

Policy Making and Natural Hazards: Vulnerability and Health

Evidence from around the World and Chile

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August 1, 2018

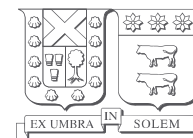
**APEC WORKSHOP: STI CONTRIBUTION TO POLICY MAKING
NATURAL DISASTER RESILIENCE**



PRESENTATION

- Disasters and health
 - The big numbers
 - Other numbers and different stories
- Public health actions for disaster risk reduction (DRR) and resiliency
- One example from Chile

DISASTERS AND HEALTH



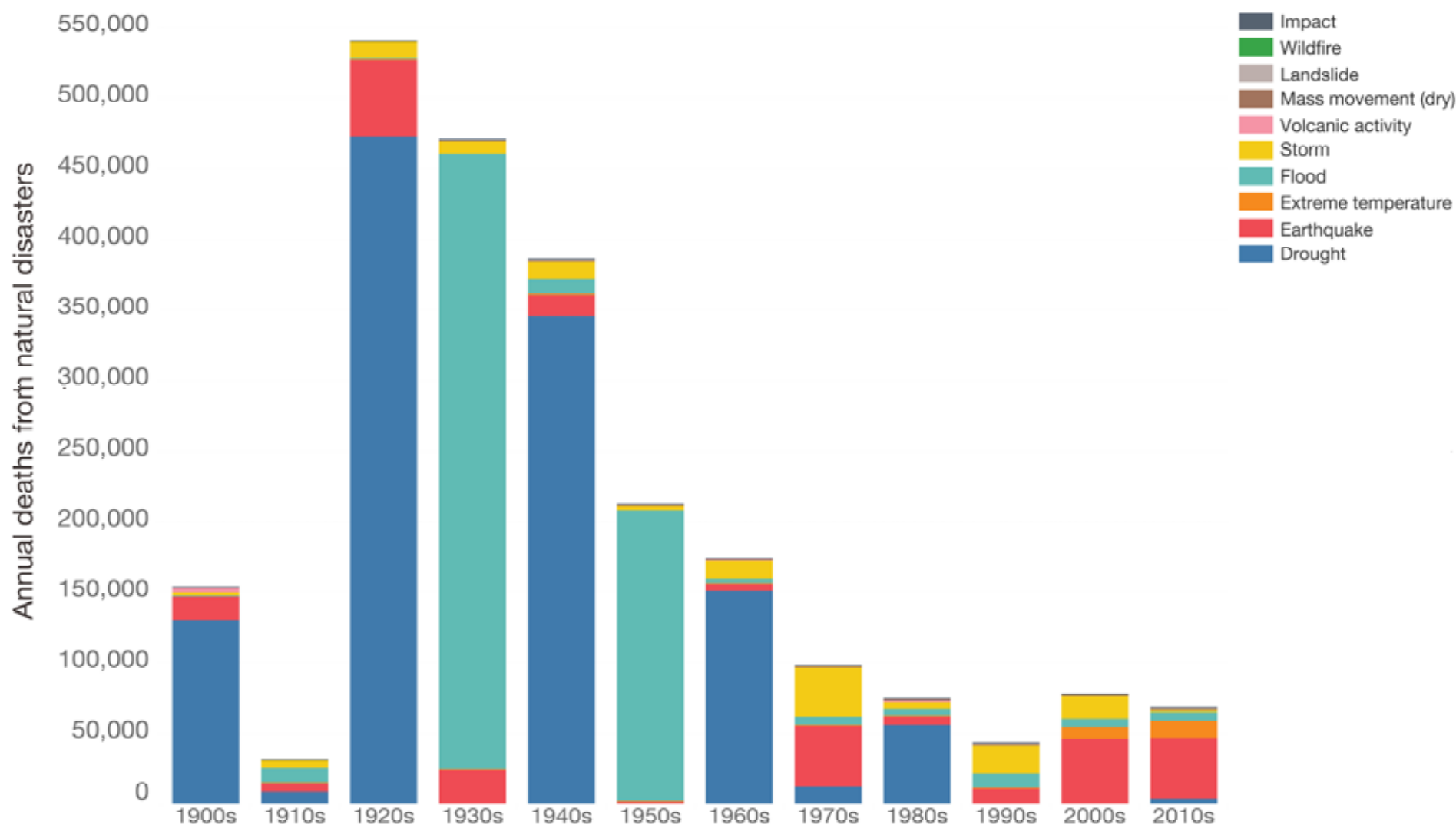
THE BIG NUMBERS

- 1994 to 2013, EM-DAT recorded 6,873 disasters worldwide.
- 218 million people were affected and claimed 1.35 million lives (around 68,000 lives each year)
- Between 2005 and 2015, more than 700 thousand people lost their lives and over 1.4 million were injured (Sendai Framework)
- In 2016 (EM-DAT), there were 342 disasters recorded, 564 million affected and 8,733 deaths.

Global annual deaths from natural disasters, by decade

Absolute number of global deaths from natural disasters, per year.

This is given as the annual average per decade (by decade 1900s to 2000s; and then six years from 2010-2015).

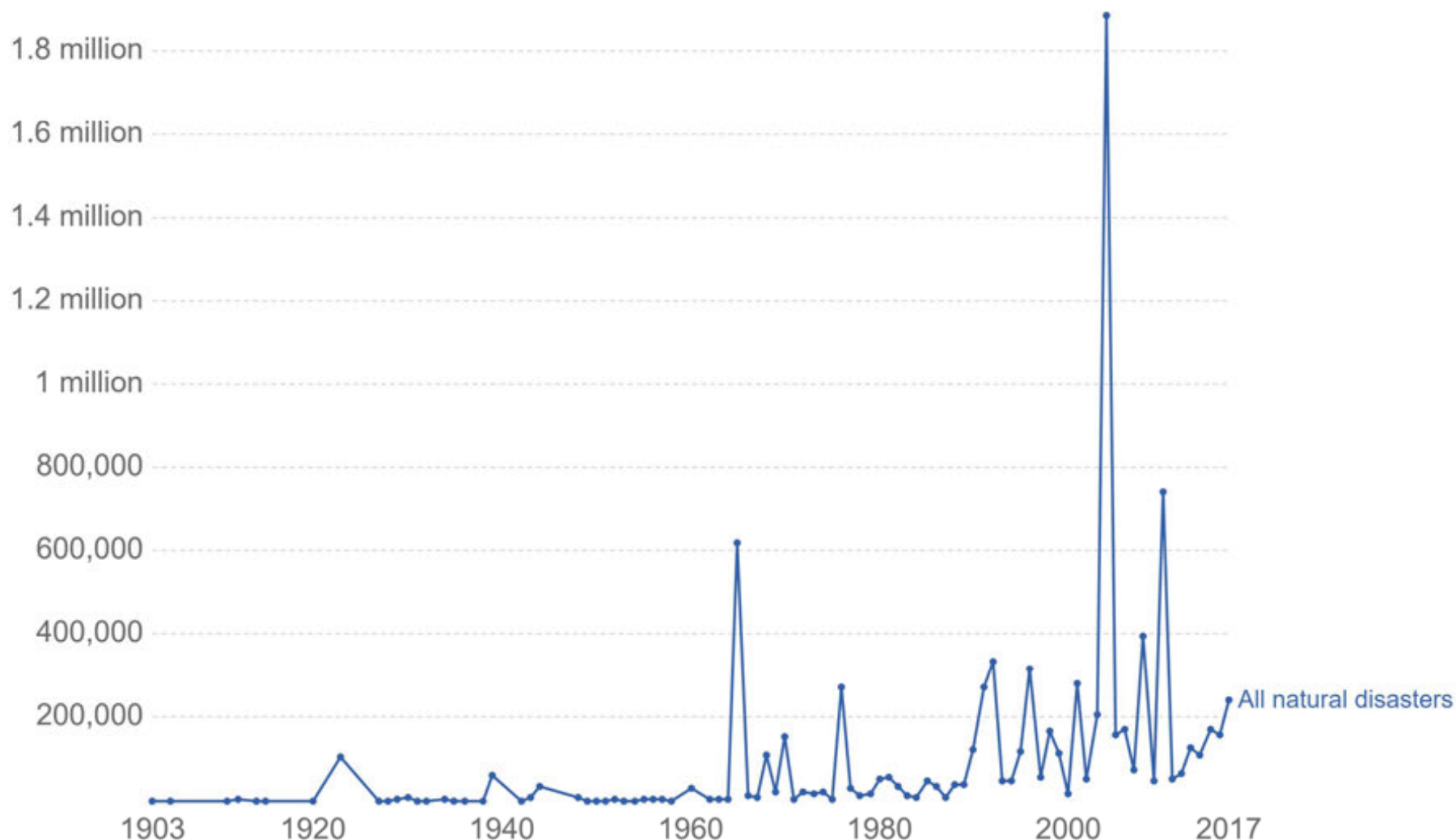


Source: EMDAT (2017): OFDA/CRED International Disaster Database, Université catholique de Louvain – Brussels – Belgium.
The data visualization is available at [OurWorldinData.org](https://ourworldindata.org). There you find research and more visualizations on this topic.

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Number injured from natural disasters, All natural disasters

Global number of people injured from natural disaster events. This is defined as "people suffering from physical injuries, trauma or an illness requiring immediate medical assistance as a direct result of a disaster."



Source: EMDAT (2017): OFDA/CRED International Disaster Database, Université catholique de Louvain – Brussels – Belgium
OurWorldInData.org/natural-catastrophes/ • CC BY-SA



del Riesgo de Desastres



Gobierno de Chile



CHILE



EX UMBRA IN SOLEM

Other numbers and different stories

DO THESE NUMBERS TELL THE COMPLETE STORY?



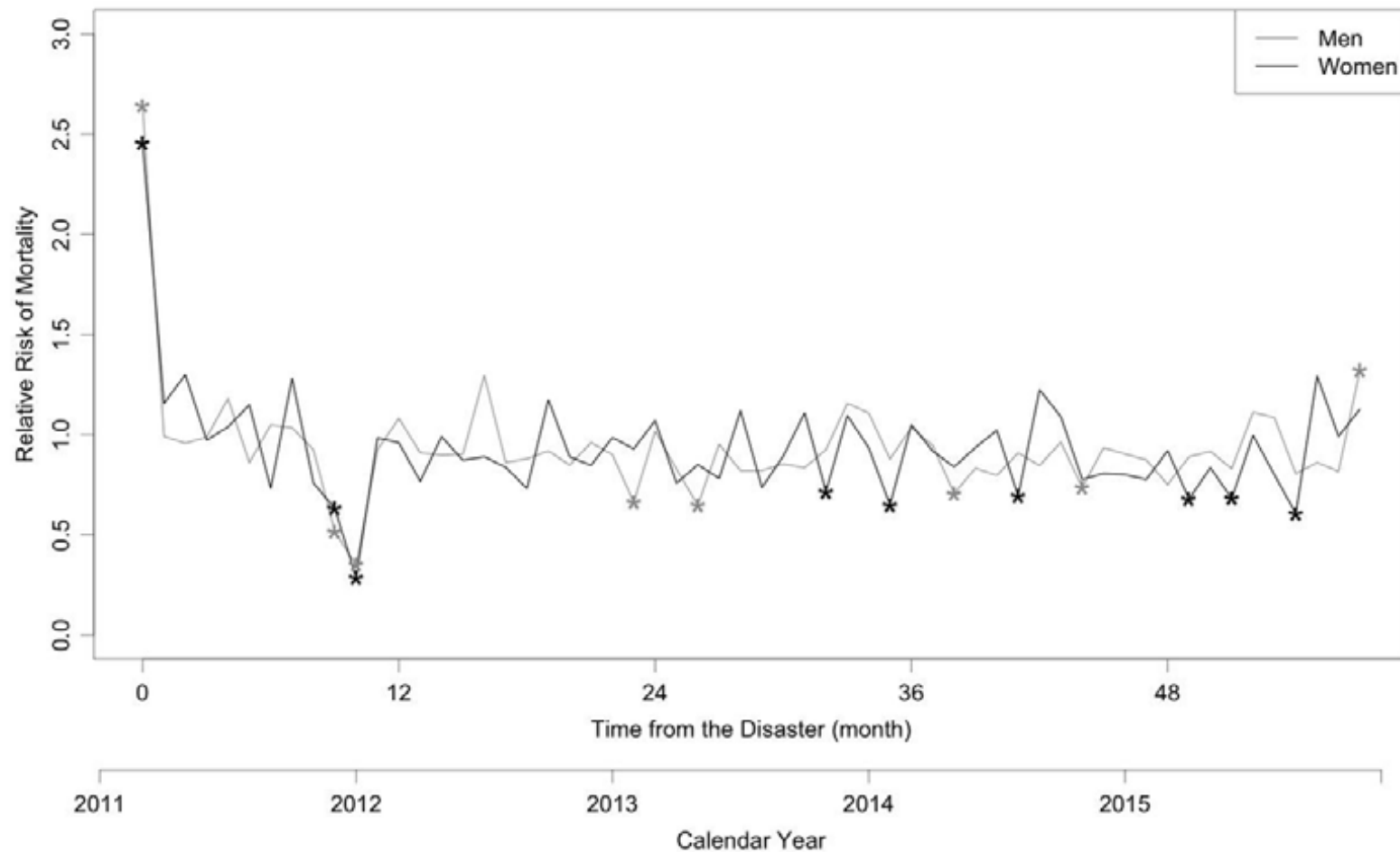
CAUSES OF MORTALITY AND MORBIDITY

- “... disaster-attributed deaths [are] those caused by either the direct or indirect exposure to the disaster. Directly related deaths are those caused by the physical forces of the disaster. Indirectly related deaths are those caused by unsafe or unhealthy conditions that occur because of the anticipation, or actual occurrence, of the disaster” (Combs, Quenemoen, Parrish, and Davis, 1999).

SOME EXAMPLES



MONTHLY TRENDS OF THE RELATIVE RISKS OF INDIRECT MORTALITY PRE AND POST DISASTER



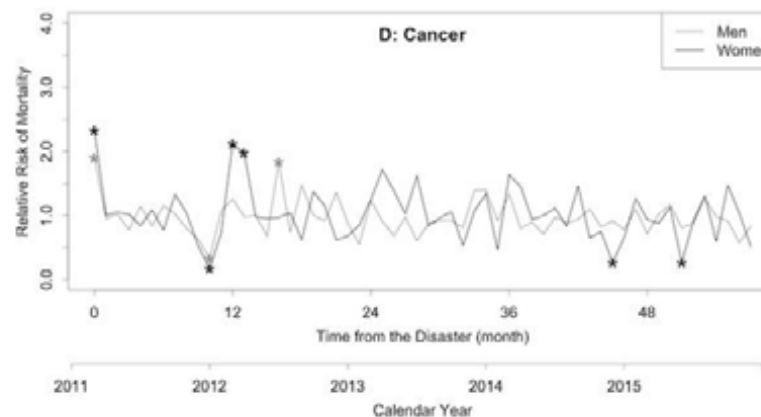
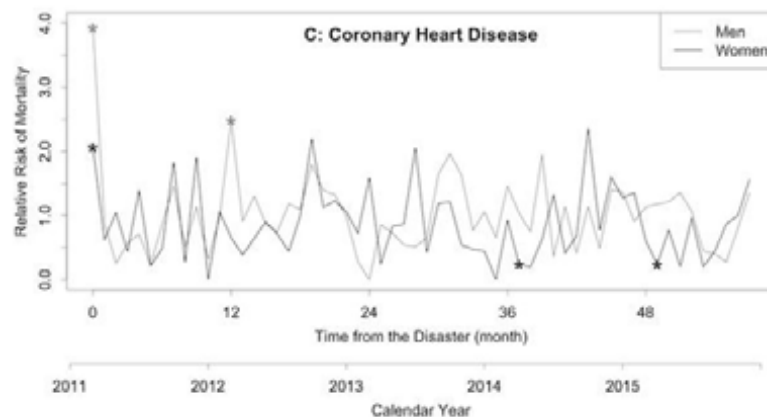
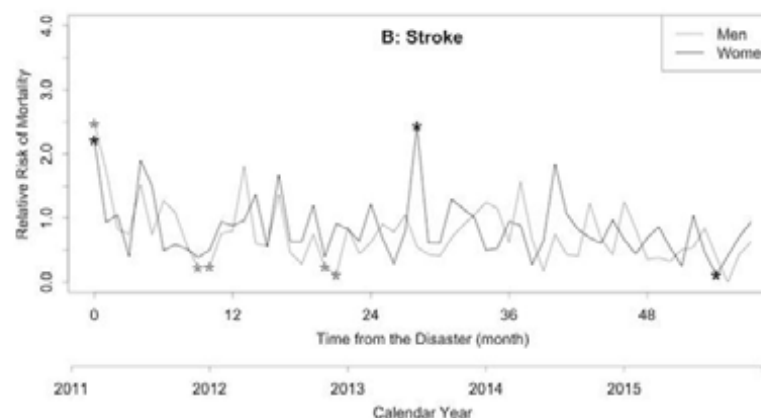
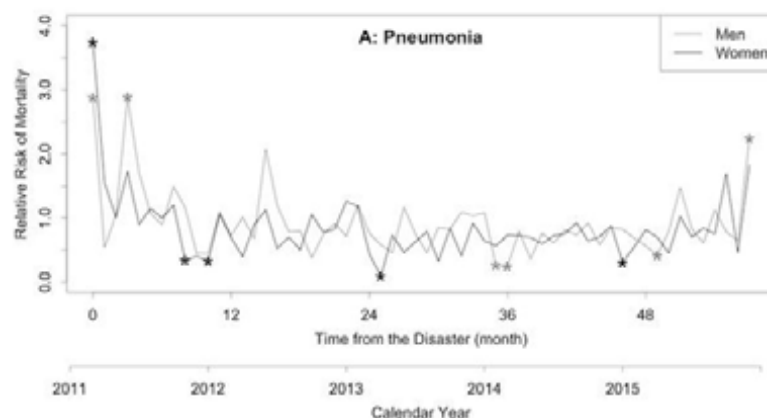
Tomohiro Morita et al. *J Epidemiol Community Health*
doi:10.1136/jech-2016-208652



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CAUSE-SPECIFIC MONTHLY TREND OF THE RELATIVE RISKS OF INDIRECT MORTALITY PREDISASTER AND POSTDISASTER: (A) PNEUMONIA, (B) STROKE, (C) CORONARY HEART DISEASE AND (D) CANCER.



Tomohiro Morita et al. J Epidemiol Community Health
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SOME OTHER EXAMPLES

- After Katrina:
 - 47% increase in deaths after Katrina (Stephens et al., 2007).
 - 20.6% of patients with chronic conditions suspended their treatment (Kessler, 2007)
 - 80% reduction in hospital capacity and 75% of clinics closed after Katrina (Dzou, Lurie & Tuckson, 2018).
- After hurricane Charley:
 - Death were caused by carbon monoxide poisoning, electrocution, suicide, exacerbation of a medical condition, among others (CDC, 2004; CDC, 2005).
- After 2010 Maule Earthquake:
 - Increased in preterm deliveries (<34 weeks) and deliver smaller babies (Oyarzo et al., 2012).

OTHER EXAMPLES: MEDICATION LOSS AFTER A MANDATORY TSUNAMI EVACUATION

Variables	Descriptives
Age	47.52 (18-95; SD=15.93)
Sex (females)	60.5% (233)
Educational level (college education and more.)	49.4% (154)
Work status (employed)	63.1% (243)
Married/with Partner	55.5% (207)
Previous exposure to earthquake/tsunami	98.4% (359)
Evacuated with medications	33.4% (117)
Preparation (has backpack prepared with items)	59.4% (230)
Risk perception	Mean= 5.513 (SD=1.39, range 1-8)
Worry health	Mean = 4.66 (SD=1.86, range 1-7)
Secondary stressors (physical consequences)	Mean = 0.29 (SD=0.25, range 0-1)
Secondary stressors (damages, material losses)	Mean = 0.32 (SD=0.30, range 0-1)
Secondary stressors (lack of supplies)	Mean = 0.71 (SD=0.34, range 0-1)
Secondary stressors (fear)	Mean = 0.69 (SD=0.34, range 0-1)

33% did not take their meds when evacuated in 2014 (Repetto et al., 2017)

Variables	B (S.E.)	EXP (B)	95% C.I. for EXP(B)	
			Lower	Upper
Age	.028 (.008)	1.028**	1.011	1.045
Sex	.255 (.279)	1.290	.746	2.231
Preparation	1.203 (.283)	3.332**	1.913	5.802
Risk perception	-.112 (.103)	.894	.731	1.093
Worry health	.197 (.083)	1.217*	1.035	1.432
Secondary stressors				
Physical health	.122 (.735)	1.129	.267	4.771
Material damages	.507 (.473)	1.661	.657	4.201
Fear	-.620 (.532)	.538	.190	1.525
Lack of supplies	.767 (.441)	2.154	.908	5.109
Constant	-3.683 (.814)	.025**		

LOCATION: HEALTH CARE CENTER IN IQUIQUE



Other numbers and different stories

WHAT ABOUT MENTAL HEALTH?



MENTAL HEALTH AND DISASTERS: WIDE SPECTRUM OF RESPONSES

104 ■ DORI B. REISSMAN, MERRITT D. SCHREIBER, JAMES M. SHULTZ, AND ROBERT J. URSANO

Table 7.1: Common Adult Responses to Disasters and Traumatic Events

<i>Physiological Responses</i>	<i>Behavioral and Emotional Responses</i>	<i>Cognitive and Spiritual Responses</i>
Fatigue	Anxiety, fear	Memory problems
Nausea, vomiting	Grief, guilt, self-doubt, sadness	Calculation difficulties
Fine motor tremors, tics, paresthesias	Irritability, anger (sometimes displaced), resentment, increased conflicts with friends/family	Confusion in general and/or confusing trivial with major issues
Chest pain, choking, or smothering sensation	Feeling overwhelmed, hopeless, despair, depressed	Concentration problems, distractibility
Nonspecific joint or body aches or pain	Anticipation of harm to self or others; isolation or withdrawal	Crisis of faith, anger at God, questioning basic religious beliefs
Profuse sweating	Changes in usual eating, sleeping patterns	Recurring dreams or nightmares
Dizziness	Gait change	Decision-making difficulties, easily confused
Gastrointestinal upset (diarrhea or constipation, pain)	Hypervigilance, startle reactions	Preoccupation with disaster events
Racing pulse, heart palpitations	Crying easily, mood swings	Lessened ability to handle complexities
Headaches	Gallows humor	Fear of crowds, strangers, or being left alone
Environmental tolerance (temperature, sound, smell)	Poor performance of usual roles (home, work, social)	Anomia
	Regression to less mature or risky behaviors	Slowed rate of thinking, speech difficulties
	Ritualistic behavior	

Table 7.2: Age-related Responses to Disasters by Children

<i>Children of All Ages</i>	<i>Preschool Age (1–5 y)</i>	<i>Early Childhood (5–11 y)</i>	<i>Adolescence (12–14 y)</i>
Anxiety and irritability	Changes in eating habits	Increased aggressiveness	Abandonment of chores, schoolwork, and other prior responsibilities
Clinging, fear of strangers	Changes in sleeping habits	Changes in eating/sleeping	Disruptiveness at home or in the classroom
Fear of separation, being alone	Clinging to parent	Difficulty concentrating	Experimentation with high-risk behaviors such as drinking or drug use
Head, stomach, or other aches	Disobedience	Regression to earlier behavior	Vigorous competition for attention from parents and teachers
Increased shyness or aggressiveness	Fear of animals, the dark, "monsters"	Competing more for the attention of parents	Resisting authority
Nervousness about the future	Hyperactivity	Fear of going to school, the dark, "monsters"	
Regression to immature behavior	Speech difficulties	Drop in school performance	
Reluctance to go to school	Regression to earlier behavior (thumbsucking, bedwetting)	Desire to sleep with parents	
Sadness and crying			
Withdrawal			
Worry, nightmares			



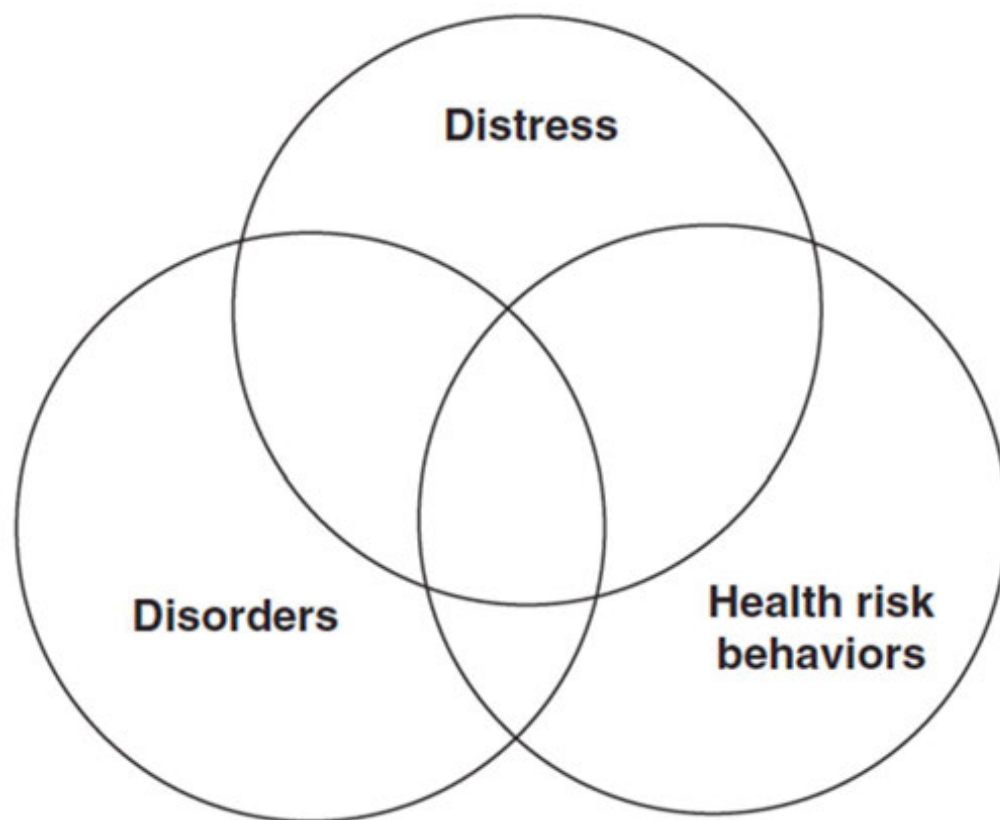


Figure 1.3 Disaster responses

Table 1.3 Post-traumatic distress

- Grief reactions and other normal responses to an abnormal event
- Altered interpersonal interactions (withdrawal, aggression, violence, family conflict, family violence)
- Decreased work functioning (ability to do work, concentration, absenteeism, quitting, effectiveness on the job)
- Change in safety/travel
- Sleep disturbance
- Loss of concentration

Table 1.4 Health risk behaviors

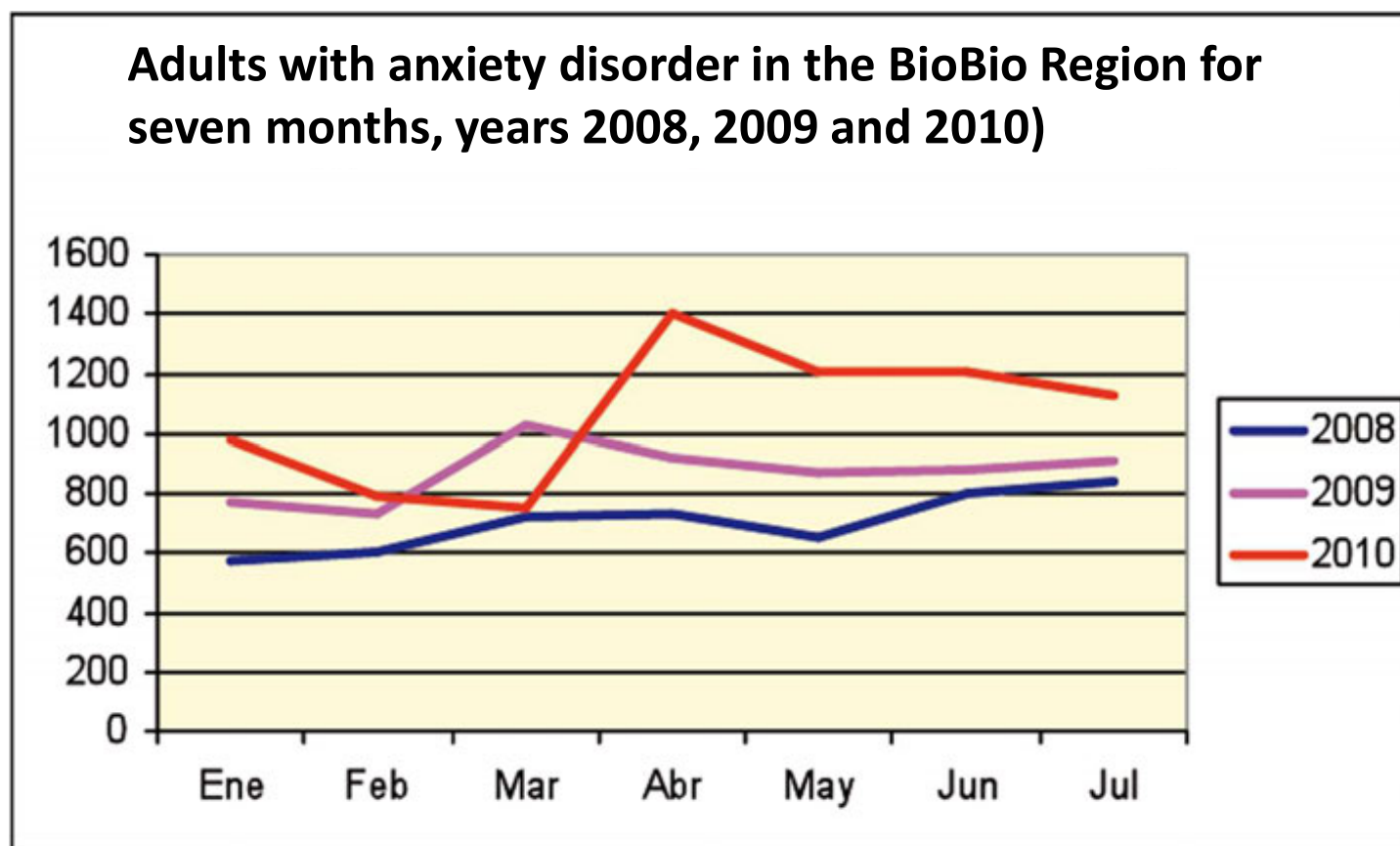
- Change in smoking
- Change in alcohol
- Balancing home and work
- Disaster behaviors
 - Evacuation
 - Overdedication
 - Adherence to medical recommendations

Ursano RJ., Fullerton CS., Weisaeth L., Raphael B. Individual and community responses to disasters. En Textbook of Disaster Psychiatry 1st Ed., New York: Cambridge University Press (2007).

MENTAL HEALTH: THE MOST COMMON DISORDERS STUDIED

- PTSD prevalences range from 3.7% to 60% (Galea et al., 2005; Neria, Gandi & Galea, 2008) within the first 2 years after the disaster.
- There are reports of prevalences around 12% after three years (Onder et al., 2016).
- Depression ranges in 20% to 35% (Norris et al., 2012; North et al., 2018).
- High comorbidity of PTSD and depression.

SELF-SEEKING BEHAVIOR: POTENTIAL UPTAKE



PAHO, 2010

POSTDISASTER COURSE OF ALCOHOL USE DISORDERS

Arch Gen Psychiatry. 2011;68(2):173-180. doi:10.1001/archgenpsychiatry.2010.131

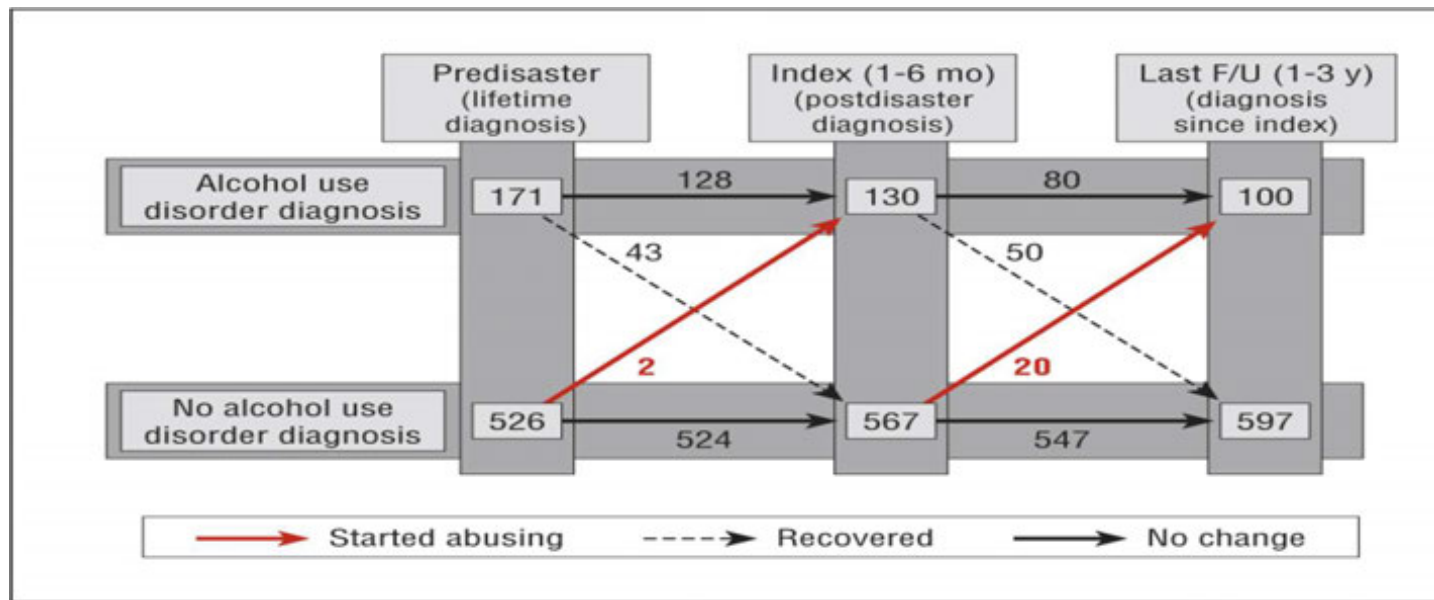


Figure Legend:

Alcohol use disorders in time frames of predisaster lifetime prevalence, postdisaster prevalence at index, and new (incident) cases since index at last follow-up (F/U).

PSYCHOLOGICAL FOOTPRINT

- The effects can be widespread and pervasive
- Range across a widespread of severity
- Can persist for a long time
- Reflect features of the disaster but also the living conditions of the individual and her community.
- And find barriers and challenges to provide effective care.

OTHER CHALLENGES

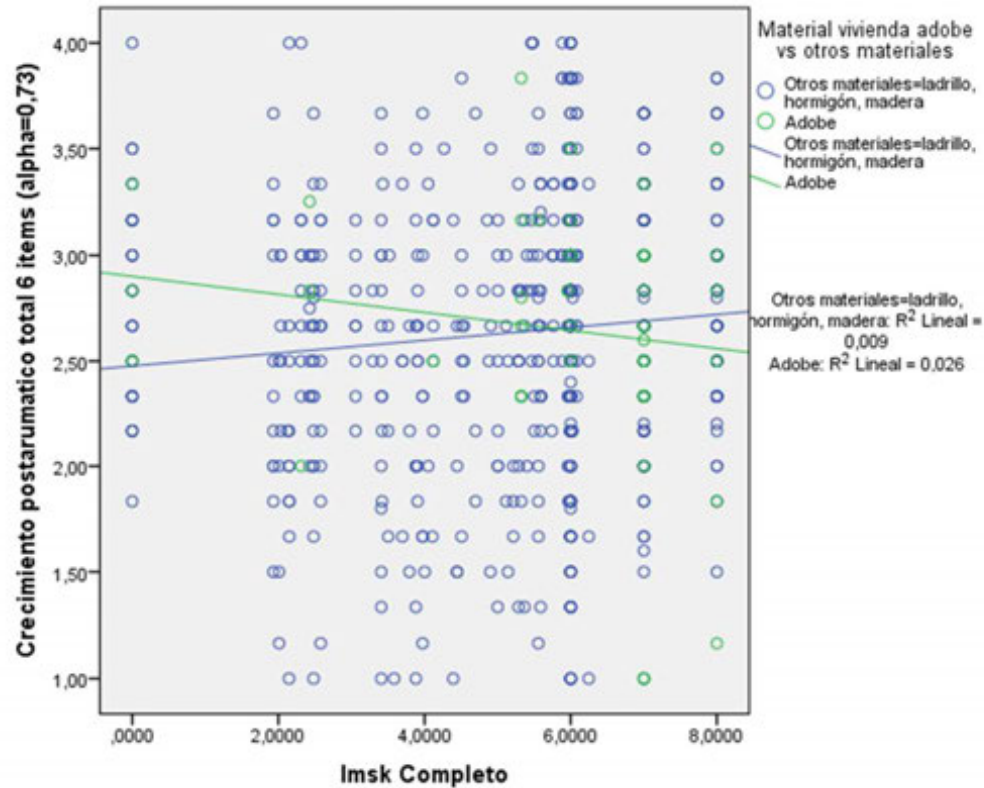
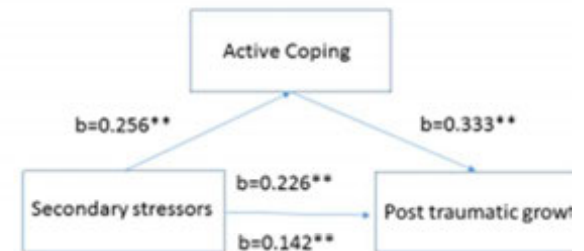
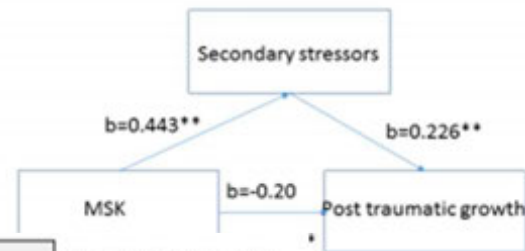
- Some public health measures (such as containment or quarantine), may compete with emotional needs of survivors (social support).
- Manifestation can appear several months later (even years).
- Personnel may have also been exposed (physical and emotional health of respondents are challenged).
- Personnel must be very well trained.
- Need to implement strategies for surveillance (we still do not have good numbers and have to improve strategies for data collection) and treatment of population hard to reach (telemedicine?)
- Excessive concern with response.
- All or multi-hazards approach.

BUT BURDEN OF DISEASE DIFFERS...

ROLE OF EXPOSURE



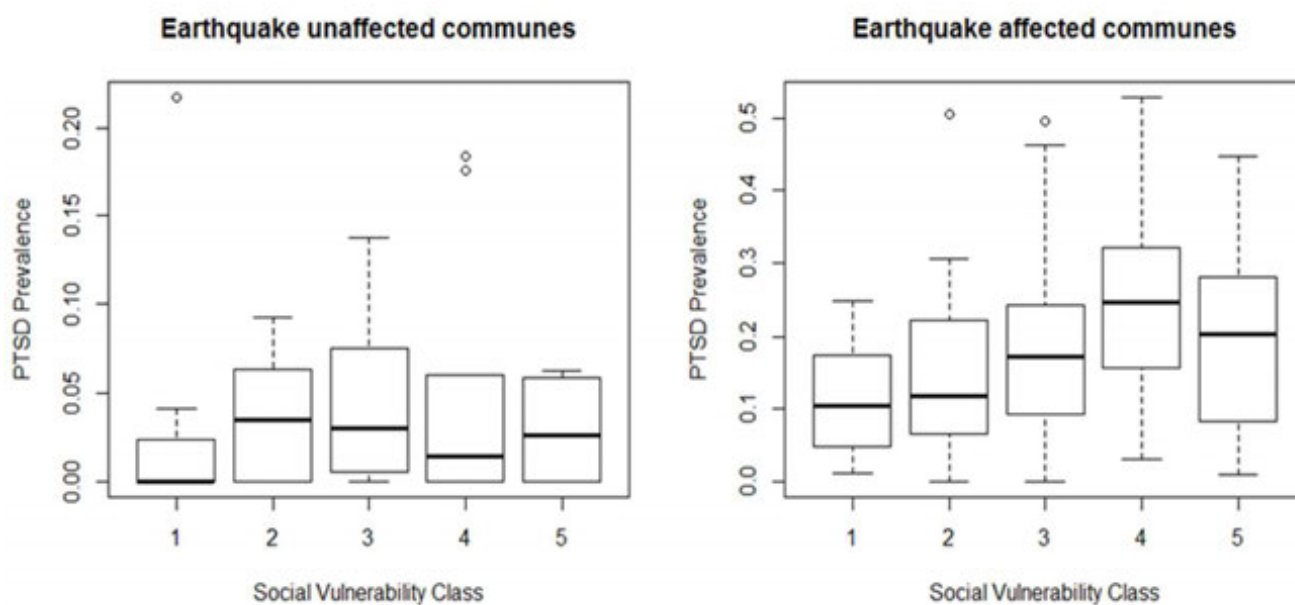
Post Traumatic Growth



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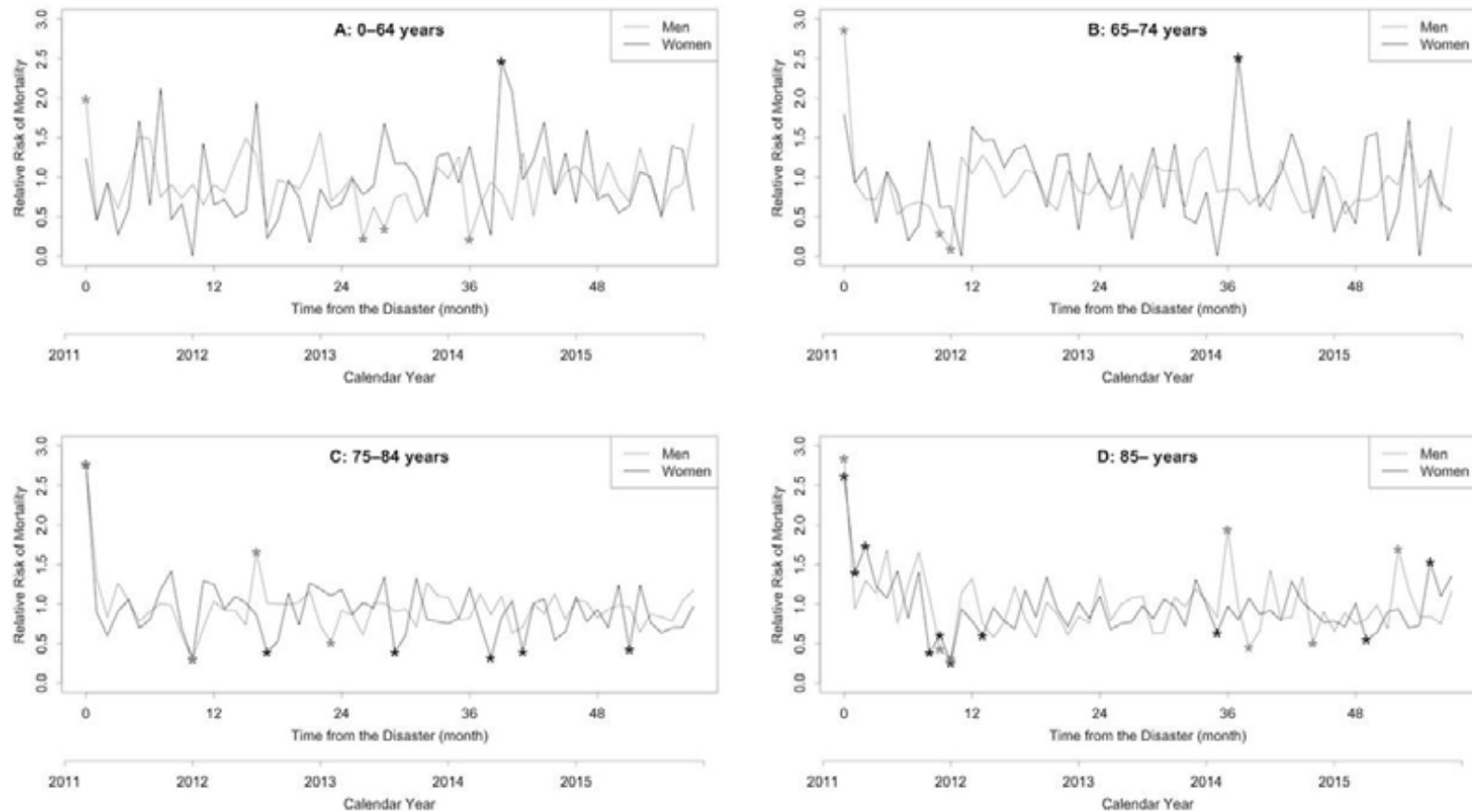


SOCIAL VULNERABILITY AND HEALTH



(Qian & Repetto, 2016)

Age-specific monthly trends of the relative risks of indirect mortality predisaster and postdisaster: (A) 0–64 years, (B) 65–74 years, (C) 75–84 years and (D) 85+ years.

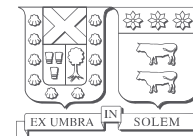


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VULNERABLE GROUPS NOT ONLY PRESENT WORST OUTCOMES

- They also face chronic stressors that limit their ability to cope
- These communities already rank high on the number of illnesses they face.
- Have limited access to resources to implement mitigation actions.
- Preparedness is not possible for those vulnerable and this will affect response and recovery.
- Requires work and collaboration of several different institutions and organizations.

SET OF PRINCIPLES AND SOME GUIDING DEFINITIONS

PUBLIC HEALTH ACTIONS FOR DRR AND RESILIENCY



PUBLIC HEALTH AND DRR

- Change public health priorities, communities health and well-being must become a priority and health sector must work with the community.
- Need to address social inequalities and attend to the areas with the greatest social vulnerabilities.
- To promote social capital (primary resource for communities), members must be engaged in all stages (bottom-up).
- Natural sources of support must be boosted (these provide effective protection).
- Preparedness should be implemented with and from the communities (local adaptation strategies can be effective) and use local resources that the public health sector can offer.
- For effective responses there must be pre-existing networks and relationships to provide support and services.
- Transfer of knowledge and collaboration with government/agencies should start early.
- Resiliency must be recognized as a metaphor, to intersect physical, sociopolitical, and psychological interrelated pathways that are always shaped by human historical power relations and are multileveled and evolving through time, and are at the core of the vulnerabilities that communities face.

- (Based on Norris et al., 2007; Keim, 2008; Aitsi-Selmi et al., 2015)

Kokoronokea project

ONE EXAMPLE FROM CHILE



GENERAL BACKGROUND

- Before the 2010 Maule Earthquake psychological aid provided to survivors of disasters was scarce.
- After that, a large number of intervention models emerged from different organizations.
- Lack of common language and practices limited the possibility to provide effective care.
- 2011 collaborative work between Chilean Ministry of Health and the Japanese Government that would provide guidelines for response teams.
- 2013 the work was re-initiated, included ONEMI and CIGIDEN.

MAIN OUTCOMES

- Agree on orientations and guidelines to integrate the perspectives of the professionals of the different agencies.
- *Protect the mental health of the population throughout the whole disaster-risk cycle, throughout the provision of guidelines that aim to reduce vulnerabilities and promote the capabilities of all actors that are part of the National System of Civilian Protection.*

INTEGRATION OF APPROACHES

Principles

- Human Rights and Equity
- First of all, do not harm
- Prevention.
- Participation.
- Mutual collaboration.
- Work across institutions
- Stepwise use of resources.

Approaches

- Community focus.
- Guided by Social Determinants of Health.
- Life Course Approach



FINAL THOUGHTS

- Health needs of survivors are wide and can extend over time.
- Actions should address social vulnerabilities and/or social inequalities (we must move towards a shared language).
- Community approach must be embraced (work must be done in and with the communities).
- We need indicators that can provide a more comprehensive picture.
- Collaborations across agencies is a must.

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