



The California Janitor Workload Study

Overview
February 28, 2025



Study Objective

A comprehensive overview of the workload, psychosocial stress, and work climate that contribute to a high prevalence of negative health outcomes among California Janitors.

Specific Aims

1. Summarize the physical workloads, work psychosocial stress, and work climate of California janitors.
2. Describe the relationship between physical workload, psychosocial stress, and work climate measures on physical and mental health.
3. Summarize the impact of the COVID-19 pandemic on janitorial workload among California janitors.
4. Describe the experience of contractors and building owners/managers in adjusting contracts to ensure adequate staffing and providing janitors with the time, training and tools needed to fulfill the cleaning standards requirements.
5. Compare the time required to clean and disinfect different types of spaces to the actual production rates based on tasks per square foot (density) and task duration (rate) by venue
6. Quantify biomechanical exposures and risk of injury while performing different types of tasks at different venues.

Survey

- COVID-19 impact
- Assess Exposures
- Mental/Physical Health

Focus Groups

(Labor Occupational Health Program - LOHP)

- Work changes
- Productivity Requirements
- Management challenges

Time Study

- Biomechanical exposures/risk
 - *4 venues: office, mall, event space, airport*
- Compare actual to ISSA production rates

Survey Methods

Cross-sectional survey (Spanish & English)

Distributed to union members and non-union members of labor organizations

Eligibility: working as California janitor, 18 years or older

- No identifying information other than age, sex, and ethnicity
- 75 questions
- 30-45 minutes to complete

Sent survey by email, text & social media

- Spring and Summer of 2022
- Continue collecting survey data via 1:1 interviews at data collection sites for future sensitivity analysis and evaluation of selection bias

JANITOR WORKLOAD STUDY
PARTICIPANTS NEEDED

COVID -19 has impacted day-to-day life.

This research study aims to assess workers' experiences with COVID-19 prevention measures at the worksite and determine safe and effective workloads for California Janitors.

Participants will take a 15 - 20 minute survey asking about the experiences they face as everyday workers during COVID - 19.

The survey is anonymous and we will not be asking for any personal information such as name or workplace.

Use the QR code to access the survey. For more information, contact ucergonomics@berkeley.edu

UNIVERSITY OF CALIFORNIA

Exposures

Task	Intensity	Frequency	Duration	Workload Index
Dusting	6	5	3	90
Mopping	5	3	2	30
Vacuum	8	2	2	32
Trash	4	5	4	80
				232

Three Ways to Summarize Exposure

Peak = highest intensity across tasks

Typical = intensity of the task performed the most

Workload Index = Intensity * Frequency * duration

Adverse Health Outcomes

Adverse Physical Health Outcomes

- Severe Pain: measured using 10-point numeric pain scale
 - 4 body regions: Neck/shoulder, elbow/hand/wrist, back, hip/knee/ankle
 - Average score ≥ 5 considered severe
- Medication Use: regularly take pain meds at least 1 week per month
- Missed work due to pain: ≥ 1 day every other month or more
- Work-related injury: ≥ 1 in last year
- Impact on outside activities: pain negatively impacted ability to perform activities outside of work in the last year

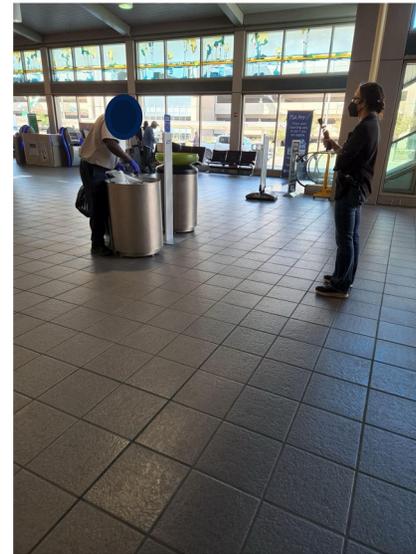
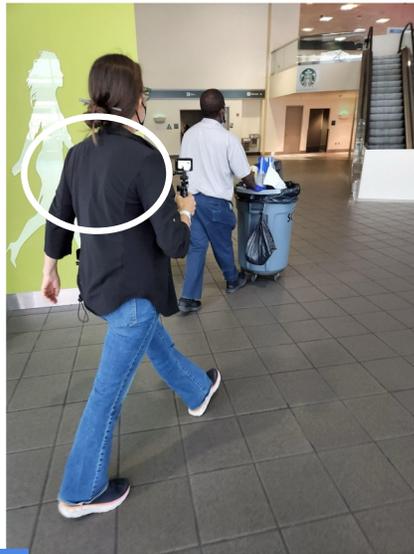
Adverse Mental Health Outcomes

- Anxiety: ≥ 10 using Generalized Anxiety Depression Scale (GAD-7)
- Depression: ≥ 10 using PHQ-9

On-site Data Collection



Handheld
Camera



Direct Measurements

Detailed Video Analysis

- Multi-Video Task Analysis (MVTA)
- Cumulative Time on Task by Space

The screenshot displays a video analysis interface. At the top, a multi-colored timeline bar represents task events. Below it, a video frame shows a person in a red shirt cleaning a desk in an office. A yellow circle highlights the person's head. A 'Records' panel on the left lists: 1: Task, 2: Space, 3: Right Hand Tool, 4: Left Hand Tool. A timestamp '07:32:22;34' is visible at the bottom of the video frame. On the right, an 'Events' list includes: Dry Mopping, Dusting, Disinfecting, Wet Mopping, Sweeping, Litter Pick Up, Trashing, Resupply, Walking, Transport, Standing, Furniture Moving, PPE, Wiping, Washing windows, Washing mirrors, Vacuum cleaning, Dish washing, Cleaning Sink, Cleaning Toilet, Repair, Break, and Null. The text 'Detailed Video Analysis 30 frames per second' is centered at the bottom of the interface.

Detailed Video Analysis

- Venue-Specific Vocabulary List

Space

Bathroom General, Hallway/Walkway, Common Space, Outdoor, Cafeteria/Lounge/Kitchen, Office/Cubicle, Supply Closet, Janitorial Storage, Trash area/Recycling area, Meeting Room, Elevator, Escalator, Breaktime

Task

Washing Windows, Washing/Cleaning Mirrors, Wet Mopping, Dry Mopping, Sweeping, Litter Pick Up, Disinfecting/Scrubbing, Dusting, Wiping, Trashing, Resupply, Transport, Walking, Standing, Furniture Moving, PPE, Vacuum Cleaning, Cleaning toilet, Cleaning sink, Breaktime

Tool

Brooms/Dust Pan, Rag/Paper Towel/Sponge, Trash Barrels, Trash, Picker Upper/Tongs, Duster, Duster Mop, Spray Bottle, Spray bottle trigger, Wet Mop + Mop Bucket, Supplies, Toilet brush, Bucket, Vacuum Cleaner, Cart, Vacuum + Cart, **Walkie Talkie, Hands, No exertion, Breaktime

Participants

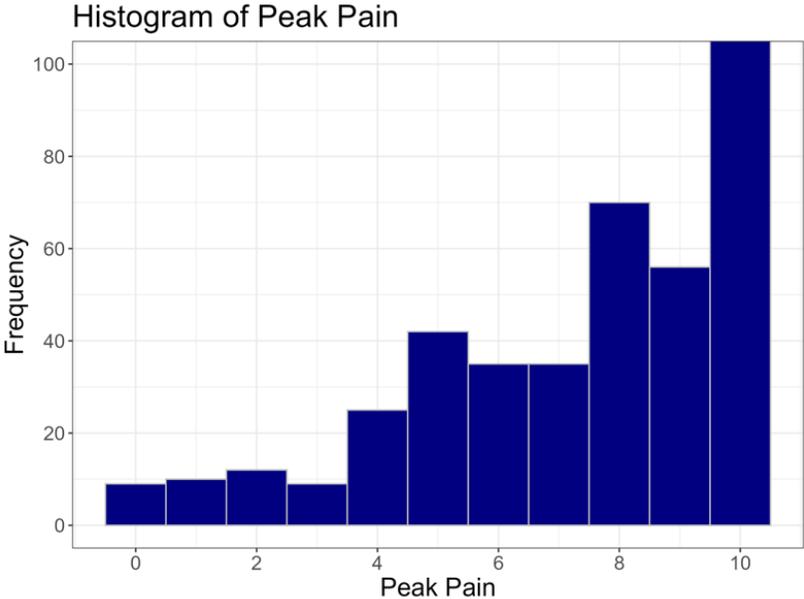
432 respondents had complete data

- Demographics
 - 73.5% Female
 - 48% 50 years of age or older
 - 96% Hispanic
- Education
 - 35% Middle School
 - 49% at least some High School/GED
- Health Status
 - 43% had a co-morbidity
- Work Organization
 - 74.8% Union Members
 - 48% worked >10 years as a Janitor
 - 71% Subcontractors

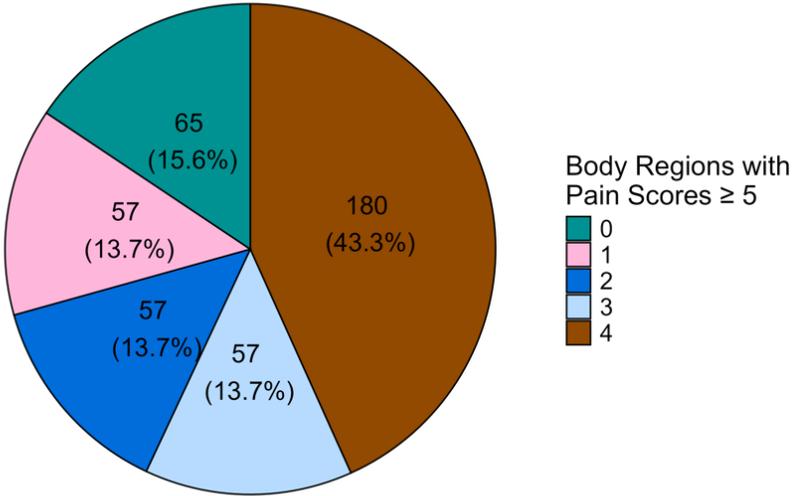
Primary Finding

1. The prevalence of adverse health outcomes was high.

Pain Prevalence



Total Body Regions with Pain Scores ≥ 5 (N (%))



Pain Prevalence

- **85% of respondents reported moderate to severe pain over the prior month in at least one body region**
- **57% had moderate to severe pain in three or four body regions**
- **Over half use medication more than once a month to manage their pain**
- **One in five workers miss work at least every other month due to their pain**
- **One in three reported having had at least one work-related injury**
- **Two of five workers reported that their pain had a moderate to extreme impact on their ability to perform activities outside of work**

Anxiety or Depression

The prevalence of anxiety or depression was much lower than the prevalence of musculoskeletal pain.

Just less than one in five workers were likely to have either anxiety or depression.

Primary Finding

2. Janitors reported high physical workloads across numerous tasks. High workloads were statistically significantly associated with adverse health outcomes.

High Physical Workloads

- **Workers in the high-exposure groups had more than a two-fold increase in the prevalence of severe pain**
 - Prevalence Ratios (PR) ranged between 1.5 to 2.4 and were statistically significant
- **High physical workload was associated with an increased risk of negative impacts from pain including:**
 - Medication use (PR=1.7; 95%CI: 1.4-2.2)
 - Missed work (PR=1.9; 95%CI: 1.1-3.2)
 - Previous injury (PR=1.8; 95%CI: 1.2-2.8)
 - Impact on outside work activities (PR=2.1; 95%CI: 1.6-2.9)
- **Only peak intensity was statistically significantly associated with an increased prevalence of anxiety or depression**
 - PR=1.6; 95%CI: 1.0-2.5

Primary Finding

3. There were some small differences in the prevalence of adverse health outcomes by sex and age.

Differences by Sex

- **There was a 6-9% higher prevalence of average and peak pain among women.**
- **Associations between workload and moderate to severe pain were statistically significant in both men and women, though effect estimates were higher among men.**
- **Associations between workload and pain impact were statistically significant in men and women.**
- **Associations between workload and the prevalence of anxiety or depression were statistically significant in women, not men.**

Differences by Age

- **There was no consistent differences in the prevalence of pain by age.**
- **Associations between workload and pain severity and pain impact with slightly higher among those younger than 50 years of age.**

Primary Finding

4. Union status and job tenure were also associated with some differences in the prevalence of adverse health outcomes.

Union Status

- **The associations between measures of workload and the prevalence of moderate to severe pain was statistically significant among all workers (union and non-union)**
 - The associations were higher among non-union janitors (PR=2.4; 95%CI=1.6-3.7) compared to unionized janitors (PR=1.7; 95%CI:1.3-2.1)
- **The associations between measures of workload and measures of pain impact varied by union status**
- **The associations with the prevalence of anxiety or depression were higher and statistically significant among those unionized**

Job Tenure

- **The associations between measures of workload and the prevalence of moderate to severe pain was statistically significantly higher among those who worked >10 years as a janitor**
 - The associations were higher among non-union janitors (PR=2.4; 95%CI=1.6-3.7) compared to unionized janitors (PR=1.7; 95%CI:1.3-2.1)
- **The associations between measures of workload and measures of pain impact did not consistently vary by job tenure**
- **There were no consistent statistically significant differences in the associations between workload and the prevalence of anxiety or depression by job tenure**
 - Typical work intensity increased the prevalence of anxiety or depression among those >10 years work as a janitor (PR=2.6; 95%CI: 1.2-5.7)

Primary Finding

5. High job strain increased the prevalence of adverse health outcomes, particularly the prevalence of anxiety or depression.

Psychosocial Stress

- **Higher job strain had a higher prevalence of moderate to severe pain, adverse pain impact outcomes, and a higher prevalence of anxiety or depression**
- **High psychological demands were associated with an increased prevalence of severe pain and anxiety or depression**
- **High decision latitude led to a lower prevalence of severe pain (was protective)**
- **Some models were unstable (had wide confidence intervals and elevated effect estimates) due to the low cell counts**

Primary Finding

6. Work Climate also had statistically significant associations with adverse health outcomes, particularly the presence of wage theft and harassment.

Work Climate

- **51% did not think it would be easy to change jobs**
- **23% of workers experienced wage theft at least 3-4 times per year, more than half of which experience it 2-4 times per month**
- **64% say they do not report their pain or injuries**
- **22% work extended hours**
- **37% experience physical (37%), verbal (26%), or sexual (13%) harassment**
 - Up to 12% experience harassment on a daily basis

Work Climate

- **Wage theft was consistently associated with negative health outcomes including pain, pain impact, anxiety/depression**
 - including a 2.4 times higher prevalence of anxiety or depression
- **Harassment of any kind was associated with negative health outcomes including pain, pain impact, anxiety/depression**
 - Including a nearly four-fold increase in the prevalence of anxiety or depression

Primary Finding

7. COVID-19 increased workload and worsened the work climate.

COVID-19 Impact on Janitors

- **Nearly half of workers reported an increase in their workload, disinfecting tasks, and pressure to work faster**
- **There was a reduction in labor during the pandemic**
- **One-third of workers reported not having the protective equipment needed.**
- **One-quarter of workers reported that they could not stay home when sick without fear of loss of job or pay;**
 - The prevalence was higher among those who were not represented by a union (38.3%) versus those represented by a union (22.4%)

Primary Finding

8. ISSA Time Allocations were not very accurate or easy to apply.

ISSA Time Allocation to Actual

- The accuracy of the ISSA time estimates varied widely by workspace and work task, across venues. Most of the top 10 common tasks did not exhibit a clear trend
- Workers were disproportionately affected
 - Mall: underestimated for 4 of 7 workers, up to 225 minutes/shift
 - Airport: underestimated time for 1 of 3 workers, up to 11 minutes/shift
 - Event Center: underestimated for 8 of 13 workers, up to 189 minutes/shift
- Some tasks did not have a corresponding category in the ISSA handbook, making a direct comparison impossible
- Interpretation and application of ISSA standards led to challenges with accurately predicting cleaning times some tasks

Primary Finding

9. Most tasks evaluated using direct measurements and validated risk assessment tools indicated high exposure and MSD risk, particularly for the upper extremities

Risk Assessment – ACGIH Hand Activity TLV, Revised NIOSH Lift Equation, Ohio Bureau of Workers’ Compensation (OBWC) Guidelines

9 of the 11 tasks had average PFI-TLV scores > 1.0 (high risk)

Lifting some Trash Bags
Push/pulling Furniture exceeded safe limits

TASK	Average PFI-TLV Score	
	n	Mean (SD)
Disinfecting/Scrubbing	32	2.66 (0.06)
Wiping	6	1.26 (0.25)
Dust Mopping	9	1.82 (0.02)
Wet Mopping	11	1.72 (0.08)
Washing Windows	4	1.69 (0.09)
Carpet/Rug Moving	1	1.64
Cleaning Escalator	2	1.28 (0.06)
Street Washing	1	1.36
Vacuuming	9	1.07 (0.01)
Sweeping	10	0.97 (0.01)
Dusting	1	0.74

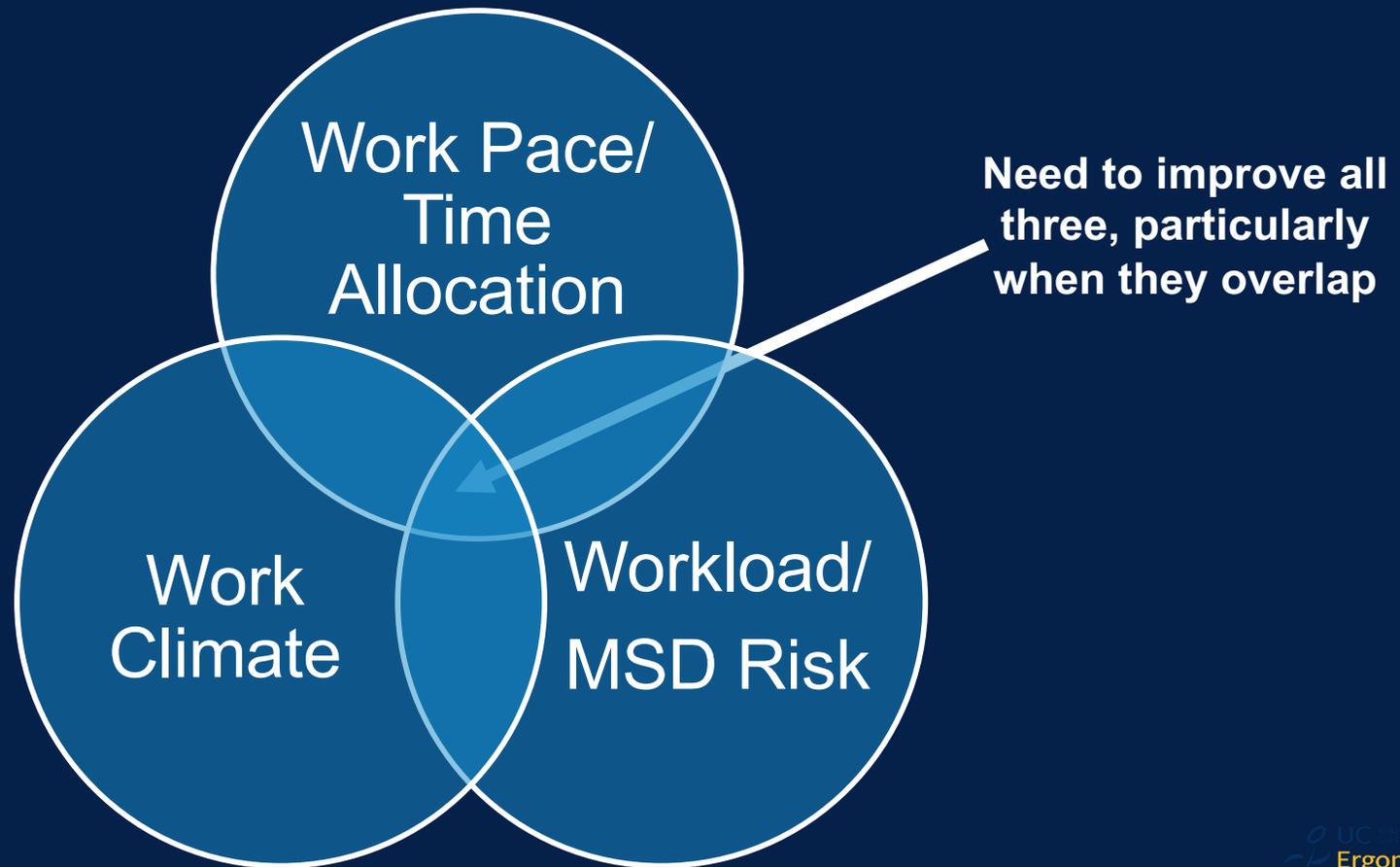


Work Allocation

Productivity guidelines are shaped by the need for efficiency and the scope of work

- Scope of work (density, square footage, and tasks clients demand) and the amount of hours that is needed to complete tasks
- Decisions around productivity guidelines are often determined by management, with some input from workers to make sure that the scope is reasonable
- Age or gender influenced the type of work assignments given. For example, more strenuous work given to men or younger people
- Older janitors had trouble “keeping up”
- Some supervisors gave preference to younger women in job assignments

Improve Janitorial Work and Health



Collaborate on Workload Calculator

Workload Calculator¹

Management Job Planning Report

Job | Work pace | Overall workload | Hand/wrist risk | Shoulder risk | Back risk |

Production rate

The total number of hours allocated to this job is:

The standard number of hours suggested by the industry standards is:

The allocated time for the should be sufficient as it is more than the standards suggested.

The table below shows the comparisons between the allocated and time needed based on the standard times for the tasks in this job. You can go back to the data entry page to adjust either the hours allocated or the productivity rates for the tasks if needed using the button below.

Management Job Planning Report

Job | Work pace | Overall workload | **Hand/wrist risk** | Shoulder risk | Back risk |

Hand/wrist loading

The hand/wrist risk level is considered

The following table shows the task-location-tool combinations that have contributed to the hand/wrist risk level. Improvement to these tasks will be most effective.

** When there are more than 1 identical task-location-tool -variation combination on the list, it means that more than one sub-task in that task-location-tool-variation combination had significant contributions to the hand/wrist loading risk.*

Task-location-tool-variation

Damp Mopping-Hard Flooring (damp mopping)-Flat Mop (hard floor)-Use bucket, area with obstacles
Damp Mopping-Hard Flooring (damp mopping)-Flat Mop (hard floor)-Use bucket, area with obstacles
Restroom/Locker Room Cleaning-Restroom (cleaning)-Tools for cleaning surfaces, toilets, floors-Straight-handled toilet brush, string mop used
Vacuuming-Office/cubicle (vacuuming)-Backpack vacuum (office/cubicle)-None
Restroom/Locker Room Cleaning-Restroom (cleaning)-Tools for cleaning surfaces, toilets, floors-Straight-handled toilet brush, string mop used

1 Bao, S., Lin, J.-H., Howard, N., & Lee, W. (2023). Development of Janitors' Workload Calculator. Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 0(0). <https://doi.org/10.1177/21695067231192623>

Recommendations

- **Reduce Workload through Design**
 - Reduce MSD risk associated with each task through evaluation and redesign of tools and tasks
 - Develop evidence-based guidelines on best practices and tools, complete with exposure and risk comparisons
- **Improve Work Pace Requirements**
 - Recommend quantitative actual versus allocated time on task comparisons with guidelines on how to evaluate and adjust
- **Improve Work Climate**
 - Work with Labor Organizations, MCTF, and other stakeholders to train workers on how to report wage theft and harassment
 - Require management/supervisor training to prevent wage theft and harassment, and reduce job strain

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