OBSTETRIC CARE IN A HEALTH MAINTENANCE ORGANIZATION AND A PRIVATE FEE-FOR-SERVICE PRACTICE: A COMPARATIVE ANALYSIS

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Obstetric care in a health maintenance organization and a private fee-for-service practice: A comparative analysis

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This study compares the quality of obstetric care provided for patients in two distinct groups: a federally-qualified health maintenance organization and a private fee-for-service practice. Patients of both groups were delivered in the same hospital with resident coverage equally accessible to both groups. From January, 1979, through December, 1981, the period of the study, the physician group delivered 2385 patients, 57% of them from the health maintenance organization and 43% from the fee-for-service practice. Not only were comparisons of maternal and fetal outcomes available for the two patient groups, but the yearly trends and individual performances of the physicians were available as well. This paper addresses the question, all other things being equal, is the level of care and ultimate outcome the same for both groups of patients? The results in some instances showed surprising differences. (AM. J. OBSTET. GYNECOL. 149:848, 1984.)

A recurring criticism of patient care provided by health maintenance organizations is that such care is often of a lower quality than that provided by fee-for-service practitioners. Some studies have tended to support this contention, whereas others have disputed it. Unfortunately, in the vast majority of these comparative studies, differences between health maintenance organizations and fee-for-service practices were confounded by differences in physician groups as well as differences in hospitals used. That is, although some differences between health maintenance organizations and fee-for-service practices may have been observed, these may be accounted for by differences in the groups of physicians or hospitals providing the services measured.

For example, during the 1981 meeting of the Central Association of Obstetricians and Gynecologists, Hall and Alexander[1] offered a comparison of the obstetric care given to three different groups of patients: those in a health maintenance organization, those in a private fee-for-service practice, and those in a clinic group. Each patient group was managed by a different set of physicians.

Two discussants, Poma and Robinson,[2] raised questions about the differences in the physician groups that could have influenced the outcome of care. Poma asked for additional information on the comparative ages, training, and experience of the three physician groups. Robinson noted that the health maintenance organization physicians, as well as the clinic physicians, provided 24-hour hospital coverage whereas fee-for-service doctors struggle under more time constraints and are more likely to act. He suggested that it would be interesting to compare the cesarean section rate of those doctors who place a physician in the hospital versus that of fee-for-service doctors who do not practice in that fashion.

In his closing statement, Hall agreed with Poma that there were significant differences in physician training and in the use of fetal monitoring between the fee-for-service groups and the other groups. He also admitted that the fee-for-service physicians were under time scheduling constraints that may have influenced their decision making (e.g., an office filled with waiting patients).

A closer analysis of Hall's presentation and the several discussions that it stimulated, plus a review of other similar reports,[3-5] revealed uncontrolled variables in physician and hospital care that could influence outcome of patient care. The performance of a five-physician team serving patients in fee-for-service and health maintenance organization groups in the same hospital would appear to offer a unique opportunity to answer some of the questions raised in this and other discussions.

Material and methods

Physicians. A total of five physicians provided all of the obstetric care to the patients studied. The three senior physicians were certified by the American Board of Obstetrics and Gynecology in 1955, 1962, and 1971. The younger physicians became board eligible in 1976 and 1980 but were not certified at the time of the study. The oldest physician ceased performing deliveries on

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Table I. Description of the total patient population (excluding delivery type and prenatal, postnatal, and fetal complications)

Variable	*N**	*%*	*Mean*	*SD*	*Minimum-maximum scores*
Total deliveries	2385	—	—	—	—
Length of hospital stay (d)	2379	—	3.77	2.58	0-67
Patient age (yr)	2378	—	24.01	5.57	13-44
Number of office visits					
First trimester	1778	—	0.99	1.10	0-9
Second trimester	1778	—	2.53	1.48	0-9
Third trimester	1776	—	4.04	2.44	0-15
Gravidity	2384	—	3.19	1.85	1-12
Parity	2382	—	2.58	1.66	0-10
Fetus monitored					
No	910	38.2	—	—	—
Yes	1469	61.6	—	—	—
Laboratory studies					
None	2288	95.9	—	—	—
Pelvimetry	52	2.2	—	—	—
Ultrasound	38	1.6	—	—	—
Both	1	0.0	—	—	—
Birth					
Live	2354	98.7	—	—	—
Stillborn	26	1.1	—	—	—
Gestation					
Term	2011	84.3	—	—	—
Premature	276	11.6	—	—	
Postmature	84	3.5	—	—	—
Apgar scores					
1-minute	2323	—	7.50	1.48	0-9
5-minute	2321	—	8.70	0.92	0-10
Birth weight (lb)	2228	—	6.99	1.23	0.38-12.25
Year of birth					
1979	834	35.0	—	—	—
1980	777	32.6	—	—	—
1981	765	32.1	—	—	—

*Number does not always equal 2385 because of missing data.

June 30, 1980; his obstetric work was taken over by a physician just out of residency. Thus at no time were more than four physicians participating in the obstetrics schedule.

Study groups. Comprehensive Health Services of Detroit is a group practice type of health maintenance organization served by salaried physicians. The five obstetricians that delivered the patients included in this study provide all of the obstetric and gynecologic services to the central division of Comprehensive Health Services of Detroit. This group also operates a private fee-for-service practice. Patients from both practices are hospitalized at Hutzel Hospital, a university hospital in Detroit that provides resident coverage to both groups. Although the face sheets of the hospital records distinguish between the two groups, there is otherwise a policy of integration.

During the 3-year period of January 1, 1979, through December 31, 1981, the five physicians performed deliveries of 2385 single infants (multiple births were separated out and will be reported elsewhere). Of this total population, 1357 (56.9%) were deliveries of health maintenance organization patients and 1025 (43.1%) were of patients in the fee-for-service group. The hospital charts of three patients did not clearly indicate their origin and were eliminated.

Data source. The following data were extracted from the medical records of Hutzel Hospital during the summer of 1982—well after the period under observation. The data extraction was performed by one member of the physician group and a fourth-year medical student. Whenever questions of medical record interpretation arose, the physician's opinion prevailed. Of the nearly 2400 charts reviewed, less than a dozen contained equivocal material that could not be readily interpreted. These data were scored as missing.

All the data were analyzed using the Statistical Package for the Social Sciences program available at the Computer Services Center at Wayne State University. The Statistical Package for the Social Sciences subprograms that were utilized included the following: condescriptives, frequencies, Pearson correlation, one-way analysis of variance, and cross-tabulation (both two-and three-way). Additionally, as described below, for one

Table II. Description of delivery types among the total patient population

Delivery type	*N**	*%†*
Vaginal		
Normal	1579	66.2
Forceps	355	14.9
Breech	43	1.8
Cesarean section		
Failure to progress	47	2.0
Fetal distress	79	3.3
Breech	22	0.9
Other indication	88	3.7
Repeat cesarean section	144	6.0
Both failure to progress and fetal distress	24	1.0
Total	2381	99.8

*Total <2385 because of missing data.

†Total <100% because of rounding and missing data.

Table III. Description of maternal prenatal and postnatal complications

Complications	*N**	*%†*
Prenatal		
None	1850	77.6
Premature rupture of membranes	197	8.3
Previous cesarean section	55	2.3
Incompetent cervix	35	1.5
Multiple complications	22	0.9
Other complications	186	7.8
Total	2345	98.4
Postnatal		
None	2094	87.8
Fever	65	2.7
Elevated blood pressure	62	2.6
Postpartum hemorrhage	56	2.3
Endometritis	32	1.3
Multiple complications	25	1.0
Other complications	41	1.7
Total	2375	99.4

*Total <2385 because of missing data.

†Total <100% because of rounding and missing data.

set of analyses, a categorical analysis of variance (CATANOVA) was manually calculated with the use of a programmable calculator.

Data collected. In addition to patient-identifying variables that were collected, the following patient information was recorded for analysis: (1) maternal length of hospitalization from date of admission; (2) patient's age at end of year (year of delivery); (3) number of times the patient was seen during the first, second, and third trimesters; (4) number of pregnancies (gravidity); (5) number of prior viable deliveries (parity); (6) use of a fetal monitor during labor; (7) use of pelvimetry and/or ultrasound during labor; (8) description of the delivery type (e.g., vaginal—normal, cesarean section—failure to progress, etc.); (9) live birth or stillbirth; (10) gestation age (term, premature, postmature); (11) birth weight; (12) both 1-minute and 5-minute Apgar scores; (13) year of birth; (14) maternal prenatal and postnatal complications; (15) fetal complications.

In addition to the patient-oriented data, the name of the specific physician who delivered the baby was recorded.

Results

General. Table I provides a general descriptive overview of the data that were obtained during the present study. Although the data in Table I are quite self-explanatory, there are a few points worthy of mention.

Length of stay. Although the regional average length of stay in hospitals for the delivery of babies is 4.07 days, the present group of deliveries resulted in an average maternal length of stay of 3.77 days. Although the per person difference is not very large (i.e., 0.30 day), when it is distributed over 2379 patients (those with known length of stay), the total cost savings are quite considerable. The patients in this study stayed a total of 713.7 fewer days in the hospital than a comparable group might have been expected to stay, given the current length-of-stay data reported above. At an average cost of $300 per hospital day (during 1979-1981) the physician group may have saved the health system approximately a quarter of a million dollars, over the 3-year period.

Fetal monitoring. More than 60% of the fetuses were monitored during labor whereas pelvimetry and/or ultrasound was performed on <4% of the mothers. These findings reflect the dominant influence of the senior physicians who stress clinical judgment as the "court of first resort" in the evaluation and management of labor and delivery. The results of this protocol are exhibited in Tables II to IV; both mothers and babies did well when compared to North Central Region data[6] in which only 37% of the pregnancies were diagnosed as completely normal.

Patient outcome. Tables II to IV suggest that in general the population studied fared fairly well. About two thirds of all the deliveries were normal. There were prenatal complications in less than 25% of the population whereas only about 12% of the mothers experienced postnatal difficulties. Moreover, all infant outcome indicators exhibited a relatively healthy prenatal development and birth. These included few fetal complications (Table IV), term deliveries, good Apgar scores, and birth weights well within normal limits (Tables I to IV).

In summary, the population as a whole reflected

Table IV. Description of fetal complications

Fetal complications	*N**	*%†*
None	2077	87.1
Fetal distress	135	5.7
Sick and hospitalized	112	4.7
Stillborn	25	1.0
Infant died	15	0.6
Total	2364	99.1

*Total <2385 because of missing data.
†Total <100% because of rounding and missing data.

pregnancy processes and outcomes consistent with good medical care. Moreover, among many of the variables of evaluation, this population did better than the norms reported for the geographic region from which the patients came.[6] A recent statistical analysis by Hutzel Hospital revealed that the group of physicians involved in this study admitted more obstetric patients, had shorter lengths of stay, and used less ancillary services than any other private group in the hospital.

Comparison of health maintenance organizations and fee-for-service practices. Contrary to much of the current literature that compares health maintenance organizations and fee-for-service practices, the health maintenance organization studied here did very well. This is important considering the level of methodological control established for this study (which warrants repetition at this point). As was described earlier, past studies comparing health maintenance organizations with fee-for-service practices have not had controls for physician or hospital differences. This study did. Patients in both health maintenance organization and fee-for-service environments were treated by the same physician group practice and in the same hospital. Consequently, the ability to attribute obtained differences to real differences in health maintenance organization and fee-for-service environments has been enhanced. The questions of validity and reliability raised by uncontrolled factors in earlier studies (different physician groups, patient populations, and hospitals) have been minimized.

Birth frequency. Fig. 1 exhibits the changing trends in birth rate between the health maintenance organization and the fee-for-service practices. During the 3 years under study, the health maintenance organization experienced a generally increasing number of deliveries while the fee-for-service practice exhibited declining trends. However, both practices had large enough numbers of deliveries to permit a rather robust and varied number of tests for significant differences (Tables V to VIII exhibit a number of these data and tests).

Length of stay. Perhaps not so surprisingly, the women in the health maintenance organization group spent

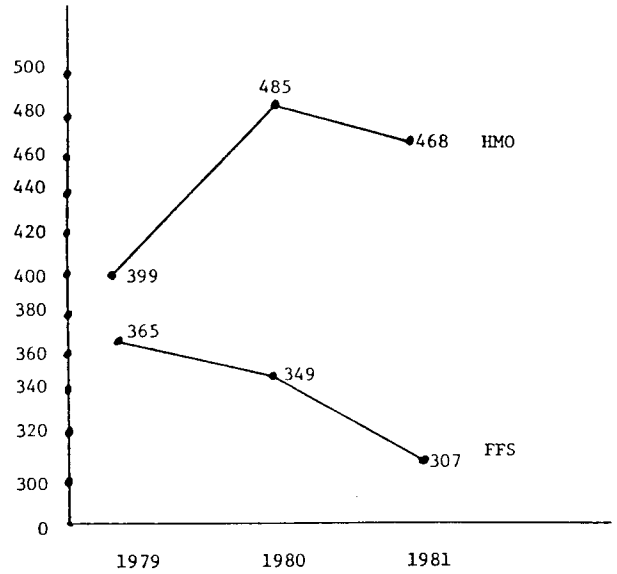

Fig. 1. Birth rates of the total study sample by practice and year of study.

fewer days in the hospital subsequent to delivery than the the fee-for-service patients ($F = 45.15$, $p < 0.0000$; see Table V). Although the difference in average length of stay was <1 day (0.71 day), when the large numbers of patients are considered, the difference in terms of cost becomes considerable. During 1981 the average hospital cost per maternity day at the hospital studied was approximately $382.00. For every 100 patients the fee-for-service practice delivered, the hospital bill was approximately $159,294. On the other hand, for every 100 patients delivered through the health maintenance organization, the bill was only $132,172—a savings of over $27,000. Of course, such savings are commendable only if the quality of patient care (as measured by maternal/neonatal outcome) is not adversely affected. Measures of outcome will be described below. However, there were other significant differences in input and in the patient care process, and these will be described first.

Demographics. Table V indicates that, demographically, there were some statistically significant differences between the two patient groups. The health maintenance organization patients were about 2½ years younger than the patients in the fee-for-service group (22.95 versus 25.40 years old, $F = 118.04$, $p < 0.0000$). On the other hand, these younger health maintenance organization patients had greater gravidity and parity rates (mean health maintenance organization gravidity = 3.48 versus 2.81, $F = 79.03$, $p < 0.0000$; mean health maintenance organization parity = 2.84 versus 2.24, $F = 85.36$, $p < 0.0000$). Although these differences are significant inferentially, clinically the differences do not appear to be important. On the average, in terms of factors related to suc-

Table V. Comparisons of the health maintenance organization (HMO) and fee-for-service (FFS) subpopulations (excluding delivery type and prenatal, postnatal and fetal complications)

Variable	*Unit*	*N*	*%**	*Mean*	*SD*	*Minimum-maximum scores*	*Level of significance*
Number of deliveries	HMO	1357	57	—	—	—	—
	FFS	1025	43	—	—	—	—
Length of hospital stay (d)	HMO	1356	56.9	3.46	1.87	1-26	
	FFS	1023	42.9	4.17	3.23	0-67	<0.0000
Patient age (yr)	HMO	1355	56.8	22.95	5.24	13-44	
	FFS	1023	42.9	25.40	5.70	13-44	<0.0000
Number of prenatal office visits							
First trimester	HMO	1017	42.6	0.78	1.03	0-9	
	FFS	758	31.8	1.26	1.13	0-7	<0.0000
Second trimester	HMO	1016	42.6	2.35	1.50	0-9	
	FFS	759	31.8	2.78	1.42	0-7	<0.0000
Third trimester	HMO	1015	42.6	3.74	2.16	0-10	
	FFS	758	31.8	4.44	2.72	0-15	<0.0000
Gravidity	HMO	1356	56.9	3.48	1.95	1-12	
	FFS	1025	43	2.81	1.64	1-9	<0.0000
Parity	HMO	1354	56.8	2.84	1.84	0-10	
	FFS	1025	43	2.24	1.31	0-8	<0.0000
Fetal monitoring							
No	HMO	541	39.9†	—	—	—	
Yes	HMO	812	59.8	—	—	—	p = 0.3744
No	FFS	368	35.9	—	—	—	
Yes	FFS	655	63.9	—	—	—	
Laboratory studies							
None	HMO	1304	96.1†	—	—	—	
Pelvimetry	HMO	31	2.3	—	—	—	
Ultrasound	HMO	18	1.3	—	—	—	
Both	HMO	1	0.1	—	—	—	p = 0.9573
None	FFS	981	95.7†	—	—	—	
Pelvimetry	FFS	21	2.0	—	—	—	
Ultrasound	FFS	20	2.0	—	—	—	
Both	FFS	0	0	—	—	—	
Birth							
Live	HMO	1337	98.5†	—	—	—	
Stillborn	HMO	16	1.2	—	—	—	p = 0.8521
Live	FFS	1014	98.9	—	—	—	
Stillborn	FFS	10	1.0	—	—	—	
Gestation							
Term	HMO	1117	82.3†	—	—	—	
Premature	HMO	190	14	—	—	—	
Postmature	HMO	44	3.2	—	—	—	p = 0.0001
Term	FFS	892	87	—	—	—	
Premature	FFS	86	8.4	—	—	—	
Postmature	FFS	39	3.8	—	—	—	
Apgar scores							
1-minute	HMO	1317	55.2	7.55	1.40	0-9	
	FFS	1003	42.1	7.45	1.57	1-9	p = 0.1012
5-minute	HMO	1315	55.1	8.69	0.97	0-10	
	FFS	1003	42.1	8.70	0.83	1-10	p = 0.7535
Birth weight (lb)	HMO	1259	52.8	6.91	1.23	0.38-11.44	
	FFS	967	40.1	7.10	1.23	1.5-12.25	p = 0.0004
Year of birth							
1979	HMO	399	29.4†	—	—	—	
1980	HMO	485	35.7	—	—	—	
1981	HMO	468	34.5	—	—		p = 0.2971
1979	FFS	365	35.6	—	—	—	
1980	FFS	349	34	—	—	—	
1981	FFS	307	30	—	—	—	

*Except where otherwise indicated, percent is based on 2385. Total may be <100% because of rounding.

†Percent is based on sample size, within unit, for this variable.

Table VI. Comparison of maternal prenatal and postnatal complications in health maintenance organization and fee-for-service study groups

Complications	*Health maintenance organization*		*Fee-for-service practice*		*Level of significance*
	*N**	*%†*	*N**	*%†*	
Prenatal					
None	1053	77.6	794	77.5	
Premature rupture of membranes	118	8.7	79	7.7	
Previous cesarean section	30	2.2	25	2.4	
Incompetent cervix	14	1.0	21	2.0	
Multiple complications	13	1.0	9	0.9	
Other complications	101	7.4	85	8.3	
Total	1329	97.9	1013	98.8	p = 0.7949
Postnatal					
None	1212	89.3	880	85.9	
Fever	33	2.4	32	3.1	
Elevated blood pressure	27	2.0	35	3.4	
Postpartum hemorrhage	29	2.1	27	2.6	
Endometritis	19	1.4	12	1.2	
Multiple complications	15	1.1	10	1.0	
Other complications	19	1.4	22	2.1	
Total	1354	99.7	1018	99.3	p = 0.0029

*Total <2385 because of missing data.

†Percent based on unit subpopulations and not the total population. Total <100% because of rounding and missing data.

Table VII. Comparison of the delivery type in health maintenance organization and fee-for-service study groups

Delivery type	*Health maintenance organization*		*Fee-for-service practice*		*Level of significance*
	*N**	*%†*	*N**	*%†*	
Vaginal					
Normal	959	70.7	619	60.4	
Forceps	190	14.0	165	16.1	
Breech	28	2.1	15	1.5	
Cesarean section					
Failure to progress	26	1.9	21	2.0	
Fetal distress	31	2.3	47	4.6	
Breech	9	0.7	13	1.3	
Other indication	35	2.6	52	5.1	
Repeat cesarean section	72	5.3	72	7.0	
Both failure to progress and fetal distress	5	0.4	19	1.9	
Total	1355	100.0	1023	99.9	p < 0.0000

*Total <2385 because of missing data.

†Percent based on unit subpopulations and not the total population. Total <100% because of rounding and missing data.

cessful child bearing, 23- and 25-year-old women are virtually identical. The same holds true for the gravidity and parity differences. considering the large sample sizes in the study, the clinically limited gravidity and parity differences are not likely to account for differences that may be obtained in outcome measures.

There were no significant differences in the total number of births that occurred during each of the 3 years of the study.

Input. Patients in the health maintenance organization setting visited their obstetrician significantly fewer times during their pregnancies (Table V). This was true in each of the three trimesters, with the health maintenance organization patients averaging about a half a visit less than the patients in the fee-for-service group. However, both patient groups exhibited increasing numbers of visits as their pregnancies progressed. This would be expected in good clinical care of pregnancies.

During the course of pregnancy there were no significant differences in the rate of prenatal complications (Table VI). A little more than three quarters of each group had normal pregnancies and the rates of

Table VIII. Comparison of fetal and neonatal complications in health maintenance organization and fee-for-service study groups

Fetal and neonate complications	*Health maintenance organization*		*Fee-for-service practice*		*Level of significance*
	*N**	*%†*	*N**	*%†*	
None	1185	87.3	890	86.8	
Fetal distress	57	4.2	77	7.5	
Sick and hospitalized	77	5.7	35	3.4	
Stillborn	15	1.1	10	1.0	
Infant died	10	.7	5	.5	
Total	1344	99.0	1017	99.2	$p = 0.0832$

*Total <2385 because of missing data.

†Percent based on unit subpopulations and not the total population. Total <100% because of rounding and missing data.

various complications were comparable between the patients in the health maintenance organizations and the fee-for-service groups ($\chi^2 = 9.54$, $p > 0.05$). (The "other complications" category in Table VI included such problems as hypertension of pregnancy, fibroid uterus, and incompetent cervix, to name a few. However, none occurred in statistically significant numbers to warrant individual discussion. The number of cases was too small to properly evaluate.)

While patients were in the hospital and prior to delivery, there were no significant differences either in the level of fetal monitoring ($\chi^2 = 4.24$, $p > 0.05$) or in the amount of laboratory studies ($\chi^2 = 2.59$, $p > 0.05$) ordered for the two groups (Table V). However, about 4% more of the patients in the fee-for-service group had fetal monitoring.

Delivery type. Table VII exhibits the array of delivery types in the two groups; the differences were significant ($\chi^2 = 66.11$, $p < 0.0000$). Because the number of cells is so large, the χ^2 statistic does not readily distinguish between differences that might be due to grouping and differences due to delivery type. Consequently, a CATANOVA was performed as well. This test provides a measure of group differences across nominal or categorical data. It also provides the proportion of total variation in the dependent variable which is accounted for by the grouping variable (i.e., health maintenance organization versus fee-for-service). (For more details see Light and Margolin.[7]) The CATANOVA was also significant at $p < 0.0000$. Thus it appears that part of the variation measured by the χ^2 may be attributable to differences between the health maintenance organization and fee-for-service environments rather than only to differences across the delivery types.

From Table VII it may be seen that generally deliveries in the health maintenance organization group appeared less complicated than those in the fee-for-service group. The health maintenance organization population experienced completely normal deliveries in over 70% of the cases, whereas the fee-for-service group exhibited only 60.4% normal deliveries. On the other hand, among the other delivery types, the proportion of the fee-for-service group experiencing a particular difficulty was about twice that of those in the health maintenance organization. In only one case did the proportion of health maintenance organization patients experiencing a particular difficulty (i.e., vaginal-breech) exceed that of the patients in the fee-for-service group, and that difference was quite small.

Outcome. On virtually every outcome measure (both for child and mother), there were no differences between the health maintenance organization and fee-for-service groups. The vast majority of births took place without fetal distress (Table VIII). Although there was a statistically significant difference in birth weight, clinically this difference was also not meaningful. The average difference in weight between the two groups was about 3 ounces, and both groups fell well within normal limits (Table V).

Once difference that did occur was in gestation; 14% of the health maintenance organization deliveries were premature whereas only 8% of the fee-for-service deliveries were premature. Unfortunately, none of the input data or other demographic characteristics served to explain this difference. Furthermore, other neonate outcome measures (such as Apgar scores) produced no differences between the two groups.

Finally, in terms of postnatal maternal complications, there was a significant difference in outcome ($\chi^2 = 35.98$, $p = 0.0029$). A larger proportion of the health maintenance organization patients went home without any postnatal complications than did patients of the fee-for-service group (Table VI). However, in both groups the proportions without any complications approached 90%. Most notably though, for most categories of complications, there were proportionately fewer patients in the health maintenance organization group than in the fee-for-service group.

In summary, the data suggest that the levels of medi-

cal input and process intervention for health maintenance organization patients was significantly lower than for patients in the fee-for-service group. (It may therefore be reasonably assumed that, on the average, the health maintenance organization patient was less expensive to bring to and through delivery than the patient in the fee-for-service group.) However, there were virtually no differences in outcome for mother and child in either the health maintenance organization or fee-for-service setting. Consequently, it appears that the reduction in quantity of medical intervention in the health maintenance organization did not in any way lead to a reduction in quality of medical care. Perhaps the law of diminishing returns (vis-a-vis medical intervention) may be in operation. Possible explanations for the obtained differences, or lack thereof, and the ramifications for the general provision of medical services follow.

Comment

This study was conducted with a sample of sufficient size to make the findings of the variables studied statistically significant. A computerized analysis of the data tends to support, for the most part, the original assumption that both groups received adequate and equal care. There were differences, however, that will profit from added explanation.

The length-of-stay period extended from the day of admission to the date of discharge for the delivery admission only. In some instances, the patient was admitted several days before labor or pregnancy termination in order to manage a prenatal complication. Such patients were also more likely to require a longer-than-usual postpartum hospital stay.

The difference in length of stay between the two groups was 0.7 day/patient less for the health maintenance group. Just as the availability of transportation, home nursing, and social service resources permitted safe, early postpartum discharge of health maintenance organization patients, these same services allowed a delay in admitting health maintenance organization patients with complications. These extra services were not readily available for the patients in the fee-for-service group, and the results are reflected in their longer periods of hospitalization.

The pelvimetry and ultrasound data refer only to those studies done during the delivery admission. A year-by-year analysis of these data shows a declining trend in the use of pelvimetry and a rise in the use of sonography in both groups. In recent years the use of pelvimetry in both patient groups has ceased.

The differences in cesarean section rates caused much concern. (Of course, the higher section rates in the fee-for-service group added to the longer length of stay.) The overall section rates for fee-for-service and health maintenance organization groups were 21.9% and 13.2%, respectively, and the primary rates were 14.9% and 7.9%. A more detailed study of the figures revealed that the four indications for cesarean section with the widest difference were those shown in Table IX.

Table IX. Comparison of the most divergent indicators for cesarean section

Study group	*Fetal distress (%)*	*Breech presentation (%)*	*Failure to progress and fetal distress (%)*	*Other indicators (%)*
Health maintenance organization	2.3	0.7	0.4	5.1
Fee-for-service practice	4.6	1.3	1.9	2.6

Our data allowed an evaluation of the performance records of the individual physicians for each of of the 3 years studied. It had been assumed that the younger physicians, by ordering more patient monitoring and delivering fewer breech presentations by the vaginal route, were largely responsible for the increase in the cesarean section rate in the fee-for-service group, if not in the entire sample. Such was not the case. As a matter of fact, the primary cesarean section rate for both service groups was lower during the third year, the year the oldest physician's obstetrical work was taken over by a new group member.

An individualized analysis of each physician's cesarean section rate for each of the several indications showed that all physicians participated in each category to the same extent. Despite the claim that the two patient groups are indistinguishable during labor and delivery, the fact remains that the cesarean section rates for four indications are significantly higher in the fee-for-service group than in the health maintenance organization group. Included among the fee-for-service group are referred obstetric cases with prior or current complications. Often these required surgical intervention and prolonged prenatal and postnatal hospitalization. Although the number of such cases may not be large enough to influence significantly the overall statistics, they are reflected more often in the cesarean section rates.

Pregnancy outcome was good in both groups. With a perinatal mortality of 9.77 per 1000 and 11.83 per 1000 in the fee-for-service and health maintenance organization groups, respectively, and one maternal death (due to disseminated intravascular coagulation), both mothers and infants did well. (We are planning a long-term follow-up of the infants with signs of distress at birth.)

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