

Computer Use by Family Physicians in the United States

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The Board of Directors of the American Academy of Family Physicians (AAFP) created the Ad Hoc Task Force to Investigate the Use of Computers by Family Physicians in August 1981. The task force adopted four objectives at its first meeting in May 1982: development of a list of family physicians using computers, investigation of the current role of computers in family practice, development of informational material to educate members about the use of computers in family practice, and consideration of a means to gather data about family practice through members' computers.

One of the techniques used to achieve the first two objectives was a national survey of active AAFP members concerning computer usage. This study was performed in late 1982.

Similar studies also have been performed by the American Medical Association (AMA) and the American Society of Internal Medicine (ASIM). From the AMA random sample of readers of *American Medical News* in 1981, it was estimated that 37,827 physicians in office-based practices, or 19.4 percent of the physician universe, were using

computers and another 6,824 were interested; the AMA estimated that 13.9 percent of family physicians in office-based practices were using computers.¹ In 1982 ASIM estimated that 1,785 members, or 17.6 percent of the respondents to its demographic survey, had in-house computers.²

This paper summarizes the results of an AAFP study on the use of computers by active Academy members.

Methods

In December 1982 a three-page questionnaire was mailed to 31,450 active members of the American Academy of Family Physicians (AAFP) who were practicing in the United States. By May 1983 8,108 physicians had responded to the survey for an effective response of 25.8 percent, a response rate lower than for most AAFP surveys. Because the object of the study was to obtain some general information on the use of computers by members rather than an in-depth analysis, the methodology in part contributed to this low response—the mailing was third-class and no follow-up was made to nonrespondents to the first mailing.

Of the 8,108 physicians who responded, there

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Table 1. Number of Family Physicians by Computer Usage and Mean Age, January 1983

Computer Usage	Number	Percentage	Mean Age (yr)
Own, rent or lease computer in office	941	14.0	46.9
Use service bureau	331	4.9	48.8
Combination of above	52	0.8	48.0
Do not use a computer	5,376	80.2	48.8
Total	6,700	100.0*	48.5
*Rounded total			

were 1,408 physicians (17.4 percent) whose current practice was limited to federal employment, teaching, administration, student health, or hospital staff. It was assumed that these physicians, who for the most part were salaried, would make little or no contribution to the selection, running, and managing of an office computer system, much less share in the actual ownership of the machine. Therefore, the responses of these physicians were eliminated from the study. All percentages relate to the 6,700 physicians constituting the respondent group of active AAFP members who are in nonfederal, direct patient care, office-based practices in the United States.

Results

Nearly one in five respondents (19.7 percent) use a computer in their medical practices (Table 1). Approximately 14.0 percent own, rent, or lease the computer in their offices, 4.9 percent use a service bureau, and 0.8 percent report a combination of the two. The 941 physicians who own, rent, or lease a computer in their offices are more likely to be younger than the 5,376 physicians who do not use computers, at an average age of 46.9 years compared with 48.8 years, respectively.

Of the 5,376 physicians who reported that they do not use computers in their practices, nearly

three in four (72.4 percent) reported that they are interested in computerizing at some future date (Table 2). Of this group of respondents, 1,550 physicians reported that they are considering the acquisition of a system within the next five years. A comparison of mean ages reveals that physicians who are not interested in computers are older as a group than physicians who are considering systems, 56.2 years compared with 46.0 years.

The 941 physicians who own, rent, or lease computers in their offices reported 85 vendors of hardware from whom they obtained their systems (Table 3). Nearly 1 in 5 respondents (18.1 percent) reported that they used IBM hardware, 1 in 10 reported they use Apple (9.6 percent) or Radio Shack (9.1 percent), and approximately 1 in 20 reported they use Burroughs (7.0 percent) or NCR (4.7 percent).

Considerable effort was spent in classifying, by type, the computers used by the respondents. Almost one half of respondents (48.7 percent) who use computers in their practices reported using currently marketed types. Several of the systems reported by the physicians were unfamiliar to the author and are, thus, classified as unknown. Indeed, at least one in five systems (18.9 percent) used by the respondents are no longer marketed by the respective vendors. Although the systems are supported and maintained, a physician interested in one of these models could not purchase it unless it was used or reconditioned.

Approximately one in three systems (34.4 percent) used by the 941 physicians with computers

Interest in Computerizing	Number	Percentage	Mean Age (yr)
Interested in computerizing	3,894	72.4	46.0
Within one year	454		44.9
Within five years	1,096		42.9
No schedule	2,291		47.5
Not reported	53		51.8
Not interested in computerizing	1,473	27.4	56.2
Not reported	9	0.2	
Total	5,376	100.0	

are microcomputers, and one in three (32.1 percent) are minicomputers. Very few physicians are on mainframe computers (1.4 percent), which probably could be explained by the restriction of this analysis to nonfederal physicians in direct patient care, office-based practices.

Most systems allowed for multiple users (40.2 percent), although at least one in three systems (32.2 percent) allowed only single users. The majority of systems (54.5 percent) supported a BASIC interpreter, an obvious reflection of the large number of programs already written in BASIC. COBOL (14.8 percent) was a distant second (Table 4).

The majority of the 941 respondents (69.7 percent) obtained their software from 264 different vendors—either software houses or the hardware vendors themselves. There were 146 physicians (15.5 percent) who either had their software custom written or wrote the programs themselves. Approximately 14.8 percent did not report the source of the software.

Accounts receivable and billing were the practice-related applications reported computerized by most respondents, with 85.4 percent (Table 5). Third-party claims (68.8 percent) and general ledger (53.8 percent) were also indicated by a majority of the respondents with computers. Very few respondents with computers reported computerizing medical histories (7.5 percent), progress notes in text form (6.5 percent), drug in-

teraction (4.5 percent), or patient education (3.9 percent).

The majority of the physicians with computers (57.1 percent) used the ICD 9-CM coding system, with very few physicians reporting ICHPPC (4.5 percent). Almost one in three physicians (31.6 percent) did not indicate which disease- or encounter-coding scheme they used, either because they do not code this information or because they failed to respond to the question.

The amount of money paid by physicians for their hardware and software was directly related to practice arrangement. Physicians in group practices outspend physicians in solo practice by at least 2.5 times for their hardware and software. Solo physicians averaged \$16,403, whereas physicians in family practice groups and multispecialty groups averaged \$41,766 and \$70,064, respectively. Similarly, solo physicians averaged \$250.70 per month for maintenance, whereas physicians in family practice groups and multispecialty groups averaged \$474.60 and \$765.78 per month, respectively.

Although 21.9 percent of physicians who own, rent, or lease computers in their office reported that they used a consultant to handle the conversion of their offices to a computerized record-keeping system, the transition appeared to take several months for all physicians with computers. Nearly one in four respondents with computers (23.3 percent) reported that they worked six or

Table 3. Number of Family Physicians by Computer Vendor, January 1983

Computer Vendor	Number	Percentage
IBM	170	18.1
Apple	90	9.6
Radio Shack	86	9.1
Burroughs	66	7.0
NCR	44	4.7
Texas Instruments	37	3.9
Data General	31	3.3
DEC	31	3.3
Wang	31	3.3
Alpha Micro	28	3.0
Honeywell	20	2.1
Altos	13	1.4
Basic Four	12	1.3
Xerox	12	1.3
Commodore	11	1.2
Cado	9	1.0
Datapoint	8	0.9
Hewlett Packard	8	0.9
Ohio Scientific	8	0.9
Vector	8	0.9
Intertec	6	0.6
North Star	5	0.5
Osborne	5	0.5
Other	122	13.0
Combination of vendors	43	4.6
Not reported	37	3.9
Total	941	100.0*

*Rounded total

more months to have their system fully operational. The median was 3.5 months.

The majority of the respondents (51.4 percent) were very satisfied with their systems, while one in three (34.3 percent) rated their systems as average. Only a small minority (6.6 percent) were totally dissatisfied with their systems. Regardless of how the physicians rated their systems, many respondents (266) did indicate reasons for which their systems gave them cause for dissatisfaction. One in three (32.3 percent) complained that their computer did not have enough storage, and one in five noted that downtime was excessive (20.3 percent), the computer was too costly (19.2 percent),

Table 4. Number of Family Physicians by Computer Language on Their Systems, January 1983

Language	Number*	Percentage*
BASIC	513	54.5
COBOL	139	14.8
RPG or RPG II	56	6.0
FORTRAN	40	4.3
Pascal	24	2.6
Assembler	16	1.7
MUMPS	8	0.9
Other	40	4.3
Not reported	194	20.6
Total	941	100.0

*Numbers and percentages do not add to totals because respondents were allowed to list two computer languages

or there was poor maintenance (18.4 percent). Nearly two in three (60.9 percent) wrote in other specific reasons for their dissatisfaction, such as insufficient applications, flawed software, lack of flexibility, slow response, instability of the vendor.

Regardless of the dissatisfaction of some members with their systems, nearly three in four respondents (72.5 percent) recommended their system to other family physicians. Approximately one in five (17.1 percent) did not recommend their systems to any physician, and one in ten (10.4 percent) did not respond to the question.

Comment

Several limitations to the data must be acknowledged. As a result of the study methodology, response rates were low; therefore, the results may not reflect accurately the use of computers by active members of the American Academy of Family Physicians. Because the study was thus limited, there may be some question as to representation of all family physicians and general

Table 5. Percentage of Family Physicians* by Computerized Medical Applications, January 1983

Medical Applications	Percentage (n = 905)
Accounts receivable and billing	85.4
Third-party claims	68.8
General ledger	53.8
Report to clinic management and outside agencies	44.6
Registration	39.4
Automated payroll	33.0
Word processing	32.7
Data base searches	30.9
Appointment scheduling	25.7
Computer-generated encounter forms	25.3
Patient profile	24.9
Patient surveillance report	12.5
Automated patient history	11.6
Medical histories	7.5
Progress notes in text form	6.5
Drug interaction	4.5
Patient education	3.9

*Total is limited to those physicians who have a computer in the office and who checked at least one of the above applications as one that was installed on the computer

practitioners. The findings, although they may not be entirely generalizable, do point to certain trends and directions that are worthy of further consideration.

An interesting factor results from a review of these data with respect to the hardware used by those physicians with computers. A large number of physicians with computers could not name the hardware they used. This fact was apparent when they named only the turnkey vendor, a hardware vendor without a series or model number, a hardware vendor with a nonexistent model number, or a hardware vendor with the model number of peripheral equipment.

It is interesting to note that at least ten family physicians volunteered that they had developed their own software and have become software

vendors to other physicians. An equal number indicated that they served as consultants to vendors.

Conclusions

Approximately four in five family physicians in this sample of nonfederal, direct patient care, office-based practices in the United States do not use computers in their offices. The majority of these physicians, however, are interested in computerizing at some future date.

Those physicians who are using computers have obtained their software from 264 vendors and their hardware from 85 vendors. Because there were so few respondents using any one particular hardware system or software package, it was not possible to compare the relative worth of machines or software packages.

Practice management applications, such as accounts receivable and billing, third-party claims, and general ledger, were more likely to be computerized than were clinical applications, such as medical histories, progress notes, and drug interactions.

Three in four respondents who use computers would recommend their systems to other family physicians. However, many physicians did indicate some problems with their systems, including not enough storage, excessive downtime, excessive cost, or poor maintenance.

Acknowledgment

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References

1. Computer Usage by the Readers of *American Medical News*. NBD: 81-489:400:4/81. Chicago, American Medical Association, 1981
2. American Society of Internal Medicine: Members' satisfaction with computers is high, survey finds. *Internist* 24:14, 1983