

Domestic and Foreign Prescription Drug Prices

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As an outgrowth of the studies conducted by the Task Force on Prescription Drugs established by the Secretary of Health, Education, and Welfare in 1967, the Social Security Administration was asked to accept the responsibility for continuing research in the area of drug costs, prices, and use. The broad base of this activity is highlighted by the fact that the total annual cost of all pharmaceutical services in the United States today, including both inpatient and outpatient care, exceeds \$7 billion. For HEW-sponsored health care programs the figure is likely to reach \$1.4 billion in the fiscal year ending June 1971.

During the same period, even though currently out-of-hospital drugs are not provided as a benefit under Medicare, Social Security Administration outlays attributable to prescription services received by aged persons in institutions will probably reach \$500 million.

Consequently, an examination of various factors that influence drug prices is relevant for both society in general and the Department of Health, Education, and Welfare, and for the SSA in particular. This analysis of domestic and foreign drug prices represents one approach for reviewing the economic dimensions of the problem.

WIDELY DIFFERING prices in the United States and eight foreign countries were found in a study of selected prescription drugs sold throughout the world. The countries in the study were those from which price data were immediately available. In addition to the United States, the countries included were Australia, Brazil, Canada, Ireland, Italy, New Zealand, Sweden, and the United Kingdom.

Comparisons of the prices are presented here in terms of charges to druggists. Charges to druggists are not necessarily the same as wholesale prices in the usually accepted sense; they represent the prices paid, on the average by druggists for a product rather than the manufacturer's

receipts for the sale of the product to druggists. The difference between the two price levels may vary from zero to 20 percent. Selection of the drugs was based on their sales importance in the United States. The 20 drugs selected are listed below, by U.S. brand name and manufacturer.

Achromycin-V (tetracycline HCl), Lederle (American Cyanamid)
Benadryl (diphenhydramine HCl), Parke-Davis
Compazine (prochlorperazine maleate), Smith, Kline, & French (SKF)
Darvon (propoxyphene HCl), Eli Lilly
Demomycin (demethylchlortetracycline HCl), Lederle
Doriden (glutethimide), Ciba
Elavil (amitriptyline HCl), Merck
Equanil (meprobamate), Wyeth (American Home)
Erythrocin (erythromycin), Abbott
Gantrisin (sulfisoxazole), Roche
Lanoxin (digoxin), Burroughs-Wellcome (B-W)
Librium (chlordiazepoxide), Roche
Orinase (tolbutamide), Upjohn
Ovulen (ethynodiol diacetate with mestranol), Searle
Polycillin (ampicillin), Bristol
Stelazine (trifluoperazine HCl), SKF
Terramycin (oxytetracycline HCl), Pfizer
Thorazine (chlorpromazine HCl), SKF
Valium (diazepam), Roche
V-Cillin-K (potassium phenoxymethylpenicillin), Eli Lilly

The data in table 1 demonstrate the great variation from country to country in prices for a single product by the same company. The price of propoxyphene, for example, was \$7.02 in the United States, where Eli Lilly is the exclusive seller; the price charged by Lilly in Ireland was \$1.66 and in the United Kingdom it was \$1.92. Pfizer charges \$20.48 for oxytetracycline in the United States under the brand name Terramycin but sells the same product for \$7.74 in Ireland.

The same diversity of price among countries exists where sellers are independent firms and related only through patent licensing agreements. Chlorpromazine, marketed in this country by Smith, Kline, & French under the brand name Thorazine, is sold to druggists here for \$6.60. Smith, Kline, & French has operated under an exclusive patent license from Rhone-Poulenc, the French firm that discovered the product and held the United States patent until its expiration in

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TABLE 1.—Comparison of selected pharmaceutical prices in
[All prices in U.S. dollars for 100 tablets or capsules]

Generic name	Price to druggist, brand name, and manufacturer			
	United States	Australia	Brazil	Canada
Analgesic: Propoxyphene HCl (65 mg.).....	\$7.02 Darvon Lilly	\$2.73 Doloxene Lilly	\$3.72 Doloxene Lilly	\$5.29 Darvon Lilly
Antibiotics: Ampicillin (250 mg.).....	21.84 Polycillin Bristol	20.48 Penbritin Bristol	41.95 ³ Polycillin Bristol	22.18 ³ Ampicin Bristol
Demethylchlortetracycline HCl (150 mg.).....	19.79 Declomycin Lederle	11.17 Ledermycin Lederle	4.93 Ledermycina Cyanamid Quim do Brasil ⁵	16.09 Declomycin Lederle
Erythromycin (250 mg.).....	26.12 Erythrocin Abbott	14.51 Erythrocin Abbott	11.92 ¹ Pantomicina Abbott	25.04 Erythrocin Abbott
Oxytetracycline HCl (250 mg.).....	20.48 Terramycin Pfizer	9.79 Terramycin Pfizer	4.63 Terramicina Pfizer	16.92 Terramycin Pfizer
Potassium phenoxymethylpenicillin (250 mg.).....	8.95 V-Cillin-K Lilly	6.11 P.V.K. Lilly	8.66 ¹ V-Cil-K Lilly	10.69 ¹ V-Cillin-K Lilly
Tetracycline HCl (250 mg.).....	5.34 ⁷ Achromycin-V Lederle	9.79 Achromycin-V Lederle	4.22 Achromycin-V Cyanamid Quim do Brasil ⁵	12.64 Achromycin-V Lederle
Antidepressant: Amitriptyline HCl (25 mg.).....	8.55 Elavil Merck	3.33 Tryptanol Merck	2.26 ¹ Tryptanol Merck	6.30 Elavil Merck
Antidiabetic: Tolbutamide (500 mg.).....	8.23 ¹ Orinase Upjohn	2.83 Rastinon Hoechst	2.77 Rastinon Hoechst	6.34 ¹ Orinase Hoechst
Antihistamine: Diphenhydramine HCl ¹⁰ (50 mg.).....	2.22 Benadryl Parke-Davis	1.60 ¹ Benadryl Parke-Davis	.81 Benadryl Parke-Davis	2.77 Benadryl Parke-Davis
Ataraxics (tranquilizers): Chlordiazepoxide HCl (10 mg.).....	6.40 ¹ Librium Roche	3.74 Librium Roche	2.40 ¹ Librium Roche	5.45 Librium Roche
Chlorpromazine HCl (50 mg.).....	6.60 Thorazine SKF ¹¹	2.22 Largactil May & Baker ¹¹	2.47 ¹ Ampticil Rhodia ¹¹	5.82 ¹ Largactil Rhône-Poulenc ¹¹
Diazepam (5 mg.).....	8.03 Valium Roche	3.74 Valium Roche	3.62 ¹ Valium Roche	6.01 Valium Roche
Meprobamate (400 mg.).....	7.06 Equanil Wyeth	4.17 Equanil Wyeth	1.91 ¹² Equanil Wyeth	5.13 ¹ Equanil Wyeth
Prochlorperazine maleate (10 mg.).....	7.86 Compazine SKF	4.44 ¹ Stemetil May & Baker	2.45 ¹ Temetil Rhodia	6.05 ¹ Stemetil Rhône-Poulenc ¹¹
Trifluoperazine HCl (5 mg.).....	9.75 Stelazine SKF	4.70 Stelazine SKF	2.42 ¹ Stelazine SKF	8.38 Stelazine SKF
Cardiovascular: Digoxin (.25 mg.).....	1.03 Lanoxin B-W	.69 Lanoxin B-W	1.31 ¹⁶ Digoxina B-W	1.51 ¹⁷ Lanoxin B-W
Oral contraceptive: Ethinodiol diacetate with mestranol (6x21 tabs, 1 mg.)..	7.38 Ovulen 21 Searle	4.11 Ovulen 21 Searle	4.82 Ovulen 20 ¹⁸ Searle	5.95 ¹ Ovulen 21 Searle
Sedative: Glutethimide (250 mg.).....	3.00 Doriden Ciba	2.11 Doriden Ciba	1.97 ¹ Doriden Ciba	2.67 Doriden Ciba
Sulfonamide: Sulfisoxazole (500 mg.).....	2.94 Gantrisin Roche	3.00 ¹ Gantrisin Roche	1.51 Gantrisin Roche	3.06 Gantrisin Roche

See notes to table 1 on page 18.

the United States and eight foreign countries, January 1970

[All prices in U. S. dollars for 100 tablets or capsules]

Price to druggist, brand name, and manufacturer—Continued					Generic name
Ireland	Italy	New Zealand	Sweden	United Kingdom	
\$1.66 Doloxene Lilly	\$7.86 ¹ Doloxene Lilly	\$2.08 Doloxene Lilly	\$3.33 Doloxene Lilly	\$1.92 Doloxene Lilly	Analgesic: Propoxyphene HCl (65 mg.).
9.31 Pentrexyl Bristol	19.15 ¹ Sintopenyl Aesculapius ⁴	11.30 ¹ Penbritin Beecham	16.58 Pentrexyl Bristol	8.23 Penbritin Beecham ⁴	Antibiotics: Ampicillin (250 mg.).
8.97 ¹ Ledermycin Lederle	17.88 ¹ Ledermycina Cyanamid ⁵	3.87 Ledermycin Lederle	19.43 Ledermycin Lederle	8.20 Ledermycin Lederle	Demethylchlortetracycline (150 mg.).
8.56 Erythrocin Abbott	24.57 ¹ Eritrocina Abbott	10.88 Official price	19.21 Erythromycin Abbott	10.02 Erythrocin Abbott	Erythromycin (250 mg.).
7.74 Terramycin Pfizer	13.27 ¹ Terramycina Pfizer	3.68 Official price	13.04 Terramycin Pfizer	9.06 Terramycin Pfizer	Oxytetracycline HCl (250 mg.).
2.77 Penicillin-V Lilly	(⁶)	2.99 Official price	(⁶)	2.40 V-Cil-K Lilly	Potassium phenoxymethylpenicillin.
3.42 Achromycin-V Lederle	10.84 ¹ Acromycina Cyanamid ⁵	13.78 ¹ Achromycin-V Lederle	13.89 Achromycin-V Lederle	5.04 Achromycin-V Lederle	Tetracycline HCl (250 mg.).
2.26 Tryptizol Merck	4.22 ¹ Tryptizol Merck	4.20 ⁸ Tryptanol Merck	3.09 Tryptizol Merck	2.28 Tryptizol Merck	Antidepressant: Amitriptyline HCl (25 mg.).
2.22 ¹ Rastinon Hoechst	2.86 ¹ Rastinon Hoechst	(⁹)	4.86 Rastinon Hoechst	2.28 Rastinon Hoechst	Antidiabetic: Tolbutamide (500 mg.).
1.37 ¹ Benadryl Parke-Davis	2.60 ¹ Benadryl Parke-Davis	1.29 ¹ Official price	2.33 ¹ Benadryl Parke-Davis	1.20 ¹ Benadryl Parke-Davis	Antihistamine: Diphenhydramine HCl ¹⁰ (50 mg.).
2.05 Librium Roche	3.55 ¹ Librium Roche	1.83 ¹ Librium Roche	3.11 Librium Roche	2.40 Librium Roche	Ataraxics (tranquilizers): Chlordiazepoxide HCl (10 mg.).
1.71 ¹ Largactil May & Baker	3.47 ¹ Largactil Farmitalia ¹¹	1.82 ¹ Official price	2.88 Largactil Rhodia	1.68 ¹ Largactil May & Baker	Chlorpromazine HCl (50 mg.).
2.46 Valium Roche	3.42 ¹ Valium Roche	2.72 Official price	3.71 Valium Roche	2.88 Valium Roche	Diazepam (5 mg.).
1.79 ¹ Equanil Wyeth	3.65 ¹ Equanil Wyeth	2.00 Official price	1.67 Equanil Ferrosan ¹²	1.74 ¹ Equanil Wyeth	Meprobamate (400 mg.).
2.87 Stemetil May & Baker	3.04 ¹ Stemetil Farmitalia	2.93 ¹ Official price	2.28 Stemetil LEO ¹⁴	3.04 ¹ Stemetil SKF	Prochlorperazine maleate (10 mg.).
2.78 ¹ Stelazine SKF	3.82 ¹ Modalina Maggioli ¹⁵	3.71 Official price	4.41 ¹ Terfluzin Rhodia	2.59 Stelazine SKF	Trifluoperazine HCl (5 mg.).
.53 Lanoxin B-W	1.73 ¹ Lanoxin Wellcome	52 ¹ Official price	.98 Lanoxin B-W	.38 Lanoxin B-W	Cardiovascular: Digoxin (.25 mg.).
3.59 Ovulen 21 Searle	8.20 Ovulen Lepetit ¹⁹	3.56 Official price	4.51 Ovulen 21 Searle	4.10 Ovulen 21 Searle	Oral contraceptive: Ethinodiol diacetate with mestranol. (6x21 tabs, 1 mg.).
.92 Doriden Ciba	1.80 ¹ Doriden Ciba	1.23 Official price	2.06 Doriden Ciba	1.00 Doriden Ciba	Sedative: Glutethimide (250 mg.).
1.64 Gantrisin Roche	2.47 ¹ Gantrisin Roche	1.11 ¹ Gantrisin Roche	2.83 ¹ Gantrisin Roche	1.92 Gantrisin Roche	Sulfonamide: Sulfisoxazole (500 mg.).

mid-1970.¹ Rhone-Poulenc, through a subsidiary, markets the identical product in Australia for \$2.22 and in Sweden for \$2.88. A closely related product, prochlorperazine, also was developed by Rhone-Poulenc. In this case the patent, again exclusively licensed to SKF in the United States, does not expire until September 1972. SKF's price for the product marketed under the brand name of Compazine is \$7.86 in this country. A subsidiary of Rhone-Poulenc charges \$2.87 in Ireland and \$3.04 in the United Kingdom.

Another product that has had a wide market in the United States is tolbutamide—an oral anti-diabetic drug—marketed here under the brand name Orinase. Upjohn, the single seller of the product in the United States, secured a patent license from Hoechst, the German discoverer of the compound. Upjohn's price in this country is \$8.23. Hoechst itself, marketing under the brand name Rastinon, sells the drug for as little as \$2.22, \$2.28, and \$2.77 in other countries.

The findings of this study show that differences between selected countries in drug prices are significant. The extent to which such variations are caused by real economic factors (differences in labor costs, size of markets, etc.) or the application of market power by pharmaceutical manufacturers cannot be determined from this study. General knowledge of the total problem suggests that it would be unwise to assume that price

discrimination exercised by drug producers is a minor factor.

The study shows that prices in the United States for these drugs are generally higher than in any other country studied. The lowest price for any drug was usually about one-fourth the highest price. In each case the product was marketed by the same manufacturer. For some of the drugs the same brand name was used both in the United States and abroad; for others the manufacturer used different brand names in different countries.

Although certain countries exhibited tendencies toward a high or low level of prices, these levels were not consistent for all products. The United States, for example, had the highest prices overall. For one category of drugs—tranquilizers—U.S. prices were highest in every case. Yet for Achromycin-V, an antibiotic, the U.S. price was among the lowest observed. The price for Polycillin was much higher in Brazil than in any other country, yet for five drugs Brazil had the lowest price.

TRENDS IN COUNTRIES WITH HEALTH INSURANCE PROGRAMS

Findings from other studies provide additional information on drug prices in some of the countries in this report.²

¹ For licensing agreements referred to in these paragraphs, see *Hearings on Administered Prices in the Drug Industry Before the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary*, United States Senate (86th Cong.), vol. 17, exhibit 86, pages 9474 ff., and exhibit 101, pages 9484 ff., and vol. 20, exhibit 306, pages 11266 ff.

(Footnotes for table 1)

¹ See Technical Note, Price Adjustments, p. 2.
² Sold as unspecified dosage, 12's for \$5.04. It is assumed the most common dosage (250 mg.) is sold in Brazil.
³ Estimated from suggested retail price of \$36.83.
⁴ Beecham holds the original British patent for ampicillin. Bristol and Aesculapius manufacture the drug by agreement with Beecham. (Hearings before the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary, *Administered Prices*, United States Senate, S. Res. 238, part 26, 1961, p. 15756, and *L'Informatore Farmaceutico*, 1970, p. 916.)
⁵ Lederle is a division of American Cyanamid.
⁶ Data not available.
⁷ Calculated from direct sale price, September 14, 1970.
⁸ Price taken from an advertisement in the June 1968 issue of the *New Zealand Medical Journal*. The drug is not covered by social security program, and the official price for amitriptyline HCl is \$2.52; difference in price must be paid by the patient.
⁹ Available in New Zealand, but no price was reported in New Zealand's Prescription Pricing Schedules.
¹⁰ Only available as Kapseals in the United States, Australia, Canada, and the United Kingdom.
¹¹ SKF licensee of Rhone-Poulenc. Farmitalia owns controlling interest in Rhone-Poulenc, which owns Rhodia and May & Baker.
¹² Sold as unspecified dosage, 24's for 46 cents. It is assumed the most common dosage (400 mg.) is sold in Brazil.
¹³ Wyeth does not distribute drugs in Sweden. There are other manufacturers of meprobamate in Sweden, but only Ferrosan's product is called

Equanil.

¹⁴ Only manufacturer of prochlorperazine maleate in Sweden.
¹⁵ Only manufacturer of trifluoperazine HCl in Italy.
¹⁶ Dosage unspecified. It is assumed the most common dosage (.25 mg.) is sold in Brazil.
¹⁷ Estimated from suggested retail price of \$2.50.
¹⁸ Available only as 20's.
¹⁹ Searle does not distribute drugs in Italy.

Sources: *Brasindice Industrial Farmaceutico*, 6th edition, July-December 1967, Brasindice Grafica Editora, Ltda., Sao Paulo and *Brasindice Industrial Farmaceutico*, Boletim de Atualizacao, No. 44, May 20, 1968; *Chemist & Druggist*, Quarterly Price List, vol. 11, No. 1, March 1970, Thomas Marns & Co., Rustington, Sussex; *F.A.S.S., 1969*, Farmaceutiska Specialiteter, i Sverige, Stockholm, 1969, Almqvist & Wiksells Boktryckeri AB, Uppsala and *F.A.S.S., 1969 Supplement*, January-August 1969; *L'Informatore Farmaceutico*, 1970, Organizzazione Editoriale Medico-Farmaceutica, Milano, 1970; *Mims, Monthly Index of Medical Specialities*, Irish edition, Medical & Allied Publications, Ltd., Dublin, April 1970; *New Zealand Medical Journal*, June 1968, Medical Association of New Zealand, Wellington; *Prescription Pricing Schedules*, August 1969, Department of Health of New Zealand, Wellington; *Price Book of Drug Store Merchandise* (36th edition), June 1969, Canadian Pharmaceutical Association, Toronto; *Price List of Prescription Proprietaries for Dispensing*, No. D/69, issued by the Federal Council of the Pharmacy Guild of Australia, Nov. 1, 1969; *U.S. Drug Topics Red Book, 1970*, Topics Publishing Co., Inc., New York.

Australia, Ireland, and Sweden pay part of the retail price of prescription medicines. In Sweden, payment is for one-half of that portion of the price between \$1 and \$3 and for everything over \$3. In Ireland, payment depends on the patient's income; in Australia, payment is for everything except a nominal copayment fee. For medicines to treat certain chronic diseases, all three countries pay the total price. The United Kingdom and Italy pay the full retail price for medicines. New Zealand pays for the least expensive brand of a drug. These six governments therefore have a direct interest in the prices at which pharmaceutical items are sold.

Sweden demonstrates this interest by regulating the prices of drugs through established regulatory codes. Ireland, New Zealand, and the United Kingdom negotiate with the industry for lower drug prices but do not exercise statutory power to enforce them. Italy and Brazil actually set drug prices, with the prices determined from data supplied by the manufacturers. (Brazilian and Italian laws require disclosure of cost information.) Australia lacks statutory power to regulate drug prices but considers the price of a drug when deciding whether to include it on the list of drugs for which the government will reimburse.

Brazil and Italy permit no patents on pharmaceuticals. Sweden grants patents only for pharmaceutical manufacturing processes. The six other countries in the study issue patents for both product and process.

Brazilian prices generally are among the lowest four of the nine countries. Because "run-away" inflation is a serious problem in Brazil, pharmaceutical manufacturers introduce new drugs in the market at artificially high prices as protection from inflation for a number of years. Yet, when inflation overtakes the prices, manufacturers apparently find it difficult to obtain government approval for price increases. Some of the prices were established many years ago, and difficulty in revising them may account in part for Brazil's low price level.

As the accompanying chart indicates, the United States has the highest median position among eight of the countries in the group.³ Twelve times out of 20, the U.S. prices are the highest.

³ New Zealand has been omitted from these comparisons and from the chart because only five of the 20 prices in that country are definitely known.

Canadian prices are second highest 14 times out of 20. Among the six European and North American countries in the group, only Canada and the United States have no national health insurance program. Many Canadian Provinces, however, have health insurance programs of their own. The United States has health insurance for the aged (Medicare) and a medical assistance program (Medicaid) for the medically indigent, as well as many private health insurance plans. There is, however, no uniformity of care and benefits as would be possible under a national program.

Ireland and the United Kingdom, which rank lowest with respect to prices, have national health insurance programs with features such as drug cost reimbursement and government control over prices. Both Sweden and Australia—ranking fourth and fifth highest, respectively—have national health insurance programs featuring reimbursement plans and government regulation of pharmaceutical prices. Italy offers the most comprehensive system of drug price controls, with prices set by the government and cost data disclosure required. Its health program covers nearly all the population and features complete government payment for drugs. Italian prices generally ranked third highest.

Additional Foreign Prices

For three of the 20 brand name drugs studied in this report, prices from additional countries are available.⁴ The 10 prices obtained are too few to warrant their inclusion in table 1. They are shown here in table 2, however, because they (1) provide added information and (2) can be used to verify or refute some of the trends shown in this report.

Table 2 presents these pharmaceutical prices for Denmark, West Germany, Norway, and Switzerland. The source of the information provided only generic name, manufacturer, and dosage. No reference was made to brand name, and the drugs may be marketed under different brand names in the foreign countries.

⁴ Information on these prices was received August 1, 1970, from the National Health Service, Copenhagen, Denmark.

Ranking of prices for sampled drugs in 8 countries

Brand Name	LOW	7th	6th	5th	4th	3rd	2nd	HIGH
ACHROMYCIN	Ir	Br	UK	US	Au	It	Ca	Sw
BENADRYL	Br	UK	Ir	Au	US	Sw	It	Ca
COMPAZINE	Sw	Br	Ir	UK/It		Au	Ca	US
DARVON	Ir	UK	Au	Sw	Br	Ca	US	It
DECLOMYCIN	Br	UK	Ir	Au	Ca	It	Sw	US
DORIDEN	Ir	UK	It	Br	Sw	Au	Ca	US
ELAVIL	Br/Ir		UK	Sw	Au	It	Ca	US
ERYTHROCIN	Ir	UK	Br	Au	Sw	It	Ca	US
EQUANIL	Sw	UK	Ir	Br	It	Au	Ca	US
GANTRISIN	Br	Ir	UK	It	Sw	US	Au	Ca
LANOXIN	UK	Ir	Au	Sw	US	Br	Ca	It
LIBRIUM	Ir	UK/It		Sw	It	Au	Ca	US
ORINASE	Ir	UK	Br	Au	It	Sw	Ca	US
OVULEN	Ir	UK	Au	Sw	Br	Ca	US	It
POLYCILLIN	UK	Ir	Sw	It	Au	US	Ca	Br
STELAZINE	Br	UK	Ir	It	Sw	Au	Ca	US
TERRAMYCIN	Br	Ir	UK	Au	Sw	It	Ca	US
THORAZINE	UK	Ir	Au	Br	Sw	It	Ca	US
VALIUM	Ir	UK	It	Br	Sw	Au	Ca	US
V-CILLIN-K*	UK			Ir	Au	Br	US	Ca

* Not available in Italy or Sweden; ranking for this drug is for 6 countries.

This report shows that U.S. prices for ataraxics are high in relation to foreign prices and that U.S. prices for antibiotics are comparable to those in foreign countries. The prices shown in table 2 for two ataraxics, Valium and Equanil,

TABLE 2.—Comparison of three pharmaceutical prices in United States and four foreign countries

[All prices stated in U.S. dollars for 100 tablets or capsules]

Country	Diazepam (10 mg., Roche) ¹	Meprobamate (400 mg., Wyeth)	Tetracycline HCl (250 mg., Lederle)
United States.....	\$11.07	\$7.06	\$5.34
Denmark.....	4.27	.58	10.54
Germany.....	4.97	(²)	12.53
Norway.....	4.91	(²)	11.15
Switzerland.....	3.74	4.43	17.17

¹ Standard dosage is shown in table 1 as 5 mg., but diazepam prices in these four countries were only available for 10 mg.

² Data not available.

reinforce the report findings, as the prices in the United States for both Valium and Equanil are higher than the prices in the four other countries.

Achromycin is an antibiotic whose U.S. price ranks among the lowest four prices of the nine countries in table 1. When the U.S. price for Achromycin is compared with Achromycin prices in these four countries, it is found to be substantially lower. The conclusion that antibiotic prices in the United States appear to be comparable with the average of foreign antibiotic prices thus receives some support.

Technical Note

To avoid biasing or compromising any conclusions drawn from the study material it was neces-

sary to standardize certain criteria for data acceptability, equivalency, and adjustment.

The 20 products were found to be available in all nine countries, except for potassium phenoxymethylpenicillin in Italy and Sweden. Moreover, it was possible to obtain prices for an individual product in each of the countries, in most cases as the proprietary of a single manufacturer. Table 1 lists the products and their manufacturers and the prices reported in each country, with the drugs grouped by therapeutic category and alphabetized by generic name. The products displayed on the price matrix were selected on the basis of the following criteria:

1. They were among the 50 most often prescribed drugs in the United States.⁵
2. Their combined sales during fiscal years 1968 and 1969 to the Veterans Administration amounted to more than \$100,000.
3. Their combined sales during fiscal year 1968 and 1969 to the Defense Personnel Support Center (Department of Defense) amounted to more than \$300,000.

In addition, foreign prices were admitted to the matrix only if they were manufactured or sold (1) by the same manufacturer or (2) by an affiliated native firm (a subsidiary, parent, licensee, or licensor of the U.S. firm) or (3) under the identical brand name by a manufacturer with no known affiliation with the U.S. firm⁶ or (4) under a different brand name by a manufacturer of unknown affiliation with the U.S. firm when there was only one manufacturer selling the product.⁷

To obtain prices for products in New Zealand, these criteria were waived. For that country, exact prices for only five of the 20 products were known, and these were obtained from magazine advertisements.⁸ The remaining 15 prices

⁵ *National Prescription Audit*, R. A. Gosselin and Co., Inc., Dedham, Mass., 1969.

⁶ Only three prices were thus obtained: Equanil (meprobamate), manufactured by Ferrosan in Sweden; Stemetil (prochlorperazine maleate), manufactured by LEO in Sweden; and Ovulen (ethynodiol diacetate with mestranol), manufactured by Lepetit in Italy.

⁷ Only the price of Modalina (trifluoperazine HCl), manufactured by Maggioni in Italy, was obtained in this way.

⁸ Doloxene (propoxyphene HCl), manufactured by Lilly; Gantrisin (sulfisoxazole), by Roche; Trypanol (amitriptyline HCl), by Merck; Librium (chlordiazepoxide HCl), by Roche; and Penbritin (ampicillin), by Beecham. (*New Zealand Medical Journal*, June 1968.)

were obtained from the New Zealand Government's official price list for pharmaceuticals. That list designates the amount the Government will pay for the products, but manufacturers are not obliged to sell their proprietaries at that price. Of the five prices known, however, four coincide with the official price. Thus it seems reasonable to assume that most brand name drugs sell at or near the official price in New Zealand. To approximate the price for the 15 remaining products, the official price was used.

All prices in this report have been converted to U.S. dollars, as of March 1970.⁹ Price comparisons are shown for a standard quantity package containing 100 tablets or capsules of uniform dosage. Where products were not available in this standard package, the necessary statistical adjustment was made.

Price Adjustments

Some adjustments of basic prices were necessary for a valid comparison. In many instances, prices were not available for the standard dosage and/or quantity employed in the study. When this occurred, prices for other dosages and/or quantities were adjusted to conform to the established standard. When the U.S. price for the standard dosage or quantity was not available, the price was calculated from a larger, hence more economical, dosage or quantity. Adjustment in the "downward" direction tends to make the calculated price equal to or less than the actual price. All adjustments of foreign prices were in the "upward" direction, which tended to make the calculated foreign prices equal to or greater than the actual prices.

The method chosen for collecting U.S. prices also avoids adjustments that could produce bias. Whenever possible, the price used was the "average wholesale price" (AWP) based on a sample of actual prices paid by druggists. Because the AWP was not available for every product,¹⁰ the "manufacturer's suggested wholesale price" was

⁹ Sources of the data on exchange rates used in converting the foreign prices were Deak & Co., Inc., Washington, D.C., and the Foreign Currency Office, Riggs National Bank, Washington, D.C.

¹⁰ The AWP was not available for Ovulen 21, Stelazine, Doriden, Compazine, Darvon, Equanil, Lanoxin, Thorazine, Benadryl, Polycillin, and V-Cillin-K.

substituted when necessary.¹¹ That price was always less than or equal to the AWP.

Listed below are the drugs for which price adjustments were necessary, with the price before adjustment indicated.

Three countries—Ireland, Italy, and Sweden—reported prices to consumers rather than prices to druggists. Irish prices were adjusted to wholesale prices by multiplying by 0.567.¹² Italian prices were adjusted by two ratios. For a drug not reimbursed by the Italian national health program (INAM), the adjustment was accomplished by multiplying the price by 0.712.¹³ For

¹¹ *Drug Topics Red Book* (1970 edition), Topics Publishing Co., Inc., New York.

¹² Conversion rate obtained from an official of the Central Pharmaceutical Co., Dublin, Ireland.

¹³ The products not reimbursable under the program are Doloxene, Triptizol, Librium, Valium, Quamil, and Ovulen. (*Italian Pharmaceutical Market, 1969*, I. M. S., vol. 1, December 1969, page 17.)

drugs reimbursed by INAM, there is a 17-percent rebate from the manufacturer to INAM on the price to the consumer; these prices were adjusted by multiplying by 0.542.

No general conversion rate was available for Sweden, but both prices to druggists and prices to consumers were available for 30 Swedish drugs.¹⁴ The markups by druggists for these 30 drugs ranged from 23.6 percent to 170.2 percent and averaged 45.3 percent. To assure that no calculated price would be less than the actual price, all Swedish prices were adjusted on the basis of the lowest markup, 23.6 percent, by multiplying consumer prices by 0.809. Use of the lowest markup means that these prices reported are equal to or greater than the actual prices in Sweden.

¹⁴ Prices were obtained from an unpublished survey by the National Health Service, Copenhagen, Denmark.

Generic name	Country	Dosage, quantity, and price before adjustment	Generic name	Country	Dosage, quantity, and price before adjustment
Analgesic: Propoxyphene HCl.....	Italy.....	65 mg., 20's for \$1.58	Ataraxics (continued) Chlorpromazine HCl.....	Brazil..... Canada..... Ireland..... Italy..... New Zealand..... United Kingdom.....	25 mg., 250's for \$3.09 50 mg., 50's for \$2.91 25 mg., 50's for \$4.43 25 mg., 25's for \$4.43 50 mg., 50's for \$9.1 50 mg., 50's for \$8.4
Antibiotics: Ampicillin.....	Italy..... New Zealand.....	250 mg., 12's for \$2.30 250 mg., 500's for \$56.50	Diazepam.....	Brazil..... Italy.....	5 mg., 20's for \$.73 5 mg., 20's for \$.68
Demethylchlortetracycline HCl.....	Ireland..... Italy.....	150 mg., 16's for \$1.44 150 mg., 16's for \$2.86	Meprobamate.....	Canada..... Ireland..... Italy..... United Kingdom.....	400 mg., 50's for \$2.57 400 mg., 20's for \$.36 400 mg., 20's for \$.74 400 mg., 20's for \$.35
Erythromycin.....	Brazil..... Italy.....	250 mg., 120's for \$14.30 250 mg., 12's for \$2.93	Prochlorperazine maleate.....	Australia..... Brazil..... Canada..... Italy..... New Zealand..... United Kingdom.....	5 mg., 25's for \$.56 5 mg., 20's for \$.25 10 mg., 50's for \$3.03 5 mg., 20's for \$.30 5 mg., 250's for \$3.66 5 mg., 25's for \$.38
Oxytetracycline HCl.....	Italy.....	250 mg., 18's for \$2.12	Trifluoperazine HCl.....	Brazil..... Ireland..... Italy..... Sweden.....	5 mg., 25's for \$.93 5 mg., 50's for \$1.39 5 mg., 25's for \$.95 5 mg., 50's for \$2.21
Potassium phenoxymethylpenicillin.....	Brazil..... Canada.....	250 mg., 8's for \$.52 250 mg., 50's for \$5.34	Cardiovascular: Digoxin.....	Italy..... New Zealand.....	0.25 mg., 50's for \$.87 0.25 mg., 1000's for \$5.20
Tetracycline HCl.....	Italy..... New Zealand.....	250 mg., 16's for \$1.73 50 mg., 25's for \$.69	Oral contraceptive: Ethinodiol diacetate with mestranol.....	Canada.....	1 mg., 5x21's for \$4.96
Antidepressant: Amitriptyline HCl.....	Brazil..... Italy.....	25 mg., 25's for \$.57 25 mg., 25's for \$.84	Sedative: Glutethimide.....	Brazil..... Italy.....	250 mg., 20's for \$.40 250 mg., 12's for \$.22
Antidiabetic: Tolbutamide.....	Canada..... Ireland..... Italy..... United States.....	500 mg., 50's for \$3.17 500 mg., 40's for \$8.88 500 mg., 20's for \$5.57 500 mg., 50's for \$4.35	Sulfonamide: Sulfisoxazole.....	Australia..... Italy..... New Zealand..... Sweden.....	500 mg., 40's for \$1.20 500 mg., 20's for \$.60 500 mg., 500's for \$6.55 500 mg., 50's for \$1.42
Antihistamine: Diphenhydramine HCl.....	Australia..... Ireland..... Italy..... New Zealand..... Sweden..... United Kingdom.....	50 mg., 50's for \$.80 25 mg., 50's for \$.34 25 mg., 25's for \$.33 50 mg., 50's for \$2.58 50 mg., 50's for \$1.17 50 mg., 50's for \$.60			
Ataraxics (tranquillizers): Chlordiazepoxide HCl.....	Brazil..... Italy..... New Zealand..... United States.....	10 mg., 20's for \$.48 10 mg., 25's for \$.89 10 mg., 25's for \$.46 10 mg., 500's for \$32.00			