

Work Productivity Loss Among Women With Menopausal Symptoms: A Systematic Literature Review

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BACKGROUND

- Most women transitioning from reproductive to post-reproductive life around the ages of 45–50 will experience moderate to severe menopausal symptoms (vasomotor symptoms [VMS], vaginal dryness, decreased libido, sleep disorder, mood changes, etc.)^{1,2}
- VMS (hot flashes) are among the most common and problematic menopausal symptoms; frequent/moderate-severe VMS can last for 7-10 years and longer for less frequent/severe VMS^{3,4}
- Women aged 45+ are a critical part of the workforce and economic activity in developed countries; in the United States, 75% of women between the ages of 45 and 54 participated in the labour force in 2021.⁵ Worldwide, the number of menopausal women is increasing, and it is estimated that 47% of menopausal women are in the workforce⁶

OBJECTIVES

- We conducted a systematic literature review (SLR) to identify and summarize health economic evidence related to menopause (see full details in Prospective Register of Systematic Reviews [PROSPERO 2020 CRD42022312194])
- In this presentation, we summarize the identified evidence of work impairments experienced by women with VMS, such as absenteeism and presenteeism, and quantify the productivity losses associated with these impairments

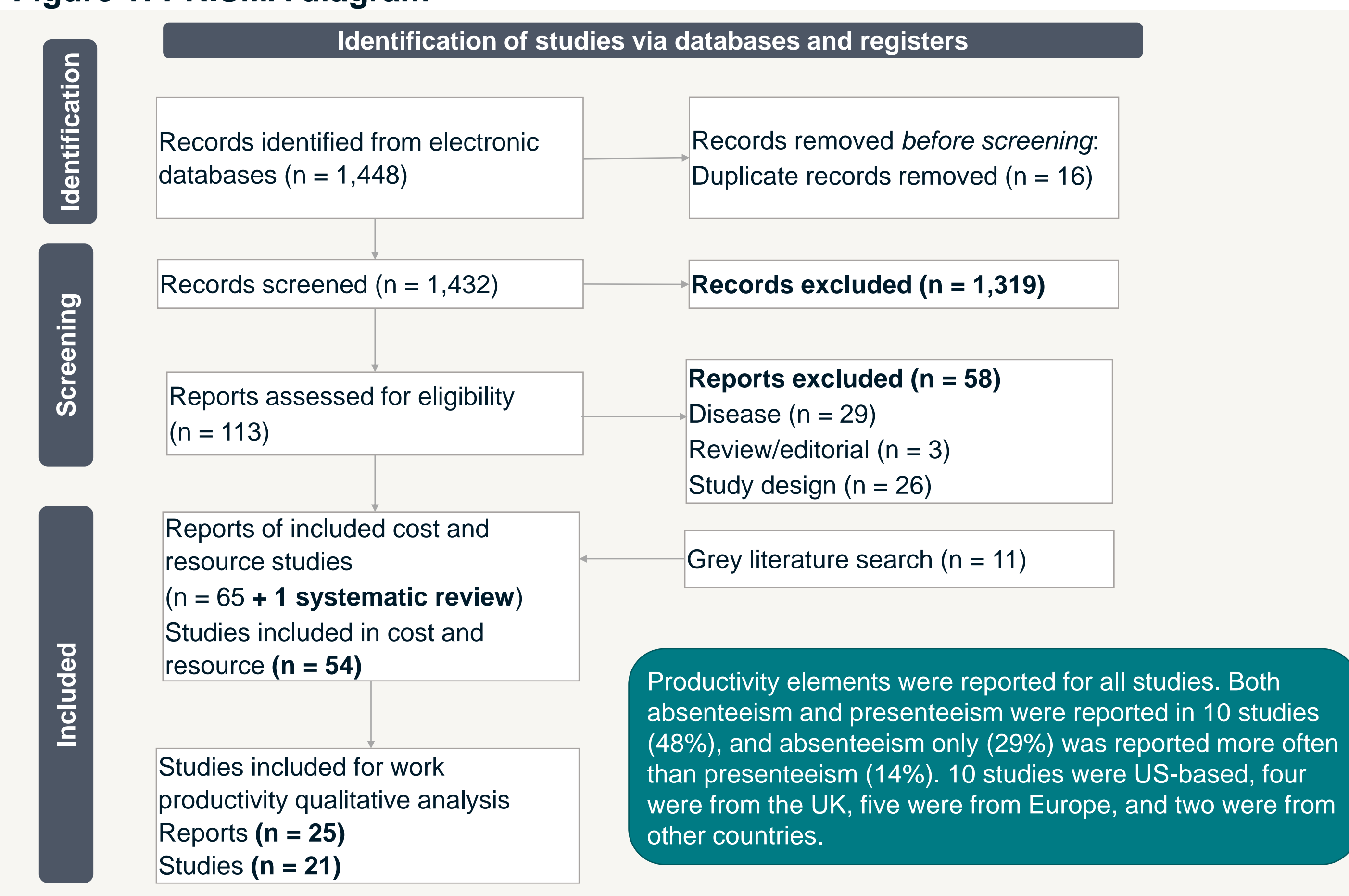
METHODS

- MEDLINE®, Embase®, MEDLINE in-Process, EconLit®, HTA Database (HTAD), Database of Abstracts of Reviews of Effects (DARE) and NHS Economic Evaluation Database (NHS EED) were searched systematically to identify studies assessing productivity loss and menopausal symptoms. Searches were conducted in accordance with PRISMA and health technology assessment guidelines.⁷⁻⁹ The Population, Intervention, Comparator, Outcome, Study Design (PICOS) and selection criteria are detailed in the PROSPERO protocol (CRD42022312194)
- Data on study characteristics, indirect costs and work impairment were collected. All costs were updated and converted to 2021 USD in accordance with EUnetHTA¹⁰ and the US Institute for Clinical and Economic Review guidance¹¹ to provide more current cost estimates. For US studies, general consumer price indices¹² were used to inflate costs from the cost year reported to 2021, as costs reported are non-healthcare costs

RESULTS

- Of the 1,459 records identified, 54 studies were included, with work impairment/productivity losses reported in 21 studies (including 10 US studies, four UK studies, five EU studies, one Canada study and one Brazil study). The PRISMA diagram for the SLR is presented in **Figure 1**

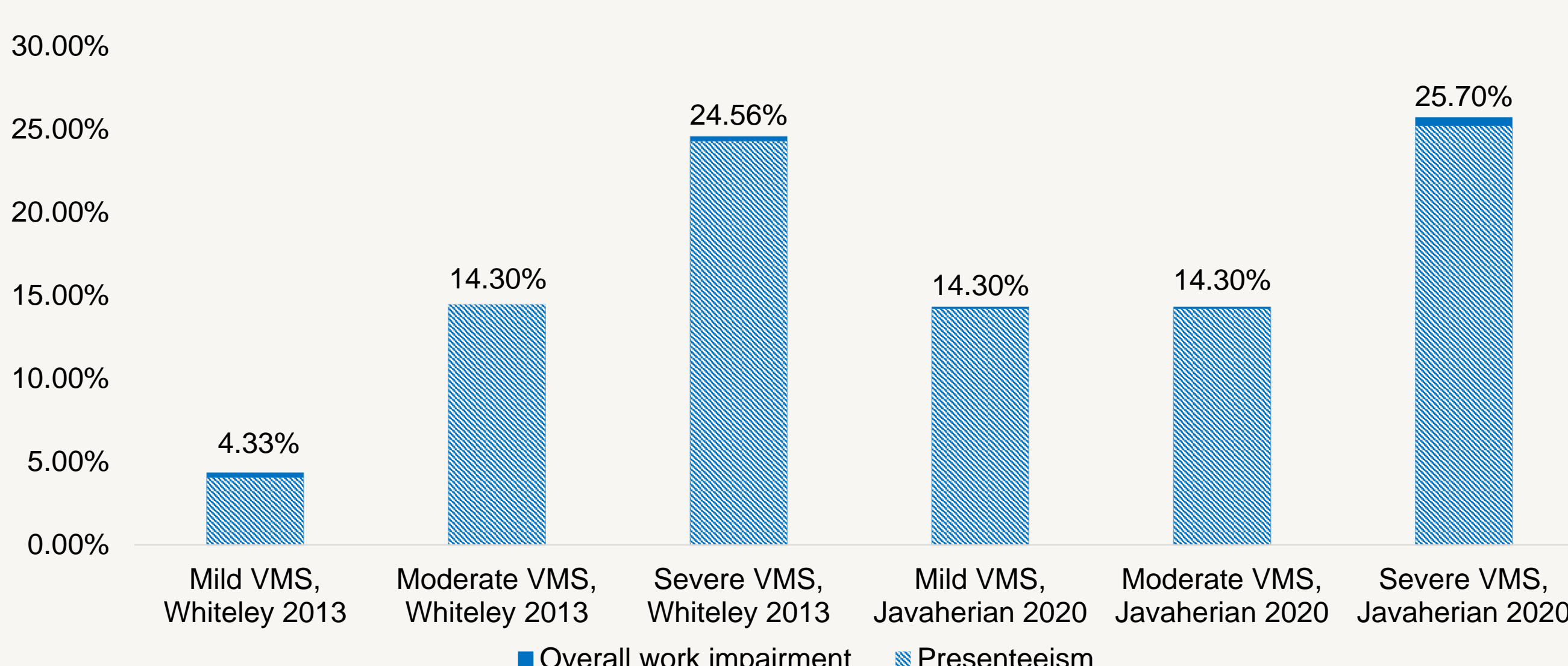
Figure 1: PRISMA diagram



Key findings on rates of absenteeism and presenteeism

- Studies showed that women with VMS, compared with non-menopausal women or those without VMS, had a higher productivity loss burden
 - In a large representative US sample, women experiencing VMS had a higher mean percent of impairment while at work compared to women without VMS (25.00% vs 14.30%), as measured by the WPAI questionnaire in Wagner et al. 2011¹³
 - A cohort of employed women in the US were identified as being diagnosed with menopausal symptoms using relevant International Classification of Diseases, Ninth Revision (ICD-9) codes. Compared with a control cohort, employees missed 1.50 more workdays per year, primarily driven by sick leave and short-term disability days¹⁴
 - Across studies, increased VMS severity was associated with higher productivity losses in terms of absenteeism, presenteeism and overall work impairment; **Figure 2** presents findings from US surveys with patient-reported outcome (PRO) data collected. Both studies found presenteeism (productivity loss while at work) to be a major source of overall work impairment and associated cost

Figure 2: Presenteeism and overall work impairment by VMS severity in the US^{15, 16}



Key findings on costs of productivity losses

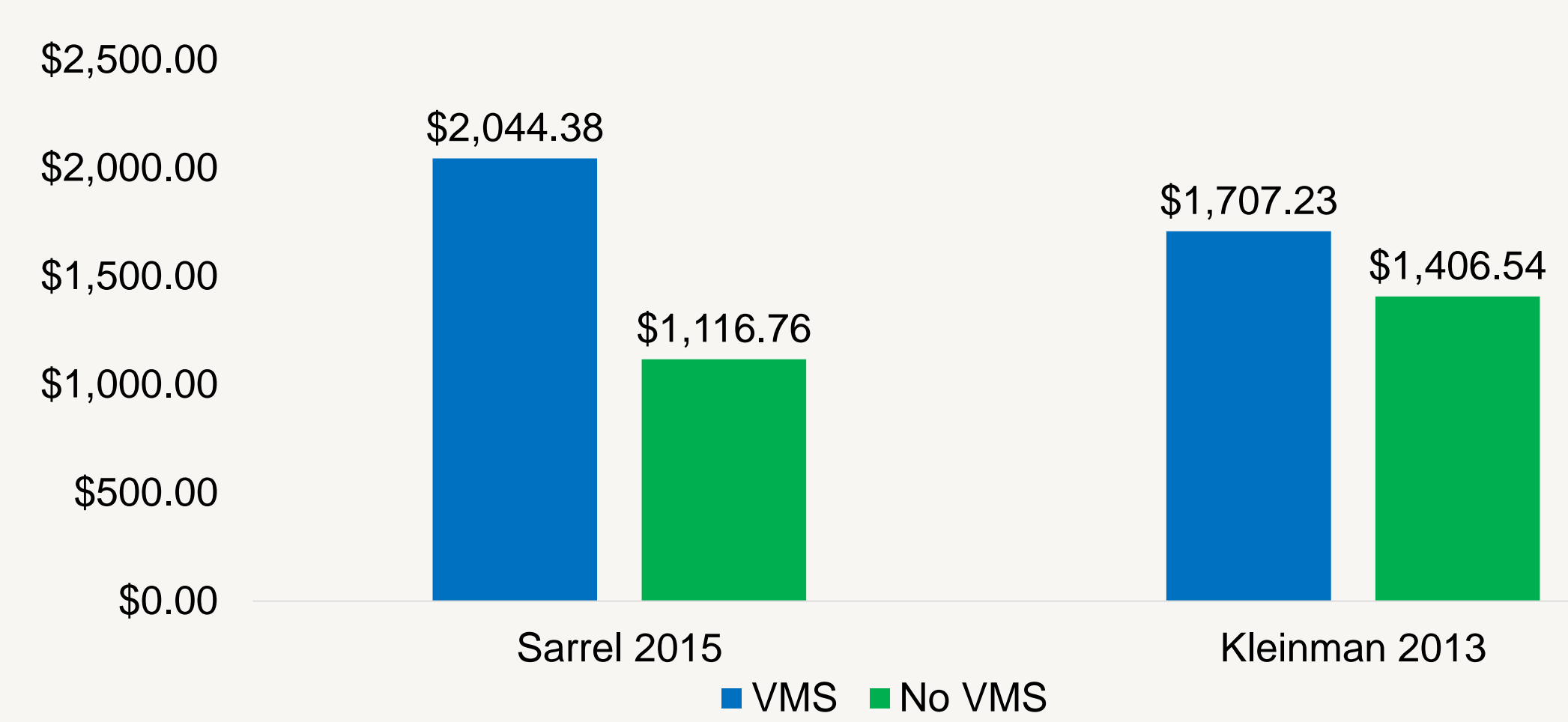
- Of the included studies, three studies reported productivity losses measured by indirect costs when comparing populations of VMS severity or VMS compared with no VMS/treated VMS in the US. A summary of key productivity loss costs is presented in **Table 1**
 - Annual productivity loss costs in the US ranged from \$1,116.76 to \$7,658.79 per patient, depending on severity of VMS symptoms
 - Sarrel 2015 and Kleinman 2013 reported \$927.62 and \$300.69 higher indirect costs per year (absenteeism, sick leave, productivity loss) for women with VMS compared with women without VMS, as presented in **Figure 3**
 - Both studies were claims database analyses that identified women with VMS using the relevant ICD-9 code

Table 1: Summary of productivity loss costs for VMS (2021 USD)

Study and country	Populations	Time horizon	Costs per patient	Author conclusion
Whiteley 2013 ¹⁷ , US	<ul style="list-style-type: none"> Participants selected from 2010 US NHWS; productivity assessed using WPAI Women with mild VMS Women with moderate VMS Women with severe VMS 	Annual	<ul style="list-style-type: none"> Observed presenteeism costs: <ul style="list-style-type: none"> Women with mild VMS: \$1,255.00 Women with moderate VMS: \$4,181.29 Women with severe VMS: \$7,658.79 Overall work impairment costs: <ul style="list-style-type: none"> Women with mild VMS: \$1,345.09 Women with moderate VMS: \$4,442.23 Women with severe VMS: \$7,629.45 	A greater severity of VMS is significantly associated with lower work productivity
			<ul style="list-style-type: none"> Untreated VMS: \$2,044.38 No VMS: \$1,116.76 VMS-related, absenteeism costs: <ul style="list-style-type: none"> Untreated VMS: \$614.40 No VMS: \$255.40 	
Sarrel 2015 ¹⁸ , US	<ul style="list-style-type: none"> Retrospective claims database analysis Women with untreated VMS Women without VMS 	Annual	<ul style="list-style-type: none"> All-cause, total indirect costs: <ul style="list-style-type: none"> Untreated VMS: \$2,044.38 No VMS: \$1,116.76 VMS-related, absenteeism costs: <ul style="list-style-type: none"> Untreated VMS: \$614.40 No VMS: \$255.40 	This high burden on women, employers and the healthcare system illustrates the need to recognize the existence of VMS and its negative effects on working women
			<ul style="list-style-type: none"> Total productivity loss costs: <ul style="list-style-type: none"> VMS: \$1,707.23 No VMS: \$1,406.54 Sick leave costs: <ul style="list-style-type: none"> VMS: \$803.91 No VMS: \$744.27 Short-term disability costs: <ul style="list-style-type: none"> VMS: \$595.17 No VMS: \$486.61 	
Kleinman 2013 ¹⁴ , US	<ul style="list-style-type: none"> Retrospective claims database analysis Women with VMS Women without VMS 	Annual	<ul style="list-style-type: none"> Total productivity loss costs: <ul style="list-style-type: none"> VMS: \$1,707.23 No VMS: \$1,406.54 Sick leave costs: <ul style="list-style-type: none"> VMS: \$803.91 No VMS: \$744.27 Short-term disability costs: <ul style="list-style-type: none"> VMS: \$595.17 No VMS: \$486.61 	<ul style="list-style-type: none"> Work productivity output was 11% to 12% lower for women with VMS Given the high prevalence of VMS in employed populations and its impact, this study emphasizes the need for employers to ensure appropriate care is available
			<ul style="list-style-type: none"> Untreated VMS: \$2,044.38 No VMS: \$1,116.76 	

Key: NHWS, National Health and Wellness Survey; VMS, vasomotor symptoms; WPAI, Workplace Productivity and Activity Impairment.

Figure 3: Annual productivity costs per patient in the US^{14,18}



- Approximately 76.2% of the 9,824,400⁵ women in the US between the ages of 45 and 49 participate in the workforce. Assuming 85%¹⁹ experience VMS during the menopausal transition, this can result in substantial costs:
 - Based on findings in Sarrel 2015, potential annual losses in the US can be upwards of \$5,902,690,840.37 when considering disability and absenteeism costs due to untreated VMS (\$927.66 per patient)
 - Economic losses could amount to \$1,913,369,816.08 across the US annually based on findings in Kleinman 2013
 - The above estimates are likely conservative as the studies captured costs of disability days, absenteeism, workers' compensation; the impact of VMS and cost of presenteeism were not fully investigated.

KEY TAKEAWAYS

- As women of menopausal age form an important part of the workforce, their menopausal symptoms have a substantial impact on society and national economic growth
- Impact on work was found to be higher for women with VMS; untreated and higher VMS severity were associated with higher costs of productivity loss
- Some impacts caused by VMS could not be easily quantified, such as effects on the gender pay gap, lost wages and/or promotional opportunities, and societal impact in female-dominated industries (nursing, teachers, social services)
- Future research on women's mid-life productivity is needed. More information, occupational health measures and better management of VMS will likely have positive impact on women and their professional contributions

REFERENCES 1. Freeman EW, Sammel MD and Sanders RJ. Risk of long-term hot flashes after natural menopause: evidence from the Penn Ovarian Aging Cohort. *Menopause* (New York, NY). 2014; 21(9):924. 2. Santoro N, Epperson CN and Matthews SB. Menopausal Symptoms and Their Management. *Endocrinol Metab Clin North Am*. 2015; 44(3):497-515. 3. Thurston RC. Vasomotor Symptoms: Natural History, Physiology, and Links with Cardiovascular Health. *Climacteric*. 2018; 21(2): 96-100. 4. National Institutes of Health State-of-the-Science Conference statement: management of menopause-related symptoms. *Ann Intern Med*. 2005; 142(12 Pt 1):1003-13. 5. International Labour Organization. Labour force participation rate by sex and age (%) - Annual. 2022. 6. Rees M, Bitzer J, Cano A, et al. Global consensus recommendations on menopause in the workplace: A European Menopause and Andropause Society (EMAS) position statement. *Maturitas*. 2021; 151:55-62. 7. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 2021; 372:n71. 8. NICE. Single technology appraisal and highly specialised technologies evaluation: User guide for company evidence submission template. 2022. Available at: <https://www.nice.org.uk/process/pmg24> 9. IQWiG General Methods 6.0. 2020. Available at: https://www.iqwig.de/methoden/general-methods_version-6-0.pdf. 10. EUnetHTA. Methods for health economic evaluations. 2015. 11. Institute for Clinical and Economic Review. ICER's Reference Case for Economic Evaluations: Principles and Rationale. 2020. 12. Federal Reserve Bank of St. Louis. Consumer Price Index for All Urban Consumers: All Items in U.S. City Average. 2022. 13. Wagner JS, DiBonaventura MD, Shah S, et al. The association of menopausal symptoms, including hot flashes, with quality of life, work productivity and resource use. *Value in Health*. 2011; 14(3):A111. 14. Kleinman NL, Rohrbacker NJ, Bushmakina AG, et al. Direct and indirect costs of women diagnosed with menopause symptoms. *J Occup Environ Med*. 2013; 55(4):465-70. 15. Whiteley J, Wagner JS, Bushmakina A, et al. Impact of the severity of vasomotor symptoms on health status, resource use, and productivity. *Menopause*. 2013; 20(5):518-24. 16. Javaherian H SM, Small M, Wild R. The impact of severe vasomotor symptoms on work productivity and activity impairment: Findings from a US real world survey. *Value in Health*. 2020; 23(Suppl1):S126. 17. Whiteley J, DiBonaventura MD, Wagner JS, et al. The impact of menopausal symptoms on quality of life, productivity, and economic outcomes. *J Womens Health (Larchmt)*. 2013; 22(11):983-90. 18. Sarrel P, Portman D, Lefebvre P, et al. Incremental direct and indirect costs of untreated vasomotor symptoms. *Menopause*. 2015; 22(3):260-6. 19. Bansal R and Aggarwal N. Menopausal Hot Flashes: A Concise Review. *J Midlife Health*. 2019; 10(1):6-13.

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