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

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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.

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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.

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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 is 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 irriatable 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 $j = 1, \ldots, r$ with corresponding multinomial probabilities for the *i*th individual, $\pi_{i1}, \pi_{i2}, \ldots \pi_{ir}$, 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

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

The proportional odds model is defined as:

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

for $g = 2, \ldots, r$, 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 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	*Normal (not at all ill)*
2	*Borderline mentally ill*
3	*Mildly ill*
4	*Moderately ill*
5	*Markedly ill*
6	*Severely ill*
7	*Extremely ill*

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.

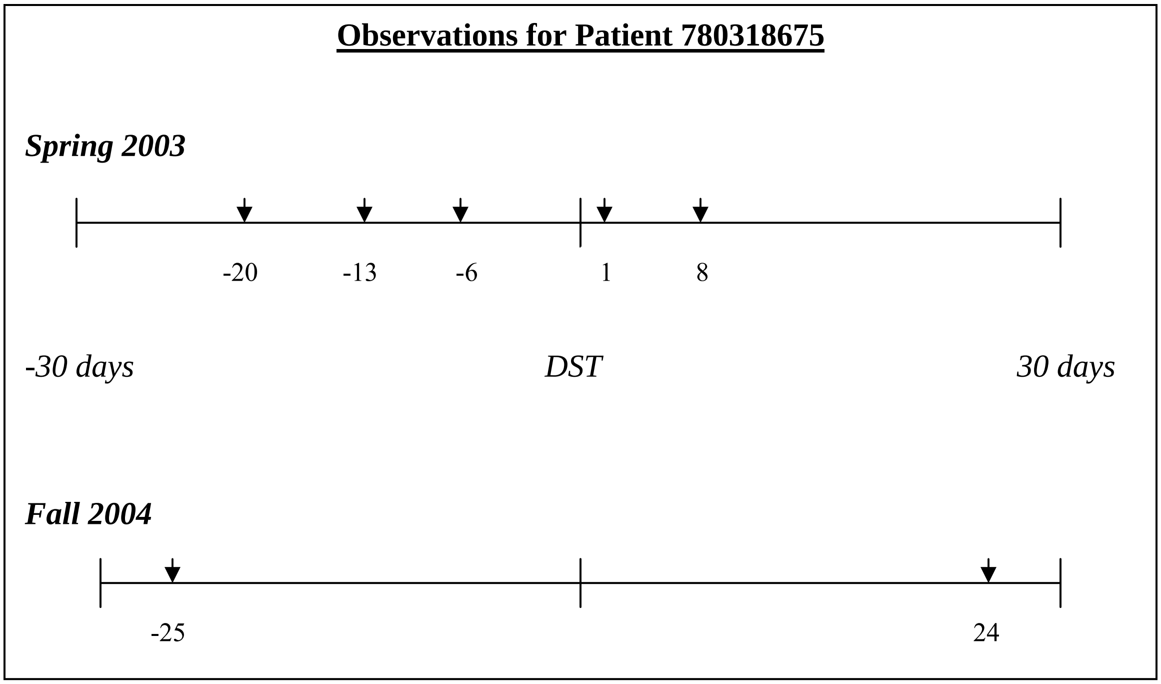


Figure 1. Example scenario of patient data

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.

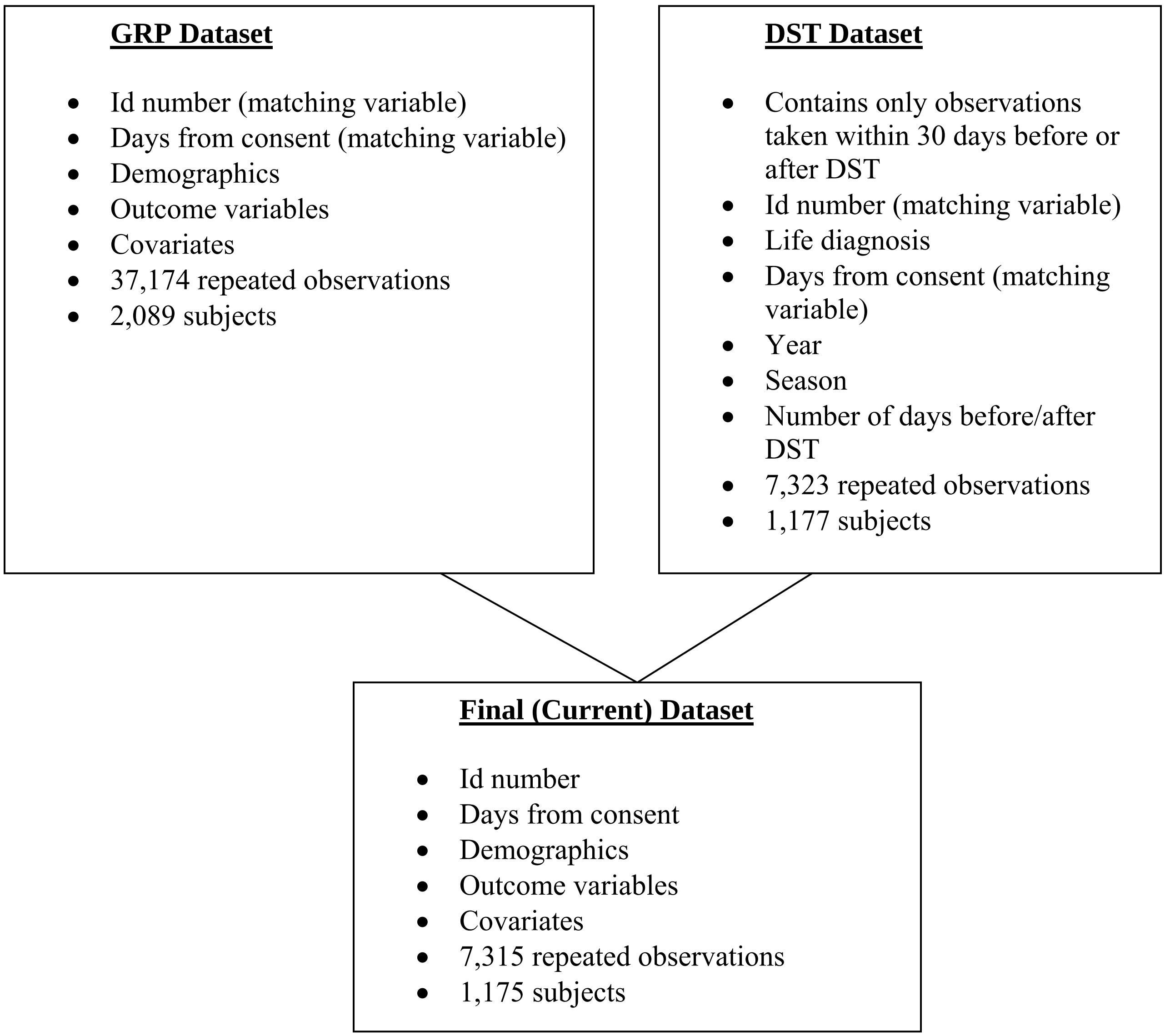


Figure 2. Creation of GRP and DST datasets

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		
1175 unique patient ID's		*2647 pairs of observations*

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)	*Age, Season, Period, Year, Site*
Model 2	*Model 1 + Season*Period*
Model 3	*Model 1 + Season*Year*
Model 4	*Age, Period, Sequence, Site*
Combined Models	
Model 5	*Age, Period, Sequence, Site, Life Diagnosis*
Model 6	*Model 5 + Life Diagnosis*Period*
Model 7	*Model 5 + Life Diagnosis*Site*
Model 8	*Model 5 + Life Diagnosis*Sequence*

*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)	*Age, Season, Post, Year, Site*
Model 2	*Model 1 + Season*Post*
Model 3	*Model 1 + Season*Year*
Combined Models	
Model 4	*Age, Season, Post, Year, Site, Life Diagnosis*
Model 5	*Model 4 + Life Diagnosis*Post*
Model 6	*Model 4 + Life Diagnosis*Season*
Model 7	*Model 5 + Life Diagnosis*Year*
Model 8	*Model 5 + Life Diagnosis*Site*

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

*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)).

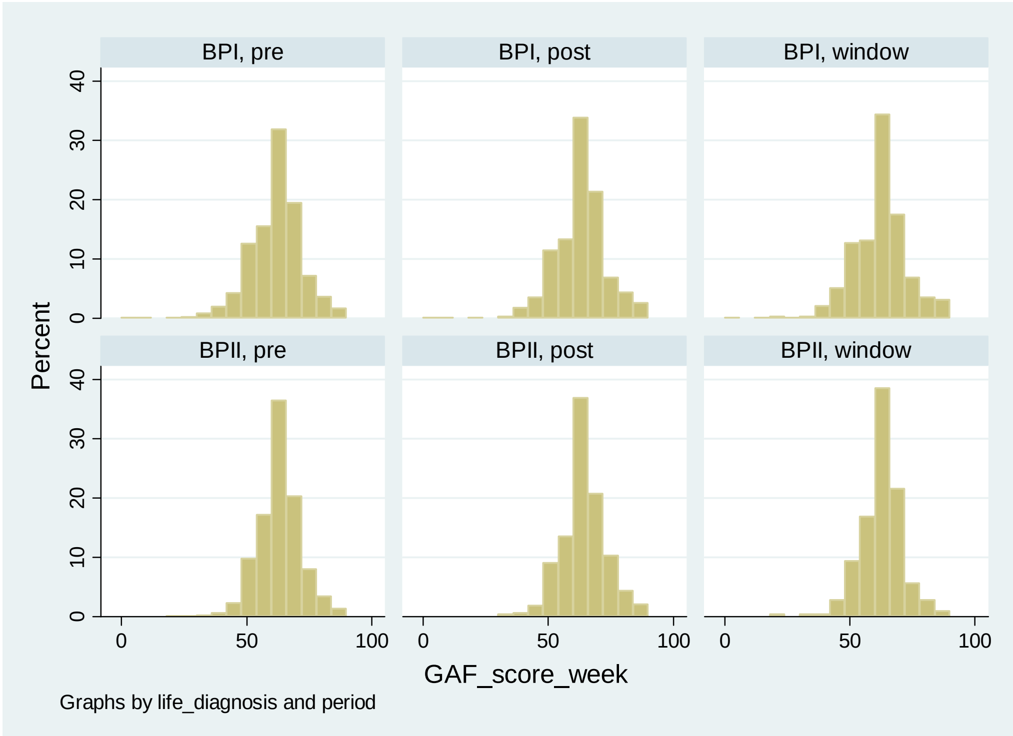


Figure 3. Histogram of GAF scores by diagnostic category and period

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

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

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

*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)
Post-DST	1.13	0.23	[0.68, 1.59]	<0.001
Window period	-0.04	0.39	[-0.80, 0.72]	0.92
Year				<0.001 (5)
2001	4.39	0.80	[2.82, 5.96]	<0.001
2002	4.64	0.77	[3.13, 6.15]	<0.001
2003	4.21	0.79	[2.67, 5.75]	<0.001
2004	5.60	0.80	[4.04, 7.17]	<0.001
2005	7.05	0.88	[5.32, 8.78]	<0.001
Site				<0.001 (11)
Site 30	0.86	1.26	[-1.60, 3.32]	0.50
Site 60	4.85	1.32	[2.25, 7.44]	<0.001
Site 70	1.02	1.34	[-1.61, 3.65]	0.45
Site 90	2.92	1.61	[-0.23, 6.08]	0.07
Site 130	4.34	1.54	[1.32, 7.36]	0.01
Site 140	-0.94	0.92	[-2.74, 0.86]	0.31
Site 160	1.46	1.11	[-0.71, 3.64]	0.19
Site 170	-0.76	1.08	[-2.88, 1.37]	0.49
Site 190	0.11	1.45	[-2.73, 2.96]	0.94
Site 200	-1.33	1.28	[-3.84, 1.17]	0.30
Site 210	-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)
Post-DST	1.12	0.32	[0.48, 1.75]	0.001
Window period	-0.77	0.55	[-1.86, 0.32]	0.17
Year				0.007 (5)
2001	0.72	1.45	[-2.12, 3.55]	0.62
2002	-1.64	1.41	[-4.40, 1.13]	0.25
2003	0.27	1.41	[-2.49, 3.03]	0.85
2004	-0.47	1.41	[-3.24, 2.30]	0.74
2005	-0.53	1.50	[-3.47, 2.42]	0.73
Site				<0.001 (11)
Site 30	-3.00	1.39	[-5.73, -0.27]	0.03
Site 60	3.16	1.41	[0.40, 5.92]	0.03
Site 70	-2.11	1.79	[-5.61, 1.39]	0.24
Site 90	-3.24	3.13	[-9.37, 2.90]	0.30
Site 130	1.08	1.72	[-2.29, 4.46]	0.53
Site 140	-2.53	1.07	[-4.63, -0.42]	0.02
Site 160	-1.03	1.00	[-2.99, 0.94]	0.31
Site 170	-1.61	1.57	[-4.70, 1.48]	0.31
Site 190	-4.70	2.14	[-8.89, -0.51]	0.03
Site 200	1.06	2.11	[-3.07, 5.20]	0.61
Site 210	-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)
Post-DST	1.14	0.23	[0.68, 1.59]	<0.001
Window period	-0.06	0.39	[-0.82, 0.70]	0.88
Sequence				<0.001 (10)
Fall 2000	-4.34	1.94	[-8.14, -0.53]	0.03
Spring 2001	1.11	1.91	[-2.63, 4.86]	0.56
Fall 2001	0.15	1.88	[-3.55, 3.84]	0.94
Spring 2002	1.20	1.88	[-2.48, 4.88]	0.52
Fall 2002	0.37	1.87	[-3.29, 4.03]	0.84
Spring 2003	0.38	1.86	[-3.27, 4.03]	0.84
Fall 2003	0.02	1.86	[-3.63, 3.67]	0.99
Spring 2004	0.55	1.87	[-3.11, 4.21]	0.77
Fall 2004	2.65	1.86	[-1.00, 6.31]	0.15
Spring 2005	3.11	1.87	[-0.54, 6.77]	0.10
Site				<0.001 (11)
Site 30	0.86	1.25	[-1.59, 3.32]	0.49
Site 60	4.90	1.32	[2.30, 7.49]	<0.001
Site 70	1.24	1.34	[-1.39, 3.87]	0.36
Site 90	3.07	1.61	[-0.09, 6.23]	0.06
Site 130	4.52	1.54	[1.50, 7.54]	0.003
Site 140	-0.91	0.92	[-2.71, 0.89]	0.32
Site 160	1.57	1.11	[-0.61, 3.74]	0.16
Site 170	-0.56	1.08	[-2.69, 1.56]	0.61
Site 190	0.13	1.45	[-2.71, 2.98]	0.93
Site 200	-1.13	1.28	[-3.64, 1.38]	0.38
Site 210	-3.83	1.40	[-6.58, -1.08]	0.01
Constant	55.24	2.17	[54.98, 63.49]	<0.001

*Note: $\rho = 0.45$
*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)
Post-DST	1.11	0.32	[0.48, 1.74]	0.001
Window period	-0.79	0.55	[-1.87, 0.29]	0.15
Sequence				<0.001 (10)
Fall 2000	-5.66	5.45	[-16.35, 5.03]	0.30
Spring 2001	-3.17	5.44	[-13.84, 7.49]	0.56
Fall 2001	-5.32	5.40	[-15.90, 5.26]	0.32
Spring 2002	-4.80	5.39	[-15.37, 5.76]	0.37
Fall 2002	-8.05	5.37	[-18.58, 2.48]	0.13
Spring 2003	-5.37	5.38	[-15.90, 5.17]	0.32
Fall 2003	-4.66	5.38	[-15.21, 5.89]	0.39
Spring 2004	-5.69	5.38	[-16.24, 4.85]	0.29
Fall 2004	-5.54	5.38	[-16.09, 5.01]	0.30
Spring 2005	-5.34	5.38	[-15.89, 5.21]	0.32
Site				<0.001 (11)
Site 30	-3.09	1.39	[-1.59, 3.32]	0.03
Site 60	3.21	1.41	[2.30, 7.49]	0.02
Site 70	-2.23	1.79	[-1.39, 3.87]	0.21
Site 90	-2.71	3.13	[-0.09, 6.23]	0.39
Site 130	1.13	1.72	[1.50, 7.54]	0.51
Site 140	-2.59	1.07	[-2.71, 0.89]	0.02
Site 160	-1.15	1.00	[-0.61, 3.74]	0.25
Site 170	-1.55	1.58	[-2.69, 1.56]	0.33
Site 190	-4.96	2.14	[-2.71, 2.98]	0.02
Site 200	1.14	2.11	[-3.64, 1.38]	0.59
Site 210	-5.92	1.87	[-6.58, -1.08]	0.002
Constant	71.00	5.54	[60.15, 81.85]	<0.001

*Note: $\rho = 0.36$
*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)
Post-DST	1.12	0.19	[0.76, 1.49]	<0.001
Window period	-0.28	0.32	[-0.90, 0.34]	0.37
Sequence				<0.001 (10)
Fall 2000	-3.97	1.78	[-7.46, -0.49]	0.03
Spring 2001	0.92	1.75	[-2.51, 4.36]	0.60
Fall 2001	-0.34	1.73	[-3.73, 3.06]	0.85
Spring 2002	0.61	1.73	[-2.78, 3.99]	0.73
Fall 2002	-0.91	1.72	[-4.27, 2.45]	0.60
Spring 2003	-0.15	1.71	[-3.51, 3.21]	0.93
Fall 2003	-0.20	1.71	[-3.55, 3.16]	0.91
Spring 2004	-0.14	1.72	[-3.50, 3.22]	0.93
Fall 2004	1.36	1.71	[-2.00, 4.72]	0.43
Spring 2005	1.73	1.72	[-1.63, 5.09]	0.31
Site				<0.001 (11)
Site 30	-0.47	0.97	[-2.37, 1.44]	0.63
Site 60	4.58	1.01	[2.60, 6.56]	<0.001
Site 70	0.30	1.10	[-1.86, 2.45]	0.79
Site 90	1.86	1.41	[-0.91, 4.63]	0.19
Site 130	3.57	1.20	[1.23, 5.92]	0.003
Site 140	-1.34	0.72	[-2.76, 0.08]	0.06
Site 160	0.59	0.78	[-0.93, 2.12]	0.45
Site 170	-0.94	0.90	[-2.71, 0.84]	0.30
Site 190	-1.15	1.22	[-3.54, 1.24]	0.35
Site 200	-0.95	1.09	[-3.09, 1.19]	0.38
Site 210	-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)
Post-DST	1.13	0.19	[0.76, 1.49]	<0.001
Window period	-0.29	0.32	[-0.90, 0.33]	0.37
Sequence (bipolar I)				<0.001 (10)
Spring 2000 (baseline)	0			
Fall 2000	-4.38	1.87	[-8.05, -0.70]	0.02
Spring 2001	1.03	1.84	[-2.58, 4.65]	0.58
Fall 2001	0.09	1.82	[-3.47, 3.66]	0.96
Spring 2002	1.12	1.81	[-2.43, 4.68]	0.54
Fall 2002	0.28	1.80	[-3.25, 3.81]	0.88
Spring 2003	0.28	1.80	[-3.25, 3.80]	0.88
Fall 2003	-0.11	1.79	[-3.63, 3.41]	0.95
Spring 2004	0.41	1.80	[-3.12, 3.94]	0.82
Fall 2004	2.51	1.80	[-1.02, 6.03]	0.16
Spring 2005	2.97	1.80	[-0.56, 6.50]	0.10
Sequence (bipolar II)				
Spring 2000 (baseline)	7.13			
Fall 2000	1.94	2.32	[-2.61, 6.49]	0.40
Spring 2001	4.36	2.09	[0.26, 8.46]	0.04
Fall 2001	2.41	2.00	[-1.52, 6.33]	0.23
Spring 2002	2.84	1.97	[-1.02, 6.70]	0.15
Fall 2002	-0.42	1.89	[-4.13, 3.30]	0.83
Spring 2003	2.39	1.89	[-1.31, 6.10]	0.21
Fall 2003	3.03	1.88	[-0.66, 6.71]	0.11
Spring 2004	2.07	1.87	[-1.59, 5.73]	0.27
Fall 2004	2.26	1.87	[-1.40, 5.93]	0.23
Spring 2005	2.47	1.88	[-1.21, 6.16]	0.19
Diagnosis*Sequence				<0.001 (10)
Site				<0.001 (11)
Site 30	-0.41	0.97	[-2.31 1.50]	0.68
Site 60	4.47	1.01	[2.50, 6.45]	<0.001
Site 70	0.25	1.10	[-1.90, 2.41]	0.82

Table 14 continued				
Site 90	2.06	1.41	[-0.71, 4.83]	0.15
Site 130	3.43	1.20	[1.09, 5.78]	0.004
Site 140	-1.36	0.72	[-2.78, 0.05]	0.06
Site 160	0.58	0.78	[-0.95, 2.10]	0.46
Site 170	-0.91	0.90	[-2.68 0.86]	0.32
Site 190	-1.10	1.22	[-3.49, 1.29]	0.37
Site 200	-0.89	1.09	[-3.03, 1.24]	0.41
Site 210	-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				
Age (per year)	-0.002	0.005	[-0.01, 0.01]	0.73
Fall Season	0.19	0.12	[-0.04, 0.43]	0.11
Post	-0.12	0.11	[-0.34, 0.09]	0.26
Year				
2001	0.13	0.37	[-0.60, 0.86]	0.73
2002	-0.50	0.35	[-1.18, 0.19]	0.15
2003	-0.47	0.35	[-1.16, 0.21]	0.18
2004	-0.16	0.35	[-0.85, 0.53]	0.65
2005	-0.05	0.38	[-0.80, 0.70]	0.89
Mildly ill				
Age (per year)	0.002	0.005	[-0.01, 0.01]	0.66
Fall Season	0.01	0.12	[-0.22, 0.24]	0.91
Post	-0.06	0.11	[-0.27, 0.15]	0.59
Year				
2001	-0.07	0.37	[-0.79, 0.65]	0.86
2002	-0.46	0.34	[-1.13, 0.21]	0.18
2003	-0.49	0.35	[-1.16, 0.19]	0.16
2004	-0.11	0.35	[-0.79, 0.57]	0.75
2005	-0.36	0.38	[-1.10, 0.38]	0.34
Moderately ill				
Age (per year)	0.003	0.005	[-0.01, 0.01]	0.52
Fall Season	0.05	0.12	[-0.19, 0.28]	0.70
Post	-0.16	0.11	[-0.38, 0.05]	0.14
Year				
2001	-0.21	0.36	[-0.92, 0.50]	0.57
2002	-0.98	0.34	[-1.65, -0.31]	0.004
2003	-0.77	0.34	[-1.44, -0.10]	0.02
2004	-0.49	0.34	[-1.16, 0.19]	0.16
2005	-0.69	0.38	[-1.43, 0.05]	0.07
Markedly/severely/extremely ill				
Age (per year)	-0.01	0.01	[-0.02, 0.01]	0.29
Fall Season	0.24	0.14	[-0.05, 0.52]	0.10
Post	-0.33	0.13	[-0.59, -0.07]	0.01
Year				
2001	-0.78	0.42	[-1.60, 0.05]	0.07
2002	-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				
Age (per year)	0.01	0.01	[-0.01, 0.02]	0.46
Fall Season	0.25	0.19	[-0.12, 0.62]	0.18
Post	0.06	0.18	[-0.28, 0.41]	0.72
Year				
2001	-0.11	0.32	[-0.74, 0.52]	0.73
2002	0.09	0.27	[-0.45, 0.62]	0.75
2003	0.19	0.23	[-0.27, 0.65]	0.41
2005	0.11	0.29	[-0.46, 0.68]	0.71
Mildly ill				
Age (per year)	0.004	0.01	[-0.01, 0.02]	0.64
Fall Season	0.22	0.19	[-0.14, 0.59]	0.24
Post	-0.09	0.17	[-0.43, 0.25]	0.62
Year				
2001	0.06	0.32	[-0.56, 0.68]	0.86
2002	0.31	0.27	[-0.22, 0.83]	0.25
2003	0.13	0.23	[-0.33, 0.59]	0.58
2005	0.24	0.29	[-0.33, 0.81]	0.41
Moderately ill				
Age (per year)	0.01	0.01	[-0.01, 0.03]	0.26
Fall Season	0.27	0.19	[-0.12, 0.65]	0.17
Post	-0.22	0.18	[-0.57, 0.14]	0.24
Year				
2001	-0.25	0.34	[-0.91, 0.41]	0.47
2002	-0.08	0.28	[-0.63, 0.47]	0.78
2003	0.02	0.24	[-0.45, 0.49]	0.95
2005	-0.05	0.31	[-0.65, 0.55]	0.86
Table 16 continued				
Markedly/severely/extremely ill				
Age (per year)	0.01	0.01	[-0.01, 0.03]	0.30

Table 16 continued				
Fall Season	0.20	0.24	[-0.26, 0.67]	0.39
Post	0.02	0.22	[-0.41, 0.44]	0.94
Year				
2001	-0.27	0.44	[-1.14, 0.59]	0.54
2002	0.67	0.32	[-0.05, 1.30]	0.04
2003	0.27	0.30	[-0.32, 0.85]	0.37
2005	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 I 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				
Age (per year)	0.001	0.004	[-0.01, 0.01]	0.75
Life Diagnosis (Bipolar II)	0.12	0.11	[-0.09, 0.33]	0.27
Fall Season	0.18	0.10	[-0.02, 0.39]	0.07
Post	-0.08	0.09	[-0.26, 0.10]	0.39
Year				
2000	0.19	0.30	[-0.41, 0.78]	0.54
2001	0.20	0.18	[-0.15, 0.55]	0.26
2002	-0.24	0.14	[-0.50, 0.03]	0.09
2003	-0.12	0.13	[-0.37, 0.13]	0.35
2005	0.09	0.16	[-0.23, 0.41]	0.59
Mildly ill				
Age (per year)	0.004	0.004	[-0.004, 0.01]	0.37
Life Diagnosis (Bipolar II)	0.21	0.11	[0.01, 0.42]	0.04
Fall Season	0.08	0.10	[-0.12, 0.27]	0.45
Post	-0.06	0.09	[-0.25, 0.12]	0.49
Year				
2000	-0.02	0.31	[-0.62, 0.58]	0.94
2001	0.05	0.18	[-0.30, 0.39]	0.79
2002	-0.17	0.13	[-0.44, 0.09]	0.20
2003	-0.17	0.13	[-0.42, 0.08]	0.19
2005	-0.08	0.16	[-0.40, 0.24]	0.64
Moderately ill				
Age (per year)	0.01	0.004	[-0.002, 0.01]	0.14
Life Diagnosis (Bipolar II)	0.14	0.11	[-0.07, 0.36]	0.19
Fall Season	0.11	0.10	[-0.09, 0.31]	0.29
Post	-0.16	0.10	[-0.35, 0.02]	0.09
Year				
2000	0.39	0.30	[-0.19, 0.98]	0.19
2001	0.13	0.18	[-0.22, 0.49]	0.47
2002	-0.44	0.14	[-0.72, -0.17]	0.002
2003	-0.10	0.13	[-0.36, 0.15]	0.44
2005	-0.14	0.17	[-0.48, 0.19]	0.40
Markedly/severely/extremely ill				
Age (per year)	0.001	0.005	[-0.01, 0.01]	0.88
Life Diagnosis (Bipolar II)	0.02	0.13	[-0.23, 0.27]	0.88
Fall Season	0.24	0.12	[-0.003, 0.48]	0.05
Post	-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_depslmin "depr_sleep_min"

. label var  grp_cmf_final_depslmax "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_clinstat "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_depslmin sleep

. label values grp_cmf_final_depslmax 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)
-----------------------------------------------------------------------------
--
              storage  display     value
variable name   type   format      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_final~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_final~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_final~b float  %9.0g      sleep     elev_hi_risk_behavior
  grp_cmf_final~f byte   %8.0g      sleep     cups_day_caffeine
  grp_cmf_fina~pd float  %9.0g      nicotene  packs_day_nicotene
  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_final~u byte   %8.0g      sleep     severity_hallucinations
  grp_cmf_final~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:  depmd, 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
```

```
                          1

  ---------------------------------------------------------------------------
--------------------
  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:  nicotene, 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]                       units:  1
         unique values:  3                        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]                       units:  1
         unique values:  3                        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]                       units:  1
         unique values:  3                        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_clinstat
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
```

```
                        70
 ------------------------------------------------------------------------------
--------------------
 grp_cmf_final_site_id
site
 ------------------------------------------------------------------------------
--------------------

                  type:  numeric (int)

                 range:  [10,210]                     units:  10
         unique values:  12                       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

              storage  display     value
variable name   type   format      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]                        units:  1
         unique values:  2                        missing .:  725/7315

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

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

                  type:  numeric (float)
                 label:  seq

                 range:  [1,11]                       units:  1
         unique values:  11                       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_depression	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_man |
         ia |      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_irr |
  itability |      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_concentration	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_distractibility	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_appetite	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_esteem	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_clinstat

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
```

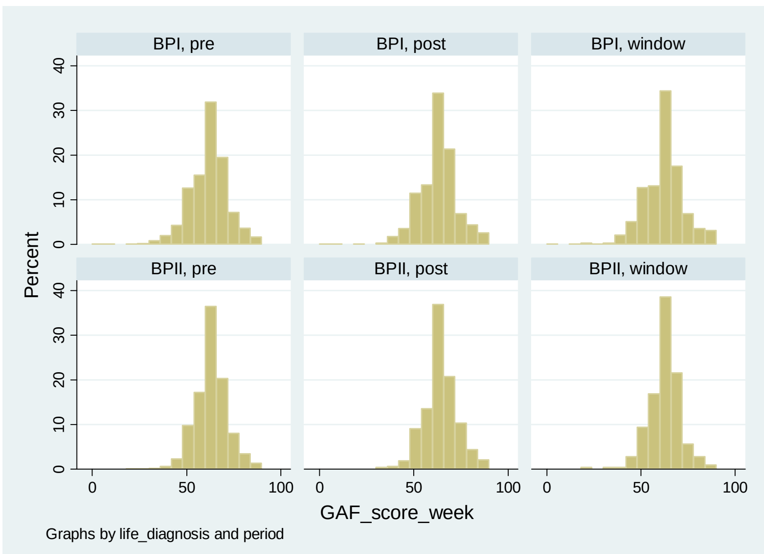
Observation level descriptives of selected variables by bipolar status (discussed in section 3.3.1)

```
. 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

           |    life_diagnosis
      site |       BPI       BPII |     Total
-----------+----------------------+----------
        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

            |    life_diagnosis
     gender |       BPI       BPII |     Total
------------+----------------------+----------
       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

           |    life_diagnosis
 CGI_score |       BPI       BPII |     Total
-----------+----------------------+----------
   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

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

*****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                      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 |      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                    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(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
_Igrp_cm~_60 |   3.205376   1.409765     2.27   0.023     .4422873
5.968466
_Igrp_cm~_70 |  -2.230927   1.788637    -1.25   0.212    -5.736592
1.274738
_Igrp_cm~_90 |  -2.714534   3.131455    -0.87   0.386    -8.852072
3.423004
_Igrp_cm~130 |   1.134532   1.722975     0.66   0.510    -2.242436
4.5115
_Igrp_cm~140 |  -2.592241   1.074637    -2.41   0.016    -4.698492    -
.4859901
_Igrp_cm~160 |  -1.153691   1.003078    -1.15   0.250    -3.119688
.8123056
_Igrp_cm~170 |  -1.546159   1.575128    -0.98   0.326    -4.633354
1.541035
_Igrp_cm~190 |  -4.955566   2.141914    -2.31   0.021    -9.153641    -
.7574915
_Igrp_cm~200 |   1.139458   2.108169     0.54   0.589    -2.992478
5.271394
```

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

*****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) |   -1.898019    .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	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
_Isequence_2	-4.33831	1.941925	-2.23	0.025	-8.144413	-.5322058
_Isequence_3	1.114034	1.910273	0.58	0.560	-2.630033	4.858101
_Isequence_4	.1448722	1.884998	0.08	0.939	-3.549656	3.839401
_Isequence_5	1.199816	1.878877	0.64	0.523	-2.482716	4.882348
_Isequence_6	.3702455	1.866754	0.20	0.843	-3.288526	4.029017
_Isequence_7	.381812	1.863263	0.20	0.838	-3.270117	4.033741
_Isequence_8	.0197998	1.860255	0.01	0.992	-3.626232	3.665832
_Isequence_9	.5499479	1.867099	0.29	0.768	-3.109499	4.209395
_Isequenc~10	2.654327	1.862858	1.42	0.154	-.9968083	6.305461
_Isequenc~11	3.113701	1.865876	1.67	0.095	-.5433483	6.770751
_cons	59.23682	2.170674	27.29	0.000	54.98237	63.49126

*****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

 ----------------------------------------------------------------------------
-
 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 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                          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(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
```

```
 _Igrp_cm~_60 |    3.205376    1.409765       2.27    0.023        .4422873
5.968466
 _Igrp_cm~_70 |   -2.230927    1.788637      -1.25    0.212       -5.736592
1.274738
 _Igrp_cm~_90 |   -2.714534    3.131455      -0.87    0.386       -8.852072
3.423004
 _Igrp_cm~130 |    1.134532    1.722975       0.66    0.510       -2.242436
4.5115
 _Igrp_cm~140 |  -2.592241   1.074637     -2.41    0.016     -4.698492    -
.4859901
 _Igrp_cm~160 |   -1.153691    1.003078      -1.15    0.250       -3.119688
.8123056
 _Igrp_cm~170 |   -1.546159    1.575128      -0.98    0.326       -4.633354
1.541035
 _Igrp_cm~190 |  -4.955566   2.141914     -2.31    0.021     -9.153641    -
.7574915
 _Igrp_cm~200 |    1.139458    2.108169       0.54    0.589       -2.992478
5.271394
 _Igrp_cm~210 |  -5.916978   1.873671     -3.16    0.002     -9.589305    -
2.244651
 _Isequence_2 |    -5.66212    5.453973      -1.04    0.299       -16.35171
5.027471
 _Isequence_3 |   -3.174838    5.441889      -0.58    0.560       -13.84074
7.491067
 _Isequence_4 |   -5.322387    5.399109      -0.99    0.324       -15.90445
5.259673
 _Isequence_5 |   -4.802942    5.390218      -0.89    0.373       -15.36758
5.761692
 _Isequence_6 |   -8.049302    5.373104      -1.50    0.134       -18.58039
2.481787
 _Isequence_7 |   -5.365736    5.376372      -1.00    0.318       -15.90323
5.17176
 _Isequence_8 |   -4.657878    5.383758      -0.87    0.387       -15.20985
5.894093
 _Isequence_9 |   -5.694322    5.381519      -1.06    0.290         -16.2419
4.853261
 _Isequenc~10 |   -5.541628    5.382731      -1.03    0.303       -16.09159
5.00833
 _Isequenc~11 |   -5.340338    5.384788      -0.99    0.321       -15.89433
5.213653
        _cons |    70.99639    5.536384      12.82    0.000        60.14528
81.8475
 -----------------------------------------------------------------------------
-
```

*****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

 ------------------------------------------------------------------------------
-
 grp_cmf_f~ek |       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                    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(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                          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(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                        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(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

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

*****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

 ------------------------------------------------------------------------------
-
             |               Robust
         cgi |       Coef.    Std. Err.       z     P>|z|      [95% Conf.
Interval]
 -------------+----------------------------------------------------------------
-
 grp_step_e~e |    .0002845    .0021807      0.13    0.896     -.0039896
.0045585
     dst_time |    .0098893    .0552592      0.18    0.858     -.0984167
.1181953
         post |  -.1121092    .0504492     -2.22    0.026    -.2109879    -
.0132305
 _Icmf_y~2001 |  -.3747787    .1532449     -2.45    0.014    -.6751333    -
.0744242
 _Icmf_y~2002 |  -.4715696    .1483077     -3.18    0.001    -.7622473    -
.180892
```

```
 _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 — Number of obs = 5045

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	(Ancillary parameters)			
_cut2	-.7067561	.184382				

```
       _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                          Number  of  obs    =
2231
                                                    Wald    chi2(19)         =
125.47
                                                    Prob   >   chi2          =
0.0000
 Log  pseudolikelihood  =  -3230.7718                  Pseudo  R2         =
0.0177

 -------------------------------------------------------------------------------
-
             |               Robust
         cgi |        Coef.    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
        /cut2 |     .5305777     .3835868                                -.2212386
1.282394
        /cut3 |    1.918538    .3847959                                 1.164352
2.672725
        /cut4 |    3.529355    .3874884                                 2.769891
4.288818
 ------------------------------------------------------------------------------
-

 . 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                           Pseudo R2         =
0.0177

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

 ------------------------------------------------------------------------------
-
               |               Robust
           cgi |        Coef.    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

 ------------------------------------------------------------------------------
-
             |               Robust
         cgi |       Coef.    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  |   -.5209262     .4285538       -1.22     0.224       -1.360876
.3190238
 _Igrp_cm~_30  |    .5368882     .3281979        1.64     0.102       -.1063679
1.180144
 _Igrp_cm~_60  |    .3420534     .2668106        1.28     0.200       -.1808858
.8649926
 _Igrp_cm~_70  |    1.246019     .3555355        3.50     0.000         .549182
1.942855
 _Igrp_cm~_90  |    .6259619     .4101622        1.53     0.127       -.1779411
1.429865
 _Igrp_cm~130  |   -.0241674     .4147608       -0.06     0.954       -.8370836
.7887488
 _Igrp_cm~140  |    .6126473     .2374695        2.58     0.010        .1472156
1.078079
 _Igrp_cm~160  |    .9566753     .2248364        4.25     0.000        .5160041
1.397347
 _Igrp_cm~170  |    1.179704     .2755128        4.28     0.000        .6397086
1.719699
 _Igrp_cm~190  |   -.2987029     .4223792       -0.71     0.479       -1.126551
.529145
 _Igrp_cm~200  |    1.847297     .2669748        6.92     0.000        1.324036
2.370558
 _Igrp_cm~210  |    3.240992     .6255952        5.18     0.000        2.014848
4.467137
 _Idst_time_1  |    .3100514     .1934268        1.60     0.109       -.0690582
.689161
         post  |   -.2852752     .1859869       -1.53     0.125       -.6498029
.0792525
 _IdstXpost_1  |   -.1142302     .2640452       -0.43     0.665       -.6317493
.4032888
        _cons  |    .3480704     .4769307        0.73     0.466       -.5866967
1.282837
 ------------------------------------------------------------------------------
-
 (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
 Log  pseudolikelihood  =  -3019.4667                      Pseudo  R2          =
0.0355

 ------------------------------------------------------------------------------
-
             |               Robust
         cgi |       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
```

_Igrp_cm~170	1.480938	.5498789	2.69	0.007	.4031955	2.558681
_Igrp_cm~190	-1.043305	.5824794	-1.79	0.073	-2.184944	.0983334
_Igrp_cm~200	-1.37772	.6477808	-2.13	0.033	-2.647347	-.1080927
_Idst_time_1	.3599712	.2629342	1.37	0.171	-.1553704	.8753128
post	.1495363	.2339314	0.64	0.523	-.3089609	.6080335
_IdstXpost_1	-.2099583	.3539383	-0.59	0.553	-.9036646	.4837481
_cons	.3602156	.4159526	0.87	0.386	-.4550364	1.175468
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
```

Prob > chi2 = 0.0000
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                      Number  of  obs    =
2127
                                                 Wald    chi2(76)          =
208.29
                                                 Prob   >   chi2           =
0.0000
 Log  pseudolikelihood = -3013.6307                     Pseudo  R2         =
0.0374

 ------------------------------------------------------------------------------
-
             |               Robust
         cgi |       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 |   1.214305   .2867644     4.23   0.000     .652257
1.776353
 _Igrp_cm~160 |   .9006861   .2356748     3.82   0.000     .438772
1.3626
 _Igrp_cm~170 |   1.286949   .5635444     2.28   0.022    .1824221
2.391476
 _Igrp_cm~190 |   .4487302   .4702422     0.95   0.340   -.4729275
1.370388
 _Igrp_cm~200 |  -.1288345   .5065299    -0.25   0.799   -1.121615
.863946
 _Idst_time_1 |   .4393038   .3022597     1.45   0.146   -.1531144
1.031722
 _Icmf_y~2001 |   .6703909   .5356897     1.25   0.211   -.3795417
1.720324
 _Icmf_y~2002 |   .4439055   .4295648     1.03   0.301   -.3980261
1.285837
 _Icmf_y~2003 |   .2034951   .3123106     0.65   0.515   -.4086224
.8156125
 _Icmf_y~2005 |   .3304563   .3039568     1.09   0.277    -.265288
.9262006
 _IdstXc~2001 |  -1.062265    .662541    -1.60   0.109   -2.360822
.2362913
 _IdstXc~2002 |  -.2981622   .5467653    -0.55   0.586   -1.369802
.773478
 _IdstXc~2003 |  -.1787481   .4701531    -0.38   0.704   -1.100231
.7427351
        _cons |   .2859601    .417366     0.69   0.493   -.5320623
1.103982
 -------------+----------------------------------------------------------------
-
 4            |
 grp_step_e~e |   .0088092   .0084147     1.05   0.295   -.0076833
.0253017
         post |  -.2128214   .1822218    -1.17   0.243   -.5699696
.1443268
 _Igrp_cm~_30 |   1.191995   .3793347     3.14   0.002    .4485122
1.935477
 _Igrp_cm~_60 |   1.103513     .35269     3.13   0.002    .4122535
1.794773
 _Igrp_cm~_70 |   2.158579   .5797258     3.72   0.000    1.022338
3.294821
 _Igrp_cm~130 |   1.720245   .5774774     2.98   0.003    .5884103
2.85208
 _Igrp_cm~140 |   1.427164   .3037365     4.70   0.000    .8318517
2.022477
 _Igrp_cm~160 |   .7302717    .260834     2.80   0.005    .2190464
1.241497
 _Igrp_cm~170 |   1.596456   .5819697     2.74   0.006     .455816
2.737095
 _Igrp_cm~190 |   1.120864   .4777674     2.35   0.019    .1844571
2.057271
 _Igrp_cm~200 |   .1978602   .5416819     0.37   0.715   -.8638169
1.259537
 _Idst_time_1 |   .5546741   .3133072     1.77   0.077   -.0593968
1.168745
 _Icmf_y~2001 |   .6005429   .5568074     1.08   0.281   -.4907796
1.691865
```

_Icmf_y~2002	.1651599	.4439157	0.37	0.710	-.704899	1.035219
_Icmf_y~2003	.0694973	.3243559	0.21	0.830	-.5662285	.7052231
_Icmf_y~2005	.073883	.3217181	0.23	0.818	-.5566728	.7044388
_IdstXc~2001	-1.472527	.704282	-2.09	0.037	-2.852894	-.0921593
_IdstXc~2002	-.4746379	.5684774	-0.83	0.404	-1.588833	.6395574
_IdstXc~2003	-.1497499	.4836087	-0.31	0.757	-1.097606	.7981058
_cons	-.3666195	.4450385	-0.82	0.410	-1.238879	.5056399
5						
grp_step_e~e	.0096152	.0093521	1.03	0.304	-.0087146	.0279451
post	.0167686	.2166311	0.08	0.938	-.4078206	.4413578
_Igrp_cm~_30	1.761464	.4826931	3.65	0.000	.8154027	2.707525
_Igrp_cm~_60	1.049552	.4988193	2.10	0.035	.0718841	2.02722
_Igrp_cm~_70	2.660189	.652584	4.08	0.000	1.381148	3.93923
_Igrp_cm~130	2.206482	.687432	3.21	0.001	.8591399	3.553824
_Igrp_cm~140	.6569158	.4829599	1.36	0.174	-.2896681	1.6035
_Igrp_cm~160	1.971815	.3568274	5.53	0.000	1.272446	2.671184
_Igrp_cm~170	2.695887	.6474358	4.16	0.000	1.426936	3.964838
_Igrp_cm~190	-.7462688	1.105149	-0.68	0.500	-2.912322	1.419784
_Igrp_cm~200	1.05713	.6607769	1.60	0.110	-.2379687	2.352229
_Idst_time_1	.3088867	.3902243	0.79	0.429	-.4559389	1.073712
_Icmf_y~2001	-.7629161	.9165963	-0.83	0.405	-2.559412	1.03358
_Icmf_y~2002	1.046984	.4929372	2.12	0.034	.0808452	2.013124
_Icmf_y~2003	.1870258	.400441	0.47	0.640	-.5978241	.9718757
_Icmf_y~2005	.282703	.3855509	0.73	0.463	-.4729628	1.038369
_IdstXc~2001	.6049503	1.062319	0.57	0.569	-1.477156	2.687057
_IdstXc~2002	-.6465028	.6496014	-1.00	0.320	-1.919698	.6266925
_IdstXc~2003	.1153332	.5906768	0.20	0.845	-1.042372	1.273038
_cons	-2.102398	.553963	-3.80	0.000	-3.188145	-1.01665

```
 --------------------------------------------------------------------------
-
 (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

 --------------------------------------------------------------------------
-
             |               Robust
         cgi |       Coef.   Std. Err.       z     P>|z|      [95% Conf. Interval]
 ------------+-------------------------------------------------------------
-
```

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	-.1683293	.1273534	-1.32	0.186	-.4179373	.0812787
_Icmf_y~2005	-.0777751	.1640927	-0.47	0.636	-.3993909	.2438407
_Igrp_cm~_30	.6580706	.2061084	3.19	0.001	.2541055	1.062036
_Igrp_cm~_60	-.4518758	.1920092	-2.35	0.019	-.828207	-.0755446
_Igrp_cm~_70	1.399792	.2602373	5.38	0.000	.8897363	1.909848
_Igrp_cm~130	.4565885	.2489592	1.83	0.067	-.0313625	.9445396
_Igrp_cm~140	.9036294	.1515533	5.96	0.000	.6065904	1.200668
_Igrp_cm~160	.5162246	.1445754	3.57	0.000	.2328622	.7995871
_Igrp_cm~170	.9388079	.2080465	4.51	0.000	.5310442	1.346572
_Igrp_cm~190	.2240505	.2306625	0.97	0.331	-.2280396	.6761407
_Igrp_cm~200	.3727791	.2204	1.69	0.091	-.059197	.8047551
_Igrp_cm~210	2.32049	.6009658	3.86	0.000	1.142619	3.498362
dx	.2126896	.1056769	2.01	0.044	.0055667	.4198126
_cons	.6484073	.2078105	3.12	0.002	.2411061	1.055708
4						
grp_step_e~e	.0060787	.0041079	1.48	0.139	-.0019727	.0141301
dst_time	.1098623	.1039912	1.06	0.291	-.0939568	.3136814
post	-.1640497	.0953739	-1.72	0.085	-.3509791	.0228796
_Icmf_y~2000	.3939924	.2975433	1.32	0.185	-.1891818	.9771666
_Icmf_y~2001	.1317031	.1812153	0.73	0.467	-.2234724	.4868786
_Icmf_y~2002	-.4440633	.1413949	-3.14	0.002	-.7211923	-.1669344
_Icmf_y~2003	-.1005577	.1301277	-0.77	0.440	-.3556032	.1544879
_Icmf_y~2005	-.1430357	.1705298	-0.84	0.402	-.477268	.1911966
_Igrp_cm~_30	.613517	.215641	2.85	0.004	.1908684	1.036166
_Igrp_cm~_60	.3868337	.1846484	2.09	0.036	.0249295	.7487378
_Igrp_cm~_70	1.472437	.2673135	5.51	0.000	.9485126	1.996362
_Igrp_cm~130	.9238574	.2490955	3.71	0.000	.4356393	1.412076
_Igrp_cm~140	1.001838	.1583104	6.33	0.000	.6915551	1.31212

_Igrp_cm~160	.3621878	.154986	2.34	0.019	.0584208	.6659547
_Igrp_cm~170	1.129028	.2138447	5.28	0.000	.7099005	1.548156
_Igrp_cm~190	.3673558	.2401381	1.53	0.126	-.1033062	.8380178
_Igrp_cm~200	.9269347	.2183686	4.24	0.000	.4989402	1.354929
_Igrp_cm~210	3.063573	.5971013	5.13	0.000	1.893276	4.23387
dx	.1431976	.10933	1.31	0.190	-.0710852	.3574804
_cons	.222244	.2177864	1.02	0.308	-.2046094	.6490975

5						
grp_step_e~e	.0006986	.0048	0.15	0.884	-.0087093	.0101064
dst_time	.2391449	.1237747	1.93	0.053	-.003449	.4817387
post	-.2228573	.112448	-1.98	0.047	-.4432513	-.0024634
_Icmf_y~2000	.4128238	.3394784	1.22	0.224	-.2525417	1.078189
_Icmf_y~2001	-.3108607	.2330535	-1.33	0.182	-.7676371	.1459157
_Icmf_y~2002	-.1182418	.1629671	-0.73	0.468	-.4376515	.2011679
_Icmf_y~2003	.0231437	.1528553	0.15	0.880	-.2764472	.3227346
_Icmf_y~2005	.1246639	.2005889	0.62	0.534	-.2684831	.5178108
_Igrp_cm~_30	.8754293	.2634214	3.32	0.001	.3591328	1.391726
_Igrp_cm~_60	.5670699	.2331342	2.43	0.015	.1101353	1.024005
_Igrp_cm~_70	1.614058	.3052736	5.29	0.000	1.015733	2.212384
_Igrp_cm~130	.6002497	.3294431	1.82	0.068	-.0454469	1.245946
_Igrp_cm~140	.6348812	.2103423	3.02	0.003	.2226178	1.047145
_Igrp_cm~160	1.237056	.1822698	6.79	0.000	.8798134	1.594298
_Igrp_cm~170	1.45879	.2493265	5.85	0.000	.9701189	1.947461
_Igrp_cm~190	-.3018675	.3818996	-0.79	0.429	-1.050377	.4466419
_Igrp_cm~200	1.806331	.2407997	7.50	0.000	1.334373	2.27829
_Igrp_cm~210	3.558165	.6145114	5.79	0.000	2.353745	4.762585
dx	.0201405	.1290226	0.16	0.876	-.2327391	.27302
_cons	-.7962107	.2693957	-2.96	0.003	-1.324217	-.2682048

```
 ---------------------------------------------------------------------------
-
 (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                     Number of obs    =
7125
                                               Wald    chi2(80)          =
542.41
                                               Prob   >   chi2           =
0.0000
Log pseudolikelihood = -10382.285                  Pseudo R2         =
0.0262

-------------------------------------------------------------------------------
-
             |               Robust
         cgi |        Coef.    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
```

_Icmf_y~2002	-.2360628	.1368758	-1.72	0.085	-.5043344	.0322089
_Icmf_y~2003	-.1202544	.1286099	-0.94	0.350	-.3723252	.1318165
_Icmf_y~2005	.0882179	.1643251	0.54	0.591	-.2338533	.4102891
_Igrp_cm~_30	.4518208	.2086818	2.17	0.030	.0428119	.8608296
_Igrp_cm~_60	-.6478664	.1975377	-3.28	0.001	-1.035033	-.2606997
_Igrp_cm~_70	.853499	.2680871	3.18	0.001	.328058	1.37894
_Igrp_cm~130	.2013053	.2554709	0.79	0.431	-.2994086	.7020191
_Igrp_cm~140	.9766304	.1506754	6.48	0.000	.6813121	1.271949
_Igrp_cm~160	.5317156	.1450518	3.67	0.000	.2474192	.8160119
_Igrp_cm~170	.7067021	.2104299	3.36	0.001	.2942671	1.119137
_Igrp_cm~190	-.1944419	.242123	-0.80	0.422	-.6689943	.2801105
_Igrp_cm~200	-.0807441	.2308045	-0.35	0.726	-.5331125	.3716244
_Igrp_cm~210	1.599631	.6135071	2.61	0.009	.3971796	2.802083
_Idx_1	.0349189	.1517737	0.23	0.818	-.2625521	.3323899
_Ipost_1	-.1308248	.1110195	-1.18	0.239	-.348419	.0867693
_IdxXpos_1_1	.1648954	.205915	0.80	0.423	-.2386906	.5684813
_cons	.7433449	.2120132	3.51	0.000	.3278066	1.158883
3						
grp_step_e~e	.0035674	.0039723	0.90	0.369	-.004218	.0113529
dst_time	.0767851	.1007833	0.76	0.446	-.1207465	.2743167
_Icmf_y~2000	-.0226627	.3052901	-0.07	0.941	-.6210203	.5756949
_Icmf_y~2001	.0480642	.17678	0.27	0.786	-.2984183	.3945466
_Icmf_y~2002	-.1716213	.1347084	-1.27	0.203	-.435645	.0924023
_Icmf_y~2003	-.1683051	.127354	-1.32	0.186	-.4179144	.0813041
_Icmf_y~2005	-.0778573	.1640963	-0.47	0.635	-.39948	.2437655
_Igrp_cm~_30	.6581628	.2061437	3.19	0.001	.2541285	1.062197
_Igrp_cm~_60	-.4520948	.1919826	-2.35	0.019	-.8283737	-.0758158
_Igrp_cm~_70	1.400076	.2602817	5.38	0.000	.8899335	1.910219

```
 _Igrp_cm~130 |      .456527    .2489541        1.83    0.067        -.031414
.944468
 _Igrp_cm~140 |     .9041456    .1516365        5.96    0.000        .6069436
1.201348
 _Igrp_cm~160 |     .5158525    .1445882        3.57    0.000        .2324649
.7992402
 _Igrp_cm~170 |     .9387285    .2080414        4.51    0.000        .5309748
1.346482
 _Igrp_cm~190 |      .225029    .2306762        0.98    0.329       -.2270879
.677146
 _Igrp_cm~200 |     .3725864    .2203726        1.69    0.091       -.0593359
.8045088
 _Igrp_cm~210 |     2.320714    .6009407        3.86    0.000        1.142892
3.498536
       _Idx_1 |     .2385923    .1492341        1.60    0.110       -.0539011
.5310857
     _Ipost_1 |    -.0448496    .1103325       -0.41    0.684       -.2610974
.1713981
  _IdxXpos_1_1 |    -.0525386    .2031404       -0.26    0.796       -.4506864
.3456093
        _cons |     .6384692    .2101145        3.04    0.002        .2266523
1.050286
 -------------+----------------------------------------------------------------
-
 4            |
 grp_step_e~e |     .0060791    .0041088        1.48    0.139       -.0019739
.0141322
     dst_time |      .109897    .1039832        1.06    0.291       -.0939064
.3137004
 _Icmf_y~2000 |     .3943465    .2975549        1.33    0.185       -.1888503
.9775433
 _Icmf_y~2001 |     .1315611    .1812223        0.73    0.468       -.2236281
.4867503
 _Icmf_y~2002 |   -.4440401    .1414028      -3.14    0.002      -.7211846    -
.1668957
 _Icmf_y~2003 |    -.1005642    .1301299       -0.77    0.440       -.3556141
.1544858
 _Icmf_y~2005 |    -.1432328    .1705326       -0.84    0.401       -.4774706
.191005
 _Igrp_cm~_30 |      .613618    .2156731        2.85    0.004        .1909065
1.036329
 _Igrp_cm~_60 |     .3867753    .1846453        2.09    0.036        .0248772
.7486734
 _Igrp_cm~_70 |     1.473061    .2673716        5.51    0.000        .9490222
1.9971
 _Igrp_cm~130 |     .9237806    .2490685        3.71    0.000        .4356153
1.411946
 _Igrp_cm~140 |     1.002492    .1584025        6.33    0.000        .6920287
1.312955
 _Igrp_cm~160 |     .3615251    .1550041        2.33    0.020        .0577226
.6653275
 _Igrp_cm~170 |     1.129028    .2138437        5.28    0.000        .7099024
1.548154
 _Igrp_cm~190 |      .368866    .2401525        1.54    0.125       -.1018242
.8395562
 _Igrp_cm~200 |     .9269223      .21836        4.24    0.000        .4989445
1.3549
```

```
  _Igrp_cm~210 |    3.063847    .5970753      5.13    0.000       1.893601
4.234093
        _Idx_1 |    .1759783    .1528261      1.15    0.250      -.1235552
.4755119
      _Ipost_1 |   -.1422021    .1133937     -1.25    0.210      -.3644496
.0800454
  _IdxXpos_1_1 |     -.07206    .2101503     -0.34    0.732       -.483947
.339827
         _cons |    .2119101    .2197334      0.96    0.335      -.2187595
.6425797
  -------------+----------------------------------------------------------------
-
  5            |
  grp_step_e~e |    .0007239    .0047987      0.15    0.880      -.0086813
.0101291
      dst_time |     .240341    .1238219      1.94    0.052      -.0023456
.4830275
  _Icmf_y~2000 |     .410702    .3396529      1.21    0.227      -.2550054
1.076409
  _Icmf_y~2001 |   -.3112853    .2331465     -1.34    0.182       -.768244
.1456734
  _Icmf_y~2002 |   -.1195542    .1628857     -0.73    0.463      -.4388043
.1996959
  _Icmf_y~2003 |    .0226648    .1529382      0.15    0.882      -.2770886
.3224181
  _Icmf_y~2005 |    .1257557    .2005266      0.63    0.531      -.2672692
.5187807
  _Igrp_cm~_30 |    .8745629    .2633251      3.32    0.001       .3584553
1.390671
  _Igrp_cm~_60 |    .5677814    .2332923      2.43    0.015       .1105369
1.025026
  _Igrp_cm~_70 |    1.611829    .3051491      5.28    0.000       1.013748
2.20991
  _Igrp_cm~130 |    .6010935    .3298913      1.82    0.068      -.0454816
1.247669
  _Igrp_cm~140 |    .6318512     .210353      3.00    0.003        .219567
1.044135
  _Igrp_cm~160 |    1.238237    .1823605      6.79    0.000       .8808168
1.595657
  _Igrp_cm~170 |    1.459262    .2493613      5.85    0.000       .9705234
1.948002
  _Igrp_cm~190 |    -.307571    .3826108     -0.80    0.421      -1.057474
.4423324
  _Igrp_cm~200 |    1.808232    .2410087      7.50    0.000       1.335863
2.2806
  _Igrp_cm~210 |    3.556684    .6146801      5.79    0.000       2.351933
4.761435
        _Idx_1 |     -.14897    .1807754     -0.82    0.410      -.5032832
.2053433
      _Ipost_1 |  -.3219922    .1338306     -2.41    0.016     -.5842954    -
.0596889
  _IdxXpos_1_1 |    .3472333    .2484104      1.40    0.162      -.1396422
.8341087
         _cons |  -.7512658    .2701625     -2.78    0.005     -1.280775     -
.221757
  ------------------------------------------------------------------------------
-
```

(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
Log pseudolikelihood = -10371.063                 Pseudo R2        =  0.0273

------------------------------------------------------------------------------
             |               Robust
         cgi |      Coef.   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	.4545375	.2080402	2.18	0.029	.0467861	.8622889
_Igrp_cm~_60	-.6588674	.1977898	-3.33	0.001	-1.046528	-.2712065
_Igrp_cm~_70	.875685	.2689211	3.26	0.001	.3486093	1.402761
_Igrp_cm~130	.1935132	.2583913	0.75	0.454	-.3129244	.6999508
_Igrp_cm~140	.9804287	.1507207	6.50	0.000	.6850216	1.275836
_Igrp_cm~160	.5387859	.1450969	3.71	0.000	.2544013	.8231706
_Igrp_cm~170	.7105186	.2108001	3.37	0.001	.297358	1.123679
_Igrp_cm~190	-.2092671	.242673	-0.86	0.388	-.6848974	.2663632
_Igrp_cm~200	-.0684799	.2314904	-0.30	0.767	-.5221928	.385233
_Igrp_cm~210	1.625746	.6130775	2.65	0.008	.424136	2.827356
_Idx_1	-.0626496	.1854404	-0.34	0.735	-.426106	.3008069
_Icmf_y~2000	.2016313	.3474381	0.58	0.562	-.4793349	.8825975
_Icmf_y~2001	.2778755	.2115158	1.31	0.189	-.1366878	.6924389
_Icmf_y~2002	-.3560177	.1622643	-2.19	0.028	-.6740498	-.0379856
_Icmf_y~2003	-.2813081	.1561043	-1.80	0.072	-.587267	.0246508
_Icmf_y~2005	.0957865	.1962176	0.49	0.625	-.2887929	.4803659
_IdxXcm~2000	-.1997554	.6818273	-0.29	0.770	-1.536112	1.136602
_IdxXcm~2001	-.3275729	.3792781	-0.86	0.388	-1.070944	.4157985
_IdxXcm~2002	.4698804	.3109745	1.51	0.131	-.1396185	1.079379
_IdxXcm~2003	.5128727	.2778408	1.85	0.065	-.0316852	1.057431
_IdxXcm~2005	-.0430155	.3322498	-0.13	0.897	-.6942132	.6081822
_cons	.7902572	.2208113	3.58	0.000	.3574749	1.22304
3						
grp_step_e~e	.0032638	.0039714	0.82	0.411	-.00452	.0110477
dst_time	.0705451	.1008648	0.70	0.484	-.1271462	.2682364
post	-.0642172	.0925658	-0.69	0.488	-.2456429	.1172085
_Igrp_cm~_30	.6524573	.206251	3.16	0.002	.2482127	1.056702
_Igrp_cm~_60	-.4608351	.1927762	-2.39	0.017	-.8386696	-.0830006

```
  _Igrp_cm~_70 |    1.420722    .2609648       5.44    0.000        .9092402
1.932203
  _Igrp_cm~130 |      .47375    .2511823       1.89    0.059       -.0185583
.9660583
  _Igrp_cm~140 |    .9057306    .1517025       5.97    0.000        .6083992
1.203062
  _Igrp_cm~160 |    .5265139    .1447118       3.64    0.000        .2428839
.8101438
  _Igrp_cm~170 |    .9407556    .2082146       4.52    0.000        .5326625
1.348849
  _Igrp_cm~190 |    .2053865    .2307127       0.89    0.373        -.246802
.6575751
  _Igrp_cm~200 |    .3784062    .2208614       1.71    0.087       -.0544743
.8112867
  _Igrp_cm~210 |    2.334479    .6000756       3.89    0.000        1.158352
3.510605
        _Idx_1 |   -.1025902    .1838376      -0.56    0.577       -.4629053
.257725
  _Icmf_y~2000 |    .0560596    .3446532       0.16    0.871       -.6194483
.7315676
  _Icmf_y~2001 |   -.0160856    .2124705      -0.08    0.940       -.4325201
.400349
  _Icmf_y~2002 |  -.3799146    .1600324     -2.37    0.018      -.6935722    -
.0662569
  _Icmf_y~2003 |  -.3135859    .1538869     -2.04    0.042      -.6151987    -
.0119731
  _Icmf_y~2005 |    -.227421     .198604      -1.15    0.252       -.6166776
.1618356
  _IdxXcm~2000 |    -.725496    .7270953      -1.00    0.318       -2.150577
.6995847
  _IdxXcm~2001 |    .1529729    .3727616       0.41    0.682       -.5776264
.8835722
  _IdxXcm~2002 |    .7367785    .3044702       2.42    0.016        .1400278
1.333529
  _IdxXcm~2003 |    .4565139    .2753163       1.66    0.097        -.083096
.9961239
  _IdxXcm~2005 |    .4004455    .3292727       1.22    0.224       -.2449173
1.045808
         _cons |    .7697643    .2180609       3.53    0.000        .3423728
1.197156
  -------------+----------------------------------------------------------------
-
  4            |
  grp_step_e~e |    .0058747    .0041074       1.43    0.153       -.0021756
.0139251
      dst_time |     .103134    .1041869       0.99    0.322       -.1010686
.3073365
          post |   -.1646224    .0954039      -1.73    0.084       -.3516106
.0223658
  _Igrp_cm~_30 |    .6137757    .2152268       2.85    0.004         .191939
1.035612
  _Igrp_cm~_60 |    .3822956    .1852028       2.06    0.039        .0193048
.7452863
  _Igrp_cm~_70 |    1.493984    .2683576       5.57    0.000        .9680128
2.019955
  _Igrp_cm~130 |    .9363872    .2516717       3.72    0.000        .4431198
1.429655
```

_Igrp_cm~140	1.004328	.158413	6.34	0.000	.6938439	1.314811
_Igrp_cm~160	.3702586	.1550647	2.39	0.017	.0663373	.6741799
_Igrp_cm~170	1.130962	.2142666	5.28	0.000	.7110069	1.550917
_Igrp_cm~190	.3523038	.2406098	1.46	0.143	-.1192827	.8238904
_Igrp_cm~200	.9369989	.2190672	4.28	0.000	.507635	1.366363
_Igrp_cm~210	3.081203	.5961256	5.17	0.000	1.912818	4.249587
_Idx_1	-.0431797	.1894539	-0.23	0.820	-.4145024	.328143
_Icmf_y~2000	.4399242	.3400249	1.29	0.196	-.2265125	1.106361
_Icmf_y~2001	.1937679	.2164624	0.90	0.371	-.2304905	.6180264
_Icmf_y~2002	-.6254882	.1680188	-3.72	0.000	-.9547991	-.2961774
_Icmf_y~2003	-.194202	.1575356	-1.23	0.218	-.5029661	.1145621
_Icmf_y~2005	-.1822177	.2050575	-0.89	0.374	-.5841231	.2196877
_IdxXcm~2000	-.363504	.6616859	-0.55	0.583	-1.660385	.9333766
_IdxXcm~2001	-.2800392	.3886425	-0.72	0.471	-1.041764	.4816861
_IdxXcm~2002	.6695916	.3185033	2.10	0.036	.0453367	1.293847
_IdxXcm~2003	.3015411	.2819516	1.07	0.285	-.2510739	.8541561
_IdxXcm~2005	.0988937	.3425623	0.29	0.773	-.5725161	.7703034
_cons	.2946823	.2282987	1.29	0.197	-.152775	.7421395
5						
grp_step_e~e	.0002794	.0048143	0.06	0.954	-.0091565	.0097153
dst_time	.2323724	.1239251	1.88	0.061	-.0105163	.475261
post	-.2233957	.1125349	-1.99	0.047	-.44396	-.0028313
_Igrp_cm~_30	.8686533	.2635953	3.30	0.001	.352016	1.385291
_Igrp_cm~_60	.5585407	.2338413	2.39	0.017	.1002201	1.016861
_Igrp_cm~_70	1.653405	.3064739	5.39	0.000	1.052727	2.254083
_Igrp_cm~130	.6360277	.3317284	1.92	0.055	-.0141481	1.286204
_Igrp_cm~140	.6405745	.2106254	3.04	0.002	.2277563	1.053393
_Igrp_cm~160	1.25306	.1828072	6.85	0.000	.8947646	1.611356

```
 _Igrp_cm~170 |    1.466968    .2498723       5.87    0.000      .9772277
1.956709
 _Igrp_cm~190 |    -.328776    .3847468      -0.85    0.393     -1.082866
.4253139
 _Igrp_cm~200 |    1.822869     .241802       7.54    0.000      1.348946
2.296792
 _Igrp_cm~210 |    3.584404    .6129784       5.85    0.000      2.382988
4.78582
       _Idx_1 |   -.2774839     .224785      -1.23    0.217     -.7180543
.1630865
 _Icmf_y~2000 |    .5625417    .3779356       1.49    0.137     -.1781985
1.303282
 _Icmf_y~2001 |   -.3497847    .2764007      -1.27    0.206       -.89152
.1919507
 _Icmf_y~2002 |   -.4151726    .1944211      -2.14    0.033      -.796231    -
.0341142
 _Icmf_y~2003 |    -.089787    .1827575      -0.49    0.623     -.4479852
.2684111
 _Icmf_y~2005 |    .0628574    .2395634       0.26    0.793     -.4066782
.5323929
 _IdxXcm~2000 |     -1.3318    .9701251      -1.37    0.170      -3.23321
.5696104
 _IdxXcm~2001 |    .1056003    .5065083       0.21    0.835     -.8871377
1.098338
 _IdxXcm~2002 |    1.052368    .3611594       2.91    0.004      .3445089
1.760228
 _IdxXcm~2003 |    .3483717    .3369949       1.03    0.301     -.3121263
1.00887
 _IdxXcm~2005 |    .1718245    .4021324       0.43    0.669     -.6163406
.9599896
        _cons |   -.6847583    .2822313      -2.43    0.015     -1.237921    -
.1315952
 ------------------------------------------------------------------------------
-
 (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

 ------------------------------------------------------------------------------
-
              |               Robust
          cgi |        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	.5155905	.1447042	3.56	0.000	.2319756	.7992055
_Igrp_cm~170	.938804	.2080553	4.51	0.000	.5310231	1.346585
_Igrp_cm~190	.2196141	.2310312	0.95	0.342	-.2331987	.672427
_Igrp_cm~200	.3731017	.2202784	1.69	0.090	-.0586359	.8048394
_Igrp_cm~210	2.320971	.6005824	3.86	0.000	1.143851	3.498091
_Idst_time_1	.0179747	.1175108	0.15	0.878	-.2123423	.2482916
_Idx_1	.1202825	.139133	0.86	0.387	-.152413	.3929781
_IdstXdx_1_1	.2048129	.2042194	1.00	0.316	-.1954498	.6050756
_cons	.6782485	.2105997	3.22	0.001	.2654808	1.091016
4						
grp_step_e~e	.0060451	.0041131	1.47	0.142	-.0020164	.0141067
post	-.1636875	.0954011	-1.72	0.086	-.3506703	.0232953
_Icmf_y~2000	.4042594	.2976943	1.36	0.174	-.1792107	.9877296
_Icmf_y~2001	.1315123	.1814931	0.72	0.469	-.2242076	.4872321
_Icmf_y~2002	-.4484418	.1414221	-3.17	0.002	-.725624	-.1712597
_Icmf_y~2003	-.1047256	.1301715	-0.80	0.421	-.359857	.1504058
_Icmf_y~2005	-.1425179	.1704069	-0.84	0.403	-.4765094	.1914735
_Igrp_cm~_30	.6112944	.2158392	2.83	0.005	.1882574	1.034331
_Igrp_cm~_60	.3942698	.1847483	2.13	0.033	.0321697	.7563698
_Igrp_cm~_70	1.476784	.2672869	5.53	0.000	.9529112	2.000657
_Igrp_cm~130	.9182604	.2496104	3.68	0.000	.429033	1.407488
_Igrp_cm~140	1.004333	.1582287	6.35	0.000	.6942106	1.314456
_Igrp_cm~160	.3613927	.155067	2.33	0.020	.057467	.6653185
_Igrp_cm~170	1.129469	.2138346	5.28	0.000	.7103604	1.548577
_Igrp_cm~190	.3614368	.2403569	1.50	0.133	-.1096541	.8325278
_Igrp_cm~200	.927897	.2182667	4.25	0.000	.5001022	1.355692
_Igrp_cm~210	3.064362	.5966407	5.14	0.000	1.894968	4.233756
_Idst_time_1	.0205127	.12084	0.17	0.865	-.2163294	.2573548

```
      _Idx_1  |    .0000537    .1450072      0.00    1.000     -.2841551
.2842626
 _IdstXdx_1_1 |    .3083565    .2112147      1.46    0.144     -.1056168
.7223297
       _cons  |    .2675682    .2203958      1.21    0.225     -.1643996
.6995359
 -------------+--------------------------------------------------------------
-
 5            |
 grp_step_e~e |    .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           =
.
 Log pseudolikelihood = -10334.509                    Pseudo R2         =
0.0307

 ------------------------------------------------------------------------------
-
```

cgi	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
2						
grp_step_e~e	.0016355	.0040672	0.40	0.688	-.0063361	.0096071
dst_time	.1926224	.1024864	1.88	0.060	-.0082474	.3934921
post	-.0775501	.0936669	-0.83	0.408	-.2611339	.1060336
_Icmf_y~2000	.1600282	.3059414	0.52	0.601	-.4396059	.7596623
_Icmf_y~2001	.1914847	.1771519	1.08	0.280	-.1557267	.538696
_Icmf_y~2002	-.2409527	.1382173	-1.74	0.081	-.5118537	.0299483
_Icmf_y~2003	-.1399376	.1291693	-1.08	0.279	-.3931049	.1132296
_Icmf_y~2005	.0962317	.1651089	0.58	0.560	-.2273757	.4198391
_Igrp_cm~_30	.4252826	.2543508	1.67	0.095	-.0732358	.923801
_Igrp_cm~_60	-1.011263	.2458211	-4.11	0.000	-1.493063	-.5294622
_Igrp_cm~_70	.9523348	.3003689	3.17	0.002	.3636226	1.541047
_Igrp_cm~130	.0175127	.2922212	0.06	0.952	-.5552304	.5902558
_Igrp_cm~140	.9656194	.1776753	5.43	0.000	.6173822	1.313857
_Igrp_cm~160	.5715639	.1805374	3.17	0.002	.2177171	.9254107
_Igrp_cm~170	.5012217	.2339814	2.14	0.032	.0426267	.9598168
_Igrp_cm~190	.0062856	.2793506	0.02	0.982	-.5412315	.5538027
_Igrp_cm~200	.0805899	.256082	0.31	0.753	-.4213216	.5825014
_Igrp_cm~210	1.380578	.6231829	2.22	0.027	.159162	2.601994
_Idx_1	.0719749	.192787	0.37	0.709	-.3058805	.4498304
_IgrpXdx_3~1	.112192	.4432906	0.25	0.800	-.7566416	.9810256
_IgrpXdx_6~1	1.022357	.4287324	2.38	0.017	.1820566	1.862657
_IgrpXdx_7~1	-.4528433	.6582309	-0.69	0.491	-1.742952	.8372656
_IgrpX~130_1	.7925048	.6410025	1.24	0.216	-.4638369	2.048847
_IgrpXd~40_1	.058986	.3355351	0.18	0.860	-.5986507	.7166227
_IgrpX~160_1	-.0580694	.2951601	-0.20	0.844	-.6365726	.5204338

_IgrpX~170_1	1.036317	.5966577	1.74	0.082	-.1331107	2.205744
_IgrpX~190_1	-.9406036	.5823507	-1.62	0.106	-2.08199	.2007829
_IgrpXd~00_1	-1.258549	.6567443	-1.92	0.055	-2.545744	.028646
_IgrpXd~10_1	18.47042	.6310867	29.27	0.000	17.23351	19.70732
_cons	.7131612	.2195142	3.25	0.001	.2829212	1.143401
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
```

```
 note: _IgrpXdx_210_1 dropped due to collinearity
 Iteration 0:   log pseudolikelihood = -10267.716
 Iteration 1:   log pseudolikelihood = -10005.363
 Iteration 2:   log pseudolikelihood = -9986.4357
 Iteration 3:   log pseudolikelihood = -9986.2093
 Iteration 4:   log pseudolikelihood = -9986.2085
 Iteration 5:   log pseudolikelihood = -9986.2085

 Multinomial logistic regression                        Number of obs    =
6870
                                                   Wald    chi2(108)       =
541.54
                                                   Prob  >  chi2           =
0.0000
 Log pseudolikelihood = -9986.2085                     Pseudo R2          =
0.0274

 ------------------------------------------------------------------------------
-
             |               Robust
         cgi |       Coef.   Std. Err.       z     P>|z|      [95% Conf.
Interval]
 -------------+----------------------------------------------------------------
-
 2           |
 grp_step_e~e |    .0010166    .0040835      0.25    0.803      -.0069869
.00902
     dst_time |    .2170776        .103      2.11    0.035       .0152012
.418954
         post |   -.0734565     .094029     -0.78    0.435        -.25775
.1108369
 _Icmf_y~2000 |     .166527    .3059639      0.54    0.586      -.4331512
.7662051
 _Icmf_y~2001 |    .2024656    .1770769      1.14    0.253      -.1445988
.54953
 _Icmf_y~2002 |   -.2118783    .1386041     -1.53    0.126      -.4835374
.0597808
 _Icmf_y~2003 |   -.1394088    .1296924     -1.07    0.282      -.3936012
.1147836
 _Icmf_y~2005 |    .1249402    .1651738      0.76    0.449      -.1987944
.4486748
 _Igrp_cm~_30 |    .4248074    .2544568      1.67    0.095      -.0739187
.9235335
 _Igrp_cm~_60 |   -1.015631    .2457994     -4.13    0.000      -1.497389    -
.5338733
 _Igrp_cm~_70 |    .9492894    .3003223      3.16    0.002       .3606685
1.53791
 _Igrp_cm~130 |    .0159091     .292244      0.05    0.957      -.5568787
.5886968
 _Igrp_cm~140 |    .9637044    .1776745      5.42    0.000       .6154688
1.31194
 _Igrp_cm~160 |    .5695804     .180503      3.16    0.002        .215801
.9233598
 _Igrp_cm~170 |    .5034304    .2339971      2.15    0.031       .0448046
.9620563
 _Igrp_cm~190 |    .0018962    .2793826      0.01    0.995      -.5456836
.549476
```

_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	.1677117	.2728284	0.61	0.539	-.3670221	.7024455
_Igrp_cm~200	.4096803	.2463988	1.66	0.096	-.0732526	.8926131
_Idx_1	-.1416881	.1958291	-0.72	0.469	-.5255059	.2421298
_IgrpXdx_3~1	.3970372	.4383711	0.91	0.365	-.4621543	1.256229
_IgrpXdx_6~1	.87185	.4208884	2.07	0.038	.0469238	1.696776
_IgrpXdx_7~1	.7269826	.6223616	1.17	0.243	-.4928236	1.946789
_IgrpX~130_1	.3391683	.6482961	0.52	0.601	-.9314686	1.609805
_IgrpXd~40_1	.4475944	.337808	1.32	0.185	-.2144972	1.109686
_IgrpX~160_1	.6513574	.2973184	2.19	0.028	.068624	1.234091
_IgrpX~170_1	.4823339	.6058475	0.80	0.426	-.7051054	1.669773
_IgrpX~190_1	.1924709	.5035105	0.38	0.702	-.7943916	1.179333
_IgrpXd~00_1	-.53602	.5611491	-0.96	0.339	-1.635852	.5638119
_cons	.770498	.2175622	3.54	0.000	.3440839	1.196912
4						
grp_step_e~e	.0070485	.0041839	1.68	0.092	-.0011518	.0152489
dst_time	.112268	.1051647	1.07	0.286	-.093851	.3183871
post	-.1840277	.096337	-1.91	0.056	-.3728447	.0047894
_Icmf_y~2000	.369744	.299732	1.23	0.217	-.2177199	.957208
_Icmf_y~2001	.1060696	.1812899	0.59	0.558	-.2492522	.4613913
_Icmf_y~2002	-.4310854	.1427065	-3.02	0.003	-.7107849	-.1513859
_Icmf_y~2003	-.1409776	.1317235	-1.07	0.285	-.399151	.1171957
_Icmf_y~2005	-.2003955	.1729989	-1.16	0.247	-.5394671	.1386761
_Igrp_cm~_30	.3286036	.2654824	1.24	0.216	-.1917324	.8489395
_Igrp_cm~_60	.1062796	.2167818	0.49	0.624	-.3186049	.5311642
_Igrp_cm~_70	1.141601	.305985	3.73	0.000	.5418816	1.741321
_Igrp_cm~130	.6666713	.2816472	2.37	0.018	.1146528	1.21869
_Igrp_cm~140	.8484119	.1860774	4.56	0.000	.483707	1.213117
_Igrp_cm~160	.2125833	.1942812	1.09	0.274	-.1682008	.5933674

_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
```

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