Treating Workers as Essential Too: An Ethical Framework for Public Health Interventions to Prevent and Control COVID-19 Infections among Meat-processing Facility Workers and Their Communities in the United States

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Abstract Meat is a multi-billion-dollar industry that relies on people performing risky physical work inside meat-processing facilities over long shifts in close proximity. These workers are socially disempowered, and many are members of groups beset by historic and ongoing structural discrimination. The combination of working conditions and worker characteristics facilitate the spread of SARS-CoV-2, the virus that causes COVID-19. Workers have been expected to put their health and lives at risk during the pandemic because of government and industry pressures to keep this “essential industry” producing. Numerous interventions can significantly reduce the risks to workers and their communities; however, the industry’s implementation has been sporadic and
inconsistent. With a focus on the U.S. context, this paper offers an ethical framework for infection prevention and control recommendations grounded in public health values of health and safety, interdependence and solidarity, and health equity and justice, with particular attention to considerations of reciprocity, equitable burden sharing, harm reduction, and health promotion. Meat-processing workers are owed an approach that protects their health relative to the risks of harms to them, their families, and their communities. Sacrifices from businesses benefitting financially from essential industry status are ethically warranted and should acknowledge the risks assumed by workers in the context of existing structural inequities.

Keywords COVID-19 · Essential workers · Undocumented workers · Meat processing · Public health ethics · Health policy · Pandemic ethics · Structural discrimination

Introduction

Coronavirus disease 2019 (COVID-19) outbreaks among meat-processing workers in the United States (U.S.) in 2020 revealed the life and death consequences for low-wage, minoritized workers in the face of long-standing structural discrimination and industry friendly government positions. Work is a social determinant of health and nationwide, a half-million workers staff approximately 3,500 animal slaughtering and meat-processing facilities (collectively, meat-processing facilities) (U.S. Bureau of Labor Statistics 2019; United States Census Bureau 2018). The U.S. food supply is heavily reliant on meat. Temporary meat-processing plant shutdowns in early 2020 created disruptions and loss across the food supply chain (Hobbs 2021). This led to calls from the industry to maintain production despite outbreaks, culminating with former President Trump’s April 2020 executive order declaring the meat supply critical to national infrastructure (Office of the White House 2020). As a result, meat-processing was treated like an essential industry and plants remained operational despite high numbers of COVID-19 positive workers.

By May 31, 2020, almost 17,000 workers in meat-processing facilities had contracted COVID-19 according to the U.S. Centers for Disease Control and Prevention (CDC), the federal government’s public health agency (Waltenburg et al. 2020). This was unsurprising in part because the executive order was not accompanied by any mandates for worker safety, and there are no national requirements for infection prevention for non-healthcare workers (Yearby and Mohapatra 2020a). Continued plant operations supported the food supply chain (Hobbs 2021), benefited state and local economies, and provided income to workers; but it came with serious health risks for workers who, while working in an industry deemed “essential,” are too often treated as expendable.

As information rapidly accumulated about the transmission, clinical presentation, and lethality of SARS-CoV-2, the virus that causes COVID-19, the commonalities between conditions that increase transmission and meat-processing working conditions were revealed both in the United States and other countries (European Center for Disease Control 2020). Outbreaks are exacerbated by prolonged exposure to the virus in indoor, crowded settings—such as meat-processing facilities with people working long shifts in close proximity. Several public health strategies can mitigate the risks of COVID-19 for workers and were reportedly implemented successfully in meat-processing plants in other countries, such as the Netherlands (de Rooij et al. 2021).
and Germany (Günther, et al. 2020). For example, after outbreaks in German meat-processing plants, the government quickly introduced legal reforms addressing on-site protections as well as structural conditions that contributed to exploitation of migrant workers (Young 2020). In the United States, however, implementation was and remains challenging both because of a societal orientation toward individualism rather than solidarity and the pro-industry, anti-regulation political environment that has prioritized industries’ economic interests over public health. By January 4, 2021 over 45,000 infections and nearly 250 deaths among meat-processing workers had been reported (Chadde 2021).

Public health practitioners advising government, industry, and community stakeholders during a pandemic face complex ethical and pragmatic concerns at the intersection of worker safety, business operations, and public well-being. This essay began with an ethics committee consultation to U.S. public health practitioners advising industry and government leaders during COVID-19 outbreaks tied to meat-processing facilities (University of Nebraska, Global Center for Health Security Ethics Committee 2020). We reflect and expand upon the advice provided in response to that request and lay out a public health ethics approach to ground infection prevention and control (IPC) recommendations for meat-processing workers, their families, and communities during the pandemic.

**Meat-Processing Work and Workers**

Several characteristics of meat-processing operations and its workforce contribute to the spread of SAR-CoV-2 (Chillag and Lee 2020). Meat-processing work is labour intensive with high risks of injury; it is characterized by dense, prolonged, proximate contact among coworkers (Krisberg 2020). Workers often share transportation to and from the workplace, live in congregate housing, and have frequent community contact with fellow workers (Waltenburg et al. 2020). Many also experience economic, housing, and food insecurity.

Immigrants, refugees, and people who are part of minoritized racial and ethnic groups comprise a majority of the meat-processing workforce—groups afflicted by decades of structural discrimination (Yearby and Mohapatra 2020a, 2020b). Many have limited English proficiency or lack the legal documentation to work in the U.S. (Jain 2016; Langellier 2020). These workers often avoid seeking healthcare because they are un or under-insured, out of fear of immigration enforcement (NILC 2017; Cervantes et al. 2021), or due to mistrust in occupational health services (Ramos et al. 2021a). In the context of the pandemic, socioeconomic disadvantages combine with race, ethnicity, and immigration status to create conditions ripe for the exacerbation of existing health inequities and ultimately, poor outcomes from COVID-19 (Kantamneni 2020).

During the current pandemic, the risks to U.S. meat-processing workers initially received less attention than other workers in essential industries, such as healthcare. Unlike health professionals, however, these workers conceivably neither anticipated that they might be expected to work while risking a life-threatening infection nor are they as socially or financially rewarded as health professionals (Draper et al. 2010). Meanwhile, the industry has not systematically adopted voluntary guidelines on IPC and personal protective equipment (PPE) (Waltenburg et al. 2020; Grabell 2020). Yet, given their circumstances, meat-processing workers have little choice but to continue to work under dangerous conditions. These workers were and are owed an approach that minimizes the risks of harms to them and their families, reduces the burdens they incur for the benefit of the essential industry and local, state, and national economies, and protects their health to the extent possible.

**Guiding Values**

Our recommendations are grounded in core public health ethical values of health and safety, health justice and equity, and community. The American Public Health Association describes these as core values that underlie public health policy and practice and ground the development process and the substance of recommendations (APHA 2019). These values also ground international public health action (Fairchild et al., 2017; WHO 2020; WFPHA nd), as well as international efforts to promote “decent work”—including workplace safety and security, opportunity, and equality of opportunity and treatment (International Labor Organization 2021). Attending to each of these core values entails balancing attention to several interrelated ethical
principles. For instance, attending to health and safety, which are necessary conditions for human flourishing, requires effective measures that promote health and well-being (principle of beneficence) while preventing and minimizing harms (principle of non-maleficence). The core value of health justice and equity implicates both procedural and distributive considerations. Procedural health justice requires attention to principles of transparency, accountability, and reliability to enhance trust by those burdened by keeping essential industries operating during the pandemic (Thomas and Dasgupta 2020). Distributive health justice requires the equitable distribution of resources and burdens, recognizing that COVID-19 disproportionately burdens some groups, including meat-processing workers, who belong to historically disenfranchised communities with compound disadvantages (APHA 2019; Goldberg 2017).

The core value of community, central to public health, means not just a collection of individual members but an ecosystem of relationships, interests, and values of interdependent members. Within the concept of community, the principle of solidarity acknowledges interdependence and honours the dignity of and respect for community members, regardless of their individual productivity, abilities, or social standing (Jennings 2019). Meanwhile, the principle of reciprocity implicates the values of both justice and community. It calls for recognizing relationships of mutual exchange and acknowledging that essential workers during a pandemic who face disproportionate burdens are owed something more than their wages in return (APHA 2019).

Measures to protect the public good during this pandemic have imposed disproportionate risks and burdens on workers in essential industries and their families (Pandemic Influenza Working Group 2005). Meat-processing workers assuming these risks are owed something in return from the industry and the larger community (including governments) in exchange for their sacrifice. They are owed measures that protect their health and safety, including not only PPE and other workplace protections but support and care for them and their families if they fall ill. They are no less worthy of protection and care because of their relative lack of social power nor are the interests of the entire community advanced if the health of these individuals is not promoted.

The following recommendations are meant to ground IPC recommendations in these core public health values and corresponding principles of public health ethics. Many of these recommendations are appropriate under normal circumstances, whereas several are specific to the pandemic context. Economic sacrifices across the industry—especially among those who profit the most—are ethically warranted and consistent with commitments to equitable burden sharing and reciprocity.

These core values and principles informed the development of a set of three ethical pillars to guide infection prevention and control (IPC) activities for meat-processing facilities (Table 1). Namely, employers and other stakeholders must work together to (1) ensure safety and reduce risks and harms in the workplace (on-site prevention) as well as (2) to create off-site conditions that mitigate risk (off-site prevention), and (3) to detect infections early and ensure adequate paid leave and care for workers who fall ill (health promotion, treatment, and remediation). This framework is based on our work to supplement IPC recommendations for meat-processing facilities, whose workers were effectively deemed essential by the President’s executive order. It is relevant for other industries that rely on low-wage workers that are or may be deemed “essential” during this or future pandemics. Although we addressed the issues in the context of conditions in spring 2020, this is also a case study in the harms of structural discrimination. Many of our recommendations would be unnecessary in a society with effective safety nets such as robust worker protection laws, universal healthcare access, fair wages, and paid time off.

### Ethical Pillars for Protecting Meat-Processing Workers from COVID-19

#### Pillar #1: On-site Prevention

An overarching commitment to worker safety is particularly salient during a pandemic and must be articulated and practiced by industry leaders and governments alike. The success of on-site prevention strategies depends on a culture of safety within facilities in which each person, regardless of their position and without threat of reprisal, feels enabled to identify and mitigate risks (Ramos et al. 2021b). Consistent messaging and actions that prioritize safety from facility leadership, as well as mechanisms to report safety concerns along with whistleblower protections (like those in healthcare workplaces) are critical for worker protections and
accord with the values of reciprocity and equity (Johns Hopkins Berman Institute of Bioethics and University of Colorado Boulder’s Masters of the Environment program 2022).

Formal mechanisms to give voice to workers are needed. Many meat-processing workers do not belong to unions and are unlikely to be empowered to advocate for their own safety (Human Rights Watch 2004). Respect for workers, as well as the core values of health and safety, justice, and solidarity during a pandemic all require comprehensive on-site protections. Local, state, and federal worker protection agencies exist to protect workers and should use the enforcement tools at their disposal, in concert with public health authorities, to hold the industry to account.

**Strategy 1.1: Implement Industry-Wide Mandatory Administrative and Engineering Controls and Adequate PPE**

Guidance issued by the CDC and U.S. Occupational Safety and Health Administration (OSHA), the federal agency charged with worker protections, (CDC and OSHA 2020), as well as by other public health authorities (Herstein et al. 2020), relies on the hierarchy of controls to protect workers (NIOSH 2015) (Fig. 1), ranging from the most protective approach of eliminating the hazard to the least protective option of PPE for individual workers.

During a pandemic in which congregate workplaces remain open, the most protective available controls are engineering controls, which isolate workers from the hazard (e.g. physical barriers, ventilation standards), followed by administrative controls, designed to reduce exposure when hazards are not well controlled (e.g. physical distancing, active screening, environmental disinfection) (Herstein et al. 2021). However, these are neither mandatory nor legally enforceable and have been inconsistently and incompletely adopted in meat-processing facilities (Waltenburg et al. 2020; Ramos et al. 2021a).

The lowest level of controls is PPE, designed to protect individual workers exposed to hazards. Existing OSHA regulations require employers to provide workers with appropriate PPE—such as a mask, face shield, and gloves (OSHA 2016) to protect against hazard in the workplace, but they are not tailored to specific to pathogens (U.S. Code 2021b) except healthcare workplaces covered by the bloodborne pathogen regulation (U.S. Code 2021a). Even with PPE regulations, PPE shortages during the much of the pandemic made adherence to these standards impossible (Raymond 2020), necessitating a harm reduction approach. The CDC’s temporary guidance on optimal use of available PPE during times of scarcity (CDC 2020a), while aimed at healthcare settings, should apply to all essential industries, including meat-processing facilities, to reduce harms to workers by providing the

| Table 1. Ethical Pillars, Strategies, Values |
|------------------------------------------|
| **Pillars** | **Strategies** | **Ethical Values** |
| 1. Onsite Protection | 1.1 Implement industry wide mandates for engineering, administrative, and PPE controls | Health and Safety; Equity and Justice; Community |
| | 1.2 Adjust line-speed and workflow | |
| | 1.3 Uniform policy application and communication | |
| | 1.4 On-site appropriate worker education | |
| | 1.5 State and local government protections | |
| 2. Off-site Protections | 2.1 Ensure adequate housing & quarantine and isolation space | |
| | 2.2 Appropriate off-site community outreach and education | |
| | 2.3 Provide safer, less-dense transportation options | |
| 3. Prevention, Treatment, & Remediation Policies | 3.1 Provide paid sick leave with no penalty and eliminate attendance bonuses | |
| | 3.2 Provide no-cost, confidential testing | |
| | 3.3 Support contact tracing by public health authorities | |
| | 3.4 Provide access to vaccinations and address resistance | |
| | 3.5 Provide healthcare coverage for COVID-19 | |
best possible level of protection under pandemic circumstances.

Regulatory agencies, such as OSHA, must require preventive measures to reduce workplace infections through engineering, administrative, and PPE controls at all congregate workplaces during a pandemic. Mandates to provide equitable protections for workers and distribute the financial impact of implementing IPC measures across the industry. In the absence of regulated uniform standards, individual sites or companies that implement more stringent protections, which typically have associated costs, will be punished in the marketplace for doing so. But if all sites are required to implement adequate protections, a level playing field is retained.

The mission of OSHA is to ensure safe and healthful working conditions (OSHA n.d.a), yet, throughout 2020 and early 2021, OSHA failed to mandate any worker protections specific to COVID-19, although the agency could have done so through its emergency rulemaking powers. This regulatory inaction left states and industries struggling to determine both the right thing to do and whether they could afford to do the right thing without penalty in the marketplace. This created a patchwork of activities and protections, which often were inadequate. In June of 2021, OSHA issued a narrow emergency temporary standard applicable only to healthcare (OSHA 2021). Going forward, OSHA should amend the existing PPE regulation to clarify its applicability to infectious disease pathogens in workplaces beyond healthcare and promulgate a new regulation for worker protections from infectious diseases spread by droplet and airborne transmission, such as COVID-19 for those in high-risk industries.

**Strategy 1.2: Adjust Line-Speeds, Workflows, and Production Rates Relative to Worker Numbers**

Line speed and workflow in meat-processing facilities influence production levels, the primary measure of economic success in the industry. The government has used line-speed regulations to protect worker’s safety for decades; however, legal mechanisms to waive maximum line-speeds (technology or line speed waivers) have expanded in recent years (USDA 2018), despite ongoing safety concerns. Remarkably, more waivers were granted in the midst of facility COVID-19 outbreaks (Safe Food Coalition 2020).
Increased line speeds jeopardize safety even under pre-pandemic conditions. During the pandemic they are decidedly unethical. Coupled with a workforce reduced by illness, increased line speeds require workers to crowd together to perform functions at speeds incompatible with maintaining IPC practices. Facilities that continue to prioritize short term profits over safety by maintaining pre-pandemic line speeds and workflows are not sharing in the burdens of the pandemic equitably. The urgent need to prevent more infections and even deaths require production level adjustments with modification to line speeds and workflow.

For reasons noted above, it is unrealistic to expect individual industry actors to slow lines speeds on a voluntary basis. The industry and government must together shoulder the burdens of reducing line speeds during the pandemic, to reduce risks of personal harm and even death among workers. At minimum, government regulators should not allow line speed waivers when doing so will undermine IPC measures. Instead, they should enforce existing requirements and create incentives for facilities to adopt COVID-safe line-speeds.

**Strategy 1.3: Ensure That Pandemic Specific Policies are Uniformly Applied and Communicated Within Facilities and the Industry**

COVID-19 responsive IPC policies must be clear, consistent, universally disseminated, effectively communicated (in culturally and linguistically appropriate ways), and enforced to effectively reduce harm to workers and ensure accountability across the industry. Even in facilities that have adopted appropriate safety measures, some frontline supervisors continue to enforce pre-pandemic and now unsafe policies, including disciplinary point systems or line speeds that prioritize short term production over IPC (Grabell 2020; Ramos et al. 2021a). These practices endanger both the workers and facility operations in the longer term. Facilities that adopt IPC are responsible for holding everyone in leadership accountable—from the plant managers to the line and floor supervisors—for consistent and appropriate policy implementation, dissemination, and enforcement. Federal regulators, such as OSHA, should consider regulation and guidance that address these issues.

**Strategy 1.4: On-Site Education to Empower Workers**

As a complement to structural and administrative protections, the industry must provide on-site education and training for workers about COVID-19 and measures to prevent the spread in and outside of work, informed by federal guidance (CDC and OSHA 2020; OSHA, n.d.a). Workers should also be informed of their rights in the workplace. Out of respect for the workers and to enhance effectiveness, the material presented must be easy to understand and communicated at the appropriate literacy level and in the preferred languages spoken or read by the workers. Because some of the information is complex and includes significant departures from normal practices, this cannot be accomplished by merely displaying signage. A designated person, such as a trained peer in the workplace or community health worker may be an especially effective educator and advocate because of their existing reputation for trustworthiness (Rosenthal et al. 2010). Attention to this issue fosters trust, adherence to safety measures, and effectively empowers workers to protect themselves and their families.

**Strategy 1.5: State and Local Governments Should Incentivize Meat-Processing Facilities Adherence to COVID-19 Responsive Policies**

OSHA was created by Congress to protect the health and safety of workers; however, enforcement might be limited by restricted resources, de-regulatory agenda, and pandemic conditions. State and local governments can sometimes fill this void by creating requirements to protect workers with robust monitoring and enforcement (State of Michigan 2020). Moreover, they are often better positioned to understand the particulars of regional industry and may have better relationships with local actors.

State and local governments have ethical and legal responsibilities for the well-being of their residents. The legal obligation to protect their residents is independent of any federal action (including when the federal government fails to act). States and localities should consider ways to implement and enforce consistent, universally applicable on-site prevention measures to keep workers safe. Even if federal regulations are implemented, states and localities are free to impose more stringent, non-conflicting requirements if deemed necessary.
A safe workforce will keep facilities within their jurisdictions operational and viable in the longer term.

Pillar #2: Off-Site Prevention

**Strategy 2.1: Ensure Adequate Housing, Especially for Quarantine or Isolation**

On-site protections will fail if workers must return to overcrowded living conditions in which effective quarantine and isolation are impossible. Meat-processing facilities should work together with local governments and others to facilitate access to no-cost pandemic housing options for workers during outbreaks, with urgent priority for those in need of isolation and quarantine. Some private and public organizations have partnered with essential industries and public health departments to provide temporary housing for workers in essential industries, such as making unoccupied hotel or dorm rooms available for use (AHLA 2020; Oliver 2020). These initiatives are critical for reducing off-site risks to workers and their communities and honouring the three core values of health and safety, justice and equity, and community. A commitment to reciprocity underlies the industry’s responsibility to reduce the risk and spread of infection among workers and their communities in exchange for substantial risks workers assume during the outbreaks.

**Strategy 2.2: Partner with Public Health Departments and Community Organizations to Foster Culturally and Linguistically Appropriate Outreach**

The power imbalances and history of worker treatment in the industry may understandably lead workers to view information coming from employers with scepticism. On the other hand, community organizations and peer educators (also called community health educator, worker, ambassador, or advocate) understand how to best mobilize information where workers and their families live and often have long established relationships within the community. They are trusted sources of information and central to educating workers and other community members on IPC strategies inside and outside of the workplace. Partnering with community advocates honours the value justice and equity by acknowledging the history of subjugation of these low-wage workers. It also fosters trust, efficacy, shows respect for workers and communities, and promotes worker and community health (Michener et al. 2020; Kobokovich et al. 2020).

**Strategy 2.3: Provide Transportation Alternatives**

Meat-processing workers often carpool in groups to and from work, presenting another opportunity for virus transmission. To reduce this risk to workers and control the spread of infection, facilities should provide alternative transportation options with reduced density and required masking during outbreaks. While only 15 per cent of facilities adopted this strategy (Waltenburg et al. 2020), it is justified by prudential and ethical factors, including harm reduction, and ultimately is in the best interest of the industry. A legal mandate for employers to provide transportation assistance is unlikely; however, governments could provide financial assistance to individuals or industry to incentivize implementation.

Pillar #3: Prevention, Treatment, and Remediation Policies

**Strategy 3.1: Provide Paid Sick Leave Without Penalty and Eliminate Attendance Bonuses**

Several common industry policies increase the risk of SAR-CoV-2 transmission. Facilities typically do not provide sick pay and use disciplinary point systems that punish workers for using unpaid sick time (Fagan and Hodgson 2016; Ramos et al. 2021a), while also providing continuing attendance bonuses—all practices that encourage workers to work while ill, and all practices that have largely continued throughout the pandemic, even in sites experiencing outbreaks (Waltenburg et al. 2020). During the pandemic, these policies are unequivocally problematic. Without paid time off or personal financial reserves, workers feel compelled to work through illness to receive pay and bonuses as well as keep their disciplinary points low to avoid termination. This furthers the spread of preventable sickness and death among workers and in the community.

Principles of justice and harm reduction require eliminating attendance bonuses and punitive sick leave policies during the pandemic and especially during community outbreaks. It demonstrates respect for the health and safety of workers and their families and the industry’s reciprocal duties to the workers who incur significant risks by working through the pandemic. This
is also prudent—a healthy workforce fosters production, which serves both business and workers’ interests.

Strategy 3.2: Provide No-Cost, Confidential Testing

Meat-processing facilities should work closely with public health departments to facilitate access to no-cost, rapid, and accurate testing for both surveillance and symptomatic testing purposes. This allows for early identification, isolation, and quarantine and may prevent facility wide outbreaks and reduce community transmission. Although it may temporarily slow production, continued spread jeopardizes not only the workers but also facility operations and potentially national food supply chains. If facilities must conduct their own testing or contract with private entities for testing, they must do so in line with current federal and state laws that govern health inquiries by employers, such as the Americans with Disabilities Act (EEOC 2021). In March 2020, the federal Coronavirus Aid, Relief, and Economic Security (CARES) Act created mandatory reporting of all COVID-19 test results (CARES Act 2020), which is achieved through existing public health data reporting methods for infectious disease reporting (HHS 2021). For future novel virus outbreaks absent legal reporting mandates, employers should share de-identified information with the public health departments to facilitate timely case investigations and reporting by industry.

Strategy 3.3 Support Contact Tracing by Public Health Departments

Contact tracing (identifying person-to-person spread) following a positive test should be done by state or local health departments rather than by the facility or industry, following available CDC guidance (CDC 2020b). Public health departments are ethically, and often legally, bound to confidentiality in the process and cannot disclose information to employers. Given the existing power inequities in the meat-processing industry, workers may reasonably fear wrongful disclosures or punitive use of confidential information, leading to mistrust and subsequent avoidance of testing and contact tracing operations performed by their employers. Confidentiality and trustworthiness are paramount in public health, grounded in principles of professionalism, procedural justice, and privacy (APHA 2019). Allowing employers to conduct contact tracing undermines trust in public health authorities and effectiveness of contact tracing as tool to reduce the spread of disease, as it may lead workers to provide less than candid responses to avoid reprisals at work and undermine the values of health and safety.

Strategy 3.4: Provide Cost-Free Vaccines and Address Vaccine Resistance

Meat-processing workers are at high risk for COVID-19, as we have outlined. As low-wage, high-exposure workers in an “essential industry,” they should be considered a priority population for a SARS-CoV-2 vaccine distributions (including future vaccine doses) (Dineen et al. 2020), although initially priority placements varied by state (Kaiser Family Foundation 2021). There is some vaccine resistance among meat processing workers, like many in the United States, which may be amplified by the lack of consistent workplace pandemic protections to date (Warren et al. 2020) and statements by government officials connecting legal status to work in the United States to vaccine eligibility (Khazanchi et al. 2021; Kuczewski 2021; Lee et al. 2021).

To increase uptake, vaccines costs should be borne by the industry and government rather than workers. Access should not be tied to healthcare settings and must be explicitly segregated from inquiries around country of origin and legal authorization to work in the United States.

In this context, coercive strategies such as vaccine mandates could further erode trust and should be avoided in settings where workers are traditionally disadvantaged until they have been implemented in workplaces featuring more empowered workers. We note that employers can legally require vaccination as a condition of employment if they allow for exemptions and offer reasonable accommodations as required under the Americans with Disabilities Act and Title VII of the Civil Rights Act. The U.S. agency charged with enforcing antidiscrimination laws in employment settings, the Equal Employment Opportunity Commission, initially discouraged mandates in December 2020 (EEOC 2020) but updated their stance in May 2021 (EEOC 2021). There are no widespread federal mandates for private sector workers, although OSHA does require employers to offer Hepatitis B vaccines at no cost to employees with potential workplace exposure (U.S. Code of Federal Regulations 2021a).
States, rather than the federal government, hold the primary power to require vaccination in the United States (Parasidis 2017). To date, limited vaccine mandates exist in several states with a focus on government and healthcare workers (NASHP 2021); in contrast, some states have passed laws prohibiting COVID-19 vaccine mandates in certain circumstances (Hawkins and Campa 2021). However, previous vaccine mandates at the state and local levels have been consistently upheld as lawful (Parmet 2018). Those cases typically involve vaccines with well-established safety and effectiveness, arguably justifying mandates based on the context-specific likelihood of reducing harm to the individual and others (Wynia 2007).

In contrast, existing COVID-19 vaccines entered the market through Emergency Use Authorizations with less safety data and fewer legal protections for individuals who experience adverse events (Krause and Gruber 2020; Food and Drug Administration 2020). These uncertainties, along with strain on already fragile trust in public health authorities and facility leadership, may have contributed to delays in vaccine uptake among workers (Bunge 2021). Full FDA approval is imminent for all three available vaccines in the United States and safety data are robust, which may change decisions going forward. In the meantime, some meat-processing companies have offered financial incentives in return for vaccination (Polansek 2021), a strategy that holds some promise (Volpp and Cannuscio 2021) but must be undertaken in conjunction with efforts to understand the root causes of vaccination resistance, provide transparent communication, and address structural factors (like lack of paid sick leave) that can hinder vaccine uptake among meat processing workers. Others moved to mandates that coincided with the FDA’s grant of full approval to the Pfizer vaccine (Olberding 2021) and numerous other private employers are adopting vaccine mandates, including Google, Facebook, Uber, Disney, and Walmart (Hirsch 2021).

Increased rates of vaccination will most certainly decrease the rates of infection among workers. At the same time, it might also lead facility management and workers to overestimate vaccine protections and erode workplace IPC strategies and PPE provision—a phenomenon described as risk compensation, negative spillover, or moral licensing (Maxin et al. 2016; Mantzari et al. 2020). This is especially concerning considering likely future variants for which existing vaccines may prove less effective and may require reimplementation of strict IPC measures to reduce transmission. Concerns about risk compensation do not justify withholding effective public health interventions (Mantzari et al. 2020); however, we raise this issue in the context of organizational decisions as vaccines are allocated to workers, since it emphasizes the importance of establishing and maintaining the capacity to rapidly re-implement worker IPC measures even as vaccination campaigns proceed.

**Strategy 3.5: Provide Healthcare Coverage for Those Who Develop COVID-19 Illness**

Providing rapid access to no-cost care for workers who contract COVID-19, regardless of insurance coverage or immigration status, is warranted in a pandemic. This is a distinct argument from ongoing national conversations about universal healthcare access and coverage. This is especially critical given the variability of workers’ compensation coverage, which in some states does not cover pandemic diseases contracted in the workplace and in others is complicated by multiple issues, such as causation (Hyman et al. 2020). This can severely delay or preclude altogether coverage for treatment, rehabilitation, and wage replacement. As a matter of equity, reciprocity, and respect, as well as to incentivize workers to seek early treatment for symptomatic infections, the cost of covering care for workers should be borne by those who profit from uninterrupted meat processing operations, including the industry and the government.

**Conclusion**

The COVID-19 pandemic has had devastating human, social, and economic effects and exposed the complex interdependence of worker health and well-being, community health, and economic security. Industries like meat-processing facilities—with congregate and high-density workplaces staffed by workers who are already disadvantaged by structural discrimination—present challenges for those charged with IPC recommendations. During a public health crisis our interdependence and commitments to equity and reciprocity become paramount (Gellert 2020). Businesses that benefit financially from essential industry status must shoulder burdens in a way that acknowledges the disadvantages and sacrifices of their workers. Namely, if an industry is
deemed essential, the workers in the industry should be treated as essential, too. We have focused on meat-processing, but the ethical values and principles we used throughout this analysis are applicable to other workers in essential industries, such as agriculture (Ramos et al. 2021c), retail and public service workers, and attendants in long-term care. Implementation of IPC recommendations must be anchored in the public health values of health and safety, justice and equity, and interdependence and solidarity with an obligation to principles of harm reduction, minimizing risks, and promoting health for workers and their communities.

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