Individual and Occupational Characteristics Associated With Respiratory Symptoms Among Latino Horse Farm Workers

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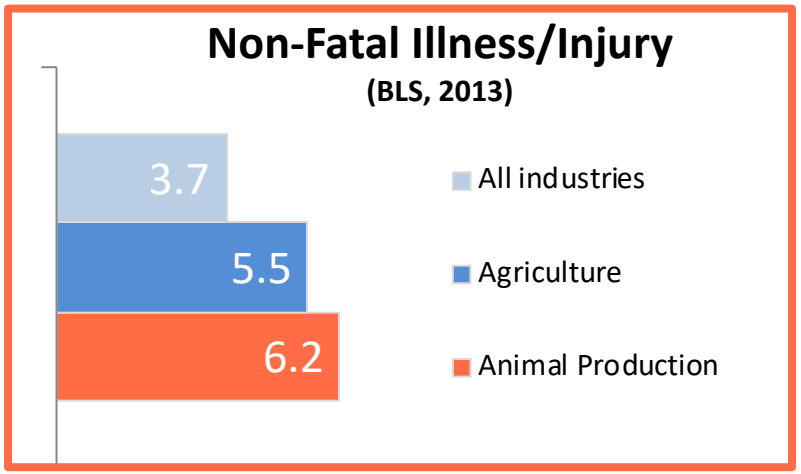
Agricultural workers: vulnerable workers

- Hazardous industry
  - Highest fatality rate across all industries (CFOI, 2014)
- Comprised mostly of Latino workers
  - Latinos = 70% of the approximately 750,000 US agriculture jobs (BLS, 2014; Carroll et al., 2011)
  - Latinos comprise 83% of crop workers in US (NAWS, 2005)
- Latinos are particularly vulnerable
  - Latino injury and fatality rates highest among all ethnic groups (CFOI, 2014) and is rising (BLS, 2014)
  - Latino farm workers = 7X the national average of injury or death compared to non-Latino farm workers (Byler 2013)
  - 25% of Latino farm workers injured in past year (Swanberg et al., 2013)

Animal Production Workers

Thoroughbred farmworkers

Animal production workers experience the **highest nonfatal injury rate** across all agricultural industries



Heightened risk for Latino thoroughbred workers in horse breeding?

The Hazards of Horse Work

Research on horse breeding is scarce, but hazards associated with horses include:

The Horse

- Bites, Kicks (Iba, et al., 2001)
- Falls (Iba, et al., 2001)
- Pulling on upper extremity +joints (Lofquist, et al., 2009)
- Horse hair/dander

Dusty Environment

- Endotoxins, Beta 1-3 Glucans, Mycotoxins, Hydrogen Sulfide, Ammonia, Metals

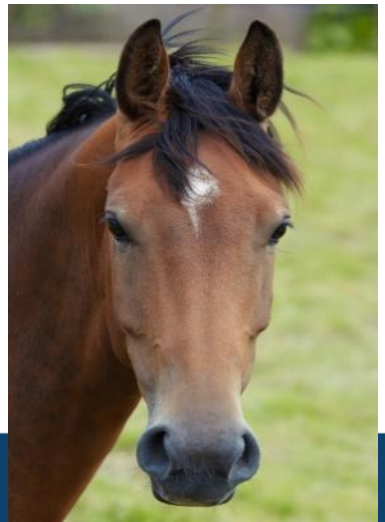
  (Elfman et al., 2009 Samadi et al., 2009; Curtis et al., 1996 Mazan and Hoffman, 2006)

Respiratory Exposures and Symptoms

- Exposure sources
  - Horse, horse barn
  - Mucking, cleaning, grooming
- Common respiratory conditions/symptoms
  - Asthma, allergies, dyspnea, cough, obstructive lung funtion (Elfman et al., 2009; Kimball-Dunn et al., 1999; Tutluoglu et al., 2002)

Latino Thoroughbred Workers

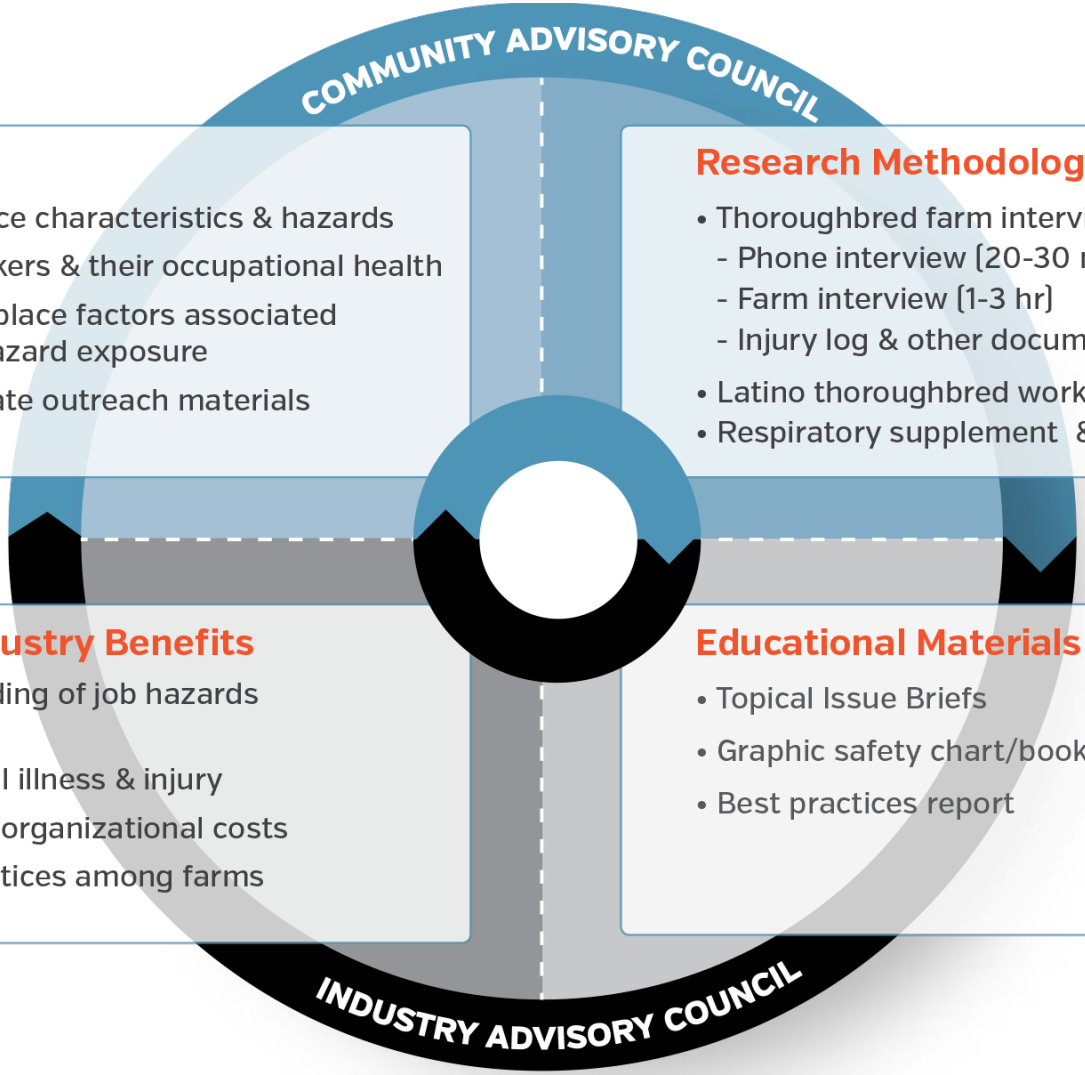
- Under-investigated vulnerable worker group with little known about respiratory health
- 50% of year-round thoroughbred farm workforce (Swanberg et al., 2013)
- Latinos experience more horse related injuries than non-Latinos (Swanberg et al., 2013)
  - Closer proximity, more time in barn
- Little concern for respiratory hazards noted among workers and managers (Swanberg et al., 2013)



Research Aims

- Assess prevalence of self-reported respiratory symptoms among Latino thoroughbred workers
- Evaluate individual and occupational factors associated with self-reported respiratory symptoms

Thoroughbred Worker & Health Safety Study



Research Goals

- Identify job/workplace characteristics & hazards
- Describe Latino workers & their occupational health
- Determine job/workplace factors associated with ill health and hazard exposure
- Develop & disseminate outreach materials

Research Methodology

- Thoroughbred farm interview
  - Phone interview (20-30 min)
  - Farm interview (1-3 hr)
  - Injury log & other documents
- Latino thoroughbred worker interview (1-1.5 hr)
- Respiratory supplement & spirometer test (30 min)

Community & Industry Benefits

- Increase understanding of job hazards and work stressors
- Reduce occupational illness & injury
- Reduce individual & organizational costs
- Sharing of best practices among farms

Educational Materials

- Topical Issue Briefs
- Graphic safety chart/booklet
- Best practices report

Methods: Sampling, Recruitment, Training

- Participants recruited via a community-based, purposive sampling strategy
- Lay community health educator (*Promotoras*) administered survey
- Inclusion/exclusion criteria
  - Self-identified as Latino
  - Work on horse farms for at least 9 out of past 12 months
  - ≥18 years old

Methods: Questionnaire

- Data collection: October 2013 - April 2014
- Demographics
  - Gender, age, educational attainment, birth country, years living in U.S., language acquisition, marital status
- Exposure factors
  - Years working on horse farms, hour exposed to barn/dust, dust mask availability, use of dust masks
- Self-reported respiratory symptoms (w/in last yr)
  - Upper respiratory symptoms
    - Nasal irritation, throat irritation, and sinus trouble
  - Lower respiratory symptoms
    - Cough, wheezing, chest tightness, shortness of breath, and difficulty breathing

Selected Factors	Total (n = 225)	Respiratory Symptoms		
		Presence (n = 139)	Absence (n = 86)	*P* Value[b]
Age (years)	**35.4 ± 9.6**	34.7 ± 9.4	36.5 ± 9.9	0.181
Sex (female, %)	**14.2**	**19.4**	**5.8**	**0.006**
Mexico as birth country (%)	**84.4**	83.5	86.1	0.901
Less than high school education (%)	**75.6**	73.4	79.1	0.335
Married or living as married (%)	**67.6**	68.4	66.3	0.748
Length of time living in US (years)	**14.5 ± 8.4**	**13.2 ± 7.5**	**16.5 ± 9.4**	**0.003**
Poor English understanding (%) (little or not at all)	**26.2**	**30.9**	**18.6**	**0.041**
Cigarette smoking (%)	-			**0.009**
Current smokers	**16.5**	**12.3**	**23.3**	
Former smokers	**26.3**	**32.6**	**16.3**	
Never smoker	**57.1**	**55.1**	**60.5**	
Years at current horse farm	**5.4 ± 4.6**	5.3 ± 4.0	5.5 ± 5.6	0.792
Years working at horse farms	**10.5 ± 7.3**	10.1 ± 6.3	11.2 ± 8.6	0.297
Work in barns (yes, %)	**92.4**	94.2	89.5	0.194
Hours working in barns per week	**22.9 ± 13.7**	22.2 ± 11.7	23.9 ± 16.5	0.401
Availability of dust mask (yes, %)	**37.9**	**31.9**	**49.3**	**0.014**
Dust mask utilization (%)[d] (never or seldom)	**63.1**	**68.9**	**52.1**	**0.018**

Prevalence (%) of Respiratory Symptoms

Symptom	Total (n = 225)	Sex		
		Women (n = 32)	Men (n = 193)	*P* Value[a]
Upper respiratory symptoms				
Nasal irritation	41.3	40.6	41.5	0.930
Throat irritation	44.9	53.1	43.5	0.312
Sinus trouble	24.3	31.3	23.3	0.333
Any of the above	52.9	62.5	51.3	0.240
Lower respiratory symptoms				
Cough	44.4	56.3	42.5	0.147
Wheezing	6.2	15.6	4.7	0.017
Chest tightness	9.3	18.8	7.8	0.048
Shortness of breath	8.0	25.8	5.2	< 0.001
Difficulty breathing	7.6	21.9	5.2	< 0.001
Any of the above	52.0	78.1	47.7	0.001
Any upper or lower symptoms	61.8	84.4	58.0	0.005

[a] Comparison between women and men.

ORs (95% CIs) of Having Respiratory Symptoms in Relation to Selected Variables

	Any Upper Symptoms	Any Lower Symptoms	Any Symptoms
Age (1 year increase)	1.00 (0.96-1.03)	1.00 (0.96-1.04)	1.00 (0.96-1.05)
Sex (female vs male)	2.13 (0.88-5.13)	**4.33 (1.60-11.70)**	**4.28 (1.45-12.63)**
Education (low vs high)	1.06 (0.51-2.23)	0.80 (0.38-1.70)	0.65 (0.29-1.46)
Years of living in US (1 year increase)	0.96 (0.92-1.01)	0.96 (0.92-1.01)	0.95 (0.90-1.00)
English understanding (poor vs good)	1.41 (0.67-2.98)	1.93 (0.90-4.11)	1.43 (0.63-3.24)
Smoking status			
Former vs never	**2.95 (1.36-6.43)**	1.48 (0.71-3.08)	**3.07 (1.30-7.26)**
Current vs never	0.83 (0.36-1.92)	0.41 (0.17-1.01)	0.59 (0.25-1.39)
Time working in barns per week (long vs short)	0.93 (0.49-1.74)	1.09 (0.58-2.05)	0.99 (0.51-1.93)
Dust mask utilization (less vs more)	**2.34 (1.21-4.53)**	1.71 (0.87-3.36)	1.79 (0.89-3.62)
Years of work at the farm	1.02 (0.94-1.10)	0.97 (0.89-1.05)	1.01 (0.93-1.09)

'Less' means never, seldom, or sometime used dust masks; 'more' means often or almost always used dust masks.
Shortmeans quartiles1and 2, longmeans quartiles 3 and 4, of hoursworking in barns.

Conclusions

- High prevalence of respiratory symptoms among Latino thoroughbred workers (62%)
  - Young worker group (35 yrs) with high prevalence of respiratory symptoms
  - Potential occupational contribution?
- Greater use/availability of PPE needed
  - Infrequent dust mask use (63%)
  - Low availability of dust masks (38%)

Conclusions

- Females heightened risk group?
  - Smaller lung volume in females may increase susceptibility to respiratory hazards
  - Social differences in gender reporting
- Spirometry testing supports high prevalence of adverse respiratory health conditions in worker group
  - 27% prevalence of abnormal pulmonary function (Primarily restrictive (20/21 cases)) (Flunker et al. 2015)

Future Research

- Dust sampling in horse barns- assess worker exposures
- Interventions: Increase level of dust mask availability and usage among thoroughbred workers

Strengths and Limitations

Strengths

- Provides insight into the respiratory health of Latino thoroughbred workers and associated occupational/demographic factors
- Utilizes trained *Promotoras* to collect data from a hard-to-access population

Limitations

- Purposive, convenience sampling; non-random
- Cross sectional study; no causality
- Potential self-reporting bias
- Limited number of unexposed workers (92% work in barns)
- Limited knowledge of risky tasks on farm/past respiratory exposures

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