

IN FREE FALL

A PROFILE OF INJURED WORKERS IN PERNAMBUCO'S COUNTRYSIDE IN NORTHEAST BRAZIL

Aryellyson Hellyton Gomes do Nascimento¹
Ana Cristina de Oliveira e Silva²
Barbara Iansã de Lima Barroso³

Abstract: Occupational accidents are one of the biggest health problems for Brazilian workers. The objective was to trace the profile of workers notified by the compulsory notification forms for serious work accidents in the countryside of Pernambuco, an isolated area located in the Northeast of Brazil, analyzing their evolution between the years 2014 and 2019. Analysis of the variables were collected through the database of the Information System for Notification of Injuries of the Regional Health Management that covers the studied area. The results found indicate the distance between the Brazilian Government and the safety of workers, and the need for attention to

¹ Occupational Therapist. Sanitarian by the Multiprofessional Residency Program in Collective Health with Emphasis in Management of Health Networks by the School of Public Health of Pernambuco (ESSPE). Recife, Pernambuco, Brazil.

E-mail: aryellyson@hotmail.com

Lattes: <http://lattes.cnpq.br/3862014449209194>

Orcid: <https://orcid.org/0000-0002-5288-0834>

² Associate Professor in the Department of Clinical Nursing at the Federal University of Paraíba (UFPB). Graduate Program in Nursing at the Federal University of Paraíba (UFPB). João Pessoa, Paraíba, Brazil.

E-mail: anacris.os@gmail.com

Lattes: <http://lattes.cnpq.br/2636448157614016>

Orcid: <https://orcid.org/0000-0002-5344-0742>

³ Assistant Professor in the Department of Preventive Medicine at the Federal University of São Paulo (UNIFESP). Graduate Program in Nursing at the Federal University of Paraíba (UFPB). João Pessoa, Paraíba, Brazil.

E-mail: bil.barroso@unifesp.br

Lattes: <http://lattes.cnpq.br/7801977858350130>

Orcid: <https://orcid.org/0000-0002-3591-4350>

the specific population. The organization of the production process is necessary, associated with an intervention based on preventive principles aimed directly at informal and formal workers.

Keywords: Public health. Worker's health. Occupational accident notification. Health surveillance. Occupational health and safety.

EM QUEDA LIVRE
PERFIL DOS TRABALHADORES ACIDENTADOS NO INTERIOR DE
PERNAMBUCO, NORDESTE DO BRASIL

Resumo: Os acidentes de trabalho são um dos maiores problemas de saúde dos trabalhadores brasileiros. O objetivo foi traçar o perfil dos trabalhadores notificados pelas fichas de notificação compulsória por acidentes de trabalho graves no interior de Pernambuco, área isolada localizada no Nordeste do Brasil, analisando sua evolução entre os anos de 2014 e 2019. A análise das variáveis foi coletados por meio do banco de dados do Sistema de Informação de Notificação de Agravos da Gerência Regional de Saúde que abrange a área de estudo. Os resultados encontrados indicam a distância entre o governo brasileiro e a segurança dos trabalhadores, e a necessidade de atenção à população específica. É necessária a organização do processo produtivo, associada a uma intervenção baseada em princípios preventivos dirigida diretamente aos trabalhadores informais e formais.

Palavras-chave: Saúde pública. Saúde do trabalhador. Notificação de acidente de trabalho. Vigilância de Saúde. Saúde e segurança Ocupacional.

Introduction

Historically, despite Brazilian Government underfunding, the Brazilian Unified Public Health System (SUS⁴) remains the largest

⁴ Abbreviation of Sistema Único de Saúde in Portuguese.

national public health provider in Brazil, which guarantees the right to universal, comprehensive, and equitable health care to the user across all areas of individual occupation, including labor (Assunção e Brito, 2011).

The path of creation and strengthening of Workers' Health (ST⁵) in the SUS did not constitute a linear path of constant and targeted implementation. With the promulgation of the Federal Constitution in 1988, as freedom returned to become a part of Brazilian daily life, the advance in more organic inclusion in the area of ST in the SUS, the challenges to its effective consolidation often emerged as real obstacles to its viability (Assunção and Brito 2011; Ribeiro and Leão, 2020).

The incorporation of Worker's Health by the SUS recognizes, in work environments and processes, the conditions for events that are harmful to the health of "those who work" from an epidemiological perspective. It is not restricted to assisting the worker who has had an accident or an injury at work, but seeks to quantify the number of people exposed to insecurity and to qualify these conditions for subsequent changes (Assunção and Brito 2011; Lacaz 2019; Ribeiro and Leão, 2020).

In Brazil, productive activities are organized in many ways, with different degrees of technological and management incorporation, in the logic of productive chains in all economic sectors (Agroindustry, Mining, Civil Construction, Industry, Services sector and others). Thus, different orders of organization of productive processes and technological incorporation can be observed - from manual and

⁵ Abbreviation of Saúde do Trabalhador in Portuguese.

handicraft work to production by robots - and forms of management and bonding of the worker with the employer or person responsible for the production, through different ways, from formal work, with signed work-cards and other contracts through cooperatives and associations and informal arrangements (Brazil 2018; Ribeiro and Leão, 2020).

Although there is still a weakening and attempts at fraud in labor rights from a capitalist perspective, the Brazilian Federal Constitution enshrined health as a right for all and a duty of the State, establishing principles to be respected by labor legislation in order to guarantee safe and healthy conditions for workers in their work environments (Brazil 2018; Senado Federal 2020; Trivellato and Paixão, 2020).

It is important to highlight work as a determinant of health, of the living conditions of workers and their families, in addition to the generation of income and inclusion of workers in society, it promotes and establishes the network of affective bonds, favoring the formation of social support networks, which are important for health. This highlights Doppler, who proposes a reflective discussion when he questions us to think about work: is it a health hazard or a health promoter (Doppler 2007).

We can see that this questioning is operatively applied, and it can present itself in two stages of the worker's life, as Lancman and Ghirardi (2002) points out, affirming that work can take many forms. On one hand, the world of work will generate suffering insofar as it confronts people with external challenges; on the other hand, work is also the main opportunity for adult growth and psychosocial development, promoting their health.

In this regard, it is necessary to provide comprehensive attention in health care for this worker, involving actions to promote

and protect health, surveillance, assistance and rehabilitation, as recommended by the national health policy for workers (Ministério da Saúde 2012).

As explained in Ordinance No 1,823 of 2012, which states that the Brazilian National Health Policy for Workers aims to define the principles, guidelines and strategies to be observed by the three spheres of management of the Brazilian Unified Public Health System (SUS), for the development of comprehensive health care for workers, with an emphasis on surveillance, aiming at the promotion and protection of workers' health and reducing morbidity and mortality resulting from development models and production processes (Ministério da Saúde 2012).

Thus, this research aims to outline the profile of workers notified by the compulsory notification forms for serious work accidents DATA EXCLUDED IN THE BLIND VERSION between the years 2014 and 2018, analyzing their evolution. The collection and analysis of this data may contribute to the improvement of norms and laws in the field of Workers' Health, alerting the competent public bodies to the harms to human health.

The Occupational Accident (OA) is an important public health problem in Brazil due to its high incidence and great impact on the population's morbidity and mortality. Art. 19 of Law No 8,213, of July 24, 1991 defines the concept of OA as that which occurs during the exercise of work, which causes body injury or functional disturbance that causes death, loss or permanent or temporary reduction of the capacity to work. Also considered are injuries that occur during the journey from the worker's residence to his workplace and vice versa (Ribeiro and Leão, 2020; Senado Federal 2020).

For Almeida (2006), Occupational Accidents (OA) are one of the biggest health issues of Brazilian workers today. These constitute a relevant theme for several sectors of our society, especially when it comes to the public health area, in view of their high incidence and the social and financial costs for the injured and their families, for the health system, for social security, for employers and the State (Almeida, 2006; Filho 2021).

The high rates of underreporting of deaths from accidents at work continues to grow, a well-known fact in Brazil⁶. Most of the national studies on the topic are based on secondary data, mostly obtained from the now defunct Ministry of Social Security. Also in the Mortality Information System (SIM⁶), managed by the Ministry of Health and supported by the number of death certificates, there is a significant underestimation of deaths resulting from occupational accidents in Brazil (Naghavi K *et al.*, 2019; Monteiro Ferreira *et al.*, 2020). The magnitude of the problem is even greater for workers not covered by social security, among whom high and even more invisible mortality rates from occupational accidents are observed (Ministério da Saúde 2012; Naghavi K *et al.*, 2019; Monteiro Ferreira *et al.*, 2020).

In this perspective, the Brazilian government implemented the Investigation Form (FI⁷) for serious work accidents, which feeds the Information System for Notification of Injuries (SINAN⁸). Through this system, notifications have to be made for all serious work accidents, regardless of whether they are linked to the employee's work, whether they occurred in the exercise of work activity, or

⁶ Abbreviation of Sistema de Informação sobre Mortalidade in Portuguese.

⁷ Abbreviation of Ficha de Investigação in Portuguese.

⁸ Abbreviation of Sistema de Informação de Agravos de Notificação in Portuguese.

on their way home from work or vice versa. Serious occupational accidents are considered as those that result in death, mutilation, and those that involve children under eighteen years old (Brazil, 2004).

However, the notification form for serious work accidents is seen as a prospect for health promotion, thus exempting itself from the preventive power that public health exercises. Bearing in mind that the accident, Ordinance GM/MS No 737/2001 classifies accidents, to a greater or lesser degree, as predictable and preventable events (Drumond and Silva, 2013).

In addition to the vision that the occupational accident is seen as a common event and originated from a single factor, a view that is also repeated among occupational health specialists, for Drumond and collaborators traditional approaches interpret the accident at work as being a simple event and determined by a single cause (or by an immediate cause, when multiple causes are recognized) (Drumond and Silva, 2013). The dichotomy and superficiality of the unsafe act ideology - a personal factor of insecurity *versus* unsafe condition - explains why accidents are treated predominantly by means of the simple prescription of Personal Protective Equipment (EPI⁹) and the dissemination of booklets that aim to raise awareness of the risks and consequently, behavior change (Brazil, 2005).

1 Methods

This is a descriptive documentary research using secondary data with retrospective data, having a quantitative approach carried

⁹ Abbreviation of Equipamentos de Proteção Individual in Portuguese.

out with data from the information system of the X Health Region of the State of Pernambuco located in the Northeast Region of Brazil, which registers data about accidents at work.

In order to obtain specific information about the occurrence of accidents, a search for historical series data was carried out, referring to the years from 2014 to 2019, an in-depth research in the Information System for Notification of Injuries (SINAN), and tabulated by the TabWin program, developed and used to treat SUS data through the SUS Informatics Department (DATASUS¹⁰) using the chosen variables, total number of notifications, occupation, age, gender and education, all by municipality of residence, available from the Ministry of Health.

The data was accessed after signing the request letter sent to X Regional Health Management, located in Afogados da Ingazeira/PE and approved by the Ethics Committee. DATA EXCLUDED IN THE BLIND VERSION; CAAE number/DATA EXCLUDED IN THE BLIND VERSION.

The inclusion criteria established for this research were: to analyze all work accidents (commuting accidents, typical, occupational diseases and accidents without notified Occupational Accident Report [CAT¹¹]) in workers belonging to the X health region of the state of Pernambuco. Occupational accidents involving workers not belonging to the X region, but who were treated at health services belonging to that same region, were excluded.

For data analysis, a database was created using the Microsoft Excel 2018 program, where this data was inserted and divided

¹⁰ Abbreviation of Equipamentos de Proteção Individual in Portuguese.

¹¹ Abbreviation of Comunicação de Acidente de Trabalho in Portuguese.

by variable, being presented respectively by the years of occurrence and notification and then treated in TabWin. The data was discussed and presented by the authors for better interpretation and sampling of the results. The years selected for the presentation of the historical series show the importance of evaluating the categories of accidents that occurred in a given time, as this variable demonstrates the importance associated with the social and political issues that have been happening in Brazil, namely, the loss of workers' rights, considering that in the present historical series, the country had changes of government: President Dilma Rousseff (2011 to 2016), and Michel Temer, after the coup d'état (2016 to 2018), and Jair Bolsonaro (2019 to 2022), who made and imposed changes to Brazilian labor legislation.

For a better understanding of the geographical delimitation, the X Regional Health Management is located in the mesoregion of Pajeú, in the Pernambuco countryside in the Northeast of Brazil, with twelve municipalities bordering the composition of the region, which are DATA EXCLUDED IN THE BLIND VERSION.

2 Results

According to data from the Information System for Notification of Injuries (SINAN) referring to serious work accidents (Table 01) related to the total number of reported accidents, a considerable and gradual increase is perceived over the years. The lowest rate reported was in 2014 and the highest in 2019, being the year with the highest rate with 75 notifications, represented by 34% of notification of total accidents over the 04 years. In comparison, we can see that the lowest rate recorded in 2014 contains 15 notifications

corresponding to 8% of the total notifications. A decrease in the rate is still visible in the year 2016 compared to 2015, but a significant increase for the years 2017 and 2018.

Table 1 - Serious work accidents notified by residence city in the years 2014 to 2019

SERIOUS WORK ACCIDENT							
Residence city	2014	2015	2016	2017	2018	2019	Total
Afogados da Ingazeira	10	11	4	25	15	18	83
Brejinho	0	0	0	1	2	2	5
Carnaíba	0	3	0	4	5	8	20
Iguaraci	2	3	5	0	3	7	20
Ingazeira	0	1	0	1	3	6	11
Itapetim	0	5	2	1	5	8	21
Quixabá	1	0	1	2	1	4	9
Santa Terezinha	0	0	2	1	4	4	11
São José do Egito	1	3	4	1	0	5	14
Solidão	0	1	1	1	2	1	6
Tabira	1	2	0	2	2	10	17
Tuparetama	0	0	0	1	1	2	4
Total	15	29	19	40	43	75	221

SOURCE / SINAN 2020.

Regarding the variable by occupation (Table 02), 41 types of occupations were identified in the space referring to the profession in the notification forms, in which a total of 220 notifications were made in the years 2014-2019. We can perceive that the number of notifications per occupation is lower when compared to the total number of notifications (Table 01), showing that in one of the forms the occupation field was ignored, generating incompleteness in fill-

ing in the data, reducing the possibility of knowing what activity the worker was performing when he/she suffered the accident.

For the sampling, the five occupations that had the most notifications among the 41 notified by SINAN were filtered, showing the total number of all occupations and the total of the five chosen for the table (Table 02).

Another perception is that the first occupations filled out in the forms refer to informal work, as in the case of agriculture or associated services, assimilating this perspective to the increase in formal unemployment in recent years and the massive growth of informal work. As we can see in the occupation item Household / Agriculture (Table II), in 2014-2015 there were 0 notifications made and in 2019 there were 46, a totally significant growth for the carrying out of preventive action in these spaces.

Table 02 - Number of notifications by occupation

OCCUPATIONS							
Notification year	2014	2015	2016	2017	2018	2019	TOTAL
Total of all occupations	15	28	19	40	43	75	220
Household (Agriculture)	0	0	4	18	24	46	92
Agricultural Worker in General	13	25	3	0	4	3	48
Student	0	0	1	4	2	4	11
Agricultural Wheel Worker	0	0	3	1	1	5	10
Bricklayer	0	0	1	2	3	3	9
Retired/Pensioner	0	1	1	0	1	3	6
Total of 5 selected occupations	13	26	13	25	35	64	176

SOURCE / SINAN 2020.

In the age group factor (Table 03), it can be seen that there is a prevalence of work accidents in the population between 35-49 years of age, with 74 notifications made, as we can see in Table 03, which also shows an increase over the years. The ages are divided and grouped by the SINAN system itself.

Another prospect of perception is that there are notifications of children and adolescents between the ages of 14 and 19, totaling 31 notifications. This is an important indicator for the analysis that child labor is still active in this region, which seriously violates Brazilian laws and international standards that advocate working only in adulthood, since only accidents at work are reported, not counting underreporting and non-accidents.

Table 03 - Number of notifications by age group

AGE GROUP							
Notification Year	Oct/14	15-19	20-34	35-49	50-64	65-79	Total
2014	0	2	5	4	4	0	15
2015	2	5	6	10	4	2	29
2016	0	2	8	2	5	2	19
2017	0	10	8	14	7	1	40
2018	2	3	11	17	6	4	43
2019	0	5	20	27	17	6	75
Total	4	27	58	74	43	15	221

SOURCE / SINAN 2020.

Table 04 shows an overview, which is a portrait of the national situation, in which the male sex is shown as the most vulnerable population for accidents at work when the division is for both sexes and the categorization is by the type of accident. In the X health region, the

number of occupational accidents reported for males totals 200 cases, representing 90% of the notifications, while female workers have 21 of the reported cases. This only counts serious and reported accidents, since in the great majority of cases, there is evasion or non-referral to the health services when work accidents occur that do not need medical intervention, thus hindering mapping and the possible study environment:

Table 4 - Number of notifications by sex

SEXO			
Notification Year	Man	Woman	Total
2014	14	1	15
2015	25	4	29
2016	14	5	19
2017	36	4	40
2018	39	4	43
2019	72	3	75
Total	200	21	221

SOURCE / SINAN 2020

Table 05 shows the reality of the Human Development Index (MHDI) - Pernambuco is 0.673 in 2010, which places this Federative Unit (UF) in the range of Average Human Development (MHDI between 0.600 and 0.699). 60 notifications of serious work accidents of workers without complete elementary education are shown in table 04, which presents the prevalence of the male sex, in view of the early termination of this population from school education to start employment. Another aspect to be considered in Table 05, is the number of notifications that ignore education as an important item for completion of the document.

Table 5- Number of notifications by school

ESCOLARIDADE							
Notification Year	2014	2015	2016	2017	2018	2019	Total
Ign/Branco	8	10	13	8	14	11	64
Illiterate	0	1	0	0	1	1	3
1st to 4th grade incomplete	0	3	2	3	5	9	22
4th complete series	2	2	0	3	4	3	14
5th to 8th grade incomplete	2	11	1	21	9	16	60
Complete primary education	1	0	0	0	2	3	6
Incomplete high school	1	1	0	3	2	7	14
Complete high school	1	1	3	2	4	24	35
Incomplete higher education	0	0	0	0	1	0	1
Complete higher education	0	0	0	0	1	1	2
Total	15	29	19	40	43	75	221

SOURCE / SINAN 2020

3 Discussion

The considerable growth of compulsory notifications in all the variables selected and presented in this study, shows an important fact about the state of work insecurity in Brazil today, and this prospectus may present several aspects to explain the prominent issue of the lack of solutions to the crisis that involves the health,

safety and security of the Brazilian worker. The first is the financial component that, according to the International Labor Organization, approximately 4% of the world's Gross Domestic Product (GDP) is reverted in direct and indirect costs resulting from accidents and illnesses at work. Additionally, about 2.3 million people worldwide die each year as a result of these injuries (Benach et al., 2002; Brazil, 2005; Dias and Hoefel, 2005; Drumond and Silva, 2013; Barkhordari, Malmir and Malakoutikhah, 2019; Cabral *et al.*, 2019; Galvão and Marcelino, 2020; International Labour Office e Organisation internationale du travail, 2020).

Another issue that complements and supports the hypothesis of an increase in the number of serious notifications of occupational accidents in current years is the massive number of workers in informal jobs, caused by the growth of unemployment in Brazil, changes in labor laws and norms, and the precarious nature of current jobs (Assunção and Brito 2011; Naghavi K *et al.*, 2019; Lacaz 2019; Ribeiro and Leão, 2020). Diagnoses carried out for occupational accidents must consider both proximal causes and underlying causes or conditions (Barkhordari, Malmir and Malakoutikhah, 2019).

The dynamics that involve formal and informal work, and the momentum caused by them in the Brazilian economy, present a strong and clear relationship of domination, which is responsible for the reproduction of the poverty level of the population, underemployment, regional imbalances, levels of social inequality, exclusion and income concentration and many other constraints. Among these constraints and anomalies are work accidents, occupational diseases, rework, turnover, waste of resources, among others (Benach et al., 2002; Dias and Hoefel, 2005; Cabral *et al.*, 2019; Galvão and

Marcelino, 2020; International Labour Office e Organisation internationale du travail, 2020).

In this sense, much of the growth in job informality and insecurity in the 1990s can be explained by the reduction and evasion by companies of the fulfillment of their labor and social responsibilities, and this, in Brazil, is largely due to the low costs of illegality (Giatti, Barreto e César, 2008; Santana et al., 2007; Lacaz *et al.*, 2013; Rizzotto and Campos, 2016).

This corroborates the fact that serious occupational accidents in the workplace grow in an uncontrolled way and without means of prevention for future events. Worldwide, occupational accidents are responsible for the highest number of deaths and serious disabilities caused by work, although many countries do not differentiate accident statistics in relation to occupational diseases (Santana *et al.*, 2007; Rocha *et al.*, 2015).

The complexity involving the population of rural workers in Brazil requires attention to the complex geography of an almost continental country, which are situated in a condition of informal and precarious work, highlighted in the study by Rocha and collaborators, which shows the worker-farmer as a human workforce, the uniqueness of the rural environment, and the conditions of the work process that generate workload, suffering, illness, and precariousness (Rocha *et al.*, 2015). Reflecting that agriculture, even today, has the largest workforce in the world, with workers living and performing work in precarious conditions, whose routine requires diverse demands, sometimes dangerous and encouraging accidents and health problems related to work, the reality of Brazil is of a country where contemporary slave

labor processes are still a reality (Day et al., 2009; Kim, Park and Park, 2016; Barros *et al.*, 2020).

Work conditions that contribute to these problems can be represented by the handling of specific machines and vehicles, tools/instruments and animals; excessive weight being carried by the worker and other activities that generate musculoskeletal injuries; exposure to noise, vibrations, infectious agents, dust, chemicals, organic substances; common conditions in rural areas, such as working in bad weather, high temperatures, solar radiation, risk of stings and bites by poisonous animals; as well as the risk of slips, trips and falls, among others (Day et al., 2009; Kim, Park and Park, 2016; Barros *et al.*, 2020).

In comparison, Rocha and collaborators define the sociodemographic profile of the injured Brazilian population in their study that verifies the types of workloads resulting from agricultural work and shows that the prevalence of accidents occurs mostly in men, with an average age of 51 years, with incomplete elementary education, similar to the population profile of the present research (Rocha *et al.*, 2015). This characteristic is seen in the study by Day and collaborators, which suggests that in Brazil, the population on the margins of social vulnerability begins to work in agriculture at a young age, and continues to work until old age; indications of a still colonial country, where low education among the rural population remains prominent (Teixeira and Freitas, 2003; Day et al., 2009).

It was also identified that, of the workers interviewed who suffered accidents at work, among these were accidents with work implements, with falls being the most frequent type of accident

among farmers. Significant associations were observed between the following variables: the occurrence of burns involving pest control activities and the use of pesticides; the occurrence of injuries with work tools with the use of rakes, mowers and cutting tools, and wheelbarrows, the occurrence of falls with the use of shovels, towing, plowing and chainsaw use (Teixeira and Freitas 2003; Smolensky et al. 2019).

For Teixeira, Teixeira and Freitas (2003), despite Brazil being a country of enormous geographical proportions, the situation of rural workers is very similar in several Brazilian states. In the interior of São Paulo, between the years 2003 and 2004, there was a daily average of 53.2 occupational accidents, in which the majority occurred during the exercise of the profession. Most of these workers had accidents with their own daily work tools, registering cuts or injuries; the most affected parts of the body are the upper and lower limbs, keeping approximately 86% of these workers away from their work activities for up to a maximum of 1 month.

As a way of better accounting and control of underreporting, which represents a strong vector for the involvement and decrease in the real numbers of accidents at work, continuing education actions contribute to the awareness of professionals and improve the quality of notifications of accidents at work. Therefore, it is important to have a greater contribution of resources for the implementation of continuing education policies for the qualification of professionals working in the Brazilian Unified Public Health System, as an important tool for understanding occupational accidents in the country (Teixeira and Freitas 2003; Smolensky et al. 2019).

Conclusion

The organization of the production process is necessary, associated with an intervention based on preventive principles aimed directly at informal and formal workers, who multiply and cause health problems in Brazil. The separation of the functioning of the health system that could work with preventive actions as a way of reducing the compulsory notification of accidents at work is a limited and incomplete configuration of action.

A discussion that goes beyond economic indicators is needed, considering that the human and social costs of occupational accidents affect a large part of the economically active population in the country, but the majority of workers are not officially registered.

Visibly there is a deficit in attention to Workers' Health within the scope of the Federal Government and public policies that involves the continuing education of professionals who work in the process of compulsory notification in the area of health, with regard to the notification of serious accidents at work, either by incorrect or late completion of supporting documents.

Therefore, it is essential that there is representation of the various levels of care and attention in the Brazilian public health system - the levels of primary care in these work environments, which, according to the profile presented in this study, are mostly composed of agricultural workers and/or activities related to this field, predominantly male and with incomplete elementary education, permeating its total prevention centered on the worker and the work mode in which he/she is situated and possibly in the decentralization and scope of risks to occupational accidents, as well as acting as a model for the prevention of serious work accidents.

This study has limits with regard to the introduction of efficient public policy mechanisms for the care and prevention of the population outlined in the profile presented in this research, although it highlights and directs where the work should be carried out, for the result of effective work, in order to reduce the underreporting of health events that affect the working population.

In addition to indicating a curious of the increase in the number of occupational accidents, even with the creation of the network and centers that work to prevent accidents in the working population. It also focuses on improving the quality of filling out the documentation for notifying work-related injuries, promoting intersectorality as a preventive and effective action, developing important mechanisms for the reduction of these events and the protection of these workers.

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