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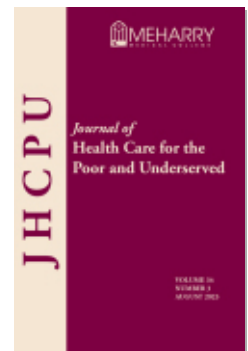
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# Understanding Health Care Utilization and Occupational Exposures of Labor-Trafficked People

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**Abstract: Objectives.** To describe health care utilization and occupational exposures during trafficking among foreign-born people labor-trafficked in the U.S. **Methods.** Retrospective analysis of immigration files for health data among 114 labor-trafficked individuals. **Results.** Mean age was 30. Files of 38% mentioned accessing medical services at least once, mostly via hospitals (73%-81%). Forty-three percent (43%) had U.S. citizen children—indicating their children and spouses interacted with social and medical systems during exploitation. Almost all (97%) had limited English proficiency, and 75% did not have legal immigration status. Employers/traffickers interfered with access to health care and forced victims to work while injured. Half (50%) had sick family members. Victims reported physical and sexual abuse, toxic and environmental occupational exposures, and sleep disturbances. **Conclusions.** This is the largest study to elucidate health concerns and care utilization patterns among labor-trafficked people. Concerted resources must be dedicated to understanding health needs and health systems intervention opportunities for labor-trafficked people.

*Key words:* Human trafficking, labor trafficking, migrant health, occupational health, forced labor.

## Background

The International Labor Organization Report recently estimated that, at any point, as many as 24.9 million people are exploited by human trafficking.<sup>1</sup> Up to 14.2 million people have experienced forced labor exploitation in industries such as agriculture, domestic work, construction, and manufacturing.<sup>1,2</sup> Additionally, 4.8 million people are exploited in forced sexual exploitation.<sup>1,2</sup> Although labor trafficking is more common globally than sex trafficking, it has received disproportionately little attention

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relative to sex trafficking in the United States (U.S.).<sup>3</sup> For example, only 11% of trafficking survivors identified through law enforcement are labor trafficking cases, and only 10% of all literature on human trafficking investigates labor trafficking.<sup>4,5</sup> According to the U.S. Department of State, “federal human trafficking cases continued to involve predominantly sex trafficking despite service providers assisting significant numbers of labor trafficking survivors.”<sup>6</sup>[p.18–19] Of the 228 federal trafficking prosecutions in 2021, 221 were for sex trafficking compared with only seven that involved labor trafficking.<sup>6</sup>

Labor trafficking has received less attention than sex trafficking from policymakers, funders, and researchers. The resulting legal loopholes, lack of funding, and poor evidence base have led to systemic inequities with less structural support systems for victims of labor trafficking. The inattention to labor trafficking is the result of a combination of factors. Firstly, it is due to the “devaluing of people experiencing labor trafficking, who are likely to be of color, including immigrants of color, [which] has roots in racism and xenophobia.”<sup>7</sup>[p.1483] Moreover, the media perpetuates the trope of the “typical” victim as a White, female, cis-gender sex-trafficking victim.<sup>8,9</sup> Finally, there are vested economic interests within industries, such as agriculture, that create conditions fostering labor exploitation at the core of the U.S. economy.<sup>10</sup> Together, these factors result in a large evidence gap to inform anti-labor trafficking responses in the United States.<sup>3</sup>

These same pernicious societal forces perpetuate inequities in health sector anti-trafficking research. Sex trafficking studies dominate the health sector trafficking literature, leading to a lack of health professional training, clinical assessment instruments, and health system protocols that address labor trafficking.<sup>11</sup> What is known specifically about labor trafficking victim health needs and opportunities for intervention is minimal. In one study of trafficking survivors within the U.S., it was found that the majority of the cohort of labor-trafficking survivors had a touchpoint with a medical provider.<sup>7,12</sup> Labor trafficking health research has demonstrated unsafe living conditions, occupational hazards, poor nutrition, psychological violence, physical violence, and sexual violence among labor-trafficked individuals, all of which increase the burden of medical and mental health disorders for this population.<sup>13–17</sup> Beyond this scant knowledge, the health care utilization patterns of labor-trafficked people during the trafficking are unknown. As a result, health care providers are insufficiently equipped to identify labor-trafficked people, to refer them to relevant resources, and to manage the acute and long-term needs of this population.<sup>9,18–23</sup>

Given the dearth of data sources documenting the experiences of labor trafficked individuals within health systems in the U.S., one potential source of retrospective data is outside health care: within the legal aid system. In the course of providing services, human trafficking victim-serving legal aid organizations maintain files that may contain crucial information about the health and health care needs of trafficked people. For example, a 2019 study by Kramer et al. used extracted data from the University of Michigan Human Trafficking Clinic’s closed case files to better describe the general needs of trafficked people.<sup>24</sup> To date, there has been no health-specific investigation into the legal case files of labor-trafficked people.

Using legal aid organization data, the purpose of our study is to describe the health care utilization and occupational exposures during trafficking among foreign-born people labor-trafficked in the U.S.

## Methods

The authors, legal advocates and medical professionals, conducted a retrospective review of the immigration files of survivors of labor trafficking. Subjects had received services from a Pennsylvania (PA)-based non-profit legal aid organization. To receive services at this organization, survivors would generally have to fall under 187.5% of the federal poverty line. Subjects' case files were selected for review if: 1) they had been granted a T visa and thus been adjudicated as survivors of a severe form of trafficking by United States Citizenship and Immigration Services (USCIS) officials, and 2) the application for T nonimmigrant status was based on indicators of labor trafficking. The Trafficking Victims Protection Act of 2000 (TVPA) defines labor trafficking as "the recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery."<sup>20</sup> In an effort to create immigration protections for foreign-born workers subjugated to labor trafficking, the T Visa was created by Congress as part of the TVPA.<sup>8,23</sup>

The 114 eligible subject case files were submitted to USCIS between 2012 and 2021. The primary document reviewed from each case file was the personal narrative statement included in support of the subject's T visa application. These personal narrative statements are drafted by legal advocates from the first-person perspective of each subject. The personal narrative statement drafting process includes multiple interviews where advocates gather facts, clarify details, and structure the subject's trafficking experience into a cohesive narrative for submission to immigration officials. Additional documents that were reviewed for each subject included legal memos prepared by their attorneys for their applications, case notes documented by legal advocates, and supplemental evidence included in the applications. Prior to reviewing subject files, the entire author team developed the list of data points that would be extracted from each case file. This list was developed based on the legal advocates' knowledge of what medical information may have been collected over the course of the immigration application and the medical professionals' knowledge of the current state of the literature regarding health outcomes and health care utilization patterns of labor-trafficking survivors.

In order to protect subject privacy, the research team neither contacted nor communicated with the survivors. All data were collected from pre-existing legal case files, which were stored on a secure server and accessible via secure laptops protected by individual identification and passwords. The team of authors that reviewed the case files were legal advocates employed by the legal aid organization where subjects sought services. As such, they were authorized to view confidential subject information, and were the only team members who had access to the information. Additionally, all information was gathered in compliance with the PA attorney rules of professional conduct. After extracting the data, the legal advocate authors de-identified the password-protected information to be shared with the rest of the medical professional author team for analysis. Upon review by the Harvard Longwood Campus Institutional Review Board, this project was found to be IRB exempt.

For each subject, the legal advocate authors reviewed the case file and extracted demographic information, details about the trafficking experience, medical vulner-

abilities present prior to the trafficking experience, health-related information from the time of the trafficking experience, and details on each workplace injury event and medical condition that occurred or developed during the trafficking experience. Narrative information from the immigration files was then coded into data points. For example, legal advocate authors collected information on the outcome of each instance where a subject described a workplace injury (i.e., as a binary value for whether the subject described any actions their employer took to interfere with their accessing medical services) and a categorical value for where they sought medical treatment, if at all. Notably, the variables, “clinic” and “private practice” referred to licensed facilities. Since the information was in narrative form, and given that the nature of immigration applications did not necessarily require the collection of complete medical information at the time of filing, some data were described qualitatively in the files. In these instances, legal advocate authors documented this information using the most conservative estimate possible. For example, if a subject reported being injured on the job “several times,” this was coded as two instances of workplace injuries, since more than one injury is referenced, but no further details about the specific number are available.

It is important to note that these case files were created for immigration applications, not medical records. Thus, any medical information was collected either because a subject voluntarily shared it with their legal advocates or was prompted by their legal advocates in the setting where it was relevant. Thus, while these files contain significant amounts of relevant medical information from the time during a subject’s trafficking experience, details or additional data may be missing. Thus, all information must be considered a lower estimate of the incidence of each medical outcome.

A linear regression analysis was conducted using STATA.<sup>25</sup> The number of injury events and the number of access points to medical service providers were regressed against subject demographics, specifics of trafficking experience, and select health-related outcomes measures.

## Results

Demographic, injury, and medical data are summarized in Table 1 and Table 2. Most labor-trafficking victims identified as male (82%) and were trafficked in the agricultural and landscaping industries (78%). Subjects’ age at the beginning of their trafficking experience varied widely, ranging from minors to individuals over the age of 65, with a mean age of 30 and a median age of 28. Subjects were almost exclusively from Latin America (92%), 70% from Mexico specifically. Language barriers were particularly widespread among subjects, 97% of whom had no or limited English proficiency. Most of the subjects did not have legal immigration status during their trafficking experience (75%), and those that did have legal immigration status were H-2A temporary agricultural workers. Lastly, 43% of subjects had U.S. citizen (USC) children, and 50% of subjects reported having sick family members prior to or during their trafficking experiences.

Injury rates among subjects was high. Nearly half (48%) of subjects reported experiencing at least one workplace injury event during their trafficking experience. Thirty-eight percent of all subjects reported accessing medical services at least once during

**Table 1.**

**KEY DEMOGRAPHIC, INJURY, AND MEDICAL DATA AMONG LABOR-TRAFFICKED PEOPLE**

		114		Total Injury Events		112	
Variable	Categories	n	%	Variable	Categories	n	%
Limited English Proficiency	Yes	111	97.4%	Trafficker/Employer Interfered in Access to	Yes	31	100.0%
	No	3	2.6%	Medical Services, Treatment Received	No	0	0.0%
Sick Family Member(s)	Yes	57	50.0%	Trafficker/Employer Interfered in Access to	Yes	78	96.3%
	No	57	50.0%	Medical Services, No Treatment Received	No	3	3.7%
Has U.S. Citizen Child(ren)	Yes	49	43.0%	Returned to Work While Injured or Before a	Yes	96	85.7%
	No	65	57.0%	Doctor-Recommended Rest Period	No	16	14.3%
				<b>Total Medical Conditions</b>	<b>97</b>		
Sleep Disturbance Cause by Long Hours and Forced Work	Yes	58	50.9%	<b>Variable</b>	<b>Categories</b>		<b>n</b>
	No	56	49.1%	Treatment Received	Yes	23	23.7%
Any Medical Conditions Developed During Trafficking	Yes	66	57.9%		No	74	76.3%
	No	48	42.1%				
Sleep Disturbances Cause by Insomnia or Nightmares	Yes	24	21.1%				
	No	90	78.9%				
Having to Work While Sick or Injured	Yes	81	71.1%				
	No	33	28.9%				
Number of Access Points with Medical Service Providers	0	71	62.3%				
	1+	43	37.7%				

**Table 2.**

**SUMMARY OF DEMOGRAPHIC, INJURY, AND MEDICAL DATA FOR LABOR-TRAFFICKED PEOPLE**

Total Subjects		114		112				
Variable	Categories	n	%	Variable	Categories	n	%	
<i>Demographic Information</i>								
Country of Origin	Africa	2	1.8%	Treatment Received	Yes	31	27.7%	
	Asia	5	4.4%		No	81	72.3%	
	Europe	2	1.8%	Where Treatment Was Received	None	81	72.3%	
	Mexico	80	70.2%		Hospital	25	22.3%	
	Latin America, Other	25	21.9%		Clinic	4	3.6%	
	<18	5	4.4%		Unknown	2	1.8%	
	18-25	45	39.5%	Trafficker/Employer Interfered in Access to Medical Services	Yes	109	97.3%	
	25-35	31	27.2%		No	3	2.7%	
	35-45	26	22.8%	<b>Total Medical Conditions</b>		<b>97</b>		
	45-55	4	3.5%	<b>Variable</b>	<b>Categories</b>	<b>n</b>	<b>%</b>	
55+	3	2.6%						
Gender	Mean	30		Where Treatment Was Received	None	74	76.3%	
	Median	28			Hospital	16	16.5%	
<i>Details of Trafficking Experience</i>	Male	93	81.6%	Private Practice	1	1.0%		
	Female	21	18.4%	Unknown	5	5.2%		
	Industry	Agriculture	15	13.2%				
		Cleaning	3	2.6%				
		Construction	2	1.8%				
		Domestic Servitude	9	7.9%				
		Hospitality	2	1.8%				
		Landscaping	74	64.9%				
		Restaurant	5	4.4%				
		Other	4	3.5%				

(continued on p. 851)

**Table 2. (continued)**

Total Subjects		114	
Variable	Categories	n	%
Legal Immigration Status During Trafficking	Yes	29	25.4%
	No	85	74.6%
Trafficked in Pennsylvania	Yes	102	89.5%
	No	12	10.5%
Years of Trafficking	≤1 years	30	26.3%
	1–5 years	39	34.2%
	5–10 years	34	29.8%
	10–15 years	6	5.3%
	15+ years	5	4.4%
	Mean	4.49	
	Median	3	
<i>Medical Vulnerabilities Prior to Trafficking</i>			
Preexisting Medical Condition	Yes	14	12.3%
	No	100	87.7%
<i>Health-Related Information During Trafficking Experience</i>			
Number of Workplace Injury Events	0	59	51.8%
	1	33	28.9%
	2	14	12.3%
	3	4	3.5%
	4+	4	3.5%
	Mean	0.86	
	Median	0	

(continued on p. 852)



**Table 2. (continued)**

Total Subjects		114	
Variable	Categories	n	%
Any Physical Assault	Yes	22	19.3%
	No	92	80.7%
Any Sexual Assault	Yes	12	10.5%
	No	102	89.5%
Unprotected Exposure to Chemicals or Hazardous Materials	Yes	22	19.3%
	No	92	80.7%
Unprotected Exposure to Unsanitary or Insufficient Living Conditions	Yes	32	28.1%
	No	82	71.9%
Unprotected Exposure to Extreme Temperatures	Yes	41	36.0%
	No	73	64.0%
Number of Access Points with Medical Service Providers	0	71	62.3%
	1	15	13.2%
	2	15	13.2%
	3	5	4.4%
	4+	8	7.0%
	Mean	1	
	Median	0	
Any Adverse Health Effects Reported After Trafficking	Yes	52	45.6%
	No	62	54.4%

their trafficking experience, including subjects who reported no workplace injuries but who did access medical services for another reason during their trafficking experience. Ninety-eight individual points of access to certified medical service providers were reported among all subjects.

In total, 112 workplace injury events were documented among all 114 subjects. Subjects were able to access medical care in 31 (28%) of those injury events from a certified medical provider. That care was accessed through hospitals by 81% of our sample, and the remaining 19% of injuries were treated at clinics or at a formal health care facility of an unknown type. Notably, subjects reported that their trafficker/employer interfered with access to medical care in 100% of those 31 injury events. Subjects reported employer interference in 78 (96%) of the 81 injury events where subjects were not able to access medical care. Trafficker/employer interference took various forms, such as fear of seeking care because of potential retaliation by the trafficker/employer, specific threats by the trafficker/employer against seeking care, or the trafficker/employer directing subjects to lie to medical providers about where the injury occurred. In a few instances, traffickers/employers even accompanied subjects to the hospital, posing as family friends or acquaintances, served as interpreters, and/or falsified information on behalf of subjects. Overall, 71% of subjects and 86% of all workplace injury events involved a situation where survivors were forced to return to work while still injured and/or before a doctor-recommended recovery period.

Fifty-eight percent (n=66) of subjects reported developing at least one medical condition during their trafficking experience and reported access to medical care in response to only 23% of those medical conditions. Medical services for medical conditions were accessed primarily through hospitals (73%). Preexisting medical vulnerabilities were also present among subjects. Half of subjects had family members that had or developed chronic or emergency medical conditions before or during their trafficking experiences. Additionally, 12% of subjects had preexisting medical conditions before the beginning of their trafficking experiences.

Subjects also reported various types of detrimental workplace exposures. Nineteen percent (19%) of subjects reported exposure to chemicals or other hazardous substances without personal protective equipment. Twenty-eight percent (28%) of subjects reported living or being housed in unsanitary or insufficient housing. Notably, 70% of those subjects who were present in the United States on an H-2A visa, which requires the employer to provide housing, reported living in unsanitary or insufficient employer-provided housing. Thirty-six percent (36%) of subjects reported being exposed to extreme cold or heat without appropriate protection. Up to 51% of subjects reported sleep disturbances caused by being forced to work longer than expected, and 21% of subjects reported sleep disturbances caused by trouble falling asleep or nightmares. Physical and sexual assault were experienced by 19% and 11% subjects, respectively. Lastly, 46% of subjects reported a long-lasting negative medical outcome that persisted after they escaped their trafficking experience.

Summaries of the regression analyses are in Tables 3 and 4. Both the regression on the number of injury events and on the number of access points to medical services were good fit models. Both models pass an alpha = 0.01 F test (prob > F = 0.006 and 0.003, respectively) and have adjusted R-squared values of 0.2062 and 0.2318, respectively.

**Table 3**  
**REGRESSION RESULTS REGARDING NUMBER OF INJURIES**

Number of Injuries	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Age at Beginning of Trafficking Experience	.014	.014	1.01	.315	-.014	.042	
Years in Trafficking	.054	.033	1.66	.102	-.011	.119	
Immigration Status During Trafficking	.582	.487	1.19	.236	-.387	1.551	
Preexisting Medical Conditions	-.089	.428	-0.21	.835	-.941	.763	
Sick Family Members	-.175	.262	-0.67	.507	-.697	.347	
U.S. Citizen Children	.399	.299	1.34	.185	-.195	.992	
Any Physical Assault	.496	.407	1.22	.226	-.313	1.306	
Any Sexual Assault	-.4	.561	-0.71	.477	-1.515	.715	
Exposure to Chemicals or Hazardous Substances	.513	.362	1.42	.16	-.207	1.234	
Unsanitary or Insufficient Living Conditions	-.157	.434	-0.36	.719	-1.02	.706	
Exposure to Unsafe Temperatures	.191	.296	0.64	.522	-.399	.78	
Sleep Disturbance due to Continued Work	.419	.351	1.19	.236	-.28	1.118	
Any Medical Conditions During Trafficking	.227	.298	0.76	.448	-.365	.82	
Sleep Disturbance due to Insomnia or Nightmares	-.477	.34	-1.41	.164	-1.153	.198	
Working While Sick or Injured	.877	.314	2.79	.007	.252	1.502	***
Any Long Term Medical Effects from Trafficking	.207	.302	0.69	.495	-.393	.806	
Gender (Male = 1)	-.767	.497	-1.54	.126	-1.754	.221	
Industry: Cleaning	-.167	1.114	-0.15	.881	-2.381	2.047	
Industry: Construction	1.281	1.13	1.13	.26	-.966	3.528	
Industry: Domestic Servitude	-1.039	.978	-1.06	.291	-2.983	.905	
Industry: Hospitality	1.817	1.651	1.10	.274	-1.466	5.1	
Industry: Landscaping	.834	.52	1.60	.113	-.2	1.867	
Industry: Other	-.886	.921	-0.96	.339	-2.718	.946	
Industry: Restaurant	1.331	.869	1.53	.13	-.398	3.059	
Region of Origin: Asia	-.113	1.025	-0.11	.912	-2.151	1.924	
Region of Origin: Europe	-1.166	1.681	-0.69	.49	-4.508	2.176	
Region of Origin: Mexico	.007	.353	0.02	.983	-.695	.709	
Region of Origin: Latin America, Other	-.82	1.379	-0.59	.554	-3.562	1.922	
Constant	-1.044	.894	-1.17	.246	-2.82	.733	
Mean dependent var		0.860	SD dependent var			1.362	
R-squared		0.403	Number of obs			114	
Adjusted R-squared		0.2062	Prob > F			0.006	
F-test		2.049	Bayesian crit. (BIC)			471.586	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

The low F-scores indicate that our models are statistically significant in predicting the number of injury events and access points to medical service providers based on the various demographic and health-related variables that were coded.

**Discussion**

In this paper, we use data from a legal aid provider to describe the demographics, occupational health exposures, self-reported medical data, and health care utilization

**Table 4****REGRESSION RESULTS REGARDING NUMBER OF ACCESS POINTS TO MEDICAL SERVICE PROVIDER**

	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
num_med_acc							
Age at Beginning of Trafficking Experience	-.01	.014	-0.69	.49	-.038	.018	
Years of Trafficking	.083	.033	2.49	.015	.017	.15	**
Immigration Status During Trafficking	.534	.497	1.07	.287	-.456	1.523	
Precexisting Medical Conditions	.326	.437	0.74	.458	-.544	1.195	
Sick Family Members	-.35	.268	-1.31	.195	-.882	.183	
U.S. Citizen Children	.371	.305	1.22	.226	-.235	.977	
Any Physical Assault	-1.32	.416	-0.32	.751	-.959	.694	
Any Sexual Assault	1.14	.572	1.99	.05	.002	2.278	**
Exposure to Chemicals or Hazardous Substances	.557	.37	1.51	.136	-.179	1.292	
Unsanitary or Insufficient Living Conditions	.201	.443	0.45	.652	-.68	1.081	
Exposure to Unsafe Temperatures	-.057	.302	-0.19	.851	-.658	.545	
Sleep Disturbance due to Continued Work	.639	.359	1.78	.078	-.074	1.352	*
Any Medical Conditions During Trafficking	.569	.304	1.87	.065	-.036	1.174	*
Sleep Disturbance due to Insomnia or Nightmares	.371	.347	1.07	.287	-.318	1.061	
Working While Sick or Injured	.316	.321	0.98	.328	-.322	.954	
Any Long Term Medical Effects from Trafficking	.123	.308	0.40	.691	-.489	.735	
Gender (Male = 1)	-.444	.507	-0.87	.384	-1.451	.564	
Industry: Cleaning	.527	1.137	0.46	.644	-1.733	2.786	
Industry: Construction	1.608	1.153	1.39	.167	-.685	3.902	
Industry: Domestic Servitude	.792	.998	0.79	.429	-1.192	2.777	
Industry: Hospitality	.543	1.685	0.32	.748	-2.808	3.894	
Industry: Landscaping	.945	.531	1.78	.079	-.11	2	*
Industry: Other	.206	.94	0.22	.828	-1.664	2.075	
Industry: Restaurant	1.554	.887	1.75	.084	-.21	3.318	*
Region of Origin: Asia	.276	1.046	0.26	.792	-1.803	2.355	
Region of Origin: Europe	1.116	1.716	0.65	.517	-2.295	4.527	
Region of Origin: Mexico	.165	.36	0.46	.648	-.551	.882	
Region of Origin: Latin America, Other	-.32	1.408	-0.23	.821	-3.119	2.478	
Constant	-1.213	.912	-1.33	.187	-3.026	.6	
Mean dependent var		0.860	SD dependent var			1.413	
R-squared		0.422	Number of obs			114	
Adjusted R-squared		0.2318	Prob > F			0.003	
F-test		2.217	Bayesian crit. (BIC)			476.243	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

patterns of labor-trafficked people. This study is the first of its kind to make use of medico-legal partnerships in presenting health care information among labor-trafficked people who were not identified by medical providers.

Our data indicate that labor-trafficked people experience adverse health outcomes and abuses throughout their exploitation, which is consistent with past research.<sup>22</sup> We found that 38% of labor-trafficked people had at least one established medical access point—with the majority receiving treatment at a hospital. All medical access points coded were instances where subjects sought treatment from a certified medical provider

at a hospital, urgent care facility, clinic, or private practice. In other words, a significant subgroup of this population accesses medical care via a formal health care touchpoint with some frequency during labor exploitation. However, given that the survivors in our sample were not identified as trafficked people by the health system, these were clinical encounters in which trafficked patients were either not screened or not identified.

Trafficker interference in accessing medical services was reported by 97% of our participants. It was found to be present across all injury events, including those for which medical care was accessed (100%) and for which medical care was not accessed (96%). This interference took various forms, such as direct threats of deportation, implied threats of losing a job, directing subjects to remove company clothing before accessing care, or attending medical visits with subjects and acting as interpreters. Besides trafficker/employer interference, subjects who did not access medical care were also limited by social determinants outside of trafficker/employer interference. As we have shown, most of our subjects were undocumented, had limited English proficiency, lived below the federal poverty line, and were originally from countries or regions with limited access to medical services. They were from a demographic that is known to be less likely to access medical care because of lack of money, lack of knowledge in navigating medical services, and non-trafficker/non-employer related fears regarding immigration status.<sup>4-6,13-16,22,24</sup> Notably, we also found that employer interference continued after care was accessed in the form of refusing to pay medical bills, discouraging follow-up visits, and threatening to call the police or immigration officials if subjects did not cover their own expenses. For example, in up to 86% of injury events, subjects reported having to continue working or return to work before being fully recovered. Thus, our data suggest that labor traffickers significantly and purposefully interfere with survivors' ability to access medical care. However, even if survivors overcome this pressure from their traffickers, they still face significant social and economic barriers to accessing care, as trafficker/employer interference did not seem to be correlated with more or less access to medical services following workplace injuries.

Interestingly, those labor trafficking survivors who were in the U.S. under an H-2A visa did not have fewer adverse health outcomes and/or injury events, and nearly 70% reported living in unsanitary or insufficient employer-provided housing. The structure of the H-2A visa program is well known to leave workers vulnerable to exploitation.<sup>24,26,27</sup> For example, recruitment fees, debt bondage, and visas tied to specific employers are all ways in which traffickers can exploit agricultural workers even through participation in the program.<sup>25</sup> Moreover, H2-A workers live in employer-provided housing, often on the same farm where they are employed. This means that H2-A workers were often in extremely rural and isolated communities and rely almost entirely on their trafficker/employer for reliable transportation to access services. This dependence on employers and isolation leaves survivors vulnerable to abusive employers/traffickers.<sup>27</sup> For example, a labor contracting company contracting H-2A agricultural workers was recently found guilty of coercing hundreds of hours of forced labor through debt bondage, confiscation of documentation, unsanitary living conditions, abuse, threats, isolation, and blackmail.<sup>26,28</sup>

We found that subjects were also likely interacting with their surrounding social systems through their children. For example, a notable portion of subjects (43%) had

USC children during all or part of their trafficking experience. Based on requirements for school and free access to health care for USC children, this indicates that subjects were likely interacting with social and medical systems to a significant degree on behalf of their children even amid labor exploitation. Their USC children were possibly interacting with the education system as well. Given contact between labor-trafficked parents of USC children and the health system, we predict that this population of survivors and their spouses potentially interacts with several health care settings: OB/GYN appointments, births, and pediatric appointments.<sup>29,20</sup> As our study cohort consists of individuals who were not identified by the health system, we believe it is a matter for concern that—even while interacting with existing social and medical systems—these survivors were not identified and connected with resources.

Regarding the regression analysis, our overall good model fits and R-squared values indicate that there are some underlying correlations between the variables we captured and the health outcomes of subjects. This illustrates a key opportunity for future work. Similar analyses with larger sample sizes may yield more detailed insights that could help better predict the interplay among exposures, health outcomes, and access to medical care among survivors of labor trafficking. Our findings suggest that we successfully captured important determinants of health outcomes and access to medical care for survivors of labor trafficking during their trafficking experience. Although our limited sample size constrains the generalizability of our prediction model, it is likely a manifestation of the degree to which the subgroup of labor-trafficked survivors unidentified by health care providers is also not represented in research efforts. We believe that presenting risk predictors, even if exploratory, for a population that is marginalized and often not incorporated into aggregate research studies represents an important contribution to the current body of literature.

There were a few major limitations to this paper. As stated in the introduction, the primary information sources used in this paper were personal narrative statements, case files, and supporting documentation in immigration applications. There are several aspects about the immigration application development process that likely led to an undercount in the health information collected from subjects. The medical experience of each individual subject is not necessarily a central component of the trafficking narratives described in applications for T visas. Following the T visa definition discussed previously, negative health outcomes are not in and of themselves a qualifying factor. Instead, they are among a series of facts that can be used to demonstrate a pattern of force, fraud, or coercion. Additionally, trauma-informed interview practices limit the amount of non-essential information that advocates will gather. Unless information about health care outcomes and injuries is needed to further the application narrative or is provided by the subject without prompting, advocates are likely to not seek additional information to not unnecessarily re-traumatize the interviewee. Thirdly, minutiae that may be of intense interest to medical advocates may be of little to no importance to legal advocates. For example, the precise number of medical appointments a subject attended may not be relevant to a given subject's immigration application. Thus, personal narrative statements often refer to a subject attending "several" or "a few" doctor's appointments, or that they attended follow-up appointments without specifying how many. In quantifying this information, the researchers were conservative, noting the

lowest possible number of medical access points that could be interpreted was listed (for example, “several” would be noted as two, “I visited the doctor again after my injury for follow ups but don’t remember how many times” would be noted as one). Thus, the information previously discussed constitutes a lower bound estimate of the true extent of the prevalence of the various health outcomes and exposures described. Additionally, given the narrative and qualitative format of certain documentation, interpretation of these data was necessary in data extraction and coding that could limit internal and external validity. Finally, our assessment of health care utilization was largely restricted to if treatment was received, where treatment was received, the number of times medical care was accessed, and if the trafficker/employer interfered with access to medical care. Further, given the nature of self-report, specific details of the medical care provided were unknown.

To better understand and address labor trafficking, we must take an interdisciplinary approach that integrates perspectives and services of health care providers, lawyers, survivor-advocates, law enforcement, researchers, and public health practitioners.<sup>31</sup> This is necessary for 1) research to better understand the needs and experiences of the labor-trafficked population, 2) assessment to better identify labor trafficking survivors, as well as 3) intervention development to ensure labor trafficking survivors receive the care and support they need.<sup>31</sup>

We provided one example of this interdisciplinary collaboration through our medico-legal approach in data collection and analysis. It allowed us to address a clear gap in the preexisting literature at a time when there is virtually no clinical data on labor trafficking. We recommend that medico-legal partnerships be used for future investigations into the relationships between labor-trafficked individuals, their health outcomes during trafficking, their health care utilization patterns, and the ways they are (or are not) identified by medical service providers and connected with specialized resources.

Our findings, while not generalizable, provide new information that warrants further investigation and consideration by the health sector. Given the frequency of labor-trafficking survivor touchpoints with clinical care, hospitals, federally qualified health centers, urgent care centers, and private practice clinics should incorporate labor-trafficking assessment into their abuse, violence, and neglect policies and procedures. Our findings underscore the need to utilize professional interpreters in medical service provision: when English is not a patient’s preferred language, a professional interpreter must be employed.<sup>17,32–34</sup> Learning about a patient’s occupation is important, as some sectors are more likely to experience labor exploitation including trafficking. During an assessment for labor trafficking, medical service providers might consider asking about 1) whether there was employer interference with medical visits and concerns; 2) whether the patient got time off from work to recover from injury events; 3) housing conditions, particularly for those on H-2A visas; 4) sleep disturbances; 5) need to work to pay for medical care for a sick family member; and 6) physical and sexual abuse. In one study, a fear of deportation was the number one reason labor-trafficking survivors did not disclose their trafficking experience to a health professional, so particular sensitivity must be taken in assuring patients of their rights.<sup>35</sup> The amount of trafficker/employer interference observed in our study underscores the crucial need for privacy among health professionals and patients. This privacy enables effective education on

rights and facilitates open discussions to address issues of exploitation.<sup>36,37</sup> A framework that accounts for many of these factors can be applied to conduct conversations with patients with concern for exploitation: the PEARR Tool.<sup>38,39</sup> This evidence-based instrument guides trauma-informed survivor assistance in health care settings through the following steps: 1) privacy, 2) education, 3) asking questions, and 4) respecting as well as responding to patients' wishes.

Globally, labor trafficking is more common than sex trafficking, yet we know little about the health care experiences and opportunities for health professional intervention for labor trafficking survivors in the United States. This study, despite all the limitations that come from its data source, provides a small window into that experience. Large-scale studies of those who have experienced trafficking, with primary data collected from survivors themselves, will allow us to better describe health care needs, health care utilization patterns, and health care opportunities for intervention and prevention.<sup>31</sup> There must be concerted resources dedicated to understanding how labor trafficking survivors access health care, their health care needs, and possibilities for intervention, guided by those with lived experience.

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