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RESEARCH ARTICLE

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Thriving from Work Questionnaire: Dimensionality, reliability, and validity of the long and short form questionnaires

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Abstract

Introduction: Thriving from Work is defined as the state of positive mental, physical, and social functioning in which workers' experiences of their work and working conditions enable them to thrive in their overall lives, contributing to their ability to achieve their full potential at work, at home, and in the community. The purpose of this study was to develop a psychometrically-sound questionnaire measuring the positive contribution that work can have on one's well-being both at, and outside of, their work.

Methods: We used both a qualitative and quantitative approach of item reduction, domain mapping dimensionality testing, development of "long-" and "short-" versions of the questionnaire, reliability, and construct and criterion validity testing. This was established in two independent online samples of US based workers (n = 1550, n = 500).

Results: We developed a bi-factor model 30-item long-form and a uni-factorial 8-item short-version. The long-form measures both the latent construct of Thriving from Work and six domains (psychological/emotional; work-life integration; social; experience of work; basic needs; health). Both long- and short- forms were found to have high empirical reliability (0.93 and 0.87 respectively). The short-form captures 94% of variance of the long-form. Construct and criterion validity were supported. Test-retest reliability was high.

Conclusions: The Thriving from Work Questionnaire appears to be a valid and reliable measure of work-related well-being in United States workers. Further testing is needed to refine and test the instrument in specific industries, unique worker populations, and across geographic regions.

KEYWORDS

flourishing, measurement, occupational health, quality of life, scale development, validation, work environment, work life balance, worker well-being, working conditions

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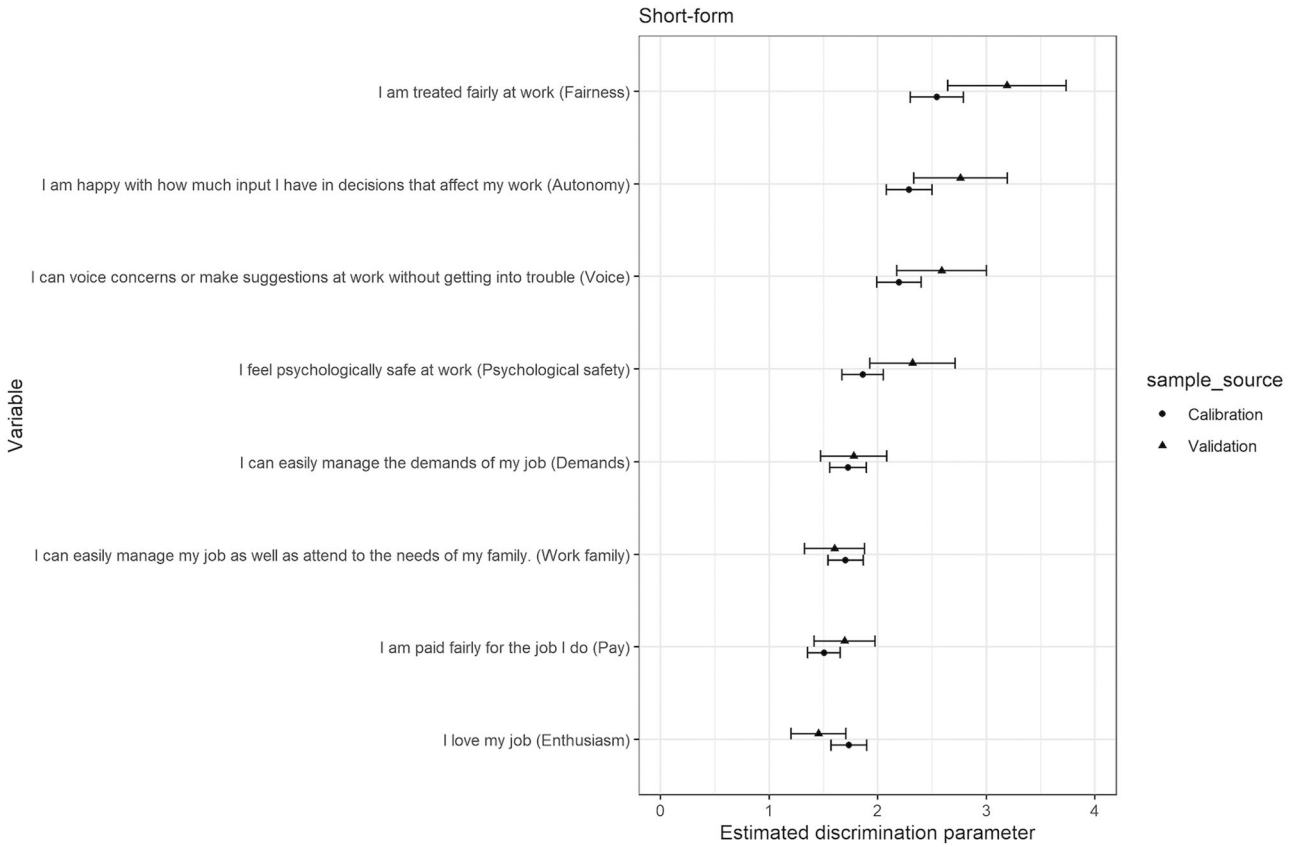

FIGURE 3 General Thriving from Work Consistency for the short-form: calibration and validation samples.

TABLE 5 Construct validity: Pearson's correlations.

	TFW (short-form)	TFW (long-form)
TFW (long-form)	0.97	
Gallup Cantrell's Ladder	0.36	0.37
Perception of best job	0.48	0.48
Life satisfaction	0.42	0.43
Mental health	−0.45	−0.45

Abbreviation: TFW, Thriving from Work.

(as determined by Cantril's life satisfaction scale), with the majority of adults "suffering" or "struggling."[42] The effects of the pandemic reflected the diverse, complex, broad, and interconnected forces that impact both worker and population well-being. The pandemic has accelerated changes in labor markets, adoption of technologies, and, to some extent, attitudes towards work both for those who must work at locations outside their homes and for those able to work remotely.[40] Employers are redesigning jobs and policies and practices to support new and emerging conditions of work and job demands.[40] These changes in working conditions will inevitably affect the extent to which workers thrive while working and outside of work, and have emphasized the important need for us to study and measure work-related well-being.

4.1 | Applications for the Thriving from Work Questionnaire

Spurred by the lack of an instrument designed specifically to measure thriving from work, we developed and tested three versions of a questionnaire that could be used for different purposes. First, we conceptualized TfW across six domains and mapped attributes of TfW to these domains using an iterative comprehensive questionnaire design process. These items—as detailed in a previous publication—could be used as a diagnostic tool to identify attributes in the workplace that require attention to improve worker well-being.[12]

From the original set of items, we then developed a long-form questionnaire with the goal of measuring the latent construct of TfW, a measure of work-related well-being, as well as our conceptualized domains of TfW. The long-form can be used as an outcome measure or to provide well-being data on the extent to which workers or populations of workers are thriving from their work. The long-form has a bifactor model allowing us to measure the latent construct of TfW, but also considers that TfW has several dimensions: Psychological and Emotional Well-being from Work; Social Well-being from Work; Work-Life Integration; Experience of Work and Job Design; Basic Needs for TfW; and Health and Physical and Mental Well-being from Work.

The psychometric testing we have conducted to date indicates that the long- and short-form versions are reproducible and valid in a US worker population. These are foundational psychometric properties that enable us to move onto the next steps of instrument development. Future studies can examine more subtle issues such as subscale structure of the dimensions of TfW and improving the ability of these dimensions to measure their latent construct (e.g., social well-being from work), different methods/models for scoring, and group measurement (e.g., can we measure thriving work groups or workforces?) and translating and adapting the questionnaire for different geographical and cultural settings. Of note, we had originally considered the Psychological and Emotional Well-being domains (as described in Peters et al.[12] as being theoretically distinct. However, our analysis found that items from these two domains loaded onto the one factor and were conceptually considered the same by participants. Thus, they were combined into one domain of TfW. Similarly, some of the subdomains of the questionnaire did not have strong enough empirical reliability for us to recommend using these as stand-alone instruments. One domain, psychological and emotional well-being had good reliability (0.82); this domain could be used as a stand-alone measure of this construct. Thus, additional research is needed to further refine the other domains if they are to be used as a domain subscale.

Lastly, we developed a short-form, that, like the long-form, is a measure of the latent construct TfW, and has utility in worker surveys where survey length needs to be considered. The short-form questionnaire is a reliable and valid measure of the latent construct of TfW capturing each dimension of the long-from. We also tested the short-form, swapping out the Psychological Safety item for the Physical Safety item, with no change in the model characteristics or robustness of the questionnaire's reliability. This has important implications for the utility of the short-form as certain populations of workers may have different experiences of physical safety or psychological safety at work due to job demands, characteristics of the workplace, or the reason for measuring TfW in the worker population. For example, psychological safety may be more relevant for office-based jobs, whereas physical safety may be more of a concern in manual laboring occupations. In future iterations of the questionnaires, we aim to test a general safety question to examine if it performs similarly to both the physical and psychological safety questions. At this stage, we recommend selecting the item (either Physical Safety or Psychological Safety) that is most relevant for the worker population when using the short-form.

4.2 | Policy implications

The measurement of well-being is essential for understanding worker and population health. Measurement of well-being at individual and population levels enables governments, policy makers, employers, and worker advocates to identify how work is benefiting or adversely affecting quality of life at one point in time or over a period of time. A granular evaluation of the influence of specific working conditions will enable the possibility of targeting interventions intended to improve workers' thriving and evaluating the consequences of their implementation for workers, their families, and communities, as well as the employing enterprises. Accurate measurement and ongoing monitoring can identify priority areas for improvements in both public and enterprise-specific policies and assist in the evaluation of the success of such interventions. Further, it allows comparisons to be made across, for example, worksites, employers, communities, regions, and countries. Well-being data can inform priority-setting, drive change in areas of need or identify best practices in places where people are thriving.

The implementation of policies, programs, and practices to improve the quality of work and work environments are of social and economic benefit for individuals, their employers, and broader society. A recent systematic review examining the effectiveness of organizational interventions to improve dimensions of worker well-being found that improvements in working conditions resulted in higher levels of general well-being, work-specific well-being, and work-family well-being.[19] Workforces with high reported well-being have also been found to be healthier, more engaged at work, more productive and less likely to leave their job.[6,43,44]

4.3 | Study strengths and limitations

The samples used in this study, while being representative of an online worker sample, may not be representative of the general US worker population. Using an online sample is a time-efficient method for conducting preliminary psychometric evaluation of the novel questionnaires and has been used in the development of other questionnaires. A strength of using an online survey through a research crowdsourcing platform, such as Prolific.co, is that the samples are more likely to be demographically diverse than limited laboratory samples. These platforms can be prone to rapid responder bias; however, we attempted to overcome this by not including worker survey responses in the final data sets that were below three standard deviations of the mean completion time. Another risk of using an online survey is that respondents may not legitimately meet the eligibility criteria, answer honestly, or may even employ bots to respond. This was a primary reason why we selected Prolific.co, as they vet their research participants and have implemented methods to overcome these limitations. In addition, we also implemented quality checks (as described in the Section 2) and found that our sample had no bots, or double respondents. Other questionnaires are often initially tested on students or in specific worker industry samples; whereas we were able to obtain a fairly diverse sample of workers. While the instrument was developed in the United States and potentially may not be representative of worker samples in other countries, we are currently conducting further studies to validate the instruments in other countries, and in different languages. In addition, further validation studies are needed to capture those with different work experiences, across different occupations and sectors, across different wage levels and positions,

and across demographically and occupationally diverse worker groups.

Much of the questionnaire development was conducted in a large part during the COVID-19 pandemic. In person research was suspended during this time, so using an online research platform to complete this study was necessary and effective. The validation of the questionnaire during the pandemic may not have been an ideal, but many of the changes brought about by the pandemic are expected to endure.[40] For example, increases in the gig workforce and workers in nonstandard work arrangements globally were evident before the pandemic—the challenges they face were merely emphasized by the pandemic impact. In high- and middle-income countries, many workplaces have transitioned to decentralized and remote locations linked by technology. This is likely to continue, with up to 25% of workers globally expected to remain in hybrid work arrangements.[45]

The present analysis found good empirical and test–retest reliability as well as validity of our new tool, which was initially evaluated in a diverse national sample of workers from different industries and of different backgrounds, and then confirmed in a new sample of workers from the same population. Further testing of the tool could focus on populations outside the United States, unique worker populations such as workers in specific sectors, and translations of the instrument.

5 | CONCLUSIONS

The TfWQ appears to be a robust measure of work-related well-being which has been designed to have broad utility across research and practice, facilitating the design, implementation, and evaluation of changes in policies and practices influencing the conditions of work. The TfWQ can be used to identify priority areas for intervention and, through use over time, may clarify the changes that benefit the well-being, satisfaction, and functioning of workers as well as social and economic outcomes of interest to employers.

AUTHOR CONTRIBUTIONS

Susan E. Peters, Gregory R. Wagner, and Daniel A. Gundersen contributed to the conception or design of the work; Susan E. Peters contributed to the acquisition of data; Daniel A. Gundersen and Susan E. Peters contributed to the analysis of the datal; Susan E. Peters, Glorian Sorensen, Jeffrey N. Katz, and Gregory R. Wagner contributed to the interpretation of data for the work; Susan E. Peters, Daniel A. Gundersen, and Gregory R. Wagner contributed to drafting the work or revising it critically for important intellectual content; Susan E. Peters, Daniel A. Gundersen, Glorian Sorensen, Jeffrey N. Katz, and Gregory R. Wagner had final approval of the version to be published and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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CONFLICTS OF INTEREST STATEMENT

The authors declare that there are no conflicts of interest.

DISCLOSURE BY AJIM EDITOR OF RECORD

John Meyer declares that he has no conflict of interest in the review and publication decision regarding this article.

ETHICS APPROVAL AND INFORMED CONSENT

This work was performed at the Harvard T.H. Chan School of Public Health. The Harvard T.H. Chan School of Public Health IRB determined that this project did not meet the regulatory definition of human subjects' research as per 45 CFR46.102 (l). The survey was anonymous and voluntary. Participants could cease participation at any time.

REFERENCES

1. U.S. Public Health Service. The U.S. surgeon general's framework for workplace mental health and well-being. 2022. Accessed November 2, 2022. https://www.hhs.gov/surgeongeneral/priorities/workplace-well-being/index.html
2. U.S. Department of Labor Bureau of labor statistics. New Release Bureau of Labor Statistics, U.S. Department of Labor. American Time Use Survey-2021 Results. USDL-22-1261. Updated June 23, 2022. Accessed 30 January, 2023. https://www.bls.gov/news.release/pdf/atus.pdf
3. Pronk NP, Ochiai E. Healthy people 2030: considerations for workplace health and well-being. *ACSM's Health Fit J*. 2020;24(5):65-68.
4. Brown DJ, Arnold R, Fletcher D, Standage M. Human thriving. *Eur Psychol*. 2017;22(3):167-179. doi:10.1027/1016-9040/a000294
5. Chari R, Chang CC, Sauter SL, et al. Expanding the paradigm of occupational safety and health: a new framework for worker well-being. *J Occup Environ Med*. 2018;60(7):589-593. doi:10.1097/JOM.0000000000001330
6. Schulte PA, Guerin RJ, Schill AL, et al. Considerations for incorporating "Well-Being" in public policy for workers and workplaces. *Am J Public Health*. 2015;105(8):e31-e44. doi:10.2105/AJPH.2015.302616
7. Centers for Disease Control and Prevention, Division of Population Health. *Health-related quality of life (HRQOL): Well-being concepts*. Updated October 31, 2018. Accessed January 13, 2021. https://www.cdc.gov/hrqol/wellbeing.htm

8. Plough AL. *Well-Being: Expanding the Definition of Progress: Insights From Practitioners, Researchers, and Innovators From Around the Globe*. Oxford University Press; 2020.
9. Harter J. Workplace: Thriving employees create a thriving business. gallup, Inc. Updated April 14, 2021. Accessed August 1, 2021. https://www.gallup.com/workplace/313067/employees-aren-thriving-business-struggling.aspx
10. Flores W, Laurent E, Prah Ruger J. Well-being as a pathway to equity. In: Plough AL, ed. *Well-Being: Expanding the Defintion of Progress*. Oxford University Press; 2020.
11. Fabius R, Thayer RD, Konicki DL, et al. The link between workforce health and safety and the health of the bottom line: tracking market performance of companies that nurture a "culture of health". *J Occup Environ Med*. 2013;55(9):993-1000. doi:10.1097/JOM.0b013e3182a6bb75
12. Peters SE, Sorensen G, Katz JN, Gundersen DA, Wagner GR. Thriving from work: conceptualization and measurement. *Int J Environ Res Public Health*. 2021;18(13):7196.
13. Porath C, Spreitzer G, Gibson C, Garnett FG. Thriving at work: toward its measurement, construct validation, and theoretical refinement. *J Organ Behav*. 2012;33(2):250-275.
14. Eaton JL, Mohr DC, Hodgson MJ, et al. Development and validation of the work-related well-being index: analysis of the federal employee viewpoint survey (FEVS) building work engagement: a systematic review and meta-analysis investigating the effectiveness of work engagement interventions. *J Occup Environ Med*. 2017;38(6):792-812. doi:10.3389/fpsyg.2017.01658
15. Warr PB. Decision latitude, job demands, and employee well-being. *Work Stress*. 1990;4(4):285-294.
16. Russell E, Daniels K. Measuring affective well-being at work using short-form scales: implications for affective structures and participant instructions. *Hum Relat*. 2018;71(11):1478-1507. doi:10.1177/0018726717751034
17. Orsila R, Luukkaala T, Manka ML, Nygard CH. A new approach to measuring work-related well-being. *Int J Occup Saf Ergon*. 2011;17(4):341-359. doi:10.1080/10803548.2011.11076900
18. National Institute for Occupational Safety and Health (NIOSH). *NIOSH worker well-being questionnaire (WellBQ)*. By Chari R, Chang CC, Sauter SL, Petrun Sayers EL, Huang W, Fisher GG. US Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 2021-110 (revised 5/2021). 2021. doi:10.26616/NIOSHPUB2021110revised52021
19. Fox KE, Johnson ST, Berkman LF, et al. Organisational- and group-level workplace interventions and their effect on multiple domains of worker well-being: a systematic review. *Work Stress*. 2021;36(1):30-59. doi:10.1080/02678373.2021.1969476
20. Fries JF, Bruce B, Cella D. The promise of PROMIS: using item response theory to improve assessment of patient-reported outcomes. *Clin Exp Rheumatol*. 2005;23(5):53-57.
21. Breen RJ, Ferguson SG, Palmer MA. Smokers' perceptions of incentivized smoking cessation programs: examining how payment thresholds change with income. *Nicotine Tob Res*. 2021;23(9):1567-1574. doi:10.1093/ntr/ntab031
22. Austen E, Greenaway KH, Griffiths S. Differences in weight stigma between gay, bisexual, and heterosexual men. *Body Image*. 2020;35:30-40. doi:10.1016/j.bodyim.2020.08.002
23. Mojzisch A, Elster C, Germar M. People perceive themselves to adhere more strictly to COVID-19 guidelines than others. *Psychol Health Med*. 2022;27(2):325-332. doi:10.1080/13548506.2021.1906435
24. Andel SA, Arvan ML, Shen W. Work as replenishment or responsibility? Moderating effects of occupational calling on the within-person relationship between COVID-19 news consumption and work engagement. *J Appl Psychol*. 2021;106(7):965-974.
25. Geldsetzer P. Knowledge and perceptions of COVID-19 among the general public in the United States and the United Kingdom: a cross-sectional online survey. *Ann Intern Med*. 2020;173(2):157-160.
26. de Vries CEE, Mou D, Poulsen L, et al. Development and validation of new BODY-Q scales measuring expectations, eating behavior, distress, symptoms, and work life in 4004 adults from 4 countries. *Obes Surg*. 2021;31:3637-3645.
27. Zhang T, Ham J, Ren X. Why exercise at work: development of the office exercise behavior determinants scale. *Int J Environ Res Public Health*. 2021;18(5):2736.
28. Sorensen G, Dennerlein JT, Peters SE, Sabbath EL, Kelly EL, Wagner GR. The future of research on work, safety, health and wellbeing: a guiding conceptual framework. *Soc Sci Med*. 2021;269:113593. doi:10.1016/j.socscimed.2020.113593
29. Gallup Inc. *Methodology: how does the Gallup National health and well-being index work?* Accessed January 30, 2023. https://news.gallup.com/poll/246200/gallup-national-health-index-work.aspx
30. Gallup Inc. *Understanding how Gallup uses the Cantril Scale: development of the "Thriving, Struggling, Suffering" categories*. Accessed September 01, 2020. https://news.gallup.com/poll/122453/understanding-gallup-uses-cantril-scale.aspx
31. Pronk NP, Kottke TE, Lowry M, et al. Concordance between life satisfaction and six elements of well-being among respondents to a health assessment survey, healthpartners employees, minnesota, 2011. *Prev Chronic Dis*. 2016;13:160309. doi:10.5888/pcd13.160309
32. Kessler RC, Green JG, Gruber MJ, et al. Screening for serious mental illness in the general population with the K6 screening scale: results from the WHO World Mental Health (WMH) survey initiative. *Int J Methods Psychiatr Res*. 2010;19(suppl 1):4-22. doi:10.1002/mpr.310
33. Cai L, Hansen M. Limited-information goodness-of-fit testing of hierarchical item factor models. *Br J Math Stat Psychol*. 2013;66(2):245-276. doi:10.1111/j.2044-8317.2012.02050.x
34. Cai L, Monroe S. *A New Statistic for Evaluating Item Response Theory Models for Ordinal Data. Cresst Report 839*. National Center for Research on Evaluation, Standards, and Student Testing (CRESST); 2014.
35. Maydeu-Olivares A, Joe H. Limited information goodness-of-fit testing in multidimensional contingency tables. *Psychometrika*. 2006;71(4):713-732.
36. Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct Equ Model*. 1999;6(1):1-55. doi:10.1080/10705519909540118
37. Chalmers RP. Mirt: a multidimensional item response theory package for the R environment. *J Stat Softw*. 2012;48(1):1-29.
38. Schulte PA, Delclos G, Felknor SA, Chosewood LC. Toward an expanded focus for occupational safety and health: a commentary. *Int J Environ Res Public Health*. 2019;16(24):4946. doi:10.3390/ijerph16244946
39. Preamble to the Constitution of WHO as adopted by the International Health Conference World Health Organization. *Preamble to the Constitution of WHO as adopted by the International Health Conference, New York, 19 June - 22 July 1946; signed on 22 July 1946 by the representatives of 61 States* (Official Records of WHO, no. 2, p. 100). 1948. Accessed March 1, 2019. http://whqlibdoc.who.int/hist/official_records/constitution.pdf
40. Peters SE, Dennerlein JT, Wagner GR, Sorensen G. Work and worker health in the post-pandemic world: a public health perspective. *Lancet Public Health*. 2022;7(72):e188-e194. doi:10.1016/S2468-2667(21)00259-0
41. VanderWeele TJ, Fulks J, Plake JF, Lee MT. National well-being measures before and during the COVID-19 pandemic in online samples. *J Gen Intern Med*. 2021;36:248-250. doi:10.1007/s11606-020-06274-3
42. Witters D, Harter J. Wellbeing: *worry and stress fuel record drop in U.S. life satisfaction*. Gallup, Inc. Updated May 8, 2020. Accessed

September, 21, 2020. https://news.gallup.com/poll/310250/worry-stress-fuel-record-drop-life-satisfaction.aspx

43. Grossmeier J, Fabius R, Flynn JP, et al. Linking workplace health promotion best practices and organizational financial performance: tracking market performance of companies with highest scores on the HERO scorecard. *J Occup Environ Med*. 2016;58(1):16-23. doi:10.1097/JOM.0000000000000631
44. Schulte PA, Pana-Cryan R, Schnorr T, et al. An approach to assess the burden of work-related injury, disease, and distress. *Am J Public Health*. 2017;107(7):1051-1057. doi:10.2105/AJPH.2017.303765
45. Lund S, Madgavkar A, Manyika J, et al. *The future of work after COVID-19*. Updated February 18, 2021. Accessed February 20, 2021. https://www.mckinsey.com/featured-insights/future-of-work/the-future-of-work-after-covid-19

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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