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Seguridad y salud laboral en Ecuador

Occupational safety and health in Ecuador

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Resumen: El diagnóstico de seguridad y salud ocupacional (SST) constituye un primer paso para el diseño de programas nacionales y revisiones continuas de las reglamentaciones existentes. El diagnóstico de SST realizado en Ecuador en 2011 es devastador debido al alto número de accidentes laborales, la escasa información oficial, la falta de educación académica de alto nivel y la investigación insuficiente. Diagnosticar el estado actual de la seguridad y salud laboral en Ecuador a partir de fuentes oficiales de información. Examinamos la situación geográfica, datos sociodemográficos y de salud pública, regulaciones legales, estadísticas de accidentes y enfermedades ocupacionales, capacitación e investigación en SST en Ecuador entre 2010 y 2015. Las principales fuentes de datos e información fueron: leyes y reglamentos nacionales sobre SST, convenios de la Organización Internacional del Trabajo, resoluciones de la Comunidad Andina de Naciones y páginas web oficiales de organismos públicos nacionales. Además, se analizó la producción científica sobre SST de autores con afiliación ecuatoriana, realizada en Ecuador, y publicada en revistas indexadas en las principales bases de datos científicos. En Ecuador, la tasa de empleo es del 94,3%, y el 40% se reconoce como empleo adecuado. El porcentaje de la población activa cubierta por la seguridad social ha aumentado durante el período de estudio, pero se mantiene alrededor del 42% de esta población. El país ha ratificado los 32 convenios de SST de la OIT y ha adoptado instrumentos reguladores regionales. El cuerpo legal nacional de SST comienza con la Constitución. Se notificó un total de 99.156 lesiones laborales y 2.733 ocupacionales, que mostraron un aumento significativo entre 2010 y 2015. En cuanto a los accidentes laborales mortales, se notificaron 1.524 casos. La formación en SST se centra en la prevención de riesgos laborales. Se identificaron 12 artículos científicos sobre SST de autores de afiliación ecuatoriana y desarrollados en un contexto nacional. La situación de la SST en Ecuador enfrenta un alto costo persistente de trabajadores informales, una población trabajadora que envejece, un aumento de accidentes laborales, una evidencia científica escasa y una legislación obsoleta. El diseño de un Plan Nacional de SST debe convertirse en una prioridad para mejorar las condiciones de trabajo y la salud en Ecuador.

Palabras clave: Ecuador; seguridad y salud ocupacional; características sociodemográficas; legislación; lugar de trabajo de accidentes; investigación
Abstract: The occupational safety and health diagnostic (OSH) constitutes a first step for the design of national programs and ongoing reviews of existing regulations. The OSH diagnostic performed in Ecuador in 2011 is devastating due to the high labor accidents' toll, the scarce official information, lack of high-level academic education, and insufficient research. To diagnose the current state of occupational safety and health in Ecuador from official sources of information. We examined the geographical situation, sociodemographic and public health data, legal regulations, statistics on occupational accidents and diseases, training and research on OSH in Ecuador between 2010 to 2015. The main sources of data and information were: national laws and regulations on OSH, conventions of the International Labor Organization, resolutions of the Andean Community of Nations, and official web pages of national public bodies. In addition, we analyzed the scientific production on OSH of authors with Ecuadorian affiliation, carried out in Ecuador, and published in journals indexed in the main scientific databases. In Ecuador, the rate of employment is 94,3%, and 40% is recognized as adequate employment. The percentage of the working population covered by the social security has raised during the period of study, but it remains around 42% of this population. The country has ratified the 32 ILO OSH conventions and has adopted regional regulatory instruments. The national OSH legal body starts with the Constitution. A total of 99.156 occupational injuries and 2.733 occupational were notified, showing a significant increase from 2010 to 2015. Regarding fatal occupational accidents, 1.524 cases were notified. Training in OSH is focused on occupational risk prevention. Twelve scientific articles on OSH from authors of Ecuadorian affiliation and developed in a national context were identified. OSH status in Ecuador faces a persistent high toll of informal workers, an aging working population, an increase of work accidents, a scarce scientific evidence and an outdated legislation. The design of a OSH National Plan should become a priority in order to improve working conditions and health in Ecuador.
Key words: Ecuador; occupational safety and health; sociodemographic characteristics; legislation; accidents workplace; research

Background

The Occupational Safety and Health (OSH) diagnostic constitutes a first step for the design of national programs and the ongoing reviews of existing regulations in this field. Furthermore, it is a tool to measure achievements through time.1,2

In the last decades, standing out international experiences have led to the reformulation and reorientation of new strategies in the national agendas of OSH based on the need to adjust to the ongoing worldwide demographic and economic changes.3,4 Furthermore, there are existing experiences that were developed through the Andean Initiative in Safety and Occupational Health (IAN-SST) in 2010, led by the Safety and Occupational Health Institute of Peru (ISAT) and the collaboration of the Government of Canada, to perform the SST diagnostics for Bolivia, Colombia, Ecuador and Peru.5;8

With respect to the results of the Safety and Occupational Health Situational Diagnosis for Ecuador developed in 2011, the existence of unfavorable work and employment conditions was evidenced. These conditions could be linked to the increase of work related accidents and the raise of the death toll with respect to prior years. In terms of occupational diseases,

establishing a real framework was considered difficult, due to the lack of information from official entities, the inexistence of a 4th Level Educational Program in Work Medicine or Occupational Health, the scarce research and scientific output related to labor risk factors, and their impact on the health of the Ecuadorian working population.7 In conclusion, the study demonstrated that multiple barriers exist in order to obtain a proper view of the OSH reality in the country since it has not been considered a priority in the public agenda for neither the Government nor the entities that deal with this area.

Furthermore, assuming the objectives of the I & II Iberoamerican Strategy of Safety and Occupational Health9,10 of the Iberoamerican Organization of Social Security (OISS), performing preliminary diagnostics related to social-working matters, social protection and specially in SST to aid with the formulation, promotion of regulations and national programs in Latin-American countries is needed. These will contribute to the reduction of labor incidents caused by working accidents or occupational diseases; it will foster economic growth and promote decent working conditions.11,12

The objective of the current study is to diagnose the status of the safety and occupational health in Ecuador based on official information sources that will allow us to evaluate the efficiency of the current policies, and to formulate strategies to improve working conditions and health of the working population of the country. Moreover, the results will then permit comparisons with other Latin American countries.13,14

Methods

The study is observational, documentary type, based on primary and secondary sources of information for the period of 2010-2016.

A model was designed to gather information for further analysis based on international safety and occupational health diagnostics3,4 and latin-american ones.13,14 The main dimensions of the object of the study are geographic situation, sociodemographic data, public health data, legal regulations, statistics of occupational diseases and working accidents, and education and research on OSH in Ecuador.

The primary information was obtained by consulting the current legal framework in terms of OSH in addition to international agreements of the International Labour Organization (ILO) and the resolutions of the Andean Nations Community (CAN) adopted by the country.

Secondary data came from official webpages of the following public entities: National Institute of Statistics and Censuses (INEC), National Institute of Standardization (INEN), National Institute of Social Security (IESS), Labor Ministry (MT), Public Health Ministry (MSP), and belonging to the Ministry of Education the Counsel of Accreditation and Quality Assurance of Superior Education (CEAACES), and the Secretary of Superior Education, Science and Technology of Ecuador (SENESCYT).

Finally, an analysis of several scientific articles on OSH. The articles came from authors with Ecuadorian affiliation, developed in the Ecuadorian context and published in journals

indexed to main databases: Scopus, MEDLINE (PubMed) from the US Library of Medicine, and the Regional Portal of the Health Virtual Library (LILACS). Such databases count with the broader number of high impact scientific journals; making the research of data easier.

Results

Geographic area and population

Ecuador is located in the North-Occidental Coast of South America. Borders with Colombia at North, and Peru to the South. Its territory extension comprises 270.670 km2 including the Galapagos Islands (7.844 Km2). The country is divided into 24 provinces; Quito is the capital of the nation.

In 2010, the total Ecuadorian population was 14.483.499 inhabitants, slightly predominated by women (50.4%) with respect to men (49.6%). The age average was 28.4 years. The provinces with higher inhabitants concentration were Guayas (3.645.483; 25.2%), Pichincha (2.576.287; 17.8%) y Manabí (1.369.780; 9.5%).15,16 In 2015, the total population was 16.144.363 inhabitants and according to INEC for 2020 there will be an estimated population of 17.512.663 habitants (Fig. 1).

Socioeconomic data

According to the National Survey of Employment, Unemployment and Underemployment (ENEMDU)17, performed on March 2016 by INEC, 69.6% of the Ecuadorian population is the working – age population (PET; age ≥ 15 years old). At the same time, 68.6% of PET is economic active (PEA) – people that worked at least 1 hour per week as a reference, or that were employed even if they didn't work, or that didn't have a job but were available to work and are seeking employment (unemployed). From the PEA, 94.3% corresponds to people with employment (wage/salary earners and independent workers). There is a 40% rate of adequate work in the country. On the other hand, the main economic activities are agriculture, cattle, hunting, forestry and fishing (28.1%), commerce (17.8%) and manufacture (10.3%).

IESS is the autonomous entity in charge and responsible for the mandatory insurance within the national system of Social Security.18 With respect to OSH, all employers are required by law to insure all workers to cover all the corresponding social benefits in case of contingencies due to work accidents and/or occupational diseases.19

The working population affiliated to IESS from 2010 to 2015 has raised by 1.072.298 insured workers, registering a maximum of 3.386.721 in 2016 (Fig. 1). Nevertheless, currently only 41.9% of the urban employed population is enrolled in Social Security and only 59.6% has employment in the formal sector.

The provinces with higher rates of Social Security affiliation in 2015 are Pichincha with 1.069.032 people (34.0%), Guayas with 843.824 (26.8%), Manabí with 223.309 (7.1%), Azuay with 184.401 (5.9%), El Oro with 110.039 (3.5%) and 93.240 (3.0%) for Tungurahua.

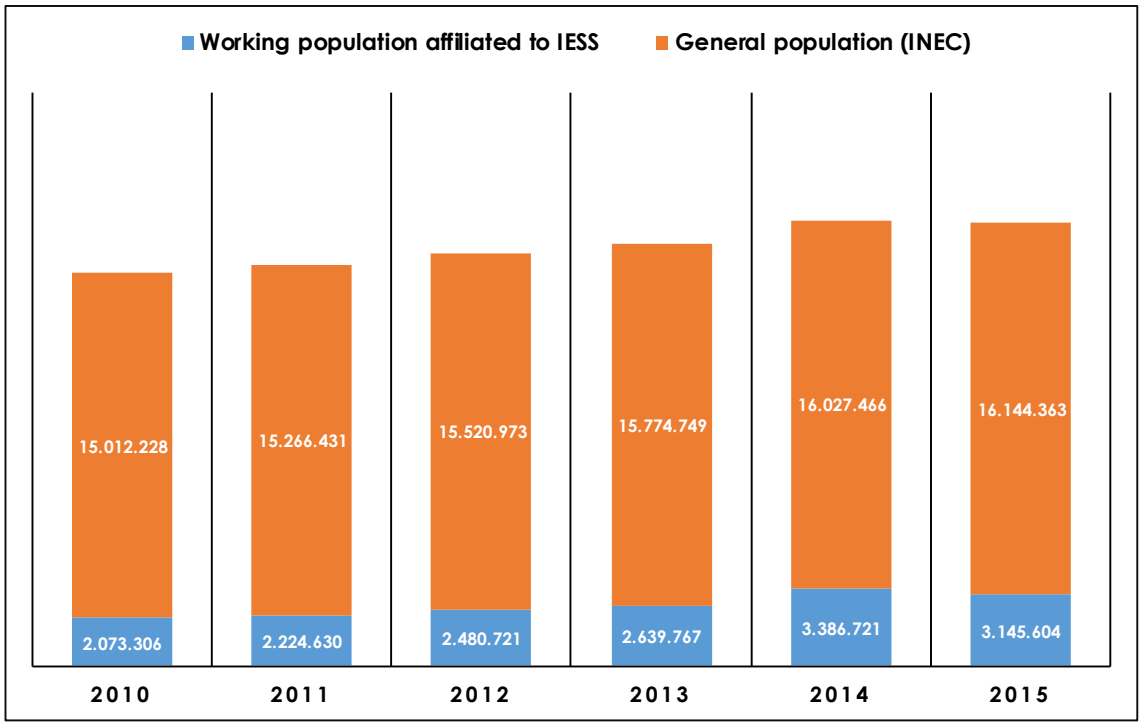

Fig. 1. Evolution of the population and workers affiliated to IESS, 2010-2015

The number of social security affiliates decreased by 241.117 in 2015 compared to 2014, mainly due to the decreases in the following provinces: Santa Elena (-56.242), Los Ríos (-34.680) and Pichincha (-30.698). This incident is tightly related to the economic deceleration that the country has been experiencing since the end of 2014 due to the fallen price of oil and the dollar appreciation.

However, between 2006 (46.802 million USD) and 2014 (100.917 million USD) the PIB growth averaged 4.3% allowing a greater social expense and investments, reducing poverty from 37.6% to 22.5% and rising the life quality of Ecuadorians.20

Finally, as far as the health state of Ecuadorian population, the results of the Sixth Round Life Conditions Survey (2013-2014) show that the 40.9% of the survey respondents expressed to have had some kind of illness in the last month.21 Moreover, according to the data on hospital discharges from the MSP, the most frequent diseases include intestinal infections, urinary tract infections and respiratory infections.22

Legislation on safety and health at work

Ecuador has ratified 32 agreements of the ILO related to OSH and has adopted the regulatory instruments issued by the CAN: Decision N° 584 Andean Safety and Occupational Health Instrument, later regulated by the Resolution N° 957 regarding the implementation of a OSH management system within the Ecuadorian legal framework.23,24

The OSH legal body starts with the Constitution.25 This Constitution establishes the right of all people to develop their labor activities in an appropriate and sound environment, that guarantees their health, integrity, safety, hygiene and wellbeing. Thus, it represents the starting point for all employment risk prevention activities for public and private entities.

In a hierarchical order, the following Executive organic laws back up this right: Work Code; amended with the Organic Law for Labor Justice and Domestic Work Recognition26; establishing the relationship between employee and employer in terms of OSH; and the Social Security Law regulating the IESS services and benefits available to affiliated workers in the case occupational injuries and diseases.18

Additionally, the current Regulation of Workers Safety and Health, and Improvement of Working Environment27 in place since 1986, which object is the prevention, reduction or elimination of labor risks, and the Regulation for the Operations of Medical Service Departments in Companies28 to promote and care for workers´ health; are both regulated by the Ministry of Labor. This entity of control performs regular reviews and inspections to Companies to ensure compliance with the Regulations of Hygiene and Safety.

Pertaining to the OSH protection for workers affiliated to IESS, the recent 2016 Regulation on the Occupational Risks General Insurance29 repeals the resolutions of 2010 and 2011.30,31 It mainly institutes an obligation to employers to implant occupational risk prevention programs by evaluating and controlling work related risks; and assigns the degree of responsibility employers have when occupational accidents or diseases occur based on their handling of risk prevention management.32

To conclude, it seems pertinent to mention INEN (http://apps.inen.gob.ec) as an issuing authority of technical regulations related with the safety and health of human, animal and vegetable life, the preservation of the environment and the protection of consumers in the country.

Statistics of occupational injuries and diseases

IESS, through the Committee of Disability Valuation and Employer Liability (CVIRP) – Occupational Risk General Insurance (http://sart.iess.gob.ec/DSGRT), is in charge of qualifying and registering occupational injuries (O.I.) and occupational diseases (O.D.) notified by employers.29 In this sense, the entity is responsible for the technical assessment functions covering OSH and the compensations to workers in case of temporal, partial, permanent, absolute disability or death caused by their work.27,32

For the 2010-2015 period, a total of 99.156 O.I. and 2.733 O.D. were notified. The higher number of notifications were reported in 2015 for both cases (24.379 and 892, respectively). The provinces with the higher casualty rates were Guayas, Pichincha, Los Ríos and Azuay. The major occurrence of O.I. was in-itinere accidents (road traffic accidents) and accidents at primary work locations.

With respect to the calculations of incidence rates related to work accident's notification (I.R.O.I.) and occupational diseases (I.R.O.D.), considering as numerator the number of cases notified by O.I. and O.D. x 100.000 and, as denominator the number of workers affiliated to IESS for each year analyzed. I.R.O.I. (381.2 in 2010; 775 in 2015) and I.R.O.D. (8 in 2011; 28.4 in 2015), present a significant increase (Fig. 2). Regarding fatal occupational injuries (F.O.I.) 1.524 cases were registered from 2010 to 2015 (Fig. 3).

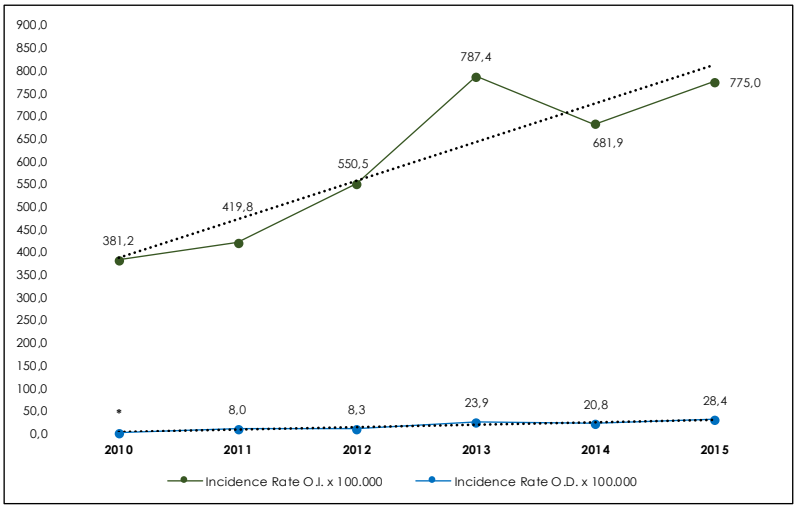

Fig. 2. Evolution and Tendency of I.R.O.I. & I.R.O.D. x 100.000 workers affiliated to IESS: 2010-2015.
* There is no O.D. data for 2010.

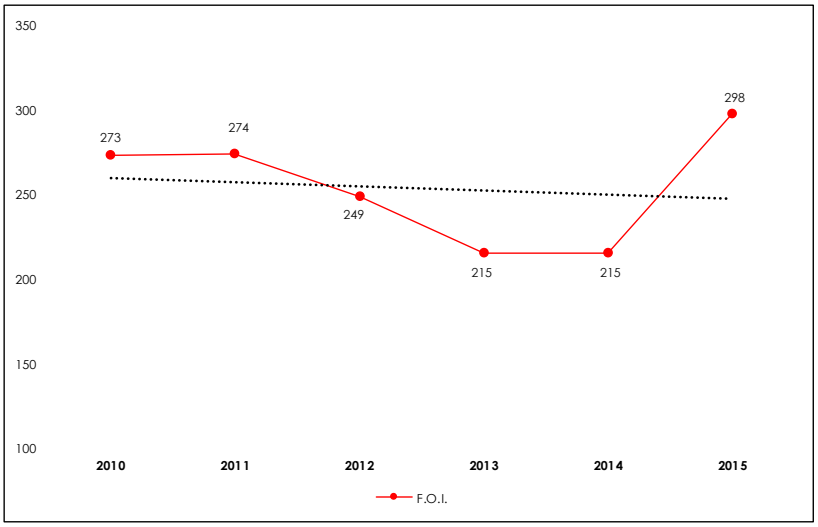

Fig. 3 Evolution and Tendency of A.T.M.: 2010-2015

Training in occupational safety and health

Currently, six higher education institutions officially accredited offer undergraduate and graduate programs in OSH nationwide, Table 1.33

These Engineering or Master programs seek to develop professionals in occupational risk prevention focusing on occupational safety, industrial hygiene, ergonomics, psychology, following a semi-presence based modality.

Table 1. OSH Undergraduate and Graduate Program Offer, Ecuador 2016

Degree Program	Duration*	Modality	University
Undergraduate Program			
Engineering in Industrial Safety and Occupational Health	5	P	UTEQ - Universidad Técnica Estatal de Quevedo
Engineering in Occupational Safety and Health	5	P-S	UISEK - Universidad Internacional SEK
Graduate Program			
Master in Occupational Safety and Health	2	P	UESS - Universidad de Especialidades Espíritu Santo
Master in Occupational Safety and Health	2	S	UISEK - Universidad Internacional SEK
Master in Industrial Safety	2	S	UNACH - Universidad Nacional de Chimborazo
Master in Occupational Safety and Health	2	S	UCE - Universidad Central del Ecuador
Master in Safety and Occupational Hazard Prevention	2	S	UTC - Universidad Técnica de Cotopaxi

*Duration in Academic Years. P=Full Time Modality. S=Semi-presence based modality

Finally, the Technical Secretary of the National System of Professional Qualifications and Training, which belongs to the Coordination Ministry of Knowledge and Human Resources, allows the professional qualification of workers through a formal certification called Assistance in the Safety and Occupational Health Management obtained through standardized private training operators.34 The Interinstitutional Committee of Safety and Hygiene at Work accredits the training operators and allows them to offer courses that last between 8 to 30 hours to prepare participants in OSH related subjects such as chemical risk prevention, first aid, safe driving of lifting trucks, electric risks, joint safety committee and workers´ health, ergonomics fundamentals, etc.27

Occupational safety and health research

In this last section, scientific production on OSH is presented from authors of Ecuadorian affiliation and developed in a national context, compiled by studying articles published in journals indexed in main international databases (Scopus – PubMed) and regional databases (LILACS – SciELO) from 2010 until 2015.

Twelve scientific articles were compiled, 5 studies talk about the ergonomic risks present in work related activities of administrative and sanitary sectors, flower production companies and universities; 4 deal with psycho-social risks; 2 refer to the study of the diagnosis of occupational diseases; and 1 with the statistics of occupational accidents or illnesses, Table 2.

The last article permits to establish an approximation of the occupational incidents in Ecuador, evidencing the sub-registry of O.I. and O.D. The manufacturing industry of the provinces of Pichincha and Guayas register the highest indices of occupational casualties.35

Table 2. Scientific articles in OSH: 2010-2015

Year	Scientific article
2010	Bravo Ortiz CM, Palucci Marziale MH. El consumo de alcohol en personal administrativo y de servicios de una universidad del Ecuador. Rev. Latino-Am. Enfermagem. 2010; 18 (Spec): Lavoie MC, Yassi A, Bryce E, Fujii R, Logronio M, Tennassee M, et al. International collaboration to protect health workers from infectious diseases in Ecuador. Rev Panam
2011	Yassi et al. Collaboration between infection control and occupational health in three continents: a success story with international impact. BMC International Health and Human
2012	Coggon D, Ntani G, Palmer KT, Felli VE, Harari R, et al. The CUPID (Cultural and Psychosocial Influences on Disability) Study: Methods of Data Collection and Characteristics of Study Vélez V. Kenny M, Nolivos V, Alegria F. Ergonomic and individual risk evaluation. Work. 2012; 41: 1900-1903. Pando Moreno M, Aranda Beltran C, Olivares Álvarez DM. Análisis factorial confirmatorio del inventario de violencia y acoso psicológico en el trabajo (IVAPT-PANDO) para Bolivia y Kenny VV, Nolivos V, Alegría F. Preventive and curative importance of the baropodometric analysis for ergonomics and occupational health. Work. 2012; 41 Suppl 1:1896-1899.
2013	Coggon D. et al. Disabling musculoskeletal pain in working populations: Is it the job, the person, or the culture?. PAIN. 2013; 154: 856-863. Coggon D, et al. International variation in absence from work attributed to musculoskeletal illness: findings from the CUPID study. Occup Environ Med. 2013; 70: 575-584.
2014	García M, González R, Aldrete M, Acosta M, León S. Relación entre Calidad de Vida en el Trabajo y Síntomas de Estrés en el Personal Administrativo Universitario. Cienc Trab. 2014; 16 Sotomayor L, Pando M. El Mobbing y los Síntomas de Estrés en Docentes Universitarios del Sector Público. Cienc Trab. 2014; 16 (49): 43-48.
2015	Gómez A, Suasnavas P. Incidencia de Accidentes de Trabajo Declarados en Ecuador en el Período 2011-2012. Cienc Trab. 2015; 17 (52): 49-53.

Discussion

Currently, the Ecuadorian population is characterized by being young and economically active. For 2050, life expectancy will be 80.5 years from birth. There are low rates of appropriate work and social security affiliation.36 As the population ages, the occupational risk factors present at work-sites will be detrimental to workers´ health, causing a socioeconomic problem and a public health hazard for the country.37

The high and persistent proportion of the working population with informal employment, which has been linked to poor working conditions (for example; temporary employment and long working hours), and hazardous exposures, constitutes an obstacle to improve the health of the working population.38

Even if the legal normative on OSH is based on the prevention and promotion of health27,28, it is evident that Ecuadorian companies do not apply prevention and control measures on occupational risk factors existing in the workplace. Tendency graphs show that for every 100.000 affiliated workers the O.I. casualty rate raised from 381.2 in 2010 to 775 in 2015. For O.D., the increase went from 8.0 to 28.4 in the same period. We can conclude that in Ecuador there are around 67 work accidents daily in average.

Until now, the Regulation of Workers Safety and Health, and Improvement of Working Environment of 1986 is still the law in force that determines the guidelines for OSH in the country.27 However, a review and update of this regulation should become a priority in order to put more emphasis on the prevention of O.I. and O.D. Even more, the OSH norms should not be

considered as a combination of laws and regulations that must be complied. In this sense, it is crucial to start processes to develop a safety culture in Ecuador as a whole.

The academic offer for undergraduate and graduate programs in OSH is still scarce compared to the working population growth enrolled in IESS, originating the demand of professionals to cover companies' needs nationwide.2 In addition, the OSH offer has been reduced in the last few years; in 2010, there were 11 masters´ programs available in the country, 2 certification programs, 4 Technical Specialties and 1 Engineering program.7

It is evident that there is a diverse offer based on the denomination of the academic title and curriculum; but even if safety and occupational health lead as a general criterion, there is no consensus on the requirements for the programs, as there are in other countries such as Colombia. It is imperative that official authorities regulating university programs accreditation set common requirements that all study plans must follow to grant OSH titles and adjust the academic offer accordingly.33

Another aspect to point out is the inexistence of specialties in ergonomics, industrial hygiene, psych-sociology, and occupational medicine. We associate this phenomenon to the low number of O.D. notifications and the lack of qualification of OSH professionals who do not have the skills needed to link occupational risk factors present in working conditions with the effects they have in the health of working population (cause – effect).

As far as scientific output, OSH research in the Ecuadorian context is still one of our greatest weaknesses compared to other Latin American countries.7 The lacking of a research culture limits the country to an approximation of working conditions and occupational health instead of providing a real framework.9,10 Regarding this concern, there is a major need to develop OSH research lines for Ecuador, with a rational, practical and participative focus to generate knowledge and offer solutions for the negative effects of globalization that detriment the health of the working population. Universities nationwide must assume this challenge and this competency.39

In addition, it is also important to generate and strengthen international and multidisciplinary collaboration networks. These networks will facilitate the development of new projects that broaden the perspective centered in the workplace and shift it into an integral view where the relationship between work and health is eminent. Finally, yet importantly, the development of an official Ph.D. program on OSH is key to foster the research and increase of professionalism of the field.

The current study permits to determine a diagnostic in the current state of OSH in Ecuador. Nevertheless, it has its limitations. First, we need to consider that there is an under-registry of O.I. and O.D. incident reports at the IESS.12 ILO estimates that only 20-25% occupational accidents are reported in Latin American countries. Considering this data, the O.I. reports for 2015 should have been 97.516 instead of 24.379 for Ecuador. Second, the articles that were compiled could include an underestimation of the investigation of OSH in a national context, since journals published in other databases such as Latindex were not taken into consideration.

Finally, as of today, Ecuador has not received the results of the First Survey on Safety and Occupational Health Conditions40, limiting the knowledge of the labor risk factors and their relationship with the health state of workers. This information could be used as a complement for the statistics of occupational casualties.10

However, we can conclude from the analyzed results, that the current OSH status in Ecuador is worrying and faces a dangerous problem that will continue for the decades to follow. The persistence of a high toll of informal workers, the aging of the working population, the increase of work accidents and the lack of knowledge on occupational diseases needs to be addressed. In addition, control authorities need to review the existing outdated legislation due to social, demographic and economic ongoing changes. They need to lead, promote and foster an occupational health safety culture nationwide and prevent the reduction of accredited academic programs on this field, which results on insufficient scientific research in OSH. All of these findings oppose to the ILO Program of Decent Work expected for 2030, which evidences the need to design a, OSH National Plan.

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