.7
$50 to $59 . . .	2.0	1.7	9.8	97.3	97.6	80.5
$60 to $79 . . .	2.0	1.7	12.7	99.3	99.3	93.2
$80 to $99 . . .	0.4	0.4	3.5	99.7	99.7	96.7
$100 and over . .	0.3	0.3	3.3	100.0	100.0	100.0

the data in Columns 2 and 5 more adequately reflect the distribution of patients by amount of X-ray expense encountered during hospitalization than do the data in Columns 3 and 6.[1] Strictly in the context of hospital charges, however, the data in the latter two columns probably would have more general applicability since in most areas there are some hospitals that do not classify X ray as a hospital service. Moreover, it should be pointed out that the data in Columns 3 and 6 are on a basis consistent with data presented in this report on other ancillary services. Referring further to Table XX, the mean charge incurred by patients in the highest classification shown, "$100 and over," was $119.50. The range of charges, however, was found to extend to somewhat more than $200.

The proportion of nonmaternity patients utilizing X ray varies only slightly among patients with lengths of stay greater than two weeks, although it is somewhat lower among those hospitalized for a shorter time. This is seen in Table XXI. The differences by length of stay intervals in the percent of patients incurring charges are relatively the same for patients in both classifications of hospitals: those including X-ray charges in patients' bill and those not.[2] Also apparent from Table XXI is the fact that patients with longer

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[1] It should be recognized, however, that important differences in X-ray charges may exist between hospitals where X ray is a hospital service and those where it is not, in respect to either unit costs for X rays or the extent of utilization, or both. For this reason, data on patients in hospitals billing for X ray may not be representative of patients in hospitals in the other category.

[2] This reflects the fact that the length of stay of patients did not differ significantly between the two classifications of hospitals. The percentage of all nonmaternity patients in the study that were from hospitals including X ray on patients' bills was highly consistent throughout all the twenty-two length-of-stay intervals tabulated.

TABLE XXI

PERCENTAGE OF NONMATERNITY PATIENTS INCURRING CHARGES FOR X RAY AND MEAN CHARGE FOR THOSE USING X RAY, BY LENGTH OF STAY

Length of Stay (days)	Percentage Incurring Charge in		Mean Charge for Patients Incurring Charge
	Hospitals Billing for X Ray	All Hospitals	
1 to 7	45.8	39.5	$17.52
8 to 14	58.5	49.6	22.31
15 to 21	70.4	59.6	27.26
22 to 30	68.2	57.8	30.08
31 to 60	72.3	61.6	37.23
61 to 90	74.8	61.9	38.45
91 to 120	75.8	64.4	46.77
All	51.3	44.0	20.66

hospital stays tend to incur greater amounts of expense for X-ray service.

Charges for Anesthesia

The data studied show that 40.7 percent of nonmaternity patients incurred charges for anesthesia. As would be expected, the proportion of maternity cases was much higher, 70.1 percent. These percentages, however, materially understate the utilization of this item of service. This would seem obviously in connection with maternity patients, since, as a general rule, they would be expected

to use anesthesia in nearly all cases. The understatement of the extent to which anesthesia is used results from variation in the manner of handling charges, as was the case with X-ray service. In fact, the difficulties in determining the incidence of use, and the expense incurred on an inclusive basis, are much greater for anesthesia.[1]

The extent to which the utilization of this item of service is understated in the data is indicated by the discrepancy seen between the percentage of patients using operating room and the percentage using anesthesia. Only about 70 percent of the number of patients who were found to have incurred charges for operating room had charges for anesthesia. Since it would usually be expected that the frequency of use of the two services would be much more nearly equal, the conclusion suggested is that a significant portion of the remaining 30 percent of those using operating room were billed by physicians for the administration of anesthesia. However, minor surgery involving the use of local anesthetics, which have been classified as drugs in patients' hospital bills, could explain part of the

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[1] Since the practices followed in including or excluding charges for anesthesia in patients' hospital bills vary within as well as among hospitals, an individual determination in each case would have been required to find the precise extent of use of anesthesia. Frequently, charges for the supplies used are included on the hospital bill, while the charge for the administration of the anesthetic is billed separately to the patient by a physician. Generally speaking, a charge specifically for anesthesia is included as a hospital charge only when anesthesia is administered by a nurse or physician on the salaried staff of the hospital, and where patients are charged for anesthetics only, these are often billed to patients as drugs. It seems reasonable to assume that where charges for anesthesia were reported by hospitals they represent the entire expense for anesthesia for a large majority of the patients involved.

discrepancy.[1] And where local anesthetics are used it is probable that patients often do not incur a separate charge for their administration.

The amount of expense incurred by patients for anesthesia tended to be highly concentrated in a relatively narrow range for patients in both the maternity and the nonmaternity categories. The mean expense incurred by maternity patients having a charge for anesthesia was $12.30, whereas the median cost was $13.04. For nonmaternity categories, the mean expense incurred by maternity patients having a charge for anesthesia was $12.30, whereas the median cost was $13.04. For nonmaternity patients having a charge, the mean was $15.79 and the median was $15.19. Additional data on the distribution of all nonmaternity cases and charges by size of bill for anesthesia are presented in Table XXII. For patients in the highest class shown in this table, "60 and over," the mean amount of expense was $69.89.

Table XXIII shows the extent to which variation in the percentage of nonmaternity patients incurring charges for anesthesia and in the mean amount of charges is associated with differences in patients' length of stay. As would be expected, the changes seen in the proportion of patients incurring charges follows a pattern rather similar to the corresponding data with respect to operating room, which were presented in Table XVII. The mean cost of anesthesia, however, rises more gradually for patients with longer

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[1] That this is a partial explanation is suggested by the data. The percentage of nonmaternity patients who incurred a charge for operating room but not for anesthesia is somewhat higher for patients hospitalized only one day than for those in other length-of-stay intervals.

TABLE XXII

PERCENTAGE DISTRIBUTION OF NONMATERNITY PATIENTS AND OF THE CHARGES THEY INCURRED FOR ANESTHESIA, BY AMOUNT OF CHARGE FOR THIS ITEM

Amount of Charge	Percentage of		Cumulative Percentage of	
	Patients	Charges	Patients	Charges
No charge	59.3	0.0	59.3	0.0
Under $10	9.7	7.7	69.0	7.7
$10 to $19	18.7	38.5	87.7	46.2
$20 to $39	10.8	42.5	98.5	88.7
$40 to $59	1.2	8.0	99.7	96.7
$60 and over	0.3	3.3	100.0	100.0

periods of hospitalization than was seen in connection with operating room in the latter table.

Charges for Nursery Care

Charges for nursery care of newborn arise only in connection with maternity cases; and of the maternity patients in the sample 98 percent had such charges.[1] The mean cost per day of nursery care

[1] The fact that charges were not incurred in all cases could be attributed either to infant mortality or the inclusion of nursery care in room and board service for maternity cases in a few institutions. If the former, the infant mortality rate indicated would be about 20 per 1,000 births, which does not exceed prevailing rates for deaths under one year of age, but would appear high for the

TABLE XXIII

PERCENTAGE OF NONMATERNITY PATIENTS INCURRING CHARGES FOR ANESTHESIA AND MEAN CHARGE FOR THOSE USING ANESTHESIA, BY LENGTH OF STAY

Length of Stay (days)	Percentage Incurring Charges	Mean Charge for Patients Incurring Charge
1 to 7	40.8	$13.16
8 to 14	44.6	20.05
15 to 21	33.5	22.64
22 to 30	30.9	24.35
31 to 60	30.4	26.13
61 to 90	31.4	29.36
91 to 120	32.9	37.00
All	40.7	15.79

was found to be $3.44, although it should be added that the data suggest that there is considerable variation among hospitals in the daily rates charged. For patients incurring expense for this service, the mean charge was $17.60 and the median was $16.43. For less than 1 percent of the cases did this item of expense exceed $50.

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interval of time prior to discharge of the mother from the hospital. Furthermore, the absence of nursery charge would not fully reflect infant mortality occurring in this interval. The other possibility, that a separate charge was not made for nursery care in a few instances, may well be the major factor accounting for no charges in 2 percent of the cases. Inclusion of nursery care of the infant in room and board charges for maternity patients is a practice followed by many hospitals, although it is rare in this area of the nation, as the findings here would indicate.

It is important to point out, however, that charges for nursery service generally do not include the costs incurred for infants requiring prolonged and special hospital care, which may involve heavy costs. Following the discharge of the mother from the hospital, and in some cases before, the infant is admitted as a patient where special or extended hospital care is necessary. And the charges incurred after the infant is admitted as a patient do not appear on the maternity patient's hospital bill.

Charges for Oxygen

Although the expense arising from the use of oxygen accounts for a very small fraction of the aggregate cost to patients of hospital care, for those who require it, oxygen is a major and not a minor item of cost. In part, this results from the fact that a relatively small proportion of patients incur the total cost of oxygen--the percentage of patients using oxygen was 5.6 and 4.2 for maternity and nonmaternity patients, respectively. But a factor of no less importance in making oxygen a burdensome item of cost is the character of the distribution of this expense among those that use the service.

The factor of uneven distribution, however, does not apply to maternity patients. Patients in this category who used oxygen tended to incur fairly uniform charges, and the median cost, $9.50, closely approximated the mean cost of $9.63. Among nonmaternity patients, on the other hand, the distribution of costs, shown in Table XXIV, is seen to be extremely skewed. For medical and surgical patients using oxygen the mean charge was $38.59--the highest mean charge on this basis incurred for any of the hospital ancillary services--and the median charge was $16.88. The mean bill for oxygen in the "$200 and over" class in Table XXIV was $289.52, and the charges

TABLE XXIV

PERCENTAGE DISTRIBUTION OF NONMATERNITY PATIENTS AND OF THE CHARGES THEY INCURRED FOR OXYGEN, BY AMOUNT OF CHARGE FOR THIS ITEM

Amount of Charge	Percentage of		Cumulative Percentage of	
	Patients	Charges	Patients	Charges
No charge	95.79	0.00	95.79	0.00
Under $10	1.13	2.86	96.92	2.86
$10 to $19	1.08	9.43	98.00	12.29
$20 to $29	0.46	7.00	98.46	19.29
$30 to $39	0.36	7.09	98.82	26.38
$40 to $59	0.45	13.11	99.27	39.49
$60 to $99	0.30	14.00	99.57	53.49
$100 to $199	0.29	24.18	99.86	77.67
$200 and over	0.14	22.33	100.00	100.00

incurred by some of the patients in this class amounted to over $500. In the table it is significant to note that patients having bills of $100 or more for oxygen bore almost half of the total cost of this ancillary service.

Since oxygen is most often required in critical illness, it is not surprising to see in Table XXV that the proportion of medical and surgical patients using oxygen is many times greater among longer-stay patients than among those remaining in the hospital one week or less. Its use is most common among patients hospitalized for a period of from one to two months and in this group oxygen is required by almost one out of four patients. Also, it is apparent

TABLE XXV

PERCENTAGE OF NONMATERNITY PATIENTS INCURRING CHARGES FOR OXYGEN AND MEAN CHARGE FOR THOSE USING OXYGEN, BY LENGTH OF STAY

Length of Stay (days)	Percentage Incurring Charges	Mean Charge for Patients Incurring Charge
1 to 7	1.7	22.15
8 to 14	5.6	24.92
15 to 21	14.6	32.80
22 to 30	15.7	64.10
31 to 60	23.3	91.33
61 to 90	15.7	152.90
91 to 120	16.4	105.42
All	4.2	38.59

from Table XXV that the mean amount of expense incurred tends to rise very rapidly for classes of patients with increasingly longer periods of hospitalization.

Charges for Electrocardiograms

Two percent of maternity and 6.4 percent of nonmaternity patients incurred expense for electrocardiograms ("E.K.G."). For the medical and surgical patients utilizing this service, the mean charge was $14.07 and the median amount was $15.25. Table XXVI shows the distribution of nonmaternity patients and charges by the size of bill incurred for E.K.G. Although the range of charges extended upward to almost $200, no more than 3 percent of those using

TABLE XXVI

PERCENTAGE DISTRIBUTION OF NONMATERNITY PATIENTS AND OF THE CHARGES THEY INCURRED FOR ELECTROCARDIOGRAMS, BY AMOUNT OF CHARGE FOR THIS ITEM

Amount of Charge	Percengage of		Cumulative Percentage of	
	Patients	Charges	Patients	Charges
No charge	93.61	0.00	93.61	0.00
Under $10	0.29	2.23	93.90	2.23
$10 to $19	5.06	63.43	98.96	65.66
$20 to $29	0.55	12.68	99.51	78.34
$30 to $39	0.30	10.47	99.81	88.81
$40 to $59	0.15	7.09	99.96	95.90
$60 and over	0.04	4.10	100.00	100.00

the service had charges greater than $40, while the charges for 80 percent fell in the interval of from $10 to $19, inclusive. Among maternity patients, no charges were found for this item exceeding $10 and a majority using the service incurred a charge of less than $6. The mean cost for these patients was $3.14.

In Table XXVII it is seen that among nonmaternity patients with relatively short hospital stays the percentage for whom electrocardiograms were made is notably lower than among all patients, whereas among patients with hospital stays of two weeks or more the proportion using this service is several times higher than for all patients. The rising mean amount of charges for patients in the length of stay intervals of greater duration suggests that repeated

TABLE XXVII

PERCENTAGE OF NONMATERNITY PATIENTS INCURRING CHARGES FOR ELECTROCARDIOGRAMS AND MEAN CHARGE FOR THOSE USING ELECTRO-CARDIOGRAMS, BY LENGTH OF STAY

Length of Stay (days)	Percentage Incurring Charges	Mean Charge for Patients Incurring Charge
1 to 7	3.6	$11.84
8 to 14	9.4	12.48
15 to 21	14.8	15.49
22 to 30	19.0	19.03
31 to 60	20.7	24.65
61 to 90	14.9	30.20
91 to 120	16.4	17.17
All	6.4	14.07

electrocardiograms are made for an increasing proportion of patients with prolonged periods of hospitalization.

Charges for Physical Therapy

None of the maternity patients and only 1.8 percent of non-maternity patients incurred charges for physical therapy. This low percentage of utilization would seem to indicate that the service is unavailable in many hospitals. Generally, only relatively large hospitals, and not all of these, have physiotherapy departments providing broad services. Most hospitals are not equipped and staffed to include modern physical therapy procedures in their program. And among

those providing such services, the extent of their development varies appreciably.

As is the case with respect to oxygen, physical therapy ranks high among the ancillary services in terms of the average cost imposed on those using the service. Although in a majority of instances bills for physiotherapy were for $14.78 or less, the mean bill amounted to $24.20. Table XXVIII provides further details on the distribution of patients and charges. The mean amount of charges in the class "$100 and over" in this table was $155.67.

TABLE XXVIII

PERCENTAGE DISTRIBUTION OF NONMATERNITY PATIENTS AND OF THE CHARGES THEY INCURRED FOR PHYSICAL THERAPY, BY AMOUNT OF CHARGE FOR THIS ITEM

Amount of Charge	Percentage of		Cumulative Percentage of	
	Patients	Charges	Patients	Charges
No charge	98.20	0.00	98.20	0.00
Under $10	0.68	6.68	98.88	6.68
$10 to $19	0.43	14.43	99.31	21.11
$20 to $39	0.47	29.58	99.78	50.69
$40 to $59	0.08	8.42	99.86	59.11
$60 to $99	0.08	12.87	99.94	71.98
$100 and over	0.06	28.02	100.00	100.00

A striking contrast in utilization is seen in Table XXIX between patients with very long hospital stays and those remaining only a week or less. Charges for physical therapy are comparatively

TABLE XXIX

PERCENTAGE OF NONMATERNITY PATIENTS INCURRING CHARGES FOR PHYSICAL THERAPY AND MEAN CHARGE FOR THOSE USING PHYSICAL THERAPY, BY LENGTH OF STAY

Length of Stay (days)	Percentage Incurring Charges	Mean Charge for Patients Incurring Charge
1 to 7	0.8	$ 9.36
8 to 14	2.7	14.10
15 to 21	4.4	27.04
22 to 30	6.0	35.64
31 to 60	9.8	45.93
61 to 90	21.6	83.93
91 to 120	20.6	133.60
All	1.8	24.20

rare for patients in the hospital for an average period of time. But among those who are hospitalized for two months or more, charges for physical therapy are quite commonly encountered. More than one out of five patients in this category, as is seen in Table XXIX, incurs costs for this item. Moreover, the costs for these patients are sizable--in some instances they were found to amount to several hundred dollars. From this table it can be concluded that utilization of physical therapy is both much more extensive and much more intensive for long-stay patients. Although these characteristics in combination have been seen to some degree in connection with all of the ancillary services, the phenomenon is considerably more pronounced for physical therapy than elsewhere.

Charges for Basal Metabolism Tests

Of all the hospital services for which data were available permitting separate analysis in this study, the determination of basal metabolic rate ("B.M.R.") was used by fewer patients and involved the least amount of cost for those using the service. Only 0.7 percent of nonmaternity and 0.4 percent of maternity patients were found to have incurred expense for basal metabolism tests. For those using this service, the mean cost was $9.87 among nonmaternity patients and $2.00 among maternity patients. The distribution of nonmaternity cases and charges by amount of expense incurred for B.M.R. is shown in Table XXX. In virtually all instances the amount of these charges was less than $20 and among the small residual exceeding this level the mean amount was $33.50.

TABLE XXX

PERCENTAGE DISTRIBUTION OF NONMATERNITY PATIENTS AND OF THE CHARGES THEY INCURRED FOR BASAL METABOLISM TESTS, BY AMOUNT OF CHARGE FOR THIS ITEM

Amount of Charge	Percentage of		Cumulative Percentage of	
	Patients	Charges	Patients	Charges
No charge	99.35	0.00	99.35	0.00
Under $10	0.45	41.82	99.80	41.82
$10 to $19	0.16	29.05	99.96	70.87
$20 and over	0.04	29.13	100.00	100.00

The proportion of patients using B.M.R. service, as seen in Table XXXI, was quite small in all length-of-stay categories, but it tends to increase among those who have been hospitalized longer. The mean cost for patients in these various categories, however, is comparatively level although it appears from the data that repeated use of this service is not infrequent.

TABLE XXXI

PERCENTAGE OF NONMATERNITY PATIENTS INCURRING CHARGES FOR BASAL METABOLISM TESTS AND MEAN CHARGE FOR THOSE USING THIS SERVICE, BY LENGTH OF STAY

Length of Stay (days)	Percentage Incurring Charges	Mean Charge for Patients Incurring Charge
1 to 7	0.76	$ 7.80
8 to 14	0.46	12.60
15 to 21	0.00	0.00
22 to 30	0.89	11.08
31 to 60	1.29	16.92
61 to 90	0.00	0.00
91 to 120	2.74	12.00
All	0.65	9.87

Charges for Miscellaneous Services

Although the services constituting this category were not specifically identified in the data and their relative importance cannot be ascertained, it was determined that generally blood and plasma

The proportion of patients using B.M.R. service, as seen in Table XXXI, was quite small in all length-of-stay categories, but it tends to increase among those who have been hospitalized longer. The mean cost for patients in these various categories, however, is comparatively level although it appears from the data that repeated use of this service is not infrequent.

TABLE XXXI

PERCENTAGE OF NONMATERNITY PATIENTS INCURRING CHARGES FOR BASAL METABOLISM TESTS AND MEAN CHARGE FOR THOSE USING THIS SERVICE, BY LENGTH OF STAY

Length of Stay (days)	Percentage Incurring Charges	Mean Charge for Patients Incurring Charge
1 to 7	0.76	$ 7.80
8 to 14	0.46	12.60
15 to 21	0.00	0.00
22 to 30	0.89	11.08
31 to 60	1.29	16.92
61 to 90	0.00	0.00
91 to 120	2.74	12.00
All	0.65	9.87

Charges for Miscellaneous Services

Although the services constituting this category were not specifically identified in the data and their relative importance cannot be ascertained, it was determined that generally blood and plasma

and their administration are the major items of expense in the category. Charges for numerous additional services, however, are also included. Among these are radium therapy, electroencephalographs, and in some instances casts and special dressings, therapeutic X ray, and minor items such as identification bracelets for newborn. In fact, itemized charges for any service rendered to patients which do not fall into one of the previous discussed service classifications, as defined by hospitals individually, are included here.

One out of three maternity patients and one out of six nonmaternity patients incurred charges for miscellaneous services; i.e., for one or more of the items in this category. For maternity patients using any of these services, the mean amount of expense involved was $7.74, and the median patient's bill was $6.51. It is significent to add that no instance was found where the amount of these charges to a maternity patient was more than $50.

The expense for nonmaternity patients, however, was substantially higher on the average. Also the total charges incurred by these patients were distributed much more unevenly than among maternity patients. The mean charge for medical and surgical patients utilizing one or more of the miscellaneous services was $22.87, despite the fact that a majority of the bills did not exceed $9.42. As this might indicate, the range of these charges was quite wide. Several patients were found in the sample who had incurred expenses of more than $800 for these services. Further detail on the distribution by level of cost may be seen in Table XXXII. For the highest class shown in the table, "$200 and over," the mean amount of charges per patient is $306.15.

In Table XXXIII it is seen that medical and surgical patients staying in the hospital for longer periods of time encountered expenses for miscellaneous services far more frequently than those

TABLE XXXII

PERCENTAGE DISTRIBUTION OF NONMATERNITY PATIENTS AND OF THE CHARGES THEY INCURRED FOR MISCELLANEOUS SERVICES, BY TOTAL AMOUNT OF CHARGE FOR THESE SERVICES

Amount of Charge	Percentage of		Cumulative Percentage of	
	Patients	Charges	Patients	Charges
No charge	83.5	0.0	83.5	0.0
Under $10	8.3	8.7	91.8	8.7
$10 to $19	3.3	11.7	95.1	20.4
$20 to $39	1.9	13.6	97.0	34.0
$40 to $59	1.5	17.1	98.5	51.1
$60 to $99	0.7	14.9	99.2	66.0
$100 to $199	0.6	23.1	99.8	89.1
$200 and over	0.2	10.9	100.0	100.0

with shorter lengths of stay. Also the mean amount of such expense tends to become progressively larger among patients who are hospitalized longer.

Summary of Findings on Charges for Specific Ancillary Services

The findings of the study with respect to the proportion of patients incurring charges for the various specific classifications of ancillary services are recapitulated in Table XXXIV. Although services in one or more of these classifications were used by all

TABLE XXXIII

PERCENTAGE OF NONMATERNITY PATIENTS INCURRING CHARGES FOR MISCELLANEOUS SERVICES AND MEAN CHARGE FOR THOSE USING SUCH SERVICES, BY LENGTH OF STAY

Length of Stay (days)	Percentage Incurring Charges	Mean Charge for Patients Incurring Charge
1 to 7	11.5	$11.25
8 to 14	23.8	30.13
15 to 21	28.8	23.07
22 to 30	33.4	42.29
31 to 60	39.4	55.66
61 to 90	41.8	67.61
91 to 120	42.5	81.81
All	16.5	22.87

maternity and by virtually all medical and surgical patients, wide differences exist in the percentages using the various specific items. For example, it is seen from the table that more than nine out of ten in both categories of patients incurred charges for laboratory services, but less than one out of a hundred had charges for basal metabolic rate determination.

Differences are also apparent between maternity and nonmaternity patients. For most of the classifications of ancillary services, the percentage of maternity patients incurring charges is higher. And, with respect to most items, the difference in the percentages for the two categories of patients is appreciable. Laboratory services, however, are a notable exception and are used by an

TABLE XXXIV

PERCENTAGE OF MATERNITY AND NONMATERNITY PATIENTS INCURRING CHARGES FOR THE VARIOUS CLASSIFICATIONS OF ANCILLARY SERVICES AND RANK OF SERVICES, BY PERCENTAGE INCURRING CHARGES

Classification of Service	Percentage of Patients Incurring Charges		Rank by Percentage Incurring Charges	
	Maternity	Nonmaternity	Maternity	Nonmaternity
Drugs and dressings	94.5	81.9	3	2
Operating room	96.6	58.3	2	3
Laboratory . . .	94.5	94.1	3	1
X ray[a]	23.6	44.0	7	4
Anesthesia[a] . .	70.1	40.7	5	5
Nursery	98.0	0.0	1	-
Oxygen	5.6	4.2	8	8
Electro-cardiogram . .	2.0	6.4	9	7
Physical therapy	0.0	1.8	-	9
Basal metabolism	0.4	0.7	10	10
Miscellaneous .	33.5	16.5	6	6
Combined ancillary	100.0	98.8		

[a] Expense for these items is more commonly encountered during hospitalization than is indicated by the percentage of patients incurring hospital charges.

almost equal proportion of both types of patients. In Table XXXIV it is seen that the items of service ranking first and second, in order of how widely used, are not the same for the two categories. However, it is more important to observe that aside from nursery care the rankings of the ancillary services are not radically different for maternity and nonmaternity patients--services ranking high for one category also tend to rank high for the other, and those lower in rank similarly tend to correspond.

Significant differences also are found in the percentage of nonmaternity patients utilizing various ancillary services, when patients are classified by length of stay. Generally, as would be expected, the percentage tends to be progressively higher among those who remain in the hospital for longer periods of time. This is not the case, however, for operating room and anesthesia. Undoubtedly reflecting shorter lengths of stay for surgical than for medical patients, the highest percentage of nonmaternity patients incurring costs for these two services is found among short-stay patients. On the other hand, the use of physical therapy, oxygen, and electrocardiograms is comparatively rare among medical and surgical patients with short periods of hospitalization, but is quite common among long-stay patients.

Table XXXV summarizes the findings of the study with respect to the composition of total charges for ancillary services as well as to the amount and distribution of the expense arising from the use of the various components. It is seen that in the aggregate the first three services listed in the table, drugs and dressings, operating room, and laboratory, greatly overshadow the other services and account for more than two-thirds of the total charges incurred by all patients for all ancillary services. The primary reason for this is not that these three services are so much more expensive when used

TABLE XXXV

PERCENTAGE OF TOTAL CHARGES FOR ANCILLARY SERVICES AND AMOUNT OF MEAN AND MEDIAN CHARGES FOR PATIENTS INCURRING EXPENSE, BY SPECIFIC CLASSIFICATIONS OF SERVICES

Classification of Service	Pct. of Total Charges Incurred by All Patients for Ancillary Services	Amount of Charges for Patients Incurring Expense for Specific Classification of Service			
		Maternity		Nonmaternity	
		Mean	Median	Mean	Median
Drugs and dressings	29.31	$10.26	$ 7.56	$31.63	$13.27
Operating room	19.93	21.17	21.95	23.81	22.87
Laboratory . . .	19.47	7.87	6.67	18.02	11.66
X ray	9.91	8.45	7.70	20.66	15.20
Anesthesia . . .	8.92	12.30	13.04	15.79	15.19
Nursery	4.59	17.60	16.43	0.00	0.00
Oxygen	1.82	9.63	9.50	38.59	16.98
Electro-cardiogram . .	0.94	3.14	5.94	14.07	15.25
Physical therapy	0.45	0.00	0.00	24.20	14.78
Basal metabolism	0.07	2.00	5.00	9.87	7.01
Miscellaneous .	4.59	7.74	6.51	22.87	9.42
Total	100.00				

than the other items of service, but rather is because the first three are more widely used. In fact, for those using the various services, the mean cost for these three services tends to be lower than the mean for some of the other items. When viewed on this basis, some of the services, which account for only a minute part of aggregate charges for ancillary services, are seen to be of considerable importance--often imposing greater costs on patients than services accounting for a substantial portion of the aggregate.

Equally if not more striking, however, is the character of the distribution of the cost of many of the services among patients using them. This is indicated by the spread between mean and median amounts of charges seen in Table XXXV. The contrast in this respect between the maternity and nonmaternity categories is remarkable. In the maternity category, although the differences seen between mean and median charges are not without significance, for most services they tend to be relatively small. But for nonmaternity patients, pronounced differences are seen for most items, indicating characteristically greater dispersion of charges in this category than among maternity patients.

Among medical and surgical patients incurring expenses for the various ancillary services, charges for drugs and dressings and for miscellaneous services are the most unevenly distributed. However, the distribution of the costs incurred for most of the other services, and especially oxygen, are also extremely skewed. Charges for operating room and anesthesia are the least so. And even with respect to each of these two items over half of the total amount of charges were incurred by less than one-fifth of all nonmaternity patients. It is significant to note further that all of the services listed in Table XXXV imposed costs of more than $100 in some instances. This occurred most frequently in connection with drugs

and dressings, and for this item charges exceeded $100 for somewhat more than one out of twenty medical and surgical patients.

The charges for the various ancillary services that were incurred by medical and surgical patients vary decidedly among patients having different lengths of stay. Without exception, the mean amount of charges was lowest for patients remaining in the hospital a week or less. For patients with longer stays, charges on this basis were characteristically much higher, tending to rise, although less than proportionately, for each successive interval containing patients with longer periods of hospitalization. The sharpest rise in the level of expense incurred by patients classified by length of stay was in connection with drugs and dressings, where the increase in the mean amount of charges was more than proportionate to increases in the duration of patients' hospitalization. Almost as steep, however, was the increase by length of stay in charges for physical therapy and oxygen. Charges were more nearly level, for patients in the various length-of-stay intervals, for basal metabolism tests and electrocardiograms, although for each of these services the mean amount of charges was more than twice as much for patients remaining in the hospital beyond the average length of stay as for those staying a week or less.

Although individual patients rarely incur expense for all of the specific ancillary services, their hospital bills usually include charges for a number of these items--frequently a majority of them. The financial impact of these costs, therefore, tend to be compounded as the costs are piled one on the other. Even though a patient who is in the upper range of cost for one of the services is not necessarily in the upper range for other services, there is far more than a random chance that he will be. This is apparent from the analysis of charges by length of stay. Moreover, to whatever amount of expense is encountered for these ancillary services in combination, room and

board charges must in all cases be added. And, as has been shown, room and board charges typically exceed charges for ancillary services, especially for patients hospitalized for extended periods.

This analysis of the expenses incurred by in-patients in general hospitals would seem to firmly support the assertion at the outset of this report that patient-financing of hospital care entails a distribution of costs which is exceptionally burdensome. Too, it would seem to amply explain why the great majority of individuals and families have sought and obtained some form of protection against the financial risk resulting from hospitalization costs. In view of the rising importance of hospital care and of the expenditures that are required of consumers, continuation of the trend toward replacement of patient-financing at the time of illness by prepayment as the accepted method of financing hospitalization can be expected. For this reason, the effectiveness of measures designed to provide protection against the costs of hospitalization is of growing importance both to consumers and providers of hospital services.

CHAPTER IV

PROTECTION AGAINST THE COSTS OF HOSPITAL CARE

General Considerations

Hospital care is costly. And it is becoming more so, as the role of the hospital expands and more extensive use is made of its facilities and services. Elaborate diagnostic and treatment services, which to an increasing extent are required in the provision of modern medical care, add not only to cost but also to the efficacy and hence the importance of hospital care, making it a more essential element of personal health services and a greater necessity for individuals and families. However, the use of these services, indeed their availability, depends on payment by, or on behalf of, those using them. For the provision of these services involves "out-of-pocket" expenditures which must be recovered from some source--generally without delay, if services are not to be curtailed. Although this study has not included investigation of the income and financial resources of hospitalized patients, the study's findings as to the magnitude of the costs of hospital care and the highly erratic character of the distribution of these costs among patients emphatically point to the conclusion that payment by the users of service at the time of hospitalization is an unsatisfactory, if not unworkable, method of financing hospital care. This, it would seem, is the single most important implication of the findings.

The Significance of Prepaid Protection

The necessity of payment for hospital care creates a problem having a number of facets, several of which involve basic social values. The aspect of the problem most familiar is that bearing directly on the self-supporting individual. For him, the problem is that he must be prepared to pay whatever amount of hospital charges that he and his dependents may incur, or be subject to the stigma of medical indigency. Participation in prepayment arrangements is generally regarded as offering the solution to this problem--in fact, obtaining such protection would seem to be the only method available to any but the wealthy by which preparedness could be assured. Furthermore, prepayment makes it possible for a far higher proportion of individuals and families to assume personal responsibility for financing their hospital care than could do so by payment at the time of hospitalization.

A second aspect of the problem of paying for hospital care has to do with the financing of the provision of services. General hospitals are characteristically nonprofit community institutions and as such they have assumed special responsibilities. Traditionally they are expected to provide services to all who need them irrespective of ability to pay. This charitable precept, however, does not reduce the cost of providing services nor avoid the necessity of obtaining revenue to finance them. And if the hospital is not reimbursed for the services it renders, a deficit is certain to result. The effect of insufficient payment for care on the scope and standards of hospital services not infrequently is direct and immediate. But inadequate financing is perhaps an even greater barrier to the broadening and improvement of services to keep pace with scientific advances than it is to the maintenance of current standards. The

crucial point of concern in this is not the self-interest of the hospital but rather it is that the level and standards of hospital services which are available to the people of the community may be at stake. The method on which hospitals are increasingly relying to assure that they will receive the financing they require is prepayment--prepayment that will enable individuals and families to finance the care they seek and will thereby reduce the incidence of nonpaying and part-paying cases.

A third major aspect of the problem of meeting the cost of hospital care affects the community as a whole. In a sense, this aspect may be considered to incorporate the other two discussed. For certainly it is a matter of community interest that individuals and families should be secure against the cost of hospital care and that the hardship involved in paying for care should be minimized. Likewise, the maintenance and improvement of standards of hospital care in the community and the extent of the availability of care are matters of concern to the entire community. But beyond this, the community is concerned with the problem of payment for hospital care because it has the residual or ultimate responsibility for financing care. To the extent that individuals and families are unable to finance the services they need, the responsibility for payment or provision of care falls on society. Commonly, public agencies are legally responsible for financing such care, although public funds allocated for this purpose generally have been notoriously inadequate. The significant point to be made, however, is that the degree and extent of dependence on the community as a whole for financing hospital care, whether through tax funds, community fund-raising drives, or other forms of private charity, reflect the success or failure of individuals and families in assuming responsibility for financing their own care. Thus, this aspect of the problem of payment for hospital

care further points up the importance of prepaid protection, because prepayment as a method of financing greatly increases the ability of individuals to avoid dependence on community funds.

The Effectiveness of Prepayment

The effectiveness of prepaid protection against the cost of hospital care, therefore, concerns the individual, the hospital, and the community. In view of this, the relationship between prepayment benefits and the amount of hospital charges for an individual patient is far too narrow a basis for adequate appraisal of prepaid protection. For example, a level of protection that was sufficient in an individual case, viewed in retrospect, may well be inadequate to provide a reasonable certainty of security for those seeking such security--or even for the same patient in the event that he is again hospitalized. And the significance of an individual case in which a given level of protection is inadequate is not confined to that individual alone. It is of significance to all individuals and families having this level of protection for it represents a contingency to which they, too, are probably exposed and against which they, too, are inadequately protected. For this reason, a given level of benefits, although it may be adequate for a substantial majority of patients, may fall short of providing the security sought by individuals and families. Furthermore, prepaid protection which is inadequate for only a small fraction of patients would usually mean that prepayment fails to assure payment to hospitals for a disproportionately larger fraction of the total amount of care rendered to all patients having this level of protection. And the degree of dependence on community funds for financing of hospital care that would accompany such a standard of protection would probably be correspondingly magnified.

The over-all effectiveness of prepayment as a method of meeting the cost of consumer-financed hospital care depends on the level of population of the coverage as well as on the level of protection that is provided for those who participate. In spreading risks and pooling costs, prepayment goes far beyond leveling out the distribution of charges among patients, which might be accomplished by adoption of a flat hospital admission charge without prepayment. Prepayment involves spreading the cost of care incurred in a given interval of time over persons who are not hospitalized as well as those who are. And in large part the potentiality of prepayment in bringing the cost of hospital care within financial reach of the vast majority of self-supporting individuals and families is attributable to this broader spreading beyond patients to all members of a protected group or population. With respect to hospital care, the spreading of costs over those who do not incur expenses as well as those who do has, in fact, a more pronounced effect than would be the case for types of expense that are more widely incurred.[1]

These dual determinants of the effectiveness of prepayment, the level of protection and the level of coverage, are not independent variables where the decision to obtain prepaid protection lies with the individual. And at the outset of consideration of benefit levels, it is important to recognize the interdependence of the two. The higher the level of protection provided, other things being equal, the

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[1] Charges for physicians' care, for example, are incurred by several times as high a proportion of the population as charges for hospital care. In the nationwide sample survey conducted by the National Opinion Research Center, to which reference has previously been made, it was found that three out of four families incurred physicians' charges as compared to one out of four incurring hospital charges. (Odin W. Anderson, op. cit., pp. 27, 40.)

higher the price that must be charged for participation in prepayment. And the higher the price of protection, the greater the number of individuals and families who cannot afford the cost involved and are thus "priced out of the market." Conversely, a lower level of protection, which can be provided at a lower price, increases the potential level of coverage that can be attained, other things being equal.[1] However, it is equally important to recognize that consumer demand for any standard of protection is not unrelated to the value it represents. And when the standard is lowered, it can be assumed that demand is reduced. Furthermore, the order of priority consumers assign to prepayment may depend as much or more on such factors as the extent of awareness of need for protection and spending habits as on the factor of price. And the actual level of coverage that is attained may be less a function of price than is commonly believed.

Nevertheless, there is without question a sizable residual segment of the population for whom the cost of substantially complete protection is beyond reach financially.[2] In the absence of subsidy,

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[1] These considerations have prompted many prepayment organizations to advocate and develop various levels of protection which are designed, in terms of price, for different income groups. Not infrequently these organizations follow a practice of tailoring the benefit provisions of policies to "fit the purse" of each particular group or individual purchasing protection. The difficulty created by this is that those who can allocate the least amount for protection, and consequently receive the least protection, tend to be the most completely dependent on their benefits in the event of hospitalization. The problem is often accentuated by higher probability of hospitalization and greater severity of illness on the part of such persons.

[2] To meet this problem, which is so directly related to the distribution of income, the proposal has often been advanced that charges for prepaid protection, against the cost of medical as well as hospital care, should be graduated according to the income of the person protected. Such graduation would not only reduce the cost of

persons in this category face the alternative of inadequate protection or no protection. If partial protection is to be provided, the problem is then one of designing a limited benefit structure that will most effectively cushion the financial impact of hospitalization. The relative effectiveness of alternative approaches where funds available necessitate partial protection will be subsequently examined.

On the other hand, there is undoubtedly a substantial proportion of the population composed of individuals and families who, in the event of hospitalization, could pay part, possibly a large part, of the cost of whatever hospital care they might require. It is sometimes said that for these individuals and families partial protection is indicated. Many of these persons, however, prefer not to expose their accumulated savings to possible depletion to defray unexpected expenses for hospital care if protection can be obtained which will remove this risk. Financial reserves, although possibly adequate to meet hospital costs, are viewed as essential to family security against other contingencies which might occur. Furthermore, savings may be earmarked for other purposes; e.g., education of children, purchase of a home, travel, or retirement. For families in these

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participation for those in low-income groups but also would presumably offset this reduction in price by an increase in price to higher-income groups, thereby avoiding or reducing the necessity of public subsidy. Such proposals do not seem to be feasible under conditions of voluntary participation and of availability of protection under arrangements where prices charged are not so graduated. Aside from this, the administrative problems involved in such graduation would be imposing.

Although income distribution is seen to be a factor affecting the extension of prepayment coverage on a self-supporting basis, it is significant to note that in view of the distribution of the costs of hospital care the necessity for prepaid protection would appear to be little changed by greater equality in income distribution.

circumstances, substantially complete prepaid protection offers a convenient and systematic method of budgeting for the contingency of hospitalization. The preference to be fully protected, instead of only partially so, is not based on necessity for complete protection in the sense of security against dependence on charity in the event of hospitalization. Rather the purpose of full protection and the need it meets is that it removes the possibility of having to draw down financial reserves to meet hospital costs, at a time and to an extent that is unpredictable--a contingency that is a threat to any personal plans that depend on keeping family savings intact. The requirements for a level of protection that will meet this need are an important consideration for the provision of prepaid protection.

Implications of Findings on Major Approaches to Prepaid Protection

Cash Indemnity Benefit Approach

The most prevalent type of hospitalization prepayment benefit provision is the cash indemnity benefit. The indemnity-benefit approach is characteristic of insurance company policies and to some extent it is also found in other types of prepayment arrangements. Under this approach stipulated monetary benefits are payable to the insured in the event of hospitalization, subject to the eligibility and other terms of his policy. Generally, benefit payments are in the way of reimbursement, meaning that the stipulated amounts are maximum allowance and that payments may not exceed the amount of cost incurred for hospital care.

Although this type of benefit may provide a lump-sum allowance applicable to whatever hospital services are used, customarily

it applies to a specific item or classification of items. Cash indemnity benefits are most extensive in connection with room and board. But they are found quite commonly in relation to ancillary services as a maximum lump-sum without allocation for specific items. Somewhat less often, such a benefit applies to a specific ancillary service, such as anesthesia or laboratory services. Where the indemnity-benefit approach is employed, the benefit structure typically is made up of two or more cash indemnity provisions, each of which is applicable to a separate item or classification of the hospital charges that may be incurred. Sometimes, however, such a provision relating to a specific service is found in combination with other types of benefits for other hospital services.

Characteristically, under the indemnity-benefit approach, the level at which the maximum cash allowance is fixed is designed to be lower than the amount of charges patients will incur when hospitalized. This is intended to provide an element of coinsurance. The rationale underlying this approach is that by leaving a margin which will have to be paid by the patient at the time of hospitalization, improper utilization is prevented or curbed. Such a margin between the amount of the benefit and the amount of anticipated charges is necessary, it is thought, to make the risk insurable. The fact that the patient himself can expect to incur a cost when hospitalized is considered to have the effect of placing the occurrence of the contingency beyond the control of the insured, a condition regarded as essential to insurability. And, in this view, if the benefit level is not below the amount of charges the patient can expect to incur, a fundamental principle of insurance is violated.[1]

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[1] It should be noted that a number of other significant aspects of the indemnity-benefit approach are not discussed since they are not directly pertinent to the consideration of the financial aspects of benefit provisions.

As a result of this design, cash indemnity benefits tend to apply to the first or bottom portion of a patient's hospital expense. Protection against cost is provided until the level of the maximum cash allowance is reached and beyond this point the entire cost is borne by the patient. Consequently, the effectiveness of an indemnity benefit provision tends to be inversely related to the amount of cost incurred by the patient having this type of protection. With the demarcation between small and large depending on the level at which the maximum cash allowance is set, indemnity benefits mean a high degree of protection against the risk of incurring a small amount of hospital charges, and a low degree of protection against the risk of unusually large costs. In effect, individuals and families covered by this type of prepaid protection remain exposed to the open-end and most expansive portion of the financial risk arising from the hazard of hospitalization.

In terms of effectiveness in relieving individuals and families of this risk, cash indemnity benefits are most applicable to items of hospital service which involve charges that are most nearly uniform in total amount for all patients utilizing the service. And for items not imposing uniform costs, the indemnity type of provision becomes increasingly inapplicable the greater the variation manifest in the distribution of charges among patients using the item or class of items to which the provision relates. From the investigation of the distribution of charges, it was found that the items of service for which patients incur charges that are most nearly uniform are electrocardiograms and basal metabolism rate determinations, and the least uniformity was found for drugs and dressings.

The most significant implication of the study findings with respect to this type of benefit, however, is that the indemnity-benefit approach seems to be ill-adapted for the accomplishment of the basic

purposes of prepaid protection. This conclusion is strongly suggested by the pronounced extent of variation that was found among patients in the amount of hospital charges incurred for individual services, for classes of services, as well as for all services combined. Even though partial protection is necessary or desired, the implication of the findings clearly is that the indemnity type of benefit provision is unsuitable for the purpose of relieving exposed persons of financial risk. For the portion of the cost not met by such a provision represents the part of the total risk against which protection is most needed.

From the findings, it is apparent that the amount of charges against which protection is not provided under the indemnity-benefit approach would tend to vary widely among patients. Furthermore, if the maximum amount of a cash allowance is fixed at a level designed so that most of the patients would bear some part of the cost for the service or services involved, then the magnitude of the costs which would exceed such a level would tend to be substantial in many instances. In fact, the difficulty of fixing the amount of a cash allowance so that it would represent a meaningful level of protection and yet be consistent with the rationale of the indemnity-benefit approach would appear insurmountable in connection with most hospital services. For example, a maximum allowance of $100 for ancillary services combined would meet no more than three-fourths of the charges incurred by medical and surgical patients for ancillary services. This benefit, however, would leave no element of coinsurance on ancillary services for more than three out of four of these patients.

A further implication of the findings on indemnity benefits is that the establishment of a cash allowance on a per day basis would tend to result in less variation among patients in the proportion of total cost, for the service or services concerned, left for the patient

to pay at the time of hospitalization. This follows from the tendency of the amount of charges to vary with length of stay, as was seen in the data. Among the various services, this relationship was most direct and proportionate in connection with room and board although it was present to a significant degree for almost all other items of service, especially drugs and dressings. Although indemnity benefits, as previously stated, generally are on a per day basis for room and board, rarely are they found on this basis when applied to other types or items of service. Nevertheless, the extent of variation found by this study in the amount of charges incurred by patients who have the same length of stay would seem to indicate that placing indemnity benefits on a per day basis does not remove the basic deficiency in their design. It should be pointed out, however, that fixing allowances on a per day basis considerably reduces the difficulty of providing meaningful benefits, yet retaining an element of coinsurance. Even though the remaining difficulty in this respect is less pronounced for room and board than for other services, still it would seem to amount to a serious obstacle to the attainment of effective prepaid protection by means of the indemnity-benefit approach.

Service Benefit Approach

A service benefit provision assures covered individuals and families of complete protection against the cost of the hospital service to which the provision applies, irrespective of the amount of the cost that may be incurred. This type of benefit is characteristic of Blue Cross Plans. Also it is found quite frequently in other types of prepayment arrangements except insurance company policies. Service benefits are generally subject to an over-all limitation on the number of days of care as well as to other provisions contained in

the prepayment contract. Very rarely does the prepayment organization pay benefits to the contract holder which are reimbursement for an outlay he was required to make at the time of receiving services. Instead, the organization makes settlement directly with the hospital that rendered the care. Typically, where service benefits are provided, a contractual relationship exists between the prepayment organization and the hospital involved. The benefit structure of a service program consists of a series of provisions setting forth the specific nature of the services to which covered persons are entitled in the event they are required and available. Frequently, cash allowances or other types of provisions for one or more items of hospital service accompany service benefits applying to the remainder. In some instances, a service benefit is modified by features requiring some payment on the part of the patient receiving the service and becomes what might be termed a quasi-service benefit provision.

The philosophy underlying the provision of benefits on a service basis is in direct contrast to that behind the indemnity-benefit approach. Service benefits are based on the concept that in the event of hospitalization the need of the patient is in terms of services rather than cash and that it is the function of prepayment to assure that medically indicated services will be provided, in so far as removal of any financial barrier can give such assurance.

The service-benefit approach applied to the hospital services used by patients represents a broad conception of the role and function of prepayment in financing hospital care. To the extent that the population of a community is covered by this type of protection, there is assurance that the problem of payment for hospital care is adequately met for individuals and families, hospitals, and the community, as well. The prepayment arrangement provides a mechanism by means of which all persons in the covered population budget for

the contingency of hospitalization and through which all participate in the financing of the operation of the community's hospitals. That the service-benefit approach has significant implications on the availability of care and standards of service in the community in addition to the security of individuals and families against hospitals costs would seem beyond doubt.[1]

The exceedingly wide variation found in the amount of expense incurred by patients and the disproportionately large share of total hospital charges which must be paid by or on behalf of a relatively few patients would seem to have considerable bearing on the validity of service benefits for all interests concerned. As was pointed out earlier, the significance of extremely large hospital bills extends beyond the few individuals and families directly affected. If adequate protection against such bills is not provided, all covered persons remain exposed to a serious hazard. This would seem to be clearly implied by the findings of the study, for example, that patients confined to the hospital for longer than 60 days could expect on the average a bill well in excess of $1,000 for hospital care, and also that a majority of patients in the highest tenth of those staying as long as three months incurred charges of more than $3,600.

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[1] It should be noted that other significant precepts, features, and implications of the service-benefit approach are not discussed since the purpose here is only to indicate the general nature of this type of benefit provision and the approach it represents.

In a financial frame of reference, as is this discussion of the desirability of service benefits, attention is drawn to that portion of the total cost of hospital care which represents the major financial problem. However, it is important to recognize that in a discussion of broader scope, health and medical considerations relating to the provision of service benefits for hospital use involving small amounts of expense would warrant equal attention.

Also pertinent to the validity of service benefits is the finding that infrequent but large hospital bills represent a substantial proportion of total hospital charges. The findings of the study show that while less than 2.5 percent of all hospital patients incurred charges totaling $500 or more, bills in this category represent more than 15 percent of the total amount of charges on which hospitals depend for revenue to finance their operations. This would seem to strongly imply that the provision of services is dependent to a significant extent on adequate financing of unusually large hospital bills. And the margin of hospital revenue involved here would seem to be of crucial importance to hospitals' ability to improve and expand their technical equipment and their specialized services, essential to make possible the miracles of modern medical science. A primary determinant of the extent of availability of such care in the community may very well be the effectiveness of prepayment benefits in meeting the costs incurred by patients with unusually large bills. And, again in this connection, it would appear that the interest of all families and individuals is affected, for no one can know whose life or health might soon depend on the availability in the community of such services.

The degree of variation found among patients in their use of services and the costs incurred would seem to have an especially important bearing on the selection of service benefits when prepaid protection is obtained on a group basis. As was pointed out in Chapter II,[1] group coverage, as distinct from individual coverage, is by far the most extensive as well as the most desirable method of prepayment coverage. The relevance of this to the matter at hand lies in the fact that where group coverage is provided a single standard

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[1] See Chapter II, p. 69 ff.

of benefits customarily is selected which applies to all persons who participate in such an arrangement for prepaid protection. In view of the probability that most groups, especially large groups, include persons in widely differing financial circumstances it would appear that only service benefits would assure that the need of the various members of the group for protection are met. Moreover, the fact that dependents of the members of the group are generally also included in the program suggests that the degree of variation in health status and range of possible need for hospital care among persons covered under a group prepayment arrangement further adds to the validity of the service-benefit approach in designing a standard of protection for group coverage.

Such considerations are even more pertinent in the development or selection of a uniform standard of prepaid protection which is designed to be extended broadly, over a substantial proportion of a community's population. The wider the population coverage and the more diversity among the groups and individuals covered, the more certain it would appear that service benefits are required to provide adequate protection.

Deductible Benefit Approach

Although deductible provisions are usually not considered to be a type of benefit provision co-ordinate to cash indemnity and service-benefit provisions, it would appear quite proper to classify the approach represented by deductible provisions in a discrete category. Generally, however, deductible provisions are viewed as a modification of either cash indemnity or service benefits. And in point of time, deductible provisions often are adopted as a modification of service or cash indemnity provisions in an existing program.

The essence of the deductible approach is that it introduces coinsurance, but at the opposite end of the risk than is the case under the cash indemnity approach. In other words, the maximum cost to be borne by the patient is fixed, instead of the maximum amount of cost to be borne by the prepayment organization. In some instances, the patient's share in the cost of hospital care is stipulated, not as a fixed amount, but in terms of days of care. Whether expressed in this way or in monetary terms, however, the effect is that protection does not apply to first costs incurred by patients but commences after a specified point and extends upward. Although a ceiling is usually placed on deductible benefits, either in the form of a limitation on total amount or on total days of care, these tend to be considerably higher than is the case for the other types of provisions discussed. Deductible provisions may be applied either to a specific item or classification of service or to all services combined.

The rationale for adoption of the deductible approach is that coinsurance, especially when applied to the first portion of expense, is effective in discouraging faulty utilization of services. Another consideration that is often stressed is the elimination of small claims. Such claims, it is said, involve amounts against which protection is not only unnecessary, but also undesirable, since the cost of handling them is excessively high in relation to the amounts involved; therefore, financing of small expenses through prepayment is wasteful. Furthermore, coinsurance in the form of a deductible provision is especially effective in reducing benefit costs, thus permitting a lower price to be charged for prepaid protection than would otherwise be necessary. This aspect of the deductible benefit approach is an appealing one at the time prepayment arrangements are initially formulated, and perhaps even more so for existing programs, particularly for those providing service benefits. Because of rising hospital costs

and increasing utilization, the maintenance of a given level of protection has required periodic and substantial price increases. As a means of avoiding or reducing the amount of such increases, adoption of deductible provisions is frequently proposed and has been adopted in a significant number of instances.

Several conclusions regarding deductible provisions are suggested by the findings of this study. In the first place, the findings show that hospitalization so rarely entails only nominal expenses that a deductible provision could eliminate few claims of that character. A moderate deductible amount of $25 or less, as is sometimes proposed, would fail to materially reduce the number of claims by excluding those under the level established. This is apparent from the results of the analysis of patients' hospital charges showing that only 1.1 percent of all patients incur total charges of less than $20. If the amount of a deductible provision were $40, then it is seen that the claims of 8.6 percent of all patients would be excluded. Beyond this level, increases in the deductible amount would eliminate benefits for proportionately more patients. If fixed at the level of $100, the number of claims would be reduced by considerably more than a third.

Furthermore, the findings show that the number of claims for small amounts of benefits, on which handling costs are said to be excessive relative to the amounts involved, would be substantially increased rather than reduced by the imposition of a small or moderate deductible amount. This follows from the data just cited. If the amount of $20 were deductible, with benefits covering charges above this level, all patients incurring charges of more than $20 but less than $40 would then receive benefits in the amount of $20 or less. And in the study it was found that only 1.1 percent of patients had total charges of less than $20, whereas 7.5 percent incur charges in

the range of $20 to $39, inclusive. Therefore, this would mean that the proportion of patients who would receive benefits of $20 or less under the deductible provision would then be over seven times as great as the proportion who receive benefits of less than $20 in the absence of the deductible provision. If the handling of benefit payments in the amount of $20 or below is considered wasteful because of expenses involved, then a similar conclusion about the effect of deductible amounts fixed at any level up to at least $200 would be reached on the basis of the study findings. This would imply that provisions stipulating a flat deductible amount applicable to patient's total hospital charges lack validity for the purpose either of reducing the number of claims by excluding those for nominal amounts or of eliminating claims for small amounts of benefits.

In reducing the number of beneficiaries, a deductible provision requiring that the patient pay the cost of hospital care for the first day or few days of his length of stay would be much more effective than a deductible provision in monetary terms.[1] The study data show that one out of eight claims would be eliminated if the entire cost for the first day of hospitalization were borne by the patient; and if the line were drawn at the first two days, claims would be reduced by somewhat more than one-fifth.

In connection with the effect of the deductible approach in reducing the number of claims, it is noteworthy that this approach applied to a single item or class of hospital services would result in little or no reduction. All maternity patients and all but 1.2 percent

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[1] It should be pointed out, however, that a deductible provision in terms of days of care and applied to all services combined creates difficult administrative problems and quite probably creates incentives for improper utilization that tend to defeat a major purpose of the provision.

of medical and surgical patients, it was found, incurred charges for more than one item or class of services. Based on the findings of the study, therefore, a deductible provision related to one item or class of services could exclude no more than the 1.2 percent; and this reduction would occur only if it were applied to room and board. Related to one or more ancillary services, a deductible provision would exclude no claims from hospitalized persons.

The principal implication of the findings on the validity of the deductible concept, however, is that in case partial protection is deemed necessary or is desired, then protection subject to deductible provisions is far more effective in reducing the financial impact of hospital costs than protection subject to cash limitations on the amount of benefits. The relative effectiveness of these approaches is suggested by the following illustration. The findings of the study of the distribution of hospital charges indicate that the extent to which total charges incurred by medical and surgical patients would be met by a lump-sum cash allowance of $250 is approximately the same as would be met by a deductible provision of $40 with benefits covering all costs incurred by patients in excess of $40. For the patients as a group, these two provisions, one a cash indemnity benefit, the other a deductible benefit, are virtually equivalent in meeting the cost of care. And presumably the price charged for the protection provided would roughly be the same for the two. The effect, however, of the two provisions would be significantly different. Under the cash allowance provision a great majority of patients would have no hospital costs to pay. But, the entire impact of the deficiency of the prepaid protection in financing hospitalization would be concentrated on the relatively small residual. And the costs falling on these patients would range upward to several thousand dollars for some individuals. Under the deductible provision, although none would have no cost to pay, no patient

would bear a cost greater than $40. There would seem to be little question but that individuals and families covered under the deductible provision would have greater financial security against the cost of hospitalization than those covered by the cash indemnity provision. And the financial problem arising from a maximum cost of $40 would seem to be far less than would be created by a lesser number of unusually large hospital bills, whether considered from the standpoint of the individuals and families, the hospital, or the community.

Although the alternatives poised are merely illustrative, the conclusion suggested is that, if partial protection is to be provided, the deductible type of benefit provision has validity, in the context of reducing the problem of payment for hospital care.[1] Protection against the risk of incurring exceptionally high costs[2] would appear to represent the first priority in terms of need for protection, and to constitute the most effective application of a limited outlay for protection purposes. In terms of spreading the risk of hospital costs,

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[1] The effect of deductible provisions on the distribution of costs, however, is only one of several grounds on which the validity of this approach should be examined. The deductible approach has broad and important implications on such matters as the purposes to be accomplished by prepayment, responsibility and methods for curbing faulty utilization of services, and access to diagnostic and treatment services early in the course of illness. Although beyond the scope of this discussion, these implications require careful evaluation as a prerequisite to balanced judgment on the deductible approach in the provision of prepaid protection.

[2] Such protection is sometimes termed "catastrophic protection." The fact that protection against extremely high costs is afforded by service benefits often is not recognized in the use of the term and generally it refers to protection which is confined entirely to the upper fringe of the risk to which persons are exposed. When so used, the catastrophic type of protection represents the deductible approach with the deductible amount fixed at a relatively high level.

the more highly skewed the distribution of charges among patients, the more pronounced the advantage of the deductible approach over other approaches which would tend to distribute the aggregate difference between the amount of charges and benefits less evenly and less widely among patients. For the purpose of reducing the financial impact of hospital costs, therefore, the deductible approach is relatively more applicable to medical and surgical than to maternity patients, since charges incurred were found to be more evenly distributed among the latter. Similarly, from the study findings, the approach would appear to be more applicable to room and board service than to combined ancillary services. And among the ancillary services, its applicability would seem to be greatest for drugs and dressings.

Implications on Other Aspects of Prepaid Protection

One of the broader implications of the findings with respect to the distribution of charges among patients relates to the segregation and exclusion from protection of admissions for one or more specified conditions which tend to involve high costs. A reduction in average benefit costs per admission accomplished in this manner tends to leave exposed a portion of the risk involving a greater need for protection than some part of the risk against which protection is provided. Although this conclusion can be reached on an a priori basis, the study findings serve to illustrate the point involved. In the event protection were provided for maternity but not for non-maternity admissions, the average benefit cost per admission would be considerably lower than if all admissions were covered. But the admissions not covered would represent relatively greater risk than those against which protection is provided. The data also indicate

that protection against admissions involving surgery to the exclusion of medical cases would tend to have a similar effect. Although segregation for the purpose of reducing average benefit costs by excluding some or all patients in a diagnostic classification tending to incur relatively high costs is seldom on the basis of as broad classifications as those referred to, nevertheless, the effect produced would tend to be the same and the conclusion suggested would seem to have rather general applicability.

Although the findings of the study have significant implications on choices between alternatives encountered at many points in developing or selecting programs for prepaid hospitalization protection, one of the more important of these involves provisions limiting the number of benefit days. Nearly all hospitalization prepayment benefit structures, whatever the type, contain provisions fixing a maximum limit of the length of stay during which benefits are available to covered patients. The effect of such provisions is that charges incurred after the exhaustion of the stipulated benefit period fall on the patient.

Although it would appear that limitation on the number of days of care might not be applicable under the cash indemnity approach, since maximums are fixed on the total amounts of benefits, such limitations are generally found relating to room and board service in programs of this type. When cash allowances for room and board charges are on a per day basis, as they customarily are, the maximum allowance for this service is derived from the maximum fixed on the number of days multiplied by the daily allowance. In some cash indemnity programs, the cash allowances for ancillary services, if not exhausted before the stated number of days, are no longer available to the covered patient, but usually this is not the case.

Under the service benefit approach, limitations on the number of days constitute the only limitation on the amount or extent of the

stipulated service that will be provided as benefits to covered patients. Typically, in a service program, the limit on benefit days is a blanket provision applying alike to all the specified hospital services included under the program. Consequently, the point at which the maximum number of benefit days is fixed is one of the more important features of such a program.

From the findings of the study it is apparent that a ceiling placed on benefit days is quite analogous in effect to a monetary ceiling on benefits, for the distribution of patients by length of stay was found to be quite similar in character to the distribution by amount of hospital bill. Based on the findings, a maximum of 21 benefit days, for example, would directly affect almost an identical proportion of all patients as a maximum lump-sum cash allowance of slightly over $500. Under either provision, about 4 percent of patients would exceed the limitation. Those exceeding the cash limitation would bear all costs incurred above the stipulated level; those whose length of stay exceeded 21 days would be required to pay for all services used beyond that time.

In the illustration, the amount of cost left for the two equal-sized groups of patients would be roughly the same.[1] But the way in which the two limitations would affect individual patients would tend to be different in some instances. As indicated by the variation of charges incurred by patients with the same length of stay, some patients who remain in the hospital for 21 days or less have hospital bills of more than $500. These patients would not be affected by the

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[1] The amount of cost that would fall on patients whose length of stay exceeds a given number of days cannot be precisely determined from the data since the point of time in the course of patients' hospital stays at which charges for various services were incurred was not determinable.

limitation on benefit days but would be affected by the ceiling on total amount of benefits. Conversely, some patients whose length of stay exceeds 21 days and who therefore would encounter the limitation on days, have hospital bills of less than $500 and so would not be affected by the maximum on amount of benefits.

Nevertheless, the over-all effect of limitations on benefit days is much the same as monetary limitations--the cost not met through prepayment is concentrated on a relatively few patients; and all persons covered under the provision remain exposed to the open-ended portion of the risk created by the cost of hospitalization. The implications of the findings on the two types of provisions, consequently, are also much the same. Even where partial protection is considered to be necessary or desirable, the imposition of limitations on the number of benefit days would seem not to represent optimum design for the benefit structures of prepayment programs.[1]

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[1] In this connection, as elsewhere, however, it should be recognized that considerations other than effectiveness in spreading the financial risk of hospital costs have an important bearing. One such consideration especially pertinent to this point is the tremendously important question of provision for the care of long-term illness and the responsibility and role of the general short-term hospital in this connection. For example, where such hospitals are not geared to provide long-term institutional care, as is generally the situation at this time, a question arises as to whether or not provision of service benefits without limitation of benefit days is appropriate. Involved here is the question not only of the responsibility and function of the general hospital, but also the question of consumer financing of long-term institutional care and the function of prepayment programs in this connection.

Use of the Findings as a Basis for Appraisal of Benefit Provisions

A factor having a crucial bearing on the problem of payment for hospital care is the extent to which individuals and families recognize the financial risk to which they are exposed and succeed in obtaining adequate protection. As surely as payment for care at the time of illness is a burdensome if not impossible method for consumers to finance the hospital care they need, the decisions made by individuals and families regarding participation in programs for prepaid protection and the choices they make as to levels of protection will largely determine whether the problem of payment becomes less intensive or becomes critical. But if these decisions are to produce a satisfactory result for the persons making them, as well as for the hospital and the community, it seems essential that the level of information possessed by consumers when purchasing prepaid protection must permit informed decisions.[1]

In this connection, information on the magnitude and distribution of hospitalization costs, such as is presented in this report, should be of value in providing content for educational measures to acquaint the public with the character and extent of the problem of paying for hospital care. However, information on the general problem, even though detailed, may fail to meet the need of purchasers of prepaid protection for objective criteria permitting comparisons between alternative selections and providing a basis on which they can judge whether they are getting the security they want against the financial risk of hospitalization.

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[1] See Chapter I, pp. 5 and 6, for discussion of the need on the part of consumers for information on which to base such decisions.

The inadequacy of information on the distribution and composition of costs for use by consumers when choosing prepaid protection is in part attributable to difficulty of application. Complications are almost invariably involved in an attempt to apply data on costs to a specific benefit provision for the purpose of ascertaining the degree of protection it affords. For example, even though it may be clear that data showing the distribution of charges incurred for a particular service or group of services have an important bearing on the effectiveness of benefit provisions relating to such services, still the effectiveness of a given benefit amount or level may not be readily ascertainable from the data. Because of the characteristics of many of the distributions of cost, changes in benefit amounts usually do not mean proportionate changes in the degree of security afforded. The difficulty is compounded where there are several factors simultaneously bearing on the level of protection, some mutually reinforcing and possibly some with cross-effects tending to cancel out. The multiplicity of items of service for which there are separate benefit provisions also adds greatly to the complexity. Sharply differing approaches to the provision of protection are encountered and these approaches often affect the distribution of costs among patients in ways that are not obvious. In fact, almost endless ramifications are involved in the matching of benefits and costs at the many points and in the many ways in which the two may be related. These are only some of the complications, but sufficient to indicate that ascertaining the comparative effectiveness of differing schedules of benefits by making use of general data on hospitalizations costs involves difficulties with which few purchasers of prepaid protection can cope.

Simplicity is a prime requisite for a device or method designed for the use of consumers in appraising benefit alternatives.

Procedures requiring use of technical materials or involving lengthy or difficult computations clearly would not be suitable for general usage. If the steps in application of a method were numerous or if extensive instruction was necessary, only limited use by consumers could be expected. Ideally, a single index or yardstick would suffice for measurement of the level of effectiveness of a given provision.

If tables or charts or other such materials presenting information on magnitude and distribution of hospital cost would not enable consumers to appraise the effectiveness of benefit standards, the question then is how might such information be made useful. It would seem that the answer is not to be found in abbreviation or consolidation of cost data or in the presentation of means or medians or other measures of central tendencies of the distributions. These would tend either to be inadequate or to require skill in interpretation and use beyond that possessed by the intended users.

The conclusion suggested is that if information on hospitalization costs is to be generally useful to consumers in their selection of prepaid protection it must be converted to a base that will coincide with the form and terms of the benefit provisions from which consumers must make their selections. Moreover, to be most useful as a guide to consumers, the information should explicitly indicate the degree of effectiveness of the benefit provisions being appraised. A further important objective in the design of a method of benefit appraisal for consumer use is that it accomplish a synthesis of various benefit components related to separate hospital services so as to indicate a composite value for an entire benefit structure. This value should represent the weighted sum of the values of the benefits contained in a hospitalization contract or policy.

Although the difficulties involved in developing such a method indeed appear formidable, they do not seem out of proportion to the

potential value of a successful method. As discussed earlier, the need of consumers is acute. Available contracts and policies frequently do not provide satisfactory protection. And consumers generally are unable to determine what they are getting in terms of degree of protection, or to what extent their selection leaves them unprotected.

If, however, a high degree of preciseness in the results of evaluation was necessary, the possibility of devising a successful method would seem remote. But this is not the case. The permissible margin of error would appear to be relatively wide. This is not to say that accuracy in appraisals of benefits is not an important consideration. Rather it is the absence of existing methods by which the effectiveness of benefits can be appraised by purchasers of prepayment which would allow wide tolerances in accuracy. Even if capable of providing only gross indications of the relative effectiveness of benefits, a usable method of appraisal would serve an important need as a guide to families and individuals seeking security against the financial risk of hospitalization.

Possible methods of relating the findings of this study to the problem of evaluating benefit provisions have been explored. Although no method has been found that fully satisfies the conditions for optimum usefulness that have been discussed, an approach has been developed which would seem to offer some possibility for practical application of information derived from the study. This approach might appropriately be called a method for bench mark estimation of the effectiveness of prepaid protection.

From the study findings a series of bench marks for use in appraising the principal types of hospitalization benefit provisions were derived. These are presented in Table XXXVI. In this table the amounts of benefits are set forth which are required to provide

TABLE XXXVI

BENCH MARKS FOR ESTIMATION OF EFFECTIVENESS OF HOSPITALIZATION BENEFIT PROVISIONS

Benefit Provision	Level of Effectiveness in Meeting Aggregate Cost of All Admissions				
	30%	50%	70%	90%	99%
For Nonmaternity Admissions:					
Amount of Cash Allowance for Ancillary Services Required for Stated Level of Effectiveness					
Drugs and dressings	$ 15	$ 33	$ 68	$182	$590
Operating room	8	13	20	35	69
Laboratory	7	12	21	55	184
X ray	8	15	25	45	88
Anesthesia	6	9	16	26	51
Oxygen	16	34	71	192	428
Electrocardiogram	5	7	12	22	58
Physical therapy	10	19	38	101	260
Basal metabolism	4	7	10	26	247
Miscellaneous	10	24	49	133	434
Combined ancillary services	27	51	93	223	729
Amount of Daily Cash Allowance for Room and Board Service Required for Stated Level of Effectiveness[a]					
Room and board	$ 4	$ 7	$ 9	$ 13	$ 16

TABLE XXXVI--Continued

Benefit Provision	Level of Effectiveness in Meeting Aggregate Cost of All Admissions				
	30%	50%	70%	90%	99%
For Nonmaternity Admissions (continued):					
Number of Benefit Days Required for Stated Level of Effectiveness for Service Benefits					
Benefit days	3 days	6 days	10 days	25 days	72 days
Deductible Amount Applied to Total Hospital Charges Results in Stated Level of Effectiveness[b]					
Deductible amount . . .	$202	$111	$ 57	$ 18	$ 2
For Maternity Admissions:					
Amount of Lump-Sum Cash Allowance Required for Stated Level of Effectiveness					
Lump-sum allowance .	$ 43	$ 67	$105	$159	$309

[a] Level of effectiveness for room and board allowance is subject to discount for limitation on benefit days. By comparison of such limitation with the bench mark levels for benefit days, the appropriate discount can be approximated.

[b] Assuming that complete protection is provided for charges exceeding the deductible amount.

five different levels of effectiveness in meeting costs that the study shows are incurred for hospital care. The design of the table reflects an attempt to maximize the applicability of the data not only by permitting appraisal of the principal types of prepayment benefit structures but also by providing for several of the more common variations within these types. The use of the table involves merely comparison of the benefit being appraised with the various bench mark levels of effectiveness. By this means, the level of protection afforded by the benefit can be approximately gauged. Following illustration of the application of the data to several prevailing benefit provisions and structures, the approach employed will be more fully discussed and evaluated.

A group insurance program covering the employees of a manufacturing establishment in the automobile parts industry provides the following cash indemnity benefits: for room and board service, $12.00 daily maximum allowance for 120 days; for ancillary services, $240.00 unallocated maximum allowance; for maternity admissions, $120.00 maximum lump-sum allowance. By reference to Table XXXVI, the level of effectiveness of this program in meeting aggregate expenses incurred for hospital care may be estimated in the following manner: The room and board allowance of $12.00 per day is seen to be somewhat below the bench mark allowance for a level of 90 percent effectiveness; in comparison with the bench marks for cash allowances related to combined ancillary services, the allowance of $240 in the program falls between the 90 percent and the 99 percent levels of effectiveness, but is obviously much closer to the former; the lump-sum allowance for maternity admissions of $120.00 is seen to be higher than the bench mark for 70 percent effectiveness but somewhat below the amount of allowance required for 90 percent effectiveness.

The level of effectiveness of the maternity provision could be roughly approximated at about 75 percent effectiveness.

From these comparisons with the bench mark levels, it would seem that a fairly good idea of the effectiveness of the program can be obtained in comparatively simple manner. As a matter of fact, it is quite possible that the estimates derived from the table constitute a better approximation of the effectiveness of the program than is available to persons directly responsible for the program.

For further illustration, the use of the table will be shown in appraising an individual type of insurance policy sold by a Midwestern insurance company specializing in this type of coverage. This policy, which is one of the most widely held policies of its type, provides the following cash indemnity benefits: for room and board service, daily cash allowances for 90 days in an amount of $3, $4, $5, and so on up to $10, depending on the benefit level selected at the time of purchase by the person buying the protection. Maximum allowances for specific ancillary services are: laboratory, $5; X ray, $10; anesthesia, $10; oxygen, $15; routine drugs, $5; penicillin, $15; and blood, $15. For operating room expenses, the policy provides for full payment of charges incurred. No provision is included for maternity admissions.

Again referring to the table for purposes of making comparisons with the bench mark levels, it is seen that the room and board allowance would vary from below 30 percent to above 70 percent in level of effectiveness, depending on the choice made by the purchaser. The allowances for the ancillary services fluctuate around the 30 percent level of effectiveness with the notable exception of operating room which, at full payment, would exceed the 99 percent level. The table does not permit evaluation of the allowance for some of the items; it would be in error, for example, to treat the allowance for penicillin

as the equivalent of an allowance in the same amount for all drugs and dressings. Likewise, the allowance for blood cannot be correctly gauged by comparison to the bench marks for miscellaneous ancillary services. It should also be noted that there was no provision in the program for several of the minor ancillary services. Although difficulties such as are here illustrated would constitute a highly complicated problem if precise evaluation were required, it would seem that they have not negated the usefulness of the table in this instance if its purpose is to convey an approximation of the degree of effectiveness or ineffectiveness of the protection provided.

Hypothetical illustrations will serve to show the use of the table in connection with service benefits. By comparison with the bench mark levels, it would be apparent, for example, that a service benefit program covering all charges incurred for 70 benefit days would be slightly below the 99 percent level. If it were found that cash allowances were provided on some items in combination with service benefits, they could be separately appraised. Likewise, with respect to deductible benefits applied to the total hospital bill it is seen, for example, that a deductible amount of $100 would mean a level of program effectiveness at slightly higher than the 50 percent bench mark. Although the fact that the deductible amounts vary inversely rather than directly with the level of effectiveness is a possible source of confusion in the use of the table, it does serve, however, to highlight the fact that the deductible type of benefit is the reverse in this respect of limitations on benefit amounts or benefit days.

The use of the findings of the study for appraisal of benefit provisions by means of the method illustrated has a number of limitations as well as some advantages to which attention was not specifically directed by the illustrations. At the outset, it should be noted

that financial considerations constitute the entire basis for appraisal, to the exclusion of other considerations which in many instances may be of equal or greater significance. Also beyond the scope of the table is the important aspect of prepayment policies and contracts dealing with eligibility. Provisions relating to waiting periods and exclusions for maternity, pre-existing conditions, specific disease conditions, repeated admissions, and such have an important bearing on the degree of protection afforded. The table, however, purports to show only the effectiveness of benefit provisions for those who receive benefits. Likewise, the table does not reflect admission rates; it is designed to indicate the level of benefit effectiveness when persons with such benefits are hospitalized, and how frequently that event occurs is beyond its purview.

What would seem to be the major weakness of the table, among the factors that are within its scope, is the failure to show the concentration of the residual cost which is not met by a given bench mark level of effectiveness. Although this can be detected from the very large increases in the benefit allowances when moving from left to right toward higher levels of effectiveness in the table,[1] this feature of the distribution of hospital costs does not appear to be adequately reflected in the table. A further limitation of the table as presented is that the relative importance of the various services is not shown. This could easily be accomplished[2] but the feasibility of providing weights to be employed in appraisal of benefit provisions by persons selecting prepaid protection would seem questionable. Attention should also be called to the fact that a major defect might

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[1] This effect is not observed in connection with allowance for room and board service because the allowance for that service is on a daily basis.

[2] The appropriate weights to be used, in connection with the table, for room and board and ancillary services, separately or combined, are the percentages found in the column headed "Nonmaternity Patients" in Table VI, page 100.

appear to exist in connection with the necessity of discounting the effectiveness of room and board allowances, because of an overriding limit on benefit days; but benefit periods of 25 days or less are so infrequent that in practical application the problem is regarded as minor.

The major advantage of the table in increasing the usefulness of the study findings would seem to be that it is simple to use. It expresses the findings in terms that are directly comparable with the benefit provisions being appraised. No derivations or computations are required. Although interpolation or extrapolation would add precision in the gauging of effectiveness, it is by no means necessary to obtain a valid result well within what would seem to be acceptable limits. Possibly, the addition of additional bench mark levels would be an advantage, but it would make the table appear more formidable. Overrefinement, it is believed, would tend to defeat the attempt to maximize the usability of the findings represented by the table.

One of the more significant aspects of the table is that the base for measuring the level of effectiveness is the total cost of hospital care for all patients. Because this total is used as a base, the readings that are made from the table as to level of effectiveness are valid from the standpoint of the protection provided to all patients combined as well as from the standpoint of financing the provision of hospital services. This does not mean, however, that the stated percentages of effectiveness are equivalent to a coinsurance provision assuring that the prepayment program assumes a stated percentage of the cost for each individual. How the residual cost is distributed among patients is determined by the design of the benefit provision and, as was previously pointed out, is not explicitly shown by the table. For example, a deductible benefit program covering 50 percent of the total amount of hospital charges incurred is shown

at the same bench mark level as a cash indemnity program meeting the same proportion of total hospitalization expenses. The character of the distribution of the residual 50 percent would be quite different in the two cases, but because the base used in the table is total cost, both programs would be shown at the same level of effectiveness.

A further important advantage is derived from measuring effectiveness in relation to total cost. Although the table can be employed for making comparisons between two or more benefit structures or provisions of the same or of a different type, comparison between alternatives is not essential to appraisal. The reading from the table has significance in itself, for it shows how a benefit standard compares to complete financing of care, rather than how one program compares with another. Furthermore, where gaps exist, they are exposed; and the user finds out not only the degree of protection provided, but also the extent to which he would remain unprotected under whatever provision or program he appraises by use of this method.

It must be recognized, however, that the method proposed for practical application of the findings does not begin to measure up to the fundamental problem of raising consumers' level of understanding and information about prepayment. The magnitude of the problem of conveying to consumers the potentialities of prepayment in serving family and community interest requires a broad program of public education involving varied and extensive activities. And it is in connection with such a program that the findings of this study might find their greatest practical application.

APPENDIX

TABLE XXXVII

PERCENTAGE DISTRIBUTION OF MATERNITY AND NON-MATERNITY PATIENTS AND OF TOTAL CHARGES FOR EACH, BY AMOUNT OF HOSPITAL BILL

Amount of Hospital Bill	Percentage of			
	Maternity		Nonmaternity	
	Patients	Charges	Patients	Charges
Under $20	0.0	0.0	1.4	0.1
$20 to $39	0.0	0.0	9.5	1.7
$40 to $59	0.0	0.0	11.9	3.4
$60 to $79	0.4	0.1	10.1	4.0
$80 to $99	6.7	3.4	8.5	4.3
$100 to $119	14.6	9.4	8.1	5.0
$120 to $139	17.3	13.7	7.4	5.4
$140 to $159	18.5	17.0	6.4	5.5
$160 to $179	16.1	16.7	5.3	5.0
$180 to $199	9.8	11.8	4.2	4.5
$200 to $249	4.3	5.7	7.6	9.6
$250 to $299	7.1	10.8	5.1	7.9
$300 to $399	3.2	6.2	6.2	12.1
$400 to $499	2.0	4.6	3.2	8.2
$500 to $599	0.0	0.0	1.7	5.2
$600 to $699	a	0.2	1.1	4.1
$700 to $799	a	0.2	0.7	2.8
$800 to $899	0.0	0.0	0.4	2.0
$900 to $999	0.0	0.0	0.3	1.4
$1,000 and over	0.0	0.0	0.9	7.8
Total	100.0	100.0	100.0	100.0

[a] Less than 0.1 percent.

TABLE XXXVIII

PERCENTAGE DISTRIBUTION OF MATERNITY AND NON-MATERNITY PATIENTS, OF DAYS OF CARE AND OF TOTAL CHARGES FOR EACH, BY LENGTH OF HOSPITAL STAY

Length of Stay (days)	Percentage of					
	Maternity			Nonmaternity		
	Patients	Days	Charges	Patients	Days	Charges
1	0.4	0.1	0.2	15.5	2.0	3.4
2	2.4	0.9	1.2	11.7	3.1	4.3
3	6.7	3.6	4.2	8.6	3.4	4.0
4	23.2	17.2	18.6	8.3	4.3	4.8
5	27.5	25.4	24.7	8.3	5.5	5.8
6	21.6	24.0	22.7	7.4	5.9	5.9
7	8.6	11.2	11.5	6.8	6.2	6.3
8	3.5	5.2	5.1	4.8	5.0	5.1
9	0.8	1.3	1.1	4.3	5.1	5.2
10	3.1	5.8	5.9	3.7	4.8	4.9
11	1.2	2.4	2.4	3.1	4.4	4.5
12	0.0	0.0	0.0	2.2	3.4	3.5
13	0.4	1.0	1.0	2.2	3.7	3.8
14	0.0	0.0	0.0	1.8	3.3	3.3
15 to 20	0.4	1.3	0.9	5.9	13.5	12.8
21	0.1	0.2	0.2	0.5	1.4	1.3
22 to 30	0.1	0.4	0.3	2.7	9.3	8.4
31	0.0	0.0	0.0	0.2	0.7	0.6
32 to 60	0.0	0.0	0.0	1.7	10.4	8.4
61 to 70	0.0	0.0	0.0	0.1	1.2	1.0
71 to 90	0.0	0.0	0.0	0.1	1.4	1.1
91 to 120	0.0	0.0	0.0	0.1	2.0	1.6
Total	100.0	100.0	100.0	100.0	100.0	100.0

LITERATURE CITED

American Hospital Association. Hospital Rates, 1954. Chicago: American Hospital Association, 1954.

American Medical Association. Hospital Service in the United States: The 1953 Census of Hospitals. Reprinted from the Journal of the American Medical Association, Hospital Number (May 15, 1954).

Anderson, Odin W. National Family Survey of Medical Costs and Voluntary Health Insurance. New York: Health Information Foundation, 1954.

Commission on Financing of Hospital Care. Financing Hospital Care in the United States. Vol. 1. Factors Affecting the Cost of Hospital Care, ed. by John H. Hayes. New York: The Blakiston Company, Inc., 1954.

Commission on Financing of Hospital Care. Financing Hospital Care in the United States. Vol. 2. Prepayment and the Community, ed. by Harry Becker. New York: McGraw Hill Book Co., 1955.

Health Insurance Council. The Extent of Voluntary Health Insurance Coverage in the United States. Health Insurance Council, 1954.

Hoffer, Charles R., Gibson, Duane L., Loomis, Charles P., Miller, Paul A., Schuler, Edgar A., and Thaden, John F. Health Needs and Health Care in Michigan. Agricultural Experiment Station, Section of Sociology and Anthropology, Special Bulletin 365. East Lansing: Michigan State College, 1950.

Hospitals, Administrators Guide Issue, Vol. 26, Part 2 (June, 1952).

Hospitals, Administrators Guide Issue, Vol. 27, Part 2 (June, 1953).

Hospitals, Administrators Guide Issue, Vol. 28, Part 2 (June, 1954).

Michigan Hospital Association. Survey of Hospital Costs in Michigan. Report to the Board of Trustees by Kenneth Babcock, M.D., President, May, 1953.

Neyman, Jerzy. "On the Two Different Aspects of the Representative Method: The Method of Stratified Sampling and the Method of Purposive Selection," Journal of the Royal Statistical Society, XCVII (Part IV, 1934), 558-625.

Pennell, Maryland Y., Sigmond, Robert M., Altman, Isidore, and Altenderfer, Marion E. Income and Expense Ratios of General Hospitals, 1951. U. S. Department of Health, Education, and Welfare, Public Health Service Publication No. 407. Washington: Government Printing Office, 1954.

Reed, Louis S., and Hollingsworth, Helen. How Many General Hospital Beds Are Needed?: A Reappraisal of Bed Needs in Relation to Population. Public Health Service Publication No. 309. Washington: Government Printing Office, 1953.

United Nations, Statistical Office. The Preparation of Sampling Survey Reports. Statistical Papers Series C, No. 1. Lake Success: United Nations, 1949.

United States Department of Commerce. National Income, 1954 Edition: A Supplement to the Survey of Current Business. Washington: Government Printing Office, 1954.

United States Department of Commerce. Statistical Abstract of the United States, 1954. Washington: Government Printing Office, 1954.

United States Department of Health, Education, and Welfare, Social Security Administration. Social Security Bulletin, 17 (September, 1954).

United States Department of Health, Education, and Welfare, Social Security Administration. Social Security Bulletin, 17 (December, 1954).

United States Department of Labor, Bureau of Labor Statistics. Consumer Prices in the United States, 1949-52. Bulletin No. 1165. Washington: Government Printing Office, 1954.