Three-year Trends in the Costs of Residency Training in Family Medicine

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Background and Objectives: *A 3-year follow-up survey was performed to update and examine trends in the financial and operational benchmarking data for family medicine residency programs within the University of Washington Network.* Methods: *Using the standardized approach that had been used in 2000, data were systematically collected by standardized questionnaire, evaluated for quality and verified, and then analyzed. Updated data regarding revenues, expenses, faculty structures, productivity, and family medicine center staffing models are reported, as well as data on trends in each of these areas for the 3-year period.* Results: *Although revenues increased during this time, expenses increased relatively more, leading to an overall increase in the "cost per resident" among the Network programs. Particular factors leading to increased costs were salary expenses and the cost of malpractice insurance in these states.* Conclusions: *The results of this study contribute to the establishment of normative data for budgeting and operational evaluation of family medicine programs and projections of cost variations over time.*

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The financing of medical education is becoming precarious. Hospitals and medical centers are facing a crisis in funding of clinical operations related to declining reimbursements despite increasing expenses of patient care. Academic medical centers are additionally challenged by declining support from all sources of funding for graduate medical education (GME),[1,2] increased competition from community hospitals, fragile financing for research, and a variety of systems problems.[3] An additional challenge for family medicine is the recent ruling by the Health Care Financing Administration (HCFA) to require payment for "volunteer" teaching physicians, upon whom many programs have relied for ambulatory training in many specialties.

State budget crises also threaten state support for medical education funding. Medicaid GME through state allocations faces cutbacks as health care costs soar and the number of underinsured and uninsured patients rise. Further, although many states have earmarked funds for primary care training,[4] those funds are now at risk as states face financial pressures and budget deficits. Increased competition has eroded private payer subsidies for teaching and charity care.[5]

Health care organizations have responded by increasing pressure on clinical practices for productivity and financial performance.[6] This pressure, however, can detract from the teaching, research, and service missions of programs.[7] All of these pressures are combining to challenge the financial viability of graduate training in family medicine, which relies on a combination of federal and state funding, primary care revenues, and support from sponsoring institutions.

The University of Washington Family Medicine Network (UWFMN) Benchmarking Project was initially begun in 2000 to systematically examine and compare the details of the costs of residency training in family medicine.[8] Fourteen training programs in the five-state region of Washington, Wyoming, Alaska, Montana, and Idaho (WWAMI) used the initial data to benchmark the operations of these programs in facing financial questions and pressures. The Benchmarking Project resulted in an extensive data set but left many questions about variables and trends.

The UWFMN determined that collecting another set of data would help to validate the original data and

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examine trends in areas that are critical to the financial stability of family medicine programs. Cooperation among the programs remains strong, including the willingness to share and compare data on program finances and operations. This has allowed updating this data set 3 years after the original project, with the intent of providing programs with updated information to respond to individual inquiries regarding expected revenues, expenses, productivity of residents and faculty, and staffing structures for training practices.

Methods

The UWFMN is currently comprised of 18 programs in the WWAMI states, operated independently and connected through affiliation with the University of Washington. Fifteen programs participated in the new study in 2003, including all 14 of the programs analyzed in the 2000 study. The programs vary in size, configuration, degree of urbanization, and presence of satellites, rural training tracks, and fellowships in addition to the core program (Table 1).

The questionnaire used to gather data was similar to that used in the 2000 study except for the simplification of some data lines that had been combined in the final analysis of the prior data set. Development of that questionnaire and methods of validation of the data with individual programs and subsequent data analysis were described in a previous paper and performed similarly.[8]

For examination of trends between the 2000 data set and the new 2003 set, the 12 programs with complete and consistent data reporting in both years were selected and compared. Medians and means were calculated based on the same data lines, allowing for accurate comparisons. Staffing of the family medicine center was compared using only the ratios of staff per 10,000 visits, simplifying the analyses done in 2000 and allowing comparisons to staffing models recommended by the Residency Assistance Program of the American Academy of Family Physicians.[13]

Results

All data noted as "per resident" refer to full-time equivalent (FTE) residents, rather than actual number of residents, since the actual number may be different in programs with part-time residents.

Revenues

Revenue data were readily available, and the definitions were clear and consistent among the 15 programs (Table 2). Eleven programs reported Medicare funding data that could be allocated to specific residents; the data reflect anticipated payments, not actual audited payments. Federal graduate medical education (GME)

Table 1

UWFMN Program Structures

State	*County Population Size, 2000*	*Setting/Number of Sponsoring Institutions*	*Total Residents/ Faculty FTE*	*Satellite/RTT/Fellowship*
Alaska	271,000	Community/1	24 R / 9.5 F	
Idaho	325,000	Community/2	27 R / 14.3 F	1 RTT; fellowship
Idaho	76,000	University/1	15 R / 9.5 F	
Montana	133,000	Community/2	18 R / 6.0 F	
Washington	1,760,000	University/1	24 R / 9.5 F	1 satellite
Washington	1,760,000	Community/1	30 R / 9.7 F	2 satellites; fellowship
Washington	1,760,000	Community/1	27 R / 8.0 F	2 satellites; fellowship
Washington	1,760,000	Community/1	15 R / 7.1 F	
Washington	1,760,000	Community/1	24 R / 11.4 F	
Washington	741,000	Community/1	24 R / 7.8 F	1 satellite; fellowship
Washington	227,000	Community/1	18 R / 8.8 F	
Washington	380,000	Community/1	21 R / 10.2 F	
Washington	222,000	Community/2	18 R / 10.7 F	
Washington	431,000	Community/2	27 R / 9.8 F	2 RTTs; fellowship
Wyoming	68,000	Community/1	24 R / 5.9 F	
Average size			**22R / 9.2 F**	

UWFMN—University of Washington Family Medicine Network
FTE—full-time equivalent
RTT—rural training track site

revenue per resident averaged $79,959, an increase of 12.4% from the average in 2000; seven programs reported an increase, and four a decrease, over the 3-year period.

Mean net patient revenue per resident increased between 2000 and 2003 for 11 of 12 programs to $115,576, an increase of 18.0%, while the median increased only 5%. This difference between the mean and median resulted from some programs increasing their net revenue disproportionately more than others. The main factor affecting revenue increases was higher charge per visit, with gross charge per visit up 36.4% to $135 and net charge per visit up 23.0% to $75. Of note, the disproportionate increase in gross versus net billings indicates a greater contractual adjustment of charges and collections in 2003 compared to 2000. The collections of gross charges, accounting for contractual allowances, decreased 8.9% between 2000 and 2003, from 61.7% to 56.2%, with a standard deviation of 7.5%.

Volume increases only accounted for a small percentage of the revenue change, with outpatient visits increasing 2.2% to an average of 27,335. Of total visits reported, 86.6% occurred in the family medicine center (FMC). The other 13.4% occurred in inpatient, nursing home, and other non-FMC based locations.

The percentage of total program revenue, excluding Medicaid GME, from patient care activities averaged 52.1%, an increase of 4.0% compared to 2000. The remaining revenues were from federal GME dollars, state funding, grants, and other sources. State funding streams contributed to total program revenues in 14 of the 15 participating programs, grant funding was included in revenues for 11 of 15 programs, and other revenue streams, which included various reimbursements from sponsoring institutions, space rentals, contracted services, and other sources, contributed in 10 of 15 programs.

The amount of Medicaid GME funding was the greatest variability among the programs, as it was in 2000. For trend comparisons, this revenue line was not included because of the variability and apparent inaccuracy of the data; in 2000, many programs did not have full data available. In Washington State, Medicaid payments average an additional 6.44% of payments for services performed in institutions with only family medicine programs. Communications with

Table 2

Program Revenues: 2000 Versus 2003

	# of Programs	*Median Value*	*Mean Value*	*Range*	*SD*
2000 federal GME revenue/resident FTE	11	$72,708	$71,110	$44,783–$90,097	$14,790
2003 federal GME revenue/resident FTE	11	$86,600	$79,959	$33,251–$128,339	$31,790
% difference 2000–2003		+19.1%	+12.4%		
2000 net patient revenue/resident FTE	12	$102,024	$97,913	$41,912–$135,629	$27,052
2003 net patient revenue/resident FTE	12	$107,089	$115,576	$53,379–$197,735	$42,254
% difference 2000–2003		+5.0%	+18.0%		
2000 total revenue*/resident FTE	12	$191,060	$192,604	$138,694–$249,636	$34,416
2003 total revenue*/resident FTE	12	$218,324	$222,106	$165,604–$281,575	$41,898
% difference 2000–2003		+14.3%	+15.3%		
2000 % of total revenue* from patient care	12	51.0%	50.1%	30.2%–60.5%	8.33%
2003 % of total revenue* from patient care	12	54.7%	52.1%	22.8%–74.0%	16.0%
% difference 2000–2003		+7.3%	+4.0%		
2000 average gross billing/all visits	12	$103	$99	$54.15–$124.10	$20.44
2003 average gross billing/all visits	12	$149	$135	$87–$186	$33
% difference 2000–2003		+44.7%	+36.4%		
2000 average net billing/all visits	12	$63	$61	$29–$77	$12
2003 average net billing/all visits	12	$77	$75	$45–$96	$16
% difference 2000–2003		+22.2%	+23.0%		

* "Total revenue" excludes Medicaid GME reimbursement (see text).

SD—standard deviation
FTE—full-time equivalent
GME—graduate medical education

the Washington Medical Assistance Administration indicated that additional annual Medicaid GME payments averaged $24,184 per resident, with a range from $4,553 to $46,350 in 2001.

Overall, the total revenue per resident, excluding Medicaid GME, increased for 11 of 12 programs, averaging 15.3%, to $222,106. The program experiencing a decrease reported significantly less net patient revenue per resident.

Expenses

Expenses continued to present the greatest difficulty in availability and reporting of data from the individual programs (Tables 3, 4, and 4A). The largest variation was "indirect expenses" incurred by a sponsoring institution for fixed and variable expenses a program would bear if it were entirely autonomous and self-supporting. Examples of these indirect expenses included some or all of the following: human resources and personnel management, information services, billing and collections, general administrative support, transcription, physical plant (rent or mortgage), expenses associated with the physical plant (utilities, telephone, maintenance, etc), capital equipment purchases, and benefits or retirement packages for employees. Which expenses were indirect, and the extent to which a sponsoring institution allocated those expenses back to the residency, were specific and unique to each program. Additionally, some institutions allocated corporate overhead to the program as a percentage of program expenses.

Compensation expense increased 24.2% from 2000 to 2003. Programs reported a 6.7% increase in the number of employees during this period, and a 16.5% increase in number of faculty. Retirement and benefit packages averaged 19.6% of total expenses across all personnel, unchanged from 2000. Percent of total compensation relative to total expenses, at 76.8%, did not change significantly.

Subtotal expenses from operations decreased, while expenses from building and maintenance increased. Indirect expenses and allocations of sponsoring institution overhead varied markedly and unpredictably between the two study periods, although overall were increased. Line-item operations expenses were not accurate enough, given the wide variability and small number reporting, to be individually reported; however, total expenses, which account for movement between direct and indirect expenses, were more consistent with expectations and prior reporting.

An estimate of FMC expense per visit, using a sum of staff compensation and operations expenses but excluding provider compensation, increased 31.8%

Table 3

Program Expenses: Compensation

	# of Programs	*Median Value*	*Mean Value*	*Range*	*SD*
2000 total compensation for all employees	12	$3,603,385	$3,569,072	$2,055,952–$4,310,307	$611,132
2003 total compensation for all employees	12	$4,414,421	$4,433,739	$2,736,508–$5,676,822	$955,414
% difference 2000–2003		***+22.5%***	***+24.2%***		
2000 total employees on payroll	12	64.9	64.3	39.2–85.3	11.2
2003 total employees on payroll	12	68.5	68.6	41.1–101.0	15.2
% difference 2000–2003		***+5.5%***	***+6.7%***		
2000 average staff salary	12	$32,487	$33,364	$20,432–$47,597	$8,057
2003 average staff salary	12	$37,543	$37,901	$27,600–$61,263	$9,586
% difference 2000–2003		***+15.6%***	***+13.6%***		
2000 average faculty salary	12	$119,788	$120,659	$95,856–$142,290	$14,818
2003 average faculty salary	12	$120,459	$120,422	$90,155–$172,852	$21,138
% difference 2000–2003		***+0.6%***	***-0.2%***		
2000 faculty on payroll	12	8.1	8.5	6.5–11.7	1.6
2003 faculty on payroll	12	9.9	9.9	6.2–14.3	2.3
% difference 2000–2003		***+22.2%***	***+16.5%***		
2000 % total compensation versus total expenses	12	75.7%	76.0%	61.6%–84.3%	7.0%
2003 % total compensation versus total expenses	12	79.1%	76.8%	56.4%–85.7%	9.6%
% difference 2000–2003		***+4.5%***	***+1.0%***		

SD—standard deviation

Table 4

Total Program Expenses and Cost Per Resident

	# of Programs	Median Value	Mean Value	Range	SD
2000 subtotal expenses from FPC and program operations	12	$417,338	$450,215	$236,543–$754,626	$155,306
2003 subtotal expenses from FPC and program operations	12	$315,484	$332,089	$195,207–$487,746	$103,282
% difference 2000–2003		-24.4%	-26.2%		
2000 expenses from building and maintenance	8	$349,344	$366,359	$191,364–$527,018	$196,923
2003 expenses from building and maintenance	8	$364,796	$418,392	$121,810–$736,735	$203,903
% difference 2000–2003		+4.4%	+14.2%		
2000 total expense*/resident	12	$232,004	$237,196	$180,672–$359,806	$48,981
2003 total expense*/resident	12	$255,945	$274,239	$181,462–$406,664	$68,219
% difference 2000–2003		+10.3%	+15.6%		
2000 corrected cost** per resident	12	$38,075	$44,592	$4,768–$110,170	$36,564
2003 corrected cost** per resident	12	$44,812	$56,081	-$60,472***–$225,439	$75,468
% difference 2000–2003		+17.7%	+25.8%		

SD—standard deviation
FPC—family practice center

* "Total expense" excludes malpractice expenses (see text).
** Total expense/resident minus total revenue/resident, excluding revenues from Medicaid GME and malpractice expenses.
*** Two programs had lower expense/resident compared to revenue/resident.

Table 4A

Total Program Expenses and Cost Per Resident, Including Uncontrolled Data*

	# of Programs	Median Value	Mean Value	Range	SD
2003 total revenue/resident FTE	12	$257,644	$246,688	$178,700–$319,106	$49,170
2003 total expense/resident	12	$250,613	$285,352	$190,539–$429,674	$85,810
2003 total cost/resident	12	$33,276	$38,664	-$22,413–$232,948	$94,633

* "Uncontrolled" data includes revenues from Medicaid GME and expenses related to malpractice, both of which were widely variable among programs, not universally available, and difficult to verify for many programs who did report.

from an average of $88 in 2000 to $116 in 2003. This contrasts with the lower 23.0% average increase of net revenue per visit during this interval, which was only $75 in 2003.

Malpractice costs were significantly different among the UWFMN programs between 2000 and 2003. In 2000, all programs shared an arrangement for malpractice coverage with a single malpractice carrier; this arrangement collapsed in 2002, and the programs had to arrange for coverage individually. Most were able to obtain this through their sponsoring institutions, but a small number needed to contract independently. The costs of these new contracts varied from $7,378 to $780,000, with a mean of $82,588, and the quoted rates have continued to fluctuate widely from year to year. Because of the chaotic insurance climate, expenses in Table 4 are reported excluding malpractice insurance costs, particularly for examining trends between 2000 and 2003.

Cost Per Resident

The total cost per resident (excluding malpractice expense and Medicaid GME revenue) increased an average of 25.8% during this 3-year time period, with the median increasing by 17.7% to $44,812. There was considerable variability among programs, with five programs decreasing their cost per resident while seven increased. There was a significant correlation (0.94)

between increased expense per FTE and increased cost per FTE, but no correlation (0.00) between increased revenue per FTE and increased cost per FTE. This confirms what was noted in the original data: that programs with lower cost per resident achieved that primarily by controlling expenses rather than enhancing revenues.

Table 4a shows the total cost per resident, including malpractice expense and Medicaid GME revenue. The data is not as reliable as data without these variables because of the uncontrolled variations in these two budget lines, as discussed earlier in the paper.

Faculty Structure

Programs maintained an average of 22 residents in the first 3 years of training, while increasing the average FTE core faculty from all disciplines from 8.0 to 9.2 (Table 5). Half of this increase was from additional family physician faculty, with the other half from small increases across a variety of specialists. Programs also reported an increase in average of "non-core" FTE faculty contracted to perform specific responsibilities, from 1.0 to 1.8.

Productivity

Provider productivity in the FMCs decreased for all categories of providers between 2000 and 2003 (Table 6). For residents, patient visits/hour improved slightly while number of clinic sessions/week decreased, with a net decrease of total patient visits/year/resident. For family medicine faculty, there was a decrease in both number of clinic sessions and patient visits/hrou. The effect of these changes on the average total outpatient visit volumes in the FMCs was offset by an increase in number of providers, yielding an average 2.2% increase over this period, from 26,735 to 27,335. Inpatient volumes during the same period increased 6.7%, averaging 4,199 in 2003 compared to an average of 3,936 in 2000.

Staffing Models in the FMC

Overall staffing per 10,000 outpatient visits in the FMCs remained almost unchanged, but the composition of those staff has changed (Table 7). Programs averaged more administrators, billers, receptionists, medical records, and nursing personnel, offset by fewer "other" staff (social work, pharmacy, others). Excluding the "other" category, which varied widely among programs, overall core staffing per 10,000 patient visits averaged 15.3% less than the Medical Group Management Association (MGMA) average.

Discussion

The UWFMN data demonstrate disheartening trends regarding the financial support for graduate medical education in family medicine. To maintain financial viability, programs need to either increase revenues or decrease expenses. In this analysis, the UWFMN programs were unable to increase revenues proportional to increased expenses, with a net increase in the average cost per resident. Many of the factors that must be

Table 5

Average Program Structure, Core Faculty* FTE**

Faculty Role	*2003 Average Full-time Equivalent*	*2000 Average Full-time Equivalent*
Administrators/directors	1.6	1.3
Family physicians	5.7	5.1
Internal medicine	0.3	0.2
Pediatrics	0.2	0.2
Behavioral science	0.9	0.9
Pharmacist	0.5	0.3
Total core faculty	9.2	8.0

FTE—full-time equivalent

* "Core faculty" was defined as those faculty employed by the program at the main residency and satellites run by the main program; it excluded faculty at satellite programs operated by other entities (such as community health centers), rural tracks, fellowships, and research and teaching functions outside of the residency program.

** FTE faculty time averaged 9.3 half days/week, excluding call.

Table 6

Annual FPC Productivity by Role per FTE

Provider	*Clinic Sessions*/ Week*	*Patient Visits/Hour*	*Patients Visits/Year*
2000 first-year resident	1.4	1.2 +/- 0.3	271 +/- 62
2003 first-year resident	1.3	1.2 +/- 0.4	258 +/- 78
% difference 2000–2003	***-7.1%***	***0%***	***-4.8%***
2000 second-year resident	2.6	1.7 +/- 0.4	695 +/- 203
2003 second-year resident	2.4	1.8 +/- 0.4	659 +/- 139
% difference 2000–2003	***-7.7%***	***+5.9%***	***-5.2%***
2000 third-year resident	3.7	2.0 +/- 0.4	1200 +/- 250
2003 third-year resident	3.4	2.1 +/- 0.4	1099 +/- 264
% difference 2000–2003	***-8.1%***	***+5.0%***	***-8.4%***
2000 core FM faculty	2.9	2.3 +/- 0.7	967 +/- 297
2003 core FM faculty	2.8	2.0	815 +/- 136
% difference 2000–2003	***-3.4%***	***-13.0%***	***-15.7%***

* Average clinic session in 2000 was 3.25 hours; in 2003, a session averaged 3.4 hours.

FTE—full-time equivalent
FM—family medicine

Table 7

Non-provider Staffing of FMC Practices

Personnel	*2003 Average FTE*	*2000 Average FTE*	*2003 FTE/ 10,000 Visits*	*2000 FTE/ 10,000 Visits*	*% Change*	*MGMA[12] FTE/ 10,000 visits*
Administration	2.1	1.3	0.80	0.52	+53.8%	1.12
Front office	7.0	5.7	2.55	2.15	+18.6%	2.74
Billing	3.4	3.0	1.43	1.11	+28.8%	2.90
Medical records	4.3	3.6	1.55	1.41	+9.9%	1.58
Nursing	11.6	9.9	4.15	3.70	+12.2%	4.04
Other*	2.5	4.4	0.83	2.35	-64.7%	3.33
Total	30.8	27.9	11.31	11.24	+0.6%	15.71

FPC—Family Medicine Center
FTE—full-time equivalent
MGMA—Medical Group Management Association

* "Other" includes laboratory, radiology, nutrition, social work, referral coordinators, and others.

considered in applying these results to other programs were enumerated in a previous paper.[8]

Revenues depend heavily on government funding through federal and state sources, grants, and patient care revenues. Threats exist to all of these funding streams. Federal GME reimbursement is projected to decline as a result of the Balanced Budget Act of 1997.[9] State budget lines are often tenuous as many states face large deficits in recent years. Grant support is inconsistent and designates funds only for specific projects and not general program revenues. Several programs have received significant support from Title VII grants, which will likely be discontinued as a result of changes in the federal budget. Lastly, patient care revenues are only increasing slightly and are often not keeping up with the increase in associated expenses.

Meanwhile, expenses continue to increase. Most prominent are individual salary increases, but there was also an upward trend in the number of staff and faculty supporting the program. Network directors in discussion attributed this trend in part to the increased regulatory environment and the implementation of resident duty hours limitations. Additionally, overall operational expenses are increasing at a faster rate than associated net revenues. This deficit emphasizes the importance of other revenue sources to support family medicine training programs, as increasing visits alone is for many programs a downward spiral in the current reimbursement climate.

To maintain 2000 costs per resident, median reimbursement would have had to increase by 26%, rather than the actual increase of 13.5%. Squeezing extra productivity from the FMC clinics has often been suggested as one way of increasing revenues. Assuming all funding sources remain unchanged, patient care revenue per resident would need to increase 31% over the 2003 level of $107,089 per resident. However, individual resident practices, which account for the large majority of total visits in the residency clinics, are limited by educational concerns in demanding more production; additionally, network programs felt that the decrease in number of yearly clinics reported for each resident group resulted from implementation of resident duty hour limitations. Faculty productivity has also declined due to increasing attending responsibilities and coverage needs taking them away from the provision of direct clinical care in the FMC. Even with the increase in faculty FTE, this trend has effected a worsening of the FMC ability to generate revenue for the program due to the resultant outpatient expense/revenue mismatch. Notably, support staff productivity in the FMC is already significantly higher than reported for MGMA practices, leading to concerns about whether the clinics are actually understaffed to achieve maximal provider productivity.

The value of residency programs to their sponsoring institutions and other funding sources clearly lies in more comprehensive analyses of the indirect benefits and the downstream effects on residency programs, rather than solely in the "bottom line" of the residency program itself; this has been described elsewhere.[10] A 2004 study of the public policy value of state funding of family medicine programs through resident stipends in Oklahoma estimated a return of $370 million on an "investment" of $139 million.[11] Additionally, the model demonstrated that the current cohort of physicians is annually responsible for 15,530 jobs and an associated payroll of $428 million. Increasingly, programs need to rely on these approaches to discuss their futures.

The University of Washington Benchmarking Study trends suggest that family medicine residency programs must look closely at their overall financial picture, including staffing structure and productivity expectations, to find ways to remain financially viable. Non-patient care revenue sources are expected to decrease. To maintain financial stability, patient care revenue must increase proportionately but cannot be done simply by forcing productivity from existing providers. The need for creative solutions has never been greater. Program viability will be increasingly threatened if the cost-per-resident trends seen in this study continue.

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