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THE FEASIBILITY OF INSURING FAMILIES AGAINST THE COST OF PRESCRIBED DRUGS

BY

MICHAEL DANIAN

A thesis submitted in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

at the

UNIVERSITY OF WISCONSIN

1964

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ACKNOWLEDGMENTS

The author wishes to thank the families who participated in this study. The study would have been impossible without their contribution. Thanks are also due the actuaries and administrators of Associated Hospital Service, Inc., Milwaukee, Wisconsin, and Sentry Insurance, Stevens Point, Wisconsin for the invaluable consultations on their concepts of insurance and premium computation formulae; the Economic Committee of the Wisconsin Pharmaceutical Association for their discussion of the study; and the American Foundation for Pharmaceutical Education for financial assistance. Grateful acknowledgment is made to Professor Robert W. Hammel for his direction, advice, support, assistance, and patience during the conduct of the study; to Dean Arthur H. Uhl for his encouragement throughout the study; and for the comments, suggestions, and help of Professors Louis W. Busse, Richard A. Ohvall, Glenn A. Sonnedecker, and Ernst W. Stieb of the School of Pharmacy, Professors William Beranek and Richard M. Heins of the School of Commerce, and Professor Kenneth G. Lutterman of the Sociology Department.

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CHAPTER I

INTRODUCTION

Insuring[1] members of the general public against the cost of prescribed drugs would have potentially significant economic, social, and professional effects on pharmacy. These potential effects influenced the decision to conduct this study, the major objective of which is an attempt to determine the practicability of insuring families against the cost of prescribed drugs. Chapter I discusses some aspects of such insurance and its potential impact on pharmacy.

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1. The definition of insurance in this study is based on the following definition in Robert Riegel and Jerome S. Miller, Insurance Principles and Practices (3rd ed.; Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1958), p. 19:

> From the functional standpoint, insurance is a social device whereby the uncertain risks of individuals may be combined in a group and thus made more certain, small periodic contributions by the individuals providing a fund out of which those who suffer losses may be reimbursed. It is the application of the statistical law of large numbers to the economic problem of risk.
>
> In its legal aspect it is a contract, the insurer agreeing to make good any financial loss the insured may suffer within the scope of the contract, and the insured agreeing to pay a consideration (the premium). The insurer may be a corporation, an association, an individual.... The varying forms of organizations that assume risk may be conveniently referred to as the insurance

Nature of Problem

The drug component of medical care expenditures has received wide attention in the United States of America during the past decade as evidenced by studies and publications by private organizations as well as governmental agencies. This attention centered primarily on the portion of these costs to total family medical care expenditures and views on the necessity or desirability of and programs for protecting[2] the family against these costs. The studies

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carrier, and the individual family who is relieved of the risk as the insured. The agreement between the two is subject to the general law of contract, considerably modified by customs and usages of the business by court decisions, and by statutes.

The essential requirements for insurance are the following adopted from Riegel and Miller, Insurance Principles and ..., pp. 19-21: (1) The insured must be subject to a real risk (the uncertainty of a financial loss); (2) The risk must be important; (3) The cost of insurance must not be prohibitive; (4) A large number of risks is necessary; (5) The risk must be capable of approximation; and (6) The person insured must possess some real interest in the subject matter insured, a doctrine known as the necessity of an insurable interest.

Lastly, insurance in this study is limited to voluntary programs of private organizations, associations, and individuals in contrast to compulsory governmental programs for financing prescribed drug costs.

2. Protect is defined by Webster's Third New International Dictionary (Springfield, Massachusetts: G. & C. Merriam Company, 1961), p. 1822, as "to cover or shield from that which would injure, destroy, or detrimentally affect." Some methods proposed to protect the family against the cost of drugs include the following: insurance; prepayment plans; group purchasing, warehousing, and distribution

and publications of these organizations vary with respect to: (1) Expenditures for drugs; and (2) The necessity and desirability of and programs for protecting the family against these costs. The absence of a uniform and clear definition of the term "drug costs" and data on these costs are important factors contributing to this situation.

Drug Costs

The definition of drug costs for this study was derived from the following definitions of drug and the commonly associated term, prescription:

(1) A drug is "any substance used as a medicine, or in making medicine or medicines."[3]

(2) The term "drug" means (1) articles recognized in the official United States Pharmacopoeia, official Homoeopathic Pharmacopoeia of the

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of drugs; the use of a drug formulary; the use of generic named drug products; union operated pharmacies; labor union or group health centers; and government financed health care programs. The objective of this study is to consider the practicability of protecting the family against the impact of financial loss from the cost of drugs through the voluntary insurance mechanism defined in footnote 1. The potential use of the other methods of protecting the family against financial loss from drug costs and their potential effect on the feasibility of a voluntary insurance program is acknowledged. However, a thorough discussion and evaluation of the influence of these factors on a voluntary insurance plan are beyond the scope of this study.

3. Webster's New Collegiate Dictionary, (Springfield, Massachusetts: G. & C. Merriam Company, 1953).

United States, or official National Formulary, or any supplement to any of them; and

(2) articles intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in man or other animals; and

(3) articles (other than food) intended to affect the structure or any function of the body of man or other animals; and (4) articles intended for use as a component of any articles specified in clause (1), (2), or (3); but does not include devices or their components, parts, or accessories."[4]

(3) A prescription is, "An order for a medicine or medicines usually written as a formula by a physician, dentist, or other licensed medicinal practitioner. It contains the names and quantities of the desired substances and instructions to the pharmacist for the preparation of the medicine and to the patient for the use of the medicine at a particular time."[5]

Drug costs, as that term is used in this study, include payments or financial obligations incurred by patients for:

(1) Medication dispensed pursuant to a prescription

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4. Federal Food, Drug and Cosmetic Act of 1938, As Amended, July 12, 1960, Sec. 201 (g).

5. Rufus A. Lyman, M.D., Pharmaceutical Compounding and Dispensing, (Philadelphia: J. B. Lippincott Company, 1949), p. 8.

order as defined by Lyman and medication dispensed pursuant to telephoned or oral orders from prescribers to pharmacists;

(2) Drugs as defined by the Federal Food, Drug and Cosmetic Act excluding its application to "other animals" and including drugs purchased without a prescription order but on the specific approval or recommendation of a physician, dentist, or other medical practitioner licensed to prescribe medicines;

(3) Drug injections and drugs dispensed by a medical practitioner.

The second criterion of this definition is premised on the assumption that if drug insurance was available the drugs purchased without a prescription order but on the specific approval or recommendation of a physician, dentist, or other medical practitioner licensed to prescribe medicines would be prescribed by these practitioners.

The comprehensive definition of drug costs used in this study normally applies only to costs for drugs received by non-hospitalized members of the family.[6] The exception to the use of the term in this manner is when it includes the cost of drugs received by hospitalized patients in which case the term is so qualified.

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6. This study provided for the inclusion of drug charges in all health care institutions. However, since all drug expenditures incurred by institutionalized members of families participating in this study were incurred in hospitals, hospitalized is synonymous with institutionalized.

Indicative of the absence of and the necessity for a uniform and clear definition of drug costs are the variety of reports on "drug costs" by private organizations and associations and governmental agencies. The limitations, from the potential drug insurer's standpoint, of the cost of drugs reported by these organizations are discussed later in this chapter.

Health Information Foundation

Studies by the Health Information Foundation[7] in 1952-1953 and 1957-1958 indicated that drugs represented 15% and 20%, respectively, of total medical care expenditures.[8,9]

These studies concluded that the average family expenditure for drugs increased from $31 to $60 per year between

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7. The Health Information Foundation was organized by leaders in the drug, pharmaceutical, chemical and allied industries for the purpose of collecting valid information on health services, facilities, and personnel in the United States and of disseminating this information to people who can use it to improve health in their own communities or in wider areas. One major function of the Foundation is to encourage scientists in undertaking well-planned projects, or to conduct studies with its own research staff in areas where knowledge is needed. See: Health Information Foundation, An Inventory of Social and Economic Research in Health, 1952, Forward by Admiral W. H. P. Blandy, USN (ret), President of HIF.

8. Odin W. Anderson, Elements of Health Insurance Today (New York: Health Information Foundation, 1960), p.8.

9. The term medical care includes physicians' service, general hospital care, both prescribed and non-prescribed drugs and medications, dental care, and all other goods and personal services for health, such as private-duty nursing, other health practitioners, eyeglasses, and orthopedic appliances.

1952-53 and 1957-58, or an increase of approximately 93%.[10] During this period the physician services component of medical care expenditures decreased from 37% to 34% and absolute expenditures for physicians' services increased by only 26%.[11] The hospital services element of total medical care costs increased from 19% to 23% and in absolute terms increased by 66%.[12] According to the HIF studies, drug expenditures showed the greatest relative increase in the amount expended and as a percentage of total medical care costs.

United States Department of Commerce

The National Income Division of the Office of Business Economics of the U. S. Department of Commerce reports yearly expenditures for the "drug preparations and sundries" component of the medical care dollar in its publication Survey of Current Business.[13] These data were adapted by The AMA News

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10. Odin W. Anderson, Patricia Collette, and Jacob J. Feldman, Family Expenditure Patterns for Personal Health Services, 1953 and 1958: Nationwide Surveys (New York: Health Information Foundation, 1960), p. 7.

11. Anderson, Elements of Health Insurance Today, p. 8.

12. Ibid.

13. For an example of such figures see: U. S. Department of Commerce, Survey of Current Business, July, 1962, Table 14, p. 14.

Drug preparations and sundries consist of drugs and medicines; surgical appliances and supplies such as supports, corn removers, adhesive plaster, and surgical dressing; and health sundries such as clinical thermometers, heating pads, and health lamps. See Appendix A.

which reported the following distribution of these expenditures in relation to the other major components of the medical care dollar:[14]

(1) In 1929 drugs, physicians, and hospitals received 20.6¢, 32.6¢, and 13.7¢, respectively, of the medical care dollar;

(2) In 1950 drugs, physicians, and hospitals received 19.7¢, 27.8¢, and 23.3¢, respectively, of the medical care dollar;

(3) In 1961 drugs, physicians, and hospitals received 19.4¢, 25.0¢, and 27.1¢, respectively, of the medical care dollar.

These data illustrate that as proportions of the medical care dollar, expenditures for both drugs and physicians' services decreased and hospital expenditures increased from 1929 through 1961.

United States Department of Health, Education, and Welfare

The Social Security Administration of the U. S. Department of Health, Education, and Welfare reported that the per capita expenditure for drugs and drug sundries increased from

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14. American Medical Association, The AMA News, September 3, 1962, p. 1. The AMA News data are based on figures of the U. S. Department of Commerce, A Supplement to the Survey of Current Business, 1954 edition, Table 30, pp. 206-7, and U. S. Department of Commerce, Survey of Current Business, July, 1962, Table 14, p. 14.

$11.44 in 1950 to $22.06 in 1960.[15] The percentage of medical care expenditures represented by drugs and drug sundries was reported to have increased from 19.9% in 1950 to 20.1% in 1960.[16] During the same ten year period the per capita expenditure for physician services increased from $17.12 to $28.57.[17] The per capita expenditures for hospital services in 1950 and 1960 were $14.15 and $29.88, respectively.[18] The

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15. U. S. Department of Health, Education and Welfare, Social Security Administration, Social Security Bulletin, vol. 24, no. 12, 1961, Table 4, p. 6.

    The drugs and drug sundries expenditures figures of the U. S. Department of HEW are based on the drug preparations and sundries figures of the National Income Division of the U. S. Department of Commerce as reported in Survey of Current Business. See: Social Security Bulletin, vol. 24, no. 12, 1961, pp. 3-4. However, the estimates made by the U. S. Department of HEW's Division of Program Research differ from those of the Department of Commerce in the following respects: (1) The figures of the Division of Program Research include total private expenditures for hospital care whereas the data from the National Income Division include only expenditure in privately controlled hospitals and lump together hospitals and private nursing homes; (2) The Social Security Administration figure for physicians' services is based on the figure from the National Income Division (estimated from the tax returns of physicians in solo or partnership service) but has been adjusted to take account of salaries paid to physicians in group practice prepayment plans; and (3) The National Income Division's estimate of net expenditures for health insurance includes both medical care and disability insurance whereas the Social Security Administration data represent the net cost of insurance to obtain medical care only.

16. Ibid., Table 1, p. 3.

17. U. S. Department of Health, Education, and Welfare, Social Security Administration, Social Security Bulletin, vol. 23, no. 12, 1960, Table 2, p. 6.

18. Ibid., vol. 24, no. 12, 1961, Table 4, p. 6.

percentage of private expenditures for medical care represented by physicians' services decreased from 28.5% in 1950 to 26.0% in 1960.[19] Hospital services expenditures increased from 24.6% of the medical care dollar in 1950 to 27.2% in 1960.[20]

American Druggist

In 1958 American Druggist published expenditures for the drug component of the medical care dollar based on reports from the National Income Division of the U. S. Department of Commerce and its own data on prescription expenditures.[21] According to this article drug and drug sundries represented 16.9% and 18.9% of the health care dollar in 1947 and 1957, respectively.[22] The same article also reported that in 1948 and 1957 prescribed drugs accounted for 41.1% and 53.0%, respectively, of drug expenditures.[23]

United States Department of Labor

The relative importance of a component of the Consumer Price Index of the U. S. Department of Labor's Bureau of

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19. Ibid., Table 1, p. 3.

20. Ibid.

21. _____, "Finds 'Extra' Billion $$ Spent on Drugs," American Druggist, September 22, 1958, p. 13.

22. Ibid.

23. Ibid.

Labor Statistics indicates how families of urban wage earners and clerical workers distribute their expenditures.[24] In 1957, the relative importance of medical care was 5.3%.[25] In other words, approximately 5.3% of these families' expenditures for goods and services was for medical care. In 1958, 1959, and 1960 these expenditures were 5.4%, 5.6%, and 5.7%, respectively.[26] Hence, the relative importance of medical care increased consistently since 1957. However, the relative importance of the prescribed and other drugs component of medical care has decreased since 1957.[27] In that year and 1958 the relative importance of prescribed and other drugs was 0.9%.[28] In 1959 this percentage dropped to 0.8% and remained

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24. U. S. Bureau of Labor Statistics, Monthly Labor Review, vol. 81, no. 7, July, 1958, p. 767.

25. Ibid., p. 769.

26. U. S. Bureau of Labor Statistics, Monthly Labor Review, vol. 82, no. 7, July, 1959, p. 779.

    U. S. Bureau of Labor Statistics, 1959 Statistical Supplement - Monthly Labor Review, p. 45-46.

    U. S. Bureau of Labor Statistics, 1960 Statistical Supplement - Monthly Labor Review, Part I, p. 23.

27. Prescribed and other drugs include prescribed antibiotics, analgesics and other anti-infectives and multiple vitamins, aspirin, and milk of magnesia.

28. U. S. Bureau of Labor Statistics, Monthly Labor Review, vol. 81, no. 7, July, 1958, p. 769.

    U. S. Bureau of Labor Statistics, Monthly Labor Review, vol. 82, no. 7, July, 1959, p. 779.

there through 1960.[29] The increase in the relative importance of medical care was attributable mainly to hospital services whose relative importance increased from 1.4% in 1957 to 2.0% in 1960.[30]

Protection

Evidence of increased concern to protect the family against the cost of drugs was demonstrated by: (1) The adoption by the American Pharmaceutical Association's House of Delegates of a resolution calling for an immediate study of all established prescription prepayment and insurance plans;[31] (2) The demand by subscribers to privately sponsored health

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29. U. S. Bureau of Labor Statistics, 1959 Statistical Supplement - Monthly Labor Review, pp. 45-46.

    U. S. Bureau of Labor Statistics, 1960 Statistical Supplement - Monthly Labor Review, Part 1, p. 23.

30. U. S. Bureau of Labor Statistics, Monthly Labor Review, volumes 81 and 82, numbers 7 and 7, July, 1958 and 1959, pp. 769 and 779.

    U. S. Bureau of Labor Statistics, 1959 Statistical Supplement - Monthly Labor Review, pp. 45-46.

    U. S. Bureau of Labor Statistics, 1960 Statistical Supplement - Monthly Labor Review, Part I, p. 23.

    Hospital services according to the U. S. Bureau of Labor Statistics includes hospital rates and insurance and surgical insurance.

31. This resolution was adopted by the House of Delegates as the result of a report by the APhA Committee on Social and Economic Relations on the problems encountered by the pharmacist-sponsored prescription prepayment plan in Windsor, Ontario, Canada, at the Association's 1959 Convention in Cincinnati, Ohio. See: "resolution VS resolute action," Journal American Pharmaceutical Association, Practical Edition, 21, (8) 409, August, 1960.

insurance policies to expand the coverage of their policies to include the cost of drugs incurred outside of the hospital;[32] (3) Voluntary health insurers'[33] need[34] for reliable and

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32. Demand for the expansion of health insurance plans to include the cost of drugs outside the hospital was cited in numerous sources of information on the subject. Included among those sources were: J. F. Follmann, Jr., Drugs, Their Cost, and Health Insurance (New York: Health Insurance Association of America, 1960), p. 75; H. Ashley Weeks, Family Spending Patterns and Health Care (Massachusetts: Harvard University Press, 1961), p. 57; "Health Insurance Benefits and the American Family," Progress in Health Services, vol. 6, no. 2, February, 1957, p. 5; "Voluntary Health Insurance Among the Aged," Progress in Health Services, vol. 8, no. 1, January, 1959, pp. 1 & 5; "Comprehensive Insurance for Physicians' Services," Progress in Health Services, vol. 9, no. 6, June, 1960, p. 6; "Health Insurance Should Cover Drugs," American Druggist, vol. 139, no. 8, p. 18.

33. An insurer is defined by Webster's Third New International Dictionary (Massachusetts: G. & C. Merriam Company, 1961), p. 1173, as: "one that contracts to indemnify another by way of insurance: An insurance company or underwriter." Insurance, as it is used in this study was defined in footnote 1. A description of the programs of voluntary health insurers is provided by Joseph F. Follmann, Jr., Director of Information and Research, Health Insurance Association of America, New York, N. Y., "Trends in the Future of Voluntary Health Insurance," reprinted from Proceedings, 1961 Annual Conference of County Medical Society Officers, Biltmore Hotel, Los Angeles, February 11-12, 1961: Each type of insurer has its distinct approach, providing the buyer of insurance the opportunity to choose the kind of plan best suited to his needs. While the resulting heterogeneity can at times present an impediment to a ready simplified understanding of the subject, it is necessary to recognize that many aspects and concepts of voluntary health insurance are quite recent and must be looked upon as experimental and that this form of insurance, like medical care itself, must remain in a dynamic state of evolution.

34. This does not imply that the insurer will indemnify the cost of drugs when reliable data on drug utilization and costs are available. However, some insurance against the cost of drugs has been provided by major medical, some Blue Cross-Blue Shield, and comprehensive insurance plans, and by Prescription Service, Inc. in Atwater, California, on the basis of an absence or small amount of information

detailed data on drug costs in order to arrive at actuarily sound premiums for policies covering the costs of drugs incurred outside the hospital;[35] (4) Labor unions' plans to finance their members' prescribed drug costs and operate pharmacies in the hope of providing low cost pharmaceutical service for their members;[36] and (5) The increase in the development of prescription prepaid and insurance plans by individual pharmacists or groups of pharmacists.[37]

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on the utilization and costs of drugs. Contra, other insurers, for example, Blue Cross of Milwaukee, will not provide coverage for drugs without reliable data on utilization and cost of drugs through pilot programs covering such costs and other sources of similar information or both.

35. _____, "APhA Mulls National Prepaid Rx Study," American Druggist, vol. 140, no. 2, July 27, 1959, p. 21; Newsletter, "The Insurability of Drug Costs," New York: Martin E. Segal and Company, Inc., vol. 3, no. 4, November, 1959; _____, "Unions Plan Corporation to Run Chain of Low Price Pharmacies in NYC," American Druggist, vol. 142, no. 1, July 11, 1960, p. 5; J. F. Follmann, Jr., Drugs, Their Cost..., pp. 87-88.

36. _____, "Rising Demand Seen for Rx Prepayment," American Druggist, vol. 138, no. 10, November 17, 1958, p. 17; _____, "New Union Pharmacy Opens in Toledo," American Druggist, vol. 142, no. 4, August 22, 1960, p. 9.

37. _____, "Rx Insurance Plan Would Give Subscribers 50% Off Usual Price," American Druggist, vol. 137, no. 12, June 16, 1958, p. 14; _____, "First Rx Prepayment Plan Reports: More Subscribers Needed to Meet Cost," American Druggist, vol. 138, no. 12, December 15, 1958, p. 5; _____, "Rx Prepay Test is Started in California," American Druggist, vol. 140, no. 8, October 19, 1959, p. 23; _____, "Texas Start 1st Pharmacy-Financed Rx Insurance," American Druggist, vol. 141, no. 13, June 27, 1960, p. 7; _____, "Washington State Assn Develops Rx Prepay Plan for 1961," American Druggist, vol. 142, no. 5, September 5, 1960, p. 16.

The Problem

The problem to which this study is directed involves the absence of variated data on family expenditures for drugs and the feasibility of various programs for protecting these families against financial loss from these costs. Financial loss refers to the family's unexpected or high expenditures due to drug costs. The intended application of the insurance mechanism is the sharing of the risk of these high or unexpected drug costs among a large number of families. This concept of the application of insurance is utilized throughout this study. Approaches to this problem are complicated by: (1) The variety of reports on drug costs by private and governmental sources; (2) The different viewpoints on the necessity and desirability of and programs for protecting the family against financial loss from the cost of drugs; and (3) The potential effects of drug insurance on economic, social, and professional aspects of pharmacy.

Reports on Drug Expenditures

The various private and governmental reports on the cost of drugs illustrate the need for more information on this subject. The reports differ with respect to the average drug cost per family and the relative importance of drug expenditures as a major component of the medical care dollar.

Protection Against Drug Costs

Different viewpoints on the necessity and desirability of and programs for protecting the family against financial loss

from drug costs range from that of an absence of a need and desirability for such programs to one espousing programs providing full protection. The former view is based on the fact that drug costs are not a large expense to the typical family and thus are budgetable or easily may be paid from current income. The latter view and those views advocating some protection have resulted in various suggestions for protecting the family against this financial loss. These suggestions may be classified as those which attempt to reduce the cost of drugs to the family and those which attempt to distribute the cost through the insurance mechanism.

Methods by which the cost of drugs might be reduced include the following:[38] (1) The use of a drug formulary; (2) The use of generic named products; and (3) Group purchase of drugs.

Protection of the family against financial loss from drug costs has been considered by private health insurers as well as governmental agencies. The former desire to distribute the cost of drugs to individual or groups of families through the insurance mechanism.[39] Local governments protect some families

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38. Committee on Medication Costs, "An Analysis of the Use Rates and Costs of Prescribed Medicines and Related Problems," Morris Brand, M.D., Director of Project, Committee on Medication Costs, 14 East 16th Street, New York 3, New York, December 16, 1960, pp. 16-18, 22-23.

39. A limited drug coverage plan is offered by Sentry Insurance Co., Stevens Point, Wisconsin.

"Health Insurers' War," The Wall Street Journal, February 17, 1960, pp. 1, 16.

"Blue Cross Plans Insurance to Cover Rxs, N. Y. Men Told," Drug Topics, vol. 105, no. 14, July 3, 1961, p. 6.

against financial loss from some drugs through city and county welfare programs. Some programs established under the Kerr-Mills Law are exemplary of state and federal cooperation to protect other families against financial loss from drugs.[40] The King-Anderson bill is an example of a federal government plan which would offer limited drug cost protection to a segment of the population.[41]

The potential influence of drug insurance on economic, social, and professional aspects of pharmacy arises from the different methods suggested for reducing the cost of drugs and the various views as to how, if at all, the family should be protected against financial loss from these costs. A complete discussion of the implications of the suggested methods of reducing drug costs and views on protection of the family against these costs is beyond the scope of this study. Therefore, only some influences of the voluntary health insurance mechanism on pharmacy are discussed briefly.

The main reasons for considering only the influence of voluntary drug insurance are: (1) The recent expansion of

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40. "Senate Unit Votes New Kerr Plan on Medical Care," The Wall Street Journal, August 15, 1960, p. 3.

"Spending by States Drops Under Kerr-Mills Program," The Capital Times, July 31, 1961, p. 22.

41. "AMA Says Medical Bill Would Aid Millions Who Do Not Need It, Ignore Other Millions," The Wall Street Journal, May 22, 1962, p. 8.

"Compromise Medical Care Plan Outlined by Mills; Passage Likely If He Pushes It," The Wall Street Journal, June 14, 1962, p. 24.

some voluntary health insurance plans to include some drug protection; (2) The recent appearance of separate and limited drug insurance plans such as those in California and Texas; and (3) Because the feasibility of using the voluntary health insurance mechanism is a primary objective of this study.

Economic, Social, and Professional Aspects

The attempt here is to discuss briefly the more immediate potential influence of the voluntary health insurance mechanism on pharmacy. The classification of an effect as either economic, social, or professional does not preclude that effect from also influencing one or both of the other two aspects of pharmacy.

Economic

The more important potential influence of drug insurance on the economic aspects of pharmacy, viewed primarily from the position of the practicing pharmacist, include the reduction or elimination of uncollectable drug accounts, a tendency to standardize prescription pricing, and an increase in prescription income as the probable result of an increase in the prescribing of drugs.

Drug insurance would reduce uncollectable accounts resulting from drug costs incurred by insured families. The insurance mechanism would spread the cost of drugs and, in a sense, force budgeting for this expense.

Prescription pricing would tend to become standardized because of the controls which likely would accompany drug

insurance plans. These controls would ensue from the insurance actuary's objective of minimizing over-all costs of operating such a plan.

An increase in the pharmacist's prescription volume may be expected when the cost of prescribed drugs is insured. An increase in the utilization of prescribed drugs was experienced under a drug insurance plan in Canada and could be expected under drug insurance programs in the United States.[42] Such an expansion in the volume of prescribed drugs may or may not increase the pharmacist's prescribed drug dollar volume. Assuming some control over the cost of prescribed drugs is exercised by the insurer, it still is not likely that such controls will influence the dollar volume of prescriptions as much as an expansion in the volume of prescribed drugs due to coverage under insurance. Thus, an increase in the pharmacist's prescribed drug dollar volume could be expected.

Social

An effective voluntary drug insurance plan would tend to reduce the apparent demand for governmental action to provide drug benefits to some or all of the population. The absence of extensive governmental provision of drug benefits would enhance the opportunity for voluntary health insurers to perform this function through the insurance mechanism in cooperation with

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42. Report prepared for Ohio State Pharmaceutical Association by Robert A. Remne, Vice President of Research, Nationwide Insurance Company, Columbus, Ohio, entitled "Drug Insurance," 1960, p. 8.

pharmacy. The desirability of providing drug benefits through the insurance mechanism in contrast to the Social Security system, for example, is illustrated by the following quotations:[43]

> Former President Herbert Hoover said, "The genius of the private enterprise system is that it generates initiative, ingenuity, inventiveness, and unparalleled productivity. With the normal rigidities that are a part of government, obviously the same forces that produce excellent results in private industry do not develop to the same degree in government business enterprises."[44]
>
> Socialized medicine allows popular demand to dictate the use of available resources through political pressure, the consequence being this gross distortion of the strategy and tactics of medical development.[45]

The desirability of providing drug benefits through private health insurers also is demonstrated by the following quotations regarding the British National Health Service:

> Since 1948 all drugs in Britain have been free to NHS patients, which means virtually everybody. The prime result has been an unsatiable demand for pills. With no pricing system to temper the desire for (and belief in) cure-everything medication, British authorities have had to invent other restraints. These have proved both futile and demoralizing.[46]

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43. See: Fleming, Secretary of Health, Education, and Welfare, v. Nestor, 363 U. S. 603, pp. 609-610 for statement that Social Security System is not insurance. Also see: Paul L. Poirot, "The Social Security Program," The Freeman, November, 1962, p. 45.

44. Willis H. Hall, "I'm for Free Enterprise - But!," The Freeman, April, 1961, p. 10.

45. Colin Brogan, "The Price of Free Medicine," The Freeman, June, 1956, p. 50.

46. Holmes Alexander, "Kefauver Ignores British Lesson," (Editorial), The Wisconsin State Journal, October 12, 1961, p. 8.

> There is the case of a woman whose baby was suffering diaper rash. She got a doctor's prescription for no fewer than ten bottles of an expensive new medicament. The rash finally was cured when the woman was told to keep her baby dry and to apply a simple ointment. The ointment which did the trick cost fourpence (about five cents); the ten bottles which did no good cost thirty pounds ($84.00). This is one example of waste, but it could be multiplied indefinitely.[47]

Other social effects of insurance are that it will enhance the prudent use of the full range of available personal health services, encourage early diagnosis and stimulate use of preventive services such as physical examinations, vaccinations, and well-child and maternity care.[48] Thus, insurance would tend to lessen any hesitancy to utilize pharmaceutical services; result in greater health care and preventive medicine; and effect a healthier populace.

Professional

Drug insurance may encourage the pharmacist to adopt the fee concept of remuneration for his professional service.[49] The

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47. Brogan, "The Price of Free ...," p. 53.

48. Anderson, Elements of Health Insurance Today, p. 6.

49. This view was expressed at the Economic Committee Meeting of the Wisconsin Pharmaceutical Association in Madison, Wisconsin on February 11, 1962. Also see: "Prepaid Rx Insurance on a Natl. Scale Could Be Outgrowth of Agreement Worked Out Between Blue Cross & APhA, Now Believed To Be At Justice for Clearance," F-D-C Reports (F-D-C Reports, Inc., Washington, D.C.), vol. 24, no. 48, November 26, 1962, pp. 14-15.

system of pricing a drug dispensed or compounded pursuant to a prescription order that is presently popular involves, for the most part, a mark-up on the pharmacist's cost of the ingredient or ingredients ordered by the prescriber. The pricing of such drugs on a fee concept of professional service rather than a mark-up on their cost has been viewed as enhancing the professional status of pharmacy.[50]

It is possible that drug insurance will reduce dispensing of drugs by physicians and thus increase the volume of drugs dispensed by pharmacists and expand their other professional activities.

Some insurers who provide limited drug coverage require negotiating the price of the pharmaceutical service which may lead to price regulation by insurers. This would be undesirable from pharmacy's viewpoint because price regulation may: (1) Result in uniform prices for pharmaceutical services which may be interpreted by the state or federal government as a violation of their respective antitrust laws; (2) Prove to be uneconomical to pharmacists; and (3) Interfere with the professional prerogatives of the pharmacist. Interference in the professional activities of the pharmacist also may result from any governmental plan to finance prescribed drug costs.

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50. Charles J. Hartleib, Herbert L. Flack, and Robert E. Abrams, "The Professional Fee Concept," Journal American Pharmaceutical Association, vol. 21, no. 11, November, 1960, pp. 696-699, and "Professional Service Concept in England and Canada," Journal American Pharmaceutical Association, vol. NS 1, no. 5, May, 1961, p. 304.

Support of this view is found in a decision with respect to government funds which held that control and title of funds appropriated by the government must remain with the government.[51] In this decision lies the possibility of the proscription of the pricing policy of the pharmacist who is remunerated by a governmental agency for his professional services.

Insurers' Problems

The insurers' problems in attempting economically to insure drug costs are complex and varied. These problems are discussed below to illustrate their complicated nature. This discussion, which is not claimed to be exhaustive, is based on the literature[52] and consultations with insurance authorities.[53]

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51. Robert R. Hamilton, Selected Legal Problems in Providing Federal Aid for Education, Prepared for the Advisory Committee on Education, (U. S. Printing Office, Washington, D. C., 1938), pp. 11-13.

52. See: Albert H. Mowbray and Ralph H. Blanchard, Insurance, Its Theory and Practice in the United States, 14th ed.; (New York: McGraw-Hill Book Company, Inc., 1955); Riegel and Miller, Insurance Principles and Practices; O. D. Dickerson, Health Insurance, (Homewood, Illinois: Richard D. Irwin, Inc., 1959); Gustave Frederick Michelbacher, Multiple-Line Insurance, (New York: McGraw-Hill Book Company, Inc., 1957).

53. Consultations were held from April, 1961 through August, 1962 with the actuaries and administrators of Blue Cross of Milwaukee, Wisconsin and Sentry Insurance of Stevens Point, Wisconsin and Professor Richard M. Heins of the University of Wisconsin.

Type of Insurer

Insurers' organizations for the purpose of insuring against drug costs and their method of providing coverage for such costs vary. Insurance organizations may be classified as one of two fundamental types: (1) The co-operative organization operating solely, in theory at least, for the benefit of its members, and (2) The proprietorship enterprise, serving as a risk carrier and as a means of profit to its proprietors. The coverage provided for drug costs can be either a separate insurance contract under one or the other of the two fundamental types of organization or included as an extension of existing insurance. The insurer's decision regarding the type of organization and method of coverage is dependent on careful consideration and evaluation of such factors as the practice of competitors and the insurer's economic and social philosophies.

Underwriting

The primary function of underwriting is to secure a safe distribution of risks. This includes an attempt to assure that the group insured has the same probability of loss, within reasonable limits, as the loss experience on which premium rates are based. The activities that are involved in the underwriting function include:

(1) An attempt to avoid adverse selection of risks, that is, an above normal proportion of poor risks.

(2) An attempt to secure an adequate volume of risks to produce dependable average results which in turn enhance the successful conduct of the business.

(3) An attempt to spread the risk, or avoid excessive amounts at risk on a single hazard. This involves determining the largest net amount the insurer will assume on a single risk, the net line (the amount remaining at risk of the insurer after any reinsurance), as well as the aggregate amount that will be taken in one group of risks subject to a single hazard, such as an area subject to an epidemic of influenza where all persons susceptible to the illness are insured against the costs of physician, hospital, and pharmaceutical services.

(4) Reinsurance, or the transfer by the insurer of a portion of its insurance to another insurer, called the reinsurer. Reinsurance is a contract whereby the reinsurer agrees to indemnify another insurer for the loss resulting from a risk assumed by the latter under a separate insurance contract issued to a third party. Reinsurance, in general, enhances the ability of an insurance organization to obtain new business, distribute risk, reduce reserves, and stabilize or increase profits. The policyholders also benefit from reinsurance because the resultant greater financial stability of the insurance company makes the insured's policy more reliable; in situations where a large amount of insurance is needed the insured may obtain it without negotiating with numerous companies; and the insurance can be written under identical contract provisions, which otherwise might vary with the different companies among which the insurance is divided.

(5) Drafting policy forms and endorsements as well as instructing agents in their proper use. The policy forms define the coverage provided and reflect the insurer's concept of insurance. The insurer's concept may indemnify costs arising from the insured risk beginning with the first cost (commonly referred to as "first dollar" coverage); insurance against expenses originating under the insurance plan after expenses have exceeded a certain amount (that is,

"catastrophic" costs which exclude small regular or intermittent costs); or some combination of those two concepts because they are not always mutually exclusive. Co-insurance, the sharing of expenses between the insured and insurer, may be a part of any of the concepts of insurance discussed above.

(6) Determining whether to insure persons or families on an individual or group basis or both. Individual persons or families usually must meet requirements which differ from those which must be met by groups. In some cases these different requirements result in the unavailability of insurance to individuals or single families. The insurer must consider many factors in deciding whether to insure persons or families on an individual or group basis or both. Illustrative of some of these considerations are adverse selection, size and kind of groups, and competition.

Rate-Making

The rate-making process is the most important, complex, and difficult of the problems that confront insurers.[54] Rates are important because if they are too low the insurer's income will be inadequate and if they are too high competition may have an advantage. Rating insurance is complex because of variations in hazard between lines of insurance, between contracts, and between risks. The difficulties involved in rating insurance arise because costs which the rates are intended to cover are incurred after the rates are fixed, sometimes long after, and because rating involves probability calculations, exercise of judgment of the future,

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54. Mowbray and Blanchard, Insurance ..., p. 337.

and consideration of a multitude of questions on public and private interests.

The rate-making procedure may be divided into two parts.[55] The first part involves determining the net premium which is the product of the claim frequency rate and the average claim value. The net premium is the insurer's expected loss. The second part, called loading expenses, includes administrative and selling expenses, profits, and taxes. The net premium added to the loading expenses gives the gross premium or insurance premium.

The rates should be adequate, reasonable, and equitable. They should be adequate in order to provide insurers with incomes which permit the effective and efficient operation of their insurance organizations. A reasonable rate is one which does not impose undue burden on insureds; is not more than the cost of the risk and the expenses of assuming the risk by the insurer; and provides a fair rate of return on the investment of the insurer. Equity requires that each insured be charged a rate which reflects, as closely as possible, the probability of loss to which he is subject, or payment in accordance with the quality of his risk.

The ideal rate is one that produces from each group of risks of the same quality exactly enough income to insurers to meet the insurance losses and expenses attributable to

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55. This procedure is based on: Ibid., p. 340, and Michelbacher, Multiple-Line Insurance, p. 74.

the group, and in addition a margin for the insurers for covering those risks.[56]

Benefit

The insurer's form of benefit to the insured is basically one of two types, cash indemnity or a fixed sum paid for a specified service without regard to the actual charge for that service. In many cases the fixed sum is less than the actual charge for the service. The second type, service benefit, requires rate or fee agreements between purveyors of service or product or both and the insurance agency.

The insurer's concept of insurance is a critical factor in determining the form of benefit to the subscriber. In general, insurance companies that provide coverage for only "catastrophic" costs favor the cash indemnity principle of benefit, whereas those which offer "first dollar" coverage prefer to use the service form of benefit.

Claim Administration

Claim administration involves the insurer's receipt of notice of submission of claims and the investigation, proof of loss, and payment of claims. The function of claim administration is to pay legitimate claims promptly, courteously, and in accordance with the terms of the contract. It is

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56. Mowbray and Blanchard, Insurance ..., p. 338.

an activity which concerns almost everyone connected with the insurance contract. The maintenance of good public relations demands that every effort be made to minimize misunderstanding over claims submitted by the insured.

Sale of Insurance

The insurer's selling function may be performed by one or more of the following systems:

(1) The General Agency. This method consists of dividing the total sales area into territories, to each of which is assigned a general agent who has control over the territory for which he is responsible. On all business that may be written within that territory he is entitled to a certain initial commission and renewal commissions on subsequent premiums paid. The general agent works largely on his own account and pays his own expenses.

(2) The Branch Office. Under this method the insurer establishes districts throughout his sales area and places branch office managers in charge of each district. A branch office is under a manager's direction, but his powers are more limited than those of a general agent because he is under direct control of the home office. The manager's remuneration consists of a straight salary and certain bonuses for increases in the volume of business.

(3) Direct Reporting. Under this system field agents are affiliated directly with the home office. The agents are remunerated under many arrangements of which the most common is a straight commission.

(4) Direct Writing. Under this method the insurer solicits business directly from buyers of insurance through regular salaried employees who work under the direct control of the insurer.

(5) Brokers. The broker, as contrasted with the agent, is the agent of the insured and not of

> the company, in spite of the fact that he derives his income directly from the latter. The broker's commission usually is standardized by an underwriters' association or cooperative company action, and is slightly less than that received by an agent.

The insurer's problem of selecting the method or methods to sell insurance involves consideration of primarily two factors, expense and control.[57] The general agency system of selling insurance is less expensive for the insurer than the branch office method. The latter, however, gives the insurer effective direct control over agents and a higher degree of uniformity in the administration of the insurer's general policies. Careful consideration is required by the insurer to determine which system of selling insurance likely will be the most effective and least expensive for him.

Reserve

Reserves are established by the insurer in order to make suitable provision in advance for contracted obligations which are to be met in the future. Legal standards of adequacy of reserves have been promulgated by respective state legislators and insurance commissioners. The establishment of reserves is necessary because the insurer's obligations under his contracts are, at the time of issuance of the policy, all in the future, although the premiums are payable in advance.

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57. Riegel and Miller, Insurance Principles and Practices, p. 57.

It is not only economically sound, but also legally required that the insurer establish reserves. Legal requirements for reserves reduce the possibility of the insurer using premium income, paid to secure future service, to meet obligations already incurred to others. The latter use of premium funds could result in the inability of the insurer to meet his obligations as they matured.

Regulation

The insurer's regulatory problems mainly involve remaining informed and complying with all applicable insurance laws and regulations. These laws and regulations include such matters as organization and solvency of insurance companies; the submission of the policy to individual insurance commissions of each state for his approval and records; reserve requirements; advertising; and taxation. These activities are regulated by the states under the provisions of the McCarran-Ferguson Insurance Regulation Act[58] which affirms that such state regulation is in the public interest and federal laws do not apply to insurance except to the extent that it is regulated inadequately by the states.

The insurer's problems are interrelated in an intricate manner. For example, the method of selling insurance affects the insurance rate; the form of benefit employed increases or decreases administrative expenses; the insurer's concept of

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58. March 9, 1945, c. 20, sec. 1, 59 Stat. 33.

insurance influences the premium; and, assuming other factors are constant, the deductible provision, if there is one, reduces the amount of the insurance premium. The insurer's task is not an easy one. Consideration of any of the problems discussed above requires consideration of them all.

The Study's Problem

The study's problem involved determining family prescribed drug costs and the practicability of protecting the family against large or unanticipated financial loss from these costs through the voluntary insurance method. Thus, the problem of the study was viewed from the potential drug insurer's standpoint. Consequently, the main concern of the study centered on the question of rate-making because of the paucity of data on the utilization and costs of drugs which form the basis of the rate-making process, the most important of the insurer's problems.[59]

The rate-making process, which yields the insurance premium, involved fundamentally two steps: calculation of the pure premium and computation of loading expenses. The latter required consideration of probable selling and administrative

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59. The term utilization is defined as the cost of drugs according to family income, family size, residence, and the age, education, and occupation of the head of the household as well as the frequency of drug cost according to these variables. Residence is one of the following areas within Dane County, Wisconsin: Urban-Madison; Non-Madison communities with pharmaceutical service; Non-Madison communities without pharmaceutical service; and Farms.

expenses and a margin of profit in the case of the insurer operating on that basis.[60]

The pure premium is the insurer's estimate of the probability of dollar loss resulting from the occurrence of the risk, or, the cost of drugs which would be indemnified, in whole or part, by an insurance contract. This estimate is based upon the frequency and severity of the losses resulting from its occurrence. The accuracy of the insurer's estimate increases with an increase in his knowledge of the risk and the losses resulting therefrom.

The importance of the accuracy of the pure premium calculation cannot be overemphasized. The pure premium represents the major portion, not infrequently 75% or more, of the insurance premium.[61] This and the fact that the amount of the insurance premium is an important criterion in evaluating the feasibility of insuring against a risk clearly illustrate the necessity for an accurate estimate of the pure premium.

Sources of Drug Expenditure Data

From a potential insurer's viewpoint a limited quantity of useable drug expenditure data are available. The Health Information Foundation sponsored studies, the study of the operations

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60. These considerations were based on information obtained from two insurers. One of these insurers based its operations on the profit and the other on the non-profit concept of management of an insurance organization.

61. This percentage is based on consultations with the actuaries of the two Wisconsin insurance companies. See footnote 53, p. 23.

of the prescription insurance plan in Essex County, Ontario, Canada, and reports on drug expenditures by several governmental agencies are the major sources of information on the subject of the utilization and costs of drugs.

Health Information Foundation

The five major Health Information Foundation studies, four of which were conducted with National Opinion Laboratory of the University of Washington under HIF sponsorship, were:

(1) The 1953 and 1958 surveys to determine how much families and individuals spent for personal health services during the previous 12 months, the extent of their enrollment in voluntary health insurance, and how insurance helped pay for health services.[62] These studies are projected to show nationwide total expenditures according to major health services, the average expenditures for personal health services by families and individuals, and the distribution of health service expenditures by families and individuals according to absolute levels. These studies were designed so their results could be compared.

(2) A study in 1954 which related insured family expenditures for health services to the group health insurance contracts under which the families were insured.[63] The group health insurance contracts were plans of Blue Cross-Blue Shield and Aetna Life Insurance Company. The study was conducted in Birmingham, Alabama and Boston, Massachusetts.

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62. Anderson, Collette, and Feldman, Family Expenditure Patterns ... .

63. Odin W. Anderson, Voluntary Health Insurance in Two Cities, (Cambridge, Massachusetts: Harvard University Press, 1957).

(3) A 1957 survey of members of three New York trade unions who had chosen between two health insurance plans, both of which covered the full range of physicians' services and drug costs.[64] The two plans were Group Health Insurance, Inc., which permitted its enrollees free choice of physician and reimbursed physicians in accordance with a payment schedule, and Health Insurance Plan of Greater New York, which provided care to its enrollees by any of 31 physician groups without charge and, within each physician group, allowed free choice of a family physician.

(4) A 1957 study of the King County medical plan in the State of Washington.[65] This study was based on interviews, by Public Opinion Laboratory of the University of Washington, with 361 families residing in King County. The heads of the households of these families were employed by Boeing Airplane Company. The study reported total and average family expenditures for health-care goods and services which reportedly covered the families' 1956 experiences.

Health Information Foundation's 1958 nationwide survey of family expenditures for personal health services provided the most detailed information on the utilization and cost of drugs. The 1953 study did not differentiate between prescribed and non-prescribed drugs as did the 1958 survey. Both of these studies analyzed drug expenditures according to age,

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64. Odin W. Anderson, Paul B. Sheatsley, Comprehensive Medical Insurance; A Study of Costs, Use, and Attitudes Under Two Plans, Health Information Foundation, Research Series no. 9, New York, 1959.

65. George A. Shipman, Robert J. Lampman, and S. Frank Miyamoto, Medical Service Corporations in the State of Washington, A Study of the Administration of Physician-Sponsored Prepaid Medical Care, (Cambridge, Massachusetts: Harvard University Press), 1961.

sex, family income, size of family, and residence.[66] The other three studies did not distinguish between prescribed and non-prescribed drugs, which was an important distinction from an insurer's viewpoint, nor did they analyze their drug data according to the above variables.

The major limitations of the 1958 HIF study were: (1) The scope of the study; (2) The accuracy; (3) Timeliness, from a potential insurer's viewpoint, of the drug expenditure data; and (4) The lack of a clear definition of drug.

The scope of the study was national and this was a limitation because potential insurers require information that accurately reflect the demographic characteristics and the drug expenditure patterns of those residing in the geographic area covered by their insurance. The study does not present analyses of any drug expenditure data which reflect differences among geographic areas. The importance of an analysis of drug expenditure data to reflect differences among geographic areas is illustrated by the varying incidence of infectious and communicable diseases. These disease patterns vary not only among geographic areas, but also among states and cities.[67]

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66. For the definition of residence in these studies see: Anderson, Collette, and Feldman, Family Expenditure Patterns..., p. 38.

67. See: Patterns of Disease, (Parke, Davis and Company, Detroit, Michigan), all monthly issues, for incidence of infectious and communicable diseases in the 50 states and over 100 cities in the United States.

The accuracy of the data was questionable because of reliance on the recall ability of the family for the information. An interviewer cannot expect the interviewee to provide accurate information, based mainly on memory, of expenditures which covered a one year period.[68]

The timeliness of drug expenditure data is important to insurers since their cost must be reflected accurately in the insurance premium. The need for current data on the risk insured and the fact that limited drug insurance was a relatively recent development emphasized the relevancy of advanced data on the utilization and cost of drugs.[69] The latest HIF study represents drug expenditure data collected over the period beginning May, 1957 and ending June, 1958.[70]

The HIF studies did not report separately on drug expenses incurred in the physician's office or the cost of drugs

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68. Odin W. Anderson and Jacob J. Feldman, Family Medical Costs and Voluntary Health Insurance: A Nationwide Survey, (New York: McGraw-Hill Book Company, Inc., 1956), p. 239. Also see: Boyd, Harper, Jr. and Westfall, Ralph, Marketing Research, (Homewood, Illinois: Richard D. Irwin, Inc., 1956), pp. 116-117 and 240-242.

69. Odin W. Anderson, Patricia Collette, Jacob J. Feldman, Health Insurance Benefits for Personal Health Services, 1953 and 1958: Nationwide Surveys, Health Information Foundation, Research Series no. 15, New York, 1960, p. 2. This study reported that insurance benefits in 1957-58 covered only 1% of expenditures for prescribed drugs and other medicines, whereas benefits covered 58% of hospital expenditures and 18% of physicians expenses.

70. "Our Increased Spending for Health," Progress in Health Services, vol. 9, no. 2, February, 1960, p. 2.

prescribed by dentists. These may be substantial expenditures for some families.

The accuracy, timeliness, and drug cost limitations of the HIF 1958 survey also apply to the other HIF studies. Two of these studies, however, have an additional limitation since their data represented only the experience of special groups.[71] One study[72] involved labor trade unions and the other[73] involved families of employees of a particular industrial firm. The potential insurer of families with characteristics dissimilar to those in these studies could not, on the basis of such data, arrive at actuarially sound premium rates.

Drug Insurance

A study of the operation of an insurance plan in Essex County, Ontario, Canada provided useful information for potential drug insurers.[74] The information of particular importance included: (1) The average insured prescribed drug price; (2) The average insured prescribed drug expenditures per person per month; (3) A comprehensive description of a method of

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71. Anderson and Sheatsley, Comprehensive Medical..., and Shipman, Lampman, and Miyamoto, Medical Service Corporations... .

72. Anderson and Sheatsley, Comprehensive Medical... .

73. Shipman, Lampman, and Miyamoto, Medical Service Corporations... .

74. T. M. Ross, "Pre-Payment of Prescriptions and the Green Shield Plan," Canadian Pharmaceutical Journal, vol. 94, August, September, October, November, and December, 1961.

insuring against the cost of drugs insured; and (4) The necessity for and the consequences of a lack of reliable data on the insured risk. The latter was demonstrated clearly by the following statements:

> At the inception of the plan, rates were arrived at by guesswork and estimation, since no accurate data were available about the level of use of prescription drugs ...[75]
>
> .....
>
> The plan had not been in operation for many months (three) before the administrators knew that their guess-estimate of premium rates was only half enough.[76]
>
> .....
>
> Roughly 17% of the people in the plan at the time of the rate increase, dropped out and this group was comprised, of course, of healthy persons who had had little or no occasion to use the plan. The group remaining represented a larger proportion of elderly and sick persons, than had the original group. The new premium of $1.56 was, therefore, insufficient to cover this group and the corporation now finds that it has been losing about $0.36 per person per month on this original group, as it is now constituted, even at the higher premium.[77]

The potential deficiencies, from an insurer's viewpoint, of that study were: (1) The lack of a description of the characteristics of the insured; (2) The absence of an analysis

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75. Ibid., December, 1961, p. 563.

76. Ibid.

77. Ibid., p. 564.

of the insureds' expenditures for prescribed drugs according to such variables as income, age, occupation, and residence; (3) The untimeliness of the data; and (4) The exclusion of insulin, vitamins, and other medication not usually purchased pursuant to a prescription order.

Other studies which provided some limited information on drug expenditures are reviewed below:

(1) A 1954 study of Hackensack, New Jersey families examined how social values and attitudes influenced expenditures, particularly in the purchase of health services.[78] The families were asked to recall how much they spent for drugs the previous year. Drug expenditure data collected in this manner are subject to recall bias which limits the value of such data. Another limitation of the study was that the term "drugs" was not defined by the interviewer. However, this study's analysis of drug expenditure data according to income provided useful information.

(2) The 1957 Life Study of Consumer Expenditures, volume 1.[79] A limitation of this study was its broad scope of drug costs. These costs were defined to include, in addition to prescribed and non-prescribed drugs, "tonics, sprays, etc.," and which may or may not have been drugs.[80]

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78. H. Ashley Weeks, Family Spending Patterns and Health Care, (Cambridge, Massachusetts: Harvard University Press, 1961).

79. Life Study of Consumer Expenditures, volume 1, cited by Joseph F. Follmann, Jr., Drugs, Their Costs, and Health Insurance, (New York: Health Insurance Association of America, 1960), p. 23.

80. Ibid.

(3) The 1957 pilot study of 286 members of the International Association of Machinists which was conducted under the direction of Columbia University.[81] The average family expenditure for drugs was based on only a 3-month period. This short period and its restriction to the summer months reduced the representativeness of the drug expenditure data. Also, the study families likely were not representative of other groups of families.

Government

The governmental agencies which regularly report drug cost data are the Office of Business Economics of the U. S. Department of Commerce, the Social Security Administration of the U. S. Department of Health, Education, and Welfare, and the Bureau of Labor Statistics of the U. S. Department of Labor. The limitations of these sources of drug cost data rise from the data collection methods and the scope of the costs they reflect.

The drug expenditure data reported by the U. S. Department of Commerce is determined by the commodity flow method.[82] Briefly, the commodity flow method entails securing commodity data at producers' prices on the output of, for example, manufacturers' drug products; segregating for each commodity the portion of total output not requiring further processing; and

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81. Columbia University, A Pilot Study of Two Hundred Eighty Six Members of the International Association of Machinists, cited by Joseph F. Follmann, Jr., Drugs, Their Costs, and Health Insurance, (New York: Health Insurance Association of America, 1960), p. 24.

82. For a detailed description of this method, see: U. S. Department of Commerce, A Supplement to the Survey of Current Business, 1954 edition, pp. 103-117.

then passing from finished output at producers' prices to final costs to consumers by tracing the commodities through the various stages of the distributive system. This procedure involves numerous estimating steps and is a "roundabout" and complex method of determining drug expenditures.[83] This limitation is emphasized by the following statement on this method of determining consumer expenditures:

> The general problem is to derive consumer sales, valued at prices paid by consumers, from total sales. This qualification regarding prices is important. If the estimating procedure starts with sales (or output) at the producer level and then adjusts them to cover sales of finished consumption commodities only, there still remains the substantial task of raising their valuation to a consumer-price basis.[84]

The U. S. Department of Commerce drug expenditure data are combined with sundries and reported as drug preparations and sundries. Sundries include such items as heating pads, health lamps, and surgical appliances. The Department estimates that 85% of its drug preparations and sundries expenditures are for drugs and medicines.[85]

Another limitation of the U. S. Department of Commerce data is that they are not reported according to various geographic areas of the United States. The importance to the insurer of such an analysis was discussed previously.

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83. Ibid., p. 104.

84. Ibid., p. 103.

85. See Appendix A.

The limitations of the drug cost data of the Social Security Administration are the same as those of the U. S. Department of Commerce because the Social Security Administration's reports are based on U. S. Department of Commerce data.

The Bureau of Labor Statistics' information on drug prices has several limitations. First, the indices only indicate how urban families of wage earners and clerical workers would distribute their expenditures if they continued to buy the same kind and amount of goods and services that they purchased in the year of the comprehensive consumer expenditure survey upon which these figures are based.[86] The BLS statistics cited earlier are based on a survey of consumer expenditures conducted in 1950.[87] The changes in the relative importance of medical care since 1950 are based on price changes for this component of the Consumer Price Index.[88] Thus, the increase in the relative importance of medical care from 5.3% of the Index in 1957 to 5.7% in 1960 does not necessarily mean that corresponding changes took place in the actual urban consumer expenditures.[89]

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86. U. S. Department of Labor, Bureau of Labor Statistics, Techniques of Preparing Major Bureau of Labor Statistics, Statistical Series, Bulletin 1168, December, 1954, chapter 9, pp. 63-81.

87. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, vol. 77, no. 8, August, 1954, p. 892. A revised Consumer Price Index, which has been updated to reflect the buying patterns of wage earners and clerical workers in the 1960's, was first published in January, 1964.

88. Ibid., p. 891.

89. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, vol. 79, no. 5, May, 1956, pp. 568-9.

A second limitation of the BLS data is that the consumer expenditure survey of goods and services conducted in 1950 is based on an interviewing technique subject to high recall bias.[90] The survey families are asked to recall expenditures that were incurred, in some cases, as long ago as one year.

Thirdly, the BLS scope of drug prices is a limitation. Its figures assume that multiple vitamins, aspirin, and milk of magnesia are representative of non-prescription drug expenditures. This is unrealistic in view of the numerous variety of non-prescription drugs available to the consumer. Expenditures for these three drugs hardly represent with reasonable accuracy prices or expenditures for other drug products and product classes that represent large shares of the non-prescription drug market.

Finally, BLS figures are indicative only of drug expenditures by urban wage earners and clerical workers' families. Expenditures by professional, non-urban, and farm families, for example, do not influence BLS figures. A potential insurer wishing to offer its insurance plan to all families would find BLS data of further limited value.

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90. U. S. Department of Labor, Bureau of Labor Statistics, Techniques of Preparing Major ..., p. 72.

CHAPTER II

THE STUDY

The objectives, methodology, limitations, and plan of the study are presented in this chapter.

Objectives

The principal objectives of this study were to: (1) Delineate insurable drug costs; (2) Collect and analyze empirical data on family drug expenditures; and (3) Evaluate the practicability of employing insurance on a voluntary basis to protect the family on a group basis against financial loss from large or unexpected drug costs.

Methodology and Scope of the Study

The methodology of the study involved, the periodic recording and collection of empirical data on family expenditures for drugs for one year and the acquisition of primary and secondary information for an evaluation of the feasibility of insuring against the cost of drugs.

Drug Expenditure Data

A descriptive study of the statistical method design was used to collect family drug expenditure data.[1] The objective of this method was to describe as accurately as possible the

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1. For a definition of this method of research see: Harper W. Boyd, Jr. and Ralph Westfall, Marketing Research, (Homewood, Illinois; Richard D. Irwin, Inc., 1956), pp. 62-63.

nature of family drug expenditures in Dane County, Wisconsin. The drug expenditure data were obtained from the same families for a one year period. This procedure enhanced the reliability of the estimate of the effect on expenditures for drugs by variations in family income, size, residence, and age, occupation, and educational level of the head of the household.

The families for the study were selected from Dane County using a systematic sampling technique.[2] Families selected to participate in the study were mailed an introductory letter on the general purpose of the study.[3] This letter also stated that a personal interview request would follow. The objective of the personal interview was to explain in greater detail the purpose of the study and the nature of the cooperation desired from the family.

The families who expressed a willingness to participate in the study for one year recorded their drug expenditures on diary forms which were provided at the beginning of each month.[4] The identified forms were returned by mail each month and each family was furnished a new blank form. This procedure attempted to provide an accurate description of the drug expenditures incurred by the family and, by repeated contact, to maintain respondents' interest in the study and their accurate recording of expenditures.

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2. See Appendix B for a detailed description of the methodology.

3. See Appendix C.

4. See Appendix D for copies of the sample, original, and revised drug expenditure forms.

The form on which the families recorded their drug expenditures was divided into four columns:

Column I - Prescribed drugs as the term is commonly used.

Column II - Other drugs purchased without a prescription order but on the specific approval or recommendation of a licensed medical practitioner, referred to as over-the-counter drugs in this study.

Column III - Charges by licensed medical practitioners for injections or other drugs.

Column IV - Drug charges incurred by hospitalized members of the family.[5]

In addition to recording the cost of drugs under the appropriate column, the families recorded the day of the month the purchase was made and whether the expense was incurred in a pharmacy, doctor's office, or in places other than these. This information enabled determination of the frequency of expenditures per family per month and the channels of drug distribution utilized by the family.

The families were classified according to family income, size, residence, and age, occupation, and educational level of the head of the household.[6] The drug expenditure data were analyzed according to these variables to measure certain relationships.

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5. In-hospital drugs were included on the form not for the purpose of obtaining information on these expenditures as a basis for insuring against these costs, but for the purpose of attempting to include all drug costs on the form.

6. See Appendix E for classification questionnaire.

The expenditure data were transferred from the monthly forms to a special form designed to facilitate conveyance of the data to data processing cards to expedite their cross tabulation, analysis, and interpretation.[7]

Feasibility of Insuring Against the Cost of Drugs

The sources of information for evaluating the feasibility of the voluntary insurance method of protecting the family on a group basis against financial loss from large and unanticipated drug costs were: (1) The study's family drug cost data; (2) Potential insurance plans based on the family drug cost data and consultations with two insurers, one operating on a non-profit basis and whose concept of insurance would insure all drug costs beginning with the first dollar and the other organized on a profit basis and whose concept of insurance would indemnify only "catastrophic" drug costs;[8] (3) The existing and proposed programs for protecting the family against drug costs; and (4) The literature.[9]

The primary considerations for this evaluation were: (1) The practices of the two insurers consulted in the study; (2) A comparison of the premium and benefits of two potential insurance plans with existing and proposed programs for protecting the family against drug costs; and (3) The amount of the premiums and adequacy of the benefits of two potential

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7. See Appendix F for special form.
8. See footnote 53, p. 23.
9. See footnote 52, p. 23.

plans in view of the family drug cost data.

Other insurers with different plans could have been consulted to appraise the feasibility of drug insurance. Time and cost limitations prohibited inclusion of consultations with other potential insurers. However, since the insurers consulted are representative of insuring organizations operating under the two different concepts of insurance, these consultations provided a reasonably sound basis for evaluating the practicability of insuring drug costs.

Limitations

The limitations of this study may be classified as general, methodological, analytical, and evaluative.

Limitations of the general type include the inability to make sound generalizations from analyses of the study data. The one-year drug expenditure data were from a sample of families residing in only one urban-rural county. The reliability of any generalizations, therefore, will depend upon the similarity of the characteristics and conditions of this study with those to which generalizations are attempted.

The drug expenditure data represented expenditures for the period October, 1960 through December, 1961.[10] These data may

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10. Interviews with families to explain the purpose of the study and request their participation were conducted beginning in October, 1960 and ending January, 1961. The families interviewed in October who were willing to participate recorded their drug expenditures starting with that month and ending with September, 1961. The families who started their participation in January, 1961 terminated their recording of drug expenditures with the month of December, 1961.

not reflect accurately experience in later periods. Drug expenditures could be influenced by factors which did not exist during the time of this study. Examples of such factors are epidemic diseases and scientific and medical breakthroughs in the use of drugs for the treatment of illnesses. However, in the absence of such influencing factors on drug expenditures the relationship of these expenditures to family income, size, residence, and age, occupation, and educational level of the head of the household would tend to remain reasonably unaffected in later years.

Limitations of the methodology include methodological deviations;[11] the accuracy of the drug expenditure data recorded by the families; and the absence of a pre-test of the introductory letter and drug expenditure form on a subsample of the universe.

The accuracy of the recorded data was dependent on the "honesty" of the family. Some families may have recorded either higher or lower costs than they actually incurred. Still other families may have forgotten to record some expenditures. However, asking the families to identify the expenditures and where they were incurred tended to reduce any bias towards reporting other than actual drug costs. The bias toward low drug expenditure data as a consequence of forgetfulness may have been reduced because a drug expenditure form and letter were mailed monthly to the families thus serving as periodic reminders to

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11. For a discussion of these deviations see Appendix B.

record any drug expenses incurred during the period.

A pre-test was not conducted on the introductory letter nor on the monthly form used to record drug expenditures. A pre-test of the introductory letter and drug expenditure form would have revealed the desirability of some minor revisions. However, the nature of the study precluded their pre-test.

The introductory letter was revised after approximately 48% of the families had been interviewed.[12] This revision deleted reference to insurance since a number of families believed the study was a means of soliciting the purchase of drug insurance.[13]

The form on which the drug expenditure data were recorded was revised for greater clarity.[14] The revisions, although not extensive, were deemed desirable because of several misunderstandings regarding the nature of the drug costs that were to be recorded. These misunderstandings occurred during the early part of the study and were corrected by correspondence with the respondents. Therefore, it is believed that there was no important adverse affect on the accuracy of the drug data due to these misunderstandings.

Limitations of the analysis of and the drug expenditure data themselves involve the absence of proof of cause and effect relationships, and the representativeness of the drug expenditure data. Analyses of the expenditure data according to family

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12. See Appendix G for copy of the revised letter.

13. See p. 64ff.

14. See Appendix D for the revised form.

income, size, residence, and age, occupation, and educational level of the head of the household does not prove cause and effect relationships.

The full-year drug expenditure data were obtained from two hundred and thirty-seven families out of five hundred families selected for the study. When compared to the five hundred families according to income, the participating group had a larger percentage of families in the higher income groups and a smaller percentage in the lower income groups.[15] A comparison by income of the selected sample of families and all families in the county showed little variation between percentages in each income group. Thus the selected sample was representative, on the basis of income, in comparison to the county, and the final sample of two hundred and thirty-seven families was biased toward the higher income families.

The bias of the one-year participation families toward higher income groups appeared to be due to an absence of interest in the study by low income families, who may have believed they could not afford the cost of drug insurance.[16] This view receives support from an analysis of the refusal sample of families which showed that low income and reference

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15. See Table 2, p. 59.

16. It is recognized that other factors such as educational level and age of the head of the household might affect the interest of the family in a study of this type. However, these factors were not available for the refusal families for an evaluation of their affect on the interest of these families in this study.

to insurance in the introductory letter appeared to affect adversely the willingness of these families to participate in the study.[17]

Limitations of an evaluative nature pertain to the approach used to evaluate the feasibility of drug insurance and the information obtained from the insurance actuaries and administrators on administrative and selling expenses which was used in the calculation of potential insurance premiums. The loading expense information was not based on proven experience in this field. The relatively little applicable experience of the insurers necessitated that they use their best judgment on providing estimates for administrative and selling expenses. However, they as well as the companies which employed them were deeply interested in the subject of drug insurance. Also both insurers provided limited coverage of drug costs and one insurer was planning to provide insurance for prescribed drug costs. These factors suggest that the information which was furnished and used in this study was as reliable and accurate as possible under the circumstances.

Plan of the Study

Chapter III presents demographic characteristics of Dane County, Wisconsin, the county from which the study sample of families was drawn, and the families residing therein. The families in the sample are analyzed according to those who: (1) Were useable or nonuseable;[18] (2) Agreed to participate;

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17. See p. 66.
18. See p. 60.

(3) Refused to participate; (4) Discontinued participation in the study before the end of the one year period; and (5) Participated in the study for one year. These family groups are compared by one or more of the following variables: family income, size, residence, and age, occupation, and educational level of the head of the household.

In Chapter IV the family drug expenditure data are analyzed as follows: (1) Distribution curves and measures of dispersion, standard deviation, and skewness of amount expended for drugs; (2) The classification and multiple correlation analyses of the dollar amount and percentage of income expended for drugs and several categories thereof according to family income, size, and residence and age, occupation, and educational level of the head of the household; and (3) Sources of family drugs.

In Chapter V an attempt is made to determine the practicability of voluntary insurance as a method of protecting the family on a group basis against financial loss from drug costs. This attempt is based primarily on an evaluation of the study's drug expenditure data and potential drug insurance plans found on consultations with representatives of insurance companies, one operating on the "first dollar" and the other on the "catastrophic" concept of insurance. This evaluation is in

terms of benefits and "lowness" of the premiums of these two potential plans.[19]

Chapter VI presents the summary and conclusions arising from the study.

The appendices contain a detailed description of the methodology, letters, forms, questionnaires, premium calculations and other information of too detailed a nature to include in the text of the study.

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19. The term "lowness" as used by insurers means, in general, the most attractive, from the insured's viewpoint, premium for drug insurance. The price of the premium is the main attraction to the insured, but the attraction also may be influenced by other factors such as an insurer's service, reputation, and the extent of drug costs covered by his insurance policy.

CHAPTER III

THE SAMPLE

The primary aims of this chapter are to: (1) Compare the study sample of families to all families in the county from which the sample was drawn; (2) Examine results of the attempt to gain study participation by the sample of families; and (3) Compare the one-year participation and county or universe families.

Dane County, Wisconsin

The county from which the sample of families was selected is an urban-rural county and the center of the second largest trading area in the state.[1] The main economic activities in the county are centered around: (1) Education - the state university; (2) Government - the state capitol; (3) Industry - meat, machine tools, batteries, and surgical supplies; (4) Hospitals - medical center; (5) Retail and wholesale trade; and (6) Agriculture - the county is among the Nation's leading counties in value of farm products sold.[2]

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1. Wisconsin's No. 1* Market (*Outside Milwaukee) (Madison Newspapers, Inc., Madison, Wisconsin), October, 1959.
2. Ibid.

The population of the county increased from 169,357 in 1950 to 222,095 in 1960 for a 31.1% increase.[3] This increase stimulated the demand for goods and services and increased employment opportunities. The diverse economic activities provided varied occupational opportunities for families residing in the county.

Original Sample of Families

In Table I the original sample of families and county or universe families are compared by income and Madison and Non-Madison residence. The original sample of families was less representative of both the lower two and upper three income groups and more representative of two middle income categories. It is possible that the sample was more or less representative than the universe due to the different sources of income which were used.

Results of Attempt to Gain Study Participation

The attempt to secure participation of the sample of families drawn for the study are summarized in Table 2. This table analyzes the income and Madison and Non-Madison residence of the original, nonuseable, noninterviewed, interviewed, refused to participate, agreed to participate, discontinued participation, and one-year participation families.

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3. See: U. S. Bureau of the Census, U. S. Census of Population: 1950, vol. II, Characteristics of the Population, Part 49, Wisconsin. U. S. Government Printing Office, Washington, D.C., 1952; and U. S. Bureau of the Census, U. S. Census of Population: 1960, General Population Characteristics, Wisconsin. Final Report PC(1)-51B. U. S. Government Printing Office, Washington, D.C., 1961.

TABLE 1

DISTRIBUTION OF COUNTY AND ORIGINAL SAMPLES OF FAMILIES ACCORDING TO FAMILY INCOME[a] AND RESIDENCE

Income	County	Original
Under $2000	6.96%	4.80%
$2000-$3999	13.80	12.20
$4000-$5999	22.96	29.40
$6000-$7999	23.18	26.40
$8000-$9999	14.49	13.00
$10000-$14999	12.99	9.60
$15000- Over	5.62	4.60
Madison Residents	57.0%	65.0%
Non-Madison Residents	43.0%	35.0%

(a) Income for county families was obtained from the 1960 Wisconsin Population Census which reported income for the year 1959.

Income for original sample of families was obtained from the 1958 Wisconsin Individual State Income Tax Return, the latest available at the time of the sample selection.

TABLE 2

SUMMARY OF ATTEMPT TO GAIN STUDY PARTICIPATION

Income	Original						Nonuseable						Useable						Noninterviewed						Interviewed					
	Madison		Non-Madison		All		Madison		Non-Madison		All		Madison		Non-Madison		All		Madison		Non-Madison		All		Madison		Non-Madison		All	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Under $2000	9	3	15	8	24	5	3	7	9	17	12	7	6	2	6	5	12	3	0	0	0	0	0	0	6	2	6	5	12	3
$2000-3999	23	7	38	21	61	12	10	23	10	19	20	23	13	5	28	22	41	10	3	15	3	19	6	17	11	4	25	23	36	10
$4000-5999	89	27	58	33	147	29	17	38	16	31	33	39	72	26	42	34	114	28	8	40	10	62	18	50	64	25	34	31	98	26
$6000-7999	90	28	42	24	132	26	6	13	11	21	17	14	84	30	31	25	115	29	5	25	0	0	5	14	78	30	31	28	109	30
$8000-9999	51	16	14	8	65	13	2	5	3	6	5	4	49	17	11	9	60	15	4	20	3	19	7	19	44	17	7	6	51	14
$10000-14999	41	13	7	4	48	10	4	9	3	6	7	9	37	13	4	3	41	10	0	0	0	0	0	0	37	15	4	4	41	11
$15000- Over	20	6	3	2	23	5	2	5	0	0	2	4	18	6	3	2	21	5	0	0	0	0	0	0	18	7	3	3	21	6
	323	100%	177	100%	500	100%	44	100%	52	100%	96	100%	279	100%	125	100%	404	100%	20	100%	16	100%	36	100%	258	100%	110	100%	368	100%

Refused to Participate						Agreed to Participate						Discontinued Participation						One-Year Participation					
Madison		Non-Madison		All		Madison		Non-Madison		All		Madison		Non-Madison		All		Madison		Non-Madison		All	
#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
4	7	2	7	6	7	2	1	4	5	6	2	0	0	0	0	0	0	2	1	4	6	6	3
4	7	5	18	9	10	7	4	20	24	27	10	1	4	5	27	6	14	6	3	15	23	21	9
19	31	11	39	30	34	45	23	23	28	68	24	7	29	7	39	14	33	38	22	16	25	54	22
10	16	9	32	19	21	68	34	22	27	90	32	6	25	4	22	10	24	62	36	18	28	80	33
14	23	0	0	14	16	30	15	7	9	37	13	5	21	0	0	5	12	25	14	7	11	32	14
8	13	0	0	8	9	29	15	4	5	33	12	2	8	1	6	3	7	27	16	3	5	30	13
2	3	1	4	3	3	16	8	2	2	18	7	3	13	1	6	4	10	13	8	1	2	14	6
61	100%	28	100%	89	100%	197	100%	82	100%	279	100%	24	100%	18	100%	42	100%	173	100%	64	100%	237	100%

Nonuseable Portion of Sample

Nineteen percent or 96 out of the 500 original sample of families were not useable. Table 2 shows that a higher percentage of non-Madison than Madison families was nonuseable, 29% versus 13½%.[4] Further, approximately 70% of the nonuseable families were in the lowest three income groups. The relatively high percentage of nonuseable non-Madison families was due to the large percentage of these families (23.2%) that were not listed in a local telephone directory.[5] This percentage was more than twice the 11.0% of Madison families who were not listed.

Failure to be listed in a local telephone directory also was responsible for the high percentage of nonuseable families in the lowest three income categories. This is shown in Tables 2, 3, and 4 which analyze the income and Madison or Non-Madison residence of the nonuseable families, the reasons for nonuse, and the income and residence of the nonlisted families. These tables show that of the 65 nonuseable families in the lowest three income categories, 54 or 83% were not listed in a local telephone directory.

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4. These percentages are calculated from the table as follows: 52/177 = 29% and 44/323 = 13.5%.

5. The study required that the family's name be listed in a local telephone directory because the source of the family's name was confidential and could not be disclosed in the event the interviewed member of this family asked how his name was chosen for the study.

TABLE 3

DISTRIBUTION OF NONUSEABLE FAMILIES ACCORDING TO REASONS FOR NONUSE

Reason	Number	Percentage
Not listed in a telephone directory[a]	76	79.2%
Physician, dentist, veterinarian, or pharmacist	10	10.3
Student[b]	4	4.2
Military personnel	4	4.2
Miscellaneous[c]	2	2.1
	96	100.0%

(a) The latest telephone directories were used in the study.

(b) University students.

(c) In one of these families the husband and wife were separated and in the other a member of the family was employed in a pharmacy.

TABLE 4

DISTRIBUTION OF INCOME AND RESIDENCE OF NONLISTED FAMILIES

Income	Madison		NonMadison		All	
	#	%	#	%	#	%
Under $2000	3	8	7	17	10	13
$2000-$3999	7	20	9	22	16	21
$4000-$5999	15	43	13	32	28	37
$6000-$7999	8	23	7	17	15	20
$8000-$9999	1	3	3	7	4	5
$10000-$14999	1	3	2	5	3	4
$15000- Over	0	0	0	0	0	0
TOTAL	35	100	41	100	76	100

The absence of a family's listing in a local telephone directory appeared to be due mainly to low income, student status, and occupations such as laborer, military, and university instructor which subject these families to the maintenance of a less permanent residence than families in other occupations.[6]

Table 3 reports the reasons for not using 96 of the families in the original sample. Approximately 80% of the families were nonuseable because they were not listed in a local telephone directory. The next largest group of nonuseable families was composed of physicians, dentists, veterinarians, and pharmacists. These families were nonuseable because their drug expenditures likely would be substantially below those paid by the average consumer of drug products.

Students were nonuseable because of their transient nature and availability of some drugs at no cost to them at the University infirmary. Military personnel were not used in the study because their drug needs were provided by military health units at no cost or a lower cost in comparison to nonmilitary families. The transient nature of military personnel was another reason for not using these families.

Noninterviewed Families

Nine percent or 36 out of 404 families that were useable for the study were not interviewed (Table 2). This table also shows

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6. Income and occupation information were available for the original sample of families. The occupational information was not complete, but adequate for this analysis.

that 13% of the non-Madison and 7.0% of the Madison useable families were not interviewed. The primary reasons for not interviewing non-Madison families were that the family had moved since the latest edition of the local telephone directory and repeated attempts to interview the family were unsuccessful.[7]

Table 5 shows the reasons for not interviewing representatives of 36 families. This table shows that 18 of the families had moved and repeated unsuccessful attempts were made to interview 13 other families. Most of the families not interviewed because of these two reasons were in the lowest three income categories, 24 out of 36 or 67% (Table 2). This tends to support the view that low income is a factor in the family's maintenance of a nonpermanent residence.

Refused to Participate Families

Of the 368 families interviewed for the study, 89 or 24% refused to participate (Table 2). The refusal percentages of the interviewed Madison and non-Madison families were nearly the same, 24% and 25%, respectively. An analysis of the income of these families showed that 64% of the non-Madison and 45% of the Madison families who refused were in the lowest three income categories. The highest percentage refusal was by families in the under $2000

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7. A minimum of two attempts were made to interview the families outside of Madison. A minimum of three attempts were made to interview the Madison families. The minimum requirement in Madison was exceeded many times. Some families were interviewed on the fourth, fifth, and even sixth attempt.

TABLE 5

REASONS FOR NOT INTERVIEWING FAMILIES

Reason	Madison #	Madison %	Non-Madison #	Non-Madison %	All #	All %
Moved	12	60	6	39	18	50
Attempted to interview twice	0	0	4	25	4	11
Attempted to interview thrice	3	15	1	6	4	11
Attempted to interview four times	3	15	1	6	4	11
Attempted to interview five times	1	5	0	0	1	3
Could not locate address	1	5	2	12	3	8
Other(a)	0	0	2	12	2	6
TOTAL	20	100	16	100	36	100

(a) One family was on vacation, the other family was not interviewed because of the death of a close relative on the day of the scheduled interview.

income category, 6 out of 12 or 50%. The willingness of the family to participate in the study was affected adversely by low income.

In Table 6 is an analysis of the families who refused to participate in the study by Madison or non-Madison residence and the type of introductory letter which they received. In general, the residence and the introductory letter which either did or did not refer to insurance apparently did not influence the decision of these families to participate in the study. The non-Madison families who received the introductory letter without reference to insurance showed a relatively higher refusal rate which apparently was due to the high percentage of low income families in this group. Seventy-eight percent of the families in this group were in the lowest three income categories.

The percentage of families who refused to participate in this study, 24%, was relatively lower than those reported by other study attempts to secure, for any length of time, family participation in a research study. For example, the Market Research Corporation of America experienced a 37.3% refusal rate; Michigan State University found that 47% of the selected respondents refused to join a panel; and the University of Georgia found that 42% refused to co-operate in a study panel.[8]

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8. Harper W. Boyd, Jr. and Ralph L. Westfall, An Evaluation of Continuous Consumer Panels as a Source of Marketing Information, (American Marketing Association, Chicago), 1960, p. 13.

TABLE 6

NUMBER AND PERCENTAGE OF FAMILIES WHO REFUSED TO PARTICIPATE ACCORDING TO TYPE OF INTRODUCTORY LETTER AND MADISON AND NONMADISON RESIDENCE

	Madison			Non-Madison		
	Number Received	Number Refused	Percent Refusal	Number Received	Number Refused	Percent Refusal
Introductory letter with reference to insurance	92	22	24.0	83	20	24.0
Introductory letter without reference to insurance	166	39	23.5	27	8	30.0

Discontinued Participation Families

Fifteen percent of the families who agreed to participate in the study discontinued their participation before the end of the study period (Table 2). A relatively higher percentage of non-Madison than Madison families discontinued participation, 22% versus 12%, respectively. An analysis of these families by income and type of introductory letter is shown in Table 7.

This analysis showed that: (1) Sixty-seven percent of the non-Madison families were in the lowest three income categories; (2) Sixty-seven percent of the Madison families were in the above $6000 income categories; (3) Seventy-eight percent of the non-Madison families received the introductory letter which referred to insurance; and (4) Seventy-one percent of the Madison families received the introductory letter without reference to insurance.

From the above analysis it cannot be inferred that either income or the type of introductory letter received by the families influenced their decision to discontinue participation in the study.

One-Year Participation Families

Eighty-five percent of the families who agreed to participate in the study participated for a full one-year period (Table 2). These families in comparison to the original sample of families were less representative of the lower three income categories and more representative of the upper four income categories. They also were more representative of the Madison than non-Madison families. The change in representativeness was due to the

TABLE 7

ANALYSIS OF INCOME, RESIDENCE, AND TYPE OF INTRODUCTORY LETTER RECEIVED BY DISCONTINUED PARTICIPATION FAMILIES

	Number of Discontinued Participation Families			
	Letter with Insurance		Letter without Insurance	
Income	Madison	NonMadison	Madison	NonMadison
Under $2000	0	0	0	0
$2000-$3999	0	5	1	0
$4000-$5999	1	3	6	4
$6000-$7999	1	4	5	0
$8000-$9999	3	0	2	0
$10000-$14999	0	1	2	0
$15000- Over	2	1	1	0
TOTAL	7	14	17	4

nonuseable, noninterviewed, and refusal families most of whom were non-Madison and low income families.

A comparison of the one-year participation and families residing in the county on the bases of income, Madison and non-Madison residence, and occupation, educational level, and age of the head of the household is shown in Table 8. The one-year participation families: (1) Under represent the lowest two income categories and over represent the other income categories; (2) Are reasonably representative of the occupations; (3) Represent a higher average educational level; (4) Under represent the youngest and oldest age groups; and (5) Represent a larger percentage of Madison families and lower percentage of non-Madison families.

The limitations of the representativeness of the one-year participation families notwithstanding, the drug expenditure data from these families were reasonably adequate for the potential insurer of drug costs to have calculated actuarially sound premiums for drug insurance and enhanced the likelihood of its efficient and economic operation.

Attrition Rate of Sample of Agreed to Participate Families and Rate of Return of Monthly Forms

The monthly attrition of the sample families who agreed to participate in the study is shown in Table 9. The largest percentage of these families discontinued their participation during the first and second months. Fifty-seven percent of the families that discontinued participation did so the first month. At the

TABLE 8

COMPARISON OF COUNTY AND SAMPLE FAMILIES WHO PARTICIPATED IN THE STUDY FOR ONE YEAR ACCORDING TO FAMILY INCOME,(a) RESIDENCE, AND AGE, OCCUPATION, AND EDUCATIONAL LEVEL OF THE HEAD OF THE HOUSEHOLD

Income	County	Final
Under $2000	6.96%	1.27%
$2000-3999	13.80	4.22
$4000-5999	22.96	28.27
$6000-7999	23.18	29.96
$8000-9999	14.49	14.77
$10000-14999	12.99	13.92
$15000-Over	5.62	7.59

Occupation	County	Final
Professional, Technical	18.01%	17.30%
Farmers and Farm Managers	6.81	7.59
Managers, Officials and Proprietors	10.51	19.83
Clerical	6.65	6.33
Sales	8.46	5.92
Craftsmen, Foremen	16.47	13.92
Operatives	14.24	13.92
Service Workers	7.18	6.75
Laborers	8.20	2.95
Retired	3.47(b)	5.49(c)

Education	County	Final
No School	0.44%	0.00%
Elementary: 1-7	11.33	2.11
Elementary: 8	18.19	13.08
High School: 1-3	12.93	10.55
High School: 4	24.64	36.71
College: 1-3	11.82	15.61
College: 4 or more	20.65	21.94
Median School Years	12.3	12.7

Age	County	Final
25-29	15.59%	3.80%
30-34	13.32	12.24
35-44	23.86	37.13
45-54	18.63	22.78
55-64	14.29	17.72
65-Over	14.31	6.33

Residence	County	Final
Madison	57.05%	73.72%
Non-Madison	42.95	27.27

(a) County family income figures are for the year 1959 as reported in U. S. Census of Population: 1960, General Population Characteristics, Wisconsin, Final Report PC(1)-51B. Final family income figures are based on questionnaires mailed after October 1, 1961 and in all probability were reported incomes for the year 1960.

(b) Occupation not reported families.

(c) The head of the household of all families are retired except one who was unemployed.

TABLE 9

SUMMARY ANALYSIS OF FAMILIES WHO AGREED TO AND DID PARTICIPATE FOR ONE YEAR AND THE ATTRITION RATE OF THE SAMPLE OF FAMILIES WHO AGREED TO PARTICIPATE

Period and Number Interviewed	Agreed to Participate	Number of Monthly Forms Returned												Number at End of Year
Oct.19-Nov.4 1960	63	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	49
		52	51	50	50	50	49	49	49	49	49	49	49	
(83)														
Nov.11-Dec.17 1960	165	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	144
		156	154	150	148	147	146	145	145	145	144	144	144	
(213)														
Jan.1-Jan.20 1961	51	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	44
		47	46	46	46	45	45	45	45	45	45	45	44	
(72)														
368	279											TOTAL:		237

end of the second month 67% of the families that discontinued participation had ceased to take part in the study.

The rate of return of the drug expenditure forms by the families is shown in Table 10. On the average 77% of the families returned their monthly form within ten days after the end of the month. On the tenth day reminder letters were mailed to the families who had not returned their forms for the previous month. By the 15th of the month an average of 87% of the families had returned their monthly forms and within 30 days after the end of the month an average of 99% of the forms had been returned. This was a reasonably good rate of return and enhanced the reliability of the drug expenditure data that were collected.

A comparison of Tables 9 and 10 shows that the only similar figures in these tables are the total of the monthly figures of the first column of the "Number of Monthly Forms Returned" part of Table 9 and the first figure of the "Number Returned" part of Table 10, or 255; and the last monthly figure of the last column of the "Number Monthly Forms Returned" part of Table 9 and the last figure of the "Number Returned" part of Table 10, or 44. This is because all the figures in Table 9 are final figures for the number of forms returned for the respective month, whereas only the first and last figures in the "Number Returned" part of Table 10 are final figures for the number of forms returned each month.

TABLE 10

RATE OF RETURN OF MONTHLY FORMS

Number Expected	Month 1961	10th*	15th	20th	30th	Number Returned
263	Jan.	79%	88%	92%	97%	255
255	Feb.	80	89	93	96	245
245	Mar.	76	91	95	100	245
245	Apr.	80	87	95	100	245
245	May	74	89	94	99+	244
244	Jun.	75	83	87	99+	243
243	Jul.	77	84	90	99+	241
241	Aug.	78	87	90	100	241
241	Sep.	75	90	92	100	241
191	Oct.	80	87	94	100	191
46	Nov.	78	87	89	99+	45
45	Dec.	80	86	91	99+	44
	AVERAGE:	77%	87%	92%	99%	

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* Letters were mailed to remind respondents who had not returned their monthly forms.

\+ Greater than 99%.

CHAPTER IV

ANALYSIS OF FAMILY DRUG EXPENDITURE DATA

The family drug expenditure data analysis includes: (1) Distribution curves and measures of central tendency, standard deviation, and skewness of drug expenditures; (2) Classification of the dollar amount and percentage of income expended for these drugs by family income, size, residence, and the age, occupation, and educational level of the head of the household; (3) Multiple correlation analyses of the variable dollar amount and percentage of income expended for these drugs with the six independent variables given in (2) above; (4) Average number and price of the various categories of drugs by the six family variables; and (5) An investigation of the drug sources utilized by the family. The data analyses also are compared with similar data from other studies whenever meaningful comparisons can be made.

The analyses describe the nature and extent of family drug expenditures and at the same time provide the potential drug insurer with information to assist in the efficient performance of such activities as determining the extent of economically feasible coverage of drug costs, the calculation of deductibles, the administration of claims, and the establishment of reimbursement schedules for the purveyors of pharmaceutical service.

Distribution Curves and Measures of Central Tendency, Standard Deviation, and Skewness of Drug Expenditures

A statistical description of the dollar amount expended by the study families for drugs is given in Figure 1. The statistics in Figure 1, in addition to describing the study drug cost data, provide an estimate of the parameters[1] of the population, the county from which the study sample of families was selected.

The sample statistics indicate that the distribution of expenditures for drugs and the four classes thereof are reasonably normal since their plotted curves: (1) Are unimodal with frequencies tapering off from both sides of the mode; (2) Show that 90-99% of the observations fall within plus and minus 2 standard deviations of the mean; and (3) Have a Personian measure of skewness less than 1.[2]

Knowledge that a variable dollar amount expended for drugs is normally distributed and of its mean and standard deviation enable an estimate of the entire distribution, and of the unknown parameters of the population in terms of the probable extent to which errors in sampling have caused the sample to deviate from the true value. For example, regarding the estimate of the entire distribution, 68% of the observations

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1. The parameter is the true value of that particular statistic, in a given population. See: Robert Ferber, Statistical Techniques in Market Research, (New York: McGraw-Hill Book Company, Inc., 1949), p. 12.

2. These criteria for a normal curve are taken from Robert Ferber, Statistical Techniques..., p. 37.

STATISTIC	DRUG CATEGORY: ALL	PRESCRIBED	OVER-THE-COUNTER	INJECTIONS PLUS PHYSICIAN DISPENSED
		- - - - -	o	x
MEAN	$ 65.90	$ 37.95	$ 13.10	$ 12.66
MEDIAN	49.72	20.15	6.10	6.60
MODE	14.30	3.35	3.05	3.05
STANDARD DEVIATION	63.79	54.77	19.70	20.29
SKEWNESS	0.81	0.63	0.55	0.53

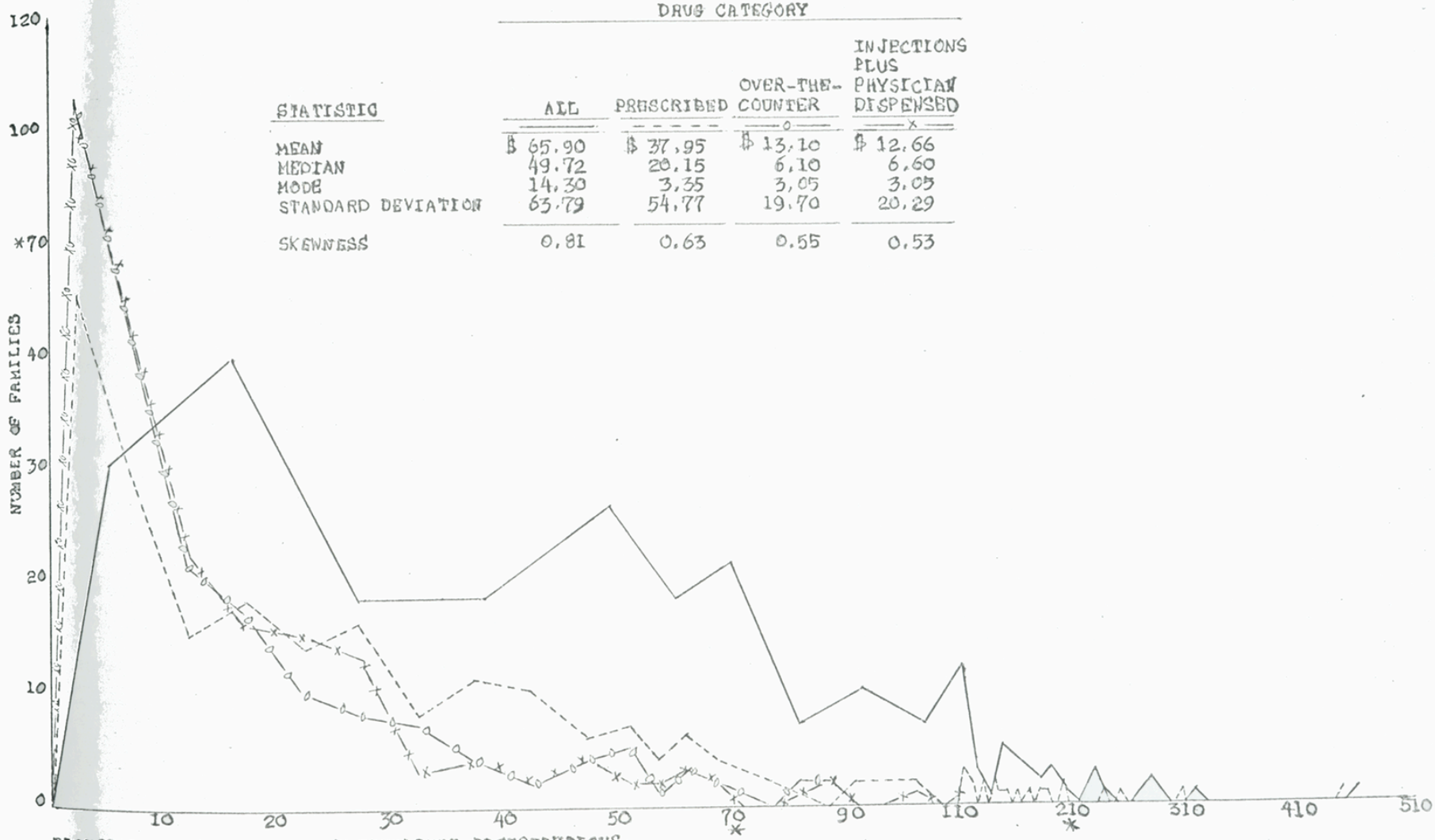


FIGURE 1. FAMILY DRUG EXPENDITURE DISTRIBUTIONS

* NOTE CHANGE IN SCALE

normally would be expected to be between plus and minus 1 standard deviation of the mean, about 95% within the interval of the mean plus and minus 2 standard deviations, and about 99% within 3 standard deviations of the mean. The actual distributions for all drug expenditures are: (1) 88% of the observations are between plus and minus 1 standard deviation; (2) 96% of the expenditures fall between plus and minus 2 standard deviations; and (3) 98% of the observations are within plus and minus 3 standard deviations of the mean. The discrepancies from the expected percentages are due to the skewed nature of the distribution. The actual distribution of the four classes of drugs also differ from the expected percentages for the same reason.

An estimate[3] of a population parameter, for example, the true mean, is provided by the mean and standard deviation of the sample data. This is accomplished by the standard error concept. This concept is that if an infinite number of samples were drawn from this population, one would be correct 68 per cent of the time if he stated, in each case, that the population mean was within the interval of the sample mean plus and minus 1 "standard error" of that mean. The standard error is the estimated value of the (unknown) standard deviation of the sample means in the population, that is, estimated from the sample data. The standard error is calculated by dividing the standard deviation by the

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3. The primary function of a sample in estimation problems is not to yield a point estimate of the population value but to provide a range of values within which the true value is thought to lie. See: Robert Ferber, Statistical Techniques in Market Research..., p. 55.

square root of the sample size. Thus, 68% of the time the true mean of the population from which the study drug data were obtained lies in the interval of the mean of the sample plus and minus 1 standard error, or $65.90 ± $4.15 or between $61.75 and $70.05.[4]

The median, mode, and standard deviation of the population also may be estimated on the basis of the standard error concept.

Such analyses of the family drug data provide the potential drug insurer with: (1) An actual and expected distribution of family drug costs; (2) A basis for a decision as to whether to insure against all or certain categories of the family's drug expenditures; and (3) Assistance in the evaluation of his insurance premium. The possible use of this information by a potential drug insurer will be considered in Chapter V along with the findings presented in the following parts of this chapter.

Classification of Dollar Amount and Percentage of Income Expended For Drugs by Family Income, Size, Residence, and Age, Occupation, and Educational Level of the Head of the Household

This discussion of the observed family drug expenditures and comparisons with findings of other studies complement the multiple correlation analysis of dollar amount and percentage of income expended for drugs with family income, size, residence, and age,

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4. See Figure 1, p. 77. The standard error of the mean was calculated as: $\frac{\sigma}{\sqrt{N}} = \frac{\$63.79}{\sqrt{237}} = \$4.15$.

occupation, and educational level of the head of the household in the following section of this chapter. The discussion pertains primarily to absolute dollar amount and percentage of income expended for drugs and the apparent relationship of these two variables to the six independent variables. This description emphasizes the prescribed, over-the-counter, and injections plus physician dispensed drug categories.

Prescribed Drugs

The average yearly family expenditure for prescribed drugs was $37.95 or approximately 58% of the total family expenditures for all drugs included within the scope of the study (Table 11). A HIF study reported an average family prescribed medicine expenditure of $40 per year which represented approximately 2/3 of the family's expenditures for medicines.[5] The findings of that study, however, are not directly comparable to those of this study because the scope and methodology of the studies differ.

The average price of prescribed drugs was $3.80. The ranges, number, and percentage of prescribed drug prices are presented in Table 12. The median price was $3.82 and the modal price range was $1.01 - 2.00.

A comparison of these prescribed drug prices with those of the 1960 and 1961 Wisconsin Prescription Surveys[6] (Table 13)

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5. Odin W. Anderson, Patricia Collette, and Jacob J. Feldman, Family Expenditure Patterns for Personal Health Services, 1953 and 1958: Nationwide Surveys, (New York: Health Information Foundation, 1960), pp. 33, 35.

6. The term, prescription, in those surveys is equivalent to prescribed drugs in this study.

TABLE 11

CHARACTERISTICS OF FAMILY DRUG EXPENDITURES,
ONE YEAR PERIOD, 1960-1961

Drug Category	Total Units	Average Number Per Family	Average Expenditure Per Family	Percentage of Total Expenditures	Average Price
Prescribed	2368	9.9	$37.95	57.5%	$3.80
O-T-C[a]	1403	5.9	13.10	20.0	2.20
Injections	650	2.7	10.46	16.0	3.81
Physician Dispensed[b]	132	0.6	2.20	3.3	3.95
In-Hospital	73	0.3	2.19	3.2	7.15[c]
ALL	4626	19.4	$65.90	100.0%	$3.37

(a) Over-the-counter drugs purchased without a prescription order but on the specific approval or recommendation of a physician, dentist, or other medical practitioner licensed to prescribe drugs.

(b) Drugs dispensed in the physician's office or home of the patient.

(c) Average expenditure for in-hospital drugs per admission.

TABLE 12

NUMBER AND PERCENTAGE OF PRESCRIBED DRUGS IN VARIOUS PRICE RANGES, ONE YEAR PERIOD, 1960-1961

Range	Number	Percentage	Cumulative Percentage
$0 -1.00	212	9.00%	9.00%
$1.01 -2.00	548	23.00	32.00
$2.01 -3.00	368	15.50	47.50
$3.01 -4.00	368	15.50	63.00
$4.01 -5.00	307	13.00	76.00
$5.01 -6.00	179	7.60	83.60
$6.01 -10.00	306	12.95	96.55
$10.01-Over	80	3.45	100.00
TOTAL	2368	100.00%	100.00%

Median - $3.82 Modal Price Range - $1.01-2.00 Mean - $3.80

TABLE 13

PRICE CHARACTERISTICS OF PRESCRIBED DRUGS IN WISCONSIN, 1960 and 1961

Range	Percent of All Prescribed Drugs 1960	Percent of All Prescribed Drugs 1961	Cumulative Percent Of Prescribed Drugs 1960	Cumulative Percent Of Prescribed Drugs 1961
$0 -1.00	9.3	7.7	9.3	7.7
$1.01 -2.00	29.5	27.8	38.8	35.5
$2.01 -3.00	18.3	23.1	57.1	58.6
$3.01 -4.00	14.9	14.1	72.0	72.7
$4.01 -5.00	11.2	11.5	83.2	84.2
$5.01 -6.00	6.9	6.3	90.1	90.5
$6.01 -10.00	9.0	7.7	98.1	98.2
$10.00-Over	1.9	1.8	100.0	100.0

Average Price: 1960 - $3.33 1961 - $3.34

Source: 1960 Wisconsin Prescription Survey, Marketing Research Memos, David D. Stiles, Director of Market Development, Abbott Laboratories, July 7, 1961, and 1961 Wisconsin Prescription Survey, Abbott Market Research Report, Market Research Department, A. G. Laufer, Manager, April 13, 1962.

shows that: (1) The average prescribed drug price of $3.80 was higher than the 1960 and 1961 Survey averages of $3.33 and $3.34, respectively; (2) In this study more of these drugs were in the upper price ranges; and (3) The modal price range of all three studies are the same, $1.01 - 2.00.

Income

The average family expenditure for prescribed drugs was not directly related to family income. The families in the $2000-$3999, followed by the $10,000-14,999 income group, had the highest expenditures for these drugs (Table 14). The average prescribed drug prices for these families were $5.14 and $4.06, respectively (Table 15). The average price of $5.14 was the highest for all income groups. The average price of $4.06 also was exceeded by the average price of $4.91 paid by families in the under $2000 income group. The average prescribed drug price for families in these three income groups was substantially above the all-family average price of $3.80. The average number of these drugs per family per year was the highest for the income category $10,000-14,999 followed by the $2000-3999 and under $2000 income groups.

An analysis of family expenditures for prescribed drugs as a percentage of income showed no consistent relationship (Table 16). Families in the lowest two income groups spent a much higher than average percentage of their incomes for these drugs. Examination of other family characteristics in these two income categories disclosed some reasons for these high percentages for

TABLE 14

AVERAGE FAMILY DRUG EXPENDITURES BY INCOME, ONE YEAR PERIOD, 1960-1961

Income[a]	Number of Families	Drugs				
		Prescribed	O-T-C	Injections Plus Physician Dispensed	In-Hospital	Total
Under $2000	3	$59.25	$ 5.35	$13.33	$20.25	$98.18
$2000-3999	10	75.53	17.05	8.70	0.00	101.28
$4000-5999	67	21.70	13.60	14.92	1.33	51.55
$6000-7999	71	37.44	8.20	14.21	2.60	62.45
$8000-9999	35	29.72	16.94	9.87	0.88	57.41
$10000-14999	33	67.78	17.02	6.64	3.18	94.62
$15000-Over	18	37.26	14.32	17.29	2.85	71.72
Total and Weighted Means	237	$37.95	$13.10	$12.66	$2.19	$65.90

(a) Weighted mean income, $8618.

TABLE 15

AVERAGE NUMBER AND PRICE OF PRESCRIBED DRUGS PER FAMILY, BY FAMILY INCOME, ONE YEAR PERIOD, 1960-1961

Income(a)	Number of Families	Number Per Family	Average Price
Under $2000	3	12.0	$4.91
$2000-3999	10	14.7	5.14
$4000-5999	67	7.1	3.07
$6000-7999	71	9.8	3.81
$8000-9999	35	8.2	3.62
$10000-14999	33	17.0	4.06
$15000-Over	18	9.9	3.77
Total and Weighted Means	237	9.9	$3.80

(a) Weighted mean income, $8618.

TABLE 16

AVERAGE FAMILY DRUG EXPENDITURES AS A PERCENTAGE OF FAMILY INCOME,[a] ONE YEAR PERIOD, 1960-1961

Income[b]	Number of Families	Drugs as a Percentage of Income				
		Prescribed	O-T-C	Injections Plus Physician Dispensed	In-Hospital	Total
Under $2000	3	5.92%	0.54%	1.33%	2.03%	9.82%
$2000-3999	10	2.52	0.57	0.29	0.00	3.38
$4000-5999	67	0.43	0.27	0.30	0.03	1.03
$6000-7999	71	0.53	0.12	0.20	0.04	0.89
$8000-9999	35	0.33	0.19	0.11	0.01	0.64
$10000-14999	33	0.54	0.14	0.05	0.03	0.76
$15000-Over	18	0.15	0.06	0.07	0.01	0.29
Total and Weighted Means	237	0.44%	0.15%	0.15%	0.03%	0.77%

(a) Family income is average income or the midpoint of the income category. In the $15,000- Over category the average income was actually calculated to be $25,000.

(b) Weighted mean income, $8618.

the $2000-3999 income category but not for the lowest income category. In one-fifth of the $2000-3999 income group families, one or more members were diabetics who had large drug expenditures. This group also had the highest average age of the head of the household. The drug expenditures by families where one or more members were diabetic is shown in Table 17. Table 21 shows increased expenditures for prescribed drugs with increased age of the head of the household. The high average age associated with these families is shown in Table 19.

Other studies[7] have shown that prescribed drug costs as a percentage of income decrease with an increase in income. Such a relationship was not consistent in this study (Table 16). Expenditures for these drugs as a percentage of income for all families was 0.44%.[8]

Size

An analysis of prescribed drug expenditures according to family size shows that the smallest families had the largest

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7. Life Study of Consumer Expenditures, vol. 1, 1957, cited by Joseph F. Follmann, Jr., Drugs, Their Cost, and Health Insurance, (New York: Health Insurance Association of America, 1960), p. 17; and Odin W. Anderson, Patricia Collette, Jacob J. Feldman, Family Expenditure Patterns for Personal Health Service, 1953 and 1958: Nationwide Surveys, (New York: Health Information Foundation, 1960), p. 33.

8. Average family prescribed drug expenditure of $37.95 divided by average family income of $8618. This figure is a weighted average. The mid-points of the income category of the family was used as its average income in the calculation of the weighted average family income.

TABLE 17

ANALYSIS OF DRUG EXPENDITURES BY DIABETIC FAMILIES, ONE YEAR PERIOD, 1960-1961

Number of Families	Drugs					
	Prescribed	O-T-C	Insulin	Injections Plus Physician Dispensed	In-Hospital	Total
1	$ -0-	$62.04	$34.04	$ 3.50	$ -0-	$ 65.54
2	2.98	89.81	66.60	22.00	-0-	114.79
3	25.80	89.43	26.64	-0-	-0-	115.23
4	-0-	2.00	-0-	69.25(a)	17.70	88.95
5	75.05	-0-	-0-	21.00	-0-	96.05
6	445.49	13.75	-0-	-0-	-0-	459.24
7	131.69	80.34	56.32	20.25	-0-	232.28
8	59.11	83.58	75.38	14.00	-0-	156.69
9	-0-	65.07	51.41	8.00	-0-	73.07
Total and Weighted Means 9	$ 82.24	$54.00	$34.49	$17.56	$ 1.97	$155.76

(a) $63.00 of this figure is for the drug Orinase.

average expenditures (Table 18).[9] Individuals comprising single member families averaged 65 years of age or over which was mainly responsible for their high average expenditure for these drugs. This view is supported by the increased prescribed drug expenditures with increased average age of the head of the household (Table 21). The higher than average age of the head of the household in the two-member families contributed to their higher than average prescribed drug expenditures (Table 19). The average family in the remaining size groups, with the exception of six-member families, had average expenditures for these drugs which was below the overall average of $37.95.

Prescribed drug expenditures tended to decrease with an increase in the size of the family (Table 18). Exceptions to this tendency were exhibited by families of four, six, and eight members. When these expenditures were calculated on a per person basis the exceptions were shown only by six and eight-member families. One study reported that prescribed drug expenditures per person decreased as family size increased.[10] This study generally supports that finding.

Prescribed drug expenditures as a percentage of average income, by family size, shows a relationship very similar to that

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9. The size of the family is the head of the household and all his legal dependents.

10. Anderson, Collette, and Feldman, Family Expenditures Patterns..., p. 37.

TABLE 18

AVERAGE FAMILY DRUG EXPENDITURES BY FAMILY SIZE,
ONE YEAR PERIOD, 1960-1961

Size[a]	Number of Families	Drugs				Total
		Prescribed	O-T-C	Injections Plus Physician Dispensed	In-Hospital	
1	2	$126.02	$14.52	$ 1.50	$ -0-	$142.04
2	49	46.77	11.38	11.75	2.24	72.14
3	47	34.54	18.65	10.62	1.02	64.83
4	61	37.10	9.76	11.20	1.77	59.83
5	46	31.53	13.30	14.54	3.16	62.53
6	16	41.20	14.10	15.60	1.40	72.30
7	7	25.02	9.12	23.71	0.60	58.45
8	7	35.68	18.42	21.60	11.93	87.63
9	2	13.68	3.56	7.50	-0-	24.74
Total and Weighted Means	237	$37.95	$13.10	$12.66	$ 2.19	$65.90

(a) Weighted mean size, 3.94.

TABLE 19

FAMILY INCOME, SIZE, RESIDENCE, OCCUPATION, AND EDUCATIONAL LEVEL ANALYZED ACCORDING TO AVERAGE AGE, ONE YEAR PERIOD, 1960-1961

Income	Under $2000 (3)(a)	$2000-3999 (10)	$4000-5999 (67)	$6000-7999 (71)	$8000-9999 (35)	$10000-14999 (33)	$15000-Over (18)
Age	41	51	36	39	42	44	42

Size	1 (2)	2 (49)	3 (47)	4 (61)	5 (46)	6 (16)	7 (7)	8 (7)	9 (2)
Age	65	50	45	36	36	34	38	33	32

Residence	Urban Madison (172)	With Pharmacy Service(b) (32)	Without Pharmacy Service(b) (16)	Farm (17)
Age	40	40	42	42

Occupation	Professional Technical (41)	Farmers and Farm Managers (18)	Managers Proprietors (47)	Clerical (15)	Sales (14)	Craftsmen Foremen (33)	Operatives (33)	Service (16)	Laborers (7)	Retired (13)
Age	43	32	41	36	39	38	36	41	35	63

Education	7th Grade (5)	8th Grade (31)	1-3 Years High School (25)	4 Years High School (87)	1-3 Years College (37)	4 or more Years College (52)
Age	52	45	41	37	40	42

(a) Number in parenthesis is number of families.
(b) Non-Madison communities.

of dollar expenditures and family size (Table 20). These relationships are similar with the exception of the percentage of income spent by the two nine-member families.

Age

An analysis of prescribed drug expenditures according to age shows increased expenditures with an increase in the age of the head of the household (Table 21). This analysis demonstrates the close relationship between old age and high expenditures for these drugs.

An investigation of the average prescribed drug price showed that families in the upper half of the age groups paid higher prices, all of which were above the study average of $3.80 (Table 22). The average number of these drugs per family per year also was higher among families in the upper age groups.

An examination of prescribed drug expenditures as a percentage of average income by age groups showed a tendency for this percentage to increase with an increase in age (Table 23). This was observed notwithstanding a decrease of the percentage of prescribed drug expenditures to income as income increased (Table 16) and an increase in income with an increase in age up to age 65 and over after which it decreased (Table 24). These two factors indicate that the percentage of these drug expenditures as a percentage of income by age should decrease as age increases. Since this was not observed, the relationship that these expenditures increase with an increase in age is clearly demonstrated.

TABLE 20

AVERAGE FAMILY DRUG EXPENDITURES AS A PERCENTAGE OF FAMILY INCOME, BY FAMILY SIZE, ONE YEAR PERIOD, 1960-1961

Size[a]	Number of Families	Average Expenditure as Percentage of Income				
		Prescribed	O-T-C	Injections Plus Physician Dispensed	In-Hospital	Total
1	2	3.15%	0.36%	0.04%	-0-%	3.55%
2	49	0.79	0.19	0.20	0.03	1.21
3	47	0.40	0.21	0.12	0.01	0.74
4	61	0.47	0.13	0.15	0.01	0.76
5	46	0.32	0.14	0.15	0.03	0.64
6	16	0.44	0.15	0.17	0.01	0.77
7	7	0.21	0.08	0.19	-0-	0.48
8	7	0.42	0.22	0.26	0.14	1.04
9	2	0.27	0.07	0.15	-0-	0.49
Total and Weighted Means	237	0.44%	0.15%	0.15%	0.03%	0.77%

(a) Weighted mean size, 3.94.

TABLE 21

AVERAGE FAMILY DRUG EXPENDITURES, BY AGE,
ONE YEAR PERIOD, 1960-1961

Size[a]	Number of Families	Drugs				
		Prescribed	O-T-C	Injections Plus Physician Dispensed	In-Hospital	Total
25-29	9	$17.97	$ 5.64	$16.08	$-0-	$ 39.69
30-34	29	19.07	7.33	15.83	2.60	44.83
35-44	88	31.23	11.11	13.45	1.81	57.60
45-54	54	37.76	14.98	10.96	2.82	66.52
55-64	42	60.77	16.46	9.21	2.22	88.66
65-Over	15	62.59	23.45	16.33	2.72	105.09
Total and Weighted Means	237	$37.95	$13.10	$12.66	$2.19	$ 65.90

(a) Weighted mean years age, 45.5.

TABLE 22

AVERAGE NUMBER AND PRICE OF PRESCRIBED DRUGS PER FAMILY BY AGE, ONE YEAR PERIOD, 1960-1961

Age(a)	Number of Families	Average Number Per Family	Average Price
25-29	9	5.3	$ 3.37
30-34	29	6.5	2.94
35-44	88	9.3	3.37
45-54	54	8.1	4.66
55-64	42	15.9	3.83
65-Over	15	14.2	4.41
Total and Weighted Means	237	9.9	$ 3.80

(a) Weighted mean years age, 45.5.

TABLE 23

AVERAGE FAMILY DRUG EXPENDITURES AS A PERCENTAGE OF FAMILY INCOME, BY AGE, ONE YEAR PERIOD, 1960-1961

Age[a]	Number of Families	Average Expenditure as Percentage of Income				
		Prescribed	O-T-C	Injections Plus Physician Dispensed	In-Hospital	Total
25-29	9	0.33%	0.10%	0.30%	-0- %	0.73%
30-34	29	0.28	0.11	0.23	0.03	0.65
35-44	88	0.39	0.14	0.17	0.01	0.71
45-54	54	0.37	0.15	0.11	0.02	0.65
55-64	42	0.58	0.16	0.09	0.02	0.85
65-Over	15	1.06	0.40	0.28	0.04	1.78
Total and Weighted Means	237	0.44%	0.15%	0.15%	0.03%	0.77%

(a) Weighted mean years age, 45.5.

TABLE 24

FAMILY SIZE, RESIDENCE, AGE, OCCUPATION, AND EDUCATIONAL LEVEL
ANALYZED ACCORDING TO AVERAGE FAMILY INCOME, ONE YEAR PERIOD, 1960-1961

Size	1 (2)(a)	2 (49)	3 (47)	4 (61)	5 (46)	6 (16)	7 (7)	8 (7)	9 (2)
Income	$4000	$5949	$8745	$7836	$9728	$9438	$12,214	$8429	$5000

Age	25-29 (9)	30-34 (29)	35-44 (88)	45-54 (54)	55-64 (42)	65-Over (15)
Income	$5444	$6862	$8119	$10,250	$10,405	$5900

Residence	Urban Madison (172)	With Pharmacy Service(b) (32)	Without Pharmacy Service(b) (16)	Farm (17)
Income	$9224	$6266	$8250	$7206

Occupation	Professional Technical (41)	Farmers and Farm Managers (18)	Managers Proprietors (47)	Clerical (15)	Sales (14)	Craftsmen Foremen (33)	Operatives (33)	Service (16)	Laborers (7)	Retired (13)
Income	$11,695	$6417	$12,894	$6800	$8179	$5970	$6833	$6000	$5286	$5269

Education	7th Grade (5)	8th Grade (31)	1-3 Years High School (25)	4 Years High School (87)	1-3 Years College (37)	4 or more Years College (52)
Income	$7000	$6500	$6240	$7063	$9608	$13,058

(a) Number in parenthesis is number of families.

(b) Non-Madison communities.

Occupation

Average prescribed drug expenditures analyzed according to the occupation of the head of the household showed that retired, professional and technical managers and proprietors, and craftsmen and foremen spent the most for these drugs (Table 25).[11] Prescribed drug expenditures as a percentage of average income, by occupation, showed that the retired farmers, craftsmen and foremen had the highest percentages (Table 26). In both these analyses the retired families demonstrated the highest absolute and relative expenditures.

Farmers paid the highest average prices for prescribed drugs, $4.55 (Table 27). The next highest average prices were paid by the craftsmen and foremen, retired, and professional groups. These four groups' average prescribed drug price was $4.37, well above the overall average price of $3.80. The average prescribed drug price of $2.96 for the other occupations was substantially below the overall average price. The farmer, craftsmen and foremen, and retired groups which had the lowest average incomes paid the highest average prescribed drug prices (Tables 24 and 27).

The highest average number of prescriptions per family per year, 19.5, was experienced by the retired families (Table 27). The next highest average number, 11.9, was experienced by the professional and manager and proprietor occupational groups.

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11. The occupation classification of this study is based on that of the U. S. Bureau of Census. See: U. S. Bureau of the Census, U. S. Census of Population: 1960, General Population Characteristics, Wisconsin, Final Report PC(1)-51B, U. S. Government Printing Office, Washington, D.C., 1961.

TABLE 25

AVERAGE FAMILY DRUG EXPENDITURES BY OCCUPATION,
ONE YEAR PERIOD, 1960-1961

Occupation	Number of Families	Drugs				
		Prescribed	O-T-C	Injections Plus Physician Dispensed	In-Hospital	Total
Professional, Technical	41	$ 50.06	$13.78	$ 7.09	$ 2.19	$ 73.12
Farmers and Farm Managers	18	29.53	17.16	21.37	9.07	77.13
Managers, Officials, and Proprietors	47	44.55	15.28	15.82	1.14	76.79
Clerical	15	22.24	7.86	13.26	2.47	45.83
Sales	14	29.46	11.35	5.00	0.30	46.11
Craftsmen, Foremen	33	39.86	13.01	15.85	1.00	69.72
Operatives	33	26.40	8.34	11.93	0.75	47.42
Service(a)	16	14.61	11.66	15.65	3.23	45.15
Laborers	7	8.80	5.97	7.43	0.60	22.80
Retired	13	83.63	22.46	8.03	4.59	118.71
Total and Weighted Mean	237	$ 37.95	$13.10	$ 12.66	$ 2.19	$ 65.90

(a) Includes private service.

TABLE 26

AVERAGE FAMILY DRUG EXPENDITURES AS A PERCENTAGE OF FAMILY INCOME, BY OCCUPATION, ONE YEAR PERIOD, 1960-1961

Occupation	Number of Families	Average Expenditure as Percentage of Income				
		Prescribed	O-T-C	Injections Plus Physician Dispensed	In-Hospital	Total
Professional, Technical	41	0.43%	0.12%	0.06%	0.02%	0.63%
Farmers and Farm Managers	18	0.46	0.27	0.33	0.14	1.20
Managers, Officials, and Proprietors	47	0.35	0.12	0.12	0.01	0.60
Clerical	15	0.33	0.12	0.20	0.02	0.67
Sales	14	0.36	0.14	0.06	0.00	0.56
Craftsmen, Foremen	33	0.67	0.22	0.27	0.01	1.17
Operatives	33	0.39	0.12	0.18	0.00	0.69
Service	16	0.24	0.19	0.26	0.06	0.75
Laborers	7	0.17	0.11	0.14	0.01	0.43
Retired	13	1.59	0.43	0.15	0.08	2.25
Total and Weighted Means	237	0.44%	0.15%	0.15%	0.03%	0.77%

TABLE 27

AVERAGE NUMBER AND PRICE OF PRESCRIBED DRUGS PER FAMILY BY OCCUPATION, ONE YEAR PERIOD, 1960-1961

Occupation	Number of Families	Average Number Per Family	Average Price
Professional, Technical	41	11.9	$ 4.21
Farmers and Farm Managers	18	6.5	4.55
Managers, Officials, and Proprietors	47	11.9	3.72
Clerical	15	7.3	3.06
Sales	14	10.7	2.75
Craftsmen, Foremen	33	9.0	4.43
Operatives	33	8.5	3.10
Service	16	5.1	2.85
Laborers	7	3.9	2.28
Retired	13	19.5	4.28
Total and Weighted Means	237	9.9	$ 3.80

Education

On the basis of the educational level of the head of the household, the average prescribed drug expenditures of the seventh graders and those with four or more years of college were the highest and nearly identical, $53.49 and $53.61, respectively (Table 28). Factors which contributed to the high average expenditures experienced by the seventh grade level families included: (1) Their average age of 62 years (Table 19); (2) The presence of one or more diabetics among 20% of the families; and (3) The relatively smaller number of families in this educational group so that high prescribed drug expenditure families, such as families with one or more diabetics, increased the average family expenditure.

The high average prescribed drug expenditures by families with four or more years of college is consistent with other findings which imply that an increase in educational level results in greater expenditures for all components of medical care.[12] Other factors which supported the high expenditures by these families were the high average prescribed drug expenditures, by professional and manager and proprietor occupations of which this educational level was mainly composed (Table 25 and Appendix H, Table 1), and the high average prescribed drug expenditures by families in the income category $10,000-14,999 which was characteristic of this educational level (Tables 14 and 24).

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12. H. Ashley Weeks, Family Spending Patterns and Health Care, (Cambridge, Massachusetts: Harvard University Press, 1961), p. 78.

TABLE 28

AVERAGE FAMILY DRUG EXPENDITURES BY EDUCATIONAL LEVEL, ONE YEAR PERIOD, 1960-1961

Education[a]	Number of Families	Drugs				
		Prescribed	O-T-C	Injections Plus Physician Dispensed	In-Hospital	Total
7th Grade	5	$53.49	$33.24	$33.25	$ 0.00	$119.98
8th Grade	31	32.69	15.92	16.21	2.19	67.01
1-3 Years High School	25	38.81	14.43	9.58	5.52	68.34
4 Years High School	87	31.20	10.70	14.33	1.83	58.06
1-3 Years College	37	33.48	11.25	11.40	0.52	56.65
4 or more Years College	52	53.61	13.97	8.40	2.63	78.61
Total and Weighted Means	237	$37.95	$13.10	$12.66	$ 2.19	$ 65.90

(a) Weighted median years education, 12.7.

This study did not show a clear relationship between educational level of the head of the household and prescribed drug expenditures. The lowest and highest educational levels showed almost identical expenditures for these drugs. The other educational levels not only showed lower expenditures, but also exhibited a narrow range of differences. These findings differ from those of the above mentioned study which reported findings implying that the use of all health care increases with an increase in educational level.

Prescribed drug expenditures analyzed according to percentage of average income by educational level show no consistent relationship. The percentages varied among the educational levels from 0.35% to 0.76% (Table 29).

The highest average prescribed drug prices were paid by families in the 1-3 years of high school level, $5.27 (Table 30). This high average price appeared to be associated with the high proportion of farmer and craftsmen and foremen occupations in this educational group (Appendix H, Table 1). Families in these occupational groups paid the highest average prescribed drug prices (Table 27).

The families in the 7th grade and four or more years of college groups showed the largest average number of prescribed drugs per family per year, 13.7 and 11.8, respectively (Table 30).

Residence

An analysis of average prescribed drug expenditures by residence showed that the urban Madison families experienced the

TABLE 29

AVERAGE FAMILY DRUG EXPENDITURES AS A PERCENTAGE OF FAMILY INCOME, BY EDUCATIONAL LEVEL, ONE YEAR PERIOD, 1960-1961

Educational Level(a)	Number of Families	Average Expenditure as Percentage of Income				
		Prescribed	O-T-C	Injections Plus Physician Dispensed	In-Hospital	Total
7th Grade	5	0.76%	0.47%	0.48%	0.00%	1.71%
8th Grade	31	0.50	0.24	0.25	0.04	1.03
1-3 Years High School	25	0.62	0.23	0.16	0.09	1.10
4 Years High School	87	0.44	0.15	0.20	0.03	0.82
1-3 Years College	37	0.35	0.12	0.12	0.00	0.59
4 or more Years College	52	0.41	0.11	0.06	0.02	0.60
Total and Weighted Means	237	0.44%	0.15%	0.15%	0.03%	0.77%

(a) Weighted median years education, 12.7.

TABLE 30

AVERAGE NUMBER AND PRICE OF PRESCRIBED DRUGS PER FAMILY, BY EDUCATIONAL LEVEL, ONE YEAR PERIOD, 1960-1961

Educational Level[a]	Number of Families	Average Number Per Family	Average Price
7th Grade	5	11.8	$ 4.53
8th Grade	31	9.7	3.38
1-3 Years High School	25	7.4	5.27
4 Years High School	87	9.1	3.44
1-3 Years College	7	8.8	3.81
4 or more Years College	52	13.7	3.90
Total and Weighted Means	237	9.9	$ 3.80

(a) Weighted median years education, 12.7.

highest average cost and families in non-Madison communities without pharmaceutical service experienced the lowest average expenditures (Table 31). The relatively higher average drug expenditures of the urban Madison families were associated with factors which were previously shown to contribute to high expenditures; professional-managerial occupation, high income, and high educational level. The low average drug expenditures by families in the non-Madison communities without pharmaceutical service may be partially explained by the absence of readily available pharmaceutical service. Families residing in non-Madison communities with pharmaceutical service experienced the second highest average expenditures for prescribed drugs. A high proportion of these families also were in the professional-managerial occupations, high average income categories, and high educational levels (Table 24 and Appendix H).

An analysis of the average number of prescriptions per family per year and the average price for prescribed drugs is shown in Table 32. The highest average number of prescriptions per family per year was obtained by urban Madison families. The lowest number of prescriptions per family per year was, as would be expected, experienced by families residing in non-Madison communities without pharmaceutical service.

Farm families paid the highest average price for prescribed drugs, $4.49 (Table 32). This was not unexpected since previous analyses showed that the educational level of the average farmer and his occupation were associated with high expenditures for these drugs (Tables 27 and 30 and Appendix H, Table 3).

TABLE 31

AVERAGE FAMILY DRUG EXPENDITURES, BY RESIDENCE,
ONE YEAR PERIOD, 1960-1961

Residence	Number of Families	Drugs				
		Prescribed	O-T-C	Injections Plus Physician Dispensed	In-Hospital	Total
Urban Madison	172	$41.28	$13.06	$10.65	$ 1.51	$66.50
Non-Madison Communities with Pharmaceutical Service	32	36.21	15.19	15.43	2.43	69.26
Non-Madison Communities without Pharmaceutical Service	16	12.21	8.17	20.51	1.30	42.19
Farms	17	31.72	13.50	21.05	9.61	75.88
Total and Weighted Means	237	$37.95	$13.10	$12.66	$ 2.19	$65.90

TABLE 32

AVERAGE NUMBER AND PRICE OF PRESCRIBED DRUGS PER FAMILY, BY RESIDENCE, ONE YEAR PERIOD, 1960-1961

Residence	Number of Families	Average Number Per Family	Average Price
Urban Madison	172	10.9	$ 3.76
Non-Madison Communities with Pharmaceutical Service	32	9.2	3.95
Non-Madison Communities without Pharmaceutical Service	16	4.2	2.98
Farms	17	7.1	4.49
Total and Weighted Means	237	9.9	$ 3.80

An analysis of prescribed drug expenditures as a percentage of average family income by residence is shown in Table 33. The urban Madison and farm families had percentages close to the overall average whereas families in non-Madison communities with and without pharmaceutical service exhibited relatively higher and lower percentages, respectively.

Over-the-Counter Drugs

The average family expenditure for over-the-counter drugs, defined as drugs purchased without a prescription order but on the specific approval or recommendation of a physician, dentist, or other medical practitioner, was $13.10 (Table 11). The average price of these drugs was $2.20 and they accounted for 20% of the average families' expenditures for all drugs included in the scope of the study.

Income

Comparison of average expenditures for over-the-counter drugs to family income showed a variation ranging from a low of $5.35 to a high of $17.05 (Table 14). There was no evidence of a relationship between income and these expenditures. This observation is apparently contrary to the report that expenditures for O-T-C drugs increased with an increase in income.[13]

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13. Anderson, Collette, Feldman, Family Expenditure Patterns..., p. 33. That study's non-prescribed drug definition differed from the definition used here.

TABLE 33

AVERAGE FAMILY DRUG EXPENDITURES AS A PERCENTAGE OF FAMILY INCOME, BY RESIDENCE, ONE YEAR PERIOD, 1960-1961

Residence	Number of Families	Average Expenditure as Percentage of Income				
		Prescribed	O-T-C	Injections Plus Physician Dispensed	In-Hospital	Total
Urban Madison	172	0.45%	0.14%	0.12%	0.01%	0.72%
Non-Madison Communities with Pharmaceutical Service	32	0.58	0.24	0.25	0.04	1.11
Non-Madison Communities without Pharmaceutical Service	16	0.15	0.10	0.25	0.01	0.51
Farms	17	0.44	0.19	0.29	0.13	1.05
Total and Weighted Means	237	0.44%	0.15%	0.15%	0.03%	0.77%

Table 34 shows analyses of O-T-C drug expenditures as a percentage of O-T-C plus prescribed drug expenditures. Table 35 shows analyses of prescribed drug expenditures as a percentage of O-T-C plus prescribed drug expenditures. These tables show no evidence of a relationship between these expenditures and income. Families who experienced the highest comparative expenditures for O-T-C drugs were in income categories $4000-5999 and $8000-9999 (Table 34). The highest comparative expenditure for prescribed drugs was exhibited by the lowest two income categories (Table 35).

The average family spent 25% of their total expenditures for prescribed plus over-the-counter drugs for O-T-C drugs and 75% for prescribed drugs.[14]

The average price of O-T-C drugs varied among the income categories with an apparent tendency for the price to increase as income increased (Table 36).

Size

Average expenditures for drugs purchased over-the-counter by family size varied from a low of $3.56 to a high of $18.65 (Table 18). There was no apparent relationship between these expenditures and family size. An average three-member family experienced nearly the same expenditures as the average eight-member family, $18.65 and $18.42, respectively. However, an analysis of expenditures on a per person basis showed that the smaller size

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14. These percentages are calculated from Table 11.

$8000-9999 (35)	$10000-14999 (33)	$15000-Over (18)
36.30	20.15	27.70

5 (46)	6 (16)	7 (7)	8 (7)	9 (2)
29.75	25.55	26.74	34.15	20.70

55-64 (42)	65- Over (5)
21.30	27.25

Sales (14)	Craftsmen Foremen (33)	Operatives (33)	Service (16)	Laborers (7)	Retired (13)
27.85	24.62	24.00	44.45	40.45	21.17

Years llege 37)	4 or more Years College (52)
5.12	20.70

TABLE 35

FAMILY PRESCRIBED DRUG EXPENDITURE AS A PERCENTAGE OF TOTAL PRESCRIBED DRUG PLUS O-T-C DRUG EXPENDITURE BY FAMILY INCOME, SIZE, RESIDENCE, AGE, OCCUPATION, AND EDUCATIONAL LEVEL, ONE YEAR PERIOD, 1960-1961

Income	Under $2000 (3)(a)	$2000-3999 (10)	$4000-5999 (67)	$6000-7999 (71)	$8000-9999 (35)	$10000-14999 (33)	$15000-Over (18)		
% Prescribed	91.71	81.60	62.50	82.05	63.70	79.85	72.30		
Size	1 (2)	2 (49)	3 (47)	4 (61)	5 (46)	6 (16)	7 (7)	8 (7)	9 (2)
% Prescribed	86.10	80.40	64.90	79.10	70.25	74.45	73.26	65.85	79.30
Residence	Urban Madison (172)	With Pharmacy Service(b) (32)	Without Pharmacy Service(b) (16)	Farm (17)					
% Prescribed	75.90	70.40	59.80	70.10					
Age	25-29 (9)	30-34 (29)	35-44 (88)	45-54 (54)	55-64 (42)	65- Over (5)			
% Prescribed	76.20	72.25	73.70	71.60	78.70	72.75			
Occupation	Professional Technical (41)	Farmers and Farm Managers (18)	Managers Proprietors (47)	Clerical (15)	Sales (14)	Craftsmen Foremen (33)	Operatives (33)	Service (16)	Laborers (7)	Retired (13)
% Prescribed	78.40	63.30	74.45	73.90	72.15	75.38	76.00	55.55	59.55	78.83
Education	7th Grade (5)	8th Grade (31)	1-3 Years High School (25)	4 Years High School (87)	1-3 Years College (37)	4 or more Years College (52)				
% Prescribed	61.65	67.25	72.40	74.45	74.88	79.20				

(a) Number in parenthesis is number of families.

(b) Non-Madison communities.

TABLE 36

AVERAGE O-T-C DRUG PRICE BY FAMILY INCOME, SIZE, RESIDENCE, AGE, OCCUPATION, AND EDUCATIONAL LEVEL, ONE YEAR PERIOD, 1960-1961

Income	Under $2000 (3)(a)	$2000-3999 (10)	$4000-5999 (67)	$6000-7999 (71)	$8000-9999 (35)	$10000-14999 (33)	$15000-Over (18)			
Price	$1.78	$1.79	$2.06	$1.92	$2.88	$2.37	$2.34			
Size	1 (2)	2 (49)	3 (47)	4 (61)	5 (46)	6 (16)	7 (7)	8 (7)	9 (2)	
Price	$4.15	$1.85	$2.03	$2.44	$2.47	$2.53	$1.68	$2.80	$3.56	
Age	25-29 (9)	30-34 (29)	35-44 (88)	45-54 (54)	55-64 (42)	65- Over (5)				
Price	$2.53	$2.12	$2.61	$2.12	$2.02	$1.91				
Occupation	Professional Technical (41)	Farmers and Farm Managers (18)	Managers Proprietors (47)	Clerical (15)	Sales (14)	Craftsmen Foremen (33)	Operatives (33)	Service (16)	Laborers (7)	Retired (13)
Price	$2.44	$2.39	$2.34	$1.90	$2.23	$1.95	$2.33	$2.66	$1.44	$1.76
Education	7th Grade (5)	8th Grade (31)	1-3 Years High School (25)	4 Years High School (87)	1-3 Years College (37)	4 or more Years College (52)				
Price	$1.62	$1.91	$1.97	$2.27	$2.67	$2.47				
Residence	Urban Madison (172)	With Pharmacy Service(b) (32)	Without Pharmacy Service(b) (16)	Farm (17)						
Price	$2.27	$2.04	$1.92	$2.14						

(a) Number in parenthesis is number of families.

(b) Non-Madison communities.

families, especially those with three members or less, experienced a higher expenditure per person than the larger size families. The average expenditures per person for 1, 2, and 3-member families were $14.52, $5.69, and $6.22, respectively. The next highest average expenditure per person was $2.66 for 5-member families. The apparent reason for high expenditures per person in small size families was the older average age of these groups. The average age of the head of the household in 1, 2, and 3-member families was 65- Over, 50, and 45, respectively (Table 19).

There was a tendency for the average price of O-T-C drugs to increase with an increase in family size (Table 36). One and seven-member families were exceptions to this tendency.

Age

The average family expenditure for drugs purchased over-the-counter increased with an increase in the age of the head of the household (Table 21). These expenditures were the highest in families where the age of the head of the household was 65 years and over. A similar observation was reported by the Health Information Foundation.[15]

Analysis of average O-T-C drug expenditure as a percentage of prescribed plus over-the-counter drug expenditures according to age of the head of the household showed the 65- over age group

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15. Anderson, Collette, Feldman, Family Expenditure Patterns..., p. 33.

had lower comparative expenditures for O-T-C drugs, even though they had the highest average absolute expenditure for these drugs (Table 34).

Average expenditures for O-T-C drugs as a percentage of income according to age increased with increased age (Table 23). The average prices paid for these drugs decreased with an increase in age except for the age group 35-44 years which showed a high price (Table 36).

Occupation

Comparison of average expenditures for over-the-counter drugs to occupation of the head of the household showed retired families experienced the highest average expenditures for these drugs (Table 25). This group was followed by the manager-proprietor and professional and technical occupations.

An analysis of average expenditures for over-the-counter drugs of prescribed plus O-T-C drug expenditures by occupation showed service, laborer, and farmer occupational groups experienced the highest percentages (Table 34). The average price paid for O-T-C drugs by these families was above average for farm and service occupations and below average for the laborer group (Table 36). The relatively high prices paid by the farm and service groups was attributable partially to their relatively large family size (Table 37). The relationship of large family size to high average prices for O-T-C drugs was shown in Table 36.

TABLE 37

FAMILY INCOME, RESIDENCE, AGE, OCCUPATION, AND EDUCATIONAL LEVEL ANALYZED BY FAMILY SIZE, ONE YEAR PERIOD, 1960-1961

Income	Under $2000 (3)(a)	$2000-3999 (10)	$4000-5999 (67)	$6000-7999 (71)	$8000-9999 (35)	$10000-14999 (33)	$15000-Over (18)
Size	3.33	2.70	4.16	3.88	3.86	3.63	4.94

Residence	Urban Madison (172)	With Pharmacy Service(b) (32)	Without Pharmacy Service(b) (16)	Farm (17)
Size	3.96	3.90	3.44	4.23

Age	25-29 (9)	30-34 (29)	35-44 (88)	45-54 (54)	55-64 (42)	65- Over (5)
Size	4.11	4.48	4.69	3.81	2.78	2.07

Occupation	Professional Technical (41)	Farmers and Farm Managers (18)	Managers Proprietors (47)	Clerical (15)	Sales (14)	Craftsmen Foremen (33)	Operatives (33)	Service (16)	Laborers (7)	Retired (13)
Size	4.09	4.33	4.12	3.73	3.85	3.91	3.88	4.00	4.43	2.22

Education	7th Grade (5)	8th Grade (31)	1-3 Years High School (25)	4 Years High School (87)	1-3 Years College (37)	4 or more Years College (52)
Size	3.60	3.74	3.48	4.26	3.38	4.17

(a) Number in parenthesis is number of families.

(b) Non-Madison communities.

Education

Average expenditures for O-T-C drugs decreased with an increase in educational level of the head of the household up through four years of high school (Table 28). From this level on, however, average expenditures for these drugs increased. This was expected due to the relationship between average expenditure for over-the-counter drugs and occupation. It was shown that, except for the retired and farmer groups, the professional and technical and manager-proprietor groups exhibited the largest average expenditures for these drugs and these two occupational groups had the highest average educational levels (Appendix H, Table 3). These findings suggest that expenditures should increase with educational level.[16] This expectation did not explain the high average expenditures for O-T-C drugs experienced by the two lowest educational levels which appeared to be due to the average age of the head of the household of the families in these two groups. The average age of the head of the household of the families in the 7th grade group was the highest of all the educational levels, 52 years, followed by that of the 8th grade group, 45 years (Table 19).

Thus, high average expenditures for O-T-C drugs at the lowest educational levels was associated with age, whereas the increase in these expenditures with an increase in educational level, at the upper levels, was associated with occupation and

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16. Footnote 12, p. 103, provides additional support of this view.

high educational level. Average O-T-C drug expenditures as a percentage of income by educational level decreased with an increase in educational level (Table 29). The average prices paid for these drugs, however, increased with increased educational levels (Table 36). Thus, although the lower educational families expended more dollars for O-T-C drugs than the higher educational level families, the average price they paid for these drugs was lower than that paid by the higher educational level families.

Residence

The highest average expenditures for over-the-counter drugs were experienced by families residing in non-Madison communities with pharmaceutical service (Table 31). However, this average did not differ greatly from the averages of the families residing on farms and in Madison. The families residing in non-Madison communities without pharmaceutical service, on the other hand, reported a relatively low average O-T-C drug expenditure. This appeared to be due to the lessened availability of pharmaceutical service since an analysis of the income, size, and age, occupation, and educational level of the head of the household of these families showed no evidence of a relationship between these variables and the families' low average expenditures for O-T-C drugs.

The average expenditure for O-T-C drugs as a percentage of average income was shown in Table 33. Of all family groups, those residing in non-Madison communities with pharmaceutical service expended the largest percentage of their income for O-T-C drugs. These families were followed by those residing on farms,

in Madison, and non-Madison communities without pharmaceutical service. This relationship was similar to that for residence and dollar expenditures for O-T-C drugs. This was observed notwithstanding the differences among the average income of the families in the several residences (Table 24).

Families residing in Madison paid the highest average price for O-T-C drugs (Table 36). Their average price of $2.27 was slightly above the average price of $2.20 for all families. Farm families experienced the next highest average price of $2.14 followed by families residing in non-Madison communities with and without pharmaceutical service who had averages of $2.04 and $1.92, respectively.

Families residing in non-Madison communities without pharmaceutical service made over 40% of their total average expenditures for prescribed plus over-the-counter drugs for O-T-C drugs (Table 34). This percentage was relatively much higher than that of the family groups whose percentages were not only lower but which did not differ greatly from each other.

Although families residing in non-Madison communities without pharmaceutical service purchased a relatively high percentage of O-T-C drugs in relationship to total expenditures for prescribed plus O-T-C drugs, the amount of these purchases from non-pharmacy outlets was relatively less than those of the other residence groups (Appendix J, Table 6). This observation indicates a certain degree of reliance on pharmacies by these families for their O-T-C drugs. The decreased availability of pharmaceutical

service to these families apparently did not influence them to purchase more of their O-T-C drugs from other than pharmacy outlets such as, mail order houses, door-to-door salesmen, and grocery stores.

Injections Plus Physician Dispensed Drugs

The average yearly family expenditure for injections and physician dispensed drugs was $10.46 and $2.20, respectively (Table 11).[17] These costs were more than 19% of the families' total expenditures for drugs included in the scope of this study. The average prices paid for injections and physician dispensed drugs were $3.81 and $3.95, respectively (Table 11). The average price of drugs dispensed by physicians was more than the average price of prescribed drugs, $3.80.

Income

Analysis of average total expenditures for injections and physician dispensed drugs showed no relationship to income (Table 38). However, there was an apparent relationship between expenditures for injections and expenditures for physician dispensed drugs. Families, with the exception of those in the under $2000 group, with comparatively high average expenditures for injections also reported high average expenditures for drugs dispensed by physicians.

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17. All of the drugs in the drug component of injections plus physician dispensed drugs were, except for some drugs dispensed by physicians in the homes of patients, dispensed in a physician's office. Therefore, drugs dispensed by physicians is synonymous with drugs dispensed by physicians, dentists, and other medical practitioners.

TABLE 38

AVERAGE NUMBER AND EXPENDITURE FOR INJECTIONS AND PHYSICIAN DISPENSED DRUGS PER FAMILY, BY INCOME, ONE YEAR PERIOD, 1960-1961

Income[a]	Number of Families	Average Number Per Family[b]	Injections[c]	Average Number Per Family[b]	Physician Dispensed Drugs[c]	Total
Under $2000	3	1.7	$13.33	0.0	$ 0.00	$13.33
$2000-3999	10	2.0	7.30	0.5	1.40	8.70
$4000-5999	67	3.4	11.82	0.8	3.10	14.92
$6000-7999	71	3.2	11.82	0.6	2.39	14.21
$8000-9999	35	2.0	9.28	0.2	0.59	9.87
$10000-14999	33	1.3	5.51	0.5	1.13	6.64
$15000- Over	18	3.1	13.10	0.7	4.19	17.29
Total and Weighted Means	237	2.7	$10.46	0.6	$ 2.20	$12.66

(a) Weighted mean income, $8618.

(b) Figures are rounded to a tenth.

(c) Figures are rounded to a cent.

The average price of drugs dispensed by a physician showed no relationship to family income (Table 39). However, the average prices of these drugs apparently were related to the total expenditure for these drugs. The families with the largest average expenditures for these drugs, the $4000-5999, $6000-7999, and $15,000- Over income category families, reported the highest average prices, $3.99, $4.05, and $6.27 (Tables 38 and 39). These families also had the highest average number of injections and drugs dispensed by a physician per family per year (Table 20).

Size

Larger sized families had higher average expenditures for injections than smaller sized families (Table 40). The exception to this observation was the 9-member families. The low average expenditure by the 9-member families likely was due to the small number of families in this size group since the high average expenditures for injections by larger sized families probably was due to various injections such as polio, diphtheria, tetanus, and pertussis which are required by children. This view is further supported by an analysis of the number of injections per family per year in Table 40 which shows, in general, an increase in the number of injections as family size increased.

Average expenditures for drugs dispensed by physicians showed no consistent relationship to size of family (Table 40). The highest average expenditure for these drugs was experienced by 2-member families. These families also paid a relatively high

TABLE 39

AVERAGE PRICE OF PHYSICIAN DISPENSED DRUGS BY FAMILY INCOME, SIZE, RESIDENCE, AGE, OCCUPATION, AND EDUCATIONAL LEVEL, ONE YEAR PERIOD, 1960-1961

Income	Under $2000 (3)(a)	$2000-3999 (10)	$4000-5999 (67)	$6000-7999 (71)	$8000-9999 (35)	$10000-14999 (33)	$15000-Over (18)		
Price	$0.00	$2.80	$3.99	$4.05	$3.41	$2.28	$6.27		
Size	1 (2)	2 (49)	3 (47)	4 (61)	5 (46)	6 (16)	7 (7)	8 (7)	9 (2)
Price	$0.00	$5.56	$3.90	$3.83	$2.36	$1.75	$2.75	$0.00	$0.00
Residence	Urban Madison (172)	With Pharmacy Service(b) (32)	Without Pharmacy Service(b) (16)	Farm (17)					
Price	$3.15	$3.11	$5.36	$3.35					
Age	25-29 (9)	30-34 (29)	35-44 (88)	45-54 (54)	55-64 (42)	65- Over (5)			
Price	$4.05	$2.54	$3.45	$3.33	$3.72	$6.43			
Occupation	Professional Technical (41)	Farmers and Farm Managers (18)	Managers Proprietors (47)	Clerical (15)	Sales (14)	Craftsmen Foremen (33)	Operatives (33)	Service (16)	Laborers (7)	Retired (13)
Price	$3.36	$3.40	$4.00	$1.00	$0.00	$5.04	$3.36	$3.71	$0.00	$1.82
Education	7th Grade (5)	8th Grade (31)	1-3 Years High School (25)	4 Years High School (87)	1-3 Years College (37)	4 or more Years College (52)				
Price	$6.80	$4.81	$3.14	$3.10	$3.95	$2.54				

(a) Number in parenthesis is number of families.

(b) Non-Madison communities.

TABLE 40

AVERAGE NUMBER AND EXPENDITURE FOR INJECTIONS AND PHYSICIAN DISPENSED DRUGS PER FAMILY, BY FAMILY SIZE, ONE YEAR PERIOD, 1960-1961

Size[a]	Number of Families	Average Number Per Family[b]	Injections[c]	Average Number Per Family[b]	Physician Dispensed Drugs[c]	Total
1	2	0.5	$1.50	0.0	$0.00	$1.50
2	49	1.9	6.98	0.9	4.77	11.75
3	47	2.4	7.88	0.7	2.74	10.62
4	61	2.6	10.20	0.3	1.00	11.20
5	46	2.9	12.90	0.7	1.64	14.54
6	16	4.0	15.39	0.1	0.21	15.60
7	7	6.6	20.96	1.0	2.75	23.71
8	7	6.0	21.60	0.0	0.00	21.60
9	2	1.5	7.50	0.0	0.00	7.50
Total and Weighted Means	237	2.7	$10.46	0.6	$2.20	$12.66

(a) Weighted mean size, 3.94.
(b) Figures are rounded to a tenth.
(c) Figures are rounded to a cent.

average price for drugs dispensed by physicians (Table 39). The high average age of the head of these households (50 years) apparently contributed to these observations. This is supported by Tables 39 and 41 which show that the highest expenditures and prices for these drugs were experienced, in general, by the older age groups. Additional support regarding increased prices for these drugs as the average age of the head of the household increased is shown in Tables 19 and 39.

Age

Average expenditures for injections decreased with an increase in the age of the head of the household (Table 41). This relationship was expected since average expenditures for injections increased with an increase in the size of the family and the average age of the head of the household decreased in family size (Tables 40 and 19).

The average number of injections and drugs dispensed by physicians per family per year showed a relationship to age that was similar to that of age and average expenditures for these drugs (Table 41). The average number of injections per family decreased, in general, as age of the head of the household increased and the average number of drugs dispensed by physicians per family per year increased as age of the head of the family increased.

Families in the age groups that reported the highest average expenditures for drugs dispensed by physicians also paid the highest prices for these drugs (Tables 39 and 41).

TABLE 41

AVERAGE NUMBER AND EXPENDITURE FOR INJECTIONS AND PHYSICIAN DISPENSED DRUGS PER FAMILY, BY AGE, ONE YEAR PERIOD, 1960-1961

Age[a]	Number of Families	Average Number Per Family[b]	Injections[c]	Average Number Per Family[b]	Physician Dispensed Drugs[c]	Total
25-29	9	3.6	$12.02	1.0	$4.06	$16.08
30-34	29	3.5	14.77	0.4	1.06	15.83
35-44	88	3.6	12.56	0.3	0.89	13.45
45-54	54	1.8	8.75	0.7	2.21	10.96
55-64	42	1.8	6.64	0.7	2.57	9.21
65- Over	15	1.6	6.47	1.5	9.86	16.33
Total and Weighted Means	237	2.7	$10.46	0.6	$2.20	$12.66

(a) Weighted mean years, 45.5.

(b) Figures are rounded to a tenth.

(c) Figures are rounded to a cent.

Occupation

The farm occupation group showed the highest average expenditure for injections (Table 42). This apparently was due to the relatively larger size and younger average age of the head of the household of these families (Tables 19 and 37). The relationship between expenditures for injections and family size and age of the head of the household were shown previously (Tables 40 and 41). Further support of this finding is found in an analysis of the size and age of the head of the household of the manager-proprietor, clerical, and service occupations. Families in these occupational groups had high average expenditures for injections and also are heavily represented in the younger age groups and larger family sizes (Tables 19, 37 and 42).

The farm and craftsmen-foremen occupational groups experienced the highest average expenditures for drugs dispensed by physicians (Table 42). The families in these occupational groups also had the highest average number of drugs dispensed by physicians per family per year. This finding appears to be associated with the comparatively low educational level of these families. Appendix H, Table 3 shows that the educational level of these families is relatively lower than all other occupations except the laborer group. The relationship of high average expenditure for drugs dispensed by physicians to low educational level families is shown in Table 43.

TABLE 42

AVERAGE NUMBER AND EXPENDITURE FOR INJECTIONS AND PHYSICIAN DISPENSED DRUGS PER FAMILY, BY OCCUPATION, ONE YEAR PERIOD, 1960-1961

Occupation	Number of Families	Average Number Per Family(a)	Injections(b)	Average Number Per Family(a)	Physician Dispensed Drugs(b)	Total
Professional, Technical	41	1.6	$6.52	0.2	$0.57	$7.09
Farmers and Farm Managers	18	3.8	14.94	1.9	6.43	21.37
Managers, Officials, Proprietors	47	2.9	12.78	0.8	3.04	15.82
Clerical	15	4.1	13.19	0.1	0.07	13.26
Sales	14	1.6	5.00	0.0	0.00	5.00
Craftsmen, Foremen	33	2.7	10.50	1.1	5.35	15.85
Operatives	33	3.0	10.92	0.2	1.01	11.93
Service	16	4.5	13.57	0.6	2.08	15.65
Laborers	7	1.6	7.43	0.0	0.00	7.43
Retired	13	1.8	7.61	0.2	0.42	8.03
Total and Weighted Means	237	2.7	$10.46	0.6	$2.20	$12.66

(a) Figures are rounded to a tenth.
(b) Figures are rounded to a cent.

TABLE 43

AVERAGE NUMBER AND EXPENDITURE FOR INJECTIONS AND PHYSICIAN DISPENSED DRUGS PER FAMILY, BY EDUCATIONAL LEVEL, ONE YEAR PERIOD, 1960-1961

Education[a]	Number of Families	Average Number Per Family[b]	Injections[c]	Average Number Per Family[b]	Physician Dispensed Drugs[c]	Total
7th Grade	5	2.2	$10.20	3.4	$23.05	$33.25
8th Grade	31	2.3	9.62	1.6	6.59	16.21
1-3 Years High School	25	2.2	8.32	0.4	1.26	9.58
4 Years High School	87	3.5	13.16	0.4	1.17	14.33
1-3 Years College	37	2.7	10.44	0.2	0.96	11.40
4 or more Years College	52	2.1	7.74	0.3	0.66	8.40
Total and Weighted Means	237	2.7	$10.46	0.6	$2.20	$12.66

(a) Weighted median years education, 12.7.

(b) Figures are rounded to a tenth.

(c) Figures are rounded to a cent.

Education

The families in the four years of high school educational level experienced the highest average expenditure for injections as well as the highest average number of injections per family per year (Table 43). This apparently was due to the relatively large sized families in this educational level, 4.26 (Table 37).

Average expenditures for drugs dispensed by physicians decreased as educational level increased (Table 43). The families in the lowest two educational levels experienced the largest average expenditures and also paid the highest average prices for these drugs (Table 39). The high average expenditures and prices for these drugs by these families apparently was related to the relatively high average age of the head of the household (Table 19). Age as a factor in both high expenditures and prices of these drugs is shown in Tables 39 and 41.

Residence

The farm residents had the highest average expenditures for injections, $13.75 (Table 44). They in turn were followed by residents in non-Madison communities with pharmaceutical service and urban Madison. Those in non-Madison communities without pharmaceutical service showed a relatively much lower average expenditure for injections.

The high average expenditure for injections by farm families apparently was due to the relatively large sized families in this category (Table 37). Further support of this

TABLE 44

AVERAGE NUMBER AND EXPENDITURE FOR INJECTIONS AND PHYSICIAN DISPENSED DRUGS PER FAMILY, BY RESIDENCE, ONE YEAR PERIOD, 1960-1961

Residence	Number of Families	Average Number Per Family(a)	Injections(b)	Average Number Per Family(a)	Physician Dispensed Drugs(b)	Total
Urban Madison	172	2.6	$10.19	0.1	$ 0.46	$10.65
Non-Madison Communities with Pharmaceutical Service	32	3.6	13.01	0.8	2.42	15.43
Non-Madison Communities without Pharmaceutical Service	16	1.7	5.44	2.8	15.07	20.51
Farms	17	3.4	13.75	2.2	7.30	21.05
Total and Weighted Means	237	2.7	$10.46	0.6	$ 2.20	$12.66

(a) Figures are rounded to a tenth.

(b) Figures are rounded to a cent.

view is shown by the families residing in non-Madison communities without pharmaceutical service who had the lowest family size and lowest average expenditure for injections (Tables 37 and 44).

Families residing in non-Madison communities without pharmaceutical service exhibited the highest average expenditure for physician dispensed drugs (Table 44). The next highest average expenditure for these drugs was experienced by farm families. The high average expenditure for physician dispensed drugs by these families apparently was due primarily to the absence of pharmaceutical service in these communities or the longer distance from established pharmacies. These two factors likely prompted physicians to supply certain drug needs of the families.

The average price for drugs dispensed by physicians was highest for families residing in communities without pharmaceutical service (Table 39). The average price of $5.36 for these drugs was relatively higher than that for the other three residences and substantially higher than the average price for prescribed drugs, $3.80 (Table 39).

In-Hospital Drugs

The average family expenditure for in-hospital drugs was $2.19 or 3.2% of the families' total recorded expenditures for drugs (Table 11). The average price reported for

in-hospital drugs was $7.15.[18]

The factors which apparently were associated with large average in-hospital drug charges were: (1) The number of hospitalizations during the year; (2) One or more births in the family; and (3) Farm and retired occupations. The families in the under $2000 income category experienced a substantially larger average expenditure for in-hospital drugs because a member of one of the families was hospitalized twice during the year (Table 14). Families with eight members showed the largest average in-hospital drug expenditures because there was a birth in two of these families (Table 18).

The high average expenditures for in-hospital drugs incurred by farm and retired occupations apparently was due to the quantities and types of drugs received by hospitalized members of these occupational groups (Table 25). This view is supported partially by an analysis of the hospitalization rate of families by residence which show that the farm residents' percentage of hospitalization does not differ greatly from the average for all residents (Table 45).

All Drugs

The average family expenditure for all drugs included in the scope of this study was $65.90 (Table 11). This table

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18. A limitation of this figure is that some families only reported total in-hospital drug charges. They did not indicate the number of units represented by the total. Thus, the figure reported as in-hospital drug price probably was in-hospital expenditure for drugs.

TABLE 45

PERCENTAGE OF HOSPITALIZATIONS DURING THE PERIOD OF THE STUDY, BY RESIDENCE, ONE YEAR PERIOD, 1960-1961

Residence	Number of Families	Percentage Hospitalized(a)
Urban Madison	172	17.45%
Non-Madison Communities with Pharmaceutical Service	32	18.75
Non-Madison Communities without Pharmaceutical Service	16	12.45
Farms	17	17.65
Total and Weighted Means	237	17.30%

(a) Interpreted as the percentage of families in which one or more members were hospitalized during the year.

also shows that the average family purchased approximately 20 units of these drugs at an average price of $3.37. The range of these expenditures was $0 - $459 with approximately 50% of the families averaging expenditures of $50 or more per year (Table 52).

The relationships of all drug expenditures to family income, size, residence, and age, occupation, and educational level of the head of the household are analyzed in Tables 14, 18, 21, 25, 28, and 31. These tables show that: (1) The families in the lowest two and second highest income categories have the highest average expenditures (Table 14); and (2) Average expenditures decreased per person as the size of the family increased (Table 18); (3) Average expenditures increased as the age of the head of the household increased (Table 21); (4) The professional and technical, farm, manager-proprietor, craftsmen-foremen, and retired occupational groups had the highest average expenditures (Table 25); (5) Families in the lowest and highest educational levels experienced the highest average expenditures (Table 28); and (6) Families residing on farms reported the largest average expenditures (Table 31). The latter finding differs from the HIF report that rural farm families spend less for medicines than families in other residences.[19] Although the findings reported by the HIF study differed from this study, there was adequate similarity in the scope of drug expenditures for a meaningful comparison.

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19. Anderson, Collette, Feldman, Family Expenditure Patterns..., p. 33.

Table 46 contains an analysis of the percentage of families and their expenditures by the six independent family variables. This analysis provides the potential insurer of drug costs with information to assist him in the selection of risks. The table, by relating the percentage of families represented and their percentage expenditure, indicates to a potential drug insurer the drug expenditure characteristics of the families whom he may insure.

Level of Drug Expenditures

Prescribed drugs, prescribed plus over-the-counter drugs, and all drugs included in the scope of the study are analyzed according to levels of expenditure in Tables 47, 48, and 49. Table 47 shows that 87.3% of the families reported prescribed drug costs of $1.00 or more during the period of the study and 12.7% of the families did not report any prescribed drug expenditures. The latter percentage, 12.7%, was approximately one-third of 33% no prescribed drug expenditures reported by the HIP study for the same length of period.[20] Forty-two percent of the families and expenditures in the $1 - $24 range and over 77% had either no prescribed drug expenditures or expenditures of less than $50.

The modal expenditure ranges for prescribed plus O-T-C drugs and for all drugs also were $1 - $24 (Tables 48 and 49).

The information provided by these tables is important to the potential insurer of drug costs whose policy would contain

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20. Ibid., p. 189.

TABLE 46

FAMILY INCOME, SIZE, RESIDENCE, AGE, OCCUPATION, AND EDUCATIONAL LEVEL ANALYZED ACCORDING TO PERCENTAGE OF FAMILIES AND AVERAGE DRUG EXPENDITURES, ONE YEAR PERIOD, 1960-1961

Income	Under $2000 (3)(a)	$2000-3999 (10)	$4000-5999 (67)	$6000-7999 (71)	$8000-9999 (35)	$10000-14999 (33)	$15000-Over (18)		
% Families	1.27	4.22	28.27	29.96	14.77	13.92	7.59		
% Expenditures	1.87	6.46	22.21	28.40	12.76	20.03	8.27		
Size	1 (2)	2 (49)	3 (47)	4 (61)	5 (46)	6 (16)	7 (7)	8 (7)	9 (2)
% Families	0.84	20.66	19.85	25.75	19.41	6.75	2.95	2.95	0.84
% Expenditures	1.82	22.60	19.40	23.40	18.45	7.42	2.64	3.93	0.34
Residence	Urban Madison (172)	With Pharmacy Service(b) (32)	Without Pharmacy Svc.(b) (16)	Farm (17)					
% Families	72.57	13.51	6.75	7.17					
% Expenditures	73.25	14.21	4.28	8.26					
Age	25-29 (9)	30-34 (29)	35-44 (88)	45-54 (54)	55-64 (42)	65- Over (15)			
% Families	3.80	12.24	37.13	22.78	17.72	6.33			
% Expenditures	2.30	8.35	32.50	22.90	23.85	10.10			
Occupation	Professional Technical (41)	Farmers and Farm Managers (18)	Managers Proprietors (47)	Clerical (15)	Sales (14)	Craftsmen Foremen (33)	Operatives (33)	Service (16)	Laborers (7)	Retired (13)
% Families	17.31	7.59	19.83	6.33	5.91	13.92	13.92	6.75	2.95	5.49
% Expenditures	19.24	8.87	23.11	4.40	4.16	14.65	10.01	4.63	1.04	9.89
Education	7th Grade (5)	8th Grade (31)	1-3 Years High School (25)	4 Years High School (87)	1-3 Years College (37)	4 or more Years College (52)				
% Families	2.11	13.08	10.55	36.71	15.61	21.94				
% Expenditures	3.84	13.25	10.94	32.45	13.32	26.20				

(a) Number in parenthesis is number of families.

(b) Non-Madison communities.

TABLE 47

PERCENTAGE DISTRIBUTION OF FAMILIES BY LEVEL OF EXPENDITURES FOR PRESCRIBED DRUGS,(a) ONE YEAR PERIOD, 1960-1961

Level of Expenditures(b)	Percentage of Families
$0	12.7
$1-24	42.5
$25-49	22.0
$50-74	10.1
$75-99	2.9
$100-149	5.2
$150-199	2.1
$200-299	1.7
$300-445	0.8
	100.0

(a) Excludes drugs received in hospital or administered and charged by the physician.

(b) There were no expenditures less than $1.00. Expenditures falling within the half-way or greater part of level interval were placed in the next higher level, for example, an average expenditure of $24.50 would be placed in the $25-49 level.

TABLE 48

PERCENTAGE DISTRIBUTION OF FAMILIES BY LEVEL OF EXPENDITURE FOR PRESCRIBED PLUS O-T-C DRUGS, ONE YEAR PERIOD, 1960-1961

Level of Expenditure (a)	Percentage of Families
$0	5.5
$1-24	37.6
$25-49	24.0
$50-74	13.1
$75-99	4.7
$100-149	8.0
$150-199	3.8
$200-299	2.5
$300-459	0.8
	100.0

(a) See footnote (b) Table 47.

TABLE 49

PERCENTAGE DISTRIBUTION OF FAMILIES
BY LEVEL OF DRUG EXPENDITURES,
ONE YEAR PERIOD, 1960-1961

Level of Expenditure(a)	Percentage of Families
$0	3.8
$1-24	28.2
$25-49	18.5
$50-74	19.0
$75-99	9.3
$100-149	11.1
$150-199	5.9
$200-299	3.4
$300-459	0.8
	100.0

(a) See footnote (b) Table 47.

a deductible feature as it would help the insurer define his drug coverage and assist him in arriving at the deductible figure for his policy.

Multiple Correlation Analyses of Dollar Amount and Percentage of Income Expended for Drugs with Family Income, Size, Residence, and Age, Occupation, and Educational Level of the Head of the Household

The multiple regression analyses of the family drug expenditure data provide an estimate of the relative importance of the six independent variables to the two dependent variables and predictive equation values for the various categories of these drug expenditures.

The six independent variables are family income, size, residence, and age, occupation, and educational level of the head of the household. These six independent variables are correlated with each of the two dependent variables, dollar amount and percentage of income expended for the various drug categories.

All the independent variables except age are entered in the regression equations as dummy variables.[21] This form of

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21. A dummy variable provides a simple and useful method of introducing into a regression analysis information contained in variables that are not conventionally measured on a numerical scale; e.g., race, sex, region, occupation, etc. See: Daniel Suits, "Use of Dummy Variables in Regression Equations," Journal of the American Statistical Association, December, 1957, vol. 52, p. 548.

Age is entered as a combination continuous and dummy variable form, except in the case of prescribed plus O-T-C and injections plus physician dispensed drugs where it is entered as a dummy variable.

the variables obviates the need for assuming a linear relationship between each dependent variable with the independent variables. Also the interpretation of the multiple regression equation in this form is different from that where the variables are continuous. In the former case, one of the classes of the particular variable is omitted and the effects of the others are assessed in relation to the effects of being in the class omitted. For example, the residence variable comprises four values, Madison, non-Madison with and without pharmaceutical service, and farm. The Madison residents are omitted and the other three residences are interpreted in relation to the Madison residents.

The following statement summarizes the multiple correlation analysis of the family drug expenditure data:

> The method of analysis ... was essentially multiple correlation of regression with dummy (one or more) variables ... It is an extension of multiple correlation to the situation where the explanatory factors are membership in subclasses like age groups, rather than numerical variables. Like any regression, it minimizes the summed squared errors of predictions made by the derived formula. We use dummy variables even where it might be possible to form a numerical scale of the explanatory factor. This has the advantage that we need make no restrictive assumptions about the linearity of the effect.[22]

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22. James Morgan, Martin David, and Harvey Brazer, "Factors Affecting Family Income: Results of a Conditional Probability Analysis," Proceedings of the Social Statistics Section, 1961, (Washington, D.C.: American Statistical Association, 1962), pp. 192-194.

The multiple regression analyses were performed on an electronic computer in the Numerical Analysis Laboratory of the University of Wisconsin.[23]

Multiple Regression Equations

Four multiple regression equations were used to analyze the family drug expenditures. The first two regression equations assess the relative sizes of the relationship of the dollar amount expended for the several categories of these expenditures and the six independent variables. Regression equations three and four estimate the correlation of the six variables and the percentage of income expended for these drug categories.

Regression equations one and three give the net effects of the six variables on the dollar amount and percentage of income expended for these drugs. Regression equations two and four give the interaction of income, education, and age and only the net effects of family size, residence, and occupation on the two dependent variables. Regression equations one and three are equivalent to Form A multiple regression analysis and regression equations two and four are equivalent to Form B multiple regression analysis.

Tables 50 and 53 show the net effect of the six variables on the dollar amount and percentage of income expended for the several groups of drugs, respectively.

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23. The preparatory work for the multiple regression analyses for the computer was accomplished with the assistance, guidance, and co-operation of Professor Kenneth G. Lutterman of the Sociology Department of the University of Wisconsin.

TABLE 50

EFFECT OF SIX VARIABLES ON DOLLAR AMOUNT AND PERCENTAGE OF INCOME EXPENDED FOR DRUGS - MULTIPLE REGRESSION ANALYSIS FORM A

Regression Equation 1	All		Prescribed		O-T-C		Prescribed plus O-T-C		Injections Plus Physician Dispensed	
	Inc. in R^2	F	Inc. in R^2	F	Inc. in R^2	F	Inc. in R^2	F	Inc. in R^2	F
Income	.0573	1.7203	.0898	2.9253*	.0327	1.6733(a)	n/a(b)	1.8362	n/a(b)	.7908
Age	.0368	2.7784*	.0337	2.7397*	.0328	1.8347	"	2.0883	"	.3699
Education	.0049	.4656	.0109	.2590	.0100	1.6961	"	.7015	"	1.3055
Family Size	.0066	.3887	.0026	.1948	.0293	1.4496	"	.3892	"	.7520
Occupation	.0521	3.1920**	.0418	2.6409*	.0247	2.8435*	"	3.8239**	"	.3879
Residence	.0240	2.0811	.0327	2.9510*	.0407	3.4844*	"	3.5686*	"	1.1669
Total R^2	.1817		.2115		.1702		.1887		.1107	
Total $\overline{R}^2$	.0934		.1264		.0806		.0925		.0054	
Regression Equation 3										
Income	.2849	10.3738**(c)	.2533	9.7174**(c)	.1116	2.2030(d)	n/a(b)	6.9514**(c)	n/a(b)	3.0829(c)*
Age	.0133	1.2557	.0126	1.2663	.0305	1.2026	"	1.6128	"	.3275
Education	.0005	.2344	.0016	.1523	.0081	1.7810	"	1.2353	"	.2455
Family Size	.0092	.6458	.0069	.5828	.0145	.5417	"	.4740	"	.7213
Occupation	.0374	2.2823*	.0268	1.9541	.0448	4.6474**	"	1.5495	"	1.4654
Residence	.0137	1.5248	.0242	2.5448	.0346	4.2450**	"	1.8370	"	1.3684
Total R^2	.3590		.3254		.2541		.2920		.1985	
Total $\overline{R}^2$	.2898		.2525		.1736		.2081		.1035	

* Significant at 0.05 level of probability.
** Significant at 0.01 level of probability.
(a) Income groups $10000-14999 and $15000- over combined significant at 0.05 level of probability.
(b) Values not available.
(c) Income under $3999 significant at 0.01 level of probability.
(d) Income categories: (1) Under $3999; and (2) $4000-5999 and $8000-9999 combined are significant at 0.05 level of probability.

Multiple Regression
Analysis Form A

Multiple regression analysis form A for all, prescribed, over-the-counter, prescribed plus over-the-counter, and injections plus physician dispensed drugs explains 18%, 21%, 17%, 19%, and 11%, respectively, of the variation in the dollar amount expended for these drugs. Corrected for degrees of freedom these percentages are 9%, 13%, 8%, 9%, and 0.5%. With respect to the percentage of income expended for these drugs these percentages are 36%, 33%, 25%, 29%, and 20% uncorrected for degrees of freedom. Corrected for degrees of freedom these percentages are 29%, 25%, 17%, 21%, and 10%.

The six variables explain more of the variation in the percentage of income than in the dollar amount expended for the several categories of drugs.

Form A analysis of the dollar amount and percentage of income expended for the various groups of drugs shows that income, age, occupation, and residence were significant variables.[24] Income was significant in its contribution to the explanation of the variance in the dollar amount expended for prescribed drugs, and the percentage of income expended for all, prescribed, prescribed plus over-the-counter, and injections plus physician dispensed drugs.

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24. The standard test of significance in this study is at the 0.05 level of probability. This is an accepted standard in market research. See: Robert Ferber, Statistical Techniques In..., p. 111.

Age contributed significantly to the variance in the dollar amount expended for all and prescribed drugs. This variable was nonsignificant in its explanation of the variance in the percentage of income expended for any of these drug categories.

Occupation was a significant variable in the explanation of the variance in the dollar amount expended for all, prescribed, over-the-counter, and prescribed plus over-the-counter drugs, and the percentage of income expended for all and over-the-counter drugs.

Residence contributed significantly to the explanation of the variance in the dollar amount expended for prescribed, over-the-counter, and prescribed plus over-the-counter drugs, and the percentage of income expended for over-the-counter drugs.

An examination of the income variable itself in Form A analysis in Tables 51 and 52 shows that: (1) The dollar amounts expended for all, prescribed and over-the-counter drugs by families in income group $10000-14999 were significantly more than expenditures for these drugs by families in income range $6000-7999; (2) The dollar amount expended for over-the-counter drugs by families in income group $8000-9999 was significantly more than these expenditures by families in the $6000-7999 income range; (3) Percentages of income expended for all, prescribed, over-the-counter, prescribed plus over-the-counter, and injections plus physician dispensed drugs by families in the under $3999 income group were

TABLE 51

REGRESSION EQUATION 1 VALUES FOR DOLLAR AMOUNT EXPENDED FOR DRUGS
MULTIPLE REGRESSION ANALYSIS FORM A

Regression Equation 1	All	Prescribed	O-T-C	Prescribed Plus O-T-C	Injections Plus Physician Dispensed	N
Constant	50.24	28.75	12.44	34.15	9.48	
Income						
Under $3999	15.24	24.78	- 1.22	18.80	- 9.85	13
$4000-5999	- 8.59	-11.66	4.24	-17.37	- 2.60	67
$6000-7999	0.00	0.00	0.00	0.00	0.00	71
$8000-9999	-10.23	-15.13	8.11[1]	- 5.58	- 3.58	35
$10000-14999	27.55[1]	24.02[1]	10.85[2]	21.88	- 6.03	33
$15000- over	- 2.23	- 9.50	6.68	- 3.50	0.62	18
Age						
Under 34 years	-19.08	-13.63	- 7.04	----	----	38
35-54 years	- 9.57	- 5.53	- 3.14	----	----	142
55- over years	12.33	12.01[1]	0.14	28.44[1] (a)	----	57
Education						
Grade School	8.04	- 1.98	4.61	- 8.69	4.97	36
High School	0.00	0.00	0.00	0.00	0.00	112
Some College	-10.83	- 6.78	- 3.68	-10.29	- 0.34	37
College Graduate	- 5.74	3.35	- 5.92	-16.49	- 5.24	52
Family Size						
one, two	- 4.28	1.16	- 7.94[1]	- 3.00	1.84	51
three	0.00	0.00	0.00	0.00	0.00	47
four	5.81	8.01	- 5.08	6.08	2.86	61
five	10.33	6.67	- 0.71	9.92	5.27	46
six or more	12.79	7.92	- 2.24	- 3.63	7.96	32
Occupation						
Professional	27.30[1]	18.54	5.13	24.42[1]	3.16	88
White Collar	- 2.02	- 2.37	0.19	- 0.08	- 0.17	29
Skilled	38.61[2]	30.79[2]	6.76	50.84[2]	1.26	33
Operatives	0.00	0.00	0.00	0.00	0.00	56
Retired	60.47[2]	47.29[2]	13.51[1]	41.26	- 3.47	13
Farm	49,82	10.89	32.06[2]	50.02	6.41	18
Residence						
Non-Madison with	- 5.62	- 8.65	- 0.47	- 8.27	2.63	32
Non-Madison without	-41.27[1]	-43.30[2]	- 8.48	-50.46[2]	9.51[1]	16
Farm	-37.99	-11.96	-29.20[2]	-38.94	2.33	17
Madison	0.00	0.00	0.00	0.00	0.00	172

(1) T-value significant at 0.05 level of probability.

(2) T-value significant at 0.01 level of probability.

(a) Age entered as a dummy variable and age group 55-64 years is significant.

TABLE 52

REGRESSION EQUATION 3 VALUES FOR PERCENTAGE OF INCOME EXPENDED FOR DRUGS
MULTIPLE REGRESSION ANALYSIS FORM A

Regression Equation 3	All	Prescribed	O-T-C	Prescribed Plus O-T-C	Injections Plus Physician Dispensed	N
Constant	.5082	.2181	.1502	.5261	.1736	
Income						
Under $3999	3.1370[2]	2.5720[2]	.2473[1]	2.5360[2]	.3308[2]	13
$4000-5999	.2091	- .0136	.1447[2]	.0426	.0646	67
$6000-7999	.0000	.0000	.0000	.0000	.0000	71
$8000-9999	- .3142	- .2951	.0691	- .0967	- .0929	35
$10000-14999	- .1288	- .0242	.0414	.1924	- .1359	33
$15000- over	- .8371[1]	- .6306	- .0381	- .4452	- .1690	18
Age						
Under 34 years	- .3537	- .2596	- .0904	----(a)	----(a)	38
35-54 years	- .0304	- .0023	- .0301	----	----	142
55- over years	.1564	.1603	.0299	----	----	57
Education						
Grade School	- .0433	- .1293	.0962	- .4110	- .0167	36
High School	.0000	.0000	.0000	.0000	.0000	112
Some College	- .1592	- .0821	- .0707	- .1750	- .0005	37
College Graduate	- .2271	- .1158	- .0883	- .3810	- .0552	52
Family Size						
one, two	.0448	.0992	- .0898	.1105	.0310	51
three	.0000	.0000	.0000	.0000	.0000	47
four	.0209	.0626	- .0604	- .0211	.0219	61
five	.3779	.3460	- .0429	.3052	.0929	46
six or more	.3030	.2304	- .0134	.0695	.1146	32
Occupation						
Professional	.5491[1]	.4138	.0889	.2988	.0422	88
White Collar	.1141	.0877	.0385	- .0844	- .0077	29
Skilled	.6785[1]	.5251[1]	.1080	.6198[1]	.0508	33
Operatives	.0000	.0000	.0000	.0000	.0000	56
Retired	1.3240[2]	.9929[1]	.4119[2]	.8468	- .0846	13
Farm	.8920	- .1633	.6456[2]	.5172	.4234[1]	18
Residence						
Non-Madison with	- .1902	- .0989	- .0718	.0454	- .0346	32
Non-Madison without	- .7858[1]	- .7337[1]	- .1806[1]	- .7767[1]	.1340	16
Farm	- .0199	.7128	- .5743[2]	.2076	- .1954	17
Madison	.0000	.0000	.0000	.0000	.0000	172

(1) T-value significant at 0.05 level of probability.

(2) T-value significant at 0.01 level of probability.

(a) Age entered as dummy variable and no age group is significant.

significantly more than such expenditures by families in income range $6000-7999; and (4) Percentage of income expended for over-the-counter drugs by families in the $4000-5999 group was significantly more than such expenditures by families in the $6000-7999 income group.

An analysis of the variable age shows that families in the55-64 years group spent significantly more for prescribed and prescribed plus over-the-counter drugs than families in the 65 and over age groups.[25]

An examination of family size shows that families of one or two members spent significantly less for over-the-counter drugs than families of three members.

An analysis of occupation shows that: (1) Professional and technical families spent dollar amounts for all and prescribed plus over-the-counter drugs and a percentage of income for all drugs that were significantly more than operatives' expenditures for these drugs; (2) Skilled families spent dollar amounts and percentages of income for all, prescribed, and prescribed plus over-the-counter drugs that were significantly more than such expenditures by operative families; (3) Retired families expended dollar amounts and percentages of income that were significantly more than operatives' expenditures for all, prescribed, and over-the-counter drugs;

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25. In the age group 55- over are two age groups, 55-64 years and 65 and over. The interpretation is in the relationship of these age groups to each other except in the case of prescribed and over-the-counter drugs where age is a dummy variable and the age group 55-64 years is interpreted in relation to the omitted age group, 35-44 years.

and (4) Farm families expended dollar amounts and percentage of income for over-the-counter and injections plus physician dispensed drugs that were significantly more than operatives' expenditures for these drugs.

An examination of residence shows that: (1) Non-Madison without pharmaceutical service families spent dollar amounts that were significantly more than Madison families' expenditures for all, prescribed, prescribed plus over-the-counter, and injections plus physician dispensed drugs; (2) Non-Madison without pharmaceutical service families spent percentages of income that were significantly more than Madison families' expenditures for all, prescribed, over-the-counter, and prescribed plus over-the-counter drugs; and (3) Farm families spent dollar amounts and percentages of income that were significantly more than Madison families' expenditures for over-the-counter drugs.

Multiple Regression Analysis Form B

The objective of multiple regression analysis Form B is to analyze the effect of the interaction term, income-education-age. Table 53 shows that this interaction was significant in its contribution to the explanation of the variance in the dollar amount expended for all and prescribed drugs and the percentage of income expended for all drugs.

An analysis of the interaction term itself shows that: (1) High income and education were significant in explaining

TABLE 53

EFFECTS OF SIX VARIABLES ON DOLLAR AMOUNT AND PERCENTAGE OF INCOME EXPENDED FOR DRUGS -- MULTIPLE REGRESSION ANALYSIS FORM B

Regression Equation 2	All		Prescribed		O-T-C		Prescribed Plus O-T-C		Injections Physician Pr	Plus escribed
	Inc. in R^2	F	Inc. in R^2	F	Inc. in R^2	F	Inc. in R^2	F	Inc. in R^2	F
Income-Education-Age	.1493	1.5500(a)*	.1545	1.6158(c)*	N/a[1]	---(d)	N/a[1]	---(g)	N/a[1]	---(i)
Family Size	.0050	.8093	.0073	.9276	"	1.8391	"	.6606	"	1.0468
Residence	.0090	2.3306	.0201	2.7318*	"	4.0767**	"	3.7013*	"	.9899
Occupation	.0802	4.0545**	.0615	3.2552**	"	3.8608**	"	4.7184**	"	.4827
Total R^2	.2450		.2434		.2420		.2282		.1529	
Total $\overline{R}^2$	.1090		.1073		.1056		.0892		.0005	
Regression Equation 4										
Income-Education-Age	.1507	1.5600(b)*	.1113	1.1024	N/a[1]	---(b)(d)	N/a[1]	---(h)	N/a[1]	
Family Size	.0065	.6292	.0111	.9118	"	.5087	"	.6819	"	
Residence	.0235	1.0560	.0252	1.6732	"	4.8145**	"	1.9368	"	---(j)
Occupation	.1068	5.9971**	.0954	5.0405**	"	6.3760**	"	4.1267**	"	.3594
Total R^2	.2875		.2430		.3136		.2458		.2029	1.4738
Total $\overline{R}^2$	.1593		.1067		.1900		.1100		.0594	1.7221

* Significant at 0.05 level of probability.

** Significant at 0.01 level of probability.

(N/a[1]) Information not available as multiple regression problem programed for computer.

(a) High income group significant at 0.05 level of probability and high education significant at 0.01 level of probability.

(b) Median age group significant at 0.05 level of probability.

(c) High income and age groups are significant at 0.05 level of probability and high education group significant at 0.01 level of probability.

(d) F statistic noncalculable. Low income group families are significant at 0.05 level of probability and medium age group families are significant at 0.01 level of probability.

(g) F statistic noncalculable. Medium income and education groups are significant at 0.05 level of probability.

(h) F statistic noncalculable. Medium education group significant at level of probability.

(i) F statistic noncalculable.

(j) F statistic noncalculable. Medium age group significant at 0.05 l.05 of probability.

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the variation in the dollar amount expended for all and prescribed drugs; (2) Medium income and education explained a significant part of the variation in the dollar amount expended for the prescribed and over-the-counter class of drugs; (3) Low income and medium age were significant in explaining the variation in the dollar amount expended for over-the-counter drugs; (4) High age was significant in explaining the variation in dollar amount expended for prescribed drugs; (5) Medium age contributed significantly to the explanation of the variance in the percentage of income expended for all, over-the-counter, and injections plus physician dispensed drugs; (6) Low income was significant in contributing to the explanation of the variance in the percentage of income expended for over-the-counter drugs; (7) Medium age was significant in explaining the variation in the percentage of income expended for the prescribed plus over-the-counter class of drugs.

Predictive Equation Values

The predictive regression equation values for dollar amount expended for all drugs and the four categories thereof are given in Table 54. These equation values predict a family's dollar amount of expenditures for these drugs given the values of the six independent variables. The calculation of the dollar amount expended for drugs from these equation values requires careful interpretation. The six independent variables in the equations yielding these values explain

TABLE 54

PREDICTIVE REGRESSION EQUATION 1 VALUES FOR D OLLAR AMOUNT EXPENDED FOR DRUGS
MULTIPLE REGRESSION ANAL YSIS FORM A

Predictive Regression Equation 1		All	Prescribed	O-T-C	Prescribed Plus O-T-C	Injections Plus Physician Dispensed
Constant		50.24	28.75	12.44	34.15	9.48
Income						
Under $3999		14.19	26.34	- 5.57	20.73	- 7.25
$4000-5999		- 9.14	-10.10	- 0.11	-15.44	0.00
$6000-7999		- 0.55	1.56	- 4.35	1.93	2.60
$8000-9999		-10.78	-13.47	3.76	- 3.65	- 0.98
$10000-14999		26.70	25.58	6.50	29.81	- 3.43
$15000- over		- 2.78	- 7.94	2.33	- 1.57	3.22
Age(a)	(b)					
Under 34 years	2	-23.10	-29.21	- 2.93	-14.61	4.64
	3	-42.18	-42.84	- 9.97	-23.13	1.09
35-54 years	4	-23.22	-23.07	- 1.41	- 6.32	- 0.55
	5	-32.79	-28.60	- 4.52	3.50	- 0.43
55- over years	6	89.04	70.11	11.99	22.12	- 2.06
	7	101.27	82.12	12.13	16.14	5.75
Education						
Grade School		9.76	- 1.35	5.78	- 1.71	5.42
High School		1.72	0.63	1.17	6.56	0.45
Some College		- 9.11	- 6.15	- 2.51	-43.90	0.11
College Graduate		- 4.02	3.98	- 4.75	-32.38	- 4.79
Family Size						
one, two		- 8.58	- 3.52	- 4.49	- 5.35	- 1.39
three		- 4.30	- 4.30	3.45	- 2.35	- 3.23
four		1.51	3.33	- 1.63	4.33	- 0.37
five		6.03	1.99	2.74	7.57	2.04
six or more		8.49	3.24	1.21	- 5.98	4.73
Occupation						
Professional		4.91	4.23	- 0.92	4.17	1.72
White Collar		-24.41	-16.68	- 5.86	-20.33	- 3.18
Skilled		16.22	16.41	0.71	30.59	- 0.18
Operatives		-22.39	-14.31	- 6.05	-20.25	- 1.44
Retired		38.08	32.98	7.46	21.01	- 4.91
Farm		27.43	- 3.42	26.01	29.77	4.97
Residence						
Non-Madison with		0.67	- 3.68	2.27	7.35	1.46
Non-Madison without		-34.98	-38.33	- 5.74	- 0.92	8.34
Farm		-31.70	- 6.99	-26.46	-43.11	1.16
Madison		6.29	4.97	2.74	-31.59	- 1.17

(a) The three age groups are entered in the regression equation as a continuous variable in the case of all, prescribed, and O-T-C drugs. In the case of prescribed plus O-T-C and injections plus physician dispensed drugs age is entered as a dummy variable. The predictive regression equation values for age entered as a continuous variable were converted to values for the six age categories. The predictive regression equation for age entered as a dummy variable gives the values for the six age categories directly.

(b) 2 = 25-29 years; 3 = 30-34 years; 4 = 35-44 years; 5 = 45-54 years; 6 = 55-64 years; and 7 = 65- over years.

18% (9%), 21% (13%), 17% (8%), 19% (9%), and 11% (0.5%) of the variation in the dollar amount expended for all, prescribed, over-the-counter, prescribed plus over-the-counter, and injections plus physician dispensed drugs, respectively. Thus, the predictive quality of these equation values is subject to the limitation of not explaining all the variation in the dependent variable, dollar amount expended for drugs.

The values in Table 54 represent deviations from the grand mean. Thus, to predict the dollar amount expended for all drugs an appropriate value of each variable is selected and algebraically added with the constant term. For example, given a family in income category $10000-14999, age of 43 years, college graduate, family size of 4, professional occupation, and Madison resident, the predictive dollar amount expended by this family for all drugs for one year is $62.41. This family approximates the average family in the professional and technical group in the study whose reported average expenditures for all drugs was $73.12. The difference, of course, is due to the limitation of the predictive equation values.

Sources of Family Drugs

The sources from which the study families obtained all drugs included in the scope of the study and the four categories thereof were analyzed by the six independent study variables and the analyses presented in Appendex I.[26] In

26. All prescribed drugs were reportedly obtained from pharmacies; therefore, this category of drugs was not analyzed by source. For average expenditure figures on prescribed drugs by the six variables see Tables 14, 18, 21, 25, 28, and 31.

terms of average expenditures, the primary sources for these drugs were pharmacies, physicians, and hospitals.

The minor sources of family drug expenditures were mail order houses, door-to-door salesmen, retail outlets of Sears, Roebuck and Company and Montgomery Ward and Company, and groceries. Approximately 60% of the drugs purchased through minor sources were purchased from mail order houses and the balance of 40% was nearly equally divided among door-to-door salesmen, retail outlets of Sears, Roebuck and Montgomery Ward, and groceries.

All drug sources were classified as pharmacy or non-pharmacy and the four categories of drug expenditures analyzed according to the six independent study variables (Appendix J). Nonpharmacy sources were utilized primarily by: (1) Larger sized families (Appendix J, Table 2); (2) Younger age groups (Appendix J, Table 3); (3) Farm, clerical, service, and laborer occupational groups (Appendix I, Table 22); (4) Families in the lower educational levels (Appendix J, Table 65); and (5) Farm families and families residing in non-Madison communities without pharmaceutical service (Appendix J, Table 6).

Table 55 presents an analysis of family expenditures for all drugs and the four categories of these expenditures by pharmacy and nonpharmacy outlets. This table shows that: (1) Approximately 25% of all drug expenditures were from non-pharmacy sources. However, only 12% of these or 2% of all drug expenditures were from mail order houses, door-to-door

TABLE 55

ANALYSIS OF FAMILY DRUG EXPENDITURES BY PHARMACY AND NONPHARMACY SOURCES, ONE YEAR PERIOD, 1960-1961

Drug Category	Source	
	Pharmacy	Nonpharmacy
All	75.50%	24.59%
All Excluding Prescribed	41.90	58.10
Prescribed plus O-T-C	97.50	2.50
O-T-C	89.75	10.25
Prescribed	100.00	0.00

salesmen, retail outlets of Sears, Roebuck and Montgomery Ward, and groceries; (2) Over 58% of all drugs excluding prescribed were purchased from nonpharmacy sources; (3) A little more than 10% of all over-the-counter drugs were purchased from nonpharmacy outlets; and (4) All prescribed drugs were reported as purchased from a pharmacy.

This analysis of drug sources and the analyses of drug expenditures in this chapter provide a potential drug insurer with information which may enhance the efficient and economic performance of his functions in claims administration, premium calculation, extent of drug coverage, and in the case of certain insurers, the negotiating of fees with the purveyors of pharmaceutical service.

CHAPTER V

FEASIBILITY OF DRUG INSURANCE

This chapter discusses the feasibility of the voluntary insurance mechanism as a method of protecting the family on a group basis against financial loss from high or unexpected prescribed drug costs. The discussion centers around potential insurance plans based on the study's family drug cost data and consultations with two insurers, one functioning under the "first dollar" and the other under the "catastrophic" concept of insurance and existing and proposed programs for protecting the family against financial loss from these drug costs.

Group Drug Insurance

The evaluation of the feasibility of drug insurance is on a group basis only for the following reasons: (1) Adverse selection is prevented; (2) Group insurance will provide protection at a lower cost than individual coverage; and (3) The limited information available on drug insurance.

Adverse selection is prevented because an acceptable group is one formed for another and more important purpose than obtaining insurance; most groups represent persons who are workers of one type or another, and this presumes some degree of good health; and provisions for the minimum number in a group and the minimum proportion of those eligible who must participate minimize adverse selection and enhance the proper spread of risk.

Group insurance generally is less expensive than individual insurance because the limitation of adverse selection results in better loss experience and because of savings in expenses. Expense savings result from the lower commissions to salesmen and because the group itself usually performs certain administrative services which otherwise must be performed by the insurer.

The limited information on drug expenditure data appears to have influenced insurers to consider only group insurance, primarily because of the two reasons outlined above. It is believed that once sufficient experience is gained with group plans, individual drug insurance plans will receive greater attention by insurers.[1] Until such time, the most practical approach is to insure only on a group basis.

"First Dollar" Concept

The administrative policies and method of premium computation under the "first dollar" concept of insurance are based on consultations with the actuary of Associated Hospital Service, Incorporated (Blue Cross) of Milwaukee, Wisconsin.[2] The insurance policies of this insurer are representative of 48% of the insurance programs against regular medical expense.[3]

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1. This view was expressed by the actuary of Associated Hospital Service, Incorporated (Blue Cross) of Wisconsin.

2. Interviews and telephone conversations with actuary and administrator of Blue Cross of Milwaukee, Wisconsin from October, 1961 through August, 1962.

3. Health Insurance Institute, Source Book of Health Insurance Data (New York: Health Insurance Institute, 1961), p. 17.

Therefore, this insurance approach likely would be representative of a large number of potential "first dollar" drug insurers.

Administration

The characteristic features of "first dollar" coverage are associated with: (1) Non-profit structure; (2) Sales procedure; and (3) Basis of indemnification.

An insurer may, of course, operate on a profit basis under the "first dollar" concept of insurance. However, Blue Cross chose to operate on a non-profit basis and since its policy dominates the "first dollar" coverage health insurance market other insurers operating under this concept of insurance generally operate on a non-profit basis for competitive reasons.

The normal sales policy of the insurer is to provide insurance coverage for a group such as the employees of an employer, an association of employers, or unions. The sales procedure normally involves obtaining an insurance contract with one of these groups. The main features of this contract are that the group administrator is billed for the insurance premium, and a certain percentage of eligible members of the group must enroll if the insurance plan is contributory. The processing and verifying of claims may be performed either by the group administrator or the insurer.

If the group insurance plan is contributory and the employer and employee share the cost of the insurance premium, the administrator of the group plan collects the employee's

share of the cost through a system such as payroll deductions. The percentage of eligible members required to enroll in a contributory group insurance plan is often 100% and seldom is lower than 80%. If the group insurance plan is noncontributory, the employer pays the full amount of the insurance premium and all employees are insured.

If the group administrator processes and verifies claims, the insurer arranges to audit the group's claims administration system. If the insurer administers claims, the members show proof of insurance coverage to the purveyor of the service or product who then submits a claim to the insurer for reimbursement.

Payment of the claim is made directly to the purveyor of the service or product by the insurer. The insured is billed by the purveyor of the service or product for any amount in excess of the claim submitted to or not paid by the insurer.

The fees the insurer pays for the purveyor's service or product normally are determined through prior negotiation. The purpose of the negotiation is to provide fair and equitable reimbursement for the purveyor's services and products and at the same time protect the insurer and subscriber against unnecessary utilization of insured services, irresponsible pricing, or both. The process of negotiating fees would be modified in determining fees for pharmaceutical services. The insurer's policy would be to determine these fees on a unilateral basis to avoid the possibility of antitrust charges by the U. S.

Justice Department's Antitrust Division.[4] Insurers are advised to develop fees for pharmaceutical services independent of any connection and consultation with pharmacy organizations or groups of registered pharmacists.

Premium Computation

The following formula was used to calculate potential premiums for "first dollar" drug insurance:[5]

(1) $$\left[\frac{\text{No. of months over which total risk cost data collected (A)} + \text{No. of months covered by insurance}}{2} + \text{No. of months between end of (A) and first month of insurance} \times \text{Estimated \% increase of risk cost per month}^{(a)}\right] + 1$$

$$\times \text{Total cost of risk} = \text{Total cost of risk anticipated over insurance period.}$$

(2) $$\text{No. of families represented by risk cost data} \times \text{No. of months represented by total risk cost data} = \text{No. family months}$$

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4. Weekly Pharmacy Reports (Pharmacy Reports, Incorporated, Washington, D.C.), volume 12, number 18, May 6, 1963, p.4.

5. See Appendix K for application of this formula to drug expenditures to provide the premiums in Tables 56, 57, 58, and 59.

(a). See Appendix L for this estimate.

(b). Includes administrative and selling and all other expenses associated with the administration of the drug insurance plan.

(3) $\frac{\text{Total cost of risk anticipated}}{\text{No. of family months}}$ = Cost of risk per family per month

(4) Cost of risk per family per month X 12 = Annual pure premium per family

(5) Annual pure premium per family plus administrative costs(b) = Premium per family per year

(b) See footnote 5(b), p. 165.

Table 56 contains premiums calculated for "first dollar" drug insurance according to varying benefits, administrative expenses, and percentage indemnification limits. These premiums are based on the drug expenditure data collected from all the families who participated in this study and best represent annual premiums for drug insurance per family for a one year period following the collection of the study drug cost data.[6]

The indemnification limit percentages and the administrative expense percentages of 25% and 30% are based on the best judgment and recommendation of the insurer's actuary. The 20% administrative expense columns were added to illustrate the effect on the premium if the insurer's administrative expenses were reduced to that percentage.

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6. The premiums for this plan are based on a policy that would be effective for one year beginning on March 1, 1962.

TABLE 56

PREMIUMS FOR "FIRST DOLLAR" CONCEPT DRUG INSURANCE ACCORDING TO TYPE OF COVERAGE, INDEMNIFICATION LIMITS AND ADMINISTRATIVE EXPENSES PER FAMILY FOR ALL FAMILIES

Coverage	Premiums								
	Administrative Expenses and Indemnification Limits								
	20% AE	25% AE	30% AE	80% IL 20% AE	80% IL 25% AE	80% IL 30% AE	75% IL 20% AE	75% IL 25% AE	75% IL 30% AE
Prescribed Legend Drugs(a)	$42.00	$44.88	$48.00	$33.60	$35.88	$38.40	$31.56	$33.60	$36.00
Prescribed Drugs	$49.92	$53.28	$57.00	$39.96	$42.60	$45.60	$37.44	$39.96	$42.72
Prescribed Plus O-T-C Drugs	$66.84	$71.28	$76.32	$53.40	$57.00	$61.08	$50.16	$53.40	$57.24
All Study Drugs	$83.52	$89.04	$95.40	$66.72	$71.28	$76.32	$62.64	$66.72	$71.52

(a) Prescribed legend drugs plus compounded prescriptions containing nonlegend drugs. The percentage of all prescription orders which specified legend drugs, those drugs whose original container bears the label statement -- CAUTION: Federal law prohibits dispensing without a prescription -- could not be determined from the prescribed drug expenditure data collected by this study. Since this information is necessary for those insurers who may provide coverage for only prescribed legend drugs, a survey was made in Dane County, Wisconsin to determine what percentage of prescription orders specified legend drugs (Appendix M).

That survey of prescription orders showed that: (1) 81.5% ordered compounded and prefabricated legend drugs; (2) 2.8% ordered compounded nonlegend drugs; and (3) 15.8% ordered prefabricated nonlegend drugs.

In this study the estimate of the percentage of nonlegend drug prescriptions which required compounding was combined with compounded and prefabricated legend drug prescriptions to approximate the percentage of prescribed drugs that might be covered by drug insurance. Thus, 81.5% plus 2.8% or 84.3% was applied to the prescribed drug data to approximate the expenditures which might be indemnified by one form of drug insurance. The reasons for this combination were: first, the consumption of compounded nonlegend prescriptions is practically beyond the direct control of the insured; and second, the absence of direct control by the insured over the risk insured is a factor in favor of insuring the risk. The refusal of the insurer to indemnify the cost of a prescription requiring several nonlegend drugs and the professional services of a pharmacist would be difficult to justify to the insured on the premise that the prescription order is for nonlegend drugs. The absence of direct control by the insured over the risk insured is the basis for the policy of Prepaid Prescription Plan, Incorporated, Lake Jackson, Texas to insure only legend drug prescriptions.

The premiums in Table 56 are for the group of 237 study families who averaged four members per family. The premiums in this table range from a low of $31.56 to a high of $95.40 per family per year. The major determinants of the premium are the extent of coverage, the percentage indemnification limit, and the administrative expense percentage. Many factors influence these determinants which in turn affect the premium. The administrative expense figure, for example, is influenced by the claim processing and verifying procedure as well as salesmen's compensation. The extent of coverage of the risk is affected not only by other drug protection programs but also by medical judgment. In other words, the benefit structure would have to prevent arbitrary intrusion by an insurer when drugs are prescribed by the physician and at the same time protect the insurance program against deliberate abuse.

Tables 57, 58, and 59 show premiums calculated for families in the professional and technical, craftsmen and foremen, and operatives occupational groups. These tables show that the families in the professional and technical group would have the highest drug insurance premiums which reflects higher drug expenditures by these families. The craftsmen and foremen families would have the next highest premiums and families in the operative occupations the lowest of the three premiums. These observations illustrate the importance of the composition of the group insured. For example, in a group composed of all these families the families in the craftsmen and foremen

TABLE 57

PREMIUMS FOR "FIRST DOLLAR" CONCEPT DRUG INSURANCE ACCORDING TO TYPE OF COVERAGE, INDEMNIFICATION LIMITS AND ADMINISTRATIVE EXPENSES PER FAMILY FOR THE PROFESSIONAL AND TECHNICAL GROUP

Coverage	Premiums								
	Administrative Expenses and Indemnification Limits								
	20% AE	25% AE	30% AE	80% IL 20% AE	80% IL 25% AE	80% IL 30% AE	75% IL 20% AE	75% IL 25% AE	75% IL 30% AE
Prescribed Legend Drugs(a)	$55.44	$59.16	$63.36	$44.40	$47.28	$50.76	$41.64	$44.40	$47.52
Prescribed Drugs	$65.88	$70.20	$75.24	$52.68	$56.16	$60.24	$49.32	$52.68	$56.40
Prescribed Plus O-T-C Drugs	$83.64	$89.28	$95.64	$66.96	$71.40	$76.44	$62.76	$66.96	$71.64
All Study Drugs	$96.24	$102.72	$110.04	$77.04	$82.20	$88.08	$72.24	$77.04	$82.56

(a) See footnote (a), Table 56.

TABLE 58

PREMIUMS FOR "FIRST DOLLAR" CONCEPT DRUG INSURANCE ACCORDING TO TYPE OF COVERAGE, INDEMNIFICATION LIMITS AND ADMINISTRATIVE EXPENSES PER FAMILY FOR THE CRAFTSMEN AND FOREMEN GROUP

Coverage	Premiums								
	Administrative Expenses and Indemnification Limits								
	20% AE	25% AE	30% AE	80% IL 20% AE	80% IL 25% AE	80% IL 30% AE	75% IL 20% AE	75% IL 25% AE	75% IL 30% AE
Prescribed Legend Drugs(a)	$44.16	$47.16	$50.52	$35.28	$37.68	$40.32	$33.12	$35.28	$37.80
Prescribed Drugs	$52.44	$55.92	$59.88	$42.00	$44.76	$47.88	$39.36	$42.00	$44.88
Prescribed Plus O-T-C Drugs	$69.24	$73.92	$79.20	$55.44	$59.16	$63.36	$51.96	$55.44	$59.40
All Study Drugs	$90.72	$96.84	$103.68	$72.60	$77.40	$82.92	$68.04	$72.60	$77.76

(a) See footnote (a), Table 56.

TABLE 59

PREMIUMS FOR "FIRST DOLLAR" CONCEPT DRUG INSURANCE ACCORDING TO TYPE OF COVERAGE, INDEMNIFICATION LIMITS AND ADMINISTRATIVE EXPENSES PER FAMILY FOR THE OPERATIVES GROUP

Coverage	Premiums								
	Administrative Expenses and Indemnification Limits								
	20% AE	25% AE	30% AE	80% IL 20% AE	80% IL 25% AE	80% IL 30% AE	75% IL 20% AE	75% IL 25% AE	75% IL 30% AE
Prescribed Legend Drugs(a)	$29.28	$31.20	$33.36	$23.40	$24.96	$26.76	$21.96	$23.40	$25.08
Prescribed Drugs	$34.68	$36.96	$39.72	$27.72	$29.64	$31.68	$26.04	$27.72	$29.76
Prescribed Plus O-T-C Drugs	$45.48	$48.60	$51.96	$36.36	$38.88	$41.64	$34.08	$36.36	$39.00
All Study Drugs	$62.04	$66.24	$70.92	$49.68	$53.04	$56.76	$46.56	$49.68	$53.16

(a) See footnote (a), Table 56.

and operative occupations would be subsidizing the higher drug costs of families in the professional and technical occupations. This would be difficult for these two groups to accept in view of their lower income. It would be especially difficult for the operative families to accept such conditions because they have, in general, the lowest average income. The nonacceptance of such conditions by families in the craftsmen and foremen and operative occupations obviously would affect the marketability of an insurer's drug insurance plan.

"Catastrophic" Concept

The administrative policies and the method of premium calculation of this insurer differ from those of the "first dollar" concept insurer. However, the basic problem of premium calculation for both insurers is similar -- the determination of the cost of risk and the addition of administrative and selling expenses to this cost.

Administration

The administrative policies of the "catastrophic" concept insurer consulted are representative of the insurers of medical care costs operating under this concept of insurance. The essential characteristics influencing the administration of drug insurance by this insurer are:[7] (1) It

7. Based on interviews and telephone conversations with an actuary and an administrator of Sentry Insurance, Stevens Point, Wisconsin from April, 1961 through June, 1962.

operates on a profit basis; (2) Drug costs are covered under a group comprehensive medical insurance plan subject to a dollar deductible, percentage indemnification limit beyond the dollar deductible, and a maximum yearly benefit figure; (3) Processing, verifying, and paying claims are performed by the insurer on the basis of a claim form submitted by the insured; and (4) Cash indemnity is the form of benefit payment.

Premium Computation

The following formula was used to calculate potential premiums for drug insurance under the "catastrophic" concept of insurance:[8]

$$\frac{X + Y}{1-PE} = \text{Premium per family per year}$$

where X = the average cost of the risk per family in group plus 20%

Y = administrative expenses such as the processing, verifying, and payment of claims per family in the group

PE = "premium expenses" per family in the group. These expenses are primarily expenses associated with the salesmen such as, office equipment, supplies, and payroll administrative expenses.

Table 60 contains premiums for drug insurance according to various yearly dollar deductibles but a constant percentage of indemnification beyond the deductibles and constant administrative expenses. The latter two percentages are not

8. See Appendix N for use of this formula to calculate premiums in Table 60.

TABLE 60

PREMIUMS FOR "CATASTROPHIC" CONCEPT DRUG INSURANCE ACCORDING TO TYPE OF COVERAGE, DOLLAR DEDUCTIBLE, INDEMNIFICATION LIMITS AND ADMINISTRATIVE EXPENSES PER FAMILY FOR ALL FAMILIES

Coverage	Premiums											
	Dollar Deductible and Indemnification Limit and Administrative Expense											
	$5D-80% IL 15% AE	$10D-80% IL 15% AE	$15D-80% IL 15% AE	$20D-80% IL 15% AE	$25D-80% IL 15% AE	$30D-80% IL 15% AE	$40D-80% IL 15% AE	$50D-80% IL 15% AE	$60D-80% IL 15% AE	$75D-80% IL 15% AE	$100D-80% IL 15% AE
Prescribed Legend Drugs(a)	$40.67	$35.70	$31.54	$27.91	$24.84	$22.24	$18.17	$15.07	$12.77	$10.14	$ 6.69
Prescribed Drugs	$49.36	$44.19	$39.74	$35.86	$32.37	$29.39	$24.44	$20.80	$17.78	$14.50	$10.43
Prescribed Plus O-T-C Drugs	$67.74	$61.70	$56.24	$51.23	$46.81	$42.88	$36.17	$30.73	$26.29	$21.26	$14.71
All Study Drugs	$89.15	$82.50	$76.29	$70.51	$65.30	$60.45	$51.45	$43.50	$37.57	$29.02	$19.77

(a) See Footnote (a), Table 56.

varied because of the insurer's belief that these same figures would be used for the calculation of future drug insurance premiums. However, the insurer was not as certain about the annual dollar deductible which, consequently, is varied from $5.00 to $100.00.

The premiums in Table 60 like those in Table 56 would be for the group of 237 study families that averaged four members per family for the same one year period shortly following the collection of the study drug cost data.

Tables 61, 62, and 63 show what drug insurance premiums would be for groups of families in the professional and technical, craftsmen and foremen, and operative occupational groups. The importance to the potential drug insurer of this information was discussed previously.

Feasibility of Drug Insurance

The foregoing premium computations for "first dollar" and "catastrophic" drug insurance form the bases for potential drug insurance plans under the concepts of insurance that are considered below in the evaluation of the feasibility of the insurance method of family drug cost protection.

The premium and benefit are the major determinants of the acceptability to the potential insured of any drug insurance plan. From the viewpoint of the insurer, these two factors are the major determinants of the marketability of any drug insurance policy. Thus, acceptability and marketability must be considered in determining the feasibility of drug insurance or the insurance method of family drug cost protection.

TABLE 61

PREMIUMS FOR "CATASTROPHIC" CONCEPT DRUG INSURANCE ACCORDING TO TYPE OF COVERAGE, DOLLAR DEDUCTIBLE, INDEMNIFICATION LIMITS AND ADMINISTRATIVE EXPENSES PER FAMILY FOR THE PROFESSIONAL AND TECHNICAL GROUP

Coverage	Premiums										
	Dollar Deductible and Indemnification Limit and Administrative Expense										
	$5D-80% IL 15% AE	$10D-80% IL 15% AE	$15D-80% IL 15% AE	$20D-80% IL 15% AE	$25D-80% IL 15% AE	$30D-80% IL 15% AE	$ 40D-80% IL 15% AE	$50D-80% IL 15% AE	$60D-80% IL 15% AE	$75D-80% IL 15% AE	$100D-80% IL 15% AE
Prescribed Legend drugs(a)	$55.75	$50.47	$46.22	$42.55	$39.25	$36.60	$32.41	$29.04	$26.14	$22.58	$17.33
Prescribed Drugs	$67.18	$61.85	$57.11	$53.22	$49.65	$46.41	$42.79	$37.59	$34.28	$30.09	$24.47
Prescribed Plus O-T-C Drugs	$86.30	$79.73	$73.36	$67.55	$62.59	$57.88	$50.30	$44.75	$40.30	$35.51	$28.40
All Study Drugs	$100.24	$93.50	$86.88	$80.62	$74.96	$69.54	$59.79	$51.77	$45.40	$38.03	$30.82

(a) See footnote (a), Table 56.

TABLE 62

PREMIUMS FOR "CATASTROPHIC" CONCEPT DRUG INSURANCE ACCORDING TO TYPE OF COVERAGE, DOLLAR DEDUCTIBLE, INDEMNIFICATION LIMITS AND ADMINISTRATIVE EXPENSES PER FAMILY FOR THE CRAFTSMEN AND FOREMEN GROUP

Coverage	Premiums										
	Dollar Deductible and Indemnification					Limit and Administrative Expense					
	$5D-80% IL 15% AE	$10D-80% IL 15% AE	$15D-80% IL 15% AE	$20D-80% IL 15% AE	$25D-80% IL 15% AE	$30D-80% IL 15% AE	$40D-80% IL 15% AE	$50D-80% IL 15% AE	$60D-80% IL 15% AE	$75D-80% IL 15% AE	$100D-80% IL 15% AE
Prescribed Legend Drugs(a)	$42.84	$37.47	$32.97	$29.01	$26.39	$24.18	$20.35	$16.87	$15.01	$12.91	$ 9.59
Prescribed Drugs	$51.96	$46.37	$41.54	$37.30	$33.70	$31.19	$26.81	$23.29	$20.57	$17.19	$13.87
Prescribed Plus O-T-C Drugs	$70.20	$64.02	$58.82	$54.15	$49.84	$46.36	$40.37	$35.25	$31.06	$26.35	$19.71
All Study Drugs	$94.01	$87.08	$80.74	$74.86	$69.45	$64.14	$54.26	$49.24	$39.41	$30.85	$22.33

(a) See footnote (a), Table 56.

TABLE 63

PREMIUMS FOR "CATASTROPHIC" CONCEPT DRUG INSURANCE ACCORDING TO TYPE OF COVERAGE, DOLLAR DEDUCTIBLE, INDEMNIFICATION LIMITS AND ADMINISTRATIVE EXPENSES PER FAMILY FOR THE OPERATIVES GROUP

Coverage	Premiums											
	Dollar Deductible and Indemnification Limit and Administrative Expense											
	$5D-80% IL 15% AE	$10D-80% IL 15% AE	$15D-80% IL 15% AE	$20D-80% IL 15% AE	$25D-80% IL 15% AE	$30D-80% IL 15% AE	$40D-80% IL 15% AE	$50D-80% IL 15% AE	$60D-80% IL 15% AE	$75D-80% IL 15% AE	$100D-80% IL 15% AE
Prescribed Legend Drugs(a)	$26.40	$21.36	$17.42	$14.04	$12.28	$ 8.88	$ 5.51	$ 3.67	$ 2.35	$ 0.89	$ 0.00
Prescribed Drugs	$32.82	$28.00	$23.45	$19.25	$15.91	$13.11	$ 8.91	$ 5.99	$ 4.27	$ 2.29	$ 0.08
Prescribed Plus O-T-C Drugs	$44.27	$38.48	$33.09	$28.12	$24.18	$20.73	$14.62	$ 9.85	$ 6.63	$ 3.76	$ 0.59
All Study Drugs	$62.51	$56.25	$50.62	$45.42	$40.60	$36.19	$27.71	$20.22	$15.02	$ 8.47	$ 1.42

(a) See footnote (a), Table 56.

The viewpoints of the insurer and insured differ with respect to the premium and benefit of an insurance plan. The insured desires maximum coverage at a low premium. The insurer, due primarily to the requirements of fiscal soundness of the insurance plan, usually cannot provide as great a scope of coverage as that desired by the insured at a given premium. This part of the chapter considers both these viewpoints and later presents two drug insurance plans which may be acceptable to both the insurer and insured.

Drug Insurance and Other Programs

In this part of the evaluation, two insurance plans based on the family drug cost data and consultations with "first dollar" and "catastrophic" concept insurers are compared, in terms of premium and benefit, to existing or proposed insurance, prepayment, and other programs designed to protect the family against these costs.

"First Dollar" Concept Insurer

The potential drug insurance plan for the "first dollar" insurer would:

(1) Provide drug insurance only on a group basis;

(2) Insure against only prescribed legend drugs subject to an 80% indemnification limit plus insulin subject to a deductible of $1.00 per vial;

(3) Contain provisions limiting the quantity of insurable drugs to a 34 day supply and renewal of the prescription only on the oral or written consent of the physician;

(4) Limit insurable drugs to the amount of $500 per family per year;

(5)5 Bill the administrator of the group for the insurance premium who in turn would collect from each member of the insured group under a contributory plan or pay the premium himself under a noncontributory plan;

(6) Require that the insured show proof of insurability to the eligible pharmacy;

(7) Reimburse the purveyor of the pharmaceutical service, the eligible pharmacy.

The premium for a drug insurance plan of this kind for the group of 237 families who participated in this study would be $35.28 per family per year.[9] The premiums for drug insurance of this type for the group of study families in the professional and technical, craftsmen and foremen, and operatives occupations would be $58.08, $48.48, and $30.12, respectively, per year.[10]

Lastly, the "first dollar" insurer consulted for the study would organize a subsidiary solely for the purpose of operating the drug insurance plan.

"Catastrophic" Concept Insurer

The potential drug insurance plan for the "catastrophic" insurer would have the following characteristics:

(1) Drug insurance only on a group basis;

(2) Insurance only against the cost of prescribed drugs;

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9. See Appendix K, p. 270 for the calculation of this premium.

10. See Appendix K, p. 270-271, for the calculation of these premiums.

(3) Coverage of prescribed drugs as a part of or attached as a rider to a comprehensive medical insurance plan and subject to a $5.00 deductible per year per family, an 80% indemnification limit beyond the dollar deductible, and a maximum coverage of $500 per family per year for insurable drugs;

(4) Payment of the premium for group drug insurance by the group itself, if the plan is contributory, which in turn collects the appropriate amount from its members;

(5) Settlement of claims involves the insured who submits the claim form directly to the insurer for processing, verification, and payment directly to the insured.

The premium for drug insurance of this kind for the group of 237 families who participated in this study would be $49.36 per family per year (Table 60). The premium for drug insurance of this type for the group of study families in the professional and technical, craftsmen and foremen, and operative occupations would be $67.18, $51.96, and $32.82, respectively, per family per year (Tables 61, 62, and 63).

The "first dollar" and "catastrophic" concept insurance plans premiums would be subject to the following inadequacies which affect the reliability of their comparison with premiums of other drug cost protection programs and the comparableness of the two plans themselves:

(1) Insufficient consideration of an increase in the utilization of insured drugs in view of their being insured;

(2) Unsatisfactory account of the possibility of an increase in price of over-the-counter drugs from the movement of these drugs to prescribed drugs;

(3) Inadequate examination of the likelihood of physicians who recommended over-the-counter drugs to change to prescribing either more expensive over-the-counter drugs or legend drugs in view of their insurance coverage.

These inadequacies are due primarily to the relative absence of this information. Drug insurance and other drug cost protection programs are a recent development and satisfactory information of the type indicated by the above inadequacies is not available.

Comparison with Other Drug Protection Programs

The premiums and benefits of the above two insurance plans and some other drug cost protection plans existing at the time these two plans were calculated are given in Table 64. The two drug insurance plans would offer the lowest premium for a group of families who average four members per family. However, these premiums are not comparable because the plans differ with respect to the insurer's concept of insurance; the extent of drug coverage; provisions such as dollar deductible and percentage indemnification limit; the quantity limits on insurable drugs; the maximum yearly benefit under some plans; the differences in the nature of the insured; and the previously mentioned inadequacies of the formulae for calculating premiums for the two plans.

TABLE 64

PREMIUMS AND BENEFITS OF "FIRST DOLLAR" AND "CATASTROPHIC" CONCEPT DRUG INSURANCE PLANS AND OTHER DRUG COST PROTECTION PROGRAMS EXISTING AT THE TIME THOSE TWO PLANS WERE CALCULATED

Drug Cost Protection Program	Premium	Benefit[a]
"First Dollar" Concept Insurance Plan	$35.28	Prescribed legend drugs subject to an indemnification limit and insulin sub a $1.00 deductible per vial. Maximum benefit of $500 per family.
"Catastrophic" Concept Insurance Plan	$49.36	Prescribed drugs subject to a $5.00 de and 80% indemnification limit on cost deductible maximum yearly benefit of family.
Prescription Service, Incorporated, Windsor, Ontario (The Green Shield Plan)	$61.20	Prescribed drugs except insulin, paten prietary or other medication not usua scribed, vitamins, medical appliances biologicals and related products norm administered by a physician. Benefit to 34 days with repeats if authorized $0.35 charge per prescribed drug.
Prescription Services, Incorporated, Atwater, California	$48.00 to $120.00[b]	Prescribed legend drugs ordered on ori scriptions. Benefit limited to twice mium in any year.
Prepaid Prescription Plan, Lake Jackson, Texas	$70.92	Prescribed legend drugs up to 1/3 of p prescribed non-legend drugs up to 1/2 except insulin, patent, proprietary o medications not usually prescribed, v medical appliances, and biologicals a products normally administered by a p Benefit limited to 34 days supply and peats if authorized.

(a) Drugs outside hospital.

(b) These premiums are based on reported cost of $4 to $10 per month per depending on number of children covered, in American Druggist, July

p. 5. Other premiums reported for this drug insurance plan of the C Pharmaceutical Association are $9.00, $12.00, $18.00, and $36.00 per family. See: footnote 38; Merwyn R. Greenlick, "The Feasibility, O and Principles of Various Plans for the Prepayment of Prescription M Expenses," Paper presented to the Section on Pharmaceutical Economic Pharmaceutical Association Meeting, Chicago, Illinois, April 25, 196 American Druggist, October 19, 1959, p. 23.

Although the extent of the differences of these plans renders them practically uncomparable, one factor common to all of these programs is that they cover the cost of prescribed legend drugs. This is the most meaningful result of this comparison for the purpose of evaluating the practicability of the insurance method of drug cost protection and is an indication of the acceptability and marketability of this method of protecting the family against this portion of their drug expenditures.

Table 65 gives the premiums and benefits of some other drug cost protection programs which followed in time the two calculated drug insurance plans. The premiums and benefits of the drug protection programs listed in this table vary for the same reasons as did those of the earlier programs listed in Table 64. These programs cover the cost of prescribed legend drugs and further indicate the acceptability and marketability of drug insurance and other programs for protecting the family against financial loss from at least these drug costs.

The Associated Hospital Service of Wisconsin (Blue Cross) plan in Table 65 is practically identical to the plan in Table 64 which was based on consultations with this insurer.

Some other programs which protect the family against drug costs are:[11]

(1) Group Health Association of Washington, D.C. This nonprofit medical care program initiated prescribed legend drug and insulin

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11. For detailed information on the concept of protection, formation, profit structure, enrollment, exemptions and limitations, and drug pricing methods of these plans, see: for plan (1), Turk, Stanley M., "Prepaid Rx Plan

TABLE 65

PREMIUMS AND BENEFITS OF OTHER DRUG COST PROTECTION PROGRAMS WHICH FOLLOWED IN TIME THE "FIRST DOLLAR" AND "CATASTROPHIC" DRUG INSURANCE PLANS CALCULATED

Drug Cost Protection Programs	Premium	Benefit
Prescription Service, Incorporated, Denver, Colorado	$41.60(a) $36.40(b)	Prescribed drugs subject to a limit of a 33-day supply except for antibiotics which are subject to a maximum 4-day supply.
Ontario Hospital Association's Prescription Plan, Owen Sound Plan (Blue Cross)	$18.00	Prescribed legend drugs and insulin. A $25 deductible per person per year and 100% reimbursement of drugs above the deductible.
Thrifty Drug Plan, Los Angeles, California	$18.00	Prescribed legend drugs and insulin subject to 30-day supply limit.
Associated Hospital Service of Wisconsin (Blue Cross)(c)	Cost borne by Blue Cross	Prescribed legend drugs and insulin subject to a $1.00 deductible per vial. Quantity of drug prescribed limited to 34-day supply.
Wisconsin Physicians Service Prescription Drug Payment Plan (Blue Shield)	$23.00	Prescribed legend drugs subject to a $25 deductible per person per year under age 65 and $50 per year per person over 65 except in groups of 25 or more, in which case $25 deductible holds.

(a) $0.50 deductible per prescribed drug.
(b) $1.00 deductible per prescribed drug.
(c) This plan was cancelled shortly after its initiation on February 1, 1963. See: "Milwaukee Blue Cross Cancels Rx Prepayment Pilot Plan...," Weekly Pharmacy Reports, ("The Green Sheet"), number 12, May 20, 1963, p. 2; and "Milwaukee Blue Cross Cancels Rx Prepayment Pilot Plan; Natln. Blue Cross Exec. Didn't Make APhA Convention Speech; Antitrust Harassment Hinted," F-D-C Reports, (25:20) May 20, 1963, p. 19.

coverage in 1960. The plan contains a $50 deductible and an 80% indemnification limit on drug costs above $50.

(2) New York City Union Plans. The unions in New York City which protect their members against the cost of insulin and prescribed legend drugs subject to a $0.50 deductible are: Bricklayers Union (7 locals); Mason Tenders Union (10 locals) Marble Workers Union; Mosaic and Terazzo Workers (2 locals); and Tile Layers Helpers (Local 88).

(3) Prescription Benefit Association of Portland, Oregon. This is a profit program with no exemptions or limitations on "prescription" costs. The cost of this plan is $12.00 per person per year. The purpose of this plan is to offer low cost "prescription" drugs to members.

(4) Hawaii Prescription Plan. This is a profit plan with no exemptions or limitations on "prescription" costs. The cost of this plan is $5.00 per

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Heading for Adoption...," Chain Store Age, volume 39, February, 1963, pp. 83-85, 88; Turk, Stanley M., "Pharmacy-backed Rx insurance plan could be model for chains," Chain Store Age, volume 39, March, 1963, pp. 73, 76-77; for plan (2), "1500 NYC Stores Join Union Rx Plan," American Druggist, volume 144, July 10, 1961, p. 11; "Bricklayers Union Prescription Plan Includes Contracts with Individual Pharmacists," NARD Journal, volume 84, February 19, 1962, pp. 22-23, 28; "Mason Tenders Follow Bricklayers with Rx Plan," Drug Topics, January 14, 1963, pp. 2, 110; Leiser, Ronald, "More Unions in N.Y. Plan Rx Programs," Drug News Weekly, November 14, 1962, pp. 1, 16; "Fifth NY Building Trade Union Launches Prepaid Rx Plan," Drug News Weekly, 3:2, January 9, 1963, pp. 1, 8; Lohren, Jerome, "Rx Scheme of New York Bricklayers Unsound and Hazardous to Signers of Contract," NARD Journal, volume 84, April 2, 1962, pp. 24, 33; for plan (3), Friedman, Ralph and Galvin, William, "Portland, Ore., Area Group Setting up Rx Benefit Plan," Drug News Weekly, 3:5, January 30, 1963; p. 12; and for plan (4), "Hawaii Plan Sets 40% Off to Members," Drug Trade News, 3:6, February 6, 1963, p. 4.

family per year. There is a $1 deductible on the first "prescription," $0.25 on the second, and none on subsequent "prescriptions."

There are other programs to protect the family against drug costs which differ from those already discussed. For example, union operated pharmacies[12] which attempt to reduce drug costs to their members and individual pharmacist's programs[13] to protect the family against drug costs. These programs further indicate a demand and market for plans to protect the family at least against the prescribed legend drug portion of their drug expenditures. The premium or cost of these programs vary and comparison of the various plans on this basis is unpractical because of the differences, which were outlined previously, among them. Notwithstanding the unpracticality of comparing the premium or cost of these programs, they do support the view that the insurance method is practicable for protecting the family against at least their prescribed legend drug costs.

Drug Expenditure Data

The drug expenditure data of this study provide information for the second part of an evaluation of the feasibility

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12. "New Union Pharmacy Opens in Toledo," American Druggist, volume 142, August 22, 1960, p. 9; "Unions Plan Corporation to Run Chain of Low-Price Pharmacies in NYC," American Druggist, volume 142, July 11, 1960, pp. 5, 7- 8; "Unions Step Up Pharmacy Operations, Seeking Lower Rx Prices for Members," American Druggist, volume 145, February 19, 1962, pp. 5-7.

13. For example see: "Rx Insurance Plan Would Give Subscribers 50% Off Usual Prices," American Druggist, volume 137, June 16, 1958, p. 14.

of drug insurance. This information is the average annual family expenditures for all drugs and the four categories thereof; the percentage each drug category represents of the average family's total drug expenditures; the family's sources of drugs; and the distribution curves for various drug expenditures.

The average annual family expenditure for all drugs and the four categories thereof provide a basis for comparing these averages with the premium and benefit of the two calculated drug insurance plans and other programs for protecting the family against drug costs. From these comparisons an indication may be obtained of an adequate[14] premium and benefit for drug insurance plans.

An analysis of the percentage which each category of drugs represents to the average family's total drug expenditure provides a basis for a judgment of insurable drug costs. This judgment includes consideration of the insurer's and potential subscriber's attitudes on insurable drug costs.

An analysis of the family's source of drugs enables an evaluation of potential drug insurer's ability to exercise efficient and effective control over insured drugs. The family's source of drugs is of particular importance to insurers who negotiate fees with the purveyors of insured drugs and establish drug indemnity schedules.

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14. In that they meet the requirement of acceptability or marketability.

The distribution curves of all study drug expenditures and the several categories thereof provide the potential drug insurer a basis on which to determine the extent of drug cost coverage.

Average Drug Costs

A comparison of the average annual family's drug expenditures insurable under the two potential drug insurance plans shows that:

(1) The "first dollar" concept insurer would cover prescribed legend drugs and insulin at a premium of $35.28 compared to an average yearly family expenditure of $30.93 for prescribed legend drugs and $1.31 for insulin of which only $0.31 would be reimbursed to the insured;

(2) The "catastrophic" concept insurer would cover prescribed drugs at a premium of $49.36 compared to an average annual family expenditure of $37.95 which is subject to a $5.00 deductible and an 80% indemnification limit on expenditures above $5.00.

This shows that: (1) The premiums of both plans would exceed the cost of the risk insured with a greater spread between premium and average risk cost evidenced by the "catastrophic" concept of drug insurance; (2) A larger portion of the family's drug expenditures would be insured by the "catastrophic" plan; and (3) The drug insurance plan with the lowest premium is the "first dollar" plan.

The potential insured would probably find it difficult to accept a drug insurance program the premium of which exceeds the benefits under it. Where the difference between the

premium and benefit are narrow, as in the case of the "first dollar" concept plan, it is more possible that a potential insured would accept it. Since the potential insured would be a member of a group, the acceptance of the drug insurance plan is of paramount importance. This acceptance depends not only on the premium, drugs insured, and the average annual family expenditure for insured drugs but also on the nature of the group and whether the drug insurance plan is offered to the group on a contributory or noncontributory basis. For example, under a contributory plan offered to employees of a common employer a certain percentage of the eligible employees must enroll in the plan before it can become effective. This percentage may be 100%. In the case of the noncontributory plan, where the employer pays the premium, all eligible employees are automatically covered. The acceptability of a contributory or noncontributory drug insurance plan would be influenced by the views of both the potentially insured and employer. The potential insured would consider: (1) The new relationship of his premium and benefit to the average annual family expenditures for drugs insured under a contributory plan; (2) His influence on the plan and its administration; and (3) The advantages and disadvantages of paying the premium from his taxable income versus the employer's purchase of the plan for the group with tax-exempt premiums. The employer would consider: (1) The effect on employees of the adoption of a contributory versus noncontributory plan; (2) The extent to which tax savings will offset the cost of the plan;

(3) The financial resources of his organization; and

(4) The control of the plan.

A clearer indication of the practicability of drug insurance may be obtained from the following analysis of the percentage which each study drug category represents to the family's total drug expenditures and these relationships to insured drugs under the two evaluated drug insurance plans.

Insurable Drugs

The percentage which each category of drug represents to the average family's total drug expenditures along with the average annual expenditures for these drugs are given in Table 66. This table shows that drug insurance plans which would cover prescribed legend and prescribed legend plus compounded nonlegend drugs would have protected the family against only 46.9% and 48.5% of their drug expenditures respectively. If these plans would insure against only the prescribed drug category they would have protected the family against only 57.5% of their total drug costs. All the drug insurance plans discussed previously protect the family against prescribed legend drugs. Several of these insurance programs protect against the cost of prescribed drugs which would include the prescribed legend plus compounded prescriptions requiring nonlegend drugs.

The major reason for the absence of insurance against O-T-C and injections plus physician dispensed drugs is that their utilization is controlled largely by the insured.

TABLE 66

PERCENTAGE AND DOLLAR DISTRIBUTION OF AVERAGE YEARLY FAMILY DRUG EXPENDITURES

Drug Category[a]	Average Expenditure	Percentage of Total Drug Expenditure
Prescribed Legend	$30.93	46.9%
Prescribed Legend Plus Compounded Nonlegend	31.95	48.5
Prescribed	37.95	57.5
Over-the-Counter	13.10	20.0
Injections Plus Physician Dispensed	12.66	19.3

(a) Excludes in-hospital drug costs.

Consultations with the actuaries and administrators of potential drug insurers revealed that relative absence of control over prescribed legend and prescribed drugs by the insured was a basic factor in their decision to insure these drug expenditures.

The insurers decision not to insure against the cost of over-the-counter and injections plus physician dispensed drugs on the basis of the insureds' control over the utilization of these drugs may be questioned. The exclusion of these drugs may be questioned on the premise that if drug insurance was available the physician would prescribe these drugs.

The O-T-C drugs reportedly were purchased by the families on the specific approval or recommendation of medical or dental practitioners. These drugs legally do not require a prescription but often are recommended or approved by the physician for the proper maintenance of the health of his patient. The patient may purchase these drugs without a prescription order or the physician may prescribe these drugs if he desires to do so. If he does, then these drugs become prescribed drugs. Thus, over-the-counter drugs purchased by the family on the specific approval or recommendation of a physician may become prescribed drugs in which case their purchase is not under the direct control of the one using them and the drugs qualify as insurable drugs under some plans. The insurer of the prescribed drug category who discounts this portion of the family's potential

prescribed drug expenditures would be offering a drug insurance plan the premium of which would be actuarily unsound. For example, this insurer's premium would be based on an average annual family expenditure for prescribed drugs of $37.95 when it should be calculated on the basis of at least $51.05. In such a case the insurer's premium accounts for only approximately 74% of the cost of the risk insured.

The insurer of prescribed legend and prescribed legend plus compounded prescriptions for nonlegend drugs would be insuring against only 63% and 61%, respectively, of the average family's drug expenditures and purchase of these drugs, from a practical viewpoint, is not under the direct control of the insured.[15] The potential insured would tend to view this insurer's drug insurance as less acceptable than the insurer of prescribed drugs where more of the family's drug costs are insured.

Injections and physician dispensed drugs represent drug expenditures over which the family has little if any direct control. The exclusion of these drug expenditures on the basis of control over their utilization by the insured would be questionable. The average family's expenditures including also the cost of injections plus physician dispensed drugs was $63.71 per year. The insurer of prescribed legend

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15. $30.95 / $51.05 = 61% $31.95 / $51.05 = 63%

If insulin is added to these drug categories these percentages are 63% and 64%, respectively.

and prescribed legend plus compounded prescriptions for nonlegend drugs would be insuring against approximately 49% ($30.93/$63.71) and 50% ($31.95/$63.71) of the family's drug expenditure which may be insured. The insurer of prescribed plus O-T-C drugs would be, in comparison, insuring against about 80% ($51.05/$63.71) of the average family's yearly drug expenditure.

Although the exclusion of injections plus physician dispensed drugs on the basis of control by the insured appears unsound, there appear to be other reasons for these drugs' exclusion. The cost of injections comprised 83% of these drug expenditures.[16] The problems mainly associated with the coverage of injections under drug insurance plans would be: (1) Negotiating fees for this service with the physician; (2) Determining the cost of the drug component of the particular injection; and (3) Insurance against injections by some major medical and other insurance plans.

The negotiation of fees with representatives of physicians increases administrative expenses and consequently the premium. This increase in cost may effect the advantage of insuring these drugs. Moreover, negotiation of fees would be complicated because of the difficulty of determining the cost of the drug component of the injection from the physician's fee for administering the drug.

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16. $10.46 / $12.66 = 83%.

Insurance by other insurance plans, for example, surgical insurance,[17] against expenditures for injections decreases the demand for inclusion of these drugs in drug insurance plans with the result that their acceptability or marketability would not be affected to any great degree.

Insuring against the physician dispensed drugs portion of the drug category injections plus physician dispensed drugs creates the problem of increasing the sources of the family's drugs which from the viewpoint of processing, verifying, and paying claims increases administrative expenses. This additional cost may outweigh the acceptability of the coverage of these costs.

The exclusion of O-T-C drugs and injections plus physician dispensed drugs on the basis of control over their utilization by the insured appears to be unsound from the viewpoint of acceptability or marketability of drug insurance plans. However, the inclusion of O-T-C drugs, in contrast to injections plus physician dispensed drugs appears less complicated.

Evidence in support of insuring against a greater portion of the family's drug expenditures is found in other programs for protecting the family against drug costs. Some of these programs insured more than only prescribed legend drugs.[18] Such programs should indicate to the potential

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17. Some Blue Shield insurance plans.

18. Prepaid Prescription Plan, Lake Jackson, Texas; Prescription Service, Incorporated, Denver, Colorado; Hawaii Prescription Plan; and Prescription Benefit Association, Portland, Oregon.

drug insurers the desirability of insuring against as much of the family's drug expenditure as is compatible with a plan the premium of which is actuarily sound. However, under these conditions the potential drug insurer may not be able to compete with programs of the type offered by Hawaii Prescription Plan and Prescription Benefit Association because of the lower drug prices offered by these programs. Both the Hawaii and Oregon programs are based on the "low cost" of drugs to members of the plan. Moreover, an implication of these plans is that their utilization will encourage purchase of other products offered by the drug sources which would increase profits or at least offset lower revenue from drugs that are priced lower than they were previous to the adoption of the programs. This is supported by the following statement by a participant in the Oregon plan: "One benefit of the plan will be to bring customers to the store, and they'll buy other things, which will make profit for the drug store."[19]

The insurance organization, obviously, cannot rely on activities other than insurance for the protection of families insured under its program. Therefore the premium for a potential drug insurer's plan may exceed the cost of programs based on other concepts of protection or economic considerations.

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19. Friedman and Galvin, "Portland, Ore., Area Group Setting Up Rx Benefit Plan," Drug News Weekly, 3:5, January 30, 1963, p. 12.

Drug Sources

The main sources of the families' drugs were pharmacies and physicians. The families purchased 94.6% of their drugs from these two sources. Pharmacies were the sources for all prescribed drugs and 97.5% of prescribed plus O-T-C drugs.

The number and type of sources for the family's drugs provide an indication of the efficiency of any proposed system of processing, verifying, and payment of claims. An efficient system of claims administration is important because it affects the administrative expenses of drug insurance which in turn affects the premium. In general, the fewer the drug sources the greater the possibility of establishing an efficient system of processing, verifying, and payment of claims or control over the cost and utilization of the risk. Since pharmacies were the source of essentially all potential insurable drugs, prescribed plus O-T-C drugs, drug insurance appears feasible.

Distribution Curves

The distribution curves of all study drug costs and the several categories thereof are similar (Figure 1, p.77). This finding supports the feasibility of an insurer extending coverage, for example, to include all prescribed drug costs. The inclusion of indemnification for prescribed nonlegend drug costs would involve mainly a consideration of only their additional cost to the pure premium in the calculation of the insurance premium. The distribution curves of all study drug

costs and the four categories thereof also indicate that these risk costs meet the capable of approximation requirement of insurance.

Feasibility

The preceeding evaluation indicates the feasibility of the insurance method of protecting the family on a group basis against drug costs. This evaluation also indicates the feasibility of insuring the family through either the "first dollar" or "catastrophic" concept of insurance and procedures for improving the acceptability and marketability of these two drug insurance plans.

Table 67 shows the essential characteristics of potentially acceptable and marketable drug insurance programs for the family on a group basis found on the previously discussed evaluation.

The premium of the "catastrophic" concept insurance plan in Table 67 would be higher than the "first dollar" concept plan for the same drug category coverage. One may question the acceptability of the "catastrophic" drug insurance plan. However, this question is unanswerable because the premium computation formulae for both plans are based on limited or no experience in insuring drug cost risk; the previously mentioned inadequacies of these formulae; and the marketability and actuarial soundness of these plans have not been tested.

TABLE 67

PREMIUMS AND BENEFITS OF FEASIBLE "FIRST DOLLAR" AND "CATASTROPHIC" CONCEPT DRUG INSURANCE PLANS

Insurance Concept	Group Insured	Source of Drugs	Premium	Benefit	Dollar Deductible	Percentage Indemnification	Administrative Expense	Quantity	Yearly Maximum	Exemptions
"First Dollar"	Families of employees of common employer, associations, and other groups formed for purpose other than insurance of size 237 or more.	Pharmacies	$57.00	Prescribed drugs (includes over-the-counter drugs purchased on specific approval or recommendation of physician on the premise that if insurance was available these drugs would become prescribed)	None	80%	25%	None	$500	Drug costs for which other insurers or governmental agencies are liable, such as, Workmen's Compensation U.S. Veteran's Administration, and other Federal and State agencies.
"Catastrophic"	Same as above.	Same as above.	$61.70	Same as above.	$10.00	80%	15%	None	$500	Same as above.

CHAPTER VI

SUMMARY AND CONCLUSIONS

This study attempts to determine the feasibility of voluntarily insuring the family on a group basis against the cost of prescribed drugs. The potential influence of drug insurance on economic, social, and professional aspects of pharmacy were primary considerations for undertaking the study. The relative absence of variated family drug expenditure data; the conflicting reports on the cost of drugs to the family; and the recent introduction of various programs for protecting the family against drug costs were other motivating factors. The main emphasis of the study is on the collection of empirical family drug cost data and the use of these data to determine the feasibility of insuring the family on a group basis against financial loss from high or unexpected drug costs.

The attempt to determine the practicability of family drug insurance on a group basis is based on: (1) The study's family drug cost data; (2) Two potential drug insurance plans found on the family drug cost data and consultations with two insurers, one operating under the "first dollar" and the other under the "catastrophic" concept of insurance; and (3) The existing programs for protecting the family against financial loss from drug costs.

The family drug expenditure data represent the one year's experience, 1960 - 1961, of two hundred and thirty-seven families drawn from an urban-rural county by a

systematic sampling technique. The drug data were collected from these families on monthly forms. The participation of each of these families was secured by an introductory letter and personal interview.

The family drug cost data were analyzed as follows: (1) Distribution curves and measures of central tendency, standard deviation, and skewness of dollar amounts expended for drugs; (2) Classification of dollar amount and percentage of income expended for all drugs included in the scope of the study, prescribed drugs, over-the-counter drugs, injections plus physician dispensed drugs, and in-hospital drugs by family income, size, residence, and age, occupation, and educational level of the head of the household; (3) Multiple correlation analyses of dollar amount and percentage of income expended for all study drugs and the four categories thereof by the six family variables; and (4) Family drug sources, for example, pharmacy, mail order houses, door-to-door salesmen, physician's office, and hospital.

The evaluation of the feasibility of the insurance method of protecting the family against financial loss from drug costs based on the above factors involved a comparison of the premiums and benefits of "first dollar" and "catastrophic" concept insurance plans with premiums and benefits of existing programs for family drug cost protection. The evaluation also considered the amount of the premiums and the adequacy of the benefits of the two potential insurance plans premised on the study family drug cost data on average

family drug costs, the percentage of all study drug costs which each study drug category represented, the sources of family drugs, and the distribution curves for all study drugs and the four drug categories.

The essential features of the "first dollar" and "catastrophic" drug insurance plans based on the above evaluation indicating their feasibility as a method of protecting the family against financial loss from drug costs are:

Insurance Concept	Coverage	Dollar Deductible	Indemmification Limit	Annual Premium
"First Dollar"	Prescribed Drugs Legal	None	80%	$57.00
"Catastrophic"	Same	$10	80%	$61.70

The "first dollar" and "catastrophic" concept insurance plans would be practicable in protecting only 80% of the study family drug costs. The injections plus physician dispensed drug expenditures raise issues which render their coverage under these plans unfeasible.

Family income, residence, and the age and occupation of the head of the household were statistically significant variables in explaining the variance in the dollar amount and percentage of income expended by families for either all study drugs or one or more of the four categories of drugs. Calculated drug insurance premiums for various occupation groups differed and indicated the importance of the occupation of the head of the household to the potential drug insurer.

Finally, the nature of the distribution curves for the various drug cost categories indicate that these data are capable of approximation which is an essential element in the feasibility of the voluntary insurance method of protecting the family against financial loss from large or unexpected drug costs.

APPENDICES

APPENDIX A

U.S. DEPARTMENT OF COMMERCE'S
GROUP OF DRUG PREPARATIONS AND SUNDRIES

DEPARTMENT OF COMMERCE
OFFICE OF BUSINESS ECONOMICS
WASHINGTON 25, D.C.

January 17, 1963

In reply refer to:
BE-54

Mr. Michael Danian
Chairman
Pharmacy Administration Department
College of Pharmacy
North Dakota State University
of Agriculture and Applied Science
Fargo, North Dakota

Dear Mr. Danian:

This is in answer to your letter of January 10.

Based on our latest (1954) benchmark data, about 85 percent of the drug preparations and sundries group consists of drugs and medicines. Approximately another 10 percent represents products in the surgical appliances and supplies group such as arch supports, corn removers, adhesive plaster, and surgical dressings (also including sanitary napkins). The remainder includes druggist and medical sundries (such as water bottles, household rubber gloves), clinical thermometers, heating pads, and health lamps.

If we may assist you in the future, please call on us, either here in Washington, or at the Department's Field Office, Room 304 Federal Building, 110 South Fourth Street, Minneapolis 1, Minnesota.

Sincerely yours,

Edward O. Bassett
National Income Division

APPENDIX B

SYSTEMATIC SAMPLING TECHNIQUE

A systematic sampling technique was derived from a systematic sampling procedure equivalent to a probability sampling method.[1] This technique may be described by outlining the systematic sampling procedure and illustrating its application to this study.

A systematic sampling procedure involves:

(1) A knowledge of the number of units in the universe from which the sample is drawn.

(2) A determination of the desired sample size.

(3) A determination of the sampling interval by dividing (1) by (2) above.

(4) The selection of a random number within the sampling interval. This number identifies the first unit in the sample. The second unit is obtained by adding the sampling interval to the first unit. This procedure is followed until the sample is drawn.

The universe of this study was the families residing in Dane County, Wisconsin in 1959. The sampling unit was the individual family or the head of the household and his legal dependents. The best available source for the number of units in the universe was the 1958 Wisconsin Income Tax

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1. A systematic sampling procedure is equivalent to a probability method of sampling when the units of the universe are in alphabetical order. See: Harper W. Boyd, Jr. and Ralph Westfall, Marketing Research, (Homewood, Illinois: Richard D. Irwin, Inc., 1956), p. 325.

Roll. The Roll contained the names of individuals who earned and reported an income taxable in Dane County. The number of names, however, was greater than the actual number of families in the universe because the Roll included the names of individuals who earned an income in the County, but who were not County residents. It also contained the names of individuals who earned taxable income but who also were legal dependents of the head of the household.

The determination of the sample size for the study involved the use of a formula and judgement. The following formula was used:[2]

$$N = \frac{\sigma^2 (Z\alpha \cdot Z\beta)^2}{(\mu_1 - \mu_0)^2}$$

where,

N = sample size

$$\sigma^2 = \frac{\Sigma f_i X_i^2 - \frac{(\Sigma f_i X_i)^2}{N}}{N - 1}$$

where, N = sample size
f_i = frequency of X_i
X_i = estimated mean yearly drug expenditures per family

$Z\alpha$ = alpha error or the chance of rejecting the true hypothesis when in fact it is true.

$Z\beta$ = beta error or the chance of accepting a false hypothesis.

μ_0 = hypothesis regarding the mean of the universe.

μ_1 = acceptable alternative hypothesis regarding the mean of the universe.

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2. The author is grateful to Professor William Beranek, School of Commerce, University of Wisconsin for recommending this formula and its application to the study.

The first step in the use of this formula involved estimating the average yearly family drug expenditure, X_i, for twenty-six families.[3] This information was used to calculate σ^2 and state a hypothesis for the mean yearly family drug expenditure for the universe from which the study sample would be drawn. The X_i for each of the 26 families was obtained from their charge accounts for the year 1959 at a pharmacy in Dane County. The basic assumptions of this method were that drug expenditures of the 26 families (a) were representative of expenditures of the families in the universe, (b) the families purchased all their drugs for the year from the pharmacy, and (c) they charged all their drug purchases at the pharmacy.

The drug expenditure data for the 26 families were for prescribed and all nonprescribed drugs obtained from the pharmacy. These data were preferred to secondary family drug expenditure data because the experience of the 26 families would tend to be more representative of the families in the county from which the study sample of families would be drawn.

The mean family yearly expenditures for prescribed and all nonprescribed drugs, $99.92, was the basis for the hypothesis regarding the universe mean, U_o. Given this value the

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3. A sample of N = 26 was sufficient for the calculation of X_i and σ^2. This view was based on consultations with Professor William Beranek, School of Commerce, University of Wisconsin.

next step was to state an alternative hypothesis, U_1, regarding the universe mean. This alternative hypothesis was that the sample of families for the study would be drawn from a universe with a mean family expenditure of $125. Given U_0 and U_1 and an alpha error of 1% and a beta error of 5%, the sample size for the study was calculated as 206.

The problem of determining sample size, after calculating N = 206, was to draw a large enough sample from the universe so that at the end of the one year period at least 206 families would have reported their drug expenditure experience. A sample of 500 families was deemed desirable on the assumption that at least half of the families who would be asked to participate in the study would do so. This estimate was based on the experiences of others who attempted to secure research co-operation from families for any length of time.[4]

The sampling interval was determined by dividing the number of units in the universe by the desired sample size, 92,017 ÷ 500 = 184. Then, a random number between 1 and 184 was needed before the sample could be drawn. That number would be obtained by merely pointing to a table of random numbers.[5]

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4. Harper W. Boyd, Jr., and Ralph L. Westfall, An Evaluation of Continuous Consumer Research as a Source of Marketing Information (Chicago, Illinois: American Marketing Association, 1960), p. 13.

5. For a table of random numbers see: Boyd and Westfall, Marketing Research, p. 286.

The systematic sampling technique of this study was similar to the probability systematic sampling method outlined above except for two deviations. First, a random number between 1 and 184 was not taken from a table of random numbers before the start of the drawing of the sample. The second deviation involved a reduction of the sampling interval by one-half approximately three quarters of the way through the sampling procedure outlined above. This latter deviation resulted in drawing a sample of 625 families out of which only 500 were used for the study. There were no objective criteria for not using the other 125 families.

THE UNIVERSITY OF WISCONSIN
MADISON 6

F PHARMACY

APPENDIX C

INTRODUCTORY LETTER REQUESTING FAMILY PARTICIPATION

Dear Mr. & Mrs.

The Pharmacy Administration Department at the School of Pharmacy has undertaken a research study designed to determine family expenditures for prescribed drugs and allied medications in Dane County.

This information is very important because it will produce a sound basis for determining whether or not the expenditures for prescribed drugs and allied medications are insurable. The potential benefit to the family of an insurance policy against the cost of medications would be similar to the advantages other types of insurance policies provide. We are doing this study in the hope of deciding whether or not it is feasible to insure these costs.

Your name is included among those to be interviewed. Your co-operation is very important to the success of our study. The limited information you will be requested to provide is for research purposes only and will be used only as part of a combination of statistical data.

Within a few days I will call in person for a short interview.

Your participation in this research project will be deeply appreciated.

Sincerely,

Michael Danian
Hollister Fellow
School of Pharmacy
University of Wisconsin

APPENDIX D

SAMPLE FORMS FOR RECORDING
FAMILY DRUG EXPENDITURES

S A M P L E F O R M

FAMILY DRUG EXPENDITURES

Prescribed Drugs			Other Medications, Vitamins, or Drugs Purchased on the Specific Recommendation of a Physician, Dentist, or Other Practitioner				Medical Payments to Practitioners for Injections and Drugs		
Date	Where Obtained	Cost	Date	What	Where	Cost	Date	Where	Cost
3-H*	Smith's Pharmacy	$2.25	7-C*	Tri-Vi-Sol Vitamin Drops	Jones' Pharmacy	$0.23	13-C	Doctor's Office	$3.00
	or								
	Hospital Pharmacy		8-H	Cheracol Cough Syrup	Brown's Pharmacy	$1.00	15-W	At Home	$4.00
	or							or	
								Any Other Place	
	Clinic Pharmacy		12-W*	Vitamins and Minerals	White's Drug Store	$5.00			
	or				or				
	Any Other Place				Any Other Nonmedical Source				

HOSPITAL or NURSING HOME	
Date of Payment	Cost
HO-19-W	$8.95 (See Hospital Bill)
NH-27-O*	$12.35

*
Husband - H
Wife - W
Child - C
Other Dependents - O

FAMILY DRUG EXPENDITURES

I			II				III		
Prescribed Drugs			Other Medications, Vitamins, or Drugs Purchased on the Specific Recommendation of a Physician, Dentist, or Other Practitioner				Medical Payments to Practitioners for Injections and Drugs		
Date	Where Obtained	Cost	Date	What	Where	Cost	Date	Where	Cost

IV	
HOSPITAL or NURSING HOME	
Date of Payment	Cost

FAMILY DRUG EXPENDITURES

I

Prescribed Drugs

Date	Where Obtained	Cost

II

Other Medications, Vitamins or Drugs Purchased WITHOUT a PRESCRIPTION but on the APPROVAL or RECOMMENDATION of a Doctor, Dentist or Other Practitioner

Date	What	Where	Cost

III

Medical Payments to Practitioner for Injections or Other Drugs but EXCLUDING SERVICE FEES. Indicate by I or D on the form.

Date	Where	Cost

IV

HOSPITAL or NURSING HOME

Date of Payment	Cost

APPENDIX E

FAMILY CLASSIFICATION QUESTIONNAIRE

1. FAMILY INCOME GROUP

Under $2000 _____
$2000 - $3999 _____
$4000 - $5999 _____
$6000 - $7999 _____
$8000 - $9999 _____
$10,000 - $14,999 _____
$15,000 - over _____

2. AGE OF HEAD OF HOUSEHOLD

Under 25 _____
25 - 29 _____
30 - 34 _____
35 - 44 _____
45 - 54 _____
55 - 64 _____
65 - over _____

3. SIZE OF FAMILY

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 or more _____

4. OCCUPATION OF HEAD OF HOUSEHOLD

_____
_____
_____
_____

(For example, 8th grade teacher, paint sprayer, farm owner, farm worker, repair TV sets, etc.)

5. YEARS OF SCHOOL COMPLETED BY HEAD OF HOUSEHOLD

None _____

Elementary
1-4 _____
5-6 _____
7 _____
8 _____

High School
1-3 _____
4 _____

College
1-3 _____
4 or more _____

M		I	S	A	O	E	R		I F		II											III						IV F		T F	
											P	F	M	F	D	F	O	F	T	F		I	F	D	F	T	F				
1	330							1	0000	0000	0000	0000	0000	00	0000	00	0000	00	0000	0000		0000	00	0000	00	0000	0000		0000	00	2	00000	0000
1	333							1	0550	0201												0600	11			0600	0101				2	01150	0302
1	337							1																							2		
1	338							1	0655	0101									0035	11	0035	0101		0500	10			0500	0100			2	01190	0302
1	339							1	1040	0101																					2	01040	0101
1	340							1	1660	0403																					2	01660	0403
1	341							1	0100	0101																					2	00100	0101
1	342							1	0150	0101	0715	0302							0715	0302											2	00265	0403
1	344							1			0296	0202							0296	0202											2	00296	0202
1	345							1	0250	0101																					2	00250	0101
1	347							1	0495	0101												0600	21			0600	0201				2	01025	0302
1	349							1	0595	0301	0250	0201							0250	0201											2	00295	0502
1	351							1	0620	0101									0053	11	0053	0101	0400	20			0400	0200			2	01073	0402
1	353							1			0592	0402							0592	0402		0300	11			0300	0101				2	00892	0503
1	355							1																							2	0000	0000
1	356							1	0295	0101	0350	0100							0350	0100		0400	10			0400	0100				2	01035	0301
1	357							1																							2		
1	359							1																							2		

THE UNIVERSITY OF WISCONSIN
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OF PHARMACY

APPENDIX G

REVISED INTRODUCTORY LETTER REQUESTING FAMILY PARTICIPATION

Dear Mr. & Mrs.

The Pharmacy Administration Department at the School of Pharmacy has undertaken a research study designed to determine family expenditures for prescribed drugs and allied medications in Dane County.

This information is very important because it will produce a sound basis to help determine how the family can meet the cost of these drugs.

Your name is included among those to be interviewed. Your co-operation is very important to the success of our study. The limited information you will be requested to provide is for research purposes only and will be used only as part of a combination of statistical data.

Within a few days I will call in person for a short interview.

Your participation in this research project will be deeply appreciated.

Sincerely,

Michael Danian
Hollister Fellow
School of Pharmacy
University of Wisconsin

APPENDIX H

CROSS-CLASSIFICATIONS OF SIX FAMILY VARIABLES

TABLE 1

FAMILY INCOME, SIZE, RESIDENCE, AGE AND EDUCATIONAL LEVEL ANALYZED BY OCCUPATION, ONE YEAR PERIOD, 1960-1961

Income	Under $2000 (3)*	$2000-3999 (10)	$4000-5999 (67)	$6000-7999 (71)	$8000-9999 (35)	$10000-14999 (33)	$15000-Over (18)
Occupation	2-3-4(a)	4;(b) 3, 2	3;(c) 1, 2, 4	3;(d) 1;(d) 2, 4	1;(e) 3, 2-4	1;(f) 3, 2-4	1;(g) 2
	1	2	3	4	5	6	7	8
Size	(2)	(49)	(47)	(61)	(46)	(16)	(7)	(7)
Occupation	1-4	3;(L) 1, 4, 2	3, 1, 2-4	1;(m) 3;(m) 2, 4	3;(n) 1;(n) 2-4	1;(o) 3, 2	1;(p) 3	1-3;(q) 2
	Urban Madison	With Pharmacy Service**	Without Pharmacy Service**	Farm				
Residence	(172)	(32)	(16)	(17)				
Occupation	1;(H) 3;(H) 4, 2	3;(I) 1;(I) 4-2	3;(J) 1;(J) 4	2;(K) 1				
	25-29	30-34	35-44	45-54	55-64	65- over		
Age	(9)	(29)	(88)	(54)	(42)	(5)		
Occupation	1-3;(R) 4	3;(S) 1, 2	3;(T) 1;(T) 2-4	1;(U) 3;(U) 2, 4	1;(V) 3;(V) 2, 4	4;(w) 1;(w) 3-2		
	7th Grade	8th Grade	1-3 Years High School	4 Years High School	1-3 Years College	4 or more Years College		
Education	(5)	(31)	(25)	(87)	(37)	(52)		
Occupation	3, 1-2-4	3;(X) 1-2, 4	3;(Y) 2, 4, 1	3;(Z) 1;(Z) 2, 4	1;(aa) 3;(aa) 2-4	1;(bb) 4, 2-3		

* Number in parenthesis is number of families.
** Non-Madison communities.
(a). Occupation equally distributed.
(b) 50% of occupations.
(c) 70% of occupations.
(d) Represent 58% and 30%, respectively, of occupations.
(e) 75% of occupations.
(f) 79% of occupations.
(g) 95% of occupations
(H) Represent 50% and 46%, respectively, of occupations.
(I) Represent 50% and 25%, respectively, of occupations.
(J) Represent 56% and 38%, respectively, of occupations.
(K) 94% of occupations.
(L) 50% of occupations.
(m) Each 46% of occupations.
(n) Each 45% of occupations.
(o) 50% of occupations.
(p) 86% of occupations.
(q) Each 43% of occupations.
(R) Each 45% of occupations.
(S) 66% of occupations.
(T) Represent 54% and 40%, respectively, of occupations.
(U) Represent 52% and 33%, respectively, of occupations.
(V) Represent 57% and 33%, respectively, of occupations.
(w) Represent 53% and 26%, respectively, of occupations.
(X) 61% of occupations.
(Y) 72% of occupations.
(Z) 59% and 31%, respectively.
(aa) 54% and 35%, respectively.
(bb) 92% of occupations.

Occupation Code:

Group 1 - Professional, Manager, Proprietors and Sales

Group 2 - Farm and Farm Managers

Group 3 - Clerical, Craftsmen and Foremen, Operatives, Service and Laborer

Group 4 - Retired (1 unemployed)

TABLE 2

FAMILY INCOME, SIZE, AGE, OCCUPATION, AND EDUCATIONAL LEVEL ACCORDING TO RESIDENCE, ONE YEAR PERIOD, 1960-1961

Income	Under $2000 (3)*	$2000-3999 (10)	$4000-5999 (67)	$6000-7999 (71)	$8000-9999 (35)	$10000-14999 (33)	$15000-Over (18)		
Residence	1;(a) 4	2, 1, 3-4(b)	1;(c) 2, 3, 4	1;(d) 2, 4, 3	1;(e) 2-3, 4	1;(f) 3, 2-4	1;(g) 4, 2-3		
Size	1 (2)	2 (49)	3 (47)	4 (61)	5 (46)	6 (16)	7 (7)	8 (7)	9 (2)
Residence	1-2	1;(H) 2, 3, 4	1;(I) 2-3-4	1;(J) 2, 3=4	1;(K) 2, 4, 3	1;(L) 2=4	1;(m) 2-4	1;(n) 2	2-3(o)
Age	25-29 (9)	30-34 (29)	35-44 (88)	45-54 (54)	55-64 (42)	65- over (5)			
Residence	1;(p) 2	1;(q) 2, 3, 4	1;(R) 2;(R) 3, 4	1;(S) 4, 2, 3	1;(T) 3-4	1;(U) 2;(U) 3, 4			
Occupation	Professional Technical (41)	Farm and Farm Managers (18)	Managers Proprietors (47)	Clerical (15)	Sales (14)	Craftsmen Foremen (33)	Operative (33)	Service (16)	Laborers (7)	Retired (13)
Residence	1;(V) 2-3	4;(W) 2	1;(x) 2, 3, 4	1;(y) 2;(y)	1	1;(z) 2, 3	1;(aa) 2-3	1;(bb) 2	1;(cc) 2-3	1-2;(dd) 3
Education	7th Grade (5)	8th Grade (31)	1-3 Years High School (25)	4 Years High School (87)	1-3 Years College (37)	4 or more Years College (52)				
Residence	1, 2-3-4	1;(ee) 2, 4, 3	1;(ff) 2, 3-4	1;(gg) 2, 3, 4	1;(HH) 2-3-4	1;(II) 2, 3, 4				

* Number in parenthesis is number of families.
(a) 50% of residences.
(b) - indicates identical % hereinafter.
, indicates different %
(c) 63% of residences.
(d) 77% of residences.
(e) 86% of residences.
(f) 82% of residences.
(g) 78% of residences.
(H) 72% of residences.
(I) 68% of residences.
(J) 74% of residences.
(K) 78% of residences.
(L) 75% of residences.
(m) 72% of residences.
(n) 86% of residences.
(o) Each 50% of residences.
(p) 89% of residences.
(q) 62% of residences.
(R) Represent 75% and 15%, respectively, of residences.
(S) 74% of residences.
(T) 81% of residences.
(U) Represent 40% and 33%, respectively, of residences.
(V) 90%.
(w) 89%.
(x) 77%.
(y) 67% and 33%, respectively.
(z) 61%.
(aa) 73%.
(bb) 94%.
(cc) 72%.
(dd) Each 45%.
(ee) 48%.
(ff) 56%.
(gg) 74%.
(HH) 84%.
(II) 89%.

Residence Code:

Group 1 - Urban Madison.

Group 2 - Non-Madison communities with pharmaceutical service.

Group 3 - Non-Madison communities without pharmaceutical service.

Group 4 - Farms

TABLE 3

FAMILY INCOME, SIZE, RESIDENCE, AGE, AND OCCUPATION ANALYZED ACCORDING TO AVERAGE EDUCATIONAL LEVEL, ONE YEAR PERIOD, 1960-1961

Income	Under $2000	$2000-3999	$4000-5999	$6000-7999	$8000-9999	$10000-14999	$15000-Over
Education	4.67(a)	3.70	4.52	5.03	6.00	5.87	5.94

Size	1	2	3	4	5	6	7	8	9
Education	5.50	4.84	4.88	5.34	5.50	5.50	5.00	4.71	3.50

Residence	Urban Madison	With Pharmacy Service(b)	Without Pharmacy Service(b)	Farm
Education	5.42	4.56	4.63	4.26

Age	25-29	30-34	35-44	45-54	55-64	65- over
Education	5.22	5.10	5.21	5.22	5.24	4.47

Occupation	Professional Technical	Farm and Farm Managers	Managers Proprietors	Clerical	Sales	Craftsmen Foremen	Operatives	Service	Laborers	Retired
Education	6.58	4.27	5.46	5.00	5.36	4.33	4.48	4.88	4.14	4.67

(a) Education Code:

- 7th Grade - 2
- 8th Grade - 3
- 1-3 Years High School - 4
- 4 Years High School - 5
- 1-3 Years College - 6
- 4 or more Years College - 7

(b) Non-Madison communities.

ANALYSES OF DRUG EXPENDITURES BY SOURCE AND FAMILY VARIABLES

TABLE 1

AVERAGE FAMILY DRUG EXPENDITURES BY INCOME AND SOURCE, ONE YEAR PERIOD, 1960-1961

Income[a]	Number of Families	Drug Sources						
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[b]	Physicians	Hospital	Total
Under $2000	3	$64.60	$ 0.00	$ 0.00	$ 0.00	$13.33	$20.25	$98.18
$2000-3999	10	91.00	0.88	0.35	0.35	8.70	0.00	101.28
$4000-5999	67	34.72	0.12	0.07	0.39	14.92	1.33	51.55
$6000-7999	71	44.14	0.76	0.56	0.18	14.21	2.60	62.45
$8000-9999	35	44.05	2.02	0.02	0.57	9.87	0.88	57.41
$10000-14999	33	83.52	0.82	0.44	0.02	6.64	3.18	94.62
$15000-over	18	50.39	1.16	0.00	0.03	17.29	2.85	71.72
Total and Weighted Means	237	$49.71	$0.80	$0.27	$0.27	$12.66	$2.19	$65.90

(a) Weighted mean income, $8618.
(b) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 2

AVERAGE FAMILY DRUG EXPENDITURES BY FAMILY SIZE AND SOURCE, ONE YEAR PERIOD, 1960-1961

Size[a]	Number of Families	Drug Sources						
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[b]	Physicians	Hospital	Total
1	2	$140.54	$0.00	$ 0.00	$0.00	$1.50	$ 0.00	$142.04
2	49	57.78	0.27	0.08	0.02	11.75	2.24	72.14
3	47	51.64	0.65	0.46	0.44	10.62	1.02	64.83
4	61	45.37	1.28	0.08	0.13	11.20	1.77	59.83
5	46	43.37	0.54	0.34	0.58	14.54	3.16	62.74
6	16	53.77	0.56	0.91	0.06	15.60	1.40	72.30
7	7	30.51	2.71	0.00	0.92	23.71	0.60	58.45
8	7	51.28	2.12	0.70	0.00	21.60	11.93	87.63
9	2	17.24	0.00	0.00	0.00	7.50	0.00	24.74
Total and Weighted Means	237	$49.71	$0.80	$0.27	$0.27	$12.66	$ 2.19	$ 65.90

(a) Weighted mean size, 3.94.
(b) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 3

AVERAGE FAMILY DRUG EXPENDITURES BY AGE AND SOURCE,
ONE YEAR PERIOD, 1960-1961

Age[a]	Number of Families	Drug Sources						
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[b]	Physicians	Hospital	Total
25-29	9	$22.81	$0.80	$ 0.00	$ 0.60	$16.08	$ 0.00	$39.69
30-34	29	25.92	0.03	0.00	0.45	15.83	2.60	44.83
35-44	88	41.25	0.73	0.11	0.25	13.45	1.81	57.60
45-54	54	50.41	1.11	0.95	0.27	10.96	2.82	66.52
55-64	42	75.91	1.14	0.00	0.18	9.21	2.22	88.66
65-over	15	84.79	0.58	0.23	0.44	16.33	2.72	105.09
Total and Weighted Means	237	$49.71	$0.80	$0.27	$0.27	$12.66	$2.19	$65.90

(a) Weighted mean years age, 45.5.
(b) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 4

AVERAGE FAMILY DRUG EXPENDITURES BY OCCUPATION AND SOURCE, ONE YEAR PERIOD, 1960-1961

Occupation	Number of Families	Drug Sources						
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[a]	Physicians	Hospital	Total
Professional, Technical	41	$61.45	$1.87	$ 0.01	$ 0.51	$ 7.09	$ 2.19	$73.12
Farmers and Farm Managers	18	43.76	0.69	2.24	0.00	21.37	9.07	71.59
Managers, Officials, Proprietors	47	58.44	1.02	0.33	0.04	15.82	1.14	76.79
Clerical	15	29.90	0.00	0.00	0.20	13.26	2.47	45.83
Sales	14	39.38	1.25	0.00	0.18	5.00	0.30	46.11
Craftsmen, Foremen	33	52.43	0.14	0.00	0.30	15.85	1.00	68.72
Operatives	33	34.00	0.45	0.14	0.15	11.93	0.75	47.42
Service	16	25.83	0.00	0.00	0.44	15.65	3.23	45.12
Laborers	7	13.81	0.00	0.00	0.96	7.43	0.60	22.79
Retired	13	104.09	1.23	0.27	0.50	8.03	4.59	118.71
Total and Weighted Means	237	$ 49.71	$0.80	$0.27	$0.27	$12.66	$2.19	$ 65.90

(a) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 5

AVERAGE FAMILY DRUG EXPENDITURES BY EDUCATIONAL LEVEL AND SOURCE, ONE YEAR PERIOD, 1960-1961

Educational Level[a]	Number of Families	Drug Sources						
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[b]	Physicians	Hospital	Total
7th Grade	5	$85.50	$0.00	$ 0.99	$ 0.24	$ 33.25	$ 0.00	$119.98
8th Grade	31	47.12	0.00	1.02	0.47	16.21	2.19	67.01
1-3 Years High School	25	52.41	0.19	0.39	0.25	9.58	5.52	68.34
4 Years High School	87	40.97	0.57	0.21	0.17	14.33	1.83	58.06
1-3 Years College	37	44.07	0.50	0.00	0.16	11.40	0.52	56.65
4 or more Years College	52	64.91	2.25	0.01	0.41	8.40	2.63	78.62
Total and Weighted Means	237	$49.71	$0.80	$0.27	$0.27	$12.66	$2.19	$65.90

(a) Weighted median years education, 12.7.
(b) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 6

AVERAGE FAMILY DRUG EXPENDITURES BY RESIDENCE AND SOURCE, ONE YEAR PERIOD, 1960-1961

Residence	Number of Families	Drug Sources						
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[a]	Physicians	Hospital	Total
Urban Madison	172	$53.31	$0.72	$ 0.03	$ 0.28	$10.65	$ 1.51	$66.50
Non-Madison Communities with Pharmaceutical Service	32	48.75	1.65	0.75	0.25	15.43	2.43	69.26
Non-Madison Communities without Pharmaceutical Service	16	19.99	0.00	0.00	0.39	20.51	1.30	42.19
Farms	17	42.41	0.72	2.09	0.00	21.05	9.61	75.88
Total and Weighted Means	237	$49.71	$0.80	$0.27	$0.27	$12.66	$2.19	$65.90

(a) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 7

AVERAGE FAMILY DRUG EXPENDITURES EXCLUDING PRESCRIBED DRUGS BY INCOME AND SOURCE, ONE YEAR PERIOD, 1960-1961

Income[a]	Number of Families	Drug Sources						
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[b]	Physicians	Hospital	Total
Under $2000	3	$ 5.35	$0.00	$ 0.00	$ 0.00	$13.33	$20.25	$38.93
$2000-3999	10	15.47	0.88	0.35	0.35	8.70	0.00	25.75
$4000-5999	67	13.02	0.12	0.07	0.39	14.92	1.33	29.85
$6000-7999	71	6.70	0.76	0.56	0.18	14.21	2.60	25.01
$8000-9999	35	14.33	2.02	0.02	0.57	9.87	0.88	27.69
$10000-14999	33	15.74	0.82	0.44	0.02	6.64	3.18	26.84
$15000- over	18	13.13	1.16	0.00	0.03	17.29	2.85	34.46
Total and Weighted Means	237	$11.75	$0.80	$0.27	$0.27	$12.66	$2.19	$27.95

(a) Weighted mean income, $8618.
(b) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 8

AVERAGE FAMILY DRUG EXPENDITURES EXCLUDING PRESCRIBED DRUGS BY FAMILY SIZE AND SOURCE, ONE YEAR PERIOD, 1960-1961

Size[a]	Number of Families	Drug Sources						
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[b]	Physicians	Hospital	Total
1	2	$14.52	$0.00	$0.00	$0.00	$1.50	$0.00	$16.02
2	49	11.01	0.27	0.08	0.02	11.75	2.24	25.37
3	47	17.10	0.65	0.46	0.44	10.62	1.02	30.29
4	61	8.27	1.28	0.08	0.13	11.20	1.77	22.73
5	46	11.84	0.54	0.34	0.58	14.54	3.16	31.21
6	16	12.57	0.56	0.91	0.06	15.60	1.40	31.10
7	7	5.49	2.71	0.00	0.92	23.71	0.60	33.43
8	7	15.60	2.12	0.70	0.00	21.60	11.93	51.95
9	2	3.56	0.00	0.00	0.00	7.50	0.00	11.06
Total and Weighted Means	237	$11.75	$0.80	$0.27	$0.27	$12.66	$2.19	$27.95

(a) Weighted mean size, 3.94.
(b) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 9

AVERAGE FAMILY DRUG EXPENDITURES EXCLUDING PRESCRIBED DRUGS BY AGE AND SOURCE, ONE YEAR PERIOD, 1960-1961

Age[a]	Number of Families	Drug Sources						
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[b]	Physicians	Hospital	Total
25-29	9	$ 4.84	$0.80	$ 0.00	$ 0.00	$16.08	$ 0.00	$21.72
30-34	29	6.85	0.03	0.00	0.45	15.83	2.60	25.76
35-44	88	10.02	0.73	0.11	0.25	13.45	1.81	26.37
45-54	54	12.65	1.11	0.95	0.27	10.96	2.82	28.76
55-64	42	15.14	1.14	0.00	0.18	9.21	2.22	27.89
65- over	15	22.20	0.58	0.23	0.44	16.33	2.72	42.50
Total and Weighted Means	237	$11.75	$0.80	$0.27	$0.27	$12.66	$2.19	$27.95

(a) Weighted mean years age, 45.5.
(b) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 10

AVERAGE FAMILY DRUG EXPENDITURES EXCLUDING PRESCRIBED DRUGS BY OCCUPATION AND SOURCE, ONE YEAR PERIOD, 1960-1961

Occupation	Number of Families	Drug Sources						
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[(a)]	Physicians	Hospital	Total
Professional, Technical	41	$11.39	$ 1.87	$ 0.01	$ 0.51	$ 7.09	$ 2.19	$23.06
Farmers and Farm Managers	18	14.23	0.69	2.24	0.00	21.37	9.07	47.60
Managers, Officials and Proprietors	47	13.89	1.02	0.33	0.04	15.82	1.14	32.24
Clerical	15	7.66	0.00	0.00	0.20	13.26	2.47	23.59
Sales	14	9.92	1.25	0.00	0.18	5.00	0.30	16.65
Craftsmen, Foremen	33	12.57	0.14	0.00	0.30	15.85	1.00	29.86
Operatives	33	7.60	0.45	0.14	0.15	11.93	0.75	21.02
Service	16	11.22	0.00	0.00	0.44	15.65	3.23	30.54
Laborers	7	5.01	0.00	0.00	0.96	7.43	0.60	14.00
Retired	13	20.46	1.23	0.27	0.50	8.03	4.59	35.08
Total and Weighted Means	237	$11.75	$0.80	$0.27	$0.27	$12.66	$2.19	$27.95

(a) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 11

AVERAGE FAMILY DRUG EXPENDITURES EXCLUDING PRESCRIBED DRUGS BY EDUCATIONAL LEVEL AND SOURCE, ONE YEAR PERIOD, 1960-1961

Education[a]	Number of Families	Drug Sources						
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[b]	Physicians	Hospital	Total
7th Grade	5	$32.01	$0.00	$ 0.99	$ 0.24	$33.25	$ 0.00	$66.49
8th Grade	31	14.43	0.00	1.02	0.47	16.21	2.19	34.32
1-3 Years High School	25	13.60	0.19	0.39	0.25	9.58	5.52	29.53
4 Years High School	87	9.77	0.57	0.21	0.17	14.33	1.83	26.86
1-3 Years College	37	10.59	0.50	0.00	0.16	11.40	0.52	23.16
4 or more Years College	52	11.30	2.25	0.01	0.41	8.40	2.63	25.01
Total and Weighted Means	237	$11.75	$0.80	$0.27	$0.27	$12.66	$2.19	$27.95

(a) Weighted median years education, 12.7.
(b) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 12

AVERAGE FAMILY DRUG EXPENDITURES EXCLUDING PRESCRIBED DRUGS BY RESIDENCE AND SOURCE, ONE YEAR PERIOD, 1960-1961

Residence	Number of Families	Drug Sources						
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[a]	Physicians	Hospital	Total
Urban Madison	172	$12.03	$0.72	$ 0.03	$ 0.28	$10.65	$ 1.51	$25.22
Non-Madison Communities with Pharmaceutical Service	32	12.54	1.65	0.75	0.25	15.43	2.43	33.05
Non-Madison Communities without Pharmaceutical Service	16	7.78	0.00	0.00	0.39	20.51	1.30	29.98
Farms	17	10.69	0.72	2.09	0.00	21.05	9.61	44.16
Total and Weighted Means	237	$11.75	$0.80	$0.27	$0.27	$12.66	$2.19	$27.95

(a) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 13

AVERAGE FAMILY EXPENDITURE FOR PRESCRIBED AND O-T-C DRUGS BY INCOME AND SOURCE, ONE YEAR PERIOD, 1960-1961

Income[a]	Number of Families	Drug Sources				
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[b]	Total
Under $2000	3	$64.60	$ 0.00	$ 0.00	$ 0.00	$64.60
$2000-3999	10	91.00	0.88	0.35	0.35	92.58
$4000-5999	67	34.72	0.12	0.07	0.39	35.30
$6000-7999	71	44.14	0.76	0.56	0.18	45.64
$8000-9999	35	44.06	2.02	0.02	0.57	46.67
$10000-14999	33	83.52	0.82	0.44	0.02	84.80
$15000- over	18	50.39	1.16	0.00	0.03	51.58
Total and Weighted Means	237	$49.71	$0.80	$0.27	$0.27	$51.05

(a) Weighted mean income, $8618.
(b) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 14

AVERAGE FAMILY EXPENDITURE FOR PRESCRIBED AND O-T-C DRUGS BY FAMILY SIZE AND SOURCE, ONE YEAR PERIOD, 1960-1961

Size[a]	Number of Families	Drug Sources				
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[b]	Total
1	2	$140.54	$ 0.00	$ 0.00	$ 0.00	$140.54
2	49	57.78	0.27	0.08	0.02	58.15
3	47	51.64	0.65	0.46	0.44	53.19
4	61	45.37	1.28	0.08	0.13	46.86
5	46	43.37	0.54	0.34	0.58	44.83
6	16	53.77	0.56	0.91	0.06	55.30
7	7	30.51	2.71	0.00	0.92	34.14
8	7	51.28	2.12	0.70	0.00	54.10
9	2	17.24	0.00	0.00	0.00	17.24
Total and Weighted Means	237	$49.71	$0.80	$0.27	$0.27	$51.05

(a) Weighted mean size, 3.94.
(b) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 15

AVERAGE FAMILY EXPENDITURE FOR PRESCRIBED AND O-T-C DRUGS BY AGE AND SOURCE, ONE YEAR PERIOD, 1960-1961

Age[a]	Number of Families	Drug Sources				Total
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[b]	
25-29	9	$22.81	$0.80	$ 0.00	$ 0.00	$23.61
30-34	29	25.92	0.03	0.00	0.45	26.40
35-44	88	41.25	0.73	0.11	0.25	42.34
45-54	54	50.41	1.11	0.95	0.27	52.74
55-64	42	75.91	1.14	0.00	0.18	77.23
65- over	15	84.79	0.58	0.23	0.44	86.04
Total and Weighted Means	237	$49.71	$0.80	$0.27	$0.27	$51.05

(a) Weighted mean years age, 45.5.
(b) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 16

AVERAGE FAMILY EXPENDITURE FOR PRESCRIBED AND O-T-C DRUGS BY OCCUPATION AND SOURCE, ONE YEAR PERIOD, 1960-1961

Occupation	Number of Families	Drug Sources				Total
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[a]	
Professional, Technical	41	$61.45	$1.87	$ 0.01	$ 0.51	$63.84
Farmers and Farm Managers	18	43.76	0.69	2.24	0.00	46.69
Managers, Officials, Proprietors	47	58.44	1.02	0.33	0.04	59.83
Clerical	15	29.90	0.00	0.00	0.20	30.10
Sales	14	39.38	1.25	0.00	0.18	40.81
Craftsmen, Foremen	33	52.43	0.14	0.00	0.30	52.87
Operatives	33	34.00	0.45	0.14	0.15	34.74
Service	16	25.83	0.00	0.00	0.44	26.27
Laborers	7	13.81	0.00	0.00	0.96	14.77
Retired	13	104.09	1.23	0.27	0.50	106.09
Total and Weighted Means	237	$ 49.71	$0.80	$0.27	$0.27	$ 51.05

(a) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 17

AVERAGE FAMILY EXPENDITURE FOR PRESCRIBED AND O-T-C DRUGS BY EDUCATIONAL LEVEL AND SOURCE, ONE YEAR PERIOD, 1960-1961

Education[a]	Number of Families	Drug Sources				Total
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[b]	
7th Grade	5	$85.50	$0.00	$ 0.99	$ 0.24	$ 86.73
8th Grade	31	47.12	0.00	1.02	0.47	48.61
1-3 Years High School	25	52.41	0.19	0.39	0.25	53.24
4 Years High School	87	40.95	0.57	0.21	0.17	41.90
1-3 Years College	37	44.07	0.50	0.00	0.16	44.73
4 or more Years College	52	64.91	2.25	0.01	0.41	67.58
Total and Weighted Means	237	$49.71	$0.80	$0.27	$0.27	$51.05

(a) Weighted median years education, 12.7.
(b) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 18

AVERAGE FAMILY EXPENDITURE FOR PRESCRIBED AND O-T-C DRUGS BY RESIDENCE AND SOURCE, ONE YEAR PERIOD, 1960-1961

Residence	Number of Families	Drug Sources				
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other(a)	Total
Urban Madison	172	$53.31	$0.72	$ 0.03	$ 0.28	$54.34
Non-Madison Communities with Pharmaceutical Service	32	48.75	1.65	0.75	0.25	51.40
Non-Madison Communities without Pharmaceutical Service	16	19.99	0.00	0.00	0.39	20.38
Farms	17	42.41	0.72	2.09	0.00	45.22
Total and Weighted Means	237	$49.71	$0.80	$0.27	$0.27	$51.05

(a) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 19

AVERAGE FAMILY EXPENDITURE FOR O-T-C DRUGS BY INCOME AND SOURCE, ONE YEAR PERIOD, 1960-1961

Income[a]	Number of Families	Drug Sources				Total
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[b]	
Under $2000	3	$ 5.35	$0.00	$ 0.00	$ 0.00	$ 5.35
$2000-3999	10	15.47	0.88	0.35	0.35	17.05
$4000-5999	67	13.02	0.12	0.07	0.39	13.60
$6000-7999	71	6.70	0.76	0.56	0.18	8.20
$8000-9999	35	14.33	2.02	0.02	0.57	16.94
$10000-14999	33	15.74	0.82	0.44	0.02	17.02
$15000- over	18	13.13	1.16	0.00	0.03	14.32
Total and Weighted Means	237	$11.75	$0.80	$0.27	$0.27	$13.10

(a) Weighted mean income, $8618.
(b) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 20

AVERAGE FAMILY EXPENDITURE FOR O-T-C DRUGS BY FAMILY SIZE AND SOURCE, ONE YEAR PERIOD, 1960-1961

Size[a]	Number of Families	Drug Sources				Total
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[b]	
1	2	$14.52	$0.00	$ 0.00	$ 0.00	$14.52
2	49	11.01	0.27	0.08	0.02	11.38
3	47	17.10	0.65	0.46	0.44	18.65
4	61	8.27	1.28	0.08	0.13	9.76
5	46	11.84	0.54	0.34	0.58	13.30
6	16	12.57	0.56	0.91	0.06	14.10
7	7	5.49	2.71	0.00	0.92	9.12
8	7	15.60	2.12	0.70	0.00	18.42
9	2	3.56	0.00	0.00	0.00	3.56
Total and Weighted Means	237	$11.75	$0.80	$0.27	$0.27	$13.10

(a) Weighted mean size, 3.94.
(b) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 21

AVERAGE FAMILY EXPENDITURE FOR O-T-C DRUGS BY AGE AND SOURCE, ONE YEAR PERIOD, 1960-1961

Age[a]	Number of Families	Drug Sources				Total
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[b]	
25-29	9	$ 4.84	$0.80	$ 0.00	$ 0.00	$ 5.64
30-34	29	6.85	0.03	0.00	0.45	7.33
35-44	88	10.02	0.73	0.11	0.25	11.11
45-54	54	12.65	1.11	0.95	0.27	14.98
55-64	42	15.14	1.14	0.00	0.18	16.46
65- over	15	22.20	0.58	0.23	0.44	23.45
Total and Weighted Means	237	$11.75	$0.80	$0.27	$0.27	$13.10

(a) Weighted mean years age, 45.5.
(b) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 22

AVERAGE FAMILY EXPENDITURE FOR O-T-C DRUGS BY OCCUPATION AND SOURCE, ONE YEAR PERIOD, 1960-1961

Occupation	Number of Families	Drug Sources				
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other(a)	Total
Professional, Technical	41	$11.39	$ 1.87	$ 0.01	$ 0.51	$13.78
Farmers and Farm Managers	18	14.23	0.69	2.24	0.00	17.16
Managers, Officials, Proprietors	47	13.89	1.02	0.33	0.04	15.28
Clerical	15	7.66	0.00	0.00	0.20	7.86
Sales	14	9.92	1.25	0.00	0.18	11.35
Craftsmen, Foremen	33	12.57	0.14	0.00	0.30	13.01
Operatives	33	7.60	0.45	0.14	0.15	8.34
Service	16	11.22	0.00	0.00	0.44	11.66
Laborers	7	5.01	0.00	0.00	0.96	5.97
Retired	13	20.46	1.23	0.27	0.50	22.46
Total and Weighted Means	237	$11.75	$0.80	$0.27	$0.27	$13.10

(a) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 23

AVERAGE FAMILY EXPENDITURE FOR O-T-C DRUGS BY EDUCATIONAL LEVEL AND SOURCE, ONE YEAR PERIOD, 1960-1961

Education[a]	Number of Families	Drug Sources				Total
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[b]	
7th Grade	5	$32.01	$ 0.00	$ 0.99	$ 0.24	$33.24
8th Grade	31	14.43	0.00	1.02	0.47	15.92
1-3 Years High School	25	13.60	0.19	0.39	0.25	14.43
4 Years High School	87	9.77	0.57	0.21	0.17	10.72
1-3 Years College	37	10.59	0.50	0.00	0.16	11.25
4 or more Years College	52	11.30	2.25	0.01	0.41	13.97
Total and Weighted Means	237	$11.75	$0.80	$0.27	$0.27	$13.10

(a) Weighted median years education, 12.7.
(b) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

TABLE 24

AVERAGE FAMILY EXPENDITURE FOR O-T-C DRUGS BY RESIDENCE AND SOURCE, ONE YEAR PERIOD, 1960-1961

Residence	Number of Families	Drug Sources				Total
		Pharmacy	Mail Order	Door-to-Door Salesmen	Other[a]	
Urban Madison	172	$12.03	$ 0.72	$ 0.03	$ 0.28	$13.06
Non-Madison Communities with Pharmaceutical Service	32	12.54	1.65	0.75	0.25	15.19
Non-Madison Communities without Pharmaceutical Service	16	7.78	0.00	0.00	0.39	8.17
Farms	17	10.69	0.72	2.09	0.00	13.50
Total and Weighted Means	237	$11.75	$0.80	$0.27	$0.27	$13.10

(a) Retail outlets of Sears, Roebuck and Company, Montgomery Ward and Company, and groceries.

APPENDIX J

ANALYSES OF PERCENTAGES OF DRUG EXPENDITURES FROM PHARMACY AND NONPHARMACY SOURCES BY FAMILY VARIABLES, ONE YEAR PERIOD, 1960-1961

TABLE 1

PERCENTAGE OF DRUG EXPENDITURES FROM PHARMACY AND NONPHARMACY SOURCES BY FAMILY INCOME, ONE YEAR PERIOD, 1960-1961

Income	Number of Families	All Drugs		All Drugs Excluding Prescribed Drugs		Prescribed and O-T-C Drugs		O-T-C Drugs		Prescribed Drugs	
		Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy
Under $2000	3	65.90%	34.10%	13.74%	86.26%	100.00%	0.00%	100.00%	0.00%	100.00%	0.00%
$2000-3999	10	89.86	10.14	60.25	39.75	97.00	3.00	90.75	9.25	100.00	0.00
$4000-5999	67	67.25	32.75	43.51	56.49	98.25	1.75	95.80	4.20	100.00	0.00
$6000-7999	71	70.75	29.25	26.80	73.20	96.77	3.23	81.75	18.25	100.00	0.00
$8000-9999	35	76.85	23.15	51.75	48.25	94.40	5.60	84.60	15.40	100.00	0.00
$10000-14999	33	88.45	11.55	58.62	41.38	98.52	1.48	92.45	7.55	100.00	0.00
$15000- over	18	70.25	29.75	38.10	61.90	97.50	2.50	91.61	8.39	100.00	0.00

TABLE 2

PERCENTAGE OF DRUG EXPENDITURES FROM PHARMACY AND NONPHARMACY SOURCES BY FAMILY SIZE, ONE YEAR PERIOD, 1960-1961

Size	Number of Families	All Drugs		All Drugs Excluding Prescribed Drugs		Prescribed and O-T-C Drugs		O-T-C Drugs		Prescribed Drugs	
		Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy
1	2	98.80%	1.20%	90.52%	9.48%	100.00%	0.00%	100.00%	0.00%	100.00%	0.00%
2	49	80.20	19.80	43.50	56.50	99.40	0.60	96.85	3.15	100.00	0.00
3	47	79.85	20.15	56.50	43.50	97.30	2.70	91.75	8.25	100.00	0.00
4	61	75.82	24.18	36.40	63.60	96.85	3.15	84.74	15.26	100.00	0.00
5	46	69.10	30.90	37.90	62.10	96.60	3.40	89.10	10.90	100.00	0.00
6	16	74.50	25.50	40.04	59.96	97.25	2.75	89.25	10.75	100.00	0.00
7	7	51.50	48.50	16.41	83.59	88.30	11.70	60.30	39.70	100.00	0.00
8	7	58.53	41.47	30.07	69.93	94.65	5.35	84.64	15.36	100.00	0.00
9	2	69.75	30.25	32.20	67.80	100.00	0.00	100.00	0.00	100.00	0.00

TABLE 3

PERCENTAGE OF DRUG EXPENDITURES FROM PHARMACY AND NONPHARMACY SOURCES BY AGE, ONE YEAR PERIOD, 1960-1961

Age	Number of Families	All Drugs		All Drugs Excluding Prescribed Drugs		Prescribed and O-T-C Drugs		O-T-C Drugs		Prescribed Drugs	
		Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy
25-29	9	57.55%	42.45%	22.24%	77.76%	96.65%	3.35%	85.80%	14.20%	100.00%	0.00%
30-34	29	58.01	41.99	26.61	73.39	98.20	1.80	93.50	6.50	100.00	0.00
35-44	88	71.75	28.25	38.08	61.92	97.50	2.50	90.25	9.75	100.00	0.00
45-54	54	75.70	24.30	44.07	55.93	95.51	4.49	84.45	15.55	100.00	0.00
55-64	42	85.65	14.35	54.25	45.75	98.25	1.75	92.10	7.90	100.00	0.00
65- over	15	80.75	19.25	52.25	47.75	98.50	1.50	94.70	5.30	100.00	0.00

TABLE 4

PERCENTAGE OF DRUG EXPENDITURES FROM PHARMACY AND NONPHARMACY SOURCES BY OCCUPATION, ONE YEAR PERIOD, 1960-1961

Occupation	Number of Families	All Drugs		All Drugs Excluding Prescribed Drugs		Prescribed and O-T-C Drugs		O-T-C Drugs		Prescribed Drugs	
		Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy
Professional	41	84.11%	15.89%	49.40%	50.60%	96.25%	3.75%	82.65%	17.35%	100.00%	0.00%
Farmers and Farm Managers	18	61.20	38.80	29.90	70.10	93.70	6.30	83.02	16.98	100.00	0.00
Managers and Proprietors	47	76.09	23.91	43.15	56.85	97.75	2.25	89.90	10.10	100.00	0.00
Clerical	15	65.25	34.75	32.50	67.50	99.25	0.75	97.50	2.50	100.00	0.00
Sales	14	85.40	14.60	59.51	40.49	96.65	3.35	87.45	12.55	100.00	0.00
Craftsmen, Foremen	33	76.21	23.79	42.10	57.90	99.20	0.80	96.50	3.50	100.00	0.00
Operatives	33	71.75	28.25	36.20	63.80	98.15	1.85	91.35	8.65	100.00	0.00
Service	16	57.30	42.70	36.80	63.20	98.40	1.60	96.25	3.75	100.00	0.00
Laborers	7	60.64	39.36	35.71	64.29	93.60	6.40	83.90	16.10	100.00	0.00
Retired	13	87.72	12.28	58.27	41.73	98.20	1.80	91.15	8.85	100.00	0.00

TABLE 5

PERCENTAGE OF DRUG EXPENDITURES FROM PHARMACY AND NONPHARMACY SOURCES BY EDUCATIONAL LEVEL, ONE YEAR PERIOD, 1960-1961

Education	Number of Families	All Drugs		All Drugs Excluding Prescribed Drugs		Prescribed and O-T-C Drugs		O-T-C Drugs		Prescribed Drugs	
		Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy
7th Grade	5	71.45%	28.55%	48.20%	51.80%	98.75%	1.25%	96.35%	3.65%	100.00%	0.00%
8th Grade	31	70.25	29.75	42.10	57.90	96.90%	3.10	90.75	9.25	100.00	0.00
1-3 Years High School	25	76.75	23.25	46.21	53.79	98.60	1.40	94.25	5.75	100.00	0.00
4 Years High School	87	70.50	29.50	36.40	63.60	97.75	2.25	91.30	8.70	100.00	0.00
1-3 Years College	37	77.80	22.20	45.83	54.17	98.65	1.35	94.21	5.79	100.00	0.00
4 or more Years College	52	82.55	17.45	45.25	54.75	95.92	4.08	80.95	19.05	100.00	0.00

TABLE 6

PERCENTAGE OF DRUG EXPENDITURES FROM PHARMACY AND NONPHARMACY SOURCES BY RESIDENCE, ONE YEAR PERIOD, 1960-1961

Residence	Number of Families	All Drugs		All Drugs Excluding Prescribed Drugs		Prescribed and O-T-C Drugs		O-T-C Drugs		Prescribed Drugs	
		Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy	Pharmacy	Nonpharmacy
Urban Madison	172	80.10%	19.90%	47.75%	52.25%	98.20%	1.80%	92.25%	7.75%	100.00	0.00
Non-Madison Communities with Pharmacy Service	32	70.50	29.50	41.70	58.30	94.90	5.10	82.56	17.44	100.00	0.00
Non-Madison Communities without Pharmacy Service	16	47.45	52.55	25.92	74.08	98.31	1.69	95.24	4.76	100.00	0.00
Farms	17	55.90	44.10	24.51	75.49	93.75	6.25	79.25	20.75	100.00	0.00

APPENDIX K

IUM CALCULATIONS FOR "FIRST DOLLAR" DRUG INSURANCE

The following formula was used to calculate premiums potential drug insurance plans based on the "first dollar" ept of insurance:

$$\left[\frac{\text{No. of months over which total risk cost data collected (A)} + \text{No. of months covered by insurance}}{2} + \right.$$

$$\left. \text{No. of months between end of (A) and first month of insurance} \times \left[\text{Estimated \% increase of risk cost per month}\right] + 1 \right]$$

$$\times \text{ Total cost of risk} = \text{Total cost of risk anticipated over insurance period.}$$

$$\text{No. of families represented by risk cost data} \times \text{No. of months represented by total risk cost data} =$$

$$\text{No. family months.}$$

$$\frac{\text{Total cost of risk anticipated}}{\text{No. of family months}} = \text{Cost of risk per family per month}$$

$$\text{Cost of risk per family per month} \times 12 = \text{Annual pure premium per family.}$$

$$\text{Annual pure premium per family plus administrative costs} = \text{Premium per family per year.}$$

The definition of the terms of this formula are as follows:

(1) (a) The number of months represented or over which the family drug expenditures or total risk cost data were collected was 15.

(b) The number of months covered by the drug insurance plan would be 12.

(c) The number of months between the last month, January, 1962, during which family drug expenditures were collected and the first month, March, 1962, of the drug insurance plan is 2.

(d) The estimated percentage increase of the risk cost per month is given in Appendix M.

(e) Total cost of risk would be the dollar amount of the insured expenditures for all families for 12 months.

(2) The number of families the risk cost data represent was 237. This multiplied by the number of months the total risk cost data represent, or 12, equals the number of family months.

(3), (4), and (5) are self-explanatory.

The subsequent pages show the calculations of premiums for various types of plans under the "first dollar" concept

of insurance. The steps in each set of calculations are explained only for the first calculation of that particular set. This method of presenting the calculations obviates considerable duplication yet it permits one to follow the calculations.

Prescribed Legend Plus Compound Nonlegend Drugs
(All Families)

$7575.22 Cost of Risk
X 1.052 Estimated Increase in Cost of Risk(a)

$7969.13 + 20% Administrative Expense(b) = $\frac{\$9961.41}{2844}$ = $3.50 X 12 = $42.00

Number of Family Months | Premium per Family per Month | Premium per Family per Year - 20% Administrative Expense

$\frac{7969.13}{.75}$(c) = $\frac{10625.50}{2844}$ = 3.74 X 12 = $44.88 Administrative expense 25%

$\frac{7969.13}{.70}$ = $\frac{11384.50}{2844}$ = 4.00 X 12 = $48.00 Administrative expense 30%

(a) This figure is calculated in the first part of step 1 of the formula as follows:

$$1 + \left[\frac{15 + 12}{2} + 2 \times \frac{.04}{12}\right] = 1.052.$$

(b) This is step 5 in the formula, but in the calculations it was performed at this stage of the calculations and does not affect the final premium figure.

(c) This is another method expressing the addition of the administrative expense, which in this case is 25%.

Prescribed Drugs
(All Families)

$8993.49
X 1.052

$9461.15

$\frac{9461.15}{.80} = \frac{11826.40}{2844} = 4.16 \times 12 = \$49.92$

$\frac{9461.15}{.75} = \frac{12614.90}{2844} = 4.44 \times 12 = \$53.28$

$\frac{9461.15}{.70} = \frac{13515.90}{2844} = 4.75 \times 12 = \$57.00$

Prescribed and O-T-C Drugs
(All Families)

$12087.25
X 1.048

$12667.44

$\frac{12667.44}{.80} = \frac{15834.30}{2844} = 5.57 \times 12 = \$66.84$

$\frac{12667.44}{.75} = \frac{16889.92}{2844} = 5.94 \times 12 = \$71.28$

$\frac{12667.44}{.70} = \frac{18096.34}{2844} = 6.36 \times 12 = \$76.32$

All Drugs Excluding In-Hospital Drugs
(All Families)

$15099.20
X 1.048

$15823.96

$\frac{15823.96}{.80} = \frac{19779.95}{2844} = 6.96 \times 12 = \$83.52$

$\frac{15823.96}{.75} = \frac{21098.61}{2844} = 7.42 \times 12 = \$89.04$

$\frac{15823.96}{.70} = \frac{22605.65}{2844} = 7.96 \times 12 = \$95.40$

Prescribed Legend Plus Compounded Nonlegend Drugs
(All Families)

$8993.49 Cost of Prescribed Drugs
X .8 Percentage Indemnification Limit
$7194.79
.8423 Estimated Percentage Prescribed Legend Plus Compounded Nonlegend Drugs
X
$6060.17
X 1.052 Estimated Increase in Cost of Risk

$\frac{6375.30}{.75} = \frac{8500.40}{2844}$

12 X 2.99 = $35.88

$\frac{6375.30}{.8} = \frac{7969.13}{2844}$

12 X 2.80 = $33.60

$\frac{6375.30}{.7} = \frac{9107.57}{2844}$

12 X 3.20 = $38.40

$8993.49
X .75
$6745.12
X .8423
$5681.41
X 1.052

$\frac{5976.84}{.75} = \frac{7969.12}{2844}$

12 X 2.80 = $33.60

$\frac{5976.84}{.8} = \frac{7471.05}{2844}$

12 X 2.63 = $31.56

$\frac{5976.84}{.7} = \frac{8538.34}{2844}$

12 X 3.00 = $36.00

Prescribed Drugs (All Families)

$8993.49 × .8 = $7194.79 × 1.052

$\frac{7568.92}{.75} = \frac{10,091.89}{2844}$

12 X 3.55 = $42.60

$\frac{7568.92}{.8} = \frac{9461.15}{2844}$

12 X 3.33 = $39.96

$\frac{7568.92}{.7} = \frac{10,812.74}{2844}$

12 X 3.80 = $45.60

$8993.49 × .75 = $6745.12 × 1.052

$\frac{7095.87}{.75} = \frac{9461.16}{2844}$

12 X 3.33 = $39.96

$\frac{7095.87}{.8} = \frac{8869.84}{2844}$

12 X 3.12 = $37.44

$\frac{7095.87}{.7} = \frac{10,136.96}{2844}$

12 X 3.56 = $42.72

Prescribed and O-T-C Drugs (All Families)

$12087.25 × .8 = $ 9669.80 × 1.048

$\frac{10133.95}{.75} = \frac{13511.93}{2844}$

12 X 4.75 = $57.00

$\frac{10133.95}{.8} = \frac{12667.44}{2844}$

12 X 4.45 = $53.40

$\frac{10133.95}{.7} = \frac{14477.07}{2844}$

12 X 5.09 = $61.08

$12087.25 × .75 = $ 9065.44 × 1.048 = 9500.58

$\frac{9500.58}{.75} = \frac{12667.44}{2844}$

12 X 4.45 = $53.40

$\frac{9500.58}{.8} = \frac{11875.73}{2844}$

12 X 4.18 = $50.16

$\frac{9500.58}{.7} = \frac{13572.26}{2844}$

12 X 4.77 = $57.24

All Drugs Excluding In-Hospital Drugs
(All Families)

$15099.20 × .8 = $12079.36 × 1.048

$15099.20 × .75 = $11324.40 × 1.048

$\frac{12659.21}{.75} = \frac{16878.94}{2844}$

12 X 5.94 = $71.28

$\frac{12659.21}{.8} = \frac{15824.01}{2844}$

12 X 5.56 = $66.72

$\frac{12659.21}{.7} = \frac{18084.59}{2844}$

12 X 6.36 = $76.32

$\frac{11867.97}{.75} = \frac{15823.96}{2844}$

12 X 5.56 = $66.72

$\frac{11867.97}{.8} = \frac{14834.96}{2844}$

12 X 5.22 = $62.64

$\frac{11867.97}{.7} = \frac{16954.24}{2844}$

12 X 5.96 = $71.52

Prescribed Legend Plus Compounded Nonlegend Drugs
(Professional Families)

$1728.89
X 1.052
$1818.79

$\frac{1818.79}{.80} = \frac{2273.49}{492} = 4.62 \times 12 = \$55.44$

$\frac{1818.79}{.75} = \frac{2425.05}{492} = 4.93 \times 12 = \$59.16$

$\frac{1818.79}{.70} = \frac{2598.27}{492} = 5.28 \times 12 = \$63.36$

$1728.89
X .8
$1383.11
X 1.052
$1455.03

$\frac{1455.03}{.80} = \frac{1818.79}{492} = 3.70 \times 12 = \$44.40$

$\frac{1455.03}{.75} = \frac{1940.04}{492} = 3.94 \times 12 = \$47.28$

$\frac{1455.03}{.70} = \frac{2078.61}{492} = 4.23 \times 12 = \$50.76$

$1728.89
X .75
$1296.67
X 1.052
$1364.10

$\frac{1364.10}{.80} = \frac{1705.13}{492} = 3.47 \times 12 = \$41.64$

$\frac{1364.10}{.75} = \frac{1818.80}{492} = 3.70 \times 12 = \$44.40$

$\frac{1364.10}{.70} = \frac{1948.71}{492} = 3.96 \times 12 = \$47.52$

Prescribed Drugs
(Professional Families)

$2052.27
X 1.052
$2158.99

$\frac{2158.99}{.80} = \frac{2698.74}{492} = 5.49 \times 12 = \$65.88$

$\frac{2158.99}{.75} = \frac{2878.65}{492} = 5.85 \times 12 = \$70.20$

$\frac{2158.99}{.70} = \frac{3084.27}{492} = 6.27 \times 12 = \$75.24$

$2052.27
X .8
$1641.82
X 1.052
$1727.20

$\frac{1727.20}{.80} = \frac{2159.00}{492} = 4.39 \times 12 = \$52.68$

$\frac{1727.20}{.75} = \frac{2302.93}{492} = 4.68 \times 12 = \$56.16$

$\frac{1727.20}{.70} = \frac{2467.43}{492} = 5.02 \times 12 = \$60.24$

$2052.27
X .75
$1539.20
X 1.052
$1619.24

$\frac{1619.24}{.80} = \frac{2024.05}{492} = 4.11 \times 12 = \$49.32$

$\frac{1619.24}{.75} = \frac{2159.00}{492} = 4.39 \times 12 = \$52.68$

$\frac{1619.24}{.70} = \frac{2313.20}{492} = 4.70 \times 12 = \$56.40$

Prescribed and O-T-C Drugs
(Professional Families)

$2617.71
X 1.048
$2743.36

$\frac{2743.36}{.80} = \frac{3429.20}{492} = 6.97 \times 12 = \$83.64$

$\frac{2743.36}{.75} = \frac{3657.81}{492} = 7.44 \times 12 = \$89.28$

$\frac{2743.36}{.70} = \frac{3919.09}{492} = 7.97 \times 12 = \$95.64$

$2617.71
X .8
$2094.17
X 1.048
$2194.69

$\frac{2194.69}{.80} = \frac{2743.36}{492} = 5.58 \times 12 = \$66.96$

$\frac{2194.69}{.75} = \frac{2926.25}{492} = 5.95 \times 12 = \$71.40$

$\frac{2194.69}{.70} = \frac{3135.27}{492} = 6.37 \times 12 = \$76.44$

$2617.71
X .75
$1963.28
X 1.048
$2057.52

$\frac{2057.52}{.80} = \frac{2571.90}{492} = 5.23 \times 12 = \$62.76$

$\frac{2057.52}{.75} = \frac{2743.36}{492} = 5.58 \times 12 = \$66.96$

$\frac{2057.52}{.70} = \frac{2939.31}{492} = 5.97 \times 12 = \$71.64$

All Drugs Excluding In-Hospital Drugs
(Professional Families)

$3012.90
X 1.048
$3157.52

$\frac{3157.52}{.80} = \frac{3946.90}{492} = 8.02 \times 12 = \$96.24$

$\frac{3157.52}{.75} = \frac{4210.03}{492} = 8.56 \times 12 = \$102.72$

$\frac{3157.52}{.70} = \frac{4510.74}{492} = 9.17 \times 12 = \$110.04$

$3012.90
X .8
$2410.32
X 1.048
$2526.02

$\frac{2526.02}{.80} = \frac{3157.53}{492} = 6.42 \times 12 = \$77.04$

$\frac{2526.02}{.75} = \frac{3368.03}{492} = 6.85 \times 12 = \$82.20$

$\frac{2526.02}{.70} = \frac{3608.60}{492} = 7.34 \times 12 = \$88.08$

$3012.90
X .75
$2259.68
X 1.048
$2368.15

$\frac{2368.15}{.80} = \frac{2960.19}{492} = 6.02 \times 12 = \$72.24$

$\frac{2368.15}{.75} = \frac{3157.53}{492} = 6.42 \times 12 = \$77.04$

$\frac{2368.15}{.70} = \frac{3383.07}{492} = 6.88 \times 12 = \$82.56$

Prescribed Legend Plus Compounded Nonlegend Drugs
(Craftsmen-Foremen Families)

$1108.08
X 1.052
$1165.70

$\frac{1165.70}{.80} = \frac{1457.13}{396} = 3.68 \times 12 = \$44.16$

$\frac{1165.70}{.75} = \frac{1554.27}{396} = 3.93 \times 12 = \$47.16$

$\frac{1165.70}{.70} = \frac{1665.29}{396} = 4.21 \times 12 = \$50.52$

$1108.08
X .8
$ 886.46
X 1.052
$ 932.56

$\frac{932.56}{.80} = \frac{1165.70}{396} = 2.94 \times 12 = \$35.28$

$\frac{932.56}{.75} = \frac{1243.41}{396} = 3.14 \times 12 = \$37.68$

$\frac{932.56}{.70} = \frac{1332.23}{396} = 3.36 \times 12 = \$40.32$

$1108.08
X .75
$ 831.06
X 1.052
$ 874.28

$\frac{874.28}{.80} = \frac{1092.85}{396} = 2.76 \times 12 = \$33.12$

$\frac{874.28}{.75} = \frac{1165.71}{396} = 2.94 \times 12 = \$35.28$

$\frac{874.28}{.70} = \frac{1248.97}{396} = 3.15 \times 12 = \$37.80$

Prescribed Drugs
(Craftsmen-Foremen Families)

$1315.51
X 1.052
$1383.92

$\frac{1383.92}{.80} = \frac{1729.90}{396} = 4.37 \times 12 = \$52.44$

$\frac{1383.92}{.75} = \frac{1845.23}{396} = 4.66 \times 12 = \$55.92$

$\frac{1383.92}{.70} = \frac{1977.03}{396} = 4.99 \times 12 = \$59.88$

$1315.51
X .8
$1052.41
X 1.052
$1107.14

$\frac{1107.14}{.80} = \frac{1383.93}{396} = 3.50 \times 12 = \$42.00$

$\frac{1107.14}{.75} = \frac{1476.19}{396} = 3.73 \times 12 = \$44.76$

$\frac{1107.14}{.70} = \frac{1581.63}{396} = 3.99 \times 12 = \$47.88$

$1315.51
X .75
$ 986.63
X 1.052
$1037.94

$\frac{1037.94}{.80} = \frac{1297.43}{396} = 3.28 \times 12 = \$39.36$

$\frac{1037.94}{.75} = \frac{1383.92}{396} = 3.50 \times 12 = \$42.00$

$\frac{1037.94}{.70} = \frac{1482.77}{396} = 3.74 \times 12 = \$44.88$

Prescribed and O-T-C Drugs
(Craftsmen-Foremen Families)

$1744.92
X 1.048
$1828.68

$\frac{1828.68}{.80} = \frac{2285.85}{396} = 5.77 \times 12 = \$69.24$

$\frac{1828.68}{.75} = \frac{2438.24}{396} = 6.16 \times 12 = \$73.92$

$\frac{1828.68}{.70} = \frac{2612.40}{396} = 6.60 \times 12 = \$79.20$

$1744.92
X .8
$1395.94
X 1.048
$1462.95

$\frac{1462.95}{.80} = \frac{1828.69}{396} = 4.62 \times 12 = \$55.44$

$\frac{1462.95}{.75} = \frac{1950.60}{396} = 4.93 \times 12 = \$59.16$

$\frac{1462.95}{.70} = \frac{2089.93}{396} = 5.28 \times 12 = \$63.36$

$1744.92
X .75
$1308.69
X 1.048
$1371.51

$\frac{1371.51}{.80} = \frac{1714.39}{396} = 4.33 \times 12 = \$51.96$

$\frac{1371.51}{.75} = \frac{1828.68}{396} = 4.62 \times 12 = \$55.44$

$\frac{1371.51}{.70} = \frac{1959.30}{396} = 4.95 \times 12 = \$59.40$

All Drugs Excluding In-Hospital Drugs
(Craftsmen-Foremen Families)

$2285.57
X 1.048
$2395.28

$\frac{2395.28}{.80} = \frac{2994.10}{396} = 7.56 \times 12 = \$90.72$

$\frac{2395.28}{.75} = \frac{3193.71}{396} = 8.07 \times 12 = \$96.84$

$\frac{2395.28}{.70} = \frac{3421.83}{396} = 8.64 \times 12 = \$103.68$

$2285.57
X .8
$1828.46
X 1.048
$1916.23

$\frac{1916.23}{.80} = \frac{2395.29}{396} = 6.05 \times 12 = \$72.60$

$\frac{1916.23}{.75} = \frac{2554.97}{396} = 6.45 \times 12 = \$77.40$

$\frac{1916.23}{.70} = \frac{2737.47}{396} = 6.91 \times 12 = \$82.92$

$2285.57
X .75
$1714.18
X 1.048
$1796.46

$\frac{1796.46}{.80} = \frac{2245.58}{396} = 5.67 \times 12 = \$68.04$

$\frac{1796.46}{.75} = \frac{2395.28}{396} = 6.05 \times 12 = \$72.60$

$\frac{1796.46}{.70} = \frac{2566.37}{396} = 6.48 \times 12 = \$77.76$

Prescribed Legend Plus Compounded Nonlegend Drugs
(Operatives Families)

$733.64
X 1.052
$771.79

$$\frac{771.79}{.80} = \frac{964.74}{396} = 2.44 \times 12 = \$29.28$$

$$\frac{771.79}{.75} = \frac{1029.05}{396} = 2.60 \times 12 = \$31.20$$

$$\frac{771.79}{.70} = \frac{1102.56}{396} = 2.78 \times 12 = \$33.36$$

$733.64
X .8
$586.91
X 1.052
$617.43

$$\frac{617.43}{.80} = \frac{771.79}{396} = 1.95 \times 12 = \$23.40$$

$$\frac{617.43}{.75} = \frac{823.24}{396} = 2.08 \times 12 = \$24.96$$

$$\frac{617.43}{.70} = \frac{882.04}{396} = 2.23 \times 12 = \$26.76$$

$733.64
X .75
$550.23
X 1.052
$578.84

$$\frac{578.84}{.80} = \frac{723.55}{396} = 1.83 \times 12 = \$21.96$$

$$\frac{578.84}{.75} = \frac{771.79}{396} = 1.95 \times 12 = \$23.40$$

$$\frac{578.84}{.70} = \frac{826.91}{396} = 2.09 \times 12 = \$25.08$$

Prescribed Drugs
(Operatives Families)

$871.01
X 1.052
$916.03

$$\frac{916.03}{.80} = \frac{1145.04}{396} = 2.89 \times 12 = \$34.68$$

$$\frac{916.03}{.75} = \frac{1221.37}{396} = 3.08 \times 12 = \$36.96$$

$$\frac{916.03}{.70} = \frac{1308.61}{396} = 3.31 \times 12 = \$39.72$$

$871.01
X .8
$696.81
X 1.052
$733.04

$$\frac{733.04}{.80} = \frac{916.30}{396} = 2.31 \times 12 = \$27.72$$

$$\frac{733.04}{.75} = \frac{977.39}{396} = 2.47 \times 12 = \$29.64$$

$$\frac{733.04}{.70} = \frac{1047.20}{396} = 2.64 \times 12 = \$31.68$$

$871.01
X .75
$653.26
X 1.052
$687.23

$$\frac{687.23}{.80} = \frac{859.04}{396} = 2.17 \times 12 = \$26.04$$

$$\frac{687.23}{.75} = \frac{916.31}{396} = 2.31 \times 12 = \$27.72$$

$$\frac{687.23}{.70} = \frac{981.76}{396} = 2.48 \times 12 = \$29.76$$

Prescribed and O-T-C Drugs
(Operatives Families)

$1146.44
X 1.048
$1201.47

$\frac{1201.47}{.80} = \frac{1501.84}{396} = 3.79 \times 12 = \$45.48$

$\frac{1201.47}{.75} = \frac{1601.96}{396} = 4.05 \times 12 = \$48.60$

$\frac{1201.47}{.70} = \frac{1716.39}{396} = 4.33 \times 12 = \$51.96$

$1146.44
X .8
$ 917.15
X 1.048
$ 961.17

$\frac{961.17}{.80} = \frac{1201.46}{396} = 3.03 \times 12 = \$36.36$

$\frac{961.17}{.75} = \frac{1281.56}{396} = 3.24 \times 12 = \$38.88$

$\frac{961.17}{.70} = \frac{1373.10}{396} = 3.47 \times 12 = \$41.64$

$1146.44
X .75
$ 859.83
X 1.048
$ 901.10

$\frac{901.10}{.80} = \frac{1126.38}{396} = 2.84 \times 12 = \$34.08$

$\frac{901.10}{.75} = \frac{1201.47}{396} = 3.03 \times 12 = \$36.36$

$\frac{901.10}{.70} = \frac{1287.29}{396} = 3.25 \times 12 = \$39.00$

All Drugs Excluding In-Hospital Drugs
(Operatives Families)

$1563.86
X 1.048
$1638.93

$\frac{1638.93}{.80} = \frac{2048.66}{396} = 5.17 \times 12 = \$62.04$

$\frac{1638.93}{.75} = \frac{2185.24}{396} = 5.52 \times 12 = \$66.24$

$\frac{1638.93}{.70} = \frac{2341.33}{396} = 5.91 \times 12 = \$70.92$

$1563.86
X .8
$1251.09
X 1.048
$1311.14

$\frac{1311.14}{.80} = \frac{1638.93}{396} = 4.14 \times 12 = \$49.68$

$\frac{1311.14}{.75} = \frac{1748.19}{396} = 4.42 \times 12 = \$53.04$

$\frac{1311.14}{.70} = \frac{1873.06}{396} = 4.73 \times 12 = \$56.76$

$1563.86
X .75
$1172.90
X 1.048
$1229.20

$\frac{1229.20}{.80} = \frac{1536.50}{396} = 3.88 \times 12 = \$46.56$

$\frac{1229.20}{.75} = \frac{1638.93}{396} = 4.14 \times 12 = \$49.68$

$\frac{1229.20}{.70} = \frac{1756.00}{396} = 4.43 \times 12 = \$53.16$

Prescribed Legend Plus Compounded Nonlegend Drugs (All Families)

Prescribed Legend Plus Compounded Nonlegend Drugs (80% Indemnification Limit)	$6060.17
Insulin Cost ($1 Deductible)	101.41
	$6161.58
	X 1.052
	$6482.04

$$\frac{6482.04}{.75} = \frac{8642.72}{2844} = 3.03 \times 12 = \$36.36$$

Prescribed Legend Drug Cost (80% Indemnification Limit)	$5863.75
Insulin Cost ($1 Deductible)	101.41
	$5965.16
	X 1.052
	$6275.35

$$\frac{6275.35}{.75} = \frac{8367.13}{2844} = 2.94 \times 12 = \$35.28$$

Prescribed Legend Plus Compounded Nonlegend Drugs (Professional Families)

Prescribed Legend Plus Compounded Nonlegend Drugs Cost	$1728.89
Insulin Cost	85.45
Less $1 Deductible	57.00
	$ 28.45
Total Cost of Risk	$1757.34
Estimated Increase in Risk Cost	X 1.052
	$1848.72

$$\frac{1848.72}{.75} = \frac{2464.96}{492} = 5.01 \times 12 = \$60.12$$

Prescribed Legend Drug Cost	$1672.60
Insulin Cost less $1 Deductible	28.45
	$1701.05
	X 1.052
	$1789.51

$$\frac{1789.51}{.75} = \frac{2386.02}{492} = 4.84 \times 12 = \$58.08$$

Prescribed Legend Plus Compounded Nonlegend Drugs
(Craftsmen-Foremen Families)

Prescribed Legend Plus Compounded Nonlegend Drugs Cost	$1108.08
Insulin Cost	102.02
Less $1 Deductible	68.00
	$ 34.02
Total Cost of Risk	$1142.10
Estimated Increase in Risk Cost	X 1.052
	$1201.49

$$\frac{1201.49}{.75} = \frac{1601.87}{396} = 4.05 \times 12 = \$48.60$$

Prescribed Legend Drugs	$1105.03
Insulin less $1 Deductible	34.02
	$1139.05
	X 1.052
	$1198.28

$$\frac{1198.28}{.75} = \frac{1597.71}{396} = 4.04 \times 12 = \$48.48$$

Prescribed Legend Plus Compounded Nonlegend Drugs
(Operatives Families)

Prescribed Legend Plus Compounded Nonlegend Drugs and Insulin Cost	$733.64
	X 1.052
	$771.79

$$\frac{771.79}{.75} = \frac{1029.05}{396} = 2.60 \times 12 = \$31.20$$

Prescribed Legend Drug and Insulin Cost	$709.87
	X1.052
	$746.78

$$\frac{746.78}{.75} = \frac{995.71}{396} = 2.51 \times 12 = \$30.12$$

APPENDIX L

PERCENTAGE ESTIMATES OF THE INCREASE IN COST OF RISKS

The estimated percentage for increase of risk cost per month was calculated as follows:

(1) Prescribed Drugs. The Lilly Digest for the years 1954 through 1960 showed that the price of prescribed drugs increased an average of 4% per year.

(2) Prescribed and OTC Drugs. The U. S. Bureau of Labor Statistics, Consumer Price Index[1] showed that the price of "other drugs" increased an average of approximately 3% per year. The percentage increase for prescribed and OTC drugs was a weighted average of 3.74%.

(3) Prescribed, OTC, and Injections plus Physician Dispensed Drugs. The percent yearly increase of injections plus physician dispensed drugs was not available. Therefore, the percent increase in physicians' fees was used to reflect the increase in cost of those items. The U. S. Bureau of Labor Statistics,

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1. See: Herman M. Somers and Anne R. Somers, Doctors, Patients, and Health Insurance (Washington, D.C.: The Brookings Institution, 1961), Table 10-1, p. 193.

Consumer Price Index showed that physicians' fees increased an average of nearly 3.75% per year.[2] The percentage increase for prescribed, OTC, and injections plus physician dispensed drugs was a weighted average of 3.75%.

2. Ibid.

APPENDIX M

A SURVEY OF PRESCRIPTION ORDERS IN DANE COUNTY PHARMACIES, 1961

This survey involved mailing a questionnaire to all community pharmacists in Dane County to be completed and returned within two weeks. A copy of the questionnaire is on p.275. The pharmacists receiving this questionnaire were divided into 12 groups. The groups represented the months of the year. Thus, the prescription orders analyzed by the pharmacists represented all of the months of the year.

Sixty pharmacists replied to the questionnaire. These pharmacists represented pharmacies located in all areas of the County. The results of the Survey based on 60 pharmacists and 6000 prescription orders are given in Table 1.

THE UNIVERSITY OF WISCONSIN
MADISON 6

OF PHARMACY

19 January 1962

Dear Pharmacist:

We need your help.

One of our graduate students has collected a year's data on Dane County residents' expenditures for prescriptions and other drugs. We need a simple analysis of the prescription orders filed in Dane County pharmacies last year in order to evaluate accurately the significance of this information.

This project is for the benefit of pharmacy and has the support and endorsement of the Wisconsin Pharmaceutical Association.

We will have adequate information for our study if each pharmacist in Dane County accurately classifies the first 100 original prescription orders filed in his pharmacy or the pharmacy in which he is employed starting on the 1st day of one month in 1961. The requested classification is a) the number of all prescriptions, compounded and prefabricated, which contained one or more Rx-legend drugs, b) the number of compounded prescriptions which did not contain a Rx-legend drug, and c) the number of prefabricated non-legend prescriptions.

Will you help by providing your experience with the first 100 original prescription orders filed starting on

a) Rx-legend _____

b) Compounded, non-legend _____

c) Prefabricated, non-legend _____

Total 100

Please take a few minutes now to provide your analysis in the above table and return this sheet in the enclosed envelope.

Your cooperation is appreciated.

Sincerely,

R. W. Hammel, Asst. Professor
of Pharmacy Administration

TABLE 1

PERCENTAGE OF PRESCRIPTION ORDERS SPECIFYING PRESCRIPTION-LEGEND, COMPOUNDED NONLEGEND, AND PREFABRICATED NONLEGEND DRUGS, DANE COUNTY, 1961

Month	Number of Pharmacists	Rx-Legend Drugs	Compounded Nonlegend Drugs	Prefabricated Nonlegend Drugs
JAN	10	79.8	3.7	16.5
FEB	1	86.0	4.0	10.0
MAR	7	78.4	3.9	17.7
APR	3	83.0	2.3	14.7
MAY	6	81.3	3.3	15.3
JUN	3	80.0	2.7	17.3
JUL	5	79.8	2.8	17.4
AUG	4	86.0	1.0	13.0
SEP	4	81.5	2.8	15.8
OCT	4	80.0	3.3	16.8
NOV	4	85.3	0.5	14.3
DEC	9	83.2	2.0	14.8
Total and Weighted Means	60	81.5	2.8	15.8

APPENDIX N

PREMIUM CALCULATIONS FOR "CATASTROPHIC" DRUG INSURANCE

The following formula was used to calculate premiums for various forms of drug insurance under the "catastrophic" concept of insurance:

$$\frac{X + Y}{1-PE} = \text{Premium per Family per Year}$$

where,

X = Average cost of risk per family plus 20%.

Y = Dollar expenses for processing and verifying claims and other administrative expenses per family.

PE = "Premium" expenses which are selling expenses and taxes per family, or 6% plus 3% equals 9%.

The next pages give the calculations of premiums for various forms of drug insurance using the above formula. The explanation of the steps of the calculations is only shown for the first set of calculations. Thereafter, only the format of the calculations is retained. This obviates considerable duplication yet enables the reader to follow the steps of the calculations.

Prescribed Legend Plus Compounded Nonlegend Drugs
(All Families)

$5 Deductible

$6609.54 Cost of Risk
1.2 Cost of Risk Plus 20%
7931.45 ÷ 237 = 33.47 Average cost of Risk Plus 20% Per Family (X)

7931.45 / .85 = 9331.12
9331.12 − 7931.45 = 1399.67 Dollar Amount Available to Administer Plan

Addition of 15% total Administrative Expense

1399.67 × .4 = 559.87 Dollar Amount for Selling Expenses

1399.67 − 559.87 = 839.80 Dollar Amount for Administrative Expenses

839.80 / 237 = 3.54 Dollar Expense per Family (Y)

37.01 (X + Y) / 91 (1-PE) = 40.67 Premium per Family per Year

$10D

$5803.09
1.2
6963.71 ÷ 237 = 29.38

6963.71 / .85 = 8192.60
8192.60 − 6963.71 = 1228.89
1228.89 × .4 = 491.56

1228.89 − 491.56 = 737.33

737.33 / 237 = 3.11

32.49 / .91 = $35.70

$15D

$5124.21
1.2
6149.05 ÷ 237 = 25.95

6149.05 / .85 = 7234.18
7234.18 − 6149.05 = 1085.13
1085.13 × .4 = 434.05

1085.13 − 434.05 = 651.08

651.08 / 237 = 2.75

28.70 / .91 = $31.54

Prescribed Legend Plus Compounded Nonlegend Drugs (All Families)

$20D

$4536.33
1.2
5443.60 ÷ 237 = 22.97

$\frac{5443.60}{.85}$ = 6404.24 − 5443.60 = 960.64 × .4 = 384.26

960.64 − 384.76 = 576.38

$\frac{576.38}{237}$ = 2.43

$\frac{25.40}{.91}$ = $27.91

$25D

$4037.21
1.2
4844.65 ÷ 237 = 20.44

$\frac{4844.65}{.85}$ = 5699.59 − 4844.65 = 854.94 × .4 = 341.98

854.94 − 341.98 = 512.96

$\frac{512.96}{237}$ = 2.16

$\frac{22.60}{.91}$ = $24.84

$30D

$3614.87
1.2
4337.84 ÷ 237 = 18.30

$\frac{4337.84}{.85}$ = 5103.34 − 4337.84 = 765.50 × .4 = 306.20

765.50 − 306.20 = 459.30

$\frac{459.30}{237}$ = 1.94

$\frac{20.24}{.91}$ = $22.24

$40D

$2953.30
1.2
3543.96 ÷ 237 = 14.95

$\frac{3543.96}{.85}$ = 4169.36 − 3543.96 = 625.40 × .4 = 250.16

625.40 − 250.16 = 375.24

$\frac{375.24}{237}$ = 1.58

$\frac{16.53}{.91}$ = $18.17

Prescribed Legend Plus Compounded Nonlegend Drugs
(All Families)

$50D

$2449.30
1.2
2939.16 ÷ 237 = 12.40

$\frac{2939.16}{.85}$ = 3457.84
-2939.16
518.68
× .4
207.47

518.68
-207.47
311.21

$\frac{311.21}{237}$ = 1.31

$\frac{13.71}{.91}$ = $15.07

$60D

$2074.69
1.2
2489.63 ÷ 237 = 10.51

$\frac{2489.63}{.85}$ = 2928.98
-2489.63
439.35
× .4
175.74

439.35
-175.74
263.61

$\frac{263.61}{237}$ = 1.11

$\frac{11.62}{.91}$ = $12.77

$75D

$1648.96
1.2
1978.75 ÷ 237 = 8.35

$\frac{1978.75}{.85}$ = 2327.94
-1978.75
349.19
× .4
139.68

349.19
-139.68
209.51

$\frac{209.51}{237}$ = 0.88

$\frac{9.23}{.91}$ = $10.14

$100D

$1087.87
1.2
1305.44 ÷ 237 = 5.51

$\frac{1305.44}{.85}$ = 1535.81
-1305.44
230.37
× .4
92.15

230.37
- 92.15
138.22

$\frac{138.22}{237}$ = 0.58

$\frac{6.09}{.91}$ = $6.69

Prescribed Drugs
(All Families)

$5D

$8023.15
1.2
9627.78 ÷ 237 = 40.62

$\frac{9627.78}{.85}$ = 11326.80 − 9627.78 = 1699.02

1699.02 × .4 = 679.61

1699.02 − 679.61 = 1019.41

$\frac{1019.41}{237}$ = 4.30

$\frac{44.92}{.91}$ = $49.36

$10D

$7180.12
1.2
8616.14 ÷ 237 = 36.36

$\frac{8616.14}{.85}$ = 10136.64 − 8616.14 = 1520.50

1520.50 × .4 = 608.20

1520.50 − 608.20 = 912.30

$\frac{912.30}{237}$ = 3.85

$\frac{40.21}{.91}$ = $44.19

$15D

$6457.93
1.2
7749.52 ÷ 237 = 32.70

$\frac{7749.52}{.85}$ = 9117.08 − 7749.52 = 1367.56

1367.56 × .4 = 547.02

1367.56 − 547.02 = 820.54

$\frac{820.54}{237}$ = 3.46

$\frac{36.16}{.91}$ = $39.74

$20D

$5827.13
1.2
6992.56 ÷ 237 = 29.51

$\frac{6992.56}{.85}$ = 8226.54 − 6992.56 = 1233.98

1233.98 × .4 = 493.59

1233.98 − 493.59 = 740.39

$\frac{740.39}{237}$ = 3.12

$\frac{32.63}{.91}$ = $35.86

Prescribed Drugs
(All Families)

$25D

$5261.55
1.2
6313.86 ÷ 237 = 26.64

$\frac{6313.86}{.85}$ = 7428.07 − 6313.86 = 1114.21 × .4 = 445.68

1114.21 − 445.68 = 668.53

$\frac{668.53}{237}$ = 2.82

$\frac{29.46}{.91}$ = $32.37

$30D

$4774.61
1.2
5729.53 ÷ 237 = 24.18

$\frac{5729.53}{.85}$ = 6740.62 − 5729.53 = 1011.09 × .4 = 404.44

1011.09 − 404.44 = 606.65

$\frac{606.65}{237}$ = 2.56

$\frac{26.74}{.91}$ = $29.39

$40D

$3972.01
1.2
4766.41 ÷ 237 = 20.11

$\frac{4766.41}{.85}$ = 5607.54 − 4766.41 = 841.13 × .4 = 336.45

841.13 − 336.45 = 504.68

$\frac{504.68}{237}$ = 2.13

$\frac{22.24}{.91}$ = $24.44

$50D

$3380.59
1.2
4056.71 ÷ 237 = 17.12

$\frac{4056.71}{.85}$ = 4772.60 − 4056.71 = 715.89 × .4 = 286.36

715.89 − 286.36 = 429.53

$\frac{429.53}{237}$ = 1.81

$\frac{18.93}{.91}$ = $20.80

Prescribed Drugs
(All Families)

$60D

$2889.91
1.2
3467.89 ÷ 237 = 14.63

3467.89 / .85 = 4079.87
-3467.89
611.98
× .4
244.79

611.98
-244.79
367.19

367.19 / 237 = 1.55

16.18 / .91 = $17.78

$75D

$2356.55
1.2
2827.86 ÷ 237 = 11.93

2827.86 / .85 = 3326.89
-2827.86
499.03
× .4
199.61

499.03
-199.61
299.42

299.42 / 237 = 1.26

13.19 / .91 = $14.50

$100D

$1693.73
1.2
2032.48 ÷ 237 = 8.58

2032.48 / .85 = 2391.15
-2032.48
358.67
× .4
143.47

358.67
-143.47
215.20

215.20 / 237 = 0.91

9.49 / .91 = $10.43

Prescribed and O-T-C Drugs
(All Families)

$5D

$11008.94 × 1.2 = 13210.73 ÷ 237 = 55.74

$\frac{13210.73}{.85}$ = 15542.03 − 13210.73 = 2331.30 × .4 = 932.52

2331.30 − 932.52 = 1398.78

$\frac{1398.78}{237}$ = 5.90

$\frac{61.64}{.91}$ = $67.74

$10D

$10027.33 × 1.2 = 12032.80 ÷ 237 = 50.77

$\frac{12032.80}{.85}$ = 14156.23 − 12032.80 = 2123.43 × .4 = 849.37

2123.43 − 849.37 = 1274.06

$\frac{1274.06}{237}$ = 5.38

$\frac{56.15}{.91}$ = $61.70

$15D

$9140.92 × 1.2 = 10969.10 ÷ 237 = 46.28

$\frac{10969.10}{.85}$ = 12904.82 − 10969.10 = 1935.72 × .4 = 774.29

1935.72 − 774.29 = 1161.43

$\frac{1161.43}{237}$ = 4.90

$\frac{51.18}{.91}$ = $56.24

$20D

$8326.49 × 1.2 = 9991.79 ÷ 237 = 42.16

$\frac{9991.79}{.85}$ = 11755.05 − 9991.79 = 1763.26 × .4 = 705.30

1763.26 − 705.30 = 1057.96

$\frac{1057.96}{237}$ = 4.46

$\frac{46.62}{.91}$ = $51.23

Prescribed and O-T-C Drugs
(All Families)

$25D

$\$7607.97$

$\frac{1.2}{9129.56} \div 237 = 38.52$

$\frac{9129.56}{.85} = 10740.66$

$10740.66 - 9129.56 = 1611.10$

$1611.10 \times .4 = 644.44$

$1611.10 - 644.44 = 966.66$

$\frac{966.66}{237} = 4.08$

$\frac{42.60}{.91} = \$46.81$

$30D

$\$6966.94$

$\frac{1.2}{8360.33} \div 237 = 35.28$

$\frac{8360.33}{.85} = 9835.68$

$9835.68 - 8360.33 = 1475.35$

$1475.35 \times .4 = 590.14$

$1475.35 - 590.14 = 885.21$

$\frac{885.21}{237} = 3.74$

$\frac{39.02}{.91} = \$42.88$

$40D

$\$5878.08$

$\frac{1.2}{7053.70} \div 237 = 29.76$

$\frac{7053.70}{.85} = 8298.47$

$8298.47 - 7053.70 = 1244.77$

$1244.77 \times .4 = 497.91$

$1244.77 - 497.91 = 746.86$

$\frac{746.86}{237} = 3.15$

$\frac{32.91}{.91} = \$36.17$

$50D

$\$4993.61$

$\frac{1.2}{5992.33} \div 237 = 25.28$

$\frac{5992.33}{.85} = 7049.80$

$7049.80 - 5992.33 = 1057.47$

$1057.47 \times .4 = 422.99$

$1057.47 - 422.99 = 634.48$

$\frac{634.48}{237} = 2.68$

$\frac{27.96}{.91} = \$30.73$

Prescribed and O-T-C Drugs
(All Families)

$60D

$4271.02
1.2
5125.22 ÷ 237 = 21.63

5125.22 / .85 = 6029.67
-5125.22
904.45
× .4
361.78

904.45
-361.78
542.67

542.67 / 237 = 2.29

23.92 / .91 = $26.29

$75D

$3456.86
1.2
4148.23 ÷ 237 = 17.50

4148.23 / .85 = 4880.27
-4148.23
732.04
× .4
292.82

732.04
-292.82
439.22

439.22 / 237 = 1.85

19.35 / .91 = $21.26

$100D

$2390.88
1.2
2869.06 ÷ 237 = 12.11

2869.06 / .85 = 3375.36
-2869.06
506.30
× .4
202.52

506.30
-202.52
303.78

303.78 / 237 = 1.28

13.39 / .91 = $14.71

All Drugs Excluding In-Hospital Drugs
(All Families)

$5D

$14489.23

$\frac{1.2}{17387.08} \div 237 = 73.36$

$\frac{17387.08}{.85} = 20455.38$

$20455.38 - 17387.08 = 3068.30$

$3068.30 \times .4 = 1227.32$

$3068.30 - 1227.32 = 1840.98$

$\frac{1840.98}{237} = 7.77$

$\frac{81.13}{.91} = \$89.15$

$10D

$13405.98

$\frac{1.2}{16087.18} \div 237 = 67.88$

$\frac{16087.18}{.85} = 18926.09$

$18926.09 - 16087.18 = 2838.91$

$2838.91 \times .4 = 1135.56$

$2838.91 - 1135.56 = 1703.35$

$\frac{1703.35}{237} = 7.19$

$\frac{75.07}{.91} = \$82.50$

$15D

$12396.89

$\frac{1.2}{14876.27} \div 237 = 62.77$

$\frac{14876.27}{.85} = 17501.49$

$17501.49 - 14876.27 = 2625.22$

$2625.22 \times .4 = 1050.09$

$2625.22 - 1050.09 = 1575.13$

$\frac{1575.13}{237} = 6.65$

$\frac{69.42}{.91} = \$76.29$

$20D

$11459.77

$\frac{1.2}{13751.72} \div 237 = 58.02$

$\frac{13751.72}{.85} = 16178.49$

$16178.49 - 13751.72 = 2426.77$

$2426.77 \times .4 = 970.71$

$2426.77 - 970.71 = 1456.06$

$\frac{1456.06}{237} = 6.14$

$\frac{64.16}{.91} = \$70.51$

All Drugs Excluding In-Hospital Drugs
(All Families)

$25D

$10611.09
1.2
12733.31 ÷ 237 = 53.73

12733.31 / .85 = 14980.36
-12733.31
2247.05
X .4
898.82

2247.05
- 898.82
1348.23

1348.23 / 237 = 5.69

59.42 / .91 = $65.30

$30D

$ 9822.57
1.2
11787.08 ÷ 237 = 49.74

11787.08 / .85 = 13867.15
-11787.08
2080.07
X .4
832.03

2080.07
- 832.03
1248.04

1248.04 / 237 = 5.27

55.01 / .91 = $60.45

$40D

$ 8362.31
1.2
10034.77 ÷ 237 = 42.34

10034.77 / .85 = 11805.61
-10034.77
1770.84
X .4
708.34

1770.84
- 708.34
1062.50

1062.50 / 237 = 4.48

46.82 / .91 = $51.45

$50D

$7069.28
1.2
8483.14 ÷ 237 = 35.79

8483.14 / .85 = 9980.16
-8483.14
1497.02
X .4
598.81

1497.02
- 598.81
898.21

898.21 / 237 = 3.79

39.58 / .91 = $43.50

All Drugs Excluding In-Hospital Drugs
(All Families)

$60D

$6106.89
1.2
7328.27 ÷ 237 = 30.92

7328.27 / .85 = 8621.49
-7328.27
1293.22
X .4
517.29

1293.22
- 517.29
775.93

775.93 / 237 = 3.27

34.19 / .91 = $37.57

$75D

$4715.40
1.2
5658.48 ÷ 237 = 23.88

5658.48 / .85 = 6657.04
-5658.48
998.56
X .4
399.42

998.56
-399.42
599.14

599.14 / 237 = 2.53

26.41 / .91 = $29.02

$100D

$3218.85
1.2
3862.62 ÷ 237 = 16.30

3862.62 / .85 = 4544.26
-3866.62
667.64
X .4
267.06

667.64
-267.06
400.58

400.58 / 237 = 1.69

17.99 / .91 = $19.77

Prescribed Legend Plus Compounded Nonlegend Drugs
(Professional Families)

$5D

$1567.09
1.2
1880.51 ÷ 41 = 45.87

1880.51 / .85 = 2212.37
-1880.51
331.86
× .4
132.74

331.86
-132.74
199.12

199.12 / 41 = 4.86

50.73 / .91 = $55.75

$10D

$1418.79
1.2
1702.55 ÷ 41 = 41.53

1702.55 / .85 = 2003.00
-1702.55
300.45
× .4
120.18

300.45
-120.18
180.27

180.27 / 41 = 4.40

45.93 / .91 = $50.47

$15D

$1299.18
1.2
1559.02 ÷ 41 = 38.03

1559.02 / .85 = 1834.14
-1559.02
275.12
× .4
110.05

275.12
-110.05
165.07

165.07 / 41 = 4.03

42.06 / .91 = $46.22

$20D

$1196.13
1.2
1435.36 ÷ 41 = 35.01

1435.36 / .85 = 1688.66
-1435.36
253.30
× .4
101.32

253.30
-101.32
151.98

151.98 / 41 = 3.71

38.72 / .91 = $42.55

Prescribed Legend Plus Compounded Nonlegend Drugs
(Professional Families)

$25D

$1103.70
1.2
1324.44 ÷ 41 = 32.30

$\frac{1324.44}{.85}$ = 1558.17
-1324.44
233.73
× .4
93.49

233.73
- 93.49
140.24

$\frac{140.24}{41}$ = 3.42

$\frac{35.72}{.91}$ = $39.25

$30D

$1029.18
1.2
1235.02 ÷ 41 = 30.12

$\frac{1235.02}{.85}$ = 1452.97
-1235.02
217.95
× .4
87.18

217.95
- 87.18
130.77

$\frac{130.77}{41}$ = 3.19

$\frac{33.31}{.91}$ = $36.60

$40D

$ 911.37
1.2
1093.64 ÷ 41 = 26.67

$\frac{1093.64}{.85}$ = 1286.64
-1093.64
193.00
× .4
77.20

193.00
- 77.20
115.80

$\frac{115.80}{41}$ = 2.82

$\frac{29.49}{.91}$ = $32.41

$50D

$816.43
1.2
979.72 ÷ 41 = 23.90

$\frac{979.72}{.85}$ = 1152.61
-979.72
172.89
× .4
69.16

172.89
- 69.16
103.73

$\frac{103.73}{41}$ = 2.53

$\frac{26.43}{.91}$ = $29.04

Prescribed Legend Plus Compounded Nonlegend Drugs (Professional Families)

$60D

$ 735.05
1.2
882.06 ÷ 41 = 21.51

882.06 / .85 = 1037.72
- 882.06
155.66
× .4
62.26

155.66
- 62.26
93.40

93.40 / 41 = 2.28

23.79 / .91 = $26.14

$75D

$ 634.92
1.2
761.90 ÷ 41 = 18.58

761.90 / .85 = 896.35
- 761.90
134.45
× .4
53.78

134.45
- 53.78
80.67

80.67 / 41 = 1.97

20.55 / .91 = $22.58

$100D

$ 487.21
1.2
584.65 ÷ 41 = 14.26

584.65 / .85 = 687.82
- 584.65
103.17
× .4
41.27

103.17
- 41.27
61.90

61.90 / 41 = 1.51

15.77 / .91 = $17.33

Prescribed Drugs
(Professional Families)

$5D

$1888.55
1.2
2266.26 ÷ 41 = 55.28

$\frac{2266.26}{.85}$ = 2666.19 − 2266.26 = 399.93 × .4 = 159.97

399.93 − 159.97 = 239.96

$\frac{239.96}{41}$ = 5.85

$\frac{61.13}{.91}$ = $67.18

$10D

$1738.70
1.2
2086.44 ÷ 41 = 50.89

$\frac{2086.44}{.85}$ = 2454.64 − 2086.44 = 368.20 × .4 = 147.28

368.20 − 147.28 = 220.92

$\frac{220.92}{41}$ = 5.39

$\frac{56.28}{.91}$ = $61.85

$15D

$1605.55
1.2
1926.66 ÷ 41 = 46.99

$\frac{1926.66}{.85}$ = 2266.66 − 1926.66 = 340.00 × .4 = 136.00

340.00 − 136.00 = 204.00

$\frac{204.00}{41}$ = 4.98

$\frac{51.97}{.91}$ = $57.11

$20D

$1496.20
1.2
1795.44 ÷ 41 = 43.79

$\frac{1795.44}{.85}$ = 2112.28 − 1795.44 = 316.84 × .4 = 126.74

316.84 − 126.74 = 190.10

$\frac{190.10}{41}$ = 4.64

$\frac{48.43}{.91}$ = $53.22

Prescribed Drugs
(Professional Families)

$25D

$1395.60
1.2
1674.72 ÷ 41 = 40.85

1674.72 / .85 = 1970.26
-1674.72
295.54
X .4
118.22

295.54
-118.22
177.32

177.32 / 41 = 4.33

45.18 / .91 = $49.65

$30D

$1304.90
1.2
1565.88 ÷ 41 = 38.19

1565.88 / .85 = 1842.21
-1565.88
276.33
X .4
110.53

276.33
-110.53
165.80

165.80 / 41 = 4.04

42.23 / .91 = $46.41

$40D

$1203.00
1.2
1443.60 ÷ 41 = 35.21

1443.60 / .85 = 1698.35
-1443.60
254.75
X .4
101.90

254.75
-101.90
152.85

152.85 / 41 = 3.73

38.94 / .91 = $42.79

$50D

$1056.90
1.2
1268.28 ÷ 41 = 30.93

1268.28 / .85 = 1492.09
-1268.28
223.81
X .4
89.52

223.81
- 89.52
134.29

134.29 / 41 = 3.28

34.21 / .91 = $37.59

Prescribed Drugs
(Professional Families)

$60D

$963.55
1.2
1156.26 ÷ 41 = 28.20

1156.26 / .85 = 1360.31 − 1156.26 = 204.05 × .4 = 81.62

204.05 − 81.62 = 122.43

122.43 / 41 = 2.99

31.19 / .91 = $34.28

$75D

$845.85
1.2
1015.02 ÷ 41 = 24.76

1015.02 / .85 = 1194.14 − 1015.02 = 179.12 × .4 = 71.65

179.12 − 71.65 = 107.47

107.47 / 41 = 2.62

27.38 / .91 = $30.09

$100D

$688.05
1.2
825.66 ÷ 41 = 20.14

825.66 / .85 = 971.37 − 825.66 = 145.71 × .4 = 58.28

145.71 − 58.28 = 87.43

87.43 / 41 = 2.13

22.27 / .91 = $24.47

Prescribed and O-T-C Drugs
(Professional Families)

$5D

$2426.22
1.2
2911.46 ÷ 41 = 71.01

2911.46 / .85 = 3425.25
-2911.46
513.79
× .4
205.52

513.79
-205.52
308.27

308.27 / 41 = 7.52

78.53 / .91 = $86.30

$10D

$2241.22
1.2
2689.46 ÷ 41 = 65.60

2689.46 / .85 = 3164.07
-2689.46
474.61
× .4
189.84

474.61
-189.84
284.77

284.77 / 41 = 6.95

72.55 / .91 = $79.73

$15D

$2062.56
1.2
2475.07 ÷ 41 = 60.37

2475.07 / .85 = 2911.85
-2475.07
436.78
× .4
174.71

436.78
-174.71
262.07

262.07 / 41 = 6.39

66.76 / .91 = $73.36

$20D

$1899.05
1.2
2278.86 ÷ 41 = 55.58

2278.86 / .85 = 2681.01
-2278.86
402.15
× .4
160.86

402.15
-160.86
241.29

241.29 / 41 = 5.89

61.47 / .91 = $67.55

Prescribed and O-T-C Drugs
(Professional Families)

$25D

$1759.78
1.2
2111.74 ÷ 41 = 51.51

2111.74 / .85 = 2484.40
-2111.74
372.66
× .4
149.06

372.66
-149.06
223.60

223.60 / 41 = 5.45

56.96 / .91 = $62.59

$30D

$1627.23
1.2
1952.68 ÷ 41 = 47.63

1952.68 / .85 = 2297.27
-1952.68
344.59
× .4
137.84

344.59
-137.84
206.75

206.75 / 41 = 5.04

52.67 / .91 = $57.88

$40D

$1414.07
1.2
1696.88 ÷ 41 = 41.39

1696.88 / .85 = 1996.33
-1696.88
299.45
× .4
119.78

299.45
-119.78
179.67

179.67 / 41 = 4.38

45.77 / .91 = $50.30

$50D

$1258.16
1.2
1509.79 ÷ 41 = 36.82

1509.79 / .85 = 1776.22
-1509.79
266.43
× .4
106.57

266.43
-106.57
159.86

159.86 / 41 = 3.90

40.72 / .91 = $44.75

Prescribed and O-T-C Drugs (Professional Families)

$60D

$1132.98
1.2
1359.58 ÷ 41 = 33.16

1359.58 / .85 = 1599.51
-1359.58
239.93
× .4
95.97

239.93
- 95.97
143.96

143.96 / 41 = 3.51

36.67 / .91 = $40.30

$75D

$ 998.34
1.2
1198.01 ÷ 41 = 29.22

1198.01 / .85 = 1409.42
-1198.01
211.41
× .4
84.56

211.41
- 84.56
126.85

126.85 / 41 = 3.09

32.31 / .91 = $35.51

$100D

$ 798.34
1.2
958.01 ÷ 41 = 23.37

958.01 / .85 = 1127.07
- 958.01
169.06
.4
67.62

169.06
- 67.62
101.44

101.44 / 41 = 2.47

25.84 / .91 = $28.40

All Drugs Excluding In-Hospital Drugs
(Professional Families)

$5D

$2818.40
1.2
3382.08 ÷ 41 = 82.49

3382.08 / .85 = 3978.92
-3382.08
596.84
X .4
238.74

596.84
-238.74
358.10

358.10 / 41 = 8.73

91.22 / .91 = $100.24

$10D

$2628.40
1.2
3154.08 ÷ 41 = 76.93

3154.08 / .85 = 3710.68
-3154.08
556.60
X .4
222.64

556.60
-222.64
333.96

333.96 / 41 = 8.15

85.08 / .91 = $93.50

$15D

$2442.41
1.2
2930.89 ÷ 41 = 71.49

2930.89 / .85 = 3448.11
-2930.89
517.22
X .4
206.89

517.22
-206.89
310.33

310.33 / 41 = 7.57

79.06 / .91 = $86.88

$20D

$2266.54
1.2
2719.85 ÷ 41 = 66.34

2719.85 / .85 = 3199.82
-2719.85
479.97
X .4
191.99

479.97
-191.99
287.98

287.98 / 41 = 7.02

73.36 / .91 = $80.62

All Drugs Excluding In-Hospital Drugs
(Professional Families)

$25D

$2107.27
1.2
2528.72 ÷ 41 = 61.68

2528.72 / .85 = 2974.97
-2528.72
446.25
X .4
178.50

446.25
-178.50
267.75

267.75 / 41 = 6.53

68.21 / .91 = $74.96

$30D

$1954.92
1.2
2345.90 ÷ 41 = 57.22

2345.90 / .85 = 2759.88
-2345.90
413.98
X .4
165.59

413.98
-165.59
248.39

248.39 / 41 = 6.06

63.28 / .91 = $69.54

$40D

$1681.15
1.2
2017.38 ÷ 41 = 49.20

2017.38 / .85 = 2373.39
-2017.38
356.01
X .4
142.40

356.01
-142.40
213.61

213.61 / 41 = 5.21

54.41 / .91 = $59.79

$50D

$1455.35
1.2
1746.42 ÷ 41 = 42.60

1746.42 / .85 = 2054.61
-1746.42
308.19
X .4
123.28

308.19
-123.28
184.91

184.91 / 41 = 4.51

47.11 / .91 = $51.77

All Drugs Excluding In-Hospital Drugs
(Professional Families)

$60D

$1276.20
1.2
1531.44 ÷ 41 = 37.35

1531.44 / .85 = 1801.69
-1531.44
270.25
× .4
108.10

270.25
-108.10
162.15

162.15 / 41 = 3.96

41.31 / .91 = $45.40

$75D

$1069.48
1.2
1283.38 ÷ 41 = 31.30

1283.38 / .85 = 1509.86
-1283.38
226.48
X .4
90.59

226.48
- 90.59
135.89

135.89 / 41 = 3.31

34.61 / .91 = $38.03

$100D

$ 866.34
1.2
1039.61 ÷ 41 = 25.36

1039.61 / .85 = 1223.07
-1039.61
183.46
X .4
73.38

183.46
- 73.38
110.08

110.08 / 41 = 2.69

28.05 / .91 = $30.82

Prescribed Legend Plus Compounded Nonlegend Drugs
(Craftsmen-Foremen Families)

$5D

$969.45 × 1.2 = 1163.34 ÷ 33 = 35.25

$\frac{1163.34}{.85} = 1368.64 - 1163.34 = 205.30 \times .4 = 82.12$

$205.30 - 82.12 = 123.18$

$\frac{123.18}{33} = 3.73$

$\frac{38.98}{.91} = \$42.84$

$10D

$848.07 × 1.2 = 1017.68 ÷ 33 = 30.84

$\frac{1017.68}{.85} = 1197.27 - 1017.68 = 179.39 \times .4 = 71.76$

$179.39 - 71.76 = 107.63$

$\frac{107.63}{33} = 3.26$

$\frac{34.10}{.91} = \$37.47$

$15D

$745.95 × 1.2 = 895.14 ÷ 33 = 27.13

$\frac{895.14}{.85} = 1053.11 - 895.14 = 157.97 \times .4 = 63.19$

$157.97 - 63.19 = 94.78$

$\frac{94.78}{33} = 2.87$

$\frac{30.00}{.91} = \$32.97$

$20D

$656.47 × 1.2 = 787.76 ÷ 33 = 23.87

$\frac{787.76}{.85} = 926.78 - 787.76 = 139.02 \times .4 = 55.61$

$139.02 - 55.61 = 83.41$

$\frac{83.41}{33} = 2.53$

$\frac{26.40}{.91} = \$29.01$

Prescribed Legend Plus Compounded Nonlegend Drugs
(Craftsmen-Foremen Families)

$25D

$\$ 597.02$
1.2
$716.42 \div 33 = 21.71$

$\frac{716.42}{.85} = 842.85$
-716.42
126.43
$\times .4$
50.57

126.43
-50.57
75.86

$\frac{75.86}{33} = 2.30$

$\frac{24.01}{.91} = \$26.39$

$30D

$\$ 547.02$
1.2
$656.42 \div 33 = 19.89$

$\frac{656.42}{.85} = 772.26$
-656.42
115.84
$\times .4$
46.34

115.84
-46.34
69.50

$\frac{69.50}{33} = 2.11$

$\frac{22.00}{.91} = \$24.18$

$40D

$\$ 460.64$
$1\ 1.2$
$552.77 \div 33 = 16.75$

$\frac{552.77}{.85} = 650.32$
-552.77
97.55
$\times .4$
39.02

97.55
-39.02
58.53

$\frac{58.53}{33} = 1.77$

$\frac{18.52}{.91} = \$20.35$

$50D

$\$ 386.01$
1.2
$463.21 \div 33 = 14.04$

$\frac{463.21}{.85} = 544.95$
-463.21
81.74
$\times .4$
32.70

81.74
-32.70
49.04

$\frac{49.04}{33} = 1.49$

$\frac{15.53}{.91} = \$16.87$

Prescribed Legend Plus Compounded Nonlegend Drugs
(Craftsmen-Foremen Families)

$60D

$339.67
1.2
407.60 ÷ 33 = 12.35

$\frac{407.60}{.85}$ = 479.53 − 407.60 = 71.93 × .4 = 28.77

71.93 − 28.77 = 43.16

$\frac{43.16}{33}$ = 1.31

$\frac{13.66}{.91}$ = $15.01

$75D

$292.06
1.2
350.47 ÷ 33 = 10.62

$\frac{350.47}{.85}$ = 412.32 − 350.47 = 61.85 × .4 = 24.74

61.85 − 24.74 = 37.11

$\frac{37.11}{33}$ = 1.13

$\frac{11.75}{.91}$ = $12.91

$100D

$217.06
1.2
260.47 ÷ 33 = 7.89

$\frac{260.47}{.85}$ = 306.44 − 260.47 = 45.97 × .4 = 18.39

45.97 − 18.39 = 27.58

$\frac{27.58}{33}$ = 0.84

$\frac{8.73}{.91}$ = $9.59

Prescribed Drugs
(Craftsmen-Foremen Families)

$5D

$1175.51
1.2
1410.61 ÷ 33 = 42.75

1410.61 / .85 = 1659.54
-1410.61
248.93
X .4
99.57

248.93
- 99.57
149.36

149.36 / 33 = 4.53

47.28 / .91 = $51.96

$10D

$1049.51
1.2
1259.41 ÷ 33 = 38.16

1259.41 / .85 = 1481.66
-1259.41
222.25
X .4
88.90

222.25
- 88.90
133.35

133.35 / 33 = 4.04

42.20 / .91 = $46.37

$15D

$ 939.87
1.2
1127.84 ÷ 33 = 34.18

1127.84 / .85 = 1326.87
-1127.84
199.03
X .4
79.61

199.03
- 79.61
119.42

119.42 / 33 = 3.62

37.80 / .91 = $41.54

$20D

$ 844.00
1.2
1012.80 ÷ 33 = 30.69

1012.80 / .85 = 1191.53
-1012.80
178.73
X .4
71.49

178.73
- 71.49
107.24

107.24 / 33 = 3.25

33.94 / .91 = $37.30

Prescribed Drugs
(Craftsmen-Foremen Families)

$25D

$ 762.48
1.2
914.98 ÷ 33 = 27.73

914.98 / .85 = 1076.45
- 914.98
161.47
× .4
64.59

161.47
- 64.59
96.88

96.88 / 33 = 2.94

30.67 / .91 = $33.70

$30D

$ 705.55
1.2
846.66 ÷ 33 = 25.66

846.66 / .85 = 996.07
- 846.66
149.41
× .4
59.76

149.41
- 59.76
89.65

89.65 / 33 = 2.72

28.38 / .91 = $31.19

$40D

$ 606.75
1.2
728.10 ÷ 33 = 22.06

728.10 / .85 = 856.59
- 728.10
128.49
× .4
51.40

128.49
- 51.40
77.09

77.09 / 33 = 2.34

24.40 / .91 = $26.81

$50D

$ 526.75
1.2
632.10 ÷ 33 = 19.16

632.10 / .85 = 743.65
- 632.10
111.55
× .4
44.62

111.55
- 44.62
66.93

66.93 / 33 = 2.03

21.19 / .91 = $23.29

Prescribed Drugs
(Craftsmen-Foremen Families)

$60D

$454.41
1.2
545.29 ÷ 33 = 16.52

545.29 / .85 = 641.52
641.52 − 545.29 = 96.23
96.23 × .4 = 38.49

96.23 − 38.49 = 57.74

57.74 / 33 = 1.75

18.27 / .91 = $20.57

$75D

$388.83
1.2
466.60 ÷ 33 = 14.14

466.60 / .85 = 548.94
548.94 − 466.60 = 82.34
82.34 × .4 = 32.94

82.34 − 32.94 = 49.40

49.40 / 33 = 1.50

15.64 / .91 = $17.19

$100D

$313.83
1.2
376.60 ÷ 33 = 11.41

376.60 / .85 = 443.06
443.06 − 376.60 = 66.46
66.46 × .4 = 26.58

66.46 − 26.58 = 39.88

39.88 / 33 = 1.21

12.62 / .91 = $13.87

Prescribed and O-T-C Drugs
(Craftsmen-Foremen Families)

$5D

$1588.42
1.2
1906.10 ÷ 33 = 57.76

1906.10 / .85 = 2242.47 − 1906.10 = 336.37 × .4 = 134.55

336.37 − 134.55 = 201.82

201.82 / 33 = 6.12

63.88 / .91 = $70.20

$10D

$1448.77
1.2
1738.52 ÷ 33 = 52.68

1738.52 / .85 = 2045.32 − 1738.52 = 306.80 × .4 = 122.72

306.80 − 122.72 = 184.08

184.08 / 33 = 5.58

58.26 / .91 = $64.02

$15D

$1330.99
1.2
1597.19 ÷ 33 = 48.40

1597.19 / .85 = 1879.05 − 1597.19 = 281.86 × .4 = 112.74

281.86 − 112.74 = 169.12

169.12 / 33 = 5.13

53.53 / .91 = $58.82

$20D

$1225.35
1.2
1470.42 ÷ 33 = 44.56

1470.42 / .85 = 1729.91 − 1470.42 = 259.49 × .4 = 103.80

259.49 − 103.80 = 155.69

155.69 / 33 = 4.72

49.28 / .91 = $54.15

Prescribed and O-T-C Drugs
(Craftsmen-Foremen Families)

$25D

$1127.65
1.2
1353.18 ÷ 33 = 41.01

1353.18 / .85 = 1591.98
-1353.18
238.80
X .4
95.52

238.80
- 95.52
143.28

143.28 / 33 = 4.34

45.35 / .91 = $49.84

$30D

$1048.70
1.2
1258.44 ÷ 33 = 38.14

1258.44 / .85 = 1480.52
-1258.44
222.08
X .4
88.83

222.08
- 88.83
133.25

133.25 / 33 = 4.04

42.18 / .91 = $46.36

$40D

$ 913.63
1.2
1096.36 ÷ 33 = 33.22

1096.36 / .85 = 1289.84
-1096.36
193.48
X .4
77.39

193.48
- 77.39
116.09

116.09 / 33 = 3.52

36.74 / .91 = $40.37

$50D

$ 797.77
1.2
957.32 ÷ 33 = 29.01

957.32 / .85 = 1126.26
-957.32
168.94
X .4
67.58

168.94
- 67.58
101.36

101.36 / 33 = 3.07

32.08 / .91 = $35.25

Prescribed and O-T-C Drugs
(Craftsmen-Foremen Families)

$60D

$\$ 702.60$

$\frac{1.2}{843.12} \div 33 = 25.55$

$\frac{843.12}{.85} = \begin{array}{r} 991.91 \\ -843.12 \\ \hline 148.79 \\ \times \ .4 \\ \hline 59.52 \end{array}$

$\begin{array}{r} 148.79 \\ -\ 59.52 \\ \hline 89.27 \end{array}$

$\frac{89.27}{33} = 2.71$

$\frac{28.26}{.91} = \$31.06$

$75D

$\$ 596.17$

$\frac{1.2}{715.40} \div 33 = 21.68$

$\frac{715.40}{.85} = \begin{array}{r} 841.65 \\ -715.40 \\ \hline 126.25 \\ \times \ .4 \\ \hline 50.50 \end{array}$

$\begin{array}{r} 126.25 \\ -\ 50.50 \\ \hline 75.75 \end{array}$

$\frac{75.75}{33} = 2.30$

$\frac{23.98}{.91} = \$26.35$

$100D

$\$ 446.17$

$\frac{1.2}{535.40} \div 33 = 16.22$

$\frac{535.40}{.85} = \begin{array}{r} 629.88 \\ -535.40 \\ \hline 94.48 \\ \times \ .4 \\ \hline 37.79 \end{array}$

$\begin{array}{r} 94.48 \\ -37.79 \\ \hline 56.69 \end{array}$

$\frac{56.69}{33} = 1.72$

$\frac{17.94}{.91} = \$19.71$

All Drugs Excluding In-Hospital Drugs
(Craftsmen-Foremen Families)

$5D

$2127.37
1.2
2552.84 ÷ 33 = 77.36

2552.84 / .85 = 3003.34
-2552.84
450.50
X .4
180.20

450.50
-180.20
270.30

270.30 / 33 = 8.19

85.55 / .91 = $94.01

$10D

$1970.31
1.2
2364.37 ÷ 33 = 71.65

2364.37 / .85 = 2781.61
-2364.37
417.24
X .4
166.90

417.24
-166.90
250.34

250.34 / .33 = 7.59

79.24 / .91 = $87.08

$15D

$1826.97
1.2
2192.36 ÷ 33 = 66.44

2192.36 / .85 = 2579.25
-2192.36
386.89
X .4
154.76

386.89
-154.76
232.13

232.13 / 33 = 7.03

73.47 / .91 = $80.74

$20D

$1693.98
1.2
2032.78 ÷ 33 = 61.60

2032.78 / .85 = 2391.51
-2032.78
358.73
X .4
143.49

358.73
-143.49
215.24

215.24 / 33 = 6.52

68.12 / .91 = $74.86

All Drugs Excluding In-Hospital Drugs
(Craftsmen-Foremen Families)

$25D

$1571.53
1.2
1885.84 ÷ 33 = 57.15

1885.84 / .85 = 2218.64
-1885.84
332.80
× .4
133.12

332.80
-133.12
199.68

199.68 / 33 = 6.05

63.20 / .91 = $69.45

$30D

$1451.53
1.2
1741.84 ÷ 33 = 52.78

1741.84 / .85 = 2049.22
-1741.84
307.38
× .4
122.95

307.38
-122.95
184.43

184.43 / 33 = 5.59

58.37 / .91 = $64.14

$40D

$1227.93
1.2
1473.52 ÷ 33 = 44.65

1473.52 / .85 = 1733.55
-1473.52
260.03
× .4
104.01

260.03
-104.01
156.02

156.02 / 33 = 4.73

49.38 / .91 = $54.26

$50D

$1038.30
1.2
1245.96 ÷ 33 = 37.76

1245.96 / .85 = 1468.84
-1245.96
222.88
× .4
89.15

222.88
- 89.15
133.73

133.73 / 33 = 4.05

44.81 / .91 = $49.24

All Drugs Excluding In-Hospital Drugs
(Craftsmen-Foremen Families)

$60D

$ 893.35
1.2
1072.02 ÷ 33 = 32.42

1072.02 / .85 = 1261.20
-1072.02
189.18
X .4
75.67

189.18
- 75.67
113.51

113.51 / 33 = 3.44

35.86 / .91 = $39.41

$75D

$ 697.99
1.2
837.59 ÷ 33 = 25.38

837.59 / .85 = 985.40
-837.59
147.81
X .4
59.12

147.81
- 59.12
88.69

88.69 / 33 = 2.69

28.07 / .91 = $30.85

$100D

$ 505.21
1.2
606.25 ÷ 33 = 18.37

606.25 / .85 = 713.24
-606.25
106.99
X .4
42.80

106.99
- 42.80
64.19

64.19 / 33 = 1.95

20.32 / .91 = $22.33

Prescribed Legend Plus Compounded Nonlegend Drugs
(Operatives Families)

$5D

$ 597.39
1.2
716.87 ÷ 33 = 21.72

716.87 / .85 = 843.38
-716.87
126.51
X .4
50.60

126.51
- 50.60
75.91

75.91 / 33 = 2.30

24.02 / .91 = $26.40

$10D

$ 483.42
1.2
580.10 ÷ 33 = 17.58

580.10 / .85 = 682.47
-580.10
102.37
X .4
40.95

102.37
- 40.95
61.42

61.42 / 33 = 1.86

19.44 / .91 = $21.36

$15D

$ 394.20
1.2
473.04 ÷ 33 = 14.33

473.04 / .85 = 556.52
-473.04
83.48
X .4
33.39

83.48
-33.39
50.09

50.09 / 33 = 1.52

15.85 / .91 = $17.42

$20D

$ 317.90
1.2
381.48 ÷ 33 = 11.56

381.48 / .85 = 448.80
-381.48
67.32
X .4
26.93

67.32
-26.93
40.39

40.39 / 33 = 1.22

12.78 / .91 = $14.04

Prescribed Legend Plus Compounded Nonlegend Drugs
(Operatives Families)

$25D

$ 277.66
1.2
333.19 ÷ 33 = 10.10

333.19 / .85 = 391.99
-333.19
58.80
X .4
23.52

58.80
-23.52
35.28

35.28 / 33 = 1.07

11.17 / .91 = $12.28

$30D

$ 201.07
1.2
241.28 ÷ 33 = 7.31

241.28 / .85 = 283.86
-241.28
42.62
X .4
17.05

42.62
-17.05
25.57

25.57 / 33 = 0.27

8.08 / .91 = $8.88

$40D

$ 124.69
1.2
149.63 ÷ 33 = 4.53

149.63 / .85 = 176.04
-149.63
26.41
X .4
10.56

26.41
-10.56
15.85

15.85 / 33 = 0.48

5.01 / .91 = $5.51

$50D

$ 83.14
1.2
99.77 ÷ 33 = 3.02

99.77 / .85 = 117.38
-99.77
17.61
X .4
7.04

17.61
-7.04
10.57

10.57 / 33 = 0.32

3.34 / .91 = $3.67

Prescribed Legend Plus Compounded Nonlegend Drugs
(Operatives Families)

$60D

$ 53.14
1.2
63.77 ÷ 33 = 1.93

63.77 / .85 = 75.02
-63.77
11225
X .4
4.50

11.25
- 4.50
6.75

6.75 / 33 = 0.21

2.14 / .91 = 2.35

$75D

$ 19.93
1.2
23.92 ÷ 33 = 0.73

23.92 / .85 = 28.14
-23.92
4.22
X .4
1.69

4.22
-1.69
2.53

2.53 / 33 = 0.08

0.81 / .91 = $0.89

$100D

0.00

Prescribed Drugs
(Operatives Families)

$5D

$ 742.91
1.2
891.49 ÷ 33 = 27.01

891.49 / .85 = 1048.81
- 891.49
157.32
× .4
62.93

157.32
- 62.93
94.39

94.39 / 33 = 2.86

29.87 / .91 = $32.82

$10D

$ 633.45
1.2
760.14 ÷ 33 = 23.04

760.14 / .85 = 894.28
- 760.14
134.14
× .4
53.66

134.14
- 53.66
80.48

80.48 / 33 = 2.44

25.48 / .91 = $28.00

$15D

$ 530.85
1.2
637.02 ÷ 33 = 19.30

637.02 / .85 = 749.44
- 637.02
112.42
× .4
44.97

112.42
- 44.97
67.45

67.45 / 33 = 2.04

21.34 / .91 = $23.45

$20D

$ 433.24
1.2
519.89 ÷ 33 = 15.75

519.89 / .85 = 611.64
- 519.89
91.75
× .4
36.70

91.75
- 36.70
55.05

55.05 / 33 = 1.67

17.52 / .91 = $19.25

Prescribed Drugs
(Operatives Families)

$25D

$ 359.84
1.2
431.81 ÷ 33 = 13.09

431.81 / .85 = 508.01
-431.81
76.20
X .4
30.48

76.20
-30.48
45.72

45.72 / 33 = 1.39

14.48 / .91 = $15.91

$30D

$ 296.63
1.2
355.96 ÷ 33 = 10.79

355.96 / .85 = 418.78
-355.96
62.82
X .4
25.13

62.82
-25.13
37.69

37.69 / 33 = 1.14

11.93 / .91 = $13.11

$40D

$ 199.05
1.2
238.86 ÷ 33 = 7.24

238.86 / .85 = 281.01
-238.86
42.15
X .4
16.86

42.15
-16.86
25.29

25.29 / 33 = 0.77

8.11 / .91 = $8.91

$50D

$ 135.45
1.2
162.54 ÷ 33 = 4.93

162.54 / .85 = 191.22
-162.54
28.68
X .4
11.47

28.68
-11.47
17.21

17.21 / 33 = 0.52

5.45 / .91 = $5.99

Prescribed Drugs
(Operatives Families)

$60D

$ 96.79
1.2
116.15 ÷ 33 = 3.52

116.15 / .85 = 136.65
-116.15
20.50
X .4
8.20

20.50
- 8.20
12.30

12.30 / 33 = 0.37

3.89 / .91 = 4.27

$75D

$ 51.79
1.2
62.15 ÷ 33 = 1.88

62.15 / .85 = 73.12
-62.15
10.97
X .4
4.39

10.97
- 4.39
6.58

6.58 / 33 = 0.20

2.08 / .91 = $2.29

$100D

$ 1.74
1.2
2.09 ÷ 33 = 0.06

2.09 / .85 = 2.46
-2.09
0.37
X .4
0.15

0.37
-0.15
0.22

0.22 / 33 = 0.01

0.07 / .91 = $0.08

Prescribed and O-T-C Drugs
(Operatives Families)

$5D

$1001.94
1.2
1202.33 ÷ 33 = 36.43

1202.33 / .85 = 1414.51
-1202.33
212.18
× .4
84.87

212.18
- 84.87
127.31

127.31 / 33 = 3.86

40.29 / .91 = $44.27

$10D

$ 868.43
1.2
1042.12 ÷ 33 = 31.58

1042.12 / .85 = 1226.02
-1042.12
183.90
× .4
73.56

183.90
- 73.56
110.34

110.34 / 33 = 3.34

35.02 / .91 = $38.48

$15D

$ 748.90
1.2
898.68 ÷ 33 = 27.23

898.68 / .85 = 1057.27
- 898.68
158.59
× .4
63.44

158.59
- 63.44
95.15

95.15 / 33 = 2.88

30.11 / .91 = $33.09

$20D

$ 636.36
1.2
763.63 ÷ 33 = 23.14

763.63 / .85 = 898.39
-763.63
134.76
× .4
53.90

134.76
- 53.90
80.86

80.86 / 33 = 2.45

25.59 / .91 = $28.12

Prescribed and O-T-C Drugs
(Operatives Families)

$25D

$546.89
1.2
656.27 ÷ 33 = 19.89

656.27 / .85 = 772.08 − 656.27 = 115.81
115.81 × .4 = 46.32

115.81 − 46.32 = 69.49

69.49 / 33 = 2.11

22.00 / .91 = $24.18

$30D

$468.84
1.2
562.61 ÷ 33 = 17.05

562.61 / .85 = 661.89 − 562.61 = 99.28
99.28 × .4 = 39.71

99.28 − 39.71 = 59.57

59.57 / 33 = 1.81

18.86 / .91 = $20.73

$40D

$330.85
1.2
397.02 ÷ 33 = 12.03

397.02 / .85 = 467.08 − 397.02 = 70.06
70.06 × .4 = 28.02

70.06 − 28.02 = 42.04

42.04 / 33 = 1.27

13.30 / .91 = $14.62

$50D

$222.77
1.2
267.32 ÷ 33 = 8.10

267.32 / .85 = 314.49 − 267.32 = 47.17
47.17 × .4 = 18.87

47.17 − 18.87 = 28.30

28.30 / 33 = 0.86

8.96 / .91 = $9.85

Prescribed and O-T-C Drugs
(Operatives Families)

$60D

$ 149.75
1.2
179.70 ÷ 33 = 5.45

179.70 / .85 = 211.41
-179.70
31.71
X .4
12.68

31.71
-12.68
19.03

19.03 / 33 = 0.58

6.03 / .91 = $6.63

$75D

$ 85.03
1.2
102.04 ÷ 33 = 3.09

102.04 / .85 = 120.05
-102.04
18.01
X .4
7.20

18.01
- 7.20
10.81

10.81 / 33 = 0.33

3.42 / .91 = $3.76

$100D

$ 13.52
1.2
16.22 ÷ 33 = 0.49

16.22 / .85 = 19.08
-16.22
2.86
X .4
1.14

2.86
-1.14
1.72

1.72 / 33 = 0.05

0.54 / .91 = $0.59

All Drugs Excluding In-Hospital Drugs
(Operatives Families)

$5D

$1414.34 × 1.2 = 1697.21 ÷ 33 = 51.43

$\frac{1697.21}{.85}$ = 1996.72 − 1697.21 = 299.51 × .4 = 119.80

299.51 − 119.80 = 179.71

$\frac{179.71}{33}$ = 5.45

$\frac{56.88}{.91}$ = $62.51

$10D

$1272.83 × 1.2 = 1527.40 ÷ 33 = 46.29

$\frac{1527.40}{.85}$ = 1796.94 − 1527.40 = 269.54 × .4 = 107.82

269.54 − 107.82 = 161.72

$\frac{161.72}{33}$ = 4.90

$\frac{51.19}{.91}$ = $56.25

$15D

$1145.30 × 1.2 = 1374.36 ÷ 33 = 41.65

$\frac{1374.36}{.85}$ = 1616.89 − 1374.36 = 242.53 × .4 = 97.01

242.53 − 97.01 = 145.52

$\frac{145.52}{33}$ = 4.41

$\frac{46.06}{.91}$ = $50.62

$20D

$1027.75 × 1.2 = 1233.30 ÷ 33 = 37.37

$\frac{1233.30}{.85}$ = 1450.94 − 1233.30 = 217.64 × .4 = 87.06

217.64 − 87.06 = 130.58

$\frac{130.58}{33}$ = 3.96

$\frac{41.33}{.91}$ = $45.42

All Drugs Excluding In-Hospital Drugs
(Operatives Families)

$25D

$ 918.89
1.2
1102.67 ÷ 33 = 33.41

1102.67 / .85 = 1297.26
-1[illegible]

77.84

194.59
- 77.84
116.75

116.75 / 33 = 3.54

36.95 / .91 = $40.60

$30D

$ 818.89
1.2
982.67 ÷ 33 = 29.78

982.67 / .85 = 1156.08
- 982.67
173.41
X .4
69.36

173.41
- 69.36
104.05

104.05 / 33 = 3.15

32.93 / .91 = $36.19

$40D

$ 627.15
1.2
752.58 ÷ 33 = 22.81

752.58 / .85 = 885.39
-752.58
132.81
X .4
53.12

132.81
- 53.12
79.69

79.69 / 33 = 2.41

25.22 / .91 = $27.71

$50D

$ 457.69
1.2
549.23 ÷ 33 = 16.64

549.23 / .85 = 646.15
-549.23
96.92
X .4
38.77

96.92
-38.77
58.15

58.15 / 33 = 1.76

18.40 / .91 = $20.22

All Drugs Excluding In-Hospital Drugs
(Operatives Families)

$60D

$ 339.87
1.2
407.84 ÷ 33 = 12.36

407.84 / .85 = 479.81
-407.84
71.97
× .4
28.79

71.97
-28.79
43.18

43.18 / 33 = 1.31

13.67 / .91 = $15.02

$75D

$ 191.74
1.2
230.09 ÷ 33 = 6.97

230.09 / .85 = 270.69
-230.09
40.60
× .4
16.24

40.60
-16.24
24.36

24.36 / 33 = 0.74

7.71 / .91 = $8.47

$100D

$ 32.11
1.2
38.53 ÷ 33 = 1.17

38.53 / .85 = 45.33
-38.53
6.80
× .4
2.72

6.80
-2.72
4.08

4.08 / 33 = 0.12

1.29 / .91 = $1.42

Prescribed Legend Plus Compounded Nonlegend Drugs
80% Indemnification Limit
(All Families)

$5D

$6015.47
1.2
7218.56 ÷ 237 = 30.46

7218.56 / .85 = 8492.42
-7218.56
1273.86
x .4
509.54

1273.86
- 509.54
764.32

764.32 / 237 = 3.23

33.69 / .91 = $37.02

$10D

$5855.75
1.2
7026.90 ÷ 237 = 29.65

7026.90 / .85 = 8266.94
-7026.90
1240.04
x .4
496.02

1240.04
- 496.02
744.02

744.02 / 237 = $3.14

32.99 / .91 = $36.03

$15D

$5736.35
1.2
6883.62 ÷ 237 = 29.05

6883.62 / .85 = 8098.38
-6883.62
1214.76
x .4
485.90

1214.76
- 485.90
728.86

728.86 / 237 = 3.08

32.13 / .91 = $35.31

$20D

$5530.30
1.2
6636.36 ÷ 237 = 28.00

6636.36 / .85 = 7807.48
-6636.36
1171.12
x .4
468.45

1171.12
- 468.45
702.67

702.67 / 237 = 2.96

30.96 / .91 = $34.02

Prescribed Legend Plus Compounded Nonlegend Drugs
80% Indemnification Limit
(All Families)

$25D

$5318.96
1.2
6382.75 ÷ 237 = $26.93

$\frac{6382.75}{.85}$ = 7509.12
-6382.75
1126.37
X .4
450.55

1126.37
- 450.55
675.82

$\frac{675.82}{237}$ = 2.85

$\frac{29.78}{.91}$ = $32.73

$30D

$5016.48
1.2
6019.78 ÷ 237 = 25.40

$\frac{6019.78}{.85}$ = 7082.09
-6019.78
1062.31
X .4
424.92

1062.31
- 424.92
637.39

$\frac{637.39}{237}$ = 2.69

$\frac{28.09}{.91}$ = $30.87

Prescribed Drugs
80% Indemnification Limit
(All Families)

$5D

$7141.72 × 1.2 = 8570.06 ÷ 237 = 36.16

$\frac{8570.06}{.85}$ = 10082.42 − 8570.06 = 1512.36 × .4 = 604.94

1512.36 − 604.94 = 907.42

$\frac{907.42}{237}$ = 3.83

$\frac{39.99}{.91}$ = $43.94

$10D

$6952.10 × 1.2 = 8342.52 ÷ 237 = 35.20

$\frac{8342.52}{.85}$ = 9814.73 − 8342.52 = 1472.21 × .4 = 588.88

1472.21 − 588.88 = 883.33

$\frac{883.33}{237}$ = 3.73

$\frac{38.93}{.91}$ = $42.78

$15D

$6810.34 × 1.2 = 8172.47 ÷ 237 = 34.48

$\frac{8172.47}{.85}$ = 9614.60 − 8172.41 = 1442.19 × .4 = 576.88

1442.19 − 576.88 = 865.31

$\frac{865.31}{237}$ = 3.65

$\frac{38.13}{.91}$ = $41.90

$20D

$6565.70 × 1.2 = 7878.84 ÷ 237 = 33.24

$\frac{7878.84}{.85}$ = 9269.22 − 7878.84 = 1390.38 × .4 = 556.15

1390.38 − 556.15 = 834.23

$\frac{834.23}{237}$ = 3.51

$\frac{36.75}{.91}$ = $40.38

Prescribed Drugs
80% Indemnification Limit
(All Families)

$25D

$6314.80
1.2
7577.76 ÷ 237 = 31.97

7577.76 / .85 = 8915.01
-7577.76
1337.25
X .4
534.90

1337.25
- 534.90
802.35

802.35 / 237 = 3.38

35.35 / .91 = $38.85

$30D

$5955.69
1.2
7146.83 ÷ 237 = 30.16

7146.83 / .85 = 8408.04
-7146.83
1261.21
X .4
504.48

1261.21
- 504.48
756.73

756.73 / 237 = 3.19

33.35 / .91 = $36.65

Prescribed and O-T-C Drugs
80% Indemnification Limit
(All Families)

$5D

$ 9630.38
1.2
11556.46 ÷ 237 = 48.76

11556.46 / .85 = 13595.84
-11556.46
2039.38
× .4
815.75

2039.38
- 815.75
1223.63

1223.63 / 237 = 5.16

53.92 / .91 = $59.25

$10D

$ 9504.22
1.2
11405.06 ÷ 237 = 48.12

11405.06 / .85 = 13417.72
-11405.06
2012.66
× .4
805.06

2012.66
- 805.06
1207.60

1207.60 / 237 = 5.10

53.22 / .91 = $58.48

$15D

$ 9356.66
1.2
11227.99 ÷ 237 = 47.37

11227.99 / .85 = 13209.40
-11227.99
1981.41
× .4
792.56

1981.41
- 792.56
1188.85

1188.85 / 237 = 5.02

52.39 / .91 = $57.57

$20D

$ 9138.96
1.2
10966.75 ÷ 237 = 46.27

10966.75 / .85 = 12902.06
-10966.75
1935.31
× .4
774.12

1935.31
- 774.12
1161.19

1161.19 / 237 = 4.90

51.17 / .91 = $56.23

Prescribed and O-T-C Drugs
80% Indemnification Limit
(All Families)

$25D	$30D
$ 8791.26	$ 8469.55
1.2	1.2
10549.51 ÷ 237 = 44.51	10163.46 ÷ 237 = 42.88
10549.51 / .85 = 12411.19	10163.46 / .85 = 11957.01
-10549.51	-10163.46
1861.68	1793.55
X .4	X .4
744.67	717.42
1861.68	1793.55
- 744.67	- 717.42
1117.01	1076.13
1117.01 / 237 = 4.71	1076.13 / 237 = 4.54
49.22 / .91 = $54.09	47.42 / .91 = $52.11

All Drugs Excluding In-Hospital Drugs
80% Indemnification Limit
(All Families)

$10D

$12009.48
1.2
14411.38 ÷ 237 = 60.80

$\frac{14411.38}{.85}$ = 16954.56 − 14411.38 = 2543.18

2543.18 × .4 = 1017.27

2543.18 − 1017.27 = 1525.91

$\frac{1525.91}{237}$ = 6.44

$\frac{67.24}{.91}$ = $73.89

$20D

$11644.51
1.2
13973.41 ÷ 237 = 58.96

$\frac{13973.41}{.85}$ = 16439.31 − 13973.41 = 2465.90

2465.90 × .4 = 986.36

2465.90 − 986.36 = 1479.54

$\frac{1479.54}{237}$ = 6.24

$\frac{65.20}{.91}$ = $71.65

$30D

$11092.46
1.2
13310.95 ÷ 237 = 56.16

$\frac{13310.95}{.85}$ = 15659.94 − 13310.95 = 2348.99

2348.99 × .4 = 939.60

2348.99 − 939.60 = 1409.39

$\frac{1409.39}{237}$ = 5.95

$\frac{62.11}{.91}$ = $68.25

$40D

$10583.63
1.2
12700.36 ÷ 237 = 53.59

$\frac{12700.36}{.85}$ = 14941.60 − 12700.36 = 2241.24

2241.24 × .4 = 896.50

2241.24 − 896.50 = 1344.74

$\frac{1344.74}{237}$ = 5.67

$\frac{59.26}{.91}$ = $65.12

All Drugs Excluding In-Hospital Drugs
80% Indemnification Limit
(All Families)

$50D

$ 9742.53
1.2
11691.04 ÷ 237 = 49.33

11691.04 / .85 = 13754.16

-11691.04
2063.12
X .4
825.25

2063.12
- 825.25
1237.87

1237.87 / 237 = 5.22

54.55 / .91 = $59.95

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THE FEASIBILITY OF INSURING FAMILIES AGAINST THE COST OF PRESCRIBED DRUGS

MICHAEL DANIAN
Under the Supervision of Associate Professor Robert W. Hammel

This study was motivated by the following factors: (1) The potential effects of drug insurance on economic, social, and professional aspects of pharmacy; (2) The conflicting reports on the need and desirability of and different programs for protecting the family against financial loss from drug costs; and (3) The relative lack of variated family drug expenditure data. The study was based primarily on empirical data on family drug expenditures and analyses of these data to evaluate the feasibility of employing voluntary insurance on a group basis.

The family drug expenditure data were collected from a sample of 237 families drawn from an urban-rural county by a systematic sampling technique. These families recorded their drug expenditures for one year on forms which were returned each month. The following categories of drug expenditures were recorded: (1) Prescribed; (2) Over-the-counter limited to those purchased on the specific approval or recommendation of a physician on the premise that if insurance is available, these drugs would be prescribed; (3) Injections plus physician dispensed; and (4) In-hospital.

The expenditure data were analyzed as follows: (1) Distribution curves and measures of central tendency, standard deviation, and skewness of the dollar amount expended for the

various categories of drugs; (2) Classification of the dollar amount and percentage of income expended for drugs in the several categories by six family variables -- income, size, residence, and age, occupation, and educational level of the head of the household; (3) Multiple correlation analyses of the dollar amount and percentage of income expended for drugs in the various categories by the six family variables; (4) The average number and average unit expenditure for drugs in each category by the six family variables; and (5) Sources of family drugs.

The feasibility evaluation was based on the above analyses and two different approaches to insurance, the "first dollar" and the "catastrophic" concepts. The evaluation was from a potential drug insurer's viewpoint and indicated that: (1) The distribution curves for drug expenditures in each category were capable of approximation which is an essential element in the feasibility of employing voluntary insurance; (2) Variance in either the dollar amount or percentage of income or both expended for either all drugs included in the scope of the study or one or more of the several categories thereof was statistically significant with one or more of the following variables: family income, residence, and age and occupation of the head of the household; (3) The average numbers and average unit expenditures for estimated prescribed legend, prescribed, prescribed plus over-the-counter, and all drugs included in the scope of the study were 8.1 and $3.82, 9.9 and $3.80, 15.8 and $3.00, and 19.4 and $3.37, respectively;

and (4) Pharmacies were the major source of the family's drugs.

The evaluation indicated it is feasible to protect the family on a group basis with voluntary drug insurance. The following represent the different potential drug insurance plans calculated from the study data:

Insurance Concept	Coverage	Deductible	Indemnification Limit	Annual Premium
"First Dollar"	Prescribed Legend Drugs	None	80%	$57.00
"Catastrophic"	~~Same~~	$10	80%	$61.70

See p 179 & 180

GRADUATE JUL 9 1964

Approved
7 July 1964

R. W. Hammel

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