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Occupational health in Ecuador: a comparison with Latin-American surveys on working conditions

Saúde do trabalhador no Equador: uma comparação com inquéritos sobre condições de trabalho na América Latina

Abstract

Introduction: Ecuador has recently implemented its First Working Conditions Survey. *Objective*: to describe working and employment conditions and workers' health status in Ecuador in a sample that allows comparison with previous Latin American surveys. *Methods*: a sample of 1,713 workers was drawn from the First Working Conditions Survey in Ecuador. Prevalence and a 95% confidence Interval (95%CI) were calculated and compared with previous Latin American surveys in Colombia, Argentina, Chile, Central America, and Uruguay. *Results*: men were more often exposed to hazardous working conditions, with noise (81% of men and 69% of women), and repetitive movements (56% and 48%, respectively) being the most frequently reported. About 31% of men and 19% of women worked more than 40 hours per week. Almost 11% of both women and men reported poor self-perceived health status. The prevalence of occupational injury was the highest in the region: 15% for men and 8.4% for women. *Conclusions*: this is a first approach to the working and employment conditions and workers' health status in Ecuador. To harmonize and improve Working Conditions Surveys in Latin America should be a priority goal for enhancing regional occupational health surveillance.

Keywords: occupational health; health information system; working conditions; health status; Ecuador.

Resumo

Introdução: *o Equador realizou recentemente seu primeiro inquérito sobre condições de trabalho.* Objetivo: *descrever as condições de trabalho e emprego e o estado de saúde dos trabalhadores equatorianos em uma amostra que permita comparação com inquéritos latino-americanos anteriores.* Métodos: *uma amostra de 1.713 trabalhadores foi selecionada do primeiro inquérito sobre condições de trabalho no Equador. Prevalências e intervalos de confiança de 95% (IC95%) foram calculados e comparados com inquéritos anteriores na Colômbia, Argentina, Chile, América Central e Uruguai. Resultados: homens foram frequentemente mais expostos a trabalho em condições perigosas, sendo as mais relatadas trabalho com ruído (81% dos homens e 69% das mulheres) e com movimentos repetitivos (56% dos homens e 48% das mulheres). Cerca de 31% dos homens e 19% das mulheres trabalhavam mais de 40 horas por semana. Quase 11% das mulheres e dos homens relataram uma autopercepção de saúde ruim. A prevalência de agravos ocupacionais foi a mais alta da região: 15% para homens e 8,4% para mulheres.* Conclusão: *este é um primeiro levantamento das condições de trabalho e emprego e do estado de saúde de trabalhadores no Equador. Harmonizar e aperfeiçoar os Inquéritos sobre Condições de Trabalho na América Latina deve ser uma meta prioritária para melhorar a vigilância em saúde do trabalhador na região.*

Palavras-chave*: saúde do trabalhador; sistema de informação em saúde; condições de trabalho; estado de saúde; Equador.*

Introduction

Employment and working conditions are heavy health determinants for workers and their families[1]. Growing scientific evidence shows that poor working and employment conditions, such as job insecurity and precarious employment, create adverse health effects, sickness absence, occupational injuries and produces health inequities among the population[2,3].

Global competition and the increased need for cost-containment have put pressure on "labor flexibility," affecting workers' safety and health[4,5]. Additionally, as globalization allows outsourcing, this health cost is generally transferred to low- and middle-income countries, where the lack of policies and control exposes workers to poor working and employment conditions. In fact, high-income countries have five times fewer fatal and non-fatal occupational accidents than the world's average and six times fewer the Latin American and the Caribbean average[6].

In low- and middle-income countries, the scarcity of reliable information on working and health conditions is one of the major barriers to establish appropriate public policies[7,8]. Several international health and development programs have recognized the improvement of occupational health information systems as a priority goal[9,10].

In this regard, working conditions surveys (WCS) have been consolidated as a reliable tool to monitor working, employment, and health conditions[11]. Over the last decade, several Latin-American countries have carried out their first WCS[12]. The purpose of these surveys is to subsidize their national policies. These efforts have also allowed the first cross-country comparisons in the region, offering better evidence for policy-makers[13].

Recently, Ecuador has implemented its first WCS, providing a first glance at working and health conditions from the worker's perspective. The objective of this study is to describe working and employment conditions and the health status of non-agricultural employees covered by the social security system in Quito and Guayaquil, in a sample that allows comparison with previous Latin-American surveys (Colombia, Argentina, Chile, Central America, and Uruguay).

Methods

The data used was obtained from the First WCS in Ecuador (I-ECSST, by its Spanish acronym), carried out in Quito, the capital city, and in Guayaquil, the most populated city in the country, between April 2016 and January 2017.

I-ECSST is a cross-sectional survey based on a sample of paid workers aged 18 or older, registered in the social security system, from all economic activity sectors and living in Quito or Guayaquil. In total, a representative sample of 1,790 was selected (741 from Quito and 1,049 from Guayaquil) through a multistage random sampling procedure stratified by neighborhood and based on the 2010 Ecuadorian Population and Housing Census. The face-to-face questionnaire was filled in at the workers' home; only one worker per household was interviewed. Details of the survey are available on the official report[14].

In order to compare the results of I-ECSST with previous WCS from Colombia (2007)[15], Argentina (2009)[16], Chile (2009-2010)[17], Central America (2011)[18], and Uruguay (2012)[19], as it was done in a previous study[13], we selected a subsample of employees who were registered in the social security system, aged between 18-64 years, and engaged in non-agricultural activities. The final sample was composed of 1,713 workers from Quito and Guayaquil (848 women and 865 men).

The variables that allowed comparison between I-ECSST and other Latin American WCS were: gender, age (grouped into 18-34 years, 35-49 years, 50-64 years), educational level (categorized into primary, secondary, university), economic sector (categorized into industry, construction, service) and occupational categories (categorized into managers, professionals, technicians, clerical support workers, services and sales workers, skilled manual and unskilled manual workers).

Regarding working conditions, we selected: noise, vibrations, handling, and breathing of hazardous chemicals, biological agents, manual handling, and repetitive movements. Following the same criteria of the previous study, responses were dichotomized into "exposed" and "non-exposed," in which any different response to "never" means "exposed." For employment conditions, it was only possible to select weekly working hours (< 30 hours, 30-40 hours, > 40 hours).

Regarding health outcomes, two variables were selected. Self-perceived health status was obtained by asking the respondents to describe their general health as "excellent," "very good," "good," "fair," "poor" or "very poor." The responses were merged into two categories, where the answers "fair," "poor" or "very poor" indicated poor self-perceived health. Occupational injuries were assessed by asking the respondents whether they had or not suffered a work accident in the previous 12 months.

The prevalence of exposure, and a 95% confidence interval (95%CI), to poor employment and working conditions, and health-related problems were calculated for each country. All analyses were stratified by gender and carried out with the statistical software package SPSS23.

Results

Most non-agricultural employees covered by social security and living in Quito or Guayaquil (**Table 1**) were young, being 11% of women and 13% of men over 50 years of age, and the overwhelming majority had secondary and university education. Both women and men were engaged mainly in the service sector (89% and 82%, respectively), and their occupations were related to services and sales, and clerical support (67% and 57%, respectively).

Regarding employment conditions, in Ecuador 19.3% (16.7%-22%) of women and 31.4% (28.3%-34.6%) of men worked more than 40 hours per week, and this was the lowest percentage of the region (for example, when compared with Chile: 63.5% of women and 83.6% of men). In relation to working conditions, being exposed to noise was the most prevalent hazard among Ecuadorian workers: 81.2% (78.5%-83.8%) of men and 69% (65.9%-72.1%) of women, followed by repetitive movements: 56.1% (52.8%-59.4%) and 48.1% (44.8%-51.5%), respectively. In all countries, the frequency of exposure was higher among men (**Table 2**). Furthermore, those exposures were higher when comparing the results obtained in Ecuador with the results from other countries in the region; for example, in Central America, the exposure to noise was 54.1% for women and 62.0% for men; to chemical substances in the air was 30.8% and 39.4%, respectively, and to biological agents was 9.9% and 9.4%, respectively.

Table 1 Socio-demographic characteristics of non-agricultural employees, by gender, in Quito and Guayaquil, Ecuador, 2016-1017 (n=1,713)

Variable	*Women n=848*		*Men n=865*	
	%	*(95%CI)*	*%*	*(95%CI)*
Age				
18-34 years	52.5	(49.1-55.8)	45.1	(41.8 -48.4)
35-49 years	36.9	(33.7-40.2)	42.2	(38.9-45.5)
50-64 years	10.6	(8.5-12.7)	12.7	(10.5-14.9)
Educational level*				
Primary	5.8	(4.2-7.3)	6.7	(5.0-8.4)
Secondary	36.8	(33.5-40.2)	46.0	(42.7-49.3)
University	56.8	(53.5-60.2)	45.9	(42.6-49.2)
Economic activity				
Industry	7.9	(6.1-9.7)	9.0	(7.1-10.9)
Construction	3.1	(1.9-4.2)	9.4	(7.4-11.3)
Services	89.0	(86.9-91.1)	81.6	(79.0-84.2)
Occupational categories				
Managers	4.4	(3.0-5.7)	6.0	(4.4-7.6)
Professionals	7.3	(5.6-9.1)	4.6	(3.2-6)
Technicians	7.7	(5.9-9.5)	11.2	(9.1-13.3)
Clerical support workers	25.1	(22.2-28.0)	12.6	(10.4-14.8)
Services and sales workers	42.3	(39.0-45.7)	42.3	(39.0-45.6)
Skilled manual worker	4.9	(3.5-6.4)	13.6	(11.4-15.9)
Unskilled manual worker	8.3	(6.4-10.1)	9.6	(7.6-11.6)

*missing data: women n=5; men n=12

Table 2 Employment and working conditions and health status of non-agricultural employees aged 18-64 years, by gender, in Ecuador, Colombia, Argentina, Chile, Central America, and Uruguay

	Ecuador	*Colombia*	*Argentina*	*Chile*	*Central America*	*Uruguay*
Variable	*% (95%CI)*	*% (95%CI)*	*% (95%CI)*	*% (95%CI)*	*% (95%CI)*	*% (95%CI)*
Women	*n=848*	*n=366*	*n=2646*	*n=1540*	*n= 1034*	*n=358*
Employment conditions						
Weekly working hours						
< 30h	5.4 (3.9-6.9)	-	21.8 (16.6-27.1)	5.2 (3.2-7.2)	12.4 (9.9-14.9)	17.5 (12.6-22.5)
30-40h	75.2 (72.3-78.1)	-	29.0 (24.3-33.6)	31.3 (26.8-35.8)	27.1 (24.0-30.3)	41.4 (35.1-47.6)
> 40h	19.3 (16.7-22.0)	-	49.2 (44.1-54.4)	63.5 (58.8-68.2)	60.5 (57-63.9)	41.1 (34.8-47.4)
Working conditions						
Noise*	69.0 (65.9-72.1)	23.3 (19.0-27.6)	14.9 (11.8-18)	22.5 (18.8-26.3)	54.1 (50.7-57.6)	22.3 (17.3-27.4)
Vibrations$	12.0 (9.8-14.2)	6.8 (4.3-9.4)	5.5 (3.6-7.4)	11.2 (8.2-14.3)	25.1 (22.2-28.1)	7.9 (4.9-10.9)
Handling of hazardous chemicals$	19.2 (16.6-21.9)	8.8 (5.9-11.7)	11.9 (6.7-17.1)	9.6 (7.1-12.2)	16.9 (14.4-19.5)	6.4 (3.7-9.1)
Breathing chemical substances*	38.8 (35.5-42.1)	19.2 (15.2-23.3)	2.6 (1.6-3.6)	7.3 (4.8-9.7)	30.8 (27.7-34.0)	14.0 (9.7-18.2)
Biological agents*	30.2 (27.1-33.3)	8.2 (5.4-11)	9.4 (6.5-12.3)	17.7 (14-21.4)	9.9 (7.8-11.9)	12.3 (8.3-16.2)
Manual handling*	36.7 (33.4-39.9)	13.4 (9.9-16.9)	24.1 (19.9-28.3)	24.0 (20.1-27.9)	13.9 (11.5-16.2)	27.8 (22.3-33.4)
Repetitive movements$	48.1 (44.8-51.5)	84.4 (80.7-88.1)	50.8 (45.6-56)	54.7 (49.9-59.5)	73.7 (70.7-76.7)	51.3 (45.0-57.8)
Health problems						
Poor self-perceived health+	10.8 (8.8-12.9)	5.5 (3.1-7.8)	-	33.4 (28.4-38.3)	24.3 (21.3-27.2)	-
Occupational injuries++	8.4 (6.5-10.2)	3.8 (1.9-5.8)	-	7.4 (4.6-10.2)	4.5 (3.1-6.0)	-
Men	*n=865*	*n=455*	*n=4402*	*n=2310*	*n= 1632*	*n=498*
Employment conditions						
Weekly working hours						
< 30h	2.5 (1.5-3.6)	-	5.4 (3.4-7.5)	0.9 (0.2-1.5)	5.6 (4.0-7.2)	7.9 (4.6-11.1)
30-40h	66.0 (62.8-69.2)	-	18.3 (15.6-21)	15.5 (12.8-18.2)	21.0 (18.6-23.5)	34.1 (28.4-39.8)
> 40h	31.4 (28.3-34.6)	-	76.3 (73.1-79.4)	83.6 (80.9-86.4)	73.3 (70.6-76.0)	58.1 (52.1-64.0)
Working conditions						
Noise*	81.2 (78.5-83.8)	45.2 (40.6-49.7)	22.5 (19.7-25.2)	45.6 (41.1-50.1)	62.0 (59.2-64.7)	30.7 (25.6-35.8)
Vibrations$	35.8 (32.6-39.0)	30.8 (26.6-35.1)	17.8 (15.4-20.2)	42.1 (37.6-46.5)	37.6 (34.79-40.4)	30.0 (24.8-35.2)
Handling of hazardous chemicals$	22.2 (19.4-25.0)	22.1 (18.3-25.9)	12.5 (10.7-14.4)	19.1 (15.9-22.4)	18.4 (16.2-20.6)	18.3 (13.9-22.8)
Breathing chemical substances *	57.5 (54.2-60.8)	50.9 (46.3-55.5)	11.9 (9.9-13.8)	32.9 (28.9-36.9)	39.4 (36.6-42.2)	31.4 (26.1-36.8)
Biological agents*	31.7 (28.6-34.8)	8.2 (5.6-10.7)	6.2 (4.7-7.6)	9.2 (7.1-11.3)	9.4 (7.7-11.2)	15.1 (10.7-19.5)
Manual handling*	58.6 (55.3-61.9)	34.4 (30.0-38.7)	44.9 (41.2-48.5)	39.9 (35.7-44.1)	36.6 (33.9-39.3)	45.5 (39.5-51.5)
Repetitive movements$	56.1 (52.8-59.4)	76.9 (73.0-80.8)	62.8 (59.1-66.5)	60,0 (55.4-64.7)	77.3 (74.9-79.9)	58.6 (52.6-64.6)
Health status						
Poor self-perceived health+	10.9 (8.8-12.9)	4.2 (2.3-6.0)	-	16.6 (13.4-19.7)	19.1 (16.9-21.4)	-
Occupational injuries++	15.0 (12.6-17.4)	9.9 (7.1-12.6)	-	6.5 (4.7-8.3)	4.9 (3.7-6.1)	-

*: "always," "very often," "sometimes" or "rarely"; $: "yes"; +: "fair," "poor" and "very poor"; ++: during the previous 12 months.

As for health problems, men from Ecuador were more prone to occupational injuries than women: 15% (12.6%-17.4%) *vs*. 8.4% (6.5%-10.2%), as it was reported in other countries, and they showed the highest prevalence in the region followed by Colombia (9.9% of men and 3.8% of women), Chile (6.5% of men and 7.4% of women) and Central America (4.9% of men and 4.5% of women). Finally, almost 11% of both women and men reported poor self-perceived health in Ecuador, a prevalence that was below Chile and Central America.

Discussion

This study is a first look at the formal workers' working conditions and health in two of Ecuador's most populated cities. It offers a first comparative perspective considering WCS previous results in Latin American countries.

Our sample shows a similar distribution to that observed in the region, with a small difference due to a greater proportion of workers engaged in the service sector: 81.6% of men from Ecuador versus 78.1% of men from Central America[13]. This difference could be explained because the Ecuadorian WCS was implemented in the two biggest commercial and administrative cities in the country.

In the region, Ecuador has the lowest percentage of men and women working more than 40 hours per week. The average working hours per week for the Ecuadorian formally employed population was 43.1 for men and 41.3 for women. Similar to the average 42 hours reported in 2013, in Latin America, based on national household surveys[20], although the formally employed population reported a lower average in others WCS of the region. This finding may be related to the laws in many countries of the region that allow longer weekly maximum hours than the recommended by the International Labor Organization[21].

Regarding working conditions, we found that some exposures were higher in Ecuador than the ones observed in the other countries of the region. This high prevalence in Ecuador could have been overestimated given the criteria adopted to group the responses, where a five-point Likert scale was dichotomized and any response that was different to "never" meant "exposed." However, it was also higher than Colombia, where a similar five-point Likert scale was used. Further research is needed to explain these differences.

Unlike Chile and Central America, we did not find gender differences related to poor self-perceived health. This could be related to the sensitivity of this measure to the cultural environment. For instance, in a European longitudinal study, substantial differences were not found in the self-perceived health by gender[22]. Anyway, the Ecuadorian percentage was above Colombia and below Chile and Central America.

Ecuador showed the highest prevalence of occupational injury in the region. These results were much higher than those reported by the Ecuadorian social security system[23], which barely reaches 0.62%. This discrepant result alerted us of a probable high sub-register in the official figures in the country. It is a problem in many countries[6].

We should consider some limitations of this study. Firstly, the sample included only workers registered in the social security system, engaged in non-agricultural activities and living in Quito or Guayaquil. This may have introduced a selection bias because, although these two cities include the largest working population covered by social security (62%)[23], informal employment was not considered. According to the Ecuadorian 2017 labor report, informal employment represents 46% of the working population[24]. It is a general problem in the region labor market, ranging from 83.1% in Bolivia to 40.5% in Chile[25]. In fact, the previous comparison among Latin-America WCS also excluded informal employment. Secondly, differences among the questionnaires (concerning the items included and the response categories) used by Latin-American WCS limited the number of variables that we could compare. For example, we excluded psychosocial results in our study because question-wording and response categories have limited comparability.

Despite these limitations, this is the best information available in Ecuador so far, and it is a first step to diagnose health and working conditions in the country. This study also presents a preliminary comparison between occupational health in Ecuador and in other Latin-American countries. It provides basic information for the surveillance of health and working conditions in the country and enhances the regional epidemiological surveillance. Furthermore, it reinforces the need to harmonize and improve WCS in Latin America[26], as well as the global occupational health surveillance[27]. This study also recognizes the need to establish appropriate occupational health public policies.

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Authors' contributions

Silva-Peñaherrera M and G Benavides F contributed to the study design, data analyses and interpretation, and manuscript drafting. Merino-Salazar P, López-Ruiz M and Gómez-García AR made substantial contributions to the study design, results interpretation and manuscript review. All authors critically reviewed the final version of the article and take full responsibility for its content.

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