

A STUDY OF EMPLOYEE ABSENTEEISM AT THE HEALTH CARE  
CORPORATION OF ST. JOHN'S

BY  
AMELITA RAMOS

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Division of Community Health and Humanities  
Faculty of Medicine  
Memorial University of Newfoundland

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## **ABSTRACT**

Absenteeism is a growing problem in the health care workforce. This thesis seeks to understand some of the factors which may influence hospital employee absenteeism in the Health Care Corporation of St. John's. The study examined how workload, workgroup behavior and previous workgroup absence patterns influence individual absence-taking behaviours.

A random effects model was used to test which factors influence absenteeism in seven health care bargaining groups. This study found that workload was associated with an increase in absence among hospital support workers and laboratory technicians, but not nurses. Our study also found a pattern in absence-taking behaviours among hospital employees. Employees who were absent within the last 5 and 30 work shifts have a greater likelihood of being absent. This study also found that the peer work group influenced absenteeism. The higher the departmental absence or overtime rate the previous day, the more likely an individual will be absent.

This study contributes to the understanding of absenteeism in the health care workforce. It provides valuable insights into factors that contribute to employee absenteeism and can be used to develop effective strategies to reduce absence.

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## **LIST OF ABBREVIATIONS**

AAHP:	ASSOCIATION OF ALLIED HEALTH PROFESSIONALS
HCCSJ:	HEALTH CARE CORPORATION OF ST. JOHN'S
HSC:	GENERAL HOSPITAL - HEALTH SCIENCES CENTRE
LMC:	DR. LEONARD A. MILLER CENTRE
MGMT:	MANAGERS
JAN	JANEWAY CHILDREN'S HEALTH & REHABILITATION CENTRE
NAPE:	NEWFOUNDLAND AND LABRADOR ASSOCIATION OF PUBLIC AND PRIVATE EMPLOYEES
NAPE LX:	NEWFOUNDLAND AND LABRADOR ASSOCIATION OF PUBLIC AND PRIVATE EMPLOYEES – LABORATORY AND X-RAY
NAPE1125:	NEWFOUNDLAND AND LABRADOR ASSOCIATION OF PUBLIC AND PRIVATE EMPLOYEES – LICENCED PRACTICAL NURSES
NB:	NON-UNIONIZED SECRETARIAL
NLNU:	NEWFOUNDLAND AND LABRADOR NURSES UNION
SCM:	ST. CLARE'S MERCY HOSPITAL
WAT:	WATERFORD HOSPITAL

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# **CHAPTER ONE: INTRODUCTION**

## **1.1 ABSENTEEISM IN THE HEALTH CARE INDUSTRY**

Employee absenteeism is a growing problem in the health care industry. According to the 2011 Statistics Canada Work Absence Rate report, employees in health occupations missed the most workdays per year (14.0), compared to other occupations such as construction (7.6). Among health care workers, health care support workers, such as health care aides, had the highest days lost at 16.6. Nursing staff had the second highest days lost at 15.8. Laboratory technicians had the least number of lost days at 13.0.

These numbers are similar to those experienced by regional hospitals across the provinces in Canada. In the St. John's region, the average number of sick leave days for all employees at the Health Care Corporation of St. John's in 2001 was 13.51 (Harvey, 2001). According to 2015/2016 Eastern Health (formerly Health Care Corporation of St. John's) Annual Performance Report, the current costs associated with sick leave are approximately \$50 million annually.

## **1.2 RATIONALE**

The financial costs associated with the increased number of days lost has put pressure on human resource management to control absenteeism in the workplace. The high cost of absenteeism not only has financial implications but also presents many challenges for management.

### ***1.2.1 Management Level***

Unscheduled short-term absences are particularly problematic for middle managers because of their random nature. In the hospital system, short-term absences can disrupt patient care, affecting the continuity and quality of care (Tauton et al., 1995). The unpredictable nature of short-term absences can lead to problems with the coordination of employee scheduling resulting in temporary shortages of employees (Sanders et al., 2004). The modifications associated with rescheduling may require employees to work overtime to cover the shifts of absentees. An insufficient patient to staff ratio may result in temporary shortages which may cause delays in treatments or procedures.

### ***1.2.2 Workgroup level***

These problems can further impact employees at the workgroup level. In this study, the workgroup is defined as individual workers working within the same unit/department. It is important to study workgroups because the social characteristics of an individual's workgroup such as workgroup cohesion and absence norms, (shared collective norms regarding absence behavior) may influence their peers' behavior (Väänänen et al., 2008). During times of high unexpected absences, the behavior of workgroup members can impact productivity, as well as increase the workload of other workgroup members.

### **1.2.2.1 Workload**

According to Canadian Federation of Nurses Union (2012), workload of health care employees such as nurses has been increasing in hospitals. The aging population has put pressure on health care resources and has raised the demand for health care services. The limited health care resources available have increased the workload of health care employees. The impact of work overload has led to burnout, increased stress, decreased job satisfaction, and reduced morale among health care workers (Lavoie-Tremblay et al., 2008, Van Bogaert et al., 2010). The combination of these factors makes it difficult for health providers to attract and retain employees.

### 1.3 PURPOSE

Although past studies have examined absenteeism among health care employees, few studies have examined the influence of hospital workload on short-term discretionary absenteeism among clinical and non-clinical hospital employees.

The purpose of this study is to understand the factors contributing to an individual's decision to be absent. This study will examine employee absenteeism in an acute care hospital setting from an economic perspective, by looking at the supply and demand side influences of an individual's decision to be absent. More specifically, the study will examine three factors: the work environment, individual, and social factors.

The first area will examine how work environment factors such as workload, seasonality, and employment location site influence absenteeism. Patient volume will be used as a proxy for workload to represent the demand side influences and to determine the impact of workload on absenteeism across different workgroups.

The second area will examine social factors such as workgroup/peer group behaviour, overtime hours worked, and workgroup size. Workgroup absence and overtime rates will be examined to determine whether the workgroup's absence and overtime patterns have an influence on individual absence-taking behaviours.

The third area will examine individual factors such as tenure, wages, and previous absence behaviour patterns. Individual absence histories will be used to profile absence behaviour patterns based on previous absence and overtime employment records.

## 1.4 OBJECTIVES

The objectives of this study are:

1. To examine the effect work environment factors such as workload, seasonality, and employment location has on employee absenteeism.
2. To examine the effect social factors such as workgroup absence, overtime behaviour, and workgroup size has on employee absenteeism.
3. To examine the extent to which individual factors such as tenure, wages, and previous absence behaviour patterns influence employee absenteeism.

## 1.5 SUMMARY

This study will provide insights into absence patterns that will allow human resources management to anticipate and adapt to changing attendance patterns and manage schedules accordingly. The understanding of the factors contributing to employee absence may allow for the development of important policy initiatives that can be used to improve the workplace environment and foster better relations among employees and management.

This thesis is organized as follows: The first chapter provides a brief overview of the problem of employee absenteeism and introduces some of the factors that may influence absence. The second chapter provides a detailed review of the existing literature on the factors influencing absenteeism. Chapter three describes the data and highlights the methods and the empirical model used to examine the work environment, social, and individual factors. Chapter four presents the results of the study. Chapter five discusses these results. Chapter six highlights key findings, discusses the limitations of the study, provides concluding remarks, and identifies areas for future research.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 OVERVIEW**

This chapter will begin with an overview of the Steers & Rhodes (1978) model, followed by a review of the economics literature on absenteeism, before concluding with a review of workload and various methods of workload measurement.

Absenteeism has been extensively researched over the past 50 years. The development of conceptual and theoretical models from various academic disciplines has identified multiple factors that cause absence. Steers and Rhodes (1978) developed a conceptual framework of employee absenteeism that identified factors influencing an employee's decision to be absent. Some of the factors include job satisfaction (Rosse & Miller, 1984), affective organizational commitment (Blau & Boal, 1987), tenure (Drago & Wooden, 1992), workgroup relations (Nicholson & Johns, 1985), wages (Barmby et al., 1995) and workload (Rauhala et al., 2007). Using the Steers and Rhodes model as a foundation, researchers across numerous disciplines have actively extended their framework on absenteeism.

### **2.2 EARLY CONTRIBUTIONS TO THE ABSENCE LITERATURE**

One of the major contributions to absenteeism research is the Steers and Rhodes (1978) process model of attendance. The model was based on a synthesis of over one hundred empirical studies. Using the results of these studies Steers and Rhodes identified a comprehensive set of categories that have been shown to influence absence (attendance)

decisions. They hypothesize that an employee's motivation to attend work is influenced by several factors: the employee's satisfaction with their job situation, and various economic, social, and personal factors which motivate them to attend work, which have been collectively termed "pressures to attend".

Steers and Rhodes also suggest that economic pressures, such as the state of the economy and the employment market, may influence an employee's decision to attend work. During times of high unemployment, there may be pressure to attend because of the threat of job layoffs. Conversely, during low unemployment, absence may increase because of better prospects of finding another job. Therefore, economic and market conditions may influence employee attendance based on the potential to change jobs. Steers and Rhodes also suggest that organizational policies that promote pay or wage incentives can influence attendance. Early studies conducted on the wage rate and absenteeism show an inverse relationship between them (Lundquist, 1959, Yolles et al., 1975).

Social pressure within the workgroup is another factor that may have an influence on attendance motivation. Specifically, workgroup 'norms' where the workgroup has an established pattern of behaviour has shown to motivate attendance. Studies have found that workgroups with a high degree of cohesiveness, along with workgroup norms that emphasize good attendance within the group, had lower absenteeism rates and increased attendance (Gibson, 1966; Whyte, 1969).

In addition to the factors previously discussed, Steers and Rhodes identified seven variables that may influence an employee's satisfaction with their current job situation. These variables are not specific to a task or job but relate to the general work

environment. They include workgroup size, job scope, job level, leader style, co-worker relations, and opportunities for advancement.

Early literature on the relationship between work group size and absenteeism has shown a positive linear relationship. Studies examining blue-collar employees have found that the larger the workgroup, the higher the incidence of absence (Indik & Seashore, 1961; Revans, 1958). It has been suggested that an increase in work group size leads to lower group cohesiveness, higher task specialization, and poorer communication (Steers and Rhodes 1978). This results in difficulty satisfying individual job requirements, thus making job attendance less appealing.

Similarly, Porter and Steers (1973) suggest another reason may be that in larger workgroups, employees' expectations are less likely to be met. They think it may be attributed to poorer communication and a lack of personal contact with other employees, which would result in higher absenteeism. Also, employees in large departments may feel that other employees can easily replace them should they decide to take time off.

The Steers and Rhodes model (1978) has been credited for developing a comprehensive theory of absenteeism, but their theory has also received many criticisms by theorists for being difficult to operationalize and empirically test due to its complexity. Conceptual categories such as "attendance motivation," "pressures to attend," and "ability to attend" have also been criticized for being poorly defined and lacking the capability of being measured (Brooke, 1986, Barmby et al., 1991). Similarly, variables such as job scope, work group norms, role stress, economic conditions, and incentive reward systems have been criticized for their conceptual imprecision and lack of construct validity. Each of these variables involves multiple concepts with conflicting effects on absence. As a

result of these problems and limitations only a few studies have been able to partially test the original Steers and Rhodes model.

Although the Steers and Rhodes (1978) model has its limitations, it has comprehensively identified several factors which influence absence/attendance. Personal factors such as job satisfaction and organizational commitment were cited as potential contributors to attendance. Organizational policies that influence pay and wages may motivate employee attendance. Social factors like workgroup relations and workgroup norms highlight the complexity of the problem of absence.

## 2.3 SOCIAL INFLUENCE ON ABSENCE

Building on the Steers and Rhodes model, several researchers have further examined the social factors influencing absence and the absence decision-making process. This section will discuss the relevant social science and economics literature.

### ***2.3.1 Social Theory of Absence***

Chadwick-Jones, Nicholson and Brown (1982) extended the view of absence as a social phenomenon with the formulation of the social theory of absence.

Chadwick-Jones et al., (1982), argue that absenteeism is best understood as a group phenomenon, where a social exchange takes place between individuals and their workgroups. They suggest that employees and individuals within the workgroup are subject to, and representative of, a set of work rules, about activities in the work situation. These work rules outline the acceptable levels of absence within the group. This shared meaning of absence among unit members forms the absence norms. This type of social exchange demonstrates how employees learn the degree and type of absence behaviour that their workgroup members will accept, and will use this information as a guideline for adjusting their own absence behaviour (Chadwick-Jones et al., 1982). As a result, an employee's level of absenteeism will be affected to some degree by the level of absenteeism of his or her co-workers (Nicholson & Johns, 1985).

### ***2.3.2 Absence Culture***

Nicholson and Johns (1985) suggest that over time, organizations and work groups may develop an absence culture. In their typology of absence cultures, they argue that the nature of absence culture depends on the salience of the culture to members of the group (work unit or organization) and on the level of trust experienced by members. They define cultural salience as the organization's or work unit's distinctive beliefs about absence and their assumptions about employment. These beliefs can be influenced by the organization's absence control policy, technological influences, and the social ecology (physical distribution of workers with various personal characteristics in the workplace) (Nicholson and Johns, 1985). Therefore, cultural salience is expected to be high where there is a clear understanding of the formal and informal rules of absence, where work is interdependent and where there is opportunity for informal communication through networks and friendships (Nicholson and Johns, 1985).

On the other hand, the trust dimension looks at the psychological contract between employer and employee. Nicholson and Johns suggests that absence beliefs differed by occupational status and the level of trust associated with this status level. Individuals in high discretion roles (for example, professionals) operate under high trust psychological contracts that reinforce the work ethic and commitment to the organization.

### ***2.3.3 Workgroup absence behaviour***

Several studies have been conducted supporting the notion of an absence culture and absence norms on absence behaviour. A study conducted by Mathieu and Kohler (1990) used a cross-level design to examine whether the social influences of a group result in individual absence.

The study found that group contextual factors helped to predict later (6-month) individual absenteeism, after accounting for the individual's past absence levels, demographics, and work attitudes. In addition, Markham and Mckee (1995) found that absence culture influenced group absence. Their results showed that groups with lower external and internal standards for absence had more absence over a year than groups with higher external and internal standards.

Gellatly (1995) examined the influence of perceived absence norms, age, tenure, affective commitment, and continuance commitment on absenteeism among nursing and food services employees in a chronic care hospital. His theoretical model supports the view that individual and group level factors influence absenteeism. More specifically, he found that an employee's beliefs regarding their co-worker's absence had an impact on absences one year later. He also found that nursing units and food services departments use social information within their workgroup to guide their own absence behaviors. This study provides evidence that perceived absence norms affect absence behavior independent of other personal and attitudinal effects.

Economists have also examined the influence of workgroup absence on individual absence by examining the peer group interaction effects. A study conducted by Ichino & Maggi (2000) examined shirking behaviour among Italian bank employees. They examined a variety of factors, including group interaction effects. They found that an employee will take one more day of absenteeism if his average coworker takes approximately 6 more days of absenteeism. Ichino & Maggi suggest that an individual's shirking behaviour may increase a co-worker's average shirking level if there are limited resources for management to monitor workers and if the workgroup has a high level of shirking, as the likelihood of an individual being reported for shirking is low.

Prior to this study, there has been a limited amount of research on group interaction effects as determinants of individual absence behaviour. Research studies trying to detect peer group interaction effects have encountered identification problems. The two main problems are related to self-selection and reflection, whereby a worker's shirking behaviour influences the shirking of other members, and at the same time is influenced by how other members behave. Different strategies have been used to overcome these issues, such as identifying exogenous determinants of the peer group, and by adding group specific fixed effects to control for correlated unobservable factors (Arcidiacono and Nicholson, 2005)

De Paola (2010) controlled for these issues in her study that analyzed how the absence behaviour of co-workers affects the absence rate of public sector employees in the same division. De Paola found that peer group effects strongly influence absenteeism. Her study found that an increase of 1% in the peer group absence rate produces an increase in individual absence rate of 0.60%. This implies that when all individual co-

workers increase their absence rate by 1% (about 18 hours), an individual will increase his absence by 10 hours. Her analysis found that individuals whose peers have higher absence rates due to family or study leave tend to be absent more often for sickness reasons, providing support for the theory that higher absenteeism in certain divisions may be due to social interaction effects.

De Paolo (2010) interprets these findings to suggest that a strong effect of peer absence behaviour on individual absence decisions may be due to the fact that when workers are provided with full insurance and are subject to low monitoring, it is easier for the individual to adapt his own behaviour to the behaviour of his peers. Therefore, she attributes absence behaviour to shirking instead of contagion effects. This study is consistent with other studies showing that individual absence behaviour is related to the absenteeism of co-workers (Bradley et al., 2007; Hesselius et al., 2009).

In summary, these studies provide further evidence of the link between the workgroups and individual absence behaviours.

#### ***2.3.4 Past Absence Behaviour***

Another aspect in the absence-decision making process is whether past absence behaviour influences or predicts future absence behaviour. Based on studies of discrete events, which examined individual histories, individuals who have experienced the event under study in the past are more likely to experience the event in the future, than are individuals who have not experienced the event.

Heckman (1981) provides two explanations for why this occurs. The first is that individuals that experience the event are altered by their experience, in that the constraints, preferences, or prices (or any combination of the three) that influences future outcomes are altered by past outcomes. Heckman refers to the effect of past outcomes as structural state dependence.

The second factor is that individuals may differ in their propensity to experience the event. If individual differences are correlated over time, and if these differences are not properly controlled, previous experience may appear to be a determinant of future experiences. Therefore, if individual differences are not controlled for, previous experience may erroneously influence future experience, leading to what Heckman refers to as spurious state dependence.

Several studies have examined the influence of past absence behaviours on future absence. A study conducted by Barmby, Orme and Treble (1995) incorporated structural state dependence in their absence model by including a dummy variable for lagged absence that indicated whether the worker was absent the previous day. The estimated coefficient for lagged absence was positive, implying that if a worker goes absent, the probability of being absent in subsequent periods increases by a constant amount, not varying over the duration of the absence spell. Therefore, in order to take into account the duration of the absence spell, the duration and duration squared variables were included in the model. The results of the estimated duration coefficients suggest that the probability of remaining absent initially increases as the spell progresses, and then falls.

Barnby and Larguem (2004) examined the remuneration contract and sickness contagion and its influence on worker absence. The study examined whether contracts specifying individuals to attend work while ill induces sickness (absence) prevalence among other workers. To capture the effect of an individual's health state, state dependence was included in the model. This would capture how individual absence in the last period affects the probability of being absent in the current period. The results of the study suggest that an increased incidence of sickness for the other workers over the past 3 days increases the probability of absence for the individual worker. This evidence suggests that sick individuals who attend work may increase subsequent absence of their co-workers.

### ***2.3.5 Work Unit Size and Absenteeism***

Early research in the psychology literature on work unit size and absenteeism suggests larger workgroups tend to exhibit higher absence due to less contact and communication with supervisors, and a lower sense of responsibility to colleagues in larger firms. These variables are often difficult to quantify and disprove (Barnby et al., 2000).

Therefore, the economic literature has taken a labour supply perspective and examined the influence of firm size and absenteeism in relation to the characteristics of an employment contract. Early economic studies on firm size and absenteeism have found that absence rates increase with firm size (Allen, 1981; Leigh 1983; De Paola (2010).

Winkelmann (1999) used a labour supply approach to examine the effects of firm size on absenteeism. His study distinguishes between two models, adjustment to equilibrium and shirking, as possible explanations to absence. In the adjustment model firm size affects absence rates only through its effect on wages. The adjustment to equilibrium approach models workers who would prefer to work less than 40 hours, but are forced into a full-time contract. These workers would adjust their absence based on the marginal rate of substitution between income and leisure to the wage rate.

Alternatively, the shirking approach models a worker who could shirk without being detected. The predicted effect using this model is that firm size has a direct effect on absence rates, for given wages, by affecting the probability of being detected. The study results show that workers in larger firms have more absent days than workers in smaller firms after controlling for wage effects. He found that workers in large firms have 1.6 more absent days than workers in small firms and he suggests that it may be due to a lower probability of being caught in large firms. Although these results indicate that larger firms tend to pay higher wages compared to smaller firms to reduce absenteeism, the author found that the effect is small compared to the larger, more direct, and positive effect firm size had on absenteeism.

Barnby et al., (2000) also examined firm size and absenteeism and argued that an equilibrium level of absence exists in firms. They suggest that large firms may find it optimal to have higher absence rates as the production costs due to worker absenteeism are lower because they can insure against absence at a lower cost. They argue that large firms can diversify risk easily because they have a buffer stock of employees with similar skill sets. An employee who is absent can be replaced by another employee with a similar

skill set. Therefore, the level of complementarity controls the marginal cost of an absence to the firm (Barmby et al., 2000). In general, larger firms with workers who are complementary in production will have lower costs of insuring against absence.

Lastly, an explanation for firms that have higher absence rates could result from the constraints on work time. They indicate that the constraints on work time are less binding in smaller firms, which would suggest that they are more flexible and therefore would have less absence.

Scoppa (2010) examined firm size to determine its impact on worker absenteeism and found that it increases with the size of the firm. He found workers in medium sized firms were absent 1.5 days more than workers from small firms, and that workers in large firms were absent approximately 2.4 days more than small firm workers. He suggests that absence tends to be higher among large firms due to the associated difficulty in monitoring workers. He also suggests superiors supervising employees in large firms are less interested in monitoring and rewarding employees using compensation systems, such as promotions and wage increases. He believes this may be due to employment protection legislation where supervisors have less incentive to control workers because they are not the claimants. These reasons may make it more difficult to dismiss employees and/or provide incentives. In summary, the economic literature on firm size and absenteeism show a positive relationship. Larger firms tend to have more employee absences than smaller firms.

### ***2.3.6 Tenure and Absenteeism***

The relationship between tenure and absenteeism has been extensively researched in the organizational psychology field. The literature on tenure and absenteeism is relatively inconsistent. Some studies report a positive relationship between tenure and absenteeism (Riphahn, 2004). Other studies have reported a negative relationship (Nicholson et al., 1977; Drago & Wooden, 1992). One study showed no relationship (e.g. Hackett, 1990).

Fitzgibbons and Moch (1980) provide an explanation for a positive or negative relationship between tenure and absenteeism. They argue that organizations base their decision to lay off an employee based on seniority. Therefore, employees working with an organization for a long period of time can be absent and not compromise their employment prospects leading one to expect a positive relationship. In contrast, employees working for the organization longer are likely to have resolved organizational or familial pressures and problems that have kept them from work, leading one to expect a negative relationship between tenure and absenteeism. Fitzgibbons and Moch's study examined the tenure-absence relationship and found that employees who have worked longer for the organization have fewer absences. They suggest that this may be due to employees with longer tenure having less pressure and being better adjusted to the organization.

Drago and Wooden (1992) take a work discipline perspective suggesting that individuals who have high absences may be laid off or fired by their employer. Therefore,

these individuals will be excluded in a data set and the data set will contain individuals with low absences leading to a negative relationship. Their study examined tenure and absenteeism and found that short tenure was associated with less absence.

The previous studies on tenure have examined the bivariate relationship with absence. However, some studies have examined the influence of tenure and age on absenteeism. The studies examining both variables have also reported inconsistent results. Thompson et al., (2000), argue that the inconsistent results are due to theoretical and methodological issues. They cite three issues with previous studies. The first is related to the inconsistent use of absence measures, such as absence duration and frequency. The second issue is the lack of studies examining the curvilinear relationship between age, tenure, and absence. Finally, they criticize previous studies for examining the simple bivariate relationship between tenure and absenteeism, and for ignoring the potential mediating or moderating effects of a third variable.

Thompson et al., (2000) address these weaknesses in their study by examining the influence of age and tenure on certified and non-certified absence in three workgroups: administrative workers, homecare workers, and residential care workers. They also examined the linear and curvilinear associations of age, tenure, and absence. The results of their study show a curvilinear relationship between tenure and absence, but the results varied with the type of absence and workgroup. The result was an inverse U-shape relationship for administrative and residential workers with certified absence. This would suggest that absence is low for both shorter and longer tenured employees, and it tends to rise to a peak during the middle period of tenure. The relationship with non-certified absence and tenure was U-shaped for homecare workers. This suggests that for home care

workers, absence is high for both shorter and longer tenured employees, and absence tends to decrease during the middle period of a worker's tenure.

Recent studies have found a positive relationship with tenure and absence. Riphahn (2004) found that German public sector workers with long tenure are absent more often than their younger colleagues. Jensen & McIntosh (2007) examined two variables, tenure at the company and tenure in occupation for men and women. The result for tenure at the company was negative and significant for women. However, the results for tenure in the occupation were positively associated with days absent in women. They suggest that some workers with a long tenure in an occupation may view absence as a substitute for good attendance.

Similarly, Scoppa (2010) found that as tenure increases, workers tend to take more days off. They found that after 10 years of tenure, the probability of being absent increases by approximately 5 percentage points. He suggested that during the early years of employment, employees are monitored closely and more frequently, also realizing that their early performance will affect their future career. This provides incentives for employees to work harder and thus avoid absenteeism.

In summary, the early literature on tenure and absence showed inconsistent results, however, more recent studies on tenure and absence show a positive relationship, suggesting that longer tenured employees are more prone to absence.

## 2.4 ECONOMIC THEORY OF ABSENCE

The economic approach to absence also builds on the Steers and Rhodes (1978) process model by modeling the decision-making process of absence behaviour. Applied psychologists have traditionally examined the motivations underlying the decisions to be absent. Based on their theories, economists have developed empirical models to explain work attendance and worker absence behaviours. Some of these models utilize the labour supply theory to determine which employment contract factors (such as wage or contract hours) influence an individual's decision to substitute work for leisure (absence) and vice versa.

### ***2.4.1 Absenteeism and the Labour Supply Model***

The traditional labour-supply model focuses on an individual's decision to attend work and their length of time at work. As such, the model essentially involves the examination of how individuals choose to spend their time, either working or taking part in leisure activities. Its basic notion is that a tradeoff occurs between an individual's use of their time for either work or leisure. An individual may choose to spend their time doing leisure activities, which requires no monetary exchange. Otherwise, the individual may choose to spend their time working for a firm in exchange for wages. Economists believe the price that is established between the employee and employer for the exchange of services for wages is a key aspect in the individual's decision to be absent.

An individual will choose the amount of time they will be willing to work based on their level of satisfaction (utility) and various combinations of work, income, leisure time and wages. It is hypothesized that an individual will make a decision that maximizes their utility subject to alternative wage rates. However, a firm may offer a set of contractual work hours that exceeds the employees' desired work effort. This results in disequilibria in which the employee is hypothesized to have an incentive to be absent, and may use more absences to equalize the imbalance of true hours of work with the desired number of hours (Kaiser, 1998). In economic terms, the marginal rate of substitution between leisure and income exceeds the wage rate; therefore, the worker will want to maximize utility by increasing leisure and reducing work (Kaiser, 1998). Research confirming the hypothesis that workers respond to disequilibria in this way has been reported by Dunn & Youngblood, 1986; Barmby & Treble, 1991 and Drago & Wooden, 1992.

#### ***2.4.2 Criticisms of the Labour Supply Model***

The majority of economic studies that examine absence, simply model labour supply influences. A major criticism of the economic literature of absence is the lack of demand side considerations in these models. Barmby and Treble (1991) argue that the conflicting results of previous studies are attributed to a lack of the demand side influences leading to a "mis-specified model".

Barmby et al (1991) incorporated demand side influences by examining an experience rated sick-pay scheme, implemented by the firm, as part of an absence control

mechanism. The scheme provided sick pay at three different rates above the statutory sick rate pay. The highest grade received full earnings and bonuses, and the lowest grade received no benefits. A point system was linked to the grades and points were allocated based on the number and type of absences. Unacceptable absences received more points and acceptable absences received less. Barmby et al. (1991) hypothesized that the sick pay scheme would provide an incentive not to be absent because of the threat of a loss of future earnings and eligibility for sick pay. The study confirmed their prediction. These results suggested that workers reduced the amount of unacceptable absences given the threat of lower future sick pay.

Several other studies have also examined demand side factors. Brown (1991) examined the relationship between an alternative overtime scheme and absence. Hassink and Koning (2009) examined a lottery based reward system, and its influence on reducing absenteeism. Hassink and Koning developed a model where good attendance made workers eligible for participation in future lotteries. They compared two groups with differing states of eligibility for participation. They found that the absence rates of workers prior to winning the lottery declined. They also found that absence rates rose among workers who had won the lottery and were no longer eligible to participate in future lotteries. This would suggest that winning the lottery eliminates the incentive, resulting in higher absences. Overall, the effect of a lottery reduced absence cost through higher attendance, but the effect of the lottery diminished over time. This study provides some evidence of the impact of a firm's policies in reducing absence by demonstrating that the opportunity to participate in future lotteries can influence the decision to report sick.

Lafranchi and Treble take a different approach in examining absenteeism and demand side factors based on a firm's policies. Lafranchi and Treble (2010) examined the relationship between the firm's production methods and the generosity of its sick pay towards absence control. They theorize that the complementarity of workers (the absence of one worker adversely affects the productivity of other workers) in the production process increases the cost of absence and is costly to the firm. Therefore, the absence of complementary workers, who are part of the production process, not only affects the production of goods (involving a loss in product), but also affects the productivity of other workers. They also apply their complementarity theory to the production of semi-finished goods. When semi-finished stocks are not available, they have to be produced continuously in order to enable downstream production to continue.

Some of the ways firms can lessen the impact of the complementarities of workers on absence costs is through the use of flexible work arrangements, and having an oversupply of temporary workers to replace an absent worker. Other methods firms have used to control absence include offering higher wages to reliable workers, using enforcement methods such as close monitoring, and incentive systems such as sick-pay entitlements to manage absence costs.

Given the impact of complementarities on a firm, Lafranchi and Treble seek to provide some evidence of how certain production methods (such as just-in-time), and the firm's policies such as monitoring and incentive systems, influence absence control. They examined the use of just-in-time (JIT) production methods and argue that firms that use JIT need to employ workers with certain demographics (i.e. male gender,

younger age group) that display low levels of absence, and that have lower absence rates, compared to other firms who do not use JIT. The findings of their study show that firms that use JIT have an employment structure that utilized more reliable workers, offered less generous sick pay, and have a workforce characterized by a demographic group of young males.

Their study provides empirical evidence to suggest that some firms may have human resources policies related to specific characteristics of their production methods that influence the absence of workers.

### **2.4.3 Wages**

A key variable in the majority of economic studies examining absenteeism is the influence of wages on an individual's decision to be absent. An increase in the wage rate may increase or decrease the desired amount of work, depending on the individual's desire for income and leisure. The impact of the change in the wage rate has two effects, an income effect and a substitution effect. An income effect occurs when an increase in the wage results in higher income. The response to more income is the consumption of more of the "desired" good. Since leisure/absenteeism is considered a "desired" good, then it is predicted that an individual with increased income will choose to take more time off. Basically, as income rises, individuals will choose to consume more leisure, and desired work hours will decrease. Conversely, if income is reduced while the wage rate is held constant, desired hours of work will go up.

A substitution effect occurs when an increase in the wage rate results in a decrease in the demand for leisure, thereby increasing work incentives. Therefore, as the cost of leisure changes, holding income constant, leisure and work hours are substituted for each other. Conversely, a decrease in the wage rate will increase the demand for leisure and reduce work incentives.

Studies examining the impact of wages using the labour-leisure model have found a negative relationship between the wages and absence behaviour implying a substitution effect (Allen, 1981; Dunn & Youngblood, 1986; Chaudhury & Ng, 1992; Drago & Wooden, 1992; Barmby & Orme & Treble, 1995; De Paola, 2010; Pfeifer, 2010).

Barmby, Orme and Treble (1995) suggest the negative relationship between wages and absence may be due to efficiency wage effects. The use of wages in their model was used to control absence behaviours. The efficiency wage theory implies that firms may increase wages above the market clearing average to increase productivity or efficiency within the firm. In the case of absenteeism, Barmby, Orme and Treble (1995) suggest that the optimal response for firms which suspect that employees are taking unacceptable absences is to increase wages, instead of increasing the cost of monitoring, to discourage shirking. This response is similar to Shapiro and Stiglitz's (1984) shirking model, which suggests that when the possibilities of monitoring workers' job performance are poor, firms may pay higher wages to provide incentives for workers to supply adequate effort.

#### ***2.4.4 Overtime and Absenteeism***

Another factor that has been documented to influence absence is overtime.

Overtime has been included in absence models because the extension of an individual's work hours has an influence on labour supply and an individual's decision to be absent. Two arguments have been proposed about the relationship between overtime and absenteeism. First, from a labour supply perspective, absenteeism arises due to the imposition of an hours' constraint (Brown, 1999). Brown suggests that flexibility in the work schedule may lead to a reduction in an employee's demand for absence. Therefore, overtime systems have been proposed as a way of counteracting absence. Leslie (1984) argues that increased overtime would reduce absence rates because a premium offered by the employer would provide an incentive for workers to work more hours.

On the other hand, Chaudry and Ng (1992) argue that working overtime may be associated with increased absence because employees face working longer hours and have less work-schedule flexibility. Kenyon and Dawkins (1989) suggest the availability of overtime should affect labour absence. They used the following three measures as proxies for availability of overtime; percentage of workers' working overtime, average hours of overtime per employee, and average hours of overtime per employee working overtime. The results of their study showed that an increase in an hour of overtime per employee would be expected to considerably reduce absence.

Dalton and Mesh (1992) highlight an issue with regard to firms allowing regular attendees to work overtime to compensate for absentees. They indicate that employees working overtime hours may be able to "afford" absence that may lead to a snowball

effect of more absenteeism. Another concern with respect to overtime is that employees may want to substitute working regular hours for overtime work due to premium pay, which would lead to more absence during standard working hours.

The literature on overtime and absenteeism is mixed. Few studies have examined the relationship between overtime and absenteeism. More studies are required to determine the influence of overtime on employee absence.

#### ***2.4.5 Seasonality***

The impact of seasonality on employee absenteeism is well documented in the absence literature. Various disciplines have examined the influence of seasonality on absenteeism. The economics literature has focused on absenteeism and the business cycle. One study conducted by Audas and Goddard (2001) investigated the effect of an aggregate industrial production measure and the rate of unemployment on absenteeism over the business cycle. They suggest absenteeism is influenced by cyclical factors within the business cycle. For example, during market recessions, opportunities for employment are less; therefore, workers may attend work more frequently to reduce the probability of being fired.

Audas and Goddard (2001) also suggest two other reasons why illegitimate absences may be seasonal. The first is that the perceived benefit of a day off from work may be higher in the summer than in the winter. A second reason is that a business's monitoring effort might vary through the seasons within the year due to the effects of labour hoarding. Audas and Goddard's examination of seasonality, absence and the

business cycle found that the implications for firms with increased absence may be lower when organizations hoard workers during busy seasons.

Other studies have also examined the influence of seasonality on absence. A study conducted by Kenyon and Dawkin (1989) examined seasonality in their absence model by including seasonal dummy variables to identify seasonal shifts. The results show that labour absence is highly seasonal. They found higher incidence of labour absence in the winter quarter, and a relatively low incidence in the summer quarter.

Other studies have noted the illness component of absenteeism is likely to account for some seasonal variation. Illness-related absences are highly seasonal, reaching their peak during the winter months (December to February) and a low during the summer months (June to August). Akyeampong (2007) indicates that higher incidence of absence during the winter months is likely associated with the prevalence of communicable diseases such as colds and influenza. The low incidence of absence during the summer may be related to the high number of employees taking summer vacation during these months. His study looked at part-week or full week absences. An examination of absence patterns found that part-week absences are roughly 30% more common in the winter months and almost 20% less so during the summer months, compared to the national average.

## 2.5 EXTERNAL FACTORS INFLUENCING ABSENCE

The economic and social theory of absence provides an explanation of how individuals and workgroups may influence absenteeism. External factors such as workload have the propensity to alter the social dynamics of a workgroup. This section will examine the different methods used to measure workload and the literature on workload in the health care field.

### *2.5.1 Workload*

Workload in health care facilities is on the rise due to a greater demand for health care services, an increase in patient acuity and shortage of skilled health care professionals. Evidence suggests workload in acute care hospitals and long-term care facilities are increasing and elevating stress levels among health care employees. Increased workload or work overload is widely cited by hospital nurses as the primary reason for occupational stress, job dissatisfaction and sickness absence (Bryant et al., 2000; McVicar, 2003). As a result, various methods of measuring workload have been developed in order to make decisions regarding staffing requirements, resource allocation, planning and budgeting for specific needs of the department.

## **2.5.2 Workload Measures**

Various measures are used to examine workload in the health administration field. Two common approaches for measuring workload include “workload measurement systems (WMS)” and hospital indicators such as length of stay, inpatient admissions, and inpatient discharges as a means of measuring workload.

### **2.5.2.1 Workload Measurement System**

Workload measurement systems (WMS) have existed since the 1970s. According to the Canadian Institute for Health Information, WMS is a mechanism to track time related to what the "hands-on" staff are doing towards fulfilling the mandate of their department. It is intended that the workload units (minutes) recorded reflect the time it took to carry out various activities of the functional centre.

Workload measurement systems are used to estimate the amount of care any given patient would require each day. Elements of patient care are broken down into sub-elements for each unit, and are timed to determine the standard of time required to complete the task. Workload measurement systems are also more commonly used in nursing. Information captured in workload measurement systems varies from hospital to hospital, depending on financial resources and technological capabilities. However, the basic information captured usually consists of the time to complete specified tasks such as cleaning and administering medications that are related to the services provided.

### **2.5.2.2 Criticisms of workload measurement systems**

Workload measurement systems have been criticized for taking a partial account of the actual work done on a daily basis. Most of the systems measure two dimensions of nursing work: direct and indirect care. The systems focus on the basic nursing tasks, ignoring the medical and nursing complexity of patients, the characteristics of nurses providing care, and the work environment (Baumann et al., 2001). Nursing researchers argue that workload measurement systems' total nursing time should include direct nursing care, indirect nursing care, and work not related to patient care. However, most systems do not include this type of information because it is difficult to measure the different aspects of a nurse's job, leading critics to believe current workload measurement systems do not accurately reflect the true workload of nursing staff.

### **2.5.2.3 Hospital Utilization Statistics**

In addition to WMS, there are three common statistics used to measure hospital utilization. These measures include length of stay, inpatient admissions, and hospital separations. These measures are routinely collected by hospitals and are generally easy to obtain.

#### **2.5.2.4 Length of Stay**

Length of Stay (LOS) is defined as the number of days an individual has spent in a hospital. It is used to measure the duration of a single episode of hospitalization. Inpatient days are calculated by subtracting the day of admission from the day of discharge. Persons entering and leaving a hospital on the same day would have a length of stay of one.

Length of stay is an indicator for hospital utilization. Fundamental changes in the practice of medicine and calls to reduce the length of stay by using more advanced technologies, and utilizing more outpatient services, have resulted in substantially shorter lengths of stay. A decrease in length of stay often results in an increase in workload for physicians and nurses because of the demands and paper work involved in discharges and new admissions. In general, shorter LOS means a more efficient hospital but a busier house staff (Dellit et al., 2001; Bourbonnais et al., 1992).

#### **2.5.2.5 Hospital Admissions**

Hospital admissions are used by administrators to provide an aggregate indicator of access and utilization of hospital resources (CIHI, 2002). Changes in care patterns, such as shorter hospital stays and higher bed occupancy rates would allow more admissions for a given bed complement. During an admission and discharge period, the workload of nursing staff is significantly influenced by the intense and time-consuming

patient care requirements. It is widely believed that inpatient admissions increase the workload and intensity of care for nurses on the unit (Jacobson et al., 1999).

#### **2.5.2.6 Hospital Separations**

A hospital separation from a healthcare facility occurs any time a patient (or resident) leaves because of death, discharge, sign-out against medical advice, or transfer. The number of separations is the most commonly used measure of the utilization of hospital services. Separations, rather than admissions, are used because hospital abstracts for inpatient care are based on information gathered at the time of discharge. Separations are usually the preferred variable for the measurement of hospital inpatient throughputs, because they measure the number of completed cases, while admissions measure the number of cases that entered treatment (CIHI, 2002).

#### **2.5.2.7 Workload Literature**

Few studies have examined hospital workload and absenteeism. A small number of studies which have looked at these variables have examined the influence of nursing workload on sickness absence or sick leave. One study conducted by Bourbonnais et al., (1992) examined the association of medically certified sick leave and workload overload of nurses. Workload was measured using the length of stay and nurse to patient ratio. Length of stay was used as an inverse measure of the nurse's workload, as the need for

nursing care is always greater in the first few days of hospitalization (Bourbonnais et al., 1992). The nurse to patient ratio was used as a direct measure of nursing workload. The study results indicate that the nurse to patient ratio influenced the occurrence of sick leave, but that the patient's length of stay did not have an effect on sick leave. The authors believed that a finer measure of workload would have produced different results.

A study conducted by Rauhala et al., (2007) used a more precise measurement of workload with the Finnish patient classification system, Rainio, Fagerström and Rauhala (RAFAELA) to examine work overload and its influence on sickness absenteeism. RAFAELA consists of patients' nursing care intensity, daily personnel resources, and a self- assessment tool, which measures the optimal nursing care intensity level. The basic premise of the system is that workload is expressed in nursing care intensity points per nurse, and is compared with the optimal nursing care intensity for the ward (Rauhala, 2007). Each nurse's patient-associated workload was computed using nursing care intensity points. The total points for each ward was totaled and divided by the number of nurses on the ward to give the average nursing care intensity per nurse. This average was divided by the optimal nursing care intensity per nurse to obtain the nursing care intensity ratio. This ratio measures nurses' patient-related workload optimality in different wards. The study examined patient-associated workload scores, short-term absence spells (self-certified sick leave), and long-term absence spells (medically certified sick leave). The results of this study show that a workload exceeding the optimum by approximately 15% or more may increase the risk of both short-term and long-term sickness absence among nurses.

These studies demonstrate an association between nursing workload, patient related workload, and absenteeism. Although more studies are needed to validate this association, those that exist provide some evidence of a link between hospital workload and absence.

## 2.6 ATTENDANCE CONTROL POLICY

For absences associated with work overload or due to illness, a policy which establishes guidelines used to support, monitor and address employee absence is crucial for the health and wellness of the employee.

The attendance policy at the Health Care Corporation of St. John's outlines the roles and responsibilities for the employee, manager and health and wellness support team. Employees who are absent are required to contact their manager on the first day of absence and submit the required documentation related to the absence (for example a medical certificate). Employees who fall below corporate standards for attendance are required to meet with their manager to discuss their attendance, outline objectives for improvement and if required referred to the health and wellness team for support. A series of 3 month follow up assessments are arranged to monitor and evaluate the employee progress and improvement.

Employees who have been medically assessed to have a long-term disability are assigned to work with an Occupational Health nurse who will evaluate and determine what resources may benefit the employee. These resources may include referrals to a

Human Resource advisor, Injury prevention or Rehabilitation professional. As the employee recovers from injury/disability, the employee will work closely with Human Resource advisors and the Occupational Health nurse to develop a return to work plan which may include modifications to the work environment. Close monitoring and regular follow up assessments are arranged until the employee is medically approved to return to work.

## 2.7 SUMMARY

Employee absenteeism is a complex problem. The landmark study conducted by Steers and Rhodes (1978) identified a number of factors influencing the decision to attend work or to be absent. Their model spurred a proliferation of research studies from various academic disciplines identifying and refining theoretical and conceptual models of absence.

The economic model of absence examines an individual's behaviour by modeling their decision to be absent. The decision to be absent may be influenced by a number of factors. In the economics literature, wages are a major component in an individual's decision to be absent. Most of the literature on wages shows a negative association with absence. This indicates employees tend to place a higher value on wages and are willing to forgo taking time off for a higher wage.

The length of employment with an organization has been reported to influence employee absenteeism. Earlier studies show that longer tenured employees tended to have less absence than employees who have had a short tenure within an organization. However, more recent studies have shown that longer tenured employees have higher absences than short tenured ones.

An individual's absence patterns may also provide an indication of their propensity to be absent in the future. Previous studies have shown past behaviours may be a predictor of future absence behaviour.

The absence of workgroup members has also been documented to influence an individual's absence behaviour. Several studies have found evidence to support the

association with workgroup absence on individual absence. In addition, the size of the workgroup has also shown to influence absence behaviours. Larger workgroups and firms tend to have higher absence rates than smaller workgroups and firms.

Work environmental factors, such as workload have been associated with employee absenteeism. Work overload has been suggested to influence sickness absence. Several studies have found that high workload contributes to sick leave among nurses. However, no studies have examined the influence of hospital workload on short-term discretionary absence.

Finally, seasonality has been associated with absence. Evidence suggests employee absenteeism at hospitals is high during the winter months and low during the summer months. One study has found seasonal shifts in the business cycle, but few studies have examined seasonal shifts of absence of several hospital workgroups.

## **CHAPTER THREE: METHODOLOGY**

### **3.1 OVERVIEW**

The previous chapters highlighted the vast literature on absenteeism and the significant problems associated with absenteeism in the workplace. The objectives of this research are to identify factors affecting absenteeism within the hospital setting and to identify any patterns associated with absenteeism. This chapter will outline the details of the development of the database and the methodology used to analyze the data.

### **3.2 DATA SOURCE**

The administrative dataset that will be used in this study was obtained from the Health Care Corporation of St. John's, the largest health care organization in Newfoundland. The Health Care Corporation is a tertiary care centre for the province and also provides health care services to the St. John's region. The Corporation consists of two adult acute care facilities (the Health Sciences General Hospital and St. Clare's Mercy Hospital), a pediatric hospital (Janeway Children's Health), a rehabilitation centre (L.A. Miller Rehabilitation Centre), and a psychiatric hospital (Waterford Hospital).

The administrative data file is composed of payroll and personnel data from January 1, 1997 to November 28, 2004<sup>1</sup>. The payroll data includes daily payroll information such as standard hours, hourly wages, overtime hours, pay grade and pay scale for all employees at the Health Care Corporation. The personnel data consists of

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<sup>1</sup> After the data was provided, Health Care Corporation St John's amalgamated with several other health boards in Eastern Newfoundland to form Eastern Health.

employee information such as union membership, departmental allocation, hospital site, job title, job classification and hire date. A unique identifier was used to protect the identity of employees and to follow individuals over time.

There are 18 active bargaining units in the Health Care Corporation of St. John's, however only the larger bargaining units were used in the analysis to protect the identity of the employees. The seven bargaining groups included in the study are:

### ***3.2.1 NLNU***

NLNU is an abbreviation for the Newfoundland and Labrador Nurses' Union. The union represents over 5000 registered nurses working in acute care, long-term care, community, education and research in Newfoundland and Labrador. There are a total of 2362 nurses included in the final data set.

### ***3.2.2 AAHP***

AAHP is an abbreviation for the Association of Allied Health Professionals. The union represents the Allied Health professionals in hospital and health care facilities in Newfoundland and Labrador. The union consists of, but is not limited to, psychologists, pharmacists, social workers, physiotherapists, occupational therapists, speech pathologists and audiologists. AAHP NC consists of six Allied Health professionals employed with the previous cancer foundation. They were combined with the larger AAHP group. The final data set includes 500 Allied Health professionals.

### **3.2.3 NAPE**

NAPE is an abbreviation for Newfoundland and Labrador Association of Public and Private Employees. NAPE is the largest union in Newfoundland and Labrador and their members work in government, health care, education, corrections, financial, hospitality, retail, and food processing sectors. NAPE employees working in the hospital or health care facilities are primarily support workers such as clerical staff, paramedic staff, housekeeping, food services and IT. NAPE CL is a small group of support workers employed at the Central Laundry site. They were included in this NAPE group.

The final data set includes 2,991 NAPE employees.

### **3.2.4 NAPE-LX**

NAPE-LX is an abbreviation for Newfoundland and Labrador Association of Public and Private Employees Laboratory group. The laboratory group is a sub-group within the NAPE bargaining group and consists of laboratory and x-ray technologists. There are a total of 467 NAPE-LX employees in the final data set.

### **3.2.5 NAPE1125**

NAPE1125 is an abbreviation Newfoundland and Labrador Association of Public and Private Employees – Licensed practical nurses. This group is also a sub-group of NAPE and consists of licensed practical nurses employed at the Waterford. There are a total of 125 licensed practical nurses working at the Waterford included in the final data set.

### **3.2.6 NB**

NB is an abbreviation for non-bargaining group. This group consists of non-unionized secretarial employees. The final data set includes 82 non-unionized secretarial employees.

### **3.2.7 MGMT**

This group consists of managers employed at the Health Care Corporation of St. John's. There are a total of 313 managers included in the final data set. Two bargaining units were reassigned to larger bargaining groups because they have similar profiles.

### 3.3 DATA STRUCTURE

#### ***3.3.1 Panel Data***

The structure of the data set is known as panel data. Panel data is a type of data structure that consists of both cross-sectional data and time series data. The cross sectional information allows for the examination of differences between employees. The time series information allows for the examination of changes within employees over time. The combination of cross-sectional and time series data allows us to follow a sample of employees for multiple time periods. Administrative panel data sets are typically large because they track a large number of employees over a long period of time.

#### ***3.3.2 Benefits of Panel Data***

The primary benefit of a panel data structure is the ability to track a wide range of individuals over time, therefore allowing for complex modeling of subject behaviour, compared to a purely cross-sectional or time series data set. Another key feature of panel data is that having multiple units for the same individual allows us to control unobserved characteristics of individuals (Wooldridge, 2003). Individual behaviours differ, therefore panel data sets are useful for controlling for time-constant unobserved features of individuals which we think might be correlated with the explanatory variables in the model (Woodridge, 2001). Finally, having a large number of observations allows us to model the dynamics of the individual behaviour. More specifically, it will allow us to

follow trends in absenteeism by examining absence patterns of different occupational groups over time.

### 3.4 DATA QUALITY

The administrative data set contains approximately 8 million data points (i.e. person-shifts). The data set was divided into seven data sets organized by year. Data quality checks were performed on each data set to ensure there were no duplicate observations or missing data. There were no missing or duplicate observations for the 1998-2004 dataset sets. The 1997 data set was excluded from the study because half the calendar was included.

### 3.5 STUDY SAMPLE

The first step of the development of the study sample involved assigning absences and attendance. This was done using a variable in the data set called an earning code. The earning code is an abbreviation used by human resources to describe different aspects of the work shift such as the type of shift and adjustments to pay and hours. An individual can have multiple earning codes associated with one work day/shift. As a result, an individual may have multiple entries in the data set on a given work day/shift. For example, a nurse working a regular evening shift on the weekend would have a minimum of three entries in the dataset for that given day. The first record would represent a regular

shift, followed by a second record indicating an evening shift, and a third observation reflecting a weekend shift.

Our analysis required one observation per shift per day. Earning codes were classified as an absence, attendance or “other” to determine its relevance to the study. In the example given above, the first record would be labeled as "attendance" and the second and third records would be labeled as "other". Earning codes labeled as an absence or attendance, were included in the data set. The earning codes labeled as “other” were excluded from the data set.

### ***3.5.1 Components of Study Sample***

#### **3.5.1.1 Absence**

An earning code was labeled an absence if an employee did not attend a scheduled work shift. Long-term absences such as vacations and Workers Compensation Board (WCB) leaves were not counted as an absence. The following earning codes were labeled as absences: sick leave (paid and unpaid), family leave, half days and special leave.

#### **3.5.1.2 Attendance**

An earning code was labeled as an attendance if the employee attended a scheduled shift. The following earning codes were classified as an attendance: regular shifts, callbacks, relief shifts and overtime. Other earning codes such as orientation, education leave, work orientation, and course work were also classified as an attendance. This was done because technically the employee is present, and these leaves were pre-scheduled, so that advance coverage would have been arranged in anticipation for any

educational/training leaves. There were three types of exclusions: miscellaneous earning codes, work hour adjustments and occupational groups.

### **3.5.1.3 Miscellaneous earning codes**

The administrative data set included additional payroll information used to describe the work shift. The earning code was used to document vacations, shift type, banked time and pay/reimbursement adjustments. These codes were not relevant in the study and were excluded from the data set. There were approximately 124 earning codes were excluded from the data set.

### **3.5.1.4 Hours**

The administrative data set also included adjustments to work hours. There were observations in the data set that were coded with zero or negative hours. These observations were pay adjustments related to previous shifts and did not reflect actual time working.

### **3.5.1.5 Occupational Groups**

The administrative data set contains information regarding all employees at the Health Care Corporation of St. John's including senior executives, clinicians, clinical residents, medical students and student apprentices. These occupational groups were excluded from the dataset because the purpose of the study is to examine large groups of hospital workers employed by the Health Care Corporation of St. John's. There were approximately 1045 employees excluded from the data set which equated to over one million observations being removed.

### **3.5.1.6 Public Service Strike**

During the study period, the NAPE bargaining unit initiated a strike, which lasted for 25 days. The strike started on April 1<sup>st</sup>, 2004 and ended on April 26, 2004. These days were excluded from the regression analysis so it would not influence the overall results.

### 3.6 DATA CONSTRUCTION

An absence history profile was subsequently created. Seven annual datasets were merged into one file and sorted by unique id and then further divided into ten datasets to allow for easier management of the data. This was done to ensure that the entire work history of an employee was captured in one data file.

Data quality checks were conducted to ensure that observations were not erroneously dropped from the data set. The data quality checks displayed multiple observations of an absence and/or attendance for a given ID number and date. This could have been the result of cases where employees may have been in attendance for  $\frac{1}{4}$  of the day and absent for the remainder of the day for various reasons.

However, in order to conduct the analysis, one observation, per ID, per date was required. In order to address the issue of multiple observations, a SAS<sup>TM</sup> code was written, so that when an absence and an attendance occurred on the same day, an absence would be selected and included in the data set. If there were three observations reflecting an absence, and two attendances, on a given day, and for a particular ID number, the absence would be selected and included in the data set. Therefore, if an employee had multiple observations for a given day and an absence was among the observations, the code would select the absence and include it in the data set. The same process was used for multiple attendances.

### ***3.6.1 Absenteeism***

Absenteeism is defined as the absence from a scheduled work shift. An employee was assigned an absence based on the earning code classification identifying whether an employee was in attendance on a given day. The unit of observation in this study is a person-day, which allows for a panel framework. Absence data was coded as attendance=0, absence=1.

The last step in the development of the study sample involved the construction of the independent variables. To determine which factors influence absence, three factors, work environment, individual and social factors will be examined. The construction of these variables will be discussed below.

### ***3.6.2 Work Environment Factors***

Various aspects of the work environment can influence absenteeism. The internal environment such as workload and the external environment such as seasonality and hospital site location may contribute to the absence of health care employees. These three variables were used to assess the influence of the work environment on absence.

### **3.6.2.1 Workload**

To determine whether patient-related workload may influence employee absence; a proxy for workload was used. Patient volume was used as a measure of workload for the entire organization because it is hypothesized that patient volume affects the amount of work for clinical and non-clinical staff. For example, high patient volume may increase work for nurses who provide care to patients, administrative personnel who admit patients, and support personnel who provide laundry and kitchen services.

#### *3.6.2.1.1 Workload Data*

The workload measure was constructed using a separate data file obtained from the Health Care Corporation of St. John's. The data set contained daily admission and discharge data by nursing unit/department for all HCCSJ hospital sites from February 2002 to November 2004. The variables in the data set included discharge date, nursing unit/department, nursing unit/departmental admission date and time, nursing unit/departmental discharge date and time, length of stay on the nursing unit/department and total length of stay. There were a total of 198,416 observations in the data set, which included 6 hospital sites and 166 nursing units/departments.

#### *3.6.2.1.2 Matching Departments in the Workload data with the Administrative Data set*

The workload data set contained a different naming convention for the nursing departments compared to the administrative data file. Therefore, a mnemonic code list was used to identify the nursing units in the workload data set and to match them with the departments in the administrative data set. There were 166 departments in the workload data, and 101 were matched with the administrative data set. There were 65 departments

that were dropped because there was no direct match in the administrative data set, or no appropriate department to group them into.

#### *3.6.2.1.3 Calculation of the workload measure*

The calculation of the workload ratio occurred in four steps. The first step required the calculation of patient volume on a nursing unit on a given day. This was done by populating each admission record by the length of stay to obtain a record of each day the patient was in the department. This was done for every admission in the workload data set. Following this procedure, a count of the number of patients in a department on a given day was computed to provide a daily measure of patient volume. Computing patient volume in this way provided an accurate count of the number of patients in a department on a given day.

#### *3.6.2.1.4 Workload Ratio*

The second step in calculating the workload measure was to calculate the workload ratio for each department, to determine the workload per employee for each department per day. First, the average number of employees working in the department per day was calculated. The total number of patients in the department per day was divided by the average number of employees working in the department per day, to give the departmental workload ratio.

Workload information was not available for all employees; therefore, the third step in the process required calculating a workload ratio by hospital site. The site average (the average number of workers per day by site) was computed for the five hospital sites (HSC, SCM, JAN, WAT & LMC). The total number of patients was divided by the site

average to get the site workload ratio. The site ratio was used for those individuals where departmental workload data was unavailable.

Workload information was also unavailable for the other departments in the Health Care Corporation (HCC), therefore the fourth stage in the process required the calculation of an organizational workload ratio. The organizational average (the average number of workers per day by organization) was calculated. This value was divided by the total number of patients in the hospital per day to give the organizational workload ratio. The organizational workload ratio was used for primarily operational and administrative support personnel working at the Health Care Corporation of St. John's.

The last stage in the process required combining all three workload ratios into a single variable called workload ratio (*wl\_ratio*). The workload ratio variable is a ratio of patients to workers on a departmental, site and organizational level.

The workload ratio was lagged, because an individual's decision to be absent may be contingent upon the previous days' workload, opposed to the workload on the given day. Therefore, in order to capture this decision-making process, workload ratio was lagged by one day.

### **3.6.2.2 Seasonality**

Absenteeism has been associated with seasonal variations. Studies have shown that absences tend to be higher during the winter months, and lower during the summer months (Audas and Goddard, 2001). A separate analysis will be conducted examining the influence of seasonality on the seven bargaining groups to determine whether there are seasonal variations in absence patterns among health care workers and administrative

staff. Monthly dummy variables were created and included in the model to examine the influence of seasonality on the 7 bargaining groups

### **3.6.2.3 Hospital Site Location**

To determine whether the location where an individual is employed may influence absence, a dummy variable was created for each hospital site. See Table 1 for description of the hospital sites and the services they provide.

Table 1. Hospital Site Description

<b>HEALTH SCIENCES CENTRE</b>	<b>ST. CLARE'S MERCY</b>	<b>DR. L.A. MILLER CENTRE</b>	<b>WATERFORD HOSPITAL</b>	<b>JANEWAY PEDIATRIC HOSPITAL</b>	<b>HCCSJ COPORATE OFFICES</b>
<p>Tertiary adult acute care facility</p> <p>Services:                      Emergency /Trauma                      -Medicine                      -Surgery                      -Cardiac Care                      -Critical Care                      - Mental Health                      -Diagnostic Imaging                      -Allied Health                      -Women's Health</p>	<p>Tertiary, adult acute care facility</p> <p>Services:                      Emergency                      -Medicine                      -Surgery                      -Cardiac Care                      -Critical Care                      -Mental Health                      -Diagnostic Imaging                      -Allied Health</p>	<p>Rehabilitation / Continuing Care Centre</p> <p>Services:                      - Functional Independence Rehabilitation                      - Vocational Rehabilitation                      -Convalescent Unit                      -Geriatric Rehabilitation                      -Allied Health</p>	<p>Mental health facility</p> <p>Services:                      -Ambulatory mental health services                      - Dialysis Laboratory                      - Diagnostic Imaging                      - Allied Health</p>	<p>Children's hospital</p> <p>Services:                      - Emergency                      - Medicine                      - Surgery                      - Cardiac Care                      - Critical Care                      - Mental Health                      -Diagnostic Imaging</p>	<p>Operational/ Support Services</p> <p>Services:                      -Human Resources                      -Information Management &amp; Technology                      -Finance                      -Health Records                      - Medical Supplies                      -Printing                      - Central Kitchen                      - Laundry</p>

### **3.6.3 Individual Factors**

An individual worker's behaviour and their decision with respect to their employment contract have been shown to be associated with absence. The four variables used to examine individual factors in this study are absence in the last 5 and 30 days, overtime in the last 5 and 30 days, wages and tenure.

#### **3.6.3.1 Absence in the Last 5 & 30 days/shifts**

Individual absence behaviours may have an influence on absenteeism of other employees within a group. For example, an absent employee may increase the workload of other workers, which could theoretically increase absence among other workers.

An examination of an individual's absence patterns, through their work history, may identify whether an individual is more prone to absence. Two variables were constructed to examine the influence of absence over the short-term (absence within the last five days/shifts) and long-term (absence within the last 30 days/shifts). To construct the variable "absences within the last five shifts", a code was written utilizing Stata™ software to count the number of days in between shifts for each employee. If an employee worked five consecutive shifts, the code computed the number of absences within a five day/shift time period of absence for each employee over their entire work history.

A similar calculation was constructed for absence in the last 30 days/shifts.

#### **3.6.3.2 Overtime in the Last 5 & 30 days/shifts**

Overtime shifts may be a contributing factor to absenteeism. To determine whether overtime may influence absenteeism, two variables were constructed, overtime in

the last 5 days, and overtime in the last 30 days. The purpose of including these variables is to determine the effect of working overtime over a short time period (five days), or a long time period (thirty days), on absence.

In this study, overtime was defined as extra hours worked in addition to regularly scheduled shifts. The overtime variables reported in the data set are daily overtime hours. The following earning codes were classified as overtime: overtime 1 hour, overtime 1.5 hours, overtime 2.0 hours, overtime hours related to sick relief (1.5 h and 2.0 h), overtime hours for callbacks (1.0 and 2.0), and extra regular hours. All earning codes classified as overtime were assigned a value of one, and all other codes were assigned a value of zero. The calculation for overtime within the last 5 days/shifts, and overtime within the last 30 days/shifts, followed the same procedure used to construct absence in the last 5 days/shifts and absence in the last 30 days/shifts.

### **3.6.3.3 Wages**

Wages have the potential to motivate employees to work. Theoretically, an employee with lower wages might be more susceptible to absenteeism. To determine whether pay may influence an individual's decision to be absent, hourly wages will be examined. Hourly wages were provided in the dataset. No modifications were required for this variable.

### **3.6.3.4 Tenure**

Tenure has been shown to have both a positive and negative effect on absenteeism (Drago and Wooden, 1992; Riphahn, 2004). To determine the influence of tenure on absence, a proxy for tenure was used in the analysis because length of employment/tenure was not included in the administrative data set. Descriptive information about the employees such as employment status (full-time/part-time/new hire), start date of employment at the HCCSJ, job title and union membership were included in the personnel data file.

The employment status variable identified new employees using the abbreviations 'A NEW', 'B NEW HIRE' and 'NEW'. Employees with this status, along with their hire date were extracted from the personnel data file. This information was available for approximately 4335 employees. Dummy variables were created by using five-year time bands beginning with the start date of 1960, and ending with 2004. There were a total of 9 dummy variables used in the analysis for the seven bargaining groups. Due to collinearity problems with the NAPE regression, a count of the number of years employed with the organization was made using the hire date for each employee.

### **3.6.4 Social Factors**

The previous studies showed that social factors have been associated with absence. In this study, absence rate by department, overtime by department, and work

group size were used to examine the social/peer effect on absence among health care employees.

#### **3.6.4.1 Absence rate by department**

To examine the impact of workgroup absence on individual absence, a lagged absence rate for each department on a given day was calculated. The numerator for the absence rate is the total number of absences in a department on a given day, and the denominator is the sum of absences and attendances on a given day.

#### **3.6.4.2 Overtime rate by department**

Similarly, to examine the influence of workgroup overtime on absence, a similar calculation was computed for overtime rate for each department. The numerator is the total number of overtime shifts on a given day and the denominator is the sum of absences and attendances on a given day. The overtime rate was also lagged by one day.

#### **3.6.4.3 Work Group Size**

To determine whether the size of the workgroup may influence absence, a variable named workgroup count was created. Work group count is the number of workers in a department on a given day. Once all the calculations were complete and the workload data set and the administrative data set were merged. The final data set contained 3,086,110 person-day observations and 40 variables.

## 3.7 ECONOMETRIC FRAMEWORK

Two approaches commonly employed to estimate parameters using a panel data structure are fixed effects and random effects models. Although, ordinary multiple regression techniques may be used on panel data, it may not be preferred because the estimates of the coefficients may be subject to omitted variable bias. Omitted variable bias occurs when an independent variable is omitted from the model when it should be included. In addition, most regression models assume independence of observations and it is quite likely that observations contributed by the same individual may not be independent of each other. Fixed effects and random effects techniques are commonly used on panel data because of their ability to control for different types of omitted variables without directly observing them, by observing changes in the dependent variable over time (Stock, 2003). Two types of omitted variables that can be controlled for are omitted variables that differ between units but are constant over time, and omitted variables that vary over time but are constant between units (Stock, 2003).

### *3.7.1 Fixed Effects Model*

Fixed effects (FE) models are used to control for omitted variables that are constant over time. For example, fixed effects can be used to control for stable characteristics of an individual that are unobserved or unmeasured. The unobserved or unmeasured component is referred to as “unobserved heterogeneity”. Unobserved heterogeneity refers to the unobserved, time-constant factors of a unit (such as gender for individuals) that are correlated with the explanatory variables in a model. Unobserved

heterogeneity can lead to biased estimators. Therefore, the fixed effects estimators use a differencing technique to eliminate the unobserved time-invariant heterogeneity (Wooldridge, 2003). Theoretically, the mean is subtracted from each observation in each time period to produce time-demeaned data. This eliminates the heterogeneity of the time invariant unobserved variables removing the source of bias. This would lead to unbiased estimates (providing all other assumptions of the model are met) because the error should no longer be correlated with each explanatory variable across all time periods.

Therefore, any explanatory variable that is constant over time (such as gender) cannot be included in the fixed effects model because they would be removed during fixed effects transformation.

### ***3.7.2 Random Effects Model***

The random effects (RE) models are used when there is a possibility that the unobserved effect is uncorrelated with the explanatory variables in each time period. If the unobserved effect is uncorrelated with the explanatory variables, then the unobserved effects becomes part of the random error and are not differenced out as was the case with the fixed effects model. However, because of the nature of panel data (repeated observations of the same unit over time), a problem of serial correlation between errors in different time periods exists. Therefore, a generalized least squares transformation is used to remove the effects of serial correlation. Serial correlation is accounted by the choice of working correlation matrix in the analysis method. The transformation will be based on the working correlation matrix). This results in a more efficient random effects estimator.

One advantage of this transformation is that it allows for explanatory variables that are constant over time to be included in the model. This is possible because RE assumes that the unobserved effect is uncorrelated with all explanatory variables, whether the explanatory variables are fixed over time or not.

### 3.7.3 Summary

Given the heterogeneity of our study population and the number of observations in our large database we used a random effects probit to test whether environmental, individual and social factors influence absenteeism in seven health care bargaining groups. Stata™ version 8 was used to run the analysis. The regression model was estimated separately for each bargaining group to see the difference in absence among each group.

The equation that represents this absence model is the following:

$$\text{Absence}_{it} = \beta_0 + \beta_1 \text{workload} + \beta_2 \text{hospital\_site} + \beta_3 \text{seasonality} + \beta_4 \text{wages} + \beta_5 \text{tenure} + \beta_6 \text{abs\_15} + \beta_7 \text{abs\_130} + \beta_8 \text{ot\_15} + \beta_9 \text{ot\_130} + \beta_{10} \text{dept\_abs} + \beta_{11} \text{dept\_ot} + \beta_{12} \text{work\_group\_size}$$

The estimation of above equation included the omission of the following:

- a) a set of dummy variables for tenure (omitted group: tenure of 10-14 years)
- b) a set of dummy variables for seasonality (omitted group: March)
- c) a set of dummy variables for hospital site (omitted group: HSC)
- d) Individual specific and time varying error terms.

## **CHAPTER FOUR: RESULTS**

### **4.1 OVERVIEW**

This chapter describes the results of the study. The first section presents the descriptive statistics and the characteristics of the data set. The second section will present the results of the random effects regression analysis.

### **4.1 DESCRIPTIVE STATISTICS**

Table 2 presents the descriptive statistics for the sample data set organized by bargaining group. The mean absence rate for the entire organization is 12.59%. The absence rate for each bargaining group ranges from 8.68% to 14.09%. The nursing union has the highest absence rate at 14.09% and the management group has the lowest absence rate at 8.68% (Figure 1 and Table 2).

Monthly absence rates suggest that management and non-bargaining group's absence rates are lower during the fall and winter months, and are higher during the summer months. The opposite trend occurs with NLNU, NAPE, NAPE1125 and NAPELX. With these groups, absences are slightly higher in the fall and winter months and slightly lower in the summer months (Figure 2).

The mean overtime for the entire organization is 3.32% (Table 2). The overtime rate for the bargaining groups ranges from 0.74% to 4.94%. NAPELX workers have the highest overtime rate, while management has the lowest overtime rate (Figure1).

The monthly overtime rates suggest that overtime tends to increase during the summer months for NLNU, AAHP, NAPE, NAPELX and NAPE1125 (Figure 3). In contrast, overtime tends to be higher during the spring months, and lower throughout the summer and fall for the non-bargaining group (Figure 3). Overtime is relatively stable all year round for the management group (Figure 3).

With respect to tenure, 62% of the employees have been with the organization for less than 10 years (Figure 4). In comparison, 16% of employees have been with the organization for more than 20 years (Figure 4).

Table 2. This table presents the descriptive statistics for the sample data set organized by bargaining group from February 2002 to November 2004.

<b>Variable</b>	<b>Total</b>	<b>NLNU</b>	<b>AAHP</b>	<b>NAPE</b>	<b>NAPELX</b>	<b>NAPE1125</b>	<b>MGMT</b>	<b>NB</b>
Mean (SD)								
<b>Absence*</b>	12.59 (33.05)	14.09 (34.80)	13.14 (33.78)	12.10 (32.61)	8.95 (28.54)	13.14 (33.79)	8.68 (28.15)	11.69 (32.13)
<b>Overtime**</b>	3.32 (17.93)	2.88 (16.73)	1.24 (11.07)	4.15 (19.94)	4.94 (21.66)	4.00 (19.60)	0.74 (8.58)	1.41 (11.80)
<b>Hourly Wages</b>	22.95 (7.15)	28.20 (1.78)	29.67 (3.08)	16.30 (2.30)	25.16 (3.58)	19.37 (0.95)	35.20 (9.89)	18.89 (1.37)
<b>#Days absent within last 5 shifts/total obs.</b>	0.35 (0.87)	0.36 (0.88)	0.40 (0.97)	0.36 (0.88)	0.28 (0.79)	0.34 (0.80)	0.27 (0.80)	0.36 (0.36)
<b>#Days absent within last 30 shifts/total observations</b>	2.17 (4.70)	2.18 (4.70)	2.58 (5.83)	2.22 (4.58)	1.78 (4.22)	1.91 (3.72)	1.71 (4.47)	2.30 (5.20)
<b>#Days of OT within last 5 shifts/total obs.</b>	0.10 (0.43)	0.07 (0.33)	0.04 (0.26)	0.12 (0.51)	0.17 (0.59)	0.10 (0.44)	0.03 (0.19)	0.04 (0.23)
<b>#Days of OT within last 30 shifts/total obs.</b>	0.55 (1.95)	0.42 (1.37)	0.22 (1.08)	0.70 (2.39)	0.95 (2.39)	0.55 (2.15)	0.13 (0.62)	0.22 (0.82)

\* Absence = total absence/total # observations

\*\*Overtime = total overtime/total # observations

Figure 1. Absence rate & Overtime rates by bargaining group (1998-2004).

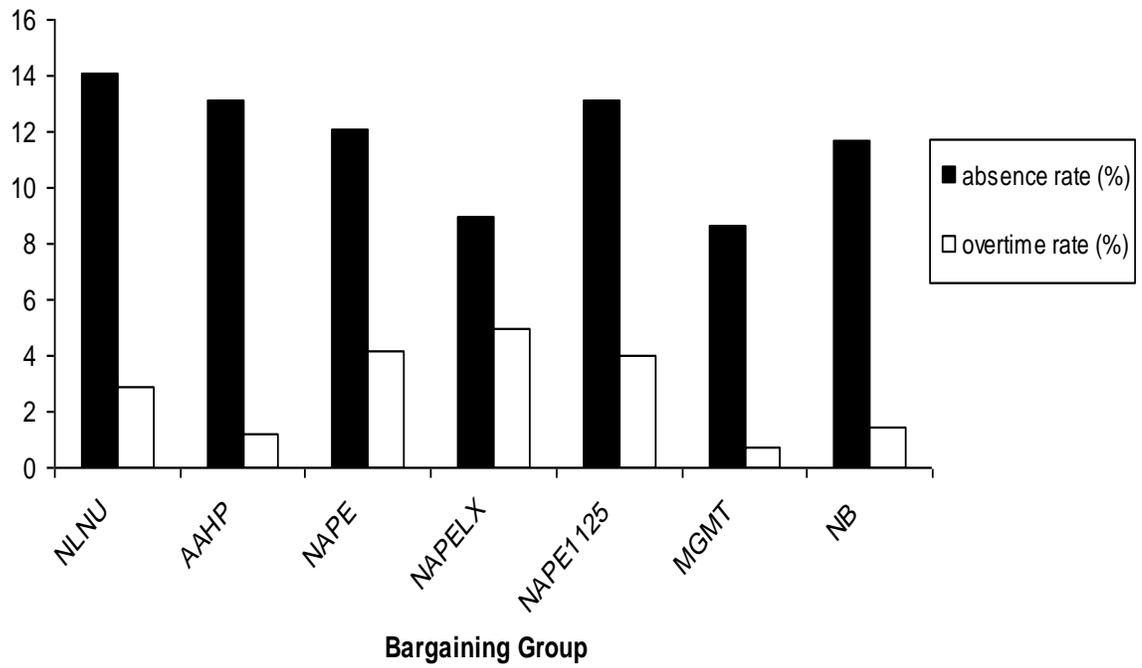


Figure 2. Monthly Absence Rates (1998-2004).

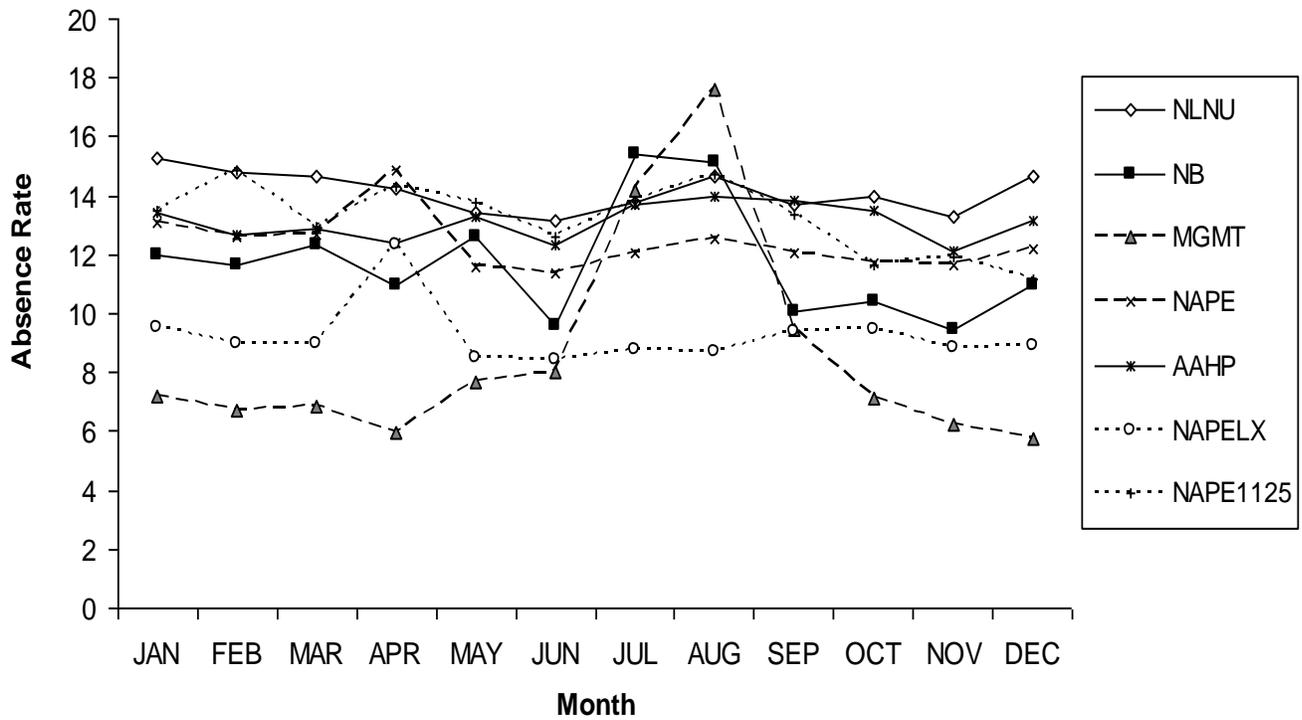


Figure 3. Monthly Overtime Rates (1998-2004).

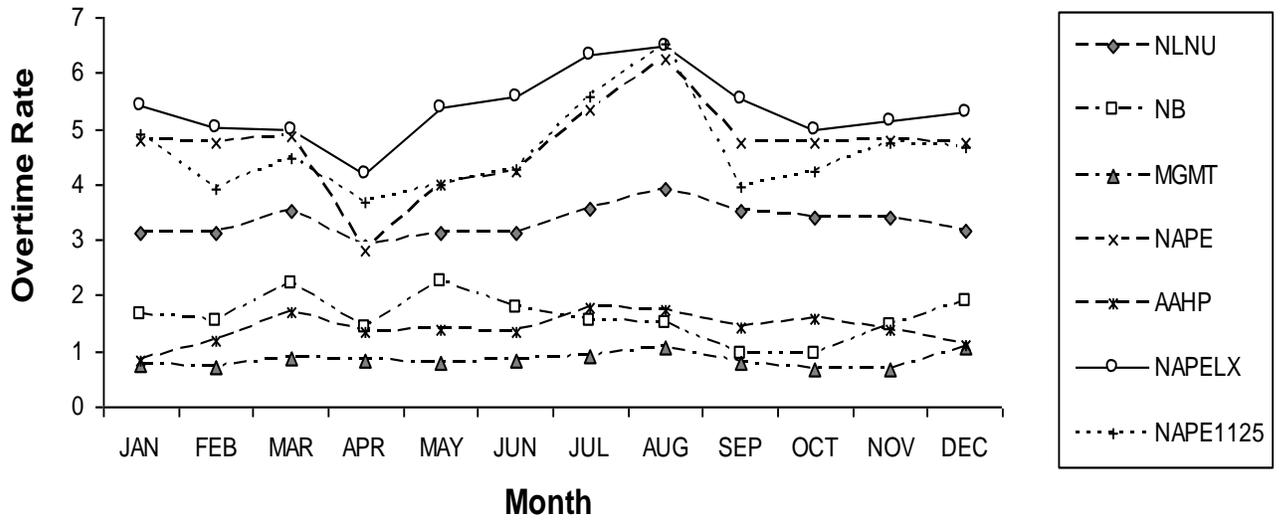
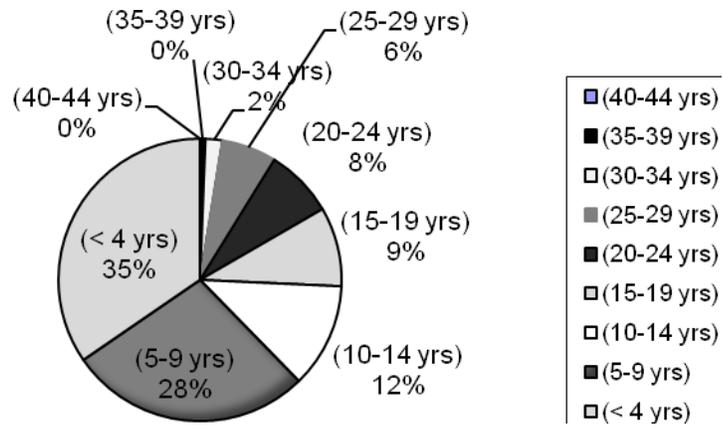


Figure 4. Distribution of Tenure (1998-2004).



## REGRESSION RESULTS

Table 3. This table presents the results of the regression analysis for the 7 bargaining groups for the study variables (workload, workgroup absence and overtime, tenure, seasonality, hospital site) for February 2002 to November 2004. The results presented in Table 3 are from a random effects model. The dependent variable, absence, is a binary outcome (absence and attendance), coded as 1 and 0 respectively.

	NLNU	AAHP	NAPE	NAPE LX	NAPE 1125	MGMT	NB
<b>Workload (Coefficient)</b>	0.012	0.062	0.071*	0.187*	0.005	0.035	-0.017
<b>Absence in past 5 shifts</b>	0.678*	0.665*	0.609*	0.635*	0.663*	0.858*	0.747*
<b>Absence in past 30 shifts</b>	0.104*	0.085*	0.063*	0.066*	0.074*	0.037*	0.052*
<b>Overtime in past 5 shifts</b>	-0.114*	-0.008	-0.046*	-0.100*	-0.065	-0.112*	-0.149
<b>Overtime in past 30 shifts</b>	0.001	0.014	0.005*	0.002	-0.031*	-0.014	-0.003
<b>Departmental Absence Rate</b>	4.875*	6.249*	5.354*	6.522*	5.059*	4.783*	4.718*
<b>Departmental Overtime Rate</b>	0.309*	0.401*	-0.063*	0.050	0.228	0.276*	-0.407
<b>Wages</b>	-0.001	-0.029*	-0.001	-0.022*	-0.025	-0.007*	0.031*
<b>Workgroup Size</b>	0.004*	0.031*	0.002 *	0.017*	-0.005	0.001	-0.001
<b>Tenure (40-44 yrs)</b>	.	.		.	.	-5.012	.
<b>Tenure (35-39 yrs)</b>	.	0.039		-0.395*	.	-0.013	.
<b>Tenure (30-34 yrs)</b>	.	-0.509*		-0.283*	.	.	-0.165
<b>Tenure (25-29 yrs)</b>	-0.124*	-0.021		0.053	.	.	0.077
<b>Tenure (20-24 yrs)</b>	-0.088*	0.551*		0.198*	.	.	-1.071*
<b>Tenure (15-19 yrs)</b>	-0.016	-0.061		0.129*	.	-0.056	-0.101
<b>Tenure (10-14 yrs)</b>	.	.		.	.	.	.
<b>Tenure (5-9 yrs)</b>	0.037	-0.472*		0.004	0.154*	0.065	0.027
<b>Tenure (&lt; 4 yrs)</b>	-0.166*	0.039*		-0.205*	.	-0.180*	-0.075
<b>Yrs_worked</b>			0.001				

\* represents significance at the 95% level

	NLNU	AAHP	NAPE	NAPELX	NAPE1125	MGMT	NB
<b>January</b>	0.040*	0.076*	0.050 *	-0.016	0.032	0.105*	0.093
<b>February</b>	0.021	0.041	0.019 *	0.010	0.038	0.028	0.002
<b>March</b>	.	.	.	.	.	.	.
<b>April</b>	0.025*	0.020	-0.058 *	-0.131*	-0.050	0.073*	0.039
<b>May</b>	0.021	0.073*	0.015	-0.067*	0.011	0.065*	-0.007
<b>June</b>	-0.006	0.041	0.026 *	-0.014	-0.033	0.077*	-0.163*
<b>July</b>	-0.033*	-0.016	-0.018*	-0.086*	-0.063	0.027	-0.114
<b>August</b>	-0.034*	-0.025	-0.035 *	-0.073*	-0.037	-0.211*	-0.454*
<b>September</b>	0.005	0.040	0.019 *	-0.030	-0.016	0.019	-0.123*
<b>October</b>	0.019*	0.009	0.031 *	-0.061*	-0.048	0.028	0.075
<b>November</b>	0.017	0.040	0.037 *	-0.063*	0.004	0.033	0.026
<b>December</b>	0.014	0.091*	0.023 *	0.012	0.003	-0.076	0.007
<b>HSC General</b>	.	.	.	.	.	.	.
<b>St. Clare's</b>	-0.016	-0.541*	0.023	-0.070	.	-0.023	0.201
<b>Janeway</b>	-0.014	-0.007	-0.111	0.119*	.	-0.118	
<b>Waterford</b>	-0.152*	0.148*	-0.045	-0.717*	.	.	0.449*
<b>Miller centre</b>	-0.036	-0.066	-0.061	.	.	.	.
<b>HCCSJ Admin Offices</b>	-0.212*	0.516*	0.028	.	.	0.102*	0.367*
<b>N</b>	940833	243441	1337186	248667	59165	163639	38523

\* represents significance at the 95% level

## 4.2 WORKLOAD

The results for workload are presented in Table 3. The results show that workload was positive and statistically significant for NAPE and NAPELX. This would suggest that as workload increases, members of the NAPE and NAPELX group are more likely to be absent. The coefficients for nurses (NLNU), Allied Health (AAHP), managers (MGMT), and NAPE1125 were also positive but not statistically significant. For the non-bargaining group, workload was negatively correlated with absenteeism; however, this was not statistically significant.

## 4.3 ABSENCE IN THE LAST 5 DAYS

The results for absence in the last 5 days are presented in Table 3. There was a positive correlation between absence in the previous 5 days, and the likelihood of absence, for all bargaining units. The coefficients for all seven bargaining groups were statistically significant which may suggest that being absent in the last five days increases the likelihood that workers will be absent.

## 4.4 ABSENCE IN THE LAST 30 DAYS

The results for absence in the last 30 days shown in Table 3 are similar to the results of absence in the last five days. The coefficients for all the bargaining groups were positive and statistically significant. These results would also suggest that workers who are absent in the last 30 days are more likely to be absent.

#### 4.5 OVER TIME IN THE LAST 5 DAYS

The results for overtime in the last 5 days in Table 3 suggest a negative relationship with absence for all bargaining groups. Four bargaining groups, nurses (NLNU), managers (MGMT), NAPELX and NAPE achieved statistical significance. These results would imply that nurses, managers, laboratory workers and health care support workers who worked overtime in the last five days have a lower likelihood of being absent. The non-bargaining (NB) Allied Health (AAHP), and NAPE1125 coefficients were also negative but did not reach statistical significance.

#### 4.6 OVERTIME IN THE LAST 30 DAYS

Working overtime in the last 30 days has a slightly different influence on absence compared to overtime in the last 5 days. The results for this variable showed that NAPE employees who had worked overtime in the last 30 days were associated with a statistically significant increase in absence. NAPE employees who worked overtime in the last 5 days showed a decrease in absence. These results may suggest that health care support workers who reported working overtime in the last five days are less likely to be absent than health care support workers who reported working overtime in the last 30 days. This could suggest that workers who reported working more overtime are more likely to be absent.

On the other hand, the result for NAPE1125 employees who worked overtime in the last thirty days was negative and statistically significant. This would imply that licensed practical nurses at the Waterford (NAPE1125) who worked overtime in the last 5 and 30 days are less likely to be absent.

The coefficients for the management and non-bargaining (NB) groups were also negative, but not statistically significant. The nurses (NLNU), Allied Health (AAHP) and NAPELX groups were associated with an increase in absence, which was also not statistically significant as shown in Table 3.

#### 4.7 DEPARTMENTAL ABSENCE RATE

The effect of the departmental absence rate on the previous day on an individual's absenteeism the following day was examined for the seven bargaining units. The results for departmental absence rate presented in Table 3 were positive and statistically significant for all bargaining groups. These results would imply that a higher departmental absence rate on a given day increases the likelihood of an individual being absent the following day.

#### 4.8 DEPARTMENTAL OVERTIME RATE

The results for the relationship between absenteeism and the departmental overtime rate are shown in Table 3. The effect of the departmental overtime rate on the previous day on an individual's absenteeism the following day was examined for the seven bargaining units. The results for departmental overtime rate, presented in Table 3, show a positive and statistically significant relationship for Allied Health (AAHP), nurses (NLNU), and managers (MGMT). These results indicate that a high departmental overtime rate the previous day was associated with an increase in absence for Allied Health employees, nurses and managers.

The coefficient for NAPELX and NAPE1125 employees was also positive, but did not achieve statistical significance.

There was a negative and statistically significant association with NAPE and absence. This would suggest that high departmental absence of health care support workers was associated with a decrease in absence. The non-bargaining coefficient was also negative but it did not achieve statistical significance.

#### 4.9 WAGES

The results for wages in Table 3 suggest a negative relationship with absence indicating that higher wages are associated with lower incidence of absence for six out of the seven bargaining groups. The coefficients for management (MGMT), Allied Health (AAHP) and NAPELX, achieved statistical significance. NAPE, NAPE1125 and nurses (NLNU) were not statistically significant. The non-bargaining group shows a positive relationship with absence, which was also statistically significant. This would suggest that higher wages for secretarial workers (NB) are associated with a higher incidence of absence.

#### 4.10 WORKGROUP SIZE

The results for the relationship of absenteeism to workgroup size are shown in Table 3. Workgroup size is associated with an increase in absence for nurses (NLNU), Allied Health (AAHP), NAPELX and NAPE indicating that the larger the workgroup, the higher the likelihood of absence. Management (MGMT) was also positive but not

significant. The coefficients for NAPE1125 and the non-bargaining (NB) group were negative, but not statistically significant.

#### 4.11 TENURE

Nine reference categories were used to examine the influence of tenure on absence. The nine categories are (40 to 44 years), (35 to 39 years), (30 to 34 years), (25 to 29 years), (15 to 19 years), (10 to 14 years), (5 to 9 years), and (<4 years). (The results for tenure in Table 3 show that nurses (NLNU) employed with the organization for 25 to 29 years, 20 to 24 years, and less than four years have a negative relationship with absence, which is statistically significant. These results would suggest that short to mid tenured nurses are less likely to be absent.

Allied Health professionals (AAHP) employed with the Health Care Corporation for 30 to 34 years and 5 to 9 years have a negative and statistically significant association with absence. Conversely, Allied Health professionals (AAHP) employed with the organization for 20 to 24 years and less than 4 years have a positive and statistically significant association with absence. These results are in contrast to nurses as short to mid-tenured Allied Health professionals are associated with an increase in absence.

For NAPE, a different measure was used to calculate tenure due to co-linearity problems. A continuous variable measuring the number of years worked was used instead of a series of dummy variables. The result for NAPE was positive but not statistically significant.

The results for NAPE-LX suggest a decrease in absence for NAPE-LX workers with very long and relatively short tenures. The results were statistically significant for laboratory workers (NAPE-LX) employed with the organization for 35 to 39 years, 30 to 34 years and less than 4 years. Conversely, the results also suggest an increase in absence for laboratory workers (NAPE-LX) employed with the organization for 20 to 24 years and 15 to 19 years. These coefficients were also statistically significant.

NAPE1125 employees working with the organization for 5 to 9 years were more likely to be absent, and this was statistically significant. Results were not available for the other five-year interval groups due to small sample sizes.

Management employed with the organization for less than five years were less likely to be absent and this was statistically significant. The coefficients for the 40 to 44, 35 to 39, and 15 to 19 groupings were negative but did not achieve statistical significance. The coefficient for the tenure group for 5 to 9 years was positive but also did not achieve statistical significance.

Lastly, secretarial workers (NB group) employed with the organization for 20 to 24 years were less likely to be absent, which was statistically significant. This would suggest that mid-tenured secretarial workers have a lower likelihood of being absent. The coefficients for 30 to 34 and less than 4 years were also negative, but did not achieve statistical significance. The coefficients for 25 to 29, 15 to 19, and 5 to 9 years were positive, and also did not reach statistical significance.

## 4.12 SEASONALITY

The results for the effect of seasonality on absenteeism are shown in Table 3. The results for March are not shown because March was used a reference month so all comparisons were done with the month of March.

### *4.12.1 January*

The results show an increase in absenteeism for managers (MGMT), Allied Health (AAHP), NAPE, and nurses (NLNU) during the month of January. This would suggest managers, Allied Health workers, nurses and health care support workers are more likely to be absent in the month of January. All four results were statistically significant. The non-bargaining (NB) group and the NAPE1125 group were also more likely to be absent in January, but this was not statistically significant. The NAPE laboratory group (NAPE-LX) was negative but not statistically significant.

### *4.12.2 February*

The results for the month of February suggest a positive relationship with absenteeism for all the bargaining groups indicating that absence is high. However, only NAPE had a statistically significant result.

#### ***4.12.3 April***

The results for the month of April show an increase in absence for nurses (NLNU) and managers (MGMT), which was statistically significant. The Allied Health (AAHP) group and the non-bargaining (NB) group were more likely to be absent for this month, but this was not statistically significant. In comparison, NAPE and NAPE-LX were associated with a decrease in absence, which was statistically significant. The coefficient for NAPE1125 was also negative, but it was not statistically significant.

#### ***4.12.4 May***

The results for the month of May show a statistically significant increase in absence for Allied Health (AAHP) workers and managers (MGMT). The coefficients for nurses (NLNU), NAPE and NAPE1125 were positive but not statistically significant. NAPE-LX was associated with a decrease in absence, which was statistically significant. The coefficient for the non-bargaining (NB) group was negative and was not statistically significant.

#### ***4.12.5 June***

The results for the month of June show health care support workers (NAPE) and managers (MGMT) were more likely to be absent. The Allied Health group (AAHP) was also positive but it was not statistically significant. The result for the non-bargaining (NB) group showed a decrease in absence, and was statistically significant. The coefficients for nurses (NLNU), NAPELX, and NAPE1125 were also negative, but not statistically significant.

#### ***4.12.6 July***

The results for the month of July show health care workers were less likely to absent. The coefficients for six out of seven bargaining groups were negative. Nurses (NLNU), health care support workers (NAPE), and laboratory workers (NAPELX) were statistically significant. Allied Health (AAHP), non-bargaining (NB) and NAPE1125 did not achieve statistical significance. The coefficient for MGMT was positive but it was not significant.

#### ***4.12.6 August***

The results for the month of August show a negative relationship with absence indicating a lower incidence of absence for all seven bargaining groups, and five were statistically significant. The coefficients for secretarial workers (NB), managers (MGMT), laboratory workers (NAPELX), healthcare support workers (NAPE), and nurses (NLNU) achieved statistical significance. The two groups that did not reach statistical significance were Allied Health (AAHP) and NAPE1125.

#### ***4.12.7 September***

The results for September show a positive and statistically significant association with absence for NAPE, indicating that health care support workers had a higher incidence of absence in this month. The results for nurses (NLNU), Allied Health employees (AAHP), and managers (MGMT) were positive but did not achieve statistical significance. These results may suggest that in the month of September, absence is on the rise for nurses, Allied Health workers, health care support workers and managers.

Conversely, the non-bargaining (NB) group was less likely to be absent. The coefficients for NAPELX and NAPE1125 were negative but were not statistically significant.

#### ***4.12.8 October***

The results for October show an increase in absence for NAPE and nurses (NLNU) and a decrease in absence for NAPELX. All three results were statistically significant. Allied Health (AAHP), managers (MGMT) and non-bargaining (NB) were more likely to be absent but did not achieve statistical significance. The results for the month of October continues to show a positive trend in absence among health care workers such as nurses, health care support workers and Allied Health workers. The coefficient for NAPE1125 was negative and was not statistically significant.

#### ***4.12.9 November***

In the month of November, NAPE workers were more likely to be absent. NAPE laboratory workers were less likely to be absent. Both groups achieved statistical significance. The coefficients for nurses (NLNU), Allied Health (AAHP), non-bargaining (NB), NAPE1125, and managers (MGMT) were positive but not significant. Although the results were not significant, the positive association suggests higher absences among these groups in the month of November.

#### **4.12.10 December**

The results for December suggest a positive correlation with absence, which was significant for Allied Health (AAHP) and NAPE workers. The coefficients for nurses (NLNU), NAPE-LX, NB and NAPE1125 were also positive, but they were not statistically significant. The management group was negatively associated with absence, but the coefficient did not reach significance.

### **4.13 HOSPITAL SITE**

The results for the effect of hospital site on absenteeism are shown in Table 3.

#### **4.13.1 St. Clare's**

The results for St. Clare's Mercy hospital show a negative effect on absence for Allied Health (AAHP), which was statistically significant. This result would suggest that Allied Health employees working at the St. Clare's Mercy hospital site have a lower incidence of absence as compared to the General Hospital at the Health Sciences Complex. The coefficient for nurses (NLNU), NAPELX and management (MGMT) was also negative but did not achieve statistical significance. In addition, the coefficients for NAPE and non-bargaining (NB) were positive, but they were not statistically significant.

#### ***4.13.2 Janeway***

The results for the Janeway Children's Hospital show a positive relationship with absence for laboratory workers (NAPELX) workers employed at the Janeway site. This was the only statistically significant result and may suggest that laboratory workers have a higher likelihood of being absent at the Janeway hospital site as compared to the General Hospital. The coefficient for NAPE was positive but did not reach statistical significance. The coefficients for nurses (NLNU), Allied Health workers (AAHP), and managers (MGMT) were negative and were not statistically significant.

#### ***4.13.3 Waterford***

The results for the Waterford Hospital suggest Allied Health (AAHP) and non-bargaining employees (NB) are more likely to be absent. Both results were statistically significant. The results also suggest lower absences for nurses (NLNU) and NAPE laboratory workers (NAPE-LX) employed at the Waterford site and both coefficients were statistically significant. The coefficient for NAPE was negative but not statistically significant. There were no results available for managers (MGMT) and NAPE1125 as no employees in these unions were based at these sites.

#### ***4.13.4 Leonard Miller Centre***

The results for the Leonard Miller Centre show there was no statistically significant association between working at the Leonard Miller Centre, and the probability of absence, for all seven bargaining groups.

#### ***4.13.5 Health Care Corporation***

The results for the Health Care Corporation administrative offices show an increase in absence for Allied Health workers (AAHP), secretarial workers (NB) and managers (MGMT) employed with the Health Care Corporation administrative offices, as compared to the General Hospital. All three coefficients were statistically significant.

In contrast, a decrease in absence was reported for nurses (NLNU) employed with the Health Care Corporation administrative offices. This result was also statistically significant. Results were not available for NAPE-LX and NAPE1125 as neither of these unions had employees based at the administrative offices

## CHAPTER FIVE: DISCUSSION

The results reported in this study have provided valuable insight into the influence of the workload, individual and social factors affecting absenteeism.

The positive relationship between workload and absenteeism for hospital support workers and laboratory technicians suggest that during periods of high patient volume, absenteeism may increase for hospital support workers and laboratory technicians. The increase in absence for hospital support workers and laboratory technicians may be explained using Karasek's (1989) demand-control model. The model focuses on two dimensions of the job: job demands, and job decision latitude (the amount of worker control or autonomy over their tasks and how they are executed). The model suggests that job strain occurs when jobs are simultaneously high in work demands, and low in worker control/autonomy. A study conducted by Zavala et al (2002) extended the Karasek's demand-control model (1989) to examine the influence of decision latitude and workload demand on absenteeism. They found unilateral relationships between workload demand and absence, and decision latitude and absence. In their study, workers with high workload demand had higher absences and individuals with lower decision latitude also had higher absences.

Based on the findings in the Zavala study (2002), it may be plausible that hospital support workers and laboratory technicians may be more prone to absence when workload is high, because of low decision latitude. It may be for this reason that during high periods of workload, employees may take a malfeasance approach to absence by

taking an absence to alleviate the pressure of high workload. Further research may be required to validate this theory. However, these results are noteworthy because it draws the attention to the impact of workload on absenteeism for hospital groups other than nurses.

Workload overload has been examined within the nursing profession more than any other health care profession. Therefore, it was surprising that the coefficient for workload was not statistically significant for the NLNU. Given the amount of literature on nursing work overload and sickness absence, we expected a statistically significant association with workload and absence for the NLNU. Although the coefficient was positive, the findings did not show a significant association with absence. This result may suggest workload may not be a significant factor in influencing nurse absenteeism. It may be that nurses' commitment to their profession may mitigate the negative reaction to workload resulting in absence. There is evidence to suggest that nurses exhibit higher degrees of commitment to their profession rather than their employer (Lu et al., 2012).

Few studies have examined the absence behaviour patterns of hospital employees. This study examined individual absence histories to identify the absence patterns of seven groups of hospital workers. Absence in the last 5 shifts and absence in the last 30 shifts were examined to determine the influence of consecutive absences taken over the short and long-term. These results provide interesting insight into absence patterns of employees at the Health Care Corporation of St. John's. The results indicate that employees who were absent within the last 5 work shifts have a greater likelihood of being absent. This result was consistent and statistically significant across all bargaining groups. The management group and the secretaries (NB) had the strongest correlation.

NAPE support workers and NAPE laboratory workers had the weakest correlation. Nevertheless, these results indicate that the more consecutive absences taken during the last 5 shifts, the higher the likelihood of being absent.

The results for absence in the last 30 shifts were similar to the results of absence in the last 5 shifts as 6 bargaining groups were significantly associated with an increase in absence. The strength of the relationship for absence in the last 30 shifts was weaker for all bargaining groups compared to absence in the last 5 shifts. This may suggest that being absent in the last 5 scheduled shifts may be a stronger predictor for an individual to be absent than individuals who were absent in the last 30 days.

The use of overtime has been commonly employed in hospitals to address temporary staff shortages. However, the use of overtime may have adverse effects on the employee and the organization as a whole. Overtime in the last 5 shifts and overtime in the last 30 shifts were included in the analysis to determine whether working consecutive shifts of overtime over the short-term and long-term influences employee absence. The results of working overtime in the last 5 shifts were significantly associated with a decrease in absence for nurses, NAPE support staff, NAPE laboratory group and management. The decrease in absence associated with working overtime in the last 5 shifts may suggest that if overtime earns a wage premium, this provides incentives for workers to reduce labour absence. Kenyon and Dawkins' (1989) study suggests that working overtime allows workers to reach a higher level of utility, by offering hours beyond the standard hours, at pay rates higher than normal. Our findings are consistent with the Kenyon and Dawkins (1989) study, showing that an increase in overtime reduces absence.

The results for overtime in the last 30 shifts show a less definitive association with absence. A positive relationship is found between working overtime within the last 30 shifts and absence with NAPE employees. The coefficient is small but statistically significant. In contrast, a negative relationship exists between working overtime in the last 30 shifts and absence with NAPE1125. The other bargaining groups (NLNU, AAHP, NAPE-LX, MGMT and NB) were not associated with absence if overtime was worked within the last 30 shifts.

Overall, the results would suggest working overtime in the last 5 shifts may provide an incentive for workers to reduce absence by providing a higher level of utility. The results may also suggest an implicit contract between employees and employers, where if employees are under high demand and are being asked to work over time, they may be less likely to be absent. However, working overtime in the last 30 shifts does not appear to provide the same effect on absence.

The majority of the absence literature tends to focus on individual and personal factors influencing absence behaviour. However, a growing body of literature has examined the social aspect of employee absence. The examination of the absence behaviour of workgroups has gained some attention in the absence literature because of the need to understand the causes of employee absence (De Paolo, 2010, Bradley et al., 2007; Hesselius et al., 2009). The results for the social factors influencing absenteeism show strong workgroup effects on absenteeism.

The results show that the higher the departmental absence rate the previous day (the more employees absent within the workgroup), the more likely an individual will be absent. This variable was significant for all bargaining groups. The strongest effect was

evident among the NAPE laboratory; Allied Health and NAPE support workers. The results are consistent with the Ichino & Maggi (2000) study, which shows that individual absence behaviour is affected by their peer group. The high absence rate among the NAPE laboratory, Allied Health and NAPE support workers may suggest the need for closer monitoring by management in these groups. A study conducted by Scoppa (2010) suggests that workers who are insured against dismissal and are subject to low monitoring are more susceptible to absence. This result may also suggest that workgroup members have developed a shared understanding about an acceptable level of absence within the workgroup and department. As such, workgroup members may develop an implicit contract within the group where workgroup members implicitly agree on the appropriate level of absence and alternate absence-taking behaviour. These results are consistent with other studies that have examined the influence of workgroup absence on individual absence behaviours (Mathieu and Kohler, 1990; Gallately, 1995).

The previous section examined whether departmental absence rate influences individual absence, this section examines whether departmental overtime rate influences individual absence. Overall, it appears that the departmental workgroup overtime rate's influence on absence varies across bargaining groups. The results indicate that the more departmental workgroup members work overtime, the more likely absences will increase for nurses, Allied Health employees and management. It may be that overtime shifts tend to be longer and more frequent due to staff shortages, and absences may be used to compensate for longer working hours. Alternately, the departmental workgroup overtime rate within NAPE tended to reduce absence. Individuals working within NAPE that worked more overtime have lower absences. These results may suggest that the premium

pay associated with working overtime may provide an incentive for workers to work more hours, and therefore reduce absence.

Another aspect of the influence of the workgroup on absence is the size of the workgroup. Existing literature on workgroup/firm size indicates that larger workgroups/firms tend to have higher absence rates (Dionne & Dostie, 2007; De Paola, 2010; Scoppa, 2010). This study found similar results as workgroup size was significantly associated with higher absence among nurses, Allied Health professionals and laboratory workers. An explanation for these results may be that larger workgroups are more difficult to monitor and thus have a lower probability of being caught shirking (Scoppa, 2010). Barmby et al (2000) also found a strong relationship between firm size and absenteeism. They suggest that for large groups that have employees with similar skill sets, firms keep a buffer supply of employees so that firms can replace an absent employee with another employee with similar skill sets. Therefore, firms with a larger pool of workers who have complementary skill sets may have lower costs of insuring against absence. This may be a consideration for human resources planning for the Health Care Corporation of St. John's, where large workgroups with complimentary skill sets are more likely to be readily able to substitute other workers. Therefore, the cost of absence, in terms of their capacity to deal with a given patient load, is less likely to be compromised.

Labour economists view the employment contract as a factor in the absence decision-making process. Several studies have been conducted examining hourly wages and its influence on absence. However, to our knowledge, no studies to date have examined the influence of wages across different hospital workgroups. Wages were

included in the regression model to provide insight into the influence of wages on absence of the seven bargaining groups.

The results of this study show that wages were significantly associated with a decrease in absence for Allied Health, NAPE laboratory workers and management. These results may suggest that employees of the Allied Health and NAPE laboratory group may place a higher value on wages and are willing to forgo taking time off for higher wages. The results for the management group suggest that a performance related pay structure may be associated with a decrease in absence. Bradley et al (2007) suggests that performance related pay may reduce shirking. Although the strength of the association was small, it provides evidence that a substitution effect exists. These results are consistent with other studies (Allen, 1981; Dunn & Youngblood, 1986; Chaudhury & Ng, 1992; Drago & Wooden, 1992; Barmby, Orme & Treble, 1995; De Paola, 2010; Pfeifer, 2010) that have found a negative relationship between wage rate and absence behaviour. The coefficient for NLNU, NAPE and NAPE-1125 were also negative but did not achieve significance.

The non-bargaining group, which consists of secretaries, showed an increase in absence with higher wages. This may suggest that as wages increase and income rises, secretaries may choose to consume more leisure by taking more time off, therefore increasing absence. The strength of relationship was also small but it provides some support that wages may incite an income effect.

The length of employment with an organization has been associated with employee absenteeism. The literature on tenure and absenteeism shows a wide variation in results. Some studies show that longer tenure is associated with a decrease in absence.

Other studies show that a shorter tenure is associated with an increase in absence. However more recent studies show a positive relationship between tenure and absence.

The results in this study varied considerably for each group studied. The results suggest that nurses both in the early, and in the later stages of their career, are absent less. The results may suggest that in the early stages of their careers, nurses are more committed and take fewer absences, and in the later years in their career, nurses' loyalty and commitment to the profession also result in taking fewer absences. It is possible during the middle stages of their career there may be more family commitments resulting in higher absence.

Allied Health professionals employed with the organization for 30 to 34 years and 5 to 9 years were less likely to be absent. Conversely, Allied Health professionals employed with the organization for 20 to 24 years and less than 5 years are more likely to be absent. The results for Allied Health workers do not show a clear pattern of absence during different stages in employment. The variability in the results may suggest that tenure may have less of an influence on absence in Allied Health workers compared to other workgroups.

The result for NAPE employees did not show a relationship between tenure and absence. The results for the NAPE laboratory group show a U-shaped pattern of absence. Short-tenured employees (< 4 years) are associated with a decrease in absence. Laboratory workers employed with the organization during the "middle period" of employment (20 to 24 years and 15 to 19 years) were associated with greater absence. Long tenured employees (35 to 39 years, 30 to 34 years) were less likely to be absent. This pattern of absence is consistent with the study conducted by Thompson et al (2000)

on tenure and absence showing an inverse U-shaped pattern for residential care workers and administrators. The results for NAPE1125, management, and the non-bargaining workgroups did not show any significant patterns of absence by tenure. Although there was a positive and significant association between absence and the tenure category of 5 to 9 years for NAPE1125, no meaningful conclusion can be made with this result, as no other results were available for the other five-year interval categories. Similarly, for the management group, the tenure category of less than five years was negative and statistically significant. However, the other results were missing or not significant. The missing results for the four tenure categories may be related to co-linearity issues with this variable. Lastly, for the non-bargaining group, the tenure category of 24 to 20 years was negative and significant.

In summary, the results across workgroups produced variable results. However, some patterns were evident among the nursing and NAPE laboratory group. In general, long tenured and short-tenured employees within these groups had lower absences. One possible explanation is that the long-tenured employees may have lower absences because of their commitment to the organization. In addition, employees with shorter tenure may have fewer absences due to their desire to advance within the organization, and thus may be more tolerable to unfavorable work environments.

Seasonal trends in absence (William et al, 2004; Harrison & Shaffer, 1994; Leonard et al., 1990; Markham et al., 1982) have been documented in the absence literature. The trends in absence indicate the highest-level of absenteeism in the winter quarter and lower absences in the summer quarter (Leonard, et al., 1990). The results of this study are consistent with previous studies showing similar trends in absence. During

the winter months of December to February, absence was positive and statistically significant for nurses, Allied Health professionals, managers, and NAPE support staff. During the summer months (July and August), absence was negative and statistically significant for nurses, NAPE, NAPE laboratory, managers and non-bargaining group employees. The increase in absence during the winter months for nurses, Allied Health professionals and NAPE support staff may be related to influenza-related illnesses, which follow a similar seasonal pattern. Given that the exposure and transmission of illnesses between sick patients and hospital staff is high during these months, it is likely to account for some of the increase in absence among employees with direct patient contact. In contrast, hospital workers may be absent less during the summer because opportunities to take vacation time may be greater due to less workload, and as a result, workers may want to “save” their entitled sick days for another time in the future when opportunities to take time off are less.

The Health Care Corporation of St. John’s is composed of six sites. Five hospital sites were included in the analysis. Four of the five hospital sites provide clinical services, and one site, the Health Care Corporation administrative offices, provides administrative and operational support services. Although the sites operate under the Health Care Corporation of St. John’s, operational structures and processes, as well as organizational culture may differ at each hospital site. Including these sites in the analysis may determine whether the site of employment influences employee absence. Among the clinical sites, the St. Clare’s Mercy hospital site (adult acute care hospital site) was associated with lower absence for the Allied Health group. These results may suggest

organizational climate and work environment characteristics at this site may be more favorable for Allied Health professionals resulting in less absence.

The results for the Waterford hospital site show lower absence among nurses and NAPE employees. These results may suggest nurses and hospital support staff may have a higher level of satisfaction with their jobs compared with their co-workers at the other hospital sites. This could be due to the chronic nature of the psychiatric patient population at the Waterford, resulting in a less stressful environment. In contrast, Allied Health employees and non-bargaining group employees employed at the Waterford hospital were associated with higher rates of absence. The higher absence may be attributed to a shortage of licensed psychologists. An operational review conducted by the Hay Group for the Health Care Corporation of St. John's in 2001 indicated that psychologists were in short supply around the time period of this study. The shortage of psychologists may have contributed to the increase in absence of the Allied Health employees (which included psychologists) due to the possible increase in workload of other psychologists at this site.

Working at the Janeway hospital was associated with a significantly higher level of absence for laboratory employees. This result may also suggest that a shortage in skilled laboratory technicians may be contributing to the rise in absence of laboratory workers at this site. Lastly, the Health Care Corporation corporate office site was associated with greater absence for the Allied Health group, management and the non-bargaining group. The strongest effect occurred with Allied Health and the non-bargaining group. This suggests that employees providing non-clinical services tend to have more absence than employees providing clinical services at this site.

Although, the sites may differ in some aspects, it is difficult to ascertain whether policies and processes specific to each site affect absence. Overall, the differences across sites were not considerable, nor consistent, suggesting that there are few systematic effects occurring within each of the major worksites.

## **CHAPTER SIX: CONCLUSIONS**

This study examined several factors (work environment, individual, and social) influencing absenteeism among employees and departmental groups at the Health Care Corporation of St. John's. With respect to the work environment, this study found that workload was associated with an increase in absence for hospital support workers and laboratory technicians. However, workload was not significantly associated with an increase in absence among nurses. The hospital site location did not show any meaningful relationship with absenteeism. In term of seasonality, the findings of this study are consistent with previous studies, with lower absences in the summer months, and higher absences in the winter months.

In terms of individual factors, the study found that the workgroup size was significantly associated with higher absence among nurses, Allied Health professionals and laboratory workers. The absence patterns among hospital employees indicate that employees who were absent within the last 5 and 30 work shifts have a greater likelihood of being absent. The absence patterns with respect to overtime show that working overtime in the last 5 shifts was significantly associated with a decrease in absence for nurses, NAPE support staff, NAPE laboratory group and management.

Finally, in terms of social factors, the peer group impact of absence shows that the higher the departmental absence rate the previous day (the more employees absent within the workgroup), the more likely an individual will be absent. This finding was significant in all 7 groups in the study. With respect to overtime, the more departmental workgroup

members work overtime, the more likely absences will increase for nurses, Allied Health employees and management.

## 6.1 LIMITATIONS

This research examined several factors that may influence absenteeism. Despite the significance of the research findings, there are several limitations to the study, which should be noted.

The first limitation is related to the workload measure used in this study. The workload measure of daily inpatient volume was calculated using daily admissions and discharges of clinical units at primarily the General hospital site and St. Clare's hospital site. This measure is a relatively crude measure of workload that only takes into account one aspect of hospital workload. Perhaps the inclusion of occupancy rate, workload intensity (severity of illness and complexity of patient population) and patient volume would have provided a more accurate measure of hospital workload and produced different results for the clinical bargaining groups – however these measures were not available.

Secondly, workload data was only available for two years (February 2002 to November 2004) and the workload information that was available was specific to clinical employees. Workload data was not available for non-clinical employees working at the Health Care Corporation. A workload measure that would more accurately reflect the type of work being performed may have changed the workload result for the non-clinical

groups. Also, the inclusion of non-clinical employees and a wider data range could have produced more robust workload results.

Thirdly, the measure of absenteeism in the study did not distinguish between culpable and involuntary absence. The assumption in the study was that absence was volitional.

Lastly, descriptive information about the study participants was not available for all the employees. Information such as gender, age and marital status was not available at the time of analysis, and this may have modified the overall results.

As shown, multiple factors influence employee absence. This study provides a snapshot of the work environment, social and individual factors influencing employee absenteeism at the Health Care Corporation of St. John's over a two-year time period. Overall, the study shows that there is wide variation in the results between the seven bargaining groups for most of the variables analyzed with the exception of absence in the last five shifts and departmental absence rate. For these variables, all bargaining groups were associated with an increase in absence. Despite the variation in the results, this study provides valuable insight into the factors contributing to the absence behaviour of different bargaining groups within a tertiary hospital system.

## 6.2 RECOMMENDATIONS

Based on the results of the study, the following recommendations are made to help mitigate the impact of absenteeism at the Health Care Corporation of St. John's:

- A variety of factors can impact short-term absence. Therefore, having a buffer supply of temporary workers to lessen the impact of an unexpected absence may help in avoiding delays in the service and treatment of patients.
- The use of cross-training may help minimize the impact of unscheduled absence due to illness, family emergencies or any other unforeseen circumstances. More specifically, the use of cross-training policies across units, and with workers with similar skill sets, can minimize travel time, makes communication easier, and may make partial coverage easier.
- Similarly, providing a blend of programs to help proactively manage work schedules, family, and health, can help alleviate the pressure on employees who may use absenteeism as a way to cope with the demands of the job, personal obligations and family responsibilities. Flexible job designs such as work at home options and reduced workweeks are options associated with lower absences.

- To manage the effects of absenteeism within the workgroup, management may consider evaluating workgroup absence and developing attendance standards for departmental workgroups.
- Closely monitoring workgroup or individual absence patterns to help identify where and when action on attendance is needed. More specifically, attendance records of workgroups may be monitored against set criteria to determine whether the level and/or pattern of individual/group absence is acceptable.

### 6.3 AREAS FOR FUTURE RESEARCH

This study provides some insight into individual absence-taking behaviours. However, absenteeism is a complex problem and using administrative data may not be sufficient to uncover the underlying issues associated with absenteeism. The inclusion of focus groups or individual interviews may be useful in identifying specific issues related to the work environment and organizational culture. It may be useful to conduct focus groups/interviews for each of the bargaining groups at different sites to see if there is variation in the responses.

The primary focus of this study was short-term absence. However, it may be interesting to examine the influence of work environment factors on both short-term and long-term absence to determine whether these factors have a short or long-standing effect on absence. Lastly, our study did not examine the influence of both age and tenure on absence. Given that age and tenure may interact. Perhaps future research could examine the effects of age and tenure on absence and on absence of different workgroups.

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