# Missiles in conflict: the issue of missiles in all its complexity

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"Our scientific power has outrun our spiritual power.
We have guided missiles and misguided men."

Martin Luther King Jr, 1963, *Strength to Love*

The centrality of missiles to today's security concerns became glaringly apparent in mid-2006. Hezbollah militia fired almost 4,000 missiles from Lebanese territory, causing serious damage and 43 deaths in the densely populated Galilee region in northern Israel. The town of Kiryat Shmona alone was the target of 911 Hezbollah-launched rockets.[1] The mostly Iranian-built rockets—portable short-range (20–40km) Katyushas, but also Zelzal rockets with a range of about 200km—were launched from sites that are hard to detect. They reached their targets within seconds, which made interception nearly impossible. Despite dropping thousands of bombs and missiles on Lebanon, destroying its infrastructure, killing more than 1,000 people and driving hundreds of thousands from their homes, Israel was not able to stop the use of these rockets against its territory. These crude rockets challenged the domination of Israel's air power and made large-scale ground operations more difficult.[2]

The hostilities in Lebanon and Israel demonstrate that the use of rockets, ballistic missiles, cruise missiles and even unmanned aerial vehicles (UAVs) is no longer the exclusive privilege of technologically advanced state armies; it has become an option for low-tech states and non-state actors. Although the number of casualties remains relatively low considering the large numbers of rockets launched (on average, about 100 rocket launches by Hezbollah caused one death in Israel), the characterization of missiles as weapons of terror has once more been realized.

As illustrated by the Hezbollah–Israel case, defence against missiles is not yet possible, and attempts to prevent further launches by eliminating launchers or supply stocks are rarely successful. Furthermore, such countermeasures cause substantial casualties if the launchers are deployed in areas where the civilian population serves as a (voluntary or involuntary) human shield. With international media highlighting the civilian victims of such raids, public opinion exerts considerable pressure on the counteracting state to stop such operations.

Experts have been warning of the looming danger of shorter-range missiles in the hands of hostile regimes or non-state actors for quite some time; this represents a significant addition to the missile threat. Rockets and missiles encompass an extremely diverse class of weapons, ranging from the

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aforementioned Katyushas to intercontinental ballistic missiles (ICBMs), from relatively crude constructions to sophisticated high-tech devices, carrying payloads from a few kilograms of conventional explosives to megaton nuclear warheads. This complexity adds to the growing security problem posed by missiles and their proliferation, demanding more determined and coherent efforts from the international community to actually resolve the issue of "missiles in all its aspects", as suggested by the name of the United Nations Panel of Governmental Experts.[3]

### Box 1. Missile definitions

**Rocket:** a vehicle that obtains thrust by the ejection of fast-moving fluid. In military terms it is a self-propelled weapon without a guidance system (i.e. once fired, it cannot be redirected). Most rockets have a relatively short range and can carry only small payloads.

**Missile:** an unmanned, self-propelled, self-contained, unrecallable, guided or unguided vehicle designed to deliver a weapon or other payload.

**Ballistic missile:** a missile guided during powered flight and unguided during free flight, when the trajectory that it follows is subject only to the external influences of gravity and atmospheric drag.

**Cruise missile:** a manoeuvrable missile that is propelled, usually at low altitudes, to its target by an air-breathing jet engine that operates throughout the flight.

**Unmanned aerial vehicle (UAV):** a pilotless aircraft with similar characteristics to a cruise missile; sometimes called a drone.

**Payloads**: these can consist of conventional weapons (explosives, cluster bombs, etc.), or nuclear, biological and chemical weapons.

**Launching:** missiles can be launched from land (hand-held or shoulder-fired, mobile erector, truck, train, silo), sea (ship and submarine), and air.

**Ranges** are used to classify ballistic missiles:

Short-range ballistic missile (SRBM) = 70–1,000km

Medium-range ballistic missile (MRBM) = 1,000–3,000km

Intermediate-range ballistic missile (IRBM) = 3,000–5,500km

Intercontinental ballistic missile (ICBM) = over 5,500km

Sources: Weapons of Mass Destruction Commission, 2006, *Weapons of Terror: Freeing the World of Nuclear, Biological and Chemical Arms,* Stockholm; *The Issue of Missiles in All Its Aspects: Report of the Secretary-General,* UN document A/57/229, 23 July 2002.

## *Increasing or decreasing? The state of missile arsenals*

The psychologically devastating effect of the unpredictable missile threat remains undiminished since the first missiles, the German V1 (cruise missile) and V2 (ballistic missile), terrorized the populations of European cities in 1944. The accuracy of the V2 was low (with a 17km deviation) and the blast of the explosive payload was partly contained in the crater created by the missile impact, but the lack of warning, and the angst, confusion and helplessness suffered by the population added considerably to the physical damage, creating a unique sense of terror.

Despite absorbing an enormous amount of resources, comparable only to the Manhattan Project, the V2 had no significant impact on the war's outcome. The weapon's performance—3,200 V2s caused around 8,000 deaths—could not match the destructive effect of the warring parties' bombing

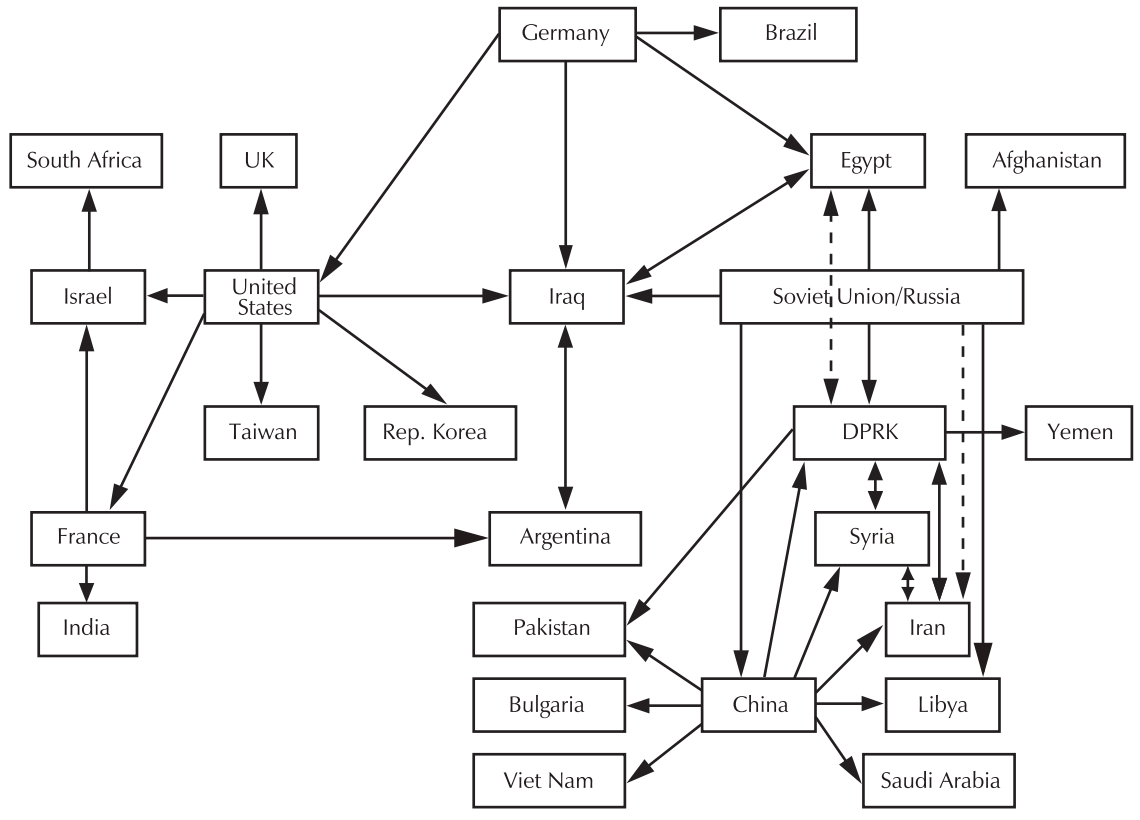
campaigns, but this novel military technology has had a lasting effect on arsenals, doctrines and policies worldwide.

Today, proliferation of missile technology is a critically important issue for international security, even more as it is linked with the proliferation of nuclear and other weapons of mass destruction (WMD). A nuclear weapon, after all, poses much less of a threat if there are no appropriate means to deliver it. The delivery requirements of a nuclear weapon consist of a payload capacity of a few hundred kilograms, a range of a few hundred kilometres and accuracy to within at least a few kilometres. A specific infrastructure—including command and control systems—is also needed.

WMD could potentially be delivered via a number of systems, including aircraft, ballistic missiles, cruise missiles, artillery and UAVs, as well as a wide range of low-technology options, such as civilian cars, ships or even suitcases. The more sophisticated and precisely targetable a delivery system, and the longer its range and bigger its payload, the more difficult and costly it is to develop and produce. But the faster and higher it can fly, the more difficult it is to defend against. Whatever the range and sophistication, missile development is a key international security concern.

## Ballistic missiles

**Figure 1. The network of ballistic missile technology proliferation**




Source: For details about the missile proliferation network, see Alexander H. Montgomery, 2006, "Proliferation Networks in Theory and Practice", *Strategic Insights*, vol. V, no. 6, July, at <www.ccc.nps.navy.mil/si/2006/Jul/montgomeryJul06.asp>.

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25. See Seymour M. Hersh, "The Iran Plans: Would President Bush Go to War to Stop Teheran from Getting the Bomb?", *The New Yorker,* 17 April 2006, at <www.newyorker.com/fact/content/articles/060417fa_fact>.
26. For more on missiles and regional security, see the article by Waheguru Pal Singh Sidhu in this issue of *Disarmament Forum.*
27. United Nations General Assembly, op. cit.
28. Dennis M. Gormley, 2003, "Missile Defence Myopia: Lessons from the Iraq War", *Survival,* vol. 45, no. 4, pp. 61–81.
29. Jürgen Scheffran, 1993, "Dual Use of Missiles and Space Technologies", in G. Neuneck, O. Ischebeck (eds), *Missile Technologies, Proliferation and Concepts for Arms Control*, Baden-Baden, Nomos, pp. 49–68.
30. J. Jerome Holton, Lora Lumpe, Jeremy J. Stone, 1993, "Proposal for a Zero Ballistic Missile Regime", in E. Kirk, W. Thomas Wander and B.D. Smith (eds), *1993 Science and International Security Anthology*, Washington, DC, AAAS, pp. 379–396, at <www.fas.org/asmp/library/articles/zerobal93.htm>; Alton Frye, 1996, "Banning Ballistic Missiles", *Foreign Affairs,* November/December, pp. 99–112.
31. For more on monitoring and verification, see the article by Mike Vannoni and Kent Biringer in this issue of *Disarmament Forum.*
32. *Thirteenth Quarterly Report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission*, in UN document S/2003/580, 30 May 2003; Timothy V. McCarthy, 1996, "Land-Based Ballistic Missile Verification: The UNSCOM Experience", in Peter Hayes (ed.), *Space Power Interests*, Oxford, Westview, pp. 183–206.
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