

SHAKY TIMES

Psychiatrist at the centre of an earthquake

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OVERVIEW

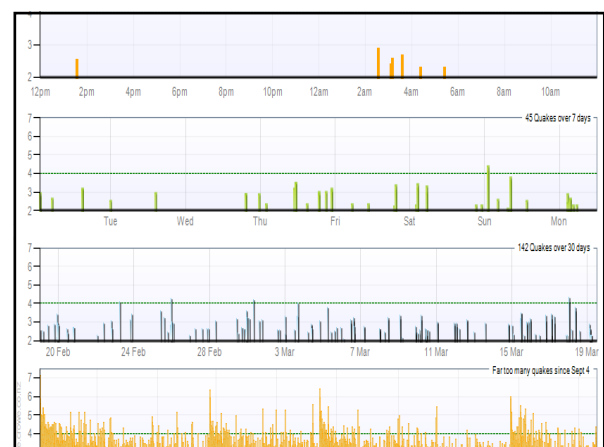
- What happened
- Understanding the neuroscience
- What has been helpful

**12.51PM
22 FEBRUARY 2011**



WHAT HAPPENED

- February 2011 earthquake – greatest shaking forces ever recorded in an urban area
- 185 deaths, multiple injuries
- Significant property and infrastructure damage
- > 10,000 Aftershocks



THEN WHAT

- Primary effects
 - Earthquakes
 - Aftershocks
- Secondary effects
 - Loss/ Damage
 - Change
 - Rebuilding, moving on – different pace
 - Unsettled claims
 - Repair problems

WHAT HAVE WE SEEN

- Reactions to life threatening events
- Reactions to aftershocks
- Reactions to secondary stressors
- Not all negative

REACTIONS TO A LIFE THREATENING EVENT

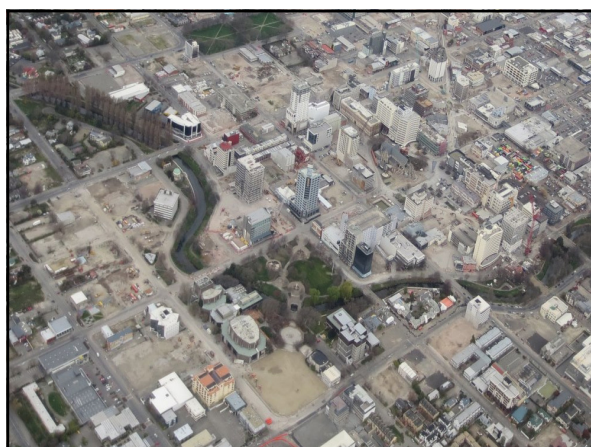
- Fear
- Reactions triggered – aftershocks, sounds, movements
- Avoidance
- Anxiety about being separated from family/home
- Worrying about what could /may happen

REACTIONS TO AFTERSHOCKS

- Hyperarousal
 - Exaggerated startle response
 - Hypervigilance
 - Concentration
 - Sleep difficulties and fatigue
 - Irritability and anger
- No control over this

REACTIONS TO SECONDARY STRESSORS

- **Homes** insurance, delays in rebuild, financial
- **Family** disrupted routines, sleep, kids, elderly, friends leaving
- **Community** changes to city, roads, people left, landscape
- **Social** no CBD, activities
- **Workplace** relocation, shared spaces





COMMON PERSISTING THEMES

- Fatigue / exhaustion
- Feeling overwhelmed and despondent
- Feelings of anger and frustration – injustice
- Concentration problems
- Interpersonal / relationship issues
- Substance abuse

CHILDREN AND ADOLESCENTS

- Children
 - Settling and sleeping problems
 - Anxious about separating
 - Regressive behaviours
 - Triggered natural events
- Adolescents
 - More irritable and emotional
 - Why stay here?

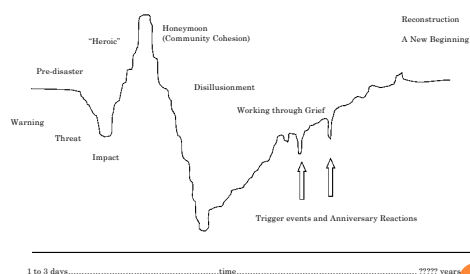
NOT ALL NEGATIVE

Some positive effects reported

- Closer to family and friends
- Less materialistic
- Re-evaluate what important in life
- Become a stronger person
- Children more mature and responsible

PHASES OF DISASTER

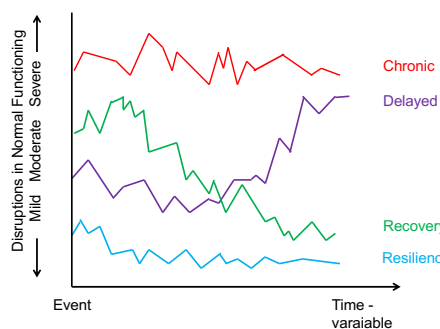
Source: Zislin/Meyers



WHAT DOES THE LITERATURE TELL US

- Disaster
 - Potentially traumatic event followed often by complex series events
- Exposure gradient
 - Clear gradient
 - Immediate exposure and secondary stressor exposure
- Timing of sampling
- Course – very little

POST-TRAUMA DISRUPTIONS IN NORMAL FUNCTIONING



RESILIENCE

- Definition
- Bad things can and do happen – common
- Concept from research childhood adversity
 - Ordinary magic
- Resilience 80% (figures mainly from single events)

KNOW MINORITY DEVELOP MENTAL HEALTH PROBLEMS

- PTSD
 - Perception death - marked hyperarousal
 - Rescue workers - PTSD
 - Previous PTSD
- Depression
- Anxiety disorders

WHO IS AT RISK

- **Before the event**
 - Previous mental health difficulties – anxiety, depression (CHDS)
 - Previous traumatic events (CHDS)
- **At time of the event**
 - High exposure
 - Perceived life threat (CHDS)
 - Peri-traumatic dissociation or arousal (CHDS)
- **After the event**
 - Stressful life events
 - Property damage
 - Financially affected
 - Limited social supports
- High risk professions
- New group – any of us

WHAT HAVE WE SEEN IN CANTERBURY

- Monitoring samples
 - CERA Wellbeing Survey
 - All Right surveys
 - Employee surveys
- Cross sectional research
- Longitudinal study
- Dispensing patterns

Original Investigation

September 2014

Impact of a Major Disaster on the Mental Health of a Well-Studied Cohort

David M. Fergusson, PhD¹, L. John Horwood, MSc¹, Joseph M. Boden, PhD¹, et al.
 > Author Affiliations | Article Information
 JAMA Psychiatry. 2014;71(9):1025-1031. doi:10.1001/jamapsychiatry.2014.652

- Birth cohort 1,265 children born in Christchurch in 1977
- 20-24 months after the start of the quake sequences
- Exposure
 - 57% exposed to one or more of the major quakes
 - 43% living outside Canterbury

THE MENTAL HEALTH (DSM-IV) CONSEQUENCES OF THE CANTERBURY EARTHQUAKES

Table 1. Associations Between the Extent of Earthquake Exposure and Rates of Mental Disorder Outcomes (Post 12 Months)

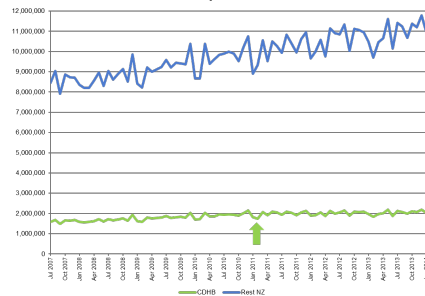
Measure	Total Earthquake Impact/Consequences Score (Quartile)					P Value ^a
	Not Exposed (n = 406)	1 (Low) (n = 137)	2 (n = 135)	3 (n = 136)	4 (High) (n = 138)	
Major depression	8.8	11.0	8.2	8.1	15.3	.02
Posttraumatic stress disorder	1.7	6.7	5.2	2.9	5.3	.02
Other anxiety disorder	11.5	11.7	11.9	15.4	20.0	.02
Suicidal ideation/attempt	1.5	3.7	1.5	2.2	3.0	.48
Nicotine dependence	11.5	15.3	17.0	10.8	11.5	<.001
Alcohol abuse/dependence	8.3	9.5	6.7	10.3	10.4	.47
Illicit drug abuse/dependence	4.7	6.4	5.0	5.2	5.3	.96
No. of disorders, mean (SD)	0.54 (0.46)	0.66 (1.15)	0.53 (0.50)	0.74 (1.09)	0.96 (1.36)	<.001

^aMantel-Haenszel χ^2 test for linear trend for dichotomous outcomes and Poisson regression for number of disorders.

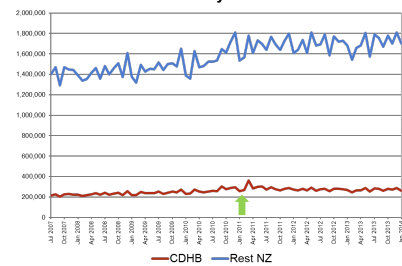
CANTERBURY PRESCRIBING DATA

- The amount of medication dispensed, in units, by all pharmacies is routinely recorded regionally and nationally. A unit of medication is defined as a tablet of any strength.
- In general, units dispensed of medication will correlate with the total amount of medication used by the population.

Antidepressants



Anxiolytics

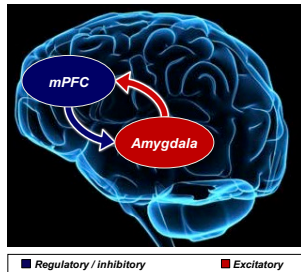


WHAT DOES ALL THIS MEAN?

- Resilience response in majority
- Extended GP consultations, free counselling, public health campaigns, community initiatives and support groups, insurance, government efforts etc.
- But minority will develop mental health disorders
 - Exposure
 - Peritraumatic distress and life threat important
 - PTSD and depression
 - Secondary stressors important

NEUROSCIENCE

NEUROBIOLOGICAL MODEL



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ACUTE HEALTHY STRESS RESPONSE – QUICK AND SAFE

- Activates the amygdala
 - Focus threat
 - Prepares fight/flight/freezing
- Hippocampus
 - Role in context (time and space)
 - Role in extinction of fear
- Reduced activation of frontal brain regions
 - Role in context and meaning
 - Less interest in non-essential
 - Role in extinction of fear

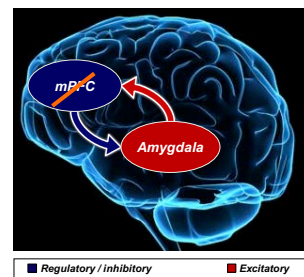


PERSISTENT STRESS

- Amygdala
 - (Hyperactive)
- Reduced activation of PFC
 - Reciprocal relationship amygdala



NEUROBIOLOGICAL MODEL



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LIFE BECOMES NARROWER

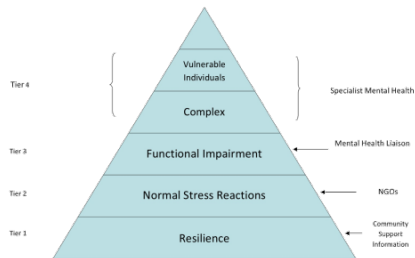
- Head down, blinkered approach
- Focus on stress - trying to deal with things can't control
- Reduction innovative strategic thinking
- Things add value dropped off



HELPFUL INTERVENTIONS



TIERED RESPONSE



WHAT HAS BEEN HELPFUL AND RESILIENCY

RESILIENCY

- Most people are remarkably resilient
- Components of a positive response:
 - Sense of safety
 - Self and community efficacy/ empowerment
 - Connectedness
 - Hope

WHAT IS HELPFUL - COMMUNITY

- Promoting wellbeing
- Community engagement
- Clear honest communication
- Dealing with practical
- Politically emphasising insurance and effects

UK FORESIGHT PROJECT

What enhances well being

- Exercise
- Learning
- Mindfulness
- Connectedness
- Gratitude
- Reduce amygdala activity
- Increase pre-frontal cortical activity

NEUROBIOLOGICAL MODEL

