

1 **I. Title: Towards A Nuclear Weapons Free-World**

2 **II. Author Identification:**

- 3 1. Corresponding author: Tova Fuller, MD, PhD, MS, Assistant Professor, Psychiatry, Weill
4 Institute for Neurosciences, University of California San Francisco. 401 Parnassus Ave,
5 San Francisco, CA 94143 Tova.Fuller@ucsf.edu | (415-502-9684) APHA member
6 number: 10350182, APHA Component Affiliation: Mental Health Section, International
7 Health Section, Environmental Health Section
- 8 2. Cameron Dacey, BS, University of Washington, Washington Physicians for Social
9 Responsibility, 1718 16th Ave. #4 Seattle, WA 98122, cmdacey@uw.edu | (206)428-
10 8088, APHA member number: 10285763, APHA Component Affiliation: Peace Caucus
- 11 3. Amy Hagopian, PhD, University of Washington, 1959 NE Pacific St, Box 357660,
12 Seattle, WA 98195, hagopian@uw.edu | 206.616.4989, APHA member number:
13 9777987, International Health Section
- 14 4. Patrice Sutton, MPH, University of California San Francisco, 311 Douglass Street, San
15 Francisco, CA 94114, psutton2000@yahoo.com 415 407 8806, APHA member number
16 ID 4420170, Occupational Health Section, Peace Caucus
- 17 5. Robert M. Gould, MD, University of San Francisco California and Physicians for Social
18 Responsibility, 311 Douglass Street, San Francisco, CA 94114 rmgould1@yahoo.com |
19 415-407-8972, APHA member number: 4610168 International Health Section,
20 Environmental Health Section, Peace Caucus

21 **III.Sponsorship:** Peace Caucus, International Health Section, Occupational Health and
22 Safety Section

23 **IV. Collaborating Organization:** Physicians for Social Responsibility (Tova Fuller,
24 Tova.Fuller@ucsf.edu)

25 **V. Endorsements:** Asian and Pacific Islander Caucus for Public Health, Injury Control and
26 Emergency Health Services, Student Assembly

27

1 **VI. Summary**

2 APHA has formally recognized, for at least four decades, the direct and indirect adverse public
3 health consequences of nuclear weapons research, development, testing, production, and use, and
4 has also explicitly recognized the essential role of public health professionals in advancing the
5 abolition of nuclear weapons. This policy statement provides an update to the evidence in
6 support of APHA’s past policy statements and reaffirms APHA’s call for the abolition of nuclear
7 weapons. This proposal calls for: 1) the United States (U.S.) and the other nuclear weapons states
8 to sign and ratify the 2017 United Nations (UN) Treaty on the Prohibition of Nuclear Weapons
9 to pursue negotiations in good faith on effective measures relating to the cessation of the nuclear
10 arms race; 2) the U.S. Congress and President to work towards the goal of a world free of nuclear
11 weapons including, but not limited to, rejoining the Intermediate-Range Nuclear Forces (INF)
12 treaty, renewing and expanding the New Start Treaty, pursuing multilateral regional treaties,
13 renouncing first use of nuclear weapons, and ending the sole presidential authority to launch a
14 nuclear attack; 3) the U.S. Congress and President to address legacy and current occupational
15 and environmental health harms posed by the U.S. nuclear weapons complex; and 4) all public
16 health professionals and schools of public health to advocate for a world free of nuclear
17 weapons, including opposition to diverting resources to weapons development and production,
18 teaching material covering health impacts of the nuclear weapons cycle in schools of public
19 health, and conducting further research and publishing materials on nuclear weapons issues.

20 **VII. Relationship to Existing APHA Policy Statements**

21 APHA has long been on record in acknowledging the direct and indirect adverse public health
22 consequences of nuclear weapons research, development, testing, production, and use, and has
23 also underscored the role of public health professionals in advancing the efforts to abolish
24 nuclear weapons. APHA resolutions on this topic include:

- 25 1. Prioritizing Cleanup of the Hanford Nuclear Reservation to Protect the Public’s Health
26 20105 (2010) [Contamination; Civilian health]
- 27 2. The Role of Public Health Practitioners, Academics, and Advocates in Relation to Armed
28 Conflict and War 20095 (2009) [War as a public health problem; Prevention; Promote
29 Peace]

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- 1 3. Opposition to US Attack on Iran 200718 (2007) [Prevent pre-emptive attack; reduce
2 nuclear weapons proliferation]
- 3 4. Opposition to the United States Plans for New Nuclear Weapons Development and Pre-
4 emptive War 200324 (2003) [Conflict resolution through negotiation; Re-establish
5 commitment to respecting international treaties]
- 6 5. Opposition to National Missile Defense and the Militarization of Space 200119 (2001)
7 [Reduce nuclear arsenal; Reinvest funds for the people]
- 8 6. Nuclear Weapon Free World 9932 (1999) [Engage in Anti-Nuclear resolutions]*
- 9 7. Taking Nuclear Weapons Off Alert 9931 (1999) [Hair trigger alert]*
- 10 8. Cessation of Continued Development of Nuclear Weapons 9804 (1998) [Opposing
11 nuclear weapons modernization]*
- 12 9. Cessation of Nuclear Testing and Abolition of Nuclear Weapons 9605 (1998) [Opposing
13 nuclear weapons modernization]*
- 14 10. Implementation of the Chemical Weapons Convention 9712 (1997) [Ban use of chemical
15 weapons]*
- 16 11. Public Health Hazards at Nuclear Weapons Facilities 8917 (1989) [Right of American
17 people to know all information in order to exercise political right; health risks]*
- 18 12. The Health Effects of Militarism Date 8531(PP) (1985) [Prevention of a Nuclear War;
19 Public Health Budgetary Impacts]*
- 20 13. Nuclear Testing and Dumping of Nuclear Waste Materials in the Pacific Ocean 8307
21 (1983) [Destruction of environment and the jeopardization of human life]*
- 22 14. Nuclear War and Nuclear Weapons 8117 (1981) [Pursuing verifiable agreement to
23 eliminate nuclear arsenals among nuclear weapons states]*
- 24 15. Nuclear Power 7909 (1979) [Significant lack of preventative health policy]*
- 25 16. World Peace and the Military Budget 7913 (1979) [Military budget as a threat to world
26 peace]*

27

28 * Denotes statement has been or will be archived this year.

29

1 **Rationale for Consideration:**

2 **APHA has a long history acknowledging the immense threat that nuclear weapons pose to**
3 **public health and human existence.** APHA is now archiving older policy resolutions, creating
4 an opportunity to consolidate and update our nuclear weapons policy statements.
5

6 **The United Nations adopted a nuclear weapons abolition treaty in July 2017,** and to date
7 there are 84 signatories and 47 ratified states [1]. This new UN treaty, for which the International
8 Campaign to Abolish Nuclear Weapons garnered the 2017 Nobel Peace Prize, represents our best
9 opportunity in generations to achieve a global consensus to abolish nuclear weapons [2].
10

11 **The pressure for resumption of explosive nuclear testing for weapons development is**
12 **increasing:** The Trump administration has been discussing pursuing the first U.S. nuclear test
13 explosion since 1992 [3].
14

15 **New threats are on the horizon:** The number of nuclear-armed states threatens to expand, with
16 the incipient weapons program of Iran stalled [4] while other countries in the Middle East such
17 as Saudi Arabia seek nuclear capabilities [5]. Previously effective arms control treaties are being
18 abandoned, and the nuclear weapons states (NWS) are rebuilding and modernizing their arsenals
19 [6].
20

1 **VIII. Problem Statement**

2 As of April 2020, approximately 13,410 nuclear weapons in the world were held by 9 countries.
3 The NWS include (with estimated total arsenal size in parentheses): Russia (6,372), United
4 States (5,800), United Kingdom (195), France (290), China (320), Israel (90), Pakistan (160),
5 India (150), and the Democratic People’s Republic of Korea (DPRK) (35) [6]. The APHA has
6 previously determined it is not possible for a country to “win” or survive a nuclear war [7], that
7 such a war would kill millions of people both directly and indirectly, and that such a war cannot
8 be limited geographically. Public health professionals are uniquely positioned to play a robust
9 role in abolishing nuclear weapons. Indeed, a previous APHA president, Dr. Victor W. Sidel,
10 together with renowned public health champion Dr. H. Jack Geiger, were, together with other
11 physicians, co-authors of seminal articles in the *New England Journal of Medicine* in 1962 on
12 the critical role of health professionals in preventing nuclear war [8].

13 ***Research, testing, production, manufacturing, storage, and use of nuclear weapons has***
14 ***harmed health***

15 The United States used nuclear weapons on the populations of Hiroshima and Nagasaki in
16 August 1945, killing close to a quarter million people by the end of that year [9]. Short-term
17 mortality and morbidity included severe burns, blast-associated trauma, and acute radiation
18 toxicity [10]. Epidemiological studies of atomic bomb survivors have demonstrated long-term
19 increased risk of hematopoietic malignancies and solid cancers, in addition to thyroid disease,
20 chronic liver disease, hypertension, and uterine myomas [11]. In utero exposures increased risk
21 of severe intellectual disability, small head size, and decreased intelligence quotient (IQ) scores
22 in offspring [12]. The use of nuclear weapons also caused profound and persistent social and
23 mental health consequences [13]. In the short term (2-3 weeks), Japanese atomic bomb survivors
24 suffered “emotional stupor,” characterized by emotional numbness and latency of emotional
25 response [14]. Likewise, increased neurotic and depressive disorders were noted 3 months after
26 the attack [15]. Note that post-traumatic stress disorder (PTSD) did not exist as a concept, let
27 alone a diagnosis, until nearly 30 years later. These effects do not dissipate with time. In 1997,
28 52 years after the bombings, a survey-based study on the survivors of the Nagasaki bombing was
29 performed finding severe apathy, disordered relationships, and anhedonia [16]. The very
30 anticipation of a nuclear war increases the risk of mental illness. Adolescents surveyed 2 months
31 preceding the outbreak of the Persian Gulf War in 1991 were again surveyed in 1995. Findings

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1 demonstrated that in adolescents reporting fear of nuclear war once a week or more often, risk of
2 common mental disorders was doubled [14]. In 1983, the WHO concluded, “the only approach
3 to the treatment of the health effects of nuclear explosions is primary prevention of such
4 explosions, that is the prevention of atomic war” [17].

5 Scientists have modeled a potential conflict involving no more than a few hundred
6 nuclear weapons, similar to the size used on Hiroshima; the resulting global environmental
7 damage would threaten the food supply and lead to mass starvation worldwide. Specifically, a
8 regional conflict between India and Pakistan, limited to 100-150 weapons used on each side,
9 could lead to global cooling by 2-5 degrees Celsius. With a decline of surface sunlight blocked
10 by explosive-related particulates and debris, and associated reduction of precipitation ranging
11 from 15-30%, agricultural productivity would decrease 15-30% on land, resulting in a “nuclear
12 famine” for up to 2 billion people, and further global collateral fatalities [18, 19].

13 Nuclear weapons research, testing, and production have resulted in widespread
14 contamination of our air, water, soil, and ecosystems. From 1945-1980 the U.S., U.S.S.R., China,
15 U.K., and France conducted more than 500 atmospheric tests—the equivalent of 440 megatons
16 of TNT. Radioactive fallout from atmospheric testing was dispersed worldwide, and downwind
17 exposure was associated with increased prevalence of thyroid cancer and leukemia [20]. The
18 National Cancer Institute has estimated atmospheric testing at the Nevada Test Site resulted in
19 11,300 to 212,000 additional cases of thyroid cancer in the U.S. [21]. Global testing of nuclear
20 weapons resulted in large doses of radioactive exposures among unsuspecting populations, and
21 an estimated tens of thousands of fatal cancers by 2000 [22].

22 The U.S. has over 40,000 hazardous sites for nuclear weapons waste; the cleanup cost so
23 far is \$41.1 billion [23]. The Waste Isolation Pilot Plant (WIPP) in New Mexico is the only
24 operational deep geologic repository for military-generated nuclear waste in the U.S., and its
25 permitted operational lifetime ends in 2024; nevertheless, the Department of Energy is currently
26 undertaking plans to utilize the site for long-term disposition of surplus
27 plutonium and conducting other activities being challenged in court as mechanisms to extend the
28 operational lifetime and capacity beyond the facilities existing permit [24, 25]. Worldwide, tons
29 of plutonium and highly enriched uranium are not properly secured, posing a risk of nuclear theft
30 and diversion into weapons programs [26]. Additionally, some spent nuclear fuel is not readily
31 transportable, and railway transport, the current preferred mode, cannot ensure safety [27].

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1 Numerous incidents involving releases of nuclear weapons-related radioactive materials
2 have occurred since the 1940s. The 1957 Kyshtym disaster in Russia led to acute hematopoietic
3 reactions to radiation exposure and long-term health harms including a higher incidence of
4 infectious, endocrine, nutritional, metabolic, and gastrointestinal diseases among the exposed
5 population [28]. Unintentional releases have also involved nuclear-armed delivery systems that
6 narrowly failed to detonate, including from the Damascus Titan missile explosion in 1980, and
7 the 1961 Goldsboro B-52 crash [29].

8 Former sites of plutonium production in Washington and Tennessee are highly
9 contaminated. At the Hanford site alone, during its 50 years of operation, 500 million gallons of
10 highly radioactive, chemically toxic waste was produced, some of which is being released
11 directly into the environment. Soil and groundwater are extensively contaminated [30].

12 The long-lived nature of radioactive and other environmental releases from the nuclear
13 weapons cycle ensures timeless human exposure. The U.S. National Academy of Sciences
14 reports: “At many sites, radiological and non-radiological hazardous wastes will remain, posing
15 risks to humans and the environment for tens or even hundreds of thousands of years. Complete
16 elimination of unacceptable risks to humans and the environment will not be achieved, now or in
17 the foreseeable future” [31].

18 ***First use and hair-trigger alert create risk for using or unintentionally launching nuclear*** 19 ***weapons***

20 According to the most recent 2018 Nuclear Posture Review (NPR), the U.S. “has never adopted
21 a ‘no first use’ policy regarding nuclear weapons,” and it “remains the policy of the United
22 States to retain some ambiguity regarding the precise circumstances that might lead to a U.S.
23 nuclear response” [32]. In addition, the 2018 NPR also states, “the United States will maintain a
24 portion of its nuclear forces on alert day-to-day and retain the option of launching those forces
25 promptly” [32]. As of 2017, the U.S., Russia, France and Britain deployed an estimated 1,869
26 nuclear warheads on alert, ready to be used on relatively short notice, with the U.S and Russia
27 deploying 1,749 warheads combined, or 94%. The U.S. possesses an estimated 892 warheads on
28 prompt alert, ready to be launched within 15 minutes, upon orders from the U.S. President,
29 including 392 ICBMs and 460 SSBNs [33]. Many of today's nuclear weapons are more than 80
30 times as powerful as the bomb dropped on Hiroshima [34, 35]. Of the U.S.’s 1,750 deployed

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1 warheads, approximately 1,300 are deployed on ballistic missiles, with another 300 at U.S.
2 strategic bomber bases. Another 150 U.S.-owned bombs are in Europe [36].

3 ***Policy allowing a U.S. president to independently launch a weapon could be catastrophic***

4 The president legally maintains complete control over the U.S. nuclear arsenal. No one in
5 Congress, the judicial branch, or even the U.S. military, can use legal means to prevent their use
6 once the president's order is given.

7 ***Costs of nuclear weapons diverts resources from public health***

8 The Department of Energy oversees the U.S. nuclear weapons research and development
9 program at federal laboratories such as the Sandia National Laboratory; Los Alamos National
10 Laboratory (LANL) in New Mexico; and Lawrence Livermore National Laboratories in
11 California. Several large corporate contractors directly operate these federal laboratories with
12 compensation in the billions of dollars in outstanding contracts [37].

13 The U.S. spent, between 1945 and 1996, \$5.5 trillion on nuclear weapons and related
14 programs. This expenditure exceeded all other categories of government spending during this
15 period, except for non-nuclear national defense and Social Security [38]. It is expected that
16 modernization, maintenance, and storage of nuclear weapons will cost \$494 billion over the next
17 decade, a cost rising each year [39]. According to the U.S. Congressional Budget Office, the U.S.
18 plans to spend an estimated \$1.2 trillion, approximately \$4 million an hour, to upgrade and
19 modernize its nuclear weapons and delivery systems over the next 30 years [40]. Cleanup, an
20 illusory concept, is also expensive; the complete remediation costs were estimated to be \$50-60
21 billion in 2004 [41]. Even without the additional plans to upgrade and modernize weapons, and
22 to remove known nuclear waste, the U.S. currently spends \$22.43 billion tax dollars per year on
23 nuclear weapons and associated costs, which otherwise could provide funding for more than
24 302,000 clean energy jobs, VA medical care for more than 2.17 million returning military
25 veterans, or 277,511 elementary school teachers for 1 year, or wind power for almost-39 million
26 households, to name a few alternative expenditures [42]. In addition, such expenditures could
27 instead be used to address major deficiencies in U.S. and global public health infrastructure and
28 access to healthcare, revealed most recently by the COVID-19 pandemic, which weaken national
29 security by creating vulnerabilities that include lowering population resilience to infectious
30 disease, other biological threats, or future pandemics, as well as decreasing military readiness
31 [43-46].

1 ***Every link in the chain of nuclear weapons production creates social inequities and injustices***

2 There is a disproportionate amount of detrimental health and environmental effects to
3 indigenous, colonized, and minority populations from the nuclear-weapons development and
4 production cycle [47]. While Indigenous lands have served as the main sites for testing nuclear
5 weapons around the world, they have also been a major source of weapons material. For
6 example, the uranium for the Hiroshima bomb was mined in the then-Belgian Congo, and a large
7 proportion of uranium mining during the Cold War (20-50%) was done in Africa [48]. In North
8 America, multiple indigenous tribes have been affected by testing and disposal of radioactive
9 material including from open uranium mines on the Spokane Indian Reservation in WA, and the
10 Navajo Nation in Arizona, Utah, and New Mexico. In fact, the largest release of radioactive
11 materials in the continental U.S. occurred in 1979 as a result of an evaporation pond dam
12 breaking at a processing site near Church Rock, New Mexico, resulting in the release of 94
13 million gallons of radioactive waste into the Puerco River, which flowed through nearby
14 communities [49]. Attempts to establish Yucca Mountain as a long-term civilian nuclear waste
15 site (an important site to the Western Shoshone and the Southern Paiute) poses similar risks [50]

16 Between 1946 and 1958 nuclear weapons testing by the U.S. on or near the Bikini and
17 Enewetak atolls in the Pacific vaporized islands that had been the homeland of the Marshallese
18 people for many generations. These 65 tests released approximately 6.3 billion curies of
19 radioactive iodine into the atmosphere, an amount 42 times greater than the total amount emitted
20 from the Nevada Test Site, and at least 116 times greater than the amount released in the 1986
21 Chernobyl meltdown [51]. The documented findings of the environmental contamination of
22 several atolls were hidden from the general public and the Marshallese people, and heavily
23 exposed research subjects were not treated adequately for radiation burns or given prophylactic
24 antibiotics [51]. For more than three decades the U.S. government sponsored several thousand
25 human-radiation experiments—many without informed consent, including secret intentional
26 releases of radiation overpopulated areas [52]. Today, on Runit Island, there is a 3.1 million
27 cubic feet dome of radioactive materials from the contaminated debris and soil from 43 nuclear
28 bombs. Radioactive materials have already leaked from the dome, with great danger of further
29 leakage from concurrent rising ocean levels from global warming [50, 53]. Today, some
30 Marshallese are nervous about marriage, out of fear of passing genetic mutations to offspring.
31 Alcohol abuse and suicide are exceedingly high, and the shift away from local fishing because of

1 legacy contamination to dependence on U.S. food aid has been associated with an epidemic of
2 diabetes. [54]

3 Soldiers were also disproportionately harmed by nuclear weapons testing. For example, a
4 1995 study of 8,550 military participants in Operation Hardtack I, a 1958 test in the Pacific
5 Proving Ground, found RR for all-cause mortality (1.23, CI 1.04-1.45), all cancers (1.42, CI
6 1.03-1.96), and liver cancer (6.42, CI 1.17-35.33) were significantly elevated [55]. Workers
7 throughout the nuclear-weapons production cycle have also been exposed to radioactive and
8 toxic materials. More than 600,000 people worked throughout the weapons complex during the
9 Cold War. Occupational disorders due to weapons production include, but are not limited to,
10 radiation-induced cancers, beryllium diseases, and silicosis [56]. In 2000, the Energy
11 Employees Occupational Illness Compensation Program was created by Congress and run
12 by the U.S. Department of Labor; however, through imposing a high burden of proof on
13 exposed workers, the compensation program has rejected almost two-thirds of the claims in
14 which radiation dose reconstructions were performed [57].

15 ***Nuclear Power: a pathway to nuclear weapons***

16 Nuclear power is intrinsically linked to nuclear weapons proliferation. There are over 450
17 nuclear reactors operating in some 30 countries around the world [58]; these operations provide
18 the materials and technical expertise for potential weapons development. Since the late 1930s,
19 thirty-one countries explored the possibility of developing potential nuclear weapons programs,
20 seventeen of which launched weapons programs, and ten acquired deliverable nuclear weapons
21 [59].

22 For example, the first nuclear weapons detonation by India in 1974, described as a
23 "peaceful nuclear explosion," utilized plutonium derived from the CIRUS (Canada India
24 Research Utility Service) reactor, with heavy water supplied by the U.S., and Canada providing
25 financing and technical expertise [60]. This event initiated the dangerous nuclear arms race in
26 South Asia whereby India and Pakistan subsequently, perfected delivery systems and increased
27 their nuclear arsenals [61]. This combustible situation was exacerbated by the signing of the
28 U.S.- India Civilian Nuclear Cooperation Agreement in 2006 [62].

29 With the collapse of the 2015 Iran Nuclear Deal (JCPOA, see section "Key Nuclear
30 Weapons Treaties are Being Abandoned" below) [63], the possibility of a new Mideast nuclear
31 arms race has increased, exemplified by the opening of a nuclear power plant by the United Arab

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1 Emirates in August 2020, and with other Arab countries such as Saudi Arabia initiating or
2 planning nuclear power programs. [64, 65].

3 ***Key nuclear weapons treaties are being abandoned***

4 Treaties have played a critical role in primary prevention of health harms, by diminishing
5 atmospheric dissemination of radionuclides and by containing the number and distribution of
6 nuclear weapons to reduce risk. As of 2020, however, the global treaty regime has shown signs
7 of unraveling.

8 In 1963, the Partial Test Ban Treaty (PTBT) banned nuclear weapon tests in the
9 atmosphere, outer space, and underwater. The Treaty on the Non-Proliferation of Nuclear
10 Weapons (NPT) was enacted in 1968 to stem proliferation by prohibiting the acquisition of
11 nuclear weapons by non-NWS and by establishing a binding agreement by the NWS to pursue
12 timely nuclear disarmament [66]. The NPT also resulted in the negotiation of nuclear weapon
13 free zones as demonstration of meeting NPT obligations, and successfully prohibited
14 manufacturing, possession, and deployment of nuclear weapons in certain parts of the world
15 [67]. In 1987, at the height of global nuclear arsenals and intense U.S.-Soviet tensions, the
16 Intermediate-Range Nuclear Forces (INF) Treaty was negotiated, opening the possibility of
17 further limitations on strategic nuclear and conventional ground-launched ballistic weapons, a
18 critical step towards elimination [68].

19 The Comprehensive Nuclear Test Ban Treaty (CTBT), which opened for signature in
20 1996, establishes a verification regime including seismic, hydro-acoustic, infrasound, and
21 radionuclide monitoring stations to register underground or atmospheric testing [69]. As of
22 October 2020, 168 states had signed and ratified the treaty. The United States, China, Iran, and
23 Israel have signed but not ratified the treaty, both steps of which are required for the treaty to
24 enter into force [70].

25 In 1999, 140 nations of the United Nations General Assembly voted to reaffirm the Outer
26 Space Treaty, which preserves use of outer space for peaceful purposes, by adopting a resolution
27 entitled "Prevention of an Arms Race in Outer Space." The U.S. voted against the resolution and
28 Israel abstained [71]. The Anti-Ballistic Missile Treaty once served as a control against the
29 militarization of space; however, the U.S. withdrew from the treaty in 2002 [72].

30 The 2011 New Strategic Arms Reduction Treaty (New Start) renewed and expanded
31 upon the Start I and II Treaties, further reduced nuclear arsenals, and created a verifiable

1 agreement between the U.S. and Russia. However, this agreement will expire in 2021 without a
2 plan for renewal [73]. To bypass the stalling of nuclear disarmament by NWS, 122 nations voted
3 to pass the Treaty on the Prohibition of Nuclear Weapons at the UN in 2017 [1]. As of October
4 2020, the Treaty has garnered 84 signatories and 47 States Parties. Though all NWS have
5 opposed this treaty, a minimum of 50 States Parties is required to have the Treaty enter into
6 force, which in effect would make nuclear weapons illegal under international law [1].

7 In May 2018, The U.S. unilaterally withdrew from the 2015 Joint Comprehensive Plan of
8 Action (JCPOA), under which Iran dismantled much of its potential nuclear weapons program
9 and had provided international inspectors extensive access to its nuclear facilities, in exchange
10 for relief of severe economic sanctions [63]. After the U.S. re-imposed severe sanctions on
11 Iranian oil exports that crippled Iran's economy, Iran resumed some of its nuclear activities, and
12 in 2020 announced its intentions to end most of its commitments to the JCPOA [74].

13 In August 2019, the Trump administration officially withdrew from the INF treaty,
14 claiming that Russia had violated the terms of the treaty, and providing the U.S. additional
15 military options to counter China's rise in military capabilities in Asia [75]. Although China had
16 nuclear weapons at the time the INF treaty was signed in 1987, it has since developed a larger
17 and more and diverse arsenal, 95% of which would have been prohibited by the INF treaty had
18 China been a signatory [75].

19 In May 2020, the Trump administration decided to withdraw from the Open Skies Treaty,
20 which permits the U.S. and Russia to conduct short-notice, unarmed reconnaissance flights over
21 the other countries in order to collect information on military activity, with the rationale that
22 Moscow was violating the treaty by not allowing flights over a suspected nuclear weapons
23 deployment site and major Russian military exercises site [76].

24 ***Rising Dangers of U.S. and Global Nuclear Weapons Modernization Programs***

25 According to the Federation of American Scientists, "all the nuclear weapon states continue to
26 modernize their remaining nuclear forces, adding new types, increasing the role they serve, and
27 appear committed to retaining nuclear weapons for the indefinite future" [6]. The U.S.'s plans to
28 rebuild essentially all of its nuclear weapons and delivery systems with new designs and
29 capabilities will likely fuel tensions with Russia and China. This new nuclear arms race is
30 exacerbated by the parallel development of hypersonic missiles (capable of delivering nuclear or
31 conventional weapons over long ranges at ultra-high velocities) by the U.S., Russia, China,

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1 India, France, and other nations. Such very accurate, nuclear-capable missiles can reach nearly
2 every point on the surface of the earth within 30 minutes, with no current defense systems having
3 the ability to intercept missiles that are able to maneuver so unpredictably at hypersonic speeds
4 [77]. A further threat of destabilization is posed by the anticipated increased incorporation of
5 autonomous systems and artificial intelligence (AI) into nuclear command, control, and
6 communications systems (NC3) as well as into nuclear delivery platforms and vehicles, which
7 could raise the chances of accidents and miscalculation, and increase the risks of escalation into
8 nuclear warfare [78].

9 In summary, as activist and former U.S. military analyst Daniel Ellsberg has stated in his
10 2017 book, *The Doomsday Machine: Confessions of a Nuclear War Planner*: “The present risks
11 of the current nuclear era go far beyond the dangers of proliferation and non-state terrorism that
12 have been the almost exclusive focus of public concern for the past generation and the past
13 decade in particular. The arsenals and plans of the two superpowers represent not only an
14 insuperable obstacle to an effective global anti-proliferation campaign: they are themselves a
15 clear and present existential danger to the human species, and most others” [79].

16 Evidence-based strategies to reduce nuclear weapons

17 ***Strengthening Treaties and Advancing Opportunities for Multilateral Diplomatic Engagement***

18 Treaties have provided a critical means for arms control, de-escalation to reduce risks of nuclear
19 war, and arsenal reduction in relation to nuclear weapons, as well as other weapons of mass
20 destruction. Treaties have reduced the global nuclear weapon arsenal from a peak in 1986 of
21 about 70,000 to less than 14,000 presently [6, 80].

22 As detailed above, there are gaps in the implementation of these treaties, and in some
23 cases, lack of participation altogether. NWS are demonstrably not moving in good faith towards
24 cessation of the nuclear arms race per Article VI of the NPT, underscored by NWS
25 modernization plans, and by recent U.S., and then, Russian withdrawal from the INF. The New
26 Start treaty will expire in 2021 and would benefit from renewal and expansion. Otherwise, for
27 the first time since 1972 there will be no legally binding agreement between the world's two
28 largest NWS [81].

29 Historic successes in banning the development, production, deployment and use of other
30 weapons of mass destruction point the way forward, exemplified by the Biological Weapons

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1 Convention of 1975 [82], the Chemical Weapons Convention of 1997 [83], and the Anti-
2 Personnel Mine Ban Convention of 1997 [84]. These conventions provide a strong legal
3 framework for the successful implementation of verifiable international agreement and ultimate
4 abolition of nuclear weapons [85]. Additional comprehensive frameworks for reductions in the
5 size and health risks of nuclear arsenals include, but are not limited to, building mutual
6 confidence in negotiations towards verifiable reduction in arsenals [86], and challenging
7 underlying policy frameworks that posit that armed states can only prevent and repel attack if
8 they are prepared to respond in kind [87, 88].

9 ***Civil society advocacy for a world free of nuclear weapons***

10 The international community has the authority to bring armed parties to the table for
11 negotiations, as they have in the past, to create further successful solutions. A strong consensus
12 to abolish nuclear weapons is evidenced by widespread global support for the 2017 Treaty on the
13 Prohibition of Nuclear Weapons [89]. The international community has a variety of persuasive
14 powers to bring states to join the treaty.

15 *Back from the Brink (BftB)*, an approach gaining momentum across the U.S., pushes for
16 stepwise, readily achievable measures leading to the ultimate abolition of nuclear weapons.
17 Health professional and community-based activism under the aegis of BftB is encouraging many
18 state and local jurisdictions to adopt anti-nuclear resolutions, including the U.S. Conference of
19 Mayors and the state legislatures of California, Oregon, Maine and New Jersey, and the cities of
20 Tucson, Los Angeles, Washington DC, Baltimore, Santa Barbara, and Portland, Oregon. Health
21 organizations on board include: People's Health Movement USA, Physicians for Social
22 Responsibility, the New Hampshire Public Health Association, and the Maine Medical
23 Association [90].

24 ***Health professionals putting nuclear weapons on the public health agenda***

25 Organizations of health professionals have successfully raised awareness among the public while
26 advocating for strong treaties. Physicians for Social Responsibility (PSR) was founded in 1961 in
27 recognition that "prevention of nuclear war is the only cure." PSR is the U.S. affiliate of the
28 International Physicians for the Prevention of Nuclear War (IPPNW), a federation of national
29 medical groups from 64 countries. IPPNW was awarded the 1985 Nobel Peace Prize for creating
30 an awareness of the catastrophic consequences of atomic warfare and has also played an
31 instrumental role in global campaigns to ban landmines and prevent armed violence [91].

1 The International Campaign to Abolish Nuclear Weapons (ICAN) focuses on mobilizing
2 civil society around the world to support a global nuclear weapon ban treaty and it received the
3 Nobel Peace Prize in 2017 for its efforts to raise awareness of the threat of nuclear weapons [92].
4 The International Red Cross and Red Crescent Movement has also helped strengthen global
5 support of treaties through mobilization of its network of nearly 100 million people [93]. The
6 success of these organizations illustrates the critical role of health professionals in efforts to
7 reduce in number and ultimately abolish nuclear weapons.

8 **VIX. Opposing Arguments**

9 Theories of “mutually assured destruction” and “deterrence” purport that armed states can
10 prevent and repel attack if they are positioned to respond in kind. While holding fully-
11 operational nuclear weapons could serve to deter an attack by a conventionally or nuclear armed
12 enemy nation (by threatening the attacker with an unacceptable material and human cost of
13 retaliation), the possession and proliferation of such weapons poses the real threat of use of
14 nuclear weapons without warning, and/or unintentionally. The historical record points to
15 countless examples of misreading of opponent’s intentions. One example is significant
16 breakdowns in NC3 systems, including numerous false warning of attacks, whereby devastating
17 nuclear warfare was narrowly averted [29]. Beyond these revelations, current advances in
18 computer modeling have predicted that even a regional nuclear conflict, predicated accidentally
19 or by intention (involving even a small fraction of global nuclear arsenals) could plunge most of
20 planet into a protracted period of loss of sunlight and rapid global cooling characterized by
21 massive crop failures and widespread famine [18].

22 The dangers of relying on nuclear weapons for deterrence of attack, or attaining
23 geostrategic advantage, have been further complicated by the anticipated incorporation of
24 autonomous systems and artificial intelligence (AI) into the design of modernized nuclear
25 warheads, delivery systems, and the NC3 systems designed to confidently carry out (or recall in
26 the case of perceived errors) nuclear attacks on various targets. While AI could theoretically
27 correct for “human factors” that have previously created dangerous situations, increased
28 autonomy of such lethal systems from timely human intervention, as well as vulnerability to
29 hacking, raises severe dangers [94].

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1 Issues surrounding nuclear deterrence have become even more problematic with the
2 planned introduction of hypersonic missiles capable of carrying either nuclear or conventional
3 payloads, with unprecedented speed and purported ability to evade all types of defense systems,
4 including heretofore largely unproven strategic missile defenses. The anticipated use of these
5 missiles will further destabilize the deterrence regime, increasing the possibility of catastrophic
6 “use it or lose it” scenarios whereby any potential incoming attack will precipitate “mutually
7 assured destruction” [95].

8 Some national security experts and government officials have argued that the use of
9 nuclear weapons should also be considered to destroy alleged, and often hardened targets. These
10 would include nuclear weapons stockpiles or production facilities, or other Weapons of Mass
11 Destruction (WMD) sites containing biological or chemical weapons, in nations lacking a robust
12 nuclear retaliation capability. A safer and more effective strategy to counter WMD proliferation
13 would be for the global community, including the NWS, to strengthen the inspection and
14 verification protocols, and increase necessary funding for such operations, subsumed under the
15 Biological Weapons Convention and Chemical Weapons Convention Treaties [96]. In addition,
16 efforts to curb nuclear proliferation would include the NWS speedily moving towards
17 compliance with the comprehensive nuclear disarmament goals mandated under Article VI of the
18 NPT, which could include the development of an enforceable Nuclear Weapons Convention, or
19 ratification, and enforcement of the 2017 Ban Treaty on Nuclear Weapons [66, 89].

20 While civilian nuclear energy programs have historically been linked to the development
21 of nuclear weapons programs, nevertheless, nuclear power has been supported by some who are
22 legitimately concerned about reducing global reliance on fossil fuels in light of our climate
23 emergency. Proponents contend that operating reactors emit far less carbon emissions than
24 burning fossil fuels. However, a life-cycle analysis of nuclear power reveals that it is far from
25 carbon-free when one includes the carbon-footprint of creating nuclear fuel, or through the
26 construction of nuclear power plants. Moreover, real and potential safety problems of nuclear
27 power threaten public health, exemplified by the 1986 explosion of the Chernobyl nuclear power
28 plant, the 2011 Fukushima Daiichi Nuclear Disaster, and through the maintenance of numerous
29 aged facilities well beyond their initially designated lifespan. As well, a wide array of adverse
30 health and environmental impacts from the operation of nuclear power plants have been
31 documented [97, 98]. Non-nuclear renewable energy sources are increasingly available for

1 speedier incorporation into the power grid at favorable cost advantage compared with nuclear or
2 fossil-fuel alternatives; this militates against the maintenance or expansion of nuclear power as a
3 climate solution [99-101]. This is especially true given the lack of societal planning for health
4 protective disposition of the legacy and continued dangerous nuclear wastes [102], as well as the
5 historic and continued stimulus for nuclear weapons proliferation.

6 **XI. Alternative Strategies - N/A**

7 **X. Action Steps**

8 **1. APHA calls on the U.S. President and Senate and the other nuclear-weapons states to**
9 sign and ratify the 2017 United Nations Treaty on the Prohibition of Nuclear Weapons and to
10 honor their existing binding commitments under Article VI of the Treaty on the Non-
11 Proliferation of Nuclear Weapons to “pursue negotiations in good faith on effective measures
12 relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on
13 a treaty on general and complete disarmament under strict and effective international control.”

14

15 **2. APHA calls on the U.S. Congress and President to work towards the goal of a world free**
16 **of nuclear weapons by:**

- 17 A. Supporting any and all current and future treaties that call for the end to nuclear weapons
18 testing, research, development, manufacture, and/or use.
- 19 B. Rejoining and working for the strengthening the Intermediate-Range Nuclear
20 Forces (INF) Treaty, while exploring the initiation of negotiations with other countries
21 that either possess or are trying to develop intermediate nuclear forces, with the aim of
22 incorporating such nations into the INF disarmament regime;
- 23 C. Extending the New Start Treaty;
- 24 D. Pursuing multilateral regional treaties to encourage non-nuclear states to renounce
25 proliferation of nuclear weapons and other weapons of mass destruction;
- 26 E. Supporting speedy and comprehensive mutually reinforcing confidence-building steps
27 towards reduction of nuclear arsenals towards 500-1,000 among major nuclear weapons
28 states, as preliminary steps towards ultimate nuclear abolition;
- 29 F. Renouncing the option of using nuclear weapons first;
- 30 G. Ending the sole, unchecked authority of any U.S. president to launch a nuclear attack;

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- 1 H. Taking nuclear weapons off hair-trigger alert;
- 2 I. Cancelling plans for enhanced, destabilizing weapons, i.e., Long-Range Stand-off
3 Weapons, hypersonic missiles;
- 4 J. Rejecting nuclear war fighting doctrines using “low-yield” nuclear weapons;
- 5 K. Halting and prohibiting all programs aiming to integrate autonomous systems and
6 artificial intelligence (AI) into nuclear warheads, weapons delivery systems, and/or
7 nuclear command, control, and communications (NC3) systems;
- 8 L. Cancelling destabilizing programs that would further militarize outer space, including the
9 development of a U.S. Space Force;
- 10 M. Rejoining the Joint Comprehensive Plan of Action with Iran to continue the verifiable
11 reversal of a potential Iranian nuclear weapons program that could stimulate additional
12 nuclear weapons programs in the Middle East; and
- 13 N. Rejoining the Open Skies Treaty.

14
15 **3. APHA calls on the U.S. Congress and President to address legacy and current**
16 **occupational and environmental health harms posed by the U.S. nuclear weapons complex**
17 **by** ensuring adequate long-term investment in research, worker protections, healthcare, and
18 environmental cleanup of facilities and communities whose health and ecosystems have been
19 damaged by nuclear weapons research, development, testing, and production, and to ensure
20 related radioactive and toxic waste containment in perpetuity. This includes the set of action
21 steps already addressed in the 2010 APHA resolution "Prioritizing Cleanup of the Hanford
22 Nuclear Reservation to protect the Public's Health 20105." These steps should be applied to all
23 facilities.

24
25 **4. APHA calls on all public health professionals and schools of public health to advocate for**
26 **a world free of nuclear weapons by** educating themselves, students, the public, and policy-
27 makers on the critical need for rapid nuclear disarmament, including supporting curriculum
28 development and uptake, and research, monitoring, publication, and dissemination of
29 information, about the direct and indirect public health consequences of nuclear weapons, and
30 the public health imperative to abolish nuclear weapons.

1 **XI. REFERENCES**

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15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30

1. ICAN. *Signature and ratification status*. Cited October 8, 2020; Available from: https://www.icanw.org/signature_and_ratification_status.
2. ICAN. *Saint Kitts and Nevis Ratifies UN Nuclear Ban Treaty on Nagasaki Anniversary*. August 9, 2020. Cited October 8, 2020; Available from: https://www.icanw.org/saint_kitts_and_nevis_ratifies_un_nuclear_weapon_ban_treaty_on_nagasaki_anniversary
3. Hudson, J. and P. Sonne, *Trump administration discussed conducting first U.S. nuclear test in decades*. *The Washington Post*. May 22, 2020. Cited October 8, 2020; Available from: https://www.washingtonpost.com/national-security/trump-administration-discussed-conducting-first-us-nuclear-test-in-decades/2020/05/22/a805c904-9c5b-11ea-b60c-3be060a4f8e1_story.html.
4. Nuclear Threat Initiative. *Iran: Nuclear*. Cited October 5, 2020; Available from: <https://www.nti.org/learn/countries/iran/nuclear/>.
5. Johnson, K., *Who's Afraid of Saudi Nukes?* February 22, 2019 *Foreign Policy*. Cited October 8, 2020. Available from: <https://foreignpolicy.com/2019/02/22/whos-afraid-of-saudi-nukes-123-kashoggi-mbs-russia-china/>.
6. Kristensen, H.M. and M. Korda. *Status of World Nuclear Forces*. April 2020. Cited July 13, 2020; Available from: <https://fas.org/issues/nuclear-weapons/status-world-nuclear-forces/>.
7. American Public Health Association. *Nuclear War and Nuclear Weapons*. 1981. Cited October 5, 2020; Available from: <https://apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/10/14/59/nuclear-war-and-nuclear-weapons>.
8. Sidel, V.W., H.J. Geiger, and B. Lown, *The medical consequences of thermonuclear war. II. The physicians role in the postattack period*. *New England Journal of Medicine*, 1962. **266**(22): p. 1137-1145.
9. Yokora, K. and N. Kamada, *The public health effects of the uses of nuclear weapons*. . *War and Public Health* (updated edition), ed. B.S. Levy and V.W. Sidel. 2000, Washington DC: American Public Health Association.

C4- Towards A Nuclear Weapons Free-World

- 1 10. Jordan, B.R., *The Hiroshima/Nagasaki Survivor Studies: Discrepancies Between Results*
2 *and General Perception*. Genetics, 2016. **203**(4): p. 1505-1512.
- 3 11. Sakata, R., E.J. Grant, and K. Ozasa, *Long-term follow-up of atomic bomb survivors*.
4 Maturitas, 2012. **72**(2): p. 99-103.
- 5 12. Kotaro, O., et al., *Epidemiological studies of atomic bomb radiation at the Radiation*
6 *Effects Research Foundation*. International Journal of Radiation Biology, 2019. **95**(7): p.
7 879-891
- 8 13. Zwigenberg, R., *Healing a Sick World: Psychiatric Medicine and the Atomic Age*. Med
9 Hist, 2018. **62**(1): p. 27-49.
- 10 14. Poikolainen, K., et al., *Fear of Nuclear War Increases the Risk of Common Mental*
11 *Disorders Among Young Adults: A Five-Year Follow-Up Study*. BMC Public Health,
12 2004. **4**: p. 1-7.
- 13 15. Okumura, N. and H. Hikita, *Results of psychoneurological studies on atomic bomb*
14 *survivors*. Kyushu Shinkei Seishin Igaku, 1949. **1**: p. 50-52.
- 15 16. Ohta, Y., et al., *Psychological effect of the Nagasaki atomic bombing on survivors after*
16 *half a century*. Psychiatry and Clinical Neurosciences, 2001. **54**(1): p. 97-103.
- 17 17. World Health Organization, *Effects of nuclear war on health and health services*. 1984.
- 18 18. Toon, O.B., et al., *Rapidly expanding nuclear arsenals in Pakistan and India portend*
19 *regional and global catastrophe*. Science Advances, 2019. **5**(10): p. eaay5478.
- 20 19. Helfand, I., *Nuclear famine: two billion people at risk? Global Impacts of Limited*
21 *Nuclear War on Agriculture, Food Supplies, and Human Nutrition*. 2013, International
22 Physicians for the Prevention of Nuclear War, Physicians for Social Responsibility.
- 23 20. Simon, S., A. Bouville, and C. Land, *Fallout from Nuclear Weapons Tests and Cancer*
24 *Risks*. American Scientist, 2006. **94**(1): p. 48.
- 25 21. Institute of Medicine and National Research Council, in *Exposure of the American*
26 *People to Iodine-131 from Nevada Nuclear-Bomb Tests: Review of the National Cancer*
27 *Institute Report and Public Health Implications*. 1999: Washington (DC).
- 28 22. International Physicians for the Prevention of Nuclear War and Institute for Energy and
29 Environmental Research, *Radioactive Heaven and Earth: The Health and Environmental*
30 *Effects of Nuclear Weapons Testing In, On and Above the Earth*. 1991, New York: The
31 Apex Press.

C4- Towards A Nuclear Weapons Free-World

- 1 23. Groeger, L., R. Grochowski Jones, and A. Lustgarten. *Bombs in your backyard*.
2 November 30, 2017 [cited January 29, 2020; Available from:
3 [https://projects.propublica.org/bombs/#b=37.11298534227514,-](https://projects.propublica.org/bombs/#b=37.11298534227514,-112.81076834807381,47.119454384567426,-93.49680350432381&c=shrink)
4 [112.81076834807381,47.119454384567426,-93.49680350432381&c=shrink](https://projects.propublica.org/bombs/#b=37.11298534227514,-112.81076834807381,47.119454384567426,-93.49680350432381&c=shrink).
- 5 24. National Academies of Sciences, Engineering, and Medicine. 2020. *Review of the*
6 *Department of Energy's Plans for Disposal of Surplus Plutonium in the Waste Isolation*
7 *Pilot Plant*. Washington, DC: The National Academies Press. Cited October 9, 2020;
8 Available from: <https://doi.org/10.17226/25593>.
- 9 25. Hedden A. WIPP utility shaft project challenged as illegal. Carlsbad Current-Argus. April
10 29, 2020. Cited October 9, 2020; Available
11 from: [https://www.currentargus.com/story/news/local/2020/04/29/wipp-utility-shaft-](https://www.currentargus.com/story/news/local/2020/04/29/wipp-utility-shaft-project-challenged-illegal/3044732001/)
12 [project-challenged-illegal/3044732001/](https://www.currentargus.com/story/news/local/2020/04/29/wipp-utility-shaft-project-challenged-illegal/3044732001/)
- 13 26. Pomper, M.A. and G. Tarini, *Nuclear terrorism – Threat or not?* AIP Conference
14 Proceedings, 2017. **1898**: p. 050001.
- 15 27. U.S. Government Accountability Office *SPENT NUCLEAR FUEL: Legislative,*
16 *Technical, and Societal Challenges to Its Transportation*. GAO-16-121T. October 1,
17 2015. Cited October 9, 2020; Available from: [https://www.gao.gov/products/GAO-16-](https://www.gao.gov/products/GAO-16-121T)
18 [121T](https://www.gao.gov/products/GAO-16-121T).
- 19 28. Akleyev, A.V., et al., *Consequences of the radiation accident at the Mayak production*
20 *association in 1957 (the 'Kyshtym Accident')*. Journal of Radiological Protection, 2017.
21 **37**(3): p. R19-R42.
- 22 29. Schlosser, E., *Command and Control. Nuclear Weapons Accidents and the Illusion of*
23 *Safety*. 2013, New York: The Penguin Press.
- 24 30. Crowley, K.D. and J.F. Ahearne, *Managing the Environmental Legacy of U.S. Nuclear-*
25 *Weapons Production: Although the waste from America's arms buildup will never be*
26 *"cleaned up," human and environmental risks can be reduced and managed*. American
27 Scientist, 2002. **90**(6): p. 514-523.
- 28 31. Wald, M. *Nuclear sites may be toxic in perpetuity, report finds*. New York Times August
29 8, 2000; Cited October 9, 2020; Available from:
30 [https://www.nytimes.com/2000/08/08/us/nuclear-sites-may-be-toxic-in-perpetuity-report-](https://www.nytimes.com/2000/08/08/us/nuclear-sites-may-be-toxic-in-perpetuity-report-finds.html?searchResultPosition=1)
31 [finds.html?searchResultPosition=1](https://www.nytimes.com/2000/08/08/us/nuclear-sites-may-be-toxic-in-perpetuity-report-finds.html?searchResultPosition=1).

C4- Towards A Nuclear Weapons Free-World

- 1 32. Department of Defense, *Nuclear Posture Review*. 2018. Cited October 9, 2020; Available
2 from: [https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-
4 POSTURE-REVIEW-FINAL-REPORT.PDF](https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-
3 POSTURE-REVIEW-FINAL-REPORT.PDF).
- 5 33. Kristensen, H.M., *Alert Status of Nuclear Weapons (Version 2). Briefing to Short Course
6 on Nuclear Weapon and Related Security Issues*, G.E.S. American Physical Society's
7 Forum on Physics/Society, FAS, AAPT George Washington University, Elliot School of
8 International Affairs April 21, 2017. Cited October 9, 2020; Available from:
9 https://fas.org/wp-content/uploads/2014/05/Brief2017_GWU_2s.pdf.
- 10 34. Hansen, C., *U.S. Nuclear Weapons: The Secret History*, ed. Aerofax. 1988, Arlington,
11 TX.
- 12 35. Bennett, J., *Here's How Much Deadlier Today's Nukes Are Compared to WWII A-
13 Bombs*. Popular Mechanics. October 10, 2016. Cited October 9, 2020; Available from:
14 <https://www.popularmechanics.com/military/a23306/nuclear-bombs-powerful-today/>.
- 15 36. Kristensen, H.M., *United States nuclear forces, 2020*. Bulletin of the Atomic Scientists,
16 January 13, 2020. **76**(1): p. 46-60. Cited October 9, 2020; Available from:
17 <https://www.tandfonline.com/doi/full/10.1080/00963402.2019.1701286>.
- 18 37. ICAN, *Producing Mass Destruction: Private companies and the nuclear weapon
19 industry*. May 20, 2019. Cited October 9, 2020; Available from:
20 [https://www.dontbankonthebomb.com/wp-content/uploads/2019/05/2019_Producers-
22 Report-FINAL.pdf](https://www.dontbankonthebomb.com/wp-content/uploads/2019/05/2019_Producers-
21 Report-FINAL.pdf).
- 23 38. Schwartz, S.I., *Introduction*, in *Atomic Audit. The costs and consequences of U.S. nuclear
24 weapons since 1940.*, S.I. Schwartz, Editor. 1998, Brookings Institution Press:
25 Washington DC. p. 4-5.
- 26 39. Congressional Budget Office, *Projected costs of U.S. nuclear forces, 2019 to 2028*.
27 January 24, 2019. Cited October 9, 2020; Available from:
28 <https://www.cbo.gov/publication/54914>.
- 29 40. Congressional Budget Office. *Approaches for managing the costs of nuclear weapons
forces, 2017 to 2046*. October 31, 2017. Cited October 9, 2020; Available from:
www.cbo.gov/publication/53211.

C4- Towards A Nuclear Weapons Free-World

- 1 41. Lichtenstein, N.D., *The Hanford Nuclear Waste Site: A Legacy of Risk, Cost, and*
2 *Inefficiency*. *Natural Resources Journal*, 2004. **44**(3): p. 809-839. Cited October 9, 2020;
3 Available from: <https://core.ac.uk/download/pdf/151598706.pdf>.
- 4 42. National Priorities Project. *Trade-offs: your money, your choices*. April 2019. Cited
5 October 9, 2020; Available from: [https://www.nationalpriorities.org/interactive-](https://www.nationalpriorities.org/interactive-data/trade-offs/?state=00&program=15)
6 [data/trade-offs/?state=00&program=15](https://www.nationalpriorities.org/interactive-data/trade-offs/?state=00&program=15).
- 7 43. Monaco L. Pandemic Disease Is a Threat to National Security. Washington Should Treat
8 It Like One. *Foreign Affairs*, March 3, 2020. Cited October 9, 2020; Available from:
9 [https://cpb-us-e1.wpmucdn.com/sites.suffolk.edu/dist/9/1764/files/2020/06/Pandemic-](https://cpb-us-e1.wpmucdn.com/sites.suffolk.edu/dist/9/1764/files/2020/06/Pandemic-Disease-Is-a-Threat-to-National-Security--Foreign-Affairs.pdf)
10 [Disease-Is-a-Threat-to-National-Security--Foreign-Affairs.pdf](https://cpb-us-e1.wpmucdn.com/sites.suffolk.edu/dist/9/1764/files/2020/06/Pandemic-Disease-Is-a-Threat-to-National-Security--Foreign-Affairs.pdf).
- 11 44. Hacker, J.S. and O. Hathaway, *Universal Health Care is a National Security Issue*. Just
12 Security, March 12, 2020. Cited October 9, 2020.
- 13 45. Mehta, A., *Public health must be part of national security calculus, says Flournoy*.
14 *Defense News*. March 26, 2020. Cited October 9, 2020. Available from:
15 [https://www.defensenews.com/news/coronavirus/2020/03/26/public-health-must-be-part-](https://www.defensenews.com/news/coronavirus/2020/03/26/public-health-must-be-part-of-national-security-calculus-says-former-defense-official/)
16 [of-national-security-calculus-says-former-defense-official/](https://www.defensenews.com/news/coronavirus/2020/03/26/public-health-must-be-part-of-national-security-calculus-says-former-defense-official/).
- 17 46. Cullison, T.R. and J.S. Morrison, *The U.S. Department of Defense's Role in Health*
18 *Security: Current Capabilities and Recommendations for the Future*, CSIS Global Health
19 Policy Center & CSIS Commission on Strengthening America's Health Security. June
20 27, 2019. Cited October 9, 2020; Available from: [https://www.csis.org/analysis/us-](https://www.csis.org/analysis/us-department-defenses-role-health-security)
21 [department-defenses-role-health-security](https://www.csis.org/analysis/us-department-defenses-role-health-security).
- 22 47. Gould, R. and P.M. Sutton, *Nuclear Weapons and Social Injustice*, in *Social injustice and*
23 *public health*, B.S. Levy and V.W. Sidel, Editors. 2019, Oxford University Press: New
24 York.
- 25 48. Hecht, G., *An elemental force: Uranium production in Africa, and what it means to be*
26 *nuclear*. *Bulletin of the Atomic Scientists*. March 1, 2012. **68**(2): p. 22-33. Cited October
27 9, 2020; Available from:
28 <https://journals.sagepub.com/doi/full/10.1177/0096340212440352>.
- 29 49. United States Government Accountability Office, *Uranium contamination: Overall*
30 *scope, time frame, and cost information is needed for contamination cleanup on the*

C4- Towards A Nuclear Weapons Free-World

- 1 *Navajo reservation*. United States Government Accountability Office. May 2014. Cited
2 October 9, 2020; Available from: <https://www.gao.gov/assets/670/662964.pdf>.
- 3 50. Rust, S., *How the U.S. betrayed the Marshall Islands, kindling the next nuclear disaster*.
4 *The Los Angeles Times*, November 10, 2019. Cited October 9, 2020; Available from:
5 <https://www.latimes.com/projects/marshall-islands-nuclear-testing-sea-level-rise/>.
- 6 51. Johnston, B.R. and H.M. Barker, *Consequential damages of nuclear war: The Rongelap*
7 *report*. 2008, Walnut Creek, CA: Left Coast Press.
- 8 52. U.S. Department of Energy, *Final report of the Advisory Committee on human radiation*
9 *experiments*. October 1995, Government Printing Office: Washington, DC. Cited October
10 9, 2020; Available from: <https://www.osti.gov/opennet/servlets/purl/129478/129478.pdf>.
- 11 53. Nhemachena, A. and M. Mawere, *Necroclimatism in a Spectral World (Dis)order?*,
12 2019, Camaroon: Langaa RPCIG, p. 358.
- 13 54. Zak, D., *A ground zero forgotten*. *The Washington Post*. November 27, 2015. Cited
14 October 9, 2020; Available from:
15 <http://www.washingtonpost.com/sf/national/2015/11/27/a-ground-zero-forgotten/>.
- 16 55. Watanabe, K.K., H.K. Kang, and N.A. Dalager, *Cancer mortality risk among military*
17 *participants of a 1958 atmospheric nuclear weapons test*. *American Journal of Public*
18 *Health*, April 1995. **85**: p. 523-527. Cited October 9, 2020; Available at:
19 <https://ajph.aphapublications.org/doi/pdfplus/10.2105/AJPH.85.4.523>.
- 20 56. U.S. Congress, *Subchapter XVI—Energy Employees Occupational Illness Compensation*
21 *Program*, in 7384, U.S. Congress, Editor. 2001: Washington D.C. Cited October 9, 2020;
22 Available at:
23 [https://uscode.house.gov/view.xhtml?path=/prelim@title42/chapter84/subchapter16&edit](https://uscode.house.gov/view.xhtml?path=/prelim@title42/chapter84/subchapter16&edition=prelim)
24 [ion=prelim](https://uscode.house.gov/view.xhtml?path=/prelim@title42/chapter84/subchapter16&edition=prelim).
- 25 57. Morris, J. and J.S. Hopkins, *Ailing, Angry Nuclear-Workers Fight for Compensation*.
26 December 11, 2015, The Center for Public Integrity. Cited October 9, 2020; Available
27 from: [https://publicintegrity.org/inequality-poverty-opportunity/workers-rights/ailing-](https://publicintegrity.org/inequality-poverty-opportunity/workers-rights/ailing-angry-nuclear-weapons-workers-fight-for-compensation/)
28 [angry-nuclear-weapons-workers-fight-for-compensation/](https://publicintegrity.org/inequality-poverty-opportunity/workers-rights/ailing-angry-nuclear-weapons-workers-fight-for-compensation/).
- 29 58. IAEA. *Preliminary Nuclear Power Facts and Figures for 2019*. January 1, 2020. Cited
30 October 9, 2020]; Available from: [https://www.iaea.org/newscenter/news/preliminary-](https://www.iaea.org/newscenter/news/preliminary-nuclear-power-facts-and-figures-for-2019)
31 [nuclear-power-facts-and-figures-for-2019](https://www.iaea.org/newscenter/news/preliminary-nuclear-power-facts-and-figures-for-2019).

C4- Towards A Nuclear Weapons Free-World

- 1 59. Bleek, P.C., *When Did (and Didn't) States Proliferate? Chronicling the Spread of*
2 *Nuclear Weapons. Discussion Paper*, Harvard Kennedy School Belfer Center for Science
3 and International Affairs and Middlebury Institute of International Studies at Monterey
4 James Martin Center for Nonproliferation Studies, June 2017. Cited October 9, 2020;
5 Available from: [https://www.belfercenter.org/publication/when-did-and-didnt-states-](https://www.belfercenter.org/publication/when-did-and-didnt-states-proliferate)
6 [proliferate](https://www.belfercenter.org/publication/when-did-and-didnt-states-proliferate).
- 7 60. Comprehensive Nuclear-Test-Ban Treaty Organization. "Smiling Buddha" on 18 May
8 1974, the First Nuclear Test Explosion Conducted by India. Cited August 4, 2020;
9 Available from: [https://www.ctbto.org/specials/testing-times/18-may-1974-smiling-](https://www.ctbto.org/specials/testing-times/18-may-1974-smiling-buddah)
10 [buddah](https://www.ctbto.org/specials/testing-times/18-may-1974-smiling-buddah).
- 11 61. Cheema, P.I., *Anatomizing Pakistan's Motivations for Nuclear Weapons*. Pakistan
12 Horizon, 2011. 64(2): p. 5-19.
- 13 62. Ghoshroy S. Taking stock. The US-India nuclear deal 10 years later. Bulletin of the
14 Atomic Scientists. February 16, 2016. Cited August 4, 2020; Available from:
15 <https://thebulletin.org/2016/02/taking-stock-the-us-india-nuclear-deal-10-years-later/>
- 16 63. Behles, C., *U.S. Withdraws from Joint Comprehensive Plan of Action*, American Society
17 of International Law. July 6, 2018. Cited October 9, 2020; Available from:
18 <https://www.asil.org/ILIB/us-withdraws-joint-comprehensive-plan-action-may-8-2018>.
- 19 64. Yee V. U.A.E Becomes First Arab Nation to Open a Nuclear Power Plant. New York
20 Times, August 1, 2020. Cited August 4, 2020; Available from:
21 [https://www.nytimes.com/2020/08/01/world/middleeast/uae-nuclear-](https://www.nytimes.com/2020/08/01/world/middleeast/uae-nuclear-Barakah.html?searchResultPosition=1)
22 [Barakah.html?searchResultPosition=1](https://www.nytimes.com/2020/08/01/world/middleeast/uae-nuclear-Barakah.html?searchResultPosition=1)
- 23 65. Mazzetti, M., D.E. Sanger, and W.J. Broad, *U.S. Examines Whether Saudi Nuclear*
24 *Program Could Lead to Bomb Effort*. *The New York Times*. August 5, 2020. Cited
25 October 9, 2020. Available from: [https://www.nytimes.com/2020/08/05/us/politics/us-](https://www.nytimes.com/2020/08/05/us/politics/us-examines-saudi-nuclear-program.html?searchResultPosition=1)
26 [examines-saudi-nuclear-program.html?searchResultPosition=1](https://www.nytimes.com/2020/08/05/us/politics/us-examines-saudi-nuclear-program.html?searchResultPosition=1).
- 27 66. United Nations. *Treaty on the Non-Proliferation of Nuclear Weapons (NPT)*. 1968; Cited
28 October 9, 2020; Available from: <https://www.un.org/disarmament/wmd/nuclear/npt/text>.
- 29 67. United Nations. *Nuclear-Weapon Free Zones*. 1999. Cited October 9, 2020; Available
30 from: <https://www.un.org/disarmament/wmd/nuclear/nwzfz/>.

C4- Towards A Nuclear Weapons Free-World

- 1 68. Bureau of Arms Control, Verification, and Compliance, *Treaty Between The United*
2 *States Of America And The Union Of Soviet Socialist Republics On The Elimination Of*
3 *Their Intermediate-Range And Shorter-Range Missiles (INF Treaty)*, U.S. Department of
4 State. 1987. Cited October 9, 2020; Available from: [https://2009-](https://2009-2017.state.gov/t/avc/trty/102360.htm)
5 [2017.state.gov/t/avc/trty/102360.htm](https://2009-2017.state.gov/t/avc/trty/102360.htm).
- 6 69. CTBTO Preparatory Commission. *WHAT IS THE CTBT?* Cited October 9, 2020;
7 Available from: [https://www.ctbto.org/the-treaty/article-xiv-conferences/2011/afc11-](https://www.ctbto.org/the-treaty/article-xiv-conferences/2011/afc11-information-for-media-and-press/what-is-the-ctbt/)
8 [information-for-media-and-press/what-is-the-ctbt/](https://www.ctbto.org/the-treaty/article-xiv-conferences/2011/afc11-information-for-media-and-press/what-is-the-ctbt/).
- 9 70. CTBTO Preparatory Commission. *Status of signature and ratification: CTBTO*
10 *Preparatory Commission*. Cited October 9, 2020; Available from:
11 <https://www.ctbto.org/the-treaty/status-of-signature-and-ratification/>.
- 12 71. Federation of American Scientists. *Prevention of an Arms Race in Outer Space*. Cited
13 October 9, 2020; Available from:
14 [https://fas.org/programs/ssp/nukes/ArmsControl_NEW/nonproliferation/NFZ/NP-NFZ-](https://fas.org/programs/ssp/nukes/ArmsControl_NEW/nonproliferation/NFZ/NP-NFZ-PAROS.html)
15 [PAROS.html](https://fas.org/programs/ssp/nukes/ArmsControl_NEW/nonproliferation/NFZ/NP-NFZ-PAROS.html).
- 16 72. Bureau of Arms Control, Verification, and Compliance, *Treaty Between The United*
17 *States of America and The Union of Soviet Socialist Republics on The Limitation of Anti-*
18 *Ballistic Missile Systems (ABM Treaty)*, 1972. U.S. Department of State. Cited October 9,
19 2020; Available at: <https://2009-2017.state.gov/t/avc/trty/101888.htm>.
- 20 73. Arms Control Association. *New START at a glance*. January 2020. Cited October 9,
21 2020; Available from: <https://www.armscontrol.org/factsheets/NewSTART>.
- 22 74. Laub, Z. and K. Robinson, *What Is the Status of the Iran Nuclear Agreement?* Council on
23 Foreign Relations. January 7, 2020. Cited October 9, 2020; Available at:
24 <https://www.cfr.org/backgrounder/what-status-iran-nuclear-agreement>.
- 25 75. Denmark, A. *U.S.-China Military Competition Intensifying Over INF Missiles*. November
26 13, 2019; Cited October 9, 2020; Available from: [https://www.wilsoncenter.org/blog-](https://www.wilsoncenter.org/blog-post/us-china-military-competition-intensifying-over-inf-missiles)
27 [post/us-china-military-competition-intensifying-over-inf-missiles](https://www.wilsoncenter.org/blog-post/us-china-military-competition-intensifying-over-inf-missiles).
- 28 76. Sanger, D.E., *Trump Will Withdraw From Open Skies Arms Control Treaty*. *The New*
29 *York Times*. May 21, 2020. Cited October 9, 2020; Available from:
30 [https://www.nytimes.com/2020/05/21/us/politics/trump-open-skies-treaty-arms-](https://www.nytimes.com/2020/05/21/us/politics/trump-open-skies-treaty-arms-control.html?searchResultPosition=1)
31 [control.html?searchResultPosition=1](https://www.nytimes.com/2020/05/21/us/politics/trump-open-skies-treaty-arms-control.html?searchResultPosition=1).

C4- Towards A Nuclear Weapons Free-World

- 1 77. Simon, S., *Hypersonic Missiles Are a Game Changer*. *New York Times*. January 2, 2020.
2 Cited October 9, 2020; Available from:
3 <https://www.nytimes.com/2020/01/02/opinion/hypersonic->
4 [missiles.html?searchResultPosition=1](https://www.nytimes.com/2020/01/02/opinion/hypersonic-missiles.html?searchResultPosition=1).
- 5 78. Horowitz, M.C., P. Scharre, and A. Velez-Green. *A Stable Nuclear Future? The Impact*
6 *of Autonomous Systems and Artificial Intelligence*. December 11, 2019. Cited October 9,
7 2020; Available from: <https://arxiv.org/pdf/1912.05291.pdf>.
- 8 79. Ellsberg, D., *The Doomsday Machine: Confessions of a Nuclear War Planner*. 2017,
9 New York: Bloomsbury.
- 10 80. Nuclear Threat Initiative. Nuclear Disarmament Resource Collection. Cited October 9,
11 2020; Available from: <https://www.nti.org/analysis/reports/nuclear-disarmament/>.
- 12 81. Reif, K. *As INF Treaty Falls, New START Teeters*. March 2019. Cited October 9, 2020;
13 Available from: [https://www.armscontrol.org/act/2019-03/news/inf-treaty-falls-new-start-](https://www.armscontrol.org/act/2019-03/news/inf-treaty-falls-new-start-teeters)
14 [teeters](https://www.armscontrol.org/act/2019-03/news/inf-treaty-falls-new-start-teeters).
- 15 82. U.S. Department of State, *Biological Weapons Convention*. Cited October 9, 2020;
16 Available from: <https://www.state.gov/biological-weapons-convention/>.
- 17 83. Organization for the Prohibition of Chemical Weapons, *Chemical Weapons Convention*.
18 Cited October 9, 2020; Available from: [https://www.opcw.org/chemical-weapons-](https://www.opcw.org/chemical-weapons-convention)
19 [convention](https://www.opcw.org/chemical-weapons-convention).
- 20 84. United Nations. *Convention on the Prohibition of the Use, Stockpiling, Production and*
21 *Transfer of Anti-Personnel Mines and on their Destruction*. 1997. Cited October 9, 2020;
22 Available at: [https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XXVI-](https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XXVI-5&chapter=26&clang=en)
23 [5&chapter=26&clang=en](https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XXVI-5&chapter=26&clang=en).
- 24 85. Nuclear Threat Initiative. *Proposed Nuclear Weapons Convention (NWC)*. November 27,
25 2018. Cited August 6, 2020; Available from: [https://www.nti.org/learn/treaties-and-](https://www.nti.org/learn/treaties-and-regimes/proposed-nuclear-weapons-convention-nwc/)
26 [regimes/proposed-nuclear-weapons-convention-nwc/](https://www.nti.org/learn/treaties-and-regimes/proposed-nuclear-weapons-convention-nwc/).
- 27 86. Pifer, S., *The Next Round: The United States and Nuclear Arms Reductions After New*
28 *START*, in *Arms Control Series, Paper 4*. Brookings December 2010. Cited October 9,
29 2020; Available from: [https://www.brookings.edu/wp-](https://www.brookings.edu/wp-content/uploads/2016/06/12_arms_control_pifer.pdf)
30 [content/uploads/2016/06/12_arms_control_pifer.pdf](https://www.brookings.edu/wp-content/uploads/2016/06/12_arms_control_pifer.pdf).

C4- Towards A Nuclear Weapons Free-World

- 1 87. Elworthy S. *Beyond Deterrence. Rethinking UK Security Doctrine*. Oxford Research
2 Group. July 27, 2015. Cited August 4, 2020; Available from:
3 [https://www.oxfordresearchgroup.org.uk/beyond-deterrence-rethinking-uk-security-
5 doctrine](https://www.oxfordresearchgroup.org.uk/beyond-deterrence-rethinking-uk-security-
4 doctrine).
- 5 88. Krieger, D., *Ten serious flaws in nuclear deterrence theory*. Nuclear Age Peace
6 Foundation, March 2011. Cited October 9, 2020. Available at:
7 https://www.wagingpeace.org/wp-content/uploads/2016/08/03_2011.pdf.
- 8 89. United Nations, *Treaty on the Prohibition of Nuclear Weapons*. 2017. Cited October 9,
9 2020; Available from:
10 [https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVI-
12 9&chapter=26](https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVI-
11 9&chapter=26).
- 12 90. Back From the Brink. *Our Five Policy Solution*. 2020. Cited October 9, 2020; Available
13 from: <https://www.preventnuclearwar.org/our-five-policy-solutions>.
- 14 91. The Nobel Prize. *International Physicians for the Prevention of Nuclear War*. 1985.
15 Cited June 28, 2020; Available from:
16 <https://www.nobelprize.org/prizes/peace/1985/physicians/facts/>.
- 17 92. The Nobel Prize. *The Nobel Prize for 2017*. 2017. Cited June 28, 2020; Available from:
18 [https://www.nobelprize.org/prizes/peace/2017/press-
21 release/#:~:text=The%20Nobel%20Peace%20Prize%202017%20was%20awarded%20to
22 %20International%20Campaign,based%20prohibition%20of%20such%20weapons.%22](https://www.nobelprize.org/prizes/peace/2017/press-
19 release/#:~:text=The%20Nobel%20Peace%20Prize%202017%20was%20awarded%20to
20 %20International%20Campaign,based%20prohibition%20of%20such%20weapons.%22).
- 21 93. The International Red Cross and Red Crescent Movement. Cited October 9, 2020.
22 Available from: <https://www.ifrc.org/en/who-we-are/the-movement/>.
- 23 94. Geist, E. and A.J. Lohn, *How might artificial intelligence affect the risk of nuclear war*.
24 *Security 2040*, Rand Corporation. April 24, 2018. Cited October 9, 2020; Available from:
25 [https://www.rand.org/content/dam/rand/pubs/perspectives/PE200/PE296/RAND_PE296.
27 pdf](https://www.rand.org/content/dam/rand/pubs/perspectives/PE200/PE296/RAND_PE296.
26 pdf).
- 27 95. Speier, R.H., et al., *Hypersonic Missile Nonproliferation: Hindering the Spread of a New
28 Class of Weapons*. Rand Corporation, February 20, 2017. Cited October 9, 2020.
29 Available from:
30 [https://www.rand.org/content/dam/rand/pubs/research_reports/RR2100/RR2137/RAND_
RR2137.pdf](https://www.rand.org/content/dam/rand/pubs/research_reports/RR2100/RR2137/RAND_
31 RR2137.pdf).

- 1 96. Blix, H., *The role of Inspection as a part of the effort to prevent the possession of*
2 *Weapons of Mass Destruction*, United Nations Monitoring Verification and Inspection
3 Commission (UNMOVIC). May 28, 2001. Cited October 20, 2020; Available from:
4 <https://www.un.org/Depts/unmovic/ExecChair/Blix%20in%20Ottawa.htm>.
- 5 97. Steinhauser, G., A. Brandl, and T.E. Johnson, *Comparison of the Chernobyl and*
6 *Fukushima nuclear accidents: A review of the environmental impacts*. Science of the
7 Total Environment, 2014. **470-471**(1): p. 800-817. Cited October 9, 2020; Available
8 from:
9 <https://www.fcav.unesp.br/Home/departamentos/morfologia/ELISABETHCRISCUOLO>
10 [URBINATI/materialdidatico/07-comparison-of-the-chernobyl-and-fukushima-nuclear-](https://www.fcav.unesp.br/Home/departamentos/morfologia/ELISABETHCRISCUOLO)
11 [accidents-2014.pdf](https://www.fcav.unesp.br/Home/departamentos/morfologia/ELISABETHCRISCUOLO).
- 12 98. Fushiki, S., *Radiation hazards in children – Lessons from Chernobyl, Three Mile Island*
13 *and Fukushima*. Brain and Development, 2013. **35**(3): p. 220-270. Cited October 9, 2020;
14 Available from: <https://pubmed.ncbi.nlm.nih.gov/23063247/>.
- 15 99. Lifton RJ and N Oreskes. The False Promise of Nuclear Power in an Age of Climate
16 Change. Bulletin of the Atomic Scientists, August 20, 2019. Cited August 4, 2020;
17 Available from: [https://thebulletin.org/2019/08/the-false-promise-of-nuclear-power-in-](https://thebulletin.org/2019/08/the-false-promise-of-nuclear-power-in-an-age-of-climate-change/)
18 [an-age-of-climate-change/](https://thebulletin.org/2019/08/the-false-promise-of-nuclear-power-in-an-age-of-climate-change/).
- 19 100. Lovins AB. Does Nuclear Power Slow or Speed Climate Change? Forbes. November 18,
20 2019. Cited August 4, 2020; Available from:
21 [https://www.forbes.com/sites/amorylovins/2019/11/18/does-nuclear-power-slow-or-](https://www.forbes.com/sites/amorylovins/2019/11/18/does-nuclear-power-slow-or-speed-climate-change/#394d5df8506b)
22 [speed-climate-change/#394d5df8506b](https://www.forbes.com/sites/amorylovins/2019/11/18/does-nuclear-power-slow-or-speed-climate-change/#394d5df8506b).
- 23 101. Jacobson, M.Z., et al., *Impacts of Green New Deal Energy Plans on Grid Stability, Costs,*
24 *Jobs, Health, and Climate in 143 Countries*. One Earth, 2019. **1**(4): p. 449-463. Cited
25 August 4, 2020; Available from: <https://www.cell.com/action/showPdf?pii=S2590->
26 [3322%2819%2930225-8](https://www.cell.com/action/showPdf?pii=S2590-3322%2819%2930225-8).
- 27 102. Ross, D., *Critics alarmed by US nuclear agency's bid to relax rules on radioactive waste*.
28 *The Guardian*, May 7, 2020. Cited October 9, 2020. Available from:
29 [https://www.theguardian.com/environment/2020/may/07/nuclear-regulatory-commission-](https://www.theguardian.com/environment/2020/may/07/nuclear-regulatory-commission-radioactive-waste)
30 [radioactive-waste](https://www.theguardian.com/environment/2020/may/07/nuclear-regulatory-commission-radioactive-waste).

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