Equitably Applying Artificial Intelligence in the United States Workforce Using Training and Collaboration

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Abstract

Advances in artificial intelligence (AI) have raised ethical concerns related to fairness, privacy, and trust. While AI may improve elements of the economy, its benefits will be unevenly experienced, with more than half of the jobs in the United States expected to become partially automated in the next 15 years. Workers at all levels could face disruptive changes and financial hardship as AI transforms work tasks. AI can bring about positive change, but systems must be built to use this technology responsibly and share the benefits equitably. Workers, their advocates and representatives, and members of the community should be included in the development and implementation of AI in the workplace. Guidance that considers equity, protection of vulnerable populations, and just outcomes is needed. Organizations may welcome these recommendations because of the challenges of using AI. This policy statement recommends four key approaches for implementing AI that focus on the workplace. First, more research is needed to determine and monitor the impact of AI. Second, training programs should be created to help those losing jobs to augmentation, support diverse leaders for the future of AI, and help people adapt to AI. Third, academic, labor, and community organizations with expertise in technology equity should engage with AI developers to offer practical tools, understand implications, and create equitable outcomes. Finally, programs that promote accessibility and inclusivity in AI should be developed, and there should be ongoing monitoring of AI applications for workers.

Key words: Artificial intelligence (AI), workers, technology, equity, computers

VII. Relationship to Existing APHA Policy Statements

- APHA Policy Statement 20124: Improving Occupational and Environmental Health in the Global Electronics Industry
- APHA Policy Statement 20138: Support for Workplace Injury and Illness Prevention Programs
- APHA Policy Statement 20179: Reducing Income Inequality to Advance Health
- APHA Policy Statement 20189: Achieving Health Equity in the United States
- APHA Policy Statement 20197: Addressing Environmental Justice to Achieve Health Equity
- APHA Policy Statement 20223: Support Decent Work for All as a Public Health Goal in the United States

Problem Statement

The use of artificial intelligence (AI) and computer learning is expected to substantially change the outlook, design, and availability of jobs.[1] Research exploring the ethical considerations of AI is still in its infancy. [2] While this technology is actively evolving, there is a time-sensitive opportunity to intervene with ethical guidelines to inform practical applications. More than half of total U.S. employment is at risk for greater automation or computer augmentation in the next 15 years, notably in transportation, administrative support, production, and service occupations.[3,4] Real-world examples include technological advances in computerized cars, algorithms for storing and retrieving data, environmental and biosensor monitoring for safety or health, video facial recognition, industrialized robots, and many others.[3,5]

While AI may improve the overall economy, the efficiencies it is capable of bringing will also likely lead to job losses in certain sectors. Labor analysts predict that AI will impact knowledge workers, including those involved in jobs in higher education.[6] It could also exacerbate inequities between workers with jobs that require training or specialization who may benefit from increased efficiency using AI and unspecialized workers who risk being replaced by AI.[7,8] Although tasks done by essential workers such as drivers, firefighters, child-care workers, and nursing assistants cannot be easily replaced by AI, some jobs currently filled by vulnerable workers could be affected by the growth of the technology. AI augmentation is expected to influence female workers twice as much as male workers because of the high impact on those in job roles such as secretaries and clerical staff, which may be more commonly filled by women, especially in high-income countries where more technology is used.[9] An American Psychological Association survey revealed that 38% of workers were worried that some or all of their duties would be replaced by AI in the future, and more than half of these people were already under current mental strain because of their job stress. Moreover, young workers, workers of color, and workers with a high school education were more likely to express worry about AI making their job obsolete.[10] However, among people who interact with AI regularly, more are hopeful that it will make their job easier (32%) than worried that it will hurt more than help (11%) according to a Pew Research Center survey.[11] Building systems without the input of workers may result in unintended consequences such as job loss or unanticipated impacts, particularly loss of worker autonomy or job control, which is linked to loss of income, job insecurity, and poorer overall worker well-being.[12]

Public health principles can help ethically guide the growth of AI, including the monitoring of social and community impact, based on historical context. There have been multiple industrial revolutions with the adage of machines to manufacture products, leading to production and efficiency increases, decreased prices for goods, and migration of workers to seek employment. However, these changes resulted in unique exposures to occupational injuries and illnesses among vulnerable populations, often marginalized individuals. The first industrial revolution (steam), the second industrial revolution (electricity), and the third industrial revolution (dissemination of information via computers) led to shifts in labor markets and manpower.[13] The current and developing state of AI is considered part of the fourth industrial revolution.[14] It will be important to delineate what humans continue to do better than AI—where optimization and efficiency are not the primary drivers, such as in the case of service and health care occupations. Yet, we should remain mindful that similar challenges related to labor shifts occurred in prior technological advancements and may provide insight that the most vulnerable populations are at risk of unethical practices.

Current innovations in AI are providing dramatically new possibilities. [15] AI encompasses many forms of machine-based, cognitive problem-solving capabilities such as machine learning, natural language processing, and robotics. This powerful tool can be used to recognize patterns in large data sets to mimic human decision making. [16] AI is being used or considered for adoption by a variety of industries to support data-driven, efficient solutions with both internal and external data sources. Examples include monitoring workplace hazards with wearable technology, assessing the risk of arrestees offending in the future, and providing super-human abilities such as those in exoskeletons.[17–19] Early reports of AI in the workplace have shown increased productivity, better dissemination of best practices, increased accuracy, and improved safety.[20,21] Research suggests that AI should be used as an employee assistance tool and not improperly applied to cause decreased job control.[12]

While there is a great deal of anticipation surrounding the possibilities of AI, as with any fast-paced technological advancement, there are ethical concerns including a lack of fairness, autonomy, privacy, transparency, security, and trust.[22] Regarding cultural responsiveness to underrepresented and underserved populations, plans are needed that address specific cultural and contextual gaps in areas such as cultural competence, transparency in legislation, and fostering of international cooperation to recognize long-term economic shifts, effects on small businesses, and disability access.[23] These principles overlap with public health core values, suggesting that public health is in a unique position to offer guidance that considers equity, protection of vulnerable populations, and just job outcomes when applying AI.[24]

Public health has played an important role in protecting vulnerable populations and supporting human health and dignity.[25] Ethical oversight in this capacity has precedent from the federal policy for the protection of human participants and the application of institutional review boards (IRBs) in human participant research.[26] There is a need for ethical design principles that support health and protect privacy from the onset of AI development rather than only oversight after deployment.[27] Companies may welcome these recommendations because there are many challenges in using AI effectively to realize performance gains, ensure high-quality outputs, and preserve a company's reputation.[28]

As is the case in other areas, occupational health and safety is a rapidly evolving field, and there are limitations on data and guidance available related to AI. However, it is important to prevent harm caused by unethical practices that may result from delaying policy and action.[29] Doing so may prevent exacerbation of occupational health disparities that are already well defined and recognized as barriers to and facilitators of occupational health and safety equity, for example disparities related to race, sex, gender, ability, age, rurality, and geographic location.[5] Beyond the need to focus on occupational health, public health must also address the critical need for developing and supporting ethical frameworks for implementing AI across the broader public health workforce. Public health is at a pivotal point, with opportunities for transformation and data modernization, while also facing challenges such as workforce shortages. Chronic capacity challenges combined with widespread hostility toward public health professionals have led to high levels of burnout and turnover, with nearly 50% of the members of the government public health workforce estimated to leave their jobs by 2025.[30] Using AI tools deliberately and strategically could augment capacity and ease staffing shortages. Seeing AI as an opportunity requires a commitment to workforce education and skill training to ensure that workers are not left behind and feel valued amid technology changes. To better assess training needs and develop guidelines for AI use, public health organizations should lean into their strength in data gathering, embracing testing and evaluation of various AI capabilities on the job and fostering collaborations with the technology sector to ensure ethical implementation. Organizations should prioritize learning and adaptability within their workforce as well as engage with diverse communities to understand broader AI implications. Decisions about how AI can most effectively increase capacity and how to best integrate it into workflows should be based on data that can also make clear where and how humans offer irreplaceable oversight and value.

AI relies on building information models based on data. However, data can be flawed, biased, and even discriminatory as a result of real-world collection limitations, a concern raised by the American Civil

Liberties Union. [31] While AI shows promise, establishing representative data for algorithm building and ongoing ethical audits will require significant commitment to ethical standards. For example, if AI is used in recruitment and hiring practices, policies and procedures will be needed to ensure that the algorithms do not lead to bias and discrimination and to address the mental health effects of AI monitoring on employees.[5,10] Certain populations, such as the LGBTQI+ (lesbian, gay, bisexual, transgender, queer, and intersex) community, may be at higher risk of being vulnerable to language bias in AI that can perpetuate harmful stereotypes and reinforce discriminatory practices, emphasizing the need for privacy-preserving techniques.[32] Key strategies for protecting privacy include developing adversarial filters to obscure identifying information and involving diverse voices in AI design. According to the World Health Organization, regulation is a desirable way to manage the risks of AI amplifying biases related to human data.[33] Comprehensive frameworks that safeguard AI data, address system vulnerabilities, and ensure ethical and regulatory compliance are necessary to protect sensitive information.[34] Public health organizations should not wait for AI developers to address issues of bias and equity; it is critical to identify implicit and explicit bias in data sources and eliminate it using AI rather than perpetuating it.

U.S. state legislators have passed or proposed bills related to reasonable care of AI development to prevent discrimination and provide disclosures to consumers in Colorado, California, and Florida.[35–37] The White House published an executive order, the AI Bill of Rights, in October 2023 that highlighted the need for safe AI systems that protect against discrimination, provide privacy, and give appropriate notice where and when it is used.[38] Many leading AI companies, including Google, Microsoft, Meta, and Amazon, have signed voluntary commitments to this executive order.[39] There are also federal bills regarding AI transparency including disclosures and establishment of standards for AI use in federal agencies with sensitive data.[40,41] Other countries and entities such as Australia and the European Union have developed voluntary ethical standards related to trustworthy and responsible AI development.[42,43] However, more is needed to guide what is defined as ethical, which populations are vulnerable to negative outcomes of AI, and best practices for ethical AI development.

Beyond various occupational applications, AI will also impact related industries, such as insurance and health care, that affect working-age people.[44] The U.S. Department of Health and Human Services, an overseer of health care delivery and public health practice, has proposed an AI rule about transparency when dealing with health data.[45] Public opinion is already forming, with one survey revealing that 86% of participants are worried about where generative AI in health care obtains information and the validity

of that information.[46] There are still many unknown aspects of AI, including those associated with clinical applications and how to overcome underrepresentation in medical care among certain populations.[32,47]

Evidence-Based Strategies to Address the Problem

AI is an emerging field with the potential to significantly enhance public health functions such as targeted interventions, real-time surveillance, and resource allocation. For instance, during the COVID-19 pandemic machine and deep learning enabled rapid diagnosis, real-time data analysis, and improved emergency preparedness.[48] In health promotion, AI has been used for sentiment analyses of social media data to better target public health campaigns and employed to predict lead poisoning risks among children, allowing for more targeted interventions.[49] AI's integration into health care requires careful consideration of ethical frameworks, regulatory standards, and social acceptance.[50] Despite the potential of AI, widespread use of the technology faces challenges including suboptimal data quality, representation bias, and privacy concerns, highlighting the need for ongoing improvements and international coordination to effectively manage future public health crises.[51] The strategies described subsequently align with principles recommended for developers and employers by the U.S. Department of Labor and bridge additional stakeholders relevant to public health.[52]

More data and research are needed to understand the impact of AI and can be used to inform future policies. Comprehensive socioeconomic impact studies, especially those focusing on vulnerable populations, are needed. These studies could help forecast the long-term effects of AI on employment, the economy, intellectual property, and societal structures, providing a basis for more informed policymaking. A multidisciplinary collaboration involving experts in ethics, law, psychology, and sociology alongside AI developers and data scientists can provide a holistic approach to AI solutions. AI systems should be designed via a context-sensitive approach, taking into account cultural nuances to avoid reinforcing harmful stereotypes, exacerbating existing disparities, or nonconsensually identifying certain populations such as those in the LGBTQI+ community or individuals with disabilities.[32,53] Culturally diverse and representative data sets are needed to avoid biases in AI algorithms, including ongoing community engagement, feedback, and adaptation to ensure that AI-driven solutions remain effective and equitable in communities such as those of indigenous people or those in multilingual health systems.[54]

Applying research findings to educate and engage the public about AI will be vital to manage public expectations and prepare society for the changes AI is bringing. Partnering public health with commercial entities could increase positive population-level impacts by supporting research to practice.[55] Research could also be used to monitor, evaluate, and adapt AI systems on an ongoing basis to ensure that strategies and policies governing the technology remain relevant and effective. This can include implementation of policies and practices for managing processes, creating audit trails, encrypting sensitive data, and adopting data minimization principles. [27,34,56] A website to share experiences and foster best practices would allow more people to benefit from ongoing development of ethical AI. [57,58]

With near-human intelligence, AI can bring about positive change, but AI systems must be built responsibly to share in the prosperity rather than benefiting a small number of individuals and concentrating existing wealth.[59] Using AI in partnership with the environment in which it is being used can lead to better, more equitable outcomes.[60] Examination of AI output may indeed help inform where discriminatory practices exist so that actions can be taken to remedy inequities.[61] Guidance for ethical AI should use public law and human rights principles to offer practical advice that can be implemented in any sector.[18] This includes providing transparent and reliable results that can be duplicated.[62] In the workplace, evidence-based, scientific principles should be used that anticipate challenges, such as using an AI workplace health and safety scorecard with identified workplace hazards. This will help create AI implementation plans that are feasible, affordable, and ethical while also being cognizant of adopters' likely varying capabilities of application.[63] Equity impact analyses can be used to better understand the tradeoffs between cost effectiveness and equitable outcomes.[64]

As AI becomes more acceptable in the workplace, occupational health and safety practitioners are in a beneficial position to advocate for worker-focused decisions and to educate organizations about the physical and psychosocial conditions affecting workers if there are AI system failures or dysfunction.[63] Investment in training workers at risk of losing their jobs to computerization would help people transition into jobs with ongoing demand.[9] Targeted investment in digital infrastructure, particularly in rural and underserved urban areas, can help communities that currently lack access to digital solutions.[65] Involving people with disabilities in the development of AI solutions and integrating accessibility training into computer science curricula can ensure that AI technologies are inclusive.[66] Furthermore, creating a pipeline of diverse leaders for the future of AI, as being implemented by Lakota tribes, can help combat blind spots in AI systems due to human discrimination impacting data.[67] AI standards are currently voluntary; however, especially in terms of monitoring employee output, implementing regulations that

allow workers to know what, when, and why processes are monitored or placing limits on employers' use of algorithmic management is needed to protect employee mental and physical health.[9] This should include disclosure of when, where, and how AI is being used in the workplace.

There are potential vulnerabilities surrounding the proposed strategies, for example training staff with AI. The use of AI in training should be monitored by a trained instructor to assess validity of content, appropriate delivery to the trainees, and whether the intended outcomes are accurate. For those without technological fluency, comfort, and accessibility, employers will need to consider the quality and depth of training programs by ensuring that training includes understanding of technical components and language used as well as raising the comfort of workers using such programs.[68]

Navigating the challenges of AI: Corporations are at the forefront of AI users, and many companies are developing policies to help navigate the challenges of AI usage. For example, Amazon Web Services offers AI services and touts responsibly built AI, including fairness, security, and transparency, as part of its business offerings. [69] At present, however, the action steps behind the company's guiding principles are not required to be published or reported.

Currently, lawsuits related to AI are making their way through the court system, likely outlining the future of AI practice. One class-action lawsuit against an insurance company claims that inaccurate AI was used to deny health care to elderly patients.[70] Other lawsuits claim copyright infringement by authors and artists whose writing and images were used to train AI models.[71] The decisions in these court cases will be decided not by technical experts but by judges using existing laws and subject-matter-expert recommendations applied to the new technology usage of AI. This liability precedent likely will have long-term impacts on how responsible use of AI is defined. For the reasons just described, more research outlining best practices for those using AI would help ensure safe and ethical application of the technology.

Leveraging established systems: At the Massachusetts Institute of Technology, researchers developed AI that could be used to screen recordings of a human cough to diagnose COVID-19. [72] The research was housed in an academic setting, reviewed by an IRB, and overseen by a team trained to search for limitations. In this case, the development team suspected age and cultural differences in coughs that were outside of the training data and clearly outlined the risks to public health if COVID-19 is overdiagnosed or underdiagnosed. The authors concluded that clinical trials with more samples will be needed to perfect

the technology. While some medical applications of AI do have oversight such as requiring clinical trials, this is not the case for all AI. Use of already-established IRBs, for example those at universities, health institutions, or corporate companies, could prove to be a quick, practical, and ethically sound way to provide external, community-based feedback to companies developing AI. This could include university IRBs, professional societies such as Public Responsibility in Medicine and Research, or companies that sell IRB reviews.

There is a need to address the education of workers and inclusion in the development and implementation of AI in the workplace. The AFL-CIO (American Federation of Labor and Congress of Industrial Organizations) and Microsoft, a major labor union and technology company, respectively, partnered to encourage such open discussion.[73] The goals of the partnership are to share knowledge between labor leaders and workers on AI, include workers' expertise in AI development, and shape policy that supports technology skills and the needs of workers. The partnership includes an agreement with Microsoft to respect workers' rights to form or join a union, build labor-management relations, and negotiate collective bargaining agreements when considering evolving technologies. The collaboration aims to deliver on key aspects toward achieving ethical and equitable AI use. First, Microsoft plans to provide formal education to labor leaders and workers on how AI works, opportunities, and possible challenges and to explore training students for potential careers in the field. Second, feedback from labor leaders and workers will proceed directly to the AI technology developers, focused on unions and workers from critical fields. Lastly, the partnership aims to support policies that prepare workers with the skills and knowledge needed to advance, including supporting the expansion of apprenticeships.

Action Steps to Implement Evidence-Based Strategies

	Evidence-Based Strategy		Action Steps
1	Gather more data and research to inform policy.	1a	Federal agencies and private organizations should increase funding for AI research to determine the impact on vulnerable populations, establish best-practice recommendations, and monitor changes to ethical considerations for AI and human interfaces within the workplace, which will help ensure an equitable reach to underserved and underrepresented workers.

		1b	A website to share best practices for AI projects should be established by industry leaders to encourage transparency, ethical practices, and collaboration between public and private entities applying AI to the workforce.
2	Create educational pipelines and programs.	2a	Union leadership should explicitly prepare trainees to transition from occupations at the highest risk of computerization to careers that are sustainable within the shift to use AI. Congress and funding initiatives should prioritize such investments.
		2b	Union leadership and technology leaders should encourage pathways to technical and career AI roles, including in leadership, and should incorporate diversity recruitment from underrepresented and historically excluded populations to create robust oversight of AI implementation and combat potential human bias in data and data collection.
		2c	Educational materials by scholars should be developed and targeted at different age groups, experience levels, and diverse communities to foster a broader understanding and use of AI. These materials could help both workers and the general public understand and adapt to AI technologies.
3	Build cross-cutting partnerships between stakeholders, including nonprofit organizations, industry, academia, advocacy groups, and	3a	Institutional review boards and ethical committees currently used in research, academic, and nonprofit settings that focus on technology ethics should offer assistance to organizations implementing voluntary AI standards by providing practical assessment tools and guidelines for research and evaluation. Channels for ongoing feedback from these stakeholders should be established to continuously improve AI practices.

	individuals with lived experience.	3b	Unions and technology stakeholders should work collaboratively to emphasize the experiences and voices of workers in the assessment and evaluation of AI in the workplace and community. Such assessments should be robust and acceptable to workers and should not contribute to psychological or physiological stress. They should include a diverse range of worker experiences and voices, including those from a variety of roles, levels of expertise, and backgrounds, to ensure a comprehensive evaluation.
4	Increase technology accessibility and inclusivity.	4a	Federal or state agencies should fund the development and launch of AI pilot projects while concurrently establishing a community of practice. These pilot initiatives will be designed to assess AI applications across various sectors, offering invaluable insights. Simultaneously, communities of practice will foster knowledge exchange and collaboration among experts, aligning with the strategic vision to drive effective AI deployment and promote a culture of continuous learning and ethical practice in the field.
		4b	Workforce development associations and health-related professional associations should promote the development of AI technologies that are inclusive and cater to diverse needs, and these technologies should be offered or incentivized to explore AI applications that benefit areas that are not currently profitable.
		4c	Federal agencies and private organizations must develop strategies and detailed execution plans that explicitly and fully address the cultural and contextual needs of underrepresented and underserved populations. This can help ensure that communities and worker populations that are difficult to reach are included and provided accessibility.

Opposing Arguments

There are arguments against creating AI oversight. Organizations face post pandemic challenges including worker shortages, strain on supply chains, and rising medical costs that can be overcome, in

part, by using intelligent systems that require fast-paced innovation and adoption.[19] However, corporate profits should not be prioritized over building systems that equitably support business growth and a safe work environment. Implementing smart technologies can lead to improvements in worker health and safety in real time, and increased oversight may delay the application of these technologies. [17,74] Without a review of the impact of smart technologies, notably on mental health, these improvements may result in short-term gains but long-term challenges.

Also, according to technology developers, there are more pressing concerns than ethical ones, such as AI being weaponized to execute cyberattacks. Ongoing resources will be needed to protect data and remain at the cutting edge of AI cybersecurity, particularly when personally identifiable information is at risk.[75] While national security and data privacy are important, most AI projects will not be at that level of security risk and should be subject to ethical considerations.

Finally, companies that voluntarily comply with ethical standards may lose their competitive edge in the marketplace by having slower releases of AI.[63] However, companies that deploy AI efforts that risk their client data or workforce face economic fallout, specifically loss of customers, increased employee turnover, and lost confidence in branding as well as potential legal turmoil via lawsuits.

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