RAPID COMMUNICATION

Global disaster nurse preparedness: Moving from reserve to rapid action

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Abstract

The brutality of the 2015 Paris terrorist attacks has placed a laser focus on the health impact of increasing global instability. Climate change, disaster, human conflict and war are changing our environment. Members of our profession recognize that nurses are critical to the protection of human health following disasters, large-scale public health emergencies (PHEs) and terrorist events. Despite this irrefutable fact and repeated calls for advancing nurse preparedness and disaster nursing science, many nurses across the world do not possess the knowledge, skills and abilities that they will need to be able to participate in a timely and appropriate manner during a disaster response. This lack of preparedness has significant implications for the ability of global healthcare systems to mount effective response and recovery initiatives. From Europe, Africa, and the Americas, across Australia and the countries of the Pacific Rim, the need for global nursing collaboration to advance nurse readiness has never been greater. The purpose of this paper is to describe the growing risk to human health created by naturally occurring and human-caused disasters, the resultant demand for healthcare services in the midst of a global shortage in the healthcare workforce, and the need for greater international collaboration in preparing nurses to respond to disaster events. Strategic efforts to prepare a global nursing workforce for disaster and public health emergency response can contribute to improvement in quality of care rendered, protection of the safety of nurses, victims and their families, and can ultimately contribute to improved population-based health outcomes.

Key words: global, disaster, nursing, policy, outcomes

INTRODUCTION

In a world where catastrophic disaster events are occurring with greater frequency and intensity and the ubiquitous threat of terrorism persists, the need for a global nursing workforce prepared to respond is of critical importance. Devastating hurricanes (Katrina 2005; Sandy 2012) and tornadoes in the USA (2011 with 178 confirmed tornadoes and multiple deaths), earthquakes that rocked Haiti (January 2010, 7.0 on the

Richter scale), China (multiple events including 2008, 2012, 2013, 2014), New Zealand (February 2011, 6.3 on the Richter scale, 180 deaths) and Nepal (April 2015, 7.8 on the Richter scale, killing over 9000 people), typhoons in the Philippines (November 2013), and the Tsunami that struck Japan damaging the Fukushima nuclear Power Plant (March 2011), underscore the recent uptick in disaster events over the past decade, as well as how quickly and completely healthcare systems can be overwhelmed or destroyed. Internationally, climate change, human conflict, complex human emergencies and de-territorialized terrorism result in a confluence of factors leading to global instability and persistent threats to health and safety. Civil war raging in Syria has forced hundreds of thousands of people to leave their homes. Attacks from Paris to Mali to U.S suburbs (San Bernadino, California, December 2015) have brought

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fear back into the forefront of national security and health systems planning. Government corruption, rogue terrorist factions and a glaring lack of coordination, communication and collaboration across governmental and non-governmental disaster response agencies can contribute to limit the effectiveness of the disaster response effort. Last year's outbreaks of Ebola and Middle East Respiratory Syndrome (MERS) remind us of the ever-present threat of global pandemics to human health.

Each of these events created a sudden and unanticipated demand for medical and nursing care that exceeded the capacity of the local health system to respond, and resulted in significant burden and often danger, for the responding nurses. When the demand for care exceeds available resources, decisions must be made about triage (sorting of patients) and allocation of scarce resources. Events involving the release of biological, chemical or radiation/nuclear materials will require nurses to understand the processes for decontamination, the proper use of personal protective equipment, and disease containment.

Nurses and nurse midwives are widely recognized as essential members of the global disaster response team. Despite this irrefutable fact and repeated calls for advancing nurse preparedness and disaster nursing science, many nurses across the world do not possess the knowledge, skills and abilities that they will need to be able to participate in a timely and appropriate manner during a disaster response. In fact, most nurses may lack the ability to participate in any type of major public health emergency response, limiting their effectiveness and increasing the likelihood of nurses themselves becoming victims of the event. This lack of preparedness has significant implications for the ability of global healthcare systems to mount effective response and recovery initiatives. The purpose of this paper is to describe the growing risk to human health created by the recent increase in naturally occurring and human-caused disasters, the resultant demand for healthcare services in the midst of a global shortage in the healthcare workforce, and the need for greater international collaboration in preparing nurses to respond to disaster events.

THE GROWING GLOBAL BURDEN OF DISASTERS AND DISEASE

A hazard is defined in the Hyogo Framework for Action as: "A potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation". Hazards can include latent

conditions that may represent future threats and can have different origins: natural (geological, hydrometeorological and biological) or induced by human processes (environmental degradation and technological hazards). The range of hazards that pose a risk to human health faced by countries worldwide is broad and highly diverse, and includes emerging infectious disease outbreaks, events that pollute food and water, chemical and radiation contamination, natural and technological hazards, war and societal conflicts, and the health consequences of climate change. Additionally, the global increase in terrorist acts perpetrated for political, religious, or socioeconomic goals with the aim to create fear, coercion, or intimidation, has significant mental and physical health impact, including the potential to increase the burden of cardiovascular disease (von Känel, 2015). The implications of such violent acts are not fully noted or addressed by healthcare systems, but the psychological burden on populations that results from the intentional use of violence is significant (Rudenstine & Galea, 2015). Ten years after the adoption of the Hyogo Framework for Action, disasters continue to undermine efforts to achieve sustainable development (International Strategy for Disaster Reduction, 2005). Vulnerability is defined in the Hyogo Framework for Action as: "The conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards". The trend toward increasing population densities into Megacities (Maclean, 2010; Hochrainer & Mechler, 2011), the progressive movement of populations to disaster-prone flood plains, coastal regions at risk for hurricanes, areas with high seismic activity, and to communities constructed in areas vulnerable to wildland fires, means that the potential for catastrophic disasters is increasing. Since 2005, over 700,000 people have lost their lives, over 1.4 million have been injured, and approximately 23 million have been made homeless as a result of disasters. Overall, more than 1.5 billion people have been affected by disasters in various ways, with people living in vulnerable situations disproportionately affected. The total economic loss was more than \$1.3 trillion U.S. dollars. In addition, between 2008 and 2012, 144 million people were displaced by disasters (Global Facility for Disaster Reduction and Recovery, 2014).

Disasters disproportionately affect the poor (particularly women, infants and children, the elderly, individuals with disabilities, migrants, refugees and other socially marginalized groups), resulting in an even greater burden on health. These groups often live in places more exposed to hazard risks, partly because of environmental

degradation from over exploitation of land, and have less ability to cope with and recover from disasters. Rural households with higher incomes have a higher ability to diversify livelihood activities to reduce risks, while informal safety nets on which the poor depend (such as borrowing food) become stretched when disasters affect the whole community. The economic losses from natural disasters are rising from US\$50 billion each year in the 1980s, to just under \$200 billion each year in the last decade (Global Facility for Disaster Reduction and Recover, World Bank, 2014), creating a complex web of constraints on a country's ability to build resilience to disasters and climate change, and to mount an adequate healthcare services response. To help meet these challenges, countries have been strongly encouraged by the United Nations (2004, 2007) and now the World Bank (2015) and the World Health Organization (World Health Organization, 2015) to strengthen their capacities for emergency risk management by incorporating measures for prevention, mitigation, preparedness, response and recovery (Global Facility for Disaster Reduction and Recovery, World Bank 2015). Focusing on local actors to promote disaster preparedness efforts and planning is key to success in terms of response and humanitarian effectiveness (International Federation of Red Cross and Red Crescent Societies, 2015). Local nurses are a critical resource in disaster risk reduction, timely response and in building community resilience. Yet, focusing upon 'local efforts' assumes that there are enough healthcare providers to meet the demand.

GLOBAL CRISIS IN HUMAN RESOURCES FOR HEALTH

In light of the current global crisis in terms of human resources for health, many areas of the world are experiencing severe nursing shortages already or may have nurses as their only source of health care. Disaster events in these locations serve to accentuate the current healthcare crisis and the forecast for the future seems poor. In 2015, the world is already experiencing a global shortage of almost 4 million healthcare workers, and by 2020, that number is expected to triple.

At the third Global Forum on Human Resources for Health in Recife, Brazil, disasters and complex human emergencies were recognized as "the gasoline on the fire" of the healthcare workforce shortage. Nurse safety during disaster events such as public health and complex human emergencies is also a growing concern. During the Ebola outbreak in 2014, over 200 healthcare providers contracted and died from the disease. The number of

nurses injured and killed while participating in humanitarian responses has skyrocketed in high conflict areas, with many nurses killed in Afghanistan, Iraq and Syria alone (Human Rights Watch, 2015).

DEMAND FOR GLOBAL NURSE PREPAREDNESS

Because of the increasing potential for large-scale disasters and global terrorism, the ability to mobilize large numbers of human resources for response; that is, physicians and nurses, is increasingly important. WHO is currently working with a wide range of partners to provide various levels of support for implementing country and community capacities in health and other sectors to manage the health risks associated with emergencies and disasters. The 2014 Ebola outbreak, however, illuminated the need to move aggressively beyond a global assumption of ability, to a state of enlightened awareness and proven evidence of readiness on a country-by-country basis. Nursing, as a profession, stands to gain by increasing self-awareness of the contribution to be made to global health and national security systems by improving our knowledge base, skills and abilities for disaster response and deployment.

The need for international collaboration in the nursing profession has never been greater and, is in fact, imperative if we are to begin to plan to meet the needs of future populations impacted by disasters, PHEs, and human conflict. Collaboration between nurses, relevant nursing organizations and societies for disaster nursing across countries could contribute to increasing access to disaster high-quality evidence-based nursing education and training programs, the creation of vehicles for sharing 'lessons learned', link researchers interested in advancing qualitative and quantitative disaster research projects, and potentially provide greater coordination and oversight for nurses deployed to disaster-affected areas. International disaster nursing collaboratives should be established, or if they already exist, they should be expanded to encourage new membership (such as the disaster nursing sub council within the World Association for Disaster and Emergency Medicine (WADEM)), or groups established within the International Council of Nurses (ICN) or Sigma Theta Tau International (STT). This initiative would be completely consistent with the global missions of these organizations, and with STT's global nursing initiative in particular.

What do global nurses need to know to acquire a higher level of readiness? Ideally, an "all hazards" approach would have nurses prepared to respond to all

types of naturally occurring disaster events, emerging infectious diseases, and intentional acts of terrorism involving chemical, biological, radiological, and explosive weapons. Hurricanes, typhoons, tsunamis, tornadoes, earthquakes, landslides, floods, heat waves and cold spells, wildfires and volcanic eruptions are potential threats each day somewhere in the world. As part of a country's overall plan for disaster preparedness, all nurses should have a basic understanding of disaster science and the key components of disaster preparedness, including the following:

1. The definition and classification system for disasters and major incidents based on common and unique features of disasters (onset, duration, effect, and reactive period).
2. Disaster epidemiology and measurement of the health consequences of a disaster.
3. The five areas of focus in emergency and disaster preparedness: preparedness, mitigation, response, recovery, and evaluation.
4. Methods such as risk assessment, hazard identification and mapping, and vulnerability analysis.
5. Awareness of the roles and responsibilities of the nurse in a much larger response system (Veenema, 2013).

Competency-based education would ensure that nurses are capable of performing a set series of functions recognized to be inherent to an effective response (World Health Organization and ICN, 2009). Yet it remains unclear 'if, how and where' schools and universities and ministries of health are using existing disaster nursing competencies to prepare nurses for response (Hutton et al., unpublished data, 2015). Efforts to identify core competencies for disaster and public health have been produced as a result of surveys and consensus building (Walsh et al., 2012), with limited integration of disaster nursing into interprofessional disaster education programming. Offering effective education and training opportunities is a challenge in the absence of ubiquitous support, incentives, or requirements among healthcare professions (Walsh, Craddock, Gulley, Strauss-Riggs, & Schor, 2015). At a minimum, nurses need to be provided with concepts of disaster, and public health emergency preparedness includes understanding how emergency management works (e.g., the U.S. emphasizes the importance of the Hospital Emergency Incident Command System—HEICS), strategies for increasing surge capacity within healthcare systems to accommodate a sudden, unanticipated demand for healthcare services, and models of disaster triage that seek to embrace the deontological rule to 'do the greatest good, for the

greatest number, with the least amount of harm' (Veenema, 2006). Nurses must be aware of and appreciate the Sphere humanitarian standards for disaster response (Sphere Handbook, 2011). International collaboration for disaster nursing education could: (1) create competency-driven evidence-based massive open online courses (MOOCs) available free-of-charge to nurses across the globe addressing major concepts and topics in disaster nursing; (2) establish international student exchange programs to facilitate greater learning; (3) create regional disaster nursing research teams to explore hazard or event-specific needs; (4) facilitate visiting professorships for faculty; (5) coordinate educational resources for optimal use; and (6) encourage more nurses to pursue disaster nursing education.

GLOBAL CRISIS PRACTICE STANDARDS FOR MEDICAL AND NURSING CARE

Nurses are committed to provide the best care possible to each and every patient, yet by definition, disasters render this goal impossible. Disasters mandate consideration of crisis standards for care (CSC). Crisis standards for care is defined as a state of being that indicates a substantial change in healthcare operations and the level of care that can be delivered in a public health emergency, justified by special circumstances (IOM, 2009; 2012). Medical and nursing care services that are delivered during disasters shifts beyond focusing on individuals to promoting the thoughtful stewardship of limited resources intended to result in the best possible health outcomes for the population as a whole (IOM, 2012). This is extremely challenging in any disaster setting and will be even more so in areas where human resources for health are minimal or absent, and the response involves foreign healthcare responders. Crisis standards of care extend the limits with respect to licensure and scope of practice and mandate reflection upon the moral, legal and ethical frameworks nurses use to deliver care. International collaboration in disaster nursing could work to establish a global code for disaster nursing ethics and reinforce existing frameworks for disaster and humanitarian response (e.g., the Sphere Project: Humanitarian Charter and Minimum Standards for Humanitarian Response).

CONCLUSION: CREATING A GLOBAL AGENDA FOR RAPID ACTION

Our world is experiencing dramatic changes as the intersection of man, nature and the environment result in

an increasing incidence of disasters, PHEs and devastating acts of violence. It is urgent and critical to anticipate, plan for and reduce disaster risk in order to more effectively protect persons, communities and countries, their livelihoods, health, cultural heritage, socioeconomic assets and ecosystems, and thus strengthen their resilience. Global nursing can and must play a role. The Sendai Framework for Disaster Risk Reduction 2015–2030, which was adopted on March 18, 2015 at the Third United Nations World Conference in Sendai, Japan, specifically addresses health as a critical component. The 2014 World Disaster Nursing conference (Beijing, China), the 2015 World Association for Disaster and Emergency Medicine (South Africa) and the 2015 ICN conference (Seoul, South Korea) reinforced the call for a global nursing workforce that is aware of the potential hazards that exist to health, that possess appropriate disaster knowledge and skills, and are competent to respond. Yet little visible action has occurred. Nursing's voice needs to be heard at global emergency preparedness tables. While it is incumbent upon each individual country to design and implement a strategic plan for nurse preparedness, we must consider our responsibilities to each other as nursing neighbors in a global community to share educational resources, our lessons learned, and our wisdom and skills for the purpose of improving the health and well-being of those victimized by disaster.

We have, before us, the opportunity to collaborate in different and perhaps more powerful ways. We can and should work together in order to create a global nursing workforce with the knowledge, skills and abilities to respond. Our aim should be for stronger, safer and supported disaster nursing initiatives. Strategic efforts to prepare a global nursing workforce for disaster and public health emergency response can contribute to improvement in quality of care rendered, protection of the safety of nurses, victims and their families, and can ultimately contribute to improved population-based health outcomes. It will take a global “village” to advance the agenda for nurse preparedness and to work to resolve the global crisis in human resources for health. The time is now and rapid action is required. Our patients, families and communities are counting on us.

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Collaborating Center for Nursing Knowledge, Information Management & Sharing at Johns Hopkins School of Nursing hosts the GANM, which allows for equitable access to knowledge and discussions regardless of Internet bandwidth to nurses and midwives and gives them a global voice.

DISCLOSURE

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REFERENCES

- Global Facility for Disaster Reduction and Recovery. (2014). Understanding risk in an evolving world: Emerging best practices in natural disaster risk assessment. Washington, DC: World Bank. [Cited 26 February 2016.] Available from <https://openknowledge.worldbank.org/handle/10986/20682> License: CC BY 3.0 IGO
- Global Facility for Disaster Reduction and Recovery. (2015). Scaling up climate and disaster resilience for the world's most vulnerable. Annual Report. Washington, D.C: World Bank. [Cited 26 February 2016.] Available from <https://www.gfdrr.org/scaling-climate-and-disaster-resilience-worlds-most-vulnerable>
- Human Rights Watch. (2015). Safeguarding health in conflict: Attacks on health global report [Cited 26 February 2016.] Available from <http://www.safeguardinghealth.org/sites/shcc/files/attacks-on-health-global-report-2015.pdf>
- Hochrainer, S. & Mechler, R. (2011). Natural disaster risk in Asian megacities: A case for risk pooling? *Cities*, 28(1), 53–61.
- Institute of Medicine (2009). *Guidance for establishing crisis standards for care in disaster situations: A letter report*. Washington, D.C. The National Academies Press. [Cited 26 February 2016.] Available from <http://www.nap.edu/read/12749/chapter/1#ii>
- Institute of Medicine (2012). *Crisis Standards of Care: A Systems Framework for Catastrophic Disaster Response. Vol. 1: Introduction and CSC Framework*. Washington, DC: The National Academies Press. [Cited 26 February 2016.] Available from <http://www.phe.gov/coi/Pages/asr.aspx>
- International Federation of Red Cross and Red Crescent Societies. (2015). World Disasters Report. Geneva, Switzerland: International Federation of the Red Cross and Red Crescent Societies. [Cited 23 November 2015.] Available from <http://reliefweb.int/sites/reliefweb.int/files/resources/1293600-World-Disasters-Report-2015.en.pdf>
- Maclean, D. (Ed.). (2010). *World Disaster Report 2010*. International Federation of the Red Cross and Red Crescent Societies. [Cited 26 February 2016.] Available from <http://www.ifrc.org/en/publications-and-reports/world-disasters-report/wdr2010/>
- Walsh, L., Subbarao, I., Gebbie, K., Schor, K. W., Lyznicki, J., Strauss-Riggs, K., ... James, J. J. (2012). Core competencies for disaster medicine and public health. *Disaster Medicine and Public Health Preparedness*, 6, 44–52.
- Walsh, L., Craddock, H., Guley, K., Strauss-Riggs, K. & Schor, K. W. (2015). Building health care system capacity: Training

- health care professionals in disaster preparedness health care coalitions. *Prehospital and Disaster Medicine*, 30, 123–130.
- Rudenstine, S., & Galea, S. (2015). Terrorism and its impact on mental health. In J. Lindert & I. Levav (Eds), *Violence and Mental Health*, (pp. 267–286). Netherlands: Springer.
- The Sphere Handbook. (2011). The Sphere Project: Humanitarian charter and minimum standards for humanitarian response. [Cited 16 January 2016.] Available from <http://www.sphereproject.org/handbook/the-humanitarian-charter/>
- United Nations. (2004). Resolution 49/22A of December 1994, International Decade for Natural Disaster Reduction. [Cited 26 February 2016.] Available from <http://www.un.org/press/en/2004/iha922.doc.htm>
- United Nations Office for Disaster Risk Reduction (UNISDR). (2007). Hyogo framework for action 2005–2015: Building the resilience of nations and communities to disasters. [Cited 16 January 2016.] Available from http://www.unisdr.org/files/1037_hyogoframeworkforactionenglish.pdf (Extract from the final report of the World Conference on Disaster Reduction (A/CONF.206/6)).
- Veenema, T.G. (2006). Expanding education opportunities in disaster response and emergency preparedness for nurses. *Nursing Education Perspectives*, 27(2), 93–98.
- Veenema, T.G. (Ed.). (2013). *Disaster nursing and emergency preparedness for chemical, biological, and radiological terrorism and other hazards*. New York: Springer Publishing Company.
- von Känel, R. (2015). Fear of terror and inflammation ignite heart health decline. *Proceedings of the National Academy of Sciences*, 112(5), 1248–1249.
- World Health Organization and International Council of Nurses (2009). ICN Framework for Disaster Nursing Competencies. [Cited 26 February 2016.] Available from http://www.icn.ch/images/stories/documents/networks/DisasterPreparednessNetwork/Disaster_Nursing_Competencies_lite.pdf
- World Health Organization. (2006). Emergency preparedness for the health sector and communities—Challenges and the way forward. Expert Consultation Report, *Pre-hospital and Disaster Medicine*, 21(Suppl. 4), s97–s109.

KEY RESOURCES FOR GLOBAL DISASTER PREPAREDNESS

- Ebola: Ending the current outbreak, strengthening global preparedness and ensuring WHO capacity to prepare for and respond to future large-scale outbreaks and emergencies with health consequences
http://apps.who.int/gb/ebwha/pdf_files/EBSS3/EBSS3_CONF1Rev1-en.pdf
- Disaster risk management in post-2015 development goals: potential targets and indicators
<http://www.odi.org/publications/7344-disaster-risk-management-post-2015-development-goals-potential-targets-indicators>
- Sendai Framework for Disaster Risk Reduction 2015–2030
http://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf
- United Nations Disaster Assessment and Coordination (UNDAC)
<http://www.unocha.org/what-we-do/coordination-tools/undac/overview>
- World Association for Disaster and Emergency Medicine (WADEM): Nursing Section <http://www.wadem.org/nursing.html>
- The United Nations Office for Disaster Risk Reduction: Third UN World Conference for Disaster Risk Reduction, March 2015
<http://www.unisdr.org/we/coordinate/wcdrr>
- Third International Conference of World Society Disaster Nursing (WSDN), June 2014 <http://cicst.org.cn/wsdn2014/welcome.html>
- World Disasters Report 2015
<http://ifrc-media.org/interactive/world-disasters-report-2015/>
- World Health Organization (WHO): Humanitarian Health Action—Emergency and disaster risk management for health
<http://www.who.int/hac/techguidance/preparedness/en/>