



Disasters and sleep disruptions

Dr. Edda Björk Þórðardóttir
Postdoctoral researcher, University of Iceland

WP.3





Researchers

- **University of Iceland**
 - Arna Hauksdóttir, professor
 - Berglind Guðmundsdóttir, associate professor
 - Unnur Valdimarsdóttir, professor
- **Karolinska Institutet**
 - Christina Hultman, professor
 - Fang Fang, associate professor
 - Hilda Daníelsdóttir, MA student
 - Huan Song, postdoc
- **National Centre for Disaster Psychiatry in Sweden**
 - Filip Arnberg, director and associate professor





Background

- Previous studies have indicated a relationship between psychological trauma and sleep disturbances
- The majority of studies assessing sleep disruptions are based on trauma occurring in adulthood
- The effects of trauma exposure in childhood on long-term sleep problems have received limited attention, particularly in the disaster field
- Children are a predominantly vulnerable group in the post-disaster period and likely to have difficulty recovering from the impact of disasters





Southeast Asia tsunami

- In December 2004 the massive Sumatra-Andaman earthquake caused tsunamis in the Indian ocean, taking the lives of over 200,000 individuals
- 543 Swedes lost their lives in the tsunami
- Previous studies have found adult Swedish survivors of the tsunami in 2004 to be at increased risk of psychiatric disorders throughout the first 5 years following the trauma





Aim

- Assess the association of sleep medication usage and disaster exposure from 2005-2009 among Swedish survivors of the 2004 southeast Asia tsunami





Methods

- The Swedish tsunami cohort consists of 3742 children and 8762 adults who arrived at Swedish airports from Dec 26th 2004 to Jan 15th 2005 and were confirmed alive through police registries
- 864 088 unexposed native Swedish adults and 320 828 unexposed Swedish children matched for sex, age, and socioeconomic status were also included in the study
- The cohort were cross-linked to the Swedish Prescribed Drug Register for ascertainties of hypnotic medication use from 2004-2009



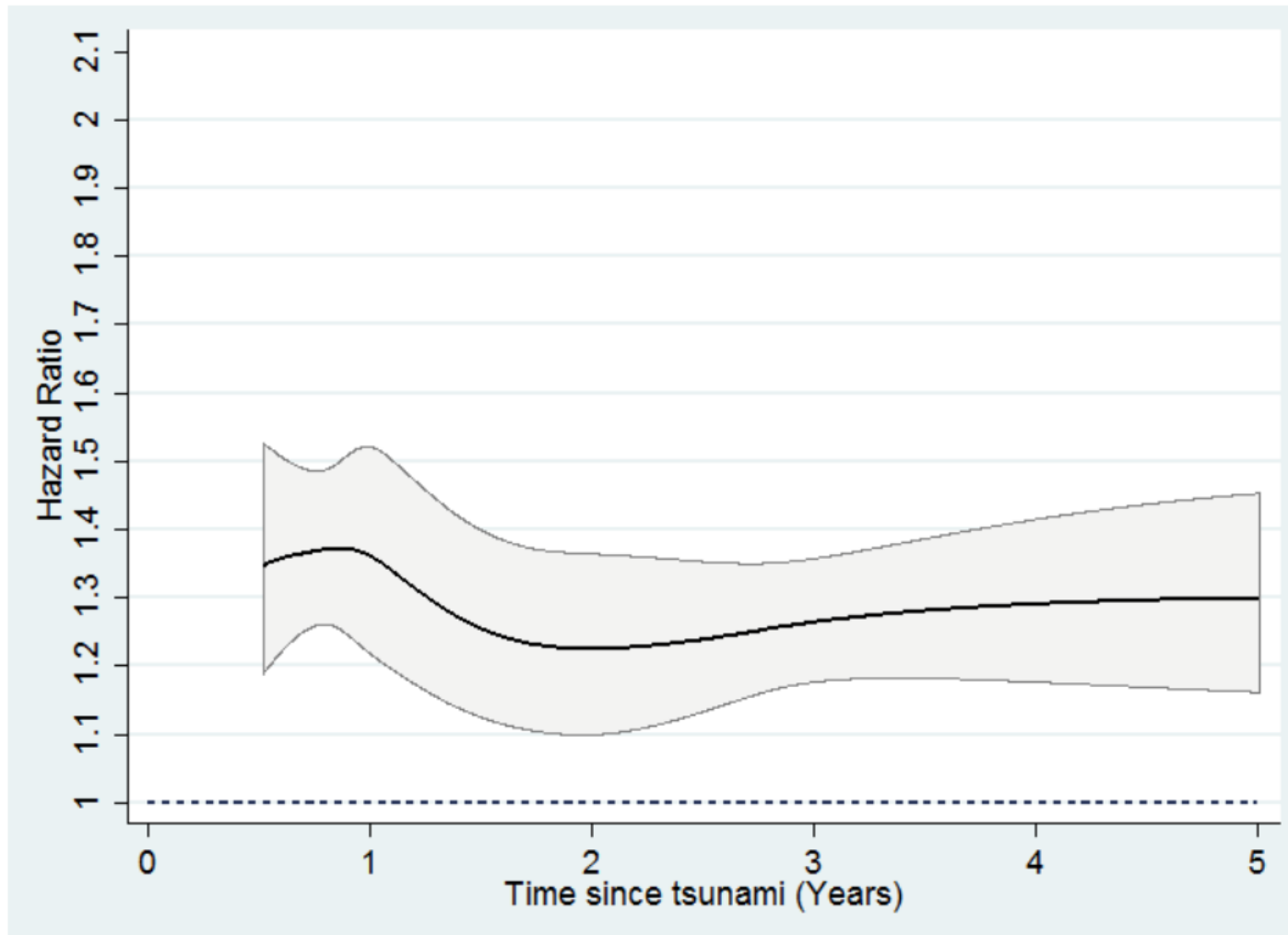


Figure 1a. Hazard ratio's and 95% CIs of hypnotic medication dispensations in adult tsunami survivors as compared with matched unexposed individuals, adjusted for pre-disaster psychiatric history. Hazard ratios were estimated from flexible parametric survival models.

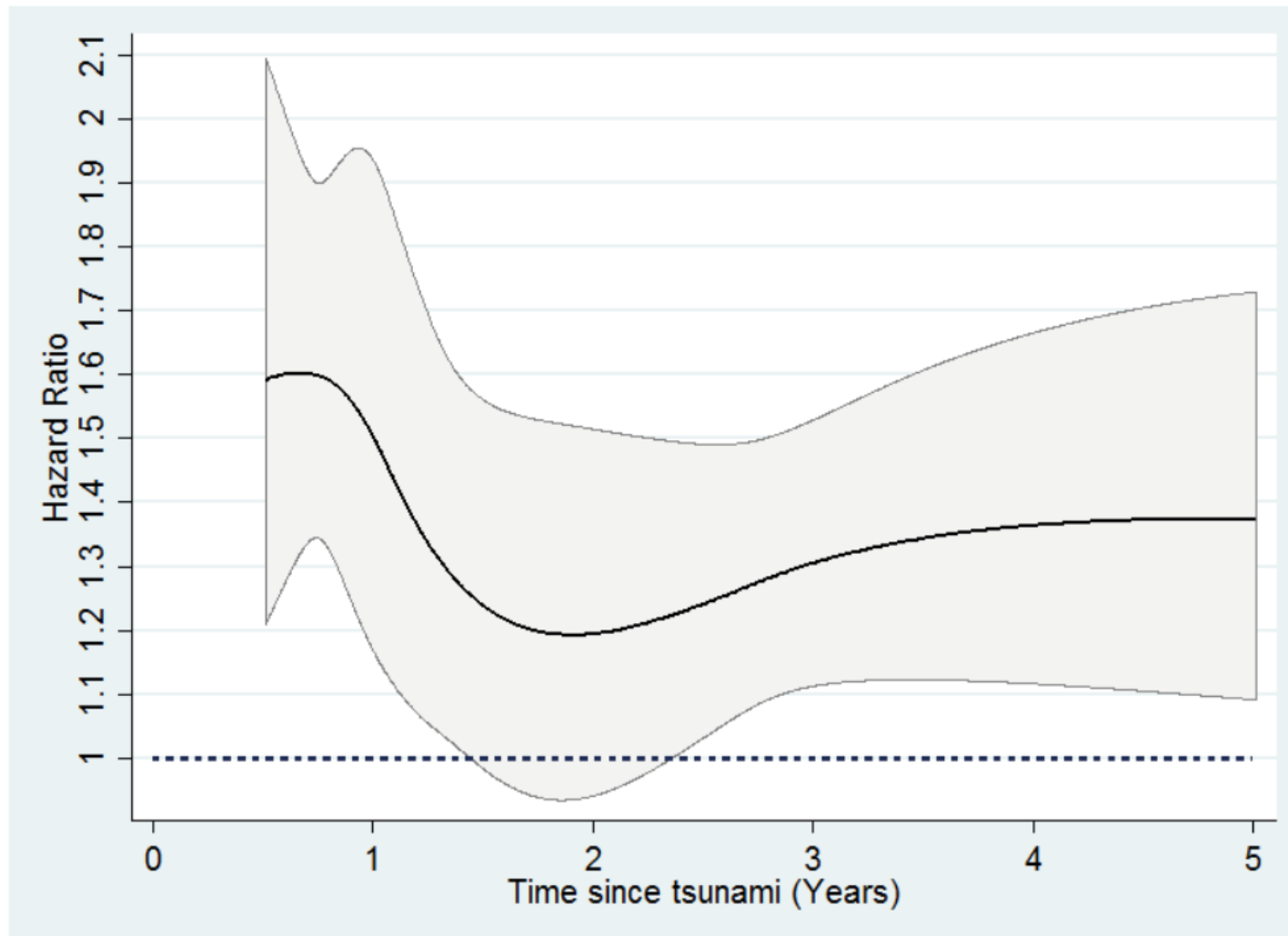


Figure 1b. Hazard ratio's and 95% CIs of hypnotic medication dispensations in directly exposed adult tsunami survivors as compared with matched unexposed individuals, adjusted for pre-disaster psychiatric history. Hazard ratios were estimated from flexible parametric survival models.

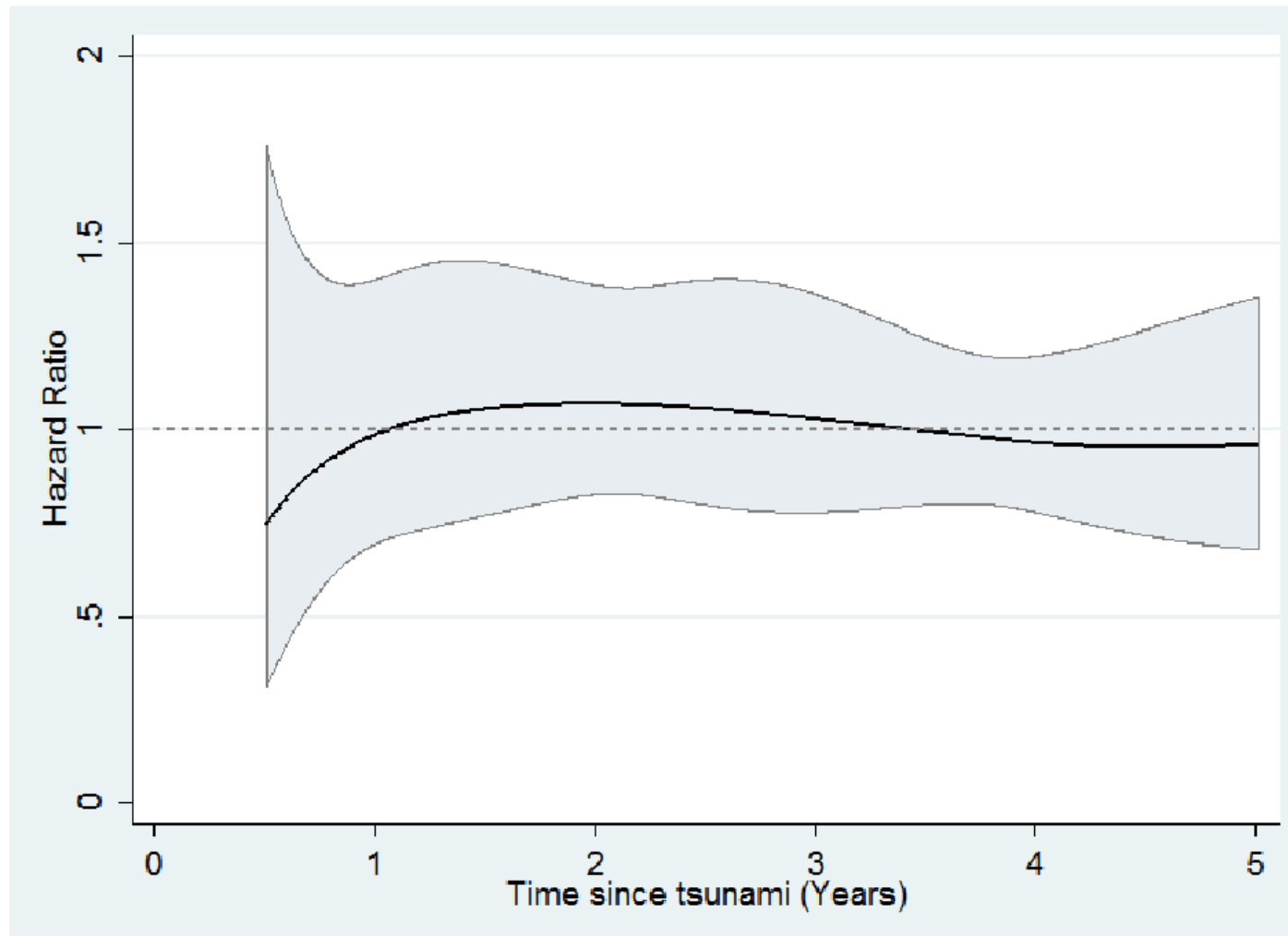


Figure 1. Hazard ratio's and 95% CIs of hypnotic medication dispensations in child and adolescent tsunami survivors as compared with matched unexposed individuals, adjusted for pre-disaster psychiatric history. Hazard ratios were estimated from flexible parametric survival models.



Conclusions

- Our preliminary results indicate that adult Swedish tsunami survivors are at increased risk of sleep medication use, compared to unexposed Swedes, at 5 years follow-up
- No significant difference was found in sleep medication usage among child tsunami survivors as compared to unexposed individuals





Avalanches in Iceland





Background

- 15% of childhood survivors experience avalanche-specific PTSD symptoms 16 years post-disaster¹
- Our results indicate a chronicity of trauma-related sleep disturbances in childhood trauma survivors, lasting into adulthood²
- Survivors who were children at the time of exposure were more than twice as likely to have trauma-related sleep disturbances, particularly symptoms of acting out than their non-exposed peers²



¹Thordardottir et al. (2016) *The manifestations of sleep disturbances 16 years post-trauma*. *Sleep*

²Thordardottir et al. (2016). *Sixteen year follow-up of childhood avalanche survivors*. *European Journal of Psychotraumatology*



Aims

- The aim of this study was to examine disaster specific risk and resilience factors, such as exposure severity, loss and social support in relation to sleep disturbances among avalanche survivors in Iceland





Pittsburg Sleep Quality Index

19-item self-report

- Assesses past month:
 - subjective sleep quality
 - sleep latency
 - sleep duration
 - habitual sleep efficiency
 - sleep disturbances
 - use of sleeping medication
 - daytime dysfunction





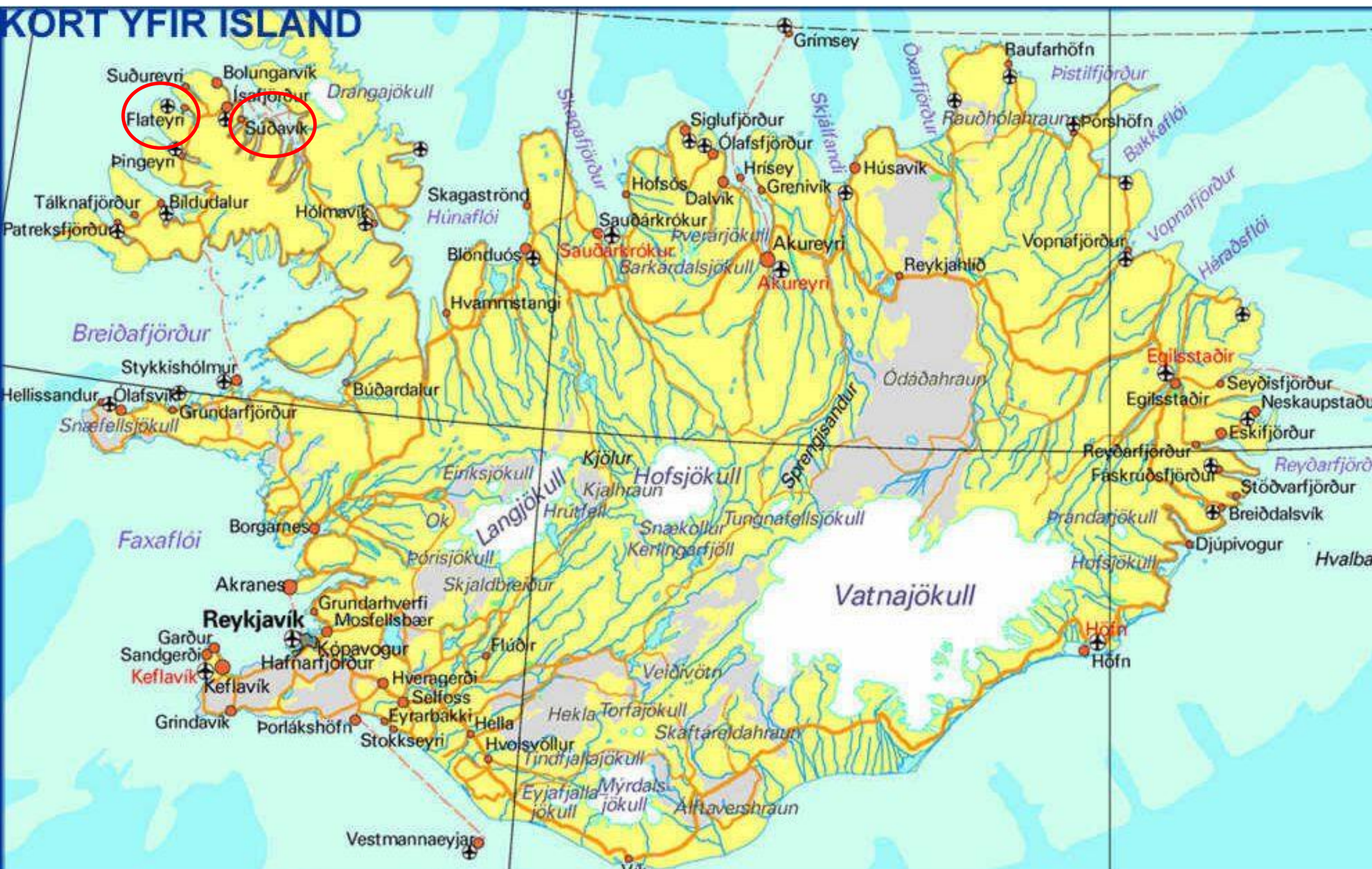
PSQI Addendum for PTSD

- Assesses disruptive nocturnal behaviors common to trauma, particularly:
 - Hot flashes
 - General nervousness
 - Memories/nightmares of trauma
 - Anxiety/panic not related to trauma
 - Bad dreams not related to trauma
 - Episodes of terror or screaming
 - Acting out dreams





KORT YFIR ISLAND





Results

- Lack of social support, feelings of intense fear or shock and caregiver outbursts of anger in the aftermath of the disaster independently predicted trauma-related sleep disruptions 16 years post-trauma
- Interventions need to focus on alleviating caregivers own distress symptoms, as the former may have a large impact on children's recovery process





Future research

- Trauma-related sleep disturbances
 - The prevalence of a newly proposed trauma-related sleep disorder in the Stress and Gene Analysis (SAGA) Cohort study
 - Whether the manifestations of trauma-related sleep disturbances differ depending on the developmental stage or age at the time of trauma exposure
- Psychiatric diagnoses following the SA-Asia 2004 Tsunami
 - The risk of psychiatric diagnoses 5-10 years after exposure to the tsunami in 2004
 - The Swedish tsunami cohort consists of 3742 children and 8762 adults, as well as 864 088 unexposed adults and 320 828 unexposed children matched for sex, age, and socioeconomic status





Thank you!



HÁSKÓLI ÍSLANDS
HEILBRIGÐISVÍSINDASVIÐ



EXTRA SLIDES





Table 3. Hypnotic medication dispensation post-disaster among adults in the tsunami cohort and unexposed adults with regard to tsunami-specific PTSD symptoms.

	Exposed	Unexposed	Crude HR (95% CI)	Adjusted HR¹ (95% CI)
Impact of Event Scale				
PTSD symptoms above cut-off ²	119/601 (19.8%)	N/A	1.38 (1.15-1.65)	1.37 (1.14-1.64)
PTSD symptoms below cut-off ³	752/3956 (19.1%)	N/A	1.31 (1.22-1.41)	1.31 (1.22-1.41)

¹Adjusted for pre-disaster psychiatric history.

²Score \geq 40 on the Impact of Event Scale

³Score $<$ 40 on the Impact of Event Scale



Posttraumatic stress disorder

- PTSD is characterized by a failure to recover from a stress reaction following exposure to a traumatic event, manifesting as symptoms of:
 - re-experiencing
 - avoidance
 - negative alterations in cognitions and mood
 - alterations in arousal and reactivity
- Symptoms become persistent and last for years post-trauma if left untreated (Kessler et al., 1995)





PTSD and sleep

- Sleep disturbances are a core feature of PTSD, with an estimated 70% to 90% of adults with PTSD having difficulty initiating and maintaining sleep and up to 70% of them experiencing nightmares
- In PTSD treatment, sleep impairment is a frequent residual complaint and often continues to negatively impact trauma survivors' lives in the long-term

