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Stress in Disasters and Crises - Consequences for Health

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Outline

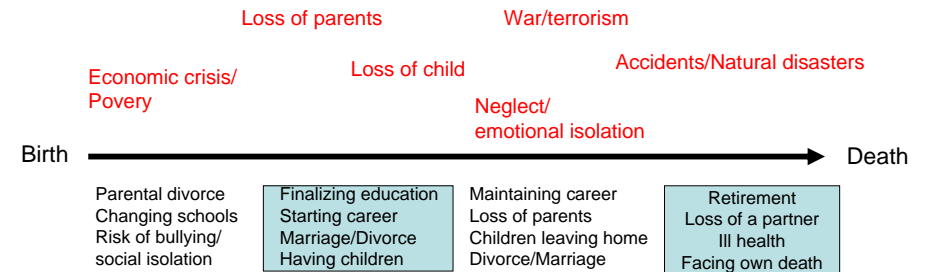
- The impact of stress on health
- Natural (or manmade) disasters and health
- Studies on what affects survivors health in the times of adversity?

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STRESS AND HEALTH

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Changes are stressful!



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Loss of next-of-kin



Loss of a child – Li et al.

- Nationwide studies in Denmark, based on registries and the possibility to link NRN's
 - 21,062 parents who lost a child (<18 years)
 - 293,745 non-bereaved parents (matched for family structure)
 - Follow-up 1980-1996

Loss of a child – Li et al.

Outcome	RR
Psychiatric hospitalizations	1.7 (NEJM, 2005)
Mortality	1.4 Natural causes, mothers 1.0 Natural causes, fathers 3.8 Unnatural causes, mothers 1.6 Unnatural causes, fathers (Lancet, 2003)
Diabetes	1.4 Type 2-diabetes (Diabet Med, 2005)
Cardiovascular disease	1.4 Fatal MI 1.3 Any first MI (Circulation, 2004) 1.0 Stroke
Cancer	1.2 Cancer survival 1.2 Cancer incidence (Br J Cancer, 2003) 1.7 (smoking related cancers)
Autoimmune disease and IBD	1.6 Multiple Sclerosis (Neurology, 2004) 0.9 Rheumatoid Arthritis 1.0 Irritable Bowels Disease

Causes for physical health decline:

- Stress – immune suppression – sympathetic arousal:
 - Inability to suppress cortisol (*Weller et al., 1990*)
 - Impaired immune function (*Irwine et al., 1988*)
- Changed health related behaviors:
 - Poor dietary habits
 - Less physical activity (*Rosenboom & Whittington, 1993*)
 - Smoking/Alcohol (*Byrne et al., 1999*)

The diagnosis of life-threatening illness

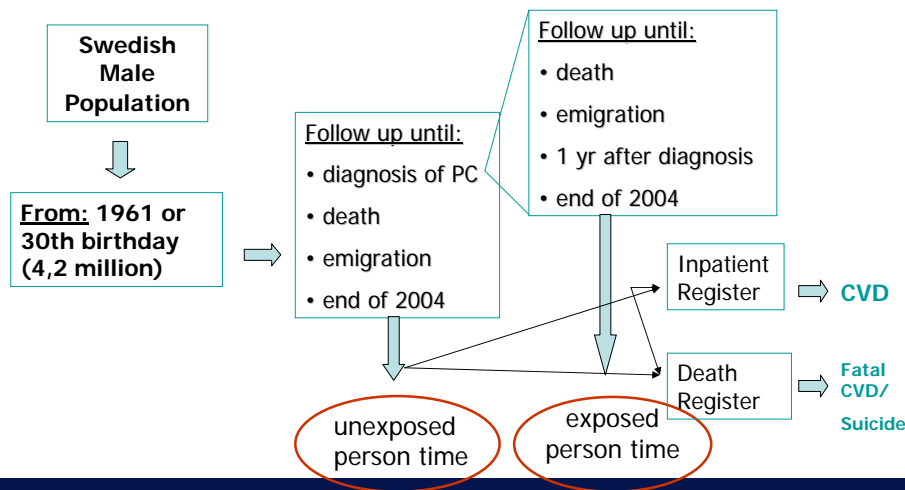
Cardiovascular Events and Suicides Among Men with Newly Diagnosed Prostate Cancer

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Meir Stampfer, Hans-Olov Adami

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Harvard School of Public Health, USA

Cohort Study within the entire Swedish population



Karolinska
Institutet

Fatal Cardiovascular Events among Newly Diagnosed Prostate Cancer Patients

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Table 2: Relative risks of non-fatal cardiovascular events from 1990-2004

	Non-fatal CVD RR (95% CI)
1990-1994	1.3 (1.2-1.4)
1995-1999	1.4 (1.3-1.5)
2000-2004	1.3 (1.2-1.4)

Table: Deaths from fatal cardiovascular events in men following the first year after diagnosis of prostate cancer, compared to men without such diagnosis in Sweden 1961-2004

years	Person-	Fatal CVD	RR(95%CI)
Prostate cancer (-)	94,044,274	883,736	Referent
Prostate cancer (+)*	149,982	7,429	1.5 (1.5-1.6)
Age (years)†			
≤54	9,339	85	8.7 (7.0-10.7)
55-64	39,134	769	2.2 (2.1-2.4)
65-74	67,398	3,130	1.7 (1.7-1.8)
≥75	34,111	3,445	1.3 (1.1-1.3)
Calendar year of follow up‡			
1961-1970	15,697	1,822	2.9 (2.8-3.1)
1971-1980	25,236	1,810	1.8 (1.7-1.9)
1981-1990	34,459	1,692	1.3 (1.3-1.4)
1991-2004	74,590	2,105	1.0 (1.0-1.1)
Time since diagnosis (days)*			
0-7	3,662	926	7.8 (7.3-8.3)
8-28	9,435	1,087	3.6 (3.4-3.8)
29-183	65,685	2,864	1.4 (1.3-1.4)
184-366	71,200	2,552	1.1 (1.1-1.2)

*RRs in overall and strata by 'time since diagnosis' are adjusted for age (<=44, 45-54, 55-64, 65-74, 75-84 and ≥85 years) and calendar year (in 5-year group between 1961 and 2004).
 †RRs in 'age' and 'calendar year of follow up' are mutually adjusted by age and calendar year.



Suicides among Newly Diagnosed Prostate Cancer Patients

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Table 1: Suicides, fatal injuries and accidents in men following the first year after their diagnosis of prostate cancer and among men without such diagnosis.

	Person-years	Fatal injuries & accidents	RR(95%CI)*	Suicides	RR(95%CI)*
Prostate cancer (-)	94,044,074	68,317	Referent	31,822	Referent
Prostate cancer (+)	149,982	262	1.2 (1.1-1.4)	136	2.6 (2.2-3.0)
Age at diagnosis (years)					
≤54	9,339	0	-	14	5.1 (2.8-8.2)
55-64	39,134	33	1.3 (0.9-1.8)	23	1.9 (1.9-2.8)
65-74	67,398	101	1.5 (1.2-1.8)	62	2.7 (2.0-3.4)
≥75	34,111	128	1.1(0.9-1.3)	37	2.6 (1.8-3.5)
Calendar year of follow up					
1961-1970	15,697	54	2.2 (1.6-2.8)	24	3.5 (2.3-5.2)
1971-1980	25,237	57	1.3 (1.0-1.6)	24	2.3 (1.5-3.3)
1981-1990	34,459	55	1.2 (0.9-1.5)	37	2.8 (2.0-3.8)
1991-2004	74,589	96	1.0 (0.8-1.2)	51	2.2 (1.7-2.9)
Time since diagnosis (days)					
0-7	3,662	38	7.3 (5.2-9.9)	11	8.4 (4.4-14.4)
8-28	9,435	31	2.3 (1.6-3.3)	9	2.7 (1.3-4.8)
29-183	65,685	107	1.2 (1.0-1.4)	69	3.0 (2.3-3.7)
184-366	67,439	86	0.8 (0.7-1.0)	47	1.9 (1.4-2.4)
Psychiatric disorders before entry†					
Yes	4,427	16	0.8 (0.5-1.3)	13	2.1 (1.1-3.4)
No	68,365	79	1.2 (0.9-1.4)	37	2.6 (1.8-3.5)

*adjusted for age (≤44, 45-54, 55-64, 65-74, 75-84 and ≥85 years) and calendar year (1961-1965, 1966-1970, 1971-1975, 1976-1980, 1981-1985, 1986-1990, 1991-1995, 1996-2000 and 2001-2004).



Natural or Manmade Disasters

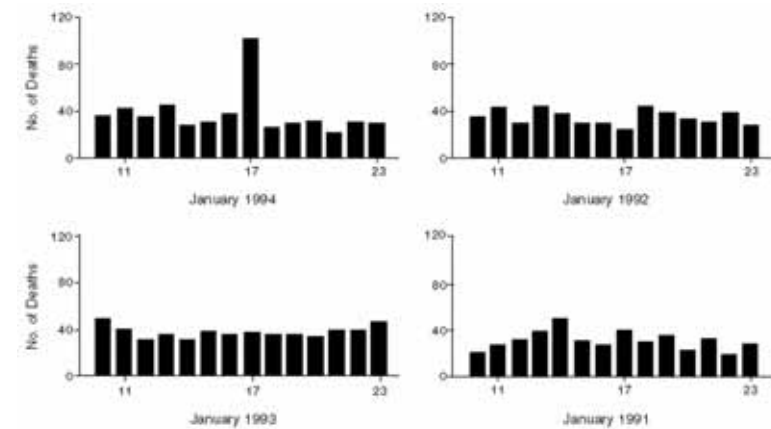


War/terrorism

- PTSD defined as a result of research on Vietnam veterans
- Sudden increase in MI in Israel after Iraqi missile attacks Meisel et al., Lancet, 1991
- 9/11: 5-8 weeks after the attack:
 - 7.5% of Manhattan residents with PTSD
 - 10% met criteria for depression
 - » Galea et al., NEJM, 2002

NATURAL DISASTERS

Daily numbers of Deaths by CVD in Los Angeles County from January 10 through 23, 1991, 1992, 1993, and 1994



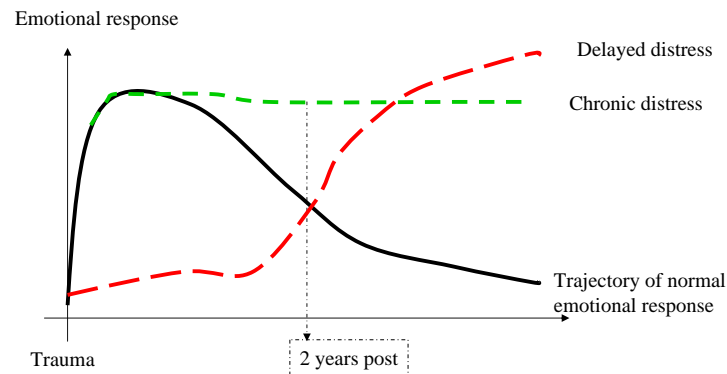
Leor et al., NEJM, 2006

Natural disasters in Iceland

- Avalanches in Vestfjords 1995, Flateyri and Súðavík
- 600 inhabitants, 35 casualties
- 25-40% had PTSD symptoms 3-4 months after avalanches
 - Women at higher risk
 - Those who lost significant others at higher risk
 - Long-term follow-up needed
 - » (Ásmundsson og Oddsson, 2000)
- Earthquakes – Suðurlandsskjálftinn 2008
 - No casualties, damages to houses
 - Systematic follow-up has started

PROMOTING HEALTH AT TIMES OF ADVERSITY?

Normal vs. long-term distress



How do we react when tragedy occurs?

- Professional decision-making may be crucial for survivors risk of long-term morbidity
- Government, health care, rescue workers etc. are forced to make decisions affecting the lives of thousands of people
 - In spite of extremely scarce scientific evidence

Some unanswered questions

- Optimal time on trauma site?
- Deceased significant others
 - effect of delay of identification?
 - Effect of viewing remains?
- Efficacy of interventions?
 - immediate support (debriefing)
 - long-term follow-up

University of Iceland Centre of Public Health Sciences – anno 2007



60 MPH, 15 DPH students



Ragnhildur Guðmundsdóttir
DrPH project:
Posttraumatic Stress and Long-term Morbidity after Natural Disasters
– Tsunami
- Avalanches



Agnes Gísladóttir
Hjúkrunarfræðingur
DrPH project:
Incidence, risk factors and consequences of sexual violence in Reykjavik 1993-2007



Edda Björk Þórðardóttir
DrPH project
Posttraumatic Stress and Health of Survivors of Vestfjords avalanches

Avalanches in Vestfjords Edda Björk Þórðardóttir PhD student



- Follow-up of all 600 survivors of Vestfjords avalanches
 - Pre-study of 70 individuals in 2007 indicates that:
 - Still 30% suffer from PTSD symptoms
 - Those that have moved away from the villages are worse of
- Þórðardóttir and Smári, 2008

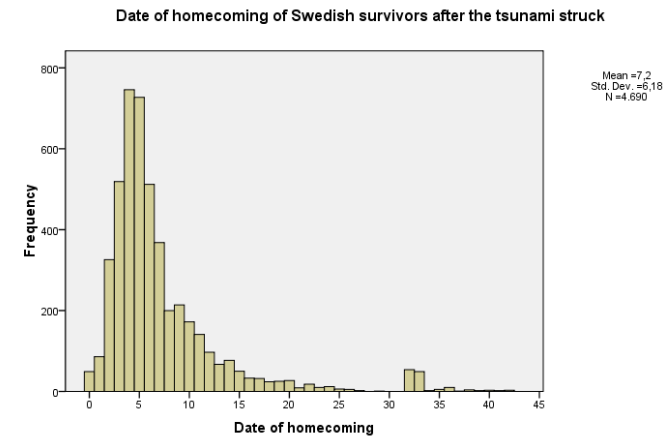
TSUNAMI

SA Asia, 26. december 2004
Ragnhildur Guðmundsdóttir PhD student

- 18.000 Swedes at trauma sites
- Study on 5000 Swedes who survived the Tsunami in SA Asia in Dec. 2004
 - Duration on trauma site?
 - Delay of identification of deceased significant others?



Vilken dag kom du till Sverige?



Date of homecoming as wished?

	Content 2597 (54%)	Too late 635 (13%)	Too early 1613 (33%)
Gender			
-female	1407 (53%)	404 (15%)	868 (32%)
-male	1186 (55%)	231 (11%)	744 (34%)
Age			
-0-19	154 (52%)	43 (15%)	97 (33%)
-20-39	840 (53%)	255 (16%)	487 (31%)
-40-69	1540 (55%)	321 (11%)	966 (34%)
-70+	55 (43%)	13 (10%)	61 (47%)
Education			
-basic	403 (51%)	82 (10%)	313 (39%)
-high school	1041 (53%)	268 (14%)	662 (34%)
-college or more	1133 (56%)	279 (14%)	619 (31%)
Revisiting trauma site			
-yes	563 (45%)	163 (13%)	522 (42%)
-no	1985 (56%)	470 (13%)	1073 (30%)

Homecoming and 14-month morbidity

	Dec. 27-29 n=931	Dec.30 - Jan.1 n=1994	Jan. 2-4 n=782	Jan. 5-7 n=410	Jan. 8-13 n=283
Sick leave last month OR (95%CI) AOR*	1.8 (1.3-2.5) 1.5 (1.0-2.3)	1.6 (1.2-2.2) 1.3 (0.9-2.0)	1.1 (0.7-1.5) 0.9 (0.6-1.5)	1.0 (0.6-1.4) 0.8 (0.5-3.2)	Ref.
GHQ (≥ 2) OR AOR*	1.9 (1.4-2.7) 1.5 (1.0-2.3)	1.8 (1.3-2.5) 1.4 (0.9-2.1)	1.3 (0.9-1.9) 1.1 (0.7-1.8)	1.5 (1.0-2.2) 1.6 (1.0-2.6)	Ref.
IES – total score ($>80^{\text{th}}$ percentile) OR AOR*	2.9 (1.9-4.5)	2.4 (1.6-3.6)	1.5 (1.0-2.4)	1.6 (1.0-2.5)	Ref.
IES – avoidance ($>80^{\text{th}}$ percentile) OR AOR*	3.2 (2.1-4.8) 2.3 (1.4-3.7)	2.7 (1.8-4.0) 1.9 (1.1-3.9)	2.0 (1.3-3.0) 2.0 (1.2-3.2)	1.7 (1.1-2.7) 1.8 (1.0-3.1)	Ref.
IES – intrusion ($>80^{\text{th}}$ percentile) OR AOR*	2.6 (1.8-3.8)	2.4 (1.7-3.4)	1.3 (0.9-2.0)	1.5 (1.0-2.4)	Ref.
IES – hyper-arousal ($>80^{\text{th}}$ percentile) OR AOR*	2.5 (1.7-3.7)	2.1 (1.5-3.1)	1.4 (1.0-2.1)	1.4 (0.9-2.2)	Ref.
Antidepressants last month OR AOR*	2.9 (1.1-7.6)	1.8 (0.8-4.2)	1.8 (0.7-4.4)	1.8 (0.7-4.6)	Ref.

Delay of realisation/ confirmation of loss

Delay in realizing death of significant other:	
-24 hours or less	84 (35%)
-2 – 7 days	95 (39%)
-8 days or more	63 (26%)
Delay in confirmation of death of significant other:	
-3 days or less	26 (10%)
-4 days – 1 month	30 (12%)
-1 – 6 months	146 (59%)
-more than 6 months/not confirmed at 14 months	47 (19%)

Conclusion

- Stressful events are important risk factors for disease and disability
- This risk may be modified by appropriate reactions of decision makers in times of crisis
- More research is needed to guide the actions of responsible professionals

Conclusion 2: Enjoy life!!

