Science and Technical Advisory Group

IRDR Networking and Partnership Meeting
- ICSU Paris 13 November 2014

UNISDR Science and Technical Advisory Group

Professor Virginia Murray.

Vice-chair UNISDR Science and Technical Advisory Group

Public Health Consultant in Global Disaster Risk Reduction, Public Health England

Outline

- Development of the UNISDR Science and Technical Advisory Group
- Development of the science outputs from the Global Platforms 2009, 2011 and 2013
- Examples of UNISDR STAG science inputs UNISDR and related UNISDR activities
- 2014 activities

Establishment of an Advisory Scientific and Technical Group for the ISDR

Inter-Agency Task Force on Disaster Reduction, third meeting, Geneva, 3-4 May 2001

The purpose of this paper is to briefly examine the main lessons learnt from the IDNDR Scientific and Technical Committee (STC) experience and to formulate proposals for the establishment of a scientific advisory structure for the ISDR.

Throughout the IDNDR and during the first year of the establishment of the ISDR, science and technology have been explictly recognised as a key input in the strategy aimed at promoting successful risk reduction. The Inter-Agency Task Force includes a number of scientific organisations such as UNESCO, WMO and ICSU while the ISDR Secretariat

ISDR

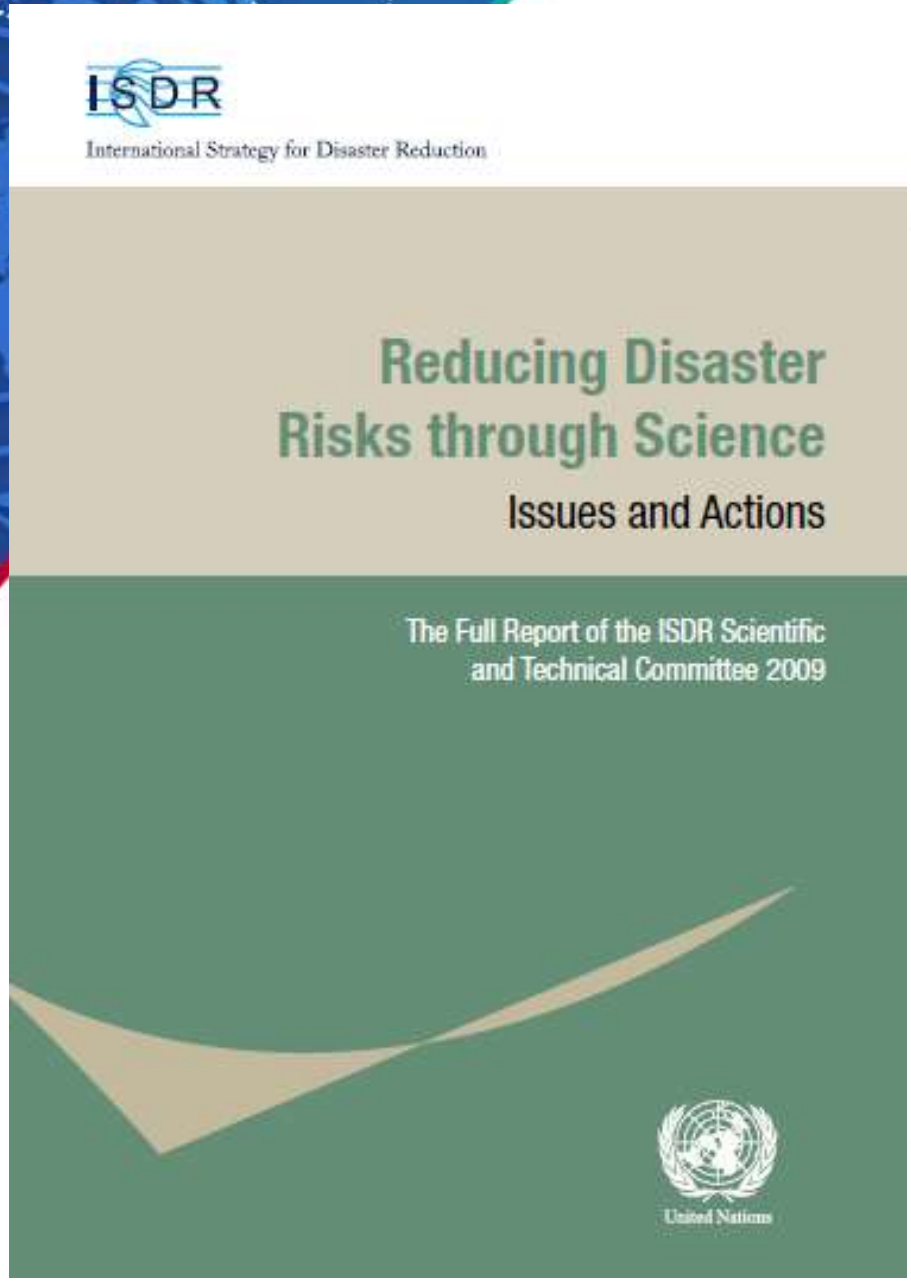
International Strategy for Disaster Reduction

HFA

Hyogo Framework for Action 2005 - 2015:

Building the Resilience of Nations and Communities to Disasters

http://www.unisdr.org/eng/hfa/docs/HFA-brochure-English.pdf



Establishment of UNISDR Scientific and Technical Committee 2008

http://www.unisdr.org/we/inform/publications/11543

UNISDR

Selected topics of current policy concern

- Climate change
- Changing institutional and public behaviour to early warnings
- Incorporating knowledge of the wide health impacts of disasters
- Improving resilience to disasters through social and economic understanding

UNISDR

Programme
Plenary
Informal Plenary
Pre-session Events
Special Events
Round Tables
Market Place
Media Events
Statements
Videos
Key Documents
Registration
Practical Information
Press Centre
Media Coverage
Photo Gallery
Contact

Welcome to the second session of the Global Platform for Disaster Risk Reduction website

This website documents proceedings and outcome of the second session of the Global Platform. The meeting took place at the Centre International de Conf□rences de Gen□ve (CICG), Geneva, Switzerland from Tuesday to Friday, 16-19 June 2009.

Proceedings: Second Session of the Global Platform for Disaster Risk Reduction

4 December 2009

Conference proceedings released:
Please find the proceedings of the second session of the Global Platform for Disaster Risk Reduction available for download below.

The Chair's Summary may also be found below in addition to further information documents on the outcomes, including recommendations from National Platforms, Parliamentarians, the ISDR Management Oversight Board and on climate change adaptation, gender, and youth engagement in disaster risk reduction on the Closing Plenary page.

A summary report of the second session of the Global Platform for Disaster Risk Reduction produced by the International Institute for Sustainable Development (IISD) is available in PDF format and provides an excellent overview of all discussions that took place during the Global Platform, including the Opening and Closing debates, High Level Panels, round tables and Informal Plenary sessions.

> View all announcements

Outcome Document: Chair's Summary of the Second Session Global Platform for Disaster Risk Reduction

This summary provides the Chair's assessment of the main thrusts of the deliberations at the second session of the Global Platform for Disaster Risk Reduction, which was attended by 152 Governments, 137 organizations, and 1688 participants in total. A draft of the summary was discussed in the final informal plenary and thereafter a revised draft was made available to participants for two weeks for further feedback, which has been considered in this final summary. More information on the meeting can be found at http://www.preventionweb.net/globalplatform/2009/

- The Global Platform …. stressed …. for the **more effective integration of science and technical information into policy and practice**.

http://www.unisdr.org/files/10750_GP09ChairsSummary.pdf

EMERGENC
Prepared

Disaster

SPECIAL REPORT

Evacuation and Sheltering of Hospitals in Emergencies: A Review of International Experience

Dr. Jayshree Bagaria, MB ChB, MRCP, DTM&H, MSc PH, MFPH;[1]
Dr. Caroline Heggie, MB ChB, BSc Hons, MRCP;[1] Jonathan Abrahams, BSc, MPH;[2]
Professor Virginia Murray, FFOM, FRCP, FRCPath, FFPH[1]

1. Specialist Registrar Public Health, Oxford Post Graduate Medical Deanery, seconded to Chemical Hazards and Poisons Division, Health Protection Agency, London
2. Emergency Medicine Trainee on secondment to Chemical Hazards and Poisons Division, Health Protection Agency, London
3. Coordinator, Risk Reduction & Emergency

Abstract
Objective: A scoping exercise to establish how common hospital evacuations are, identify hospital evacuation policies and review case studies to identify triggers, processes and challenges involved in the evacuation of hospitals globally.
Design: A systematic search of PubMed and disaster agency online resources, search of grey literature and media reports.
Results: This study showed that hospitals are vulnerable to both natural and man made disasters and that hospital evacuations do occur globally. It highlighted the paucity of published data and policy on hospital evacuation and emphasised the vital need to collect data on triggers, reasons for evacuation, sheltering facilities and the process of evacuation.

World Health Organization

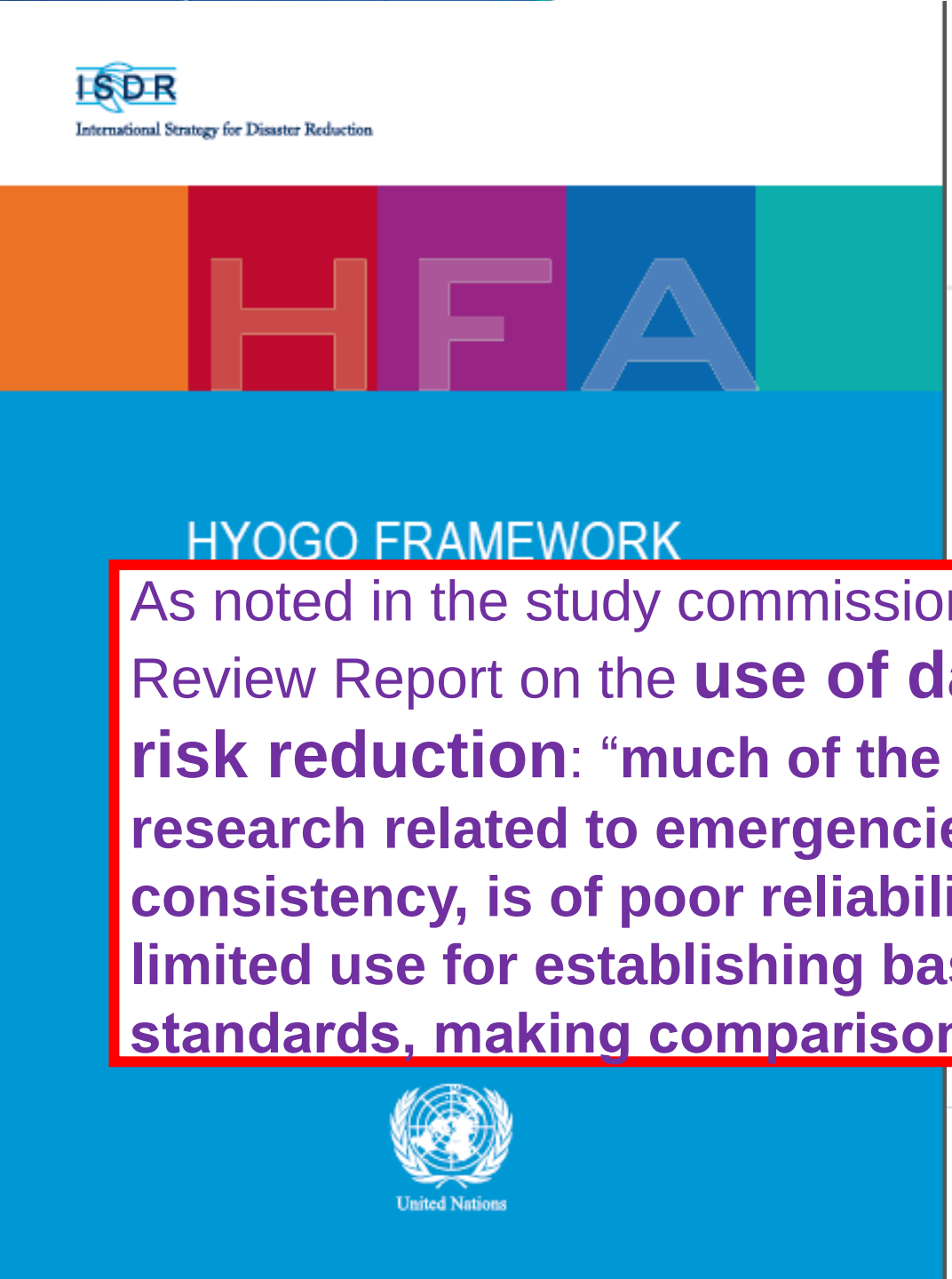
ISDR
International Strategy for Disaster Reduction

Thematic Platform: Disaster Risk Reduction for Health

Introduction

At the 2009 Global Platform for Disaster Risk Reduction, participants supported a proposal to establish a Thematic Platform for Disaster Risk Reduction for Health. The launch of this platform, dedicated to protecting public health through disaster risk reduction, coincides with the International Day for Disaster Reduction on 14 October 2009.


Revealing Risk,
Redefining
Development
2011
GAR
Global Assessment Report
on Disaster Risk Reduction
2013
UNISDR



http://www.unisdr.org/files/18197_midterm.pdf

As noted in the study commissioned for the Mid-Term Review Report on the **use of databases for disaster risk reduction**: "**much of the existing operational research related to emergencies and disasters lacks consistency, is of poor reliability and validity and is of limited use for establishing baselines, defining standards, making comparisons or tracking trends.**" 85

UNISDR


3RD
GLOBAL PLATFORM
for Disaster Risk Reduction
Invest Today for a Safer Tomorrow
Increase Investment in Local Action
World Reconstruction Conference
WRC High L
FDRR

Global Platform
for Disaster Risk Reduction
Third Session, Geneva, Switzerland
8 - 13 May 2011

Statement on Science and Technology for the Third Session of the Global Platform for Disaster Risk Reduction

This statement presents recommendations related to science and technology in support of the outcomes of the Third Session of the Global Platform for Disaster Risk Reduction. It includes emerging priority issues in support of the implementation of the Hyogo Framework for Action (Annex 1) and a report on the work of the ISDR Scientific and Technical Committee (STC) (Annex 2).

The statement is prepared by the ISDR Scientific and Technical Committee (STC) based on work with scientific, technical and thematic networks, the Global Assessment Report 2011 (GAR), the Mid Term Review of the Hyogo Framework for Action, the Intergovernmental Panel on Climate Change Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX), the outcomes of the International Disaster Risk Conference (IDRC, Davos 2010), the work of the Integrated Research on Disaster Risk (IRDR) programme and many other scientific and technical partners. A preparatory workshop for the Global Platform for Disaster Risk Reduction Third Session on

Global Platform
for Disaster Risk Reduction
Third Session, Geneva, Switzerland
8 - 13 May 2011

World Reconstruction Conference
Geneva, May 10-13, 2011
Recovering and Reducing Risks after Natural Disasters

Chair's Summary

Third Session of the Global Platform for Disaster Risk Reduction
and World Reconstruction Conference, Geneva, 8-13 May 2011

http://www.preventionweb.net/globalplatform/2011/

1. The Third Session of the Global Platform for Disaster Risk Reduction and the World

7.8 Actively engage and support scientific and technical communities to inform decision-making

committed to building resilience – including several Heads of State, Ministers, a Managing Director of the World Bank, over 2,600 delegates representing 168 Governments, 25 inter-governmental organizations, 65 non-governmental organizations, Parliamentarians, private sector, local government, academic institutions, civil society and international organizations.

3. Half of humanity is now living in cities. By 2050 urbanization will rise to 70 percent and urban risk will increase as well. Risk is further driven by factors such as rural and urban poverty, climate change, declining ecosystems, and development choices including in energy infrastructure. Commitment to resilience is urgently needed particularly in vulnerable groups,

UNISDR
The United Nations Office for Disaster Risk Reduction

Towards a Post-2015 Framework for Disaster Risk Reduction

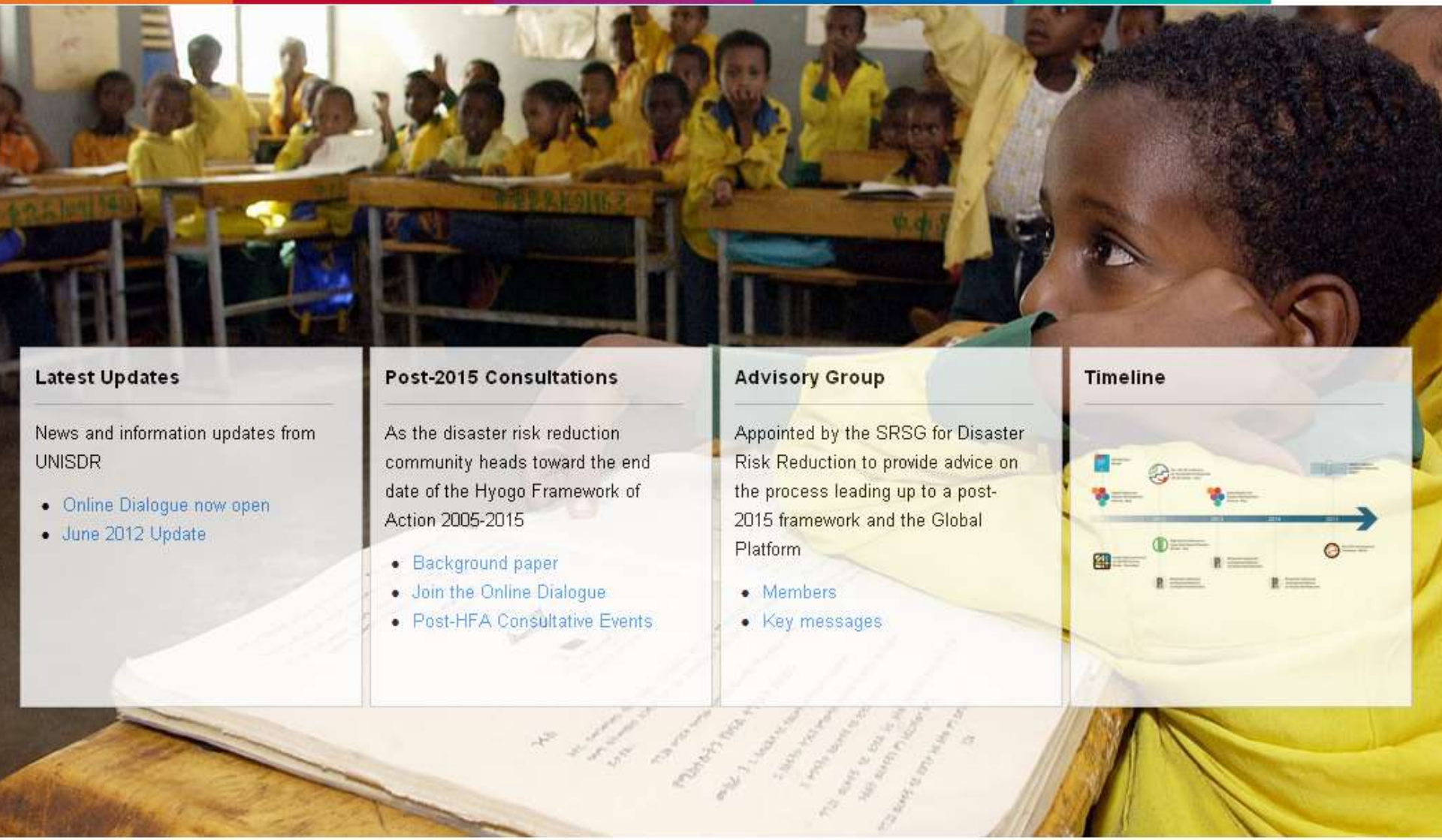
The *Hyogo Framework for Action 2005-2015 (HFA) – Building the Resilience of Nations and Communities to Disasters,* is the inspiration for knowledge, practice, implementation, experience and the **science** for disaster risk reduction.

Other consultations with specific stakeholders' groups to explore their views on a post-2015 framework for disaster risk reduction…. include, but are not limited to …. the **scientific community**…..

Towards a post-2015 framework for

Disaster Risk Reduction

BUILDING THE RESILIENCE OF NATIONS AND COMMUNITIES TO DISASTERS



Latest Updates

News and information updates from UNISDR

- Online Dialogue now open
- June 2012 Update

Post-2015 Consultations

As the disaster risk reduction community heads toward the end date of the Hyogo Framework of Action 2005-2015

- Background paper
- Join the Online Dialogue
- Post-HFA Consultative Events

Advisory Group

Appointed by the SRSG for Disaster Risk Reduction to provide advice on the process leading up to a post-2015 framework and the Global Platform

- Members
- Key messages

Timeline

Proposal for an IPCC special report on managing the risk of extreme events to advance climate change adaptation

Proposed by Norway and the Secretariat of the International Strategy for Disaster Reduction (ISDR) System

This paper lays out policy linkages of climate change adaptation and disaster risk reduction. Norway and the United Nations International Strategy for Disaster Reduction system propose that the IPCC undertake a Special Report to assess policies, measures, tools and practices for managing extreme events risk to advance effective adaptation.

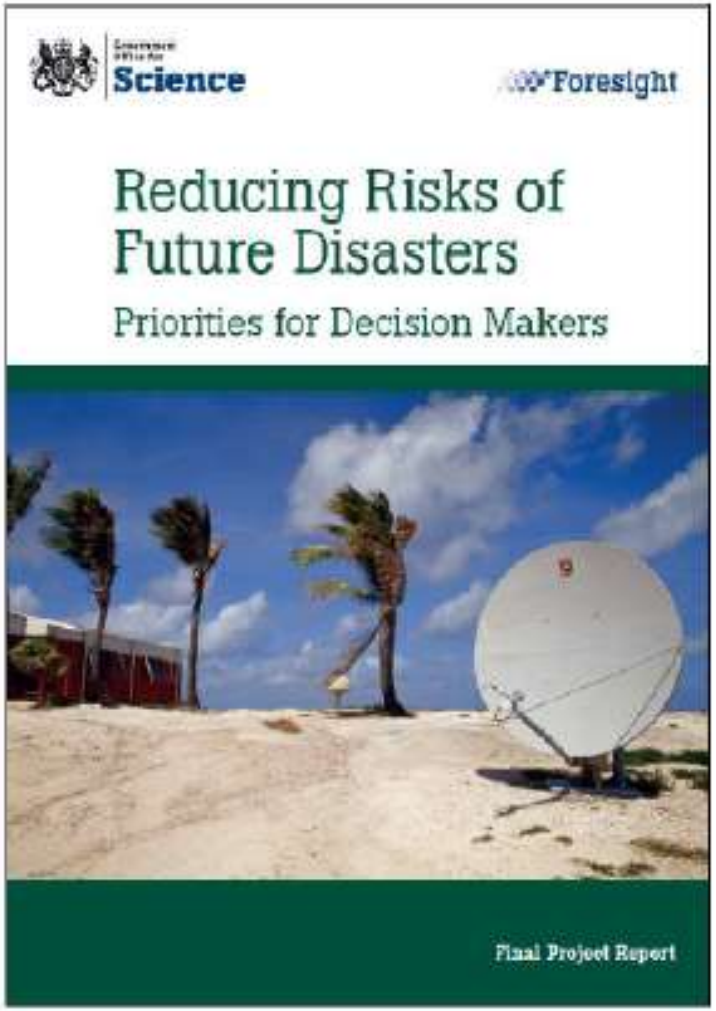
Norway offered at the IPCC Twenty-Eighth Session to host a scoping workshop to assess whether a Special Report to the IPCC should be undertaken on the

The IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation

ipcc
INTERGOVERNMENTAL PANEL ON climate change

Government Office for Science

Reducing Risks of Future Disasters: Priorities for Decision Makers



Professor Sir John Beddington

Chief Scientific Adviser to HM Government

Foresight

Global Platform
for disaster risk reduction

Fourth session
Geneva, Switzerland
19-23 May 2013

#gpdrr13
Tweet about the GP

Home »
About
Preparatory Process
Programme
Official Statements
High Level Dialogue
Consultation Days
Ceremonies & Receptions
Plenaries
Featured Events
Informal Plenaries
Side Events
Market Place
IGNITE Stage

Global Platform in Action

GP 2013 in the news

Nigeria: adherence to planning reduces disaster

Latest Announcements

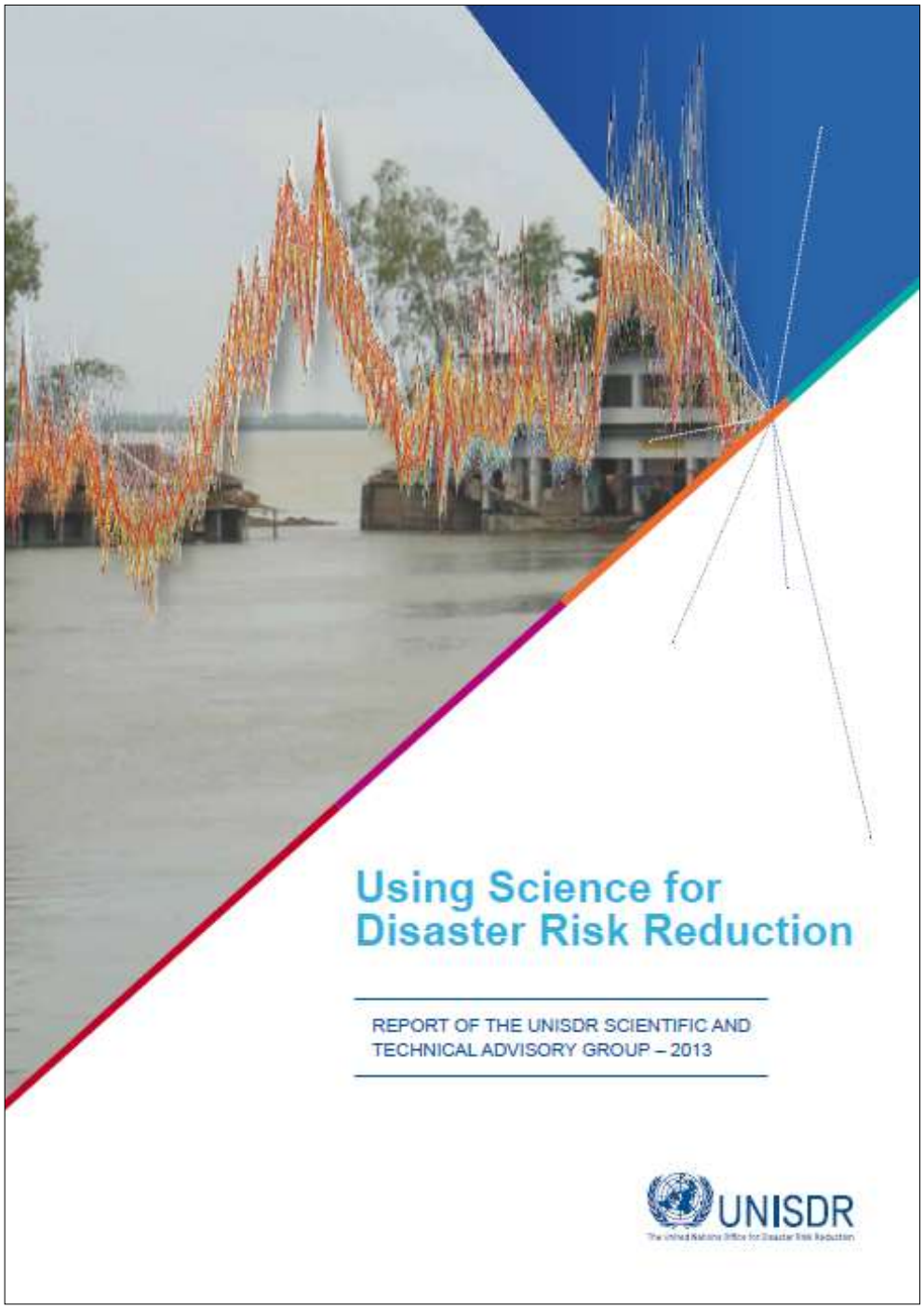
The Chair's Summary - DRAFT FOR COMMENT
posted: 23/5/2013 - read more »

Global Platform Highlights - Thursday, May 23
posted: 23/5/2013 - read more »

View all announcements RS

Experience the GP

Stay updated



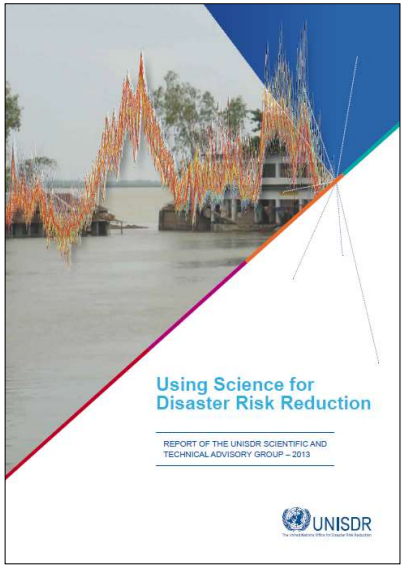
Report of the UNISDR Scientific and Technical Advisory Group – 2013

Southgate RJ, Roth C, Schneider J, Shi P, Onishi T, Wenger D, Amman W, Ogallo L, Beddington J, Murray V. Using Science for Disaster Risk Reduction. 2013.

http://www.unisdr.org/files/32609_stagreport2013assembled.pdf

Case Studies: Objectives

- The disaster risk reduction problem
- The science
- Application to policy and practice
- Did it make a difference?



UNISDR

CASE STUDY 1:

Tsunami Warning and Mitigation for the Indian Ocean Region

Image 1: The 11th March 2011 Tohoku tsunami striking the eastern coast of Japan.
Source: Newscom/Kyodo/MENN.com

The Problem

On 26th December 2004, the Indian Ocean was struck by a massive earthquake and tsunami which killed 230,000 people and caused widespread destruction [1]. Although we cannot prevent tsunamis, early warning of their approach combined with physical defences and well-practiced evacuation procedures can save many lives.

Prior to 2004, tsunamis were not considered a high-risk hazard, certainly not outside the Pacific Ocean. Tsunami science was a niche scientific field, with little translation of knowledge into practice, even though scientists published work on a possible ocean-wide tsunami in the Indian Ocean just months before the 2004 event [2]. This combined with rapid population growth of coastal communities in the region set the scene for catastrophic consequences for the Indian Ocean rim in 2004.

The science

The early 1960s saw the development and acceptance of plate tectonic theory, wherein earthquakes and volcanoes were first recognised to be the direct manifestation of the forces that create oceans and build continents [3]. The first global seismographic network was established in 1961 [4], allowing earthquakes to be monitored worldwide.

By the 2000s, great advances had been made in earth observations, computer modelling of hazards and telecommunications. Electronic sensors were developed that could rapidly detect earthquake shaking on land and tsunami waves at sea. For instance, the United States National Oceanic and Atmospheric Administration (NOAA) developed the Deep-Ocean Assessment and Reporting of Tsunamis system, known as DART II, in which a sensor on the ocean floor detects tsunami waves and communicates these to a surface buoy with satellite telecommunications capability [5] (Figure 1).

Computer models were developed that simulate tsunami impacts on communities [6, 7]; and satellites could now transmit signals to high-speed computers, empowering humans to issue local and pan-oceanic tsunami warnings in minutes [8, 9].

The application to policy and practice

In less than three months following the devastating Indian Ocean tsunami, scientists worked together with policymakers to form an international commitment to develop an Indian Ocean Tsunami Warning & Mitigation System (IOTWS). The IOTWS is now fully operational, comprising a set of Regional Tsunami Service Providers (India, Australia, and Indonesia) issuing tsunami advisories to all National Tsunami Warning Centres of the Indian Ocean rim countries [10]. The IOTWS also developed the first international guidelines for tsunami hazard and risk assessment [11].

The most heavily affected nations of Indonesia, Sri Lanka and India developed new disaster management policy frameworks, governance structures and national disaster management plans to address tsunami and other natural disaster risks. For instance, the Indonesian Government developed the Presidential Tsunami Master Plan for Reducing Tsunami Risk [12], which is underpinned by national-scale tsunami hazard mapping to establish tsunami shelters and strengthen warning systems for at risk coastal communities.

Did it make a difference?

The IOTWS now provides warnings to all Indian Ocean country members, reaching millions of people who had no warnings in 2004. Furthermore, tsunami hazard mapping and evacuation planning has been carried out for hundreds of coastal communities.

Gains in tsunami preparedness were demonstrated during the 12 April 2012 magnitude 8.5 earthquake offshore of northern Sumatra, Indonesia. Although no tsunami eventuated, due to the large magnitude and location, a tsunami warning was issued in several countries. In Banda Aceh, where most of the tsunami-related deaths occurred in 2004, over 75% of the population started to evacuate soon after the earthquake [13]. Despite this, traffic jams slowed the evacuation considerably [14], demonstrating that challenges still remain in getting dense populations to safety within very short warning timeframes.

Meanwhile, the 2011 Tohoku tsunami severely tested Japan's highly advanced warning system, seawalls and evacuation plans (Image 1). Tragically 18,000 people lost their lives [15], totaling 4% of the population located in the inundation area. In comparison, the 2004 Indian Ocean Tsunami resulted in over 20% fatalities in the inundation area [16]. While any fatalities are shocking, it is clear that the application of science and technology can save lives.

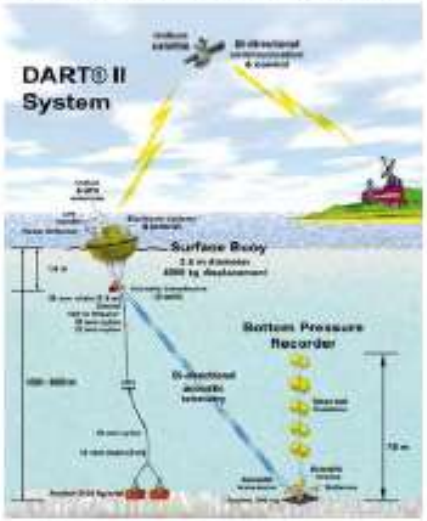


Figure 1: Overview of the DART II System for tsunami detection.
Source: National Oceanic and Atmospheric Administration [17].

1 Doocy S, Rofi A, Moodie C, Spring E, Bradley S, Burnham G, Robinson C. Tsunami mortality in Aceh Province, Indonesia. Bulletin of the World Health Organization. 2007; 85(3):273-278.
2 Cochrane P, Murbage D. Brutal threat, but warning sounded for tsunami research. Australian News. 2004; 15:4-7.
3 Dewey JF, Bird JM. Mountain belts and the new global tectonics. Journal of Geophysical Research. 1970; 75(14): 2625-2647.
4 Acoustics and Seismics Laboratory, Institute of Science and Technology, The University of Michigan. Handbook: World-wide Standard Seismograph Network. Ann Arbor: University of Michigan; 1964. (p500).
5 Bernard EN, Gonzalez F, Meinig C, Milburn HB. Early detection and real-time reporting of deep-ocean tsunamis. In: Proceedings of the International Tsunami Symposium 2001 (ITS 2001) (on CD-ROM). NTHMP Review Session, Seattle, WA. 7 – 10 August 2001.
6 Shuto N, Goto T. Numerical simulation of tsunami run-up. Coastal Engineering Japan. 1978;21:5-9.
7 Titov V, Synolakis C. Numerical modeling of tidal wave runup. Journal of Waterway, Port, Coastal and Ocean Engineering. 1998; 124(4):157-171.
8 Rudloff A, Lauterjung J, Münzer U, Tost B. The GITEWS Project (German-Indonesian Tsunami Early Warning System). Natural Hazards and Earth System Sciences. 2009; 9:1381-1382.
9 Crawford G. 2005. NOAA Weather Radio (NWR) - a coastal solution to tsunami alert and notification. In: Bernard EN (editor). Developing Tsunami-resilient Communities. Dordrecht: Springer Netherlands; 2005.
10 United Nations Educational, Scientific and Cultural Organization (UNESCO). Indian Ocean Tsunami Warning System: Up And Running [webpage]. 2009. Available at: http://portal.unesco.org/en/ev.php-URL_ID=29849&URL_DO=DO_TOPIC&URL_SECT=201.html [accessed] 20 March 2013].
11 Intergovernmental Oceanographic Commission Tsunami risk assessment and mitigation for the Indian Ocean: knowing your tsunami risk – and what to do about it. IOC Manuals and Guides No. 52. Paris: UNESCO; 2009.
12 Indonesian National Disaster Management Agency. Presidential Master Plan for Tsunami Risk Reduction. 2012.
13 Goto Y, Affan M, Fadli, N. Quick Report No. 2: Response of the people in Banda Aceh just after the 2012 April 11 Off-Sumatra earthquake (M8.5). 2012. Available at: http://www.tsunamisymposium.org/assets/publications/goto%20report%20no%202%20tsunami%20evacuation%2011012.pdf [accessed 8 April 2013].
14 Ibid
15 National Police Agency of Japan. 2013. Countermeasures for the Great East Japan Earthquake: Damage Situation and Police Countermeasures [webpage]. 2013. Available at: http://www.npa.go.jp/archive/keibi/biki/index_e.htm [accessed 8 March 2013].
16 Doocy S, Rofi A, Moodie C, Spring E, Bradley S, Burnham G, Robinson C. Tsunami mortality in Aceh Province, Indonesia. Bulletin of the World Health Organization. 2007; 85(3):273-276.
17 National Oceanic and Atmospheric Administration (NOAA). DART II System. Available at: http://www.ndbc.noaa.gov/dart/dart.shtml [accessed 29 April 2013].

Image 2: A child receives a rubella vaccination.
Source: Wellcome Images.

CASE STUDY 7:

Preventing Congenital Rubella Syndrome: Health disaster risk reduction through Rubella vaccination

The problem

When a woman contracts the disease rubella (or German measles) in early pregnancy, her unborn baby also becomes infected. While the woman may experience only a mild illness, the unborn baby will suffer major birth defects such as deafness, blindness, heart defects, and blood disorders. Severe learning disabilities can also occur; these may worsen throughout life and may also be associated with deformities of the skull (such as a small head size, as seen in Image 1). In some cases the unborn baby will die from the infection [1, 2].

Rubella is an infectious disease caused by a virus. It spreads from person to person through sneezing and coughing. Outbreaks of rubella are public health disasters.In the 1960s a rubella epidemic swept through the world in the United states alone, approximately 11,000 babies died and 20,000 babies were born with birth defects [3, 4].

The science

In the first half of the twentieth century, the link between rubella and birth defects was not known. At that time, the fact that intrauterine infections could cause fetal damage, birth defects and fetal loss was largely unrecognised. Rubella was a fairly common infectious disease, mostly occurring in children but also in adults, including pregnant women.

In 1941, an Australian eye doctor called Norman Gregg was treating babies born with eye problems. He noticed that there were many more such infants that year than in the preceding years. One day he overheard two mothers talking about how they had both suffered from rubella when pregnant [5]. This led him to review the medical records of many mothers and babies. He connected the increased numbers of such damaged infants he had observed to a large epidemic of rubella which had recently occurred [6].

Gregg went on to show that rubella in early pregnancy could be linked to many serious birth defects in children [7].

This was a new discovery and, at first, even the possibility that such an apparently trivial illness could be so destructive was dismissed by some influential medical voices. It took some time - and further proof from scientists in other parts of the world - before doctors and policy-makers were convinced Gregg's findings were correct. The birth defects seen in babies infected with rubella while in the womb were later named Congenital Rubella Syndrome (CRS).

The application to policy and practice

A vaccination to prevent rubella first became available in 1969. The world now had a way of preventing the harm caused by rubella infection.

Since that time, increasing numbers of countries around the world have introduced the vaccine into their national immunisation policies. This is mostly done by vaccinating all the children in a population when they are still young (Image 2).

1 US Centers for Disease Control and Prevention (CDC). Rubella: Make Sure Your Child Gets Vaccinated. http://www.cdc.gov/features/rubella/ [accessed 6 April 2013].
2 CDC. Progress Toward Control of Rubella and Prevention of Congenital Rubella Syndrome – Worldwide, 2009. Morbidity and Mortality Weekly Report. 2010; 59(40): 1307-1310.
3 Willis JJ, Kershner AW. Epidemiology of rubella. American Journal of Diseases of Children. 1968; 116:107-12.
4 De Quadros CA. Vaccines: Preventing Disease and Protecting Health. Geneva: World Health Organization, 2004. pp.53.
5 Gregg NM. Congenital Cataract following German Measles in the Mother. Transactions of the Ophthalmological Society of Australia. 1941; 3:35-46.
6 Gregg NM. Further observations on congenital defects in infants following maternal rubella. Transactions of the Ophthalmological Society of Australia. 1944; 4: 119-131.

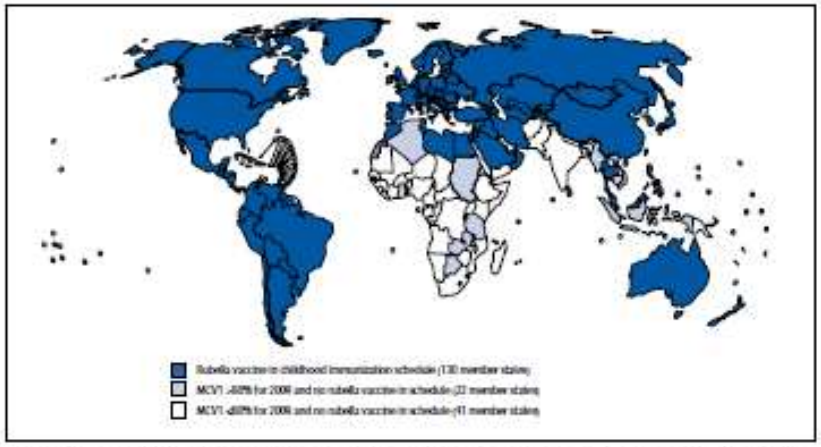


Figure 1: Countries using rubella vaccine and countries meeting WHO criteria for rubella vaccine introduction, 2009. Source: CDC, 2010 [9].

Following good progress in rubella immunisation in the 1990s, the Pan-American Health Organization (PAHO) resolved in 2003 to eliminate rubella and CRS from the region by 2010 [8].

Did it make a difference?

The number of World Health Organization (WHO) Member States using rubella-containing vaccine in their national immunisation programmes is continuing to grow, increasing from 83 of the 190 Member States (44%) in 1996 to 130 of 194 (67%) in 2009 [10] (Figure 1).

Rubella has been eliminated in the WHO Region of the Americas [11]; this means less than 1 case of CRS per 100,000 births. Their experiences have been turned into guidance to support elimination in other regions of the world. Lessons identified include: high-level commitment and partnerships are essential; link political commitment with technical strategies; use proven surveillance tools; recognise outstanding performance by individual countries; provide on-going training for surveillance staff [12].

The WHO Regional Office for Europe has now set a target for elimination of CRS in its Member States [13, 14].

Gregg's scientific work has saved countless lives and prevented much disability, family tragedy and economic loss around the world. However, CRS still affects an estimated 110,000 infants in developing countries each year [15, 16], meaning the full benefits of his work are yet to be realised.

Image 1: A newborn baby with 'microcephaly' or small head size. Source: masterstrokehealthcare.net.

8 Perlagia MR. Elimination of Rubella and Congenital Rubella Syndrome: We Did It Together. The Journal of Infectious Diseases. 2011; 204 (Suppl 2): 1.
9 CDC. Progress Toward Control of Rubella and Prevention of Congenital Rubella Syndrome – Worldwide, 2009. Morbidity and Mortality Weekly Report. 2010; 59(40): 1307-1310.
10 Strebel PM, Sutter RW, Cochi SL, Hinman AR, Chen RT, Clemens JD, Aaby P, Modlin JF. Epidemiology of measles after global measles control efforts. Vaccine. 2003; 21 Suppl 1:S1-14.
11 Perlagia MR. Elimination of Rubella and Congenital Rubella Syndrome: We Did It Together. The Journal of Infectious Diseases. 2011; 204 (Suppl 2): 1.
12 Jones B, Morris-Glasgow V, Andrus JK, Castillo-Solorzano C, Dosiosa JG, and the Caribbean Surveillance Group. Lessons Learned From Integrated Surveillance of Measles and Rubella in the Caribbean. The Journal of Infectious Diseases. 2011; 204:S620-S626.
13 CDC. Progress Toward Control of Rubella and Prevention of Congenital Rubella Syndrome – Worldwide, 2009. Morbidity and Mortality Weekly Report. 2010; 59(40): 1307-1310.
14 British Paediatric Surveillance Unit. 23rd Annual Report 2008-2009. London: Royal College of Paediatrics and Child Health. 2009.
15 CDC. Progress Toward Control of Rubella and Prevention of Congenital Rubella Syndrome – Worldwide, 2009. Morbidity and Mortality Weekly Report. 2010; 59(40): 1307-1310.
16 Cutts FT, Vynnycky E. Modelling the incidence of congenital rubella syndrome in developing countries. International Journal of Epidemiology. 1999; 28:1176-84.

CASE STUDY 10:

Building Resilience to Earthquakes in Chile

Image 1: Tie-column reinforcement cages extending from foundations of a new building; these are a key feature of 'confined masonry' construction. *Source: Brzev, Astroza and Yedlin, 2010*[1].

The problem

Hundreds of thousands of people have lost their lives due to the collapse of buildings during earthquakes in the last two decades; billions of dollars of financial loss have also been sustained. Building vulnerability generally results from a lack of understanding of engineering science and poor enforcement of building codes. The problem is most severe in developing countries where populations are growing, towns and cities are expanding and buildings are more vulnerable to damage[2–4].

The science

Scientists have studied the ways in which materials and structures are affected by strong shaking as experienced in an earthquake. By exposing structures to physical forces in the laboratory, and by studying the effects of real-life earthquakes, scientists can see how structural elements like beams, columns and walls behave under earthquake ground shaking, what type of damage they experience and how collapse takes place. This has brought an understanding of how to construct buildings to better withstand earthquakes.

For instance, buildings constructed in the 'confined masonry' style, have been designed to withstand earthquakes better than buildings built with other, more traditional building techniques[5]. 'Confined masonry' buildings are characterized by masonry walls combined with reinforced concrete confining elements, such as tie-column and tie-beam reinforcement cages (Image 1), and, in some cases, concrete bands through walls[6–8].

Building codes with seismic provisions are the most common tool used to put this scientific knowledge into practice. If adequately enforced, seismic building codes result in earthquake-resistant buildings that are less likely to collapse even in severe earthquakes, thus ensuring the safety of inhabitants.

Seismic code provisions are generally based on earthquake hazard maps and are more stringent in high hazard regions and for structures with high importance such as schools, hospitals, fire and police stations, and critical facilities. Building codes are generally updated regularly to incorporate new knowledge and experience gained from major earthquake events.

The application to policy and practice

The South American country of Chile experiences frequent earthquakes which have claimed many lives[9]. Chile has a long history of regulated 'confined masonry' construction practice, starting in the 1930s, after the 1928 Talca earthquake of magnitude 8.0[10].

Seismic design provisions for buildings were first formally laid out in 1940[11]. From the 1960s onwards, the Chilean government funded research work into seismic design codes for the country[12] and, in 1997, new building regulations were introduced which gave provisions for all new buildings to be designed and constructed in the 'confined masonry' style[13]. The regulations specify how buildings should be constructed and include standards such as the required strength for clay and concrete masonry units such as bricks and blocks. The regulations include the newest methods and techniques available[14].

The 1997 building regulations have been enforced well, with local authorities requiring that seismic and structural computations in the design of new buildings are verified by an independent professional[15].

Similar examples are seen in other areas of the world, particularly in Pakistan, which is also heavily affected by earthquakes. The new Building Code of Pakistan[16] was prepared after the 2005 Kashmir earthquake; these guidelines move away from the use of traditional adobe structures and adopt 'confined masonry' as the main building typology[16, 17]. More than 400,000 buildings were reconstructed in the affected areas after the 2005 earthquake, using the new code and with the aim to 'build back better'[18]. Other examples include the introduction of the Dhajji Diwari building typology (clay brick confined by small timber elements) in Kashmir[19].

Internationally, 'confined masonry' technology is being promoted by earthquake engineering experts. For instance, the Confined Masonry Network[20] has developed guidelines on seismic design for low-rise constructions, targeting countries where 'confined masonry' is not yet used[21].

Did it make a difference?

Over 200,000 people died in the magnitude 7.0 Haiti earthquake in January 2010 but when a magnitude 8.8 earthquake struck central Chile the next month, on 27th February 2010, only around 300 people lost their lives due to collapsed buildings[22] (Image 2). Well-enforced, science-based seismic building codes have been suggested as a major reason for the low number of casualties in the Chile earthquake[24, 25]. The earthquake was the most severe since the 1930s and produced significant ground-shaking over a large area of the country. Despite this, 'confined masonry' buildings of all sizes performed very well and it is estimated that only about 1% of the total building stock in the affected area was damaged[26]. Similarly in Pakistan, buildings constructed in line with seismic codes have survived several moderate and strong earthquakes over the past five decades with no or only minor damage[27, 28]. In this way, integration of science into building practice can and does save lives and livelihoods.

Image 2: A building with a collapsed ground floor as a result of the February 2010 earthquake in Chile. *Source: Brzev, Astroza and Yedlin, 2010*[23].

1 Brzev S, Astroza M, Yedlin MO. Performance of confined masonry buildings in the February 27, 2010 Chile earthquake. EERI report. Confined Masonry Network, 2010. Available at: http://www.confinedmasonry.org/performance-of-confined-masonry-buildings-in-the-february-27-2010-chile-earthquake [accessed 4 April 2013].

2 Jain SK. Historical developments in India towards seismic safety and lessons for future. Proceedings of the 14th World Conference on Earthquake Engineering, Beijing, China, October 2008.

3 Maqsood ST, Schwetz J. Building vulnerability and damage during the 2008 Baluchistan earthquake in Pakistan and past experiences. Seismological Research Letters. 2010; 81(3):514-525.

4 Maqsood ST, Schwetz J. Comparison of seismic vulnerability of buildings before and after 2005 Kashmir earthquake. Seismological Research Letters. 2010; 81(1):85-96.

5 Meli R, Brzev S, Astroza M, Boen T, Crisafulli F, Dai J et al for the Confined Masonry Network. Seismic Design Guide for Low-Rise Confined Masonry Buildings. Oakland: Earthquake Engineering Research Institute, 2011. Available at: http://www.confinedmasonry.org/wp-content/uploads/2012/04/ConfinedMasonryDesignGuide2011.pdf [accessed 11 April 2013].

6 Ibid.

7 International Association for Earthquake Engineering (IAEE). Guidelines for Earthquake Resistant Non-engineered Construction. Columbia and Delhi: IAEE, 2004.

8 Chilean Ministerio de Tierras y Colonización. Ordenanza General de Urbanismo y Construcción. Decreto Supremo N° 1 (Mar de 1940). Santiago, 1940.

9 Arze D, Crisafulli FJ. Seismicity and Design Codes in Chile: Characteristic Features and a Comparison with some of the Provisions of the Romanian Seismic Code. Constructii. 2010; 2:69-76.

10 Brzev S, Astroza M, Yedlin MO. Performance of confined masonry buildings in the February 27, 2010 Chile earthquake. EERI report. Confined Masonry Network, 2010. Available at: http://www.confinedmasonry.org/performance-of-confined-masonry-buildings-in-the-february-27-2010-chile-earthquake [accessed 4 April 2013].

11 Chilean Ministerio de Tierras y Colonización. Ordenanza General de Urbanismo y Construcción. Decreto Supremo N° 1 (Mar de 1940). Santiago, 1940.

12 Arze D, Crisafulli FJ. Seismicity and Design Codes in Chile: Characteristic Features and a Comparison with some of the Provisions of the Romanian Seismic Code. Constructii. 2010; 2:69-76.

13 Instituto Nacional de Normalización (INN). Norma Chilena Oficial 2123.Of 1997. Confined masonry – Requirements for structural design. Santiago: INN, 1997.

14 Arze D, Crisafulli FJ. Seismicity and Design Codes in Chile: Characteristic Features and a Comparison with some of the Provisions of the Romanian Seismic Code. Constructii. 2010; 2:69-76.

15 Ibid.

16 Maqsood ST, Schwetz J. Comparison of seismic vulnerability of buildings before and after 2005 Kashmir earthquake. Seismological Research Letters. 2010; 81(1):85-96.

17 Ministry of housing and public works. Building Code of Pakistan – seismic provisions. Islamabad, 2007.

18 Maqsood ST, Schwetz J. Comparison of seismic vulnerability of buildings before and after 2005 Kashmir earthquake. Seismological Research Letters. 2010; 81(1):85-96.

19 Maqsood ST, Schwetz J. Building vulnerability and damage during the 2008 Baluchistan earthquake in Pakistan and past experiences. Seismological Research Letters. 2010; 81(3):514-525.

20 www.confinedmasonry.org/ [accessed 11 April 2013].

21 Meli R, Brzev S, Astroza M, Boen T, Crisafulli F, Dai J et al for the Confined Masonry Network. Seismic Design Guide for Low-Rise Confined Masonry Buildings. Oakland: Earthquake Engineering Research Institute, 2011. Available at: http://www.confinedmasonry.org/wp-content/uploads/2012/04/ConfinedMasonryDesignGuide2011.pdf [accessed 11 April 2013].

22 Brzev S, Astroza M, Yedlin MO. Performance of confined masonry buildings in the February 27, 2010 Chile earthquake. EERI report. Confined Masonry Network, 2010. Available at: http://www.confinedmasonry.org/performance-of-confined-masonry-buildings-in-the-february-27-2010-chile-earthquake [accessed 4 April 2013].

23 Meli R, Brzev S, Astroza M, Boen T, Crisafulli F, Dai J et al for the Confined Masonry Network. Seismic Design Guide for Low-Rise Confined Masonry Buildings. Oakland: Earthquake Engineering Research Institute, 2011. Available at: http://www.confinedmasonry.org/wp-content/uploads/2012/04/ConfinedMasonryDesignGuide2011.pdf [accessed 11 April 2013].

24 Ibid.

25 Arze D, Crisafulli FJ. Seismicity and Design Codes in Chile: Characteristic Features and a Comparison with some of the Provisions of the Romanian Seismic Code. Constructii. 2010; 2:69-76.

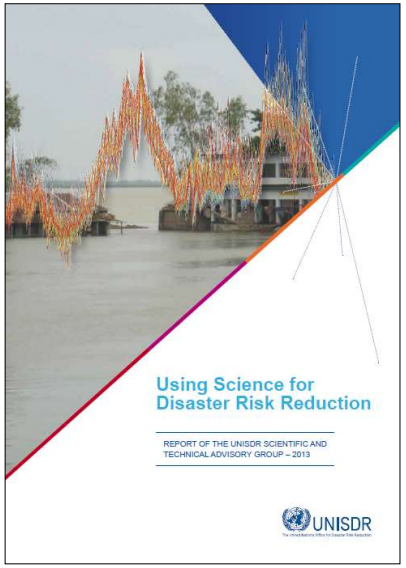
26 Brzev S, Astroza M, Yedlin MO. Performance of confined masonry buildings in the February 27, 2010 Chile earthquake. EERI report. Confined Masonry Network, 2010. Available at: http://www.confinedmasonry.org/performance-of-confined-masonry-buildings-in-the-february-27-2010-chile-earthquake [accessed 4 April 2013].

27 Maqsood ST, Schwetz J. Building vulnerability and damage during the 2008 Baluchistan earthquake in Pakistan and past experiences. Seismological Research Letters. 2010; 81(3):514-525.

28 Maqsood ST, Schwetz J. Comparison of seismic vulnerability of buildings before and after 2005 Kashmir earthquake. Seismological Research Letters. 2010; 81(1):85-96.

RECOMMENDATIONS

1. Encourage science to demonstrate that it can inform policy and practice
2. Use a problem-solving approach to research that integrates all hazards and disciplines
3. Promote knowledge into action
4. Science should be key to the Post-2015 Hyogo Framework for Action



UNISDR


Prof. Takashi Onishi
Science Council, Japan


Chair's Summary
Submit comments by 31 May 2013
globalplatform@un.org
Global Platform
for Disaster Risk Reduction
Fourth Session, Geneva, Switzerland
19-23 May 2013
UNISDR

Global Platform
for Disaster Risk Reduction
Fourth session, Geneva, Switzerland
19-23 May 2013

PEOPLE
RESILIENT
PLANET

It is expected that the HFA2 will recognize the need to govern disaster risk reduction and resilience through clear responsibilities, strong coordination, enabled local action, appropriate financial instruments and a clear recognition of a central role for science.

and science. The session builds on regional platforms for disaster risk reduction convened in Africa, the Americas, Asia-Pacific, Arab States and Europe as well as many consultative and preparatory meetings convened by civil society, national and local governments and Red Cross and Red Crescent national societies.

AfRP '14
ABUJA 13-16 MAY

UN World Conference on
Disaster Risk Reduction
2015 Sendai Japan

Plataforma Regional para la Reducción del Riesgo de Desastres de las Américas

The 6th Asian Ministerial Conference on Disaster Risk Reduction
Bangkok, Kingdom of Thailand 22 – 26 June 2014

مخاطر الكوارث

16 – 14 ايلول / سبتمبر 2014

مخاطر الكوارث

2014

ون وممثلو المنظمات الإقليمية والدولية الحكومية وغير
في مدينة شرم الشيخ، جمهورية مصر العربية خلال
ورية مصر العربية قيادةً ودولةً وشعباً ولمحافظة جنوب

EFDRR
EUROPEAN FORUM
FOR DISASTER RISK REDUCTION
Spanish Chairmanship

5th EUROPEAN FORUM FOR DISASTER RISK REDUCTION

Madrid Outcomes

6-8 October 2014

We, the participants of the European Forum for Disaster Risk Reduction (EFDRR), present at the Madrid Session hosted and Chaired by Spain and Co-Chaired by France;

1. Recognize the importance of the upcoming Third United Nations World Conference on Disaster Risk Reduction (WCDRR) (14-18 March 2015, Sendai, Japan). Acknowledge the European Union Council conclusions of 5 June 2014 on the post 2015 Hyogo framework for action: managing risks to achieve resilience, and the Outcome Document of the European Ministerial Meeting on disaster risk reduction held in Milan, Italy, on 8 July 2014. Contribute

Terminology

TERMINOLOGY ON DRR

UNISDR develop these basic definitions on disaster risk reduction to promote a common understanding on the subject for use by the public, authorities and practitioners.

The terms are based on a broad consideration of different international sources. Feedback from specialists and other practitioners to improve these definitions will be most welcome.

Current members of STAG

UNISDR Margareta Wahlstrom, Pedro Basabe
STAG Chair Dennis Wenger US

- Vice-Chair Virginia Murray, UK
- Delilah Al-Khudhairy, Joint Research Centre, EU
- Walter Amman, GRF, Switzerland
- David Johnston, IRDR, New Zealand
- Laban Ogallo, ICPAC, Kenya
- Takashi Onishi, SCJ, Japan
- Ortwin Renn, Stuttgart University, Germany
- Aromar Revi, India
- Cathy Roth, WHO
- John Schneider, Australia
- Peijun Shi, Beijing Normal University, China

Observers: Brett Schothorst, US; Wang Ming, China; Toshio Koike, Japan; Julie Calkins, UK; Amina Aitsi-Selmi, UK.
;

UNISDR

In summary

- The role of UNISDR Science and Technical Advisory Group has grown over the last years
- Call for case studies continues
- Opportunities exist for greater collaboration and partnership

UNISDR