

Executive Summary

Contract HRA 230-75-0062

Developing Methodologies for Health Planners to Evaluate
Services Shared by Health Care Organizations

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INTRODUCTION

The purpose of this document is to give a brief summary of research results obtained during two years of work on contract HRA-230-75-0062. During the two years, new data on the subject of shared service arrangements (SAs) were assembled and analyzed. Two major reports have been submitted to the government:

- {D1} "Methodologies for Health Planners to Evaluate Services Shared by Health Care Organizations"
- {D2} "The Economic Impact of Shared Service Arrangements"

These reports contain much material, including an annotated bibliography, detailed guidelines and techniques for health planners, a conceptual framework for addressing economic impact, and detailed information on the organization and operation of shared services in case studies involving 19 sites. The tables of contents for the major reports are given in Appendixes A and B.

Definitions

A shared service may be defined as "a service provided as a result of the cooperative efforts of two or more health care organizations." The types of arrangements that may be subsumed by this definition are quite varied and depend heavily on the nature of the participating hospitals. In some instances a highly structured and complex organization with explicitly delineated powers, restrictions, and safeguards is necessary to win the cooperation of the hospitals in a particular area. In other cases a simple hand shake suffices. Between these extremes of formalized corporate structure and informal agreement there are large numbers of possible arrangements. Many of the advantages and disadvantages of each arrangement can be evaluated only in the local context. Instances are known where the participants decided to form a separate corporation in order to be eligible for some grant or other outside funding. Corporations have also been formed so that the accounting of the shared service, would be separate and in isolation from the hospitals; this facilitates determining the financial effectiveness of the venture. Informal sharing frequently is based on a philosophical concept which accepts as in a marriage, there is an occasional maldistribution of benefits or burdens between the partners. This view holds that in the long run, and for the whole community, the total benefits outweigh occasional disadvantages.

For purposes of this project, an initial fourfold classification of arrangements was utilized, on the basis of the control over the service:

Referred Service. The service is operated in only one (or a limited small number) of the participating institutions as a referred service. This also includes "tradeoff" in services; for instance, one hospital has the obstetric services and another the pediatric services for both (or all) participating institutions.

Purchased Service. A group of organizations or institutions cooperatively negotiates one contract with one provider of a service or resource. (This is sometimes also referred to as a "joint contract" service.)

Multisponsored Service. The service is organized and operated on a cooperative basis by the participating organizations or institutions, frequently through the creation of a separate organization.

Regional Service. The service is organized, operated, and available through a metropolitan, state, or regional association of institutions.

In developing hypotheses about economic impacts of shared services, the researchers further classified SAs according to whether they were exclusive in membership, binding through long-term commitments, and/or symmetric in the benefits and costs.

Medical Services

Anesthesiology	Nuclear Medicine
Blood Bank	Obstetrics
Electrocardiology	Outpatient
Emergency	Pediatrics
Extended Care	Pharmacy
Hemodialysis	Physical Therapy/Rehabilitation
Home Health Care	Psychiatry/Mental Health
Laboratory/Pathology	Radiology, Diagnostic
Medical/Surgical	Radiology, Therapeutic
Multiphasic Screening	Respiratory, Inhalation

Administrative (Supportive) Services

Biomedical/Clinical Engineering Service	Management Engineering Services
Central Equipment Pool	Medical Library
Credit and Collections	Medical Records/Transcription
Credit Union	Microfilm
Communications	Personnel/Collective Bargaining
Dietary Services	Planning
Electronic Data Processing	Plant Engineering/Facilities
Employee Health Insurance	Management
Financial Data/Statistical Processing	Printing/Duplicating
Fund Development Services	Public Relations Information
Group Insurance	Purchasing/Material Management
Housekeeping Services	Quality Assurance Program/
Investment Services	Utilization Review
Laundry/Linen	Safety Programs
Legal	Transportation
	Office Equipment/Maintenance

Educational Services

Audiovisual	Education/Training
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Manpower Services

Admitting Personnel	Grant Preparation
Administrative	Hospital Security
Auxiliaries/Volunteers	Medical Staff
Consultants	Social Worker
Elevator Operators	Nursing Administration

The economic impact of a shared service arrangement is most generally all changes in the allocation of real resources among alternative uses and users, all changes in the distribution of products among consumers, and all changes in the distribution of resource costs in the community. In the final 6 case studies, undertaken to assess economic impact quantitatively, the key measurement issues concerned economies of large-scale production, cost savings owing to reduced fluctuation in demands and higher average utilization, avoidance of capital financing burdens, and the exertion of collective negotiating strength in input markets.

In the initial 16 site visits, judgments on relative effects of SAs were obtained for the criteria of cost containment and each of the following.

Accessibility. A service becomes more accessible if it is extended to a population that was not previously served or did not previously utilize the service. Geographic, financial, cultural, or other barriers may be causes of nonutilization.

Availability: For purposes of this study, availability is defined as the simple presence of a service in a particular institution.

Comprehensiveness: There are two parts to this definition:

1. Levels of care. Comprehensiveness of services for a particular institution increases if a sharing arrangement makes possible better or more direct access to primary, secondary, or tertiary levels of care.
2. Components of services. Comprehensiveness of services for an institution improves if access to new specialties or subspecialties, specialized staff, or specialized equipment becomes available through a sharing arrangement.

Quality: A positive change in any of the other aspects defined implies an improvement in quality. Four surrogate measures or indicators were used as presumptive indexes of quality.

1. Formalized procedures, including education/training--this is process oriented.
2. Quality control committee--this is structure oriented.

3. Changes in output--these must be documented, and different measures apply for different services.
4. The regular performance of evaluation of inputs, processes, outputs, or the structure.

Acceptance: Acceptance is the overt or tacit approval of a service by employees, management, staff, physicians, patients, the community, and other providers.. Indirect measures are (1) level of participation and (2) utilization.

METHODOLOGIES

Research Objectives

The explicit purpose of the contract was to provide helpful information and operational guidelines for health planners to analyze and initiate SAs. More specifically, the objectives were to supply information concerning the characteristics and effects of existing SAs, to present a comprehensive annotated bibliography, and to recommend detailed techniques and procedures for planners to use in evaluating and initiating SAs.

Many possible effects of an SA have been defined; the economic impact was isolated for particular attention. The objective of the special attention to economic impact during the second year of the contract was to derive more firm quantitative assessments than have been attempted previously.

Data Resources

The following source materials were the primary data sources used in the course of the research:

- S1. National Survey of Shared Services, 1971, conducted by Health Services Research Center of Hospital Research and Educational Trust and Northwestern University. All short-term community hospitals were queried. Approximately 30,000 instances of sharing were reported.
- S2. Special survey of 156 shared service organizations, 1974, conducted by American Hospital Association (AHA).
- S3. Hospital Administrative Services (HAS) program data files for 1968 through 1976 based on reports by member institutions.
- S4. Case studies based on visits to 16 sites by project staff, 1975.
- S5. Case studies based on visits to 6 sites by project staff, 1976.

Limitations of the Results

Before the principal results are presented, some of the limitations should be explained.

The agreements studied were all made voluntarily. The 19 sites used for the analysis of 22 services were not a random sample of all SAs in the country. They were a selected subset of the 156 shared service organizations (S2). In fact, the SAs selected for this study tended to be sites with stable organizational growth and a pronounced willingness to expose their operations to outside scrutiny. The final six sites were also chosen because financial data concerning their operations were available.

No attempt was made to assess all impacts of all shared services at a site. Thus, the importance of broad commitments to sharing by each hospital tended to be underestimated.

Because the nonrandomized design of the entire study was broad, cutting across many different types of services, geographic locations, and arrangements, the planner should consider that broad extrapolation of the results may not be reasonable.

PRINCIPAL RESULTS

Existing Arrangements

The 1974 AHA survey (S2) indicated that the 156 shared service organizations offered 61 different medical, administrative, educational, and manpower services. (See tables 1 to 3.) The number of services would have been about 50 percent greater except for the decision to combine a number of related services into inclusive categories, rather than to list each service separately. Administratively more meaningful for program planning purposes were the findings that the average number of shared services offered per organization was 5.2, with a range of 1 to 33. The average number of hospital members in an arrangement was 60.9, with a range of 3 to 900. Overall, a total of 809 services was available to a membership of 9,502 hospitals. Although the reported hospital membership exceeds the number of known hospitals, the apparent discrepancy can be explained by the fact that many hospitals avail themselves of the services of several shared service organizations and were counted more than once. It was not uncommon for the various shared service organizations within a given state or region to have many of the same member hospitals. Some hospital associations administered or were otherwise associated with two or more shared services in which all or nearly all of the associations' members participated. However, when a hospital association indicated that its entire membership participated in a shared service it is possible that some of the hospitals were not actually engaged in the sharing activities.

Table 1. Number of Services Offered, Number of Hospital Participants, and Number of Shared Service Organizations by Region

Census Region	Number of Organizations	Number		Range			
		Services Offered	Hospitals	Services		Hospitals	
				Low	High	Low	High
New England	13	35	453	1	7	6	140
Middle Atlantic	21	121	1917	1	26	3	900
South Atlantic	19	106	552	1	33	5	84
East North Central	35	181	1104	1	20	4	125
East South Central	7	40	377	1	11	3	130
West North Central	15	109	782	1	33	5	195
West South Central	9	25	2162	1	6	12	644
Mountain	14	110	525	1	28	11	61
Pacific	23	82	1630	1	16	5	399
Total	156	809	9502	1	33	3	900

Table 2. Number of Participating Hospitals and Number of Shared Service Organizations by Type of Arrangement (for Sharing)

Type of Arrangement	No. of Organizations	No. of Hospitals	No. of Services	Hospitals per Organization	Services per Organization
Multisponsored	84	4,938	358	58.8	4.3
Regional	44	3,265	213	74.2	4.8
Other *	9	273	76	30.3	8.4
Not stated	19	1,026	162	54.0	8.5
Total	156	9,502	809	60.9	5.2

* Referred or purchased

Table 3. Number of Shared Service Organizations by
Most Frequently Available Services

Service	Organizations Offering Service	
	Number	Percent*
Purchasing/material management	74	47.4
Educational/training	57	36.5
Group insurance	41	26.2
Personnel/collective bargaining	39	25.0
Management engineering services	36	23.1
Credit and collections	34	21.8
Laundry/linen	32	20.5
Consultants	31	19.9
Electronic data processing	28	17.9
Financial data/statistical processing	26	16.7
Biomedical/clinical engineering	23	14.7
Planning	22	14.1
Communications	21	13.5
Safety	19	12.2
Audiovisual	19	12.2
Microfilming	18	11.5
Printing/Duplicating	18	11.5

* Based on 156 organizations

Summary of Survey (S2) Results

- The 1974 AHA survey (S2) identified 156 shared service organizations offering 61 different medical, administrative, educational, and manpower services.
- As expected, the regions with the largest number of hospitals registered with the American Hospital Association had the largest number of shared service organizations, the largest number of participating hospitals, and a somewhat wider range of services.
- The largest number of shared service organizations was found in the East North Central, Pacific, and Middle Atlantic regions.
- About one-third of the shared service organizations provided only one service. The median number of services offered was 2.5.
- Partially indicative of the size of operation is that nearly one-half (46 percent) of the shared service organizations had 30 or more hospital participants.

- . Nearly 90 percent of the shared service organizations for which tax status was known were considered as nonprofit.
- . The for-profit shared service organizations (when compared to the not-for-profit) seemed to have the smallest average number of hospital participants and the smallest average number of services.
- . Although there were some problems in classifying type of sharing arrangement, it appears that 60 percent of the arrangements which could be identified were multisponsored.
- . The five most frequently reported services available for sharing were purchasing, education/training, group insurance, personnel/collective bargaining, and management engineering.
- . Nearly half (46 percent) of the shared service organizations confined their activities solely to administrative services. However, many sharing arrangements included education and manpower activities.

The evidence seemed to indicate that some geographic areas or regions had a few shared service organizations offering many services. Other regions seemed to have many sharing organizations offering a limited number of services. The actual geographic distribution of shared service organizations and the services offered should be more fully explored. The finding that various shared service organizations had many of the same participating hospital members suggests an area for possible consolidation of effort. Finally, the small number of shared medical services reported suggests that the potential for this type of service should be explored further.

Effects of Sharing Arrangements

The national data source (S3) offers only some fragments of information on the effects of shared services. Through a cross-sectional statistical analysis of hospitals reporting to the Hospital Administrative Services (HAS) program, the following results were obtained.

Fifteen Frequently Shared Services

Nearly one-fifth of the study hospitals increased their scope of service by sharing one or more services. Home care, cobalt therapy, and renal dialysis were the leading shared services as measured by increased availability. In all regions there was evidence of greater accessibility of services owing to sharing. However, those regions with the largest number of hospitals had the greatest amount of sharing and service accessibility. When hospitals having one or more selected services were compared to hospitals with access to one or more selected services through sharing, the latter group had a higher average number of services available as well as a higher proportion of hospitals with more than 10 services. Thus it is suggested that sharing does increase comprehensiveness of services.

Cost Effects for Five Selected Services

The major findings of the study for five specific services with regard to

cost effects are:

Laundry and Linen. The percentages of hospitals sharing laundry facilities and those sharing linen purchasing increased with the bed size and the size of the SMSA area. In these two services, as hospital bed size increased more sharing was found.

Credit and Collection. The regression analyses show, as was hypothesized, that the sharing of a collection agency tended to reduce the number of bad debts. This conclusion was tentative; more indepth analysis will be needed before it is firmly established.

Blood Banking. The main statistically significant result in the blood bank analysis is that sharing reduced the direct costs and direct costs per operating room visit. In addition, average direct costs per operating room visit increased for both sharing and nonsharing hospitals by bed size.

Radiology. More medium-sized hospitals in medium-sized urban areas shared radiology services than small or large hospitals in rural or large urban areas. The sharing of radiology services yielded about the same direct cost per procedure as nonsharing. This result was expected because the primary impact of radiology should appear with regard to indirect costs or total direct and indirect costs.

Laboratories. The hospitals which shared laboratory services tended to perform more tests per man-hour. This indicated a somewhat higher productivity. However, the total direct costs per test were not consistently lower for sharing hospitals and indeed were higher for some services. An analysis of indirect as well as direct costs is needed. However, some of the results which can cautiously be suggested until such an analysis is performed are that purchasing of laboratory supplies, biochemistry laboratories, and autopsy services tend to have lower average direct costs and microbiology and anatomic pathology laboratories tend to have higher average direct costs in hospitals which share when compared with hospitals that do not share.

The 16 case studies (S4) made possible a more informative pattern of judgments on the effects of shared services than is feasible with the national data presently available.

The evaluations of each service obtained during the site visits are coded as follows:

Letter Code

- | | |
|----|---|
| I | The effect of sharing has produced an improvement or change in a desirable direction. |
| D | The effect of sharing has produced a deterioration or change in an undesirable direction. |
| NE | The sharing arrangement has had no appreciable effect. |
| O | Insufficient information existed for an evaluation. |

The analysis of the case studies by category of services and by type of arrangement showed that, in most instances, a shared arrangement provided participants with services of high quality and improved accessibility. However, the shared arrangements increased the cost or affected the cost adversely in 6 of 25 instances. It appears that a sharing arrangement makes a service more accessible to participants that previously were not served because of geographic or other inhibiting factors. The cost of overcoming these barriers to accessibility may increase the cost of providing the service.

Some effects explained by the analysis of the categories of services do not appear as strongly in the types of arrangements. The information collected through interviews suggests that the sharing of the medical services studied resulted in an improvement in the overall cost picture and that sharing of educational services had the opposite effect. Medical services often have significant random usage and high capital and operating costs. Sharing tends to smooth these factors and to lead to overall cost improvement. On the other hand, educational services, when not shared, may not be offered as extensively or as frequently, so that the institution of shared services in this category could lead to higher costs but a significant improvement in accessibility, comprehensiveness, and quality.

The evaluations are tabulated below according to service and type of arrangement.

Arrangement and Service	Cost	Accessi- bility	Avail- ability	Comprehen- siveness	Quality	Acceptance
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Multisponsored:

Blood bank	I	NE	NE	NE	I	I
Emergency medical	0	I	NE	I	I	I
Planning	D,0	I,I	0,I	I,I	I,I	0,NE
Credit/col- lection	I,I	NE,I	NE,NE	NE,NE	I,I	I,I
Laundry	0,I	0,NE	I,NE	0,NE	I,I	I,I
Education	D	I	I	I	I	0
Security	D	NE	NE	I	I	NE

Regional:

Social serv- ice	0	I	I	I	I	I
Education	D	I	I	I	0	I
Management engineering	NE	I	I	I	I	I
Biomedical engineering	0	I	I	I	I	NE
Medical com- bined ^a	I	I	NE	I	I	I
Laboratory	0	I	NE	I	I	I

^aDataphone (electrocardiograph), pediatrics, physical rehabilitation

Arrangement and Service	Cost	Accessi- bility	Avail- ability	Comprehen- siveness	Quality	Acceptance
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Referred:

Nursing Admin- istration	O	O	O	I	I	O
Planning	O	I	O	I	I	I
Education	D	I	I	I	I	I
Pediatrics	I	D	D	I	I	O
Obstetrics	I	D	D	NE	I	D

Purchased:

Physical therapy	D	I	NE	I	I	I
EMI brain scanner	I	I	I	I	O	D

Recommended Methodologies for Health Planners

Two methodologies and one discussion of tools and techniques requisite for initiating shared services have been developed for use by health planners. All of the previously mentioned data bases provided some input into the development of the methodologies.

The first methodology outlines steps for identifying and analyzing current arrangements for sharing services. The data to be collected, as well as the methods for collecting them, are specified. Two basic approaches are stressed: (1) working with and through one or two established shared service organizations to identify all sharing in the region or (2) performing an exhaustive survey of all potential providers or consumers of shared services. Methods for sketching the networks of existing arrangements and for assessing their effectiveness (for cost containment, increasing availability, quality, comprehensiveness, and acceptability of services) are provided.

The second methodology builds on the data and analyses of the first methodology to identify and analyze the potential for implementing arrangements for sharing. In addition, service profiles of health care delivery organizations are compiled and combined with area needs and area health plans. The analyses under this methodology involve provider interest in sharing, documented area needs, and project review. The discussion of the tools and techniques to be used by health planning agencies for initiating arrangements for shared services describes the techniques that various governmental agencies have utilized. The discussion also suggests some further techniques that would be appropriate to planners. A major finding relating to this is that comprehensive health planning agencies have had a minimal impact in initiating sharing. The most successful governmental technique was the provision through regional medical programs, of seed or study funds to hospitals exploring the possibility of sharing. The hospitals themselves then

developed the plans and proposal. Sharing of services appears to be a voluntary activity, usually internally motivated and initiated. The planner's main role should be that of change agent or facilitator, with a sound knowledge of shared services and a backup of information.

Economic Impact of Sharing Arrangements at Six Sites

In the cases studied, lower costs have been achieved for laundry processing, printing, blood banking and the purchase of certain supplies, through economies of scale. As the volume of these activities increase the cost per unit decreases and, in many cases, decreases significantly. Cost savings are then passed on to the participating hospitals in several ways. The most direct way is lower unit prices. A second way is the increased net worth and solvency of the SA (owned by the participating hospitals). A third way is the subsidization of other jointly shared services, which are often too costly for individual hospitals to support because the volume is insufficient to permit economies of scale. Some of the services which are often subsidized are education and training, management engineering, dietetics, warehousing, radiology, EMI brain scanning, and emergency medical services.

Specifically, economies of scale were noted in the following cases.

1. In shared laundry processing the primary reason for the scale economies is that increased units of production (pounds of laundry in this case) can be processed without a similar increase in the fixed costs. The magnitude of the benefits appears to be related to the difference in volume between the centralized unit and the inhouse hospital units. Managerial effectiveness appears to be a prerequisite for realizing the direct economies as well as other advantages, such as standardization and mass purchasing of linen. Finally, economies of scale tend to be understated, in that most cost calculations do not consider the alternate use of the released resources when a hospital joins a shared service. Significant space can be freed, and some reduction in personnel may occur at each participating hospital.
2. The blood banking case study also demonstrated significant economies of scale. There, the savings from the spreading of fixed costs was further augmented by more efficient inventory control and the reduction of the large presharing fluctuations between the supply of and the demand for blood and blood components at the individual hospitals. However, the cost of donor recruitment appears to have some built-in diseconomies, partly because of the lack of overall regional coordination of recruitment efforts and of the competition for donors from nonparticipating hospitals and other blood banks.
3. In the procurement of such supplies as anti-sera, blood bags, and RIA test kits (in the blood bank study) significant volume discounts were realized. The discounts were passed on directly in the prices charged to each hospital by the SA. In the laundry studies any volume discounts from linen purchasing were included in the per pound laundry charges. However, a significant additional cost for centralized linen

services resulted from the large loss of linen supplies (presumably caused by hospital employee theft). Strong management controls would need to be instituted in order to keep this cost down; however, such controls may be expensive and possibly not cost effective.

4. In shared printing services, there can be very large economies of scale if the participating hospitals are willing to standardize many of their forms and/or if they order in large quantities. Too often, however, each hospital desires a slightly different form, and a large setup cost is thus incurred in its production. Also the hospitals do not wish to place large orders, possibly because of their tight cash flow situation but more likely because of their desire not to have large inventories of forms which they may wish to change at a later date.

In general, the cost savings realized by economies of scale persist over the long run. These cost savings may be passed on by the participating hospitals to the patients directly in the form of lower bills or indirectly in the form of expanded or higher quality services at the hospitals. In this way the patient community and/or insurers and taxpayers benefit from the cost savings.

In the cases reported in this study, there were no apparent overall diseconomies of scale owing to some segments of the costs per unit increasing faster than others decreased as the volume rose. It is conceivable, however, that as the services expand beyond certain volume levels, larger per unit costs of transportation, information processing, and administration could in the long run result in diseconomies of scale.

Capital Requirements

The availability of large amounts of capital to a consortium of hospitals and the lack of capital or the undesirability of a large debt for an individual hospital may contribute to the creation of an SA so that hospitals may obtain needed services. In the cases studied, if a large capital investment was needed for its formation, the SA tended, at least initially, to be somewhat exclusive in membership and to require rather binding relationships among the participants. If the service was primarily administrative in nature, the service was fairly equally shared by all participants. On the other hand, if the service was primarily medical in nature, it was centered at one or a few participants and utilized by the others. In either event a significant re-allocation of resources was involved. One shared medical service discussed in the previous volumes was the purchase of an EMI brain scanner. In the case studies discussed in this volume, services needing a sizable capital investment were blood banking, laundry, and renovation of existing obstetric facilities.

Specifically, large capital requirements were noted in the following cases.

1. In order to start a centralized blood service, each of nine participating hospitals invested \$100,000 for the procurement of facilities and equipment, rental of space, and working capital for initial operations. Because of the previously mentioned economies of scale and the large net surplus realized, the debt is expected to be repaid

in four years, and at the same time the SA is expected to be operating at more than 60 percent net worth.

2. In the shared obstetric service study, one hospital faced a capital investment of more than \$1,500,000. Rather than make this large investment for a medical service which was declining in volume and experiencing low and erratic occupancy, the hospital decided to combine the service with the obstetric department of another hospital in the SA and to locate the service at that hospital. In this manner a large capital outlay was avoided, and the facilities were used for other profitable purposes. For a moderate capital outlay, the obstetric -related facilities at the host hospital were upgraded and expanded to provide for the increased utilization.

The agreement for this consolidation is essentially exclusive and binding because the obstetric facilities at the one hospital were eliminated and the host hospital is operating at high occupancy levels.

3. One of the centralized laundry processing services studied required an initial capital investment of about \$2,000,000 to serve 10 hospitals, and the other about \$1,000,000 for 6 hospitals. In the former case the initial capital was raised by a long-term loan from a commercial bank. In the latter case the hospitals contributed about \$400,000, with the remainder coming from Hill-Burton funds. Because of the large capital commitments, the agreements tend to restrict withdrawal by the original participants. Furthermore, each participant receives about equal value (relative to its size) from its agreements. However, the SAs are not exclusive in that new members are encouraged to join. As partial compensation for the initial capital commitment of the original participants, the new participants are charged a slightly higher fee for service.

In the long run, owing to economies of scale, the large initial capital outlays will be repaid, and the SAs will be able to pass on the increased savings directly or indirectly to the participants in the ways previously mentioned-- lower costs, higher quality, and/or additional services.

The direct and indirect effects of the resource reallocations (caused by the large capital needs of shared blood banking, laundry, and obstetric services) on the nonparticipants and the community are more logically explained through the analysis of economic phenomena other than capital needs. For this reason the impact on these groups is discussed in the following pages.

Unified Strength for Pricing and/or Negotiating

If a more unified or united approach is taken to certain services and activities performed in hospitals, greater short-run benefits may accrue. These services often involve a consolidation of power or approach, so that the combined strength or unity of the hospitals is exercised through collective voices in such areas as billings to patients, purchasing of supplies, and labor relations. In the first instance the collective strength takes the form of monopoly power in setting prices. In the other instances the collective strength

is manifested as monopsony power when the SA deals with supplies, employees, and labor unions.

In none of the case studies was monopoly power evident as a means for achieving economic benefits through shared services. However, as only individual services were examined, it was not possible to infer whether monopoly power is a significant element in the success of the SA as a whole - for example, in basic negotiations with reimbursers.

Monopsony power, exerted overtly with clear direction and cohesion, also was not observed. In the purchasing area, the cost savings resulted from volume discounts rather than from a single buyer and many suppliers. In the labor relations study, the SA did not want a statewide or even a multi-hospital labor agreement, like that of the New York League of Voluntary Hospitals. Instead, the unifying approach taken was to disseminate all wage and benefit information collected from participating hospitals (both organized and nonorganized) to conduct educational forums on labor relations, and to aid in negotiations at individual hospitals when requested to do so. The economic benefits of this approach have been an averaging of wage-benefit levels in the state (except for urban-rural differences) and a 2 percent lower rate of hourly wage increases for registered nurses relative to the national average for 1970 to 1974. These benefits have occurred without a reduction in hours or quality of care.

The labor relations program of the SA is nonexclusive and not binding on the participants, that is, they may join or leave as they desire. Furthermore, all benefits are equally available to all participants who desire them.

The nonparticipants in the state (there are only a dozen or so) have possibly benefited indirectly from the SA, in the sense that the overall state level of wage and benefits paid has been lower than the national level and, consequently, lower in nonparticipating as well as participating hospitals.

The community has benefited from lower hospital charges without reductions in the quality or level of care.

Reduction of Formerly Unmet Health Needs

It is doubtful that patient demand has increased because of the existence of any of the shared services studied. In the obstetrics and pediatrics study, there was a significant relocation of demand from some hospitals to others. It is possible that some increased demand was experienced at the hospitals with the consolidated facilities, owing to an upgrading in quality and an expansion of the facilities, rather than just a transfer of demand from those hospitals which closed or downgraded the scope of their facilities. However, it is not possible to assess the amount of this increased demand or to tell whether it was merely a transfer from nonparticipating hospitals or was newly emerging formerly unmet needs.

It is clear, however, that a small but significant amount of the former patient demand at the hospitals which closed their facilities went to

nonparticipants in the SA. In this sense, the nonparticipants benefited from the existence of the SA.

Reduction in Random Fluctuations

In the medical shared services studied--obstetrics, pediatrics, and blood banking--there has been a significant improvement in planning and scheduling (both medical and administrative) because of reductions in the random fluctuations of patient demands. The reductions occur because of the larger volume of activity in each service without any significant increase in the variability of the activities. Indeed, in blood banking the coefficient of variation is much lower because the supply of and the demand for blood and blood components are pooled.

Specifically, reductions in demand fluctuations were noted in the following cases:

1. In the obstetric service the host hospital of the SA received more than half of the demand formerly handled by the hospital which closed its obstetric service. This increase came at an opportune time because obstetric admissions had been steadily declining and occupancy would have been a serious problem in the future.
2. A similar phenomenon occurred in medical pediatrics. Specifically, medical pediatric cases at the host hospital were increased by more than 100 percent during the postconsolidation period (1970 to 1975).
3. The sharing of blood banking services leads to large reductions in the fluctuations of supply and demand. Much of the supply is drawn by phlebotomists on mobiles. Often the number of units at these drawings is large. Because whole blood and packed red cells expire in 21 days, an individual hospital cannot use all of the supply in a three-week period. Spread over many hospitals, however, the supply is easily used.

Demand for blood and components at any single hospital varies greatly from day to day. When the daily demands for many hospitals are added together, the variation evens out. Because of these smoothing effects, shared blood banking services handling a volume of 40,000 or more units can realize a reduction of blood shortages to the 0 to 1 percent level and of outdates to the 2 to 4 percent level. Independent non-participating small or medium-sized hospital blood banks often have much higher shortages and outdates at the 15 to 20 percent level.

Spatial Reallocation of Resources

In most of the case studies there has been a spatial reallocation of resources. There was a complete spatial reallocation of medical pediatrics and obstetrics from the hospitals closing these services to the host hospitals of the SA. In laundry processing and printing, the spatial reallocation of the service is virtually complete. That is, very few laundry or printing activities have been retained by the participants, and most of the work is performed at the SA location.

The shared blood services have resulted in less spatial reallocation of resources. Most participants retain some donor services and small processing capabilities. All participants still need facilities for inventory storage and crossmatching. Some even retain full phlebotomy facilities.

Specifically, spatial reallocation of resources was noted in the following cases.

1. The hospital which closed its obstetric department used the facilities to expand the available number of beds for another department which had a very high occupancy rate. Because there was an excess demand for beds in this department, the new beds were needed and used. Thus, the consolidation turned a money-losing obstetric department into a nonloss activity.

The medical pediatric facilities at the hospitals which closed this department were used for the expansion of other medical and surgical pediatric departments.

The obstetricians and medical pediatricians whose departments were closed were given full privileges at the host SA hospital. However, there was considerable dissatisfaction among these physicians about the consolidation, and a few of them essentially withdrew their practice from the consortium.

2. Even though some of the participating hospitals in the laundry processing SAs still maintain small laundries for specialty items, they have physical space available for other activities. A few participants have converted the old space to marginal uses, but even these participants have benefited by not allocating space in new construction or renovation for laundry processing.
3. In the blood banking activity, the small amount of space freed because handling, processing, and donor service activities are performed at the SA, has often been used for the routine growth in other blood bank activities or to expand the laboratory facilities of the hospital. The medical technicians who handled blood processing in the blood bank were reassigned to the laboratory or to other blood banking activities. Because many of the donor recruiters were volunteers, their services were used elsewhere. Finally, the phlebotomists were usually absorbed in the system to perform other tasks (often they were only partially assigned to phlebotomy even before the SA was organized.)

The spatial reallocation of resources caused by the creation of the SAs had little effect on the nonparticipating hospitals, except in the case of obstetric and medical pediatric activities. Some of the obstetricians and medical pediatricians moved their primary practice to nonparticipating hospitals. Although the data are not clear, perhaps the host SA hospitals may have received some of their increased demand at the expense of the nonparticipants, because the shared facilities were upgraded and expanded. In these activities, the spatial reallocation of resources has also caused some transportation and scheduling problems for the physicians and the patients

formerly affiliated with the hospitals which closed their facilities. Indeed, the host hospital for obstetrics is located in a different county, so many welfare patients go to nonparticipating hospitals in their own county.

All of the foregoing benefits and disadvantages of the spatial reallocation of resources have resulted in the few years since the consolidations. In the long run, it is anticipated that there will be little change in the effects of these reallocations in laundry, printing, or blood banking. However, the long-run effects in obstetrics and medical pediatrics are not clear. Unfortunately it may be difficult to measure the long-run effects because of other factors, such as social values and regional changes in demographic characteristics, which will tend to confound the analysis.

Quality, Comprehensiveness, Accessibility, Availability, and Acceptability

Economic effects such as improvements or reductions in the quality, comprehensiveness, accessibility, availability, and acceptability of services provided by SAs were extensively discussed in the earlier four volumes. The effects in the case studies included in these volumes, have been discussed in this section. In general, the SAs tend to provide a wider range and mix of services than any one hospital can economically provide by itself. Furthermore, the quality of these services is usually as high as or higher than the quality of the services provided by the participants prior to sharing. In services such as laundry/linen, printing, blood banking, and labor relations the accessibility, availability, and acceptability present no problems, and, indeed these services are usually very well received by the participants. The reallocation and transportation difficulties in the obstetric and medical pediatric consolidations have presented accessibility and acceptability problems, as has already been mentioned.

In summary, the SAs studied in this report have been quite successful in achieving their short-run economic objectives through the realization of economies of scale; the obtaining of needed capital and working cash; collective negotiating with suppliers, employees, and unions; better planning because of reduced random demand fluctuations; improvement in the spatial reallocation of resources; and improvement in the quality, comprehensiveness, accessibility, availability, and acceptability of their services.

Most of these short-run benefits will carry over to the long run because they are based on economies of scale, higher productivity, and improved profit and cash positions. Furthermore, the existence of most of the services does not threaten, and in some cases actually enhances, the position of the nonparticipants. Because many of the services are nonexclusive, some nonparticipants have later joined the SAs.

Most of the economic benefits are passed on directly to the patients (and indirectly to the community and taxpayers) through lower costs and higher quality and range of services. Some of the benefits are indirectly passed on by subsidization of other services and activities.

There are, however, some disadvantages and disruptions owing to some of the sharing activities. Several of these appear in the consolidation

of obstetrics and medical pediatrics, where the long-run benefits and impacts on patients, physicians, and nonparticipating hospitals are not clear. In the printing area, many of the potential benefits are not realized because of the various hospitals' desire to have different forms and to make changes on reruns. The purchasing of linen by an SA appears to result in a greater loss problem than if the hospitals own their own linen. However, purchase of linen by the SA results in greater volume discounts, and there is no need for the SA laundry to sort each hospital's linen by name after laundering.

In most cases the economic benefits of sharing greatly outweigh the disadvantages if the shared service is well managed and the participants are willing to yield some of their autonomy. Nonparticipants are in large measure unaffected by the sharing of administrative services, and the community, in general, tends to benefit. Nonparticipants appear to benefit from the medical pediatric and obstetric consolidations. The community, in general benefits from higher quality, up-to-date service, but some patients must travel farther to obtain care.

Appendix A

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