UC Berkeley

Theses

Title

Medical Group Practice: A Survivor Analysis from 1969 to 1991

Permalink

https://escholarship.org/uc/item/7gk1c4jf

Author

Schiff, Marshall J

Publication Date

1993-04-01

Copyright Information

Medical Group Practice:

A Survivor Analysis from 1969 to 1991

by

Marshall Jonah Schiff

B.S. (Stanford University) 1989

A thesis submitted in partial satisfaction of the

requirements for the degree of

Master of Science

in

Health and Medical Sciences

in the

GRADUATE DIVISION

of the

UNIVERSITY of CALIFORNIA at BERKELEY

Committee in charge:

Professor Theodore E. Keeler, Chair
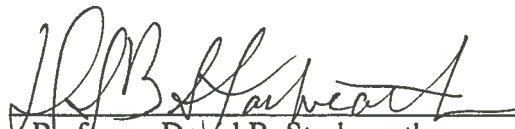Professor David B. Starkweather
Professor Henrik Blum

1993

The thesis of Marshall Jonah Schiff is approved:

Theodore E. Keeler   5/13/93

Professor Theodore E. Keeler (Chair)   Date

David B. Starkweather   5/14/93

Professor David B. Starkweather   Date

Henrik L. Blum   4/30/93

Professor Henrik Blum   Date

University of California at Berkeley

1993

Medical Group Practice:

A Survivor Analysis from 1969 to 1991

Copyright 1993

Marshall Jonah Schiff

Abstract
Medical Group Practice: A Survivor Analysis from 1969 to 1991
by
Marshall Jonah Schiff
Master of Science in Health and Medical Sciences
University of California at Berkeley
Professor Theodore Keeler, Chair

Objective.--This study reviews national census data to determine medical group practice survival patterns and examine the relationship between organizational size and viability.

Data sources.--Published and unpublished national census data from the American Medical Association (AMA) 'Medical Groups in the U. S.' surveys (1969, 1975, 1980, 1984, 1990, 1993 editions) and the AMA Physician Masterfile.

Results.--Nationally, the survivor analysis indicates that medical groups are getting larger in all regions and specialty types and that as of 1991 medical groups with 7 or more physicians are optimal. As of 1991 multi-specialty groups were optimal at all sizes; in contrast, only single specialty groups with 16 or more physicians maintained market share. General and family practice groups reached a 20-year market share nadir in 1991, further documenting the primary care crisis. Although the Western region had the strong growth in medical group practice from 1969 to 1988 especially from 100 or more physician multi-specialty groups, the West was the only geographic region to lose medical group practice market share from 1988 to 1991. All of the West's loss in market share came from the decline in Western regional groups with fewer than 26 physicians.

Conclusion.-- Economies of scale and managed competition have and will lead to larger and more multi-specialty medical groups. The future of medical group practice, however, may not be traditional group or staff model HMOs if smaller medical groups are able to collaborate both formally and efficiently in IPA and other contractual arrangements.

Dedication

I would like to dedicate this thesis to the Gilberts, a wonderful family who helped me through both the good and the bad during my UC Berkeley experience. I would also like to extend a special thank you to Richard Gilbert, Ph.D. who introduced me to the survivor approach.

Table of Contents

List of Figures

Acknowledgments

I would like to thank Theodore Keeler Ph.D., David Starkweather Ph.D., and Henrik Blum M.D. for all of their help as formal members of my thesis committee. They contributed more than just intelligent criticism and insight but were supportive of my ideas and motivated me to do my best work. I would also like to extend a special thank you to Penny Havlicek, Ph.D. at the American Medical Association for her assistance in this project.

I. Introduction

Choosing a doctor in the past was much simpler than the current system of choosing a PPO, EPO, IPA, or group, staff, or mixed model HMO. Today, the patients are "clients" and the doctors "providers". The changes in the organization of medical care have led to the decline of the solo practitioner and the rise of group practice. Between 1969 and 1991 the number of physicians practicing in a medical group grew from 40,000 to 160,000.[1] Medical group practice (MGP) is defined by the American Medical Association (AMA) as:

> the application of medical services by three or more physicians
> formally organized to provide medical care, consultation,
> diagnosis, and/or treatment through the joint use of equipment and
> personnel, and with the income from medical practice distributed
> in accordance with methods previously determined by members of
> the group.[2]

The movement of physicians toward medical group practice may alter the type of medical care provided. Karl Mannheim argues in the classic nature vs. nurture debate that "both motives and actions very often originate not from within but from the situation in which individuals find themselves," that is MGP shapes physician practice patterns.[3] Although great variability exists among groups, multiple studies indicate that MGP generally improves the quality of care provided due to improvements in physician performance, productivity, and peer interaction.[4] Greater efficiency results from the economies of scale (EOS) that exist in a group versus solo practice. Among the myriad of factors influencing the success of a MGP, group size is the most consistent determinant of group survival.[5] Before health policy or business decisions are made regarding the future organization of MGP, it is essential to have an understanding of

---

[1] American Medical Association, Medical Group Practice Survey, 1990.
[2] AMA, Medical Group Practice Survey, 1990.
[3] Friedson, 1970.
[4] White 1967, Donabedian 1969, Shortell 1974, Freidson 1975, Clute 1963, Reinhardt 1972, Freidson and Rhea 1963.
[5] Blau 1970, 1972.

past and current changes in the organization of MGP. This paper will present an organizational survivor analysis to examine how group size influenced group viability between the years of 1969 and 1991.

Since survival for MGP could be the result of lower costs and higher quality medical care, limiting access to the poor, and/or ownership and over utilization of ancillary services; the results of the survivor analysis are non-specific. The technique is similar to the 'black box' treatment modalities given to many patients. For example, a patient presents with joint pain and is treated with bed rest, non-steroidal anti-inflammatory drugs, Chinese herbs, and acupuncture. The patient feels better one week later. What was the cure? The survival analysis of MGP presented faces the same problem; recovery may or may not have had anything to do with the treatment modalities, and if recovery were assisted by treatment then which aspects of treatment were more effective. This analysis treats MGP as physicians sometimes treat their patients: if size X (drug X) leads to increased survivability of the MGP (patient), then size X (drug X) works. Neither approach looks into the proverbial black box.

The black box approach is the major strength of this technique because group survival incorporates all influential factors including non-economic factors such as physician and patient personal practice preferences and the sociologic factors of working in a group. Sometimes the mechanism of action of size X (drug X) is unknown; however, what is vitally important from the practice's or patient's viewpoint may not be the mechanism but the positive outcome--survival. The survivor analysis finds the "drugs" that work, leaving the mechanism to be discovered by future researchers. Decision makers must use any and all information available regarding MGP to assess future uncertainties; the survivor analysis is one useful place to begin. The technique does not explain the inner workings of the proverbial black box;

however, it does allow one to continue the search for quality and efficiency in MGP by focusing attention on the appropriately sized black box.

Estimates of production functions for physician services, statistical cost analyses, comparison of rates of return on investment, and physician salary assessment all help to measure cost-scale relationships within MGP. Unfortunately, these methods are extraordinarily challenging because they demand data that is usually unobtainable or else dated, requiring many assumptions to be made regarding physician behavior. The key problem is establishing controls for individual physician differences within and between different types of organizations. Heterogeneity in both inputs and outputs confound productivity and quality measurements; physicians may work varying numbers of hours, spend varying amounts of time per office visit, provide varying quality health care, and demand varying amounts of their patients' time. Existing methods will not account for differences between group practices if some of the variation includes real differences between doctors practicing in different practice arrangements.

Depending on the assumptions made and the methods used conflicting study results occur. If one assumes that physicians in smaller groups work longer hours, then any study that compares productivity based on office visits per week would bias productivity estimates toward small practices. In this example, physicians in smaller groups may work longer hours to compensate for possible decreased efficiency. Even with detailed cost data, the costs associated with medical care are difficult to measure because patient time costs are not readily quantifiable. When some studies ignore time costs, further conflicts between study results occur. Thus, careful analysis of the accounting data associated with costs, production, and scale economies for MGP may still not be sufficient to assess MGP viability because other unknown forces may be at

work. The survival technique's more global approach incorporates all unknown factors influencing the survival of different sized medical groups.

Cost and production functions (based on accounting data) view caring for the sick as the "medical service production process." However, many intangible non-quantifiable factors exist in medicine that may not permit the scale and production process assumptions made in other industries to be made for health care. For example, ball bearing production and heavy manufacturing techniques may be different from caring for the injured. When patients begin to look like widgets perhaps not only the patient but also the analysis needs to be reexamined. With the resurgence of the biopsychosocial model in medicine[6], conceptions of good medical practice are changing to include a more holistic understanding of the person with the disease, not just the disease. One must also question whether the quality remains the same when one cuts costs and improves efficiency. Prescribing the appropriate drug, performing the appropriate procedure, and minimizing time spent with the patient may maximize physician productivity; however, the biopsychosocial model implies that this lowers the quality of medical care. The survivor analysis does more than examine gross revenues and the bottom line; the survivor technique includes all factors that alter the success rate between practices of different sizes including: quality of care, physician job satisfaction, and physician autonomy within his/her practice.

Whether or not economies of scale (EOS) are the major force promoting stability of a particular group size, *ceteris paribus*, the group that is more efficient will survive. *A priori* one may argue the existence of EOS because cost savings occur from shared resources including fixed costs such as office space, supplies, billing, and personnel. One supporter of large groups states that no obligation exists to prove the existence of EOS in MGP because "the burden of proof should be on those who would deny their

---

[6] Engel 1977.

4

existence rather than on others to demonstrate that they are present."[7] Jay Sanders, of Oak Brook, Ill. based Professional Business Consultants Inc., estimated the 'seed' money necessary to form a 6-doctor group at $30,000 or $5,000 per doctor; whereas, a 25-doctor group requires $80,000 or $3,200 per doctor.[8] However, not all economists agree. Richard Bailey has questioned traditional tenets to conclude, "Many of our present beliefs about economies of scale in medical practice are founded on sand, not rock."[9] Bailey found minimal changes in scale economies for groups with one to five physicians and attributed these changes to individual physician variation.[10] Whether our foundation is sandy or rocky even Bailey agrees, "The question is not whether [economies of scale] exist but where they are found and how significant they are." [11]

Since Bailey's study only included practices with five or fewer physicians, EOS may exist in larger organizations; however, diseconomies of scale may also be present from inefficiencies inherent to large organizations. "A mistake made by a platoon commander demands only an instantaneous 'As you were!' A mistake make by an Army Commander may require days of labor to set right."[12] Communication and coordination tend to become problematic as organizations grow[13]. In large groups physicians more likely receive a set salary independent of productivity thus leading to a free rider problem. "The cost of delivering output to customers (or bringing customers to the place where service is provided) can also limit the size-increasing effect of scale economies."[14] Eventually, the marginal costs associated with increased size outweigh

---

[7] Fein 1967, p. 98.
[8] Bill Clements, "Road Map to Forming a Group," American Medical News, 7 September 1992, p. 16.
[9] Bailey 1970.
[10] Bailey 1970.
[11] Bailey 1970, p. 257.
[12] Robinson, 1958, p. 41.
[13] Pauly 1970.
[14] Scherer and Ross, 1990, p. 106.

the marginal benefits leading to the characteristic U-shaped cost curve of many industries.[15]

Identification of the minimum point on the long run cost curve would help all parties--doctors, patients, private insurers and the federal government--develop cost effective sized medical practices. Medical care insurers including the federal government could then selectively contract with those sized practices that provide patient care most cost effectively. Patients would benefit through a reduction in the growth of premiums or tax dollars spent on health care. Physicians would benefit by working in more stable practices that can compete more effectively in the highly competitive health care environment. Educated health policy and business decisions require specific information concerning the viability and efficiency of all sized medical practices. Therefore, further research is required to identify and promote the development of optimally sized medical groups. This paper will use the merit of the survival technique to compare different sized physician group practices from a macro economic perspective.

---

[15] The U-shaped cost curve refers to a plot of cost on the 'Y-axis' versus the size of the firm on the 'X- axis.' If an optimal firm size exists that minimizes costs, then any firm larger or smaller than the optimal size would have higher costs. The shape of the curve resembles the letter 'U'.

II. Analytic Technique

A. *The Survival Principle*

Origins of the survival principle began in the biological sciences with Darwin and others who developed the theories of natural selection and the survival of the fittest.[16] The Darwinian viewpoint is that differing structural characteristics of organisms lead to differing survival patterns: those organisms with "fitter" structures are more adaptable to their external environment, survive longer, and reproduce. George Stigler and others[17] have applied natural selection to non-biologic systems to develop an economic survivor analysis. The elegance of the survivor technique is in its simplicity: firm sizes that survive and contribute increasing fractions of an industry's output over time are assumed to be efficient; those that do not are either too large or too small. An efficient firm size within the survivor framework "is one that meets any and all problems the entrepreneur actually faces: strained labor relations, rapid innovation, government regulation, unstable foreign markets, and what not."[18]

Application of the technique to health care has shown to be quite enlightening.[19] The survivor technique was first applied to MGP by Frech and Ginsberg for the period from 1965 to 1969.[20] They concluded that groups were more efficient than solo practice at the margin and that multi-specialty and pre-paid groups were relatively more efficient than single-specialty and fee-for-service groups, respectively. Among groups, small and large groups were more efficient than middle-sized (7-25 physicians) practices leading to an inverted U-shaped average cost curve for MGP.

---

[16] Buffon and Lamarck 1801, Darwin 1859.
[17] Stigler 1958, Saving 1961, Shepherd 1967, Weiss 1964.
[18] Stigler 1958, p. 56.
[19] Frech and Ginsberg 1974, Marder and Zuckerman 1985, Bays 1986.
[20] Frech and Ginsberg 1974.

Marder and Zuckerman extended Frech and Ginsberg's MGP survivor analysis from 1969 to1980 to reveal changing trends.[21] In the period from 1969 to 1975 they found that almost all sizes of medical groups were optimal without regional differences. Optimality of large (100 or more physicians) multi-specialty groups was exemplified by rapid growth. The only exception found is that 3-7 physician multi-specialty groups experienced declining market share. Data through 1975, supports Frech and Ginsberg's prediction that optimal practice arrangements include more prepaid groups and more multi-specialty groups; however, from 1975 to 1980 significant changes in MGP survival trends occurred. Only large groups, 100 or more physicians, continued to be in the optimal size range except for certain geographic regions where solo practices appeared to be optimal. Stratification by specialty composition revealed that only single specialty groups with 3-7 physicians and 26-99 physicians continued to appear in the optimal size range. Multi-specialty groups with fewer than 100 physicians were inefficient. In summary, Marder and Zuckerman found geographic and specialty composition variability with an aggregate L-shaped cost curve for MGP. This paper will continue the analysis of Marder and Zuckerman through 1991.

B. *Data sources*

National data regarding medical groups came from published and unpublished sources from the American Medical Association's (AMA) Physician Masterfile. Published surveys used in the analysis were the following: Medical Groups in the U.S. 1969, 1975, 1980, 1984, 1990, 1993 ed. Unpublished data from the 1990 and 1993 AMA surveys was generously provided by P. Havlicek, lead author of the two most recent AMA publications. With the assistance of the American Group Practice Association and the Medical Group Management Association, the AMA has identified the universe of group medical practices in the U. S. The AMA surveys attempt to reach

---

[21] Marder and Zuckerman 1985.

8

all groups within the universe. Mail and telephone surveys of actual and potential groups with repeated follow-up give the AMA excellent response rates (60% to 90%) to their surveys. Census data for the total number of office based physicians came from another AMA publication, _Physician Characteristics and Distribution in the U. S_. The 1988 and 1991 number of office based physicians in the U. S. was estimated by simple linear regression of 1985, 1989, and 1990 data points because precise data is not available for these years.

C. *Methodology*

The scale dimension for MGP chosen in this analysis is the number of full time equivalent physicians (FTEPs)--the commonly accepted dimension in the literature and a good proxy for other scale variables. Survivor analysis methods from other industries use gross revenue or units of output to directly measure market share of a given firm.[22] When equating the number of FTEPs to firm size, market share can not be directly measured by gross revenue or numbers of patients seen; however, market share can be approximated with the assumption that one physician produces on average one unit of medical care, an assumption implicitly made in prior MGP survivor analyses.[23] On the basis of this assumption, market share is calculated for each MGP size by dividing the total number of FTEPs within a given size category by the total number of office based practicing physicians in the U.S. Thus, market share is defined as the percentage of office based practicing physicians who practice within a certain sized practice.

This analysis will not include solo practice arrangements because accurate data is not available. Prior studies have approximated the numbers of physicians in these practices by subtracting the total number of physicians in group practice (3+ physicians

---

[22] Stigler 1958, Saving 1961, Weiss 1964, Shepherd 1967.
[23] Frech and Ginsberg 1974, Marder and Zuckerman 1985.

practicing together) from the total number of office based practicing physicians in the U.S.[24] These approximations assume that census data from the AMA "represent the total number of group practices known to be in existence in the U. S." [25] despite the fact that the AMA has never had a 100% response rate. [26] This assumption grossly overestimates the number of one and two physician practices. Another problem with studying solo practice from these data is that 2-physician practices can not be distinguished from solo practice. Prior authors have defined "solo" practice to include both one and two physician practices.[27] Most accepted definitions of 'solo' refer to one physician practicing alone so that comparison of previous survivor analysis results to other literature on solo practice would not be possible. For these reasons, this author has chosen to exclude non-group practice from the analysis and focus exclusively on medical *group* practice. Because of the exclusion of non-group practice, total market share of all groups studied will not equal 100%.

Groups are stratified by size, geographic region, legal form of ownership, specialty type, and ownership of ancillary services. Section III, the results, present the different survival trends in different sized medical practices from 1969 to 1991. Sections IV and V are a critique of the survivor analysis and discussion of the results, respectively.

---

[24] Frech and Ginsberg 1974, Marder and Zuckerman 1985.
[25] Marder and Zuckerman1985, p. 170.
[26] All AMA MGP surveys have response rates that are less than 100%. Personal communication with the AMA and P. Havlicek documented their high but less than perfect response rate.
[27] Frech and Ginsberg 1974, Marder and Zuckerman 1985.

III. Results

The change in market share between 1969-75, 1975-80, 1980-84, 1984-88, and 1988-91 is computed for the following size classifications: 3-6, 7-15, 16-25, 26-99, and 100 or more physicians practicing in a given group. The time periods prior to 1980 have been well analyzed by Marder and Zuckerman and are included here for trend analysis in the discussion. The results are clearly documented and presented in both tabular and graphical form in figures one to eleven to facilitate rapid assimilation of the results. Assess the slopes of the curves on each graph to identify market share gain (loss) and optimal (non-optimal) MGP size. Since health care and MGP are in dynamic flux, it is important to focus on adjacent time periods so that temporal variability is minimized.

Figure one presents national census data for all medical groups. Figures two through four stratify the national data into the following specialty type classifications: single specialty, multi-specialty, and general or family practice. Figures five and six assess changes in the legal form of MGP organizations disaggregated by sole proprietorships, partnerships, and professional corporations. Figures seven through eleven compare different geographic regions. The geographical divisions are: the Northeast (New England and Middle Atlantic census divisions), North Central (West and East North Central census divisions), South (West and East South Central, and South Atlantic census divisions), and the West (Pacific and Mountain census divisions). The results will show more groups with market share gains than losses because MGP as a whole gained market share with respect to non-group practice (one or two physicians practicing alone).

## National Census Data for Medical Group Practice: 1969 to 1991
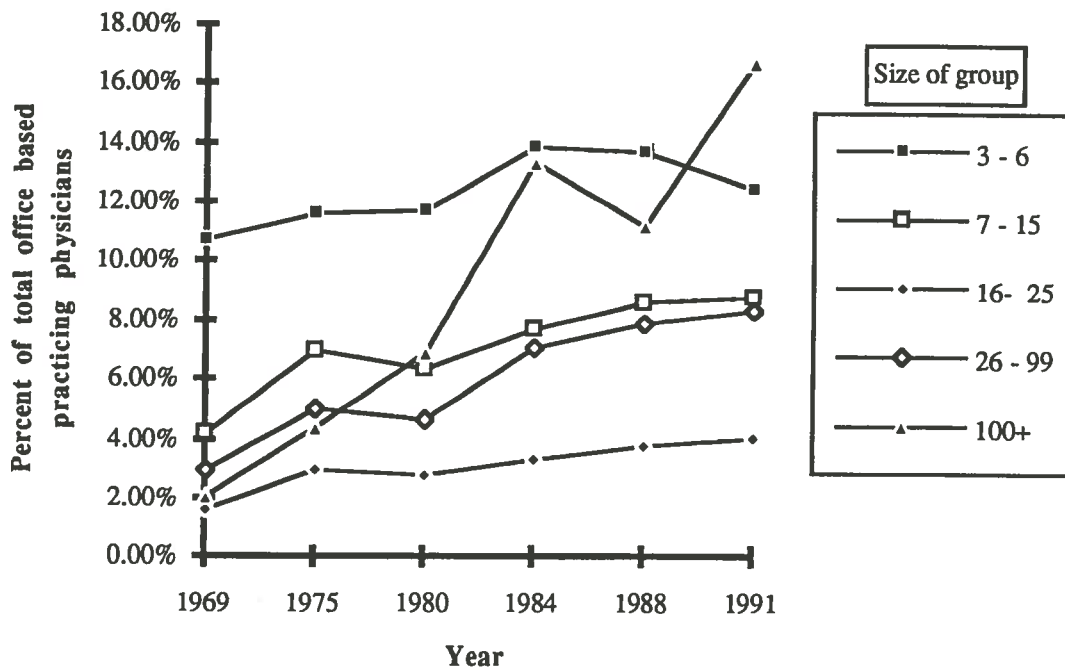
Sources: Bidese and Dannais (1982), Goodman and Mason (1976), Goodman et al. (1976), Havlicek (1985), Havlicek (1990), Havlicek et al. (1992), Henderson et al. (1982), Roback et al. (1990), Todd and McNamara (1971).

Group size	1969	1975	1980	1984	1988	1991
3 - 6	10.76%	11.67%	11.72%	13.89%	13.73%	12.41%
7 - 15	4.20%	7.00%	6.33%	7.67%	8.56%	8.75%
16- 25	1.66%	2.95%	2.81%	3.34%	3.81%	4.02%
26 - 99	3.00%	5.03%	4.65%	7.06%	7.89%	8.31%
100+	2.12%	4.38%	6.95%	13.34%	11.21%	16.73%
Total: MGP	21.75%	31.03%	32.46%	45.30%	45.20%	50.23%

Figure 1: National census data for medical groups in the U.S. Note that since 1980, groups sized from 7 to 99 physicians have consistently expanded their market share; in contrast, large (100+ physicians) groups had erratic growth including a sudden fall in market share between 1984 and 1988 and a rebound gain from 1988 to 1991. Market share for groups of 3-6 physicians peaked in 1984. Not shown is the steady and consistent fall in market share of one and two physician practices.

Single Specialty Medical Groups
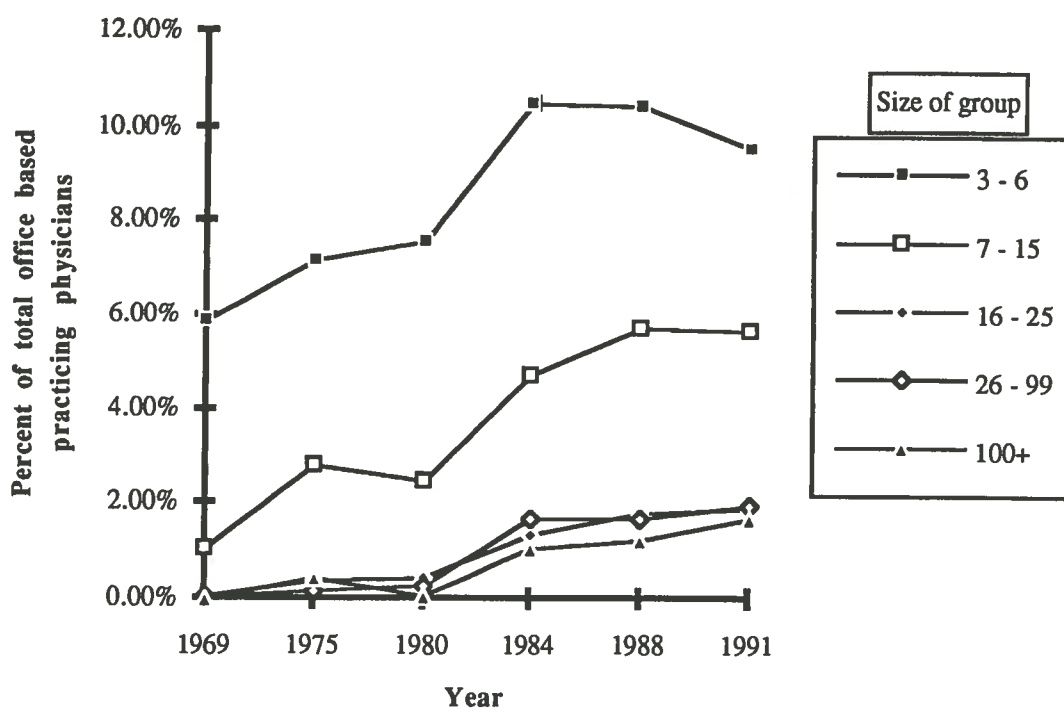
Sources: See figure 1.

Single specialty (SS)	1969	1975	1980	1984	1988	1991
3 - 6	5.89%	7.17%	7.59%	10.52%	10.44%	9.52%
7 - 15	1.08%	2.79%	2.48%	4.70%	5.71%	5.68%
16 - 25	0.07%	0.37%	0.46%	1.32%	1.82%	1.90%
26 - 99	0.04%	0.17%	0.26%	1.71%	1.67%	1.96%
100+	0.00%	0.43%	0.04%	1.08%	1.23%	1.69%
Total: SS	7.08%	10.94%	10.83%	19.33%	20.87%	20.75%

Figure 2: Single specialty groups. Groups of less than 15 physicians have lost market share from 1988 to 1991. The strong growth of 7-15 physician groups in the 1980s has peaked. Single specialty groups with 16+ physicians, virtually non-existent before 1980, made moderate market gains.

Multispecialty Medical Groups
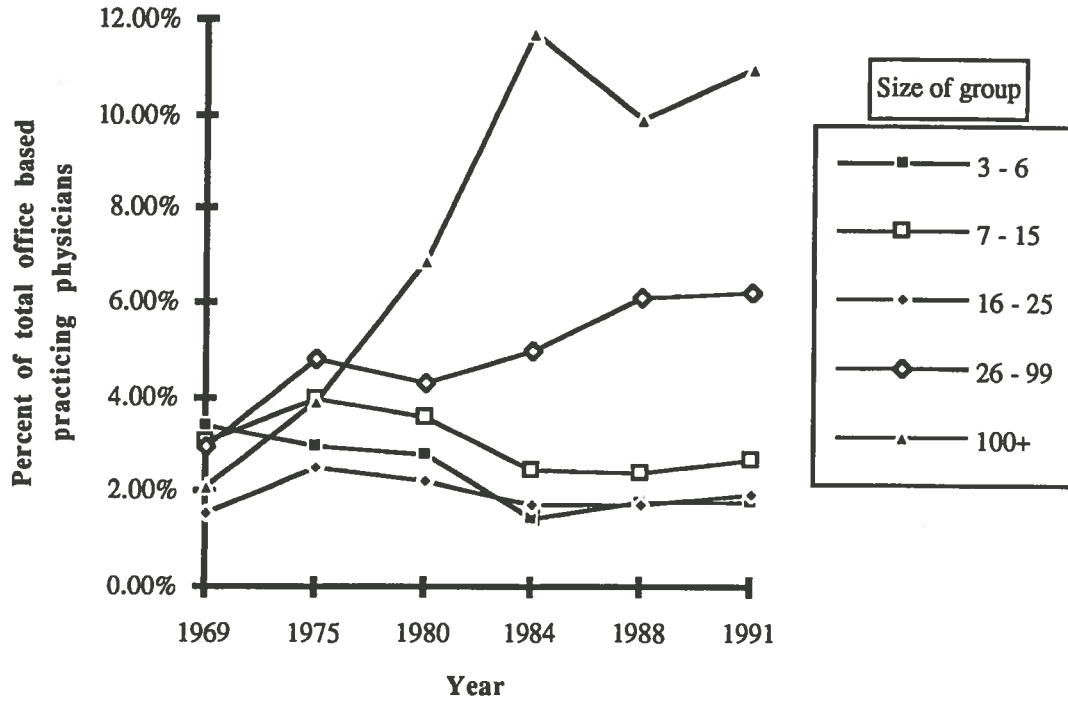
Multi-specialty (MS)	1969	1975	1980	1984	1988	1991
3 - 6	3.44%	3.00%	2.82%	1.46%	1.77%	1.80%
7 - 15	3.09%	3.97%	3.61%	2.47%	2.43%	2.68%
16 - 25	1.59%	2.53%	2.26%	1.71%	1.76%	1.98%
26 - 99	2.96%	4.81%	4.31%	4.99%	6.09%	6.21%
100+	2.12%	3.94%	6.91%	11.75%	9.95%	10.99%
Total: MS	13.21%	18.25%	19.90%	22.39%	22.00%	23.66%

Figure 3: Multi-specialty medical groups. From 1984 to 1991, large multi-specialty groups lost market share in stark contrast to exponential growth from 1969 to 1984. From 1988 to 1991, multi-specialty groups of all sizes gained market share.

General and Family Practice
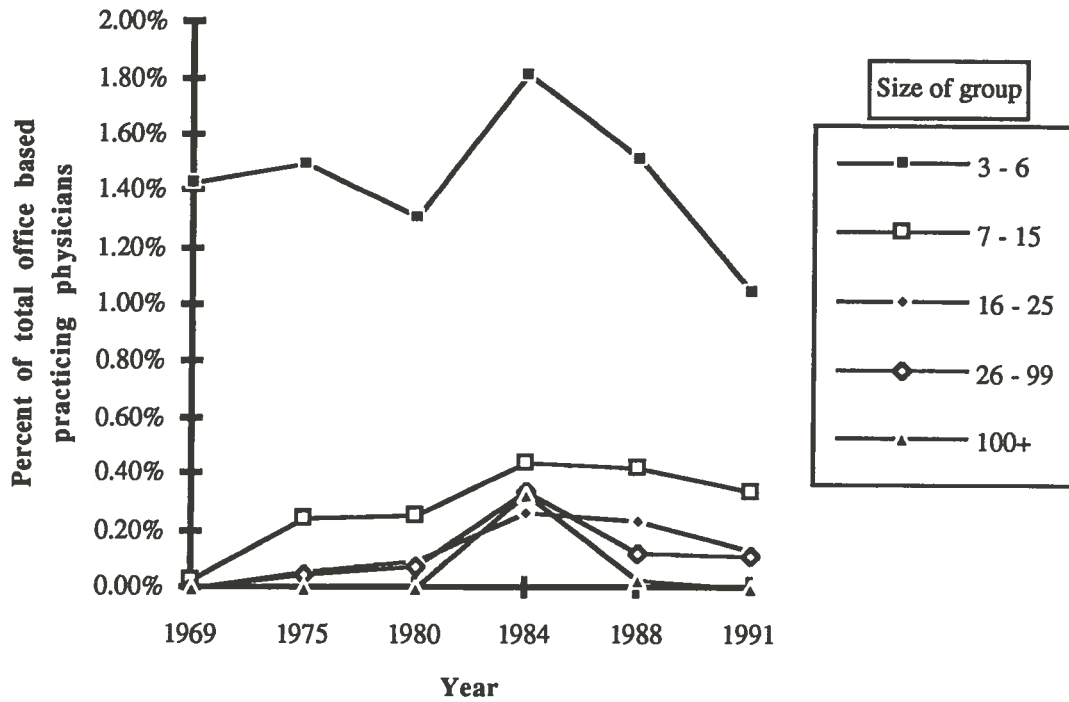
Sources: See figure 1.

General/Family	1969	1975	1980	1984	1988	1991
3 - 6	1.43%	1.50%	1.31%	1.81%	1.52%	1.04%
7 - 15	0.03%	0.24%	0.25%	0.44%	0.42%	0.34%
16 - 25	0.00%	0.05%	0.09%	0.26%	0.23%	0.13%
26 - 99	0.00%	0.05%	0.08%	0.33%	0.12%	0.11%
100+	0.00%	0.00%	0.00%	0.33%	0.03%	0.00%
Total: GP/FP	1.46%	1.84%	1.73%	3.17%	2.33%	1.63%

Figure 4: General and Family medical practices. General and family practices lost market share at every size level. Practices with 3-6 physicians declined significantly from 1984 to 1991.

The Legal Status of Medical Groups
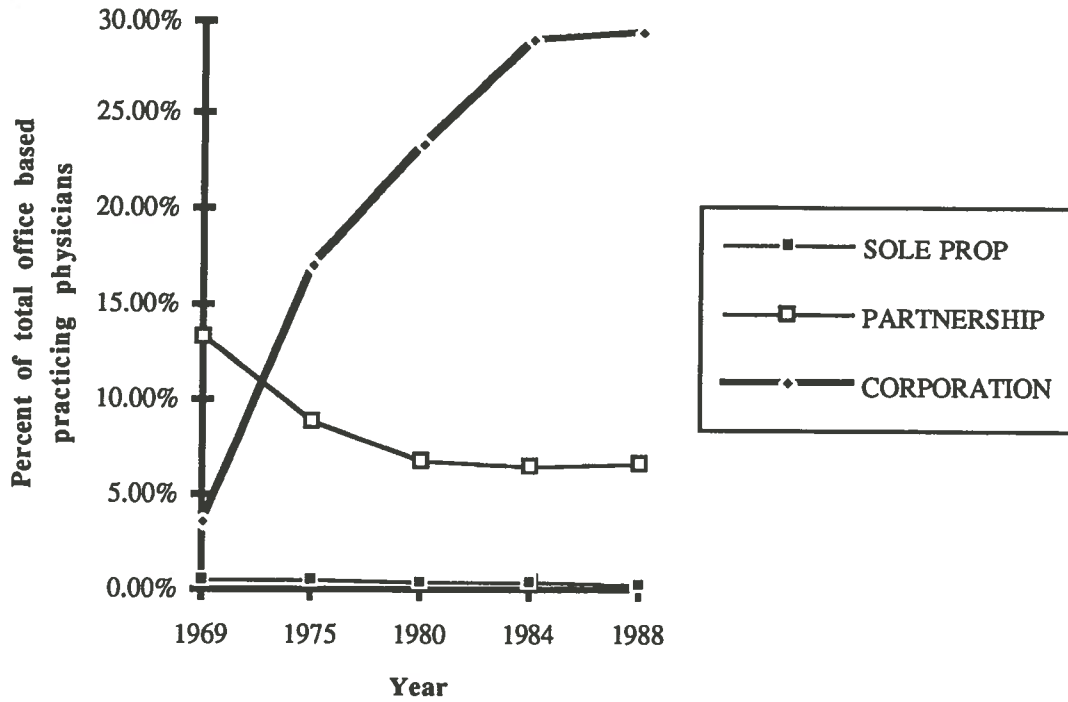
Sources: See figure 1.

Legal form of ownership	1969	1975	1980	1984	1988
Sole Proprietorship	0.51%	0.46%	0.41%	0.39%	0.25%
Partnership	13.35%	8.91%	6.80%	6.52%	6.64%
Corporation	3.63%	17.07%	23.33%	28.95%	29.44%

Figure 5: The legal status of medical group practice. Corporations are the rule with a smaller number of partnerships. Sole proprietorships are almost non-existent.

Professional Corporations
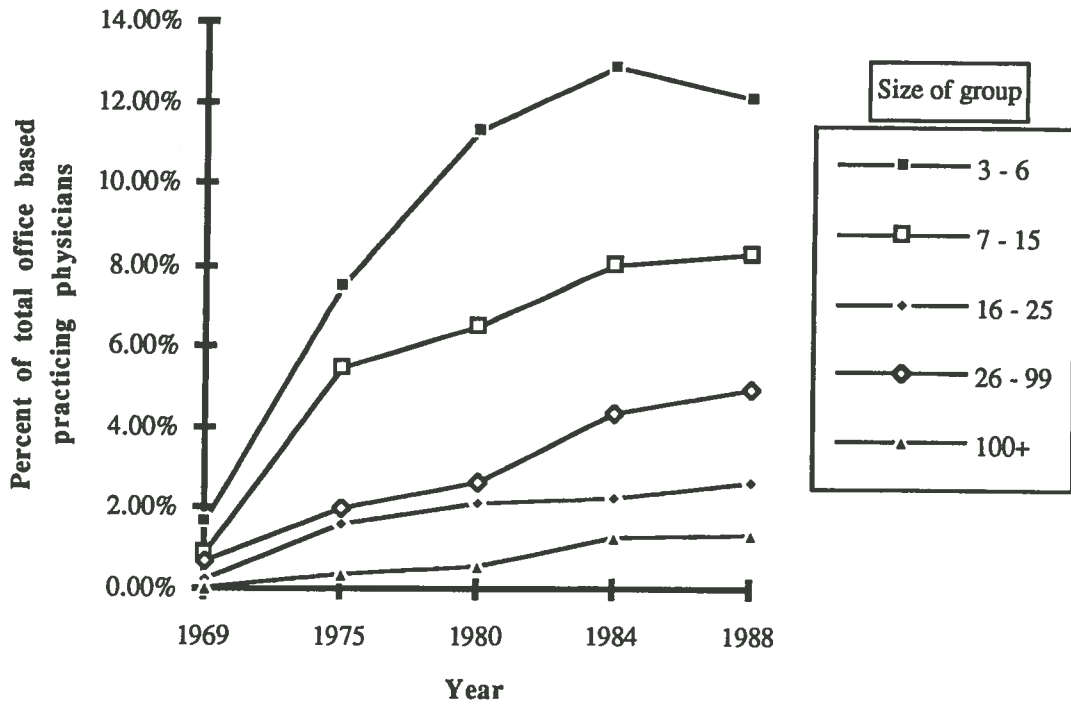
Sources: See figure 1.

Corporations	1969	1975	1980	1984	1988
3 - 6	1.67%	7.56%	11.33%	12.91%	12.14%
7 - 15	0.90%	5.48%	6.57%	8.07%	8.29%
16 - 25	0.28%	1.62%	2.14%	2.30%	2.66%
26 - 99	0.73%	2.03%	2.70%	4.36%	4.99%
100+	0.05%	0.38%	0.60%	1.30%	1.36%
Total: Corporations	3.63%	17.07%	23.33%	28.95%	29.44%

Figure 6: Professional corporations. All 7+ physician groups have steadily incorporated. The 3-6 physician groups have not continued to incorporate.

Geographic Growth in Medical Groups
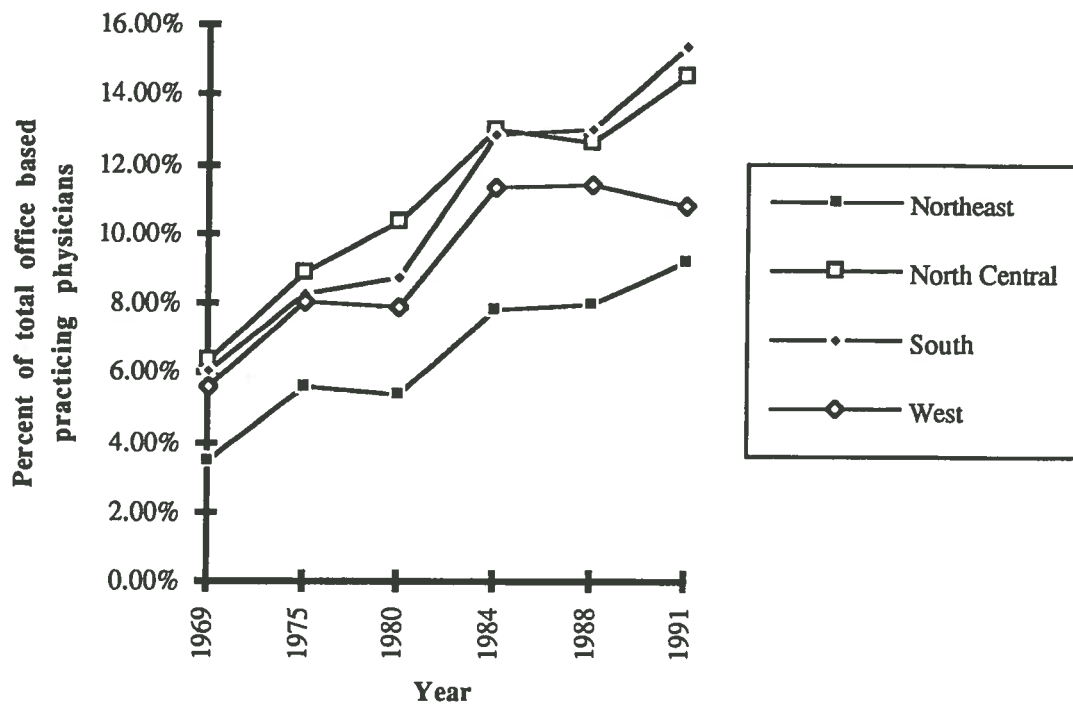
Sources: See figure 1.

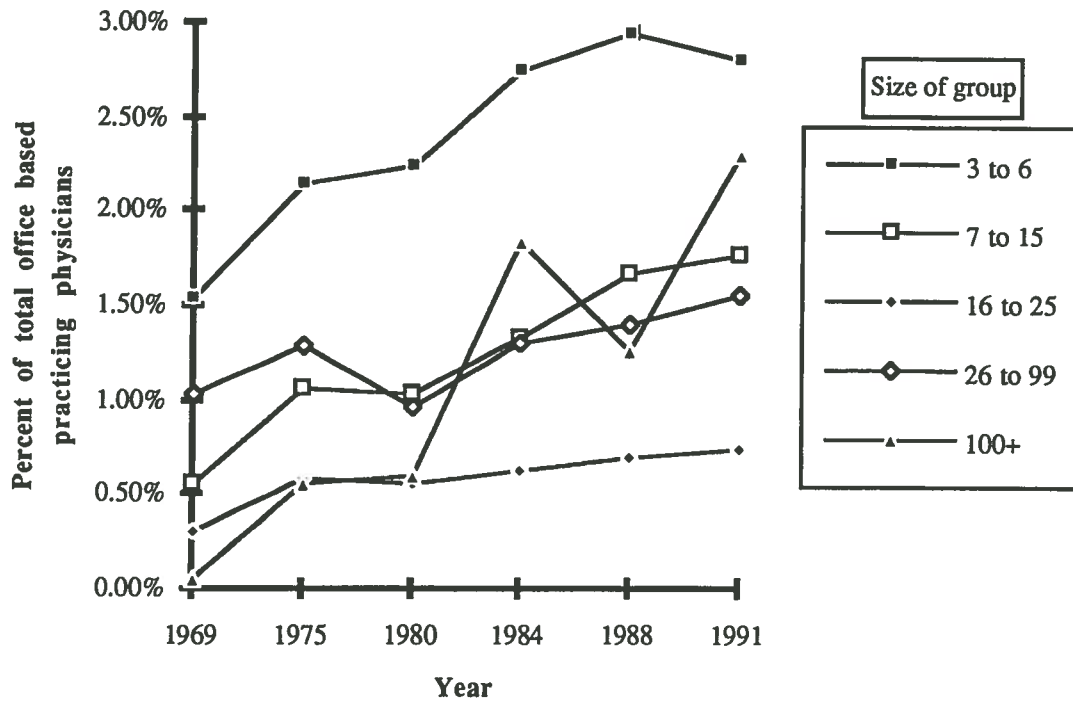| All regions	1969	1975	1980	1984	1988	1991
Northeast	3.52%	5.64%	5.41%	7.86%	8.00%	9.19%
North Central	6.41%	8.93%	10.33%	13.06%	12.63%	14.56%
South	6.11%	8.28%	8.74%	12.90%	13.05%	15.42%
West	5.68%	8.12%	7.92%	11.33%	11.45%	10.84%
Total: overall	21.71%	30.97%	32.41%	45.15%	45.12%	50.02%

Figure 7: Geographic growth in medical groups. Steady growth in all regions leveled off in 1984. Between 1984 and 1988, the North Central region was the only area to exhibit a loss in market share. From 1988 to 1991, the West was the only region that lost market share in contrast to overall gains made nationally and in all other regions.

Northeast

North east	1969	1975	1980	1984	1988	1991
3 to 6	1.55%	2.14%	2.24%	2.75%	2.95%	2.81%
7 to 15	0.57%	1.06%	1.03%	1.34%	1.67%	1.77%
16 to 25	0.32%	0.58%	0.56%	0.63%	0.71%	0.74%
26 to 99	1.04%	1.28%	0.96%	1.31%	1.40%	1.56%
100+	0.05%	0.57%	0.61%	1.84%	1.27%	2.31%
Total: NE	3.52%	5.64%	5.41%	7.86%	8.00%	9.19%

Figure 8: Northeast. In the Northeast, all sized groups except for the 100+ physician groups gained market share from 1984 to 1988. From 1969 to 1988, 3 to 6 physician groups gained market share, yet from 1988 to 1991 these small physician groups were the only group size to lose market share.

North Central
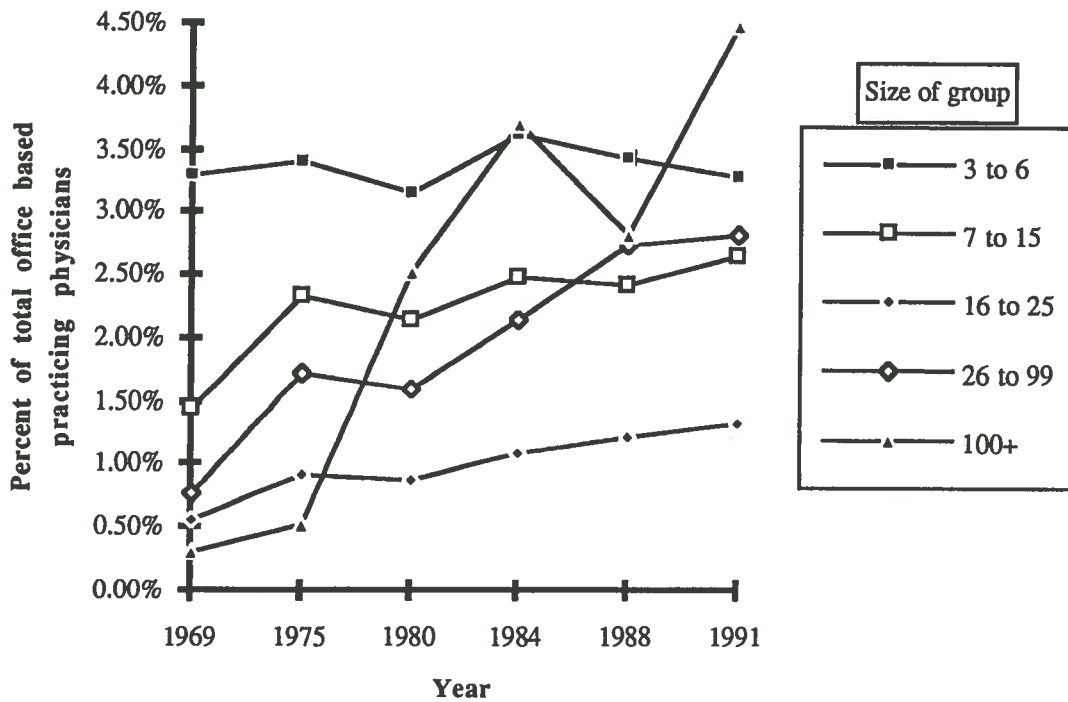
Sources: See figure 1.

North Central	1969	1975	1980	1984	1988	1991
3 to 6	3.30%	3.41%	3.15%	3.62%	3.43%	3.28%
7 to 15	1.45%	2.34%	2.14%	2.49%	2.42%	2.64%
16 to 25	0.56%	0.93%	0.89%	1.09%	1.22%	1.33%
26 to 99	0.79%	1.72%	1.61%	2.15%	2.73%	2.82%
100+	0.31%	0.53%	2.53%	3.71%	2.83%	4.49%
Total: N. Central	6.41%	8.93%	10.33%	13.06%	12.63%	14.56%

Figure 9: North Central. All groups, except 3 to 6 physician groups, gained market share from 1988 to 1991.

South
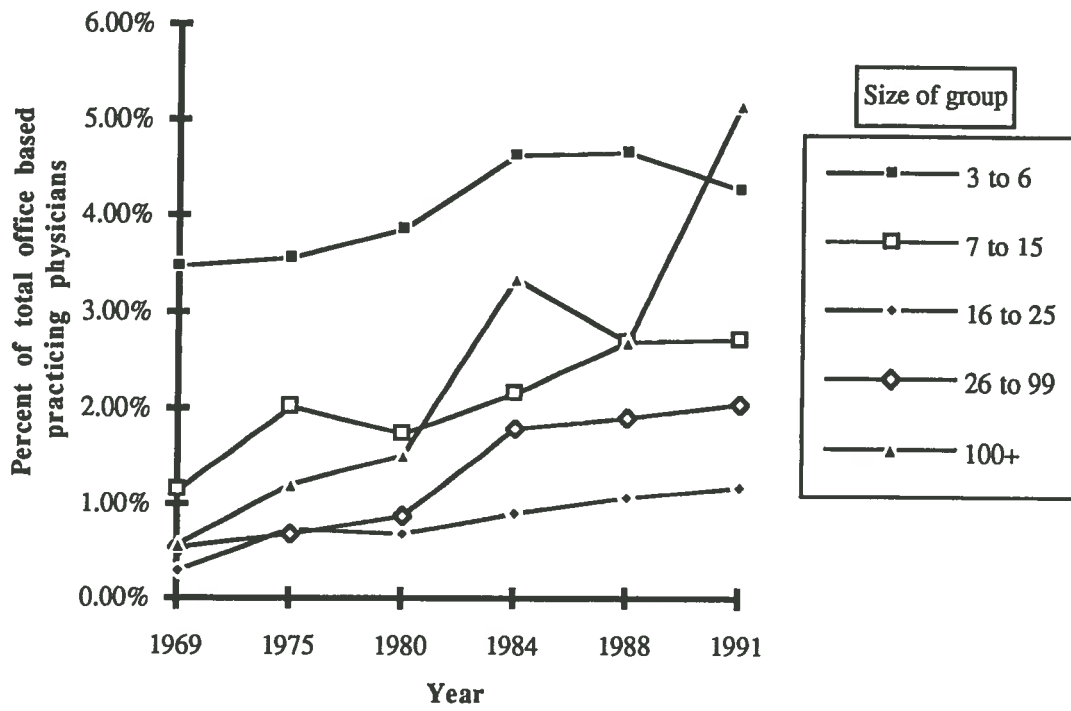
Sources: See figure 1.

South	1969	1975	1980	1984	1988	1991
3 to 6	3.50%	3.58%	3.89%	4.64%	4.69%	4.29%
7 to 15	1.16%	2.03%	1.76%	2.16%	2.69%	2.71%
16 to 25	0.32%	0.75%	0.69%	0.93%	1.07%	1.19%
26 to 99	0.55%	0.70%	0.89%	1.81%	1.92%	2.05%
100+	0.58%	1.22%	1.52%	3.36%	2.69%	5.18%
Total: South	6.11%	8.28%	8.74%	12.90%	13.05%	15.42%

Figure 10: South. All groups, except 3 to 6 physician groups, gained market share from 1988 to 1991.

West
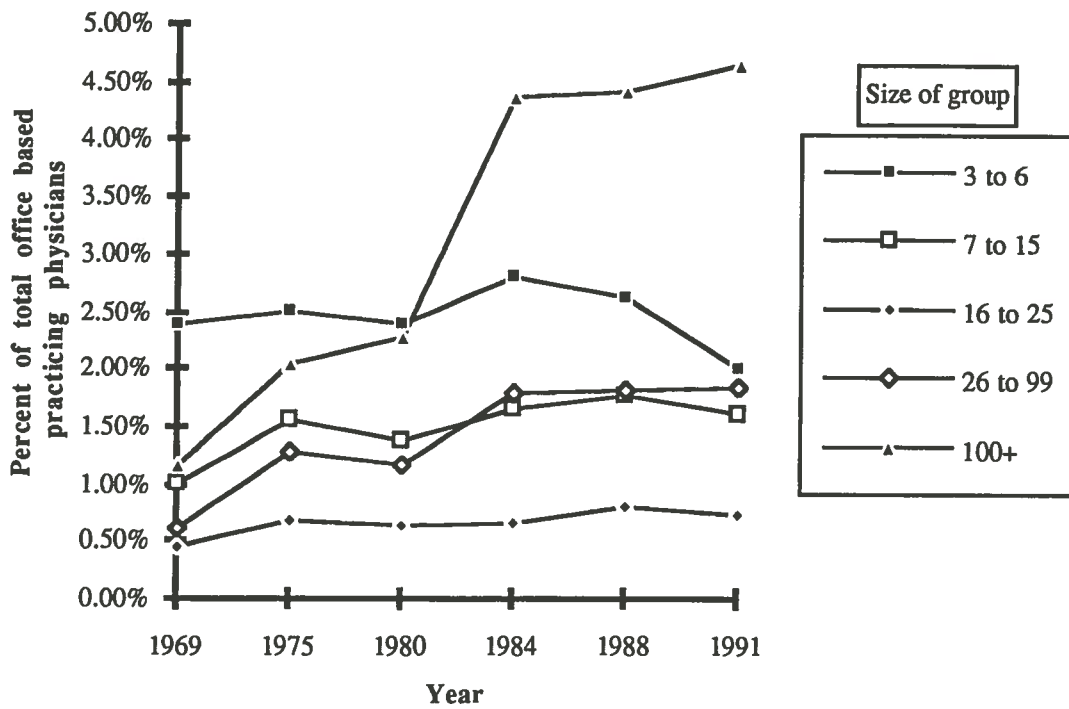
Sources: See figure 1.

West	1969	1975	1980	1984	1988	1991
3 to 6	2.40%	2.51%	2.40%	2.82%	2.62%	2.00%
7 to 15	1.02%	1.56%	1.38%	1.65%	1.77%	1.61%
16 to 25	0.46%	0.69%	0.66%	0.68%	0.80%	0.75%
26 to 99	0.63%	1.30%	1.19%	1.79%	1.82%	1.84%
100+	1.17%	2.06%	2.29%	4.39%	4.43%	4.65%
Total: West	5.68%	8.12%	7.92%	11.33%	11.45%	10.84%

Figure 11: West. The West is the only region where large (100+) physician groups gained market share consistently from 1969 to 1991. Only groups with 26+ physicians gained market share from 1988 to 1991. Small (3 to 6 physician) practices have lost considerable market share from 1984 to 1991 reaching a 20 year market share nadir in 1991.

From 1980 to 1984, aggregate data revealed that all sizes of medical groups were optimal without regional differences including particularly strong growth of large organizations. Stratification by specialty reveals that single specialty groups including general or family practices are optimal at all levels, yet multi-specialty groups are optimal only in the 26-99 and 100 or more physician size ranges. Thus, between 1980 and 1984 optimality existed for all MGP sizes without regional differences with especially strong growth in large (100 or more physician) groups.

The greatest change occurred between 1984 and 1988 when the data revealed a U-shaped average cost curve for MGP. Aggregate data show a precipitous loss in market share of large groups and a slight loss in small (3-6 physician) groups with gains for groups sized 7-99 physicians. Significant regional differences revealed that small groups were optimal in the Northeast and South despite national inefficiencies and that large groups remained efficient in the West. Other regional differences can be noted from figures 7-11. Single specialty groups are no longer optimal at all sizes; 3-6 and 26-99 physician groups are not optimal. For the first time large (100 or more) multi-specialty groups were not optimal; in contrast, 3-6 physician multi-specialty groups gained market share. Coupling the small gain in market share for the 3-6 physician multi-specialty group with the slight decline in market share for 7-15 physician multi-specialty groups reveals that multi-specialty groups less than 25 physicians barely maintained their small market share. General and family practice growth peaked in 1984 with a decline in market share for all size ranges.

The most recent time period, 1988 to 1991, has one significant change from the 1984-88 period: large groups exhibit strong gains in market share. Other aggregate changes remain consistent with previous results indicating efficiency at medium sizes (7-99 physicians) and inefficiency for small (3-6 physician) groups. Striking geographic variation in this period revealed a loss in MGP market share for the West,

23

only. Of note is that the West's loss of market share was exclusively from practices with fewer than 25 physicians. Consistent findings across all regions are that 3-6 physician practices lost and 100+ practices gained market share. Optimal size for single specialty groups exists for all groups of 16 or more physicians. Unique to this modern period is that multi-specialty groups are optimal at all sizes including 3-6 physician groups. General and family practices continued to be inefficient at all sizes falling to their smallest percentage of market share in over 20 years.

Physician ownership of ancillary services delves into many ethical and political issues that are beyond the scope of this paper; however, data presented in the Appendix reveals a few trends from 1988 to 1991. One hundred plus physician groups owned or leased more ancillary equipment in 1991 than 1988 within all categories analyzed--clinical laboratories, surgical suites, radiology, electrocardiology, optometry, and audiology; in contrast, small and medium sized groups tended to have declining ownership interests. In both 1988 and 1991, physician ownership of their practice is inversely related to the size of the group, yet 1991 reveals a general increase in the percentage of physician owners independent of size and specialty composition. Overall, the results vary by type of equipment. (see Appendix)

IV. Strengths and Limitations of the Survivor Model

Terms such as "successful," "efficient," and "optimal" refer to the economic considerations of profit maximization--maximizing total revenues and minimizing total costs. Specifically, the optimal sized practice can be identified by finding the minimum point on a long run average cost curve ($d/dx = 0$). Although these terms are repeated throughout this analysis one must remember that other factors must be assessed before calling any organization optimal or successful by a more global, non-economic definition of these terms. Economic success may occur through excess utilization of services, decreased quality, and/or denying care to those unable to pay. The social optimum may be a very different size than that identified by the survivor technique. Despite these major confounders, increased survivability indicates some degree of increased efficiency and economic viability for the group.

A major assumption implicit to the survivor principle includes a particular view regarding organizational growth. On the surface, stating that a specific organizational size exists in an industry that optimizes EOS, minimizes costs, and will inevitably dominate seems reasonable; however, many (most?) organizations believe that growth is a necessary component to success. The life cycle model of organizational development views growth as an inevitable process. Organizations begin as small entities that grow larger and more bureaucratic over time. Eventually an organization will reach a point late in its life cycle where it grows too large to change or adapt to its environment. At this stage smaller groups will bud off to begin the process anew. In brief, no size is optimal and bigger is better, if not inevitable, for all successful organizations.

The survivor analysis is not necessarily contradictory to the life cycle model because the survivor analysis identifies the *phase* of the life cycle that is most viable for an organization. Contradiction between the models does exist to some extent because

25

the survivor principle assumes that groups tend to grow or shrink toward a specific optimal size which is different from assuming inevitable growth. Since the survivor analysis assumes firms move toward equilibrium in a static industry, a given optimal point in one time period would be significantly different from a later time period in a dynamic industry such as health care. As the equilibrium changes, the survivor analysis can track these changes with new optimal sizes for a given industry. Since optimal size for medical groups has been steadily growing over the past twenty years, both the survivor principle and the life cycle model coincide. Both models together explain the dominance of large medical groups over the past 20 years and predict that the inefficiencies inherent in large organizations would lead to a resurgence of small medical groups.

Health care is in a state of dynamic change with no short or long term equilibrium points; hence, the "optimal" size for MGP in a given year is simply a static assessment of an industry under rapid change. This means that optimal size is a transient phenomena without much meaning unless current environmental factors are also assessed. Recent and proposed legislation creating changes in physician ownership of ancillary equipment, Medicare and Medicaid reimbursement changes, and the Clinton thrust toward managed competition among many other environmental fluxes will continue to shift market equilibrium. Future predictions made with the survivor analysis regarding health care must also assess the political, business, medical, and environmental health care milieu.

Another assumption of the survivor analysis is that access to identical resources must be possible for fair market competition. A common market and free trade must exist so that barriers to entry and monopolistic conditions do not alter true economies. As in other industries outside health care, large size brings greater influence over the environment allowing large groups to promote favorable conditions for their

organizations. Historically, organized medicine has opposed prepaid or managed care, thereby creating institutional barriers to larger group practices. More recently, this trend seems to be reversed. On a national and regional level environmental forces influence the survival size of MGP. These barriers may or may not promote efficiency and EOS yet are incorporated into the survival trends.

The survivor analysis applied to medical care also assumes that one physician equals one unit of production meaning that market share is defined solely by the number of physicians in a given practice arrangement. This approximation of market share may not have a perfect correlation with numbers of patients seen per week or other productivity measurements. Variation exists in practice patterns between both physicians and medical groups. Physician variations may exist for many reasons including individual variability, years of experience, specialty type, amount of training, location (rural versus urban practices), and group practice size. For example, older physicians with large patient loads tend to practice in smaller groups. If these older physicians treat more patients than younger physicians in large groups, then small groups' market share would be underestimated in the analysis. Younger physicians, however, tend to work in large organizations that may place external time constraints on office visits increasing patient visits per hour (i.e., physician productivity in large groups). These competing factors, among a myriad of others, will roughly counterbalance so that using census data the assumption that one physician provides one unit of medical care is a very good estimate.

This analysis is concerned with changes over time; therefore, any consistent error in the AMA data collection methods or assumptions made would not affect the rate of change of MGP growth. Unfortunately, if changes occur within a given MGP size stratification over time then the results of this analysis may be misinterpreted. For example, if 100+ groups decrease physician services and simultaneously increase

utilization of non-physician personnel such as physician's assistants and nurse practitioners to a greater extent than smaller groups, then their "market share" as defined in this analysis would decline. In the above example, limiting the number of physicians in the organization may improve efficiency and force other physicians, in the short run, into less efficient or desirable practice arrangements. Over the long run, however, the survivor analysis would dictate that the most efficient and desirable organizations will survive. Since market share is defined by the number of physicians within a given practice arrangement, market share can also be used as an excellent proxy for physician practice preference and employment opportunity in varying sized MGPs.

Addressing quality differences among MGP is extremely difficult or ignored in many (most) economic analyses. Physician productivity studies, detailed accounting studies, and other studies only analyze a few economic components of a successful MGP. Quality differences between physicians and different group arrangements exist and should be compared. Some patients express concern over impersonal service from large organizations. In addition to quality factors, time costs for service within large groups are usually greater whether it be because of increased travel to the facility, increased time required to make an appointment, or increased waiting time. These higher time costs per patient visit lead to difficulty quantifying true cost for the quality of service rendered. Solo practitioners may not discuss their difficult cases with colleagues as often as group practice physicians because of logistics, ego, or cost. Since higher quality MGPs are more likely to remain viable *ceteris paribus*, quality of care is one of the many factors promoting MGP survival. Unfortunately, quality in a harsh health care economic climate may not be an essential factor influencing viability.

V. Discussion

As expected with any industry in dynamic flux, the 22 year survivor analysis of MGP presented contains some contradictory findings.[28] Between 1965 and 1969, Frech and Ginsberg described an inverted U-shaped average cost curve for MGP; results that contradict the 1984 to 1988 period's rotation to an upright U-shaped cost curve. Even in temporally adjacent periods, the results may not remain consistent. For example, in the 1988 to 1991 period large groups made strong gains in market share even though they were not "optimal" from 1984 to 1988. Clearly, the survival analysis has its limitations and is not the proverbial crystal ball that will enable us to view the future of MGP; however, the data does elucidate several unifying trends.

One general trend is that larger medical groups tend to be more viable. According to AMA data and definitions, from 1969 to 1991 large medical groups (100+ physicians) have shown enormous gains in market share, and since 1980 medium sized groups (7-99 physicians) have also exhibited steady growth in market share. Small groups (3-6 physicians) were the only MGP size to lose market share from 1984 to 1991. For the three most recent time periods studied,1980-1984, 1984-1988, and 1988-1991; the minimum optimal size for single specialty groups grew from 3+ to 7+ to 16+ physicians, respectively.[29] Multi-specialty groups also gained market share from 1969 to 1991. Although multispecialty groups are generally larger organizations, this practice type was optimal at any size from 1988 to 1991. An independent survey conducted for *Hospitals* by Hamilton/KSA found strong growth of multi-specialty

---

[28] One of the assumptions in the Stigler survivor model is that the industry studied is moving toward a static equilibrium point. Anomalies and contradictions are expected in all industries that violate this assumption.

[29] Due to the clustering of the data, the minimum optimal sizes may not be exact. It is significant, however, that with consistent clustering of the data, the optimal size for single specialty group practice has grown.

groups, corroborating these results.[30] The data indicate that optimal size for group practice will continue to grow and that multi-specialty practices will continue to gain market share, yet how one defines (or redefines) group practice will affect this prediction.

Managed competition, the new *modus operandi* for MGP, has blurred the definition of medical group practice. Networked care arrangements such as Preferred Provider Organizations (PPOs) and Independent Practice Associations (IPAs) contract with businesses and insurers to provide total patient care for a specified patient volume and price.[31] One may define this arrangement as either one large multispecialty medical group or use the AMA definition for MGP and consider the managed care arrangement as a collection of smaller groups. Regardless of definition, the survivor analysis would dictate that contracted care arrangements are efficient because of their gain in market share. In 1991, 69% of groups were likely to contract with Preferred Provider Organizations (PPOs), compared with only 56% in 1988. The percentage of MGPs likely to contract with HMOs rose from 50% to 54% during the same period.[32] Although the survivor analysis reveals that medium sized groups are optimal and that contracted care arrangements are also optimal, causation is not identified. Are PPO and IPA contracts necessary for smaller group viability or are more efficient smaller groups more likely to contract? Because the two variables are correlated and highly

---

[30] "Data Watch: Multispecialty groups show strongest growth," Hospitals, 20 August 1992, p. 12.

[31] For the uninitiated into all of the subtypes of HMOs, here are a few brief definitions. Staff model HMOs are large MGPs that directly provide patient care through salaried physician employees. Group model HMOs are similar to staff models except that the HMO contracts with one independent large physician group (i.e. Kaiser). Network models are HMOs that contract with two or more independent group practices to provide health services. Networks are predominantly organized around groups not solo practices. An IPA is an HMO that contracts directly with physicians in independent practices, medical groups, and solo providers. Mixed model types are any HMO using a combination of the model types mentioned. These definitions match the InterStudy HMO data presented.

[32] Havlicek 1993

interrelated, it is likely that optimal sized practices will have both efficient practice patterns and contracted care arrangements.

Recent survival trends, 1988 to 1991, indicate that 100+ groups continue to gain market share, yet the loss in market share from 1984 to 1988 may indicate increased competition. One plausible hypothesis is that gains in IPA and PPO market penetration strengthened the viability of small and/or medium sized groups. InterStudy HMO data between 1980 and 1990 elucidates the validity of this hypothesis.[33] Depending on the type of HMO as defined by InterStudy (group, staff, network, IPA, and mixed HMO model types), an HMO may be one, several, or many medical groups combined: group and staff model HMOs represent 100+ organizations, networks include medium and large groups, and IPAs consist primarily of small and medium sized groups. Using these rough approximations for group size, stratification of HMOs by model type provides alternative data regarding group size and rate of growth. (See Figures 12 and 13) Between 1984 and 1988, IPAs increased their enrollment by 220%--the only HMO model type that includes smaller groups. During the same period, group model HMOs lost 42% of their total enrollment--almost exclusively large multi-specialty groups. These HMO enrollment gains (loses) correlate with both the decline in physicians practicing in 100 plus organizations and the increase in medium sized groups shown in the survivor analysis between 1984 and 1988.

---

[33] Kraus 1990

31

Pure HMO Enrollment
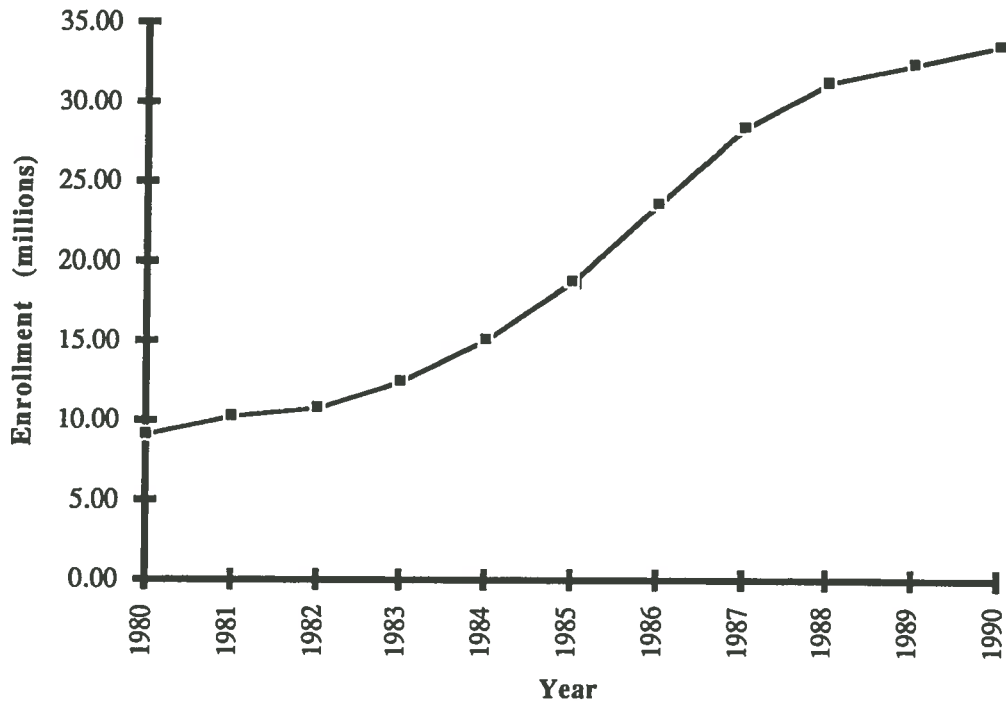
Figure 12: Total U.S. HMO enrollment in millions. Enrollment values include staff, group, network, IPA, and mixed HMO model types. Total HMO enrollment from 1980 to 1990 continues to increase yet the annual growth rate has slowed since 1986. Since these HMO model types are not all 100+ groups, nor are they all single groups, it is unclear from figure 12 how size affects group viability.

HMO Enrollment By Model Type
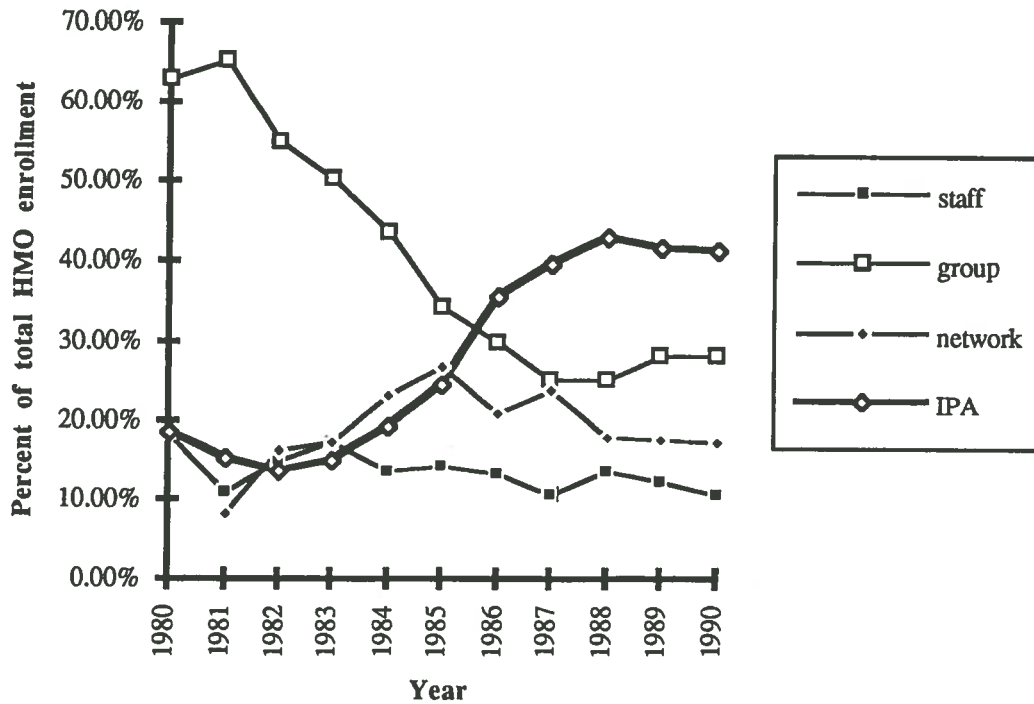
Source: See figure 12.

Figure 13: HMO enrollment by model type. Stratification by HMO model type is necessary to approximate group size. Note the large growth of IPAs between 1984 and 1988; the only HMO that includes smaller groups. During this period, IPAs gained 220% and group model HMOs lost 42% of their total enrollment.

The correlation between InterStudy's strong IPA growth data and the survivor analysis' loss of 100+ group "market share" from 1984 to 1988 does not presuppose causation; however, InterStudy data describes enrollment pattern shifts that are a direct definition of market share. An actual and significant market share increase for IPAs (smaller groups) must lead to a decline in market share of other organizations; therefore, it is reasonable to assume that IPA growth negatively affects market share gains of 100+ physician organizations. Thus, these findings may be interpreted as either the resurgence of smaller medical groups or as the amalgamation of small MGPs into new large multi-specialty organizations.

One reason for the significant growth in IPA (and PPO) arrangements is the greater pliability of an HMO without walls. Large health care organizations may face similar problems as other large business organizations where size and entrenched corporate culture may hinder an organization's ability to change. In the 1950s, 60s, and 70s, mega-corporations such as General Motors, American Express, IBM, and Sears flourished, but in the 1990s these large corporations are restructuring and decentralizing their decision making processes. Smaller organizations appear to be more successful because they can more rapidly adapt to environmental factors and consumer needs. According to Coopers & Lybrand, the accounting firm, the 90s are an era of the small firm. A study of 478 emerging growth companies showed that they created jobs at a rate of 18 percent a year during the past five years, while the Fortune 500 cut jobs by 2 percent annually. Even in the 1950s, the minimum efficient plant or firm size tended to be small relative to market size in many industries. T. R. Saving found in his 1947-1954 survivor analysis that 64 of 91 manufacturing industries had a minimum efficient plant size of one percent of the market or less.[34] Teaching an

---

[34] Saving 1961, p. 580.

elephant to dance may sometimes be easier than getting a large organization to change; health care organizations may be no different.

Despite the decreased flexibility as compared to small groups, large groups or systems that provide a wide range of services are more likely to be optimal. Large multi-specialty groups have shown their viability in both the survivor analysis and other studies.[35] Even small multi-specialty groups are better able to serve their patients within the group. For example, a rheumatologic/orthopedic group could treat arthritic joints both medically and surgically without outside referral; therefore, smaller multi-specialty groups may be able to adequately treat a given niche within the population. Those groups able to provide total patient care for subsets of diseases and disorders become highly desirable because contracting arrangements and coordination is simpler. Thus, it appears that optimal MGP size requires a group to either provide all patient care (large multi-specialty groups) or be a practice of sufficient size to effectively contract and/or work within various health care systems.[36]

One survivor trend of particular concern is that with the movement toward large multi-specialty groups, general and family practice groups have not been optimal at any size from 1984 to 1991. This is a result of either the declining number of physicians entering primary care or the result of increased difficulty for primary care MGP to survive or both. The combined effect of current medical students greater willingness to work in larger organizations and lack of interest in primary care may perpetuate the decline in GP/FP single specialty practices, especially the decline in small primary care groups. Regardless of the reason, the shift of MGP away from all general and family practice groups and all small groups will adversely affect all communities that require

---

[35] Riddick 1992; "Data Watch:" Hospitals, 20 August 1992, p. 12.

[36] Optimality for MGP becomes very complicated and beyond the scope of this thesis when forming formal practice networks and associations. Future research needs to determine how and when "synchronized dancing" between medical groups is easier than teaching *one* elephant to dance.

(or prefer) small primary care practices. Low density geographic regions where individual primary care physicians are needed will continue to lose primary care services unless change is made from the status quo.

Although single specialty general and family practices are inefficient, primary care physicians may be successfully practicing in multi-specialty groups. Between 1988 and 1991, multi-specialty groups were optimal at all sizes indicating that these groups had an increased need for primary care practitioners within their preexisting groups. Many primary care physicians in small MGPs are a bit apprehensive about joining a large organization; however, a study done in Dane County, Wisconsin concluded that physician job "satisfaction can be fairly high for primary care physicians in bureaucratic settings."[37] According to this study, the probable movement of GP and FP physicians into multi-specialty practices may not be the end to the satisfaction inherent in the provision of primary care. Unfortunately, if these primary care physicians are economically pressured to leave underserved regions to join large centralized organizations, then both physicians and the communities they serve will suffer. Formal associations with large health care networks that allow primary care physicians to remain in rural areas may be a partial solution for some of these practices. In brief, the survivor analysis reaffirms the wealth of literature and statistics depicting the primary care crisis.

Geographic variation exists among regions of the country which would indicate that aggregate data is *not* representative of all regions. From an evolutionary viewpoint this could mean either that different regions of the country are at different stages of the same evolutionary path or that different geographic areas are evolving differently. Figures 7 and 11 reveal that West has unique growth patterns compared to other geographic regions. In 1990, the West had 23.8% of its population enrolled in HMOs

---

[37] Riddick 1981, Schulz et. al. 1992.

36

far exceeding all other regions and the national average of 13.5% total enrollment.[38] The dominant corporation responsible for this large HMO population is Kaiser Foundation Health Plan, Inc. which runs the two largest HMO plans in the country: Kaiser--Northern California and Kaiser--Southern California. Kaiser's success in the West could be due to California's high population density, yet other portions of the country also have high population densities. Perhaps Kaiser has more effective management and business practices than other health care groups? If so, then the survivor analysis and good business sense would predict that Kaiser or organizations similar to Kaiser would have greater market penetration in other regions. Other forces must influence the geographic variation identified by the survivor analysis.

Barriers to entry and market saturation may have been two of the factors that caused smaller groups (less than 25 physicians) in the West to lose market share. In California, people have come to know Kaiser as a source of high quality, low cost medical care as revealed by Kaiser's decades of steady enrollment growth. Once a large group such as Kaiser has an established organization, reputation, and significant market share; new small MGPs may find it difficult to penetrate into the market. Out of the 25 fastest growing HMOs in the U.S. ranked by the rate of increase in enrollment, only one is located in the West (the Blue Shield HMO, an IPA).[39] The lack of rapid growing HMOs indicates that the West may be approaching HMO market saturation or barriers to new HMO entry exist. Further evidence of market saturation is revealed in Figure 7 by the West's loss of market share to the other regions.

Are the changes in the West predictive for the future of MGP or is the West its own unique "animal?" Outside the West, physicians in MGP and practices with 7+ physicians are viable and growing. From the list of the 25 fastest growing HMOs in

---

[38] Kraus 1990, p. 58.
[39] Kraus, p. 15.

the U.S., 24 are not in the West and 19 are IPAs; therefore, non-West MGP growth is associated with increased or new IPA penetration. Historically, IPAs had a chance to develop in the Northeast creating strong organizations before large HMOs were able to become established. Today, 6 of the 10 largest IPAs in the country are located in the Northeast.[40] In geographic areas with low population densities such as in rural America, large organizations are not cost effective; furthermore, centrally located urban health centers have increased patient time costs for rural residents and the quality of care may be significantly lower because care may not be administered in a timely fashion. Patient and physician preference for smaller organizations and/or solo practice may also impede the growth of large organizations. In California, the general population is receptive to the idea of high quality managed care. Other regions may not have as a receptive opinion toward large MGPs.

Although much more research into geographic variability is necessary for a definitive assessment, it is likely that geographic differences among populations, attitudes, beliefs, and organizations will remain uniquely different between regions. From a national policy perspective, choices and decisions must be sensitive to this diversity by providing direction and guidelines that promote a diversity of solutions: no *one* solution exists.

---

[40] Kraus, p. 15.

VI. Policy implications

With the new Clinton administration, health care has moved to the center of the national policy arena. A desire and willingness for change may lead to the implementation of a new national health care plan with the principles and goals enumerated by ex-governor Bill Clinton in the New England Journal of Medicine.[41] President Clinton states,

> Insurers, physicians, and health care institutions will be given strong incentives to collaborate in developing local health networks. Such networks will negotiate fees with participating providers and institutions, which will be responsible for the total care of the patients served.[42]

Networks, collaboration, and responsibility for total patient care are the phrases in Clinton's plan clearly indicating that physicians must work more closely together in this era of change. Mrs. Clinton's health care task force has also emphasized the virtues of managed competition which means that physicians will face even greater pressure to contain health care costs through contracted care arrangements. Since most of the survivor analysis results and existing trends regarding medical groups and MGP size are already moving in the direction that the Clintons' prefer, the Clinton plan will accelerate existing trends; groups will get larger and coordination between groups will increase. Fewer physicians will survive in solo-practice as the small and medium sized groups struggle to organize themselves (or be organized) into new medical care systems.[43]

---

[41] Clinton 1992.

[42] Clinton 1992, p. 805.

[43] Issue to address beyond the scope of this thesis would include the future of fee-for-service (FFS) medicine, third party reimbursement, and anti-trust legislation. This author feels that effective new systems will replace FFS with physician income pooling that includes productivity and quality bonuses. Third party reimbursement systems eliminate provider cost consciousness; therefore,

Because acceleration of survivor analysis trends would further decrease the viability of general or family practice groups, the Clinton administration must specifically rectify this socially non-optimal outcome. According to the survivor analysis, independent primary care practices will lose market share at all sizes and family and general practice physicians will face increased pressure to work in larger groups. Clinton acknowledges this problem in his NEJM article by stating that primary care clinics are needed yet fails to mention how he intends to address this problem.[44] The health care task force also has indicated that primary care must be supported without providing any details. Active and specific support for primary care must be part of the Clinton health care plan because the survivor analysis indicates that primary care groups will *not* be economically optimal in a climate of managed competition.

---

new systems must change and require physicians to be at least partially financially responsible for every office visit, procedure, hospitalization, laboratory test, ancillary service utilization, etc., that they perform or order. Anti-trust legislation will also have to be changed to promote managed competition since "different" provider groups will be sharing financial information and setting prices together. New definitions of anti-trust are needed for the new definitions of a MGP.

[44] Clinton 1992, p. 805.

VII.   Conclusion

The survivor analysis conducted for MGP from 1969 to 1991 is based on the evolutionary theory of survival of the fittest--those organizations best able to adapt to their environment will prevail. The results of the analysis may not clearly illuminate an optimal size for MGP; however, the result does refine some very difficult questions regarding MGP. Smaller MGPs will probably not survive alone, but if they band together will they have the economic strength to compete with the "elephant(s)"? So much change is occurring in health care that perhaps completely new organizational entities will evolve. Mixed model HMOs first defined by InterStudy in 1990 as the combination of other model types have shown promise and may be the wave of the future. Hence, success may not depend on size per se but on the ability to contract, negotiate, and work formally with other groups, HMOs, and hospitals.

The strong growth in managed care in the 1980s with predicted growth in the 1990s could be viewed as an impetus for all MGP to participate in managed care arrangements. The survivor analysis would dictate such action, but the survivor analysis may not identify possible health care "lemmings".[45] Blindly moving in the direction of any national or regional trend is not wise. Managed care arrangements may be the future of MGP, both small and large, but individual MGPs, health plans, and geographic regions must carefully review any and all future managed care contracts and/or arrangements--else the individual contractor may face the same fate as the ignorant lemming.

---

[45] A lemming is a rodent of genus *Lemmus* noted for mass migrations after large population increases. During migrations, lemmings sometimes blindly follow each other off cliffs assuming that the lemmings in the front know where they are going.

VIII. References

Bailey, Richard M., "Economies of Scale in Medical Practice." In Empirical Studies in Health Economics, ed. Herbert Klarman. Baltimore: Johns Hopkins Press, 1970, pp. 255-273.

Bays, Carson W., "The Determinants of Hospital Size: A Survivor Analysis." Applied Economics, 1986, 18:359-377.

Bidese, Catherine M. and Donald G. Dannais, Physician Characteristics and Distribution in the U.S., 1981 ed. Chicago: American Medical Association, 1982.

Blau, Peter M., "A Theory of Differentiation in Organizations." American Sociological Review, 1970, 35:201-218.

Blau, Peter M., "Interdependence and Hierarchy in Organizations." Social Science Research, 1972, 1:1-24.

Clements, Bill. "Road Map to Forming a Group." American Medical News, 7 September, 1992. pp.11-16.

Clinton, Bill, "The Clinton Health Care Plan." The New England Journal of Medicine. 10 September 1992, 327(11):804-806.

Clute, K. F., The General Practitioner: A Study of Medical Education and Practice in Ontario and Nova Scotia. Toronto: University of Toronto Press, 1963.

Darwin, Charles, The Origin of Species. New York: The Modern Library,1859.

"Data Watch: Multi-Specialty Groups Show Strongest Growth." Hospitals, 1992, 66(16):12.

Donabedian, A., "An Evaluation of Prepaid Group Practice." Inquiry, 1969, 6:3-27.

Engel, George L., "The Need for a New Medical Model: A Challenge for Biomedicine." Science, 1977, 196(4286):129-136.

Fein, Rashi, The Doctor Shortage: An Economic Diagnosis. Washington, DC: The Brookings Institution, 1967.

Frech, H. E. "Ted" and Paul B. Ginsberg, "Optimal Scale in Medical Practice: A Survivor Analysis." Journal of Business, 1974, 47:23-36.

Freidson, Eliot and Buford Rhea, "Processes of Control in a Company of Equals." Social Problems, 1963, 11:119-131.

Freidson, Eliot, Doctoring Together: A Study of Professional Social Control. New York: Elsevier, 1975.

Gaynor, Martin and Mark Pauly, "Compensation and Productive Efficiency in Partnerships: Evidence from Medical Group Practice." Journal of Political Economy, 1990, 98(3):544-573.

Gaynor, Martin and Paul Gertler, "Moral Hazard in Partnerships." NBER Working Paper #3373, 1990.

Getzen, Thomas E., "A 'Brand Name Firm' Theory of Medical Group Practice." The Journal of Industrial Economics, 1984, 33:199-215.

Goodman, Louis J. and Henry R. Mason, Physician Distribution and Medical Licensure in the U.S., 1975. Chicago: American Medical Association, 1976.

Goodman, Louis J., Edward H. Bennett and Richard J. Odem, Group Medical Practice in the U.S., 1975. Chicago: American Medical Association, 1976.

Haug, James N. and Genevieva A. Roback, Distribution of Physicians, Hospitals, and Hospital Beds in the U.S., 1969. Chicago: American Medical Association, 1970.

Havlicek, Penny, Mary Ann Eiler, and Ondria T. Neblett, Medical Groups in the U.S.: A Survey of Practice Characteristics, 1993 ed. Chicago: American Medical Association, 1992.

Havlicek, Penny, Medical Groups in the U.S., 1984. Chicago: American Medical Association, 1985.

Havlicek, Penny, Medical Groups in the U.S.: A Survey of Practice Characteristics, 1990 ed. Chicago: American Medical Association, 1990.

Held, Philip J. and Uwe Reinhardt, Analysis of Economic Performance in Medical Group Practice: Final Report. Princeton: Mathematica Policy Research, Inc., 1970.

Henderson, Sharon R., Richard J. Odem, and Karen M. Ginsberg, Medical Groups in the U.S., 1980. Chicago: American Medical Association, 1982.

Keeler, Theodore E., "Deregulation and Scale Economies in the U.S. Trucking Industry: An Econometric Extension of the Survivor Principle." The Journal of Law & Economics, 1989, 32(2):229-253.

Kenney, Joseph W., Bruce J. Miller, and Donald W. Fisher, "Focus on Quality in Group Practices." Group Practice Journal, 1990, 39(1):28-30.

Kimbell, Larry J. and John H. Lorant, "Physician Productivity and Returns to Scale." Health Services Research, 1977,12:367-379.

Kralewski, John, Laura Pitt, and Deborah Shatin, "Structural Characteristics of Medical Group Practices." Administrative Science Quarterly, 1985, 30:34-45.

Kraus, Nancy, Michelle Porter, and Patricia Ball, Managed Care: A Decade in Review 1980 - 1990. Minnesota: InterStudy publications, 1990.

Langenbrunner, John C., Deborah Williams, and Sherry Terrell, "Physician Incomes and Work Patterns Across Specialties: 1975 and 1983-84." Health Care Financing Review, 1988, 10(2):17-24.

Marder, William D. and Stephen Zuckerman, "Competition and Medical Groups: A Survivor Analysis." Journal of Health Economics, 1985, 4:167-176.

Newhouse, Joseph P., "The Economies of Group Practice." The Journal of Human Resources, 1971, 8(1):37-56.

"One-Fourth of Some Group Practitioners' Income is Prepaid." Medical Economics, 1990, 67(5):105.

Reinhardt, Uwe, "A Production Function for Physician Services." The Review of Economics and Statistics, 1972, 54:55-66.

Riddick Frank A., "Patient Care in the Major Multi-Specialty Groups." In Hope Conference Report: The Role of Major Medical Clinics in Meeting Future National Health Needs. Millwood, Virginia: Project Hope, 1981, pp. 70-75.

Riddick, Frank A., "The Role of the Multispecialty Clinic in Health Care Delivery in the Twenty-First Century." The Medical Clinics of North America, 1992, 76(5):1015-1020,

Roback, Gene, Lillian Randolph, and Bradley Seidman, Physician Characteristics and Distribution in the U.S., 1992 ed. American Medical Association, 1990. Also prior editions.

Robinson, E.A.G., The Structure of Competitive Industry, re. ed. Chicago: University of Chicago Press, 1958.

Rossiter, Louis F., "Prospects for Medical Group Practice Under Competition." Medical Care, 1984, 22(1):84-92.

Saving, T. R., "Estimation of Optimum Size of Plant by the Survivor Technique." Quarterly Journal of Economics, 1961, 75:569-607.

Scherer and Ross, Industrial Market Structure and Economic Performance, Third Edition. Houghton Mifflin, 1990.

Schulz, Rockwell, Chris Girard, and William Scheckler, "Physician Satisfaction in a Managed Care Environment." The Journal of Family Practice, 1992, 34:298-304.

Shepherd, William G., "What Does the Survivor Technique Show About Economies of Scale?" Southern Economic Journal, 1967, 37: 113-122.

Shortell, Stephen M., "Determinants of Physician Referral Rates: An Exchange Theory Approach." Medical Care, 1974, 12:13-31.

Stigler, George J., 1958, "The Economies of Scale." Journal of Law and Economics, 1:54-71.

Todd, Clifford and Mary E. McNamara, Survey of Medical Groups in the U.S., 1969, American Medical Association, Chicago, IL, 1971.

"Trends in Physician Compensation." SMS Report, Chicago: American Medical Association, 1989, 3(6):1-4.

Weiss, Leonard W., "The Survivor Technique and the Extent of Sub Optimal Capacity." Journal of Political Economy, 1964, 72:246-266.

White, Kerr L., "Patterns of Medical Practice." in Duncan Clark and Brian MacMahon, Preventive Medicine. Boston: Little Brown, 1967, pp. 849-870.

Wolinsky, Fredric and William Marder, The Organization of Medical Practice and the Practice of Medicine. Ann Arbor, Michigan: Health Administration Press, 1985.

IX. Appendix: Physician ownership and leasing of ancillary services

Physician ownership (and leasing) of supplemental services is a topic that requires detailed discussion of the economic, moral, and ethical issues far beyond the scope of this thesis. Although none of these issues will be addressed, the quantitative information provided may help with future analyses of economies of scale and MGP.

Appendix B will present 1988 to 1991 changes in the percentage of groups with ownership interests in the following categories: clinical laboratories, pharmacies, surgical suites, ECG, radiology, audiology, and optometer equipment. Physician ownership of their own MGP is also presented. All tables and charts are percentages of groups of a given size not individual physicians within those groups. Since market share is approximated in this thesis by the number of physicians practicing in a given sized organization, these data do not follow the methodology of the survivor analysis previously described nor do they approximate market share; the data is descriptive only.

The results vary by category as shown. One consistent trend is that 100 plus organizations are owning or leasing a greater percentage of every ancillary service assessed. Another consistent trend is that at all sizes of MGP, physicians have a greater ownership interest in their own practice in 1991 than in 1988. This trend exists for single, multi, and general practice specialties (data not shown).

Tables: Physician ownership or leasing of ancillary services and MGP

Pharmacy	1988	1991
3	2%	2%
4	3%	2%
5 to 6	3%	3%
7 to 9	6%	5%
10 to 15	10%	7%
16 to 25	20%	12%
26 to 49	42%	21%
50 to 75	38%	35%
76 to 99	48%	36%
100+	35%	44%

Clinical Lab	1988	1991
3	23%	26%
4	27%	26%
5 or 6	27%	30%
7 to 9	32%	30%
10 to 15	34%	31%
16 to 25	46%	39%
26 to 49	67%	50%
50 to 75	63%	64%
76 - 99	78%	65%
100+	49%	60%

Optometer	1988	1991
3	4%	4%
4	4%	4%
5 or 6	4%	5%
7 to 9	4%	5%
10 to 15	6%	6%
16 to 25	12%	10%
26 to 49	36%	21%
50 to 75	43%	45%
76 - 99	52%	53%
100+	42%	52%

Surgical Suite	1988	1991
3	8%	7%
4	7%	6%
5 or 6	6%	6%
7 to 9	9%	6%
10 to 15	9%	8%
16 to 25	15%	11%
26 to 49	26%	13%
50 to 75	35%	30%
76 - 99	41%	25%
100+	31%	32%

Radiology	1988	1991
3	27%	27%
4	29%	28%
5 or 6	31%	31%
7 to 9	42%	39%
10 to 15	43%	43%
16 to 25	56%	50%
26 to 49	68%	59%
50 to 75	66%	70%
76 - 99	72%	67%
100+	56%	63%

Audiology	1988	1991
3	13%	12%
4	13%	13%
5 or 6	12%	12%
7 to 9	15%	14%
10 to 15	21%	15%
16 to 25	34%	25%
26 to 49	60%	41%
50 to 75	59%	55%
76 - 99	79%	60%
100+	57%	64%

MGP ownership	1988	1991
3	81%	83%
4	75%	79%
5 or 6	70%	76%
7 to 9	65%	74%
10 to 15	58%	67%
16 to 25	53%	62%
26 to 49	52%	66%
50 to 75	44%	49%
76 - 99	44%	54%
100+	30%	33%

ECG	1988	1991
3	28%	28%
4	25%	23%
5 or 6	23%	24%
7 to 9	30%	26%
10 to 15	33%	31%
16 to 25	45%	38%
26 to 49	67%	53%
50 to 75	64%	60%
76 - 99	89%	65%
100+	56%	68%

Sources: Havlicek (1990), Havlicek et al. (1992).
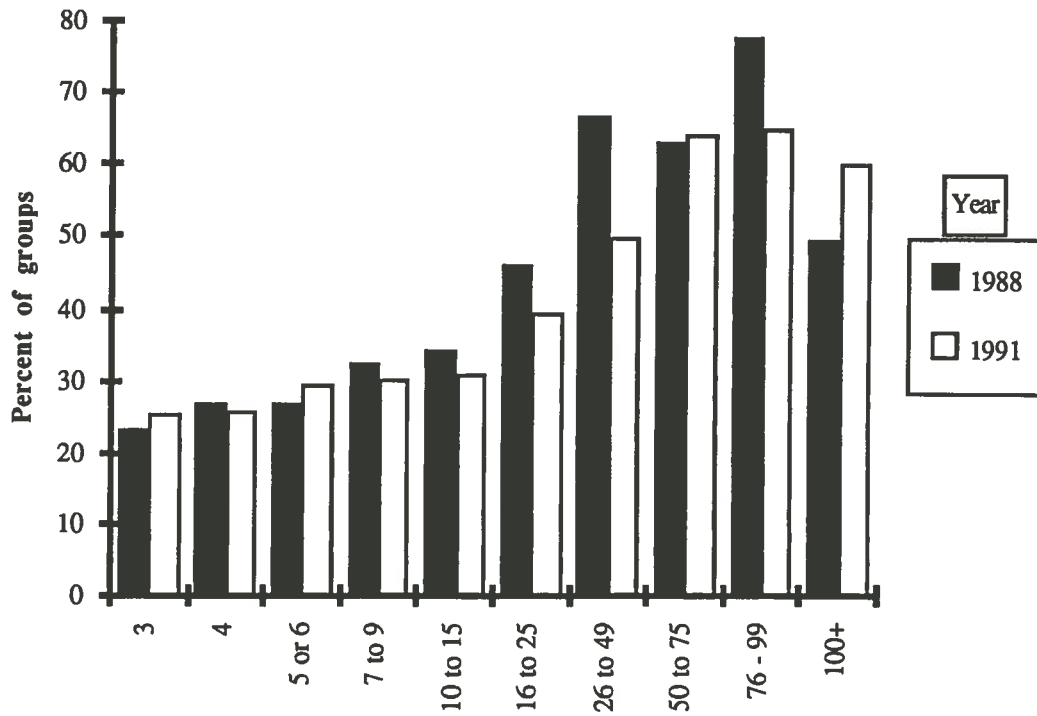
Pharmacy: Own or Lease
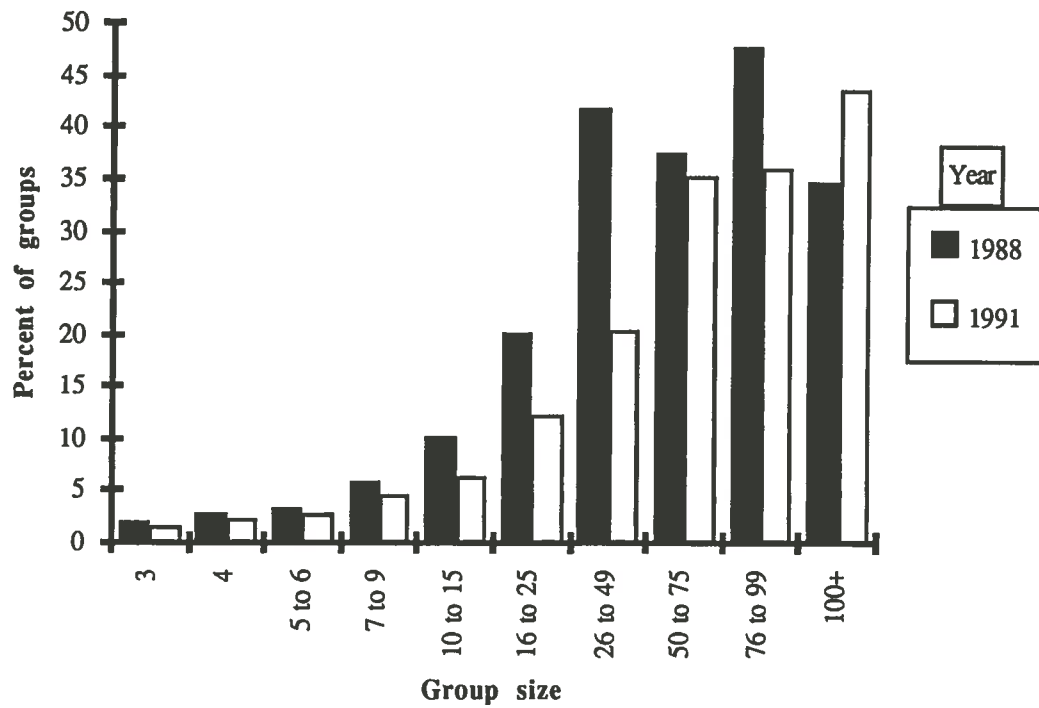
Sources: Havlicek (1990), Havlicek et al. (1992).

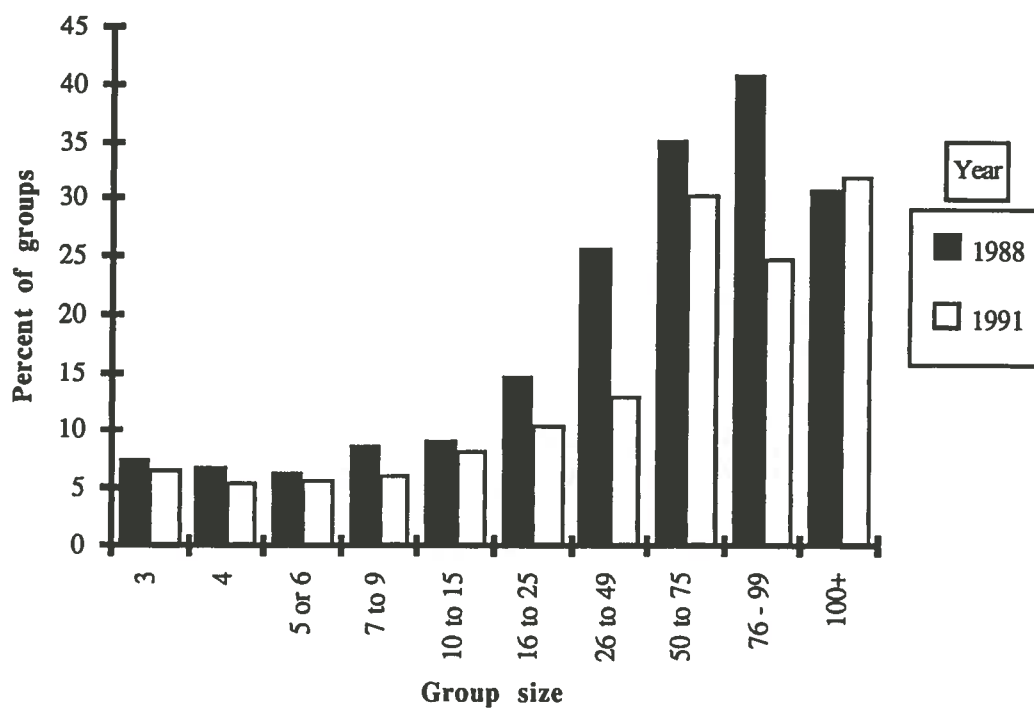**Figure 14:** Pharmacy data. Ownership or leasing arrangements by group size.

Clinical Laboratory: Own or Lease

Sources: See figure 14.

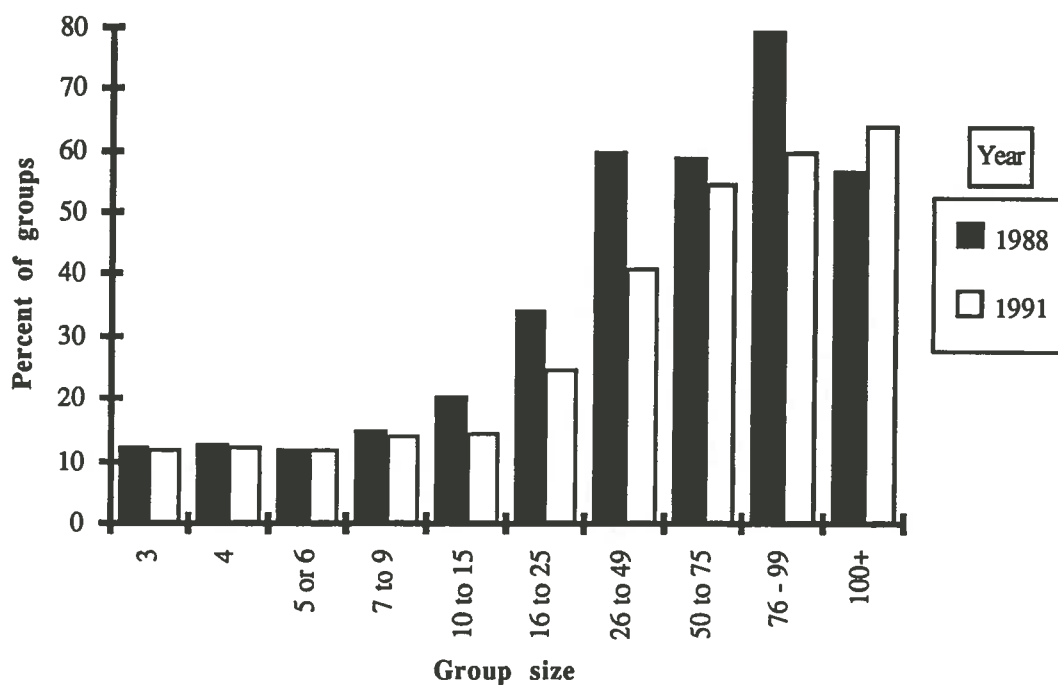**Figure 15:** Clinical laboratory data. Ownership or leasing arrangements by group size.

Surgical Suite: Own or Lease

Sources: See figure 14.

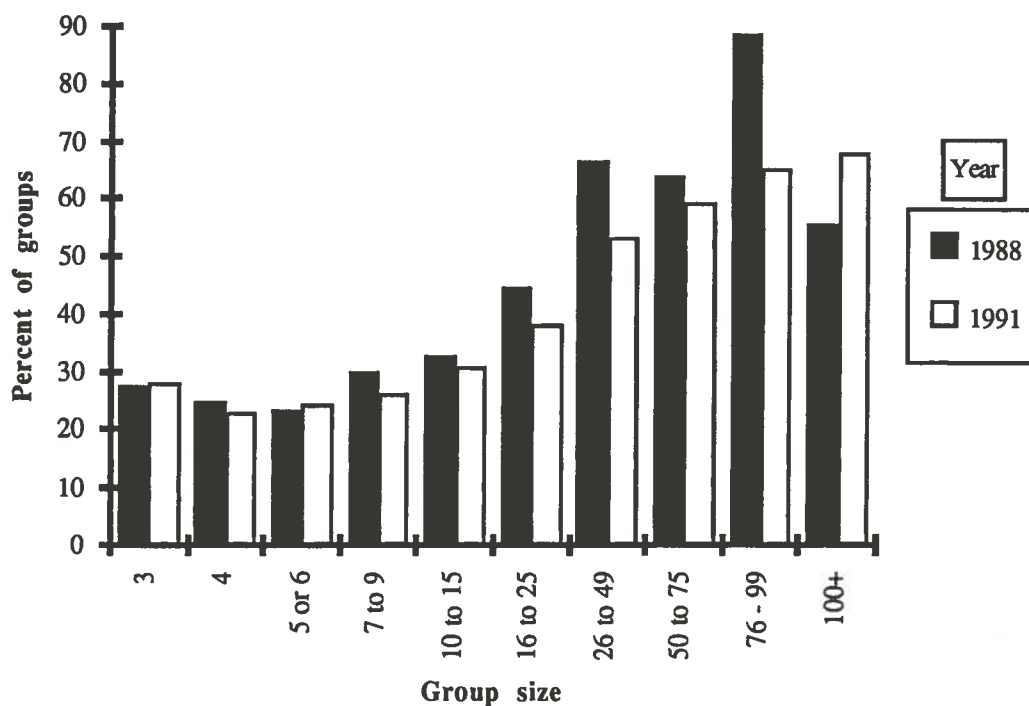**Figure 16:** Surgical suite data. Ownership or leasing arrangements by group size.

Audiology: own or lease

Sources: See figure 14.

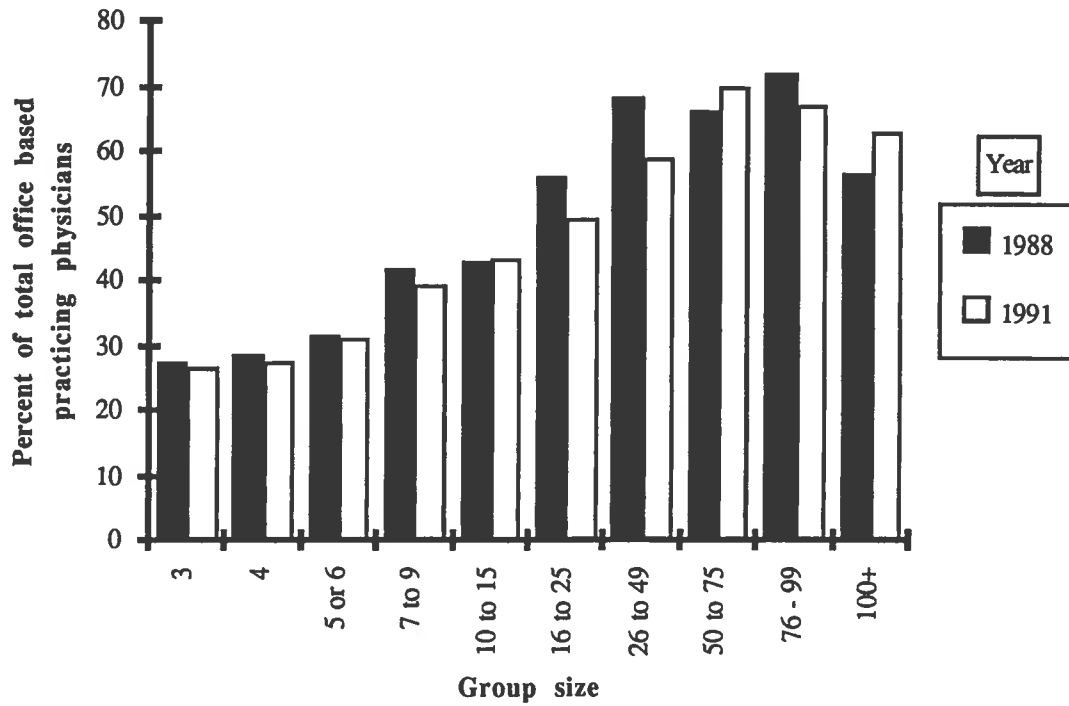**Figure 17:** Audiology data. Ownership or leasing arrangements by group size.

Electrocardiology: Own or Lease

Sources: See figure 14.

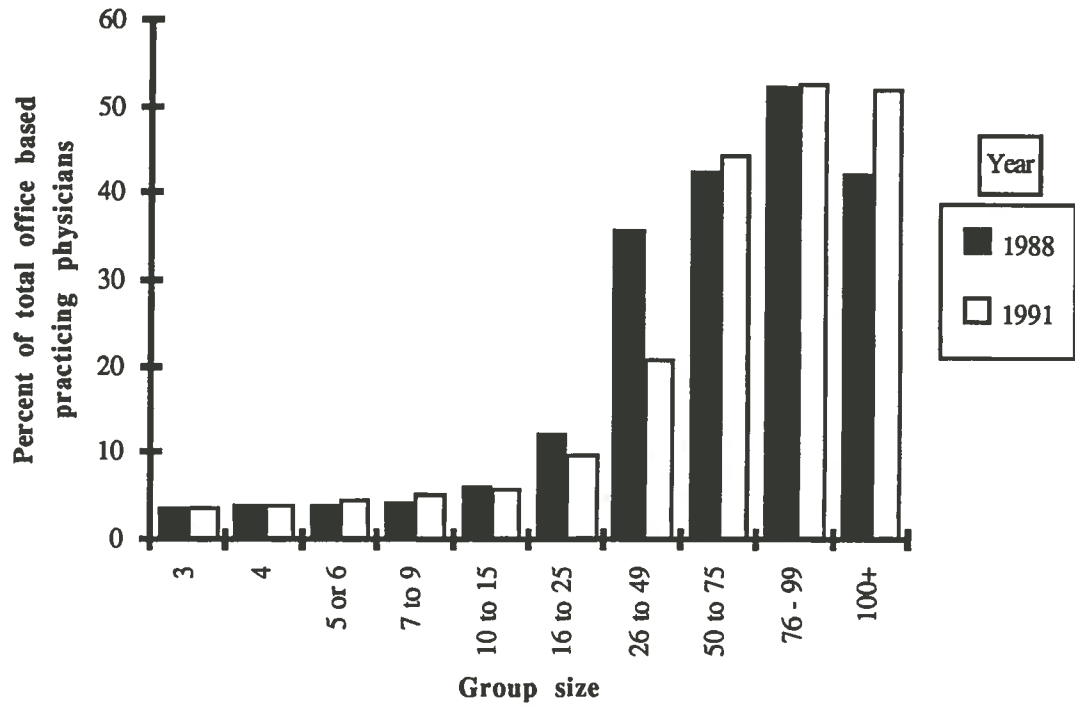**Figure 18:** Electrocardiology data. Ownership or leasing arrangements by group size.

Radiology: own or lease

Sources: See figure 14.

Figure 19: Radiology data. Ownership or leasing arrangements by group size.

Optometer: own or lease

Sources: See figure 14.

Figure 20: Optometer data. Ownership or leasing arrangements by group size.

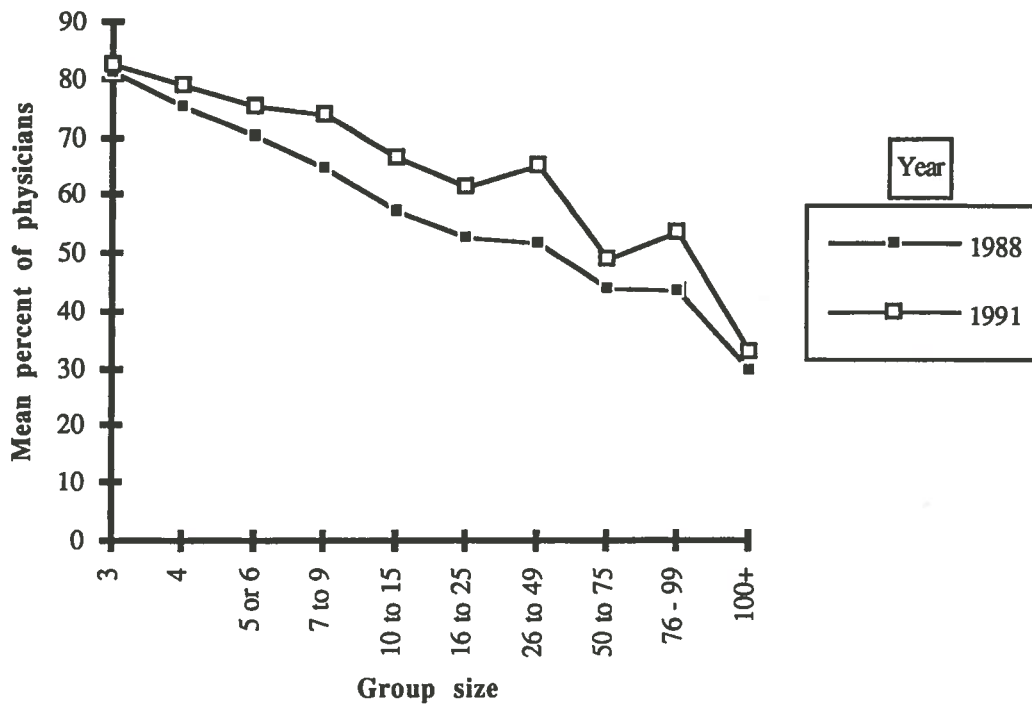## Group Physicians as Owners by Group Size

Figure 21: Group physicians as owners by group size. As the size of a group increases, fewer physicians on average maintain ownership of the MGP. Compared to 1988, a greater percentage of physicians owned their MGP in 1991 for all group sizes.