

September 2010

# AIR AMBULANCE

## Effects of Industry Changes on Services Are Unclear



GAO

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## Why GAO Did This Study

Changes in the air ambulance industry's size and structure have led to differences of opinion about the implications for air ambulance use, safety, and services. Some industry stakeholders believe that greater state regulation would be good for consumers. While states can regulate the medical aspects of air ambulances, the Airline Deregulation Act (ADA) preempts states from economic regulation—i.e., regulating rates, routes, and services—of air ambulances. Other stakeholders view the industry changes as having been beneficial to consumers and see no need for a regulatory change.

Asked to review the U.S. air ambulance industry, GAO examined (1) changes in the industry in the last decade and the implications of these changes on the availability of air ambulances and patient services and (2) the relationship between federal and state oversight and regulation of the industry. GAO analyzed available data about the industry; synthesized empirically based literature on the industry; visited four air ambulance providers with differing views on the industry changes; and interviewed federal and industry officials.

GAO is not making recommendations in this report. GAO incorporated comments on a draft this report from the appropriate federal agencies and key industry and emergency medical services stakeholders.

## AIR AMBULANCE

### Effects of Industry Changes on Services Are Unclear

## What GAO Found

From 1999 through 2008, the number of patients transported by helicopter air ambulance increased from just over 200,000 to over 270,000, or by about 35 percent, and the number of dedicated air ambulance helicopters increased from 360 to 677, or by about 88 percent. During the same period, the structure of the industry changed from a preponderance of providers affiliated with a specific hospital to a fairly even split between hospital-based and independent providers, often located outside hospitals, in suburban or rural communities. Perspectives on the implications of these changes vary. Supporters of the existing regulatory framework say that the growth in the number of helicopters provides, among other things, flexibility to perform aircraft maintenance on some helicopters while keeping others available to respond as needed. Proponents of a change in the regulatory framework maintain that the growth in helicopters has led to medically unnecessary flights. These stakeholders assert that high fixed costs create economic pressure to fly in unsafe weather and use less costly small helicopters that limit some patient services. GAO found few data that support either perspective.

Court cases and advisory opinions from the Department of Transportation (DOT) have helped to clarify the relationship between federal and state oversight and regulation of the air ambulance industry, but DOT has acknowledged a continuing lack of clarity in some areas. Generally, the federal government has authority and oversight concerning the economic and safety aspects of the industry; states—which are preempted from regulating matters related to prices, routes, and services—have authority over the medical aspects. However, when both economic and medical or safety and medical issues are involved, questions about jurisdiction may arise. To resolve such questions, states have sought DOT's opinion and, in response, DOT has issued eight opinion letters since 1986. Some state officials have expressed concerns, particularly in relation to a DOT opinion letter on Hawaii laws, that the open-ended nature of the opinion could allow any medical regulation to be challenged as an economic regulation and thus be preempted under the ADA. States can continue to seek DOT's opinion on a case-by-case basis, as further questions surface. Additionally, states can also contract directly with air ambulance providers, which would allow states to control specific services as the customer.

### Air Ambulance Helicopter



Source: Mark Mennie.

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# Contents

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<b>Letter</b>		1
	Background	3
	The Air Ambulance Industry Has Seen Growth and Structural Change, but Perspectives Differ on Implications for Availability, Efficient Use, Safety, and Services Provided	6
	Federal and State Courts and DOT Have Clarified Some Boundaries of Federal and State Regulation of Air Ambulances, but Questions Remain	20
	Agency and External Comments and Our Evaluation	26
<b>Appendix I</b>	<b>Scope and Methods</b>	29
<b>Appendix II</b>	<b>Literature Synthesis</b>	32
<b>Appendix III</b>	<b>Key Court Cases and Opinion Letters from DOT or State Attorneys General</b>	36
<b>Appendix IV</b>	<b>Comments from the National Transportation Safety Board</b>	41
<b>Appendix V</b>	<b>GAO Contact and Staff Acknowledgments</b>	46
<b>Bibliography</b>		47
<b>Tables</b>		
	Table 1: Differing Results of Sequential Helicopter Requests	13
	Table 2: Perceived and Intentional Call Jumping	14
	Table 3: Issues Related to Air Ambulances That Courts, DOT, and State Attorneys General Have Ruled Can and Can Not Be Regulated by States	23

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Table 4: Summary of Key Court Cases Related to the Air Ambulance Industry	36
Table 5: Summary of DOT or State Attorneys General Opinions Related to the Air Ambulance Industry	37

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## Figures

Figure 1: Percentage of Payments for Air Ambulance Transports Received from Different Sources	5
Figure 2: Number of Air Ambulance Helicopters and Patient Transports, 1999 through 2008	7
Figure 3: Number of Air Ambulance Helicopters in Each State in 2009	8
Figure 4: Schematic Representation of Helicopter Air Ambulance Geographic Coverage When Based at a Hospital Compared with Bases in the Community	10
Figure 5: Example of a Medical Bay in a Single-Engine Helicopter	17
Figure 6: Depiction of Aviation and Medical Components of an Air Ambulance	21
Figure 7: Literature Synthesis Process and Results	35

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## Abbreviations

AAMS	Association of Air Medical Services
ACCT	Association for Critical Care Transport
ADA	Airline Deregulation Act of 1978
ADAMS	Atlas and Database of Air Medical Services
AMOA	Air Medical Operators Association
ASRS	Aviation Safety Reporting System
CUBRC	Calspan-University of Buffalo Research Center
DOT	Department of Transportation
EMS	emergency medical services
EVENT	Emergency Medical Service Voluntary Event Notification Tool
NAEMSP	National Association of EMS Physicians
NASEMO	National Association of State EMS Officials
FAA	Federal Aviation Administration
NTSB	National Transportation Safety Board

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United States Government Accountability Office  
Washington, DC 20548

September 30, 2010

The Honorable John L. Mica  
Ranking Member  
Committee on Transportation and Infrastructure  
House of Representatives

The Honorable Jerry F. Costello  
Chairman  
The Honorable Thomas E. Petri  
Ranking Member  
Subcommittee on Aviation  
Committee on Transportation and Infrastructure  
House of Representatives

The Honorable Jason Altmire  
House of Representatives

The Honorable John D. Rockefeller  
Chairman  
The Honorable Kay Bailey Hutchinson  
Ranking Member  
Committee on Commerce, Science, and Transportation  
United States Senate

During the past decade, the air ambulance industry has grown and its structure has changed. Air ambulances are generally helicopters or fixed-wing aircraft that are specifically outfitted to transport ill or injured persons. Air ambulances may transport patients from accident scenes to hospitals, or transport patients between hospitals to receive more sophisticated medical care at specialty facilities such as trauma, burn, or cardiac centers. Most air ambulance companies operate as commercial entities and are subject to a mixture of federal and state regulation. The industry is subject to Federal Aviation Administration (FAA) safety regulations covering areas such as pilot training requirements, flight equipment, and aircraft configuration. States can regulate the medical aspects of air ambulances, but the Airline Deregulation Act of 1978 preempts states from economic regulation—i.e., regulating rates, routes, and services—of air ambulances. Some industry stakeholders are concerned with the growth in the industry and view the industry's changes as having a negative effect on the services provided to patients. These stakeholders generally support changing the regulatory and oversight

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framework to provide states more regulatory authority. Other groups of stakeholders view the growth in the industry as having been beneficial to society and generally don't support such a change.

Given the differences of opinion about the effects of the air ambulance industry's growth and changes to its structure, you asked us to review the U.S. air ambulance industry. To do this, we examined: (1) how the industry changed in the last decade and the implications of these changes for the availability of services, efficient use of air ambulance resources, safety, and services provided and (2) the relationship between federal and state oversight and regulation of the air ambulance industry. To examine these issues, we obtained and analyzed available data that provided information on the growth and evolution of the industry, shifts in business models, and the types of air ambulance aircraft that are used to provide services. Specifically, we obtained and analyzed data on the trends in air ambulance industry growth from a research database<sup>1</sup> and from the Atlas and Database of Air Medical Services (ADAMS).<sup>2</sup> We also analyzed Medicare payment data. We reached out to the air ambulance community by emailing more than 400 air ambulance providers, industry associations, and state emergency medical services (EMS) officials, asking that they provide us any data, information, published or unpublished reports, papers, articles, or other potentially relevant sources of information of which they would like us to be aware. We also conducted a comprehensive literature search to identify peer-reviewed studies that reached empirically based conclusions on air ambulance practices or outcomes. We identified and synthesized over 250 studies related to the air ambulance industry, dating as far back as 1975. We reviewed past GAO reports, transcripts of congressional and National Transportation Safety Board (NTSB) hearings, industry association position papers, and other industry documents. In addition, we conducted interviews with representatives from the key air ambulance associations—Association of Air Medical Services (AAMS), Association for Critical Care Transport (ACCT), and the Air Medical

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<sup>1</sup>With permission, we used the data compiled by Ira J. Blumen, MD; Medical/Program Director, University of Chicago Aeromedical Network, University of Chicago Medical Center; Professor, Section of Emergency Medicine, University of Chicago. We determined that these data are sufficiently reliable for our purposes.

<sup>2</sup>The Atlas and Database of Air Medical Services shows, among other things, the number and location of fixed wing and helicopter air ambulances in each state. It has been published annually since 2004 as a partnership effort between the Association of Air Medical Services and the Calspan-University of Buffalo Research Center (CUBRC). We determined that these data are sufficiently reliable for our purposes.

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Operators Association (AMOA). We also met with the National Association of State EMS Officials (NASEMSO). We conducted four site visits to air ambulance providers that reflected differing geographic locations, business models, and opinions about the implications of changes in the industry.

To analyze the relationship between federal and state oversight and regulatory responsibilities, we reviewed federal and state court cases and opinions issued by the Department of Transportation's (DOT) Office of General Counsel. We also discussed the implications of industry trends and federal and state authority with the key industry stakeholders mentioned above, as well as with officials at FAA, the National Highway Traffic Safety Administration, NTSB; as well as representatives of NASEMSO. See appendix I for a more complete description of our scope and methodology and appendix II for a more complete description of our literature review and synthesis.

We conducted this review from December 2009 to September 2010, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Background

Air ambulances can play an important role in transporting patients with time critical injuries and conditions to medical facilities and providing patients with advanced care while en route. Air ambulances transported more than 270,000 patients in 2008, and their use is widely believed to improve the chances of survival for trauma victims and other critical patients. Composing more than 80 percent of air ambulance aircraft, helicopter air ambulances transport patients from the scene of an accident to a hospital or perform short-distance interhospital patient transfers. Because fixed-wing aircraft only fly between airports, they are not typically used to transport injured patients from an accident scene. Patients are transported by ground to and from the airport. Fixed-wing air ambulances generally perform more long-distance interhospital transports, often moving patients from a hospital to a distant specialized facility. Just over half of air ambulance transports are for moving patients between hospital facilities, one-third are for transporting victims from the accident scene to a hospital, and the remainder are for other purposes, such as

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organ transports or specialty care flights such as for pediatric and neonatal patients.

Most air ambulances carry a pilot and a two-person medical crew. The medical crew may include a physician, nurse, paramedic, emergency medical technician, or other medical personnel. According to AAMS, the typical medical crew includes a critical care nurse and a paramedic. A critical care nurse has specialized training in responding to life-threatening health problems, such as those faced by many patients who are transported on air ambulances. Paramedics represent the highest licensure level of prehospital emergency care in most states, as they have enhanced skills and can administer a range of medications and interventions. Other caregivers and physicians may be added to a medical crew if the patient's condition necessitates further care.

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### Air Ambulance Providers Operate Under Three Basic Business Models

In the air ambulance industry, the business model is generally defined by the entity that owns or contracts for the aviation and medical services that are provided. Air ambulance providers generally use one of the following three business models.

- *Hospital-based*: a hospital generally controls the business by providing medical services and staff while usually contracting out for the aviation component, including the pilots, mechanics, and aircraft.
- *Independent*: operations are not controlled or run by a specific medical facility. Independent providers may directly employ, or can contract for, the medical and flight crews to provide air ambulance services.<sup>3</sup>
- *Government operator*: a state or local government or military unit owns and operates the air ambulances.

However, a large number of variations exist within these structures. Some providers have adopted a “hybrid” model or have established joint ventures with hospitals.

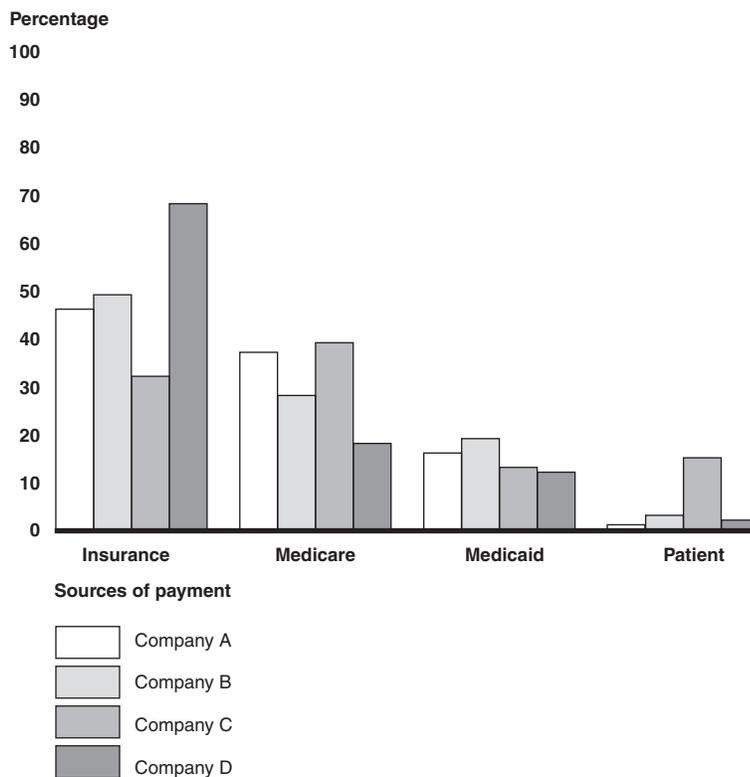
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<sup>3</sup>The hospital-based model is sometimes referred to as the “traditional model,” while the independent provider model is sometimes referred to as the “community based model.” In this report, we use the terms hospital-based and independent provider, respectively, to refer to these models.

## Air Ambulance Providers Receive Revenue from a Variety of Sources, Including Federal Medicare and Medicaid Programs

Air ambulance companies receive payment for transports from several sources, including private health insurance, government programs such as Medicare and Medicaid, and the patient. While industry revenue and payment data are not widely available, we obtained data on the percentage of total income that four air ambulance providers receive from each source. (See fig. 1.) For these four companies, private insurance companies or Medicare paid for most of the transport costs. A relatively small percentage of the costs were paid for by the patient themselves.

**Figure 1: Percentage of Payments for Air Ambulance Transports Received from Different Sources**



Source: GAO analysis of air ambulance company data.

Note: Includes providers of various sizes that operate under variations of the hospital-based or independent business models. Does not include government operators.

From 2002 through 2006, the Centers for Medicare and Medicaid Services, the agency within the Department of Health and Human Services that administers Medicare and Medicaid, phased in a national fee schedule for air ambulance providers as a part of a series of Medicare payment reforms

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that Congress mandated in 1997. The national fee schedule redistributed, on a budget-neutral bases, payments among various types of ambulance services. Prior to 2002, Medicare reimbursement differed depending on the air ambulance provider's business model: hospital-based providers were reimbursed based on reasonable costs,<sup>4</sup> while independent providers were reimbursed based on reasonable charges.<sup>5</sup> This policy contributed to wide variation in the reimbursement rate for the same service, with hospital-based providers generally receiving higher reimbursement than independent providers for similar services. The new national fee schedule established one payment rate for fixed-wing transports and another rate for helicopter transports. The fee schedule also provides higher reimbursement for transports in rural areas, but it does not differentiate payments according to the business model followed, the size of the aircraft used, or the level of medical or safety equipment on board.<sup>6</sup>

In addition to the revenue they receive from transports, air ambulance providers may receive or generate income for their operations from other sources. For example, hospital-based providers may receive funding from the hospital, and some independent air ambulance providers have established membership programs that generate income from annual fees.<sup>7</sup> Government operators may receive funding through taxes or surcharges. For example, Maryland's government-operated air ambulance service receives funding through a surcharge on state motor vehicle registrations.

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## The Air Ambulance Industry Has Seen Growth and Structural Change, but Perspectives Differ on Implications for Availability, Efficient Use, Safety, and Services Provided

From 1999 through 2008, the number of patients transported by helicopter air ambulances increased from just over 200,000 to over 270,000, or about 35 percent, and the number of air ambulance helicopters increased from

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<sup>4</sup>Reasonable-cost payments were based upon the provider's cost of providing ambulance services as reported on costs reports.

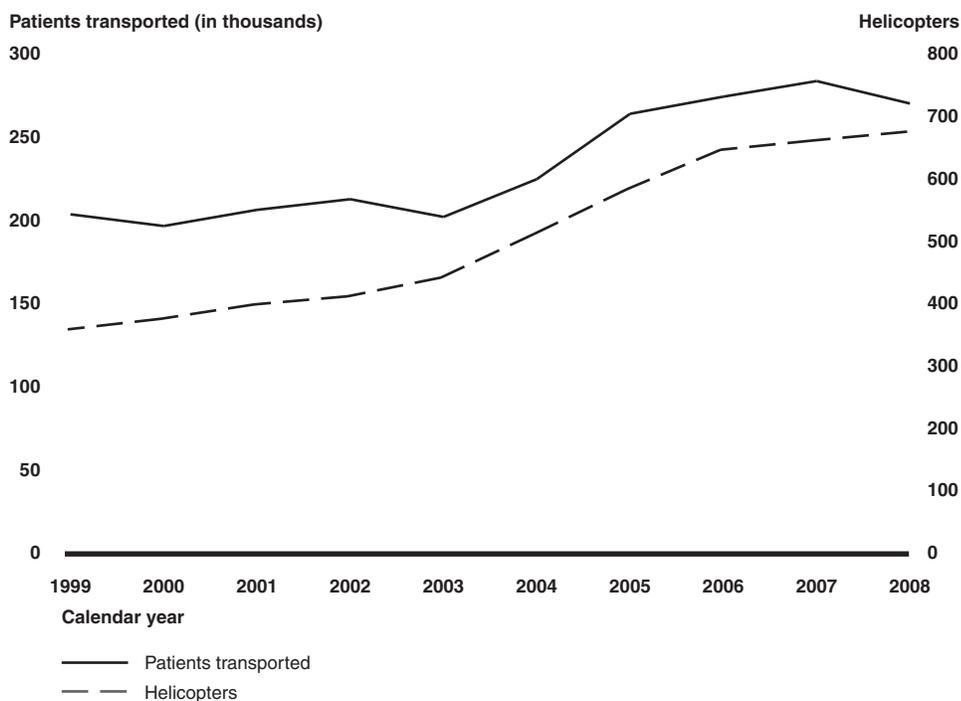
<sup>5</sup>Reasonable-charge payments were based on the bill from the ambulance service provider, but were subject to an upper limit.

<sup>6</sup>Payments for Medicare air ambulance transports are determined through a nationally uniform unadjusted base rate; and a geographic adjustment factor.

<sup>7</sup>Membership programs cover the patient's cost in the event that the member requires an air ambulance transport. To utilize membership benefits, the member must be transported by the company that sold the membership. The member does not pay for any cost of the transport that is not covered by insurance. These services specify some limitations to the availability of service such as when aircraft are currently transporting another patient, maintenance of the aircraft is required, or weather conditions limit the ability to fly. One large air ambulance provider that sells memberships has about 800,000 members.

360 to 677,<sup>8</sup> or by about 88 percent. The data also show that between 2007 and 2008 there were an increasing number of helicopter air ambulances and a decreasing number of transports. (See fig. 2.) We were unable to determine whether the downward movement in 2008 represents a trend because 2009 data on patients transported were not available.

**Figure 2: Number of Air Ambulance Helicopters and Patient Transports, 1999 through 2008**



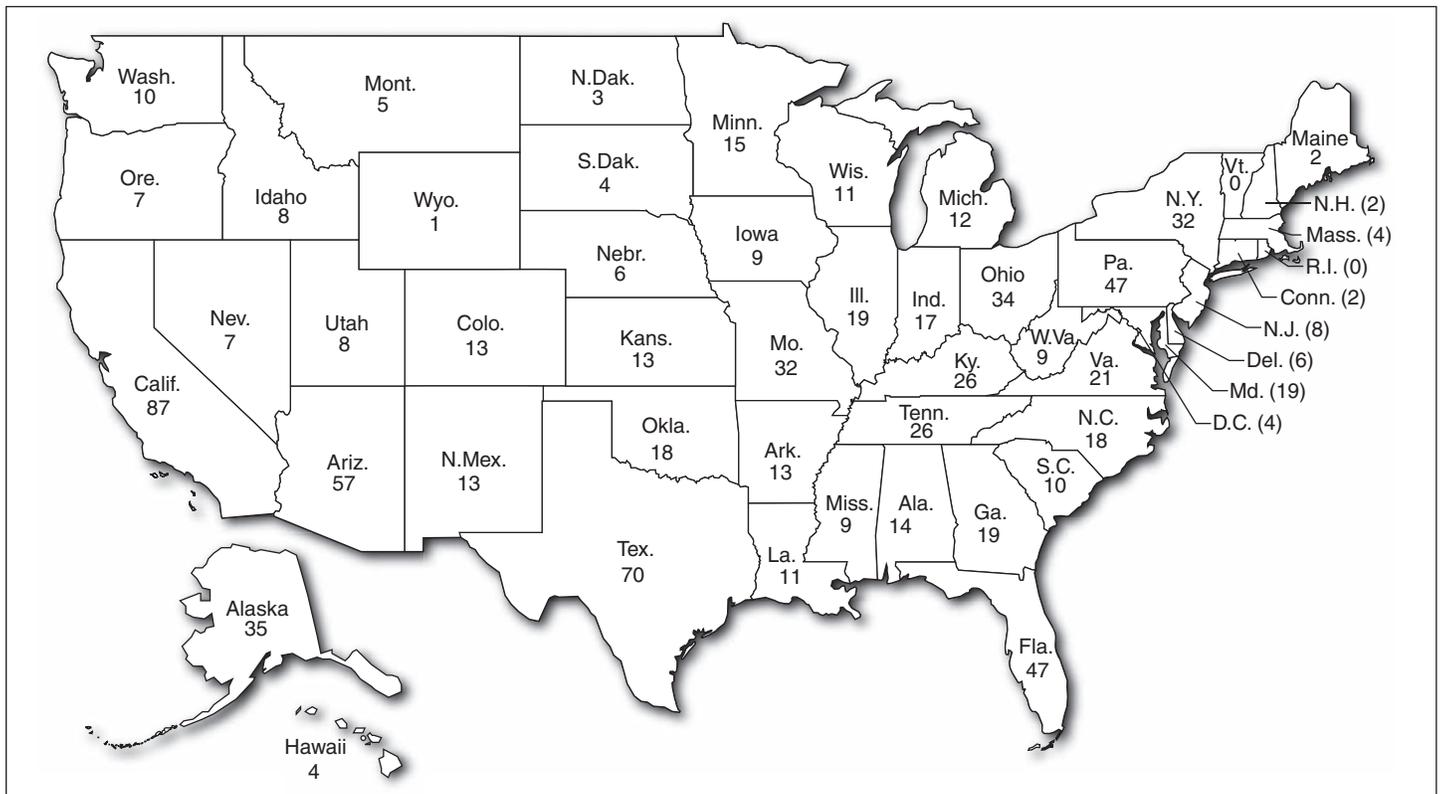
Source: GAO analysis of University of Chicago Aeromedical Network data.

Note: This research data was compiled by Ira J. Blumen, MD, Medical/Program Director, University of Chicago Aeromedical Network, as presented to NTSB, February, 2009. Dr. Blumen's data is the only source that we could find that provided continuous data spanning the past decade.

The number of air ambulance helicopters varies widely by state. (See fig. 3.) Most states have multiple helicopters based in their state. Vermont and Rhode Island have none, but their air transport needs are served by providers in bordering states.

<sup>8</sup>Excludes military helicopters and dual-use helicopters (helicopters that are used as air ambulances and for other purposes).

**Figure 3: Number of Air Ambulance Helicopters in Each State in 2009**



Sources: GAO analysis of *Atlas and Database of Air Medical Services*, 2009 edition; Map Resources (map).

Note: ADAMS is based on voluntary data reporting and shows, among other things, the number and location of air ambulance helicopters in each state. The numbers for Alaska and North Carolina include air ambulance helicopters, 17 and 3 respectively, from selected military units that are routinely used in civilian rescue.

Since 1999, the structure of the air ambulance industry has also changed. In the past, most air ambulance providers were hospital-based, whereas today, about half the providers are independent, with no support from hospitals in terms of ownership, risk, and financial support.

According to industry stakeholders, a variety of factors contributed to the industry's growth and structural change. The downsizing or closing of some community hospitals, according to stakeholders, resulted in longer transports to get some patients to hospitals, making it more advantageous to use air ambulances that could transport patients over longer distances more quickly than by ground ambulances. Similarly, the establishment of regional medical facilities, such as cardiac and stroke centers that provide

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highly specialized care for critically ill patients, encouraged the use of air ambulances, again because they could transport patients more quickly from outlying areas. Finally, implementation of the Medicare fee schedule provided those wishing to provide air ambulance services a degree of predictability for Medicare reimbursement, which stakeholders noted enabled air ambulance providers to develop more accurate financial plans.

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### Growth in the Number of Air Ambulances and Movement of Their Bases into Communities Have Increased Availability

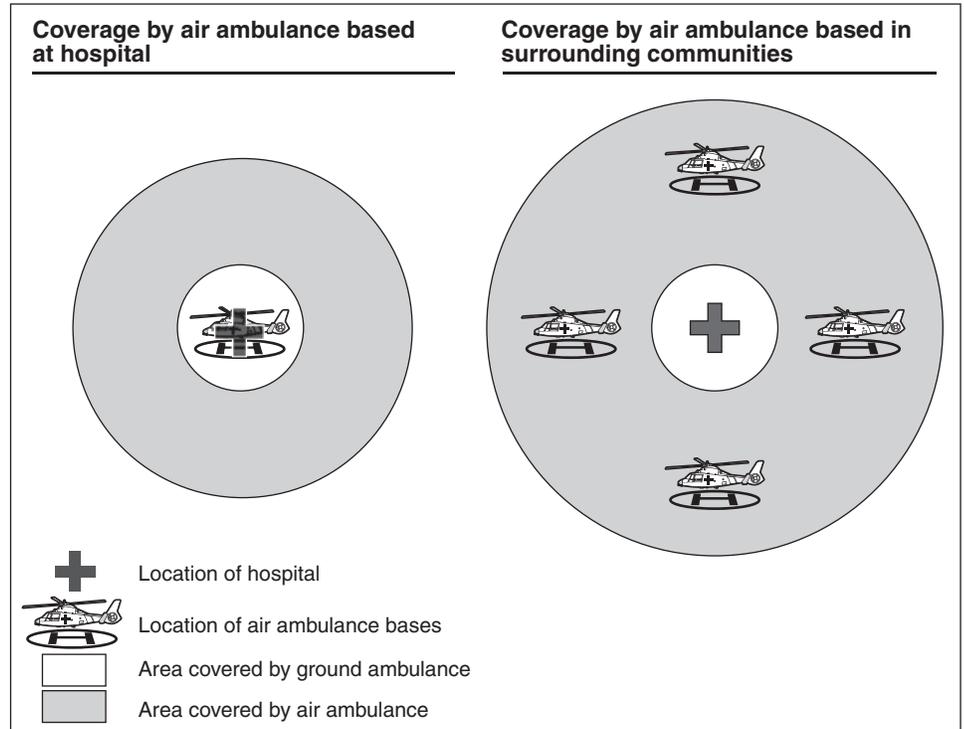
The growth in the number of helicopters and their movement into communities have generally made them more available to those in need. According to some stakeholders, having multiple air ambulances in an area increases the industry's capacity to meet regional needs. For example, if one helicopter is unavailable because it is undergoing scheduled maintenance or responding to an air medical transport request, another helicopter in the same region is more likely to be available. Additionally, with more air ambulances available in rural communities, rural ground ambulances may be involved less frequently in transporting patients over long distances, and rural communities are less likely to be left without an ambulance or EMS crew.

Providers also relocated air ambulance bases, moving them from hospitals into surrounding communities and thereby extending their availability. (See fig. 4.) A 2005 nationwide study of access to trauma centers in the United States found that 84 percent of the population had access to a Level I or II trauma center within 60 minutes. Of that population, almost 28 percent could only access those trauma centers in an hour or less because they were located within the coverage of an air ambulance.<sup>9</sup> Stakeholders concerned with the growth in the industry, noted that the increase in the number of helicopters has been focused in areas that already have multiple air ambulance services while rural areas remain underserved. They said that ensuring the availability of air ambulance services in rural areas is problematic because covering a large, sparsely populated geographic area affects profitability and impacts companies' ability to provide services in these areas.

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<sup>9</sup>See Bibliography: Branas (2005); Criteria used in differentiating levels of trauma care vary by state, but are mostly based on the guidelines published by the American College of Surgeons Committee on Trauma. Level I and II trauma centers provide comprehensive care for the most critically injured patients and have immediate availability of trauma surgeons and certain other physician specialists. Level III centers provide prompt assessment, resuscitation, surgery, and stabilization with transfer to a Level I or II center when necessary.

**Figure 4: Schematic Representation of Helicopter Air Ambulance Geographic Coverage When Based at a Hospital Compared with Bases in the Community**



Source: GAO.

Note: Ground ambulances may also be based in the communities surrounding hospitals, but their geographic range is more limited than that of an air ambulance. Fly circles and locations of specific air ambulance providers vary based on several factors, including the capabilities of their aircraft and local terrain.

**Literature Indicates That Questions about the Medical Necessity of Some Air Ambulance Transports Have Existed for Decades**

Stakeholders concerned with industry growth believe that uncontrolled growth of air ambulances in a region leads to medically unnecessary use—that is, when an air ambulance is dispatched for a patient whose injury or illness is not severe enough for the patient to need air transport. One stakeholder group compared data on the severity of patients’ injuries and discharge rates, developed by Arizona’s Department of Health Services, with similar data for a Level I Trauma Center in New Hampshire, and an air ambulance service in Boston. According to their analysis, the injuries of patients transported in Arizona, a state with a comparatively large number of helicopters, were less severe than those of patients transported

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in the two other states that have fewer helicopters.<sup>10</sup> However, the comparison does not examine other factors involved in decisions about how to transport patients, including transport distances, who makes the transport decision, and what protocols guide the decision maker. Additionally, the decision to request an air ambulance is generally made by the attending physician at a hospital or by first responders at an accident scene.

Concerns about medically unnecessary use of air ambulances have existed since the early 1980s. We identified 32 studies examining triage criteria using data collected from as early as 1975 to as recently as 2008.<sup>11</sup> Fifteen study authors conclude that further measurement indices are needed to better identify over- and undertriage of patients transported by air ambulance.<sup>12,13</sup> Because triage protocols and patterns of air ambulance utilization have changed considerably in the past 30 years, early reports must be interpreted with caution and their relevance to current triage protocols and air ambulance is unclear. It is also important to consider these studies in their historical context. Numerous guidelines on appropriate use of ambulances have been published. In 2006, the American College of Emergency Physicians and the National Association of EMS Physicians (NAEMSP) issued *Guidelines for Air Medical Dispatch* that built upon earlier guidelines published by NAEMSP, AAMS, and the American Academy of Pediatrics. The 2006 position statement recognized the continuing debate surrounding air medical transport and noted that research regarding the appropriate deployment of complex medical care systems was in its infancy. Furthermore, the position statement noted that many EMS systems have their own criteria for air medical dispatch, which

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<sup>10</sup>This analysis is unpublished and has not been peer reviewed.

<sup>11</sup>See Bibliography: Bledsoe (2006), Tiamfook-Morgan (2008), Cunningham (1997), Brathwaite (1998), Boyd (1989), Moront (1996), Wuerz (1996), Carr (2006), Schwartz (1990), Jacobs (1989), Emerson (2003), King (2009), McCowan (2008), Benson (1993), Purtill (2008), Norton (1996), Cocanour, (1997), O'Malley (1994), Stohler (1991), Urdaneta (1987), Urdaneta (1984), Eckstein (2002), Burney (1988), McCowan (2006), Gabram (1991), Williams (1990), Falcone (1993), Fromm (1992), Baxt (1987), Johnson (1995), Savitsky (1995), and Cook (2001).

<sup>12</sup>See Bibliography: Bledsoe (2006), Tiamfook-Morgan (2008), Moront (1996), Wuerz (1996), Carr (2006), Schwartz (1990), Coconaur (1997), Eckstein (2002), Burney (1988), McCowan (2006), Gabram (1991), Falcone (1993), Fromm (1992), and Savitsky (1995).

<sup>13</sup>Overtriage refers to unnecessary mobilization of the trauma response team for patients without significant injuries, whereas, undertriage refers to missing significant injuries in patients.

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usually differ between regions based on demographic, geographic, and health care resource considerations.

Work on developing national guidelines is under way. After its February 2009 air ambulance safety public hearing, NTSB recommended that the Federal Interagency Committee on Emergency Medical Services develop national guidelines for selecting the most appropriate emergency transportation mode for urgent care.<sup>14</sup> In response, the committee has begun to develop guidelines for the emergency transport of trauma victims from the scene of injury. These guidelines may eventually include recommendations for the transport of patients with other medical emergencies and for interfacility transports.

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## Little Evidence Exists to Link Industry Growth to Safety Concerns

Proponents of increasing state regulatory authority argue that having multiple providers in the same area creates pressure to fly that can lead to a number of unsafe practices.<sup>15</sup> They maintain that providers' high fixed costs create economic pressure to fly, and the concentration of many air ambulances in a geographic area further exacerbates this pressure. Air ambulance providers' fixed costs can amount for up to 80 percent of a provider's total costs. The air ambulance itself can cost from \$600,000 to \$12 million when outfitted with varying levels of flight and medical equipment.

Participants at NTSB's February 2009 public hearing discussed potential safety concerns with helicopter shopping. Helicopter shopping refers to the practice of calling, in sequence, various providers until a provider agrees to take a flight assignment. Stakeholders who support the existing

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<sup>14</sup>The Federal Interagency Committee on Emergency Medical Services was established to, among other things, ensure coordination among the federal agencies involved with state, local, tribal and regional emergency medical services and 9-1-1 systems and advise, consult, and make recommendations on matters relating to the implementation of the coordinated state emergency medical services programs.

<sup>15</sup>In 2007, we reported on safety issues facing the air ambulance industry and FAA's safety oversight of air ambulances. See GAO, *Aviation Safety: Improved Data Collection Needed for Effective Oversight of Air Ambulance Industry*, GAO-07-353 (Washington D.C.: Feb. 21, 2007). We found that while the number of air ambulance accidents did increase in some years, FAA lacks basic information on the industry to determine the extent to which the increased number of accidents resulted from increased air ambulance traffic or decreased safety. We recommended that FAA identify the data needed to better understand the air ambulance industry and develop a systematic approach for gathering and analyzing the data. FAA agreed with, but as of September 2010, had not implemented this recommendation.

regulatory and oversight framework noted that there are situations where calling additional providers is an appropriate and safe use of resources. (See table 1.)

**Table 1: Differing Results of Sequential Helicopter Requests**

Results in potentially unsafe flight	Results in appropriate use of resources
A dispatcher calls a provider who turns down the request because of weather conditions. The dispatcher then calls other providers, potentially not disclosing information about the prior turndown, until a provider accepts the flight. This provider might have less weather information than the provider that turned down the flight and might not have accepted the flight had it known of the prior turndown.	A dispatcher calls a provider who turns down the request because of localized weather conditions. The dispatcher then calls a second provider and informs this provider of the prior turndown and the reason for it. The second provider accepts the transport because its helicopter is located in a different geographical area, and its flight path to the patient would not be affected by the localized weather conditions.

Source: GAO.

Having information on prior turndowns or aborted missions could help a provider decide whether it is safe to fly. FAA has provided state EMS officials with a sample letter that could be given to dispatchers within their state that outlines sample communications policies, including policies on disclosing information about prior turndowns. However, even with information on prior turndowns, pilots are responsible for checking weather conditions and determining if the conditions meet FAA’s requirements for flying. NASEMSO representatives suggested that the time spent sequentially calling additional air ambulance providers consumes time during which a patient could be en route to a trauma center via ground ambulance.

Call jumping occurs when a provider sends an air ambulance to an accident scene without a request. If another air ambulance provider is also responding based on a request from first responders, there is a heightened risk of collision. Stakeholders who advocate for an increase in state regulatory authority maintain that, like helicopter shopping, call jumping can result from economic pressure to fly. However, some instances perceived as call jumping may stem from a lack of communication among first responders. (See table 2.)

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**Table 2: Perceived and Intentional Call Jumping**

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**Two providers respond to separate requests for the same emergency**

Two providers are independently dispatched to respond to an accident scene by different first responders at the scene—for example, by the paramedics and by the police. The first responders’ failure to communicate with each other may lead each provider to perceive that the other has “jumped” the call.

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**Air ambulance is dispatched by provider**

A provider dispatches an air ambulance to a scene based on monitored radio traffic, without being requested.

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Source: GAO.

To minimize the risk of two helicopters responding based on separate requests from first responders, states can establish communication and coordination protocols to be followed at the more than 6,000 public safety answering points, or 911 call centers, nationwide. These centers provide the opportunity to coordinate air ambulance requests and avoid dispatching two air ambulances to the same crash scene. However, these centers are locally based and operated, and their structure varies widely.

Beyond anecdotes, we found little evidence of helicopter shopping resulting in unsafe flights or of call jumping. We identified FAA’s Aviation Safety Reporting System (ASRS)<sup>16</sup> as a potential source for such information. As a voluntary reporting system, ASRS contains reporting biases reflecting that not all participants in the aviation system are equally aware of ASRS or equally willing to file reports. Consequently, ASRS statistics represent a conservative measure of the number of such events that are occurring. In our review of 464 air ambulance reports submitted to ASRS over 15 years, we found 2 that contained information about call jumping and none that described instances of helicopter shopping. These data could indicate that helicopter shopping and call jumping occur infrequently. On the other hand, these practices may be underreported if

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<sup>16</sup>ASRS is a confidential, voluntary, and nonpunitive online reporting system that allows pilots (including air ambulance pilots), air traffic controllers, maintenance personnel, flight attendants, and others to report safety-related incidents. ASRS is available to the public and can be accessed at <http://asrs.arc.nasa.gov/index.html>. FAA has other voluntary programs that rely on cooperation between FAA and industry personnel. These include the Aviation Safety Action Program, Flight Operational Quality Assurance, and the Voluntary Disclosure Reporting Program. See GAO, *Aviation Safety: Improved Data Quality and Analysis Capabilities are Needed as FAA Plans a Risk-Based Approach to Safety Oversight*, [GAO-10-414](#) (Washington, D.C.: May 6, 2010).

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air ambulance crews are unaware that they can report safety issues to ASRS.<sup>17</sup>

During the summer of 2010, the Center for Leadership, Innovation and Research in EMS<sup>18</sup> established the EMS Voluntary Event Notification Tool (EVENT)—an anonymous, non-punitive and confidential web-based system that allows anyone in the United States or Canada to report an event or action that leads to or has the potential to lead to a worsened patient outcome. Reports received in EVENT are sent to the EMS governing body of the state, territory or province responsible for the EMS system in which the event occurred. Once the governing body receives the anonymous notification, they would be encouraged to address systemic issues in order to improve the overall quality of care provided. As of September 1, 2010, EVENT had received one report. While it is too early to evaluate the impact of the EVENT reporting system, it appears to be a positive step that could provide useful data for state regulators.

FAA is in the process of addressing several NTSB recommendations related to safety issues that NTSB has made regarding helicopter air ambulance safety.<sup>19</sup> FAA officials expect to release a notice of proposed rulemaking in the fall of 2010 that would address issues such as additional safety equipment requirements, minimum acceptable weather conditions, use of risk management practices, and additional training requirements.

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<sup>17</sup>The remaining ASRS reports related to air ambulances dealt with issues such as landing zone coordination, pressure to fly potentially unsafe aircraft, weather issues, air traffic control, and maintenance concerns.

<sup>18</sup>Center for Leadership, Innovation and Research in EMS is a nonregulatory, not-for-profit group that is promoting and advancing the practice and profession of EMS internationally.

<sup>19</sup>NTSB has made numerous recommendations aimed at improving helicopter air ambulance safety. NTSB's searchable recommendations database can be found at <http://www.nts.gov/safetyrecs/private/QueryPage.aspx>.

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## Perspectives Differ on the Impact of Cost-Related Business Decisions on the Services Provided in Air Ambulances

Stakeholders concerned with the growth of the industry assert that economic pressures have led some air ambulance providers to cut costs by using smaller, less expensive helicopters and less experienced medical crews.<sup>20</sup> In particular, they point to the use of small, single-engine helicopters instead of twin-engine helicopters. According to these stakeholders, larger helicopters allow access to the patient's entire body, while the smaller helicopters that some providers use restrict medical access to the full body of the patient. However, single-engine helicopters are not always smaller than twin-engine helicopters.<sup>21</sup>

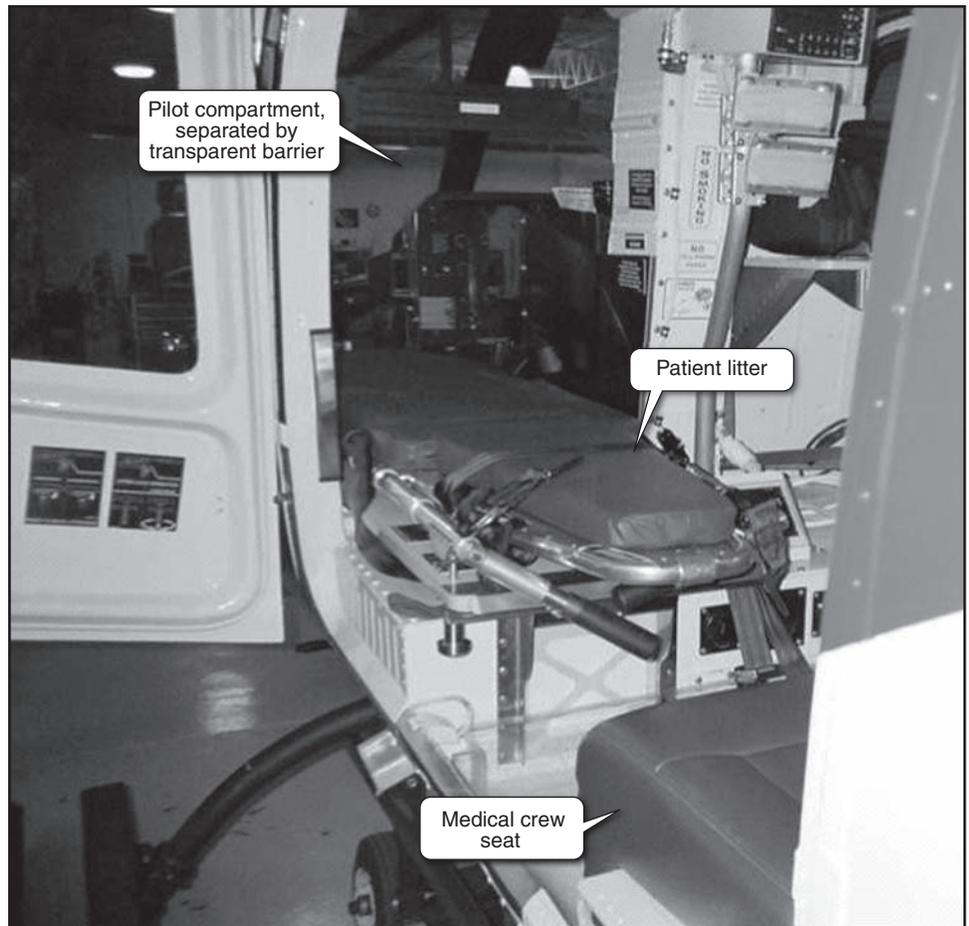
During our site visits, we observed how patients were transported in one particular single-engine helicopter. We also saw that medical personnel had access to the patient's upper body, which facilitates airway management, an important component of prehospital care. (See fig. 5.) The patient's lower body is situated next to the pilot with a transparent barrier separating the patient and the pilot. A senior official at that provider agreed that the space inside the helicopter is limited but said the helicopter meets the medical needs of most patients. However, there are differing perspectives in the industry about the need to have access to a patient's entire body during transport.

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<sup>20</sup>These stakeholders maintained that because Medicare payments are the same regardless of the type of helicopter and crew configuration, the financial incentives to use less expensive equipment and staffing could negatively affect the services provided in air ambulances.

<sup>21</sup>For example, both the single-engine Aerospatiale AS350 and twin-engine AS355 are used in the air ambulance industry, and both have the same cabin cubic volume. The single-engine Bell 205 and twin-engine Bell 212 are also used in the air ambulance industry and have the identical aft cubic volume of 220 cubic feet. The Bell 205 also has a larger aft cubic volume than the twin-engine Bell 429.

**Figure 5: Example of a Medical Bay in a Single-Engine Helicopter**



Source: GAO.

Stakeholders concerned with growth in the industry told us that small helicopters generally lack climate control, which results in temperatures in the aircraft that may be either too cold or too hot. According to an experienced emergency medical technician-paramedic, air that is too cold has a bad effect on trauma patients, while air that is too hot has a bad effect on cardiac patients. Stakeholders who favor the existing regulatory and oversight framework point out that the need for climate control might vary depending on the region in which the air ambulance operates. An air ambulance provider that operates in a southern climate may not need a heater, while one that operates in a northern climate may not need an air conditioner. One provider we visited that generally operates smaller helicopters told us that all of its 87 aircraft have heaters and are being

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outfitted with air conditioning as they undergo refurbishment. We were told that physicians and hospitals can exercise some degree of control over helicopter characteristics. For example, we were told that the requesting physician sometimes requires that an air ambulance have climate control when it is necessary for the medical care of the patient in interfacility transfers. One stakeholder we spoke with commented that physicians are often unaware that air ambulances may lack climate control and would therefore not be inclined to ask about it. According to a senior DOT official, the department was exploring whether regulation of climate control in air ambulance helicopters is under federal or state jurisdiction.

Stakeholders concerned with the growth in the industry also argue that, to save on costs, some providers are hiring less experienced medical crews, which they maintain degrade patient services. We were unable to validate this argument through our literature synthesis. We identified seven studies on the impact of a medical crew's composition—whether, for example, the crew consists of a physician and a nurse or a nurse and a paramedic—but there was no consensus on how the composition of the medical crew influences a patient's outcome.<sup>22</sup> We also found three studies examining the impact of crew composition on transport time, and all three studies found that crew composition had no impact on transport time.<sup>23</sup> We found no studies examining the impact of a medical crew's experience on patient outcomes.

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### Evidence Lacking to Suggest Recent Growth Has Affected Medical Outcomes from Air Transports

Several of the concerns raised by stakeholders within the air ambulance community appear to be outcomes of industry growth and competition. For example, concerns about helicopter shopping or call jumping might arise if providers are competing to gain business. Similarly, concerns about migration toward single-engine aircraft or reductions in the qualifications of medical staff might arise as companies seek to cut costs to improve profitability. The pressure of competing for business and working to obtain maximum efficiency through cost containment arises in nearly all business endeavors. These forces are usually good for consumers because they lead to efficiency, lower prices, and service offerings better tailored to the needs and desires of consumers. However, health care markets have some imperfections and these forces might work differently in these markets. For example, health care consumers may lack

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<sup>22</sup> See Bibliography: Burney (1992), Wirtz (2002), Rhee (1986), Hamman (1991), Pettett (1975), Snow (1986), Baxt (1987).

<sup>23</sup> Burney (1995), Housel (1994), Rodenberg (1992).

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information about their diagnoses, treatment needs, the quality of different providers, as well as the prices charged by different providers. Additionally, health insurance can affect consumer's ability or inclination to make informed health care choices.<sup>24</sup> Air medical patients have limited influence on air medical markets and are not typically making the choice in terms of mode of transport or provider.

For air ambulance services, medical outcomes are a critical measure of quality. Through our research, we identified numerous articles documenting rigorous research on various aspects of air ambulances, but very few shed light on the effect of the growth of the industry. For example, we found no studies that compare patient outcomes between states that have multiple providers in the same region, and states with fewer providers. Consequently, we were unable to draw definitive conclusions to support or refute many of the allegations that have been raised. DOT's General Counsel and National Highway Traffic Safety Administration officials agreed that more data on many aspects of air ambulance operations would enlighten the debate about providing states greater regulatory authority over air ambulances. While there was consensus among the stakeholders in the industry that there is a lack of data about potential concerns, ACCT stated that the debate about the extent of state regulatory authority of air ambulances is fundamentally one of philosophical differences about the government's role in controlling public services, such as emergency medical services.

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<sup>24</sup>Consumers who enroll in an air ambulance provider's subscription program would have information about cost and that provider's level of service, but they may not have information on other providers prices or services to use as a basis for comparison.

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## Federal and State Courts and DOT Have Clarified Some Boundaries of Federal and State Regulation of Air Ambulances, but Questions Remain

Because air ambulances have both an aviation component, regulated by the FAA, and a medical component, regulated by the states, the boundaries of federal and state regulation have come under question. The aviation components include the aircraft itself, including its airworthiness and safety, as well as the personnel who maintain and pilot the aircraft, communicate with ground personnel, and monitor flight instruments, while medical personnel attend to the health of the patient on board. (See fig 6.) These safety components are under the jurisdiction of FAA, which administers federal aviation regulations that govern safety and operational requirements, nationwide.<sup>25</sup> Hence, the industry is subject to FAA safety regulations covering areas such as pilot training requirements, flight equipment, and aircraft configuration. The medical component, on the other hand, is under state regulatory authority. DOT opinion letters and federal and state court decisions have affirmed that states have the authority to enact and enforce requirements for medical services delivered to patients in air ambulances and for the medical staffing, personnel, and equipment used to deliver those services.<sup>26</sup> States also have the authority to develop training on how to use an aircraft or equipment so as to ensure proper patient care. For example, such training might focus on how pressurization in the aircraft cabin affects specific medical conditions.<sup>27</sup>

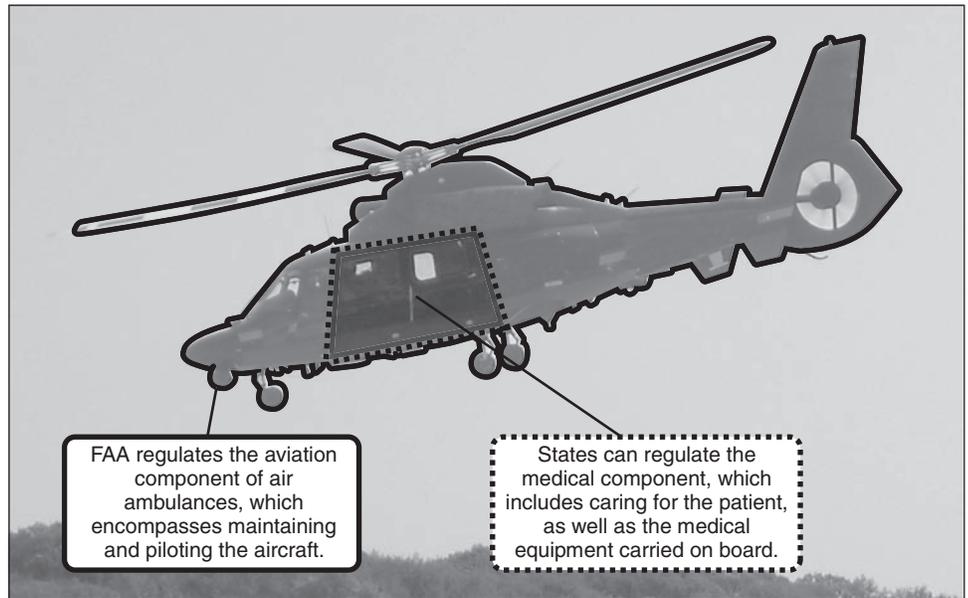
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<sup>25</sup>Courts have found that federal law preempts state regulation in the area of aviation safety. See e.g., *Abdullah v. American Airlines, Inc.*, 181 F.3d 363, 371 (3d Cir. 1999) (“it follows from the evident intent of Congress that there be federal supervision of air safety and from the decisions in which courts have found federal preemption of discrete, safety-related matters, that federal law preempts the general field of aviation safety.”); *Air Evac EMS v. Kenneth S. Robinson, Commissioner of Health*, 486 F. Supp. 2d 713 (M.D. Tenn. 2007) (holding that Congress has preempted the field of aviation safety and that state laws regulating air ambulance avionics equipment are therefore invalid).

<sup>26</sup>See, e.g., *Hiawatha Aviation of Rochester, Inc. v. Minnesota Department of Health*, 389 N.W. 2nd 507 (Sup. Ct. Minn. 1986); Letter dated February 20, 2007 from James R. Dann, Deputy Assistant General Counsel for the Department of Transportation to Donald Jansky, Assistant General Counsel, Office of the General Counsel, Texas Department of State Health Services.

<sup>27</sup>See *Med-Trans Corp. v. Benton*, 591 F.Supp. 2d 812 (E.D.N.C. 2008) (Order of Permanent Injunction).

**Figure 6: Depiction of Aviation and Medical Components of an Air Ambulance**



Source: GAO.

Note: State regulations governing medical equipment on board an aircraft must be consistent with FAA's safety requirements.

As noted earlier, some stakeholders favor changing the regulatory and oversight framework so that states would have a stronger role in regulating the nature and scope of services that an air ambulance provider must offer. For example, state EMS officials believe that they should be able to determine the appropriate number of air ambulances serving a particular area and set additional standards in terms of equipment used and services provided, as they currently do for other parts of the EMS system. However, strengthening the states' role would require federal legislation to alter the Airline Deregulation Act (ADA) of 1978 that deregulated the air carrier industry. Court decisions subsequent to the passage of the ADA determined that air ambulances were air carriers as defined by the ADA.<sup>28</sup> In enacting the ADA, Congress determined that “maximum reliance on competitive market forces” would best further “efficiency, innovation, and low prices” as well as “variety [and] quality ...

<sup>28</sup>Under the ADA, air ambulances are considered on-demand air carriers, along with air taxis and helicopter tour operators.

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of air transportation.”<sup>29</sup> One ADA provision, designed to phase out state governments’ economic control over the industry, explicitly precludes state regulation of matters related to air carrier rates, routes, and services.<sup>30</sup> Courts have ruled that this provision preempts states from acting in some regulatory areas, such as requiring prospective air ambulance providers to obtain a certificate of need based on the state’s assessment of the population to be served and the potential for unnecessary duplication of services.

Over the past two decades, federal and state courts, and DOT, through opinion letters issued by its Office of General Counsel, have affirmed these authorities and have determined the specific issues that states can and can not regulate. (See table 3.) Dating as far back as 1986, courts have ruled that state certificate of need laws are unenforceable because they conflict with the ADA by limiting the number of air ambulance services doing business within the state.<sup>31</sup> DOT, responding to numerous inquiries from state Attorneys General and private industry, has advised that certificate of need provisions and similar “public convenience and necessity” provisions are expressly preempted by the ADA because the states are attempting to regulate in the area of price, routes, and services.<sup>32</sup> Most recently and prominently, a federal district court in North Carolina found that the state’s certificate of need requirement was preempted by ADA.<sup>33</sup> These rulings are limited to specific states.

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<sup>29</sup>*Morales v. Trans World Airlines, Inc.*, 504 U.S. 374, 378(1992) (citing 49 U.S.C. App. 1301(a)(4), 1302(a)(9)).

<sup>30</sup>49 U.S.C. §41713, “...States may not enact or enforce a law, regulation, or other provision having the force and effect of law related to a price, route, or service of an air carrier...”

<sup>31</sup>See, e.g., *Hiawatha Aviation of Rochester, Inc. v. Minnesota Department of Health*, 389 N.W. 2d 507 (Minn. 1986).

<sup>32</sup>*Letter dated June 16, 1986 from Jim J. Marquez, General Counsel of the Department of Transportation to Chip Wagoner, Office of Attorney General, State of Arizona (The Arizona Letter); Letter dated April 23, 2007 from Rosalind A. Knapp, Acting General Counsel of the Department of Transportation to Gregory S. Walden, Counsel for Pacific Wings, LLC (The Hawaii letter); Letter dated October 10, 2007 from D.J. Gribbin, General Counsel of the Department of Transportation to Michael Grief, Assistant General Counsel, Office of the General Counsel, Florida Department of Health (The Florida letter).*

<sup>33</sup>*Med-Trans Corporation v. Benton*, 581 F. Supp. 2d 721 (E.D.N.C. 2008) (Known as the *Med-Trans* decision).

**Table 3: Issues Related to Air Ambulances That Courts, DOT, and State Attorneys General Have Ruled Can and Can Not Be Regulated by States**

States can regulate	States can not regulate
<ul style="list-style-type: none"> <li>• Requirements for appropriate medical supplies—patient oxygen masks, litters, blankets, etc.</li> <li>• Adequacy of medical equipment</li> <li>• Medical personnel qualifications</li> <li>• Requirements for maintenance of sanitary conditions</li> <li>• Communication equipment for use with EMS officials</li> <li>• Medically dictated pickup and dispatch protocols</li> <li>• Inspections for compliance with medically related regulations</li> <li>• Aircraft configuration serving medical purposes, to the extent consistent with FAA safety and operations requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Certificates of need, public necessity, and convenience</li> <li>• Rates</li> <li>• Passenger/third party flight accident liability insurance requirements</li> <li>• 24/7 availability requirements</li> <li>• Advertising</li> <li>• Bonding requirements</li> <li>• Requiring participation by air ambulance providers in an EMS peer review committee that provides local government officials with a mechanism to prevent an air ambulance provider from operating within the state</li> <li>• Pilot training</li> <li>• Aircraft configuration unrelated to medical purposes</li> <li>• Limitations on geographic service areas</li> <li>• Weather-minimum performance standards</li> <li>• Safe storage of equipment</li> <li>• Avionics equipment</li> <li>• Very high frequency aircraft transceivers</li> </ul>

Sources: GAO analysis of federal and state court cases and DOT and state attorneys general opinions.

Stakeholders concerned with the growth in the industry generally support a stronger role for states in regulating the air ambulance industry. They believe that many of the court rulings and DOT opinions diminish states' ability to oversee patient care and safety. For example, DOT, in a letter to an attorney in the state of Hawaii, wrote that states cannot require, through regulation, that air ambulance providers operate on a 24/7 basis on the grounds that such a requirement constitutes economic regulation. These stakeholders view a requirement for air ambulances to operate on a 24/7 basis as a patient care issue that states should be able to control. DOT further stated in its letter that states could contract with air ambulance providers for these services. Under such circumstances, the states would be functioning as customers rather than regulators, and therefore not be subject to federal preemption of state regulation.<sup>34</sup> In commenting on a draft of this report, ACCT and NASEMSO stated that contracting for air ambulance services in this manner is not a realistic option for states

<sup>34</sup>Letter dated April 23, 2007, from Rosalind A. Knapp, Acting General Counsel of the Department of Transportation to Gregory S. Walden, Counsel for Pacific Wings, LLC (the Hawaii letter).

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because of fiscal resource limitations. (See app. III for a complete description of significant federal and state court cases and DOT and state attorneys general opinions.)

However, there are some limited instances in which state regulations of air ambulances have served multiple purposes. Particularly, when these state regulations involve both medical and safety or medical and economic aspects of air ambulances, the federal and state courts and DOT have issued opinions determining the boundaries of federal and state regulations. For example, DOT's letter to Hawaii stated that a state's requirements concerning the quality, accessibility, availability and acceptability of air ambulance services are preempted. Stakeholders who favor change in the regulatory and oversight framework interpret these preemptions as limiting states' abilities to regulate quality or acceptability of medical care. In opinion letters pertaining to regulations in Texas, DOT acknowledged that certain types of regulations, such as equipment and service issues with possible FAA safety implications, did not lend themselves to "bright-line standards," and recommended that the state raise these issues with its local FAA safety inspectors. One of the most controversial DOT opinions appeared in the letter to Hawaii, in a discussion of the state's requirement for specific medical equipment on air ambulances.<sup>35</sup> DOT stated that Hawaii's requirements for items such as "patient oxygen masks, litters, blankets, sheets, and trauma supplies" were acceptable state medical regulations, but then maintained that states would not be allowed to enact medical requirements as a means of indirectly engaging in economic regulation. Specifically, DOT stated that,

it is possible that a state medical program, ostensibly dealing with only medical equipment/supplies aboard aircraft, could be so pervasive or so constructed as to be indirectly regulating in the pre-empted economic area of air ambulance prices, routes or services.

Stakeholders have expressed concern that the open-ended nature of this statement allows any medical regulation to be challenged as an economic regulation and thus be preempted under the ADA. However, it is important to note that DOT did not find that any specific "medical" regulation was

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<sup>35</sup>Letter dated April 23, 2007, from Rosalind A. Knapp, Acting General Counsel of the Department of Transportation to Gregory S. Walden, Counsel for Pacific Wings, LLC (the Hawaii letter).

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preempted under this reasoning and has not yet found that any state regulation to date falls within this category.

Stakeholders have raised concerns that there is no regulation at either the federal or state level to protect the public from the economic consequences of air ambulance practices. These stakeholders also expressed concerns about areas of state regulation that create uncertainty because DOT and the federal and state courts have yet to rule on them, such as a requirement for climate control on air ambulances. Uncertainty about how the courts would rule has led to calls for a federal legislative solution that would spell out federal and state authorities. Several federal legislative proposals seek to clarify the states' role in regulating medical issues and to allow the states to institute certain types of economic regulation for air ambulances, including certificate of need requirements, by carving out an exception to the ADA's preemption of state regulation of prices, routes, and services. However, the current scheme of regulation of air ambulances has been in place since 1978 and has generated four significant court decisions that, for the most part, have addressed fact-specific questions about the relationship between federal and state authority to oversee and regulate the industry. DOT has stated that the continued use of case-by-case departmental determinations can still clarify the appropriate role of states in regulating air ambulance services. DOT officials told us that states should address their uncertainties to DOT, and the department is more than willing to respond with an opinion based on the facts and circumstances presented. However, it appears that states have not fully utilized this option. Since 1986, DOT has issued only eight opinion letters in response to inquiries on the limits of federal and state authority over air ambulances. Stakeholders favoring increased state regulatory authority have expressed concerns with continuance of this case-by-case approach, stating that it results in piecemeal guidance, inconsistency, and confusion.

DOT officials have also raised concerns that allowing states to exert authority, in this case in the economic area, could create a patchwork of state regulation disrupting what has been, until now, a fairly well-understood set of uniform rules. Moreover, DOT, along with the Federal Trade Commission and the Department of Justice, have expressed concern that state authority to implement certificate of need laws could be used to limit market entry for air ambulances and reduce competition in the air ambulance industry—an outcome Congress sought to avoid when enacting the ADA.

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## Agency and External Comments and Our Evaluation

We provided a draft of this report to the Departments of Transportation (DOT) and Health and Human Services (HHS), and the National Transportation Safety Board (NTSB) for comment. We also invited representatives from the Association of Air Medical Services (AAMS), the Association for Critical Care Transport (ACCT), the Air Medical Operators Association (AMOA) and the National Association of State EMS Officials (NASEMSO) to review a draft of this report and provide comments. There was a consensus among the reviewers that there is a lack of data about the air ambulance industry and a recognition that the study had to rely on available data and information, which we obtained by conducting a comprehensive review of the existing subject area literature and recording stakeholder comments and opinions. Further, this lack of empirical evidence limited our ability to determine the full impact of changes in the industry. Our research of the air ambulance industry and discussions with stakeholders within the industry identified two distinct perspectives about the impact of the changes. To the extent that data or other information was available, we provided it to inform these perspectives. Where data or other information did not exist, we clearly attributed statements and identified the perspective of the stakeholders making the comment.

DOT's Office of General Counsel and HHS provided technical comments that we incorporated as appropriate. NHTSA, within DOT, provided detailed comments that we also incorporated as appropriate. NTSB transmitted written comments to us in a letter. (See app. IV). NTSB's statement in its letter that GAO was asked to "review the U.S. air ambulance industry to determine if changes in oversight authority are needed" is not accurate. As stated in the report, the objectives of our work were to examine how the air ambulance industry had changed over the last decade and the implications of these changes, as well as to examine the relationship between the federal and state oversight and regulation of the industry. While our report contains information that may be used when considering whether changes in oversight authority for the air ambulance industry may be needed, we were not asked to determine if changes are needed and thus do not address this question in our report. NTSB identified three issues that it believed should be discussed in more detail in our report. First, NTSB noted that the draft should have addressed in greater detail that competition in the air ambulance industry is restricted because of fixed fee reimbursements by payers (private insurers, Medicare, and Medicaid) for air ambulance services and the industry's limited capacity to adjust prices. While Medicare and Medicaid reimbursement rates are fixed, private sector prices are not. As is the case with most health care services, air ambulance providers generally negotiate prices with insurance companies. NTSB further noted that such

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restricted competition could be linked to safety concerns. Following the Board's February 2009 public hearing on air ambulance helicopter safety, NTSB issued several safety recommendations, including one to HHS to determine if reimbursement rates should differ according to the level of air ambulance transport safety provided. In response, HHS stated that it did not believe that payment should vary based on the level of transport safety provided but that all air ambulance operators should meet minimum FAA safety standards. Second, NTSB also noted said that the draft did not clearly state whether there is evidence that helicopter shopping and call jumping occur, and if so, to what extent. In response, we clarified that beyond anecdotes, we found little evidence of helicopter shopping resulting in unsafe flights or of call jumping. NTSB additionally raised questions about our use of ASRS as a source of information regarding the prevalence of these practices. We agree that ASRS has limitations, and opted to include it in the report because it is one of the few available data sources with information applicable to the industry. We added additional information in the report about the limitations and potential under-reporting. Finally, NTSB noted that it would be helpful to know if there is evidence to support the belief that the use of air ambulances improves the chances of survival for trauma victims and other critical patients. It was not our objective to determine if air ambulance transport is beneficial and we did not do the research necessary to comment on the validity of the belief.

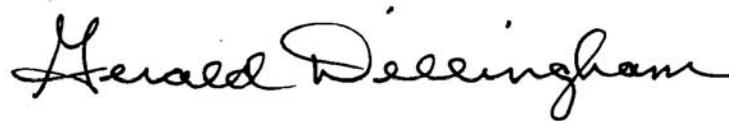
AAMS provided technical comments which we incorporated where appropriate. Comments provided by ACCT, AMOA, and NASEMSO were generally reflective of their views regarding the implications of the changes in the air ambulance industry and the role of states in regulating the industry. We incorporated their comments throughout the report as appropriate.

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We are sending copies of this report to the appropriate congressional committees, DOT, the Department of Health and Human Services, NTSB, and other interested parties. The report also is available at no charge on the GAO Web site at <http://www.gao.gov>.

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If you or your staff members have any questions about this report, please contact me at (202) 512-2834 or [dillinghamg@gao.gov](mailto:dillinghamg@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix IV.

A handwritten signature in black ink that reads "Gerald Dillingham". The signature is written in a cursive style with a large, prominent initial "G".

Gerald L. Dillingham, Ph.D.  
Director, Physical Infrastructure Issues

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# Appendix I: Scope and Methods

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The scope of our review was the structure and practices of the air ambulance industry in the United States, and framework for overseeing and regulating U.S. air ambulance services.

To determine how the U.S. air ambulance industry changed from 1999 through 2008, we obtained and analyzed available data that provided information on the growth and evolution of the industry, including shifts in business models, and the types of air ambulance aircraft that are used to provide services. Specifically, we reviewed and analyzed data compiled by Ira Blumen, MD. Dr. Blumen is the Medical/Program Director, University of Chicago Aeromedical Network. His database on the air ambulance industry extends back to 1980 and includes the number of helicopter air ambulances used in the industry and the number patients transported.<sup>1</sup> We also reviewed and analyzed the data contained in the Atlas and Database of Air Medical Services (ADAMS) and interviewed a senior official at the Calspan-University of Buffalo Research Center (CUBRC), the research organization that maintains and publishes the database in partnership with the Association of Air Medical Services (AAMS). ADAMS has been annually updated since 2004 and serves as a centralized source of information on air medical service providers, including the number and location of air ambulance helicopter bases. ADAMS began including data for fixed-wing air ambulances in 2007. At our request, CUBRC also provided us with an update of the types of helicopters used in the air ambulance industry. We also obtained and analyzed data on Medicare payments to air ambulance providers from the Centers for Medicare and Medicaid, the agency within the Department of Health and Human Services that administers the Medicare and Medicaid programs.<sup>2</sup> Additionally we reached out to more than 400 air ambulance providers, industry associations, and state Emergency Medical Services officials asking that they provide us any data, information, published or unpublished reports, papers, articles, or other potentially relevant sources of information of which they would like us to be aware. To determine how the industry has evolved, we examined industry, National Transportation Safety Board, and stakeholder documents. To determine the implications of these changes for the availability of services, efficient use of air

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<sup>1</sup>We determined that Dr. Blumen's and ADAMS' data were sufficiently reliable for our purposes.

<sup>2</sup>Medicare is the federal health care program for elderly and certain disabled individuals. Medicaid is a joint federal-state health care financing program for certain categories of low-income individuals.

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ambulance resources, safety, and services provided, we undertook an extensive literature synthesis covering over 250 articles describing scholarly research that produced quantitative results. For more detailed information on the literature synthesis, see appendix II. We attended two semiannual meetings of the Federal Interagency Committee on Emergency Medical Services. We also reviewed previous GAO reports; Federal Aviation Administration (FAA) documents; the transcript of a 2009 National Transportation Safety Board's (NTSB) hearing on helicopter emergency medical services and the board's recommendation letters; a congressional hearing transcript; and congressional testimonies, reports, and position papers published by AAMS and other stakeholder associations; and published documents of the Foundation for Air-Medical Research and Education, and the Flight Safety Foundation. In addition, we conducted interviews with representatives of AAMS; industry stakeholders who favor changing the regulatory and oversight framework, including representatives of the Association for Critical Care Transport (the leading proponent of change in the regulatory and oversight framework) and industry stakeholders who oppose changing the regulatory and oversight framework, including representatives of the Air Medical Operators Association (the key industry group favoring the existing regulatory and oversight framework). We also conducted four site visits to air ambulance providers that reflected differing geographic locations, business models, and opinions about regulatory structure. Specifically, we observed operations at a government-provided air ambulance service operated by Maryland State Police, a hospital-based air ambulance service in the mid-Atlantic region (MedStar Transport) and independent providers headquartered in Missouri (Air Evac Lifeteam) and Maine (LifeFlight of Maine). Air Evac LifeTeam's management favors the existing regulatory structure, while LifeFlight of Maine's management advocates increased state regulation of the air ambulance industry. We also met with representatives of Dartmouth-Hitchcock Advanced Response Team, which is a hospital-based provider, and Boston Medflight, which is consortium-owned.

To determine the relationship between federal and state oversight and regulation of the air ambulance industry, we reviewed federal aviation laws, and the Airline Deregulation Act (ADA) of 1978, and challenges to state authority to regulate in matters that are federally preempted under these acts. We also reviewed Department of Transportation (DOT) General Counsel letters and state attorneys general opinion letters to state officials or attorneys. We discussed these letters, which interpret provisions of the ADA, with DOT General Counsel officials. We also discussed the implications of industry trends and federal and state regulatory authority

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with the key industry stakeholders mentioned above, as well as with officials at the Federal Aviation Administration (FAA); the National Highway Traffic Safety Administration; NTSB; and representatives of the National Association of State Emergency Medical Services Officials. We also received briefings and reviewed documents provided by proponents and opponents of increased state regulation.

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# Appendix II: Literature Synthesis

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We reviewed literature and studies related to the air ambulance industry to obtain an understanding of what is known about the implications of the industry's growth and structural change for the availability of services, efficient use of air ambulance resources, safety, and services provided. The team used the following steps to perform the literature synthesis:

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## Step 1. Literature search

To identify and evaluate literature and studies that contain empirical data related to the air ambulance industry, we conducted a literature synthesis. Our objective was to identify any studies with empirical data related to air ambulance availability, services provided in the air ambulance, competition, and cost. We initially searched for articles published in the preceding 5 years, from January 2005 to January 2010. The search focused on the safety, cost, quality, and oversight of air ambulance services, including studies and articles that addressed the issues of helicopter shopping and call jumping. The search statements included a variety of terms to capture materials that examined these issues. We queried various bibliographic research databases including

- ProQuest,
- AcademicOneFile,
- MEDLINE,
- Dialog Transportation and Transportation Business,
- Electronic Collections Online,
- Nexis for scholarly and trade literature,
- Congressional Research Service,
- Congressional Budget Office,
- GAO,
- Government Printing Office,
- National Technical Information Service databases for publications produced by or funded by the federal government,
- PolicyFile, and
- WorldCat for government publications and literature that is not published commercially or is not generally accessible.

The results of this search, combined with articles obtained through discussions with stakeholders in the air ambulance industry, Internet searches, and our review of air ambulance-related Web sites, yielded 36 relevant studies.

As the job progressed, and the dearth of quantifiable data became evident, we expanded our search criteria to include all articles published between January 1, 2000, and May 2010, which contained empirically derived

results. We determined that this time frame would include studies performed prior to the proliferation of helicopters in the air ambulance industry that started occurring around 2002-2003. In this search, we looked at air ambulances in a broader context and aimed to be more comprehensive than in previous searches. Search statements relied primarily on subject terms (when available) for air ambulances and similar concepts and did not include any other search terms as modifiers. The databases searched were

- Nexis Statistical Master File,
- ProQuest,
- Academic OneFile,
- GAO,
- MEDLINE,
- Biosis,
- SciSearch,
- Cumulative Index to Nursing and Allied Health Literature,
- EMBASE,
- PASCAL,
- Gale Group Health and WellnessDatabase,
- National Technical Information Service,
- TRIS,
- Government Printing Office,
- Electronic Collections Online, and
- Ovid.

The librarian reviewed the search results and removed duplicate citations, foreign air ambulance service, military based, or medical procedure studies, and nonrelevant articles. A total of 641 citations were sent to the team for review.

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## Step 2. Abstract review

The team reviewed all the titles sent by the librarian. Articles with no abstract were excluded due to lack of empirical findings, high probability of article pertaining to current events, or an editorial commentary of current policy issues. For articles with abstracts, two team members independently reviewed the abstract to determine if the article addressed the previously identified topics and appeared to contain empirical data. If both reviewers agreed that the article was relevant or not relevant, the article was saved or rejected accordingly. When the reviewers disagreed, a third team member reviewed the abstract and made the final decision. The team requested that the librarians obtain complete copies of all saved, relevant articles. This process yielded 91 relevant studies.

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### Step 3. Synthesis

All relevant full text studies underwent three reviews—first by an analyst who synthesized the study, second an initial review by a methodologist, and the third and final review by a second methodologist. The methodologists determined whether the research was sufficiently rigorous to support the stated conclusions. Articles that were not based on U.S. populations or did not include empirical data were excluded. Relevant articles were summarized in a synthesis document that captured the title, authors, setting, sponsor of the research, methods, findings and conclusions, and limitations.

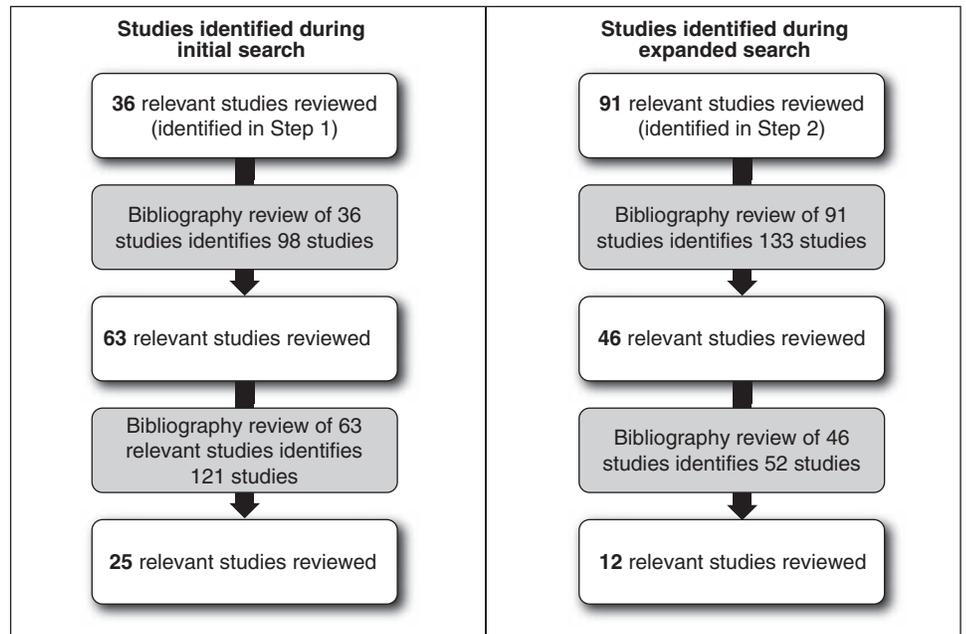
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### Step 4. Bibliography review

The team reviewed the bibliography for relevant articles synthesized in step 3 to identify additional potentially relevant articles. The team then selected articles from the bibliographies that appeared relevant and were (1) in English, (2) not based on a foreign population, (3) not international studies, and (4) not military studies. For articles that met these criteria, the team attempted to obtain the abstracts from the National Institute of Health's, National Library of Medicine PubMed database (<http://www.ncbi.nlm.nih.gov/pubmed>).

The team then repeated the abstract review, synthesis, and bibliography review process one additional time (see fig. 7).

Figure 7: Literature Synthesis Process and Results



Source: GAO.

## Step 5. Analysis

With a methodologist’s help, the team analyzed and aggregated the synthesized articles to develop narratives describing the findings of the literature.

# Appendix III: Key Court Cases and Opinion Letters from DOT or State Attorneys General

Table 4 summarizes key court cases related to the air ambulance industry. Table 5 summarizes DOT or state Attorneys General Opinions related to the air ambulance industry.

**Table 4: Summary of Key Court Cases Related to the Air Ambulance Industry**

Court case	Issues court determined to be preempted	Issues court determined not to be preempted
<i>Med-Trans Corp. v. Benton</i> , 581 F. Supp. 2d 721 (E.D. N.C. 2008)	<p>Safety and operational standards</p> <ul style="list-style-type: none"> <li>• “Flight” equipment requirements that cannot be detached from aviation safety and associated solely with EMS.</li> <li>• Prohibiting structural or functional defects affecting the “safe operation of the aircraft.”</li> <li>• Regulations requiring crew members to be trained in “in flight emergencies specific to the aircraft used in the program” and “aircraft safety.”</li> <li>• Requiring a helicopter pilot to provide backup medical care for EMS personnel.</li> </ul> <p>Economic requirements</p> <ul style="list-style-type: none"> <li>• Requiring air ambulances to provide service 24 hours per day.</li> <li>• Certificate of need requirement.</li> <li>• Requirement to document “defined service area.”</li> <li>• Requirements to document “a written plan for transporting patients to appropriate facilities when diversion or bypass plans are activated.”</li> <li>• Requirements to install very high frequency aircraft transceivers.</li> <li>• Requiring an air ambulance provider to undergo an EMS Peer Committee Review that provides local government officials with a mechanism to prevent an air ambulance provider from operating within the state.</li> </ul>	<p>Medical aspects</p> <ul style="list-style-type: none"> <li>• Requirement for air ambulances to synchronize voice radio communications with local EMS resources (requiring air ambulances to be equipped with special two-way radios to communicate with public safety entities).</li> <li>• Requirements that are primarily medical in nature.</li> <li>• Requirement for air ambulances to be inspected for compliance with medically related regulations.</li> <li>• Medically related equipment, and sanitation, supply and design requirements</li> <li>• Requirement for air carriers to document a plan for inspecting, repairing, and cleaning medical and other patient care related equipment.</li> <li>• Requirement for vehicle or equipment-related training undertaken specifically for the purposes of ensuring proper patient care (i.e., training regarding cabin pressurization as it relates to specific medical conditions).</li> <li>• Requirement for air ambulance to be staffed by at least two persons.</li> </ul>
<i>Abdullah v. American Airlines, Inc.</i> , 181 F.3d 363 (3rd Cir. 1999)	<p>Safety and operational standards</p> <ul style="list-style-type: none"> <li>• Standards of care in the field of aviation safety.</li> </ul>	<p>Safety and operational standards</p> <ul style="list-style-type: none"> <li>• Traditional state and territorial law damage remedies for violation of federal aviation standards.</li> </ul>
<i>Hiawatha Aviation of Rochester v. Minn. Dept. of Health</i> , 389 N.W.2d 507 (Sup. Ct. Minn. 1986)	<p>Economic requirements</p> <ul style="list-style-type: none"> <li>• Requirement for license from the state to operate.</li> </ul>	<p>Medical aspects</p> <ul style="list-style-type: none"> <li>• Requirements for equipment and promulgation of standards for maintenance of sanitary conditions.</li> <li>• Regulation of staffing requirements and qualifications of personnel as part of traditional role in delivery of medical services.</li> </ul>

**Appendix III: Key Court Cases and Opinion  
Letters from DOT or State Attorneys General**

<b>Court case</b>	<b>Issues court determined to be preempted</b>	<b>Issues court determined not to be preempted</b>
<i>Air Evac v. Robinson</i> , 486 F. Supp. 2d 713 (M.D. Tenn. 2007)	Flight and safety requirements <ul style="list-style-type: none"> <li>Requirement for helicopters licensed in the state to have certain avionics equipment on board.</li> </ul>	
<i>Eagle Air Med Corp. v. Colorado Board of Health</i> , 570 F. Supp. 2d 1289, (D. Col. 2008)	Safety standards <ul style="list-style-type: none"> <li>Requirement for air ambulance providers to acquire and maintain accreditation by the Commission on Accreditation of Medical Transport Systems, whose standards primarily address aviation safety issues.</li> </ul>	
<i>Rocky Mountain Holdings, LLC v. Cates, Director, Mo. Dept. of Health</i> , No. 97-4165-CV-C-9 (W.D. Mo. Central Div. September 3, 1997)	Economic requirements <ul style="list-style-type: none"> <li>Making the determination that the “public convenience and necessity” requires a proposed air ambulance service.</li> </ul>	

Source: GAO analysis of key court cases.

Note: State court decisions are generally limited to the state, and federal appellate decisions, the circuit, in which the challenge was raised. However, these decisions could be used as support for legal challenges in other states or circuits.

**Table 5: Summary of DOT or State Attorneys General Opinions Related to the Air Ambulance Industry**

<b>DOT and State Attorneys General letters</b>	<b>Issues DOT and State Attorneys General determined to be preempted</b>	<b>Issues DOT and State Attorneys General determined not to be preempted</b>
DOT to Texas 2/20/2007	Safety and operational standards <ul style="list-style-type: none"> <li>Regulation of flight safety aspects of medical services, such as safe storage of equipment.</li> <li>Regulating aviation safety, including minimum standards for aircraft, pilots, and “weather minimums.”</li> <li>Requiring accreditation by outside body that sets aviation standards.</li> </ul> Economic requirements <ul style="list-style-type: none"> <li>Regulating when and where ambulances can fly, scheduling, routing, and rates.</li> <li>Limiting federal preemption to interstate transportation.</li> <li>Regulating advertising.</li> <li>Insurance requirements (air carrier liability insurance for injuries, death, and/or property damage to third parties caused by crash of aircraft).</li> </ul>	Medical aspects <ul style="list-style-type: none"> <li>Minimum requirements for medical equipment.</li> <li>Regulating medical services, particularly as delivered to patients/passengers in the cabins of aircraft.</li> <li>Training and licensing requirements for medical crew.</li> <li>Insurance addressing “other perils” (such as medical malpractice by the medical staff) would be considered on a case-by-case basis.</li> <li>Requiring accreditation of an outside body that deals exclusively with medical care.</li> </ul>

**Appendix III: Key Court Cases and Opinion  
Letters from DOT or State Attorneys General**

<b>DOT and State Attorneys General letters</b>	<b>Issues DOT and State Attorneys General determined to be preempted</b>	<b>Issues DOT and State Attorneys General determined not to be preempted</b>
DOT to Texas 5/23/2007	<p>Flight requirements</p> <ul style="list-style-type: none"> <li>• Requiring certain avionics equipment.</li> <li>• Licensing requirements to ensure ambulances are following FAA flight requirements.</li> <li>• Taking punitive action, in context of a state licensing regime, if FAA requirements are not being followed.</li> </ul>	<p>Flight requirements</p> <ul style="list-style-type: none"> <li>• Review of air ambulance records and documents to ensure air ambulances are following FAA requirements.</li> <li>• Bringing to the attention of FAA or DOT enforcement office any information or evidence that a carrier may be violating federal requirements.</li> </ul>
DOT to Texas 11/3/2008	<p>Economic requirements</p> <ul style="list-style-type: none"> <li>• Requiring air ambulance service be available to all people, including nonsubscribers.</li> <li>• Establishing minimum standards for the creation and operation of an EMS subscription program, including obtaining State Health Services department approval (which depends on many levels of approval from state and local officials) prior to soliciting, advertising, or collecting subscription or membership fees.</li> <li>• Requiring air ambulance provider based in another state to obtain an EMS license from the state.</li> <li>• Compliance with state and federal rules on billing and reimbursement.</li> <li>• Requirement to show financial responsibility through bonding or self-insurance in order to receive state approval for EMS subscription program.</li> </ul>	

**Appendix III: Key Court Cases and Opinion  
Letters from DOT or State Attorneys General**

<b>DOT and State Attorneys General letters</b>	<b>Issues DOT and State Attorneys General determined to be preempted</b>	<b>Issues DOT and State Attorneys General determined not to be preempted</b>
DOT to Hawaii 4/23/2007	<p>Safety and operational standards</p> <ul style="list-style-type: none"> <li>• Regulating aircraft operation and equipment.</li> <li>• Medical equipment installation and storage aboard aircraft.</li> <li>• Regulating pilot qualifications.</li> </ul> <p>Economic requirements</p> <ul style="list-style-type: none"> <li>• State operating certificates based on state's determination of "public need" for it, the "reasonableness" of the "cost of the ... service," and other criteria including "quality, accessibility, availability and acceptability."</li> <li>• Requirement to operate 24 hours per day. (Note: A 24-hour requirement may be pursued through contractual means rather than through regulatory actions.)</li> <li>• A state medical program, ostensibly dealing with only medical equipment/supplies aboard aircraft, that is so pervasive or so constructed as to be indirectly regulating in the preempted economic area of air ambulance prices, routes, or services.</li> <li>• Accident liability insurance.</li> </ul> <p>Flight requirements</p> <ul style="list-style-type: none"> <li>• Requirements as to medical training for flight crew.</li> </ul>	<p>Medical aspects</p> <ul style="list-style-type: none"> <li>• Requirements for patient oxygen masks, litters, blankets, sheets, and trauma supplies.</li> </ul>
DOT to San Diego 1/2/1997	<p>Flight requirements</p> <ul style="list-style-type: none"> <li>• Aircraft configuration and airman certification.</li> </ul>	
DOT to Nebraska 12/5/1989	<p>Economic requirements</p> <ul style="list-style-type: none"> <li>• Controlling entry into the field of interstate air ambulances, or imposing economic regulations.</li> </ul>	<p>Medical aspects</p> <ul style="list-style-type: none"> <li>• Equipment requirements as part of regulation of medical services.</li> <li>• Staffing requirements, personnel qualifications, and sanitary condition standards.</li> <li>• Governing medical services.</li> </ul>
DOT to Arizona 6/16/1986	<p>Economic requirements</p> <ul style="list-style-type: none"> <li>• Certificate of public convenience and necessity.</li> <li>• Regulating rates.</li> <li>• Regulating operating and response times and the base of operations.</li> <li>• Bonding requirements.</li> <li>• Accounting and report systems.</li> </ul>	
DOT to Florida 10/10/2007	<p>Economic requirements</p> <ul style="list-style-type: none"> <li>• Certificate of public convenience and necessity from each county within the state where it wants to operate (with counties free to reject applications).</li> </ul>	

**Appendix III: Key Court Cases and Opinion  
Letters from DOT or State Attorneys General**

<b>DOT and State Attorneys General letters</b>	<b>Issues DOT and State Attorneys General determined to be preempted</b>	<b>Issues DOT and State Attorneys General determined not to be preempted</b>
Letter from Richard E. Israel, Assistant Attorney General, Maryland, to Sen. John J. Hafer (4/11/02)	<p>Safety and operational requirements</p> <ul style="list-style-type: none"> <li>• For intrastate commercial air ambulances: “Clearance” regulations, including regulation that air ambulance can only respond to scene of public safety emergency if cleared by the state communication center.</li> </ul> <p>Economic requirements</p> <ul style="list-style-type: none"> <li>• For intrastate commercial air ambulances, requirements that responses to transports shall be carried out without regard to patient’s ability to pay and with no charge to the state or a jurisdictional EMS program.</li> <li>• For interstate commercial air ambulances: “Clearance” regulations that place limitations on charges.</li> <li>• For interstate commercial air ambulances: “Clearance” regulations dealing with helicopter landings that allow clearance decisions based on considerations of economic competition.</li> </ul>	<p>Medical requirements</p> <ul style="list-style-type: none"> <li>• For interstate commercial air ambulances: “Clearance” regulations that reference a determination of the safety and appropriateness of a helicopter landing for patient transport that are concerned only with the health and safety of the patient.</li> </ul>
Tex. Atty. Gen. Op. GA-0634, 2008 WL 4964344 (Tex. A.G.)	<p>Medical aspects</p> <ul style="list-style-type: none"> <li>• Regulation by Department of State Health Services of EMS providers’ subscription programs for emergency medical services.</li> </ul>	
1987 Ariz. Op. Atty. Gen. 261, 1987 WL 121388 (Ariz. AG 1987)	<p>Economic regulations</p> <ul style="list-style-type: none"> <li>• Economic regulation under certificate of need statutes.</li> </ul>	<p>Safety and operational requirements</p> <ul style="list-style-type: none"> <li>• Essential public health and safety matters (regulation of transport of sick, injured, wounded, or otherwise incapacitated or helpless individuals by air ambulance only in critical and emergency situations and only with regard to essential medical health and safety aspects of such transport).</li> </ul>

Sources: GAO analysis of DOT and state attorneys general opinions.

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# Appendix IV: Comments from the National Transportation Safety Board

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Office of Research  
and Engineering

## National Transportation Safety Board

Washington, D.C. 20594

September 16, 2010

Gerald L. Dillingham, Ph.D.  
Director, Civil Aviation Issues  
U.S. Government Accountability Office  
441 G Street, NW  
Washington, DC 20548

Dear Dr. Dillingham;

The NTSB staff appreciates the opportunity to provide comments on the GAO's draft report titled *AIR AMBULANCE - Effects of Industry Changes on Services and Need for Changes in Oversight Authority are Unclear*.

According to the draft report, Congress asked the GAO to review the U.S. air ambulance industry to determine if changes in oversight authority are needed. The focus of this evaluation is articulated on page 1 of the draft where GAO states:

Given the differences of opinion about the effects of the air ambulance industry's growth and changes to its structure, you asked us to review the U.S. air ambulance industry. To do this, we examined: (1) how the industry changed in the last decade and the implication of these changes for the availability of services, efficient use of air ambulance resources, safety, and services provided and (2) the relationship between the federal and state oversight and regulation of the air ambulance industry.

The NTSB staff believes the GAO met some of the goals of the study. We do not believe, however, that the study adequately evaluated the impact of rapid growth and change on the safety of the air medical industry. We believe that the discussion of certain issue areas needs to be expanded and we also have concerns about the strength of some of the evidence cited in the draft report. These concerns are further discussed below.

### **Competition and Air Medical Consumers**

Pages 19 and 20 of the draft report address air medical transport growth and competition, and medical outcomes. The GAO states:

These [competitive] forces are usually good for consumers because they lead to efficiency, lower prices, and service offerings better tailored to the needs and desires of consumers. However, health care markets have some imperfections. Health care consumers may lack information about their diagnoses, treatment needs, the quality of different providers, and the prices charged by different providers. [ ] Because of the various imperfections in health care markets, it is difficult to discern the extent to which the beneficial properties afforded by competition have been realized.

Competition in air medical transport is not the same as competition between retailers or other open markets. While the statement quoted above hints at the differences, NTSB staff believes that the GAO report does not go far enough by fully describing the unique characteristics of a competitive environment for air medical operators or recognize its potential negative influence on operational safety.

Air medical patients have limited influence on air medical markets. They typically have no choice in transport mode or provider since they are in acute need of transport. The choice is usually made for the patient, often by pre-arranged agreements between hospitals, air medical providers and first responders. It is common for hospitals and independent air medical providers to work with other hospitals and first responders to pre-arrange transport request procedures and areas of coverage. In those geographic areas where more two or more air medical operators provide service, decisions about who covers what area become more difficult and are subject to competitive pressures. Air medical operators typically respond by targeting marketing efforts to first responders and hospitals, using financial incentives and other types of marketing efforts to establish transport agreements.

A key component of a free market is the determination of prices and wages by unrestricted competition between businesses. This principle does not work in the air medical market. Prices for patient transport are fixed at a set rate by private insurance companies, Medicare, and Medicaid. Only a small portion of transport fees is self-paid by patients. Competitive forces therefore have very limited influence on the price of transport. Air medical transport reimbursement is discussed on pages 5-7 of the GAO draft report but it is not addressed within the context of competition.

Air medical companies have few factors they can adjust to respond to competitive pressures. All air medical operators are limited by fixed pricing, only get paid when patients are transported, and (according to the GAO) have significant fixed costs that approach 80%. There are three primary factors air medical operators can use to ensure revenues covers costs. These include reducing fixed costs relating to items such as aircraft, staffing, and facilities; increasing revenue through increased patient volume and/or improved revenue collection; and finding supplemental sources of income, such as subscription membership programs or hospital support.

The NTSB has expressed concern that the combination of these unique competitive pressures and fixed fee reimbursement practices in the air medical industry

may result in decreased levels of safety. Following the NTSB's February 2009 public hearing on the safety of helicopter emergency medical (HEMS) operations, during which sworn testimony was provided on these topics, the NTSB issued safety recommendations to the Department of Health and Human Services (HHS).<sup>1</sup> We do not believe the draft GAO report adequately addresses this area of concern and we respectfully submit that the discussion of this topic should be expanded in the GAO report to address the issues identified above.

#### **Helicopter Shopping and Call Jumping**

The GAO draft report identifies helicopter shopping (the practice of calling various providers until a provider agrees to take a flight assignment) and call jumping (when a provider sends an air ambulance to an accident scene without a request) as potential safety risks. However, we believe that the discussion of this issue is incomplete and does not clearly state whether or not there is evidence that these practices occur and if so, to what extent.

One statement in the draft report that downplays the issue of call jumping is the following on page 14-15:

Stakeholders maintain that, like helicopter shopping, call jumping can result from economic pressure to fly. However, some instances perceived as call jumping may stem from a lack of communication among first responders.

The GAO draft report cites the Aviation Safety Reporting System (ASRS) as a potential source of information on the topic, stating there were 464 air ambulance ASRS reports submitted over 15 years (31 per year). Of these, GAO states there were 2 reports (over 15 years) that discussed helicopter call jumping and no reports that addressed helicopter shopping. The GAO states:

This data could indicate that helicopter shopping and call jumping occur infrequently. On the other hand, these practices may be underreported if air ambulance crews are unaware that they can report safety issues to ASRS.

The NTSB believes that the GAO reference to the low number of ASRS reports associated with call jumping and helicopter shopping is somewhat misleading. First, ASRS reports are typically submitted by aviation operational personnel such as pilots and air traffic controllers who report operational anomalies associated with operation of the aircraft. The issue of call jumping and helicopter shopping are not operational issues associated with aircraft operation. It is therefore unlikely that air medical pilots would report such issues to ASRS. Second, ASRS air medical reports overall are exceedingly

<sup>1</sup> See Safety Recommendations A-09-104 through 107, issued September 24, 2009 asking the HHS, Centers for Medicare and Medicaid Services, to evaluate the existing HEMS reimbursement rate structure to determine if reimbursement rates should differ according to the level of HEMS transport safety provided and, if warranted, establish a new reimbursement rate structure.

rare. One air medical flight typically involves the transport of one patient. There were approximately 3,150,000 patients flown by air medical transport for the time period of 1993-2007 (210,000 per year).<sup>2</sup> Using this as a frame of reference, one can estimate that roughly 0.007% of all air medical flights result in an ASRS report.

ASRS reports are submitted voluntarily. NASA, which manages the ASRS program, states on its website that “the existence in the ASRS database of reports concerning a specific topic cannot, therefore, be used to infer the prevalence of that problem within the National Airspace System.”<sup>3</sup>

The NTSB supports the development and use of voluntary safety reporting programs. We believe, however, that there is no evidence to suggest that voluntary reporting of safety events in the air medical community is routine or representative. The evidence cited by the GAO highlights this fact and should be so noted in the text. Further, the fact that the GAO chose to focus on voluntary reporting as the primary source of evidence on the presence or absence of call jumping and helicopter shopping ignores the body of sworn testimony provided during the NTSB’s February 2009 public hearing. While that testimony does not establish that such practices are common or directly associated with air medical crashes, we believe it does provide useful information and insight that should be cited in the GAO report.

#### **Air Ambulance Effectiveness**

On page 3 of the draft report, GAO states “Air ambulances transported more than 270,000 patients in 2008 and their use is widely believed to improve the chances for survival for trauma victims and other critical patients.” While this may in fact be a widely-held belief, it would be useful to know if the GAO found factual support for this statement. Later in the report, the GAO states that evidence of air medical transport effectiveness is “uneven.” The GAO cites 17 peer-reviewed articles that show no medical benefit compared to ground transport, 12 that showed air transport provided a benefit and 5 showing that ground transport was resulted in better patient outcomes (pages 11-12).

In closing, we acknowledge that evaluating the influence of air medical growth and structural changes on service and safety is challenging. While we believe the GAO study is a good first step, we find that there is significant reliance on anecdotal information provided by various stakeholders within the air medical community. This is not surprising due to the lack of reliable empirical evidence on the topic. We believe that lack of evidence limited the GAO’s ability to adequately answer the primary questions associated with this topic. A related area of concern is the lack of conclusions or a summary statement in the report. This makes it difficult for the reader to determine the main results of the study. The lack of clear conclusions may be related to the lack of good

<sup>2</sup> Derived from presentation of Ira Blumen, M.D., NTSB public hearing on the safety of HEMS operations, Feb 3, 2009. <http://www.nts.gov/Dockets/Aviation/DCA09SH001/411077.pdf>.

<sup>3</sup> [http://asrs.arc.nasa.gov/docs/rpsts/acr\\_fatg.pdf](http://asrs.arc.nasa.gov/docs/rpsts/acr_fatg.pdf)

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**Appendix IV: Comments from the National  
Transportation Safety Board**

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evidence. We believe that the GAO should add conclusions to the report to highlight those areas where the evidence is, and isn't, clear.

Thank you for the opportunity to comment on this draft report.

Sincerely,



Joseph M. Kolly  
Director, Office of Research  
and Engineering

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# Appendix V: GAO Contact and Staff Acknowledgments

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## GAO Contact

Gerald L. Dillingham, Ph.D., (202) 512-2834, or [dillinghamg@gao.gov](mailto:dillinghamg@gao.gov)

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## Staff Acknowledgments

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