

Why nuclear weapons are a very present danger – now

A briefing for UK health professionals

What's good for human rights is bad for nuclear weapons.

This briefing describes the current situation concerning nuclear weapons in a global context and why health professionals have a duty to act urgently.

Nuclear arms are not really 'weapons' at all. They are instruments of genocide which create only terror, not security.

Robin Stott; 'Even before the bomb drops', MCANW 1988

Medact

Health professionals for a
safer, fairer & better world

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Nuclear Weapons Group of Medact
www.medact.org

Glossary of some acronyms

CPI Consumer Prices index (UK)

CTBT Comprehensive Test Ban Treaty

GDP Gross Domestic Product

ICAN International Campaign to Abolish Nuclear Weapons

IPPNW International Physicians for the Prevention of Nuclear War

Kt Kilo-tonne - explosive power (of nuclear weapons) expressed as equating to the weight of TNT in Kt

MCANW Medical campaign against nuclear weapons (UK, open to all health professionals)

NPT Nuclear Non-Proliferation Treaty

NWC Nuclear Weapons Convention

NWS Nuclear Weapon-possessing States

NNWS Non Nuclear Weapon-possessing States

P5 China, France, Russia, UK, USA - the five permanent member and veto-carrying states of the UN Security Council; all the P5 are Nuclear Weapons States

PWR Pressurised Water Reactors (system for nuclear powered submarine engines)

SIPRI Stockholm International Peace Research Institute

Introduction

In a world threatened by 15,700 nuclear warheads of which at least 2200 are operational - that is, deployed and ready to fire within hours or even minutes¹ - health professionals are ethically bound to highlight the medical nature of the threat, even if not used, and to promote disarmament as the best form of prevention.

A war in which less than 5% of that operational firepower is detonated would destroy medical services for the millions injured, and risk a decade of global famine which would starve to death two billion or so non-combatants.^{2, 3} A peace maintained by massive military spending backed by nuclear hardware merely maintains the power imbalance; it would not be peace at all for the gravely impoverished billions, deprived of quality of life, prospects and of human rights.

Humankind under stress

Précis

Nuclear weapons exist in a global framework where, due to the resource demands of an increasing and developing human population, all humankind is facing a crisis of many dimensions and inter-linked causes.

- ☒ Excess use of inappropriate energy sources, including nuclear energy
 - o Increased greenhouse gas emissions to the atmosphere
 - ☒ Climate change and extreme weather conditions - rain in the 'wrong places', desertification and unusual flooding
 - o Accumulation of long-lived radio-active nuclear waste
 - ☒ Unethical delegation of safety responsibilities to future generations

- ☒ Excessive water consumption; exhaustion of 'fossil' aquifers
 - o Inadequate global crop production and very high food prices
 - ☒ 'Water conflicts' (usually within states up to now)

- ☒ Advances in communication technologies
 - o Speed of social media informing more people about inequities

- ☒ facilitating revolutionary movements - for example, during the ‘Arab Spring’
- o World stock markets controlled by robotic algorithms conveyed at the speed of light
 - ☒ Opportunities for human intervention limited
- ☒ The crisis from gross economic mismanagement
- o More resources diverted to the self-serving Military-Industrial Complex, where
 - traditional laws of free-market capitalism do not apply*⁴
 - ☒ Increasing the wealth gap between rich and poor folk

The widening wealth (poverty) gap

It is claimed the richest 2% have over half the world’s wealth (about \$223US Trillion), and the richest 300 have as much as the poorest 3 billion,⁵ undermining societies and fostering conditions for conflict.⁶ Among the many factors behind the widening gap are:

- ☒ trade mispricing; allowing a form of tax evasion
- ☒ rich countries trading cheap labour and resources from poor counties which are-
- ☒ repaying debts to rich, e.g. the ‘P5’ - often several times over.

Buying military ‘security’ - false hopes

Global military spending in 2014 was \$1.776 Trillion, 2.3% of global Gross Domestic Product.⁷ According to SIPRI, in 2012 the top spending nations (\$US 2011) were

- ☒ US at \$685bn, China at \$166bn, Russia at \$90.7bn and the UK at \$60.8bn.

Regional expenditures in 2014, after Allied withdrawal from Afghanistan, cf 2013:

- ☒ N America; \$627bn in 2014, down 6.4%; W&Central Europe; \$292bn, down 1.9%,
- ☒ But in Africa \$50bn in 2014, up 5.9% from 2013; E Asia (incl China) \$309bn in 2014, up 6.2%; E Europe \$93.9bn in 2014, up 8.4%; Middle East \$196bn, up 5.2%.

In real terms the US figure is 60% higher than in 2001, due to the expanding Military Industrial Complex and the “war against terror”. But these cannot address, for example,

- ☒ the detonation of
 - o an improvised near-Hiroshima-sized device (c10Kt) in a major city ⁸
 - o a ‘dirty bomb’ in a city - the impact of which would cost £billions ⁹
- ☒ the growing instability in the Middle East (Libya, Syria, Iraq, IS, Israel/Palestine)
- ☒ other flash-points – Ukraine; the oil-rich East and South China Seas; India/Pakistan

Global population trends

world-trends

Source: UN Population Division World Population Prospects: The 2010 Revision, medium variant (2011)

By 2050 the world population will be about 9 billion (median estimate) and still be rising. Developing countries, with high birth rates and young populations, will account for 97%. The poorest 48 countries (with very low incomes, high economic vulnerability, short life expectancy and poor education) will see the most growth. Of these 33 are in sub-Saharan Africa where only 20% of married women use modern family planning.¹⁰

Food and water supplies

Global sugar prices rose in the year to May 2013 by 250%; cereals and dairy by 240% and meat by 180%.^{11,12} Although partly offset by general inflation, the cost of food for many people is getting beyond their reach as wage rises fail to keep pace - conditions which contributed to the Arab Spring.¹³ In the UK, the CPI rose by only 2.7%.¹⁴

Overpumping aquifers for irrigation has caused some nations to reach ‘peak water’ and agricultural production is declining.¹⁵ Although the annual global yields of the four main crops (maize, wheat, rice and soybean) is increasing by just over

1%, double this rate is required to keep pace with expected demands by 2050.¹⁶ This is very significant in the US, China and India; and also in Iran, Mexico and Saudi Arabia. Overall, food has become more difficult to grow and in spite of technological advances (including new GM crops) increasing the global production will become more difficult in the near future. Increasing dependence on 'monoculture' causes additional ecological problems.

Energy

The world's energy demand rose from 8,752 'Megatonnes of Oil Equivalent' (MTOE) in 1990 to 13,000 in 2013. Consumption *per capita* rose by 10% although the US and Europe had virtually no *per capita* rise due to recession and as Western industries decline, energy demands divert to the less carbon-efficient developing world;¹⁷ so globally energy use continues to rise.

In 2010, 33.5 billion tonnes of CO₂ were emitted - 50% more than in 1990.¹⁸ Coal, the most carbogenic energy source, produced 25% of the world's energy and 31% of the CO₂ rise. Asia had the largest share of the overall rise although Africa's rise was proportionately similar. Rising CO₂ emissions will aggravate climate change.

In 1999 the price of petroleum was just under \$20 US per barrel but in 2008 rose to peak at \$140, dropped sharply to \$50 in 2009, rose again to about \$100¹⁹ but for the past year have been about \$60. Fluctuations are largely due to speculation in commodities and 'futures' fuelled by 'quantitative easing', clandestinely resulting in more money in bankers' pockets,²⁰ but the current relatively low prices are due to over-production relative to demand. In 2011 the London-based Overseas Development Institute suggested that high oil prices reduce African GDP by 1%, decreasing healthcare funding and causing the loss of life of 5,000 infants and 10,000 children. "It is often the poorest within developing countries that are more exposed to an oil price rise because their consumption is most dependent on oil."²¹ High oil prices may make hitherto expensive energy sources such as shale oil and gas relatively more economical. Although hydraulic fracturing of shale deposits is costly, excessively carbogenic (releasing methane) and pollutes water tables²², the large shale deposits in North America could lower US dependence on Middle East and Russian oil and gas and, worryingly, increase American bellicosity. The current phase of relatively low oil prices is revising assessments as

shale oil and nuclear energy production become less competitive. Nevertheless, low-carbon renewable energy sources becomes more urgent.

Summary so far;-

Pressure on and mal-distribution of markets in basic resources (food, water, energy) has become unsustainable. The extra stress on humankind, never before so extreme, gives rise to a real risk that, in a moment of irrationality or panic, a nuclear war will be started.

The nuclear threat

Current global nuclear arsenals¹

The situation in January 2015 is summarised below

World Nuclear Forces. Combined inventory of warheads (early 2015)					
NWS	Operational Strategic *	Operational Nonstrategic	Reserve/ Nondeployed	Military Stockpile	Total Inventory
Russia	1,780	0	2,720	4,500	7,500
US	1,900	180	2,600	4,700	7,200
France	290	n.a.	10	300	300
China	0	?	80	80	80
UK	150	n.a.	65	215	215

Israel	0	n.a.	80	80	80
Pakistan** *	0	n.a.	100-120	100-120	100-120
India***	0	n.a.	90-110	90-110	90-110
N o r t h Korea	0	n.a.	<10	<10	<10
Total:	~4,120*	~180**	~6,000	10,300	~15,700

All numbers are approximate estimates and further described in the [Nuclear Notebook](#) in the *Bulletin of the Atomic Scientists*, and the nuclear appendix in the [SIPRI Yearbook 2015](#).

* About half of these are deployable within hours, others within 2 to 3 days.

** Non-Strategic; tactical limited deployment of single weapons e.g. by NATO

*** Pakistan and India are increasing their arsenals: India is trialling a submarine ('Arihant')

To deter a land invasion of Western Europe, NATO has long deployed 'tactical' US nuclear weapons (to be used singly on the 'battlefield'). In 1971 there were about 7,300, but now there are only 180 - of types B61-3 (170Kt) and B61-4 (45Kt) - distributed at bases in Belgium, Holland, Italy, Germany and Turkey (most are in Italy and Turkey). Although technically and diplomatically obsolescent, over the next decade they will be modernised to type B61-12. This will exacerbate tensions with Russia^{23, 24} but all nuclear states are modernising their arsenals.

The global inventory peaked at 70,000 in 1987: most were in the USSR (45,000) and the USA (23,000).²⁵ Argentina and Brazil came near nuclear weapon capability, and apartheid South Africa did develop a weapon but completely disarmed, renounced its programme in 1993²⁶ and signed the Nuclear Non-Proliferation Treaty (NPT - see below). Brazil signed in 1998 and Argentina in 1995. Belarus, Ukraine and Kazakhstan 'inherited' substantial stocks from the USSR, but removed them (to Russia) and signed the NPT in 1994.

Nevertheless, it cannot be assumed that all current non-nuclear states will remain so. Recent negotiations (July 2015) will stop Iran – a hitherto likely contender to be the next NWS – getting a nuclear bomb for at least 15 years, ease its economic suffering and make war less likely for the moment²⁷.

One nation where nuclear-weapons development proposals re-surface from time to time is, ironically, Japan.²⁸ Although article 9 of its post-war constitution outlaws war, there were calls for nuclear arms during the election campaign of 2012 and the current government finance minister Taro Aso is a nuclear advocate. The opening of the Rokkasho reprocessing plant in Honshu has also re-awakened fears

of a resurging militaristic spirit in a country with China, North Korea and Russia as neighbours.

Other nations such as South Korea and Taiwan have been suggested²⁹.

Unless there is significant improvement in global nuclear disarmament, and while 'deterrence' remains not just the basis of orthodox nuclear doctrine but underpins nuclear aggression, as for example in accusations by some of Russia in the current Ukraine crisis,³⁰ a further outbreak of proliferation is not unlikely. In the authors' opinion, increasing reliance on a 'new nuclear build' of civil nuclear energy power plants is likely to aggravate the risk of weapons-proliferation.

What, if any, are the specific threats to the UK?

David Cameron reacted to the North Korean tests in April 2013 by saying it would be foolish to leave the country defenseless when the "highly unpredictable and aggressive" regime in North Korea was developing ballistic missiles that could eventually threaten Europe²⁹. But this is far from realistic given that North Korea's concerns are far more parochial (feeding its own people, and the young Leader's family and allies securing their own positions). That Iran is even less than a threat is supported by President Rouhani's willingness to talk to the US, backed by the all-powerful Religious authorities. China is the only nuclear power to declare a no-nuclear-first-strike policy - and supports a Convention against their use*. The main Chinese threat is to the US economy and its virtual capture of the US dollar reserve. Nevertheless in response to increased spending by the American Military Industrial Complex (MIC), China feels compelled to modernise its own nuclear arsenal and develop its own MIC⁴.

* In 2007 an updated draft Nuclear Weapon Convention (NWC) was submitted to the UN by Costa Rica and Malaysia, modeled on the chemical, biological and anti-personnel landmines weapons conventions. The NWC was intended to supplement the NPT and the CTBT but the P5 argued instead that it undermined the NPT – their favoured diplomatic tool – rather than supplementing it. The P5 are applying a similar argument to the currently proposed 'ban treaty' – see later.

The main military threat against the West is still perceived to be Russia, which in turn sees itself threatened by NATO (i.e. US) bases and nuclear weapons in Europe and the US 'Missile Defense' policy. Clearly a mutual downgrading of the

nuclear threat would serve each side far better - and the START III treaty is a real, although small, step in that direction. But Russia's 2014 incorporation of Crimea without Ukraine's consent and the rapid downturn into armed conflict and suggestions on both sides for upgrading their nuclear postures have led to a highly dangerous situation given that Russia cannot accept any loss of influence on Ukraine, while NATO military officials claim a 'need to regain dominance by being more aggressive than its opponent'³⁰. The US must carefully endeavour to keep a working relationship with Russia: both must recognise the unacceptable humanitarian consequences of a nuclear war. UK's Trident seems scarcely relevant here; indeed, such situations show how much safer the world would be if there were no nuclear sabres to rattle at all.

Nuclear disarmament - the challenge

Although the global nuclear weapons inventory has declined from its 1987 peak of 70,000, the rate of decline has stalled and 15,700 remain. None of the 'P5' States has disarmed completely or shown willingness to do so. The 'New Start' bilateral treaty between the US and Russia, which came into force in 2011 and is meant to last to 2021, should reduce their combined deployed strategic warheads to 1,550 but does not affect their non-deployed stockpiles.

The main diplomatic tool to eliminate the risk of nuclear war is the United Nations' *Nuclear Non-Proliferation Treaty* (NPT) of 1970.³¹ This is essentially a deal between the P5 and the NNWS whereby the P5 will disarm *in good faith* while the NNWS can develop peaceful civil nuclear energy so long as they never develop nuclear weapons. 190 states have now signed, including Iran. The non-signatory states Israel, India and Pakistan have nuclear weapons but are excluded from the NPT processes: North Korea, a signatory, breached the NPT in order to develop nuclear bombs.

Since 1970, major 'Review' Conferences of the NPT ('RevCons') have been held every five years, usually in early May. The 2010 and 2015 RevCons coincided with UK General Elections. Between RevCons, Preparation Conferences (PrepCons) are held. The 2010 RevCon produced a series of 'Action Points' enabling any NWS or NNWS to demonstrate actions supporting NPT fulfilment. The UK undertook disarmament verification (with Norway - a valid, very difficult technical point), and reducing weapon deployment to 40 per submarine (now achieved). However, little progress – rather, some regress – occurred at the 2015 RevCon.

International reaction

Lack of progress of the NPT and rejection of the draft NWC is causing discontent, frustration and cynicism among most NNWS who are calling for ‘renewed political engagement at a high level’.³² Work on other important international treaties is proceeding only very slowly, e.g. the Fissile Materials Cut-off Treaty (FMCT which would put strong limits on weapons-grade material availability) and the CTBT. Many nations including US have not ratified these although seismic detection of even small nuclear detonations is now possible.

In 2008 IPPNW helped found the International Campaign to Abolish Nuclear Weapons (ICAN), a network of civil society organisations in many countries. Medact is one of several ICAN partners in the UK. ICAN supported inter-governmental meetings hosted by Norway in March 2013, re-convened in Mexico in February and in Vienna in December 2014. Concern over the dire humanitarian consequences of nuclear war^{2, 3} led to calls for a new ‘ban-treaty’ filling the legal gaps in the NPT, supported by a ‘humanitarian pledge’ launched at Vienna and now signed by 110 States; but the P5, who did not attend the Oslo and Mexico meetings (although the US, UK and China sent observers to Vienna), discount the case for such a ban-treaty which they say would undermine the NPT, and indeed claim that the awful humanitarian consequences add to the deterrent effect thereby making the world safer (see also ref³³).

International Diplomatic Moves

In 2007 four very established and distinguished Cold War American leaders called for ‘a world free of nuclear weapons’.³⁴ *“The end of the Cold War made the doctrine of mutual Soviet-American deterrence obsolete. Deterrence continues to be a relevant consideration for many states with regard to threats from other states. But reliance on nuclear weapons for this purpose is becoming increasingly hazardous and decreasingly effective”* and *“We endorse the goal of a world free of nuclear weapons”* and *“working energetically on the actions required to achieve that goal”*. Four senior UK statesmen issued a supportive statement in 2008.³⁵ Barack Obama has spoken likewise, most recently at the Brandenburg Gate in June 2013

But such support must be judged by results: so far these are very poor. A ‘de-alerting’³⁶ of all weapon delivery systems (removal from their current ‘operational’ status) would be a very encouraging step - at least as a start.

Solutions and Final Comments

The case for global nuclear disarmament needs to be understood better as it is essential for a healthy planet. Disarmament and human advancement are inter-dependent: although neither is risk-free, both are certainly achievable and among other factors would be aided by -

- ☒ Rebalancing the global economy and eliminating corruption
 - o 'Fair trade' - profitable enterprises which encourage gainful employment
 - o fair investment policies and taxation for the public good
 - o reforming the market in commodities and improving global stock market controls (for example, better supervision of computerised algorithms).
- ☒ Achieving more equal societies
 - o Gender equality, equal opportunities
- ☒ Improving resources and distributing them more fairly
 - o low-carbon energy and transport
 - o water and land for food production, giving
- ☒ better and more diverse crops (including appropriate GM)
- ☒ animal husbandry of high quality, but much less of it overall
- ☒ Developing good public health
 - o nutrition, clean water, quality housing, sanitation
 - o vaccination programmes
 - o good health-care services including mental and elderly health care
 - o promoting the humanities, exercise, adventure, sport etc.
- ☒ Relieving population pressures
 - o empowering women, including the freedom to control their fertility
 - o improving education for all, particularly concerning sustainability.

Nuclear weapons systems

- ☒ have no credible use,
 - o they would be useless against 'terrorist' attacks
 - o their use would be inhumane, immoral and illegal
 - o do not deter conventional attacks even against a NWS (e.g Falklands 1982)
- ☒ possession, to give protection and deter others, is deluded thinking³³
 - o wars between states cannot be won by using them in even a 'modest'

exchange

(of about 100 bombs - just 2.5% or so of the total deployed global arsenal)

o but would be followed by a massive humanitarian catastrophe.

☒ are expensive to maintain;

o even transporting them increases vulnerability and diverts valuable resources

☒ even if not used, pose unique and long-term hazards to public health

The process of nuclear disarmament is extra-ordinarily complicated, not least - quite apart from the politics - because of the technical complexity and radioactivity of the weapons, and the need for accurate verification and safe disposal. Nevertheless a healthier, safer and fairer world, where nuclear weapons are banned, is eminently achievable *if people wish for it*. For example, within a very few years all NWS could agree never to use them first (not agreed at present by the US, UK, France and Russia); there could be no more than a very few nuclear warheads in the world; and missile delivery and space-based systems could be accommodated within a ban treaty. The 'Humanitarian Pledge', initiated in December 2014, for bringing into force an international treaty to ban nuclear weapons completely is a source of optimism which the P5 and their allies should be encouraged to embrace. Several credible road-maps show how the world's states could reach this goal.^{37, 38} As the urgency is great the next serious and tangible steps toward complete nuclear disarmament, such as comprehensive de-alerting, need to be taken now, hand-in-hand with improvements in human relations between and within nation states.

A ban sanctioned by international law is essential for such a development but can only succeed if accompanied by effective confidence-building measures. For an agreed ban to be maintained, universal human rights must be promoted *and* practiced responsibly, for individuals *and* for communities, with due respect for diversity of traditions, cultures and customs, and not least for the environment. But it remains to be seen how long it will be before the P5 feel confident enough to embark on such processes. It is vital, therefore, to conduct clear and accountable diplomacy designed to reassure the citizens and leaders of all NWS that they would be safer in the absence of any nuclear arsenals *and while they were being negotiated away*. Developing such mind-sets, coupled with real progress in eradicating the sources of human suffering including hunger and avoidable ill-health, is entirely achievable although undoubtedly it would not be easy.

These are not naïve hopes; any progress is bound to be fraught with difficulties and to falter at times, but such steps can produce a far more stable security than

any holding at present, therefore making it much more likely that humankind will survive in a truly meaningful sense.

REFERENCES

- 1 Status of World Nuclear Forces. www.fas.org/programs/ssp/nukes/nuclearweapons/nukestatus.html
- 2 Robock A, Oman L, Stenchikov G. 2007. Nuclear winter revisited. *J. Geophys. Res.*, 112.
- 3 Helfand I. 2013. Nuclear Famine <http://www.psr.org/assets/pdfs/two-billion-at-risk.pdf>
- 4 Vijay Mehta, 2011. *The economics of killing*. Pluto Press, London
- 5 Jeremy Williams 2013. <http://makewealthhistory.org/2013/04/16/global-wealth-inequality/>
- 6 Wilkinson RG, Pickett K. 2010 *The Spirit Level*. 2nd Edition; Penguin Books
- 7 Stockholm International Peace Research Institute, 2013 Year Book.
- 8 “Small” Nuclear Blast Would Devastate Downtown D.C. <http://www.nti.rsvp1.com/gsn/article/small-nuclear-blast-would-devastate-downtown-dc-eport/?mgh=http%3A%2F%2Fwww.nti.org&mgf=1>
- 9 “Dirty Bomb” Strike on L.A. Could Cost Billions <http://www.nti.rsvp1.com/gsn/article/dirty-bomb-strike-l-could-cost-billions-researchers-say/?mgh=http%3A%2F%2Fwww.nti.org&mgf=1>
- 10 Carl Haub, 2012. Fact Sheet World Population Trends 2012. <http://www.prb.org/Publications/Datasheets/2012/world-population-data-sheet.aspx>
- 11 FAO 2013. Food Price Index in June www.fao.org/worldfoodsituation/wfs-home/foodpricesindex/en/
- 12 Hossain N, King R, Kelbert A. 2013. Squeezed; Life in a time of food price volatility, Year 1. Oxfam and IDR. <http://www.ids.ac.uk/files/dmfile/rr-squeezed-food-price-volatility-year-one-230513-en.pdf>
- 13 Climate Change and Rising Food Prices Arab Spring. Scientific American March 4, 2013 www.scientificamerican.com/article.cfm?id=climate-change-and-rising-food-prices-heightened-arab-spring
- 14 Office for National Statistics. Consumer Price Inflation Summary, May 2013 <http://www.ons.gov.uk/ons/rel/cpi/consumer-price-indices/may-2013/>
- 15 Lester Brown, 2012. Full Planet, Empty Plates: The New Geopolitics of Food Scarcity. Earth Policy Institute <http://www.earth-policy.org/books/fpep> Also, *Observer*, 6 July 2013
- 16 Ray DK, Mueller ND, West PC, Foley JA. June 2013. Yield Trends Are Insufficient to Double Global Crop Production by 2050. *PLOS One*; Vol 8, Issue 6 |e66428
- 17 Shift Project Portal <http://www.tsp-data-portal.org/all-datasets>
- 18 Global Carbon Budget. www.globalcarbonproject.org/carbonbudget/12/hl-compact.htm
- 19 Wikipedia 2013 https://en.wikipedia.org/wiki/File:Brent_Spot_monthly.svg
- 20 How you pay for the City. David Grossman. BBC Radio 4 Broadcast, 24th August 2013
- 21 te Velde DW. 2011 Counting the cost of oil price shocks across the developing world <http://www.odi.org.uk/opinion/5673-oil-prices-poor-countries-policy-responses>
- 22 Health and Fracking. http://www.medact.org/wp-content/uploads/2015/04/medact_fracking-report_WEB4.pdf
- 23 *Global Security Newswire* July 17, 2013, U.S. Nuclear Weapons on the Territories of 5 NATO States. www.nti.org/analysis/articles/nato-nuclear-disarmament/
- 24 Norton-Taylor R. 11 May 2012 Proposals to modernise nuclear arsenal will heighten tensions with Russia. www.guardian.co.uk/world/2012/may/11/nato-nuclear-weapons-upgrade
- 25 Hans M. Kristensen 2012, http://fas.org/docs/Non_Strategic_Nuclear_Weapons.pdf and <http://fas.org/programs/ssp/nukes/publications1/TrimmingNuclearExcess.pdf>
- 26 de Klerk, FW. 2014. The importance of rejecting the Gollum’s ring of nuclear power. *Medicine Conflict and Survival*;30: Supplement 1, s3 – s9
- 27 Joint statement by EU High Representative Federica Mogherini and Iranian Foreign Minister Javad Zarif Vienna, 14 July 2015 http://eeas.europa.eu/statements-eeas/2015/150714_01_en.htm
28. Peter Symonds 2013. Is Japan Developing a Nuclear Weapons Program? <http://www.globalresearch.ca/is-japan-developing-a-nuclear-weapons-program/5334227>
- 29 John H Large. 2006 The actual and potential development of nuclear weapons technology in N E Asia. <http://web.archive.org/web/20070710105632/http://www.largeassociates.com/R3126-A1-%20final.pdf>
- 29 www.theguardian.com/politics/2013/apr/04/david-cameron-trident-north-korea April 2013
- 30 BBC News, March 15, 2015. Ukraine conflict: Putin 'was ready for nuclear alert'. <http://www.bbc.co.uk/news/world-europe-31899680> and Ewan MacAskill; Guardian 17 June 2015 <http://www.theguardian.com/world/2015/jun/17/nato-russia-elaborate-training-exercise-dangerous-signal>
- 31 Wikipedia 2013. Treaty on the Non-Proliferation of Nuclear Weapons. https://en.wikipedia.org/wiki/Treaty_on_the_Non-Proliferation_of_Nuclear_Weapons
- 32 Matthew Harries and Carol Naughton, 2013. The link between non-proliferation and disarmament in the NPT: is there a consensus behind the conflict? British Pugwash Group

- 33 Medact 2013. The Delusional Thinking behind a Policy of ‘Nuclear Deterrence’
34 **George P. Shultz, William J. Perry, Henry A. Kissinger, and Sam Nunn.** A World Free of Nuclear
Weapons Hoover Institute Digest, January 2007. Originally in Wall Street Journal
35 Douglas Hurd, Malcolm Rifkind, David Owen and George Robertson. The Times June 30, 2008.
www.timesonline.co.uk/tol/comment/columnists/guest_contributors/article4237387.ece
36 Reframing nuclear de-alert, EastWest Institute 2009. http://www.ewi.info/reframing_dealert
37 Eliminating Nuclear Threats <http://icnnd.org/Pages/default.aspx>
38 The road to zero timeline. <http://www.globalzero.org/get-the-facts/timeline>