

In most phases of flight — including takeoff, climb, en route and approach — 22% of those on board survived fatal crashes in the 1970s, compared with 15% in 2000-09.

More passengers are surviving fatal airline accidents during landing, but survival rates during stages of flight when most accidents happen have not improved from decades ago, a new USA TODAY study shows.

Only 9% of fatal accidents since 1970 occurred during landing, while the vast majority happened during other phases of flight. In those other phases — which include takeoff, initial climb, en route and approach to an airport — 22% survived in the 1970s, compared with 15% in the most recent decade (2000-09).

Fatal accidents are rare. U.S. airlines operate more than 9 million flights annually and, according to the study, were involved in just five fatal accidents from Jan. 1, 2008, through July 10, 2013. The number of accidents worldwide has also declined. There were 394 such accidents in the 1970s, compared with 269 from Jan. 1, 2000, through July 10, 2013.

USA TODAY's exclusive study — which analyzed Aviation Safety Network fatal accident data from Jan. 1, 1970 through July 10, 2013, for aircraft 12 seats or more — looked at 1,268 fatal airline accidents worldwide that killed 42,444 passengers and 4,510 crewmembers. The Netherlands-based Aviation Safety Network gathers accident data for the International Civil Aviation Organization and the Flight Safety Foundation.

Of fatal accidents worldwide since 1970, the largest percentage — nearly 40% — happened on approach. During that flight phase, 18% of people survived fatal accidents in the 1970s and 20% in 2000-09. If recent fatal accidents are included, just 18% survived from Jan. 1, 2000, through July 10, 2013.

Former National Transportation Safety Board chairman Jim Hall reviewed the data in the study and agreed with USA TODAY's conclusions.

"It is fascinating," Hall said. "I don't draw any different conclusions than you did."

STORY: Air crash survival improves at landing, lags elsewhere

The data show "it's important" that the aviation industry "continues to work to increase survivability," he said.

The en route flight phase — after an aircraft's initial climb until its initial approach — had the second-largest number of fatal accidents, the study shows. During that phase, only 11% of people survived fatal accidents worldwide in the 1970s, compared with 7% in 2000-09.

During all phases of flight, the study found, just 4% of people aboard U.S. airline flights survived fatal accidents from Jan. 1, 2000, through July 10, 2013.

The low survivability percentage is "surprising at first glance," but "when you look closer, the numbers make more sense," said Anthony Brickhouse, an associate professor at Embry-Riddle Aeronautical University.

He said the low percentage can be attributed to crashes that "were not survivable," because impact forces were "so extreme." He cites an American Airlines jet that plummeted into a suburban neighborhood and killed all 251 aboard after takeoff from New York's John F. Kennedy Airport in November 2001.

Edwin Galea, a professor at the University of Greenwich in England who is an aircraft evacuation expert, said the USA TODAY study is "interesting" but omits some serious accidents without fatalities.

For instance, the data do not include all 155 aboard who survived a US Airways flight that ditched into the Hudson River in January 2009 after a bird strike on departure from New York's La Guardia Airport. Had serious accidents without fatalities, such as the "Miracle on the Hudson" flight, been added, the survivability percentages during flight phases would have gone up.

Former Department of Transportation Inspector General Mary Schiavo said the study clearly shows that, considering all flight phases, more people are not surviving fatal accidents.

"I think the study is highly significant and really important," said Schiavo, who is now an aviation lawyer. "It is a more realistic way to look at accident statistics, because it throws out the fender-bender and looks only at accidents with fatalities."

A March 2001 National Transportation Safety Board survivability study included fatal and non-fatal accidents of U.S. airline flights from 1983 to 2000. The study concluded that 56% survived 26 "serious" accidents, but it omitted two crashes abroad that killed 415 of 419 occupants. The NTSB said it would not comment on USA TODAY's study.