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The California Janitor Workload Study

The impact of precarious work and psychosocial stress on physical and mental health of California janitors

UC Berkeley San Francisco Ergonomics Program

Northern California Center for Occupational & Environmental Health

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Protecting workers and communities from occupational and environmental health hazards through teaching, research, and service

Academic

Research

Outreach

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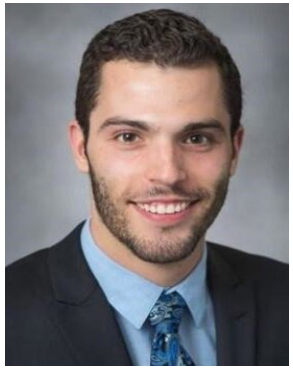

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Survey

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

Focus Groups

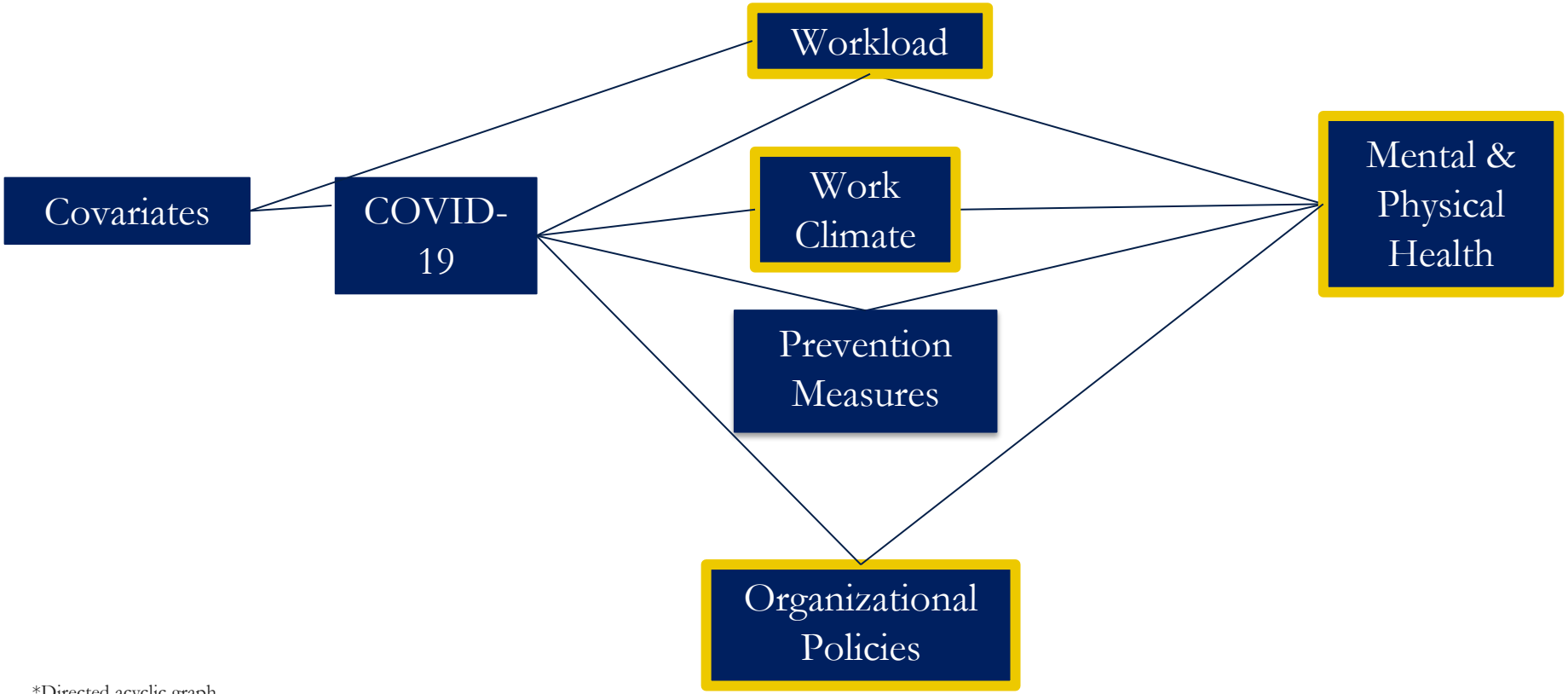
(Labor Occupational Health Program - LOHP)

- Work changes
- Productivity Requirements
- Management challenges

Time Motion Study

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

Survey



*Directed acyclic graph

Today's Updates

Assess the associations between:

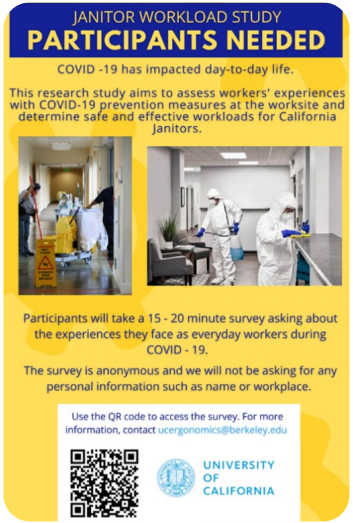
- **Physical Workload**
- **Job Strain**
- **Precarious Work**

and adverse mental and physical health outcomes.

Update on the progress of the time motion study

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



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Physical Workload

Data Collection

- Crosssectional survey sent to 40,000 CA janitors in a union (SEIU) and non union organization (MCTF)
- Spanish & English
- email/text interview

Exposures

- 16 common tasks (vacuuming, dusting, mopping, etc.)
- Workload index: arbitrary unit
- - intensity x frequency x duration
- Typical intensity: intensity of task done for most time
- Peak intensity: maximum intensity of all tasks

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

** Workload Index = Intensity * Frequency * duration

Job Strain

Modified Job Content Questionnaire (JCQ) survey (Karasek, 1998)

4-point scale - strongly disagree to strongly agree

Decision Latitude (job control)

1. On my job, I have very little freedom to decide how I do my work
2. I have a lot of say about what happens on my job
3. My job allows me to make a lot of decisions on my own

Psychological Demands (job demand)

1. I do not have enough time to get my job done
2. My job requires very fast work
3. My job requires very hard work
4. My job requires excessive work
5. My job involves conflicting demands

Precarious Work

- **Job Insecurity**
  - How easy would it be for you to find a job with another employer with approximately the same income and fringe benefits that you have now?
- **Wage theft**
  - How often have you worked hours that were not paid?
- **Under-reporting injuries**
  - Rate your agreement with this statement about your supervisor: ‘I can report an injury without fear of retaliation’

Precarious Work

- **Working extended hours**
  - Have more than one job AND total work hours per week > 40
- **Physical, sexual, verbal bullying**
  - How often are you concerned about being:
    - Physically bullied or harassed
    - Sexually bullied or harassed
    - Verbally bullied or harassed
- **Harassment**
  - Any type of bullying/harassment

Adverse Health Outcomes

Adverse Physical Health Outcomes

- Severe Pain measured using 1-10 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

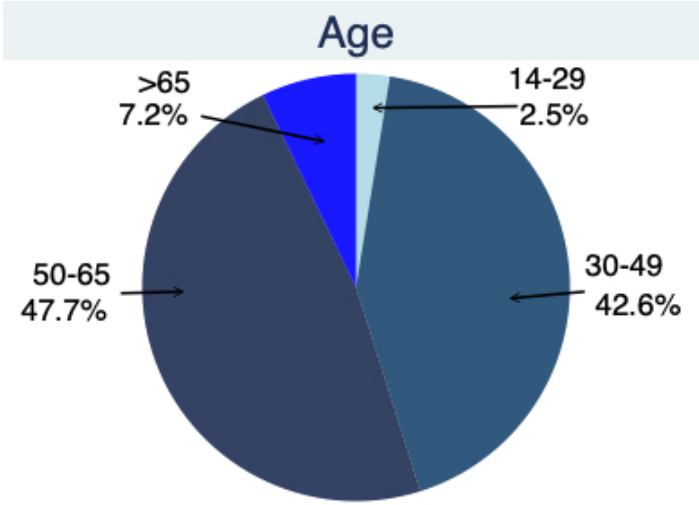
Adverse Mental Health Outcomes

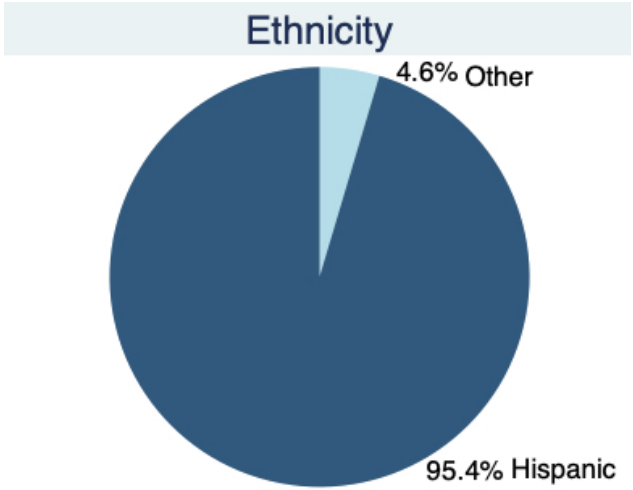
- Anxiety: ≥ 10 using Generalized Anxiety Depression Scale (GAD-7)
- Depression: ≥ 10 using PHQ-9

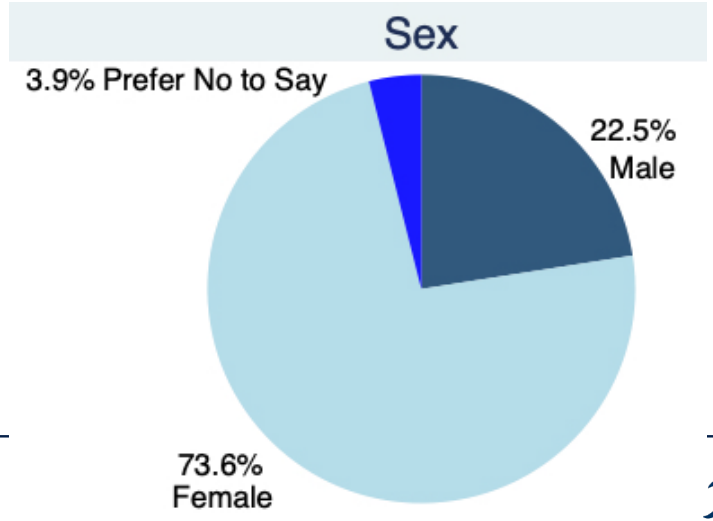
Statistical Analysis

- To evaluate the associations, odds ratios and 95% confidence intervals calculated using logistic regressions (StataBE 17, College Station Texas)
  - Physical Workload and adverse health outcomes
  - Job strain measures and adverse health outcomes
  - Precarious work measures and adverse health outcomes
- All models were adjusted for sex and age
  - Education, comorbidities, and smoking were determined to not be confounders

Results - Demographics







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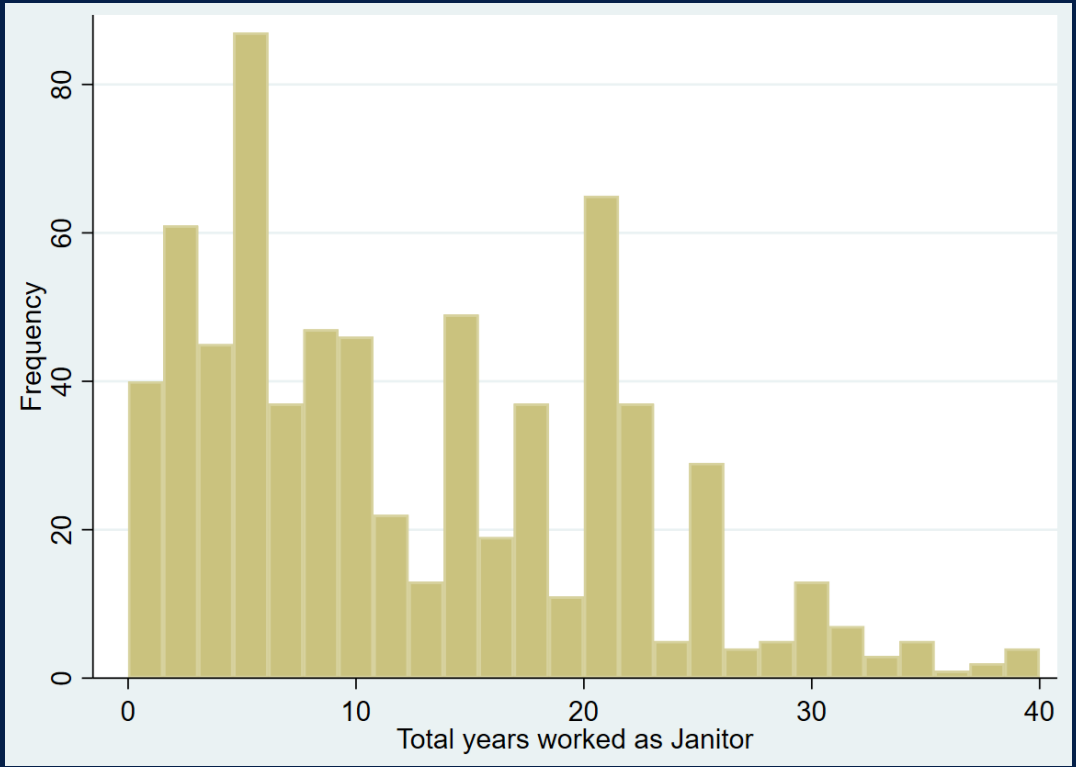
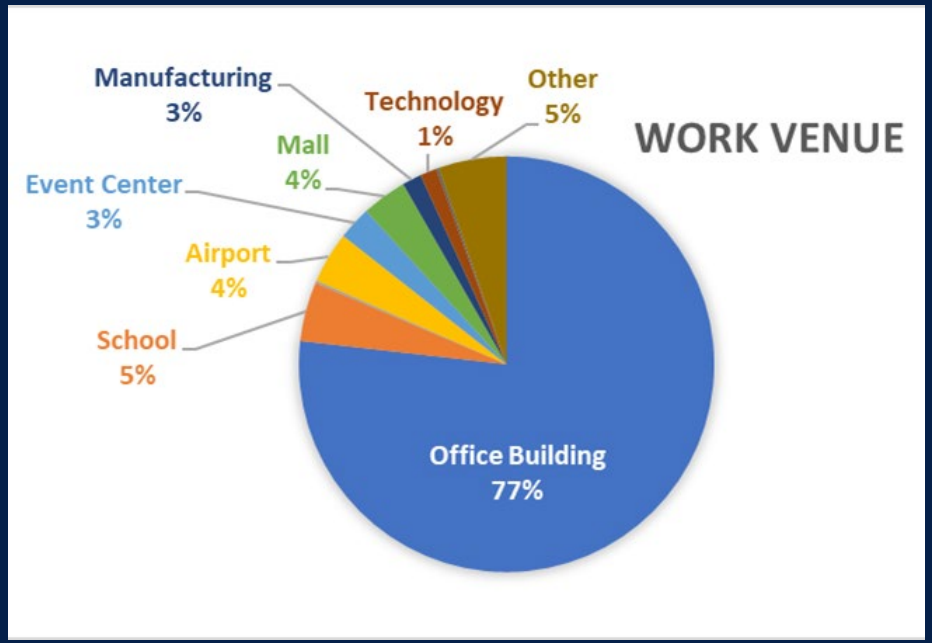
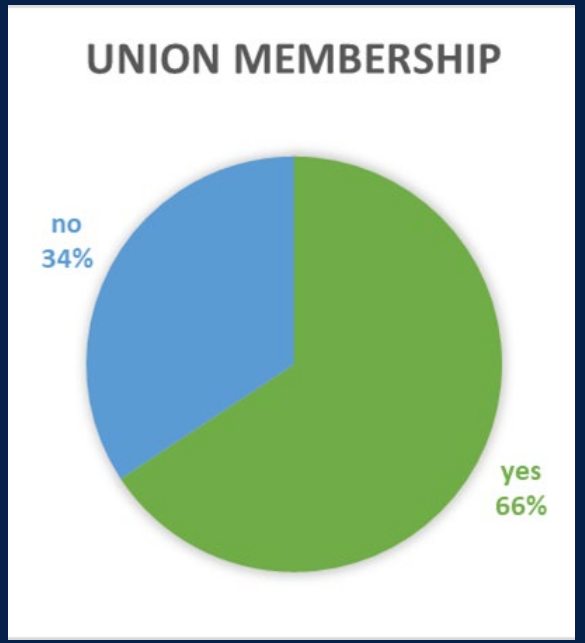
Mean number of years worked as a janitor

12.5 years (SD 8.8)



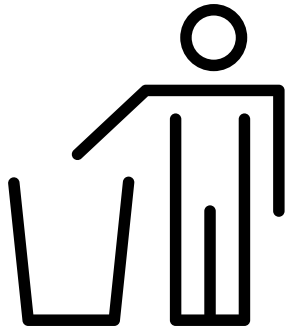

WORK VENUE
Manufacturing
3%
Technology
1%
Other
5%
Mall
4%
Event Center
3%
Airport
4%
School
5%
Office Building
77%


UNION MEMBERSHIP
no
34%
yes
66%

Results – Physical Workload

Exposure	Mean	SD
Peak intensity (0-10)	8.33	1.92
Typical intensity (0-10)	7.42	2.45
Workload index* (0.2 - 2300)	609.11	385.65

*arbitrary units (intensity * duration * frequency) used for modeli



RPE SCALE	
1	Nothing
2	Very Easy
3	Easy
4	Comfortable
5	Somewhat Difficult
6	Difficult
7	Hard
8	Very Hard
9	Extremely Hard
10	Maximal/Exhaustion

Results – Adverse Health Outcomes

Outcomes	N (%)
Severe Pain	
Severe Pain (≥5)	235 (56%)
Pain Medication Use	
Regularly uses	240 (58%)
Missed Work due to Pain	
Regularly misses	80 (20%)
Work Injuries (in last year)	
One or more	149 (33%)
Anxiety or Depression	
Present	64 (17%)

Results – Workload Severe Pain

Severe Pain	Total (N)	Cases (n)	Adj OR (95% CI)
Workload Index			
Low	117	39	1.00
Medium	125	65	**2.17 (1.29, 3.67)**
High	137	112	**8.97 (5.02, 16.04)**
Typical intensity			
Low	119	35	1.00
Medium	148	88	**3.60 (2.15, 6.04)**
High	113	93	**11.41 (6.09, 21.37)**
Peak intensity			
Low	221	92	1.00
High	159	124	**4.97 (3.13, 7.88)**

Results – Workload Medication Use

Med Use	Total (N)	Cases (n)	Adj OR (95% CI)
Workload Index			
Low	115	49	1.00
Medium	129	67	1.49 (0.89, 2.50)
High	135	102	**4.22 (2.44, 7.31)**
Typical intensity			
Low	118	49	1.00
Medium	153	87	**1.93 (1.17, 3.17)**
High	109	82	**4.49 (2.52, 8.02)**
Peak intensity			
Low	224	109	1.00
High	156	109	**2.45 (1.58, 3.79)**

Results – Workload Missed Work

Missed Work	Total (N)	Cases (n)	Adj OR (95% CI)
Workload Index			
Low	113	15	1.00
Medium	128	22	1.37 (0.67, 2.78)
High	137	36	**2.35 (1.21, 4.56)**
Typical intensity			
Low	118	14	1.00
Medium	152	32	**2.00 (1.01, 3.96)**
High	109	27	**2.44 (1.20, 4.96)**
Peak intensity			
Low	223	38	1.00
High	156	35	1.41 (0.84, 2.35)

Results – Workload Injury in the past Year

Injury	Total (N)	Cases (n)	Adj OR (95% CI)
Workload Index			
Low	126	25	1.00
Medium	132	36	1.50 (0.84, 2.69)
High	130	47	**2.30 (1.31, 4.06)**
Typical intensity			
Low	125	24	1.00
Medium	155	42	1.54 (0.87, 2.72)
High	109	42	**2.66 (1.47, 4.81)**
Peak intensity			
Low	231	53	1.00
High	158	55	**1.81 (1.16, 2.85)**

Results – Workload Anxiety or Depression

Anxiety/Depression	Total (N)	Cases (n)	Adj OR (95% CI)
Workload Index			
Low	118	10	1.00
Medium	128	21	2.12 (0.95, 4.71)
High	135	23	**2.22 (1.01, 4.88)**
Typical intensity			
Low	120	14	1.00
Medium	152	16	0.88 (0.41, 1.89)
High	109	24	**2.15 (1.05, 4.42)**
Peak intensity			
Low	226	26	1.00
High	155	28	1.71 (0.96, 3.04)

Associations - Pain Severity by Sex and Age

	All	***Men***	***Women***	***< 50***	***≥ 50***
Pain Severity (moderate to severe pain ≥ 5)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Peak Intensity (0-10)					
High (≥ 9)	4.81 (3.11-7.44)	2.5 (1.03-6.05)	6.44 (3.65-11.37)	6.38 (3.17-12.84)	4.07 (2.20-7.52)
Typical Intensity (0-10)					
High (≥ 8)	5.79 (3.69-9.06)	3.81 (1.52-9.53)	7.96 (4.40 - 14.41)	8.37 (4.00-17.58)	4.82 (2.58-8.97)
Workload					
High	4.23 (2.79-6.42)	7.20 (2.78-18.62)	3.88 (2.33-6.47)	5.37 (2.77-10.41)	3.44 (1.94-6.13)

Associations – Missed Work by Sex and Age

	All	***Men***	***Women***	***< 50***	***≥ 50***
Miss Work (at least once every other month)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Peak Intensity (0-10)					
High (≥ 9)	1.43 (.873-2.33)	1.68 (.532-5.29)	1.44 (.803-2.59)	1.47 (.703 - 3.05)	1.35 (.657-2.78)
Typical Intensity					
High (≥ 8)	1.52 (.930-2.49)	1.68 (.532-5.29)	1.59 (.884-2.86)	1.90 (.908-3.96)	1.18 (.572-2.43)
Workload					
High	2.05 (1.22-3.44)	1.96 (.565-6.83)	2.42 (1.30-4.50)	3.50 (1.57-7.79)	1.25 (.600-2.60)

Results – Job Strain and Severe Pain

	Total (N)	Cases (n)	Adj OR (95% CI)
Psychological Demands			
Low	82	28	1.00
High	78	55	**4.64 (2.37-9.08)**
Decision Latitude			
Low	107	63	1.00
High	53	20	**0.42 (0.21-0.83)**
Job Strain Ratio			
Low	77	25	1.00
High	83	58	**4.80 (2.45-9.40)**

Results – Job Strain and Anxiety or Depression

	Total (N)	Cases (n)	Adj OR (95% CI)
Psychological Demands			
Low	59	15	1.00
High	95	13	**3.07 (1.29-7.27)**
Decision Latitude			
Low	113	15	1.00
High	41	13	0.44 (0.19-1.03)
Job Strain Ratio			
Low	108	15	1.00
High	46	13	**3.53 (1.50-8.31)**

Results – Precarious Work Severe Pain

	Total (N)	Cases (n)	Adj OR (95% CI)
Job Insecurity			
Difficult to replace job	92	56	**2.08 (1.14-3.81)**
Wage Theft			
Hours worked without pay	82	59	**2.39 (1.40-4.10)**
Under Reporting of Injuries			
Fear of retaliation for reporting	59	33	1.20 (0.64-2.27)
Working Extended Hours			
2+ jobs & 40+ hours/week	84	51	1.27 (0.77-2.09)
Harassment			
Concerned about any harassment	131	88	**2.06 (1.30-3.27)**

Results – Precarious Work Injury Prevalence

	Total (N)	Cases (n)	Adj OR (95% CI)
Job Insecurity			
Difficult to replace job	92	26	0.92 (0.48-1.75)
Wage Theft			
Hours worked without pay	81	28	1.48 (0.87-2.51)
Under Reporting of Injuries			
Fear of retaliation for reporting	53	18	1.29 (0.64-2.60)
Working Extended Hours			
2+ jobs & 40+ hours/week	82	23	1.01 (0.58-1.74)
Harassment			
Concerned about any harassment	125	48	**2.20 (1.36-3.56)**

Results – Precarious Work Anxiety or Depression

	Total (N)	Cases (n)	Adj OR (95% CI)
Job Insecurity			
Difficult to replace job	86	13	0.90 (0.39-2.07)
Wage Theft			
Hours worked without pay	71	21	**2.80 (1.51-5.20)**
Under Reporting of Injuries			
Fear of retaliation for reporting	55	11	1.36 (0.59-3.17)
Working Extended Hours			
2+ jobs & 40+ hours/week	83	15	1.11 (0.58-2.11)
Harassment			
Concerned about any harassment	125	38	**3.76 (2.09-6.77)**

Conclusion

We found a **high burden** of workload and negative health outcomes in CA janitors in 2022.

For each of the three ways of characterizing exposure- **workload index, typical intensity, and peak intensity**-
high exposure significantly increases the odds of having the following negative health outcomes:

- **severe pain**
- **regular use of pain medications**
- **regularly missing work due to pain**
- **work-related injuries**
- **anxiety/depression**

Conclusion

- Women had higher odds of adverse physical and mental health outcomes than men
- Healthy worker effect present among women and older adults
- Small differences in means of job strain measures between groups (sex, age), but trends showed **higher decision latitude** (more job control) for men than women

Conclusion

Exposure-response relationships were found for **job strain** and negative physical and mental health outcomes

- High **psychological demands** were associated with increased prevalence of severe pain and anxiety or depression
- High **job strain** ratio was associated with increased odds of anxiety or depression
- High **decision latitude** led to a **lower** prevalence of severe pain
  - *Job control had a protective effect*

Conclusion- Precarious Work

- 51% feel insecure in their ability to find another job if laid off
- 37% of janitors are concerned with being harassed at work
  - *14% are concerned with sexual harassment at work- higher for women*
  - *33% are concerned with verbal harassment at work- higher for men*
- 33% may under report injuries for fear of retaliation
- 23% experience wage theft
- 22% work more than a full-time job schedule

Job insecurity and precarious work conditions may lead to tolerating harassment and work-related pain for fear of losing job or not being able to get another job

Conclusion

Exposure-response relationships were found for **precarious work** and negative health outcomes

- Those concerned with any type of **bullying or harassment** had significantly higher odds of severe pain prevalence and anxiety or depression
  - Workplace harassment effects physical and mental health

Time Motion Study

Venue 1 Mall (N=16)	Data Collection in progress (N=7)
Venue 2 Airport (N=16)	Data Collection in progress (N=4)
Venue 3 Event/Convention (N=16)	Data Collection in progress(N=12)
Venue 4 Office Buildings (N=16)	Still trying to gain access

23 of 64 (36%)

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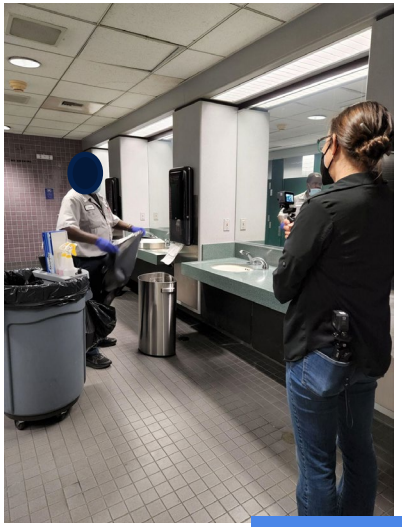
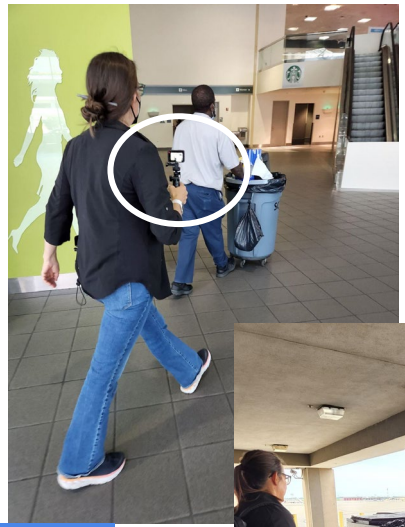
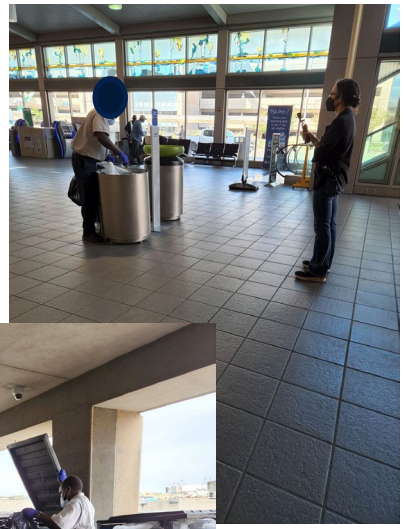
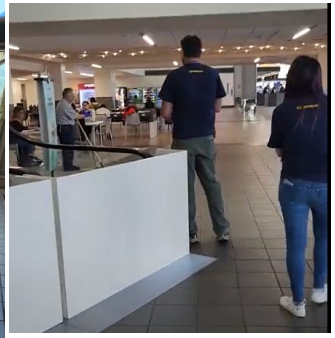
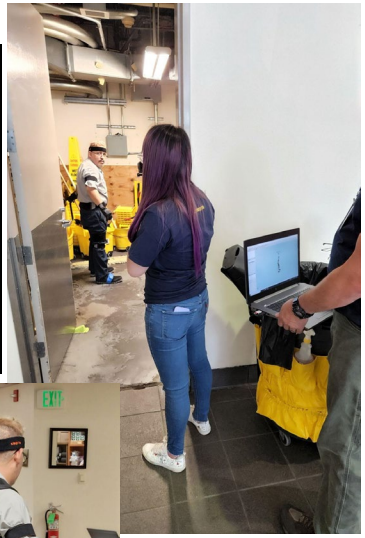
Detailed Data Collection

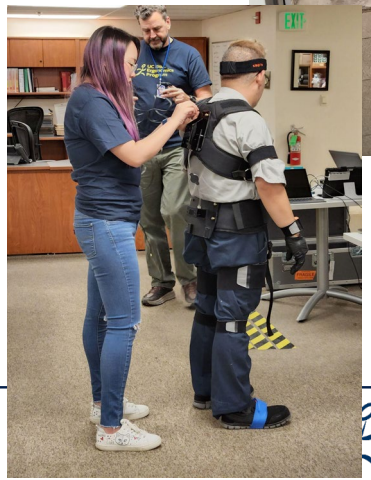












Handheld Camera

Wearable Sensors

Direct Measurements

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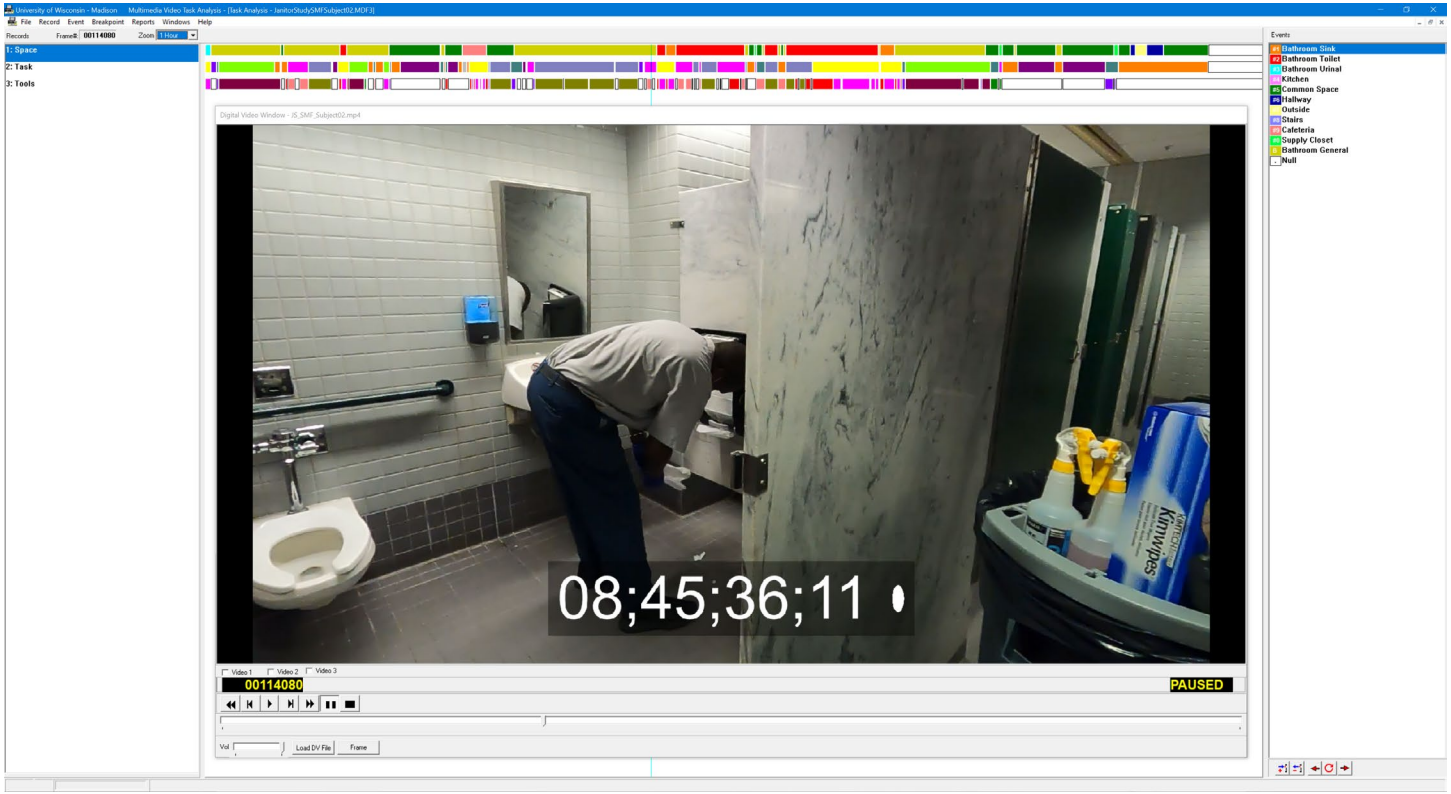
Detailed Video Analysis

- Comparison to ISSA Rates
- Low Back and Upper Extremity Risk Allocation per Task



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CHSWC

MCTF
Cleaning up the cleaning industry

SEIU

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