

Work schedule, including rotating night shift work, and risk of breast cancer: a prospective cohort study

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Background

The International Agency for Research on Cancer (IARC) classified circadian rhythm-disrupting shift work as a probable (group 2A) carcinogen in humans

Working shifts or at night alters circadian rhythm, and modifies hormone levels, such as melatonin

Case-control studies suggest an increased risk of breast cancer among night shift workers

Cohort studies have had largely null results

The Nurses' Health Study II found that women who worked night shift for ≥20 years had an increased risk of breast cancer (Wegrzyn et al. 2017)

The Sister Study

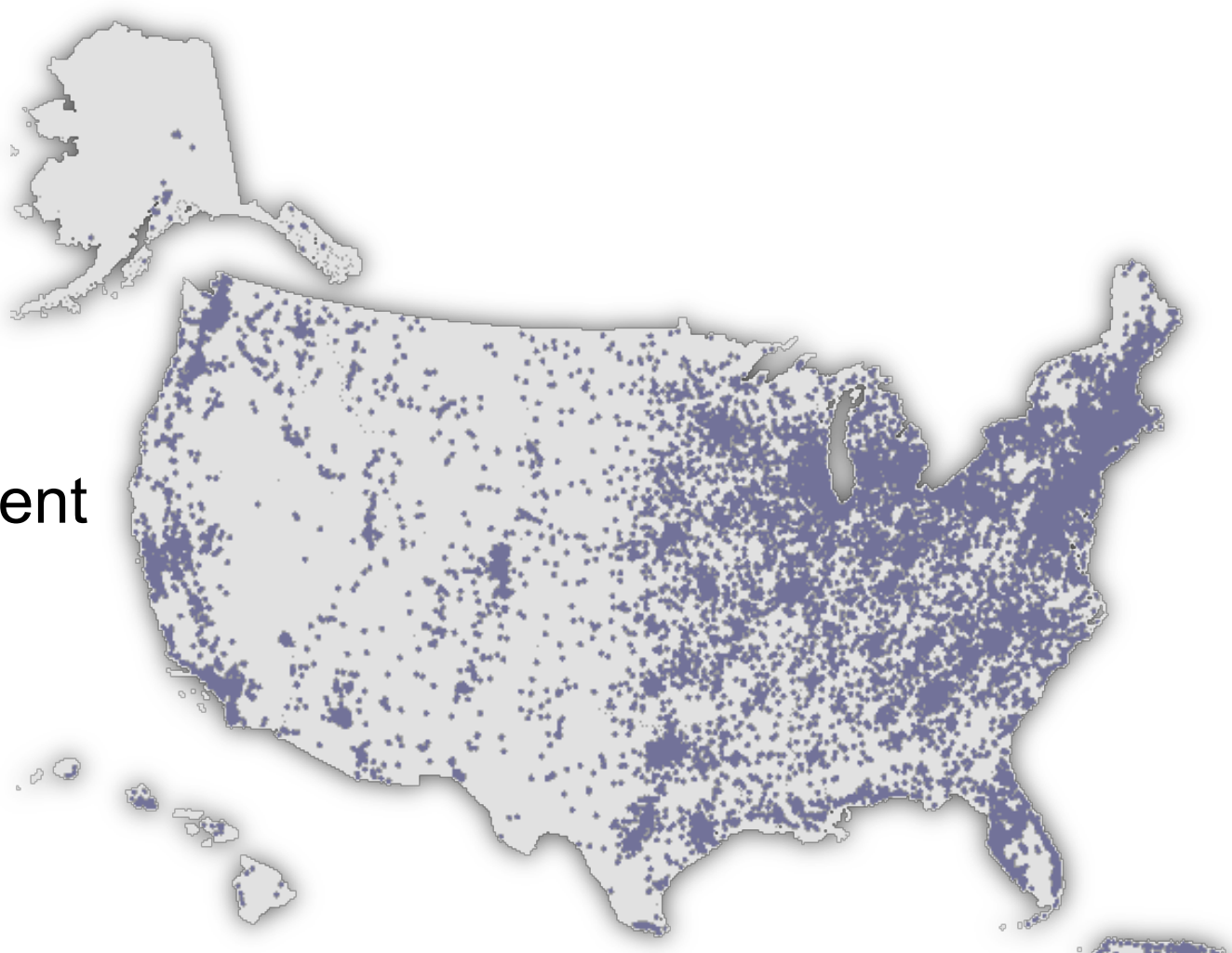
Nationwide prospective cohort (N=50,884)

- Women aged 35 to 74
- Recruited between 2003-2009
- Had ≥1 sister with breast cancer

Exclusions:

- N=57 women with breast cancer prior to completion of enrollment
- N=2,295 women who completed a different occupational questionnaire
- N=57 who were missing information on important covariates

N=48,452 women included in analysis
Followed for a mean of 9.1 person-years
N=3,191 incident breast cancer cases



Statistical Analysis

Exposure:

For current job and all past jobs held for ≥2 years

- Rotating shift work
- Rotating night shift work
- Any work at night
- Working irregular hours

Potential modifiers:

- Family history
- Race
- Estrogen receptor status
- Menopausal status

Outcome:

- DCIS and invasive breast cancer

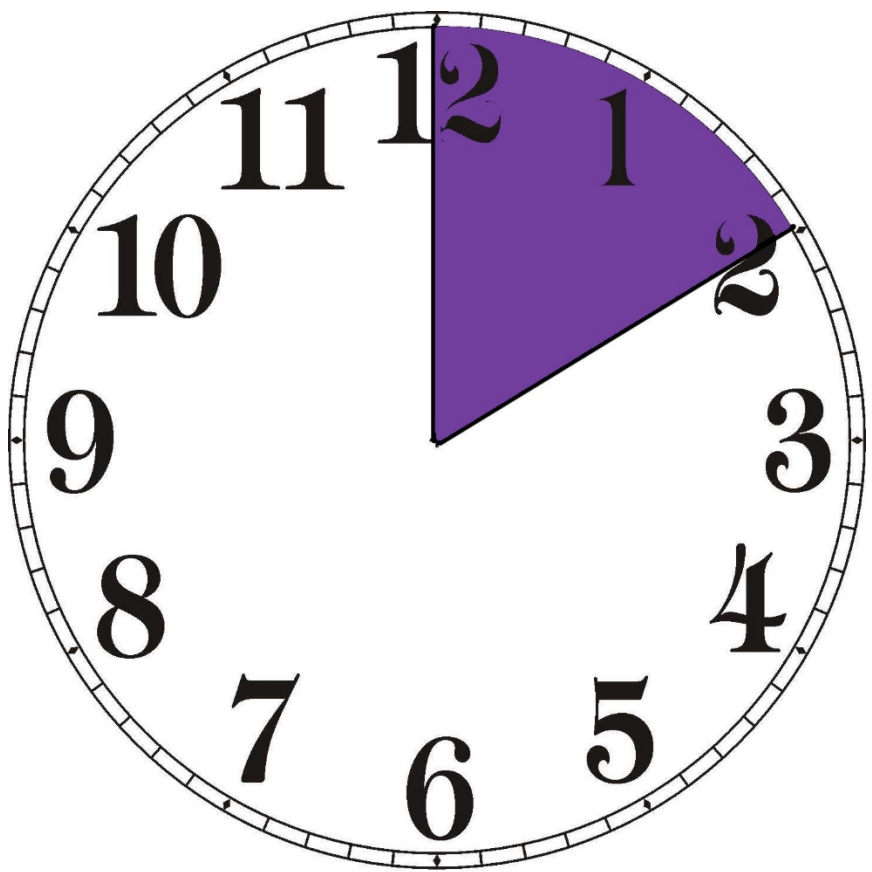
Statistical analysis:

Cox proportional hazards regression (age as time scale)

Adjusted for age, race/ethnicity,

education, marital status, parity

Deaths and losses to follow-up were censored



Night work: ≥1 hour between 12 and 2 am

Study Participant Characteristics

	Never night shift work (N=44,689)	Ever night shift work (N=2,275)	Work schedule	Proportion of population
Mean age	55.7	55.4	Rotating shift work	6.8%
Non-Hispanic white	83.4%	83.6%	Rotating night shift work	4.8%
Bachelor's degree or higher	51.1%	52.2%	Any night work	32.4%
Never married	5.4%	6.6%	Irregular hours	33.7%
Nulliparous	17.9%	20.6%		
Postmenopausal	65.6%	63.9%		

Discussion

Findings of a null association are generally consistent with other cohort studies

Increase in risk for shorter duration (>0-5 years) of night work jobs conflicts with findings from Nurses' Health Study II, which found that women who had worked ≥20 years of rotating night shift work at baseline were at increased risk (HR=2.15, 95% CI: 1.23-3.73) (Wegrzyn et al. 2017)

- Sister Study includes a wider range of occupations and had few long-term shift workers

Strengths:

Assessed lifetime occupational exposure
Occupational diversity (not limited to nurses)
Incorporates other non-night shift work schedules
Includes both invasive and DCIS cases

Limitations:

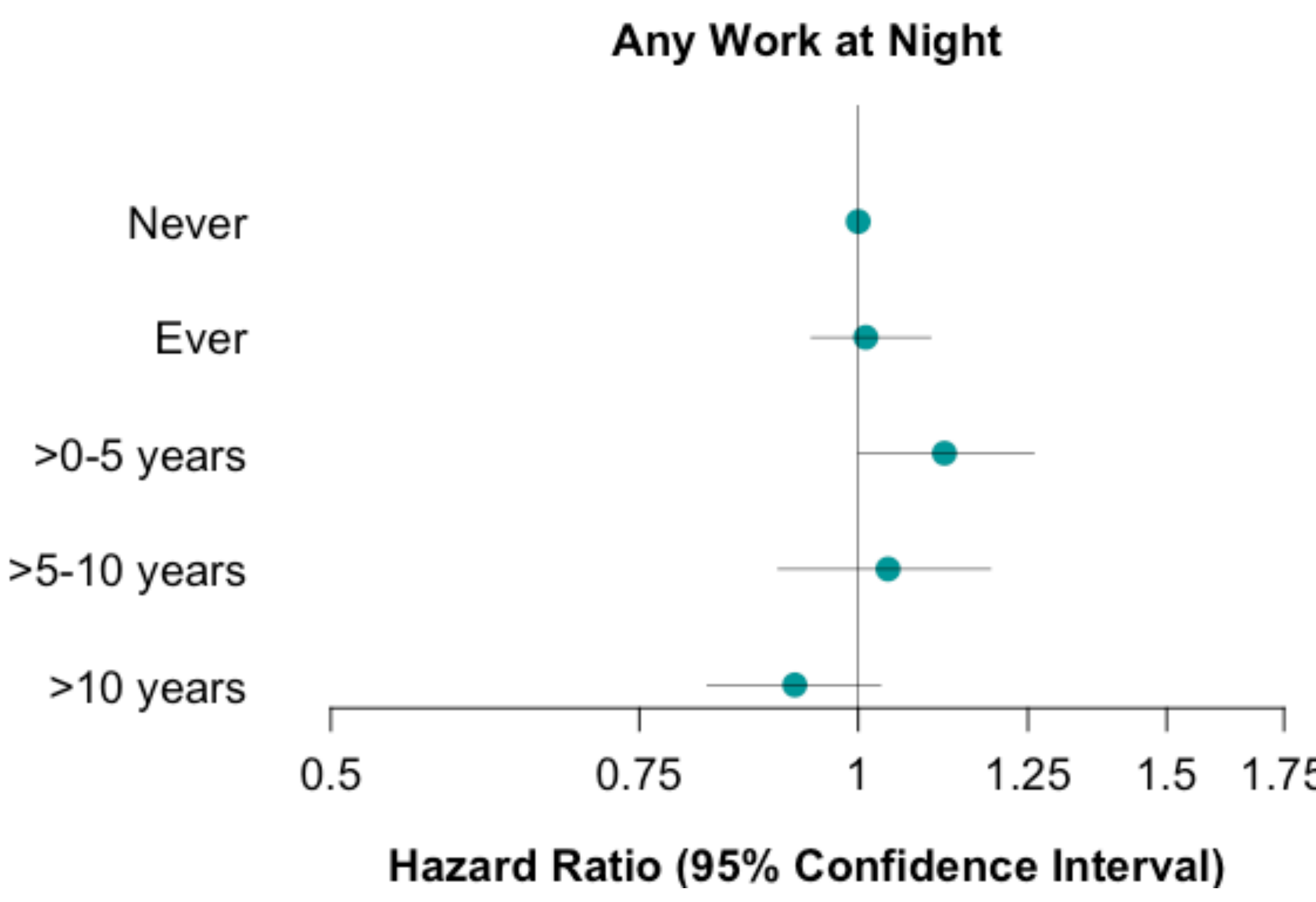
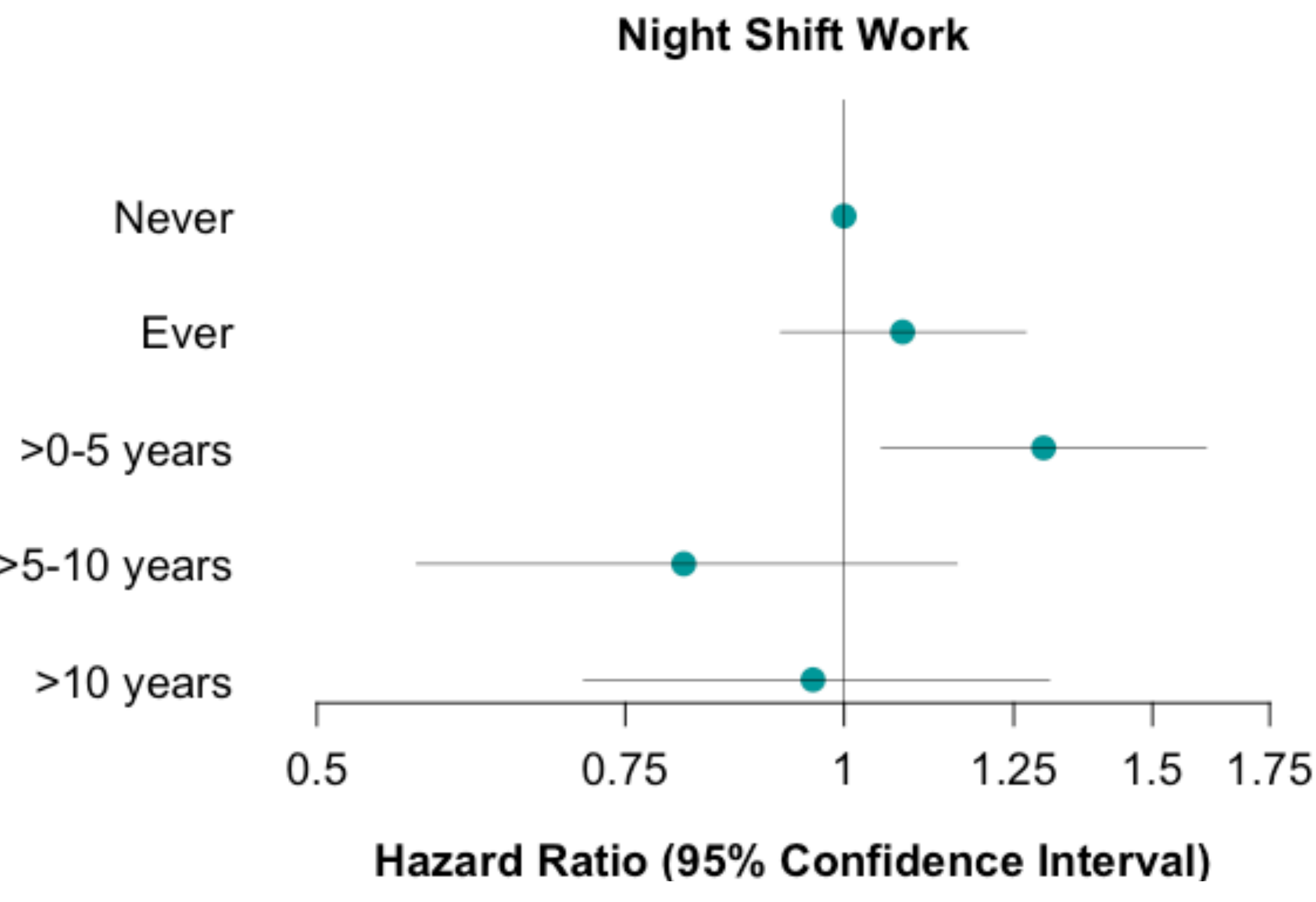
Underpowered for some stratified analyses
Retrospective exposure assessment

We observed little to no increase in breast cancer risk associated with rotating shift work or working at night

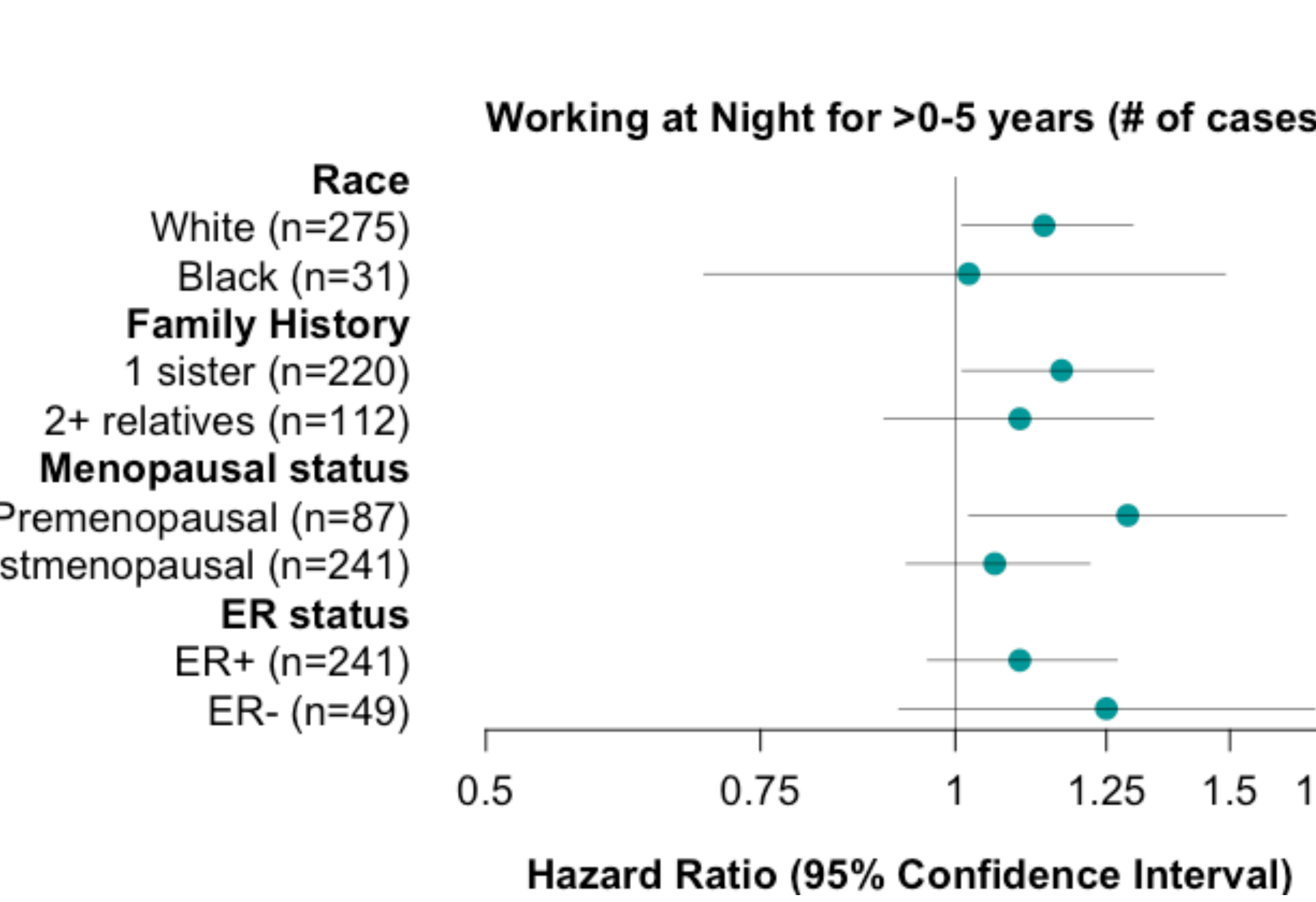
However, short-term night work was associated with an increased risk of breast cancer



Short-Term Duration of Night Work Associated with an Increased Risk of Breast Cancer



Association Not Modified by Participant or Disease Characteristics



Acknowledgments

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