

Update to Lewis, Fetter, and Gronlund, "Casualties and Damage from Scud Attacks in the 1991 Gulf War," March 1993.

Since we published this paper, some additional information relevant to the paper has become available:

(1) According to the official Israeli Air Force assessment, the number of Patriots that dove into the ground in Israel was eight (in the paper we said "at least four"). This assessment also states that Patriot probably destroyed no Scud warheads in Israel, although there is some circumstantial evidence for one successful intercept.

(2) In the paper, we say that "somewhat less than 47" Scuds were engaged by Patriot. It is now possible to deduce that the actual number is 44. It now also appears possible that there were only 16 engagements in Israel, rather than the figure of 17 we used, but this is not certain.

(3) The US Army has now stated that there were a total of four dud Scud warheads recovered (this statement seems to leave open the possibility that other duds may have occurred in the desert or sea). One of these at Tel Aviv before Patriot was operational (on January 19). The Army has stated that the other three dud Scuds were all engaged by Patriot, and the Army claims all three as warhead kills. One of these was in Israel (February 19) and the other two were in Saudi Arabia (one was on February 24, the date of the other is not known to us). In addition, the Army has stated that there was one Scud with a concrete warhead recovered near Dimona, Israel.

(4) The Army continues to claim that it successfully intercepted over 70% of the Scuds in Saudi Arabia and over 40% in Israel, with 40% percent of the claimed warhead kills being characterized as "highest confidence" kills. It is now possible to reconstruct the Army's claims:

Warhead kills (Scud warhead exploded in air):	20
Warhead kills (Scuds warhead does not explode):	3
Mission kills (Scuds deflected off course):	2
Mission kills (Scud explodes with reduced yield):	2
No kill:	15
Unknown:	2

	44

(5) Additional information is now available about the two Scuds fired at Riyadh on February 24. CNN videos have been used to confirm that the times we gave are at least approximately correct, so footnote 116 can be ignored. The first Scud (at about 4:40 am) hit a school building and destroyed it. It was unoccupied and there were no injuries reported. The second Scud (about 9:30 pm) was engaged by two Patriots. The first Patriot self-destructed shortly after launch, and the second Patriot exploded well behind the Scud. The Army has stated that this Scud was a "confirmed warhead kill." It appears that this Scud was a dud.