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Primary Care Physician Trends: Dissatisfaction, Stress, And Burnout In The US And 9 Comparator Countries, 2012–22

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ABSTRACT **Burnout and decreased well-being among primary care physicians threaten workforce sustainability and health outcomes. Understanding how primary care physician burnout and its mitigators differ across countries could inform policy changes, but evidence is limited. Using 2012–22 survey data from primary care physicians in the United States and nine other high-income countries, we found that shares reporting stress rose across countries. By 2022, the US had one of the highest shares of primary care physicians reporting burnout (44 percent). Switzerland (18 percent) and the Netherlands (12 percent) had the lowest shares reporting burnout, alongside higher shares with satisfaction and lower shares with stress. Across countries, female physicians had higher odds of burnout, whereas workplace factors—including satisfaction with income and administrative workload—and better care quality were associated with reduced odds of burnout. Efforts to reduce burnout should address disparities by sex and should include systemic supports including quality initiatives, flexible work, and arrangements for patient cross-coverage; in-depth cross-national learning could reveal additional strategies.**

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In the United States, many health care experts have raised concerns about the well-being of primary care physicians in the context of growing work demands and capacity constraints.[1] Compared with other specialties, US primary care physicians experience among the highest rates of burnout,[2,3] which worsens aspects of well-being, including satisfaction, and is connected to prolonged stress.[4–6] Burnout can also undermine health care quality, equity, and economic sustainability. Studies have found associations between primary care physicians reporting burnout and higher rates of medical errors and patients reporting diminished satisfaction.[7–9] Another potential consequence of burnout, or work settings that create conditions under which physicians burn out, is higher primary care physician turnover, especially in underserved communities.[10] Multiple studies found an association between higher turnover and unnecessary hospitalizations.[11,12] The financial impact is equally concerning, with burnout-related primary care physician turnover in the US alone generating an estimated $260 million in excess health care expenditures annually.[13]

The role of physician sex in primary care burnout across countries is important, yet not fully understood. Although some US studies show that burnout disproportionally affects female physicians,[14–16] others show that it depends on the practice setting and specialty.[17] Findings from other high-income countries show mixed results on the existence of burnout differences by sex or gender.[14,18,19] In the US, disparities in burnout by sex or gender have been attributed to

female or women physicians facing higher administrative and domestic workloads, different role expectations, and less career support.[20–22] Despite notable differences in physician and work characteristics across countries, there is little research examining how primary care physician burnout rates compare between nations.

Understanding similarities and differences between countries in physician well-being, including satisfaction, stress, and burnout, can inform efforts to address the resulting consequences for physicians, patients, and the health care system. Considering the profound shifts in care delivery prompted by the COVID-19 pandemic, and particularly the rise of asynchronous[23] and remote[24] care, it is essential to examine whether physicians in some countries were more successful than others in avoiding burnout. Using survey data from primary care physicians in the US and nine other high-income countries, this study addressed the following three questions: How did primary care physicians' job satisfaction and stress change in the US and nine other high-income countries from 2012 to 2022? What were the differences in burnout among primary care physicians across these countries overall and by sex after the pandemic, in 2022? Which physician and work characteristics were associated with postpandemic burnout in the US and comparator countries during this period?

Study Data And Methods

STUDY DESIGN This cohort study was a secondary analysis of data from the Commonwealth Fund International Health Policy Survey of primary care physicians, conducted in 2012, 2015, 2019, and 2022, which were provided to the authors. The surveys collected self-reported cross-sectional data from primary care physicians in ten high-income countries: Australia, Canada, France, Germany, the Netherlands, New Zealand, Switzerland, Sweden, the United Kingdom, and the United States. Survey instruments were administered digitally in each country's official language and translated into English for analyses. Different modes (telephone, postal, and email) were used for initial primary care physician contact and were tailored to best practices for reaching primary care physicians in each country (online appendix exhibit A1).[25] A random sample of primary care physicians was contacted by the country-specific recruitment organization (appendix exhibit A2).[25] In many countries, primary care physicians care for both adults and children. To ensure cross-national comparability, we included both primary care physicians and pediatricians in countries where these roles are split. Ethical review exemption was granted by Brown University's Institutional Review Board.

STUDY OUTCOMES The main outcomes of the study were self-reported satisfaction (reported in all years), job stress (reported in 2015, 2019, and 2022), and burnout (reported in 2022). Although stress and burnout are distinct concepts, they have reciprocal links, including persistent stress increasing the risk for burnout and vice versa.[2] All outcome variables were originally measured on a five-point Likert scale and then dichotomized. Overall satisfaction with practicing medicine was dichotomized into satisfied and not satisfied. Stressfulness of one's job as a primary care physician was dichotomized into stressed and not stressed. Both measures are closely aligned with the Mini Z 2.0 questionnaire.[26] Burnout was based on the validated, nonproprietary, single-item burnout measure,[27] with five response options to the question, "Overall, based on your definition of burnout, how would you rate your current level of burnout?," dichotomized into burnout and no burnout. This measure primarily correlates with the "emotional exhaustion" dimension of burnout.[28,29] See appendix exhibit A3 for more details.[25]

EXPLANATORY VARIABLES Explanatory variables included physician age (categorical), sex (male or female), and country. We also examined work characteristics that have been hypothesized to relate to burnout, based on previous literature;[30–33] were available in the data set; and were not likely to be colinear with other included variables: practice location[30] (urban, suburban, or rural), workload[31] (workload change since the pandemic; after-hours work, including on weekends or post-6 p.m. on weekdays; weekly hours worked; and weekly count of consultations), support[31] (presence of an arrangement with another practice for patients to be seen when one's practice is closed), distribution of work[32] (clinician-level share of consultations that are in-person versus virtual or telephone based, and satisfaction with administrative workload), and meaning and accomplishment[33] (satisfaction with the income from practicing medicine, satisfaction with work-life balance, and the perceived change postpandemic in the quality of the care one could provide). All variable specifications are in appendix exhibit A3.[25]

STATISTICAL ANALYSES We performed descriptive analyses of the percentage of primary care physicians who reported satisfaction (all survey years) and stress (2015, 2019, and 2022) in each year by country, overall and stratified by physician sex. Next, we described the percentage of all primary care physicians, and male and female physicians separately, reporting burnout in 2022. Finally, we built three multivariable logis-

US primary care physicians persistently reported dissatisfaction, stress, and burnout throughout the period 2012–22.

tic regression models. Model A included the country as an explanatory variable; model B included the country and physician characteristics (including sex); and model C included country, physician characteristics (including sex), and work characteristics (details are in appendix exhibit A4).[25] This stepwise approach allowed us to assess how much of the observed cross-national variation was explained by physician and work characteristics. Statistical significance was defined as $p < 0.05$. We used complete case analysis to handle small amounts of missing data (appendix exhibit A5).[25] Analyses were conducted with R, version 4.4.1, and were weighted to be representative of the given country's primary care physician population (appendix exhibit A6).[25]

LIMITATIONS We acknowledge several limitations. First, although we accounted for potential nonresponse bias through oversampling of subgroups known for lower response rates and weighting for representativity, results might still be biased toward physicians willing and able to share information, potentially limiting generalizability. This is also reflected in the varying response rates by country. Second, the survey employed a single-item burnout measure because it both is commonly used in the literature and minimizes respondent burden,[27] although this measure primarily correlates with the burnout dimension "emotional exhaustion"[28] and is unlikely to capture the additional dimensions of the Maslach Burnout Inventory (depersonalization and sense of personal accomplishment).[34] Third, although we controlled for a range of work characteristics, results may have been confounded by unobservable differences.

Study Results

SAMPLE CHARACTERISTICS The survey response rate by country in 2022 ranged from 6.5 percent in France to 39.7 percent in the Netherlands; it was 18.8 percent in the US (appendix exhibit A7).[25] Across the four survey waves and all countries, most primary care physicians were ages 35–64. The percentage of female primary care physicians increased from 39.5 percent in 2012 to 51.8 percent in 2022 (appendix exhibit A8).[25] Throughout the results, for brevity, "physician" refers to primary care physicians.

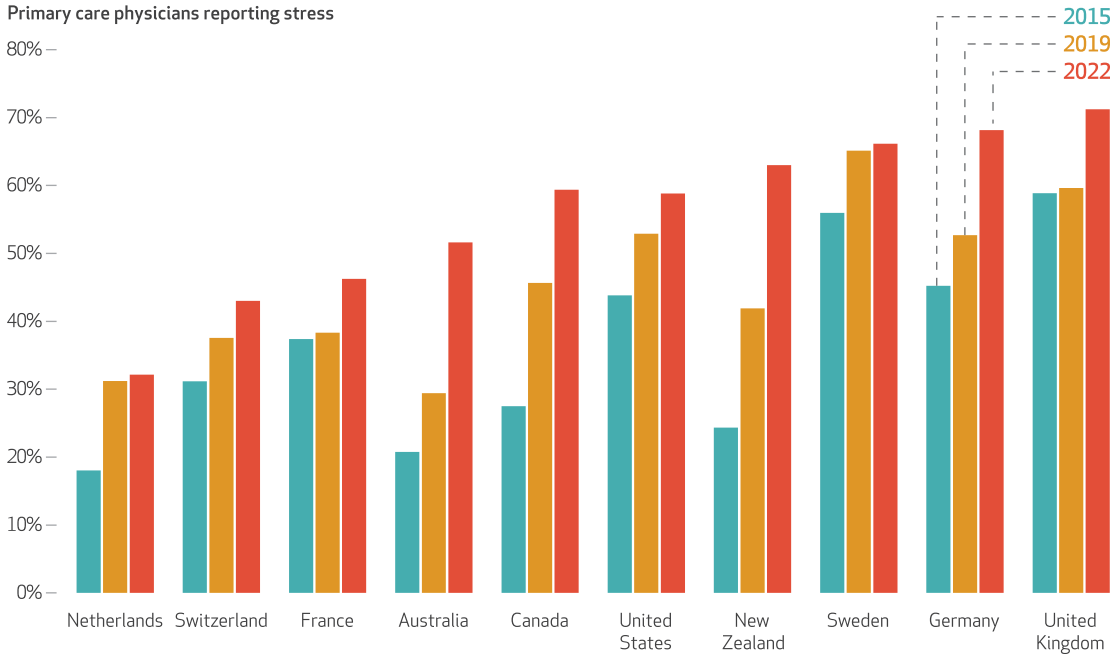
PHYSICIAN SATISFACTION Trends in primary care physicians' satisfaction with practicing medicine varied across countries (appendix exhibit A9).[25] Satisfaction declined in some countries, but it increased in others. In the US, shares of physicians reporting satisfaction rose modestly, increasing from 69 percent in 2012 to 72 percent in 2019 and 2022, placing US physicians among the least satisfied overall. Physicians in the Netherlands and Switzerland were consistently the most likely to report satisfaction across all years, reaching 88 percent (2012) and 87 percent (2022) in the Netherlands and increasing from 84 percent to 91 percent in Switzerland during the same period. In most countries and survey years, female physicians were more likely to report satisfaction than their male counterparts (appendix exhibit A9).[25]

PHYSICIAN STRESS Across all countries, a greater share of primary care physicians reported stress over time (exhibit 1). The highest shares of physicians reporting stress in 2022 were found in Germany and the UK, whereas the share in the US was slightly lower (59 percent). The lowest reported shares in all years were found in the Netherlands (32 percent in 2022) and Switzerland (43 percent in 2022). In earlier years, female physicians were less likely than their male counterparts to report stress in several countries (UK, New Zealand, Australia, France, and Switzerland) (appendix exhibit A10).[25] However, in all other years and countries, female physicians were more likely to report stress than their male peers. By 2022, higher proportions of female physicians than male physicians reported stress in every country.

PHYSICIAN BURNOUT Burnout in 2022 varied substantially across countries (exhibit 2), with the lowest shares of primary care physicians reporting burnout in the Netherlands (12 percent) and Switzerland (18 percent) and the highest in New Zealand (49 percent), Canada (47 percent), and the US (44 percent). Across nearly all countries, female physicians were more likely to report burnout than their male counterparts, with the exception of Australia, where female physicians were slightly less likely to report burnout. The difference by sex ranged from −3 percentage points in Australia and 2 percentage points in the Netherlands to 13 percentage points in Canada.

EXHIBIT 1

Proportion of primary care physicians who reported feeling stressed in 10 high-income countries, 2015, 2019, and 2022

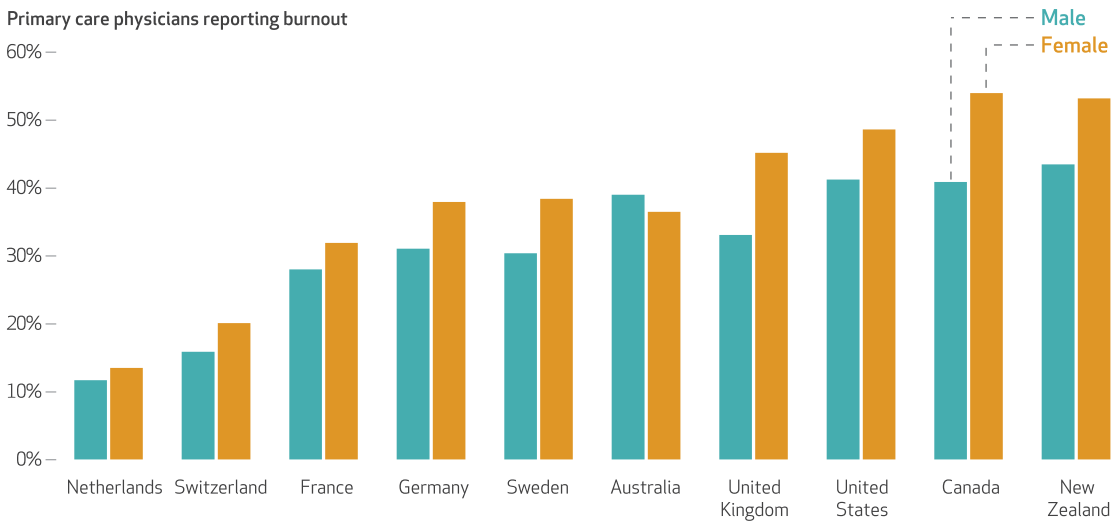


SOURCE Authors' analyses of data from the 2015, 2019, and 2022 Commonwealth Fund International Health Policy Surveys of primary care physicians for the 10 countries shown. **NOTES** Sample sizes were 11,919 (2015), 13,029 (2019), and 9,341 (2022). The analysis was weighted for representativeness.

FACTORS ASSOCIATED WITH PHYSICIAN BURNOUT In multivariable models examining factors associated with primary care physician burnout, all other countries had similar (Australia, Canada, and New Zealand) or statistically significantly lower (the other six countries) odds of burnout compared with the US (exhibit 3), including the Netherlands (odds ratio: 0.18; 95%

EXHIBIT 2

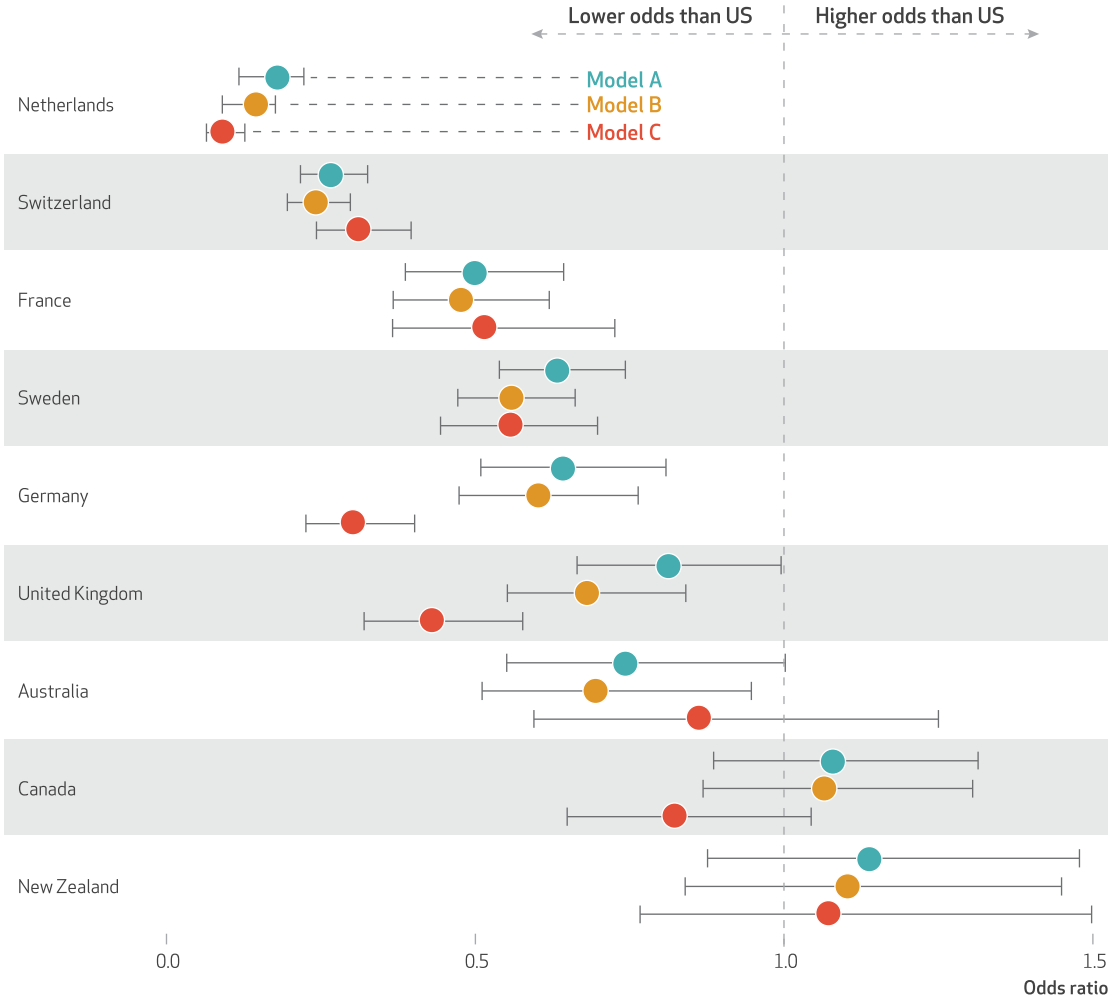
Proportion of primary care physicians reporting burnout in 10 high-income countries, by sex, 2022



SOURCE Authors' analyses of data from the 2022 Commonwealth Fund International Health Policy Survey of primary care physicians for the 10 countries shown. **NOTES** *N* = 9,341. The analysis was weighted for representativeness.

EXHIBIT 3

Association between country and primary care physician burnout in 9 high-income countries compared with the US, 2022



SOURCE Authors' analyses of data from the 2022 Commonwealth Fund International Health Policy Survey of primary care physicians for the 9 countries shown and the US. **NOTES** The figure presents multivariable logistic regression results of models A, B, and C. Model A includes country, model B adds physician characteristics to model A, and model C adds work characteristics to model B. An odds ratio less than 1.0 indicates lower odds of burnout compared with the reference group, which is the US. The analysis was weighted for representativeness.

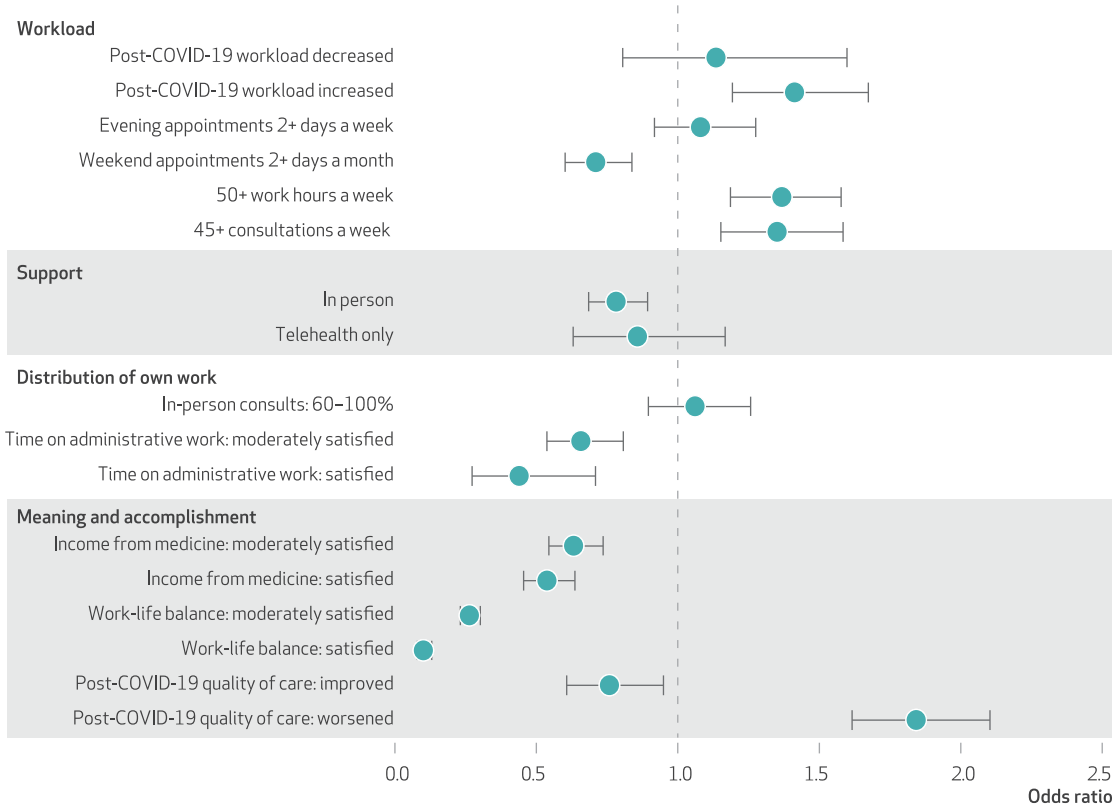
confidence interval: 0.14, 0.24) and Switzerland (OR: 0.27; 95% CI: 0.22, 0.33). These differences remained statistically significant after physician and work characteristics were accounted for. In this fully adjusted model (model C), the lower odds of burnout in the Netherlands declined further (adjusted OR: 0.09; 95% CI: 0.07, 0.13), whereas the reduction in Switzerland attenuated (aOR: 0.31; 95% CI: 0.24, 0.40).

In the full model that included country, physician, and work characteristics (model C), we found that sex and age, as well as several work characteristics, were statistically significantly associated with burnout (exhibit 4, with detailed regression output in appendix exhibit A11).[25] Specifically, there were greater odds of burnout among female physicians (aOR: 1.31; 95% CI: 1.15, 1.49) (appendix exhibit A11)[25] and among physicians reporting that their workload increased after the pandemic (aOR: 1.41; 95% CI: 1.19, 1.67); working at least fifty hours a week (aOR: 1.37; 95% CI: 1.19, 1.58); having at least forty-five consultations a week (aOR: 1.35; 95% CI: 1.15, 1.58); and being able to provide worse care quality after the pandemic (aOR: 1.84; 95% CI: 1.62, 2.10) (exhibit 4).

The full model showed lower odds of burnout in the oldest age group (ages sixty-five and older; aOR: 0.32; 95% CI: 0.25, 0.41) (appendix exhibit A11).[25] Work characteristics associated with lower odds of burnout were weekend appointments offered more than two days a month (aOR:

EXHIBIT 4

Association between work characteristics and primary care burnout in 10 high-income countries, 2022



SOURCE Authors' analyses of data from the 2022 Commonwealth Fund International Health Policy Survey of primary care physicians for Australia, Canada, France, Germany, the Netherlands, New Zealand, Switzerland, Sweden, the United Kingdom, and the United States. **NOTES** The figure presents multivariable logistic regression results of model C, which includes country and physician and work characteristics. An odds ratio less than 1.0 indicates lower odds of burnout compared with the reference groups: post-COVID-19 workload stayed the same, evening appointments fewer than 2 days a week, weekend appointments fewer than 2 days a month, work hours fewer than 50 hours a week, fewer than 45 consults per week, no other practice support, fewer than 60% in-person consults, not satisfied with time on administrative work, not satisfied with income from medicine, not satisfied with work-life balance, and post-COVD-19 quality of care stayed the same. The analysis was weighted for representativeness.

0.71; 95% CI: 0.60, 0.84); the presence of in-person arrangements for patients to be seen when one's practice is closed (aOR: 0.78; 95% CI: 0.69, 0.89); satisfaction with the time spent on administrative work (moderately satisfied, aOR: 0.66 [95% CI: 0.54, 0.81]; satisfied, aOR: 0.44 [95% CI: 0.27, 0.71]); satisfaction with the income from practicing medicine (moderately satisfied, OR: 0.63 [95% CI: 0.54, 0.74]; satisfied, aOR: 0.54 [95% CI: 0.46, 0.64]); and satisfaction with one's work-life balance (moderately satisfied, aOR: 0.26 [95% CI: 0.23, 0.30]; satisfied, aOR: 0.10 [95% CI: 0.08, 0.13]); as well as whether physicians perceived that post-COVID-19, the quality of care they could provide improved (aOR: 0.76; 95% CI: 0.61, 0.95) (exhibit 4).

Discussion

This study of trends in primary care physician well-being and burnout across high-income countries both overall and by sex demonstrated notable cross-national variation. US primary care physicians persistently reported dissatisfaction, stress, and burnout throughout the period 2012–22. Shares of US physicians reporting burnout were among the highest across all countries studied, exceeded only by New Zealand and Canada. Other countries, notably Switzerland and the Netherlands, consistently had the lowest shares of primary care physicians reporting burnout and stress and the highest shares reporting satisfaction. Across countries, several workplace factors—including in-person arrangements for patients to be seen in primary care physicians' absence, satisfaction with income and administrative workload, and the perceived lack of worsening care quality after the

The results raise questions about the policy and organizational environments that may promote primary care physician well-being.

pandemic—were associated with reduced odds of burnout, whereas female primary care physicians had higher odds of burnout.

In most countries, female primary care physicians were more likely than their male counterparts to report burnout, even after workplace and demographic characteristics were adjusted for. In addition, female physicians were more likely to experience stress than male physicians across all countries in 2022, although not consistently in earlier survey years. These findings are in line with literature suggesting worsened gender inequality in household labor and child care obligations during the COVID-19 pandemic.[35,36] Differential work patterns among primary care physicians, such as women receiving more messages from colleagues and patients than men[37] in the setting of increased message volume overall during and postpandemic,[38] women spending more time with patients per visit,[39] and gendered patient expectations,[40] might also contribute to lasting and increasing sex and gender differences. At the same time, the findings are at odds with the common policy maker narrative that gender differences in physician well-being will disappear naturally as more women enter the medical workforce—what Sonia Kang and Sarah Kaplan call the "pipeline problem myth."[41] Our findings illustrate that sex differences were not necessarily higher in countries with higher overall stress and burnout rates, implying that targeted strategies to understand and reduce sex disparities in stress and burnout rates (for example, as suggested by Aimee Eden and coauthors)[42] might be necessary in some countries.

The results also raise important questions about the policy and organizational environments that may promote primary care physician well-being. Although work characteristics such as workload, administrative burden, and income satisfaction were linked to burnout, they do not fully explain cross-national differences. Other international comparisons suggest that differences in institutional and systemic supports play a crucial role in mitigating stress and burnout. For instance, a study across thirty-three countries found lower distress among primary care physicians working in larger practices with protected time for guideline review.[43] Countries such as the Netherlands demonstrate a strong emphasis on team-based primary care[44]—a model that contrasts with the frequent experience of incomplete teams and staffing shortages reported by US physicians, which is itself associated with increased burnout.[45]

Although solo practice is associated with higher burnout in other countries,[43] a US study reported a lower risk for burnout in such settings.[46] However, this finding is nuanced; Jessica Creager and colleagues showed that practice type is not independently associated with burnout in the US when practice environment factors such as work stressors and teamwork are controlled for, suggesting that targeted interventions for burnout reduction can be beneficial, regardless of practice structure.[47]

The degree of professional autonomy also appears to be an important factor, with studies suggesting that a stronger sense of autonomy protects physicians from burnout.[48,49] In the US, greater requirements from multiple payers and growing physician employment (rather than independent practice) might reduce perceived professional autonomy among US physicians; indeed, in the US, poorer control over work has been associated with physician burnout.[50]

In our study, primary care physicians in the Netherlands and Switzerland were more likely to report satisfaction and not being stressed across the entire study period, not just in the more recent years, which merits further investigation. These trends suggest that these countries might have had long-standing approaches to supporting primary care physician well-being, which should be further explored. Physician workforce composition in these countries is different and may contribute to the differences in primary care physician well-being: In 2022, primary care physicians made up 47 percent of all physicians in the Netherlands and 26 percent in Switzerland compared with 12 percent in the US.[51] Primary care physicians in these countries may also benefit from potentially fewer working hours in training as a result of the European Working Time Directive.[52]

Notably, we found that the odds of burnout across countries was 1.8 times higher among

primary care physicians who perceived that the quality of care they could provide worsened after the COVID-19 pandemic. This association suggests lingering effects of the pandemic, possibly due to moral distress, resource constraints, or shifting patient expectations, although it is unclear whether perceived poorer quality itself contributed toward burnout or whether burnout leads to a perception of lower quality of care.

Finally, the relationship between providing more weekend appointments and lower burnout odds appears counterintuitive but may reflect a level of scheduling flexibility and autonomy or the fact that primary care physicians experiencing burnout are less likely to offer weekend care. The association between perceived work-life balance and lesser burnout, even after workload is controlled for, underscores the importance of broader cultural and structural supports that enable primary care physicians to manage their roles both within and beyond the workplace.[53]

It's important to note that observed differences in primary care physician well-being across countries may have been influenced by numerous factors beyond the countries' health care systems. Although our observations suggest a potentially more resilient approach to addressing new demands in the Netherlands and Switzerland compared with countries such as New Zealand, Australia, and Canada, it is crucial to consider alternative explanations. Cross-national variation might reflect differing social systems and lifestyles, and even subtle variations in how questions are interpreted and responded to because of linguistic and cultural nuances. This underscores the complexity of attributing observed differences solely to health care–specific aspects. Further research is needed to disentangle these various influences and develop a more comprehensive understanding of cross-national variations in primary care physician well-being.

The findings of this study build on existing literature identifying administrative burden and high workload as key drivers of physician burnout,[4,54–57] while adding a cross-national perspective showing system-level differences that go beyond known work characteristics. This study also integrated physician sex and work characteristics in a unified analysis, offering a more complete understanding of physician well-being after the pandemic. Although prior US studies have shown that female primary care physicians are more prone to burnout,[15,16] our analyses indicate that this pattern extends internationally. Our findings also reinforce recent studies highlighting pandemic-related decline in care quality and increase in moral injury,[58,59] as well as the importance of quality improvement initiatives, not only for patients but also for physician well-being.[53]

Persistent and growing sex disparities in physician well-being demand dedicated attention.

Conclusion

This study confirmed that as of 2022, primary care physicians remained under stress and at risk for burnout across several high-income countries, including the US. We also found that meaningful variation existed between nations, with countries such as the Netherlands and Switzerland faring much better. Lessons learned from these settings may offer actionable insights that can be adopted elsewhere. Specifically, policy solutions could focus on ensuring manageable work hours and administrative work, in-person support structures, fair payment, work-life balance, and the opportunity to provide consistent quality of care. Quality improvement initiatives and policies that enhance control over schedules and work-home conflicts are possible first steps. At the same time, persistent and growing sex disparities in physician well-being demand dedicated attention. Efforts to improve physician burnout must go beyond one-size-fits-all interventions and account for both systemic and demographic drivers of stress and burnout. ■

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NOTES

1 Arndt BG, Micek MA, Rule A, Shafer CM, Baltus JJ, Sinsky CA. More tethered to the EHR: EHR workload trends among academic primary care physicians, 2019–2023. Ann Fam Med. 2024;22(1):12–8.
2 McManus IC, Winder BC, Gordon D. The causal links between stress and burnout in a longitudinal study of UK doctors. Lancet. 2002;359 (9323):2089–90.
3 Naji L, Singh B, Shah A, Naji F, Dennis B, Kavanagh O, et al. Global prevalence of burnout among postgraduate medical trainees: a systematic review and meta-regression. CMAJ Open. 2021;9(1):E189–200.
4 Shanafelt TD, West CP, Dyrbye LN, Trockel M, Tutty M, Wang H, et al. Changes in burnout and satisfaction with work-life integration in physicians during the first 2 years of the COVID-19 pandemic. Mayo Clin Proc. 2022;97(12):2248–58.
5 Ortega MV, Hidrue MK, Lehrhoff SR, Ellis DB, Sisodia RC, Curry WT, et al. Patterns in physician burnout in a stable-linked cohort. JAMA Netw Open. 2023;6(10):e2336745.
6 Menon NK, Shanafelt TD, Sinsky CA, Linzer M, Carlasare L, Brady KJS, et al. Association of physician burnout with suicidal ideation and medical errors. JAMA Netw Open. 2020;3(12):e2028780.
7 Hodkinson A, Zhou A, Johnson J, Geraghty K, Riley R, Zhou A, et al. Associations of physician burnout with career engagement and quality of patient care: systematic review and meta-analysis. BMJ. 2022;378: e070442.
8 Anagnostopoulos F, Liolios E, Persefonis G, Slater J, Kafetsios K, Niakas D. Physician burnout and patient satisfaction with consultation in primary health care settings: evidence of relationships from a one-with-many design. J Clin Psychol Med Settings. 2012;19(4):401–10.
9 Owoc J, Mańczak M, Tombarkiewicz M, Olszewski R. Burnout, wellbeing, and selfreported medical errors among physicians. Pol Arch Intern Med. 2021;131(7-8):626–32.
10 Lee J, Kontopantelis E. A systematic review exploring the factors that contribute to increased primary care physician turnover in socio-economically deprived areas. PLoS One. 2024;19(12):e0315433.
11 Knight JC, Mathews M, Aubrey-Bassler K. Relation between family physician retention and avoidable hospital admission in Newfoundland and Labrador: a population-based cross-sectional study. CMAJ Open. 2017;5(4):E746–52.
12 Parisi R, Lau YS, Bower P, Checkland K, Rubery J, Sutton M, et al. Predictors and population health outcomes of persistent high GP turnover in English general practices: a retrospective observational study. BMJ Qual Saf. 2023;32(7):394–403.
13 Sinsky CA, Shanafelt TD, Dyrbye LN, Sabety AH, Carlasare LE, West CP. Health care expenditures attributable to primary care physician overall and burnout-related turnover: a cross-sectional analysis. Mayo Clin Proc. 2022;97(4):693–702.
14 Linzer M, McMurray JE, Visser MRM, Oort FJ, Smets E, de Haes HCJM. Sex differences in physician burnout in the United States and The Netherlands. J Am Med Womens Assoc (1972). 2002;57(4):191–3.
15 Eden AR, Jabbarpour Y, Morgan ZJ, Wilkinson E, Peterson LE. Burnout among family physicians by gender and age. J Am Board Fam Med. 2020;33(3):355–6.
16 Hoff T, Trovato K, Kitsakos A. Burnout among family physicians in the United States: a review of the literature. Qual Manag Health Care. 2024;33(1):1–11.
17 Marshall AL, Dyrbye LN, Shanafelt TD, Sinsky CA, Satele D, Trockel M, et al. Disparities in burnout and satisfaction with work-life integration in U.S. physicians by gender and practice setting. Acad Med. 2020; 95(9):1435–43.
18 Khan N, Palepu A, Dodek P, Salmon A, Leitch H, Ruzycki S, et al. Cross-sectional survey on physician burnout during the COVID-19 pandemic in Vancouver, Canada: the role of gender, ethnicity, and sexual orientation. BMJ Open. 2021;11(5): e050380.
19 Pantenburg B, Luppa M, König HH, Riedel-Heller SG. Burnout among young physicians and its association with physicians' wishes to leave: results of a survey in Saxony, Germany. J Occup Med Toxicol. 2016;11:2.
20 West CP, Dyrbye LN, Shanafelt TD. Physician burnout: contributors, consequences, and solutions. J Intern Med. 2018;283(6):516–29.
21 Rotenstein L, Harry E, Wickner P, Gupte A, Neville BA, Lipsitz S, et al. Contributors to gender differences in burnout and professional fulfillment: a survey of physician faculty. Jt Comm J Qual Patient Saf. 2021; 47(11):723–30.
22 Lyubarova R, Salman L, Rittenberg E. Gender differences in physician burnout: driving factors and potential solutions. Perm J. 2023;27(2): 130–6.
23 Huang M, Khurana A, Mastorakos G, Wen A, He H, Wang L, et al. Patient portal messaging for asynchronous virtual care during the COVID-19 pandemic: retrospective analysis. JMIR Hum Factors. 2022; 9(2):e35187.
24 Shaver J. The state of telehealth before and after the COVID-19 pandemic. Prim Care. 2022;49(4): 517–30.
25 To access the appendix, click on the Details tab of the article online.
26 Linzer M, Smith CD, Hingle S, Poplau S, Miranda R, Freese R, et al. Evaluation of work satisfaction, stress, and burnout among US internal medicine physicians and trainees. JAMA Netw Open. 2020; 3(10):e2018758.
27 Dolan ED, Mohr D, Lempa M, Joos S, Fihn SD, Nelson KM, et al. Using a single item to measure burnout in primary care staff: a psychometric evaluation. J Gen Intern Med. 2015; 30(5):582–7.
28 Rohland BM, Kruse GR, Rohrer JE. Validation of a single-item measure of burnout against the Maslach Burnout Inventory among physicians. Stress Health. 2004;20(2): 75–9.
29 Flickinger TE, Kon RH, Jacobsen R, Owens J, Schorling J, Plews-Ogan M. Single-item burnout measure correlates well with emotional exhaustion domain of burnout but not depersonalization among medical students. J Gen Intern Med. 2020; 35(11):3383–5.
30 Woolcock SC, Patterson DG, Dunn JA, Peterson LE, Andrilla CHA. Rural and urban differences in family physician burnout before and during the COVID-19 pandemic. J Rural Health. 2025;41(3):e70051.
31 Sterling R, Rinne ST, Reddy A, Moldestad M, Kaboli P, Helfrich CD, et al. Identifying and prioritizing workplace climate predictors of burnout among VHA primary care physicians. J Gen Intern Med. 2022; 37(1):87–94.
32 Ali-Hassan H, Clayton S, Zangiabadi S. Effect of mode of healthcare delivery on stress and intention to quit among physicians in Canada during the COVID-19 pandemic. PLOS Glob Public Health. 2024;4(7):e0003377.
33 Gibbons GM, Bland HW, Aslakson A, Melton B. Understanding the relationship between burnout, quality of life, and career intentions in emergency medicine. Am J Lifestyle Med. 2025 Jun 7. [Epub ahead of print].
34 Maslach C, Jackson SE, Leiter MP. Maslach Burnout Inventory: third edition. In: Zalaquett CP, Wood RJ, editors. Evaluating stress: a book of resources. Lanham (MD): Scarecrow Press; 1997. p. 191–218.
35 Sewell M, Nobel T, Lynch KA, Gilliland J, Harrington C, Boerner T, et al. The impact of COVID-19 on the division of household labor among women physicians and advanced practice providers. J Gen Intern

Med. 2025;40(7):1646–54.
36 Johnston RM, Mohammed A, van der Linden C. Evidence of exacerbated gender inequality in child care obligations in Canada and Australia during the COVID-19 pandemic. Polit Gend. 2020;16(4):1131–41.
37 Rittenberg E, Liebman JB, Rexrode KM. Primary care physician gender and electronic health record workload. J Gen Intern Med. 2022;37(13):3295–301.
38 Holmgren AJ, Apathy NC, Sinsky CA, Adler-Milstein J, Bates DW, Rotenstein L. Trends in physician electronic health record time and message volume. JAMA Intern Med. 2025;185(4):461–3.
39 Ganguli I, Sheridan B, Gray J, Chernew M, Rosenthal MB, Neprash H. Physician work hours and the gender pay gap—evidence from primary care. N Engl J Med. 2020;383(14):1349–57.
40 Linzer M, Harwood E. Gendered expectations: do they contribute to high burnout among female physicians? J Gen Intern Med. 2018;33(6):963–5.
41 Kang SK, Kaplan S. Working toward gender diversity and inclusion in medicine: myths and solutions. Lancet. 2019;393(10171):579–86.
42 Eden AR, Jabbarpour Y, Morgan ZJ, Dai M, Coffman M, Bazemore A. Gender differences in personal and organizational mechanisms to address burnout among family physicians. J Am Board Fam Med. 2020;33(3):446–51.
43 Collins C, Clays E, Van Poel E, Cholewa J, Tripkovic K, Nessler K, et al. Distress and wellbeing among general practitioners in 33 countries during COVID-19: results from the cross-sectional PRICOV-19 study to inform health system interventions. Int J Environ Res Public Health. 2022;19(9):5675.
44 Freund T, Everett C, Griffiths P, Hudon C, Naccarella L, Laurant M. Skill mix, roles, and remuneration in the primary care workforce: who are the healthcare professionals in the primary care teams across the world? Int J Nurs Stud. 2015;52(3):727–43.
45 Rotenstein LS, Shah P, Shanafelt T, Sinsky CA. Incomplete team staffing, burnout, and work intentions among US physicians. JAMA Intern Med. 2025;185(6):739–42.
46 Edwards ST, Marino M, Balasubramanian BA, Solberg LI, Valenzuela S, Springer R, et al. Burnout among physicians, advanced practice clinicians, and staff in smaller primary care practices. J Gen Intern Med. 2018;33(12):2138–46.
47 Creager J, Coutinho AJ, Peterson LE. Associations between burnout and practice organization in family physicians. Ann Fam Med. 2019;17(6):502–9.
48 Kruse CS, Mileski M, Dray G, Johnson Z, Shaw C, Shirodkar H. Physician burnout and the electronic health record leading up to and during the first year of COVID-19: systematic review. J Med Internet Res. 2022;24(3):e36200.
49 Olson K, Marchalik D, Farley H, Dean SM, Lawrence EC, Hamidi MS, et al. Organizational strategies to reduce physician burnout and improve professional fulfillment. Curr Probl Pediatr Adolesc Health Care. 2019;49(12):100664.
50 Sinsky CA, Brown RL, Rotenstein L, Carlasare LE, Shah P, Shanafelt TD. Association of work control with burnout and career intentions among U.S. physicians: a multi-institution study. Ann Intern Med. 2025;178(1):20–8.
51 World Health Organization. Global Health Workforce statistics database [Internet]. Geneva: WHO; [last updated 2026 Jan 23; cited 2026 Jan 30]. Available from: https://www.who.int/data/gho/data/themes/topics/health-workforce
52 Goddard AF. The European Working Time Directive and the impact on training: the current evidence. Clin Med (Lond). 2010;10(4):317–8.
53 Edwards ST, Marino M, Solberg LI, Damschroder L, Stange KC, Kottke TE, et al. Cultural and structural features of zero-burnout primary care practices. Health Aff (Millwood). 2021;40(6):928–36.
54 Helfrich CD, Simonetti JA, Clinton WL, Wood GB, Taylor L, Schectman G, et al. The association of team-specific workload and staffing with odds of burnout among VA primary care team members. J Gen Intern Med. 2017;32(7):760–6.
55 Gardner RL, Cooper E, Haskell J, Harris DA, Poplau S, Kroth PJ, et al. Physician stress and burnout: the impact of health information technology. J Am Med Inform Assoc. 2019;26(2):106–14.
56 Shanafelt TD, Dyrbye LN, Sinsky C, Hasan O, Satele D, Sloan J, et al. Relationship between clerical burden and characteristics of the electronic environment with physician burnout and professional satisfaction. Mayo Clin Proc. 2016;91(7):836–48.
57 Küppers L, Göbel J, Aretz B, Rieger MA, Weltermann B. Associations between COVID-19 pandemic–related overtime, perceived chronic stress and burnout symptoms in German general practitioners and practice personnel—a prospective study. Healthcare (Basel). 2024;12(4):479.
58 Mansfield KE, Mathur R, Tazare J, Henderson AD, Mulick AR, Carreira H, et al. Indirect acute effects of the COVID-19 pandemic on physical and mental health in the UK: a population-based study. Lancet Digit Health. 2021;3(4):e217–30.
59 Rosenbaum L. Beyond moral injury—can we reclaim agency, belief, and joy in medicine? N Engl J Med. 2024;390(10):951–5.