APLN
Asia Pacific Leadership Network for Nuclear Non-Proliferation and Disarmament

CNND
Centre for Nuclear Non-Proliferation and Disarmament

Policy Brief No. 1 **June 2013**

Nuclear Weapons: The Opportunity Costs

John Page and Ramesh Thakur

Summary

Nuclear weapons are inherently unusable but hugely expensive. The United States alone has spent an estimated US $8.7 trillion on nuclear weapons between 1940 and 2011. Looking ahead, the nine nuclear-armed states will spend more than one trillion dollars over the next decade on their nuclear arsenals. But at what return for the price? For poor countries such spending entails significant opportunity costs for development priorities. For developed countries it adds continuing stress to already overstretched government budgets, and inhibits investment in defence platforms and systems that are actually usable.

Questions that Need to be Asked

1. Nuclear weapons are not just uniquely destructive, but almost universally accepted as militarily – and politically – unusable. The devastation inherent in any nuclear exchange between nuclear-armed states would likely prove mutually suicidal. And for any use of nuclear weapons against non-nuclear-weapon countries, the political costs of breaking the taboo against the most indiscriminately inhumane weapons ever invented, would vastly exceed any battlefield gains.[1] Why then do countries continue to maintain weapons that cost huge amounts of money, are militarily unusable, are of dubious political utility, compromise the quality of conventional defence preparedness, and drain resources that could otherwise be used to achieve development and economic recovery goals?

2. A robust and open public debate is needed on the claimed benefits of nuclear weapons versus their costs. Governments should be able to explain clearly how the large amounts invested in nuclear weaponry are a better use of national resources than competing areas of national security budgets or alternatives such as social welfare or development programs and assistance. Governments justify nuclear-weapons spending in terms of deterrence and defence. Development of new types of nuclear weaponry and modernization of existing weapons are presented as essential to maintaining an effective nuclear deterrent, as are programs to maintain and expand nuclear weapons infrastructure. With the end of the Cold War, new perils such as North Korea, Iran and conventional force imbalances are claimed as proof that substantial nuclear forces are essential to the national security of the nuclear-armed states.

3. Preserving and enhancing national security is central to national interests, and expenditure in support of this goal is rightly a significant part of states' budgets. However, the extent to which nuclear deterrence contributes to the national security of the nuclear-armed states and their allies is at best questionable, and many cogent rebuttals have been made of the case for nuclear weapons.[2] Nuclear-armed

[1] On the military unusability of nuclear weapons see *Report of the Canberra Commission on the Elimination of Nuclear Weapons* (Canberra: Department of Foreign Affairs and Trade, August 1996), pp. 22–24. On the political taboo see International Commission on Nuclear Non-proliferation and Disarmament (ICNND) (Gareth Evans and Yoriko Kawaguchi co-chairs), *Eliminating Nuclear Threats: A Practical Agenda for Global Policymakers* (Canberra and Tokyo: ICNND, 2009), pp. 59–61, and Ramesh Thakur and Gareth Evans, eds., *Nuclear Weapons: The State of Play* (Canberra: Centre for Nuclear Non-Proliferation and Disarmament, 2013), pp. 72–73. See also Ward Wilson, *Five Myths about Nuclear Weapons* (New York: Houghton Mifflin Harcourt, 2013).

[2] See for example, *Report of the Canberra Commission on the Elimination of Nuclear Weapons* (Canberra: Department of Foreign Affairs and Trade, August 1996), pp. 30–47,

states are themselves hard pressed to define convincingly the threats being deterred by their nuclear forces, often relying on generalities, and conflating the capabilities of potential adversaries with actual threats.

4. Rational assessment of the contribution, if any, of nuclear weapons to national security is complicated by governments' readiness to portray nuclear weapons to domestic audiences as a sign of national strength and a measure of global status. In reality, nuclear-weapons spending likely reduces the security of the nuclear-armed states by diverting funds from conventional forces and other options of use in addressing contemporary security challenges. And nuclear weapons alone do not deliver a status benefit or confer rights as a regional or global power. This is readily evident by comparing the national standing of nuclear-armed India and Pakistan since 1998. India's global reputation and prestige has gone up since then, Pakistan's has, at best, stayed static. The key in both cases is economic growth and political regime stability; nuclear weapons are essentially irrelevant. Similarly, no one would dispute that non-nuclear South Korea's global standing is well above that of nuclear-armed North Korea.

5. Matching the uncertainty about the contribution of nuclear weapons to national security, is the problem of knowing how much is actually spent on nuclear-weapons programs. Some nuclear-armed states provide little or no information on the costs of their nuclear-weapons programs. Where information is available, counting rules vary, for example some estimates build in the environmental and health costs of nuclear-weapons programs. Further areas of uncertainty include the assignment of proportional costs for military capacities with both nuclear and non-nuclear elements, and disaggregating the civilian and military components of some national nuclear programs. The US Government Accountability Office reported in 2005 that not even the Department of Defense knew precisely how much the nuclear mission costs.[3]

6. The opportunity costs of nuclear weapons are at their starkest in Pakistan, North Korea and India where nuclear-weapons expenditure takes place against a backdrop of widespread poverty and unmet basic needs. But even the wealthiest countries make choices when allocating funds, and opportunity costs are an issue for all the nuclear-armed states.

7. A further question is whether nuclear weapons enable states to cut back sharply on their conventional military expenditure, thereby reducing the opportunity costs of nuclear arms. This is emphatically not the case. The fact that nuclear weapons are all but unusable, rendering them of little or no value in projecting military power, compels nuclear-armed states to maintain large conventional forces alongside their nuclear forces.

Nuclear Weapons Costs

8. Estimates of the cost of nuclear-weapons programs can vary widely, depending on the information used and which costs are included. Whatever the methodology employed, the conclusion is the same. The nuclear-armed states have spent, and plan to continue spending, vast amounts on their nuclear arsenals, including modernization/life extension programs, nuclear-weapons infrastructure and other support programs.

9. A recent major report *Building Mutual Security in the Euro–Atlantic Region*, published in April 2013 by the European Leadership Network, the Nuclear Threat Initiative, the Russian International Affairs Council, and the Munich Security Conference, put the estimated cost of US programs to build new nuclear-armed ballistic missile submarines and strategic bombers at more than US $400 billion, and extending the life of nuclear weapons deployed in Europe at US $10 billion. The same study noted that Russia reportedly plans to spend 1.9 trillion roubles, or US $61 billion, over the next decade to modernize its strategic nuclear forces, while Britain estimates the cost of Trident replacement at £25 billion, or US $38 billion.[4]

available at http://www.dfat.gov.au/publications/security/canberra-commission-report/CCREPORT.PDF. The report *Building Mutual Security in the Euro–Atlantic Region* published in April 2013 by the European Leadership Network, the Nuclear Threat Initiative, the Russian International Affairs Council, and the Munich Security Conference includes a forceful argument on the need to reduce the role of nuclear weapons in security policies in the Euro–Atlantic region which includes more than 95 per cent of global nuclear inventories. The full report is available at http://www.europeanleadershipnetwork.org/building-mutual-security-in-the-euro-atlantic-region-report_507.html.

[3] "U.S. Nuclear Weapons Budget: An Overview," Nuclear Threat Initiative, 7 March 2013, http://www.nti.org/analysis/ articles/us-nuclear-weapons-budget-overview/.

[4] Des Browne, Wolfgang Ischinger, Igor Ivanov and Sam

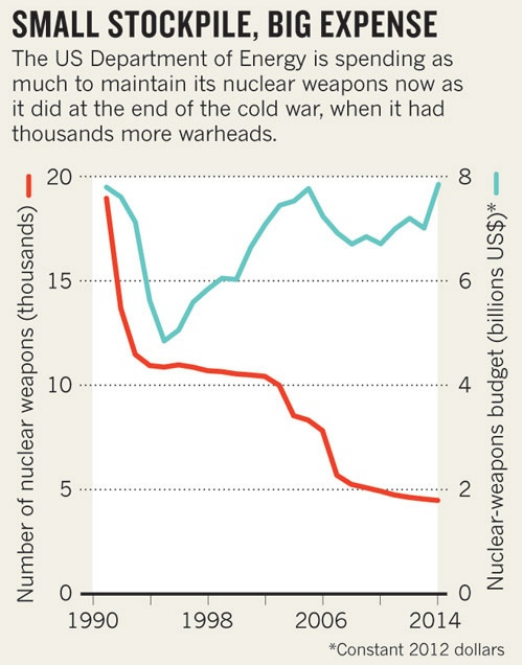
10. Global Zero researchers Bruce Blair and Mathew Brown in 2011 estimated that the full cost (including mitigating health and environmental consequences) of worldwide spending on nuclear weapons by the nuclear-armed states was then running at US $104.9 billion. They further estimated, taking into account planned worldwide upgrading of nuclear arsenals, that aggregate spending by these states over the next decade will exceed US $1 trillion – that is, US $1,000 billion.[5] Global Zero's estimates of nuclear and total military expenditures for the nine nuclear-armed states are set out in Table 1.

11. Some estimates put US nuclear-weapons costs over the next decade at approximately US $640 billion.[6] Replacement of existing nuclear-weapons systems and modernization of the nuclear-weapons complex is a significant component of projected costs, including up to US $110 billion to replace current Ohio-class submarines, US $7 billion to upgrade Minuteman III ballistic missiles, and at least US $88 billion over ten years to refurbish weapons laboratories and other infrastructure.[7] Declining weapons numbers have not been accompanied by a commensurate decline in the US nuclear-weapons budget, which is as high as it was at the end of the Cold War despite the marked fall in weapons numbers (Figure 1). Richard Garwin, a physicist and one of the designers of the first hydrogen bomb, has said of the US stockpile stewardship program that "It's been far more expensive than it needs to be," and "There's a real lack of control over budgets and programmes."[8]

12. Russia, like the United States, is embarked on modernization of its nuclear-weapons systems and infrastructure with planned major expenditure over the next decade on a fleet of new strategic submarines, silo and mobile land-based rockets, warhead production, and maintenance of nuclear infrastructure.

13. British nuclear-weapons spending levels will be determined largely by whether the existing fleet of four Trident-missile carrying submarines is replaced on a like-for-like basis. The decision whether to proceed with replacement is to be made in 2016. China's actual spending on the current modernization of its nuclear forces is unknown. Growth in the nuclear budget is expected to increase in proportion to the steady increases in China's overall defence budget.[9] Estimates vary of the cost of France's nuclear-weapons program, including the modernization currently underway. The French government has indicated nuclear-weapons expenditure is approximately US $4.6 billion per year.[10]

Figure 1:



Source: Jeff Tollefson "US warheads to get a facelift," *Nature*, 7 May 2013; http://www.nature.com/news/nukesgraphic-jpg-7.10419?article=1.12948.

Nunn "Revamping Euro–Atlantic Security," *New York Times*, 2 April 2013.

[5] Bruce G. Blair and Matthew A. Brown, "World Spending on Nuclear Weapons Surpasses $1 Trillion Per Decade" (Washington DC: Global Zero Technical Report, Nuclear Weapons Cost Study, June 2011), p. 1, http://www.globalzero.org/ en/page/cost-of-nukes.

[6] "What Nuclear Weapons Cost Us," Ploughshares Fund Working Paper, September 2012, http://www.ploughshares.org/sites/ default/files/resources/What%20Nuclear%20Weapons%20Cost%20Us%20Final%20(100212).pdf. See also Joseph Cirincione, "How to Shave a Bundle Off the Deficit: Spend Less on Nukes," *The Atlantic*, July 2011.

[7] Dana Priest, "Aging U.S. nuclear arsenal slated for costly and long-delayed modernization," *Washington Post*, 15 September 2012.

[8] Jeff Tollefson, "US warheads to get a facelift," *Nature*, 7 May 2013, http://www.nature.com/news/us-warheads-to-get-a-facelift-1.12948.

[9] Bruce G. Blair and Matthew A. Brown, "World Spending on Nuclear Weapons Surpasses $1 Trillion Per Decade," p. 5.

[10] Ray Acheson (ed), "Assuring Destruction Forever," *Reaching Critical Will*, 2012, p. 4, http://www.reachingcriticalwill.org/ images/documents/Publications/modernization/assuring-destruction-forever.pdf.

Table 1: Military and Nuclear Weapons Expenditures (US $ billion, 2010 exchange rates)

	Total Military Spending	*Nuclear Weapons (2011, estimated)*	
	(2010)	*Core Cost*	*Full Cost*
USA	687	34.0	61.3
Russia	53-86	9.8	14.8
China	129	6.4	7.6
France	61	4.7	6.0
UK	57	4.5	5.5
India	35	3.8	4.9
Israel	13	1.5	1.9
Pakistan	7.9	1.8	2.2
North Korea	8.8	0.5	0.7
TOTAL	1052-1085	67.0	104.9

Core costs refer to researching, developing, testing, operating, maintaining and upgrading the nuclear arsenal (weapons and delivery vehicles) and the nuclear command-control-communications and early warning infrastructure. Full costs add unpaid/deferred health and environmental costs, missile defences assigned to defend against nuclear weapons, and nuclear threat reduction and incident management. Air defences, anti-submarine warfare and nuclear weapons-related intelligence and surveillance expenses are not included.

Source: Bruce Blair and Matthew A. Brown, "World Spending on Nuclear Weapons Surpasses $1 Trillion Per Decade" (Washington DC: Global Zero, June 2011). Available at: http://www.globalzero.org/en/page/cost-of-nukes.

14. India and Pakistan do not provide information on the cost of their nuclear programs. Both countries are substantially increasing their nuclear forces, diversifying their nuclear platforms (from land to land, air and sea-based) and, at least in the case of Pakistan, expanding the roles of their nuclear weapons. Estimates for the cost of the nuclear-weapons programs of Israel and North Korea are highly problematic owing to the lack of information.

15. Looking back, it is estimated that in the period 1940–2011 the United States alone spent US $8.7 trillion (in inflation-adjusted 2010 dollars) on nuclear weapons.[11] France is thought to have spent about US $1.5 trillion to develop its nuclear arsenal, with past spending figures for other nuclear-armed states not available.[12]

[11] Stephen Schwartz quoted in "More Light on Nuclear Budget Numbers," Ploughshares Fund blog, http://www.ploughshares.org/blog/2011-12-01/more-light-nuclear-budget-numbers.
[12] http://www.nuclearfiles.org/menu/key-issues/ethics/issues/military/economic-aspects-conversion_print.htm.

Nuclear Weapons: Impact on Conventional Forces

16. The history of the nuclear age provides ample evidence that nuclear weapons do not enable reductions in spending on conventional forces. The indiscriminate, highly destructive power of nuclear weapons renders them unusable except possibly as a weapon of last resort in the most desperate of circumstances. Hence, nuclear weapons cannot serve as a substitute for capable conventional forces.

17. This issue was addressed by the 1996 Canberra Commission on the Elimination of Nuclear Weapons which reported that notwithstanding the US/NATO strategy of "massive retaliation," the United States simultaneously decided to reverse the drastic demobilization that occurred after World War II and to maintain indefinitely large standing conventional forces. The Korean War strongly reinforced this policy position. Much the same happened in the other nuclear-weapons states. It was quickly recognized that the circumstances in which nuclear weapons could beneficially be employed were extremely narrow if, indeed,

they existed at all. Rather than nuclear weapons being regarded as a substitute for conventional forces, the overwhelmingly dominant line of reasoning has been to maintain the strongest practicable conventional capabilities and thereby maximize the firebreak between conventional war, should it break out, and nuclear war.[13]

18. In the current climate of financial stringency, rather than supporting conventional capabilities, nuclear forces risk undermining them. The wisdom of using large amounts of finite defence budgets on weapons that are essentially unusable and of no value in meeting contemporary security challenges – such as terrorism, insurgency, secession, climate change, food, energy and health security, acquisition of nuclear weapons by "rogue" states, and cyber security – is being questioned, particularly as nations struggle to reduce budget deficits.

19. In the United States, core nuclear deterrence forces including the submarine, bomber and ICBM legs of the triad are exempt from the sequester cuts and expected to experience little or no effect, leaving other areas of the US military to absorb US $41 billion in cuts in 2013.[14] Nuclear-weapons spending and the treatment of nuclear-weapons budgets is in marked contrast with spending on preventing the further spread of nuclear weapons. Under the Obama Administration's fiscal 2014 spending plan, the core non-proliferation budget would be US $1.88 billion, a cut of 18 per cent on 2013 levels, while at the same time the administration is seeking US $7.87 billion for nuclear-weapons activities, a US $654 million boost from two years ago.[15] Even without sequestration, the impact of nuclear-weapons spending on other areas of the budget was evident. In 2009, the United States Navy indicated that it would have to cut 56 vessels from its shipbuilding budget in order to afford the proposed new fleet of 12 ballistic missile submarines (SSBNs).[16] In 2013 US Navy Vice Admiral William Burke warned that funding the 12 new ballistic missile submarines, combined with the potential impact of sequestration, could result in a fleet in the vicinity of 200 ships "at which point we may not be considered a global navy."[17]

20. Alexei Arbatov, Scholar in Residence, Nonproliferation Program at the Carnegie Moscow Center and a former deputy chairman of the Russian Duma Defence Committee, has drawn attention to the security paradox inherent in Russia's emphasis on nuclear weapons. In highlighting the real security threats faced by Russia, Arbatov points out that by emphasizing nuclear deterrence in its relations with the United States, "Russia is increasingly lagging behind in developing information management systems vital for future combat operations, coordinating different services and branches of the armed forces, and using high-precision defensive and offensive conventional weapons." In Arbatov's view, "Building up the nuclear submarine fleet and planning projects to build nuclear aircraft carriers may undermine the Navy's capabilities to combat poaching, piracy and the smuggling of drugs, weapons, and WMD materials, and maintain control over sea lanes and economic zones."[18]

21. France's April 2013 defence White Paper confirmed that it will retain its nuclear deterrent, while reducing its armed forces by 34,000 between 2014 and 2019.[19] Within France, belief in the necessity of the nuclear deterrent is by no means universal. Former Prime Minister Michel Rocard has suggested that France should abandon its independent deterrent, saying that the money spent on maintaining it "serves absolutely no purpose."[20] Former French Defence Minister Paul Quilès has described nuclear weapons as "an expensive absurdity."[21] Regarding the 2013 White Paper, General Vincent Desportes, a former chief of

[13] *Report of the Canberra Commission,* pp. 40–41.
[14] Elaine Grossman "Amid Deep Cuts, Pentagon Labors to Sustain Military Readiness for Korea," *Global Security Newswire*, 11 April 2013, http://www.nti.org/gsn/article/amid-deep-cuts-pentagon-labors-sustain-military-readiness-korea/.
[15] Douglas Guarino "Key Democrat Criticizes Nuke, Nonproliferation Budgets," *Global Security Newswire*, 25 April 2013, http://www.nti.org/gsn/article/key-democrat-criticizes-obama-nuke-nonproliferation-budget/.
[16] Joseph Cirincione "How to Shave a Bundle Off the Deficit: Spend Less on Nukes," *The Atlantic*, 13 July 2011.
[17] Rachel Oswald "Building New Ballistic Missile Subs Could Demand Smaller Fleet, Navy Says," *Global Security Newswire*, 30 April 2013, http://www.nti.org/gsn/article/vice-admiral-warns-renewing-ohio-fleet-will-impact-other-navy-procurement-projects/.
[18] Alexei Arbatov "Real and Imaginary Threats: Military Power in World Politics in the 21st Century," Carnegie Moscow Center, 15 April 2013, http://carnegieendowment.org/2013/04/15/real-and-imaginary-threats/g0n3.
[19] Hugh Carnegy "France aims to keep firepower while cutting military," *Financial Times*, 29 April 2013.
[20] Harvey Morris, "France and Britain Weigh the Price of Nuclear Deterrence," *New York Times*, 27 September 2012.
[21] "France Could Eliminate Nukes to Save Money: Ex-Officials," *Global Security Newswire*, 19 July 2012, http://www.nti.org/gsn/article/france-could-eliminate-nukes-save-money-ex-officials/.

France's war college, has warned that retaining nuclear weapons at the expense of stronger conventional forces will end with "a model that doesn't work, namely the nuclear bomb plus gendarmes."[22]

22. In the United Kingdom, Trident replacement planning continues within the context of a sharply diminished military budget, the UK's 2010 strategic defence and security review having cut defence funding by 8 per cent and personnel by 30,000.[23] Nick Harvey, a former Armed Forces Minister, has said that senior military commanders have privately questioned whether Britain needs to maintain its current level of nuclear deterrence when the existing Trident submarines are decommissioned. According to Harvey, senior military leaders are asking: "Is the opportunity cost of having another generation of nuclear weapons too high in terms of what it would prevent us doing on other fronts?"[24] Former Conservative Defence Secretary Michael Portillo has said of the UK's nuclear arsenal: "It is neither independent, nor is it any kind of deterrent because we face enemies like the Taliban and al-Qaeda, who cannot be deterred by nuclear weapons. It is a tremendous waste of money and is done entirely for reasons of national prestige."[25] *The New York Times* reported recently that an anonymous senior US official has said of Britain: "Either they can be a nuclear power and nothing else or a real military partner."[26]

23. There appears to be little questioning in India and Pakistan whether high levels of nuclear-weapons spending deliver value-for-money national security outcomes. What is clear is that India's and Pakistan's possession of nuclear weapons is no deterrent against conventional conflict, as demonstrated by the 1999 Kargil war. Nor is possession of substantial nuclear forces able to protect India against attack from terrorist groups with alleged links to Pakistan. Not only do nuclear weapons offer no protection to the state and society of Pakistan against the internal jihadist threat; the confluence of the two heightens national and global anxieties about the robustness of the nuclear security installations and institutions in the country. Such obvious limitations underscore the need for debate within India and Pakistan on the value of their nuclear weapons.

24. Questioning of the role of nuclear weapons within militaries is appropriate and timely. As noted by the Canberra Commission, "conventional capabilities constitute a realistic deterrent. In contrast to nuclear weapons, they can be used."[27]

Social and Development Costs

25. Beyond the issue of military budgets is the question whether some or all of the money used to little purpose on nuclear weapons would be better directed to non-military use. Applied globally, security benefits from improved international relations could be expected, in contrast to the international tensions generated by nuclear-weapons programs.

26. Domestically, the potential benefits of redirecting funds from nuclear weapons are most obvious in Pakistan, India and North Korea. India's much larger GDP means that the relative cost of its nuclear-weapons programs is much less than that of its subcontinental rival. But neither country is in a position where putting large-scale spending on nuclear weapons ahead of developmental problems can readily be justified. The UNDP 2013 Human Development Report ranks India at 136th, placing it at the lower end of the Medium Human Development category and equal with Equatorial Guinea. Pakistan is ranked at 146th, towards the top of the Low Human Development category.[28]

[22] Tom Coghlan "France to strengthen military links with Britain after defence cuts," *The Times*, 1 May 2013.
[23] "Defence chief Sir David Richards warns over MoD cuts," *BBC News*, 15 November 2012, http://www.bbc.co.uk/news/uk-20334974.
[24] Oliver Wright and Kim Sengupta "Top military chiefs go cold on nuclear deterrent," *The Independent*, 26 September 2012.
[25] Quoted in Acronym Institute for Disarmament Diplomacy "Proliferation in Parliament: A Review of recent developments in the UK Government & Parliament" (Winter 2012–2013), http://www.acronym.org.uk/news-reviews/parliamentary-news-review/201301/proliferation-in-parliament-review-recent-developments-in-uk-government-parliament.
[26] Steven Erlanger, "Shrinking Europe Military Spending Stirs Concern," *New York Times*, 22 April 2013.
[27] *Report of the Canberra Commission*, p. 41.
[28] UNDP, *Summary Human Development Report 2013*, http://hdr.undp.org/en/media/HDR2013_EN_Statistics.pdf.

Table 2: Nuclear-Armed States: Public Expenditure Priorities (% of GDP)

Country (UNDP Human Development Index rank in brackets)	Health 2010	Education 2005–10	Military 2010	Social: Military[a]	Perception of Safety (%)
United States (3)	9.5	5.4	4.8	3.1	75
Russia (55)	3.2	4.1	3.9	1.8	40
China (101)	2.7	3.3[b]	2.1	2.8	80
France (20)	9.3	5.9	2.3	6.6	63
United Kingdom (26)	8.1	5.6	2.6	5.2	70
India (136)	1.2	3.1	2.7	1.5	70
Pakistan (146)	0.8	2.4	2.8	1.1	46
North Korea (N/A)	2.0[f]	N/A	33?[e]		
OECD Countries Average	9.5[c]	6.2[d]	1.7	9.2	
Least Developed Countries Average	2.2	3.7	2.2	2.6	

Source: Except where otherwise indicated, data is from UNDP, *Human Development Report 2013 – The Rise of the South*, Tables 6 and 9, pp.162–65 and 174–77, http://hdr.undp.org/en/media/HDR2013_EN_Statistics.pdf.

Notes

a. (Education + Health) divided by (Military).
b. OECD Education at a Glance 2011, Country note – China. http://www.oecd.org/china/48677215.pdf.
c. 2010 figure from OECD Health Data 2012. "How Does Australia Compare," http://www.oecd.org/australia/BriefingNoteAUSTRALIA2012.pdf.
d. 2009 figure from "Education at a Glance 2012: OECD Indicators," http://www.oecd.org/edu/ educationataglance2012oecdindicators-chapterbfinancialandhumanresourcesinvestedineducation-indicators.htm.
e. Reliable data on North Korean military expenditure is not available. The South Korean state-run research institute, the Korea Institute of Defense Analyses (KIDA) is reported to have estimated North Korean military expenditure in 2009 at about a third of GDP. See Reuters Canada, "North Korea spends about a third of income on military: group," 18 January 2011, report.http://ca.reuters.com/ article/topNews/idCATRE70H1BW20110118.
f. 2009 estimate from CIA, *The World Factbook*, https://www.cia.gov/library/publications/the-world-factbook/geos/kn.html.

27. In the area of poverty reduction, India and Pakistan have much to achieve, with Indian poverty levels generally worse than those of Pakistan. The 2013 Human Development Report estimates 49.4 per cent of Pakistan's population to be living in multidimensional poverty compared to 53.7 per cent of India's population; 27.4 per cent of Pakistanis and 28.6 per cent of Indians live in severe poverty; and 21 per cent of Pakistanis and 32.7 per cent of Indians are living below the international poverty line of US $1.25 per day.[29] Nuclear-weapons spending continues apace in both countries notwithstanding their efforts to reduce overall outlays and cut deficits. Pakistan's 2011 budget increased military spending by over Rs. 50 billion but cut social and economic development by Rs. 100 billion.[30] For US $815 million – a little over one-third of Pakistan's present nuclear weapons-related expenditure – 11,000 schools could be funded.[31]

28. North Korea's nuclear program has come at the cost of international isolation and economic backwardness. The UN has estimated that two-thirds of North Korea's 24 million population is chronically food-insecure and nearly 28 per cent of children under five are stunted from malnutrition. North Korea's health care services are unable to meet basic needs.[32]

[29] UNDP, *Human Development Report 2013*, pp. 160–61.
[30] Ray Acheson (ed), "Still assuring destruction forever," *Reaching Critical Will*, 2013, p. 15, http://www.reachingcriticalwill.org/ images/documents/Publications/modernization/still-assuring-destruction-forever.pdf.
[31] Adrianna Wolaver, "The Real Price of Nuclear Weapons," http://wagingpeacetoday.blogspot.com.au/2010/08/real-price-of-nuclear-weapons.html.
[32] "One in four N Korean kids malnourished: UN," *SBS World News*, 16 March 2013,

29. Nuclear-weapons opportunity cost questions should also be asked in China. The UNDP 2013 Human Development Report ranks China at 101st, towards the top of the Medium Human Development category. [33] While poverty in China is nowhere near that of India and Pakistan, it is still a problem. The 2013 Human Development Report estimates 12.5 per cent of China's population to be living in multidimensional poverty and 13.1 per cent of the population to be living below the international poverty line of US $1.25 per day.[34]

30. Table 2 sets out spending, as a percentage of GDP, on health, education and the military, for each of the nuclear-armed states, as well as spending on health and education in proportion to military spending. When compared to combined health and education spending, nuclear-armed states with the lowest Human Development Index rankings give the highest priority to military spending. For Pakistan, combined spending on health and education is only 10 per cent greater than military spending and less than half of the Least Developed Countries (LDC) average. India spends a larger proportion of its GDP on health and education than does Pakistan, but still proportionately less than the LDC average. Russia's low expenditure on health and high expenditure on the military puts it below the LDC average for combined health and education spending compared to military spending.

31. In the developed nuclear-armed states there is also ample scope to build better societies by redirecting funds from nuclear weapons. Nuclear-weapons modernization is taking place at a time of the harshest cuts to public spending for decades as governments attempt to cut spending and deficits, including by reduced outlays on social security, health care and education. In the United Kingdom, the full cost of Trident-system submarine replacement including missiles, warheads and running costs has been estimated to be in excess of £100 billion.[35] According to the UK Campaign for Nuclear Disarmament, £100 billion would enable the United Kingdom to scrap student tuition fees for the next 30 years, or employ 150,000 new nurses and teachers every year for over 30 years, or fully fund all Accident and Emergency services in hospitals for over 40 years.[36]

32. In the United States, US $800 million, a small fraction of the nuclear-weapons budget, would fund a year of "Head Start," a comprehensive program for low-income children and their families, for more than 95,000 children. US $2 billion could be used to create 58,000 education-related jobs. And the 25 per cent projected increase for nuclear-weapons stockpile support – of over US $400 million – would provide more than 10,000 university students with four-year scholarships.[37] Global Zero estimates that the cost of maintaining one nuclear weapon for one year equals the cost of healthcare for 36,000 low income Americans, 200 jobs, 400 university scholarships, 78 firefighters or 99,000 square feet of solar panels.[38]

33. Globally, UN Secretary-General Ban Ki-moon has drawn attention to the human cost of current military expenditures, noting that nuclear budgets are especially ripe for deep cuts.[39] An obvious area where savings from nuclear-weapons expenditure could be employed is pursuit of the UN Millennium Development Goals (MDGs). In 2012 the OECD estimated that achieving unmet goals by the 2015 deadline would cost about US $120 billion[40] – that is, in the order of Global Zero's estimated full cost (US $104.9 billion) of nuclear-weapons spending in 2011.

34. The global recession has seen a decline in major donors' aid to developing countries which could be readily offset by redirecting some nuclear-weapons expenditure. Official development assistance (ODA) contributions by members of the Development Assistance Committee (DAC) of the OECD fell by 4% in real terms in 2012, following a 2% fall in 2011.[41] In 2012, DAC members provided US

http://www.sbs.com.au/news/article/1747296/One-in-four-NKorean-kids-malnourished-UN.
[33] UNDP, *Summary Human Development Report 2013*.
[34] UNDP, *Human Development Report 2013*, pp. 160–61.
[35] Rebecca Johnson, "North Korea and UK's Trident," *International Campaign to Abolish Nuclear Weapons*, 22 April 2013, http://www.icanw.org/campaign-news/united-kingdom/north-korea-and-uks-trident/.

[36] http://www.cnduk.org/scraptrident/.
[37] Wolaver, "The Real Price of Nuclear Weapons."
[38] Global Zero, "Education & Clean Energy Running Neck-and-Neck in Cut Nukes Petition" http://globalzero.tumblr.com/post/9946254748/education-clean-energy-running-neck-and-neck-in.
[39] Ban Ki-moon, "The World is Over-Armed and Peace is Under-Funded," UN Office for Disarmament Affairs Update, 30 August 2012, http://www.un.org/disarmament/update/20120830/.
[40] OECD (2012), "Executive summary", in J. Stijns, et al. , *Can We Still Achieve the Millennium Development Goals?: From Costs to Policies*, OECD Publishing. doi: 10.1787/9789264173248-3-en.
[41] http://www.oecd.org/dac/stats/aidtopoorcountriesslipsfurtherasgovernmentstightenbudgets.htm.

$125.6 billion in net ODA. By way of comparison the Global Zero study referred to earlier, estimated the full cost of nuclear weapons in 2011 at US $104.9 billion. The 2012 ODA contribution of the largest donor, the United States, was US $30.5 billion,[42] representing about half of Global Zero's estimate of the full cost of 2011 US spending on nuclear weapons.

35. Increased effort on meeting development goals remains a chronic need. Reaching Critical Will in *Still Assuring Destruction Forever* reports that "Projections indicate that by 2015 about one billion people will be living on an income of less than US $1.25 per day, the World Bank's measure of extreme poverty. 22,000 children die each day due to poverty. Nearly 870 million people suffered from chronic malnutrition in 2010–2012."[43] It has been estimated that US $18 billion annually – about one sixth of Global Zero's estimate of total nuclear-weapons expenditure in 2011 – would provide one year's "universal access to effective AIDS prevention in Africa and prevent 2.25 million new infections."[44]

State of the Debate

36. In circumstances where governments of the nuclear-armed states are able to justify the need to maintain a substantial nuclear deterrent as a 'given', it comes as no surprise that discussion of the opportunity costs of nuclear weapons is almost non-existent. British Prime Minister David Cameron epitomized the superficiality of the public discourse recently when, in supporting Trident-system replacement, he claimed that "we need our nuclear deterrent as much today as we did when a previous British Government embarked on it over six decades ago."[45] In expanding on this statement, Cameron referred to the nuclear programs of Iran and North Korea, seemingly suggesting that a state without nuclear weapons (Iran) and one that has a few nuclear devices and may, or may not, be able to deliver them (North Korea), together with the undefined danger that new nuclear-armed states might emerge, are equal to the Cold War nuclear threat. Such reasoning is highly challengeable, to say the least.

37. Inertia and vested interests are further impediments to debate on the opportunity costs of nuclear weapons. Nuclear-weapons supporters claim that nuclear-weapons programs benefit employment and support advances in technology. Others dismiss the claimed economic benefits as one of the myths about nuclear weapons and draw attention to studies that have reported that nuclear spending is an extremely inefficient method of job creation.[46] In the second BASIC Trident Commission report, Professor Keith Hartley concluded that Trident cancellation would result in almost 31,000 jobs being lost. However, Hartley noted that submarine manufacture is particularly capital-intensive, so that more alternative jobs could be created with the same investment. He also concluded that cancellation of the Trident renewal program could produce substantial cost savings of up to £83.5 billion over the period 2016 to 2062, equivalent to an annual average saving of £1.86 billion.[47] Economics aside, using nuclear weapons as some form of job creation scheme raises very serious moral questions.

38. Governments should have to explain convincingly and thoroughly the reasons for current and planned massive expenditures on nuclear weapons. Publics should not be satisfied with unsubstantiated generalizations about the need to maintain an effective deterrent, nuclear weapons providing a security guarantee, being the ultimate national insurance and the like. Clarity about the benefits that nuclear-weapons expenditure delivers would enable informed assessment of the opportunity costs involved. It is to be hoped that the interplay of fiscal pressures and imminent decision points on future nuclear expenditure, such as the Britain's Trident decision, will foster such a discussion.

---

[42] http://www.oecd.org/dac/stats/aidtopoorcountriesslipsfurtherasgovernmentstightenbudgets.htm.

[43] " Still assuring destruction forever," *Reaching Critical Will*, 2013, p. 5.

[44] Wolaver, "The Real Price of Nuclear Weapons."

[45] David Cameron "We need a nuclear deterrent more than ever," *The Telegraph*, 3 April 2013.

[46] Ray Acheson, "Remarks on Ward Wilson's 'Five myths about nuclear weapons'," *Reaching Critical Will*, http://www.reachingcriticalwill.org/news/latest-news/7447-remarks-on-ward-wilson-s-five-myths-about-nuclear-weapons.

[47] Keith Hartley, "Defence-Industrial Issues: Employment, Skills, Technology and Regional Impacts," 21 March 2012, *British American Security Information Council (BASIC),* http://www.basicint.org/publications/keith-hartley/2012/defence-industrial-issues-employment-skills-technology-and-regional-

The Authors

JOHN PAGE is a research officer at the Centre for Nuclear Non-Proliferation and Disarmament. He is a former officer of the Australian Department of Foreign Affairs and Trade and served on the Secretariats of the Canberra Commission on the Elimination of Nuclear Weapons and the International Commission on Nuclear Non-Proliferation and Disarmament.

RAMESH THAKUR is Director of the Centre for Nuclear Non-Proliferation and Disarmament in the Australian National University's Crawford School of Public Policy. He was formerly Senior Vice Rector of the United Nations University (and UN Assistant Secretary-General) and then Foundation Director of the Balsillie School of International Affairs in Waterloo, Ontario. He was a Responsibility to Protect Commissioner and Principal Writer of Secretary-General Kofi Annan's 2002 UN reform report.

APLN and CNND

The **Asia Pacific Leadership Network (APLN)** comprises over thirty former senior political, diplomatic and military leaders from fourteen countries around the region including nuclear-weapons possessing states China, India and Pakistan. The objective of the group, convened by former Australian Foreign Minister and President Emeritus of the International Crisis Group Gareth Evans, is to inform and energize public opinion, and especially high-level policy-makers, to take seriously the very real threats posed by nuclear weapons, and do everything possible to achieve a world in which they are contained, diminished and ultimately eliminated. See further http://apln.anu.edu.au

The **Centre for Nuclear Non-Proliferation and Disarmament (CNND)** contributes to worldwide efforts to minimize the risk of nuclear-weapons use, stop their spread and ultimately achieve their complete elimination. It works in partnership with the Geneva Centre for Security Policy (GCSP) and the Stockholm International Peace Research Institute (SIPRI), and acts as the Secretariat for APLN. The director of the Centre is Professor Ramesh Thakur, former UN Assistant Secretary-General, and it is assisted by a distinguished International Advisory Board chaired by Professor Gareth Evans. See further http://cnnd.anu.edu.au

APLN/CNND Policy Briefs

These express the views of the authors, and do not necessarily reflect the views of APLN members or the CNND, or other organizations with which the authors may be associated. They are published to encourage debate on topics of policy interest and relevance regarding the existence and role of nuclear weapons.

Contact Us

Centre for Nuclear Non-Proliferation and Disarmament
Crawford School of Public Policy
The Australian National University
Canberra ACT 0200
AUSTRALIA
Email: cnnd@anu.edu.au
Telephone: + 61 2 6125 0912