

National working conditions surveys in Latin America: comparison of methodological characteristics

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Background: High-quality and comparable data to monitor working conditions and health in Latin America are not currently available. In 2007, multiple Latin American countries started implementing national working conditions surveys. However, little is known about their methodological characteristics.

Objective: To identify commonalities and differences in the methodologies of working conditions surveys (WCSs) conducted in Latin America through 2013.

Methods: The study critically examined WCSs in Latin America between 2007 and 2013. Sampling design, data collection, and questionnaire content were compared.

Results: Two types of surveys were identified: (1) surveys covering the entire working population and administered at the respondent's home and (2) surveys administered at the workplace. There was considerable overlap in the topics covered by the dimensions of employment and working conditions measured, but less overlap in terms of health outcomes, prevention resources, and activities.

Conclusions: Although WCSs from Latin America are similar, there was heterogeneity across surveyed populations and location of the interview. Reducing differences in surveys between countries will increase comparability and allow for a more comprehensive understanding of occupational health in the region.

Keywords: Occupational health, Health surveys, Health information systems, Occupational risk factors, Latin America

Introduction

High-quality data on occupational health are essential to improve workers' health and safety.¹ In Latin America, there is a need for improved and coordinated data collection efforts to increase the comparability of occupational health indicators.² However, despite the efforts of several organizations for improved information, it still remains a challenge.^{3,4}

Traditional sources of information, such as registries of occupational injuries and diseases, are important for occupational health surveillance, but provide limited information on the complex relationship between working and employment conditions and health.⁵ In addition, registries require sustained investment, maintenance, and networks. However, national working conditions surveys (WCSs) can be

easily implemented and are comparatively cheaper, therefore allowing for a quicker and broader view of occupational health indicators than traditional registries.^{6,7} These WCSs typically collect data about working and employment conditions, health-related problems, and occupational risk preventive activities.⁸

In economically developed countries, WCSs were introduced more than four decades ago. The first national WCS was conducted in 1969–1970 in the United States,⁹ while in Europe the first national WCSs were conducted in France in 1978 and in Germany in 1979.¹⁰ Beginning in 1990, the European Union conducts a WCS every 5 years in all its member states. This European WCS stands out among transnational surveys due to its wide geographical coverage and high-quality standards.¹¹ A worldwide study in 2006 identified 66 national and eight transnational surveys that measured the working environment as part of a larger survey (e.g. the Survey of Family, Income and Employment from the New Zealand) or

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that focused exclusively on the working environment (e.g. the Work and Health Survey from Finland).¹²

WCSs are a reliable source of information on occupational health in European countries and have been instrumental in occupational health research and policy development.¹³ Several studies have been conducted to improve survey quality.^{6,14} Accordingly, two comparative analyses on the methodological characteristics of the WCSs available in 2006 identified diverse strategies for conducting WCSs.^{10,12}

In recent years, several countries in Latin America have conducted their first national WCS, including Colombia¹⁵ and Guatemala¹⁶ in 2007, Argentina in 2009,¹⁷ Chile¹⁸ in 2009–2010, all Spanish-speaking Central American countries in 2011,^{19,20} and Uruguay in 2012.²¹ Colombia implemented the second edition of their WCS survey in 2013.²² These surveys pursue similar objectives. Overall, they seek to provide relevant information on working and employment conditions, preventive resources and activities, and health-related outcomes. However, the lack of a standard protocol for conducting national WCSs dramatically affects comparisons and conclusions across countries. There is, therefore, a need for a comparison of methodologies among the WCSs in Latin America.

The objective of this study was to identify commonalities and differences in the methodologies of national WCSs conducted in Latin America through 2013. We propose that this comparison could improve the quality and comparability of future surveys.

Material and methods

Working condition surveys

We identified all WCSs in Latin America through 2013 (Table 1). Our study included the first WCS of Colombia,¹⁵ Argentina,¹⁷ Chile,¹⁸ Central America,^{19,20} and Uruguay.²¹ The Guatemalan survey¹⁶ was excluded due to missing methodological information and lack of access to the dataset. Likewise, the second Colombian survey²² was excluded because only a preliminary report was available at the time of this study. Information about the included WCSs

was obtained from official reports and questionnaires. In some cases, additional information was requested from responsible institutions. We analyzed only the employee questionnaire, excluding an additional questionnaire used in Colombia targeting employers.

Methodological characteristics

The comparison of survey methodologies was divided into three sections: (1) sampling design dimensions: universe, population size, sampling frame, sample size, sampling design, stratum variables, sampling units, and selection of the final sampling unit; (2) data collection strategy: place and mean duration of the interview, number of questionnaire items, and response rate; and (3) questionnaire content divided into seven dimensions based on a previously developed occupational health conceptual framework: sociodemographic and individual characteristics, company characteristics, family characteristics, employment conditions, working conditions, resources and preventive activities, and health outcomes.²³ Working conditions were organized into four categories: safety, environmental, ergonomic, and psychosocial. Violence, sexual harassment, and discrimination were considered in the psychosocial category. Survey topics were included in analysis when any questionnaire included at least one item measuring this topic.

Results

Characteristics of the sampling design

Two groups of surveys were identified based on sampling design (Table 2): surveys that used the population census as the sampling frame (Central America, Chile, and Uruguay) and surveys sampling workers from registered workplaces using company registers as the sampling frame (Argentina and Colombia). In all surveys, sampling units were selected through multistage stratified random sampling. In the last stage – worker's selection – Argentina and Uruguay used quota sampling.

Table 1 National working conditions surveys (WCSs) identified in Latin America up until 2013^a

Country	Year	Survey name
Colombia	2007	First National Survey on Health and Working Conditions
Guatemala ^b	2007	First National Survey on Working Conditions, Health and Occupational Safety
Argentina	2009	First Survey for Workers: Employment, Work, Working Conditions and Environment
Chile	2009–2010	First National Survey on Worker's Employment Conditions, Equity, Work, Health and Quality of Life
Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panamá	2011	First Central American Working Conditions and Health Survey
Uruguay	2012	First Survey on Working Conditions, Safety and Occupational Health of Uruguay
Colombia ^b	2013	Second National Survey of Conditions of Health and Safety of Colombia

^aOnly includes surveys of multi-sectoral scope. ^bThis survey is not included in our analysis.

Table 2 Characteristics of the sampling design of the first working conditions surveys (WCSs) in Colombia, Argentina, Chile, Central America and Uruguay

	Colombia	Argentina	Chile	Central America	Uruguay
Population Situation in the labor market	Employed	Employed	Employed and unemployed, who had any paid job in the last 12 months	Employed at time of the interview or during the previous week for at least one hour ^a	Employed
Employment status	Employee	Employee	Employee, self-employed	Employee, self-employed	Employee, self-employed
Age	–	–	Over 15	Over 18	Over 14
Workplaces characteristics	Registered in the general system of professional risk	Private companies registered in the social security system	–	–	–
Size of the workplace	Two workers or more	Five workers or more	–	–	–
Sectors of economic activity	All sectors	Secondary and tertiary	All sectors	All sectors	All sectors
Formal or informal economy	Formal	Formal	Formal or informal	Formal or informal	Formal or informal
Urban or rural living	–	–	Urban and rural	Urban and rural	Urban and rural
Population size	445 550 workplaces ^b	3 432 653	7 392 170	12 468 047	1 141 251 ^c
Sampling frame	Database of payments to the occupational hazards fund of 2006	Register of companies from the integrated system of retirement and pensions	Census of Population and Housing 2002	The most recent population census available in each country ^d	Area sampling frame from the Census of 2004
Sample size	924 persons in 737 workplaces	7195	9503	12 024 (2004/country)	2057
Type of sampling design	Multistage stratified random sampling	Multistage stratified random sampling and quota sampling	Multistage stratified random sampling	Multistage stratified random sampling	Multistage stratified random sampling and quota sampling
Stratum variables	Regions and economic activity	Urban areas, economic activity, and size of the company	Regions, urban and rural areas	Countries and departments or provinces	Groups of departments and the capital
Selection of the final sampling unit	Workplaces and workers within selected workplaces were selected through random selection ^e	Workers were selected in the companies through quota sampling by sex and occupation	Compact segment sampling for household selection/one person was selected in the household through random selection	Random walk method for household selection/the next birthday method selection was used to select the person within the household when there was more than one eligible candidate	Random walk method for household selection/one or more persons were selected within the household considering quotas of economic activity

^a Including people who were absent from work due to illness, vacation, or other reasons. ^b Information regarding the size of the target population was not available. ^c Accounts for about 90% of the total working population. ^d Guatemala (2002), El Salvador (2007), Honduras (2001), Nicaragua (2005), Costa Rica (2000), and Panamá (2000). ^e Any worker who was at the workplace at the time of the interview (232 473 workers in total) was included, regardless of the type of contractual relationship.

Data collection strategy

In Argentina and Colombia, interviews were conducted in the workplace. In Central America, Uruguay, and Chile, they were administered in the respondent's home (Table 3). Most interviews lasted half an hour, with Chile reporting a longer duration. The number of items in the questionnaires ranged from 143 in Colombia to 428 in Chile.

Questionnaire content

Questionnaire topics are shown in Table 4. Most countries collected similar sociodemographic and individual characteristics data, although there were differences in ethnicity, urban and rural living, and health-related behaviors. Economic activity and company size were collected in most surveys. Family characteristics were not consistently collected across countries. The same employment and working conditions topics were collected in most countries, but no common topics were identified for safety risk factors. All surveys collected data on at least four topics related to resources and preventive activities, and all surveys included questions about physical and mental health and occupational injuries.

Discussion

To our knowledge this is the first paper to compare characteristics of national WCSs in Latin America. The main findings were: (1) in Latin America, there were two types of WCSs differentiated by working population covered and the site of the interview and 2) there was considerable overlap between the different surveys with regard to topics covered by the dimensions of employment and working conditions, but less overlap of topics covered by the dimensions of health outcomes, and prevention resources and activities. Family characteristics were rarely collected.

The sampling frame and the interview site influenced populations sampled in the Latin American WCSs. Thus, while surveys carried out at the respondent's workplace were based on official registries and, by definition, were restricted to formal employment, surveys carried out at the respondent's home relied on population censuses and captured a wider spectrum of the working population, including informal employees. Conducting home interviews is the more appropriate strategy, especially in contexts such as Latin America where 48% of the workforce is employed informally.²⁴ Only 5.9 million of 17.8 million workers in Colombia were registered in the General System of Professional Risks in 2007, leaving two-thirds of the national working population excluded from the Colombian WCS.²⁵ Likewise, approximately three-fourths of the national working population in 2009²⁶ were not represented by the Argentinian WCS, affecting workers from

Table 3 Data collection strategy of the working conditions surveys (WCSs) in Colombia, Argentina, Chile, Central America, and Uruguay

	Colombia	Argentina	Chile	Central America	Uruguay
Respondents	Workers and a representative of the workplace	Workers	Workers	Workers	Workers
Place of interview	Respondent's workplace	Respondent's workplace	Respondent's home	Respondent's home	Respondent's home
Mean duration of the interview	^a 143 ^c	35 minutes	45–60 minutes ^b	32 minutes	30 minutes ^b
Number of items	79 ^c	292 ^a	428	146	342 ^a
Response rate (%)			74	50–80 ^d	

^a Information was not available. ^b Described as expected time. ^c Survey conducted for workers. ^d Panamá, El Salvador, and Nicaragua around 80%, Honduras over 60%, and Costa Rica 50%.

Table 4 Questionnaire content of the working conditions surveys (WCSs) in Colombia, Argentina, Chile, Central America, and Uruguay

	Colombia	Argentina	Chile	Central America	Uruguay
Sociodemographic and individual conditions					
Age	✓	✓	✓	✓	✓
Sex	✓	✓	✓	✓	✓
Educational level	✓	✓	✓	✓	✓
Country of birth	—	✓	✓	✓	✓
Ethnic group	—	—	✓ ^a	✓	—
Urban and rural living	—	—	—	✓	—
Occupation	✓	✓	✓	✓	✓
Health-related behaviors	—	—	✓	—	—
Company characteristics					
Economic activity of the company	✓ ^b	✓	✓	✓	✓
Type of company ^c	—	—	✓	✓	—
Size of the company	—	✓	✓	✓	✓
Family characteristics					
Marital status	—	✓	✓	✓	✓
Household size	—	✓	✓	—	—
Children in household	—	✓	✓	—	✓
People over 65 in household	—	—	✓	—	—
Head of household	—	✓	✓	—	—
Contribution to family income	—	✓	✓	—	—
People who are economically dependent on the respondent	—	—	—	✓	—
Number of hours in domestic work	—	—	—	✓	—
Care of people ^d	—	—	✓	✓	—
Leisure time	—	—	✓	—	✓
Employment conditions					
Employment situation ^e	—	—	✓	—	—
More than one job	—	✓	✓	✓	✓
Status in employment ^f	✓	—	✓	✓	✓
Type of contract ^g	—	✓	✓	✓	✓
Contract duration	—	✓	✓	✓	✓
Form of contracts ^h	—	✓	✓	✓	—
Social security coverage	✓	✓	✓	✓	—
Outsource work	—	✓	✓	✓	—
Job seniority	✓	✓	✓	✓	✓
Social rights	—	✓	✓	✓	✓
Working hours	✓ ⁱ	✓	✓	✓	✓
Overtime	✓	✓	—	—	—
Time traveling to and from work	✓	✓	✓	✓	✓
Working weekends/holidays	—	✓	✓	✓	✓
Work schedule ^j	✓	✓	✓	✓	✓
Flexible work schedule	—	✓	—	✓	—
Weekly rest periods	✓	✓	—	—	—
Daily rest periods	✓	✓	—	—	—
Annual holidays	—	✓	—	—	—
Salary	—	✓	✓	✓	✓
Type of remuneration	✓	—	✓	—	—
Child labor	—	—	—	✓	—
Work history	—	—	✓	—	—
Safety risk factors					
Safety hazards	—	✓ ^k	—	—	—
Causes of safety hazards	✓ ^l	✓ ^l	—	—	—
Openings, gaps, stairs, slopes	—	✓	—	✓	✓
Surfaces	—	—	—	✓	✓
Limited space at work	—	✓	—	✓	✓
Tools, machines and equipments	—	✓	✓	✓	✓
Environmental risk factors					
Usual working place	✓	✓	✓	✓	✓
Temperature	✓	✓	✓	✓	✓
Humidity	✓	—	—	✓	✓
Noise	✓	✓	✓	✓	✓
Vibrations	✓	✓	✓	✓	✓
Solar radiations	—	—	✓	✓	—
Handling of chemical or hazardous substances	✓	✓	✓	✓	✓
Exposure to chemicals substances in the air	✓	✓	✓	✓	✓
Tobacco smoke	✓	—	✓	✓	✓
Ventilation	—	✓	—	—	—
Biological agents	✓	✓	✓	✓	✓
Radiation	✓	✓	✓	—	—

Table 4 Continued

	Colombia	Argentina	Chile	Central America	Uruguay
Ergonomic risk factors					
Working postures	√	√	√	√	√
Manual handling	√	√	√	√	√
Repetitive movements	√	√	√	√	√
Workstation space	√	√	—	√	—
Lighting	√	√	√	√	√
Psychosocial risk factors					
Psychological job demands	√	√	√	√	√
Emotional labor	√	√	—	√	√
Skill discretion	√	√	√	√	√
Decision authority	—	√	√	√	√
Social support	—	√	√	√	√
Reward	—	√	√	—	√
Violence	√	√	√	√	√
Sexual harassment	—	√	√	√	√
Discrimination	—	—	√	—	√
Resources and preventive activities					
Medical checkup	√	√	—	√	√
Information and training about occupational risks	√	√	√	√	√
Information and training about work performance	—	√	—	—	√
Personal protective equipment	√	√	√	√	√
Perception of the importance given to safety and health in the enterprise	—	—	√	√	√
Identification or evaluation of working conditions	√	—	—	—	√
Chemical products labeling	—	√	—	—	√
Prevention resources	—	√	—	—	√
Safety and health committees	√	√	—	—	√
Unions	√	√	√	—	√
Health outcomes					
Self-perceived health status	√	—	√	√	—
Physical health symptoms	√	√	√	√	√
Mental health symptoms	√	√	√	√	√
Occupational injuries	√	√	√	√	√
Perceived health damaged by work	—	√	—	—	√
Occupational diseases	√	√	√	—	√
Musculoskeletal disorders due to physical workload	—	√	√	—	—
Medical examination due to work-related disorders	—	√	√	√	√
Sickness absence	—	—	—	—	—
Satisfaction with working life	√	—	√	—	—
Satisfaction with quality of life	—	—	√	—	—

√ The questionnaire included at least one question measuring the topic.

^a Asked if the respondent is part or is a descendent of an indigenous community. ^b The answers were transcribed from the companies' questionnaire. ^c Refers to private or public sector. ^d Refers to children, elderly people, or people with disabilities or with chronic conditions. ^e Refers to individual's situation in the labor market concerning employed and unemployed persons. ^f Refers to individual's situation in the labor market concerning salaried and self-employed workers. ^g Refers to the permanent or temporary contract. ^h Refers to written, oral, or no contract. ⁱ Daily hours of work. ^j Refers to the arrangement of working time. ^k The question includes the main safety hazards among multiple response categories. ^l The question includes the main causes of safety hazards among multiple response categories.

primary sectors, public administrations, and those informally employed. In an attempt to overcome this limitation, both countries made complementary data collection efforts. The second edition of the Colombian survey²² included an additional questionnaire addressed to formal and informal employees to be administered in home. In 2014, Argentina conducted a separate home survey²⁷ with agricultural workers.

In-home interviewing is a common practice in other countries and has advantages over workplace-administered interviews. A study conducted in Spain in 2005 showed that although administering the interview at the workplace reduced costs and time, in-home interviews improved access to difficult to reach populations (e.g. workers on sick leave,

workers without a contract) and resulted in more reliable responses.²⁸ As a result of these findings, interviews for the 2007 Spanish WCS were conducted in the respondent's home instead of in their workplace.²⁹ A worldwide study about the methodological characteristics of WCSs found that 23 of 34 surveys performed in-home interviews.¹² This is true for the European WCS, which has administered in-home interviews since its inception in 1990. However, well-designed workplace surveys may complement household surveys. For instance, the workplace health and safety surveys (WHASS) of Great Britain³⁰ included separate workplace and workers surveys. These surveys study the state of health and safety in British workplaces by interviewing health

and safety stakeholders in a representative sample of workplaces, and by telephone interviewing a representative sample of workers in their homes. In addition, the enterprise survey on new and emerging risks (ESENER), which focuses on health and safety practices in European workplaces,³¹ interviewed a large sample of managers and health representatives through computer-assisted telephone interviewing. Both initiatives complement household surveys of occupational health, providing a broader perspective of the occupational health conditions.

The decision to inclusion certain topics in the Latin American WCSs may be the result of conceptual (i.e. the use of similar occupational health conceptual frameworks guiding the topic selection) and/or practical reasons (i.e. the use of the Spanish and the European WCSs, the longest running WCSs, as model surveys). The resulting commonalities increase comparability between the Latin American surveys, but may also result in topics, potentially relevant in a WCS, not being included in the questionnaire since they had not been previously included in model surveys. This may be the case for the family dimension. Although many studies have shown the importance of the domestic and family sphere for health of men and women, as well as its interaction with employment status and employment conditions,³² the Spanish WCSs do not collect data on family characteristic questions. This trend may change in future WCSs because of the increasing attention given to inequalities in occupational health.³³ In fact, this has resulted in the incorporation of more household questions in the fifth European WCS.¹¹ In addition, the lack of joint efforts between countries has prevented the development of a core set of occupational health topics. For instance, although most of the dimensions of working conditions are the same across countries, safety risk factors collected are markedly different.

Given the precariousness of occupational health information systems in Latin America, the development of national WCSs in the region with probabilistic samples is a commendable development. They provide a first look at a wide range of occupational health topics at the country level. However, greater consistency and comparability should be achieved through joint efforts within and across countries. There is still much to learn from other WCSs, such as the European WCS, which has evolved over time, adopted strict quality guidelines, and employed strict methodological procedures to enhance comparability between populations.¹⁴ WCSs in Latin America would benefit by utilizing large household samples similar to the European Union Labour Force Survey (EU LFS)³⁴ and the Labour Force Survey (LFS)³⁵ of Great Britain.

A limitation of this study is the lack of information on relevant methodological features such as procedures for replacement of missing units, substitution rate, allocation, and quality control procedures. For instance, given that questionnaires were administered during face-to-face interviews, it would have been useful to have information about interviewer training. Similarly, the validity of the WCSs instruments was not reported. We identified only one validated instrument, the General Health Questionnaire,³⁶ used in Chile and Central America; and some items taken from validated tools such as ISTAS-COPSOQ³⁷ in the Chilean WCS and the Maslach Burnout Inventory³⁸ in the Uruguayan WCS. In addition, we did not analyze number, wording, or response categories of items although differences existed between the WCSs. For instance, some topics common to all surveys were seldom measured with the same set of items (e.g. psychosocial risk factors). This analysis was beyond the scope of our work.

In conclusion, while there was considerable overlap between the WCSs conducted in Latin America with regard to topics covered by the dimensions of employment and working conditions, less overlap was observed related to topics covered by health outcomes, and prevention resources and activities. Moreover, both the working population covered and the site of interviewing differed between surveys. Hence, data for corresponding topics on the WCSs may be compared, but caution is required, due to methodological differences. Although the implementation of WCSs in several Latin American countries in the last few years is improving occupational health surveillance in the region, these differences reflect a lack of any agreed methodological approach across countries. Based on the findings from this study, we recommend a consensual design of core topics and other methodological characteristics by experts involved in the design, implementation, or analysis of the WCSs in Latin America. Moreover, these findings support efforts directed toward achieving a high-quality and cross-country comparable WCS in the region – perhaps, a future Latin American WCS. Finally, we recommend that WCS data be publicly accessible, allowing relevant stakeholders (e.g. policy makers, social agents, researchers) to use data for research, program, and policy development aimed toward improving working conditions and health in the region.

Disclaimer Statements

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Conflicts of interest None.

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