

**MIGRATION OF OBSTETRICIANS-GYNECOLOGISTS
INTO AND OUT OF RURAL AREAS, 1985-1990**

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Migration Of Obstetricians-Gynecologists Into and Out of Rural Areas, 1985-1990

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ABSTRACT

Objective. To determine if there are county level factors that are associated with the movement of obstetricians-gynecologists (ob-gyns) into and out of rural areas.

Data Source. County level descriptive data from the Area Resource File (ARF) were used to characterize nonmetropolitan counties in 1985 and 1990, the American Medical Association (AMA) Physician Masterfile was used to characterize the ob-gyns who moved, and the American Hospital Association Guide was used for data describing hospitals.

Study Design. This is a correlational study that includes measures of change to associate ecological indicators of communities (counties) with categorical indicators of gain or loss of ob-gyns in nonmetropolitan counties. Descriptive statistics were used to characterize the supply and movement of ob-gyns into and out of nonmetropolitan counties by size and location of the counties and to characterize the ob-gyns themselves. Multinomial logistic regression models were used to determine the net effect of the ecological indicators on the movement.

Principal Findings. The characteristics of counties that gained ob-gyns were quite similar to those who lost ob-gyns. Rural counties that experienced movement of ob-gyns tended to be "medium" sized counties; small rural counties tended to be without ob-gyns across both time periods, while those counties with the largest population tended to retain their obstetrical providers. In addition to population, the number of hospital beds in the county and adjacency to metropolitan areas were strong predictors of whether a county retained, was unstable, or never had OBs. Unobserved individual state characteristics were significant predictors of the ability to retain ob-gyns while indicators of economic change in counties do not predict

with accuracy movement of ob-gyns either into or out of nonmetropolitan counties.

Conclusions. The supply of ob-gyns in medium sized rural counties is dynamic and, during 1985-1990, in overall balance. There is no clear evidence that there are competitive relationships between family physician supply and ob-gyn supply. There is evidence that the largest influence in the migration of obstetricians into and out of nonmetropolitan counties and their retention in those counties is a function of state level policies and activities. The counties to which obstetricians are attracted are substantially different from those where there is stability of supply or from which they emigrate.

Keywords. Rural, obstetrics, physician migration, obstetrician-gynecologist

INTRODUCTION

Obstetrical care is perhaps one of the most common and important types of medical care needed by women. Research has found that women in rural areas are less likely than women in urban areas to have access to the services of an obstetrician-gynecologist (ob-gyn) (Zweig, Williamson, Hosokawa, Ellis and Taylor, 1990; Nesbitt, Connell, Hart and Rosenblatt, 1990), making the shortage of ob-gyns in rural areas an important policy concern (Taylor and Ricketts, 1993; Lambrew and Ricketts, 1993). The combination of these factors begs the question: What motivates an ob-gyn to begin practice in or to leave a rural area? Research on the reasons for choosing rural practice (recruitment) and the reasons for staying in rural areas (retention), indicates that both community and personal characteristics may influence this decision (Pathman, Konrad and Ricketts, 1994a, 1994b; Connor, Hillson and Kralewski, 1994). This paper examines trends in the movement of obstetrician-gynecologists into and out of rural areas between the years 1985 and 1990 and describes the personal characteristics of ob-gyns who move. The relationship between community characteristics and the flow of ob-gyns is explored, while controlling for state-level policy factors.

BACKGROUND

I Obstetrics in Rural Areas

Obstetrician services are less often available in rural than urban areas in the United States (Nesbitt, Connell, Hart and Rosenblatt, 1990; Allen and Kamradt, 1991). In rural places where deliveries occur, you are as likely to encounter a family practitioner as an ob-gyn (Schmittling and Tsou, 1989; Greenberg and Hochheiser, 1994; Baldwin, Hart and Rosenblatt, 1991). According to a recent survey by the American Hospital Association, in urban areas, 78.1% of babies are delivered by an ob-gyn compared to 5.3% by a family practitioner. In contrast, in rural areas, 69.3%

of deliveries are done by ob-gyns and 24.7% by family physicians. Certified nurse midwives deliver slightly more babies in urban areas, 5.1% versus 4.6% of all deliveries in rural areas (Hospitals and Health Networks 1994). Several studies have observed that physicians who provide obstetrical care are increasingly tending to give up doing deliveries (ACOG, 1988; Institute of Medicine, 1989; Machala and Miner, 1994; Kruse, Phillips and Wesley 1990; Rosenblatt and Detering, 1990; Rosenblatt, Weitkamp, Lloyd, Schafer, Winterscheid and Hart, 1990; Bronstein, 1992). These same studies have identified multiple reasons for this occurrence, including rising malpractice costs, lack of shared coverage, the burden of doing deliveries, poor reimbursement for deliveries, and no "demand" for services. All of these factors are more likely to occur in rural than urban areas and two of those conditions, malpractice climate and payment level, especially from Medicaid, vary widely from state to state.

II. Migration Trends of Obstetricians

Multiple studies have demonstrated a growing divergence in the supply of physicians in rural as compared to urban areas (Ricketts, 1994a; Kindig and Movassaghi, 1989; Frenzen, 1991; Study of Models, 1992). The Rural Policy Research Institute (1994) in its review of the important issues facing rural health care delivery contends that provider supply in rural areas is one of the most significant policy concerns facing this country, and cites obstetric supply as critical to the health of rural people.

Studies of supply issues have tended to focus on individual physicians and their personal reasons for choosing to go into or leave a rural area or to drop the practice of obstetrics. Bronstein and Morrissey (1991) point out that physician practices, to remain viable, need sufficient numbers of patients with at least a minimum income and/or insurance; these conditions are less likely to be met in

rural than urban areas. In addition, these authors suggest that the availability of hospital back-up services is an important consideration for obstetricians or family physicians deciding whether or not to provide obstetrical care, and such services may not be available in rural locations (Bronstein and Morrisey, 1991a, 1991b). Bronstein (1992) observed that as the number of specialists (ob-gyns) increased in rural areas, family physicians in these places were likely to move to a more rural location to begin practice; in this single state study there appeared to be competition between obstetricians and family practitioners doing obstetrics in rural areas where there were fewer women in need of services.

Newhouse (1990) similarly suggests that physicians move into and out of locations due mainly to the effects of competition and to maximize their profit. Hicks and Glenn (1991) support this view, and determined the "critical mass" or population size necessary to support various specialties in rural areas. Baumgardner (1988) also contends that specialist physicians can only maintain their practices in densely populated areas. Steiber (1982) studied physician migration and found that physician movers were typically in specialties and were likely to move into self-employment or office-based medical practices. These studies seem to suggest that specialist physicians are more likely than generalist physicians to move their practices, most often in search of a greater "demand" for their services.

These studies of physician migration into and out of rural areas have been focused on a single state or have examined the entire physician population. This article narrows the focus to obstetricians-gynecologists but looks at national data. In any study of rural versus urban resource issues, the problem of a definition of rural comes into play. The choice of a particular indicator of rurality is both problematic in a technical sense and can influence the results of any comparison (Ricketts, 1994b). As the data used in this study are aggregated at the county level, the US Office of Management and Budget (OMB) designation of counties as being either

“metropolitan”, that is, classified as part of a Metropolitan Statistical Area (MSA), or “nonmetropolitan,” not in an MSA, is used.

ABOUT THE DATA

For these analyses, the American Medical Association (AMA) provided physician location data from the Physician Masterfile which were used in conjunction with the Area Resource File (ARF) and the 1989 American Hospital Association’s (AHA) Survey of Hospitals. The AMA data contain all moves by physicians into and out of rural areas from 1986-1990, and includes personal and practice type characteristics of the physicians, such as gender, age, board certification, type of practice, major professional activity, and federal affiliation. The 1992 ARF was used to analyze county characteristics and their potential effects on migration. The selection of variables to classify and characterize counties was based on earlier research cited above that identified selected county descriptors as potentially influencing an ob-gyn’s decision to enter or leave a rural area. Additionally, the 1989 American Hospital Association “Guide” included descriptions of the degree to which hospitals provided obstetrical service and support technology.

METHODS

A central issue which needed to be addressed was how to categorize counties as having gained or lost obstetricians. The gain or loss of obstetrical providers in the county can be measured in two ways: as absolute change in number of physicians or as a change in population-to-provider ratios. If “gain” of ob-gyns is intended to represent better access to care while “loss” represents a decrease in access, change in ratios is a preferred measure. Sensitivity analyses were performed comparing absolute gain or loss of at least one provider with gain or loss categorically defined using various threshold changes in ratios (where a lower ratio represents a measure

of improvement or gain, and a higher ratio represents a loss). Table 1 illustrates this analysis.

Table 1 about here

For example, when gain or loss is categorized according to a threshold change of plus or minus 500 women to one ob-gyn, there were 142 counties where, although there was an absolute loss in the number of ob-gyns, population shifts resulted in an improvement in population-to-provider ratios. The threshold of $\pm 1:1500$ was chosen as the measure of "ratio change." This ratio is large enough to indicate that there is sufficient new demand for a practitioner or loss of demand to cause a practitioner to leave the community. This level also agrees with several prescriptions for the appropriate ratio to provide adequate access to physician services for primary and general care, there being no clear standard for access to obstetrical providers (Hicks and Glenn, 1991). Using this threshold, all of the counties which had no absolute change (n=1752) also fell within the "no change" ratio determined category. In the categorization of counties using the lower ratio thresholds, there were instances where there were absolute changes but not enough ratio change to categorize the counties consistently.

Descriptive statistics were generated from the AMA datasets to show the personal characteristics of ob-gyn movers. Since the AMA datasets contained a fairly high percentage of both in- and out-migrants who reported that their next type of practice (after either moving into or out of a rural county) was retirement, these individuals were removed from this analysis since they would be likely to provide little patient care.

Statistics which capture the overall trends in physician migration into and out of US nonmetropolitan counties between 1985 and 1990 and the characteristics

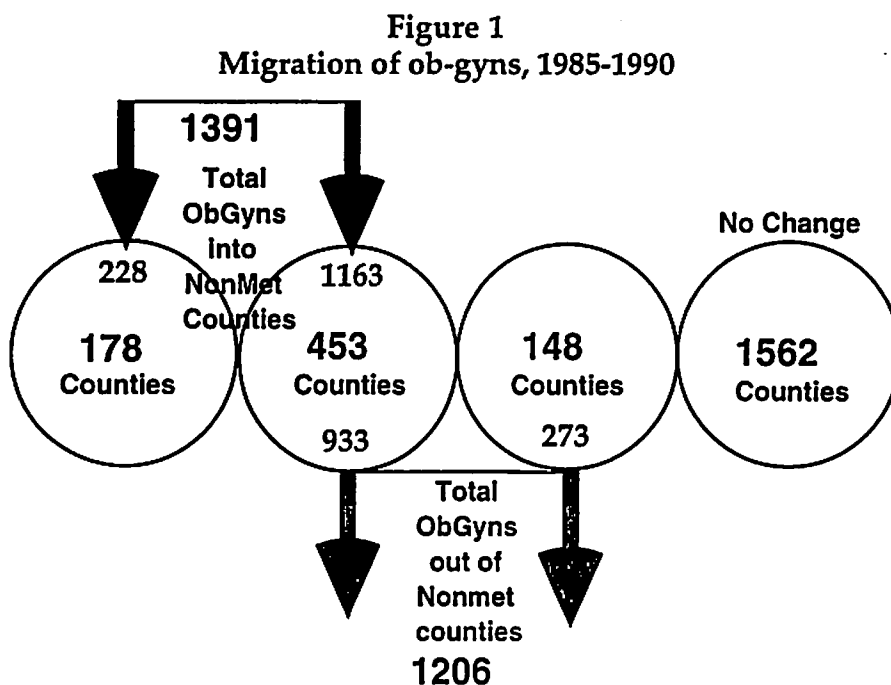
of counties categorized by changes in access are described for 1985 and 1990 (except per capita income and the number of females of reproductive age, where data were only available for 1989). Mean values of selected descriptors were compared using t-tests to determine if the differences between counties that gained, lost, retained or never had ob-gyns were possible due to chance variation.

The association between county-level characteristics and the probability of gain or loss of ob-gyns is assessed with a multinomial logit. State-level fixed effects are included to control for unobserved state characteristics which influence physician movement. Four dependent variable states were possible: no ob-gyns in either time period, 1985 and 1990; gain of ob-gyns (defined as a decrease in population-to-provider ratio of at least 1500); loss of ob-gyns (defined as an increase in population-to-provider ratio of at least 1500); and retention of ob-gyns across the two time periods. The independent variables include: per capita income in 1985 and percent change in per capita income 1985-1989, percent unemployed in 1985 and percent change in the unemployment rate between 1985 and 1990, the number of patient care family physicians in the county in 1985, the number of acute care hospital beds in the county in 1985 (coded as three dummy variables), an indicator of whether there was an obstetric unit in the hospital, natural log of the 1980 population, and an indicator of whether the county was adjacent to a metropolitan county. In addition, dummy variables were coded that captured gain or loss in total hospital beds (in instances where at least a 10% increase or decrease occurred), and gain, loss, or retention of family physicians between 1985 and 1990.

RESULTS

There were a total of 1,206 moves out of nonmetropolitan (rural) counties and 1,391 moves into rural counties. The moves out came from a total of 601 different rural counties, and the moves in were to a total of 631 different rural

counties. Four hundred fifty-three counties experienced at least one move in *and* out between 1986 and 1990. Figure 1 summarizes the flow of ob-gyns into and out of nonmetropolitan counties. The circles represent unduplicated nonmetropolitan counties in each of four groups according to the net migration of ob-gyns.



There were 148 rural counties from which obstetricians left and none entered, and 178 rural counties which had only a move in, while the remaining 453 rural counties experienced at least one ob-gyn move out and one ob-gyn move in. A cross tabulation of counties that had no obstetricians in 1985 versus those that had one or more in 1990 found that, of the 2,342 rural counties, 104 had no ob-gyns in 1985 and at least one in 1990, while 102 counties had at least one ob-gyn in 1985 and none in 1990.

Table 2 provides descriptive statistics from the American Medical Association's Physician Masterfile for the ob-gyns who left rural areas during the period 1986-1990 for any reason other than retirement. This totaled 928 physicians. Eighty-one percent of the physicians in this dataset were male. The majority (25.9%) were aged 31-35 years, followed closely by the age group of 36-40 years (21.3%).

Approximately one-quarter of the physicians in this subset said they left their rural area in each of the four years (1987-1990). Ninety percent of these physicians were not federally employed. Eighty percent of these physicians reported office-based practice as their following professional activity, while 10% reported full-time staff physician at a hospital. It makes sense, then, that 87.8% of these ob-gyns responded that their type of practice upon leaving was direct patient care.

Table 2 Here

Table 2 also portrays those physicians who migrated *into* rural counties. The number of ob-gyns moving at least once into a rural area from 1986-1990 was 1,260. As with the out-migration dataset, some of these physicians moved more than once (once into a rural area, and then again into another rural area). Such double moves were eliminated. The results are similar to those in the out-migration dataset. Approximately 80% of those included are male, and one-third are aged 31-35 years. Each year about one-third of the immigrants moved into rural areas. Over 90% of those in this dataset were non-federally employed. The major professional activity for 70% of the immigrants was office-based practice, and 79.2% cited direct patient care as their type of practice.

Table 3 compares mean values of county-level characteristics for counties defined by change in ratios as experiencing out-migration, in-migration, retention, or those who had no ob-gyns during the period 1985-1990. Counties that experienced movement in either direction had significant larger average populations than counties with no ob-gyns in either year, and significantly smaller mean populations than counties which retained their obstetrical providers across the time period studied. The counties that experienced change were also in the mid-range for the mean values for all other indicators variables except for per capita income. One possible explanation for this phenomenon is that while the counties

with the largest population and most health care resources can retain their obstetrical providers, and the smallest simply do not even have the population to attract ob-gyns, the counties in the middle have population and resources which are sufficient to either acquire an ob-gyn initially or to add one or more, but not necessarily enough resources to retain them; the counties were not so large that they had the sufficient resources to retain a larger number of providers nor so small or lacking in resources that they could not gain any providers.

Table 3 Here.

The multinomial logistic regression form was chosen to analyze these data because it allows us to understand the relative risk that one or more independent variables is associated with an outcome that can be measured in categories or classes. The multinomial logit model also allows the analyst to simultaneously control for the effects of other variables that describe the environment and conditions in the county. The classes used in this model were in-migration, out-migration, retention of providers, and no providers in either year, with this last category serving as the comparison group. This approach is appropriate for categorical variables to determine the effects of ecological variables and indicators of change (Allison, 1982, 1984; Maddala, 1983).

Table 4 presents the results of the multinomial logit regression analysis of the association between selected county characteristics and the probability of in- or out-migration as measured by a change in the ratio of women aged 15-44 to obstetricians of ± 1500 . The relative risks are reported in the table. The counties with no providers in either time period was set as the reference category. The same analytic model was run with the dependent variable being the four categories of absolute change: increase of one or more providers, or decrease of one or more providers, no providers in 1985 or 1990, and no change in number of providers. The model

analyzing absolute change included variables that measured the percent change in the county female 15-44 and total 1985 baseline population in addition to the natural logarithm of total population. As the estimation results of the model with absolute change as the categorization criteria were very similar to the results of the ratio change analysis only the latter are included in the tables and discussed here. Estimation results of the former are available from the authors upon request.

The variables for this analysis were chosen to broadly characterize the need for obstetrical services, general medical resources, and economic conditions in the counties. The results presented in Table 4 indicate separate structures for correlates of out-migration, in-migration and retention of providers as compared to rural counties with no obstetricians in either year. Rural counties with out-migration are significantly more likely to have larger populations than counties with no providers. Loss of hospital beds between 1985 and 1990 also significantly increases the risk of out-migration of obstetricians. Counties with in-migration are negatively correlated with the number of family physicians (relative risk of 0.93). Per capita income (1.0004), the two larger classifications of hospital beds size in the county, and the natural logarithm of total 1980 population are all positive predictors of in-migration as compared to no providers. This pattern of association is expected for the population variable, the income variable and the hospital variable. Although the negative relative risk value for number of family physicians may agree with the hypothesis that the supply of family physicians is inversely related to the supply of obstetricians, the expected relationship with the variables describing changes in the family physician supply is not significant. with population having a significant relationship. The counties that retained their obstetricians were characterized by less ability to retain their family physicians, had higher per capita income, greater hospital capacity (but the presence of an obstetric unit was not significant), were not adjacent to a metropolitan county, and had much higher population than the

counties that had no obstetricians in either year, factors generally consonant with the ability to compete for professional service.

An important result of the regression was the influence of the state dummy variables. For the out-migration dependent class, there were significant influence on the risk for Kentucky, Michigan, North Carolina, South Dakota, Vermont, and West Virginia for greater outmigration. For the in-migration class, there were significant correlations for California, Georgia, Kentucky, Montana, Nevada, New Mexico, New York, North Carolina, Pennsylvania, and Utah for greater in-migration. For the retention class, the state dummy variables were significant for all states with nonmetropolitan counties. The inclusion of state level dummy variables accounts for differences in Medicaid payment levels for obstetric services, the presence or absence of an office of rural health and primary care associations (which may or may not be effective in recruiting and retaining providers), and, to the extent that they are consistent state-wide, malpractice insurance costs.

Table 4 here

DISCUSSION

The data reviewed in this article show that, although there were substantial flows of ob-gyns into and out of nonmetropolitan counties between 1985 and 1990, the net change was small. An examination of movement by size of county indicates that while ob-gyns do move into and out of rural counties, they have not chosen to move into the most rural counties. Those counties which were found to have had either in- or out-migration between 1985 and 1990 were those nonmetropolitan counties with "medium" population and health care resources, while rural counties which retained their providers tended to have the largest population and the most health care resources.

The physicians who move into or out of nonmetropolitan counties were clustered between the ages of 31-40. Since both in- and out-migration tend to be concentrated in these age groups, it suggests that obstetricians may move into a rural area, but not stay for a long time or that this is the time period when these physicians are, in general, most mobile. There doesn't appear to be a "burn-out" factor that causes older physicians to move away from rural areas. These results bear closer examination as to the true reasons for mobility in this younger group and whether there is a loss of obstetrical services hidden in low rates of obstetrical provider movement.

Using multivariate analyses it is possible to isolate net factors correlated with the ability of counties to add, lose, or retain obstetricians. The results show that population and hospital resources are important, but potentially of greater importance are factors related to state level policies such as malpractice premiums, Medicaid reimbursement, or the activity of state Offices of Rural Health. The significance of the adjacency variable as a negative predictor of retention might indicate that while rural counties closer to larger cities are at increased risk of never having obstetricians, proximity to services in nearby areas may mitigate to some degree the lack of obstetric resources in the immediate county. The multivariate model did not confirm a close relationship between family practitioner supply and change and obstetrician supply and change. This suggests that counties with the ability to retain obstetricians do not necessarily retain family practitioners.

Overall, these findings suggest that obstetrician in- and out-migration is associated with both specific county characteristics and specific state characteristics. The importance of county population is consistent with literature suggesting a threshold level or minimum level of population necessary to support a provider. Additionally, younger physicians are more likely to be those doing any type of migrating at all. It is quite possible that much of the observed movement results

from new physicians searching for the appropriate place to locate and are affected by both competition factors and demand factors; while the very small rural counties do not have enough population and resources to support a practice, the large rural counties may already have enough ob-gyns to meet demand. This, combined with the neutral net total migration indicates that the ob-gyn portion of the obstetrical capacity across all rural areas is both dynamic and stable.

This characterization of the migration patterns of these providers raises questions of how this type of turnover may affect the quality and continuity of care received by women living in rural counties. In rural counties where there is a "revolving door" pattern of migration, it will be important to determine if there are resulting negative effects on continuity of care and outcomes.

LIMITATIONS

The literature has suggested that obstetricians, and other providers of obstetrical care, may avoid high malpractice premiums by moving to lower cost areas or by quitting obstetrics completely. In those states where malpractice premiums vary, the state dummy variable will not control for the malpractice climate of the county. It is likely, based on studies of ob-gyns and their reasons for continuing to do obstetrics, that these are potentially important factors in obstetrician geographic migration. Further analysis should consider the impact of malpractice costs on in- and out-migration from rural areas. Additionally, this study does not provide a clear look at migration patterns over a long period of time. The five-year period between 1985 and 1990 used in these analyses gives a sense of the net migration experience of rural counties but can only partially suggest future rates or trends. The lack of association between the migration indicators and changes in ecological variables describing the counties may indicate that five-year (and shorter) trends are not sufficient to capture the true character of change in

community structures. The restriction to the county as the unit of analysis might also mask the true characteristics of the service areas of the obstetricians under study; many rural obstetricians serve women in more than one county. Future studies should take time into account and assess the rate of migration over a longer period of time and consider multi-county service areas for ecologic analyses.

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Table 1. Comparison of Changes in Absolute Numbers of Obstetricians and Changes in the Ratios of Obstetrician-to-Females-15-44 Ratios, 1985-1990.

	Loss defined as Ratio increase plus $\geq 500:1$	No Change defined as Ratio change $\pm < 500:1$	Gain defined as decrease minus $\geq 500:1$	Total
Loss of ≥ 1 OB	102	55	142	299
No change	30	1698	24	1752
Gain of ≥ 1 OB	141	47	103	291
Total	273	1800	269	2342

	Loss defined as Ratio increase plus $\geq 1000:1$	No Change defined Ratio change $\pm < 1000:1$	Gain defined as Ratio decrease minus $\geq 1000:1$	Total
Loss of ≥ 1 OB	101	101	97	299
No change	1	1747	1	1752
Gain of ≥ 1 OB	105	83	103	291
Total	207	1931	204	2342

	Loss defined as Ratio increase plus $\geq 1500:1$	No Change defined Ratio change $\pm < 1500:1$	Gain defined as Ratio decrease minus $\geq 1500:1$	Total
Loss of ≥ 1 OB	98	135	66	299
No change	0	1752	0	1752
Gain of ≥ 1 OB	80	112	99	291
Total	178	1999	165	2342

Table 2. Personal Characteristics of In-Migrants (n=1260) and Out-migrants (n=928)

	In-Migrants		Out-Migrants	
	N	Percent	N	Percent
Gender				
Male	1020	81.1	750	80.8
Female	240	19.0	178	19.2
Age Group				
30 or less	98	7.8	19	2.1
31-35	348	27.6	232	25.9
36-40	200	15.9	191	21.3
41-45	143	11.4	134	14.6
46-50	141	11.1	130	14.5
51-55	89	7.1	78	8.7
56-60	64	5.1	52	5.8
61-65	64	5.1	47	5.2
66+	113	9.0	45	5.0
Year Moved Out Of Area				
1987	312	24.8	232	25.0
1988	349	27.7	290	31.2
1989	349	27.7	219	23.6
1990	250	19.8	187	20.2
Federal Employment Status				
Federal	97	7.7	93	10.0
Non-federal	1163	92.3	835	90.0
Major Professional Activity (After Move)				
Administration	13	1.0	3	0.3
Clinical Fellow	12	1.0	8	0.9
Resident first year	33	2.6	1	0.1
Resident--other years	91	7.2	50	5.7
Medical Teaching	7	0.6	7	0.8
Research	3	0.2	3	0.3
Office-based/Direct Pt Care	890	70.6	710	80.3
Full time Staff Physician	112	8.9	95	10.7
Other	89	7.1	1	0.1
Type Of Practice When Md Left (Before move)				
Resident--first year	33	2.6	17	1.8
Resident--other years	91	7.2	69	7.4
Clinical Fellow	12	1.0	11	1.2
Direct Patient Care	998	79.2	815	87.8
Administration	13	1.0	5	0.5
Medical teaching	7	0.6	4	0.4
Medical Research	3	0.2	4	0.4
Retired/Inactive	89	7.1	0	0
No Classification	12	1.0	3	0.3

Table 3. Mean Values of County Characteristics for Nonmetropolitan Counties which had Out-migration, In-migration, No ob-gy in 1985 or 1990, or No Change in ob-gy in 1985-1990.

Variable	Out-Migration N=178	In-Migration N=165	No Ob in 1985 or 1990 N=1408	Retention of Obs 1985-1990 N=591
Population 1980	29,500Q1 (14,700)	31,800 (19,700)	11,800 (7,900)	42,900Q (25,000)
Population 1990	30,200Q1 (15,200)	33,300 (20,500)	11,800 (8,400)	45,500Q (28,300)
Number of FPs, 1985	4.9Q1 (3.5)	5.0Q1 (3.23)	2.1 (2.4)	7.5Q (6.6)
Number of FPs 1990	5.7Q1 (4.1)	6.3Q1 (4.5)	2.4 (2.7)	8.9Q (7.7)
Unemployment Rate 1985	9.91 (3.9)	9.4 (3.7)	8.9 (4.4)	9.1 (3.5)
Unemployment Rate 1990	7.11 (2.1)	7.0Q1 (2.5)	6.3 (3.2)	6.4 (2.4)
Per Capita Income 1985	10,3381 (1,897)	10,6521 (1,707)	10,526 (2,579)	11,027Q (1,946)
Per Capita Income 1989	12,8911 (2,329)	13,2191 (2,195)	13,138 (2,975)	13,823Q (2,535)
Hospital Beds 1985	139Q1m (123)	181Q1 (203)	53 (82)	262Q (260)
Hospital Beds 1990	117Q1m (100)	157Q1 (176)	47 (74)	240Q (233)

Q significantly different from mean values for counties with no Obs (T<=0.05).

I significantly different from mean value for counties with retention (T<=0.05).

m significantly different from mean value for counties with in-migration (T<=0.05).

Table 4. Relative Risk of Net *In*-migration, Net *Out*-migration, no Ob-Gyns or Stable Number of Ob-Gyns Between 1985 and 1990, Relative to NoOb-Gyns in Either Year.

Variable	Out-Migration Relative Risk (Std Error)	In-Migration Relative Risk (Std Error)	Retention Relative Risk (Std Error)
Increase In Family Physicians, 1985-90	2.3032 (1.7496)	5.2045 (5.5258)	0.5526 (0.2518)
Loss Of Family Physicians, 1985-90	2.2465 (1.7386)	2.9185 (3.1547)	0.4698 (0.2229)
Retention Of Family Physicians, 1985-90	2.0328 (1.5534)	3.0904 (3.3079)	0.3834 (0.1784)
% Change In Unemployment Rate, 85-90	.9993 (0.0646)	0.9982 (0.0674)	0.9472 (0.0541)
% Change In Per Capita Income, 85-89	1.0001 (0.0001)	0.9999 (0.0001)	1.0002 (0.0001)
Gain Hospital Beds, 85-90	1.2296 (0.4386)	1.1531 (0.4115)	1.5206 (0.4122)
Lose Hospital Beds, 85-90	1.5458 (0.3259)	1.0309 (0.2265)	0.9237 (0.1618)
Number Of Family Physicians, 1985	0.9610 (0.0358)	0.9259 (0.03651)	0.9865 (0.0305)
Unemployment Rate, 1985	1.0031 (0.0513)	1.0306 (0.0555)	1.0296 (0.0449)
Per Capita Income, 1985	1.0001 (0.0002)	1.0004 (0.0002)	1.0003 (0.0001)
1-60 Hospital Beds In County, 1985	1.0988 (0.5223)	2.7307 (1.9881)	4.7403 (2.7723)
61-244 Hospital Beds In County, 1985	1.6610 (0.8060)	6.9213 (4.9989)	11.3457 (6.6576)
245 Or More Beds	1.4782 (0.9105)	11.8549 (9.5486)	24.4037 (15.8797)
At Least One Ob Unit	1.0582 (0.3503)	1.4380 (0.5372)	1.2947 (0.3809)
Adjacent To A Metropolitan County	0.8225 (0.1696)	0.8718 (0.1917)	0.4093 (0.0735)
Ln Population, 1980	16.4578 (4.4339)	16.4841 (4.6421)	34.1123 (7.8576)
State Level Dummy Variables For All States With Nonmetropolitan Counties	KY, MI, NC, SD, VT, WV	CA, GA, KY, MT, NV, NM, NC, NY, PA, UT	(Contact Authors For Full Results of state level analysis)

Bold Face=significant at 0.05 level; **Bold-Italic**=significant at .01 level

Chi-square 1994.32 with 183 degrees of freedom (p=0.0001). Pseudo R-square = 0.4111