La Medicina del Lavoro

Med Lav 2020; 111, 3: 163-165
DOI: 10.23749/mdl.v111i3.9735

A global perspective on addressing occupational safety and health hazards in the future of work

The future of work is a topic of broad academic and public interest, as evidenced by the vast literature on the topic. The "future of work" is generally portrayed in terms of the impact of technology on jobs and labor markets (16). Numerous scenarios in the gray and peer-reviewed literature provide expansive future visions, but they rarely focus on task level scenarios or go beyond manual and cognitive descriptors of work. Moreover, there is a limited literature on the hazards, both traditional and nontraditional, accompanying future of work scenarios. Most common visions address two different views of the impact of technology: a dystopian one characterized by high rates of job displacement and work degradation, and; a more optimistic one in which numerous new and upgraded jobs are created, as has historically been the case with the advent of new technologies. It is important to appreciate the role of technology in the future of work, but other factors are also important and less often discussed (4). These include globalization, demographics, urbanization, sustainability, pandemics, and climate-related factors, to name a few.

Five major issues should be addressed when considering the future of work. One issue is that technological impact is not inevitable because technology's impact is under social and political control (20). However, this control will be increasingly difficult to exercise as technological development increases exponentially and technologies become more "sentient" (12).

The second issue is that life-long learning will be needed to keep pace with technological advancements. One international report noted that children in school today may be working in jobs in the future that do not yet exist (8). The current workforce will need reskilling and upskilling. How this can happen will depend on how societies view who is responsible for training: the worker, the employer, or the government. Regardless, it is likely that many current workers will have difficulty upskilling. They will require high quality jobs in which they can develop skills and competencies, additional educational opportunities, and protection by a social safety net.

Third, although the future will hold many new jobs yet to be envisioned, it will also include many of the traditional tasks and well-known hazards (e.g. exposure chemicals and safety hazards) that will still require occupational safety and health expertise and control methods.

Fourth, the future of work will not occur everywhere in the world the same way or at the same time. Technology and globalization will have different impacts at different times. It is not useful or accurate to use only a "Western lens" through which to view the future of work. In the West, being employed means generating an income in the formal economy; but in the developing world, being employed typically represents a small fraction of those that are economically active "with the majority engaged in low productivity activities in the informal sector (1)." Thus, the impact of automation in rich and poor economies has different consequences and implications for skills development (2). In both types of economies, future of work scenarios do not address the growing gap between productivity and compensation (1). Labor's share of income is increasingly less than the share that accrues to capital. As a result, tensions in industrial relations might increase, possibly hindering collaboration on critical occupational safety and health issues.

Finally, there is a need to consider the future of work because deleterious scenarios are not inevitable. The future can be shaped by an informed, empowered workforce, particularly the younger members (18). Social dialogue between workers, businesses, and governments based on multifaceted, transdisciplinary and transparent effort is needed if effective shaping of the future is to occur (6, 14). Thinking that technology is the main or only driver, ignores other significant contributors such as climate, social unrest and pandemics. The recent COVID-19 pandemic reminds us how the world is susceptible to forces hiding in plain sight but not addressed (5). This pandemic illustrates how work can be drastically changed. The pandemic also lays bare how the loss of employment due to a global disruption has ripple effects across all areas of economic and

social life. These negative impacts are not evenly distributed among citizens, with the most vulnerable being disproportionately affected.

While it is important to consider other factors when exploring the future of work, the role of technology in imagining this future cannot be understated. It is increasingly clear that, over the next 5-10 years, Information and Communication Technologies and Enabling Technologies (ICT-ET) will change the equipment, tools and technical systems that can be used to organize, manage and deliver products and or services across most occupational sectors (17). ICT-ETs such as 3D and 4D printing and bioprinting, autonomous vehicles (including drones) robotics (including collaborative robotics, AI, VR and AR will be used in work (17). There is a general consensus that, in future work scenarios, psychosocial hazards will be more pervasive than traditional occupational safety and health hazards (3, 11, 16, 17), with profound effects on mental and physical health. Psychosocial hazards are those aspects of the design and management of work, and its social and organizational contexts, that have a potential for causing psychological and physical harm (7). These include but are not limited to risks related to: new forms of employment contracts and job insecurity, the aging workforce, work intensification, highly emotional demands at work, digital surveillance and poor work-life balance (17).

The role of occupational safety and health in the future of work will need to evolve to include a more holistic and public health-oriented approach to addressing worker health (9, 13, 15, 19). Based on a global survey of occupational safety and health professionals (19), it is anticipated that there will be an increase in complexity of health and safety requirements in the future. Four major global factors that the survey indicated will influence the practices of occupational health and safety are: the UN 2030 Agenda for Sustainability Development and its Sustainable Development Goals (SDGs); the Revised GRI 403: Occupational Health and Safety Global Reporting Initiative; the ISO 45001 International Occupational Health and Safety Standard; and International Labour Organization ILO Guidelines on Occupational Safety and Health Management Systems (10).

The realization that work will continue to change in the future requires that the field of occupational safety and health include but go beyond traditional concerns such as exposures to chemical, physical and biological agents and focus on an expanded paradigm that addresses the interaction occupational and individual risk factors, the work-life continuum and ultimately on operationalizing and implementing a concept for the well-being of workers. This holistic view will require new systems thinking and transdisciplinary approaches to occupational safety and health in the future (15).

Paul A. Schulte
Department of Health and Human Services,
Centers for Disease Control and Prevention,
National Institute for Occupational Safety and Health (NIOSH),
Cincinnati, OH, United States

References

1. Bureau of Labor Statistics. US Department of Labor. The Economic Daily. The compensation productivity gap. Available at https://www.bls.gov/opub/ted/2011/ted_20110224.htm (last accessed 22nd June 2020)
2. Chandy L, editor. The future of work in the developing world. Proceedings of the 13th annual Brookings-Blum Roundtable; 2016 Aug 3-5; Aspen, Colorado. Brookings Institute, Washington DC, 2016
3. Cox T, Griffiths A. The nature and measurement of work-related stress: Theory and practice. In JR Wilson and N Lorlett (eds), Evaluation of human work (3rd ed.). London CRS Press 2018
4. Degryse C. (2016) Digitalisation of the economy and its impact on labour markets. Brussels: European Trade Union Institute. Working paper no. 2016.02 https://www.etui.org/publications/working-papers/digitalisation-of-the-economy-and-its-impact-on-labour-markets (last accessed 22nd June 2020)
5. Gates B. Innovation for Pandemics. N Engl J Med. 2018;378(22):2057-2060. doi:10.1056/NEJMp1806283
6. Global Commission on the Future of Work. Work for a Brighter Future. International Labour Organization. Geneva, Switzerland 2019

7. Harrison J, Dawson L. Occupational health: meeting the challenges of the next 20 years. Safe Health Work; 2016; 7(2): 143–149
8. ILO guidelines on occupational safety and health management systems, ILO-OSH 2001. 2nd ed. International Labour Office Geneva, 2009 at https://www.ilo.org/safework/info/standards-and-instruments/WCMS_107727/lang--en/index.htm (last accessed 22nd June 2020)
9. International SOS Foundation. HSE 2030: what will occupational health and safety look like in 2030? Amsterdam: International SOS Foundation 2018 Available at http://learn.internationalsosfoundation.org/hse2030 (last accessed 22nd June 2020)
10. International Standard. ISO 45001, Occupational Safety and Health Management Systems-Requirements with guidance for use; ISO45001:2018(E)
11. Leso V, Fontana L, Iavicoli I. The occupational health and safety dimension of industry 4.0. Med Lav; 2018; 110(5): 327–338
12. Moore PV. OSH and the future of work: benefits and risks of artificial intelligence tools in workplaces. European Agency for Safety and Health at Work (EU-OSHA). Discussion paper 2019 https://osha.europa.eu/en/publications/osh-and-future-work-benefits-and-risks-artificial-intelligence-tools-workplaces/view (last accessed 22nd June 2020)
13. Peckham TK, Baker MG, Camp JE, Kaufman JD, Seixas NS. Creating a Future for Occupational Health. Annals of Work Exposures and Health; 2017; 61(1):3–15
14. Rus D, Oeij PRA, Pot FD, Totterdill P. Workplace innovation: a review and potential future avenues. Int J. Technology Transfer and Commercialisation 2019; 16 (3): 208–227
15. Schulte PA, Delclos G, Felknor SA, Chosewood LC. Toward an expanded focus for occupational safety and health: a commentary. Int J Env Res Pub Health 2019; 16(24): pii E4946
16. Schulte PA, Streit JMK, Sherriff F, Delclos G, Felknor SA, Tamers SL, Fendinger S, Grosch J, Sala R. Potential scenarios and hazards in the work of the future: A systematic review of the peer-reviewed and gray literatures. Ann Work Exp Health (In Press, 2020) doi: 10.1093/annewh/wxaa
17. Stacey N, Ellwood P, Bradbrook S, Reynolds J, Williams H, Lye D. Foresight on new and emerging occupational safety and health risks associated with digitalisation by 2025. Bilbao: European Agency for Safety and Health at Work (EU- OSHA) 2018
18. Tornio A, Gorden-Bray A, Tooley C, Cajen F, Sachetti FC, Banora F et al. Shaping the future of work. Global Shapers Community, World Economic Forum 2019
19. United Nations (UN) Resolution, "Transforming our world: the 2030 Agenda for Sustainable Development,2015. https://www.globalreporting.org/standards/work-program-and-standards-review/review-of-gri-403-occupational-health-and-safety/ (last accessed 22nd June 2020)
20. Wajcman J. Pressed for time: the acceleration of life in digital capitalism. University of Chicago Press, Chicago 2015
21. World Bank Group. World development report 2019: the changing nature of work. World Bank, Washington DC, 2019

The findings and conclusions in this paper are those of the author and do not necessarily represent the official position of the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention.