A quantitative trend investigation of absenteeism within a selected chemical operational unit

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ABSTRACT

Workplace absence, or otherwise known as absenteeism, is the failure of an employee to report for a scheduled work arrangement. Absenteeism is a serious problem on a global scale that result in reduced efficiency, financial losses and affect the work-life balance of fellow employees. Absenteeism management is a complicated task that requires clear rules, policies and sufficient support focus to affect a positive change in absence behaviour. This study investigated absenteeism and the management thereof. As a major consideration, the management of absenteeism provided the direction for the research objectives. The management of absenteeism includes the identification of focus areas, and as a result, the objectives of investigation revolved around identifying absenteeism trends through the analysis of empirical attendance data. The population was used in the data analysis and no sampling was drawn. The study investigated two absenteeism influences classified as personal traits and organisational characteristics. A quantitative research design was used. The findings confirm that absenteeism trends are linked to both personal traits and organisational characteristics. The findings also confirmed the Pareto principle in absence behaviour; a small number of individuals contribute largely to the overall absence duration. The individual traits that were linked to absence trends based on absence frequency and duration included age, seasonality and first day first of absence. The organisational characteristics that were linked to absence trends based on absence frequency, and duration included role category (organisational responsibility), years of service absence type.

Keywords: absenteeism, trends, investigation, absence behaviour, individual traits, organisational characteristics.

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1.1 INTRODUCTION

The primary focus of the investigation is about absenteeism and absence management within the operations sections of a chemical manufacturing organisation situated in Sasolburg in the Free State province of South Africa. This chapter briefly defines the concept of absenteeism and the impact on the organisation under investigation.

Absenteeism, in the simplest of explanation, can be defined as any unplanned absence from duty or obligation without good reason. Therefore, employee absenteeism can include any form of absence that is unplanned and prevents an employee from performing his/her work obligations. This includes unplanned sick leave, coming late for work, taking longer than contracted lunch and tea breaks and performing personal tasks during working hours amongst other things (Kocakülâh *et al.*, 2018:116). Absenteeism is a huge managerial problem that managers have to handle daily and it affect production efficiency, employee motivation and morale and can result in financial losses if not dealt with it can spread and result in disciplinary problem (Karimbil, 2019).

The organisation under investigation is a large chemical manufacturing organisation that have three distinct operations sections in the Sasolburg region and produce various chemicals to local and international customers.

1.2 PROBLEM STATEMENT

Business managers within a chemical operation unit have to deal with non-attendance of employees on a day to day basis. This results in the frequent implementation of short notice solutions (firefighting) that affects business results and the work-life balance of fellow employees (Godøy & Dale-Olsen, 2018:190; Kocakülâh *et al.*, 2016a:91). The figure below indicates the historical absenteeism rate (sum of absent hrs per month

divided by the sum of monthly hours worked) against the target set by the top management of the organisation.

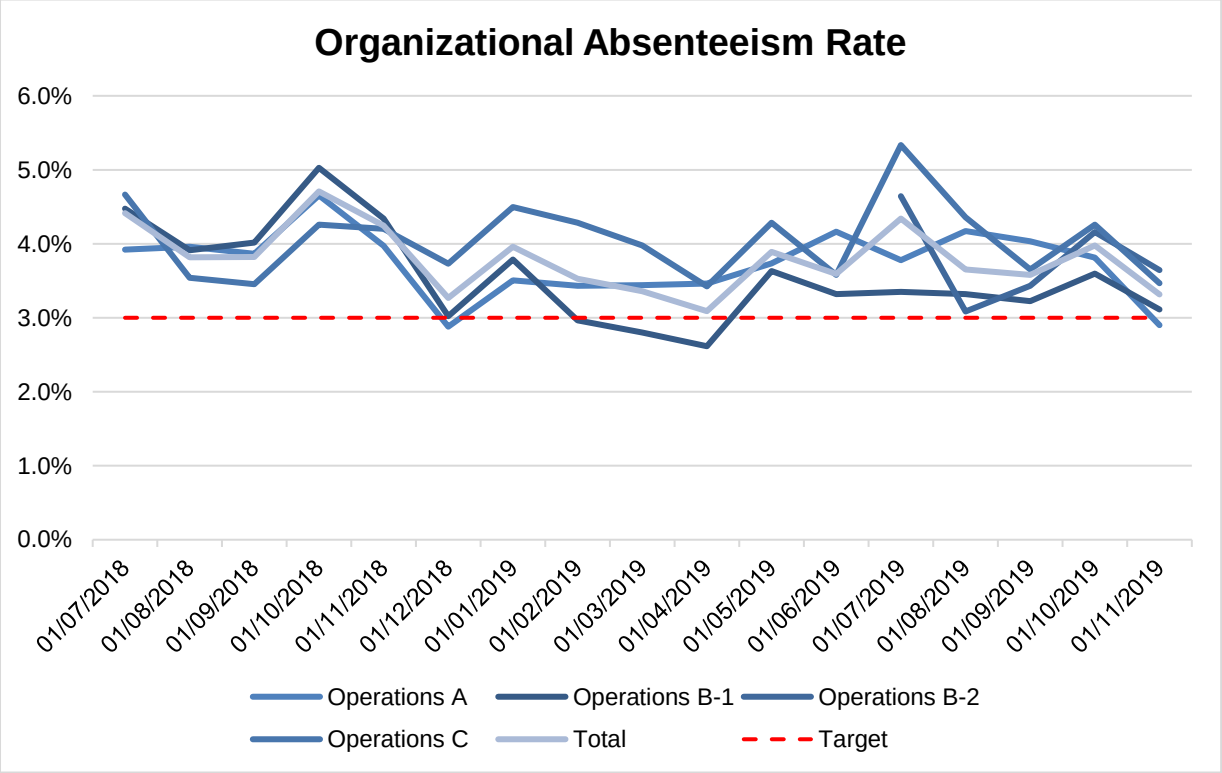


Figure 1-1: Historical absenteeism rate at the organisation

It becomes clear from the above that absenteeism management is a real concern within the operational unit of the organisation under investigation with actual absenteeism rates exceeding organisational targets regularly. Managers within the organisation rely on attendance reports compiled by the HR department to determine where to intervene with individuals with high sick leave utilisation. To tackle the absenteeism dilemma, managers need to be in a position where they understand what factors could contribute to employee absenteeism based on identifiable employee characteristics. Uncontrolled and high sick leave utilisation not only impacts the organisation financially (overtime to cover the sick employee) but also affect other employees' work-life balance. This problem the study aimed to address could have a material impact on the operational stability, profitability and work-life balance of other employees. Ultimately the desired result would be evident through a decrease in employee absenteeism after recommendations were implemented.

1.3 RESEARCH QUESTIONS

Various questions can be addressed through an investigation into absenteeism, but for this research, the primary research question was:

- What absenteeism trends exist for unplanned absences that can be utilised to assist the organisation in the management of absenteeism?

The secondary research questions were:

- To what extent is absenteeism correlated to personal or individual traits when considering both absence frequency and duration?
- To what extent is absenteeism correlated to organisational characteristics considering both absence frequency and duration?
- Does absenteeism follow the Pareto principle: what presentative of absentees contribute to the majority of unplanned absences?

1.3.1 The expected contribution of the study

There are multiple sources and studies that all confirm that absenteeism is impacting organisations on various levels. If it is not managed effectively, it can and could result in significant financial losses. Seeing as absenteeism targets at the organisation was not met consistently, it can be argued that absenteeism management was not effective in reducing employee absenteeism. Absenteeism is not only a global dilemma but was also affecting the South African economy. There are also various different approaches on how best to manage absenteeism through all the other industries across the world. South African organisations are bound by law to offer paid sick leave, and therefore, the risk of higher absenteeism rates also increases.

With the enormity of the absenteeism dilemma and all the research and information available in the field of absenteeism, it can be expected to have determined a solution to the absenteeism dilemma. However, this is not the case. Therefore, this study was focused on determining trends in absenteeism and determine whether correlations between absenteeism and biographical and organisational data existed that could assist in improved management of absenteeism/workplace absences.

1.3.2 Research objectives

The investigation included both primary and secondary research objective, as stated below:

1.3.3 Primary objective

The primary objective of this investigation was to investigate absenteeism through the finding of absenteeism patterns that will assist the organisation in the management of high absenteeism rates.

1.3.4 Secondary objectives

The first secondary objective of this investigation was to determine if correlations exist between absenteeism and biographical traits (independent of the organisation) and included data such as age, gender, season, month and day of absence by considering both absence frequency and duration.

The next secondary objective of this investigation was to determine if correlations exist between absenteeism and organisational characteristics (directly related of the organisation) and included data such as employee group, organisational unit, role category, absence type and years of service considering both absence frequency and duration

The last secondary objective was to compare absenteeism based on absence behaviour of individuals (absence utilisation) in an attempt to determine if organisational absenteeism follows the Pareto principle: the majority of absence being as a result of a small number the absentees.

1.4 RESEARCH DESIGN

A cross-sectional study approach is a “snapshot” in a single point in time. This investigation was aimed to establish variation between different cases to examine if there is any association or patterns between the different variables as per the definition of a cross-sectional study (Bryman *et al.*, 2014:105 - 108; Trochim & Donnelly, 2007:6). The investigation followed a cross-sectional research design through a quantitative trend investigation of absenteeism data and biographical information of the population.

1.5 RESEARCH METHOD

This research, related to the specific objectives stated above, was conducted in two phases: firstly, a literature review followed by an empirical investigation. Chapter three provides details about the research methodology that was followed, and therefore the following sections will provide and a brief overview of the stated topics.

1.5.1 Literature review

The first phase of the research method was to conduct a comprehensive literature review about the research topic of absenteeism to provide a holistic overview of the complexities around absenteeism and the management thereof. The literature review defines absenteeism and provides a model thereof that includes the individual, social phycological and economic approaches to absenteeism. The literature review further elaborates on absence types, classification and causes thereof before providing details about absenteeism measurements, management and significance of technological advancement with the field. The last section of the literature review connects the literature review to the investigation that was conducted. The sources that were utilised to conduct to literature review included:

- approved journals,
- articles,
- internet search engines,
- previous dissertations and theses and
- textbooks to gather the required information.

1.5.2 Empirical investigation

The second phase of the research method involved an empirical investigation into absenteeism utilising existing organisational data (attendance and HR reports) and applying statistical and analytical methods to obtain results about the research objectives in the form of descriptive research.

1.5.2.1 Population, sampling and data collection

The population of this research was specific operations divisions employees (individuals) that are all involved in the production of chemicals within the organisation where the

investigation was completed. Further details on the population are provided in chapter three. Due to the nature of the data acquisition, there was no requirement for the development of, and measurement tool and data collection involved obtaining multiple attendances and HR report to compile into a single data set. The accessibility to all of the required data (whole population) resulted in the selection of a census sample or the entire population that comprised of 2,048 individuals.

1.5.3 Data preparation and desensitization

The data from different attendance and HR reports were combined into a new single data set with all the required data to conduct a comprehensive analysis into absenteeism. Details of data preparation and desensitization are discussed in chapter three.

1.5.4 Statistical analysis and reporting

The statistical analysis was conducted by the Statistical Consultation Services of the North-West University, Potchefstroom campus. Frequency distributions were utilised to evaluate data and were presented in the figures and data tables. The mean values were calculated to measure and interpret the central tendency, and standard deviations indicated the distribution of data. T-tests and ANOVAs were utilised to evaluate statistical differences of the means of the two or more groups. Further details of data analysis and interpretation are discussed in chapter three.

1.5.5 Ethical considerations

During the investigation, there was no direct contact with the respondents seeing as data analysis was conducted on existing data in the form of attendance and HR reports. Desensitizing of the data was conducted to ensure no data can be utilised to identify respondents of the study. Employee numbers were replaced by randomized respondent numbers that are only be known to the researcher.

The Scientific Committee approved the study, whereafter the Economic and Management Sciences Research Ethics Committee (EMS-REC) issued a formal ethics number *NWU-00893-20-A4* (see Annexure B). Additional approval to use the data was obtained from the organisation’s authorized HR representatives.

1.5.6 Limitations of the investigation

Limitations are restriction or constraints of the research and are beneficial for future research that may follow on this investigation to know what the limitations were. The limitations of this research are listed below:

- The data set for this investigation limited the research to what data was available on organisational reports and database. They could not be extended to acquire additional data (directly from the individuals in the population) due to research time restrictions.
- The national lockdown as a result of the COVID-19 pandemic limited accessibility to individuals, and therefore, the investigation was conducted in a non-contact manner to ensure compliance with national COVID-19 requirements.
- The impact of the implemented COVID-19 lockdown on unplanned absences behaviour was anticipated, and therefore, the investigation period was limited to pre-lockdown.
- The investigation was limited to specific regional operations divisions within a chemical manufacturing organisation due to the manageability of the size of the investigation and accessibility to data, and therefore the findings are not generalizable to the rest of the organisation.
- Employee turnover and new appointments were not considered in the analysis of the data and were analysed as if all individuals were employed for the full duration of the investigation.

1.6 CHAPTER DIVISION

The chapters of this mini-dissertation are presented as follows:

Chapter 1: **Problem statement, objectives and method**

This chapter focused on the overview and background of the investigation and presented the problem statement, objectives and limitations of the research investigation. The chapter consists of an introduction, problem statement, research question, research objectives, research design and research method sections.

Chapter 2: **Literature review**

This chapter focused on the review of the literature to provide a holistic view of absenteeism and the management thereof. The chapter consists of an introduction, absenteeism, models of absenteeism, absence types, classification of absenteeism, causes of absenteeism, absenteeism measurement, absenteeism management, technological support and connecting the literature to the investigation sections.

Chapter 3: **Research methodology**

This chapter focused on the research methodology that was utilised in the execution of the investigation. The chapter consists of an introduction, research design, population and sampling, data collection, data preparation and desensitization, data coding, analysis software and data analysis sections.

Chapter 4: **Data analysis, results and discussion**

This chapter focused on the data analysis and interpretation of the results. The chapter consists of an introduction, statistical analysis, frequency analysis, independent t-test and ANOVA's, mixed methods of data analysis, the results and summary sections.

Chapter 5: **Conclusion and recommendation**

This chapter focused on the conclusion of the investigation, providing future research recommendations and making managerial recommendations to the organisation. The chapter consists of an introduction, conclusions, recommendations, achievement of study objectives and summary sections.

CHAPTER 2 LITERATURE REVIEW

2.1 INTRODUCTION

“I’m calling in sick because I have an eye problem…. I can’t see myself coming into work today.” – Absenteeism humour

Work attendance or the lack thereof is a significant concern of many organisations all around the world. It is disruptive to operations and costly to employers, and therefore it needs to be managed properly.

Management of employee absenteeism is a day to day reality for business managers in basically every industry across the world. There have been various studies and research that have focused on different aspects of absenteeism. Recent studies included the reasons for absenteeism in a manufacturing company in India (Chowdhury, 2016:335), positive effects of workforce diversity on absenteeism in the Australian manufacturing sector (D'Netto *et al.*, 2014:1243), how absenteeism affected a company’s financial performance in the USA (Kocakülâh *et al.*, 2016a:116-117) and so the list can go on with various other studies all around the world (Bennedsen *et al.*, 2018; Frick *et al.*, 2018; Gottfried & Hutt, 2019; Hassink, 2018; Kocakülâh *et al.*, 2016a; McHugh *et al.*, 2019). It is therefore clear that employee absenteeism is an international dilemma that is still relevant today and therefore is also applicable to the South African businesses.

The result of high levels of absenteeism within an organisation leads to an increase in the organisation’s costs and therefore also a decrease in the profitability of the organisation (Caine, 2015; Chowdhury, 2016:333; Kocakülâh *et al.*, 2018:129-130; Kocakülâh *et al.*, 2016b:91). According to Crous (2015:30), Occupational Care South Africa (OCSA) and Statistics South Africa released statistics late in 2014 that revealed that the South African economy is losing R16 billion a year due to absenteeism. This figure relates to an approximation of 15% of employees being absent from work on any given day. It is for this reason that organisations need to monitor employee absenteeism and find workable solutions to improve employee work attendance.

Employee absenteeism is in most cases seen as only harming an organisation, and therefore the ideal would be to drive down the absenteeism rate to zero. Even if this was remotely possible, other considerations need to be identified (Ahn & Yelowitz, 2016:10):

Firstly, employees that come to work while being ill have the potential of infecting other employees and ultimately resulting in more employees falling ill and booking off sick. Secondly, an ill worker will not be as productive as a healthy one. It is therefore important to note that the focus of organisations must be to manage absenteeism (reduce, not eliminate).

2.2 ABSENTEEISM

Absenteeism can be defined as the habitual pattern of absence from a duty or obligation without good reason. Generally, absenteeism is accepted as unplanned absences. Therefore, employee absenteeism can include any form of absence that is unplanned and prevents an employee from performing his/her work obligations. This includes unplanned sick leave, coming late for work, taking longer than contracted lunch and tea breaks and performing personal tasks during working hours amongst other things (Kocakülâh *et al.*, 2018:116).

According to UKEssays (2018), workplace absenteeism can be defined as reoccurring absence from work and can be seen as a reflection of a demoralised or dissatisfied employee. To define absenteeism in the simplest explanation possible, it can be described as an employee failing to report for a scheduled work agreement.

From the definitions above, absenteeism is explained as repeat unplanned absences from work commitments regardless of the cause of the absence. The absences need only be unplanned (relating to very short notice or no notice before the absence occurrence) and repeated absences to be associated with absenteeism. The absences can become a habit or follow certain patterns such as repeat sick leave days on the first day after payday or specific days in the week. Even normal leave can be classified as absent behaviour if repeated short notice leave is utilised. For this reason, all absence types that comply with the stated prerequisites should be considered as part of an absenteeism management program.

2.3 MODELS OF ABSENTEEISM

The phenomena of absenteeism have been researched from different angles resulting in multiple models and theories all exploring absenteeism from a different approach. Harrison and Martocchio (1998) summarized the origins of absenteeism under different

variables and include personality, demographic characteristics, job-related attitudes, social context and decision-making mechanisms as causes of absenteeism. Some of the absenteeism models and theories are explored below using sources from researchers that made significant contributions to the field of absenteeism as well as more recent works (last five to seven years):

2.3.1 An Integrative Model of absenteeism

Magee *et al.* (2016) state that absenteeism is a complex phenomenon as a result of many interrelated factors that can influence employees' attendance decision and ability. Absenteeism can be examined from the individual, social and economic approach to establish the cause of absenteeism. The different approaches can be linked to either reduce or increase absence behaviour. Nicholson and Johns (1985) argued that an individual with a low level of job satisfaction that is placed in an organisational unit where absence is tolerated, and there is no economic incentive to change the absence behaviour are more likely to continue or even increase in absence behaviour. Therefore, it is important to grasp the different approaches to absenteeism.

From the aforementioned, it is deduced that absenteeism is not a result of an individual cause but as a result of many different contributing factors that create the situation or environment where the absence decision is deemed (by the individual) to be acceptable. These different contributing factors can be categorised in the different approaches based on the characteristics of the contributing element.

2.3.1.1 Individual approach

There exist several variables, such as age, gender, job satisfaction, motivation, behaviour, commitment and family structure, that has been identified to impact workplace attendance from multiple levels of measure including that of an individual's nature (Daouk-Öyry *et al.*, 2014). The factors mentioned above are viewed as potential predictors of absenteeism and also include the individual's prior attendance history, burnout and work attitude such as job satisfaction, commitment, involvement and stress amongst other things. Kaiser (2018) states that based on the work of Steers and Rhodes (1978), individual job satisfaction is the most researched individual factor affecting employee attendance behaviour and relates to individual motivation and the ability to attend as the principal root of absenteeism.

According to Trahan (2017), it is beneficial for organisations to identify the individuals' (employees) characteristics that demonstrate higher attendance rates (lower absenteeism) and in doing so, the organisation can understand absenteeism. These learnings and increased understanding can then be translated into direct initiatives to rectify the absenteeism problem.

It is therefore derived from the aforementioned authors' (Daouk-Öyry *et al.*, 2014; Kaiser, 2018; Trahan, 2017) approaches that the identification of individual factors relating to both high absenteeism and high attendance could increase to the understanding of attendance behaviour within the researched organisation and result in an increased ability to implement improvement initiatives.

2.3.1.2 Social phycological approach

Geurts (1994) attributes the contributions of the social phycological approach towards absenteeism in the form of a few theories and models dating back from the 1950s through to the 1990s.

The Hill and Trist's model (Hill & Trist, 1962; Hill & Trist, 1953) is considered a social phycological approach due to the introduction of the concept of a social norm regarding absenteeism behaviour. The model presents absenteeism as a withdrawal from work-related stressors and follows the organisational norms relating to absence behaviour. The Hills and Trist's model is considered speculative due to the lack of empirical evidence to support the model's assumptions.

The equity theory of social exchange is based on the work of Adams (1965) that represented employee absence as a means of restoring an inequitable exchange relationship between the employee and the organisation. The theory is based on the employee's perception of personal inputs (educational, seniority, experience) and outcomes in comparison to other employees' inputs and outcomes and determining the relative justice of the exchanges. The perceived injustice or imbalance of equity (inequity) will be restored to a balanced state through one of six identified means available to the employee of which one relates to withdrawal from the exchange relationship (manifested in absence).

The further development and in-depth social psychological analysis of absenteeism (Chadwick-Jones *et al.*, 1982; Kaiser, 1990; Nicholson & Johns, 1985) resulted invaluable contributions to the body of knowledge concerning absence behaviour. The abovementioned contributions include the recognition of the importance of group absence norms on acceptable absence behaviour, the inclusion of absence explained by social exchange theory and absence decision being affected by employees' comparison to others.

Lieke *et al.* (2016) found an increased likelihood of sickness absence (employee calling in sick) in an environment with a higher tolerance towards absence demonstrated by co-workers also frequently calling sick (absence culture). The findings revealed employee attendance behaviour being influenced by both team acceptance of absence norms and norms of expected cooperation.

The social psychological approach to absenteeism, therefore, deals with the acceptance of absent behaviour by the organisation and other employees and the perceived fairness of how employees are treated in comparison to other employees in this regard. Employees will be more likely to be absent from a work commitment if the absence is experienced as being allowed or deemed acceptable seeing as other employees or the manager also being absent frequently. Creating a culture of frequent absence not being acceptable could therefore discourage frequent absence of individuals and reduce levels of absenteeism within the organisation.

2.3.1.3 Economic approach

Economic incentives are recognized as methods of reducing absenteeism, while generous sick leave policies have the opposite effect (Scognamiglio, 2020). Organisations have applied various economic approaches to reduce absenteeism rates and includes both incentive and deterrent strategies.

Chinyio *et al.* (2018) state that monetary rewards and compensation impacts organisations' ability to attract, retain, motivate and satisfy (job satisfaction) employees. Employee motivation and job satisfaction have been identified as factors influencing absenteeism (Burmeister *et al.*, 2019; Jensen *et al.*, 2019; Rodriguez Amador, 2019; Schaumberg & Flynn, 2017; Wang *et al.*, 2020) and therefore it is reasoned that there exists a link between monetary reward (compensation) and levels of absenteeism.

As good compensation practices can increase employee motivation and job satisfaction resulting in lower absenteeism levels, so to can bad compensation practices have the opposite effect. Alfitian *et al.* (2020) found that incentivising attendance (bonuses) can lead to an increase in absenteeism in the workplace due to a perceived legitimacy of absenteeism.

From the aforementioned views on economic strategies for absence/attendance management it is deduced that there needs to be a balances approach seeing as both over and under-compensation or incentivising of employees can lead to higher absenteeism levels. It is, therefore, reasoned that economic approaches to absence management should be included in remuneration and incentives and must consider implementation risks. The organisation where the investigation will be conducted is considered to have very generous economic benefits with the allocation of paid sick, compassionate and family responsibility leave far exceeding regulatory requirements and short term incentives (bonuses) not including any attendance requirements.

2.4 ABSENT TYPES

To elaborate on the concept of absenteeism the concept of workplace absence types, firstly needs to be explored to produce a comprehensive understanding of absenteeism and absence behaviour dimensions. Generally, there is a couple of accepted absence types as defined in The Basic Conditions of Employment Act (75 of 1997) (SA, 1997). In chapter three of the Act (75 of 1997) the different types of leave are defined as:

2.4.1 Annual leave

A full-time employee is entitled to 21 consecutive days of annual leave or one day for every 17 days of employment. Annual leave is also referred to as vacation leave. There must be an agreement between the employer and the employee on when annual leave will be taken. If an agreement cannot be achieved, the employer can determine the time of the leave.

In the organisation under investigation, the annual leave cycle runs from the first day of February annually until the last day of January the next year. The annual leave allocation is divided into two main categories: compulsory leave and additional leave. The full allocation to mandatory leave (21 days per cycle) is expected to be taken within the given

leave cycle. Additional leave is allocated monthly, and the quantity is based on length of service. Additional leave is allowed to accumulate up to a maximum of 60 days.

2.4.2 Sick leave

A sick leave cycle is defined as 36 months. A full-time employee is entitled to paid sick leave that is equal to the same amount of days of normal work over six weeks during every sick leave cycle. The employers do not need to pay the employee if the proof of incapacity (signed sick note from a person who is certified to diagnose and treat patients) is not available on request of the employer. Bruniquel (2017:20-21) states the importance of sick leave management and failing to address sick leave problems could ultimately result in the abuse of sick leave.

In the organisation where the investigation was focused, the sick leave cycle starts on the day of the appointment. Sick leave allocation is based on employee role categorization (SP - salaried personnel and MSP - monthly salaried personnel). MSP employees are awarded 36 payroll days per cycle, while SP employees are granted 90 payroll days per cycle. When applying The Basic Conditions of Employment Act (75 of 1997) (SA, 1997), the MSP employees working shifts are entitled to 21 paid payroll days (12 hours per payroll day) of sick leave within the three-year cycle and therefore are awarded 15 payroll days more than the minimum requirement. Applying the same requirement to SP employees, the additional sick leave allocation exceeds the minimum requirement with 60 payroll days.

2.4.3 Other absence types

Other absence types of leave include maternity leave and family responsibility leave, as is explained in the Act (75 of 1997). Most organisations use sick leave records as the basis to measure and monitor absenteeism. This is also the practice of the organisation under investigation.

2.5 CLASSIFICATION OF ABSENTEEISM

Differences in employee absenteeism can be categorised by two broad sets of explanations. The first explanation for differences in employee absenteeism is the role the organisation play in the motivation of employees' efforts through remuneration,

promotions based on performance relative to peers, team structures and training programs amongst other things. This explanation can be referred to as incentives for good attendance. The second explanation for differences in employee absenteeism deals with the individual employee characteristics, including personal motivation, loyalty and work ethic and can be referred to as selection (Bennedsen *et al.*, 2018:2). These explanations focus on both the role of the employer and employee on the cause of the absenteeism.

In another approach to the classification of employee absenteeism, the employee is solely responsible for the cause of the absenteeism and can be classified as voluntary and involuntary absenteeism (Birioukov, 2016:341; UKEssays, 2018):

- Voluntary absenteeism implies that the employee could have avoided the absence but through his/her own free will decided not to do so. Examples of this type of absenteeism include:
    - An employee failing to report to scheduled work to attend a social function.
    - Abuse of sick leave (Calling in sick even though the employee is not).
    - Regular use of unfounded excuses for not attending work or coming late for work.
- Involuntary absenteeism implies that the cause of the absence is out of the employees' control and acceptable examples of this type of absenteeism include:
    - Absence due to illness (genuine illness)
    - An absence due to family-related emergency (hospitalisation of a child, being injured in a vehicle accident)
    - An absence due to public unrest (strike action resulting in intimidation)

Absenteeism classification, as stated above, can be classified by looking at the contribution towards the absence behaviour. The organisation have to treat employees fairly to motivate employees and therefore promote good attendance or discourage high absence behaviour. On the other hand, the employee also plays a role in his or her absence behaviour. This is categorised into two categories. Involuntary absence is

unavoidable, and the organisation cannot affect the involuntary absences. Voluntary absences, on the other hand, are within the employee's control and can therefore be changed. Differentiating between the two, however, is not an easy feat. The investigation aims to identify individual characteristics and organisational characteristics that can be linked to high absence behaviour.

2.6 CAUSES OF ABSENTEEISM

Various research has been conducted on what are the causes of workplace absence. According to Verma and Chaubey (2016), causes of absenteeism includes illness, accidents, low morale, poor working conditions, job boredom, lack of job satisfaction, inadequate leadership and supervision, a problem of a personal nature (including substance abuse, marital, financial and childcare amongst others), poor physical fitness, transportation problems and stress. According to Crous (2016), apart from illness, other causes of absenteeism include taking care of family members (children and elderly), depression, disengagement and burnout. A different approach to identify the causes of absenteeism is by classifying absenteeism factors in terms of institutional (organisational), structural (social environment) and economical categories (Mashaba, 2018). Trade unionism is also identified as a cause of absenteeism through legal strikes and industrial action aimed to address salary disputes or poor working conditions. Regardless of the cause, Visser (2019) states the importance of identifying the cause of absence to manage absenteeism. If rules aren't applied consistently, it could result in a culture of absenteeism or a social norm being created.

As stated above, there exist many causes of absenteeism and knowing what the most common absence causes are within the investigated organisation can result in providing areas of focus where the most significant improvement opportunities lie.

2.6.1 Illness absence

The obvious cause of absence is due to illness. As stated previously, illness absence can be classified as either voluntary (pointing to abuse of sick leave) or involuntary (genuine illness). According to Ticharwa *et al.* (2019), illness absence illustrated a seasonal trend with winter reporting more illness absences. The seasonality of illness absence also manifested in increased absence to care for a family member that has fallen ill.

The study in the seasonality of illness absence did not result in a determination of a seasonal trend with regards to the month of absence events as can be seen in chapter 4. The results did, however, illustrate seasonality once the absence hours were summated and therefore support absence due to seasonality based on total absence duration (Ticharwa *et al.* 2019:111).

An important aspect of sick leave abuse and the management thereof lies in recognition of patterns of absence (Bruniquel, 2017). Employees who abuse sick leave tend to do so before or after weekends (scheduled off days) and public holidays and claim different maladies, visit different doctors and take short, absent spells (typically one or two days). Sick leave abuse generally is also accompanied by other symptoms that include, amongst others also poor housekeeping (late for work). This emphasises the importance of analysing sick leave to establish trends and determine absence durations, the number of diagnoses and the number of doctors visited.

The study into the trends of sick leave (abuse) resulted in determining the presence of higher or more absences on specifically Monday, Wednesday and Friday and aligns with days of shift change. This points to higher absence behaviour after scheduled off days (weekends) and could be as a result of sick leave abuse (Bruniquel 2017).

2.6.2 Personal factors as a cause of absence

Personal factors point to the individual employee and include, amongst other factors such as age, gender and personality (Msosa, 2020:3). In a study conducted by Kumar and Babu (2017:644) it was found that there exist relationships between absenteeism and employee age, the number of dependents, distance from the workplace, marital status and gender. Years of service relate to the duration an employee has been employed at a particular organisation and has been stated to be an important factor affecting absenteeism and holds a relationship with absence behaviour (Buzeti, 2020:54).

The study confirmed the influence of the personal factor of age through an inverted relationship between age and absence duration per event and is illustrated clearly in chapter 4. There was no statistical difference of absence behaviour (average absence frequency and duration per six months) based on the age of the individual.

The study into the relationship between absenteeism and gender yielded no statistical evidence to support the findings of Msosa (2020:10) and Kumar and Babu (2017:644) as stated above.

The study into the relationship between absenteeism and years of service yielded no statistical evidence to support the findings of Buzeti (2020:54). The results in chapter four do indicate the best absence behaviour being demonstrated by employees with less than two years of service in terms of both absence frequency and duration.

2.6.3 Situational factors as a cause of absence

According to Msosa (2020), situational factors are attributed to job-related factors that would include the nature of the job (repetitive and boring). Organisational policies such as remuneration and promotion policies have been proven through multiple empirical studies to have relation to employee withdrawal, and it is agreed that low pay and lack of promotion opportunities are causes of withdrawal (evident through high absence) (Porter & Steers, 1973).

2.7 ABSENTEEISM MEASUREMENT

Absenteeism data is widely used as measures of employee engagement, job satisfaction and even employee commitment. Absenteeism is an organisational measurable indicator in most organisations, and it can be depicted in several ways (UKEssays, 2018).

2.7.1 Absence/incapacity rate

Absenteeism can be measured in the form of absence or incapacity rate and is presented as the total number of absent days or hours over a specified period (7 days/6 months) (Nagalingam & Sasikumar, 2019:287). The absence rate is a very simple and easy measurement to implement and monitor. The organisation where the study was conducted make use of the absence/incapacity rate measurement in the absenteeism policy. The policy states that line managers, with the support of an HR practitioner, must implement interventions with employees where the absence (sick leave) exceed the set absence/incapacity rate. The interventions are briefly described below:

- *First intervention* - where the employee's sick leave utilisation exceeds seven days in six months. The first intervention intends to make the employee aware

of excessive sick leave utilisation and allow the employee the opportunity to disclose reasons for the high sick leave utilisation so that the company can be aware of the contributing circumstances and provide possible assistance though employee wellness initiatives. The disclosure is voluntary.

- *Second intervention* - where the employee's sick leave utilisation exceeds 14 days in 12 months. The second intervention intends to further engage with the employee about the continuous high absence rate and formally refer the employee for assessment. The assessment is in the form of a medical assessment, at the organisation's doctor, or through the employee wellness program or both. The assessments are conducted with employee consent and are intended to provide the employee's management information on how the employee can be assisted to improve attendance behaviour.
- *Third intervention* - where the employee's sick leave utilisation exceeds 21 days in 18 months. The third intervention intends to further engage with the employee about the continuous high absence rate and provide formal feedback on the consequences should the high absence rate continue.
- *Fourth intervention* - where the employee's sick leave utilisation exceeds 28 days in 24 months. The fourth intervention is in the form of an Ill health enquiry. The details from all the interventions are considered by a chairperson and based on the findings the employee may be accommodated in a more suitable role, based on a skills assessment and availability of vacancies, discharged on medical disability or dismissed based on abuse on sick leave.

Based on the abovementioned organisational implementation of an absence management policy, it is clear that the preferred or targeted absence rate per employee is below seven days per six-month period on average. The study reveals the actual state of absenteeism within the organisation based on the definition of absenteeism (include all unplanned leave) and utilising the organisation's absence management measures.

2.7.2 Absenteeism rate

Absenteeism rate is another alternative measurement of absenteeism. The absenteeism rate calculation is illustrated by the following formula:

$$Absenteeism\ Rate\ \% = \frac{(\ Missed\ \#\ of\ workdays)}{(Average\ \#\ of\ employees\ \times Total\ \#\ of\ workdays)} \times 100$$

The absenteeism rate indicates what fraction of the workforce or employees are absent from work on a regular workday. The number of missed workdays relates to days as a result of absenteeism, thus including all unplanned or unauthorised absences of leave. It is however not an easy task to keep records of all unplanned absence types (according to the absenteeism definition), and most absenteeism is then calculated using sick leave days (paid and unpaid) as of measurement data.

Monitoring absenteeism rate as the only attendance measure is not sufficient in making accurate conclusions of the state of absence within an organisation. The absenteeism rate could decrease due to a decrease in the length of absences while there is an increase in shorter duration absences. To address this drawback of the absenteeism rate measurement, an organisation need also to consider the frequency and the length of absences. It is for this reason that both the absenteeism rate and frequency was utilised in the investigation.

2.7.3 Absenteeism frequency rate

Absenteeism frequency rate refers to the total number of absences over a specific period (Nagalingam & Sasikumar, 2019:287). The following formula is an illustration of how absenteeism frequency rate is calculated:

$$Frequency\ rate\ \% = \frac{(Total\ number\ of\ times\ unplanned\ leave\ was\ availed)}{(Total\ number\ of\ workdays\ in\ period)} \times 100$$

The frequency rate indicates the frequency of absences without consideration to the length of absences. This method of absence measurement is utilised by employers that identify that a higher frequency of absences poses more significant management challenges compared to less but more prolonged absences (Crowley, 2018).

The inverse of the absenteeism frequency rate will give an indication of the average time (workdays) between absences. To illustrate the application of frequency rate measurement the following hypothetical example is considered: A department consisting of 10 employees where there were four separate absences (one employee responsible for two separate absences and two employees each responsible for one absence each)

in a month that consisted of 24 workdays. The table below illustrates the frequency measurement:

Table 2-1:Application of frequency rate measurement, by Author (2020)

	Separate absences	Frequency rate (%)	1/Frequency rate (workdays)
Department	4	4/24 x 100 =16.67%	1/ (4/24) = 6
Employee X	2	2/24 x 100 =8.33%	1/ (2/24) = 12
Employee Y or Z	1	1/24 x 100 =4.17%	1/ (1/24) = 24

From table 2-1 above the measurement can be utilised and applied uniformly on an individual basis or a larger audience or group. It is, however, possible for the frequency rate to exceed 100% and is more likely to do so as the size of the measured group increases. It is for this reason that the study utilised the absenteeism frequency rate based on the individuals in the population instead of the entire population.

2.7.4 Severity rate

The severity rate measurement indicates the average length of absence. The following formula is an illustration of how absenteeism severity rate is calculated:

$$Severity\ rate\ (\frac{days}{event}) = \frac{(Total\ workdays\ absence\ in\ a\ specific\ period)}{(Total\ number\ of\ absences\ in\ the\ same\ period)}$$

From the formula above is it clear that the severity rate measurement incorporates both the frequency and length of absences to provide the average length of absence. As per the previous absenteeism measurements, the severity rate by itself also does not give a good holistic view of the health of attendance (absenteeism) as it does not capture the magnitude of the absenteeism.

2.7.5 Bradford factor

An alternative measure of absenteeism that incorporates both the frequency and the length of absence is the Bradford factor score analysis. The Bradford factor score analysis makes use of a simple formula to establish an employee's score based on the different

weighting of his/her the unplanned absences (sick leave, unpaid leave, family care). The Bradford factor score can be utilised as a measurement tool to identify individual employees within an organisation that needs intervention due to absenteeism (Mikulec & Špačková, 2017).

The Bradford factor score is calculated with the use of the total amount of the employee's sick leave days as well as the total number of separate sick leave occasions as per the equation below (People HR Blog, 2017):

$$B = S^2 \, X \, D$$

Where: $B =$ Bradford factor score

$S =$ Separate occasions of sick leave

$D =$ Total days sick leave

Two hypothetical examples will be used to illustrate the difference score calculations for the Bradford factor: Both employee X and employee Y had taken eight days sick leave over the past 6 months, but employee X took sick leave on two ovations (5 days and 3 days) while employee Y took sick leave on five occasions (2 days, 2 days, 2 days, 1 day and 1 day). The Bradford factor score is calculated for both employee X and employee Y in the table below:

Table 2-2: Bradford factor scoring example, by Author (2019)

	Separate occasions of sick leave (S)	**Total days sick leave (D)**	**Bradford factor score (B)**
Employee X	2	8	32
Employee Y	5	8	200

From table 2 above it clearly illustrates the difference in the Bradford factor scoring for two different employees with the same total number of sick leave days. With the use of the Bradford factor score and the relevant labour laws, the appropriate actions or interventions can then be implemented.

2.7.6 Combining absenteeism measurement

From the above explanations of absenteeism measurement, it is clear that the different measurement methods give different perspectives about the state of absenteeism within an organisation. The two significant considerations of absenteeism are the total duration of absence and the frequency of absences. To demonstrate why both duration and frequency should be considered in absenteeism management the following hypothetical scenarios are demonstrated: Consider three different employees where the records all indicate that the total duration of absence of the last year was 14 days. Employee A's absence details are one 12-day absence due to a medical emergency and one two-day absence due to illness. Employee B's absence details are seven separate two-day absences due to illness. Employee C's absence details are six one-day absences due to scheduled reoccurring medical treatments, two two-day absences due to illness and one four-day absence due to illness. Consider the table with the different absenteeism measurements below.

Table 2-3: Combination of absenteeism measurement

	Absence rate (days/year)	Absenteeism rate (%)	Frequency Rate (%)	Severity rate (days/ absence)	Bradford factor score
Employee A	14	5.4%	0.8%	7.00	56
Employee B	14	5.4%	2.7%	2.00	686
Employee C	14	5.4%	3.5%	1.56	1134
Note: Calculations assume 260 workdays in a year					

Based on table 2-3 above it becomes clear that even though all three employees had 14 absent days there is a difference in the measurement and thus emphasising the importance of considering more than one measurement in attendance management policies. Absence rate and absenteeism rate only indicates the duration of the absences but don't give more characteristics about the absences. The frequency rate illustrates the frequency of absences and higher frequency percentage points to more absence events. The severity rate illustrates the duration per absence event and the Bradford factor score combines the frequency and absence duration to provide a single score.

Another important aspect that needs to be included in the absenteeism measurements is the consideration of whether the absence is planned or unplanned. When considering

employee C's situation above it may be viewed to be the worst attendance behaviour in comparison to the other two employees, but when classifying the scheduled reoccurring medical treatments as planned absences the calculations and interpretation of results change significantly. Planned absences can provide the organisation with sufficient time to plan for the absence and therefore limit the impact of the absence.

Table 2-4: Combination of absenteeism measurement considering planned absences

	Absence rate (days/year)	Absenteeism rate (%)	Frequency Rate (%)	Severity rate (days/ absence)	Bradford factor score
Employee A	14	5.4%	0.8%	7.00	56
Employee B	14	5.4%	2.7%	2.00	686
Employee C	14	3.1%	3.5%	2.67	72
Note: Calculations assume 260 workdays in a year					

Table 2-4 above clearly indicates the improvement of absenteeism measurements when considering planned absences. As per the definition of absenteeism being focused on unplanned absences, all of the absenteeism measurements improved for employee C with the exception of the absence rate.

The organisation where this study was conducted make use of the absence rate to flag or identify where interventions must be implemented. Furthermore, only sick leave is incorporated into the absenteeism management policy and do not differentiate between planned or unplanned sick leave. This could, therefore, result in miss-diagnosing the crucial focus areas and the actual extent of absence behaviour within the organisation.

2.8 ABSENTEEISM MANAGEMENT

The study that was conducted is firstly into absenteeism and absence behaviour and secondly into providing management guidance to improve absence behaviour within the organisation. Therefore, for the sake of comprehensiveness and providing a wholistic review of aspects relating to the research goals, the management of absenteeism is included in the literature review.

There are various recommendations for the management of employee absenteeism. These include implementation of absenteeism management programs/disciplinary

proceedings, incentivising good work attendance and improving company culture (Kocakülâh *et al.*, 2016b:92-94). Maquilan (2019:23) stated the most effective absenteeism management strategies deals with both reward and punishment in attendance monitoring. Punishment can be in the form of disciplinary proceedings against employees guilty of excessive sick leave utilisation. Any organisation may, as long as it is lawful, impose disciplinary proceedings in cases where absenteeism has become excessive or where there is a particular pattern of repeated absences. Although it is allowed in the South African labour laws, it is a long and tedious process that requires a lot of company resources and an immaculate paper trail.

According to Bruniquel (2014) and Chowdhury (2016), another perceived reason for high employee absenteeism is due to the lack of any action by the employer against employees with high levels of absenteeism. It leads to other employees not taking absenteeism seriously since there is a culture or a perception that management will not impose consequences or corrective actions for excessive absenteeism.

In terms of rewards, Maquilan (2019:23) refers to other studies where implementation of a financial reward system for perfect attendance resulted in both a decline on absenteeism, and an increase in perfect attendance. It is concluded that the reward and punishment strategies are effective in reducing employee absenteeism.

In a qualitative study conducted by Litchfield and Hinckley (2016), four themes were identified as the key factors that impacted on a reduced absenteeism rate: employee health, employee engagement, organisational factors and policy. Kanerva *et al.* (2018:1) confirm the hypothesis that an unhealthy lifestyle (employee health) can contribute to increased absenteeism rate and therefore also increased cost to the employer.

Litchfield and Hinckley (2016) state that: “The impact of correctly implementing a precisely worded attendance management policy has long been recognized…”. The emphasis is on “correctly implementing” and “precisely worded”. One can then argue that a mere policy by itself would not be as effective at reducing absenteeism and that a policy that is not clear and specific will also fail at achieving the required outcome. The focus must, therefore, be on the consistent implementation of the policy and the exact wording of the policy to remove ambiguity.

Bruniquel (2017) adds that clear disciplinary rules about absence notification are important to contest sick leave abuse and must address to whom and when absence must be reported. The recommendation for absence reporting rules is to allow sufficient time (an hour before the start of the shift) to arrange for a replacement and for the employee to report to his or her manager. Additionally, the implementation of return to work interviews is viewed as critical to discourage chancers and provide a platform to provide support (where required) or obtain reasons that may warrant disciplinary action.

In the South African context, there is also the matter of very restrictive laws in terms of sick leave laws. The Basic Conditions of Employment Act (75 of 1997) states that an employee is entitled to six weeks' paid sick leave over three years. This translates to 30 days sick leave over three years for a five-day workweek or on average 10 days sick leave per year. An employer may insist on a medical certificate for sick absences of more than two days or when sick leave is reoccurring within a specified period. This leaves a lot of opportunity for abuse of sick leave for personal gain: paid time off. By doing the math, the maximum allowable absenteeism rate that is per the Act (75 of 1997) is approximately 4%. This is not the case with many organisations' absenteeism rate as high as 12% (Bydawell, 2016) and therefore leaving room for improvement in reducing absenteeism.

Bruniquel (2017) stated that according to Absolv Software Technologies, the direct cost of sickness absence for South Africa is estimated at R34.1 billion while indirect cost accounts for approximately R68.2 billion making up for almost 3% of GDP. This highlights the extent of the absenteeism dilemma for businesses operating within the South African economy.

Managing absenteeism can be a daunting task for many businesses managers, but according to some research, absenteeism also follows the Pareto principle in that 80% of sickness absence is caused by 20% of employees within an organisation (Ahn & Yelowitz, 2016:8; Bydawell, 2016). By focusing on the critical few, it will have a major effect in reducing absenteeism. The study was aimed to identify characteristics that can be linked to high absence behaviour (both absenteeism frequency and duration) and provide management focus to take on the absenteeism dilemma within the organisation.

2.8.1 Policy implementation effectiveness

As the previous section pointed out, implementation of an effective policy (clear and specific) can produce the required results with regards to absenteeism reduction. There are a couple of factors that can influence the desired outcome of absenteeism reduction when it comes to policy implementation. These factors include the following: The policy itself must be effective (clear and specific), the role of the stakeholders in the policy implementation and the support for the implementation of the policy.

2.8.1.1 Policy clarity

The Basic Conditions of Employment Act (75 of 1997) (SA, 1997) itself is very clear and specific in terms of sick leave allocations but no so much on employer rights where excessive sick leave is used. Organisational policy needs as a minimum to align with the requirements of the act. According to Ahn and Yelowitz (2016), it is important in absenteeism reduction that the policy is robust and clear to reduce the sense of entitlement. Ahn and Yelowitz (2016) continue by adding that other research has also indicated that policies that include financial incentives are also effective at improving work attendance. There is, however, a risk of increased presenteeism due to employees attending work to qualify for the financial incentive but not being able to function at full productivity due to a minor illness.

The organisational absence management policy at the organisation under investigation is specific in terms of the use of sick leave but fails to include other leave types that can be an indication of a high absence behaviour. The investigation, therefore, included the absence type that is in line with the absenteeism definition.

2.8.1.2 Stakeholder impact on policy implementation

Another consideration that needs to be explored when one discusses policy implementation effectiveness is the roles of the various stakeholders. The devolution of HR-related tasks to line manager plays a crucial part in HRM strategies (Stankeviciene *et al.*, 2017) and ultimately, the line managers play a pivotal role in the implementation of absenteeism policies. Research on this matter have increased as the devolution of HR-related tasks to line managers have accelerated. There is still a perception that the implementation effectiveness is lacking as the result of line managers failing to

consistently implement and take ownership of their simple HR-related responsibilities (Op de Beeck *et al.*, 2018). The contributing factors identified by Op de Beeck *et al.* (2018) for line managers failing in their HR-related tasks include the lack of desire, lack of capacity, lack of competencies, lack of support and lack of policy and procedures.

2.8.1.3 Support for implementation

As mentioned above, the contributing factors already include lack of support as one of the elements preventing line managers from implementing absenteeism policies. Implementation support can be divided into various categories:

- Firstly, there is support in terms of access to absenteeism data. To manage absenteeism, managers need to know the detail of absenteeism. If the absenteeism data is not readily available and correct, there is the risk that employees may get the perception that management is not committed to the implementation of the organisation's absenteeism policy due to delayed intervention with highly absent employees.

- Secondly, there is also the issue of physical support with regards to guidance and training. According to Huo *et al.* (2018), the support from HR professionals will enable line manages to implement HRM policies effectively. HR professionals that are unavailable and unwilling to support line managers will result in the lack of HR skills transfer and a loss in motivation from managers to perform their HR responsibilities.

2.9 ABSENTEEISM MANAGEMENT THROUGH TECHNOLOGICAL SUPPORT

Tende and Eketu (2019) state that nearly all organisations are starting to utilise technology-enhanced processes to improve efficiency and the inability to adapt or embrace advancement in technology may result in business failure or financial losses. That is why the effect of technological support in absenteeism management is discussed below.

In a recent study by Lima *et al.* (2020), it was attempted to use deep learning models as predictive tools to identify employees with a high probability of excessive illness absenteeism. This was made possible through the advancements in big data technologies and the availability of big data sets (HR datasets). Due to the inherent

unpredictability of absenteeism, any predictive model on the topic would be very relevant and useful for absenteeism management. Lima *et al.* (2020) managed to prove the feasibility of a predictive model for their study population using a combination of deep learning models and features from the HR database consisting of six years of historical data. Accuracies of up to 78% were achieved by combining common attributes of employees and historical absenteeism data to form a newly compiled dataset containing the most relevant data and applying deep learning model techniques. The identified employee characteristics were: unit of work, age of the employee, organisational level, gender, service years, year of absence and total absence for a specific year. Even though the research in this field is still very limited. However, it does provide promising potential solutions for the future absenteeism management. Some of the characteristics identified and utilised in the work of Lima *et al.* (2020) was included in the investigation and the results are available in chapter four.

2.10 CONNECTING THE LITERATURE TO THE INVESTIGATION

As stated above, there are multiple sources and studies (Chinyio *et al.*, 2018; Godøy & Dale-Olsen, 2018; Kocakülâh *et al.*, 2018; Kocakülâh *et al.*, 2016a; Neingo & Tholana, 2016; Verma & Chaubey, 2016) that all confirm that absenteeism is impacting organisations on various levels and if it is not managed effectively, it can and will result in significant financial losses. Absenteeism is not only a global dilemma but is also affecting the South African economy. There are also various approaches on how best to manage absenteeism through all the different industries across the world. South African organisations are bound by law to offer paid sick leave and the risk of higher absenteeism rates also increases.

There is also ample research on the devolution of HR-related tasks to line managers and the importance of line managers in the implementation of HRM strategies (McGoldrick *et al.*, 2001; Nabi *et al.*, 2017; Op de Beeck *et al.*, 2016). Under this field, policy implementation and factors influencing the effectiveness of policy implementation, such as support, is also covered.

With the enormity of the absenteeism dilemma and all the research and information available in the field of absenteeism, one would expect to have a solution to the absenteeism dilemma. This is not the case. Therefore, this study is focused trend

identification on providing support to lines managers through the identification of high absent employees.

The study into absenteeism trends showed that absenteeism is also a real concern within the organisation. The total unplanned absences attributed to 29,957 payroll days over 21 months. These figures relate to an average of 0.70 payroll days of unplanned absence per employee per month. It was also found that 15% of the population exceeded the organisational target for an average absence duration of less than seven payroll days per six months and contributed towards 34% of the total unplanned absence duration as demonstrated in chapter four.

CHAPTER 3 RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter explains the research method used and describes the population details of the study.

The main focus of this study is to investigate absenteeism through trend analysis of historical employee absence data within selected chemical operational units of a chemical manufacturing organisation. The intent is also to make recommendations on how to improve absenteeism management based on the results obtained through the investigation.

The data utilised for the empirical study was obtained through the human resource department of the organisation by combining and desensitising existing historical HR reports (employee attendance and headcount reports).

3.2 RESEARCH DESIGN

A research design is defined as the structural framework within which the study is implemented. According to Andrade (2019), a study can be described under different heads of research design, and use of certain descriptors can be mutually exclusive while other descriptors are not. The following descriptors are considered for the research design that was followed:

3.2.1 Quantitative or qualitative

Quantitative research can be defined as research into a social phenomenon through testing of variables that are measured with numbers and analysed with statistics to explain or predict the phenomena (Yilmaz, 2013).

Qualitative research is more difficult to be defined due to its multifaceted nature. Still, it is considered a research approach that requires insight to reveal descriptive terms related to phenomena and is deemed to be emergent, inductive, interpretive and naturalistic in approach (findings not arrived at by statistical or quantification means) (Yilmaz, 2013).

The research descriptor most suitable for this study is that of a quantitative method due to the statistical approach and numerically measurable variables that were utilised during the investigation.

3.2.2 Empirical or non-empirical

Empirical research can be defined as research that utilises empirical evidence in the form of data that are analysed and interpreted to draw a conclusion. Therefore the conclusion is verifiable (Question Pro, 2020). The advantages of an empirical research design are an increased internal validity, the higher level of control over variables, the ability to validate traditional research and the research being conducted are viewed as competent and authentic.

Non-empirical research can be defined as research utilising a theoretical approach to the research design and involves inductive and deductive reasoning to theorize logical assumptions about the research topic.

The research descriptor most suitable for this study is that of an empirical method due to the utilisation of empirical data that can be verified.

3.2.3 Cross-sectional or longitudinal

A cross-sectional study can be described as a “snapshot” in a single point in time to determine variations that may exist between more than one case (Bryman *et al.*, 2014:105 - 108; Trochim & Donnelly, 2007:6). Through a cross-sectional design, it is only possible to determine the relationship between variables but not directionality.

A longitudinal design involves mapping of change through data gathering from a sample at different points in time and provides insight into the time order of the variables. Therefore, it would be possible to make causal inferences in a longitudinal research design (Bryman *et al.*, 2014:109)

The research descriptor most suitable for this study is that of a cross-sectional research design due to the single point in time of data collection.

3.2.4 Description of the research framework

Considering the details from the aforementioned three sections, the most suitable description of the study is that of a quantitative, empirical, cross-sectional study into absenteeism trends within the organisation under investigation.

3.3 POPULATION AND SAMPLING

The population (also referred to as the population of interest) of a study can be defined as the group of individuals with similar characteristics that are of interest for the researcher (Majid, 2018:3). The sampling of a population is used to reduce the (large) population to a representative, manageable and accessible group of individuals. This makes a study executable while also maintaining generalizability of the results (Bryman *et al.*, 2014:168).

The focus of this study will be individuals in specific operational sections (comprising out of three larger business units) of a large chemical manufacturing organisation in South Africa. The focus of this study is aimed to gain insight through the investigation of existing organisational absenteeism data.

The common characteristic of the individuals of the populations is that all the individuals are or were employed within operational or manufacturing departments within the same organisation in the chemical manufacturing industry. The nature of the industry is continuous operations/processes in a high stress, high performance and results orientated environment. Due to the nature of the processes, personal protective equipment is a requirement in most areas within the facility to address potential safety risks.

Three specific sections will make up the population of this study. All three sections are performing the same functions, namely, operations. The three sections have different management teams that all report into the same larger divisional manager having similar objectives and targets. The three sections staffing establishment comprised out of 464, 843 and 699 personnel that include employees and management. The total population comprises approximately 2048 individuals (N = 2048). Due to employee turnover and new employee appointments during the study period, the total number of individuals in the study is higher than the stated staff establishment, and not all individuals in the population

were employed within the operations sections for the full duration of the investigation. The population details are illustrated below:

Table 3-1: Population detail, by Author (2019)

Operations A		Operations B		Operations C	
Total	478	Total	861	Total	709

3.3.1 Suitability of the population

The organisation, where this study was conducted, is a large organisation, and the effect of absenteeism can be quite large and provide a sufficient amount of data available to conduct the investigation. With the significant amount of available data on employee attendance (available HR reports), a trend investigation could lead to an improvement in the knowledge about organisational employee absenteeism and guide management on how the dilemma of absenteeism could be approached to affect an improvement in employee attendance.

With the population covering three relatively similar groups or strata with similar work activities and work demands, it could be possible to determine similarities and or differences (trends) that could be explored in further detail and ultimately give answers to the research questions.

3.3.2 Location of the population

The population is the production sections of an organisation situated within the northern part of the Free State (South Africa) in the industrial section of the town called Sasolburg.

3.3.3 Sampling requirements

Due to the accessibility of the population, the total population was utilised, and there was no requirement for a specific sampling technique that would have been representative.

3.4 DATA COLLECTION

Data collection for research can be defined as the process of obtaining or collecting the required information to conduct an analysis technique or method; for this study the data

was obtained from an HR department representative in the form of existing attendance reports (HR reports). The data used in this study is therefore classified as secondary data since the researcher did not collect the data. The organisational attendance records provided a large database that was beneficial to the quantitative research and provided sufficient high-quality data captured on an enterprise resource planning system (SAP) of the organisation thus ensuring confidence in the data reliability. The required data were extracted from the reports to ensure no individual within the population is identifiable in the final dataset to ensure no harm can be caused as a result of this study (desensitization of the data).

3.5 DATA PREPARATION AND DESENSITIZATION

Data preparation included the removal of planned absences from the original data set supplied and therefore all leave (vacation leave) was removed. The desensitization process included re-assigning randomly generated study numbers to each individual. The employee attendance reports contained approximately 72 000 absence entries from the 1st of July 2018 until 27 March 2020 (the lockdown period was excluded from the dataset) and each entry contained the employee number that needed to be replaced with the randomly assigned study number. Due to the magnitude of the available dataset, it was not feasible to substitute the employee numbers manually, and therefore a self-developed Microsoft Excel visual basic code was utilised to replace the employee numbers with the randomly assigned study numbers (see Annexure B for details of the code).

The next desensitization action included the calculation of the employee age based on the available date of birth of each employee and only stating the age in years at the date of the most recent report provided/obtained (October 2020).

The data from the different HR reports were combined into a single dataset (Annexure A) that contained the following variables:

Table 3-2: Study variables and descriptions

Variable	Description of Variable
Study Number	Newly assigned number to each individual in the population
Population	The total population of the study (2053 individuals)
Subdivision	The population divided into three subdivisions
Employee group	Employees separated into remuneration group (Total package or base salary and benefits)
Role category	Employees divided into responsibility hierarchy
Start Date	Start date of absence
End Date	The end date of absence
Absence type	Clarification of the type of absence
Absence hours	Total hours of absence
Total payroll days	Total days subtracted from the allocated absence bucket (sick leave allocation, compassionate leave allocation)
Day	Day of first absence day (Monday, Tuesday, and so forth)
Month	The month of first absence day (January, February, and so forth)
Gender	The gender of the individual
Age in years	Calculated age in October 2020
Service Years	Year working as a permanent employee for the organisation
Frequency Rate	The calculated frequency rate of absence averaged over the total study and expressed in absences per six months
Duration (hrs)	The calculated duration of absence averaged over the total study and expressed in absence hours per six months
Duration (Payroll days)	The calculated duration of absence averaged over the total study and expressed in payroll days per six months

The data preparation process also included a verification step to ensure that duplicated entries are removed since it is not possible for and employee to have multiple absences during the same day and period. After the data preparation and desensitization was completed, the variable coding process was implanted as explained below.

3.6 DATA CODING

The data coding strategy that was utilised in this study was to assign numerical values to the different sub-categories for each field. As an example, consider the field of gender: There exist two sub-categories namely male and female. The coding strategy ensured that each subcategory was assigned a numerical identification code within the field, namely male = “1” and female = “2”. Each field was narrowed down into sub-categories,

and identification coding was assigned according to the mentioned above strategy. The coding sheet is available in Annexure C.

3.7 ANALYSIS SOFTWARE

The software program that used to analyse the data is the IBM Statistical Package for Social Science (Version 26) (IM SPSS, 2020)

3.8 DATA ANALYSIS

The presence of trends between work attendance/absenteeism and respondents' biographical and organisational characteristics was investigated with the assistance of a statistician from the North-West University's statistical consultation services.

3.8.1 Techniques

The following statistical techniques were used: frequencies, independent t-tests (in the case of two groups), ANOVA's (3 or more groups) and mixed model analysis. Effect sizes instead of p-values were used for interpretation purposes as a result of the lack of generalizability.

For the t-tests, ANOVA's and mixed model analysis an effect size of 0.2 was an indication of a small or practical non-significant effect, 0.5 medium or practical visible effect and 0.8 large or practical significant effect.

Descriptive statistics, more specifically, frequencies, mean values and standard deviations, were used to summarize the data. Where applicable, the data was represented graphically.

CHAPTER 4 DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 INTRODUCTION

In this chapter, the results of the data analysis are reported and discussed on the presence of trends within the organisation were the trend investigation of absenteeism within a selected chemical operational unit was conducted.

4.2 STATISTICAL ANALYSIS

The data analysed in the subsequent sections reflect the attendance behaviour of the entire population. The final desensitized dataset contained the attendance data of 2048 respondents. The difference between the population (N = 2048) and the size of the staff establishment (N = 2006) is attributed towards employees' turnover and new appointments into either of three operations sections.

4.3 FREQUENCY ANALYSIS

Frequency analysis or frequencies are the numbers of counts or the number of times a data value appears based on the options (coding) within the variables and provide an overview of the data.

Frequency analysis was conducted on two subgroups within the data set. The first group is classified as the biographical, demographical and organisational data and how it relates to the individuals within the population. The second group is the data relating to the individual absences and the identified or captured characteristics of the absences and is classified as absence data.

4.3.1 Biographical, demographical and organisational data

The following biographical, demographical and organisational data were included within the study framework and are represented in the subsequent sections: gender, age, service years, division within the organisation, employee group (based on remunerational rules), role category of the individual, individual absence frequency and individual absence duration (expressed in actual absence hours and payroll day deductibles).

4.3.1.1 Gender

The following illustration is the indication of the gender of the individuals within the population. Figure 4-1 below indicates that the population consisted of 88.75% of males and 11.25% of females.

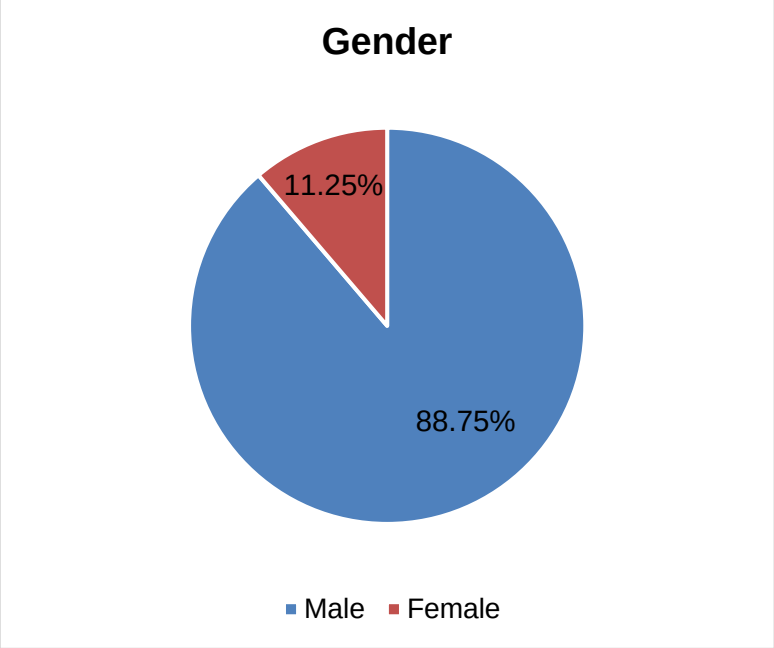


Figure 4-1: Gender distribution

4.3.1.1.1 Discussion of gender results

The male-dominated result was expected due to physicality required to operate the units and the slow transformation of gender inequality within the chemical manufacturing industry.

4.3.1.2 Age

The illustration below is the presentation of the age distribution of the population. There were 102 individual's data not available in the HR reports obtained for the study and was excluded from the age analysis.

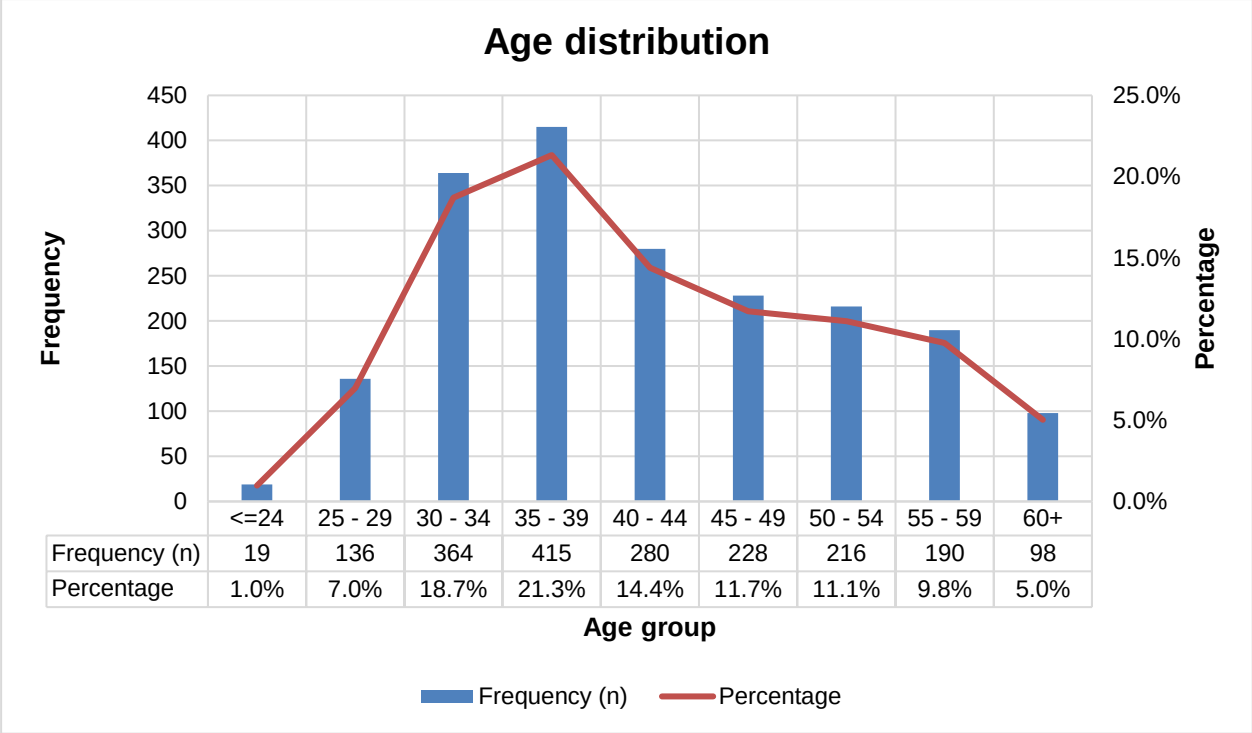


Figure 4-2: Age distribution

Figure 4-2 reflects that the age distribution of the population consisted of 21.3% (n=415) aged between 35 – 39 years, 18.7% (n=364) aged between 30 – 34 years, 14.4% (n=280) aged between 40 – 44 years, 11.7% (n=228) aged between 45 – 49 years, 11.1% (n=216) aged between 50 – 54 years, 9.8% (n=190) aged between 55 – 59 years, 7.0% (n=136) aged between 25 – 29 years, 5.0% (n=98) age 60+ years and 1.0% (n=19) aged 24 years or less.

4.3.1.2.1 Discussion of age results

The age distribution of the population indicates the two largest groups being aged between 30 and 39 years of age. There exists a gradual decrease in the number of individuals per group as the age ranges of the groups increase from 40 years and older. The age distribution is leaning towards the younger age groups.

4.3.1.3 Service years

The illustration below is the presentation of the years of service distribution of the population. There were 102 individual's data not available in the HR reports obtained for the study and was excluded from the age analysis.

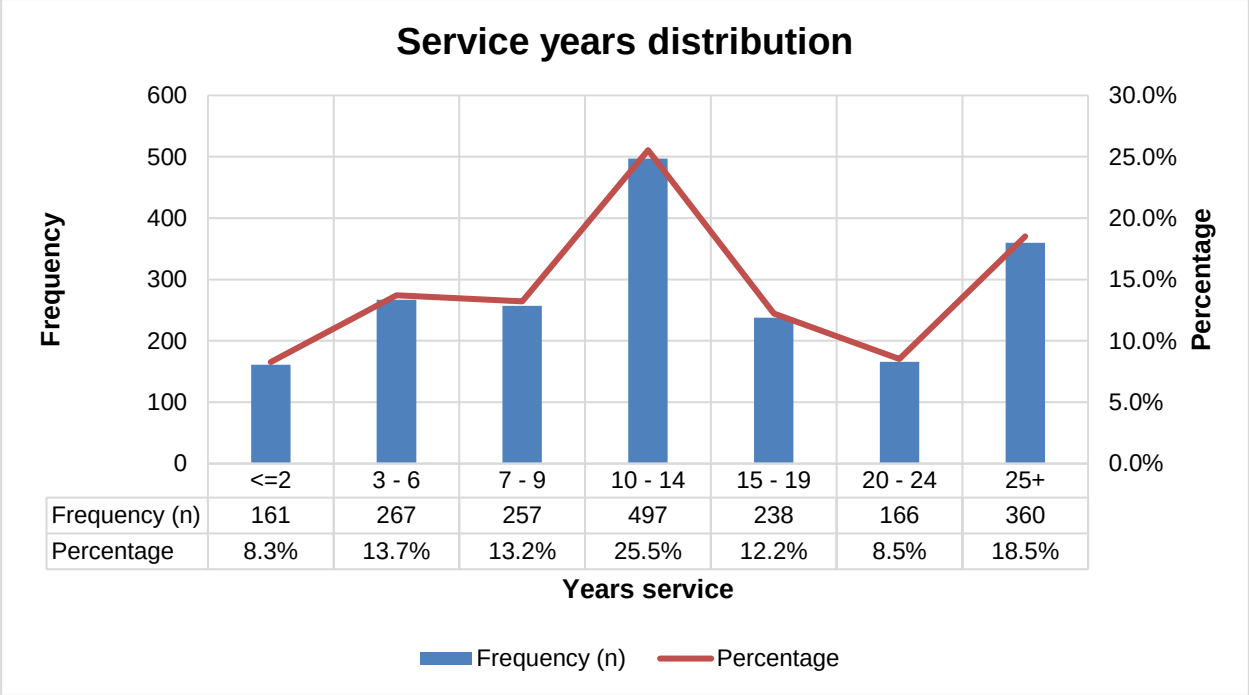


Figure 4-3: Service years distribution

Figure 4-3 reflects that the service years distribution of the population consisted of 25.5% (n=497) ranging between 10 – 14 years of service, 18.5% (n=360) having 25+ years of service, 13.7% (n=267) ranging between 3 – 6 years of service, 13.2% (n=257) ranging between 7 – 9 years of service, 12.2% (N=238) ranging between 15 – 19 years of service, 8.5% (N=166) ranging between 20 – 24 years of service and 8.3% (n=161) having 2 years or less service.

4.3.1.3.1 Discussion of service years results

The service years distribution results indicate that the largest group of individuals have 10 to 14 service years and the second-largest group of individuals have more than 25 service years. The distribution does not follow a bell shape distribution due to the high number of individuals in the 25+ service years. This could be contributed to the coding allocation not continuing with five-year increments after the 25 + service years category. The peak of the service years distribution is aligned with the peak of the age distribution considering that individuals become eligible for employment from the age of 18 years (directly after school) to 22 years (after completing tertiary education).

4.3.1.4 Organisational division

The illustration below is the presentation of the organisational division distribution of the individuals within the population. Fig 4-4 below indicates that the population consisted of 42.0% from the operations B division, 34.6% from the operations C division and 23.3% from the A operations division.

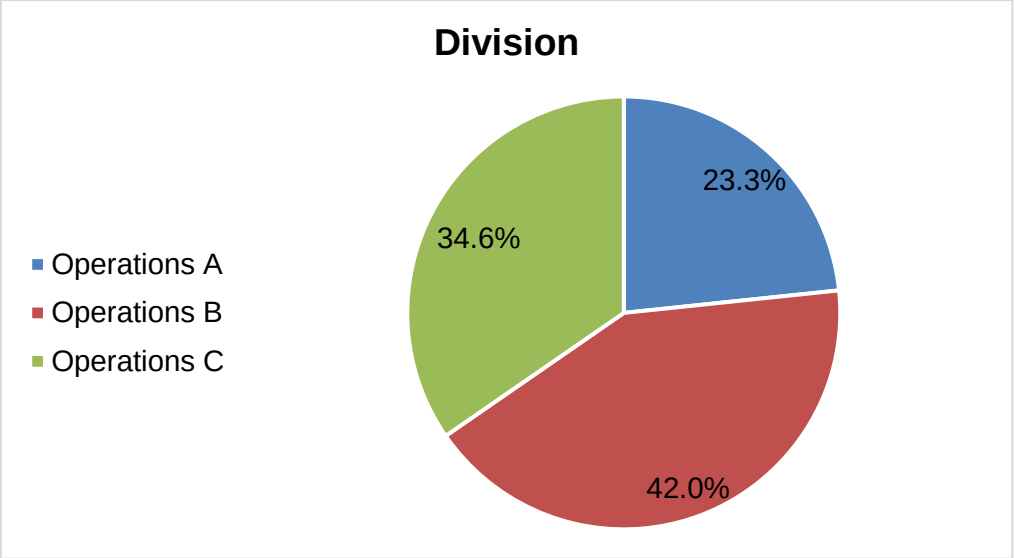


Figure 4-4: Division distribution

4.3.1.4.1 Discussion of organisational division results

The population of the study can be subdivided into three subdivisions reporting into three different leadership structures within the same organisation. The divisions' size distribution is adequate to utilise in comparative analysis to determine whether there exist statistical differences in absence behaviour between the three different divisions.

4.3.1.5 Employee group

The illustration below is the presentation of the employee group (based on remuneration structure) distribution of the individuals within the population. Fig 4-5 below indicates that the population consisted of 77.9% from the monthly salaried personal (MSP) employee group and 22.1% from the salaried personal (SP) employee group. The difference between the employee groups is the remuneration structure. MSP remuneration is based on a base salary with added benefits that include allowances (housing, shift work, danger pay, medical aid) while SP remuneration is based on a total guaranteed package that

allows flexibility in the adjustment of benefits within certain rules (pension contribution, car allowance) to maintain a total remuneration amount for the individual.

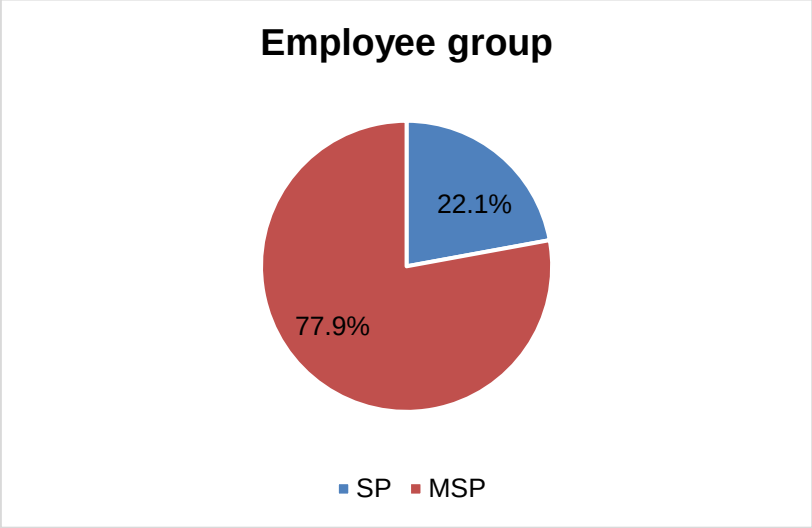


Figure 4-5: Employee group distribution

4.3.1.5.1 Discussion of employee group results

The employee group distribution results indicate that the majority of the individuals fall within the MSP group. This is to be expected as the MSP groups consist of workers (no managerial responsibilities) while the SP group include all individuals with managerial responsibility. The distribution of the employee group is adequate to utilise in comparative analysis to determine whether there exist statistical differences in absence behaviour between the two employee groups.

4.3.1.6 Role category

The illustration below is the presentation of the organisational role category distribution of the individuals within the population. Figure 4-6 reflects that the role category distribution of the population consisted of 67.2% (n=1376) in the process implementation role category, 13.5% (n=277) in the process optimisation role category, 13.1% (n=268) in the operations role category, 3.5% (n=71) in the optimisation role category, 1.7% (n=35) in the execution role category and 1.0% (n=21) in the leadership and specialisation role category. The role category indicates the level of responsibility within the organisation.

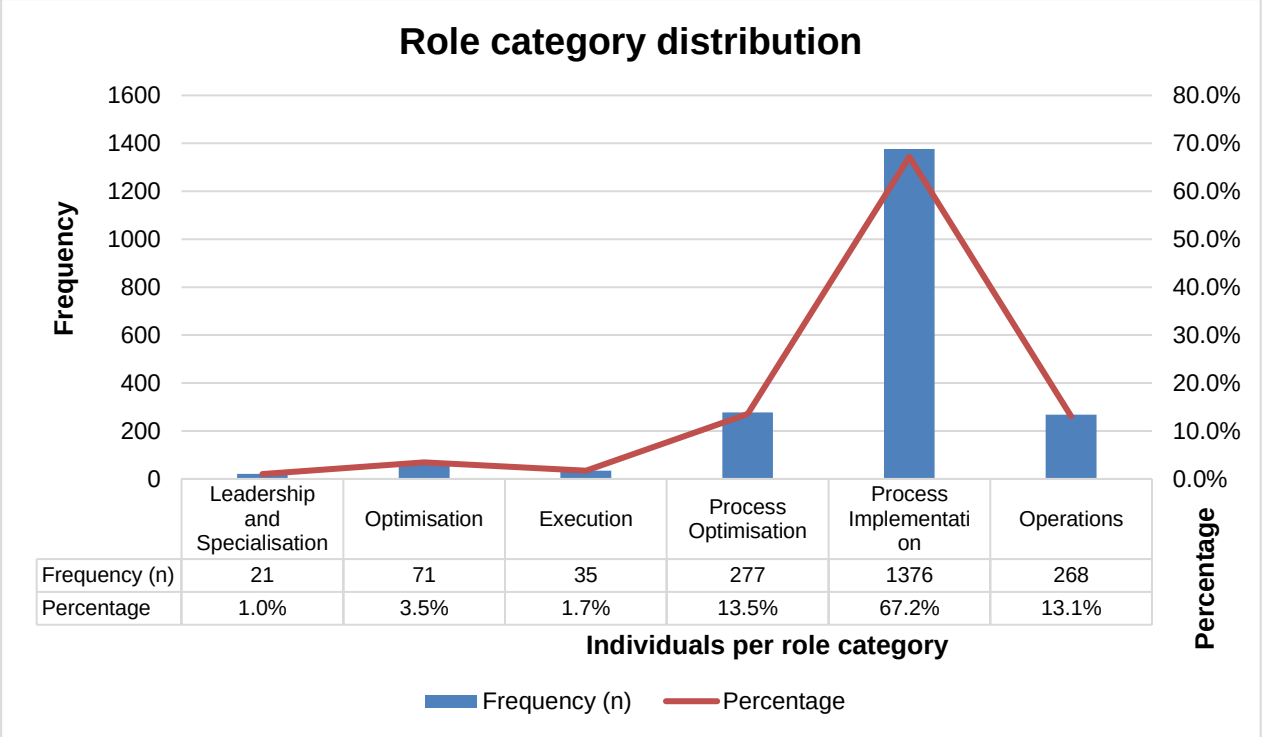


Figure 4-6: Role category distribution

4.3.1.6.1 Discussion of role category results

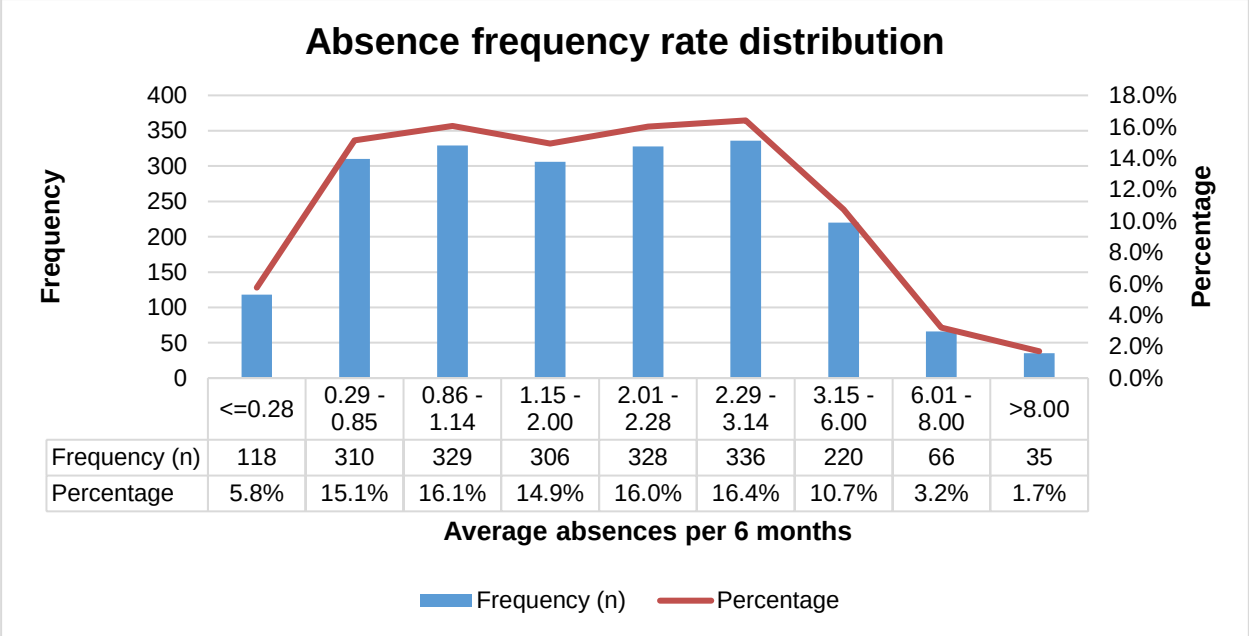
The role category distribution results indicate the majority of individuals within the process implementation role. These results are aligned with the employee group seeing as the majority of the process optimisation and operations role category fall within the MSP groups as well. The following table reflects the hierarchical order and description of the role categories within the organisation.

Table 4-1: Role category description

Role category	Description of role category
Leadership and specialisation	Include the Vice presidents of the various operational groups and senior managers of the maintenance and process functions.
Optimisation	Include the area managers of the various maintenance departments, the area managers of the processes and the senior technologists from the various maintenance disciplines (control and instrumentation, electrical and mechanical).
Execution	Include technologist and technicians from the various disciplines (control and instrumentation, electrical and mechanical).
Process optimisation	Include foreman from the various disciplines (process, control and instrumentation, electrical and mechanical), maintenance and production coordinators and technicians from the various maintenance disciplines (control and instrumentation, electrical and mechanical).
Process execution	Include the various grades of artisans within the various disciplines (process, control and instrumentation, electrical and mechanical).
Operations	Include process and maintenance operators and controllers within the various disciplines (process, control and instrumentation, electrical and mechanical).
Note: The execution, process execution and operations role categories don't include people management.	

4.3.1.7 Absence frequency rate

The illustration below is the presentation of the absence frequency distribution of the individuals within the population. It is reported in a six-month average number of absences over the entire duration of the study (number of absences per six months). The absence frequency rate includes all unplanned leave absences (sick leave, family care, short time, compassionate leave and absence without official leave).



	<=0.28	0.29 - 0.85	0.86 - 1.14	1.15 - 2.00	2.01 - 2.28	2.29 - 3.14	3.15 - 6.00	6.01 - 8.00	>8.00
Frequency (n)	118	310	329	306	328	336	220	66	35
Percentage	5.8%	15.1%	16.1%	14.9%	16.0%	16.4%	10.7%	3.2%	1.7%

Figure 4-7: Frequency rate distribution

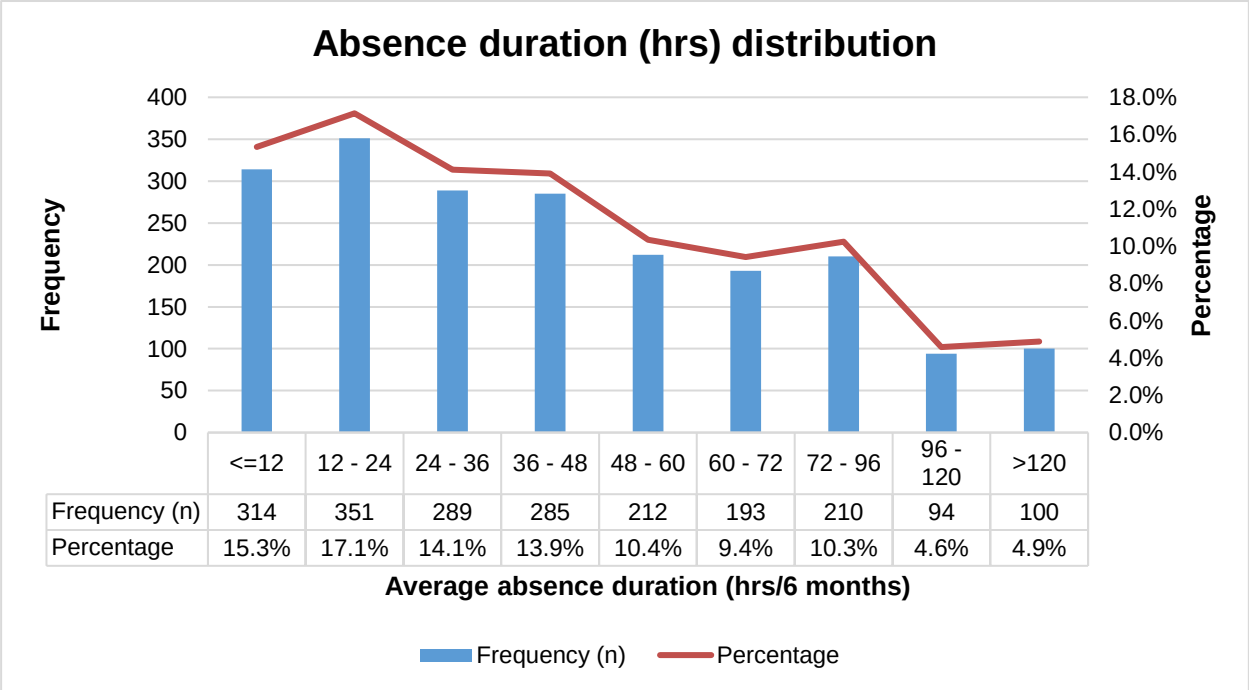
Figure 4-7 reflects that the average (6-monthly) frequency of absence distribution throughout the study of the population consisted of 16.4% (n=336) of employees being absent between 2.29 – 3.14 times, 16.1% (n=329) of employees being absent between 0.86 – 1.14 times, 16.0% (n=328) of employees being absent between 2.01 – 2.28 times, 15.1% (n=310) of employees being absent between 0.29 – 0.85 times, 14.9% (n=306) of employees being absent between 1.15 – 2.00 times, 10.7% (n=220) of employees being absent between 3.15 – 6.00 times, 5.8% (n=118) of employees being absent less than 0.28 times, 3.2% (n=66) of employees being absent between 6.01 – 8.00 times and 1.7% (n=35) of employees being absent more than 8.00 times within six months.

4.3.1.7.1 Discussion of absence frequency rate results

The absence frequency rate results indicate a fairly uniform distribution of absence frequency rates for average frequencies ranging between 0.29 to 3.14 absences in a six months duration. This lower end of this range translates to approximately one absence in a two-year duration while the upper end of this range relates to one absence every second month. Approximately 4.9% (3.2% + 1.7%) of the population recorded an average frequency rate exceeding six absences within six months. This relates to 101 individuals that on average record at least one absence every month for the duration of the investigation. This highlights the extent of the absenteeism dilemma within the organisation that was referred to in chapter 2.

4.3.1.8 Absence duration

The illustrations below are the presentation of the absence duration distributions of the individuals within the population and are reported in average six-month absence durations. The absence duration is reported in two different manners due to the difference in work hours arrangements. There are both shift workers (continues operation) that work 12-hour shifts, both dayshift and night shift, according to different shift rosters and then there are normal dayshift workers working Mondays to Fridays according to work hour arrangements. The absence duration includes all unplanned leave absences (sick leave, family care, short time, compassionate leave and absence without official leave).



	<=12	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 96	96 - 120	>120
Frequency (n)	314	351	289	285	212	193	210	94	100
Percentage	15.3%	17.1%	14.1%	13.9%	10.4%	9.4%	10.3%	4.6%	4.9%

Figure 4-8: Absence duration distribution (hrs)

Figure 4-8 reflects that the average (6-monthly) total absence duration distribution throughout the study of the population consisted of 17.1% (n=351) of employees being absent between 12 – 24 hours, 15.3% (n=314) of employees being absent less than 12 hours, 14.1% (n=289) of employees being absent between 24 – 36 hours, 13.9% (n=285) of employees being absent between 36 – 48 hours, 10.4% (n=212) of employees being absent between 48 – 60 hours, 10.3% (n=210) of employees being absent between 72 – 96 hours, 9.4% (n=193) of employees being absent between 60 – 72 hours, 4.9% (n=100) of employees being absent more than 120 hours and 4.6% (n=94) of employees being absent between 96 – 120 hours within six months.

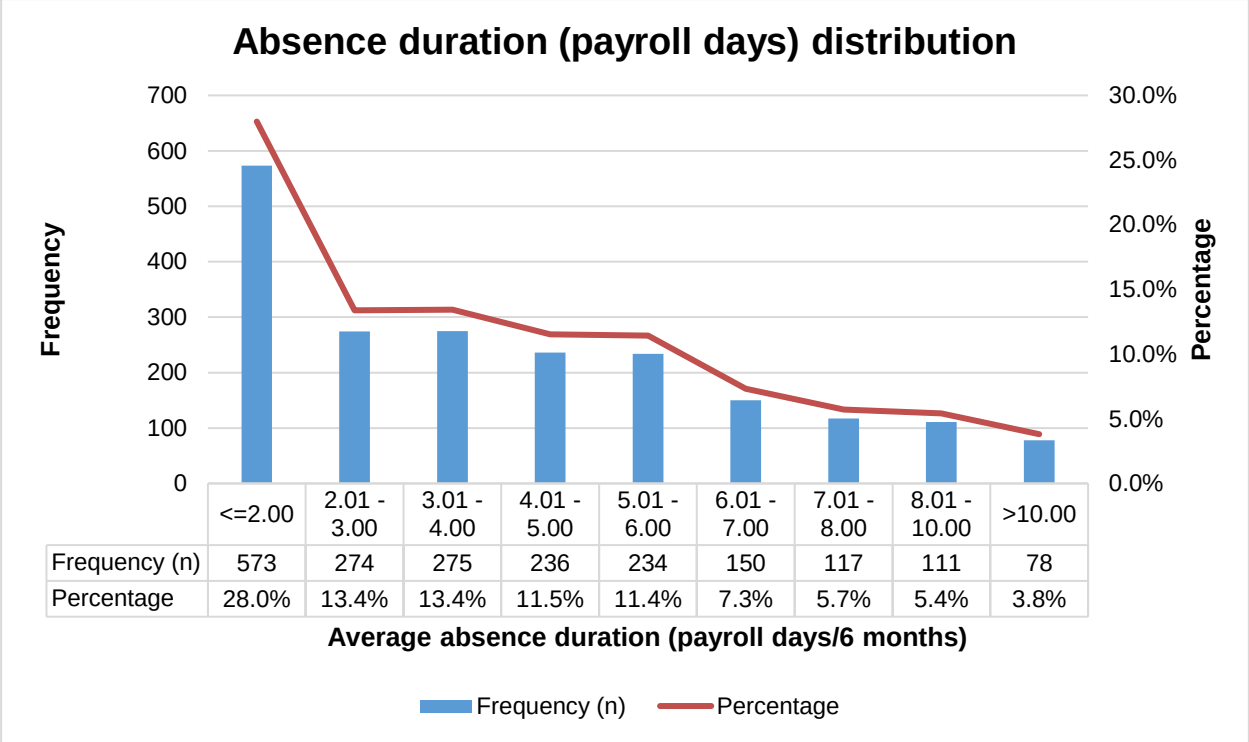


Figure 4-9: Absence duration distribution (payroll days)

Figure 4-9 reflects that the average (6-monthly) total absence duration distribution throughout the study of the individuals within the population consisted of 28.0% (n=573) of employees being absent less than two payroll days, 13.4% (n=275) of employees being absent between 3.01 – 4.00 payroll days, 13.4% (n=274) of employees being absent between 2.01 – 3.00 payroll days, 11.5% (n=236) of employees being absent between 4.01 – 5.00 payroll days, 11.4% (n=234) of employees being absent between 5.01 – 6.00 payroll days, 7.3% (n=150) of employees being absent between 6.01 – 7.00 payroll days, 5.7% (n=117) of employees being absent between 7.01 – 8.00 payroll days, 5.4% (n=111) of employees being absent between 8.01 – 10.00 payroll days and 3.8% (n=78) of employees being absent more than 10.00 payroll days within six months.

4.3.1.8.1 Discussion of absence duration results

The absence duration results illustrated that the biggest number of individuals recorded average absences of two payroll days or less within six months and the number of individuals per duration category reduced as the average absence duration increased. The average absence duration reported in terms of absence hours followed a similar trend. When applying the organisational absence management guidelines or target for conducting interventions (above seven days per six-month duration), the results indicate that 14.9% (5.7% + 5.4% + 3.8%) of the population have exceeded the average absence duration of more than seven absence days over six months for the duration of the study and therefore 306 individuals need to have been at or close to the fourth intervention. This is an illustration that the current organisational absence behaviour does follow the Pareto principle in terms of identifying individuals with high absence behaviour.

When comparing the frequencies of the average absence duration hours with the payroll days, it becomes evident that the payroll days frequency is significantly lower than the frequency reported in the hours. The frequency of the more than 120 hours is reported at 4.9% or 100 individuals while the frequency of more than 10 payroll days is reported at 3.8% or 78 individuals. This is an indication that the actual extent of absenteeism and the impact on the organisation may be understated.

4.3.1.9 Descriptive statistics summary of biographical, demographical and organisational data

According to Laerd Statistics (2018), descriptive statistics are a term given to the analysis of data to assist in describing, showing and summarizing the data in a meaningful way that can be useful for the emergence of patterns amongst other things. Descriptive statistics enables a simplified manner for data presentation that also simplify the interpretation of the data. Table 4-2 below presents the descriptive statistics for the data presented above:

Table 4-2: Descriptive statistics summary (individual level)

	N	Minimum	Maximum	Mean	Std. Deviation
Age of individuals(years)	1946	21.00	66.00	42.00	9.91
Service years of individuals (years)	1946	0.00	45.00	14.70	9.97
Frequency rate of absences per individual (absences/6months)	2048	0.29	20.57	2.54	2.01
Duration of absences per individual (hrs/6months)	2048	0.07	500.57	48.17	42.46
Duration of absences per individual (payroll days/6months)	2048	0.01	29.14	4.18	3.05

The standard deviation presents the spread of the data or how far the data is spread out. From the table above, each of the variable fields is interpreted to acquire a better understanding of the data that has been presented.

4.3.2 Absence data

The following absence data were included within the study framework and are represented in the subsequent sections: absence type, day of absence (capture as the first day of the absence), the month of absence (captured as the month of the first day of absence) and duration of individual absences (captured in payroll days).

4.3.2.1 Absence type

All forms of absences that were deemed as unplanned were included in the data set to be analysed, seeing that the definition of absenteeism includes all unplanned absences. The organisation where the study was conducted only utilise sick leave absences in absenteeism management and don't differentiate between planned and unplanned sick leave. Table 4-3 below reflects all the unplanned absences for the population for the period of the study according to the different absence type classification being utilised at the organisation under investigation.

Table 4-3: Absence type distribution

Absence type	Frequency	Percentage
Sick leave - part day	2488	13.65%
Sick with Note	2743	15.05%
Sick no Note(>2days)	16	0.09%
Sick no Note(<=2days)	748	4.10%
Sick no Note<=2d(Shift<6)	828	4.54%
Sick with Note (Shift<6)	5268	28.90%
Sick no Note>2d(Shift<6)	14	0.08%
Family Care Leave	2649	14.53%
Family Care - Part day	961	5.27%
Short time (< 1day)	1731	9.50%
Unpaid sick leave <=120 d	62	0.34%
A.W.O.L.	142	0.78%
Compassionate leave	109	0.60%
Compassionate Leave (No QTA)	430	2.36%
Compassionate Part Day	35	0.19%
Comp Part Day (No QTA)	6	0.03%
Total	**18230**	**100.00%**

The total number of absences recorded for the period of the study came in at 18,230 with the highest recorded absence being sick leave for shift workers with a note at 28.90% (n=5268) followed by sick leave for non-shift workers with a note at 15.05% (n=2743). The third highest absence recorded was family care leave with 14.53% (n=2649) of the total absences. To simplify the presentation of the absence type data the data were combined into the following groups:

- **Part day sick leave**: Sick leave - part day
- **Sick with note**: Sick with note and Sick with note (Shift<6)
- **Sick no note**: Sick no Note(>2days), Sick no Note(<=2days), Sick no Note<=2d(shift<6) and Sick no Note>2d(shift<6)
- **Family care leave**: Family Care Leave and Family Care - Part day
- **Unpaid leave**: Short time (< 1day), Unpaid sick leave <=120 d and A.W.O.L
- **Compassion leave:** Compassionate leave, Compassionate Leave (No QTA), Compassionate Part Day and Comp Part Day (No QTA)

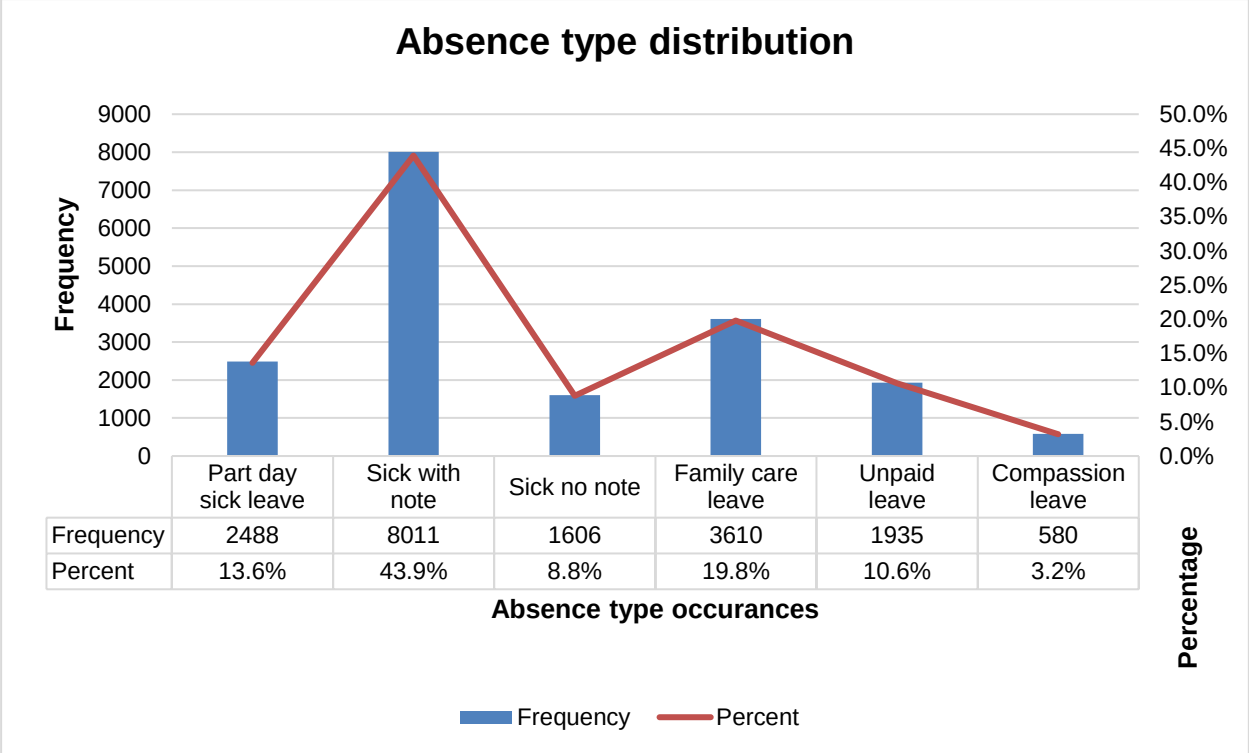


Figure 4-10: Absence type distribution

Figure 4-10 reflects that the absence type distribution of al of the absences for the population consisted of 43.9% (n=8011) being sick leave with a note, 19.8% (n=3610) being family care leave, 13.6% (n=2488) being part day sick leave, 10.6% (n=1935) being unpaid leave, 8.8% (n=1606) being sick leave with without a note and 3.2% (n=580) being compassionate leave.

The table below is an illustration of the total absence duration according to the absence type distribution and subdivision of individuals into groups that are based on the individuals' average absence duration during the span of the investigation. The three groups are individuals with more than seven payroll days per six months (n = 306), individuals with between four and seven payroll days per six months (n = 647) and individuals with less than four payroll days per six months (n = 1095).

Table 4-4: Total absence duration according to the absence type and absence utilisation group (payroll days)

	Total absence duration during the investigation period (payroll days)							
	Total population		Individuals with more than 7 payroll days/6months (High utilisation)		Individual with 4 to 7 payroll days/6months (Medium utilisation)		Individuals with less than 4 payroll days/6months (Low utilisation)	
	payroll days	%	payroll days	%	payroll days	%	payroll days	%
Part day sick leave	961.2	3.2%	236.1	2.3%	369.5	3.1%	355.6	4.6%
Sick with note	20793.0	69.4%	7573.5	74.7%	8364.5	69.4%	4855.0	62.6%
Sick no note	2006.0	6.7%	526.0	5.2%	834.0	6.9%	646.0	8.3%
Family care leave	4085.9	13.6%	992.5	9.8%	1737.3	14.4%	1356.1	17.5%
Unpaid leave	572.3	1.9%	359.5	3.5%	128.2	1.1%	84.7	1.1%
Compassion leave	1538.8	5.1%	453.3	4.5%	621.2	5.2%	464.3	6.0%
Total	29957.3	100%	10140.9	100%	12054.8	100%	7761.7	100%

Table 4-4 reflects that individuals with higher absence utilisation record less part day sick leave (2.3%) than the medium utilisation (3.1%) and low utilisation (4.6%) groups. The high absence utilisation group recorded a higher percentage of sick with note type absences (74.7%) compared to the medium utilisation (69.4%) and low utilisation (62.6%) groups. The high absence utilisation group recorded a lower percentage of sick no note type absences (5.2%) compared to the medium utilisation (6.9%) and low utilisation (8.3%) groups. The high absence utilisation group recorded a lower percentage of sick no note type absences (5.2%) compared to the medium utilisation (6.9%) and low utilisation (8.3%) groups. The high absence utilisation group recorded a lower percentage of family care leave type absences (9.8%) compared to the medium utilisation (14.4%) and low utilisation (17.5%) groups. The high absence utilisation group recorded a higher percentage of unpaid leave type absences (3.5%) compared to the medium utilisation (1.1%) and low utilisation (1.1%) groups. The high absence utilisation group recorded a lower percentage of compassionate leave type absences (4.5%) compared to the medium utilisation (5.2%) and low utilisation (6.0%) groups. The total contribution towards unplanned absences is considerably higher for the high absence utilisation group (10,140.9 payroll days or 33.9% of total absence duration) compared to the medium

utilisation group (12,054.8 payroll days or 40.2% of total absence duration) and the low utilisation group (7,761.65 payroll days or 25.9% of total absence duration).

The following table is an illustration of the total absence duration according to the absence type distribution and subdivision of individuals into groups that are based on the individuals' average absence duration during the span of the investigation normalized to indicate the results per one individual.

Table 4-5: Normalized total absence duration according to the absence type and absence utilisation group (payroll days/individual)

	Total absence duration during investigation period per individual (payroll days/individual)			
	Total population	**Individuals with more than 7 days/6months**	**Individual with 4 to 7 days/6months**	**Individuals with less than 4 days/6months**
Part day sick leave	0.47	0.77	0.57	0.32
Sick with note	10.15	24.75	12.93	4.43
Sick no note	0.98	1.72	1.29	0.59
Family care leave	2.00	3.24	2.69	1.24
Unpaid leave	0.28	1.17	0.20	0.08
Compassion leave	0.75	1.48	0.96	0.42
Total	14.63	33.14	18.63	7.09

Table 4-5 reflects that individuals with higher absence utilisation records higher absence durations in all unplanned absence types. From the table above, it is clear that unplanned absence utilisation (regardless of type) has a direct relationship with average absence duration on an individual level. An increase in average absence duration reflects an increase in all absence types' utilisation per individual.

4.3.2.1.1 Discussion of absence type distribution results

The absence type distribution results indicate that the absence due to illness (captured as sick leave) contribute to 66.4% of absenteeism related absences. The absences due to family-related matters contributed towards 19.8% of absence events. As stated in chapter 2 and considering that family care leave is not currently incorporated or included in the organisational absence management policy, highlights a deficiency in identifying the holistic state of absenteeism within the organisation.

The unpaid leave absences contribute to 10.6% of absences of which the majority is as a result of short time (9.5%) absences. This is another absence type that is not catered for the organisational policy that is also considered an indication of a high absence behaviour.

The companionate leave contributes to 3.2% of absences seeing as this absence type is also considered as being an unplanned absence. This absence type is considered an involuntary absence type as defined in chapter 2 and therefore is not within the organisation's ability to influence or improve the individuals' absence behaviour.

4.3.2.2 Day of absence

The illustration below is the presentation of the first day of absence distribution of the population's absences during the period of the investigation. The population consists of both dayshift workers working Mondays to Fridays with weekends and public holidays being off days and shift workers that work both day and night shifts. The shift workers' schedules result in shift changes on Mondays, Wednesdays and Fridays.

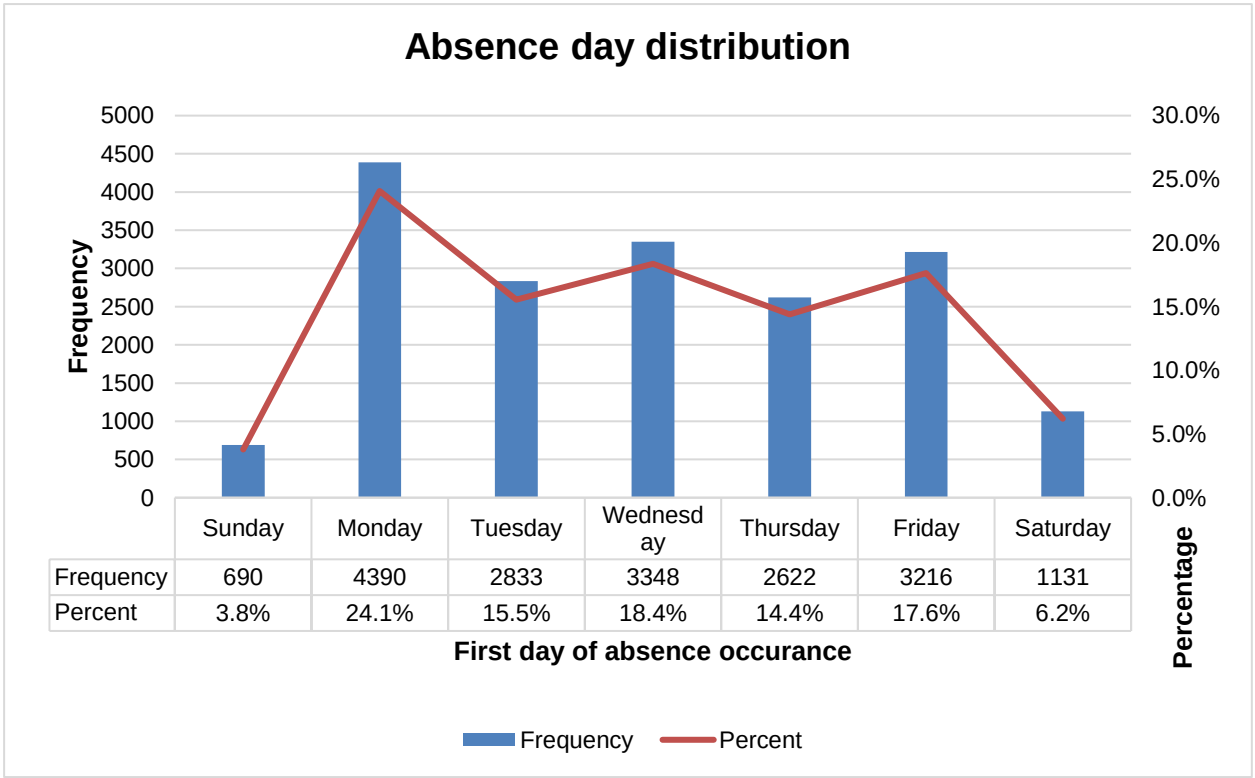


Figure 4-11: Absence day distribution

Figure 4-11 illustrates that the first day of absence distribution of al of the absences for the population consisted of 24.1% (n=4390) occurring on Mondays, 18.4% (n=3348)

occurring on Wednesdays, 17.6% (n=3216) occurring on Fridays, 15.5% (n=2883) occurring on Tuesdays, 14.4% (n=2622) occurring on Thursdays, 6.2% (n=1131) occurring on Saturdays and 3.8% (n=390) occurring on Sundays.

4.3.2.2.1 Discussion of day of absence results

The day of absence results indicates that the three days with the highest frequency of absences are related to the shift change over days and are Mondays, Wednesdays and Fridays. Mondays recorded the highest frequency of absences and can be contributed due to non-shift workers starting work on Mondays as well. These results, therefore, indicate higher frequencies for absences on the first day back after the scheduled off days and support previous findings discussed in the literature review in chapter two.

4.3.2.3 Month of absence

The illustration below is the presentation of the month of absence distribution of the population's absences during the period of the investigation. Due to the COVID-19 pandemic, the investigation period excluded the duration of the lockdown resulting data from 27 March until 30 June 2020 was excluded. This was done to remove the effects of the COVID-19 pandemic from the data analysis.

Table 4-6: Month of absence distribution

Month of absence	Frequency	Percentage
January	1735	9.5%
February	1573	8.6%
March	1510	8.3%
April*	827	4.5%
May*	927	5.1%
June*	816	4.5%
July	1851	10.2%
August	1806	9.9%
September	1789	9.8%
October	2029	11.1%
November	1878	10.3%
December	1489	8.2%
Total	18230	100.0%
Note: * -Indication of months with only one year's data		

The results were normalized to make an informed interpretation by averaging the absences and presenting the results in monthly averages. The illustration below is the

indication of the normalized results relating to the month within which the first day of absence occurs. Should an absence's period be from the last day of a month and continues into the following month the absence is captured to have started in the prior month.

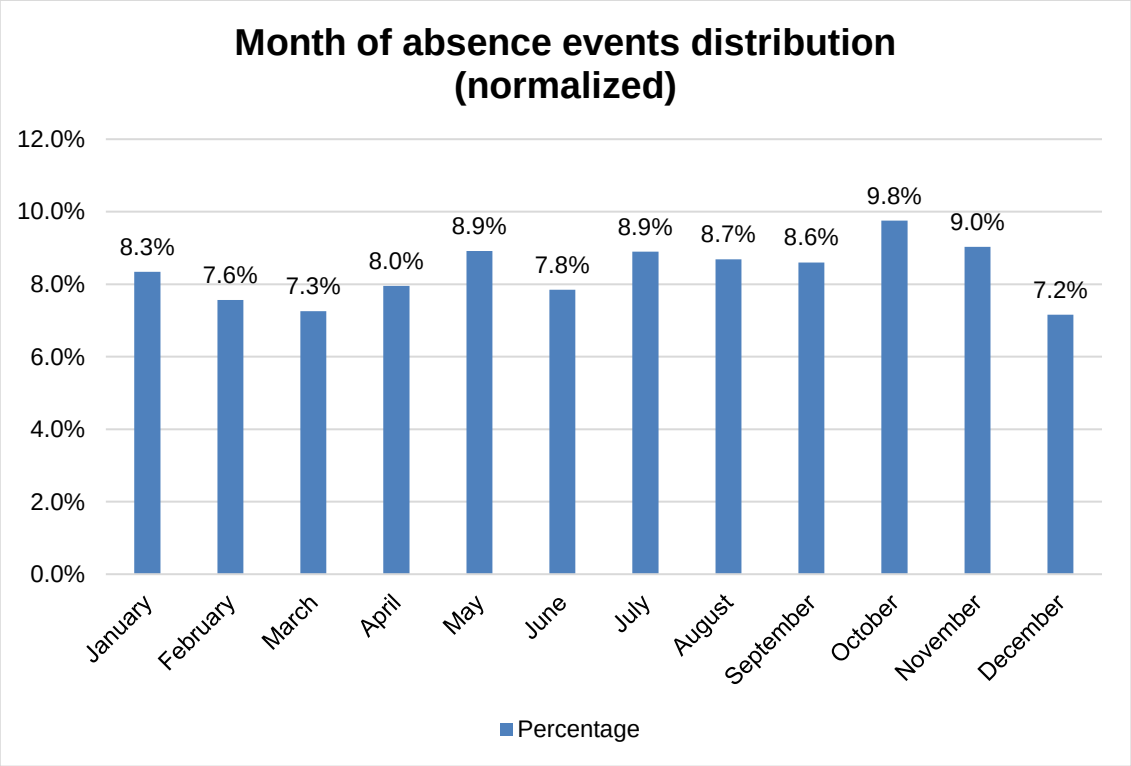


Figure 4-12: Month of absence distribution (normalized)

Figure 4-12 illustrates that the month of absence distribution of al of the absences for the population consisted of 9.8% occurring in October, 9.0% occurring in November, 8.9% occurring in May and July, 8.7% occurring in August, 8.6% occurring September, 8.3% occurring in January, 8.0% occurring in April, 7.6% occurring in February, 7.3% occurring in March and 7.2% in December.

Based on a finding of Ticharwa *et al.* (2019) stated in chapter two that found that absence behaviour follows a seasonal trend with the highest absence hours being recorded during the winter months, the month of absence based on absence hours were included into the investigation. The illustration below is a presentation of absence hours based on the month of the year, and due to the implementation of the lockdown the absence hours were normalized by averaging the hours.

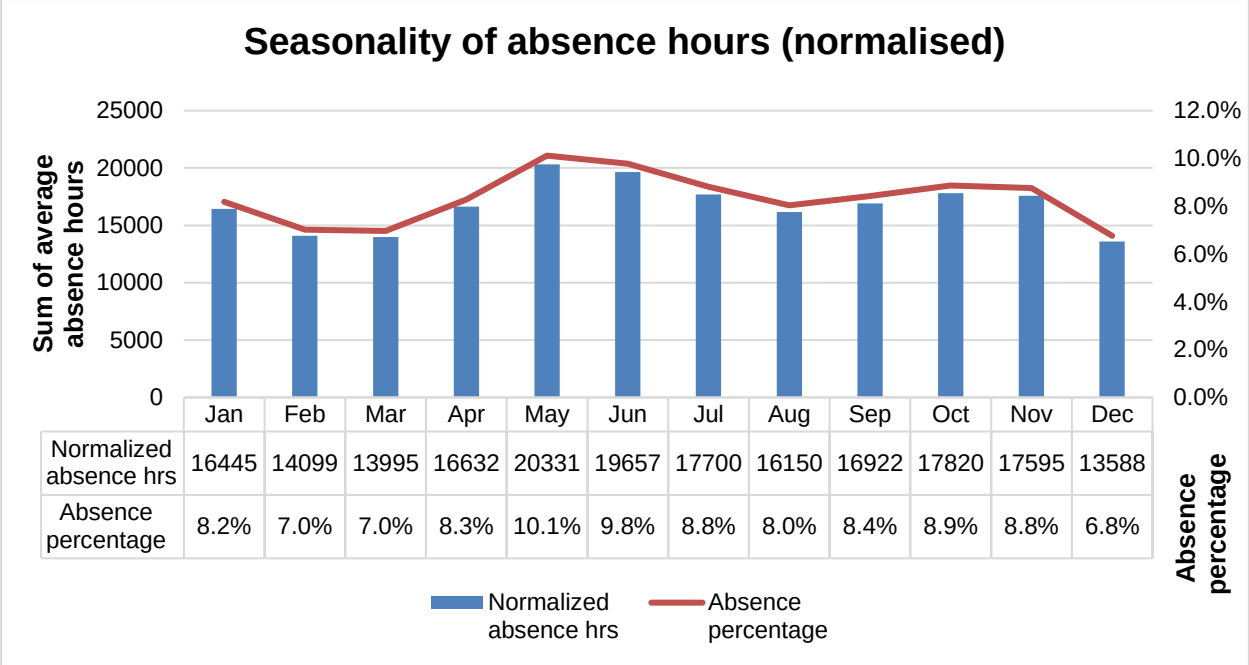


Figure 4-13: Seasonality of absence behaviour

Figure 4-13 illustrates that the absence hours in May, June and July represent three of the four highest absence hours month while December, January, February and March contain three of the four lowest absence hours months.

4.3.2.3.1 Discussion of month of absence results

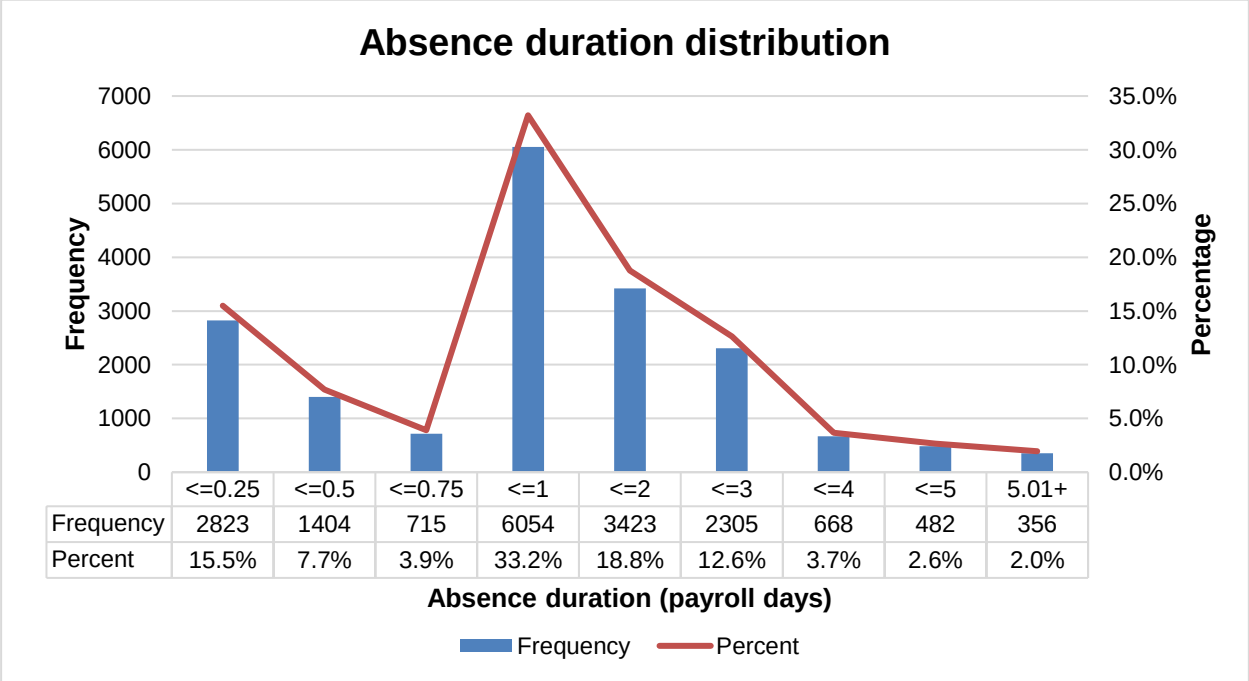
The month of absence results indicates slightly higher absence events in October and November and the lowest number of absence events in December. The difference in the monthly absence events are small and therefore, not considered as a significant finding. It was expected to see a seasonal trend for absence behaviour as stated in the literature review in chapter two. However, there is no such definitive evidence being illustrated in the absence of events results.

The month of absence hours, however, does illustrate seasonality with the dataset capturing a higher amount of absence hours during the winter months and lowers the number of absence hours during the summer months.

The explanation to the reasoning behind why the absence events don't follow seasonality, but the total hours do is attributed to the difference in the absence duration. Even though there are fewer absence events during the winter months, the total duration of the absences exceeds that being recorded during summer months and could be attributed to longer recuperation times required in the winter months.

4.3.2.4 Absence duration

The illustration below is the presentation of the absence duration distribution of the population's absences during the period of the study reported in payroll days per absence.



	<=0.25	<=0.5	<=0.75	<=1	<=2	<=3	<=4	<=5	5.01+
Frequency	2823	1404	715	6054	3423	2305	668	482	356
Percent	15.5%	7.7%	3.9%	33.2%	18.8%	12.6%	3.7%	2.6%	2.0%

Figure 4-14: Absence duration distribution (payroll days/absence)

Figure 4-13 illustrates that the absence duration per absence distribution of al of the absences for the population consisted of 33.1% (n=6054) ranging between 0.76 - 1.00 payroll days, 18.8% (n=3423) ranging between 1.01 - 2.00 payroll days, 15.5% (n=2823) less than 0.25 payroll days, 12.6% (n=2305) ranging between 2.01 - 3.00 payroll days, 7.7% (n=1404) ranging between 0.26 - 0.50 payroll days, 3.9% (n=715) ranging between 0.51 – 0.75 payroll days, 3.7% (n=668) ranging between 3.01 - 4.00 payroll days, 2.6% (n=482) ranging between 4.01 - 5.00 payroll days and 2.0% (n=356) more than 5.01 payroll days per absence.

To gauge the magnitude of the absences of the different duration categories, the actual absence duration for each category was summated and presented in table 4-7 below:

Table 4-7: Summated absence duration per category

Payroll day/absence Category	Sum of absences (payroll days)	Percentage
<=0.25	281.6	1.0%
<=0.5	528.5	1.8%
<=0.75	441.0	1.5%
<=1	6008.3	20.6%
<=2	6008.3	20.6%
<=3	6915.0	23.7%
<=4	2672.0	9.2%
<=5	2386.5	8.2%
5.01+	3925.0	13.5%
Total	29166.2	100.0%

Based on the data above the absence category that contributed to the highest total absence duration was the absence duration ranging from 2.01 – 3.00 payroll days with 23.7% (6915.0 payroll days) of the total duration, followed by both absences ranging from 0.76 – 1.00 and 1.01 – 2.00 payroll days with 20.6% (6008.3 payroll days) of the total duration in each category and then absence durations more than 5.01 payroll days with 13.5% (3925.0 payroll days) of the total absence durations.

4.3.2.4.1 Discussion of absence duration results

According to the literature review in chapter two, there exists an inverse relationship between absenteeism and age of the individual. Table 4-8 is an illustration of the events relating to absence duration per age group. The age group less than 24 years have a higher percentage absences less than 0.25 payroll days per absence (31% of absence events) while the age groups aged more than 60 years have a low percentage of absences less than 0.25 payroll days per absence (11% and 7%). On the other hand, the age group less than 24 years have a lower percentage absences more than 3.00 payroll days per absence (4% of absence events) while the age groups aged more than 60 years have a higher percentage of absences more than 3.00 payroll days per absence (12% and 15%).

Table 4-8:Absence duration events per age group

Payroll day/ absence	<=24		25 - 29		30 - 34		35 - 39		40 - 44	
	n	%	n	%	n	%	n	%	n	%
<=0.25	45	31%	201	17%	716	19%	596	14%	377	15%
<=0.5	13	9%	83	7%	193	5%	328	8%	215	8%
<=0.75	5	3%	38	3%	139	4%	171	4%	104	4%
<=1	38	26%	435	36%	1305	34%	1499	36%	800	32%
<=2	30	20%	240	20%	768	20%	774	19%	518	20%
<=3	11	7%	130	11%	473	12%	537	13%	329	13%
<=4	1	1%	40	3%	131	3%	122	3%	88	3%
<=5	4	3%	23	2%	74	2%	69	2%	69	3%
5.01+	0	0%	6	1%	46	1%	51	1%	39	2%
Total	147	100%	1196	100%	3845	100%	4147	100%	2539	100%
	45 - 49		50 - 54		55 - 59		60 - 64		65+	
	n	%	n	%	n	%	n	%	n	%
<=0.25	234	13%	273	15%	207	14%	74	11%	4	7%
<=0.5	167	9%	179	10%	133	9%	41	6%	4	7%
<=0.75	75	4%	69	4%	52	4%	33	5%	1	2%
<=1	525	30%	593	32%	440	31%	209	32%	26	43%
<=2	335	19%	306	17%	234	16%	119	18%	8	13%
<=3	242	14%	228	12%	171	12%	98	15%	8	13%
<=4	88	5%	78	4%	72	5%	27	4%	3	5%
<=5	64	4%	59	3%	66	5%	25	4%	3	5%
5.01+	34	2%	50	3%	54	4%	27	4%	3	5%
Total	1764	100%	1835	100%	1429	100%	653	100%	60	100%

To demonstrate the trend of absence duration in comparison to the age distribution of the individuals, the table below is presented. Table 4-9 clearly illustrates, by considering the cumulative absence duration of equal and less than two payroll days, that the cumulative percentage is inverted with the age distribution. As the group increase in age, the cumulative percentage decrease. This is an indication that younger employees have shorter absences compared to older employees who then by definition by the inverted relationship have longer absences.

Table 4-9: Demonstration of absence duration based on age and cumulative absence percentage

Absence duration	Age group distribution									
	<=24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65+
<=0.25	31%	17%	19%	14%	15%	13%	15%	14%	11%	7%
<=0.5	39%	24%	24%	22%	23%	23%	25%	24%	18%	13%
<=0.75	43%	27%	27%	26%	27%	27%	28%	27%	23%	15%
<=1	69%	63%	61%	63%	59%	57%	61%	58%	55%	58%
<=2	89%	83%	81%	81%	79%	76%	77%	75%	73%	72%
<=3	97%	94%	93%	94%	92%	89%	90%	87%	88%	85%
<=4	97%	98%	97%	97%	96%	94%	94%	92%	92%	90%
<=5	100%	99%	99%	99%	98%	98%	97%	96%	96%	95%
5.01+	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

4.3.2.5 Descriptive statistics summary of absence data

The descriptive statistics on the absence events level is illustrated in the table below. Table 4-10 indicates that the mean duration for the absence events is 18.93 hours per absence or 1.64 payroll days per event depending on the capturing method utilised. Considering that the majority of the population is shift workers and a payroll day equates to 12 hours for shift workers, the two methods are closely correlated seeing as the maximum expected hours for 1.64 payroll days equals 19.68 hours. The standard deviations for the absence duration per event are reported as 31.91 hours per event and 1.93 payroll days per event. Following the same approach, as stated above the maximum expected hours for 1.93 payroll days are equal to 23.16 hours. This illustrates a much higher deviation from the mean comparison. From the standard deviations and mean values stated in the descriptive statistics, it can be concluded that the majority of absences' durations is less than 3.57 payroll days per absence, pointing to short-term absenteeism.

Table 4-10: Descriptive statistics summary (absence level)

	N	Minimum	Maximum	Mean	Std. Deviation
Absence duration (hours/absence)	18230	0	1188	18.93	31.91
Absence duration (payroll days/absence)	18230	0	31	1.64	1.93

4.4 INDEPENDENT T-TEST AND ANOVA'S

The independent t-test is utilised to compare two independent groups' mean values to establish whether there exist significant statistical differences between the two groups (Kent State University Libraries, 2020). The independent t-test can only be utilised to compare two groups' mean values, and should there be a need to compare more groups an alternative approach needs to be used. An alternative to the independent t-test is to run an ANOVA test that can compare two or more groups' mean values. The ANOVA test is an analysis of variance test and should yield the same results as the independent t-test when comparing two groups' mean values.

The effect sizes that were utilised in the interpretation of results to illustrate significant differences in the mean values used the following guidelines:

- ≈ 0.2 is an indication of a small or practically insignificant difference
- ≈ 0.5 is an indication of a medium or practically visible difference
- ≈ 0.8 is an indication of a large or practically significant difference

P-values are also reported in the results for the sake of completeness but will not be interpreted due to a census sample being utilised instead of a random sample technique.

4.4.1 Independent t-test - Gender comparison

The table below is the illustration of the results of the independent t-tests that were conducted for the gender groups (male vs female).

Table 4-11: Independent t-tests for gender

	Gender	N	Mean	Std. Deviation	p-values	Effect size
Frequency rate (absences/6 months)	Male	1727	2.543	2.005	0.010	0.186
	Female	219	2.926	2.063		
Absence duration (hrs/6 months)	Male	1727	47.957	41.443	0.400	0.051
	Female	219	50.070	34.076		
Absence duration (payroll days/6 months)	Male	1727	4.166	2.980	0.074	0.126
	Female	219	4.542	2.918		

Table 4-11 reflects that based on the effect sizes there are only small or practically insignificant differences in the mean values of the males and females concerning the frequency rate and absence duration (both hrs/six months and payroll days/six months) with all effect sizes being smaller than 0.2.

4.4.1.1 Discussion of independent t-test - Gender comparison results

The literature review in chapter 2 indicated that absenteeism is influenced by personal factors such as gender but based on the results of the independent t-test there exist no statistical difference in absence behaviour (absence frequency and duration) measurement mean values. The gender results, therefore, do not align with the findings of the literature review.

4.4.2 Independent t-test - Employee group comparison

The table below is the illustration of the results of the independent t-tests that were conducted for the employee groups (SP vs MSP).

Table 4-12 reflects that based on the effect sizes there are only small or practically insignificant differences in the mean values of the SP and MSP groups concerning the frequency rate and absence duration (payroll days/six months) and a medium or practically visible difference with regards to absence duration (hours/six months)

Based on the reported effect sizes there exist a medium or practically visible difference (d=0.405) between the SP and MSP groups concerning the absence duration (hours/six months). The SP group (mean=34.634, SD=42.934) had a lower absence duration (hours per six months) than the MSP group (mean=34.634, SD=42.934).

Table 4-12: Independent t-tests for employee group

	Employee group	N	Mean	Std. Deviation	p-values	Effect size
Frequency rate (absences/6 months)	SP	453	2.016	1.726	0.001	0.329
	MSP	1595	2.693	2.054		
Absence duration (hrs/6 months)	SP	453	34.634	42.934	0.001	0.405
	MSP	1595	52.008	41.544		
Absence duration (payroll days/6 months)	SP	453	3.610	3.476	0.001	0.210
	MSP	1595	4.341	2.896		

4.4.2.1 Discussion of independent t-test - Employee group comparison results

The employee group comparison results indicated a medium or visible difference in terms of absence duration (hours/six months). This difference could be attributed to the difference in working hour arrangements (8.5 hours per day for the majority of the SP group compared to 12 hours per shift for the majority of the MSP group), but the causality cannot be confirmed or denied by the implemented study method. The employee group can be classified as an organisational factor and must be considered in the recommendations.

4.4.3 ANOVA - Age comparison

The table below is the illustration of the results of the ANOVA test that was conducted for the employee age distribution and absence frequency rate (absences/six months) on an individual level. Table 4-13 reflects that based on the effect sizes, there are only small or practically insignificant differences in the mean values of the absence frequency (absences/six months) compared to the age distribution.

Table 4-13: ANOVA test for employee age and absence frequency rate

	Age	N	Mean	Std. Deviation	ANOVA p-value	Welch p-value	Effect size (age)						
							<= 29 with ….	<= 34 with …	<= 39 with ….	<= 44 with …	<= 49 with …	<= 54 with …	<= 59 with ….
Frequency rate (absences/6 months)	<=29	155	2.476	2.142	<0.0001	<0.0001							
	<=34	364	3.018	2.224			0.24						
	<=39	415	2.855	1.997			0.18	0.07					
	<=44	280	2.591	2.157			0.05	0.19	0.12				
	<=49	228	2.211	1.840			0.12	0.36	0.32	0.18			
	<=54	216	2.427	2.006			0.02	0.27	0.21	0.08	0.11		
	<=59	190	2.149	1.498			0.15	0.39	0.35	0.20	0.03	0.14	
	60+	98	2.079	1.387			0.19	0.42	0.39	0.24	0.07	0.17	0.05
	Total	1946	2.586	2.015									

The table below is the illustration of the results of the ANOVA test that was conducted for the employee age distribution and absence duration (hrs/ six months) on an individual level. Table 4-14 reflects that based on the effect sizes there are only small or practically insignificant differences in the mean values of the absence duration (hours/six months) compared to the age distribution.

Table 4-14: ANOVA test for employee age and absence duration (hrs/ six months) on an individual level

	Age	N	Mean	Std. Deviation	ANOVA p-value	Welch p-value	Effect size (age)						
							<= 29 with ….	<= 34 with …	<= 39 with ….	<= 44 with …	<= 49 with …	<= 54 with …	<= 59 with ….
Absence duration (hrs/6 months)	<=29	155	39.52	30.03	0.002	<0.0001							
	<=34	364	53.22	36.03			0.38						
	<=39	415	48.05	36.55			0.23	0.14					
	<=44	280	48.53	47.36			0.19	0.10	0.01				
	<=49	228	40.79	35.96			0.04	0.34	0.20	0.16			
	<=54	216	49.35	44.34			0.22	0.09	0.03	0.02	0.19		
	<=59	190	50.87	50.15			0.23	0.05	0.06	0.05	0.20	0.03	
	60+	98	52.38	45.55			0.28	0.02	0.10	0.08	0.25	0.07	0.03
	Total	1946	48.19	40.68									

The table below is the illustration of the results of the ANOVA test that was conducted for the employee age distribution and absence duration (payroll days/ six months) on an individual level.

Table 4-15:ANOVA test for employee age and absence duration (payroll days/ six months) on an individual level

	Age	N	Mean	Std. Deviation	ANOVA p-value	Welch p-value	Effect size (age)						
							<= 29 with ….	<= 34 with …	<= 39 with ….	<= 44 with …	<= 49 with …	<= 54 with …	<= 59 with ….
Absence duration (payroll days/6 months)	<=29	155	3.45	2.32	0.002	<0.0001							
	<=34	364	4.61	2.69			0.43						
	<=39	415	4.33	2.84			0.31	0.10					
	<=44	280	4.15	3.13			0.22	0.15	0.06				
	<=49	228	3.80	3.00			0.12	0.27	0.18	0.11			
	<=54	216	4.35	3.40			0.26	0.08	0.01	0.06	0.16		
	<=59	190	4.13	3.23			0.21	0.15	0.06	0.00	0.10	0.06	
	60+	98	4.38	3.19			0.29	0.07	0.02	0.07	0.18	0.01	0.08
	Total	1946	4.21	2.97									

Table 4-15 reflects that based on the effect sizes there are only small or practically insignificant differences in the mean values of the absence duration (payroll days/six months) compared to the age distribution.

4.4.3.1 Discussion of ANOVA - Age comparison results

As stated in the literature review in chapter 2 it was expected to find evidence of statistical differences in absenteeism measurements based on the age of the individuals included in the study seeing that there exist trends in absenteeism based on age in another study. The results of the ANOVA test found only small or practically insignificant differences in the mean values of the absence frequency and duration based on the different age groups.

4.4.4 ANOVA – Service years comparison

The table below is the illustration of the results of the ANOVA test that was conducted for the service years distribution and absence frequency rate (absences/six months) on an individual level.

Table 4-16:ANOVA test for employee service years and absence frequency rate

	Service years	N	Mean	Std. Deviation	ANOVA p-value	Welch p-value	Effect size (service years)					
							<= 2 with …	<= 6 with …	<= 9 with …	<= 14 with …	<= 19 with …	<= 24 with …
Frequency rate (absences/6 months)	<=2	161	1.949	1.822	<0.0001	<0.0001						
	<=6	267	3.104	2.379			0.49					
	<=9	257	3.140	2.054			0.58	0.01				
	<=14	497	2.726	2.078			0.37	0.16	0.20			
	<=19	238	2.577	1.844			0.34	0.22	0.27	0.07		
	<=24	166	2.258	1.612			0.17	0.36	0.43	0.23	0.17	
	25+	360	2.056	1.714			0.06	0.44	0.53	0.32	0.28	0.12
	Total	1946	2.586	2.015								

Table 4-16 reflects that based on the effect sizes there are mostly small or practically insignificant differences and three medium or practically visible differences in the mean values of the absence frequency rate (absences/six months) compared to the service years groups.

Based on the reported effect size there exist medium or practically visible differences (d=0.49 and d=0.58) between the groups with service years of equal or less than two years' service and the groups with more than two years' service but less than or equal to nine years' service when considering absence frequency rate. The less or equal to two service years' group (mean=1.949, SD=1.822) had a lower absence frequency rate than the two to six service years' group (mean=3.104, SD=2.379) and the six to nine years' service group (mean=3.140, SD=2.054).

Based on the reported effect size there exist a medium or practically visible differences (d=0.53) between the six to nine service years group and the 25+ service years group when considering absence frequency rate. The six to nine service years group (mean=3.140, SD=2.054) had a higher absence frequency rate than the 25+ service years group (mean=2.056, SD=1.714).

The table below is the illustration of the results of the ANOVA test that was conducted for the service years distribution and absence duration (hours per six months) on an individual level.

Table 4-17: ANOVA test for service years and absence duration (hrs/ six months) on an individual level

	Service years	N	Mean	Std. Deviation	ANOVA p-value	Welch p-value	Effect size (service years)					
							<= 2 with …	<= 6 with …	<= 9 with …	<= 14 with …	<= 19 with …	<= 24 with …
Absence duration (hrs/6 months)	<=2	161	35.28	38.42	<0.0001	<0.0001						
	<=6	267	50.66	34.71			0.40					
	<=9	257	54.09	33.70			0.49	0.10				
	<=14	497	49.95	41.37			0.35	0.02	0.10			
	<=19	238	44.96	32.33			0.25	0.16	0.27	0.12		
	<=24	166	50.76	56.01			0.28	0.00	0.06	0.01	0.10	
	25+	360	46.47	44.58			0.25	0.09	0.17	0.08	0.03	0.08
	Total	1946	48.19	40.68								

Table 4-17 reflects that based on the effect sizes there are mostly small or practically insignificant differences and one medium or practically visible difference in the mean values of the absence duration (hours/six months) compared to the service years groups.

Based on the reported effect size there exist a medium or practically visible differences (d=0.49) between the of equal or less than two years' service group and the six to nine years' service group when considering absence duration (hours/ six months). The equal or less than two years' service group (mean=35.28, SD=38.42) had a lower absence duration than the six to nine years' service group (mean=54.09, SD=33.70).

The table below is the illustration of the results of the ANOVA test that was conducted for the service years distribution and absence duration (payroll days per six months) on an individual level.

Table 4-18 reflects that based on the effect sizes there are mostly small or practically insignificant differences and two medium or practically visible differences in the mean values of the absence duration (payroll days/six months) compared to the service years groups. Based on the reported effect size there exist medium or practically visible differences (d=0.54 and d=0.66) between the groups with service years of equal or less than two years' service and the groups with more than two years' service but less than or equal to nine years' service when considering absence duration (payroll days/six months). The less or equal to two service years' group (mean=3.012, SD=2.515) had a lower

absence duration than the two to six service years' group (mean=4.596, SD=2.914) and the six to nine years' service group (mean=4.725, SD=2.592).

Table 4-18:ANOVA test for service years and absence duration (payroll days/ six months) on an individual level

	Service years	N	Mean	Std. Deviation	ANOVA p-value	Welch p-value	Effect size (service years)					
							<= 2 with …	<= 6 with …	<= 9 with …	<= 14 with …	<= 19 with …	<= 24 with …
Absence duration (payroll days/6 months)	<=2	161	3.012	2.515	<0.0001	<0.0001						
	<=6	267	4.596	2.914			0.54					
	<=9	257	4.725	2.592			0.66	0.04				
	<=14	497	4.314	2.966			0.44	0.10	0.14			
	<=19	238	4.255	2.900			0.43	0.12	0.16	0.02		
	<=24	166	4.062	2.833			0.37	0.18	0.23	0.08	0.07	
	25+	360	3.977	3.407			0.28	0.18	0.22	0.10	0.08	0.03
	Total	1946	4.208	2.974								

4.4.4.1 Discussion of ANOVA – Service years comparison results

The results of the service years comparison indicated that almost all of the visible differences involved the group with less or equal to two years' service. In all instances, the differences indicated that the less or equal to two years' service group had lower/the lowest absenteeism measurement results based on both absence frequency and duration. The literature review in chapter two indicated a social phycological approach to absenteeism being presented as a result of a social norm of acceptable absence behaviour within the organisation. The result presented above could be an indication of the presence of a social norm as a cause of high absence behaviour within the organisation, but due to the limitations of this study method (only being able to confirm the relationship and not causality), the cause would need to be confirmed through a qualitative study method.

4.4.5 ANOVA – Division comparison

The table below is the illustration of the results of the ANOVA test that was conducted for the divisional distribution and absence frequency rate (absence/six months) on an individual level.

Table 4-19: ANOVA test for divisional distribution and absence frequency rate (absences/six months) on an individual level

	Division	N	Mean	Std. Deviation	ANOVA p-value	Welch p-value	Effect size	
							Operations A with….	Operations B with….
Frequency rate (absences/6 months)	Operations W&S	478	2.80	2.37	0.001	0.002		
	Operations G/L	861	2.54	1.99			0.11	
	Operations Mid	709	2.37	1.72			0.18	0.09
	Total	2048	2.54	2.01				

Table 4-19 reflects that based on the effect sizes there are only small or practically insignificant differences in the mean values of the absence frequency rates (absences/six months) compared to the divisional distribution seeing as all effect sizes reporting low values.

The table below is the illustration of the results of the ANOVA test that was conducted for the divisional distribution and absence duration (hours/six months) on an individual level.

Table 4-20:ANOVA test for divisional distribution and absence duration (hours/six months) on an individual level

	Division	N	Mean	Std. Deviation	ANOVA p-value	Welch p-value	Effect size	
							Operations A with….	Operations B with….
Absence duration (hrs/6 months)	Operations A	478	2.80	2.37	0.018	0.021		
	Operations B	861	2.54	1.99			0.10	
	Operations C	709	2.37	1.72			0.04	0.12
	Total	2048	2.54	2.01				

Table 4-20 reflects that based on the effect sizes there are only small or practically insignificant differences in the mean values of the absence duration (hours/six months) compared to the divisional distribution seeing as all effect sizes reporting low values.

The table below is the illustration of the results of the ANOVA test that was conducted for the divisional distribution and absence duration (payroll days/six months) on an individual level.

Table 4-21: ANOVA test for divisional distribution and absence duration (payroll days/six months) on an individual level

	Division	N	Mean	Std. Deviation	ANOVA p-value	Welch p-value	Effect size	
							Operations W&S with….	Operations G/L with….
Absence duration (payroll days/6 months)	Operations A	478	2.80	2.37	0.051	0.047		
	Operations B	861	2.54	1.99			0.11	
	Operations C	709	2.37	1.72			0.00	0.10
	Total	2048	2.54	2.01				

Table 4-21 reflects that based on the effect sizes there are only small or practically insignificant differences in the mean values of the absence duration (payroll days/six months) compared to the divisional distribution seeing as all effect sizes reporting low values.

4.4.5.1 Discussion of ANOVA – Division comparison results

Based on the ANOVA results above there is no evidence of statistical differences between the mean values of the different absenteeism measurements and therefore it is concluded that the organisational factor as a result of different operational areas and management teams does not indicate any difference in absence behaviour of the individuals within the population.

4.4.6 ANOVA – Role category comparison

The table below is the illustration of the results of the ANOVA test that was conducted for the role category distribution and absence frequency rate (absences/six months) on an individual level. The role category of leadership and specialisation is reported under the category of other.

Table 4-22:ANOVA test for role category distribution and absence frequency rate (absences/six months) on an individual level

	Role category	N	Mean	Std. Deviation	ANOVA p-value	Welch p-value	Effect size				
							Optimisation with….	Execution with…	Process Optimisation with…	Process Implementation with…	Operations with…
Frequency rate (absences/6 months)	Optimisation	71	1.50	0.95	<0.0001	<0.0001					
	Execution	35	2.20	1.81			0.38				
	Process Optimisation	277	1.88	1.61			0.23	0.17			
	Process Implementation	1376	2.75	2.08			0.60	0.27	0.42		
	Operations	268	2.56	1.99			0.53	0.18	0.34	0.09	
	Other	21	1.39	1.03			0.11	0.45	0.31	0.66	0.59
	Total	2048	2.54	2.01							

Table 4-22 reflects that based on the effect sizes there are mostly small or practically insignificant differences and a few medium or practically visible differences in the mean values of the absence frequency (absences/six months) compared to the role category distribution. Based on the reported effect size there exist medium or practically visible differences (d=0.60 and d=0.53) between the optimisation group and the process

implementation and operations groups considering absence frequency rate (absences/six months). The optimisation group (mean=1.50, SD=0.95) had a lower absence frequency than the process implementation (mean=2.75, SD=2.08) and operations group (mean=2.56, SD=1.99).

Based on the reported effect size there also exist medium or practically visible differences (d=0.66 and d=0.59) between the other group (leadership and specialisation) and the process implementation and operations groups considering absence frequency rate (absences/six months). The other group (mean=1.39, SD=1.03) had a lower absence frequency than the process implementation (mean=2.75, SD=2.08) and operations group (mean=2.56, SD=1.99).

The table below is the illustration of the results of the ANOVA test that was conducted for the role category distribution and absence duration (hours/six months) on an individual level. The role category of leadership and specialisation is reported under the category of other.

Table 4-23: ANOVA test for role category distribution and absence duration (hours/six months) on an individual level

	Role category	N	Mean	Std. Deviation	ANOVA p-value	Welch p-value	Effect size				
							Optimisation with....	Execution with...	Process Optimisation with...	Process Implementation with...	Operations with...
Absence duration (hrs/6 months)	Optimisation	71	19.47	18.23	<0.0001	<0.0001					
	Execution	35	31.71	40.71			0.30				
	Process Optimisation	277	39.88	50.39			0.40	0.16			
	Process Implementation	1376	51.07	39.88			0.79	0.48	0.22		
	Operations	268	54.07	47.08			0.73	0.47	0.28	0.06	
	Other	21	16.16	12.16			0.18	0.38	0.47	0.88	0.81
	Total	2048	48.17	42.46							

Table 4-23 reflects that based on the effect sizes there are mostly small or practically insignificant differences, three medium or practically visible differences and four large or practically significant differences in the mean values of the absence duration (hours/six

months) compared to the role category distribution. Based on the reported effect size there exist large or practically significant differences (d=0.79 and d=0.73) between the optimisation group and the process implementation and operations groups considering absence duration (hours/six months). The optimisation group (mean=19.47, SD=18.23) had a lower absence duration (hours/six months) than the process implementation (mean=51.07, SD=39.88) and operations group (mean=54.07, SD=47.08).

Additionally, there also exist medium or practically visible differences (d=0.48 and d=0.47) between the execution group and the process implementation and operations groups considering absence duration (hours/six months). The execution group (mean=31.71, SD=40.71) had a lower absence duration (hours/six months) than the process implementation (mean=51.07, SD=39.88) and operations group (mean=54.07, SD=47.08).

Lastly, there a exist medium or practically visible difference (d=0.47) and large or practically significant differences (d=0.88 and d=0.81) between the other (leadership and specialisation) group and the process optimisation, process implementation and operations groups considering absence duration (hours/six months). The other group (mean=16.16, SD=12.16) had a lower absence duration (hours/six months) than the process optimisation (mean=39.88, SD=50.39), process implementation (mean=51.07, SD=39.88) and operations group (mean=54.07, SD=47.08).

The table below is the illustration of the results of the ANOVA test that was conducted for the role category distribution and absence duration (payroll days/six months) on an individual level. The role category of leadership and specialisation is reported under the category of other.

Table 4-24: ANOVA test for role category distribution and absence duration (payroll/six months) on an individual level

	Role category	N	Mean	Std. Deviation	ANOVA p-value	Welch p-value	Effect size				
							Optimisation with….	Execution with…	Process Optimisation with…	Process Implementation with…	Operations with…
Absence duration (payroll days/6 months)	Optimisation	71	2.29	2.17	<0.0001	<0.0001					
	Execution	35	3.59	3.71			0.35				
	Process Optimisation	277	3.75	3.50			0.42	0.04			
	Process Implementation	1376	4.36	2.91			0.71	0.21	0.17		
	Operations	268	4.46	3.17			0.68	0.24	0.20	0.03	
	Other	21	2.00	1.58			0.13	0.43	0.50	0.81	0.78
	Total	2048	4.18	3.05							

Table 4-24 reflects that based on the effect sizes there are mostly small or practically insignificant differences, two medium or practically visible differences and three large or practically significant differences in the mean values of the absence duration (payroll days/six months) compared to the role category distribution. Based on the reported effect size there exist a large or practically significant difference (d=0.71) and a medium or practically visible difference (d=0.68) between the optimisation group and the process implementation and operations groups considering absence duration (payroll days/six months). The optimisation group (mean=2.29, SD=2.17) had a lower absence duration (payroll days/six months) than the process implementation (mean=4.36, SD=2.91) and operations group (mean=4.46, SD=3.17).

Additionally, there also exist a medium or practically visible difference (d=0.50) and large or practically significant differences (d=0.81 and d=0.78) between the other (leadership and specialisation) group and the process optimisation, process implementation and operations groups considering absence duration (payroll days/six months). The other group (mean=2.00, SD=1.58) had a lower absence duration (payroll days/six months) than the process optimisation (mean=3.75, SD=3.50), process implementation (mean=4.36, SD=2.91) and operations group (mean=4.46, SD=3.17).

4.4.6.1 Discussion of ANOVA – Role category comparison results

The results from the role category comparison provided statistical evidence of differences in absence behaviour based on role category. The two role categories with the lowest absence behaviour (lowest absence frequency and duration) happen to be the groups with the highest organisational responsibility (other – leadership and specialisation and optimisation) while the role categories with the highest absence behaviour were identified to be the role categories with the lowest organisational responsibility. Based on the results, it is clear that there exists an inverse relationship between absence behaviour (both absence frequency and duration) and organisational responsibility based on role categories.

4.5 MIXED MODEL ANALYSIS

A mixed model analysis is a statistical tool that contains both fixed (for example, gender and age) and random effects. For the data with more than one incident per person, mixed models have been used due to the dependency (on the person) within the data. The person dependency had been taken into account by adding that as a random effect into the models, the estimated mean values for the different dependent variables had then been calculated to determine whether or not there are any differences between the mean values of the different dependent variables.

The reported p-values are indications of the statistically significant effect of the variable with a guideline for the p-value of less than 0.05, indicating statistical significance. The p-values will be reported for the sake of completeness, but due to the use of the census sample (not a random sample), the p-values will not be interpreted. Covariance parameter was estimated as an indication of the variance within the data. The interpretation of the effect sizes will follow the same approach that was stated previously and utilised in the independent t-test and ANOVA tests as an indication of difference.

The two dependent variables that were investigated were absence duration in term of hours and payroll days.

4.5.1 Mixed model analysis – Gender

A p-value of 0.147 was reported for the mixed model and used to tests for differences between genders in terms of absence duration (hours) with gender as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 747.37, and the standard error was 8.79. The covariance parameter estimate for the intercept was 316.22, and the standard error was 18.65. The table below reports the estimated mean values calculated in the mix model analysis based on gender and absence duration (hours) as well as the effect size.

Table 4-25: Estimated mean values resulting from the mixed model analysis results based on gender and absence duration (hours) as well as effect size

Absence (hours)		
Gender	**Mean**	**Effect size**
Male	21.249	0.07
Female	19.099	

Table 4-25 reflects that based on the effect size there is a small or practically insignificant difference between the mean values of the absence duration (hours) of males and females

A p-value of 0.103 was reported for the mixed model and used to tests for differences between genders in terms of absence duration (payroll days) with gender as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 3.14, and the standard error was 0.04. The covariance parameter estimate for the intercept was 0.48, and the standard error was 0.03. The table below reports the estimated mean values calculated in the mixed model analysis based on gender and absence duration (payroll days) as well as the effect size.

Table 4-26: Estimated mean values resulting from the mixed model analysis results based on gender and absence duration (payroll days) as well as effect size

Absence (payroll day)		
Gender	**Mean**	**Effect size**
Male	1.772	0.06
Female	1.662	

Table 4-26 reflects that based on the effect size there is a small or practically insignificant difference between the mean values of the absence duration (payroll days) of males and females

4.5.2 Mixed model analysis – Age

A p-value of <0.0001 was reported for the mixed model. It used to test for significant differences between age in terms of absence duration (hours) with age as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 747.88, and the standard error was 8.81. The covariance parameter estimate for the intercept was 307.50, and the standard error was 18.43. The table below reports the estimated mean values resulting from the mix model analysis based on age and absence duration (hours) as well as the effect sizes.

Table 4-27: Estimated mean values resulting from the mix model analysis based on age and absence duration (hours) as well as the effect sizes

Absence (hours)		Effect size						
Age	**Mean**	**<= 29 with ….**	**<= 34 with …**	**<= 39 with ...**	**<= 44 with …**	**<= 49 with …**	**<= 54 with …**	**<= 59 with ….**
<=29	17.76							
<=34	19.58	0.06						
<=39	18.80	0.03	0.02					
<=44	21.50	0.11	0.06	0.08				
<=49	19.69	0.06	0.00	0.03	0.06			
<=54	23.48	0.18	0.12	0.14	0.06	0.12		
<=59	25.96	0.25	0.20	0.22	0.14	0.19	0.08	
60+	27.89	0.31	0.26	0.28	0.20	0.25	0.14	0.06

Table 4-27 reflects that based on the effect sizes there are only small or practically insignificant differences between the mean values of the absence duration (hours) based on the age distribution.

A p-value of <0.0001 was reported for the mixed model. It was used to test for differences between age in terms of absence duration (payroll days) with age as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 3.14, and the standard error was 0.04. The covariance parameter estimate for the intercept was 0.45, and the standard error was 0.03. The table below reports the estimated mean values resulting from the mix model analysis based on age and absence duration (payroll days) as well as the effect sizes.

Table 4-28: Estimated mean values resulting from the mix model analysis based on age and absence duration (payroll days) as well as the effect sizes

Absence (payroll days)		Effect size						
Age	Mean	<= 29 with ….	<= 34 with …	<= 39 with ...	<= 44 with …	<= 49 with …	<= 54 with …	<= 59 with ….
<=29	1.51							
<=34	1.65	0.07						
<=39	1.61	0.05	0.02					
<=44	1.71	0.11	0.03	0.05				
<=49	1.82	0.16	0.09	0.11	0.05			
<=54	1.98	0.25	0.17	0.19	0.14	0.09		
<=59	2.02	0.27	0.20	0.22	0.16	0.11	0.02	
60+	2.27	0.40	0.33	0.35	0.29	0.24	0.15	0.13

Table 4-28 reflects that based on the effect sizes, there are only small or practically insignificant differences between the mean values of the absence duration (payroll days) based on the age distribution.

4.5.3 Mixed model analysis – Service years

A p-value of <0.0001 was reported for the mixed model. It was used to test for differences between service years in terms of absence duration (hours), with services years as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 747.92, and the standard error was 8.81. The covariance parameter estimate for the intercept was 307.21, and the standard error was 18.40. The table below reports the estimated mean values resulting from the mix model analysis based on service years and absence duration (hours) as well as the effect sizes.

Table 4-29: Estimated mean values resulting from the mix model analysis based on service years and absence duration (hours) as well as the effect sizes

Absence (hours)		Effect size					
Service years	Mean	<= 2 with…	<= 6 with….	<= 9 with…	<= 14 with….	<= 19 with….	<= 24 with….
<=2	19.8812						
<=6	18.1757	0.05					
<=9	19.3665	0.02	0.04				
<=14	20.2284	0.01	0.06	0.03			
<=19	18.9326	0.03	0.02	0.01	0.04		
<=24	26.077	0.19	0.24	0.21	0.18	0.22	
25+	25.2715	0.17	0.22	0.18	0.16	0.2	0.02

Table 4-29 reflects that based on the effect sizes, there are only small or practically insignificant differences between the mean values of the absence duration (hours) based on the service years distribution.

A p-value of <0.0001 was reported for the mixed model, and it was used to test for differences between services years in terms of absence duration (payroll days) with service years as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 3.14, and the standard error was 0.04. The covariance parameter estimate for the intercept was 0.45, and the standard error was 0.03. The table below reports the estimated mean values resulting from the mix model analysis based on service years and absence duration (payroll days) as well as the effect sizes.

Table 4-30: Estimated mean values resulting from the mix model analysis based on service years and absence duration (payroll days) as well as the effect sizes

Absence (payroll days)		Effect size					
Service years	Mean	<= 2 with…	<= 6 with….	<= 9 with…	<= 14 with….	<= 19 with….	<= 24 with….
<=2	19.8812						
<=6	18.1757	0.03					
<=9	19.3665	0.02	0.01				
<=14	20.2284	0.02	0.05	0.04			
<=19	18.9326	0.05	0.08	0.07	0.03		
<=24	26.077	0.12	0.15	0.14	0.11	0.08	
25+	25.2715	0.23	0.26	0.25	0.21	0.18	0.1

Table 4-30 reflects that based on the effect sizes there are only small or practically insignificant differences between the mean values of the absence duration (payroll days) based on the service years.

4.5.4 Mixed model analysis – Organisational division

A p-value of 0.003 was reported for the mixed model and used to test for differences between organisational divisions in terms of absence duration (hours) with the organisational division as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 814.31, and the standard error was 9.38. The covariance parameter estimate for the intercept was 327.84, and the standard error was 18.63. The table below reports the estimated mean values resulting from the mix model analysis based on organisational division and absence duration (hours) as well as the effect sizes.

Table 4-31: Estimated mean values resulting from the mix model analysis based on organisational division and absence duration (hours) as well as the effect sizes

Absence (hours)		Effect size	
Division	**Mean**	**Operations W&S with….**	**Operations G/L with….**
Operations A	19.89		
Operations B	20.31	0.01	
Operations C	23.62	0.11	0.11

Table 4-31 reflects that based on the effect sizes, there are only small or practically insignificant differences between the mean values of the absence duration (hours) based on the organisational division.

A p-value of <0.0001 was reported for the mixed model and used to test for differences between organisational division in terms of absence duration (payroll days) with the organisational division as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 3.24, and the standard error was 0.04. The covariance parameter estimate for the intercept was 0.51, and the standard error was 0.03. The table below reports the estimated mean values calculated in the mix model analysis based on organisational division and absence duration (payroll days) as well as the effect sizes.

Table 4-32: Estimated mean values resulting from the mix model analysis based on organisational division and absence duration (payroll days) as well as the effect sizes

Absence (payroll days)		Effect size	
Division	Mean	Operations W&S with….	Operations G/L with….
Operations A	1.70		
Operations B	1.71	0.01	
Operations C	1.92	0.11	0.11

Table 4-32 reflects that based on the effect sizes, there are only small or practically insignificant differences between the mean values of the absence duration (payroll days) based on the organisational division.

4.5.5 Mixed model analysis – Employee group

A p-value of 0.204 was reported for the mixed model and used to test for differences between employee group in terms of absence duration (hours) with employee group as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 814.03, and the standard error was 9.37. The covariance parameter estimate for the intercept was 331.30, and the standard error was 18.73. The table below reports the estimated mean values resulting from the mix model analysis based on employee group and absence duration (hours) as well as the effect size.

Table 4-33:Estimated mean values resulting from the mix model analysis based on employee group and absence duration (hours) as well as the effect size

Absence (hours)		
Employee group	Mean	Effect size
SP	20.17	0.04
MSP	21.65	

Table 4-33 reflects that based on the effect size, there is only a small or practically insignificant difference between the mean values of the absence duration (hours) based on the employee group.

A p-value of <0.0001 was reported for the mixed model and used to test for differences between employee group in terms of absence duration (payroll days) with employee group as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 3.24, and the standard error was 0.04. The

covariance parameter estimate for the intercept was 0.52, and the standard error was 0.03. The table below reports the estimated mean values resulting from the mix model analysis based on employee group and absence duration (payroll days) as well as the effect size.

Table 4-34: Estimated mean values resulting from the mix model analysis based on employee group and absence duration (payroll days) as well as the effect size

Absence (payroll days)		
Employee group	**Mean**	**Effect size**
SP	1.96	0.12
MSP	1.73	

Table 4-34 reflects that based on the effect size there is only a small or practically insignificant difference between the mean values of the absence duration (payroll days) based on the employee group distribution.

4.5.6 Mixed model analysis – Role category

A p-value of 0.003 was reported for the mixed model and used to test for differences between role category in terms of absence duration (hours) with role category as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 814.61, and the standard error was 9.38. The covariance parameter estimate for the intercept was 325.83, and the standard error was 18.53. The table below reports the estimated mean values resulting from the mix model analysis based on role category and absence duration (hours) as well as the effect sizes.

Table 4-35: Estimated mean values resulting from the mix model analysis based on role category and absence duration (hours) as well as the effect sizes

Absence (hours)		Effect size				
Role category	**Mean**	**Optimisation with….**	**Execution with…**	**Process Optimisation with…**	**Process Implementation with…**	**Operations with…**
Optimisation	14.90					
Execution	14.02	0.03				
Process Optimisation	24.02	0.27	0.30			
Process Implementation	21.07	0.18	0.21	0.09		
Operations	23.11	0.24	0.27	0.03	0.06	
Other	14.27	0.02	0.01	0.29	0.20	0.26

Table 4-35 reflects that based on the effect sizes, there are only small or practically insignificant differences between the mean values of the absence duration (hours) based on the role category.

A p-value of <0.0001 was reported for the mixed model and used to test for differences between role category in terms of absence duration (payroll days) with role category as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 3.24, and the standard error was 0.04. The covariance parameter estimate for the intercept was 0.50, and the standard error was 0.03. The table below reports the estimated mean values resulting from the mix model analysis based on role category and absence duration (payroll days) as well as the effect size.

Table 4-36: Estimated mean values resulting from the mix model analysis based on role category and absence duration (payroll days) as well as the effect size

Absence (payroll days)		Effect size				
Role category	**Mean**	**Optimisation with…**	**Execution with…**	**Process Optimisation with…**	**Process Implementation with…**	**Operations with…**
Optimisation	1.65					
Execution	1.65	0.00				
Process Optimisation	2.15	0.26	0.26			
Process Implementation	1.71	0.03	0.03	0.23		
Operations	1.87	0.12	0.11	0.15	0.08	
Other	1.59	0.03	0.03	0.29	0.06	0.14

Table 4-36 reflects that based on the effect sizes there are only small or practically insignificant difference between the mean values of the absence duration (hours) based on the role category.

4.5.7 Mixed model analysis – Absence type

The absent types were grouped into smaller groups based on the characteristics of the absence as stated earlier in the chapter.

A p-value of <0.0001 was reported for the mixed model and used to test for differences between absence type in terms of absence duration (hours) with absence type as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 713.65, and the standard error was 8.28. The covariance parameter estimate for the intercept was 286.68, and the standard error was 16.97. The table below reports the estimated mean values resulting from the mix model analysis based on absence type and absence duration (hours) as well as the effect sizes.

Table 4-37: Estimated mean values resulting from the mix model analysis based on absence type and absence duration (hours) as well as the effect sizes

Absence (hours)		Effect size				
Absence type	Mean	Sick leave - part day with....	Sick leave - with note with...	Sick leave - no note with	Family care with...	Compassionate with...
Sick leave - part day	6.22					
Sick leave - with note	31.94	0.81				
Sick leave - no note	13.90	0.24	0.57			
Family care	13.97	0.24	0.57	0.00		
Compassionate	30.63	0.77	0.04	0.53	0.53	
Other	3.44	0.09	0.90	0.33	0.33	0.86

Table 4-37 reflects that based on the effect sizes there are small or practically insignificant difference, medium or practically visible differences and large or practically significant differences between the mean values of the absence duration (hours) based on the absence types. Based on the reported effect size there are large or practically significant differences between the estimated mean values of sick leave - part day vs. sick leave - with note (d = 0.81) and compassionate leave (d= 0.77). The estimated mean absence hours for sick leave – part day (mean = 6.22) is considerably lower than those of the other two leave types, with sick leave - with note (mean = 31.94) and compassionate (mean 30.63) respectively.

There are large or practically significant differences between the estimated mean values of the other leave type vs sick leave - with note (d = 0.90) and compassionate leave (d= 0.86). The estimated mean absence hours for the other leave types (mean = 3.44) is also considerably lower than those of the other two leave types.

Medium or practically visible differences had been reported between the estimated mean values of sick leave - with note vs sick leave - no note (d = 0.57) and family care (d= 0.57). The estimated mean absence hours for sick leave - with note (mean = 31.94) is considerably higher than those of the other two leave types, with sick leave - no note (mean = 13.90) and Family care (mean 13.97) respectively. There are medium or practically visible differences between the estimated mean values of compassionate leave vs sick leave - no note (d = 0.53) and family care leave (d= 0.53). The estimated

mean absence hours for the compassionate leave type (mean = 30.63) is also considerably higher than those of the other two leave types.

Considering all of the above, the estimated mean absence hours of leave types sick leave - with note and compassionate leave differ quite substantially from the other leave types. This is an expected result that can be explained by leave characteristics. As stated in chapter 2, the employer may request proof of incapacity to pay the employee sick leave benefits, and it is the requirement of the organisation for the employee to supply such proof for absences of two or more days of sick leave. Compassionate leave is granted to employees who experienced a death in the direct family. Therefore, one would expect that employees would need and utilised the full allocation of such leave (set at three days per event for the organisation) to deal with suck loss.

A p-value of <0.0001 was reported for the mixed model and used to test for differences between absence type in terms of absence duration (payroll days) with absence type as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 2.53, and the standard error was 0.03. The covariance parameter estimate for the intercept was 0.34, and the standard error was 0.02. The table below reports the estimated mean values resulting from the mix model analysis based on absence type and absence duration (payroll days) as well as the effect sizes.

Table 4-38: Estimated mean values resulting from the mix model analysis based on absence type and absence duration (payroll days) as well as the effect sizes

Absence (payroll days)		Effect size				
Absence type	Mean	Sick leave - part day with….	Sick leave - with note with…	Sick leave - no note with ….	Family care with…	Compassionate with…
Sick leave - part day	0.41					
Sick leave - with note	2.65	1.32				
Sick leave - no note	1.29	0.52	0.80			
Family care	1.21	0.47	0.85	0.05		
Compassionate	2.70	1.35	0.03	0.83	0.88	
Other	0.37	0.02	1.35	0.54	0.50	1.38

Table 4-38 reflects that based on the effect sizes there are small or practically insignificant difference, medium or practically visible differences and a majority large or practically significant differences between the mean values of the absence duration (payroll days) based on the absence types. Based on the reported effect size there are large or practically significant differences between the estimated mean values of sick leave - part day vs sick leave - with note (d = 1.32) and compassionate leave (d= 1.35) and medium or practically visible differences between the estimated mean values of sick leave – part day vs sick leave – no note (d = 0.52) and family care (d = 0.47). The estimated mean absence hours for sick leave – part day (mean = 0.41) is considerably lower than those of the other two leave types, with sick leave - with note (mean = 2.65), compassionate (mean = 2.70), sick leave – no note (mean = 1.29) and family care (mean = 1.21) respectively.

There are large or practically significant differences between the estimated mean values of the other leave type vs sick leave - with note (d = 1.35) and compassionate leave (d= 1.38) and medium or practically visible differences between the estimated mean values of the other leave type vs sick leave – no note (d = 0.54) and family care (d = 0.50). The estimated mean absence hours for the other leave types (mean = 0.37) is also considerably lower than those of the other four leave types.

There are large or practically significant differences between the estimated mean values of sick leave - with note type vs sick leave - no note (d = 0.80) and family care (d= 0.80).

The estimated mean absence duration (payroll days) for the sick leave – with note (mean = 2.65) is considerably higher than those of the other two leave types. Similarly, there are also large or practically significant differences between the estimated mean values of compassionate leave vs sick leave - no note (d = 0.83) and family care (d= 0.88). The estimated mean absence duration (payroll days) for the compassionate leave (mean = 2.65) is considerably higher than those of the other two leave types.

As stated above, the same explanation for the higher estimated mean absence hours can be applied to the higher estimated duration (payroll days).

4.5.8 Mixed model analysis – First absence day

A p-value of <0.0001 was reported for the mixed model and used to test for differences between first absence day in terms of absence duration (hours) with first absence day as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 805.5, and the standard error was 9.29. The covariance parameter estimate for the intercept was 325.11, and the standard error was 18.53. The table below reports the estimated mean values resulting from the mix model analysis based on first absence day and absence duration (hours) as well as the effect sizes.

Table 4-39: Estimated mean values resulting from the mix model analysis based on first absence day and absence duration (hours) as well as the effect sizes

Absence (hours)		Effect size					
First absence day	Mean	Sunday with ….	Monday with…	Tuesday with….	Wednesday with…	Thursday with…	Friday with…
Sunday	13.50						
Monday	22.73	0.27					
Tuesday	18.27	0.14	0.13				
Wednesday	23.21	0.29	0.01	0.15			
Thursday	17.31	0.11	0.16	0.03	0.18		
Friday	25.35	0.35	0.08	0.21	0.06	0.24	
Saturday	19.57	0.18	0.09	0.04	0.11	0.07	0.17

Table 4-39 reflects that based on the effect sizes there are only small or practically insignificant differences between the mean values of the absence duration (hours) based on the first absence day.

A p-value of <0.0001 was reported for the mixed model and used to test for differences between first absence day in terms of absence duration (payroll days) with first absence day as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 3.18, and the standard error was 0.04. The covariance parameter estimate for the intercept was 0.50, and the standard error was 0.03. The table below reports the estimated mean values resulting from the mix model analysis based on first absence day and absence duration (payroll days) as well as the effect sizes.

Table 4-40: Estimated mean values resulting from the mix model analysis based on first absence day and absence duration (payroll days) as well as the effect sizes

Absence (hours)		Effect size					
First absence day	Mean	Sunday with ….	Monday with…	Tuesday with….	Wednesday with…	Thursday with…	Friday with…
Sunday	1.15						
Monday	1.92	0.40					
Tuesday	1.55	0.21	0.19				
Wednesday	1.96	0.42	0.02	0.22			
Thursday	1.41	0.13	0.27	0.07	0.29		
Friday	2.06	0.47	0.07	0.27	0.05	0.34	
Saturday	1.61	0.24	0.16	0.03	0.19	0.10	0.24

Table 4-40 reflects that based on the effect sizes, there are mostly small or practically insignificant differences between the mean values of the absence duration (payroll days) based on the first absence day. Based on the reported effect size there is a medium or practically visible difference between the estimated mean values of Sunday as first absence day vs Friday as first absence day (d = 0.47). The estimated mean absence duration (payroll days) for Sunday (mean = 1.15) is considerably lower than that of Friday (mean = 2.06).

Considering the above, the estimated mean absence duration (payroll days) for Sunday as first absence day differ from the other days as first absence day. Sunday as first absence day can only be utilised by shift workers and therefore is viewed as either a day before shift change (changing from day shift on Sunday to night shift on Monday) or last day of the shift cycle (day off on Monday). The observation is that Sunday is not the first day of a new shift and reported lower estimated mean absence duration. Monday,

Wednesday and Friday (all shift change days) reported higher estimated mean absence durations.

4.5.9 Mixed model analysis – Absence month

A p-value of <0.0001 was reported for the mixed model and used to test for differences between absence month in terms of absence duration (hours) with absence month as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 812.31, and the standard error was 9.36. The covariance parameter estimate for the intercept was 332.35, and the standard error was 18.75. The table below reports the estimated mean values resulting from the mix model analysis based on absence month and absence duration (hours) as well as the effect sizes.

Table 4-41: Estimated mean values resulting from the mix model analysis based on absence month and absence duration (hours) as well as the effect sizes

Absence (hours)		Effect size										
Month	Mean	January with ….	February with…	March with….	April with…	May with…	June with…	July with….	August with…	September with…	October with….	November with…
January	21.57											
February	20.20	0.04										
March	21.42	0.00	0.04									
April	22.02	0.01	0.05	0.02								
May	24.11	0.08	0.12	0.08	0.06							
June	26.26	0.14	0.18	0.14	0.13	0.06						
July	21.85	0.01	0.05	0.01	0.01	0.07	0.13					
August	19.94	0.05	0.01	0.04	0.06	0.12	0.19	0.06				
September	20.88	0.02	0.02	0.02	0.03	0.10	0.16	0.03	0.03			
October	20.06	0.04	0.00	0.04	0.06	0.12	0.18	0.05	0.00	0.02		
November	21.44	0.00	0.04	0.00	0.02	0.08	0.14	0.01	0.04	0.02	0.04	
December	20.63	0.03	0.01	0.02	0.04	0.10	0.17	0.04	0.02	0.01	0.02	0.02

Table 4-41 reflects that based on the effect sizes there are only small or practically insignificant differences between the mean values of the absence duration (hours) based on the absence month.

A p-value of <0.0001 was reported for the mixed model and used to test for differences between absence month in terms of absence duration (payroll days) with absence month

as the fixed effect and absence duration as dependent variables. The covariance parameters estimated for residual was 3.23, and the standard error was 0.04. The covariance parameter estimate for the intercept was 0.53, and the standard error was 0.03. The table below reports the estimated mean values resulting from the mix model analysis based on absence month and absence duration (payroll days) as well as the effect sizes.

Table 4-42: Estimated mean values resulting from the mix model analysis based on absence month and absence duration (payroll days) as well as the effect sizes

Absence (payroll days)		Effect size										
Month	Mean	January with ….	February with…	March with….	April with…	May with…	June with…	July with….	August with…	September with…	October with….	November with…
January	1.79											
February	1.73	0.03										
March	1.83	0.02	0.06									
April	1.72	0.04	0.00	0.06								
May	1.86	0.04	0.07	0.01	0.07							
June	2.17	0.19	0.23	0.17	0.23	0.16						
July	1.87	0.04	0.07	0.02	0.08	0.00	0.15					
August	1.65	0.07	0.04	0.10	0.04	0.11	0.27	0.11				
September	1.73	0.03	0.00	0.06	0.00	0.07	0.23	0.07	0.04			
October	1.74	0.02	0.01	0.05	0.01	0.06	0.22	0.06	0.05	0.01		
November	1.79	0.00	0.03	0.03	0.03	0.04	0.20	0.04	0.07	0.03	0.02	
December	1.67	0.06	0.03	0.08	0.03	0.10	0.25	0.10	0.01	0.03	0.04	0.06

Table 4-42 reflects that based on the effect sizes there are mostly small or practically insignificant differences between the mean values of the absence duration (payroll days) based on the absence month.

4.6 RESULTS SUMMARY

The results and discussion of the results for the trend investigation were presented in chapter four. The study was conducted in a quantitative nature through the analysis of existing attendance data (secondary data). The biographical, demographical and organisational data were analysed, and the findings included agreements with certain absenteeism constructs identified as previous findings and discussed in the literature

review in chapter two. More specifically, the absence frequency demonstrated the extent of the absenteeism dilemma in the organisation and indicated a small number of individuals (n = 101 or 4.9%) illustrating excessive unplanned absence behaviour. The average absence duration results further highlighted the absenteeism dilemma and illustrated a larger portion of the population (n =306 or 14.9%) illustrating excessive absence behaviour that even exceeded to organisational imposed limits. There also exists a misalignment between the absence duration in term of the hours and payroll days that result in the misrepresentation of the extent of absenteeism within the organisation.

The absence data analysis illustrated a significant contribution towards unplanned absences as a result of family care leave utilisation (n = 3610 or 19.8%). The analysis results illustrated that a higher absence utilisation reflected an increase in the utilisation of all unplanned leave types. The absence day results indicated agreement with previous findings stated in the literature review with a higher number of absences recorded days after scheduled off days. Seasonality of absence was also confirmed with higher total absence duration recorded in winter months. The inverse relationship between the age of the individual and the duration of absence event was also confirmed and is aligned with previous findings stated in chapter two.

The independent t-test and ANOVA results demonstrated practically visible differences existed between the mean values of absence frequency and duration based on service years of the individual with employees with less than two years' service reporting the lowest absence frequency and absence duration. The role category results provided statistical evidence for differences in absence frequency and duration means based on role category and confirmed an inverse relationship between absence behaviour (frequency and duration) and organisational responsibility.

The mixed model analysis results illustrated practically visible and practically significant differences in the absence duration means based on absence type. The differences were explained through the differences in absence type characteristics.

CHAPTER 5 CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION

The objective of this last chapter to conclude on the empirical study results discussed in chapter four and make recommendations on absenteeism management improvements and areas of focus within the organisation where the study was conducted that could assist in reducing the high absenteeism rate.

The layout of this chapter comprises of four sections with the first section focusing on the conclusion of the results from the previous chapter. The following section will provide recommendations based on the findings and conclusions of the investigation. The next section will be an evaluation of the achievement of the research objectives, and lastly, future research suggestions will be made.

5.2 CONCLUSIONS

The conclusions are founded in the results of the analysis presented in chapter four. The conclusions will include the presence or lack of trends becoming visible through the analysis of the biographical, demographical and organisational data on an individual and absence event level with focus provided to absence frequency and duration. The utilisation of a census sample (total population) resulted in the p-value carrying no significant importance in the interpretation of the analysis results.

5.2.1 Biographical, demographical and organisational conclusions

The majority of the population were male and are attributed to the physical requirements of the industry. The population age ranged from 21 to 66 years, with an average age of 42 years on the largest age range frequency being 35 to 39 years of age. The majority of the population had 10 to 14 years' service within the organisation. The three organisational divisions are forming part of the population comprised out of a sufficient number of individuals respectively to conduct meaningful analysis about the organisational or managerial influences or relationships with absence behaviour.

5.2.1.1 Gender conclusion

The study did not find any evidence of a relationship between gender and absenteeism when considering absence frequency and duration. The findings are contradicting the findings of Msosa (2020:10) and Kumar and Babu (2017:644). These researchers did find a relationship between absenteeism and gender.

5.2.1.2 Age conclusion

The study found evidence of an inverse relationship between age and absenteeism when considering absence event duration based of employee age and therefore confirm the findings of Msosa (2020:10) and Kumar and Babu (2017:644) who did find a relationship between absenteeism and age.

5.2.1.3 Service years conclusion

The study found practically visible differences between the absence duration means involving the less than two years' service group but could not definitively ascertain the presence of a relationship between years of service and absenteeism. The findings are contradicting the findings of Buzeti (2020:57) who found that the length of absence decreases with an increase in seniority.

5.2.1.4 Organisational characteristics conclusions

This section of the conclusions will include the conclusions of absenteeism based on the role of the organisational characteristics (organisational division, employee group and role category).

The study did not find any evidence of a relationship between organisational division and absenteeism when considering absence frequency and duration. It is therefore concluded that the three different management structures did not influence the absence behaviour of employees.

The study found practically visible differences between the absence duration (hours/six months) means involving employee group. This difference is attributed to a difference in working hours arrangements and therefore cannot definitively confirm the existence of a relationship between employee group and absenteeism.

The study found practically visible and significant differences between the absence duration means involving the role classification and absence frequency and duration, thus confirming an inverse relationship between role category (organisational responsibility) and absenteeism.

5.2.1.5 Absence data conclusions

This section of the conclusions will include the conclusions of absenteeism based on the absence frequency and duration, absence type, day of absence and month of absence.

The study found that a small portion of the population were responsible for high absence frequency (more than 3.15 absences/six-month: n = 321 or 15.6%) and duration (more than seven payroll days/six months: n = 306 or 14.9%). These findings support the previous findings of Bydawell (2016) and Ahn and Yelowitz (2016:8) that stated that the majority of absences are as a result of a small number of individuals within the organisation.

The study found practically visible and significant differences between the absence duration means considering absence types that were attributed to the characteristics of the different absence types. The study also identified and direct relationships between all of the absence types and the individual's absence utilisation.

The study found evidence of higher absence frequency starting on days of shift change over or on the first day of scheduled work agreement after a scheduled off day. This is contradicting the finding of Ticharwa *et al.* (2019:112) that found higher absenteeism rates during the mid-week days. Based on the statement of Bruniquel (2017), this could be an indication of absence abuse.

The study found evidence to support the seasonal effects on absenteeism based on total absence duration. This finding is in support of previous findings of Ticharwa *et al.* (2019:111) that also found a higher likelihood of absenteeism during the winter months.

5.3 RECOMMENDATIONS

The following recommendations are made based on the study results and conclusions:

The study confirmed certain personal traits showing a relationship with absence behaviour, and therefore, it recommended to continue with an study to determine the causality of high absence related to the identified personal traits. A qualitative research method could be beneficial to determine the reason for the relationships.

The scope of the study included the operations sections of the organisation within a specific region for a large chemical operation and therefore excluded other operation section in a different region. A repeat of this study could be beneficial in confirming certain existence of relationships within the larger organisation.

A strong relationship was established between absence behaviour and role category within the organisation with the first-line leaders' group (process implementation) showing only a marginally better absence behaviour than the groups under their leadership. It is proposed to investigate the influence of first-line leaders on the absence behaviour of followers.

The literature study revealed improvement in technologies that assisted in the pro-active identification of potential high absence individuals and therefore could be beneficial to the organisation to investigate a suitable pro-active identification technology that could be implemented to provide further managerial focus.

Managerial recommendations that could be considered for implementation to provide improvement in the existing absence management at the organisation is the implementation of a return to the work interview process for all forms of unplanned absences, implementation of absence reporting rules to ensure that absences get reported directly to line managers and well in advance to ensure sufficient time is available to arrange for relief and differentiate between planned and unplanned sick leave type absences to improve the identification of potential high absence individuals that are contributing towards the absenteeism dilemma. Additional focus also needs to be on the implementation of interventions as soon as possible or even on the first day of return after an unplanned absence to ensure that individuals who are abusing sick leave are deterred. For this to be effective, the flagging or reminder of required interventions must be simplified with the use of a technology-driven process that will support line managers. Lastly, as stated in the literature review, the causes of unplanned absence must be investigated to detect potential abusive behaviour by capturing and analysing, for

instance, the reported illness, the practitioner who provided the absence note and monitoring high absence individuals more closely.

5.4 ACHIEVEMENT OF STUDY OBJECTIVES

This section deals with the assessment of the research objectives to determine whether the objectives set out in chapter one have been met.

5.4.1 Primary objectives revisited

The primary objective of the study was to determine what absenteeism trends exist for unplanned absences that can be utilised to assist the organisation in the management of absenteeism. Through the trend study into absenteeism, the primary objective was accomplished through the information obtained by answering the secondary research questions stated below. In answering the secondary research questions, it was possible to identify managerial focus areas and knowing the link between absenteeism and the various personal traits and organisational factors. Additional information regarding absenteeism was obtained by establishing the presence of relationships with situational factors such as the seasonal effect of absenteeism and signs of potential abuse of sick leave demonstrated through excessive absences after scheduled off days. The relationship between individuals' absence utilisation and absence types provide an additional area of focus.

5.4.2 Secondary objectives revisited

The secondary research objectives that were explored through the conducted trend study into absenteeism at the organisation and assisted in answering the primary research question are stated below:

- To what extent is absenteeism correlated to personal or individual traits when considering both absence frequency and duration?
- To what extent is absenteeism correlated to organisational characteristics considering both absence frequency and duration?
- Does absenteeism follow the Pareto principle: what presentative of absentees contribute to the majority of unplanned absences?

The first question was explored by identifying the previously identified finding in the literature review of chapter two, and by analysing the available data to determine a link between absenteeism and the various personal factors. The results and discussion of results in chapter three reflected the linkage (or the lack thereof) between absenteeism and personal factors. The identified factors that were investigated included age, gender and years of service. There was no evidence of a link between absenteeism and gender, contradicting previous findings identified in the literature review. The study found that both age and years of service have been linked to absenteeism. The linkage between absenteeism and personal traits have, therefore, been established based on the available information in the data set.

The second question was explored by identifying potential organisational characteristics in the available dataset and determine a link between absenteeism and the various organisational characteristics. The results and discussion of results in chapter three reflected the linkage (or the lack thereof) between absenteeism and organisational characteristics. The identified factors that were investigated included organisational division, employee group and role category. There was no evidence of a link between absenteeism and organisational division. There was a medium or practically visible difference between absence duration of the employee groups (based on remuneration structure) but no difference in absence frequency of the employee groups. The study also found that there were medium or practically visible and large or practically significant differences between the absenteeism (both frequency and duration) based on role category of the individuals. The linkage between absenteeism and organisational characteristics have, therefore, been established based on the available information in the data set.

The last question was explored by analysing the absence data and by quantifying the extent of absenteeism based on the individual's absence data (absence frequency and duration) for the period of the investigation. It was clearly illustrated in section 4.3.2.1 that 306 individuals, classified by high absence utilisation, contributed to 33.9% of the total unplanned absence duration compared to the 1,095 individuals, classified by low absence utilisation, who contributed only 25.9% of the total unplanned absence duration.

5.5 SUMMARY

The trend investigation of absenteeism within a selected chemical operational unit was successfully conducted, and the research objectives met. The conclusions and recommendations made within this chapter were based on the literature review of chapter two and the results obtained and discussed in chapter four and therefore is sound and executable. This study added to the body of knowledge by confirming previous findings and providing guidance to the management of absenteeism within the organisation under investigation.

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ANNEXURE A – DATA SET

Due to the enormity of the data set, it was not included in the Annexure but it can be made available on request from the author.

ANNEXURE B – ETHICAL CLEARANCE AND APPROVAL

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

Private Bag X6001, Potchefstroom
South Africa 2520

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Economic and Management Sciences Research
Ethics Committee (EMS-REC)

30 October 2020

Prof C Botha
Per e-mail
Dear Prof Botha,

EMS-REC FEEDBACK: 30102020
Student: Stander, B (12525375)(NWU-00893-20-A4)
Applicant: Prof C Botha - MBA

Your ethics application on, *A quantitative trend investigation of absenteeism within a selected chemical operational unit*, which served on the EMS-REC meeting of 30 October 2020, refers.

Outcome:

Approved as a minimal risk study. A number **NWU-00893-20-A4** is given for one year of ethics clearance.

Due to the Covid-19 lock down ethics clearance for applications that involve data collection or any form of contact with participants are subject to the restrictions imposed by the South African government.

Kind regards,

Mark Rathbone

Prof Mark Rathbone
Chairperson: Economic and Management Sciences Research Ethics Committee (EMS-REC)

[redacted]

16 October 2019

To whom it may concern

Letter of Permission for utilization of company information for completion of MBA.

This letter serves as support for B. v d W Stander to use [redacted] as his choice of organisation in the completion of the Master of Business Administration studies at NWU and he will require to use information regarding the organisation when completing his final research paper.

Based on his research topic *"The effect of policy implementation on absenteeism reduction in a South African chemical operation"* we believe the results will be mutually beneficial to the organisation.

As stated in his request to use information at [redacted], no confidential information will be used as part of the research.

We therefore grant permission to Benjamin Stander to use [redacted] as his organisation of choice for completing his research paper.

We hereby confirm that are authorised to grant permission on behalf of the organisation.

APPROVED:

Charmaine Bantom

16/10/19

C Bantom **Date**

Snr Manager: Human Resources Operations

Megan Nel

21/11/19

M Nel **Date**

VP: [redacted]

ANNEXURE C – LANGUAGE EDITING

Dynamic Language & Translation Specialists

Antoinette Bisschoff
71 Esselen Street,
Potchefstroom
Tel: 018 293 3046
Cell: 082 878 5183
Language@dlts.co.za
CC No: 1995/017794/23

Tuesday, 08 December 2020

To whom it may concern

Re: Confirmation of language edit, typography and technical precision

The MBA dissertation by **B vd W. Stander, "A quantitative trend investigation of absenteeism within a selected chemical operational unit"** was edited for language, typography and technical precision. The referencing and sources were checked and comply with the Harvard guidelines specified by the 2020 NWU Reference guide.

Final, last-minute corrections remain the responsibility of the author.

Antoinette Bisschoff

BA Languages (UPE – now NMU); MBA (PU for CHE – now NWU); Translation and Linguistic Studies (NWU)

Officially approved language editor of the NWU since 1998
Member of SA Translators Institute (no. 100181)

ANNEXURE D – TITLE REGISTRATION

Private Bag X1290, Potchefstroom
South Africa 2520

Tel: 018 299-1111/2222
Fax: 018 299-4910
Web: http://www.nwu.ac.za

Higher Degree Administration
Tel: 018 299 2626
Email: 21711542@nwu.ac.za

4 December 2020

Dear Mr Stander

REGISTRATION OF TITLE

Note has been taken that you wish to submit your **(mini-)dissertation/thesis** for examination. The registered title as it must appear on the examining copies and on the title page of the final copies is indicated below. An example of your title page will be sent together with this letter.

A quantitative trend investigation of absenteeism within a selected chemical operational unit

The above-mentioned title may under **no circumstances** be changed without consulting your supervisor and obtaining the approval from the relevant committee in the mentioned faculty, in regard of which this office must be furnished with the latest approved title.

In the instance that you wish to submit for examination, please inform your supervisor/promoter accordingly. *Also ensure absolute adherence to the prescripts of A Rule 4.10 for the submission of a Master's study and of A rule 5.10 for the submission of Doctoral thesis.*

Please notify me and your supervisor if you are unable to submit for examination, as this would affect the schedule of your examiners expecting your copy for examination.

Your attention is drawn to the following matters regarding the above.

- You may submit your examination copies from **1 September 2020 to 18 December 2020 to possibly qualify for the Autumn (May) graduation ceremony in 2021.**
- **Submissions received after 18 December 2020 will be considered in time for examination towards possible graduation during the Winter (July) graduation series.**
-

You are required to submit your examination copy in the following format:

- **One electronic copy in Word format and one electronic copy in PDF format to be submitted in a drop box created for you for this purpose on the eFundi website by HDA. You may also submit via email, or in person, over the counter to an HDA official.**

The following forms must be submitted with your examination copies:

- **The signed Solemn Declaration form**
- **TurnItIn report (Only the summary)**
- **Copy of your ID**
- **Personal particulars form (only applicable for PhD students)**
- Please update your courier address as well for the purpose of sending your degree certificate to the correct address after a ceremony. **Please visit the DIY Student 360° to ensure that your personal details are correct on the system and on your degree certificate please**

For ease of reference, herewith a reference to the following useful resources:

- General Academic Rules (A-Rules):
- Manual for Master's and Doctoral Studies:
- Policy on academic integrity:
-

I trust you find the above in order. Please do not hesitate to contact the undersigned for any more related information.

Yours sincerely

Ms N Blom
for REGISTRAR

Original details: (10812187) M:\HDA Toolbox\Phase 2\1 Title Registration\Title registration letter.docm
22 February 2018

File reference: 7.1.11.1

ANNEXURE E – SOLEMN DECLARARTION

NWU®
NORTH-WEST UNIVERSITY
NOORDWES-UNIVERSITEIT
YUNIBESITI YA BOKONE BOPHIRIMA

Higher Degrees Administration

SOLEMN DECLARATION AND PERMISSION TO SUBMIT

Solemn declaration by student

I, **Benjamin van der Westhuyzen Stander**

declare herewith that the thesis/dissertation/mini-dissertation/article entitled (**exactly as registered/approved title**).

A quantitative trend investigation of absenteeism within a selected chemical operational unit

which I herewith submit to the North-West University is in compliance/partial compliance with the requirements set for the degree:

MBA

is my own work, has been text-edited in accordance with the requirements and has not already been submitted to any other university.

LATE SUBMISSION: If a thesis/dissertation/mini-dissertation/article of a student is submitted after the deadline for submission, the period available for examination is limited. No guarantee can therefore be given that (should the examiner reports be positive) the degree will be conferred at the next applicable graduation ceremony. It may also imply that the student would have to re-register for the following academic year.

Ethics number: NWU-00893-20-A4

ORCiD: 0000-0001-8979-9071

Signature of Student: Benjamin Stander — Benjamin Stander 2020.12.09 11:47:54 +02'00'

University Number: 12525375

Signed on this 9 day of December of 20 20

Permission to submit and solemn declaration by supervisor/promoter

The undersigned declares that the thesis/dissertation/mini-dissertation complies with the specifications set out by the NWU:

- with regards to A-rules (PhD students shoud have at least one paper on aspects of the thesis submitted for review in an accredited scientific journal) Yes ○ No ○ Not applicable (n/a) ●
- with regards to faculty rules on submission or acceptance by an accredited scientific journal: Yes ○ No ○ n/a ●
- with regards to faculty rules on peer reviewed conference proceedings: Yes ○ No ○ n/a ○
- the student is hereby granted permission to submit his/her mini-dissertation/ dissertation/thesis: Yes ● No ○
- that the student's work has been checked by me for plagiarism (by making use of TurnItIn software for example) and a satisfactory report has been obtained: Yes ● No ○

and that the work was language edited before submission for examination.

Signature of Supervisor/Promoter: Prof CJ Botha — Digitally signed by Prof CJ Botha Date: 2020.12.09 13:24:51 +02'00'

Date

Original details: Marietjie Ackermann(10512187) R/SSupport docs\SOLEMN DECLARATION AND PERMISSION TO SUBMIT.docm 28 July 2017
File reference: 7.1.11.3.2/3

ANNEXURE F – STATISTICAL CONSULTATION SERVICES

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Tel: 018 299-1111/2222
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Statistical Consultation Services
Tel: +27 18 299 2651
Fax: +27 0 87 231 5294
Email: erika.fourie@nwu.ac.za

7 December 2020

Re: Thesis, Mr B. v d W. Stander, student number: 12525375
A quantitative trend investigation of absenteeism within a selected chemical operational unit

We hereby confirm that the Statistical Consultation Services of the North-West University analysed the data of the above-mentioned student and assisted with the interpretation of the results. However, any opinion, findings or recommendations contained in this document are those of the author, and the Statistical Consultation Services of the NWU (Potchefstroom Campus) do not accept responsibility for the statistical correctness of the data reported.

Kind regards

Dr E Fourie
Senior Consultant: Statistical Consultation Services

ANNEXURE G – DESENSITIZATION CODE

(General) BulkSubstitute

```
Sub BulkSubstitute()

For i = 5 To 2178

Worksheets("Raw Data").Range("X3:X18975").Select

Selection.Replace What:=Worksheets("Raw data Head count").Cells(i, 3).Value, Replacement:=Worksheets("Raw data Head count").Cells(i, 5).Value, _
LookAt:=xlWhole, SearchOrder:=xlByRows, MatchCase:=False

Next

Worksheets("Raw data Head count").Cells(1, 1).Select

End Sub
```

ANNEXURE H – CODING SHEETS

Division	Coding
Operations A	1
Operations B	2
Operations C	3

Att./Absence type	Coding
Sick leave - part day	1
Sick with Note	2
Sick no Note(>2days)	3
Sick no Note(<=2days)	4
Sick no Note<=2d(Shift<6)	5
Sick with Note (Shift<6)	6
Sick no Note>2d(Shift<6)	7
Family Care Leave	8
Family Care - Part day	9
Short time (< 1day)	10
Unpaid sick leave <=120 d	11
A.W.O.L.	12
Compassionate leave	13
Compassionate Lve(No QTA)	14
Compassionate Part Day	15
Comp Part Day (No QTA)	16

Day	Coding
Sunday	1
Monday	2
Tuesday	3
Wednesday	4
Thursday	5
Friday	6
Saturday	7

Month	Coding
January	1
February	2
March	3
April	4
May	5
June	6
July	7
August	8
September	9
October	10
November	11
December	12

Gender	Coding
Male	1
Female	2

Age in years	Coding
25 and less	1
26 - 30	2
31 - 35	3
36 - 40	4
41 - 45	5
46 - 50	6
51 - 55	7
56 - 60	8
61 +	9

Service Years	Coding
0 t 3	1
4 t 7	2
8 t 10	3
11 t 15	4
16 t 20	5
21 t 25	6
26 +	7

Total payroll days	Coding
0.0 t 0.25	1
0.26 t 0.5	2
0.51 t 0.75	3
0.76 t 1.0	4
1.01 t 2.0	4
2.01 t 3.0	6
3.01 t 4.0	7
4.01 t 5.0	8
5.01 +	9

Absence duration (Payroll days/6 months)	Coding
0 t 2	1
2.01 t 3	2
3.01 t 4	3
4.01 t 5	4
5.01 t 6	5
6.01 t 7	6
7.01 t 8	7
8.01 t 10	8
10.01 +	9

Frequency Rate (Absences/6 months)	Coding
0.0 t 0.5	1
0.51 t 1.0	2
1.01 t 1.5	3
1.51 t 2.0	4
2.01 t 3.0	4
3.01 t 4.0	6
4.01 t 6.0	7
6.01 t 8.0	8
8.01 +	9

Absence duration (hrs/6 months)	Coding
0 t 12	1
12.01 t 24	2
24.01 t 36	3
36.01 t 48	4
48.01 t 60	5
60.01 t 72	6
72.01 t 96	7
96.01 t 120	8
120 +	9