

Psychological Factors Affecting Health after the Chernobyl Disaster: A 20-Year Review

Johan M. Havenaar
Department of Psychiatry
VU Medical Centre
GGZ Buitenamstel,
Amsterdam
March 24, 2006



The psychological impact of the Chernobyl disaster

- Disaster: Latin “ bad star” or “ill fate”
- From the beginning debate about the extent of psychological damage
- Chernobyl disaster viewed as a worst case scenario, associated with nuclear energy production
- The general public regards nuclear power with almost apocalyptic awe



2006 Report of the Chernobyl Forum

“The mental health impact of Chernobyl is the largest public health problem caused by the accident to date.”

What is the evidence that documents this conclusion?



Psychological consequences of disasters

- Over the past 100 years, many descriptive epidemiologic and clinical studies of the psychological impact of natural and human-made disasters

*high risk groups

*general population



Psychological impact of disasters

- Depression (suicide)
- Anxiety (especially post-traumatic stress)
- Medically unexplained physical sx (MUPS) (fatigue, weakness, headaches, joint and muscle pain)
- Substance abuse
- Changes in health related behaviour
 - Increased medical service utilization
 - Changes in attributional style



Common risk factors for adverse emotional outcomes after disasters:

- Personal:
female; having young children; prior psychiatric or alcohol history; poverty; low social support; poor physical health
- Disaster:
magnitude & severity of exposure; number of deaths; evacuation; death of a loved one; physical threat
- Post-disaster:
inadequate practical or emotional support; inadequate or inappropriate professional interventions; media coverage



Two post-disaster risk factors unique to toxic disasters

Stigma

&

Fear of cancer and congenital
abnormalities



Radiation events and stigma

- Japanese survivors – hibakusha (explosion-affected people)
 - A-bomb neurosis – excessive anxiety about health and fear of cancer
-
- Chernobyl evacuees - “glow worms”
 - Vegetative dystonia – weakness, headaches, fatigue (non-specific physical sx and stress reactions)
 - Radiophobia – excessive anxiety (derogatory & non-scientific)



Features that Chernobyl a “high-risk” disaster (1)

- Widespread exposure
- Death toll??
- Delayed, chaotic and permanent evacuation
- Abortion assembly-lines
- Battle for residency permits
- Increase in thyroid disease in exposed children



Chernobyl features (2)

- Incomplete disclosure by authorities
- Prolonged contradictory reports by news media
- Distrust in government authorities
- Wide array of symptoms attributed to event by medical community
- Intensive health monitoring by international community



Chernobyl features (3)

- Followed by political and social upheaval
- Decline in standard of living
- Periods when food and electricity were not available
- Shortening of life expectancy in men
- Broken promises in terms of benefits to evacuee pop.
- Locally referred to as “second Chernobyl”



Evidence on psychological “fall-out”

cautionary comments



1. Context of the research

- Prior to Chernobyl, no tradition of: epidemiology or of western psychiatry
- No baseline data on prevalence of mental illness, mental retardation, dementia, or alcoholism
- Suicide data unreliable
- No experience adapting standardized tools for studying well-being used in other parts of the world



2. Disentangling the effects of multiple stressors

- Socio-economic conditions and political turmoil also contributed to pop. mental health
- Chernobyl itself entailed multiple stressors
- Complex web of exposures whose effects are inseparable



3. Reliable psychological research began 6 years later

Acute psychological effects, and effects during first 5 years, were not documented at the time they occurred



Areas of research

1. Population-based morbidity studies
2. Cognitive impairment in at risk children
3. Mental health of liquidators



Four population-based morbidity studies

- Finnish/Russian community study
- Dutch/Belarus epidemiologic study
- US/Kiev high risk group study
- Ukraine national survey findings



Population-based morbidity studies: conclusion

- Significant adverse psychol consequences – prolonged (anxiety, MUPS)
- - increased use of medical services
- No apparent rise in diagnosable disorder
- Risk factors – female, having young children, poverty, risk perceptions

Consistent with research on TMI and Hiroshima/Nagasaki, and toxic disasters



(2) Cognitive Impairment in Children

International Pilot Study of Brain Damage In-Utero (WHO) (age 7)

Additional follow-up in Belarus

Additional work in Kiev RCRM

Stony Brook/Kiev research (age 11)

Israeli study of children expo < age 4 (+ in utero)



Cognitive Impairment in Children

Each study involved:

- a battery of neuropsychological tests of memory, intelligence, attention
- standard psychological evaluations
- non-exposed control group
- Separate evaluation of children *in utero*



Cognitive Impairment in Children

No exposure effects:

- WHO sample (age 7, from all 3 republics)
- Stony Brook/Kiev (age 11)
- Israeli sample (from Gomel (hi expo; N=667), Mogilev & Kiev (mild expo; N=408), and non-expo regions (N=564))



Cognitive Impairment in Children: Conclusion

Highest levels of exposure in exposed children were lower than the levels at which mental retardation was found in the offspring of Hiroshima/Nagasaki survivors

Tentative conclusion: no compelling evidence suggesting adverse effects of radiation exposure



(3) Mental health of liquidators

2 issues:

Effects of exposure on neurocognitive
impairment (3 reports)

Emotional or alcohol-related consequences



Suicide: Estonia

Rahu et al. 1997

- Cohort of ~5,000 cleanup workers assembled in 1992; ave. age at arrival at C. = 32 yrs
- No significant excess of cancer deaths (1986-1993)
- Significant excess of suicide (SMR=1.52; 95% CI=1.01-2.19)



Mental health of liquidators: conclusion

- Mental health effects are unknown, but findings on neurocognitive effects are dubious (or reflect excess alcoholism)
- Suicide findings are worrisome
 - *Dropped the ball in this area:*
- Occupational stress research → significant diff's in alcoholism and depression between C-expo and other work forces



Does the evidence support the WHO
conclusion about public mental
health impact of Chernobyl?



Conclusions

- Psychological impact is long-term, protracted
- Anxiety, depression, MUPS
- Increased use of medical services
- High risk groups (women, mothers, evacuees)
- No evidence of brain effects or diagnosable psychiatric disorders
- Psychological effects not only in area of mental health, but also in health-related behaviours



Are the findings from Chernobyl unique?

- Findings are consistent with research on other toxic exposures
- Consistency of the basic findings with other research is crucial aspect of one's ability to generalize (Rothman & Greenland 1998)

TMI	A-bomb
Bhopal	Tokyo gas attack
Chemical spills	Persian Gulf
Toxic waste leaks	Occup. Exposures



Future directions

- Descriptive studies of clean-up workers
- Analytic epid. studies of risk and protective factors for psychiatric problems
- (testable) interventions to reduce the level of psychological morbidity:
 - Medical professionals/health authorities
 - Local research communities
 - Participants in ongoing research studies
- Public health community must take other health impacts seriously



Thank you for your attention

