COMMUNITY CHARACTERISTICS AND THE PROVISION OF EMERGENCY MEDICAL SERVICES

by

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Thesis submitted to the Faculty of the

Virginia Polytechnic Institute and State University

in partial fulfillment of the requirements for the degree of

MASTER

in

Urban and Regional Planning

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November, 1985
Blacksburg, Virginia

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ABSTRACT

Emergency Medical Services (EMS) is provided in a variety of different ways in the United States. Methods of service delivery range from the purely private to the completely public and include mixtures that are not clearly one or the other. Based on a review of the literature, this variation is hypothesized to reflect, in part, variation in community characteristics. Using localities in the Commonwealth of Virginia, this hypothesis is tested by examining the characteristics of forty-seven communities in which emergency medical services are provided. Survey research was used to explore the association between public or private provision of EMS and five variable clusters: socioeconomic, medical resources, geographic, governmental, and unique local resources. Analysis of these variable clusters resulted

in the conclusion that there is a statistically significant difference between the characteristics of communities with public service provision and the characteristics of communities with private provision. Thus, it seems highly likely that the public-private variation in EMS service delivery reflects to a certain extent differences in the communities themselves. Socioeconomically advantaged, urban communities with quick access to a large number of medical facilities are more likely to provide EMS through private means. On-the-other-hand, relatively socioeconomically disadvantaged, rural communities with fewer medical resources are more likely to publicly provide EMS service. The fact that this relationship between the characteristics or nature of the community and the method of service provision exists raises several issues. It indicates that rural communities are carrying the burden of public service provision while more urban areas have been able to recover some costs. It also raises the issue of service provision to the indigent in urban areas, since we are unsure as to whether or not a fee structure inhibits utilization by the poor. The relationship between access to the EMS system and the selection of a financing strategy of service provision deserves investigation. Perhaps most importantly, this effort points out how little we know about emergency medical services in the larger context of municipal services.

ACKNOWLEDGEMENTS

I would like to take this opportunity to thank Dr. Sara Rosenberry for her patience and dedication to assisting with this project over several long years. More importantly, I would like to thank her for willingness to help me sort-out a reasonable research effort that encompassed both planning and emergency medical services. I would also like to thank Dr.s James Bohland and John Levy for serving on the committee. The willingness of the directors and officers of almost two hundred emergency medical services agencies in the Commonwealth to complete the lengthly survey should not go unacknowledged. Lastly, I owe a debt of gratitude to my parents who patiently and calmly allowed me to pursue this effort.

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INTRODUCTION

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Accidential trauma (personal injury or wound) is the leading cause of death in the United States for those between the ages of one and forty-four. Heart attack is the leading cause of death after age forty-four. Each year 75 million Americans are injuried and 650,000 will have a heart attack. Approximately 165,000 of those injuried will die from their wounds and 17 million will be disabled, many permanently. Of those suffering heart attacks, 250,000 will die, over half of them outside of the hospital. The cost of accidential trauma in 1982 for the U.S. alone was over $75 billion; including more than $63 million per day in lost wages (Roanoke Memorial Hospitals 1984: p. 1; American Heart Association 1984: p 1).

In 1966, the National Academy of Sciences called accidential trauma the "neglected epidemic of modern society" and the "nation's most important environmental health problem." At the time this report was published there were a mere 52 million injuries a year at a cost of approximately $18 billion. Between 1966 and 1982 the number of injuries

has increased 44% while the cost has increased 316%. One of the responses in this country to these figures has been the establishment of emergency medical services systems.

Emergency medical services (EMS) is the provision of pre-hospital medical care to individuals who become suddenly ill or injured. Agencies providing this service are identified by a variety of names, including rescue squad, EMS agency, life saving crew, ambulance service, and first aid crew. Regardless of title, the provision of emergency medical services involves the delivery of medical care at the scene of the incident by a team of specially trained individuals and subsequent transport to a medical facility.

In 1981 there were almost 500,000 individuals licensed or certified to provide pre-hospital medical care, 14,425 agencies involved in the provision of this service, and almost 40,000 ambulances in the United States. In Virginia alone, close to 500 agencies and over 35,000 individuals are involved in the provision of emergency medical care. What these figures tell us is that EMS is a service that is frequently utilized and consequently requires an going commitment of resources to provide.

While the service provided by various EMS agencies is essentially identitical, the ways in which these emergency medical services are organized and financed are not. The

method of service provision varies from community to community. Some rely on agencies that are completely public while others rely on purely private agencies to provide the service. In the former instances, EMS as an emergency service is often treated in a similar way as police or fire protection. In these cases, EMS is seen as one of several public safety services for which the individual patient or victim is not billed directly but rather which the community supports out of general or special revenues. In the latter instances, EMS as a service appears to have more in common with other health care services which tend to rely on private provision and financing. In these instances emergency medical services is treated as a health (or medical) care commodity with the individual patient or victim paying for the specific services rendered.

This variation in how EMS is provided seems to reflect a lack of consensus on the question of what EMS means to a community. This lack of consensus is not merely an academic question in that the method of service provision may determine access. Thus, while the need for the service may be universal, access to the system may or may not be depending upon how the service is organized and financed. providing state-of-the-art health care services.

Since EMS is provided at the local level, the decision regarding how to deliver this service is made by each locality. It thus seems logical to assume that variation in how service is provided is somehow linked to community characteristics. The variation itself can be seen as either a product of a deliberate decision or as a reflection of the characteristics of the community.

This research attempts to explore the association between characteristics of the community and the manner in which EMS service is provided. The initial expectation, which is supported by the study results, is that certain types of communities (e.g. urban, affluent) will select specific public provision methods while other types of communities will select private methods of provision.

Using a data set consisting of information collected from 47 Virginia communities, localities were divided into two groups depending upon the method of service provision selected. The two groups were then examined for differences in socioeconomic, geographic, governmental, medical, and local characteristics.

Chapter II

RESEARCH RATIONALE

Variation in community services is perhaps more the norm than the exception. A limited number of services tend to be universally provided by local government. Law enforcement and public education immediately suggest themselves. Past that point it is difficult to make general statements about service provision. So it seems reasonable to ask why any particular interest should be focused on emergency medical services. There are two reasons that come to mind. First is that EMS is a relatively new service and the individuals and agencies involved are now and will continue to be in the process of searching for organizational and financial arrangements that will allow them to best meet the mission of their service. This search is not currently being aided by any academic research. There is available a growing number of consultants who are promoting strategies based on personal experience. It is my belief that public officials need better assistance and that that assistance should come from social science research. The second reason is that the choice of service delivery patterns has an impact on the citizens of the community. The implications for citizens are as important, if not more so, than the implications for the agencies involved.

1. Methods of service provision

The first step in understanding any variation is to establish some method of measuring the variation that we wish to explain. Thus, to look at a variation in the nature of EMS service provision, we must be able to differentiate organizational and financial schemes. EMS provision has been classified in a number of ways. The most common is to describe who provides the service. Typical categories in this type of descriptive system include municipal, volunteer, commerical, fire department, or other public utility.

It is easy, but mistaken, to assume that these categories tell us more than they do. As definitions, they describe who technically provides the service, but for the most part, they do not tell us anything about the character of the service or its accessibility to community members. For example, a volunteer agency does not necessarily provide a free or public good. Many volunteer agencies require an annual subscription or charge a fee for service. Similarly, a commerical operation may be retained by a community to provide coverage under a contractual rather than a fee for service basis. Unfortunately for those of us interested in the nature of EMS service, most information collected is done in terms of who is providing the service, not how the service is financed or for whom the service is available.

While the question of access is recognized as important, it has, nevertheless, been largely ignored in previous work.

This question is obviously critical in the case of EMS. Where there is a need for the service, the time required to establish the right to service when that right is not assumed to be universal can mean the difference between life and death. In that sense describing who provides the service is a minor piece of information when compared to knowing for whom the service is provided.

A far less common type of classification has been developed by Doeksen, Anderson, and Leonard in their study of Oklahoma EMS agencies. They identify what they refer to as "the most widely used methods of financing" (Doeksen et al 1982: pp. 31). These sources are special taxation districts, sales tax, public utilities assessment, county and city subsidies, fees for service, and third party reimbursement. As one of the few documents which looks at financing mechanisms, this categorization of funding sources would seem particularly important to consider in focusing on access. Interestingly, the categories do not appear to fit the situation in Virginia communities. In particular the statements that fees for service have "traditionally paid for pre-hospital care in the United States" and that community fund-raising "cannot provide the solid financial base

... necessary for a viable EMS system" are not true for the state of Virginia. The failure in the Oklahoma study to include organizational fund-raising and charitable contributions, such as the United Way, which are major funding sources for EMS in Virginia, is indicative that how communities provide for emergency medical services certainly varies greatly from community to community and also from region to region.

Furthermore, while this categorization does provide certain financial information, it fails to ground that discussion in any theoretical framework which would link financing choices to the issue of access. In short, what do differences among the strategies used by Oklahoma communities mean to the potential consumer? Descriptive classification tells us that there is a wide variety in EMS in terms of who functionally provides the service and to a certain extent, how it is funded. What it does not tell us is what the significance of such variation is in regard to the users of the system.

2. EMS Literature

The literature in the field of EMS generally fails to address the choices regarding service provision. In the last several years increasingly more work comparing different EMS systems has appeared and attempts have been made to develop models of service provision (Stout 1980: pp. 22-25, Narad 1981: pp. 77-8). But the majority of academic research on EMS does not establish criteria related to how or why service has been institutionalized in a particular manner. Most often they focus on the medical or cost effectiveness of different operational strategies (Sytkowski 1981: pp 526-46, Urban 1981: pp. 379-92; Hallstrom 1981: pp. 13-7). Volunteers versus paid professionals, fire department provision versus a "third service" approach have long been issues of interest to EMS providers (FEMA: 1980). This discussion has been about management issues and has not dealt with EMS within the larger context of municipal services. Even the very recent discussion of federal reimbursement policies by Jack Stout in JEMS, one of the EMS field's trade magazines, fails to identify the link between financing and access. While Stout provides a very concise review of Medicaid and Medicare pricing policies for EMS care, he refers to municipal provision of EMS as "socialized medicine" and provides no references for his conclusions

(Stout: 1984, p. 33). Since the literature available in the EMS field provides no guidance regarding these issues, it seems useful to turn to other fields, particularly economics, and the literature investigating private versus public goods.

3. Examining Public Goods and Services

During a period of scarce resources it becomes important to develop a greater understanding of options for service provision and the factors which direct communities to select certain options. This is particularly true in emergency medical services because changes over the past ten years in the character of the service potentially available mean that choices between service options (i.e. choices as to whether or not a particular individual or group has access to the service) may have life or death consequences. "The introduction of basic and advanced life support techniques has transformed pre-hospital care from a system of mere transportation to an important lifesaving and stabilization service" (Lande 1982: p. 44). The availability of these advanced techniques to some or all members of a community may well depend on how the service is organized and financed by the community.

The move from a transportation service to a medical service has greatly increased the cost of service provision. The ambulance as an extension of the hospital requires sophisticated, specialized equipment and highly skilled personnel. As the cost of the service rises, more localities will need to make decisions regarding the choice of treating EMS as a public service, funded and distributed freely, or deciding it is a private commodity with access dependent on the individual's ability to pay.

Economists often use the "exclusion principle" to define public goods (Ostrom 1961: p. 833). This refers to the situation where once a public good has been provided, an individual cannot be excluded from the benefits of that good (Haveman 1976: p. 41). National defense is the classic cited public good. There are other categories of public goods - ones which the community values enough to provide even though they are not exclusive and even though "private firms have no incentive to produce and market these commodities" (Haveman 1976: p. 41). The classic example in this case is public health services. In this category of public good, everyone derives health benefits from water quality standards and universal vaccination. Another example is legal aid. In this instance the good is valued as a fundamental right of citizenship.

Emergency medical service is clearly an excludable commodity and thus not a public good in the classic sense. Use of the EMS system is a discrete event for which a fee can be charged. It is also a good that private firms can provide at a profit and is in some cases. However, two arguments can be made to explain why emergency medical services is or in some instances treated as a public good, thus assuring its availablity to all community members. The first argument states that the real value of EMS lies in the fact that emergency medical service reduces death and disability. Death and disability can be measured in terms of economic loss to society. The Nebraska State Health Department in research on the effectiveness of the state's EMS system estimates that the cost to the community from years of life lost during the period 1977-80 was over $1 billion. Because the study concludes that the EMS system was largely responsible for reducing the annual number of years of life lost, the system is credited with the financial gain for the state (Page et al 1982: p. 4). If the EMS service is viewed as one that reduces the economic loss to society created by the death and disability of individuals, then the argument can be made that EMS service should be a public good because its benefits have a "spill-over" effect. In other words, the benefits from the service affect or spill-over to individu-

als other than the person who specifically used the service. In this case, reduced morbidity not only positively affects the patient but also society through reduced disability and unemployment benefits and through the taxation and economic productivity of that individual as a member of the work force. Crompton refers to these choices as "an investment in human capital from which everyone in the community benefits" (1981: p. 47).

The second cateory of non-classic public goods also applies. Haveman refers to these public goods as goods provided "based on an ethical judgement and not on market failure" (Haveman 1976: p. 43). Society may decide to provide certain goods because the income distribution the market establishes is not morally acceptable. Communities may choose to provide certain goods because it is ethically unacceptable to exclude people simply because the market value is too high for the poorest members of society to afford.

Ostrom argues that economic efficiency as the base for defining public goods cannot explain the selection of many goods that are currently publicly provided. "The exclusion principle provides a criterion for distinguishing most public goods from private, but it does not, as commonly stated, clarify or specify the conditions which determine patterns of organization in the public service economy. However, by

viewing public goods as 'the maintenance of preferred states of community affairs we may introduce a modified concept of packageability'" (1961: p. 837).

If economic efficiency is the sole criteria used to define public goods, then emergency medical services would obviously be a private commodity. However, if other criteria such as spill-over or income distribution effects are considered, then EMS may logically be justified or defined as a public commodity. In fact, rejecting economic efficiency as the criteria for selection of public goods is relatively common, and Crompton argues that "much of the growth of government has resulted from decisions to provide private services at public expense" (1981: p. 47). EMS can be seen as such a good and in many communities it is viewed and delivered in such a manner.

That this issue is not settled is evidenced by the fact that some communities choose to deliver emergency medical service as if it were a private good, while others treat it as a public good. One explanation for such variation would be that individual communities have made explicit decisions to provide EMS as a "private" versus a "public" good. While this is a possibility, it does not appear likely. Common sense tells us that the decision regarding how to deliver service was not in most cases a product of deliberate or ex-

plicit debate regarding the merits of defining EMS as a private versus a public good. Certainly, this flies in the face of conventional wisdom about how decisions are made in the public sector. If we look beyond the possibility of explicit community choice regarding the nature of the good, we are left asking what alternative explanations exist to describe this variation in service provision.

4. Examining the Community

If the decision is made incrementally and in a defacto manner it would imply that it is the product of community conditions. But what conditions? There are small communities and large communities, wealthy communities and poor communities, bedroom communities and retirement communities and vacation communities. There are abundant sources available that give us information about the characteristics of communities and allow us to separate and/or group those communities according to the chosen dimensions. That the types and numbers of services provided to those communities varies is also abundantly clear. As Lineberry states "The answer to the question of who gets what apparently differs from community to community and even from service to service" (Lineberry 1977: p. 271). Economic theory allows us to link these two facts, or to hypothesize about what community con-

ditions might serve to direct community decisions toward selection of public or private delivery mechanisms.

The literature on community characteristics and municipal services rarely addresses the provision of emergency medical services directly. However, it has examined numerous other services both publicly and privately provided, and generally indicates that the nature of the community is linked to the types and methods of service provision. The terms "nature" or "type" refer to our attempt to group communities together into descriptive categories based on specific characteristics.

Schneider and Logan in their investigation of the distribution of public services in suburban municipalities provide an example of one effort to explore levels of support for public services based on community characteristics. The following quotation from their 1981 work indicates the manner in which the characteristics of a community can be used to group like communities and draw conclusions about the services provided.

> "It should be noted that the allocation of resources across services differs significantly by the type of community. The affluent suburbs spend significantly more on common services, such as parks and recreation and general government, than do other communities. Yet there are significant differences in the average numbers of common services offered by different types of communities - if anything, affluent suburbs tend to offer marginally fewer common services than other communities. This indicates that affluent communities are supporting the common services in which they invest at a higher level than other communities. As may be

> expected, wealthier suburbs also offer significantly fewer social services than do other communities, and expend considerably fewer dollars on such services. In contrast, poor suburbs spend disproportionately more on such social services, probably in part accounting for the higher intergovernmental transfers they receive. But middle communities are still the lowest spenders for common governmental services, so their disadvantage relative to the poor suburbs is only in part explicable by different service obligations" (Schneider and Logan 1981: pp. 31-2).

While the above example focuses on size as the critical independent variable, the literature reveals that research in this area utilizes a range of socioeconomic, geographic, and demographic characteristics to differentiate among communities. Rich identified socioeconomic and geographic characteristics as important factors in community preferences for municipal services (Rich 1977: pp. 383-4). Shaffer utilized the demographic, economic and spatial base of the community to examine the relationship between the community and municipal services and concludes that "Awareness of the linkages between municipal services and community characteristics is critical in any effort to examine the decision making system" (Shaffer 1978: pp. 62-3). Since the investigation of community characteristics in relationship to service provision has proved useful in looking at groups of services, this approach has been utilized for attempting to explain variation in means of financing and providing EMS.

5. The Research Hypothesis

Research in the area of municipal services indicates that it is possible to distinguish various types of communities, in a meaningful way, based on variations in the characteristics of those communities. Given this foundation, the hypothesis investigated in this research is that the variation in the method of provision of emergency medical services can be at least partially understood as a reflection of differences between the communities themselves, and that these communities can be differentiated through examination of various socioeconomic, geographic, and demographic characteristics.

Chapter III

METHODOLOGY

1. The Private-Public Concept

While the research objective is to distinquish whether emergency medical services in the community are provided in a manner described as a public good or a private commodity, the distinction between public and private is not always easily made. There is often a level of public subsidy to otherwise private operations. For example, a municipal provider may charge for service, but at a rate below market value, the difference being made up from public sources. Similarly, a volunteer provider might charge for service but receive insurance, vehicle maintenance, utility rate reductions, or other subsidies from the municipality. The value of these subsidies is difficult to calculate, yet clearly they decrease the cost per unit of the service and thus affect the availability of this service to those with limited incomes. In addition to this problem, many agencies object to disclosure of their financial situation and many other agencies are so lacking in basic financial record management that even they have no idea of the cost of their service. For these reasons, a clear dichotomy does not exist. It is relatively easy and perhaps more valid to think of EMS ser-

vice as existing along a spectrum ranging from a pure private to a pure public good.

public publi
100% 0%

0% 100%
private priva

This spectrum ranges from the service that is a completely publicly provided service to that which is entirely a private operation. Services with a wide range of payment systems and public subsidies fall somewhere between these two extremes. While this tends to clarify things a little, the lack of information on costs of service and financial arrangements makes it almost impossible to assign many providers to a specific place in the spectrum.

It is possible, however, to use a broad definition of private and thus operationalize the concept in specific terms. Thus agencies become public or private and fall not along a spectrum, but into two mutually exclusive categories. If a provider charges the patient, regardless of whether it is a true market value or a fee reduced by public

subsidy, it seems to indicate a willingness to view emergency medical services as a private good: a discrete and potentially excludable event. The actual billing of patients for services provided can be thought of as reflecting a particular ideological stance. That stance being an unwillingness to accept the entire burden of service provision at public expense, thus implying that the service is not entirely a public responsibility. For the purposes of this study, the decision to charge the patient a fee is the criteria used for defining private services.

At the other end of the spectrum are the services provided free of charge to the patient. If we accept the argument that charging the patient indicates a rejection of the idea of public responsibility for providing service, then it follows that not charging the patient indicates an acceptance of public responsibility. This establishes a situation in which a decision has been made not to exclude individuals based on economic resources. The appeal generally made in this case is that the emergency nature of the situation makes the delivery of service fundamentally different from that of other services. While it is possible to plan for or prevent the need for other services such as garbage collection or routine health care; it is not possible to anticipate the need for pre-hospital medical treatment. The

issue then is often argued on the basis of do we want to deny treatment to an individual who is literally dying on the street. We assume that those communities providing service at no cost have made a decision that the service should be a non-excludable one. These communities have been defined as the public provision communities.

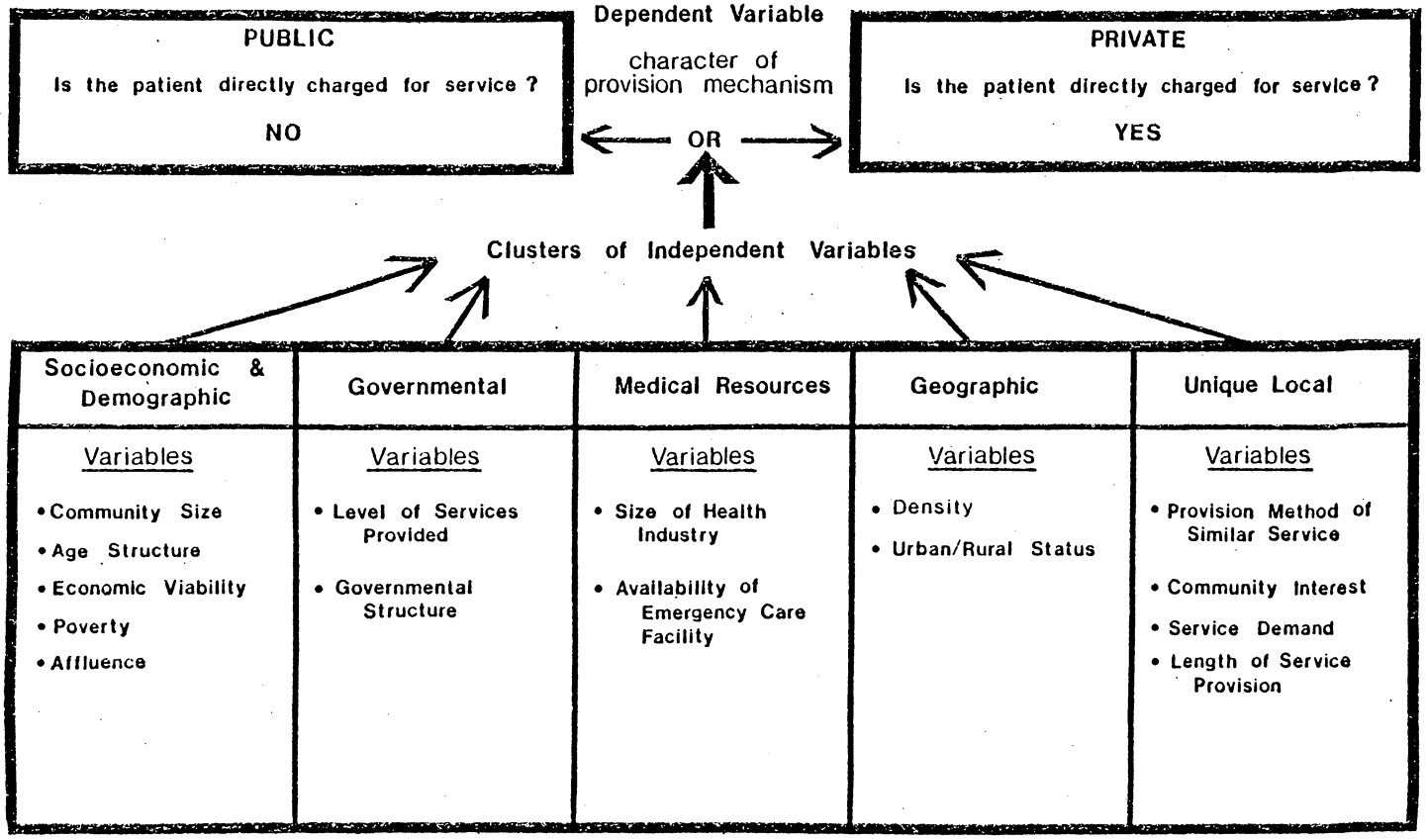
Thus, by using the presence or absence of charging the patient as an indicator, services can be described as public or private. Those providers that charge the patient are categorized as private and those that do not bill the patient are categorized as public. This private-public description serves as the dependent variable in investigating the nature of the community.

2. Describing the Community

Community characteristics are the independent variables. After grouping communities as having either public or private provision of emergency medical services, the object is to determine if those two groups of communities have other differing characteristics. If one argues that provision of services is reflective of the nature of the community; then we would expect to find at least broad similarities between communities grouped by service provision. Vice versa we would expect some general differences between communi-

ties that provide services in dissimilar ways. The question is then, which characteristics would be expected to reflect this difference.

Based on past research in the area of municipal services, though not necessarily EMS specifically, five general sets or clusters of factors were identified as potentially related to the public-private choice. The lack of literature specifically addressing EMS limits our ability to have specific expectations. The possible relationships and linkages expected in advance are necessarily based more on intuition developed out of experience in EMS service provision than on results of past research. However, some guidance has been available from literature on other municipal services. In general, indicators that proved statistically significant in those works cited below were included. For each set of variables, indicators were established that were thought might be linked to service provision. The five sets or clusters of hypothesized independent variables are: socioeconomic and demographic, governmental, medical resources, geographic, and unique local variables (Figure 1).



Relationship Between the Dependent Variable and Clusters of Independent Variables

Figure 1

A. The Socioeconomic and Demographic Variable Cluster

For the socioeconomic and demographic cluster, several variables were defined as potentially important. Socioeconomic and demographic variables are those most frequently appearing in literature about municipal services. Fromer states that "disparities in access to health care often reflect income, residence, age, race, and similar variables" (Fromer 1981: p. 18). Shaffer finds socioeconomic and geographic variables important in the study of municipal fire services (Shaffer 1978: pp.58-69). Socioeconomic characteristics are linked to the provision of municipal services by Schneider and Logan who find this pattern particularly noticeable in the areas of health and housing (Schneider and Logan 1981: pp.23-36). Socioeconomic variables were also linked to the public versus private provision of a variety of municipal services by Florestano and Gordon in 1980.

Size is an obvious way to begin to differentiate between communities. It seems natural to assume that service provision may differ between very large and very small communities. It is generally true that a wider range of services are provided in older satellite suburban communities (Schneider and Logan 1981: p.25). Medical needs differ among varying age groups, so the age structure of the community population was included. This could prove an important

linkage when one thinks of EMS as primarily a health care service. Economic viability was explored as possibly affecting the provision of services. Thriving communities and stagnate or declining communities may provide different numbers or varieties and mixes of services. In addition, it seems plausible that the economic status of a community might affect the decision about how the service is provided. A community with severe economic problems would be expected to place relatively more importance on issues of economic efficiency than a community's whose financial base allows for more generous options. The relative wealth of the community was included. Affluence in a community may indicate a demand for greater services as a reflection of the individual's capability to withstand a greater tax burden. Certainly, education seems to fall within this category. We have numerous examples of wealthy communities having relatively high property taxes to support a large expenditure per student for education. Alternatively, it is possible that wealthy communities might leave the cost of EMS to the individual, particularly since within this type of community, the citizens as a whole would have a greater ability to pay. This could be reinforced by the fact that health care is essentially a private sector activity in the United States. Similarly, the relative incidence of poverty may

affect service provision. The poor have generally lower levels of health and the economic consequences of sudden illness or injury are porportionally higher. Yet we know that the poverty stricken population probably have the least capability of handling the financial burden of emergency medical care. At the same time there is some evidence that low income individuals suffer more open traumatic injury. Therefore, EMS might be publicly provided in these communities, if indeed, the population distribution is such that the community as a whole is improvished.

B. The Governmental Variable Cluster

The second cluster of variables examined are governmental factors. "Local governments in the United States vary in their ability to deal with problems. Whether the focus is overall performance or the delivery of a specific public service, some communities are, by reputation or by performance criteria, more capable than others" (Gargan 1981: p. 649). It is clear that the mix of services provided varies from community to community. "There are significant differences in the average numbers of common services offered by different types of communities" (Schneider and Logan 1981: p.31). There is no examination in the literature that deals directly with the provision of EMS service, therefore we

have no specific guidance from past efforts as to which aspects of municipal government might be related to the selection of a service provision method. However, in the examination of other literature, particularly that concerned with refuse collection, we find the selection of several governmental indicators for study. Savas in his work on methods of refuse collection provision has utilized community size as a variable in comparing various communities (Savas 1979: p. 30; 1981: p. 49) and Gargan on his review of local government capacity identifies resource management, including financial management, as a key determinator of local capacity (1981: p. 650). Schneider and Logan use per capita expenditure as one measure of the fiscal characteristics of a community in their study of municipal service provision (1981: pp. 31-33). Lineberry considers the size of the jurisdiction as part of "an interlocking matrix of service delivery issues" (1977: p. 268). Specifically, we have examined city status as an indicator of the urban-rural status of the community and per capita expenditure as an indicator of the overall level of services provided.

C. The Medical Resources Variable Cluster

Three variables are explored for the medical resources cluster. The size of the health care industry in the commu-

nity was included. Some coummunities have very large health care industries and the presence of this industry might be expected to spill-off an EMS "industry". The number of physicians per capita and the number of hospitals in the community were the indicators used to reflect the size of the health care industry. The availability of emergency hospital care was the second variable investigated. Many communities in Virginia lack a 24 hour emergency health care facility and this might influence the decision on how to provide EMS service. We have known for a long time that the consumption of medical services does not respond to traditional market incentatives (Feldstein 1979: pp. 406-415). Much of this market perversity appears to arise from within the health care industry itself. "The amount and cost of hospital treatment in a community have more to do with the number of physicians there, their medical specialities and the procedures they prefer than with the health of the residents" (Wennberg and Gittelsohn 1982: p. 120).

The last variable under medical resources was the availability of emergency medical services. The number of EMS agencies varies widely across the state (from one to twenty-five per community), thus the the relative availability of such service might affect the decision to charge a fee. For example, a large number of services within a sin-

gle commmunity might reflect a situation in which EMS is a profitable venture, attracting one or more commerical providers. Alternatively, a lack of emergency care facilities and EMS agencies might act in a way that redefines exactly what is an emergency situation. Where facilities are lacking it seems reasonable to postulate that many people choose not to access the EMS system. That is to say, in a community lacking resources individuals might be more likely to take individual responsibility (and thus independent action) for seeking medical intervention. Then the defination, in the mind of an individual, of what constitutes an emergency is changed: the situation must be truely dire. If this is true, then the individual surrounded by many resources would be more likely to utilize those resources. The definition of emergency is subsequently lowered and a greater number of incidents or situations fit the emergency category. In other words, the consumption of the commodity is directly related to its availability.

D. The Geographic Variable Cluster

The first geographic variable was the size of the community or service area. With transportation and speed necessary elements in emergency medical services, the actual physical size of the community could influence the method of

service provision. The number of square miles is the indicator for this variable. The urban or rural status of the community was examined since, like population size, urban-rural status seems to be a fundamental distinction between communities. The indicator for this variable is density.

Shaffer argues that the spatial base of a community impacts the level and quality of municipal service and reviews in his work numerous additional research efforts utilizing geographical components such as "land area and population density" (1978: pp. 62-63). Florestano and Gordon review all of their data in terms of population size and draw conclusions on the nature of service provision based on this factor (1980: p. 31). Even the limited EMS literature suggests that geographical patterns are important in the review of service delivery. In fact, this may be the strongest area of specific EMS literature with studies available on geographical patterns for the location of patients (Mayer 1981: pp. 329-334), impact on utilization in rural areas (Sytkowski et al 1981: pp. 526-546) and on cost-effectiveness in suburban areas (Urban et al 1981: pp. 379-392).

E. Unique Local Variable Cluster

Emergency medical services remains outside of the "traditional" municipal services list. As long as it does

so, it seems that decisions surrounding service provision will be susceptable to localized factors. Indeed, Yin's case study's of the life histories of EMS services in 15 communities identifies such localized events as failure to obtain a federal grant and fire department support as key factors in routinizing the new service (Yin 1981: p. 24). Given this, it seems important to examine a cluster of variables that relate to specific characteristics of each community.

Four variables were included for the unique local cluster. The method of provision of similar services was explored since this might provide a feel for the consistency of a communities' approach to services or perhaps indicate a uniqueness in the handling of EMS. The method of provision for fire services in the community is the indicator. Community interest was included to provide background on general community involvement and concern about issues relative to service provision. The indicator for community interest is employer support. Support is evidenced either through financial assistance or through work policies that allow employees to leave for emergency calls. Finally, actual demand for service could have an impact on the method of provision. High service demand might make the public provision of the service of great concern to the locality. On

the other hand, high service demand might require more resources than the community is willing to invest. The number of EMS calls annually is the indicator for service demand. The length of time that the service has been institutionalized was the indicator for consideration of how established the provision of EMS is in the community.

3. The Research Design

While information on community characteristics is readily available from published sources, information on EMS is not. State agencies responsible for the regulation of ambulance services collect a certain amount of information, as do provider-oriented periodicals. However, the collection of information regarding fee for service or in fact almost any financial information is rarely done. For this reason, survey of provider agencies appeared the most appropriate way to determine exactly when the patient was charged and thus the public-private nature of the service.

The survey was limited to the Commonwealth of Virginia. Virginia contains a large number of communities (95 counties and 41 independent cities) that vary greatly in terms of geography, economic status, and demographics. In addition, there are almost 500 providers of EMS service in the state. Thus, the state provides a sample universe large enough to

expect a survey return rate that will result in a sample of sufficient numbers to perform statistical tests.

The unit of observation is necessarily the community, which is defined as a county or independent city. However, the community was not directly surveyed. Surveys were mailed to each provider agency in the state. For a community to be included in the study, survey results had to be obtained from each provider operating in the community. The existence of multiple service agencies in one community created several instances where differing methods of service provision were in effect in a single community. This variation was accounted for in operationalizing the dependent variable (see below). These results were then combined to provide a complete picture of service provision for the area. The final sample was comprised of forty-seven communities; twenty-three counties and twenty-four independent cities (Figure 2, Map 1).

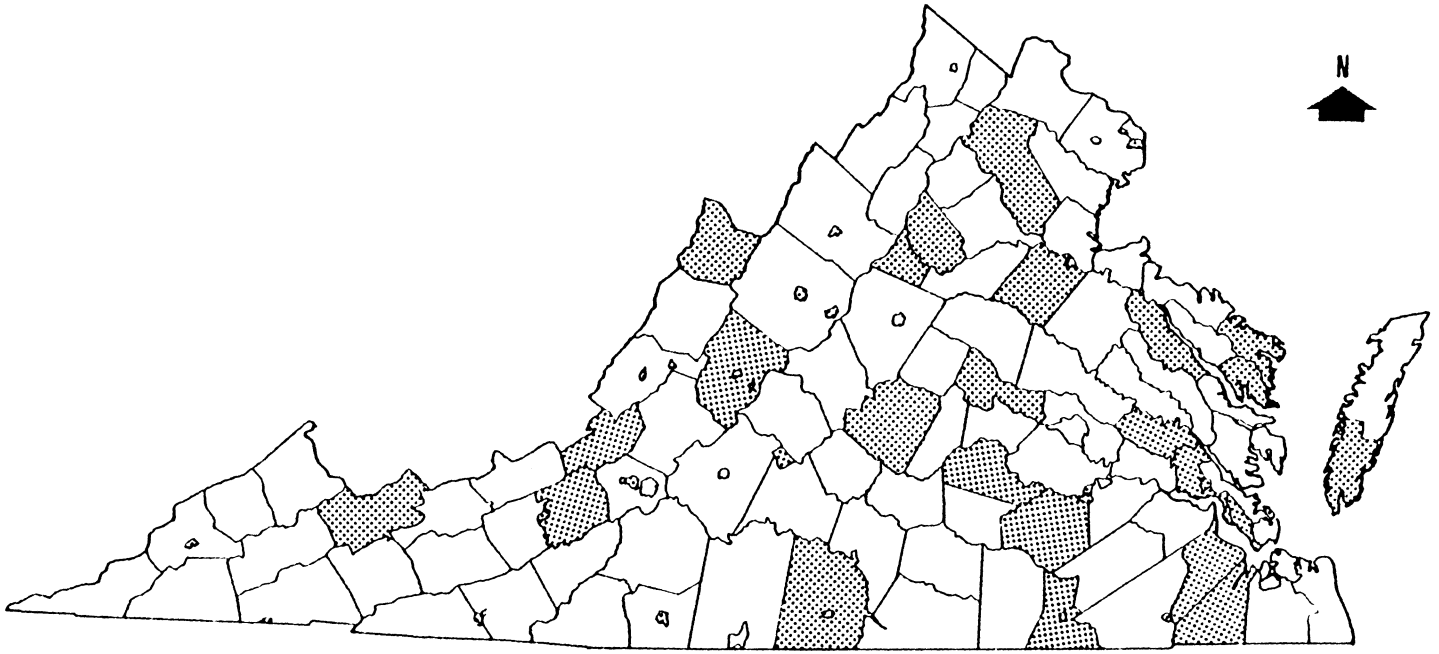
A. Operationalizing the Dependent Variable

The dependent variable in the study is the method of EMS service provision, defined in terms of the choice between provision as a public or private good. Specifically, an agency in which patients are charged a fee for utilizing the EMS service is categorized as choosing to define EMS as a private good.

Counties	Cities
Amelia	Alexandria
Arlington	Bristol
Buckingham	Buena Vista
Craig	Colonial Heights
Dinwiddie	Covington
Essex	Emporia
Fauquier	Franklin
Greene	Fredericksburg
Greensville	Galax
Goochland	Harrisonburg
Halifax	Lexington
Highland	Lynchburg
Isle of Wight	Martinsville
James City	Newport News
Lancaster	Norton
Madison	Petersburg
Montgomery	Poquoson
New Kent	Radford
Northampton	Salem
Northumberland	South Boston
Rockbridge	Suffolk
Spotsylvania	Staunton
Tazewell	Waynesboro
	Williamsburg

The Research Sample

Figure 2



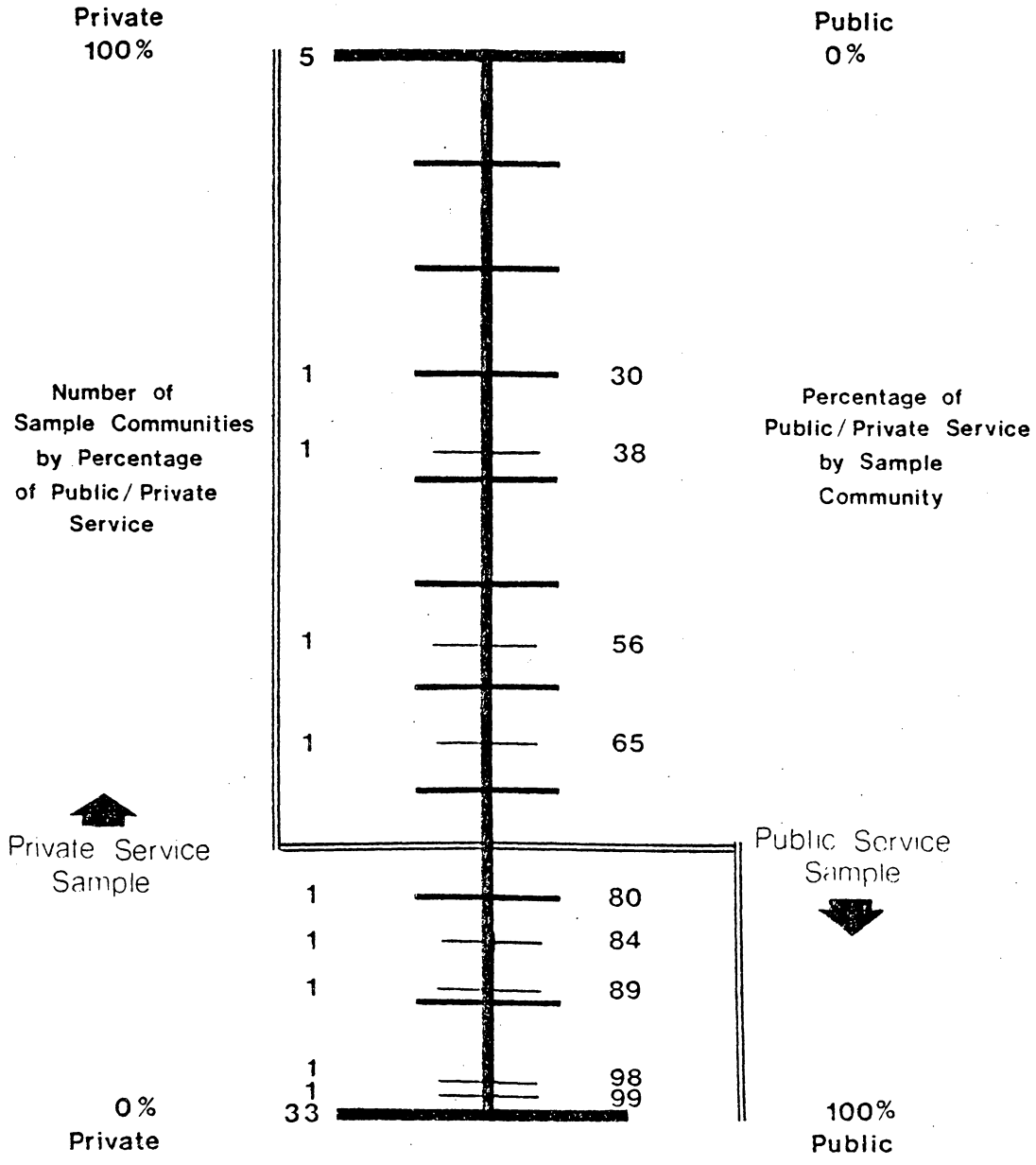
SOURCE: Commonwealth of Virginia Department of Highways,
COUNTY SEATS AND INDEPENDENT CITIES, 1977.
DATA: SURVEY, 1982.

RESEARCH SAMPLE

Map 1

All communities fall on a scale from completely private to completely public, depending on how their agency or agencies provide services. Many communities are in fact served by more than one agency. In Virginia, the average number of agencies per community is 3.5, with some communities being served by as many as twenty-five agencies. Where more than one agency serves a community the information from all agencies in the community was combined. When the agencies differed in the method of service provision; the community was placed on a scale based on the percentage of total service calls that were publicly provided. This figure was calculated from the number of calls each agency handled in the community. For example, in a community with two agencies, each of which answers 1000 calls a year, one agency charges the patient and one agency does not. The community would fall at 50% public on the scale. The communities actually sampled ranged from 100% public to 100% private (Figure 3).

The survey resulted in thirty-three communities clearly identified as 100% public and fourteen communities falling at less than 100% public. In graphing the distribution of communities there appears to be a natural break between sixty-five percent and eighty percent public provision.

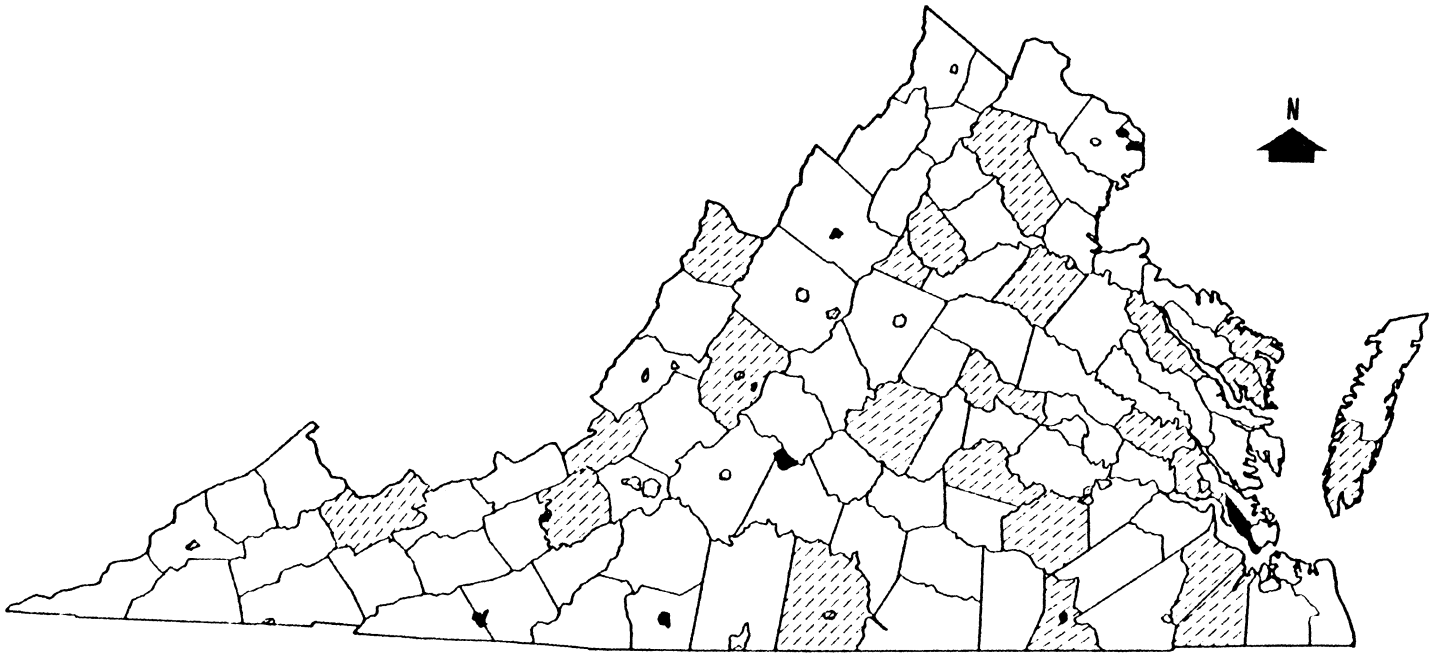


Scale of Public to Private Provision

Figure 3

This gap was used as the dividing point. Communities at eighty percent public service or more were defined as public service communities. Those communities that deliver at least thirty-five percent of their services privately were defined as private provision communities (Figure 4, Map 2). (In initial trials for determining the point at which to seperate the public from the private service communities, two alternative points where examined: between eighty-four and eighty-nine percent and between eighty-nine and ninety-eight percent public. The major advantage of these two alternatives was to increase the size of the private provision sample. These alternative distributions did affect the statisical significance of a few variables. However, they did not change the significance of an entire cluster of variables. Therefore, the decision was made to proceed with the most natural and more theoretically justifiable division point on the scale.) Therefore, the sample consists of forty-seven communities, thirty-eight of which provide EMS as a public service and nine which provide EMS as a private commodity.

The clusters of independent variables represent the characteristics of the community. Each cluster of independent variables consists of two or more variables with a quantifiable indicator identified for each variable (Table 1).



KEY:

PRIVATE SERVICE

PUBLIC SERVICE

SOURCE Commonwealth of Virginia Department of Highways, COUNTY SEATS AND INDEPENDENT CITIES, 1977. DATA SURVEY, 1982.

DEPENDENT VARIABLE

Map 2

Private Provision	*Public Provision*
Alexandria	Amelia County
Arlington	Bristol
Franklin	Buckingham County
Galax	Buena Vista
Harrisonburg	Colonial Heights
Lynchburg	Covington
Martinsville	Craig County
Newport News	Dinwiddie County
Radford	Essex County
	Emporia
	Fauquier County
	Fredericksburg
	Goochland County
	Greene County
	Greensville County
	Halifax County
	Highland County
	Isle of Wight County
	James City County
	Lancaster County
	Lexington
	Madison County
	Montgomery County
	New Kent County
	Northampton County
	Northumberland County
	Norton
	Petersburg
	Poquoson
	Rockbridge County
	Salem
	South Boston
	Spotsylvania County
	Staunton
	Suffolk
	Tazewell County
	Waynesboro
	Williamsburg

The Dependent Variable by Location

Figure 4

Table 1

INDEPENDENT VARIABLES

Variable Clusters	Variable	Indicator	Source
Socioeconomic and Demographic	• Community Size	• Population Size	• 1980 Census
	• Age Structure	• Median Age	• 1970 Census
	• Economic Viability	• Percent Unemployment	• 1970 Census
	• Poverty	• Percent Families Below Poverty	• 1970 Census
	• Affluence	• Per Capita Income	• 1970 Census
Governmental	• Level of Services Provided	• Per Capita Expenditure	• 1970 Census
	• Governmental Structure	• City Status	• 1980 Census
Medical Resources	• Size of Health Industry	• Physicians per Capita	• 1980 Census
		• Number of Hospitals Utilized	• Survey
	• Availability of Emergency Care Facility	• Distance from Nearest 24 hour Emergency Department	• Survey
		• Time from Nearest 24 hour Emergency Department	• Survey
	• Prehospital Emergency Care Availability	• Number of EMS Agencies	• VA Division of EMS
Geographic	• Size of Service Area	• Number of Square Miles	• 1980 Census
	• Urban/Rural Status	• Density	• 1980 Census
Unique Local	• Method of Provision of Similiar Services	• Fire Service Provision Method	• Survey
	• Community Interest	• Employer Support	• Survey
	• Service Demand	• Annual Number of Calls	• Survey
	• Length of Service Provision	• Year EMS Service Established	• Survey

These indicators are, for the most part, readily available from published sources such as the U.S. Census. With the community defined as a county or independent city we can use this type of information to describe the characteristics of a given community. Once the community is placed into a descriptive category (public or private) it is then possible to look for a relationship between the public-private provision method of EMS service delivery and the nature of the community.

B. Techniques of Analysis

The public-private dichotomy used to describe the dependent variable limits the techniques for analyzing the data to those tests that provide a meaningful comparison between two groups of different sizes. While this may seem limited at first, it fits nicely with the purpose of the research by reducing the tendency to perform a large number of statistical tests that are not completely relevant.

A test was sought that would tell us whether or not the distribution of community characteristics between the two groups was statisically significant. The standard error of the difference between two means was selected.

As Freund describes the purpose of this statistic: "There are many situations in which we must decide whether

an observed difference between two sample means can be attributed to chance, or whether it is indicative of the fact that the two samples come from populations with unequal means" (Freund 1976: p. 242). This test provides the standard deviation which can then be substituted for the sample standard deviation to calculate a z score.

The z score is utilized in a test of significance which allows us to decide whether the difference between the two means is statistically significant. If the result is statistically significant, then the difference between the two means is too large to be reasonably due to chance. The level of significance (alpha) or the probability that we will reject a conclusion even though it is true, was set at 0.05. The major disadvantage of these statistical procedures is that the sample size for communities with private service provision was less than 30. Even with this disadvantage, the lack of research on emergency medical services requires that some basis be established to support further research. At a minimum, we need to know whether or not the communities in which the services exist differ in respect to the type of service provision. Once this is established, it opens the way for verification through further research and provides a background for data collection that will support the use of more powerful and demanding statistical tests.

Chapter IV

FINDINGS

1. Introduction

If the public-private nature of EMS service provision is indeed linked to the characteristics of the community, then we would expect some pattern or form to develop that distinguishes these groups of communities. First review of the data indicates that this is indeed the case. More importantly, the z score statistical analysis suggests that the differences between these two groups of communities is not a random occurrence. Specifically, the communities in each group have in common various socioeconomic, geographic, and medical resource characteristics within a group and that these characteristics in common differ between the two different groups.

A. The Socioeconomic and Deomgraphic Variable Cluster

Four of the five of the socioeconomic and demographic indicators examined showed a statistically significant difference between the two groups at a significance level of 0.05. This indicates that the probability that the differences between the two groups are purely due to chance is 0.05. We can feel reasonably certain then that the socioe-

conomic characteristics of each group are truely different from each other.

The communities that have public provision of EMS service tend to have smaller populations, greater unemployment, a greater incidence of poverty and are less affluent than those communities that employ private provison methods (Table 2). Differences in the median age of the residents of the communities were not statistically significant.

Thus, the variables that differ between public and private communities are community size, economic viability, incident of poverty, and community affluence. It is clear then, that communities that have public EMS service provision and those that have private EMS service provision have differing socioeconomic and demographic characteristics.

B. The Medical Resources Variable Cluster

Two of the medical resource attributes were significant, while three were not. The time and the distance from the nearest 24 hour Emergency Department differed significantly between the two types of communities. Those communities that publicly provide EMS service have further and longer to travel to emergency care facilities than those that rely on private provision. Communities with private provision are much closer to emergency health care facilities.

Table 2

Socioeconomic and Demographic Variable Cluster

Indicator	Mean	/Z/	Significant at 0.01	Significant at 0.05
Population Size				
PRIVATE PUBLIC	59148 17859	491	YES	YES
Median Age				
PRIVATE PUBLIC	28.0 29.2	1.79	NO	NO
Percent Unemployment				
PRIVATE PUBLIC	2.79 3.97	2.85	YES	YES
Percent of Families Below Poverty				
PRIVATE PUBLIC	10.26 15.91	7.06	YES	YES
Per Capita Income				
PRIVATE PUBLIC	5179 3764	100	YES	YES

The number of physicians per capita, the number of EMS agencies, and the number of hosptials utilized, however, were not significantly different between the two groups (Table 3).

In terms of the variables examined, this means that the availability of emergency health care facilities and of pre-hospital emergency care differs between the two communities, while the size of the health care industry does not. Thus, it appears that the availablity of certain types of medical resources does have an impact on the nature of EMS service provision.

C. The Geographic Variable Cluster

Both of the indicators for the geographic variable cluster were statistically significant. Those communities with private service provision cover a much smaller area in terms of square miles, but an area with a far higher population density. Communities with public service provision then are relatively large and sparsely populated. The differences illustrated in these two indicators are particularly dramatic, with public services covering more than twice the land area but 35% fewer individuals than private provision services (Table 4).

Table 3

Medical Resources Variable Cluster

Indicator	Mean	/Z/	Significant at 0.01	Significant at 0.05
Physicians per Capita				
PRIVATE PUBLIC	.0014 .0011	.0294	NO	NO
Number of Hospitals Utilized				
PRIVATE PUBLIC	2.3 2.5	.377	NO	NO
Distance from nearest 24 hour E.D.				
PRIVATE PUBLIC	1.00 2.29	6.88	YES	YES
Time from nearest 24 hour E.D.				
PRIVATE PUBLIC	2.22 3.33	3.09	YES	YES
Number of EMS Agencies				
PRIVATE PUBLIC	1.8 1.9	.349	YES	YES

Table 4

Geographic Variable Cluster

Indicator	Mean	/Z/	Significant at 0.01	Significant at 0.05
Number of Square Miles				
PRIVATE PUBLIC	21.2 227.9	71.6	YES	YES
Density				
PRIVATE PUBLIC	2867 785	129	YES	YES

Table 5

Governmental Variable Cluster

Indicator	Mean	/Z/	Significant at 0.01	Significant at 0.05
Per Capita Expenditure				
PRIVATE PUBLIC	346.7 248.4	31.6	YES	YES
City Status				
PRIVATE PUBLIC	1.11 1.61	2.21	NO	YES

Thus, both the size of the service area variable and the urban/rural status variable show a difference between the two types of communities. The geographic variable cluster appears linked to different service provision methods.

D. The Governmental Variable Cluster

The governmental indicators, per capita expenditure and city status, were both statistically significant at 0.05. Public service provision communities are more likely to be counties and spend less per capita on municipal services. Private service provision communities are more likely to be cities and spend about one third more per capita on municipal services. These are the indicators for level of municipal services provided and governmental structure (Table 5). Thus, the governmental variable cluster is linked to the method of EMS service provision.

D. The Unique Local Variable Cluster

Of the indicators for the unique local variables only the annual number of calls is statistically significant. Private service provision communities average almost four times as many EMS services calls on an annual basis as do public service provision communities.

Table 6

Unique Local Variable Cluster

Indicator	Mean	/Z/	Significant at 0.01	Significant at 0.05
Fire Service Provision				
PRIVATE PUBLIC	2.0 2.1	.37	NO	NO
Employer Support				
PRIVATE PUBLIC	1.44 1.55	.12	NO	NO
Annual Number of Calls				
PRIVATE PUBLIC	5874 1495	172.9	YES	YES
Year Service was Established				
PRIVATE PUBLIC	2.22 1.65	1.34	NO	NO

The method of provision of similar services, employer support, and the year the service was established did not vary in a signficant manner between the two groups (Table 6). Therefore, only the variable service demand appears related to the method of service provision and in terms of the overall variable cluster, unique local factors do not seem to participate in explaining the difference between community service provison methods.

2. Conclusions

The results of the survey tell us that the provision of emergency services is similar to the provision of other muncipial services in that the character of their provision is related to some characteristics of the community. "The level and quality of municipal services in a community influences the community's demographic, economic, and spatial base and in turn are affected by them. This two-way flow of influence demonstrates an interaction and feedback phenomenon in the community" (Shaffer 1978: p. 62).

Specifically, the socioeconomic, demographic, geographic, and medical resource characteristics of the community are linked to whether or not a community has public or private provision of emergency medical services. This conclu-

sion is verified by similar conclusions in the investigation of other municipal services. This study does not utilize inferential statistics and no attempt was made to design a predictive model. However, we can not only provide discrete descriptions of the two types of communities within the sample, but also suggest questions for further research.

Communities that charge patients for emergency medical services have large, dense populations. The total land area is small and the distance from the nearest appropriate health care facility is also small. The population tends to be employed and affluent. The demand for services, including EMS service is high. Even more broadly we can say that communities with private service provision have a relatively large number of medical resources available, are generally urban communities, and are socioeconomically advantaged.

Communities that have public provision of emergency medical services tend to be large in terms of land area and sparsely populated. The population is less wealthy and more likely to be poor and/or unemployed. The population of these communities is further away from health care facilities. At the same time, there is less demand for EMS service in particular and the per capita expenditure for all services is lower. Broadly stated, the public provision community is rural, has a reduced access to some medical re-

sources, and is socioeconomical disadvantaged when compared to private provision communities (Figure 5).

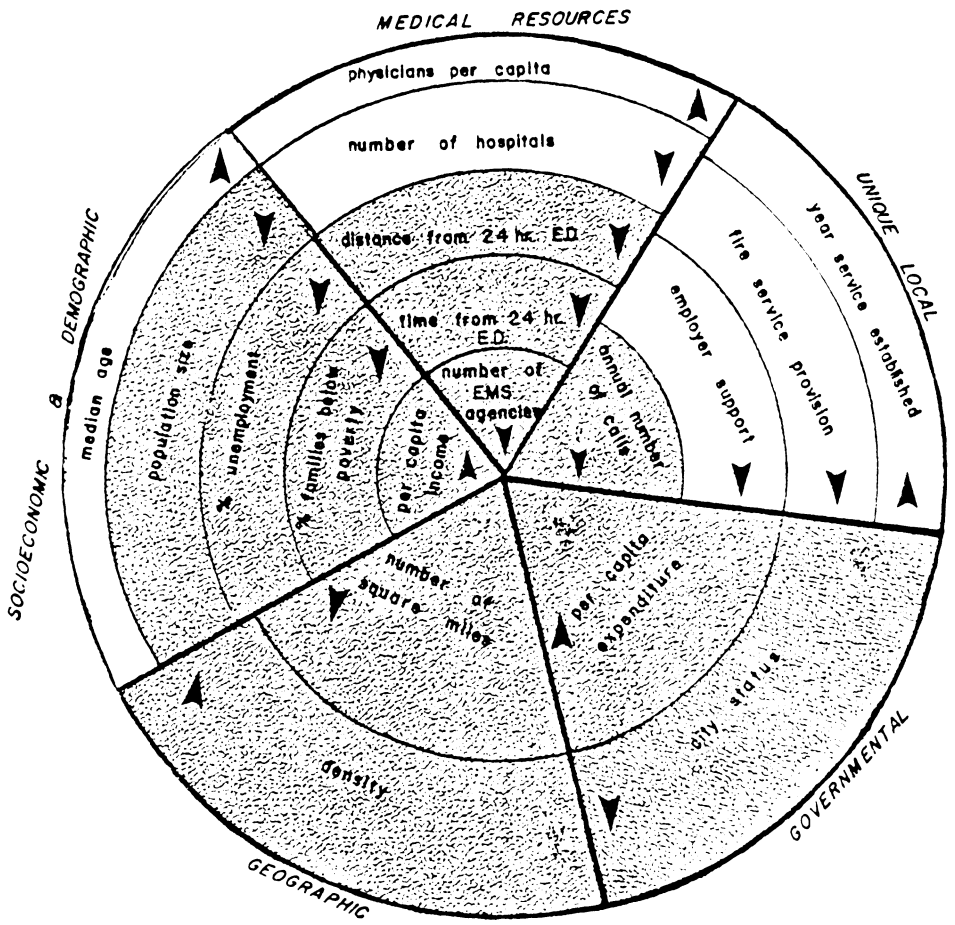
3. Future Efforts

Retrospective review of the methodology leaves us with a number of ways to improve the research effort. Knowing now, what we did not know at the beginning, we would make several changes. First, the large number of variables used to describe the community leads us to believe that to a certain extent the variable clusters are inter-related. Some of the individual variables are probably proxies for each other. This situation was, at least partly, created by our inability to have a strong prior anticipation for which characteristics might be worth investigation. A situation which was not helped in the review of the literature.

Since we now have a feeling for what might be related, two tactics suggest themselves. First, that the variables utilized be used in a multiple regression analysis and that the evaluation of the R scores locate those related variables. However, we do not believe that the raw data is of sufficient quality for regression anaylsis and that a better alternative might be discriminate analysis. This would allow us to eliminate many of the individual variable and perhaps reduce the number of variable clusters. Secondly, a

new variable cluster that should prove interesting would be the health status of the community. This would involve utilizing information regarding death and accident rates by disease and injury categories.

The use of the public-private dicotomy could be refined in future efforts. To a certain extent the imposition of a dicotomy is a false one. Many communities fall somewhere between the the purely public and the purely private. Using this same methodology, it would be preferable to eliminate those communities rather than search for a natural break in the scale. By eliminating this part of the sample, the issue of sample size needs to be addressed. Utilization of the t distribution with pooled variances would have dealt with this issue better than the z score. While t distribution with pooled variances would have been better for this particular research, for future efforts it leads us back to consideration of discriminate analysis.



KEY

statistically significant

not statistically significant

▲ Indicates the mean was higher for private service provision

▼ Indicates the mean was lower for private service provision

ATTRIBUTES OF THE INDEPENDENT VARIABLES

Figure 5

Chapter V

CONCLUSIONS

1. Introduction

If one can make a single summary statement from this research it appears to be that the decision to consider EMS a public good is related to the urban/rural nature of communities. This statement in itself doesn't tell us a whole lot about the issue, but it does raise a number of questions that take us from the specific nature of EMS to areas of greater theoretical implication. Now it becomes important to ask why is there a difference between urban and rural communities in this respect, how did we get into the business of public provision of EMS, do we want to stay there, and what are the implications of these decisions.

2. Urban and Rural Communities

Why is it that rural communities provide EMS as a public good and urban communities charge a fee for service? On one hand, one can argue that the rural communities have made an explicit statement about the type of services that they see as being appropriate governmental responsiblities.

There does not seem to be any basis for arguing that the reason that urban municipalities tend to charge for ser-

vices is that they place less importance on governmental provision of EMS. There exist numerous urban communities that provide high quality advanced care with adequate coverage and funding and also charge the patient a fee.

In the case of EMS, the traditional arguments used to distinguish between public and private provision of goods do not seem to explain the variation in provision. Delivery modes do not seem to indicate a level of value or concern over service provision by the community. It seems more reasonable to suggest that perhaps the urban/rural difference is related to the history and economics of the situation. If one accepts the definition of public good as those goods which individuals collectively desire but that the market fails to provide, then one could assume that the market fails in areas which publicly provide EMS. Thus, rural communities provide public EMS service because it is not profitable enough for private provision. In other words, if rural communities did not provide public EMS service, there wouldn't be any service at all.

Following this argument then, urban communities appear to have reached some sort of critical mass where it becomes possible for EMS to function as a private commodity. Certainly the demand for service as measured by the number of calls responded to is far higher in the urban communities.

Thus, the price increase (from zero to whatever) doesn't appear to negatively affect demand. On the contrary, it seems to reach a profitable level. While demand levels seem to support this argument, again it is an area that requires further research. It is possible that there are other elements that could be responsible. We simply don't know enough about EMS to decide what infrastructure needs to be in place and, perhaps more interesting - at what levels, to know when EMS reaches a point at which it becomes feasible for private operation.

The serious implication of this argument is that it suggests that the rural community is faced with a burden that perhaps the urban community is not. Given current trends in EMS and American medicine in general, this is a serious burden indeed. Adequate provision of state-of-the-art EMS coverage for a rural community costs hundreds of thousands of dollars. In states where health care has historically been an accepted county responsiblity, we are finding the programs in deep trouble (Roye 1983: pp.19-23). EMS is following those same trends and the provision of this service during a period of economic recession is an increasing burden. It seems entirely possible that, as happened in parts of rural Louisiana, communities will simply find them faced one day with no service available at all (Zuschlag 1981: p. 15, Hamm 1981: p. 30).

3. Implications of Private Provision

If, on the other hand, an explicit decision is made to provide emergency medical services as a private commodity, then the situation becomes one in which people may be deliberately excluded. The decision to exclude translates to a decision to let individuals die, since we know that developed EMS systems reduce the incidents of mortality and morbidity. As Fromer states "... assuming that not all can invariably receive all needed and available health care services, which individuals should receive them? The microallocation problem sometimes involves life and death dilemmas. Ethical problems in microallocation generally revolve around selection criteria and the persons making selection decisions. As a result of policy decisions, some people may suffer death or severe and irreparable harm, while others are saved from such a fate" (Fromer 1981: p. 18). The implication is that a deliberate decision to provide service in a private manner indicates a willingness to exclude individuals from life-giving treatment.

There are two assumations underlying this train of thought. The first is that no provision is made under a private service mode for those individuals that cannot pay the costs of the service. Intuitively we think that this is probably not true. It seems reasonable to assume that some

form of provision is made for the indigent. Just as there is little information available on the private - public nature of EMS service, the issue of how communities respond to the emergency medical needs of the indigent is not addressed in existing literature. There is also a flip side of this coin. When the general public knows that a fee is charged for emergency service, how many individuals not capable of paying these fees deliberately choose not to access the EMS system and what is the potential cost of this decision to society? If, as research indicates, EMS reduces mortality and morbidity then use of the system by the ill and injured reduces that individual's potentially lost economic productivity. Thus, not accessing the system because of the fees involved could possibly create a greater societal loss than failing the recoup the single fee-for-service. Certainly, it seems an area requiring further research, not only for the pragmatic value of the information, but also for the light it throws on how communities view the nature of EMS service itself. And perhaps most importantly, to address the question of whether or not the poor and indigent in this country are denied service, whether it be through deliberate public policy or through subtle intimidation created by the fee structure.

The second assumption made when addressing private provision is that the decision has been a deliberate one. There is a tendency to assume that EMS service provision is the reflection of specific local policy or decisions regarding that service. And this may indeed be the case in many communities. However, it seems equally likely that the service mode currently in place has developed through incremental budgetary decisions and the issue of appropriate governmental roles has never been addressed explicitly by many municipalities. An example of this appears in Yin's work on the routinization of new innovations, where a new EMS service becomes established by slow incorporation into the existing municipal fire department budget (Yin 1981: pp. 25-27).

For example, it seems entirely possible that many communities' first involvement in EMS was through a small financial request from either a volunteer agency or perhaps the municipal fire department. In the early sixties this service could be provided with a station wagon and a few pieces of equipment. Over the last twenty years, the initial small request may have grown into a full-fledged paramedic service requiring substantial financial commitment. The issue of how EMS should fit into the framework of existing muncipal services may have never been addressed formal-

ly. The system in place may not reflect community preferences at all, since its development may have occurred largely outside of the normal routes of local government accountability.

Given this type of situation, it becomes clear that the public-private nature of EMS service provision may not necessarily reflect explicit community decisions. Certainly the question of how localities got involved in EMS service provision is one worth further investigation.

4. Where From Here

The end result of this research appears to be three suggestions for the future. First, that local government re-evaluate the position of EMS service within its existing framework of municipal services and make explicit decisions on their appropriate involvement. Second, that further research be conducted to provide public officials with information sources at least equal to those involving other municipal services. Lastly, that the planning profession begin to recognize EMS as an almost universal service and to begin to provide some training in this area for the planning student and some literature for the practicing planner. Until elected officials and planning professionals develop some understanding of this service, communities will be forced to

respond to the agendas of the individuals directly involved in service provision. It is important that local government develop the expertise in this field to add EMS to the list of desirable services and allocate financial resources based on the needs and wants of the community. To rephrase this argument in traditional economic terms: government must have some basis of knowledge about services on one hand and community needs on the other. Limited resources are allocated to provide the most satisfactory mix of services and goods. Information is the key to determining the mix provided. And the one absolute statement we can make about EMS in the municipal service setting is that we don't know much about it. It is far better for professionals in the field to begin to address their responsiblity towards this service now, than to wait until the local provider goes bankrupt or evaluation is forced upon the municipality in the wake of a disaster.

Appendix A

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Appendix B

EMS AGENCY SURVEY

VIRGINIA TECH EMS SURVEY

1. Your EMS service is provided by:

[ ] private commercial firm
[ ] private firm contracted by the municipality
[ ] municipal department
[ ] volunteer rescue squad
[ ] volunteer fire department
[ ] combination volunteer and municipal
[ ] local hospital
[ ] local funeral home
[ ] other (explain)

2. Is this service the same type service that has always served the community?

[ ] yes [ ] no

If YES, answer 2a If NO, answer 2b and 2c

2a. What year was the service established?

[ ] before 1960
[ ] 1960-65
[ ] 1965-70
[ ] 1970-75
[ ] 1975-80
[ ] after 1980

2b. What year was the service currently in use established?

[ ] before 1960
[ ] 1960-65
[ ] 1965-70
[ ] 1970-75
[ ] 1975-80
[ ] after 1980

2c. What type of service was in place before the present service was established?

[ ] private commercial firm
[ ] private firm contracted by the community
[ ] municipal department
[ ] volunteer rescue squad
[ ] volunteer fire department
[ ] local hospital
[ ] local funeral home
[ ] other (explain)

3. The fire department in your service area is:

[ ] private commercial firm
[ ] private firm contracted by the community
[ ] municipal department
[ ] volunteer
[ ] combination volunteer and municipal
[ ] other (explain)

4. The following are common sources of funding for EMS. Would you indicate which sources are available for your agency by estimating the percent of total operating costs covered by this each revenue source. For example, 35% general revenue taxation, 55% donations.

[ ] general revenue taxation
[ ] specific service taxation
[ ] donations and memorials
[ ] user fees
[ ] grants and awards
[ ] fund-raising activity
[ ] United Way funding
[ ] local government contribution
[ ] other

5. Has your funding always been provided in this manner?

[ ] yes [ ] no

If NO, answer 5a and 5b

5a. What year did your funding generally first break-down into these percentages? _____

5b. What were the sources of funding in percentages prior to this?

[ ] general revenue taxation
[ ] specific service taxation
[ ] donations and memorials
[ ] user fees
[ ] grants and awards
[ ] fund-raising activity
[ ] United Way funds
[ ] local government contribution
[ ] other

6. Do you ever directly charge the user of the EMS service for services provided?

[ ] yes [ ] no

If YES, answer 6a, 6b, 6c, and 6d If NO, answer 6e

6a Does that fee cover the entire cost of the service?

[ ] yes
[ ] no

6b Is a serious attempt made to collect the fee?

[ ] yes
[ ] no

6c Are unpaid bills turned over to a collection agency?

[ ] yes
[ ] no

6d What is the current fee for the service?

[ ] one standard fee per call
[ ] one standard fee per call plus a charge per mile
[ ] charge varies according to medical care provided
[ ] charge varies according to medical care provided plus a standard fee
[ ] charge varies according to medical care plus a standard fee plus a charge per mile

6e If you do not now charge user fees, have they ever been considered as a method to cover operating costs?

[ ] yes
[ ] no

7. In what town, city, or county is your service located?

_____

8. What is the exact location (street address, town, city, or county) of your headquarters or main office?

_____

_____

9. Does your EMS service regularly provide service to individuals who live outside of the town or city where your headquarters are located?

[ ] yes [ ] no

If YES

9a. Do you provide primary or first due service for:

[ ] part of one county
[ ] one town/city plus part of the county
[ ] one town/city plus all of the county
[ ] the entire county plus all enclosed towns and cities
[ ] two towns or cities plus part of the county
[ ] three towns or cities plus part of the county
[ ] four or more towns or cities plus part of the county
[ ] parts of more than one county
[ ] other, please explain

9b. Do all the communities served contribute directly or indirectly to the funding for the service?

[ ] yes
[ ] no

10. How many calls a year does your EMS agency answer? _____

11. What percentage of these calls are outside the town, city, or county where your headquarters are located? _____

12. What would you estimate is the average distance in miles traveled from the location of the patient to the nearest 24-hour emergency department?

[ ] less than 10 miles
[ ] 10-20 miles
[ ] 20-30 miles
[ ] 30-40 miles
[ ] 40-50 miles
[ ] greater than 50 miles

13. What would you estimate is the average time in minutes from the location of the patient to the nearest 24-hour emergency department?

[ ] less than 5 minutes
[ ] 5-10 minutes
[ ] 10-20 minutes
[ ] 20-30 minutes
[ ] 30-40 minutes
[ ] 40-50 minutes
[ ] 50-60 minutes
[ ] greater than one hour

14. Is there a major employer or industry in your area that has supported the activities of your rescue squad?

[ ] yes [ ] no

If YES

14a What type of support is/was provided?

[ ] financial
[ ] initial organizer
[ ] management and organizational support
[ ] operates the service
[ ] allows employees to leave work to answer calls
[ ] other, please explain

14b What is the name of that employer or industry?

_____

15. Is there a major hospital or health care facility in your area that has supported the activities of your rescue squad?

[ ] yes [ ] no

If YES, answer 15a and 15b

15a What type of support?

[ ] financial
[ ] initial organizer
[ ] management or organizational support
[ ] operates the service
[ ] allows employees to leave work to answer calls
[ ] other, please explain

15b What is the name of that hospital or health care facility?

_____

_____

16. How many hospitals do you regularly deliver patients to?

[ ] one
[ ] two
[ ] three
[ ] four
[ ] five or more

17. The purpose of this research is to try and begin to understand why communitites have the type of EMS service that they have. Is there any important characteristic of your community, something special about your EMS service or how it was founded that might be important?

18. If we should have any further questions about your EMS service or community, who should we contact?

name: _____

title: _____

phone number: _____

address: _____

Thank-you very much for helping with the survey. If you have any questions, please don't hestitate to call or write.

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