

# Early retirement of construction workers in South Africa: Case of occupation permanent disability

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## Abstract

The purpose of this study is to determine the types of accidents that lead to permanent disability of construction workers resulting in early retirement. The data was obtained from Federated Employer Mutual Assurance (FEM). The types of accidents were analysed from the decade of data from 2007 to 2016. The data was analysed using descriptive and inferential statistics. The analysis established that 7 670 accidents were experienced in the construction industry from 2007 to 2016, of which the major cause of accidents in the construction industry in South Africa was being struck by e.g. object while working. Furthermore, the highest average cost of accident was when a construction worker was electrocuted, the average cost was R214 767.00. The most fatal accidents was caused by motor vehicles. The study further established that there is a 10% chance of a construction worker to be permanently disabled and take early retirement or permanently disabled without taking early retirement when involved in any type of accident while at work. In conclusion construction workers using any work related vehicle, either being transported to site or using the vehicle on site, caution should be adhered to in order to prevent fatalities. The government of South Africa should ensure that strict measures are taken for drivers who do not observe the traffic rules on site and on the public roads. This will ensure the prevention of permanent disability, among the construction workers in South Africa. It is also imperative for construction workers to receive training on health and safety when they work in any construction project, this need to be emphasized on a daily on site by the construction health and safety practitioners. The authors recommends a further study on the type of injury and ill-health associated with the type of accident that force the construction worker to retire early.

**Keywords:** accidents, construction industry, permanent disability, pension.

## 1. Introduction

Construction industry is hazardous and dangerous. The hazard and dangerous conditions of the industry are experienced when workers manually handle heavy materials, and are exposed to malfunctioning and vibrating equipment. Furthermore, noise and dust pollution of the work environment and chemicals, exacerbates the dangerous and hazardous conditions on construction site, which might lead to accidents and ill health of the workers. Robroek, Schuring, Croezen, Statten, and Burdorf, (2013) argued that the work environment is important, as physical and psychosocial demands in certain industries can make it

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hard for workers to work with chronic diseases and ill-health. To buttress this observation, Brenner and Ahern (2000), found that over 677 000 working days were lost due to sickness absence, which were related to workers being absent from work as a result of work related injuries and sickness. Furthermore, they established that over 24 000 potential years of quality working lives were lost due to early retirement on health grounds.

The Health and Safety Executive (HSE, 2016) reported that in 2015, there were 43 fatal injuries among construction workers in Britain. The rate of fatal injury was 1.94 per 100,000 workers, compared to a five-year average of 2.04. In Hong Kong, the construction industry recorded 3 723 industrial accidents in 2015, 7.4 per cent up compared to 3 467 in 2014. Over the same period, the accident rate per 1 000 workers decreased by 6.5 per cent from 41.9 to 39.1. The construction industry recorded the highest number of fatalities and accident rate among all industry sectors in Hong Kong (Labour Department, 2016). The Bureau of Labor Statistics (BLS, 2016) in the US recorded 226 incidents based on construction transportation, 17 incidents of fires and explosion, 364 falls, trips and slips, 138 cases of workers exposed to harmful substances or environment and 159 cases, of workers being in contact with objects and equipment. It can be argued that these incidents have cost implication to the economy.

Waehrer, Dong, Miller, Haile, and Men, (2007), established that the total cost of fatal and non-fatal injuries in the construction industry in the US was estimated at \$11.5 billion in 2002, a disproportionately high 15% of the costs for all industries. The average cost per case of fatal or non-fatal injury was \$27,000 in construction, almost double the per-case cost of \$15,000 for all industries in 2002. In spite of the high economic cost of fatal and non-fatal workplace injuries, there is dearth of research in the type of accident that is prevalent to permanent disability of construction workers, which will push the construction workers to receive pension, therefore leading to early retirement.

It is imperative to prevent work disability pension because of the human and societal costs. Prevention of early retirement as a result of disability is important, because the number of construction workers at risk for early retirement on health grounds is likely to rise in the near future as a result of the ageing population and work force (de Zwart, Frings-Dresen, and van Duivenbooden 1999). A study conducted by Brenner and Ahern (2000) established that the mean annual rate of early retirement of construction workers in Ireland on health grounds was 5.3/1000 workers.

Disability pension is an important means to leave working life into early retirement. In a European study of 4923 older persons, physical and psychosocial demands led to an increased exit from paid employment due to work disability (Robroek, Schuring, Croezen, Stattin, and Burdorf, 2013). Brenner and Ahern (2000) found that in the construction industry in Ireland, cardiovascular disease and musculoskeletal disorders each accounted for nearly one third of the conditions leading to permanent disability on the grounds of which early retirement was granted. Boschman, van der Molen, Sluiter and Frings-Dresen, (2012) indicated that a high prevalence of musculoskeletal disorders (MSD) among construction workers in two different construction-related occupations, bricklayers and supervisors was evident in Netherlands. Chau et al., (2004) also established that the causes of occupational injuries depended on the type of work, and that preventive measures against injuries from moving objects must be taken, more especially for masons, plumbers and electricians. Preventive measures against injuries from construction machinery and devices should be taken for carpenters, roofers, and civil-engineering workers. In Poland Szubert, and Sobala, (2005) suggested that the risk factors for early retirement were the conditions of work i.e. the piecework system, heavy lifting at work, shortage of leisure time,

disability, increased rate of sickness absence, and alcohol abuse. A study in Sweden by Falkstedt, et al., (2014), found that women had higher rate of disability pension than men, regardless of diagnosis, whereas men had a steeper increase in disability pension with decrease in educational level. Claessen, Arndt, Drath, and Brenner, (2009), established that moderate overweight among construction workers is not associated with occupational disability. But obesity increases the risk of work disability due to osteoarthritis and cardiovascular disease.

Järholm, Stattin, Robroek, Janlert, Karlsson, and Burdorf, (2014), indicated that the work environment was a predictor for disability pension among construction workers with those in physically heavy jobs having the highest burden of disability. They found that risk varied considerably among blue-collar workers. For example, rock workers had double the risk of disability pension compared to electricians. However, Arndt (2005) found that the general work force appear to experience a higher risk of disability than the blue collar workers in general. Furthermore, most working years lost due to disability pensions were found among men over 50 years, mainly as a result of musculoskeletal and cardiovascular diseases. Arndt, (2005), affirms the sentiment of Järholm et al., (2014). Furthermore, it is important to note that, Arndt (2005), calls for further efforts to sustain the health of construction workers in there working life. Based on this discussion and a dearth of research in South Africa on early retirement as a result of permanent disability in the construction industry, this study seeks to fill this gap. In order to fill this gap a number of specific research questions have been stated.

- What type of accident is the major cause of permanent disability of construction workers in South Africa?
- What are the major causes of fatality of construction workers in South Africa?
- What is the probability of an accident leading a construction worker to permanent disability and early retirement or permanent disability without early retirement?

## **1.1 Type of accidents**

According to Agumba and Haupt, (2014) they established that, the frequently experienced accident and injury among small and medium construction workers was, workers being cut while working, struck by falling object and workers falling from height. The injury mostly experienced were wounds. Hinze and McGlothlin (2002) reported that slips, trips and falls accounted for 15% to 20% of all workers' compensation cases; with older workers having higher percentage of falls compared to younger workers.

The collapse of tower cranes leads to accidents. When there is failure of any part of the crane or the load carry systems they can cause serious accidents, with both crane operators, site personnel and general public (Skinner, Watson, Dunklry, and Blackmore, 2006). Occupational Safety and Health Administration (2005) posited that significant and serious injuries of fatality may occur if cranes are not inspected before use and if they are not used properly. Often, these injuries occur when a worker is struck by an overhead load or caught within the crane's swing radius. It therefore implies that, crane accidents are associated with erection or assembling, usage, dismantling and supervision or inspection and are major treat to life of workers on any building site.

Mitra, Cameron, and Gabble (2007) reported that ladder falls or accidents increased significantly in 2001-2005 in Australia, which gave a significant rise in serious injury from ladder falls. This was

evident in their investigation of 4553 site workers presented to Victorian Hospital with injuries from ladder fall. Of these, 160 patients were classified as major trauma case. A fall from height, more than one metre, was the most common mechanism of injury accounting for 59% of the total. It was also established that about 20% of ladder-related falls greater than one metre and major trauma cases occurred while people are working on site. It can further be stated that, despite the knowledge of the dangers of falls from ladders, there has been a significant increase in the number of casualties from ladder falls which resulted into broken limb, fracture and bruises on building sites.

In order to overcome some of the causes of injuries and illness among construction workers Chau et al., (2004), suggested that training of young workers when using hand-tools was necessary. Furthermore, the occupational physician could encourage overweight workers to reduce their weight, the workers with hearing disorders or sleep disorders to consult a specialist to solve their problems, and all the workers to practise regularly sporting activities, as they could prevent injuries due to the handling and carrying of objects (Chau et al., 2004).

## **1.2 Disability and Disability pension**

A disability, unlike an impairment, represents the socioeconomic loss that an individual sustains as a result of an injury, illness, or condition. If a worker is injured and as a result cannot return to work, the disability is deemed a very serious one. However, another worker, with precisely the same injury and the same degree of impairment, may be able to return to work quickly with little or no impact on his or her earnings. The injury to that worker would have resulted in a much lower degree of disability (Barth, 2003/2004). Therefore, a permanent impairment need not, but is likely to, result in disability, and the same degree of impairment can result in a vastly different degree of disability for different individuals (Barth, 2003/2004).

Disability pension is a social security benefit given to working age people who have limitations in their working capacity due to occupation disability obtained from accidents or diseases. In Sweden for example the Social Insurance Office records all cases regarding disability pension. In the past ten years in Sweden, the annual inflow in the program has decreased mainly due to tightened eligibility rules (Järvholm et al., 2014).

## **1.3 Temporary disability**

Temporary disability is when a worker is unable to work or cannot do all the work because of an injury or disease, however it is expected that the person will get better. In this case workers can claim for compensation. However, the worker should be put off duty by a medical practitioner for more than three days. The worker is compensated for the duration of time that he or she was unable to work including the first three days (Western Cape Government, 2014, Compensation for Occupational Injuries and Diseases Act, (COIDA, 1997). Barth, (2003/2004) indicated that in the USA, states pay permanent partial disability benefits to workers because they suffer an impairment, a disability, or some combination of the two. Each state's approach to compensating permanent partial disabilities differs, but for convenience the states can use an approach based on impairment, loss of earning capacity, loss of wages, or one that combines features of the other approaches.

In South Africa if a worker is not able to work because of temporary disability, the worker get paid 75% (three-quarters) of the normal monthly or weekly wage. If the worker can only do some of the work, the work will still get paid by your employer. The compensation fund will pay the worker 75% (three-quarters) of the difference between what you got paid and what you would have been paid before the injury. All medical expenses are also paid if the medical accounts are submitted to the Commissioner (Western Cape Government, 2014, COIDA, 1997). A worker can claim compensation for temporary disability for one year. This can be extended to two years, there after the Commissioner may decide that the condition is permanent and grant compensation on the basis of permanent disability (Western Cape Government, 2014).

A review by Mitra, (2009) on temporary and partial disability benefit programs in, Australia, Germany, Great Britain, Japan, the Netherlands, Norway, South Africa, Sweden and the US, posited that in several countries, a focus on time-limited benefits and the design of specific programs for young adults are important recent developments. Time-limited benefits appear to offer some potential in terms of improved return to work and reduced program costs.

#### **1.4 Permanent disability**

In South Africa according to the Amended Compensation for Occupational Injuries and Diseases Act, (COIDA, 1997), permanent disability is an injury or illness that the worker will never recover from, for example, loss of hands, an eye etc. The seriousness of the disability determines whether you will never be able to work again or whether the work will be more difficult to undertake (Western Cape Government, 2014). Disabilities are rated from 100% to 1% depending on the seriousness. For example, a 100% would be the loss of both your hands or the loss of your sight. The loss of one small toe is a 1% disability as indicated in the Amended Compensation for Occupational Injuries and Diseases Act, (1997). However, it is imperative that a doctor write a medical report in relation to the disability. The Commissioner and various other doctors will then decide how serious the disability is (Western Cape Government, 2014). Barth, (2003/2004) concurs with the importance of the disability evaluation of the worker by a medical professional. However the assessment should also take some account of the person's occupation and employment history, education and training, and probably other demographic and labour market variables (Barth, 2003/2004).

If the disability is more than 30% disability, the worker get paid a monthly pension. The amount of pension depends on what your salary was and on the seriousness of the disability. If you have a 100% disability the worker get paid 75% (three-quarters) of the wages. If the disability is less serious, the Commissioner calculates the monthly payment. If the disability is less than a 30% disability, the worker is paid a lump sum. The lump sum payment is a once-off payment. However, the monthly payment will be paid for the rest of the worker's life (Western Cape Government, 2014, COIDA, 1997).

#### **1.5 Death or fatal**

In south Africa according to the Amended Compensation for Occupational Injuries and Diseases Act, (COIDA, 1997), if the family member that earns money to support the family (breadwinner) was killed due to an occupational injury or disease, the family can claim from the compensation fund. The amount of compensation that the family members will be paid depends on your relationship to the person who died. The total amount paid to the family cannot be more than the pension the dead worker would have

received. The worker's spouse and children under the age of 18 (including illegitimate, adopted and step-children) are entitled for the compensation.

## **1.6 Research methodology**

The study consisted of a literature review and an analysis of secondary data sourced from Federated Employer's Mutual Assurance Company (FEM). This is the only private workman's compensation insurer registered by the Department of Labour to cater for construction workers accidents. The data presented was on the types of accidents collected during the period 2007 to 2016. This data was comprehensive for analysis and is represented in Table 1. It can be indicated that this information is a record of the actual data recorded by FEM. Hence, the information is reliable and indicative of a high degree of ecological validity (Gill and Johnson, 2010). Due to the nature of the study, ethical approval for the study was not necessary given that no particular party would be harmed by the disclosure of the findings of the study. No data would be traceable to a particular construction enterprise or its personnel. The data was represented using descriptive and inferential statistics, that is, percentages and disjoint and independent probability respectively. Disjoint probability was used to determine if an accident led a construction worker to be permanently disabled, taking early retirement or construction worker was permanently disabled without taking early retirement. On the other hand independent probability was computed to determine if a construction worker was permanently disabled, with early retirement and construction worker was disabled without taking early retirement.

## **1.7 Results and discussion**

The data in Table 1, shows that the construction industry is dangerous and hazardous based on the 7 670 accidents that have been experienced from 2007 to 2016. This result is supported by the data obtained from the, Bureau of Labour Statistics in the US in 2017 and from Labour Department (2016) in Hong Kong. These accident still occur despite the promulgation of the construction regulation in health and safety in 2014. Further, the major type of accident that was experienced in the last decade in the South African construction industry was, workers being struck by e.g. an object. In that period a total of 2585 cases were reported out of 7 670 cases. On average in ten years this result translates to approximately 258.5 cases per year. Hence in the US, the BLS (2016) reported that 159 workers were in contact with equipment and objects in 2015. The US report, however did not support the study in South Africa. It can be suggested that more construction workers were injured in South Africa compared to the US per year.

The data in Table 1, further indicates that the major type of accident that engender construction workers to be permanently disabled, was workers being struck by e.g. an object while at work. Of the 806 permanent disablement of construction workers reported in this period, being struck by e.g., an object, contributed 263 cases. Of which two workers were forced to take early retirement as a result of the permanent disability, whereas 261 workers did not take early retirement or receive their pension.

Furthermore, the type of accident that caused fatality among the construction workers in South Africa was motor vehicle accidents. Of the 67 fatal accidents experienced in this period nearly half i.e. 33 of the fatalities were caused by motor vehicle accidents. The Bureau of Labor Statistics (2016) in the US recorded 226 incidents based on construction transportation. However, the report did not suggest if the incidents were fatal or non-fatal. Furthermore, HSE (2016) in Britain indicated that the industry

experienced 43 fatal incidents. The HSE report as the case with the BLS (2016) did not separate the type of accident that caused the fatality. However, to buttress the statistics in South Africa, Occupational Safety and Health Administration (2005) posited that significant and serious injuries of fatality may occur if cranes are not inspected before use and if they are not used properly.

Table 1 further, indicates that permanent disabilities not resulting in pension were 796, this suggests that construction workers could have lost an eye, a leg etc., as indicated in Table 1, whereas permanent disabilities resulting in pension were 10. The type of accident that led construction workers to take early retirement was motor vehicle accident, followed by struck by an object. In order for the construction worker to be accorded early retirement they could have lost total eyesight, being totally paralysed, etc. The results in Table 1 connotes that the ratio of construction workers taking early retirement as a result of an accident was 1 out of 767 accidents taking place. Whereas the ratio of an accident not driving a construction worker to early retirement but the construction worker being permanently disabled was 1 out of 9.64 accidents. However, it is interesting to note that statistically analysing the probability of either a worker being permanently disabled and receiving early retirement or permanently disabled without receiving early retirement, using disjoint probability was 0.10 or 10% chance of the occurrence of these situation.

The lost days that could have generated economic gains to the construction industry and South Africa was 33 636 days. This could be translated to approximately 92.15 years. The study of Brenner and Ahern (2000) supports the current study in South Africa. They found that 677 000 working days were lost due to sickness absence related to workers occupational injuries and illness. Furthermore, they found that over 24 000 potential years of working lives were lost due to early retirement on health grounds. In regard to this statistics it is imperative that the construction industry stakeholders in South Africa should emphasize the importance of construction Health and safety in their projects.

It is important to note that the number of accidents associated with electrocution were 48 compared to 2585 of accidents associated with struck by e.g. an object etc. The result of data suggest that the total average cost per type of accident was R42 816.00 from 2007 to 2016. However, on average the cost of accident associated with electrocution or being in contact with electricity was the highest at R214 767.00. It can be inferred that on average the cost of electrocution was 11 times higher, compared to the cost of being struck by an object despite the fact that being struck by an object occurred approximately 54 times more than a worker being in contact with electricity.

**Table 1: Accident data 2007-2016**

Cause	Number of accidents	Accidents percentage	Fatal accidents	Lost days	Permanent disabilities not resulting in pension	Permanent disabilities resulting in pension	Average cost per accident (Rand ZAR)	Ranking using number of accidents
Struck by	2585	33.70	9	8572	261	2	19397	1
Striking against	1130	14.73	0	3189	136	0	11971	2

Slip or over-exertion	1007	13.13	1	3298	40	1	18941	3
Fall on to different levels	899	11.72	4	7540	107	1	36566	4
Motor vehicle accident	833	10.86	33	4541	79	4	66424	5
Caught in, on, between	535	6.98	4	3150	89	1	26206	6
Fall on to same level	270	3.52	0	1543	25	0	22453	7
Accident type (Not Elsewhere Classified (N.E.C)) e.g.	139	1.81	6	363	10	1	43010	8
Contact with extreme temperature	117	1.53	4	300	34	0	35973	9
Inhalation absorption, ingestion	105	1.37	1	195	1	0	16190	10
Contact with electric current	48	0.68	5	937	14	0	214767	11
Awaiting information	1	0.01	0	0	0	0	26096	12
Unclassified not sufficient Data	1	0.01	0	8	0	0	18614	13
Total	7670	100	67	33636	796	10	42816	

Source: FEM data 2017

## 2. Conclusion and recommendations

In conclusion, the major type of accident in the construction industry in South Africa in the last decade i.e. from 2007 – 2016 was, workers being struck by e.g. an object while working. Furthermore, being struck by e.g. an object was a major type of accident that led construction workers to be permanently disabled. The study further indicate that there is a 10% chance of construction workers to be permanently disabled and take early retirement or permanently disabled without taking early retirement when involved in an accident while at work. It is therefore recommended that construction workers receive training on health and safety when they work in any project. They should be trained on how to identify hazardous objects. This need to be emphasized on a daily basis on site by the construction health and safety officer, as a result of the number of accidents that have been reported in the last decade by FEM. This will ensure that the workers entrench a health and safety culture in all the construction activities they will be doing and hence avert accidents.



In relation to fatality occurrence, motor vehicle accident was the major cause. Furthermore, construction employees who were involved in motor vehicle accidents were likely to go for early retirement as a result of the accident. It can be stated that when construction workers are using any work related vehicle, either being transported to site or using the vehicle on site, caution should be adhered to in order to prevent accidents. The government of South Africa should ensure that strict measures are taken for drivers who do not observe the traffic rules on site and on the public roads. The vehicle should be roadworthy and be driven by a competent driver. This will ensure the prevention of permanent disability and pre-mature retirement, among the construction workers in South Africa as a result of motor vehicle accidents.

Recommendation for future study is to evaluate the type of injuries and diseases that is occupational among construction workers that, lead to permanent disability but not early retirement and the type of permanent disabilities that lead construction employees to early retirement.

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