Articles

Impact Of Qualified Occupational Accidents In Ecuador During The Period 2014 - 2023

Impact Of Qualified Work Accidents In Ecuador During The Period 2014 - 2023

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Page 48-69

ABSTRACT

The present work analyzes the impact of qualified work accidents in Ecuador during the period 2014-2023, given the high rate of work accidents reported and qualified by the Ecuadorian Institute of Social Security (IESS), but the most worrying thing is that there is still a high rate of underreporting of accidents according to the International Labor Organization (ILO), which puts everyone involved on alert. The purpose of this research is to compile all the existing statistical information published on the web page by the control entity, analyze it and determine the impact of occupational accidents in the country, based on a review of official statistical data and recent literature, it

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is necessary to apply the descriptive-quantitative method, In order to analyze the behavior of the variables, we also reviewed the occupational accident statistics published by the annual bulletins of the Seguro General de Riesgos del Trabajo (SGRT), and evaluated the incidence of these accidents on the economy, occupational health and public policies. It also highlights trends in the frequency and severity of accidents, as well as the strategies implemented for their prevention and mitigation. In conclusion, the occupational accident rate in the country continues to be a matter of concern. It is necessary to wait for the short or medium term changes that may be brought about by the new Executive Decree No. 255 (Occupational Safety and Health Regulations), which, together with other regulations that are being analyzed in the technical roundtables in charge of the governing bodies such as the Ministry of Labor and the Ministry of Public Health, are expected to reduce the impact of occupational accidents in the country. This study seeks to generate evidence-based recommendations to improve occupational safety in Ecuador.

Key words: Occupational accidents, Underreporting, Descriptive statistics, Affiliated population, Occupational accidents.

RESUMEN

El presente trabajo analiza el impacto de los accidentes de trabajo calificados en Ecuador durante el período 2014–2023, dado el alto índice de accidentes de trabajo reportados y calificados por el Instituto Ecuatoriano de Seguridad Social (IESS), pero lo más preocupante es que existe aún un alto índice de subregistros de accidentes según la Organización Internacional del Trabajo (OIT), lo cual pone en alerta a todos los involucrados. La presente investigación tiene como propósito recopilar toda la información estadística existente y publicada en la página web por el ente de control, analizarla y determinar el

impacto que tienen los accidentes de trabajo en el país, todo esto, a partir de una revisión de datos estadísticos oficiales y literatura reciente se hace necesario aplicar el método descriptivo-cuantitativo, para analizar el comportamiento de las variables también se revisaron las estadísticas de siniestralidad laboral publicadas por los boletines anuales del Seguro General de Riesgos del Trabajo (SGRT), se evalúa la incidencia de estos accidentes en la economía, la salud ocupacional y las políticas públicas. Asimismo, se destacan las tendencias en la frecuencia y severidad de los accidentes, así como las estrategias implementadas para su prevención y mitigación. En conclusión, la siniestralidad laboral en el país sigue siendo un tema preocupante. Hay que esperar a corto o mediano plazo los cambios que puedan traer el nuevo Decreto Ejecutivo No. 255 (Reglamento de Seguridad y Salud en el Trabajo) que, sumada a otras normativas que están siendo analizados en las mesas técnicas a cargo de los organismos rectores como lo son el Ministerio del Trabajo y Ministerio de Salud Pública, con lo cual se espera que se logre reducir el impacto que tiene la siniestralidad laboral en el país. Este estudio busca generar recomendaciones basadas en evidencia para mejorar la seguridad laboral en Ecuador.

Palabras Clave: Accidente de trabajo, Subregistro, Estadística descriptiva, Población afiliada, Siniestralidad laboral.

INTRODUCTION

According to historical records the International Labor Organization ILO, (2020) , was constituted in the year 1919 as part of the Treaty of Versailles, after the end of the First World War, being its main objective to promote social justice and labor rights worldwide Callau Dalmau, (2018) . The ILO, maintains the policy of improving working conditions and promoting equity at work, this includes the promotion of decent work, protection of labor rights, job creation, job security, social protection and permanent dialogue between governments, employers and workers. These social policies are reflected in the conventions of each country and in the action programs

that the ILO promotes worldwide. Guevara Villacres & Medina Hinojosa, (2019) . According to the ILO for the Andean countries; Ecuador has been a member since 1934 adopting international standards and adapting them to the National legislation. Atencio González et al., (2020) Decent work is currently promoted through productive development policies. The 2030 Agenda for Sustainable Development (ODS) contains 17 goals, 169 targets and 232 indicators. The ILO reports to the United Nations (UN) 17 indicators grouped into five goals, which prioritize people and the planet, and which propose the need to work together in order to address the challenges related to the world of work. Yépez et al., (2020)

Ecuador is a country divided into regions with many natural privileges such as geography, climate and biodiversity. In contrast, health, economic and labor conditions reflect a worrying panorama (Gómez García, 2021) . In terms of labor and since statistics from the Ecuadorian Institute of Social Security (IESS) - General Insurance of Labor Risks (SGRT) are available, there are different figures on the evolution and trends of labor accidents. Damián-Aguilar & Campoverde-Jiménez, (2024) .

The right of all people in Ecuador is to develop their work activities in a safe work environment. In addition to this right, there are international agreements with the ILO, those corresponding to the Andean Community, organic and ordinary laws, regional norms, decrees, regulations, agreements and resolutions. Constitution of the Republic of Ecuador, (2008)

The legal framework for occupational safety and health in the country aims to prevent occupational hazards and reduce the accident rate resulting from occupational accidents and diseases. (J. Toro Toro et al., 2014; J. de L. Toro Toro et al., 2020).

According to Art. 1.n. of the Andean Occupational Safety and Health Instrument, an occupational accident is considered to be any sudden event occurring because of or in connection with work that causes organic injury, functional disturbance, disability or death to the worker. Ecuador is one of the countries that is at the top of the occupational accident rate due to the high rate of underreporting Valenzuela López & Vallejo Ronquillo, (2022; Valenzuela Mendieta et al., (2020) . The pyramid of occupational accidents developed by Frank Bird in 1969 revealed as a conclusion the following: that, for each accident with serious or fatal consequences, there were 10 minor injuries that only required first aid attention, 30 accidents with property damage and 600 accidents without injuries or material losses González et al., (2016) . The present research aims to make an analysis of the statistics of qualified occupational accidents by the IESS during the period 2014 - 2023 and determine the incidence rates in the proposed variables.

MATERIALS AND METHODS

This research collects, describes and interprets the statistical results that are outstanding and reliable so that decisions can be made according to the case study. (Guevara Alban et al., 2020) . The quantitative information collected comes from the website: https://www.iess.gob.ec/es/web/guest/visor-riesgos corresponding to occupational accidents reported annually, during the period 2014 - 2023. Using the descriptive and cross-sectional method, the aim is to analyze the impact of occupational accidents with the following variables: number of ***occupational accidents*** (A.T) per year, A.T by place of occurrence, A.T by sex, A.T. incapacities generated and A.T. injuries caused. Gómez García & Suasnavas Bermúdez, (2015) . The statistical records of the affiliated population in these periods were compiled from the IESS statistical bulletins available from Instituto Nacional de Estadística y Censos, (2024) (INEC). The study calculates the incidence index for each of the variables mentioned above, which are harmonized with the formula established by Eurostat (Methodology used by European Union countries and comparable with those of the ILO), which states: ***Incidence Indicator*** (**I.I.**) = number of accidents with sick leave during the working day per one hundred thousand workers over the annual average of those affiliated to social security schemes with contingencies for accidents at work covered. Moreira Macías, (2019) .

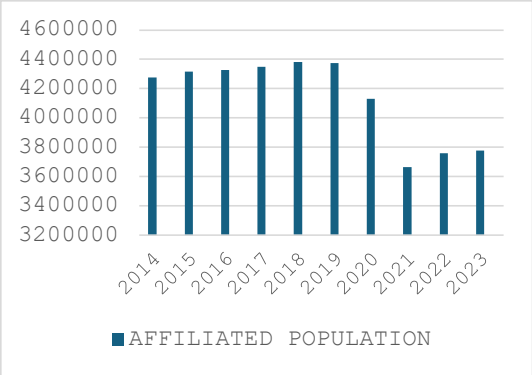
It can be said that a mixed methodology was used for this research, combining the following parameters:

1. **Bibliographic review**: Consultation of academic articles, reports from international organizations and Ecuadorian legislation.
2. **Secondary data analysis**: Use of official statistics from the Ecuadorian Social Security Institute (IESS), the National Institute of Statistics and Census (INEC) and the Ministry of Labor of Ecuador.
3. **Case studies**: Review of key economic sectors such as construction, mining and agriculture.

Revision and data analysis

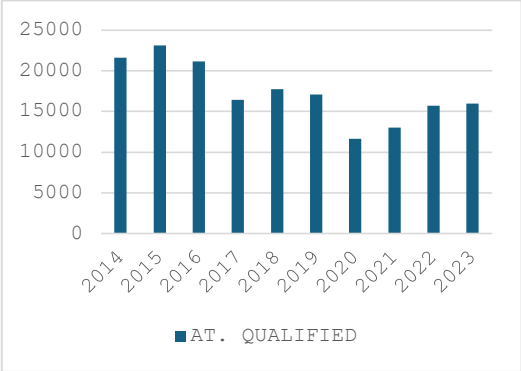
The present study has taken into consideration two parameters to establish the population affiliated to social security and they are: Affiliation with paid contributions and Active affiliates of the peasant insurance. The results of the affiliated population presented in (Figure 1) come from the statistical bulletins provided on its website the National Institute of Statistics and Census, (2024) (INEC) for the periods between 2014 - 2023.

Figure 1: IESS affiliated population. 2014-2023Source: INEC statistical bulletins.



The Instituto Ecuatoriano de Seguridad Social, 2024) through Seguro General de Riesgos del Trabajo SGRT qualified a total of 173,357 AT during the period 2014 - 2023 (Figure:2), the first five-year period analyzed of qualified occupational accidents (**AT**) maintains an average of 19.982.8 with a slight decrease until the pandemic, then there is a post-pandemic growth, which does not exceed the average of 14,688.6 According to other authors, government agencies and employers should place greater emphasis on awareness campaigns regarding the welfare of the worker and thus reduce or eliminate the high statistics of (W. Muñoz et al., 2020) .

Figure 2: Qualified T.A. Report.



Source: Own elaboration based on data provided by the annual statistics of occupational accidents of the IESS - SGRT.

Table 1 shows the incidence rate per year, showing the number of accidents with sick leave per 100,000 workers exposed to different types of risks.

Table 1: Incidence rate by year

YEAR	P.A.	A.T.	I.I.
2014	4'277,415	21577	504,44
2015	4'316,057	23104	535,30
2016	4'328,872	21110	487,65
2017	4'347,615	16400	377,21
2018	4'383,214	17723	404,33
2019	4'372,997	17056	390,02
2020	4'132,359	11629	281,41
2021	3'664,982	13043	355,88
2022	3'759,076	15730	418,45
2023	3'777,922	15985	423,11

Source: Own elaboration based on data provided by SGRT - INEC.

(**PA**) Affiliated population,

(**AT**) Occupational Accidents,

(**I.I.**) Incidence Index.

As can be seen, this has been progressively decreasing and with greater emphasis since the pandemic. In relation to the Incidence Index, the frequency with which the first five-year period is observed is decreasing because in 2014 the I.I. was 504.44 and in 2018 it was 404.33. The pandemic caused a drop in the I.I. (2019-2020) but then began a rise that reached 423.11 in 2023, up to a certain point. (2019-2020) but then began a rise that reached 423.11 in 2023. To a certain extent it can be interpreted that the II in this decade has been decreasing and this is not only due to the pandemic, on the contrary, the public management of control and new legal provisions with employer responsibility have awakened the interest of employers and workers, so that their work environments are safe.

Another of the variables analyzed in this period is the place where the accidents that qualified as a TBI occurred (Figure 3). Of the total number of qualified TTIs, 59.75% occurred at the work center or place of work, followed by those occurring on the commute from home to work or vice versa (IN-ITINERE or IN TRANSIT) 23.05%, followed by those occurring during the workday 8.14%, then 7.11% at another work center and finally 1.95% on secondment. It is worth noting in the figure presented that in each year analyzed, TAs have always occurred in a greater proportion in the workplace.

Figure 3: Record of TA, rated by place of occurrence. Source: Own elaboration based on data provided by the annual statistics of occupational accidents of the SGRT.

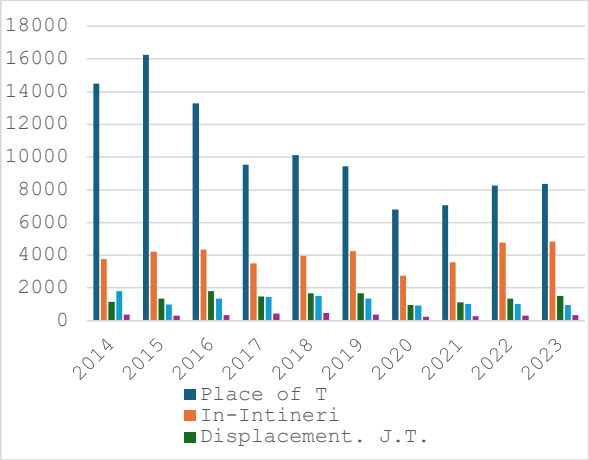


Table 2, has taken as main reference the TA data provided in Table 1, by year and from this information has been broken down proportionally according to the data in Table 2 and in this way the proportional **I.I.** is presented by place where the accidents occurred, it is highlighted in the information that during the period 2014 - 2023 the **I.I.** of the **TA** that took place in the work centers, in 2014 obtained 67.18 % and concluded in 2023 with 52.38 % which represents a decrease. Regarding the TA in transit in 2014 it started with 17, 44 % and by 2023 it reached 30.29 % which represents a considerable growth. Although the remaining ones are in smaller proportion, the TA in displacement present an increase that goes from 5.35% to 9.36% and those happened in another place are observed 8.40% with respect to 2014 and 5.88% with respect to 2023 and finally by secondment 1.68% in 2014 and 2.04% in 2023.

Table 2: Incidence Rate by Place of Occurrence

YEAR	A.T.	I.I.	**% A.T. LUG. T.**	I.I. LUG. T.	**% A.T. IN INTIN ERE**	I.I. IN INTIN ERE	**% A.T. DESP. LAZA MIEN**	I.I. DESP LAZA MIEN.	**% A.T OTHER L.T.**	I.I. IN OTHER L.T.	**% AT. CO, SERVICE**	I.I. IN COM. SERVICE
2014	21.577	504,44	**67,18**	338,88	**17,44**	87,97	**5,35**	26,98	**8,40**	42,37	**1,68**	8,47
2015	23.104	535,30	**70,29**	376,26	**18,22**	97,53	**5,87**	31,42	**4,26**	22,91	**1,33**	7,11
2016	21.110	487,65	**62,90**	306,73	**20,55**	100,21	**8,60**	41,94	**6,43**	31,35	**1,51**	7,36
2017	16.400	377,21	**58,05**	218,97	**21,41**	80,76	**9,03**	34,06	**8.81**	33,23	**2,69**	10,14
2018	17.723	404,33	**57,11**	230,91	**22,30**	90,16	**9,52**	38,49	**8,43**	34,08	**2,63**	10,63
2019	17.056	390.02	**55,40**	216,07	**24,97**	97,38	**9,72**	37,91	**7,80**	30,42	**2,09**	8,15
2020	11.629	281.41	**58,31**	164,09	**23,51**	66,15	**8,32**	23,41	**7,93**	22,31	**1,93**	5,43
2021	13.043	355,88	**54,04**	192,31	**27,27**	97,04	**8,61**	30,64	**7,87**	28,00	**2,19**	7,79
2022	15.730	418,45	**52,59**	220,06	**30,39**	127,16	**8,65**	36,20	**6,43**	26,90	**1,93**	8,07
2023	15.985	423,11	**52,38**	221,62	**30,29**	128,16	**9,36**	39,60	**5,88**	24,88	**2,04**	8,63

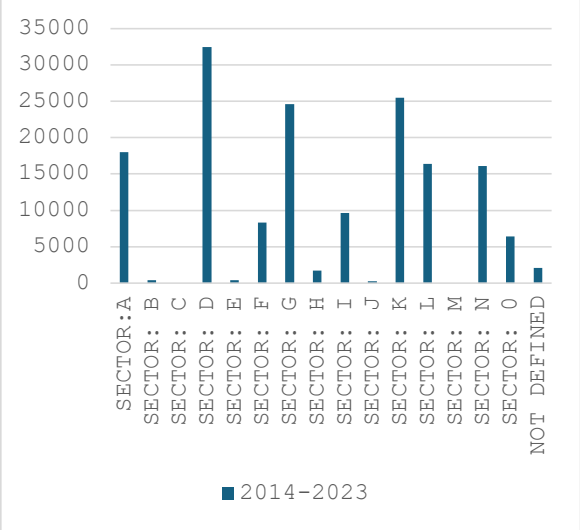
Figure 4 shows the order in which the country's economic sectors have had the

greatest impact:

- ***Sector D***: Manufacturing Industry (32,410),
- ***Sector K:*** Real Estate Activities (25.471),
- ***Sector G:*** Wholesale and retail trade. Repair of vehicles, motorcycles and household goods (24.618),
- ***Sector A:*** Agriculture, Livestock, Hunting and Forestry (17,988),
- ***Sector L:*** Public Administration and defense. Social Security Plans (16,412),
- ***Sector N:*** Activity. Health and social services (16.104),
- ***Sector I:*** Transportation, Storage and Communications (9,634),
- ***Sector F:*** Construction (8,343),
- ***Sector O:*** Other community, social and personal activ. Community, social and personal activities. Service type (6,446).
- ***Sector H:*** Hotels and Restaurants (1742) and
- The Undefined (2078).

It should be noted that due to the lack of information from agencies such as the SGRT and INEC, they do not have records of the affiliated population by economic sector, which is why it has not been possible to determine the incidence rate; what stands out in this information gathered is that the Manufacturing Sector has had the greatest impact in the 10 years in a row, which allows us to establish some hypotheses in this regard.

Figure 4: Qualified T.A.'s by economic sector during the period 2014-2023



Source: Prepared by the authors based on data provided by the SGRT's annual occupational accident statistics.

Figure 5, presents the result of the T.A.s that have occurred during the period 2014 - 2023 and its variable is sex, from which it is highlighted that 76.5% of the T.A.s fall on males and 23.5% on females. According to the figure, T.A.T. in relation to males has decreased in the first five years and after the pandemic its growth is slight. In relation to the female sex with the same criterion, but in a lower proportion.

Figure 5: Qualified T.A.'s by gender. Source: Own elaboration based on data provided by the annual statistics of occupational accidents of the SGRT.

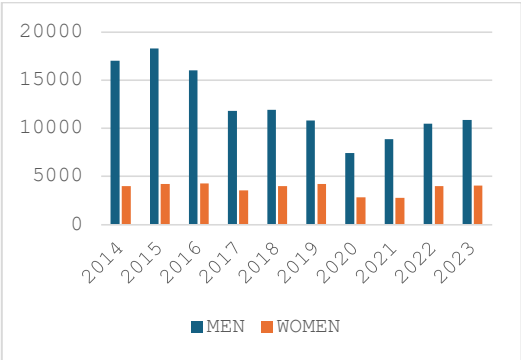


Table 3, has taken as a basis for analysis the TA by year and its I.I., from which the impact on both male and female workers is distributed proportionally. It should be noted that during the period 22014 - 2023, the male sex has the highest impact trend in each year analyzed. Regarding the I.I. in men, in 2014 it was 504.44 and in 2023 it was 423.11, unlike in women that in 2014 the I.I. was 96.05 and in 2023 it reached

111.70 although the proportion is lower, this rebound in women should be considered.

Table 3: T.A. Incidence Rate by Sex.

AÑO	A.T.	I.I.	% AT. H	I.I. H.	% AT.M	I.I. M.
2014	21577	504,44	80,96	408,39	19,04	96,05
2015	23104	535,30	81,10	434,13	18,90	101,17
2016	21110	487,65	78,75	384,02	21,25	103,63
2017	16400	377,21	76,45	288,38	23,55	88,83
2018	17723	404,33	74,73	302,16	25,27	102,17
2019	17056	390,02	72,69	283,51	27,31	106,51
2020	11629	281,41	73,58	207,06	26,42	74,35
2021	13043	355,88	76,93	273,78	23,07	82,10
2022	15730	418,45	73,30	306,72	26,70	111,73
2023	15985	423,11	73,60	311,41	26,40	111,70

The SGRT and INEC do not present statistics on affiliations by age range, which is why the impact of T.A. is not determined. It is worth noting, according to Figure 6, that workers in the 21-30 age range have suffered the highest percentage of T.A., followed by workers between 31 and 40 years of age, in third place, those between 41 and 50, and in each age range, the male sex has a greater impact. What stands out according to the figure is that women in the same age range as men also have a high indicator, and consequently in the following age ranges.

Figure 6: Qualified T.A. by age range and sex. Source: Own elaboration based on data provided by the annual statistics of occupational accidents of the SGRT.

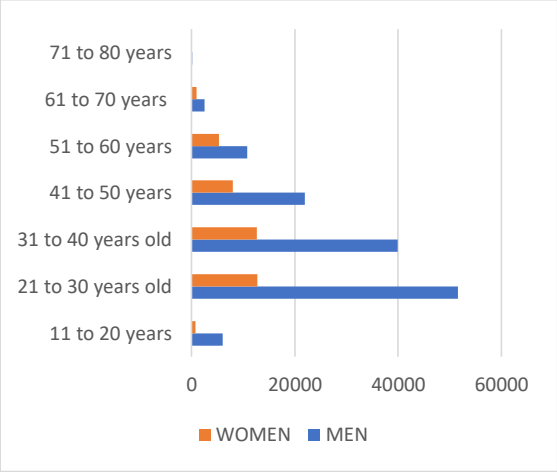


Figure 7 is the result of the analysis of the statistics presented by the SGRT of the IESS, and it should be noted that the information is continuous for the variables of temporary disability and death of the member, but not for the others.

Figure 7: A.T. Types of disability

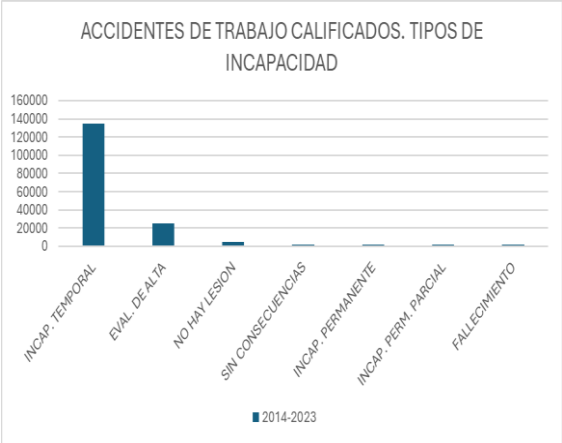


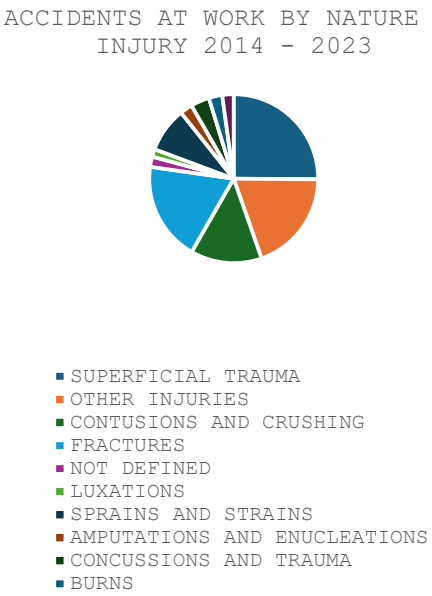
Table 4 presents the results obtained from the calculation of the I.I. by type of disability generated and for this purpose the Temporary Disability data from 2014 to 2023 was considered and consequently the statistics of the member's death. It should be noted that of the 100 % of I.I. generated, 90.67 % started in 2014, although with a decrease in 2023 of 64.41 % and with regard to death this impact has therefore been decreasing in the period observed.

Table 4: Disability Incidence Rate .

AÑO	I.I. A. T	% I. T	I.I.- I. T	% M	I.I.- M
2014	504,44	90,67	457,37	1,42	7,16
2015	535,30	93,06	498,15	1,48	7,92
2016	487,65	94,64	461,51	1,25	6,09
2017	377,21	90,95	343,07	1,32	4,98
2018	404,33	89,29	361,03	1,22	4,93
2019	390.02	56,89	221,88	1,17	4,56
2020	281.41	54,99	154,75	1,35	3,80
2021	355,88	59,13	210,43	1,6	5,69
2022	418,45	58,73	245,75	1,31	5,48
2023	423,11	64,41	272,52	1,39	5,88

Figure 8 shows that 25% of this population that has been qualified as T.A. have suffered superficial trauma, which refers to physical injuries or wounds. Twenty percent have other types of wounds and 19% have fractures, which can be considered as a partial or total rupture of the bone. And with 14%, followed by contusions and crushing.

Figure 8: T.A. by Nature of Injury. Source: Own elaboration based on data provided by SGRT annual statistics of occupational accidents.



With the data initially obtained on the total I.I. and by year, proportionally, the same was considered to determine the I.I. by nature of injury, the same that annually there is a variability of its impact according to subsequent tables:

Table 5: Nature of Injury

NATURALEZA DE LESION	2014 A.T.	% A.T.	I.I.	2015 A.T.	% A.T.	I.I.	2016 A.T.	% A.T.	I.I.
TRAUMATISMO SUPERFICIAL	4501	20,86	105,22	4137	17,90	95,82	3317	15,71	76,61
OTRAS HERIDAS	3510	16,27	82,07	4401	19,05	101,97	4132	19,57	95,43
CONTUSIONES Y APLASTAMIEOS	3500	16,21	81,77	4722	20,44	109,42	4472	21,18	103,28
FRACTURAS	3486	16,16	81,52	3698	16,01	85,70	3385	16,03	78,17
NO DEFINIDO	1853	8,60	43,38	813	3,52	18,85	00	0,00	0,00
LUXACIONES	00	0,00	0,00	00	0,00	0,00	398	1,88	9,17
TORCEDURAS Y ESGUINCES	1568	7,27	36,67	2123	9,19	49,19	2495	11,82	57,64
AMPUTACIONES Y ENUCLEACION	760	3,52	17,75	724	3,13	16,75	438	2,07	10,09
CONMOCIONES Y TRAUMATISMO	668	3,09	15,59	731	3,16	16,92	985	4,67	22,77
QUEMADURAS	587	2,72	13,73	612	2,65	14,18	544	2,58	12,59
LESIONES MULTIPLES	413	1,91	9,64	416	1,80	9,63	280	1,34	6,53
OTRAS LESIONES NO DEFINIDAS	731	3,39	17,10	727	3,15	16,87	664	3,15	15,37
TOTAL	**21577**	**100%**	**504,44**	**23104**	**100%**	**535,30**	**21110**	**100%**	**487,65**

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Table 6: Nature of Injury

NATURALEZA DE LESION	2017	% A.T.	I.I.	2018	% A.T.	I.I.	2019	% A.T.	I.I.
TRAUMATISMO SUPERFICIAL	3850	23,48	88,57	5786	32,65	132,01	5250	30,78	120,05
OTRAS HERIDAS	3308	20,17	76,08	3397	19,17	77,51	3471	20,35	79,36
CONTUSIONES Y APLASTAMIENTOS	2301	14,03	52,92	1484	8,37	33,84	1352	7,93	30,93
FRACTURAS	2950	17,99	67,86	3218	18,16	73,43	3320	19,47	75,94
NO DEFINIDO	225	1,37	5,17	00	0,00	0,00	00	0,00	0,00
LUXACIONES	328	2,00	7,54	333	1,88	7,60	307	1,80	7,02
TORCEDURAS Y ESGUINCES	1593	9,71	36,63	1405	7,93	32,07	1398	8,20	31,98
AMPUTACIONES Y ENUCLEACIONES	321	1,96	7,39	342	1,93	7,80	340	1,99	7,76
CONMOCIONES Y TRAUMATISMO	639	3,89	14,67	543	3,06	12,37	387	2,27	8,86
QUEMADURAS	449	2,74	10,341	489	2,76	11,16	401	2,35	9,17
LESIONES MULTIPLES	00	0,00	0,00	349	1,97	7,97	473	2,77	10,80
OTRAS LESIONES NO DEFINIDAS	436	2,66	10,04	377	2,12	8,57	357	2,09	8,15
TOTAL	**16400**	**100%**	**377,21**	**17723**	**100%**	**404,33**	**17056**	**100%**	**390,02**

In 2017 despite representing a decreasing period, the TA caused superficial trauma in greater proportion reaching its impact to be I.I = 88.57 and in 2018 the same consequences are maintained reaching an impact of I.I = 132.01 in the same way is repeated in 2019 where the I.I = 120.0.

Table 7: Nature of Injury

NATURALEZA DE LESION	2020	% A.T.	I.I.	2021	% A.T.	I.I.
TRAUMATISMO SUPERFICIAL	3051	26,24	73,84	3693	28,32	100,79
OTRAS HERIDAS	2385	20,51	57,72	2421	18,56	66,05
CONTUSIONES Y APLASTAMIENTOS	914	7,86	22,12	900	6,90	24,56
FRACTURAS	2187	18,81	52,93	2700	20,70	73,66
NO DEFINIDO	00	0,00	0,00	00	0,00	0,00
LUXACIONES	187	1,61	4,53	288	2,21	7,87
TORCEDURAS Y ESGUINCES	806	6,93	19,50	888	6,81	24,24
AMPUTACIONES Y ENUCLEACIONES	220	1,88	5,29	302	2,32	8,26
CONMOCIONES Y TRAUMATISMO	351	3,02	8,50	534	4,09	14,55
QUEMADURAS	267	2,29	6,44	295	2,26	8,04
LESIONES MULTIPLES	1024	8,81	24,80	719	5,51	19,61
OTRAS LESIONES NO DEFINIDAS	237	2,04	5,74	303	2,32	8,25
TOTAL	**11629**	**100%**	**281,41**	**13043**	**100%**	**355,88**

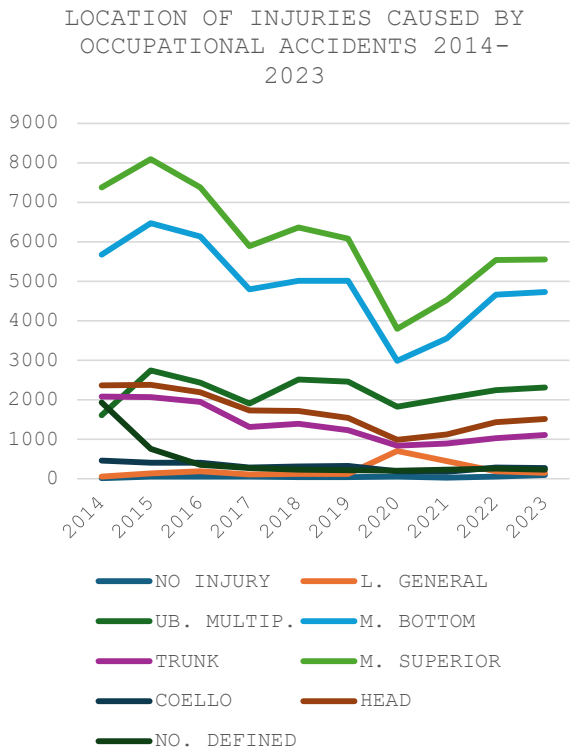
Table 8: Nature of Injury

NATURALEZA DE LESION	2022	% A.T.	I.I.	2023	% A.T.	I.I.
TRAUMATISMO SUPERFICIAL	4367	27,76	116,16	4434	27,74	117,37
OTRAS HERIDAS	2953	18,77	78,54	2986	18,68	79,04
CONTUSIONES Y APLASTAMIENTOS	1487	9,45	39,54	1891	11,83	50,05
FRACTURAS	3505	22,28	93,23	3540	22,15	93,72
NO DEFINIDO	204	1,30	5,44	212	1,33	5,63
LUXACIONES	319	2,03	8,50	318	1,99	8,42
TORCEDURAS Y ESGUINCES	1149	7,30	30,55	1099	6,88	29,11
AMPUTACIONES Y ENUCLEACIONES	320	2,04	8,54	279	1,74	7,36
CONMOCIONES Y TRAUMATISMO	818	5,20	21,76	609	3,81	16,12
QUEMADURAS	339	2,16	9,04	353	2,20	9,31
LESIONES MULTIPLES	00	0,00	0,00	00	0,00	0,00
OTRAS LESIONES NO DEFINIDAS	269	1,71	7,15	264	1,65	6,98
TOTAL	**15730**	**100%**	**418,45**	**15985**	**100%**	**423,11**

In the year 2022 the I.I = 116.16 and in 2023 the I.I = 117.37 and therefore the injuries correspond to superficial trauma. It is necessary to understand that this indicator is known as the damage to the physical integrity of a person causing pain, morbidity, mortality and incapacity to the worker. Narváez, P. E. C. (1999)

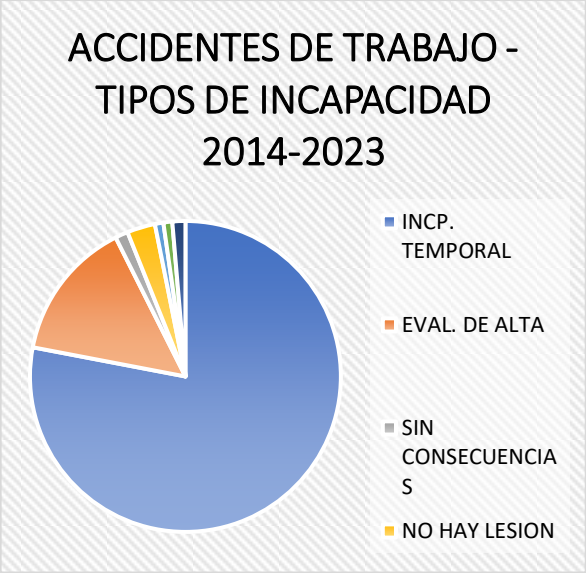
Figure: 9 provides information on the part of the human body in which the injuries have occurred or originated as a result of T.A. and the results show that there is a greater affectation in both upper and lower limbs.

Figure 9: Location of injuries caused by A.T. Source: Own elaboration based on data provided by the annual statistics of occupational accidents of the SGRT.



Finally, Figure 10 shows the types of incapacities that caused the TA that were analyzed during the period 2014 - 2023 and that, according to the analysis, 78 % (135,071) corresponds to temporary incapacity and that it is necessary to prepare to prevent them. M. T. Muñoz et al., (2014) .

Figure 10: T.A. and Types of Disability Generated. Source: Own elaboration based on data provided by SGRT annual statistics of occupational accidents.



RESULTS

Trends in occupational accidents

Between 2014 and 2023, there was a general decrease in the frequency of reported accidents, although serious and fatal accidents remained at worrying levels. Sector D Manufacturing Industry concentrated the highest number of incidents, followed by Sector K Real Estate activities and Sector G, wholesale and retail trade. These activities present inherent risks due to the use of heavy machinery, adverse environmental conditions, and uneven compliance with safety regulations.

Economic impact

The costs associated with occupational accidents, including lost days, medical expenses, indemnities and lost productivity, represent a significant percentage of the Gross Domestic Product (GDP). In addition, the financial burden on the public health system and businesses affects economic competitiveness.

Occupational health

Illnesses resulting from hazardous working conditions continue to be underestimated in official records, which hinders the development of comprehensive prevention strategies. Musculoskeletal disorders, respiratory diseases and psychological disorders stand out as the main ailments associated with working environments.

Regulatory framework

The implementation of the Occupational Health and Safety Management System (OHSMS) has shown significant progress, but faces compliance challenges, especially in small and medium-sized enterprises (SMEs). Insufficient oversight and lack of adequate training contribute to these difficulties.

DISCUSSION

The research is based on the statistics of occupational accidents presented by the IESS - SGRT, which are published annually through its virtual page, highlighting the qualified occupational accidents, which were analyzed during the period 2014 - 2023. In the first five years of this period, social security affiliates were 4'277,415 in 2014, with a slight growth in 2018 reaching 4'383,214 which meant an increase of 105,799 (2.47%) new affiliates. The second five-year period starting in 2019 with 4'372,997 members already in the pandemic and until 2023 the number of members reached 3'777,922, showing a considerable decrease of around 595,075 fewer members in the second five-year period. The causes of this decrease in the number of active members, the greatest impact was the pandemic and on the other hand the country's labor policies with the post pandemic. With the same criteria, the qualified work accidents in these periods were analyzed, obtaining an average of 19,982.8 during the first five-year period and in the second five-year period the average was considered to be 14,688.6 in relation to this figure.This decrease was initially due to control policies established by the IESS through the system of labor risk audits (SART) as well as the Regulation of the General Insurance of Labor Risks (Resolution 513) on notification of accidents at work and finally the pandemic forced control agencies, employers and workers to establish prevention protocols with greater firmness, penalizing non-compliance with employer responsibility. It should be considered that in these periods the highest incidence rate was 535.30 and the lowest was 281.41 (per 100,000 workers) to which it should be added that the highest number of AT occurred in the workplace and in transit (journey home from work and vice versa). The economic sector with the highest incidence rate during these 10 consecutive years has been the manufacturing sector (Sector D), followed by other service sectors. This manufacturing sector has a high percentage of workers in high-risk activities. It is surprising that in all the periods analyzed the male sex has the greatest impact and in second place the female with the least impact. It should be considered that in high-risk activities there is generally a higher percentage of male participation and the age range in which the statistics show that the greatest number of accidents are generated is between 21 and 30 years of age, both in men and in women. The TA have caused superficial traumatisms, contusions, fractures and injuries that are located both in upper and lower extremities, generating a temporary disability of 78% in relation to the TA given during the period 2014 - 2023.

Articles
Revista tecnológica ciencia y educación Edwards Deming
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Indeed, the impact of occupational accidents in Ecuador is multidimensional, affecting not only the direct victims, but also their families, communities and the public health system. Government initiatives to promote a culture of prevention have had a positive, albeit insufficient, impact. In addition, the lack of a robust monitoring system limits the ability to effectively evaluate interventions. Comparison with neighboring countries that have implemented advanced technologies and stricter regulatory frameworks reveals opportunities for improvement of current systems in the country.

In view of the above, it is concluded that although the laws in the country have been improved, many employers in both productive and service economic sectors still persist in not respecting the rights of workers, established in the Constitution of Ecuador, Art. 326 Literal 5, which states the right of workers to develop their activities in a safe working environment. On the other hand, it should be noted that in 2008 the ILO consultant. Juan Carlos Hiba, expressed in a report that in the country there was a registration of 2% of TA and an under-registration of 98%. This has probably decreased slightly due to everything that is currently being done by the control entities and the awareness of many employers, highlighting recently in 2024 the Executive Decree 255 (Regulation of Safety and Health at Work) as well as the Equality Plan and the Plan for the Promotion of Health of workers, to these plans that are being reformulated we recommend the following criteria that would strengthen safety systems such as:

Strengthen control and follow-up: Increase supervision and sanctions in high-risk sectors, ensuring that companies comply with occupational health and safety regulations.

Continuous training: Promote educational programs for workers and employers on occupational risk prevention. This includes the design of courses adapted to each sector and periodic evaluation of their effectiveness.

Reliable data: Improve the collection and analysis of data related to occupational accidents and illnesses through digital systems and inter-institutional collaborations.

Encourage investment in technology: Implement innovative solutions, such as safety sensors, artificial intelligence and remote monitoring systems, that reduce risks in the workplace.

Promote a culture of safety: Integrate awareness programs in schools, universities and communities to build a collective commitment to occupational safety.

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