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# Key Sources of Multinational Data on Conventional and Nuclear Armaments

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I am pleased to offer this column on sources of conventional and nuclear armaments. Author David Lincove has taken a very complicated research topic and provided clear and concise descriptions of where to find data and other types of information. Many of the items in his column are web-only resources that would make a fine addition to subject guides in the military sciences, peace studies, political science, international relations, and more.—*Editor*

**T**his article is a guide to current data sources on conventional and nuclear military armaments. The resources provide statistical and textual data for assessing the comparative trends in weapons build-ups, expenditures, and trade among nations and regions. In addition, sources may include detailed information on specific weapons and data on military personnel in the armed forces. Many countries compile data on their own armaments, but the resources below bring together information from multiple sources and nations. The resources will be of interest to students and researchers engaged in studying national security, international relations, foreign policy, history, and military affairs. They may use the data to advise leaders regarding domestic and regional security, understand current and historical international politics, and contribute to practical and theoretical approaches to the study of conflict and peace in the world.

Armaments data is complex given, for example, the great variety of armaments, different standards for measuring trade valuations or weapons specifications, and the use of arms for offensive and defensive purposes. Users of the data need to analyze it in the context of national policies, traditions, international relationships, and power structures. The complexity of the weapons data can make it difficult to compare figures among nations, but it offers the potential for better understanding, among arms experts and the public, of the role of armaments in international conflicts, national budgets, and politics.

The compilation of data on national military forces and armaments has historical roots in the last quarter of the nineteenth century.<sup>1</sup> It was furthered by the human and material devastation in World War I that focused the attention of postwar political and military leaders on the consequences of a future arms race combined with industrial and technological advances in the production and sale of ever increasingly powerful weapons of war. The covenant of the League of Nations, incorporated into the Treaty of Versailles in 1919, called for the worldwide reduction of arms and the sharing of information about national arms holdings and

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purchases. The concept was that increasing the knowledge of arms held by nations, coupled with greater cultural exchange and the league's theoretical framework for settling grievances between nations, would enhance arms transparency and international understanding and reduce suspicions about the intentions of potential adversaries. The league's Disarmament Section developed data publications to support its mandate to devise a scheme to control the arms trade and reduce arms holdings.<sup>2</sup> Although these publications ceased by 1940, they serve as historical data sources, and their conceptual framework influenced future data compilation efforts by the United Nations and peace research organizations. After the Second World War, the UN accepted the same philosophy of transparency and openness but delayed a program in publishing arms data.

Virtually all of the data found in the resources below originate from openly available information, including government documents, commercial periodicals, independent authoritative research, and surveys completed by national governments. The data on the same categories of arms may differ from one source to another due to the complexity of compiling the information and defining military armaments. The openly available data on arms holdings and trade is unlikely to provide a complete picture based on the assumption that nations do not disclose all of their information on domestic arms production, arms holdings, and new arms development.

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## CONVENTIONAL ARMAMENTS

### United Nations and World Bank

*UN Report on Military Expenditures* (<http://www.un-arm.org/Milex/home.aspx>)

This database provides data back to 2000. Each participating country reports their military expenditures, and since 1981, 126 nations have participated but most do not report every year. (Data prior to 2000 is available from *DAG Repository* [<http://repository.un.org/>] using the original title, *Military Expenditures in Standardized Form Reported by States*.) Reported military expenditures refer to "all financial resources that a State spends on the uses and functions of its military forces."<sup>3</sup> The consistency, currency, and completeness of reported annual expenditure data varies from one reporting country to another. Country profiles provide graphic visualizations of some data and detailed tables by military forces (land, naval, air, and other) and categories of armaments such as missiles, aircraft, and armored vehicles. Detailed statistics are available for personnel, procurement and construction, research and development, and operations and maintenance. Users may download the statistical tables in PDF and copy tabular data into Microsoft Excel.

*UN Register of Conventional Arms* (<https://www.unroca.org/>)

The register provides detailed arms data in graphic and tabular format from 170 countries in seven categories: battle

tanks, armored combat vehicles, large-caliber artillery systems, combat aircraft and unmanned combat aerial vehicles, attack helicopters, warships, missiles, and missile launchers. The data illustrates national exports and imports of weapons by trading country and stockpiles of these weapons back to 1992. Data for small arms and light weapons began in 2006. The consistency, currency, and completeness of reported data vary from one reporting country to another. A separate table combines imports and procurements through domestic production for each weapon category. Data for exports and imports include types of weapons purchased. Users can compare the data with reports from trading partners. Associated with UNROCA, *Global Reported Arms Trade (GRAT)* shows stockpiles and trade in heavy weapons at <http://www.un-register.org/HeavyWeapons/Index.aspx> and small weapons at <http://www.un-register.org/SmallArms/Index.aspx>.

*UNData* (<http://data.un.org>)

Sources for this database are publications from the UN, World Bank, and International Monetary Fund. Use the UNData homepage search box to enter either the words *military*, *arms*, or *weapons* to view relevant data files on military arms production, trade, or expenditures by country or worldwide. Users may download data in various formats.

*UN Comtrade Database* (<https://comtrade.un.org/>)

This database provides data on commodity trading that includes trade in small military weapons by country and commodity codes. Search for code 9301 (HS or harmonized system code) or 891 (SITC, *Standard International Trade Classification* code). Also available in the database is the *International Trade Statistics Yearbook* (<https://comtrade.un.org/pb/>) in PDF online by country. Search for SITC commodity code 891.

*World Bank Open Data* (<https://data.worldbank.org/>)

The World Bank uses data from Stockholm International Peace Research Institute (SIPRI), *Military Balance*, and Peace Research Institute Oslo (PRIO). It covers armed forces personnel and armed forces personnel as a percentage of total labor force, total military expenditures and military expenditures as a percentage of central government expenditure, and arms imports and exports. It allows downloading and displaying graphs for individual countries and the world generally.

### International Institute of Strategic Studies (IISS)

*Military Balance: The Annual Assessment of Global Military Capabilities and Defence Economics*. Taylor & Francis, 1959–. Annual (ISSN: print 0459-7222; online 1479-9022). *Military Balance+* Available online as a subscription from International Institute of Strategic Studies at (<http://www.iiss.org/en/publications/military-s-balance/militarybalanceplus>).

In 1959 the Institute of Strategic Studies published *Military Balance* to fill a gap in understanding the "strategic balance between the great powers and their allies." Until the 1963/64 edition, the title varied as it compared military strengths of

Communist bloc nations with those of the West.<sup>4</sup> It provides an analysis of regional and national security status, defense spending and policy, new procurements and deployments, and political impacts on military affairs. The 2017 issue offers data on 171 countries and provides detailed textual, graphical, and other visual illustrations with information on the organization and number of military forces. Data appear for specific military equipment, including satellites and early warning systems. Editors do not provide source references, but rely on cooperation from governments and estimates. *Military Balance+* is an online database with three years of data that users may customize for downloading.

## Stockholm International Peace Research Institute (SIPRI), Stockholm, Sweden

*SIPRI Yearbook: Armaments, Disarmament and International Security*. New York: Oxford University Press, 2018.

The 2018 yearbook offers broad assessments and data on armed conflicts, peace operations, conflict management, security issues, military spending, arms transfers, nuclear forces, and general disarmament. SIPRI uses data on arms expenditures, production, and trade from the SIPRI databases shown below. The data is in the form of tables and graphs accompanied by additional data in chapters written by experts. Data on nuclear weapons appear in separate chapters for each nuclear country showing global stocks and production of fissile material. SIPRI uses data from government sources, the *Bulletin of the Atomic Scientists*, and publications of the Federation of American Scientists. From one year to another, there are different chapter themes but also consistency in reporting arms data.

*SIPRI Arms Transfers Database* (<https://www.sipri.org/databases/armstransfers>)

This database has three types of data, downloadable in either Microsoft Word or Excel, from 1950 to recent years and measures the flow of specific major armaments between nations. This allows for the detection of weapons buildups to national militaries, paramilitaries, and rebel groups. The “Trade Register” section provides information based on user selection of nations supplying and receiving weapons, a range of years, and type of weapon systems. “Importer/Exporter TIV [trend-indicator value] Tables” illustrate the arms transfers for each country. The “Top List TIV Tables” produces a list of the “largest suppliers or recipients, along with the TIV of global arms imports or exports” based on the user’s selections. Examples of the weapons in transfers are aircraft, air defense systems, missiles, and ships. The main sources are military periodicals, newspapers, government publications, and the *UN Register of Conventional Arms*.

*SIPRI Arms Industry Database* (<https://www.sipri.org/databases/armsindustry>)

This database contains two Microsoft Excel files. The first shows the top 100 largest arms-producing and military

services companies in OECD and developing countries (except China) with data from 2002 to current years on total sales, percentage of sales in armaments, profit, and the number of employees. The second file indicates aggregate figures on arms sales and percentage changes. The database covers only public and private companies. Among the sources used are annual reports, newspapers, military journals, and Internet news services.

*SIPRI Military Expenditure Database* (<https://www.sipri.org/databases/milex>)

SIPRI provides a Microsoft Excel file with military expenditures for countries grouped by regions. The time series covers 1949–2017 with annual updates. Figures are not available for all dates for each nation. Monetary values show local currencies. For visual representations of the data, see <http://visuals.sipri.org/>. Also available are three PDF files with 1988–2017 annual expenditures in constant US dollars, local currencies, and as a share of GDP. An additional PDF shows figures for the regions. Sources for the data include government publications, government responses to questionnaires, and secondary sources.

*Financial Value of the Global Arms Trade* (<https://www.sipri.org/databases/financial-value-global-arms-trade>)

SIPRI provides Microsoft Excel files showing the financial value of arms exports (1994–2015). SIPRI obtains the figures from governments and industry organizations.

*National Reports on Arms Exports* (<https://www.sipri.org/databases/national-reports>)

SIPRI links to reports published by individual countries that contain information on national export control systems and arms export licenses granted.

## United States Government and Related Sources

*World Military Expenditures and Arms Transfers* (WMEAT) (<https://www.state.gov/t/avc/rls/rpt/wmeat/>)

From 1966 to 1999 the US Arms Control and Disarmament Agency (ACDA) published data for the years 1964–1997 to assist American diplomatic and defense officials. In 1999, the US Department of State absorbed the ACDA.<sup>5</sup> The current title, published annually, began with the 1975 volume covering data for 1963–1973. Categories of data are generally consistent over the years for countries and regions. In the 2017 edition, data for eleven years (2005–2015) is available for 170 countries. Data appears for armed forces personnel, population and labor force, imports and exports of arms compared with total trade expressed in monetary values and ratios, military expenditures, GDP, arms trade by major suppliers and countries of destination, and value of arms exported and imported by major suppliers. All tables and graphics in 2017 are in Microsoft Excel files, and users may limit to individual countries. The tables are dense with data, require careful analysis, and may require some

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familiarity with statistical methods. In 2017 a sample of sources used are NATO, *UN Register of Conventional Arms*, IMF, *Military Balance*, and *Jane's Defense Budgets*.

*World Military and Social Expenditures (WMSE)*. Leesburg, VA: WMSE Publications, World Priorities, 1974–1996. Irregular (ISSN: 0363-4795).

Ruth Leger Sevard, a sociologist and economist who was chief of the Economics Division at the US Arms Control and Disarmament Agency (ACDA), was involved with the publication of early volumes of WMEAT. Sevard created this parallel series after a dispute with the ACDA regarding a decision to exclude social data in WMEAT. WMSE includes each country's social data such as population, gross national product, and public education expenditures along with military data.<sup>6</sup>

### Additional International Sources

*Defence Expenditures of NATO Countries* ([https://www.nato.int/cps/en/natohq/topics\\_49198.htm](https://www.nato.int/cps/en/natohq/topics_49198.htm))

The North Atlantic Treaty Organization (NATO) publishes annual, aggregate data on defense expenditures reported by each NATO country's Ministry of Defense. The data is for current and estimated future defense expenditure. These figures may differ from those “quoted by national authorities or given in national budgets.”<sup>7</sup> In the 2018 report, users can compare graphical and numerical information related to defense expenditures (annual change, percentage of GDP, per capita and per military personnel, and distribution by equipment categories). Users may download graphs and tables in PDF, and a single table of defense expenditures in Microsoft Excel format. The topics related to defense expenditures in graphs and tables may vary from one year to another.

*European Defence Agency: Defence Data Portal* (<https://www.eda.europa.eu/info-hub/defence-data-portal>)

The European Defence Agency (EDA) compiles armaments data reported by the Ministry of Defense from twenty-seven European Union states. The most current data shows graphic displays and statistical tables. Graphic information covers aggregate, total defense expenditures and expenditure breakdown in relation to GDP and total government spending, member collaboration in procurement, and deployed military personnel. Tables show recent defense data by country and aggregate EDA data since 2005. In some years, EDA and US data are compared. Monetary figures are in Euros.

*European Network against Arms Trade (ENAAT)* (<http://enaat.org/eu-export-browser/licence.en.html>)

Founded in 1984, ENAAT works as a force against the sale of arms by European Union countries due to the negative impact of increasing armaments on human rights, security, and economic development.<sup>8</sup> Beginning with 1998, ENAAT distributes annual arms trade data published in the *Official Journal* of the EU. All monetary figures are in Euros. Data

is available by year with selling EU country, military products sold, and the country of destination. Users may limit sales data by year, selling and destination countries, and individual products. In addition, there are limits by Value of Licensed Goods, Value of Exported Goods, Number of Licenses Approved, and Number of Licenses Refused. There is no convenient way to download information.

*International Trade Statistics 2001–2017* (<http://www.intracen.org/itc/market-info-tools/trade-statistics/>)

Select imports or exports “by product group” and scan down the list of ITC code 93. Expand by clicking on + and select code 9301 (military weapons, incl. sub-machine guns) and 9306 (bombs, grenades, torpedoes, mines, missiles, cartridges, and other ammunition and projectiles) for data in US dollars by country for recent years. Similar data may be found in the OECD *International Trade by Commodity Statistics* as part of *OECD iLibrary*.

### Jane's Information Group

The commercial products of the Jane's Information Group, owned and published by IHS Markit of the UK, provide a wide range of publications with data derived from openly available sources on individual countries and comparative graphics focusing on military personnel, armaments, and risk assessments related to country security and stability. IHS Markit compiles data organized by country on specific arms inventories and procurements and military organization (i.e., “order of battle”) and assessment in *IHS Jane's World Armies*, *IHS Jane's World Navies*, and *IHS Jane's World Air Forces* among many other related publications and online resources offering news, new armament development, and military analysis. These three publications are available for purchase in semiannual print editions or from more frequently updated, online subscriptions to either individual titles or as part of packaged resources from Jane's Military and Security Assessments Intelligence Centre (<https://ihsmarkit.com/products/janes-military-security-assessments.html>) or Jane's Security: Military Capabilities (<https://ihsmarkit.com/products/janes-amphibious-special-forces.html>). Online access provides country data on full defense budgets, budgets for military branches, and locations of military bases. Country reports are available for download.<sup>9</sup>

### Nuclear Weapons Stockpiles

*Federation of American Scientists* (<https://fas.org/issues/nuclear-weapons/>)

The Federation of American Scientists (FAS) provides “reliable information about the status and trends of the nuclear weapons arsenals” in nuclear nations. The FAS derives data on nuclear weapons stockpiles from open sources such as official documents, testimonies, and commercial satellite imagery. Select “Status of World Nuclear Forces” for international data on national stockpiles of

weapons in graphical and tabular form. Other links, such as the “FAS Nuclear Notebook” and a link to Nuclear Information Project (NIP) Publications provide country studies and essays analyzing issues but also include statistical data since 1987.<sup>10</sup> NIP publications may appear in *The Bulletin of the Atomic Scientists* and *SIPRI Yearbook* (see above). Nuclear stockpiles and an interactive map from the FAS also appear at the website of the International Campaign to Abolish Nuclear Weapons (ICAN).<sup>11</sup>

*Ploughshares Fund* (<https://www.ploughshares.org/>)

The Ploughshares Fund (PF) seeks “to reduce and eventually eliminate the dangers posed by nuclear weapons” through discussion, advocacy, and projects. The PF website provides the “World Nuclear Weapon Stockpile,”<sup>12</sup> which illustrates weapons holdings of nuclear nations. Users may download the most recent country annual reports containing detailed data and analysis of nuclear arsenals, including offensive and defensive nuclear weapons and intercontinental ballistic missiles (ICBM). The reports, written by researchers with the Nuclear Information Project at the Federation of American Scientists, provide extensive bibliographies. The current and previous reports are available from the *Bulletin of the Atomic Scientists*. In addition, the *Bulletin* provides a free interactive, comparative graphic tool, “Nuclear Notebook: Nuclear Arsenals of the World,” for analyzing the growth of nuclear weapons in countries from 1945 to present.<sup>13</sup>

*Nuclear Weapons: Who Has What at a Glance* (<https://www.armscontrol.org/factsheets/Nuclearweaponswhohaswhat>)  
*Country Resources* (<https://www.armscontrol.org/countryresources>)

The Arms Control Association is “dedicated to promoting public understanding of and support for effective arms control policies.”<sup>14</sup> This webpage offers graphical representations of national and global stockpiles of nuclear warheads. One graph illustrates the steep reduction of worldwide stocks of warheads. The web page also has brief information on nuclear countries and a link to country resources with additional data about nuclear, chemical, and biological weapons and arms control agreements, policies, practices, and holdings of fissile material. ACA compiles the data from documents available from US Department of Defense, US Department of State, SIPRI, and the Federation of American Scientists. The figures are estimations.

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