

WORKING PAPER – I will discuss this paper in Friday’s talk. The paper comes from my dissertation work and I am close to sending it out for publication. I will be focusing on the Total Costs results and some technical issues with their estimation.

Any suggestions / feedback are very welcome either at the talk or even if you can’t make it. Please email suggestions/feedback to me, Brent Gibbons, at g2@umbc.edu

Along with David Salkever, I need to thank Dave Marcotte and Marsha Goldfarb for their enormous help.

Title: “Working with a Severe Mental Illness: Estimating the causal effect of employment on mental health status and total mental health costs”

Authors: Brent Gibbons & David Salkever

The large majority of adults with a severe mental illness (SMI) in the U.S. (80%) are not working (Diehl et al., 2014), but reports consistently find that most with a SMI do want to work (Burke-Miller et al., 2006). Employment services (e.g. IPS supported employment) are increasingly considered a critical component of the overall treatment of SMI and employment is viewed as a valued goal in recovery (Warner, 2009). It has also been forcefully argued that employment has nonvocational benefits, such as improved symptoms and other measures of mental health (MH) status (e.g. functioning) (Bond & Drake, 2014). However, it remains possible for the stress of work to lead to a relapse of worsening symptoms (Marwaha & Johnson, 2005).

Obtaining estimates of the causal effect of employment on non-vocational outcomes presents multiple research design challenges. It is extremely difficult to design and implement a randomized control trial (RCT) in which employment is randomly assigned and adhered to by treatment subjects. Second, standard statistical analyses of non-experimental contemporaneous data (i.e., within the same time period) on measures of employment and MH status measured for study subjects will tend to produce positively biased estimates of causal effects of employment. This is because indicators (or dimensions) of better MH status that are not captured in these statistical models will tend to be positively related both to being employed (the key explanatory variable) and to dependent variable measures of MH status (Salkever, 2012 and 2013). Third, non-experimental models that relate lagged employment status (i.e., in a prior time period) to a dependent variable measuring current MH status may diminish but not eliminate the bias in these

statistical analyses due to omitted MH indicators that are stable over time. Fourth, while instrumental variables (IV) estimation methods may provide a strategy for obtaining unbiased estimates of causal employment effects, finding available data on instruments that are both strong predictors of employment status_and statistically unrelated to the MH status dependent variable is a very challenging task.

A review of relevant literature illustrates these concerns. While almost all studies correlating contemporaneous employment and MH status measures have acknowledged that such correlations may not imply causation, opposing interpretations of these associations have been offered. A number of studies by economists and mental health researchers used regression analysis to estimate the influence of MH indicators on contemporaneous employment status (Ojeda, Frank, McGuire, & Gilmer, 2010; Rosenheck et al., 2006; Salkever et al., 2007; Slade, 2001). Other contemporaneous studies by mental health researchers interpret this association as a causal link from employment to MH status. Thus, Mueser et al. (1997) found that patients working at follow-up assessments tended to have “lower symptoms...higher Global Assessments Scores...(and)...better self-esteem”, and concluded that “(t)hese findings underscore the potential importance of work in the overall rehabilitation process.” From a study that included both contemporaneous and follow-up outcome analyses, Burns et al. (2009) reported that subjects “who worked had better global functioning, fewer symptoms, and less social disability at final follow-up...Working was associated with having been in remission and out of hospital for the previous 6 months,...a slight decrease in depression, and with being in remission over the subsequent 6 months.” They conclude that “there is sufficient

evidence of work having beneficial effects on clinical and social functioning to merit further exploration.”

Bell and associates (1996) randomized 150 persons with SMI into paid and volunteer jobs. Actual work participation for the 22-week intervention was classified as full, partial, and nonparticipation. Full participants made up 62% of the paid work group and 18% of the volunteer group; thus randomization appears to have influenced participation of subjects, but actual levels of participation were still probably subject to a variety of unmeasured MH status factors resulting in bias in causal inferences regarding employment effects on mental health. Study results indicated that persons who worked a high percentage of weeks (paid or volunteer) had significantly lower PANSS symptom scores than non-participants, and a lower rate of rehospitalization. While interpreting these results as beneficial effects of work participation, the authors noted that “..it remains possible that symptom reduction increased participation or that some other characteristic of participants is responsible for their symptomatic improvement.”

A more recent study (Kukla et al. 2012) compared data over a 2-year intervention period for 187 patients randomized to one of two different employment programs. Subjects were divided into 4 groups based on their two-year work experiences over the follow-up period: no paid work, minimal paid work, steady paid noncompetitive work, and steady paid competitive work. Analysis of follow-up data in 6 month intervals showed significant employment group differences for PANSS total and positive scales; however the only group-time interaction was for the negative subscale (with only the steady competitive group

showing a steady decline). The authors also note that significant group differences in total and positive symptoms “...are difficult to interpret, and the direction of influence impossible to determine.” They specifically note possible problems of reverse and/or simultaneous causation between symptoms and employment groupings.

In summary, the literature tends to report positive associations between MH status and employment but the great bulk of this literature uses contemporaneous data that make causal interpretation difficult. Several econometric studies of employment outcomes (e.g., (Ojeda et al., 2010) and (Banerjee et al. 2013)) have used estimation techniques to allow for endogeneity of explanatory variables that are MH measures, but similar approaches have yet to be applied in studying causal impacts of employment on MH status. Moreover, the literature studying employment impacts on MH status has limitations due to small sample sizes, that inhibit the use of more than a few regression covariates, the use of IV techniques, and formal tests of regressor endogeneity. A further limitation in much of this literature is the lack of lagged data that allow for the estimation of recursive models.

This study investigates the causal impact of employment status on MH status using longitudinal observational data on a large study sample (N=5,058) of patients served by Maryland’s Public Mental Health System. We estimate causal employment effects from a recursive model in which prior employment influences subsequent MH status. To control for and test for the potential endogeneity of prior employment, we employ full information maximum likelihood (FIML) estimations with measures of local labor markets used similarly to instrumental variables.

Data and Design

The study utilizes two data sources: the Outcomes Measurement Survey (OMS) data for those using Maryland's Public Mental Health System (PMHS) from September 1, 2006 through August 31, 2009, and PMHS claims data for the same persons and time period. Maryland's PMHS is a fee-for-service system managed by an Administrative Services Organization. The OMS is administered approximately every six months by MH clinics to document patient progress and includes the BASIS-24 symptom questions along with employment and other information. The BASIS-24 questions aggregate into an Overall MH score and seven symptom scores. The claims dataset contains all service claims from the PMHS during the study period. Claims records include the individual's diagnosis, demographic, and reimbursement information.

The study population was selected from all individuals who used the PMHS during the three-year time period, and for whom at least three consecutive and largely complete (19 out of 24 BASIS-24 questions completed) OMS records exist (N=8,577). When necessary, earlier records were chosen over later records, the logic being to avoid effects from the recent U.S. recession. The data were then narrowed to only include individuals who report "not currently working" in OMS interview 1. Other selection criteria are having a primary diagnosis of a SMI, being aged 18 to 65, and being eligible for PMHS services through Supplemental Security Income (SSI) or other non-family programs. This study population (N=5,047) was then divided into an employment group (N=749), consisting of those who report "currently working" at the time of the second OMS interview, and a comparison

group of persons who report “not currently working”. Eight percent (N=384) of persons who report “Not currently working” in interview two reported in a follow-up question that they were employed in the past 6 months, in the period between interviews one and two. These (N=384) persons can arguably be placed in either the comparison group or the employment group. Separate models are therefore estimated where these persons are included in the comparison group (Model A) and the employment group (Model B).

Outcome Measures

Outcome variables are MH symptom scores measured at OMS interview 3 for Overall MH status, Depression, Relationships, Functioning, and Emotional Lability (see Table 1 for variable definitions). Subject responses to the BASIS-24 questions are on a five point ordered scale and aggregated via a proprietary algorithm into continuous scores ranging from 0 to 4 (scores are inverted for interpretation purposes). The overall score and selected subscores for this study are those that have approximately normal distributions. Summary statistics for these five outcome variables with corresponding baseline variable are displayed in Table 2. Total MH Costs is also an outcome variable. It is the sum of all reimbursements paid by the PMHS between interviews 2 and 3. To account for variation in time between interview 2 and 3, Total MH Costs was divided by the number of days in the time period. It was then converted to the natural log form to approximate a normal distribution in the variable.

Explanatory Variables

As indicated in Table 1, explanatory variables include baseline variables for each outcome variable, the time 2 binary employment indicator, variables measuring local labor market conditions, and a number of characteristics of individuals in our study group. These individual characteristics include a prior employment variable, other baseline mental health and diagnosis indicators, indicators of individuals' demographic characteristics and living situation, Medicaid eligibility group, and indicators of attachment to a particular provider. Descriptive statistics on all these explanatory variables are presented in Table 2.

Statistical Methods

Using full information maximum likelihood (FIML), we estimate the coefficients of a recursive model with two parts: 1) a Probit equation for employment at time 2 and 2) a Tobit equation for the MH status outcome at time 3 or Ordinary Least Squares (OLS) for Total MH Costs. We assume a normally distributed random disturbance for each equation and we allow for the possibility that these disturbances are correlated with one another (which is the case when the employment indicator is endogenous). The assumption of normality appears justified, based on the skewness and kurtosis of the outcome variables (see online appendix). FIML estimation allows us to use the estimated correlation of the two disturbance terms, and the standard error of this estimate, to formally test for endogeneity of the employment indicator.

We specify both a “main” employment effect (β_1) and an interaction effect (β_2) between the employment dummy and the baseline value of the dependent variable measure of MH status or Total MH Costs. This specification is similar to the

specification of health “production functions” in the health economics literature **(e.g. reference)** and is consistent with the idea that treatment should have more positive effects on persons in poorest health relative to persons in better levels of health. It also reflects the notion of “ceiling effects”, because there is a maximum level of MH status that is attainable. All covariates are used in both equations with the exception that the covariate group for labor force indicators is excluded in equation 2. Estimations are performed for both Model A and Model B (see definition in Data and Design section).

Results

The test of endogeneity (ρ), reported in Table 3, is a two-tailed test on the correlation of the error terms between the two models. The expected sign for the endogeneity test statistic for the BASIS-24 scores is positive (negative for Total MH Costs) because omitted factors that make employment more likely should also make MH status better (Total MH Costs lower). A significant test statistic implies employment endogeneity is present and statistical control for endogeneity (i.e. FIML) is necessary; an insignificant result suggests control for endogeneity is unnecessary and a single equation Tobit (or OLS for Total Costs) is appropriate. Model A test statistics are significant for the Depression score (.4, .003), Relationship score (.23, .019), and the Overall MH score (.3, .009). The endogeneity test for the other three Model A outcome variables are in the expected direction but are insignificant; All Model B endogeneity tests are clearly insignificant. This insignificant test statistic result suggests that in our recursive model, the inclusion of a large number of individual characteristics as covariates obviates the need for

treating T2 employment as endogenous. In the case of the Model A outcomes, the Depression, Relationship, and Overall MH scores, the case for endogeneity is stronger.

The estimated main (β_1) and interaction (β_2) regression coefficients for T2 employment are presented in Table 3. In the FIML estimations for both Models A and B, the estimates of β_1 are insignificant for all MH status variables and Total MH Costs, though the Functioning score (.27, .101 two-tailed; Model A) and the Overall MH score (.27, .074 two-tailed; Model B) are both positive and marginally significant. The estimates of β_2 are all negative and clearly significant for models A and B for all status variables except Model A Emotional Lability, which is marginally significant (-.05, .119 two-tailed); Total MH Costs β_2 estimates are insignificant. The negative sign is consistent with the expectation that employment should have a stronger effect in improving mental health for persons with worse baseline mental health.

The single equation Tobit estimation coefficients differ from the FIML coefficients primarily in the results of the main (β_1) coefficients. All of the β_1 Tobit coefficient estimates are positive and clearly significant except Emotional Lability (.18, .058 two-tailed); the β_1 for the OLS Total MH Costs is negative and insignificant. The interaction coefficient (β_2) estimates are virtually identical to the FIML results for all outcome variables.

The last set of results in Table 3 is the calculated average marginal effects of employment. For the FIML results, the marginal effects of employment are negative and significant for Model A Depression (-.43, .023 two-tailed) and Relationships (-

.53, .033) scores and marginally significant for the Overall MH status (-.19, .107 two-tailed); all other FIML average marginal effects are insignificant. By contrast, the Tobit average marginal effects for MH status scores are all positive and significant except Emotional Lability (.06, .122 two-tailed); the average marginal effect is also negative and significant for Total MH Costs. The magnitudes of these marginal effects are considered in the conclusions section.

Conclusions

Endogeneity is an issue in estimating the causal relationship of employment status on Depression, Relationships, and Overall MH status for Model A only, but does not appear to be an issue with other Model A or all Model B MH status variables or Total MH Costs, in a specification that includes a high number of covariates. The three variations of local labor force conditions are strongly correlated with employment status and, with two exceptions, are uncorrelated with the outcome variables. In the estimations that do not test significantly for endogeneity, it is possible that the high number of covariates included in the model may be capturing what would otherwise be omitted variable bias. In the estimations that do test significantly for endogeneity, the average marginal effect changes from being positive and significant in the Tobit results to being negative and significant or marginally significant.

Second, the Tobit results for Functioning, Total MH Costs, and less so Emotional Lability are evidence that employment, measured as “currently working” or “not”, has an improving causal effect on specific aspects of MH status. Inferring a causal effect is appropriate because of the study design and the econometric method

used to control and test for endogeneity. A third conclusion is that the estimated causal effect of employment on MH status is mostly moderate in magnitude, but it also varies in effect size according to a person's pre-employment MH status. For example those with a lower Relationships score at the 25th percentile (1.61) have an estimated employment effect of .21 points whereas those with a higher Relationships score at the 75th percentile (3.0) have an estimated employment effect of .05 points. **[I need to update the numbers in this - to reflect updated estimations].**

Discussion

This study has strong generalizability due to the large sample size, but is limited by the study's requirement of three consecutive OMS records, which equates to approximately one year in the PMHS. The study population thus consists of more persisting PMHS users and is not representative of its more transient users. The type of employment is both competitive (77%) and non-competitive (23%) jobs and most (84%) competitive jobs had no record of supported employment services in the six months prior to employment.

Limitations to this study are a lack of more detailed information about employment and missing covariates (e.g. educational attainment, physical comorbidities, and a more detailed prior work history). Details about the work hours, pay, and type of job by sector, would all provide a better understanding of how employment impacts MH status. However, each of these employment variables would need to use some form of an IV estimation to test for potential endogeneity. Though possible, it will be difficult to both obtain this information and find adequate

instruments. Other missing covariates such as physical co-morbidities will be important to explore in future research. Finally, other dependent variables besides MH status and Total MH Costs, for example changes in specific MH service use and more specific costs (e.g. psychiatric inpatient costs), will give a more complete picture of the effects of employment on mental health.

This is the first study to attempt to control for potential endogeneity in measuring the impact of employment on MH status and addresses several study design issues that prevented previous studies from interpreting the estimated relationship as a causal one. The first two study design issues are the use of a contemporaneous measure of employment with MH status and not having lagged MH status. This study uses three time periods to ensure that the measure of lagged MH status at time 1 is prior to the measurement of employment at time 2, which is succeeded by the follow-up MH status at time 3. While several studies in the literature review do have subsequent MH status, e.g. (Bell et al., 1996; Burns et al., 2009), there remains the potential for omitted MH indicators that are consistent over time to bias results. The FIML estimation, using local labor force variables similarly to instrumental variables, allows us to control and test for endogeneity, and to interpret our findings as being causal in nature.

The implications are unclear of this study for results from prior studies, that have different designs and that may use a different measure of employment and different measures of MH status. Unlike prior studies, our model was able to contain a large number of covariates including county dummy variables, because of the large study population (N=5,). Another important difference between this study and

many others in the literature is this study was not part of a vocational service RCT. MH status could be impacted differently from employment obtained through a vocational service. Employment in this study is more broadly representative of the types of jobs held by persons with a SMI. The major differences between the current and prior studies indicate that endogeneity may still be an issue in prior studies and further research is necessary. The results from this study are mixed. It provides some evidence in support of moderate effects of employment on MH status. However, the endogeneity in the estimations of Depression, Relationships and Overall MH status is a caution for future studies measuring the effect of employment on MH status. Furthermore, our Model A estimations found some evidence of a negative impact of employment on MH status.

Policy-makers and service providers should consider the mostly positive (though mixed) effects on MH stats and Total MH Costs when deciding whether and how to provide vocational services for persons with SMI. The three estimations where endogeneity tests significantly and the effect is negative and significant (or close to) should not only be a caution to researchers, but suggests MH providers should coordinate care for patients with vocational rehabilitation (VR) providers and otherwise monitor employment for persons not in VR. Finally, the finding that beneficial effects of employment are greater for persons with worse pre-employment MH status is supportive of VR programs that provide services regardless of severity of MH status or other criteria; this should further prompt providers to encourage employment and vocational programs when persons being treated express interest.

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Table 1: Variable Definitions

DEPENDENT (OUTCOME) VARIABLES (All scores are cumulative between 0 (very poor) and 4 (best))	
<i>depr_T3</i>	Depression symptom score at Interview 3 (depression questions only)
<i>relat_T3</i>	Relationships score at Interview 3 (relationships questions only)
<i>funct_T3</i>	Functioning score at Interview 3 (functioning questions only)
<i>emot_T3</i>	Emotional lability symptom score at Interview 3 (emotional lability questions only)
<i>overall_T3</i>	Overall symptom score at interview 3 (based on ALL BASIS-24 questions)
<i>reimb_tot2</i>	Total Public Mental Health System reimbursements between OMS interviews 2 and 3
EXPLANATORY VARIABLES	
Baseline Values for Outcome Vars. (All scores are cumulative between 0 (very poor) and 4 (best))	
<i>depr_T1</i>	same as <i>depr_T3</i> but at OMS interview 1
<i>relat_T1</i>	same as <i>relat_T3</i> but at OMS interview 1
<i>funct_T1</i>	same as <i>funct_T3</i> but at OMS interview 1
<i>emot_T1</i>	same as <i>emot_T3</i> but at OMS interview 1
<i>overall_T1</i>	same as <i>overall_T3</i> but at OMS interview 1
<i>reimb_tot1</i>	Total Public Mental Health System reimbursements between OMS interviews 1 and 2
Individual Employment and Services Use	
<i>employed_T2</i>	1 if employed at OMS interview 2; 0 if Not
<i>pastemp</i>	1 if employed in 6 months prior to OMS interview 1
Other Baseline Mental Health and Diagnosis	
<i>subst_T1</i>	BASIS-24 Substance abuse score at OMS interview 1
<i>slfhm_T1</i>	BASIS-24 Self-harm score at OMS interview 1
<i>psyc_T1</i>	BASIS-24 Psychosis score at OMS interview 1
<i>schiz_dx</i>	1 if Primary diagnosis of schizophrenia (ICD-9 295)
<i>bip_dx</i>	1 if Primary diagnosis of bipolar (ICD-9 296 - 296.16; 296.4 - 296.89)
<i>dep_dx</i>	1 if Primary diagnosis of depression (ICD-9 296.2 - 296.36; 296.9 - 296.99; 300.4)
<i>othsmi_dx</i>	1 if primary diagnosis is 'other' SMI (see appendix for list)
PMHS Eligibility	
<i>elig_unins</i>	Uninsured and meets PMHS coverage requirements (doesn't include Med. Assist. (MA))
<i>elig_ssi</i>	Eligible by having Supplemental Security Income (SSI); (includes MA)
<i>elig_paa</i>	Eligible through Public Assistance to Adults (PAA), an income assistance program for those aged, blind, or disabled living in community-based residences. (Includes MA)
<i>elig_abd</i>	Eligible through being aged, blind or disabled (ABD); (Includes MA)
<i>elig_pac</i>	Eligible through Primary Adult Care (PAC); (Includes ambulatory care MA)
Clinic duration	
<i>clindur0</i>	1 if OMS interview 1 is an Intake/ First service visit at clinic
<i>clindur1</i>	1 if received services at the OMS interview 1 clinic for less than 1 year
<i>clindur2</i>	1 if received services at OMS interview 1 clinic for 1 year or more
Demographics	
<i>female</i>	1 if female
<i>black</i>	1 if non-hisp black
<i>white</i>	1 if non-hisp white
<i>other</i>	1 if other race
<i>age</i>	age in years, 18-55
Living Situation	
<i>liv_fam</i>	1 if Private residence with family or significant other
<i>liv_nfam</i>	1 if Private residence alone or with non-family roommates
<i>liv_grp</i>	1 If Residential rehabilitation facility
<i>liv_hless</i>	1 if Homeless
<i>liv_other</i>	1 if Other living situation
Local employment variables	
<i>emprate_zip</i>	employment rate at OMS interview 2 for each zipcode (from population not included in study because only had 2 OMS records)
<i>bpemprate_tract</i>	employment rate for those with income below the poverty threshold at the tract geographic level (American Community Survey data)
<i>unemprate_cnty</i>	County unemployment rate rate, 6 months prior to OMS interview 1

Table 2. Dependent variable summary statistics, by employment group (showing Model A only*)

vars.	Employed (n=749)				Not Employed (n=4,298)				T-Test	
	mean	sd	min	max	mean	sd	min	max	t-stat	p-value
<i>Dep variables</i>										
depr_T3	2.60	.88	0	4	2.31	.96	0	4	-7.47	<.001
relat_T3	2.60	.84	0	4	2.37	.91	0	4	-6.09	<.001
funct_T3	2.40	.72	.40	4	2.17	.73	0	4	-7.77	<.001
emot_T3	2.40	1.03	0	4	2.24	1.08	0	4	-3.60	<.001
overall_T3	2.80	.66	.53	4	2.59	.72	.22	4	-7.61	<.001
reimb_tot2 (thousands)	4.4	7.3	0	57.5	4.8	7.6	0	104.7	1.68	.094
<i>Lagged variables</i>										
depr_T1	2.33	.93	0	4	2.12	.99	0	4	-5.09	<.001
relat_T1	2.43	.89	0	4	2.26	.93	0	4	-4.72	<.001
funct_T1	2.20	.76	0	4	2.06	.75	0	4	-4.48	<.001
emot_T1	2.26	1.08	0	4	2.08	1.11	0	4	-4.01	<.001
overall_T1	2.60	.69	.71	4	2.43	.74	.24	4	-5.49	<.001
reimb_tot1 (thousands)	4.6	7.3	0	56.8	4.8	7.5	0	80.1	1.05	.296
<i>COVARIATES - Other baseline mental health / past employment</i>										
subst_T1	3.52	.74	0	4	3.56	.74	0	4	1.83	.068
slfhm_T1	3.67	.65	0	4	3.57	.79	0	4	-3.28	.001
psyc_T1	3.17	.92	0	4	2.97	1.03	0	4	-4.87	<.001
pastemp	.35	.48	0	1	.12	.32	0	1	-17.7	<.001
<i>Diagnosis</i>										
schiz_dx	.24	.43	0	1	.27	.44	0	1	2.26	.024
bip_dx	.26	.44	0	1	.24	.43	0	1	-1.43	.153
dep_dx	.34	.47	0	1	.37	.48	0	1	1.38	.166
othsmi_dx	.16	.37	0	1	.12	.33	0	1	-3.11	.002
<i>PMHS eligibility</i>										
elig_unins	.29	.45	0	1	.11	.31	0	1	-13.3	<.001
elig_ssi	.33	.47	0	1	.52	.50	0	1	9.8	<.001
elig_paa	.12	.32	0	1	.10	.30	0	1	-1.20	.229
elig_abd	.07	.25	0	1	.14	.34	0	1	5.43	<.001
elig_pac	.20	.40	0	1	.13	.34	0	1	-5.10	<.001
<i>Clinic duration</i>										
clindur0	.28	.45	0	1	.31	.46	0	1	1.14	.255
clindur1	.25	.43	0	1	.19	.39	0	1	-3.62	<.001
clindur2	.47	.50	0	1	.50	.50	0	1	1.85	.064
<i>Demographics</i>										
female	.48	.50	0	1	.58	.49	0	1	4.88	<.001
black	.34	.47	0	1	.41	.49	0	1	3.90	<.001
white	.44	.50	0	1	.49	.50	0	1	2.19	.029
other	.21	.41	0	1	.10	.30	0	1	-9.37	<.001
age (years)	36.1	10.7	18	55	40.1	10.2	18	55	9.9	<.001
<i>Local employment variables</i>										
emprate_zip	.14	.06	0	.375	.13	.05	0	.375	-6.31	<.001
bpemprate_tract	.32	.16	0	1	.29	.15	0	1	-6.13	<.001
unemprate_cnty	3.97	1.21	2.3	11	4.37	1.31	2.3	11	8.23	<.001

* Model A and Model B comparisons of summary statistics by employment group do not vary enough to warrant displaying both.

Table 3. Test of employment endogeneity, Coefficient results, and Average Marginal Effects (includes results from Model A and Model B)*

DV:	Depression		Relationships		Functioning		Emot. Lability		Overall score		Total Costs	
1. TEST OF ENDOGENEITY	t-stat	p-val.	t-stat	p-val.	t-stat	p-val.	t-stat	p-val.	t-stat	p-val.	t-stat	p-val.
Model A: Rho (correlation of error terms)	.439	.003	.457	.015	.030	.808	.143	.344	.306	.009	-.073	.682
Model B: Rho (correlation of error terms)	.262	.312	-.080	.700	.067	.551	.012	.908	.128	.304	.030	.685
COEFFICIENTS	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.
<i>FIML estimation coefficients**</i>	Probit/Tobit		Probit/Tobit		Probit/Tobit		Probit/Tobit		Probit/Tobit		Probit/OLS	
Mod A: main effect (β_1)	-.21	.382	-.32	.307	.27	.101	-.05	.836	.06	.679	.08	.755
Mod A: interaction effect (β_2)	-.11	.002	-.10	.012	-.07	.036	-.05	.119	-.10	.001	-.02	.414
Mod B: main effect (β_1)	.10	.799	.42	.194	.19	.186	.18	.338	.27	.074	-.01	.962
Mod B: interaction effect (β_2)	-.13	<.001	-.08	.010	-.06	.048	-.07	.018	-.12	<.001	-.03	.211
<i>Single eq. coefficients</i>	Tobit		Tobit		Tobit		Tobit		Tobit		OLS	
main effect (β_1)	.44	<.001	.40	<.001	.30	<.001	.18	.058	.40	<.001	-.023	.742
interaction effect (β_2)	-.12	<.001	-.12	.002	-.07	.047	-.06	.148	-.11	.001	-.02	.366
3. RESULTS: MARG. EFF.	ME	p-val.	ME	p-val.	ME	p-val.	ME	p-val.	ME	p-val.	ME***	p-val.
Mod A: FIML Avg. Marginal Effect of employment (β_1 & β_2)	-.43	.023	-.53	.033	.12	.386	-.15	.499	-.19	.107	.03	.916
Mod B: FIML Avg Marginal Effect of employment (β_1 & β_2)	-.18	.590	.22	.445	.06	.595	.03	.838	-.02	.900	-.07	.489
Single equation estimation - Avg. Marginal Effect of Employment (β_1 & β_2)	.16	<.001	.13	<.001	.15	<.001	.06	.122	.12	<.001	-.08	.025
N	5,163		5,193		5,192		5,201		5,125		5,174	

*Model A places persons in the Not Employed group those who report 'not currently working' at Interview 2 but who reported working sometime in the past 6 months between interviews 1 and 2 (N=384). Model B places the same N=384 persons into the Employed group for comparison purposes given the ambiguous classification of these persons.

** The coefficients from the 2nd equation of the Full Information Maximum Likelihood estimation (FIML) are presented. Each FIML estimation consists of a probit estimator for the 1st equation and a Tobit model for the 2nd equation (except OLS for Total Costs).

*** These marginal effects need to be retransformed. I will be addressing this issue in the talk. One way is to use the duan smearing method, however this is complicated by heteroskedasticity. Other options will be explored.

Table 4. FIML 2nd Stage covariate coefficients and p-values from Model A*

Var.	Depression		Relationships		Functioning		Emotional Lability		Overall		Total Costs	
	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.
pastemp	.13	.007	.02	.713	.04	.221	.06	.270	.08	.007	-.06	.277
reimb_tot1	.01	.569	-.03	.020	.01	.366	.04	.002	.00	.759	.74	.000
overall_T1	.86	0.000	.73	0.001	.36	0.020	.64	0.006	.86	0.000	.08	.686
depr_T1	-.04	.669	-.30	.001	-.05	.482	-.18	.090	-.21	.002	-.04	.631
relat_T1	-.08	.007	.23	.000	-.01	.731	-.06	.111	-.05	.021	-.02	.549
funct_T1	.15	.000	.08	.001	.33	.000	.03	.212	.09	.000	-.02	.270
emot_T1	-.05	.134	-.07	.062	-.03	.224	.27	.000	-.03	.220	-.01	.871
slfhm_T1	-.096	.001	-.073	.012	-.040	.068	-.08	.014	-.062	.002	-.017	.543
psyc_T1	-.02	.464	-.03	.200	-.01	.436	.04	.118	.02	.308	-.005	.840
subst_T1	-.09	.000	-.06	.004	-.04	.005	.00	.842	-.04	.002	-.03	.178
schiz_dx	.13	.000	-.03	.354	.05	.028	.16	.000	.08	.001	.11	.001
bip_dx	-.02	.567	-.03	.357	.001	.970	-.13	.000	-.04	.092	.05	.125
othsmi_dx	.01	.873	-.07	.054	-.04	.143	-.03	.527	.00	.925	-.07	.038
elig_un	.03	.583	-.13	.005	-.09	.019	-.03	.629	-.01	.688	-.19	.001
elig_paa	-.02	.722	-.04	.442	.07	.096	-.11	.093	-.03	.390	.49	.000
elig_abd	-.16	.000	-.09	.021	-.13	.000	-.18	.000	-.12	.000	-.09	.036
elig_pac	-.05	.249	-.12	.002	-.10	.003	-.13	.009	-.07	.015	-.14	.001
clin_intake	.03	.289	.07	.018	.03	.208	.02	.492	.02	.316	-.05	.149
clin_ltyr	.03	.369	.03	.341	.05	.030	.00	.918	.02	.432	.04	.259
female	-.071	.003	.000	.999	.00	.942	-.13	.000	-.039	.023	.00	.948
black	.12	.000	.00	.875	.05	.018	.01	.668	.06	.005	.00	.933
other	.09	.029	-.01	.785	.01	.699	.09	.058	.06	.052	.00	.917
age	-.004	.004	.002	.062	-.001	.157	.002	.087	-.001	.136	.00	.427
liv_nfam	-.04	.219	-.05	.141	.01	.605	.01	.697	-.02	.336	-.03	.382
liv_grp	.10	.037	.04	.430	.015	.677	.09	.103	.08	.021	.03	.622
liv_hless	.02	.759	-.02	.756	.05	.296	-.08	.243	-.02	.654	.04	.541
liv_other	-.05	.468	-.15	.017	-.012	.795	-.11	.112	-.06	.197	.00	.972
N	5,163		5,135		5,192		5,201		5,125		5,174	
Wald chi-sq	3482 <.001		1811 <.001		2899 <.001		3338.75 <.001		1119 <.001		15314 <.001	
AIC	15,937		16,424		13,497		17,539		16,424		16,374	
BIC	16,651		17,144		14,218		18,254		17,144		17,088	

*Model A and Model B Full Information Maximum Likelihood results do not differ substantially for the covariates.

Online Appendix

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A. Further description of methods

This study uses a full information maximum likelihood (FIML) estimation method. The method is performed using the Stata program `cmp`. The FIML equations are as follows:

Note that other dependent variable BASIS-24 scores (depression, relationships, functioning, emotional lability) are substituted for the overall score in Equation 2 and the employment variable is interacted with the lagged version of the dependent variable. Also, equation 2 below is ordinary least squares (OLS) for total mental health (MH) costs and the employment interaction is with the lagged version of total MH costs.

Eq. 1: FIML equation 1 using a probit for the binary dep. var. employment at T2

$$\text{employed_T2}_i = \psi_0 + \psi_1 \text{overall_T1}_i + \psi_2 \text{pastemp}_i + \psi'_a \text{diagnosis}_i + \psi'_b \text{PMHSEligibility}_i + \beta'_c \text{clinicduration}_i + \psi'_d \text{sociodemographics}_i + \psi'_e \text{livingsituation}_i + \psi'_f \text{laborforce}_i + \psi'_g \text{counties}_i + \epsilon_i$$

Eq. 2: FIML equation 2 using 2-limit tobit for MH status at T3 [overall MH status is presented here; similar models are used for the other MH status measures]

$$\text{overall_T3}_i = \beta_0 + \beta_1 \text{employed_T2}_i + \beta_2 \text{employed_T2} * \text{overall_T1}_i + \beta_3 \text{overall_T1}_i + \beta_4 \text{pastemp}_i + \beta'_a \text{diagnosis}_i + \beta'_b \text{PMHSEligibility}_i + \beta'_c \text{clinicduration}_i + \beta'_d \text{sociodemographics}_i + \beta'_e \text{livingsituation}_i + \beta'_f \text{counties}_i + \epsilon_i$$

Equation 1 is a probit regression on *employed_T2*. *Overall_T1* is a measure of MH status at time 1 and *pastemp* indicates whether or not individuals worked in the six months prior to time 1. Other covariate groups have coefficient groups $\psi'_a - \psi'_h$, and ϵ represents the error term for each individual, estimated jointly with equation 2. Equation 2 models the continuous but truncated dependent variable *overall_T3* (also, substitute *depr_T3*, *relat_T3*, *func_T3*, and *emot_T3*) with a two-limit tobit estimator. For Total MH Costs, Equation 2 is estimated using OLS. Both a “main” treatment effect (β_1) and an interaction effect (β_2) between the employment “treatment” dummy and the baseline value of the dependent variable measure of MH status are specified.

B. Full Probit Marginal Effects for both Model A and Model B

DV: employed_T2	Model A		Model B	
	Avg. Marg. Effect	P-value	Avg. Marg. Effect	P-value
female	-.016	.092	-.015	.156
black	.008	.507	.014	.273
other	.035	.020	.016	.359
ageB	-.003	<.001	-.004	<.001
pastemp	.122	<.001	.195	<.001
overall_T1	.042	.619	.068	.452
depr_T1	-.008	.840	-.017	.675
funct_T1	.016	.072	.016	.088
relat_T1	-.003	.830	-.003	.853
psyc_T1	.001	.946	-.001	.877
slfhm_T1	-.002	.835	-.007	.598
subst_T1	-.016	.049	-.027	.002
emot_T1	-.002	.892	-.006	.666
reimb_tot1	-.0001	.977	-.004	.461
clin_intake	-.061	.000	-.049	<.001
clin_ltyr	-.003	.825	-.0004	.977
schiz_dx	-.009	.537	-.007	.651
bip_dx	-.003	.779	.009	.495
othsmi_dx	.024	.092	.023	.162
elig_un	.129	<.001	.154	<.001
elig_paa	-.017	.454	.011	.656
elig_abd	-.012	.482	-.006	.729
elig_pac	.092	<.001	.103	<.001
liv_nfam	-.013	.339	-.005	.704
liv_grp	.076	<.001	.076	<.001
liv_hless	-.001	.952	.009	.716
liv_other	.024	.345	.061	.020
cnty_allegany	-.035	.175	-.046	.099
cnty_annarundel	-.146	<.001	-.158	<.001
cnty_baltimore	-.080	.009	-.064	.044
cnty_calvert	-.159	.001	-.174	.001
cnty_caroline	-.181	.002	-.200	.001
cnty_carroll	-.067	.134	-.043	.359
cnty_cecil	-.074	.088	-.078	.103
cnty_charles	-.065	.266	-.064	.326

cnty_dorchester	-0.051	.289	-0.034	.499
cnty_frederick	-.119	.006	-.116	.009
cnty_garrett	-.163	.002	-.072	.100
cnty_harford	-.128	.001	-.089	.029
cnty_howard	-.119	.021	-.090	.096
cnty_kent	-.103	.050	-.094	.092
cnty_montgomery	-.158	<.001	-.137	.002
cnty_princegeorges	-.113	.001	-.120	.000
cnty_queenannes	-.093	.140	-.089	.200
cnty_stmarys	-.185	<.001	-.166	.002
cnty_somerset	-.090	.258	-.089	.273
cnty_talbot	-.116	.052	-.089	.158
cnty_washington	-.081	.025	-.094	.017
cnty_wicomico	-.080	.031	-.044	.251
cnty_worcester	.017	.708	.002	.964
emprate_zip	.213	.052	.221	.060
bpemprate_tract	.117	<.001	.120	<.001
unemprate_cnty	-.052	<.001	-.050	<.001
N	5,143		5,143	
LR chi-sq	553.59 <.001		770.03 <.001	
AIC	3,823		4,336	
BIC	4,177		4,689	

C. Full FIML (Full Information Maximum Likelihood) Results (Coefficients) for both Model A and Model B of Outcome Variables Depression, Relationships, and Functioning

	Depression				Relationships				Functioning			
	Model A		Model B		Model A*		Model B		Model A		Model B	
Eq. 2	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.
employed_T2	-.21	.382	.10	.799	-.32	.307	.42	.194	.27	.101	.19	.186
employed_T2*lagDV	-.11	.002	-.13	<.001	-.10	.012	-.08	.010	-.07	.036	-.06	.048
pastemp	.13	.007	.11	.316	.18	.001	.03	.773	.04	.221	.05	.286
reimb_tot1	.01	.569	.01	.577	-.03	.023	-.02	.032	.01	.366	.01	.377
overall_T1	.86	<.001	.86	<.001	.74	.001	.71	.001	.36	.020	.37	.019
depr_T1	-.04	.669	-.04	.699	-.30	.002	-.29	.002	-.05	.482	-.05	.476
relat_T1	-.08	.007	-.08	.006	.23	<.001	.23	<.001	-.01	.731	-.01	.717
funct_T1	.15	<.001	.14	<.001	.09	<.001	.08	<.001	.33	<.001	.34	<.001
emot_T1	-.05	.134	-.05	.116	-.06	.086	-.06	.082	-.03	.224	-.03	.218
slfhm_T1	-.10	.001	-.10	.001	-.07	.015	-.07	.014	-.04	.068	-.04	.068
psyc_T1	-.02	.464	-.02	.411	-.03	.245	-.03	.244	-.01	.436	-.01	.435
subst_T1	-.09	<.001	-.09	<.001	-.07	.001	-.06	.007	-.04	.005	-.04	.006
schiz_dx	.13	<.001	.13	<.001	-.04	.257	-.03	.359	.05	.028	.05	.032
bip_dx	-.02	.567	-.01	.669	-.03	.301	-.03	.301	.001	.970	.001	.973
othsmi_dx	.01	.873	-.003	.937	-.04	.269	-.06	.111	-.04	.143	-.04	.153
elig_un	.03	.583	-.01	.932	.03	.607	-.09	.170	-.09	.019	-.09	.028
elig_paa	-.02	.722	-.004	.946	-.08	.201	-.06	.271	.07	.096	.07	.109
elig_abd	-.16	<.001	-.16	<.001	-.10	.015	-.09	.016	-.13	<.001	-.13	<.001
elig_pac	-.05	.249	-.07	.170	-.03	.521	-.11	.029	-.10	.003	-.09	.004
clin_intake	.03	.289	.05	.137	.01	.785	.06	.101	.03	.208	.03	.256
clin_ltyr	.03	.369	.03	.369	.03	.347	.03	.335	.05	.030	.05	.030
female	-.07	.003	-.07	.005	-.01	.619	-.001	.960	.001	.942	-.0001	.997
black	.12	<.001	.12	<.001	.008	.789	-.0005	.987	.05	.018	.05	.019
other	.09	.029	.08	.072	.04	.329	.01	.854	.01	.699	.02	.598
age	-.004	.004	-.003	.093	-.0004	.751	.002	.232	-.001	.157	-.001	.186
liv_nfam	-.04	.219	-.03	.279	-.06	.049	-.06	.063	.01	.605	.01	.636
liv_grp	.10	.037	.08	.142	.13	.020	.06	.249	.01	.677	.02	.579
liv_hless	.02	.759	.03	.665	-.03	.570	-.03	.610	.05	.296	.04	.335
liv_other	-.05	.468	-.05	.473	-.13	.046	-.16	.015	-.01	.795	-.02	.735
cnty_allegany	.07	.247	.06	.272	.20	.001	.21	<.001	-.07	.109	-.07	.106
cnty_annarundel	-.01	.882	-.01	.897	.12	.230	.23	.021	.04	.605	.03	.667
cnty_baltimore	-.01	.883	-.02	.695	.13	.072	.16	.018	.06	.243	.06	.272
cnty_calvert	.06	.440	.05	.540	.27	.020	.35	.002	.14	.104	.13	.114
cnty_caroline	-.04	.701	-.03	.769	.01	.953	.11	.407	-.06	.537	-.06	.484

cnty_carroll	.15	.054	.12	.157	.47	<.001	.47	<.001	.002	.976	.0003	.997
cnty_cecil	.03	.760	.02	.822	.31	.011	.36	.004	.01	.872	.01	.904
cnty_charles	.14	.245	.10	.370	.31	.039	.32	.030	.09	.426	.10	.418
cnty_dorchester	-.19	.077	-.19	.073	-.04	.743	-.02	.861	-.11	.114	-.12	.096
cnty_frederick	.09	.132	.08	.177	.32	.002	.38	<.001	.20	.007	.20	.008
cnty_garrett	.01	.877	.04	.676	.28	.004	.36	<.001	.12	.128	.11	.158
cnty_harford	-.06	.368	-.06	.397	.18	.061	.24	.010	.04	.592	.03	.662
cnty_howard	.11	.237	.09	.349	.33	.009	.37	.002	.15	.104	.15	.116
cnty_kent	.10	.276	.10	.293	.20	.094	.25	.035	.13	.133	.13	.142
cnty_montgomery	.004	.918	-.003	.946	.16	.105	.24	.012	.16	.024	.15	.029
cnty_princegeorges	.01	.772	.01	.794	.14	.078	.22	.006	.02	.687	.02	.744
cnty_queenannes	.22	.106	.18	.193	.29	.078	.29	.091	.16	.239	.16	.235
cnty_stmarys	-.04	.677	-.03	.691	.07	.570	.18	.141	.01	.917	.001	.986
cnty_somerset	-.05	.708	-.04	.764	-.19	.177	-.15	.248	.10	.297	.10	.311
cnty_talbot	-.02	.884	-.03	.796	.14	.325	.18	.161	-.02	.839	-.03	.800
cnty_washington	-.06	.407	-.07	.330	.13	.154	.18	.049	.04	.512	.04	.539
cnty_wicomico	.12	.087	.11	.174	.23	.007	.23	.005	.15	.028	.14	.033
cnty_worcester	.34	.001	.32	.002	.34	.002	.29	.006	.07	.440	.08	.415
unemprate_cnty					.04	.174	.07	.009	.04	.046	.04	.057
Eq. 1												
female	-.08	.082	-.06	.160	-.07	.120	-.07	.143	-.09	.079	-.07	.147
black	.03	.636	.06	.297	.03	.652	.06	.278	.04	.505	.06	.261
other	.17	.026	.07	.369	.16	.037	.07	.347	.17	.022	.07	.359
age	-.01	<.001	-.02	<.001	-.01	<.001	-.02	<.001	-.01	<.001	-.02	<.001
pastemp	.61	<.001	.86	<.001	.60	<.001	.85	<.001	.61	<.001	.85	<.001
overall_T1	.07	.868	.24	.542	.04	.924	.30	.453	.22	.610	.31	.440
depr_T1	.04	.831	-.04	.820	.04	.837	-.08	.666	-.04	.827	-.08	.656
funct_T1	.08	.055	.08	.071	.08	.063	.07	.091	.08	.067	.07	.080
relat_T1	.003	.957	-.01	.911	.02	.752	-.01	.863	-.02	.810	-.01	.856
psyc_T1	.01	.892	-.01	.900	.01	.846	-.004	.918	.001	.991	-.01	.836
slfhm_T1	.01	.883	-.02	.698	.00	.968	-.03	.620	-.005	.939	-.02	.686
subst_T1	-.08	.073	-.12	.002	-.08	.067	-.12	.002	-.08	.046	-.12	.002
emot_T1	.01	.902	-.02	.731	.02	.832	-.03	.665	-.01	.877	-.03	.644
reimb_tot1	-.004	.866	-.02	.385	.009	.688	-.02	.440	-.002	.926	-.02	.424
clin_intake	-.30	<.001	-.22	.000	-.32	<.001	-.22	<.001	-.31	<.001	-.22	<.001
clin_ltyr	-.03	.668	-.01	.891	-.03	.586	-.005	.938	-.02	.791	-.001	.982
schiz_dx	-.05	.443	-.04	.580	-.04	.538	-.03	.649	-.05	.530	-.03	.660
bip_dx	-.02	.715	.03	.548	.004	.945	.04	.524	-.02	.772	.04	.481
othsmi_dx	.14	.058	.11	.119	.14	.056	.10	.175	.12	.088	.10	.142
elig_un	.64	<.001	.67	<.001	.64	<.001	.68	<.001	.65	<.001	.67	<.001
elig_paa	-.08	.466	.05	.647	-.11	.343	.05	.627	-.08	.509	.06	.606
elig_abd	-.06	.488	-.03	.737	-.07	.404	-.03	.751	-.06	.497	-.03	.725
elig_pac	.46	<.001	.46	.000	.45	<.001	.45	<.001	.46	<.001	.45	<.001

liv_nfam	-0.03	.614	-.02	.784	-.08	.200	-.02	.739	-.06	.348	-.02	.715
liv_grp	.40	<.001	.34	<.001	.38	<.001	.33	<.001	.38	<.001	.33	<.001
liv_hless	.02	.848	.05	.631	.02	.837	.04	.718	-.01	.953	.04	.700
liv_other	.13	.304	.27	.019	.10	.418	.27	.020	.12	.354	.27	.021
cnty_allegany	-.19	.128	-.22	.075	-.18	.161	-.20	.100	-.17	.176	-.20	.100
cnty_annarundel	-.74	<.001	-.73	<.001	-.74	<.001	-.69	<.001	-.73	<.001	-.69	<.001
cnty_baltimore	-.42	.004	-.30	.029	-.43	.004	-.28	.050	-.41	.009	-.28	.043
cnty_calvert	-.82	<.001	-.81	<.001	-.82	<.001	-.76	.001	-.80	.001	-.76	.001
cnty_caroline	-.84	.003	-.86	.001	-.72	.011	-.91	.002	-.91	.002	-.87	.001
cnty_carroll	-.34	.124	-.21	.307	-.31	.158	-.19	.355	-.33	.142	-.18	.382
cnty_cecil	-.36	.093	-.34	.114	-.37	.085	-.34	.104	-.37	.089	-.34	.106
cnty_charles	-.36	.212	-.32	.251	-.34	.242	-.28	.330	-.33	.273	-.28	.329
cnty_dorchester	-.22	.335	-.12	.579	-.22	.348	-.16	.476	-.25	.294	-.15	.505
cnty_frederick	-.65	.002	-.56	.004	-.64	.002	-.51	.010	-.59	.007	-.50	.011
cnty_garrett	-.91	<.001	-.35	.070	-.82	.001	-.32	.099	-.82	.002	-.32	.100
cnty_harford	-.63	.001	-.40	.025	-.66	.001	-.39	.029	-.64	.002	-.39	.031
cnty_howard	-.64	.010	-.43	.071	-.58	.023	-.39	.099	-.60	.022	-.39	.099
cnty_kent	-.49	.062	-.44	.075	-.47	.070	-.42	.088	-.48	.069	-.43	.085
cnty_montgomery	-.82	.000	-.64	.001	-.81	<.001	-.60	.002	-.79	<.001	-.60	.002
cnty_princegeorges	-.59	.000	-.55	<.001	-.57	<.001	-.52	.001	-.57	.001	-.52	<.001
cnty_queenannes	-.48	.121	-.43	.150	-.42	.178	-.40	.192	-.45	.149	-.38	.213
cnty_stmarys	-.98	<.001	-.76	.001	-.94	<.001	-.73	.002	-.93	<.001	-.72	.002
cnty_somerset	-.51	.192	-.44	.226	-.43	.249	-.39	.269	-.46	.255	-.39	.274
cnty_talbot	-.58	.046	-.42	.126	-.58	.039	-.39	.155	-.58	.055	-.38	.169
cnty_washington	-.43	.016	-.43	.014	-.40	.022	-.41	.017	-.41	.026	-.40	.019
cnty_wicomico	-.39	.030	-.20	.242	-.38	.035	-.20	.245	-.40	.033	-.19	.265
cnty_worcester	.07	.755	.01	.981	.04	.862	.02	.942	.09	.712	.01	.969
emprate_zip	1.03	.052	.96	.060	.89	.092	1.01	.055	1.04	.061	.94	.067
bpemprate_tract	.57	<.001	.52	.001	.52	.001	.52	<.001	.59	<.001	.53	<.001
unemprate_cnty	-.26	<.001	-.23	<.001	-.26	<.001	-.22	<.001	-.26	<.001	-.22	<.001
N	5,163		5,163		5,193		5,193		5,192		5,192	
Wald chi-sq	3482	<.001	3638	<.001	1826	<.001	1960	<.001	2899	<.001	3084	<.001
AIC	15,937		16,441		16,585		17,108		13,497		14,013	
BIC	16,651		17,155		17,306		17,829		14,218		14,734	

D. Full FIML (Full Information Maximum Likelihood) Results (Coefficients) for both Model A and Model B of Outcome Variables Emotional Lability, Overall MH Score, and Total Costs

	Emotional Lability				Overall MH Score				Total Costs			
	Model A		Model B		Model A		Model B		Model A		Model B	
Eq. 2	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.
employed_T2	-.05	.836	.18	.338	.06	.679	.27	.074	.08	.755	-.01	.962
employed_T2*lagDV	-.05	.119	-.07	.018	-.10	.001	-.12	<.001	-.02	.414	-.03	.211
pastemp	.06	.270	.03	.665	.08	.007	.06	.181	-.06	.277	-.03	.454
reimb_tot1	.04	.002	.04	.002	.002	.759	.003	.722	.74	<.001	.74	<.001
overall_T1	.64	.006	.64	.006	.86	<.001	.87	<.001	.08	.686	.08	.678
depr_T1	-.18	.090	-.18	.089	-.21	.002	-.21	.001	-.04	.631	-.04	.632
relat_T1	-.06	.111	-.06	.111	-.05	.021	-.05	.019	-.02	.549	-.02	.559
funct_T1	.03	.212	.03	.257	.09	<.001	.08	<.001	-.02	.270	-.02	.291
emot_T1	.27	.000	.27	<.001	-.03	.220	-.03	.209	-.01	.871	-.01	.879
slfhm_T1	-.08	.014	-.08	.013	-.06	.002	-.06	.001	-.02	.543	-.02	.540
psyc_T1	.04	.118	.04	.120	.02	.308	.01	.335	-.005	.840	-.004	.847
subst_T1	.005	.842	.01	.710	-.04	.002	-.04	.005	-.03	.178	-.03	.148
schiz_dx	.16	<.001	.16	<.001	.08	.001	.08	.001	.11	.001	.11	.002
bip_dx	-.13	<.001	-.13	<.001	-.04	.092	-.03	.108	.05	.125	.05	.126
othsmi_dx	-.03	.527	-.03	.452	.003	.925	-.003	.924	-.07	.038	-.07	.040
elig_un	-.03	.629	-.06	.283	-.01	.688	-.04	.267	-.19	.001	-.18	<.001
elig_paa	-.11	.093	-.10	.114	-.03	.390	-.03	.482	.49	.000	.49	<.001
elig_abd	-.18	<.001	-.18	<.001	-.12	<.001	-.12	<.001	-.09	.036	-.09	.034
elig_pac	-.13	.009	-.15	.002	-.07	.015	-.09	.003	-.14	.001	-.14	.001
clin_intake	.02	.492	.04	.300	.02	.316	.03	.133	-.05	.149	-.05	.082
clin_ltyr	.003	.918	.002	.958	.02	.432	.02	.431	.04	.259	.04	.252
female	-.13	<.001	-.13	<.001	-.04	.023	-.04	.029	.002	.948	.0001	.996
black	.01	.668	.01	.720	.06	.005	.06	.006	-.002	.933	-.001	.973
other	.09	.058	.08	.076	.06	.052	.05	.100	.005	.917	.01	.830
age	.002	.087	.003	.039	-.001	.136	-.001	.381	-.001	.427	-.002	.241
liv_nfam	.01	.697	.02	.649	-.02	.336	-.02	.387	-.03	.382	-.03	.380
liv_grp	.09	.103	.07	.171	.08	.021	.06	.061	.03	.622	.04	.492
liv_hless	-.08	.243	-.07	.266	-.02	.654	-.02	.696	.04	.541	.04	.538
liv_other	-.11	.112	-.12	.092	-.06	.197	-.06	.159	-.003	.972	.002	.983
cnty_allegany	-.01	.927	-.01	.897	.06	.158	.06	.171	-.07	.218	-.07	.221
cnty_annarundel	.06	.310	.06	.290	.0002	.996	.002	.958	-.12	.028	-.12	.026
cnty_baltimore	-.03	.480	-.04	.347	.003	.911	-.01	.842	-.05	.232	-.04	.275
cnty_calvert	-.06	.444	-.07	.392	.04	.494	.03	.576	-.01	.858	-.01	.889
cnty_caroline	.17	.136	.18	.114	.01	.944	.01	.867	-.06	.572	-.06	.521

cnty_carroll	.01	.926	-.02	.847	.12	.044	.10	.101	-.13	.146	-.11	.173
cnty_ceil	-.06	.563	-.06	.539	-.002	.970	-.01	.921	-.08	.393	-.08	.402
cnty_charles	.11	.365	.08	.473	.11	.267	.08	.376	-.04	.795	-.03	.851
cnty_dorchester	-.11	.311	-.11	.316	-.12	.107	-.12	.104	.15	.111	.15	.111
cnty_frederick	.03	.689	.02	.784	.07	.092	.07	.122	-.07	.269	-.07	.290
cnty_garrett	-.06	.606	-.05	.655	.04	.584	.05	.477	.01	.931	.01	.929
cnty_harford	-.20	.006	-.21	.005	-.05	.286	-.05	.240	.11	.046	.12	.036
cnty_howard	.03	.746	.01	.886	.08	.180	.07	.281	-.13	.228	-.12	.260
cnty_kent	.08	.465	.07	.518	.05	.508	.04	.544	-.17	.047	-.16	.052
cnty_montgomery	-.01	.761	-.02	.617	-.01	.790	-.01	.635	-.01	.877	-.003	.950
cnty_princegeorges	-.04	.439	-.04	.431	.02	.669	.02	.647	-.02	.722	-.02	.712
cnty_queenannes	.20	.143	.18	.203	.17	.099	.15	.148	-.05	.681	-.04	.759
cnty_stmarys	-.16	.128	-.16	.127	-.05	.426	-.05	.431	-.17	.050	-.17	.049
cnty_somerset	-.25	.091	-.24	.097	-.04	.704	-.03	.740	.20	.162	.20	.165
cnty_talbot	-.08	.540	-.09	.466	-.02	.813	-.03	.726	-.22	.126	-.21	.129
cnty_washington	-.15	.085	-.15	.080	-.05	.333	-.05	.301	-.03	.674	-.03	.682
cnty_wicomico	.01	.909	-.01	.924	.06	.242	.04	.385	-.15	.036	-.14	.043
cnty_worcester	.18	.145	.17	.178	.24	.004	.22	.006	-.03	.728	-.03	.763
Eq. 1												
female	-.08	.089	-.07	.157	-.08	.128	-.06	.207	-.08	.096	-.07	.156
black	.04	.544	.06	.274	.03	.576	.06	.258	.04	.535	.06	.322
other	.18	.018	.07	.358	.17	.024	.07	.345	.18	.019	.07	.335
age	-.01	<.001	-.02	<.001	-.01	<.001	-.02	<.001	-.01	<.001	-.02	<.001
pastemp	.61	<.001	.85	<.001	.60	<.001	.85	<.001	.60	<.001	.84	<.001
overall_T1	.21	.620	.30	.451	.07	.868	.24	.548	.21	.629	.27	.508
depr_T1	-.04	.853	-.08	.675	.04	.852	-.04	.815	-.03	.865	-.06	.750
funct_T1	.08	.079	.07	.089	.10	.027	.08	.045	.07	.101	.07	.112
relat_T1	-.01	.847	-.01	.853	.002	.976	-.01	.893	-.01	.828	-.01	.919
psyc_T1	.002	.958	-.01	.875	.02	.714	.001	.986	.01	.896	-.002	.953
slfhm_T1	-.01	.863	-.03	.599	.001	.993	-.03	.648	-.01	.875	-.02	.658
subst_T1	-.08	.053	-.12	.002	-.08	.050	-.12	.002	-.08	.062	-.12	.003
emot_T1	-.01	.883	-.03	.665	.004	.958	-.03	.703	-.01	.891	-.02	.718
reimb_tot1	.0003	.990	-.02	.463	-.001	.967	-.02	.461	-.002	.919	-.02	.479
clin_intake	-.30	<.001	-.22	<.001	-.31	<.001	-.22	<.001	-.30	<.001	-.21	<.001
clin_ltyr	-.02	.778	-.002	.973	-.03	.659	-.01	.921	-.02	.793	-.001	.987
schiz_dx	-.05	.487	-.03	.647	-.04	.559	-.02	.707	-.04	.612	-.03	.691
bip_dx	-.02	.730	.04	.499	-.02	.764	.04	.529	-.02	.763	.03	.568
othsmi_dx	.12	.109	.10	.165	.14	.060	.11	.117	.12	.119	.09	.234
elig_un	.65	<.001	.68	<.001	.64	<.001	.67	<.001	.66	<.001	.68	<.001
elig_paa	-.09	.437	.05	.658	-.08	.468	.06	.583	-.08	.523	.05	.660
elig_abd	-.07	.457	-.03	.727	-.05	.548	-.02	.811	-.06	.502	-.03	.744
elig_pac	.47	<.001	.45	<.001	.47	<.001	.46	<.001	.46	<.001	.45	<.001

liv_nfam	-.06	.352	-.02	.704	-.06	.409	-.03	.686	-.06	.377	-.02	.729
liv_grp	.39	<.001	.33	<.001	.39	<.001	.33	<.001	.37	<.001	.33	<.001
liv_hless	.004	.977	.04	.713	-.002	.990	.03	.764	-.02	.894	.04	.700
liv_other	.13	.325	.27	.020	.14	.261	.27	.022	.12	.368	.27	.019
cnty_allegany	-.18	.169	-.20	.098	-.20	.135	-.21	.088	-.18	.167	-.20	.101
cnty_annarundel	-.75	<.001	-.70	.000	-.77	<.001	-.73	<.001	-.77	.001	-.69	<.001
cnty_baltimore	-.41	.007	-.28	.045	-.45	.002	-.31	.026	-.43	.011	-.29	.043
cnty_calvert	-.81	.001	-.76	.001	-.86	<.001	-.81	<.001	-.84	.001	-.76	.001
cnty_caroline	-.92	.002	-.88	.001	-.88	.003	-.88	.001	-.93	.002	-.88	.001
cnty_carroll	-.35	.120	-.19	.358	-.37	.096	-.21	.310	-.37	.120	-.19	.350
cnty_cecil	-.37	.084	-.34	.103	-.40	.064	-.35	.090	-.40	.079	-.34	.106
cnty_charles	-.35	.236	-.28	.326	-.34	.236	-.26	.342	-.33	.286	-.24	.398
cnty_dorchester	-.26	.284	-.15	.498	-.32	.205	-.19	.385	-.25	.295	-.14	.534
cnty_frederick	-.62	.004	-.51	.010	-.67	.001	-.55	.005	-.63	.007	-.51	.010
cnty_garrett	-.83	.001	-.32	.100	-.89	.001	-.34	.115	-.84	.002	-.31	.109
cnty_harford	-.66	.001	-.39	.029	-.69	<.001	-.43	.019	-.69	.002	-.40	.031
cnty_howard	-.63	.015	-.40	.100	-.67	.007	-.43	.071	-.64	.019	-.40	.097
cnty_kent	-.53	.046	-.41	.092	-.54	.032	-.45	.063	-.54	.047	-.41	.096
cnty_montgomery	-.81	<.001	-.60	.002	-.87	<.001	-.65	.001	-.83	<.001	-.60	.002
cnty_princegeorges	-.58	<.001	-.53	.001	-.62	<.001	-.56	.000	-.60	.001	-.52	.001
cnty_queenannes	-.48	.127	-.39	.200	-.53	.097	-.44	.154	-.50	.129	-.39	.208
cnty_stmarys	-.95	<.001	-.73	.002	-.98	<.001	-.75	.002	-.97	<.001	-.73	.002
cnty_somerset	-.47	.238	-.39	.272	-.50	.208	-.42	.235	-.47	.248	-.38	.283
cnty_talbot	-.60	.045	-.39	.158	-.63	.046	-.43	.144	-.62	.046	-.39	.159
cnty_washington	-.41	.025	-.41	.017	-.48	.009	-.47	.008	-.41	.029	-.39	.023
cnty_wicomico	-.40	.028	-.19	.250	-.41	.020	-.21	.224	-.43	.032	-.19	.260
cnty_worcester	.10	.674	.01	.961	.07	.776	-.003	.990	.07	.789	.01	.958
emprate_zip	1.07	.050	.97	.060	1.16	.036	1.06	.048	1.04	.062	.96	.064
bpemprate_tract	.59	<.001	.53	<.001	.57	<.001	.51	.001	.58	<.001	.53	<.001
unemprate_cnty	-.26	<.001	-.22	<.001	-.27	<.001	-.23	<.001	-.27	<.001	-.22	<.001
N	5,201		5,201		5,125		5,125		5,174		5,174	
Wald chi-sq	3339	<.001	3592	<.001	2971	<.001	3246	<.001	15314	<.001	15604	<.001
AIC	17,539		18,051		12,502		13,016		16,374		16,888	
BIC	18,254		18,765		13,215		13,729		17,088		17,602	

E. Full Tobit coefficients for Outcomes Depression, Relationships, and Functioning presented for Model A and Model B

Vars.	Depression				Relationships				Functioning			
	Model A		Model B		Model A*		Model B		Model A		Model B	
	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.
employed_T2	.44	<.001	.46	.000	.41	<.001	.30	.001	.30	<.001	.26	<.001
employed_T2*lagDV	-.12	<.001	-.14	.000	-.12	.002	-.08	.013	-.07	.047	-.06	.052
pastemp	.02	.492	.004	.910	.07	.053	.06	.097	.04	.160	.03	.343
reimb_tot1	.01	.529	.01	.487	-.03	.012	-.03	.013	.01	.374	.01	.358
overall_T1	.89	<.001	.89	.000	.77	<.001	.76	<.001	.37	.019	.37	.019
depr_T1	-.05	.564	-.05	.620	-.32	.001	-.32	.001	-.05	.467	-.05	.468
relat_T1	-.09	.005	-.09	.004	.24	<.001	.24	<.001	-.01	.745	-.01	.727
funct_T1	.14	<.001	.14	.000	.09	<.001	.09	<.001	.34	<.001	.34	.000
emot_T1	-.06	.093	-.06	.094	-.06	.075	-.06	.077	-.03	.222	-.03	.220
sifhm_T1	-.11	<.001	-.11	.000	-.08	.007	-.08	.007	-.04	.060	-.04	.061
psyc_T1	-.02	.390	-.02	.362	-.03	.156	-.03	.165	-.01	.423	-.01	.425
subst_T1	-.08	<.001	-.08	.000	-.07	.002	-.07	.002	-.04	.005	-.04	.007
schiz_dx	.14	<.001	.14	.000	-.03	.386	-.03	.370	.05	.029	.05	.032
bip_dx	-.01	.677	-.01	.658	-.03	.342	-.03	.334	.0005	.984	-.0004	.986
othsmi_dx	-.01	.748	-.01	.745	-.07	.080	-.07	.085	-.04	.110	-.04	.115
elig_un	-.06	.160	-.07	.120	-.07	.088	-.07	.086	-.10	.004	-.10	.003
elig_paa	-.001	.991	-.004	.944	-.06	.283	-.07	.264	.07	.089	.07	.110
elig_abd	-.16	<.001	-.16	.000	-.10	.013	-.10	.013	-.13	<.001	-.13	<.001
elig_pac	-.11	.004	-.11	.004	-.10	.014	-.10	.014	-.10	.001	-.10	.001
clin_intake	.08	.009	.07	.011	.06	.073	.05	.086	.03	.152	.03	.178
clin_ltyr	.03	.350	.03	.340	.03	.309	.03	.302	.05	.030	.05	.030
female	-.07	.005	-.07	.004	-.0001	.996	-.001	.983	.002	.910	.001	.950
black	.12	<.001	.11	.000	.01	.841	.004	.897	.05	.018	.05	.020
other	.06	.141	.07	.110	.01	.847	.01	.779	.01	.684	.02	.589
age	-.002	.112	-.002	.178	.002	.131	.002	.107	-.001	.160	-.001	.243
liv_nfam	-.03	.325	-.03	.319	-.06	.062	-.06	.055	.01	.583	.01	.618
liv_grp	.05	.289	.05	.291	.07	.145	.08	.131	.01	.722	.01	.684
liv_hless	.03	.581	.03	.595	-.03	.656	-.03	.589	.05	.291	.04	.331
liv_other	-.06	.347	-.07	.268	-.16	.015	-.16	.013	-.01	.829	-.02	.705
cnty_allegany	.06	.300	.06	.282	.23	<.001	.23	<.001	-.07	.118	-.07	.122
cnty_annarundel	-.003	.953	.001	.992	.23	.013	.23	.015	.05	.512	.05	.517
cnty_baltimore	-.04	.337	-.04	.310	.18	.011	.17	.014	.06	.222	.06	.247
cnty_calvert	.04	.577	.05	.548	.36	.002	.36	.002	.14	.084	.14	.082
cnty_caroline	-.01	.895	-.01	.883	.12	.361	.12	.375	-.05	.603	-.05	.592
cnty_carroll	.07	.308	.07	.352	.51	<.001	.50	<.001	.004	.959	.0003	.997

cnty_cecil	.02	.871	.02	.880	.39	.003	.39	.003	.02	.821	.02	.825
cnty_charles	.05	.655	.05	.636	.33	.033	.33	.030	.10	.401	.10	.391
cnty_dorchester	-.18	.090	-.19	.073	-.003	.975	-.01	.908	-.11	.118	-.12	.099
cnty_frederick	.06	.310	.07	.272	.40	<.001	.39	<.001	.21	.005	.21	.005
cnty_garrett	.05	.577	.04	.685	.37	<.001	.36	<.001	.13	.111	.11	.144
cnty_harford	-.07	.249	-.08	.203	.26	.006	.25	.008	.05	.494	.04	.563
cnty_howard	.05	.550	.05	.599	.39	.002	.39	.002	.15	.094	.15	.106
cnty_kent	.08	.428	.08	.423	.27	.028	.26	.031	.14	.119	.13	.125
cnty_montgomery	-.02	.583	-.03	.523	.25	.008	.25	.010	.17	.018	.16	.022
cnty_princegeorges	.01	.870	.01	.827	.23	.004	.23	.004	.03	.646	.03	.655
cnty_queenannes	.20	.205	.20	.200	.31	.078	.31	.079	.17	.227	.17	.223
cnty_stmarys	-.04	.628	-.04	.603	.18	.119	.18	.129	.01	.863	.01	.893
cnty_somerset	-.04	.743	-.04	.769	-.16	.241	-.16	.238	.10	.293	.10	.300
cnty_talbot	-.06	.602	-.06	.574	.20	.131	.18	.157	-.02	.862	-.02	.831
cnty_washington	-.07	.296	-.07	.297	.19	.038	.19	.042	.05	.464	.05	.461
cnty_wicomico	.08	.291	.06	.365	.25	.004	.24	.005	.15	.028	.14	.035
cnty_worcester	.30	.003	.30	.003	.30	.006	.31	.006	.07	.452	.07	.429
unemprate_cnty					.08	.004	.08	.004	.04	.029	.04	.033
N	5,163		5,163		5,193		5,193		5,192		5,192	
F-test	52.96 <.001		53.2 <.001		21.72 <.001		21.65 <.001		43.95 <.001		43.85 <.001	
AIC	12,354		12,343		13,111		13,118		9,796		9,798	
BIC	12,708		12,697		13,471		13,478		10,156		10,159	

F. Full Tobit Results (coefficients) for Outcomes Emotional Liability and Overall MH Score, and OLS Results for Outcome Total Costs; presented for Model A and Model B

Vars.	Emotional Liability				Overall MH Score				Total Costs			
	Model A		Model B		Model A		Model B		Model A		Model B	
	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.	coeff.	p-val.
employed_T2	.18	.058	.21	.010	.40	<.001	.40	<.001	-.02	.742	.03	.597
employed_T2*lagDV	-.06	.148	-.08	.018	-.11	.001	-.12	<.001	-.02	.366	-.03	.224
pastemp	.02	.610	.02	.661	.03	.208	.02	.424	-.04	.247	-.05	.215
reimb_tot1	.04	.005	.04	.004	.003	.713	.003	.677	.74	<.001	.74	<.001
overall_T1	.79	.002	.79	.002	.87	<.001	.88	<.001	.09	.676	.08	.687
depr_T1	-.23	.042	-.23	.041	-.21	.001	-.21	.001	-.04	.630	-.04	.637
relat_T1	-.08	.040	-.08	.040	-.05	.022	-.05	.021	-.02	.298	-.02	.279
funct_T1	.04	.166	.04	.160	.08	<.001	.08	<.001	-.02	.552	-.02	.558
emot_T1	.28	<.001	.28	<.001	-.03	.212	-.03	.215	-.004	.840	-.004	.849
slfhm_T1	-.11	.002	-.11	.002	-.06	.003	-.06	.003	-.02	.545	-.02	.545
psyc_T1	.04	.169	.04	.175	.01	.370	.01	.389	-.03	.155	-.03	.163
subst_T1	.002	.943	.003	.904	-.04	.010	-.04	.013	-.01	.871	-.01	.883
schiz_dx	.19	<.001	.19	<.001	.08	<.001	.08	.001	.11	.002	.11	.002
bip_dx	-.13	.001	-.13	.001	-.03	.115	-.04	.114	.05	.130	.05	.131
othsmi_dx	-.04	.376	-.04	.377	-.01	.788	-.01	.791	-.07	.043	-.07	.039
elig_un	-.06	.225	-.06	.220	-.06	.054	-.06	.042	-.18	<.001	-.19	<.001
elig_paa	-.10	.162	-.10	.161	-.03	.498	-.03	.464	.48	<.001	.49	<.001
elig_abd	-.19	<.001	-.19	<.001	-.12	<.001	-.12	<.001	-.09	.035	-.09	.036
elig_pac	-.16	.001	-.15	.001	-.10	<.001	-.10	<.001	-.13	.001	-.14	<.001
clin_intake	.05	.192	.04	.214	.04	.044	.04	.055	-.06	.072	-.05	.092
clin_ltyr	.01	.863	.005	.895	.02	.414	.02	.412	.04	.259	.04	.255
female	-.13	<.001	-.13	.000	-.04	.034	-.04	.032	.0001	.997	.001	.977
black	.03	.464	.02	.479	.06	.005	.05	.007	-.002	.954	-.002	.958
other	.07	.126	.08	.110	.04	.159	.05	.127	.01	.810	.01	.853
age	.004	.007	.004	.007	-.0004	.607	-.0003	.752	-.001	.241	-.001	.266
liv_nfam	.02	.614	.02	.614	-.02	.432	-.02	.416	-.03	.366	-.03	.383
liv_grp	.08	.155	.08	.148	.05	.113	.05	.108	.04	.480	.03	.532
liv_hless	-.07	.283	-.07	.290	-.01	.794	-.01	.744	.04	.557	.04	.538
liv_other	-.13	.093	-.13	.086	-.06	.141	-.07	.111	-.0004	.995	-.001	.990
cnty_allegany	-.02	.805	-.02	.813	.06	.164	.06	.157	-.07	.227	-.07	.223
cnty_annarundel	.05	.410	.06	.401	.003	.936	.005	.897	-.12	.028	-.12	.028
cnty_baltimore	-.05	.267	-.05	.272	-.01	.648	-.01	.616	-.05	.260	-.05	.244
cnty_calvert	-.09	.304	-.08	.315	.03	.611	.03	.586	-.01	.894	-.01	.883
cnty_caroline	.17	.153	.17	.158	.02	.777	.02	.783	-.06	.531	-.06	.542
cnty_carroll	-.004	.966	-.004	.967	.08	.112	.08	.121	-.12	.162	-.12	.149

cnty_cecil	-.04	.722	-.04	.707	-.004	.965	-.01	.948	-.08	.404	-.08	.404
cnty_charles	.06	.636	.06	.643	.06	.449	.07	.427	-.03	.857	-.03	.826
cnty_dorchester	-.12	.292	-.12	.281	-.11	.151	-.12	.125	.14	.115	.15	.112
cnty_frederick	.01	.842	.02	.818	.06	.164	.06	.143	-.07	.294	-.07	.276
cnty_garrett	-.04	.767	-.04	.738	.05	.412	.05	.488	.001	.987	.01	.932
cnty_harford	-.21	.006	-.21	.006	-.05	.237	-.06	.188	.11	.042	.11	.041
cnty_howard	.02	.848	.02	.852	.05	.380	.05	.409	-.12	.249	-.12	.239
cnty_kent	.04	.699	.04	.709	.04	.621	.03	.624	-.16	.051	-.16	.049
cnty_montgomery	-.04	.406	-.04	.388	-.02	.475	-.02	.427	-.003	.943	-.01	.909
cnty_princegeorges	-.07	.230	-.07	.235	.01	.724	.01	.673	-.02	.729	-.02	.716
cnty_queenannes	.21	.191	.21	.188	.14	.185	.14	.177	-.03	.773	-.04	.729
cnty_stmarys	-.18	.091	-.19	.086	-.05	.382	-.05	.374	-.17	.050	-.17	.050
cnty_somerset	-.26	.107	-.26	.106	-.03	.684	-.03	.694	.20	.169	.20	.167
cnty_talbot	-.12	.371	-.12	.363	-.04	.581	-.04	.560	-.21	.133	-.22	.127
cnty_washington	-.16	.081	-.16	.081	-.05	.320	-.05	.322	-.03	.691	-.03	.684
cnty_wicomico	-.03	.734	-.03	.713	.03	.525	.03	.597	-.14	.039	-.14	.036
cnty_worcester	.15	.263	.15	.259	.21	.004	.22	.003	-.02	.784	-.03	.746
N	5,201		5,201		5,125		5,125		5,174		5,174	
F-test	46.61 <.001		46.63 <.001		59.76 <.001		59.77 <.001		279.8 <.001		279.9 <.001	
AIC	14,198		14,195		8,827		8,821		12,563		12,567	
BIC	14,552		14,549		9,180		9,174		12,911		12,914	