

DOES FUNCTIONING DIFFER BEFORE AND AFTER DAYLIGHT SAVINGS TIME
CHANGES AMONG PATIENTS WITH BIPOLAR DISORDER?

by

Erika L. Douglas

BS, Carnegie Mellon University, 2005

Submitted to the Graduate Faculty of

Department of Biostatistics

Graduate School of Public Health in partial fulfillment

of the requirements for the degree of

Master of Science

University of Pittsburgh

2007

UNIVERSITY OF PITTSBURGH

Graduate School of Public Health

This thesis was presented

by

Erika L. Douglas

It was defended on

June 11, 2007

and approved by

Thesis Advisor

Roslyn A. Stone, Ph.D.
Associate Professor
Department of Biostatistics
Graduate School of Public Health
University of Pittsburgh

Sati Mazumdar, Ph.D.
Professor
Department of Biostatistics
Graduate School of Public Health
University of Pittsburgh

Vishwajit Nimgaonkar, M.D., Ph.D.
Professor
Departments of Psychiatry & Human Genetics
School of Medicine & Graduate School of Public Health
University of Pittsburgh

DOES FUNCTIONING DIFFER BEFORE AND AFTER DAYLIGHT SAVINGS TIME CHANGES
AMONG PATIENTS WITH BIPOLAR DISORDER?

Erika L. Douglas, M.S.

University of Pittsburgh, 2007

ABSTRACT

Longitudinal studies, which are characterized by repeated measures taken on individual subjects, play a major role in the field of public health. One area of research that has been particularly impacted by longitudinal studies is bipolar disorder. Patients afflicted with this illness often suffer from occupational as well as social disruptions in their normal functioning, not to mention the burden this disease creates on both families of bipolar patients as well as the nation's economy.

One factor believed to be involved in the pathogenesis of bipolar disorder is circadian abnormalities, such as disturbances in sleep and appetite patterns. One such source of circadian rhythm disruption is brought about by the semi-annual occurrence of daylight savings time (DST). While research has shown that DST may have detrimental, though temporary, effects on circadian functioning in normal populations, little has been done to investigate the effects of DST in patients with bipolar disorder. Due to the high cost and disturbance in daily functioning that bipolar patients frequently experience, it is of public health importance to further investigate this disorder so that more effective ways to manage it may be discovered.

A population-averaged approach was taken using GEE modeling on the Global Assessment of Functioning (GAF) outcome, and multinomial logistic regression modeling on the Clinical Global Impressions (CGI). This thesis reviews the literature on methods for analyzing

longitudinal data in bipolar research, including both GEE and multinomial regression modeling; also reviewed are two commonly used mental illness rating scales: the GAF and the CGI. A subset of data from a bipolar disorder treatment and maintenance trial (7,315 repeated observations on 1175 patients) was used to conduct the present investigation. The results indicate that while DST changes are significantly associated with changes in clinical symptom severity, the magnitude of these differences is relatively small.

TABLE OF CONTENTS

PREFACE.....	IX
1.0 INTRODUCTION.....	1
1.1 BIPOLAR DISORDER.....	1
1.2 CIRCADIAN FUNCTIONING AND DST.....	2
1.3 THE STEP-BD STUDY	3
1.4 THE GRP STUDY.....	3
1.5 STATEMENT OF THE PROBLEM.....	4
2.0 LITERATURE REVIEW.....	7
2.1 METHODS FOR ANALYZING LONGITUDINAL DATA ON BIPOLAR DISORDERS.....	7
2.2 GEE.....	9
2.3 ORDINAL LOGISTIC REGRESSION	10
2.4 MULTINOMIAL LOGISTIC REGRESSION.....	11
2.5 GLOBAL ASSESSMENT OF FUNCTIONING RATING SCALE.....	12
2.6 CLINICAL GLOBAL IMPRESSIONS RATING SCALE	13
3.0 METHODS	15
3.1 CREATION OF CURRENT DATASET.....	15
3.2 CREATION OF NEW VARIABLES	19

3.3	STATISTICAL METHODS	21
3.3.1	Descriptive analyses	21
3.3.2	GEE models for the GAF	21
3.3.3	Ordinal models for the CGI.....	23
4.0	RESULTS	26
4.1	DESCRIPTIVE ANALYSES.....	26
4.2	STATISTICAL MODELING.....	32
4.2.1	GAF (PRIMARY OUTCOME).....	34
4.2.2	CGI (SECONDARY OUTCOME).....	47
5.0	DISCUSSION	55
	APPENDIX A: STATA PROGRAM USED IN ANALYSIS	58
	BIBLIOGRAPHY	215

LIST OF TABLES

Table 1. CGI ratings and their clinical definitions.....	14
Table 2. Summary of final project dataset.....	19
Table 3. Models considered for GAF	23
Table 4. Models considered for CGI.....	24
Table 5. Baseline characteristics of the study population by diagnostic category.....	27
Table 6. Average GAF scores by bipolar status and period for each season/year combination...	30
Table 7. Overall distribution of CGI scores.....	32
Table 8. Data Structure	34
Table 9. Results from main effects GEE model for GAF in bipolar I patients.....	35
Table 10. Results from main effects GEE model for GAF in bipolar II patients	37
Table 11. Results from reparameterized GEE model for GAF in bipolar I patients	39
Table 12. Results from reparameterized GEE model for GAF in bipolar II patients.....	41
Table 13. Results from main effects GEE model for GAF in the combined dataset.....	43
Table 14. Combined GEE model for GAF with interaction between life diagnosis and sequence	45
Table 15. Main effects CGI model for bipolar I patients.....	48
Table 16. Main effects CGI model for bipolar II patients	50

Table 17. Main effects CGI model for combined dataset..... 53

LIST OF FIGURES

Figure 1. Example scenario of patient data.....	16
Figure 2. Creation of GRP and DST datasets	17
Figure 3. Histogram of GAF scores by diagnostic category and period.....	29

PREFACE

I would like to express my sincere gratitude to my committee chair, Dr. Roslyn Stone, for her guidance, patience, and support throughout this process. I would also like to thank Dr. Vish Nimgaonkar for his unwavering help, encouragement, and input during this challenging undertaking and Dr. Sati Mazumdar for her keen eye to detail and helpful suggestions along the way.

Special thanks to Laurie Silfies for her patience, understanding, and promptness in addressing the many questions I presented her with throughout the past few months. I deeply appreciate all she has done to assist me with understanding and managing the data. In addition, I would like to thank Joel Wood for his technical help and support throughout this process.

Finally, I would like to thank my family and friends for their endless support and encouragement, and for always believing in me. You mean the world to me, and I could not have accomplished all I have without your patience, advice, and understanding.

1.0 INTRODUCTION

Longitudinal studies play a major role in the fields of public health, medicine, and the social sciences. These studies are defined as those in which the outcome variable is measured repeatedly on the same individual, therefore causing the measurements within an individual to be correlated. Over the last decade, interest in the statistical analysis of longitudinal studies has continued to grow (Twisk, 2004). In a study of the association of Daylight Savings Time (DST) with changes in functioning and clinical severity ratings in bipolar patients, we have observational data on 1175 bipolar patients in the thirty days prior to and following DST. We consider the GEE method (Liang & Zeger, 1986; Diggle et al., 2002) to analyze global functioning, and ordinal models for clustered data as well as multinomial logistic regression modeling to analyze severity of illness.

1.1 BIPOLAR DISORDER

Bipolar disorder is a major public health concern, causing significant medical disability as well as decreased life expectancy in those affected (Sachs et al., 2003). This disorder is characterized by episodes of depression, mania, and hypomania (American Psychiatric Association, 2000), and is associated with significant impairment in functioning (Oswald et al., 2007). According to a survey done by the National Depressive and Manic-Depressive Association in 2000, the

prevalence rate of bipolar I and II disorder in the U.S. is estimated to be about 3.4% (Berk et al., 2006). In addition to the hardships that bipolar patients themselves face, this disease also creates a burden on the economy, costing the nation's healthcare systems an estimated \$45 billion a year as of 1991 (Sachs et al., 2003). The high cost and disruption in daily functioning of the lives of bipolar patients provide strong motivation to further investigate and understand this disorder so that more effective ways to manage it may be identified.

1.2 CIRCADIAN FUNCTIONING AND DST

One factor that is believed to be involved in the pathogenesis of bipolar disorder is circadian abnormalities (Healy, 1987; Mitterauer, 2000). Many patients afflicted with bipolar disorder report disturbances in their circadian rhythms, such as changes in sleep and appetite pattern, as well as changes in energy levels during episodes of depression or mania. Natural shifts in circadian functioning are brought about in the general population by the semi-annual occurrence of daylight savings time (DST), and previous studies have shown that, even in healthy individuals, adjustment to time changes may take time and could initially have adverse, though temporary, effects on performance and alertness (Monk & Folkard, 1976). While several studies have been done on the effects of DST on the general population with respect to circadian functioning (Varughese & Allen, 2001; Lambe & Cummings, 2000), little has been done to investigate the effect that twice-yearly time change has on individuals with illnesses such as bipolar disorder.

1.3 THE STEP-BD STUDY

(Sachs et al., 2003) conducted a longitudinal study aimed at improving treatment and manageability of bipolar disorder by assessing the effectiveness of available treatment. The study cohort included 4,139 bipolar patients ages 15 and above, who were systematically treated with a variety of methods and were followed over an extended period of time. This study, which is known as the Systematic Treatment Enhancement Program for Bipolar Disorder (STEP-BD), was an NIMH funded, twenty-two site national public health initiative conducted from 2000-2005. Patients enrolled in the study were evaluated by trained clinicians at quarterly intervals for the first year of the study, and then semi-annually after the first year, though some were seen more frequently as needed. During each clinic visit patients were administered a battery of diagnostic tests designed to assess their symptoms, such as the Clinical Monitoring Form (CMF; Sachs et al., 2003); items from this form were used as outcome measures in the present study. Throughout the course of the STEP-BD study, eligible participants were offered the opportunity to participate in a number of sub-studies. One such sub-study was the Genetics Repository for Participants (GRP); these data were used to conduct the present inquiry.

1.4 THE GRP STUDY

The main goal of the GRP was to collect cell lines, DNA, and clinical data from participants enrolled in STEP-BD in an effort to facilitate future genetic research on bipolar disorder. It is important to note that once enrollment closed for the STEP-BD study, NIMH permitted an additional 191 patients to be enrolled specifically in the GRP study, though these patients were

not included in the complete STEP-BD dataset. Recruitment for GRP was conducted at twelve of the twenty-two original STEP-BD clinical sites, and eligible participants were recruited by one of two methods:

1. Participants currently enrolled in STEP-BD were informed of the GRP study by their treating clinician, and were provided written information on the study. After reviewing the written information, potential participants took part in an informed consent discussion with their clinician.
2. Previously enrolled STEP-BD participants who were no longer attending clinic visits but had not withdrawn consent were mailed a letter containing information about the GRP study, and were offered the option of either calling or returning a response postcard if interested in participating. Upon returning the postcard or calling, these potential participants spoke with either a GRP study staff clinician or psychiatrist to schedule an appointment for the informed consent discussion as well as a blood draw.

The final GRP dataset consisted of 37,174 repeated observations on 2,089 patients, and a subset of these data was extracted and used to conduct the present investigation.

1.5 STATEMENT OF THE PROBLEM

The present inquiry seeks to investigate the association between DST and clinical severity ratings in bipolar patients. The research hypothesis is that clinical severity ratings will increase following changes to or from daylight savings time, concurrent with changes in circadian function associated with DST. In addition, we anticipate that the effects of DST may differ depending on the season (spring or fall) in which the time change takes place. Specifically, we

speculate that functioning and symptom severity will improve following fall DST changes and worsen following DST changes taking place in the spring. Finally, we predict that the impact of DST may vary by diagnostic category, as the clinical features of bipolar I disorder differ from those of bipolar II disorder. More specifically, bipolar I disorder is characterized by the occurrence of at least one manic episode lasting a week or more and typically (but not necessarily) episodes of depression and in some cases hypomania. The defining features of mania include a persistent and abnormally elevated and/or irritable mood coupled with symptoms such as grandiosity, flight of ideas, distractibility, poor judgment, decreased need for sleep, and pressured speech, among others. These episodes caused marked impairment in the patient and are often associated with psychotic features and may require hospitalization (Mitchell, Malhi, & Ball, 2004; Oswald et al., 2007). Alternatively, bipolar II disorder is defined by recurrent depressive episodes as well as episodes of hypomania, which are milder than full-blown manic episodes and shorter in duration. While hypomanic patients experience elevated and/or irritable mood symptoms and changes in functioning, these episodes do not cause significant impairment in the patient, are not associated with psychotic features, and do not require hospitalization (Mitchell, Malhi, & Ball, 2004; Oswald et al., 2007).

The primary outcome variable in the present study will be the Global Assessment of Functioning (GAF) score (American Psychiatric Association, 1987), which is an overall assessment of a person's level of social, occupational and psychological functioning, and is measured on a continuous scale taking values from 0-100. The secondary outcome of interest is the Clinical Global Impressions (CGI) score (Guy, 1976), a three-item scale used to assess treatment response in psychiatric patients. The current study utilizes only one of the three CGI items, severity of illness. This is measured on an ordinal categorical scale with values ranging

from 1-7. The findings of this investigation may be helpful to clinicians treating bipolar patients if we can identify periods in which bipolar patients are at a particularly high risk of having an episode. This would allow for better preventive treatment during these periods and better overall management of the patient's illness. The specific goals of the present inquiry are as follows:

1. Describe the clinical characteristics of the patients in the current dataset relevant to DST
2. Assess differences in GAF and CGI score before and after DST as a function of:
 - Age (at enrollment, in years)
 - Life diagnosis (bipolar I or bipolar II)
 - Season (spring or fall)
 - Period (pre-DST, post-DST, or window period → days 0-6)
 - Year (2000-2005)
 - Site
3. Explore differential associations with bipolar status

2.0 LITERATURE REVIEW

2.1 METHODS FOR ANALYZING LONGITUDINAL DATA ON BIPOLAR DISORDERS

Due to the frequent changes in affective state and symptom severity that many bipolar patients experience, outcomes in bipolar research almost inevitably must be longitudinal (Hennen, 2003). There are a number of commonly used methods in analyzing data obtained from longitudinal bipolar research studies, including the following:

1. Independent (usually, endpoint) analysis: This method involves carrying out the analysis at a single time point or separately at several discrete time points. While this method is simple, it has several disadvantages, including increased likelihood of type I error due to multiple comparisons and exclusion of subjects with missing data, leading to a loss of statistical power (Hennen, 2003).
2. Independent analysis with LOCF: This is a commonly used method for handling missing data, but leads to misinterpretation of results and is less reliable than other methods (Lane, 2007).
3. Time-to-event (survival analysis) modeling: These types of analyses measure follow-up time from a specified starting point to the incidence of a particular event of interest (Bewick, Cheek, & Ball, 2004).

4. Multivariate analysis of variance (MANOVA): This method addresses the question of whether two treatments differ in any way over time. A weakness in this method is that the question answered by the MANOVA technique is both ambiguous and overly sensitive to missing data, and is therefore not of particular functional interest in bipolar research. In addition, this method does not properly address the element of time (Hennen, 2003).
5. Analysis of variance (ANOVA) with repeated measures: These analyses are limited to normally distributed outcome variables and do not allow for the analysis of time-varying covariates (Diggle et al., 2002).
6. Random effects/mixed effects regression modeling: This type of model treats the probability distributions of the outcome variables for each subject as multivariate normal, while allowing the parameters of the specific distribution to vary across individuals (Laird & Ware, 1982; Hennen, 2003). These models are also known as “subject specific” models and focus on the change within a subject over time. This technique assumes normal random effects, and if the effects are not in fact normal then the model is subject to an incorrect assumption.
7. Generalized estimating equation (GEE) regression modeling: This approach designates the marginal expectation as a function of the explanatory variables. GEE models can be fit to continuous as well as non-continuous outcomes, and are robust to variance misspecification (Hennen, 2003).
8. Multinomial logistic regression modeling: This method is used for categorical outcome variables, and essentially estimates separate binary logits for each pair of outcomes with more than two levels (Long & Freese, 2006).

Several of the methods discussed above were not suitable for answering the question of interest, regardless of their strengths or weaknesses. For example, since the research question in the present investigation does not focus on methods for dealing with missing data, the first two approaches listed above were ruled out as potential methods for analysis. In addition, we were not looking at time to event data, so survival methods were also deemed inappropriate. Since the question of interest involves looking at whether GAF scores change following DST, the most appropriate available methods for analyzing the GAF are random effects/mixed effects modeling and GEE. A population-based approach was chosen as opposed to a subject-specific approach, as we wish to look at whether, on average, bipolar patients score differently (as measured by the GAF) after DST as opposed to before. We are also interested in looking at whether this association varies by season and bipolar status (bipolar I versus bipolar II). We also had relatively few observations per patient. These criteria led to the adoption of GEE as the method of choice for the primary outcome variable in the current analysis. Due to the multi-level categorical nature of the CGI outcome, this analysis will initially involve fitting an ordinal logistic regression model to the data, and then subsequently fitting a multinomial logistic regression model in the event that the proportional odds assumption is not met for the ordinal model.

2.2 GEE

GEE is commonly used to analyze longitudinal data. GEE models the marginal expectation of the outcome variable as a function of covariates, while accounting for the correlation among repeated observations for an individual subject (Zeger & Liang, 1986). Fitting a GEE model

requires specification of: (1) the link function, (2) the distribution of the dependent variable, and (3) the correlation structure for the dependent variable (Ballinger, 2004). One of the main merits of the GEE method is that it allows for the inclusion of time-varying covariates. Another advantage that GEE offers over other methods is that it yields relatively precise estimates of the standard errors, therefore producing more accurate confidence intervals. While other techniques, such as random effects models, approximate the between-cluster variation and integrate this as well as the residual variance into the estimation of standard errors, the GEE method takes a different approach. Rather than modeling the between-cluster variation, GEE instead estimates the within-cluster correlation of the residuals, and then uses this correlation estimate to create a new approximation of the regression coefficients and to compute standard errors (Hanley, et al., 2003). GEE also has the benefit of allowing the variance estimator to be robust to misspecification of the correlation structure. (Mirea, Bull, & Stafford, 2003). This means that even if an incorrect correlation structure is specified, the GEE parameter estimates will still be consistent. A Huber-White robust variance estimator (Huber, 1967; White, 1980) can be used in conjunction with GEE to relax the assumed model-based variance structure as well as the assumed correlation structure. GEE also provides a flexible method for analyzing panel data, as it does not require that the outcome variables be normally distributed (Harrison and Hulin, 1989).

2.3 ORDINAL LOGISTIC REGRESSION

Logistic regression is used to express the relationship between a categorical outcome variable and a series of explanatory variables that may be either continuous or categorical. One extension of logistic regression to ordinal multi-level response variables is known as the proportional odds

model. This model identifies a cumulative logit link to relate p covariates to an ordinal outcome assuming the values $j = 1, \dots, r$ with corresponding multinomial probabilities for the i th individual, $\pi_{i1}, \pi_{i2}, \dots, \pi_{ir}$, and $\sum_{j=1}^r \pi_{ij} = 1$. If we let θ_{ig} represent the odds of observing the g th category or higher for the i th individual, we have

$$\theta_{ig} = \frac{P(Y_i \geq g)}{P(Y_i < g)} = \frac{\pi_{ig} + \pi_{i(g+1)} + \dots + \pi_{ir}}{\pi_{i1} + \pi_{i2} + \dots + \pi_{i(g-1)}}.$$

The proportional odds model is defined as:

$$\text{logit}(P(Y_i \geq g)) = \log(\theta_{ig}) = \gamma_g + \beta_1 x_{i1} + \dots + \beta_p x_{ip}$$

for $g = 2, \dots, r$, where the intercept terms account for various log odds and probabilities that the outcome is at least as great as g in the baseline population (Preisser & Koch, 1997). One of the basic assumptions of the proportional odds model is that a common slope parameter exists across all possible values of g ; therefore it is essential to evaluate this assumption in determining the suitability of this model (Stiger, Barnhart, & Williamson, 1999).

2.4 MULTINOMIAL LOGISTIC REGRESSION

The multinomial logit model is one of the most commonly utilized methods to analyze discrete outcome variables (Tse, 1987). The term logit simply refers to the logarithm of the odds ratio (Wickens, 1998). This method involves a nominal response variable with three or more categories, and produces multiple equations. An outcome with k categories will generate $k-1$ equations using the multinomial model. Each of these $k-1$ equations compares a particular group

with the baseline group. This model assumes that the log-odds of each response follow a linear model. The multinomial logit model is similar to an ordinary logistic regression model with the exception that we have $k-1$ equations as opposed to just one equation. Multinomial models also may be used for ordinal categorical data if the ordering is ignored.

2.5 GLOBAL ASSESSMENT OF FUNCTIONING RATING SCALE

Global assessment of functioning exemplifies a key characteristic of clinical evaluation and practice (Schorre & Vandvik, 2003). Standard assessments of global functioning are becoming increasingly common in the field of psychiatry, as well as in other clinical fields (Oliver et al., 2003). One of the first global assessment scales published was the Health Sickness Rating Scale (HSRS; Luborsky, 1962). This scale was eventually modified in order to rectify the deficiencies inherent in the HSRS, and then became known as the Global Assessment Scale (GAS; Endicott et al., 1976). Finally, in 1987, the GAS was again modified to become the Global Assessment of Functioning scale, which was Axis V of the DSM-III-R multi axial classification system (American Psychiatric Association, 1987), and still remains so in the current DSM-IV (American Psychiatric Association, 1994). Some believe the GAF to be the most widely utilized clinical rating scale in current practice (Moos, McCoy, & Moos, 2000). This assessment tool evaluates patients on a scale from 0-100, with higher values indicating better levels of functioning. The GAF scale is divided into 10-point increments, with characteristics of typical functioning listed at each cut point; it is important to note though that despite the fact that the GAF is presented in 10-point increments, patients are measured on a continuous scale and can receive ratings ranging

anywhere from 0 to 100. A 5-10 point change in the GAF score is required in order to be clinically meaningful in terms of a significant change in overall functioning. Merits of the GAF are that it is easy to administer and has acceptable interrater reliability both in research conditions (Tracy et al., 1997) as well as in the clinical environment (Rey, et al., 1995). Another advantage of the GAF is comprehensiveness, as it measures not only psychological functioning but social and occupational performance as well (Yamauchi et al., 2002).

2.6 CLINICAL GLOBAL IMPRESSIONS RATING SCALE

The Clinical Global Impressions Scale (CGI) is a standard instrument used in making global assessments (Guy, 1976). This scale typically produces three measures: (1) severity of illness, (2) global improvement (comparison of the individual's baseline condition to his/her current condition), and (3) efficacy index (comparison of the individual's baseline condition with a ratio of current therapeutic benefit to severity of side effects) (Kadouri, Corruble, & Falissard, 2007). The present study, however, only evaluates the first item of the CGI, severity of illness, which is measured on a 7-point scale. A summary of this scale and the corresponding clinical definitions is presented in Table 1. By definition, healthier patients score lower on the CGI than those who are more severely ill. The CGI is commonly used in clinical practice, due to its face validity and practicability, and has been found to be a useful tool in the field of psychiatry (Kadouri, Corruble, & Falissard, 2007).

Table 1. CGI ratings and their clinical definitions

Rating	Clinical Definition
1	<i>Normal (not at all ill)</i>
2	<i>Borderline mentally ill</i>
3	<i>Mildly ill</i>
4	<i>Moderately ill</i>
5	<i>Markedly ill</i>
6	<i>Severely ill</i>
7	<i>Extremely ill</i>

3.0 METHODS

3.1 CREATION OF CURRENT DATASET

In order to be included in the current dataset, a patient was required to have at least one Clinical Monitoring form (CMF) administered within thirty days prior to the DST change, and at least one CMF within thirty days after the DST change. It is important to note that a patient was only included in the final dataset if they had at least one pair of CMF observations. For the purposes of this investigation, a pair was defined as one measurement pre DST and one measurement post DST in a given season/year. Some subjects had more than one pair, and some observations were not pair-matched (i.e. a person may have one measurement pre DST and 3 post DST in a given season/year). Figure 1 lists an example scenario using actual patient data.

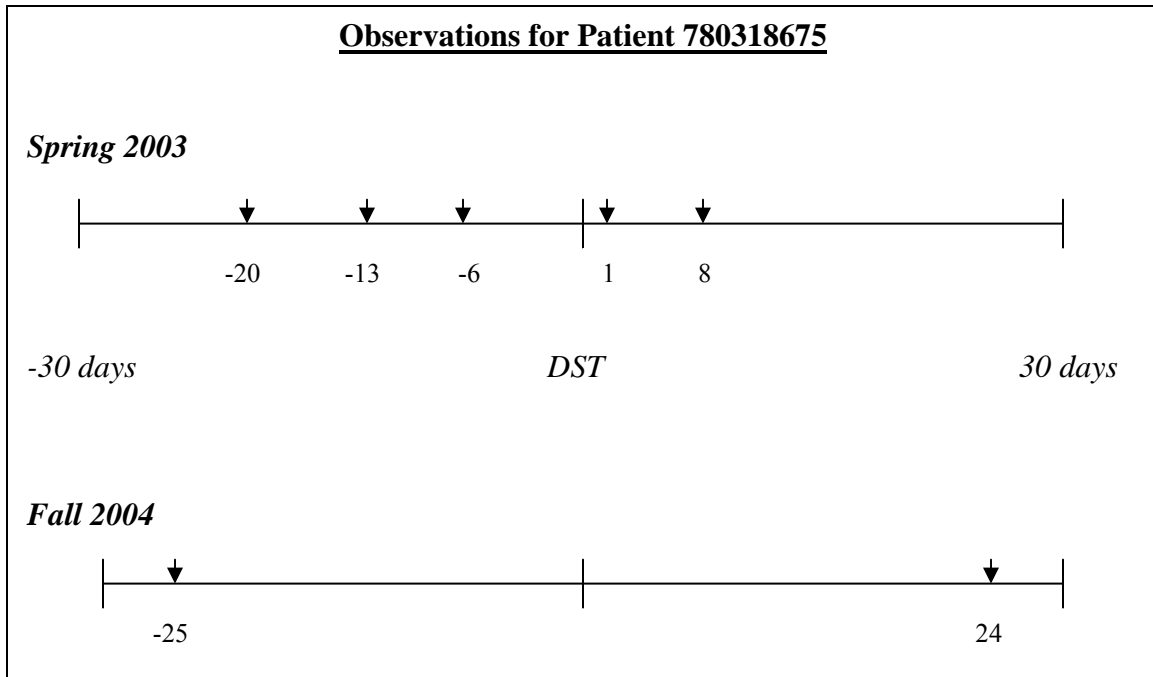


Figure 1. Example scenario of patient data

This particular patient had data for spring of 2003 and fall of 2004. In the spring of 2003, the participant was evaluated 20, 13, and 6 days prior to the DST change, and then at one and 8 days after DST. This would be an example of observations that are not matched pairs, because we have 3 pre-DST measurements but only 2 post-DST measurements in this particular season/year combination. In the fall of 2004, this same patient was seen 25 days prior to DST and 24 days after DST, which would be an example of a pair-matched set, because we have one observation pre-DST and one post-DST.

In order to create the final data file, I began with two separate datasets, which were eventually matched and merged. The two original datasets were the GRP and the DST files (created in Microsoft Excel by the programmer at the University of Pittsburgh's Epidemiology Data Center), both of which are described in Figure 2.

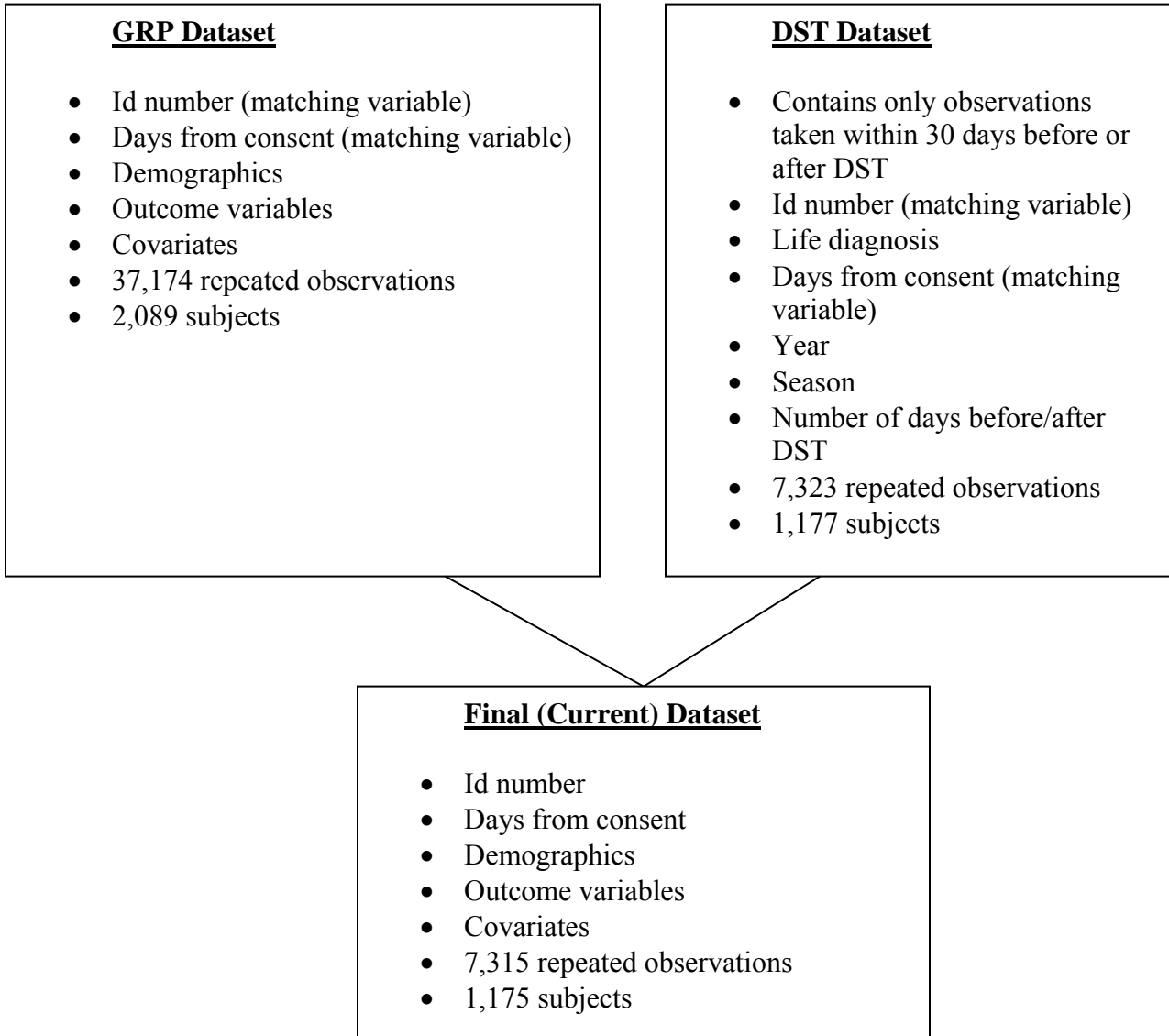


Figure 2. Creation of GRP and DST datasets

The present dataset was extracted from the larger GRP dataset in the following way:

1. Patients from the GRP dataset were matched on Id number and days from consent to those in the DST dataset using Microsoft Access.
2. Information (demographics, outcome variables, covariates) from the larger GRP dataset was merged with the information in the DST dataset for patients who had observations taken within a 30-day window (before or after) DST.
3. Patients were required to have at least one measurement pre-DST and one measurement post-DST in a given season/year in order to be included in the final dataset; one subject was found to have only two pre-DST measurements and no post-DST measurements, so the 2 invalid observations were deleted but the subject was kept in the final dataset due to the fact that they had other valid observations (meaning at least one pair) in a different season/year.
4. One subject was found to have two post-DST measurements but no pre-DST measurements. Consequently, this subject was removed from the final dataset, as these were the only 2 observations for this participant.
5. Another patient was mistakenly included in the DST dataset but was not in the GRP dataset; therefore when the datasets were matched, this person was not identified; as a result, this participant's observations (4) were deleted.

After the datasets were matched, merged, and the invalid observations listed above deleted, the final dataset consisted of 7315 repeated measure observations on 1175 subjects who participated in the STEP-BD study and subsequently in the GRP study. The final dataset is summarized in Table 2. The project dataset contains 2647 pairs, equaling 5294 pair-matched observations. We also included 2021 additional non-paired observations, for a total of 7,315 observations.

Table 2. Summary of final project dataset

Number of patients	Number of pairs of CMF's	Total
494	1	494
301	2	602
175	3	525
96	4	384
53	5	265
28	6	168
18	7	126
8	8	64
1	9	9
1	10	10
Total		
<i>1175 unique patient ID's</i>		<i>2647 pairs of observations</i>

3.2 CREATION OF NEW VARIABLES

In order to conduct the current inquiry, the data were labeled and recoded using the Stata version 9.2 statistical software package (StataCorp., 2005) and separate variables were created using the generate command to look at GAF scores pre-and-post DST for both spring and fall of each year. A sequence variable was also generated, which consisted of all possible season and year combinations, resulting in 11 groupings (there were no observations for fall of 2005, as the study ended prior to this DST change). Observations that were taken on days 0-6 were questionable, as many of the items on the CMF address patients' symptoms over the past 7 days, meaning that measurements taken during this time period encompass symptoms that occurred both before and after DST. This made it difficult to use these observations in answering the current question of

interest regarding the GAF. In order to manage this issue, these observations were coded in three different ways:

1. A “period” variable was created, and observations taken before the DST change were coded 0, observations taken after day 6 were coded 1, and observations in the “window” as we will call it (days 0-6) were coded 2.
2. A “window” variable was created, and observations were coded as listed above with the exception that the window observations were treated as missing values.
3. A “post” variable was created, and observations taken before the DST change were coded 0 while observations taken after DST (including those taken in the window period (days 0-6)) were coded 1.

This will allow for an initial assessment of whether there is a change in severity of symptoms, as measured by the GAF, after DST occurs. In addition, I will be able to assess whether this relationship differs depending on the season in which DST takes place (spring or fall).

The CGI question on the CMF did not refer to the past 7-day time frame; instead this rating was based only on the patient’s symptom severity on the day the subject was evaluated. Therefore, the problem encountered with respect to the window period for the GAF outcome did not present an issue when analyzing the CGI, and we were able to conduct all analyses on this outcome using the post variable.

3.3 STATISTICAL METHODS

3.3.1 Descriptive analyses

In order to verify the validity of the final dataset, preliminary descriptive analyses were performed on all variables in the dataset. This includes tabulations for all categorical variables as well as the calculation of basic summary statistics (means, medians, and standard deviations) for continuous variables using Stata's `tabulate`, `tabstat`, and `summarize` commands. While most of the exploratory analyses were done at the observation level, I also looked at person level descriptive statistics for age, gender, site, and life diagnosis (bipolar I versus bipolar II). Given that both season and life diagnosis are of particular interest in answering the research question at hand, the impact of these two variables were explored in further detail. In particular, I generated several summary tables as well as a histogram of the distribution of GAF scores by time period (pre-DST, post-DST, or window period (days 0-6)) and diagnostic category (bipolar I or II), to provide a preliminary evaluation of whether DST appears to be associated with changes in clinical severity ratings, as measured by the GAF and the CGI.

3.3.2 GEE models for the GAF

After all descriptive analyses were complete, I formally addressed the question of interest through the use of GEE modeling (`xtgee` command in Stata). I first examined the GAF, as this is my primary outcome variable. A summary of all models that were considered for the GAF is displayed in Table 3. I fit each of these models, and then chose the best fitting model based on the Wald's χ^2 statistic for the added terms. The first model I tested was a GEE main effects

model with an exchangeable correlation structure (Model 1). Patients with a life diagnosis of bipolar I disorder and those with a bipolar II life diagnosis were modeled separately. The use of two separate models allowed me to assess whether the effect of DST differs by diagnostic category. These models included as covariates: age at study enrollment, season (coded 0 if spring and 1 if fall), period (coded 0 if the observation was taken before the DST change, 1 if the observation was taken after the DST change, and 2 if the observation was taken on days 0-6 (window period)), year, and site. In all models, age was treated as a continuous variable and all others were treated as categorical (with dummy variables being created for period, year, and site through the use of Stata's xi command). The initial main effects model allowed me to see which of the covariates listed above were significant predictors of GAF score. Global Wald tests were conducted on both site and year (using Stata's testparm command) to assess overall effects across all levels of the predictor. In addition, I used the lincom command in Stata to test whether the window period (days 0-6) differed significantly from the post-DST time period.

After assessing these initial main effects models, I considered a few models with interaction effects. The first (Model 2) included the interaction between season and period. I also looked at Model 3, which included the interaction between season and year. In the event that the interaction between season and year was significant, Model 3 would be reparamaterized in terms of the sequence variable (season/year combination) in place of the interaction term (Model 4).

After all of the diagnosis specific models were considered, I fit a main effects model (Model 5) and several interaction models (Models 6-8) to the combined dataset; these models included bipolar status (bipolar I versus bipolar II) as a covariate. Model 5 included life

diagnosis as a main effect, while Models 6-8 considered various interaction terms involving life diagnosis with period, site, and sequence.

Table 3. Models considered for GAF

Diagnosis Specific Models	Covariates
Model 1 (Base Model)	<i>Age, Season, Period, Year, Site</i>
Model 2	<i>Model 1 + Season*Period</i>
Model 3	<i>Model 1 + Season*Year</i>
Model 4	<i>Age, Period, Sequence, Site</i>
Combined Models	
Model 5	<i>Age, Period, Sequence, Site, Life Diagnosis</i>
Model 6	<i>Model 5 + Life Diagnosis*Period</i>
Model 7	<i>Model 5 + Life Diagnosis*Site</i>
Model 8	<i>Model 5 + Life Diagnosis*Sequence</i>

*The sequence variable listed in Model 4 is defined as season/year combination (i.e. Spring 2000)

3.3.3 Ordinal models for the CGI

Due to the categorical nature of the secondary outcome variable (CGI score), I used an ordinal logistic model with robust variance (ologit command in Stata), clustering on subject. The robust variance estimator at the cluster level approximates the comparable GEE ordinal model, but does not involve the second set of iterations that GEE does. A summary of all models considered for the CGI is presented in Table 4.

Table 4. Models considered for CGI

Diagnosis Specific Models	Covariates
Model 1 (Base Model)	<i>Age, Season, Post, Year, Site</i>
Model 2	<i>Model 1 + Season*Post</i>
Model 3	<i>Model 1 + Season*Year</i>
Combined Models	
Model 4	<i>Age, Season, Post, Year, Site, Life Diagnosis</i>
Model 5	<i>Model 4 + Life Diagnosis*Post</i>
Model 6	<i>Model 4 + Life Diagnosis*Season</i>
Model 7	<i>Model 5 + Life Diagnosis*Year</i>
Model 8	<i>Model 5 + Life Diagnosis*Site</i>

I fit three main effects models (one for bipolar I patients, another for bipolar II patients and a final combined model) containing the same covariates as for the GAF outcome; however, instead of the period variable (pre-DST, post-DST, or window period), the CGI models were fit using the post variable (pre-DST or post-DST). I also tested the proportional odds assumption for this model, which states that “the ratio of the odds of being in the first k categories given \mathbf{X}_i , to the odds of being in the first k categories given \mathbf{X}_j , is proportional, on an exponential scale, to the distance between \mathbf{X}_i and \mathbf{X}_j for all k ” (Stiger, Barnhart, & Williamson, 1999). The testing of the proportional odds assumption was done through the use of Stata’s `omodel` command, which provides an approximate likelihood ratio test for whether the proportional odds assumption is met. If this statistic is <0.05 , then the proportional odds assumption is violated. In the present study, violation of the proportional odds assumption led to the fitting of multinomial models for the CGI outcome (`mlogit` command in Stata), again with a robust variance estimator calculated at the cluster level. The multinomial level allows for the comparison of each CGI category to baseline, and assumes that the log odds of each response follow a linear model. Throughout, p -

values <0.05 were considered to be statistically significant, and other than using global tests when appropriate, no adjustments were made for multiple comparisons.

4.0 RESULTS

4.1 DESCRIPTIVE ANALYSES

Because diagnostic category (bipolar I versus bipolar II) is of particular interest in the present inquiry, this variable was taken into account in all descriptive analyses. Table 5 summarizes the baseline characteristics of the study population by diagnostic category.

Table 5. Baseline characteristics of the study population by diagnostic category
(N = 1175 patients)

	Bipolar I (n= 783)	Bipolar II (n=392)
	Mean <i>(Standard Deviation)</i>	
Age at enrollment (in years)	42.85 <i>(12.42)</i>	42.76 <i>(12.71)</i>
	Frequency <i>(Percent)</i>	
Gender		
<i>Female</i>	445 <i>(56.83%)</i>	249 <i>(63.52%)</i>
<i>Male</i>	336 <i>(42.91%)</i>	143 <i>(36.48%)</i>
<i>Transgender</i>	2 <i>(0.26%)</i>	0 <i>(0.00%)</i>
Site		
<i>Site 10</i>	156 <i>(19.92%)</i>	69 <i>(17.60%)</i>
<i>Site 30</i>	55 <i>(7.02%)</i>	30 <i>(7.65%)</i>
<i>Site 60</i>	47 <i>(6.00%)</i>	30 <i>(7.65%)</i>
<i>Site 70</i>	44 <i>(5.62%)</i>	14 <i>(3.57%)</i>
<i>Site 90</i>	31 <i>(3.96%)</i>	5 <i>(1.28%)</i>
<i>Site 130</i>	32 <i>(4.09%)</i>	18 <i>(4.59%)</i>
<i>Site 140</i>	136 <i>(17.37%)</i>	73 <i>(18.62%)</i>
<i>Site 160</i>	71 <i>(9.07%)</i>	94 <i>(23.98%)</i>
<i>Site 170</i>	81 <i>(10.34%)</i>	21 <i>(5.36%)</i>
<i>Site 190</i>	38 <i>(4.85%)</i>	10 <i>(2.55%)</i>
<i>Site 200</i>	49 <i>(6.26%)</i>	12 <i>(3.06%)</i>
<i>Site 210</i>	43 <i>(5.49%)</i>	16 <i>(4.08%)</i>

*Percentages presented are column percentages

As Table 5 shows, the average age in the two diagnostic groups is very similar (42.85 in the bipolar I group compared to 42.76 in the bipolar II group), as are their standard deviations (12.42 for bipolar I patients and 12.71 for bipolar II patients). It is interesting to note that there are two transgender individuals in the bipolar I population, though this only accounts for a very small percentage of the overall study population. We can also see from the table that a few of the sites enrolled a relatively large percentage of the patient population (such as sites 10 and 140 for both diagnostic groups, and site 160 for bipolar II patients), while the others enrolled around 10% or less of patients in each diagnostic group. Site 90 enrolled the fewest number of patients (36 total).

The initial assessment of the 45 variables in the dataset showed no invalid observations, with the exception of four “-1” values present for the “cups of caffeine per day” variable. These invalid measurements are most likely due to data entry errors, though this issue was not further investigated because this variable was not of interest in this study. However, unknown values existed for some variables, including both outcome measures: the GAF contained 42 unknown values (0.57%), while the CGI contained 39 unknown observations (0.53%). Figure 3 presents a histogram of the distribution of GAF scores (excluding unknown values) by both diagnostic category (bipolar I (k = 5,046 non-missing observations) versus bipolar II (k = 2,227 non-missing observations)) and period (pre-DST, post-DST, or window (days 0-6)).

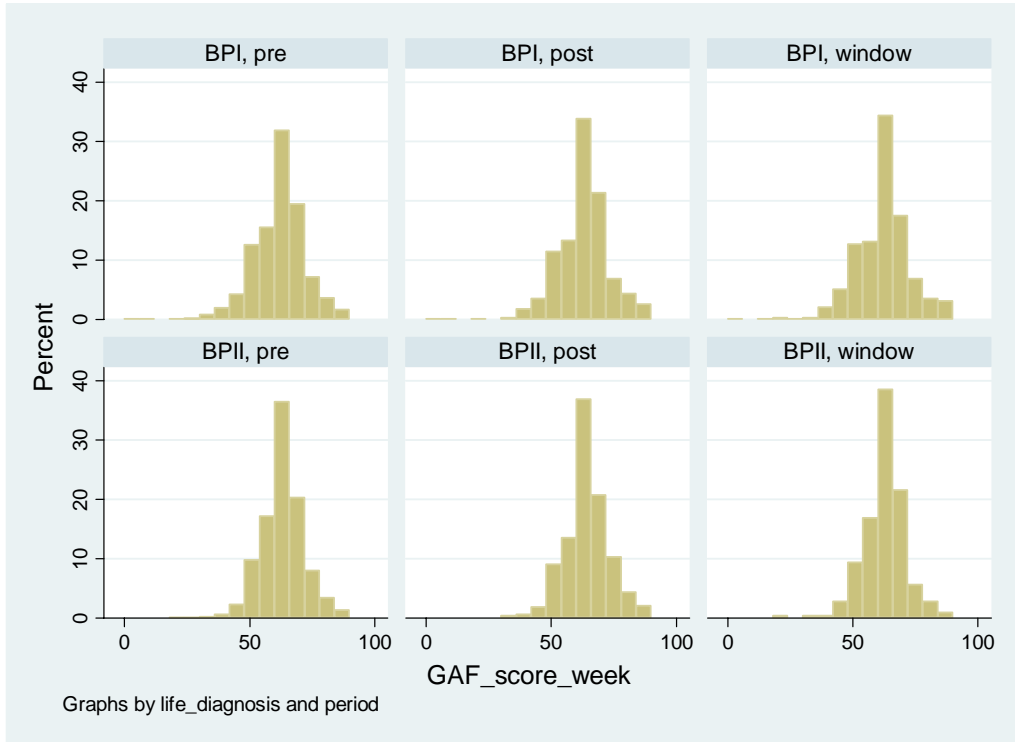


Figure 3. Histogram of GAF scores by diagnostic category and period

As Figure 3 illustrates, the bipolar I and II patients look relatively similar with respect to the marginal distributions of GAF scores across time periods. To provide a more detailed description of the primary outcome variable, Table 6 shows average GAF scores by bipolar status and period for each sequence (season/year combination).

Table 6. Average GAF scores by bipolar status and period for each season/year combination

	Bipolar I (n = 783)			Bipolar II (n = 392)		
	Mean GAF Score <i>(Standard Deviation)</i> <i>k = number of observations</i>					
<i>Sequence(Year/Season)</i>	<i>Pre</i>	<i>Post</i>	<i>Window</i>	<i>Pre</i>	<i>Post</i>	<i>Window</i>
<i>Spring 2000</i>	63.79 (12.32) <i>k= 14</i>	65.09 (14.00) <i>k= 11</i>	57.33 (13.81) <i>k= 6</i>	70.00 *(N/A) <i>k= 1</i>	N/A (no data) <i>k= 0</i>	70.00 *(N/A) <i>k= 1</i>
<i>Fall 2000</i>	55.61 (12.09) <i>k= 77</i>	59.21 (11.83) <i>k= 61</i>	55.83 (16.51) <i>k= 18</i>	62.47 (11.91) <i>k= 15</i>	64.20 (15.82) <i>k= 15</i>	61.20 (7.05) <i>k= 5</i>
<i>Spring 2001</i>	63.43 (9.41) <i>k= 97</i>	62.52 (9.91) <i>k= 84</i>	64.47 (11.53) <i>k= 17</i>	65.89 (8.61) <i>k= 36</i>	66.06 (11.54) <i>k= 31</i>	69.75 (4.27) <i>k= 4</i>
<i>Fall 2001</i>	63.21 (9.22) <i>k= 168</i>	62.45 (11.85) <i>k= 140</i>	63.71 (13.93) <i>k= 34</i>	63.74 (9.96) <i>k= 53</i>	62.94 (10.39) <i>k= 50</i>	62.00 (5.29) <i>k= 8</i>
<i>Spring 2002</i>	62.71 (11.49) <i>k= 194</i>	62.38 (11.44) <i>k= 155</i>	61.17 (13.84) <i>k= 41</i>	63.84 (7.44) <i>k= 63</i>	62.77 (10.06) <i>k= 60</i>	64.06 (8.10) <i>k= 17</i>
<i>Fall 2002</i>	61.92 (10.40) <i>k= 311</i>	62.75 (10.71) <i>k= 253</i>	61.88 (10.60) <i>k= 52</i>	60.51 (9.93) <i>k= 128</i>	62.27 (10.17) <i>k= 105</i>	56.84 (12.19) <i>k= 25</i>
<i>Spring 2003</i>	59.90 (12.03) <i>k= 333</i>	61.94 (10.49) <i>k= 257</i>	60.34 (11.00) <i>k= 67</i>	63.45 (8.83) <i>k= 126</i>	64.51 (8.99) <i>k= 106</i>	61.25 (9.04) <i>k= 24</i>
<i>Fall 2003</i>	60.75 (9.66) <i>k= 310</i>	60.99 (10.36) <i>k= 274</i>	59.59 (10.01) <i>k= 44</i>	62.89 (7.95) <i>k= 149</i>	65.35 (8.51) <i>k= 127</i>	63.71 (8.32) <i>k= 21</i>
<i>Spring 2004</i>	59.91 (10.89) <i>k= 347</i>	62.43 (9.72) <i>k= 249</i>	60.09 (10.18) <i>k= 74</i>	62.53 (10.12) <i>k= 188</i>	64.44 (9.57) <i>k= 139</i>	62.32 (8.48) <i>k= 38</i>

Table 6 continued						
Fall 2004	62.44 (9.64) k= 382	63.97 (8.91) k= 292	62.34 (9.51) k= 74	62.38 (8.38) k= 189	63.38 (7.29) k= 151	61.65 (8.14) k= 31
Spring 2005	62.18 (9.94) k= 314	64.23 (9.43) k= 214	63.18 (10.34) k= 82	63.22 (7.41) k= 164	62.97 (7.05) k= 118	63.18 (7.14) k= 39

*There is no standard deviation listed here because there is only one observation

It appears that the average GAF scores are slightly higher for bipolar II patients than for bipolar I patients in most season/year combinations, though in some cases the scores are relatively similar. Even for those sequences in which the average score for bipolar II patients is higher, these small differences are unlikely to be of much clinical relevance. The average scores also appear to increase slightly from pre-to-post DST for most sequences, contrary to what we predicted in our primary hypothesis. However, it is not always the case that the average GAF score increases after DST occurs. In some instances, the effect differs by diagnostic category. For example, in the fall of 2003, the average GAF score for bipolar I patients is 60.75 before DST occurs, and remains virtually the same after DST (60.99), but for bipolar II patients, the average score actually increases from 62.89 to 65.35 from pre to post. This is an early indicator that diagnostic category may have an impact on the effect of DST in bipolar patients, though we can see that the changes from pre-to-post DST are relatively small, leading us to predict that the association between DST and clinical symptom severity may not be very strong.

In addition to the primary outcome variable (GAF score), I also looked at descriptive statistics of the secondary outcome, CGI score. A summary of the distribution of scores for this variable is presented in Table 7.

Table 7. Overall distribution of CGI scores

CGI Score	Bipolar I		Bipolar II		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
<i>Unknown</i>	31	0.61	8	0.36	39	0.53
<i>1</i>	451	8.88	175	7.82	626	8.56
<i>2</i>	1,372	27.03	629	28.09	2,001	27.35
<i>3</i>	1,471	28.98	717	32.02	2,188	29.91
<i>4</i>	1,240	24.43	512	22.87	1,752	23.95
<i>5</i>	430	8.47	171	7.64	601	8.22
<i>6</i>	78	1.54	27	1.21	105	1.44
<i>7</i>	3	0.0006	0	0.00	3	0.04
Total	<i>5,076</i>	<i>100.00</i>	<i>2,239</i>	<i>100.00</i>	<i>7,315</i>	<i>100.00</i>

*Categories 5, 6, and 7 were combined for the statistical modeling

*Percentages may not add up to exactly 100% due to rounding

By definition, the CGI scores increase as severity of illness worsens, and 81.21% of CGI ratings are in the range of 2 to 4 (Table 7). These are patients who are borderline to moderately ill, so we would expect to see more observations in this range compared to the “not at all ill” or “extremely ill” categories, as these events are more extreme and consequently less common. Categories 5, 6, and 7 were combined for the statistical modeling.

4.2 STATISTICAL MODELING

Due to the presence of 42 unknown values for the primary outcome variable and 39 unknown values for the secondary outcome, all GEE analyses were conducted with these observations excluded. Table 8 summarizes the general data structure for the entire dataset as well as for the GAF and CGI outcome analyses. As the table illustrates, once the unknown values were excluded, we were left with 7273 total observations on 1175 subjects for the primary outcome

(meaning that although we lost several observations, we were still able to maintain our original number of patients). As for the secondary outcome, once unknown observations were eliminated we had 7276 observations on 1174 subjects (one patient was lost). With respect to the GAF score we lost 30 observations in the bipolar I model due to unknown values, and 12 in the bipolar II group. For the CGI analyses 31 observations were eliminated in the Bipolar I group and 8 in the Bipolar II group. It is also important to note that the minimum number of observations per patient dropped to 1 in both groups (for both outcomes) due to the exclusion of unknown values; these singleton observations will be included in the GEE models.

Table 8. Data Structure

	Bipolar I	Bipolar II	Combined
Entire Dataset (including unknown observations)			
# Observations	5076	2239	7315
# Patients	783	392	1175
Observations per patient (min)	2	2	2
Observations per patient (average)	6.5	5.7	6.2
Observations per patient (max)	36	34	36
GAF outcome (excluding unknown values)			
# Observations	5046	2227	7273
# Patients	783	392	1175
Observations per patient (min)	1	1	1
Observations per patient (average)	6.4	5.7	6.2
Observations per patient (max)	36	34	36
CGI outcome (excluding unknown values)			
# Observations	5045	2231	7276
# Patients	782	392	1174
Observations per patient (min)	1	1	1
Observations per patient (average)	6.5	5.7	6.2
Observations per patient (max)	36	34	36

4.2.1 GAF (PRIMARY OUTCOME)

The main effects (Model 1 in Table 3) was fit to the GAF outcome for only the Bipolar I patients. Results from this model are summarized in Table 9.

Table 9. Results from main effects GEE model for GAF in bipolar I patients

Covariate	Coefficient	Standard Error	95% Confidence Interval	p-value(df*)
Age (per year)	0.04	0.02	[-0.01, 0.08]	0.13
Fall Season	0.15	0.27	[-0.38, 0.69]	0.58
Period				<0.001 (2)
<i>Post-DST</i>	1.13	0.23	[0.68, 1.59]	<0.001
<i>Window period</i>	-0.04	0.39	[-0.80, 0.72]	0.92
Year				<0.001 (5)
<i>2001</i>	4.39	0.80	[2.82, 5.96]	<0.001
<i>2002</i>	4.64	0.77	[3.13, 6.15]	<0.001
<i>2003</i>	4.21	0.79	[2.67, 5.75]	<0.001
<i>2004</i>	5.60	0.80	[4.04, 7.17]	<0.001
<i>2005</i>	7.05	0.88	[5.32, 8.78]	<0.001
Site				<0.001 (11)
<i>Site 30</i>	0.86	1.26	[-1.60, 3.32]	0.50
<i>Site 60</i>	4.85	1.32	[2.25, 7.44]	<0.001
<i>Site 70</i>	1.02	1.34	[-1.61, 3.65]	0.45
<i>Site 90</i>	2.92	1.61	[-0.23, 6.08]	0.07
<i>Site 130</i>	4.34	1.54	[1.32, 7.36]	0.01
<i>Site 140</i>	-0.94	0.92	[-2.74, 0.86]	0.31
<i>Site 160</i>	1.46	1.11	[-0.71, 3.64]	0.19
<i>Site 170</i>	-0.76	1.08	[-2.88, 1.37]	0.49
<i>Site 190</i>	0.11	1.45	[-2.73, 2.96]	0.94
<i>Site 200</i>	-1.33	1.28	[-3.84, 1.17]	0.30
<i>Site 210</i>	-4.11	1.40	[-6.86, -1.36]	0.003
Constant	55.19	1.42	[52.40, 57.98]	<0.001

*df > 1 are denoted in parentheses

*Note: $\rho = 0.45$

This model contained 5046 observations on 783 patients, and showed a significant average improvement in the GAF of 1.13 points post-DST period compared to the pre-DST period (baseline), but no significant difference between the window period compared to pre-DST. Age and season were not statistically significant ($p = 0.13$ for age and $p = 0.58$ for season), and

overall Wald tests showed significant heterogeneity across both years and sites ($p < 0.001$ for each).

A comparable model was run for bipolar II patients (2227 observations on 392 patients), and the results are displayed in Table 10. In this model, we see a larger decrease in the window period than we did in the bipolar I model, though this effect still did not reach statistical significance. We see a negative effect of age in the bipolar II population, which is different in direction from that seen in the bipolar I model; however, neither effect reached statistical significance at the $\alpha = 0.05$ level. Finally, for the season variable, we see from Table 10 a stronger but non-significant effect in the bipolar II population, but the effect is in the opposite direction (we see a non-significant negative effect of fall season in the bipolar II group, whereas this effect was non-significant and positive for bipolar I patients). All other results obtained from this model were similar to those found in the bipolar I population, including the significant heterogeneity across sites and years. Although age and season were not statistically significant in Model 1 for either diagnostic category, both were kept in all subsequent models, as we wish to adjust for age and season is of primary interest in the research question under study.

Table 10. Results from main effects GEE model for GAF in bipolar II patients

Covariate	Coefficient	Standard Error	95% Confidence Interval	p-value(df*)
Age (per year)	-0.01	0.03	[-0.06, 0.04]	0.64
Fall Season	-0.61	0.38	[-1.36, 0.14]	0.11
Period				<0.001 (2)
<i>Post-DST</i>	1.12	0.32	[0.48, 1.75]	0.001
<i>Window period</i>	-0.77	0.55	[-1.86, 0.32]	0.17
Year				0.007 (5)
<i>2001</i>	0.72	1.45	[-2.12, 3.55]	0.62
<i>2002</i>	-1.64	1.41	[-4.40, 1.13]	0.25
<i>2003</i>	0.27	1.41	[-2.49, 3.03]	0.85
<i>2004</i>	-0.47	1.41	[-3.24, 2.30]	0.74
<i>2005</i>	-0.53	1.50	[-3.47, 2.42]	0.73
Site				<0.001 (11)
<i>Site 30</i>	-3.00	1.39	[-5.73, -0.27]	0.03
<i>Site 60</i>	3.16	1.41	[0.40, 5.92]	0.03
<i>Site 70</i>	-2.11	1.79	[-5.61, 1.39]	0.24
<i>Site 90</i>	-3.24	3.13	[-9.37, 2.90]	0.30
<i>Site 130</i>	1.08	1.72	[-2.29, 4.46]	0.53
<i>Site 140</i>	-2.53	1.07	[-4.63, -0.42]	0.02
<i>Site 160</i>	-1.03	1.00	[-2.99, 0.94]	0.31
<i>Site 170</i>	-1.61	1.57	[-4.70, 1.48]	0.31
<i>Site 190</i>	-4.70	2.14	[-8.89, -0.51]	0.03
<i>Site 200</i>	1.06	2.11	[-3.07, 5.20]	0.61
<i>Site 210</i>	-5.83	1.87	[-9.50, -2.15]	0.002
Constant	65.96	2.01	[62.03, 69.90]	<0.001

*Note: $\rho = 0.36$

I next fit Model 2 (Table 3), on bipolar I and bipolar II patients separately. The estimated exchangeable correlation coefficient for this model was 0.45 in the bipolar I group and 0.35 in the bipolar II group. The interaction between season and period did not reach statistical significance in either diagnostic group (bipolar I: $p = 0.48$; bipolar II: $p = 0.74$); consequently, this model was not considered further.

The next model fit was Model 3 (Table 3) to evaluate the interaction between season and year. In the bipolar I group the overall Wald test to evaluate the interaction term (season*year) was statistically significant ($p < 0.001$). In addition, the post-DST period showed a significant average improvement of 1.14 points on the GAF scale relative to pre-DST. The window period, however, was not found to be significant compared to the pre-DST period. I then tested whether the window period was significant relative to the post-DST period, and I found that there was a statistically significant difference between these two time periods ($p = 0.003$). Age was not significant in this model ($p = 0.17$), but a significant overall effect for the site variable was found ($p < 0.001$). The estimated exchangeable correlation coefficient for this model was $\rho = 0.45$.

In the bipolar II group, the interaction term for season*year also achieved statistical significance ($p = 0.002$). The post-DST score was on average 1.11 points higher on the GAF scale relative to the pre-DST GAF score ($p = 0.001$), and the window period showed no significant difference in average GAF score compared to baseline (pre-DST). A test comparing the window period to the post-DST period produced a significant result ($p = 0.001$). Age was not statistically significant ($p = 0.57$), but an overall Wald test for site produced a significant result ($p < 0.001$). The estimated exchangeable correlation coefficient for this model was $\rho = 0.36$.

Due to the significant interaction between year and season for both bipolar I and bipolar II patients, I then reparameterized Model 3 in terms of the sequence variable (season/year combination) in place of the interaction term to look at the specific effects of each season and year combination (Model 4). Results from this model for bipolar I patients are displayed in Table 11.

Table 11. Results from reparameterized GEE model for GAF in bipolar I patients

Covariate	Coefficient	Standard Error	95% Confidence Interval	p-value(df*)
Age (per year)	0.03	0.02	[-0.01, 0.08]	0.17
Period				<0.001 (2)
<i>Post-DST</i>	1.14	0.23	[0.68, 1.59]	<0.001
<i>Window period</i>	-0.06	0.39	[-0.82, 0.70]	0.88
Sequence				<0.001 (10)
<i>Fall 2000</i>	-4.34	1.94	[-8.14, -0.53]	0.03
<i>Spring 2001</i>	1.11	1.91	[-2.63, 4.86]	0.56
<i>Fall 2001</i>	0.15	1.88	[-3.55, 3.84]	0.94
<i>Spring 2002</i>	1.20	1.88	[-2.48, 4.88]	0.52
<i>Fall 2002</i>	0.37	1.87	[-3.29, 4.03]	0.84
<i>Spring 2003</i>	0.38	1.86	[-3.27, 4.03]	0.84
<i>Fall 2003</i>	0.02	1.86	[-3.63, 3.67]	0.99
<i>Spring 2004</i>	0.55	1.87	[-3.11, 4.21]	0.77
<i>Fall 2004</i>	2.65	1.86	[-1.00, 6.31]	0.15
<i>Spring 2005</i>	3.11	1.87	[-0.54, 6.77]	0.10
Site				<0.001 (11)
<i>Site 30</i>	0.86	1.25	[-1.59, 3.32]	0.49
<i>Site 60</i>	4.90	1.32	[2.30, 7.49]	<0.001
<i>Site 70</i>	1.24	1.34	[-1.39, 3.87]	0.36
<i>Site 90</i>	3.07	1.61	[-0.09, 6.23]	0.06
<i>Site 130</i>	4.52	1.54	[1.50, 7.54]	0.003
<i>Site 140</i>	-0.91	0.92	[-2.71, 0.89]	0.32
<i>Site 160</i>	1.57	1.11	[-0.61, 3.74]	0.16
<i>Site 170</i>	-0.56	1.08	[-2.69, 1.56]	0.61
<i>Site 190</i>	0.13	1.45	[-2.71, 2.98]	0.93
<i>Site 200</i>	-1.13	1.28	[-3.64, 1.38]	0.38
<i>Site 210</i>	-3.83	1.40	[-6.58, -1.08]	0.01
Constant	55.24	2.17	[54.98, 63.49]	<0.001

*Note: $p = 0.45$

*Window period was significantly different from post-DST period ($p = 0.003$)

Here we see that the GAF score increases, on average, by 1.14 points in the post-DST period compared to the pre-DST period ($p < 0.001$), and the window period is not statistically significant compared to the pre-DST period. Age did not achieve statistical significance in this model ($p =$

0.17). Site, however, was statistically significant ($p < 0.001$). An overall Wald test for the sequence variable produced a significant result ($p < 0.001$), which is what we would expect considering that the year*season interaction was significant in the previous model.

Model 4 (Table 3) was also run for bipolar II patients, and the results are summarized in Table 12. For bipolar II patients, the GAF score increases by 1.11 points, on average, in the post-DST period compared to pre-DST ($p = 0.001$). This is similar to what we found with the bipolar I patients. In addition, the window period is non-significant compared to the pre-DST period. I also performed a test comparing the window and post-DST periods, and a significant result was obtained ($p = 0.001$). The overall Wald test for the sequence variable produced a significant result, indicating that there are some significant differences present among these groups. This is what we would expect considering that the year*season interaction was significant in Model 3 (Table 3). It is interesting to note that all sequence effects in the bipolar II group were negative, while all of these effects were positive in the bipolar I group (with the exception of fall 2000). All other results were similar to those found in the bipolar I group.

Table 12. Results from reparameterized GEE model for GAF in bipolar II patients

Covariate	Coefficient	Standard Error	95% Confidence Interval	p-value(df*)
Age (per year)	-0.01	0.03	[-0.07, 0.04]	0.57
Period				<.001 (2)
<i>Post-DST</i>	1.11	0.32	[0.48, 1.74]	0.001
<i>Window period</i>	-0.79	0.55	[-1.87, 0.29]	0.15
Sequence				<0.001 (10)
<i>Fall 2000</i>	-5.66	5.45	[-16.35, 5.03]	0.30
<i>Spring 2001</i>	-3.17	5.44	[-13.84, 7.49]	0.56
<i>Fall 2001</i>	-5.32	5.40	[-15.90, 5.26]	0.32
<i>Spring 2002</i>	-4.80	5.39	[-15.37, 5.76]	0.37
<i>Fall 2002</i>	-8.05	5.37	[-18.58, 2.48]	0.13
<i>Spring 2003</i>	-5.37	5.38	[-15.90, 5.17]	0.32
<i>Fall 2003</i>	-4.66	5.38	[-15.21, 5.89]	0.39
<i>Spring 2004</i>	-5.69	5.38	[-16.24, 4.85]	0.29
<i>Fall 2004</i>	-5.54	5.38	[-16.09, 5.01]	0.30
<i>Spring 2005</i>	-5.34	5.38	[-15.89, 5.21]	0.32
Site				<0.001 (11)
<i>Site 30</i>	-3.09	1.39	[-1.59, 3.32]	0.03
<i>Site 60</i>	3.21	1.41	[2.30, 7.49]	0.02
<i>Site 70</i>	-2.23	1.79	[-1.39, 3.87]	0.21
<i>Site 90</i>	-2.71	3.13	[-0.09, 6.23]	0.39
<i>Site 130</i>	1.13	1.72	[1.50, 7.54]	0.51
<i>Site 140</i>	-2.59	1.07	[-2.71, 0.89]	0.02
<i>Site 160</i>	-1.15	1.00	[-0.61, 3.74]	0.25
<i>Site 170</i>	-1.55	1.58	[-2.69, 1.56]	0.33
<i>Site 190</i>	-4.96	2.14	[-2.71, 2.98]	0.02
<i>Site 200</i>	1.14	2.11	[-3.64, 1.38]	0.59
<i>Site 210</i>	-5.92	1.87	[-6.58, -1.08]	0.002
Constant	71.00	5.54	[60.15, 81.85]	<0.001

*Note: $p = 0.36$

*Window period was significantly different from post-DST period ($p = 0.001$)

The results from my diagnostic specific models showed that the best fitting model for both bipolar I and bipolar II patients was Model 4 (Table 3). This model produced significant

results in both diagnostic categories for all variables except age; however, this variable was kept in both final diagnosis specific models due to our desire to adjust for it.

After all of my diagnosis specific modeling was complete, I moved on to fit several combined models, this time including diagnostic category as a covariate rather than fitting two separate models based on this variable. The first combined model fit was a main effects model (Model 5 in Table 3), and the results are displayed in Table 13.

Table 13. Results from main effects GEE model for GAF in the combined dataset

Covariate	Coefficient	Standard Error	95% Confidence Interval	p-value(df*)
Age (per year)	0.02	0.02	[-0.02, 0.05]	0.32
Life Diagnosis (bipolar II)	1.16	0.48	[0.21, 2.11]	0.02
Period				<0.001 (2)
<i>Post-DST</i>	1.12	0.19	[0.76, 1.49]	<0.001
<i>Window period</i>	-0.28	0.32	[-0.90, 0.34]	0.37
Sequence				<0.001 (10)
<i>Fall 2000</i>	-3.97	1.78	[-7.46, -0.49]	0.03
<i>Spring 2001</i>	0.92	1.75	[-2.51, 4.36]	0.60
<i>Fall 2001</i>	-0.34	1.73	[-3.73, 3.06]	0.85
<i>Spring 2002</i>	0.61	1.73	[-2.78, 3.99]	0.73
<i>Fall 2002</i>	-0.91	1.72	[-4.27, 2.45]	0.60
<i>Spring 2003</i>	-0.15	1.71	[-3.51, 3.21]	0.93
<i>Fall 2003</i>	-0.20	1.71	[-3.55, 3.16]	0.91
<i>Spring 2004</i>	-0.14	1.72	[-3.50, 3.22]	0.93
<i>Fall 2004</i>	1.36	1.71	[-2.00, 4.72]	0.43
<i>Spring 2005</i>	1.73	1.72	[-1.63, 5.09]	0.31
Site				<0.001 (11)
<i>Site 30</i>	-0.47	0.97	[-2.37, 1.44]	0.63
<i>Site 60</i>	4.58	1.01	[2.60, 6.56]	<0.001
<i>Site 70</i>	0.30	1.10	[-1.86, 2.45]	0.79
<i>Site 90</i>	1.86	1.41	[-0.91, 4.63]	0.19
<i>Site 130</i>	3.57	1.20	[1.23, 5.92]	0.003
<i>Site 140</i>	-1.34	0.72	[-2.76, 0.08]	0.06
<i>Site 160</i>	0.59	0.78	[-0.93, 2.12]	0.45
<i>Site 170</i>	-0.94	0.90	[-2.71, 0.84]	0.30
<i>Site 190</i>	-1.15	1.22	[-3.54, 1.24]	0.35
<i>Site 200</i>	-0.95	1.09	[-3.09, 1.19]	0.38
<i>Site 210</i>	-4.38	1.14	[-6.63, -2.14]	<0.001
Constant	61.19	1.93	[57.41, 64.97]	<0.001

*Note: $\rho = 0.44$

As the table illustrates, diagnostic category is significant, indicating that GAF scores are 1.12 points higher on average for bipolar II patients than for otherwise similar bipolar I patients in the

post-DST period ($p < 0.001$). As with the diagnosis specific models, I again found a significant overall effect of the sequence variable ($p < 0.001$) and a significant effect of site ($p < 0.001$) in the combined main effects model. Age did not produce a significant result ($p = 0.32$).

After the combined main effects model was assessed, I looked at several combined interaction models. The first was Model 6 (Table 3), which assessed the interaction between diagnosis and period. The estimated exchangeable correlation coefficient for this model was $\rho = 0.44$. The overall Wald test for the interaction term did not reach statistical significance ($p = 0.57$); consequently, this model was not explored further. I also evaluated Model 7 (Table 3), which included an interaction between diagnosis and site. The estimated exchangeable correlation coefficient for this model was $\rho = 0.43$. I again found that the interaction term did not reach statistical significance ($p = 0.49$) so this model was also discarded.

The final combined model fit was Model 8 (Table 3), which looked at the interaction between life diagnosis and sequence. The results for this model are presented in Table 14.

Table 14. Combined GEE model for GAF with interaction between life diagnosis and sequence

Covariate	Coefficient	Standard Error	95% Confidence Interval	p-value(df*)
Age (per year)	0.02	0.02	[-0.02, 0.05]	0.33
Life Diagnosis (bipolar II)	7.13	5.92	[-4.46, 18.73]	0.23
Period				<0.001 (2)
<i>Post-DST</i>	1.13	0.19	[0.76, 1.49]	<0.001
<i>Window period</i>	-0.29	0.32	[-0.90, 0.33]	0.37
Sequence (bipolar I)				<0.001 (10)
<i>Spring 2000 (baseline)</i>	0			
<i>Fall 2000</i>	-4.38	1.87	[-8.05, -0.70]	0.02
<i>Spring 2001</i>	1.03	1.84	[-2.58, 4.65]	0.58
<i>Fall 2001</i>	0.09	1.82	[-3.47, 3.66]	0.96
<i>Spring 2002</i>	1.12	1.81	[-2.43, 4.68]	0.54
<i>Fall 2002</i>	0.28	1.80	[-3.25, 3.81]	0.88
<i>Spring 2003</i>	0.28	1.80	[-3.25, 3.80]	0.88
<i>Fall 2003</i>	-0.11	1.79	[-3.63, 3.41]	0.95
<i>Spring 2004</i>	0.41	1.80	[-3.12, 3.94]	0.82
<i>Fall 2004</i>	2.51	1.80	[-1.02, 6.03]	0.16
<i>Spring 2005</i>	2.97	1.80	[-0.56, 6.50]	0.10
Sequence (bipolar II)				
<i>Spring 2000 (baseline)</i>	7.13			
<i>Fall 2000</i>	1.94	2.32	[-2.61, 6.49]	0.40
<i>Spring 2001</i>	4.36	2.09	[0.26, 8.46]	0.04
<i>Fall 2001</i>	2.41	2.00	[-1.52, 6.33]	0.23
<i>Spring 2002</i>	2.84	1.97	[-1.02, 6.70]	0.15
<i>Fall 2002</i>	-0.42	1.89	[-4.13, 3.30]	0.83
<i>Spring 2003</i>	2.39	1.89	[-1.31, 6.10]	0.21
<i>Fall 2003</i>	3.03	1.88	[-0.66, 6.71]	0.11
<i>Spring 2004</i>	2.07	1.87	[-1.59, 5.73]	0.27
<i>Fall 2004</i>	2.26	1.87	[-1.40, 5.93]	0.23
<i>Spring 2005</i>	2.47	1.88	[-1.21, 6.16]	0.19
Diagnosis*Sequence				<0.001 (10)
Site				<0.001 (11)
<i>Site 30</i>	-0.41	0.97	[-2.31 1.50]	0.68
<i>Site 60</i>	4.47	1.01	[2.50, 6.45]	<0.001
<i>Site 70</i>	0.25	1.10	[-1.90, 2.41]	0.82

Table 14 continued				
<i>Site 90</i>	2.06	1.41	[-0.71, 4.83]	0.15
<i>Site 130</i>	3.43	1.20	[1.09, 5.78]	0.004
<i>Site 140</i>	-1.36	0.72	[-2.78, 0.05]	0.06
<i>Site 160</i>	0.58	0.78	[-0.95, 2.10]	0.46
<i>Site 170</i>	-0.91	0.90	[-2.68, 0.86]	0.32
<i>Site 190</i>	-1.10	1.22	[-3.49, 1.29]	0.37
<i>Site 200</i>	-0.89	1.09	[-3.03, 1.24]	0.41
<i>Site 210</i>	-4.37	1.14	[-6.61, -2.13]	<0.001
Constant	60.53	1.99	[56.62, 64.44]	<0.001

*Note: $\rho = 0.44$

*Window period was significantly different from post-DST period ($p < 0.001$)

As the table illustrates, the interaction between life diagnosis and sequence was significant ($p < 0.001$), indicating that the effect of season/year combination varies by diagnostic category. For bipolar I patients, the only significant sequence was fall 2000 ($p = 0.02$). This effect was not significant in the bipolar II group ($p = 0.40$). Spring 2001, however, was significant in the bipolar II population ($p = 0.04$), but not in the bipolar I group ($p = 0.58$). While all other sequences were non-significant for both groups, we did see a change in the direction of the effect for several sequences. For example, in fall 2000, we see a large negative effect in the bipolar I group, while this effect is small and positive in the bipolar II group. Also, in fall 2002, we see small effects in both groups, but the direction of this effect differs. Finally, in fall 2003 we see a small negative effect in the bipolar I patients, but a large positive effect in the bipolar II patients. I also found significant heterogeneity across sites ($p < 0.001$), as well as a significant effect of the post-DST period compared to the pre-DST period ($p < 0.001$). On average, the GAF score is 1.13 points higher after DST occurs compared to scores before DST. The window period was not significant compared to baseline (pre-DST); however, the window period did significantly differ from the post-DST period ($p < 0.001$). As in all previous models, age did not reach statistical significance at the $\alpha = 0.05$ level.

The results from my combined models showed the best fitting model to be Model 8 (Table 3). Although the diagnosis term in this model is non-significant ($p = 0.23$), the interaction (life diagnosis*sequence) is significant and should be included in the final model. Consequently, the life diagnosis term must be kept in the model even though it does not reach statistical significance as a main effect.

4.2.2 CGI (SECONDARY OUTCOME)

For the secondary outcome, I first fit diagnostic specific ordinal logistic regression main effects models (Model 1 Table 4), using the post variable (which treats observations in the window period as post-DST observations) in place of the period variable. The main effects models did not satisfy the proportional odds assumption (bipolar I: $p < 0.001$; bipolar II: $p < 0.001$), so I refit these models, and all subsequent models, using multinomial logit modeling. In the bipolar I group, I fit an initial main effects model (Model 1 Table 4) and then two subsequent interaction models (Models 2 and 3 Table 4). In models 2 and 3, neither of the interaction terms reached statistical significance (season*period: $p = 0.46$; season*year: $p = 0.60$). Since the season*year interaction term was not significant, Model 3 was not reparameterized in terms of the sequence variable and it was determined that Model 1 (Table 4) was the best fitting model for this group. The results from this model are summarized in Table 15.

Table 15. Main effects CGI model for bipolar I patients

Covariate	Log Odds	Standard Error	95% Confidence Interval	p-value(df*)
Borderline mentally ill				
<i>Age (per year)</i>	-0.002	0.005	[-0.01, 0.01]	0.73
<i>Fall Season</i>	0.19	0.12	[-0.04, 0.43]	0.11
<i>Post</i>	-0.12	0.11	[-0.34, 0.09]	0.26
Year				
<i>2001</i>	0.13	0.37	[-0.60, 0.86]	0.73
<i>2002</i>	-0.50	0.35	[-1.18, 0.19]	0.15
<i>2003</i>	-0.47	0.35	[-1.16, 0.21]	0.18
<i>2004</i>	-0.16	0.35	[-0.85, 0.53]	0.65
<i>2005</i>	-0.05	0.38	[-0.80, 0.70]	0.89
Mildly ill				
<i>Age (per year)</i>	0.002	0.005	[-0.01, 0.01]	0.66
<i>Fall Season</i>	0.01	0.12	[-0.22, 0.24]	0.91
<i>Post</i>	-0.06	0.11	[-0.27, 0.15]	0.59
Year				
<i>2001</i>	-0.07	0.37	[-0.79, 0.65]	0.86
<i>2002</i>	-0.46	0.34	[-1.13, 0.21]	0.18
<i>2003</i>	-0.49	0.35	[-1.16, 0.19]	0.16
<i>2004</i>	-0.11	0.35	[-0.79, 0.57]	0.75
<i>2005</i>	-0.36	0.38	[-1.10, 0.38]	0.34
Moderately ill				
<i>Age (per year)</i>	0.003	0.005	[-0.01, 0.01]	0.52
<i>Fall Season</i>	0.05	0.12	[-0.19, 0.28]	0.70
<i>Post</i>	-0.16	0.11	[-0.38, 0.05]	0.14
Year				
<i>2001</i>	-0.21	0.36	[-0.92, 0.50]	0.57
<i>2002</i>	-0.98	0.34	[-1.65, -0.31]	0.004
<i>2003</i>	-0.77	0.34	[-1.44, -0.10]	0.02
<i>2004</i>	-0.49	0.34	[-1.16, 0.19]	0.16
<i>2005</i>	-0.69	0.38	[-1.43, 0.05]	0.07
Markedly/severely/extremely ill				
<i>Age (per year)</i>	-0.01	0.01	[-0.02, 0.01]	0.29
<i>Fall Season</i>	0.24	0.14	[-0.05, 0.52]	0.10
<i>Post</i>	-0.33	0.13	[-0.59, -0.07]	0.01
Year				
<i>2001</i>	-0.78	0.42	[-1.60, 0.05]	0.07
<i>2002</i>	-0.90	0.38	[-1.65, -0.14]	0.02

Table 15 continued				
2003	-0.77	0.38	[-1.51, -0.02]	0.05
2004	-0.59	0.38	[-1.34, 0.16]	0.12
2005	-0.52	0.43	[-1.36, 0.32]	0.22

*Site was included in the model but the estimates are not shown

In this model, I found significant heterogeneity across both years and sites ($p < 0.001$ for each) but no significant effect of age or season ($p = 0.28$ for age and $p = 0.09$ for season). In particular, the years 2002 and 2003 were significant in both the moderately ill (2002: $p = 0.004$; 2003: $p = 0.02$) and markedly/severely/extremely ill (2002: $p = 0.02$; 2003: $p = 0.05$) groups. Also, in comparison to the pre-DST period, the post-DST period was not statistically significant overall ($p = 0.06$), but this variable did reach statistical significance in the markedly/severely/extremely ill category ($p = 0.01$). The odds ratio for this effect is 0.72, indicating that the odds of being markedly/severely/extremely ill compared to being normal/not at all ill (baseline) are lower post-DST than they are in the pre-DST period.

In the bipolar II group, I initially fit a main effects model (Model 1 Table 4), and then several interaction models (Models 2 and 3 Table 4). Some of the models could not be properly fit due to sparse data in certain categories. In particular, the baseline group for year (2000) had only 37 observations, so this group was deleted and the baseline was changed to the year 2004. The reason for choosing 2004 as the baseline as opposed to 2005 is because we only have data for spring 2005, as the study ended prior to the fall 2005 DST change, and we wanted to choose a baseline that contained data for both seasons. In addition, the model was unable to provide estimates for sites 90 and 210 for any of the models, so both of these sites were also deleted and the models were re-run. These deletions resulted in the loss of 104 observations and 22 patients, so we were then left with 2127 observations on 370 patients. In Models 2 and 3, neither of the interaction terms achieved statistical significance (season*period: $p = 0.77$; season*year: $p =$

0.43), so these two models were not considered further. There was no need to reparameterize the season*year interaction in terms of the sequence variable since the interaction term was not significant, so it was decided that Model 1 (Table 4) was the best fitting model in the bipolar II group. The results from this model are summarized in Table 16.

Table 16. Main effects CGI model for bipolar II patients

Covariate	Log Odds	Standard Error	95% Confidence Interval	p-value(df*)
Borderline mentally ill				
<i>Age (per year)</i>	0.01	0.01	[-0.01, 0.02]	0.46
<i>Fall Season</i>	0.25	0.19	[-0.12, 0.62]	0.18
<i>Post</i>	0.06	0.18	[-0.28, 0.41]	0.72
Year				
<i>2001</i>	-0.11	0.32	[-0.74, 0.52]	0.73
<i>2002</i>	0.09	0.27	[-0.45, 0.62]	0.75
<i>2003</i>	0.19	0.23	[-0.27, 0.65]	0.41
<i>2005</i>	0.11	0.29	[-0.46, 0.68]	0.71
Mildly ill				
<i>Age (per year)</i>	0.004	0.01	[-0.01, 0.02]	0.64
<i>Fall Season</i>	0.22	0.19	[-0.14, 0.59]	0.24
<i>Post</i>	-0.09	0.17	[-0.43, 0.25]	0.62
Year				
<i>2001</i>	0.06	0.32	[-0.56, 0.68]	0.86
<i>2002</i>	0.31	0.27	[-0.22, 0.83]	0.25
<i>2003</i>	0.13	0.23	[-0.33, 0.59]	0.58
<i>2005</i>	0.24	0.29	[-0.33, 0.81]	0.41
Moderately ill				
<i>Age (per year)</i>	0.01	0.01	[-0.01, 0.03]	0.26
<i>Fall Season</i>	0.27	0.19	[-0.12, 0.65]	0.17
<i>Post</i>	-0.22	0.18	[-0.57, 0.14]	0.24
Year				
<i>2001</i>	-0.25	0.34	[-0.91, 0.41]	0.47
<i>2002</i>	-0.08	0.28	[-0.63, 0.47]	0.78
<i>2003</i>	0.02	0.24	[-0.45, 0.49]	0.95
<i>2005</i>	-0.05	0.31	[-0.65, 0.55]	0.86
Table 16 continued				
Markedly/severely/extremely ill				
<i>Age (per year)</i>	0.01	0.01	[-0.01, 0.03]	0.30

Table 16 continued				
<i>Fall Season</i>	0.20	0.24	[-0.26, 0.67]	0.39
<i>Post</i>	0.02	0.22	[-0.41, 0.44]	0.94
<i>Year</i>				
<i>2001</i>	-0.27	0.44	[-1.14, 0.59]	0.54
<i>2002</i>	0.67	0.32	[-0.05, 1.30]	0.04
<i>2003</i>	0.27	0.30	[-0.32, 0.85]	0.37
<i>2005</i>	0.25	0.36	[-0.47, 0.96]	0.50

*Site was included in the model but the estimates are not shown

In this model, I found significant heterogeneity across sites ($p < 0.001$), but not across years ($p = 0.42$). However, I did find a significant effect of year in the markedly/severely/extremely ill group for the year 2002 ($p = 0.04$). The odds ratio for this effect was 1.95, indicating that for a patient in 2002, this person has higher odds of being markedly/severely/extremely ill compared to being normal/not at all ill (baseline) relative to an otherwise similar person in 2004. I found no significant effect of age ($p = 0.64$), season ($p = 0.72$) or post (post-DST versus pre-DST; $p = 0.25$) in this model.

The results for the diagnosis specific modeling done on the CGI showed that the best fitting model for both the bipolar I and the bipolar II populations was the main effects model. While the bipolar I model treated the year 2000 as the baseline, problems were encountered when fitting this model to the bipolar II patients due to the presence of sparse data in some categories. Therefore, the main effects model fit to the bipolar II patients differed from that fit to the bipolar I patients because the year 2004 was used as the baseline and the year 2000 was deleted for the purposes of the analysis. In addition, two of the eleven original sites were deleted from the bipolar analyses, again due to sparse data. These differences in the two models make it difficult to compare them as the baseline values differ for the year variable.

After my diagnosis specific models were complete, I then fit a series of combined models, including an initial main effects model and several interaction models (Models 4-8 Table 4). As with the bipolar II models, I again had trouble fitting several of the combined models due to sparse data in certain categories. While site 210 did not appear to be problematic as it was in the bipolar II models, the combined models were still unable to produce parameter estimates for site 90; consequently, this site was dropped. I also used the year 2004 as the baseline for the combined models, as I could not fit the models to the data using the year 2000 as the baseline; however, this year was kept in the model. These deletions resulted in the loss of 151 observations and 36 patients, leaving us with 7125 observations on 1138 individuals. For the main effects model (Model 4 Table 4), I found significant heterogeneity across both years and sites ($p = 0.001$ for year and $p < 0.001$ for site). In particular, in the moderately ill group, I found a significant effect of the year 2002 ($p = 0.002$). The odds ratio for this effect was 0.64, indicating that the odds of being in the moderately ill group compared to being normal/not at all ill (baseline) is lower for someone in 2002 relative to an otherwise similar person in 2004. Age was not statistically significant ($p = 0.35$), nor was season ($p = 0.18$). I also found that compared to the pre-DST period, the post-DST time period was also non-significant ($p = 0.17$). However, in the markedly/severely/extremely ill category, I did find a borderline significant effect of both season and the post variable ($p = 0.05$ for both). In addition, the diagnosis variable did not achieve statistical significance at the $\alpha = 0.05$ level ($p = 0.16$). However, this variable was significant in the mildly ill group ($p = 0.04$). The odds ratio for this effect was 1.23, indicating that the odds of being in the mildly ill category compared to being normal/not at all ill is higher for a bipolar II patient relative to an otherwise similar bipolar I patient. These results are summarized in Table 17.

Table 17. Main effects CGI model for combined dataset

Covariate	Log Odds	Standard Error	95% Confidence Interval	p-value(df*)
Borderline mentally ill				
<i>Age (per year)</i>	0.001	0.004	[-0.01, 0.01]	0.75
Life Diagnosis (Bipolar II)	0.12	0.11	[-0.09, 0.33]	0.27
<i>Fall Season</i>	0.18	0.10	[-0.02, 0.39]	0.07
<i>Post</i>	-0.08	0.09	[-0.26, 0.10]	0.39
Year				
<i>2000</i>	0.19	0.30	[-0.41, 0.78]	0.54
<i>2001</i>	0.20	0.18	[-0.15, 0.55]	0.26
<i>2002</i>	-0.24	0.14	[-0.50, 0.03]	0.09
<i>2003</i>	-0.12	0.13	[-0.37, 0.13]	0.35
<i>2005</i>	0.09	0.16	[-0.23, 0.41]	0.59
Mildly ill				
<i>Age (per year)</i>	0.004	0.004	[-0.004, 0.01]	0.37
Life Diagnosis (Bipolar II)	0.21	0.11	[0.01, 0.42]	0.04
<i>Fall Season</i>	0.08	0.10	[-0.12, 0.27]	0.45
<i>Post</i>	-0.06	0.09	[-0.25, 0.12]	0.49
Year				
<i>2000</i>	-0.02	0.31	[-0.62, 0.58]	0.94
<i>2001</i>	0.05	0.18	[-0.30, 0.39]	0.79
<i>2002</i>	-0.17	0.13	[-0.44, 0.09]	0.20
<i>2003</i>	-0.17	0.13	[-0.42, 0.08]	0.19
<i>2005</i>	-0.08	0.16	[-0.40, 0.24]	0.64
Moderately ill				
<i>Age (per year)</i>	0.01	0.004	[-0.002, 0.01]	0.14
Life Diagnosis (Bipolar II)	0.14	0.11	[-0.07, 0.36]	0.19
<i>Fall Season</i>	0.11	0.10	[-0.09, 0.31]	0.29
<i>Post</i>	-0.16	0.10	[-0.35, 0.02]	0.09
Year				
<i>2000</i>	0.39	0.30	[-0.19, 0.98]	0.19
<i>2001</i>	0.13	0.18	[-0.22, 0.49]	0.47
<i>2002</i>	-0.44	0.14	[-0.72, -0.17]	0.002
<i>2003</i>	-0.10	0.13	[-0.36, 0.15]	0.44
<i>2005</i>	-0.14	0.17	[-0.48, 0.19]	0.40
Markedly/severely/extremely ill				
<i>Age (per year)</i>	0.001	0.005	[-0.01, 0.01]	0.88
Life Diagnosis (Bipolar II)	0.02	0.13	[-0.23, 0.27]	0.88
<i>Fall Season</i>	0.24	0.12	[-0.003, 0.48]	0.05
<i>Post</i>	-0.22	0.11	[-0.44, -0.002]	0.05
Year				

Table 17 continued				
2000	0.41	0.34	[-0.25, 1.08]	0.22
2001	-0.31	0.23	[-0.77, 0.15]	0.18
2002	-0.12	0.16	[-0.44, 0.20]	0.47
2003	0.02	0.15	[-0.28, 0.32]	0.88
2005	0.12	0.20	[-0.27, 0.52]	0.53

*Site was included in the model but the estimates are not shown

Next I fit several interaction models focusing on life diagnosis (Models 5-8 Table 4). None of the interaction terms in Models 5-7 reached statistical significance ($p = 0.13$ for diagnosis* post, $p = 0.10$ for diagnosis*year, and $p = 0.64$ for diagnosis*season). Consequently, these models were not considered further. Model 8, which looked at the interaction between diagnosis and site, was the only combined model that was unable to be fit based on the criteria described in the previous paragraphs. Site 210 presented a problem in this model, so the model was tested both with site 210 in the dataset and also with site 210 deleted. The results were similar for both models, so the model with site 210 excluded was used. The exclusion of this site (along with site 90) resulted in the loss of 406 observations and 95 patients, leaving us with 6870 observations on 1079 individuals. In this model, the interaction term was statistically significant ($p < 0.001$), as were the main effects for both site ($p < 0.001$) and diagnosis ($p = 0.01$). An overall test for age was not non-significant ($p = 0.19$) and relative to the pre-DST period, the post-DST period was not significant ($p = 0.12$). In addition, season did not reach statistical significance at the $\alpha = 0.05$ level ($p = 0.21$).

The results from the model fitting in the combined dataset indicate that the best fitting model is the main effects model (Model 1 Table 4). While the interaction between site and diagnosis was significant, a lot of observations as well as patients were lost in fitting this model due to sparse data in several categories, so it was decided that this model was not the best fitting for these data.

5.0 DISCUSSION

The present study looked at the association of DST with overall functioning and clinical severity of symptoms in bipolar patients. Circadian abnormalities are thought to play a role in the development of bipolar disorder, and the semi-annual occurrence of DST brings about a natural shift in circadian functioning. While the effect of DST has been studied in normal populations, little has been done to look at its effect in bipolar patients.

A subset of data from a bipolar disorder treatment and maintenance trial were analyzed, focusing on two response variables. The first was the GAF, which was analyzed using GEE, and the second was the CGI, analyzed first with ordinal models and subsequently with multinomial logistic regression. We hypothesized that functioning and symptoms would worsen following spring DST changes, while improving after fall DST changes. We also took diagnosis (bipolar I versus bipolar II into account), as we anticipated that the impact of DST might vary by diagnostic category.

The results for the GAF showed a statistically significant effect of DST on GAF scores, with scores improving following DST, though these changes were small in magnitude. Contrary to our hypothesis, season did not play a role in the direction of the effect; however, the effect did vary significantly among season/year combinations. Our hypothesis regarding the diagnosis variable was confirmed; we found GAF scores to be significantly higher in bipolar II patients, indicating better overall functioning.

The analyses on the CGI showed no significant differences in severity of symptoms post-DST compared to pre-DST in either group (bipolar I or bipolar II). This effect remained non-significant in the combined model. Similar results were obtained with respect to the season variable, contrary to our original hypothesis. In the combined model, we found that the effect of diagnosis varied significantly across sites, but again we found no statistically significant results regarding differences in symptom severity post-DST compared to the pre-DST period.

This study has both strengths and limitations. Some of the strengths include the large sample size, which increases the power of our analyses, the relatively small amount of missing data on the outcome variables, and the inclusion of several outcome variables which allowed us to assess both global functioning as well as clinical severity of symptoms. One major limitation is that medication status was not taken into account in the current study. The data were not collected for the purpose of the present inquiry, and as a result the way in which the medication data was collected and coded prevented it from being of practical use in our study. Another limitation centers on the issue we encountered with the window period. Although we accounted for this problem in our analyses, a daily rather than weekly GAF score would have been more informative for the purposes of addressing the question of interest.

The overall results of this study indicate that while DST changes are significantly associated with changes in overall functioning, the magnitude of these differences are not of much clinical relevance. We also found that DST is not significantly associated with clinical symptom severity as measured by the CGI. It is important to mention that during our analyses, we realized that there were sparse data in some categories, which may have affected our results. In particular, we encountered very small samples sizes in the spring 2000 category. This sequence was treated as the baseline category for all of our GEE analyses, and several of the CGI

analyses, so these results should be interpreted with caution, as it is likely that there are issues with sensitivity to the small number of observations in the baseline group. Also of relevance is the fact that throughout the course of a bipolar patient's illness, it is possible for the patient to switch from a bipolar II diagnosis to a bipolar I (though not from bipolar I to II), and this was not taken into account in the present study. In future studies, I would recommend taking medication status into account, as well as performing diagnostics and sensitivity analyses on all models. It would also be of interest to see if these results are consistent across other outcome variables aside from the two considered here. In addition, I would recommend deleting the spring 2000 values due to the small number of observations in this category, and instead choosing a baseline group with a larger sample size. Finally, I would suggest performing contrasts on the sequence variable in order to evaluate whether any of the season/year combinations differ from one another.

APPENDIX A

STATA PROGRAM USED IN ANALYSIS

Reading in the data

```
.insheet using "C:\Documents and  
Settings\Mary\Desktop\GRP_FINAL_100206\Thesis Data to Use\final_data(4-17).csv"  
(45 vars, 7315 obs)
```

Labeling the variables

```
. label var public_id "id"  
. label var lifedx "life_diagnosis"  
. label var cmf_dayscons "days_from_consent"  
. label var cmf_year "year"  
. label var dst_time "fall"  
. label var cmf_from_dst "days_before/after_DST"  
. label var grp_step_enrol_final_age "age_at_consent"  
. label var grp_step_enrol_final_gender "gender"  
. label var grp_cmf_final_curdepr "current_depression"  
. label var grp_cmf_final_curenjoy "less_joy"  
. label var grp_cmf_final_curmania "current_mania"  
. label var grp_cmf_final_curirrit "current_irritability"  
. label var grp_cmf_final_deprmd "depressed_mood"  
. label var grp_cmf_final_depsleep "depressed_sleep"
```

. label var grp_cmf_final_depsslmin "depr_sleep_min"
. label var grp_cmf_final_depsslmax "depr_sleep_max"
. label var grp_cmf_final_depenerg "depr_energy"
. label var grp_cmf_final_depconcn "depr_concentration"
. label var grp_cmf_final_depdist "depr_distractibility"
. label var grp_cmf_final_depappet "depr_appetite"
. label var grp_cmf_final_elvselfe "elev_self_esteem"
. label var grp_cmf_final_elvsleep "elev_sleep"
. label var grp_cmf_final_elvtalk "elev_talking"
. label var grp_cmf_final_elvfoi "elev_racing_thoughts"
. label var grp_cmf_final_elvdistr "elev_distractibility"
. label var grp_cmf_final_elvgdact "elev_goal_dir_activity"
. label var grp_cmf_final_elvpma "elev_PMA"
. label var grp_cmf_final_elvhrb "elev_hi_risk_behavior"
. label var grp_cmf_final_cdcaf "cups_day_caffeine"
. label var grp_cmf_final_ppd "packs_day_nicotene"
. label var grp_cmf_final_alcabuse "alcohol_abuse"
. label var grp_cmf_final_subabuse "substance_abuse"
. label var grp_cmf_final_genmedtx "general_med_trt"
. label var grp_cmf_final_sigilln "signif_medical_illness"
. label var grp_cmf_final_weight "weight"
. label var grp_cmf_final_psimo "psychosocial_interventions_month"
. label var grp_cmf_final_ectmo "ECT_month"
. label var grp_cmf_final_smspi "severity_PI"
. label var grp_cmf_final_smsior "severity_IOR"
. label var grp_cmf_final_smsocd "severity_OCD"
. label var grp_cmf_final_smshallu "severity_hallucinations"
. label var grp_cmf_final_smsdelus "severity_delusions"

```

. label var grp_cmf_final_clinostat "clinical_status"
. label var grp_cmf_final_cgi "CGI_score"
. label var grp_cmf_final_gafweek "GAF_score_week"
. label var grp_cmf_final_site_id "site"

```

Defining and labeling values for the variables

```

. label define dx 1 BPI 2 BPII -6 unknown

. label values lifedx dx

. label define sex 1 male 2 female 3 transgender

. label values grp_step_enrol_final_gender sex

. label define symptoms -6 unknown 1 no 2 probable 3 definite

. label values grp_cmf_final_curdepr symptoms
. label values grp_cmf_final_curenjoy symptoms
. label values grp_cmf_final_curmania symptoms
. label values grp_cmf_final_curirrit symptoms

. label define depmd -8 not_on_original_form -6 unknown

. label values grp_cmf_final_deprmd depmd

. label define sleep -6 unknown

. label values grp_cmf_final_depsleep sleep
. label values grp_cmf_final_depsslmin sleep
. label values grp_cmf_final_depsslmax sleep
. label values grp_cmf_final_depenerg sleep
. label values grp_cmf_final_depconcn sleep
. label values grp_cmf_final_depdist sleep
. label values grp_cmf_final_depappet sleep
. label values grp_cmf_final_elvselfe sleep
. label values grp_cmf_final_elvsleep sleep
. label values grp_cmf_final_elvtalk sleep
. label values grp_cmf_final_elvfoi sleep
. label values grp_cmf_final_elvdistr sleep

```

```

. label values grp_cmf_final_elvgdact sleep
. label values grp_cmf_final_elvpma sleep
. label values grp_cmf_final_elvhrb sleep
. label values grp_cmf_final_cdcaf sleep
. label values grp_cmf_final_smspi sleep
. label values grp_cmf_final_smsior sleep
. label values grp_cmf_final_smsocd sleep
. label values grp_cmf_final_smshallu sleep
. label values grp_cmf_final_smsdelus sleep
. label define nicotene -6 unknown
. label values  grp_cmf_final_ppd nicotene
. label define abuse -6 unknown 0 no 1 yes
. label values grp_cmf_final_alcabuse abuse
. label values grp_cmf_final_subabuse abuse
. label values grp_cmf_final_genmedtx abuse
. label values grp_cmf_final_sigilln abuse
. label define wt -8 not_on_original_form -7 refused -6 unknown
. label values grp_cmf_final_weight wt
. label define gaf -6 unknown
. label values grp_cmf_final_gafweek gaf
. label values grp_cmf_final_cgi gaf

```

Description of variables

```
. describe
```

Contains data

```

obs:          7,315
vars:         45
size:        746,130 (97.8% of memory free)

```

```
-----
```

variable name	storage type	display format	value label	variable label
---------------	--------------	----------------	-------------	----------------

```
-----
```

public_id	long	%12.0g		id
lifedx	byte	%8.0g	dx	life_diagnosis
cmf_dayscons	int	%8.0g		days_from_consent
grp_cmf_fina~de	int	%8.0g		GRP_CMF_FINAL_CERTCODE
cmf_year	int	%8.0g		year
dst_time	byte	%8.0g		fall
cmf_from_dst	byte	%8.0g		days_before/after_DST
grp_step_enro~e	byte	%8.0g		age_at_enrollment
grp_step_enro~r	byte	%11.0g	sex	gender
grp_cmf_fina~pr	byte	%8.0g	symptoms	current_depression
grp_cmf_fina~y	byte	%8.0g	symptoms	less_joy
grp_cmf_fina~ia	byte	%8.0g	symptoms	current_mania
grp_cmf_fina~it	byte	%8.0g	symptoms	current_irritability
grp_cmf_fina~md	float	%20.0g	depmd	depressed_mood
grp_cmf_~psleep	float	%9.0g	sleep	depressed_sleep
grp_cmf_fina~in	byte	%8.0g	sleep	depr_sleep_min
grp_cmf_fina~ax	byte	%8.0g	sleep	depr_sleep_max
grp_cmf_fina~g	float	%9.0g	sleep	depr_energy
grp_cmf_fina~cn	float	%9.0g	sleep	depr_concentration
grp_cmf_fina~st	float	%9.0g	sleep	depr_distractibility
grp_cmf_fina~et	float	%9.0g	sleep	depr_appetite
grp_cmf_fina~fe	float	%9.0g	sleep	elev_self_esteem
grp_cmf_~vsleep	float	%9.0g	sleep	elev_sleep
grp_cmf_fina~lk	float	%9.0g	sleep	elev_talking
grp_cmf_fina~oi	float	%9.0g	sleep	elev_racing_thoughts
grp_cmf_fina~tr	float	%9.0g	sleep	elev_distractibility
grp_cmf_fina~ct	float	%9.0g	sleep	elev_goal_dir_activity
grp_cmf_fina~ma	float	%9.0g	sleep	elev_PMA
grp_cmf_fina~b	float	%9.0g	sleep	elev_hi_risk_behavior
grp_cmf_fina~f	byte	%8.0g	sleep	cups_day_caffeine
grp_cmf_fina~pd	float	%9.0g	nicotene	packs_day_nicotine
grp_cmf_~cabuse	byte	%8.0g	abuse	alcohol_abuse
grp_cmf_~babuse	byte	%8.0g	abuse	substance_abuse
grp_cmf_fina~tx	byte	%8.0g	abuse	general_med_trt
grp_cmf_fina~ln	byte	%8.0g	abuse	signif_medical_illness
grp_cmf_fina~ht	int	%20.0g	wt	weight
grp_cmf_fina~pi	byte	%8.0g	sleep	severity_PI
grp_cmf_fina~or	byte	%8.0g	sleep	severity_IOR
grp_cmf_fina~cd	byte	%8.0g	sleep	severity_OCD
grp_cmf_fina~u	byte	%8.0g	sleep	severity_hallucinations
grp_cmf_fina~s	byte	%8.0g	sleep	severity_delusions
grp_cmf_fina~at	byte	%8.0g		clinical_status
grp_cmf_fina~gi	byte	%8.0g	gaf	CGI_score
grp_cmf_fina~ek	byte	%8.0g	gaf	GAF_score_week
grp_cmf_fina~id	int	%8.0g		site

--
Sorted by:
Note: dataset has changed since last saved
. codebook

public_id
id

```

type: numeric (long)
range: [7.803e+08,7.805e+08] units: 1
unique values: 1175 missing .: 0/7315

mean: 7.8e+08
std. dev: 73749.3

percentiles:      10%      25%      50%      75%      90%
                  7.8e+08  7.8e+08  7.8e+08  7.8e+08  7.8e+08

```

```

-----
lifedx
life_diagnosis
-----

```

```

type: numeric (byte)
label: dx

range: [1,2] units: 1
unique values: 2 missing .: 0/7315

tabulation: Freq.  Numeric  Label
              5076      1     BPI
              2239      2     BPII

```

```

-----
cmf_dayscons
days_from_consent
-----

```

```

type: numeric (int)
range: [-1822,736] units: 1
unique values: 1859 missing .: 0/7315

mean: -202.338
std. dev: 470.873

percentiles:      10%      25%      50%      75%      90%
                  -877      -509      -113      126      344

```

```

-----
grp_cmf_final_certcode
GRP_CMF_FINAL_CERTCODE
-----

```

```

type: numeric (int)
range: [1100,21244] units: 1

```

```

unique values: 123                               missing .: 0/7315
      mean:    11263.4
      std. dev: 6734.35

percentiles:      10%      25%      50%      75%      90%
                  1159     3182     14185    16155    19161

```

```

-----
cmf_year
year
-----

```

```

      type: numeric (int)
      range: [2000,2005]           units: 1
unique values: 6                   missing .: 0/7315

tabulation:  Freq.  Value
              224   2000
              727   2001
             1420   2002
             1848   2003
             2160   2004
              936   2005

```

```

-----
dst_time
fall
-----

```

```

      type: numeric (byte)
      range: [0,1]                 units: 1
unique values: 2                   missing .: 0/7315

tabulation:  Freq.  Value
              3733   0
              3582   1

```

```

-----
cmf_from_dst
days_before/after_DST
-----

```

```

      type: numeric (byte)
      range: [-30,30]             units: 1
unique values: 61                 missing .: 0/7315

      mean:    -.30663

```

std. dev: 17.2236

percentiles: 10% 25% 50% 75% 90%
 -24 -16 -2 16 24

grp_step_enrol_final_age
age_at_enrollment

type: numeric (byte)

range: [17,85] units: 1
unique values: 62 missing .: 0/7315

mean: 43.2596
std. dev: 12.422

percentiles: 10% 25% 50% 75% 90%
 27 33 44 52 59

grp_step_enrol_final_gender
gender

type: numeric (byte)
label: sex

range: [1,3] units: 1
unique values: 3 missing .: 0/7315

tabulation:	Freq.	Numeric	Label
	2864	1	male
	4441	2	female
	10	3	transgender

grp_cmf_final_curdepr
current_depression

type: numeric (byte)
label: symptoms

range: [-6,3] units: 1
unique values: 4 missing .: 0/7315

tabulation:	Freq.	Numeric	Label
	10	-6	unknown
	4431	1	no

931 2 probable
1943 3 definite

grp_cmf_final_curenjoy
less_joy

type: numeric (byte)
label: symptoms

range: [-6,3] units: 1
unique values: 4 missing .: 0/7315

tabulation: Freq. Numeric Label
16 -6 unknown
4432 1 no
810 2 probable
2057 3 definite

grp_cmf_final_curmania
current_mania

type: numeric (byte)
label: symptoms

range: [-6,3] units: 1
unique values: 4 missing .: 0/7315

tabulation: Freq. Numeric Label
15 -6 unknown
6485 1 no
393 2 probable
422 3 definite

grp_cmf_final_curirrit
current_irritability

type: numeric (byte)
label: symptoms

range: [-6,3] units: 1
unique values: 4 missing .: 0/7315

tabulation: Freq. Numeric Label
26 -6 unknown
5590 1 no
769 2 probable

930 3 definite

grp_cmf_final_deprmd
depressed_mood

type: numeric (float)
label: deprmd, but 16 nonmissing values are not labeled
range: [-8,2] units: .01
unique values: 18 missing .: 0/7315
examples: 0
 0
 .5
 1

grp_cmf_final_depsleep
depressed_sleep

type: numeric (float)
label: sleep, but 18 nonmissing values are not labeled
range: [-6,2] units: .01
unique values: 19 missing .: 0/7315
examples: -.75
 0
 0
 .5

grp_cmf_final_depslmin
depr_sleep_min

type: numeric (byte)
label: sleep, but 20 nonmissing values are not labeled
range: [-6,20] units: 1
unique values: 21 missing .: 0/7315
examples: 4
 6
 7
 8

grp_cmf_final_depslmax
depr_sleep_max

 type: numeric (byte)
 label: sleep, but 24 nonmissing values are not labeled

 range: [-6,24] units: 1
unique values: 25 missing .: 0/7315

examples: 7
 8
 9
 11

grp_cmf_final_depenerg
depr_energy

 type: numeric (float)
 label: sleep, but 18 nonmissing values are not labeled

 range: [-6,2] units: .01
unique values: 19 missing .: 0/7315

examples: -1
 -.5
 0
 0

grp_cmf_final_depconcn
depr_concentration

 type: numeric (float)
 label: sleep, but 14 nonmissing values are not labeled

 range: [-6,1.5] units: .01
unique values: 15 missing .: 0/7315

examples: -1
 -.5
 0
 0

grp_cmf_final_depdist
depr_distractibility


```
      type: numeric (float)
      label: sleep, but 15 nonmissing values are not labeled

      range: [-6,2]                units: .01
unique values: 16                missing .: 0/7315

      examples: 0
                0
                .5
                1
```


grp_cmf_final_depappet
depr_appetite


```
      type: numeric (float)
      label: sleep, but 17 nonmissing values are not labeled

      range: [-6,2]                units: .01
unique values: 18                missing .: 0/7315

      examples: -.5
                0
                0
                .5
```


grp_cmf_final_elvselfe
elev_self_esteem


```
      type: numeric (float)
      label: sleep, but 17 nonmissing values are not labeled

      range: [-6,2]                units: .01
unique values: 18                missing .: 0/7315

      examples: -1
                0
                0
                0
```


grp_cmf_final_elvsleep
elev_sleep


```
      type: numeric (float)
      label: sleep, but 15 nonmissing values are not labeled

      range: [-6,2]                units: .01
```

unique values: 16 missing .: 0/7315

examples: 0
0
0
0

grp_cmf_final_elvtalk
elev_talking

type: numeric (float)
label: sleep, but 15 nonmissing values are not labeled

range: [-6,2] units: .01
unique values: 16 missing .: 0/7315

examples: 0
0
0
0

grp_cmf_final_elvfoi
elev_racing_thoughts

type: numeric (float)
label: sleep, but 12 nonmissing values are not labeled

range: [-6,2] units: .01
unique values: 13 missing .: 0/7315

examples: 0
0
0
.5

grp_cmf_final_elvdistr
elev_distractibility

type: numeric (float)
label: sleep, but 14 nonmissing values are not labeled

range: [-6,2] units: .01
unique values: 15 missing .: 0/7315

examples: 0
0
.5

```
grp_cmf_final_elvgdact
elev_goal_dir_activity
```

```
      type: numeric (float)
      label: sleep, but 15 nonmissing values are not labeled

      range: [-6,2]                units: .01
unique values: 16                  missing .: 0/7315

      examples: 0
                0
                0
                0
```

```
grp_cmf_final_elvpma
elev_PMA
```

```
      type: numeric (float)
      label: sleep, but 11 nonmissing values are not labeled

      range: [-6,2]                units: .01
unique values: 12                  missing .: 0/7315

      examples: 0
                0
                0
                .5
```

```
grp_cmf_final_elvhrb
elev_hi_risk_behavior
```

```
      type: numeric (float)
      label: sleep, but 9 nonmissing values are not labeled

      range: [-6,2]                units: .01
unique values: 10                  missing .: 0/7315

      examples: 0
                0
                0
                0
```

grp_cmf_final_cdcaf
cups_day_caffeine

type: numeric (byte)
label: sleep, but 17 nonmissing values are not labeled
range: [-6,25] units: 1
unique values: 18 missing .: 0/7315
examples: 0
 0
 1
 2

grp_cmf_final_ppd
packs_day_nicotene

type: numeric (float)
label: nicotine, but 33 nonmissing values are not labeled
range: [-6,4] units: .01
unique values: 34 missing .: 0/7315
examples: 0
 0
 0
 .40000001

grp_cmf_final_alcabuse
alcohol_abuse

type: numeric (byte)
label: abuse
range: [-6,1] units: 1
unique values: 3 missing .: 0/7315
tabulation: Freq. Numeric Label
 59 -6 unknown
 6969 0 no
 287 1 yes

grp_cmf_final_subabuse
substance_abuse

```
type: numeric (byte)
label: abuse

range: [-6,1]
unique values: 3

units: 1
missing .: 0/7315
```

```
tabulation: Freq.   Numeric  Label
              62      -6   unknown
              7074     0     no
              179      1     yes
```

grp_cmf_final_genmedtx
general_med_trt

```
type: numeric (byte)
label: abuse

range: [-6,1]
unique values: 3

units: 1
missing .: 0/7315
```

```
tabulation: Freq.   Numeric  Label
              191      -6   unknown
              6035     0     no
              1089     1     yes
```

grp_cmf_final_sigilln
signif_medical_illness

```
type: numeric (byte)
label: abuse

range: [-6,1]
unique values: 3

units: 1
missing .: 0/7315
```

```
tabulation: Freq.   Numeric  Label
              285      -6   unknown
              5367     0     no
              1663     1     yes
```

grp_cmf_final_weight
weight

```
type: numeric (int)
label: wt, but 238 nonmissing values are not labeled

range: [-8,405]

units: 1
```

unique values: 241 missing .: 0/7315

examples: -6 unknown
146
180
215

grp_cmf_final_smspi
severity_PI

type: numeric (byte)
label: sleep, but 5 nonmissing values are not labeled
range: [-6,4] units: 1
unique values: 6 missing .: 0/7315

tabulation:	Freq.	Numeric	Label
	41	-6	unknown
	6719	0	
	376	1	
	145	2	
	30	3	
	4	4	

grp_cmf_final_smsior
severity_IOR

type: numeric (byte)
label: sleep, but 5 nonmissing values are not labeled
range: [-6,4] units: 1
unique values: 6 missing .: 0/7315

tabulation:	Freq.	Numeric	Label
	41	-6	unknown
	7126	0	
	91	1	
	45	2	
	10	3	
	2	4	

grp_cmf_final_smsocd
severity_OCD

type: numeric (byte)
label: sleep, but 5 nonmissing values are not labeled

range: [-6,4] units: 1
unique values: 6 missing .: 0/7315

tabulation:	Freq.	Numeric	Label
	47	-6	unknown
	6837	0	
	215	1	
	157	2	
	55	3	
	4	4	

grp_cmf_final_smshallu
severity_hallucinations

type: numeric (byte)
label: sleep, but 5 nonmissing values are not labeled

range: [-6,4] units: 1
unique values: 6 missing .: 0/7315

tabulation:	Freq.	Numeric	Label
	61	-6	unknown
	7028	0	
	142	1	
	71	2	
	11	3	
	2	4	

grp_cmf_final_smsdelus
severity_delusions

type: numeric (byte)
label: sleep, but 5 nonmissing values are not labeled

range: [-6,4] units: 1
unique values: 6 missing .: 0/7315

tabulation:	Freq.	Numeric	Label
	65	-6	unknown
	7139	0	
	50	1	
	39	2	
	13	3	
	9	4	

grp_cmf_final_clinostat
clinical_status

type: numeric (byte)
range: [1,9] units: 1
unique values: 9 missing .: 0/7315

tabulation:	Freq.	Value
	1644	1
	103	2
	75	3
	141	4
	1125	5
	378	6
	1895	7
	1953	8
	1	9

grp_cmf_final_cgi
CGI_score

type: numeric (byte)
label: gaf, but 7 nonmissing values are not labeled
range: [-6,7] units: 1
unique values: 8 missing .: 0/7315

tabulation:	Freq.	Numeric	Label
	39	-6	unknown
	626	1	
	2001	2	
	2188	3	
	1752	4	
	601	5	
	105	6	
	3	7	

grp_cmf_final_gafweek
GAF_score_week

type: numeric (byte)
label: gaf, but 68 nonmissing values are not labeled
range: [-6,90] units: 1
unique values: 69 missing .: 0/7315
examples: 55
60
65

```
-----
grp_cmf_final_site_id
site
-----
```

```

                type:  numeric (int)
                range:  [10,210]
unique values:  12
                units:  10
                missing .:  0/7315

                mean:    111.044
                std. dev: 67.3416

percentiles:    10%      25%      50%      75%      90%
                10       30       140     160     190

```

Creation of post, period, and window variables (discussed in Section 3.2)

```
. gen post =1

. replace post = 0 if cmf_from_dst <0
(3685 real changes made)

. label variable post "post_DST"

. label define pos 0 pre 1 post

. label values post pos

. tabulate post
```

post	Freq.	Percent	Cum.
pre	3,685	50.38	50.38
post	3,630	49.62	100.00
Total	7,315	100.00	

```
. gen period =1

. replace period =0 if post ==0
(3685 real changes made)

. replace period =2 if cmf_from_dst >-1 & cmf_from_dst <7
(725 real changes made)

. label variable period "period"

. label define per 0 pre 1 post 2 window

. label values period per

. tabulate period
```

period	Freq.	Percent	Cum.
--------	-------	---------	------

pre	3,685	50.38	50.38
post	2,905	39.71	90.09
window	725	9.91	100.00

Total	7,315	100.00	

```
. generate window = 1
```

```
. replace window =0 if post ==0  
(3685 real changes made)
```

```
. replace window = . if cmf_from_dst >-1 & cmf_from_dst <7  
(725 real changes made, 725 to missing)
```

```
. label variable window "window"
```

```
. label values window pos
```

```
. tabulate window
```

window	Freq.	Percent	Cum.
pre	3,685	55.92	55.92
post	2,905	44.08	100.00

Total	6,590	100.00	

Creation of sequence (year/season combination) variable (discussed in Section 3.2)

```
. egen sequence = group ( cmf_year dst_time)
```

```
. label var sequence "sequence"
```

```
. label define seq 1 Spring_2000 2 Fall_2000 3 Spring_2001 4 Fall_2001 5  
Spring_2002 6 Fall_2002 7 Spring_2003 8 Fall_2003 9 Spring_2004 10 Fall_2004 11  
Spring_2005
```

```
. label values sequence seq
```

```
. tabulate sequence
```

sequence	Freq.	Percent	Cum.
Spring_2000	33	0.45	0.45
Fall_2000	191	2.61	3.06
Spring_2001	269	3.68	6.74
Fall_2001	458	6.26	13.00
Spring_2002	539	7.37	20.37
Fall_2002	881	12.04	32.41
Spring_2003	920	12.58	44.99
Fall_2003	928	12.69	57.68
Spring_2004	1,036	14.16	71.84
Fall_2004	1,124	15.37	87.20
Spring_2005	936	12.80	100.00

Total | 7,315 100.00

Description of newly created variables

. describe post period window sequence

variable name	storage type	display format	value label	variable label
post	float	%9.0g	pos	post_DST
period	float	%9.0g	per	period
window	float	%9.0g	pos	window
sequence	float	%11.0g	seq	sequence

. codebook post period window sequence

post
post_DST

type: numeric (float)
label: pos
range: [0,1] units: 1
unique values: 2 missing .: 0/7315
tabulation: Freq. Numeric Label
3685 0 pre
3630 1 post

period
period

type: numeric (float)
label: per
range: [0,2] units: 1
unique values: 3 missing .: 0/7315
tabulation: Freq. Numeric Label
3685 0 pre
2905 1 post
725 2 window

window
window

```

-----
type: numeric (float)
label: pos

range: [0,1]
unique values: 2
units: 1
missing .: 725/7315

tabulation: Freq. Numeric Label
             3685      0 pre
             2905      1 post
             725       .

-----
sequence
sequence
-----

```

```

type: numeric (float)
label: seq

range: [1,11]
unique values: 11
units: 1
missing .: 0/7315

examples: 5 Spring_2002
          7 Spring_2003
          9 Spring_2004
          10 Fall_2004

```

Descriptives for all variables in dataset (discussed in sections 3.3.1 and section 4.1)

```
. tabulate grp_cmf_final_cgi
```

CGI_score	Freq.	Percent	Cum.
unknown	39	0.53	0.53
1	626	8.56	9.09
2	2,001	27.35	36.45
3	2,188	29.91	66.36
4	1,752	23.95	90.31
5	601	8.22	98.52
6	105	1.44	99.96
7	3	0.04	100.00
Total	7,315	100.00	

```
. tabulate grp_cmf_final_gafweek
```

GAF_score_w eek	Freq.	Percent	Cum.
unknown	42	0.57	0.57
0	1	0.01	0.59

1	1	0.01	0.60
3	1	0.01	0.62
4	2	0.03	0.64
5	1	0.01	0.66
10	2	0.03	0.68
15	1	0.01	0.70
20	10	0.14	0.83
22	1	0.01	0.85
25	8	0.11	0.96
28	1	0.01	0.97
30	19	0.26	1.23
31	4	0.05	1.29
32	1	0.01	1.30
33	1	0.01	1.31
35	15	0.21	1.52
37	4	0.05	1.57
38	7	0.10	1.67
39	5	0.07	1.74
40	83	1.13	2.87
41	14	0.19	3.06
42	25	0.34	3.40
43	9	0.12	3.53
44	11	0.15	3.68
45	184	2.52	6.19
46	20	0.27	6.47
47	8	0.11	6.58
48	67	0.92	7.49
49	17	0.23	7.72
50	446	6.10	13.82
51	145	1.98	15.80
52	111	1.52	17.32
53	40	0.55	17.87
54	45	0.62	18.48
55	665	9.09	27.57
56	42	0.57	28.15
57	41	0.56	28.71
58	241	3.29	32.00
59	44	0.60	32.60
60	854	11.67	44.28
61	243	3.32	47.60
62	281	3.84	51.44
63	103	1.41	52.85
64	78	1.07	53.92
65	919	12.56	66.48
66	50	0.68	67.16
67	54	0.74	67.90
68	438	5.99	73.89
69	66	0.90	74.79
70	694	9.49	84.28
71	167	2.28	86.56
72	141	1.93	88.49
73	22	0.30	88.79
74	28	0.38	89.17
75	346	4.73	93.90
76	10	0.14	94.04
77	4	0.05	94.09
78	32	0.44	94.53

79	12	0.16	94.70
80	214	2.93	97.62
81	13	0.18	97.80
82	10	0.14	97.94
83	4	0.05	97.99
84	1	0.01	98.00
85	63	0.86	98.87
87	3	0.04	98.91
88	3	0.04	98.95
90	77	1.05	100.00

Total	7,315	100.00	

. summarize grp_cmf_final_gafweek if grp_cmf_final_gafweek >-1

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	7273	62.22948	10.12493	0	90

. tabulate grp_cmf_final_weight

weight	Freq.	Percent	Cum.
not_on_original_form	4	0.05	0.05
refused	6	0.08	0.14
unknown	1,564	21.38	21.52
90	4	0.05	21.57
94	2	0.03	21.60
95	2	0.03	21.63
97	1	0.01	21.64
99	1	0.01	21.65
100	6	0.08	21.74
101	4	0.05	21.79
102	2	0.03	21.82
103	9	0.12	21.94
104	15	0.21	22.15
105	14	0.19	22.34
106	14	0.19	22.53
107	7	0.10	22.62
108	13	0.18	22.80
109	6	0.08	22.88
110	32	0.44	23.32
111	4	0.05	23.38
112	14	0.19	23.57
113	7	0.10	23.66
114	13	0.18	23.84
115	37	0.51	24.35
116	14	0.19	24.54
117	15	0.21	24.74
118	24	0.33	25.07
119	19	0.26	25.33
120	68	0.93	26.26
121	13	0.18	26.44
122	26	0.36	26.79
123	28	0.38	27.18
124	21	0.29	27.46

125	52	0.71	28.17
126	30	0.41	28.59
127	23	0.31	28.90
128	34	0.46	29.36
129	27	0.37	29.73
130	74	1.01	30.75
131	22	0.30	31.05
132	49	0.67	31.72
133	32	0.44	32.15
134	33	0.45	32.60
135	83	1.13	33.74
136	31	0.42	34.16
137	34	0.46	34.63
138	64	0.87	35.50
139	23	0.31	35.82
140	84	1.15	36.97
141	28	0.38	37.35
142	32	0.44	37.79
143	27	0.37	38.15
144	27	0.37	38.52
145	83	1.13	39.66
146	29	0.40	40.05
147	30	0.41	40.46
148	42	0.57	41.04
149	17	0.23	41.27
150	117	1.60	42.87
151	21	0.29	43.16
152	36	0.49	43.65
153	25	0.34	43.99
154	16	0.22	44.21
155	70	0.96	45.17
156	34	0.46	45.63
157	36	0.49	46.12
158	43	0.59	46.71
159	31	0.42	47.14
160	129	1.76	48.90
161	22	0.30	49.20
162	44	0.60	49.80
163	28	0.38	50.18
164	26	0.36	50.54
165	104	1.42	51.96
166	22	0.30	52.26
167	38	0.52	52.78
168	46	0.63	53.41
169	23	0.31	53.73
170	88	1.20	54.93
171	28	0.38	55.31
172	49	0.67	55.98
173	28	0.38	56.36
174	28	0.38	56.75
175	79	1.08	57.83
176	24	0.33	58.15
177	25	0.34	58.50
178	36	0.49	58.99
179	23	0.31	59.30
180	129	1.76	61.07
181	25	0.34	61.41

182	34	0.46	61.87
183	28	0.38	62.26
184	34	0.46	62.72
185	74	1.01	63.73
186	46	0.63	64.36
187	26	0.36	64.72
188	21	0.29	65.00
189	24	0.33	65.33
190	122	1.67	67.00
191	33	0.45	67.45
192	47	0.64	68.09
193	39	0.53	68.63
194	35	0.48	69.10
195	81	1.11	70.21
196	32	0.44	70.65
197	26	0.36	71.00
198	45	0.62	71.62
199	14	0.19	71.81
200	119	1.63	73.44
201	13	0.18	73.62
202	32	0.44	74.05
203	19	0.26	74.31
204	22	0.30	74.61
205	64	0.87	75.49
206	27	0.37	75.86
207	30	0.41	76.27
208	19	0.26	76.53
209	23	0.31	76.84
210	107	1.46	78.30
211	13	0.18	78.48
212	28	0.38	78.87
213	18	0.25	79.11
214	36	0.49	79.60
215	48	0.66	80.26
216	30	0.41	80.67
217	19	0.26	80.93
218	37	0.51	81.44
219	21	0.29	81.72
220	108	1.48	83.20
221	22	0.30	83.50
222	43	0.59	84.09
223	24	0.33	84.42
224	26	0.36	84.77
225	59	0.81	85.58
226	35	0.48	86.06
227	15	0.21	86.26
228	23	0.31	86.58
229	13	0.18	86.75
230	83	1.13	87.89
231	14	0.19	88.08
232	30	0.41	88.49
233	17	0.23	88.72
234	17	0.23	88.95
235	45	0.62	89.57
236	26	0.36	89.92
237	23	0.31	90.24
238	27	0.37	90.61

239	18	0.25	90.85
240	43	0.59	91.44
241	13	0.18	91.62
242	30	0.41	92.03
243	10	0.14	92.17
244	3	0.04	92.21
245	32	0.44	92.65
246	15	0.21	92.85
247	10	0.14	92.99
248	7	0.10	93.08
249	10	0.14	93.22
250	41	0.56	93.78
251	4	0.05	93.83
252	20	0.27	94.11
253	15	0.21	94.31
254	9	0.12	94.44
255	20	0.27	94.71
256	11	0.15	94.86
257	8	0.11	94.97
258	14	0.19	95.16
259	7	0.10	95.26
260	30	0.41	95.67
261	6	0.08	95.75
262	7	0.10	95.84
263	1	0.01	95.86
264	8	0.11	95.97
265	23	0.31	96.28
266	7	0.10	96.38
267	5	0.07	96.45
268	2	0.03	96.47
269	17	0.23	96.71
270	12	0.16	96.87
271	9	0.12	96.99
272	11	0.15	97.14
273	11	0.15	97.29
274	3	0.04	97.33
275	23	0.31	97.65
276	3	0.04	97.69
277	3	0.04	97.73
278	11	0.15	97.88
279	1	0.01	97.89
280	7	0.10	97.99
281	2	0.03	98.02
282	3	0.04	98.06
283	6	0.08	98.14
284	1	0.01	98.15
285	9	0.12	98.28
286	2	0.03	98.30
287	1	0.01	98.32
288	7	0.10	98.41
290	8	0.11	98.52
291	3	0.04	98.56
293	1	0.01	98.58
294	5	0.07	98.65
295	4	0.05	98.70
296	6	0.08	98.78
297	3	0.04	98.82

298	7	0.10	98.92
299	3	0.04	98.96
300	12	0.16	99.13
301	3	0.04	99.17
302	6	0.08	99.25
303	3	0.04	99.29
304	3	0.04	99.33
305	4	0.05	99.38
308	1	0.01	99.40
310	4	0.05	99.45
311	2	0.03	99.48
315	1	0.01	99.49
316	1	0.01	99.51
320	4	0.05	99.56
322	2	0.03	99.59
324	1	0.01	99.60
325	3	0.04	99.64
326	1	0.01	99.66
327	1	0.01	99.67
328	1	0.01	99.69
330	1	0.01	99.70
333	1	0.01	99.71
334	1	0.01	99.73
335	1	0.01	99.74
340	2	0.03	99.77
343	1	0.01	99.78
348	1	0.01	99.79
349	2	0.03	99.82
350	3	0.04	99.86
355	1	0.01	99.88
380	1	0.01	99.89
385	1	0.01	99.90
390	1	0.01	99.92
395	2	0.03	99.95
398	2	0.03	99.97
400	1	0.01	99.99
405	1	0.01	100.00

Total | 7,315 100.00

. summarize grp_cmf_final_weight if grp_cmf_final_weight >-1

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ht	5741	184.4442	45.79244	90	405

. tabulate grp_cmf_final_curdepr

current_dep ression	Freq.	Percent	Cum.
unknown	10	0.14	0.14
no	4,431	60.57	60.71
probable	931	12.73	73.44
definite	1,943	26.56	100.00
Total	7,315	100.00	

. tabulate grp_cmf_final_curenjoy

less_joy	Freq.	Percent	Cum.
unknown	16	0.22	0.22
no	4,432	60.59	60.81
probable	810	11.07	71.88
definite	2,057	28.12	100.00
Total	7,315	100.00	

. tabulate grp_cmf_final_curmania

current_mania	Freq.	Percent	Cum.
unknown	15	0.21	0.21
no	6,485	88.65	88.86
probable	393	5.37	94.23
definite	422	5.77	100.00
Total	7,315	100.00	

. tabulate grp_cmf_final_curirrit

current_irritability	Freq.	Percent	Cum.
unknown	26	0.36	0.36
no	5,590	76.42	76.77
probable	769	10.51	87.29
definite	930	12.71	100.00
Total	7,315	100.00	

. tabulate grp_cmf_final_deprmd

depressed_mood	Freq.	Percent	Cum.
not_on_original_form	494	6.75	6.75
unknown	9	0.12	6.88
-2	7	0.10	6.97
-1.5	42	0.57	7.55
-1.25	2	0.03	7.57
-1	161	2.20	9.77
-.75	7	0.10	9.87
-.5	198	2.71	12.58
-.25	37	0.51	13.08
0	2,523	34.49	47.57
.25	333	4.55	52.13
.5	1,338	18.29	70.42
.75	90	1.23	71.65
1	1,695	23.17	94.82
1.25	38	0.52	95.34
1.5	263	3.60	98.93
1.75	12	0.16	99.10

2	66	0.90	100.00

Total	7,315	100.00	

. tabulate grp_cmf_final_depsleep

depressed_s leep	Freq.	Percent	Cum.
unknown	5	0.07	0.07
-2	63	0.86	0.93
-1.75	7	0.10	1.03
-1.5	167	2.28	3.31
-1.25	17	0.23	3.54
-1	1,198	16.38	19.92
-.75	36	0.49	20.41
-.5	1,074	14.68	35.09
-.25	219	2.99	38.09
-.15	1	0.01	38.10
0	2,759	37.72	75.82
.25	105	1.44	77.25
.5	550	7.52	84.77
.75	34	0.46	85.24
1	850	11.62	96.86
1.25	11	0.15	97.01
1.5	140	1.91	98.92
1.75	3	0.04	98.96
2	76	1.04	100.00

Total	7,315	100.00	

. tabulate grp_cmf_final_depslmin

depr_sleep_ min	Freq.	Percent	Cum.
unknown	431	5.89	5.89
0	172	2.35	8.24
1	73	1.00	9.24
2	234	3.20	12.44
3	360	4.92	17.36
4	699	9.56	26.92
5	845	11.55	38.47
6	1,341	18.33	56.80
7	1,117	15.27	72.07
8	1,163	15.90	87.97
9	334	4.57	92.54
10	340	4.65	97.18
11	52	0.71	97.89
12	118	1.61	99.51
13	9	0.12	99.63
14	11	0.15	99.78
15	5	0.07	99.85
16	5	0.07	99.92
17	3	0.04	99.96
18	2	0.03	99.99
20	1	0.01	100.00

```
-----+-----
Total |          7,315      100.00
```

```
. summarize grp_cmf_final_depslmin if grp_cmf_final_depslmin >-1
```

```
-----+-----
Variable |          Obs          Mean      Std. Dev.        Min        Max
-----+-----
grp_cmf_f~in |          6884      6.208309      2.440734           0         20
```

```
. tabulate grp_cmf_final_depslmax
```

```
depr_sleep_ |
max |          Freq.      Percent      Cum.
-----+-----
unknown |             420         5.74      5.74
0 |              9         0.12      5.86
2 |             11         0.15      6.02
3 |             31         0.42      6.44
4 |             93         1.27      7.71
5 |            175         2.39     10.10
6 |            492         6.73     16.83
7 |            711         9.72     26.55
8 |           1,514        20.70     47.25
9 |           1,028        14.05     61.30
10 |           1,044        14.27     75.57
11 |            356         4.87     80.44
12 |            742        10.14     90.58
13 |            119         1.63     92.21
14 |            245         3.35     95.56
15 |             85         1.16     96.72
16 |            115         1.57     98.29
17 |             15         0.21     98.50
18 |             55         0.75     99.25
19 |              5         0.07     99.32
20 |             34         0.46     99.78
21 |              2         0.03     99.81
22 |              4         0.05     99.86
23 |              1         0.01     99.88
24 |              9         0.12    100.00
```

```
-----+-----
Total |          7,315      100.00
```

```
. summarize grp_cmf_final_depslmax if grp_cmf_final_depslmax >-1
```

```
-----+-----
Variable |          Obs          Mean      Std. Dev.        Min        Max
-----+-----
grp_cmf_f~ax |          6895      9.339521      2.813829           0         24
```

```
. tabulate grp_cmf_final_depenerg
```

```
depr_energy |          Freq.      Percent      Cum.
-----+-----
unknown |             11         0.15      0.15
-2 |             85         1.16      1.31
-1.75 |              2         0.03      1.34
-1.5 |            279         3.81      5.15
```

-1.25	20	0.27	5.43
-1	2,130	29.12	34.55
-.75	65	0.89	35.43
-.5	1,413	19.32	54.75
-.25	288	3.94	58.69
-.17	1	0.01	58.70
0	2,531	34.60	93.30
.1	1	0.01	93.32
.25	59	0.81	94.12
.5	219	2.99	97.12
.75	6	0.08	97.20
1	183	2.50	99.70
1.25	2	0.03	99.73
1.5	15	0.21	99.93
2	5	0.07	100.00

Total	7,315	100.00	

. tabulate grp_cmf_final_depconcn

depr_concn tration	Freq.	Percent	Cum.
unknown	8	0.11	0.11
-2	76	1.04	1.15
-1.75	1	0.01	1.16
-1.5	171	2.34	3.50
-1.25	6	0.08	3.58
-1	2,128	29.09	32.67
-.75	48	0.66	33.33
-.5	1,344	18.37	51.70
-.25	291	3.98	55.68
0	3,018	41.26	96.94
.25	32	0.44	97.38
.5	110	1.50	98.88
.75	1	0.01	98.89
1	73	1.00	99.89
1.5	8	0.11	100.00

Total	7,315	100.00	

. tabulate grp_cmf_final_depdist

depr_distra ctibility	Freq.	Percent	Cum.
unknown	31	0.42	0.42
-2	1	0.01	0.44
-1.5	3	0.04	0.48
-1	47	0.64	1.12
-.75	2	0.03	1.15
-.5	44	0.60	1.75
-.25	18	0.25	2.00
0	3,633	49.67	51.66
.05	1	0.01	51.67
.25	316	4.32	55.99
.5	1,379	18.85	74.85

.75	55	0.75	75.60
1	1,636	22.37	97.96
1.25	8	0.11	98.07
1.5	102	1.39	99.47
2	39	0.53	100.00

Total	7,315	100.00	

. tabulate grp_cmf_final_depappet

depr_appeti te	Freq.	Percent	Cum.
unknown	5	0.07	0.07
-2	21	0.29	0.36
-1.75	1	0.01	0.37
-1.5	51	0.70	1.07
-1.25	5	0.07	1.13
-1	756	10.33	11.47
-.75	16	0.22	11.69
-.5	700	9.57	21.26
-.25	140	1.91	23.17
0	4,003	54.72	77.89
.25	112	1.53	79.43
.5	692	9.46	88.89
.75	15	0.21	89.09
1	720	9.84	98.93
1.25	2	0.03	98.96
1.5	48	0.66	99.62
1.75	1	0.01	99.63
2	27	0.37	100.00

Total	7,315	100.00	

. tabulate grp_cmf_final_elvselfe

elev_self_e steem	Freq.	Percent	Cum.
unknown	3	0.04	0.04
-2	39	0.53	0.57
-1.75	3	0.04	0.62
-1.5	175	2.39	3.01
-1.25	5	0.07	3.08
-1	1,461	19.97	23.05
-.75	26	0.36	23.40
-.5	898	12.28	35.68
-.25	129	1.76	37.44
0	4,151	56.75	94.19
.25	71	0.97	95.16
.5	197	2.69	97.85
.75	4	0.05	97.91
1	142	1.94	99.85
1.25	1	0.01	99.86
1.5	8	0.11	99.97
1.75	1	0.01	99.99
2	1	0.01	100.00

```
-----+-----
Total |      7,315      100.00
```

```
. tabulate grp_cmf_final_elvsleep
```

elev_sleep	Freq.	Percent	Cum.
unknown	3	0.04	0.04
-2	17	0.23	0.27
-1.5	22	0.30	0.57
-1	308	4.21	4.78
-.75	10	0.14	4.92
-.5	255	3.49	8.41
-.25	50	0.68	9.09
0	5,708	78.03	87.12
.25	44	0.60	87.72
.5	329	4.50	92.22
.75	8	0.11	92.33
1	477	6.52	98.85
1.25	3	0.04	98.89
1.5	66	0.90	99.79
1.75	1	0.01	99.81
2	14	0.19	100.00
Total	7,315	100.00	

```
. tabulate grp_cmf_final_elvtalk
```

elev_talkin g	Freq.	Percent	Cum.
unknown	4	0.05	0.05
-2	2	0.03	0.08
-1.5	5	0.07	0.15
-1.25	1	0.01	0.16
-1	88	1.20	1.37
-.75	4	0.05	1.42
-.5	113	1.54	2.97
-.25	14	0.19	3.16
0	5,689	77.77	80.93
.25	207	2.83	83.76
.5	719	9.83	93.59
.75	23	0.31	93.90
1	407	5.56	99.47
1.25	3	0.04	99.51
1.5	34	0.46	99.97
2	2	0.03	100.00
Total	7,315	100.00	

```
. tabulate grp_cmf_final_elvfoi
```

elev_racing _thoughts	Freq.	Percent	Cum.
unknown	7	0.10	0.10
-1	10	0.14	0.23

-.5	19	0.26	0.49
-.25	5	0.07	0.56
0	5,270	72.04	72.60
.25	261	3.57	76.17
.5	872	11.92	88.09
.75	33	0.45	88.54
1	759	10.38	98.92
1.25	6	0.08	99.00
1.5	59	0.81	99.81
1.75	2	0.03	99.84
2	12	0.16	100.00

Total	7,315	100.00	

. tabulate grp_cmf_final_elvdistr

elev_distra ctibility	Freq.	Percent	Cum.
unknown	3	0.04	0.04
-2	1	0.01	0.05
-1.5	2	0.03	0.08
-1	22	0.30	0.38
-.75	1	0.01	0.40
-.5	28	0.38	0.78
-.25	6	0.08	0.86
0	3,998	54.65	55.52
.25	269	3.68	59.19
.5	1,267	17.32	76.51
.75	53	0.72	77.24
1	1,528	20.89	98.13
1.25	5	0.07	98.20
1.5	96	1.31	99.51
2	36	0.49	100.00

Total	7,315	100.00	

. tabulate grp_cmf_final_elvgdact

elev_goal_d ir_activity	Freq.	Percent	Cum.
unknown	35	0.48	0.48
-2	7	0.10	0.57
-1.5	35	0.48	1.05
-1.25	1	0.01	1.07
-1	257	3.51	4.58
-.75	3	0.04	4.62
-.5	213	2.91	7.53
-.25	15	0.21	7.74
0	5,809	79.41	87.15
.25	105	1.44	88.59
.5	485	6.63	95.22
.75	14	0.19	95.41
1	320	4.37	99.78
1.25	2	0.03	99.81
1.5	13	0.18	99.99

2	1	0.01	100.00

Total	7,315	100.00	

. tabulate grp_cmf_final_elvpma

elev_PMA	Freq.	Percent	Cum.
unknown	34	0.46	0.46
-1	4	0.05	0.52
-.5	6	0.08	0.60
-.25	1	0.01	0.62
0	5,152	70.43	71.05
.25	245	3.35	74.40
.5	1,033	14.12	88.52
.75	35	0.48	89.00
1	740	10.12	99.11
1.25	3	0.04	99.15
1.5	55	0.75	99.90
2	7	0.10	100.00

Total	7,315	100.00	

. tabulate grp_cmf_final_elvhrb

elev_hi_ris k_behavior	Freq.	Percent	Cum.
unknown	15	0.21	0.21
-1	2	0.03	0.23
-.5	1	0.01	0.25
0	6,722	91.89	92.14
.25	76	1.04	93.18
.5	314	4.29	97.47
.75	6	0.08	97.55
1	160	2.19	99.74
1.5	12	0.16	99.90
2	7	0.10	100.00

Total	7,315	100.00	

. tabulate grp_cmf_final_cdcaf

cups_day_ca ffeine	Freq.	Percent	Cum.
unknown	503	6.88	6.88
-1	4	0.05	6.93
0	2,492	34.07	41.00
1	1,469	20.08	61.08
2	1,404	19.19	80.27
3	625	8.54	88.82
4	379	5.18	94.00
5	149	2.04	96.04
6	118	1.61	97.65
7	26	0.36	98.00
8	62	0.85	98.85

9	14	0.19	99.04
10	37	0.51	99.55
11	1	0.01	99.56
12	21	0.29	99.85
15	8	0.11	99.96
16	2	0.03	99.99
25	1	0.01	100.00

Total	7,315	100.00	

```
. summarize grp_cmf_final_cdcaf if grp_cmf_final_cdcaf >-1
```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_fi~f	6808	1.576821	1.953545	0	25

```
. tabulate grp_cmf_final_ppd
```

packs_day_n icotene	Freq.	Percent	Cum.
unknown	520	7.11	7.11
0	5,081	69.46	76.57
.05	5	0.07	76.64
.08	1	0.01	76.65
.1	49	0.67	77.32
.13	1	0.01	77.33
.14	2	0.03	77.36
.15	4	0.05	77.42
.17	4	0.05	77.47
.2	27	0.37	77.84
.25	122	1.67	79.51
.28	1	0.01	79.52
.29	1	0.01	79.54
.3	19	0.26	79.79
.33	14	0.19	79.99
.4	9	0.12	80.11
.5	394	5.39	85.50
.6	1	0.01	85.51
.63	1	0.01	85.52
.66	1	0.01	85.54
.75	44	0.60	86.14
.8	2	0.03	86.17
.9	2	0.03	86.19
1	653	8.93	95.12
1.25	6	0.08	95.20
1.3	1	0.01	95.22
1.5	174	2.38	97.59
1.75	7	0.10	97.69
2	139	1.90	99.59
2.5	15	0.21	99.79
2.75	1	0.01	99.81
3	8	0.11	99.92
3.5	2	0.03	99.95
4	4	0.05	100.00

Total	7,315	100.00	

```
. summarize grp_cmf_final_ppd if grp_cmf_final_ppd >-1
```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~pd	6795	.2344224	.494756	0	4

```
. tabulate grp_cmf_final_alcabuse
```

alcohol_abu se	Freq.	Percent	Cum.
unknown	59	0.81	0.81
no	6,969	95.27	96.08
yes	287	3.92	100.00
Total	7,315	100.00	

```
. tabulate grp_cmf_final_subabuse
```

substance_a buse	Freq.	Percent	Cum.
unknown	62	0.85	0.85
no	7,074	96.71	97.55
yes	179	2.45	100.00
Total	7,315	100.00	

```
. tabulate grp_cmf_final_genmedtx
```

general_med _trt	Freq.	Percent	Cum.
unknown	191	2.61	2.61
no	6,035	82.50	85.11
yes	1,089	14.89	100.00
Total	7,315	100.00	

```
. tabulate grp_cmf_final_sigilln
```

signif_medi cal_illness	Freq.	Percent	Cum.
unknown	285	3.90	3.90
no	5,367	73.37	77.27
yes	1,663	22.73	100.00
Total	7,315	100.00	

```
. tabulate grp_cmf_final_smspi
```

severity_PI	Freq.	Percent	Cum.
unknown	41	0.56	0.56
0	6,719	91.85	92.41
1	376	5.14	97.55

2	145	1.98	99.54
3	30	0.41	99.95
4	4	0.05	100.00

Total	7,315	100.00	

. tabulate grp_cmf_final_smsior

severity_IO R	Freq.	Percent	Cum.
unknown	41	0.56	0.56
0	7,126	97.42	97.98
1	91	1.24	99.22
2	45	0.62	99.84
3	10	0.14	99.97
4	2	0.03	100.00

Total	7,315	100.00	

. tabulate grp_cmf_final_smsocd

severity_OC D	Freq.	Percent	Cum.
unknown	47	0.64	0.64
0	6,837	93.47	94.11
1	215	2.94	97.05
2	157	2.15	99.19
3	55	0.75	99.95
4	4	0.05	100.00

Total	7,315	100.00	

. tabulate grp_cmf_final_smshallu

severity_ha llucination s	Freq.	Percent	Cum.
unknown	61	0.83	0.83
0	7,028	96.08	96.91
1	142	1.94	98.85
2	71	0.97	99.82
3	11	0.15	99.97
4	2	0.03	100.00

Total	7,315	100.00	

. tabulate grp_cmf_final_smsdelus

severity_de lusions	Freq.	Percent	Cum.
unknown	65	0.89	0.89
0	7,139	97.59	98.48
1	50	0.68	99.17

2	39	0.53	99.70
3	13	0.18	99.88
4	9	0.12	100.00

Total	7,315	100.00	

```
. tabulate grp_cmf_final_clinostat
```

clinical_st atus	Freq.	Percent	Cum.
1	1,644	22.47	22.47
2	103	1.41	23.88
3	75	1.03	24.91
4	141	1.93	26.84
5	1,125	15.38	42.21
6	378	5.17	47.38
7	1,895	25.91	73.29
8	1,953	26.70	99.99
9	1	0.01	100.00

Total	7,315	100.00	

```
. tabulate grp_cmf_final_site_id
```

site	Freq.	Percent	Cum.
10	1,420	19.41	19.41
30	471	6.44	25.85
60	398	5.44	31.29
70	453	6.19	37.48
90	157	2.15	39.63
130	281	3.84	43.47
140	1,330	18.18	61.65
160	1,306	17.85	79.51
170	574	7.85	87.35
190	258	3.53	90.88
200	412	5.63	96.51
210	255	3.49	100.00

Total	7,315	100.00	

Observation level descriptives of selected variables by bipolar status (discussed in section 3.3.1)

```
. sort lifedx
```

```
. by lifedx: summarize grp_step_enrol_final_age
```

```
-----
```

```
-> lifedx = BPI
```

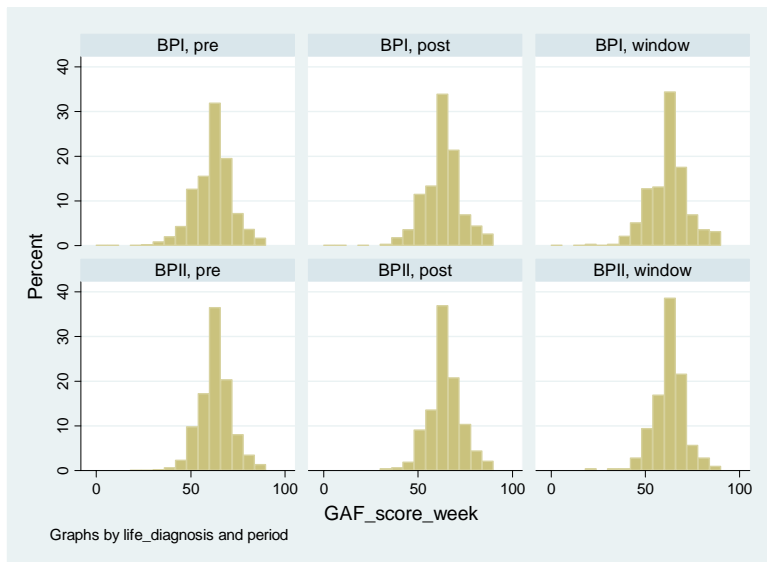
Variable	Obs	Mean	Std. Dev.	Min	Max
grp_step_e~e	5076	43.11643	12.24212	17	85

```
-----
-----
-> lifedx = BPII
```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_step_e~e	2239	43.58419	12.8173	18	85

Generating histogram for distribution of GAF scores by diagnostic category & period (Figure 3):

```
. histogram grp_cmf_final_gafweek if grp_cmf_final_gafweek != -6, by
(lifedx period) percent bin (15)
```



Person level descriptives (first need to re-read dataset into Stata)

```
. insheet using "C:\Documents and Settings\Mary\Desktop\GRP_FINAL_100206\Thesis Data to Use\final_data(4-17).csv"
(45 vars, 7315 obs)
```

*****generating an index variable in order to end up with only one record per person (first need to label variables with code shown above)**

```
. sort public_id cmf_year dst_time cmf_from_dst
```

```
. quietly by public_id: generate index = _n
```

```
. keep if index == 1
(6140 observations deleted)
```

```
. tabulate grp_step_enrol_final_gender
```

gender	Freq.	Percent	Cum.
male	479	40.77	40.77
female	694	59.06	99.83
transgender	2	0.17	100.00

```

Total |      1,175      100.00
. tabulate grp_cmf_final_site_id

  site |      Freq.      Percent      Cum.
-----+-----
    10 |         225       19.15       19.15
    30 |          85        7.23       26.38
    60 |          77        6.55       32.94
    70 |          58        4.94       37.87
    90 |          36        3.06       40.94
   130 |          50        4.26       45.19
   140 |         209       17.79       62.98
   160 |         165       14.04       77.02
   170 |         102        8.68       85.70
   190 |          48        4.09       89.79
   200 |          61        5.19       94.98
   210 |          59        5.02      100.00
-----+-----
Total |      1,175      100.00

```

```

. tabulate lifedx

life_diagno |
  sis |      Freq.      Percent      Cum.
-----+-----
    BPI |         783       66.64       66.64
    BPII |         392       33.36      100.00
-----+-----
Total |      1,175      100.00

```

```

. summarize grp_step_enrol_final_age

Variable |      Obs      Mean  Std. Dev.      Min      Max
-----+-----
grp_step_e~e |    1175  42.81617  12.51331      17      85

```

Person Level Descriptives by Bipolar status (Table 5)

```

. sort lifedx
. by lifedx: summarize ( grp_step_enrol_final_age)

```

```
-----
-> lifedx = BPI
```

```

Variable |      Obs      Mean  Std. Dev.      Min      Max
-----+-----
grp_step_e~e |    783  42.84547  12.42267      17      85

```

```
-----
-> lifedx = BPII
```

```

Variable |      Obs      Mean  Std. Dev.      Min      Max

```

```
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
grp_step_e~e |          392    42.75765    12.70821          18          85
```

```
. tabulate grp_cmf_final_site_id lifedx
```

site	life_diagnosis		Total
	BPI	BPII	
10	156	69	225
30	55	30	85
60	47	30	77
70	44	14	58
90	31	5	36
130	32	18	50
140	136	73	209
160	71	94	165
170	81	21	102
190	38	10	48
200	49	12	61
210	43	16	59
Total	783	392	1,175

```
. tabulate grp_step_enrol_final_gender lifedx
```

gender	life_diagnosis		Total
	BPI	BPII	
male	336	143	479
female	445	249	694
transgender	2	0	2
Total	783	392	1,175

Observation Level Descriptives by Bipolar status (need to use full dataset here)

```
. tabulate grp_cmf_final_cgi lifedx
```

CGI_score	life_diagnosis		Total
	BPI	BPII	
unknown	31	8	39
1	451	175	626
2	1,372	629	2,001
3	1,471	717	2,188
4	1,240	512	1,752
5	430	171	601
6	78	27	105
7	3	0	3
Total	5,076	2,239	7,315

Creation of Table 6 (mean GAF scores by bipolar status & sequence)

*****to obtain the pre-DST GAF means for each sequence for Bipolar I patients:**

```
. sort sequence
```

```
. by sequence: summarize grp_cmf_final_gafweek if grp_cmf_final_gafweek > -
1 & period ==0 & lifedx ==1
```

```
-----
-> sequence = Spring_2000
```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	14	63.78571	12.31746	50	85

```
-----
-> sequence = Fall_2000
```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	77	55.61039	12.09301	25	90

```
-----
-> sequence = Spring_2001
```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	97	63.43299	9.408448	40	85

```
-----
-> sequence = Fall_2001
```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	168	63.21429	9.22191	42	90

```
-----
-> sequence = Spring_2002
```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	194	62.71134	11.48954	31	90

```
-----
-> sequence = Fall_2002
```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	311	61.9164	10.40252	35	90

```
-----
-> sequence = Spring_2003
```

Variable	Obs	Mean	Std. Dev.	Min	Max
----------	-----	------	-----------	-----	-----


```
grp_cmf_f~ek |      333      59.9009      12.0308      1      90
```

```
-----  
-> sequence = Fall_2003
```

```
Variable |      Obs      Mean  Std. Dev.      Min      Max  
-----+-----  
grp_cmf_f~ek |      310  60.75161  9.658552      25      90
```

```
-----  
-> sequence = Spring_2004
```

```
Variable |      Obs      Mean  Std. Dev.      Min      Max  
-----+-----  
grp_cmf_f~ek |      347  59.90778 10.88737      5      90
```

```
-----  
-> sequence = Fall_2004
```

```
Variable |      Obs      Mean  Std. Dev.      Min      Max  
-----+-----  
grp_cmf_f~ek |      382  62.43979  9.641625      3      90
```

```
-----  
-> sequence = Spring_2005
```

```
Variable |      Obs      Mean  Std. Dev.      Min      Max  
-----+-----  
grp_cmf_f~ek |      314  62.18153  9.938574      20      85
```

```
****to obtain post-DST GAF means for each sequence for Bipolar I patients:
```

```
. by sequence: summarize grp_cmf_final_gafweek if grp_cmf_final_gafweek > -1  
& period ==1 & lifedx ==1
```

```
-----  
-> sequence = Spring_2000
```

```
Variable |      Obs      Mean  Std. Dev.      Min      Max  
-----+-----  
grp_cmf_f~ek |      11  65.09091 14.00325      50      90
```

```
-----  
-> sequence = Fall_2000
```

```
Variable |      Obs      Mean  Std. Dev.      Min      Max  
-----+-----  
grp_cmf_f~ek |      61  59.21311 11.8295      20      85
```

```
-----  
-> sequence = Spring_2001
```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	84	62.52381	9.913452	40	88

-> sequence = Fall_2001

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	140	62.45	11.84937	20	90

-> sequence = Spring_2002

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	155	62.38065	11.43603	10	90

-> sequence = Fall_2002

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	253	62.75494	10.71137	35	90

-> sequence = Spring_2003

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	257	61.94163	10.48737	40	90

-> sequence = Fall_2003

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	274	60.98905	10.35964	4	90

-> sequence = Spring_2004

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	249	62.4257	9.721293	20	90

-> sequence = Fall_2004

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	292	63.96575	8.906474	30	90

-> sequence = Spring_2005

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	214	64.22897	9.4287	0	90

*****to obtain GAF means in the window period for each sequence for Bipolar I patients:**

. by sequence: summarize grp_cmf_final_gafweek if grp_cmf_final_gafweek > 1 & period ==2 & lifedx ==1

-> sequence = Spring_2000

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	6	57.33333	13.80821	45	75

-> sequence = Fall_2000

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	18	55.83333	16.5147	4	75

-> sequence = Spring_2001

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	17	64.47059	11.5332	45	85

-> sequence = Fall_2001

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	34	63.70588	13.93172	28	90

-> sequence = Spring_2002

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	41	61.17073	13.84179	15	90

```

-----
-----
-> sequence = Fall_2002

  Variable |      Obs      Mean  Std. Dev.    Min    Max
-----+-----
grp_cmf_f~ek |      52  61.88462  10.60273     40    90

-----
-----
-> sequence = Spring_2003

  Variable |      Obs      Mean  Std. Dev.    Min    Max
-----+-----
grp_cmf_f~ek |      67  60.34328  11.00489     40    90

-----
-----
-> sequence = Fall_2003

  Variable |      Obs      Mean  Std. Dev.    Min    Max
-----+-----
grp_cmf_f~ek |      44  59.59091  10.00771     30    90

-----
-----
-> sequence = Spring_2004

  Variable |      Obs      Mean  Std. Dev.    Min    Max
-----+-----
grp_cmf_f~ek |      74  60.09459  10.18079     20    90

-----
-----
-> sequence = Fall_2004

  Variable |      Obs      Mean  Std. Dev.    Min    Max
-----+-----
grp_cmf_f~ek |      74  62.33784   9.514628     40    90

-----
-----
-> sequence = Spring_2005

  Variable |      Obs      Mean  Std. Dev.    Min    Max
-----+-----
grp_cmf_f~ek |      82  63.18293  10.34364     20    90

***to obtain pre-DST GAF means for each sequence for Bipolar II patients:
. by sequence: summarize grp_cmf_final_gafweek if grp_cmf_final_gafweek > -
1 & period ==0 & lif
> edx ==2

-----
-----
-> sequence = Spring_2000

```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	1	70	.	70	70

-> sequence = Fall_2000

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	15	62.46667	11.90958	45	90

-> sequence = Spring_2001

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	36	65.88889	8.611546	45	87

-> sequence = Fall_2001

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	53	63.73585	9.957894	40	85

-> sequence = Spring_2002

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	63	63.84127	7.444865	50	80

-> sequence = Fall_2002

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	128	60.50781	9.929671	20	80

-> sequence = Spring_2003

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	126	63.45238	8.827781	45	90

-> sequence = Fall_2003

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	149	62.88591	7.953013	42	85

-> sequence = Spring_2004

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	188	62.53191	10.11612	25	90

-> sequence = Fall_2004

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	189	62.38095	8.379487	30	81

-> sequence = Spring_2005

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	164	63.21951	7.412515	35	85

*****to obtain post-DST GAF means for each sequence for Bipolar II patients:**

. by sequence: summarize grp_cmf_final_gafweek if grp_cmf_final_gafweek > 1 & period ==1 & lifedx ==2

-> sequence = Spring_2000

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	0				

-> sequence = Fall_2000

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	15	64.2	15.81681	31	90

-> sequence = Spring_2001

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	31	66.06452	11.53527	41	90

```

-----
-----
-> sequence = Fall_2001

  Variable |      Obs      Mean  Std. Dev.    Min    Max
-----+-----
grp_cmf_f~ek |      50    62.94   10.38525     42    87

-----
-----
-> sequence = Spring_2002

  Variable |      Obs      Mean  Std. Dev.    Min    Max
-----+-----
grp_cmf_f~ek |      60   62.76667   10.06482     30    85

-----
-----
-> sequence = Fall_2002

  Variable |      Obs      Mean  Std. Dev.    Min    Max
-----+-----
grp_cmf_f~ek |     105   62.26667   10.1728     35    85

-----
-----
-> sequence = Spring_2003

  Variable |      Obs      Mean  Std. Dev.    Min    Max
-----+-----
grp_cmf_f~ek |     106   64.50943    8.990201     45    90

-----
-----
-> sequence = Fall_2003

  Variable |      Obs      Mean  Std. Dev.    Min    Max
-----+-----
grp_cmf_f~ek |     127   65.34646    8.508052     42    90

-----
-----
-> sequence = Spring_2004

  Variable |      Obs      Mean  Std. Dev.    Min    Max
-----+-----
grp_cmf_f~ek |     139   64.43885    9.569059     35    90

-----
-----
-> sequence = Fall_2004

  Variable |      Obs      Mean  Std. Dev.    Min    Max
-----+-----
grp_cmf_f~ek |     151   63.37748    7.285366     45    85

```

```
-----  
-----  
-> sequence = Spring_2005
```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	118	62.9661	7.050407	45	80

*****to obtain GAF means in the window period for each sequence for Bipolar II patients:**

```
. by sequence: summarize grp_cmf_final_gafweek if grp_cmf_final_gafweek > -  
1 & period ==2 & lifedx ==2
```

```
-----  
-----  
-> sequence = Spring_2000
```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	1	70	.	70	70

```
-----  
-----  
-> sequence = Fall_2000
```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	5	61.2	7.049823	51	70

```
-----  
-----  
-> sequence = Spring_2001
```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	4	69.75	4.272002	65	75

```
-----  
-----  
-> sequence = Fall_2001
```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	8	62	5.291503	54	70

```
-----  
-----  
-> sequence = Spring_2002
```

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	17	64.05882	8.09684	50	80

```
-----  
-----  
-> sequence = Fall_2002
```


Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	25	56.84	12.1918	20	75

-> sequence = Spring_2003

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	24	61.25	9.042172	40	80

-> sequence = Fall_2003

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	21	63.71429	8.319512	46	75

-> sequence = Spring_2004

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	38	62.31579	8.479244	45	85

-> sequence = Fall_2004

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	31	61.64516	8.138585	45	80

-> sequence = Spring_2005

Variable	Obs	Mean	Std. Dev.	Min	Max
grp_cmf_f~ek	39	63.17949	7.140956	50	85

Creation of Table 7

. tabulate grp_cmf_final_cgi lifedx

CGI_score	life_diagnosis		Total
	BPI	BPII	
unknown	31	8	39
1	451	175	626
2	1,372	629	2,001
3	1,471	717	2,188
4	1,240	512	1,752
5	430	171	601
6	78	27	105

7	3	0	3
-----+-----+-----			
Total	5,076	2,239	7,315

Creation of Table 9: Main effects GEE (Model 1 Table 3) for GAF in Bipolar I patients (excluding observations with unknown GAF scores):

```
. iis public_id

. xi: xtgee      grp_cmf_final_gafweek      grp_step_enrol_final_age      dst_time
i.period      i.cmf_year      i.grp_cmf_final_site_id      if      lifedx      ==      1      &
grp_cmf_final_gafweek > -1
i.period      _Iperiod_0-2      (naturally coded; _Iperiod_0 omitted)
i.cmf_year      _Icmf_year_2000-2005(naturally coded; _Icmf_year_2000
omitted)
i.grp_cmf_fi~id      _Igrp_cmf_f_10-210      (naturally coded; _Igrp_cmf_f_10
omitted)
```

Iteration 1: tolerance = .76709758
Iteration 2: tolerance = .01652639
Iteration 3: tolerance = .0003048
Iteration 4: tolerance = 5.517e-06
Iteration 5: tolerance = 9.984e-08

GEE population-averaged model
5046
Group variable: public_id Number of groups =
783
Link: identity Obs per group: min =
1
Family: Gaussian avg =
6.4
Correlation: exchangeable max =
36
Wald chi2(20) =
150.26
Scale parameter: 107.2285 Prob > chi2 =
0.0000

```
-----+-----+-----+-----+-----+-----
-
grp_cmf_f~ek |      Coef.      Std. Err.      z      P>|z|      [95% Conf.
Interval]
-----+-----+-----+-----+-----+-----
-
grp_step_e~e |      .0352365      .0233491      1.51      0.131      -.0105269
.0809999
dst_time |      .152186      .2732662      0.56      0.578      -.383406
.6877779
_Iperiod_1 |      1.132473      .2327085      4.87      0.000      .6763724
1.588573
_Iperiod_2 |      -.0382881      .3887566      -0.10      0.922      -.800237
.7236607
_Icmf_y~2001 |      4.390536      .7987796      5.50      0.000      2.824956
5.956115
_Icmf_y~2002 |      4.63969      .7726336      6.01      0.000      3.125356
6.154024
```

_Icmf_y~2003		4.207936	.7863528	5.35	0.000	2.666712
5.749159						
_Icmf_y~2004		5.603368	.7974615	7.03	0.000	4.040372
7.166363						
_Icmf_y~2005		7.047438	.8825461	7.99	0.000	5.317679
8.777197						
_Igrp_cm~_30		.8575465	1.255451	0.68	0.495	-1.603092
3.318185						
_Igrp_cm~_60		4.845276	1.323867	3.66	0.000	2.250544
7.440007						
_Igrp_cm~_70		1.023237	1.341208	0.76	0.446	-1.605482
3.651956						
_Igrp_cm~_90		2.924712	1.609856	1.82	0.069	-.2305474
6.079971						
_Igrp_cm~130		4.337014	1.54151	2.81	0.005	1.315709
7.358318						
_Igrp_cm~140		-.9385467	.9193305	-1.02	0.307	-2.740401
.8633079						
_Igrp_cm~160		1.462629	1.110452	1.32	0.188	-.7138166
3.639075						
_Igrp_cm~170		-.7580321	1.084616	-0.70	0.485	-2.88384
1.367776						
_Igrp_cm~190		.1134679	1.451766	0.08	0.938	-2.73194
2.958876						
_Igrp_cm~200		-1.334469	1.279674	-1.04	0.297	-3.842584
1.173646						
_Igrp_cm~210		-4.107866	1.403589	-2.93	0.003	-6.85885
1.356882						
_cons		55.19125	1.422268	38.81	0.000	52.40366
57.97885						

*****Overall Wald test for year**

. testparm _Icmf_year_2001 _Icmf_year_2002 _Icmf_year_2003 _Icmf_year_2004
_Icmf_year_2005

- (1) _Icmf_year_2001 = 0
- (2) _Icmf_year_2002 = 0
- (3) _Icmf_year_2003 = 0
- (4) _Icmf_year_2004 = 0
- (5) _Icmf_year_2005 = 0

chi2(5) = 75.81
Prob > chi2 = 0.0000

*****Overall Wald test for site**

. testparm _Igrp_cmf_f_30 _Igrp_cmf_f_60 _Igrp_cmf_f_70 _Igrp_cmf_f_90
_Igrp_cmf_f_130 _Igrp_cm
> f_f_140 _Igrp_cmf_f_160 _Igrp_cmf_f_170 _Igrp_cmf_f_190 _Igrp_cmf_f_200
_Igrp_cmf_f_210

- (1) _Igrp_cmf_f_30 = 0
- (2) _Igrp_cmf_f_60 = 0
- (3) _Igrp_cmf_f_70 = 0
- (4) _Igrp_cmf_f_90 = 0
- (5) _Igrp_cmf_f_130 = 0

```

( 6)  _Igrp_cmf_f_140 = 0
( 7)  _Igrp_cmf_f_160 = 0
( 8)  _Igrp_cmf_f_170 = 0
( 9)  _Igrp_cmf_f_190 = 0
(10)  _Igrp_cmf_f_200 = 0
(11)  _Igrp_cmf_f_210 = 0

      chi2( 11) =    48.53
      Prob > chi2 =    0.0000

```

*****correlation coefficient**

```
. xtcorr, compact
```

```
Error structure: exchangeable
Estimated within-public_id correlation: 0.4516
```

*****Overall Wald test for period**

```
. testparm _Iperiod_2 _Iperiod_1
```

```

( 1)  _Iperiod_2 = 0
( 2)  _Iperiod_1 = 0

      chi2( 2) =    25.41
      Prob > chi2 =    0.0000

```

Creation of Table 10: Main effects GEE (Model 1 Table 3) for GAF in Bipolar II patients (excluding observations with unknown GAF scores):

```
. xi: xtgee    grp_cmf_final_gafweek    grp_step_enrol_final_age    dst_time
i.period    i.cmf_year    i.grp_cmf_final_site_id    if    lifedx    ==    2    &
grp_cmf_final_gafweek > -1
i.period    _Iperiod_0-2    (naturally coded; _Iperiod_0 omitted)
i.cmf_year    _Icmf_year_2000-2005(naturally coded; _Icmf_year_2000
omitted)
i.grp_cmf_fi~id    _Igrp_cmf_f_10-210    (naturally coded; _Igrp_cmf_f_10
omitted)
```

```

Iteration 1: tolerance = .98425882
Iteration 2: tolerance = .04446275
Iteration 3: tolerance = .00160503
Iteration 4: tolerance = .00006024
Iteration 5: tolerance = 2.264e-06
Iteration 6: tolerance = 8.512e-08

```

```

GEE population-averaged model                                Number of obs    =
2227
Group variable:                public_id                    Number of groups  =
392
Link:                identity                Obs per group: min =
1
Family:                Gaussian                                avg =
5.7
Correlation:                exchangeable                max =
34
                                                                    Wald    chi2(20)    =
75.31

```

Scale parameter: 78.00536 Prob > chi2 = 0.0000

```

-----
-
grp_cmf_f~ek |          Coef.      Std. Err.      z    P>|z|      [95% Conf.
Interval]
-----+-----
-
grp_step_e~e |    -.0122219      .0260837     -0.47   0.639     -.063345
.0389012
  dst_time |    -.6098143      .3807275     -1.60   0.109     -1.356027
.1363979
  _Iperiod_1 |     1.115164      .3224076      3.46   0.001      .4832567
1.747071
  _Iperiod_2 |    -.7705976      .5545222     -1.39   0.165     -1.857441
.316246
  _Icmf_y~2001 |     .7185656       1.44664      0.50   0.619     -2.116797
3.553928
  _Icmf_y~2002 |    -1.636285      1.412427     -1.16   0.247     -4.40459
1.132021
  _Icmf_y~2003 |     .2723144      1.407325      0.19   0.847     -2.485992
3.030621
  _Icmf_y~2004 |    -.4733734      1.413008     -0.34   0.738     -3.242819
2.296072
  _Icmf_y~2005 |    -.5264262      1.502574     -0.35   0.726     -3.471417
2.418565
  _Igrp_cm~_30 |   -2.999767      1.393366     -2.15   0.031     -5.730714   -
.268819
  _Igrp_cm~_60 |     3.157779      1.409237      2.24   0.025      .3957239
5.919833
  _Igrp_cm~_70 |    -2.110523      1.787357     -1.18   0.238     -5.613678
1.392632
  _Igrp_cm~_90 |    -3.238526      3.130259     -1.03   0.301     -9.37372
2.896668
  _Igrp_cm~130 |     1.081737      1.721203      0.63   0.530     -2.291758
4.455233
  _Igrp_cm~140 |   -2.525905      1.07399      -2.35   0.019     -4.630887   -
.4209234
  _Igrp_cm~160 |    -1.026656       1.00218     -1.02   0.306     -2.990892
.9375804
  _Igrp_cm~170 |    -1.61118       1.574819     -1.02   0.306     -4.697768
1.475407
  _Igrp_cm~190 |   -4.699484      2.138679     -2.20   0.028     -8.891218   -
.5077494
  _Igrp_cm~200 |     1.064763      2.108958      0.50   0.614     -3.068719
5.198245
  _Igrp_cm~210 |   -5.825294      1.873738     -3.11   0.002     -9.497752   -
2.152835
  _cons |     65.96473      2.007353     32.86   0.000      62.03039
69.89907
-----

```

*****Overall Wald test for year**

```

. testparm _Icmf_year_2001 _Icmf_year_2002 _Icmf_year_2003 _Icmf_year_2004
_Icmf_year_2005

```

(1) _Icmf_year_2001 = 0

```
( 2)  _Icmf_year_2002 = 0
( 3)  _Icmf_year_2003 = 0
( 4)  _Icmf_year_2004 = 0
( 5)  _Icmf_year_2005 = 0
```

```
chi2( 5) = 15.81
Prob > chi2 = 0.0074
```

*****Overall Wald test for site**

```
. testparm _Igrp_cmf_f_30 _Igrp_cmf_f_60 _Igrp_cmf_f_70 _Igrp_cmf_f_90
_Igrp_cmf_f_130 _Igrp_cmf_f_140 _Igrp_cmf_f_160 _Igrp_cmf_f_170 _Igrp_cmf_f_190
_Igrp_cmf_f_200 _Igrp_cmf_f_210
```

```
( 1)  _Igrp_cmf_f_30 = 0
( 2)  _Igrp_cmf_f_60 = 0
( 3)  _Igrp_cmf_f_70 = 0
( 4)  _Igrp_cmf_f_90 = 0
( 5)  _Igrp_cmf_f_130 = 0
( 6)  _Igrp_cmf_f_140 = 0
( 7)  _Igrp_cmf_f_160 = 0
( 8)  _Igrp_cmf_f_170 = 0
( 9)  _Igrp_cmf_f_190 = 0
(10)  _Igrp_cmf_f_200 = 0
(11)  _Igrp_cmf_f_210 = 0
```

```
chi2( 11) = 36.91
Prob > chi2 = 0.0001
```

*****correlation coefficient**

```
. xtcorr, compact
```

```
Error structure: exchangeable
Estimated within-public_id correlation: 0.3551
```

*****Overall Wald test for period**

```
. testparm _Iperiod_2 _Iperiod_1
```

```
( 1)  _Iperiod_2 = 0
( 2)  _Iperiod_1 = 0
```

```
chi2( 2) = 17.19
Prob > chi2 = 0.0002
```

GEE (Model 2 Table 3) for GAF in Bipolar I patients with interaction between season and period:

```
. xi: xtgee grp_cmf_final_gafweek grp_step_enrol_final_age i.cmf_year
i.grp_cmf_final_site_id i.dst_time*i.period if lifedx ==1 &
grp_cmf_final_gafweek > -1
i.cmf_year _Icmf_year_2000-2005(naturally coded; _Icmf_year_2000
omitted)
i.grp_cmf_fi~id _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
omitted)
i.dst_time _Idst_time_0-1 (naturally coded; _Idst_time_0 omitted)
i.period _Iperiod_0-2 (naturally coded; _Iperiod_0 omitted)
i.dst~e*i.per~d _IdstXper_#_# (coded as above)
```

```
Iteration 1: tolerance = .77025963
```

Iteration 2: tolerance = .01651871
 Iteration 3: tolerance = .00030482
 Iteration 4: tolerance = 5.520e-06
 Iteration 5: tolerance = 9.994e-08

GEE population-averaged model
 5046 Number of obs =
 Group variable: public_id Number of groups =
 783
 Link: identity Obs per group: min =
 1
 Family: Gaussian avg =
 6.4
 Correlation: exchangeable max =
 36
 Wald chi2(22) =
 151.77
 Scale parameter: 107.1978 Prob > chi2 =
 0.0000

```
-----
```

grp_cmf_f~ek	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
grp_step_e~e	.0351432	.0233468	1.51	0.132	-.0106157
.080902					
_Icmf_y~2001	4.391451	.7986454	5.50	0.000	2.826135
5.956767					
_Icmf_y~2002	4.636718	.7725537	6.00	0.000	3.122541
6.150896					
_Icmf_y~2003	4.208781	.7863779	5.35	0.000	2.667509
5.750054					
_Icmf_y~2004	5.603014	.7973703	7.03	0.000	4.040197
7.165831					
_Icmf_y~2005	7.051251	.8826997	7.99	0.000	5.321191
8.78131					
_Igrp_cm~_30	.8583037	1.2553	0.68	0.494	-1.602039
3.318647					
_Igrp_cm~_60	4.851843	1.323802	3.67	0.000	2.257238
7.446448					
_Igrp_cm~_70	1.021335	1.34105	0.76	0.446	-1.607075
3.649746					
_Igrp_cm~_90	2.92819	1.609675	1.82	0.069	-.2267157
6.083096					
_Igrp_cm~130	4.335038	1.54133	2.81	0.005	1.314087
7.355989					
_Igrp_cm~140	-.9404074	.9192351	-1.02	0.306	-2.742075
.8612602					
_Igrp_cm~160	1.461661	1.110329	1.32	0.188	-.7145434
3.637866					
_Igrp_cm~170	-.7629066	1.084494	-0.70	0.482	-2.888476
1.362663					
_Igrp_cm~190	.1102861	1.451621	0.08	0.939	-2.734839
2.955411					

_Igrp_cm~200 1.175144		-1.332683	1.279527	-1.04	0.298	-3.84051
_Igrp_cm~210 1.363033		-4.113703	1.403429	-2.93	0.003	-6.864373
_Idst_time_1 1.099836		.4147428	.3495439	1.19	0.235	-.2703508
_Iperiod_1 2.038403		1.392006	.3298007	4.22	0.000	.7456081
_Iperiod_2 1.23997		.2197845	.5205123	0.42	0.673	-.8004009
_IdstXper~1 .3934472		-.5181987	.465134	-1.11	0.265	-1.429845
_IdstXper~2 .9665277		-.5631351	.7804546	-0.72	0.471	-2.092798
_cons 57.86211		55.06757	1.42581	38.62	0.000	52.27304

-
*****lincom for period2(window) - period1(post)**

. lincom _Iperiod_2 - _Iperiod_1

(1) - _Iperiod_1 + _Iperiod_2 = 0

-
grp_cmf_f~ek | Coef. Std. Err. z P>|z| [95% Conf. Interval]
-----+-----
-
(1) | -1.172221 .5418735 -2.16 0.031 -2.234274 -
.1101686

-

*****Overall Wald test for year**

. testparm _Icmf_year_2001 _Icmf_year_2002 _Icmf_year_2003 _Icmf_year_2004
_Icmf_year_2005

- (1) _Icmf_year_2001 = 0
- (2) _Icmf_year_2002 = 0
- (3) _Icmf_year_2003 = 0
- (4) _Icmf_year_2004 = 0
- (5) _Icmf_year_2005 = 0

chi2(5) = 75.87
Prob > chi2 = 0.0000

*****testparm for site**

. testparm _Igrp_cmf_f_30 _Igrp_cmf_f_60 _Igrp_cmf_f_70 _Igrp_cmf_f_90
_Igrp_cmf_f_130 _Igrp_cmf_f_140 _Igrp_cmf_f_160 _Igrp_cmf_f_170 _Igrp_cmf_f_190
_Igrp_cmf_f_200 _Igrp_cmf_f_210

- (1) _Igrp_cmf_f_30 = 0
- (2) _Igrp_cmf_f_60 = 0
- (3) _Igrp_cmf_f_70 = 0


```
( 4)  _Igrp_cmf_f_90 = 0
( 5)  _Igrp_cmf_f_130 = 0
( 6)  _Igrp_cmf_f_140 = 0
( 7)  _Igrp_cmf_f_160 = 0
( 8)  _Igrp_cmf_f_170 = 0
( 9)  _Igrp_cmf_f_190 = 0
(10)  _Igrp_cmf_f_200 = 0
(11)  _Igrp_cmf_f_210 = 0
```

```
      chi2( 11) =    48.64
Prob > chi2 =    0.0000
```

*****correlation coefficient**

. xtcorr, compact

Error structure: exchangeable
 Estimated within-public_id correlation: 0.4516

*****testparm for interaction term**

. testparm _Idst*per_1_1 _Idst*per_1_2

```
( 1)  _IdstXper_1_1 = 0
( 2)  _IdstXper_1_2 = 0
```

```
      chi2(  2) =    1.46
Prob > chi2 =    0.4830
```

GEE (Model 2 Table 3) for GAF in Bipolar II patients with interaction between season and period:

```
. xi:  xtgee  grp_cmf_final_gafweek  grp_step_enrol_final_age  i.cmf_year
i.grp_cmf_final_site_id          i.dst_time*i.period          if  lifedx  ==2  &
grp_cmf_final_gafweek > -1
  i.cmf_year          _Icmf_year_2000-2005(naturally coded; _Icmf_year_2000
omitted)
  i.grp_cmf_fi~id          _Igrp_cmf_f_10-210          (naturally coded; _Igrp_cmf_f_10
omitted)
  i.dst_time          _Idst_time_0-1          (naturally coded; _Idst_time_0 omitted)
  i.period          _Iperiod_0-2          (naturally coded; _Iperiod_0 omitted)
  i.dst~e*i.per~d          _IdstXper_#_#          (coded as above)
```

```
Iteration 1: tolerance = .96886795
Iteration 2: tolerance = .04637513
Iteration 3: tolerance = .00169486
Iteration 4: tolerance = .0000645
Iteration 5: tolerance = 2.458e-06
Iteration 6: tolerance = 9.371e-08
```

```
GEE population-averaged model          Number of obs          =
2227
Group variable:          public_id          Number of groups          =
392
Link:          identity          Obs per group: min =
1
Family:          Gaussian          avg =
5.7
```

Correlation: exchangeable max =
 34 Wald chi2(22) =
 75.95
 Scale parameter: 77.95151 Prob > chi2 =
 0.0000

```
-----
```

grp_cmf_f~ek	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
grp_step_e~e	-.0122854	.0260672	-0.47	0.637	-.0633762
.0388053					
_Icmf_y~2001	.6965507	1.446952	0.48	0.630	-2.139423
3.532524					
_Icmf_y~2002	-1.659226	1.412983	-1.17	0.240	-4.428621
1.110169					
_Icmf_y~2003	.2460407	1.407944	0.17	0.861	-2.513478
3.00556					
_Icmf_y~2004	-.4979377	1.413469	-0.35	0.725	-3.268287
2.272411					
_Icmf_y~2005	-.5571738	1.50319	-0.37	0.711	-3.503372
2.389024					
_Igrp_cm~_30	-2.987761	1.392563	-2.15	0.032	-5.717135
.2583881					
_Igrp_cm~_60	3.153558	1.408377	2.24	0.025	.3931895
5.913925					
_Igrp_cm~_70	-2.122425	1.786233	-1.19	0.235	-5.623377
1.378527					
_Igrp_cm~_90	-3.254164	3.128534	-1.04	0.298	-9.385977
2.877649					
_Igrp_cm~130	1.067793	1.720266	0.62	0.535	-2.303866
4.439452					
_Igrp_cm~140	-2.522036	1.073326	-2.35	0.019	-4.625717
.4183549					
_Igrp_cm~160	-1.027932	1.00154	-1.03	0.305	-2.990914
.9350506					
_Igrp_cm~170	-1.603939	1.573842	-1.02	0.308	-4.688612
1.480734					
_Igrp_cm~190	-4.701069	2.137309	-2.20	0.028	-8.890117
.5120202					
_Igrp_cm~200	1.040155	2.108029	0.49	0.622	-3.091506
5.171815					
_Igrp_cm~210	-5.833609	1.872702	-3.12	0.002	-9.504038
2.16318					
_Idst_time_1	-.6750438	.4883575	-1.38	0.167	-1.632207
.2821193					
_Iperiod_1	.9745005	.4515678	2.16	0.031	.0894439
1.859557					
_Iperiod_2	-.5325206	.7346002	-0.72	0.469	-1.972311
.9072692					
_IdstXper~1	.2832401	.6448704	0.44	0.661	-.9806826
1.547163					
_IdstXper~2	-.5687062	1.118484	-0.51	0.611	-2.760894
1.623481					

_cons		66.02376	2.011092	32.83	0.000	62.08209
69.96543						

*****lincom for period2(window) - period1(post)**

. lincom _Iperiod_2 - _Iperiod_1

(1) - _Iperiod_1 + _Iperiod_2 = 0

grp_cmf_f~ek		Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
(1)		-1.507021	.7621919	-1.98	0.048	-3.00089 - .0131525

*****Overall Wald test for year**

. testparm _Icmf_year_2001 _Icmf_year_2002 _Icmf_year_2003 _Icmf_year_2004 _Icmf_year_2005

(1) _Icmf_year_2001 = 0
 (2) _Icmf_year_2002 = 0
 (3) _Icmf_year_2003 = 0
 (4) _Icmf_year_2004 = 0
 (5) _Icmf_year_2005 = 0

chi2(5) = 15.80
 Prob > chi2 = 0.0074

*****Overall Wald test for site**

. testparm _Igrp_cmf_f_30 _Igrp_cmf_f_60 _Igrp_cmf_f_70 _Igrp_cmf_f_90
 _Igrp_cmf_f_130 _Igrp_cmf_f_140 _Igrp_cmf_f_160 _Igrp_cmf_f_170 _Igrp_cmf_f_190
 _Igrp_cmf_f_200 _Igrp_cmf_f_210

(1) _Igrp_cmf_f_30 = 0
 (2) _Igrp_cmf_f_60 = 0
 (3) _Igrp_cmf_f_70 = 0
 (4) _Igrp_cmf_f_90 = 0
 (5) _Igrp_cmf_f_130 = 0
 (6) _Igrp_cmf_f_140 = 0
 (7) _Igrp_cmf_f_160 = 0
 (8) _Igrp_cmf_f_170 = 0
 (9) _Igrp_cmf_f_190 = 0
 (10) _Igrp_cmf_f_200 = 0
 (11) _Igrp_cmf_f_210 = 0

chi2(11) = 36.86
 Prob > chi2 = 0.0001

*****correlation coefficient**

. xtcorr, compact

Error structure: exchangeable
 Estimated within-public_id correlation: 0.3547

*****Overall Wald test for interaction term**

. testparm _Idst*per_1_1 _Idst*per_1_2

- (1) _IdstXper_1_1 = 0
- (2) _IdstXper_1_2 = 0

chi2(2) = 0.59
 Prob > chi2 = 0.7443

GEE (Model 3 Table 3) for GAF in Bipolar I patients with interaction between season and year:

```
. xi: xtgee grp_cmf_final_gafweek grp_step_enrol_final_age i.period
i.grp_cmf_final_site_id i.dst_time*i.cmf_year if lifedx ==1 &
grp_cmf_final_gafweek > -1
i.period _Iperiod_0-2 (naturally coded; _Iperiod_0 omitted)
i.grp_cmf_fi~id _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
omitted)
i.dst_time _Idst_time_0-1 (naturally coded; _Idst_time_0 omitted)
i.cmf_year _Icmf_year_2000-2005(naturally coded; _Icmf_year_2000
omitted)
i.dst~e*i.cmf~r _IdstXcmf_#_# (coded as above)
note: _IdstXcmf_1_2005 dropped due to collinearity
```

Iteration 1: tolerance = 2.9545732
 Iteration 2: tolerance = .08668766
 Iteration 3: tolerance = .00148681
 Iteration 4: tolerance = .0000271
 Iteration 5: tolerance = 4.944e-07

```
GEE population-averaged model
5046 Number of obs =
Group variable: public_id Number of groups =
783
Link: identity Obs per group: min =
1
Family: Gaussian avg =
6.4
Correlation: exchangeable max =
36
Wald chi2(24) =
178.88
Scale parameter: 106.8494 Prob > chi2 =
0.0000
```

grp_cmf_f~ek	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
grp_step_e~e	.032205	.0233317	1.38	0.167	-.0135242 .0779342
_Iperiod_1	1.138537	.2321293	4.90	0.000	.6835722 1.593503
_Iperiod_2	-.0605184	.3878098	-0.16	0.876	-.8206116 .6995749

_Igrp_cm~_30		.866495	1.254224	0.69	0.490	-1.591738	
3.324728							
_Igrp_cm~_60		4.898534	1.323509	3.70	0.000	2.304503	
7.492564							
_Igrp_cm~_70		1.240584	1.340603	0.93	0.355	-1.386949	
3.868117							
_Igrp_cm~_90		3.068763	1.611901	1.90	0.057	-.0905057	
6.228031							
_Igrp_cm~130		4.523167	1.540737	2.94	0.003	1.503379	
7.542956							
_Igrp_cm~140		-.9086844	.9187106	-0.99	0.323	-2.709324	
.8919553							
_Igrp_cm~160		1.565308	1.109972	1.41	0.158	-.6101965	
3.740813							
_Igrp_cm~170		-.5615573	1.084576	-0.52	0.605	-2.687286	
1.564172							
_Igrp_cm~190		.1316183	1.451515	0.09	0.928	-2.713299	
2.976536							
_Igrp_cm~200		-1.131259	1.279583	-0.88	0.377	-3.639196	
1.376678							
_Igrp_cm~210		-3.830342	1.402944	-2.73	0.006	-6.580061	-
1.080622							
_Idst_time_1		-4.33831	1.941925	-2.23	0.025	-8.144413	-
.5322058							
_Icmf_y~2001		1.114034	1.910273	0.58	0.560	-2.630033	
4.858101							
_Icmf_y~2002		1.199816	1.878877	0.64	0.523	-2.482716	
4.882348							
_Icmf_y~2003		.381812	1.863263	0.20	0.838	-3.270117	
4.033741							
_Icmf_y~2004		.5499479	1.867099	0.29	0.768	-3.109499	
4.209395							
_Icmf_y~2005		3.113701	1.865876	1.67	0.095	-.5433483	
6.770751							
_IdstXc~2001		3.369148	2.097195	1.61	0.108	-.7412788	
7.479575							
_IdstXc~2002		3.508739	2.024439	1.73	0.083	-.4590882	
7.476566							
_IdstXc~2003		3.976297	2.012076	1.98	0.048	.0327019	
7.919893							
_IdstXc~2004		6.442688	2.002922	3.22	0.001	2.517034	
10.36834							
_cons		59.23682	2.170674	27.29	0.000	54.98237	
63.49126							

*****lincom for period2(window) - period1(post)**

. lincom _Iperiod_2 - _Iperiod_1
(1) - _Iperiod_1 + _Iperiod_2 = 0

-
grp_cmf_f~ek | Coef. Std. Err. z P>|z| [95% Conf. Interval]

```

-----+-----
-          (1) |  -1.199056    .4009528    -2.99    0.003    -1.984909    -
.4132027
-----
-

```

*****Overall Wald test for interaction term**

```

. testparm    _Idst*cmf_1_2001    _Idst*cmf_1_2002    _Idst*cmf_1_2003
_Idst*cmf_1_2004

```

- (1) _IdstXcmf_1_2001 = 0
- (2) _IdstXcmf_1_2002 = 0
- (3) _IdstXcmf_1_2003 = 0
- (4) _IdstXcmf_1_2004 = 0

```

          chi2( 4) =    27.96
        Prob > chi2 =    0.0000

```

*****Overall Wald test for site**

```

. testparm    _Igrp_cmf_f_30    _Igrp_cmf_f_60    _Igrp_cmf_f_70    _Igrp_cmf_f_90
_Igrp_cmf_f_130    _Igrp_cmf_f_140    _Igrp_cmf_f_160    _Igrp_cmf_f_170    _Igrp_cmf_f_190
_Igrp_cmf_f_200    _Igrp_cmf_f_210

```

- (1) _Igrp_cmf_f_30 = 0
- (2) _Igrp_cmf_f_60 = 0
- (3) _Igrp_cmf_f_70 = 0
- (4) _Igrp_cmf_f_90 = 0
- (5) _Igrp_cmf_f_130 = 0
- (6) _Igrp_cmf_f_140 = 0
- (7) _Igrp_cmf_f_160 = 0
- (8) _Igrp_cmf_f_170 = 0
- (9) _Igrp_cmf_f_190 = 0
- (10) _Igrp_cmf_f_200 = 0
- (11) _Igrp_cmf_f_210 = 0

```

          chi2( 11) =    47.88
        Prob > chi2 =    0.0000

```

*****correlation coefficient**

```

. xtcorr, compact

```

```

Error structure: exchangeable
Estimated within-public_id correlation: 0.4525

```

GEE (Model 3 Table 3) for GAF in Bipolar II patients with interaction between season and year:

```

. xi: xtgee  grp_cmf_final_gafweek  grp_step_enrol_final_age  i.period
i.grp_cmf_final_site_id          i.dst_time*i.cmf_year  if  lifedx  ==2  &
grp_cmf_final_gafweek > -1
i.period          _Iperiod_0-2          (naturally coded; _Iperiod_0 omitted)
i.grp_cmf_fi~id  _Igrp_cmf_f_10-210    (naturally coded; _Igrp_cmf_f_10
omitted)
i.dst_time          _Idst_time_0-1    (naturally coded; _Idst_time_0 omitted)
i.cmf_year          _Icmf_year_2000-2005(naturally coded; _Icmf_year_2000
omitted)
i.dst~e*i.cmf~r  _IdstXcmf_#_#    (coded as above)

```

note: _IdstXcmf_1_2005 dropped due to collinearity

Iteration 1: tolerance = 1.0325025
 Iteration 2: tolerance = .04196598
 Iteration 3: tolerance = .00144529
 Iteration 4: tolerance = .00005155
 Iteration 5: tolerance = 1.841e-06
 Iteration 6: tolerance = 6.574e-08

GEE population-averaged model
 2227 Number of obs =
 Group variable: public_id Number of groups =
 392
 Link: identity Obs per group: min =
 1
 Family: Gaussian avg =
 5.7
 Correlation: exchangeable max =
 34
 Wald chi2(24) =
 93.07
 Scale parameter: 77.56781 Prob > chi2 =
 0.0000

grp_cmf_f~ek	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
grp_step_e~e	-.0147471	.0260976	-0.57	0.572	-.0658974
__Iperiod_1	1.11102	.3206676	3.46	0.001	.4825234
__Iperiod_2	-.7869986	.5516425	-1.43	0.154	-1.868198
__Igrp_cm~_30	-3.089056	1.393865	-2.22	0.027	-5.820981
__Igrp_cm~_60	3.205376	1.409765	2.27	0.023	.4422873
__Igrp_cm~_70	-2.230927	1.788637	-1.25	0.212	-5.736592
__Igrp_cm~_90	-2.714534	3.131455	-0.87	0.386	-8.852072
__Igrp_cm~130	1.134532	1.722975	0.66	0.510	-2.242436
__Igrp_cm~140	-2.592241	1.074637	-2.41	0.016	-4.698492
__Igrp_cm~160	-1.153691	1.003078	-1.15	0.250	-3.119688
__Igrp_cm~170	-1.546159	1.575128	-0.98	0.326	-4.633354
__Igrp_cm~190	-4.955566	2.141914	-2.31	0.021	-9.153641
__Igrp_cm~200	1.139458	2.108169	0.54	0.589	-2.992478

_Igrp_cm~210 2.244651		-5.916978	1.873671	-3.16	0.002	-9.589305	-
_Idst_time_1 5.027471		-5.66212	5.453973	-1.04	0.299	-16.35171	
_Icmf_y~2001 7.491067		-3.174838	5.441889	-0.58	0.560	-13.84074	
_Icmf_y~2002 5.761692		-4.802942	5.390218	-0.89	0.373	-15.36758	
_Icmf_y~2003 5.17176		-5.365736	5.376372	-1.00	0.318	-15.90323	
_Icmf_y~2004 4.853261		-5.694322	5.381519	-1.06	0.290	-16.2419	
_Icmf_y~2005 5.213653		-5.340338	5.384788	-0.99	0.321	-15.89433	
_IdstXc~2001 14.51335		3.514571	5.611723	0.63	0.531	-7.484204	
_IdstXc~2002 13.23488		2.41576	5.520061	0.44	0.662	-8.403362	
_IdstXc~2003 17.13988		6.369978	5.494949	1.16	0.246	-4.399925	
_IdstXc~2004 16.56811		5.814814	5.486479	1.06	0.289	-4.938487	
_cons 81.8475		70.99639	5.536384	12.82	0.000	60.14528	

*****lincom for period2(window) - period1(post)**

. lincom _Iperiod_2 - _Iperiod_1

(1) - _Iperiod_1 + _Iperiod_2 = 0

grp_cmf_f~ek Interval]	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
(1)	-1.898019	.5678523	-3.34	0.001	-3.010989 - .7850488

*****Overall Wald test for interaction term**

. testparm _Idst*cmf_1_2001 _Idst*cmf_1_2002 _Idst*cmf_1_2003
_Idst*cmf_1_2004

- (1) _IdstXcmf_1_2001 = 0
- (2) _IdstXcmf_1_2002 = 0
- (3) _IdstXcmf_1_2003 = 0
- (4) _IdstXcmf_1_2004 = 0

chi2(4) = 17.32
Prob > chi2 = 0.0017

*****Overall Wald test for site**


```

. testparm   _Igrp_cmf_f_30   _Igrp_cmf_f_60   _Igrp_cmf_f_70   _Igrp_cmf_f_90
_Igrp_cmf_f_130 _Igrp_cmf_f_140 _Igrp_cmf_f_160 _Igrp_cmf_f_170 _Igrp_cmf_f_190
_Igrp_cmf_f_200 _Igrp_cmf_f_210

```

- (1) _Igrp_cmf_f_30 = 0
- (2) _Igrp_cmf_f_60 = 0
- (3) _Igrp_cmf_f_70 = 0
- (4) _Igrp_cmf_f_90 = 0
- (5) _Igrp_cmf_f_130 = 0
- (6) _Igrp_cmf_f_140 = 0
- (7) _Igrp_cmf_f_160 = 0
- (8) _Igrp_cmf_f_170 = 0
- (9) _Igrp_cmf_f_190 = 0
- (10) _Igrp_cmf_f_200 = 0
- (11) _Igrp_cmf_f_210 = 0

```

          chi2( 11) =   38.48
    Prob > chi2 =   0.0001

```

*****correlation coefficient**

```

. xtcorr, compact

```

```

Error structure: exchangeable
Estimated within-public_id correlation: 0.3587

```

GEE (Model 4 Table 3) for GAF in Bipolar I patients using sequence (season/year combination) in place of interaction term (Table 11):

```

. xi: xtgee   grp_cmf_final_gafweek   grp_step_enrol_final_age   i.period
i.grp_cmf_final_site_id i.sequence if lifedx ==1 & grp_cmf_final_gafweek > -1
i.period           _Iperiod_0-2           (naturally coded; _Iperiod_0 omitted)
i.grp_cmf_fi~id     _Igrp_cmf_f_10-210     (naturally coded; _Igrp_cmf_f_10
omitted)
i.sequence           _Isequence_1-11       (naturally coded; _Isequence_1 omitted)

```

```

Iteration 1: tolerance = 2.9545732
Iteration 2: tolerance = .09394107
Iteration 3: tolerance = .00187211
Iteration 4: tolerance = .00003411
Iteration 5: tolerance = 6.224e-07

```

```

GEE population-averaged model           Number of obs           =
5046
Group variable:                          public_id           Number of groups           =
783
Link:                                      identity           Obs per group: min =
1
Family:                                    Gaussian           avg =
6.4
Correlation:                              exchangeable           max =
36
                                           Wald   chi2(24)           =
178.88
Scale parameter:                          106.8494           Prob > chi2           =
0.0000

```

-

grp_cmf_f~ek Interval]	Coef.	Std. Err.	z	P> z	[95% Conf.
-					
grp_step_e~e .0779342	.032205	.0233317	1.38	0.167	-.0135242
_Iperiod_1 1.593503	1.138537	.2321293	4.90	0.000	.6835722
_Iperiod_2 .6995749	-.0605184	.3878098	-0.16	0.876	-.8206116
_Igrp_cm~_30 3.324728	.866495	1.254224	0.69	0.490	-1.591738
_Igrp_cm~_60 7.492564	4.898534	1.323509	3.70	0.000	2.304503
_Igrp_cm~_70 3.868117	1.240584	1.340603	0.93	0.355	-1.386949
_Igrp_cm~_90 6.228031	3.068763	1.611901	1.90	0.057	-.0905057
_Igrp_cm~130 7.542956	4.523167	1.540737	2.94	0.003	1.503379
_Igrp_cm~140 .8919553	-.9086844	.9187106	-0.99	0.323	-2.709324
_Igrp_cm~160 3.740813	1.565308	1.109972	1.41	0.158	-.6101965
_Igrp_cm~170 1.564172	-.5615573	1.084576	-0.52	0.605	-2.687286
_Igrp_cm~190 2.976536	.1316183	1.451515	0.09	0.928	-2.713299
_Igrp_cm~200 1.376678	-1.131259	1.279583	-0.88	0.377	-3.639196
_Igrp_cm~210 1.080622	-3.830342	1.402944	-2.73	0.006	-6.580061
_Isequence_2 .5322058	-4.33831	1.941925	-2.23	0.025	-8.144413
_Isequence_3 4.858101	1.114034	1.910273	0.58	0.560	-2.630033
_Isequence_4 3.839401	.1448722	1.884998	0.08	0.939	-3.549656
_Isequence_5 4.882348	1.199816	1.878877	0.64	0.523	-2.482716
_Isequence_6 4.029017	.3702455	1.866754	0.20	0.843	-3.288526
_Isequence_7 4.033741	.381812	1.863263	0.20	0.838	-3.270117
_Isequence_8 3.665832	.0197998	1.860255	0.01	0.992	-3.626232
_Isequence_9 4.209395	.5499479	1.867099	0.29	0.768	-3.109499
_Isequenc~10 6.305461	2.654327	1.862858	1.42	0.154	-.9968083
_Isequenc~11 6.770751	3.113701	1.865876	1.67	0.095	-.5433483
_cons 63.49126	59.23682	2.170674	27.29	0.000	54.98237

*****overall Wald test for site**

```
. testparm _Igrp_cmf_f_30 _Igrp_cmf_f_60 _Igrp_cmf_f_70 _Igrp_cmf_f_90
_Igrp_cmf_f_130 _Igrp_cmf_f_140 _Igrp_cmf_f_160 _Igrp_cmf_f_170 _Igrp_cmf_f_190
_Igrp_cmf_f_200 _Igrp_cmf_f_210
```

- (1) _Igrp_cmf_f_30 = 0
- (2) _Igrp_cmf_f_60 = 0
- (3) _Igrp_cmf_f_70 = 0
- (4) _Igrp_cmf_f_90 = 0
- (5) _Igrp_cmf_f_130 = 0
- (6) _Igrp_cmf_f_140 = 0
- (7) _Igrp_cmf_f_160 = 0
- (8) _Igrp_cmf_f_170 = 0
- (9) _Igrp_cmf_f_190 = 0
- (10) _Igrp_cmf_f_200 = 0
- (11) _Igrp_cmf_f_210 = 0

```
chi2( 11) = 47.88
Prob > chi2 = 0.0000
```

*****Overall Wald test for sequence term (season/year combination)**

```
. testparm _Isequence_2 _Isequence_3 _Isequence_4 _Isequence_5 _Isequence_6
_Isequence_7 _Isequence_8 _Isequence_9 _Isequence_10 _Isequence_11
```

- (1) _Isequence_2 = 0
- (2) _Isequence_3 = 0
- (3) _Isequence_4 = 0
- (4) _Isequence_5 = 0
- (5) _Isequence_6 = 0
- (6) _Isequence_7 = 0
- (7) _Isequence_8 = 0
- (8) _Isequence_9 = 0
- (9) _Isequence_10 = 0
- (10) _Isequence_11 = 0

```
chi2( 10) = 109.86
Prob > chi2 = 0.0000
```

*****lincom for period2(window) - period1(post)**

```
. lincom _Iperiod_2 - _Iperiod_1
```

- (1) - _Iperiod_1 + _Iperiod_2 = 0

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
(1)	-1.199056	.4009528	-2.99	0.003	-1.984909 - .4132027

*****overall Wald test for period**

```
. testparm _Iperiod_1 _Iperiod_2
```

- (1) _Iperiod_1 = 0
- (2) _Iperiod_2 = 0

```

      chi2( 2) =    25.97
    Prob > chi2 =    0.0000

```

*****correlation coefficient**

```
. xtcorr, compact
```

```

Error structure: exchangeable
Estimated within-public_id correlation: 0.4525

```

GEE (Model 4 Table 3) for GAF in Bipolar II patients using sequence (season/year combination) in place of interaction term (Table 12):

```

. xi: xtgee grp_cmf_final_gafweek grp_step_enrol_final_age i.period
i.grp_cmf_final_site_id i.sequence if lifedx ==2 & grp_cmf_final_gafweek > -1
i.period _Iperiod_0-2 (naturally coded; _Iperiod_0 omitted)
i.grp_cmf_fi~id _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
omitted)
i.sequence _Isequence_1-11 (naturally coded; _Isequence_1 omitted)

```

```

Iteration 1: tolerance = 1.0325025
Iteration 2: tolerance = .04196598
Iteration 3: tolerance = .00144529
Iteration 4: tolerance = .00005155
Iteration 5: tolerance = 1.841e-06
Iteration 6: tolerance = 6.574e-08

```

```

GEE population-averaged model
2227
Group variable: public_id Number of obs =
392 Number of groups =
Link: identity Obs per group: min =
1 avg =
Family: Gaussian max =
5.7
Correlation: exchangeable
34
Wald chi2(24) =
93.07
Scale parameter: 77.56781 Prob > chi2 =
0.0000

```

```

-----
-
grp_cmf_f~ek |      Coef.   Std. Err.      z    P>|z|     [95% Conf.
Interval]
-----+-----
-
grp_step_e~e |  -.0147471   .0260976    -0.57   0.572    - .0658974
.0364032
_Iperiod_1 |    1.11102   .3206676     3.46   0.001     .4825234
1.739517
_Iperiod_2 |  -.7869986   .5516425    -1.43   0.154    -1.868198
.2942009
_Igrp_cm~_30 | -3.089056   1.393865    -2.22   0.027    -5.820981
.3571314

```

5.968466	__Igrp_cm~_60	3.205376	1.409765	2.27	0.023	.4422873
1.274738	__Igrp_cm~_70	-2.230927	1.788637	-1.25	0.212	-5.736592
3.423004	__Igrp_cm~_90	-2.714534	3.131455	-0.87	0.386	-8.852072
4.5115	__Igrp_cm~130	1.134532	1.722975	0.66	0.510	-2.242436
.4859901	__Igrp_cm~140	-2.592241	1.074637	-2.41	0.016	-4.698492
.8123056	__Igrp_cm~160	-1.153691	1.003078	-1.15	0.250	-3.119688
1.541035	__Igrp_cm~170	-1.546159	1.575128	-0.98	0.326	-4.633354
.7574915	__Igrp_cm~190	-4.955566	2.141914	-2.31	0.021	-9.153641
5.271394	__Igrp_cm~200	1.139458	2.108169	0.54	0.589	-2.992478
2.244651	__Igrp_cm~210	-5.916978	1.873671	-3.16	0.002	-9.589305
5.027471	__Isequence_2	-5.66212	5.453973	-1.04	0.299	-16.35171
7.491067	__Isequence_3	-3.174838	5.441889	-0.58	0.560	-13.84074
5.259673	__Isequence_4	-5.322387	5.399109	-0.99	0.324	-15.90445
5.761692	__Isequence_5	-4.802942	5.390218	-0.89	0.373	-15.36758
2.481787	__Isequence_6	-8.049302	5.373104	-1.50	0.134	-18.58039
5.17176	__Isequence_7	-5.365736	5.376372	-1.00	0.318	-15.90323
5.894093	__Isequence_8	-4.657878	5.383758	-0.87	0.387	-15.20985
4.853261	__Isequence_9	-5.694322	5.381519	-1.06	0.290	-16.2419
5.00833	__Isequenc~10	-5.541628	5.382731	-1.03	0.303	-16.09159
5.213653	__Isequenc~11	-5.340338	5.384788	-0.99	0.321	-15.89433
81.8475	__cons	70.99639	5.536384	12.82	0.000	60.14528

*****Overall Wald test for site**

```
. testparm __Igrp_cmf_f_30 __Igrp_cmf_f_60 __Igrp_cmf_f_70 __Igrp_cmf_f_90
_Igrp_cmf_f_130 __Igrp_cmf_f_140 __Igrp_cmf_f_160 __Igrp_cmf_f_170 __Igrp_cmf_f_190
_Igrp_cmf_f_200 __Igrp_cmf_f_210
```

- (1) __Igrp_cmf_f_30 = 0
- (2) __Igrp_cmf_f_60 = 0
- (3) __Igrp_cmf_f_70 = 0
- (4) __Igrp_cmf_f_90 = 0
- (5) __Igrp_cmf_f_130 = 0
- (6) __Igrp_cmf_f_140 = 0
- (7) __Igrp_cmf_f_160 = 0

```
( 8)  _Igrp_cmf_f_170 = 0
( 9)  _Igrp_cmf_f_190 = 0
(10)  _Igrp_cmf_f_200 = 0
(11)  _Igrp_cmf_f_210 = 0
```

```
chi2( 11) = 38.48
Prob > chi2 = 0.0001
```

*****Overall Wald test for sequence (year/season combination)**

```
. testparm _Isequence_2 _Isequence_3 _Isequence_4 _Isequence_5 _Isequence_6
_Isequence_7 _Isequence_8 _Isequence_9 _Isequence_10 _Isequence_11
```

```
( 1)  _Isequence_2 = 0
( 2)  _Isequence_3 = 0
( 3)  _Isequence_4 = 0
( 4)  _Isequence_5 = 0
( 5)  _Isequence_6 = 0
( 6)  _Isequence_7 = 0
( 7)  _Isequence_8 = 0
( 8)  _Isequence_9 = 0
( 9)  _Isequence_10 = 0
(10)  _Isequence_11 = 0
```

```
chi2( 10) = 36.65
Prob > chi2 = 0.0001
```

*****lincom for period2(window) - period1(post)**

```
. lincom _Iperiod_2 - _Iperiod_1
```

```
( 1) - _Iperiod_1 + _Iperiod_2 = 0
```

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
(1)	-1.898019	.5678523	-3.34	0.001	-3.010989 - .7850488

*****overall Wald test for period**

```
. testparm _Iperiod_1 _Iperiod_2
```

```
( 1)  _Iperiod_1 = 0
( 2)  _Iperiod_2 = 0
```

```
chi2( 2) = 17.40
Prob > chi2 = 0.0002
```

*****correlation coefficient**

```
. xtcorr, compact
```

```
Error structure: exchangeable
Estimated within-public_id correlation: 0.3587
```

Creation of new binary diagnosis variable to be used in combined models:

```
. generate dx = 0

. replace dx = 1 if lifedx ==2
(2239 real changes made)

. label define diag 0 BPI 1 BPII

. label values dx diag

. tabulate dx
```

diagnosis	Freq.	Percent	Cum.
BPI	5,076	69.39	69.39
BPII	2,239	30.61	100.00
Total	7,315	100.00	

Combined main effects model for GAF (Model 5 Table 3; results presented in Table 13):

```
. xi: xtgee grp_cmf_final_gafweek grp_step_enrol_final_age i.period
i.sequence i.grp_cmf_final_site_id dx if grp_cmf_final_gafweek > -1
i.period _Iperiod_0-2 (naturally coded; _Iperiod_0 omitted)
i.sequence _Isequence_1-11 (naturally coded; _Isequence_1 omitted)
i.grp_cmf_fi~id _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
omitted)
```

```
Iteration 1: tolerance = 1.3241907
Iteration 2: tolerance = .07666313
Iteration 3: tolerance = .00205925
Iteration 4: tolerance = .00005032
Iteration 5: tolerance = 1.227e-06
Iteration 6: tolerance = 3.001e-08
```

```
GEE population-averaged model
7273
Group variable: public_id Number of obs =
1175
Link: identity Number of groups =
1 Obs per group: min =
Family: Gaussian avg =
6.2
Correlation: exchangeable max =
36
Wald chi2(25) =
216.78
Scale parameter: 99.03439 Prob > chi2 =
0.0000
```

```
-----
-
grp_cmf_f~ek | Coef. Std. Err. z P>|z| [95% Conf.
Interval]
```

-						
grp_step_e~e	.0180417	.0180723	1.00	0.318	-.0173794	
.0534627						
_Iperiod_1	1.123709	.1876931	5.99	0.000	.7558368	
1.49158						
_Iperiod_2	-.2811379	.316496	-0.89	0.374	-.9014586	
.3391828						
_Isequence_2	-3.973673	1.7791	-2.23	0.026	-7.460645	-
.4867006						
_Isequence_3	.9240839	1.752314	0.53	0.598	-2.510388	
4.358556						
_Isequence_4	-.3363039	1.731742	-0.19	0.846	-3.730457	
3.057849						
_Isequence_5	.6054333	1.7268	0.35	0.726	-2.779033	
3.989899						
_Isequence_6	-.9080623	1.715864	-0.53	0.597	-4.271094	
2.454969						
_Isequence_7	-.1513692	1.714105	-0.09	0.930	-3.510952	
3.208214						
_Isequence_8	-.1953096	1.712242	-0.11	0.909	-3.551243	
3.160624						
_Isequence_9	-.1423308	1.715504	-0.08	0.934	-3.504657	
3.219996						
_Isequenc~10	1.361728	1.713432	0.79	0.427	-1.996537	
4.719993						
_Isequenc~11	1.729618	1.715559	1.01	0.313	-1.632816	
5.092052						
_Igrp_cm~_30	-.467149	.9713482	-0.48	0.631	-2.370956	
1.436658						
_Igrp_cm~_60	4.579214	1.008276	4.54	0.000	2.603029	
6.555399						
_Igrp_cm~_70	.2968205	1.100923	0.27	0.787	-1.860948	
2.454589						
_Igrp_cm~_90	1.85949	1.412831	1.32	0.188	-.9096067	
4.628587						
_Igrp_cm~130	3.57302	1.195392	2.99	0.003	1.230095	
5.915945						
_Igrp_cm~140	-1.340032	.7243412	-1.85	0.064	-2.759715	
.0796505						
_Igrp_cm~160	.5916448	.7773033	0.76	0.447	-.9318416	
2.115131						
_Igrp_cm~170	-.9387051	.9049695	-1.04	0.300	-2.712413	
.8350026						
_Igrp_cm~190	-1.148884	1.218338	-0.94	0.346	-3.536783	
1.239015						
_Igrp_cm~200	-.953832	1.091294	-0.87	0.382	-3.09273	
1.185066						
_Igrp_cm~210	-4.384968	1.144897	-3.83	0.000	-6.628924	-
2.141012						
dx	1.159739	.4841537	2.40	0.017	.2108147	
2.108662						
_cons	61.19091	1.928347	31.73	0.000	57.41142	
64.9704						

***Overall Wald test for site


```
. testparm _Igrp_cmf_f_30 _Igrp_cmf_f_60 _Igrp_cmf_f_70 _Igrp_cmf_f_90
_Igrp_cmf_f_130 _Igrp_cmf_f_140 _Igrp_cmf_f_160 _Igrp_cmf_f_170 _Igrp_cmf_f_190
_Igrp_cmf_f_200 _Igrp_cmf_f_210
```

- (1) _Igrp_cmf_f_30 = 0
- (2) _Igrp_cmf_f_60 = 0
- (3) _Igrp_cmf_f_70 = 0
- (4) _Igrp_cmf_f_90 = 0
- (5) _Igrp_cmf_f_130 = 0
- (6) _Igrp_cmf_f_140 = 0
- (7) _Igrp_cmf_f_160 = 0
- (8) _Igrp_cmf_f_170 = 0
- (9) _Igrp_cmf_f_190 = 0
- (10) _Igrp_cmf_f_200 = 0
- (11) _Igrp_cmf_f_210 = 0

```
chi2( 11) = 70.08
Prob > chi2 = 0.0000
```

*****Overall Wald test for sequence**

```
. testparm _Isequence_2 _Isequence_3 _Isequence_4 _Isequence_5 _Isequence_6
_Isequence_7 _Isequence_8 _Isequence_9 _Isequence_10 _Isequence_11
```

- (1) _Isequence_2 = 0
- (2) _Isequence_3 = 0
- (3) _Isequence_4 = 0
- (4) _Isequence_5 = 0
- (5) _Isequence_6 = 0
- (6) _Isequence_7 = 0
- (7) _Isequence_8 = 0
- (8) _Isequence_9 = 0
- (9) _Isequence_10 = 0
- (10) _Isequence_11 = 0

```
chi2( 10) = 100.02
Prob > chi2 = 0.0000
```

*****correlation coefficient**

```
. xtcorr, compact
```

```
Error structure: exchangeable
Estimated within-public_id correlation: 0.4419
```

*****lincom for period2(window) - period1(post)**

```
. lincom _Iperiod_2 - _Iperiod_1
```

- (1) - _Iperiod_1 + _Iperiod_2 = 0

```
-----
```

grp_cmf_f~ek	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
(1)	-1.404847	.3268601	-4.30	0.000	-2.045481 - .7642124

```
-----
```

*****Overall Wald test for period**

. testparm _Iperiod_1 _Iperiod_2

- (1) _Iperiod_1 = 0
- (2) _Iperiod_2 = 0

chi2(2) = 41.59
 Prob > chi2 = 0.0000

Combined GAF model with diagnosis*period interaction (Model 6 Table 3):

. xi: xtgee grp_cmf_final_gafweek grp_step_enrol_final_age i.sequence
 i.grp_cmf_final_site_id i.period*dx if grp_cmf_final_gafweek > -1
 i.sequence _Isequence_1-11 (naturally coded; _Isequence_1 omitted)
 i.grp_cmf_fi~id _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
 omitted)
 i.period _Iperiod_0-2 (naturally coded; _Iperiod_0 omitted)
 i.period*dx _IperXdx_# (coded as above)

Iteration 1: tolerance = 1.3286217
 Iteration 2: tolerance = .07703314
 Iteration 3: tolerance = .00207254
 Iteration 4: tolerance = .0000507
 Iteration 5: tolerance = 1.237e-06
 Iteration 6: tolerance = 3.010e-08

GEE population-averaged model
 7273 Number of obs =
 Group variable: public_id Number of groups =
 1175
 Link: identity Obs per group: min =
 1
 Family: Gaussian avg =
 6.2
 Correlation: exchangeable max =
 36
 Wald chi2(27) =
 217.91
 Scale parameter: 99.02951 Prob > chi2 =
 0.0000

grp_cmf_f~ek	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
grp_step_e~e	.0180901	.0180722	1.00	0.317	-.0173308
.053511					
_Isequence_2	-3.96704	1.779061	-2.23	0.026	-7.453935
.480145					
_Isequence_3	.9252092	1.752252	0.53	0.597	-2.509142
4.35956					
_Isequence_4	-.3368281	1.731694	-0.19	0.846	-3.730887
3.05723					

_Isequence_5		.6118791	1.726761	0.35	0.723	-2.77251
3.996268						
_Isequence_6		-.9013278	1.715819	-0.53	0.599	-4.26427
2.461615						
_Isequence_7		-.1463413	1.714059	-0.09	0.932	-3.505835
3.213152						
_Isequence_8		-.1893834	1.712193	-0.11	0.912	-3.545221
3.166454						
_Isequence_9		-.1368199	1.715458	-0.08	0.936	-3.499055
3.225415						
_Isequenc~10		1.365308	1.713389	0.80	0.426	-1.992874
4.723489						
_Isequenc~11		1.735615	1.715517	1.01	0.312	-1.626736
5.097966						
_Igrp_cm~_30		-.4563183	.9713956	-0.47	0.639	-2.360219
1.447582						
_Igrp_cm~_60		4.583704	1.008276	4.55	0.000	2.607518
6.559889						
_Igrp_cm~_70		.2910898	1.100929	0.26	0.791	-1.866691
2.448871						
_Igrp_cm~_90		1.864522	1.412824	1.32	0.187	-.9045623
4.633607						
_Igrp_cm~130		3.576026	1.195384	2.99	0.003	1.233116
5.918937						
_Igrp_cm~140		-1.335799	.7243476	-1.84	0.065	-2.755494
.0838963						
_Igrp_cm~160		.5922301	.7772988	0.76	0.446	-.9312476
2.115708						
_Igrp_cm~170		-.9377581	.9049628	-1.04	0.300	-2.711453
.8359364						
_Igrp_cm~190		-1.142196	1.218354	-0.94	0.349	-3.530126
1.245735						
_Igrp_cm~200		-.954011	1.091285	-0.87	0.382	-3.092891
1.184869						
_Igrp_cm~210		-4.380545	1.144893	-3.83	0.000	-6.624494
2.136596						
_Iperiod_1		1.123171	.2255442	4.98	0.000	.6811126
1.56523						
_Iperiod_2		-.0720391	.3766036	-0.19	0.848	-.8101685
.6660904						
dx		1.227272	.5202848	2.36	0.018	.2075327
2.247012						
_IperXdx_1		.0012113	.4064547	0.00	0.998	-.7954253
.7978479						
_IperXdx_2		-.7119197	.6933372	-1.03	0.305	-2.070836
.6469964						
_cons		61.16128	1.9295	31.70	0.000	57.37953
64.94303						

*****Overall Wald test for interaction term**

. testparm _Iper*dx_1 _Iper*dx_2

(1) _IperXdx_1 = 0

(2) _IperXdx_2 = 0

chi2(2) = 1.12

Prob > chi2 = 0.5712

***correlation coefficient

. xtcorr, compact

Error structure: exchangeable

Estimated within-public_id correlation: 0.4419

Combined GAF model with diagnosis*site interaction (Model 7 Table 3):

```

. xi: xtgee grp_cmf_final_gafweek grp_step_enrol_final_age i.period
i.sequence i.grp_cmf_final_site_id*dx if grp_cmf_final_gafweek > -1
i.period _Iperiod_0-2 (naturally coded; _Iperiod_0 omitted)
i.sequence _Isequence_1-11 (naturally coded; _Isequence_1 omitted)
i.grp_cmf_fi~id _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
omitted)
i.grp_cmf~id*dx _IgrpXdx_# (coded as above)

```

```

Iteration 1: tolerance = 1.2862831
Iteration 2: tolerance = .07423971
Iteration 3: tolerance = .00176599
Iteration 4: tolerance = .0000383
Iteration 5: tolerance = 8.291e-07

```

```

GEE population-averaged model
7273
Group variable: public_id Number of groups =
1175
Link: identity Obs per group: min =
1
Family: Gaussian avg =
6.2
Correlation: exchangeable max =
36
Wald chi2(36) =
227.41
Scale parameter: 98.46295 Prob > chi2 =
0.0000

```

```

-----
-
grp_cmf_f~ek |          Coef.   Std. Err.      z    P>|z|      [95% Conf.
Interval]
-----+-----
-
grp_step_e~e |    .0172483    .0180116     0.96   0.338    - .0180538
.0525504
_Iperiod_1 |    1.125389    .1883689     5.97   0.000     .7561931
1.494586
_Iperiod_2 |   -.2728515     .317601    -0.86   0.390    - .895338
.3496351
_Isequence_2 |  -4.016278    1.783065    -2.25   0.024    -7.511021  -
.5215353
_Isequence_3 |    .9200772    1.75641     0.52   0.600    -2.522423
4.362578
_Isequence_4 |   -.3628799    1.735722    -0.21   0.834    -3.764833
3.039073

```

_Isequence_5		.5768611	1.730729	0.33	0.739	-2.815306
3.969028						
_Isequence_6		-.9210922	1.719899	-0.54	0.592	-4.292033
2.449848						
_Isequence_7		-.1899312	1.717956	-0.11	0.912	-3.557063
3.1772						
_Isequence_8		-.2009473	1.716217	-0.12	0.907	-3.56467
3.162776						
_Isequence_9		-.1706608	1.719351	-0.10	0.921	-3.540526
3.199204						
_Isequenc~10		1.338584	1.717342	0.78	0.436	-2.027344
4.704512						
_Isequenc~11		1.697196	1.719376	0.99	0.324	-1.672719
5.067111						
_Igrp_cm~_30		.7584643	1.189511	0.64	0.524	-1.572934
3.089863						
_Igrp_cm~_60		4.932112	1.25478	3.93	0.000	2.472789
7.391435						
_Igrp_cm~_70		1.27591	1.2701	1.00	0.315	-1.21344
3.765259						
_Igrp_cm~_90		2.934438	1.526794	1.92	0.055	-.0580237
5.926899						
_Igrp_cm~130		4.525446	1.45838	3.10	0.002	1.667074
7.383817						
_Igrp_cm~140		-.8296763	.8703781	-0.95	0.340	-2.535586
.8762335						
_Igrp_cm~160		1.570226	1.050987	1.49	0.135	-.4896708
3.630123						
_Igrp_cm~170		-.5347081	1.026964	-0.52	0.603	-2.547521
1.478104						
_Igrp_cm~190		-.1740289	1.374913	-0.13	0.899	-2.868808
2.520751						
_Igrp_cm~200		-1.216772	1.211716	-1.00	0.315	-3.591691
1.158147						
_Igrp_cm~210		-3.719591	1.32352	-2.81	0.005	-6.313643
1.125539						
dx		2.919637	1.094671	2.67	0.008	.7741211
5.065152						
_IgrpXdx_30		-3.704146	2.035937	-1.82	0.069	-7.69451
.2862168						
_IgrpXdx_60		-1.317352	2.084367	-0.63	0.527	-5.402637
2.767933						
_IgrpXdx_70		-3.539494	2.488366	-1.42	0.155	-8.416601
1.337613						
_IgrpXdx_90		-5.859048	3.971508	-1.48	0.140	-13.64306
1.924965						
_IgrpXdx_130		-2.974273	2.501803	-1.19	0.234	-7.877717
1.929171						
_IgrpXdx_140		-1.71738	1.542686	-1.11	0.266	-4.740989
1.306228						
_IgrpXdx_160		-2.571373	1.590196	-1.62	0.106	-5.688101
.545354						
_IgrpXdx_170		-1.142077	2.136089	-0.53	0.593	-5.328734
3.04458						
_IgrpXdx_190		-3.857128	2.876428	-1.34	0.180	-9.494823
1.780567						

_IgrpXdx_200		2.734302	2.754132	0.99	0.321	-2.663698
8.132302						
_IgrpXdx_210		-2.269894	2.554431	-0.89	0.374	-7.276486
2.736699						
_cons		60.7178	1.940893	31.28	0.000	56.91372
64.52188						

*****Overall Wald test for interaction term**

```
. testparm _Igrp*dx_30 _Igrp*dx_60 _Igrp*dx_70 _Igrp*dx_90 _Igrp*dx_130
_Igrp*dx_140 _Igrp*dx_160_Igrp*dx_170 _Igrp*dx_190 _Igrp*dx_200 _Igrp*dx_210
```

- (1) _IgrpXdx_30 = 0
- (2) _IgrpXdx_60 = 0
- (3) _IgrpXdx_70 = 0
- (4) _IgrpXdx_90 = 0
- (5) _IgrpXdx_130 = 0
- (6) _IgrpXdx_140 = 0
- (7) _IgrpXdx_160 = 0
- (8) _IgrpXdx_170 = 0
- (9) _IgrpXdx_190 = 0
- (10) _IgrpXdx_200 = 0
- (11) _IgrpXdx_210 = 0

```
chi2( 11) = 10.47
Prob > chi2 = 0.4891
```

*****correlation coefficient**

```
. xtcorr, compact
```

```
Error structure: exchangeable
Estimated within-public_id correlation: 0.4346
```

Combined GAF model with diagnosis*sequence interaction (Model 8 Table 3; results presented in Table 14):

```
. xi: xtgee grp_cmf_final_gafweek grp_step_enrol_final_age i.period
i.grp_cmf_final_site_id i.sequence*dx if grp_cmf_final_gafweek > -1
i.period _Iperiod_0-2 (naturally coded; _Iperiod_0 omitted)
i.grp_cmf_fi~id _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
omitted)
i.sequence _Isequence_1-11 (naturally coded; _Isequence_1 omitted)
i.sequence*dx _IseqXdx_# (coded as above)
```

```
Iteration 1: tolerance = 2.6549367
Iteration 2: tolerance = .10799473
Iteration 3: tolerance = .00267971
Iteration 4: tolerance = .0000671
Iteration 5: tolerance = 1.675e-06
Iteration 6: tolerance = 4.179e-08
```

```
GEE population-averaged model Number of obs =
7273
Group variable: public_id Number of groups =
1175
Link: identity Obs per group: min =
1
```

```

Family:                Gaussian                avg =
6.2
Correlation:          exchangeable            max =
36
                                Wald  chi2(35)      =
265.01
Scale parameter:      98.58499      Prob > chi2    =
0.0000

```

```

-----
-
grp_cmf_f~ek |          Coef.   Std. Err.   z     P>|z|     [95% Conf.
Interval]
-----+-----
-
grp_step_e~e |    .0175192     .018061     0.97   0.332     -.0178797
.052918
  _Iperiod_1 |    1.12658     .1869975    6.02   0.000     .7600715
1.493088
  _Iperiod_2 |   -.2851387     .315379    -0.90   0.366     -.9032702
.3329928
  _Igrp_cm~_30 |  -.4054285     .9704814    -0.42   0.676     -2.307537
1.49668
  _Igrp_cm~_60 |    4.47308     1.007758    4.44   0.000     2.497911
6.448249
  _Igrp_cm~_70 |    .2540208     1.100198    0.23   0.817     -1.902327
2.410368
  _Igrp_cm~_90 |    2.05965     1.412441    1.46   0.145     -.708684
4.827983
  _Igrp_cm~130 |    3.434747     1.195013    2.87   0.004     1.092564
5.77693
  _Igrp_cm~140 |   -1.364171     .723674    -1.89   0.059     -2.782546
.0542035
  _Igrp_cm~160 |    .5764621     .777028     0.74   0.458     -.9464848
2.099409
  _Igrp_cm~170 |   -.9083775     .9042046    -1.00   0.315     -2.680586
.8638308
  _Igrp_cm~190 |   -1.101215     1.217713    -0.90   0.366     -3.48789
1.285459
  _Igrp_cm~200 |   -.8929004     1.09045     -0.82   0.413     -3.030143
1.244342
  _Igrp_cm~210 |  -4.370591     1.143844    -3.82   0.000     -6.612484   -
2.128699
  _Isequence_2 | -4.375836     1.874722    -2.33   0.020     -8.050225   -
.701448
  _Isequence_3 |    1.032932     1.843866     0.56   0.575     -2.580978
4.646842
  _Isequence_4 |    .0912655     1.818809     0.05   0.960     -3.473536
3.656067
  _Isequence_5 |    1.124146     1.812846     0.62   0.535     -2.428967
4.677258
  _Isequence_6 |    .2813134     1.800858     0.16   0.876     -3.248303
3.81093
  _Isequence_7 |    .2780148     1.797527     0.15   0.877     -3.245074
3.801104
  _Isequence_8 |   -.1119433     1.7944     -0.06   0.950     -3.628904
3.405017

```

3.941625	_Isequence_9	.4118905	1.800918	0.23	0.819	-3.117844
6.027328	_Isequenc~10	2.505612	1.796827	1.39	0.163	-1.016103
6.495763	_Isequenc~11	2.968439	1.799688	1.65	0.099	-.558885
18.72695	dx	7.131879	5.915963	1.21	0.228	-4.463195
11.00473	_IseqXdx_2	-.8174859	6.031852	-0.14	0.892	-12.6397
7.973539	_IseqXdx_3	-3.807507	6.010848	-0.63	0.526	-15.58855
6.864153	_IseqXdx_4	-4.816568	5.959661	-0.81	0.419	-16.49729
6.246816	_IseqXdx_5	-5.41618	5.950617	-0.91	0.363	-17.07918
3.790734	_IseqXdx_6	-7.828361	5.928219	-1.32	0.187	-19.44746
6.606143	_IseqXdx_7	-5.016948	5.930257	-0.85	0.398	-16.64004
7.643063	_IseqXdx_8	-3.993621	5.937193	-0.67	0.501	-15.63031
6.162167	_IseqXdx_9	-5.472234	5.936028	-0.92	0.357	-17.10664
4.258563	_IseqXdx_10	-7.374741	5.935469	-1.24	0.214	-19.00805
4.013618	_IseqXdx_11	-7.627554	5.939482	-1.28	0.199	-19.26873
64.44173	_cons	60.53336	1.994103	30.36	0.000	56.62499

*****Overall Wald test for interaction term**

. testparm _Iseq*dx_*

- (1) _IseqXdx_2 = 0
- (2) _IseqXdx_3 = 0
- (3) _IseqXdx_4 = 0
- (4) _IseqXdx_5 = 0
- (5) _IseqXdx_6 = 0
- (6) _IseqXdx_7 = 0
- (7) _IseqXdx_8 = 0
- (8) _IseqXdx_9 = 0
- (9) _IseqXdx_10 = 0
- (10) _IseqXdx_11 = 0

chi2(10) = 46.97
 Prob > chi2 = 0.0000

*****Overall Wald test for site**

. testparm _Igrp_cmf_f_30 _Igrp_cmf_f_60 _Igrp_cmf_f_70 _Igrp_cmf_f_90
 _Igrp_cmf_f_130 _Igrp_cmf_f_140 _Igrp_cmf_f_160 _Igrp_cmf_f_170 _Igrp_cmf_f_190
 _Igrp_cmf_f_200 _Igrp_cmf_f_210

- (1) _Igrp_cmf_f_30 = 0
- (2) _Igrp_cmf_f_60 = 0
- (3) _Igrp_cmf_f_70 = 0


```
( 4)  _Igrp_cmf_f_90 = 0
( 5)  _Igrp_cmf_f_130 = 0
( 6)  _Igrp_cmf_f_140 = 0
( 7)  _Igrp_cmf_f_160 = 0
( 8)  _Igrp_cmf_f_170 = 0
( 9)  _Igrp_cmf_f_190 = 0
(10)  _Igrp_cmf_f_200 = 0
(11)  _Igrp_cmf_f_210 = 0
```

```
      chi2( 11) =    68.20
Prob > chi2 =    0.0000
```

*****Overall Wald test for sequence**

```
. testparm _Isequence_2 _Isequence_3 _Isequence_4 _Isequence_5 _Isequence_6
_Isequence_7 _Isequence_8 _Isequence_9 _Isequence_10 _Isequence_11
```

```
( 1)  _Isequence_2 = 0
( 2)  _Isequence_3 = 0
( 3)  _Isequence_4 = 0
( 4)  _Isequence_5 = 0
( 5)  _Isequence_6 = 0
( 6)  _Isequence_7 = 0
( 7)  _Isequence_8 = 0
( 8)  _Isequence_9 = 0
( 9)  _Isequence_10 = 0
(10)  _Isequence_11 = 0
```

```
      chi2( 10) =   115.34
Prob > chi2 =    0.0000
```

*****Overall Wald test for period**

```
. testparm _Iperiod_1 _Iperiod_2
```

```
( 1)  _Iperiod_1 = 0
( 2)  _Iperiod_2 = 0
```

```
      chi2(  2) =    42.16
Prob > chi2 =    0.0000
```

*****lincom for period2(window) - period1(post)**

```
. lincom _Iperiod_2 - _Iperiod_1
```

```
( 1)  - _Iperiod_1 + _Iperiod_2 = 0
```

```
-----
```

grp_cmf_f~ek	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
(1)	-1.411719	.3257407	-4.33	0.000	-2.050159

```
-----
.7732787
-----
```

*****correlation coefficient**

```
. xtcorr, compact
```

Error structure: exchangeable
 Estimated within-public_id correlation: 0.4437

*****lincoms to get information in Table 14 for bipolar II patients**

. lincom dx + _Isequence_2 + _IseqXdx_2

(1) _Isequence_2 + dx + _IseqXdx_2 = 0

```
-----
-
grp_cmf_f~ek |          Coef.    Std. Err.      z    P>|z|      [95% Conf.
Interval]
-----+-----
-
          (1) |          1.938556    2.321073    0.84    0.404    -2.610664
6.487777
-----
```

. lincom dx + _Isequence_3 + _IseqXdx_3

(1) _Isequence_3 + dx + _IseqXdx_3 = 0

```
-----
-
grp_cmf_f~ek |          Coef.    Std. Err.      z    P>|z|      [95% Conf.
Interval]
-----+-----
-
          (1) |          4.357304    2.091223    2.08    0.037    .2585824
8.456025
-----
```

. lincom dx + _Isequence_4 + _IseqXdx_4

(1) _Isequence_4 + dx + _IseqXdx_4 = 0

```
-----
-
grp_cmf_f~ek |          Coef.    Std. Err.      z    P>|z|      [95% Conf.
Interval]
-----+-----
-
          (1) |          2.406576    2.002077    1.20    0.229    -1.517423
6.330574
-----
```

. lincom dx + _Isequence_5 + _IseqXdx_5

(1) _Isequence_5 + dx + _IseqXdx_5 = 0

```
-----
-
grp_cmf_f~ek |          Coef.    Std. Err.      z    P>|z|      [95% Conf.
Interval]
-----+-----
```

```

-----+-----
-
(1) |      2.839844      1.967804      1.44      0.149      -1.01698
6.696669
-----

```

```

. lincom dx + _Isequence_6 + _IseqXdx_6

```

```

( 1) _Isequence_6 + dx + _IseqXdx_6 = 0

```

```

-----+-----
-
grp_cmf_f~ek |      Coef.      Std. Err.      z      P>|z|      [95% Conf.
Interval]
-----

```

```

(1) |      -.4151691      1.893328      -0.22      0.826      -4.126023
3.295685
-----

```

```

. lincom dx + _Isequence_7 + _IseqXdx_7

```

```

( 1) _Isequence_7 + dx + _IseqXdx_7 = 0

```

```

-----+-----
-
grp_cmf_f~ek |      Coef.      Std. Err.      z      P>|z|      [95% Conf.
Interval]
-----

```

```

(1) |      2.392946      1.891442      1.27      0.206      -1.314213
6.100104
-----

```

```

. lincom dx + _Isequence_8 + _IseqXdx_8

```

```

( 1) _Isequence_8 + dx + _IseqXdx_8 = 0

```

```

-----+-----
-
grp_cmf_f~ek |      Coef.      Std. Err.      z      P>|z|      [95% Conf.
Interval]
-----

```

```

(1) |      3.026314      1.881348      1.61      0.108      -.6610604
6.713689
-----

```

```

. lincom dx + _Isequence_9 + _IseqXdx_9

```

```

( 1) _Isequence_9 + dx + _IseqXdx_9 = 0

```

```

-----
-
grp_cmf_f~ek |          Coef.      Std. Err.      z    P>|z|      [95% Conf.
Interval]
-----+-----
-
          (1) |          2.071535      1.868068      1.11    0.267      -1.589812
5.732882
-----

```

```

. lincom dx + _Isequence_10 + _IseqXdx_10

```

```

( 1)  _Isequence_10 + dx + _IseqXdx_10 = 0

```

```

-----
-
grp_cmf_f~ek |          Coef.      Std. Err.      z    P>|z|      [95% Conf.
Interval]
-----+-----
-
          (1) |          2.26275      1.86914      1.21    0.226      -1.400698
5.926197
-----

```

```

. lincom dx + _Isequence_11 + _IseqXdx_11

```

```

( 1)  _Isequence_11 + dx + _IseqXdx_11 = 0

```

```

-----
-
grp_cmf_f~ek |          Coef.      Std. Err.      z    P>|z|      [95% Conf.
Interval]
-----+-----
-
          (1) |          2.472764      1.879816      1.32    0.188      -1.211608
6.157136
-----

```

Creating new variable for CGI that collapses categories and drops unknown values

```

. generate cgi = 1

```

```

. replace cgi = . if grp_cmf_final_cgi == -6
(39 real changes made, 39 to missing)

```

```

. replace cgi = 2 if grp_cmf_final_cgi == 2
(2001 real changes made)

```

```

. replace cgi = 3 if grp_cmf_final_cgi == 3
(2188 real changes made)

```

```

. replace cgi = 4 if grp_cmf_final_cgi == 4
(1752 real changes made)

```

```
. replace cgi = 5 if grp_cmf_final_cgi == 5 | grp_cmf_final_cgi ==6 |
grp_cmf_final_cgi ==7
(709 real changes made)
```

```
. tabulate cgi
```

cgi	Freq.	Percent	Cum.
1	626	8.60	8.60
2	2,001	27.50	36.11
3	2,188	30.07	66.18
4	1,752	24.08	90.26
5	709	9.74	100.00
Total	7,276	100.00	

Main effects ordinal logistic model for Bipolar I patients (Model 1 Table 4):

```
. xi: ologit cgi grp_step_enrol_final_age dst_time post i.cmf_year
i.grp_cmf_final_site_id if dx == 0, robust
i.cmf_year _Icmf_year_2000-2005(naturally coded; _Icmf_year_2000
omitted)
i.grp_cmf_fi~id _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
omitted)
```

```
Iteration 0: log pseudolikelihood = -7598.6389
Iteration 1: log pseudolikelihood = -7492.4405
Iteration 2: log pseudolikelihood = -7492.0758
Iteration 3: log pseudolikelihood = -7492.0758
```

```
Ordered logistic regression                                Number of obs =
5045
Wald chi2(19) =
206.60
Prob > chi2 =
0.0000
Log pseudolikelihood = -7492.0758                        Pseudo R2 =
0.0140
```

```
-----
```

cgi	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
grp_step_e~e	.0002845	.0021807	0.13	0.896	-.0039896
dst_time	.0098893	.0552592	0.18	0.858	-.0984167
post	-.1121092	.0504492	-2.22	0.026	-.2109879
_Icmf_y~2001	-.3747787	.1532449	-2.45	0.014	-.6751333
_Icmf_y~2002	-.4715696	.1483077	-3.18	0.001	-.7622473

```
-----
```

_Icmf_y~2003		-.3690464	.1484079	-2.49	0.013	-.6599205	-
.0781722							
_Icmf_y~2004		-.3369328	.1461091	-2.31	0.021	-.6233013	-
.0505644							
_Icmf_y~2005		-.4520636	.1643958	-2.75	0.006	-.7742734	-
.1298539							
_Igrp_cm~_30		.1196318	.1164957	1.03	0.304	-.1086956	
.3479592							
_Igrp_cm~_60		.5506831	.1577131	3.49	0.000	.241571	
.8597952							
_Igrp_cm~_70		.3847314	.1066391	3.61	0.000	.1757226	
.5937403							
_Igrp_cm~_90		.6705597	.1764915	3.80	0.000	.3246428	
1.016477							
_Igrp_cm~130		.3447432	.1298401	2.66	0.008	.0902613	
.5992252							
_Igrp_cm~140		.1135622	.0786946	1.44	0.149	-.0406764	
.2678008							
_Igrp_cm~160		.1146113	.0942376	1.22	0.224	-.0700911	
.2993136							
_Igrp_cm~170		.5299125	.0984874	5.38	0.000	.3368807	
.7229444							
_Igrp_cm~190		.0130191	.1421652	0.09	0.927	-.2656195	
.2916578							
_Igrp_cm~200		1.090574	.1235193	8.83	0.000	.8484807	
1.332668							
_Igrp_cm~210		1.260828	.1308336	9.64	0.000	1.004399	
1.517258							

-							
/cut1		-2.485152	.1886643			-2.854927	-
2.115377							
/cut2		-.7067561	.1842207			-1.067822	-
.3456901							
/cut3		.5351715	.1840958			.1743504	
.8959927							
/cut4		2.13213	.1877451			1.764157	
2.500104							

. estimates store ologit

*****testing proportional odds assumption**

```
. xi: omodel logit cgi grp_step_enrol_final_age dst_time post i.cmf_year
i.grp_cmf_final_site_id if dx ==0
i.cmf_year          _Icmf_year_2000-2005(naturally coded; _Icmf_year_2000
omitted)
i.grp_cmf_fi~id     _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
omitted)
```

```
Iteration 0: log likelihood = -7598.6389
Iteration 1: log likelihood = -7492.4405
Iteration 2: log likelihood = -7492.0758
Iteration 3: log likelihood = -7492.0758
```

```

Ordered logit estimates
5045
Number of obs =
LR chi2(19) =
213.13
Prob > chi2 =
0.0000
Log likelihood = -7492.0758
Pseudo R2 =
0.0140

```

```

-----+-----
-
      cgi |      Coef.   Std. Err.   z     P>|z|     [95% Conf.
Interval]
-----+-----
-
  grp_step_e~e |      .0002845   .0021374     0.13   0.894     -.0039048
.0044738
    dst_time |      .0098893   .0551526     0.18   0.858     -.0982077
.1179863
      post |     -.1121092   .0504963    -2.22   0.026     -.2110802   -
.0131382
  __Icmf_y~2001 |     -.3747787   .1540533    -2.43   0.015     -.6767176   -
.0728398
  __Icmf_y~2002 |     -.4715696   .1466446    -3.22   0.001     -.7589878   -
.1841514
  __Icmf_y~2003 |     -.3690464   .1461221    -2.53   0.012     -.6554404   -
.0826523
  __Icmf_y~2004 |     -.3369328   .1451196    -2.32   0.020     -.621362    -
.0525037
  __Icmf_y~2005 |     -.4520636   .1621976    -2.79   0.005     -.7699652   -
.1341621
  __Igrp_cm~_30 |      .1196318   .1202345     0.99   0.320     -.1160235
.3552871
  __Igrp_cm~_60 |      .5506831   .1338437     4.11   0.000     .2883543
.8130119
  __Igrp_cm~_70 |      .3847314   .1137849     3.38   0.001     .1617171
.6077458
  __Igrp_cm~_90 |      .6705597   .1686834     3.98   0.000     .3399463
1.001173
  __Igrp_cm~130 |      .3447432   .1365036     2.53   0.012     .077201
.6122854
  __Igrp_cm~140 |      .1135622     .08065     1.41   0.159     -.0445088
.2716332
  __Igrp_cm~160 |      .1146113   .0902031     1.27   0.204     -.0621835
.2914061
  __Igrp_cm~170 |      .5299125   .1003468     5.28   0.000     .3332363
.7265887
  __Igrp_cm~190 |      .0130191   .1431512     0.09   0.928     -.2675521
.2935903
  __Igrp_cm~200 |      1.090574   .1128296     9.67   0.000     .8694322
1.311716
  __Igrp_cm~210 |      1.260828   .1391407     9.06   0.000     .9881176
1.533539
-----+-----
-
      _cut1 |     -2.485152   .1886325
      _cut2 |     -.7067561   .184382
(Ancillary parameters)

```

```

      _cut3 | .5351715 .1843249
      _cut4 | 2.13213 .1876005

```

Approximate likelihood-ratio test of proportionality of odds across response categories:

```

      chi2(57) = 226.75
      Prob > chi2 = 0.0000

```

Main effects ordinal logistic model for bipolar II patients (Model 1 Table 4):

```

      . xi: ologit cgi grp_step_enrol_final_age dst_time post i.cmf_year
      i.grp_cmf_final_site_id if dx == 1, robust
      i.cmf_year          _Icmf_year_2000-2005(naturally coded; _Icmf_year_2000
      omitted)
      i.grp_cmf_fi~id     _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
      omitted)

```

```

      Iteration 0: log pseudolikelihood = -3288.8432
      Iteration 1: log pseudolikelihood = -3231.0554
      Iteration 2: log pseudolikelihood = -3230.7719
      Iteration 3: log pseudolikelihood = -3230.7718

```

```

      Ordered logistic regression
      2231
      Wald chi2(19) =
      125.47
      Prob > chi2 =
      0.0000
      Log pseudolikelihood = -3230.7718
      Pseudo R2 =
      0.0177

```

	cgi	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
grp_step_e~e		.0044019	.0033833	1.30	0.193	-.0022292
.011033						
dst_time		.0802653	.0861481	0.93	0.351	-.0885818
.2491124						
post		-.1095702	.0770499	-1.42	0.155	-.2605853
.041445						
_Icmf_y~2001		.195669	.3433268	0.57	0.569	-.4772392
.8685772						
_Icmf_y~2002		.4493188	.3294246	1.36	0.173	-.1963416
1.094979						
_Icmf_y~2003		.2822434	.3283855	0.86	0.390	-.3613804
.9258672						
_Icmf_y~2004		.3051247	.3254796	0.94	0.349	-.3328037
.943053						
_Icmf_y~2005		.3217612	.3413735	0.94	0.346	-.3473186
.9908411						

_Igrp_cm~_30		.7906337	.1695112	4.66	0.000	.4583979
1.122869						
_Igrp_cm~_60		.8678113	.1987023	4.37	0.000	.4783619
1.257261						
_Igrp_cm~_70		1.334576	.1688772	7.90	0.000	1.003582
1.665569						
_Igrp_cm~_90		1.02043	.3354998	3.04	0.002	.3628622
1.677997						
_Igrp_cm~130		1.075692	.2588876	4.16	0.000	.5682814
1.583102						
_Igrp_cm~140		.460455	.1249077	3.69	0.000	.2156404
.7052696						
_Igrp_cm~160		.6771817	.1240029	5.46	0.000	.4341405
.9202229						
_Igrp_cm~170		.6503463	.2135368	3.05	0.002	.2318218
1.068871						
_Igrp_cm~190		.7777335	.2395405	3.25	0.001	.3082429
1.247224						
_Igrp_cm~200		.8415456	.3730706	2.26	0.024	.1103406
1.572751						
_Igrp_cm~210		1.91186	.2556956	7.48	0.000	1.410706
2.413014						

-	/cut1		-1.404155	.3884541		-2.165511	-
.6427992							
1.282394	/cut2		.5305777	.3835868		-.2212386	
2.672725	/cut3		1.918538	.3847959		1.164352	
4.288818	/cut4		3.529355	.3874884		2.769891	

. estimates store ologit

*****testing the proportional odds assumption**

```
. xi: omodel logit cgi grp_step_enrol_final_age dst_time post i.cmf_year
i.grp_cmf_final_site_id if dx ==1
i.cmf_year          _Icmf_year_2000-2005(naturally coded; _Icmf_year_2000
omitted)
i.grp_cmf_fi~id     _Igrp_cmf_f_10-210      (naturally coded; _Igrp_cmf_f_10
omitted)
```

```
Iteration 0:  log likelihood = -3288.8432
Iteration 1:  log likelihood = -3231.0554
Iteration 2:  log likelihood = -3230.7719
Iteration 3:  log likelihood = -3230.7718
```

Ordered logit estimates		Number of obs	=
2231			
	LR	chi2(19)	=
116.14			
	Prob	> chi2	=
0.0000			

Log likelihood = -3230.7718
0.0177

Pseudo R2 =

Interval]	cgi	Coef.	Std. Err.	z	P> z	[95% Conf.
	grp_step_e~e	.0044019	.0031722	1.39	0.165	-.0018155
.0106193	dst_time	.0802653	.0847788	0.95	0.344	-.0858981
.2464288	post	-.1095702	.0765225	-1.43	0.152	-.2595514
.0404111	_Icmf_y~2001	.195669	.3312	0.59	0.555	-.4534711
.8448091	_Icmf_y~2002	.4493188	.3164451	1.42	0.156	-.1709022
1.06954	_Icmf_y~2003	.2822434	.3148726	0.90	0.370	-.3348954
.8993823	_Icmf_y~2004	.3051247	.313266	0.97	0.330	-.3088654
.9191147	_Icmf_y~2005	.3217612	.3297344	0.98	0.329	-.3245062
.9680287	_Igrp_cm~_30	.7906337	.1662981	4.75	0.000	.4646954
1.116572	_Igrp_cm~_60	.8678113	.18316	4.74	0.000	.5088242
1.226798	_Igrp_cm~_70	1.334576	.1792625	7.44	0.000	.9832274
1.685924	_Igrp_cm~_90	1.02043	.433883	2.35	0.019	.1700346
1.870825	_Igrp_cm~130	1.075692	.2345095	4.59	0.000	.6160616
1.535322	_Igrp_cm~140	.460455	.1293685	3.56	0.000	.2068973
.7140127	_Igrp_cm~160	.6771817	.1203104	5.63	0.000	.4413776
.9129858	_Igrp_cm~170	.6503463	.1983124	3.28	0.001	.2616612
1.039031	_Igrp_cm~190	.7777335	.2474238	3.14	0.002	.2927918
1.262675	_Igrp_cm~200	.8415456	.3201751	2.63	0.009	.214014
1.469077	_Igrp_cm~210	1.91186	.2704665	7.07	0.000	1.381756
2.441965						
	_cut1	-1.404155	.3682156			(Ancillary parameters)
	_cut2	.5305777	.3648068			
	_cut3	1.918538	.3666063			
	_cut4	3.529355	.372322			

Approximate likelihood-ratio test of proportionality of odds

across response categories:
 chi2(57) = 151.36
 Prob > chi2 = 0.0000

Main effects multinomial model for bipolar I patients (Model 1 Table 4; results presented in Table 15):

```
. xi: mlogit cgi grp_step_enrol_final_age dst_time post i.cmf_year
i.grp_cmf_final_site_id if dx == 0, baseoutcome(1) robust
i.cmf_year _Icmf_year_2000-2005(naturally coded; _Icmf_year_2000
omitted)
i.grp_cmf_fi~id _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
omitted)
```

```
Iteration 0: log pseudolikelihood = -7598.6389
Iteration 1: log pseudolikelihood = -7390.9863
Iteration 2: log pseudolikelihood = -7377.8043
Iteration 3: log pseudolikelihood = -7377.632
Iteration 4: log pseudolikelihood = -7377.6306
Iteration 5: log pseudolikelihood = -7377.6306
```

```
Multinomial logistic regression                                Number of obs =
5045
                                                                Wald      chi2(76)      =
429.17
                                                                Prob > chi2      =
0.0000
Log pseudolikelihood = -7377.6306                            Pseudo R2      =
0.0291
```

```
-----
```

	cgi	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
2						
grp_step_e~e		-.0015724	.0046235	-0.34	0.734	-.0106342
.0074895						
dst_time		.1905492	.1200828	1.59	0.113	-.0448087
.4259071						
post		-.1244224	.1097585	-1.13	0.257	-.3395451
.0907004						
_Icmf_y~2001		.1295944	.3701304	0.35	0.726	-.5958478
.8550367						
_Icmf_y~2002		-.4971285	.3484412	-1.43	0.154	-1.180061
.1858037						
_Icmf_y~2003		-.4748309	.3497972	-1.36	0.175	-1.160421
.210759						
_Icmf_y~2004		-.1603971	.3507907	-0.46	0.647	-.8479342
.52714						
_Icmf_y~2005		-.0519097	.3811009	-0.14	0.892	-.7988536
.6950343						
_Igrp_cm~_30		.4426681	.2547025	1.74	0.082	-.0565397
.9418758						
_Igrp_cm~_60		-1.033107	.246424	-4.19	0.000	-1.516089
.5501251						

_Igrp_cm~_70		.975185	.3012664	3.24	0.001	.3847137
1.565656						
_Igrp_cm~_90		-.2201356	.3528858	-0.62	0.533	-.9117791
.471508						
_Igrp_cm~130		.0357342	.2939106	0.12	0.903	-.5403199
.6117884						
_Igrp_cm~140		.9672603	.1779435	5.44	0.000	.6184974
1.316023						
_Igrp_cm~160		.5656058	.1812826	3.12	0.002	.2102984
.9209132						
_Igrp_cm~170		.523742	.2342728	2.24	0.025	.0645758
.9829083						
_Igrp_cm~190		-.0048864	.2808519	-0.02	0.986	-.555346
.5455731						
_Igrp_cm~200		.1010482	.2568676	0.39	0.694	-.402403
.6044994						
_Igrp_cm~210		1.441814	.6251404	2.31	0.021	.216561
2.667067						
_cons		1.087327	.4194597	2.59	0.010	.265201
1.909453						

3						
grp_step_e~e		.0020096	.0045718	0.44	0.660	-.0069511
.0109702						
dst_time		.0135367	.1178857	0.11	0.909	-.217515
.2445884						
post		-.0583403	.1086919	-0.54	0.591	-.2713725
.1546919						
_Icmf_y~2001		-.065827	.3672312	-0.18	0.858	-.785587
.653933						
_Icmf_y~2002		-.4594501	.3440614	-1.34	0.182	-1.133798
.2148978						
_Icmf_y~2003		-.4879595	.3450539	-1.41	0.157	-1.164253
.1883337						
_Icmf_y~2004		-.1085873	.3468436	-0.31	0.754	-.7883882
.5712137						
_Icmf_y~2005		-.3613162	.3790321	-0.95	0.340	-1.104206
.3815731						
_Igrp_cm~_30		.5520516	.2521408	2.19	0.029	.0578647
1.046239						
_Igrp_cm~_60		-.7181286	.2309182	-3.11	0.002	-1.17072
.2655372						
_Igrp_cm~_70		1.242922	.2960061	4.20	0.000	.662761
1.823084						
_Igrp_cm~_90		-.0110193	.3346294	-0.03	0.974	-.6668809
.6448423						
_Igrp_cm~130		.4035929	.2783575	1.45	0.147	-.1419777
.9491635						
_Igrp_cm~140		.7931207	.1793171	4.42	0.000	.4416656
1.144576						
_Igrp_cm~160		.2694562	.1843818	1.46	0.144	-.0919255
.6308379						
_Igrp_cm~170		.8557313	.2274896	3.76	0.000	.4098598
1.301603						
_Igrp_cm~190		.1432648	.2733008	0.52	0.600	-.392395
.6789245						

_Igrp_cm~200	.4122977	.246875	1.67	0.095	-.0715685
.8961638					
_Igrp_cm~210	2.116685	.6075835	3.48	0.000	.9258433
3.307527					
_cons	1.055535	.4170225	2.53	0.011	.2381857
1.872884					

4					
grp_step_e~e	.0030586	.0047187	0.65	0.517	-.0061899
.0123071					
dst_time	.0466424	.1209104	0.39	0.700	-.1903375
.2836223					
post	-.1632824	.1111535	-1.47	0.142	-.3811392
.0545745					
_Icmf_y~2001	-.2073103	.3629975	-0.57	0.568	-.9187723
.5041518					
_Icmf_y~2002	-.9826136	.3411979	-2.88	0.004	-1.651349
.313878					
_Icmf_y~2003	-.772048	.3425934	-2.25	0.024	-1.443519
.1005774					
_Icmf_y~2004	-.4869072	.3437944	-1.42	0.157	-1.160732
.1869175					
_Icmf_y~2005	-.6935657	.3772322	-1.84	0.066	-1.432927
.0457958					
_Igrp_cm~_30	.3417815	.2661179	1.28	0.199	-.1798001
.8633631					
_Igrp_cm~_60	.0826974	.2175306	0.38	0.704	-.3436546
.5090495					
_Igrp_cm~_70	1.168351	.3067019	3.81	0.000	.5672261
1.769476					
_Igrp_cm~_90	.8246314	.319644	2.58	0.010	.1981407
1.451122					
_Igrp_cm~130	.6752459	.2833204	2.38	0.017	.1199481
1.230544					
_Igrp_cm~140	.8552737	.1863239	4.59	0.000	.4900857
1.220462					
_Igrp_cm~160	.2032375	.1945412	1.04	0.296	-.1780562
.5845313					
_Igrp_cm~170	1.007881	.2336587	4.31	0.000	.5499186
1.465844					
_Igrp_cm~190	.1387433	.2855652	0.49	0.627	-.4209542
.6984409					
_Igrp_cm~200	.9653996	.2441311	3.95	0.000	.4869114
1.443888					
_Igrp_cm~210	2.780529	.6045762	4.60	0.000	1.595582
3.965477					
_cons	1.055947	.4174977	2.53	0.011	.2376668
1.874228					

5					
grp_step_e~e	-.0060009	.0056745	-1.06	0.290	-.0171227
.0051209					
dst_time	.2362342	.1439032	1.64	0.101	-.0458109
.5182793					

post		-.3305143	.1313867	-2.52	0.012	-.5880275	-
.0730011							
_Icmf_y~2001		-.7770406	.4212889	-1.84	0.065	-1.602752	
.0486704							
_Icmf_y~2002		-.8953252	.3838927	-2.33	0.020	-1.647741	-
.1429094							
_Icmf_y~2003		-.7654443	.381393	-2.01	0.045	-1.512961	-
.0179277							
_Icmf_y~2004		-.5924386	.3830519	-1.55	0.122	-1.343207	
.1583294							
_Icmf_y~2005		-.5229331	.4289451	-1.22	0.223	-1.36365	
.3177839							
_Igrp_cm~_30		.5341396	.3282435	1.63	0.104	-.1092058	
1.177485							
_Igrp_cm~_60		.3407859	.2669498	1.28	0.202	-.1824262	
.863998							
_Igrp_cm~_70		1.247102	.3553545	3.51	0.000	.5506201	
1.943584							
_Igrp_cm~_90		.6252172	.4101891	1.52	0.127	-.1787387	
1.429173							
_Igrp_cm~130		-.0251676	.4147969	-0.06	0.952	-.8381545	
.7878194							
_Igrp_cm~140		.6124307	.2375124	2.58	0.010	.1469151	
1.077946							
_Igrp_cm~160		.9561039	.2248019	4.25	0.000	.5155002	
1.396708							
_Igrp_cm~170		1.180108	.2754312	4.28	0.000	.6402729	
1.719943							
_Igrp_cm~190		-.2993417	.4224612	-0.71	0.479	-1.12735	
.528667							
_Igrp_cm~200		1.846268	.2671184	6.91	0.000	1.322726	
2.369811							
_Igrp_cm~210		3.241009	.6254163	5.18	0.000	2.015215	
4.466802							
_cons		.3766547	.4752586	0.79	0.428	-.5548349	
1.308144							

(cgi==1 is the base outcome)

*****Overall Wald test for year**

. test _Icmf_year_2001 _Icmf_year_2002 _Icmf_year_2003 _Icmf_year_2004
_Icmf_year_2005

- (1) [2]_Icmf_year_2001 = 0
- (2) [3]_Icmf_year_2001 = 0
- (3) [4]_Icmf_year_2001 = 0
- (4) [5]_Icmf_year_2001 = 0
- (5) [2]_Icmf_year_2002 = 0
- (6) [3]_Icmf_year_2002 = 0
- (7) [4]_Icmf_year_2002 = 0
- (8) [5]_Icmf_year_2002 = 0
- (9) [2]_Icmf_year_2003 = 0
- (10) [3]_Icmf_year_2003 = 0
- (11) [4]_Icmf_year_2003 = 0
- (12) [5]_Icmf_year_2003 = 0
- (13) [2]_Icmf_year_2004 = 0

```
(14) [3]_Icmf_year_2004 = 0
(15) [4]_Icmf_year_2004 = 0
(16) [5]_Icmf_year_2004 = 0
(17) [2]_Icmf_year_2005 = 0
(18) [3]_Icmf_year_2005 = 0
(19) [4]_Icmf_year_2005 = 0
(20) [5]_Icmf_year_2005 = 0
```

```
chi2( 20) = 48.41
Prob > chi2 = 0.0004
```

*****Overall Wald test for site**

```
. test _Igrp_cmf_f_30 _Igrp_cmf_f_60 _Igrp_cmf_f_70 _Igrp_cmf_f_90
_Igrp_cmf_f_130 _Igrp_cmf_f_140 _Igrp_cmf_f_160 _Igrp_cmf_f_170 _Igrp_cmf_f_190
_Igrp_cmf_f_200 _Igrp_cmf_f_210
```

```
( 1) [2]_Igrp_cmf_f_30 = 0
( 2) [3]_Igrp_cmf_f_30 = 0
( 3) [4]_Igrp_cmf_f_30 = 0
( 4) [5]_Igrp_cmf_f_30 = 0
( 5) [2]_Igrp_cmf_f_60 = 0
( 6) [3]_Igrp_cmf_f_60 = 0
( 7) [4]_Igrp_cmf_f_60 = 0
( 8) [5]_Igrp_cmf_f_60 = 0
( 9) [2]_Igrp_cmf_f_70 = 0
(10) [3]_Igrp_cmf_f_70 = 0
(11) [4]_Igrp_cmf_f_70 = 0
(12) [5]_Igrp_cmf_f_70 = 0
(13) [2]_Igrp_cmf_f_90 = 0
(14) [3]_Igrp_cmf_f_90 = 0
(15) [4]_Igrp_cmf_f_90 = 0
(16) [5]_Igrp_cmf_f_90 = 0
(17) [2]_Igrp_cmf_f_130 = 0
(18) [3]_Igrp_cmf_f_130 = 0
(19) [4]_Igrp_cmf_f_130 = 0
(20) [5]_Igrp_cmf_f_130 = 0
(21) [2]_Igrp_cmf_f_140 = 0
(22) [3]_Igrp_cmf_f_140 = 0
(23) [4]_Igrp_cmf_f_140 = 0
(24) [5]_Igrp_cmf_f_140 = 0
(25) [2]_Igrp_cmf_f_160 = 0
(26) [3]_Igrp_cmf_f_160 = 0
(27) [4]_Igrp_cmf_f_160 = 0
(28) [5]_Igrp_cmf_f_160 = 0
(29) [2]_Igrp_cmf_f_170 = 0
(30) [3]_Igrp_cmf_f_170 = 0
(31) [4]_Igrp_cmf_f_170 = 0
(32) [5]_Igrp_cmf_f_170 = 0
(33) [2]_Igrp_cmf_f_190 = 0
(34) [3]_Igrp_cmf_f_190 = 0
(35) [4]_Igrp_cmf_f_190 = 0
(36) [5]_Igrp_cmf_f_190 = 0
(37) [2]_Igrp_cmf_f_200 = 0
(38) [3]_Igrp_cmf_f_200 = 0
(39) [4]_Igrp_cmf_f_200 = 0
(40) [5]_Igrp_cmf_f_200 = 0
(41) [2]_Igrp_cmf_f_210 = 0
```

```
(42) [3]_Igrp_cmf_f_210 = 0
(43) [4]_Igrp_cmf_f_210 = 0
(44) [5]_Igrp_cmf_f_210 = 0

      chi2( 44) = 346.51
      Prob > chi2 = 0.0000
```

*****Overall Wald test for age**

```
. test grp_step_enrol_final_age

( 1) [2]grp_step_enrol_final_age = 0
( 2) [3]grp_step_enrol_final_age = 0
( 3) [4]grp_step_enrol_final_age = 0
( 4) [5]grp_step_enrol_final_age = 0

      chi2( 4) = 5.08
      Prob > chi2 = 0.2796
```

*****Overall Wald test for season**

```
. test dst_time

( 1) [2]dst_time = 0
( 2) [3]dst_time = 0
( 3) [4]dst_time = 0
( 4) [5]dst_time = 0

      chi2( 4) = 7.99
      Prob > chi2 = 0.0918
```

*****Overall Wald test for post variable**

```
. test post

( 1) [2]post = 0
( 2) [3]post = 0
( 3) [4]post = 0
( 4) [5]post = 0

      chi2( 4) = 8.89
      Prob > chi2 = 0.0639
```

Main effects multinomial model for bipolar II patients (Model 1 Table 4; results presented in Table 16):

```
. char cmf_year[omit] "2004"

. xi: mlogit cgi grp_step_enrol_final_age dst_time post i.cmf_year
i.grp_cmf_final_site_id if dx == 1 & cmf_year > 2000 & grp_cmf_final_site_id
!= 90 & grp_cmf_final_site_id != 210, baseoutcome(1) robust
i.cmf_year          _Icmf_year_2000-2005(naturally coded; _Icmf_year_2004
omitted)
i.grp_cmf_fi~id     _Igrp_cmf_f_10-210      (naturally coded; _Igrp_cmf_f_10
omitted)
```

```
note: _Icmf_year_2000 dropped due to collinearity
note: _Igrp_cmf_f_90 dropped due to collinearity
note: _Igrp_cmf_f_210 dropped due to collinearity
Iteration 0: log pseudolikelihood = -3130.6738
Iteration 1: log pseudolikelihood = -3026.3298
```



```

Iteration 2: log pseudolikelihood = -3020.4441
Iteration 3: log pseudolikelihood = -3020.3601
Iteration 4: log pseudolikelihood = -3020.3599
Iteration 5: log pseudolikelihood = -3020.3599

```

```

Multinomial logistic regression
Number of obs = 2127
Wald chi2(64) = 202.14
Prob > chi2 = 0.0000
Log pseudolikelihood = -3020.3599
Pseudo R2 = 0.0352

```

```

-----
-

```

	cgi	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
2						
grp_step_e~e		.0060359	.0082157	0.73	0.463	-.0100665
.0221383						
dst_time		.2517714	.1886261	1.33	0.182	-.1179288
.6214717						
post		.0622726	.1760098	0.35	0.723	-.2827002
.4072454						
_Icmf_y~2001		-.1123854	.3206638	-0.35	0.726	-.7408749
.516104						
_Icmf_y~2002		.0869093	.2734168	0.32	0.751	-.4489779
.6227964						
_Icmf_y~2003		.1907406	.2334441	0.82	0.414	-.2668015
.6482826						
_Icmf_y~2005		.10957	.2924974	0.37	0.708	-.4637143
.6828544						
_Igrp_cm~_30		.4816382	.3654426	1.32	0.188	-.2346162
1.197893						
_Igrp_cm~_60		.014129	.3511495	0.04	0.968	-.6741113
.7023694						
_Igrp_cm~_70		.4586232	.6008086	0.76	0.445	-.71894
1.636186						
_Igrp_cm~130		.7145212	.5769422	1.24	0.216	-.4162646
1.845307						
_Igrp_cm~140		.9954038	.2827999	3.52	0.000	.4411261
1.549681						
_Igrp_cm~160		.492573	.2362416	2.09	0.037	.0295481
.955598						
_Igrp_cm~170		1.48178	.5501288	2.69	0.007	.4035473
2.560013						
_Igrp_cm~190		-1.048035	.5837094	-1.80	0.073	-2.192085
.0960143						
_Igrp_cm~200		-1.376614	.6481914	-2.12	0.034	-2.647046
.1061822						
_cons		.4049397	.414465	0.98	0.329	-.4073968
1.217276						

-						
3						
grp_step_e~e		.003731	.0080831	0.46	0.644	-.0121116
.0195736						
dst_time		.2214497	.1867435	1.19	0.236	-.1445608
.5874602						
post		-.0862025	.1737095	-0.50	0.620	-.4266669
.2542618						
_Icmf_y~2001		.0574343	.3155937	0.18	0.856	-.561118
.6759865						
_Icmf_y~2002		.305392	.2664252	1.15	0.252	-.2167917
.8275757						
_Icmf_y~2003		.1305184	.2339304	0.56	0.577	-.3279767
.5890135						
_Icmf_y~2005		.2400741	.2896908	0.83	0.407	-.3277094
.8078577						
_Igrp_cm~_30		.882189	.3635405	2.43	0.015	.1696627
1.594715						
_Igrp_cm~_60		.1340362	.3533822	0.38	0.704	-.5585801
.8266525						
_Igrp_cm~_70		1.903196	.5648615	3.37	0.001	.796088
3.010304						
_Igrp_cm~130		.6707539	.5938979	1.13	0.259	-.4932647
1.834772						
_Igrp_cm~140		1.198173	.2849099	4.21	0.000	.6397596
1.756586						
_Igrp_cm~160		.9239275	.2364123	3.91	0.000	.460568
1.387287						
_Igrp_cm~170		1.273991	.5620213	2.27	0.023	.1724493
2.375532						
_Igrp_cm~190		.4368082	.4708005	0.93	0.354	-.4859439
1.35956						
_Igrp_cm~200		-.1277706	.5070072	-0.25	0.801	-1.121487
.8659453						
_cons		.3547969	.4073578	0.87	0.384	-.4436098
1.153204						

-						
4						
grp_step_e~e		.0095243	.0084606	1.13	0.260	-.0070582
.0261068						
dst_time		.2665807	.1949168	1.37	0.171	-.1154493
.6486107						
post		-.2154478	.181943	-1.18	0.236	-.5720496
.141154						
_Icmf_y~2001		-.2455719	.3365049	-0.73	0.466	-.9051093
.4139656						
_Icmf_y~2002		-.0788183	.2808991	-0.28	0.779	-.6293704
.4717339						
_Icmf_y~2003		.0151453	.2397281	0.06	0.950	-.4547131
.4850038						
_Icmf_y~2005		-.0527589	.3057668	-0.17	0.863	-.6520508
.5465331						
_Igrp_cm~_30		1.228587	.3786973	3.24	0.001	.486354
1.97082						

_Igrp_cm~_60	1.072746	.353401	3.04	0.002	.3800925
1.765399					
_Igrp_cm~_70	2.17697	.5784681	3.76	0.000	1.043193
3.310746					
_Igrp_cm~130	1.682207	.5747684	2.93	0.003	.5556818
2.808733					
_Igrp_cm~140	1.410603	.3022056	4.67	0.000	.8182908
2.002915					
_Igrp_cm~160	.7635649	.2608478	2.93	0.003	.2523127
1.274817					
_Igrp_cm~170	1.576766	.5795644	2.72	0.007	.4408409
2.712692					
_Igrp_cm~190	1.115356	.4816516	2.32	0.021	.1713363
2.059376					
_Igrp_cm~200	.1904043	.5405629	0.35	0.725	-.8690796
1.249888					
_cons	-.2737134	.4339585	-0.63	0.528	-1.124256
.5768296					

5					
grp_step_e~e	.0097715	.009384	1.04	0.298	-.0086208
.0281639					
dst_time	.2035336	.2390096	0.85	0.394	-.2649167
.6719839					
post	.0162468	.2166038	0.08	0.940	-.4082888
.4407824					
_Icmf_y~2001	-.2725306	.4405807	-0.62	0.536	-1.136053
.5909916					
_Icmf_y~2002	.6715596	.3193508	2.10	0.035	.0456436
1.297476					
_Icmf_y~2003	.2655076	.2971702	0.89	0.372	-.3169353
.8479504					
_Icmf_y~2005	.2475875	.3642324	0.68	0.497	-.4662948
.9614699					
_Igrp_cm~_30	1.76589	.4846761	3.64	0.000	.8159426
2.715838					
_Igrp_cm~_60	1.049259	.4979528	2.11	0.035	.0732894
2.025228					
_Igrp_cm~_70	2.700643	.6468881	4.17	0.000	1.432766
3.968521					
_Igrp_cm~130	2.218349	.6861726	3.23	0.001	.8734751
3.563222					
_Igrp_cm~140	.6870294	.4770734	1.44	0.150	-.2480174
1.622076					
_Igrp_cm~160	1.983237	.3562081	5.57	0.000	1.285082
2.681392					
_Igrp_cm~170	2.693321	.6447845	4.18	0.000	1.429567
3.957075					
_Igrp_cm~190	-.700576	1.112953	-0.63	0.529	-2.881925
1.480773					
_Igrp_cm~200	1.034255	.6568655	1.57	0.115	-.2531774
2.321688					
_cons	-2.078927	.5334866	-3.90	0.000	-3.124541
1.033312					

(cgi==1 is the base outcome)

*****Overall Wald test for year**

. test _Icmf_year_2001 _Icmf_year_2002 _Icmf_year_2003 _Icmf_year_2005

- (1) [2]_Icmf_year_2001 = 0
- (2) [3]_Icmf_year_2001 = 0
- (3) [4]_Icmf_year_2001 = 0
- (4) [5]_Icmf_year_2001 = 0
- (5) [2]_Icmf_year_2002 = 0
- (6) [3]_Icmf_year_2002 = 0
- (7) [4]_Icmf_year_2002 = 0
- (8) [5]_Icmf_year_2002 = 0
- (9) [2]_Icmf_year_2003 = 0
- (10) [3]_Icmf_year_2003 = 0
- (11) [4]_Icmf_year_2003 = 0
- (12) [5]_Icmf_year_2003 = 0
- (13) [2]_Icmf_year_2005 = 0
- (14) [3]_Icmf_year_2005 = 0
- (15) [4]_Icmf_year_2005 = 0
- (16) [5]_Icmf_year_2005 = 0

chi2(16) = 16.50
Prob > chi2 = 0.4186

*****Overall Wald test for site**

. test _Igrp_cmf_f_30 _Igrp_cmf_f_60 _Igrp_cmf_f_70 _Igrp_cmf_f_130
_Igrp_cmf_f_140 _Igrp_cmf_f_160 _Igrp_cmf_f_170 _Igrp_cmf_f_190 _Igrp_cmf_f_200

- (1) [2]_Igrp_cmf_f_30 = 0
- (2) [3]_Igrp_cmf_f_30 = 0
- (3) [4]_Igrp_cmf_f_30 = 0
- (4) [5]_Igrp_cmf_f_30 = 0
- (5) [2]_Igrp_cmf_f_60 = 0
- (6) [3]_Igrp_cmf_f_60 = 0
- (7) [4]_Igrp_cmf_f_60 = 0
- (8) [5]_Igrp_cmf_f_60 = 0
- (9) [2]_Igrp_cmf_f_70 = 0
- (10) [3]_Igrp_cmf_f_70 = 0
- (11) [4]_Igrp_cmf_f_70 = 0
- (12) [5]_Igrp_cmf_f_70 = 0
- (13) [2]_Igrp_cmf_f_130 = 0
- (14) [3]_Igrp_cmf_f_130 = 0
- (15) [4]_Igrp_cmf_f_130 = 0
- (16) [5]_Igrp_cmf_f_130 = 0
- (17) [2]_Igrp_cmf_f_140 = 0
- (18) [3]_Igrp_cmf_f_140 = 0
- (19) [4]_Igrp_cmf_f_140 = 0
- (20) [5]_Igrp_cmf_f_140 = 0
- (21) [2]_Igrp_cmf_f_160 = 0
- (22) [3]_Igrp_cmf_f_160 = 0
- (23) [4]_Igrp_cmf_f_160 = 0
- (24) [5]_Igrp_cmf_f_160 = 0
- (25) [2]_Igrp_cmf_f_170 = 0
- (26) [3]_Igrp_cmf_f_170 = 0
- (27) [4]_Igrp_cmf_f_170 = 0
- (28) [5]_Igrp_cmf_f_170 = 0

```

(29) [2]_Igrp_cmf_f_190 = 0
(30) [3]_Igrp_cmf_f_190 = 0
(31) [4]_Igrp_cmf_f_190 = 0
(32) [5]_Igrp_cmf_f_190 = 0
(33) [2]_Igrp_cmf_f_200 = 0
(34) [3]_Igrp_cmf_f_200 = 0
(35) [4]_Igrp_cmf_f_200 = 0
(36) [5]_Igrp_cmf_f_200 = 0

```

```

      chi2( 36) = 167.04
    Prob > chi2 = 0.0000

```

*****Overall Wald test for age**

```
. test grp_step_enrol_final_age
```

```

( 1) [2]grp_step_enrol_final_age = 0
( 2) [3]grp_step_enrol_final_age = 0
( 3) [4]grp_step_enrol_final_age = 0
( 4) [5]grp_step_enrol_final_age = 0

```

```

      chi2( 4) = 2.54
    Prob > chi2 = 0.6380

```

*****Overall Wald test for season**

```
. test dst_time
```

```

( 1) [2]dst_time = 0
( 2) [3]dst_time = 0
( 3) [4]dst_time = 0
( 4) [5]dst_time = 0

```

```

      chi2( 4) = 2.11
    Prob > chi2 = 0.7163

```

*****Overall Wald test for post variable**

```
. test post
```

```

( 1) [2]post = 0
( 2) [3]post = 0
( 3) [4]post = 0
( 4) [5]post = 0

```

```

      chi2( 4) = 5.43
    Prob > chi2 = 0.2463

```

Multinomial model with season*period interaction for bipolar I patients (Model 2 Table 4):

```

. xi: mlogit cgi grp_step_enrol_final_age i.cmf_year i.grp_cmf_final_site_id
i.dst_time*post if dx ==0, baseoutcome(1) robust
  i.cmf_year          _Icmf_year_2000-2005(naturally coded; _Icmf_year_2000
omitted)
  i.grp_cmf_fi~id     _Igrp_cmf_f_10-210      (naturally coded; _Igrp_cmf_f_10
omitted)
  i.dst_time          _Idst_time_0-1         (naturally coded; _Idst_time_0 omitted)
  i.dst_time*post     _IdstXpost_#          (coded as above)

```

```

Iteration 0: log pseudolikelihood = -7598.6389
Iteration 1: log pseudolikelihood = -7389.2791
Iteration 2: log pseudolikelihood = -7376.0027
Iteration 3: log pseudolikelihood = -7375.8287
Iteration 4: log pseudolikelihood = -7375.8273
Iteration 5: log pseudolikelihood = -7375.8273

```

```

Multinomial logistic regression
Number of obs = 5045
Wald chi2(80) = 432.61
Prob > chi2 = 0.0000
Log pseudolikelihood = -7375.8273
Pseudo R2 = 0.0293

```

```

-----
-

```

cgf	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
2					
grp_step_e~e	-.0016315	.0046216	-0.35	0.724	-.0106896
.0074267					
_Icmf_y~2001	.1299154	.3699658	0.35	0.725	-.5952043
.855035					
_Icmf_y~2002	-.4980012	.3481075	-1.43	0.153	-1.180279
.184277					
_Icmf_y~2003	-.4741659	.3495529	-1.36	0.175	-1.159277
.2109451					
_Icmf_y~2004	-.160419	.3504958	-0.46	0.647	-.8473782
.5265402					
_Icmf_y~2005	-.0496337	.3808675	-0.13	0.896	-.7961203
.6968529					
_Igrp_cm~_30	.4470982	.2548424	1.75	0.079	-.0523837
.9465802					
_Igrp_cm~_60	-1.029894	.2461388	-4.18	0.000	-1.512317
.5474703					
_Igrp_cm~_70	.9713618	.3015454	3.22	0.001	.3803436
1.56238					
_Igrp_cm~_90	-.2197298	.3525722	-0.62	0.533	-.9107586
.4712991					
_Igrp_cm~130	.0366414	.2939246	0.12	0.901	-.5394403
.6127231					
_Igrp_cm~140	.9672029	.1778949	5.44	0.000	.6185354
1.31587					
_Igrp_cm~160	.566448	.1814547	3.12	0.002	.2108032
.9220927					
_Igrp_cm~170	.5212221	.2344449	2.22	0.026	.0617185
.9807256					
_Igrp_cm~190	-.0065846	.2808777	-0.02	0.981	-.5570947
.5439256					
_Igrp_cm~200	.1024906	.2566439	0.40	0.690	-.4005221
.6055034					

_Igrp_cm~210	1.439966	.6256408	2.30	0.021	.2137326
2.666199					
_Idst_time_1	.3747435	.1673144	2.24	0.025	.0468133
.7026737					
post	.0443299	.1522937	0.29	0.771	-.2541603
.3428201					
_IdstXpost_1	-.35293	.2206761	-1.60	0.110	-.7854472
.0795873					
_cons	1.004419	.4227903	2.38	0.018	.1757654
1.833073					

3					
grp_step_e~e	.0019543	.0045706	0.43	0.669	-.0070039
.0109124					
_Icmf_y~2001	-.0654816	.3668599	-0.18	0.858	-.7845139
.6535506					
_Icmf_y~2002	-.4601526	.3436283	-1.34	0.181	-1.133652
.2133465					
_Icmf_y~2003	-.4873238	.3446831	-1.41	0.157	-1.16289
.1882427					
_Icmf_y~2004	-.108493	.3463818	-0.31	0.754	-.7873888
.5704028					
_Icmf_y~2005	-.3591364	.378659	-0.95	0.343	-1.101294
.3830217					
_Igrp_cm~_30	.5562055	.2524049	2.20	0.028	.0615009
1.05091					
_Igrp_cm~_60	-.7152605	.2309045	-3.10	0.002	-1.167825
.262696					
_Igrp_cm~_70	1.239443	.2961746	4.18	0.000	.658951
1.819934					
_Igrp_cm~_90	-.0106495	.3348033	-0.03	0.975	-.6668519
.6455529					
_Igrp_cm~130	.4044617	.2784046	1.45	0.146	-.1412013
.9501246					
_Igrp_cm~140	.7931208	.1793138	4.42	0.000	.4416722
1.144569					
_Igrp_cm~160	.2702537	.1846095	1.46	0.143	-.0915742
.6320816					
_Igrp_cm~170	.8535545	.2276195	3.75	0.000	.4074286
1.29968					
_Igrp_cm~190	.1418642	.2732626	0.52	0.604	-.3937207
.677449					
_Igrp_cm~200	.4137024	.246465	1.68	0.093	-.0693601
.8967649					
_Igrp_cm~210	2.115103	.607943	3.48	0.001	.9235571
3.30665					
_Idst_time_1	.180858	.1658392	1.09	0.275	-.144181
.5058969					
post	.091457	.1500776	0.61	0.542	-.2026898
.3856037					
_IdstXpost_1	-.3175467	.2185219	-1.45	0.146	-.7458419
.1107484					
_cons	.9815017	.4199914	2.34	0.019	.1583338
1.80467					

4						
grp_step_e~e	.0030054	.0047167	0.64	0.524	-.0062392	
.01225						
_Icmf_y~2001	-.2070435	.3625201	-0.57	0.568	-.9175699	
.5034829						
_Icmf_y~2002	-.9834787	.3406294	-2.89	0.004	-1.6511	-
.3158573						
_Icmf_y~2003	-.7715986	.3420809	-2.26	0.024	-1.442065	-
.1011323						
_Icmf_y~2004	-.4870257	.3432422	-1.42	0.156	-1.159768	
.1857166						
_Icmf_y~2005	-.6917508	.3767251	-1.84	0.066	-1.430118	
.0466168						
_Igrp_cm~_30	.3457351	.2662818	1.30	0.194	-.1761677	
.8676378						
_Igrp_cm~_60	.085592	.2174525	0.39	0.694	-.3406071	
.5117911						
_Igrp_cm~_70	1.164982	.3067458	3.80	0.000	.5637717	
1.766193						
_Igrp_cm~_90	.8250148	.3191952	2.58	0.010	.1994038	
1.450626						
_Igrp_cm~130	.6760879	.2831503	2.39	0.017	.1211235	
1.231052						
_Igrp_cm~140	.8552831	.1862511	4.59	0.000	.4902378	
1.220328						
_Igrp_cm~160	.2040139	.1947262	1.05	0.295	-.1776425	
.5856703						
_Igrp_cm~170	1.005747	.2339349	4.30	0.000	.5472434	
1.464251						
_Igrp_cm~190	.1372617	.2856581	0.48	0.631	-.4226179	
.6971413						
_Igrp_cm~200	.9667444	.2440397	3.96	0.000	.4884352	
1.445053						
_Igrp_cm~210	2.778989	.6048856	4.59	0.000	1.593435	
3.964543						
_Idst_time_1	.2088161	.1683265	1.24	0.215	-.1210979	
.53873						
post	-.0173514	.1536731	-0.11	0.910	-.3185451	
.2838423						
_IdstXpost_1	-.309062	.2233574	-1.38	0.166	-.7468345	
.1287106						
_cons	.984398	.4206623	2.34	0.019	.159915	
1.808881						

5						
grp_step_e~e	-.0060406	.0056716	-1.07	0.287	-.0171568	
.0050756						
_Icmf_y~2001	-.7763666	.4209768	-1.84	0.065	-1.601466	
.0487328						
_Icmf_y~2002	-.8952684	.3834169	-2.33	0.020	-1.646752	-
.1437851						
_Icmf_y~2003	-.7645302	.3810052	-2.01	0.045	-1.511287	-
.0177737						
_Icmf_y~2004	-.5917041	.3825857	-1.55	0.122	-1.341558	
.1581502						

__Icmf_y~2005 .3190238		-.5209262	.4285538	-1.22	0.224	-1.360876
__Igrp_cm~_30 1.180144		.5368882	.3281979	1.64	0.102	-.1063679
__Igrp_cm~_60 .8649926		.3420534	.2668106	1.28	0.200	-.1808858
__Igrp_cm~_70 1.942855		1.246019	.3555355	3.50	0.000	.549182
__Igrp_cm~_90 1.429865		.6259619	.4101622	1.53	0.127	-.1779411
__Igrp_cm~130 .7887488		-.0241674	.4147608	-0.06	0.954	-.8370836
__Igrp_cm~140 1.078079		.6126473	.2374695	2.58	0.010	.1472156
__Igrp_cm~160 1.397347		.9566753	.2248364	4.25	0.000	.5160041
__Igrp_cm~170 1.719699		1.179704	.2755128	4.28	0.000	.6397086
__Igrp_cm~190 .529145		-.2987029	.4223792	-0.71	0.479	-1.126551
__Igrp_cm~200 2.370558		1.847297	.2669748	6.92	0.000	1.324036
__Igrp_cm~210 4.467137		3.240992	.6255952	5.18	0.000	2.014848
__Idst_time_1 .689161		.3100514	.1934268	1.60	0.109	-.0690582
post .0792525		-.2852752	.1859869	-1.53	0.125	-.6498029
__IdstXpost_1 .4032888		-.1142302	.2640452	-0.43	0.665	-.6317493
_cons 1.282837		.3480704	.4769307	0.73	0.466	-.5866967

(cgi==1 is the base outcome)

*****Overall Wald test for interaction term**

. test _IdstXpost_1

- (1) [2]_IdstXpost_1 = 0
- (2) [3]_IdstXpost_1 = 0
- (3) [4]_IdstXpost_1 = 0
- (4) [5]_IdstXpost_1 = 0

chi2(4) = 3.60
Prob > chi2 = 0.4636

Multinomial model with season*period interaction for bipolar II patients (Model 2 Table 4):

```
. xi: mlogit cgi grp_step_enrol_final_age i.cmf_year i.grp_cmf_final_site_id
i.dst_time*post if d
> x ==1 & cmf_year > 2000 & grp_cmf_final_site_id != 90 &
grp_cmf_final_site_id != 210, baseou
> tcome(1) robust
```

```

i.cmf_year          _Icmf_year_2000-2005(naturally coded; _Icmf_year_2004
omitted)
i.grp_cmf_fi~id     _Igrp_cmf_f_10-210      (naturally coded; _Igrp_cmf_f_10
omitted)
i.dst_time          _Idst_time_0-1         (naturally coded; _Idst_time_0 omitted)
i.dst_time*post     _IdstXpost_#          (coded as above)

```

```

note: _Icmf_year_2000 dropped due to collinearity
note: _Igrp_cmf_f_90 dropped due to collinearity
note: _Igrp_cmf_f_210 dropped due to collinearity
Iteration 0:  log pseudolikelihood = -3130.6738
Iteration 1:  log pseudolikelihood = -3025.4594
Iteration 2:  log pseudolikelihood = -3019.5509
Iteration 3:  log pseudolikelihood = -3019.467
Iteration 4:  log pseudolikelihood = -3019.4667
Iteration 5:  log pseudolikelihood = -3019.4667

```

```

Multinomial logistic regression              Number of obs   =
2127                                         Wald     chi2(68)    =
205.40                                     Prob >  chi2      =
0.0000                                     Pseudo R2       =
Log pseudolikelihood = -3019.4667
0.0355

```

```

-----
-
          |
          |      Robust
          |      Coef.   Std. Err.   z    P>|z|    [95% Conf.
Interval] +-----+-----+-----+-----+-----+
-
  2      |
  grp_step_e~e |      .0060596   .0082056   0.74   0.460   -.0100232
.0221423      |
  _Icmf_y~2001 |     -.109423    .320931   -0.34   0.733   -.7384362
.5195902      |
  _Icmf_y~2002 |     .0838066    .2736803   0.31   0.759   -.4525969
.6202102      |
  _Icmf_y~2003 |     .1898035    .2335551   0.81   0.416   -.2679561
.6475632      |
  _Icmf_y~2005 |     .1112654    .2923384   0.38   0.703   -.4617073
.6842382      |
  _Igrp_cm~_30 |     .4810346    .3657511   1.32   0.188   -.2358244
1.197894      |
  _Igrp_cm~_60 |     .016314     .3513855   0.05   0.963   -.6723889
.7050169      |
  _Igrp_cm~_70 |     .4639157    .5997871   0.77   0.439   -.7116454
1.639477      |
  _Igrp_cm~130 |     .7142349     .577161    1.24   0.216   -.4169799
1.84545       |
  _Igrp_cm~140 |     .9959239    .2827931   3.52   0.000   .4416596
1.550188      |
  _Igrp_cm~160 |     .4927459    .2363866   2.08   0.037   .0294367
.9560551

```

2.558681	__Igrp_cm~170	1.480938	.5498789	2.69	0.007	.4031955
.0983334	__Igrp_cm~190	-1.043305	.5824794	-1.79	0.073	-2.184944
.1080927	__Igrp_cm~200	-1.37772	.6477808	-2.13	0.033	-2.647347
.8753128	__Idst_time_1	.3599712	.2629342	1.37	0.171	-.1553704
.6080335	post	.1495363	.2339314	0.64	0.523	-.3089609
.4837481	__IdstXpost_1	-.2099583	.3539383	-0.59	0.553	-.9036646
1.175468	__cons	.3602156	.4159526	0.87	0.386	-.4550364

3	grp_step_e~e	.0037619	.0080726	0.47	0.641	-.0120601
.0195838	__Icmf_y~2001	.0604775	.3158856	0.19	0.848	-.558647
.679602	__Icmf_y~2002	.3027206	.2666855	1.14	0.256	-.2199733
.8254145	__Icmf_y~2003	.1297227	.2340035	0.55	0.579	-.3289158
.5883611	__Icmf_y~2005	.2416217	.289429	0.83	0.404	-.3256487
.8088922	__Igrp_cm~_30	.8818104	.3635256	2.43	0.015	.1693134
1.594308	__Igrp_cm~_60	.1357087	.3534676	0.38	0.701	-.557075
.8284924	__Igrp_cm~_70	1.907664	.5638044	3.38	0.001	.8026275
3.0127	__Igrp_cm~130	.6707552	.5937333	1.13	0.259	-.4929408
1.834451	__Igrp_cm~140	1.198637	.2848714	4.21	0.000	.6402998
1.756975	__Igrp_cm~160	.9240388	.2365005	3.91	0.000	.4605064
1.387571	__Igrp_cm~170	1.273306	.5619245	2.27	0.023	.1719546
2.374658	__Igrp_cm~190	.4410719	.4697315	0.94	0.348	-.4795849
1.361729	__Igrp_cm~200	-.1284959	.5060283	-0.25	0.800	-1.120293
.8633013	__Idst_time_1	.3136127	.2579848	1.22	0.224	-.1920282
.8192537	post	-.0143689	.231881	-0.06	0.951	-.4688473
.4401095	__IdstXpost_1	-.176924	.3490416	-0.51	0.612	-.8610329
.507185	__cons	.3171532	.4080715	0.78	0.437	-.4826522
1.116959						

4						

grp_step_e~e	.0095357	.0084543	1.13	0.259	-.0070344
.0261058					
_Icmf_y~2001	-.2418084	.3373191	-0.72	0.473	-.9029417
.4193248					
_Icmf_y~2002	-.0849072	.2813263	-0.30	0.763	-.6362966
.4664823					
_Icmf_y~2003	.01297	.2398307	0.05	0.957	-.4570895
.4830296					
_Icmf_y~2005	-.0503416	.3053819	-0.16	0.869	-.6488792
.548196					
_Igrp_cm~_30	1.227201	.3787207	3.24	0.001	.4849217
1.969479					
_Igrp_cm~_60	1.076725	.3544926	3.04	0.002	.3819327
1.771518					
_Igrp_cm~_70	2.188092	.5772	3.79	0.000	1.056801
3.319383					
_Igrp_cm~130	1.681152	.5746191	2.93	0.003	.5549191
2.807385					
_Igrp_cm~140	1.411736	.3022263	4.67	0.000	.8193839
2.004089					
_Igrp_cm~160	.7639443	.2610044	2.93	0.003	.2523851
1.275504					
_Igrp_cm~170	1.574681	.5790331	2.72	0.007	.4397974
2.709565					
_Igrp_cm~190	1.125789	.4806017	2.34	0.019	.1838268
2.067751					
_Igrp_cm~200	.1884791	.5397231	0.35	0.727	-.8693587
1.246317					
_Idst_time_1	.4771242	.2662551	1.79	0.073	-.0447261
.9989745					
post	-.023804	.2433822	-0.10	0.922	-.5008244
.4532163					
_IdstXpost_1	-.4273138	.3651104	-1.17	0.242	-1.142917
.2882895					
_cons	-.3681541	.4366773	-0.84	0.399	-1.224026
.4877176					

5					
grp_step_e~e	.0098002	.0093746	1.05	0.296	-.0085738
.0281741					
_Icmf_y~2001	-.2693681	.4406945	-0.61	0.541	-1.133113
.5943773					
_Icmf_y~2002	.6685948	.3195347	2.09	0.036	.0423183
1.294871					
_Icmf_y~2003	.2649072	.2971863	0.89	0.373	-.3175672
.8473816					
_Icmf_y~2005	.2494708	.3640444	0.69	0.493	-.4640432
.9629848					
_Igrp_cm~_30	1.765339	.4844981	3.64	0.000	.8157399
2.714937					
_Igrp_cm~_60	1.05148	.4979892	2.11	0.035	.0754392
2.027521					
_Igrp_cm~_70	2.706112	.6457823	4.19	0.000	1.440402
3.971822					
_Igrp_cm~130	2.218105	.6865192	3.23	0.001	.8725523
3.563658					

```

_Igrp_cm~140 |      .6875933      .4770005      1.44      0.149      -.2473104
1.622497
_Igrp_cm~160 |      1.983438      .3561783      5.57      0.000      1.285342
2.681535
_Igrp_cm~170 |      2.692429      .6447385      4.18      0.000      1.428765
3.956093
_Igrp_cm~190 |     -.6955851      1.11259      -0.63      0.532      -2.876221
1.485051
_Igrp_cm~200 |      1.033222      .6551209      1.58      0.115      -.2507912
2.317235
_Idst_time_1 |      .3133341      .328594      0.95      0.340      -.3306983
.9573664
      post |      .104697      .2915723      0.36      0.720      -.4667742
.6761682
_IdstXpost_1 |     -.2126899      .4359938      -0.49      0.626      -1.067222
.6418422
      _cons |     -2.124763      .5356466      -3.97      0.000      -3.174612      -
1.074915
-----
-

```

(cgi==1 is the base outcome)

*****Overall Wald test for interaction term**

. test _IdstXpost_1

- (1) [2]_IdstXpost_1 = 0
- (2) [3]_IdstXpost_1 = 0
- (3) [4]_IdstXpost_1 = 0
- (4) [5]_IdstXpost_1 = 0

chi2(4) = 1.79
Prob > chi2 = 0.7746

Multinomial model with season*year interaction for bipolar I patients (Model 3 Table 4):

```

. xi: mlogit cgi grp_step_enrol_final_age post i.grp_cmf_final_site_id
i.dst_time*i.cmf_year if dx ==0, baseoutcome(1) robust
i.grp_cmf_fi~id _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
omitted)
i.dst_time _Idst_time_0-1 (naturally coded; _Idst_time_0 omitted)
i.cmf_year _Icmf_year_2000-2005(naturally coded; _Icmf_year_2000
omitted)
i.dst~e*i.cmf~r _IdstXcmf_#_# (coded as above)

```

note: _IdstXcmf_1_2005 dropped due to collinearity

```

Iteration 0: log pseudolikelihood = -7598.6389
Iteration 1: log pseudolikelihood = -7383.9405
Iteration 2: log pseudolikelihood = -7370.5513
Iteration 3: log pseudolikelihood = -7370.3744
Iteration 4: log pseudolikelihood = -7370.373
Iteration 5: log pseudolikelihood = -7370.373

```

```

Multinomial logistic regression          Number of obs      =
5045
                                           Wald      chi2(92)      =
445.17

```

0.0000 Prob > chi2 =
 Log pseudolikelihood = -7370.373 Pseudo R2 =
 0.0300

```
-----
```

	cgi	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
2	grp_step_e~e	-.0015056	.0046262	-0.33	0.745	-.0105728
.0075616	post	-.1237558	.1097918	-1.13	0.260	-.3389437
.0914321	_Igrp_cm~_30	.4467709	.2557164	1.75	0.081	-.054424
.9479659	_Igrp_cm~_60	-1.037041	.2466154	-4.21	0.000	-1.520398
.5536836	_Igrp_cm~_70	.9636908	.3020341	3.19	0.001	.3717148
1.555667	_Igrp_cm~_90	-.2459529	.3545222	-0.69	0.488	-.9408037
.4488979	_Igrp_cm~130	.0324381	.2939458	0.11	0.912	-.5436851
.6085613	_Igrp_cm~140	.9666377	.1780986	5.43	0.000	.6175709
1.315704	_Igrp_cm~160	.5622264	.1820061	3.09	0.002	.2055011
.9189517	_Igrp_cm~170	.5135455	.2354505	2.18	0.029	.0520711
.9750199	_Igrp_cm~190	-.0093794	.2837463	-0.03	0.974	-.5655119
.546753	_Igrp_cm~200	.0972255	.2571452	0.38	0.705	-.4067698
.6012207	_Igrp_cm~210	1.425669	.6250902	2.28	0.023	.2005145
2.650823	_Idst_time_1	.1295058	.7603564	0.17	0.865	-1.360765
1.619777	_Icmf_y~2001	-.1059338	.7299658	-0.15	0.885	-1.53664
1.324773	_Icmf_y~2002	-.6147989	.6980462	-0.88	0.378	-1.982944
.7533465	_Icmf_y~2003	-.4860669	.693117	-0.70	0.483	-1.844551
.8724174	_Icmf_y~2004	-.1424465	.698234	-0.20	0.838	-1.51096
1.226067	_Icmf_y~2005	-.1063597	.696295	-0.15	0.879	-1.471073
1.258353	_IdstXc~2001	.367649	.8425564	0.44	0.663	-1.283731
2.019029	_IdstXc~2002	.1721915	.7957081	0.22	0.829	-1.387368
1.731751	_IdstXc~2003	-.0235161	.7900939	-0.03	0.976	-1.572072
1.52504						

_IdstXc~2004		-.0708399	.7932052	-0.09	0.929	-1.625493
1.483814						
_cons		1.140405	.7158757	1.59	0.111	-.262686
2.543495						

3						
grp_step_e~e		.0019063	.0045816	0.42	0.677	-.0070734
.0108861						
post		-.0577431	.1087466	-0.53	0.595	-.2708824
.1553963						
_Igrp_cm~_30		.5570769	.2533358	2.20	0.028	.0605478
1.053606						
_Igrp_cm~_60		-.7245346	.2311714	-3.13	0.002	-1.177622
.2714469						
_Igrp_cm~_70		1.240108	.2968069	4.18	0.000	.658377
1.821839						
_Igrp_cm~_90		-.0355995	.3343017	-0.11	0.915	-.6908187
.6196198						
_Igrp_cm~130		.3973433	.2780855	1.43	0.153	-.1476942
.9423808						
_Igrp_cm~140		.7922819	.1795048	4.41	0.000	.440459
1.144105						
_Igrp_cm~160		.2679697	.185331	1.45	0.148	-.0952725
.6312118						
_Igrp_cm~170		.8564467	.2284145	3.75	0.000	.4087625
1.304131						
_Igrp_cm~190		.1424084	.2764203	0.52	0.606	-.3993655
.6841824						
_Igrp_cm~200		.4114648	.2470469	1.67	0.096	-.0727382
.8956679						
_Igrp_cm~210		2.118464	.6078203	3.49	0.000	.9271582
3.30977						
_Idst_time_1		.121815	.7465114	0.16	0.870	-1.341321
1.58495						
_Icmf_y~2001		-.0680476	.7150781	-0.10	0.924	-1.469575
1.33348						
_Icmf_y~2002		-.4117359	.6828501	-0.60	0.547	-1.750098
.9266257						
_Icmf_y~2003		-.3298363	.6779148	-0.49	0.627	-1.658525
.9988523						
_Icmf_y~2004		-.0247672	.6836397	-0.04	0.971	-1.364677
1.315142						
_Icmf_y~2005		-.2784141	.6836145	-0.41	0.684	-1.618274
1.061446						
_IdstXc~2001		.046299	.8292298	0.06	0.955	-1.578962
1.671559						
_IdstXc~2002		-.0425202	.7811727	-0.05	0.957	-1.573591
1.48855						
_IdstXc~2003		-.271205	.7752695	-0.35	0.726	-1.790705
1.248295						
_IdstXc~2004		-.1050121	.7787874	-0.13	0.893	-1.631407
1.421383						
_cons		.9762713	.7054057	1.38	0.166	-.4062985
2.358841						

4						
grp_step_e~e		.0034444	.0047254	0.73	0.466	-.0058173
.0127062						
post		-.1626336	.1112318	-1.46	0.144	-.380644
.0553768						
_Igrp_cm~_30		.3470518	.2665669	1.30	0.193	-.1754097
.8695134						
_Igrp_cm~_60		.0854748	.2183252	0.39	0.695	-.3424348
.5133845						
_Igrp_cm~_70		1.145721	.3076112	3.72	0.000	.5428146
1.748628						
_Igrp_cm~_90		.8162562	.3203427	2.55	0.011	.1883961
1.444116						
_Igrp_cm~130		.6695871	.2831479	2.36	0.018	.1146274
1.224547						
_Igrp_cm~140		.8525634	.1865017	4.57	0.000	.4870268
1.2181						
_Igrp_cm~160		.1913047	.1954562	0.98	0.328	-.1917825
.5743919						
_Igrp_cm~170		.9848264	.2351171	4.19	0.000	.5240053
1.445648						
_Igrp_cm~190		.1374042	.2890167	0.48	0.634	-.4290581
.7038664						
_Igrp_cm~200		.9512151	.2447029	3.89	0.000	.4716063
1.430824						
_Igrp_cm~210		2.736947	.6053321	4.52	0.000	1.550518
3.923376						
_Idst_time_1		.3548667	.762805	0.47	0.642	-1.140204
1.849937						
_Icmf_y~2001		-.1297004	.7370877	-0.18	0.860	-1.574366
1.314965						
_Icmf_y~2002		-.8239571	.7072473	-1.17	0.244	-2.210136
.5622222						
_Icmf_y~2003		-.5623929	.7020726	-0.80	0.423	-1.93843
.8136441						
_Icmf_y~2004		-.0522511	.7072093	-0.07	0.941	-1.438356
1.333854						
_Icmf_y~2005		-.4399896	.7068474	-0.62	0.534	-1.825385
.9454059						
_IdstXc~2001		-.014928	.8452013	-0.02	0.986	-1.671492
1.641636						
_IdstXc~2002		-.1456319	.7994867	-0.18	0.855	-1.712597
1.421333						
_IdstXc~2003		-.2144555	.7921862	-0.27	0.787	-1.767112
1.338201						
_IdstXc~2004		-.6562234	.7959356	-0.82	0.410	-2.216228
.9037817						
_cons		.7918665	.7308282	1.08	0.279	-.6405306
2.224264						

5						
grp_step_e~e		-.0055677	.0056889	-0.98	0.328	-.0167177
.0055823						
post		-.3298761	.1314374	-2.51	0.012	-.5874887
.0722635						

_Igrp_cm~_30		.5422813	.3292683	1.65	0.100	-.1030727
1.187635						
_Igrp_cm~_60		.3309921	.2656972	1.25	0.213	-.1897649
.851749						
_Igrp_cm~_70		1.218981	.355431	3.43	0.001	.5223496
1.915613						
_Igrp_cm~_90		.6107364	.4099273	1.49	0.136	-.1927064
1.414179						
_Igrp_cm~130		-.0427532	.4147222	-0.10	0.918	-.8555936
.7700873						
_Igrp_cm~140		.6025579	.237189	2.54	0.011	.1376761
1.06744						
_Igrp_cm~160		.9338169	.2247625	4.15	0.000	.4932905
1.374343						
_Igrp_cm~170		1.150019	.2761012	4.17	0.000	.6088703
1.691167						
_Igrp_cm~190		-.297572	.4244029	-0.70	0.483	-1.129386
.5342423						
_Igrp_cm~200		1.820637	.2671408	6.82	0.000	1.297051
2.344223						
_Igrp_cm~210		3.196641	.6262137	5.10	0.000	1.969285
4.423998						
_Idst_time_1		1.432654	1.228355	1.17	0.243	-.9748782
3.840185						
_Icmf_y~2001		.1454698	1.240219	0.12	0.907	-2.285315
2.576255						
_Icmf_y~2002		.1594861	1.196654	0.13	0.894	-2.185912
2.504884						
_Icmf_y~2003		.2734779	1.192895	0.23	0.819	-2.064553
2.611508						
_Icmf_y~2004		.6720572	1.1959	0.56	0.574	-1.671863
3.015977						
_Icmf_y~2005		.5685419	1.197044	0.47	0.635	-1.777621
2.914705						
_IdstXc~2001		-.9159413	1.321995	-0.69	0.488	-3.507004
1.675121						
_IdstXc~2002		-1.127281	1.258909	-0.90	0.371	-3.594696
1.340135						
_IdstXc~2003		-1.100418	1.254589	-0.88	0.380	-3.559367
1.358532						
_IdstXc~2004		-1.516879	1.256356	-1.21	0.227	-3.979291
.9455343						
_cons		-.7194844	1.209706	-0.59	0.552	-3.090464
1.651495						

(cgi==1 is the base outcome)

*****Overall Wald test for interaction term**

. test _IdstXcmf_1_2001 _IdstXcmf_1_2002 _IdstXcmf_1_2003 _IdstXcmf_1_2004

- (1) [2]_IdstXcmf_1_2001 = 0
- (2) [3]_IdstXcmf_1_2001 = 0
- (3) [4]_IdstXcmf_1_2001 = 0
- (4) [5]_IdstXcmf_1_2001 = 0
- (5) [2]_IdstXcmf_1_2002 = 0
- (6) [3]_IdstXcmf_1_2002 = 0

```
( 7) [4]_IdstXcmf_1_2002 = 0
( 8) [5]_IdstXcmf_1_2002 = 0
( 9) [2]_IdstXcmf_1_2003 = 0
(10) [3]_IdstXcmf_1_2003 = 0
(11) [4]_IdstXcmf_1_2003 = 0
(12) [5]_IdstXcmf_1_2003 = 0
(13) [2]_IdstXcmf_1_2004 = 0
(14) [3]_IdstXcmf_1_2004 = 0
(15) [4]_IdstXcmf_1_2004 = 0
(16) [5]_IdstXcmf_1_2004 = 0
```

```
chi2( 16) = 13.99
Prob > chi2 = 0.5991
```

Multinomial model with season*year interaction for bipolar II patients (Model 3 Table 4):

```
. xi: mlogit cgi grp_step_enrol_final_age post i.grp_cmf_final_site_id
i.dst_time*i.cmf_year if d
> x ==1 & cmf_year > 2000 & grp_cmf_final_site_id != 90 &
grp_cmf_final_site_id != 210, baseou
> tcome(1) robust
i.grp_cmf_fi~id _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
omitted)
i.dst_time _Idst_time_0-1 (naturally coded; _Idst_time_0 omitted)
i.cmf_year _Icmf_year_2000-2005(naturally coded; _Icmf_year_2004
omitted)
i.dst~e*i.cmf~r _IdstXcmf_#_# (coded as above)
```

```
note: _Igrp_cmf_f_90 dropped due to collinearity
note: _Igrp_cmf_f_210 dropped due to collinearity
note: _Icmf_year_2000 dropped due to collinearity
note: _IdstXcmf_1_2000 dropped due to collinearity
note: _IdstXcmf_1_2005 dropped due to collinearity
Iteration 0: log pseudolikelihood = -3130.6738
Iteration 1: log pseudolikelihood = -3020.207
Iteration 2: log pseudolikelihood = -3013.7339
Iteration 3: log pseudolikelihood = -3013.631
Iteration 4: log pseudolikelihood = -3013.6307
Iteration 5: log pseudolikelihood = -3013.6307
```

```
Multinomial logistic regression
2127 Number of obs =
208.29 Wald chi2(76) =
0.0000 Prob > chi2 =
Log pseudolikelihood = -3013.6307 Pseudo R2 =
0.0374
```

```
-----+-----
-      |
      |      Robust
      |      Coef.   Std. Err.      z    P>|z|      [95% Conf.
Interval]
-----+-----
```

2						
grp_step_e~e		.0057251	.0081683	0.70	0.483	-.0102844
.0217346						
post		.0623416	.1761183	0.35	0.723	-.2828439
.4075272						
_Igrp_cm~_30		.4666003	.3642625	1.28	0.200	-.2473411
1.180542						
_Igrp_cm~_60		.0319047	.3500769	0.09	0.927	-.6542334
.7180427						
_Igrp_cm~_70		.4271219	.6026037	0.71	0.478	-.7539596
1.608203						
_Igrp_cm~130		.7494979	.5781877	1.30	0.195	-.3837292
1.882725						
_Igrp_cm~140		.9941678	.284311	3.50	0.000	.4369285
1.551407						
_Igrp_cm~160		.472089	.2355861	2.00	0.045	.0103488
.9338293						
_Igrp_cm~170		1.48888	.5540945	2.69	0.007	.4028743
2.574885						
_Igrp_cm~190		-1.054161	.5834442	-1.81	0.071	-2.197691
.0893684						
_Igrp_cm~200		-1.37458	.644459	-2.13	0.033	-2.637696
.1114632						
_Idst_time_1		.5459137	.3021097	1.81	0.071	-.0462103
1.138038						
_Icmf_y~2001		.3067368	.5600217	0.55	0.584	-.7908856
1.404359						
_Icmf_y~2002		.4720361	.4328217	1.09	0.275	-.3762788
1.320351						
_Icmf_y~2003		.3086898	.3106272	0.99	0.320	-.3001282
.9175079						
_Icmf_y~2005		.2412665	.3059638	0.79	0.430	-.3584115
.8409445						
_IdstXc~2001		-.7575419	.6856774	-1.10	0.269	-2.101445
.5863611						
_IdstXc~2002		-.6948297	.5567611	-1.25	0.212	-1.786061
.3964021						
_IdstXc~2003		-.2644836	.4695698	-0.56	0.573	-1.184824
.6558563						
_cons		.2936461	.4228726	0.69	0.487	-.5351691
1.122461						

3						
grp_step_e~e		.0032479	.0080229	0.40	0.686	-.0124767
.0189726						
post		-.0838962	.1738291	-0.48	0.629	-.4245949
.2568025						
_Igrp_cm~_30		.8570979	.3627178	2.36	0.018	.146184
1.568012						
_Igrp_cm~_60		.1560731	.3533973	0.44	0.659	-.5365728
.8487191						
_Igrp_cm~_70		1.891945	.5681226	3.33	0.001	.7784448
3.005445						
_Igrp_cm~130		.7053988	.597587	1.18	0.238	-.4658503
1.876648						

_Igrp_cm~140 1.776353		1.214305	.2867644	4.23	0.000	.652257
_Igrp_cm~160 1.3626		.9006861	.2356748	3.82	0.000	.438772
_Igrp_cm~170 2.391476		1.286949	.5635444	2.28	0.022	.1824221
_Igrp_cm~190 1.370388		.4487302	.4702422	0.95	0.340	-.4729275
_Igrp_cm~200 .863946		-.1288345	.5065299	-0.25	0.799	-1.121615
_Idst_time_1 1.031722		.4393038	.3022597	1.45	0.146	-.1531144
_Icmf_y~2001 1.720324		.6703909	.5356897	1.25	0.211	-.3795417
_Icmf_y~2002 1.285837		.4439055	.4295648	1.03	0.301	-.3980261
_Icmf_y~2003 .8156125		.2034951	.3123106	0.65	0.515	-.4086224
_Icmf_y~2005 .9262006		.3304563	.3039568	1.09	0.277	-.265288
_IdstXc~2001 .2362913		-1.062265	.662541	-1.60	0.109	-2.360822
_IdstXc~2002 .773478		-.2981622	.5467653	-0.55	0.586	-1.369802
_IdstXc~2003 .7427351		-.1787481	.4701531	-0.38	0.704	-1.100231
_cons 1.103982		.2859601	.417366	0.69	0.493	-.5320623

4						
grp_step_e~e .0253017		.0088092	.0084147	1.05	0.295	-.0076833
post .1443268		-.2128214	.1822218	-1.17	0.243	-.5699696
_Igrp_cm~_30 1.935477		1.191995	.3793347	3.14	0.002	.4485122
_Igrp_cm~_60 1.794773		1.103513	.35269	3.13	0.002	.4122535
_Igrp_cm~_70 3.294821		2.158579	.5797258	3.72	0.000	1.022338
_Igrp_cm~130 2.85208		1.720245	.5774774	2.98	0.003	.5884103
_Igrp_cm~140 2.022477		1.427164	.3037365	4.70	0.000	.8318517
_Igrp_cm~160 1.241497		.7302717	.260834	2.80	0.005	.2190464
_Igrp_cm~170 2.737095		1.596456	.5819697	2.74	0.006	.455816
_Igrp_cm~190 2.057271		1.120864	.4777674	2.35	0.019	.1844571
_Igrp_cm~200 1.259537		.1978602	.5416819	0.37	0.715	-.8638169
_Idst_time_1 1.168745		.5546741	.3133072	1.77	0.077	-.0593968
_Icmf_y~2001 1.691865		.6005429	.5568074	1.08	0.281	-.4907796

1.035219	__Icmf_y~2002		.1651599	.4439157	0.37	0.710	-.704899
.7052231	__Icmf_y~2003		.0694973	.3243559	0.21	0.830	-.5662285
.7044388	__Icmf_y~2005		.073883	.3217181	0.23	0.818	-.5566728
.0921593	__IdstXc~2001		-1.472527	.704282	-2.09	0.037	-2.852894
.6395574	__IdstXc~2002		-.4746379	.5684774	-0.83	0.404	-1.588833
.7981058	__IdstXc~2003		-.1497499	.4836087	-0.31	0.757	-1.097606
.5056399	_cons		-.3666195	.4450385	-0.82	0.410	-1.238879

5	grp_step_e~e		.0096152	.0093521	1.03	0.304	-.0087146
.4413578	post		.0167686	.2166311	0.08	0.938	-.4078206
2.707525	__Igrp_cm~_30		1.761464	.4826931	3.65	0.000	.8154027
2.02722	__Igrp_cm~_60		1.049552	.4988193	2.10	0.035	.0718841
3.93923	__Igrp_cm~_70		2.660189	.652584	4.08	0.000	1.381148
3.553824	__Igrp_cm~130		2.206482	.687432	3.21	0.001	.8591399
1.6035	__Igrp_cm~140		.6569158	.4829599	1.36	0.174	-.2896681
2.671184	__Igrp_cm~160		1.971815	.3568274	5.53	0.000	1.272446
3.964838	__Igrp_cm~170		2.695887	.6474358	4.16	0.000	1.426936
1.419784	__Igrp_cm~190		-.7462688	1.105149	-0.68	0.500	-2.912322
2.352229	__Igrp_cm~200		1.05713	.6607769	1.60	0.110	-.2379687
1.073712	__Idst_time_1		.3088867	.3902243	0.79	0.429	-.4559389
1.03358	__Icmf_y~2001		-.7629161	.9165963	-0.83	0.405	-2.559412
2.013124	__Icmf_y~2002		1.046984	.4929372	2.12	0.034	.0808452
.9718757	__Icmf_y~2003		.1870258	.400441	0.47	0.640	-.5978241
1.038369	__Icmf_y~2005		.282703	.3855509	0.73	0.463	-.4729628
2.687057	__IdstXc~2001		.6049503	1.062319	0.57	0.569	-1.477156
.6266925	__IdstXc~2002		-.6465028	.6496014	-1.00	0.320	-1.919698
1.273038	__IdstXc~2003		.1153332	.5906768	0.20	0.845	-1.042372
1.01665	_cons		-2.102398	.553963	-3.80	0.000	-3.188145

(cgi==1 is the base outcome)

***Overall Wald test for interaction term

. test _IdstXcmf_1_2001 _IdstXcmf_1_2002 _IdstXcmf_1_2003

- (1) [2]_IdstXcmf_1_2001 = 0
- (2) [3]_IdstXcmf_1_2001 = 0
- (3) [4]_IdstXcmf_1_2001 = 0
- (4) [5]_IdstXcmf_1_2001 = 0
- (5) [2]_IdstXcmf_1_2002 = 0
- (6) [3]_IdstXcmf_1_2002 = 0
- (7) [4]_IdstXcmf_1_2002 = 0
- (8) [5]_IdstXcmf_1_2002 = 0
- (9) [2]_IdstXcmf_1_2003 = 0
- (10) [3]_IdstXcmf_1_2003 = 0
- (11) [4]_IdstXcmf_1_2003 = 0
- (12) [5]_IdstXcmf_1_2003 = 0

chi2(12) = 12.20
Prob > chi2 = 0.4296

Multinomial main effects for combined dataset (Model 4 Table 4; results presented in Table 17):

. xi: mlogit cgi grp_step_enrol_final_age dst_time post i.cmf_year
i.grp_cmf_final_site_id dx
> if grp_cmf_final_site_id != 90, baseoutcome(1) robust
i.cmf_year _Icmf_year_2000-2005(naturally coded; _Icmf_year_2004
omitted)
i.grp_cmf_fi~id _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
omitted)

note: _Igrp_cmf_f_90 dropped due to collinearity
Iteration 0: log pseudolikelihood = -10661.984
Iteration 1: log pseudolikelihood = -10401.504
Iteration 2: log pseudolikelihood = -10386.071
Iteration 3: log pseudolikelihood = -10385.82
Iteration 4: log pseudolikelihood = -10385.816
Iteration 5: log pseudolikelihood = -10385.816

Multinomial logistic regression	Number of obs	=
7125		
	Wald	chi2(76) =
535.38		
	Prob >	chi2 =
0.0000		
Log pseudolikelihood = -10385.816	Pseudo R2	=
0.0259		

	cgi	Robust				
Interval]		Coef.	Std. Err.	z	P> z	[95% Conf.

2						
grp_step_e~e	.0012888	.0040332	0.32	0.749	-.0066162	
.0091938						
dst_time	.184982	.1021621	1.81	0.070	-.015252	
.385216						
post	-.0801505	.0933921	-0.86	0.391	-.2631956	
.1028946						
_Icmf_y~2000	.1859886	.3036815	0.61	0.540	-.4092163	
.7811935						
_Icmf_y~2001	.2003064	.1767881	1.13	0.257	-.1461919	
.5468048						
_Icmf_y~2002	-.2353773	.1368699	-1.72	0.085	-.5036374	
.0328827						
_Icmf_y~2003	-.1203107	.1285957	-0.94	0.349	-.3723536	
.1317321						
_Icmf_y~2005	.087949	.1643452	0.54	0.593	-.2341616	
.4100596						
_Igrp_cm~_30	.452126	.2086877	2.17	0.030	.0431056	
.8611465						
_Igrp_cm~_60	-.6484883	.1974195	-3.28	0.001	-1.035423	-
.2615532						
_Igrp_cm~_70	.854377	.2681161	3.19	0.001	.3288791	
1.379875						
_Igrp_cm~130	.2010616	.2555019	0.79	0.431	-.299713	
.7018362						
_Igrp_cm~140	.978011	.1506305	6.49	0.000	.6827807	
1.273241						
_Igrp_cm~160	.5310709	.1450118	3.66	0.000	.2468531	
.8152888						
_Igrp_cm~170	.7064815	.2104264	3.36	0.001	.2940533	
1.11891						
_Igrp_cm~190	-.1913731	.2419693	-0.79	0.429	-.6656241	
.282878						
_Igrp_cm~200	-.0815856	.2308152	-0.35	0.724	-.533975	
.3708038						
_Igrp_cm~210	1.600239	.6134433	2.61	0.009	.397912	
2.802565						
dx	.1194313	.1074131	1.11	0.266	-.0910945	
.329957						
_cons	.7179172	.2105215	3.41	0.001	.3053026	
1.130532						

3						
grp_step_e~e	.0035657	.0039715	0.90	0.369	-.0042182	
.0113496						
dst_time	.0768029	.1007843	0.76	0.446	-.1207308	
.2743366						
post	-.0642232	.0925153	-0.69	0.488	-.2455499	
.1171036						
_Icmf_y~2000	-.0226933	.3053182	-0.07	0.941	-.621106	
.5757194						
_Icmf_y~2001	.0480439	.1767666	0.27	0.786	-.2984123	
.3945						
_Icmf_y~2002	-.1718897	.1346937	-1.28	0.202	-.4358845	
.0921052						

_Icmf_y~2003 .0812787		-.1683293	.1273534	-1.32	0.186	-.4179373
_Icmf_y~2005 .2438407		-.0777751	.1640927	-0.47	0.636	-.3993909
_Igrp_cm~_30 1.062036		.6580706	.2061084	3.19	0.001	.2541055
_Igrp_cm~_60 .0755446		-.4518758	.1920092	-2.35	0.019	-.828207
_Igrp_cm~_70 1.909848		1.399792	.2602373	5.38	0.000	.8897363
_Igrp_cm~130 .9445396		.4565885	.2489592	1.83	0.067	-.0313625
_Igrp_cm~140 1.200668		.9036294	.1515533	5.96	0.000	.6065904
_Igrp_cm~160 .7995871		.5162246	.1445754	3.57	0.000	.2328622
_Igrp_cm~170 1.346572		.9388079	.2080465	4.51	0.000	.5310442
_Igrp_cm~190 .6761407		.2240505	.2306625	0.97	0.331	-.2280396
_Igrp_cm~200 .8047551		.3727791	.2204	1.69	0.091	-.059197
_Igrp_cm~210 3.498362		2.32049	.6009658	3.86	0.000	1.142619
dx .4198126		.2126896	.1056769	2.01	0.044	.0055667
_cons 1.055708		.6484073	.2078105	3.12	0.002	.2411061

4						
grp_step_e~e .0141301		.0060787	.0041079	1.48	0.139	-.0019727
dst_time .3136814		.1098623	.1039912	1.06	0.291	-.0939568
post .0228796		-.1640497	.0953739	-1.72	0.085	-.3509791
_Icmf_y~2000 .9771666		.3939924	.2975433	1.32	0.185	-.1891818
_Icmf_y~2001 .4868786		.1317031	.1812153	0.73	0.467	-.2234724
_Icmf_y~2002 .1669344		-.4440633	.1413949	-3.14	0.002	-.7211923
_Icmf_y~2003 .1544879		-.1005577	.1301277	-0.77	0.440	-.3556032
_Icmf_y~2005 .1911966		-.1430357	.1705298	-0.84	0.402	-.477268
_Igrp_cm~_30 1.036166		.613517	.215641	2.85	0.004	.1908684
_Igrp_cm~_60 .7487378		.3868337	.1846484	2.09	0.036	.0249295
_Igrp_cm~_70 1.996362		1.472437	.2673135	5.51	0.000	.9485126
_Igrp_cm~130 1.412076		.9238574	.2490955	3.71	0.000	.4356393
_Igrp_cm~140 1.31212		1.001838	.1583104	6.33	0.000	.6915551

__Igrp_cm~160 .6659547		.3621878	.154986	2.34	0.019	.0584208	
__Igrp_cm~170 1.548156		1.129028	.2138447	5.28	0.000	.7099005	
__Igrp_cm~190 .8380178		.3673558	.2401381	1.53	0.126	-.1033062	
__Igrp_cm~200 1.354929		.9269347	.2183686	4.24	0.000	.4989402	
__Igrp_cm~210 4.23387		3.063573	.5971013	5.13	0.000	1.893276	
dx .3574804		.1431976	.10933	1.31	0.190	-.0710852	
_cons .6490975		.222244	.2177864	1.02	0.308	-.2046094	

5							
grp_step_e~e .0101064		.0006986	.0048	0.15	0.884	-.0087093	
dst_time .4817387		.2391449	.1237747	1.93	0.053	-.003449	
post .0024634		-.2228573	.112448	-1.98	0.047	-.4432513	-
_Icmf_y~2000 1.078189		.4128238	.3394784	1.22	0.224	-.2525417	
_Icmf_y~2001 .1459157		-.3108607	.2330535	-1.33	0.182	-.7676371	
_Icmf_y~2002 .2011679		-.1182418	.1629671	-0.73	0.468	-.4376515	
_Icmf_y~2003 .3227346		.0231437	.1528553	0.15	0.880	-.2764472	
_Icmf_y~2005 .5178108		.1246639	.2005889	0.62	0.534	-.2684831	
_Igrp_cm~_30 1.391726		.8754293	.2634214	3.32	0.001	.3591328	
_Igrp_cm~_60 1.024005		.5670699	.2331342	2.43	0.015	.1101353	
_Igrp_cm~_70 2.212384		1.614058	.3052736	5.29	0.000	1.015733	
_Igrp_cm~130 1.245946		.6002497	.3294431	1.82	0.068	-.0454469	
_Igrp_cm~140 1.047145		.6348812	.2103423	3.02	0.003	.2226178	
_Igrp_cm~160 1.594298		1.237056	.1822698	6.79	0.000	.8798134	
_Igrp_cm~170 1.947461		1.45879	.2493265	5.85	0.000	.9701189	
_Igrp_cm~190 .4466419		-.3018675	.3818996	-0.79	0.429	-1.050377	
_Igrp_cm~200 2.27829		1.806331	.2407997	7.50	0.000	1.334373	
_Igrp_cm~210 4.762585		3.558165	.6145114	5.79	0.000	2.353745	
dx .27302		.0201405	.1290226	0.16	0.876	-.2327391	
_cons .2682048		-.7962107	.2693957	-2.96	0.003	-1.324217	-

-
(cgi==1 is the base outcome)

*****Overall Wald test for year**

```
. test _Icmf_year_2000 _Icmf_year_2001 _Icmf_year_2002 _Icmf_year_2003  
_Icmf_year_2005
```

- (1) [2]_Icmf_year_2000 = 0
- (2) [3]_Icmf_year_2000 = 0
- (3) [4]_Icmf_year_2000 = 0
- (4) [5]_Icmf_year_2000 = 0
- (5) [2]_Icmf_year_2001 = 0
- (6) [3]_Icmf_year_2001 = 0
- (7) [4]_Icmf_year_2001 = 0
- (8) [5]_Icmf_year_2001 = 0
- (9) [2]_Icmf_year_2002 = 0
- (10) [3]_Icmf_year_2002 = 0
- (11) [4]_Icmf_year_2002 = 0
- (12) [5]_Icmf_year_2002 = 0
- (13) [2]_Icmf_year_2003 = 0
- (14) [3]_Icmf_year_2003 = 0
- (15) [4]_Icmf_year_2003 = 0
- (16) [5]_Icmf_year_2003 = 0
- (17) [2]_Icmf_year_2005 = 0
- (18) [3]_Icmf_year_2005 = 0
- (19) [4]_Icmf_year_2005 = 0
- (20) [5]_Icmf_year_2005 = 0

chi2(20) = 46.46
Prob > chi2 = 0.0007

*****Overall Wald test for site**

```
. test _Igrp_cmf_f_30 _Igrp_cmf_f_60 _Igrp_cmf_f_70 _Igrp_cmf_f_130  
_Igrp_cmf_f_140 _Igrp_cmf_f  
> _160 _Igrp_cmf_f_170 _Igrp_cmf_f_190 _Igrp_cmf_f_200 _Igrp_cmf_f_210
```

- (1) [2]_Igrp_cmf_f_30 = 0
- (2) [3]_Igrp_cmf_f_30 = 0
- (3) [4]_Igrp_cmf_f_30 = 0
- (4) [5]_Igrp_cmf_f_30 = 0
- (5) [2]_Igrp_cmf_f_60 = 0
- (6) [3]_Igrp_cmf_f_60 = 0
- (7) [4]_Igrp_cmf_f_60 = 0
- (8) [5]_Igrp_cmf_f_60 = 0
- (9) [2]_Igrp_cmf_f_70 = 0
- (10) [3]_Igrp_cmf_f_70 = 0
- (11) [4]_Igrp_cmf_f_70 = 0
- (12) [5]_Igrp_cmf_f_70 = 0
- (13) [2]_Igrp_cmf_f_130 = 0
- (14) [3]_Igrp_cmf_f_130 = 0
- (15) [4]_Igrp_cmf_f_130 = 0
- (16) [5]_Igrp_cmf_f_130 = 0
- (17) [2]_Igrp_cmf_f_140 = 0
- (18) [3]_Igrp_cmf_f_140 = 0
- (19) [4]_Igrp_cmf_f_140 = 0
- (20) [5]_Igrp_cmf_f_140 = 0

```
(21) [2]_Igrp_cmf_f_160 = 0
(22) [3]_Igrp_cmf_f_160 = 0
(23) [4]_Igrp_cmf_f_160 = 0
(24) [5]_Igrp_cmf_f_160 = 0
(25) [2]_Igrp_cmf_f_170 = 0
(26) [3]_Igrp_cmf_f_170 = 0
(27) [4]_Igrp_cmf_f_170 = 0
(28) [5]_Igrp_cmf_f_170 = 0
(29) [2]_Igrp_cmf_f_190 = 0
(30) [3]_Igrp_cmf_f_190 = 0
(31) [4]_Igrp_cmf_f_190 = 0
(32) [5]_Igrp_cmf_f_190 = 0
(33) [2]_Igrp_cmf_f_200 = 0
(34) [3]_Igrp_cmf_f_200 = 0
(35) [4]_Igrp_cmf_f_200 = 0
(36) [5]_Igrp_cmf_f_200 = 0
(37) [2]_Igrp_cmf_f_210 = 0
(38) [3]_Igrp_cmf_f_210 = 0
(39) [4]_Igrp_cmf_f_210 = 0
(40) [5]_Igrp_cmf_f_210 = 0
```

```
chi2( 40) = 436.95
Prob > chi2 = 0.0000
```

*****Overall Wald test for age**

```
. test grp_step_enrol_final_age
```

```
( 1) [2]grp_step_enrol_final_age = 0
( 2) [3]grp_step_enrol_final_age = 0
( 3) [4]grp_step_enrol_final_age = 0
( 4) [5]grp_step_enrol_final_age = 0
```

```
chi2( 4) = 4.45
Prob > chi2 = 0.3489
```

*****Overall Wald test for season**

```
. test dst_time
```

```
( 1) [2]dst_time = 0
( 2) [3]dst_time = 0
( 3) [4]dst_time = 0
( 4) [5]dst_time = 0
```

```
chi2( 4) = 6.33
Prob > chi2 = 0.1760
```

*****Overall Wald test for post variable**

```
. test post
```

```
( 1) [2]post = 0
( 2) [3]post = 0
( 3) [4]post = 0
( 4) [5]post = 0
```

```
chi2( 4) = 6.52
Prob > chi2 = 0.1636
```

***Overall Wald test for diagnosis

. test dx

(1) [2]dx = 0
 (2) [3]dx = 0
 (3) [4]dx = 0
 (4) [5]dx = 0

chi2(4) = 6.57
 Prob > chi2 = 0.1605

Multinomial model with diagnosis*post interaction for combined dataset (Model 5 Table 4):

```
. xi: mlogit cgi grp_step_enrol_final_age dst_time i.cmf_year
i.grp_cmf_final_site_id i.dx*i.post if grp_cmf_final_site_id != 90,
baseoutcome(1) robust
i.cmf_year _Icmf_year_2000-2005(naturally coded; _Icmf_year_2004
omitted)
i.grp_cmf_fi~id _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
omitted)
i.dx _Idx_0-1 (naturally coded; _Idx_0 omitted)
i.post _Ipost_0-1 (naturally coded; _Ipost_0 omitted)
i.dx*i.post _IdxXpos_#_# (coded as above)
```

note: _Igrp_cmf_f_90 dropped due to collinearity

Iteration 0: log pseudolikelihood = -10661.984
 Iteration 1: log pseudolikelihood = -10398.1
 Iteration 2: log pseudolikelihood = -10382.541
 Iteration 3: log pseudolikelihood = -10382.289
 Iteration 4: log pseudolikelihood = -10382.285
 Iteration 5: log pseudolikelihood = -10382.285

Multinomial logistic regression
 7125
 542.41
 0.0000
 Log pseudolikelihood = -10382.285
 0.0262

Number of obs =
 Wald chi2(80) =
 Prob > chi2 =
 Pseudo R2 =

	cgi	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
2	grp_step_e~e	.0012919	.0040328	0.32	0.749	-.0066122 .0091961
	dst_time	.1854639	.102172	1.82	0.069	-.0147895 .3857174
	_Icmf_y~2000	.185641	.303798	0.61	0.541	-.4097921 .7810742
	_Icmf_y~2001	.2003321	.1767674	1.13	0.257	-.1461256 .5467898

0.0322089	_Icmf_y~2002	-.2360628	.1368758	-1.72	0.085	-.5043344
.1318165	_Icmf_y~2003	-.1202544	.1286099	-0.94	0.350	-.3723252
.4102891	_Icmf_y~2005	.0882179	.1643251	0.54	0.591	-.2338533
.8608296	_Igrp_cm~_30	.4518208	.2086818	2.17	0.030	.0428119
.2606997	_Igrp_cm~_60	-.6478664	.1975377	-3.28	0.001	-1.035033
1.37894	_Igrp_cm~_70	.853499	.2680871	3.18	0.001	.328058
.7020191	_Igrp_cm~130	.2013053	.2554709	0.79	0.431	-.2994086
1.271949	_Igrp_cm~140	.9766304	.1506754	6.48	0.000	.6813121
.8160119	_Igrp_cm~160	.5317156	.1450518	3.67	0.000	.2474192
1.119137	_Igrp_cm~170	.7067021	.2104299	3.36	0.001	.2942671
.2801105	_Igrp_cm~190	-.1944419	.242123	-0.80	0.422	-.6689943
.3716244	_Igrp_cm~200	-.0807441	.2308045	-0.35	0.726	-.5331125
2.802083	_Igrp_cm~210	1.599631	.6135071	2.61	0.009	.3971796
.3323899	_Idx_1	.0349189	.1517737	0.23	0.818	-.2625521
.0867693	_Ipost_1	-.1308248	.1110195	-1.18	0.239	-.348419
.5684813	_IdxXpos_1_1	.1648954	.205915	0.80	0.423	-.2386906
1.158883	_cons	.7433449	.2120132	3.51	0.000	.3278066

3	grp_step_e~e	.0035674	.0039723	0.90	0.369	-.004218
.2743167	dst_time	.0767851	.1007833	0.76	0.446	-.1207465
.5756949	_Icmf_y~2000	-.0226627	.3052901	-0.07	0.941	-.6210203
.3945466	_Icmf_y~2001	.0480642	.17678	0.27	0.786	-.2984183
.0924023	_Icmf_y~2002	-.1716213	.1347084	-1.27	0.203	-.435645
.0813041	_Icmf_y~2003	-.1683051	.127354	-1.32	0.186	-.4179144
.2437655	_Icmf_y~2005	-.0778573	.1640963	-0.47	0.635	-.39948
1.062197	_Igrp_cm~_30	.6581628	.2061437	3.19	0.001	.2541285
.0758158	_Igrp_cm~_60	-.4520948	.1919826	-2.35	0.019	-.8283737
1.910219	_Igrp_cm~_70	1.400076	.2602817	5.38	0.000	.8899335

_Igrp_cm~130 .944468		.456527	.2489541	1.83	0.067	-.031414
_Igrp_cm~140 1.201348		.9041456	.1516365	5.96	0.000	.6069436
_Igrp_cm~160 .7992402		.5158525	.1445882	3.57	0.000	.2324649
_Igrp_cm~170 1.346482		.9387285	.2080414	4.51	0.000	.5309748
_Igrp_cm~190 .677146		.225029	.2306762	0.98	0.329	-.2270879
_Igrp_cm~200 .8045088		.3725864	.2203726	1.69	0.091	-.0593359
_Igrp_cm~210 3.498536		2.320714	.6009407	3.86	0.000	1.142892
_Idx_1 .5310857		.2385923	.1492341	1.60	0.110	-.0539011
_Ipost_1 .1713981		-.0448496	.1103325	-0.41	0.684	-.2610974
_IdxXpos_1_1 .3456093		-.0525386	.2031404	-0.26	0.796	-.4506864
_cons 1.050286		.6384692	.2101145	3.04	0.002	.2266523

4						
grp_step_e~e .0141322		.0060791	.0041088	1.48	0.139	-.0019739
dst_time .3137004		.109897	.1039832	1.06	0.291	-.0939064
_Icmf_y~2000 .9775433		.3943465	.2975549	1.33	0.185	-.1888503
_Icmf_y~2001 .4867503		.1315611	.1812223	0.73	0.468	-.2236281
_Icmf_y~2002 .1668957		-.4440401	.1414028	-3.14	0.002	-.7211846
_Icmf_y~2003 .1544858		-.1005642	.1301299	-0.77	0.440	-.3556141
_Icmf_y~2005 .191005		-.1432328	.1705326	-0.84	0.401	-.4774706
_Igrp_cm~_30 1.036329		.613618	.2156731	2.85	0.004	.1909065
_Igrp_cm~_60 .7486734		.3867753	.1846453	2.09	0.036	.0248772
_Igrp_cm~_70 1.9971		1.473061	.2673716	5.51	0.000	.9490222
_Igrp_cm~130 1.411946		.9237806	.2490685	3.71	0.000	.4356153
_Igrp_cm~140 1.312955		1.002492	.1584025	6.33	0.000	.6920287
_Igrp_cm~160 .6653275		.3615251	.1550041	2.33	0.020	.0577226
_Igrp_cm~170 1.548154		1.129028	.2138437	5.28	0.000	.7099024
_Igrp_cm~190 .8395562		.368866	.2401525	1.54	0.125	-.1018242
_Igrp_cm~200 1.3549		.9269223	.21836	4.24	0.000	.4989445

_Igrp_cm~210 4.234093		3.063847	.5970753	5.13	0.000	1.893601
_Idx_1 .4755119		.1759783	.1528261	1.15	0.250	-.1235552
_Ipost_1 .0800454		-.1422021	.1133937	-1.25	0.210	-.3644496
_IdxXpos_1_1 .339827		-.07206	.2101503	-0.34	0.732	-.483947
_cons .6425797		.2119101	.2197334	0.96	0.335	-.2187595

5						
grp_step_e~e .0101291		.0007239	.0047987	0.15	0.880	-.0086813
dst_time .4830275		.240341	.1238219	1.94	0.052	-.0023456
_Icmf_y~2000 1.076409		.410702	.3396529	1.21	0.227	-.2550054
_Icmf_y~2001 .1456734		-.3112853	.2331465	-1.34	0.182	-.768244
_Icmf_y~2002 .1996959		-.1195542	.1628857	-0.73	0.463	-.4388043
_Icmf_y~2003 .3224181		.0226648	.1529382	0.15	0.882	-.2770886
_Icmf_y~2005 .5187807		.1257557	.2005266	0.63	0.531	-.2672692
_Igrp_cm~_30 1.390671		.8745629	.2633251	3.32	0.001	.3584553
_Igrp_cm~_60 1.025026		.5677814	.2332923	2.43	0.015	.1105369
_Igrp_cm~_70 2.20991		1.611829	.3051491	5.28	0.000	1.013748
_Igrp_cm~130 1.247669		.6010935	.3298913	1.82	0.068	-.0454816
_Igrp_cm~140 1.044135		.6318512	.210353	3.00	0.003	.219567
_Igrp_cm~160 1.595657		1.238237	.1823605	6.79	0.000	.8808168
_Igrp_cm~170 1.948002		1.459262	.2493613	5.85	0.000	.9705234
_Igrp_cm~190 .4423324		-.307571	.3826108	-0.80	0.421	-1.057474
_Igrp_cm~200 2.2806		1.808232	.2410087	7.50	0.000	1.335863
_Igrp_cm~210 4.761435		3.556684	.6146801	5.79	0.000	2.351933
_Idx_1 .2053433		-.14897	.1807754	-0.82	0.410	-.5032832
_Ipost_1 .0596889		-.3219922	.1338306	-2.41	0.016	-.5842954
_IdxXpos_1_1 .8341087		.3472333	.2484104	1.40	0.162	-.1396422
_cons .221757		-.7512658	.2701625	-2.78	0.005	-1.280775

(cgi==1 is the base outcome)

*****Overall Wald test for interaction term**

. test _IdxXpos_1_1

- (1) [2]_IdxXpos_1_1 = 0
- (2) [3]_IdxXpos_1_1 = 0
- (3) [4]_IdxXpos_1_1 = 0
- (4) [5]_IdxXpos_1_1 = 0

chi2(4) = 7.03
 Prob > chi2 = 0.1343

Multinomial model with diagnosis*year interaction for combined dataset (Model 6 Table 4):

```
. xi: mlogit cgi grp_step_enrol_final_age dst_time post
i.grp_cmf_final_site_id i.dx*i.cmf_year if grp_cmf_final_site_id != 90,
baseoutcome(1) robust
i.grp_cmf_fi~id _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
omitted)
i.dx _Idx_0-1 (naturally coded; _Idx_0 omitted)
i.cmf_year _Icmf_year_2000-2005(naturally coded; _Icmf_year_2004
omitted)
i.dx*i.cmf_year _IdxXcmf_#_# (coded as above)
```

note: _Igrp_cmf_f_90 dropped due to collinearity
 Iteration 0: log pseudolikelihood = -10661.984
 Iteration 1: log pseudolikelihood = -10387.19
 Iteration 2: log pseudolikelihood = -10371.322
 Iteration 3: log pseudolikelihood = -10371.067
 Iteration 4: log pseudolikelihood = -10371.063
 Iteration 5: log pseudolikelihood = -10371.063

```
Multinomial logistic regression                                Number of obs    =
7125                                                            Wald      chi2(96)    =
564.31                                                            Prob > chi2      =
0.0000                                                            Pseudo R2      =
Log pseudolikelihood = -10371.063
0.0273
```

```
-----+-----
```

	cgi	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
2	grp_step_e~e	.0010462	.0040282	0.26	0.795	-.0068489
.0089412	dst_time	.1765594	.1023271	1.73	0.084	-.023998
.3771168	post	-.0800432	.0934235	-0.86	0.392	-.2631499
.1030635						

```
-----+-----
```


__Igrp_cm~_30 .8622889		.4545375	.2080402	2.18	0.029	.0467861	
__Igrp_cm~_60 .2712065		-.6588674	.1977898	-3.33	0.001	-1.046528	-
__Igrp_cm~_70 1.402761		.875685	.2689211	3.26	0.001	.3486093	
__Igrp_cm~130 .6999508		.1935132	.2583913	0.75	0.454	-.3129244	
__Igrp_cm~140 1.275836		.9804287	.1507207	6.50	0.000	.6850216	
__Igrp_cm~160 .8231706		.5387859	.1450969	3.71	0.000	.2544013	
__Igrp_cm~170 1.123679		.7105186	.2108001	3.37	0.001	.297358	
__Igrp_cm~190 .2663632		-.2092671	.242673	-0.86	0.388	-.6848974	
__Igrp_cm~200 .385233		-.0684799	.2314904	-0.30	0.767	-.5221928	
__Igrp_cm~210 2.827356		1.625746	.6130775	2.65	0.008	.424136	
__Idx_1 .3008069		-.0626496	.1854404	-0.34	0.735	-.426106	
__Icmf_y~2000 .8825975		.2016313	.3474381	0.58	0.562	-.4793349	
__Icmf_y~2001 .6924389		.2778755	.2115158	1.31	0.189	-.1366878	
__Icmf_y~2002 .0379856		-.3560177	.1622643	-2.19	0.028	-.6740498	-
__Icmf_y~2003 .0246508		-.2813081	.1561043	-1.80	0.072	-.587267	
__Icmf_y~2005 .4803659		.0957865	.1962176	0.49	0.625	-.2887929	
__IdxXcm~2000 1.136602		-.1997554	.6818273	-0.29	0.770	-1.536112	
__IdxXcm~2001 .4157985		-.3275729	.3792781	-0.86	0.388	-1.070944	
__IdxXcm~2002 1.079379		.4698804	.3109745	1.51	0.131	-.1396185	
__IdxXcm~2003 1.057431		.5128727	.2778408	1.85	0.065	-.0316852	
__IdxXcm~2005 .6081822		-.0430155	.3322498	-0.13	0.897	-.6942132	
__cons 1.22304		.7902572	.2208113	3.58	0.000	.3574749	

3							
grp_step_e~e .0110477		.0032638	.0039714	0.82	0.411	-.00452	
dst_time .2682364		.0705451	.1008648	0.70	0.484	-.1271462	
post .1172085		-.0642172	.0925658	-0.69	0.488	-.2456429	
__Igrp_cm~_30 1.056702		.6524573	.206251	3.16	0.002	.2482127	
__Igrp_cm~_60 .0830006		-.4608351	.1927762	-2.39	0.017	-.8386696	-

1.932203	__Igrp_cm~_70	1.420722	.2609648	5.44	0.000	.9092402
.9660583	__Igrp_cm~130	.47375	.2511823	1.89	0.059	-.0185583
1.203062	__Igrp_cm~140	.9057306	.1517025	5.97	0.000	.6083992
.8101438	__Igrp_cm~160	.5265139	.1447118	3.64	0.000	.2428839
1.348849	__Igrp_cm~170	.9407556	.2082146	4.52	0.000	.5326625
.6575751	__Igrp_cm~190	.2053865	.2307127	0.89	0.373	-.246802
.8112867	__Igrp_cm~200	.3784062	.2208614	1.71	0.087	-.0544743
3.510605	__Igrp_cm~210	2.334479	.6000756	3.89	0.000	1.158352
.257725	__Idx_1	-.1025902	.1838376	-0.56	0.577	-.4629053
.7315676	__Icmf_y~2000	.0560596	.3446532	0.16	0.871	-.6194483
.400349	__Icmf_y~2001	-.0160856	.2124705	-0.08	0.940	-.4325201
.0662569	__Icmf_y~2002	-.3799146	.1600324	-2.37	0.018	-.6935722
.0119731	__Icmf_y~2003	-.3135859	.1538869	-2.04	0.042	-.6151987
.1618356	__Icmf_y~2005	-.227421	.198604	-1.15	0.252	-.6166776
.6995847	__IdxXcm~2000	-.725496	.7270953	-1.00	0.318	-2.150577
.8835722	__IdxXcm~2001	.1529729	.3727616	0.41	0.682	-.5776264
1.333529	__IdxXcm~2002	.7367785	.3044702	2.42	0.016	.1400278
.9961239	__IdxXcm~2003	.4565139	.2753163	1.66	0.097	-.083096
1.045808	__IdxXcm~2005	.4004455	.3292727	1.22	0.224	-.2449173
1.197156	__cons	.7697643	.2180609	3.53	0.000	.3423728
-						
.0139251	4					
.3073365	grp_step_e~e	.0058747	.0041074	1.43	0.153	-.0021756
.0223658	dst_time	.103134	.1041869	0.99	0.322	-.1010686
1.035612	post	-.1646224	.0954039	-1.73	0.084	-.3516106
.7452863	__Igrp_cm~_30	.6137757	.2152268	2.85	0.004	.191939
2.019955	__Igrp_cm~_60	.3822956	.1852028	2.06	0.039	.0193048
1.429655	__Igrp_cm~_70	1.493984	.2683576	5.57	0.000	.9680128
	__Igrp_cm~130	.9363872	.2516717	3.72	0.000	.4431198

_Igrp_cm~140 1.314811		1.004328	.158413	6.34	0.000	.6938439	
_Igrp_cm~160 .6741799		.3702586	.1550647	2.39	0.017	.0663373	
_Igrp_cm~170 1.550917		1.130962	.2142666	5.28	0.000	.7110069	
_Igrp_cm~190 .8238904		.3523038	.2406098	1.46	0.143	-.1192827	
_Igrp_cm~200 1.366363		.9369989	.2190672	4.28	0.000	.507635	
_Igrp_cm~210 4.249587		3.081203	.5961256	5.17	0.000	1.912818	
_Idx_1 .328143		-.0431797	.1894539	-0.23	0.820	-.4145024	
_Icmf_y~2000 1.106361		.4399242	.3400249	1.29	0.196	-.2265125	
_Icmf_y~2001 .6180264		.1937679	.2164624	0.90	0.371	-.2304905	
_Icmf_y~2002 .2961774		-.6254882	.1680188	-3.72	0.000	-.9547991	-
_Icmf_y~2003 .1145621		-.194202	.1575356	-1.23	0.218	-.5029661	
_Icmf_y~2005 .2196877		-.1822177	.2050575	-0.89	0.374	-.5841231	
_IdxXcm~2000 .9333766		-.363504	.6616859	-0.55	0.583	-1.660385	
_IdxXcm~2001 .4816861		-.2800392	.3886425	-0.72	0.471	-1.041764	
_IdxXcm~2002 1.293847		.6695916	.3185033	2.10	0.036	.0453367	
_IdxXcm~2003 .8541561		.3015411	.2819516	1.07	0.285	-.2510739	
_IdxXcm~2005 .7703034		.0988937	.3425623	0.29	0.773	-.5725161	
_cons .7421395		.2946823	.2282987	1.29	0.197	-.152775	

5							
grp_step_e~e .0097153		.0002794	.0048143	0.06	0.954	-.0091565	
dst_time .475261		.2323724	.1239251	1.88	0.061	-.0105163	
post .0028313		-.2233957	.1125349	-1.99	0.047	-.44396	-
_Igrp_cm~_30 1.385291		.8686533	.2635953	3.30	0.001	.352016	
_Igrp_cm~_60 1.016861		.5585407	.2338413	2.39	0.017	.1002201	
_Igrp_cm~_70 2.254083		1.653405	.3064739	5.39	0.000	1.052727	
_Igrp_cm~130 1.286204		.6360277	.3317284	1.92	0.055	-.0141481	
_Igrp_cm~140 1.053393		.6405745	.2106254	3.04	0.002	.2277563	
_Igrp_cm~160 1.611356		1.25306	.1828072	6.85	0.000	.8947646	

_Igrp_cm~170 1.956709		1.466968	.2498723	5.87	0.000	.9772277
_Igrp_cm~190 .4253139		-.328776	.3847468	-0.85	0.393	-1.082866
_Igrp_cm~200 2.296792		1.822869	.241802	7.54	0.000	1.348946
_Igrp_cm~210 4.78582		3.584404	.6129784	5.85	0.000	2.382988
_Idx_1 .1630865		-.2774839	.224785	-1.23	0.217	-.7180543
_Icmf_y~2000 1.303282		.5625417	.3779356	1.49	0.137	-.1781985
_Icmf_y~2001 .1919507		-.3497847	.2764007	-1.27	0.206	-.89152
_Icmf_y~2002 .0341142		-.4151726	.1944211	-2.14	0.033	-.796231
_Icmf_y~2003 .2684111		-.089787	.1827575	-0.49	0.623	-.4479852
_Icmf_y~2005 .5323929		.0628574	.2395634	0.26	0.793	-.4066782
_IdxXcm~2000 .5696104		-1.3318	.9701251	-1.37	0.170	-3.23321
_IdxXcm~2001 1.098338		.1056003	.5065083	0.21	0.835	-.8871377
_IdxXcm~2002 1.760228		1.052368	.3611594	2.91	0.004	.3445089
_IdxXcm~2003 1.00887		.3483717	.3369949	1.03	0.301	-.3121263
_IdxXcm~2005 .9599896		.1718245	.4021324	0.43	0.669	-.6163406
_cons .1315952		-.6847583	.2822313	-2.43	0.015	-1.237921

(cgi==1 is the base outcome)

*****Overall Wald test for interaction term**

. test _IdxXcmf_1_2000 _IdxXcmf_1_2001 _IdxXcmf_1_2002 _IdxXcmf_1_2003
_IdxXcmf_1_2005

- (1) [2]_IdxXcmf_1_2000 = 0
- (2) [3]_IdxXcmf_1_2000 = 0
- (3) [4]_IdxXcmf_1_2000 = 0
- (4) [5]_IdxXcmf_1_2000 = 0
- (5) [2]_IdxXcmf_1_2001 = 0
- (6) [3]_IdxXcmf_1_2001 = 0
- (7) [4]_IdxXcmf_1_2001 = 0
- (8) [5]_IdxXcmf_1_2001 = 0
- (9) [2]_IdxXcmf_1_2002 = 0
- (10) [3]_IdxXcmf_1_2002 = 0
- (11) [4]_IdxXcmf_1_2002 = 0
- (12) [5]_IdxXcmf_1_2002 = 0
- (13) [2]_IdxXcmf_1_2003 = 0
- (14) [3]_IdxXcmf_1_2003 = 0
- (15) [4]_IdxXcmf_1_2003 = 0
- (16) [5]_IdxXcmf_1_2003 = 0
- (17) [2]_IdxXcmf_1_2005 = 0

```
(18) [3]_IdxXcmf_1_2005 = 0
(19) [4]_IdxXcmf_1_2005 = 0
(20) [5]_IdxXcmf_1_2005 = 0
```

```
chi2( 20) = 28.63
Prob > chi2 = 0.0952
```

Multinomial model with diagnosis*season interaction for combined dataset (Model 7 Table 4):

```
. xi: mlogit cgi grp_step_enrol_final_age post i.cmf_year
i.grp_cmf_final_site_id i.dst_time*i.dx if grp_cmf_final_site_id != 90,
baseoutcome(1) robust
i.cmf_year _Icmf_year_2000-2005(naturally coded; _Icmf_year_2004
omitted)
i.grp_cmf_fi~id _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
omitted)
i.dst_time _Idst_time_0-1 (naturally coded; _Idst_time_0 omitted)
i.dx _Idx_0-1 (naturally coded; _Idx_0 omitted)
i.dst_~e*i.dx _IdstXdx_#_# (coded as above)
```

```
note: _Igrp_cmf_f_90 dropped due to collinearity
Iteration 0: log pseudolikelihood = -10661.984
Iteration 1: log pseudolikelihood = -10400.304
Iteration 2: log pseudolikelihood = -10384.805
Iteration 3: log pseudolikelihood = -10384.553
Iteration 4: log pseudolikelihood = -10384.549
Iteration 5: log pseudolikelihood = -10384.549
```

```
Multinomial logistic regression                                Number of obs =
7125
                                                                Wald chi2(80) =
541.48
                                                                Prob > chi2 =
0.0000
Log pseudolikelihood = -10384.549                            Pseudo R2 =
0.0260
```

```
-----
```

	cgi	Robust Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
2	grp_step_e~e	.0012748	.0040378	0.32	0.752	-.0066392 .0091887
	post	-.0797686	.0934093	-0.85	0.393	-.2628474 .1033102
	_Icmf_y~2000	.1911141	.3039085	0.63	0.529	-.4045357 .7867639
	_Icmf_y~2001	.1995818	.1769962	1.13	0.259	-.1473245 .546488
	_Icmf_y~2002	-.2386804	.1369251	-1.74	0.081	-.5070486 .0296878
	_Icmf_y~2003	-.1225816	.1286156	-0.95	0.341	-.3746636 .1295004

__Icmf_y~2005		.0868914	.1642291	0.53	0.597	-.2349918
.4087746						
__Igrp_cm~_30		.4506522	.2086729	2.16	0.031	.0416608
.8596437						
__Igrp_cm~_60		-.6449991	.1974649	-3.27	0.001	-1.032023
.257975						
__Igrp_cm~_70		.8569195	.2680583	3.20	0.001	.3315349
1.382304						
__Igrp_cm~130		.1980449	.2554899	0.78	0.438	-.3027062
.6987959						
__Igrp_cm~140		.9794317	.1505624	6.51	0.000	.6843349
1.274528						
__Igrp_cm~160		.5304702	.1451243	3.66	0.000	.2460318
.8149086						
__Igrp_cm~170		.7063089	.210439	3.36	0.001	.293856
1.118762						
__Igrp_cm~190		-.1951131	.2421466	-0.81	0.420	-.6697118
.2794855						
__Igrp_cm~200		-.0815028	.2307227	-0.35	0.724	-.533711
.3707054						
__Igrp_cm~210		1.600449	.6131706	2.61	0.009	.3986565
2.802241						
__Idst_time_1		.1391787	.1184308	1.18	0.240	-.0929414
.3712987						
__Idx_1		.0469167	.1417639	0.33	0.741	-.2309356
.3247689						
__IdstXdx_1_1		.164001	.2068792	0.79	0.428	-.2414749
.5694768						
__cons		.741068	.2133939	3.47	0.001	.3228237
1.159312						

3						
grp_step_e~e		.0035456	.0039759	0.89	0.373	-.004247
.0113382						
post		-.0637932	.0925331	-0.69	0.491	-.2451548
.1175685						
__Icmf_y~2000		-.0160254	.3056647	-0.05	0.958	-.6151172
.5830664						
__Icmf_y~2001		.0475203	.1769721	0.27	0.788	-.2993387
.3943793						
__Icmf_y~2002		-.1754911	.1347353	-1.30	0.193	-.4395674
.0885851						
__Icmf_y~2003		-.1711149	.1273581	-1.34	0.179	-.4207321
.0785024						
__Icmf_y~2005		-.0784392	.1639521	-0.48	0.632	-.3997795
.242901						
__Igrp_cm~_30		.6563781	.2061873	3.18	0.001	.2522585
1.060498						
__Igrp_cm~_60		-.4474462	.1920315	-2.33	0.020	-.8238209
.0710715						
__Igrp_cm~_70		1.402968	.2601933	5.39	0.000	.8929989
1.912938						
__Igrp_cm~130		.4529038	.24925	1.82	0.069	-.0356172
.9414248						
__Igrp_cm~140		.9053736	.1514519	5.98	0.000	.6085334
1.202214						

_Igrp_cm~160 .7992055		.5155905	.1447042	3.56	0.000	.2319756
_Igrp_cm~170 1.346585		.938804	.2080553	4.51	0.000	.5310231
_Igrp_cm~190 .672427		.2196141	.2310312	0.95	0.342	-.2331987
_Igrp_cm~200 .8048394		.3731017	.2202784	1.69	0.090	-.0586359
_Igrp_cm~210 3.498091		2.320971	.6005824	3.86	0.000	1.143851
_Idst_time_1 .2482916		.0179747	.1175108	0.15	0.878	-.2123423
_Idx_1 .3929781		.1202825	.139133	0.86	0.387	-.152413
_IdstXdx_1_1 .6050756		.2048129	.2042194	1.00	0.316	-.1954498
_cons 1.091016		.6782485	.2105997	3.22	0.001	.2654808

4						
grp_step_e~e .0141067		.0060451	.0041131	1.47	0.142	-.0020164
post .0232953		-.1636875	.0954011	-1.72	0.086	-.3506703
_Icmf_y~2000 .9877296		.4042594	.2976943	1.36	0.174	-.1792107
_Icmf_y~2001 .4872321		.1315123	.1814931	0.72	0.469	-.2242076
_Icmf_y~2002 .1712597		-.4484418	.1414221	-3.17	0.002	-.725624
_Icmf_y~2003 .1504058		-.1047256	.1301715	-0.80	0.421	-.359857
_Icmf_y~2005 .1914735		-.1425179	.1704069	-0.84	0.403	-.4765094
_Igrp_cm~_30 1.034331		.6112944	.2158392	2.83	0.005	.1882574
_Igrp_cm~_60 .7563698		.3942698	.1847483	2.13	0.033	.0321697
_Igrp_cm~_70 2.000657		1.476784	.2672869	5.53	0.000	.9529112
_Igrp_cm~130 1.407488		.9182604	.2496104	3.68	0.000	.429033
_Igrp_cm~140 1.314456		1.004333	.1582287	6.35	0.000	.6942106
_Igrp_cm~160 .6653185		.3613927	.155067	2.33	0.020	.057467
_Igrp_cm~170 1.548577		1.129469	.2138346	5.28	0.000	.7103604
_Igrp_cm~190 .8325278		.3614368	.2403569	1.50	0.133	-.1096541
_Igrp_cm~200 1.355692		.927897	.2182667	4.25	0.000	.5001022
_Igrp_cm~210 4.233756		3.064362	.5966407	5.14	0.000	1.894968
_Idst_time_1 .2573548		.0205127	.12084	0.17	0.865	-.2163294

.2842626	_Idx_1	.0000537	.1450072	0.00	1.000	-.2841551
.7223297	_IdstXdx_1_1	.3083565	.2112147	1.46	0.144	-.1056168
.6995359	_cons	.2675682	.2203958	1.21	0.225	-.1643996

5	grp_step_eve	.0006799	.0048037	0.14	0.887	-.0087352
.010095	post	-.2224669	.1124578	-1.98	0.048	-.4428802
.0020537	_Icmf_y~2000	.4164655	.3397043	1.23	0.220	-.2493427
1.082274	_Icmf_y~2001	-.313171	.2333199	-1.34	0.180	-.7704696
.1441276	_Icmf_y~2002	-.1217251	.1630139	-0.75	0.455	-.4412263
.1977762	_Icmf_y~2003	.0204186	.1528303	0.13	0.894	-.2791234
.3199605	_Icmf_y~2005	.1214643	.2005329	0.61	0.545	-.271573
.5145016	_Igrp_cm~_30	.8744232	.2634787	3.32	0.001	.3580144
1.390832	_Igrp_cm~_60	.5697759	.2332412	2.44	0.015	.1126316
1.02692	_Igrp_cm~_70	1.616199	.3052337	5.29	0.000	1.017952
2.214446	_Igrp_cm~130	.5980341	.3295818	1.81	0.070	-.0479343
1.244002	_Igrp_cm~140	.6359301	.2102712	3.02	0.002	.2238062
1.048054	_Igrp_cm~160	1.23676	.182353	6.78	0.000	.8793544
1.594165	_Igrp_cm~170	1.458684	.2493127	5.85	0.000	.9700403
1.947328	_Igrp_cm~190	-.3048192	.382524	-0.80	0.426	-1.054552
.444914	_Igrp_cm~200	1.806127	.2406974	7.50	0.000	1.334369
2.277885	_Igrp_cm~210	3.557923	.6142386	5.79	0.000	2.354038
4.761809	_Idst_time_1	.2022093	.1425378	1.42	0.156	-.0771597
.4815783	_Idx_1	-.0335363	.1740111	-0.19	0.847	-.3745917
.3075191	_IdstXdx_1_1	.1266341	.2496971	0.51	0.612	-.3627632
.6160315	_cons	-.7769074	.2723618	-2.85	0.004	-1.310727
.2430881						

(cgi==1 is the base outcome)

*****Overall Wald test for interaction term**

. test _IdstXdx_1_1


```

( 1) [2]_IdstXdx_1_1 = 0
( 2) [3]_IdstXdx_1_1 = 0
( 3) [4]_IdstXdx_1_1 = 0
( 4) [5]_IdstXdx_1_1 = 0

      chi2( 4) =      2.54
Prob > chi2 =      0.6380

```

Multinomial model with diagnosis*site interaction for combined dataset with site 210 excluded (Model 8 Table 4):

```

. xi: mlogit   cgi   grp_step_enrol_final_age   dst_time   post   i.cmf_year
i.grp_cmf_final_site_id*i.dx if grp_cmf_final_site_id != 90, baseoutcome(1)
robust
  i.cmf_year           _Icmf_year_2000-2005(naturally coded; _Icmf_year_2004
omitted)
  i.grp_cmf_fi~id      _Igrp_cmf_f_10-210      (naturally coded; _Igrp_cmf_f_10
omitted)
  i.dx                 _Idx_0-1                (naturally coded; _Idx_0 omitted)
  i.grp~id*i.dx        _IgrpXdx_#_#           (coded as above)

```

note: _Igrp_cmf_f_90 dropped due to collinearity
note: _IgrpXdx_90_1 dropped due to collinearity

```

Iteration 0: log pseudolikelihood = -10661.984
Iteration 1: log pseudolikelihood = -10356.577
Iteration 2: log pseudolikelihood = -10335.276
Iteration 3: log pseudolikelihood = -10334.677
Iteration 4: log pseudolikelihood = -10334.57
Iteration 5: log pseudolikelihood = -10334.531
Iteration 6: log pseudolikelihood = -10334.517
Iteration 7: log pseudolikelihood = -10334.512
Iteration 8: log pseudolikelihood = -10334.51
Iteration 9: log pseudolikelihood = -10334.509
Iteration 10: log pseudolikelihood = -10334.509
Iteration 11: log pseudolikelihood = -10334.509
Iteration 12: log pseudolikelihood = -10334.509
Iteration 13: log pseudolikelihood = -10334.509
Iteration 14: log pseudolikelihood = -10334.509
Iteration 15: log pseudolikelihood = -10334.509
Iteration 16: log pseudolikelihood = -10334.509
Iteration 17: log pseudolikelihood = -10334.509
Iteration 18: log pseudolikelihood = -10334.509
Iteration 19: log pseudolikelihood = -10334.509
Iteration 20: log pseudolikelihood = -10334.509

```

```

Multinomial logistic regression                               Number of obs   =
7125                                                         Wald      chi2(115)   =
.                                                         Prob >  chi2      =
.                                                         Pseudo R2      =
Log pseudolikelihood = -10334.509
0.0307

```

-

Interval]	cgi	Coef.	Robust Std. Err.	z	P> z	[95% Conf.
-						
2						
.0096071	grp_step_e~e	.0016355	.0040672	0.40	0.688	-.0063361
.3934921	dst_time	.1926224	.1024864	1.88	0.060	-.0082474
.1060336	post	-.0775501	.0936669	-0.83	0.408	-.2611339
.7596623	_Icmf_y~2000	.1600282	.3059414	0.52	0.601	-.4396059
.538696	_Icmf_y~2001	.1914847	.1771519	1.08	0.280	-.1557267
.0299483	_Icmf_y~2002	-.2409527	.1382173	-1.74	0.081	-.5118537
.1132296	_Icmf_y~2003	-.1399376	.1291693	-1.08	0.279	-.3931049
.4198391	_Icmf_y~2005	.0962317	.1651089	0.58	0.560	-.2273757
.923801	_Igrp_cm~_30	.4252826	.2543508	1.67	0.095	-.0732358
.5294622	_Igrp_cm~_60	-1.011263	.2458211	-4.11	0.000	-1.493063 -
1.541047	_Igrp_cm~_70	.9523348	.3003689	3.17	0.002	.3636226
.5902558	_Igrp_cm~130	.0175127	.2922212	0.06	0.952	-.5552304
1.313857	_Igrp_cm~140	.9656194	.1776753	5.43	0.000	.6173822
.9254107	_Igrp_cm~160	.5715639	.1805374	3.17	0.002	.2177171
.9598168	_Igrp_cm~170	.5012217	.2339814	2.14	0.032	.0426267
.5538027	_Igrp_cm~190	.0062856	.2793506	0.02	0.982	-.5412315
.5825014	_Igrp_cm~200	.0805899	.256082	0.31	0.753	-.4213216
2.601994	_Igrp_cm~210	1.380578	.6231829	2.22	0.027	.159162
.4498304	_Idx_1	.0719749	.192787	0.37	0.709	-.3058805
.9810256	_IgrpXdx_3~1	.112192	.4432906	0.25	0.800	-.7566416
1.862657	_IgrpXdx_6~1	1.022357	.4287324	2.38	0.017	.1820566
.8372656	_IgrpXdx_7~1	-.4528433	.6582309	-0.69	0.491	-1.742952
2.048847	_IgrpX~130_1	.7925048	.6410025	1.24	0.216	-.4638369
.7166227	_IgrpXd~40_1	.058986	.3355351	0.18	0.860	-.5986507
.5204338	_IgrpX~160_1	-.0580694	.2951601	-0.20	0.844	-.6365726

2.205744	_IgrpX~170_1	1.036317	.5966577	1.74	0.082	-.1331107
.2007829	_IgrpX~190_1	-.9406036	.5823507	-1.62	0.106	-2.08199
.028646	_IgrpXd~00_1	-1.258549	.6567443	-1.92	0.055	-2.545744
19.70732	_IgrpXd~10_1	18.47042	.6310867	29.27	0.000	17.23351
1.143401	_cons	.7131612	.2195142	3.25	0.001	.2829212

3	grp_step_e~e	.003275	.0040105	0.82	0.414	-.0045855
.0111355	dst_time	.082389	.1011781	0.81	0.415	-.1159163
.2806944	post	-.0654554	.0927133	-0.71	0.480	-.2471701
.1162593	_Icmf_y~2000	-.0449927	.3069576	-0.15	0.883	-.6466185
.5566331	_Icmf_y~2001	.039104	.1768665	0.22	0.825	-.307548
.3857559	_Icmf_y~2002	-.1765372	.1358197	-1.30	0.194	-.442739
.0896645	_Icmf_y~2003	-.1784782	.127841	-1.40	0.163	-.429042
.0720856	_Icmf_y~2005	-.0771222	.1651031	-0.47	0.640	-.4007183
.246474	_Igrp_cm~_30	.5525482	.2515786	2.20	0.028	.0594631
1.045633	_Igrp_cm~_60	-.7036618	.2300553	-3.06	0.002	-1.154562
.2527617	_Igrp_cm~_70	1.214102	.294914	4.12	0.000	.6360808
1.792123	_Igrp_cm~130	.3862001	.2771404	1.39	0.163	-.1569851
.9293852	_Igrp_cm~140	.7795236	.1789229	4.36	0.000	.4288411
1.130206	_Igrp_cm~160	.2730364	.1837243	1.49	0.137	-.0870566
.6331294	_Igrp_cm~170	.8376709	.227427	3.68	0.000	.3919222
1.28342	_Igrp_cm~190	.1712259	.2728426	0.63	0.530	-.3635357
.7059876	_Igrp_cm~200	.408676	.2462808	1.66	0.097	-.0740254
.8913774	_Igrp_cm~210	2.098201	.606433	3.46	0.001	.9096141
3.286788	_Idx_1	-.1442093	.1958109	-0.74	0.461	-.5279915
.2395729	_IgrpXdx_3~1	.4039449	.4381641	0.92	0.357	-.4548409
1.262731	_IgrpXdx_6~1	.8698862	.4209639	2.07	0.039	.0448121
1.69496	_IgrpXdx_7~1	.7249934	.6223848	1.16	0.244	-.4948584
1.944845						

_IgrpX~130_1		.3334383	.6476349	0.51	0.607	-.9359028
1.602779						
_IgrpXd~40_1		.4480079	.3377838	1.33	0.185	-.2140362
1.110052						
_IgrpX~160_1		.6518044	.2973402	2.19	0.028	.0690282
1.234581						
_IgrpX~170_1		.4865012	.6058973	0.80	0.422	-.7010357
1.674038						
_IgrpX~190_1		.1988277	.5035951	0.39	0.693	-.7882006
1.185856						
_IgrpXd~00_1		-.5287882	.5615306	-0.94	0.346	-1.629368
.5717916						
_IgrpXd~10_1		18.36561	.5726863	32.07	0.000	17.24317
19.48806						
_cons		.7584328	.216625	3.50	0.000	.3338556
1.18301						

-						
4						
grp_step_e~e		.0061782	.0041536	1.49	0.137	-.0019626
.0143191						
dst_time		.1109573	.104402	1.06	0.288	-.0936668
.3155814						
post		-.1678676	.0956084	-1.76	0.079	-.3552566
.0195214						
_Icmf_y~2000		.3833307	.2998324	1.28	0.201	-.2043301
.9709914						
_Icmf_y~2001		.1192099	.1815347	0.66	0.511	-.2365916
.4750114						
_Icmf_y~2002		-.4442361	.1424552	-3.12	0.002	-.723443
.1650291						
_Icmf_y~2003		-.1146861	.130689	-0.88	0.380	-.3708319
.1414597						
_Icmf_y~2005		-.1469343	.1715752	-0.86	0.392	-.4832155
.189347						
_Igrp_cm~_30		.3329473	.265397	1.25	0.210	-.1872213
.8531158						
_Igrp_cm~_60		.1092532	.2166159	0.50	0.614	-.3153062
.5338125						
_Igrp_cm~_70		1.146949	.3060464	3.75	0.000	.5471093
1.746789						
_Igrp_cm~130		.6758722	.2815701	2.40	0.016	.1240049
1.227739						
_Igrp_cm~140		.8478233	.186035	4.56	0.000	.4832014
1.212445						
_Igrp_cm~160		.2139022	.1943139	1.10	0.271	-.1669461
.5947505						
_Igrp_cm~170		.9863045	.2334404	4.23	0.000	.5287697
1.443839						
_Igrp_cm~190		.1828344	.2839268	0.64	0.520	-.3736518
.7393207						
_Igrp_cm~200		.9534796	.2433562	3.92	0.000	.4765101
1.430449						
_Igrp_cm~210		2.715585	.6024741	4.51	0.000	1.534757
3.896412						
_Idx_1		-.3864014	.216319	-1.79	0.074	-.8103789
.0375761						

__IgrpXdx_3~1		.9082561	.4608256	1.97	0.049	.0050545
1.811458						
__IgrpXdx_6~1		1.00939	.4127654	2.45	0.014	.2003849
1.818396						
__IgrpXdx_7~1		1.17636	.6359873	1.85	0.064	-.070152
2.422873						
__IgrpX~130_1		1.066852	.6321837	1.69	0.091	-.1722052
2.305909						
__IgrpXd~40_1		.5967683	.356582	1.67	0.094	-.1021196
1.295656						
__IgrpX~160_1		.5671544	.322852	1.76	0.079	-.0656239
1.199933						
__IgrpX~170_1		.645028	.6230114	1.04	0.301	-.5760518
1.866108						
__IgrpX~190_1		.7043445	.5241508	1.34	0.179	-.3229722
1.731661						
__IgrpXd~00_1		-.66112	.5809273	-1.14	0.255	-1.799717
.4774766						
__IgrpXd~10_1		18.97309	.5366499	35.35	0.000	17.92127
20.0249						
_cons		.3588217	.2269727	1.58	0.114	-.0860366
.80368						

5						
grp_step_e~e		.0004365	.0048509	0.09	0.928	-.0090711
.0099442						
dst_time		.2291866	.1243268	1.84	0.065	-.0144895
.4728627						
post		-.2233213	.1127127	-1.98	0.048	-.444234
.0024085						
__Icmf_y~2000		.4131031	.3415699	1.21	0.226	-.2563617
1.082568						
__Icmf_y~2001		-.2987945	.2326485	-1.28	0.199	-.7547771
.1571881						
__Icmf_y~2002		-.0931211	.1637089	-0.57	0.569	-.4139847
.2277425						
__Icmf_y~2003		.0157946	.1537811	0.10	0.918	-.2856107
.3171999						
__Icmf_y~2005		.1164665	.2018174	0.58	0.564	-.2790884
.5120214						
__Igrp_cm~_30		.5235854	.3276507	1.60	0.110	-.1185982
1.165769						
__Igrp_cm~_60		.3580019	.2668035	1.34	0.180	-.1649234
.8809271						
__Igrp_cm~_70		1.195294	.3540973	3.38	0.001	.5012762
1.889312						
__Igrp_cm~130		-.0676554	.4140061	-0.16	0.870	-.8790925
.7437816						
__Igrp_cm~140		.5991947	.2371079	2.53	0.012	.1344717
1.063918						
__Igrp_cm~160		.9638218	.2239301	4.30	0.000	.524927
1.402717						
__Igrp_cm~170		1.138725	.2752822	4.14	0.000	.5991816
1.678268						
__Igrp_cm~190		-.253201	.4180521	-0.61	0.545	-1.072568
.5661661						

__Igrp_cm~200		1.817768	.2659478	6.84	0.000	1.29652
2.339016						
__Igrp_cm~210		3.145227	.6236771	5.04	0.000	1.922842
4.367611						
__Idx_1		-.7713104	.3332204	-2.31	0.021	-1.42441
.1182105						
__IgrpXdx_3~1		1.249765	.5807634	2.15	0.031	.1114895
2.38804						
__IgrpXdx_6~1		.9091716	.5498742	1.65	0.098	-.168562
1.986905						
__IgrpXdx_7~1		1.620008	.7296624	2.22	0.026	.1898959
3.05012						
__IgrpX~130_1		2.320111	.7847272	2.96	0.003	.782074
3.858148						
__IgrpXd~40_1		.1389795	.5334229	0.26	0.794	-.9065102
1.184469						
__IgrpX~160_1		1.00659	.4190208	2.40	0.016	.1853244
1.827856						
__IgrpX~170_1		1.614741	.6917049	2.33	0.020	.2590243
2.970458						
__IgrpX~190_1		-.5501492	1.175433	-0.47	0.640	-2.853955
1.753657						
__IgrpXd~00_1		-.8091043	.7062526	-1.15	0.252	-2.193334
.5751253						
__IgrpXd~10_1		19.39899
.						
__cons		-.6078833	.2786344	-2.18	0.029	-1.153997
.0617699						

(cgi==1 is the base outcome)

*****Overall Wald test for interaction term**

test	__IgrpXdx_30_1	__IgrpXdx_60_1	__IgrpXdx_70_1	__IgrpXdx_130_1
__IgrpXdx_140_1	__IgrpXdx_160_1	__IgrpXdx_170_1	__IgrpXdx_190_1	__IgrpXdx_200_1
__IgrpXdx_210_1				

- (1) [2]_IgrpXdx_30_1 = 0
- (2) [3]_IgrpXdx_30_1 = 0
- (3) [4]_IgrpXdx_30_1 = 0
- (4) [5]_IgrpXdx_30_1 = 0
- (5) [2]_IgrpXdx_60_1 = 0
- (6) [3]_IgrpXdx_60_1 = 0
- (7) [4]_IgrpXdx_60_1 = 0
- (8) [5]_IgrpXdx_60_1 = 0
- (9) [2]_IgrpXdx_70_1 = 0
- (10) [3]_IgrpXdx_70_1 = 0
- (11) [4]_IgrpXdx_70_1 = 0
- (12) [5]_IgrpXdx_70_1 = 0
- (13) [2]_IgrpXdx_130_1 = 0
- (14) [3]_IgrpXdx_130_1 = 0
- (15) [4]_IgrpXdx_130_1 = 0
- (16) [5]_IgrpXdx_130_1 = 0
- (17) [2]_IgrpXdx_140_1 = 0
- (18) [3]_IgrpXdx_140_1 = 0
- (19) [4]_IgrpXdx_140_1 = 0
- (20) [5]_IgrpXdx_140_1 = 0

```

(21) [2]_IgrpXdx_160_1 = 0
(22) [3]_IgrpXdx_160_1 = 0
(23) [4]_IgrpXdx_160_1 = 0
(24) [5]_IgrpXdx_160_1 = 0
(25) [2]_IgrpXdx_170_1 = 0
(26) [3]_IgrpXdx_170_1 = 0
(27) [4]_IgrpXdx_170_1 = 0
(28) [5]_IgrpXdx_170_1 = 0
(29) [2]_IgrpXdx_190_1 = 0
(30) [3]_IgrpXdx_190_1 = 0
(31) [4]_IgrpXdx_190_1 = 0
(32) [5]_IgrpXdx_190_1 = 0
(33) [2]_IgrpXdx_200_1 = 0
(34) [3]_IgrpXdx_200_1 = 0
(35) [4]_IgrpXdx_200_1 = 0
(36) [5]_IgrpXdx_200_1 = 0
(37) [2]_IgrpXdx_210_1 = 0
(38) [3]_IgrpXdx_210_1 = 0
(39) [4]_IgrpXdx_210_1 = 0
(40) [5]_IgrpXdx_210_1 = 0
Constraint 40 dropped

      chi2( 39) = 2336.81
      Prob > chi2 = 0.0000

```

*****Overall Wald test for age**

```

. test grp_step_enrol_final_age

( 1) [2]grp_step_enrol_final_age = 0
( 2) [3]grp_step_enrol_final_age = 0
( 3) [4]grp_step_enrol_final_age = 0
( 4) [5]grp_step_enrol_final_age = 0

      chi2( 4) = 4.26
      Prob > chi2 = 0.3720

```

*****Overall Wald test for season**

```

. test dst_time

( 1) [2]dst_time = 0
( 2) [3]dst_time = 0
( 3) [4]dst_time = 0
( 4) [5]dst_time = 0

      chi2( 4) = 6.12
      Prob > chi2 = 0.1901

```

*****Overall Wald test for post variable**

```

. test post

( 1) [2]post = 0
( 2) [3]post = 0
( 3) [4]post = 0
( 4) [5]post = 0

      chi2( 4) = 6.71
      Prob > chi2 = 0.1521

```

*****Overall Wald test for diagnosis**

```
. test _Idx_1
```

```
( 1) [2]_Idx_1 = 0
( 2) [3]_Idx_1 = 0
( 3) [4]_Idx_1 = 0
( 4) [5]_Idx_1 = 0
```

```
chi2( 4) = 12.29
Prob > chi2 = 0.0153
```

*****Overall Wald test for year**

```
. test _Icmf_year_2000 _Icmf_year_2001 _Icmf_year_2002 _Icmf_year_2003
_Icmf_year_2005
```

```
( 1) [2]_Icmf_year_2000 = 0
( 2) [3]_Icmf_year_2000 = 0
( 3) [4]_Icmf_year_2000 = 0
( 4) [5]_Icmf_year_2000 = 0
( 5) [2]_Icmf_year_2001 = 0
( 6) [3]_Icmf_year_2001 = 0
( 7) [4]_Icmf_year_2001 = 0
( 8) [5]_Icmf_year_2001 = 0
( 9) [2]_Icmf_year_2002 = 0
(10) [3]_Icmf_year_2002 = 0
(11) [4]_Icmf_year_2002 = 0
(12) [5]_Icmf_year_2002 = 0
(13) [2]_Icmf_year_2003 = 0
(14) [3]_Icmf_year_2003 = 0
(15) [4]_Icmf_year_2003 = 0
(16) [5]_Icmf_year_2003 = 0
(17) [2]_Icmf_year_2005 = 0
(18) [3]_Icmf_year_2005 = 0
(19) [4]_Icmf_year_2005 = 0
(20) [5]_Icmf_year_2005 = 0
```

```
chi2( 20) = 46.62
Prob > chi2 = 0.0007
```

Multinomial model with diagnosis*site interaction for combined dataset with site 210 excluded (Model 8 Table 4):

```
. xi: mlogit cgi grp_step_enrol_final_age dst_time post i.cmf_year
i.grp_cmf_final_site_id*i.dx if grp_cmf_final_site_id != 90 &
grp_cmf_final_site_id != 210, baseoutcome(1) robust
i.cmf_year _Icmf_year_2000-2005(naturally coded; _Icmf_year_2004
omitted)
i.grp_cmf_fi~id _Igrp_cmf_f_10-210 (naturally coded; _Igrp_cmf_f_10
omitted)
i.dx _Idx_0-1 (naturally coded; _Idx_0 omitted)
i.grp~id*i.dx _IgrpXdx_#_# (coded as above)
```

```
note: _Igrp_cmf_f_90 dropped due to collinearity
note: _Igrp_cmf_f_210 dropped due to collinearity
note: _IgrpXdx_90_1 dropped due to collinearity
```


__Igrp_cm~200		.0810793	.2561273	0.32	0.752	-.4209211
.5830796						
__Idx_1		.0748299	.1928039	0.39	0.698	-.3030589
.4527187						
__IgrpXdx_3~1		.1051291	.4433743	0.24	0.813	-.7638685
.9741268						
__IgrpXdx_6~1		1.022721	.4287989	2.39	0.017	.1822906
1.863151						
__IgrpXdx_7~1		-.4498474	.6581221	-0.68	0.494	-1.739743
.8400482						
__IgrpX~130_1		.7958834	.6415679	1.24	0.215	-.4615667
2.053333						
__IgrpXd~40_1		.0583367	.3355915	0.17	0.862	-.5994106
.7160839						
__IgrpX~160_1		-.0581346	.2951312	-0.20	0.844	-.6365811
.5203118						
__IgrpX~170_1		1.03234	.5966742	1.73	0.084	-.1371196
2.2018						
__IgrpX~190_1		-.9504883	.5821631	-1.63	0.103	-2.091507
.1905305						
__IgrpXd~00_1		-1.263276	.6566214	-1.92	0.054	-2.55023
.0236781						
__cons		.7146753	.2202315	3.25	0.001	.2830295
1.146321						

-						
3						
grp_step_e~e		.0026864	.0040309	0.67	0.505	-.0052141
.0105869						
dst_time		.1026732	.101802	1.01	0.313	-.0968551
.3022015						
post		-.0697905	.0931655	-0.75	0.454	-.2523916
.1128105						
__Icmf_y~2000		-.0425797	.3069029	-0.14	0.890	-.6440982
.5589389						
__Icmf_y~2001		.0453425	.1767463	0.26	0.798	-.3010739
.3917589						
__Icmf_y~2002		-.1526168	.1361478	-1.12	0.262	-.4194616
.1142281						
__Icmf_y~2003		-.1919762	.1286015	-1.49	0.135	-.4440305
.0600781						
__Icmf_y~2005		-.0494634	.1651472	-0.30	0.765	-.373146
.2742193						
__Igrp_cm~_30		.5528586	.2516769	2.20	0.028	.0595809
1.046136						
__Igrp_cm~_60		-.7086017	.2300199	-3.08	0.002	-1.159432
.257771						
__Igrp_cm~_70		1.211933	.2948964	4.11	0.000	.633947
1.789919						
__Igrp_cm~130		.3849261	.2770599	1.39	0.165	-.1581014
.9279535						
__Igrp_cm~140		.7773034	.1789294	4.34	0.000	.4266081
1.127999						
__Igrp_cm~160		.2708649	.1837057	1.47	0.140	-.0891918
.6309215						
__Igrp_cm~170		.8406476	.2274522	3.70	0.000	.3948495
1.286446						

_Igrp_cm~190 .7024455		.1677117	.2728284	0.61	0.539	-.3670221
_Igrp_cm~200 .8926131		.4096803	.2463988	1.66	0.096	-.0732526
_Idx_1 .2421298		-.1416881	.1958291	-0.72	0.469	-.5255059
_IgrpXdx_3~1 1.256229		.3970372	.4383711	0.91	0.365	-.4621543
_IgrpXdx_6~1 1.696776		.87185	.4208884	2.07	0.038	.0469238
_IgrpXdx_7~1 1.946789		.7269826	.6223616	1.17	0.243	-.4928236
_IgrpX~130_1 1.609805		.3391683	.6482961	0.52	0.601	-.9314686
_IgrpXd~40_1 1.109686		.4475944	.337808	1.32	0.185	-.2144972
_IgrpX~160_1 1.234091		.6513574	.2973184	2.19	0.028	.068624
_IgrpX~170_1 1.669773		.4823339	.6058475	0.80	0.426	-.7051054
_IgrpX~190_1 1.179333		.1924709	.5035105	0.38	0.702	-.7943916
_IgrpXd~00_1 .5638119		-.53602	.5611491	-0.96	0.339	-1.635852
_cons 1.196912		.770498	.2175622	3.54	0.000	.3440839

4						
grp_step_e~e .0152489		.0070485	.0041839	1.68	0.092	-.0011518
dst_time .3183871		.112268	.1051647	1.07	0.286	-.093851
post .0047894		-.1840277	.096337	-1.91	0.056	-.3728447
_Icmf_y~2000 .957208		.369744	.299732	1.23	0.217	-.2177199
_Icmf_y~2001 .4613913		.1060696	.1812899	0.59	0.558	-.2492522
_Icmf_y~2002 .1513859		-.4310854	.1427065	-3.02	0.003	-.7107849
_Icmf_y~2003 .1171957		-.1409776	.1317235	-1.07	0.285	-.399151
_Icmf_y~2005 .1386761		-.2003955	.1729989	-1.16	0.247	-.5394671
_Igrp_cm~_30 .8489395		.3286036	.2654824	1.24	0.216	-.1917324
_Igrp_cm~_60 .5311642		.1062796	.2167818	0.49	0.624	-.3186049
_Igrp_cm~_70 1.741321		1.141601	.305985	3.73	0.000	.5418816
_Igrp_cm~130 1.21869		.6666713	.2816472	2.37	0.018	.1146528
_Igrp_cm~140 1.213117		.8484119	.1860774	4.56	0.000	.483707
_Igrp_cm~160 .5933674		.2125833	.1942812	1.09	0.274	-.1682008

_Igrp_cm~170		.9831453	.2335088	4.21	0.000	.5254765
1.440814						
_Igrp_cm~190		.1792531	.2838948	0.63	0.528	-.3771706
.7356767						
_Igrp_cm~200		.9474705	.2433578	3.89	0.000	.4704981
1.424443						
_Idx_1		-.3901689	.2164435	-1.80	0.071	-.8143902
.0340525						
_IgrpXdx_3~1		.9175632	.461016	1.99	0.047	.0139884
1.821138						
_IgrpXdx_6~1		1.014206	.4127967	2.46	0.014	.2051392
1.823273						
_IgrpXdx_7~1		1.179766	.6359406	1.86	0.064	-.066655
2.426186						
_IgrpX~130_1		1.077524	.6328257	1.70	0.089	-.1627916
2.317839						
_IgrpXd~40_1		.6004046	.3566279	1.68	0.092	-.0985731
1.299382						
_IgrpX~160_1		.5682568	.3228627	1.76	0.078	-.0645426
1.201056						
_IgrpX~170_1		.651593	.6236028	1.04	0.296	-.5706461
1.873832						
_IgrpX~190_1		.7130815	.52369	1.36	0.173	-.313332
1.739495						
_IgrpXd~00_1		-.6502621	.5816425	-1.12	0.264	-1.790261
.4897363						
_cons		.3421749	.2286527	1.50	0.135	-.1059761
.7903259						

5						
grp_step_e~e		.0003269	.0048952	0.07	0.947	-.0092675
.0099214						
dst_time		.1881339	.126487	1.49	0.137	-.0597761
.4360438						
post		-.2242576	.114555	-1.96	0.050	-.4487812
.000266						
_Icmf_y~2000		.5077435	.3429302	1.48	0.139	-.1643873
1.179874						
_Icmf_y~2001		-.2168616	.2345384	-0.92	0.355	-.6765484
.2428252						
_Icmf_y~2002		.02212	.1668271	0.13	0.895	-.3048551
.3490951						
_Icmf_y~2003		.1369316	.1578999	0.87	0.386	-.1725465
.4464097						
_Icmf_y~2005		.1796493	.2053625	0.87	0.382	-.2228539
.5821524						
_Igrp_cm~_30		.5188876	.3279269	1.58	0.114	-.1238373
1.161612						
_Igrp_cm~_60		.3633872	.2673175	1.36	0.174	-.1605455
.8873199						
_Igrp_cm~_70		1.18588	.353671	3.35	0.001	.4926974
1.879062						
_Igrp_cm~130		-.0875781	.4144473	-0.21	0.833	-.8998798
.7247236						
_Igrp_cm~140		.5977162	.2371472	2.52	0.012	.1329163
1.062516						

_Igrp_cm~160		.961261	.2238844	4.29	0.000	.5224557
1.400066						
_Igrp_cm~170		1.131944	.2752767	4.11	0.000	.592412
1.671477						
_Igrp_cm~190		-.2748633	.4179047	-0.66	0.511	-1.093942
.5442149						
_Igrp_cm~200		1.812148	.2659719	6.81	0.000	1.290852
2.333443						
_Idx_1		-.7663992	.333223	-2.30	0.021	-1.419504
.1132941						
_IgrpXdx_3~1		1.247349	.5808731	2.15	0.032	.1088586
2.385839						
_IgrpXdx_6~1		.8848919	.5500512	1.61	0.108	-.1931886
1.962972						
_IgrpXdx_7~1		1.625846	.7285099	2.23	0.026	.1979926
3.053699						
_IgrpX~130_1		2.326087	.7858561	2.96	0.003	.7858378
3.866337						
_IgrpXd~40_1		.135406	.5332724	0.25	0.800	-.9097887
1.180601						
_IgrpX~160_1		1.010382	.4189455	2.41	0.016	.1892636
1.8315						
_IgrpX~170_1		1.609776	.6918224	2.33	0.020	.2538292
2.965723						
_IgrpX~190_1		-.5666751	1.175181	-0.48	0.630	-2.869987
1.736637						
_IgrpXd~00_1		-.8033327	.7071667	-1.14	0.256	-2.189354
.5826887						
_cons		-.6543346	.2829799	-2.31	0.021	-1.208965
.0997042						

 (cgi==1 is the base outcome)

*****Overall Wald test for interaction term**

```

. test _IgrpXdx_30_1 _IgrpXdx_60_1 _IgrpXdx_70_1 _IgrpXdx_130_1
_IgrpXdx_140_1 _IgrpXdx_160_1 _Ig
> rpXdx_170_1 _IgrpXdx_190_1 _IgrpXdx_200_1

```

- (1) [2]_IgrpXdx_30_1 = 0
- (2) [3]_IgrpXdx_30_1 = 0
- (3) [4]_IgrpXdx_30_1 = 0
- (4) [5]_IgrpXdx_30_1 = 0
- (5) [2]_IgrpXdx_60_1 = 0
- (6) [3]_IgrpXdx_60_1 = 0
- (7) [4]_IgrpXdx_60_1 = 0
- (8) [5]_IgrpXdx_60_1 = 0
- (9) [2]_IgrpXdx_70_1 = 0
- (10) [3]_IgrpXdx_70_1 = 0
- (11) [4]_IgrpXdx_70_1 = 0
- (12) [5]_IgrpXdx_70_1 = 0
- (13) [2]_IgrpXdx_130_1 = 0
- (14) [3]_IgrpXdx_130_1 = 0
- (15) [4]_IgrpXdx_130_1 = 0
- (16) [5]_IgrpXdx_130_1 = 0
- (17) [2]_IgrpXdx_140_1 = 0
- (18) [3]_IgrpXdx_140_1 = 0

```
(19) [4]_IgrpXdx_140_1 = 0
(20) [5]_IgrpXdx_140_1 = 0
(21) [2]_IgrpXdx_160_1 = 0
(22) [3]_IgrpXdx_160_1 = 0
(23) [4]_IgrpXdx_160_1 = 0
(24) [5]_IgrpXdx_160_1 = 0
(25) [2]_IgrpXdx_170_1 = 0
(26) [3]_IgrpXdx_170_1 = 0
(27) [4]_IgrpXdx_170_1 = 0
(28) [5]_IgrpXdx_170_1 = 0
(29) [2]_IgrpXdx_190_1 = 0
(30) [3]_IgrpXdx_190_1 = 0
(31) [4]_IgrpXdx_190_1 = 0
(32) [5]_IgrpXdx_190_1 = 0
(33) [2]_IgrpXdx_200_1 = 0
(34) [3]_IgrpXdx_200_1 = 0
(35) [4]_IgrpXdx_200_1 = 0
(36) [5]_IgrpXdx_200_1 = 0
```

```
chi2( 36) = 96.06
Prob > chi2 = 0.0000
```

*****Overall Wald test for age**

```
. test grp_step_enrol_final_age
```

```
( 1) [2]grp_step_enrol_final_age = 0
( 2) [3]grp_step_enrol_final_age = 0
( 3) [4]grp_step_enrol_final_age = 0
( 4) [5]grp_step_enrol_final_age = 0
```

```
chi2( 4) = 6.12
Prob > chi2 = 0.1906
```

*****Overall Wald test for season**

```
. test dst_time
```

```
( 1) [2]dst_time = 0
( 2) [3]dst_time = 0
( 3) [4]dst_time = 0
( 4) [5]dst_time = 0
```

```
chi2( 4) = 5.85
Prob > chi2 = 0.2107
```

*****Overall Wald test for post variable**

```
. test post
```

```
( 1) [2]post = 0
( 2) [3]post = 0
( 3) [4]post = 0
( 4) [5]post = 0
```

```
chi2( 4) = 7.35
Prob > chi2 = 0.1186
```

*****Overall Wald test for diagnosis**

```
. test _Idx_1
```

```
( 1) [2]_Idx_1 = 0
( 2) [3]_Idx_1 = 0
( 3) [4]_Idx_1 = 0
( 4) [5]_Idx_1 = 0
```

```
chi2( 4) = 12.37
Prob > chi2 = 0.0148
```

*****Overall Wald test for site**

```
. test _Igrp_cmf_f_30 _Igrp_cmf_f_60 _Igrp_cmf_f_70 _Igrp_cmf_f_130
_Igrp_cmf_f_140 _Igrp_cmf_f_
> 160 _Igrp_cmf_f_170 _Igrp_cmf_f_190 _Igrp_cmf_f_200
```

```
( 1) [2]_Igrp_cmf_f_30 = 0
( 2) [3]_Igrp_cmf_f_30 = 0
( 3) [4]_Igrp_cmf_f_30 = 0
( 4) [5]_Igrp_cmf_f_30 = 0
( 5) [2]_Igrp_cmf_f_60 = 0
( 6) [3]_Igrp_cmf_f_60 = 0
( 7) [4]_Igrp_cmf_f_60 = 0
( 8) [5]_Igrp_cmf_f_60 = 0
( 9) [2]_Igrp_cmf_f_70 = 0
(10) [3]_Igrp_cmf_f_70 = 0
(11) [4]_Igrp_cmf_f_70 = 0
(12) [5]_Igrp_cmf_f_70 = 0
(13) [2]_Igrp_cmf_f_130 = 0
(14) [3]_Igrp_cmf_f_130 = 0
(15) [4]_Igrp_cmf_f_130 = 0
(16) [5]_Igrp_cmf_f_130 = 0
(17) [2]_Igrp_cmf_f_140 = 0
(18) [3]_Igrp_cmf_f_140 = 0
(19) [4]_Igrp_cmf_f_140 = 0
(20) [5]_Igrp_cmf_f_140 = 0
(21) [2]_Igrp_cmf_f_160 = 0
(22) [3]_Igrp_cmf_f_160 = 0
(23) [4]_Igrp_cmf_f_160 = 0
(24) [5]_Igrp_cmf_f_160 = 0
(25) [2]_Igrp_cmf_f_170 = 0
(26) [3]_Igrp_cmf_f_170 = 0
(27) [4]_Igrp_cmf_f_170 = 0
(28) [5]_Igrp_cmf_f_170 = 0
(29) [2]_Igrp_cmf_f_190 = 0
(30) [3]_Igrp_cmf_f_190 = 0
(31) [4]_Igrp_cmf_f_190 = 0
(32) [5]_Igrp_cmf_f_190 = 0
(33) [2]_Igrp_cmf_f_200 = 0
(34) [3]_Igrp_cmf_f_200 = 0
(35) [4]_Igrp_cmf_f_200 = 0
(36) [5]_Igrp_cmf_f_200 = 0
```

```
chi2( 36) = 281.66
Prob > chi2 = 0.0000
```

*****Overall Wald test for year**

```
. test _Icmf_year_2000 _Icmf_year_2001 _Icmf_year_2002 _Icmf_year_2003
_Icmf_year_2005
```

```
( 1) [2]_Icmf_year_2000 = 0
( 2) [3]_Icmf_year_2000 = 0
( 3) [4]_Icmf_year_2000 = 0
( 4) [5]_Icmf_year_2000 = 0
( 5) [2]_Icmf_year_2001 = 0
( 6) [3]_Icmf_year_2001 = 0
( 7) [4]_Icmf_year_2001 = 0
( 8) [5]_Icmf_year_2001 = 0
( 9) [2]_Icmf_year_2002 = 0
(10) [3]_Icmf_year_2002 = 0
(11) [4]_Icmf_year_2002 = 0
(12) [5]_Icmf_year_2002 = 0
(13) [2]_Icmf_year_2003 = 0
(14) [3]_Icmf_year_2003 = 0
(15) [4]_Icmf_year_2003 = 0
(16) [5]_Icmf_year_2003 = 0
(17) [2]_Icmf_year_2005 = 0
(18) [3]_Icmf_year_2005 = 0
(19) [4]_Icmf_year_2005 = 0
(20) [5]_Icmf_year_2005 = 0
```

```
      chi2( 20) =    51.99
Prob > chi2 =    0.0001
```


BIBLIOGRAPHY

- American Psychiatric Association (1987). Diagnostic and Statistical Manual of Mental Disorders (3rd edn, revised) (DSM-III-R). Washington, D.C.: American Psychiatric Association.
- American Psychiatric Association (1994). Diagnostic and Statistical Manual of Mental Disorders (4th edn) (DSM-IV). Washington, D.C.: American Psychiatric Association.
- American Psychiatric Association (2000). Diagnostic and Statistical Manual of Mental Disorders (4th edn text revision) (DSM-IV). Washington, D.C.: American Psychiatric Association.
- Ballinger, G.A. (2004). Using Generalized Estimating Equations for Longitudinal Data Analysis. *Organizational Research Methods* 7: 127-50.
- Berk, M., Berk, L., Moss, K., et al. (2006). Diagnosing bipolar disorder: how can we do it better? *Medical Journal of Australia* 184: 459-62.
- Bewick, V., Cheek, L., and Ball, J. (2004). Statistics review 12: Survival analysis. *Critical Care* 8: 389-94.
- Diggle, P.J., Heagerty, P., Liang, K.Y., and Zeger, S.L. (2002). *Analysis of Longitudinal Data* (2nd ed). Oxford, UK: Oxford University Press.
- Endicott, J., Spitzer, R. L., Fleiss, J. L., et al. (1976). The Global Assessment Scale. *Archives of General Psychiatry* 33: 766-71.
- Guy, W. (1976). Clinical Global Impressions. In: ECDEU Assessment Manual for Psychopharmacology, revised (DHEW Publ No ADM 76-338). Rockville, MD: National Institute of Mental Health.
- Hanley, J.A., Negassa, A., Edwardes, M.D., and Forrester, J.E. (2003). Statistical Analysis of Correlated Data Using Generalized Estimating Equations: An Orientation. *American Journal of Epidemiology* 157: 364-75.
- Harrison, D.A., and Hulin, C.L. (1989). Investigations of absenteeism: Using event-history models to study the absence-taking process. *Journal of Applied Psychology* 74: 300-16.

- Healy, D. (1987). Rhythm and blues. Neurochemical, neuropharmacological and neuropsychological implications of a hypothesis of circadian rhythm dysfunction in the affective disorders. *Psychopharmacology (Berl)* 93:271-85.
- Hennen, J. (2003). Statistical methods for longitudinal research on bipolar disorders. *Bipolar Disorders* 5:156-68.
- Huber, P.J. (1967). The behavior of maximum likelihood estimates under nonstandard conditions. In *Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability 1*: 221-3. Berkeley, CA: University of California Press.
- Kadouri, A., Corruble, E., and Falissard, B. (2007). The improved Clinical Global Impression Scale (iCGI): development and validation in depression. *BMC Psychiatry* 7: 7.
- Laird, N.M. and Ware, J.H. Random-Effects Models for Longitudinal Data. *Biometrics* 38: 963-74.
- Lambe, M. and Cummings, P. (2000). The shift to and from daylight savings time and motor vehicle crashes. *Accident Analysis & Prevention* 32: 609-11.
- Lane, P. (2007). Handling drop-out in longitudinal clinical trials: a comparison of the LOCF and MMRM approaches. *Pharmaceutical Statistics* Mar 9 [Epub ahead of print].
- Liang, K.Y. and Zeger, S.L. (1986). Longitudinal data analysis using generalized linear models. *Biometrika* 73:13–22.
- Long, J.S. and Freese, J. (2006). *Regression Models for Categorical Dependent Variables Using Stata* (2nd ed). College Station, TX: Stata Press.
- Luborsky, L. (1962). Clinicians' judgements of mental health. A proposed scale. *Archives of General Psychiatry* 7: 407-17.
- Mitterauer, B. (2000). Clock genes, feedback loops and their possible role in the etiology of bipolar disorders: an integrative model. *Medical Hypotheses* 55:155-9.
- Mirea, L., Bull, S.B., and Stafford, J. Comparison of Haseman-Elston regression analyses using single, summary, and longitudinal measures of systolic blood pressure. *BMC Genetics* 4(Suppl 1): S23.
- Mitchell, P.B., Malhi, G.S., and Ball, J.R. (2004). Major advances in bipolar disorder. *Medical Journal of Australia* 181: 207-10.
- Monk, T.H. and Folkard, S. (1976). Adjusting to the changes to and from Daylight Saving Time. *Nature* 261:688-9.

- Moos, R.H., McCoy, L., Moos, B.S. (2000). Global assessment of functioning (GAF) ratings: determinants and roles as predictors of one-year treatment outcomes. *Journal of Clinical Psychology* 56:449-61.
- Oliver, P., Cooray, S., Tyrer, P., and Cicchetti, D. (2003). Use of the Global Assessment of Function scale in learning disability. *British Journal of Psychiatry* 182: s32-5.
- Oswald, P., Souery, D., Kasper, S., et al. (2007). Current issues in bipolar disorder: A critical review. *European Neuropsychopharmacology* 17 [in press, corrected proof].
- Preisser, J.S. and Koch, G.G. (1997). Categorical data analysis in public health. *Annual Review of Public Health* 18: 51-82.
- Rey, J.M., Starling, J., Wever, C., et al. (1995). Inter-rater reliability of global assessment of functioning in a clinical setting. *Journal of Child Psychology and Psychiatry* 36:787-92.
- Sachs, G.S., Thase, M.E., Otto, M.W., et al. (2003). Rationale, design, and methods of the systematic treatment enhancement program for bipolar disorder (STEP-BD). *Biological Psychiatry* 53:1028-42.
- StataCorp. (2005). *Stata Statistical Software: Release 9.2*. College Station, TX: StataCorp.
- Stiger, T.R., Barnhart, H.X., and Williamson, J.M. (1999). Testing proportionality in the proportional odds model fitted with GEE. *Statistics in Medicine* 18: 1419-33.
- Tracy, K., Adler, L.A., Rotrosen, J., et al. (1997). Interrater reliability issues in multicenter trials, part 1: theoretical concepts and operational procedures used in Department of Veterans Affairs cooperative study #394. *Psychopharmacology Bulletin* 33: 53-7.
- Tse, Y.K. (1987). A Diagnostic Test for the Multinomial Logit Model. *Journal of Business and Economic Statistics* 5: 283-6.
- Twisk, J.W. (2004). Longitudinal data analysis. A comparison between generalized estimating equations and random coefficient analysis. *European Journal of Epidemiology* 19:769-76.
- Varughese, J. and Allen, R.P. (2001). Fatal accidents following changes in daylight savings time: the American experience. *Sleep Medicine* 2: 31-6.
- White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica* 48: 817-30.
- Wickens, T.D. (1998). Categorical Data Analysis. *Annual Review of Psychology* 49: 537-58.

Yamauchi, K., Ono, Y., Baba, K., and Ikegami, N. (2002). The actual process of rating the global assessment of functioning scale. *Comprehensive Psychiatry* 42: 403-9.

Zeger, S.L. and Liang, K.Y. (1986). Longitudinal data analysis for discrete and continuous outcomes. *Biometrics* 42: 121-30.