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# Trends in medical school library statistics in the 1980s

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Ten years of statistics from over 140 U.S. and Canadian medical school libraries are analyzed to determine trends in library collections, staffing, services, and expenditures. In addition, ratios of use patterns and personnel utilization are shown. Costs over the ten-year period are examined in both actual and constant dollar amounts. The trends in costs show continuous rises in absolute and constant dollars both for materials and personnel. The number of serials subscriptions remained fairly constant while the number of monographs added declined slowly. Collection use grew, although traditional external circulation declined. Interlibrary lending and borrowing increased throughout the decade. Reference service workload increased, while the use of external databases decreased. The longitudinal data indicate trends in medical school libraries that may assist administrators and staff to shape future services, staffing patterns, and budget requests.

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Early in a new decade it is appropriate to look back on the previous one for insights that can assist in planning for the future. Changes in the environment of medical school libraries during the 1980s (the rapid automation of services, changes in funding from the National Library of Medicine [NLM], and the seemingly inexorable rise in costs of materials, to mention a few) must have had effects on those libraries. To the extent that objective, quantitative data can lend some insight, it is instructive to study the data for significant trends. This paper, based on a review of data collected for ten years from U.S. and Canadian medical school libraries, presents a comprehensive picture of more than 140 libraries during the period 1980 through 1989.

## BACKGROUND

In 1978, the Houston Academy of Medicine-Texas Medical Center (HAM-TMC) Library began publish-

ing the *Annual Statistics of Medical School Libraries in the United States and Canada*, replacing an abbreviated statistical publication that was issued from 1975 to 1977 by the University of Texas Southwestern Medical School Library in Dallas [1]. In 1979, the Association of Academic Health Sciences Libraries Directors (AAHSLD) began providing financial and editorial support for the *Annual Statistics*, recognizing the value of the prompt and accurate reporting of medical school library statistics. In 1991, the *Annual Statistics* became fully supported by AAHSLD.

Each fall, the *Annual Statistics* Editorial Board sends questionnaires to more than 140 U.S. and Canadian medical school libraries to gather data for the libraries' fiscal years ending in the year of each survey. Specifications and definitions are set by the editorial board, which is composed of six medical school library directors selected from the AAHSLD membership. Richard Lyders, who initiated the publication at the HAM-TMC Library in 1977 with the assistance

**Table 1**  
Constant dollar multipliers

Year	CPI* United States	Constant dollar	CPI Canada	Constant dollar
1980	—	1.00	—	1.00
1981	10.3	0.897	12.5	0.875
1982	6.2	0.841	10.8	0.781
1983	3.2	0.814	5.8	0.735
1984	4.3	0.779	4.3	0.704
1985	3.6	0.751	4.0	0.675
1986	1.9	0.737	4.2	0.647
1987	3.6	0.711	4.4	0.619
1988	4.1	0.681	4.0	0.594
1989	4.9	0.648	5.3	0.562

\* Consumer price index.

of Maurice Leatherbury, has continued to serve as the board's chairman.

After the survey forms have been returned, the data are entered into computer databases to produce the printed *Annual Statistics*. The publication appears annually, usually in early spring. Over the years, participation among the libraries eligible for inclusion (those holding "institutional" or "affiliate institutional" membership in the Association of American Medical Colleges) has been very high, at least 95%. The data, therefore, present a comprehensive view of medical school libraries in the United States and Canada each year.

## DATA COLLECTION AND ANALYSIS

Data are available from machine-readable files for each of the twelve years that the survey has been taken. Data from ten years are included in this article, spanning the decade of the 1980s [2]. The choice of data to report was limited by the availability of data elements. For example, data have never been collected on expenditures for professional salaries by number of librarians, so trends in librarians' salaries could not be shown. Definitions of some data elements have changed over the years, so ten-year comparisons were not always possible. "Serials subscriptions," for example, initially included only printed serials; later refinements in data collection separated print from microform subscriptions.

Additions to the data elements in the later years of the decade provide important information on new trends, such as expenditures for computer software, but such data are insufficient to indicate long-term trends. The choice of data reported here, therefore, was to a large extent dictated by the number of years during which data were collected.

To provide meaningful comparisons between expenditures over the ten-year period, constant dollars have been calculated. Both nominal dollars (actual

current-year dollars) and constant dollars (dollars adjusted for inflation, indexed to 1980) are reported for all expenditure amounts. U.S. and Canadian conversions were calculated based on the consumer price index for each country for the years reported, as found in official U.S. government publications [3-4]. With 1980 as the base year and 1981 as the first year of constant dollar adjustment, the previous year's dollar value was multiplied by the current year's consumer price index (the percentage increase in prices over the previous year), then that result was subtracted from the previous year's dollar value to give the current year's value in 1980 dollars. For example, the inflation rate in 1981 was 10.3%. Multiplying 1.00 (the 1980 dollar value) by 0.103 and subtracting that from 1.00, one arrives at 0.897. This means that in 1981, the dollar bought only 89.7% as much as it had in 1980. Each country's inflation rate was used to produce the constant dollar multipliers for expenditures that are reported later (Table 1).

The figures presented reflect means of the responding libraries in each year for the different variables shown. Some libraries did not respond to the questionnaire in all of the years analyzed, and missing data on variables were excluded from means, so data points on the graphs may not represent the same number of responding libraries from year to year. In 1980, 123 libraries responded to the questionnaire, while in 1989, 144 libraries did so, and it is possible that variations in the responding libraries may have skewed the data over the period examined. However, in the ten-year period covered, the minimum response rate from all medical school libraries was in excess of 95%.

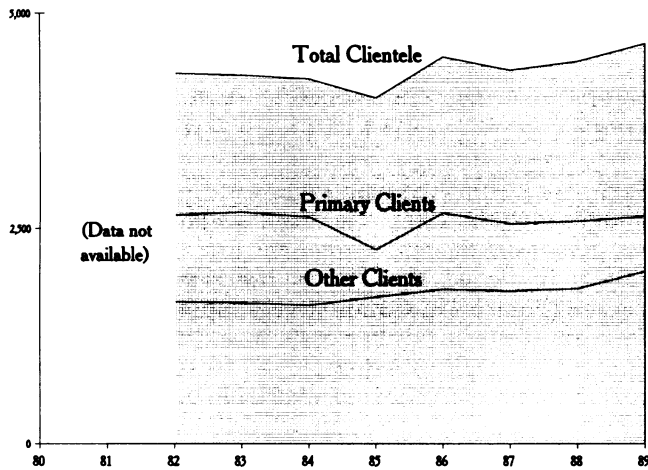
## CLIENTELE

Figure 1 shows the mean number of primary clients in the health sciences (faculty, students, and house staff in the academic health sciences programs) per library. As the definition of "primary users" changed in 1981, the first two years of the decade are excluded from the chart. With the exception of a 14% decrease in 1985, the mean number of primary clients has remained almost constant over the decade. On the other hand, the number of other clients (faculty and students from other programs on campus, hospital staff, etc.) has slowly increased by some 22%. The data therefore indicate a trend toward increased nonacademic health science users, with primary clients comprising only 56% of total users by 1989.

## COLLECTIONS

Trends in several aspects of medical school library collections are shown in Figure 2. The number of print volumes added declined early in the decade,

**Figure 1**  
Mean number of clients in medical school libraries, 1982–1989:  
primary, other, and total



rose again in the middle years, then leveled off as the end of the decade approached (Figure 2a). Since the number of print serial subscriptions remained relatively constant (Figure 2d), the leveling off in the number of print volumes added later in the decade may be related to the slow decline in the number of monographs added to the collections (Figure 2b). Monograph data were collected only in the last six years of the decade, and medical school libraries collected fewer monographs as the decade came to a close (Figure 2b). The libraries maintained the currency of their collections by withdrawing higher numbers of printed materials each year of the decade except during the years 1983 and 1984 (Figure 2c).

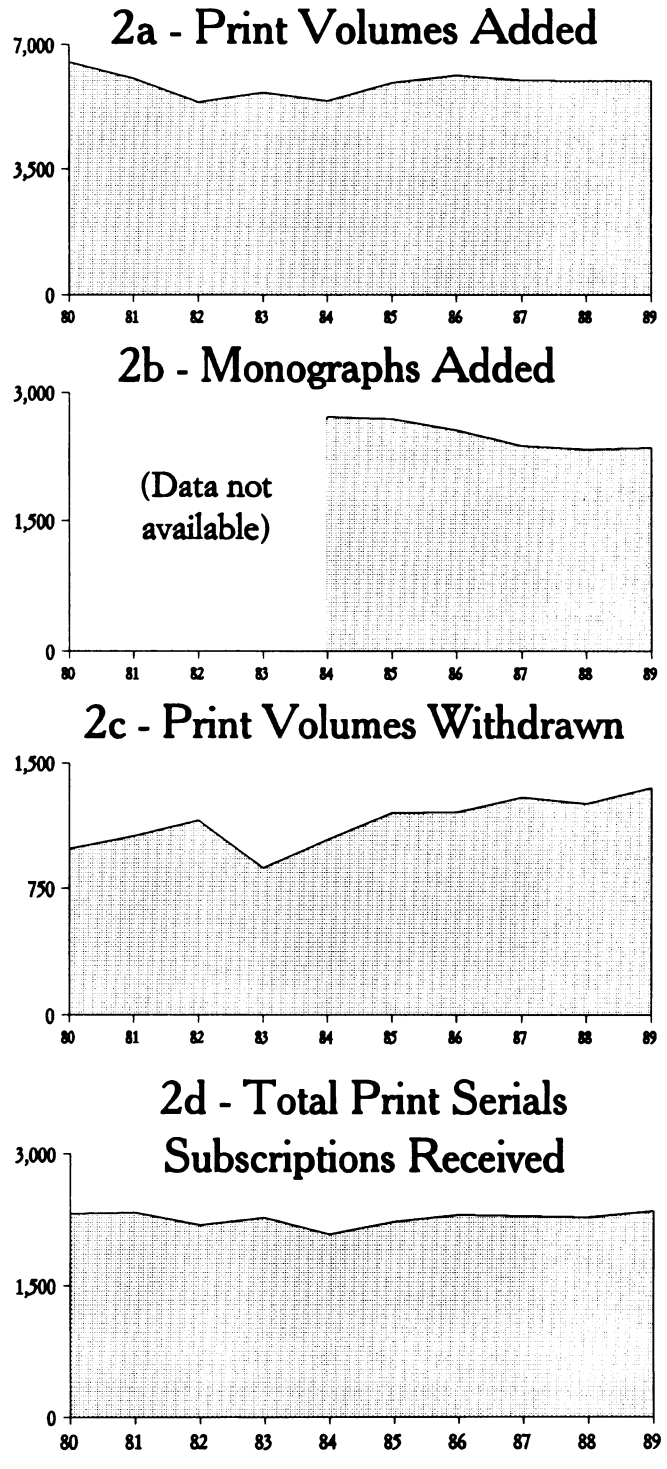
The heart of the medical school library collection, its serials subscriptions, showed a downward trend through the first half of the decade as budgets were sparse both in actual dollars as well as in their purchasing power (Figure 2d). The second half, however, shows a slight rise in the average number of serials subscriptions (12.8% increase from 1984 to 1989). From 1986 to the end of the decade, the rise is uneven, possibly a reflection of the effect of increased serials prices.

#### EXPENDITURES FOR MONOGRAPHS, SERIALS, AND BINDING

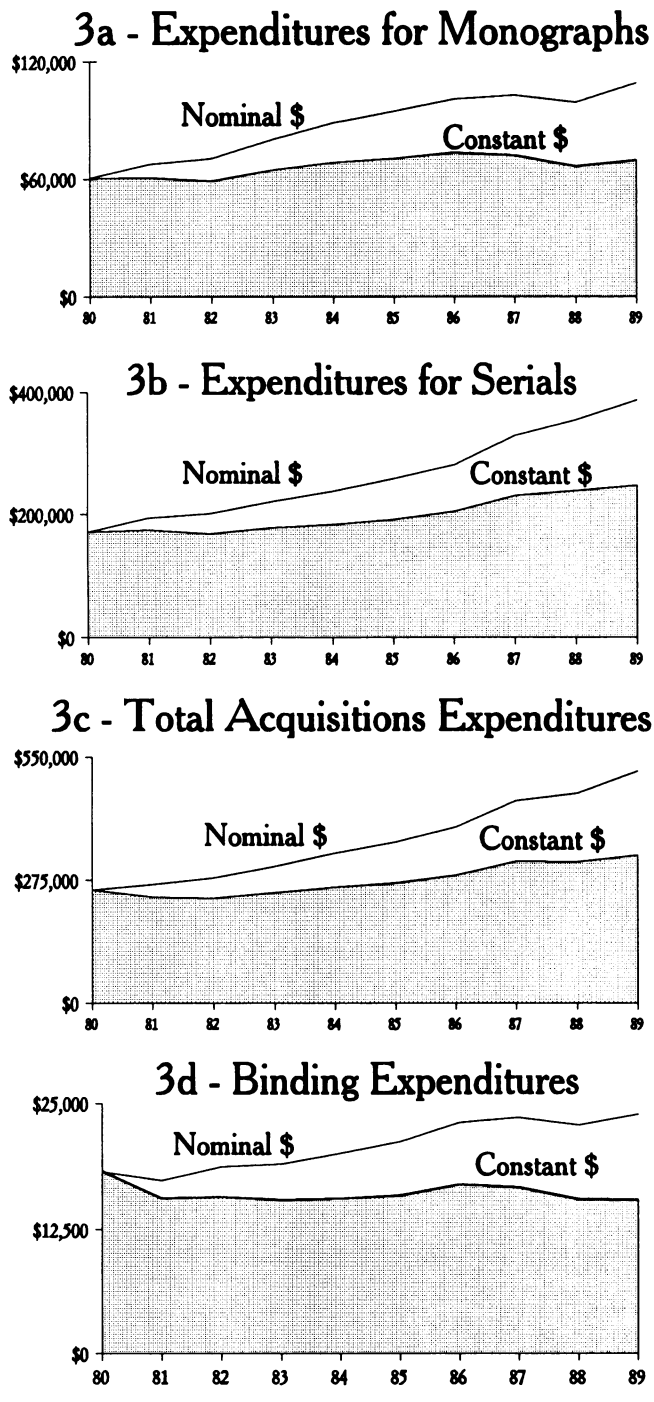
Each of the expenditure graphs shown in Figure 3 shows the nominal dollar amounts (actual, unadjusted expenditures in dollars) as well as constant dollars (adjusted for inflation, indexed to 1980). For comparison purposes, the constant dollar charts are more indicative of real differences.

In constant dollars, the figures show that mono-

**Figure 2**  
Number of print volumes added, monographs added, print  
volumes withdrawn, total serials received, 1980–1989



**Figure 3**  
Expenditures for monographs, serials, and binding, 1980–1989



graph expenditures (Figure 3a) grew at an average rate of 1.5% per year while serials expenditures (Figure 3b) grew at an average rate of 4.5% per year. When total expenditures for all collection materials (print,

audiovisual, microform, computer software, etc.) are combined (Figure 3c), the trend also shows a gradual increase in constant dollars (3.1% per year). Expenditures for binding (Figure 3d) decreased in 1981 and increased slightly in 1986, otherwise they were essentially flat over the decade.

#### EXPENDITURES: PERSONNEL, LIBRARY OPERATIONS, AND REVENUE SOURCES

Salaries consume the greatest proportion of a library's budget (46% in 1989). Constant dollar expenditures for personnel decreased over the first two years then slowly increased throughout the remainder of the decade (Figure 4a). Cumulatively, nominal costs rose 78%, and constant dollar costs rose 14%. Staff development expenditures (employee travel, conference registrations, etc.) showed a variable picture over the decade (Figure 4c), with an average overall increase of 3.4% per year. All expenditures gradually increased over the decade until 1986, followed by a slight increase; then they leveled off in the three succeeding years (Figure 4e).

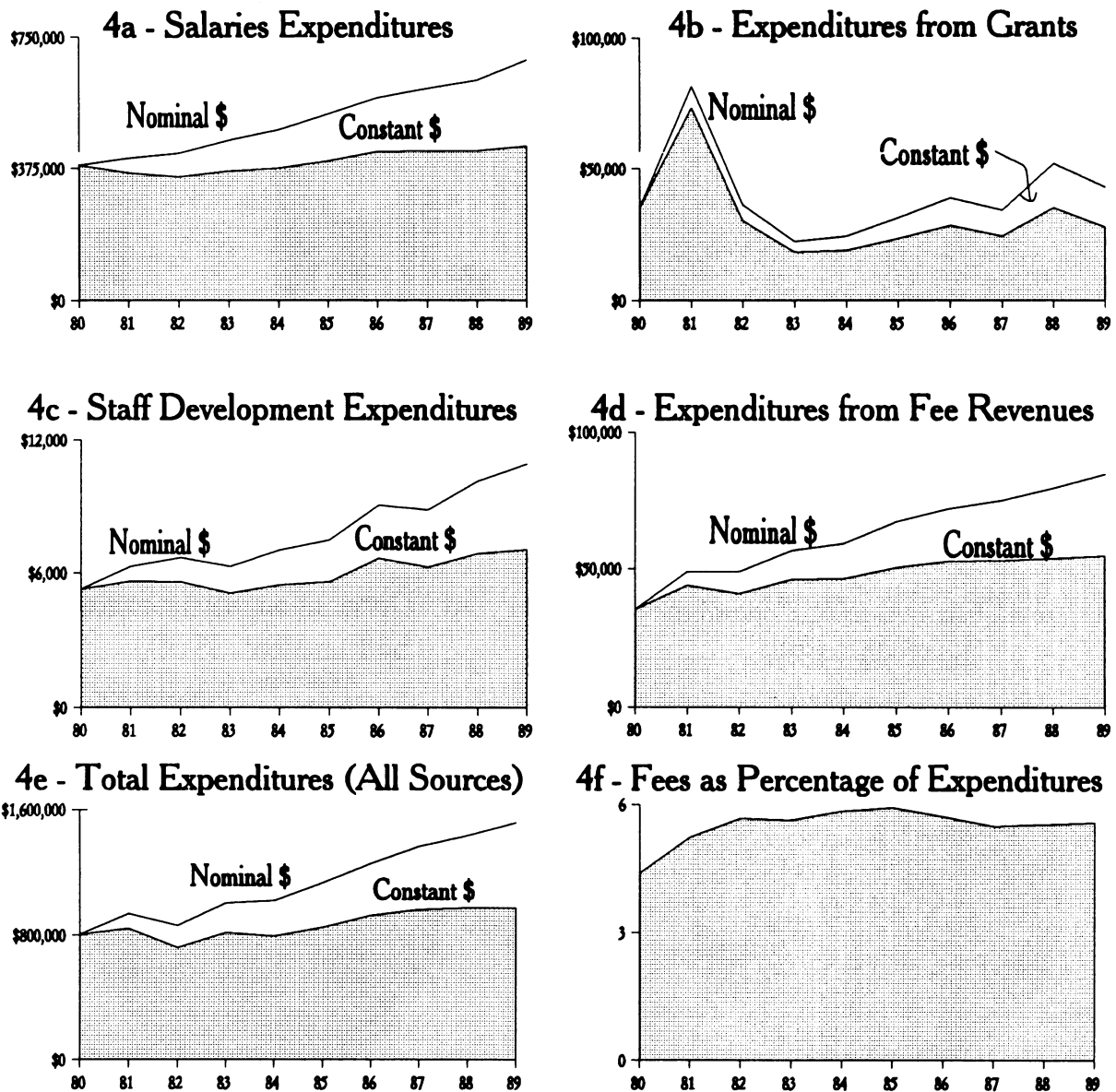
While not significant compared with funds from regular sources (appropriated or fee-for-services), grants are important to medical school libraries, as they provide funds for research and development. Average expenditures from grants (Figure 4b) fluctuated during the decade, falling from their peak in 1981 of \$81,651.00 to \$42,979.00 nominal dollars in 1989, a decline of 47%. This pattern generally reflects the budget for the Medical Library Assistance Act, as described by Bunting, suggesting that the variation was caused by the changing levels of government grant support to medical libraries [5].

Williams, Lemkau, and Burrows stated that fee revenues in the libraries they studied rose as a percentage of nongrant expenditures from 1981 to 1985 [6]. Figure 4f confirms that rise (Figure 4d shows the expenditures themselves), followed by a leveling off in the second half of the decade. From a peak of 5.9% in 1985 (compared to William's 6.5%, but for recurring expenditures only), the percentage declined to 5.5% in 1987, then rose slightly to 5.6% in the last year of the decade. The decline may be attributed to the leveling off in photocopying for clients and the drop in mediated database searches, both important sources of revenue in many libraries. (Those two services are charted later.)

#### PERSONNEL

The average number of personnel employed in medical school libraries varied little throughout the decade (Figure 5a). The number of professionals also remained relatively constant, ranging from a low of 9.7 per library in 1982 to a peak of 10.7 in 1986. For

**Figure 4**  
Average library expenditures: personnel, total expenditures, revenue sources, 1980–1989

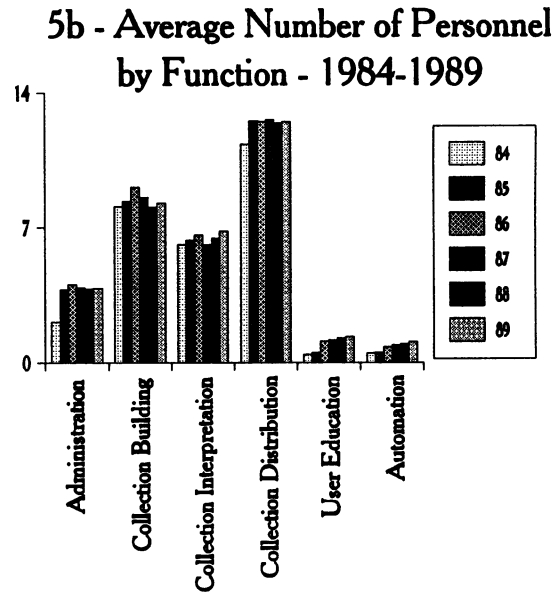
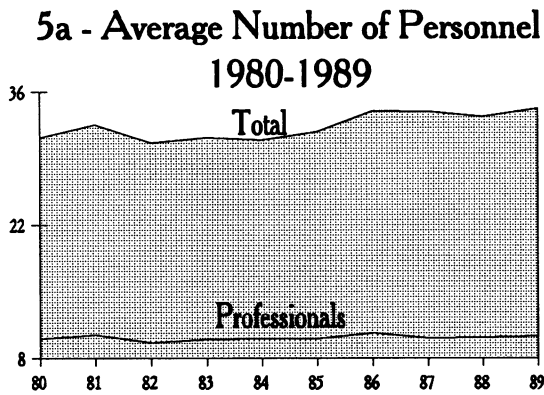


all personnel, the average number rose slowly from a low of 30.6 in 1982 to 34.5 in the last year of the decade. Medical school libraries have therefore made increasing use of support personnel (paraprofessionals, clerks, and hourly workers). Figures are not available throughout the decade to show trends in types of personnel, but by 1989, clerical workers were employed more than any other type, followed by professional, hourly, and finally paraprofessional workers (Figure 5c).

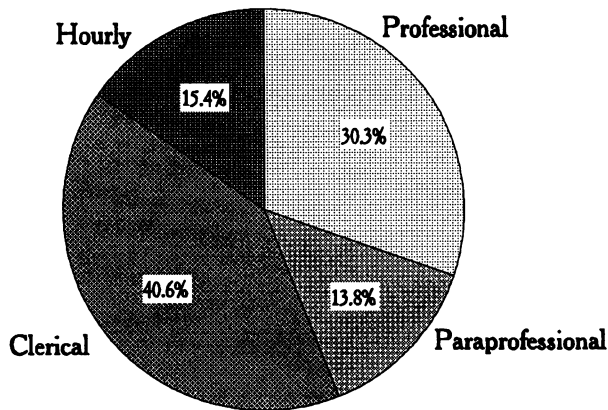
The distribution of workers by function showed

minor changes (Figure 5b). "Collection building" includes acquisitions, cataloging, collection development, and physical processing. "Collection interpretation" includes information services, special collections, and audiovisual services. "Collection distribution" encompasses circulation, interlibrary loan, photocopy, and stack maintenance. "User education" represents education and outreach functions. In the last year of the decade (Figure 5d), building and circulating the collection consumed more than 60% of the personnel resources of the libraries; one fifth of

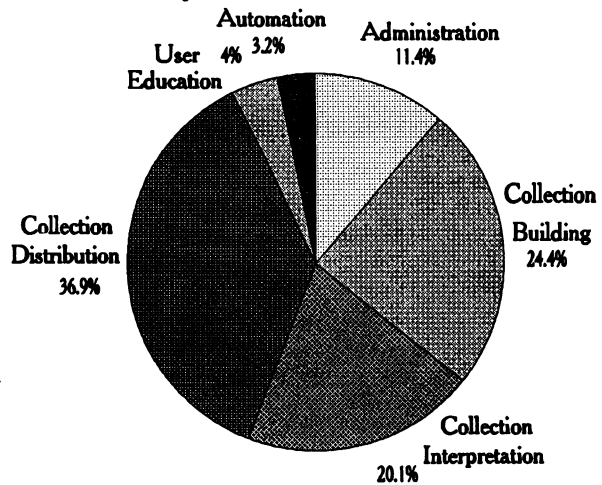
**Figure 5**  
Personnel in medical school libraries, 1980-1989



**5c - Distribution of Personnel by Class - 1989**



**5d - Distribution of Personnel by Function - 1989**



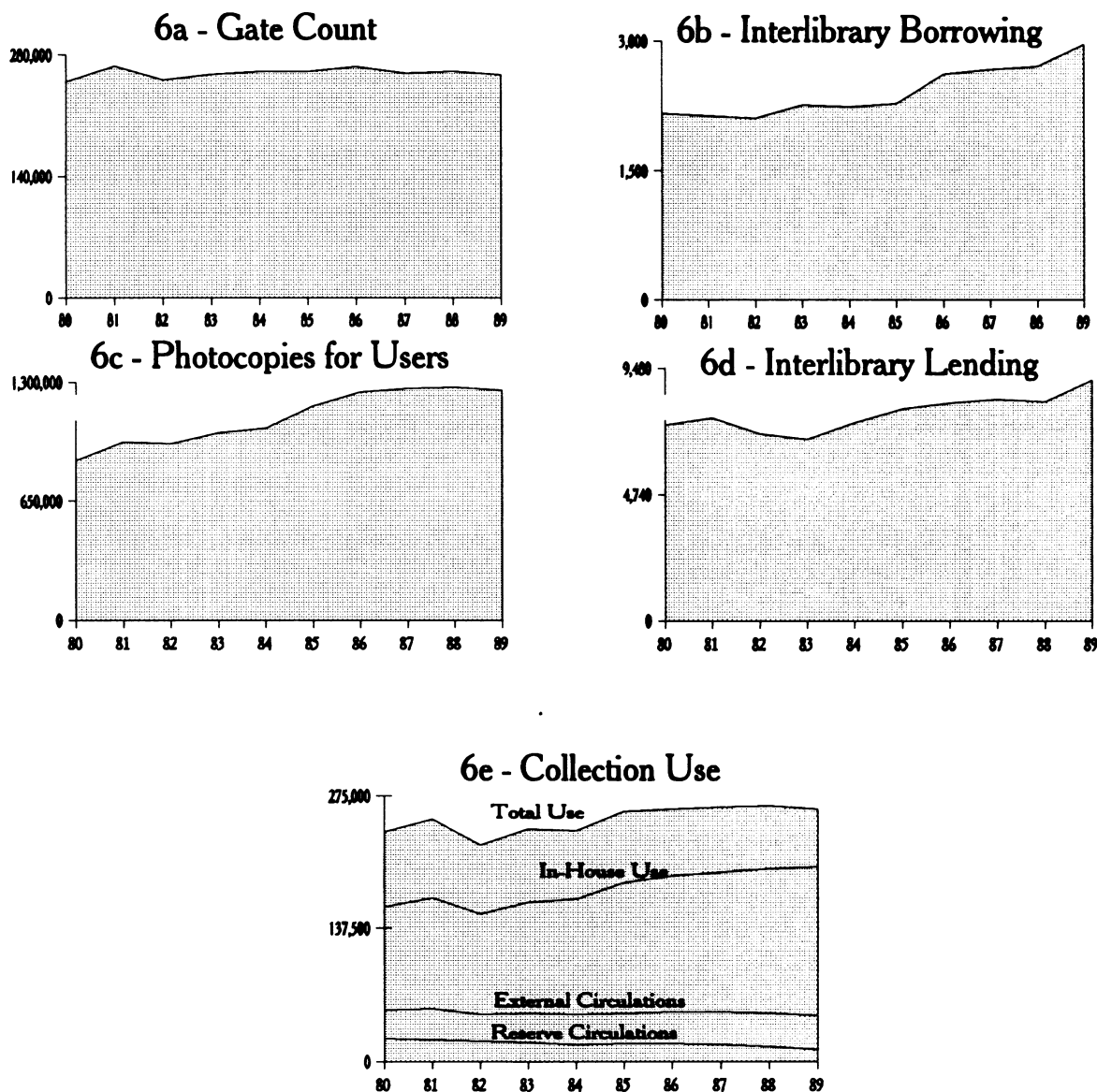
library personnel assisted clients in use of the collections; and one in every ten library employees was involved in administration.

**HEALTH SCIENCES LIBRARY USE**

Gate count (the number of persons entering the library) was fairly constant over the decade (Figure 6a), with a slight peak in 1981, leveling off through 1989.

From 1980, external circulation of materials declined by 11% by 1989, while reserve circulations declined by a much larger 41%. In-house use of library materials, on the other hand, consistently increased over the last eight years of the decade. Because the volume of materials used in-house dominated circulation data, the trend in total collection use was generally upward, although it did drop in 1982 and declined slightly in the last year of the decade (Figure 6e).

**Figure 6**  
Medical school libraries use, 1980–1989

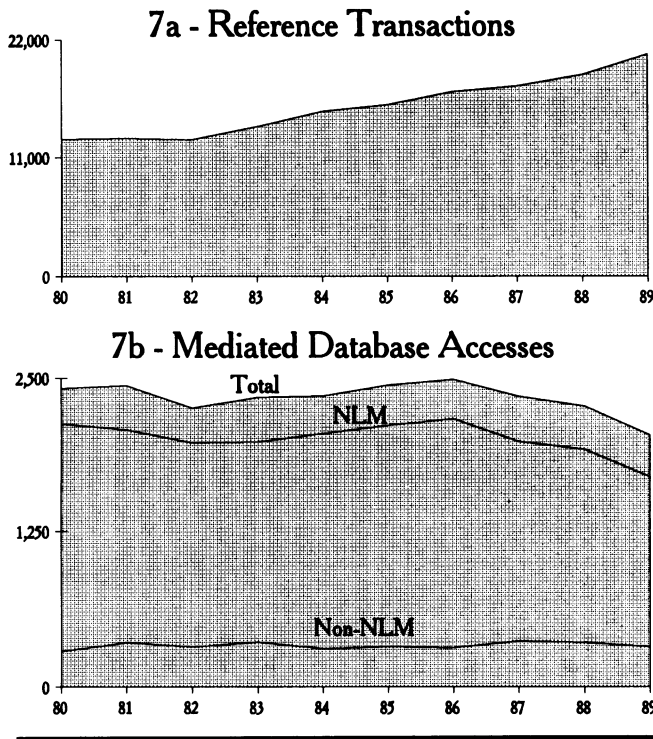


The number of pages photocopied for clients (Figure 6c) increased about 70% over the decade, but also leveled off during the last five years. Interlibrary borrowing (Figure 6b) and lending (Figure 6d) increased almost uniformly; medical school libraries needed to go outside their own resources more frequently to fill their clients' needs and lent more of their materials to other libraries. The drop in interlibrary lending from 1981 to 1983 coincides with changes in NLM's funding of such activity, as documented by Bunting [7].

#### REFERENCE TRANSACTIONS AND MEDIATED DATABASE ACCESSES

Activity at the reference desk of medical school libraries increased, on the average, some 60% between 1980–1989 (Figure 7a). On the other hand, librarian-mediated database searching (Figure 7b) showed mixed trends, with NLM database searching declining in the first third of the decade, increasing slightly in the middle third, then declining rapidly in the last third of the decade. There was little change in the

**Figure 7**  
Average number of reference transactions and mediated database accesses in medical school libraries, 1980–1989



use of non-NLM databases, although the volume of searches was small relative to NLM database searches. In the last four years, the clear downward trend in librarian-mediated database searches may have resulted from increased end-user searching through locally mounted tape or CD-ROM databases and the availability of local area networks.

### SUBSCRIPTION COSTS, MONOGRAPH COSTS, AND SALARIES

Subscription costs are a sensitive, even explosive subject in the library world today. Librarians accuse serials publishers of price gouging, while publishers justify cost increases by citing inflation and increased article counts in their publications [8–9]. Figure 8a supports the view that journal price increases outstripped the general inflation rate in both the United States and Canada during the latter part of the decade. Paid subscription prices over the past five years (Figure 8a) show a 23% increase in constant dollar cost, meaning that subscription price increases outpaced inflation by an average of nearly 5% per year. The price index compiled by the American Library Association's Association for Library Collections and Technical Services (ALCTS) in 1990 showed that U.S.

medical periodicals increased in price by 9.3% in constant dollars in the 1989 subscription year [10]. However, the average cost of the serials subscribed to by medical school libraries declined in constant dollars between 1988 and 1989 by one half of a percentage point. Several explanations of this discrepancy in cost differences are possible: Tagler's assertion that prices would decline in 1989 was true [11]; the ALCTS price index includes only a small sample (182 titles) of U.S.-only medical periodicals and is not representative of the subscriptions actually purchased by the libraries in the *Annual Statistics*; and libraries canceled high-cost serials or replaced them with lower-cost ones.

The price of monographs also increased in constant dollars during the past five years (Figure 8b), although the last two years show a decline, then an increase. The percentage rise in cost over the five-year period, however, was not nearly as severe as for journals: 12% as compared with 23%.

Average salaries shown in Figure 8c are gross aggregations as they combine professionals, paraprofessionals, clerks, and hourly workers. The figure shows that constant dollar personnel costs increased consistently in the last nine years of the decade. After a steep drop in 1981 (inflation in that year was 10.3%), the average library staff enjoyed a steadily increasing income. The real purchasing power of library salaries increased about 15% since 1981.

### VISITS TO LIBRARY, IN-HOUSE USE, CIRCULATIONS, AND REFERENCE TRANSACTIONS PER CLIENT

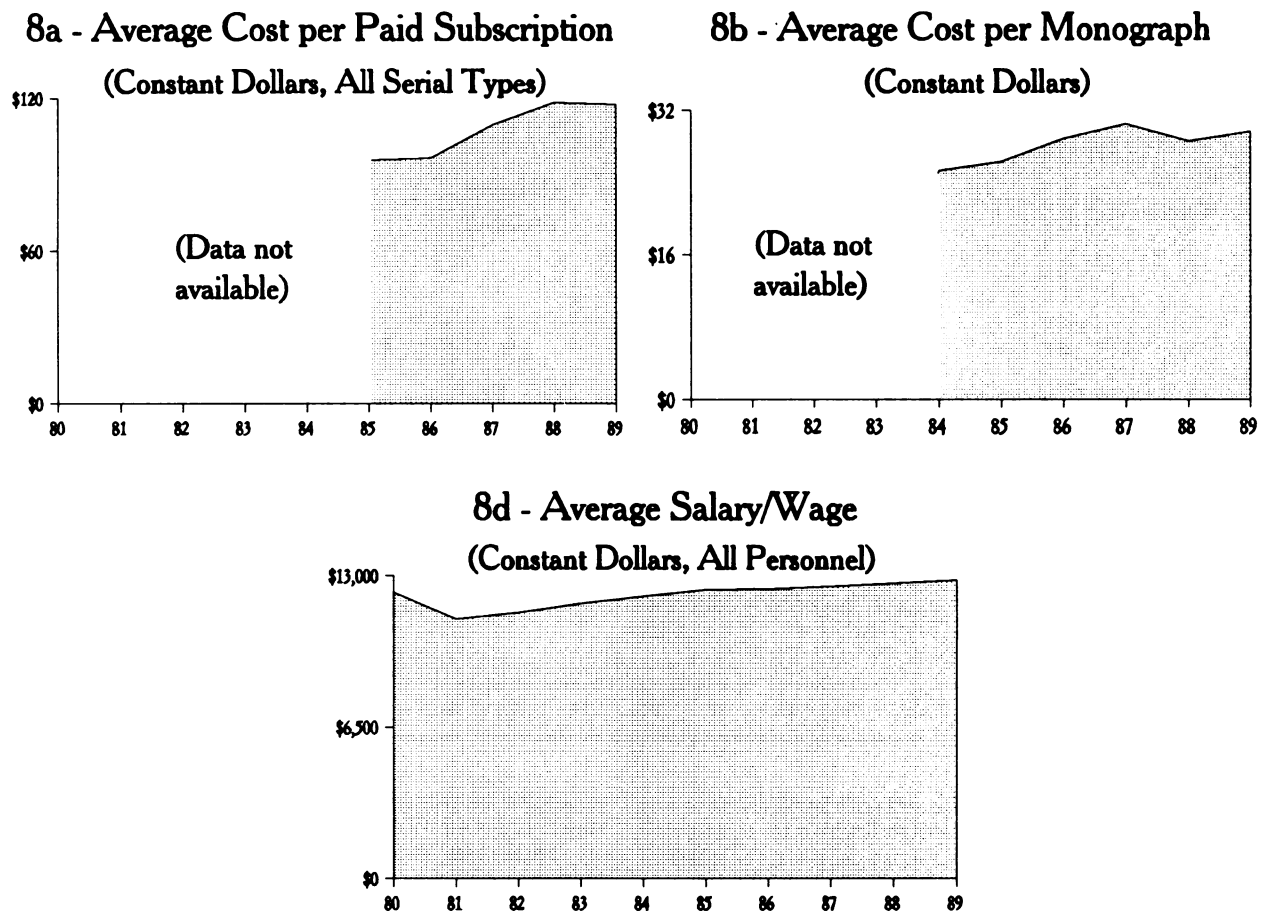
Figure 9 shows the density in use of medical school library facilities and collections as measured by uses per client. (Because the definition of primary clients changed in the 1981 survey, data for 1980 and 1981 are not shown.) Figure 9a shows that the average library client came to the library less frequently at the end of the decade than at the beginning and checked-out fewer items (Figure 9c). On the other hand, the average client made heavier use of library materials while in the library (Figure 9b), although in recent years this use has declined. The trend in reference transactions of all types asked per client (Figure 9d), however, is clearly upward for the decade, with only a slight decline in 1986. Reference transactions reflect use of the library in an age of automation and networking, as it takes into account use of the library from outside as well as inside (telephone and walk-in use).

### DISCUSSION

It is difficult to draw general conclusions about trends in medical school libraries during the 1980s, as many variables are involved in the interpretation of macro



**Figure 8**  
Average subscription costs, monograph costs, and salaries in medical school libraries, 1980–1989



data. The following broad trends, however, may be inferred:

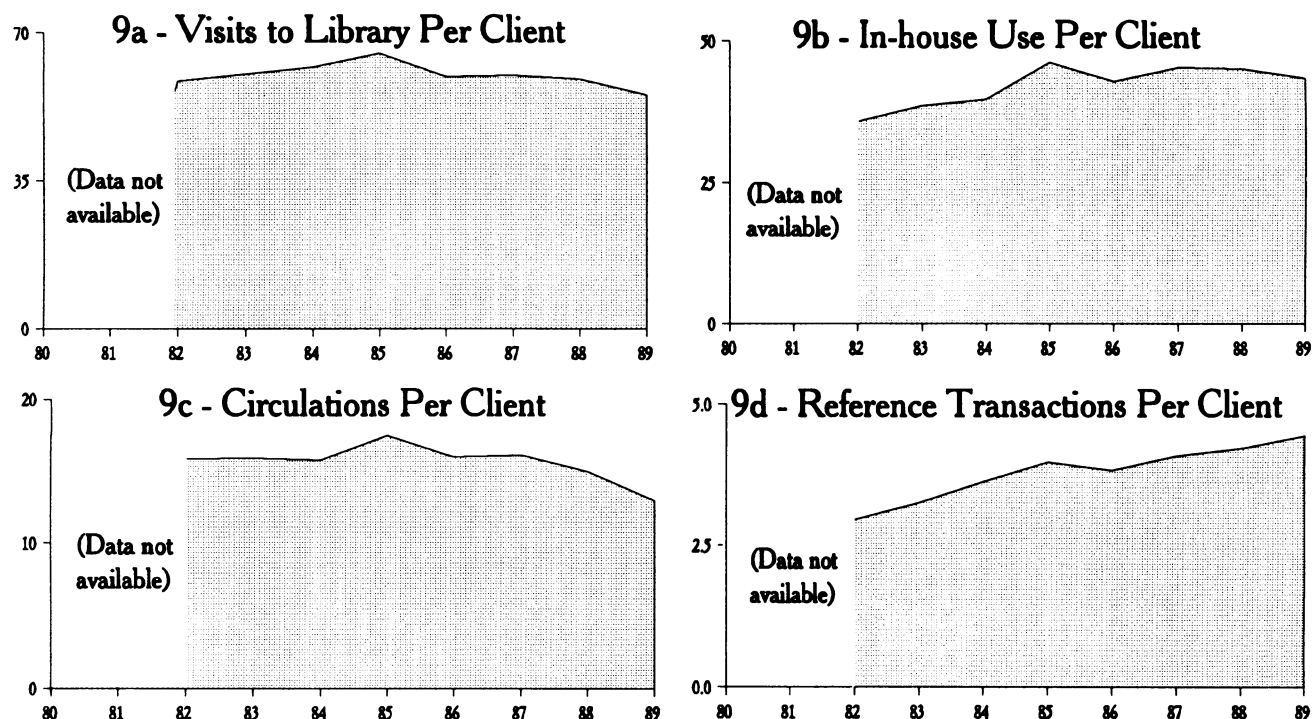
- **Costs.** The costs of providing library services to medical school clients continues to rise, both in absolute and in constant dollars. The data do not permit conclusions about the total productivity of the library, as value judgements about the relative worth of services (interlibrary loan, database searching, circulation of materials, user training, etc) cannot be made.
- **Collections.** The number of serial subscriptions remained fairly constant over the decade, while the number of monographs added to the collection declined slowly, particularly at the end of the decade. The costs of these materials rose throughout the decade, outstripping the general rate of inflation in the economies of the United States and Canada. A slight abatement in the rise of serial costs was indicated in 1989, but it is too insignificant for projecting a trend.
- **Personnel.** The number of personnel employed in medical school libraries varied only slightly during

the decade. Although functional assignments (reference, cataloging, interlibrary loan, etc.) remained relatively constant, the number of support personnel increased in comparison with professionals.

- **Library use.** Use of the libraries' collections rose during the decade, but of major significance is that the increase was fueled entirely by in-house use, which may be attributed to photocopying, interlibrary loan, and document delivery via fax and mail. The traditional practice of checking materials out for use in offices and living quarters declined, as did reserve circulations. It is difficult to detect a consistent trend in use of the libraries' buildings, as the number of clients actually visiting the library varied from year to year. Borrowing and lending of materials from library to library were both up throughout the decade, indicating that medical school libraries are increasingly sharing their resources.

- **Information services use.** Library clients asked more questions, but as the decade ended, librarians

**Figure 9**  
Average visits to library, in-house use, circulations, and reference transactions, per client, 1982-1989



were asked to search external databases much less frequently. This trend may be attributed to the increasing use of locally mounted tape or CD-ROM databases and to the availability of local area networks.

The data presented in this paper are longitudinal and do not necessarily reflect what is happening in the dynamic world of today's medical school library. They do, however, show trends that may assist administrators and staff in shaping future services, staffing patterns, and budget requests of medical school libraries. In the future, trend-line analysis may yield formulas that could be useful in projecting expenditures and demand for services.

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