The Privilege of Good Sleep? Understanding the Impact of Intersectional Social Inequalities and Neighborhood Context on Sleep Disparities

ESS-SHARE User conference

Wien, 10.10.2023

Enrique Alonso-Perez
Charité – Universitätsmedizin Berlin

DISCLAIMER

This is ongoing research and therefore only preliminary results.

The author takes sole responsibility for any issues with the analyses.

Please ask for authorized consent before sharing any information included here.

1

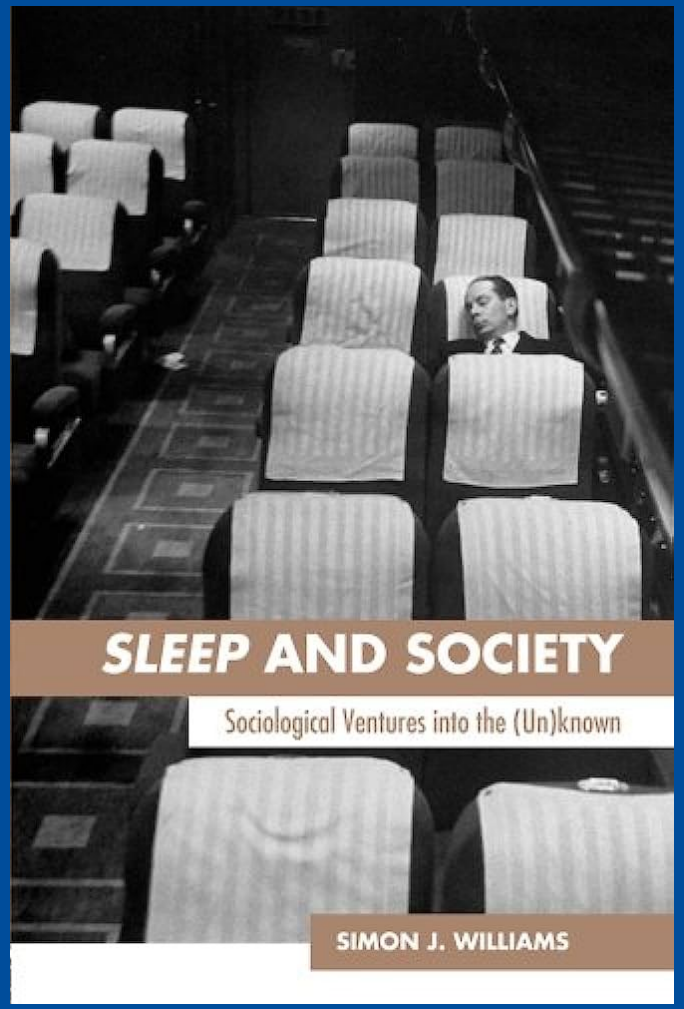
Background

Importance of sleep health

- Normal sleep is crucial for maintaining good health and overall well-being (Carskadon & Dement, 2005).
- Poor sleep is associated with multiple adverse health effects: elevated rates of all-cause mortality, chronic heart disease, diabetes, obesity and cancer (Hale et al., 2020).
- 10% - 15% adults report sleep problems (Kocevska et al., 2021) → "Epidemic of poor sleep"?
- Sleep problems are unequally distributed: sleep disparities.
- Importance of social determinants of sleep health: Women, people with migration background or lower SES: reporting more sleep problems.

“When we sleep, where we sleep, and with whom we sleep are all important markers or indicators of social status, privilege, and prevailing power relations.”

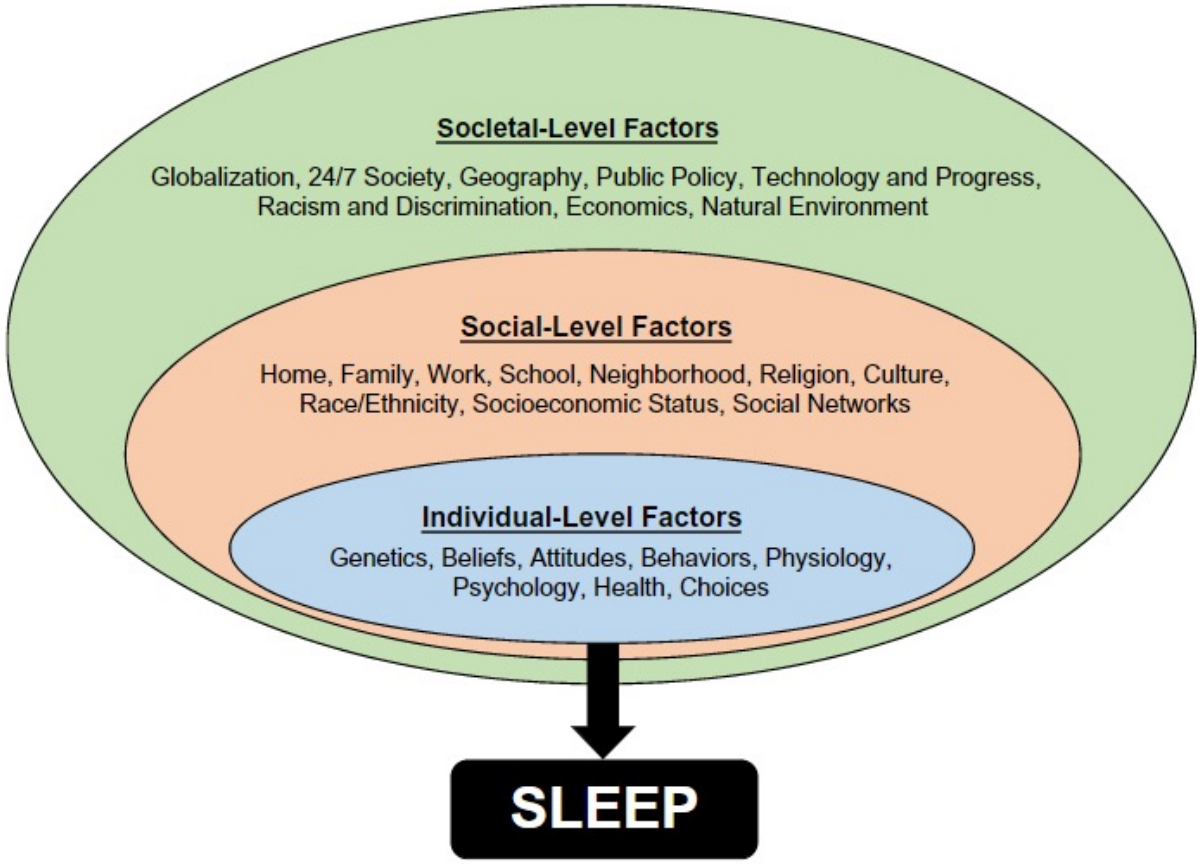
Simon J. Williams, *Sleep and Society* (2005)



Sleep as a social construct: Social-ecological model

- Sleep is adaptive to the physical and social environment: sleep health is a social construct (Grandner, 2019).
- Broader lens to encompass upstream effects and address social forces beyond the individual.
- Influences on sleep are primarily driven at the individual-level, but together, these interconnected levels jointly act as sleep health determinants.

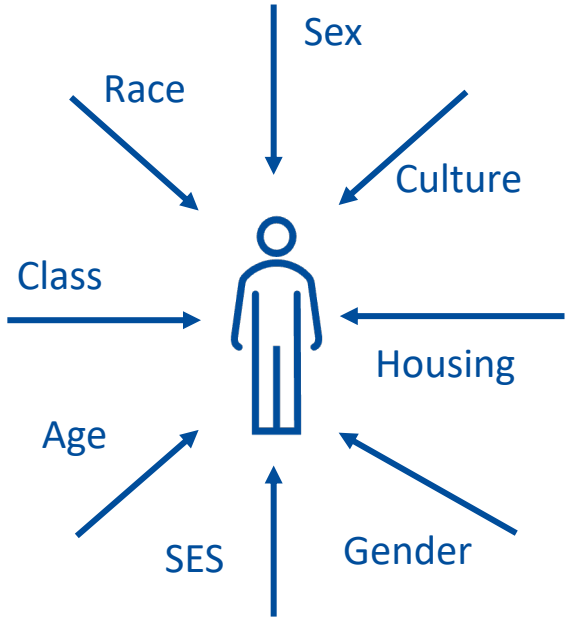
↳ Need to study them together



Adapted from Gradner (2019)

Intersectionality and Sleep

- Systems of power and structural inequalities oppress marginalized individuals situated at unique social positions, created by the intersection of several axes of social characteristics (Crenshaw, 1990).
- Unequally distributed social risks intersect in shaping the lived experience of sleep health (Jackson et al., 2020).
- Subgroups experience simultaneous dimensions of inequality.
- Identify which groups are at risk/resilient for sleep disparities (public health intervention targets).



Research Aims

1. Explore disparities in sleep disturbances accross intersectional strata.
2. Investigate to what extent sleep disturbances vary by the neighborhood context (intersectional social-level).
3. Identify which intersectional strata display different sleep disturbances than expected based on the main effects only (interactions).

2

Data and Methods

Methods

- SHARE waves 4 (2011) and 5 (2013)
- Analyzed sample: N = 26,850 adults aged 50 - 95
- Outcome variable: Sleep Disturbances Index (0 - 4) (Sterniczuk et al., 2013)
  Sum of four binary variables: trouble sleeping, bothered by sleeping problems, feeling fatigued, taking sleep medication
- Social determinants combined to create 96 intersectional social strata

Sex/gender (2)	Migration background	Education (ISCED-11)	Occupation (ISCO-88)	Neighborhood
Male	No	High	White-Collar	Cohesive & Privileged
Female	Yes	Medium	Blue-Collar	Cohesive & Deprived
		Low		Non-cohesive & Privileged
				Non-Cohesive & Deprived

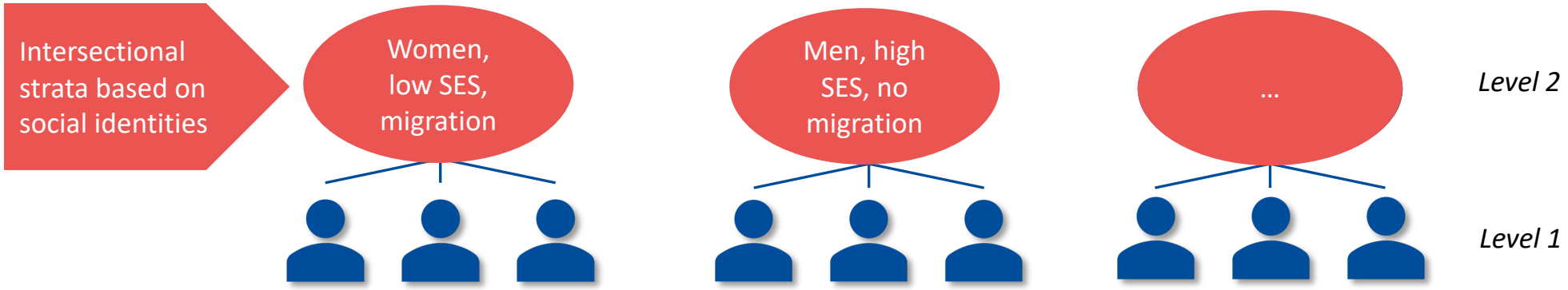
2x2x3x2x4=96

Methods: Multilevel Analysis of Individual Heterogeneity and Discriminatory Accuracy (MAIHDA)

Classic Multilevel models: nested data structure

Mapping Disparities

Determine whether effects are additive or multiplicative



- Measuring Variance Partition Coefficient (VPC) and Proportional Change in Variance (PCV)
- Proportion of Sleep Disturbances variation explained by strata (degree of clustering)
- Advantages

  (Merlo, 2018)

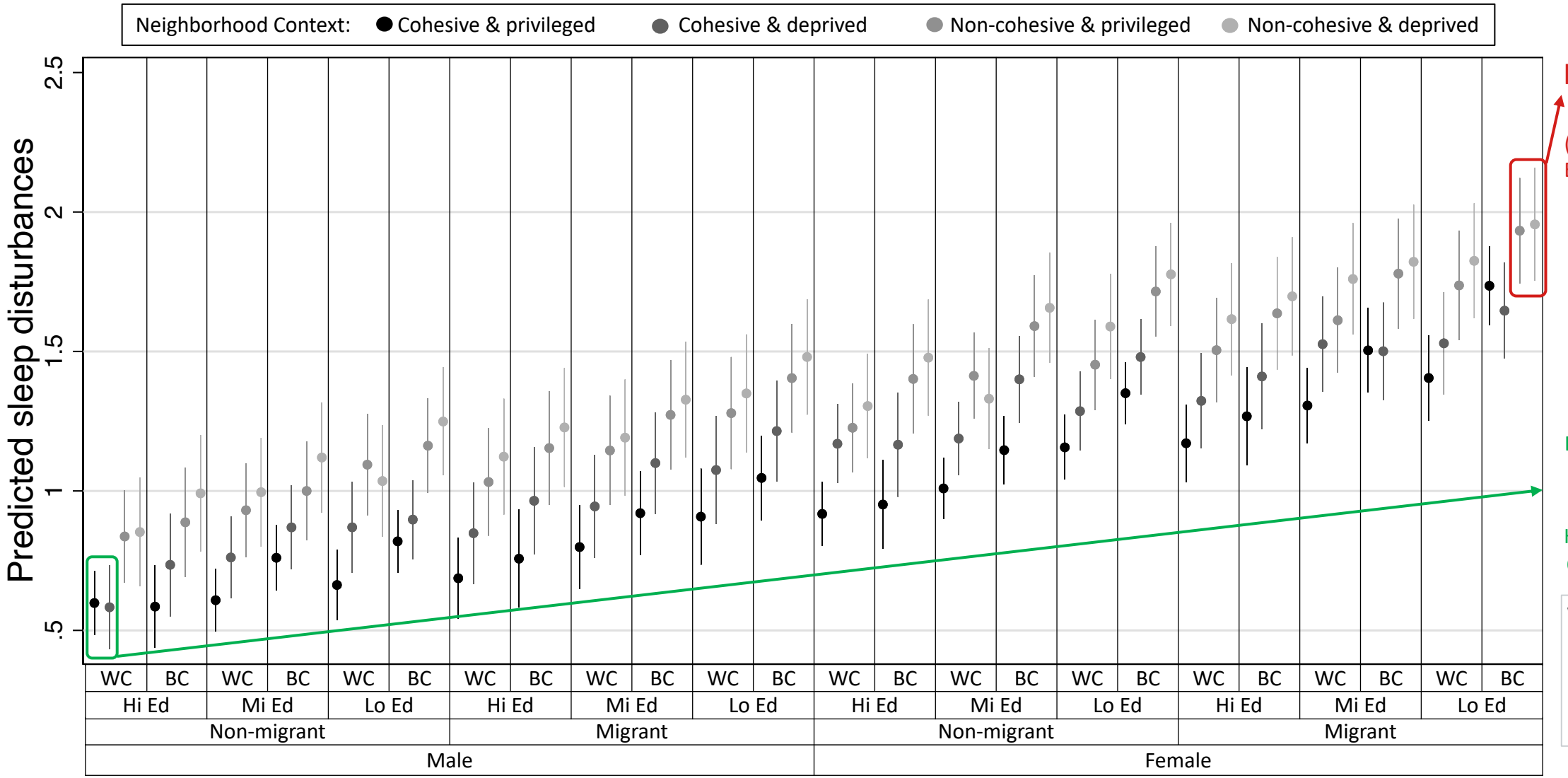
  → Theoretical: no reference category

  → Methodological: improved scalability and parsimony, adjustment for (small) sample size of strata

3

Results

Mapping intersectional disparities in sleep



Intersections in least advantaged positions (Female, Migrant, Low Education, Blue-Collar, Non-cohesive areas)

Intersections in most advantaged positions (Male, Non-migrant, High Education, White-Collar, Cohesive areas)

WC: White-Collar
BC: Blue-Collar
Hi Ed: High Education
Mi Ed: Mid Education
Lo Ed: Low Education

CHARITÉ

MAIHDA: Sleep disparities accross intersectional strata

Parameter (95% CI)	Model 1	Model2a	Model 2b	Model 2c	Model 2d	Model 2e	Model 5
Constant	**1.18 (1.10, 1.26)**	**0.9 (0.81, 0.98)**	**1.09 (0.98, 1.19)**	**1.03 (0.89, 1.17)**	**1.12 (1.01, 1.23)**	**0.99 (0.85, 1.12)**	**0.29 (0.17, 0.40)**
Age							**0.08 (0.07, 0.09)**
Sex/gender							
Male		*ref*					*ref*
Female		**0.51 (0.40, 0.63)**					**0.48 (0.42, 0.54)**
Migration							
Non-migration background			*ref*				*ref*
Migration background			**0.21 (0.05, 0.37)**				**0.24 (0.17, 0.30)**
Education							
High Education				*ref*			*ref*
Mid Education				0.16 (-0.04, 0.35)			**0.13 (0.05, 0.21)**
Low Education				**0.29 (0.10, 0.48)**			**0.25 (0.17, 0.33)**
Occupation							
White-Collar					*ref*		*ref*
Blue-Collar					0.12 (-0.04, 0.28)		**0.13 (0.07, 0.19)**
Neighborhood							
Cohesive & privileged						*ref*	*ref*
Cohesive & deprived						0.14 (-0.06, 0.33)	**0.14 (0.07, 0.21)**
Non-cohesive & privileged						**0.32 (0.12, 0.53)**	**0.34 (0.25, 0.43)**
Non-cohesive & deprived						**0.44 (0.23, 0.66)**	**0.41 (0.30, 0.51)**
Between-strata Variance (95% CI)	0.13 (0.09, 0.18)	0.06 (0.04, 0.09)	0.12 (0.08, 0.17)	0.11 (0.08, 0.17)	0.12 (0.02, 0.09)	0.10 (0.07, 0.15)	0.01 (0.00, 0.02)
Within-strata Variance (95% CI)	1.28 (1.26, 1.30)	1.28 (1.26, 1.30)	1.28 (1.26, 1.30)	1.28 (1.26, 1.30)	1.28 (0.01, 1.26)	1.28 (1.26, 1.30)	1.28 (1.26, 1.30)
VPC (%)	9.01%	4.39%	8.46%	8.23%	8.84%	7.51%	0.57%
PCV (%)	-	53.64%	6.68%	9.48%	2.09%	17.98%	94.23%

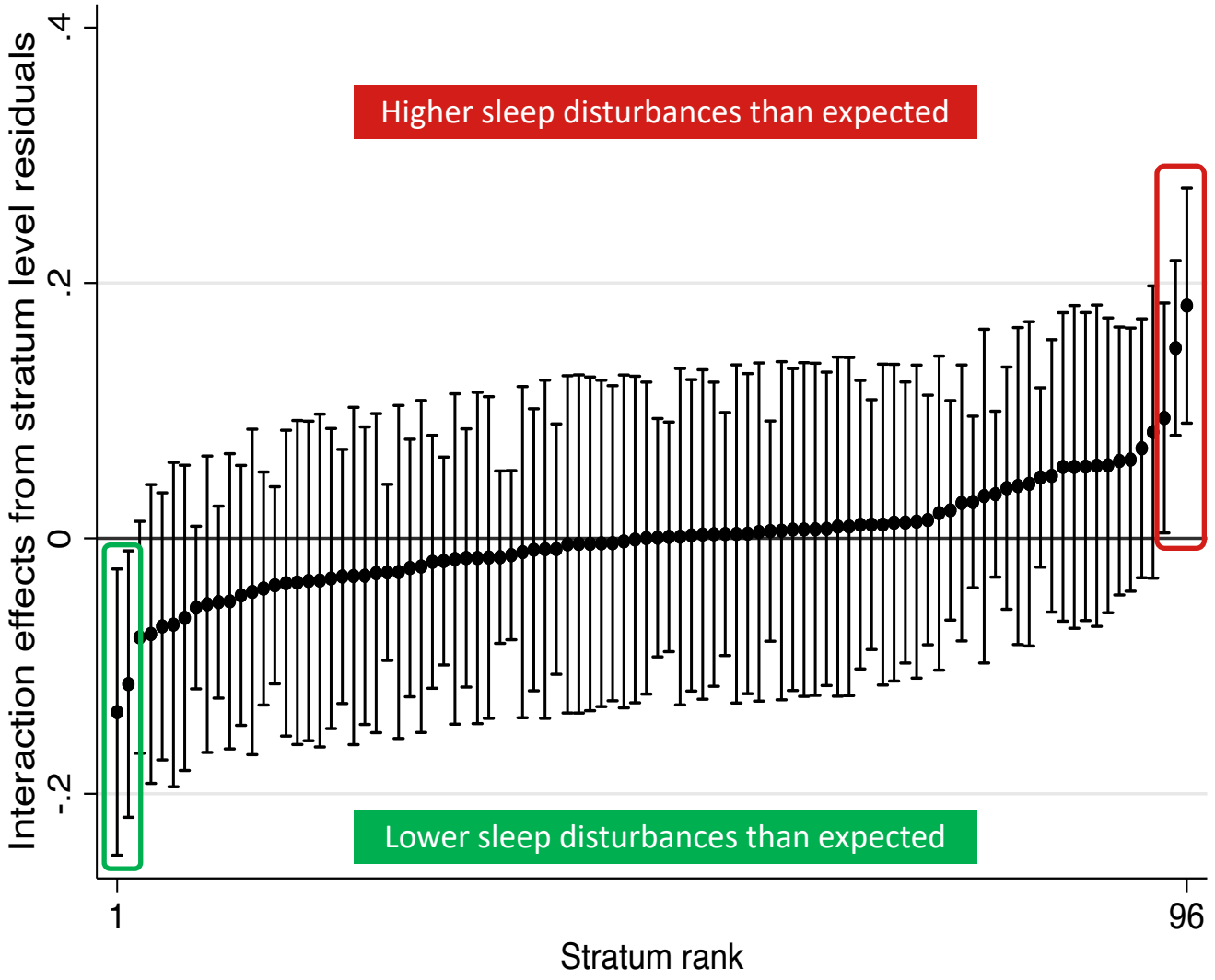
High between-strata variance

Variance explained by sex/gender

Mainly explained by main effects

Variance explained by neighborhood

Strata with intersectional interaction effects



Strata with intersectional interaction effects

	Sex/Gender		Migration		Education			Occupation		Neighborhood				
	M	W	No	Yes	Hi	Me	Lo	WC	BC	Cohesive & privileged	Cohesive & deprived	Non-cohesive & privileged	Non-cohesive & deprived	
Stratum	**Five Strata with the most positive (hazardous) interaction effects**													**Total predicted (95% CI)**
60														**0.18 (0.08, 0.27)**
53														**0.15 (0.07, 0.22)**
22														**0.09 (0.01, 0.18)**
86														0.08 (-0.03, 0.20)
67														0.07 (-0.04, 0.17)
	Five Strata with the most negative (protective) interaction effects													
85														-0.07 (-0.17, 0.04)
82														-0.07 (-0.20, 0.04)
50														-0.08 (-0.17, 0.01)
1														**-0.11 (-0.23, -0.01)**
93														**-0.14 (-0.27, -0.02)**

4

Discussion and Conclusion

Discussion

- Substantial sleep disparities between intersectional strata, mostly due to additive effects (Jackson et al., 2020).
- Stronger sleep risk factors:
  - Women: Physiological differences; more likely to sacrifice sleep for care (Patel et al., 2010; Hale et al. 2020).
  - Low-cohesive neighborhoods: residential seggregation, social fragmentation (Hill et al., 2016; Chen-Edinboro et al. 2016).

Limitations/open questions

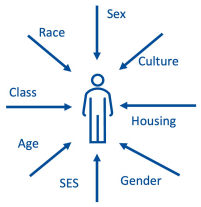
- Subjective measures: sleep & neighborhood.
- Modest intersectional interaction effects (high PCV).
- Choice of social categories needs to be rooted in intersectional theory.

Conclusions

Clear link between multiple social inequalities and sleep disturbances.

Precision public health measures beyond the individual: Importance of living environment.

MAIHDA valuable tool for mapping social and health inequalities.



Increased population diversity calls for intersectional approaches.

References

- Carskadon, M. A., & Dement, W. C. (2005). Normal human sleep: an overview. Principles and practice of sleep medicine, 4(1), 13-23.
- Crenshaw, K. (1990). Mapping the margins: Intersectionality, identity politics, and violence against women of color. Stan. L. Rev., 43.
- Chen-Edinboro, L. P., Kaufmann, C. N., Augustinavicius, J. L., Mojtabai, R., Parisi, J. M., Wennberg, A. M., Smith, M. T., & Spira, A. P. (2014). Neighborhood physical disorder, social cohesion, and insomnia: results from participants over age 50 in the Health and Retirement Study. *International psychogeriatrics*, 1–8.
- Grandner, M. A. (2019). Social-ecological model of sleep health. In *Sleep and health* (pp. 45-53). Elsevier.
- Hale, L., Troxel, W., & Buysse, D. J. (2020). Sleep Health: An Opportunity for Public Health to Address Health Equity. *Annual Review of Public Health*, *41*(1), 81-99.
- Hill, T. D., Trinh, H. N., Wen, M., & Hale, L. (2016). Perceived neighborhood safety and sleep quality: a global analysis of six countries. *Sleep medicine*, 18, 56–60.
- Jackson, C. L., Walker, J. R., Brown, M. K., Das, R., & Jones, N. L. (2020). A workshop report on the causes and consequences of sleep health disparities. *Sleep*, 43(8).
- Kocevska, D., Lysen, T. S., Dotinga, A., Koopman-Verhoeff, et al. (2021). Sleep characteristics across the lifespan in 1.1 million people from the Netherlands, United Kingdom and United States: a systematic review and meta-analysis. *Nature Human Behaviour*, *5*(1), 113-122.
- Merlo, J. (2018). Multilevel analysis of individual heterogeneity and discriminatory accuracy (MAIHDA) within an intersectional framework. *Soc Sci Med*, *203*, 74-80.
- Patel, N. P., Grandner, M. A., Xie, D., Branas, C. C., & Gooneratne, N. (2010). "Sleep disparity" in the population: poor sleep quality is strongly associated with poverty and ethnicity. *BMC Public Health*, *10*(1), 475.
- Sterniczuk, R., Theou, O., Rusak, B., & Rockwood, K. (2013). Sleep disturbance is associated with incident dementia and mortality. *Curr Alzheimer Res*, *10*(7), 767-775.

Many thanks for your attention

Questions?

enrique.alonsoperez@charite.de