

sometimes referred to as "making glorified mud-pies."⁶⁶ Furthermore, since no basic research was involved, the returns to more and more intensive exploitation of the same method have approached zero. No important antibiotic has been found in the United States since 1955, and the same is true in other drug fields.

B. Degree of product substitutability among drugs

With this background, which cannot pretend to do justice to the many complexities of the research issue, it is possible to turn to the evaluation of market performance in the four drug product categories investigated during the Senate Subcommittee Hearings, corticosteroid hormones, tranquilizers, oral antidiabetic drugs, and antibiotics. These four categories accounted for about 42 per cent of all ethical drug sales in 1959. The corticosteroids market will first be described, and will then be used as the point of departure for parallel comparisons with other drug product categories. By virtue of the emphasis which it places upon the continuous obsolescence of existing corticosteroids through the development of new synthetic steroid hormones eligible for patent protection, this market may be taken as typical of ethical drugs as a whole.

The important corticosteroids in 1959 were seven in number: cortisone, hydrocortisone, prednisone, prednisolone, methylprednisolone, triamcinolone, and dexamethasone. All of the corticosteroids are to some extent substitutes for one another in the treatment of many disorders. Striking evidence of this is available on the basis of a 1959 study by the Pharmaceutical Manufacturers Association, showing that all seven of the major corticosteroids were prescribed in every one of the seven disease groups requiring such therapy, with but two exceptions.⁶⁷ No one of these drugs is apparently characterized by advantages so great that its actual use is always exclusively in order in a certain disease group. Obviously, for individual diseases or for individual classes of patients this may not be the case, for the disease groups are not very narrowly defined, and even within the limits of a single disease, patients of different ages or with different degrees of proneness to complications might require different specific drugs. Nevertheless, it is striking that in no instance is as much as two-fifths of any disease group treated by a single drug. In such a situation it may well be the case that no drug has any commanding advantage over all the others for any major disease group; hence the patterns of demand may be greatly influenced by sales efforts, and the products may be differentiated in terms of their claimed freedom from side effects, their relative potency, their probable impact on certain types of patients, and in fact upon anything but their relative prices.

Similar evidence is available for the tranquilizers market from the same source. This time, each of the seven major tranquilizers is prescribed in every one of the five disease groups requiring such therapy.⁶⁸ The maximum usage in any disease group is 41.4 per cent. If all drugs were prescribed at random for all disease groups, each would be used in 14.3 per cent of all treatments. In only four instances is the frequency of use more than twice what one would expect on the basis of random choice. Substitution among drugs is apparently as much the rule in tranquilizers as in corticosteroids.

The oral antidiabetics drug market is more readily described. There are three such drugs, tolbutamide, chlorpropamide and phenformin. All seem to be fairly close substitutes, and tolbutamide (Upjohn's "Orinase") and chlorpropamide (Pfizer's "Diabinese") have been subjected to strenuous competitive product differentiation programs. The market shares follow the order of priority of market appearance, the earliest to appear having the largest share. These products may not be perfect substitutes, however, for it has been claimed that chlorpropamide is effective in some cases where tolbutamide is not,⁶⁹ and there is evidence to show that side effects are more frequent and severe with chlorpropamide.⁷⁰

It is impossible to summarize the extent of possible substitution among antibiotics in brief compass. The main areas in which substitution is possible are among the five "broad spectrum" antibiotics, all of which are considered interchangeable in many uses, and all of which are highly advertised; and between

⁶⁶ Subcomm. Report 124.

⁶⁷ Hearings on Administered Prices, pt. 19, at 10826. (One drug was prescribed in only five groups.)

⁶⁸ *Id.*, pt. 19, at 10827.

⁶⁹ Testimony of Dr. C. J. Donovan, formerly of Upjohn, *id.*, pt. 20, at 11070-72.

⁷⁰ Testimony of Dr. Henry Dolger, Mount Sinai Hospital of New York, *id.*, pt. 20, at 11146.