NEW YORK CITY COMPTROLLER
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Safeguarding Outdoor Workers in a Changing Climate

BUREAU OF LABOR LAW AND
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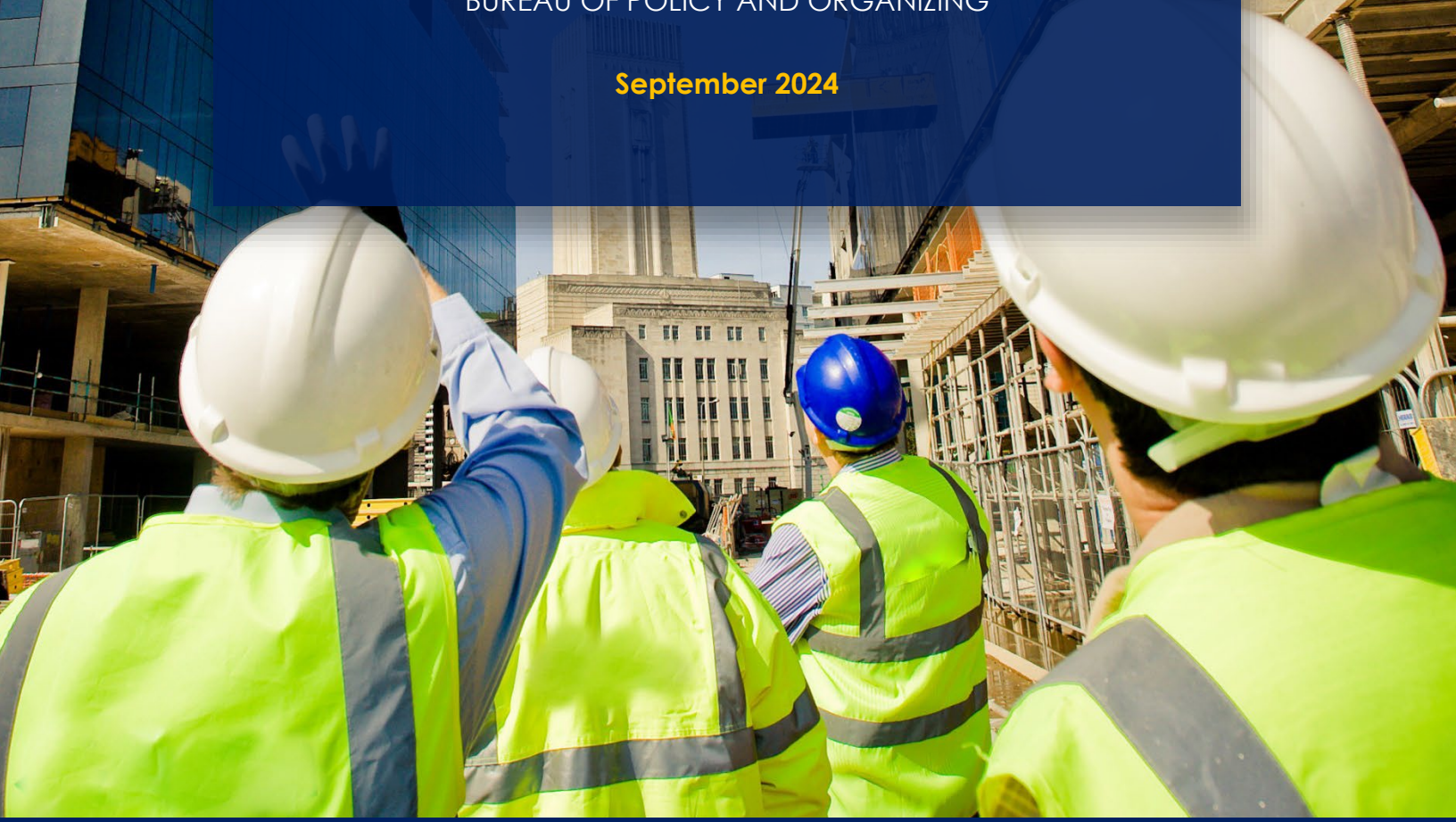

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Executive Summary

Climate change is bringing more extreme weather to New York City, from frequent heat waves to wildfire smoke. Outdoor workers, such as construction and transportation workers who perform physically demanding tasks, are among the most vulnerable to extreme weather because of the dangers of working in hot or smoggy conditions. Without sufficient regulations that protect New York City's outdoor workers from these climate change-induced occupational hazards, workers will face increasing risks on the job. This report analyzes the health impacts of extreme temperatures and unsafe air quality, quantifies the New York City outdoor worker population, and identifies national best practices for labor standards. The report concludes with policy recommendations that should be taken by New York City and State to protect outdoor workers.

Key Findings

- Roughly 1.4 million workers, or a third of New York City's workforce, work outdoors for prolonged periods of time. Of the total NYC outdoor workforce, 12.4% (roughly 173,700 workers) are constantly exposed to the outdoors. These figures are conservative underestimates given many outdoor workers, such as street vendors, app-based delivery workers, and day laborers, are self-employed, independent contractors, or gig workers without traditional employment arrangements[1] and not captured by official data sources.
- New York City's outdoor workforce tends to have higher proportions of non-citizen immigrants, Hispanic/Latino or Black, and male workers.
- Jobs with higher outdoor exposure tend to be paid lower wages. For every one percent increase in the proportion of outdoor workers in each job type, workers make $700 less each year in New York City.
- While efforts are underway to strengthen federal and state protections, no outdoor labor standards exist at the city, state, or federal level that protect outdoor workers against growing climate threats.

Summary of Recommendations

A two-fold approach is needed to most effectively protect all of New York City's outdoor workforce to institute requirements for employers to provide safety measures to workers, and public health initiatives that will benefit a broader range of workers and residents alike.

[1] Defined as W-2 employment, workers who are directly employed by an employer with a regular schedule.

Employer Requirements

The following legislation should be passed and implemented to better protect workers with traditional employment arrangements against extreme weather conditions.

1. Pass the Temperature Extreme Mitigation Program (TEMP) Act, sponsored by New York State Senator Jessica Ramos and Assemblymember Harry Bronson. This bill would require employers to provide workers with protections against extreme heat, such as water, shade and rest breaks.
2. Expand outdoor heat standards to cover all NYC outdoor workers through City legislation. Many outdoor workers in the five boroughs work in sectors that are not covered by the TEMP Act. Additional protections must be put into place to ensure that all NYC-based outdoor workers have safe working conditions during heat waves.
3. Pass City or State legislation to set labor standards for unsafe air quality to require employers to develop air quality illness prevention plans that ensure access to safe air, PPE, and reduced strenuous activities.

Public Health Initiatives

The City should also pursue broader public health initiatives to ensure that self-employed, contracted, and gig workers are protected from extreme temperature and poor air quality.

4. Collect and publicly report data on the occupational impacts of extreme weather.
5. Develop emergency protocols to protect the health and safety outdoor labor during extreme weather.
6. Expand public bathroom access, especially in areas with high concentrations of outdoor workers.
7. Reform the City Street Vending Code to permit street vendors to use awnings for shade coverage.
8. Establish a City PPE distribution program for air quality emergencies for outdoor workers with non-standard employment arrangements.
9. Develop a proactive outreach program to educate outdoor workers and employers on how to stay safe during extreme weather.

Introduction

Climate change is bringing more frequent heat waves and wildfires to New York City. 2023 was the hottest year on record for both the world[1] and NYC.[2] 2024 is already slated to outpace last year's record temperatures.[3] 2023 was also the most extreme for wildfires, which have more than doubled in the last two decades.[4]

Outdoor workers, such as construction and transportation workers, who often perform physically demanding tasks, face higher occupational risks during extreme weather. Unfortunately, efforts to set labor standards for outdoor workers have been piecemeal and slow. Some states have even taken measures to *prohibit* outdoor labor standards: Governors De Santis and Abbott signed laws in Florida and Texas banning local municipalities from enacting heat protections for outdoor workers.[5]

Many efforts to protect outdoor workers have focused on agricultural workers. There has been little attention to the unique needs of outdoor workers in dense urban areas like New York City. New York has often been at the forefront of workers' rights. However, neither the City nor State has yet to take action to protect outdoor workers from unsafe climate and weather conditions.

This report offers strategies to protect outdoor workers in light of the changing climate. Using labor data, the report identifies the people and industries that makeup NYC's outdoor workforce. The recommendations propose employer requirements and public health initiatives to maintain safe working conditions during extreme temperatures.

Occupational Health Impacts of Climate Change on Outdoor Workers

Heat waves and wildfires, which will continue to increase in frequency and intensity lead to a wide range of negative impacts among all those who experience them. While much of the population can seek ways to stay safe in these events, outdoor workers are particularly vulnerable to associated health risks because of their inability to escape the outdoors. The occupational health risks that outdoor workers face include those that are byproducts of extreme temperatures, heat and cold along with unsafe air quality.

Extreme Heat

Extreme heat is the leading cause of weather-related deaths in the country[6] and in New York City. Each year in New York City, there are 7 deaths directly caused by heat and 340 heat-exacerbated deaths.[7] Heat exposure can result in heat stress, heat stroke, heat rashes, heat cramps, and exhaustion, causing accidents and injuries on the job.[8] Older age and underlying medical conditions such as heart disease and diabetes can also exacerbate heat impacts. Between 1992 and 2020 nationally, heat stress led to the deaths of 963 workers and caused nearly 33,000 serious injuries and illnesses.[9]

Outdoor workers face significant higher heat risks compared the general public. One study found that construction workers were 13-times more likely to die from heat exposure than workers in other industries.[10] App-based delivery workers and street vendors, who do not have set workplaces, face unique challenges in extreme heat without access to bathrooms and or places to cool down. Delivery workers can be penalized for future work if they take rest breaks longer than 10-15 minutes.

Two-thirds of all street vendors lack access to restrooms.[11] Street vendors often hesitate to leave their merchandise unattended to use the restroom because health inspectors can confiscate their equipment as abandoned property. As a result, many intentionally limit how much water they drink even in extreme heat to avoid having to urinate during working hours.[12] In addition to dehydration, many of these workers also develop urinary tract infections.[13]

Lack of access to shade and cooling also causes sunburn and other skin conditions due to prolonged sun exposure. While the street vending code permits street vendors to use umbrellas, vendors are currently prohibited from using awnings if they exceed a 5’ by 10’ footprint.

In 2024, NYC Emergency Management started a pilot program to distribute “cool kits” with essential heat safety items to outdoor workers.[14] That said, occupational risks from extreme heat will only become more dangerous as temperatures rise. By 2030, the number of days with heat index above 95°F may increase six-fold.[15] Workers experience a 6-9% increase in injury rates on

days where temperatures exceed 90°F, and 10-15% increase in injury rates when temperatures exceed 100°F.[16]

Poor Air Quality

Wildfires release pollutants into the air. The Environmental Protection Agency (EPA) Air Quality Index (AQI) sets air quality standards for public health.[17] The AQI identifies the health risks across six levels of air pollution.

Air Quality Index

AQI Value	Level of Concern	Description of Air Quality
0-50	Good	Air quality is satisfactory, and air pollution poses little or no risk.
51-100	Moderate	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
101-150	Unhealthy for Sensitive Groups	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
151-200	Unhealthy	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
201-300	Very Unhealthy	Health alert: The risk of health effects is increased for everyone.
301 and higher	Hazardous	Health warning of emergency conditions: everyone is more likely to be affected.

Source: Environmental Protection Agency

Poor air quality can result in eye irritations, sore throats, asthma, pulmonary and respiratory illnesses, bronchitis and pneumonia, adverse birth outcomes, and cardiovascular issues.[18] While prolonged exposure to poor air quality poses health risks, relatively little information exists about the occupational impacts of wildfire smoke on outdoor workers. It remains a nascent policy issue: only a few jurisdictions, including California, Oregon and Washington State, have passed labor standards for air quality emergencies.

For the first time in June 2023, New York City experienced an air quality emergency due to smoke from Canadian wildfires. The Air Quality Index (AQI) rose to hazardous levels, peaking at 465 on

June 7. As the sky turned orange and New Yorkers scrambled to understand what to do to stay safe and healthy, the City was slow to issue guidance. Many employers lacked protocols to address hazardous air quality. Groups like La Colmena and Street Vendor Project scrambled to secure and distribute masks to outdoor workers in their networks.

The incident prompted NYC Emergency Management (NYCEM) to initiate a protocol for air quality emergencies. In May 2024, Mayor Adams indicated that the City updated its air quality guidance, but has not yet added air quality emergencies to its hazard mitigation plan.[19, 20]

Although 2023 was the first air quality emergency, it was not the last. About a year later in June 2024, the New York State Departments of Environmental Conservation and Health issued an air quality alert due to high ozone.[21] In that instance, wildfire smoke was not responsible, but rather gases emitted from fossil fuel combustion from activities like driving gas-powered vehicles. The AQI was forecast to be 101, which is considered unhealthy for sensitive groups. Neither the State nor City issued employer- or worker-specific guidance issued at that time. NYCEM forecasts a potentially active 2024 wildfire season due to dry conditions in Canada that may increase the risk of additional poor air quality days to New York City.[22]

Extreme Cold

Even as global temperatures rise, New York City will continue to face harsh winters. Winter storms that bring snow, sleet, and freezing rain may also intensify with climate change. On average, 15 New Yorkers die of cold-related deaths each year.[23] Winter weather results in 150 emergency room visits and 255 hospital admissions annually in New York City.[24] Unfortunately, little data exists about the occupational impacts of extreme cold for the five boroughs. In general, workers exposed to extreme cold may experience fatigue, loss of coordination, confusion and disorientation, loss of consciousness, and hypothermia.[25] Ice and snow increase the chance of dangerous traffic accidents for delivery workers in particular.[26]

NYC's Outdoor Workforce

To mitigate occupational health risks faced by outdoor workers in NYC, it is essential to understand who these workers are and how many workers in NYC are impacted by these health risks.

Quantifying NYC's Outdoor Workforce

An estimated 1.4 million workers, or a third of New York City's workforce, work outdoors for prolonged periods of time. Of the total NYC outdoor workforce, 12.4% (roughly 173,700 workers) are constantly exposed to the outdoors.[2] The primary sectors that make up New York City's outdoor workforce are construction; protective services; agriculture and forestry; installation, repair, and maintenance; cleaning and maintenance; transportation; and personal care and service jobs (Figure 1). Construction workers have the highest outdoor exposure rates: 92% of construction workers perform outdoor labor and 39% are constantly exposed to the outdoors. Over a quarter of agriculture workers and building and maintenance workers are also constantly exposed to the outdoors. A more detailed individual occupations with high outdoor exposure rates are listed in Figure 6 of the Appendix.

Figure 1: Outdoor Exposure for NYC Workforce

Job type (SOC Group)	Total number of NYC workers in SOC group[27]	Percent of workers exposed to outdoors[28]	Estimated number of NYC workers exposed to outdoors[3]
Protective service occupations	162,950	89.4%	145,677
Transportation and material moving occupations	244,840	57.6%	141,028
Healthcare support occupations	424,570	33.1%	140,533
Educational instruction and library occupations	286,030	42.9%	122,707
Installation, maintenance, and repair occupations	129,830	79.4%	103,085
Construction and extraction occupations	110,050	92.4%	101,686

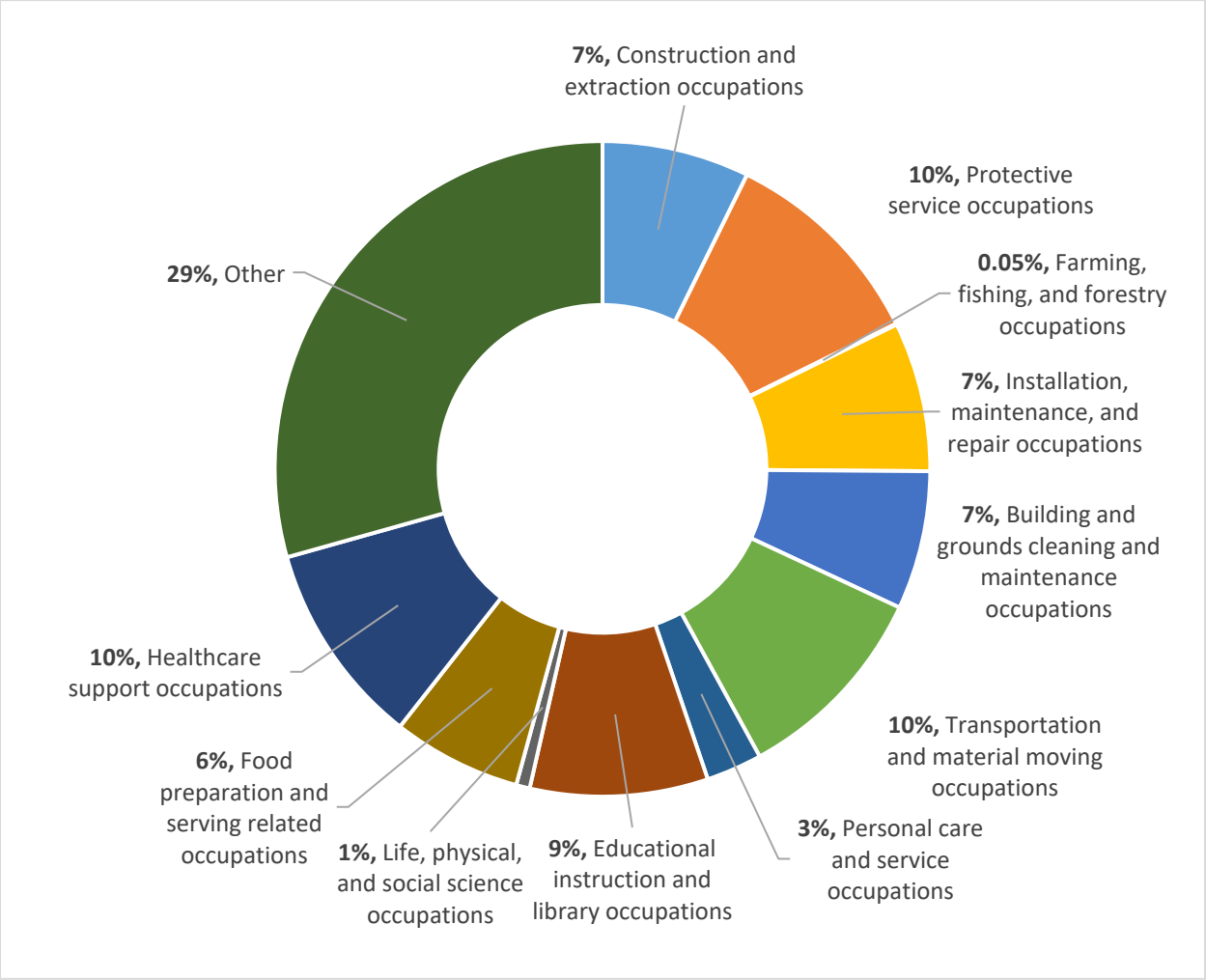
[2] DOL defines "constant outdoor exposure" as workers who spend at least two-thirds of workday outdoors.

[3] Calculated by multiplying the number of NYC workers in each respective SOC by the national rate of outdoor workers for that SOC.

Job type (SOC Group)	Total number of NYC workers in SOC group[27]	Percent of workers exposed to outdoors[28]	Estimated number of NYC workers exposed to outdoors[3]
Sales and related occupations	343,270	28.1%	96,459
Building and grounds cleaning and maintenance occupations	129,590	73.8%	95,637
Food preparation and serving related occupations	265,380	33.5%	88,902
Management occupations	304,660	23.8%	72,509
Arts, design, entertainment, sports, and media occupations	150,410	27.7%	41,664
Personal care and service occupations	74,820	51.5%	38,532
Business and financial operations occupations	412,870	9.1%	37,571
Office and administrative support occupations	513,110	4.7%	24,116
Community and social service occupations	86,380	24.2%	20,904
Healthcare practitioners and technical occupations	230,810	7.3%	16,849
Architecture and engineering occupations	32,240	31.8%	10,252
Life, physical, and social science occupations	25,930	36.3%	9,413
Production occupations	64,810	11.4%	7,388
Computer and mathematical occupations	166,530	1.6%	2,664
Legal occupations	77,070	1.6%	1,233
Farming, fishing, and forestry occupations	830	82.5%	685
All NYC workers	**4,236,990**	**33%**	**1,398,207**

Source: "Total number of NYC Workers in SOC group" is from the NYS Department of Labor's *Occupational Employment and Wage Statistics* and "Percent of Workers Exposed to Outdoors" is from the Bureau of Labor Statistics' *Occupational Requirements Survey*. Data was matched from both sources on the field SOC group. "Estimated number of NYC Workers exposed to outdoors was calculated. See Methodology section and footnotes for more information.

Figure 2: Sectors with Significant Outdoor Workforce in NYC



Source: This graph was created by multiplying the number of NYC workers in each respective SOC by the national rate of outdoor workers for that SOC, and then dividing that number by the calculated total of outdoor workers in NYC. "Other" includes the following SOC groups: Architecture and engineering occupations, Sales and related occupations, Arts, design, entertainment, sports, and media occupations, Community and social service occupations, Management occupations, Production occupations, Business and financial operations occupations, Healthcare practitioners and technical occupations, Office and administrative support occupations, Computer and mathematical occupations, and Legal occupations.

Estimates of Independent Contractors, Gig Workers, and Self-Employed Workers

An estimated 93,000 individuals work as street vendors, app-based delivery workers, and day laborers in New York City. Workers in these occupations are often undercounted in official data sources, as many lack traditional employment arrangements. These jobs require near-constant outdoor exposure and are not fully captured in the official Census data summarized earlier in this report.

All three of the following types of jobs include largely immigrant workforces who are self-employed, or employed on a contract or contingent basis. As a result, these workers are often unprotected from existing labor laws that govern employee-employer relationships. Workers in these job sectors disproportionately experience wage theft, unsafe working conditions, and other labor violations.

- **Street vendors**: There are an estimated 23,000 street vendors selling food and merchandise throughout public spaces in New York City.[29] Vending is a long-term career and primary source of income for the vast majority of street vendors. Nearly all vendors are immigrants of color: 96% were born outside of the United States and 98% are people of color.[30] Most street vendors are Hispanic/Latino (60%), followed by Middle Eastern/North African (22%).[31] Over half of all street vendors speak little to no English.[32] Street vendors are typically self-employed and work outdoors for long hours. 89% of NYC street vendors are food vendors; the rest are general merchandise vendors. Vendors need both licenses and permits to operate legally. However, the City has only made less than 4,000 permits available. Three-quarters of food vendors operate unpermitted,[33] or pay exorbitant fees to rent permits on the secondary market.[34] As a result, many vendors are vulnerable to harassment, ticketing, confiscation of merchandise and equipment, and even arrests.[35] Despite a recently passed law in 2021 that increased the number of permits provided, very few additional permits have been issued to vendors.[36]

- **App-Based Delivery workers**: New York City is home to roughly 65,000 delivery workers.[37] These delivery jobs are mostly held by immigrants from Latin America, South Asia, West Africa, and China. Delivery workers are classified as independent contractors. They are paid by delivery app companies, like DoorDash or Uber Eats, to deliver food on behalf of restaurants that use the app's services. App-based delivery workers are not considered direct employees of the app companies and therefore are not covered under most state and federal labor laws. Although independent contractor status is typically intended for temporary or part-time work, the vast majority of delivery workers functionally work full time. One study found that 81% of NYC delivery workers work five or more days and two-thirds work for six or seven days a week.[38] The relationship between delivery workers and app company employers is entirely facilitated through technology. Algorithms determine delivery assignments, assign performance evaluations, and recommend when to fire or take other personnel actions. Workers are typically paid by the trip. Inclement weather and shade, heat, or bathroom breaks that affect how quickly they can complete delivery trips can result in reduced shifts or wages, or even get fired.

- **Day laborers**: Day laborers work and get paid on a day-to-day basis. The most common jobs for day laborers with high outdoor exposure include construction workers, gardeners and landscapers, painters, roofers, and drywall installers.[39] An estimated 43% of the 10,000 day laborers in New York City work in construction.[40] As part of the informal economy, day laborers' job sites and employers change frequently. Day laborers are largely immigrant workers, many of whom are undocumented. Because day laborers are not hired through formal employment arrangements, they often have precarious relationships with employers and are not covered by labor regulations.[41, 42]

Figure 3: Estimated NYC Employment of Undercounted Workers

Job Type	Estimated Number of Workers in NYC
Street Vendors	23,000 (20,500 are food vendors)
App-based Delivery Workers	65,000
Day Laborers	10,000
Total	**98,000**

Source: The number of street vendors is from the Immigration Research Initiative, the number of app-based delivery workers is from The Workers Justice Project, and the number of day laborers is from the National Day Laborer Organizing Network. See endnotes for more information.

Characteristics of Outdoor Workers in NYC

The analysis below pairs Federal and NYS Departments of Labor with the U.S Census Bureau's SOC data for the job groups with the largest concentrations of outdoor workers in New York City. The analysis below does not account for independent contractors and gig workers (street vendors, delivery workers, and day laborers), which tend to have significantly lower wages and higher proportions of non-citizen immigrants and Hispanic/Latino workers.

- **Job types with higher concentrations of outdoor workers are paid lower wages.** As Figure 4 shows, median annual wages decrease for job types with more outdoor workers. For every one percent increase in the proportion of outdoor workers in each job type, workers make $700 less per year in New York City.[43]

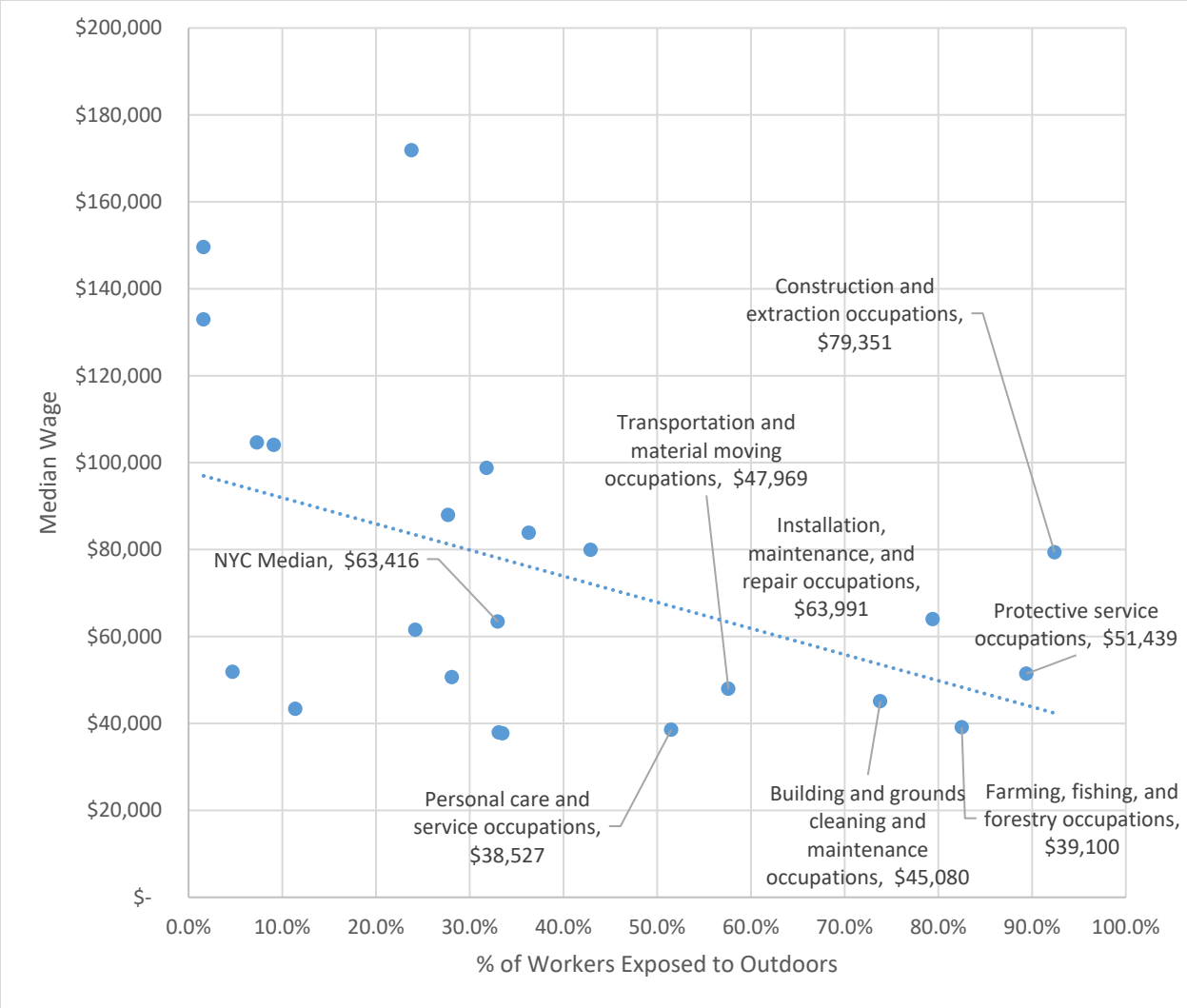
- **The outdoor workforce has a higher proportion of non-citizen immigrants.** 27% of workers in the majority-outdoor sectors are non-citizens, compared to 21% non-citizens for all NYC workers. The outdoor work sectors with the highest percentage of non-citizen immigrants are construction workers (41% non-citizen immigrants) and cleaning and maintenance workers (34% non-citizen immigrants).

- **Sectors with higher concentrations of outdoor workers tend to have more Hispanic/Latino and Black workers.** SOC groups with high outdoor exposure have significantly more Hispanic/Latino workers and slightly more Black workers than the citywide workforce (Figure 5). The sectors with the highest percentages of Hispanic/Latino workers include cleaning and maintenance workers (56%), construction workers (48%), and installation and repair (36%). The majority-outdoor sectors with the highest percentages of Black workers are protective services (45% Black) and transportation workers (35% Black).

- **Outdoor workers tend to be predominantly male, except for personal care workers.** Overall, men make up the majority of workers in the SOC categories with the highest outdoor exposure. The construction and installation and repair sectors are both 96%

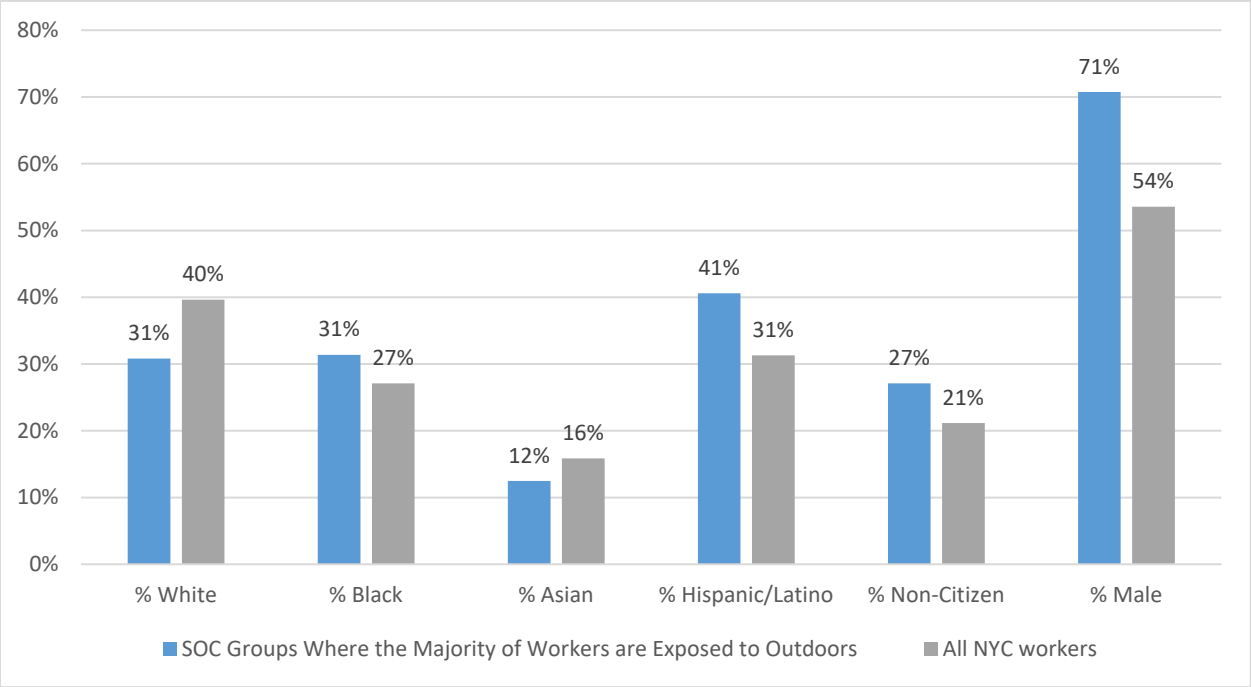
male. Protective services are 70% male. Personal care workers are the exception, with a workforce that is 69% female. Cleaning and maintenance workers are majority male, but 47% are female workers.

Figure 4: Outdoor Worker Exposure and NYC Median Wage by SOC Group



Source: "Median Wage" is from the NYS Department of Labor's *Occupational Employment and Wage Statistics* and "% of Workers Exposed to the Outdoors, is from the Bureau of Labor Statistics' *Occupational Requirements Survey*. Data was matched from both sources on the field SOC group. See Methodology section for more information.

Figure 5: Demographics of SOC Groups with Majority Outdoor Workers compared to the NYC Workforce



Source: All demographic categories are from the U.S Census' *American Community Survey 1-Year Estimates Public Use Microdata Sample* (2022)," Outdoor exposure data is from the Bureau of Labor Statistics' *Occupational Requirements Survey.* Data was matched from both sources on the field SOC group. See Methodology section for more information.

Current Efforts to Protect Outdoor Workers from Climate Health Risks

While there are currently no protections in place for New York City's outdoor workforce, the increase of extreme weather has prompted proposals for increasing worker safety and the federal and state levels.

OSHA Rulemaking

Currently, the Occupational Safety and Health Administration (OSHA) standards require employers to provide a hazard-free workplace, but do not put forward specific requirements for combating the hazard of extreme heat or unsafe air quality.[44]

OHSA initiated a rulemaking process in October 2021 to develop a new heat-related injury and illness prevention standard.[45] The City of New York[46] and the New York State Attorney General[47] both submitted comments in response to OSHA's Advance Notice of Proposed Rulemaking. In July 2024, OSHA released the proposed rule, covering most outdoor workers and indoor workers without sufficient air-conditioning, requiring employers to provide access to water, rest breaks, and shade, among others (as is currently required in California, Oregon, Washington, Colorado, Minnesota).[48] Once finalized, the standards promulgated by OSHA will govern workplace safety laws for all private sector workplaces in the country.[49]

OSHA rulemaking is historically a long process that requires significant feedback and consultation. One Government Accountability Report found that on average it takes OSHA more than 7 years to create a new rule.[50] In 2023, over 110 members of Congress signed on to a letter calling on OSHA to implement the rule as fast as possible, emphasizing the urgency of the need as temperatures rapidly increase.[51, 52] In February 2024, a coalition of 10 attorneys general (including NY Attorney General Letitia James) also signed a petition to urge OSHA for a faster implementation.[53] As part of this push, Rep. Greg Casar of Texas led a daylong thirst and hunger strike in Washington, D.C. to raise awareness and urgency for the need for a federal outdoor workplace standard.[54]

New York TEMP Act

In New York, State Senator Jessica Ramos and Assemblymember Latoya Joyner (the Assembly sponsor is now Assemblymember Harry Bronson) introduced the Temperature Extreme Mitigation Program (TEMP) Act in 2023.[55] Largely modeled off the existing West Coast regulations, the TEMP Act mandates that employers in specific industries take various safety measures when the temperature exceeds 80°F:

- **Potable water** that is located as close as practicable but no more than a quarter mile from the areas where employees are working.
- **Access to shade**, that is as close to the worksite as reasonably possible, with access to open air or cooling with ventilation, and is big enough to accommodate all employees on a preventative break.
- **Paid preventative breaks** when employees experience the onset of heat illness.
- **PPE** defined as "protective equipment, gear, and uniforms to withstand the extreme heat…[including] but not limited to fans…air-conditioning mandated in all delivery vehicles" to combat heat illness.
- **Medical monitoring** by employers of employees exhibiting signs of or reporting symptoms of heat illness, along with worker access to first aid or other treatment.
- **Air-conditioning** in employer-provided vehicles.
- **Heat Prevention Plans** made available to workers (along with applicable labor organizations) and regulators that document how each employer will to carry out the above requirements.

When the temperature reaches or exceeds 95°F, employers are mandated to provide cool-down breaks for 10 minutes every two hours. The bill also creates enforcement, reporting, and training mechanisms for the NYS Department of Labor to enforce. To help workers come forward and report when their employers violate these standards, the TEMP Act also includes strong whistleblower protections, to prevent illegal employer retaliation.[56]

The TEMP Act applies to all employers in covered industries, regardless of the number of people they employ. The specific industries covered in the TEMP Act include agriculture, construction (unless the employer is party to a collective bargaining or project labor agreement), landscaping, car wash services, commercial shipping, food service, and warehousing. While the TEMP Act has wide coverage of statewide sectors with large outdoor workforces, the bill does not include many outdoor jobs unique to New York City. For instance, TEMP Act does not cover workers in protective services;[4] installation, maintenance, and repair;[5] and personal care that represent a

[4] Notable individual occupations with significant exposure percentages within this SOC group include: "Firefighters, Police and sheriff's patrol officers; fire inspectors and investigators; crossing guards and flaggers; and security guards all have high outdoor exposure."

[5] Notable individual occupations with significant exposure percentages within this SOC group include: "Electrical power-line installers and repairers; heating, air conditioning, and refrigeration mechanics and installers; mobile heavy equipment mechanics, except engine; control, and valve installers and repairers, except mechanical door; recreational vehicle service technicians; helpers--installation, maintenance, and repair workers; motorcycle mechanics."

significant portion of NYC's outdoor workforce.[6] The TEMP Act also does not cover janitors and cleaners; bus, ambulance, chauffeur, and shuttle drivers; parking attendants; street vendors; and delivery workers.

The TEMP Act has yet to pass and become law. The bill continues to receive support from a coalition of unions and worker centers.

NYS Department of Labor Guidance

The New York State Department of Labor recently issued guidance to employers on extreme heat in the workplace.[57] The guidance provides recommendations to employers for providing water, rest and shade relief, clothing and PPE, training, and preparedness planning. The guidance, which generally aligns with the TEMP Act requirements, does not establish enforceable legal requirements for employers.

[6] Notable individual occupations with significant outdoor exposure percentages include: "Funeral attendants; morticians, undertakers, and funeral arrangers; childcare workers; and recreation workers."

Models from other jurisdictions

Without comprehensive federal standards, efforts to address outdoor workforce safety has been left to state and local governments. A handful of states, along with the City of Phoenix, have passed laws that protect workers from extreme heat. Most of these laws mandate employers actions to mitigate heat illness. The state and local regulations that provide heat illness protections for workers include:

- California's *Heat Illness Prevention Standard*, covering outdoor workers.[58, 59]
- Washington state's *Outdoor Heat Exposure Rule*, covering outdoor workers.[60, 61]
- Oregon's *Heat Illness Law*, covering both indoor and outdoor workers.[62, 63]
- Colorado's *Agricultural Labor Conditions Rules* for heat.[64]
- Minnesota's *Indoor Ventilation and Temperature in Places of Employment*.[65]
- Phoenix recently passed an ordinance providing extreme heat protections to employees of city contractors.[66]

Covered Workers

Most of the existing state regulations tend to apply to all outdoor workers. California is an exception: while the baseline heat protections apply to all workers at 80°F, only specific industries must follow High Heat Procedures when temperatures exceed 95°F. Some regulations also exempt agricultural workers, firefighters, and other workers providing emergency services, but mandate a separate set of heat protection standards for those occupations. Furthermore, some of the regulations do not apply to workers with minimal outdoor exposure. Minimal exposure is typically defined as less than 15 consecutive minutes in a 60-minute period. These laws apply to all employers in covered sectors regardless of how many people they employ.

Baseline Heat Illness Protections (80°F)

The core elements of these laws require employers to enact standard protections when temperatures exceed 80°F. These measures typically include the following employer requirements:

- **Potable, cold water** for workers to drink in sufficient quantities (defined as 32 ounces per hour)
- **Shade** for rest breaks that is open to outside air, large enough to accommodate all workers on a given rest period, and close to where employees work (often the laws allow employers to be exempted from shade requirements if they can provide equally effective alternative cooling measures, such as air-conditioned space)

- **Procedures and plans** to mitigate heat illness that are made available to regulators and all employees in languages that they speak, including:
    - **Acclimatization Plans** for all new employees, including those returning from leave, to be closely monitored for heat illness to ensure they properly adjust to the high temperatures, for around two weeks.
    - **Prevention Plans** that outline how employers will combat heat illness risks at the workplace
    - **Emergency Response Procedures** to respond to signs and symptoms of heat illness along with emergency events that are triggered by high heat
    - **Training programs** for employees on preventing heat illness and injury risks.

Most states enforce outdoor heat protection laws through employer prevention plans. For instance, in California, most of the fines are for employers without sufficient prevention plans.[67]

High-Heat Procedures (90-100°F and up)

Most laws also include more stringent employer requirements for heat prevention when temperatures exceed even higher levels. The high-heat thresholds vary by state but are typically triggered when temperatures are above 90°-100°F. These high-heat procedures tend to include the following requirements:

- **More frequent rest breaks**: For example, Washington requires 10-minute breaks every two hours at 90°, and 15-minute breaks every hour at or above 100°F.
- **Real-time communication**: Employers are required to establish an effective system of communication with employees to inform each other of emerging heat safety issues or signs of heat illness among workers.
- **Monitoring**: Employers must set up systems to monitor employees for signs and symptoms of heat-related illness and call for emergency medical services. Monitoring may be conducted by front-line supervisors, designated employees, or buddy systems within work crews.

Air Quality Protection

Only three states have laws protecting outdoor workers from unsafe air quality. California[68], Oregon,[69] and Washington State[70] have *Protection from Wildfire Smoke* regulations that outline employer requirements when AQI levels exceed an unsafe threshold.[7] The AQI thresholds are

[7] In addition to these three states, Colorado as part of its *Agricultural Labor Conditions Rules* for heat has AQI-related protections, but this applies only to agricultural workers.

151 for California and 101 for the other two states. Employers with outdoor workplaces must provide one of the following options for reducing exposure:

- An enclosed location with filtered air (often referred to as "engineering controls")
- "Administrative controls"[8] including:
  - Relocating workers to another outdoor location with a lower AQI
  - Changing work schedules
  - Reducing work intensity, or providing more rest periods
- Respiratory protective equipment such as NIOSH-approved particulate respirators.

The laws also require employers to communicate to workers about the current AQI levels, health risks of poor air quality, and measures they can take to protect themselves and to train workers in wildfire smoke safety.

Outreach and Education

Some states conduct robust outreach and education efforts to ensure workers and employers understand their rights and risks during extreme heat. Cal/OSHA's outreach program serves as a model for how government agencies can proactively work to combat heat illness among outdoor workers.

To support employer compliance with the law, Cal/OSHA provides voluntary consultations to proactively identify employers of what they need to change to comply with the law without being issued a citation. Cal/OSHA also makes informational materials and trainings about the law and heat illness available to employers for free.[71]

Cal/OSHA also devotes significant resources to educate outdoor workers on heat illness and their rights under the law:[72]

- Employ Bilingual Community Engagement Liaisons and Spanish-speaking liaisons to do outreach on worker rights at churches and community colleges and with community and advocacy organizations.[73]
- Run media campaigns with ads, billboards, radio, and online materials to spread awareness of heat illness prevention. These materials are made available in Spanish and other languages.

[8] California and Oregon use this term, but Washington States does not but has the same requirements.

- Conduct Labor Rights Caravan to drive vans through farmworker communities. These vans share information through digital billboards, megaphones, and multilingual materials.[74]
- Organize an annual Heat Illness Prevention Network Call for private and public sector employers.
- Manage a listserv to updates their network on any regulatory changes or relevant news.

Recommendations

A two-fold approach is needed to most effectively protect all of New York City's outdoor workforce. First, legislation must expand employer requirements to cover workers with traditional employment arrangements[9] against extreme weather conditions. Second, the City must implement broader public health initiatives that benefit independent contractors and gig workers.

Employer Requirements

Labor laws that mandate employer actions are the most direct way to set standards for the outdoor workforce. A suite of legislation that addresses extreme heat, extreme cold, and unsafe air quality will provide a floor for comprehensive worker protections in the face of climate threats.

1. **Pass the TEMP Act.** To protect workers against extreme heat, first and foremost the State should pass the TEMP Act, which sets clear employer requirements to provide access to shade, water, PPE, and monitoring during periods of extreme heat. If passed, the TEMP Act would be the most significant first step in setting labor standards for increasingly hot working conditions as NYC temperatures continue to rise.

2. **Expand outdoor heat standards to cover all NYC outdoor workers through City legislation.** The TEMP Act only covers agriculture, non-union construction, landscaping, car wash, commercial shipping, food service, and warehousing sectors. The bill leaves out many NYC-based outdoor jobs, including protective services; installation, maintenance, and repair; personal care; and transportation sectors. Following the passage of the TEMP Act at the State level, the City should pass legislation to expand the TEMP Act heat protections to all NYC outdoor workers. In addition to expanding coverage, Council should also consider more robust heat illness protections above and beyond the TEMP Act based on best practices from other jurisdictions. Expanded heat measures include increasing the duration and frequency of rest breaks as temperatures rise, and acclimatization periods for new employees are gradually increase outdoor exposure to better acclimate to hot working conditions.

3. **Pass City or State legislation to set labor standards for unsafe air quality.** The predicted increase in western wildfires and air pollution concerns from high ozone are likely to bring more air quality emergencies to New York City. Legislation to protect outdoor workers from unsafe air quality should be modeled after

[9]Defined as W-2 employment, workers who are directly employed by their employer

California's wildfire smoke protection law. Air quality protections should define protocols for employers to provide the following:

a) **Reduce strenuous physical activity**: instituting rest breaks or reducing the intensity of labor will reduce the amount of unsafe air quality that workers breathe in.

b) **PPE**: NIOSH-approved particulate respirators will allow employees to remain safely outdoors when the AQI exceeds a certain threshold.

c) **Safe air access (engineering controls)**: enclosed indoor spaces with filtered air can offer workers safe respite during air quality emergencies.

d) **Administrative controls**: employers should identify procedures to relocate workers to locations with healthy air quality where possible, or change work schedules to avoid exposure during high AQI periods.

e) **Air quality illness prevention plans:** like cold and heat illness prevention plans, air quality prevention plans should identify the measures employers will take to communicate with workers about unsafe AQI levels in real-time, relocate or adjust work schedules during air quality emergencies, and train employees on how to protect themselves against health risks from unsafe air quality. Plans should be made available to all employees and regulators.

Public Health Initiatives

Employer requirements do not apply to independent contractors and proprietors, or workers in the informal economy who are already among the most vulnerable to poor labor conditions. Given the large number of street vendors, delivery workers, and day laborers in NYC, the City should implement public health initiatives that support the specific needs of NYC's outdoor workers with non-standard employment arrangements.

4. **The City should develop emergency guidance for employers to protect the health and safety outdoor labor during extreme weather.** Currently, the City's guidance for extreme weather emergencies is for the general public. This has left many employers and workers unclear about best workplace practices in the face of extreme weather. The City should develop specific guidance that outlines best practices for employers and outdoor workers to mitigate the health impacts of heat waves, air quality emergencies, extreme cold, and other climate disasters. This guidance should be written in plain language and made available in multiple languages. The City should proactively make this guidance accessible to workers and employers through outreach to chambers of commerce, industry associations, unions, labor advocates, and places of worship, as well as through relevant City agencies including the Departments of Consumer and Worker Protection (DCWP) and Small Business Services (SBS).

5. **Expand public bathroom access, especially in areas with high concentrations of outdoor workers.** Interviews with advocates and labor organizations representing outdoor workers all featured a consistent theme: the need for more public bathroom access. Without bathroom access, outdoor workers suffer from dehydration and urinary tract infections because they intentionally limit water intake. Over the past couple years, there have been mounting efforts to increase public bathroom access throughout the city.[10] Notably in 2021, the City Council passed legislation granting food delivery workers the right to use bathrooms of the restaurants for which they make deliveries, regardless of whether they are employed by the restaurant.[75] However, awareness and enforcement of this law has been inconsistent. First and foremost, the City should better enforce this law to ensure better bathroom access for delivery workers. In June 2024, the City launched "Ur In Luck," a program to build 46 new restrooms and renovate 36 existing restrooms across the five boroughs.[76] Informed by the Capital Process Reform Task Force recommendations, the City should expedite these critical capital projects and publicly report on progress toward this goal each year.

6. **Reform the City Street Vending Code to permit food vendors to use awnings for shade coverage**. Food vendors were previously permitted to use awnings for shade, but that practice is no longer allowed. The City should amend NYC Administrative Code §20-465 covering "restrictions on the placement of vehicles, pushcarts, and stands" to allow for taller heights and broader coverage so that merchandise vendors can access shade.[77]

7. **Establish a City PPE distribution program for air quality emergencies for outdoor workers with non-standard employment arrangements.** When the air quality emergency happened in 2023, groups serving outdoor workers scrambled to secure PPE through corporate and philanthropic donations. The City should maintain a stockpile of PPE for outdoor workers without traditional employers, as it did during the height of the Covid-19 crisis for essential workers. The City should partner with existing labor organizations, such as La Colmena, Street Vendor Project, and Workers Justice Project, to distribute PPE to their members during air quality emergencies.

8. **Develop a proactive outreach program to educate outdoor workers on how to stay safe during extreme weather.** The City should create a centralized website and hotline where workers can access real-time information about how extreme weather may impact outdoor labor conditions, as well as City resources and know-your-rights materials. Materials should be written in easy-to-understand plain language, as well as translated into all the languages spoken by outdoor workers.

[10] In 2022, the City Council passed a law introduced by CM Rita Joseph mandating a report on suitable locations for installing public bathrooms. In 2023, City Councilmember Sandy Nurse introduced a long-term bill to establish a strategic planning process to provide one toilet per 2,000 residents by 2035. This bill has yet to pass.

To supplement that effort, the Department of Consumer and Worker Protections (DCWP) should develop a comprehensive outreach strategy to ensure that these resources are getting into the hands of outdoor workers. Examples of such strategies include know-your-rights trainings, informational materials and media campaigns about how to stay safe during different types of extreme weather, multilingual community liaisons to provide hands-on engagement to meet outdoor workers where they are at. The City's existing outreach contracts with worker justice organizations should be expanded to conduct engagement and trainings on worker safety during extreme weather and poor air quality.

9. **The City should collect and publicly report data on the occupational impacts of extreme weather.** Little data exists on New York City's outdoor workforce—not to mention the occupational health impacts of climate change. To address this data gap, the City should annually collect data on occupational extreme weather-related fatalities (for both heat and cold), injuries, health conditions, and workplace illness incidents. These data should be disaggregated by occupation, race, gender, languages spoken, country of origin, and other demographic information for a clearer picture of how extreme heat, extreme cold, and poor air quality affects outdoor workers. The City should publish this information in an annual report that tracks the impacts of climate change on labor and can be used to inform new labor standards, education and outreach to workers about their safety and rights, where to site public bathrooms to best serve outdoor gig workers, and other policy solutions.

Conclusion

The hundreds of thousands of outdoor workers in NYC are among the most vulnerable to increasingly frequent heat waves and air quality emergencies. Safeguarding our outdoor workforce from the impacts of climate change requires swift action to ensure access to safe working conditions. Employers must be held accountable to provide safety protections on job sites. Meanwhile, the City must expand public health initiatives to benefit independent contractors and gig workers. The City and State must center the needs of workers on the frontlines of climate change for a just and equitable future.

Appendix

Figure 6: Individual Occupations with 90% or Greater Outdoor Exposure Rates

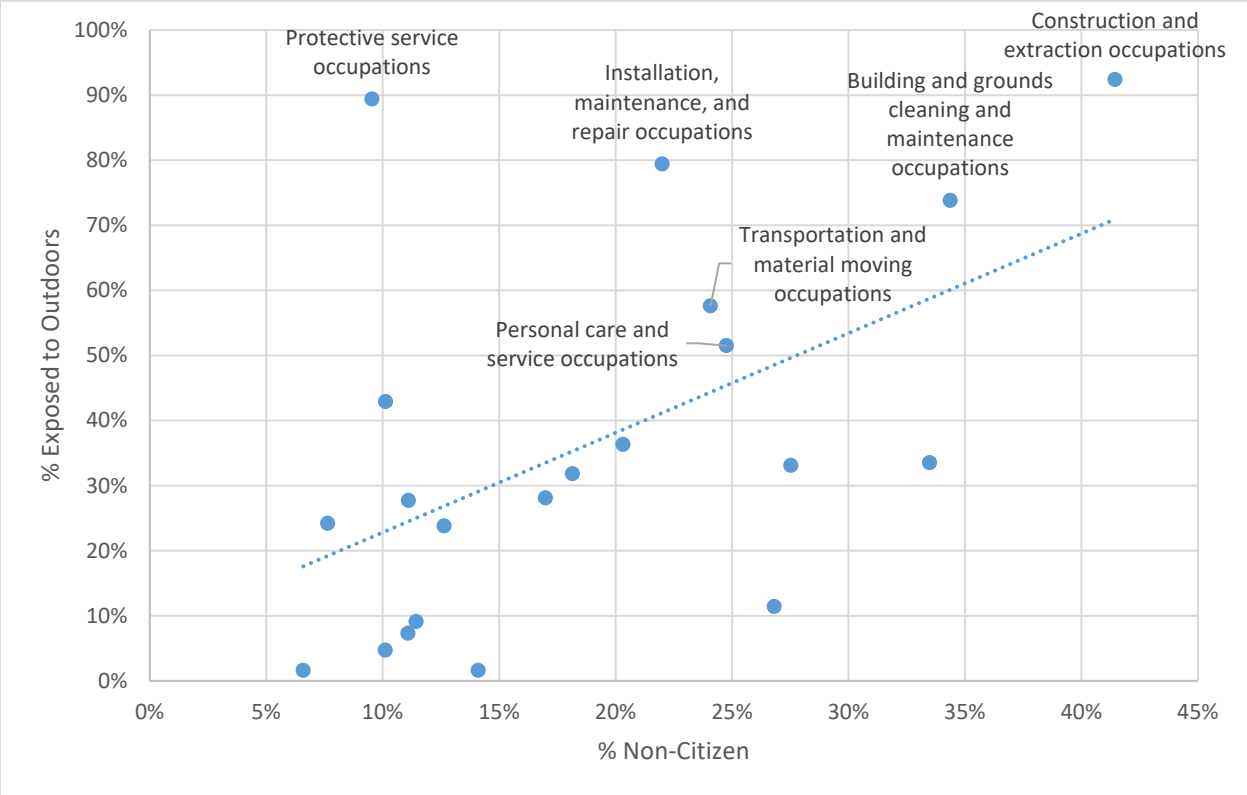
Occupation	SOC Group	% Exposed to Outdoor
Ambulance drivers and attendants, except emergency medical technicians	Transportation and material moving occupations	100%
Earth drillers, except oil and gas	Construction and extraction occupations	100%
Firefighters	Protective service occupations	100%
Rail-track laying and maintenance equipment operators	Construction and extraction occupations	100%
Roofers	Construction and extraction occupations	100%
Landscaping and groundskeeping workers	Building and grounds cleaning and maintenance occupations	100%
Construction laborers	Construction and extraction occupations	100%
Highway maintenance workers	Construction and extraction occupations	100%
Electrical power-line installers and repairers	Installation, maintenance, and repair occupations	100%
Operating engineers and other construction equipment operators	Construction and extraction occupations	100%
Police and sheriff's patrol officers	Protective service occupations	99%
Insurance appraisers, auto damage	Business and financial operations occupations	98%
Reinforcing iron and rebar workers	Construction and extraction occupations	98%
Captains, mates, and pilots of water vessels	Transportation and material moving occupations	98%
Paramedics	Healthcare practitioners and technical occupations	97%
Fire inspectors and investigators	Protective service occupations	97%
Heating, air conditioning, and refrigeration mechanics and installers	Installation, maintenance, and repair occupations	97%

Occupation	SOC Group	% Exposed to Outdoor
Funeral attendants	Personal care and service occupations	97%
Mobile heavy equipment mechanics, except engines	Installation, maintenance, and repair occupations	96%
Carpenters	Construction and extraction occupations	95%
Control and valve installers and repairers, except mechanical door	Installation, maintenance, and repair occupations	95%
Cement masons and concrete finishers	Construction and extraction occupations	95%
Crossing guards and flaggers	Protective service occupations	95%
Paving, surfacing, and tamping equipment operators	Construction and extraction occupations	95%
Electricians	Construction and extraction occupations	94%
Construction and building inspectors	Construction and extraction occupations	94%
Water and wastewater treatment plant and system operators	Production occupations	94%
Appraisers and assessors of real estate	Business and financial operations occupations	93%
Recreational vehicle service technicians	Installation, maintenance, and repair occupations	92%
Heavy and tractor-trailer truck drivers	Transportation and material moving occupations	92%
Preschool teachers, except special education	Educational instruction and library occupations	92%
Helpers--installation, maintenance, and repair workers	Installation, maintenance, and repair occupations	92%
Motorcycle mechanics	Installation, maintenance, and repair occupations	91%
Mining and geological engineers, including mining safety engineers	Architecture and engineering occupations	91%
Light truck drivers	Transportation and material moving occupations	91%
Shuttle drivers and chauffeurs	Transportation and material moving occupations	91%

Occupation	SOC Group	% Exposed to Outdoor
Security guards	Protective service occupations	90%
Morticians, undertakers, and funeral arrangers	Personal care and service occupations	90%
News analysts, reporters, and journalists	Arts, design, entertainment, sports, and media occupations	90%
Parking attendants	Transportation and material moving occupations	90%
Bus drivers, transit, and intercity	Transportation and material moving occupations	90%

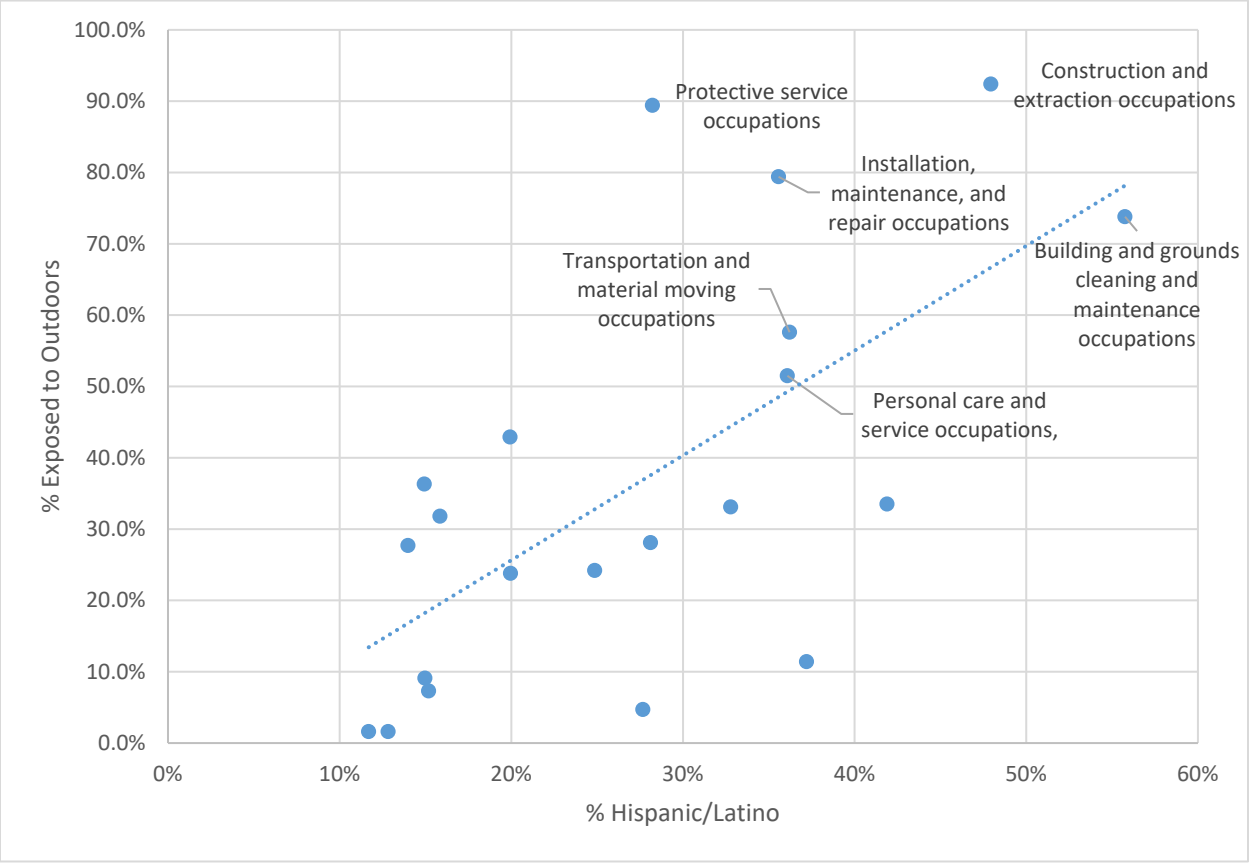
Source: Bureau of Labor Statistics, *Occupational Requirements Survey* (2023)

Figure 7: SOC Group Outdoor Exposure by Non-Citizen Share in NYC



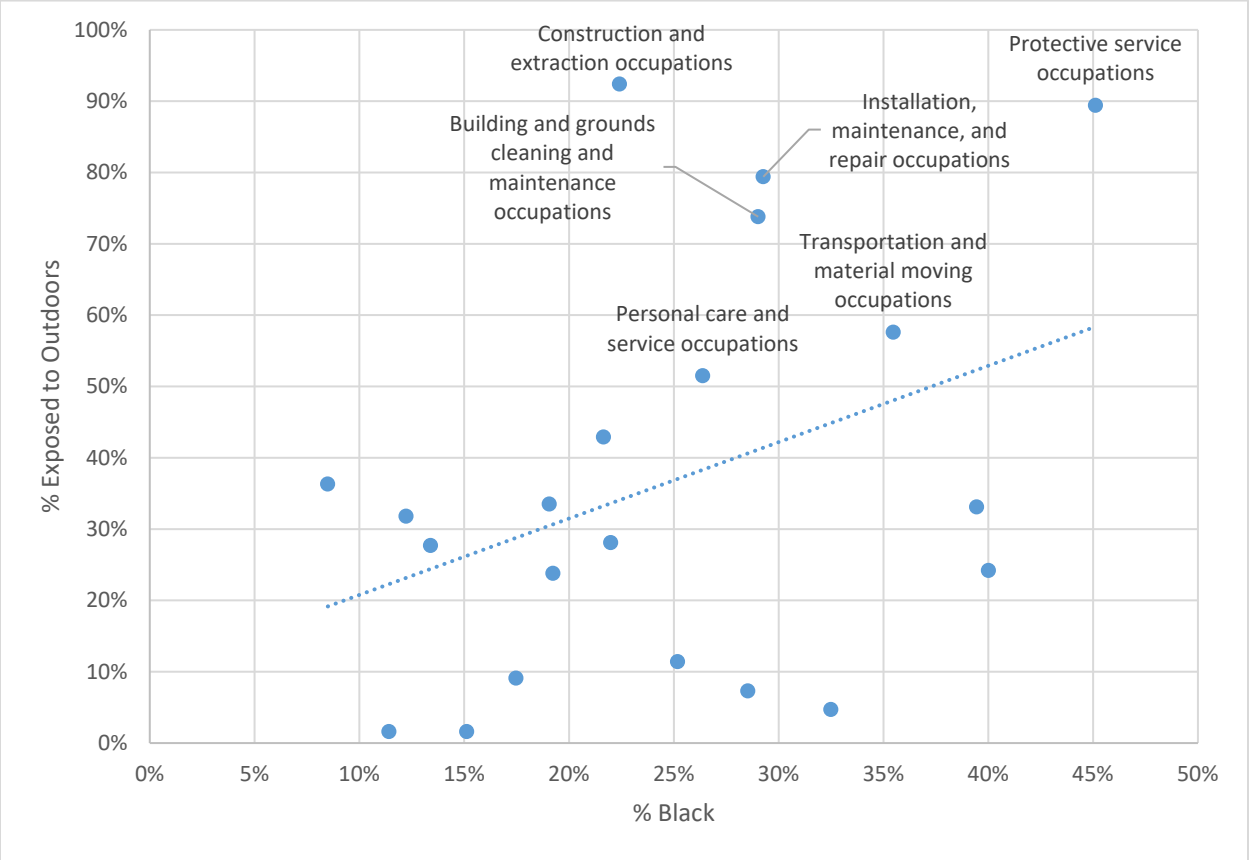
Source: % Exposed to the outdoors is from the Bureau of Labor Statistics, *Occupational Requirements Survey* (2023), % Non-Citizen is from the U.S Census Bureau's *American Community Survey 1-Year Estimates Public Use Microdata Sample* (2022). Data was matched from both sources on the field SOC group. See Methodology section for more information.

Figure 8: SOC Group Outdoor Exposure by Hispanic/Latino Worker Share in NYC



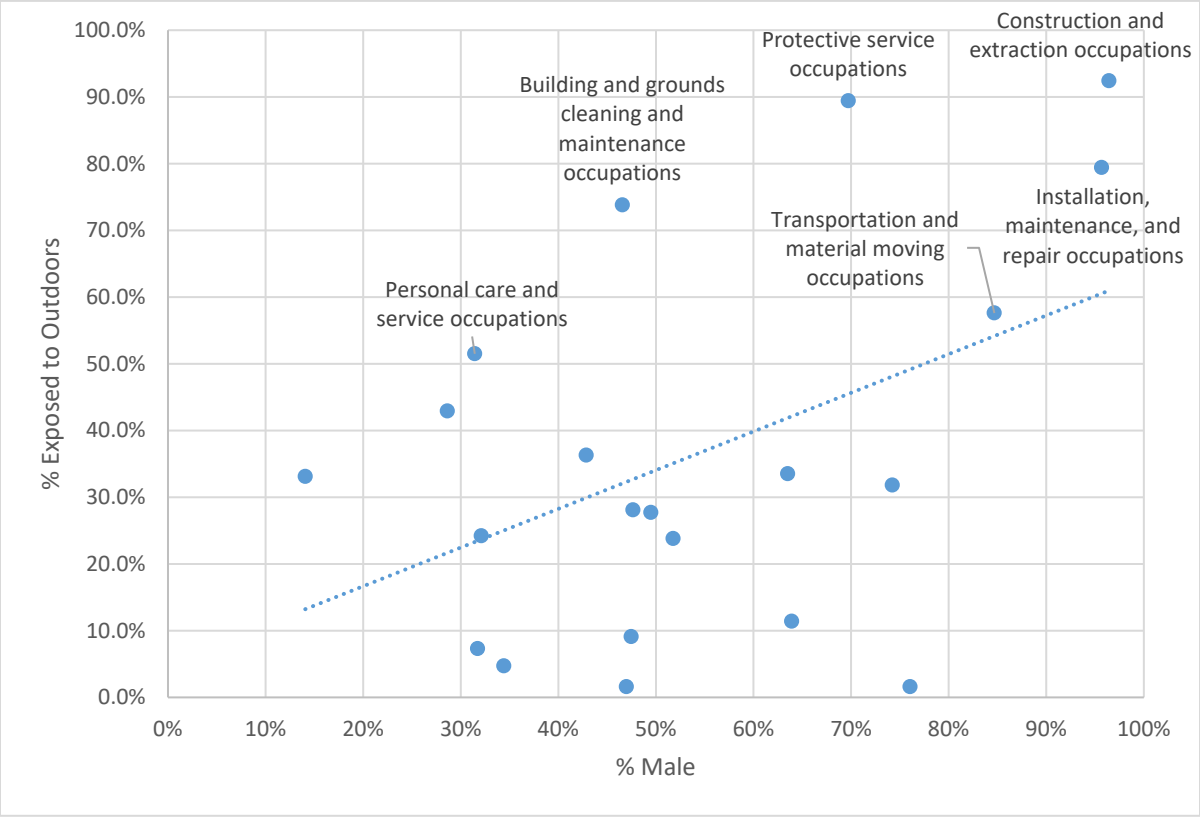
Source: % Exposed to the outdoors is from the Bureau of Labor Statistics, Occupational Requirements Survey (2023), %Hispanic/Latino is from the U.S Census Bureau's American Community Survey 1-Year Estimates Public Use Microdata Sample (2022). Data was matched from both sources on the field SOC group. See Methodology section for more information.

Figure 9: SOC Group Outdoor Exposure by Black Worker Share in NYC



Source: % Exposed to the outdoors is from the Bureau of Labor Statistics, Occupational Requirements Survey (2023), %Black is from the U.S Census Bureau's American Community Survey 1-Year Estimates Public Use Microdata Sample (2022). Data was matched from both sources on the field SOC group. See Methodology section for more information.

Figure 10: SOC Group Outdoor Exposure by Male Worker Share in NYC



Source: % Exposed to the outdoors is from the Bureau of Labor Statistics, *Occupational Requirements Survey* (2023), % Non-Citizen is from the U.S Census Bureau's *American Community Survey 1-Year Estimates Public Use Microdata Sample* (2022). Data was matched from both sources on the field SOC group. See Methodology section for more information.

Methodology

Quantifying NYC's Outdoor Workforce

Outdoor Exposure

The U.S. Department of Labor Bureau of Labor Statistics' *Occupational Requirements Survey* (ORS) provides data on characteristics of different occupations, including the percentage of workers in each Standard Occupational Classification (SOC) group exposed to the outdoors. These data represent national rates of outdoor exposure. The data on outdoor exposure rates were paired with data from the NYS Department of Labor's *Occupational Employment and Wage Statistics* (OEWS) that quantify the number of NYC workers in each SOC group. To estimate the number of outdoor workers in New York City, the NYC Comptroller's Office multiplied the ORS 2023 estimates of "Percent of workers, exposed to outdoors" for each SOC group by OEWS 2023 data on total number of NYC workers in each SOC group. The ORS data also identifies "Percent of workers with constant outdoor exposure," defined as being outdoors for two-thirds of the workday.

NYC Employment Count and Wages

Data on employment counts and wages of workers in SOC Groups and individual occupations is from the NYS Department of Labor's OEWS (2023, Quarter 1). The Comptroller's Office retrieved these data by identifying "New York City" in the "AREANAME" category. The variable, "Number of workers exposed to outdoors," was calculated for all SOC groups along with the whole NYC workforce by applying the respective ORS percent of workers with outdoor exposure to the OEWS estimate of the total number of workers in NYC. For the NYC workforce as a whole, the national percentage for all workers was applied to calculate the total number of outdoor workers.~~.~~ Shares of the NYC workforce were calculated by taking SOC groups' total counts of workers and dividing them by the total number of workers in NYC.

The Comptroller's Office ran a linear regression on the relationship between median salary of an SOC Group, the percentage of time workers were exposed to the outdoors, and total employment within the New York City, all as reported to the Bureau of Labor Statistics. The regression formula was: Median Salary = $\alpha+\beta1*$Exposure + $\beta2*$Total Employment. The results found that for every one percentage point increase in exposure, the median salary of the SOC Occupation group declined by $698. Both the intercept and exposure coefficients were statistically significant, with an R-squared value of 25%.

Demographics

Data on citizenship status, race/ethnicity, and gender are from the U.S. Census' *ACS 1-Year Estimates Public Use Microdata Sample (2022),* using a PUMS Person Weight. The Comptroller's Office used the total counts for all the Public Use Microdata Areas (PUMAs) that fall within NYC.

Based on surveys of workers, the variables in the original data are all estimates of the number of workers within a specific occupation that fall within a specific demographic (e.g. the count of dishwashers who are not U.S citizens). For each variable, all percentages for SOC groups were calculated by dividing the total estimates of all relevant individual occupations within that SOC group by the total number of workers in that SOC group surveyed on that variable question. In Figure 5, percentages for the grouping, "Majority of workers exposed to the outdoors" were calculated the same way, just with the calculated totals of the relevant SOC groups (SOC groups where their percentage exposed to the outdoors was greater than 50%). For these calculations, "Farming, fishing, and forestry occupations" and "Military occupations" were excluded due to a lack of counts available among multiple variables.

Note that each racial group is its own data field. Survey respondents are not asked to pick one race out of a set of options, and therefore respondents may answer "Yes" for multiple races.

Stakeholder Interviews

In order to better understand the on-the-ground impacts that outdoor workers face during extreme weather conditions, the NYC Comptroller's Office also interviewed staff and workers of the several organizations who represent or engage with the outdoor workforce in NYC. These interviews offered insight about the needs and experiences of outdoor workers during heat waves, extreme cold, and air quality emergencies. Interviewees described their experiences to us. The interviews where information is cited in the report include:

List of Organizations Interviewed

Organization	Date of Interview
Los Deliveristas Unidos	5/21/2024
Street Vendor Project	5/22/2024
Cal/OSHA	5/23/2024
La Colmena	5/30/2024
International Brotherhood of Teamsters, Local 804	5/31/2024
Immigrant Research Initiative	5/31/2024

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