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# FACTS AT A GLANCE

# Trauma Stabilization Services in Rural Texas

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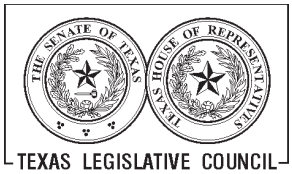


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# Introduction

This publication contains information relating to trauma stabilization services in rural Texas. Following a brief summary and background on the issues relating to the provision of emergency medical care and trauma services, the publication provides a discussion of the taxonomies used to define urban, rural, and frontier populations; an overview of the Texas EMS/trauma system; information about relevant federal and state programs and funding opportunities; and descriptions of rural and frontier health and EMS/trauma initiatives in other states.

# Summary

The interconnectedness of the health care system makes it difficult to examine a specialized component of the health care system, such as emergency and trauma care, without an analysis of the system as a whole or to accurately reflect the status of those services in rural areas without a comparison to their condition in other settings. Likewise, the role of federal funding mechanisms, such as Medicare or Medicaid, in the development of state trauma systems and rural emergency medical services and their influence on state legislative initiatives dictates thorough explanations of large federal programs. These issues are complicated by the fact that there is no single source for Texas data relating to the trauma system or emergency medical services, and reporting inconsistencies often result in conflicting information within the data that are available.

The unique obstacles to basic health care access in rural areas are especially debilitating to the delivery of emergency medical and trauma care. This publication identifies many of those concerns, such as medical professional shortages, recruitment, retention, and training; uncompensated care costs; facility closures; financial support for emergency medical services; and Medicaid/Medicare reimbursement rates; and it discusses them in the context of the development of the Texas trauma system, the role of emergency medical services providers and first responders, and state and federal legislative efforts.

Legislative reports over the past 10 years relating to trauma care at hospitals have increasingly included testimony concerning the rates for medical malpractice liability insurance. It would be remiss not to mention the impact of the rates on physicians practicing in rural Texas, particularly South Texas and the Rio Grande Valley. Whatever the cause for the increases, it is undeniable that they exist and are threatening doctors who practice in medically underserved areas and who specialize in fields of practice that involve or require high-risk procedures, such as trauma and emergency medicine. The landmark legislation passed by the 78th Texas Legislature was not the only state legislative effort to address the problem, as many states are faced with similar physician shortages. It remains to be seen if these efforts will reduce malpractice liability rates and reverse the trend of physicians leaving practice.

The Texas Department of Health has designated 131 basic (Level IV) trauma centers in the state of Texas. The basic function of a Level IV trauma center, by definition, is to resuscitate and stabilize trauma patients and to arrange for the transfer of trauma victims to a more specialized trauma facility when medically necessary. Level IV centers provide trauma stabilization to rural Texas. However, there are vast stretches of rural Texas that are hundreds of miles from the nearest physician let alone a hospital with an emergency department or a basic trauma center. For these communities, the pre-hospital care administered by emergency medical services (EMS) providers and first responders is often as important as the care given in a hospital setting. But there are impediments to providing these services as well, and many rural EMS providers are under-equipped and under-trained.

Although there are no federal or state programs that provide funding solely for the development of trauma stabilization or Level IV trauma centers in rural areas, the state of Texas participates in a number of federal grant programs designed to provide resources to the statewide trauma system, rural hospitals and health clinics, and EMS providers and first responder organizations. In addition, Texas participates in federal programs aimed at recruitment and retention of medical professionals in rural communities, including primary care physicians. These efforts help alleviate the strain on emergency medical systems by reducing the need for rural populations to seek primary and basic health care in hospital emergency departments.

# Background

"Trauma" refers to a severe blunt or penetrating injury commonly caused by automobile crashes, gunshots, knife wounds, falls, assault, battery, or burns. The Bureau of Emergency Management at the Texas Department of Health reports that almost 30 Texans die every day from trauma-related injuries and that, for every trauma victim who dies, at least six are seriously injured. In fact, trauma is the leading cause of death among persons between the ages of 1 and 44.[1] In 2002, there were a reported 11,898 injury-related deaths in Texas, of which 68.8 percent (8,182) were unintentional, resulting from neither assault nor suicide.[2]

Care administered to victims of injury takes many forms. Acute care refers to the treatment of an emergency medical event, such as a heart attack, in the context of a hospital, while emergency care includes pre-hospital care, such as first response and emergency medical services, and triage (the process of sorting patients for treatment based on the urgency of their condition). Trauma care is distinguished from these types of care because the severity of a traumatic injury requires immediate diagnosis and specialized treatment. Studies indicate that victims of severe injury who are treated at trauma centers have a better rate of survival than those who receive treatment at a non-specialized emergency department.[3]

The challenges to providing effective statewide emergency care are myriad, complicated, and interrelated. Following the 77th legislative session, Lieutenant Governor William "Bill" Ratliff charged the Senate Finance Committee with evaluating the infrastructure, capacity, and funding of trauma care in the state of Texas. In November 2002, the Senate Finance Subcommittee on Trauma Care issued its report to the 78th Legislature. The report identified a number of items that impact the health care system as a whole with specific consequence to trauma care, including increased demand for services and diminished capacity; rising uncompensated care costs; facility closure and staff shortages; training and funding for pre hospital care; and the lack of a statewide, comprehensive EMS system. A basic explanation of just a few of these issues serves to illustrate the extent to which these problems are interrelated.

In 1986, the United States Congress passed the Emergency Medical Treatment and Active Labor Act to guarantee public access to emergency medical care regardless of a person's ability to pay. The law requires facilities that participate in Medicare and that offer emergency services to provide a medical screening examination on request and to provide stabilizing treatment or an appropriate transfer to another facility for patients with an emergency medical condition. This requirement extends to patients transferred from other hospitals unable to provide the necessary level of care. The law has had a tremendous impact on the financial viability of trauma centers for three reasons: uncompensated care provided to uninsured trauma patients, undercompensated care provided to trauma patients covered by Medicaid, and the increasing number of uninsured patients seeking basic and primary health care at emergency rooms.

With 25 percent (5,257,710 in 2002) of Texas' total population uninsured,[4] one of the biggest cost-drivers to hospital trauma centers and emergency rooms is the care provided to uninsured patients. According to a survey conducted by Bishop+Associates, trauma centers in Texas treated 56,072 injured patients in 2001 at a total cost to the hospitals of $564 million.[5] Of that amount, approximately 32 percent or $181 million was incurred treating uninsured patients. Although uninsured patients do not necessarily equate with uncompensated care, the treatment provided trauma patients is extremely expensive and often out of reach for self-pay and uninsured patients. In 2001, among the seven most populous states, Texas ranked first in total uncompensated care reported by hospitals, in per capita uncompensated care, and in the ratio of uncompensated care to gross patient revenue.[6] The Texas EMS/Trauma Registry at the

Texas Department of Health estimates that of the 30,489 emergency room visits reported in 2002 that resulted in a stay of less than 24 hours, 26.5 percent of the patients admitted received care for which the hospital was not compensated.[7] Recognizing the impact of uncompensated care costs to the trauma system, the 78th Texas Legislature passed S.B. 1131, which significantly increased the percentage of money in the trauma system fund dedicated to cover uncompensated care costs at designated trauma centers. But uncompensated care is only one source of financial loss to trauma centers. The Bishop+Associates survey also concluded that low reimbursement rates for care provided to patients covered by Medicaid resulted in $27.2 million in additional losses to Texas trauma centers.

The problems of uncompensated and undercompensated care are compounded by the fact that the care is being provided at a significantly increasing rate. The Texas Department of Health Center for Health Statistics Annual Survey of Hospitals indicated that emergency room visits increased by 38 percent between 1993 and 2002.[8] According to the Texas Hospital Association, in 2002, 66 percent of hospitals surveyed reported that their emergency departments were working at or above capacity, including 100 percent of Level I and Level II designated trauma facilities and 84 percent of Level III trauma facilities.[9] (See "Trauma Facility Designation.") These emergency rooms not only are treating victims of trauma, but are increasingly providing primary and basic health care to the uninsured,[10] further diverting limited resources from trauma care. The costs of so many emergency rooms operating at capacity are not only financial. Trauma centers are often forced to redirect ambulances because of a lack of available beds, delaying care to trauma patients for whom, above all, time is of the essence.

The issues identified by the Senate Finance Subcommittee on Trauma Care as encumbering emergency care in the state of Texas are especially complicated for rural communities. The delivery of rural health care generally, and emergency response or trauma care specifically, is a complex issue with no single point of derivation and no single solution. The most important element in the effective treatment of a traumatic injury—time—is often impeded in rural areas by the obvious limitations wrought by geography, distance, and low population density—namely, widely dispersed medical facilities and services, insufficiently trained personnel, and a general lack of resources.

Emergency medical services providers are the critical link between the community and the rest of the trauma system, providing immediate medical assistance and rapid transportation to a medical care facility, coordinating inpatient and outpatient treatment so the most seriously injured patients are quickly triaged to a trauma center, and often providing emergency medical dispatch. The isolation of many rural and frontier communities and their distance from specialized trauma facilities means the care administered by EMS providers within the "golden hour" between an injury and hospital arrival is even more important to the survival of rural trauma victims. The Bureau of Emergency Management at the Texas Department of Health reports that the rate of preventable deaths in rural areas could be as much as 85 percent higher than in urban areas.[11] But rural communities often rely on volunteer first responders and EMS providers with only basic emergency medical training. Moreover, the sparse population in rural areas means a relatively low volume of emergency calls; in Texas, this affects the amount of state funding available to an EMS provider, and there is no statutory requirement that county governments provide funding to EMS providers. (See "EMS and Trauma Care Funding.") Moreover, the expansive areas served by rural providers increase the cost of operation compared to urban providers. With such low potential for profit, rural communities cannot support private providers, and as a result rural EMS is often staffed by volunteers. Nationwide, volunteers constitute between 57 and 90 percent of first responders in rural areas.[12]

Paradoxically, rural areas have a greater need for emergency medical services. One-third of all motor vehicle accidents nationwide, and two-thirds of the deaths attributed to these accidents, occur on rural roads.[13] The Texas Department of Public Safety reported that in 1999, 59.6 percent of deaths due to automobile accidents and 21.9 percent of injury accidents occurred in rural Texas.[14] Studies have indicated a seven times greater likelihood of death for victims with a wait time of longer than 30 minutes for EMS response,[15] but, nationally, average response times from motor vehicle accidents to EMS arrival in rural areas is eight minutes greater than in urban areas.[16] Additionally, rural residents are almost twice as likely as urban residents to die of unintentional injuries other than motor vehicle accidents and also are at a significantly higher risk of death by gunshot.[17]

In addition to delivering emergency medical care, EMS providers are increasingly relied on as a safety net for basic health services in rural and frontier communities ever challenged by inadequate access to other medical services. In 2001, the Texas State Board of Medical Examiners reported that of the 196 Texas counties classified as rural or frontier counties, 24 had no physician, 19 had only one physician, and 22 had only two physicians. In 2002, according to the Texas Department of Health, 61 Texas counties were reported to contain no hospital, 105 counties contained only one hospital, and 26 counties contained only two hospitals.[18] (See "Definitions of Urban, Rural, and Frontier.") In fact, rural residents are less likely to seek primary and preventive care, but when forced to meet their basic health care needs they must do so in hospital emergency departments, often the only care available.

However, access to hospitals in rural areas is also in jeopardy. Rural hospital closures nationwide reached a post-World War II high during the 1980s when nearly 10 percent of all rural hospitals closed.[19,20] During the 1990s, 35 percent of the 460 general hospital closures in the United States occurred in rural areas. The loss of hospital facilities further contributes to the loss of physicians and reduces availability of emergency services. For the rural hospitals that do remain open, there are significant impediments to retaining staff and maintaining expertise. Many rural emergency room directors are not specialized in emergency medicine, and for those who are the low volume of emergency patients makes it difficult to maintain the necessary skills. The financial constraints of operating a 24-hour emergency department also create staffing problems and lead to an overreliance on nurses to provide care until the arrival of a physician.

Aside from the obvious problems of access to medical professionals and facilities and emergency medical services, other issues identified as critical to trauma care in the state as a whole by the Senate Finance Subcommittee on Trauma are even more so to rural Texas. Hospital capacity in urban areas directly affects access to care for rural communities that are not served by a Level I trauma facility. If a patient cannot receive the level of care necessary to treat injuries at a Level IV or Level III trauma facility, the patient is transferred to the nearest trauma center available to administer the level of care required. However, the 2002 Emergency Care Issues Survey conducted by the Texas Hospital Association revealed that 72 percent of rural facilities experienced transfer problems and that statewide ambulance diversions due to a lack of beds have increased significantly, with more than a quarter of all hospitals reporting increases of more than 75 percent in ambulance diversions and another 56 percent of hospitals reporting increases between 25 and 50 percent in diversions. All levels of trauma facilities, including those in rural communities, experienced increases in ambulance diversion.[21] Obviously, delays as a result of ambulance diversion can have grave consequences for trauma patients.

Uncompensated and undercompensated care is another issue of particular significance to rural hospitals. Rural populations are older, poorer, and less likely to be insured.[22] Moreover, rural hospitals serve a population with a higher proportion of Medicare beneficiaries but receive lower hospital reimbursement-to-cost payments from Medicare.[23]

These are the common themes relating to rural emergency medical and trauma care in Texas as distinguished from care for urban populations: access to primary care, medical professionals and hospitals, and emergency medical services; uncompensated care costs; and Medicare/ Medicaid reimbursement rates.

# Definitions of Urban, Rural, and Frontier

The demographic characteristics that so readily differentiate urban from rural populations serve to highlight the importance of determining a quantitative measure of rurality, particularly in developing policy to address the problem of access to specialized health services such as trauma care. The White House Office of Management and Budget acknowledges that federal and state agencies are often required by statute to allocate program funds and set program standards according to an area's designation as urban or rural. But policymakers at the state and federal levels have long struggled with how to assess the rurality of a given geographic area. As of November 2002, there were 24 different definitions of "rural" in Texas statutes and the Texas Administrative Code.[24] Similarly, three federal agencies each use different definitions that are applied by federal legislation to various health programs. According to the U.S. Census Bureau, 2,907,272 resided in "non-urban" Texas in 2000,[25] while the White House Office of Management and Budget (OMB) designated 2,946,740 Texans as nonmetro residents in 2003.[26] In addition to these designations, the extreme isolation of many communities has given rise to a subset of rural and nonmetro known as "frontier." The Department of Agriculture Economic Research Service (ERS) has classified 29 Texas counties as completely rural and not adjacent to a metro area, while the National Rural Health Association has adopted a definition that classifies 131 Texas counties as frontier.[27]

The differences between these numbers can be best understood by explaining how they are derived and, in turn, how each designation relates to another. The following are brief explanations for the three primary federal definitions that apply to what is typically considered "urban" and "rural" by policymakers and researchers; the definition of "frontier" developed by the Frontier Education Center and adopted by the National Rural Health Association; the definitions of "rural" in Texas statutes and the Texas Administrative Code that are relevant to state rural health policy; and other state and federal designations that affect rural health policy.

## Federal Definitions

The U.S. Census Bureau defines "rural" as consisting of all territory located outside of an urban area. There are two types of urban areas: an urbanized area (UA) or an urban cluster (UC). An urbanized area is found wherever there is an urban nucleus of 50,000 or more people with a population density of at least 1,000 people per square mile. An urbanized area may also include adjoining territory with a density of at least 500 people per square mile. An urban nucleus does not necessarily require an individual city of 50,000 or more people. It can simply be a core of census block groups or individual census blocks with the required density and may comprise a smaller central city and its densely populated environs. An urban cluster is an area that meets the same population density criteria but has a nucleus of at least 2,500 but less than 50,000. (Less densely populated territory may be part of a UA or UC in certain circumstances.) Urban areas and clusters do not necessarily follow municipal boundaries. By this definition, rural areas comprise open country and settlements with fewer than 2,500 in population. According to the Census 2000, the rural population of the United States was 59 million (21 percent).[28]

Census Bureau data serve as the statistical basis for most federal definitions that categorize an area as urban or rural. The definitions used by the Census Bureau, OMB, and ERS are parameters that, applied to the Census Bureau data, attempt to accurately describe a given area. The OMB and ERS categorizations of an area's rurality are each based on a juxtaposition of

nonmetropolitan areas versus metropolitan areas within or across individual or adjacent counties and are determined on a countywide basis. The advantage of this approach is that county estimates of populations, employment, and income are available annually.

The Office of Management and Budget classification system that designates an area as "metro" or "nonmetro" originated in 1949 and is often used to differentiate urban from rural in America. In June 2003, the OMB released new classification criteria based on the Census 2000 data. As of that update, nonmetro Texas comprises 177 counties and is home to 13.3 percent (2,946,740) of the Texas population.[29] The new classification criteria are based on nine rural-urban continuum codes (Beale codes) and introduce a "core-based statistical area" system that includes a subdivision of nonmetro territory known as a micropolitan statistical area. These rural-urban continuum codes differentiate metro counties according to the population of their metro area and nonmetro counties by their degree of urbanization or proximity to metro areas.

| Code | Description |
|---|---|
| | **Metro Counties** |
| 1 | Counties in metro areas of 1 million population or more |
| 2 | Counties in metro areas of 250,000 to 1 million population |
| 3 | Counties in metro areas of fewer than 250,000 population |
| | **Nonmetro Counties** |
| 4 | Urban population of 20,000 or more, adjacent to a metro area |
| 5 | Urban population of 20,000 or more, not adjacent to a metro area |
| 6 | Urban population of 2,500 to 19,999, adjacent to a metro area |
| 7 | Urban population of 2,500 to 19,999, not adjacent to a metro area |
| 8 | Completely rural or less than 2,500 urban population, adjacent to a metro area |
| 9 | Completely rural or less than 2,500 urban population, not adjacent to a metro area |

According to the rural-urban continuum codes, of the 177 nonmetro counties in Texas, 86 are either completely rural or have an urban population of less than 20,000 and are not adjacent to a metro area.

Under the core-based system, a metropolitan statistical area comprises one or more entire counties and is basically a core area containing a substantial population nucleus taken together with adjacent communities having a high degree of economic and social integration with that core. The OMB designates an area as metro if it has at least one urbanized area with a population of 50,000 or more. Outlying counties are included if they are economically tied to the core counties as measured by the percentage of the population commuting for work to or from the core. Nonmetro counties are all counties outside the boundaries of a metro area and are further subdivided into micropolitan and noncore areas. An area is designated micropolitan if it has one or more urban clusters with a population of at least 10,000 but less than 50,000. All other counties are considered noncore.

The Economic Research Service further developed the core-based classification scheme to subdivide the metro and nonmetro categories into a 12-part county codification based on an area's geographic context.

| Code | Description |
|---|---|
| | **Metro Counties** |
| 1 | In large metro area of 1+ million residents |
| 2 | In small metro area of less than 1 million residents |
| | **Nonmetro Counties** |
| 3 | Micropolitan adjacent to large metro |
| 4 | Noncore adjacent to large metro |
| 5 | Micropolitan adjacent to small metro |
| 6 | Noncore adjacent to small metro with own town |
| 7 | Noncore adjacent to small metro with no own town |
| 8 | Micropolitan not adjacent to a metro area |
| 9 | Noncore adjacent to micro with own town |
| 10 | Noncore adjacent to micro with no own town |
| 11 | Noncore not adjacent to metro or micro with own town |
| 12 | Noncore not adjacent to metro or micro with no own town |

## Definitions of Frontier Counties

The Census Bureau, OMB, and ERS each define rurality by exclusion, i.e., that which is not "urban" or "metro." The subset of rural known as "frontier" was developed in an effort to define certain sparsely populated regions more inclusively by the features unique to these areas. Federal agencies generally consider rural counties frontier if they have a population density of seven or fewer people per square mile. However, the vast area of many rural counties is not easily measured in terms of population characteristics or adjacency to an urban core or metro county. For example, a large county with an urban center in one corner can skew overall population figures and population density and thereby obscure the dynamics of a considerable majority of the county. Similarly, a smaller county with a higher population density but located hundreds of miles from the nearest significant market or service area may not be accurately depicted in terms of density alone.

In 1997, the Frontier Education Center, in conjunction with the federal Office of Rural Health Policy, developed a definition of "frontier" to describe this subset of rural. The definition is based on a matrix that includes population density and distance in miles and travel time in minutes to the nearest market-service area. This definition has been adopted by the National Rural Health Association. According to its criteria, Texas includes 131 frontier counties and more than 10 percent (1,131,334) of the total frontier population of the United States.

The Texas Department of Health also defines much of the state as frontier. The department determines a county to be frontier if it includes a total population of less than 50,000 with an average population density of less than six people per square mile. Using this definition, frontier Texas includes 58 counties.

## Definitions of Rural in Texas With State Rural Health Policy Impact

The impact of these urban, rural, and frontier designations on health policy can be easily ascertained by a review of rural health programs in the state of Texas with applicable definitions of "rural." The table below identifies the current definitions for "rural" and the health programs affected.

| Program | Agency | Definition | Source |
|---|---|---|---|
| Statewide Rural Health Care System | Texas Department of Insurance | "Rural area" means: (A) a county with a population of 50,000 or less; (B) an area that is not delineated as an urbanized area by the United States Bureau of the Census; or (C) any other area designated as rural by a rule adopted by the commissioner [of insurance], subject to Section 845.003 (see next entry). | Section 845.002(9), Insurance Code. |
| Statewide Rural Health Care System | Texas Department of Insurance | [An area eligible to be designated a "rural area" under agency rules is] any area that is delineated as an urbanized area by the United States Bureau of the Census and: (1) is contiguous with and not more than 10 miles away from a rural area described by Section 845.002(9)(A) or (B) (see previous entry); (2) is sparsely populated, compared to areas within a 10-mile radius that are delineated as urbanized areas by the United States Bureau of the Census; (3) has not increased in population in any single calendar year in the seven years before the commissioner [of insurance] makes the designation; and (4) | Section 845.003, Insurance Code. |

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| | | in which emergency or primary care services [meet certain criteria]. | |
| Permanent Fund for Children and Public Health<br><br>Community Hospital Capital Improvement Fund | Texas Department of Health | "Rural area" [is a] county that had a population in the most recent decennial United States census of 150,000 or less, or that part of a county with a population of greater than 150,000 that is not delineated as urbanized by the United States Census Bureau. | 25 Tex. Admin Code, 83.2(7), 2000.<br><br>25 Tex. Admin. Code, 83.21(8), 2000. |
| Designation of a Hospital as a Rural Hospital | Center for Rural Health Initiatives (Office of Rural Community Affairs) | [To be designated as a rural hospital, a hospital must be located in a "rural area" specified as:] (1) a county with a population of 75,000 persons or less; (2) a county with a population density of less than 100 persons per square mile of land area; (3) a municipality of 10,000 persons or less; and (4) a rural census tract. | 25 Tex. Admin. Code, 500.705, 2002. |
| School-based Health Centers | Texas Department of Health | "Rural area" [is a] county with a population of not greater than 50,000, or an area that has been designated under state or federal law as: (A) a health professional shortage area; (B) a medically underserved area; or (C) a medically underserved community as defined by the Center for Rural Health Initiatives. | 25 Tex. Admin. Code 37.532(10), 2000. |
| Rural Emergency Medical Services Scholarship Incentive Program | Center for Rural Health Initiatives (Office of Rural Community Affairs) | "Rural county" [is a] county that has a population in the most recent decennial United States census of 50,000 or less, or with respect to a county that has a | 25 Tex. Admin. Code 500.503(9), 2000. |

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| | | population of more than 50,000 and contains a geographic area that is not delineated as urbanized by the federal census bureau, that part of the county that is not delineated as urbanized. | |
| Texas Health Service Corps Program | Center for Rural Health Initiatives (Office of Rural Community Affairs) | "Rural county" [is any] county within Texas that is not designated as a Metropolitan Statistical Area by the United States Bureau of the Census. | 25 Tex. Admin. Code 500.203(7), 1998. |
| Designation of a Health Care Facility as a Rural Provider<br><br>Hospital Discharge Data Rules | Texas Health Care Information Council | [To qualify as a rural provider, a health care facility must be located in a "rural county," that is, a county that:] (A) has a population estimated by the United States Bureau of the Census to be not more than 35,000 as of July 1 of the most recent year for which county population estimates have been published; or (B) has a population of more than 35,000, but that does not have more than 100 licensed hospital beds and is not located in an area that is delineated as an urbanized area by the United States Bureau of the Census. | Section 108.0025, Health and Safety Code, 1997.<br><br>25 Tex. Admin. Code, 1301.11(39), 1997. |
| Community Scholarship Program | Center for Rural Health Initiatives (Office of Rural Community Affairs) | "Rural county" [is a] county in Texas designated as nonmetropolitan by the U.S. Office of Management and Budget. | 25 Tex. Admin. Code 500.62(12), 1994. |
| Rural Health Facility Capital Improvement | Office of Rural Community Affairs | "Rural county" means: (A) a county that has a population of 150,000 or less; or (B) with respect to a county that has a population of more than 150,000 and that | Section 487.301(2), Government Code, 2001.<br><br>25 Tex. Admin. Code 500.402(7), 2000. |

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| | | contains a geographic area that is not delineated as urbanized by the federal census bureau, that part of the county that is not delineated as urbanized. | |
| Outstanding Rural Scholar Recognition and Loan Program for Rural Health Care | Office of Rural Community Affairs | "Rural community" means a municipality in a nonmetropolitan county as defined by the United States Census Bureau in its most recent census. | Section 487.101(5), Government Code, 2001.<br><br>25 Tex. Admin. Code 500.22(16), 1995. |
| Rural Physician Recruitment Program | Center for Rural Health Initiatives (Office of Rural Community Affairs) | "Rural community" means a rural area as defined by the [Center for Rural Health Initiatives]. | Section 487.501(1), Government Code, 2003. |
| Rural Physician Relief Program | Office of Rural Community Affairs | "Rural" means: (A) a community located in a county with a population not greater than 50,000; (B) an area designated under state or federal law as: (i) a health professional shortage area; or (ii) a medically underserved area; or (C) a medically underserved community designated by the office. | Section 487.601 (3), Government Code, 2003. |
| Temporary Exemptions for Rural EMS | Bureau of Emergency Management | "Rural area" means: (1) a county with a population of 50,000 or less; or (2) a relatively large, isolated, and sparsely populated area in a county with a population of more than 50,000. | Section 773.0045(a), Health and Safety Code, 2003. |

## Other State and Federal Designations Affecting Rural Health Policy

Federal and state rural health programs also rely on more specific designations related to detailed characteristics in an area otherwise defined as urban or rural, metro or nonmetro, or frontier. With regard to health policy that may affect rural trauma services, these designations include "health professional shortage areas" and "medically underserved areas/medically underserved populations."

The Bureau of Health Professions National Center for Health Workforce Analysis of the Health Resources and Services Administration (HRSA) develops criteria used to determine whether a geographic area or certain population group is a health professional shortage area (HPSA) or a medically underserved area (MUA) or population (MUP). An area designated as an HPSA may have a shortage of either primary medical care, dental, or mental health care providers. Nearly 20 percent of the nation's population lives in primary medical care health professional shortage areas and more than 34 federal programs use the shortage designation to determine eligibility or as a funding preference.

Health professional shortage areas are based on the OMB's designations of metro and nonmetro. An HPSA may be an urban or rural area, a population group, or a medical or other public facility. The secretary of health and human services designates an area as having a shortage of primary medical care if three criteria are met: (1) the area is a rational area for the delivery of primary medical care services; (2) the area has a population to full-time-equivalent primary care physician ratio of at least 3,500 to 1, or the area has a population to full-time-equivalent primary care physician ratio of less than 3,500 to 1 but greater than 3,000 to 1 and has unusually high needs for primary care services or insufficient capacity of existing primary care providers; and (3) primary medical care professionals in contiguous areas are overused, excessively distant, or inaccessible to the population of the area under consideration. According to these standards, Texas contains 100 designated HPSAs in nonmetro or frontier areas.[30] Of these, 67 are counties, 29 are population groups, 3 are comprehensive health centers, and 1 is a rural health clinic.

A medically underserved area may be a whole county or a group of contiguous counties, a group of county or civil divisions, or a group of urban census tracts in which residents have a shortage of personal health services. Medically underserved populations may include groups who face economic, cultural, or linguistic barriers to health care. Designation as an MUA or MUP involves the application of the index of medical underservice (IMU) to data on a particular service area to obtain a score from zero to 100, where zero represents completely underserved and 100 is best served or least underserved. Each service area or population with an IMU score of 62.0 or less qualifies for designation as a MUA. The index involves four variables for each service area: (1) the ratio of primary medical care physicians to 1,000 population; (2) the infant mortality rate; (3) the percentage of population with income below the poverty level; and (4) percentage of population age 65 or older. Medically underserved area and medically underserved population designations are used as qualification for a number of federal health programs.

Although there are other governmental designations and alternative taxonomies that have been developed to further distinguish urban and rural areas and to clarify the rurality of a given area, most state and federal health policy relies on Census Bureau data and the standards applied by the bureau, OMB, ERS, and HRSA. To the extent possible, the definitional basis for each program and study cited throughout this publication has been identified or noted.

# The Texas EMS/Trauma System

## Overview

The trauma system in Texas was born out of concern for rural health care. Senate Concurrent Resolution 25, passed by the 70th Texas Legislature, Second Called Session, 1987, created the Special Task Force on Rural Health Care Delivery in Texas. The task force was charged with addressing a growing crisis in the rural health care delivery system in Texas that was characterized by hospital closures, a shortage of rural medical professionals, and a general lack of emergency medical transportation. Recognizing the complex and interrelated nature of the problems facing rural health care, the task force focused on five issues: the emergency medical system and trauma care; medical manpower; financing rural health care; regulatory restrictions; and obstetrics and medical malpractice liability. In its report, the task force recommended, among other things, the following actions: (1) forming a Center for Rural Health Initiatives; (2) establishing a statewide trauma system; (3) encouraging the Texas Department of Highways and Transportation (currently the Texas Department of Transportation) to allow access to training programs funded by the department to EMS providers; and (4) investigating the feasibility of implementing the federal Rural Health Clinics Act.

Acting on the recommendations of the task force, the 71st Texas Legislature, Regular Session, 1989, passed H.B. 18, known as the Omnibus Health Care Rescue Act. The act directed the Bureau of Emergency Management at the Texas Department of Health to develop and implement a statewide emergency services and trauma care system, designate trauma facilities, and develop a statewide trauma registry to be used to monitor the system and provide statewide cost and epidemiological data. In January 1992, the Texas Board of Health adopted rules for the implementation of the system. The board divided the state into 22 trauma service areas (TSAs) and provided for the formation of a regional advisory council (RAC) for each TSA. The rules required that each TSA consist of at least three counties and contain a general (Level III) trauma facility to serve as the lead facility for the area. (See "Trauma Facility Designation.")

The regional advisory councils are voluntary entities composed of representatives from hospitals, EMS providers, and the general public. Each RAC is responsible for the development and implementation of a regional trauma plan to include components relating to injury prevention, communications, pre-hospital and facility triage criteria, ambulance and patient diversion policies, and planning for trauma facility designation and the identification of lead trauma facilities for the TSA. Regional trauma plans must be approved by the Bureau of Emergency Management. By 2001, all RACs in Texas had achieved 501(c)(3) nonprofit status and were actively implementing approved regional EMS/trauma plans.[31]

The composition of the original 22 TSAs was based on patient transfer patterns for hospitals in each county throughout the state. However, changes have been made, and a county may be realigned from one TSA to another either by the bureau or at the request of the county or a licensed health care facility or licensed emergency services provider in the county. Requests for realignment must have the approval of the receiving RAC and specify patient routing patterns used by EMS providers and health care facilities, including the distances and transport times involved in the routing, and a list of all facilities and EMS providers in the requesting county.

The Texas Trauma System is administered by the Bureau of Emergency Management at the Texas Department of Health. There are currently 12 facilities designated as Level I (comprehensive) trauma facilities, 9 designated as Level II (major) trauma facilities, 36 designated as Level III (general) trauma facilities, and 131 designated as Level IV (basic) trauma facilities.

## Trauma Facility Designation

Trauma facility designation is governed by Texas Department of Health rule. The Bureau of Emergency Management recommends the designation of a trauma center to the commissioner of health based on criteria promulgated by the American College of Surgeons for Level I and II facilities, and criteria established by TDH for Level III and IV facilities. These levels of designation correspond with a facility's ability to provide a certain level of care and its role in serving the needs of its trauma service area.

- Basic (Level IV) trauma centers provide resuscitation and stabilization and arrange for the transfer of trauma victims to a higher level trauma facility when medically necessary. Level IV centers provide ongoing educational programs in trauma-related topics for health care professionals and the general public and implement targeted injury prevention programs that are guided by standards prescribed by TDH.
- General (Level III) trauma centers provide resuscitation, stabilization, and assessment of injury and either treat the trauma victim or arrange for appropriate transfer to a higher level trauma facility. Level III centers provide ongoing educational programs in trauma-related topics for health care professionals and the general public and implement targeted injury prevention programs that are guided by standards prescribed by TDH. Level III centers can also serve as the lead trauma facility for a particular trauma service area. Although lead facility responsibilities can be shared by more than one hospital, lead trauma facilities commit to receive major and severe trauma patients transferred from lower-level centers and to provide ongoing support to the regional advisory council and regional outreach in the form of trauma educational activities to all trauma service providers regardless of hospital system affiliation.
- Major (Level II) trauma centers provide trauma care for all patients with major trauma injuries but refer to Level I centers those cases involving microvascular surgery or hemodialysis. Level II centers are not required to conduct research or provide public educational programs. Level II centers must actively participate on the appropriate regional advisory council and submit data to the state trauma registry.
- Comprehensive (Level I) trauma centers provide complete trauma care for every aspect of even the most severe injuries, take the lead in developing prevention strategies, provide educational programs for trauma care providers and the general public, conduct trauma research, and include a teaching facility. Level I centers must actively participate on the appropriate regional advisory council and submit data to the state trauma registry.

## EMS and Trauma Care Funding

No state funding was applied to the development or operation of the state trauma system until 1997. Senate Bill 102, passed by the 75th Texas Legislature, Regular Session, 1997, established the EMS/trauma care system fund. The fund was created to provide for the continued development, implementation, and evaluation of the Texas EMS/trauma care system. The legislature then appropriated $4 million to the fund from the 9-1-1 emergency services fee account in a contingency appropriation for implementation of S.B. 102. After deducting a certain amount to establish a reserve, the remainder of the money was distributed to EMS providers and to the 22 TSAs, with two percent set aside for certain Level I-III trauma facilities to help cover uncompensated care costs.

The money provided for S.B. 102 was a one-time appropriation. A permanent fund was created during the 76th Texas Legislature on passage of H.B. 1676. House Bill 1676 created a dedicated account, known as the permanent fund for EMS and trauma care, with money from the tobacco litigation settlement. The available earnings of the permanent fund are used to provide ongoing money for the trauma system in Texas, including grant programs for local EMS projects, RAC system development, and hospital system development.

Senate Bill 1131, passed by the 78th Texas Legislature, Regular Session, 2003, made major changes to the funding of the EMS/trauma care system. The bill amended the Code of Criminal Procedure to establish an additional $100 fine for intoxication-related offenses to be deposited in a new account called the emergency medical services, trauma facilities, and trauma care systems account. The administration of the new account was combined with that of the previous EMS and trauma care system account created by S.B. 102 and funded from the 9-1-1 equalization surcharge.

A comparison of the amount available to the trauma system fund in 2001 and the revenue gains estimated by the Legislative Budget Board (LBB) to be available on passage of S.B. 1131 clearly demonstrates the impact of the legislation. For state fiscal year (FY) 2001, the total amount available to the EMS/trauma care systems account was $2 million.[32] In the fiscal note attached to S.B. 1131, the LBB estimated there would be $3,082,000 available to the account in FY2004 and $4,709,000 in FY2005.

Disbursements from the two accounts created or amended by S.B. 102 and S.B. 1131 are made as follows: each year, the commissioner is allocated an amount sufficient to maintain a reserve of $500,000 for extraordinary emergencies; of the funds remaining after subtraction for the reserve, 50 percent is allotted for local EMS support, not more than 20 percent is allotted to the RACs for operation of the 22 TSAs, at least 27 percent is allotted to fund a portion of the uncompensated trauma care provided at trauma facilities, and 3 percent is allotted to the Bureau of Emergency Management for administrative costs. Senate Bill 1131 not only increased overall funding but also substantially altered the distribution of funds, shifting money from local EMS support to funding of uncompensated care. Before passage of S.B. 1131, the EMS allotment from the trauma system account created by S.B. 102 (through the 9-1-1 surcharge) comprised 70 percent of the funds remaining after deductions for the extraordinary emergencies reserve, and the uncompensated care allotment comprised only 2 percent. Senate Bill 1131 also increased the amount of the reserve from $250,000 to $500,000.

Reserve for Extraordinary Emergencies. The commissioner's extraordinary emergency fund is distributed by the Bureau of Emergency Management to support EMS providers whose ability to provide emergency medical care will be severely disrupted and cause an unexpected disruption of the regional EMS/trauma system if the request for funding were denied. Requests are submitted by emergency health care providers and evaluated based on several factors, including the impact to the regional or local system, the number of counties served by the applicant, and the level of care available to the county or counties served by the emergency care provider. The awards vary widely in amount, recipient organization, and intended purpose. In FY2000, for instance, Central EMS in Brazoria County was given $80,000 to replace an ambulance damaged irreparably in an accident. In that same year, the Sterling Volunteer Fire Department in Sterling County received $1,174 to replace outdated stretchers.

Local EMS Support Allotment. The EMS allotment is distributed to eligible EMS providers by each RAC. Each RAC is required to develop an allotment distribution plan, collaborating with the EMS providers in its TSA, to ensure equitable distribution of the funds available. These allotment plans are approved by the bureau. The formula for distribution is governed

by Section 773.122(c), Health and Safety Code, and is based on the relative geographic size and population of the county in which the recipient provider operates and the relative number of emergency or trauma care runs performed by the provider in the county. However, smaller rural populations mean fewer EMS runs, which affects the amount of the allotment distributed to rural providers.

An EMS provider can receive funds from the allotment only if it is eligible under bureau standards. The current eligibility standards require that the provider maintain active involvement in system development in every RAC for each TSA within which the provider operates; be licensed; submit certain data to the RAC regional registry or TDH; use RAC regional protocols relating to patient destination and transport; and actively participate in the regional system quality improvement program. For FY2004, there are 40 counties with no eligible EMS provider. Use of the funds distributed to EMS providers are restricted to the purchase and maintenance of supplies, equipment, vehicles, and communications systems; operating expenses; and education and training. Each EMS provider is required to submit an annual expenditure report to the bureau. In FY2000, the bureau reported that of the funds distributed to EMS providers, 43 percent was spent on equipment, 31 percent on supplies, 13 percent on communication systems, 7 percent on education and training, and 5 percent on vehicles.

The General Appropriations Act of the 76th Texas Legislature attempted to alter the distribution of the EMS allotment by including a rider to the appropriation for the Texas Department of Health that modified the formula of allocation. Rider 61 directed TDH to distribute at least 40 percent of the EMS allotment to urban counties and 60 percent to rural and frontier counties. This rider was subsequently found to be invalid by the Texas Attorney General.[33]

RAC Allotment for TSA Operations. House Bill 2085, the 1999 sunset review legislation for the Texas Department of Health, made an important change to the way the regional advisory council allotment was distributed. Before the 2000-2001 biennium, the allotment was distributed from TDH to the county of residence of each RAC chair. House Bill 2085 authorized the department to disburse the funds directly to each RAC. According to the Bureau of Emergency Management, this change has resulted in quicker distribution of funds and improved communication between the bureau and RACs. Like EMS providers, regional advisory councils must follow eligibility requirements and restrictions on the expenditure of allotted funds. Eligibility requirements include demonstration of an ongoing system quality improvement process and documentation that at least 40 percent of EMS providers and hospitals in the TSA submit data to the state trauma registry. Each RAC is required to submit to the bureau an annual expenditure report. In FY2000, the bureau reported that of the funds distributed to regional advisory councils, 30 percent was spent on operating expenses, 26 percent on educational programs, 19 percent on supplies, 17 percent on equipment, and 8 percent on communications systems.

Uncompensated Care Allotment. In FY2001, before the changes in the trauma fund allotments mandated by S.B. 1131, $77,615 was available for distribution to cover uncompensated care. In addition to the minimum 27 percent of the trauma care funds allotted for uncompensated care, Sections 773.122(c) and (d), Health and Safety Code, require that unexpended funds from the EMS and RAC allotments be added to the uncompensated care allotment. As mentioned above, there are currently 40 counties with no EMS provider eligible for funds from the EMS allotment. As a result, for FY2004, $88,788 of the EMS allotment is currently unexpended. Designated trauma facilities submit proposals to TDH requesting reimbursement for uncompensated care from the allotment. The proposals are generally evaluated based on the number of years the facility has been a designated trauma center and the total amount of uncompensated care provided by the facility. Uncompensated care costs are calculated according to the Medicare reimbursement formula.

The 76th Legislature provided additional funding for trauma centers during state fiscal years 2001 and 2002. House Bill 2573 and House Bill 1799 created the tertiary medical care program under which certain unclaimed lottery prize money was appropriated to the Texas Department of Health. Under the legislation, the first $40 million in unclaimed prize money in each biennium was dedicated to state-owned multicategorical teaching hospitals. All prize money in excess of the first $40 million was dedicated to the tertiary medical care program to reimburse certain facilities for tertiary care services, stabilization services, or services provided in the event of an extraordinary emergency for which the facility had not received full payment from any public or private source. Tertiary care services were defined as certain services provided by a primary teaching hospital or a state designated Level I, II, or III trauma facility. Level IV trauma facilities were eligible only for reimbursement of stabilization services. House Bill 2573 stipulated that at least 86 percent of the appropriated money in the tertiary care account be used to compensate facilities for unreimbursed tertiary medical services and that no more than four percent be used to compensate tertiary care facilities and Level IV trauma centers for unreimbursed stabilization services. In FY2002, $40,510,013 was available for tertiary medical care services and $1,687,917 for stabilization services.

## Emergency Medical Service Providers

Emergency medical care in the state of Texas is regulated by the Emergency Medical Services Act, Chapter 773, Health and Safety Code. The act includes certification and licensing requirements for EMS personnel and providers, personnel and provider qualifications, and minimum standards of care.

Emergency medical services providers are staffed by personnel certified or licensed in one of five levels of expertise: (1) emergency care attendant (ECA); (2) emergency medical technician (EMT); (3) emergency medical technician-intermediate (EMT-I); (4) emergency medical technician-paramedic (EMT-P); and (5) licensed paramedic.

An ECA is certified as minimally proficient to provide pre-hospital care by providing initial aid that promotes comfort and avoids aggravation of an injury or illness. An EMT is certified as minimally proficient to provide pre-hospital care necessary for basic life support, including cardiopulmonary resuscitation and the control of hemorrhaging. Certification as an EMT-I qualifies a person to provide pre-hospital care by initiating under medical supervision certain procedures, including intravenous therapy and endotracheal or esophageal intubation. An EMT-P is qualified to provide advanced life support that includes initiation under medical supervision of procedures in addition to those expected of an EMT-I, such as electrical cardiac defibrillation or cardioversion, and drug therapy. In addition to minimal proficiency to provide the same level of care as an EMT-P, a licensed paramedic is required to have, at minimum, an associate's degree in emergency medical services.

Emergency medical service providers are similarly required to be licensed or certified by the Texas Department of Health. An EMS provider firm can be certified or licensed as one of four types of provider: (1) basic life support (BLS); (2) advanced life support (ALS); (3) mobile intensive care unit (MICU); and (4) specialized EMS. A firm can be certified in varying degrees of service level, including BLS with ALS capability, BLS/MICU, and ALS/MICU.

An EMS firm is qualified as a BLS provider if it provides a vehicle designed for transporting the sick or injured and has personnel and sufficient equipment for providing basic life support—pre-hospital care that uses noninvasive medical acts. A BLS vehicle, when in service, is required to be staffed by at least two ECAs. An ALS provider meets the same requirements as a BLS provider and has personnel and sufficient equipment to provide intravenous therapy

and endotracheal or esophageal intubation. In addition to the level of care provided by an ALS provider, an MICU can provide cardiac monitoring, defibrillation, cardioversion, drug therapy, and two-way radio communication. A specialized EMS provider uses a vehicle such as a helicopter, boat, fixed-wing aircraft, or ground vehicle and has personnel to provide for the specialized needs of the patient being transported.

There are currently 817 active, licensed EMS providers in the state of Texas.[34] Of these providers, 483 provide service to urban counties, 243 provide service to rural counties, and 82 provide service to frontier counties. There are five out-of-state providers serving border communities.[35]

Although the importance of rural and frontier EMS providers in Texas stands in contrast to their levels of funding, staffing, service capability, and training and the general availability of resources, efforts to ensure the availability of services to rural Texas date back to 1973 and the beginnings of a coordinated EMS system in the state. More recently, in addition to the $4 million appropriation for implementation of S.B. 102, the 75th Legislature included Rider 29 in the General Appropriations Act to appropriate $3.1 million to improve emergency medical services through grants to local EMS providers and, in 1999, Speaker James E. "Pete" Laney charged the House Committee on Public Health to examine the requirements imposed on EMS providers in rural areas and to determine whether individual requirements encouraged or hindered the provision of services. The committee's interim report offered a detailed history of the development of emergency medical services in Texas and a statistical status of rural and frontier EMS providers at the time. The tables that follow compare the data reported by the committee in its October 2000 interim report to the 77th Legislature with current data from the Bureau of Emergency Management.

Because of funding constraints rural and frontier EMS providers are often staffed by volunteers with only basic emergency medical training. There are several statutory provisions intended to alleviate the financial strain on these providers. Section 773.0581, Health and Safety Code, exempts providers staffed exclusively by volunteers from the fees otherwise required to operate or maintain an emergency medical service.

Tables 1 and 2 illustrate the change between 2000 and 2004 in the number of providers relying on volunteer staff as indicated by their exempt status. Fifty-two (63.4 percent) of the 82 EMS providers in frontier counties and 81 (33.3 percent) of the 243 providers in rural counties currently are fee-exempt. The total number of providers in these counties has remained constant over the past four years, and, although the use of paid personnel by these providers has increased, a significant percentage remain exclusively staffed by volunteer personnel. The committee reported there were a total of 80 EMS providers in frontier counties and 244 providers in rural counties, with 68.8 percent of frontier providers and 44.7 percent of rural providers fee-exempt in 2000.

**Table 1. Volunteer EMS Providers (2000)**

| | Frontier | Rural | Urban |
|---|---|---|---|
| **Fee-exempt** | 55 | 109 | 69 |
| **Non-exempt** | 25 | 135 | 299 |
| **Total** | 80 | 244 | 368 |

**Table 2. Volunteer EMS Providers (2004)**

| | Frontier | Rural | Urban |
|---|---|---|---|
| **Fee-exempt** | 52 | 81 | 61 |
| **Non-exempt** | 30 | 162 | 422 |
| **Total** | 82 | 243 | 483 |

Tables 3 and 4 compare rural and frontier providers by level of service the provider is certified or licensed to provide. The committee's report did not include data for urban counties. For purposes of comparison, data for urban counties have been included in the table depicting levels of service in 2004.

**Table 3. Rural and Frontier EMS Providers by Level of Service (2000)**

| | Frontier | Rural |
|---|---|---|
| **MICU** | 0 | 23 |
| **ALS** | 0 | 0 |
| **BLS** | 16 | 39 |
| **BLS/ALS** | 17 | 41 |
| **BLS/MICU** | 46 | 127 |
| **ALS/MICU** | 1 | 14 |
| **Total** | 80 | 244 |

**Table 4. Urban, Rural, and Frontier EMS Providers by Level of Service (2004)**

| | Frontier | Rural | Urban |
|---|---|---|---|
| **MICU** | 0 | 19 | 122 |
| **ALS** | 1 | 0 | 2 |
| **BLS** | 14 | 19 | 15 |
| **BLS/ALS** | 15 | 35 | 17 |
| **BLS/MICU** | 49 | 124 | 161 |
| **ALS/MICU** | 0 | 10 | 17 |
| **Designation Not Available** | 3 | 36 | 149 |
| **Total** | 82 | 243 | 483 |

Although there is no statutory requirement that county governments fund emergency medical services, many cities and counties do maintain and operate EMS teams. The committee's report did not include information relating to EMS providers by operational entity for frontier counties. Again, for purposes of comparison, the data for frontier counties has been included in the table depicting operational entities for 2004.

**Table 5. Urban and Rural EMS Providers by Operation (2000)**

| | Rural | Urban |
|---|---|---|
| **State** | 1 | 1 |
| **Police Department** | 1 | 0 |
| **Hospital** | 41 | 30 |
| **Fire Department** | 41 | 98 |
| **County** | 111 | 47 |
| **City** | 69 | 45 |
| **Private** | 65 | 158 |
| **Total** | 329 | 379 |

**Table 6. Urban, Rural, and Frontier EMS Providers by Operation (2004)**

| | Frontier | Rural | Urban |
|---|---|---|---|
| **State** | 0 | 0 | 2 |
| **Police Department** | 1 | 1 | 0 |
| **Hospital** | 10 | 39 | 28 |
| **Fire Department** | 3 | 38 | 110 |
| **County** | 33 | 46 | 19 |
| **City** | 20 | 48 | 51 |
| **Private** | 15 | 69 | 266 |
| **Operation Description Not Available** | 0 | 2 | 7 |
| **Total** | 82 | 243 | 483 |

While the challenges to the delivery of rural emergency care are relatively unchanged, so too are the primary cost-drivers of EMS operation: procuring and maintaining communications systems, vehicles, and equipment; training personnel; and complying with state and federal regulations relating to staffing requirements, certification, and licensing. To address the difficulty of maintaining qualified EMS personnel and providers in rural and frontier Texas, the 78th Legislature passed S.B. 529, providing for temporary exemptions from certain statutory requirements for rural EMS providers and personnel. The bill authorizes TDH to exempt EMS personnel in counties with a population of 50,000 or less or relatively large, isolated, and sparsely populated areas in a county with a population of more than 50,000 from certain minimum standards requirements of Section 773.050, Health and Safety Code. These include standards relating to the minimum number of certified ECAs required to staff BLS vehicles;

staffing requirements for ALS vehicles, MICUs, and specialized EMS vehicles; personnel certification; and training programs. These exemptions are in addition to the statutory exemptions from certain fees extended to providers staffed by volunteers to include private, municipal, and hospital-based firms.

## First Responder Organizations

First responder organizations (FROs) are certified EMS personnel or organizations that provide immediate on-scene care to ill or injured persons but do not transport the victims. First responders include volunteers, EMTs, and paramedics and, in Texas, are required to operate under an agreement with all licensed EMS providers and their medical directors who routinely transport patients by the FRO's personnel. First responder organizations are a critical component of the emergency care system in rural and frontier communities.

Texas currently has 484 approved FROs, with 5 pending approval by the Bureau of Emergency Management. These FROs are approved to provide either basic life support or advanced life support.

## Emergency Services Districts

Emergency services districts (ESDs) are political subdivisions of the state established by local voters and have independent taxing authority to fund emergency medical and ambulance services and fire prevention. Although they are not technically a component of the trauma system, the services they provide obviously include members of the system. Emergency services districts raise money with ad valorem taxes on all real property within the district, and some ESDs also raise funds through a sales tax levy. Senate Bill 1021, passed by the 78th Legislature, required all rural fire prevention districts to convert to emergency services districts.

## State 9-1-1 Emergency Communications

Each year Texans place approximately 12.2 million 9-1-1 calls.[36] The majority of these calls are answered by local police or sheriff's departments (known as public safety answering points) that either respond to the call or transfer the call to the appropriate emergency responder, such as EMS. The 9-1-1 emergency response number was designated as the nationwide number for citizens to report emergencies by the President's Commission on Law Enforcement and Administration of Justice in 1968. By 1980, at least 20 Texas cities had independently established emergency dispatch programs. As some of the larger cities began to incorporate more area, coordinating emergency communications in rural areas within a city's greater metropolitan area became difficult. As a result, the larger municipalities developed regional plans, such as the Greater Harris County 9-1-1 Emergency Network. In many cases, these regional plans were established as emergency communication districts (ECDs). Twenty-four of these districts have been established across the state since 1983. Recognizing the need for a statewide emergency communications system to serve the areas not covered by city and ECD service, the 69th Legislature created the Advisory Commission on State Emergency Communications (CSEC), the work of which culminated in H.B. 911, passed by the 70th Legislature, Regular Session, 1987, establishing the commission as the administrator of a statewide 9-1-1 system.

Currently, emergency communications services are administered by three entities: 24 councils of government that serve as the regional administrators of the statewide system in behalf of the commission; ECDs; and home-rule cities. The state program and the ECDs are governed by Chapters 771 and 772, Health and Safety Code, respectively. The systems operated by home-rule

cities are not governed by statute and, therefore, not bound by statutory restrictions regarding fee amounts or uses for fees collected. Texans fund 9-1-1 services with fees imposed on home, business, and wireless telephone lines: the 9-1-1 service fee, the 9-1-1 equalization surcharge, and wireless communication fees. Home-rule city services are funded by fees established by city ordinance.

The link between inadequate access to medical services and increased reliance on scarce pre-hospital resources and emergency departments in rural areas means that federal and state programs seeking to ameliorate problems of access to health care professionals and facilities similarly are likely to improve emergency and trauma care. There are a number of federal and state programs specifically intended to develop rural health care networks and increase access to primary and specialized care.

# Federal Programs Affecting Rural Health and Emergency Medical and Trauma Care

Responding to the hospital closures that plagued rural health care systems during the 1980s and early 1990s, the United States Congress authorized the Rural Hospital Medicare Flexibility Program (Flex program) with passage of the federal Balanced Budget Act of 1997. The purpose of the Flex program is to support the development of health care networks in rural communities to improve access to medical care. This is to be achieved through two primary components: the critical access hospital (CAH) program administered by the Centers for Medicaid and Medicare Services and a grant program administered by the Federal Office of Rural Health Policy (FORHP) to improve rural health systems.

## CAH Program

Under the CAH program states receive funds to designate and support rural hospitals that are limited service inpatient facilities as a CAH. The designation qualifies the hospital for reimbursement through Medicare on a cost basis for certain services.[37] To be designated a CAH, a hospital must be located in a rural area more than 35 miles from a hospital or another CAH or more than 15 miles in areas with mountainous terrain or only secondary roads, provide 24-hour emergency care services, and average 96 hours or less for patients' length of stay. The National Conference of State Legislatures reports that the vast majority of CAHs are located in health professional shortage areas and in counties with an over-65 population higher than the state average and are the only hospitals in their respective counties. The Health Facility Licensing and Compliance Division reports that as of June 2004, Texas had 55 designated CAHs.

The Benefits Improvement and Protection Act (BIPA) of 2000 and the Medicare Prescription Drug, Improvement and Modernization Act (MMA) of 2003 made significant changes to the CAH program. Under the Flex program, CAHs are permitted to enter into swing-bed agreements whereby a hospital can use a bed to provide either acute care or skilled nursing facility care. The BIPA authorized CAH swing beds to be reimbursed on a cost basis instead of the prospective payment system. Before the passage of the MMA, states could apply for a waiver to the distance requirements for CAHs that were certified by the state as a "necessary provider" of health care services to residents in a particular area. The MMA sunsets this provision effective January 1, 2006. Providers with CAH status certified as "necessary providers" will be grandfathered on and after the sunset date. The MMA also authorized an exception to size limitations to allow CAHs to operate up to 25 beds, instead of 15, for inpatient acute care. These beds are still subject to the 96-hour average length of stay requirement.

## FORHP Grant Program

The Flex program originally provided a four-year, $25 million per year grant program that authorized awards of up to $775,000 for states to improve rural health systems. The program explicitly provides for the use of grant funds to support improvements to rural EMS systems. The FORHP contracted with five rural health research centers and the Rural Policy Research Institute to track the Flex program. Aside from the grant-based EMS initiatives, the institute has reported that hospitals converting to CAH facilities may affect local EMS providers. Critical access hospitals are required to establish written agreements between the CAH and at least one referral hospital relating to patient transfers. These agreements could affect EMS in the areas surrounding a CAH community. The requirement that CAHs provide 24-hour access to

the emergency department may also influence EMS behavior. The Benefits Improvement and Protection Act of 2000 provided incentive for CAHs to own and operate their own ambulance services by authorizing those facilities that are also located where there is no provider of ambulance service within 35 miles to receive cost-based reimbursement.

## Rural Health Clinic Program

Another congressional effort to address problems of access to medical care in rural communities was the Rural Health Clinic Services Act enacted in 1977. A rural health clinic (RHC) is a federally certified facility authorized to receive cost-based reimbursement under Medicare and Medicaid for services provided by physicians and certain mid-level practitioners such as nurse practitioners, certified nurse-midwives, and physician assistants. To be certified as an RHC, a clinic must meet certain location requirements, including being located outside an urbanized area as defined by the U.S. Bureau of the Census and in a medically underserved area or health professional shortage area, and requirements relating to staffing and laboratory services. Certified RHCs provide primary care services that might otherwise be provided by outpatient clinics, emergency departments, or EMS. Rural health clinics may be independent (privately owned) or hospital-based. Between 1978 and 1990, only 581 RHCs were certified nationwide. By 1989 there were only seven active RHCs in Texas.

Attempting to increase participation in the program after the closure of rural hospitals through the 1980s and early 1990s, Congress made several changes to the RHC program, including increasing the reimbursement cap for independent RHCs, mandating annual increases to the cap calculated according to the Medicare Economic Index, and providing a temporary waiver of midlevel employment requirements if a clinic experienced difficulty recruiting. There are currently 324 active, certified RHCs in the state of Texas.

## Federally Qualified Health Centers

Health clinics may also seek federal designation as a federally qualified health center (FQHC) or federally qualified health center look-alike (FQHC look-alike). The Omnibus Budget Reconciliation Acts of 1989, 1990, and 1993 created FQHCs as a new category of Medicaid and Medicare facility. The Health Centers Consolidation Act of 1996 amended Section 330 of the Public Health Service Act to consolidate different types of these health centers into one grant program. Currently, there are five types of health centers collectively referred to as federally qualified health centers: community health centers, migrant/seasonal farmworker health centers, health care for the homeless health centers, public housing primary care health centers, and school-based health centers. Federally qualified health centers are required to provide the same type of services as those provided by rural health clinics. These services and other ambulatory services are reimbursed under Medicaid and Medicare cost-based reimbursement (enhanced Medicaid reimbursement). Texas currently has 40 FQHC organizations that operate approximately 185 service sites.[38]

Of foremost interest to rural health care delivery are the community health centers that provide comprehensive outpatient primary and preventive health care to medically underserved areas. In November 2002, President George W. Bush announced the Initiative to Expand Community Health Centers. This five-year plan included $2.2 billion in funding through federal fiscal year 2006. With funds available from this federal initiative, the Primary Care Office at the Texas Department of Health initiated the FQHC Incubator program. The funds available through President Bush's initiative are distributed on a competitive bid basis, and the FQHC Incubator program was designed to strengthen bids from Texas health centers. The total grant amount for a new FQHC is $650,000. According to the Primary Care Office at TDH, the average annual grant amount for an FQHC in Texas is approximately $1.3 million.[39]

## FQHC Look-Alike Program

The FQHC look-alike program is a designation for clinics that meet the requirements for qualification as an FQHC but do not receive federal grant funding under Section 330 of the Public Health Service Act. As an FQHC look-alike, a health clinic is eligible for cost-based reimbursement under Medicaid and Medicare and for participation in the federal drug pricing program. There are currently two designated FQHC look-alikes in Texas: one in El Paso County and one in Williamson County. The Bureau of Primary Health Care at the HRSA administers the FQHC and FQHC look-alike programs and recommends designation to the Centers for Medicare and Medicaid Services. Designation and levels of funding are all determined at the federal level.

## Foreign Resident Physician Visa Waivers

In addition to efforts to maintain the presence of health care facilities in rural areas, the federal government has also addressed physician recruitment through visa waiver programs. The Exchange Visitor Program, administered by the Bureau of Consular Affairs, allows nonimmigrant visitors to enter the United States temporarily for a specific purpose, such as education or to gain work experience in a particular field. The J-1 visa waiver program waives the requirement that international medical students in the United States under the Exchange Visitor Program return to their home country for two years after completing their education before being eligible to apply for an immigrant visa, permanent residence, or a different nonimmigrant status and return to the United States. The waiver program has been used to recruit foreign physicians to practice medicine in health professional shortage areas. Eligibility for a waiver can be obtained by direct request of a U.S. government agency as an "interested agency" in behalf of a person engaged in work of official interest to the agency or by request through a state office of public health that sponsors a person to work as a physician in a health professional shortage area (HPSA).

Between 1995 and 2002, the U.S. Department of Agriculture (USDA) participated in the J-1 waiver program as an "interested agency" and recommended 424 waivers for physicians providing full-time primary medical care in rural HPSAs in Texas. In March 2002, the USDA withdrew from the program. However, in December 2002, the U.S. Department of Health and Human Services announced it would serve as an interested agency to process the J-1 physician waiver requests pending at the time the USDA withdrew. In June 2003, HHS announced the availability of applications for waivers for physicians who agree to deliver primary care for three years in HPSAs or MUA/Ps.

Eligibility for the J-1 waiver obtained through a state office of public health is limited to 30 waivers per year. This program is commonly known as the Conrad/State 30 program and is administered in Texas by the Texas Primary Care Office at the Texas Department of Health. House Bill 1018, enacted by the 77th Legislature in 2001, restricted the waivers recommended by the state of Texas to qualified physicians who accepted certain employment with the Lower Rio Grande Valley Regional Academic Health Center, served on the faculty of the center, and helped the graduate medical education program at the center obtain professional accreditation by practicing and teaching medicine in a specialty field required for such accreditation.[40] The requirements of H.B. 1018 had unintended consequences on the waiver program after the withdrawal of the USDA. With no federal agency accepting recommendations for J-1 waivers as an interested agency, the state was reduced to recommending a maximum of 30 waivers per year for physicians to serve as faculty at one facility. Senate Bill 558 enacted by the 78th Legislature deleted the requirements relating to employment with the Lower Rio Grande Valley

Regional Academic Health Center and opened the application for Conrad/State 30 waivers to the entire state. Since passage of S.B. 558, the U.S. Department of State has approved 69 J-1 waivers recommended by the state of Texas under the Conrad/State 30 program.

The federal authorization for the Conrad/State 30 program beyond 2004 has expired. The House Committee on the Judiciary Subcommittee on Immigration, Border Security, and Claims of the 108th United States Congress is currently considering House Bill H.R. 4453, relating to a one-year reauthorization of the Conrad/State 30 J-1 visa waiver program. The Congress is also considering several other pieces of legislation relating to rural and frontier health care and emergency medical services. These include, but are not limited to, the Rural Community Hospital Assistance Act (House Bill H.R. 937), the Frontier Healthcare Access Act of 2003 (Senate Bill S. 1883), the Medicare Rural Access Preservation Act of 2003 (H.R. 830), and the Trauma Research and Access to Urgent Medical Attention Act of 2004 (H.R. 3999).

The Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services is the lead federal agency providing funds to ensure the availability of quality health care to low income, uninsured, isolated, vulnerable, and special needs populations—populations such as those in rural and frontier communities. As a result, HRSA is the funding source for several federal programs that apply to rural and frontier primary health, emergency medical, and trauma care, including:

- The Rural Health Care Services Outreach Grant Program—supports projects that demonstrate creative or effective models of outreach and service delivery in rural communities.
- The Rural Health Network Development Grant Program—supports development of rural health networks. Grant funds are used to support activities that strengthen the organizational capabilities of these networks whose purpose is to overcome the fragmentation and vulnerability of providers in rural areas.
- The Rural Health Network Development Planning Grant Program—supports one year of planning activities to develop integrated health care networks in rural areas.
- The Small Rural Hospital Improvement Program—provides grants to small rural hospitals to help them do any or all of the following: (1) pay for costs related to the implementation of the Medicaid prospective payment system; (2) comply with provisions of the Health Insurance Portability and Accountability Act (HIPAA); and (3) reduce medical errors and support quality improvement.
- Grants for Policy-Oriented Rural Health Services Research—awards are available for competitive grants for policy-oriented rural health services research.
- The Rural Health Research Grant Program—Cooperative Agreement—awards are available from the Office of Rural Health Policy for competitive cooperative agreements for rural health research centers.
- Public Access Defibrillation Demonstration Projects Grant Program—designed to assist both urban and rural communities in increasing survivability from sudden cardiac arrest. The program provides funding for the purchase, placement, and training in the use of automated external defibrillators.
- The Rural Emergency Medical Service Training and Equipment Assistance Program—enacted to assist rural and frontier communities in increasing access to desperately needed funding for EMS agencies serving such areas. The program provides funding for innovative solutions to continuing education, initial provider licensure, skill retention, and expanding scopes of practice to support paramedicine as a source of primary care in those communities.

- The Rural Health Best Practices and Community Development Cooperative Agreement Program—develops and continues a number of programs that: (1) help identify and promote best practices for rural health care providers; (2) provide resources to communities for help in shaping their local health care systems to best meet community need; (3) promote best practices to help rural communities with health quality initiatives; (4) identify and translate the key points from emerging policy issues to rural health care providers, researchers, and policymakers; and (5) work with state-based entities such as state offices of rural health and state rural health associations to provide technical assistance in identifying key rural health challenges and programs and resources that will assist rural communities in addressing these challenges.
- The Frontier Extended Stay Clinic Cooperative Agreement Program—evaluates the effectiveness of a new type of provider: the frontier extended stay clinic. Funds must be used to support activities related to the coordination of frontier extended stay clinic efforts throughout a state, including development of protocols, licensure and certification criteria, and program evaluation.

Texas was also selected as one of five states to participate in a project initiated by the Office of Rural Health Policy at the HRSA to identify and promote models to improve collaboration between FQHCs and CAHs. The federal government funded a consultant to meet with the participating states and create a manual based on the information obtained. Although Texas only has three instances of service area crossover between FQHCs and CAHs, the manual produced could offer valuable information to the state and other types of facilities. The Texas Department of Health is monitoring the development of the project.

# State Programs and State Administration of Federal Grants Affecting Rural Health and Emergency Medical and Trauma Care

The State Office of Rural Health (formerly the Center for Rural Health Initiatives) is the state administrator for many of the federal grants awarded to Texas for rural health programs, including those awarded through the Flex program, the Rural Health Clinic program, and the federally qualified health clinic program. The office also administers state programs affecting emergency medical and trauma care in rural Texas.

House Bill 7, passed by the 77th Legislature, Regular Session, 2001, created the Office of Rural Community Affairs (ORCA) and abolished the Center for Rural Health Initiatives, incorporating the center's functions in the new State Office of Rural Health at ORCA. House Bill 7 was the most comprehensive legislation affecting rural health since the Omnibus Rural Health Care Rescue Act in 1989. The bill provided funding for several new programs designed to address problems of access to health care in rural areas: the Outstanding Rural Scholar Recognition and Loan Program, the Health Careers Promotion and Education Program, the Texas Health Service Corps Program for Medically Underserved Areas, and the Rural Health Facility Capital Improvement Program. Below is a list and descriptions of several state programs administered by the office that provide funding and grant opportunities directed at the issues affecting rural health and emergency medical care identified in this publication.

- Critical Access Hospital Board Training Reimbursement—encourages continuing education for all members of CAH boards of trustees and trustees in the governance of a CAH.
- Critical Access Hospital Designation—the State Office of Rural Health is the state administrator for the CAH program in Texas. All applicants for CAH designation are processed by the office.
- Critical Access Hospital Feasibility Study Grant—provides support for health care facilities to conduct a study to determine if CAH designation is appropriate for a particular rural hospital. Grants are awarded in amounts up to $5,000.
- Critical Access Hospital Network Grant—supports collaborative efforts among rural health care organizations and other community entities in improving access to or quality of essential health care and emergency medical services that meet local needs. Funds are available to be used for staff and contractual or professional services to aid in the development of the network. Up to $5,000 of the total grant may be used for capital investment. Grants are not eligible to be used for direct patient care delivery, the purchase, construction, or renovation of facilities, or the purchase of vehicles.
- Access to Emergency Devices Grants—the office is the administrator for federal grants for the purchase of automated external defibrillators (AEDs) and cardiopulmonary resuscitation and AED training.
- Capital Improvement Loan Fund—grants for capital improvements to existing facilities, construction of new facilities, and the purchase of capital equipment, including information systems hardware and software. Eligible applicants include public and nonprofit hospitals in counties of less than 150,000 population. Funds are available for projects up to $50,000. Total funds available are expected to be $2 million.
- Small Rural Hospital Improvement Program—helps small rural hospitals pay for costs related to the implementation of the prospective payment system and compliance with HIPAA.

- Rural Communities Healthcare Investment Loan Reimbursement Program—funds rural community loan reimbursement up to $6,000 per year to any non-physician health care professional who resides and practices in the community.
- Rural Physician Relief Program—offers affordable relief services to physicians who provide primary care in rural Texas so those physicians can take time away from their practice.
- Medically Underserved Community-State Matching Incentive Program—provides funding to cover costs of establishing a private practice to enhance the ability of underserved communities to attract and retain primary care physicians.
- Rural Recruitment and Retention Initiative—assists critical access hospitals with projects that enhance the community's ability to support and improve delivery of local health care and/or emergency medical services.
- Outstanding Rural Scholar Recognition Program—matches community funds with state funds to support the education of a health professional student from the community.
- Texas Health Service Corps Program—provides stipends to physicians in residency who agree to provide primary care services to an underserved community for one year for every year the stipend is awarded.

The state emergency medical dispatch resource center pilot program created by H.B. 3312, enacted in the 77th Legislature, was specifically designed to serve rural populations and to help provide timely response to emergency situations. The bill directed the Texas Department of Health to select a public safety answering point to serve as an emergency medical dispatch resource center that would accept incoming 9-1-1 emergency calls from underserved rural communities to deliver emergency medical instruction to the caller before the arrival of a first responder or emergency medical service provider. The pilot program was extended until 2005 by S.B. 1409 enacted by the 78th Legislature.

# Other States' Trauma Systems and Trauma Care Initiatives

Texas is unique. The vast majority of the state's land area is within the 177 counties designated as nonmetro, and the state's frontier land area is second only to Alaska's. In addition, Texas' frontier population is the largest in the United States but represents less than six percent of the state's total population. All these factors make comparisons to other states difficult at best. However, a number of other states' rural health programs have initiated changes in federal policy to great success. Montana's Medical Assistance Facility demonstration project, on which the Medicare Rural Hospital Flexibility Program was partially based, is one example.

Most states fund their trauma systems and EMS providers through tobacco litigation settlement funds, fines assessed on certain moving violations, vehicle registration or driver license fees, and 9-1-1 surcharge fees. Some states have authorized ambulance districts or other specific purpose districts to levy ad valorem or sales taxes with the express purpose of funding EMS providers.

A number of other states have created innovative programs to meet the needs of their medically underserved populations. Most of these programs focus on improving emergency medical services:

- Minnesota has developed the Comprehensive Advanced Life Support (CALS) program to train rural health care providers such as physicians, nurses, and physician assistants through a special emergency medicine course designed to prepare the provider for a wide range of emergencies.
- New Mexico developed a program to train paramedics and community health specialists in certain primary and preventive care, reducing the demand for transporting patients long distances by ambulance for nonemergency care. The program has resulted in a decrease in nonemergency ambulance transport from 78 percent to 11 percent of all emergency calls.
- Family practice medical students at the University of Tennessee are trained in emergency care that may be required in a rural setting, such as trauma, medical and psychiatric crises, and childbirth. These skills are applied at a 90-bed hospital in a rural county, and the students staff the hospital's 24-hour emergency room.

Immediately after the Medicare Flexibility Program was enacted, legislation was filed in the United States Senate to expand the program to apply enhanced Medicaid reimbursement to frontier county health clinics. These clinics would become extended-stay primary care (ESPC) clinics and would expand the Flex program to include facilities outside the hospital scope-of-practice guidelines used to designated CAHs. The state of Alaska submitted a state rural health plan to the federal government that includes the development and implementation of an extended-stay primary care program and amends the state's Medicaid plan to include enhanced reimbursement for ESPC services.

# Conclusion

This publication is not intended as a comprehensive resource for all of the information needed to formulate policy relating to such a complex issue as rural trauma and emergency medical services. It is intended to provide background on the development of the Texas trauma system, the unique hindrances to effective trauma and emergency medical care in rural Texas, and the history and scope of federal and state programs impacting the delivery of that care in Texas.

# Notes

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9. Texas Hospital Association, Emergency Care Issues Survey, July 2002.

10. Madelyn Goldman, RN, BSN, "Implications of Emergency Rooms as Primary Care Facilities," *Vital Signs Magazine*, Vol. XIV, No. 02, February 3, 2004.

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13. Ibid.

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28. United States Census Bureau, Census 2000 data.

29. Economic Research Service, United States Department of Agriculture.

30. This figure does not include HPSAs consisting of correctional facilities.

31. EMS and Trauma Care System Account, Final Report to the 77th Legislature, February 2001. Bureau of Emergency Management, Texas Department of Health.

32. Ibid. The allotment breakdown of the account for FY2001 included $1,225,000 for the EMS allotment; $437,500 for the RAC allotment; $35,000 for the uncompensated care allotment; and $52,500 for administrative costs.

33. Texas Attorney General Opinion No. JC-0178 (2000).

34. The sum of the EMS providers serving urban, rural, frontier, and border communities (813) was obtained from data sets provided by the Bureau of Emergency Management. The 817 figure is a more recent total transmitted to the Texas Legislative Council via a phone call without a service area breakdown for the additional EMS providers.

35. The data referenced in this section is based on the following definitions: urban—located in a county with a population of more than 50,000; rural—located in a county with a population of less than 50,000 and an average population density of more than six people per square mile; frontier—located in a county with a population of less than 50,000 and an average population density of less than six people per square mile.

36. Commission on State Emergency Communications publication, "9-1-1 in Texas."

37. Cost-based reimbursement or retrospective cost-based reimbursement is the practice of reimbursing for services provided based on the reasonable costs incurred in delivering the services. After passage of the Social Security Amendments Act of 1983, most Medicare programs have operated on a prospective payment system by which "costs" are based on predetermined rates that represent the cost of treating a patient according to the patient's medical condition.

38. According to the Texas Department of Health Center for Health Statistics there are 40 FQHC organizations in Texas. At the time this publication was completed, name and service site information were obtained for 42 health centers, some of which are administered by a single organization. These affiliations account for the difference in number.

39. This is a statistical average calculated by taking the total amount of grant funds and dividing it by 40, the total number of FQHCs in the state.

40. At the time H.B. 1018, Acts of the 77th Legislature, 2001, was enacted, the limit on Conrad waivers was 20; accordingly, the program was referred to as the Conrad/State 20 program. The limit was increased to 30 in November 2002. The four counties served by the Lower Rio Grande Valley Academic Health Center are Cameron, Hidalgo, Starr, and Willacy Counties.