National Institute of Health Research
Department of Disaster & Emergency Health

Tehran University of Medical Sciences
Department of Disaster Public Health

پژوهش برای تهرانی تاب آور در برابر بلایا

دکتر علی اردلان

رییس آکادمی سلامت در حوادث و بلایا، دانشگاه علوم پزشکی تهران

مشاور معاون وزیر بهداشت و سرپرست دفتر کاهش خطر بلایا، وزارت بهداشت

دانشمند مهمان، دانشکده بهداشت، دانشگاه هاروارد

فلوی ارشد، مرکز اقدامات بشردوستانه، دانشگاه هاروارد

مشاور پاره وقت سازمان جهانی بهداشت

سرفصل مطالب

- تعریف پژوهش و اهداف آن در مدیریت خطر بلایا
- مثال هایی از کاربرد دانش و پژوهش در مدیریت خطر بلایا – سایر نقاط جهان
- مثال هایی از کاربرد دانش و پژوهش در مدیریت خطر بلایا – ج ا ایران
- پژوهش برای تهرانی تاب آور در برابر بلایا – بحث و کارگروهی

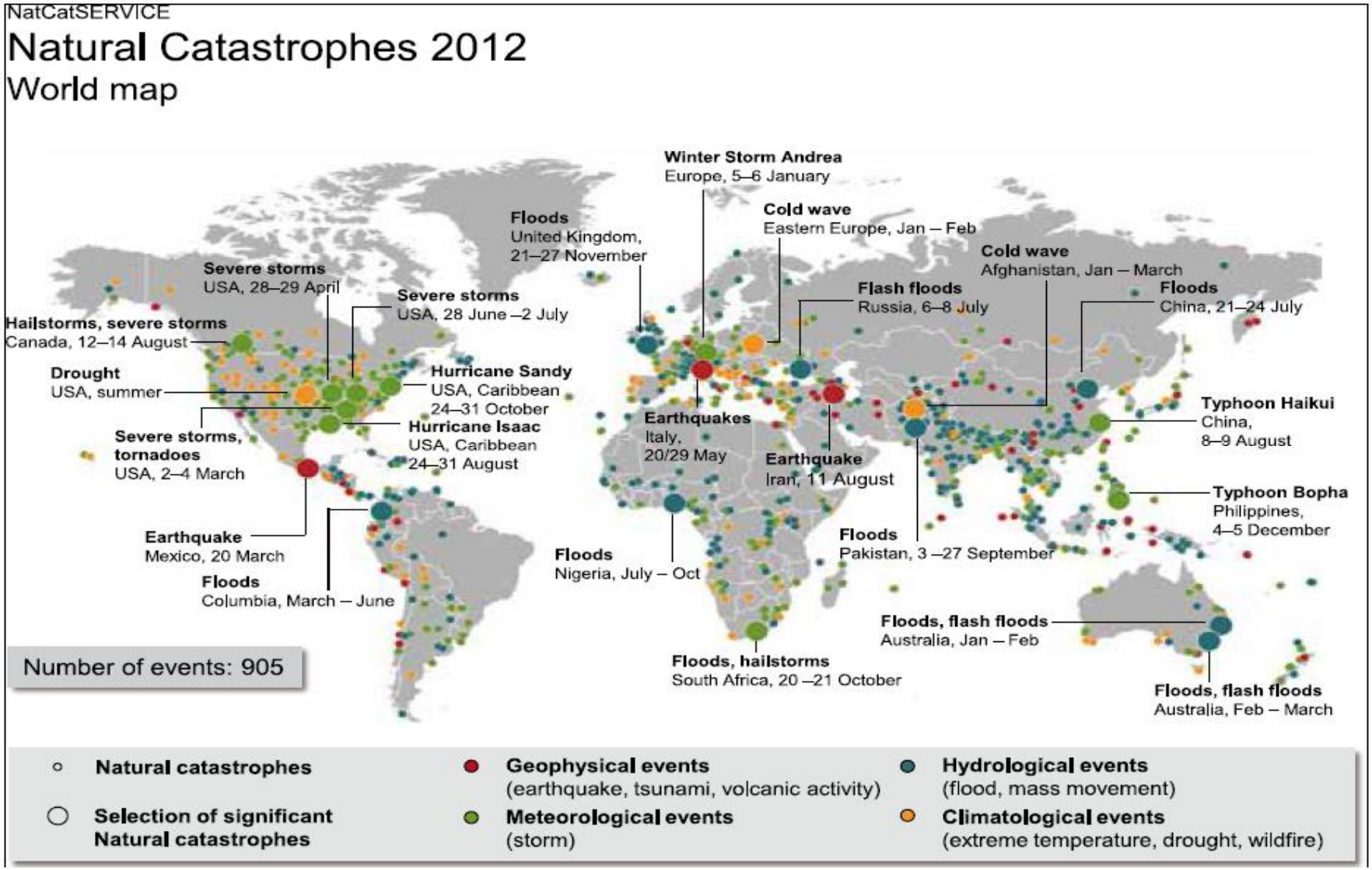


Figure 1: Natural catastrophes 2012 – World map. *Source: Munich Re, 2013*[1]

Research

- RESEARCH is defined as: “studious inquiry or examination; to investigate thoroughly; investigation *or experimentation aimed at* the discovery and interpretation of facts, revisions of accepted theories or laws in the light of new facts, or the practical application of such new or revised theories or laws.”

Reference: Thatcher VS,McQueen A (eds): *The New Webster Dictionary of English Language. Consolidated Book Publishers: Chicago, 1971, p 984.*

Research *vs.* Evaluation

- *To evaluate is a verb and is defined as: "to determine* or fix a value to; to determine the significance or worth of, usually by careful appraisal or study."

- These two terms vary in their purpose:
  - *research* is to discover or change laws and theory
  - *evaluation is to affix value to the* process or outcome

- Evaluation research, therefore, is investigation for the purpose of affixing a value to what is being studied.

TFQCDM/WADEM: *Health Disaster Management: Guidelines for Evaluation and Research in the "Utstein Style". Chapter 2:Methods* used for disaster medical research. *Prehosp Disast Med 2002;17(Suppl 3):* 25–30.

Objectives of Research in Disasters

1. Developing an understanding of the pathophysiology of disasters

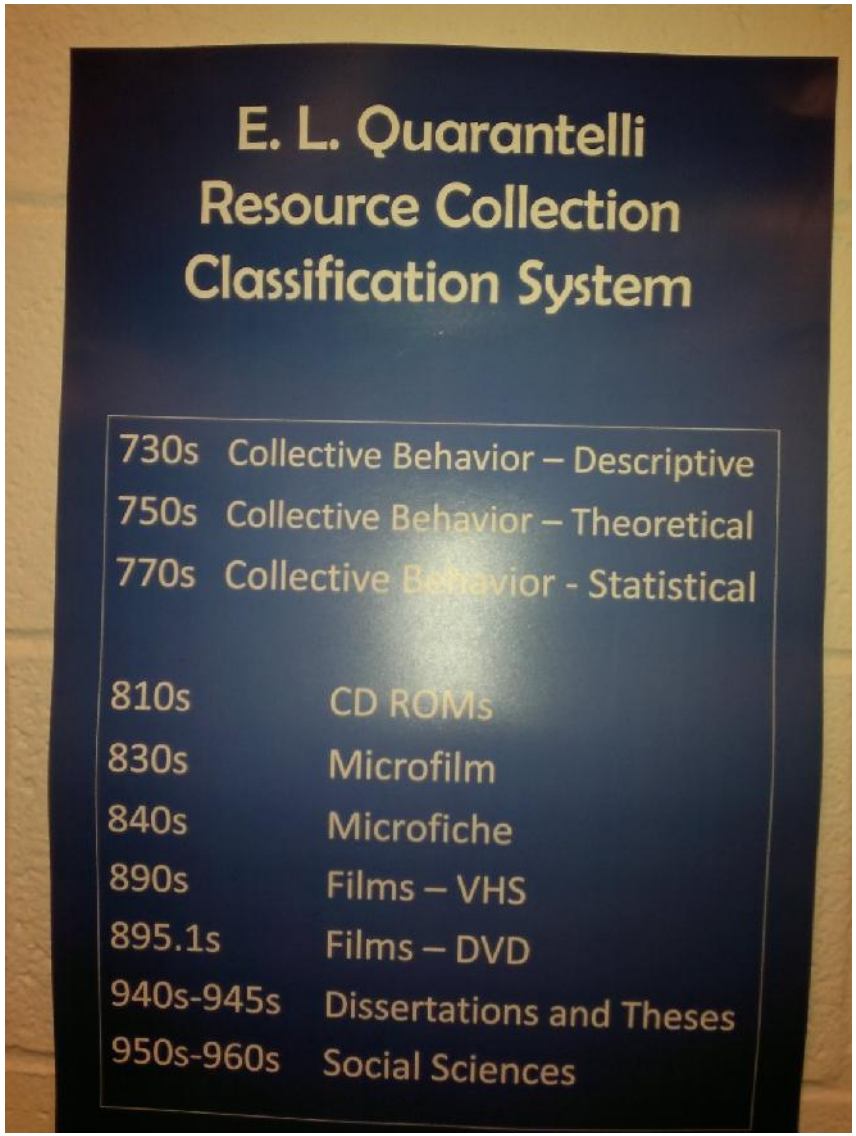
2. Evaluating the effects of specific interventions on the affected population or populations at risk

TFQCDM/WADEM: *Health Disaster Management: Guidelines for Evaluation and Research in the "Utstein Style". Chapter 2:Methods* used for disaster medical research. *Prehosp Disast Med 2002;17(Suppl 3):* 25–30.

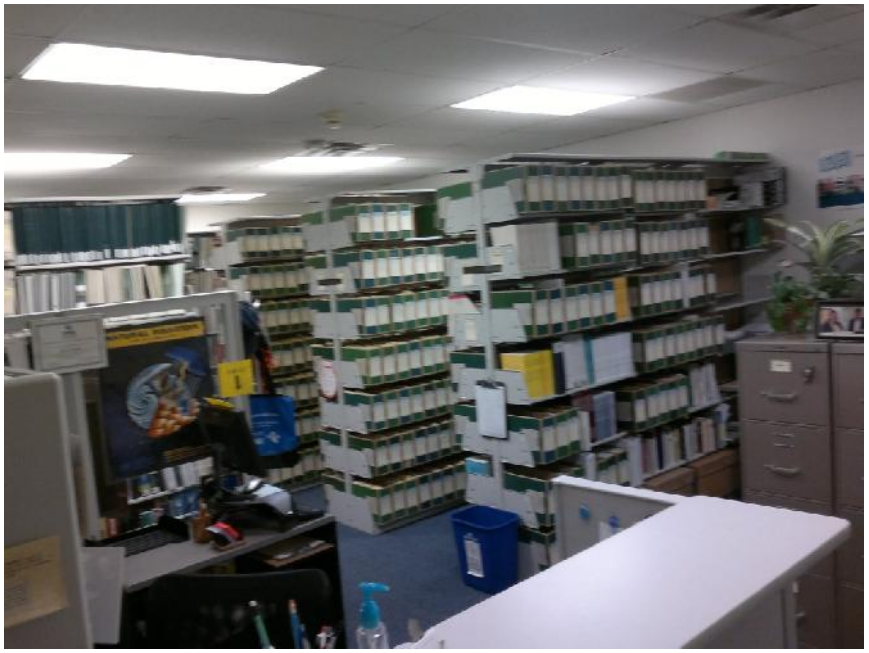
Disaster Research Center (DRC)

- The first social science research center in the world devoted to the study of disasters
- Established at Ohio State University in 1963 and moved to the University of Delaware in 1985
- Faculty members: Sociology and Criminal Justice, Engineering

Source: Wikipedia



Source: Ali Ardalan



Source: Ali Ardalan

Source: Ali Ardalan

Margareta Wahlström:

Special Representative of the Secretary-General for Disaster Risk Reduction

- A resilient planet needs robust science for disaster risk reduction. It is clear from any review of the disaster risk landscape that progress can be made in saving lives, jobs and critical infrastructure by integrating science into both policy making and best practice for disaster management.

Photo: UNISDR

Source: UNISDR. Using Science for Disaster Risk Reduction. Report of the UNISDR Scientific and Technical Advisory Group. 2013.

We look to science and technology to find the answers to these important questions:

- How long-term weather patterns will influence society in a more profound way and how we should respond?

- As rainfall intensifies and sea levels rise, how and when should vulnerable populations be re-located permanently out of harm's way?

- As rainfall diminishes, how much investment should there be in research and development into drought-resistant crop production?

Photo: UNISDR

Source: UNISDR. Using Science for Disaster Risk Reduction. Report of the UNISDR Scientific and Technical Advisory Group. 2013.

Application of Scientific Research to DRR

- Science can:
  1. be driven by the need to address the adverse effects of disasters on lives,
  2. livelihoods, economies and societies
  3. enable more focused disaster risk assessment
  4. reduce the impact of disasters by better forecasting
  5. improve disaster risk mitigation programmes

- As a result of scientific research, there are now programmes to forecast floods, detect tsunami waves, prevent infectious disease outbreaks with vaccination and effectively communicate disaster risk to enhance community resilience.

Source: UNISDR. Using Science for Disaster Risk Reduction. Report of the UNISDR Scientific and Technical Advisory Group. 2013.

Application of Scientific Research to DRR

- Science is knowledge obtained through study or practice

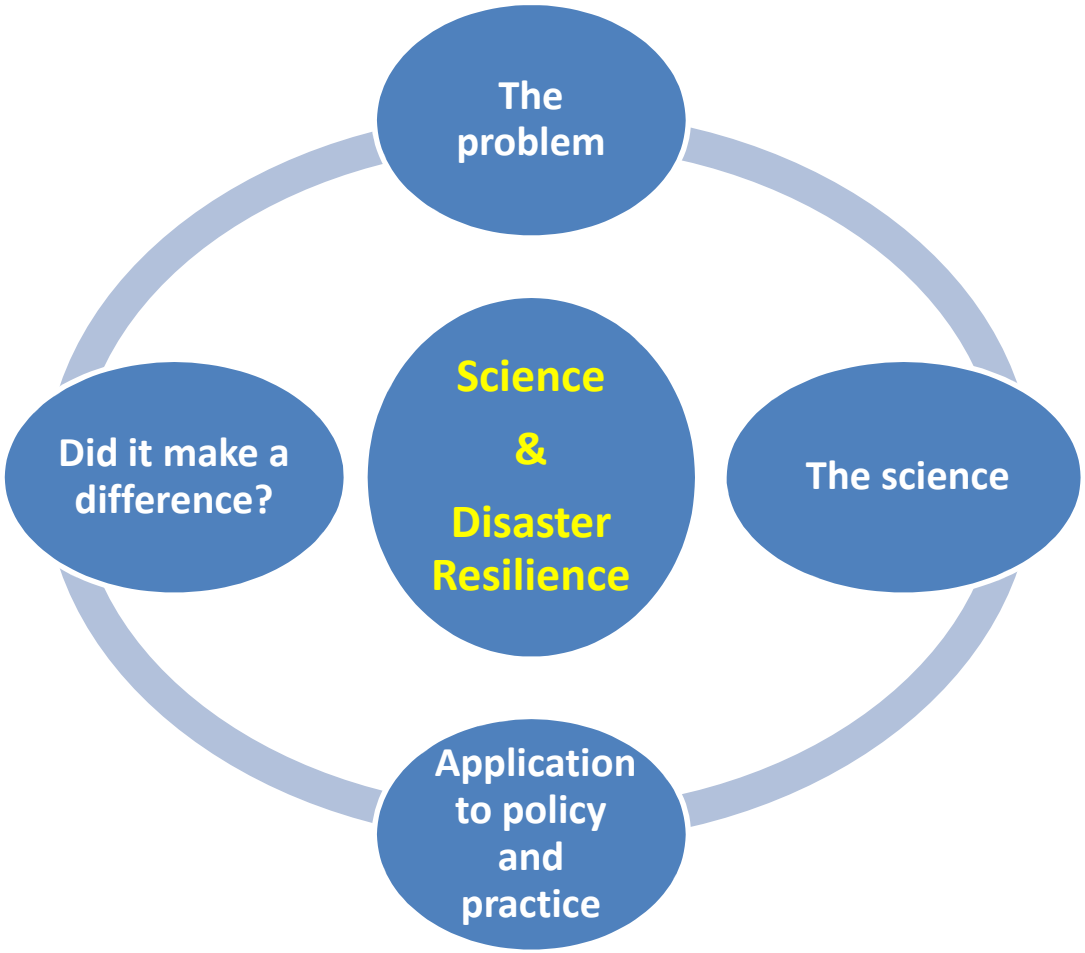
- For disaster risk reduction, science is considered in its widest sense to include these disciplines:
  - natural
  - environmental
  - social
  - economic
  - health
  - engineering

Source: UNISDR. Using Science for Disaster Risk Reduction. Report of the UNISDR Scientific and Technical Advisory Group. 2013.

Application of Scientific Research to DRR

- Widespread integration of science into disaster risk reduction policymaking will depend on science being:
  1. Useful
  2. Useable
  3. Used

Source: UNISDR. Using Science for Disaster Risk Reduction. Report of the UNISDR Scientific and Technical Advisory Group. 2013.


The problem
Science & Disaster Resilience
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Did it make a difference?

Tsunami Warning and Mitigation for the Indian Ocean Region

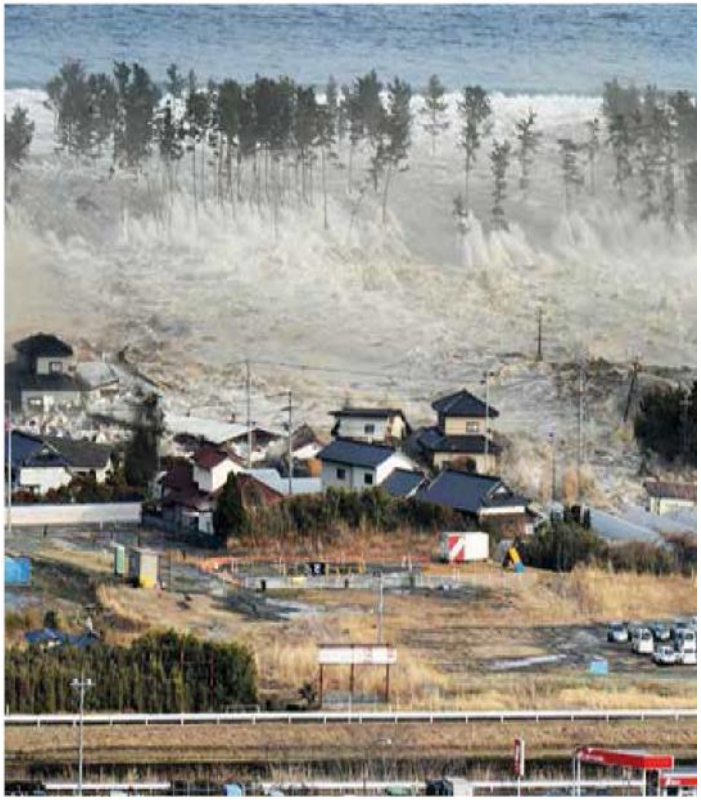


Image 1: The 11th March 2011 Tohoku tsunami striking the eastern coast of Japan.
Source: Newscom/Kyodo/WENN.com.

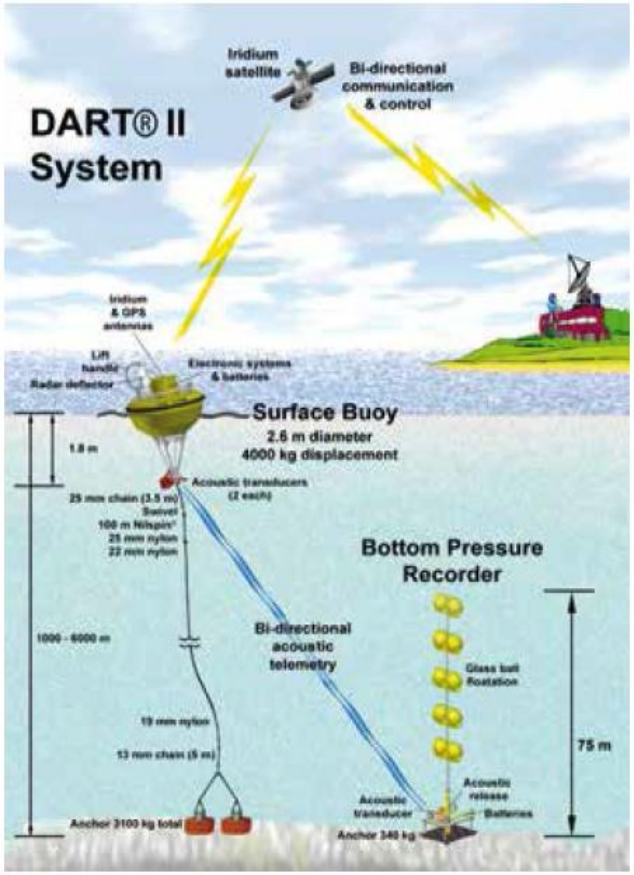


Figure 1: Overview of the DART II System for tsunami detection.
Source: National Oceanic and Atmospheric Administration[17].

Source: UNISDR. Using Science for Disaster Risk Reduction. Report of the UNISDR Scientific and Technical Advisory Group. 2013.

Assessing Vulnerability to Improve Risk Reduction

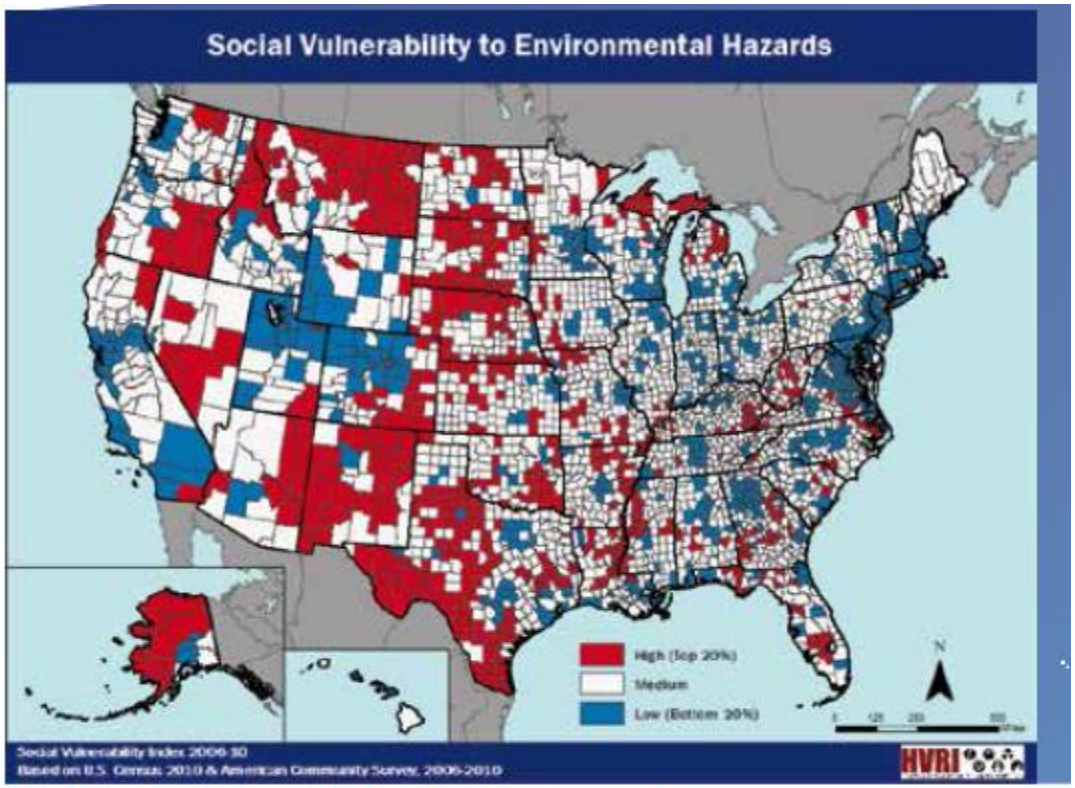


Figure 1: Social Vulnerability Index for the United States, 2006-2010.
Source: Hazards and Vulnerability Research Institute[6].

Source: UNISDR. Using Science for Disaster Risk Reduction. Report of the UNISDR Scientific and Technical Advisory Group. 2013.

Flood Early Warning in Bangladesh

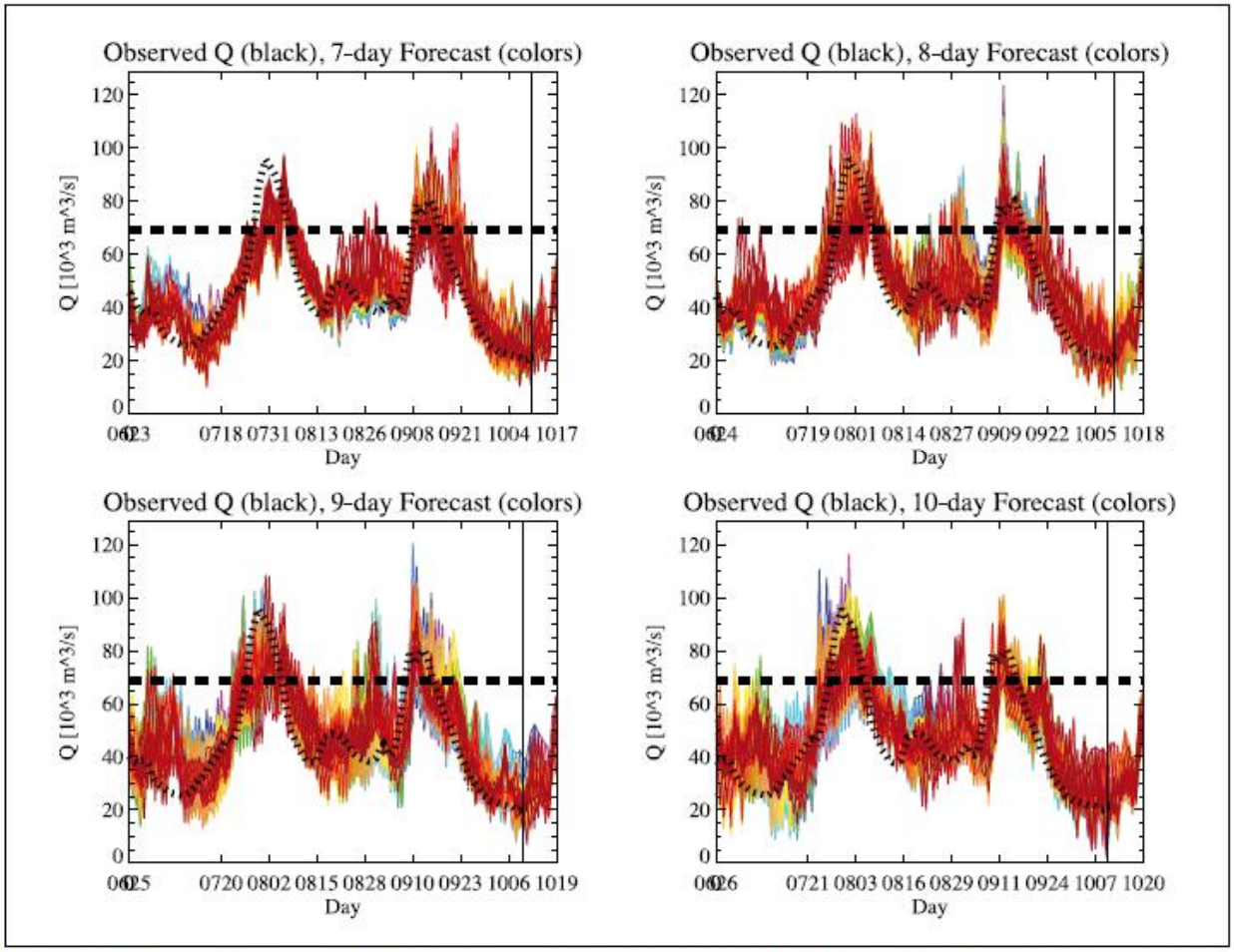
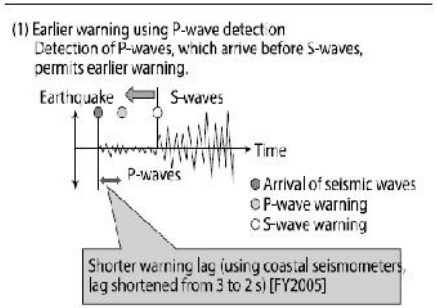


Figure 1: Graphs comparing the CFAN-RIMES model forecasts with observed river flow for the Brahmaputra in 2007. The wide, coloured band represents the output of each of the model's predictions. The thin dotted black line indicates the observed values of river discharge. The closeness of the coloured and black lines shows that the model is reliable in predicting flooding. *Source: RIMES* [8].

Source: UNISDR. Using Science for Disaster Risk Reduction. Report of the UNISDR Scientific and Technical Advisory Group. 2013.

An Earthquake Early Warning for Japanese Bullet Trains

Image 1: A derailed Shinkansen bullet train, Niigata Prefecture, Japan, 2004. *Source: Japanese Transportation Safety Committee.*



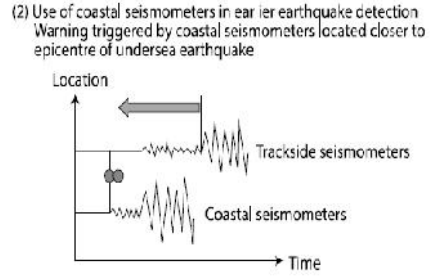


Figure 1: Diagrams showing the additional seconds of warning time given by improved detection of P-waves and use of coastal seismometers. *Source: Ogura, 2006*[9].

Source: UNISDR. Using Science for Disaster Risk Reduction. Report of the UNISDR Scientific and Technical Advisory Group. 2013.

Flood Risk Reduction in the Netherlands: The "Room for the River" project

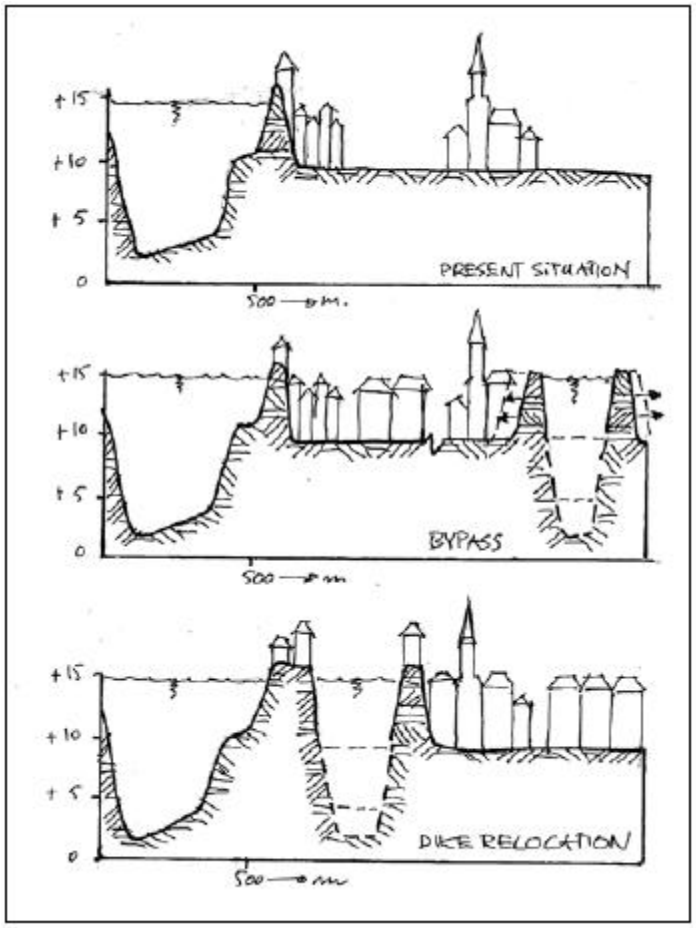


Figure 1: Options for increasing river flow at Nijmegen. The top

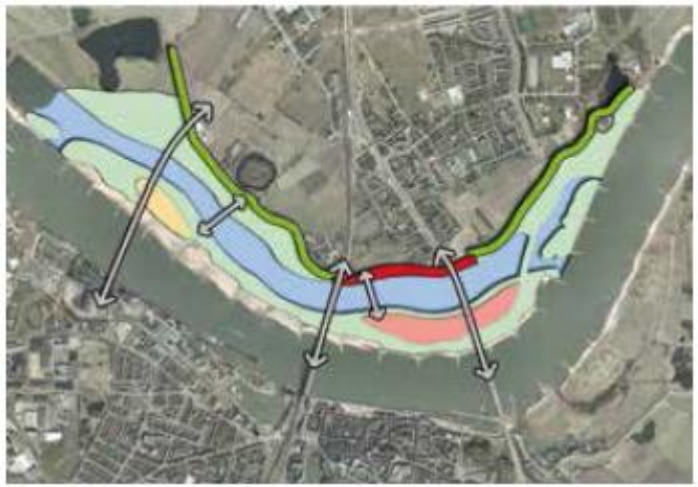


Figure 2: The 'Room for the River' plan at Nijmegen. The green

Source: UNISDR. Using Science for Disaster Risk Reduction. Report of the UNISDR Scientific and Technical Advisory Group. 2013.

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

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

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

Source: UNISDR. Using Science for Disaster Risk Reduction. Report of the UNISDR Scientific and Technical Advisory Group. 2013.

An Atlas of Hazards and Disaster Risks to Support Disaster Risk Reduction in China

Image 1: Covers of the three Atlases of natural disaster risk in China. *Source: The People's Insurance Company of China, 19923, Shi, 20034 and Shi, 2011*[1].

Source: UNISDR. Using Science for Disaster Risk Reduction. Report of the UNISDR Scientific and Technical Advisory Group. 2013.

Mathematical Models for Cambodia to Reduce the Risk of H5N1 Flu Outbreaks in Poultry

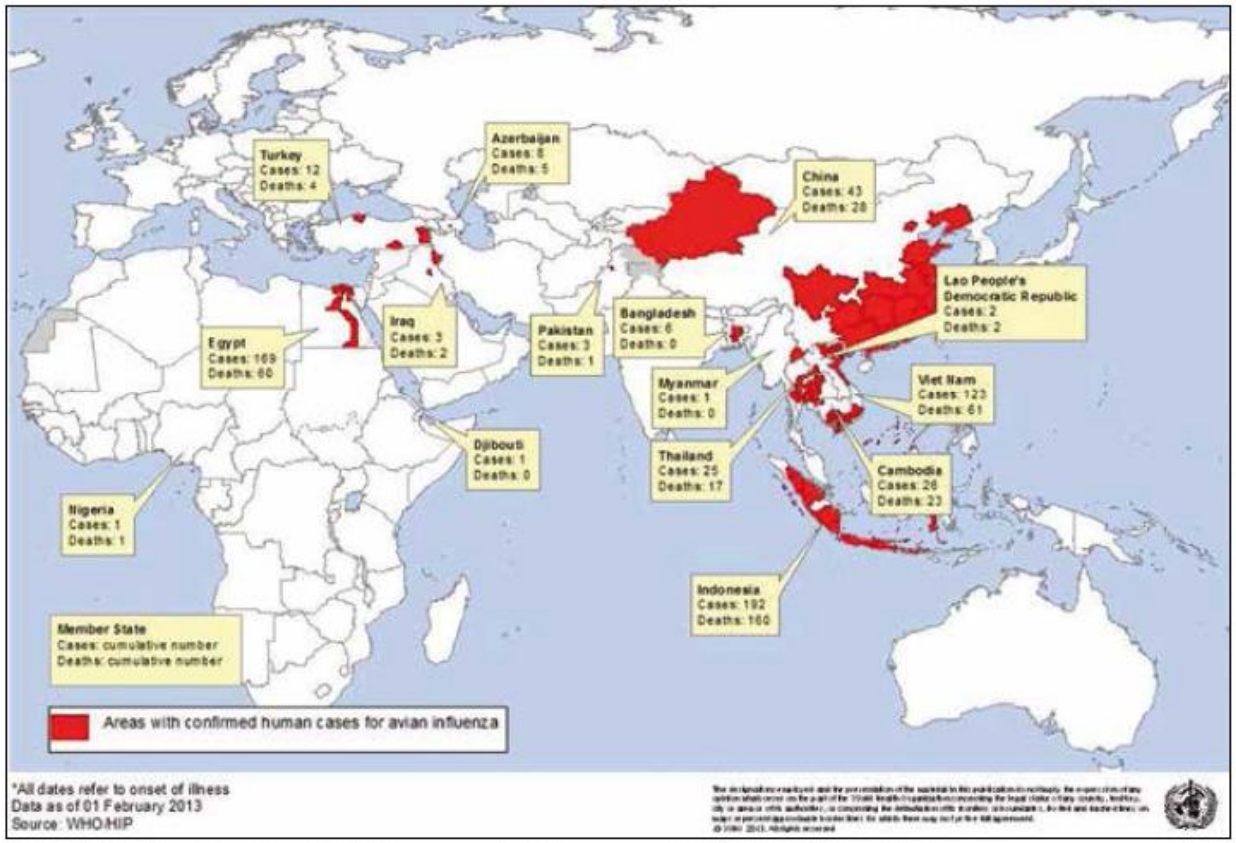


Figure 1: Countries with confirmed H5N1 influenza reported in human populations between 2003 and 2013.
Source: World Health Organization, 2013[10].

Source: UNISDR. Using Science for Disaster Risk Reduction. Report of the UNISDR Scientific and Technical Advisory Group. 2013.

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 Yadlin, 2010*[1].

Source: UNISDR. Using Science for Disaster Risk Reduction. Report of the UNISDR Scientific and Technical Advisory Group. 2013.

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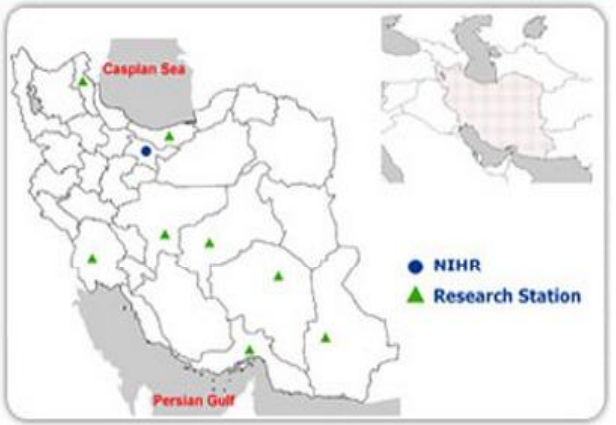

About Us

Mission statement

Disaster & Emergency Health (DEH) Academy is established to enhance Iran's health system capacity in terms of qualified human resources and evidence-based decision making in emergencies and disasters' mitigation, preparedness, response and recovery.

Background

Established in 2006, DEH Academy has been shaped based on a collaboration between

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Tuesday, 15 October 2013
National Conference on Disability & Disasters, 15 Oct 2013 [more...]

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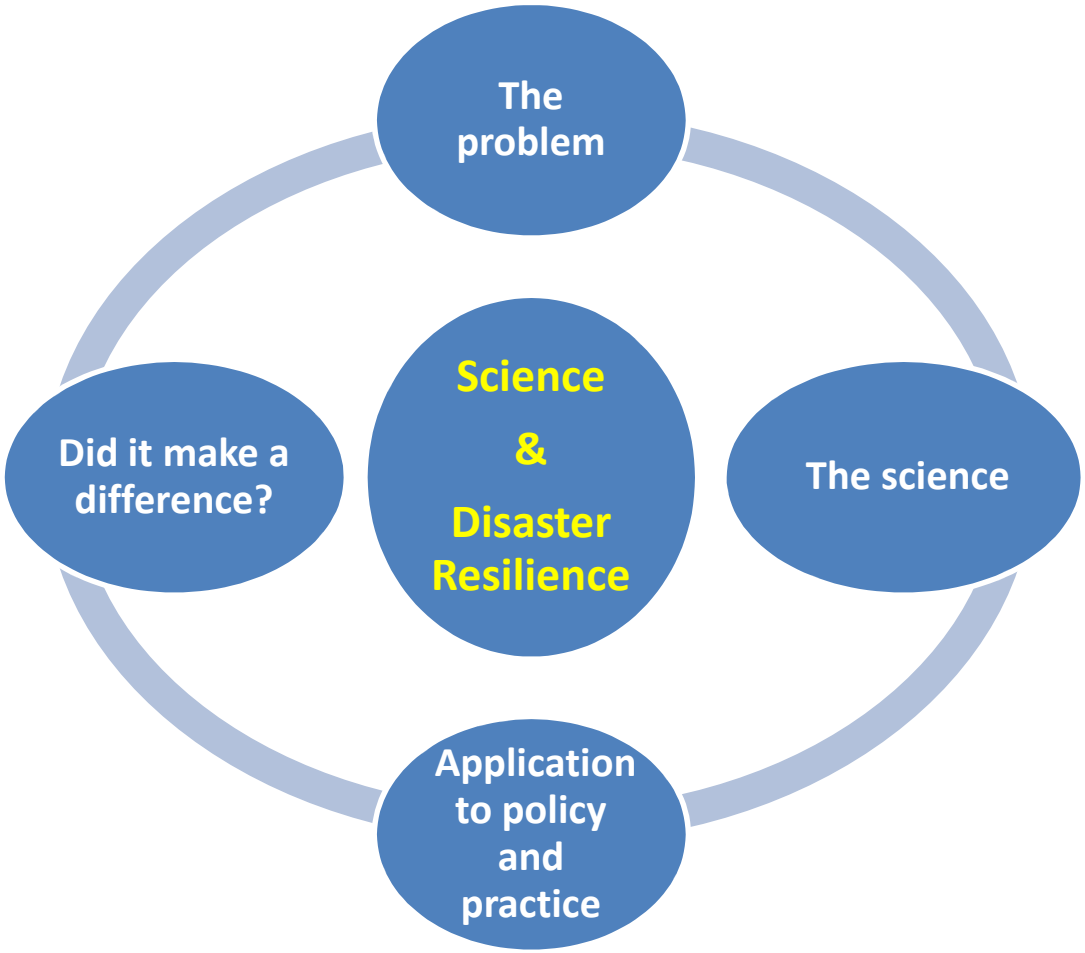

The problem
Science & Disaster Resilience
The science
Application to policy and practice
Did it make a difference?

Evidence-Based Integration of Disaster Risk Management to Primary Health Care, the Case of I.R.Iran

Source: Ali Ardalan. Submitted to UNISDR Scientific and Technical Advisory Group.

The Problem

- Disaster is a public health concern in I.R.Iran affecting both health system and health of population.
- Iran has a well-established network of primary health care (PHC) including over 24,000 centers that spans both urban and rural areas.
- While this network has been always the key node for delivery of public health services in disasters, it did not have an integrated program for disaster risk management (DRM).
- In addition, it lacked the component of community DRM.

Source: Ali Ardalan. Submitted to UNISDR Scientific and Technical Advisory Group.

The Science

A *baseline assessment* revealed while the PHC has been always in frontline of response to disasters, it lacks:

1. integrated program for DRM
2. metrics system to monitor and evaluate DRM activities
3. component of community DRM.

Source: Ali Ardalan. Submitted to UNISDR Scientific and Technical Advisory Group.

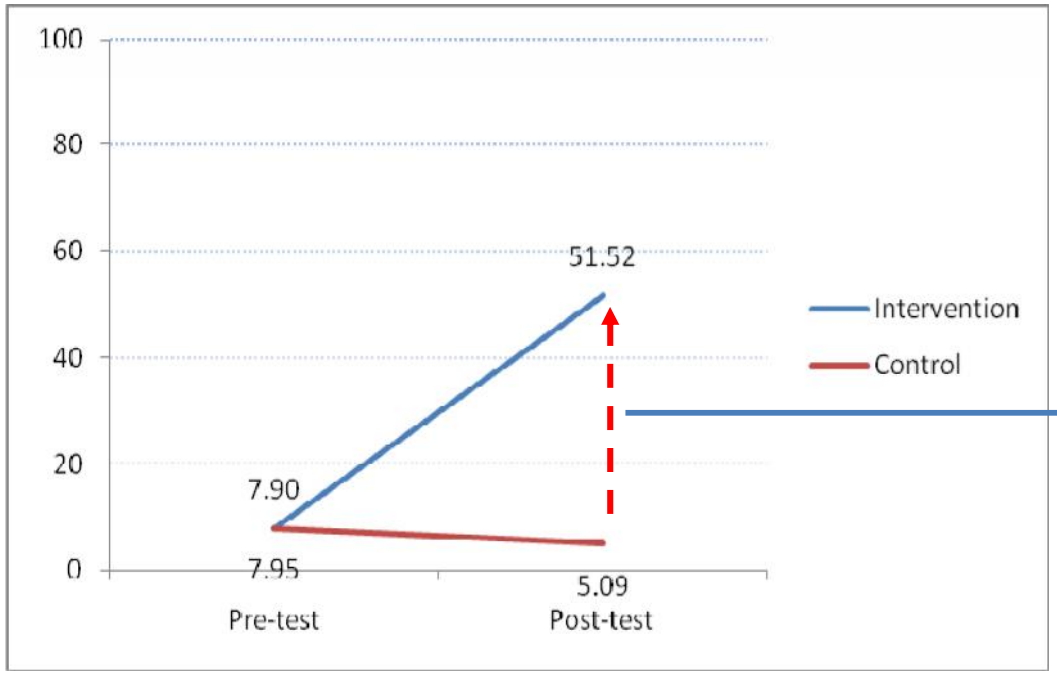
The Science

- A *retrospective survey* showed increasing impacts of natural hazards on physical components and functions of PHC, especially due to climatic hazards
- The *third* study on 2,715 facilities, estimated the overall resilience of PHC 22%
- The *forth* study demonstrated that disaster preparedness among Iranian households is only 8.5%
- The *fifth* interventional research showed PHC system could enhance disaster preparedness of households to seven times of the baseline status over one year.

Source: Ali Ardalan. Submitted to UNISDR Scientific and Technical Advisory Group.

سنجش اثربخشی برنامه های آموزشی آمادگی خانوارها برای بلایا

- تدوین شاخص
- تدوین ابزار
- مقدار شاخص (سال ۹۲): ٪۸



Change indicator:
Percent change

Source: Ali Ardalan. Submitted to UNISDR Scientific and Technical Advisory Group.

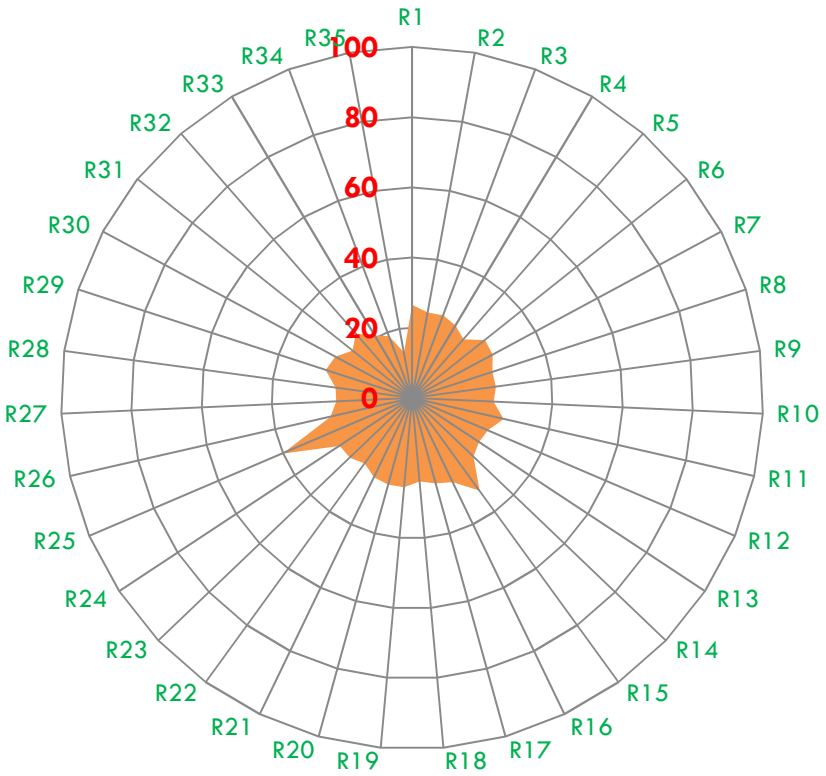
سنجش ایمنی واحدهای بهداشتی برای بلایا
نمونه ۳۰۰۰ واحد بهداشتی کشور

Component	Score
Functional capacity	21
Nonstructural safety	31
Structural safety	14
Safety score	22
Safety class	3

	Safety class	Safety score (minimum)	Safety score (maximum)
	10	91	100
	9	81	90
	8	71	80
	7	61	70
	6	51	60
	5	41	50
	4	31	40
√	3	21	30
	2	11	20
	1	0	10

Source: Ali Ardalan. Submitted to UNISDR Scientific and Technical Advisory Group.

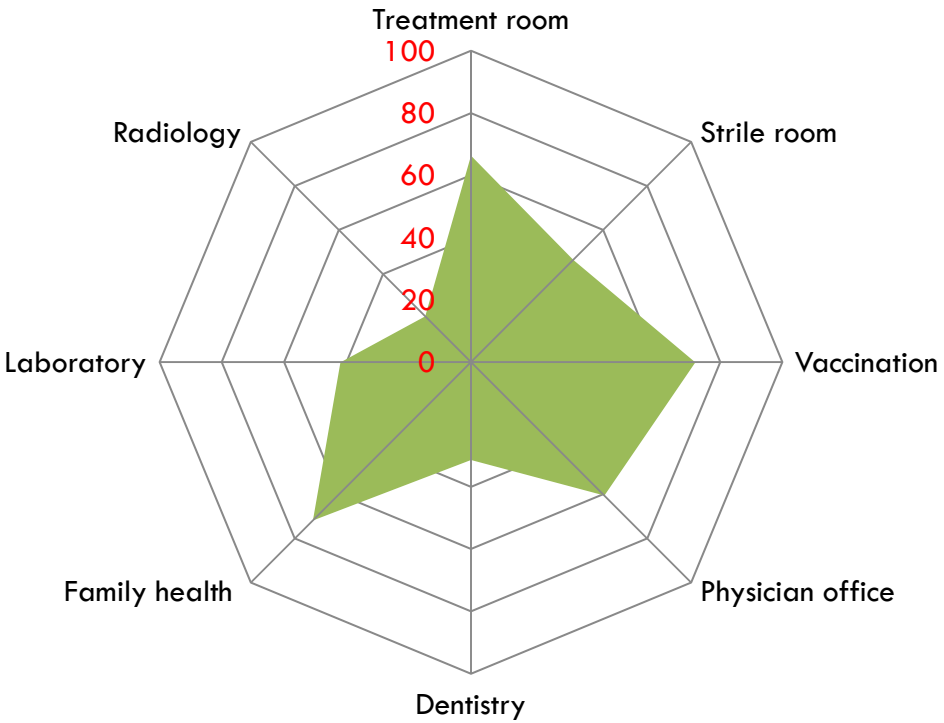
آمادگی عملکردی واحدهای بهداشتی کشور



R1: Structure of disaster mgmt. , **R2:** Emergency plan, **R3:** HVA, **R4:** Mitigation measures, **R5:** Insurance coverage, **R6:** Coordination, **R7:** Command, **R8:** Communication and EWS, **R9:** Evacuation, **R10:** Rapid assessment, **R11:** Supply of technical items, **R12:** Supply of PPEs, **R13:** Food and water supply, **R14:** Psychosocial support from staff, **R15:** Continuity of service delivery, **R16:** Transportation, **R17:** Donation and volunteers mgmt., **R18:** Finance, **R19:** Information safety, **R20:** Safety of water, electricity & gas, **R21:** VIP mgmt., **R22:** Security, **R23:** Public awareness, **R24:** Rapid response team, **R25:** Fire extinguishing, **R26:** Rehabilitation process, **R27:** Exercise, **R28:** Training, **R29:** Environmental health, **R30:** Communicable diseases, **R31:** NCDs, **R32:** Reproductive health, **R33:** Nutrition, **R34:** Psychosocial support, **R35:** Emergency medical care

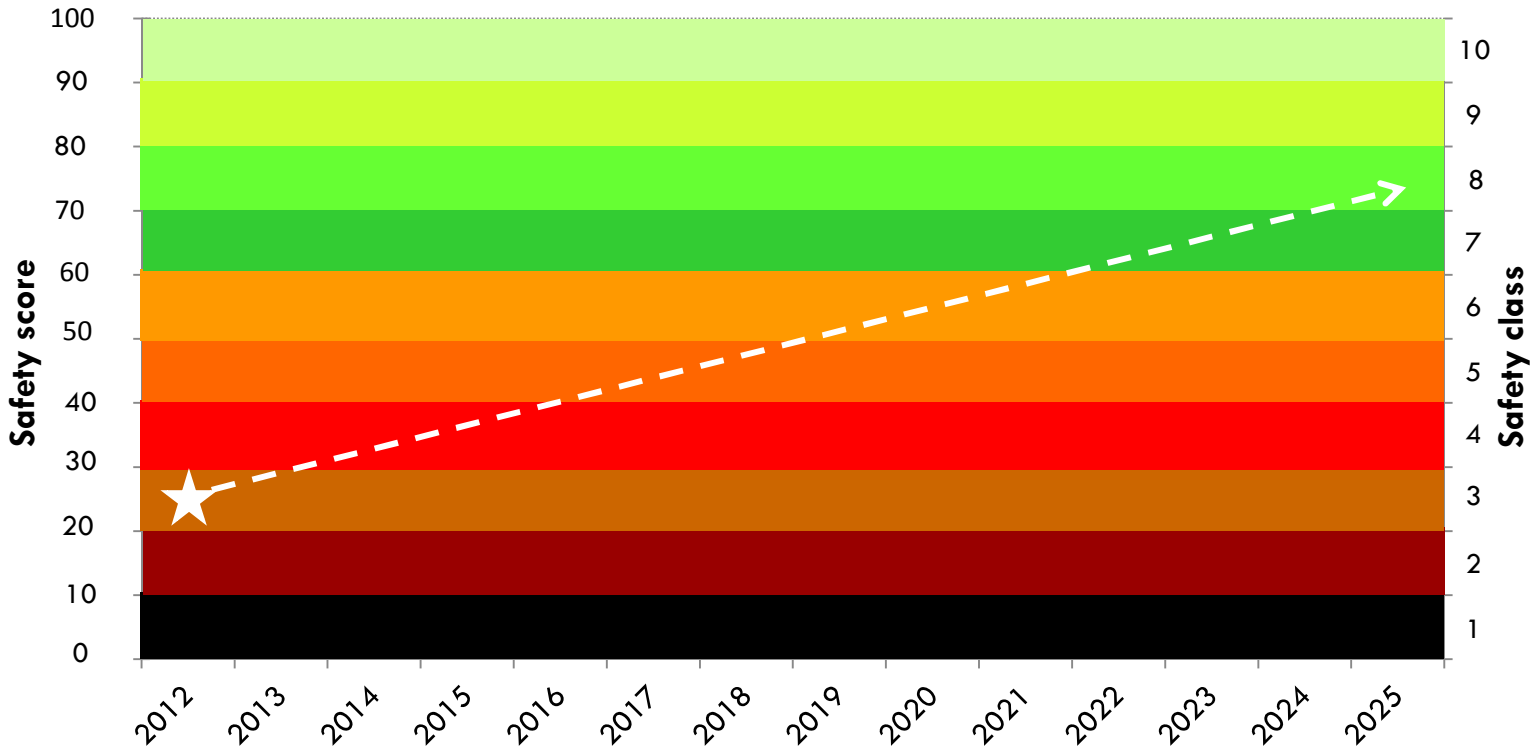
Source: Ali Ardalan, Submitted to UNISDR Scientific and Technical Advisory Group.

ایمنی غیرسازه ای واحدهای بهداشتی کشور



Source: Ali Ardalan. Submitted to UNISDR Scientific and Technical Advisory Group.

تغییر مورد انتظار شاخص ایمنی واحدهای بهداشتی برای بلایا



Source: Ali Ardalan. Submitted to UNISDR Scientific and Technical Advisory Group.

The application to policy and practice

- In late 2012, MOHME started to pilot integration of DRM to PHC in 10 provinces including:
  1. hazard vulnerability assessment (HVA) of PHC centers
  2. surveillance of disasters' occurrence and impacts on PHC facilities and services
  3. development and testing emergency operations plan (EOP)
  4. training of households for disaster preparedness.

- A DRM metrics also was produced and integrated to national Health Information System (HIS).

Source: Ali Ardalan. Submitted to UNISDR Scientific and Technical Advisory Group.

Did it make a difference?

- Impact of the baseline researches and results from the pilot program has been significant.

- They not only have raised awareness of policy makers but also could enhance the capacity of Iranian PHC for a consolidated and proactive approach to DRM targeting both PHC facilities and services, and population.

- Today, DRR is an accepted concept in Iranian PHC.

Source: Ali Ardalan. Submitted to UNISDR Scientific and Technical Advisory Group.

Did it make a difference?

As of September 2014:

- over 50% of health facilities have conducted HVA
- a disaster surveillance system is expanded from national to district level
- national and provincial EOPs have been developed and tested
- coverage of disaster insurance in PHC facilities has been increased from 3 to 17%
- EOP has helped health system with a consolidated response to recent disasters
- over 100,000 households are trained for disaster preparedness

Source: Ali Ardalan. Submitted to UNISDR Scientific and Technical Advisory Group.

Did it make a difference?

- Because of DRM indicators, the Iranian health policy makers now are able to measure effectiveness of DRM interventions over time at the national, provincial, district, and local levels.

- Our evidence-based integration process also provided a training model for next generation of health and DRM scientists and administrators.

Source: Ali Ardalan. Submitted to UNISDR Scientific and Technical Advisory Group.

شایعترین نوع پژوهش های منتشر شده

After-action reports:

- anecdotal descriptions with little or no structure.
- generated by response organizations
- biased and self-serving
- little scientific and practical values

TFQCDM/WADEM: *Health Disaster Management: Guidelines for Evaluation and Research in the "Utstein Style". Chapter 2:Methods* used for disaster medical research. *Prehosp Disast Med 2002;17(Suppl 3):* 25–30.

مطالعات توصیفی

Objective:

- to enhance our overall knowledge about the consequences of disasters and interventions that seem to have made a difference in the outcome
  - usually have *assumed* a link between the responses or interventions and some or all of the outcomes

Applications:

- to describe the adverse effects of a disaster on the (healthcare) system and the kinds of services that were available or provided to the population affected
  - serve to shape our perceptions/intervention of the medical needs associated with particular sudden, gradual, or slow-onset events.

TFQCDM/WADEM: *Health Disaster Management: Guidelines for Evaluation and Research in the "Utstein Style". Chapter 2:Methods* used for disaster medical research. *Prehosp Disast Med 2002;17(Suppl 3):* 25–30.

مطالعات تحلیلی

- To investigate risk factors for injury and death.
- limited in terms of its scope and cannot be used readily as a tool for judging or evaluating the effectiveness and adequacy of health services provided during disaster medical response.
- Nevertheless, disaster epidemiological techniques are very useful to answer specific research questions as part of the overall design of an evaluative study.

TFQCDM/WADEM: *Health Disaster Management: Guidelines for Evaluation and Research in the "Utstein Style". Chapter 2:Methods* used for disaster medical research. *Prehosp Disast Med 2002;17(Suppl 3):* 25–30.

مطالعات مداخله ای

- Clinical trial
- Field trial
- Community intervention trail
- Quasi-experimental

مطالعات کمی / مطالعات کیفی

- مطالعات کمی: برای متغیرهایی که قابلیت اندازه گیری عددی دارند

- مطالعات کیفی: برای متغیرهایی که قابلیت اندازه گیری عددی ندارند، ساخت تئوری، شناخت یک جامعه یا پدیده جدید، اعتبارسنجی مطالعات کمی

مطالعات ترکیبی

- استفاده از چند روش برای پاسخ به یک سوال یا فرضیه
- تری انگولیشن

بحث و کارگروهی
پژوهش در چرخه مدیریت بحران شهر تهران

برای ایجاد تهرانی تاب آور در برابر بلایا، در هر یک فازهای مدیریت خطر بلایا:

1. سوالات یا فرضیاتی که نیاز داریم تا پاسخ آنها را بدانیم یا آزمون کنیم را فهرست کنید.

2. برای هر یک از موارد فوق، یک متد پژوهشی پیشنهاد کنید.

3. در اجرای این متد با چه محدودیت هایی مواجه خواهید بود؟

4. راه حل های پیشنهادی شما برای مواجهه با این محدودیت ها کدامند؟

بحث و کارگروهی
پژوهش در چرخه مدیریت بحران شهر تهران
فاز پیشگیری و کاهش آسیب

سوال / فرضیه	متد پژوهش	محدودیت ها	راهبردهای رفع محدودیت

بحث و کارگروهی
پژوهش در چرخه مدیریت بحران شهر تهران
فاز آمادگی

سوال / فرضیه	متد پژوهش	محدودیت ها	راهبردهای رفع محدودیت

بحث و کارگروهی
پژوهش در چرخه مدیریت بحران شهر تهران
فاز پاسخ

سوال / فرضیه	متد پژوهش	محدودیت ها	راهبردهای رفع محدودیت

بحث و کارگروهی
پژوهش در چرخه مدیریت بحران شهر تهران
فاز بازیابی

سوال / فرضیه	متد پژوهش	محدودیت ها	راهبردهای رفع محدودیت

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