Planetary health requires eradicating nuclear weapons

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Consultant: Australian Red Cross, WHO

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Thanks

- Alan Robock
  - Rutgers, New Jersey

- Michael Mills
  - NCAR, Colorado

- Ira Helfand
  - IPPNW, Massachusetts
Overview

• Consequences of nuclear war:
  – acute, largely irreversible existential threat
  – a hospitable climate is crucial to planetary health

• The growing danger of nuclear war

• The race against time to end nuclear weapons:
  – ICAN and the Humanitarian Initiative
  – The Treaty on the Prohibition of Nuclear Weapons
  – The Nobel Peace Prize for 2017
SO, WHAT DO YOU WANT TO BE WHEN YOU GROW UP?

ALIVE... IF IT'S NOT TOO MUCH TROUBLE....

GROUND ZERO
1 MEGATON WARHEAD
YOU ARE VAPORIZED

2 MILES
YOU ARE VERY DEAD

5 MILES
YOU ARE COOKED
Nuclear Weapons constitute the greatest immediate threat to the Health and Welfare of Mankind.
“the ICRC has over the past 6 years made an in-depth assessment of its own capacity, and that of other agencies, … We have concluded that an effective means of assisting a substantial portion of survivors of a nuclear detonation, while adequately protecting those delivering assistance, is not currently available at national level and not feasible at international level. It is highly unlikely that the immense investment required to develop such a capacity will ever be made. If made, it would likely remain insufficient.”

– Peter Maurer, ICRC President, Oslo 4 March 2013
Nuclear weapon induced fires

“Even the smallest of nuclear weapons, such as the ~15 kt weapon used on Hiroshima, exploding in modern megacities would produce firestorms that would build for hours, consuming buildings, vegetation, roads, fuel depots, and other infrastructure, releasing energy many times that of the weapon’s yield.”


Hiroshima: fires released ~1000 times the energy of the n explosion
Regional nuclear war

- 100 Hiroshima-size bombs
  - India – Pakistan scenario
    - Contested volatile border with daily shooting in Kashmir, 3 wars since independence, mobilised up to 1 million troops twice more
    - India “Cold Start” invasion plans, Pakistan plans early use of nuclear weapons in a war with India
      - Estimated 6 million tons of black carbon soot/smoke

- 44 million casualties including 21 million deaths in major cities in India and Pakistan (some studies suggest 35 m deaths)

- Radioactive contamination throughout both countries and in Nepal, Bangladesh, Sri Lanka, Tibet, China, and other neighbours

- 0.4% of global nuclear weapons, 0.07% of total yield

- Global climate disruption from smoke and soot
Black carbon mass mixing ratio

SOOT01 [kg/kg], 01Jan2013 00:00

Mesosphere
Stratosphere
Troposphere

Day 1
Sooty smoke plume

Altitude (km)
Pressure (mb)

South pole
Equator
North pole
Latitude

Global climate response to regional war

GISS Model E
full ocean
no chemistry
response
Robock et al. (2007)

SOCOL
ozone chemistry
shallow ocean
Stenke et al. (2013)

CESM(WACCM)
ozone chemistry
full ocean,
sea ice, land
Mills et al., (2014)

Sooty Smoke
Sunlight
Temperature
Precipitation
Global ozone hole after regional nuclear war

Surface temperature change (°C)

DJF average, years 1-5
Change in growing season (days), years 2-6 average

Nuclear Winter

Cold, dry, dark, and more UV
Crops dying and global famine
Ways agriculture can be affected by a nuclear war

- Colder temperatures
  - shortened frost-free growing season
  - cold spells during growing season
  - slower growth → lower yield
- Darkness
- Less rainfall
- Enhanced ultraviolet radiation from ozone loss
- Radioactivity
- Toxic chemicals in atmosphere, soil, and water
- Lack of water supplies
- Lack of fertilizer
- Lack of fuel for machinery
- Lack of pesticides (but not of pests)
- Lack of seeds (and those that do exist are genetically engineered for the current climate)
- Lack of distribution system

Not yet modeled
Following a nuclear war between India and Pakistan, reduced global temperatures, precipitation, and sunlight reduce food production globally.

<table>
<thead>
<tr>
<th></th>
<th>First 5 years</th>
<th>Second 5 years</th>
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</thead>
<tbody>
<tr>
<td>US maize</td>
<td>-20%</td>
<td>-10%</td>
</tr>
<tr>
<td>US soybeans</td>
<td>-15%</td>
<td>-10%</td>
</tr>
<tr>
<td>China maize*</td>
<td>-15%</td>
<td>-12%</td>
</tr>
<tr>
<td>China middle season rice*</td>
<td>-26%</td>
<td>-21%</td>
</tr>
<tr>
<td>China spring wheat*</td>
<td>-26%</td>
<td>-20%</td>
</tr>
<tr>
<td>China winter wheat*</td>
<td>-38%</td>
<td>-23%</td>
</tr>
</tbody>
</table>

Özdoğan et al., Impacts of a nuclear war in South Asia on soybean and maize production in the Midwest United States, *Climatic Change*, 2012, 116, 373.
Chronic malnutrition today

- 815 million people at or below this level 2016, 155m children U5 stunted, 52 m wasted (FAO, 2017)
- 108m facing crisis level food insecurity or worse 2016, up from 80m in 2015 (FAO 2017)
- 20% acute malnutrition in Kenya, Ethiopia, Somalia
- 1/3 children <5y malnourished in sub-Saharan Africa
- Major factor in 4 m (>50%) under 5 child deaths/y
Global food supply

Global cereal ending stocks 2017/18 forecast at a record level:

105 days utilisation

FAO Cereal Supply and Demand Brief 5 April 2018

People dependent on imported food for >50% caloric consumption:

>300 million
Limited regional nuclear war with low yield weapons:

2 billion victims of starvation from nuclear famine?

+ epidemics, conflict

Helfand I. Nuclear famine: two billion people at risk? 2nd ed. IPPNW 2013
Ohio class submarines

- US: 14 Ohio class submarines
- 24 Trident II D5 missiles per submarine
- Average 4 warheads per missile – 96 per sub; can carry up to 144
- Warheads 100 or 455 kt – each 6-30 times Hiroshima
- 144 100 kt warheads on Chinese cities: 23 million tons of smoke
Self-assured destruction: The climate impacts of nuclear war

Alan Robock and Owen Brian Toon

http://climate.envsci.rutgers.edu/pdf/RobockToonSAD.pdf
Accidental nuclear war

9 November 1979
USA/NORAD training tapes appeared to show real Soviet strike

3 June 1980
USA/SAC faulty computer chip shows Soviet missile launches

26 September 1983 – Stanislav Petrov incident
Sunlight reflects off clouds towards Soviet monitoring satellite

Soviet leadership mistakenly concluded that a large scale NATO exercise, Able Archer 83, was the cover for a planned surprise attack

25 January 1995 – Norwegian rocket incident
Russia detects USA/Norway scientific rocket launch off Norway coast
Planned nuclear war

- First use considered and threatened by almost all nuclear-armed states since Japan 1945
  - eg US – at least 25 times (Ellsberg D. The doomsday machine. 2017)
    - USSR Berlin 1948,58, 61,7; Suez 56; Cuba 62; Arab-Israel 73; Iran 80
    - N Korea 1950,1,3, 1968, 76, 95, 2003, 17
    - Vietnam 1954, 68, 9-72
    - Egypt 1956
    - China 1953,4/5,8
    - Libya chemical weapons facility 1996

- Recent escalation of threats coupled with more aggressive deployments, exercises
  - US/NATO – Russia
  - India-Pakistan
  - Israel
  - North Korea - US
A resurgent Cold War – 2016

“The danger of nuclear catastrophe is greater than it was during the Cold War … growing greater every year”

Igor Ivanov, Russian Foreign Minister 98-04

“The risk of confrontation with the use of nuclear weapons in Europe is higher than in the 1980s.”
Mikhail Gorbachev

“It looks as if the world is preparing for war.”

“…Trump’s administration …orients US foreign policy toward “political, economic, and military competitions around the world” and calls for the development of new, “more flexible” nuclear weapons. This means lowering the threshold for the use of nuclear weapons even further.

… Putin … announced the development in Russia of several new types of weapons, including weapons that no country in the world yet possesses.”

-Time, 27 Jan 2017, 9 March 2018
Cyberwarfare and nuclear weapons

Might be possible for terrorists to hack into Russian or American command and control systems and launch nuclear missiles, with a high probability of triggering a wider nuclear conflict.

Gen James Cartwright, fmr head US Strategic Command, June 2015
FAO. The state of food security and nutrition in the world 2017.
“In 2017, world leaders failed to respond effectively to the looming threats of nuclear war and climate change, making the world security situation more dangerous than it was a year ago – and as dangerous as it has been since WW II. The greatest risks last year arose in the nuclear realm.

... Hyperbolic rhetoric and provocative actions by both sides have increased the possibility of nuclear war by accident or miscalculation.

.. the closest the Clock has ever been to Doomsday, as close as it was in 1953, at the height of the Cold War.

They can rewind the Doomsday Clock.”
UN General Assembly Resolution 1.1

Figure 3.1. The first meeting of the United Nations General Assembly, London, January 1946. Passed on 24 January 1946, General Resolution 1.1 established a commission to draw up a plan “for the elimination from national armaments of atomic weapons.” Source: United Nations Photo.
Advisory Opinion 8 July 1996, unanimously:

“...there exists an obligation to pursue in good faith and bring to conclusion negotiations leading to nuclear disarmament in all its aspects under strict and effective international control.”
Indiscriminate &/or inhumane weapons banned by international treaty:

- [Dum dum bullets 1899]
- Biological weapons 1972
- Chemical weapons 1993
- Landmines 1997
- Cluster munitions 2008

- The main basis for bans on all these has been humanitarian – unacceptable harm intrinsic to any use the weapon
- Proven process: stimatise – prohibit - eliminate
Disarmament is stalled

• No nuclear-armed state is disarming
  – (?? North Korea)
  – No negotiations underway

• All nuclear-armed states investing massively in indefinitely retaining and modernising their arsenals, adding new capacities
  – >US$105 billion/y
  – US – US$1.25 trillion over next 30y

• How can states without NW change the game?
Founded by IPPNW and MAPW in Melbourne

Campaign coalition: ~500 partner organisations in >100 countries

Goal: A treaty for prohibit and provide for the elimination of nuclear weapons

Based on the unacceptable, catastrophic consequences of any use of nuclear weapons

www.icanw.org
Bringing the era of nuclear weapons to an end

ICRC President Jakob Kellenberger
20 April 2010 to Geneva diplomatic corps

• “Nuclear weapons are unique in their destructive power, in the unspeakable human suffering they cause, in the impossibility of controlling their effects in space and time, in the risks of escalation they create, and in the threat they pose to the environment, to future generations, and indeed to the survival of humanity.

• “… preventing the use of nuclear weapons requires … negotiations aimed at prohibiting and completely eliminating such weapons through a legally binding international treaty. ”
May 2010 NPT Review Conference

• A commitment to “achieve the peace and security of a world without nuclear weapons.”

• “expresses ... deep concern about the catastrophic humanitarian consequences of any use of nuclear weapons, and reaffirms the need for all States at all times to comply with applicable international law, including international humanitarian law.”
Three intergovernmental conferences on HINW, attracting most of the world’s governments, concluded with no significant challenge:

- any use of nuclear weapons would be a *catastrophe*
- *no effective humanitarian response* is possible
- risk of nuclear weapons use has been underestimated, is growing, and exists as long as the weapons do
- there is a *legal gap*: the most destructive of all weapons are not explicitly prohibited
The Austrian Humanitarian Pledge

Joined by 127 states

“Austria pledges to cooperate with all relevant stakeholders ... to stigmatize, prohibit and eliminate nuclear weapons.”

– AUSTRIAN PLEDGE
2012-15 joint statements by states on humanitarian dimensions of nuclear weapons

• 2012 NPT PrepCom Norway: 15 states + Holy See (16)

• UNGA (Oct 2012) Switzerland: 34 states + Holy See (35)
  – “All States must intensify their efforts to outlaw nuclear weapons and achieve a world free of nuclear weapons”
  – Algeria, Argentina, Austria, Bangladesh, Belarus, Brazil, Chile, Colombia, Costa Rica, Denmark, Ecuador, Egypt, Holy See, Iceland, Indonesia, Ireland, Kazakhstan, Liechtenstein, Malaysia, Malta, Marshall Islands, Mexico, New Zealand, Nigeria, Norway, Peru, Philippines, Samoa, Sierra Leone, South Africa, Swaziland, Switzerland, Thailand, Uruguay and Zambia

• NPT PrepCom 2013: (weaker) S Africa: 79 states + HS (80)

• UNGA Oct 2013 New Zealand: 124 states + Holy See (125)
  – Counter statement by Australia (17)

• UNGA Oct 2014 New Zealand: (155)

• NPT PrepCom 2015 Austria (159)
The health and humanitarian case for banning and eliminating nuclear weapons

International Physicians for the Prevention of Nuclear War (IPPNW)†
World Medical Association††
World Federation of Public Health Associations‡
International Council of Nurses††

Working paper submitted to the Open-Ended Working Group Taking Forward Multilateral Nuclear Disarmament Negotiations (OEWG)
May 2016
“Banning and eliminating nuclear weapons is the only way to ensure planetary health”

The four leading international federations representing the world’s physicians, public health professionals and nurses came together for the first time ahead of the May session to warn governments that urgent action is needed to prohibit and eliminate nuclear weapons. A new treaty banning nuclear weapons, they said, would be “the only course of action commensurate with the existential danger they pose”.

The World Medical Association, the World Federation of Public Health Associations, the International Council of Nurses, and the International Physicians for the Prevention of Nuclear War submitted a joint working paper on the health and humanitarian case for banning nuclear weapons.

They emphasized that a nuclear war could kill many more people in a few hours than were killed during the entire Second World War, with the radioactive fallout lingering in the environment.
United Nations Conference to Negotiate a Legally Binding Instrument to Prohibit Nuclear Weapons, Leading Towards Their Total Elimination
16 Feb, 27-31 March, 15 June – 7 July 2017

Conference President Ambassador Elayne Whyte Gómez, Costa Rica
UN conference to negotiate a legally binding instrument to prohibit nuclear weapons, leading towards their total elimination

A legally binding instrument to prohibit nuclear weapons would establish general prohibitions and obligations as well as a political commitment to achieve and maintain a nuclear-weapon-free world.
Sue Coleman-Haseldine, Kokatha nuclear test survivor, South Australia
Karina Lester, Anangu Pitjantjatjara Yankunytjatjara 2nd generation nuclear test survivor
South Australia

My father Yami Lester was blinded by the British nuclear test. Many of his family and people died and many are still suffering today. The emotional, mental and physical suffering is felt by generation after generation.

- Karina Lester, second generation nuclear test survivor from Anangu Pitjantjatjara Yankunytjatjara Aboriginal land in South Australia
Voting Result:

IN FAVOUR 122
AGAINST 1
ABSTENTION 1
BIOLOGICAL WEAPONS BANNED 1972
CHEMICAL WEAPONS BANNED 1993
LAND MINES BANNED 1997
CLUSTER BOMBS BANNED 2008
NUCLEAR WEAPONS BANNED 2017!

i can
international campaign to abolish nuclear weapons
Treaty on the prohibition of nuclear weapons

• Reflects health /humanitarian evidence
  – “Catastrophic consequences cannot be adequately addressed, pose grave implications for human survival, the environment, socioeconomic development, … food security and the health of current and future generations
  – First disarmament treaty to cite disproportionate impact on women and girls and indigenous peoples

• Categorical and comprehensive prohibition

• Provides pathways for all states to join
  – Possess NW
  – Prior possession NW
  – NW stationed
  – Assist in preparations for use of NW

• Maintains/strengthens safeguards

• Obligations:
  – for victim assistance and environmental remediation
  – International cooperation
  – Promote universalisation

• Indefinite duration

• No reservations
“Without the leadership so ably displayed by ICAN, we would not have achieved our objective today.”
Thomas Hajnoczi, Austrian Ambassador, 7.7.17
• “… for its work to draw attention to the catastrophic humanitarian consequences of any use of nuclear weapons and for its ground-breaking efforts to achieve a treaty-based prohibition of such weapons.”
The first Nobel Peace Prize born in Australia
"Those who have the privilege to know have the duty to act."

“The unleashed power of the atom has changed everything save our modes of thinking, and thus we drift towards unparalleled catastrophe.”

Albert Einstein
1946
The 2017 Nobel Peace Prize and the Doomsday Clock —
The End of Nuclear Weapons or the End of Us?

Lachlan Forrow, M.D., Tilman Ruff, M.B., B.S., and Setsuko Thurlow, C.M., M.S.W.

The awarding of the 2017 Nobel Peace Prize to the International Campaign to Abolish Nuclear Weapons (ICAN) may mark a turning point in efforts to ensure that humanity survives...
Thank you!