Essentially Unprotected

Health Data and Surveillance of Essential Workers During the COVID-19 Pandemic

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Summary of Findings

In March 2020, local governments across the United States began instituting stay-at-home orders to curb the spread of COVID-19. Key to these orders were exceptions for "essential workers," in a variety of industries who were expected to continue reporting in person. Rather than keep essential workers home, politicians and public health officials recommended, or mandated, a number of changes to their workplaces—social distancing and masking, but also temperature scans and contact tracing. While the exact mandates varied greatly from state to state, many of these interventions relied on the introduction of public health surveillance into the workplace. But it remained unclear just how invasive such surveillance would be, and how the health data collected from essential workers would be handled by employers.

Our research shows that, with few exceptions, essential workplaces did not use the pandemic to justify new, invasive forms of surveillance. Data was collected, but most often in haphazard ways, and the results were often kept for the benefit of the employer, and rarely made available to workers. Many of the workers we spoke to didn't care where their data went. What they wanted was to know who specifically in their workplace has tested positive for COVID-19 in a timely manner so that they could decide how to protect themselves and people in their homes. Privacy protection laws permitted employers to collect COVID-19 infection data about employees but did not allow the details about who was infected to be shared with employees. Workers wanting access to private health information to protect themselves were often at odds with employers navigating a confusing legal landscape that requires medical information be held as confidential. As a result, workers often deployed creative workarounds to understand who had been infected with COVID-19. Through word-of-mouth contact tracing—communicating with coworkers and observing others' behaviors in the workplace—workers filled in health information gaps, taking their health into their own hands. During these critical times, interpersonal relationships were crucial to protect workers' physical and mental health.

When asked what changes they wanted to see, workers fundamentally wanted to be treated with dignity and respect, and to have that manifest through basic protective policies and a right of action against harmful employers. Many of them currently lack paid time off, paid sick leave, and functional, affordable health insurance. They also want their wages, which have stagnated over the last decades, to rise and financial acknowledgment of the risks of the work they do. And they want the respect of timely, specific, and accurate information about infection and contact tracing in their workplace, collected and shared in a way that also respects worker privacy.

Other worker advocates, public health officials, policy experts, and academics recommended revising guidance around the Americans with Disabilities Act (ADA) that requires all health information in the workplace be held as private, and increased funding to OSHA to enable it to enforce existing laws and hold negligent employers accountable. Further, laying the groundwork for innovations in the relationships between employers and workers, like worker health committees, are other areas for exploration, funding, and study.

Introduction

The question of who counted as an "essential worker" became suddenly critical for Peter* in March 2020, when he was required to report to the warehouse where he worked, while others stayed home. In those early days of the pandemic, Peter remembered his warehouse doing temperature checks with a far-from-accurate tabletop forehead scanner. For a little while, at least. Management soon scrapped the checks, along with any other health-related surveillance. In some cases, it seemed like managers were actively obscuring health information. Peter angrily recalled being lied to about his own exposure—he didn't find out the truth until he texted his supervisor to ask her why she wasn't at work.

At an Amazon facility during the same period, Mary was put in charge of the new "Distance Assistant" system—a set of cameras, a computer, and a screen that showed how close workers were to each other in real time. Quickly, Mary was overwhelmed by a string of automated notifications to her phone as workers passed within six feet of each other while working. These notifications were then joined by a chorus of messages from her own managers, complaining that her facility's social distancing "scores" were far too low. Despite feeling committed to helping her community during a crisis, exhausted, she eventually moved to another job with less oppressive monitoring.

Laura also found herself designated as a health monitor at her food processing plant. Very early in the pandemic, the plant suffered an outbreak and several workers died. The union responded with a push for new safety monitors, pulled from existing employees rather than outside staff. Suddenly, Laura had a new job on top of her current one. With no automated systems like those at Amazon, she watched and monitored her coworkers directly, reminding them about masking and social distancing. In the worst cases, she would mark down their names and report them up to management. While the plant historically had rigorous health and safety precautions to protect the consumers of the food they produced, she wished they would have done more to help her feel safe at work.

Bill told us how much he liked his job before describing the clip-on tracker that he was told to wear. At his manufacturing plant, his employer was clear that the trackers wouldn't collect any data beyond simple proximity to each other. He liked the limited data collection, but he did roll his eyes at the chirping. Instead of a video monitor, the trackers gave off a high-pitched note when they passed within six feet of another. Bill described with appreciation how the system would let him know about his exposure to someone sick, while still maintaining their privacy.

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* All names in this report are pseudonyms.

Despite many differences, all of these stories are about workers dealing with new public health surveillance in their workplaces in response to COVID-19. This report examines how essential workers reacted to, and in some cases worked around, that surveillance in four large commercial sectors: grocery, meat and food processing, warehousing, and manufacturing. Along with an analysis of different health surveillance methods, this report highlights how employees actually lived and worked in the context of these new interventions. We heard firsthand from workers how they had to adapt to radically altered workplaces, struggling to share information and keep themselves and their families safe.

Given the massive upheaval caused by COVID-19, some worker advocates and privacy scholars worried that the pandemic would be used to justify new, invasive, and technology-based surveillance of workers.[1] Some of the workplaces we examined were already outfitted for monitoring employees, and quickly embraced new technological means of health surveillance. Many more workplaces, however, chose to implement simpler forms of data collection, often in haphazard ways. In all but a few cases, employees described these measures as prioritizing the needs of the employer—keeping production up, meeting compliance thresholds—rather than the safety of employees. Still, the differences in how COVID-related surveillance was implemented significantly changed workers' lives. Across all sectors, most workers experienced fear and uncertainty around missing, contradictory, or insufficient information about infection in the workplace. This reflected the most common pattern we found: whether high-tech or low, most workplaces collected health data from workers but did not provide the results of that data to workers, or not with enough specificity.

If worker health data was being collected but unevenly used to implement safety measures, then what were the actual effects of this surveillance on workers' lives?

A few essential workers, like Bill from the manufacturing plant, did benefit from a thoughtful, privacy-preserving roll out of a digital contact tracing and social distancing device. But most workers in this study grappled with information voids—many a product of federal regulations controlling health information sharing in the workplace—that left them with enough information to know that the virus was present in their workplace, but not enough precision to be able to understand their own risk.

If worker health data was being collected but unevenly used to implement safety measures, then what were the actual effects of this surveillance on workers' lives? In *The Atlantic* in July 2020, Derek Thompson coined the term "hygiene theater" to refer to policies that focused on increased sanitation, cleaning, and disinfecting surfaces to prevent COVID-19 transmission,[2] even after data debunked the idea of surface transmission of the virus. The result was that rigorous surface cleaning was not really accomplishing what it was designed to, that is, eliminate traces of the virus and reduce infection risks, nor was it necessarily accompanied with evidence-based practices like masking or, later, vaccination. And yet, these routines still had real effects by making the exceptional

pandemic conditions visible or helping to project an atmosphere of caution and seriousness into public spaces. Critics of hygiene theater argued that such practices created a "false sense of security,"[3] but it is important to consider all the effects of such a visible performance of care.

Many of the workers we spoke to described the new health surveillance in workplaces as affecting their daily lives but not always making them feel safer. They experienced the wide array of protocols, behaviors, and objects that were introduced into the "essential" pandemic workplace as a type of "COVID theater." Temperature scans and check-in points, ubiquitous signage, and constant monitoring, all communicated to workers that *something* was being done, even if it didn't actually benefit them. The result was that many essential workers described supplementing or working around their employer-mandated forms of health surveillance with their own, community-based measures. This meant using physical barriers like masks, gloves, or vaccines, even in the absence of employer mandates, but it also meant leveraging relationships, and leaning on their personal networks to do their own information gathering and sharing. Sometimes this was as simple as texting coworkers for information outside of official channels, but others described true worker-led organizing to change behaviors at their worksite.

Our findings come from 50 interviews, conducted in English and Spanish, with essential workers across four sectors: grocery, meat and food processing, warehousing, and manufacturing.* This report discusses the impact of COVID-related health surveillance on those workers in three sections: In Part 1, we provide a summary of the *context* of labor in the US at the time pandemic health measures began being implemented in March of 2020, with a specific focus on the relationship between public health and workplace surveillance. Part 2 is a description of the actual surveillance measures that were put into place, told through the words of the workers who experienced them. Finally, in Part 3, we present the interventions to health surveillance that workers produced themselves, focusing on the way they leveraged relationships to gain access to critical data and information. We close with what workers asked for to mitigate these challenges, and recommendations from researchers, worker advocates, and public health officials for broader structural and regulatory changes.

Ultimately, these accounts reveal that the most common risk produced by new workplace health surveillance was not creeping forms of privacy violation, but rather deepening gaps in how much information was *given back* to workers. As essential workers were increasingly hailed as "heroes," they found themselves increasingly visible, their health status and practices documented, their data collected and their labor monitored, at times through intensive tech surveillance like at Amazon. At the same time, workers and their lives were not valued. In workplaces where workers are perceived as easily replaceable, where they have little power to leave jobs because of precarity or because of loss of income or benefits of a job—employers value the worker only for the labor they provide and not for the skills and humanity they bring to the workplace. This visibility for workers is rarely for their benefit but almost always for the benefit of the employer, who might take a body temperature but not share the results with the person scanned. Taking the concerns of essential workers seriously would mean changing workplace health and privacy regulations to give workers the data they need, as well as implementing systemic safety net policies like paid leave and hazard pay, that would allow them the agency to make decisions about their health, inside and outside the workplace.

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* We also asked four workers to map their workplaces and discuss its architecture. In addition, we interviewed nine academics, public health officials, government agency staff, and non-profit workers for context and broader perspectives. Learn more about the study' s methods in our Methods section at the end of the report.

Part 1: The Precarity of Essential Work in the US

> "I was really upset with her initially when [my coworker came to work with COVID] because I couldn't wrap my head around the idea where money is worth more than my life, but I realized if I don't have money, I don't have a life either… I didn't understand, I don't understand money versus possibly killing multiple people. But now, especially farther into this pandemic, I totally understand because if I took that ten-day quarantine off every time I thought I had COVID, I would be homeless, and my kids would have been taken by the state."
>
> —Nia, Warehouse Worker

The interviews we conducted with essential workers were designed to understand their experiences of navigating new public health surveillance in the workplace. However, throughout the research, workers not only described the inconsistent (and sometimes contradictory) ways in which they were surveilled on the job, they also gave heart-wrenching accounts of intense pressures during this time. Workers struggled to show up early enough to pass through lengthy check-in stations, or to get accurate information about who around them was sick, but they also struggled with a lack of support unrelated to data collection: essential workers often lacked adequate sick leave, were only given temporary boosts to income and found themselves working unprecedented hours with fewer coworkers. The result was high levels of risk and vulnerability. And it would be inaccurate to suggest that this precarity was solely, or mostly produced by COVID-19, or the resulting health surveillance. To understand how the disparities around health surveillance truly impact essential workers requires also understanding the context of precarious labor in the United States and how these conditions collided with a set of hastily and unevenly implemented political mandates for new public health measures.[4]

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Essential Work Is Already High Risk and Low Wage

Even prior to the pandemic, many essential workers were employed in high-risk, low-benefit workplaces that often impacted worker health. Despite exceptional occupational hazards, few employers of these workers offer sufficient health insurance, if any at all. Many employers also do not offer paid sick leave, and the economic precarity experienced by these laborers often restricts their ability to take any time off work.[5] Many workers admitted to going to work sick given the absence of paid time off. While the federal Families First Coronavirus Response Act instituted 10 days of paid sick leave for US workers in companies with between 50 and 500 workers starting in April 2020, the provision sunset on December 31, 2020, and many workers did not know of these provisions.[6] While some workplaces provided hazard pay in the first months of 2020, those payments stopped as the year went on.

In addition, immigrants and migrants comprise a large portion of the essential workforce. According to 2020 data, 69% of all immigrants in the US labor force and 74% of undocumented workers are essential workers.[7] While we never explicitly asked about immigration status, some workers we spoke to hinted at being undocumented, mentioned being paid in cash on a week-to-week basis and expressed concern about seeking medical help when sick, in fear of going to hospitals. Some workers also spoke about their mistrust or confusion about vaccinations and the medical system writ large. Many essential workers also had to juggle work with intense caregiving responsibilities for children or sick family members, which added to the increased sense of stress that workers and their family experienced.[8] As a consequence of all these factors, essential workers, especially in retail work, experienced high levels of stress and burnout and were more likely to be diagnosed with a mental health issue.[9]

The Conditions of Essential Work Put Workers of Color at Disproportionate Risk

While many white-collar jobs shifted overnight to remote work, the "essential" positions where Black and migrant workers have been historically, and currently overrepresented, remained the same: under protected. Accordingly, Black, Indigenous, Latinx, and other people of color faced

disproportionate harms during the pandemic, experiencing COVID-19 deaths at nearly double the rate of white people in the United States, when adjusted for age.[10] The reasons for such drastic disparities are complex and rooted in systemic racism—long-standing inequality in access to health care services and resources, medical discrimination, and the overrepresentation of people of color in essential work all contributed to poorer health outcomes for people of color. A report by the Urban Institute notes that when the pandemic began, 31% of Latinx workers, and 33% of Black workers were employed in essential jobs that required them to work in person and in proximity to others.[11] During the pandemic, these jobs carried outsized risk of infection at work, as well as persistent precarity due to low wages, diminished labor organizing power, and poor or no health insurance, resulting in disproportionately high infections and deaths.

At the same time they were working under these conditions, these workers were being called not only essential, but heroic. While thank you banners and displays of gratitude like public clapping in the first pandemic months were ubiquitous, workers reported resenting being called "heroes."[12] More often than not, this hero discourse did not come with benefits, safer workplaces, or increased pay. Instead, this rhetoric reinforced the idea of sacrificial labor that workers had been engaged in all along.[13]

Public Health Agencies Struggled to Manage the Crisis of COVID-19

It was into an economy already anchored on precarious labor that public health institutions and governments attempted to introduce COVID-specific interventions. The stay-at-home orders of March 2020 were the start of a years-long period of crisis, where workers had to navigate a complicated array of new health recommendations and regulations. This meant having to navigate public health information like that released by the World Health Organization (WHO) and Centers for Disease Control (CDC), as well as specific state and local government mandates for masking, distancing, or closures. For essential workers who continued to report to work in person for most (if not all) of this period, there were also the specific workplace safety interventions instituted by their workplaces. Guidelines from the Occupational Safety and Health Administration (OSHA) and the CDC recommended conducting COVID-19 "hazard assessments" to identify how and where COVID-19 spread in the workplace.[14] Accordingly, contact tracing, symptom assessments, and mobility monitoring were integrated into workplace surveillance regimes; though without accountability, implementation was based on the goodwill and initiative of employers and advocacy of workers. In short, each workplace crafted its own mix of safety measures. Some attempted to embrace the layered approach supported by the CDC, which involved a range of measures including distancing, personal protective equipment, increased ventilation, enhanced cleaning, and reopening plans. Other workplaces took far fewer steps to secure worker safety, often, but not always lining up with the political bent of the community (or company owners).

The meatpacking sector provides a poignant example of the power relationships between workers, employers, and government. Early in the shutdown period, major meatpacking companies, specifically Tyson and Smithfield Foods, fearing a loss of profits, successfully lobbied for an executive order declaring meat processing an essential business. The Trump administration went along with the proposal, signed the order in April 2020, instructing plants to remain open and even providing new liability protections for the companies, even as it continued to export meat to other countries.[15] All of these efforts were made in light of the clear and direct threat to workers in meatpacking plants, and the existing evidence of worker deaths.

Of the public health advising entities, OSHA was the only one with the mandate to conduct investigations in workplaces, to hold employers accountable for the health of their workforce, although virtually no inspections occurred. OSHA has been heavily criticized by worker advocacy groups for neglecting to follow up on worker complaints and providing insufficient guidelines.[16] These investigations are especially critical because in the United States, workers do not have a "private right of action" and thus lack legal recourse against their employers if they are harmed or killed on the job.

This lack of enforcement, the result of chronic, bipartisan underfunding of the agency, mattered. According to the Food and Environment Reporting Network, as of March 31, 2021, over 76,000 meat and food processing workers tested positive for COVID-19, and at least 335 workers had died.[17] After thousands of COVID-19 cases at multiple plants, and several deaths, OSHA fined Smithfield and JBS meat processing plants less than $16,000 each, for failure to provide worker protection from COVID-19.[18]

National Health Regulation Limited the Critical Health Information Essential Workers Could Receive

The data collected about work-related health and injury is protected by privacy laws that prevent employers from sharing confidential health information about employees. Signed into law in 1990, the Americans with Disabilities Act (ADA) generally forbids employers from requiring employees to undergo medical examinations unless the information collected is both job-related and a business necessity. While most of the ADA's provisions concern people with disabilities, the act also includes protections for all medical information that employers collect. During the pandemic, debates about what constitutes medical information have complicated this confidentiality provision, calling into question what claims to privacy workers have. For example, temperature scans are clearly medical exams, defined by the Equal Employment Opportunity Commission's (EEOC) enforcement guidance for the ADA as a procedure or test that seeks information about an individual's health, and therefore fall under privacy protections for workers.[19] On the other hand, data from GPS trackers used for social distancing or air quality sensors measuring ventilation do not produce medical information related to the individual, and are not covered by the ADA.

COVID-19 tests and other medical test results also fall clearly into the category of medical exams and information. The EEOC has stated that an examination is considered compliant with ADA if the employer has a reasonable belief that an employee poses a direct threat due to a medical condition, paving the way for employers to require their employees to undergo COVID-19-related testing, tracing, and questioning.[20] However, employers are not mandated to report these results to other employees in the workplace, and most erred on the side of tightly limiting who in the workplace had access to health information. While employers have a duty to provide a safe workplace, exactly what that has meant around COVID-19 has varied greatly. While employers can legally collect COVID-19 health information from employees, the ADA requires employers to hold this data confidential and severely limits its sharing within the workplace. The most critical information for workers was data about who was infected with COVID-19, and that data was quite clearly covered under the ADA's privacy rules and employers were instructed through government guidance to severely limit its sharing to managers health and safety personnel.

Part 2: Health Surveillance in the Essential Workplace

For essential workers some of the earliest, most visible, and longest lasting COVID-19 interventions were the reconfigurations of space and time, and the introduction of new tools of surveillance to the workplace. Nearly overnight, new tools, procedures, data, and jobs were created to oversee and enforce distancing and health practices among employees. The tools and reconfigurations were to keep people distant, avoid crowding, or, where this was impractical, to erect some physical barrier between them, and to monitor workers' behavior. Less visible were the ways in which these rearrangements and devices enabled surveillance and captured new health-related data about workers as they entered and moved through the worksite. Across the COVID-19 workplace, employers were tasked with trying to keep the virus out of the workplace, and when it inevitably crept in, implementing measures to limit the spread of infection, and ensure that employers, at least, had access to data about worker's health in service of these goals. But this information was not evenly distributed and shared, with employers—in many cases trying to comply with ambiguous health privacy regulations—withholding the vital health data that employees needed and exacerbating mental and physical health risks to employees and their families.

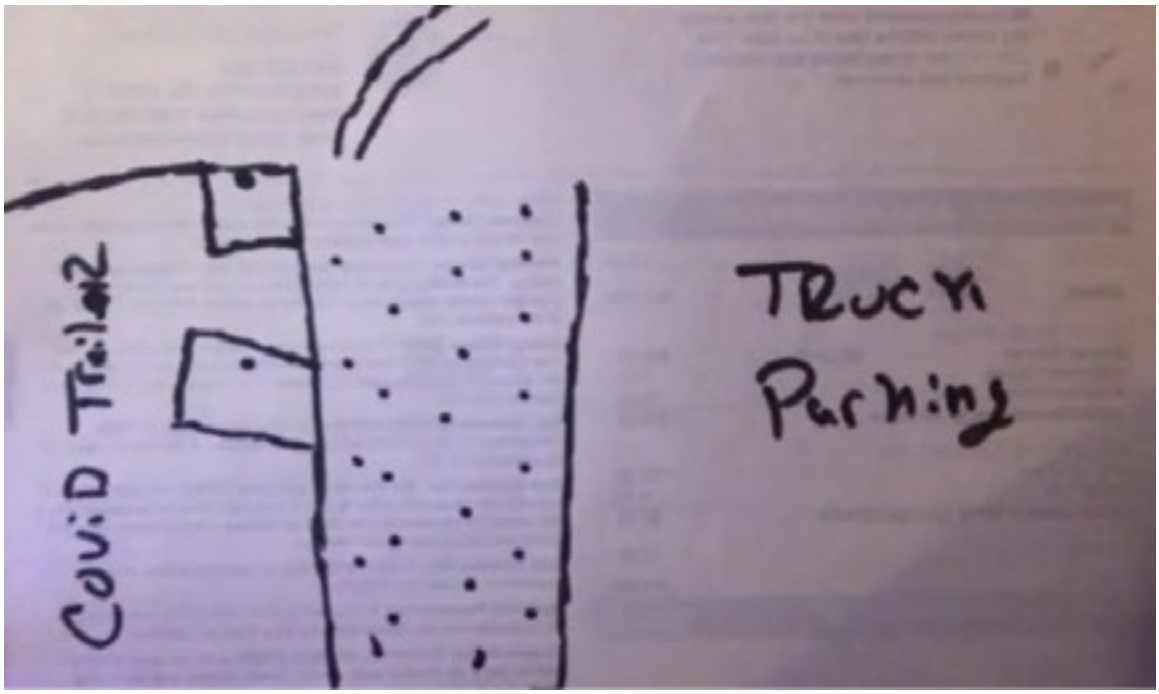
Guarding the Gates: Entrance Surveillance to Prevent the Spread of COVID-19 at Work

Entrance checkpoints produced long waits, uncompensated time, and unclear data.

The experience of coming into work changed drastically, altering how workers could access the workplace to start their shift. Temperature checkpoints were placed at the entrance, at times paired with screening questionnaires about symptoms. In some workplaces, especially in manufacturing, warehousing, and meatpacking located in large, suburban areas, a dedicated point—a tent structure or trailer—was placed outside. COVID-19 testing was present at this health checkpoint in some instances, while in others, a nurse, or other personnel, often a security guard, would conduct a temperature check and ask about potential COVID-19 symptoms.

While secured facilities like Amazon or large meatpacking plants already had a strong protocol for regulating and monitoring access,[21] at other companies the boundary between outside and inside the workplace was reinforced, with the entrance becoming a major site of health-related surveillance and data collection. In many cases, however, workers commented on the counterintuitive nature of some of these entrance protocols that caused long lines, crowding, or that required them to come into work early (often without additional pay) to make sure they would clock in on time.

Robert, a meatpacking worker in a very large plant in the Midwest, had to first check in at a specific COVID-19 trailer that was placed in the facility parking lot. Each worker had to go into the trailer, get their temperature checked, answer questions about potential symptoms, and then check into work. Robert reported that this added a lot of time to his workday and he had to show up to work earlier than usual to ensure that he'd be inside the facility to clock in on time.



In this map, Robert, a meatpacking worker in a large plant in the Midwest, shows the presence of a COVID-19 trailer (left) dedicated to triaging the entrance of workers. The dots represent workers attempting to socially distance while waiting for their turn to be checked and enter the facility.

Temperature scanners were a critical part of the surveillance of the health of workers when they entered the workplace during the pandemic. Temperature scanners include a range of devices from the simplest handheld forehead thermometer held by a nurse or security guard, as in Robert's workplace, to overhead infrared thermometers, and temperature scanners integrated into facial recognition technology that served simultaneously as a timecard, identity verification, and temperature scan. The temperature scanners were often paired with verbal, written, or online surveys at the point of entry. These surveys asked questions about the current state of the worker's health by asking about symptoms, exposure to others with symptoms, and COVID-19 test results. Surveys and temperature scans were widely deployed and present in the majority of the workplaces of participating workers.

These tools generated an enormous amount of data about the health of workers on a near-daily basis, but as will be outlined in more detail later in the report, much of this data proved ephemeral (not retained, or disposed of immediately after collection) or opaque, with its future uses by the employer unclear.

Workers witnessed lots of faulty data collection.

Temperature scans, as with most health-related technology, did not always work perfectly. Many workers lacked trust in the scanners and believed they were generally not accurate. Many described false positives, with workers flagged for high temperatures because of working or commuting in hot conditions. One food processing worker explained how it worked over the summer at her already oppressively hot workplace:

> If you weren't OK, if your temperature was high, they'd leave you out there another 10–15 minutes ... to try to take your temperature again to see if it was normal or not. Sometimes it did work. Sometimes it didn't because people were sent back home because it didn't work. Because it was in the heat… Then you would see people with ice cold bottles putting it on their heads, so [the temperature] wouldn't come out so high… They said, "Go over there to that tree, over there in the shade. Then, come back later."

Another worker questioned the overall accuracy of the technology, and what temperature scans meant for her risk of exposure in the workplace:

> I don't think they're accurate at all. And I don't think they're accurate because I personally know that my temperature is always running high. I'm always at a 99 or 100 … It always says that I'm perfectly fine, and I know this can't be working, because I know that from what I've heard, COVID doesn't require you to have a super high fever. It is at 99, 100, 101—that is the COVID detector. So, the fact that it's not catching me at 99 or 100 makes me nervous—is anybody actually being detected for not being healthy? … I can't say that I think I have COVID and stay off of work without getting in trouble, so I think that there are a lot of people who are coming in knowing that they're sick or knowing that they very well could be very sick because they can't afford not to come in.

"So, the fact that it's not catching me at 99 or 100 makes me nervous—is anybody actually being detected for not being healthy?"

It wasn't only doubts about technology working as intended, and the risks that it posed—in some cases, workers and managers simply stopped using temperature scanners and other untrustworthy health surveillance technology altogether. One warehouse worker described a "goofy-looking" camera and temperature sensor used at the entrance of their workplace, but he also notes that "most of the time I don't even think it was working. But no. Everybody gave up the heat camera, actually. Three weeks, a month, month and a half." Other research suggests that workers often have little direct recourse when workplace monitoring technologies are inaccurate.[22]

Entrance surveillance normalized the discussion of illness in the workplace.

Even when inaccurate (or inoperable), the presence of temperature scanners and entrance surveys did contribute to one of the positive aspects of COVID theater, increasing health and safety by normalizing asking for time off when ill, especially for workplaces without paid sick leave and cultures of working through illness. As Nia, a warehouse worker explains about her job at a smaller facility, "We do have one of the temperature scanner things… I'm not super confident those actually are functioning in a way that they're meant to, but … I do feel a lot more comfortable to say to my manager now like hey, I'm not feeling well."

These devices also help some workers feel better about their employer and safer at work, either because they believe that temperature scans will, at a minimum, prevent a portion of actively sick people from entering the workplace, or because it demonstrates care, even if somewhat ineffectively, and a desire to keep workers in the workplace safe(r) from infection. As with other COVID-19 health theater, these visible performances of care by employers for workers can help some workers feel safer and better about going to work during pandemic uncertainty—even as it frustrates and annoys other workers who chafe at what they see as an ineffective gesture.

Occasionally, workplaces had integrated cameras into one-stop-shop identity verification, timecard, and temperature check kiosks. A grocery store worker describes the device in his workplace:

> It looks like an ATM. … And then there's a little red dot [that] you get to your forehead because that's where the thermometer's taking your temperature. And then after about three seconds it takes your read. It says whatever your temperature is. And then, prints out a little sticker that you just keep with you, or you can put it on.

These kiosks took surveillance of workers one step further. In addition to collecting productivity (timecard) and health (temperature and symptom) data, these kiosks also help to make visual surveillance of workers' health status visible in the workplace. These kiosks print stickers that note that the wearer (with a photo of the person on the badge) is fever free and has "passed" the entrance health survey were also administered by the kiosk. Though some workers put the stickers in their pockets to show supervisors if required, when worn on the body, the sticker makes an individual's health status immediately visible to managers, other coworkers, and customers in the workplace. "I'm vaccinated" stickers, T-shirts, or masks in "mask or vax" workplaces do similar work of making otherwise invisible vaccination status visible to others.

Stopping the Spread: Employers Use Digital and Analog Surveillance Tools and Practices to Monitor Workers' Health Behaviors to Limit Viral Transmission

Employers changed both physical layouts, roles, and schedules to impose social distancing and better enforce health behaviors.

Once inside the workplace, workers found a number of interventions—both changes to workspace and the addition of new roles and devices for surveillance of workers. Employers changed the workplaces by reassigning existing spaces, closing off other areas to limit crowding, and mandating new movement patterns to facilitate social distancing. Shifts or start times were staggered, or shifts were added to have fewer or better separated workers on the floor. Signs and arrows on the floor reminded workers of the new spatial rules. For example, in warehouses and food processing plants, floor markings were placed around the facilities to remind workers to keep a safe distance. In bathrooms, every other bathroom stall was blocked off. In grocery stores, markings and arrows were placed to direct the flow of customers as a reminder to socially distance. Areas that used to offer social gathering spots for workers like break rooms, changing rooms, and cafeterias often became moments of isolation, containment, or control. In lunchrooms and break rooms, many workplaces removed tables to avoid crowding.

Areas that used to offer social gathering spots for workers like break rooms, changing rooms, and cafeterias often became moments of isolation, containment, or control.

Changes to space and time were visible reminders to workers of changes under COVID-19.

Throughout the workplaces in all sectors, visible signage and messaging appeared to encourage employees to modify their behavior. However, this signage also seemed to replace other measures, placing responsibility on employees to enact COVID-19 safety—a sort of self-surveillance. For example, Nick, a manufacturing worker, noted how signs like "do not enter if you have a fever" were present at a worksite without temperature monitoring to check for an actual fever.

The expectations for new behaviors for employees in space also did not align with the implementation of contact tracing to protect the health and safety of employees. One meatpacking worker said that a sign would be posted by the entrance of the plant with the message that there had been a positive COVID-19 case. However, it would have been too late to not show up for work, and the expectation was that workers would just live with the knowledge of a potential outbreak while performing their job. In addition, many meatpacking workers commuted to and from work in shared vans, further putting workers at risk.

New COVID-19 monitors surveilled their coworkers' social distancing and masking behavior.

Across sectors, even significant changes to workplace layouts, schedules, and rules were unable to produce consistent social distancing and health behavior change. In response, numerous workplaces created new roles for workers, who became "social distance monitors," and reminded employees to keep their distance, or in some cases enforce other health and safety rules, like mask-wearing.

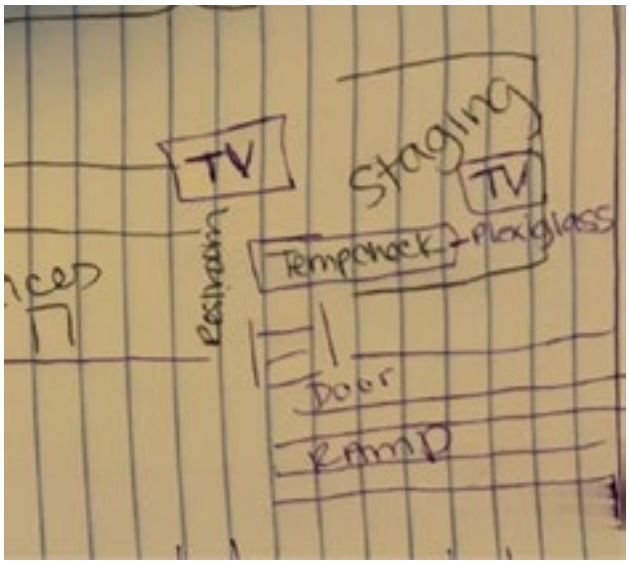
Heidi, who works in a large food processing plant on the West Coast, described the job of a COVID monitor as "mak[ing] sure that people keep their distance, that they wear their masks, that they don't gather in the dining room, that they're not in crowds in the lines, that there's sanitizer, that everyone is washing their hands."

In grocery stores, the vagaries of customer behavior added another layer of uncertainty, and another group of people to monitor in the workspace. In grocery stores with mask mandates (whether state-mandated or corporate policy), workers were stationed at the entrance to make sure that customers would comply, in addition to asking customers to abide by social distancing requirements. This created significant tensions for employees, who could not control the behavior of customers. One grocery store employee recalled feeling antagonized by customers who increased the risk for workers in these public-facing retail workplaces.

> You got a lot of customers … Some of them do stuff, just seem like they just want to be nasty. We've seen people come in, pull their mask down and just cough all over the produce… We have seen it many times.
>
> A lot of customers weren't paying attention to [distance]. That's where a lot of fights was coming out with the customers. Because somebody was too close, but yeah … [there were] markers six feet apart all the way down the aisles and around the front and all throughout the store.

In warehousing, especially at Amazon, staff were also put in charge of monitoring social distancing. An Amazon manager on the West Coast recalled how committed she was to ensuring that people were at a safe distance. While this was stressful, she tried to infuse some enthusiasm among staff:

> I was really happy and trying to continuously improve high-traffic areas and getting people on board to remember "hey we got to socially distance." One fun thing that I had done with my shift leaders when it first started, because other sites would have people—they were called "Social Distancing Monitor." They would have them dress up. I remember one site showed pictures of somebody dressing up as a flamingo, "This is six feet." One thing that I did was I got broomsticks that were six feet long and had all the managers decorate them so they could have them with them and be, "This is six feet." I didn't want to stress anyone out more than we were already stressed with increasing volumes, [and] not enough people.



In this map, Amazon manager Mary draws the temperature check station, the plexiglass barriers, and the TV monitors that show workers if they are appropriately social distancing via the Distance Assistant.

Before the pandemic, break rooms were important spaces for socialization and rest. With the risk of COVID-19, break rooms were not only where employees unmasked to eat and drink, but also became sites of surveillance by management through greater control over workers' time. In addition to the spatial modifications like furniture removal, crowding in break spaces was also managed through enforcement and control of worker breaks. As Maya, a young woman working at a large retail and food store reported, the problem of crowded break rooms was solved by controlling who took breaks and when. The management of space and social distancing overlapped with the control and monitoring of employee behavior:

> They started monitoring when we were clocking out [to take our breaks] and ... providing a list of when we should be taking our breaks. … They started making a list of when we should be taking our breaks so that no one is doing it at the same time.

Cameras were selectively used for retroactive and punitive surveillance.

Cameras, and to a lesser degree scanners and badges, were quickly integrated into the health surveillance regimes in essential workplaces. Cameras were already heavily present in these essential workplaces, but surveillance tools also include handheld scanners and badges that allow for tracking worker movements within a worksite through product scans or door entries. In many cases, the technologies and tools were already in the workplace deployed for various purposes and were repurposed to monitor worker health and health practices. Cameras provide the best example of repurposing—most workplaces had cameras that had been used for many years to watch workers for the purposes of reducing theft, managing conflict, problem solving broken processes, and documenting injury or accident. Surveillance of compliance with health practices (masking and distancing) was added to the list of things managers reviewing footage could or should look for, though in practice in most workplaces we encountered in this study, footage was only reviewed retroactively after a problem arose, or punitively, when a manager was looking for a

reason to discipline or fire a particular worker. As one worker observed, "I think that when you put in a camera, it's just to record anything that's going on in your company. … When they install cameras, you can put it to different uses."

One warehouse worker, Kevin, described ruefully how he and his colleagues learned that the cameras in the building were indeed remotely monitored at the organization's central office:

> I don't think people really thought that anyone was watching the cameras until someone was like, "We saw that at two o'clock, you guys were all standing in a circle over there. And no one had a mask on." And then they're like, oh wow, they're actually watching the cameras to see that we have the masks on, so we better be right in front of the cameras.

Not all workers were aware of or focused on the cameras in their workspaces or were uncertain about the degree of monitoring occurring via the devices. Other workers had a sense of being monitored but didn't know where the cameras were in their workspace. When asked if there were any cameras inside his warehouse, Frank said, "Not that I know about, I imagine there is, I probably just don't know about." And Hannah, another warehouse worker notes that they "can see everything" and she assumes "they're like really high up on the ceiling. But I've never like put my eye on one. I know they're there."

"Of course, they're watching you. Of course, they're watching you. Of course, they're watching. They pulled it up on camera showing that they were watching me."

With a few exceptions like Kevin, the unmasked warehouse worker, camera footage was selectively monitored by supervisors. Most of the time, camera footage was used for contact tracing or punitively, when a supervisor was looking for a reason to discipline or dismiss a particular employee. One Amazon worker when asked if he thought management was watching him on the cameras in the facility said, "Of course, they're watching you. Of course, they're watching you. Of course, they're watching. They pulled it up on camera showing that they were watching me."

Unions inserted themselves into this dynamic, negotiating when and how footage could be accessed and used by managers in unionized workplaces. In certain workplaces, unions did not want violations of health protocols caught on camera to be used to discipline workers and fought the companies to prevent this surveillance. A manufacturing worker who works in multiple plants, some of which are unionized and some of which or not, reflected on enforcement of camera-caught infractions in one of the unionized plants:

> The security cameras … are everywhere. We're only allowed to use them to diagnose problems. … If I'm looking at the security camera to figure out what happened in a problem, and I see a guy on the security camera sleeping, I'm not allowed to use that to write him up.

> …the technologies and tools were already in the workplace deployed for various purposes and were repurposed to monitor worker health and health practices.

Wearable contact tracers, when deployed transparently and with limits, can mitigate worker fears about workplace infection.

Another key piece of the health surveillance architecture during the pandemic was contact tracing—figuring out who in the workplace had been exposed to an infected worker in the hopes of slowing or stopping an outbreak. In most of the workplaces covered in this study, contact tracing was an analog affair, if it happened at all, with managers and coworkers looking at schedules, and physical proximity and calling or talking directly to potentially affected employees. But in a handful of workplaces—mostly high-complexity manufacturing and high-tech warehousing, in large facilities owned by well-capitalized companies—employers used cameras, sensors, and wearable technologies to track worker proximity to enforce social distancing and enable contact tracing when needed.

A handful of workers in our study were issued wearable devices specifically for the purpose of contact tracing. With brand names like Triax and Track 'n' Trace, these small rechargeable devices are worn clipped onto clothes on the front of the worker's body or on a lanyard, wristband, or belt. One manufacturing worker described how his large, multisite workplace deployed wearable contact tracing badges:

> And some plants were able to get a hold of track and trace badges quicker than others. So you had to wear a track and trace badge. And then it would record who you were in close proximity to. So that way, if you did test positive for COVID, your exposure data could say who needs to go get tested, or quarantine, or whatever.

The few workers in the study who used the badges generally had positive experiences with them, reporting that it took away some of the worry about exposure in the workplace as they knew the badges would help the organization alert them about their risk while also protecting the privacy of the people who tested positive for COVID-19. However, these folks mostly had generally positive experiences in their workplaces and a trusting relationship with management. In at least one case, management had been clear about the limitations on the data collected by the tracker—only recording proximity and duration, not location—which made the workers feel more comfortable with the data that was being collected. In other workplaces, with less amiable relations between workers and management, proximity data can still be used against workers, especially around worker and union organizing. These tools are used most positively from a worker's perspective when they reduce the information asymmetries between management and worker, through practices of data minimization (collecting only the data you need and nothing more) and transparency

about what is collected and how it is used. By targeting the data collection to the specific health-related need, these devices—in spaces of trust and relatively more worker power—could reduce fear and worry among workers and limit outbreaks, and limit potential loss of revenue for the business.

Some trackers also served as social distancing tools, warning users when they got too close to other trackers. One manufacturing worker, Bill, did report that the tracker his organization used also chirped to indicate too-close proximity to other workers. The tracker alerted constantly, creating an annoying incessant chirping in the workplace: "You feel like you're in an aviary."

…[Amazon's] Distance Assistant both makes visible the workers behavior and serves as a constant reminder of the surveillance regime inside the workspace.

Other devices in the workplace that denote location can also serve as ad hoc contact tracers, including scanning logs from handheld scanners used to manage materials on a worksite or camera footage. One worker, Bryan, an overnight shift lead in a convenience store, described how his manager had to go back through the footage of the whole night shift after one worker tested positive for COVID-19, recording how long different team members spent in proximity to the infected worker:

> If somebody went out with COVID or something, they would have to check the cameras to make sure that the people who were in contact with that person, who went out to get tested, or went out and tested positive, that they would have to go and get a test as well. Everybody who was—I think it was with them for maybe half an hour or 15 minutes. If they were closer than six feet for that amount of time, then they would have to also go and be out of work as well.

As previously mentioned, in most workplaces distance regulation and monitoring is done through stickers, posters, verbal warnings from human monitors, and spatial changes. However, Amazon's Distance Assistant ups the surveillance ante. The Distance Assistant takes cameras and adds in a monitor and a computer with software that creates a visual and auditory real-time display and data capture of how close workers are to each other in a particular space. As a part of a broader intensive and gamified surveillance regime in Amazon facilities, the Distance Assistant both makes visible the workers behavior and serves as a constant reminder of the surveillance regime inside the workspace. Further, the data generated by the Distance Assistant was used until mid-2021 to produce scores that were used to manage workers and first-line managers, who would receive incessant notifications for violations of proximity rules and low facility-wide scores.

All of these surveillance tools taken together gather a large amount of data about workers. These data collections make it difficult for workers to know what data is collected about them and how it might be used within the organization for decisions around staffing, hiring, promotion and layoffs, and how critical information about workers' health and the presence of the virus in the workplace is not equitably shared between management and workers. By creating information asymmetries within the workplace, they exacerbate existing power inequities between workers, managers and employers, a set of tensions we explore more fully in the next section.

Acting on Health Data: Collection, Analysis, and Withholding

The introduction of new tools and technologies into essential workplaces during the pandemic generated a wealth of workers' health data. While the handling of health data by employers has been a long-standing (and regulated) practice, the challenges of a new, airborne, highly contagious, and possibly lethal disease threw many standard practices of data collection into question. Adding public health surveillance into the preexisting productivity surveillance of workers at work taxed workplaces practices and procedures systems that in many cases were already under strain.

The specific risks of COVID-19 also challenged what is, and is not, considered health information. The term health data encompasses the various forms of information collected about workers and their bodies. However, data relevant to health and COVID-19 infection—like team members' movements in the workplace or CO_2 monitoring to assess ventilation and air quality—was also present in the information exchanged between workers and employers. Conversations between employees, with managers, and with employers about COVID-19 tests, cases, and symptoms created "information flows" where health information was communicated person-to-person. This guesswork, rumors, and word-of-mouth exchanges about individual workers' health constitute a more expansive form of health data that includes not only verifiable or quantifiable information about workers and their bodies but also observed, inferred, and assumed information gathered through interpersonal networks of communication.

Across industries, essential workers often had no idea where their health data went after it was collected. While some workplaces asked managers to retain health information (whether on paper or digitally) to reference later, others simply captured one-time metrics that were discarded or did not record observed data at all. This opacity of health data collection in many essential workplaces frustrated some employees. While many workers didn't care where their data went, others expressed frustration that information about active COVID-19 infections in their workplace wasn't shared with employees. Given the highly contagious nature of COVID-19, many workers felt that they could not protect themselves from infection without specific, de-anonymized information about cases.

Across industries, essential workers often had no idea where their health data went after it was collected.

In addition to data collected by *employers* in the workplace (information like temperature, proximity, or symptoms), employers also had to make decisions about how to handle COVID-19 test results reported by *employees.* US law puts employers in a position of relative privilege, allowing them to require the reporting of test results from employees, but not mandating the reporting of these results to other employees. So, employees would know that the virus was affirmatively present in their workplace, but without enough specificity that might help them determine their own risk. The result was that, in many workplaces, COVID-19 infection, and later, vaccination status percolated as a kind of constant rumor. Employees often attempted to deduce their risk of infection from other employees' absences or behaviors, an atmosphere at times intensified by different pro- and anti-vaccination attitudes in workplaces, potentially with the effect of dividing workers. This was part of a larger practice

we heard described again and again: the collection and circulation of ad hoc information by employees, outside of official channels—a form of informal data collection that many workers relied on to keep them, or their loved ones safe.

> …in many workplaces, COVID-19 infection, and later, vaccination status percolated as a kind of constant rumor.

Most workers didn't know what happened with the data collected from them.

While health data was sometimes captured using technology, information was more often collected using analog methods like writing notes on paper or verbal communication. Most workers did not know what happened to the data about their health after it was collected. At the managerial level, employees had some knowledge about where workers' health data traveled but less insight into how it was being used. Regardless, despite the influx of health information flowing through essential workplaces, workers reported that this data was often not documented, retained, or communicated back to them.

In workplaces where workers' health data was collected using low-tech methods, some workers didn't know where the information collected about them went, while others didn't care. Several workers assumed or discovered that their health data was either discarded or sent to Human Resources or other higher-up departments and filed away in order to meet regulatory requirements. However, even in workplaces that ostensibly retain health data to track their compliance with pandemic protocols, these protocols are still being ignored:

> They keep track, there's a paper, they write down your name, they write down your employee number, if you're with an agency or the company, they write down if you feel sick, they ask you questions, like, do you feel sick, do you have a headache, have you gotten tested for the COVID and if so, is it negative, how long ago? And then they take your temperature and write it down [on paper]. … And to be honest it's not done properly, because I've seen it, they'll just scan you and say, "Thank you, have a good day." They don't even read the number. They probably turn them into HR. … I think they just keep it as a record in case OSHA comes back, they have proof that they're following protocols, which like I said, they're not really.

The tools used to monitor and collect workers' health data in essential workplaces—scanners, cameras, wearables—created digital records of health information for employers to use. The most high-tech workplaces, like Amazon, generated a firehose of workers' health data and had the preexisting data systems to collect, retain, and leverage this data. Risk-related health information was sometimes communicated back to workers directly via different methods. Apps, text messages, and phone calls from employers notified employees about test results and contact tracing:

> Once somebody tested positive, either through on-site testing or their own testing, they would call in to our employee assistance and our resources. That would get recorded. They'd get recorded, they would do what was needed on their end, and then a text message would be sent out to the entire warehouse stating, "An associate tested positive. Their last day on site was this." Other teams working in on it would be loss prevention. They would check the cameras to see if that person was in close contact with any other associates. That was handled through loss prevention, HR, if somebody had close contact and should be notified.

However, most workers didn't know where their data went after it was collected. Workers rarely experienced negative repercussions resulting from their health data alone. While tools like cameras and distance monitors were sometimes repurposed as surveillance tools to punish workers, most health data collection during the pandemic carried few tangible consequences. Having become accustomed to the new measures introduced during the pandemic, some workers expressed indifference about how their data was used:

> *Interviewer:* Do you know where all that information goes, like who keeps it?
>
> *Worker:* I have no idea. The third-party company, maybe corporate? It's like VeriCheck, I don't know if that's even the company. I have no idea. They just said that's the temperature check so that's what you got to do.

In contrast to this disinterest in their own health data, when asked about their coworkers' health data, especially positive COVID-19 cases, workers expressed interest in more transparency from their employers. Given the highly infectious nature of COVID-19, workers sought specific information about who tested positive for the virus in their workplace to determine their own risk of illness. However, because of health privacy policies mandated by the ADA, workers were almost never told who in the workplace had COVID-19, making it hard for workers to evaluate risk.

Another sensitive piece of health data was workers' vaccination status. Vaccines were highly polarizing and caused conflict between workers, and between workers and employers. Workers' attitudes toward vaccination ranged from people angered by the anti-vaccination sentiments of their colleagues to workers who were frustrated by vaccination pressures and mandates, and adamant in their refusal of the vaccine. Many workplaces did create vaccine mandates. These different mandates ran the gamut, where going without a vaccine meant anything from mandatory mask-wearing, weekly testing, or termination. Workplaces with these requirements often had intensive surveillance of workers around this status and these obligations. As one manufacturing worker explained:

> If you are not vaccinated [you wear] the mask of course, but you have to get tested weekly by our nurse. That's not negotiable. … Now that is tracked. The nurse will log it in. If you do miss it, it's probably not the end of the world, but your boss will get an automated [message that says] "The time clock shows so and so was here this week. He or she did not come in for a test." Our boss will let them know, "Got to get in there."

Workplaces also took steps to create visibility for managers and other workers about an individual's vaccination status. Sometimes this was through stickers on body-worn employee ID cards, other times it was simply the fact that the worker was wearing a mask at all:

> We have stickers for people that are vaccinated. And we keep it on our ID and we have to keep our ID on our lanyard or our vests, so it is visible. And we have a manager that is really intense about it. She'll be like, "Do you have a sticker?" … OK I can visually see that you're vaccinated, instead of asking every single person.

Some workplaces take the opposite approach—viewing vaccination status as sensitive information and restricting managers from asking. As one worker described her manager as saying: "Technically, we are not allowed to ask if you are vaccinated. … I can get in trouble for asking anybody that." Another worker described vaccination status as "a minefield" to be navigated carefully.

Workers collaborated to circulate their own health information.

The risk of COVID-19 infection at work is not just individual. We heard from workers who feared they might get infected at work and pass it onto people they live with—high-risk kids, parents with cancer, spouses with compromised immune systems—all were front of mind for essential workers who had no choice but to go to work. Reflecting on their coworkers' fears of spreading the virus to loved ones, one worker said, "I think a lot of them were really worried. Another coworker has elderly parents and one just recently had surgery." Workers' fear of infection was not just perceived. Several interviewees reported confirmed or assumed close contacts at work and positive cases of COVID-19.

Difficulty evaluating risk led workers to engage in informal contact tracing. By observing which coworkers were absent from the workplace, talking with coworkers who were present, and making inferences based on limited information from employers, workers do "their own research":

> Nine times out of 10 everybody be doing their own research. You would narrow it down like who it is. You know what I'm saying. Narrow it down. You used to seeing a person and you don't see him.

In one instance, a worker found out that a coworker had COVID-19 by seeing them experience symptoms: "In my case, I saw a woman faint. When they called the doctors, it turned out that she had COVID."

"Nine times out of 10 everybody be doing their own research. You would narrow it down like who it is. You know what I'm saying. Narrow it down. You used to seeing a person and you don't see him."

ADA regulations allowed employers to silo information.

Some workers understood that specificity about cases was "not good business," and that revealing confidential health information about individual employees is a violation of workplace protection laws. But the pandemic has complicated an already complex legal framework around the sharing of health information, especially when it comes to employee testing, tracing, and disclosure.[23] The ADA is the law that regulates health data in the workplace. The act's privacy provisions hinge upon the ambiguous parameters of "medical information." However, this provision does not require employers to report test results to employees, and an expansive definition of medical information supports employers' rights to withhold identifiable information about positive COVID-19 test results. In other words, while workers' desires to receive specific information about positive cases in their workplace are understandable as they help workers assess their own risk of contracting and spreading a deadly virus, employers are well within their rights to refuse to disclose identifiable medical information, including COVID-19 test results. At the same time, employers are legally permitted to share some information about health and have a responsibility to provide a safe work environment, so workers' demands for anonymous reporting of COVID-19 cases could be met by employers who engage in diligent contact tracing and notification.

> "No contact tracing, none. … I was livid. I couldn't believe that out of every little thing they wouldn't give me the kindest thing of just [saying] "Go get tested." Not even saying who got it, just saying go get tested it's for your health. Nothing. Just wear your mask—which nobody did—and that was that."

Despite the fact that employers are not required to disclose test results nor permitted to disclose individual health information, many workers were frustrated by what they perceived as their employers' unwillingness (as opposed to inability) to provide specific information about cases in the workplace. Peter, a warehouse worker living with an at-risk roommate, recalled two outbreaks in his workplace during the pandemic, both of which infected entire departments including his own. At first, he noticed that his manager didn't show up to work and texted her on his personal cell phone to check in. She confirmed Peter's fear: not only did she have COVID-19, so did another employee he worked with. When Peter got into work, he confronted another manager and expressed his anger that he was not notified that he had close contacts while on the job. In response, his manager denied that the two employees had COVID-19:

> No contact tracing, none. … I was livid. I couldn't believe that out of every little thing they wouldn't give me the kindest thing of just [saying] "Go get tested." Not even saying who got it, just saying go get tested it's for your health. Nothing. Just wear your mask—which nobody did—and that was that.

Peter reasoned that his manager lied because of HIPAA laws* but argued that he was still owed some transparency because COVID-19 presented "special circumstances where people might actually die." Here, the tension between the legality of sharing medical information and the unique threat posed by COVID-19 is clear. While Peter understands that health information is private, he still desires that information because without it he feels helpless to protect his own and his roommate's health. Furthermore, Peter was able to act on this desire by utilizing his interpersonal networks of communication, conducting informal contact tracing that produced actionable health information in place of his employer's denial.

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* Many workers believe that HIPAA protects their health privacy at work, though in practice, it is the ADA that controls the privacy of that data.

The Amazon Exception

While in most of the essential workplaces, data collection about worker health was relatively haphazard, Amazon proved to be a stark exception. Amazon is different from other employers in the intensity and expansiveness of their data capture about myriad aspects of their workforce and worksites. Amazon develops and deploys proprietary surveillance technology designed to extract the maximum amount of data about workers to enable the company to extract the maximum amount of work or "productivity" from each worker.[24] During the pandemic, Amazon integrated the capture of employees' health data by repurposing, reintroducing, and adding onto its preexisting work surveillance infrastructure. This maximalist surveillance regime created a workplace culture defined by feelings of anger and dissatisfaction at the opaque algorithmic monitoring of frontline employees and first-line managers.

Some of Amazon's health surveillance techniques are common practice at other companies and in other industries, but it is the intensity, comprehensiveness, and drive toward innovation of Amazon's surveillance that stands apart. Before the pandemic began, Amazon constantly monitored workers' every move within the warehouse using two proprietary tools: the AtoZ app and handheld scanners.* All Amazon employees are required to use the AtoZ app to log their hours. While we heard from non-Amazon workers about scheduling apps, AtoZ is uniquely equipped with location monitoring: when workers clock in, the app checks their location to verify that they are on site.

Inside the warehouse, many workers use handheld scanners to scan and sort items. Along with scanning items, these devices allowed managers to locate individual workers in the warehouse through a system called Find People. As one manager explains, "[Find People] would tell me where that person was, when their last scan was, if they were on break, or if they had logged out of the system completely." The AtoZ app and handheld scanners, along with camera footage, allow Amazon managers to constantly monitor its warehouse workers.

Adding to its extensive surveillance infrastructure, Amazon introduced a tool called Distant Assistant to monitor and manage social distancing in its warehouses. The tool overlays live video footage with color-coded graphics that indicate the distance between workers and sets off auditory alerts if the six-foot distance is breached.

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* Note that in some Amazon facilities, these scanners are a part of a fixed array of cameras and sensors at a worker's station that document their actions and the locations of products.

Managers are able to skirt minimal privacy measures easily (like blurred faces) built into these surveillance tools and thus are privy to every movement of a worker's body within the warehouse. The result is the blurring of boundaries between health data and productivity data. Metrics, images, videos, and logs collected from temperature scans, ID badges, cameras, the AtoZ app, handheld scanners, and the Distance Assistant, create a massive trove of information about workers for managers to use. And unlike at most other workplaces in our study, Amazon has preexisting teams and systems to capture, store, and analyze this data.

Along with implementing the surveillance of workers, lower-level Amazon managers are surveilled by higher-ups. Managers are incentivized to enforce social distancing through "scores" that the Distance Assistant produces, calculating how well people are social distancing based on the camera's monitors. These metrics cause managers stress. If managers fail to maintain a certain score, they are susceptible to reprimand from their higher-ups:

> We'd get a score every day, it was called our camera imagery score, based on the social distancing. The goal was to be above 90%. And I think the lowest in the two years was maybe a 70%. But eventually, they got rid of the imagery score in July, as things changed. It was July of this year, 2021.

Despite the intensification of the surveillance regime through new health monitoring technologies during the pandemic, Amazon workers reported that the bottom-line remained untouched: productivity at the cost of workers' health. Amazon's hyper-surveillance of worker activity, including intense scrutiny of the amount of time each worker is not being productive, disincentivizes workers from connecting with one another. In efforts to limit and prevent unionization, Amazon monitors internal and external activities. In addition to using cameras to identify and discipline workers for a failure to social distance, management will refer to cameras to identify groups of people suspected of organizing.[25]

In this high-tech environment, workers feel pressured to come into work while sick or injured for fear of losing their job, which affects their families and the communities they live in. Despite the Distance Assistant, Amazon workers face difficulties adhering to social distancing while also trying to meet productivity and movement demands. Under constant watch by networked surveillance technology, workers do not feel safe. As one worker recounts: "Everybody that I know that left Amazon it was like, 'They tried to kill me. They put my health at risk. They're putting my safety at risk. They just don't care.'"

As Amazon continues to develop in-house surveillance technologies and drive innovation in the warehouse industry, workers suffer from the pressures that the technology places on their labor. While Amazon managers must monitor various surveillance technologies and workers, they are also managed through chatbots and digital notifications by higher-ups. Unlike the other sectors in this study, Amazon has an intense and pervasive surveillance regime that existed before the pandemic and has since intensified. Blending the collection of health data and productivity data, Amazon is developing and deploying surveillance technologies that dominate warehouses, restructure work culture, and cause employees—both managers and workers—extreme stress.

Part 3: Navigating the Pandemic Workplace

The pandemic workplace was fraught with changes and inconsistencies around public health knowledge and recommendations, physical space, and labor and productivity demands. Managing a worksite through this unprecedented time required agility and flexibility from workers and their managers. As we have described, workers had strong reactions to these new reconfigurations, measures, and technologies and their implementation; some interventions were welcomed, others greeted with skepticism. However, in all situations, workers described the importance of *relationships* in making interventions manageable. In this section, we examine how workers exerted their agency, leveraging relationships to navigate surveillance and gather their own information.

Relationships are always a crucial aspect of the workplace, not only establishing shared norms of trust and safety, but also contributing to mental health and well-being.[26] And even without pandemic conditions, many employers obstructed worker relationships, from scheduling that rotates work forces to outright suppression of unionization or other forms of organization. Many pandemic health interventions made these conditions even worse, as social spaces were cordoned off, shifts were re-ordered, or temporary workers were brought in. The result was an atmosphere of increased isolation on top of the constant risk of infection. And it wasn't only feelings of camaraderie that workers struggled with. In places where employers withheld information about infection and exposure, relationships between workers were one of the main ways those workers could stay safe.

Indispensable but Overworked: Severe Pandemic Stress and Overwork Had Debilitating Physical and Mental Effects on Workers

During the pandemic, workers increasingly felt how indispensable their labor was, especially as production demands increased with fewer staff. Given the heightened demand and decrease in laborers, many workers were aware that they would be difficult, if not impossible, to replace:

> [The pandemic] made us a lot busier. They say they were never going to get rid of you because I would say we even got busier as it was.
>
> [I'd] be there just about on time, maybe five minutes late. They don't really give a shit. I'm not going to get fired. I'm literally too fucking important for them to put me anywhere else.

Still, this increasing indispensability also led to serious overwork. Peter reflected on his pandemic employment as draining his will to live. Despite his salary not matching the increase in responsibility, he was tasked with managerial labor, including supervising a dozen people after his own manager left due to stress and overwork. For the first few months of the pandemic, Peter recalled light work due to supply chain issues. However, when production ramped back up, it surpassed normal production levels by over 300% and he worked 13–15-hour workdays. It was physically taxing on his body, he started to experience migraines, physical aches and pains, and problems with his vision. Peter stated:

> There was some days I was like, "I can't fucking do this. I really can't go in there." My legs are killing me. My pushing arm is just so fricking tired because it's just being pushed to move stuff out of the way. And my eyes were killing me. At least once a week, I wake up bloodshot and just go, eye drop, eye drop, eye drop, eye drop. Trying to get it worked out as best as I can.

Another worker likened working in Amazon fulfillment warehouses to being an animal in line for slaughter: "Whoever orders a product in Amazon, when they receive their mail, another product in the mail, they need to think about it. There's someone donating, giving their blood. … Amazon fulfillment is the place you can slaughter humans."

"I just think that the company could do better if they wanted to, [rather] than just looking at us as just numbers, and try and see us as human beings…"

Grocery store workers experienced another layer of risk—the risk of infection not just from coworkers but from exposure to customers as well—enhanced by customers in certain stores and regions ignoring distancing markers, evading plexiglass barriers, and refusing to wear masks, even as workers were required to wear them. While many customers respected the guidelines, especially early in the pandemic, workers in conservative or politically mixed states and counties recounted customers who refused to comply. "They felt like it wasn't real," said a grocery worker in Virginia, "they felt like this was a make-believe thing; they didn't respect my boundaries, I guess you would say."

As workers felt the pressures of being essential to their workplace, many workers felt that they were not met with compassion, respect, or even acknowledgment for their sacrifices. As food-worker Laura relates, "I just think that the company could do better if they wanted to, [rather] than just looking at us as just numbers, and try and see us as human beings, as people that have been risking their lives every single day for them and that we need to feel appreciated at least."

Relationships to Other Workers: Connection with Colleagues and Others in the Workplace Improved Health and Safety Practices

As workers were caught between being both essential and interchangeable, employees valued consistency among their teams or close coworkers. When employees felt they knew those working with and near them, they were better able to understand the health practices of their colleagues, adjust their own practices, and even introduce protective measures that employers did not require. We spoke with Nolan, a warehouse worker who attributed his mental well-being during the COVID-19 pandemic to his connection with his colleagues, whom he called "brothers." Nolan shared:

> Having these people around and everybody trying to work was hard because it was a scary moment and everybody's trying to keep safe. ... So, we would share information, we would do research and we would try to find credible information from credible sources and that's helped us actually. Having them around, having the team around, having my brothers around, they made me stronger, they [helped me] feel better during the COVID-19 period.

Feelings of worker solidarity at times led workers to act collectively and implement protective policies like masking, even when it was not required by their employer. While his supervisors refused to take the pandemic seriously, Nolan also told us that the members of his team established a masking policy in their division that spread throughout the worksite:

> It was not an [official] policy because some of the people in leadership did not believe it was necessary to put on mask. We actually came up with something of a policy of our own that you shouldn't come in our warehouse if you don't have a mask on. And we ensured that it went through to the top. So many people started seeing the sense of it and started coming to work with masks. But actually, it was not a policy because [it was] our own initiative and we are glad that it worked.

When the conditions of work became too intense for workers, colleagues were key in understanding what resources existed. Harry, a unionized grocery store worker on the West Coast, suffered a panic attack while on the job, likely triggered by stress and exacerbated by a suffocating mask. By talking to a former coworker, he learned how to get medical help and navigate bureaucratic obstacles to access paid time off. The physician his colleague recommended helped him apply for a leave of absence and facilitated his access to employer-provided therapy.

> The doctor that [my colleague] found takes our insurance. ... He was like, "You can't say like it's the mask or anything about COVID…" He just signed the leave of absence. He was like, "Here's the paper. Give this to your manager, say you're on leave of absence, and go home."

Building on a history of mutual aid, some workers felt as though their care for each other and preexisting relationships were justification for taking particular caution inside and outside the worksite and reinforced their obligation to come into work. Betty, a grocery worker, said that this caution

was also important to protect the community, especially the older customers who had frequented the store for years. Betty had worked at this location for many years and referred to her workplace as a family. She shared:

> I call my store my family, because everybody has been in there for 20, 30, 10, 50 [years], we have vets in there, so they're my family, even the store manager, they're family. So everybody did everything to protect, and we knew the risk was catching COVID, maybe some of us died, maybe someone's getting really sick. We knew we had an obligation to be in there and do what we can do so they can have essential things that they needed, plus not too many people were working, so we had the opportunity to be able to work and make money and [do] what we needed to do by paying bills and putting food on the table.

Especially during COVID-19, coworker relationships were harder to maintain.

These acts of self-protection and mutual aid, however, were less feasible in places with high turnover. While in some sectors, high turnover predated the pandemic, in others, employers began to rely more on temporary workers, changing scheduling, and moving people around to different parts of the facility. For full-time employees who experienced this inconsistency, the inability to form relationships with their coworkers, and lack of knowledge about their coworkers' beliefs and habits were additional stressors.

"We'd see each other before work, after work and talk about the stuff that was going on. A lot of times that's how we would find out if there had been a COVID outbreak was that somebody else would tell us from another department. They wouldn't notify the whole plant,..."

Kendra, a meatpacking worker, described the dramatic shift in distribution of temporary workers and full-time workers. By January 2021, her plant floor was roughly half temporary workers, and she was frequently moved to different parts of the facility, which made it difficult for her as an immunocompromised parent to feel safe while at work: "if I was working with the same people every day, I'd feel more comfortable with it. But if I'm working here one day and here the next, I don't know what these other people got when they're putting me in there." Because she did not have a relationship with her temp worker colleagues, Kendra had to be exceptionally vigilant about her own COVID-19 mitigation practices for herself and family. Nonetheless, Kendra still found that sharing information with other workers before and after shifts was a crucial part of understanding the state of the workplace and risk of infection:

> They started shifting us all around, so then we were all over the plant. We'd see each other before work, after work and talk about the stuff that was going on. A lot of times that's how we would find out if there had been a COVID outbreak was that somebody else would tell us from another department. They wouldn't notify the whole plant, they would just notify that person, then they would go their way. But if you knew somebody else that was in that part and they'd say hey, they've got COVID really bad over here.

The influx of new or temporary workers not only complicated information sharing among employees, but it also dulled the effectiveness of other COVID-19 policies. Delivery drivers, temporary and seasonal or "flex" workers often were disconnected or excluded from information about managing COVID-19 at work. This ranged from changing practices like mask mandates, health and safety protocols, or COVID-19 monitoring practices. Their lack of knowledge (or employers' lack of information sharing) was frustrating to other workers, especially as their actions posed additional risk and stress around managing that risk.

Managers—good or bad—were critical in determining workers' sense of safety.

A worker's relationship with their manager also had substantial bearing on their sense of safety at work. Regardless of sector or implementation of specific interventions, direct supervisors were a fundamental part of both the surveillance and protection of workers. Positive relationships with managers, with managers trusting and looking out for their employees made a difference, especially under conditions of extreme stress. A warehouse worker told us that his manager gave instructions, checked that work was being done, and had a good relationship with employees because of being a good communicator:

> He's very nice. He gets along well with his work group. A good boss, none of that. [We don't feel monitored.] He knows how to get information through to us without us feeling pressured.

In contrast, workers in poorly managed environments described feeling as though protecting their well-being was in conflict with the financial situation of their employers. Peter, a warehouse worker, stated:

> At any one point, I felt like the warehouse was just going to burn down through either sheer negligence of management or just literally something was going to break. … That warehouse was literally falling apart. It seems to me, one other supervisor, and the main guy were the only ones able to hold it down most of the time.

Unions attempted to provide the missing circulation of health data to and from workers.

Unions and union representatives were another important relationship inside unionized workplaces. Before the COVID-19 pandemic, OSHA under the Trump administration had conducted the fewest inspections of the last two decades.[27] During the pandemic, most of these inspections

were conducted without an on-site inspection.[28] Lack of enforcement mechanisms complicated and limited the implementation of a number of other public health and state recommendations. Unions and shop stewards took on the role of occupational health and safety reporting and inspectors, through providing illness data and making and enforcing health recommendations. Operating as advocates for employees, grocery store and food processor unions attempted to mitigate pandemic risks by responding to employee inquiries and complaints; negotiating hazard pay, sick leave, and benefits; encouraging vaccination; and enforcing COVID-19 health and safety measures in stores.

In some workplaces, unions played an important role in raising worker concerns to management and providing guidance to workers through on-site and off-site representatives. During the height of the pandemic, they also played a role in risk mitigation and addressing workers' anxieties. Shop stewards and other worker leaders would report to the union which risk management measures were implemented, if any, and the quality of implementation. The shop stewards we spoke with felt that the presence of the union was important when addressing and reporting employer negligence.

> I can't speak for anybody else's store, but my store was really on task with it. … It was like we have a union and the union made sure that they follow guidelines, and the managers follow guidelines and then the employees follow guidelines, and if anybody kind of fell off, you had somebody to put you back in your place and that even goes with customers.

Some shop stewards shared that their union representatives were very involved in COVID-19 mitigation efforts. These practices varied substantially across the unionized grocery stores, even when the workers are represented by the same union:

> Once they confirm [a] positive [test result], they have to let the store know, the store lets my union know, my union rep puts out a mass message to everybody that somebody—because everything's confidential—tested positive at your store. And if you have questions about it, contact this number.

For Mary, a former Amazon manager now working in a unionized large company, the contrast was stark: "I came from a nonunion company at one point into a unionized company and my eyes were just opened. I just could not believe the big difference that a union can do."

It should be noted that unions representing other groups of workers (such as manufacturing workers) when representing the desires of their members, sometimes advocated against health measures like masking or vaccine mandates. Where the politics and priorities of union members pushed for individual liberty or personal freedoms, unions in our study pushed for fewer restrictions and health precautions in their workplaces.

Still, while we interviewed several shop stewards and union supporters, not all workers felt positively about the union. While several workers noted that some unions were able to advocate for hazard pay, paid sick leave, and protective measures like masks and plexiglass barriers, workers had unmet needs. Some workers felt the union was incapable of enacting real change or saw the union as unnecessarily cutting into their take-home pay. One worker remembered a coworker leaving the union after they failed to get paid time off when their spouse contracted COVID-19. While in some cases the union's position as a mediator was useful, other times workers felt it made it difficult to pinpoint who is responsible for conflict resolution. Still, research suggests that unions enhance the health and safety of their workers broadly,[29] and that unionized workplaces had better COVID-protection practices.[30]

Conclusion: What Would It Take to Feel Protected? What Do Workers Want?

Essential workers bore the stress and high cost of the pandemic, risking their lives and their health. But what if they could have had power over their workplaces? What would they like to see changed? At the end of each interview, we asked workers what they would have wanted to see in their workplaces, and what things employers could have implemented to help them feel safer.

First, **many workers gave mixed feedback about the implementation of COVID-19 measures.** While some recognized that employers could have done better, they also understood that adapting to changing recommendations was hard. Still, workers felt confused and frustrated that some health surveillance interventions were implemented, while others were not, such as having temperature scans but not masking. In most cases, workers' worry increased whenever protections were lifted or scaled back. In workplaces where there was little surveillance, some workers would have liked to have more screenings or checks:

> Some of my friends are going to work and every day they have to have a rapid COVID test or get their temperature checked. And we never had anything like that… There was no check-in, not even a questionnaire about if we were having any symptoms or anything, ever.

Second, **workers wanted more transparency and communication about COVID-19 cases.** Many employees wanted to know identifiable information about COVID-19 cases and have more detailed communication from their employers about cases, but the ADA discouraged this communication. Some workers felt employers could have done more to communicate the presence of infection in the workplace. Not knowing who was sick was a great source of stress for people and their families. One meatpacker shared, "I think if somebody tests positive, they should have to notify everybody in the plant." The lack of information and transparency was not only about COVID-19 cases but also extended to confusion about COVID-19 itself. One worker suggested that the employer could have sent "some people from the health department, doctors or somewhere, to come out and talk to [workers] about it."

Third, **workers consistently mentioned the lack of basic social policies and support around illness as having a great impact on their life.** The lack of paid sick leave or any paid time off weighed significantly on workers and their families. While some workplaces had paid COVID-19 leave for a period of time, many others did not, and few applied the leave to positive cases in the workers' household. Workers had to decide between caregiving, typically for a spouse, child, or elder, and potentially bringing COVID-19 into their workplace. Hazard pay, durable salary increases, and benefits for hourly employees, including good-quality health insurance were also mentioned as policies that would significantly improve workers' lives. One worker explicitly said what he would do: "I would reimplement hazard pay. I would make sure that your recovery time, your quarantine time was paid for. I would raise the minimum wage to at least 15 [dollars]."

And finally, while being asked to rise to the challenges of being on the "frontlines," **many workers expressed a sense of feeling not only unprotected, but extremely dehumanized, and a desire for greater respect:**

> "I just wish that more workplaces would realize that these are human lives, and my life is not just this job. This is probably the most minuscule part of my life, although it's necessary. I think that they take the fact that people have to work to survive way too far. … I don't need to work for your business but your business needs somebody to work for them. So maybe treat those people like you need them and not the other way around."

While the pandemic exacerbated the precarity of essential work, it was also a time when the public spotlight shone on the realities of labor in the US and galvanized workers toward collective action. Workers across sectors engaged in strikes, collective organizing, and efforts to unionize their workplaces.[31] The momentum led to unionization within large corporations despite strong efforts of union busting, famously the victory of the Amazon Labor Union at a Staten Island Amazon warehouse. Other community-led movements like Children of Smithfield shed light on the conditions of meatpacking workers in large meatpacking plants.

"I just wish that more workplaces would realize that these are human lives, and my life is not just this job."

Some promising new models have emerged on how to involve workers and get feedback on how to improve occupational health especially during COVID-19. With the support of unions and worker organizations, the Los Angeles Department of Public Health piloted a Public Health Councils program, where worker-led councils conduct peer-to-peer education to identify health violations and make worksites safer, especially in regard to COVID-19.[32] Similar programs are also under development in New York.[33]

Well-deployed contact tracing devices with limited and transparent data collection also may help workers and employers walk the narrow line between protecting worker's privacy and giving workers the information they need to protect themselves during an infectious disease pandemic.

Faced with unsafe, dehumanizing labor conditions, essential workers want their health and safety needs to be met and protected in the workplace.

From a regulation standpoint, there is a lot that can be done. Workers face significant barriers when filing complaints and advocating for their rights the regulatory agency responsible for enforcing worker protection laws—OSHA—is underfunded, understaffed, and disempowered. As it stands, workers have no individual private right of action to sue their employers for negligence without proof that the employer intended to hurt them. In 2020, OSHA inspections fell to a 20-year low, greatly diminishing the agency's ability to respond to an influx of formal complaints during the pandemic.[34] The USDA's focus on food safety inspections left it unequipped to address public health threats in workplaces, and thus less effective in keeping workers safe. Increasing the funding for OSHA, giving workers an independent legal private right of action, increasing enforcement of anti-retaliation laws and cross-training other types of inspectors from the USDA and the FDA to look for worker safety issues would begin to address some of the power imbalances that currently tip away from the worker.

Faced with unsafe, dehumanizing labor conditions, essential workers want their health and safety needs to be met and protected in the workplace. Long before the pandemic, workers have been advocating for paid sick leave, sanitation stations, improved ventilation and temperature, reduced line speeds, and bathroom breaks. Workers continue to make these demands, and, in addition to navigating a complicated and disempowered state and federal regulatory system, they are building coalitions to organize collectively for their rights. Whereas individual workers can face the threat of retaliation or get lost in bureaucracy, worker coalitions gather around the shared goal to protect their communities. Balancing independence and collective organizing, worker coalitions enable workers to communicate across worksites, navigate the legal system, and protect their health and safety, and ultimately, reclaim their power and dignity.

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Methods

This report draws on conversations with essential workers during the COVID-19 pandemic to understand how health surveillance in the COVID workplace was changing workers' experiences and power.

To this end, we focused on essential workers, defined as workers who were required to report to work during the pandemic, especially during times of lockdowns when many others were not allowed to go to work or could work remotely. We recruited workers from four industry sectors—grocery and big box retail, warehousing, meatpacking and food processing, and manufacturing—ranging from small firms to large corporations. We intentionally excluded health care workers because of the baseline expectation of exposure to pathogens in the workplace—generally absent from the essential workplaces in our focus.

To ground this work, we first reached out to different worker organizations, advocacy groups, and unions across a variety of sectors to understand what they had seen and heard from the workers in and represented by their orgs. We also talked with academics, journalists, and researchers to better understand sector differences and the local and national political, economic, and social contexts that surrounded the pandemics' essential workers.

After this initial work, we developed the study questionnaire and research protocol. The study protocol and human subject protections were reviewed and approved by Advarra IRB, an independent institutional review board.

Participants were initially recruited through personal networks, worker organizations, and union outreach and snowballed to other participants from those contacts. In January 2022, we broadened our outreach to include recruiting through Reddit and Craigslist.

We spoke with 50 workers across the four sectors over the course of five months between October 2021 and March 2022. Interviews were conducted online over Zoom in English and Spanish. Participants were offered complete confidentiality. Participants were given the option to keep their video on or off. Interviews were audio recorded, and in order to protect the privacy and anonymity of our research participants, we collected only minimal demographic information.

Workers were interviewed for about an hour by one or two researchers, and participants received a $50 e-gift card incentive and, in some cases, a gift card to an online retailer. To fully capture some of the spatial changes occurring during the pandemic, four participants sat for an extended

interview (an additional 20–40 minutes), during which they drew maps and talked the researchers through the physical layout of their worksite. These participants received an additional $40 incentive for this extra time. This method allowed us to get a more tangible sense for how workers were navigating the spatial changes in their day-to-day and understand the differences between different sectors.

In addition to the worker interviews, we also spoke to nine individuals who worked at local, state, or federal government agencies; were experts in workplace safety or public health; and/or researchers who study workplace health and safety. These interviews provided a broader legal, regulatory, and political context for the worker interviews.

It is important to note that interviews were conducted over a period of six months that included new COVID-19 variants, infection peaks and valleys, and evolving guidance and regulations. Many of these changes varied significantly based on geographic region, state, city, or worksite. Additionally, interviewees were reflecting on nearly a year (and often more) of unrelenting stress. Enduring distress impacts our ability to remember exactly when particular events occurred. As such, we are presenting this work as about the pandemic experience untethered to specific days or months, in acknowledgment of the challenges of time recall under stress.

All interviews were transcribed, and Spanish language interviews were first transcribed in Spanish and then translated into English. Qualitative data was analyzed iteratively using ATLAS.ti. These initial themes were then shared in listening sessions, offered in both English and Spanish, with the preliminary themes shared with participants, who reflected on and responded to these initial findings.

All names in the report are pseudonyms.

A critical ethical and methodological consideration is to be made here. As researchers who work in a virtual workplace, it is important to mention we had the privilege of not being exposed to the virus at our place of work, a privilege that the workers we interviewed did not have. This difference in positionality is something we kept in mind throughout the process of conducting this research.

Authorship

Author Livia Garofalo worked on recruitment, logistics, conducted research interviews including all interviews in Spanish, did some English-Spanish translation, did data analysis, and wrote the report.

Author Amanda Lenhart designed the study, worked on recruitment, logistics, conducted research interviews, did data analysis, and wrote the report.

Author Iretiolu Akinrinade wrote the literature review, managed and executed recruitment and panelist management logistics, conducted research interviews, did data analysis, and wrote the report.

Author Joan Mukogosi wrote the literature review, conducted research interviews, did data analysis, and wrote the report.

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