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Strengthening Global Systems to Prevent and Respond to High-Consequence Biological Threats

Jan-Cédric Hansen MD, PhD¹, Paul Barach MD, MPH^{2,3,4}, Donald Donabue PhD, MBA, MSJ⁵, Stefan Göbbels MD, MSC⁶, John Quinn EMT, MD, MPH, PhD⁷, Frank Van Trimpont MD⁸

1. President, International Commission on Disaster Medicine, Paris, France
2. Thomas Jefferson University, Philadelphia, USA
3. Sigmund Freud University, Vienna, Austria
4. University of Queensland, Brisbane, Australia
5. University of Maryland, Baltimore, USA
6. Branch Head for International Cooperation Bundeswehr Medical Service Headquarters of Bundeswehr, Berlin, Germany
7. Institute of Hygiene and Epidemiology First Faculty of Medicine Charles University, Prague, Czech Republic
8. ECDM, Strasbourg, France

Introduction: The world is facing the devastating impact a biological event can have on human health, economies, and political stability. COVID-19 has revealed that national governments and the international community are woefully unprepared to respond to pandemics—underscoring our shared vulnerability to future catastrophic biological threats that could meet or exceed the severe consequences of the current pandemic. This study examines potential threats related to deliberate Russian military use and misuse of the tools of modern biology or an accident caused by a CBRN event evolving rapidly in the highly volatile political environment in and around Ukraine and other conflicts.

Method: A participatory foresight, co-creative, future and transformation-oriented methodology was used to structure a transformative model for a disciplined exploration of scenarios to confront complex challenges and facilitate improved outcomes. Foresight helps to evaluate current policy priorities and potential new policy directions; see how the impact of possible policy decisions may combine with other developments; inform, support and link policy-making in and across a range of sectors; identify future directions, emerging technologies, new societal demands and challenges; and anticipate future developments, disruptive events, risks and opportunities.

Results: The study found that the “mitigation scenarios” are based on the “Confront, Regulate, Overcome” metamodel combined with the “Security, Rescue, Care” response modalities.

These require the cooperation/coordination of law enforcement forces along with military forces, fire departments and civil security resources, hospital and first-line responder teams, in order to appropriately address populations, assets and territories issues elicited by the identified threat, which drives key decision makers’ tasks at the strategic level.

Conclusion: The participatory foresight exercise demonstrated gaps in national and international biosecurity and pandemic preparedness architectures highlighted by the challenges of the Ukraine war—exploring opportunities for better cooperation to improve prevention and response capabilities for high-consequence biological events, and generate actionable recommendations for the international community.

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A Systematic Review of PPE Recommendations for First Responders, and Medical Professionals to Nuclear Radiological Events at Nuclear Power Plants

Chaverle Noel MPH, Benjamin Ryan PhD, Erica Bruce PhD
Baylor University, Waco, USA

Introduction: Due to climate change, many countries are exploring nuclear power as a clean, sustainable, and alternative energy source. However, radiophobia stemming from a history of major accidents at nuclear power plants (most recently Fukushima Daiichi) inhibits the expansion of this industry. In an unlikely event of a large-scale accident, the risks posed to humans are minimal when mitigation measures are followed. This includes appropriate Personal Protective Equipment (PPE) for first responders, and medical professionals responding to these emergencies. An examination of the PPE recommendations for these scenarios will highlight best practices for minimizing exposures, and the effects of radiation.

Method: A systematic literature review will provide a historical baseline of the PPE worn during previous nuclear power plant events. Additionally, current recommendations for PPE levels in response to these emergencies will be explored. Five databases will be utilized for this study, including PubMed, Web of Science, and SCOPUS.

Results: Many studies examine different types of nuclear radiological exposures, but few focus on nuclear power plant

