

GAO

Testimony

Before the Subcommittee on Aviation,  
Committee on Transportation and  
Infrastructure, House of Representatives

---

For Release on Delivery  
Expected at 10:00 a.m. EDT  
Wednesday, April 22, 2009

# AVIATION SAFETY

## Potential Strategies to Address Air Ambulance Safety Concerns

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



GAO

Accountability \* Integrity \* Reliability

---

GAO  
Accountability · Integrity · Reliability

# Highlights

Highlights of [GAO-09-627T](#), a testimony before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, House of Representatives

## Why GAO Did This Study

Air ambulance transport is widely regarded as improving the chances of survival for trauma victims and other critical patients. However, recent increases in the number of air ambulance accidents have led to greater industry scrutiny by government agencies, the public, the media, and the industry itself. The National Transportation Safety Board (NTSB) and others have called on the Federal Aviation Administration (FAA), which provides safety oversight, to issue more stringent safety requirements for the industry.

This testimony discusses (1) recent trends in the air ambulance industry with regard to its size, composition, and safety record; (2) recent industry and government efforts to improve air ambulance safety; and (3) potential strategies for improving air ambulance safety. This testimony is based primarily on GAO's February 2007 study on air ambulance safety ([GAO-07-353](#)). To update and supplement this 2007 report, GAO analyzed the latest safety information from NTSB and FAA, reviewed published literature on the state of the air ambulance industry, and interviewed FAA officials and industry representatives.

GAO provided a copy of the draft testimony statement to FAA. FAA provided technical comments, which GAO incorporated as appropriate.

To view the full product, including the scope and methodology, click on [GAO-09-627T](#). For more information, contact Gerald L. Dillingham at (202) 512-2834 or [dillingham@gao.gov](mailto:dillingham@gao.gov).

## AVIATION SAFETY

### Potential Strategies to Address Air Ambulance Safety Concerns

#### What GAO Found

The air ambulance industry has increased in size, and concerns about its safety have grown in recent years. Available data suggest that the industry grew, most notably in the number of stand alone (independent or community-based) as opposed to hospital-based operators, and competition increased among operators, from 2003 through 2008. During this period, the number of air ambulance accidents remained at historical levels, fluctuating between 11 and 15 accidents per year, and in 2008, the number of fatal accidents peaked at 9. This accident record is cause for concern. However, a lack of reliable data on flight hours precludes calculation of the industry accident rate—a critical piece of information in determining whether the increased number of accidents reflects industry growth or a declining safety record.

The air ambulance industry and FAA have acted to address accident trends and causes. For example, FAA enhanced its oversight to reflect the varying sizes of operators, provided technical resources to the industry, launched an accident mitigation program, and revised the minimum standards for weather and safe cruising altitudes that apply to air ambulance operations.

Despite the actions to improve air ambulance safety, 2008 was the deadliest year on record for the industry. Through its work on aviation safety, including air ambulance safety; review of the published literature; and interviews with government and industry officials, GAO has identified several potential strategies for improving air ambulance safety, including the following:

- Obtain complete and accurate data on air ambulance operations.
- Increase the use of safety technologies.
- Sustain recent efforts to improve air ambulance safety.
- Fully address NTSB's recommendations.
- Adopt safety management systems within the air ambulance industry.
- Clarify the role of states in overseeing air medical services.
- Determine the appropriate use of air ambulance services.

#### Air Ambulance Helicopters



Sources: FEMA and Washington State Department of Health.

---

Mr. Chairman and Members of the Subcommittee:

I appreciate the opportunity to testify before you today on air ambulance safety. My remarks will focus on (1) recent trends in the air ambulance industry with regard to size, composition, and safety record; (2) recent industry and government efforts to improve air ambulance safety; and (3) potential strategies for improving air ambulance safety. My testimony is based primarily on our February 2007 report on air ambulance safety, which we conducted at the request of the Chairman.<sup>1</sup> To update and supplement our existing work, we analyzed the latest safety information from the National Transportation Safety Board (NTSB) and the Federal Aviation Administration (FAA), reviewed published literature on the state of the air ambulance industry, and interviewed officials from NTSB and FAA and industry representatives.<sup>2</sup> We conducted this work in March and April 2009.

---

## Background

Air ambulances are an integral part of U.S. emergency medical systems, primarily transporting patients between hospitals, but also providing transport from accident scenes or for organs, medical supplies, and specialty medical teams. Air ambulances may be helicopters or fixed-wing aircraft. Helicopter air ambulances provide on-scene responses and much of the shorter-distance hospital-to-hospital transport, while fixed-wing aircraft are used mainly for longer facility-to-facility transport. (See fig. 1.) Helicopter air ambulances make up about 74 percent of the air ambulance fleet and, unlike fixed-wing aircraft, do not always operate under the direction of air traffic controllers. They also often operate in challenging conditions, flying, for example, at night during inclement weather and using makeshift landing zones at remote sites. My testimony today focuses on the safety of helicopter air ambulance operations.

---

<sup>1</sup>GAO, *Aviation Safety: Improved Data Collection Needed for Effective Oversight of Air Ambulance Industry*, [GAO-07-353](#) (Washington, D.C.: Feb. 21, 2007). This review and our updated work was conducted in accordance with generally accepted government auditing standards.

<sup>2</sup>FAA is the federal agency responsible for providing aviation safety oversight in the United States and NTSB is an independent federal agency charged with investigating each U.S. aviation accident.

---

**Figure 1: Air Ambulance Helicopter**



Source: Clare McLean ©2006.

Air ambulance operations can take many different forms but are generally one of two business models—hospital-based or stand-alone.<sup>3</sup> In a hospital-based model, a hospital typically provides the medical services and staff and contracts with an aviation services provider for pilots, mechanics, and aircraft. The aviation services provider also holds the FAA operating certificate. The hospital pays the operator for services supplied.<sup>4</sup> In a stand-alone (independent or community-based) model, an independent operator sets up a base in a community and serves various facilities and localities. Typically, the operator holds the FAA operating certificate and either employs both the medical and flight crews or contracts with an aviation services provider for them. This stand-alone model carries more financial risk for the operator because revenues depend solely on payments for transporting patients. Some operators provide both hospital-based and stand-alone services and may have bases located over wide geographic areas.

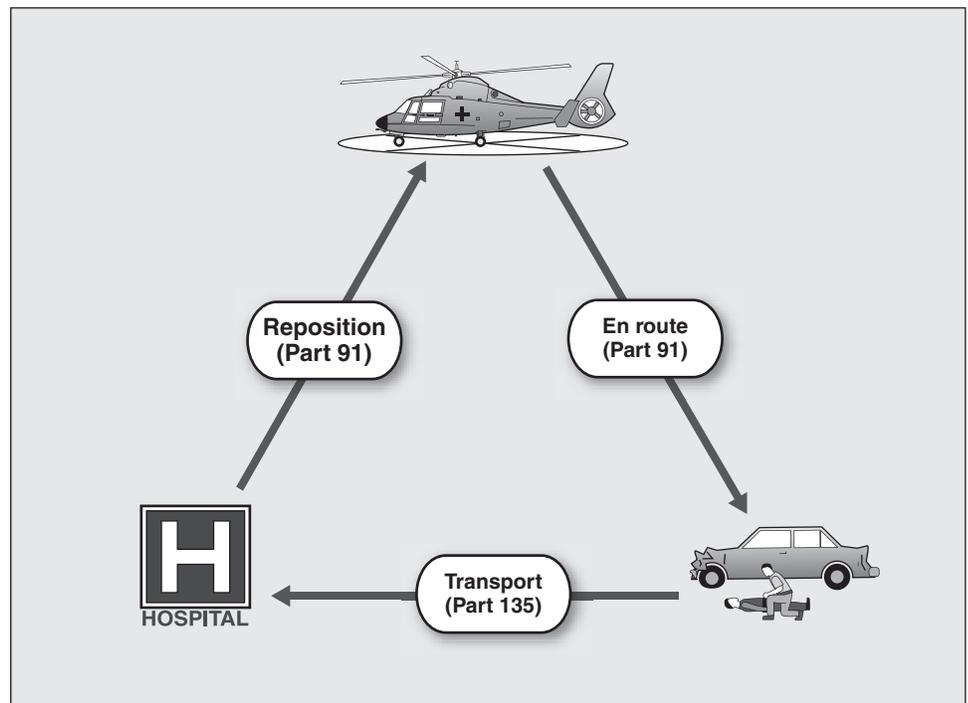
---

<sup>3</sup>Other types of operations include services that are operated by government entities or the military.

<sup>4</sup>A hospital, or other nonairline entity, may hold an exemption from the Department of Transportation to operate as an “indirect air carrier,” that is, an entity that does not actually operate aircraft, to sell air ambulance air services to the public and contract with a licensed airline for the air transportation.

Regardless of the business model employed, most air ambulances—except government and military aircraft—must operate under rules specified in Part 135 of Title 14 of the Code of Federal Regulations when patients are on board and may operate under rules specified in Part 91 when patients are not present. As a result, different legs of air ambulance missions may be flown under different rules. However, some operators fly under part 135 regardless of whether patients are on board the aircraft. (See fig. 2.) Flight rules under Parts 91 and 135 differ in two key areas—(1) minimum requirements for weather and visibility and (2) rest requirements for pilots. The Part 135 requirements are more stringent.

**Figure 2: Air Ambulance Scene Response Flight Legs**



Source: GAO.

Note: Flight rules under Parts 91 and 135 differ in two key areas—(1) minimum requirements for weather and visibility and (2) rest requirements for pilots. The Part 135 requirements are more stringent.

---

## Industry Has Expanded and Safety Concerns Have Grown in Recent Years

---

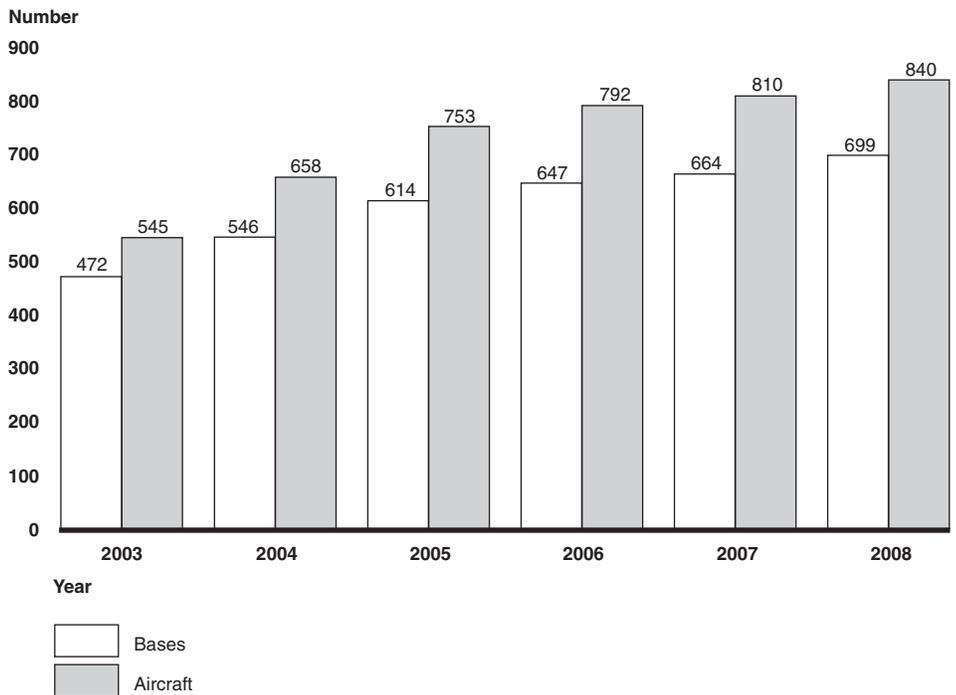
### Available Data Suggest Industry Growth and Increased Competition

According to industry experts and observers, the air ambulance industry has grown, but data limitations make it difficult to determine by how much. Data for several years on the number of aircraft and number of operating locations are available in a database maintained by the Calspan-University of Buffalo Research Center (CUBRC) in alliance with the Association of Air Medical Services (AAMS).<sup>5</sup> For 2003, the first year for which data are available, AAMS members reported a total of 545 helicopters stationed at 472 bases (airports, hospitals, and helipads). By 2008, the number of helicopters listed in the database had grown to 840, an increase of 54 percent, and the number of bases had grown to 699, an increase of 48 percent (see fig. 3). While a database official said that the data partly reflect the use of a revised criterion that allowed for the inclusion of more helicopters and for improved reporting since the database was established, the increase also reflects actual growth.

---

<sup>5</sup>AAMS is a nonprofit international association that serves providers of air and medical transport systems.

**Figure 3: Number of Air Ambulance Bases and Aircraft, 2003 through 2008**



Source: GAO analysis of Association of Air Medical Services, Atlas and Database of Air Medical Services data.

Data are less readily available on whether this increase number of aircraft translates into an increased number of operating hours. FAA does not collect flight-hour data from air ambulance operators. Unlike scheduled air carriers, which are required to report flight hours, air ambulance operators and other types of on-demand operators regulated under Part 135 are not required to report flight activity data to FAA or the Department of Transportation.<sup>6</sup> Historically, FAA estimated the number of flight hours, using responses to its annual General Aviation and Air Taxi and Avionics (GAATAA) survey. These estimates may not be reliable, however, because the survey is based on a sample of aircraft owners and response rates have historically been low.

According to the government and industry officials we interviewed and the literature we reviewed, most of the air ambulance industry's growth has

<sup>6</sup>NTSB previously recommended that FAA require flight activity reporting for all Part 135 operators.

---

been in the stand-alone (independent) provider business model.<sup>7</sup> Testimony from industry stakeholders recently submitted to NTSB further identifies the stand-alone provider business model as the current area of industry growth. The growth in the stand-alone provider business model has led to increased competition in some locales. According to the officials we interviewed and others who have studied the industry, the increase in the stand-alone provider business model is linked to the development, mandated in 1997, of a Medicare fee schedule for ambulance transports, which has increased the potential for profit making.<sup>8</sup> This fee schedule was implemented gradually starting in 2002, and since January 2006, 100 percent of payments for air ambulance services have been made under the fee schedule.<sup>9</sup> Because the fee schedule has created the potential for higher and more certain revenues, competition has increased in certain areas, according to many of our sources.

Increased competition can lead to potentially unsafe practices, industry experts said. Although we were unable to determine how widespread these activities are, experts cited the potential for such practices, including helicopter shopping and call jumping. Helicopter shopping refers to calling a series of operators until an operator agrees to take a flight assignment, without telling the subsequently called operators why the previously called operators declined the flight. This practice can be unsafe if the operator that accepts the flight assignment is not aware of all of the facts surrounding the assignment.<sup>10</sup> Call jumping occurs when an air ambulance operator responds to a scene without being dispatched to it or when multiple operators are summoned to an accident scene. This

---

<sup>7</sup>For example, a 2006 public policy paper by the Foundation for Air Medical Research & Education (FARE) observed that many air medical services “had become independent, community based resources.” Similarly, a 2005 FAA research paper noted that “the fastest growing segment of the [air medical] industry is the independent provider.

<sup>8</sup>Balanced Budget Act of 1997, P.L. No. 105-33, § 4523 (Aug. 5, 1997).

<sup>9</sup>Prior to 2002, all ambulance service reimbursements by Medicare were based on the type of provider.

<sup>10</sup>For example, in July 2004, an air ambulance collided with trees shortly after take-off, killing the pilot, flight nurse, flight paramedic, and patient. Three other air ambulance operators had previously turned down this same flight, including one that had attempted it but was forced to return because of fog. The pilot during the accident, however, was not informed by emergency medical service dispatchers that other pilots had declined the flight because of adverse weather conditions. In 2006, FAA issued a letter to all state Emergency Medical Services Directors (or equivalent positions) describing “helicopter shopping” and requesting that the directors take action within their jurisdiction to implement standards and procedures to prohibit this practice.

---

situation is potentially dangerous because the aircraft are all operating in the same uncontrolled airspace—often at night or in marginal weather conditions—increasing the risk of a midair collision or other accident.

---

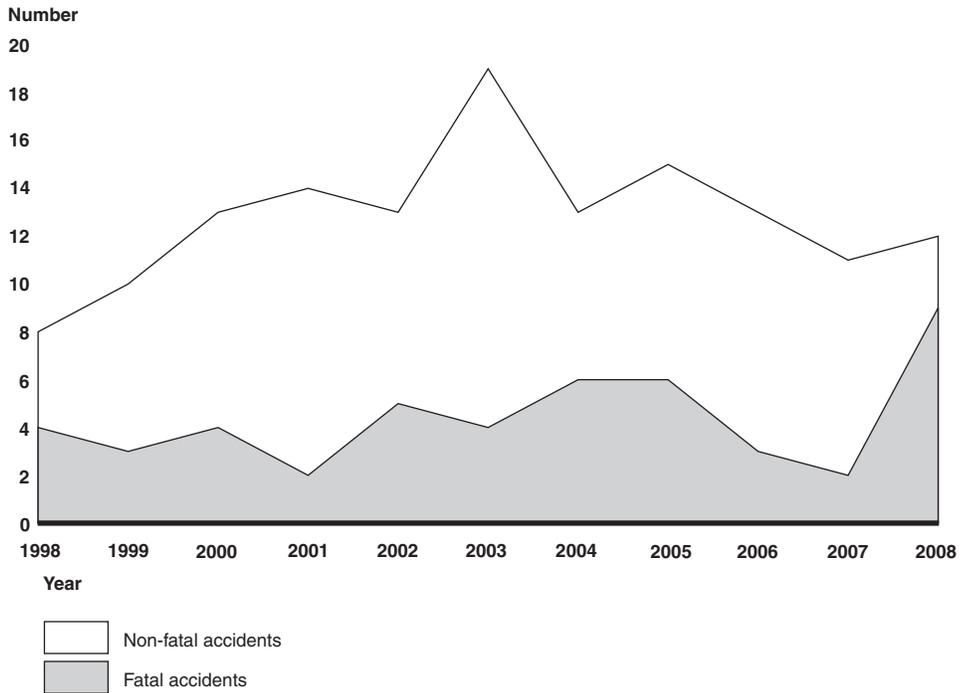
**Industry Experienced Highest Number of Fatal Accidents in 2008, but Data Limitations Preclude Complete Understanding of Safety Record**

From 1998 through 2008, the air ambulance industry averaged 13 accidents per year, according to NTSB data.<sup>11</sup> The annual number of air ambulance accidents increased from 8 in 1998 to a high of 19 in 2003. Since 2003, the number of accidents has slightly declined, fluctuating between 11 and 15 accidents per year. While the total number of air ambulance accidents peaked in 2003, the number of fatal accidents peaked in 2008, when 9 fatal accidents occurred (see fig. 4). Of 141 accidents that occurred from 1998 to 2008, 48 accidents resulted in the deaths of 128 people. From 1998 through 2007, the air ambulance industry averaged 10 fatalities per year. The number of overall fatalities increased sharply in 2008, however, to 29.

---

<sup>11</sup>NTSB has revised its definition of an air ambulance accident since our 2007 report to include accidents with an aircraft (1) dedicated to air medical operations, (2) configured for such operations, and (3) piloted by a dedicated air medical flight crew. Consequently, the numbers of accidents presented in this testimony for 1998 through 2005 is slightly higher than those presented in our 2007 report.

**Figure 4: Fatal and Non-fatal Air Ambulance Accidents, 1998-2008**



Source: GAO analysis of NTSB data.

Note: These numbers include accidents of public-use aircraft as well as additional accidents for 1998 through 2005 that NTSB included in its totals after revising its definition of an air ambulance accident.

Both the spike in the number of fatal accidents in 2008 and the overall number of accidents are a cause for concern. However, given the apparent growth in the industry, the increase in the number of accidents may not indicate that the industry has experienced, on the whole, the industry's safety record has worsened. More specifically, without actual data on the number of hours flown, no accident rate can be accurately calculated. Because an accurate accident rate is important to a complete understanding of the industry's safety, we recommended in 2007 that FAA collect data on flight activity, including flight hours.<sup>12</sup> In response, FAA has surveyed all helicopter air ambulance operators to collect flight activity data. However, to date, FAA's survey response rate is low, raising

<sup>12</sup>[GAO-07-353](#).

---

questions about whether this information can serve as an accurate measure or indicator of flight activity.

In the absence of actual flight activity data, others have attempted to estimate flight hours and accident rates for the industry. For example, an Air Medical Physician Association (AMPA) study estimated annual flight hours for the air medical industry through an operator survey, determining that the overall air medical helicopter accident rate has dropped slightly in recent years to approximately 3 accidents per 100,000 flight hours.<sup>13</sup> However, the study's preliminary estimates for 2008 indicate that the fatal accident rate tripled over the 2007 rate, increasing from 0.54 fatal accidents per 100,000 flight hours in 2007 to 1.8 fatal accidents per 100,000 flight hours in 2008.

Data on the causes and factors underlying air ambulance accidents indicate that while the majority of accidents are caused by pilot error, a number of risks, including nighttime operations, adverse weather conditions, and flights to remote sites, also contribute to accidents. NTSB data on helicopter accidents occurring from 1998 through 2008 show that pilot error was deemed the probable cause in more than 70 percent of air ambulance accidents, while factors related to flight environment (such as light, weather, and terrain) contributed to 54 percent of all accidents.<sup>14</sup> Nighttime accidents for air ambulance helicopters were prevalent, and air ambulance accidents tended to be more severe when they occurred at

---

<sup>13</sup>Ira J. Blumen, M.D., and the University of Chicago Aeromedical Network, *A Safety Review and Risk Assessment in Air Medical Transport: Supplement to the Air Medical Physician Handbook* (November 2002). The methodology used in this study was updated in a follow up study to include the nine largest air ambulance operators in the United States. To determine flight hours, the study's author multiplied the average flight hours per program by the total number of programs identified in each year. For more information, see I.J. Blumen and D. Lees, "Air medical Safety: Your First Priority" *Principles and Direction of Air Medical Transport* (Salt Lake City, Utah: Air Medical Physician Association, September 2006). The methodology was further expanded following the 2006 study to include nearly 20 operators, representing a reported 90 percent of air medical helicopters in the United States. I.J. Blumen, "An Analysis of HEMS Accidents and Accident Rates" (Washington, D.C.: NTSB public hearing: Safety of Helicopter Emergency Medical Services Operations, February, 2009). We interviewed Dr. Blumen about the study's methodology and findings. We determined that the study's methodology and findings were sufficiently reliable for our purposes.

<sup>14</sup>Numbers do not add to 100 percent because multiple factors could contribute to a single accident. Some 2008 accidents were excluded from this analysis because NTSB has not yet completed their accident investigations and made determinations of cause and underlying factors.

---

night than during the day. Similarly, air ambulance accidents were often associated with adverse weather conditions (e.g., wind gust and fog). Finally, flying to remote sites may further expose the crew to other risks associated with unfamiliar topography and makeshift landing sites.

---

## Industry and FAA Have Acted to Address Air Ambulance Accident Trends and Causes

---

### Increase in Number of Accidents Has Led to Greater Industry Focus on Safety

In 2007, we reported that the air ambulance industry's response to the higher number of accidents has taken a variety of forms, including research into accident causes and training.<sup>15</sup> Since then, the industry has continued its focus on improving safety by, for example, initiating efforts to develop an industry risk profile and share weather information. In July 2008, for instance, AAMS convened a conference (summit) on safety to encourage open communication between the medical and aviation sectors of the industry. AAMS plans to issue a summary of the summit's proceedings that will include recommended next steps. Table 1 highlights examples of recent industry initiatives.

---

<sup>15</sup>For more information on the industry safety initiatives we identified, see [GAO-07-353](#).

**Table 1: Examples of Recent Air Ambulance Industry Initiatives to Address Safety Concerns**

Year	Organization	Initiative
2007	AirMed International LLC	Administers the Web Site WeatherTurndown.com, which allows medical transport programs to share current information on delays or cancellations due to weather.
2008	AAMS	Safety summit with operators, regulators, medical professionals, and insurance providers to discuss and learn from recent accidents.
2008	Commission on the Accreditation of Medical Transport Systems (CAMTS)	Produced and distributed a video on “helicopter shopping,” which can lead to an unsafe condition in which an operator initiates a flight that it may have declined if it had been told that other operators had turned down the flight for safety reasons.
2008	Bell Helicopter	Sponsored safety risk profile of the industry.
2009	Air Medical Operators Association (AMOA), AAMS, and Helicopter Association International	Developed and submitted recommendations to NTSB that are intended to enhance air medical safety.

Source: GAO.

## FAA Has Taken a Number of Actions to Address Safety Concerns

In 2007, we reported that FAA, the primary federal agency overseeing air ambulance operators, has issued guidance, expanded inspection resources, and collaborated with the industry to reduce the number of air ambulance accidents. Since then, FAA has taken additional steps to improve air ambulance safety including the following:

- Enhanced oversight to better reflect the unique nature of the industry.** FAA has changed its oversight to reflect the varying sizes of operators. Specifically, large operators with 25 or more helicopters dedicated to air medical flights are now assigned to dedicated FAA Certificate Management Teams (CMT)—groups of inspectors that are assigned to one air ambulance operator. These CMTs range in size from 4 inspectors for Keystone Helicopter Corporation, which has a fleet of 38 helicopters, to 24 inspectors for Air Methods, which has a fleet of 322 helicopters. Additionally, CMTs use a data- and risk-based process to target inspections to areas that pose greater safety risk. For operators of all sizes, FAA has asked inspectors to consider using the Surveillance Priority Index tool, which can be used to identify an operator’s most

---

pressing safety hazards. In addition, FAA is hiring more aviation safety inspectors with rotorcraft experience.

- **Provided technical resources.** FAA has revised its guidance for the use of night vision goggles (NVG) and established a cadre of NVG national resource inspectors.<sup>16</sup> FAA has also developed technical standards for the manufacture of helicopter terrain awareness and warning systems for air medical helicopters.<sup>17</sup> These standards articulate the minimum performance standards and documentation requirements that the technology must meet to obtain FAA approval. FAA also commissioned the development of an air ambulance weather tool, which provides weather assessments for the community.<sup>18</sup>
- **Launched accident mitigation program.** Initiated in January 2009, this program provides guidance for inspectors of air ambulance operators, requiring them to ensure, among other things, that these operators have a process in place to facilitate safe operations, such as a risk assessment program.
- **Revised minimum standards for weather and safe cruise altitudes:** To enhance safety, FAA revised its minimal requirements for weather and safe cruise altitudes for helicopter air ambulances in November 2008.<sup>19</sup> Specifically, FAA revised its specifications to require that if a patient is on board for a flight or flight segment and at least one of the flight segments is therefore subject to Part 135 rules, then all of the flight segments must be conducted within the revised weather minimums and above a minimum safe cruise altitude determined in preflight planning.
- **Issued guidance on operational control:** To help operators better assess risk, improve the flow of information before and during flights, and increase support for flight operations, FAA issued guidance to help air

---

<sup>16</sup>See FAA Order 8900.1 and Notice 8000.349.

<sup>17</sup>TSO-C194, December 17, 2008.

<sup>18</sup>Developed as a result of FAA's 2006 air ambulance weather summit, the air ambulance weather tool provides assessments of ceilings and visibility for a given time and location. It does not report observations or forecasts and currently can only be used in visual flight rule operations to determine whether to initiate a flight.

<sup>19</sup>73 Fed. Reg. 6754, Nov. 14, 2008.

---

medical operators develop, implement, and integrate operations control centers and enhance operational control procedures.<sup>20</sup>

To date, FAA has opted not to use its rulemaking authority to require certain actions, relying instead on notices and guidance to encourage air ambulance operators to take certain actions. FAA guidance and notices are not mandatory for air ambulance operators and are not subject to enforcement. FAA officials told us that rulemaking is a time-consuming process that can take years to complete, hindering the agency's ability to quickly respond to emerging issues. By issuing guidance rather than regulations, FAA has been able to quickly respond to concerns about air ambulance safety. However, we previously noted that FAA lacked information on the extent to which air ambulance operators were implementing the agency's voluntary guidance and on the effect such guidance was having. Consequently, we recommended that FAA collect information on operators' implementation of the voluntary guidance and evaluate the effectiveness of that guidance. In response, in January 2009, FAA directed safety inspectors to survey the air medical operators they oversee about their adoption of suggested practices, such as implementing risk assessment programs and developing operations control centers.<sup>21</sup> According to the inspectors, most of the 74 operators surveyed said they had adopted these practices.

---

## Potential Strategies for Improving Air Ambulance Safety

Despite the actions taken by the industry and the federal government, 2008 was the deadliest year on record for the air ambulance industry. As a board member noted at the recent NTSB hearing on air ambulance safety, the recent accident record of the industry is unacceptable. Based on our body of work on aviation safety, including air ambulance safety; a review of the published literature; and interviews with government and industry officials, we have identified several potential strategies for improving air ambulance safety. Each of these strategies has merits and challenges, and we have not analyzed their benefits and costs. But, as the recent accident numbers show, additional efforts are warranted.

- **Obtain complete and accurate data on air ambulance operations:** As we reported in 2007, FAA lacks basic industry information, such as the number of flights and flight hours. In response to our prior

---

<sup>20</sup>Advisory Circular 120-96.

<sup>21</sup>See FAA Notice 8900.63.

---

recommendation that FAA collect flight activity data, FAA surveyed all helicopter air ambulance operators in 2008, but fewer than 40 percent responded, thereby raising questions about the reliability of the information collected. The low response rate also suggests that many operators will not provide this information unless they are required to do so. Until FAA obtains complete and reliable information from all air ambulance operators, it will be unable to gain a complete understanding of the industry and determine whether its efforts to improve industry safety are sufficient and accurately targeted.

- **Increase use of safety technologies:** We have previously reported that using appropriate technology and infrastructure can help improve aviation safety.<sup>22</sup> For example, the development and installation of terrain awareness and warning systems on large passenger carriers has almost completely eliminated controlled flights into terrain,<sup>23</sup> particularly for aircraft equipped with this system. When we studied the air ambulance industry in 2006 and 2007, the most frequently cited helicopter-appropriate technology was night vision goggles. Additional safety technology has been developed or is in development that will help aircraft avoid cables and enhance terrain awareness for pilots, among other things. However, testimony submitted by industry stakeholders at NTSB's February 2009 hearing on air ambulance safety indicated that the implementation of such technology has been slow. NTSB previously recommended that FAA require terrain awareness and warning systems on air ambulances. Proposed legislation (H.R. 1201) would also require FAA to complete a study within one year of the date of enactment on the feasibility of requiring flight data and cockpit voice recorders on new and existing air ambulances.<sup>24</sup>
- **Sustain recent efforts to improve air ambulance safety:** Our past aviation safety work and anecdotal information on air ambulance accident trends suggest that the industry and federal government must sustain recent efforts to improve air ambulance safety. In 1988, after the number

---

<sup>22</sup>GAO, *Aviation Runway and Ramp Safety: Sustained Efforts to Address Leadership, Technology, and Other Challenges Needed to Reduce Accidents and Incidents*, GAO-08-29 (Washington, D.C.: Nov. 20, 2007).

<sup>23</sup>Controlled flight into terrain occurs when an airworthy aircraft under the control of the flight crew is flown unintentionally into terrain, obstacles or water, usually with no prior awareness by the crew.

<sup>24</sup>H.R. 1201, "Air Medical Safety Act." The bill would also require a complete rulemaking within 30 months requiring flight data and cockpit voice recorders on board air ambulances.

---

of accidents increased in the mid-1980s, NTSB published a study that examined air ambulance safety issues.<sup>25</sup> The study contained 19 safety recommendations to FAA and others. FAA took action, including implementing the NTSB recommendations, and the number of ambulance accidents declined in the years that immediately followed.<sup>26</sup> However, as time passed, the number of accidents started to increase, peaking in 2003. This again triggered a flurry of government and industry actions. Similarly, FAA took steps to address runway incursions and overruns after the number and rate of incursions peaked in fiscal year 2001, but FAA's efforts later waned, and the number and rate of incursions and overruns remained steady.<sup>27</sup>

- **Fully Address NTSB recommendations:** In 2006, NTSB published a special report focusing on the air ambulance industry, which included four recommendations to FAA to improve air ambulance safety.<sup>28</sup> Specifically, NTSB called for FAA to (1) require that all flights with medical personnel on board be conducted in accordance with Part 135 regulations, (2) develop and implement flight risk evaluation programs, (3) require formalized dispatch and flight-following procedures, and (4) require terrain awareness and warning systems on aircraft. As of January 2009, FAA had sufficiently addressed only the recommendation to require formalized dispatch and flight-following procedures, according to NTSB. However, NTSB's February 2009 air ambulance hearing highlighted the status of the NTSB recommendations, and major industry associations have said they agree in principle with the recommendations, but would like to work with FAA and NTSB to adapt the recommendations to the industry's circumstances and gain more flexibility. Proposed legislation (H.R. 1201) also would require most of the safety enhancements NTSB recommended.
- **Adopt safety management systems within the air ambulance industry:** Air operators rely on a number of protocols to help reduce the potential for poor or erroneous judgment, but evidence suggests that these

---

<sup>25</sup>NTSB, *Safety Study: Commercial Emergency Medical Services Helicopter Operations* (Washington, D.C.: 1988).

<sup>26</sup>Because of the lack of flight activity data and the number of other factors that could affect accident trends, we do not know to what extent, if at all, FAA's actions contributed to the decline in the number of accidents.

<sup>27</sup>[GAO-08-29](#).

<sup>28</sup>National Transportation Safety Board, *Special Investigative Report on Emergency Medical Services Operations* (Washington, D.C., 2006).

---

protocols may be inconsistently implemented or followed in air ambulance operations. According to an FAA report on air ambulance accidents from 1998 through 2004, a lack of operational control (authority over initiating, conducting, and terminating a flight) and poor aeronautical decision making were significant factors contributing to these accidents.<sup>29</sup> To combat such issues, FAA has been encouraging air ambulance operators to move toward adopting safety management systems, providing guidance, developing a generic flight risk assessment tool for operators, and requiring inspectors to promote the adoption of safety best practices.

- **Clarify the role of states in overseeing air ambulance services:** Air ambulance industry stakeholders disagree on the role that states should play in overseeing broader aspects of air medical operations. In particular, some industry stakeholders have advocated a greater role for states in regulating air ambulance services as part of their public health function. Other industry stakeholders, however, oppose increased state oversight, noting, for example, that the Airline Deregulation Act explicitly prohibits states from regulating the price, route, or service of an air carrier. This legislation generally limits oversight at the state or local levels to the medical care and equipment provided by air ambulance services, although the extent of this oversight varies by state. Proposed legislation (H.R. 978) would recognize and clarify the authority of the states to regulate intrastate air ambulance services in accordance with their authority over public health.<sup>30</sup>
- **Determine the appropriate use of air ambulance services:** According to a May 2007 article by two physicians, multiple organizations are concerned that air ambulance services are overused and misused.<sup>31</sup> The study further notes concerns that decisions about where to transport a patient may be influenced by nonmedical reasons, such as insurance coverage or agreements with hospitals. Another industry expert has posited that excessive use of air ambulances may be unsafe and not beneficial for most patients, citing recent studies that conclude few air transport patients benefited significantly over patients transported by ground and noting the recent increase in the number of air medical accidents. Other studies, however, have disagreed with this position, citing

---

<sup>29</sup>For more information, see Matthew J. Rigsby, FAA, *U.S. Civil Helicopter Emergency Medical Services Accident Data Analysis, the FAA Perspective* (September 2005).

<sup>30</sup>H.R. 978, "Helicopter Medical Services Patient Safety, Protection, and Coordination Act."

<sup>31</sup>Mary E. Fallat, MD, FACS, and John Overton, MD et al, "Air Medical Transport Safety," *Bulletin of the American College of Surgeons*, May 2007.

---

reductions in mortality achieved by using air ambulances to quickly transport critically injured patients.

---

## Agency Comments

We provided a draft copy of this testimony to FAA for review and comment. FAA provided technical clarifications, which we incorporated as appropriate.

---

Mr. Chairman, this concludes my prepared statement. I would be pleased to respond to questions from you or other Members of the Subcommittee.

---

## GAO Contact and Staff Acknowledgments

For further information on this statement, please contact Dr. Gerald L. Dillingham at (202) 512-2834 or [dillinghamg@gao.gov](mailto:dillinghamg@gao.gov). Contact points for our Congressional Relations and Public Affairs offices may be found on the last page of this statement. Individuals making key contributions to this testimony were Nikki Clowers, Assistant Director; Vashun Cole, Elizabeth Eisenstadt, Brooke Leary, and Pamela Vines.

---

---

This is a work of the U.S. government and is not subject to copyright protection in the United States. The published product may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.

---

## GAO's Mission

The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

---

## Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's Web site ([www.gao.gov](http://www.gao.gov)). Each weekday afternoon, GAO posts on its Web site newly released reports, testimony, and correspondence. To have GAO e-mail you a list of newly posted products, go to [www.gao.gov](http://www.gao.gov) and select "E-mail Updates."

---

## Order by Phone

The price of each GAO publication reflects GAO's actual cost of production and distribution and depends on the number of pages in the publication and whether the publication is printed in color or black and white. Pricing and ordering information is posted on GAO's Web site, <http://www.gao.gov/ordering.htm>.

Place orders by calling (202) 512-6000, toll free (866) 801-7077, or TDD (202) 512-2537.

Orders may be paid for using American Express, Discover Card, MasterCard, Visa, check, or money order. Call for additional information.

---

## To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Web site: [www.gao.gov/fraudnet/fraudnet.htm](http://www.gao.gov/fraudnet/fraudnet.htm)

E-mail: [fraudnet@gao.gov](mailto:fraudnet@gao.gov)

Automated answering system: (800) 424-5454 or (202) 512-7470

---

## Congressional Relations

Ralph Dawn, Managing Director, [dawnr@gao.gov](mailto:dawnr@gao.gov), (202) 512-4400  
U.S. Government Accountability Office, 441 G Street NW, Room 7125  
Washington, DC 20548

---

## Public Affairs

Chuck Young, Managing Director, [youngc1@gao.gov](mailto:youngc1@gao.gov), (202) 512-4800  
U.S. Government Accountability Office, 441 G Street NW, Room 7149  
Washington, DC 20548

