



The Sendai Framework for Disaster Risk Reduction and Its Indicators—Where Does Health Fit in?

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Abstract The Sendai Framework for Disaster Risk Reduction 2015–2030 recognizes the strong connection between health and disasters and promotes the concept of health resilience throughout. Several of the seven global targets stated in the Sendai Framework are directly related to health in terms of reducing disaster mortality, the number of affected people, disaster damage to critical infrastructure, and disruption of basic services such as health facilities. The Sendai Framework also maintains close coordination with other United Nations landmark agreements relevant to health such as the Sustainable Development Goals. However, the measurement of health-related indicators is challenging. Issues arise, for example, in linking deaths to disasters because of the complex interplay between exposure, risk, vulnerability, and hazards. The lack of a universal classification of disasters also means that recording of health data in disasters is not standardized. Developing the guidelines to enable data on

the indicators to be collected and reported to support the Sendai targets requires detailed thinking, time, and consultation with a diverse range of stakeholders. Strong collaboration and partnership will be vital to achieving success.

Keywords Disaster risk reduction · Global health targets · Health indicators · Sendai Framework

1 Introduction

Two years have passed since the adoption of the Sendai Framework for Disaster Risk Reduction 2015–2030 by 187 United Nations Member States at the Third United Nations World Conference on Disaster Risk Reduction in Japan in March 2015 (UNISDR 2015). Three other UN landmark agreements linking directly to the health aspects within the Sendai Framework were made in 2015—the Sustainable Development Goals (United Nations 2015), the Paris Climate Agreement (UNFCCC 2015), and the Habitat III New Urban Agenda (United Nations Habitat III 2016).

The Sendai Framework aims to reinforce the shift in policy and practice of governments and stakeholders from managing disasters and other events to managing disaster risk. The Framework's success will be assessed through action at all levels—local, regional, national, and global (Wahlström 2015). Rather than focusing exclusively on the response to emergencies, the Sendai Framework recognizes that by reducing and managing conditions of hazard, exposure, and vulnerability—while building the capacity of communities and countries for prevention, preparedness, response, and recovery—losses and impacts from disasters can be effectively alleviated.

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Adoption of the Sendai Framework by the UN Member States includes agreement on seven global targets to assess global progress in disaster risk reduction. Paragraph 18 of the Sendai Framework states that: “these targets will be measured at the global level and will be complemented by work to develop appropriate indicators. National targets and indicators will contribute to the achievement of the outcome and goal of the present Framework.” The seven global targets (UNISDR 2015, p. 12) are:

- (a) Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020–2030 compared to the period 2005–2015;
- (b) Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020–2030 compared to the period 2005–2015;
- (c) Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030;
- (d) Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030;
- (e) Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020;
- (f) Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of the present Framework by 2030;
- (g) Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030.

This article builds on previous efforts to discuss the significance of health as a core theme throughout the Sendai Framework (Aitsi-Selmi et al. 2015). In light of the UN General Assembly’s adoption of indicators for the seven global targets in February 2017 (UNISDR 2017), this article provides an update on the role of health as an outcome and sector within disaster risk reduction, an examination of the presence of health in the Sendai global targets and indicators, and a brief analysis of the challenges and opportunities when using health indicators to address the goals of disaster risk reduction.

2 Disaster Risk Management and Health

A United Nations survey identified health as a universal priority for societies around the world (UNMC 2014). While a vital sector in itself, the health sector contributes across all other sectors (for example, education and

employment), as well as being one to which other sectors contribute. In the Hyogo Framework for Action 2005–2015 (UNISDR 2005), there was little explicit mention of the important role of disaster risk reduction strategies in improving health outcomes for people at risk or affected by emergencies and disasters. Sendai has changed this, and health resilience is strongly promoted throughout the Framework.

The Sendai Framework recognizes that a holistic approach to managing risks associated with natural and human-induced hazards—including prevention, preparedness, response, and recovery—is required. It refers to the implementation of an all-hazards approach to managing disaster risk, which includes tackling biological risks such as epidemics and pandemics. Health is therefore a key theme (Aitsi-Selmi and Murray 2015). The Hyogo Framework for Action contained few explicit references to health, whereas the Sendai Framework contains many, with the word health mentioned 38 times (UNISDR 2005). Actions/paragraphs specific to health within the Sendai Framework include:

- Paragraph 18: Inclusion of health targets and indicators for monitoring and reporting on disaster risk management;
- Paragraph 22(n): Establishing a mechanism of case registry and a database of mortality caused by disaster in order to improve the prevention of morbidity and mortality;
- Paragraph 30(i): Enhancing the resilience of national health systems through training and capacity development; Supporting the implementation of the International Health Regulations (WHO 2005);
- Paragraph 30(j): Strengthening the design and implementation of inclusive policies and social safety-net mechanisms, such as supporting access to basic health-care services, including maternal, newborn, and child health, sexual and reproductive health;
- Paragraph 33(c): Improving the resilience of critical infrastructure to ensure new and existing health facilities remain operational in emergencies and disasters;
- Paragraph 33(o): Enhancing recovery schemes to provide psychosocial support and mental health services, and assisting those disproportionately affected by disasters including those with life threatening and chronic disease.

3 Sendai Global Targets and Indicators

The Sendai Framework addresses the need for a shared understanding of disaster risk through its global targets and indicators, which also provide a focus for attention on

concerns that are universal to all countries (WHO 2005). These targets can act as a catalyst to accelerate change within countries as their high public profile attracts political commitment and financial resources. The benchmarking of targets as a global process can also provide a strong motivating factor for countries.

Nevertheless, indicators are not without their limitations. Their measurement often relies on robust and complete data, which may not be available across all countries, resulting in comparability issues. Moreover, indicators have the potential to be misleading, if the data, assumptions, or analyses behind them are incorrect. Aggregated data, for example, may mask inequalities within vulnerable groups that, unless disaggregated, will remain hidden to policymakers. In the extreme, this can lead to a phenomenon known as Simpson's paradox, where a body of data displays a trend, yet when the data are broken into subgroups, the opposite trend is apparent for different subgroups (Wagner 1982).

Successful global targets and indicators share the following characteristics in their design: they are inspiring, clearly understood, few in number, ambitious yet feasible, and most importantly they are measurable (Vandemoortele 2012; United Nations Data Revolution 2014). Coherence of indicators and targets with other global initiatives is also key. The UN Statistics Division recently confirmed indicators developed by the Inter-Agency and Expert Group on Sustainable Development Goal Indicators, and this process is closely coordinated with the Sendai Framework (UNSTATS 2017).

On 2 February 2017, the UN General Assembly adopted resolution A/71/644, which states the necessary indicators associated with the global targets (United Nations 2017). Through the collection of the information on these indicators, UN Member States can measure their progress in disaster risk reduction efforts by 2030, including mortality, persons affected, economic loss, and damage to critical infrastructure and disruption of basic services.

Many of the Sendai indicators are health-related. Within Target A, for example, an indicator measures the number of deaths attributed to disasters, while an indicator in Target B measures the number of injured or ill people attributed to disasters. Within Target D, the numbers of health facilities damaged or destroyed, as well as the disruptions to health services attributed to disasters are to be measured.

4 Measuring the Sendai Framework Health-Related Indicators: Challenges and Opportunities

Paragraph 14 of the Sendai Framework for Disaster Risk Reduction (UNISDR 2015, p. 11) states that “there is a need to address existing challenges and prepare for future

ones by focusing on monitoring, assessing and understanding disaster risk and sharing such information and on how it is created.” Several agreed systems of health indicators are currently in use. These include:

- The International Health Regulations (IHR)—Designed to assist the global community in preventing and responding to acute public health risks that have the potential to cross borders and threaten people worldwide (WHO 2005). The regulations mandate countries to assess their capacities for disease surveillance and response and report whether these are sufficient to meet their obligations.
- The Global Health Security Agenda (GHSA)—Initiated in 2014 by the Obama administration, a non-binding coalition of countries, nongovernmental organizations, and international organizations working together to help build country capacity to respond to infectious disease threats, elevate global health security as a national and global priority, and ultimately spur progress on implementing the IHR (GHSA 2016).
- The Joint External Evaluation (JEE) Alliance—A voluntary, collaborative process to assess a country's capacity to adhere to IHR requirements to prevent, detect, and rapidly respond to public health threats (WHO 2016a). The JEE is a tool that has been developed by the World Health Organization in collaboration with other initiatives such as the GHSA, and assesses 19 technical areas. It allows countries (the United Kingdom was one of the initial volunteer countries) to identify and prioritize the most urgent needs within their health security systems, and to engage with donors and partners to target resources effectively (WHO 2016b).
- The WHO R&D Blueprint for Action to Prevent Epidemics—A global strategy and preparedness plan published in May 2016, sparked by the Ebola crisis that allows the rapid activation of research and development activities during epidemics. Its aim is to fast-track the availability of effective tests, vaccines, and medicines that can be used to save lives and avert large-scale crises (WHO 2016c). However, disaster risk reduction also requires ongoing, steady, and continual research and development, including horizon scanning and scenario testing.
- The Paris-based World Organization for Animal Health (OIE)—Founded in 1924 as the Office International des Epizooties (OIE), coordinates global animal disease control, and has created the Performance of Veterinary Services tool, used to evaluate veterinary capacity in countries around the world (OIE 2013).
- The Lancet Countdown—An international research collaboration identifying the health benefits in

responding to climate change. It is currently engaged in a consultation process to develop indicators that will give a global overview on the relationship between health and climate (Watts et al. 2017).

Each of these systems faces a number of common data collection challenges. Baseline data may not be available, and there may be a lack of comparable disaster damage and loss data due to differences in data recording and standards over time and across countries (European JRC 2015). Significant data challenges became apparent, for example, following the establishment of the Millennium Development Goals (Fehling et al. 2013). These issues produced a number of important learning points apparent in the 2015 agreements, with particular respect to ensuring broad engagement in collection, reporting, and analysis. As noted by Moon et al. (2017), in light of the West African Ebola epidemic, the global community needs to invest resources in monitoring, governance, and accountability mechanisms in order to bring about effective change in reducing the health impacts of disasters.

Engagement and political will can drive change. The above programs for health indicators are evidence of the desire for systemic progress. In the 2004 round of the Global AIDS Reporting System, for example, only 53% of countries (52 UN Member States) reported data. By the 2012 round, this figure had increased to 96% (186 UN Member States) (Alfvén et al. 2017). Nevertheless, the collection of such data must be cross-validated to ensure it is robust, with existing and novel reporting methods made evident. The World Health Organization's Global Reference List of 100 Core Health Indicators aims to contribute to greater alignment between countries on the reporting of health trends (WHO 2015). A new edition that takes account of the Sustainable Development Goals indicators, including those linked to the Sendai Framework, is due for publication in 2017. Through a series of continuing workshops on the Sendai Framework indicators, particular issues and challenges have been identified for the health-related indicators:

- *Temporality* Deaths attributable to a disaster can occur during a slow-onset and protracted event or months, sometimes years after the initial impact of a sudden-onset event, and may differ according to the hazard. Temporal dimensions need to be specified in relation to recording a death associated with a hazardous event or disaster.
- *Attribution* Linking mortality and morbidity to events or disasters can be problematic. With certain hazards, the cause of death may be obvious, for example drowning as a result of a flood. However, particularly with slow-onset hazards, the causes are often indirect. For example, in the case of droughts, some of the indirect causes of morbidity and mortality have included communicable diseases, malnutrition, and disruption to basic health care (Stanke et al. 2013).
- *Baselines* Progress and change can only be monitored if there is a baseline. In the Sendai targets, countries will report on loss data for the period 2005–2015 to enable comparison with data from 2015 to 2030 per 100,000 population. However, the collection of historic loss data will require an investment of time and resources. One possibility with the health-related indicators of the Sendai Framework is to explore using resources such as the Global Burden of Disease study (an open, collaborative, independent study) to comprehensively model and, where possible, measure epidemiological levels and trends of disease and risk factor burden worldwide. The study has already been used to generate comparable, valid, and consistent baseline measurements for the health-related Sustainable Development Goals (Lim et al. 2016).
- *Classification of hazards* Paragraph 24(j) of the Sendai Framework calls for the strengthening of “technical and scientific capacity to capitalize on and consolidate existing knowledge and to develop and apply methodologies and models to assess disaster risks, vulnerabilities and exposure to all hazards”(UNISDR 2015, p. 15). So far as can be determined, there does not appear to be a single established universal taxonomy or set of classifications for use in disasters. A number of taxonomies have been put together by individual organizations, yet none are approved international standards. These include the Peril Classification and Hazard Glossary developed by the Integrated Research on Disaster Risk (IRDR 2014) and the one used by the Centre for Risk Studies at the Cambridge University Judge Business School (Cambridge Centre for Risk Studies 2017). It will be essential to ensure that all hazards identified within the scope of the Sendai Framework are represented to avoid bias (Gall et al. 2009). However, it should be acknowledged that disasters are caused by vulnerability that is contextual; therefore, creating a single taxonomy may oversimplify the diverse characteristics displayed by disasters.
- *Thresholds* Disasters encapsulate events of all scales and have no minimum threshold. However, some disaster databases such as EM-DAT (CRED 2017) define threshold criteria (events are only reported, for example, if 10 or more people died) that do not capture all disasters.

5 Conclusion

The three landmark agreements finalized in 2015—the Sustainable Development Goals (United Nations 2015), the Paris Climate Agreement (UNFCCC 2015), and the Sendai Framework for Disaster Risk Reduction

2015–2030 (UNISDR 2015)—directly address impacts on health. This presence of health issues in the motivations of policymakers is not without precedent, but with respect to disaster risk reduction, the focus on health has increased.

Developing data collection and reporting guidelines for indicators requires detailed consultation with a diverse range of stakeholders. It is critical that indicators are useful, useable, and used (Aitsi-Selmi et al. 2016). Reporting burden upon countries must be minimal, and methods advised should be applicable locally and nationally, as well as at the global level. For this reason, collaboration with other similar indicator processes is necessary. A strong emphasis should also be placed on the importance of learning and sharing experiences of best practice. It is important to understand the ultimate utility of indicators as an input to answers and impetus for action.

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