WORKSITE WELLNESS: AN ANALYSIS OF A REGIONAL UNIVERSITY WELLNESS PROGRAM

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With the Affordable Care Act, worksite wellness programs will be a part of the national public health strategy at a predicted cost of $4.2 trillion annually by 2023 (Anderko, Roffenbender & Novelli, 2012, p.1). With such a large economic investment in this strategy the importance of understanding this approach's true potential and benefits is greater than ever. This regional university workplace wellness analysis is only one review of the ACA's overall goal, but studies such as this which evaluate the effectiveness of worksite wellness on employee health and lifestyle through health status and participation will be crucial to determining the impact wellness programs have on employees. This is a descriptive study identifying the factors associated with participation in a university-based worksite wellness program. Secondary data

was collected over four year (2009-2013) biometric results and five year (2010-2014) participation results. These data periods were obtained from the regional university's human resources (HR) database and used in this study. IBM SPSS Statistics 21.0 was used to analyze the data by chi square, descriptive, and frequency test determining trends, descriptive results, and relationships deemed significant from year to year for each sample. Findings suggested that various variables such as gender and age had an effect on participation. Total employee participation decreased over the 5 year span and aggregate results showed higher female participation in biometric screenings and participation. Certain aspects of the wellness program, such as WellPoints, were not an effective incentive for increasing participation as 70% of participants did not complete any points (0 points-nonparticipating). Females collected more discounts over males and all participants were more likely to receive $100 and $200 level insurance discounts. Females were at least 20% more likely to have biometric screenings over males. Participation related to age showed no distinguishable difference with slightly higher participation from ages 21-49. The components of the program showed various participation levels that correlated over a four year period. Proper wellness program components and evaluation techniques between participation and biometrics are essential to determining if a return on investment (ROI) is provided.

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Introduction

Wellness programs do save money, but are underused and without them health related expenses are left unchecked. Worksite wellness programs are cost-beneficial with a positive return on investment (Pronk, 2009, p.28). It is a crucial part of improving the public health. While employees are older and continuing to age, with many having multiple chronic conditions, treatment and medical cost are becoming increasingly complicated. Among workers, there has been a decrease in traumatic injuries and an increase in chronic conditions such as depression and anxiety contributing to lower productivity. Worksite wellness programs can be used to address these issues. With 60% of Americans receiving health care through their place of employment, wellness programs are developed to respond to the health needs of a varied workforce (Anderko, Roffenbender & Novelli, 2012, p.3). In a culture of health, employees show an initiative to take action in health, better performance, improved job satisfaction, and job advancement. Organizations recognize that they need profits to survive. They generally relate success to profit. If employers can grasp the notion that healthy leaders are linked to improved corporate revenue and profit, they are much more likely to invest in programs to promote health among their employees. Healthier employees produce more profit and improve the company's productivity and environment. Health care cost is directly related to the employee health status and the healthier the employee the less the company spends on health insurance (Pronk, 2009, p.28). Healthy employees generate better productivity ratings as well so more quality work is completed. Companies can see improvement in worksite environment, company culture, health plan design, corporate policies, and access to health management programs. Health management programs improve the company's return on investment as they will appreciate more money earned than invested. Other values of investment include employee attraction and retention,

improved morale, reduced absence, and enhanced company loyalty. Health management programs help fully insured organizations of any size. Based on this information, wellness programs have a rightful place in the field of health and the worksite. The purpose of this study was to evaluate the effectiveness of worksite wellness on employee's health status through participation in the wellness program. This is crucial in determining if the current program at this institution is successful. Without evaluating the data gathered through the university's collection tool, identifying the impact of this program is difficult. It is also vital to discover the weaknesses and strengths of the wellness program in order to make the necessary alterations for healthier employees in the future. Analysis can determine ways to increase participation. This study will assess a worksite wellness program at a regional university located in Eastern Kentucky to determine it's effectiveness toward employees. This is a descriptive study identifying the factors associated with participation in a university-based worksite wellness program. For the purpose of this study it will be referred to as the *wellness program*.

Operational Definitions

Tobacco Declaration Form (TDF): Signed consent document stating that the participant does not consume tobacco.

Health Risk Assessment: Questionnaire (HA) used to determine the relative health risk that a participant is associated with.

WellPoints (Level of Participation): A form of points earned for participation in an activity associated with the wellness program, resulting in reduced health insurance premiums.

Unit/ College: The unit in which the employee works.

Hourly/Salary: The employee's payment by the hour or a yearly salary.

Family/single/2-person: Family is greater than 2 participants, single is 1 participant, and 2-person is less than or equal to 2 participants.

Coverage Level: The type of coverage offered to the employee being employee only, employee plus spouse, or employee plus family.

Amount of Insurance Discount: The total insurance discount gained through participating in the wellness program. This includes a total of WellPoints, TDF, HA, and employee status as single or with a spouse/family. ($0-$500).

Literature Review

The Affordable Care Act (ACA), Center for Disease Control (CDC), and American Heart Association (AHA), among other sources, provide information and study results to better understand how the future of worksite wellness will play an integral role in the health care system. This review identifies a variety of knowledge related to the impact of new health strategies linked to worksite wellness.

The ACA supports prevention and wellness initiatives within the workplace. With the ACA, worksite wellness programs will be part of the national public health strategy at a predicted cost of $4.2 trillion annually by 2023 (Anderko, Roffenbender & Novelli, 2012, p.3). Public health in the United States can be improved by building workplace "cultures of health" that support healthy lifestyles. The ACA, which includes the Prevention and Public Health Fund, supports a new focus on prevention and wellness, offering opportunities to strengthen the public's health through workplace wellness initiatives. The government has taken an interest in wellness promotion programs and they will be a major future goal for many organizations.

A report from the RAND Health Corporation sponsored by the U.S. Department of Labor and the U.S. Department of Health and Human Services reviewed scientific and trade literature

and a national survey of employers with at least 50 employees in the public and private sectors. Statistical analyses of health plan claims and wellness program data, and case studies of five employers with established wellness programs were used. Existing evidence and original analyses was used to document composition of wellness programs on health and cost outcomes, and investigate the use and impact of financial incentives to promote program commitment. Because of this, this resource is of interest not only to this study, but also to national and state policymakers, employers and wellness program vendors, employer and employee advocacy organizations, and health researchers. Any individuals with responsibilities related to designing, implementing, participating in, and monitoring workplace wellness programs can find this information useful. Conclusions showed that workplace wellness programs have become common practice and many employers are optimistic about their success. Improvements in health can be seen, but health care cost reductions are rare. Reduction in risk factors result from lifestyle management programs incorporated into worksite wellness and these changes in behavior can be sustained. Because of this, workplace wellness programs can contain behavior and lifestyle modifications related to diseases that are a major contributor to premature death in the United States (Mattke, Hangsheng, Caloyeras, Huang, Van Busum, Khodyakov & Shier, 2013). The progress of worksite wellness's integration into an increasing amount of organizations was another promising result. The return on investment or financial savings due to better employee health was discussed through its importance in the evaluation of a program's success. Many of these sources will show how to evaluate the financial benefit of worksite wellness programs and how they are becoming successful.

The American Heart Association discusses the benefits of worksite wellness directed towards healthcare savings. Wellness programs are on the rise and more companies are being

encouraged to incorporate them. More than 1,200 companies have been deemed "fit-friendly" by the AHA, encouraging employees and employers to make use of new wellness practices associated with workplace programs. A study by Medco on prescription benefit management trends showed nearly 60% of plan sponsors believe wellness programs are the single most important influence in containing health care cost over the next 3 to 5 years. From the organizations in the study both participation and the amount of employers intending to offer wellness programs increased over the span of 1 year. Medical costs fall by nearly $3.27 for every $1.00 spent while absenteeism costs fall by $2.37 for every $1.00 spent (Rossi, 2010). This is further evidence that worksite wellness programs can decrease the burden of healthcare costs among the many other benefits that they provide.

The ROI related to a wellness program is important in determining it's success. Significant ROIs can be accomplished but implementation of programs needs to be carefully implemented as part of a broader goal to create a healthy and effective workplace (Cyboran & Paralkar, 2013). Key points were discussed as guidelines to organizations that use programs such as choosing an approach to wellness that follows the business's strategies or engaging employees to take action in the improvement of their health. When a wellness program is properly designed and implemented it can have a positive impact. Successful wellness programs can expect a ROI of $3.27 per $1.00 spent on health care that will generally grow over time. Recent meta-evaluations of economic return on investment in 2012 have even shown a $6 to $1.00 spent ROI (Cyboran & Paralkar, 2013). ROI is a valued aspect for any organization.

The cost and savings associated with wellness programs is discussed in various case studies through the analysis of different literature (Baicker, Cutler & Song, 2010). The focus was on studies that examine the effects of healthcare costs and absenteeism. The findings showed that

medical costs drop $3.27 for every $1.00 spent on wellness programs. Absentee costs dropped by about $2.73 for every $1.00 spent (Baicker, Cutler & Song, 2010). This ROI shows that an increase in the adoption of wellness programs can be beneficial for budgets and productivity among a wide variety of establishments. This is directly related to the current study because it shows exact financial amounts that result from these programs.

Employee Wellness Programs (EWPs) are adopted by an increasing number of employers searching for ways to stabilize their health care costs and improve productivity. There has been a changing scene from large employers toward small and mid-size companies. Credible evidence is mounting and programs are becoming increasingly more successful and intuitive (National Institute for Health Care Management, 2011). Increased attention to EWPs has heightened through programs such as the ACA. Other programs such as the U.S. National Physical Activity Action Plan have taken steps to promote physical activity interventions for the worksite as well (National Institute for Health Care Management, 2011). Important entities are taking interest in worksite wellness and if this study can prove that the current programs at higher education institutions are working, more interest may be taken in this area.

A 6-month worksite health intervention conducted by staff trained in cardiac rehabilitation and exercise training identified the effect on patients and cost-effectiveness through worksite health programs (Lavie & Milani, 2009). The significance of this study is it's relation to the issue of health care cost. Villaire and Mayer (as cited in Lavie & Milani, 2009) report that chronic disease accounts for 75% of annual health care cost. Over half of employers profit is being spent on health benefits. By using innovative methods such as cardiac rehabilitation and exercise training, employers can combat these problems. Worksite health interventions can show improvements in various aspects of general health (Lavie & Milani,

2009). High risk subjects can reach low-risk status in a short time. For example, at least a six-fold return on investment can be seen within one year by implementing a cardiac rehabilitation and exercise training worksite health program (Lavie & Milani, 2009). Health interventions in the workplace have the possibility of producing positive significant results in employee health status within one year by improvements in general health such as less anxiety and better health habits, lowering health risk categories, and better quality of life among other aspects (Lavie & Milani, 2009).

Worksite nutrition and physical activity programs showed modest improvements in the employee weight status after a 6-12 month follow up. Nine Research and Training Centers (RTC) found an estimated decrease of 2.8 pounds and six RTC's concluded a -0.5 decrease in BMI among both male and female employees (Anderson, Quinn, Glanz, Ramirez, Kahwati, Johnson, Buchanan & Archer, 2009). Although the approach studied showed only modest results on weight loss when presented toward a larger employee population, control and prevention of overweight and obesity levels may be seen.

Other worksite health promotion programs have also shown success in reducing obesity. Through a systematic review of 7 studies, worksite programs that combined nutrition and physical activity demonstrated initial weight loss ranging from 4-26 pounds in a sample from smaller (<300) and medium (300-500) organizations. However, weight regain was common in follow-up studies (Williams-Piehota, Hersey, Alexander, Isenberg, Rooks, Sparling, Hill & O Dunet, 2008).

Two of the top three leading causes of death in the United States are cardiovascular disease (CVD) and stroke. Heart diseases cost $304.6 billion with $122 billion related to productivity losses and morbidity and mortality. Stroke contributes $68.9 billion in cost for

treatment (Carnethon, Whitsel, Franklin, Etherton, Milani, Pratt & Wagner, 2009). With over 130 million Americans employed, worksites provide an advantageous stage for CVD and stroke prevention. Worksite wellness programs can prevent the major risk factors such as cigarette smoking and obesity that contribute to stroke and CVD through program tools such as tobacco cessation and prevention, health screenings, and nutritional education (Carnethon, Whitsel, Franklin, Etherton, Milani, Pratt & Wagner, 2009). The opportunity that workplaces provide for intervention is unmatched for not only CVD and stroke but many other health disparities.

The link between chronic illness and modifiable risk factors is undeniable. Worksite health promotion is used to address these modifiable risk factors and contribute to overall wellness. In a study by Goetzel & Ozminkowski (2008) approximately 70% of the total burden of disease is associated with preventable illness. These modifiable risk factors have major impacts on employer cost associated with health care, loss of productivity, and absenteeism. Worksite health programs have the ability to achieve long-term behavior change and risk reduction among employees. ROI ratios for absenteeism scaled from $2.50 to $10.10 per $1.00 spent. Early studies showed a median ROI of $3.00 per $1.00 spent.

Blue Cross Blue Shield of Kansas City implemented a worksite wellness program in 2005 and the health risk appraisals and biometric screenings were used to evaluate program impact (Hochart & Lang, 2011). It was initiated to impact employer culture and assist employees in keeping low risk categories and reducing those at moderate to high risk for 3 consecutive years from 2006-2008. Results showed that 85.8% of individuals in the low-risk category remained over the 3 year study. Other categories showed improvements with 39.9% of those in medium-risk and 48.9% of those in high-risk categories shifting to lower risk in the final year of

2008. Improvements were seen in blood pressure and total cholesterol. Participants also showed smaller increases in emergency room costs per member per month compared to non-participants.

Johnson & Johnson Family of Companies started its worksite health promotion program in 1979. The effect of this thirty year program on health risk and health care cost from 2002-2008 showed a total medical spending that was 3.7 percentage points lower than similar large companies (Henke, Goetzel, McHugh & Isaac, 2011). Employees showed reductions in rates of high blood pressure, obesity, high cholesterol, inactivity, poor nutrition, and use of tobacco. Average annual saving per employee was $565 in 2009. This produced an ROI from $1.88-$3.92 for every $1.00 spent. If such a large company as Johnson & Johnson can continually find success with a lasting program the nation should be able to as well.

Physical inactivity and poor diet can increase health care cost. Each, on average, is contributable to approximately 2% of the total health care cost. Indirect cost associated with loss of productivity attributed to physical inactivity and poor diet can be related to fourfold of the health care cost (Proper & Mechelen, 2007). Worksite health promotion programs that address physical activity and diet have shown effectiveness in behavior change and health related outcomes along with other CVD risk factors. Cost saving from absenteeism shows $2.50 to$4.90 for every $1.00 spent and $2.50 to $4.50 for every $1.00 spent related to health care savings.

Musculoskeletal disorders represent a major cause of absenteeism and morbidity causing high medical care cost. Worksite health programs can be used to address this ergonomic issue by recognizing the importance of workplace changes and conditions. A review of 42 epidemiologic studies consisting of 537,319 employees over 3.6 years showed a 30% decrease in absenteeism, 21.8% decrease in health care cost, and a $5.67 return on every $1.00 spent (Punnet, Cherniack, Henning, Morse & Faghri, 2009).

Research on worksite wellness is on the rise. The majority of these studies look at various employers to determine the effectiveness of employee wellness programs. Institutions will not only learn from this study to determine their own program strengths and weaknesses, but also contribute to the valued perspective offered by data that can gain more support for the ACA and wellness programs in general.

Methods

Secondary data collected over four (2009-2013) and five (2010-2014) year periods were obtained from the regional university's human resources (HR) database and used in this study. HR collected data, but according to their contract with the external agency, which carried out the biometrics, no aggregate data was supplied to the program, only a report was filed. Therefore, creating a situation in which there was no relevant approach to analyze matching participants in the two sets of data. The study samples included wellness program participants from a total of 1,160 employees (administration, faculty, and staff) employed at the regional university. The sample population used for this study included only employees who were covered by full benefits, contracted services, or full time employees at the time of data collection.

Wellness program staff collected all relevant data on health indices, and human resources formed the data into a spreadsheet. Participant information was obtained via human resources benefits and wellness program data. Participation data comes from data collected in 2010-2014. This data included gender, units, health risk assessment, tobacco declaration forms, WellPoints, coverage level, age, and the total amount of insurance discount. Biometric data was collected from 2009-2013 by the contracted agency. The aggregate data over the four year period was afforded to the researcher as a service. HR did not have the comprehensive data, only a report in written and chart format. Biometric data included body mass index (BMI), resting heart

rate, systolic and diastolic blood pressure, cholesterol (HDL/LDL), glucose, biometric impedance analysis, gender, and triglyceride levels.

IBM SPSS Statistics 21.0 was used to analyze the data and run chi square, descriptive, and frequency test determining trends, descriptive results, and relationships deemed significant from year to year for each sample. For the chi square test, the independent variable was the wellness program (Refer to Appendix A) and the dependent variable was biometrics and participation.

Results

The participation data from 2010-2014 showed similarities and distinctions from year to year (Refer to Appendix D: Table 1). A noteworthy finding showed the total employee participation decreased over the 5 year span from 818-708 with an average population of 756; an average percentage of males equaling 43% and females 57%; and a mean age of 48 with a mode age of 46 years. Over 5 years the unit of VP, Admin. & Fiscal Services had the highest acquired average participation rate of 24%. Employee only coverage level was associated with the most participants at 51% and employee plus family consisted of 28%. An average of 85% of employees completed the health risk assessment with a 15% incompletion rate. The lowest incompletion rate was in 2011 at 11% which was at least 4% lower than any other year recorded. Completion of the tobacco declaration form had an average participation rate of 78 and 22% non-completion.

The highest levels of employee insurance discount amount showed $100 level discount with an average of 27%, $200 level discounts at 38 %, $300 level discounts at 11%, $400 level discounts at 13%, and lastly the highest discount ($500) also showed the lowest percentage at 7%. The remaining discounts all fall below 2%. In accordance with the WellPoints, the

participation rates resulted in averages of 4% (50-59 points), 5% (60-69 points), 21% (70+ points), and 70% of participants not completing any points (0 points-nonparticipating). Incompletion rates of WellPoints decreased from 2010-2013 with a 10% increase in 2014. Significant chi square results for each year, from 2010-2014 can be found in Appendix D: Table 2.

Important chi square results noted in participation rates show that units and gender demonstrated overall more females participated in any portion of the wellness program such HA, TDF, and WellPoints over males. The amount of insurance discount related to gender showed that females collected more discounts over males and all participants were more likely to attain $100 or $200 discount levels over higher rates except in the year 2014 which also produced a large amount of $400 level discounts. The units of VP, Admin. & Fiscal Services Offices and College of Science and Technology continually showed the largest majority of participating employees over all other units. Health Risk Assessment related to unit presented VP, Admin. & Fiscal Services Offices as the highest completion of the health risk assessment with no more than 144 individual non-completions through all four years. Participants age 43 were the most likely to have a coverage level including family members while those age 56 were more likely to have employee only coverage. Employees who obtained a $200 discount were more likely to complete the health risk assessment over other amounts of discount. Employees with $100 discounts and $200 discounts were less likely to complete WellPoints. Employee only, employee plus spouse, and employee plus family were less likely to obtain WellPoints and if they did participate were more likely to obtain 70+ points. Both males and females were less likely to obtain WellPoints from the population and if they did attain points it was most likely 70+. Females completed HA and TDF more frequently than males. Every year except for 2010 showed greater participation

from ages 49 and under by at least 5%. The year 2010 resulted in a 17% more participants from the 50 and over age group. Specific significance related to certain assessments relative to age was found. In 2012 and 2014 ages 49 and under were 3% more likely to complete the HA while 2013 showed ages 50 and over to complete the HA 1% more frequently. In 2012 ages 49 and under showed a 1% higher completion of WellPoints. Lower amounts of discount were associated with completion of the tobacco declaration form mainly in the $200 amount (Refer to Appendix D: 2010-2014 Participation Chi Square Result Analysis).

The overview of biometric data from 2009-2013 showed similarities and distinctions from year to year (Refer to Appendix F: Tables 3, 5, 7, 9, 11). The total employee participation population ranged from the least of 108 to the most of 147 over the 5 year span. The average number of participants was 193 over all the years. The total average of males equaled 35% and females 65%. BMI showed an average overweight (25-29.9) participant rate of 32%, obese (>30) rate of 32%, and a normal (≤24.9) rate of 36%. Employees with a health risk associated with HDL (<40) levels equaled 27% and LDL (≥130) levels equaled 29%. At risk levels for triglyceride measurements included 28% of the participants. At risk levels for glucose were associated with an average of 28% of the population. A total of 37% of employees had a health risk due to high cholesterol levels. Systolic and diastolic blood pressure health risk affected less than 1% of participants.

From 2009-2013 the following variables showed significance independent t-test results each year (Appendix E: Tables 4, 6, 8, 10, and 12): Significantly important is the finding that female participation was always higher by at least 20%. High Density Lipoprotein, systolic blood pressure, diastolic blood pressure, and bioelectrical impedance analysis levels showed significant differences between males and females. Every year except for 2009 showed females

with lower percentages at risk than males for HDL by at least 11%. In 2009 females were at greater risk for HDL by 13%. Glucose showed significant results in 2009, 2012, and 2013 with females having at least 13% less risk than males. Diastolic blood pressure only showed a risk in 2009 with 2 males and 1 female. Systolic blood pressure resulted in risk every year except 2009 with an equal amount of 7 males and 7 females. BIA risk in males was always lower than females by at least 21% every year. Significant triglyceride results in 2009 indicated that females were 49% more at risk than males (Refer to Appendices E).

Discussion

Participation decreases over the 5 year period which is not expected for an implemented worksite wellness program. The approach taken to engage employees to take action is important to a program's success as discussed by Cyboran and Paralkar (2013). Retention in this wellness program did not produce the same or increased employee participation through these years. Another commonality between years is the greater amount of female participation by an average margin of 14% (Refer to Appendix B). The limitation of not knowing the total number of male and female employees makes it difficult to judge if this is actually a regularly occurring issue in university based wellness programs. The mean age of participants was 46 and 48 throughout showing that participation in middle aged adults occurred most often. A limitation of this result is being unable to discern if the mean age was a function of the overall ages in the university. VP, Admin. & Fiscal Services had the highest participation rate. Another limitation to this result is not knowing the total employees in each unit so if they had more employees then there is a greater chance of more participation. It is important to recognize units that have low participation percentage such as the VP, Planning, & Budgets Offices and the President's Office which had the lowest total every year. By considering specific outreach to those employees participation

increases may be seen. In every year average completion of the TDF and HA was at least 78% with 2011 having the highest completion rate of 89% for the HA. Recognizing methods that were implemented in 2011 could help increase participation as this was the most significant year for completion of the HA. Participation by age for Wellpoints, HA, and TDF was at similar rates generally no more than 5% differences. On average, levels of discounts earned were only $100 and $200 level discounts. These monetary levels are associated with completion of the TDF and/or HA and as completion rates show the lowest year was 78%. Employees are not reaching the maximum level of discounts and this could be a sign that this method of incentive is not producing the highest level of results. The WellPoints portion of the wellness program is not effective in the 5 year period based on the result of at least 70% of participants not attaining any points, and this is the reason for employees being unable to reach their maximum insurance discount. A total of a $400 discount can be reached by completing 70+ WellPoints and both assessments (HA and TDF) for a single employee. An employee with a spouse or family has a $500 discount available to them by completing the same task. Some portion of the wellness program is not providing the initiative to receive WellPoints and in turn gain an insurance discount. This is a key finding as the regional university uses resources to provide various program components to build points and improve employee wellness and only an average of 30% of the population are participating. Overall, WellPoints are one of the more diverse and larger sections of the wellness program that requires more resources only to receive a small amount of employee participation. This is a reason for proper evaluation techniques including proper data collection to better wellness programs. Cyboran and Paralkar (2013) discuss how a properly designed and implemented wellness program, can have a positive impact and being able to see that certain pieces are not effective such as WellPoints is a part of this. From the initial

year 2010 which consisted of 67% of employees aged 50 or older, an increase of younger participants with at least 55% every year took place through 2014. This could be due to retirement or altering the target audience to gain more of the younger employees to introduce to the wellness program. Exposing employees to improved health information and options earlier in their occupation can help to alter unhealthy behaviors for long-term change.

Biometric results over 5 years had an average of 193 participants. This is a 563 participant difference from the average participation in the wellness program. This makes it difficult to properly evaluate the effectiveness of the wellness program on employee health indices. Female participation as in the wellness program was higher in biometric screenings with an average margin of 30% more. Whether this is an issue with the assessment of the target population in the wellness program or a greater number of female employees are unknown. Research conducted by Deeks, Lombard, Michelmore, and Teede (2009) aimed to evaluate health practices, behavior, and beliefs between genders through self-completion surveys in 1,456 adult residents of Australia. Results indicated that participants believed their health and lifestyle was their responsibility and priority, but this did not influence them to use preventative strategies such as screenings. More specifically women were more likely to feel responsible for seeking preventative advice over men and declared more often that they would participate in these strategies. Significantly more men than women had no interest in attaining information related to illness prevention (Deeks, Lombard, Michelmore & Teede, 2009). It is interesting to see that females seem to take a greater interest in their health and lifestyle. This is reflected in both participation results and biometric screenings through this study also. In every year females were significantly higher with a 14% margin in participation data and 30% margin associated with biometric data.

Employees were considered overweight to obese 64% of the time. Cholesterol put 37% of participants at risk. Glucose, LDL, HDL, and triglycerides were all greater than 27%. Biometric readings fluctuate from year to year both increasing and decreasing with no steady improvements (Refer to Appendix C). This is a major issue for the wellness program. With different participants involving themselves in the wellness program rather than the biometric screenings or vice versa it is impossible to find significance among them. The same participants in the wellness program were not necessarily the same who participated in the biometric screenings. This made it impossible to correlate both samples of employees. If the regional university is unable to properly evaluate the wellness program then its true effectiveness on the employee population is unable to be identified. By using a contracted company rather than utilizing all in-house procedures time and money is spent on an initiative that has no basis for support. According to Baicker, Cutler, and Song (2010) a ROI of $3.27 per dollar for medical cost and $2.37 per dollar for absentee cost can be seen from worksite wellness for certain establishments. With proper evaluation methods statistics such as this can be discovered and can provide evidence to the wellness program's actual effect at a university. Another key limitation to this study could be instrumentation failure during testing done by HR or the contracted company, and incorrect information could be reflected in the current database and unknown to researchers. The wellness program shows many significant findings that correlate over all four years. Participation is affected by certain variables and different aspects of the program effect whether an employee decides to complete the task or not.

Delimitations/Limitations/Assumptions

Delimitations comprised of the sample only included employees at the regional university who participated in some form of the wellness program or biometric screening. Limitations

included employees having different experiences with wellness programs at the regional university. Data came from a secondary source and could not be validated. Employees may have participated in regular physical activity and proper nutrition outside of the wellness program affecting biometric results. Instrumentation failure could be a threat to internal validity from the processes that Human Resources staff used to collect employee data by leaving out participants or losing WellPoint sheets (Refer to appendix A). Limitations through HIPPA make the study unable to correctly test for significance between participation and biometrics as it disables the ability to link data; only employees who participated in one or more programs were used over differing years. For future reference, incorporating an identifier and conducting the assessment in the same year to include a related population would allow for a direct relationship and analysis of participation in the wellness program and biometric results. Totals for the amount of male and female employees and college/units were unattained. Assumptions include that participants responded truthfully to any measurement instruments used concerning the wellness program and that participants have a general understanding of the wellness program components.

A significant limitation required the data to be analyzed using two different sets of years; participation 2009-2013 and biometric data 2010-2014. This incongruence was due to the unfortunate sequence where the participation data was collected by the HR department and the biometric data was collected by a contracted agency outside of the university. While this sometimes happens as a result of beginning new programs, it does limit the analyses to be only pertinent to the data sets individually. It would be in the best interest of the study to be able to compare the data as one unit; however it was not delivered to this researcher in a manner that allowed such analysis.

Recommendations

The information that the regional university provided for biometric data was from a contracted company. The proper data wasn't available to make a comparison between biometrics and participation over the years that were provided. Further study is needed covering wellness programs and various levels including universities. By gaining the proper information that includes the same population and an identifier a direct comparison on a university wellness program's effect on employee health indices could be accomplished.

Conclusion

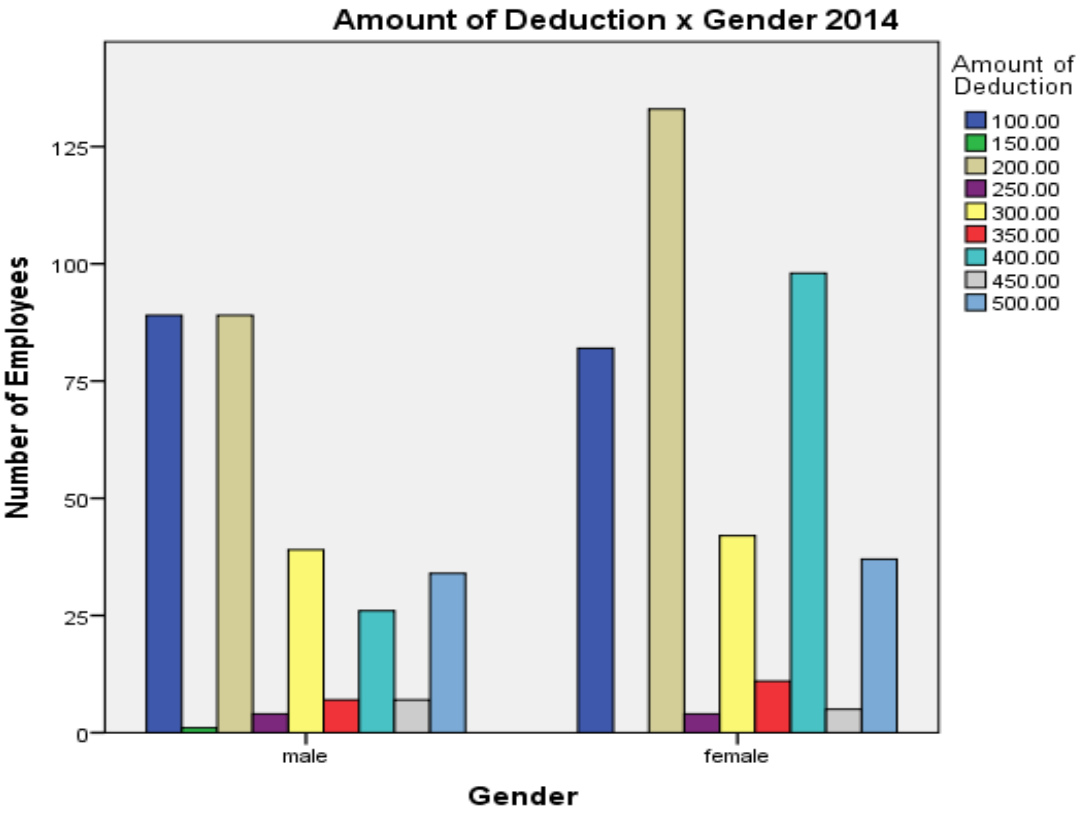
There are high hopes for the decisive effectiveness of wellness programs at many different worksites. Determining if they truly are successful will require studies such as this to identify the variables that play a major role in participation and determining the components that are working or are overlooked. For instance, why are participation rates higher in females rather than males over all four years? Being able to determine units with low participation in any part a wellness program can help to improve outreach and implementation. If employees understand the full benefit of participating in the wellness program from insurance discounts to healthy lifestyle changes participation rates may improve. By making employees aware of the full line of benefits available to them they will be more likely to participate. Proper wellness program components and evaluation techniques are crucial to determining if a ROI is provided. These are important areas to the evaluation of worksite programs and the areas that effect participation rates. As a researcher having the ability to identify participants during data collection while abiding by HIPPA and confidentiality guidelines is crucial to determining the effectiveness of a wellness program. Being able to identify through an employee ID number could have shown

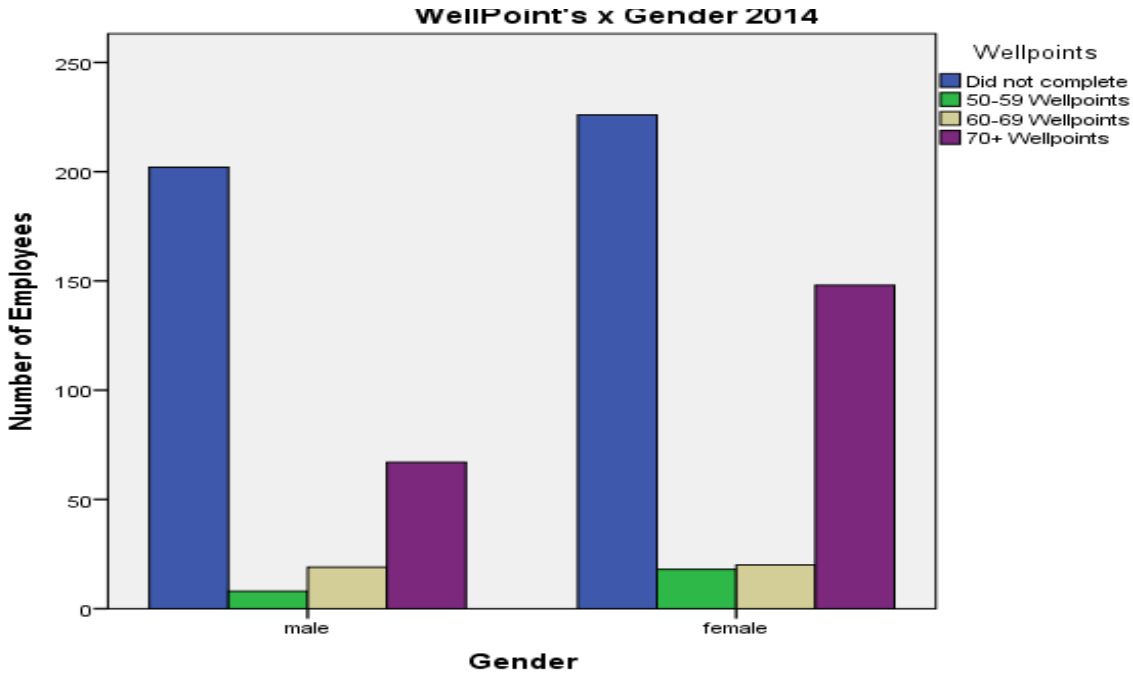
how participation in program components affected the biometric outcome. If these metrics improve, a wellness program shows its value with a valid ROI.

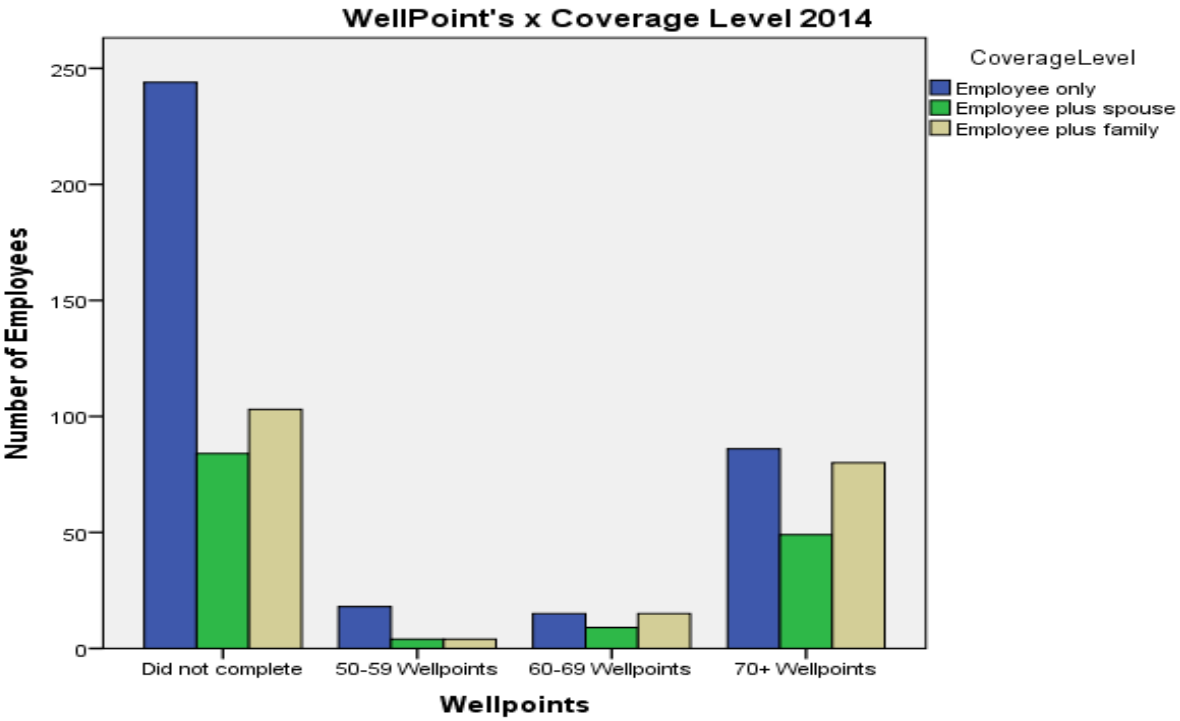
Appendix A Wellness Program

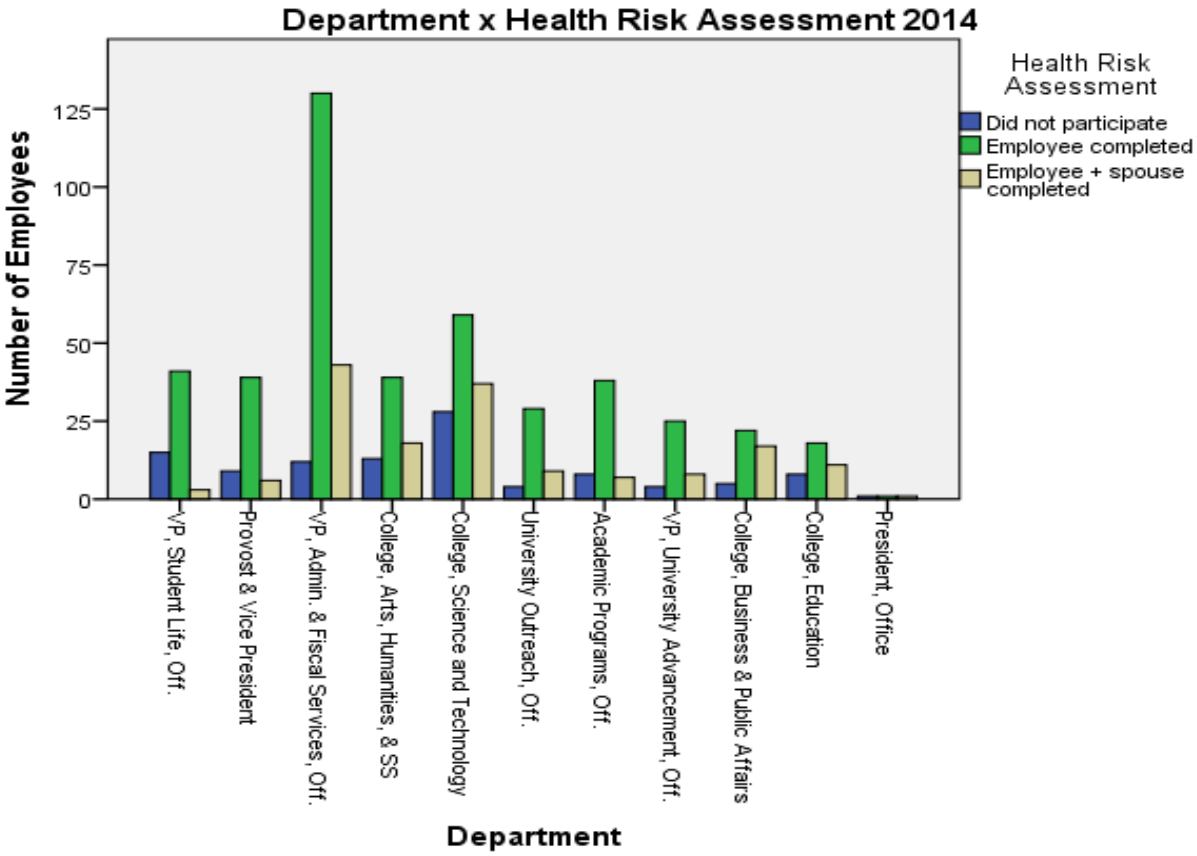
The regional university's wellness program is a comprehensive approach to healthier lifestyles for its employees. The program contains a wellness advisory team to represent the faculty and staff of the institution with upper management feedback and keeping individuals informed. Wellness champions are chosen to promote the regional university's wellness program and act as a role-model to fellow employees. WellPoints are received by participating in certain events associated with the program. Along with TDF and HA a monetary discount of $0-$500 is used to in the annual health insurance discount and as an incentive. This amount is also determined by the employee's status as single or with a spouse or family. Biometric screenings are conducted by a registered nurse year round. These results are used as a baseline and incentive for the following years. Varying challenges are offered to promote different program aspects. The wellness program includes wellness workshops and seminars that contribute to the WellPoints. Smoking cessation is included with the Cooper/Clayton Method free of charge to spouses as well. The Regional Universities' Recreation and Wellness Center works with the wellness program to better facilitate the program through activities such as group fitness classes. The regional university's own form of Weight Watchers with testimonials supplements the program. General information and guidelines, as well as references to obtain help are available.

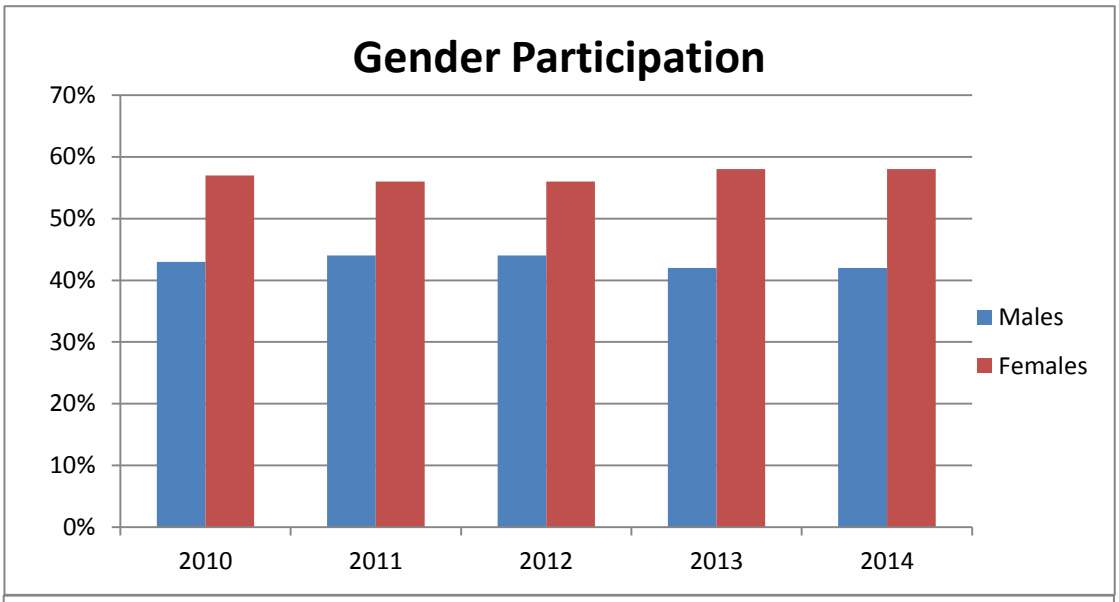
Appendix B Participation Graphs 2014

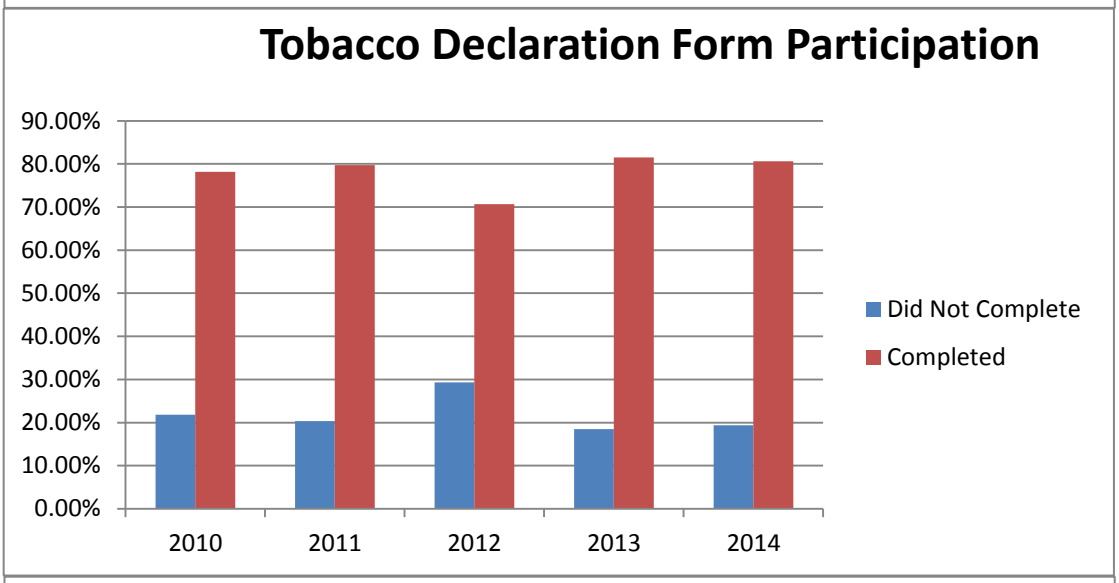


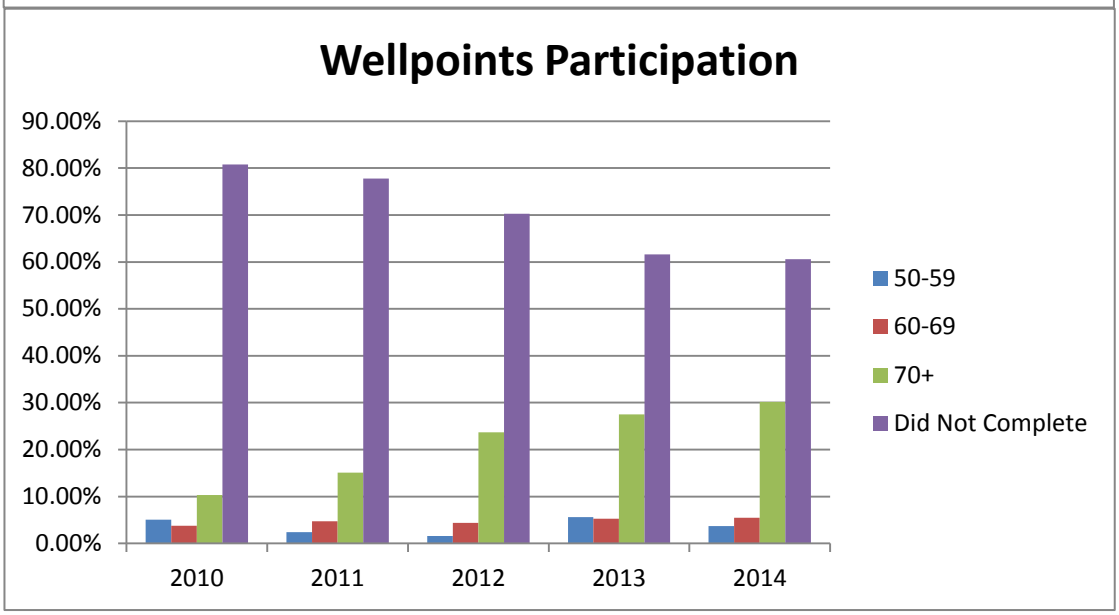


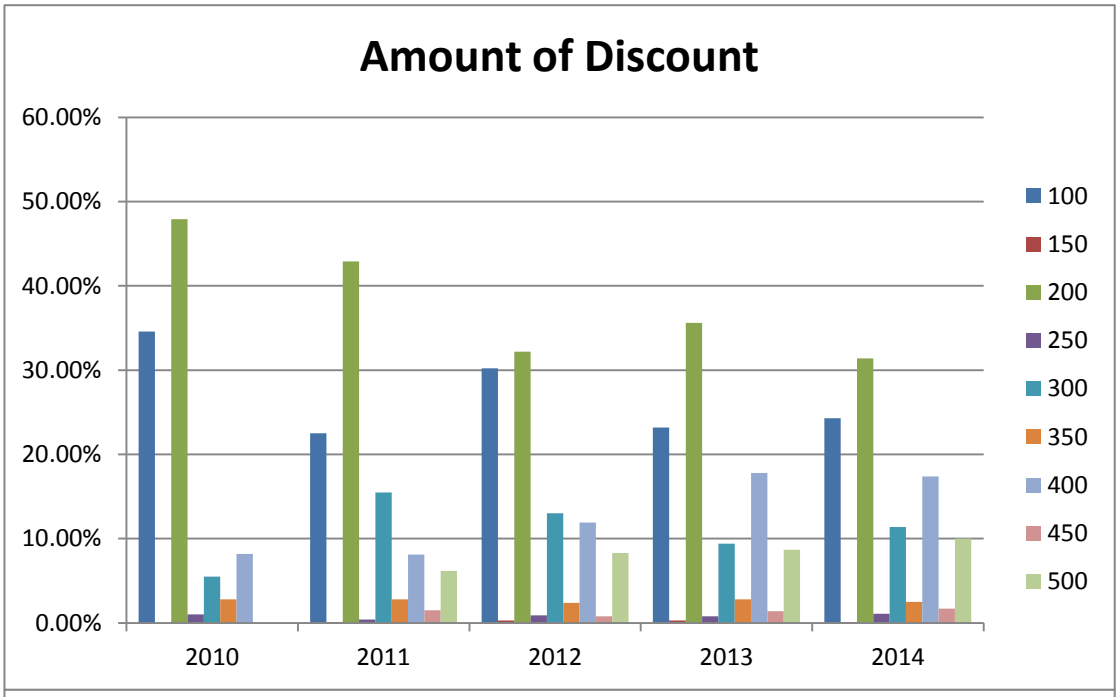

WellPoint's x Coverage Level 2014
CoverageLevel
Employee only
Employee plus spouse
Employee plus family
Number of Employees
250
200
150
100
50
0
Did not complete
50-59 Wellpoints
60-69 Wellpoints
70+ Wellpoints
Wellpoints

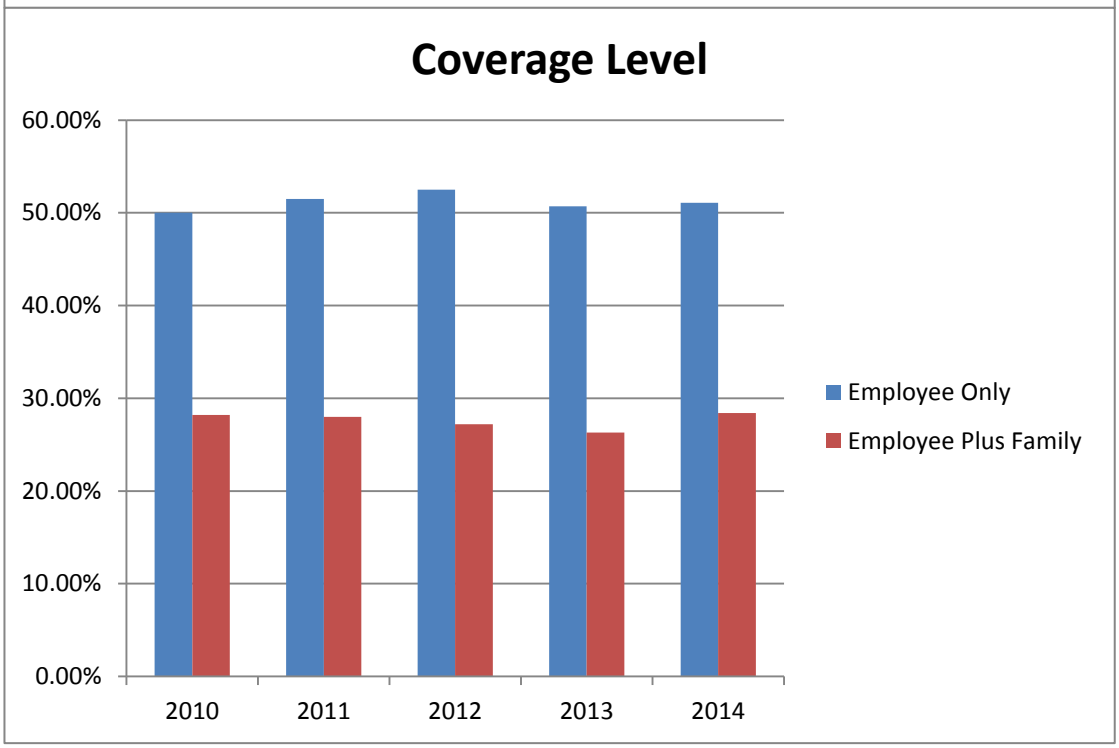

Department x Health Risk Assessment 2014
Health Risk Assessment
Did not participate
Employee completed
Employee + spouse completed
Number of Employees
125
100
75
50
25
0
VP, Student Life, Off.
Provost & Vice President
VP, Admin. & Fiscal Services, Off.
College, Arts, Humanities, & SS
College, Science and Technology
University Outreach, Off.
Academic Programs, Off.
VP, University Advancement, Off.
College, Business & Public Affairs
College, Education
President, Office
Department


Gender Participation
70%
60%
50%
40%
30%
20%
10%
0%
2010
2011
2012
2013
2014
Males
Females

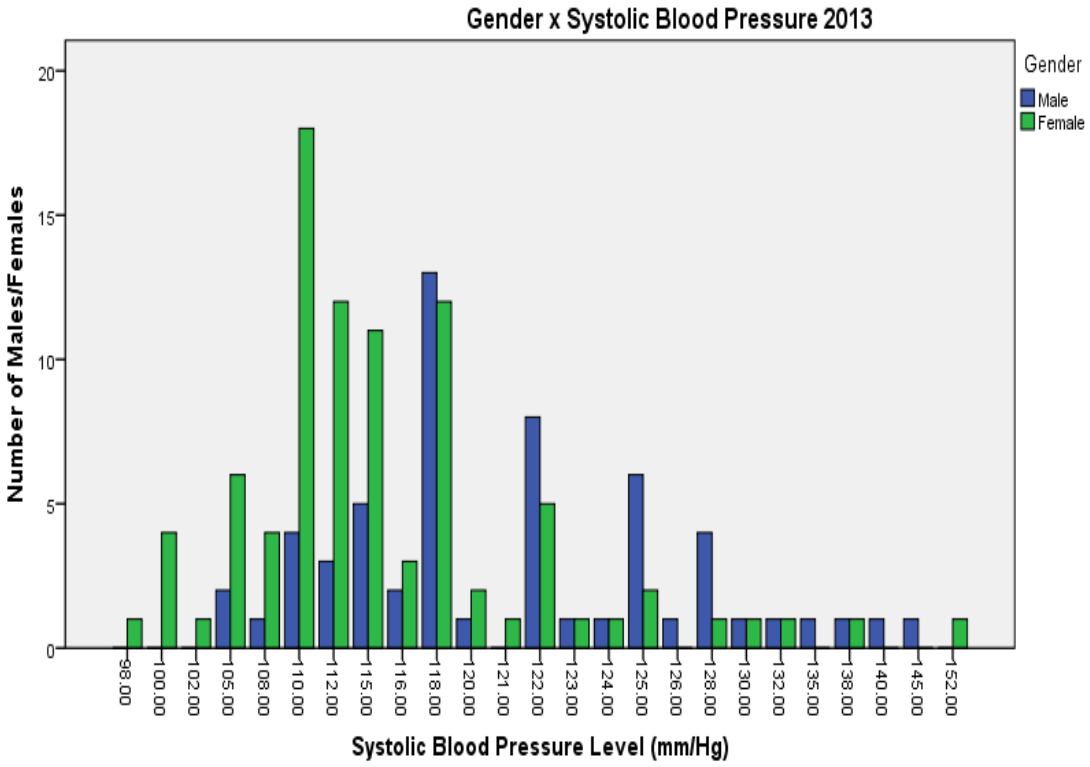

Tobacco Declaration Form Participation
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
2010
2011
2012
2013
2014
Did Not Complete
Completed

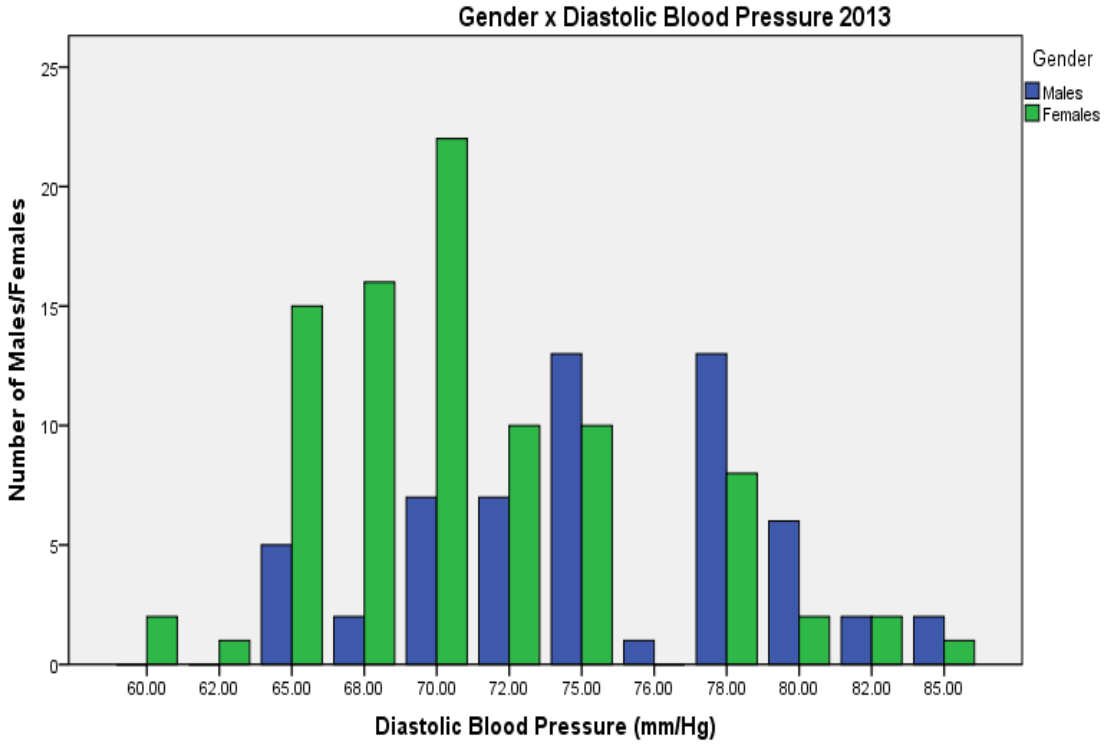

Wellpoints Participation
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
2010
2011
2012
2013
2014
50-59
60-69
70+
Did Not Complete

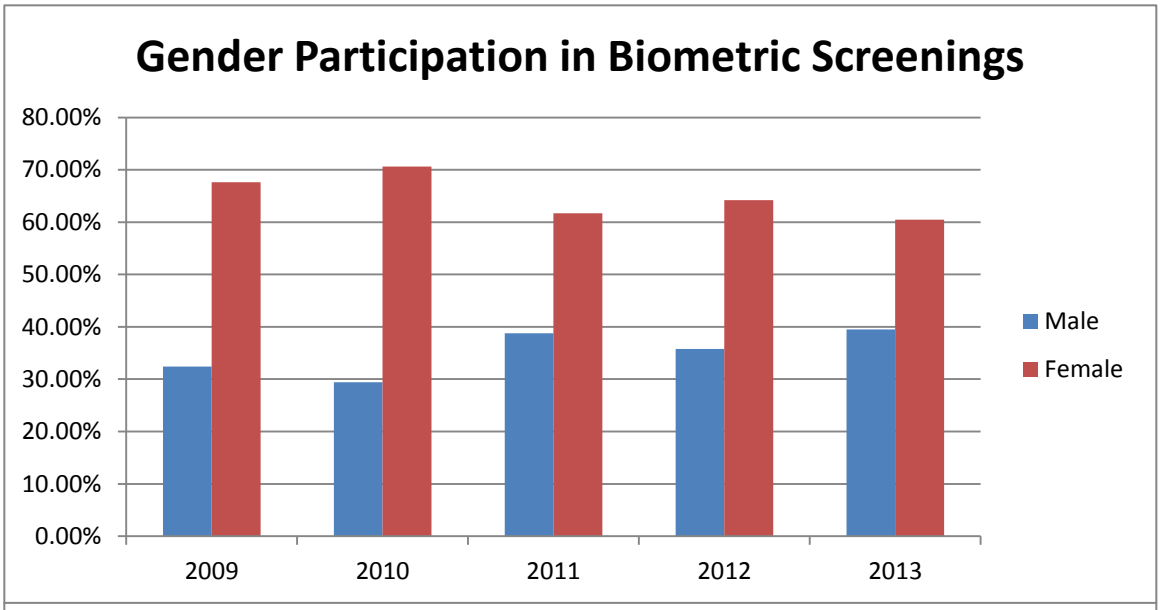

Amount of Discount
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
2010
2011
2012
2013
2014
100
150
200
250
300
350
400
450
500

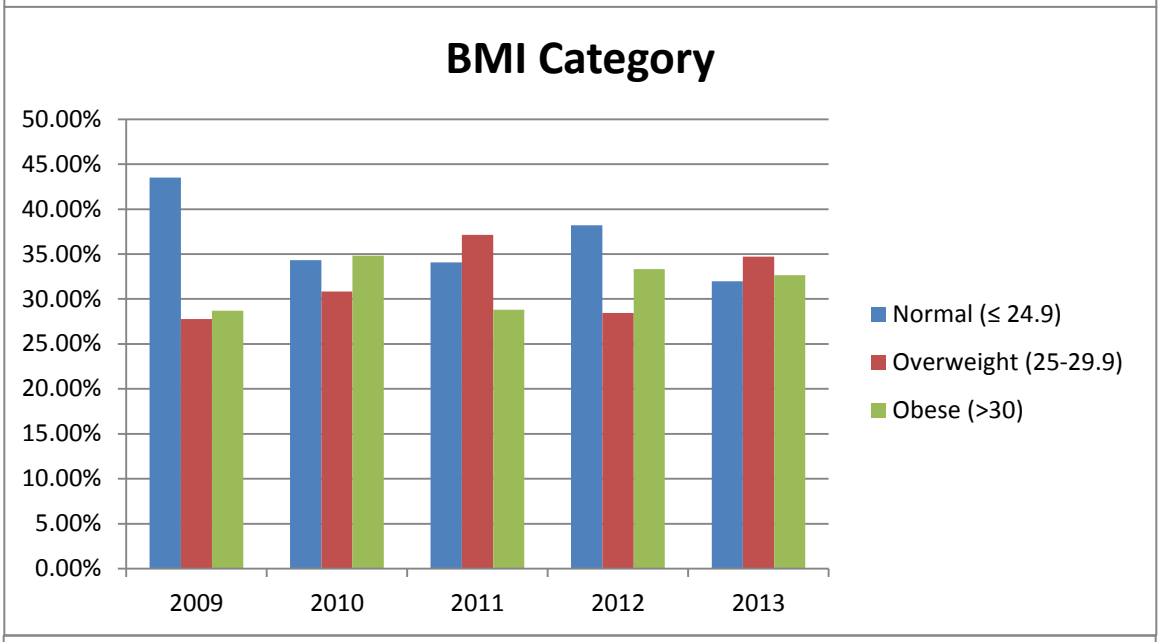

Coverage Level
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
2010
2011
2012
2013
2014
Employee Only
Employee Plus Family

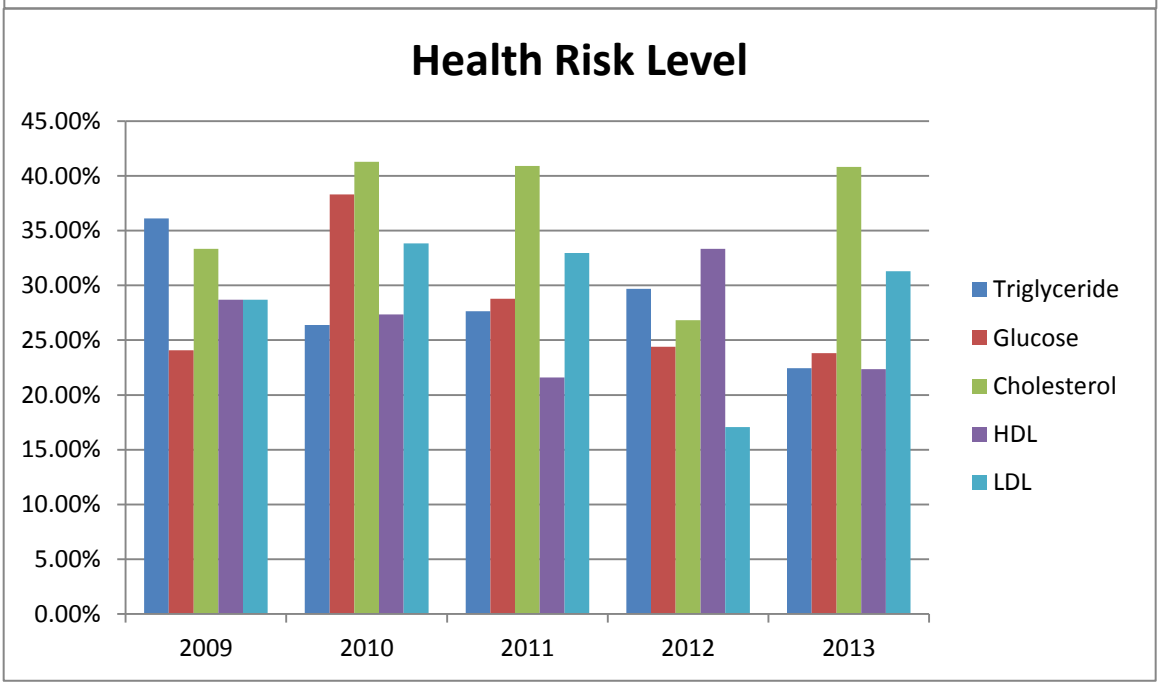
Appendix C Biometric Graphs 2013






Gender Participation in Biometric Screenings
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
2009
2010
2011
2012
2013
Male
Female


BMI Category
50.00%
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
2009
2010
2011
2012
2013
Normal (≤ 24.9)
Overweight (25-29.9)
Obese (>30)


Health Risk Level
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
2009
2010
2011
2012
2013
Triglyceride
Glucose
Cholesterol
HDL
LDL

Appendix D

Table 1

Variables	Table 1: Frequency		
Gender	**Male**	**Female**	
	355/43.4% (10) 344/43.8% (11) 330/43.8% (12) 302/42.3% (13) 296/41.8% (14)	463/56.6% (10) 441/56.2% (11) 424/56.2% (12) 412/57.7% (13) 412/58.2% (14)	
Age	**Range**	**Mean**	
	24-84yrs (10) 23-76yrs (11) 24-76 yrs (12) 23-76yrs (13) 21-76yrs (14)	48.44yrs (10) 47.51 yrs (11) 47.51yrs (12) 47.25 yrs (13) 46.57yrs (14)	
Unit	**VP, Admin. & Fiscal Services**		
	196 /24% (10) 190/24.2% (11) 181/24% (12) 184/25.8% (13) 185/26.1% (14)		
Coverage Level	**Employee only**	**Employee plus spouse**	**Employee plus family**
	409/50% (10) 406/51.5% (11) 396/52.5% (12) 362/50.7% (13) 363/51.1% (14)	178/21.8% 161/20.4% 154/20.4% 164/23% 146/20.5%	231/ 28.2% 221/28% 205/27.2% 188/26.3% 202/28.4%
Health Risk Assessment (HA)	**Employee completed**	**Employee + spouse completed**	**Did not Participate**
	674/82.4% (10) 485/61.5% (11) 432/57.2% (12) 439/61.5% (13) 442/62.2% (14)	N/A 217/27.5% 204/27% 158/22.1% 161/22.6%	144/17.6% 86/10.9% 119/15.8% 117/16.4% 108/15.2%
Tobacco Declaration Form (TDF)	**Completed**		**Did not complete**
	640/: 78.2% (10) 628/79.7% (11) 582/81.5% (12) 582/81.5% (13) 573/80.6% (14)		178/21.8% 160/20.3% 221/29.3% 132/18.5% 138/19.4%

Well Points 0-70+	**50-59 WellPoints**		**60-69 WellPoints**			**70+ WellPoints:**		**Did not complete**	
	42/5.1% (10) 19/2.4% (11) 12/1.6% (12) 40/5.6% (13) 26/3.7% (14)		31/3.8% 27/4.7% 33/4.4% 38/5.3% 39/5.5%			84/ 10.3% 119/15.1% 179/23.7% 196/27.5% 215/30.2%		661/80.8% 613/77.8% 531/70.3% 440/61.6% 431/60.6%	
Amt Insurance Discount $100-$500	**$100**	**$150**	**$200**	**$250**	**$300**	**$350**	**$400**	**$450**	**$500**
	283/34.6%(10) 177/22.5%(11) 228/30.2%(12) 166/23.2%(13) 173/24.3%(14)	N/A 1/.1 % 2/.3 % 2/.3 % 1/.1 %	392/47.9 % 338/42.9 % 243/32.2 % 254/35.6 % 223/31.4 %	8/1% 3/.4% 7/.9% 6/.8% 8/1.1 %	45/5.5% 122/15.5 % 98/13% 67/9.4% 81/11.45	23/2.8 % 22/2.8 % 18/2.4 % 20/2.8 % 18/2.5 %	67/8.2% 64/8.1% 90/11.9% 127/17.8 % 124/17.4 %	N/A 12/1.5 % 6/.8% 10/1.4 % 12/1.7 %	N/A 49/6.2 % 63/8.3 % 62/8.7 % 71/10 %

*n=818 (2010); 785 (2011); 754 (2012); 714 (2013); 708 (2014)

Table 2

Table 2: 2010-2014 Participation Chi Square Results								
Variables		**Gender**	**Unit**	**Coverage Level**	**Health Risk Assessment**	**WellPoints**	**Tobacco Declaration**	**Hourly Salary**
Age	2010	.481 (df 52)	**.020* (df 572)**	**.000* (104)**	.729 (df 52)	.942 (df 156)	.302 (df 52)	
	2011	.685 (df50)	.186 (df 550)	**.005* (100)**	.340 (df 100)	.937 (df 150)	.236 (df 50)	
	2012	.736 (df 49)	**.015* (df 539)**	**.005* (98)**	**.036* (df 98)**	.334 (df 147)	.914 (df 49)	
	2013	.730 (df 49)	.400 (df 490)	**.030* (98)**	**.046* (df 98)**	.958 (df 147)	.603 (df 49)	
	2014	.397 (df 51)	**.007* (df 510)**	**.022* (102)**	**.021* (df 102)**	.630 (df 153)	.983 (df 51)	146 (df 51)

Unit	2010	**.000* (df 11)**		**.006* (df 22)**	**.000* (df 11)**	**.027* (df 33)**	**.000* (df 11)**	
	2011	**.000* (df 11)**		**.000* (df 22)**	**.000* (df 22)**	**.016* (df 33)**	**.000* (df 11)**	
	2012	.000* (df 11)		**.007* (df 22)**	**.001* (df 22)**	.098 (df 33)	.068 (df 11)	
	2013	.000* (df 10)		.083 (df 20)	**.000* (df 20)**	**.010* (df 30)**	**.000* (df 10)**	
	2014	.000* (df 10)		.057 (df 20)	**.000* (df 20)**	.158 (df 30)	**.000* (df 10)**	**.000* (df 10)**
Coverage Level	2010	**.008* (df 2)**	**.006* (df 22)**		.116 (df 2)	**.024* (df 6)**	**.043* (df 2)**	
	2011	.058 (df 2)	**.000* (df 22)**		**.000* (df 4)**	.053 (df 6)	.802 (df 2)	
	2012	.085 (df 2)	**.007* (df 22)**		**.000* (df 4)**	**.004* (df 6)**	.594 (df 2)	
	2013	**.019* (df 2)**	.083 (df 20)		**.000* (df 4)**	**.041* (df 6)**	.838 (df 2)	
	2014	**.038* (df 2)**	.057 (df 20)		**.000* (df 4)**	**.001* (df 6)**	.262 (df 2)	**.000* (df 2)**
Health Risk Assessment (HA)	2010	.052 (df 1)	**.000* (df 11)**	.116 (df 2)		.146 (df 3)	**.000* (df 1)**	
	2011	**.012* (df 2)**	**.000* (df 22)**	**.000* (df 4)**		**.000* (df 6)**	**.000* (df 2)**	
	2012	.079 (df 2)	**.001* (df 22)**	**.000* (df 4)**		**.000* (df 6)**	**.000* (df 2)**	
	2013	.124 (df 2)	**.000* (df 20)**	**.000* (df 4)**		**.000* (df 6)**	.337 (df 2)	
	2014	**.000* (df 2)**	**.000* (df 20)**	**.000* (df 4)**		**.000* (df 6)**	**.000* (df 2)**	**.000* (df 2)**

WellPoints	2010	**.002* (df 3)**	**.027* (df 33)**	**.024* (df 6)**	.146 (df 3)		**.026* (df 3)**	
	2011	**.026* (df 3)**	**.016* (df 33)**	.053 (df 6)	**.000* (df 6)**		.180 (df 3)	
	2012	**.000* (df 3)**	.098 (df 33)	**.004* (df 6)**	**.000* (df 6)**		.052 (df 3)	
	2013	**.001* (df 3)**	**.010* (df 30)**	**.041* (df 6)**	**.000* (df 6)**		.246 (df 3)	
	2014	**.001* (df 3)**	.158 (df 30)	**.001* (df 6)**	**.000* (df 6)**		.144 (df 3)	.825 (df 3)
Tobacco Declaration Form (TDF)	2010	.638 (df 1)	**.000* (df 11)**	**.043* (df 2)**	**.000* (df 1)**	**.026* (df 3)**		
	2011	.606 (df 1)	**.000* (df 11)**	.802 (df 2)	**.000* (df 2)**	.180 (df 3)		
	2012	**.002* (df 1)**	.068 (df 11)	.594 (df 2)	**.000* (df 2)**	.052 (df 3)		
	2013	.229 (df 1)	**.000* (df 10)**	.838 (df 2)	.337 (df 2)	.246 (df 3)		
	2014	.320 (df 1)	**.000* (df 10)**	.262 (df 2)	**.000* (df 2)**	.144 (df 3)		**.000* (df 1)**
Amount of Insurance Discount	2010	**.005* (df 5)**	**.008* (df 55)**	.150 (df 10)	**.000* (df 5)**	**.000* (df 15)**	**.000* (df 5)**	
	2011	**.000* (df 8)**	**.001* (df 88)**	**.000* (df 16)**	**.000* (df 16)**	**.000* (df 24)**	**.000* (df 8)**	
	2012	**.000* (df 8)**	.129 (df 88)	**.000* (df 16)**	**.000* (df 16)**	**.000* (df 24)**	**.000* (df 8)**	
	2013	**.000* (df 8)**	**.004* (df 80)**	**.000* (df 16)**	**.000* (df 16)**	**.000* (df 24)**	**.000* (df 8)**	
	2014	**.000* (df 8)**	**.007* (df 80)**	**.000* (df 16)**	**.000* (df 16)**	**.000* (df 24)**	**.000* (df 8)**	.171 (df 8)

Gender	2010		**.000* (df 11)**	**.008* (df 2)**	.052 (df 1)	**.002* (df 3)**	.638 (df 1)	
	2011		**.000* (df 11)**	.058 (df 2)	**.012* (df 2)**	**.026* (df 3)**	.606 (df 1)	
	2012		**.000* (df 11)**	.085 (df 2)	.079 (df 2)	**.000* (df 3)**	**.002* (df 1)**	
	2013		**.000* (df 10)**	**.019* (df 2)**	.124 (df 2)	**.001* (df 3)**	.229 (df 1)	
	2014		**.000* (df 10)**	**.038* (df 2)**	**.000* (df 2)**	**.001* (df 3)**	.320 (df 1)	**.001* (df 1)**
	Notes: Significant at the $p < 0.05$ value, df= degrees of freedom, n=818 (2010); n=785 (2011); n=754 (2012); n=714 (2013) ; n=708 * $p < 0.05$							

2010 Participation Chi Square Result Analysis

Unit x Gender: A total of 355 males and 463 females from the population participated in a portion of the wellness program with VP, Admin. & Fiscal Services Offices showing the majority at 196 participants. The lowest participation is associated with the unit of VP, Planning, & Budgets Offices at 3 female participants.

Gender x Amount of Insurance Discount: Females collected more of the discounts over males (355 males, 463 females) and all participants were more likely to attain 100 (lowest) (total=283) and 200 (total=392) point discounts rather than higher levels.

Unit x Age: The highest numbers of participants (32) were age 45 working for the unit of VP, Admin. & Fiscal Services Offices.

Unit x Coverage Level: The majority of participants obtained an employee only coverage level (409) by their unit with VP, Admin. & Fiscal Services Offices reporting 105 employee only participants.

Unit x HA: VP, Admin. & Fiscal Services Offices had 177 employees complete the health risk assessment. A total of 674 employees completed this assessment with 144 incomplete from the total population.

Unit x WellPoints: College of Science and Technology had 27 employees complete WellPoints. A total of 661 employees did not complete any WellPoints from the total population.

Unit x TDF: College of Science and Technology had 125 employees complete the tobacco declaration form. A total of 640 employees completed the form from the total population.

Coverage Level x Age: Age 43 was more likely to include family members in the wellness program and age 46 was more likely to be employee only.

Coverage Level x Gender: Employee only coverage levels were more closely associated with females (250) as well as making up the majority of coverage (409).

HA x Amount of Insurance Discount: Employees who obtained a 200 point discount were more likely to complete the health risk assessment (387).

HA x Gender: More females (392) completed the health risk assessment than males (282).

Amount of Insurance Discount x WellPoints: Employees with higher amounts of discount were more likely to complete WellPoints.

WellPoints x Coverage Level: Employee only (341) was more likely to not complete WellPoints rather than employee plus spouse (149) or employee plus family (171).

WellPoints x Gender: Both males (308) and females (353) were less likely to obtain WellPoints (total=661) from the population.

TDF x Amount of Insurance Discount: Lower amounts of discount were associated with completion of the TDF.

TDF x HA: Employees who completed the TDF were more likely to complete the health risk assessment (total= 497).

TDF x Coverage Level: Employee only (332) showed the highest completion of the TDF.

2011 Participation Chi Square Result Analysis

Unit x Gender: A total of 344 males and 441 females from the population participated in a portion of the wellness program with VP, Admin. & Fiscal Services Offices showing the majority at 190 participants. The lowest participation is associated with the unit of President's Office at 1 male and 1 female participant.

Gender x Amount of Insurance Discount: Females collected more of the discounts over males (344 males, 441 females) and all participants were more likely to attain 100 (total=175) and 200 (total=337) point discounts rather than higher levels.

Unit x Coverage Level: The majority of participants obtained an employee only coverage level (405) by their unit with VP, Admin. & Fiscal Services Offices reporting 109 employee only participants.

Unit x HA: VP, Admin. & Fiscal Services Offices had 131 employees complete the health risk assessment. A total of 786 employees completed this assessment with 84 incomplete from the total population.

Unit x WellPoints: College of Science and Technology had 32 employees' complete WellPoints. A total of 611 employees did not complete any WellPoints from the total population.

Unit x TDF: College of Science and Technology had 125 employees complete the tobacco declaration form. A total of 626 employees completed the form from the total population.

Unit x Amount of Insurance Discount: VP, Admin. & Fiscal Services Offices had the most discounts (190) with 100 point (175) and 200 point (338) amounts the most frequent.

Coverage Level x Age: Age 43 was more likely to include family members in the wellness program and age 56 was more likely to be employee only.

Coverage Level x Gender: Employee only coverage levels were more closely associated with females (240) as well as making up the majority of coverage (404).

Coverage Level x HA: Employee only (358) was more likely to complete the health risk assessment.

Coverage Level x WellPoints: All coverage levels were less likely to obtain WellPoints and if they did participate were more likely to obtain 70+ points.

Coverage Level x Amount of Insurance Discount: Employee only was more likely to receive 200 point discounts (223) while employee plus family was more likely to receive a 300 point discount (68).

HA x Amount of Insurance Discount: Employees who obtained a 200 point discount were more likely to complete the health risk assessment (337).

HA x Gender: More females (292) completed the health risk assessment than males (192).

Amount of Insurance Discount x WellPoints: Employees with 200 points of discount (336) were less likely to complete WellPoints.

WellPoints x HA: Employees who completed the health risk assessment (399) were less likely to obtain WellPoints.

WellPoints x Gender: Both males (284) and females (326) were less likely to obtain WellPoints (total=610) from the population.

TDF x Amount of Insurance Discount: Lower amounts of discount were associated with completion of the TDF.

TDF x HA: Employees who completed the TDF were more likely to complete the health risk assessment (total= 628).

2012 Participation Chi Square Result Analysis

Unit x Gender: A total of 330 males and 424 females from the population participated in a portion of the wellness program with VP, Admin. & Fiscal Services Offices showing the majority at 181 participants. The lowest participation is associated with the unit of President's Office at 2 female participants.

Gender x Amount of Insurance Discount: Females collected more of the discounts over males (330 males, 424 females) and all participants were more likely to attain 100 (total=227) and 200 (total=243) point discounts rather than higher levels.

Unit x Age: The highest numbers of participants (28) were age 57 with six working for the unit of College of Science and Technology.

Unit x Coverage Level: The majority of participants obtained an employee only coverage level (395) by their unit with VP, Admin. & Fiscal Services Offices reporting 102 employee only participants.

Unit x HA: VP, Admin. & Fiscal Services Offices had 114 employees complete the health risk assessment. A total of 636 employees completed this assessment with 118 incomplete from the total population.

Coverage Level x Age: Age 43 and 46 were more likely to include family members in the wellness program and age 56 was more likely to be employee only.

Coverage Level x HA: Employee only (316) was more likely to complete the health risk assessment.

Coverage Level x WellPoints: All coverage levels were less likely to obtain WellPoints and if they did participate were more likely to obtain 70+ points.

Coverage Level x Amount of Insurance Discount: Employee only was more likely to receive 100 point discounts (152) while employee plus family was more likely to receive a 300 point discount (54).

HA x Amount of Insurance Discount: Employees who obtained a 200 point discount were more likely to complete the health risk assessment (235).

HA x Age: Ages 29, 38, 39, and 43 had the highest levels of not completing the health risk assessment. Age 52 had the highest employee only completion and age 46 had the highest employee plus spouse completion.

Amount of Insurance Discount x WellPoints: Employees with 100 (228) and 200 (234) points of discount were less likely to complete WellPoints.

WellPoints x HA: Employees who completed the health risk assessment (433) were less likely to obtain WellPoints.

WellPoints x Gender: Both males (261) and females (269) were less likely to obtain WellPoints (total=530) from the population.

WellPoints x Age: Ages 45, 51, and 56 were more likely to not complete WellPoints while ages 46 and 57 were more likely to complete 70+ WellPoints.

TDF x Amount of Insurance Discount: 100, 200, 300, 400 and 500 amounts of discount were closely associated with completion of the TDF however a 100 level of discount showed a greater number of non-completions (130).

TDF x HA: Employees who completed the TDF were more likely to complete the health risk assessment (total= 423).

TDF x WellPoints: The majority of participants who completed the tobacco declaration form were more likely to not complete WellPoints (361). If they did complete WellPoints, they were more likely to attain 70+ points (140).

TDF x Gender: Both males (214) and females (319) were more likely to complete the tobacco declaration form with females showing higher completion.

2013 Participation Chi Square Result Analysis

Unit x Gender: A total of 302 males and 412 females from the population participated in a portion of the wellness program with VP, Admin. & Fiscal Services Offices showing the majority at 184 participants. The lowest participation is associated with the unit of President's Office at 1 male and 1 female participant.

Gender x Amount of Insurance Discount: Females collected more of the discounts over males (302 males, 412 females) and all participants were more likely to attain 100 (total=166) and 200 (total=254) point discounts rather than higher levels.

Unit x HA: VP, Admin. & Fiscal Services Offices had 170 employees complete the health risk assessment. A total of 597 employees completed this assessment with 117 incomplete from the total population.

Unit x WellPoints: VP, Admin. & Fiscal Services Offices had 52 employees' complete WellPoints. A total of 440 employees did not complete any WellPoints from the total population.

Unit x TDF: VP, Admin. & Fiscal Services Offices had 117 employees complete the tobacco declaration form. A total of 582 employees completed the form from the total population.

Unit x Amount of Insurance Discount: VP, Admin. & Fiscal Services Offices had the most discounts (184) with 100 point (166) and 200 point (254) amounts the most frequent.

Coverage Level x Age: Age 47 was more likely to include family members in the wellness program and ages 45 and 50 were more likely to be employee only.

Coverage Level x Gender: Employee only coverage levels were more closely associated with females (227) as well as making up the majority of coverage (412).

Coverage Level x HA: Employee only (303) was more likely to complete the health risk assessment.

Coverage Level x WellPoints: All coverage levels were less likely to obtain WellPoints and if they did participate were more likely to obtain 70+ points.

Coverage Level x Amount of Insurance Discount: Employee only was more likely to receive 200 point discounts (158) while employee plus family was more likely to receive a 200 point discount (44).

HA x Amount of Insurance Discount: Employees who obtained a 200 point discount were more likely to complete the health risk assessment (229).

HA x Age: Age 48 had the highest levels of non-completion for the health risk assessment. Age 45 and 56 had the highest employee only completion and age 57 had the highest employee plus spouse completion.

Amount of Insurance Discount x WellPoints: Employees with 100 (161) and 200 (240) points of discount were less likely to complete WellPoints.

WellPoints x HA: Employees who completed the health risk assessment (300) were less likely to obtain WellPoints.

WellPoints x Gender: Both males (205) and females (235) were less likely to obtain WellPoints (total=440) from the population.

TDF x Amount of Insurance Discount: 100, 200, 300, 400 and 500 amounts of discount were closely associated with completion of the TDF with the highest rating in the 200 level (228).

2014 Participation Chi Square Result Analysis

Unit x Gender: A total of 296 males and 412 females from the population participated in a portion of the wellness program with VP, Admin. & Fiscal Services Offices showing the majority at 185 participants. The lowest participation is associated with the unit of President's Office at 2 males and 1 female participant.

Gender x Amount of Insurance Discount: Females collected more of the discounts over males (296 males, 412 females) and all participants were more likely to attain 100 (total=171), 200 (total=222), or 400(total=124) point discounts.

Unit x Age: The highest numbers of participants (29) were age 46 with eight working for the unit of VP, Admin. & Fiscal Services Offices.

Unit x Coverage Level: The majority of participants obtained an employee only coverage level (361) by their unit with VP, Admin. & Fiscal Services Offices reporting 98 employee only participants.

Unit x HA: VP, Admin. & Fiscal Services Offices had 173 employees complete the health risk assessment. A total of 601 employees completed this assessment with 107 incomplete from the total population.

Unit x TDF: VP, Admin. & Fiscal Services Offices had 117 employees complete the tobacco declaration form. A total of 572 employees completed the form from the total population.

Unit x Amount of Insurance Discount: VP, Admin. & Fiscal Services Offices had the most discounts (185) with 100 point (171) and 200 point (222) amounts the most frequent.

Unit x Hourly/Salary: The majority of units had employee participants paid with salary (466) with VP, Admin. & Fiscal Services Offices having the most hourly (124) and College of Science and Technology having the most salary (102).

Coverage Level x Age: Age 43 was more likely to include family members in the wellness program and ages 56 were more likely to be employee only.

Coverage Level x Gender: Employee only coverage levels were more closely associated with females (224) as well as making up the majority of coverage (412).

Coverage Level x HA: Employee only (300) was more likely to complete the health risk assessment.

Coverage Level x WellPoints: All coverage levels were less likely to obtain WellPoints and if they did participate were more likely to obtain 70+ points.

Coverage Level x Amount of Insurance Discount: Employee only was more likely to receive 200 point discounts (148) while employee plus family was more likely to receive a 500 point discount (47).

Coverage Level x Hourly/Salary: Employee only, employee plus spouse, and employee plus family were more likely to be paid a salary (total=468).

HA x Amount of Insurance Discount: Employees who obtained a 200 point discount were more likely to complete the health risk assessment (217).

HA x Gender: More females (361) completed the health risk assessment than males (240).

HA x Age: Age 48, 56, and 57 had the highest levels of non-completion for the health risk assessment. Age 46 and 56 had the highest employee only completion and ages 41 and 33 had the highest employee plus spouse completion.

Amount of Insurance Discount x WellPoints: Employees with 100 (173) and 200 (213) points of discount were less likely to complete WellPoints. 400 point discount was more likely to complete 70+ WellPoints (122).

WellPoints x HA: Employees who completed the health risk assessment (338) were less likely to obtain WellPoints.

WellPoints x Gender: Both males (202) and females (226) were less likely to obtain WellPoints (total=428) from the population and if they did attain points it was most likely 70+ (215).

TDF x Amount of Insurance Discount: 100, 200, 300, 400 and 500 amounts of discount were closely associated with completion of the TDF with the highest rating in the 200 level (206) however a 100 level of discount showed a greater number of non-completions (80).

TDF x HA: Employees who completed the TDF were more likely to complete the health risk assessment (total= 468).

TDF x Hourly/Salary: Salary employees had a greater number of completions for the tobacco declaration form (407).

Hourly/Salary x HA: Salary employees were more likely to complete the health risk assessment (385).

Hourly/Salary x Gender: Males (215) and females (251) are more likely to be paid a salary rather than hourly (total=466).

Appendix E

Table 4: 2009 Biometrics Independent T-test Results	
Variables	**Gender**
Cholesterol	.520
Body Mass Index (BMI)	.725
High Density Lipoprotein (HDL)	.015* (Males 44, Females 50.19)
Low Density Lipoprotein (LDL)	.069
Triglycerides	.035* (Males 119.20, Females 150.33)
Glucose	.038* (Males 99.34, Females 91.53)
Systolic Blood Pressure	.000* (Males 123.46, Females 116.42)
Diastolic Blood Pressure	.001* (Males 80.31, Females 75.51)
Bioelectrical Impedance Analysis (BIA)	.000* (Males 23.32, Females 33.47)
Heart Rate (HR)	.542
Age	.127
Notes: Significant at the $p < 0.05$ value, n=108 * $p < 0.05$	

HDL levels showed 14 males (45%) and 18 females (58%) at risk. Triglyceride levels resulted in 9 males (23%) and 30 females (77%) at risk. Glucose readings put 12 males (34%) and 14 females (19%) at risk. None of the employees were at risk for systolic blood pressure levels and the most frequent reading among both genders was 118 mm/Hg. Diastolic blood pressure readings showed 2 males and 1 female at risk. BIA showed 80% of females at least below average and 59% of males below average or well below average.

Table 6: 2010 Biometrics Independent T-test Results	
Variables	**Gender**
Cholesterol	.403
Body Mass Index (BMI)	.449
High Density Lipoprotein (HDL)	.000* (Males 42.20, Females 56.26)
Low Density Lipoprotein (LDL)	.184
Triglycerides	.663
Glucose	.653
Systolic Blood Pressure	.000* (Males 122.97, Females 115.97)
Diastolic Blood Pressure	.000* (Males 78.08, Females 74.84)
Bioelectrical Impedance Analysis (BIA)	.000* (Males 24.98, Females 33.92)
Heart Rate (HR)	.177
Age	.125
Notes: Significant at the $p < 0.05$ value, n=201 * $p < 0.05$	

HDL levels showed 28 males (47%) and 22 females (15%) at risk. None of the employees were at risk for diastolic blood pressure levels. Systolic blood pressure readings showed 2 males and 2 female at risk. BIA showed 78% of females at least below average and 53% of males below average or well below average.

Table 8: 2011 Biometrics Independent T-test Results	
Variables	**Gender**
Cholesterol	.919
Body Mass Index (BMI)	.167
High Density Lipoprotein (HDL)	.002* (Males 49.08, Females 55.59)
Low Density Lipoprotein (LDL)	.025* (Males 125.58, Females 115.37)
Triglycerides	.293
Glucose	.548
Systolic Blood Pressure	.001* (Males 118.36, Females 115.16)
Diastolic Blood Pressure	.034* (Males 74.72, Females 73.33)
Bioelectrical Impedance Analysis (BIA)	.000* (Males 26.54, Females 33.1)
Heart Rate (HR)	.133
Age	.009* (Males 43.58, Females 47.25)
Notes: Significant at the $p < 0.05$ value, n=264 * $p < 0.05$	

HDL levels showed 29 males (39%) and 45 females (28%) at risk. LDL levels resulted in 39 males (39%) and 45 females (28%) at risk. None of the employees were at risk for diastolic

blood pressure levels. Systolic blood pressure readings showed 1 male and 2 females at risk. BIA showed 78% of females at least below average and 49% of males below average or well below average. Employees at risk for age showed 41 males (41%) and 42 females (26%).

Table 10: 2012 Biometric Independent T-test Results	
Variables	**Gender**
Cholesterol	.051
Body Mass Index (BMI)	.522
High Density Lipoprotein (HDL)	.000* (Males 41.74, Females 54.32)
Low Density Lipoprotein (LDL)	.281
Triglycerides	.829
Glucose	.012* (Males 101.23, Females 92.85)
Systolic Blood Pressure	.000* (Males 119.3, Females 114.68)
Diastolic Blood Pressure	.000* (Males 73.17, Females 70.35)
Bioelectrical Impedance Analysis (BIA)	.000* (Males 25.63, Females 34.98)
Heart Rate (HR)	.552
Age	.808
Notes: Significant at the $p < 0.05$ value, n=246 * $p < 0.05$	

HDL levels showed 45 males (51%) and 28 females (18%) at risk. Glucose readings put 29 males (33%) and 31 females (20%) at risk. None of the employees were at risk for diastolic blood pressure levels. Systolic blood pressure readings showed 2 males and 2 females at risk. BIA showed 84% of females at least below average and 27% of males below average or well below average.

Table 12: 2013 Biometric Independent T-test Results	
Variables	**Gender**
Cholesterol	.938
Body Mass Index (BMI)	.227
High Density Lipoprotein (HDL)	.000* (Males 45.9, Females 59.74)
Low Density Lipoprotein (LDL)	.115
Triglycerides	.696
Glucose	.012* (Males 97.71, Females 89.83)
Systolic Blood Pressure	.000* (Males 120.45, Females 114.19)
Diastolic Blood Pressure	.000* (Males 74.72, Females 70.65)
Bioelectrical Impedance Analysis (BIA)	.000* (Males 25.97, Females 35.44)
Heart Rate (HR)	.015* (Males 66.86, Females 69.07)
Age	.476
Notes: Significant at the $p < 0.05$ value, n=147 * $p < 0.05$	

HDL levels showed 22 males (38%) and 9 females (10%) at risk. Glucose readings put 21 males (36%) and 14 females (16%) at risk. None of the employees were at risk for diastolic blood pressure levels. Systolic blood pressure readings showed 2 males and 1 female at risk. HR showed that 66 bpm was the most common (20 males/43 females) (43%).

Appendix F

Table 3: 2009 Biometrics Descriptive Statistics				
Variables	**Mean**	**Range**	**Health Risk Frequency**	**Frequency**
Gender	-	-	-	Male (35) 32.4% Female (73) 67.6%
Body Mass Index (BMI)(kg/m)	27.57	16-47.2	Overweight (25-29.9) = 30 (27.78%) Obese (>30) = 31 (28.70%) Normal (≤24.9) =47(43.52%)	-
High Density Lipoprotein (HDL)(mg/dL)	48.19	19-100	<40=32(29.6%)	-
Low Density Lipoprotein (LDL)(mg/dL)	111.09	52-212	≥130=31(28.7%)	-
Triglycerides	140.24	22-576	≥151=39(36.11%)	-
Glucose (mg/dL)	94.06	50-187	≥100=26(24.07%)	-
Systolic Blood Pressure (mm/Hg)	118.70	92-138	≥140=0	-
Diastolic Blood Pressure (mm/Hg)	77.06	59-100	≥90=3(2.78%)	-
Bioelectrical Impedance Analysis (BIA)	30.15	13-47.8	*Female: ≥Average: 20% ≤ Below Average: 80% *Male: ≥Average: 41% ≤ Below Average: 59%	-
Heart Rate (HR) (bpm)	55.38	36-77	40-100	-
Age	44.31	21-67	Men ≥45: 19 (54%) Women ≥55: 13 (18%)	Mode=44
Cholesterol (mg/dL)	187.76	102-288	≥200=36(33.33%)	-
Note: n=108 *Percentages drawn from a comparison report by a contracted company.				

Table 5: 2010 Biometrics Descriptive Statistics				
Variables	**Mean**	**Range**	**Health Risk Frequency**	**Frequency**
Gender	-	-	-	Male (59) 29.4% Female (142) 70.6%
Body Mass Index (BMI)(kg/m)	28.46	15-54.8	Overweight (25-29.9) = 62(30.85%) Obese (>30) = 70(34.83%) Normal (≤24.9) =69(34.33%)	-
High Density Lipoprotein (HDL)(mg/dL)	52.11	15-100	<40 =50(24.8%)	-
Low Density Lipoprotein (LDL) (mg/dL)	120.49	29-229	≥130=68(33.83%)	-
Triglycerides	129.38	45-580	≥151=53(26.37%)	-
Glucose(mg/dL)	99.06	68-237	≥100 =77(38.31%)	-
Systolic Blood Pressure(mm/Hg)	118.02	84-140	≥140 =4 (1.99%)	-
Diastolic Blood Pressure(mm/Hg)	75.79	58-88	≥90 =0	-
Bioelectrical Impedance Analysis (BIA)	31.29	7.7-49	*Female: ≥Average: 22% ≤ Below Average: 78% *Male: ≥Average: 47% ≤ Below Average: 53%	-
Heart Rate (HR)(bpm)	61.72	48-77	40-100	-
Age	45.06	21-74	Men ≥45: 32 (54%) Women ≥55: 31 (39%)	Mode=41
Cholesterol(mg/dL)	197.29	112-315	≥200=83 (41.29%)	-
Note: n=201 *Percentages drawn from a comparison report by a contracted company.				

Table 7: 2011 Biometrics Descriptive Statistics				
Variables	**Mean**	**Range**	**Health Risk**	**Frequency**
Gender	-	-	-	Male (101) 38.3% Female (163) 61.7%
Body Mass Index (BMI)(kg/m)	28.04	16.8-56.4	Overweight (25-29.9) = 98 (37.12%) Obese (>30) = 76 (28.79%) Normal (≤24.9) =90 (34.09%)	-
High Density Lipoprotein (HDL)(mg/dL)	53.1	15-100	<40 =57 (21.59%)	-
Low Density Lipoprotein (LDL) (mg/dL)	119.20	32-304	≥130 =87 (32.95%)	-
Triglycerides	129.19	45-589	≥151=73 (27.65%)	-
Glucose(mg/dL)	97.36	62-241	≥100 =76 (28.79%)	-
Systolic Blood Pressure(mm/Hg)	116.38	90-160	≥140 =3 (1.14%)	-
Diastolic Blood Pressure(mm/Hg)	73.86	60-86	≥90 =0	-
Bioelectrical Impedance Analysis (BIA)	30.58	10.9-50	*Female: ≥Average: 22% ≤ Below Average: 78% *Male: ≥Average: 51% ≤ Below Average: 49%	-
Heart Rate (HR)(bpm)	63.45	42-78	40-100	-
Age	45.85	22-70	Men ≥45: 41 (41%) Women ≥55: 42 (26%)	Mode=42
Cholesterol(mg/dL)	195.65	100-339	≥200=108 (40.91%)	-
Note: n=264 *Percentages drawn from a comparison report by a contracted company.				

Table 9: 2012 Biometrics Descriptive Statistics				
Variables	**Mean**	**Range**	**Health Risk Frequency**	**Frequency**
Gender	-	-	-	Male (88) 35.8% Female (158) 64.2%
Body Mass Index (BMI)(kg/m)	28.46	16.6-50.8	Overweight (25-29.9) = 70 (28.46%) Obese (>30) = 82 (33.33%) Normal (≤24.9) =94 (38.21%)	-
High Density Lipoprotein (HDL)(mg/dL)	49.85	15-100	<40=73 (29.67%)	-
Low Density Lipoprotein (LDL) (mg/dL)	105.94	52-236	≥130=42 (17.07%)	-
Triglycerides	129.93	45-650	≥151=73 (29.67%)	-
Glucose(mg/dL)	95.85	54-295	≥100=60 (24.39%)	-
Systolic Blood Pressure(mm/Hg)	116.33	90-160	≥140=4 (1.63%)	-
Diastolic Blood Pressure(mm/Hg)	71.36	60-85	≥90=0	-
Bioelectrical Impedance Analysis (BIA)	31.61	11.10-49.90	*Female: ≥Average: 16% ≤ Below Average: 84% *Male: ≥Average: 27% ≤ Below Average: 73%	-
Heart Rate (HR)(bpm)	67.80	56-80	40-100	-
Age	45.46	23-71	Men ≥45: 28 (32%) Women ≥55: 22 (14%)	Mode=35
Cholesterol(mg/dL)	181.25	107-328	≥200=66(26.83%)	-
Note: n=246 *Percentages drawn from a comparison report by a contracted company.				

Table 11: 2013 Biometric Descriptive Statistics				
Variables	**Mean**	**Range**	**Health Risk Frequency**	**Frequency**
Gender	-	-	-	Male (58) 39.5% Female (89) 60.5%
Body Mass Index (BMI)(kg/m)	28.18	17.20-50.20	Overweight (25-29.9) = 51(34.70%) Obese (>30) = 48(32.65%) Normal(≤24.9)=47(31.97)	-
High Density Lipoprotein (HDL)(mg/dL)	4 54.28	25-100	<40=31(21.09%)	-
Low Density Lipoprotein (LDL) (mg/dL)	117.31	21-243	≥130=46 (31.29%)	-
Triglycerides	121.81	45-427	≥151=33 (22.45%)	-
Glucose(mg/dL)	92.94	58-247	≥100=35 (23.81%)	-
Systolic Blood Pressure(mm/Hg)	116.66	98-152	≥140 =3 (2.04%)	-
Diastolic Blood Pressure(mm/Hg)	72.26	-85	≥90=0	-
Bioelectrical Impedance Analysis (BIA)	31.68	5.70-49.10	-	-
Heart Rate (HR)(bpm)	68.2	54-77	40-100	-
Age	48.33	26-72	Men ≥45: 33 (57%) Women ≥55: 34 (38%)	Mode=48
Cholesterol(mg/dL)	193.85	100-348	≥200=60 (40.82%)	-
Note: n=147				

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