An examination of factors that impact the length of illness among the Jamaican population

Name: Roy McPherson

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Introduction

Stephen Moore (2008) explained that being ill can be unpleasant and possibly life-threatening. At the onset of an illness, there is little one is able to do, if anything at all. The term illness is often used interchangeably with disease. However, Eisenberg (1977) explained that there is a unique difference. For him, "illnesses are experiences of disvalued changes in states of being and social function: diseases are abnormalities in the structure and function of body organs and systems" pg. 10. In other words, an illness is something that people experience as having unpleasant impact on their lives and activities, while a disease reflects harmful physical changes in the body. Such differences are not necessarily important for the Jamaica Survey of Living Conditions (JSLC) 2008, as they are often treated as one.

Illnesses/diseases have a number of effects on the society in which one lives as societies are comprised of groups of people interacting with each other and sharing the same social space (Haralambos and Holborn, 2007). One of the most common effects of long lasting illnesses/diseases according to Bowling (1996) is finding/maintaining a job which increases the burden of the working age population as they have to cater for these dependents.

A number of factors affect how long an illness/disease lasts. Some include: age, how many visits made to the doctor or practitioner, smoking, union status, hospital type and sex. Studies have shown that all these variables affect how long an illness/disease will last (Swinford, 2014; Harvard Health Publication, ND; Johns Hopkins School of Hygiene and Public Health, 2000). The research proposal will explore these variables and their effects on the longevity of illnesses/diseases in the Jamaican society.

Overall Background and Rationale

Everyone experiences some form of illness in his or her life, regardless of gender, social support, age or how many times he or she visits the doctor. With any illness, there is always the desire to get better in the quickest time possible so that life can resume its regular course. Illnesses such as the flu, cold, diarrhoea, asthma attack, diabetes and high blood pressure have rapid onsets and usually last for short periods (Hadjiliadis, 2014). The immune system therefore is very important in determining how long harmful viruses, bacteria or substances stay in the body as well as the lifestyle choices individuals make when they are ill. The literature that will be explored examines the impact of gender, age, visits to the doctor, smoking, union status, and hospital type on the length of an illness.

In studies that have examined the gender differences in the response of the immune system, estrogen and testosterone hormones greatly contribute to the length of an illness. For example, in a study that gave men and women flu shots, women had higher levels of immune system molecules circulating in their blood and produced more effective antibodies against the flu virus while males took a longer time to recover. In addition, males who had higher levels of testosterone responded more weakly to the virus (Steakley, 2014). This concurs with other studies that have found that men more susceptible to bacterial, viral and parasitic infection, where as women are generally more resistant, especially between puberty and menopause (Klein & Roberts, 2015). During this stage of a woman's development, the sexual hormones are very active because of the reproductive changes that may be occurring at that time, making her immune system more resistant than males. Another explanation for the difference in immune response can be linked to DNA. In comparison to the Y chromosome, the X chromosome is larger and contains more genes responsible for reproduction and immune regulation (Klein &

Roberts, 2015). These biological differences in males and females however do not always contribute to the outcome of recovery. External factors such as coping mechanisms, access to health care and adherence to medication can influence the course of an illness for men and women.

Age is another factor that plays a role in the length of an illness. The following changes tend to occur in the immune system as age changes, making the period of recovery longer for aging adults. The immune system becomes slower to respond thus affecting wound healing and internal healing because there are fewer immune cells that bring healing. Older adults are also at a higher risk of developing autoimmune diseases which occurs when the immune system mistakenly attacks and destroys healthy blood cells (Martin, 2014). The aging process also affects muscle mass and strength, slower wound healing and healing of broken bones (Keller & Engelhardt, 2014; Guo & DiPietro, 2010; Gruber, et al., 2006); therefore the recovery time for older persons is usually longer. While the aging process naturally affects the body's ability to resist illnesses and recovery quickly, poor health practices in young or elderly persons such as lack of exercise, unhealthy diets, smoking and excess intake of alcohol can make the recovery from an illness longer than it usually is.

Another factor that can be examined for how long an illness lasts is the number of visits one makes to the doctor. One of the outcomes of a doctor's visit is the issuing of medication to speed up recovery or eliminate the illness altogether or advise for prevention and management. If the medication is effective and the advice is followed, the individual would not need frequent visits to the doctor for the kinds of illnesses mentioned above. Additionally, the individual would know what to do if the illness comes again. It has been reported that the healthier someone is, the less visits to the doctor that they will need. According to the Centres for Disease Control and

Prevention in the United States, approximately 37.3 million and 12.4 million of visits to the physician, hospital and emergency wards were due to diabetes and heart conditions respectively (Kannall, 2013). The best ways to boost the immune system from viruses, bacteria and other illnesses are eating nutritious food and getting adequate amounts of fluids daily. Once the immune system is functioning at its best and persons are adhering to the medication and advice given by health practitioners, the need to visit the doctor's office should decrease.

Linked to the longevity of an illness is whether or not someone smokes. In 2008, a study done by the Yale University concluded that smoking worsens illnesses. In fact, smokers are more likely to die from previous illnesses such as influenza and other chronic and non-chronic illnesses. The logic behind this is that smoking decreases anti-viral responses and in turn weakens one's immune system. At the same time, studies by Yale have demonstrated the opposite to be true. Experiments have shown that the immune systems of mice that have been exposed to two cigarettes a day for two weeks overreacted when they were also exposed to an illness, in this case, the flu virus. The immune systems of the mice cleared the virus normally although the inflammation caused by smoking increase tissue damage. However, this finding cannot be generalized because it was done on mice, and only one illness was proven to be unaffected by smoking.

One's health or ability to recover from an illness is also dependent on social relationships (Tavris and Wade, 2011). Social support may come in the form of friends, families and even animals. People who live in a network of close connections live longer and recover faster from illnesses than those who do not. When the social support comes from a loving partner, it benefits on the immune system are powerful. In one study, it was revealed that one's health was improved dramatically in married couples compared to other relationships. Chemicals such as

oxytocins are released when support is given from someone who is close which helps the immune system fight illnesses. In fact, the more distant the social support is, the longer time it took to regain full health from an illness (Tavris and Wade, 2011).

Many Jamaicans opt for private hospitals over public health facilities although the private services are more expensive (Bourne et. al., 2010). This use is generally due to the facilities available to the public. Private hospitals are privately owned and tend to be smaller than public hospitals. They are therefore more equipped to offer personalized care and have a better doctor to patient ratio. In addition, they tend to have cutting edge technology and shorter wait times compared to public hospitals. Illnesses can therefore be addressed quickly which could subsequently lead to a faster recovery. One would therefore expect that all other services outside of that which is private will result in a slower recovery rate. As a result, the days taken to recovery from an illness will be more for services outside of private hospitals.

The paper presented will explore the Jamaican reality of the relationship among sex, age, visits to the doctor, union status, hospital type and smoking on length of illnesses. These variables consistently presented themselves as priority variables associated with longevity of an illness. The study is therefore necessary as it will provide additional insight into Jamaica's unique case.

Methodology

Research question: What impact do age, sex, smoke, union status, hospital type and how often one visits the doctor have on how long an episode of illness lasts?

Operationalisation and description of variables

A total of seven variables were examined. See Table 1 below:

Dependent variable (DV)	Independent variable (IV)
How long did this last episode of illness last? (a4)	Sex
	Age
	How many visits did you make to health practitioners in the past 4 weeks? (a7)
	Where did the visits take place? In public hospital? A8a
	Where did the visits take place? In private hospital? A8c
	Does the individual smoke? A25
	Union Status

The above variables were chosen as the literature indicated that these variables were very influential in terms of determining how long an illness last. One's social class also plays a pivotal role in how long an illness lasts. However, this variable was excluded due to the issue of an inadequate sample size and it not being in the survey/dataset (See Appendix 1).

Sex: Sex had a total of two categories: male with a code of 1 and female coded as 2. No cleaning was necessary. The total was 22294 with a mode of two (See Appendix 1). **Age:** Age had a range of 0 to 99 years. There was no cleaning necessary. The mean was 30.16, median 25, mode 15, SD 21.868, skewness .689, range 99, minimum 0 and maximum 99 with a total of 22294 (See Appendix 1). **A7:** How many visits did you make to health practitioners in the past 4 weeks? It had a range of 1 to 17 visits. The categories 97 to 99 were treated as missing as they are universal codes. The mean was 1.44, median 1, SD 1.129, skewness 5.581, range 16,

minimum 1 and maximum 17 with a total of 1339 (See Appendix 1). **A8a:** Where did the visits take place? In public hospital? There were a total of two categories: Yes with a code of 1 and No with a code of 2. The mode was 2 with a total of 1389 (See Appendix 1). **A8c:** Where did the visits take place? In private hospital? The variable also had a total of two categories: Yes with a coding of 1 and No with a coding of 2. The mode was 2 with a total of 1381 (See Appendix 1). **A25:** Does the individual smoke? The variable had a total of two categories: Yes with a code of 1 and No with a code of 2. The mode was 2 with a total of 15129. The categories 8 and 97 were treated as missing because they were entered mistakenly.

Union status: had a total of 4 categories: married with a code of 1, common law with a code of 2, visiting with a code of 3, and single with a code of 4. Married and common law were grouped together and given a new value of one with a label of strong social support unit, and 3 and 4 were given a new value of 0 with a label of weak social support unit. The literature suggested that married and common law unions will have stronger social support unit than those who are single and in a visiting relationship. The mode was weak support unit with a total of 14678 (See Appendix 1). **A4:** How long did this episode of illness last? The variable had a range of 1 to 180 days. The categories 996, 997, 998 and 999 were treated as missing as they were universal codes. The variable was recoded into four categories as it violated assumptions of an initial procedure for analysis-multiple regression. Range 1 to 3 days was given a new value of 1, 4 to 7 days a new value of 2, 8 to 14 days a new value of 3 and 15 to 180 days a new value of 4. The mode was 4 to 7 days (See Appendix 1).

Analytical Plan

The Statistical Package for the Social Sciences (SPSS) version 19 was used for the analysis. Descriptive statistics will be produced for all individual variables (See Appendix 1). The variables were in three datasets and were merged to facilitate analysis. The key variable used was individual number as all files were individual files. The statistical procedure used was multinomial logistic regression with a significance level of 0.05.

Requirements

The Durbin-Watson test statistic (1.985) demonstrates that the assumption for independent errors was met as the value was between 1 and 3. The VIF (variance inflation factor) was below ten for all variables which suggested the assumption of multicollinearity was met. However, all the tolerance figures were over .9 but less than 1 which was not a good sign. Andy Field suggested that slightly violating these assumptions will not be necessarily detrimental (See Appendix 2).

Hypotheses

General: There exists a statistically significant relationship between how long an illness last (DV) and sex, age, smoke, union status, public hospital, private hospital and how many visits made to the health practitioner. See Table 2 for specific hypotheses.

Ho	Ha
There is no or negative relationship between how long illness(es) last and age	There exists a positive relationship between how long illness(es) last and age
Women's illnesses will last the same time or longer than men's	Women's illnesses will last for a shorter time than men's
There is no or a negative relationship between how long an illness lasts and how many visits made to the practitioner.	There exists a positive relationship between how long an illness lasts and how many visits made to the practitioner

Those who have a strong social support unit will recover from an illness the same time as those with a weak social support unit or at a slower rate.	Those who have a strong social support unit will recover faster from an illness than those who have a weak social support unit.
Those who use public hospitals will recover from an illness at the same rate or faster than those who do not.	Those who use public hospitals will recover from an illness slower than those who do not.
Those who use private hospitals will recover from an illness at the same rate or slower than those who do not.	Those who use private hospitals will recover from an illness faster than those who do not.
Those who smoke will recover from an illness at the same rate or slower than those who do not.	Those who smoke will take a longer time to recover from an illness than those who do not.

Sample Design

The sample design was the same as the Labour Force Survey (LFS). The design was considered to be a two stage stratified sampling design. The first stage involved the selection of primary sampling units (PSUs) (same as enumeration districts (EDs)) and the second stage involved a selection of dwellings. The survey was done in 2008, and during this time all PSUs were grouped in sampling regions (SR) of equal size according to dwelling. Two PSU were selected from each ER with probability equal to size. In each of these PSU, a list of all dwellings was prepared which became the final list for the final sample. The data were collected using household questionnaires and were administered to a sample of 22, 294 household members. A total of 6, 513 questionnaires were administered to these persons by way of interview.

Limitations

- There was conflicting results between pearson and deviance as indicated by Table 4. This could be a result of having too many empty cells as indicated by the warning sign (See Appendix 3). This is a general weakness of logistic regression and could have affected the results.

- There were very little persons for both hospital variables which could also have affected results in terms of significance.
- Visits to the doctor was in the last 4 weeks, however the length of an illness went up to 180 days. Due to such a short time for visits to the doctor; a pronounced relationship may not be evident.
- The variable social class was excluded as it was not available in dataset and would not have been included in the model due to issues related to inadequate sample size. The sample size for the model was 918 (See Appendix 3).

Findings

Table 3 showing model fitting information

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Intercept only	2140.86			
Final	2052.17	88.687	21	.000

The change or difference between the most basic model and the final model (2140.86-2052.17=88.69) was significant (χ^2=88.687 (21), p<0.05). This meant that the final model with all variables added was better than the original model**.**

Table 4 showing goodness of fit

	Chi-square	Df	Sig.
Pearson	2670.992	1848	.000
Deviance	1782.215	1848	.861

Table 2 indicates according to the deviance that the model was a good fit (χ^2=1782.215 (1848), p>0.05). However, the pearson statistic was showing the opposite (χ^2=2670.992 (1848), p<0.05). One reason may be because of overdispersion which would be a major problem. However, pearson dispersion parameter statistic was 1.44, while deviance was 0.96. Neither value was close to 2 which meant the model issue was not due to overdispersion.

Table 5 showing results of the multinomial logistic regression model

		95% CI for Odds Ratio		
	B(SE)	**Lower**	**Odds Ratio**	**Upper**
1 to 3 days vs. 15 to180 days				
Intercept	2.17 (0.39)*			
Age	-.01 (0.01)*	.98	.99	1
Visits to doctor	-.76 (0.13)*	.36	.47	.61
Smoke (1)	.02 (0.38)	.49	1.02	2.14
Sex (1)	.17 (0.22)	.78	1.19	1.81
Public hospital (1)	-.40 (0.21)	.42	.67	1.02
Private hospital (1)	-.44 (0.44)	.27	.64	1.52
Family support (0)	.32 (0.21)	.92	1.38	2.06
4 to 7 days vs. 15 to 180 days				
Intercept	2.05 (0.37)*			
Age	-.02 (0.01)*	.97	.98	.99
Visits to doctor	-.38 (0.10)*	.57	.68	.82
Smoke (1)	.14 (0.37)	.55	1.15	2.40
Sex (1)	-.14 (0.22)	.57	.872	1.34
Public hospital (1)	-.19 (0.21)	.55	.83	1.26
Private hospital (1)	-.17 (0.42)	.37	.84	1.91
Family support (0)	.22 (0.21)	.83	1.24	1.86
8 to 14 days vs. 15 to 180 days				
Intercept	1.34 (0.40)*			
Age	-.02 (0.01)*	.971	.98	.99
Visits to doctor	-.24 (0.09)*	.663	.78	.93
Smoke (1)	-.30 (0.43)	.320	.74	1.71
Sex (1)	.26 (0.24)	.815	1.29	2.05
Public hospital (1)	-.05 (0.23)	.605	.951	1.49
Private hospital (1)	-.27 (0.47)	.303	.77	1.94
Family support (0)	.12 (0.23)	.729	1.13	1.75
Note: R^2= .092 (Cox and Snell), .099 (Nagelkerke). Model $\chi^2(21)=88.687$, $p<0.05$. *p<.05				

Interpretation: 1 to 3 days vs. 15 to180 days

Age was found to be statistically significant for how long an episode of illness lasts for the group 1 to 3 days compared to 15 to 180 days (Wald$\chi^2(1)=4.186$, $p<0.05$). A unit change in age resulted in a .01 decrease in the logit of 1 to 3 days of how long an illness lasted compared to 15

to 180 days. Therefore, as age increased by a unit, the probability of illness lasting 1 to 3 days compared to 15 to 180 days decreased by 1 % based on the odds ratio.

Visits to the doctor was also statistically significant (Wald$\chi^2(1) = 31.671$, $p<0.05$). A unit change in visits to the doctor resulted in a .76 decrease in the logit of 1 to 3 days of how long an illness lasted compared to 15 to 180 days. As visits to the doctor increased by a unit, the probability of an illness lasting 1 to 3 days compared to 15 to 180 days decreased by 53% based on the odds ratio.

Whether or not one smoked did not affect how long an illness last (Wald$\chi^2(1)=.003$, $p>0.05$). Whether or not one was male or female also did not affect how long an illness last (Wald$\chi^2(1) = .621$, $p>0.05$). The same was found for whether or not someone visited public or other health facilities, private or other health facilities and whether or not one had a weak or strong social support unit (Wald$\chi^2(1)=3.484$, $p>0.05$; Wald$\chi^2(1) = 1.003$, $p>0.05$ and Wald$\chi^2(1) = 2.447$, $p>0.05$ respectively).

Interpretation: 4 to 7 days vs. 15 to180 days

Age was also found to be statistically significant for the outcome 4 to 7 days vs. 15 to 180 days (Wald$\chi^2(1)=11.731$, $p<0.05$). A unit change in age resulted in a .02 decrease in the logit of 4 to 7 days of how long an illness lasted compared to 15 to 180 days. In other words, as age increased by a unit, the probability or odds of an illness lasting 4 to 7 days decreased by 1.8% compared to 15 to 180 days based on the odds ratio.

How many visits made to the doctor was also significant for illness lasting 4 to 7 days group vs. 15 to 180 days (Wald$\chi^2(1) = 15.865$, $p<0.05$). A unit change in how many visits made to the doctor resulted in a .38 decrease in the logit of illness lasting 4 to 7 days vs. 15 to 180 days.

Therefore, as visits to the doctor increased by a unit, the probability of an illness lasting 4 to 7 days decreased by 32% compared to 15 to 180 days based on the odds ratio.

In addition, whether or not one smoked, was male or female, visited public or other medical facilities, private or other medical facilities and had a weak or strong social support unit were not statistically significant (Wald$\chi^2(1)$=.145, p>0.05; Wald$\chi^2(1)$=.385, p>0.05; Wald$\chi^2(1)$=.781, p>0.05; Wald$\chi^2(1)$=.170, p>0.05 and Wald$\chi^2(1)$=1.129, p>0.05).

Interpretation: 8 to 14 days vs. 15 to180 days

Age was found to be statistically significant for the outcome 8 to 14 days vs. 15 to 180 days **(**Wald$\chi^2(1)$ =10.582, p<0.05). For every unit change in age, there was a .02 decrease in the logit 8 to 14 days of how long an illness lasted compared to 15 to 180 days. In other words, for every unit increase in age, the probability or odds of an illness lasting 8 to 14 days decreased by 1.8% based on the odds ratio.

The number of visits made to the doctor was also significant for the group 8 to 14 days compared to 15 to 180 days (Wald$\chi^2(1)$=8.062, p<0.05). The b value indicated that for every unit change in visits to the doctor, there was a .24 decrease in the logit of 8 to 14 days compared to 15 to 180 days. Based on the odds ratio, for every unit increase in visits to the doctor, the probability of an illness lasting 8 to 14 days decreased by 22% compared to 15 to 180 days.

In addition, whether or not one smoked, was male or female, visited public or other medical facilities, private or other medical facilities and had a weak or strong social support unit were not statistically significant in terms of how long an illness lasted (Wald$\chi^2(1)$=.492, p>0.05; Wald$\chi^2(1)$=1.186, p>0.05; Wald$\chi^2(1)$=.047, p>0.05; Wald$\chi^2(1)$=.315, p>0.05 and Wald$\chi^2(1)$=.294, p>0.05).

The Cox and Snell R square (0.092) suggested that 9.2% of the variation in how long an illness lasted can be explained by the variables above. In addition, the R square for Nagelkerke (.099) indicated that 9.9% of the variation in how long an illness lasted can be explained by the variables above. Based on the literature, the effect size would be normal or slightly below average. It was also discovered that there was no **interaction** present between variables.

Discussion and Conclusion

It was found that age was a contributing factor to how long an illness last. Martin (2014) and others explained that as one gets older the immune system becomes weaker and slower which results in illnesses lasting for longer periods. The findings substantiated this argument, which was the basis for the researcher's null hypothesis. This could be improved if persons adopt a healthy diet, exercise and quit smoking.

The more one visited the doctor, the longer an episode of illness will last based on the findings. In other words, one can either have an illness lasting 1-3 days or 15-180 days. The more you go to the doctor, the chances of one having an illness lasting 1-3 days decreases rather than increases. This was the same for all three groups (See Table 5). This contradicted the researcher's null hypothesis that was based on the literature. A reason for this may be due to the poor health care system that the country has. Hibbert (2015) explained that hospitals in Jamaica have poor resources to cater for patients. In fact, a number of patients die yearly in hospitals and other medical facilities due to poor resources and poor treatment of patients. In addition, many patients are unable to afford essential medications that would improve their health. Patients as a result resort to buying one set of medication at a time which is insufficient. It is also worth noting that the number of visits made to the doctor was in the last four week while the number of days an illness lasted at a maximum of 180 days. An argument could be made that if the number of visits to the doctor did not have a limit of four weeks, the results could have been different.

In addition, whether or not one smoked, was male or female, visited public or other medical facilities, private or other medical facilities and had a weak or strong social support unit were not

significant. Therefore, the researcher's hypotheses were contradicted or they were failed to be proven.

One reason behind the non-significant relationship between whether or not someone smoked and how long an illness lasted was that smoking did not exacerbate an illness. Although there was overwhelming literature to suggest otherwise, the 2008 study done at the Yale University (see literature) explained that what smoking does is to increase damage to muscle tissues and not necessarily the rate of recovery from an illness.

It could be argued for both sex and social support that the sample did not consist of enough variation to present a statistically significant difference. In other words, the final sample used for the procedure had too many respondents who were similar instead of different. In fact, there was no way of knowing if the illness was cold, diarrhea, asthma attack, just to name a few. Therefore, it is plausible to infer that most respondents could have had only one illness. One could argue that this should have been the case for the two variables that were significant, however, it can also be argued that age and how many visits made to the doctor were more influential variables than the others. It is important to note that the variability in the data was previously an issue (no variable was significant) using binomial logistic regression, but was remedied by transforming the necessary variables for multinomial regression.

Without a doubt, there is a universal difference between how long an illness lasts and if one visits a private or public hospital as indicated by the literature. However, it could be possible that the difference in Jamaica was not distinct enough to constitute a statistically significant relationship. Hospitals in Jamaica, as expressed by Hibbert (2015) and others were generally poor compared to international standards. In other words, standards of public and private hospital

in Jamaica were not at the level of international standards to have constituted a statistical difference.

Finally, it is important to note that the sample size could have negatively affected the results (non-significant relationships). A larger sample could have possibly led to more pronounced significant relationships.

The r square indicated that the variables in the model played an important role in how long an illness lasted (See Table 5). Policies and other intervention programmes could target the variables that were significant to help the Jamaican population in terms of improving its health.

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Appendix 1

Table showing frequency and percentage of sex

Response	Frequency	Percent
Male	10883	48.8
Female	11411	51.2
Total (n)	22294	100

Mode=Female

Table showing description of age

N=22294	
Mean	30.16
Median	25.00
Mode	15
Std. Deviation	21.868
Variance	478.219
Skewness	.689
Std. Error of Skewness	.016
Range	99
Minimum	0
Maximum	99

Table showing description how many visits made to the practitioner in the last four weeks

N=1339 Missing=20955	
Mean	1.44
Median	1.00
Mode	1
Std. Deviation	1.129
Variance	1.274
Skewness	5.581
Std. Error of Skewness	.067
Range	16
Minimum	1
Maximum	17

Table showing frequency and percent distribution of visit to a public hospital

Response	Frequency	Percent
Yes	571	41.1
No	818	58.9
Total (n)	**1389**	**100**

Mode=No

Table showing frequency and percent distribution of visit to a private hospital

Response	Frequency	Percent
Yes	63	4.6
No	1318	95.4
Total (n)	**1381**	**100**

Mode=No

Table showing frequency and percent distribution of whether or not respondents smoke

Response	Frequency	Percent
Yes	2238	14.8
No	12891	85.2
Total (n)	**15129**	**100**

Mode=No

Table showing frequency and percent distribution of how long an illness lasts

Response	Frequency	Percent
1 to 3 days	630	33.6
4 to 7 days	666	35.6
8 to 14 days	315	16.8
15 to 180 days	262	14
Total (n)	**1873**	**100**

Mode=4 to 7 days

Table showing frequency and percent distribution of family support unit

Response	Frequency	Percent
Weak social support	8969	61.1
Strong social support	5709	38.9
Total (n)	**14678**	**100**

Mode=weak social support

Appendix 2

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.259[a]	.067	.060	1.063	1.985

A

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.231	.443		5.033	.000		
	a25 Does this person smoke..?	.040	.132	.010	.304	.761	.937	1.068
	ageyrs Age of individual- years	.002	.002	.046	1.428	.154	.995	1.005
	sex Sex of individual	.017	.076	.007	.221	.825	.929	1.077
	a8a Where did visits take place....Public Hospital?	-.170	.075	-.075	-2.265	.024	.940	1.063
	Family_supportunit	.117	.072	.053	1.628	.104	.975	1.026
	a8c Where did visits take place....Private Hospital?	-.153	.156	-.032	-.980	.327	.978	1.023
	a7 How many visits made to practitioner in past 4 weeks?	.199	.030	.220	6.687	.000	.946	1.057

a. Dependent Variable: a4_recoded

Appendix 3

Case Processing Summary

		N	Marginal Percentage
a4_recoded	1 1 to 3 days	299	32.6%
	2 4 to 7 days	274	29.8%
	3 8 to 14 days	175	19.1%
	4 15 to 180 days	170	18.5%
a25 Does this person	1 Yes	75	8.2%
smoke..?	2 No	843	91.8%
sex Sex of individual	1 Male	326	35.5%
	2 Female	592	64.5%
a8a Where did visits take	1 Yes	335	36.5%
place....Public Hospital?	2 No	583	63.5%
a8c Where did visits take	1 Yes	50	5.4%
place....Private Hospital?	2 No	868	94.6%
Family_supportunit	0 Weak support unit	534	58.2%
	1 Strong support unit	384	41.8%
Valid		918	100.0%
Missing		21376	
Total		22294	
Subpopulation		624[a]	

a. The dependent variable has only one value observed in 479 (76.8%) subpopulations.

Model Fitting Information

	Model Fitting Criteria			Likelihood Ratio Tests		
Model	AIC	BIC	-2 Log Likelihood	Chi-Square	Df	Sig.
Intercept Only	2146.866	2161.332	2140.866			
Final	2100.179	2215.912	2052.179	88.687	21	.000

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	2670.992	1848	.000
Deviance	1782.215	1848	.861

Pseudo R-Square

Cox and Snell	.092
Nagelkerke	.099
McFadden	.036

Likelihood Ratio Tests

	Model Fitting Criteria			Likelihood Ratio Tests		
Effect	AIC of Reduced Model	BIC of Reduced Model	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	2100.179	2215.912	2052.179[a]	.000	0	.
ageyrs	2109.369	2210.635	2067.369	15.190	3	.002
a7	2145.432	2246.699	2103.432	51.253	3	.000
a25	2095.593	2196.859	2053.593	1.414	3	.702
sex	2098.700	2199.966	2056.700	4.521	3	.210
a8a	2098.776	2200.042	2056.776	4.597	3	.204
a8c	2095.252	2196.518	2053.252	1.073	3	.784
Family_supportunit	2096.879	2198.145	2054.879	2.700	3	.440

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Parameter Estimates

a4_recoded[a]	B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)

								Lower Bound	Upper Bound
1 1 to 3 days	Intercept	2.171	.387	31.524	1	.000			
	ageyrs	-.010	.005	4.186	1	.041	.990	.980	1.000
	a7	-.756	.134	31.671	1	.000	.469	.361	.611
	[a25=1]	.020	.378	.003	1	.958	1.020	.486	2.141
	[a25=2]	0[b]	.	.	0	.	.	.	.
	[sex=1]	.171	.217	.621	1	.431	1.186	.776	1.814
	[sex=2]	0[b]	.	.	0	.	.	.	.
	[a8a=1]	-.398	.213	3.484	1	.062	.671	.442	1.020
	[a8a=2]	0[b]	.	.	0	.	.	.	.
	[a8c=1]	-.440	.439	1.003	1	.317	.644	.272	1.524
	[a8c=2]	0[b]	.	.	0	.	.	.	.
	[Family_support unit=0]	.320	.205	2.447	1	.118	1.378	.922	2.058
	[Family_support unit=1]	0[b]	.	.	0	.	.	.	.
2 4 to 7 days	Intercept	2.053	.371	30.627	1	.000			
	ageyrs	-.018	.005	11.731	1	.001	.982	.973	.992
	a7	-.381	.096	15.865	1	.000	.683	.566	.824
	[a25=1]	.142	.374	.145	1	.704	1.153	.554	2.402
	[a25=2]	0[b]	.	.	0	.	.	.	.
	[sex=1]	-.137	.221	.385	1	.535	.872	.566	1.344
	[sex=2]	0[b]	.	.	0	.	.	.	.
	[a8a=1]	-.188	.212	.781	1	.377	.829	.547	1.257
	[a8a=2]	0[b]	.	.	0	.	.	.	.
	[a8c=1]	-.172	.418	.170	1	.680	.842	.371	1.909
	[a8c=2]	0[b]	.	.	0	.	.	.	.
	[Family_support unit=0]	.218	.205	1.129	1	.288	1.243	.832	1.858
	[Family_support unit=1]	0[b]	.	.	0	.	.	.	.

3 8 to 14 days	Intercept	1.341	.396	11.436	1	.001			
	ageyrs	-.018	.006	10.582	1	.001	.982	.971	.993
	a7	-.243	.086	8.062	1	.005	.784	.663	.928
	[a25=1]	-.300	.428	.492	1	.483	.741	.320	1.714
	[a25=2]	0[b]	.	.	0	.	.	.	.
	[sex=1]	.256	.235	1.186	1	.276	1.292	.815	2.047
	[sex=2]	0[b]	.	.	0	.	.	.	.
	[a8a=1]	-.050	.230	.047	1	.827	.951	.605	1.494
	[a8a=2]	0[b]	.	.	0	.	.	.	.
	[a8c=1]	-.266	.473	.315	1	.575	.767	.303	1.939
	[a8c=2]	0[b]	.	.	0	.	.	.	.
	[Family_support unit=0]	.121	.223	.294	1	.588	1.129	.729	1.748
	[Family_support unit=1]	0[b]	.	.	0	.	.	.	.

a. The reference category is: 4 15 to 180 days.

b. This parameter is set to zero because it is redundant.

Appendix 4

Merging the data

1. DATASET ACTIVATE DataSet1.
MATCH FILES /FILE=*
/RENAME (agemth fath_fig hhmember id_fath id_moth id_partn marriage moth_fig mths_inh partner
record relat serial whynotme = d0 d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 d11 d12 d13)
/FILE='DataSet2'
/RENAME (a1 a2_1 a2_2 a2_3 a2_4 a2_5 a2_6 a3 a5 a6 a8b_hrs a8b_min a8d_hrs a8d_min a8e a8f_hrs
a8f_min a8g a8h_hrs a8h_min a8i a8j_hrs a8j_min record serial = d14 d15 d16 d17 d18 d19 d20 d21 d22
d23 d24 d25 d26 d27 d28 d29 d30 d31 d32 d33 d34 d35 d36 d37 d38)
/BY ind
/DROP= d0 d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 d11 d12 d13 d14 d15 d16 d17 d18 d19 d20 d21 d22 d23 d24
d25 d26 d27 d28 d29 d30 d31 d32 d33 d34 d35 d36 d37 d38.

```
EXECUTE.

2. MATCH FILES /FILE=*
  /RENAME (a21 a22 a23 a24_1 a24_2 a24_3 a24_4 a24_5 a24_6 a24_7 a24_8 a24_9 a26 a27
a28 record
    serial = d0 d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 d11 d12 d13 d14 d15 d16)
  /FILE='DataSet1'
  /BY ind
  /DROP= d0 d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 d11 d12 d13 d14 d15 d16.
EXECUTE.
```

Recodes and frequencies

```
DATASET ACTIVATE DataSet1.
RECODE union_st (1 thru 2=1) (3 thru 4=0) (ELSE=SYSMIS) INTO Family_supportunit.
EXECUTE.

RECODE a4 (1 thru 3=1) (4 thru 7=2) (8 thru 14=3) (15 thru 180=4) (ELSE=SYSMIS) INTO
a4_recoded.
EXECUTE.

FREQUENCIES VARIABLES=a25 ageyrs sex a7 a8a a8c Family_supportunit a4_recoded
  /STATISTICS=STDDEV VARIANCE RANGE MINIMUM MAXIMUM MEAN MEDIAN
MODE SKEWNESS SESKEW
  /ORDER=ANALYSIS.
```

Testing assumptions

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS BCOV R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT a4_recoded
  /METHOD=ENTER a25 ageyrs sex a7 a8a a8c Family_supportunit
  /RESIDUALS DURBIN.
```

Multinomial test

```
NOMREG a4_recoded (BASE=LAST ORDER=ASCENDING) BY a25 sex a8a a8c
Family_supportunit WITH ageyrs a7
  /CRITERIA CIN(95) DELTA(0) MXITER(100) MXSTEP(5) CHKSEP(20) LCONVERGE(0)
PCONVERGE(0.000001)
    SINGULAR(0.00000001)
  /MODEL
```

```
  /STEPWISE=PIN(.05) POUT(0.1) MINEFFECT(0) RULE(SINGLE) ENTRYMETHOD(LR)
REMOVALMETHOD(LR)
  /INTERCEPT=INCLUDE
  /PRINT=CELLPROB FIT PARAMETER SUMMARY LRT CPS STEP MFI IC
  /SAVE ESTPROB PREDCAT PCPROB ACPROB.
```