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Profile of Declared Work Accidents at the Parakou Agency of the National Social Security Fund, 2015-2021, Benin

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Abstract

Introduction: Work accidents (WA) have consequences for both the individual and the company. The objective of this study is to study the profile of work accidents declared to the Parakou agency of the National Social Security Fund (CNSS) from 2015 to 2021. **Method:** This was a descriptive cross-sectional study with retrospective data collection. It concerned workers affiliated with the CNSS in Parakou, victims of declared WA whose file was available and exploitable. The sampling was exhaustive. Data was collected from registers and worker records. The variables studied were socio-demographic and related to the accident. They were analyzed using R version 4.1 software. **Results:** The annual incidence rate of WA varied from 5.8% in 2015 to 1.7% in 2021. The victims were 90.6% male. There were more subjects aged 28 to 37 years (37.1%). Workers and laborers were the most concerned. Fractures (22.9%) were the major lesions. At 38.5% they sat in the thoracic limbs and at 22.5% in the pelvic limbs. The majority (63.6%) of these accidents occurred in the workplace. The processing industry sector was mainly (52.1%) the place of accidents. **Conclusion:** The prevalence of WA declared to the agency of the National Social Security Fund of Parakou from 2015 to 2021 is decreasing. The most affected were young people. It is important to assess their socio-economic impacts.

Keywords

Accident at Work, Declared, Agency, CNSS, Parakou

1. Introduction

Current modes of production and commercial exchanges have given rise to new forms of work organization. The resulting work situations have favored occupational risk factors that were previously non-existent in the workplace, in particular occupational accidents. The Beninese social security code considers an accident at work, whatever the cause, the accident occurring to a worker: by the fact or on the occasion of work; during the journey from his residence to the place of work and vice versa or during the journey between the place of work and the place where he usually takes his meals and vice versa insofar as the journey has not been interrupted or diverted for personal or non-employment reasons; and during trips for which the costs are borne by the employer [1]. According to the International Labor Office (ILO, 2005), nearly 268 million work accidents occur each year [2]. Due to their frequency and seriousness, accidents at work constitute a real public health problem [3]. The International Labor Organization (ILO) estimated that these accidents cause more than 350,000 deaths worldwide every year. On the African continent alone, 45 million ATs occurred, causing at least 59,000 in 2014 [4]. In Senegal (2013), the cost of AT represented 4% of the gross domestic product every year [5]. The unavailability of a study on the characteristics of work accidents occurring in northern Benin motivated this study on the profile of work accidents declared to the Parakou agency of the National Social Security Fund from 2015 to 2021.

2. Methods

This was a descriptive historical cohort study. Data collection took place from February 2 to April 30, 2022. It concerned workers in the departments of Borgou and Alibori affiliated with the National Social Security Fund (CNSS) of the Parakou regional agency. The outcome sought was the occurrence of a work accident. To do this, we took into account the files of victims of work accidents (WA) declared from January 1, 2015 to December 31, 2021. This was an exhaustive sampling including the available and exploitable files of all workers affiliated with the CNSS Parakou agency. Data on accident cases were collected from AT declaration registers and worker files, using a tally sheet. The variables studied were socio-demographic (sex, age, seniority, professional category, department of location of the company), and the characteristics of work accidents. Data collection was digital with the KoBoToolbox platform and the KoboCollect application. The quantitative variables were described by their mean with standard deviation and those qualitative by the percentage. Data processing and analysis were performed using R version 4.1 software. The study received approval from the Ethics Committee of the Faculty of Medicine of the University of Parakou under the number REF: 0450/CLERB-UP/P/SP/R/SA.

3. Results

Of the 735 files, 733 were available and usable, *i.e.* 99.72%. The department of

Borgou had counted 558 (76.1%) and 175 (23.9%) for that of Alibori. The proportion of annual incidence of AT was 2.98% varying between 5.8% in 2015 and 1.7% in 2021 (see **Figure 1**). The victims were 90.6% male. The average age of the subjects was 36 ± 10 years. The youngest were 16 and the oldest were 67. Those under 18 made up 0.4% of the sample. There were more subjects aged 28 to 37 (37.1%) as well as those with less than 5 years of seniority in their professional activity (66.7%). Manual workers and laborers were the most concerned with respective proportions of 46.7% and 31.2% (**Table 1**). Collision (32.8%) and recklessness (21.3%) were the main cause mechanisms of occurrence. Fractures (22.9%) were the most frequent traumatic lesions. The lesions were most often found in the thoracic limbs (38.5%) particularly in the hand (25%) and in the pelvic limbs (22.5%) particularly in the foot (10.5%) (**Table 3**). The majority of accidents occurred in the workplace (63.6%) (**Table 2**). The transformation industry sector was mainly concerned (52.1%) followed by that of buildings and public works (19.8%) (**Table 2**).

4. Discussion

The data for the study was collected from the files of all clients of the CNSS Parakou agency from 2015 to 2021 and from the AT declaration register and victim files from this same period; which seems appropriate for this retrospective study.

Annual frequency of accidents: The average annual frequency of AT was 2.98%. Fayomi *et al.* in 1993 in Benin, obtained a frequency of 4% [6]. A study carried out in 2000 showed that work accidents declared in Benin evolved in Sawtooth around the annual frequency of 4.8% on average [7]. In Tunisia, the evolution of WA was down from 43.2% in 1995 to 33.3% in 2005 [8].

Socio-demographic characteristics of the victims: Young people between the ages of 28 and 37 represented 37.1% of the sample. Our results are also similar to those found by Diallo in Mali where the most affected age group was 25 to 34 years [9]. In Togo in 2018, Mikponhoué *et al.* [10], found that the age group of 25 to 39 years was more affected. Article 459 of the Beninese Individuals and Family Code stipulates that the age of majority is 18 years [11]. In our study, 0.4% of WA victims were minors (under 18). There are therefore minors who work in companies in northern Benin. Almost all (90.6%) of the victims were male. This result is in line with those of the work of Mikponhoué *et al.* 2018 [10] in Togo (89%), Hami *et al.* [12] in 2018 in Morocco (91.8%), Mihaja *et al.* [13] in 2020 in Madagascar (95.81%) and Maoua *et al.* [14] in 2016 in Tunisia (87.5%).

Characteristics of accidents: The secondary sector of activity (industry, buildings and public works) ranks first (52.1%, 19.7%) in terms of the occurrence of declared accidents. In 2018 in Senegal, in the construction and public works sector, 22.6% of employees had been victims of AT (Dia *et al.*) [5]. Workers and laborers were the most victims of work accidents with respectively 46.4% and 31.2% of the whole. In 1993, Fayomi *et al.* [6] had already noted a strong involvement of these two categories of workers in Benin in work.

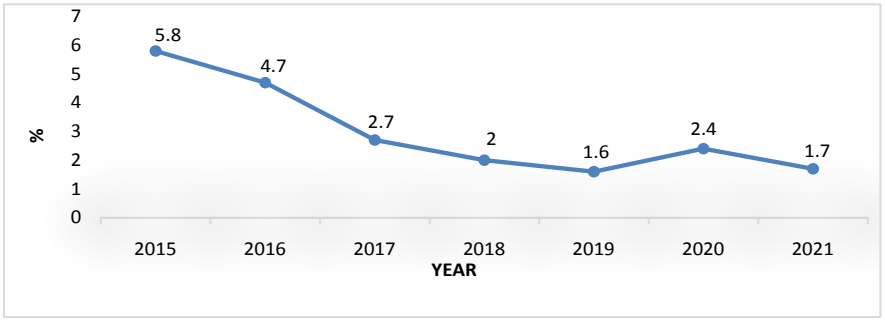

Figure 1. Evolution of the annual incidence of WA declared to the CNSS, Parakou agency from 2015 to 2021.

Table 1. Breakdown of reported victims of WA according to age, seniority and professional category, Parakou agency of the CNSS, 2015-2021 (n = 733).

	Number	Percentage
Ages (years)		
<18	3	0.4
18 - 27	136	18.6
28 - 37	272	37.1
38 - 47	137	18.7
48 - 57	101	13.8
58 - 67	13	1.8
Not specified	71	9.7
Seniority (years)		
<5	489	66.7
[5 - 10[	110	15
[10 - 15[	46	6.3
[15 - 20[	40	5.5
≥20	48	6.5
Professional category		
Workers	342	46.7
Maneuvers	229	31.2
Office workers	84	11.5
Not specified	29	4
Security agent	24	3.3
Pharmacy assistant, teacher, health worker	24	3.3

Table 2. Distribution of accident victims according to the place of occurrence, mechanism of accident and sector of activity, CNSS Parakou agency, 2015-2021 (n = 733).

	Number	Percentage
Type of TA		
Workplace accident	466	63.6
Accident on the way	258	35.2
Mission crash	9	1.2

Continued

Place of occurrence		
Industry	225	47.4
Handling	156	32.8
Maintenance	48	10.1
Guarding	7	1.5
Health training	10	2.1
Road	15	3.2
Residence	6	1.3
School	4	0.8
Food	3	0.6
Agricultural environment	1	0.2
Mechanism of accidents		
Collision	156	32.8
Imprudence	101	21.3
Misuse of equipment	92	19.4
Fall	65	13.7
Projectile	54	11.4
Heist	7	1.5
Sector of activity		
Processing industry	382	52.1
Building and public works	145	19.8
Commerce, hospitality and tourism	85	11.6
Bank and insurance	36	4.9
Care services	24	3.3
Other service activities	18	2.5
Education	10	1.4
Church and social communities	10	1.4
Transportation and communications	9	1.2
Organization and social structures	7	0.9
Security	7	0.9

Table 3. Breakdown of reported WA victims according to location and type of lesion, CNSS Parakou agency, 2015-2021 (n = 733).

	Number	Percentage
Site of lesions		
Hands	183	25.0
Pelvic limbs (feet excepted)	99	13.5
Head (excluding eyes)	95	13.0

Continued

Thoracic limbs (hands excepted)	88	12.0
Feet	77	10.5
Eyes	66	9.0
Multiple	28	3.8
Thorax	22	3.0
Abdomen	9	1.2
Neck	7	1.0
Unspecified	11	1.5
Others (Clavicle, Pelvis, Jaw, Hip)	48	6.5
Types of lesions		
Fracture	168	22.9
Wounds	155	21.1
Sprain	43	5.9
Contusion	41	5.6
Eye trauma	29	4.0
Burns	19	2.6
Cranio-encephalic trauma	18	2.5
Amputation	14	1.9
Concussion	11	1.5
Tooth avulsion	14	1.2
Osteo-ligament lesion	53	7.2

accidents (77%). From this observation, we can then say that there has been a regression of occupational accidents over the years in this country, as shown in Figure 1. In Burkina Faso (N'guessan *et al.* 2019) [15], workers and maneuvers were also the most victims (36.68%). Those with less than 5 years of practice represented 66.7% of the accident victims. Observations of Mikponhoué *et al.* [10] in Togo in 2018 (78.53%), Horwitz *et al.* 2005 [16] in Oregon in the USA (53.2%) agree with our observation. Parakou regional agency from 2015 to 2021 occurred in the workplace (63.8%). At the CNSS of Senegal (Dia *et al.* 2018) [5] and that of Togo (Atitché *et al.* 2017) [17], it was similar at 77.4% and 67.1% respectively. The lack of surveillance in the workplace and the lack of continuous training for workers would partly explain this. The WA occurring on the journeys was 35.2%. This reflects that the situation in Benin with regard to commuting accidents has therefore not changed since 2013. In Burkina Faso, the rate is higher (62%) (Sanon Lampo *et al.* 2019) [18]. This high rate of commuting accidents in Benin, as elsewhere in the sub-region, raises the issue of road safety, particularly in relation to the state of the roads and respect for the highway code. Machinery and hand tools were 19.0% and 17.2% the most common causes, respectively. The same observation was made by Diallo in Mali but at a higher

frequency (44.11%) [9]. The predominant lesions were fractures (22.9%) followed by wounds (21.1%). In the series by Rahmani *et al.* in 2013 [19] and Sanon Lompo *et al.* in 2019 [18] in Ouagadougou, invoices also came first in higher proportions (25.21% and 48.88%). According to the work of Halvani *et al.* in Iran in 2012 [20], wounds came first (55.9%). The hands and feet were the most affected (25% and 10.5%). These are the parts of the body most in contact with the rolling means and even with the work equipment.

The limits of the study are linked to the retrospective collection, hence the incomplete data (the number of workdays lost or the number of hours off work) and our inability to trace the history of all the information on the workers. However, it provides usable scientific information.

5. Conclusion

The average annual frequency of occupational accidents recorded at the regional agency of the National Social Security Fund of Parakou from 2015 to 2021 is decreasing but still high. Men are much more affected than women. The most concerned were young people and those who had less than five years of seniority in their profession. Recklessness was the main cause of accidents. The lesions are most frequently found at the extremities of the limbs. The secondary business sector is more at risk. It is important to assess their socio-economic impacts, and necessary concerted and adapted actions involving all the actors of health and safety at work.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] République du Bénin. Loi No. 98-019 portant code de sécurité sociale en République du Bénin du 21 mars 2003.
https://documentation-anbenin.org/s/textes-de-lois/item/846

[2] Bureau international du travail (BIT) Rapport IV, Cadre promotionnel pour la sécurité et la santé au travail, 93ème session 2005 Genève.

[3] Gerry, E. (2003) Le Programme de santé au travail au siège de l'OMS. *The Global Occupational Health Network*, **5**, 1.

[4] OIT (2014) Un monde sans accidents du travail mortels est possible.
https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_301800/lang--fr/index.htm

[5] Dia, S.A., Mohamed, A.S., Gaye, F.S., Ndoye, E.H.O., Fall, M.C.G., Soumah, M.M. and Ndiaye, M. (2018) Caractéristiques des accidents du travail et devenir des victimes: À propos de 133 cas déclarés auprès de la Caisse de Sécurité Sociale de Dakar (Sénégal). *Pan African Medical Journal*, **30**, Article 156.
https://doi.org/10.11604/pamj.2018.30.156.10517

[6] Fayomi, E.B. and Zohoun, T.H. (1993) Les accidents de trajets: Un enjeu socio-sanitaire au Bénin. *Médecine d'Afrique Noire*, **40**, 649-652.

[7] Ayélo, P. (2000) Tendance évolutive et prise en charge AT à la l'Office Béninois de Sécurité Sociale de Cotonou. Thèse de médecine, Université d'Abomey-Calavi, Bénin.

[8] Ben Laiba, M. (2022) Profil National de Santé et Sécurité au Travail en Tunisie. https://vdocuments.mx/profil-national-de-sante-et-securite-au-travail-en-adaptitadapt-indice-a-zwp-contentuploads2014.html

[9] Diallo, M. (1993) Accident du travail: Étude épidémiologique dans les entreprises industrielles du district de doctorate. Thesis, University of Bamako, Bamako.

[10] Mikponhoue, R., Adjobimey, M., Bongue, L., Alasane, T., Hinson, A.V. and Ayélo, P. (2018) Étude épidémiologique des accidents sur les lieux de travail dans une compagnie d'énergie électrique au Togo. *Journal de la Recherche Scientifique de l'Université de Lomé*, **20**, 369-375.

[11] République du Bénin. Loi No. 2002-07 portant Code des personnes et de la famille en République du Bénin. 205.

[12] Hami, H., Raougui, D., Azzaoui, F.Z., Fadli, M., Abdelrhani, M., Soulaymani, A. and Ahami, A. (2018) Les accidents du travail du BTP au Maroc. *Archives des Maladies Professionnelles et de l'Environnement*, **79**, 425. https://doi.org/10.1016/j.admp.2018.03.488

[13] Mihaja Ramanarivo, N. (2020) Les traumatismes oculaires par accident du travail dans deux hôpitaux d'Antananarivo. *Archives des Maladies Professionnelles et de l'Environnement*, **81**, 633. https://doi.org/10.1016/j.admp.2020.03.540

[14] Maoua, M., Aroui, H., Boughattas, W., Brahem, A., Guedri, S., Kalboussi, H., Chatti, S., Rejeb, K., Mlaouah, A.J., Bousarsar, I., Debbabi, F., El Maalel, O. and Mrizak, N. (2016) Accident du travail avec traumatisme grave du coude. Devenir professionnel des victimes. *Archives des Maladies Professionnelles et de l'Environnement*, **77**, 391. https://doi.org/10.1016/j.admp.2016.03.075

[15] N'guessan, L.M. (2019) Les accidents de travail au sein de l'usine d'égrenage de coton au Burkina-Faso. *RAMReS Sciences de la Santé*, **2**, 90-96.

[16] Horwitz, I. and McCall, B. (2005) The Impact of Shift Work on the Risk and Severity of Injuries for Hospital Employees: An Analysis Using Oregon Workers' Compensation Data. *Occupational Medicine*, **54**, 556-563. https://doi.org/10.1093/occmed/kqh093

[17] Atitche, K., Edorh, G. and Kouassi, Y.M. (2017) Profil épidémiologique des accidents du travail dans une cimenterie au Togo. *Journal de la Recherche Scientifique de l'Université de Lomé*, **19**, 443-451.

[18] Sanon Lompo, M.S., Owona Manga, J.L., Ayelo, P., Traore, S., Ouedraogo, A.F. and Traore, I. (2019) Aspects épidémiologiques et cliniques des accidents du travail avec incapacité permanente partielle: À propos de 221 cas colligés. *Science et Technique, Sciences de la Santé*, **42**, 9-20.

[19] Rahmani, A., Khadem, M., Madreseh, E., Aghaei, H.A., Raei, M. and Karchani, M. (2013) Descriptive Study of Occupational Accidents and their Causes among Electricity Distribution Company Workers at an Eight-Year Period in Iran. *Safety and Health at Work*, **4**, 160-165. https://doi.org/10.1016/j.shaw.2013.07.005

[20] Halvani, G., Jafari, N. and Mirmohammadi, S. (2012) A Survey on Occupational Accidents among Construction Industry Workers in Yazd City: Applying Time Series 2006-2011. *Journal of Occupational Health and Epidemiology*, **1**, 1-8. https://doi.org/10.18869/acadpub.johe.1.1.1