Labor Impacts of Climate Change

To: Occupational Safety and Health Administration (OSHA)
From: Sam Salwan (Massachusetts Institute of Technology)
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Re: Protecting the labor force from climate change through time shifting

The Problem

As climate change continues to worsen, its impacts on labor can be expected to increase. While this will undoubtedly impact factors such as health or quality of life, it will certainly also impact how individuals work, further augmenting disparities between blue and white collar workers. As temperatures rise, jobs that involve manual labor, such as manufacturing and agriculture, will become increasingly difficult due to heat stress. The first mechanism of impact is a loss of productivity; studies have shown that around 228 billion hours per year of heavy labor has been lost globally due to heat exposure (Parsons et al., 2021). This could be detrimental to the livelihoods of many; if labor becomes less productive, it is foreseeable that the demand for manual labor in manufacturing and agriculture will decrease due to automation or wages could dip. Secondly, climate change directly impacts the mortality rate. On average, 37.0% of warm-season heat-related deaths can be traced back to climate change (Vicedo-Cabrera et al., 2021).

Since the impacts of increased heat stress will hit blue collar jobs the most, labor related climate burdens are disproportionately faced by those in vulnerable communities. These jobs are also precisely those in which access to cooling systems are limited, further increasing the risks of working manual labor jobs. In a world of rising temperatures, the compounding effects of heat stress on job opportunities and health outcomes augment the cycle of inequality, widening the gap between socioeconomic groups.

This problem is worsened by the lack of policy and measures to protect the labor force from heat stress. Beyond informal recommendations from Occupational Safety and Health Administration (OSHA) and the Centers for Disease Control and Prevention (CDC), there is a lack of firm action and investment in the labor force's wellbeing in the face of rising heat stress challenges.

By framing the labor issue comprehensively and highlighting the equity challenges faced by marginalized communities, we can better motivate action to mitigate the impacts of climate change on the workforce and promote more equitable labor practices.

Policy Recommendations

In order to best deal with the inequality that is exacerbated by climate change, robust policies should be put in place to protect workers in the most vulnerable geographical areas and industries. Addressing this issue requires a two pronged approach.

First, after identifying regions that are most affected by heat stress, a midday work break from 12:30pm - 3:00pm in the months of June, July and August for those that are working in

open spaces and under direct sunlight can be mandated. Establishing which regions would benefit from this policy the most requires 3 metrics of analysis: absolute temperature, the within day temperature range and humidity. While absolute temperature is vital to consider to understand how hot on average it is, thinking about range allows us to accommodate for which regions will benefit the most from shifting their labor force's hours. Humidity tends to exacerbate heat stress even further. As such, it is incredibly important to take a decentralized approach to this issue and for guidelines to establish regional metrics. There is past precedent for unique regional policies: it is not entirely unusual for different OSHA states to have different approaches to labor standards. While many OSHA states do adopt the federal standards verbatim, many states do expand upon these standards in order to better protect their labor force. In this case, these states might be those with particularly harsh climates. Implementing unique regional policy solutions may be slightly more complex to roll out, but in the long run these concerns will subside, and the labor force will be better protected from heat stress. This aspect of the solution has already been implemented in various regions in the Middle East, such as the United Arab Emirates. As of 2022, the UAE has mandated that outdoor labor under direct sunlight is halted in the period of time between June and September.

The second aspect of the proposal is to implement a broader heat warning system for how to structure different intensities of work (i.e. light to heavy physical workload) depending on the level of heat stress. Within each of the warnings (high to low heat stress), recommendations can be set up on how to assign time to work and rest. For example, during periods of high heat stress, the recommendation might be to rest for 45 minutes for every 15 minutes of work. This was inspired by Hong Kong's recent enactment of a 3 tier heat stress warning system.

These two aspects of the solution work together to create a comprehensive framework for addressing heat stress in the labor force, balancing safety, productivity, and equity. While this integrated approach prioritizes the wellbeing of the labor force, it also fosters an increasingly resilient labor force capable of thriving in the face of climate challenges.

Although these policies and recommendations are helpful in providing a set of guidelines, it is essential to foster community engagement and public awareness on this issue as well. In the process of implementing the recommendation system, involving local communities and stakeholders in the process will allow for important discussions on understanding specific needs. Depending on the region and the industry, recommendations might look slightly different, and, as such, engaging in conversations with the community can lead to more effective and locally tailored solutions. Additionally, during the enactment of the recommendations and mandates, there should also be a focus on developing public awareness through education on the impacts of climate change related heat stress on the labor force. Both employers and employees should be educated through campaigns that promote understanding and compliance with the proposed policies.

The major obstacle to this proposal is that it is politically expensive, meaning it would require significant public facing effort to support this policy which may not gain them significant

political favorability. This solution requires major changes in how a number of industries have historically operated, likely leading to increased short term costs for firms. Given the influence of industry based lobbying on the policymaking process, there will likely be major political pushback which may make policymakers significantly less likely to back such a proposal. However, the case should be made to firms that employing these solutions will increase return on investment in human capital as they will see a productivity rise. A climate modeling study shows that moving labor from the hottest hours of the day to cooler times could potentially recover around 30% of global heavy labor losses in the current climate (Parsons et al., 2021). The potential for productivity recovery will only increase as climate change further augments within day temperature heterogeneity. In addition, it is important to acknowledge that it may be difficult for a national regulatory organization such as OSHA to implement decentralized policy recommendations. However, complex regional climate variations necessitate tailored worker safety policy. In order to overcome these challenges, national agencies can seek to develop collaborative partnerships with local governing bodies, industry representatives, and community stakeholders. Additionally, piloting these decentralized policies can serve as valuable case studies to demonstrate the extent to which tailored approaches are feasible and effective. Ultimately, while there may be challenges in a national agency implementing regionally different safety frameworks, the potential benefits in terms of protecting workers and fostering community resilience justify the effort and collaboration required.

As our understanding of climate change continues to develop, it is imperative that these policies are continuously monitored and updated as needed in order to ensure worker safety and enhanced productivity.

Conclusion

In conclusion, it is vital that policy measures are undertaken swiftly in order to protect the labor force and address the intersection of climate change and inequality. Given the detrimental impacts of rising temperatures on both the wellbeing and productivity of the labor force, the urgency of implementing safeguards cannot be understated. As such, the proposed policy recommendations to implement midday work breaks and a comprehensive heat warning system offer a practical solution to mitigate and adapt to the stresses of climate change. It should be noted that the midday work break system would operate on a regional metric system that would allow for regional differences in climate to be taken into account when creating appropriate safety measures against heat stress. These two aspects of the solution come together to promote the safety of workers facing heat stress, while providing guidelines that keep the labor force engaged in productive activity. While there are anticipated political challenges and short term costs for firms, it is essential to consider the high level of wellbeing and productivity gains that will occur for both individual citizens and industries given the implementation of these policy recommendations. Overall, these policy recommendations serve as a crucial change to foster resilience for the labor force in the face of climate change, ensuring a more equitable and sustainable future for all.