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EXECUTIVE SUMMARY	4
INTRODUCTION	8
About the Arctic Health Preparedness Conference	9
Strengthened Health Preparedness in the Arctic:	
About the project	10
SUMMARY OF PRESENTATIONS	11
MAIN CHALLENGES AND OPPORTUNITIES	25
Main challenges within Arctic	
health preparedness	26
Opportunities for Strengthening Arctic	
Health Preparedness	28
GAPS AND AREAS FOR FURTHER RESEARCH	32

EXECUTIVE SUMMARY

"The sense of urgency brings us together today."

- Anne Bergh, Secretary-General of the Norwegian Red Cross, at the opening of the Arctic Health Preparedness Conference in Oslo, January 2025.

The Arctic is experiencing rapid changes due to climate change, increased tourism, and shifting geopolitical dynamics. These changes impact health preparedness, as new risks and challenges arise, in an environment where emergency response is already complicated by the Arctic's vast distances, limited resources and harsh weather conditions. It is essential to examine both the challenges and opportunities to develop effective health preparedness plans that ensure the safety and well-being of Arctic communities. The "Strengthening Arctic Health Preparedness" project was initiated to get a better understanding of current and emerging risks to health preparedness and emergency response in the Arctic, with a special focus on how civil society resources — in particular those of organised and volunteer-driven preparedness organisations with a local presence in the Arctic — can increase their collaboration with Arctic States' health authorities to collectively strengthen our understanding and collaboration in preparation for emergencies, accidents and crises situations in the Arctic.

This report summarizes findings from the Arctic Health Preparedness Conference organised by the Norwegian Red Cross/International Federation of the Red Cross and Red Crescent Societies (IFRC) and the Northern Norway Regional Health Authority (Helse Nord) in January 2025.





1. Climate change has a major impact on Arctic health preparedness.

The Arctic faces significant climaterelated challenges, including melting sea ice, rapid warming, permafrost thaw, and extreme weather events. These changes impact the environment, local communities, and health preparedness. Thawing permafrost releases contaminants, while increased wildfires and heavy rainfall disrupt ecosystems and strain emergency response systems. Rising temperatures introduces new pathogens and contribute to the spread of diseases and increasing air pollution negatively affects human health. Indigenous communities face mental health challenges due to climate-induced disruptions of traditional lifestyles and cultural practices. The harsh conditions in the Arctic region complicate emergency response, highlighting the need for effective health preparedness.



2. Communities experience several geographical and logistical barriers to health preparedness.

Providing health preparedness in remote
Arctic communities is challenging due to vast
distances, limited infrastructure, and unreliable
communication. Small communities often lack
resources, trained personnel, and emergency
response capabilities, complicating healthcare
delivery and support for volunteer-based search and
rescue operations. This is further exacerbated by the
distances and the harsh weather conditions, which
complicate access to health service delivery, both for
individuals and communities



3. Increased economic activity challenges healthcare resources and capacities in the Arctic.

For Indigenous populations, the land is integral to identity, culture, and livelihood. Industrial and tourism development, such as wind farms, fisheries, mining, and infrastructure, pressure Arctic land and sea areas, causing environmental degradation and disrupting traditional lifestyles such as reindeer herding. Increased economic activity including shipping and tourism raises the risk of accidents and strains local emergency response systems. Cruise ship accidents in remote areas pose significant challenges for mass rescue operations due to harsh conditions and limited resources.



4. Geopolitical tensions in the Arctic region affect the delivery of health services.

Geopolitical tensions have been rising in the Arctic region in recent years, as the region has strategic geographic importance. Distrust in multilateral systems and political polarization can hinder international cooperation on Arctic health and climate issues including cross-border health services.



5. There is an opportunity to strengthen health preparedness through community resilience and local capacity building.

Enhancing Arctic health preparedness involves integrating Indigenous knowledge and training laypeople in emergency response. Collaborating with Indigenous communities strengthens resilience and improves emergency preparedness. Structured volunteer programs and specialized training in first aid and mental health support are crucial. Additionally, developing mental health support systems for both organised and unorganised volunteers ensures that they remain emotionally resilient during emergencies. These measures collectively enhance community resilience and effective emergency response in the Arctic.



6. Through collaboration, partnership, and knowledge sharing, we can strengthen health preparedness in the Arctic.

Collaboration and knowledge exchange are vital for Arctic health preparedness. Cooperation between international communities, civil society, and local groups enhances emergency response, especially in remote areas. Partnerships between scientists, government officials, and end users help move from identifying problems to finding solutions. Sharing best practices and cross-border collaboration improve resource sharing and coordination. Platforms for knowledge exchange and research collaboration can develop evidence-based guidelines, ensuring better preparedness for future challenges.



7. Innovative solutions, health technology, and One Health approach is essential to improving health preparedness.

Innovative health technologies and solutions can significantly enhance Arctic health preparedness. These include drones for Search and Rescue (SAR) operations and projects such as the Walking Blood Banks. Drones can transport medical supplies, and locate patients, though their use is limited by harsh Arctic weather. Additionally, modular, rapid-deployment kits like "drop bags" are essential for volunteers, aiding in large-scale emergencies.

The One Health approach, which connects human, animal, and environmental health, is vital in the Arctic because of the interdependence between communities and their environment. Incorporating One Health principles into Arctic health strategies provides a comprehensive response to health challenges, particularly in the context of climate change and emerging zoonotic diseases.



8. Policy development and governance are critical for strengthening health preparedness in the Arctic.

Policy development and governance are critical for strengthening health preparedness in the Arctic. Initiatives like Emergency Medical Teams and Emergency Response Units can be implemented across the Arctic. Such frameworks ensure that healthcare can be rapidly deployed in non-conflict zones while maintaining coordination with local resources. Policies should support local capacity and involve Indigenous communities in decision-making to ensure health strategies meet their unique needs and knowledge.

Gaps and areas for further research

The conference participants identified several areas missing from the conference that have an impact or pose a threat to Artic Health preparedness. These include the role of volunteers that are not involved in the search and rescue system, the involvement of schools and education authorities and the importance of telemedicine. Preparedness related to loss of critical infrastructure, the role of non-governmental organisations (NGOs) in the changed geopolitical landscape, and motivating factors for people to stay in remote areas were also highlighted as important areas that could have been better addressed at the conference.

Areas needing further research and analysis to enhance health preparedness in the Arctic were also identified by the conference speakers and participants. Key areas mentioned include support systems and the role of volunteers and laypeople in health emergencies, lifelong learning education in Arctic health preparedness and cross border crisis preparedness. More research to find non-toxic alternatives in food production and household products, cold climate medicine, and research into diseases, particularly re-emerging ones, were listed as essential.

Integrating Indigenous knowledge into research was stated as important to provide a holistic approach to health preparedness. Gathering data to inform policymakers and developing platforms for knowledge exchange was mentioned as crucial for creating robust health strategies. Research should use the "One Health" approach, and focus on human factors, vulnerabilities, and societal responses to climate change, particularly for Indigenous people.





The Arctic is undergoing significant and rapid changes in climate, environment, and human activity, all within a vast region characterized by limited resources, vast distances and harsh weather conditions. The impacts of climate change are more pronounced in the Arctic than anywhere else on the planet, intensifying existing risks and increasing the chances of large-scale emergencies. This situation necessitates highly effective emergency planning and response, utilizing all available resources to safeguard people's lives and health.

This report summarizes presentations, findings, knowledge gaps, discussions, and recommendations for further research from the Arctic Health Preparedness Conference organised by the Norwegian Red Cross/International Federation of the Red Cross and Red Crescent Societies (IFRC) and the Northern Norway Regional Health Authority (Helse Nord) that took place in Oslo, 22-23 January 2025.

The report draws on information from the conference presentations, panel discussions, and evaluation survey responses. Each presentation and panel discussion were summarized based on extensive notes taken during the conference. An evaluation survey was sent to all conference participants after the conference to gather feedback on what they were missing from the conference and to generate ideas for further research.

About the Arctic Health Preparedness Conference

The Conference was the main delivery in the Norwegian Red Cross and the Northern Norway Regional Health Authority's joint project on" Strengthening health preparedness in the Arctic", which was approved as a project under the Emergency Prevention, Preparedness and Response (EPPR) Working Group of the Arctic Council, with financial support from the Norwegian Ministry of Foreign Affairs. The conference was hosted by the Norwegian Red Cross and the Northern Norway Regional Health Authority (Helse Nord) in Oslo, 22-23 January 2025. During the Norwegian Chairship of the Arctic Council (2023-2025), the Norwegian Red Cross is representing the International Federation of the Red Cross and Red Crescent Societies (IFRC) as an Observer to the Arctic Council.

Over 80 participants from Arctic local communities and civil society, as well as health officials across the Arctic countries, participated in the conference. The participants represented Red Cross National Societies from the Arctic states, other voluntary organisations involved in health preparedness and response, governmental agencies from health civil protection, and search and rescue services, the Sami council and the Sami parliament, academia, and the private sector, in addition to representatives from the International Federation of the Red Cross and Red Crescent Societies (IFRC).

This conference was first and foremost devoted to discussions of how health preparedness is organised and planned across the Arctic. The participants had the opportunity to engage in conversations about current and emerging risks to human lives and health in the Arctic. The various presentations and panel discussions examined current measures for ensuring effective emergency response and highlighted the role of local communities and civil society in emergency response planning, risk mitigation, and disaster response in the Arctic. The objective was to lay the foundation for furthering existing collaboration and partnerships in the Arctic between local communities and public authorities in the Arctic to establish a shared situational awareness about what the main risks and threats to securing health service delivery in the Arctic are.









Strengthened Health Preparedness in the Arctic: About the project

The Arctic Health Preparedness Conference was a project deliverable of the joint project initiated by the Norwegian Red Cross and the Northern Norway Regional Health Authority under the Norwegian Chairship of the Arctic Council (2023-2025). The project was approved as a project under the Council's Emergency Prevention, Preparedness and Response (EPPR) Working Group, and received funding from the Norwegian Ministry of Foreign Affairs. The International Federation of Red Cross and Red Crescent Societies (IFRC) is an Observer to the Arctic Council. Observers are encouraged to make relevant contributions to the work of the Arctic Council through engagement primarily at the level of the Council's Working Groups. During the Norwegian Chairship of the Arctic Council, the Norwegian Red Cross has represented the IFRC as an Observer. This project has been led by the Norwegian Red Cross, with support from the IFRC, in collaboration with the Northern Norway Regional Health Authority.

Building on the knowledge from the Finnish Red Cross' Arctic Disaster Management Study (2018), which assessed the Red Cross National Societies in the Arctic's resources and response capacities in the Arctic, the aim of this project has been to look more closely at risks associated with threats to human life and health in Arctic emergencies, and identify existing and future modes of closer cooperation and collaboration between resources from civil society and health authorities in future Arctic emergencies.

The premise for the project is the acknowledgement that a whole-of-society approach to health preparedness is required everywhere, but all the more necessary in remote areas with limited resources and intensified risks to human lives and health as a result of on-going changes occurring in the Arctic.





SUMMARY OF PRESENTATIONS

Opening of the conference

INGA NYHAMAR, representative for the Norwegian Chairship and Chair of the Arctic Council Sustainable Development Working Group (SDWG)

Inga Nyhamar opened the conference by emphasizing the importance of strengthening health preparedness in the Arctic, particularly through knowledge sharing and closer cooperation. She highlighted the logistical challenges faced by remote communities, such as vast distances and limited access to medical services. Nyhamar stressed the need to integrate traditional Indigenous knowledge into health strategies, encapsulated by the concept of "One Arctic, One Health." Nyhamar also discussed ongoing projects, such as suicide prevention and alcohol use initiatives, which aim to address the unique health challenges of Arctic populations. Her presentation underscored the importance of a holistic approach to health preparedness in the region.

BIRGITTE B. EBBESEN,
Regional Director for Europe at the International
Federation of the Red Cross and Red Crescent Societies
(IFRC)

Birgitte Ebbesen outlined several challenges the Arctic region faces, including geopolitical challenges, political polarization, distrust in multilateral systems, and humanitarian challenges. Ebbesen introduced the concept of poly-crisis, stating that "we are facing multiple crises that are interacting and making new forms of crises." To face these challenges, Ebbesen highlighted the importance of standing firmly with local communities, strengthening sustainable solutions, mental health support, pandemic preparedness, and implementing indigenous lifestyles and knowledge, to help Arctic communities emerge stronger and better prepared. Ebbesen emphasized the IFRC's mantra, "As local as possible, as international as needed," saying that



Birgitte B. Ebbesen, Regional Director for Europe at the International Federation of the Red Cross and Red Crescent Societies (IFRC)

trust, equity, and local action are crucial for community preparedness. Ebbesen also called for enhanced engagement with the Arctic Council to strengthen health preparedness, particularly in the face of climate change. Her presentation highlighted the need for innovative solutions and partnerships to address the complex challenges of the Arctic.



Anne Bergh started by underlining the severity of climate change, saying that "The sense of urgency brings us together today." The Arctic is experiencing rapid climate change with temperature rising three times faster than the global average. Changes are going on that are going to take place, whether we do something or not. Bergh discussed the challenges posed by these conditions in the Arctic, addressing issues such as vast geography, extreme weather, and limited access to health services. She emphasized the importance of training local volunteers and building resilient communities capable of handling emergencies saying "The first help comes from those who are on the spot. The capability needs to be in the local communities." Bergh also called for more research to gather data and improve preparedness efforts. She highlighted three major points for improving health preparedness: we need to team up, we need to prepare for the unexpected and we need to unite our resources. Her presentation underscored the need for collaboration between international Arctic communities, civil society,



Anne Bergh, Secretary-General of the Norwegian Red Cross

and local communities to share knowledge and prepare for large-scale emergencies.

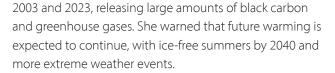
Setting the scene

Marianne Kroglund, Arctic Monitoring and Assessment Programme

Marianne Kroglund presented preliminary findings from the updated and soon to be published Climate Update Report of the Arctic Monitoring and Assessment Programme (AMAP), an Arctic Council working group providing information on the status and emerging challenges to the Arctic environment. Kroglund emphasized the alarming facts of climate change in the Arctic, also stating that the region is warming threefour times faster than the global average, leading to significant changes in sea ice, permafrost, and glaciers. Climate change results in extreme weather events such as heatwaves, heavy rain, extreme snowfall, and wildfires, which impact both the Arctic and the global climate system. According to the AMAP analysis, sea ice has declined by 60 percent since the late 1970s, and snow cover could reduce by up to 60 percent by the end of the century. Kroglund highlighted that thawing permafrost is causing ground sinking, landslides, and the release of greenhouse gases and contaminants like mercury. AMAP's analysis also indicates that the Arctic Ocean is acidifying three times faster than other oceans, affecting ecosystems and marine food chains. Kroglund noted that wildfires in the Arctic have increased fourfold between



Carl-Fredrik Donjem, MD, Senior Advisor for International Cooperation at The Northern Norway Regional Health Authority (Helse Nord)



Kroglund emphasized the complexity and unpredictability of climate change, and that climate change is the driver of multiple risks to the Arctic, affecting health and local communities. She called for adaptation measures to secure a liveable future for Arctic communities. Kroglund's presentation underscored the need for scientific data to inform policy decisions and the importance of addressing the health risks posed by climate change in the Arctic. Collaboration between scientists, government officials, and end users is essential to move from describing problems to finding solutions.

Carl-Fredrik Donjem, MD, Senior Advisor for International Cooperation at The Northern Norway Regional Health Authority (Helse Nord)

Representing the view of the Norwegian health authorities, Carl-Fredrik Donjem explained that Norway is divided into four health authorities, each responsible for various health services. Helse Nord, responsible for Northern Norway and Svalbard, oversees a large area with a low population density. Helse Nord manages four hospital trusts, patient transfer, and air ambulance, and has three SAR bases controlled by the Ministry of Justice. Donjem cited a Norwegian poet, Alf Berg Jacobsen, to



Tonje Margrete Winsnes Johansen, Advisor and Project Manager, Sami Council

illustrate Norway's vast geographical stretch, noting that the country spans from Spain to Poland in length. Due to the distances from hospitals, many missions rely on air ambulance services.

Donjem highlighted several challenges to health preparedness in the Arctic, including climate impacts, health provision, technology, increased migration, hybrid events, security policy situation, demography, and sustainability. Addressing these challenges requires cooperation at various levels due to vast land area and limited resources. Helse Nord participates in international cooperation through the Arctic Council and the Barents Euro-Arctic Council. Helse Nord also contributes to NATO, Northern Health Across Borders, and provides specialized treatment for the Sami population through Sami Klinihkka.

Donjem concluded by stating that the conference serves as an opening key for further conversations and collaboration, with the Bodø for the Arctic Emergency Management in March 2025 as an opportunity to continue discussions.

Tonje Margrete Winsnes Johansen, Advisor and Project Manager, Sami Council

Tonje Margrete Winsnes Johansen presented the main findings from the Sami Council report "Climate Change in Sápmi – An Overview and a Path Forward" from a health perspective. The Sami Council, with members in Norway, Sweden, Finland, and Russia, works to ensure Sami's

interests and serves as a Permanent Participant to the Arctic Council.

The report, created with the Sami Parliament, addresses climate change impacts on the Arctic and the Sami population. Johansen stressed the importance of including Indigenous knowledge in emergency strategies and urged participants to rethink crisis preparedness, noting that adaptation to climate change is often underemphasized. Climate change affects physical and mental health, with Sami people facing challenges like floods, thinner ice, and avalanches. These hazards impact livelihoods and mental health, causing stress and psychological strain. The land's connection to Sami identity and culture adds pressure, with industrial and tourism development further stressing the land.

Johansen emphasized that health preparedness in the context of climate change requires a holistic approach, including mental health. Integrating Sami knowledge and perspectives is crucial for effective crisis management. The report recommends recognizing climate action as vital to health policies and ensuring the autonomy of Sami health institutions. Safeguarding Sami lands and considering socio-cultural aspects in climate decisions are also essential.

As local as possible – the sessions of day 1 demonstrated the importance of local knowledge, science, resources and innovation in health preparedness; utilising local resources to respond to the health needs of the local population.

As local as possible – the sessions of day 1 demonstrated the importance of local knowledge, science, resources and innovation in health preparedness; utilising local resources to respond to health needs and emergencies with locally available resources and adoption of dynamic approaches for the delivery of health care and medical aid in remote locations

Epidemic and Pandemic Preparedness

Christian Sonne, professor of Veterinary and Ecotoxicology and Wildlife Medicine, Aarhus University

Christian Sonne presented the One Health concept, integrating human, animal, and ecosystem health to address Arctic challenges. Sonne explained that monitoring health in the Arctic involves studying polar bears, including pollution, biodiversity, and zoonotic diseases. Local knowledge, culture, and health are also integrated into this research.

Sonne stated that studying polar bears and other animals provides insights into the Northern Hemisphere's environmental conditions. A higher concentration of long-range transported pollution, such as mercury and per- and polyfluoroalkyl substances (PFAS) are found in the Arctic. Exposure to high levels of these chemicals has been associated with a range of health problems including cardiovascular- and neurological disease, cancer, infertility, cognitive impairment, and weakened immune system. Humans in Greenland have higher levels of mercury and PFAS, consuming polar bears and seals. Lyme disease, bird flu, and other diseases are moving north. Unknown diseases are migrating north with new dolphin species that could disrupt biodiversity. Connecting the local and the global, Sonne warned that future pandemics and regional diseases could emerge from the Arctic oceans.

Sonne called for more long-term research and integration of diseases into AMAP programs to address Arctic challenges. He warned that surpassing the nine climate change tipping points will lead to irreversible changes and stated that "The Paris Agreement does not apply to the Arctic, we are far past this point."



Diana M. Bensyl, Director of the Arctic Investigations Program, CDC, Alaska

Diana M. Bensyl discussed the emergency preparedness efforts of the Arctic Investigations Program (AIP), a collaborative initiative that has brought together health authorities and tribal health organisations in Alaska for 50 years. The program focuses on mitigating infectious diseases through partnerships with tribal, local, and territorial health departments

The program's history dates back to the US Public Health Service and the Arctic Health Research Center in Fairbanks. AIP maintains a specimen bank with 500,000 specimens and conducts public health surveillance and research among all Alaskans and Alaska Native communities. A notable aspect of their work is the specimen bank, which includes samples mostly from Alaska Native people, used for ongoing studies after full tribal approval has been received.

AIP's current international partnerships focus on monitoring for invasive bacterial diseases. The program can also do all hazards emergency response. One example is their involvement in the COVID-19 response, which included serving as a vaccine depot for communities in Alaska and supporting lab and epidemiology staff from state of Alaska and tribal organizations.

Bensyl stressed that climate change brings multiple threats to communities and noted that zoonotic diseases cause billions of cases of sickness and millions of deaths worldwide each year. Changing weather and landscapes provide new opportunities for zoonotic disease to spread. Addressing these challenges requires a unified approach, where collaboration with Indigenous people and Arctic communities worldwide is necessary. Bensyl emphasized the importance of continued research, surveillance, and emergency response efforts to address health security in the Arctic.



Bent-Ove Jamtli, Project leader for Project Blood Preparedness, The Northern Norway Region Health Authority (Helse Nord)

Megan Hudson, Senior Manager, Health Promotion (Indigenous Program Team) and Dr. Ayham Alomari, Senior Director, Health in Emergencies (Canada and International), both from Canada Red Cross

Megan Hudson and Dr. Ayham Alomari discussed the Canadian Red Cross's (CRC) efforts in epidemic control and engagement with Indigenous communities in northern Canada. They emphasized the importance of creating safe environments and strategies, learning from past experiences, and collaboration.

The CRC's mission is to preserve health, dignity, and safety. In Canada during COVID-19, the focus was on prevention and isolation, with fewer deaths in northern regions due to effective protection measures. However, human resource shortages, especially in nursing stations, remain a challenge. Hudson highlighted the "Indigenous People Help Desk" program, which provided virtual support to communities. The Community Wellness & Protection team offered psychological first aid and stress safety measures. Engaging Indigenous communities involved both virtual and in-person interactions, fostering new relationships.

For long-term support, communities need in-person assistance with health promotion and emergency planning. Hudson and Alomari stressed the importance of being present in communities during normal times to strengthen local epidemic readiness. Hudson stated, "It's very easy to sit back and say what the challenges are but it's more important that our focus is on capacities and what the communities bring to the table".

Blood preparedness

Bent-Ove Jamtli, Project leader for Project Blood Preparedness, The Northern Norway Region Health Authority (Helse Nord)

Bent-Ove Jamtli discussed the pilot project for walking blood banks in remote areas like Svalbard and Finnmark. A walking blood bank is a system for emergency collection of whole blood from donors to treat patients with lifethreatening bleeding. This project aims to improve blood preparedness in Northern Norway, where only two blood banks have all blood products, and extreme weather can delay blood transport.

Initiated in 2021, the project established walking blood banks in four communities. These banks collect blood on-site during emergencies, a practice common in the military but unique in civilian settings. The project involves recruiting type O blood donors, developing standard operating procedures, training personnel, and ensuring regulatory approval and supervision. So far, four walking blood banks have been established, with a fifth pending. There have been 15 live activations, with an average response time of 30 minutes or less. Over 60 personnel have been trained, and more than 100 emergency blood donors have been recruited. The project has shown that walking blood banks can provide better early treatment in remote areas. The goal is to expand the project and establish a joint Nordic blood preparedness initiative with Finland, Sweden, and Norway.



Jouni Lauronen , Conny Graumann and Bent-Ove Jamtli.

Jouni Lauronen, Doctor and Chief of Department at the Finnish Red Cross Blood Service

Jouni Lauronen discussed blood preparedness in Finland, where the Finnish Red Cross has managed blood services since 1948. Operating from new facilities in Vantaa, the Finnish Red Cross is the sole blood operator, mandated to manage blood services under both normal and exceptional conditions. They provide various services, including biobank and educational programs.

Lauronen talked about preparedness planning and the focus on the 5 Cs: capacity, contingency, cybersecurity, crisis-specific products, and contacts. Blood donations are collected at ten different centres, mobile stands, and a donation bus. Currently, 3.5 percent of eligible donors give blood, intending to increase this to 5 percent.

The Finnish Red Cross supports donors with a mobile app for urgent blood needs and carefully manages blood stocks to prevent expiration. For crisis-specific needs, they plan to establish walking blood banks and have considered incorporating them into Emergency Response Units (ERUs).

Conny Graumann, Biomedical Laboratory Scientist and Coordinator for Walking Blood Bank, Alta, Norway

Conny Graumann discussed the operation of walking blood banks in Alta, Norway, and their success. These blood banks are crucial in Northern Norway, where winter often isolates communities.

Graumann talked about the importance of a well-coordinated team with regular training and maintained procedures. Documentation and clear instructions are also critical. The emergency blood donors are on duty 24/7 and undergo regular tests. The Alta Walking Blood Bank has participated in Nordic response exercises, with an average response time of 27 minutes. Graumann emphasized the need for organisation, insurance coverage, and recruiting more local donors.

Panel discussion with Bent-Ove Jamtli, Jouni Lauronen, and Conny Graumann

During the discussion, questions arose about unforeseen challenges in activating walking blood banks. Panellists mentioned unexpected bleeding types in emergency rooms, transport difficulties when planes are grounded, and nighttime team responsiveness issues. The loss of documentation during patient transfers was also highlighted, emphasizing the need to review procedures. Despite concerns about acting too quickly, the consensus was that walking blood banks should be activated in lifethreatening cases.

Insurance challenges were also discussed. Phlebotomists not employed by hospitals or communal services might face insurance issues. Organising through the Red Cross can provide coverage, and in Svalbard, those drawing blood are given zero percent positions at the hospital to ensure insurance. In Finland, special insurance for donors covers expenses.

The panel addressed why walking blood banks are being implemented now. Regulatory issues and scepticism about using whole blood have been barriers to establishing this service. Strict national regulations and ethical and economic concerns contributed to hesitation. However, medical developments and the use of whole blood in war zones have influenced current adoption. Walking blood banks were used in Svalbard in the early 1990s, showing the concept is not entirely new.



Terje Olav Øen, the Norwegian Directorate of Health

Local resources

Terje Olav Øen, the Norwegian Directorate of Health

Terje Olav Øen presented the use of local resources as emergency responders, in remote areas where medical personnel are far away or not available. In Norway, these local resources called "acute helpers" include civilians, police, fire and ambulance personnel organised by municipalities. These responders receive the necessary training, with refresher courses every two years, and are insured as healthcare workers during their duties.

Training of "acute helpers" is one of the contributions to the Norwegian Directorate of Health's national initiative "Together We Save Lives". Øen highlighted the importance of clear agreements between municipalities and health organisations, trained personnel, and standardized procedures. He also stressed the need for better documentation and data collection to improve the effectiveness of emergency responders.

Stijn Van de Velde, Senior Researcher at Magic Evidence Ecosystem Foundation, and Kriki de Smet, Magic Evidence Ecosystem Foundation

Stijn Van de Velde and Kriki De Smet presented findings from a mapping review conducted as preparation for



Stijn Van de Velde, Senior Researcher at Magic Evidence Ecosystem Foundation.

a planned mixed methods review on empowering laypeople in Arctic health emergencies and strengthening ties with professional responders. The project titled LAYCAREMIX aims to study how laypeople and local volunteers can enhance emergency response in underserved Arctic communities. Initial findings were presented at the conference, with hopes to continue research and secure further funding. The project involves the University of Toronto and seeks additional Arctic partners with indigenous perspectives. It focuses on the role of community members in first aid and emergency response, covering various emergencies ranging from life-threatening situations in the community (including mental health first aid), search and rescue outside the community and disaster situations requiring a wholeof-society response. For example, one of the studies on a cardiac arrest response program in Austevoll showed faster response times by volunteers compared to ambulances, but emotional strain led to a high dropout rate among volunteers. Another study on drones, tested for search and rescue operations In Arviat, Nunavut, showed that while faster than traditional methods, poor flying conditions limited their use. More opportunities to enhance first aid skills together with psychosocial support for volunteers were perceived as burning needs. A further example from avalanches in Iceland, illustrated how community members and organized volunteers had a crucial role in the emergency response, together with experiences on how to the response across all levels of society can be improved.

Van de Velde and De Smet emphasized that while there is significant potential to learn through synthesizing the existing research, also more research is needed for specific issues that remain unaddressed. This is especially important as the challenges in the Arctic are increasing, with more incidents and emergencies more frequent and more severe. They claimed that an important direction for future research is TMITITKWITMIT, meaning that "the most important thing is to know what is the most important thing". As part of the mixed methods reviews the project group plans interviews with a range of stakeholders across the arctic to help interpret the findings and to collect perceptions on what is most important.



Elisabeth Erke, Member of the Governing Council of the Sami Parliament

Day 2

Setting the scene

Elisabeth Erke, Member of the Governing Council of the Sami Parliament

Elisabeth Erke highlighted the severe impact of climate change on Arctic communities, especially indigenous people. She emphasized the need for resilience, more research, and sustainable practices and noted the challenges posed by geographic isolation and the importance of cooperation between civil society and government.

Erke discussed the crises faced by reindeer herding communities, particularly the 2022 crisis affecting 160,000 reindeer. Erke stressed the importance of traditional knowledge and the careful consideration of new methods like supplementary feeding. Erke highlighted the "One Health" model, linking the health of people, the environment, and animals. She recognized the mental health impact on Sami herders and the need for specialized services in indigenous areas, adhering to the principle of "Nothing about us without us." In conclusion, Erke urged the Sami Parliament to prioritize health

preparedness, cooperation, and the significant work being done in the Arctic, stressing that losing the Arctic means losing the world.

"As global as needed" - Day 2

focused on large-scale emergency preparedness and response, where local resources may be insufficient to respond to the health needs of those affected and resources from the outside must be deployed, and the aftermath of crises and the importance of supporting local communities and volunteer helpers after the emergency



Tore Hongset, SAR Mission Coordinator at Joint Rescue Coordination Centre (JRCC) Norway, member of Arctic Council Search and Rescue Expert Group (SAR EG)

Tore Hongset discussed the implications of the 2019 incident in Hustadvika, where the Viking Sky cruise ship required a large-scale rescue operation coordinated by JRCC South Norway. He explained that Mass Rescue Operations (MROs) involve multi-agency, multi-jurisdictional responses to high-consequence, low-probability incidents. During the Viking Sky incident, severe weather prevented using lifeboats, leading to the deployment of six helicopters that rescued 466 people in 18 hours.

Hongset also explored the potential consequences if the Viking sky incident had occurred in the Arctic, emphasizing the unique challenges of Arctic SAR operations, including long distances, limited rescue assets, extreme weather, unreliable communications, various ice types,



Tore Hongset, SAR Mission Coordinator at Joint Rescue Coordination Centre (JRCC) Norway, member of Arctic Council Search and Rescue Expert Group (SAR EG)

and lack of daylight. Hongset emphasized the importance of reception centres for rescued individuals, and the critical role of voluntary organisations, especially in small communities. He stressed that Mass Rescue Operations in the Arctic would face greater challenges due to distances, fewer resources, and the need for mainland reinforcements.

Frigg Jørgensen, Executive Director of the Association of Arctic Expedition Cruise Operators (AECO)

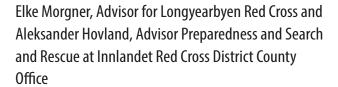
Frigg Jørgensen discussed the role of cruise operators in emergency planning and response, focusing on expedition cruise vessels. AECO, founded in 2003, promotes sustainable and responsible cruise tourism with 80 international members and 60 vessels.

Jørgensen stated that AECO members conduct numerous community visits and landings in the Arctic, significantly contributing to local economies. She emphasized that their members must adhere to strict guidelines on community interactions, environmental protection, and invasive species management. She pointed out that the industry is a reliable partner through initiatives like the Clean Seas Project, climate change efforts, and supporting local education and employment. Jørgensen noted that AECO has focused on SAR issues for a decade, organising the Joint Arctic SAR event and participating in various exercises to enhance emergency response.



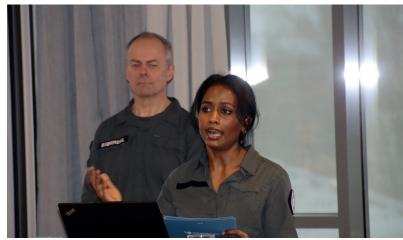
Elke Morgner, Advisor for Longyearbyen Red Cross and Aleksander Hovland, Advisor Preparedness and Search and Rescue at Innlandet Red Cross District County Office

Jørgensen described how expedition cruise vessels are well-equipped with tools and personnel to handle emergencies and provide healthcare services. The vessels can assist in various emergencies, providing immediate support and resources. Jørgensen stressed that collaboration and outreach are essential for leveraging these capabilities, and AECO encourages projects to enhance emergency response.



Elke Morgner and Alexander Hovland discussed the unique challenges in Svalbard, where limited cell phone service and reliance on small airplanes, helicopters, skis, and snowmobiles complicate transportation. The Governor oversees SAR operations, and the hospital, part of Helse Nord, lacks elderly care and mental health services, requiring residents to travel to the mainland for long-term care.

In large-scale incidents, Svalbard relies on mainland assistance, which is often delayed due to weather. The community's strength lies in its collective response, as seen in the 2015 avalanche where over 90 people assisted within 90 minutes. Hovland highlighted challenges with large cruise ship incidents, including evacuation, towing, remoteness, cold climate, and long travel times. Exercises show mass evacuations to Longyearbyen take too long, so passengers must be evacuated to the nearest land.



Øystein Bjørndal, The Norwegian Directorate of Civil Protection, and Anitha Kathirgamadas, The Norwegian Directorate of Health

The government has purchased inflatable tents and "drop bags" for emergency shelter and water.

Hovland and Morgner raised questions about rescue capacity, decision-making, and funding. The challenges faced by the Longyearbyen Red Cross underscore the need for careful planning, resource management, and community involvement in emergency preparedness and response.

Emergency Medical Teams (EMTs) and Emergency Response Units (ERUs)

Øystein Bjørndal, The Norwegian Directorate of Civil Protection, and Anitha Kathirgamadas, The Norwegian Directorate of Health

Anitha Kathirgamadas and Øystein Bjørndal presented the Emergency Medical Team (EMT) initiative. Kathirgamadas detailed the team composition and framework and explained that teams undergo classification every five years. Bjørndal discussed the guiding principles of EMTs, noting that NOR-EMT operates in non-conflict zones and can deploy specialist teams from other countries. He emphasized self-sufficiency, using local resources only if



Dr. Ayham Alomari, Senior Director, Health in Emergencies (Canada & International), Canada Red Cross

agreed upon, and employing interpreters when necessary. NOR-EMT aims to be operational within 72 hours, setting up a base within six hours of arrival and typically stays for two to six weeks. Personnel are trained in cold climates and equipped with suitable clothing, personal accommodation, and ruggedized tents. The team uses a "drop bag" concept for quick deployment of shelter and supplies, emphasizing redundancy and modularity in their operations. Bjørndal also highlighted logistical challenges, including transport, customs, and vaccine handling.

Dr. Ayham Alomari, Senior Director, Health in Emergencies (Canada & International), Canadian Red Cross

Dr. Ayham Alomari discussed innovations in enhancing local resilience by adapting Emergency Response Unit (ERU) and Emergency Medical Team (EMT) expertise to develop climate tools and Arctic mobile hospital capacity. During the early 2020s, the Canadian Red Cross developed Domestic Emergency Units (D-ERU) to respond to the Covid-19 pandemic. In total, Canada had 12 deployments of these teams during 2020-2023, where the focus was SARI treatment centers, testing units, and vaccination units.

Dr. Alomari discussed repurposing key tools, such as positive pressure rooms, for other emergencies like wildfires. Maintaining readiness is costly, and governments prefer funding response efforts over readiness. In 2023, the Red Cross explored solutions to repurpose COVID-19

tools for emergencies, considering multi-purpose climate hubs, which could be used to deliver warm/cool/clean air anywhere in Canada.

A partnership between the Cree Board of Health and Social Services of James Bay and the Canadian Red Cross aims to enhance local emergency health capacity. This partnership focuses on preparedness, knowledge translation, and adapting to local experiences, given the limited local health infrastructure. Key milestones include developing standard operating procedures (SOPs) and conducting exercises. The next steps are winter procurement, training development, and summer and winter simulation.

Panel discussion with Anitha Kathirgamadas, Øystein Bjørndal, and Ayham Alomari

During the discussion, the panellists addressed various aspects of local engagement, host nation support, and contingency planning for cold weather climates.

Kathirgamadas and Alomari emphasized the importance of working closely with local communities, using local resources, and integrating traditional knowledge. True partnership involves listening to the community and adapting plans accordingly. Alomari supported this and highlighted that communities are often resourceful and respond to emergencies themselves, with external support serving to assist, rather than take over.

Bjørndal highlighted differences in preparedness between Greece and Haiti, noting that Greece was more prepared for external support, while Haiti faced challenges due to criminality and unclear authority structures. Alomari discussed plans for deploying in harsh Canadian conditions, including winter exercises with the community of Cree, and the aim to learn from Norwegian and Finnish colleagues.



Ingibjörg Lilja Ómarsdóttir, Civil Protection Department, Iceland

Loss and impact – support to local communities and helpers after the event

Ingibjörg Lilja Ómarsdóttir, Civil Protection Department, Iceland

Ingibjörg Lilja Ómarsdóttir discussed the impact of natural hazards in Arctic communities, focusing on the evacuation of Grindavík due to volcanic activity. Iceland frequently faces natural hazards, activating its civil protection system involving police, ICE-SAR, the Red Cross, and volunteers. If local capacity is exceeded, national and international resources are needed. Since 2020, ten such events have caused mental health strains.

Grindavík, with 3,800 residents, evacuated on November 10th, 2023, due to high volcanic activity. The Red Cross registered evacuees, and three mass care centers were opened, with special attention to vulnerable groups. A "one-stop shop" service center provided assistance and

psychosocial support. Temporary housing was provided until January 15, 2024, and the school team maintained routines for children. Ómarsdóttir stated that most residents have moved to new communities, but concerns remain for vulnerable groups. The ongoing volcanic activity raises questions about infrastructure, mitigation, and recovery. Ómarsdóttir stressed the need for answering difficult questions like "How often are we going to re-build the roads to Grindavík before someone says this is enough?". Money for psychological support and social support is also needed. Despite not living together, Ómarsdóttir stressed that the community of Grindavík remains strong and connected, fostering resilience and adaptation.

Anette Kristian Karlsen, volunteer at the Norwegian Red Cross (Alta Red Cross)

In a video contribution, Karlsen shared a story from a rescue mission where a woman tragically passed away. Karlsen expressed the guilt she felt afterward, believing they should have found the woman sooner. This experience made her question her ability to continue as a volunteer, as she worried about her psychological resilience.

During a debriefing session, a leader recognized Karlsen's mental state and arranged for follow-up conversations to help her process her thoughts. This support was crucial, and Karlsen remains a dedicated volunteer to this day. Her story highlights the importance of discussing incidents and seeking help after challenging missions. Karlsen also mentioned that she now uses these conversations more frequently to process even minor events. She emphasized the need for good role models to demonstrate the importance of talking about experiences.

Øyvind Løkeng, Volunteer team leader, Search and Rescue at the Norwegian Red Cross (Narvik Red Cross)

Øyvind Løkeng shared a story from a difficult search and rescue (SAR) mission around Beifjordtøtta on April 29, 2021. A person fell from the mountains, and no helicopters could be used because of challenging weather conditions. The rescue team used snowmobiles and eventually found the person, who was in critical condition. The person in need also happened to be Løkengs friend. The team leader emphasized the urgency to leave because of the unsafe environment. As they prepared to move, an avalanche occurred. The team ran, but Løkeng returned to help the injured friend. The avalanche hit them but fortunately stopped before burying them. A doctor assisted on the way down and the mission had a good outcome, with the patient surviving.

Afterwards, they had a debrief but didn't discuss the incident much further. It wasn't until Løkeng's partner noticed a change in his behaviour that he realized he needed help processing what had happened during the rescue mission. Løkeng discussed the strong bonds in a small community, and the challenges and risks volunteers face during SAR missions. Unexpected responses after missions can occur, and psychological support is important. Løkeng emphasized the importance of psychological support available to all volunteer groups. He highlighted that organised volunteers benefit from structured mechanisms which ensure that volunteers requiring support after incidents are identified and assisted. Organised volunteers also have access to insurance that covers necessary treatments. Unorganised or spontaneous volunteers often lack access to such support due to the absence of a responsible entity.

Panel discussion, Ingibjörg Lilja Ómarsdóttir, Freja Ulvestad Kärki, Øyvind Løkeng, and Per-Henning Mathisen

The panel discussed psychosocial support for volunteer helpers, where key points included the challenges of providing psychological support due to resource limitations, the importance of structured support systems, and recognizing volunteers as essential parts of the task force.

Ómarsdóttir emphasized positive discussions among volunteers and proposed trauma awareness talks in schools. Kärki highlighted the need to include volunteers in municipal preparedness plans and the importance of understanding leadership styles in crises. Mathisen discussed the unique challenges faced by the Sami community and the importance of relationships between rescue organisations and Indigenous communities. Løkeng advocated for awareness, training, and person-toperson support for volunteers. The panel recommended recognizing volunteers as crucial resources, including them in preparedness plans, and training leaders to understand their behaviour in crises. They stressed the need for proactive mental health support systems, educational programs on trauma, and leveraging digital tools for support.

Wrap-up, summary and ways forward

Anine Kongelf, Senior Advisor, Norwegian Red Cross

In closing of the conference Anine Kongelf reflected on the intense knowledge sharing that had taken place during the conference, setting the stage for the project's starting point: the collaboration between the Red Cross and Helse Nord and the central question: how civil society can contribute to strengthened health preparedness in the Arctic region. Multiple examples of great collaboration have been shared in the conference, and questions raised where further research is needed.

A panel discussion featured Kate Proctor, Andreas von Weissenberg, and Hanne Austerheim, shared their experience from the conference. They noted that the Arctic often feels like an "Arctic silo," with the rest of the world not recognizing its importance due to its relatively small community. At the same time there is much to learn and share with the rest of the world, other indigenous communities and communities living in remoteness. Another challenge discussed was how to integrate experience-based knowledge into research. Understanding ways of working with communities to gather this information is crucial. Many conversations with indigenous communities may be uncomfortable due to their colonial experiences, but it is important to listen, address these issues, and learn from them, whilst accepting the uncomfortableness.



MAIN CHALLENGES AND OPPORTUNITIES

This chapter will summarize the main challenges and opportunities for health preparedness in the Arctic with a specific look at the role of civil society in health preparedness covered by the conference presentations and panel discussions.

Main challenges within Arctic health preparedness

Climate-related challenges:

Most of the conference speakers highlighted various climate-related challenges and risks that have an impact both on the environment and ecosystem but also on the local communities and their health preparedness and response. The Arctic region is warming rapidly, approximately three to four times faster than the global average, which leads to permafrost thaw, sea ice loss, torrential rain, avalanches, wildland fires, and other extreme weather events increasing the frequency of natural disasters. Thawing permafrost damages infrastructure and releases contaminants like mercury and PFAS, posing health risks to wildlife and humans. The increased wildfires, heavy rainfall, and flooding disrupt ecosystems and strain emergency response systems.

The emerging health risks that come with the rising temperatures and environmental changes contribute to the spread of zoonotic diseases (Lyme disease, bird flu etc) and vector-borne illnesses. Air pollution from wildfires and long-range transported pollutants (e.g., mercury, PFAS) affect respiratory and cardiovascular health.

The presenter noted that when it comes to responding to health emergencies, incidents, and accidents, the Arctic region poses unique challenges related to climate and weather. The Polar winter brings extended periods of darkness, and harsh and unpredictable weather conditions, such as heavy snowfall and storms, which can make transportation and logistics challenging, isolating communities and hindering emergency response.

Health challenges unique for the Arctic population:

One of the main messages from the conference stress that Indigenous populations and communities are particularly vulnerable to climate-related risks and limited health resources. The harsh weather conditions, frequent landslides and avalanches, unstable ice conditions and

other climate-related changes and risks have major impacts on the local communities and Indigenous people, such as Sami reindeer herders. These conditions pose mental health challenges, including stress, depression, and suicidal tendencies, which are exacerbated by climate-induced disruptions to traditional livelihoods and cultural practices. For example, reindeer herders face significant mental and physical health challenges due to the loss of grazing lands and unstable weather. Receding and changing ice for example may mean that hunting and fishing activities become very dangerous and the source for food and income diminish.

Many of the speakers mentioned that small, remote communities often lack the resources and people to maintain robust healthcare systems, including trained medical personnel, equipment, and emergency response capabilities. Volunteer-based search and rescue (SAR) operations face challenges in recruitment, retention, and mental health support. Limited access to healthcare and mental health services and the need for culturally sensitive care further complicate health preparedness.

Increased economic activity:

For the Indigenous local population, the land is intertwined with identity, culture, and livelihood. The Arctic land and sea areas are increasingly pressured by industrial and tourism development, including for example windfarms, commercial fisheries and aquaculture, mining, and infrastructure. The land is subject to environmental degradation and traditional lifestyles and cultural practices of Indigenous peoples, such as reindeer herding, are disrupted by this.

The conference speakers pointed out that the rise in economic activity such as shipping and Arctic tourism also increases the risk of accidents and strains local emergency response systems. Cruise ship accidents in remote areas pose significant challenges for mass rescue operations due to harsh conditions and limited resources and healthcare capacities to care for big groups in smaller communities.

Increased geopolitical interest and significance of the region:

Geopolitical tensions have been rising in the Arctic region in recent years, as the region has strategic geographic importance and conflicts also spill over to Arctic governance regimes. Distrust in multilateral systems and political polarization can hinder international cooperation on Arctic health and climate issues including cross-border health, and search and rescue services.

Some of the speakers mentioned that the Arctic region subject to poly-crises, meaning that multiple crises exist independent of one another but interact, influence and often exacerbate one another. This can for example mean that the climate crisis may link to resource conflicts over for example energy sources, which in turn may cause political tensions. Changes in the political climate may also cause issues with disinformation, funding, international agreements and humanitarian challenges that require additional resources from the voluntary organisations.

Logistical challenges:

The conference speakers pointed out several geographic and logistical barriers when it comes to providing adequate health preparedness services in small and remote communities around the Arctic. Remote communities in the Arctic face several logistical

challenges due to long distances from major cities with critical health care services such as hospitals, care facilities and mental health services, and harsh environmental conditions that may isolate the communities during storms, floods, avalanches and other events such as the COVID-19 pandemic. Unreliable communication networks in some remote areas may also hinder coordination during emergencies.

Long distances between communities and lack of robust infrastructure such as roads and airports make it difficult to provide timely medical care and emergency response as transportation and receiving help from first responders can be extremely time-consuming. The speakers stressed that this exacerbates the challenges of delivering healthcare, acute medical care and rescue efforts in remote areas and may mean that people who need acute care may not receive it.

The distances and limited infrastructure in the Arctic also challenge search and rescue operations. An incident or an accident can happen anywhere, which means that there may be a large-scale emergency at a remote location without enough facilities and responding personnel to shelter the people involved. In a major SAR event such as a mass rescue operation, it will take a long time to bring assets to the scene and it may be necessary to establish ad-hoc solutions for receptions centre and shelter. Volunteers are crucial for providing this to the people affected by these emergencies. Natural disasters such as volcano eruptions also challenge community response as whole communities may have to evacuate from their homes and are in need of accommodation.



Opportunities for Strengthening Arctic Health Preparedness

The conference discussions highlighted several opportunities to strengthen health preparedness in the Arctic across various key themes, including community resilience, collaboration, innovative health technologies, and policy development.

Community Resilience and Local Capacity Building

One key opportunity identified for enhancing health preparedness in the Arctic was the integration of traditional knowledge to strengthen community resilience. Several speakers discussed the invaluable knowledge the Indigenous people possess and how their knowledge and lifestyles are crucial and beneficial to local communities. Collaborating with Indigenous communities to integrate their traditional ecological and health knowledge into emergency preparedness plans could contribute to community engagement, foster sustainable practices for long-term resilience, and help Arctic communities emerge stronger and better prepared.

Another opportunity discussed was the training of laypeople and volunteers. Many speakers emphasized the critical role of trained volunteers in enhancing emergency response, especially in remote areas. Laypeople and volunteers often provide initial assistance during health emergencies until professional help arrives. Developing structured volunteer training programs and integrating them into local emergency response plans could help formalize and optimize the contributions of laypeople in Arctic emergencies. The Canadian Red Cross

partnership program with local communities, as well as the Norwegian model of "acute helpers" where local civilians, police, and ambulance personnel are trained to handle emergencies in remote areas were highlighted as successful frameworks. These models ensure that even in the absence of professional healthcare workers, local communities can mobilize and respond effectively. Expanding these models to more Arctic communities and enhancing the training for local responders in first aid, mental health support, and specialized emergency techniques would significantly improve community resilience. Speakers also discussed the importance of being present in communities during "normal times", with a focus on the strengths of the community. To build local capacity, both professional and volunteer organisations need to use the knowledge and the capacity already in the community.

Enhanced mental health support for both volunteers and laypeople responding to emergencies was another critical area of focus. Many speakers underlined the need for increased mental health support for people involved in high-stress emergencies. In times of crisis, organised volunteers and laypeople can provide crucial contributions. Organised volunteers, such as those affiliated with Red Cross, often have access to structured support systems and training, which can enhance their

effectiveness and resilience. In contrast, spontaneous volunteers from local communities may lack similar support, potentially facing greater personal risks and challenges.

Many speakers talked about how communities work together during crisis, making them more resilient. While the "all hands on deck" approach can be invaluable during emergencies, it is not without its complications. The absence of a support framework for unorganised volunteers can lead to disparities in the assistance provided and the well-being of the volunteers. Acknowledging these differences is essential for optimizing volunteer efforts and safeguarding the individuals who step forward to help in times of need. Developing mental health support systems for all volunteers could help reduce trauma and ensure they maintain the emotional resilience necessary for continued participation in emergency responses.



Collaboration, Partnerships, and Knowledge Sharing

Collaboration, partnerships, and knowledge sharing emerged as another key area for strengthening health preparedness in the Arctic. The conference speakers discussed how collaboration between international Arctic communities, civil society, and local communities can enhance emergency preparedness. These partnerships are particularly valuable in remote areas, where resources are limited and the ability to provide immediate care is crucial.

The speakers also highlighted the importance of collaboration between scientists, bureaucrats, and end users to move from describing problems to finding solutions. They emphasized that cooperation at various levels is necessary due to the vast land area and limited resources in the Arctic. A unified approach is needed, balancing the roles of professionals and what communities are capable of handling. Sharing best practices across local, regional, and national borders can significantly improve health preparedness.

New partnerships and increased collaboration under a non-political framework were also discussed as ways to strengthen Arctic cooperation. The speakers noted that cross-border and international collaboration, including partnerships between Arctic Council member states and international organisations, can enhance resource sharing and coordination. Joint exercises and knowledge exchange were highlighted as methods to improve preparedness for large-scale emergencies.

Another opportunity presented was strengthening partnerships with industries, like cruise lines, to improve healthcare access in the Arctic. Expedition cruise vessels are equipped with medical teams and equipment and can offer immediate assistance in small and large-scale emergencies, making them a valuable asset in the Arctic, especially in remote areas with limited resources.

Additionally, the speakers emphasized the value of research data in shaping health emergency strategies, particularly through research on organised and unorganised volunteers. A suggestion was to create platforms for knowledge exchange and research collaboration to help develop evidence-based guidelines, ensuring that Arctic health systems are better prepared for future challenges.

Innovative Solutions, Health Technology, and One Health Approach

Conference speakers discussed the use of innovative technologies to improve health preparedness in the Arctic. The use of drone technology for Search and Rescue (SAR) operations was mentioned, noting that while drones can provide aerial surveillance, transport medical supplies, and locate patients in remote areas, the harsh Arctic weather limits flyable days. The importance of equipping volunteers with the necessary tools for missions was also highlighted. Modular, rapid-deployment kits, such as "drop bags" containing shelter and water, can be quickly deployed in crises, enhancing rapid-response capabilities in Arctic health emergencies. The speakers also introduced the "Walking Blood Banks" project, which aims to establish a network of pre-screened blood donors in local communities. This initiative ensures a readily available supply of blood for emergencies, crucial in remote areas where traditional blood banks are not available.

The speakers emphasized the importance of the One Health approach, which links human health, animal health, and environmental well-being.

This approach is particularly relevant in the Arctic due to the interdependence of indigenous communities and the environment. Integrating One Health principles into all aspects of Arctic health strategies would provide a more holistic response to health challenges, especially in the face of climate change and emerging zoonotic diseases.

Policy Development and Governance

Policy development and governance are critical for strengthening health preparedness in the Arctic. The conference speakers discussed how initiatives like Emergency Medical Teams and Emergency Response Units can be implemented across the Arctic. Such frameworks ensure that healthcare can be rapidly deployed in non-conflict zones while maintaining coordination with local resources.

Additionally, the challenges of Mass Rescue Operations (MROs), especially in the Arctic's challenging conditions, were discussed as a key area where policy development could improve health preparedness. MROs require extensive coordination and logistical planning, and the speakers emphasized that strengthening these frameworks through exercises and scenario-based planning would improve readiness for large-scale emergencies. Another opportunity for policy development involves ensuring that local and regional Search and Rescue (SAR) agencies, healthcare organisations, and volunteer groups are integrated into cohesive networks. This would ensure that resources are available and can be quickly mobilized during health emergencies. The isolation of Arctic communities also highlights the need for policies that support local capacity while ensuring timely external aid during large-scale incidents.

Speakers also discussed the importance of involving Indigenous communities in health governance, noting that including Indigenous populations in decision-making processes would ensure that health strategies reflect their unique needs, cultural practices, and knowledge.



GAPS AND AREAS FOR FURTHER RESEARCH

Several conference speakers underscored the critical need for more research to enhance health preparedness in the Arctic. To explore areas needing further research and to identify areas missing from the conference, all participants were asked to answer three questions in an evaluation survey after the conference. These questions focused on topics missing from the conference program but still have an impact on health preparedness, areas related to Arctic health preparedness that require further research or action, and topics or initiatives for further opportunities in Arctic health preparedness collaboration. Their responses were collected through an online questionnaire and will be presented in this chapter.

Gaps

The conference participants listed several areas regarding topics missing from the conference program that have an impact or pose a threat to health preparedness in the Arctic. One suggestion was to look into the role of volunteers who are not directly involved in search and rescue operations. The role of schools and education authorities in health preparedness and disaster response was another area that participants felt needed more attention. This includes the means of providing services such as mobile medical and mental health and psychosocial support (MHPSS) teams, and the role of telemedicine in connecting professionals on the mainland or in cities with responders in remote areas. Additionally, understanding the motivating factors for people in remote areas to stay was mentioned as important.

Participants also felt that the conference could have better addressed the roles of non-governmental organisations (NGOs) in the changed geopolitical landscape after February 2022. With reduced contact and dialogue among Arctic states, there is a need to explore the functions or actions that NGOs or networks could take to enhance Arctic preparedness for various crises. The absence of professional health actors' perspectives,

focusing solely on volunteers, was noted as a gap. There was a call for more discussion on the military threat and civil-military cooperation. The logistics capabilities and resilience in this context were also seen as important topics that could have been discussed. Preparedness related to the loss of critical infrastructure, such as telecommunications and power, as well as security threats and hacking, were mentioned as areas needing more focus.

Areas for further research

Several conference speakers underscored the critical need for more research to enhance health preparedness in the Arctic and recommended various areas for further investigation. One key recommendation was to conduct more research on laypeople and their role in improving emergency responses, particularly in underserved areas. This includes the role of organised and unorganised volunteers in rescue operations, psychological first aid, support systems, and follow-up programs for debriefings after incidents. The consequences of mental health on





responders, as well as language barriers in Indigenous communities during crises, were identified as critical areas of focus. Additionally, more research is needed on how to recruit and retain volunteers.

Another area mentioned needing more research or action was host nation support. Lifelong learning education in Arctic health preparedness and more bottom-up initiatives where small communities organise their own preparedness were highlighted. There was also a call for research into accurate and appropriate supplements to public healthcare and the potential deployment of Emergency Medical Teams (EMTs) across borders, including relevant legislation. Cross-border crisis preparedness was another area mentioned, with suggestions on how international non-governmental networks could ensure preparedness when states have limited contact.

The speakers emphasized the importance of gathering data to improve preparedness in the Arctic, which would inform policymakers and guide the development of robust health strategies. Creating platforms for knowledge exchange and research collaboration was suggested, as such platforms would help develop evidence-based guidelines, ensuring that Arctic health systems are better

prepared for future challenges.

There was also a call for more research into diseases, particularly within the framework of the Arctic Monitoring and Assessment Programme (AMAP), to better understand and address health threats in the region, including studies to strengthen infectious disease surveillance in the Arctic by using a One Health approach. Integrating Indigenous knowledge into research efforts was highlighted as a way to provide a more holistic and culturally relevant approach to health preparedness. Becoming more robust and less vulnerable involves addressing difficult questions with a long-term approach, ensuring comprehensive recovery and resilience. There is a need to focus on human factors and the decisions that are made, analysing vulnerabilities such as harsh weather and the challenges faced by civil society.

Other suggestions included more research into non-toxic alternatives in food production and household products, as well as cold climate medicine. Improving the documentation and sharing of lessons learned from programs and incidents was also highlighted. Encouraging the sharing of reports in specialized Arctic databases, ideally with English abstracts, could make experiences more accessible and useful.

Collaboration opportunities

Participants suggested several specific topics and initiatives for further opportunities in Arctic health preparedness collaboration. One area of focus was Antimicrobial Resistance (AMR) in the Arctic. The role of volunteer team leaders who have led and will lead responses was also highlighted, with suggestions on how to better equip and train them to manage and emotionally support teams and act as interlocutors with professional authorities. Collaborations and partnerships between emergency organisations, communities, and universities were recommended. Some participants felt that more input from those living in remote Arctic villages would be highly valuable. Increasing cross-

border cooperation was another area mentioned, with suggestions for cross-border desktop crisis exercises even when states do not have dialogue and identifying other actors who need involvement or roles.

The impact of Nordic cooperation after Finland and Sweden joined NATO was mentioned, particularly concerning prolonged evacuation times and field care. There were calls to collaborate more with youth organisations, hunters, and trappers' communities. Including the Emergency Medical System (EMS) in the yearly Joint Arctic SAR TTX Events in Iceland was also suggested.



