MOLOCH, THE META-CRISIS, AND INTEGRATED NUCLEAR DETERRENCE

Research Report | September 2023

MESA | THE MEDIA ECOLOGY AND STRATEGIC ANALYSIS GROUP

"It does not matter whether you believe in myth, what matters is that the world behaves as if the Gods exist."

~a Bardic gwers

ABOUT MESA

The Media Ecology and Strategic Analysis (MESA) is an interdisciplinary group with a broad mission to address the rising need for strategic narrative assessment as a tool for promoting cooperative assistance and creating community power. For more information on the MESA Group, visit https://mesagroup.okstate.edu.

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ACKNOWLEDGMENTS

This report is based upon work supported by NSI, Inc. for the Strategic Multilayer Assessment- 21st Century Strategic Deterrence Frameworks project. Cover image by George Hodan.

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EXECUTIVE SUMMARY

This project examines global perspectives on evolving nuclear challenges and deterrence approaches by analyzing discourse across media, arms control experts, and social platforms in major nuclear-armed nations. Using computational analysis and qualitative coding, it compiles insights from news articles, arms control blogs, and Twitter commentary over the past decade. The goal is to gain an expansive view of public conversations regarding nuclear weapons issues to inform strategic planning and assessment of the strategic environment. By compiling diverse qualitative data points, the project aims to identify areas of alignment and mismatch between official deterrence policies and public discourse that could illuminate whether existing strategies sufficiently account for media, arms control experts, and public perceptions of emergent risks. The key findings include:

Discussion Trends and Global Landscape:

- → Recent discussions on integrated nuclear warfare show a notably negative trend surpassing expected pessimism levels.
- → The emotional nature of discussions reflects mixed optimistic and pessimistic views, with limited neutrality.
- → China and the US dominate news and arms control blogs; India and Pakistan feature in hybrid warfare Twitter posts.
- → Ukraine's prominence emphasizes fears of nuclear catastrophe due to Russian aggression.
- → Most nations receive consistently positive coverage for navigating integrated warfare complexities.
- → Positive depiction suggests well-received efforts in managing evolving security challenges.
- → Different countries have distinct nuclear weapon concerns; the global landscape is marked by crises and power competition.

Term Associations and Social Media Patterns:

- → Term associations were analyzed across news, blogs, and Twitter data.
- → "Nuclear war" co-occurs frequently with "sanctions" and "arms race," linking conflicts to economic and military strategies.
- → "Deterrence" is linked to "nuclear war" and "sanctions," highlighting its assumed ties to aggression prevention.
- → "Hypersonic missiles" and "AI" interactions are sparse.
- → "Deterrence" and "nuclear war" often co-occur in social media, suggesting correlations.
- → "Artificial intelligence" and "deterrence" are relevant.

→ "Cyber warfare" and "information warfare" converge.

Multipolar Power Competition:

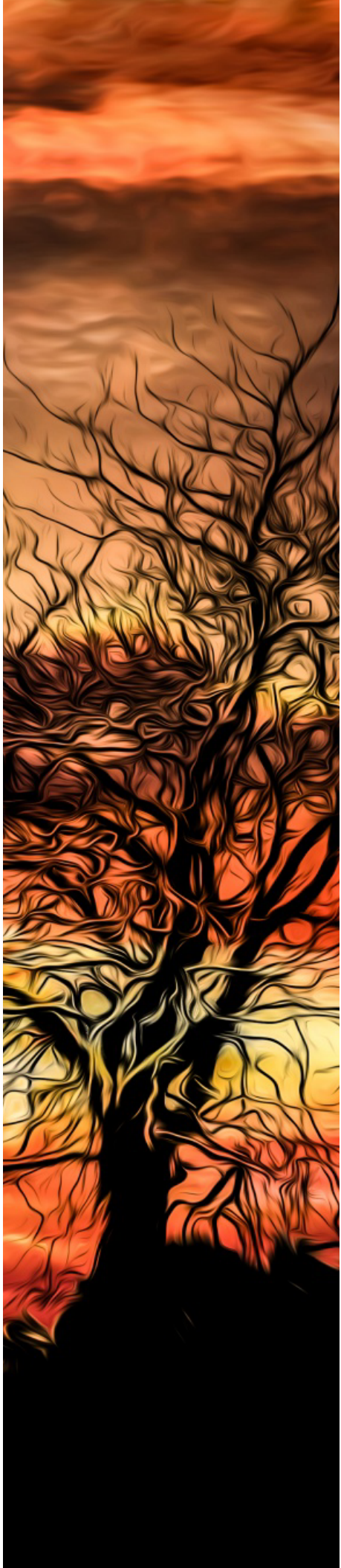
→ Multi-crisis landscape coincides with a shift towards multipolar power competition.
→ Technological and political shifts spawn both advancements and global threats.
→ The dichotomy of Western liberalism fuels achievements and challenges.
→ Multipolar power competition hastens global challenges, including nuclear arms control.
→ The rise of multipolar power competition destabilizes, revealing global disparities.

Hybrid Warfare and Challenges:

→ Hybrid warfare emerges, enabled by technology and economic interconnectivity.
→ Hybrid activities blur lines between conflict and below-threshold operations.
→ Cyber warfare targets include military systems, energy grids, and nuclear command structures.
→ "Nuclear entanglement" has arisen with cyber incursions potentially causing nuclear escalation.
→ An erosion of trust among global powers is hampering arms control and norms.

New Arms Race and Escalation Concerns:

→ A new arms race, tied to technology and mistrust, is underway with advanced weapons.
→ Russia and China are developing next-gen nuclear weaponry with unique capabilities.
→ Low-yield nuclear weapons are blurring the line between conventional and nuclear forces.
→ An increased risk of fantastical weapons with hypersonic speeds and enhanced evasion abilities.
→ Overt nuclear threats are more frequent and reflect broader fears and instabilities.
→ An erosion of arms control architecture contributes to dangerous escalations.



The Complexity of Nuclear Decision-Making:

- → Nuclear weapons decision-making is complex, involving political, conventional, and strategic considerations.
- → US decision-making is mainly political, with limited checks on Presidential orders.
- → China maintains a "no first use" policy, focusing on defensive posture and disarmament.
- → Russia and the US are more ambiguous on usage, facing challenges from new technologies.
- → India, Pakistan, and AUKUS alliance add complexity to deterrence strategies.
- → Integration of AI and cyber capabilities raise new risks in nuclear conflicts.

Challenges in Addressing Arms Control:

- → The international system fails to address the risks of an arms race and nuclear enhancements.
- → The UN is ineffective in regulating nuclear armament and the degradation of global conditions.
- → Disarmament organizations struggle to convert public opinion into action.
- → Lack of attention to nuclear threats due to broader meta-crises like climate change, conflicts, and terrorism.
- → Pathways for arms control are needed, including a comprehensive treaty to account for emerging capabilities.
- → Transparency is crucial to build trust and facilitate international cooperation.

Conclusions:

- → There is an urgent need for a coordinated international response to nuclear proliferation and arms race escalations.
- → The study findings emphasize the need for transparency, public support, and cooperation among nations to reduce the threats of nuclear warfare.

CHAPTER 1 | INTRODUCTION

Moloch and the Meta-Crisis

Moloch, a proto-deity of the ancient Semitic people before the conquest of YHWH, is known as the god of the "Children of Ammon." An abomination who calls for the ritual sacrifice of children,[i] Moloch is a fallen angel who rallies his brethren to war against God by arguing they are the victims of an unjust existence. In myth, he calls for vengeance and illegitimately casts himself upon the pagan pantheon as a god of fertility.[ii]

Moloch is analogous to the hidden force driving negative returns in game theory, where individual incentives lead to destructive outcomes for everyone involved. Though individual actors might realize the long-term consequences of their actions are harmful to themselves and the overall system, the immediate social, cultural, and economic returns motivating their behavior are too ingrained and incentivized to overcome.[iii]

Here, Moloch represents an overarching framework from which to make sense of the insights concerning deterrence and great power competition amid the larger so-called "meta-crisis" unfolding before the global community. The "meta-crisis" is defined as the underlying crisis driving a multitude of current crises that feed Moloch. These include ecological, economic, immigration, political, and energy crises, as well as crises of cultures and the mind that deals with how human beings understand themselves in the world. At its root, the meta-crisis takes place in the mind of the human being as a series of challenges: a challenge of sense-making in an increasingly complex natural environment, a challenge of conceptual capability to solve rising problems of social integration, a challenge of legitimation toward political and bureaucratic powers whose mandates lack convincing rationales, and a challenge of meaning at the level of individual experience to give purpose to life.[iv]

The meta-crisis, and the demonic gravity of Moloch, are useful concepts to the study of deterrence as deterrence is only needed when action that is system negative produces positive individual returns. Further, scarcity, whether real or manufactured, underlies all competition; and it is ultimately misaligned competition that fuels and propels the meta-crisis.

The thesis of the work presented here on integrated nuclear deterrence is that current deterrence strategies and efforts, and their associated doctrines, international agreements, treaties, and laws are woefully inadequate and out of speed to the challenges of the meta-crisis. The incentivized structures of great power competition overshadow trust in authority and regulation in ways that render systematic restraint and coordination untenable, exposing the global population to extreme risk.

This study examines whether current nuclear deterrence strategies and doctrines are adequately accounting for risks arising from great power competition dynamics. It will compile insights drawn from news media, arms control blogs, and social media commentary in all major nuclear-armed nations (except North Korea).

Rather than definitively attributing causality, the analysis aims to explore potential correlations between public perspectives on nuclear weapons issues and the broad framework of misaligned incentives represented metaphorically by the ancient figure of Moloch. The "Moloch" lens is not presumed definitive but rather used for conceptual exploration.

By gathering a diversity of qualitative data points, the study intends to assess areas of alignment and mismatch between official deterrence policies and public discourse/sentiment concerning nuclear arsenals and escalation risks. This assessment of correlations and gaps could shed light on whether existing strategies sufficiently account for emergent risks.

Any policy recommendations will focus directly on evidence-based improvements to nuclear deterrence and nonproliferation approaches themselves, rather than speculative notions of "combatting Moloch." There are limitations to determining causality from this methodology alone.

In summary, this study aims to provide an expansive perspective on the complex issue of nuclear deterrence using a metaphorical framework. The goal is to inform discussions.

Purpose

This study contributes to a US Strategic Command project assessing deterrence approaches amid evolving strategic threats. The goal is to gain perspective on conversations around nuclear coercion, arms control, and integrated nuclear warfare from 2014 to now.

It does this by examining discourse in national news media, expert arms control communities, and social media across nuclear-armed and host nations (except North Korea).

The study refers to the concept of "integrated nuclear deterrence". While no formal definition exists, this concept closely aligns with what experts call "Conventional-Nuclear Integration" (CNI). As described by the Center for Strategic and International Studies, CNI broadly refers to the intersection of conventional and nuclear forces to strengthen deterrence. This involves conventional forces operating with nuclear considerations in mind, as well as nuclear forces carrying out deterrence operations to prevent opponents from utilizing conventional or unconventional forces. It also entails preparing U.S. forces to potentially conduct nuclear strikes within a conventional conflict.[v] CNI is distinct from actually conducting integrated nuclear and conventional warfare.

In short, integrated nuclear deterrence refers to integrating nuclear and conventional military planning and operations to enhance deterrence and operational flexibility against major adversaries without restricting the analysis to specific terminology representative of US perspectives and strengths.

The study focuses on describing unique national assumptions on deterrence and providing a big-picture view of integrated nuclear warfare discussions. This supports assessing the strategic environment and arms control dynamics.

Research Questions

RQ1: What nations and topics drive integrated nuclear warfare conversations?

RQ2: What topic associations exist concerning integrated nuclear warfare across the data?

RQ3: How do news media and arms control experts describe the "meta-crisis" regarding integrated nuclear warfare?

RQ4: How do news media and arms control experts describe global powers' response to the meta-crisis concerning integrated nuclear warfare?

RQ5: How do news media and arms control experts describe how the meta-crisis alters how global powers project nuclear deterrence strategies?

RQ6: How do news media and arms control experts discuss mitigating future risks of nuclear-integrated warfare within the meta-crisis?

In summary, the study leverages discourse analysis across media, experts, and social platforms to evaluate perspectives on evolving nuclear challenges, aiming to inform strategic planning.

CHAPTER 2 | METHODS

For this study, we analyzed news media, social media, and blog content about nuclear weapons issues over 10 years, using a mixed-methods approach (computational and qualitative). Our approach aimed to provide a comprehensive understanding of narratives and themes in this discourse. For additional information on methods, see Appendix A.

Study Data

News Media Data

To analyze news coverage of nuclear weapons and arms control, we used Factiva to search major publications in 11 countries from January 2013 through May 2023. We searched for articles containing key terms related to nuclear weapons, arms control, military action, and weapons programs (i.e. "arms control", "nuclear war", "hybrid warfare", "nuclear weapon", "nuclear proliferation", "nuclear warfare", "nuclear deterrence", "nuclear weapons programs", "nuclear integration", "weapons" (filtered for articles covering international relations). Terms were adjusted slightly for each nation based on qualitative assessments of articles populated. After removing duplicates, our dataset consisted of 7,402 articles. From these, we randomly sampled 490 articles for in-depth qualitative analysis. The number sampled from each country was: Turkey (30), Israel (30), India (30), UK (50), Russia (50), Netherlands (30), Italy (20), Germany (50), Pakistan (30), China (50), France (50), US (70).

Blog Data

The study sourced sixteen of the most viewed and subscribed to online microsites and blogs on the topic of arms control, according to feedly.com. We collected all posts (n = 6,492) from these sites using a Python module, *Selenium*. The average number of posts per blog was 405. The site's titles, number of analyzed posts (n) and qualitative sample representation (qual. smpl) are in the Appendix. Of the 6,492 posts, 209 were selectively sampled for qualitative analyses. Special attention was paid in selection of posts to discussions relevant to integrated nuclear deterrence.

Social Media Data

We collected original tweets about nuclear threats and deterrence from March 2014 through April 2023 using Twitter's API using similar key terms to the news media dataset (i.e. "arms control", "nuclear war", "hybrid warfare", "nuclear weapon", "nuclear proliferation", "nuclear deterrence", "nuclear warfare", "nuclear integration"). Our initial dataset contained 1,096,823 tweets. After excluding retweets, replies, and duplicates, our final dataset totaled 781,339 tweets.

Analytical Approaches

Time Periods

For analysis, we divided the data into three time periods: 2013-2015, 2016-2020, and 2021-2023. This allowed us to examine changes in narratives over time.

Qualitative Analysis

We used NVivo software to inductively code and analyze samples of news articles (n = 490) and blog posts (n = 209). Coding focused on identifying key themes related to integrated nuclear warfare and deterrence strategies, guided by Fisher's narrative paradigm.

Topic Analysis

We used Latent Dirichlet Allocation (LDA) modeling to identify key topics in each data source during the specific time periods. LDA is a statistical technique in natural language processing (NLP) that extracts main topics from documents.

The LDA Process

1. We chose to generate 10 topics from the data.
2. The model made initial guesses by randomly assigning each word in the documents to one of the 10 topics.
3. It refined these topic assignments through multiple iterations, considering:
    a. How prevalent the assigned topic was in that document
    b. How often those words appeared under the assigned topic overall
4. Words were reassigned to different topics based on this information.
5. The model reached a steady state where assignments no longer changed.

The final assignments represent the extracted topics. Since LDA relies on probability distributions, topic order does not indicate importance.

Sentiment Analysis

We used sentiment analysis to examine emotional opinions and compare key countries. Sentiment analysis uses NLP to classify the attitude or emotion within the text. For the overall sentiment, we used the Natural Language Toolkit (NLTK) VADER tool, designed for social media text. It classifies sentiment as positive, negative, or neutral, with composite scores indicating intensity. For country comparisons, we used TextBlob which provides a polarity score from -1 to 1. This continuous score enabled comparison.

Keyword Association

We built co-occurrence matrices to examine word associations. These count how often word pairs appear together in the data within a context window. Frequent co-occurrence implies an association.

In summary, we used probabilistic modeling, rule-based sentiment analysis, and co-occurrence statistics to extract key topics, opinions, and word relationships from the textual data.

CHAPTER 3 | FINDINGS

Moloch and Integrated Nuclear Warfare

"The assertion that nuclear weapons guaranteed security was unsustainable, intrinsically immoral and 'an insult to our intelligence'... Nuclear Powers had a responsibility 'proportionate to the infinite madness of their doctrines of dissuasion and their incessant arms race'."[vi]

The data reveals two concerning trends in nuclear deterrence discourse that call to mind Moloch. We mention them here to recall the reader to the Moloch lens.

First, justifications for expanding nuclear arsenals rely on theoretical deterrence arguments rather than factual assessments. Supporters claim new weapons will enhance deterrence. But deterrence logic is deductive, based on assumptions, not evidence.

Intentionally ambiguous strategies enable subjective threat calculus. This readily morphs into a rationale for more nukes. The result is uncertain nuclear strategies, not careful policy.

In truth, no one can win a nuclear war. Impartial research shows even limited strikes would spark catastrophic climate changes, global famine, and billions dead.[vii] Believing nuclear weapons have strategic value ignores the reality that the acute danger of these weapons demands urgent elimination.

Second, the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) bargain trading non-proliferation for disarmament is crumbling. Nuclear states resist abolishing weapons despite commitments. They are modernizing arsenals while non-nuclear states see no progress toward disarmament.

Frustrated non-nuclear states increasingly consider acting outside the NPT framework. The imbalance of power created by nuclear weapons was never meant to be permanent. Without disarmament, more states may pursue nuclear capabilities themselves.

In summary, reliance on unproven nuclear deterrence and resistance to disarmament perpetuates global insecurity. The data demands renewed focus on evidence-based policy and measured disarmament to reduce nuclear dangers.

Descriptives

Frequencies

Overall, news article publications concerning nuclear-integrated warfare have remained constant, with no statistically significant decreases or increases over the years. The total average of new stories per year was 706. Blog posts on the topic of nuclear-

integrated deterrence were found to be significantly decreasing over the years, with 1039 posts in 2013 down to only 378 in 2022 and 120 posts through the 2023 data (for the months that data was collected). The bulk of public conversations on Twitter concerning integrated nuclear warfare took place during 2016-2020 (500,916 posts, 64.1% of the data). The most engaged tweets were in discussing the Trump administration's nuclear brinkmanship with North Korea and Russia's war of aggression in Ukraine. For a complete description of the data, see Appendix B.

Topic Analysis

We analyzed 10 emergent key topics from news, blogs, and Twitter data during each analytical period using the Latent Dirichlet Allocation (LDA) model. Note that the order of the topics does not mean the importance of the topic comparing others. For a complete description of the data, see Appendix C.

News Media Summary

The discussion on nuclear disarmament has significantly evolved over time, with the spotlight shifting between different nations and events.

2013-2015: This period focused heavily on Iran's nuclear program and negotiations leading to the 2015 Iran nuclear deal (Joint Comprehensive Plan of Action (JCPOA)). North Korea and China were also discussed. The Obama administration's role in Iran talks and deals was a major theme.

2016-2020: The Trump administration's withdrawal from the JCPOA and increased tensions with North Korea and China marked a major shift. Russia's adherence to treaties and China's global role also gained prominence. Discussions increased around India, Pakistan, and Kashmir.

2021-2023: China became more prominent, likely due to its growing power. Russia, Iran, and Israel remained significant. Newer topics included the AUKUS pact and advanced technologies like AI. Overall, the technological aspects of nuclear programs drew more focus.

Blogs Summary

Some common themes emerged across the periods, like Iran's nuclear activities, missiles, and major powers. But each period also had unique focuses:

2013-2015: More attention on chemical weapons and international agreements. Increasing concern about atomic security.

2016-2020: Noticeable increase in discussions about China, North Korea, and Trump. Reflected real-world geopolitical shifts like the US withdrawal from Iran deal. International Atomic Energy Agency's (IAEA) role became more prominent.

2021-2023: Continued focus on Iran's nuclear activities. Significant emphasis on Russia, likely due to Ukraine tensions. Prominence of technical terms like centrifuges and uranium enrichment. A notable rise in discussions of conflict and war, indicating escalating global tensions.

Social Media Summary

While nuclear and tactical threats, strikes, and conflicts persisted as themes from 2013-2023, the specifics shifted over time:

2013-2015: Largely focused on nuclear threats from North Korea, Iran, Russia, and Pakistan. "Tactical threats", "deterrence", "strikes", and "warfare" were keywords.

2016-2020: Nuclear threats continued, but "surgical strikes" became prominent, especially between India and Pakistan. "Hybrid warfare," "tactical nukes," and leaders like Trump, Putin, and Modi were mentioned, pointing to new warfare tactics and political discourse. Fewer Iran mentions compared to before.

2021-2023: Focus remained on nuclear threats and tactical warfare related to Ukraine, Russia, Iran, North Korea, and China. Surgical strikes in India-Pakistan also continued. Terms like "chemical threats" and "Armageddon" emerged, suggesting evolving threat perceptions.

Sentiment Analysis

News Media

Overall, 54.30% of the articles were negative, 45.12% were positive, and only 0.58% were netrual.

2013-2015: Predominantly negative sentiment, followed closely by positive. Neutral articles are scarce.
2016-2020: Negative sentiment continued to dominate over positive. Neutral sentiment remained low.
2021-2023: Negative sentiment higher than expected based on prior years. Positive sentiment dropped. Neutral sentiment stayed low.
Statistical analysis showed significant differences in sentiment distribution over time, especially in 2021-2023. This period diverged from expected values with increased negative sentiment and declined positive sentiment. See Table 1.

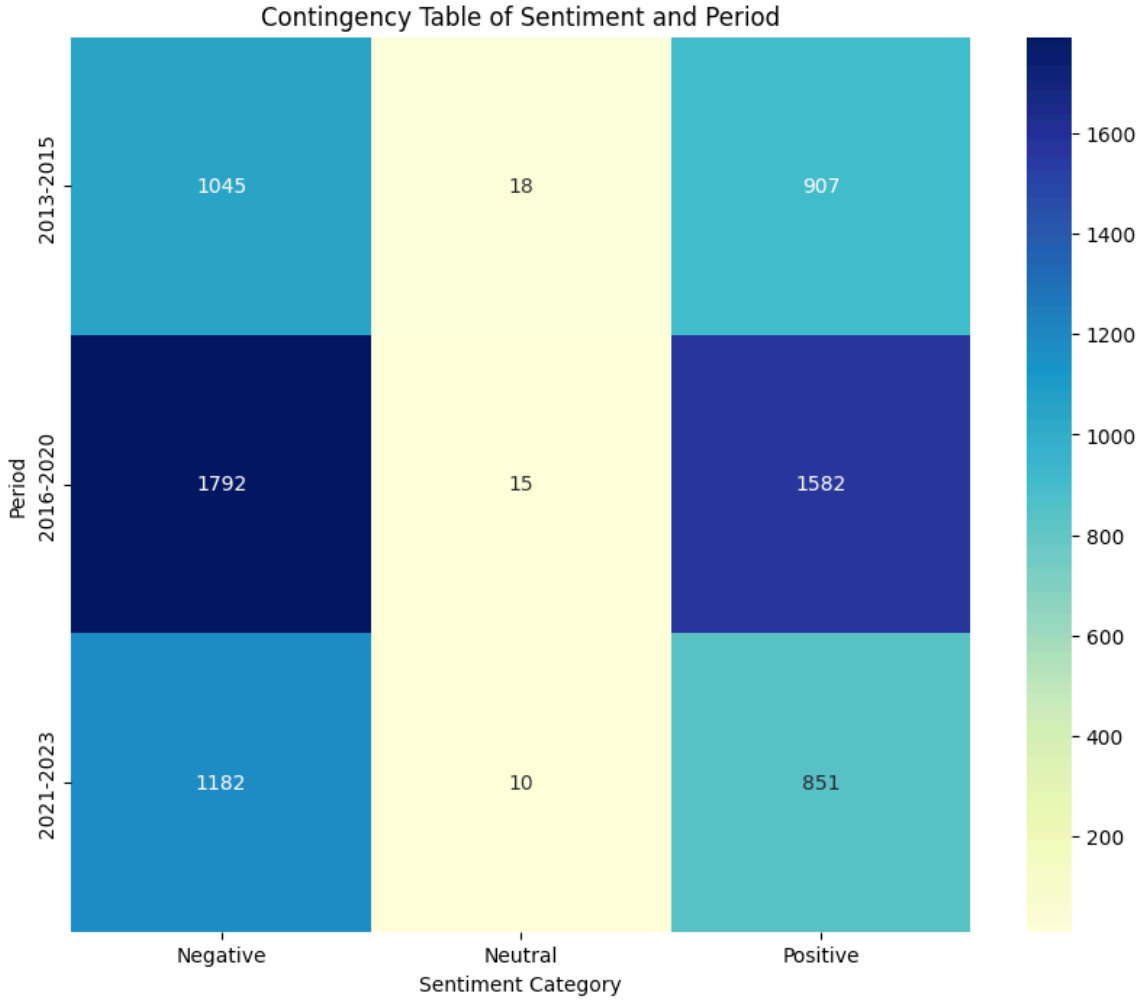


Table 1. Contingency table of sentiment and period for news media.

Blogs

Overall, positive sentiment blog posts made up 52.47% of the data, 43.67% of the data had negative sentiment, and 3.86% were neutral.
Statistical analysis showed significant differences in sentiment proportions over time.
2013-2015: More positive than negative sentiment posts. Very few are neutral.
2016-2020: Positive sentiment slightly higher than negative. Neutral sentiment increased compared to before.
2021-2023: Decreases in both positive and negative sentiments. Neutral remained low.

Comparing observed counts to expected values under the null hypothesis revealed notable differences, especially in 2021-2023. Namely, positive sentiment counts were lower than expected and negative sentiment counts were higher than expected.

This suggests a shift in sentiment balance in 2021-2023 compared to earlier periods, with more negative and less positive sentiment than anticipated based on prior trends. See Table 2.

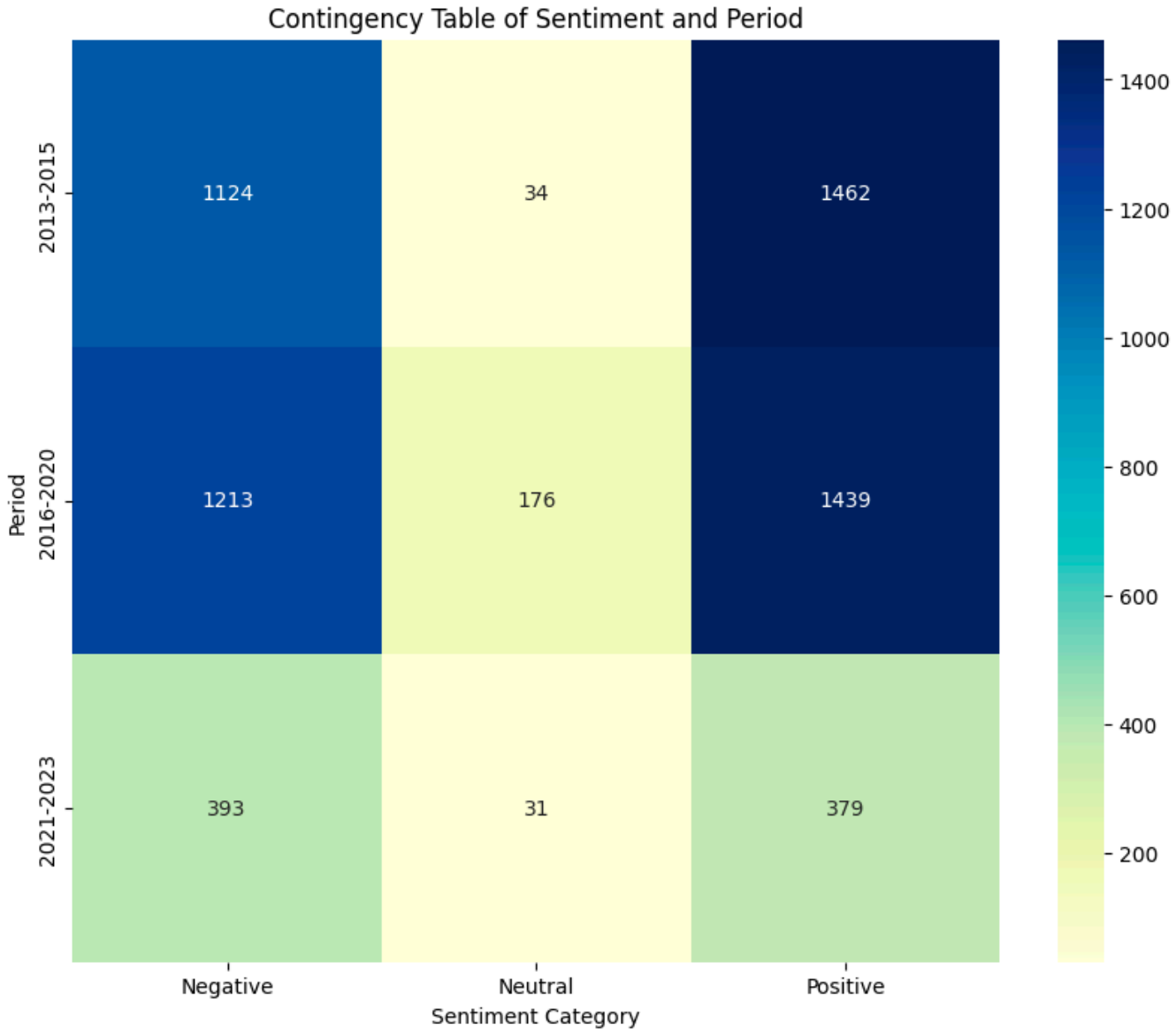


Table 2. Contingency table of sentiment and period for blogs.

Social Media

2013-2015: More negative sentiment tweets than positive or neutral.
2016-2020: Negative sentiment tweets are very high. Positive and neutral lower.
2021-2023: Negative sentiment tweets are still predominant. Declines in positive and neutral.

Statistical analysis showed significant differences in sentiment proportions across periods. Observed counts diverged markedly from expected values, especially in 2021-2023.

2021-2023 saw substantially fewer positive sentiment tweets than expected. While, negative sentiment tweets exceeded expectations.

This points to a clear shift in sentiment on social media during 2021-2023 compared to earlier periods. The period saw more negative and fewer positive sentiments than anticipated based on prior trends. See Table 3.

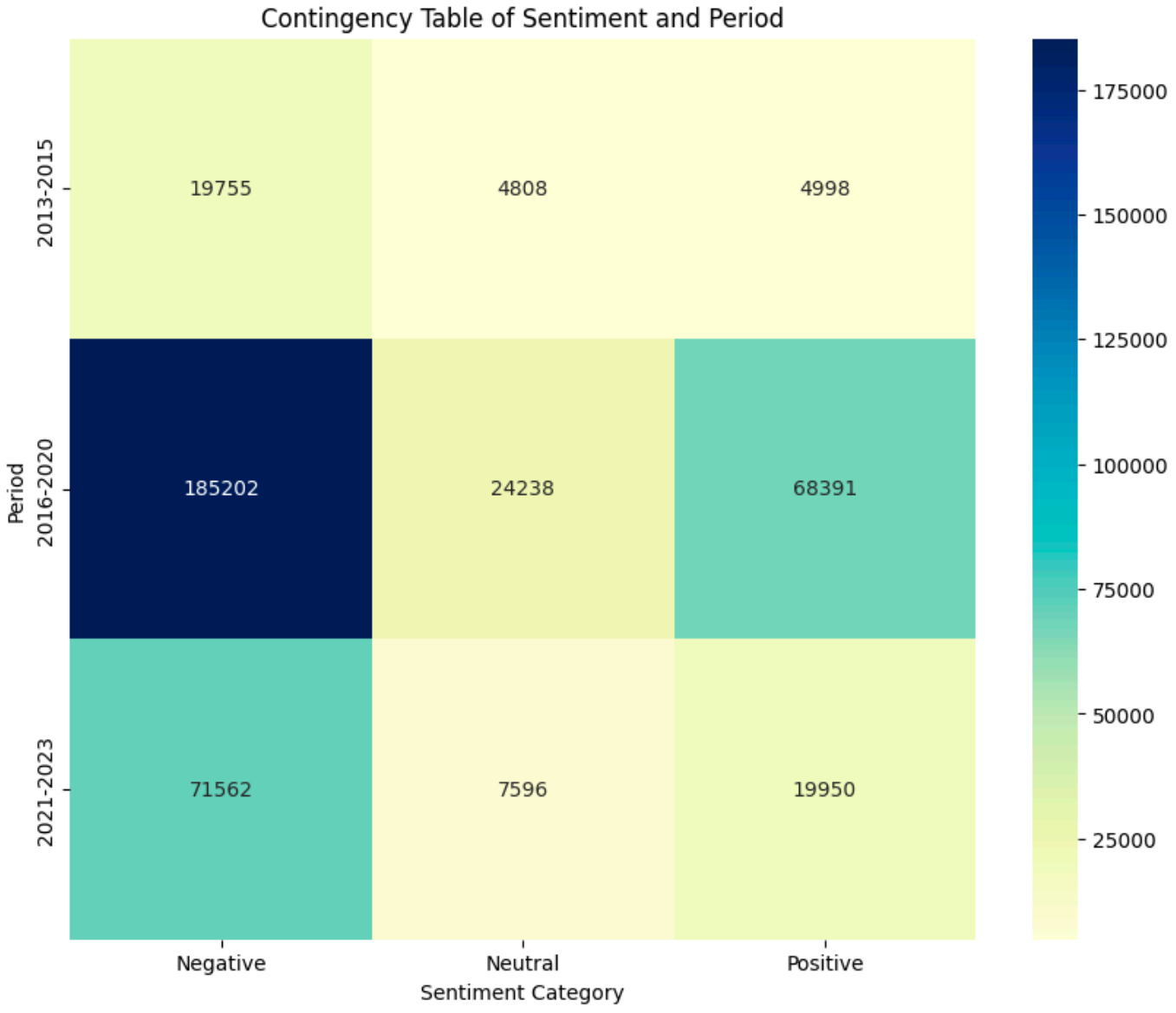


Table 3. Contingency table of sentiment and period for social media.

Research Questions

RQ1: What nations and topics drive integrated nuclear warfare conversations?

Overall, China and the United States dominate coverage in the news media and arms control blogs. Twitter data reveals a more diverse conversation, with India and Pakistan featured in notably dynamic and frequent posts regarding hybrid warfare. Ukraine features prominently in all media, as fear of nuclear disaster and outright nuclear strikes brought on by Russia's war of aggression become increasingly present. With a few exceptions (i.e., Israel, Turkey, and Italy), coverage of each nation is remarkably positive across all media. While this may be attributable to national news biases in new media, the consistent positive representation of nations in blog and Twitter data suggests that attempts by nations to grapple with the changing security complexities of integrated warfare are presented favorably.

Topic models that show concerns for nuclear weapons and warfare vary considerably for each nation. While Russia, the United States, and China have broader international considerations, other nations such as India, Israel, and Pakistan are more focused on regional nuances or particular rivals. In general, Western European nations are more likely to mention human rights and the responsibilities of nuclear-powered nations toward the welfare of the world. Iran and North Korea have topical relevance for several nations primarily in episodic coverage of key events and negotiations. Common across the data are concerns for security arising from external threats related to nuclear weapons development and the posturing of national power within the international system.

News Media

Frequently mentioned countries

Table 4 reveals the top 10 countries most frequently mentioned in the news during three distinct periods: 2013-2015, 2016-2020, and 2021-2023.

The news media coverage reveals some notable trends in the prominence of different countries over time:

- → China was consistently the most-mentioned country across all three periods from 2013 to 2023, although its mentions decreased slightly after 2016-2020.
- → The United States held the second spot throughout, with relatively stable mentions until a decline in 2021-2023.
- → Pakistan peaked in mentions in 2016-2020 before declining in 2021-2023, remaining in the top 3.
- → Ukraine surged from 2013-2015 to 2016-2020, likely due to the conflict with Russia, and stayed high in 2021-2023.
- → Israel fluctuated, with high mentions in 2013-2015 and 2016-2020 before dropping in 2021-2023.
- → India rose until 2016-2020 but then declined in 2021-2023, maintaining significance.
- → France held steady in mentions across periods. Japan remained stable but lower than the top countries.
- → Germany consistently made the top 10 despite decreasing after 2016-2020.
- → Iraq had the fewest mentions overall and declined steadily across the periods.

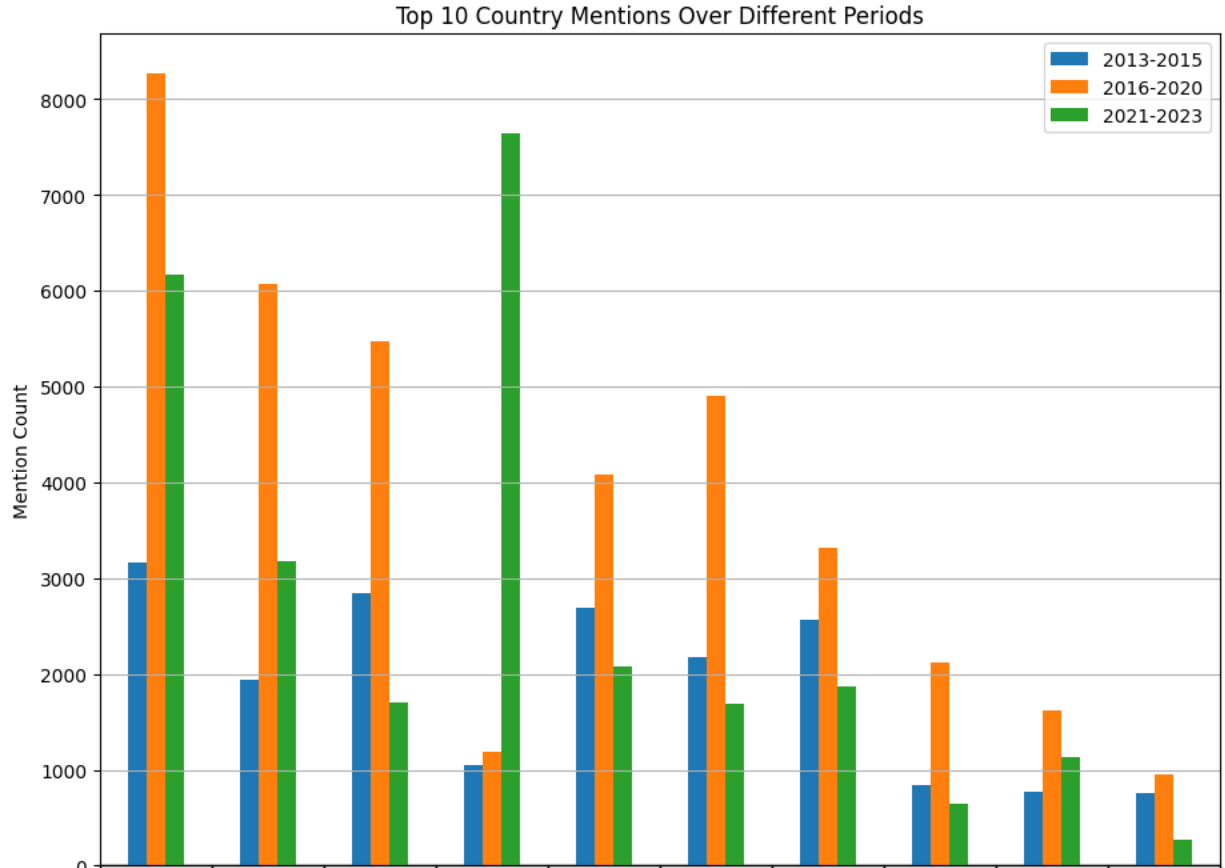
Changes in geopolitical events, economics, conflicts, and media priorities likely drove these shifts in the prominence of countries over time.

News media topic analysis of nuclear-equipped nations

Russia: The topics related to Russia predominantly revolve around issues such as nuclear weapons, international relations, conflicts (e.g., Ukraine), and the role of President Putin. The different topics highlight Russia's involvement in international affairs, arms control, and military capabilities.

United States: The LDA topics for the United States encompass issues such as nuclear agreements (e.g., the Iran nuclear deal), international relations, and the military.

China: Identified topics include discussions on nuclear weapons, relations with India and Pakistan, international security, and military activities.
France: Topics cover nuclear issues, particularly arms control treaties, along with its relationship with Russia and its involvement in international affairs.
Pakistan: The topics mainly revolve around nuclear weapons and their implications on regional and international security.
India: The topics revolve around the security of India's nuclear program, its relations with Pakistan, and other major powers like the US, China, and Russia. The focus seems to be on international security concerns and India's military capabilities.
Israel: The main focus is on Israel's perspective regarding Iran's nuclear program, the Iran nuclear deal, and the involvement of the US and international sanctions. The articles highlight Israel's concerns about Iran's nuclear ambitions.
North Korea: The topics mainly revolve around North Korea's nuclear weapons program, and its relations with the US, South Korea, and China. The role of former US President Donald Trump is also discussed concerning North Korea's nuclear capabilities.
Turkey: The topics focus on Turkey's relations with Russia and the US, its position on issues like Iran's nuclear program, the conflict in Ukraine, and Turkey's involvement in NATO. There is an emphasis on international relations and security concerns.



	China	United States	Pakistan	Ukraine	Israel	India	France	Japan	Germany	Iraq
2013-2015	3164	1944	2840	1050	2695	2179	2571	842	776	755
2016-2020	8266	6076	5469	1189	4085	4897	3315	2123	1626	948
2021-2023	6169	3176	1703	7643	2078	1683	1872	648	1134	276

Table 4. Top ten countries most frequently mentioned in news media, by period.

Italy: The topics include discussions on Russia, the US, Iran, and international relations. There are references to the Iran nuclear deal and how it impacts Italy's foreign policy. The topics also touch upon issues related to weapons and military matters.

Belgium: The topics include discussions on Russia, the US, and Ukraine, with references to nuclear weapons and international relations. The discussions also involve topics related to the Nobel Peace Prize and its significance in international affairs.

Germany: The topics revolve around Germany's position in international politics and its relations with Russia, Iran, and the US. There are mentions of the Iran nuclear deal, military matters, and international sanctions.

Netherlands: The topics focus on discussions about nuclear issues, weapons, and international relations, with references to Russia, the US, and Ukraine. The topics also include discussions about human rights and the role of the Netherlands in international affairs.

News media sentiment analysis of nuclear-equipped nations

The sentiment analysis of news media coverage reveals some notable trends:

- → Russia received the highest overall positive sentiment score, followed closely by China.
- → Despite being the most mentioned country, the United States had a lower positive sentiment score compared to Russia and China.
- → North Korea, Pakistan, and India also received overall positive sentiment scores.
- → In contrast, countries like Belgium, the UK, and the Netherlands had lower, more neutral, or slightly negative sentiment scores.

Overall, the analysis shows more positive sentiments expressed toward countries like Russia and China in news coverage, while Western nations tended to have more neutral or negative associations. This provides insight into the general tone of sentiments directed toward these nuclear-equipped nations within the analyzed news media data. See Table 5.

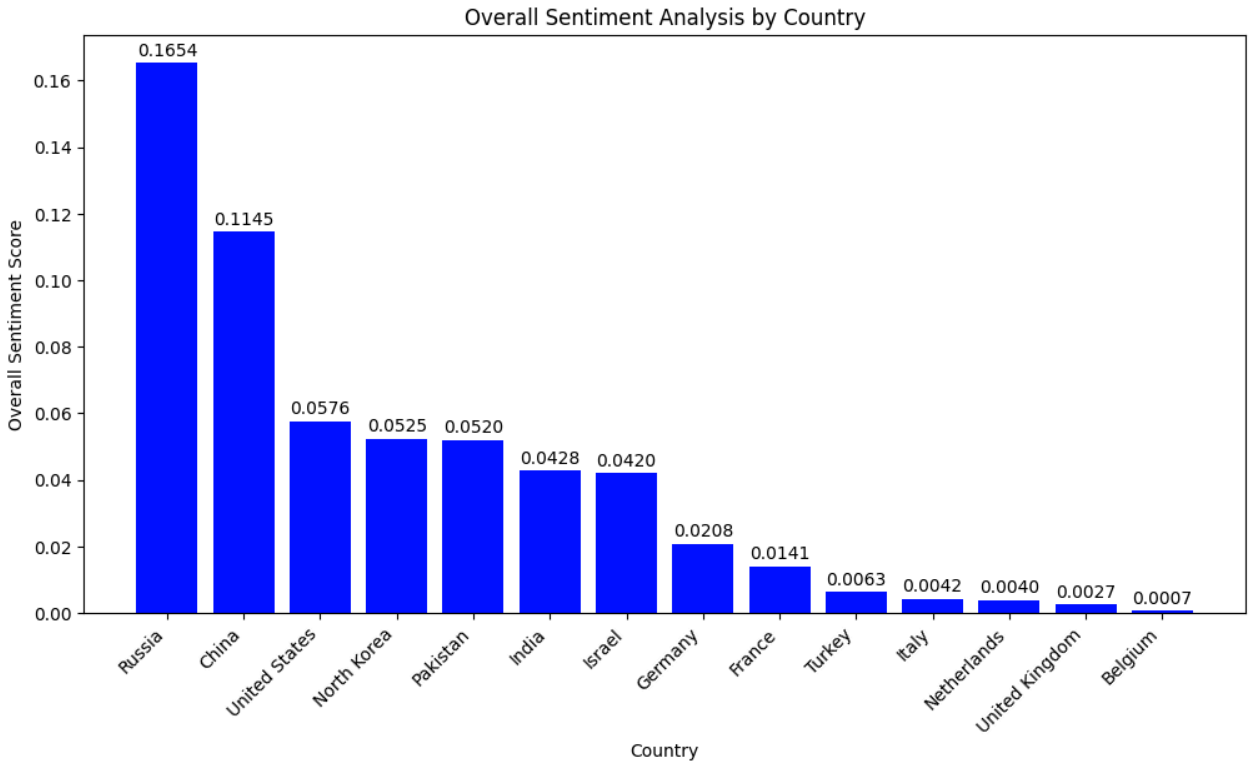


Table 5. Overall sentiment analysis in news media, by country.

Blogs

Frequently mentioned countries

→ The United States consistently had the highest number of mentions in blogs across all three periods, peaking in 2016-2020 and declining in 2021-2023.

→ China closely followed the US in mentions, also peaking in 2016-2020 before dropping in 2021-2023.

→ Ukraine showed a notable increase from 2013-2015 to 2016-2020, remaining high in 2021-2023.

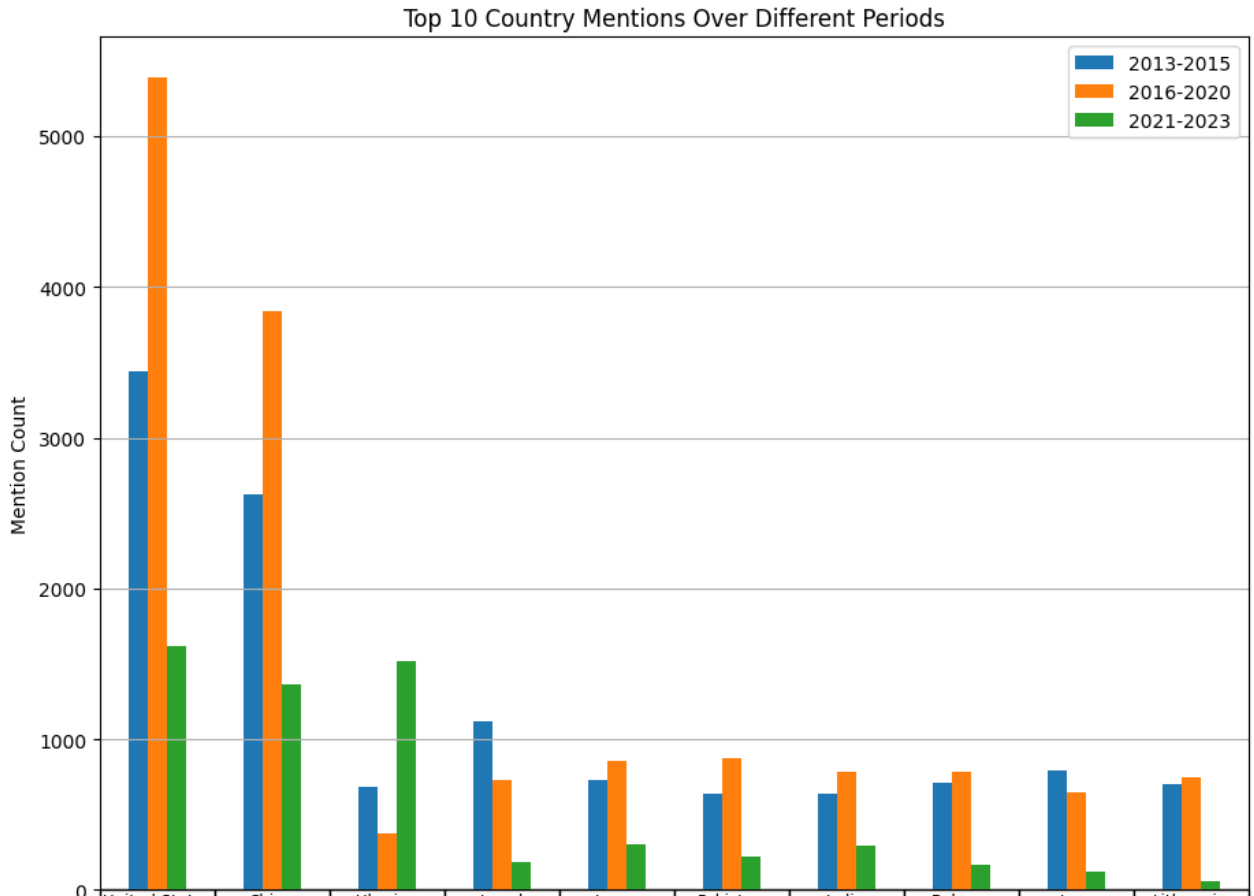
→ Israel peaked in 2013-2015 then decreased, with just 186 mentions in 2021-2023.

→ Japan's mentions were relatively stable over time.

→ Pakistan and India rose until declining in 2021-2023.

→ Belarus, Iraq, and Lithuania fluctuated, with Lithuania dropping significantly in 2021-2023.

Overall, geopolitical events and developments likely drove these trends in the prominence of different countries in blogs over time. The rises and falls in mentions reflect real-world shifts in international relations and conflicts. See Table 6.



	United States	China	Ukraine	Israel	Japan	Pakistan	India	Belarus	Iraq	Lithuania
2013-2015	3441	2620	682	1118	731	636	637	710	790	701
2016-2020	5388	3840	377	728	861	871	787	781	645	745
2021-2023	1617	1367	1516	186	305	226	297	169	120	59

Table 6. Top ten countries most frequently mentioned in blogs, by period.

Blogs topic analysis of nuclear-equipped nations

Russia: The dominant topics relate "nuclear weapons" to "missiles." There are mentions of Iran, the IAEA, and the JCPOA, indicating discussions about Iran's nuclear program and international agreements. Topics also include references to the US, China, and Russia regarding nuclear weapons and arms.
United States: Like Russia, nuclear weapon-oriented topics are prevalent. Specific countries like Iran and North Korea are mentioned, potentially referring to the US's involvement in nuclear talks with these nations. The name "Trump" suggests discussions around the Trump administration's policies on nuclear weapons and nuclear agreements.
China: Again, nuclear weapons-related discussions dominate the topics, including references to countries like Iran and Russia. The data presents US-China relations centering around ongoing conflicts as well as conflicting nuclear policies or strategies. Topics also include mentions of the IAEA and scientific reports related to nuclear matters.
France: France's topics heavily involve nuclear-related discussions, including those with Iran. References to specific regions like the Middle East suggest France's role in diplomatic or political issues in these areas.
United Kingdom: The data is focused mainly on a specific topic related to Iran's nuclear program. The top words in each topic suggest that the model has identified discussions or news related to Iran's nuclear activities, international relations, and diplomatic matters involving the UK.
Pakistan: Pakistan appears to be centered around the security of nuclear weapons and its status as a nuclear power. The top words in each topic indicate discussions about Pakistan's nuclear program, its stance on nuclear weapons, and possibly international concerns about nuclear proliferation.
India: The primary focus is on its own nuclear weapons program. The top words in each topic suggest discussions related to India's nuclear program, its stance on nuclear weapons, and potentially international affairs involving nuclear issues.
Israel: The LDA model for Israel shows a strong emphasis on the topic of Iran's nuclear program. The top words in each topic indicate discussions related to Israel's concerns about Iran's nuclear activities, international diplomacy, and possible actions related to the issue.
North Korea: Virtually all of the conversations about North Korea are focused on its nuclear program and weapons.
Turkey: The dominant words in the topics for Turkey are "nuclear" and "weapons." "Iran" also appears, indicating that discussions about Turkey may often involve its relations with Iran, possibly in a nuclear context.
Italy: The focus is again on nuclear weaponry. There is less of an emphasis on other specific nations, suggesting that the conversation about Italy may be more internally focused or cover a variety of international relationships.
Belgium: The discussions indicate broader geopolitical concerns for nuclear security and international norms.
Germany: The main topics revolve around Iran and nuclear-related issues, focusing on topics related to Iran's nuclear situation or policies.
Netherlands: The discussions revolve around international nuclear weapons and nuclear policies. However, Iran does not appear to be a focus of the Netherlands' topics.

Blogs sentiment analysis of nuclear-equipped nations

- → The United States received the highest overall positive sentiment score of 0.191, indicating the most favorable sentiment.
- → China followed closely with a positive score of 0.152, also denoting positive sentiment.
- → Russia ranked third with a positive score of 0.109.
- → In contrast, Italy received a slightly negative score of -0.000553.
- → Countries like Belgium, the Netherlands, and the United Kingdom had slightly positive sentiment scores close to zero.

Overall, the analysis reveals:

→ The most positive sentiments in the content were expressed toward the US
→ China and Russia also saw largely positive sentiment.
→ Western European nations tended toward neutral sentiment.
→ Italy had a mildly negative tone.

These results provide clarity on the general sentiments directed toward these nuclear-powered countries within the analyzed blogs. The US and China saw the most favorable coverage, while other nations were viewed more neutrally or negatively.

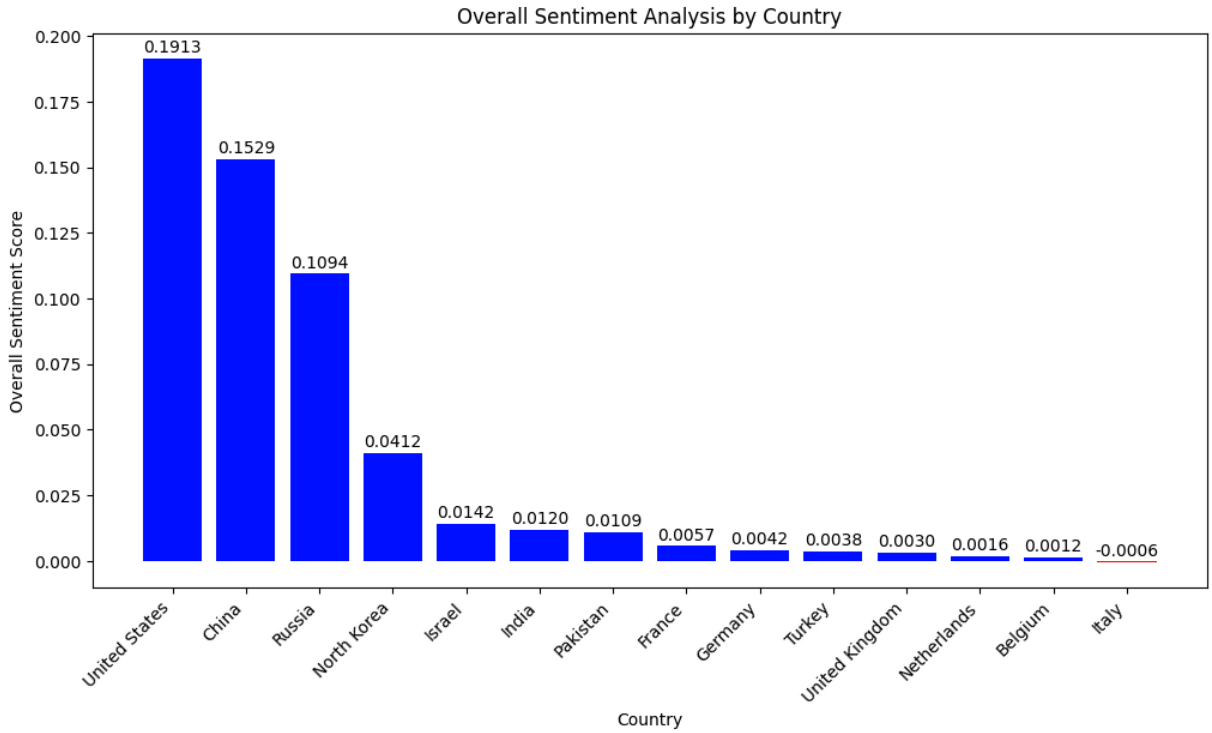


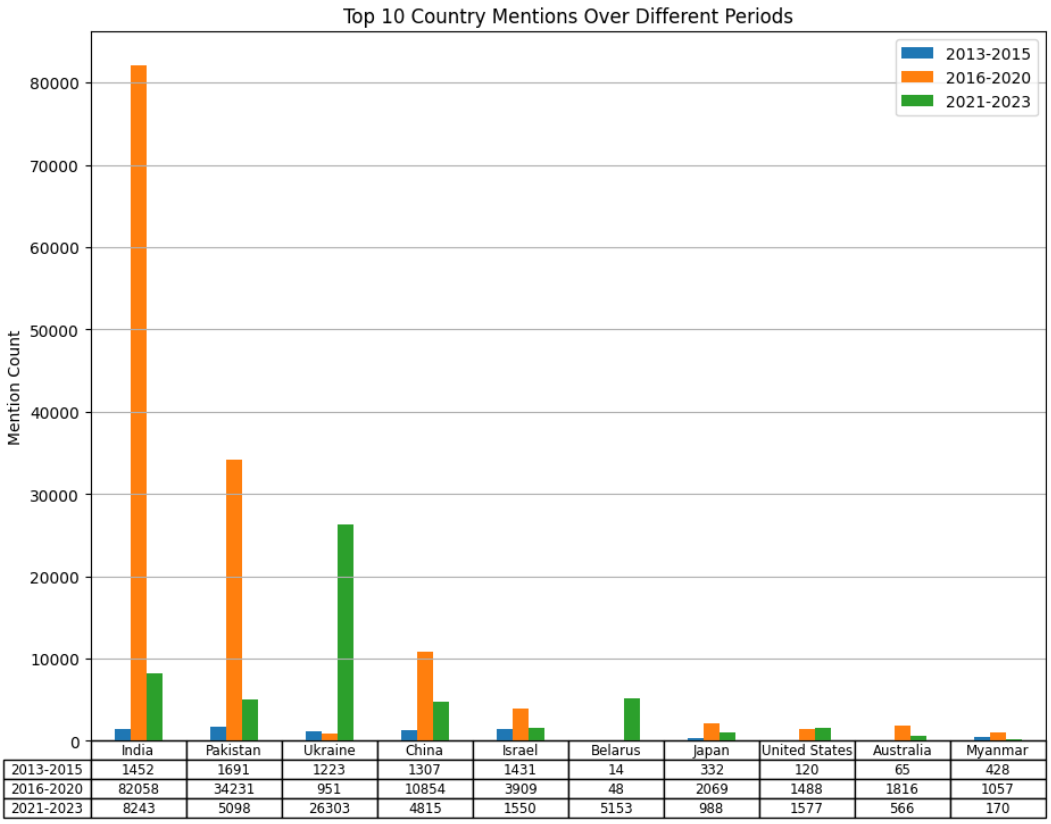
Table 7. Overall sentiment analysis in blogs, by country.

Social Media

Frequently mentioned countries

→ Tweet mentions of countries fluctuated notably between 2013-2023:
→ India peaked dramatically in 2016-2020 with 82,058 mentions, much higher than before or after.
→ Pakistan also rose in 2016-2020 but less sharply.
→ Ukraine skyrocketed in 2021-2023 to 26,303 mentions, from minimal previous mentions.
→ China increased in the middle period but dropped in recent years. Israel followed a similar pattern.
→ Belarus surged surprisingly in 2021-2023 despite minimal early mentions.
→ Japan, the US, and Australia had moderate variations over time.
→ Myanmar declined significantly by 2021-2023.

Overall, the Twitter data highlights the dynamic shifts in country-related discussions over the decade, with sudden rises and falls in prominence. Certain countries spiked during particular periods based on events, only to drop off again later. This underscores the rapidly evolving nature of social media conversations tied to real-world developments. See Table 8.



	India	Pakistan	Ukraine	China	Israel	Belarus	Japan	United States	Australia	Myanmar
2013-2015	1452	1691	1223	1307	1431	14	332	120	65	428
2016-2020	82058	34231	951	10854	3909	48	2069	1488	1816	1057
2021-2023	8243	5098	26303	4815	1550	5153	988	1577	566	170

Table 8. Top ten countries most frequently mentioned in social media, by period.

Social media topic analysis of nuclear-equipped nations

Russia: The topics include discussing President Putin, nuclear weapons, tactical deployment, potential threats, and interactions with Ukraine. There are also mentions of possible invasions and preparations, as well as discussions on strategic stations and strikes.

United States: The topics include discussions about nuclear weapons, threats, deterrence, and intelligence. There are also mentions of North and South Korea, along with concerns about chemical weapons. The analysis focuses on the US's role in global security and its relationship with other nations.

China: The topics related to China revolve around discussions about nuclear weapons, tactical deployment, and threats. There are also mentions of territorial issues, surgical strikes, and interactions with other countries like India, Pakistan, and Taiwan. The analysis highlights China's strategic positioning and its impact on global security.

France: In the case of France, the topics include discussions about nuclear weapons, deterrence, and tactical deployment. There are also mentions of President Macron and his stance on nuclear issues. The analysis suggests focusing on France's nuclear policy and its role in maintaining regional and global stability.

Pakistan: The topics encompass discussions about surgical strikes, fake news, nuclear deterrence, government actions, and hybrid warfare.

India: The topics revolve around nuclear threats, surgical strikes, India-Pakistan relations, political discussions, and social media debates.

Israel: Topics encompass nuclear threats, hybrid warfare strategies, fake news, Israel-Iran relations, and Israel's position in regional and international relations.

North Korea: The topics include joint military efforts against threats, nuclear threats, US involvement, nuclear weapons, and Kim Jong Un's role in international relations.

Turkey: The LDA topics for Turkey show discussions revolving around nuclear weapons, tactical threats, and international dynamics.
Italy: The topics for Italy cover discussions about nuclear strikes, hybrid warfare, and international relations.
Belgium: The topics emphasize discussions on nuclear threats, NATO, and developing weapons.
Germany: The topics highlight concerns about nuclear warfare strategies, threats to the country, and its position in international relations, including relations with Russia and NATO.
Netherlands: The emphasize concerns about nuclear weapons capabilities, tactical threats, and the Netherlands' involvement in international dynamics, particularly within NATO.

Social media sentiment analysis of nuclear-equipped nations

Among the 13 key countries, India had the highest positive sentiment score at 0.0129, followed by Pakistan and Russia. North Korea and China also had slight positive sentiment scores.

The United States, Germany, France, Italy, the UK, Belgium, and the Netherlands were close to neutral but leaning positive. Turkey and Israel were the only countries with negative sentiment scores, with Israel the most negative at -0.000674.

In summary:

- → India, Pakistan, and Russia saw the most positive Twitter sentiment.
- → North Korea and China had mildly positive sentiments.
- → Western nations were perceived as mostly neutral.
- → Turkey and Israel had mildly negative Twitter sentiments.
- → Israel had the most negative sentiment overall.

This analysis provides perspective on how these nuclear-powered countries were viewed on Twitter. India, Pakistan, and Russia enjoyed the most positive sentiments, while Israel and Turkey faced more negative associations. Western nations sat closer to neutral. See Table 9.

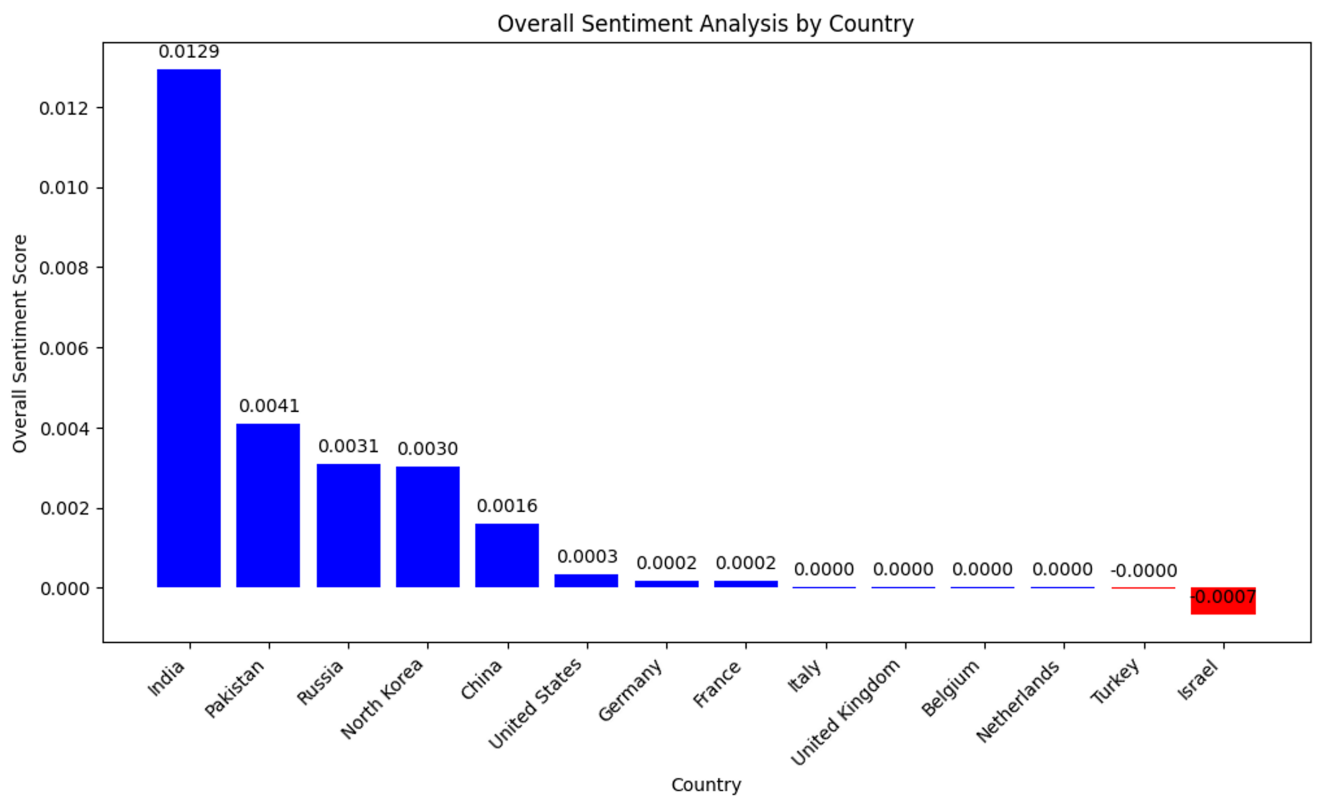


Table 9. Overall sentiment analysis in social media, by country.

RQ2: What topics associations exist concerning integrated nuclear warfare across the data?

Keyword Association

The co-occurrence matrices below illustrate the frequency of term pairs appearing together in a given context, while diagonal elements are set to 0.0 for self-occurrences. Matrices are conducted for each data set (viz. news, blogs, Twitter). These symmetric matrices reveal notable associations between terms. "Nuclear war" frequently co-occurs with "sanctions" (589 times) and "arms race" (349 times), suggesting a strong linkage of nuclear conflict discussions with economic strategies and competitive military advancements. Similarly, "deterrence" is linked to "nuclear war" (221 times) and "sanctions" (150 times), highlighting its role in preventing aggression. Conversely, terms like "NATO" and "information warfare" have limited co-occurrences, indicating standalone topics. The data also reflects sparse interactions between "hypersonic missiles" and "artificial intelligence," implying a less common discourse on their combination than one might expect. In the realm of social media, "deterrence" co-occurs prominently with "nuclear war" and "sanctions," suggesting potential correlations. "Artificial intelligence" and "deterrence" share relevance, while "hypersonic missiles" and "artificial intelligence" show limited discussion. "Cyber warfare" and "information warfare" exhibit convergence, with terms like "NATO" and "banning nuclear weapons" standing more independently.

News Media

Table 10 presented below is a co-occurrence matrix, capturing how often pairs of particular terms appear together within a given context, such as a news article. Its diagonal elements, such as the value for "hypersonic missiles" versus itself, are set to 0.0, which is standard, as it isn't meaningful to count a term's occurrence with itself. Notably, the matrix is symmetric, meaning the frequency of term A with term B is the same as term B with term A. Within this data, the term, "nuclear war" frequently co-occurs with other terms, notably appearing 589 times with "sanctions" and 349 times with "arms race." This suggests that the dataset often connects discussions of nuclear war with "sanctions" and the concept of an "arms race." Likewise, sanctions frequently appear with deterrence and arms race, hinting at their intertwined nature in discussions. On the other hand, terms like "NATO," "banning nuclear weapons," and "information warfare" have sparse co-occurrences, indicating they might be less connected or less frequently discussed with other topics.

Blogs

Most notably, "nuclear war" and "sanctions" have been cited together 92 times, indicating a strong discussion interlinking economic strategies with the threat of nuclear conflict. Similarly, the term "deterrence" prominently intersects with "nuclear war" 221 times, emphasizing the longstanding narrative that the threat of retaliation, especially with nuclear capabilities, is a principal strategy for preventing aggression. Interestingly, the mention of "hypersonic missiles" alongside "artificial intelligence" appears a mere 2 times, suggesting that discussions intertwining these cutting-edge topics are not as common. The terms "arms race" and "nuclear war" co-occur 180 times, highlighting the perception that nuclear capabilities remain a focal point in competitive military advancements. It's also worth noting that some terms, such as "NATO" and "information warfare," have limited co-occurrence with other terms, indicating they might be standalone topics or not as prevalently discussed in conjunction with the other themes in the dataset. See Table 11.

Social Media

At a glance, the term "deterrence" has a strong association with many of the other terms. Specifically, it co-occurs 421 times with "nuclear war" and 150 times with "sanctions," indicating a possible correlation between discussions of deterrence and these two topics. The term "artificial

intelligence" appears alongside "deterrence" 68 times, suggesting that AI's role in modern warfare strategies and discussions on deterrence might be of notable importance. Interestingly, "hypersonic missiles" and "artificial intelligence" are mentioned together in texts only twice, suggesting that, as of this data, their combined strategic importance hasn't been broadly discussed. "Cyber warfare" and "information warfare" display a strong linkage with 12 co-occurrences, perhaps pointing towards convergence in discussions about these emerging warfare domains. Several terms, such as "NATO," "no first use," and "banning nuclear weapons," show fewer connections with others, indicating they might be more standalone topics in the discussed texts. See Table 12.

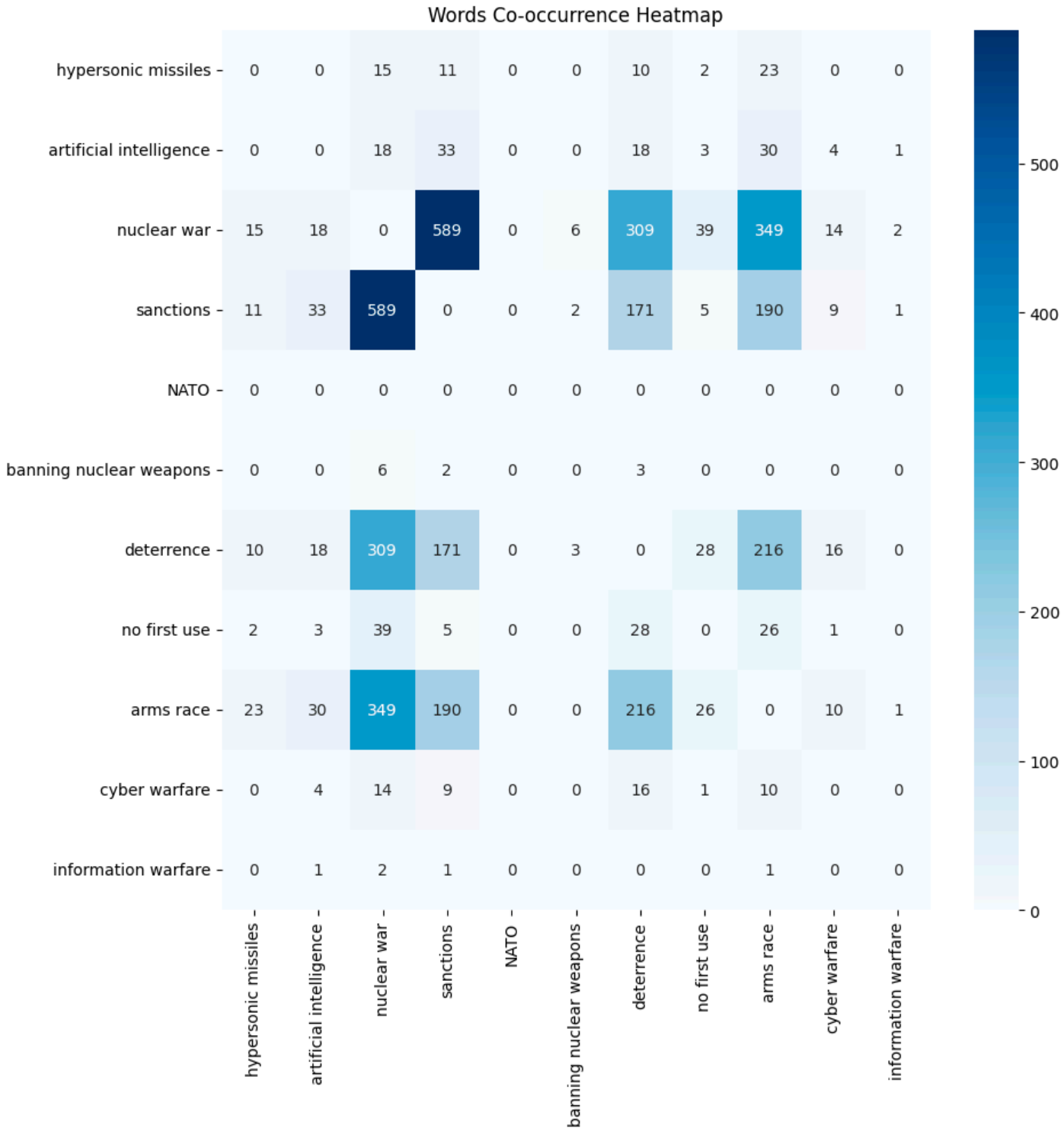


Table 10. News media co-occurrence matrix.

Table 11. Blogs co-occurrence matrix.

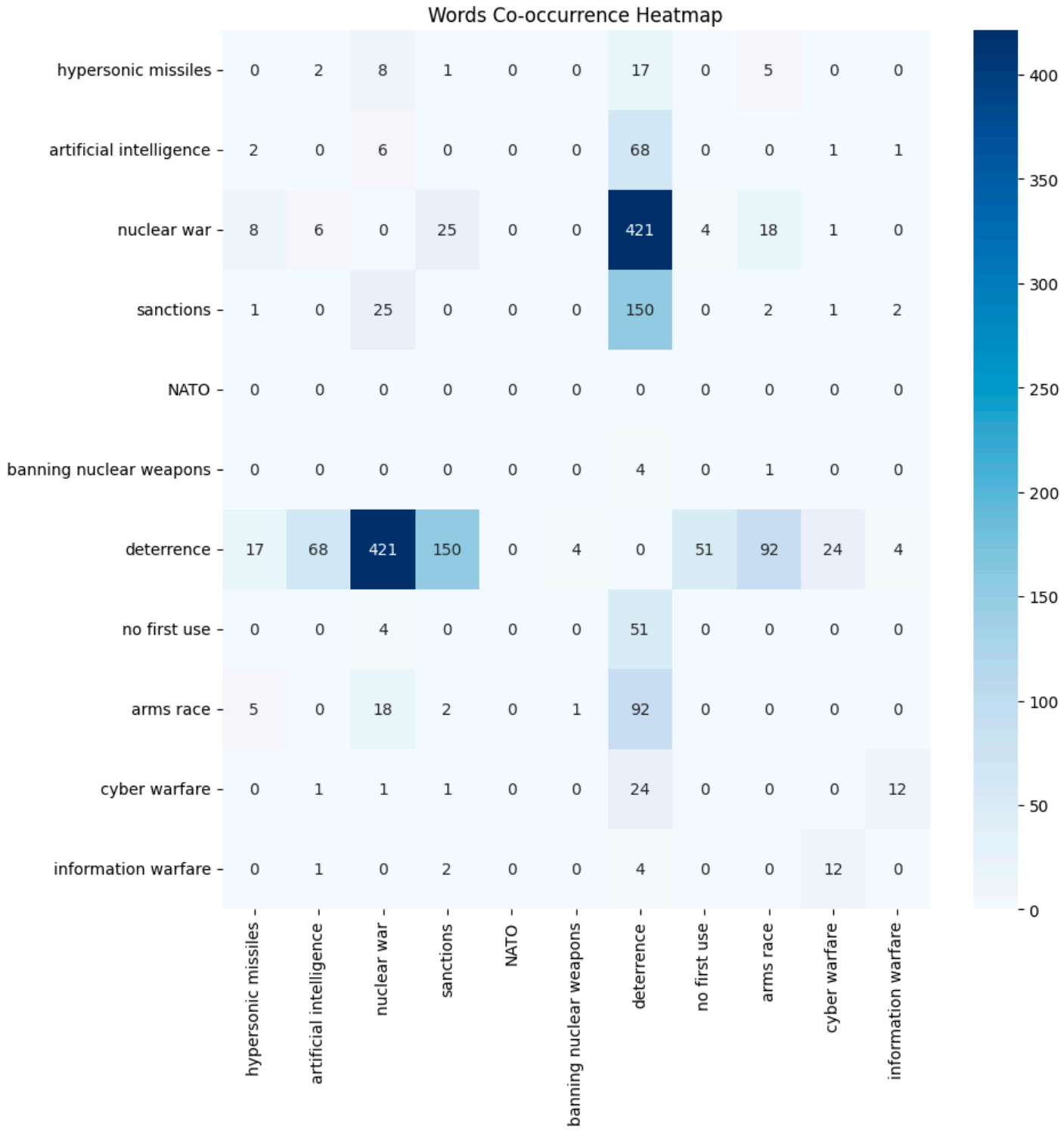


Table 12. Social media co-occurrence matrix.

RQ3: How do news media and arms control experts describe the "meta-crisis" regarding integrated nuclear warfare?

"The world in 2023 faces twin existential crises that have been exacerbated by a global pandemic from which we have yet to fully recover. We are at greater risk of nuclear war than at any time since the Cold War of the 1980s. And the accelerating pace of the climate crisis, driven by carbon emissions from the unchecked burning of fossil fuels, is bringing extreme weather events, agricultural disruption, rising sea levels, and vector-borne diseases to every corner of the world."[viii]

The meta-crisis surrounding integrated nuclear warfare is described as being catalyzed by several key factors:

- → The rise of a multipolar power competition as the Western-led unipolar order gives way to a more complex balance of power. This fuels destabilizing international competition between major powers, exacerbating crises like climate change, inequality, and nuclear proliferation. As one expert stated, "*The world is no longer bipolar. The great powers are in competition with each other.*"[ix]
- → An array of interconnected global challenges including food insecurity, poverty, health disparities, and accelerating climate change. The threat of outright conflict and nuclear exchange could tip this precarious situation into collapse.
- → Increasing use of hybrid warfare tactics such as cyberattacks, disinformation campaigns, and economic coercion that intentionally remain below the threshold of open conflict. This blurs the line between peace and war and risks rapid uncontrolled escalation.
- → Growing "nuclear entanglement" where cyberattacks aimed at conventional military targets and infrastructure could spill over to impact nuclear command and control systems. This introduces dangerous uncertainties and hair-trigger dynamics that could lead to misunderstandings and uncontrolled escalation between nuclear powers.
- → An unraveling of longstanding arms control regimes and erosion of nuclear non-proliferation norms, with major agreements being violated, withdrawn from, or allowed to expire. This loss of guardrails reduces transparency and breeds mistrust between competitors.
- → An absence of trust and good faith dialogue between major powers, exacerbated by the secrecy surrounding new capabilities like cyber and advanced technologies. This impedes diplomatic solutions and increases the chance of miscalculation.

In essence, the meta-crisis emerges from a complex interaction of geopolitical, technological, environmental, and social stresses. The data suggests we are entering an unstable new era characterized by blurred thresholds for conflict, weakened arms control guardrails, and deep mistrust between competing powers. Overcoming these threats likely requires restoring cooperation and shared norms. For illustrative quotes from the data, see Appendix D.

RQ4: How do news media and arms control experts describe global powers' response to the meta-crisis concerning integrated nuclear warfare?

"As Mikhail Gorbachev wrote in 2017, 'it all looks as if the world is preparing for war,' including nuclear war."[x]

A key theme is that major powers are engaged in a new arms race, developing more advanced nuclear weapons and expanding military budgets to alarming new heights.

- → Multiple sources warn of a dangerous new nuclear arms race between the US, Russia, and China as trust declines and technology advances. There are warnings of a potential "new Cold War" emerging.
- → Global military spending hit a record $2.24 trillion in 2022, with over half coming from NATO states. The US nuclear budget alone

is at an all-time high, with plans to spend $2 trillion over 30 years modernizing arsenals.

→ World powers are reported to be building new types of nuclear weapons, like lower-yield and non-ballistic missiles that blur the line between conventional and nuclear conflict. Russia and China are testing hypersonic and undersea delivery systems. The US has deployed new lower-yield submarine warheads.

→ There are concerns these new arsenals make nuclear weapons more "usable" and lower the threshold for escalation. China and Russia view US missile defense advancements as enabling a disarming first strike without concern for retaliatory consequences.

→ North Korea continues nuclear and missile testing despite sanctions, while the US, Russia, and possibly China conduct tests related to nuclear delivery systems. Some suggest the US should resume weapons testing.

Alongside weapons buildup, the use of nuclear threats as coercion has increased, especially by Russia regarding Ukraine. North Korea also issues recurring nuclear threats over joint drills and perceived slights. Threat rhetoric appears more commonplace, signaling dangerous instabilities.

In summary, experts and media depict an extremely troubling situation defined by rising military budgets, new nuclear arms races, eroding norms, and loosened inhibitions on brandishing nuclear threats as tools of policy. This risks fueling miscalculations and uncontrolled escalation absent concerted diplomacy. For illustrative quotes from the data, see Appendix D.

RQ5: How do news media and arms control experts describe how the meta-crisis alters how global powers project nuclear deterrence strategies?

"The aim is to reach any point on the globe within an hour at the least. Of course, this is a new destabilizing factor. Add to this the official US refusal to join the Comprehensive Test Ban Treaty and plans to deploy weapons in outer space. Incidentally, these plans have been announced not only by the Americans but also by the French."[xi]

The evolving meta-crisis characterized by multipolar instability, hybrid threats, and interconnected tensions is fundamentally impacting how major nuclear powers are projecting and adapting their deterrence postures and strategies.

Deterrence erosion and new arms racing

A dominant theme is that the advancement of new technologies like hypersonic delivery systems, growing cyber threats, as well as AI-enabled warfare are compressing decision timeframes, blurring escalation ladders, and eroding traditional notions of deterrence based on capabilities and rationality.

Russia's development of exotic new missiles and China's testing of hypersonic glide vehicles are reactions to perceived reductions in their second-strike capabilities and regional deterrence influence. They aim to regain strategic parity against US missile defense advancements through new deterrence tools.

This action-reaction dynamic is fueling intense arms racing between competitors that perceive their adversaries as gaining advantage across conventional, nuclear, space, and cyber domains. Trust has deteriorated amidst this competition, leading to worst-case thinking. Rising defense budgets reflect this arms buildup.

Doctrinal impacts and risks

Experts worry the emergence of tactical low-yield nuclear weapons, with unclear usage doctrines, lowers the threshold for nuclear escalation in conflicts. Their integration risks making nuclear weapons more "usable" and blurring firebreaks between conventional and nuclear realms.

The proliferation of dual-use and AI technologies also creates escalation risks by compressing decision-making timelines and potentially removing humans

from the loop of retaliatory choices. Cyber threats to nuclear command and control systems exacerbate these uncertainties.

Adaptation and recalibration

To push back against perceived deterrence erosion, Russia and the US are increasingly deploying nuclear-capable assets closer to potential frontlines in Europe and the Pacific as signaling moves. China's opacity about its nuclear posture also sows instability.

The development of counterforce capabilities is seen as potentially enabling disarming strikes. As a result, states feel forced to continually recalibrate their deterrence postures and expand their armament options. This sparks countermoves, fueling arms racing.

Multipolar competition and meta-crisis pressures

Experts assess that the intensifying competition between nuclear powers, absence of arms control guardrails, and interconnected global tensions are exacerbating threat perceptions and encouraging aggressive deterrence posturing that increases instability risks.

Trust and communication channels between competitors have deteriorated amidst the meta-crisis, hampering diplomacy. Returning to more cooperative and shared understandings of deterrence may require resolving these deeper geopolitical strains.

Several other points related to the projection of deterrence strategies emerge in the data:

- → The decision to use nuclear weapons ultimately rests with the President in the US, and once an order is given there are few checks or overrides. This centralized authority raises concerns as new types of arms are developed with unclear usage doctrines.
- → Aside from China's stated no-first-use doctrine, most nuclear powers maintain strategic ambiguity on usage that allows for multiple gray areas based on threat assessments, conventional strike thresholds, and political framing. This ambiguity creates crisis instability and uncertainties.
- → The emergence of new weapons like hypersonic delivery systems and low-yield nuclear warheads is compressing decision timeframes and blurring traditional escalation ladders based on strike impacts. Their increasing deployment risks undermining doctrines of nuclear deterrence.
- → Advanced missile defense and prompt global strike programs by the US, Russia, and China are viewed by adversaries as potentially enabling disarming first nuclear strikes. This perception is fueling arms buildups and changes in deployment postures.
- → Russia's tactical redeployments of nuclear arms to Europe, and new trilateral pacts like AUKUS involving the US and allies, are raising fears of undermined deterrence and triggering countermoves.
- → The proliferation of dual-use technologies and advances in AI pose risks of uncontrolled escalation in crises and even inhuman decision-making regarding nuclear use. Cyber threats to nuclear command and control systems are also a pressing concern.
- → Lingering fears persist among nations like North Korea and Pakistan of advanced powers potentially thwarting their nuclear capabilities through disarming strikes and covert operations.

In summary, the data illustrates how major nuclear powers are engaged in intensifying arms racing and aggressive deterrence posturing in response to perceptions of strategic instability and eroding deterrence, as exemplified by Russia's statement that new US prompt strike capabilities are "destabilizing."

Experts describe an action-reaction cycle fueled by the multipolar competition and pressures of the broader meta-crisis, with nations expanding their nuclear capabilities and recalibrating deterrence strategies due to fears that new technologies like hypersonics and evolving cyber and space threats are compressing decision timelines and undermining

traditional nuclear deterrence. However, analysts warn that this competition and assertive posturing, without new cooperative guardrails, risks greater instability and possible inadvertent escalation. Overall, the data paints a picture of strained nuclear deterrence dynamics amidst the complex pressures of the evolving multi-dimensional meta-crisis environment. For illustrative quotes from the data, see Appendix D.

RQ6: How do news media and arms control experts discuss mitigating future risks of nuclear-integrated warfare within the meta-crisis?

"The greatest urgency to action to prevent any further spread of nuclear weapons. International agreements on this must be our first disarmament priority."[xii]

With the meta-crisis fueling nuclear tensions, experts emphasize the urgent need to pursue risk mitigation measures. But this requires overcoming divisions given breakdowns in cooperation.

Treaty reinforcement and norm setting

Many advocate for reinforcing existing treaties like the NPT and Comprehensive Nuclear-Test-Ban-Treaty (CTBT), plus wider adoption of norms like no-first-use pledges. The universality of these treaties/norms is seen as crucial, but this requires bringing holdouts on board, through incentives and transparency:

"The path to a nuclear-weapons-free world has now been charted by the Treaty on the Prohibition of Nuclear Weapons."[xiii]

New frameworks attuned to new capabilities

Experts argue future arms control arrangements should consider limitations or reductions across different domains (e.g., outer space, cyberspace) and different capabilities (e.g., nuclear delivery vehicles, conventional hypersonic weapons), in a style known as asymmetric arms control. This could involve asymmetric arrangements and automatic treaty expansion. Future arms control arrangements should require stronger, more effective clauses for new kinds of strategic offensive arms that applies to both nuclear and non-nuclear weapons of strategic range and automatically makes new kinds of weapons accountable to the terms of the arrangement.

Multilateral diplomacy and gradual build down

Many advocate for expanded multilateral diplomacy and gradual build-down of arsenals as a pragmatic path forward. Proposals for extending three norms of no first use, no testing, and no new proliferation toward global, public conversation of no use under any circumstances is a goal argued for by arms control experts to reduce the dangers of nuclear entanglement.

Coalition building around shared interests

Some propose using shared interests like technology controls to rebuild unity for non-proliferation. The evolving threat of nuclear war and technology proliferation coupled with the lack of meaningfully matched responses to these threats should prompt consideration of how to ensure export control policies are not exploited by actors with ill intent.

Confidence building and crisis management

Finally, bilateral risk reduction measures like hotlines are endorsed to manage crises:

"*Given the breadth of capabilities and concerns on the table, arms control must encompass a broad range of initiatives, including not only traditional legally binding treaties but also risk reduction, crisis management, and confidence-building measures, such as establishing hotlines between high-brass military officials*."[xiv]

In summary, experts acknowledge the urgent need for pragmatic nuclear risk mitigation strategies given the erosions of cooperation amidst the meta-crisis. But divisions pose immense challenges for collective action.

Proposed Mitigation Approaches

- → Reinforcing and expanding adoption of existing arms control treaties like the NPT, and CTBT and norms like no-first-use pledges. Achieving universality is crucial but faces obstacles like holdouts resistant to transparency. Some argue a new comprehensive treaty is needed covering emerging capabilities.
- → Crafting flexible frameworks attuned to new technological capabilities like cyber, space, and AI weapons that interact with the nuclear domain. Limitations and automatic expansion clauses are proposed. But verification and definitional hurdles for these asymmetric arrangements exist.
- → Pursuing gradual multilateral reductions through built-down models to avoid past ratio-based disputes. But momentum is lacking as nations modernize arsenals, and talks are disrupted.
- → Forging united fronts around shared interests like export controls on sensitive technologies to control proliferation risks. This could rebuild cooperation momentum but consensus is difficult currently.
- → Bilateral confidence-building and crisis management to reduce risks of inadvertent escalation. But deep mistrust between competitors impedes meaningful progress currently.
- → Promoting transparency and communication to shape public opinion and enable verification. But secrecy mindsets around nuclear postures persist, obscuring intentions.

In the context of multi-polar tensions, experts propose a variety of pragmatic nuclear risk mitigation strategies, from norm-setting to crisis management. But collective action is extremely difficult currently given eroded cooperation and persistent divisions. Bridging these divides is essential but hugely challenging. The feasibility of proposed mitigation measures remains uncertain absent renewed commitment to shared interests and reducing tensions. For illustrative quotes from the data, see Appendix D.

CHAPTER 4 | CONCLUSIONS

The analysis shows that recent discussions about integrated nuclear warfare exhibit a pronounced negative trend exceeding expected levels of pessimism. The discussions are emotionally charged, displaying both optimistic and pessimistic viewpoints, with limited neutral expressions. China and the US dominate news and arms control blogs, while India and Pakistan feature prominently in Twitter conversations on hybrid warfare. Ukraine's prominence across platforms underscores fears of nuclear catastrophe due to Russia's aggressions. Most nations receive consistently positive coverage for their efforts related to nuclear-integrated warfare. This favorable depiction of nations dealing with issues of integrated warfare suggests well-received efforts in navigating evolving security complexities. Distinct concerns about nuclear weapons emerge for different countries, with Russia, the US, and China considering broader international factors, and India, Israel, and Pakistan focusing on regional dynamics. This complex landscape reflects the intertwined nature of crises and the evolving dynamics of power competition, hybrid warfare, and international norms erosion.

Across news, blogs, and Twitter data, symmetric matrices reveal significant associations between terms. “Nuclear war” often co-occurs with “sanctions” and “arms race”, linking conflict discussions to economic and military strategies. “Deterrence” links to “nuclear war” and “sanctions”, highlighting its aggression-prevention role. “NATO” and “information warfare” have limited co-occurrences, indicating standalone themes. “Hypersonic missiles” and “artificial intelligence” interactions are sparse, contrasting expectations. In social media, “deterrence” prominently co-occurs with “nuclear war” and “sanctions,” suggesting correlations. “Artificial intelligence” and “deterrence” are relevant, while “hypersonic missiles” and “AI” have minimal discussion. “Cyber warfare” and “information warfare” converge, while “NATO” and “banning nuclear weapons” stand independently.

The qualitative data shows a multifaceted crisis landscape coinciding with a shift towards multipolar power competition. This meta-crisis emerges from technological and political transitions associated with Western ideologies, simultaneously spawning both advancements and serious global threats. The sentiment highlights the dichotomy of Western liberalism, which fosters achievements like democracy and advanced technology, yet also fuels pressing issues like inequality, climate change, and nuclear proliferation.

Within this framework, the intensifying multipolar power competition shapes the global landscape. The discourse underscores the degradation of international norms and the hastening of global challenges, including nuclear arms control. Rising power competition, marked by transitioning to a multipolar world order, is a pivotal destabilizing

factor. This evolving landscape draws attention to the dynamics of global disparities in areas such as food security, climate change, and poverty, revealing their interconnectedness with the rise of multipolar power competition.

Moreover, hybrid warfare emerges as a pivotal concern in this era of competition. Enabled by technological and economic interconnectivity, it encompasses strategies below the threshold of outright conflict, disrupting operations and eroding morale. This includes the growing realm of cyber warfare, which targets military systems, energy grids, and even nuclear command and control structures. The blurring of lines between conventional and hybrid warfare introduces the concept of "nuclear entanglement," where cyber incursions could trigger uncontrollable nuclear escalation.

Compounding these challenges, trust between major global powers erodes, attributed to distorted attributions and overestimations. This lack of trust hinders arms control efforts and contributes to the erosion of international norms. Major arms treaties have been abandoned or violated, and the lack of agreement on strategic stability exacerbates existing concerns.

The analysis underscores the intertwined nature of multiple crises, ranging from power competition to hybrid warfare and the erosion of international norms. This complex landscape necessitates a multifaceted approach, as the challenges emanate from a confluence of technological advancements, shifting ideologies, and geopolitical maneuvers.

A new arms race is underway, marked by the development of more sophisticated weapons of mass destruction, including nuclear weapons. This resurgence in weapons-building is closely tied to advancements in technology and a lack of trust among major powers whose interests are perceived as conflicting. Nations like Russia and China are working on new generations of nuclear weaponry, each with unique capabilities. Russia's efforts include the development of large missiles with miniaturized warheads and an underwater drone designed to spread radioactive contamination. China, on the other hand, is testing hypersonic glide vehicles that maneuver at high speeds, rendering missile defenses largely ineffective. This arms race is further fueled by substantial increases in global military budgets, which have reached record highs.

The proliferation of these new weapons raises concerns about thresholds for nuclear warfare escalation. Low-yield, non-ballistic nuclear weapons are being developed, blurring the line between conventional and nuclear forces. The risk of more fantastical weapons, such as those with hypersonic speeds and enhanced evasion capabilities, is also increasing. Amidst this, overt nuclear threats have become more frequent in international rhetoric, with leaders like Vladimir Putin and North Korea's Kim Jong Un using bold language to signal their willingness to escalate tensions. The growing frequency of nuclear threats reflects broader fears and instabilities that could potentially lead to nuclear weapon use. Moreover, the erosion of arms control architecture and the absence of international disarmament dialogues are contributing to the dangerous escalation of these tensions.

The use of nuclear weapons, escalation ladders, and nuclear frameworks of war involves complex considerations within various countries' strategies and policies. During the Cold War era and beyond, the decision to use nuclear weapons in the US has primarily been a political decision made by the President, with limited checks to undermine such an order once given. China stands out as a country with a "no first use" nuclear policy, pledging not to initiate the use of nuclear weapons. China publicly maintains a defensive posture and emphasizes nuclear disarmament.

However, other nuclear-powered nations, such as Russia and the US, have more ambiguous usage considerations that involve evaluating conventional strike thresholds, the potential for first strikes, and political framing. The development of new technologies like hypersonic weapons and low-yield nuclear weapons is challenging established deterrence strategies and compressing decision-making timeframes in crises.

Tensions between nations like India and Pakistan, as well as the involvement of regional alliances like AUKUS (Australia, UK, US), have added complexity to nuclear deterrence strategies. There are concerns about the potential for arms races, proliferation, and the destabilizing effects of artificial intelligence on nuclear strategies. Moreover, the integration of AI into military decision-making and cyber capabilities has raised the potential for new risks and unforeseen consequences in nuclear conflict scenarios.

Thwarting nuclear capabilities through infrastructure attacks or surgical strikes is a growing concern, and nations like Pakistan and North Korea have expressed worries about their adversaries' potential to disrupt their nuclear capabilities.

The international system has been unable to address the increasing risks posed by the arms race and nuclear weapon enhancements among nuclear weapon states. The unraveling of international norms and the degradation of global conditions are seen as symptoms of the absence of a regulatory body capable of limiting integrated nuclear warfare. Despite the existence of disarmament organizations, their inability to translate public opinion into government action is noted. This inattention is attributed partly to the broader meta-crisis context, with other global issues such as climate change, terrorism, and economic inequality taking precedence.

Challenging the demon of Moloch and achieving arms control is complex. Especially, given the lack of compliance with existing treaties such as the non-compliance of nuclear-armed states with the UN Treaty on the Prohibition of Nuclear Weapons. However, there are pathways offered in the data. The need for a comprehensive treaty to address emerging capabilities is seen as important, as is transparency and public support of nuclear disarmament efforts.

The concept of transparency in the nuclear domain is examined, emphasizing the need for clear communication about the consequences of nuclear weapons. The data suggests that greater transparency can build trust and facilitate more international cooperation.

Various mitigation approaches are mentioned including flexible frameworks attuned to new technological capabilities like cyber, space, and AI weapons that interact with the nuclear domain as well as bilateral confidence building.

Overall, the analysis underscores the urgent need for a coordinated international response to address the risks of nuclear proliferation and the ongoing arms race, emphasizing the importance of transparency, public support, and cooperation among nations.

In closing, the analysis reveals an increasingly dangerous landscape characterized by an intensifying nuclear arms race and erosion of cooperative norms amidst the meta-crisis. This complex threat environment echoes the mythical battle between the Children of Danu and the forces of darkness. In Celtic mythology, the Children of Danu of the Exalted Brigid and the Good God Dagda, despite being the epitome of light, truth, and justice were nevertheless equipped with treasured weapons in their four prosperous cities. In the mythical city of Falias was a sacred stone called the Lia Fáil or "Stone of Destiny," which would sing when stepped upon by a righteous ruler. In Gorias, the Children of Danu held a mighty sword called the "Retaliator" which was fashioned before even the time of the gods. In Finias, there was a magical spear named the "Red Javelin" which could strike down any enemy, no matter where, once cast. And in Murias, there was the "Cauldron of Plenty," from which entire nations could feed from and yet never fully deplete.[xv]

Much like the magical treasures of the four cities gave the Children of Danu abilities to determine truth, defend against aggression, target threats, and sustain abundance, we too must cultivate tools to address the metastasizing risks of nuclear conflict. The breakdown of arms control regimes has severely weakened defenses against proliferation. To fortify deterrence, we must renew mechanisms enabling verification and build-down of arsenals. Like the singing Stone of Destiny, robust transparency can

help distinguish truth from deception in signaling. Confidence-building measures can also affirm peaceful intentions.

Hybrid warfare and cyber-nuclear entanglement risk uncontrolled escalation. Here the Red Javelin's capacity for calibrated response is instructive - enhanced decision-making capabilities and clarified escalation thresholds can prevent reckless nuclear use. Crisis communication channels likewise facilitate targeted de-escalation.

While competition is inexorable, the Cauldron of Plenty demonstrates that self-reinforcing cycles of suspicion can be escaped through interdependence. Rebuilding unity around shared interests may temper zero-sum mentalities. A comprehensive treaty addressing new technologies could institutionalize this cooperation.

In a complex world, integrated strategies are essential. The Retaliator Sword conferred protection only when united with the other treasures, not in isolation. Similarly, balancing deterrence with arms control and collaborative problem-solving is key for security. By learning from myths and history, we can cultivate insight into the instruments needed to wisely navigate nuclear risks, rewarding light over darkness. But this requires reforging fractured bonds and affirming our collective duty to protect humanity's shared future.

"Between now and 2040 technological innovation in open societies will lead to economic growth, which will enable solutions to domestic problems, build public confidence, reduce vulnerabilities and establish an attractive model for emulation by others. Transparency is both a precondition and a consequence of this process…Open, democratic systems proved better able to foster scientific research and technological innovation, catalyzing an economic boom. Strong economic growth, in turn, enabled democracies to meet many domestic needs, address global challenges, and counter rivals." [xvi]

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APPENDIX A | EXPANDED METHODOLOGY

News Media Sources by Nation

China (*China Daily*)
France (*Agence France Presse*)
Germany (*Spiegel Online International, Deutsche Welle, Handelsblatt Global, Die Welt*)
India (*The Times of India*)
Israel (*The Times of Israel, Israel Defense, Haaretz*)
Italy (*24 Ore Raiocor, ANSA*)
Netherlands (*NL Times*)
Pakistan (*Pakistan Observer, Dawn*)
Russia (*Russian Government News*)
Turkey (*Cihan News Agency*, *Anadolu Agency*)
United Kingdom (*The Sunday Times, The Times*)
United States (*The New York Times*)

Blog Sources

The study sourced sixteen of the most viewed and subscribed to online microsites and blogs on the topic of arms control, according to feedly.com. We collected all posts (*n* = 6,492) from these sites using a Python module, *Selenium*. The average number of posts per blog was 405. The site's titles, number of analyzed posts (n) and qualitative sample representation (qual. smpl) are below. Of the 6,492 posts, 209 were selectively sampled for qualitative analyses. Special attention was paid in selection of posts to discussions relevant to integrated nuclear deterrence.

Center for Arms Control and Non-Proliferation (n=559, qual. smpl=22)
Arms Control Wonk (n=157, qual. smpl=10)
Arms Control Association (n=96, qual. smpl=10)
Arms Control Law (n=465, qual. smpl=5)
Brookings Topics-Arms Control (n=317, qual. smpl=15)
The Equation (n=392, qual. smpl=8)
Rand Corporation- the Rand Blog (n=232, qual. smpl=16)
IPPNW Peace and Health Blog (n=541, qual. smpl=18)
Federation of American Scientists (n=1460, qual. smpl=15)
Restricted Data (n=155, qual. smpl=10)
Russian Strategic Nuclear Forces (n=446, qual. smpl=15)
Nuclear Diner (n=783, qual. smpl=22)
the Trench (n=202, qual. smpl=10)
Institute for Science and International Security (n=511, qual. smpl=17)
International Panel on Fissile Materials (n=58, qual. smpl=5)
Defusing the Nuclear Threat (n=118, qual. smpl=11)

Analytical Approaches

Topic Analysis

Latent Dirichlet Allocation (LDA) modeling was used to figure out key message topics during a particular period from each medium (viz., news source, blog, Twitter). LDA is a Bayesian probabilistic model often used in natural language processing to extract the main topics from a document or a collection of documents. LDA assumes that a collection of documents or messages consists of several topics. Each topic is characterized by a distribution of words, i.e., it assumes that certain words are more likely to appear in documents about that topic. A simplified process of LDA was as follows:

1. We chose ten topics (k = 10), which means the machine learning model generates 10 topics from the analysis.
2. For each document, LDA randomly assigned each word to one of the ten topics. This gives an initial topic assignment and can be thought of as the model's initial guesses for the topic of each word.
3. It then begins to iterate and refine these guesses, for each word in each collection, based on:
4. How prevalent is that topic in the document? (Are there many words assigned to this topic in the document?)
5. How prevalent are those words under this topic overall? (Are there many documents that assign this word to this topic?)
6. The model went through multiple iterations, potentially reassigning each word to a different topic based on the information from the previous step.
7. The model eventually reached a steady state where the topic assignment no longer changed. At this point, we gain this assignment as the algorithm's output.

Through the above process, data was interpreted in topics. The topic order of each period (2013-2015, 2016-2020, or 2021-2023) does not indicate the importance of each topic because the LDA model is based on the probability distribution model (the "bag of words" model).

Sentiment Analysis

Sentiment analysis involves natural language processing, text analysis, and computational linguistics to determine and extract subjective information from source materials. Simply put, it's the process of determining the attitude or emotion of a writer concerning some topic or the overall contextual polarity of a document. The unit of analysis was a tweet for the Twitter data, a blog post for the blog data, and a news article for the news data. Typically, the outcome of sentiment analysis is scored, meaning the higher scores indicate more positive sentiment. Also, the scored outcomes are frequently categorized into positive, negative, and neutral groups. For example, positive sentiment means the message (viz., tweet, blog post, and news article) expresses positive emotion (e.g., "I love this product."), negative sentiment means the message expresses negative emotion (e.g., "This is the worst movie I've ever seen."), and neutral sentiment means neither positive nor negative expressions (e.g., "It's a car with four doors.").

In this project, we used sentiment analysis to meet two goals: to examine the emotional opinions of each media and to compare key countries related to nuclear weapons regarding the sentiment of the messages describing the countries.

For the first goal, we used the Natural Language Toolkit (NLTK), which is a popular library in Python that provides tools for working with human language data (text). The reasons that NLTK was adopted were two. First,

NLTK includes VADER (Valence Aware Dictionary and sEntiment Reasoner), a lexicon and rule-based sentiment analysis tool specifically designed for texts from social media (blog posts and tweets). Second, NLTK classifies a text as having positive, negative, or neutral sentiment and provides a composite score to gauge the intensity of sentiment.

For the second goal, we used *TextBlob*, a popular Python library for processing textual data. Unlike NLTK, TextBlob is a machine-learning method using a pre-trained classification model, so it is useful for quick and basic sentiment evaluations. Also, TextBlob provides a polarity score which is a float within the range from -1.0 to 1.0. This outcome shape is great for comparing outcomes but not for determining negative, positive, and neutral sentiment status.

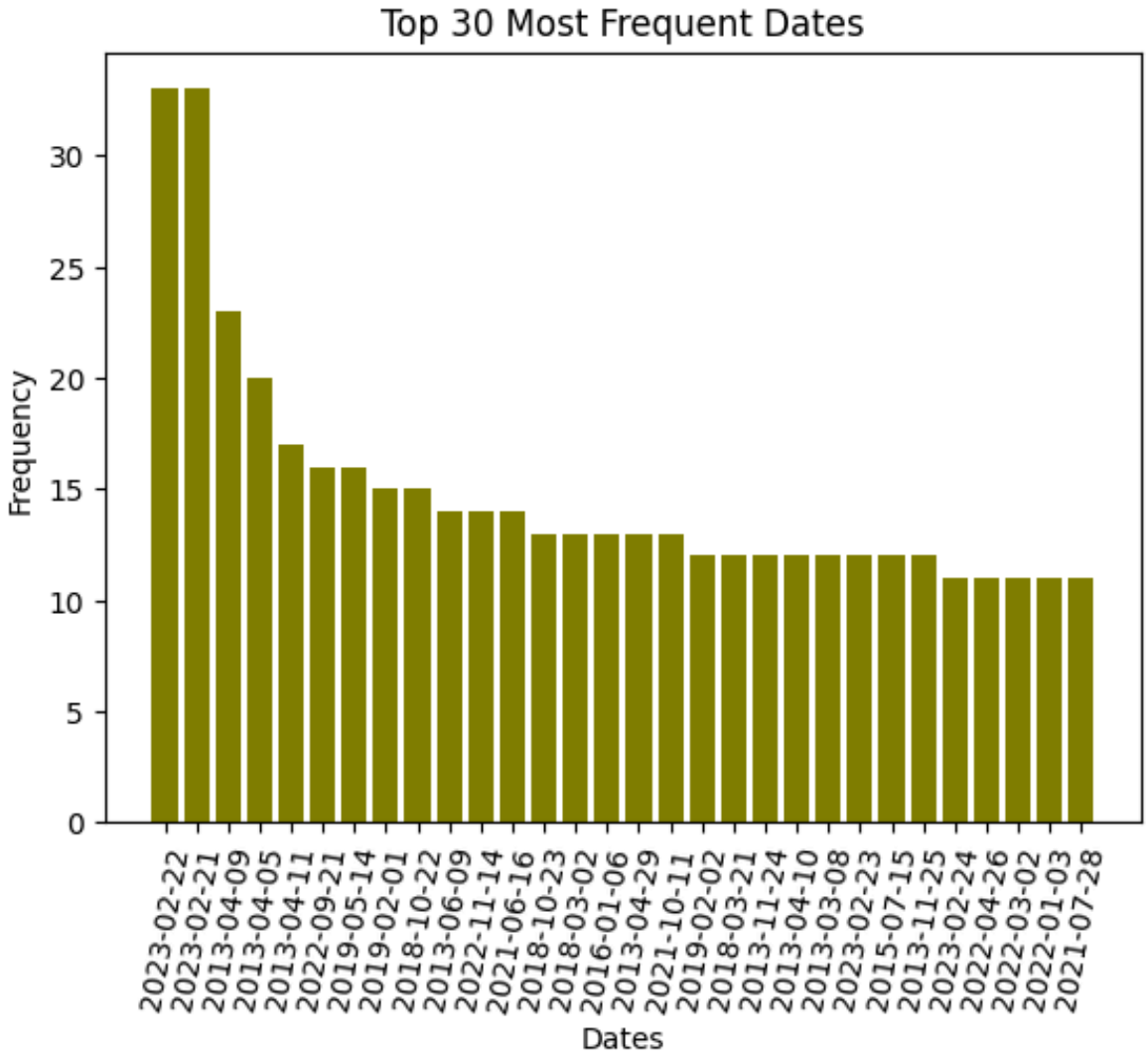
Keyword Association

To examine the associations of words, we built a co-occurrence matrix. In Natural Language Processing (NLP), a co-occurrence matrix is a representation that captures the frequency with which pairs of words (or terms) appear together in a given dataset, often within a specified context window. We counted the frequencies when the given words appeared in the same document.

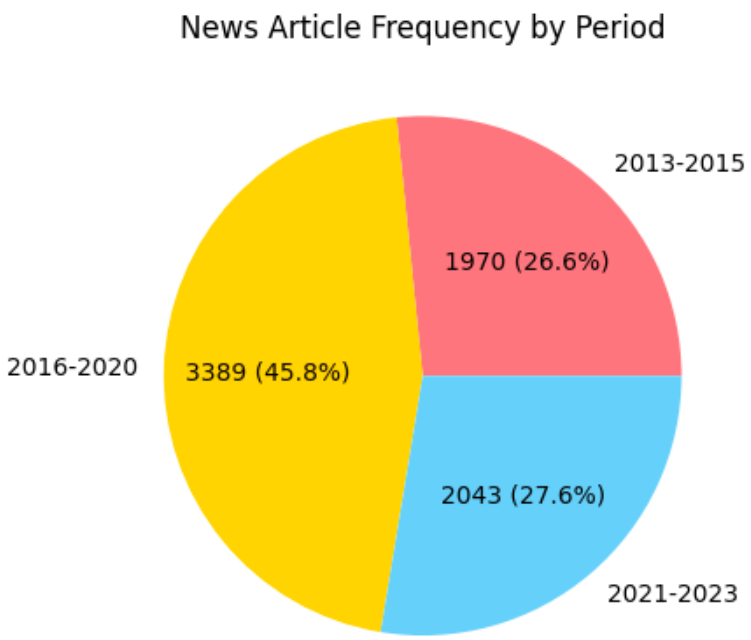
APPENDIX B | EXPANDED DESCRIPTIVES

News Media

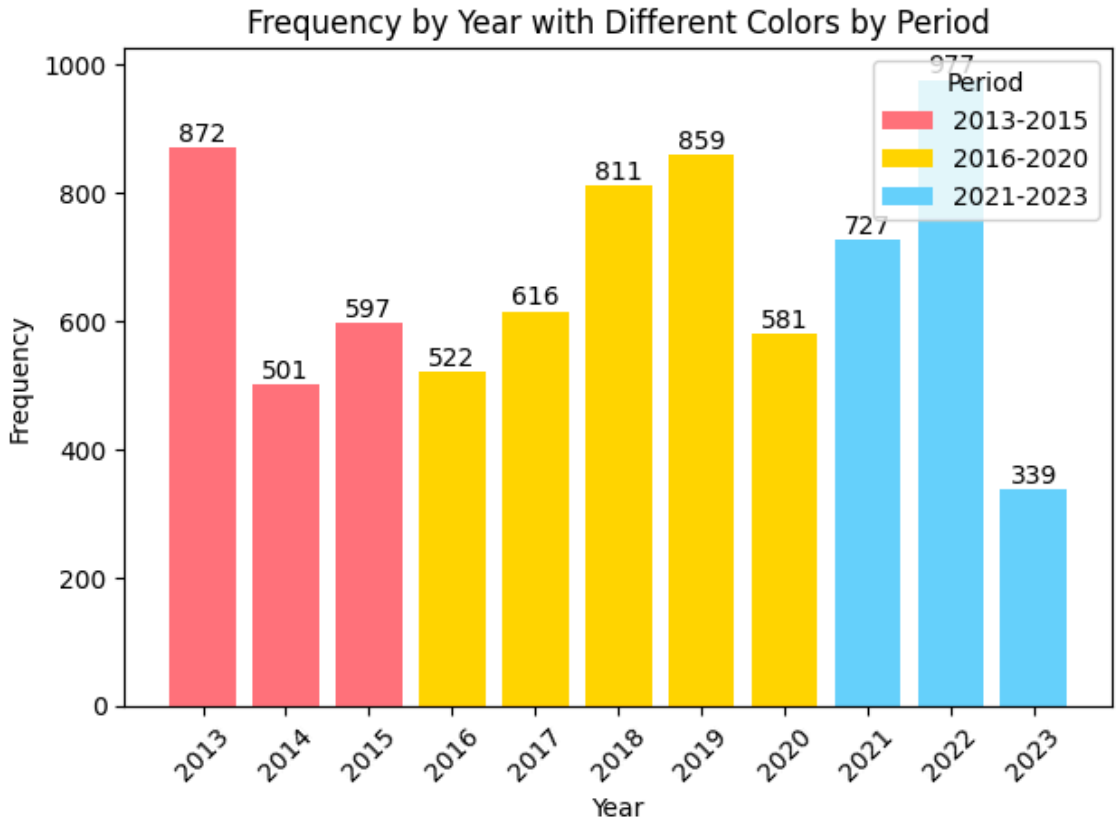
The date on which the news articles were published was February 22, 2023 (*n* = 33) and February 21, 2023 (*n* = 33), followed by April 9, 2013 (*n* = 23), April 5, 2013 (*n* = 20), April 11, 2013 (*n* = 17), September 21, 2022 (*n* = 16), and May 14, 2019 (*n* = 16). The following plot shows the top 30 most frequent dates.



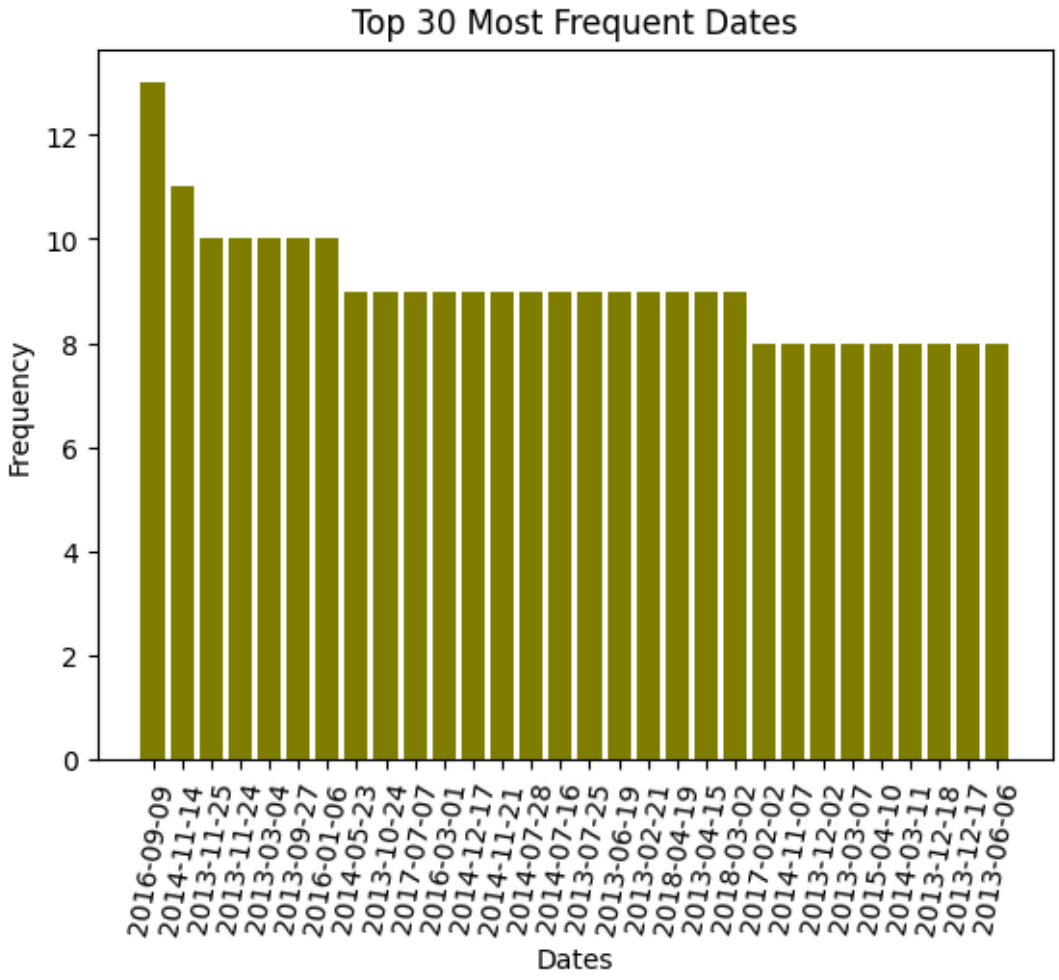
The number of news articles in 2016-2020 was the most (*n* = 3,389, 45.8%) among the three periods. Second was 2021-2023 (*n* = 2,043, 27.6%). The pie chart below shows the proportion of news articles by period.



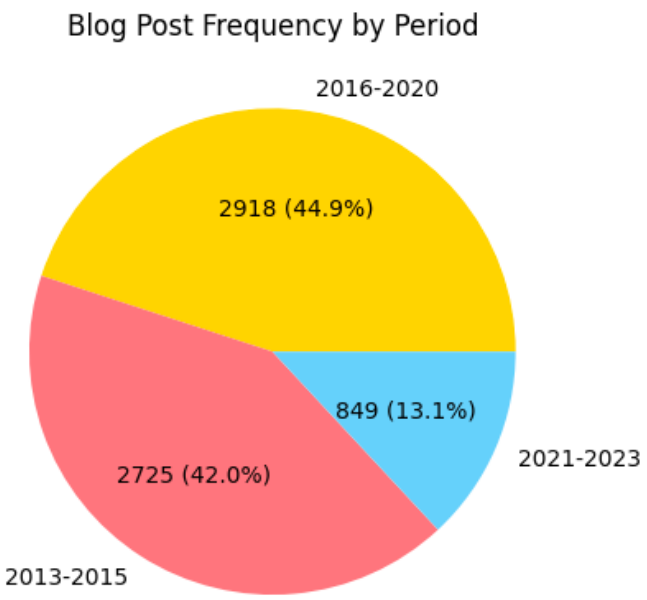
We conducted a regression analysis to analyze news article frequency trends. However, articles were not significantly increased or decreased over the years. We also conducted a time series analysis (Autoregressive integrated moving average (ARIMA) model) to predict the number of news articles. The ARIMA model predicted 915 in 2023 and 930 in 2024. The following plot shows the number of articles each year during 2013-2023.



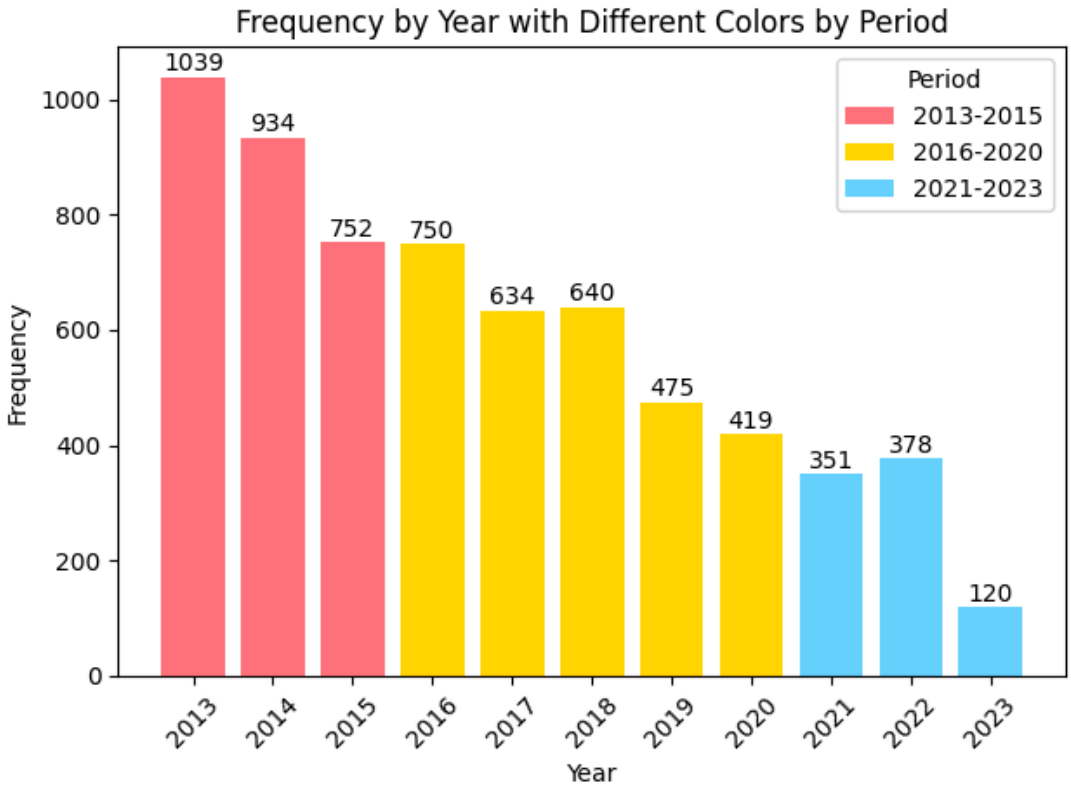
Overall periods, the date on which the most blog posts were published was September 9, 2016 (*n* = 13), followed by November 14, 2014 (*n* = 11), November 25, 2013 (n = 10), November 24, 2013 (n = 10), March 4, 2013 (*n* = 10), September 27, 2013 (*n* = 10), and January 6, 2016 (*n* = 10). The following plot shows the top 30 most frequent dates.



Period 2 (2016-2020) involved the most blog posts (*n* = 2918, 44.9%), followed by Period 1 (2013-2015; *n* = 2725, 42.0%). The pie chart below shows the proportion of blog posts by period.

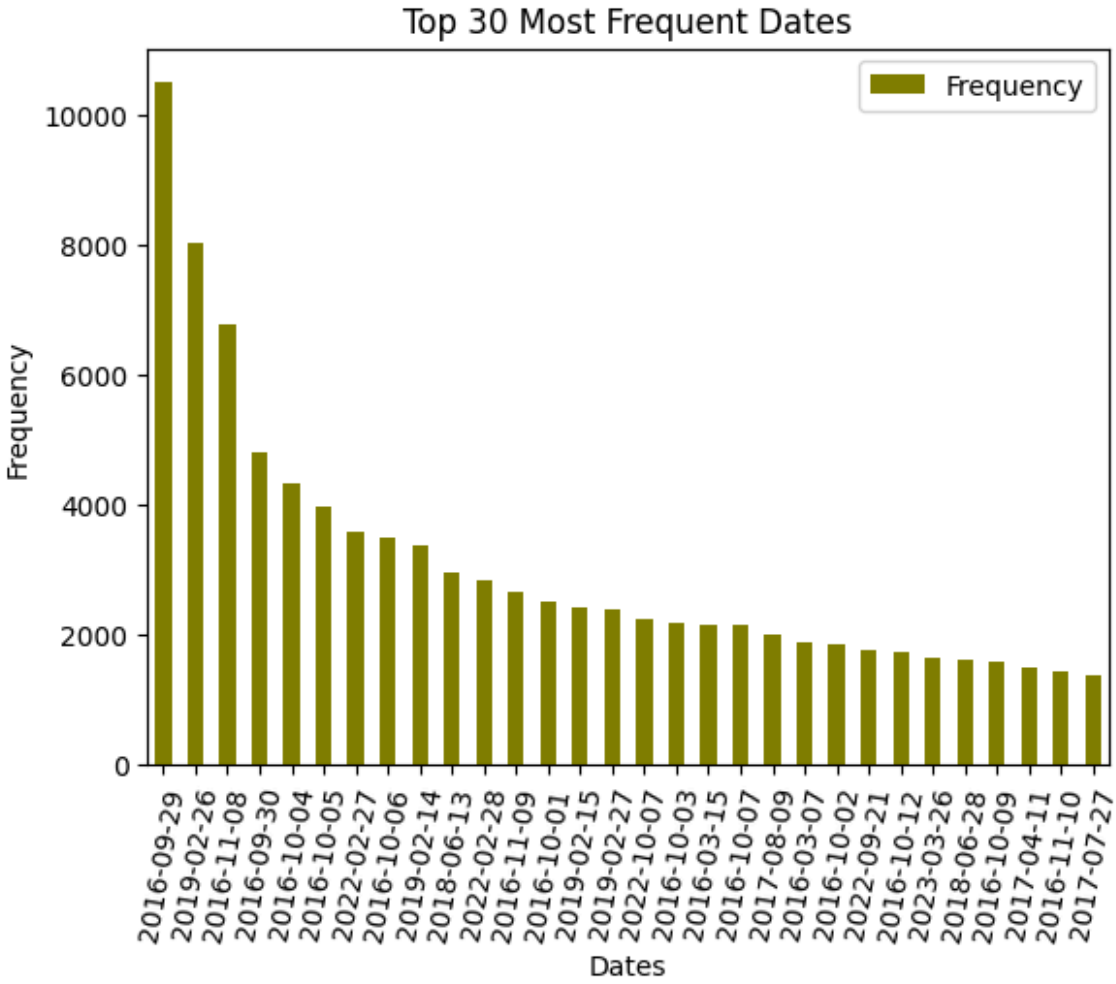


The number of posts published each year tends to be decreasing. We conducted a linear regression analysis to predict the number of blog posts based on the year. The predictor was the year (from 2013 to 2022), and the dependent variable was the number of blog posts. The results of the regression indicated that the predictor explained 95.2% of the variance ($R^2 = 0.952$, $F(1, 8) = 158.7$, $p < 0.001$). It was found that the year significantly predicted the number of articles ($\beta = -75.8$, $t = -12.6$, $p < 0.001$). The regression model predicts the number of blog posts from 2023 to 2025 as 220, 144, and 68, respectively. The following bar chart shows the number of blog posts each year.



Social Media

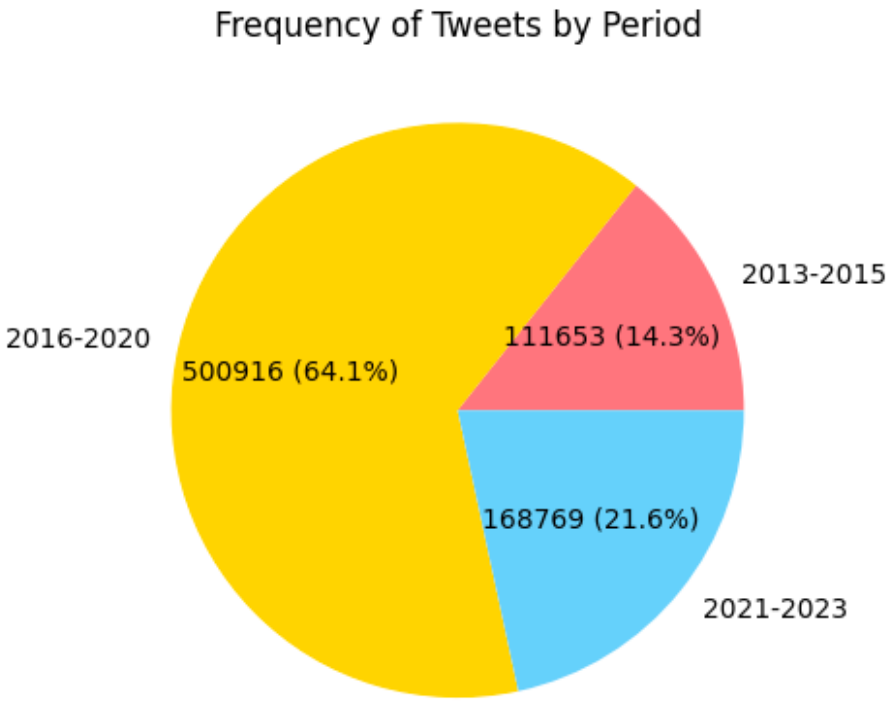
The most frequent date in the data was September 29, 2016 (*n* = 10,489), followed by February 26, 2019 (*n* = 8,026), November 8, 2016 (*n* = 6,759), September 30, 2016 (*n* = 4,796), and October 4, 2016 (*n* = 4,314). The following plot indicates the top 30 frequent dates.



The three tweets which got the most likes are listed below.

1. https://twitter.com/mehdirhasan/status/1324489154286231552 (76K likes)
2. https://twitter.com/amanpour/status/1629168856840417280 (41.5K likes)
3. https://twitter.com/kamalaharris/status/1145368179864231936 (39.9K likes)

In 2016-2020, 64.1% of tweets (n = 500,916) were created, 21.6% were in 2021-2023, and 14.3% were in 2013-2015. The pie chart below shows the proportion of blog posts by period.



Only during 2016-2020 the number of tweets tended to decrease (R^2 = 0.868, $F(1, 3)$ = 19.80, $p < 0.05$), but during the overall years, the changes were not significant. ARIMA model predicts the number of tweets will be 105,265 in 2023 and 105,403 in 2024.

APPENDIX C | EXPANDED TOPIC MODELING

Topic Analysis

We analyzed the key 10 topics on news media, blogs, and social media during each analytical period using the Latent Dirichlet Allocation (LDA) model. Note that the order of the topics does not mean the importance of the topic compared to others.

News Media

Summary

The discussions about nuclear disarmament have evolved significantly, with different nations and events taking the spotlight.

→ During 2013-2015, Iran's nuclear program was a dominant theme, along with North Korea and China. This was the period of significant negotiations and discussions that led to the 2015 Iran nuclear deal, known as the Joint Comprehensive Plan of Action (JCPOA). The role of the Obama administration in these talks and the subsequent deal also figured prominently in discussions.

→ During 2016-2020, a major shift in discourse with the entry of the Trump administration, its withdrawal from the JCPOA, increased tensions with North Korea, and its negotiations with Kim Jong-un. Also significant during this time was Russia, with concerns about its adherence to nuclear treaties and China's expanding role in global geopolitics. This period also marked a rise in discussions about India, Pakistan, and the conflict over Kashmir.

→ During 2021-2023, China became even more prominent, possibly due to its growing economic and military strength and the shifting balance of power in the Pacific. Russia, Iran, and Israel remained significant subjects, reflecting ongoing concerns about nuclear programs and regional stability. Newer topics included the AUKUS pact between Australia, the UK, and the US and increased focus on technological factors, with AI and advanced systems becoming part of the conversation.

2013-2015

Topic 1: Iran's nuclear deal and its relations with China, and possibly Obama's administration's role in these discussions.
Topic 2: North Korea, possibly its nuclear stance and relationships with South Korea, Israel, Russia, and China.
Topic 3: Missile technologies about Iran, Russia, North Korea, and possibly Obama's administration.
Topic 4: Nuclear discussions involving Iran, Obama's administration, China, North Korea, Pakistan, and India.
Topic 5: Nuclear discussions involving Pakistan and India, possibly their rivalry, with mentions of Iran, Russia, and China.
Topic 6: Iran and North Korea's nuclear activities and possibly China's stance.
Topic 7: Nuclear deal with Iran, its relations with China, Russia, North Korea, and possibly the impacts of American sanctions on Iran.
Topic 8: Iran's nuclear deal, its impact on foreign relations, and possibly Israel's stance.

Topic 9: North Korea, Iran, and Russia's armament, and possibly mentions of Agence France-Presse's (AFP) news about them.
Topic 10: Sanctions on North Korea and Iran, possibly their impacts on foreign relations, and the role of China.

2016-2020

Topic 1: China's role in the nuclear discussions, including the involvement of Russia, governmental policies, and treaties.
Topic 2: President Trump, Iran, North Korea, and various treaties and deals.
Topic 3: Iran and Russia's role in the nuclear discussions, including the impacts of agreements, sanctions, and the UN's involvement.
Topic 4: China's role in the development and use of missile systems and strategic forces in a global context.
Topic 5: Pakistan's role in the nuclear discussions, focusing on India and the Kashmir issue.
Topic 6: Various treaties, specifically relating to China, Russia, and the US (Trump and Biden). The role of Putin and Moscow may also be a key element.
Topic 7: Various treaties and agreements, specifically the Intermediate-Range Nuclear Forces (INF) Treaty, possibly about European countries, Iran, Russia, the US (Trump), and China.
Topic 8: North Korea, specifically discussions involving Trump, missile development, Kim Jong-un, and China's role in these discussions.
Topic 9: Trump's administration and its policies towards India, Pakistan, Iran, and China.
Topic 10: Trump's foreign policies, potentially discussing American attitudes, Israel, Iran, and other related topics.

2021-2023

Topic 1: China's role in global politics, possibly involving NATO, treaties, and the words of officials like Putin. The role of different agencies is also highlighted.
Topic 2: China's influence on regional dynamics, possibly involving Israel, Iran, and the AUKUS pact between Australia, the UK, and the US. There could be discussions of threats and peace in the region.
Topic 3: Diplomatic relationships and negotiations involving Iran, the UN, and the EU, possibly with Moscow playing a key role. It could discuss Iran's nuclear program, specifically its heavy water component.
Topic 4: Technology, possibly involving AI, and its potential use in China and elsewhere.
Topic 5: Israel and the Palestinian territories, with potential discussions on technology and space systems.
Topic 6: Missile tests and technology, potentially involving Putin and other officials. There could be speculation ("think") about potential developments.
Topic 7: China and North Korea and discussions about nuclear arsenals.
Topic 8: Korean peninsula, likely discussing North and South Korea's relations and possibly the Biden administration's regional policy.
Topic 9: Technology and future trends. The use of words like "think," "way," "want," "going," "around," and "lot" suggest broad speculative discussions or analysis.
Topic 10: NATO's role in global conflicts, potentially involving Pakistan, Iran, Israel, Ukraine, and Biden's administration.

Blogs

Summary

The three periods share some common themes, such as discussions about Iran's nuclear activities, missile-related issues, and the role of major world powers like the US, Russia, and China.

→ During 2013-2015, while Iran's nuclear program, the role of major powers, and missile technology were prominent, more attention was given to the use of chemical weapons and international agreements. The increasing concern about atomic security can also be noted.

→ During 2016-2020, there was a noticeable increase in discussions relating to China, North Korea, and the Trump administration. This reflects the geopolitical shifts during this period, particularly the Trump administration's withdrawal from the Iran nuclear deal and the increasing tensions with North Korea and China. The themes of the Iran nuclear deal and the role of international agencies like the IAEA became more prominent, reflecting real-world events and shifts in international relations.

→ During 2021-2023, the focus remained on Iran's nuclear activities, but there was also a significant emphasis on Russia, likely due to geopolitical tensions involving Ukraine. The prominence of terms related to centrifuges and uranium enrichment indicates a focus on technical aspects of nuclear programs. There's a notable rise in the discussion around conflict and war during this period, suggesting escalating global tensions around nuclear weapons and disarmament.

2013-2015

Topic 1: War, specifically mentioning "bomb," "war," "world," "atomic," and "security." It might be discussing some conflict or war scenario involving atomic weapons.
Topic 2: Information reporting and potentially national security. It's interesting to see "China" and "scientist" in the same context, possibly indicating discussions or reports about scientific advancements or issues related to China.
Topic 3: International politics, featuring "Russia," "president," "Iran," "deal," "sanction," and "policy." The "Obama" keyword suggests that this topic might refer to the policies of the Obama administration regarding Russia and Iran.
Topic 4: Iran and international security but also brings up "chemical" and "treaty," perhaps referring to the international agreements or treaties on chemical weapons or nuclear programs.
Topic 5: Iran, with "agreement," "deal," "IAEA" (International Atomic Energy Agency), and "sanction." This topic might be referring to the Iran nuclear deal and the role of Congress and the IAEA.
Topic 6: Military capabilities or strategies, with keywords such as "missile," "force," "treaty," and references to Russia and China.
Topic 7: Military defense and international relations, particularly concerning missile defense systems, mentions China and Russia.
Topic 8: War-related research, with references to "research," "war," "bomb," and "project."
Topic 9: Iran, mentioning "deal," "missile," "agreement," "program," and "sanction." This topic likely refers to the Iran nuclear program and related deals and sanctions.
Topic 10: Military and defense topics, with "missile," "Russian," "reactor," and "force" appearing prominently. This might relate to discussions of military technology and capabilities.

2016-2020

Topic 1: Missile technology and defense strategies involving China and Russia. The presence of "Trump" and "administration" indicates discussions about the Trump administration's policies or actions concerning these matters.
Topic 2: Iran and international issues surrounding it, potentially the uranium enrichment and the possible military implications ("military," "war").
Topic 3: Geopolitical issues involving China and North Korea, with mentions of "missile" and "security," possibly related to the missile tests and threats posed by North Korea during this period.
Topic 4: Missile technology, strategic treaties (like the START treaty), and Iran. The words "centrifuge" and "uranium" hint at discussing Iran's nuclear program.
Topic 5: Iran's nuclear program and international monitoring and regulation, as suggested by "IAEA" (International Atomic Energy Agency), "uranium," "centrifuge," "program," and "JCPOA" (Joint Comprehensive Plan of Action).
Topic 6: North Korea, chemical weapons, and possibly the Trump administration's policies or world reactions to these issues.
Topic 7: Monitoring and inspection of Iran's nuclear sites by the IAEA, as well as potential implications for health and public security.
Topic 8: Arms control and treaties, particularly in the context of the Trump administration. North Korea and missile technology also feature prominently.
Topic 9: Public communication or perception of security and policy issues during the Trump administration.
Topic 10: China's military capabilities and tests, with possible implications for defense policy.

2021-2023

Topic 1: Iran's nuclear program, with potential involvement or concern from Russia. "IAEA," "uranium," and "centrifuge" suggest discussions about Iran's uranium enrichment activities. The terms "security," "war," and "control" may hint towards international security concerns related to these activities.
Topic 2: Iran's nuclear program, potentially in a quantitative sense (given "percent"). It might discuss the progress or status of the program, perhaps with some relation to Russia.
Topic 3: Arms control and possibly treaties (given "treaty"), involving Iran, Russia, the US, and China.
Topic 4: Russia's military activities or geopolitical issues, with terms such as "missile," "country," "war," "Ukraine," and "security". Iran's nuclear program might also be part of the discussions.
Topic 5: Global geopolitics, covering Russia, China, Iran, and US policies. It might involve discussions around war, security, and power dynamics.
Topic 6: Iran's nuclear program ("Iran," "centrifuge," "uranium") with China, the US, and possibly international military concerns or issues ("war," "military," "missile").
Topic 7: Iran and Russia's international actions, possibly within the context of the conflict in Ukraine. "War", "international", and "security" suggest discussions about war and international security concerns.
Topic 8: Geopolitical situations involving Iran and Russia. The mentions of "uranium," "centrifuge," and "missile" might hint at nuclear weapons or arms control discussions, possibly related to Ukraine as well.
Topic 9: Heavily focus on Iran, Russia, and Ukraine, possibly discussing a war situation. The discussion also appears to involve Iran's nuclear program and its international implications.
Topic 10: War situations or international conflicts involving Russia, Iran, and Ukraine. The term "Putin" might indicate the involvement or actions of Russia's leader, Vladimir Putin, in these situations.

Social Media

Summary

Over the three periods from 2013 to 2023, there are several recurring themes about nuclear and tactical threats, strike actions, and regional conflicts, but also some notable shifts in the specificities of these themes. The constant theme over these periods concerns nuclear threats and tactical warfare. The shifts in focus from Iran and North Korea to a heightened emphasis on India and Pakistan, and eventually Ukraine and Russia, indicates changes in geopolitical tensions and global conflict hotspots over time. The emergence of terms like "hybrid warfare," "surgical strike," and "chemical threats" possibly suggest changes in warfare and threat perceptions.

→ In 2013-2015, the focus seemed largely centered on nuclear threats, specifically mentioning countries such as North Korea, Iran, Russia, and Pakistan. Tactical nuclear threats, deterrence, strike, and warfare are other keywords.

→ During 2016-2020, the focus on nuclear threats continues, but a new theme of 'surgical strikes' becomes prominent, especially in India and Pakistan, indicating escalating regional tensions. References to "BJP" and "Congress" indicate a focus on Indian domestic politics, possibly tied to the public reaction to these strikes. There are also mentions of "hybrid warfare," "tactical nuclear weapons," and the names of key political leaders like "Trump," "Putin," and "Modi." This could point toward the increased role of non-traditional warfare tactics and the political discourse surrounding them. Interestingly, mentions of North Korea's nuclear threats persist, but there are fewer references to Iran compared to the previous period.

→ In 2021-2023, references to "nuclear" threats and "tactical" warfare remained constant, with specific mentions of Ukraine, Russia, Iran, North Korea, and China suggesting the primary areas of concern. There is a continued focus on "surgical strikes" between India and Pakistan. This period also mentions "chemical" threats and "Armageddon," which could signal an evolution like perceived threats.

2013-2015

Topic 1: Tactical nuclear threats, with potential references to the terrorist group ISIS and countries like Pakistan.
Topic 2: The nuclear threat posed by North Korea, including news about the deployment of the US and European Union.
Topic 3: Russian military threats and readiness, including potential nuclear strikes
Topic 4: Nuclear deterrence strategies, referencing several countries, including Pakistan, India, Israel, and Iran.
Topic 5: New forms of warfare, specifically 'hybrid warfare', a military strategy that blends conventional warfare, irregular warfare, and cyberwarfare. Russia, NATO, and Ukraine are mentioned, suggesting geopolitical tensions in that region.
Topic 6: Nuclear threats and potential strikes involving Russia, Ukraine, and NATO. The term 'doctrine' suggests discussions around strategic planning.
Topic 7: Nuclear threat from Iran, with potential references to Israeli-Iranian tensions and Israeli leader Netanyahu.
Topic 8: Threat of nuclear or surgical strikes, possibly with a focus on the actions and statements coming out of the White House. North Korea and Russia's leader, Putin, are also mentioned.
Topic 9: Arms proliferation and tactical weapons, mentioning regions like Crimea and Nigeria.
Topic 10: China's nuclear capacity and potential threats to the US, potentially altering the strategic balance.

2016-2020

Topic 1: Chinese national politics, potentially involving the Congress. It seems to involve a discourse around authenticity (with the word "fake") and possibly protests or opposition ("anti").
Topic 2: The concept of a "surgical strike," possibly about an air attack in Uri. The countries mentioned are Pakistan and India, suggesting it might be about military operations or tensions between them.
Topic 3: Watching real-life events or competitions, with mentions of "teams" and "majors." It could also refer to personal commentary or discussions, given words like "ever," "man," "two," and "call." – However, this topic result is rather vague.
Topic 4: Political discussions around India's Bharatiya Janata Party (BJP), possibly involving terrorist threats, strategic issues, and voting.
Topic 5: Nuclear deterrence and tactical weapons, possibly in the context of a government's security strategy. There are references to "new" and "election," which may relate to political developments or changes.
Topic 6: Digital-related matters. The words "order," "general," "based," and "national_security" suggest it might involve online security or cyber issues. There's also mention of "Kim," which could reference a person or a nation (e.g., North Korea).
Topic 7: The potential of a nuclear strike, with references to "war," "day," "launch," and "president." "Trump" is mentioned, suggesting these tweets might discuss the nuclear policies or decisions made during Trump's presidency.
Topic 8: Nuclear threat posed by North Korea, with mentions of "Trump," "US," "strike," "Iran," "proof," and "China." This suggests an international discussion of nuclear politics.
Topic 9: "Hybrid warfare," possibly involving or targeting countries like China and Russia. There's also a specific mention of "Narendra Modi," the Prime Minister of India, and "ji," a respectful term used in India.
Topic 10: Military actions such as "surgical strikes" involving India, Pakistan, and potentially China. The word "Modi" is present, suggesting discussions about his role or decisions regarding these operations.

2021 – 2023

Topic 1: The possibility or ramifications of a nuclear strike on Europe. There appears to be speculation about how people might respond and the potential for escalation.
Topic 2: Belarus and its geopolitical relationship with Russia ("Vladimir" likely refers to Russian president Vladimir Putin). There may be concerns about "hybrid warfare" and discussions about security and deterrence strategies.
Topic 3: A "surgical strike" and countries like India and Pakistan. The context suggests military operations or tension between these countries.
Topic 4: Potential nuclear threats. The words "time," "get," "going," "go," "hit," "test," and "end" suggest discussions about the imminent nature of a potential threat.
Topic 5: The Ukrainian military and potential nuclear risk, likely involving high-ranking officials such as the president and the chief of the security council.
Topic 6: Geopolitical and military discussions around Iran, Japan, and Israel, with "Armageddon" and "uses" suggesting discussions about extreme conflict or nuclear use.
Topic 7: Proof and claims of military activity, possibly involving troops. The words "win," "small," "article," "consequences," "seriously," "read," and "due" suggest discussions around the legitimacy and consequences of these claims.
Topic 8: Potential nuclear strike, discussing elements like launch procedures, the involvement of the US and UK, and the role of certain officials. The mention of "Trump" and "preemptive" suggests these tweets might discuss the nuclear policies or decisions made during Trump's presidency.

Topic 9: Nuclear weaponry, specifically tactical weapons, and their potential use. Russia, North Korea, and Ukraine are mentioned, indicating the discussion is likely around these countries' nuclear capabilities or threats.
Topic 10: Russia's nuclear threat under Putin's leadership, specifically focusing on Ukraine. There are mentions of NATO and the US, indicating that these entities are central to the discussions as well.

APPENDIX D | SUPPORTING QUALITATIVE QUOTES

The Meta-Crisis and Integrated Nuclear Warfare

Nuclear deterrence is hypothetical

"*The advocates of those lower-yield nuclear weapons rely on firm assertions about deterrence, a foundation of nuclear war strategy—which is mostly concerned with averting it. Deterrence balances adversaries' judgments of unacceptable harm to themselves against the gains they might make. The calculation includes conventional military power as well as nuclear. It depends on the opponent's state of mind.*"[xvii]

"*Even those involved in nuclear planning know only their own side. Yet the advocates of these weapons have provided no answers beyond the assumption that being able to respond in kind to an escalate to de-escalate strike will deter the first strike from happening at all.*"[xviii]

"*Nations abstain from war for many reasons. The concept of deterrence has come to represent that abstention, while at the same time shrinking it to the matching of weapons, one for one. Although the arguments for that sort of deterrence are flimsy, the magic of the term justifies spending enormous sums—for purely theoretical gains, and the likely ratcheting up of nuclear danger.*"[xix]

"*The evidence that nuclear weapons are effectively global suicide bombs which cannot be used as legitimate weapons and which threaten rather than enhance anyone's security has never been clearer. Extensively peer-reviewed, published and validated scientific findings show that even a regional nuclear war utilising less than 2% of the global nuclear arsenal and less than 1% of its explosive yield would loft millions of tons of black smoke into the stratosphere, within days plunging temperatures worldwide to ice age levels, reducing rainfall and sunlight.*"[xx]

"*To believe that nuclear weapons can serve security interests, that there can be a legitimate use for the most indiscriminate and inhumane of all weapons, that they can be retained without being used…these are dangerous delusions that risk planetary health.*"[xxi]

"*Real understanding of what nuclear weapons actually do invalidates all arguments for their continued possession and requires that they urgently be prohibited and eliminated as the only course of action commensurate with the existential danger they pose.*"[xxii]

"How much security can nuclear weapons provide when we are willing to tear ourselves apart?"[xxiii]

"Key leaders and millions of people around the globe have become more aware of the grim realities of nuclear weapons: even 'limited" nuclear use likely would trigger nuclear escalation with global consequences and millions of deaths, nuclear weapon use is immoral and illegal, and nuclear deterrence is unsustainable and ultimately unacceptable. The Russian invasion of Ukraine has also demonstrated the limitations of nuclear weapons in actual war. US and NATO nuclear weapons have done nothing to help prevent Russian aggression against Ukraine."[xxiv]

"*North Korea nuclear crisis has taught us at least four lessons: 1. Nuclear deterrence does not work. 2. Nuclear weapons can cause war. 3. There are no 'safe hands' for nuclear weapons. 4. As long as there are nuclear weapons in the world we risk a nuclear war, possibly leading to the destruction of the whole human civilization.*"[xxv]

The nuclear to non-nuclear state dyad is not meant to be permanent

"*Pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control.*"[xxvi]

"*Countries without nuclear weapons are growing increasingly impatient as the United States and Russia drag their feet on further nuclear reductions but spend hundreds of billions on modernizing their arsenals, keeping them viable for many decades to come.*"[xxvii]

"*That is, the NPT's two-tier structure, with its split between the nuclear 'haves' and 'have-nots,' is based on the requirement that this situation be only temporary, and that the nuclear weapon states work toward getting rid of these weapons completely.*"[xxviii]

"*Many non-nuclear weapon states are growing impatient and seeking new avenues for progress*."[xxix]

"*The assertion that nuclear weapons guaranteed security was unsustainable, intrinsically immoral and 'an insult to our intelligence'... Nuclear Powers had a responsibility 'proportionate to the infinite madness of their doctrines of dissuasion and their incessant arms race'.*"[xxx]

"*If the nuclear weapon states do not make appreciable progress soon, more and more non-nuclear weapon states are prepared to take action outside the NPT. In particular, many countries are calling for a treaty to ban nuclear weapons*."[xxxi]

RQ3 asks how do news media and arms control experts describe the meta crisis in relation to integrated nuclear warfare?

"Humanity's most glorious achievements ever have undoubtedly occurred under Western liberalism, notably the immense freedom provided by democracy and the spectacular technology provided by science. However, it is equally true that individualism, materialism, free-market capitalism and imperialism are causing today's most serious global threats, including climate change, nuclear proliferation, unsurpassed inequality, anomie and economic depressions."[xxxii]

"The world is no longer bipolar. The great powers are in competition with each other."[xxxiii]

"The world will be 'increasingly out of balance and contested at every level' over the next twenty years due to the pressures of demographic, environmental, economic and technological change"[xxxiv]

"The world is facing grave and complex security challenges. As strategic competition becomes more acute, the regional security situation remains tense. Global and regional security faces the combined effect of traditional and nontraditional threats, such as the proliferation of weapons of mass destruction, terrorism, cyberattacks, climate change, biohazards, organized crime, and major communicable diseases. The Cold War mentality of encirclement, constraint, confrontation and threat is resurfacing. Hegemonism and power politics are surging."[xxxv]

"*The world in 2023 faces twin existential crises that have been exacerbated by a global pandemic from which we have yet to fully recover. We are at greater risk of nuclear war than at any time since the Cold War of the 1980s. And the accelerating pace of the climate crisis, driven by carbon emissions from the unchecked burning of fossil fuels, is bringing extreme weather events, agricultural disruption, rising sea levels, and vector-borne diseases to every corner of the world.*"[xxxvi]

"*On the vulnerability of the global climate and food supply to long-term disruption from the smoke from burning cities; on the fragility of achievements in global health, development and wellbeing as we increasingly come up against the Earth's environmental limits. Any use of nuclear weapons would invite retaliation and risk uncontrollable escalation.*"[xxxvii]

"Political warfare spanned a range of overt and covert activities, across all elements of national power diplomatic, informational, military and economic—to coerce an adversary and achieve contested ends below the threshold of conventional conflict. Political warfare is the preferred form of warfare by both state and non-state actors today."[xxxviii]

"'Whether we like it or not, we are engaged in a new era of competition.' Despite the ubiquitous rhetoric, the United States still struggles to internalize what this means in practice. For much of the national-security apparatus, the 'new era of competition' means a renewed focused on a high-end conflict with near peer adversaries, when it, in fact, reflects a deeper strategic reality. The United States' principal adversaries are actually fighting—and gaining ground—by employing a host of tactics short of all-out war."[xxxix]

"Both [China and Russia] are very worried about the US hacking their weapons systems...Their answer will be to try to make their networks more secure, and speaking as a former UN negotiator, they are not interested in 'arms control. It's a new battlefront in an invisible war."[xl]

"A global cyberwar has begun. And it will probably never end. That is the brutal truth that governments, militaries, intelligence services, companies and individuals are facing up to — everywhere."[xli]

"The 1.3-million strong Indian Army is sharpening its entire war-fighting strategy, ranging from creation of agile integrated battle groups (IBGs) and expansive cyber warfare capabilities to induction plans for launch-on-demand micro satellites, directed-energy weapons, artificial intelligence (AI), robotics and the like. India is currently faced with a 'No War, No Peace' scenario due to management of the 'complex and active' unresolved borders with China and Pakistan, coupled with 'hybrid warfare' or "statesponsored proxy war and acts of terrorism from across the border", says the Army's new Land Warfare Doctrine-2018."[xlii]

"Given the complexities of defence and offence in such complex conflict, it will become increasingly difficult to prevent the escalation of hybrid wars to the conventional and even the nuclear level."[xliii]

"The uncertainty and speed of cyber warfare mix with the astronomical stakes of nuclear weapons, triggering a spiral of escalation all the way to the brink of nuclear war."[xliv]

"In a world of increasingly formidable technology that can either elevate or dismantle human civilisation, there is no definitive solution to the competition between great powers, let alone a military one. An unbridled technological race, justified by the foreign policy ideology in which each side is convinced of the other's malicious intent, risks creating a catastrophic cycle of mutual suspicion like the one that triggered World War I, but with incomparably greater consequences."[xlv]

"Today in the cyber realm, verification is not possible. There is nothing to count. So as the world sinks deeper into the cyberwar era, finding anything approaching trust between the major powers might be the biggest challenge of all."[xlvi]

"Proliferating cyber-attacks put nuclear command and control at risk in myriad new ways."[xlvii]

Lack of trust among nation states

"The trust that was painstakingly developed over decades has disappeared."[xlviii]

Erosion of international norms & the abandonment of treaties

"We witness the international security and strategic stability environment undergoing steady degradation. The system of arms control goes through the crisis the scale of which is without precedent in the newest history." (Russia Nuclear Weapons)

"A public dialogue in the United States about extended nuclear guarantees and the modernization of the nuclear triad unnerve many nations that rely on the US nuclear umbrella as a foundation of their security and defense. This talk led several nations — Japan, South Korea and Saudi Arabia to name a few — to consider whether their long-term security interests are better served with national nuclear weapons programs."[xlix]

"The existing regimes for arms control and disarmament have been disintegrating for years."[l]

"Longstanding arms-control structures have been fraying."[li]

"The current state of arms control is now characterized by its diminished condition: treaty violations, withdrawals and suspensions, abruptly terminated dialogues, and diplomacy voids. New challenges posed by the new security landscape are co-mingling to render the repair and renewal of the arms control enterprise — and indeed, the negotiation of future agreements — anywhere from overwhelming to impossible. What's more, fatigue is setting in, which makes for perhaps lackluster efforts to dissect the problem."[lii]

"NATO head Jens Stoltenberg said Wednesday he was 'disappointed' by Russia's decision to quit the landmark Treaty on Conventional Forces in Europe as arms control efforts remained important to all sides."[liii]

"Washington claims that Russia has broken with the Intermediate Nuclear Forces Treaty, signed during the Cold War, that prohibits the deployment of short- and intermediate-range missiles."[liv]

"If New START is not followed by a new treaty by the time it expires in 2026, there will no limits on US and Russian nuclear forces for the first time the 1970s. Moreover, political polarization makes it highly uncertain if the US Congress would approve a new treaty."[lv]

"The US has withdrawn from the Treaty on the Limitation of Anti-Ballistic Missile Systems and the Intermediate-Range Nuclear Forces Treaty while it is continuously pushing for the deployment of a global anti-ballistic system"[lvi]

"The United States unilaterally withdrew from the ABM Treaty and launched an intensive construction of a strategic ballistic missile defense system as part of their strategic nuclear forces transferred to the periphery, and started constructing missile deployment areas in Romania and, subsequently, in Poland."[lvii]

"We note that the United States, if it really resolves to resume nuclear tests, will deal an irreparable blow to the entire non-proliferation and arms control system."[lviii]

"A considerable number of non-nuclear nations might decide that, given the US government's failure to fulfill its treaty obligations, their adherence to the nuclear Nonproliferation Treaty no longer made sense. Therefore, they would begin nuclear testing to facilitate developing their own nuclear weapons arsenals."[lix]

"The Trump administration this year pulled out of another key arms control agreement, the Intermediate-Range Nuclear Forces treaty, with NATO allies saying a Russian missile system was in violation."[lx]

"He accused China of flaunting its growing nuclear arsenal 'to intimidate the United States and our friends and allies,' calling it 'irresponsible, dangerous behavior.' US intelligence has forecast that China is in the midst of doubling the size of its nuclear arsenal, troubling the Trump administration, which considers Beijing a global rival and resents the constraints of New START."[lxi]

"Iran has consistently violated its obligations under the Nuclear Non-Proliferation Treaty (NPT) to cooperate with the International Atomic Energy Agency (IAEA) and fully account for its past and present nuclear activities."[lxii]

"With its multiple violations of the JCPOA, Iran has reached previously uncharted territory, accumulating important new knowledge, experience, and practice, representing a significant block of nuclear capability banned to Iran by this point in time under the JCPOA."[lxiii]

"The regime is doing engineering and weaponization testing at a walled military complex south of Tehran, a location which Iran has declared off-limits to inspectors, said the National Council of Resistance of Iran (NCRI) and its main operational arm, the People's Mujaheddin of Iran (MEK)."[lxiv]

"North Korea 'abrogates all agreements on non-aggression reached between the North and the South', the state-run Committee for the Peaceful Reunification of Korea (CPRK) said in a statement."[lxv]

"Additionally, North Korea has conducted dozens of missile tests in recent years, leading to fears that they could eventually arm these missiles with nuclear warheads which could reach the US mainland."[lxvi]

RQ4 asks how do news media and arms control experts describe global powers' response to the meta-crisis in relation to integrated nuclear warfare?

A new arms race and expanding military budgets

"Meanwhile, both Russia and China are building their own new generations of nuclear weapons. According to a recent New York Times report, Russia is developing 'big missiles topped by miniaturized warheads,' while 'the Russian Navy is developing an undersea drone meant to loft a cloud of radioactive contamination from an underwater explosion that would make target cities uninhabitable.' For its part, the Chinese military is flight testing a 'hypersonic glide vehicle' that is fired into space 'on a traditional long-range missile but then maneuvers through the atmosphere, twisting and careening at more than a mile a second,' thus rendering missile defenses 'all but useless.'"[lxvii]

"The US aims to combine PGS (Conventional Prompt Strike) with its space and anti-missile technologies to form an integrated defense system, which could render other countries' strategic weapons, including nuclear arms, almost useless. It intends to break the global and regional strategic balance, minimize other countries' capability of strategic counterattack during emergencies and squeeze their strategic space."[lxviii]

"Europe is on the verge of a new arms race and must take action, argues Frank-Walter Steinmeier, Germany's foreign minister. To avoid further escalation, leaders must examine current policies and make urgent changes."[lxix]

"NATO fears that without an INF missile ban it will be more difficult to prevent an arms race in Europe. The tensions are stirring memories of the 1980s and the Cold War."[lxx]

"The number of new nuclear weapons being developed and distributed and the increased tensions between states that own nuclear weapons pose a major risk to international security"[lxxi]

"Modern weapons have greater destructiveness, range, accuracy while military spending has continued to increase to record levels even through the COVID-19 pandemic, to a staggering USD1981 billion in 2020. NATO members account for 56%, the US alone for 39%, and Russia for 3.1% of the global total."[lxxii]

"As Mikhail Gorbachev wrote in 2017, 'it all looks as if the world is preparing for war,' including nuclear war."

"All nine nuclear-armed states are not only failing to disarm, but investing gargantuan sums in not just retaining but modernising their arsenals with new capacities and weapons, some never seen before, like hypersonic delivery vehicles, and Russian nuclear-powered missiles and torpedoes."[lxxiii]

"Nuclear weapon states continue to spend billions maintaining and upgrading their nuclear arsenals to ensure that they will be effective for decades to come, with no sign that they anticipate eliminating them in the foreseeable future."[lxxiv]

"It could be inferred that global nuclear inventories would keep on increasing and modernizing unless robust, rational and unbiased non-proliferation efforts are streamlined by major nuclear power states. Otherwise states would continue spending a major junk of their budgets on nuclear weapon program in self-defence."[lxxv]

New weapons

"Putin is trying to boondoggle the United States into an arms race, or perhaps a reconsideration of the Antiballistic Missile Treaty. But has someone boondoggled Putin into supporting fantastical weapons."[lxxvi]

"Meanwhile, both Russia and China are building their own new generations of nuclear weapons…Russia is developing 'big missiles topped by miniaturized warheads,' while 'the Russian Navy is developing an undersea drone meant to loft a cloud of radioactive contamination from an underwater explosion that would make target cities uninhabitable.' For its part, the Chinese military is flight testing a 'hypersonic glide vehicle' that is fired into space 'on a traditional long-range missile but then maneuvers through the atmosphere, twisting and careening at more than a mile a second,' thus rendering missile defenses 'all but useless.'[lxxvii]

"It's difficult to keep track of all kind of new ICBMs that Russia is planning to deploy - in addition to the Topol-M/RS-24 Yars deployment that is underway, Russia plans to introduce a new road mobile missile, RS-26, in 2015 and a new "heavy" ICBM, Sarmat, some time around 2020…Russia tests hypersonic glide vehicle."[lxxviii]

"China 'is developing a new road-mobile ICBM, the CSS-X-20 (DF-41) capable of carrying MIRVs.'…foreign media sources routinely claim the DF-41 could carry 10 or 12 nuclear warheads."[lxxix]

"the Pentagon confirmed that the US Navy has now deployed the W76-2—a new, lower-yield tactical nuclear warhead that is launched from submarines—in response to a non-existent 'gap' that the Trump administration asserted hurt the US nuclear arsenal. Deployment of this warhead, which blurs the lines between conventional and nuclear forces, is a step back toward the dangerous idea that nuclear weapons are not just for deterrence but can actually be used in war."[lxxx]

Weapons testing

"Even if US nuclear tests were conducted underground and, thus, violated only the CTBT, the result would be a dramatic loss of credibility for the United States and an escalation of the nuclear arms race. As Daryl Kimball, executive director of the Arms Control Association, has remarked: 'Other nuclear powers would undoubtedly seize the opportunity provided by a US nuclear blast to engage in explosive tests of their own, which could help them perfect new and more dangerous types of warheads.'"[lxxxi]

"The impasse around the CTBT is increasingly worrisome. The responsibility for the fact that in the more than a quarter century of its existence the Treaty has never entered into force lies mainly with the United States, which defiantly refused to ratify it and are clearly intent on resuming testing."[lxxxii]

"US testing may lower perceived political costs to potential proliferators, such as Iran, of conducting tests to develop nuclear weapons. US demands that North Korea refrain from further nuclear testing would carry less weight. Likewise, India and Pakistan, both of which carried out nuclear tests in 1998, might feel free to do so again, thereby exacerbating tensions in an unstable region."[lxxxiii]

"Vladimir Putin…boasted that Russia had two operational hypersonic weapons: the Kinzhal, a fast, air-launched missile capable of striking targets up to 1,200 miles away; and the Avangard, designed to be attached to a new Sarmat intercontinental ballistic missile before maneuvering toward its targets. Russian media have claimed that nuclear warheads for the weapons are already being produced and that the Sarmat missile itself has been flight-tested roughly 3,000 miles across Siberia"[lxxxiv]

"He [Putin] said a team of young, high-tech specialists had labored secretly and assiduously to develop and test the new weapons, including a nuclear-powered missile that could reach anywhere and evade interception."[lxxxv]

"It's unclear whether China plans to deploy a hypersonic weapon in the future, and, even if it does, whether they would be armed with nuclear warheads. But General Milley's deputy, Gen. John Hyten, who is retiring as the vice chairman of the Joint Chiefs, told

reporters in October that the Chinese military had conducted 'hundreds' of hypersonic tests, compared with nine by the United States."[lxxxvi]

"North Korea in recent weeks has revved up its cycle of missile provocations—its go-to method of securing leverage against the United States and South Korea in the on-again off-again nuclear negotiations. On September 11, it launched a long-range cruise missile described as a "strategic weapon of great significance"—implying a nuclear component."[lxxxvii]

"Mr. Kim doubled down on his nuclear arms buildup, offering an unusually detailed list of weapons that the North was developing. They included 'ultramodern tactical nuclear weapons,' 'hypersonic gliding-flight warheads,' 'multi-warhead' missiles, military reconnaissance satellites, a nuclear-powered submarine, and land- and submarine-launched intercontinental ballistic missiles that use solid fuel."[lxxxviii]

Escalation and threats of nuclear war

"By its recent actions, the Russian Federation is indicating once again that it regards nuclear weapons as tools of threats and intimidation, not deterrence, he said, declaring: 'The Kremlin is ready to threaten the world with nuclear apocalypse.'"[lxxxix]

"Putin has threatened that it could cause a radioactive tidal wave that would destroy the east coast of the United States. It is said to be nuclear-powered, so that it can loiter around the seas and be brought into action rapidly."[xc]

"Since sending troops into Ukraine last year, President Vladimir Putin has issued thinly veiled warnings that he could use nuclear weapons there if Russia were threatened."[xci]

"North Korean leader Kim Jong Un has announced that Pyongyang no longer considers itself bound by its moratoriums on nuclear and intercontinental ballistic tests, threatening a demonstration of a new strategic weapon."[xcii]

"The governments of both nuclear-armed nations escalated their threats. Dispatched to South Korea, US Vice President Mike Pence declared that 'the era of strategic patience is over,' and warned: 'All options are on the table.' Not to be outdone, North Korea's deputy representative to the United Nations told a press conference that 'thermonuclear war may break out at any moment.' Any missile or nuclear strike by the United States would be responded to 'in kind.' Several days later, the North Korean government warned of a 'super-mighty preemptive strike' that would reduce US military forces in South Korea and on the US mainland 'to ashes.' The United States and its allies, said the official statement, 'should not mess with us.'"[xciii]

"The most immediately dangerous situation, however, is North Korea. Trump has sent an 'armada' and is threatening a devastating military assault if North Korea continues to test nuclear-capable missiles. In turn, North Korea threatens a pre-emptive war including an all-out artillery assault on greater Seoul which is just 22 kilometers from the border and has a population of 25 million people."[xciv]

"President Donald Trump on Friday ignored international calls for restraint in his face-off with North Korea, warning Pyongyang that it would 'truly regret' taking any hostile action, as the US military is 'locked and loaded.' Trump has been engaged all week in a war of words with the North over its weapons and missile programs, as US media reported Pyongyang has successfully miniaturized a nuclear warhead."[xcv]

"And Pyongyang never paid the serious penalty that Western nations threatened. Even when Tehran begins stockpiling weapons, it need not make its nuclear status official. For example, Israel has long maintained a policy of ambiguity regarding its nuclear weapons, believed to consist of 100-200 warheads. Iran could follow suit."[xcvi]

"Current reports of the US developing a global first-strike nuclear capability could herald the end of the world. Trump says he will go to war to prevent Iran or North Korea developing nuclear weapons while abetting Israel's illegal nuclear arsenal. He talks of keeping

'all options on the table' including the threat of nuclear strikes against non-nuclear countries. Iran negotiated a nuclear deal that Trump threatens to tear up."[xcvii]

"Dissuasion worked as long as there were few actors and they were considered rational,' he said in a recent op-ed. 'Their [nuclear weapons] proliferation increases the possibility for misunderstandings, false interpretations of another's intentions, or unbalanced judgement in autocratic regimes.' The BAS set its Doomsday Clock to two and a half minutes to midnight in January this year partly as a result of a Trump's 'comments over North Korea, Russia and nuclear weapons.'"[xcviii]

RQ5 asks how do news media and arms control experts describe how the meta-crisis alters how global powers project nuclear deterrence strategies?

The use of nuclear weapons, escalation ladders and nuclear frameworks of war

"The President may direct the use of nuclear weapons through an execute order via the Chairman of the Joint Chiefs of Staff to the combatant commanders and, ultimately, to the forces in the field exercising direct control of the weapons. Which seems pretty definitive. The order jumps immediately from the President to the military, in the form of the Chairman of the Joint Chiefs of Staff, and from there percolates through the system of command, control, and communication to the various people who actually turn the keys and put the 'birds' into the air."[xcix]

"China has also pledged that it will never be first to use nuclear weapons—a position it adopted at the time of its first nuclear test and which it has consistently reaffirmed ever since."[c]

"[Nuclear powers] should also reduce the role of nuclear weapons in their respective security strategy, refrain from first-use of nuclear weapons, and jointly maintain regional and global strategic stability to achieve the ultimate goal of a nuclear-weapon-free world by dismantling their nuclear weapons."[ci]

"China is the only one of the five countries that has promised no first use of nuclear weapons. If all nuclear-weapon countries, particularly the UK and France both of which are under the US' nuclear protection, make the same promise, the risks of a nuclear war would diminish markedly."[cii]

"China has always adhered to a self-defensive nuclear strategy and maintains its nuclear force at the minimum level required for national security. This in itself is an important contribution to global strategic stability."[ciii]

"These tactical nuclear weapons were part of Pakistan's full spectrum deterrence, which provides a qualitative response to conventional threats and asymmetry perceived by India. Moreover, it offers range of options as Pakistan will not be forced to retaliate with strategic nuclear weapon as first response to conventional force."[civ]

"Forced to counter Pakistan's persistent use of terrorism under a nuclear cover and the slippery slope that introduced to the region, India may be re-interpreting its no-first-use of nuclear weapons policy to allow pre-emptive strikes against its neighbor, the nuclear pundits community is deducing, based among other things on cryptic statements from the Indian establishment."[cv]

"Pakistan will not be forced to retaliate with strategic nuclear weapons as a first response to conventional force. Conversely, it has been lately expressed by Indian former head 'India would hardly risk giving Pakistan the chance to carry out a massive nuclear strike after the Indian response to Pakistan using tactical nuclear weapons.'"[cvi]

"The United States will continue to strengthen conventional capabilities and reduce the role of nuclear weapons in deterring non-nuclear attacks, with the objective of making deterrence of nuclear attack on the United States or our allies and partners the sole purpose of US nuclear weapons."[cvii]

"On its part, India has indicated that use of any nuclear weapon by Pakistan, regardless of its size, will result in massive retaliation."[cviii]

"The conventional (non-nuclear) weapon, for instance, can target Chinese aircraft carriers and other warships, or block Pakistan's Gwadar port by sinking a few ships in the harbour for that matter. "The world-class BrahMos is now capable of being launched from the land, sea and air, completing the tactical cruise missile triad for India," said the defence ministry."[cix]

Undermining deterrence-weapons movement, proliferation, alliance concerns

"This could put other countries in a dilemma: they either lose the capability to launch a strategic nuclear counterattack or use nuclear weapons first to avoid devastation."[cx]

"But since other countries, compared to the US, are at a disadvantage in terms of conventional weapon systems, they have to adopt asymmetric corresponding actions. Global strategic stability depends more on the stability in Europe and Northeast Asia. This is something that the international community should understand and tell the countries that are calling for a 'nuclear-free world' not to develop conventional weapons to replace nuclear ones, because it will have serious consequences on international security."[cxi]

"The United States switched on an $800 million missile shield in Romania on Thursday, a step it sees as vital to defend itself and Europe but which the Kremlin said is aimed at blunting its own nuclear arsenal."[cxii]

"The aim is to reach any point on the globe within an hour at the least. Of course, this is a new destabilizing factor. Add to this the official US refusal to join the Comprehensive Test Ban Treaty and plans to deploy weapons in outer space. Incidentally, these plans have been announced not only by the Americans but also by the French."[cxiii]

"Russia started its hypersonics program to ensure it could get around any American ballistic missile defenses"[cxiv]

"In a state of the nation address on Thursday, Putin said Russia had tested new nuclear weapons, including a nuclear-powered cruise missile that he described as 'invincible.' The Russian president also warned that his country's military buildup would be able to cancel out NATO's amassment of military force on Russia's borders…"[cxv]

"Russia has 1600 deployed strategic nuclear weapons, and 1912 tactical nuclear weapons. Most of the delivery systems for the latter can carry either conventional or nuclear warheads, increasing the risk of worst-case thinking and precipitous and over reaction on the other side, and the danger of the threshold to nuclear escalation being crossed. The US has 1650 deployed strategic nuclear weapons, and 100 B-61 nuclear bombs deployed to bases in Belgium, Germany, Italy, Netherlands and Turkey for delivery by aircraft of those nations. France has 280 deployed nuclear weapons, and the UK 120 deployed nuclear weapons. If the threshold of use of nuclear weapons is crossed, those who have managed nuclear weapons and nuclear war plans tell us the risks of rapid and large-scale escalation are very high."[cxvi]

"Moscow is also sending nuclear capable Iskander missiles to the exclave Kaliningrad region bordering EU members Poland and Lithuania. Lithuanian President Dalia Grybauskaite slammed the deployment, saying the missiles "can reach nearly half of European capitals, it can reach Berlin."[cxvii]

"Experts say that the missiles could upend the grim psychology of Mutual Assured Destruction, the bedrock military doctrine of the nuclear age that argued globe-altering wars would be deterred if the potential combatants always felt certain of their opponents' devastating response."[cxviii]

"'It is possible,' the United Nations Office of Disarmament Affairs said in a February report, that 'in response [to] the deployment of hypersonic weapons,' nations fearing the destruction of their retaliatory-strike capability might either decide to use nuclear weapons under a wider set of conditions or simply place 'nuclear forces on higher alert levels' as a matter of routine."[cxix]

"The advocates of those lower-yield nuclear weapons rely on firm assertions about deterrence, a foundation of nuclear war strategy—which is mostly concerned with averting it. Deterrence balances adversaries' judgments of unacceptable harm to themselves against the gains they might make. The calculation includes conventional military power as well as nuclear."[cxx]

"The idea is that Russia would use a small nuclear weapon on an aircraft carrier group or a city like Warsaw or Tallinn. That would prove that they are serious about using nuclear weapons, the United States would shy away from a nuclear response, and Russia would gain an advantage."[cxxi]

"So, NATO either continues nuclear deterrence, which the alliance is already doing, or NATO can engage in nuclear coercion, where it engages with Russia to discourage it from deploying weapons to Belarus. But under the current situation, I think NATO will continue nuclear deterrence."[cxxii]

"The US is considering the deployment of intermediate-range missiles in Europe for the first time since the Cold War to counter a newly threatening Russia."[cxxiii]

"One of America's most senior military officers added to concerns this week by warning that China could one day launch a surprise nuclear attack"[cxxiv]

"Asked if the hypersonic glide vehicle, travelling at more than five times the speed of sound, hit the target, he replied: 'Close enough.' Were the glide vehicle to be armed with a nuclear warhead, it would not need to be that accurate. 'Why are they building all of this capability?' Hyten questioned. 'They look like a first-use weapon. That's what those weapons look like to me.'"[cxxv]

"Instead, the United States is now facing questions about how to manage a three-way nuclear rivalry, which upends much of the deterrence strategy that has successfully avoided nuclear war."[cxxvi]

"'By the 2030s the United States will, for the first time in its history, face two major nuclear powers as strategic competitors and potential adversaries,' the Pentagon said last fall in a policy document. 'This will create new stresses on stability and new challenges for deterrence, assurance, arms control, and risk reduction.'"[cxxvii]

"Under the painted veil of AUKUS lies the bad precedent set by the nuclear submarine cooperation among the US, the UK and Australia, in which a nuclear weapon state will transfer weapons-grade highly enriched uranium to a nonnuclear weapon state. This constitutes severe nuclear proliferation risks, runs counter to the purposes and goals of non-proliferation of nuclear weapons and will create endless troubles."[cxxviii]

"China said on Thursday cooperation of the United States, the United Kingdom and Australia on nuclear-powered submarines severely harmed regional peace and stability, and added it would closely follow the development of the situation."[cxxix]

"What the Biden administration has done, instead, is forming AUKUS (a security alliance among Australia, the UK and the US) in 2021, under which the US and the UK will provide nuclear-powered submarines for Australia. In fact, the formation of AUKUS indicates nuclear nonproliferation has given way to US security concerns, triggering worldwide dismay."[cxxx]

"The US and the UK want to beef up the military presence in the region so they can manipulate smaller countries and draw economic benefits from them. Containing China's influence in the region and disrupting its economic collaboration with other countries is another goal."[cxxxi]

"Moreover, once Australia obtains weapons-grade nuclear materials, the power balance of the Asia-Pacific region will be tipped and conflicts among countries may be deepened."[cxxxii]

"It [AUKUS] is likely to cause instability in the regional peace and security of ASEAN and thus affect the investment climate in the region."[cxxxiii]

"The nuclear weapons proliferation potential of this deal will be significant. A government assurance on the matter is totally inadequate. Other nations will see it differently."[cxxxiv]

"India's accumulation of uranium through deals with Australia, Canada and other countries based on NSG exemption is generating immense pressure on Pakistan to maintain strategic/deterrence equilibrium against India."[cxxxv]

"These actions taken by India to achieve its national goal of being a regional and international power, changed the security lay out of South Asia. In addition, it has pulled the region into never ending conventional and non-conventional arms race. Cherry on the top is the defiance of deterrence stability by India, which is fueling security dilemma in the region. Thus, to avoid war and counter India, Pakistan resorted to nuclear deterrence as strategic stability is way idealistic goal in an environment of mistrust and on-going conflicts."[cxxxvi]

"It is a common conceit, regardless of nationality, to assume that more and better nuclear capabilities mean stronger deterrence. But a nuclear arms competition does not result in added security or stability. Instead, the more one side builds up its nuclear deterrent, the more uncomfortable the other feels."[cxxxvii]

Dual use technology and AI

"Many proliferation sensitive goods are dual-use goods, which have applications both in nuclear and non-nuclear industries and institutions."[cxxxviii]

"Whether nations knowingly provided the technology or North Korea covertly obtained the material should be examined. Nations have a legal obligation under the 2004 U.N. Security Council Resolution 1540 to control exports to prevent the proliferation of dangerous missile, nuclear, and military technologies. While U.N. sanctions, international treaties and laws, and national export control efforts have slowed the flow of technology and increased the time for development, it is clear they have not stopped the proliferation of these dangerous technologies."[cxxxix]

"While the rapid development of artificial intelligence and robotics in the past decade have led to improvements for consumers, the transport sector and human health, the military application of greater autonomy in weapons systems has evoked images of Terminator-type sci-fi war machines entering the battlefield to hunt down adversaries without any human behind the controls."[cxl]

"Lethal autonomous weapons systems are not like nuclear weapons since they cannot be counted and they do not fall under arms control agreements."[cxli]

"The world is entering a new era of warfare, with artificial intelligence taking center stage. AI is making militaries faster, smarter and more efficient. But if left unchecked, it threatens to destabilize the world."[cxlii]

"But the same seductive logic that accelerated the nuclear arms race could, over a period of years, propel AI up the chain of command. How fast depends, in part, on how fast the technology advances, and it appears to be advancing quickly. How far depends on our foresight as humans, and on our ability to act with collective restraint."[cxliii]

"We can see all our national strengths and weaknesses in the AI debate: a smart, dynamic private sector but weak public leadership; proud military services that unfortunately are tied to legacy weapons systems such as manned fighter jets and giant aircraft carriers; a public education system that doesn't prepare students well for the tech jobs that matter; a broken immigration policy that doesn't serve our economic needs."[cxliv]

Thwarting nuclear capability

"A few years back, a US journalist, Seymour M Hersh created an alarm by writing an article that a squad of US special elite forces, which has been trained to operate covertly for the extraordinary assignments like seizure of nuclear weapons in case of real emergency, is already in Islamabad."[cxlv]

"Pragmatically, is it possible for India to locate all Pakistani nuclear weapons and completely destroy Pakistan's nuclear forces"[cxlvi]

RQ6 How do news media and arms control experts discuss mitigating future risks of nuclear integrated warfare within the meta-crisis?

Multilateral export controls and unity among the global community

"*Despite their empty promises, all nine nuclear weapon states are enhancing, modernizing, and increasing their nuclear arsenals…Recent nuclear threats are a symptom of a broken system which allows nine nations to hold the world hostage with their genocidal weapons.*"[cxlvii]

"*The United Nations, of course, was created in the aftermath of the vast devastation of World War II in the hope of providing national security. But, as history has demonstrated, it is not strong enough to do the job—largely because the 'great powers,' fearing that significant power in the hands of the international organization would diminish their own influence in world affairs, have deliberately kept the world organization weak.*"[cxlviii]

"This difficulty in reaching a consensus points to a fundamental flaw in the FCM design. As long as the accuser and the accused play their part in consensus building, the mechanism cannot arrive at a clear determination, one way or the other."[cxlix]

"*The relative weakness of the current United Nations in enforcing nuclear disarmament is illustrated by the status of the UN Treaty on the Prohibition of Nuclear Weapons…Although the treaty officially went into force in 2021, it is only binding on nations that have decided to become parties to it. Thus far, that does not include any of the nuclear armed nations.*"[cl]

"The proliferation record in few last decades shows that the international mechanism to combat nuclear proliferation is relatively proving inadequate to handle prevailing challenges as the suspected cases of nuclear proliferation i.e. India, Israel, Pakistan, Iran, North Korea, Libya and Syria, were not deterred or reversed."[cli]

"One factor is certainly the public's preoccupation with other important issues, among them climate change, immigration, terrorism, criminal justice, civil liberties, and economic inequality. Another appears to be a sense of fatalism."[clii]

"A stronger argument for continued secrecy is that there are ways that an enemy's weapons could be rendered ineffective if their exact compositions were known…And, of course, that hypothetical future would include actors other than the United States and Russia: the other nuclear powers of the world are less likely to want to share nuclear warhead schematics with each other, and an ideal system could be used by non-nuclear states involved in inspections as well. But even if everyone did share their secrets, such verification systems might still be useful, because they would eliminate the need for trust altogether, and trust is never perfect"[cliii]

"The situation in the Security Council is difficult because of a lack of great power cooperation. But the vast majority of UN member states are still committed to the goals of nuclear disarmament, non-proliferation and the complete elimination of nuclear weapons. The UN can and does play an important role as a trusted and neutral broker. We bring the different parties together: our member states and also other actors. While we must safeguard the great gains made to date, there is a need for more creativity, for a new vision and new approaches in arms control and disarmament. The UN is ready and willing to facilitate new thinking on such a vision."[cliv]

"It is crucial that all foreign policy tools, including arms control and non-proliferation, be taken advantage of and utilized in the most effective way possible. In the wake of insecurity brought on by Russian nuclear threats and Iran's heightened enrichment capabilities, it's time for more consideration to be taken of new, creative solutions for the old threat of nuclear proliferation."[clv]

"National export controls restrict the transfer of sensitive materials that could be used for nuclear and emerging technologies weapons proliferation to particular states or regions of concern. These controls can be implemented without the inclusion of adversaries in the decision-making and implementation process, making their effort less likely to be thwarted."[clvi]

"Given the importance of Western technologies to Russia's war effort and China's disregard for global standards such as intellectual property protections, it may be time to reincorporate elements of the Cold War-era Coordinating Committee for Multilateral Export Controls (COCOM) and block the transfer of technologies to Russia and China that could fuel military aggression and nuclear threats."[clvii]

"Having a more permanent, standardized export control policy among the United States and allies will demonstrate credibility of threats to diminish Russia's military capabilities and unity among the international community, and ensure the effect of export controls on Russia's economic, military, and technological proliferation abilities is as durable as possible. Cooperation among Western states is crucial to ensure the strongest possible effect is made and to diminish the risk of non-compliant spoilers that continue to practice free trade with these states."[clviii]

"We must remember that collective security was born because of great power conflict, not in spite of it, and its re-emergence presents an opportunity to reimagine non-proliferation in a way that builds on the foundation of liberal values that America spent the last half-century spreading across the world"[clix]

"Threats of nuclear retaliation are not only unnecessary and counterproductive, but also would legitimate Putin's own threats and set red lines no one can afford to cross."[clx]

"To eliminate the danger, we must actively reinforce the legal prohibitions and norms against nuclear weapons use and threats of use – as well as their development, testing, possession, and proliferation – and press for effective disarmament diplomacy that leads to concrete action that puts us on the path toward the complete, irreversible, and verifiable elimination of all nuclear weapons."[clxi]

Need for a comprehensive treaty that deals with emerging capabilities

"The greatest urgency to action to prevent any further spread of nuclear weapons. International agreements on this must be our first disarmament priority."[clxii]

"The TPNW builds on the solid lessons of history that prohibition treaties have been key to driving work to eliminate inhumane weapons, influencing countries even that do not join them, and that no weapon has been controlled without first being prohibited."[clxiii]

"[TPNW] is a step toward mobilizing citizens worldwide to help ensure that humanity survives the existential threat posed by nuclear weapons. The Treaty on the Prohibition of Nuclear Weapons lights a path that all countries can take. The stakes could not be higher."[clxiv]

"The path to a nuclear-weapons-free world has now been charted by the Treaty on the Prohibition of Nuclear Weapons."[clxv]

"Given the breadth of capabilities and concerns on the table, arms control must encompass a broad range of initiatives, including not only traditional legally binding treaties but also risk reduction, crisis management, and confidence-building measures, such as establishing hotlines between high-brass military officials."[clxvi]

The science of nuclear use and clearer meaning of transparency

"The transparency that one person considers indispensable is often deemed to be unnecessary, inappropriate or even threatening by someone else."[clxvii]

"New START 'gives us some degree of predictability on what our potential adversaries look like.' This is a significant benefit for the military, which has to plan for a huge range of potential threats and values whatever predictability it can get to make that job a little bit easier."[clxviii]

"It also could bolster the creation of a single, international system to track and route satellites, an air traffic control for orbital space. Such a system would enable much better awareness and communication than exists today."[clxix]

"Mutual, verifiable nuclear arms control offers the most effective, durable and responsible path to reduce the role of nuclear weapons in our strategy and prevent their use."[clxx]

Public support

"Nuclear transparency is not just about pleasing the arms controllers – it is important for national security"[clxxi]

No first use declarations to no use via build down

"'One thing is certain and generally agreed…, namely that the only sure and easily recognized 'firebreak' is the dividing line between conventional weapons and nuclear weapons, however small. Once that point has been passed everyone would be in an unknown world.' Alastair Buchan,"[clxxii]

"I don't think there's any such thing as an ability to easily use a tactical nuclear weapon and not end up with Armageddon."[clxxiii]

"First use leads to more use, and uncontrolled escalation would be a crime against humanity and nature."[clxxiv]

Weapons free zones

"He went on to say that China will never seek hegemony, still less bully smaller countries, and the nation supports ASEAN's efforts to build a nuclear weapon-free zone."[clxxv]

"All ASEAN member states are signatories to the Southeast Asia Nuclear-Weapon-Free Zone Treaty, or SEANWFZ, which is committed to keeping nuclear weapons out of the region."[clxxvi]

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