



**Describing economic benefits and costs of
nonstandard work hours:
A scoping review**

Truck and Bus Operator Health and Wellness
Subcommittee, ACS60(3)

Transportation Research Board 101st Annual Meeting

January 11, 2022

Prof. Michael H. Belzer

Wayne State University, Detroit

Wong, Imelda S.; Brian Quay; Emma Irvin and Michael H. Belzer. 2021. "Describing Economic Benefits and Costs of Nonstandard Work Hours: A Scoping Review." *American Journal of Industrial Medicine*. Wiley. DOI: 10.1002/ajim.23302

- Follow-up effort from NIOSH Working Hours, Sleep and Fatigue Forum and Working Time Society in September 2019.
- See Wong I, Swanson N. "NIOSH working hours, sleep and fatigue forum: meeting the needs of American workers and employers." *AJIM*. 2020.
- Purpose of series: "identify the research gaps in our understanding of working hours, sleep, and fatigue that are specific for industry sectors and working populations at higher risk for fatigue-related OSH events in the United States."
- These "papers provide overviews of the current state of research, identify safety and health risks, highlight effective interventions, and suggest future research directions."



Scoping Review

- Topic-based review of research in a complex subject
- Commonly part of a research agenda in health fields but completely foreign to economists
- Identify nature and extent of available evidence
- Specifically useful for interdisciplinary topics
- Get researchers' arms around the topic
- The goal is to frame the issue and assess the available resources that could be used to study.



Non-standard work

- Compare benefits and costs
 - May make workers or industry more productive.
 - We lack systematic knowledge of economic benefits and costs associated with these schedules
- Is the work essential?
- Are the irregular long hours of work necessary or just convenient?
- This kind of study can create a structure for research.



Methodology

- We included terms related to nonstandard work hours, and economics in the search strategy.
- Searched MEDLINE (OVID), EMBASE (OVID), PsycINFO, Scopus, EconLit, Business Source, National Safety Council, and the National Academies Press.
- Also included peer-reviewed literature and gray literature.

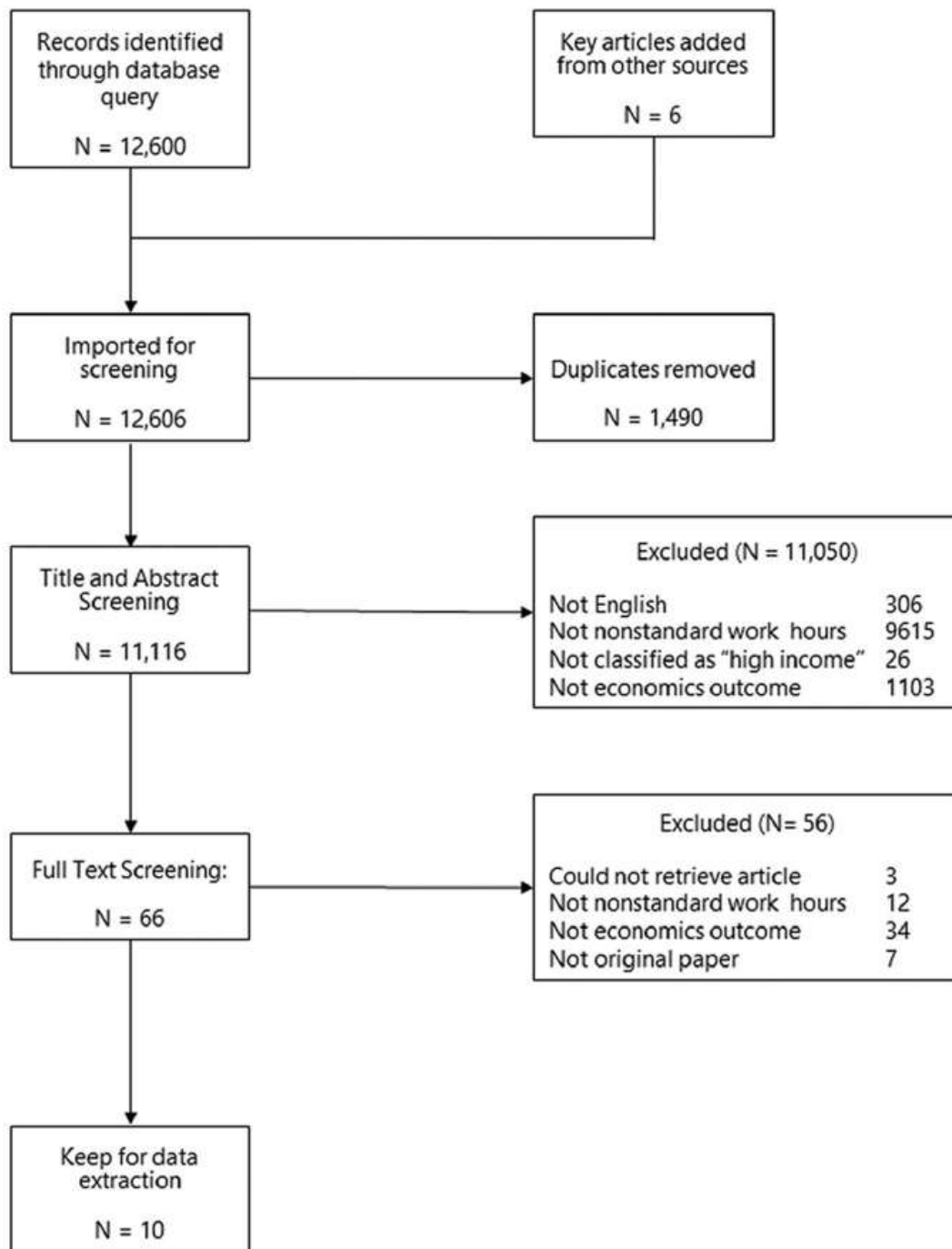


Criteria

- Published since 1980.
- Study addressed adults exposed to non-standard work like long work hours and shift-work
- Limited to OECD countries or similar.
- Outcome of interest had to be reported in economic terms.
- Included descriptions of benefits, costs, or interventions.
- Search netted 11,116 possible studies.
- Out of this, 66 articles remained for full-text screening.
- 10 articles made the final step of data charting.
- Of these, most looked at broad populations
 - Two focused on health care professions.
 - One focused on truck drivers



FIGURE 1 Overview of scoping methodology



Results

- Ten studies met conditions for inclusion
- Studies used large datasets
- Costs estimated include health-related expenses, productivity losses, and projections of future loss of earnings
- Cost analyses of interventions included OSA screening, employer-based educational program, and increased staffing to cover overtime hours



Diverse approaches

- Costs included medical expense, productivity losses, work-related motor vehicle crashes, and health outcomes.
- Five looked only at employer costs.
- Four looked at external costs to worker, family, and society.
- Most studies used multiple data sources to estimate costs of non-standard work.
- Studies did not estimate economic effects in real-dollar terms.
- Some studies also addressed costs of interventions.



Discussion

- Studies we reviewed only analyzed costs, not benefits, of non-standard work hours and related interventions.
 - Costs reported were mainly from the employer perspective.
 - Such studies are invalid from the economic welfare perspective.
 - One study estimated workers' comp covers about 25% of actual cost of workplace illness and injury, leaving the rest to society.
 - This is inefficient from an economic welfare perspective.
 - Assessments restricted to the employer perspective ignore the burden that employers create, which is borne by their workers, the community, and society—including taxpayers.
- The impacts of nonstandard schedules extend beyond the workplace, affecting not only the well-being of the worker, but also the worker's family, community, and society.



Conclusions

- Few studies assess nonstandard work hours in economic terms
- More studies are needed to expand economic evaluations beyond the employer level
- Need to include those at the societal level because impacts of nonstandard work go beyond the workplace and are important for policy analysis and formulation.
- This is “economic welfare” benefit/cost analysis
- Most U.S. regulations require economic welfare analysis by law.

