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Appendix A. Time Series: Sources and Methods

Expenditures: Data on national expenditures for physicians' services are published periodically by the Social Security Administration in the *Social Security Bulletin* and in *Research and Statistics Note*. See, for example, [11] and [8]. The series used in this paper (Table 1) represents the most recent official revision of these figures [12].

The principal component of this expenditures series is gross business receipts of physicians in private practice (sole proprietorships, partnerships, and corporations) reported to the Internal Revenue Service. Also included are the estimated gross receipts of osteopaths, a share of the gross of medical and dental laboratories (estimated to represent patient payments to them), and estimated expenses of group-practice prepayment plans in providing physicians' services (to the extent that these are not included in physicians' gross self-employment income). Estimated receipts of physicians for making life insurance examinations are deducted from the above. It should be noted that the expenditures series so obtained does not represent the market value of the services of all practicing physicians. Excluded are the salaries of public and private hospital staff physicians (considered a component of hospital care); salaries of physicians in public health departments (classed with government public health expenditures); and salaries of physicians in the Armed Forces and Indian Health Service (classed as expenditures for "medical activities in Federal units other than hospitals") [35].

Public expenditures: Federal, state, and local payments for the services of private practice physicians. These data are published regularly by the Social Security Administration, along with the data on total expenditures. We have used the most recent revision of these figures [12].

Customary price: Average annual level of the index of physicians' fees of the Consumer Price Index [60].

Average price: See Appendix B.

Insurance: Private health insurance benefit payments for surgical and regular medical expenses (including major medical payments for these purposes). Annual data are published by the Health Insurance Institute [23]. For 1952-60, see [23, 1961 edition, p. 41]; for 1960-68, see [23, 1969 edition, p. 35]. For 1948-51, data published in [23] only apply to commercial insurance companies and Blue Shield—they do not include benefits paid by Blue Cross or by independent

hospital-medical plans. We therefore estimate a total for these years by assuming that the ratio of Blue Shield benefits to payments made by all noncommercial insurers was the same in 1948-51 as in the average of the two succeeding years (71.4 per cent in 1952, 71.8 per cent in 1953). This gives us an estimate of benefits paid by noncommercial sources. Adding this to the benefit figure for insurance companies, we have total private insurance benefits for physicians' services for these four years.

Third-party payments: The sum of public expenditures and private insurance benefits.

Net price: The sum payable by the patient himself for one standard visit. Net price is computed as average price multiplied by the ratio of direct expenditures (total expenditures less third-party payments) to total expenditures.

Persons insured: The number of individuals with at least one form of private insurance coverage for physician expenses. This is estimated as the number of persons covered by surgical insurance policies plus 2 per cent of those with regular medical policies plus 2 per cent of those with major medical policies [23]. An explanation of this formula is included in Appendix B, under variable I_p .

Quantity: Expenditures divided by the average price index.

Population series: U.S. civilian resident population, July 1 of each year. Alaska and Hawaii are included beginning 1959. For 1948-58, see [46]; for 1959-67, see [47]; and for 1968, see [45].

Real disposable personal income: [14].

Demographic index—visits: For 1948, 1956, 1966, and 1968, the percentage of the total population in each of twelve age-sex classes [47: 1949, 1957, 1967, and 1969 editions] was weighted by average per capita physician visits for that class, July 1963-June 1964 [56, Table 7], to arrive at a predicted per capita visit figure for each year.

Demographic Index—expenditures: For 1948, 1956, 1966, and 1968, the percentage of the total population in each of twelve age-sex classes was weighted by average per capita expenditures for physicians' services for that class, 1962 [55, Table 1], to arrive at a predicted per capita expenditures figure for each year.

Real gross national product (GNP): GNP [14, p. 177] divided by GNP implicit price deflator [14, p. 180].

Persons engaged (total economy): For 1948-65, [48, pp. 112-13]; for 1966-68, [50].

Crude death rate: A three-year average, centered on the given year, of the number of deaths per 1,000 population. For 1949-67, see [47]; for 1968, see [32].

Crude death rate, cancer and heart disease: A three-year moving average. For 1949-67, see [47].

Average length of stay (days): For nonfederal, short-term general hospitals and other special hospitals [25, various issues].

Hospital days: Product of admissions and average length of stay, for nonfederal, short-term general hospitals and other special hospitals [25, various issues].

Physicians: The basic series used in the computation of expenditures per physician and of quantity per physician (Tables 7 and 9) refers to physicians in private practice. Prior to 1959 the figures apply to the forty-eight states and the District of Columbia; beginning with that year the data are for fifty states and the District of Columbia. The sources for this series, as well as for the complete categorization of all U.S. physicians by activity, are [31, p. 3] for 1949, 1955, 1957, and 1959, and [2] for 1963, 1966, and 1967.

Specialists: Private practice physicians who are full-time specialists [31], [2]. Prior to 1963 the number of private practice physicians with a part-time specialty was steadily shrinking relative to the number with full-time specialty. Since then the AMA statistics only distinguish "specialists" and general practitioners, with no explanation given as to the current classification of those physicians who formerly would have fallen into the part-time specialist category.

General practitioners: [31], [2]. Prior to 1963 the figure includes part-time specialists.

Per cent partners: Number of physicians filing partnership returns as a per cent of all physicians filing business income tax returns for medical practice [33, p. 74].

Visits per physician: Applies to self-employed physicians under sixty-five years of age. In 1947, the average physician had 25.1 visits per day and worked 6 days a week, 48.75 weeks per year, giving a total of 7,342 visits per year. By 1968, the median number of visits per week had fallen to 131 and the median number of weeks worked to 47.9 (1967), for a total of 6,275 visits per year. [29, issues of February 1948, March 1948, May 1949, April 1, 1968, and December 8, 1969].

Quantity per visit: The increase in the quantity of physicians' services per visit which has occurred over time can be decomposed into an increase in quantity attributable to the shift toward specialization—analogue to an increase in quality insofar as specialists are higher-quality physicians—and a residual representing the pure productivity increase for physicians of a given level of training. The quality of the average visit in a given year is computed by determining the per cent of total visits performed by each kind of practitioner, and then weighting specialists' visits according to their higher average receipts, in this case 1.93 (see Appendix C, variable a). Thus

$$QL = \frac{V_g G + a V_s S}{V_g G + V_s S}$$

where QL = quality of the average visit; V_g , V_s = visits per G. P., visits per specialist; G, S = number of G. P.'s, number of specialists; a = "quality" of a specialist's visit relative to one by a G. P. (measured by ratio of average gross receipts per visit). In 1947, G. P.'s (67.7 per cent of the total) made 27 visits per day, while specialists made only 22 [29, May 1949]; in 1966, G. P.'s (34.2 per cent of total) were making 154 visits per week, specialists, 91 per week [29, Feb. 6, 1967]. These data cover solo practitioners only. Thus, the average quality of a visit rose from 1.26 to 1.49 over this nineteen-year period (a rate of 0.9 per cent per year) as a result of the shift to specialization.

Average business expenses per physician: Average gross business receipts per physician minus average net profit per physician, as reported to the Internal Revenue Service [33, p. 75].

Expenditures for dental services: [28].

Fee index for dental services: [28].

Dentists: [33].

Table A-1
Public Expenditures and Insurance, 1948-68

Year	Public Expenditures for Physicians' Services (Millions of \$)	Private Medical Insurance Benefits (Millions of \$)	Persons with Private Medical Insurance Coverage (Millions)
1948	\$116	\$158	34.3
1949	126	196	41.5
1950	143	294	54.6
1951	164	413	65.4
1952	184	537	73.2
1953	207	655	81.9
1954	230	735	86.9
1955	248	840	90.1
1956	272	955	99.5
1957	310	1,178	106.9
1958	348	1,315	109.4
1959	371	1,474	114.9
1960	366	1,642	119.6
1961	407	1,878	125.5
1962	446	2,084	129.6
1963	475	2,311	134.8
1964	511	2,577	138.5
1965	552	2,876	143.8
1966	785	3,086	148.2
1967	1,989	3,535	154.1
1968	2,638	3,761	159.6

Table A-2
Physicians, by Type of Practice, 1947-68

Year	Physicians in Private Practice	Specialists in Private Practice	Per Cent in Partnership Practice	Average Business Expenses per Physician
1947	148,627 ^a	47,943	5.8	\$6,443
1948	149,519 ^a	51,300 ^a		
1949	150,417	54,891		
1950				
1951				
1952				
1953			9.5	8,755
1954				
1955	152,305	67,114		
1956	153,825 ^a		14.0 ^b	
1957	155,827	74,384	12.1 ^b	11,113
1958			15.5 ^b	12,139
1959	160,592	78,635	12.6	12,707
1960	164,847 ^a		16.8	12,768
1961			16.0 ^b	13,038
1962			15.1	13,405
1963	178,295	110,204	16.3	14,379
1964			22.4	15,794
1965			22.2	16,480
1966	185,847	122,270	22.7	17,450
1967	188,772	126,508		
1968	191,037 ^a			

^a Interpolated or extrapolated.

^b Estimated by Louis S. Reed, [33].