EXAMINING INTERACTIONS BETWEEN NON-STANDARD WORK ARRANGEMENTS AND OCCUPATIONAL REQUIREMENTS ON THE RISK OF AMBULATORY DISABILITY: A POPULATION-LEVEL ANALYSIS

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April 4th, 2025

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DISCLOSURE(S)

I have no commercial relationships to disclose.

ACKNOWLEDGMENTS

This work was supported by the Pilot Project Research Training Program of the Southern California NIOSH Education and Research Center (SCERC), under Grant Agreement Number T42 OH004812 from the Centers of Disease Control and Prevention (CDC). Its contents are solely the responsibility of the authors and do not necessarily represent the official view of the CDC.

1 CHANGES IN THE WORKFORCE – AGE, RACE/ETHNICITY, NATIVITY

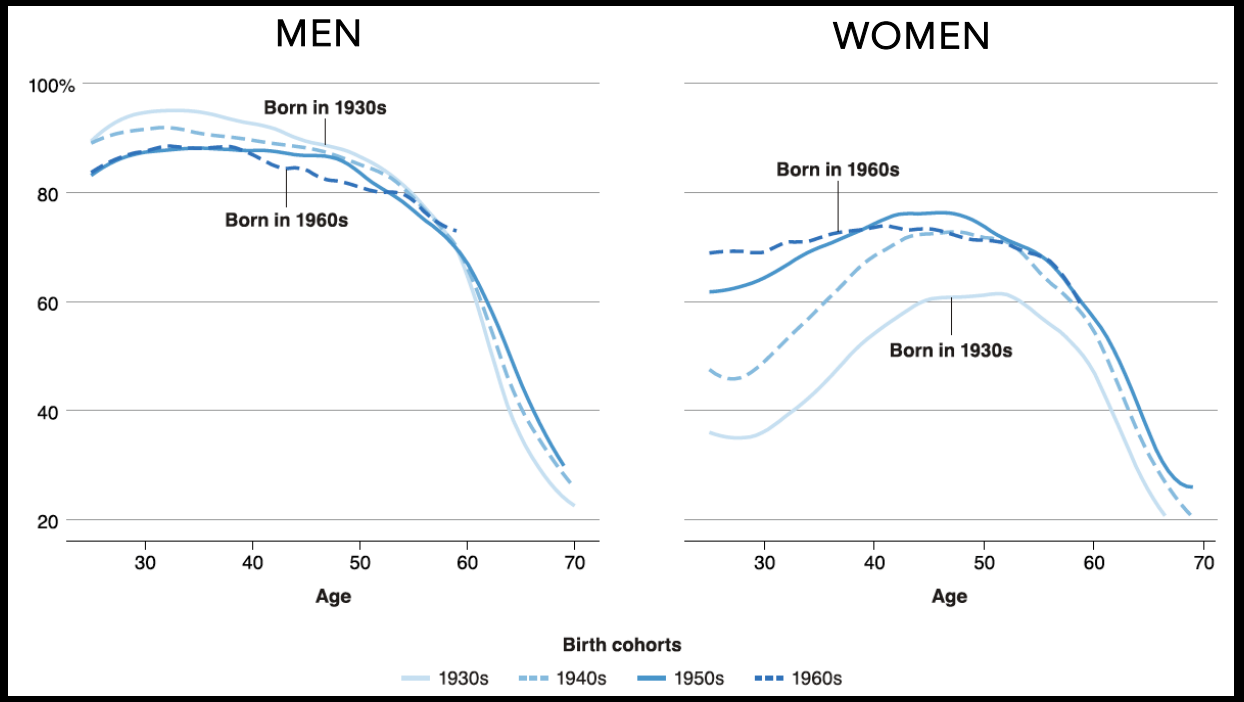
2 INEQUITIES IN WORK CONDITIONS

3 LINKING WORK CONDITIONS TO DISABILITY

POPULATION AGING & WORK

- As Americans live longer, they are also working longer

EMPLOYMENT RATES BY SEX

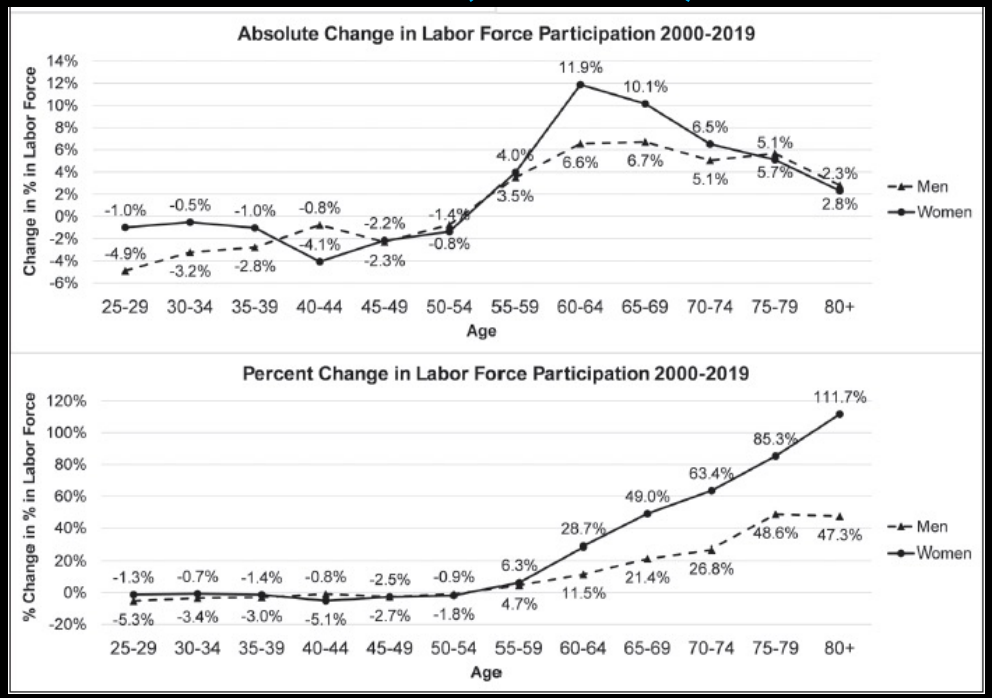


Source: Berkman, L. F., & Truesdale, B. C. (2023). Working longer and population aging in the US: Why delayed retirement isn'ta practical solution for many. *The Journal of the Economics of Ageing*, *24*, 100438.

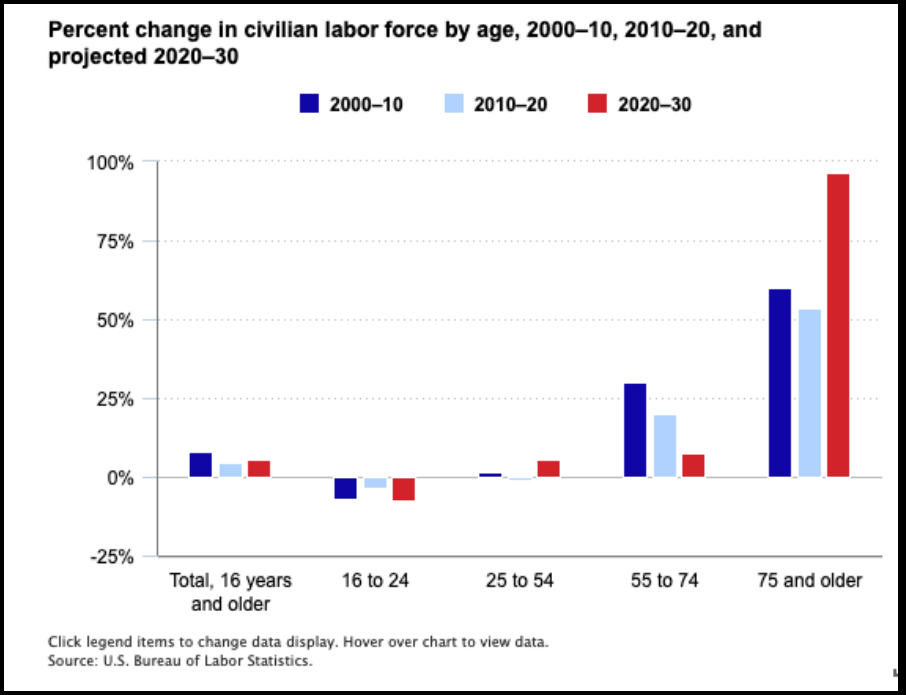
POPULATION AGING & WORK

- As Americans live longer, they are also working longer at much older ages

CHANGES IN LABOR FORCE PARTICIPATION BY AGE (2000-2019)



PROJECTED CHANGES IN LABOR FORCE PARTICIPATION BY AGE AND DECADE - 2030

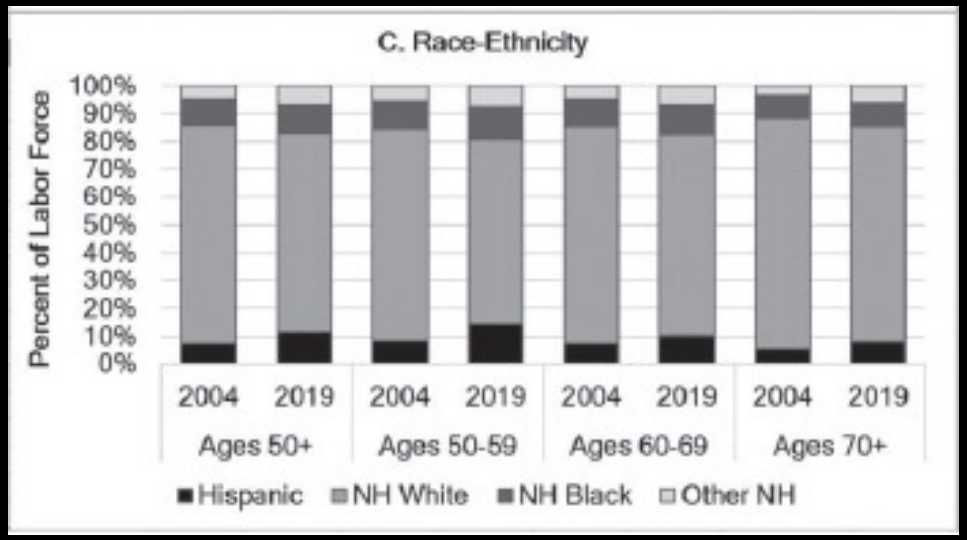


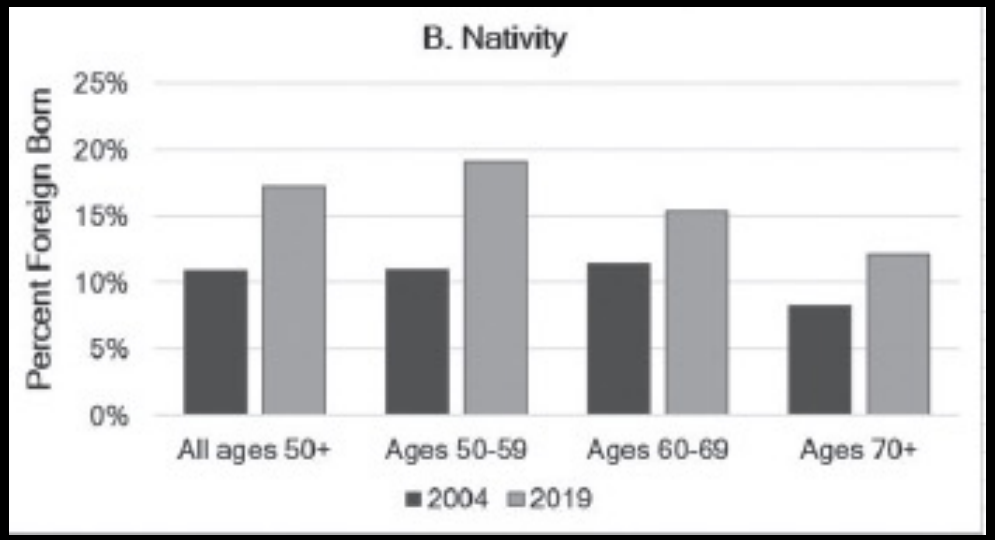
Sources: National Academies of Sciences, Engineering, and Medicine 2022. Understanding the Aging Workforce: Defining a Research Agenda. Washington, DC: The National Academies Press; https://www.bls.gov/opub/ted/2021/number-of-people-75-and-older-in-the-labor-force-is-expected-to-grow-96-5-percent-by-2030.htm

HETEROGENEITY IN WORK AT OLDER AGES (2004 v. 2019)

- Non-NH White Percent of LF: 21.2 → 28.9 (largest change among 50s)
- FB Percent of LF: 11.0 → 19.1 (largest change among 50s)

PERCENT OF LABOR FORCE BY RACE-ETHNICITY AND NATIVITY IN 2004 and 2019



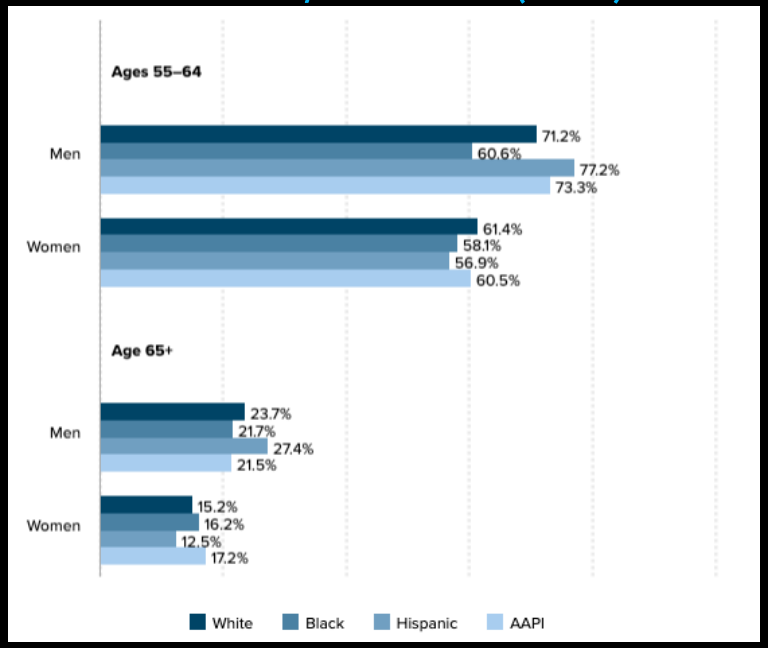


7 Source: National Academies of Sciences, Engineering, and Medicine 2022. Understanding the Aging Workforce: Defining a Research Agenda. Washington, DC: The National Academies Press.

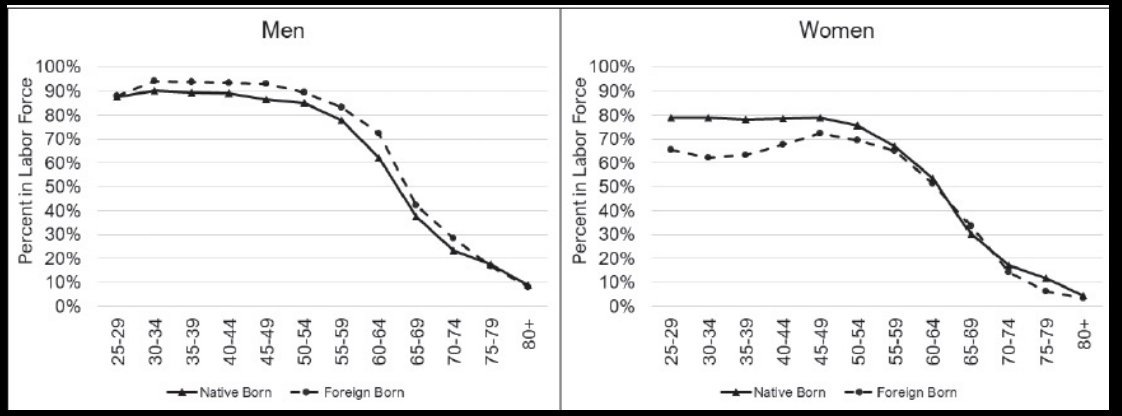
HETEROGENEITY IN WORK AT OLDER AGES

- Older adults' employment patterns are diverse by race/ethnicity and nativity

LABOR FORCE PARTICIPATION RATES OF OLDER AMERICANS BY RACE/ETHNICITY, GENDER, AND AGE (2022)



LABOR FORCE PARTICIPATON AMONG AGES BY GENDER AND NATIVITY (2019)



Sources: https://www.epi.org/publication/chapter-1-older-workers/; National Academies of Sciences, Engineering, and Medicine 2022. Understanding the Aging Workforce: Defining a Research Agenda. Washington, DC: The National Academies Press.

JOB QUALITY

- Job quality can be evaluated across multiple dimensions

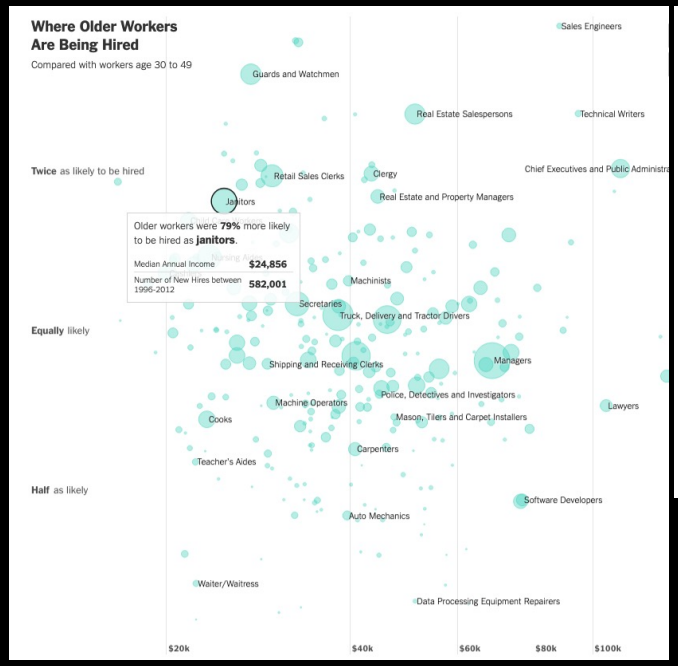
Work arrangements/schedules
- Nonstandard (evening, irregular shifts)

Physical demands
- Intensity of physical work

JOB QUALITY: PHYSICALLY DEMANDING WORK

- Older adults hold more physically demanding jobs

LIKELIHOOD OF OLDER WORKERS IN OCCUPATION BY MEDIAN ANNUAL OCCUPATIONAL INCOME (1996-2012)



JOB	NUMBER OF HIRES	LIKELIHOOD OF BEING HIRED*
Truck, Delivery and Tractor drivers	827,383	+9%
Salespersons	683.280	+7%
Janitors	582,001	+79%
Nursing aides	509,121	+41%
Secretaries	506,560	+15%
Retail Sales Clerks	433,379	+100%
Guards and Watchmen	370,599	+211%
Real Estate Salespersons	362,835	+162%
Bookkeepers and Accounting Clerks	324,223	+56%
Cashiers	307,026	+31%

Most Common Occupations for Men and Women Ages 62 and Older (2004-2014)

The 25 Most Common Occupations for Men and Women Ages 62 and Older

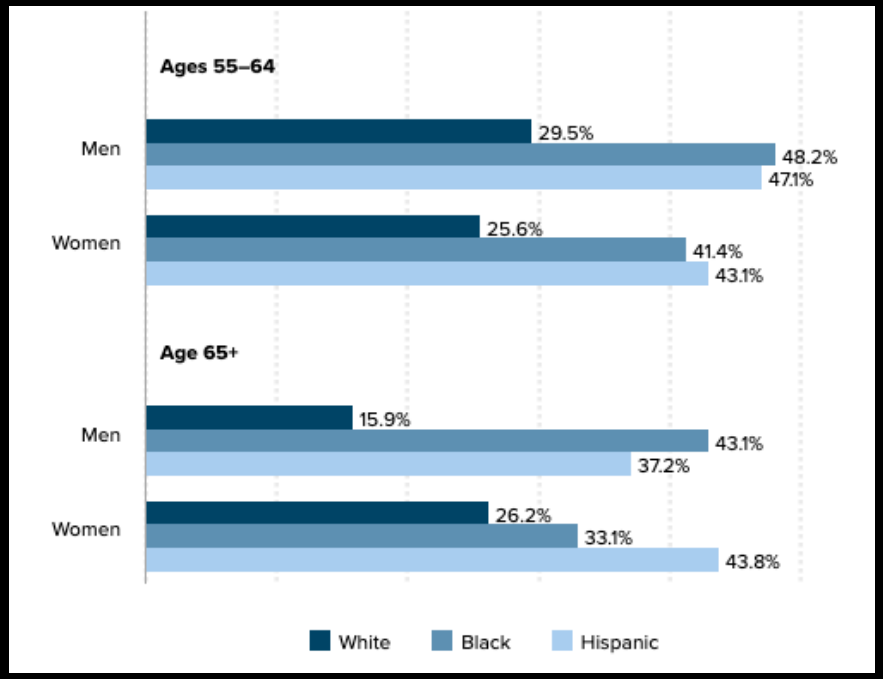
Men		Women	
Top occupations	**% of older workers**	**Top occupations**	**% of older workers**
Delivery workers and truck drivers	3.95	Teachers, except postsecondary	6.30
Janitors and building cleaners	2.99	Secretaries and administrative assistants	6.04
Farmers and ranchers	2.58	Personal care aides	3.60
Postsecondary teachers	2.39	Registered nurses	3.45
Lawyers	2.37	Child care workers	3.36
Teachers, except postsecondary	2.18	Bookkeeping and accounting clerks	3.20
Grounds maintenance workers	2.05	Retail salespersons	3.08
Sales representatives, wholesale and manufacturing	1.99	Maids and housekeepers	2.91
Supervisors of retail sales workers	1.95	Nursing, psychiatric, and home health aides	2.85
Construction laborers	1.88	Supervisors of office and administrative workers	2.30

Sources: https://www.urban.org/sites/default/files/publication/95011/what-are-the-top-jobs-for-older-workers_0.pdf; https://www.nytimes.com/2016/08/18/upshot/as-more-older-people-seek-work-they-are-put-into-old-person-jobs.html

JOB QUALITY: PHYSICALLY DEMANDING WORK

- Non-White older adults hold more physically demanding jobs

SHARE OF OLDER WORKERS IN PHYSICALLY DEMANDING JOBS BY RACE/ETHNICITY, GENDER, AND AGE (2018)

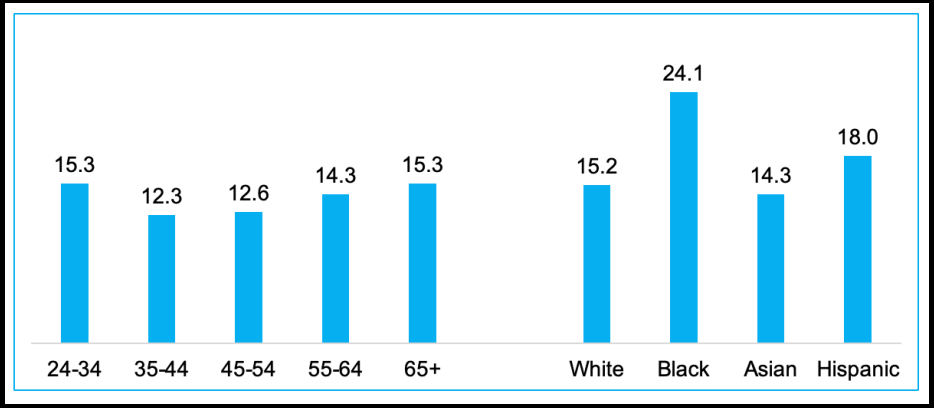


Source: https://www.nytimes.com/2016/08/18/upshot/as-more-older-people-seek-work-they-are-put-into-old-person-jobs.html

JOB QUALITY: WORK TEMPORALITY

- Temporality is a dimension of job quality
- Non-standard (NS) work schedules: >30 million U.S. workers
  - Shift work: evening/night, rotating, split
  - Irregular/on call
- NS work schedules afford flexibility for both workers and employers
- NS work schedules consequential for employee well-being
  - Fatigue, sleepiness, shift work sleep disorder
  - Coupled with physical activity, greater risk of injuries and accidents

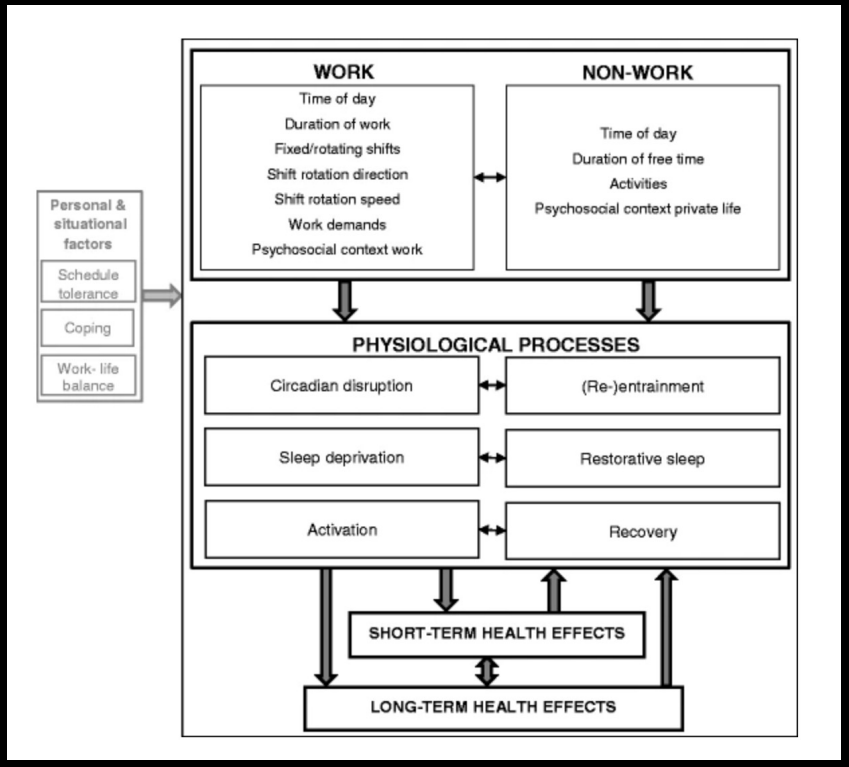
SHARE OF WORKERS WITH NON-STANDARD SCHEDULES BY AGE AND RACE/ETHNICITY (2017-2018)



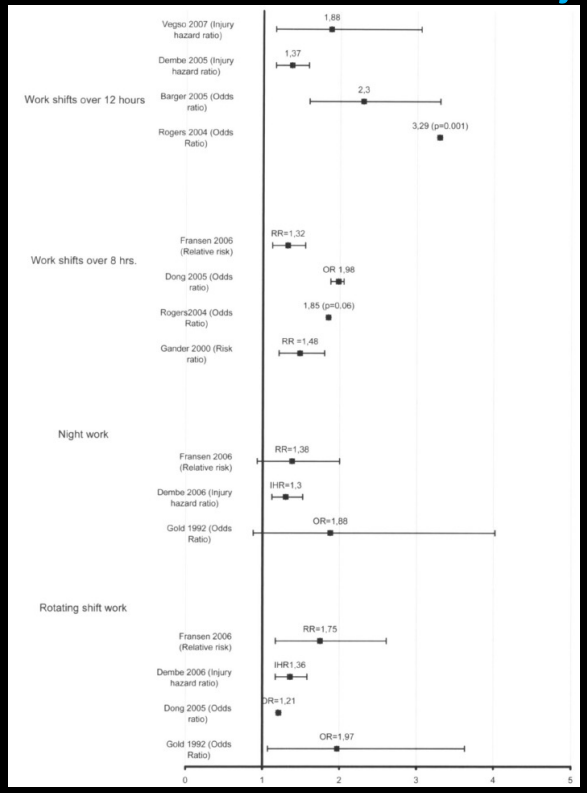
Sources: https://www.epi.org/publication/chapter-1-older-workers/; American Time Use Survey 2017-2018.

CONSEQUENCES OF WORK FOR HEALTH IN LATER LIFE: NON-STANDARD SCHEDULES

Model of Nonstandard Working Schedules and Health



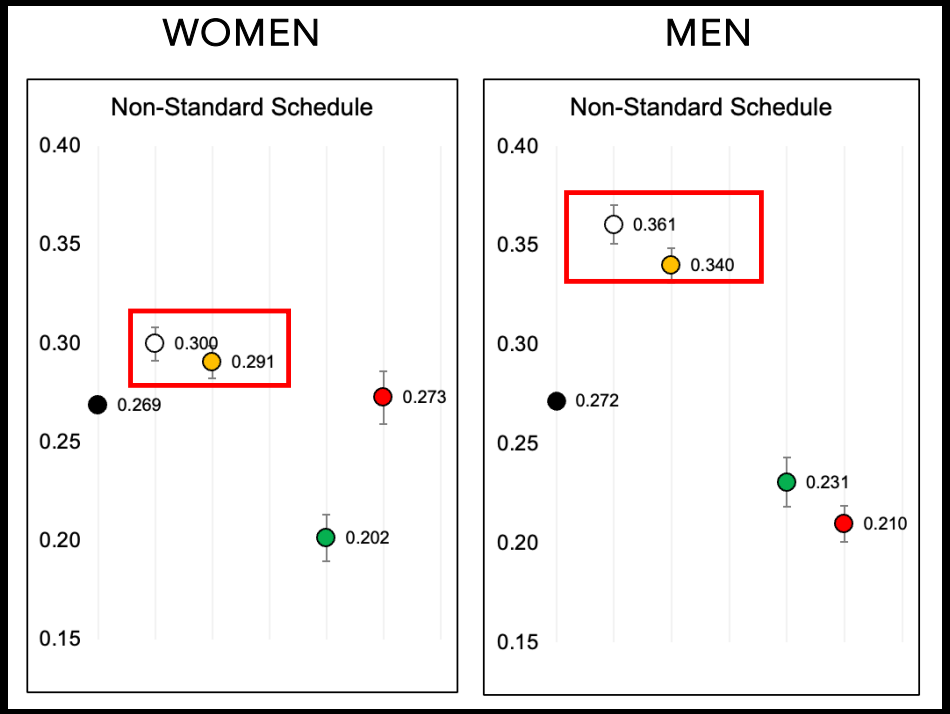
Results from Studies Examining Shift Work and Work-Related Accidents and Injuries



Sources: Merkus, S. L., Holte, K. A., Huysmans, M. A., van Mechelen, W., & van der Beek, A. J. (2015). Nonstandard working schedules and health: the systematic search for a comprehensive model. *BMC Public Health*, *15*, 1-15.; Wagstaff, A. S., & Lie, J. A. S. (2011). Shift and night work and long working hours-a systematic review of safety implications. *Scandinavian journal of work, environment & health*, 173-185.

JOB QUALITY: WORK TEMPORALITY

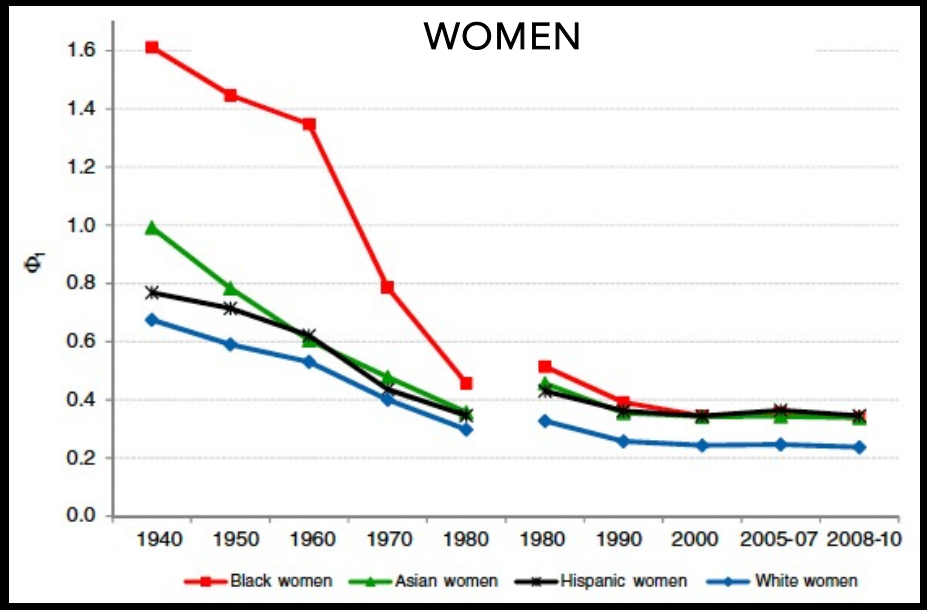
- Non-standard (NS) schedules to be most common for NB population, especially NB Blacks and NB Latinos

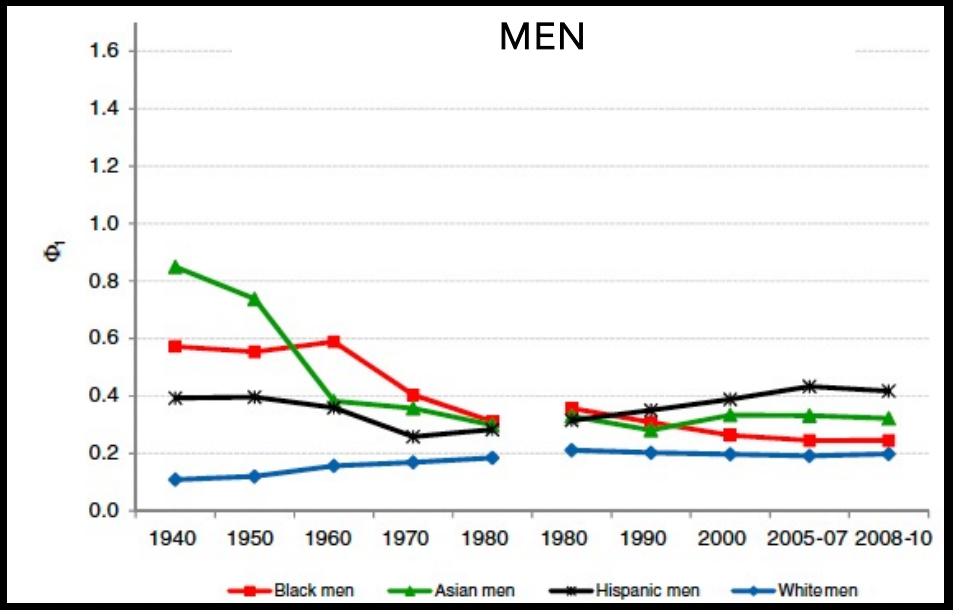


Source: Author's calculations.

JOB QUALITY & OCCUPATIONAL SEGREGATION

- 1940-1980: segregation strongly decreased for all groups of women (especially for Black women) and increased for White men (although not for other men)
- 1980+: segregation decreased only slightly for female groups, and this integration process came to a halt in 2000





Source: Del Río, C., & Alonso-Villar, O. (2015). The evolution of occupational segregation in the United States, 1940–2010: Gains and losses of gender–race/ethnicity groups. *Demography*, *52*, 967-988.

MECHANISMS OF OCCUPATIONAL SEGREGATION

SOCIAL NETWORKS DURING JOB SEARCH

REQUIRED CREDENTIALS

DISCRIMINATION DURING HIRING PROCESS

WORKPLACE DISCRIMINATION (PROMOTIONS)

CURRENT STUDY AIMS

1. Examine workers' exposure to both physical job requirements (PJR) and non-standard work schedules (NS) (PJR-NS) by race-ethnicity-nativity and age.
2. Determine if there is an association between ambulatory disability and PJR-NS that varies by age
3. Determine if there is an association between ambulatory disability and PJR-NS that varies by age and race-ethnicity-nativity
   - Short-term and chronic ambulatory disability

DATA

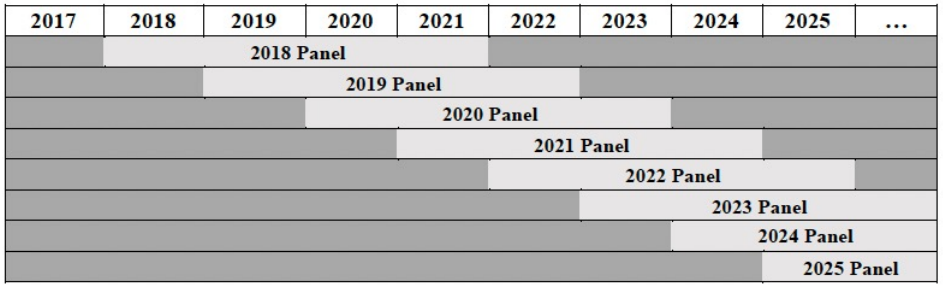
- Survey of Income and Program Participation (SIPP): 2018, 2019, 2020, 2021 panels
  - First wave or first two waves (one year apart)
  - Up to 7 jobs
  - Work schedules

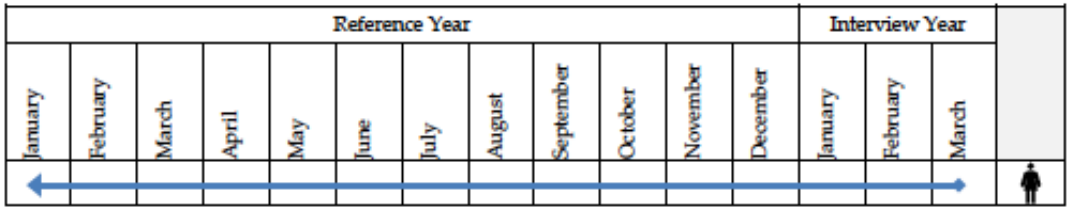
- Occupational Requirements Survey (ORS): 2023
  - Nationally representative establishment-based survey
  - Estimates are produced from a probability sample of 56,300 establishments

DATA

- Survey of Income and Program Participation (SIPP)
  - Overlapping panel design
  - Retrospective event history calendar of jobs

FIGURE 1-1. OVERLAPPING PANELS ILLUSTRATION





ORS SAMPLING FRAME

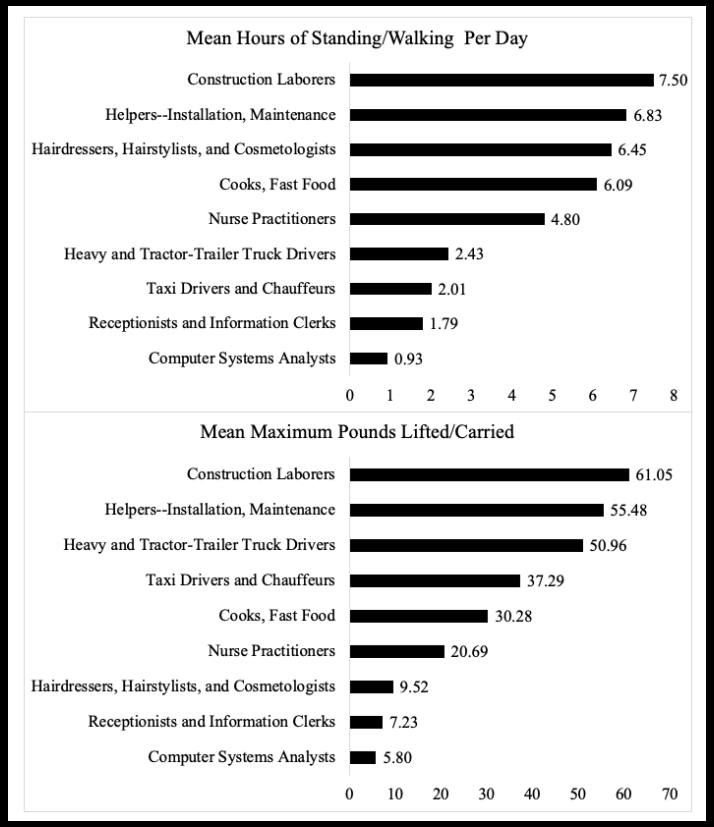
- Differences between O*NET and ORS
  - Sampling frame
    - Establishments from the Quarterly Census of Employment and Wages data and information from the Railroad Retirement Board (rather than Dun & Bradstreet list of businesses and the BLS Occupational Employment Statistics survey)
    - Occupations within establishments are sampled from an occupational frame using the Occupational Employment and Wage Statistics (OEWS) program (rather than job incumbents selected from a list of eligible employees. If sampling is not feasible, expert method is used, whereby experts are selected from membership lists provided by professional or trade associations)
    - Field economists then select jobs in those occupations from each establishment based on multiple criteria, including the size of the establishment

ORS DATA

- Objective measures of work characteristics

Question Wording/Description for Selected Physical Activities by Data Source

Physical Activity	O*NET Question	ORS Data Element
Standing	How much time in your current job do you spend standing? Response Categories: [Never, Less than half the time, About half the time, More than half the time, Continually or almost continually]	Percent of day standing/walking is required Estimate: Mean
Walking	How much time in your current job do you spend walking or running? Response Categories: [Never, Less than half the time, About half the time, More than half the time, Continually or almost continually]	Percent of day standing/walking is required Estimate: Mean
Climbing	How much time in your current job do you spend climbing ladders, scaffolds, poles, etc.? Response Categories: [Never, Less than half the time, About half the time, More than half the time, Continually or almost continually]	Climbing ladders, ropes, or scaffolds is required Estimate: % of Workers…



OUTCOME

- Ambulatory disability: "Does this person/you have serious difficulty walking or climbing stairs?"
  - Chronic: difficulty at both waves 1 and 2
  - Consistent with the mandates from the Affordable Care Act that required the US Department of Health and Human Services (HHS) to establish minimum standards for collecting data on disability status in national population health surveys
    - six questions designed to be consistent with the International Classification of Functioning, Disability, and Health, a conceptual framework published by the World Health Organization

- Is this person deaf or does he/she have serious difficulty hearing?
- Is this person blind or does he/she have serious difficulty seeing even when wearing glasses?

[if ages 5 and older:]

- Because of a physical, mental, or emotional condition, does this person have serious difficulty concentrating, remembering, or making decisions?
- Does this person have serious difficulty walking or climbing stairs?
- Does this person have difficulty dressing or bathing?

[if ages 15 and older:]

- Because of a physical, mental, or emotional condition, does this person have difficulty doing errands alone, such as visiting a doctor's office or shopping?

FOCAL MEASURES

- Employment-Work Conditions
  - Physical Job Requirements (PJR) x NS Work Schedule
    - High – NS Work Schedule
    - Medium – NS Work Schedule
    - Low – NS Work Schedule
    - High – Standard Work Schedule
    - Medium – Standard Work Schedule
    - Low – Standard Work Schedule
    - No Work

- Race-ethnicity-nativity
  - NB White, NB Black, NB Hispanic, FB Hispanic

- Age (categorical)

ANALYTIC SAMPLE & METHOD

- Rs aged 35+ from SIPP 1st wave, pooled data (N_{women}=56,570; N_{men}=44,302)
- Sex-specific logistic regressions
  - Controls for educational attainment, household income, survey year
- Interactions: employment-work conditions x race-ethnicity-nativity [age] to examine differential vulnerability
- Examine transitions (responding to waves 1 and 2) into the different work conditions with outcomes
- Weighted using balanced-repeated replicate weights

PROFILE OF SAMPLE

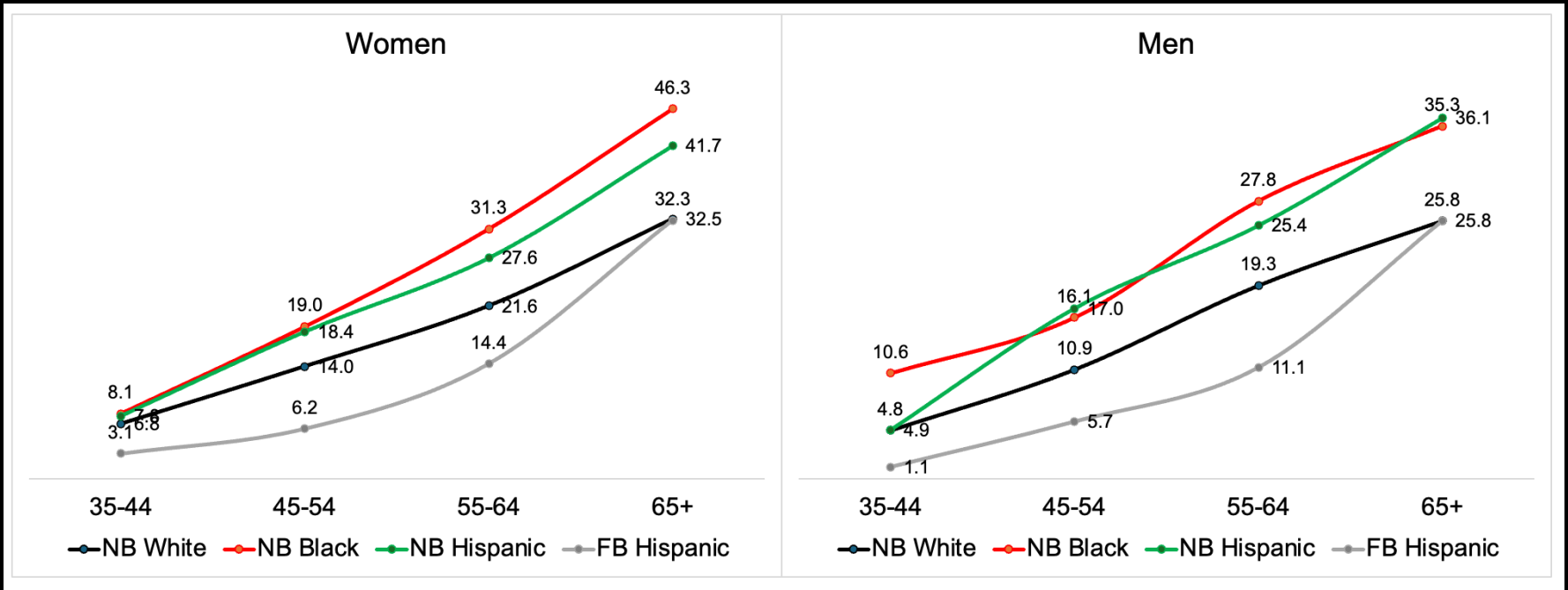
- NB Black and Hispanic women and men have the highest prevalence of ambulatory disability
- Convergence of FB to NB Whites at 65+, but still lower than NB non-Whites

	Women				Men			
	NB White	NB Black	NB Hisp	FB Hisp	NB White	NB Black	NB Hisp	FB Hisp
	% or mean (SE)	% or mean (SE)	% or mean (SE)	% or mean (SE)	% or mean (SE)	% or mean (SE)	% or mean (SE)	% or mean (SE)
Race-Ethnicity-Nativity Distribution	66.1%	9.4%	7.4%	17.2%	70.0%	7.6%	7.6%	14.8%
Ambulatory Disability	22.8%	29.7%	24.6%	14.3%	32.7%	39.4%	39.9%	29.4%
Work Limitation	24.8%	34.8%	27.5%	14.2%	44.7%	60.9%	56.0%	37.1%
Age								
65+	44.2	36.1	30.5	27.6	41.3	32.8	27.5	25.8

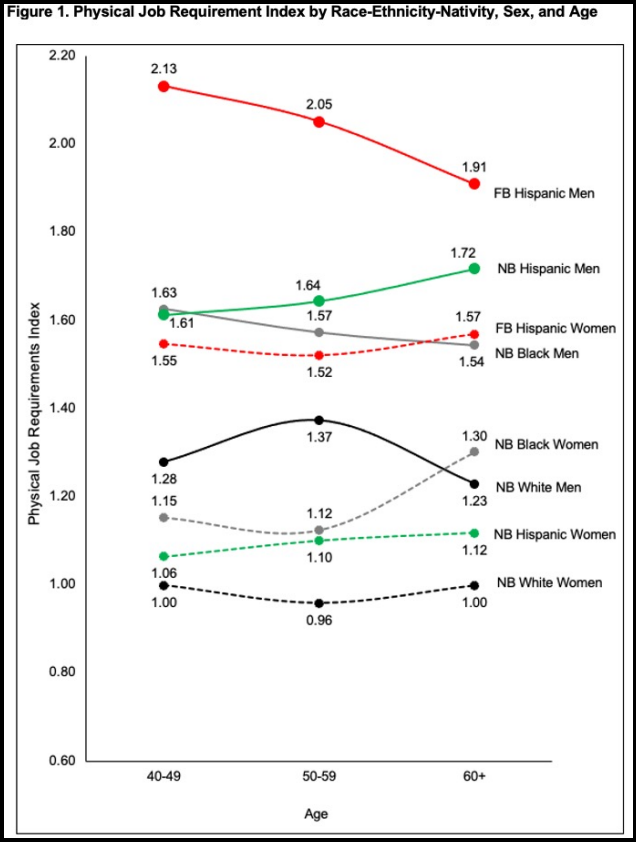
PROFILE OF SAMPLE

- NB Black and Hispanic women and men have the highest prevalence of ambulatory disability
- Convergence of FB to NB Whites at 65+, but still lower than NB non-Whites

PREVALENCE OF AMBULATORY DISABILITY BY SEX, AGE, RACE-ETHNICITY-NATIVITY (2018-2021)

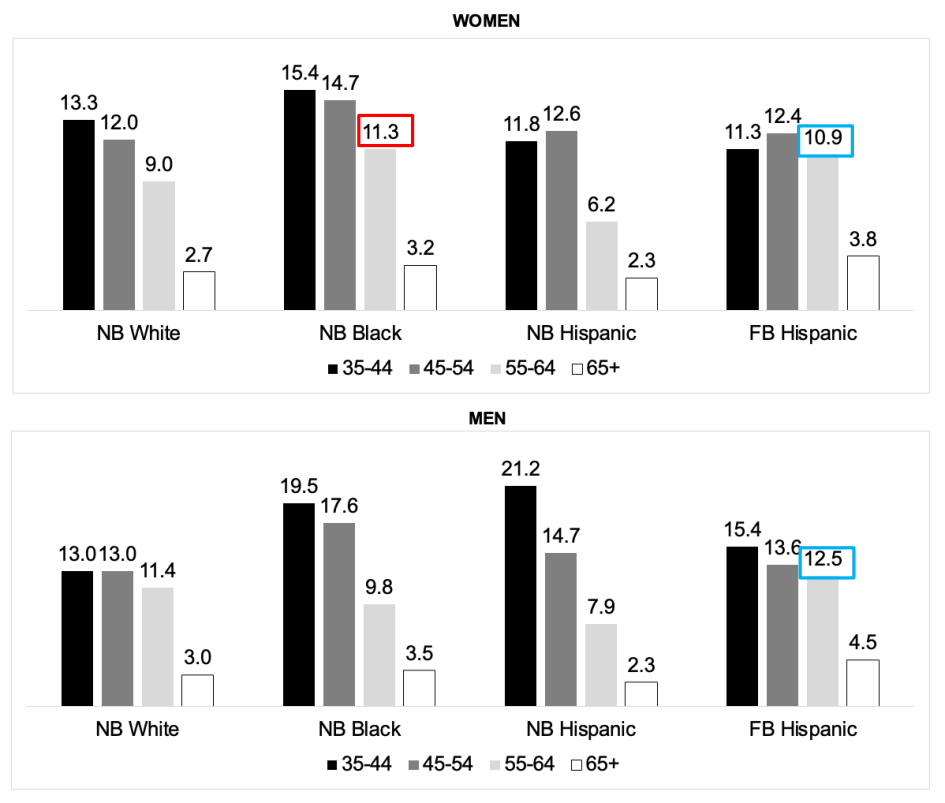


PHYSICAL JOB REQUIREMENTS



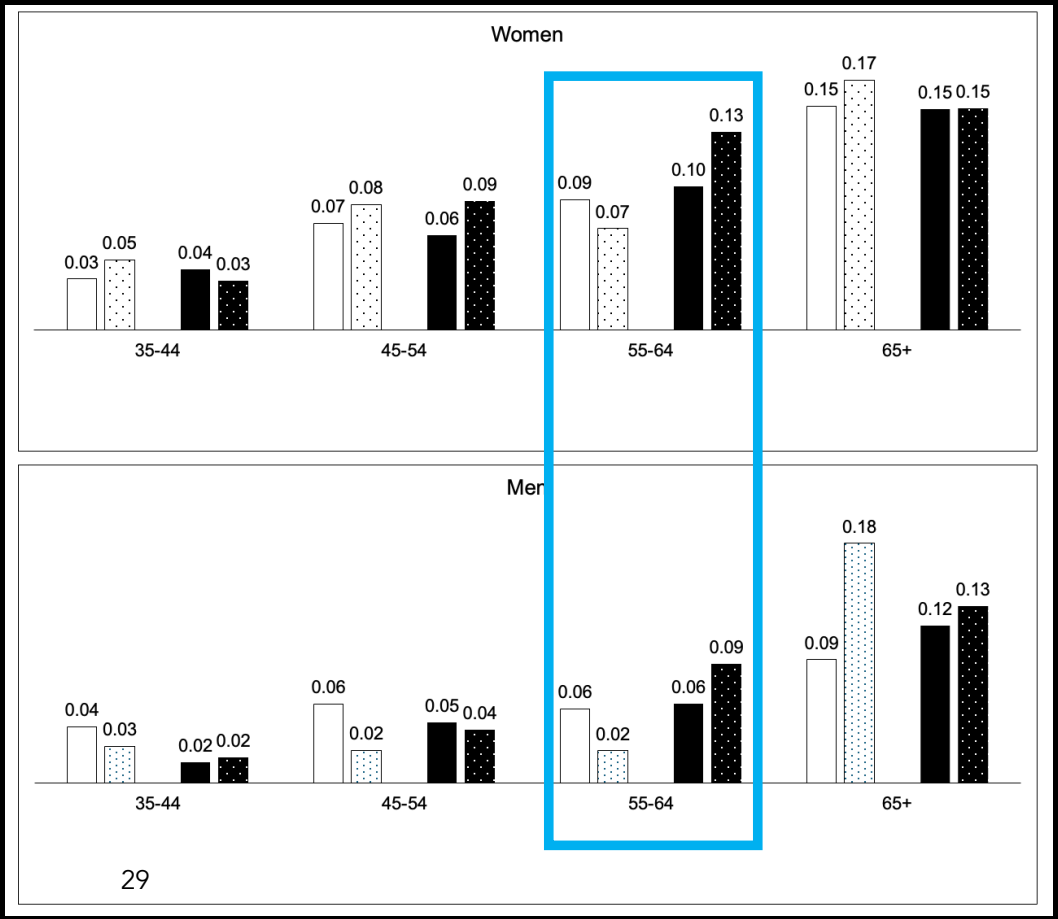
- FB Hispanic men are exposed to the most physical work, irrespective of age, followed by their NB male counterparts
- Among women, FB Hispanics have the highest PJR index values across all ages, while White women have the lowest values

Aim 1. Examine workers' exposure to both physical job requirements (PJR) and non-standard work schedules (NS) by race-ethnicity-nativity and age.



- Considering both PJR and NS: consistent pattern across race-ethnicity-nativity as adults age
  - High/Medium PJR + NS decreases with age, with dramatic decreases at age 65+
- Starting in the mid-50s, FB Hispanics have greater exposure to both dimensions of work than NB counterparts
  - Exception: NB Black women 55-64

Aim 2. Determine if there is an association between ambulatory disability and PJR-NS that varies by age

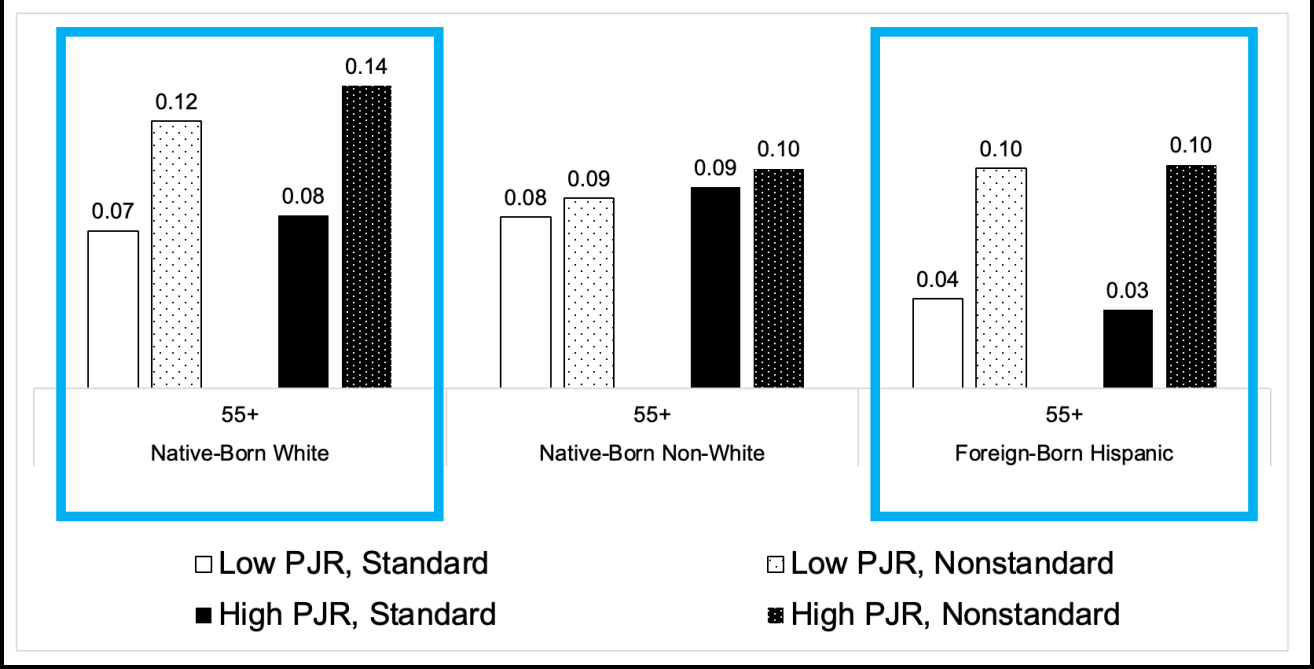


- Predicted probabilities of ambulatory disability from multivariate models with controls, with interactions with age
- Age 55-64 group: 30-50% increase in reporting ambulatory disability for women and men if there is simultaneous exposure to high PJR and NS

□ Low PJR - Standard
▨ Low PJR - Nonstandard
■ High PJR - Standard
■ High PJR - Nonstandard

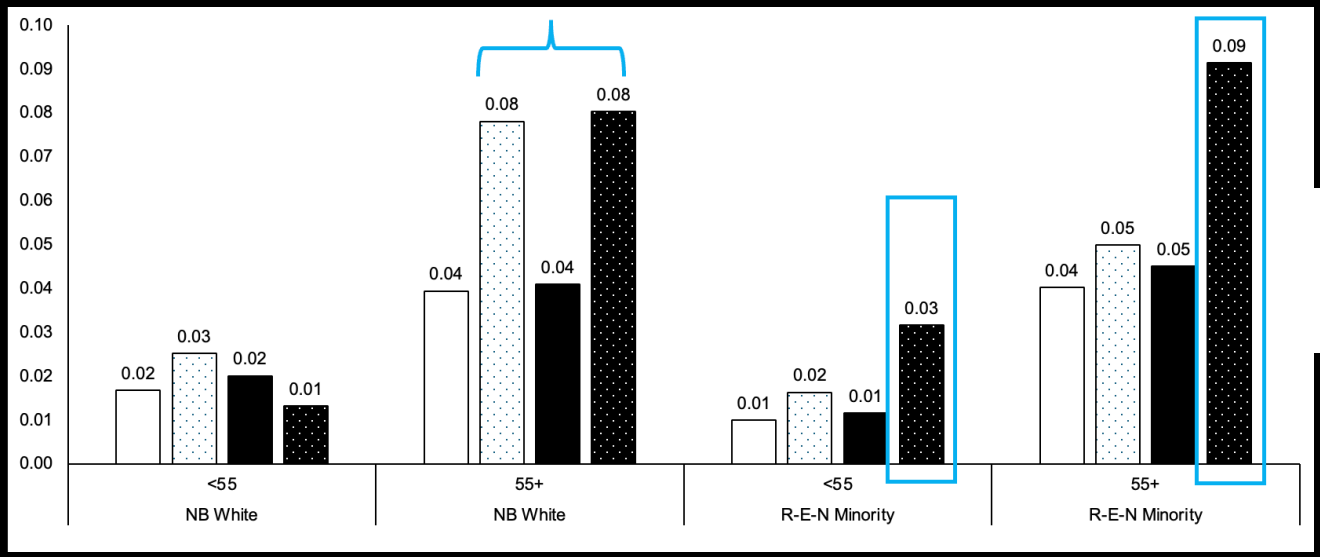
Aim 3. Determine if there is an association between ambulatory disability and PJR-NS that varies by age and race-ethnicity-nativity

- Among Rs aged 55+, non-standard work is positively associated with reporting an ambulatory disability for NB White and FB women



Aim 3. Determine if there is an association between chronic ambulatory disability and PJR-NS that varies by age and race-ethnicity-nativity

- Minority R always holding NS schedules and increasing their physical intensity more likely to have a chronic ambulatory disability (0.03 for <55 and 0.09 for 55+) than:
  - Minority counterparts who also increase their PJRs but have experienced a standard work schedule (0.01 for <55 and 0.05 for 55+)
  - Minority counterparts who always had a NS schedule but had similar or lower levels of physically active jobs in the prior wave (0.02 for <55 and 0.05 for 55+)
  - Patterns not observed for NB Whites



SUMMARY

- There are large differences in exposures work conditions by race-ethnicity-nativity and age, with minorities in late middle-age (mid-50s) being disadvantaged with greater exposure to poor quality job dimensions

- Considering multiple job characteristics of physical demands and work arrangements simultaneously will provide a different perspective on risk factors that affect workers' chronic ambulatory disability
  - Workers 55+ for NB Whites and for younger and older workers who are minorities

- Workplace policy and practice changes will differentially impact workers by age and race-ethnicity-nativity

THANK YOU!

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