

Dataset Integrity Check (DSIC) for the HEALTHY Data Files

Reference paper:

NEJM 363(5) [2010 Jul 29]:443-53.

HEALTHY is a cluster randomized trial designed to investigate the effectiveness of an integrated intervention in middle schools in the reduction of risk factors for type 2 diabetes. The trial was conducted at 7 field centers in 42 middle schools, randomly assigned to intervention or control. Student recruitment and baseline data collection took place during the first semester of 6th grade (2006); the intervention was implemented the following semester (2007) and continued through 8th grade (2007-2009). The intervention, designed to impact the environment and lifestyle choices of middle school children, was implemented at the school-level. As a partial check of the integrity of the HEALTHY baseline survey dataset archived in the NIDDK data repository, a dataset integrity check (DSIC) was performed to verify that selected published results from the HEALTHY study can be reproduced using the archived dataset. The DSIC consists of a small number of analyses performed to duplicate published results reported by the HEALTHY Study Group [1] in *NEJM* in July 2010. Results of the DSIC are described below.

The intent of this DSIC is to provide confidence that the data distributed by the NIDDK repository is a true copy of the study data. Our intent is *not* to assess the integrity of the statistical analyses reported by study investigators. As with all statistical analyses of complex datasets, complete replication of a set of statistical results should not be expected on a first exercise in secondary analysis. This occurs for a number of reasons including differences in the handling of missing data, restrictions on cases included in samples for a particular analysis, software coding used to define complex variables, etc. Experience suggests that most discrepancies can ordinarily be resolved by consultation with the study data coordinating center (DCC), however this process is labor-intensive for both DCC and Repository staff. We do not attempt to resolve minor or inconsequential discrepancies with published results or discrepancies that involve complex analyses, *unless staff of the NIDDK Repository suspect that the observed discrepancy suggests that the dataset may have been corrupted in storage, transmission, or processing by repository staff.* We do, however, document in the integrity check those instances in which our secondary analyses produced results that were not fully consistent with those reported in the target publication.

Archived Dataset Contents. The DCC submitted ten *SAS* transport data files representing the raw data collected from 8 data collection forms, plus files with laboratory values and school randomization assignments. Electronic files of 7 of the 8 data collection forms also were submitted, with fields populated with the corresponding *SAS* variable names. (The nutrition questionnaire was not submitted due to copyright issues.) The numerical value for check-box style categorical variables was noted to the lower right of the check-boxes on the collection forms.

Dataset deidentification. To prevent identification of participants in the study, the archived datasets were subjected to masking prior to submission to the Repository. All personal identifiers and dates were removed, and school ID was replaced by a randomly generated 2-digit masked ID number. Age at both baseline and end of study was removed. (The distribution of participant age

is described in the accompanying Repository Documentation provided by the DCC, Section 2.3.1). Variables with fine strata that might identify a particular individual were collapsed into wider groupings; e.g., race/ethnicity was coded as “White”, “Black”, “Hispanic”, and “Other”; family history of diabetes was recoded as “first degree” if mother, father or sibling was reported having diabetes and as “second degree” if grandmother, grandfather, or aunt/uncle was reported having diabetes. The highest grade completed in school by the head of household was collapsed into “high school diploma or less”, versus “some college or more”.

Highest and lowest measures in anthropomorphic data were also collapsed to protect participant identity. Relevant to this analysis, participants with a BMI z-score of at most -0.50 were grouped together, as were those with a BMI z-score of at least 2.10. Also, participants with a waist circumference of at most 57 cm were grouped together, as were those with a waist circumference of at least 97 cm.

Due to deidentification procedures implemented in archived data, results of archived data analyses are expected to differ somewhat from published results. However, we would expect the conclusions of such data analysis to remain the same as what was previously published.

DSIC Analysis Methods. A portion of published results was replicated to ensure integrity of archived datasets.

First, school randomization assignment was matched to each participant via masked school ID number. Next, sixth grade level (‘baseline’) data were merged with eighth grade (‘followup’) data, by masked participant ID number, to produce the primary analysis cohort.

Next, distributions of gender, race/ethnicity, education of head of household, and family history of diabetes were calculated and compared to published breakdowns. Outcomes BMI $\geq 85^{\text{th}}$ percentile, BMI $\geq 95^{\text{th}}$ percentile, fasting insulin ≥ 30 U/ml, and fasting glucose ≥ 100 mg/dl were calculated for students in control and intervention groups, at baseline (6th grade) and at followup (8th grade). Prevalences of outcomes were compared to published numbers. Outcome change scores, from baseline to followup, were calculated for control vs. interventions groups; change scores were compared to published numbers.

Generalized Linear Mixed Modeling (GLMM) was used to assess for treatment differences in bi-level outcomes, adjusting for school as a random effect. Odds ratios and *p*-values were compared to published numbers.

As previously described, participants with extreme values of BMI z-score or waist circumference were collapsed into broad groups. To retain these participants in the DSIC analysis, those coded as having a BMI z-score of -0.50 *or less* were assigned a z-score of exactly -0.50; those with BMI z-score of 2.10 *or more* were assigned a z-score of 2.10. Likewise, participants with a waist circumference of 57 cm *or less* were assigned a waist circumference of exactly 57 cm; those with a waist circumference of 97 *or more* were assigned a waist circumference of 97 cm. Means and standard deviations then were calculated for continuous outcomes: BMI z score, waist circumference, in addition to fasting insulin and fasting glucose. This was done for control versus intervention groups, at baseline and at followup. Mean change scores from baseline to

followup were also calculated. Mean scores of continuous outcomes, and mean change scores, were compared to published results. Mixed modeling was used to assess for treatment differences in continuous change scores, adjusting for school as a random effect. As indicated in the publication, fasting insulin was log-transformed prior to analysis, due to skewness in the data. *P*-values derived from mixed modeling were compared to published results.

All statistical analyses were conducted using *SAS version 9.2 (Cary, NC)*.

DSIC Results: Demographics. Merging of raw datasets as described produced an analysis dataset with 4603 participants in 42 schools. These sample sizes match those of the publication. Distributions of gender, race/ethnicity, education of head of household, and family history of diabetes closely matched published breakdowns; any difference was in the decimal points, easily attributable to rounding. As described in the methods, age was not included in archived data, and could not be analyzed. [Table 1].

Table 1 (continues next page). Baseline Characteristics of the Students: Archived vs. Published Results
(published results extracted from Table 1 in *Healthy Study Group, et al., NEJM 363(5), p. 446*)

	<u>Total</u>	
	<u>Published</u>	<u>Archived</u>
No. of students (% within group)	4603 (100)	4603 (100)
Age (yr)	11.3 + 0.6	n.a.
Male sex (%)	47.3	47.3
Race or ethnic group (%)		
Hispanic	54.2	54.2
Black	18.0	18.0
White	19.3	19.3
Other	8.5	8.5
Highest education level attained by head of household (%)*		
HS Diploma or less	51.7	51.7
More than HS Diploma	48.3	48.3
Family history of diabetes (%)**	17.6	17.6

n.a. = Not Available in archived data

Table 1, continued. Baseline Characteristics of the Students: Archived vs. Published Results
(published results extracted from Table 1 in Healthy Study Group, et al., NEJM 363(5), p. 446)

	<u>Intervention Group</u>						<u>Control Group</u>					
	<u>Total</u>		<u>BMI <85th percentile</u>		<u>BMI ≥85th percentile</u>		<u>Total</u>		<u>BMI <85th percentile</u>		<u>BMI ≥85th percentile</u>	
	<u>Published</u>	<u>Archived</u>	<u>Published</u>	<u>Archived</u>	<u>Published</u>	<u>Archived</u>	<u>Published</u>	<u>Archived</u>	<u>Published</u>	<u>Archived</u>	<u>Published</u>	<u>Archived</u>
No. of students (% within group)	2307 (100)	2307 (100)	1147 (49.7)	1147 (49.7)	1160 (50.3)	1160 (50.3)	2296 (100)	2296 (100)	1164 (50.7)	1164 (50.7)	1132 (49.3)	1132 (49.3)
Age (yr)	11.3 ± 0.5	n.a.	11.3 ± 0.5	n.a.	11.2 ± 0.5	n.a.	11.3 ± 0.6	n.a.	11.3 ± 0.6	n.a.	11.3 ± 0.6	n.a.
Male sex (%)	47.4	47.4	44.2	44.2	50.5	50.5	47.1	47.1	44.0	44.0	50.4	50.4
Race or ethnic group (%)												
Hispanic	54.8	54.8	51.3	51.3	58.4	58.4	53.5	53.5	50.3	50.3	56.7	56.7
Black	20.3	20.3	22.2	22.2	18.4	18.4	15.7	15.7	15.3	15.3	16.2	16.2
White	17.1	17.0	18.6	18.6	15.5	15.5	21.6	21.6	24.4	24.4	18.6	18.6
Other	7.8	7.8	7.9	7.9	7.7	7.7	9.2	9.2	10.0	10.0	8.5	8.5
Highest education level attained by head of household (%)*												
HS Diploma or less	51.8	51.8	49.7	49.6	53.9	53.9	51.6	51.5	48.2	48.2	54.9	54.9
More than HS	48.2	48.2	50.3	50.4	46.1	46.1	48.4	48.5	51.8	51.8	45.1	45.1
Family history of diabetes (%)**	17.1	17.1	13.0	13.0	20.9	20.9	18.1	18.1	12.4	12.4	24.2	24.2

n.a. Not Available in archived data

* In archived data, responses are collapsed into two categories

** In archived data, the variable is 'from first degree relative'

DSIC Results: Analysis of Outcomes. Prevalences of bi-level outcomes, i.e., BMI $\geq 85^{\text{th}}$ percentile, BMI $\geq 95^{\text{th}}$ percentile, fasting insulin ≥ 30 U/ml, and fasting glucose ≥ 100 mg/dl, were calculated for students in control and intervention groups, at baseline (6th grade) and at followup (8th grade). Change scores (from baseline to followup) were also calculated by treatment group. Calculated prevalences of bi-level outcomes were similar to published results. Differences were in the decimal places, easily attributable to rounding. Outcome-specific odds ratios and *p*-values for intervention versus control groups were approximately similar in archived versus published results. Differences in odds ratios and *p*-values could be attributed to differences in the application of GLMM methodology (e.g., method used to calculate the variance/covariance ratio, etc.), which were not specified in the publication. [Table 2]

Means and standard deviations were calculated for continuous outcomes, i.e., BMI z-score, waist circumference, fasting insulin, and fasting glucose, by control and intervention groups, at baseline and at followup. Mean change scores were also calculated. Slight differences between published and archived results in continuous outcomes were found. Variances tended to be smaller in archived results compared to those that were published. This is expected, due to the recoding of extreme anthropomorphic measures to a constant in archived data. Mean change scores also differed slightly between published and archived results; the largest discrepancy being the mean change in waist circumference among intervention students (3.5 cm in archived results, versus 4.6 cm in published results). Recoding/collapsing of extreme values in the archived dataset may also help explain these differences. *P*-values for differences in treatment effects differed between archived and published results; the differences in variances may help explain this. The discrepancy in *p*-values for the change in waist circumference was $p=0.07$ (published) versus $p=0.13$ (archived); for the change in BMI z-score, the discrepancy was $p=0.04$ (published) versus $p=0.08$ (archived). [Table 2]

Conclusion. With the replication of selected results, the analysis of archived data closely matches published results, allowing for rounding error and variations expected from data masking. We are confident there were no errors in the transmission of archived datasets from the DCC to the Repository. Approved data users are advised to interpret results of analysis of outcomes with caution (especially that of continuous data outcomes), due to the data masking procedures that were implemented in archived data.

Table 2. Baseline and End-of-Study Assessments of Students in Intervention and Control Schools: Archived vs. Published Results
(published results extracted from Table 2 in Healthy Study Group, et al., NEJM 363(5), p. 448)

	Baseline		End of study		Change		Odds Ratio for Intervention vs. Control		P Value	
	Published	Archived	Published	Archived	Pub'd	Arch'd	Published	Archived	Pub'd	Arch'd
BMI ≥85th percentile -- % of students							0.99 (0.82 - 1.19)	0.99 (0.83 - 1.19)	0.92	0.92
Control	49.3	49.3	45.2	45.2	-4.1	-4.1				
Intervention	50.3	50.3	45.8	45.8	-4.5	-4.5				
BMI ≥95th percentile -- % of students							0.81 (0.66 - 1.00)	0.83 (0.68 - 1.01)	0.05	0.06
Control	30.4	30.4	26.6	26.6	-3.8	-3.9				
Intervention	30.1	30.1	24.6	24.6	-5.5	-5.5				
BMI z score*							not calculated		0.04	0.08
Control	0.87 ± 1.12	0.92 ± 0.92	0.86 ± 1.05	0.89 ± 0.88	-0.01	-0.03				
Intervention	0.90 ± 1.08	0.93 ± 0.91	0.85 ± 1.03	0.87 ± 0.87	-0.05	-0.06				
Waist circumference -- cm*							not calculated		0.07	0.13
Control	75.7 ± 14.8	75.0 ± 12.8	81.0 ± 14.8	79.0 ± 12.0	5.3	4.0				
Intervention	76.0 ± 15.1	75.1 ± 12.7	80.6 ± 14.8	78.6 ± 11.9	4.6	3.5				
Fasting insulin ≥30 U/ml -- % of students							0.91 (0.71 - 1.17)	0.96 (0.74 - 1.16)	0.46	0.48
Control	7.3	7.3	11.2	11.2	3.9	3.9				
Intervention	6.3	6.4	10.1	10.2	3.8	3.8				
Fasting insulin -- U/ml							not calculated		0.04	0.03
Control	13.4 ± 12.4	13.4 ± 12.3	17.4 ± 13.4	17.4 ± 13.3	4.0	4.0				
Intervention	13.1 ± 10.6	13.1 ± 10.6	16.9 ± 15.4	16.9 ± 15.3	3.8	3.8				
Fasting glucose ≥100 mg/dl							0.89 (0.63 - 1.27)	0.92 (0.69 - 1.22)	0.52	0.55
Control	16.2	16.3	23.1	23.4	6.9	6.9				
Intervention	15.8	15.8	20.7	20.6	4.9	4.9				
Fasting glucose -- mg/dl							not calculated		0.33	0.33
Control	93.6 ± 6.7	93.6 ± 6.8	94.3 ± 7.9	94.3 ± 7.9	0.7	0.7				
Intervention	93.5 ± 6.6	93.5 ± 6.6	93.5 ± 8.6	93.5 ± 8.6	0.0	0.0				

References

[1] HEALTHY Study Group, Foster GD, Linder B, Baranowski T, Cooper DM, Goldberg L, Harrell JS, Kaufman F, Marcus MD, Treviño RP, Hirst K. A school-based intervention for diabetes risk reduction. *N Engl J Med.* 363(5) [2010 Jul 29]: 443-53. Epub 2010 Jun 27.

Appendices

[1] Full Text of *Healthy Study Group, et al., NEJM 363(5)*, provided to approved data requestors.

[2] SAS version 9.2 Log for programming code submitted for the replication of results in *Healthy Study Group, et al., NEJM 363(5)*

[3] SAS version 9.2 Output for programming code submitted for the replication of results in *Healthy Study Group, et al., NEJM 363(5)*

Attachment 1

“The full text of the article referenced will be provided to approved data requestors along with the data archived.”

HEALTHY Study Group, Foster GD, Linder B, Baranowski T, Cooper DM, Goldberg L, Harrell JS, Kaufman F, Marcus MD, Treviño RP, Hirst K.

A school-based intervention for diabetes risk reduction.

New England Journal of Medicine 363(5) [2010 Jul 29]: 443-53.

Epub 2010 Jun 27.

Attachment 2

**SAS version 9.2 Log
for programming code submitted
for the replication of results
in Tables 1 and 2 of
Healthy Study Group, et al., *NEJM* 363(5)**

NOTE: Copyright (c) 2002-2008 by SAS Institute Inc., Cary, NC, USA.

NOTE: SAS (r) Proprietary Software 9.2 (TS2M2)
Licensed to RTI INTL MAIN, Site 70006746.

NOTE: This session is executing on the XP_PRO platform.

NOTE: SAS initialization used:
real time 3.36 seconds
cpu time 0.90 seconds

1 options ps=55 ls=78 nonumber formchar='|----|+\---+=|~^<>*' mprint
orientation=portrait

1 ! ;

2

3

4

5

6

7

8

9

10

11

11

NOTE: Libref IN was successfully assigned as follows:

Engine: V9
Physical Name: C:\Documents and Settings\stan\My
Documents\DATA\NIDDK\HEALTHY\Official_Archive\HEALTHY_data

12

13

13

NOTE: Format BMIGE85F has been output.

14

NOTE: Format BMIGE95F has been output.

15

NOTE: PROCEDURE FORMAT used (Total process time):

real time 0.71 seconds
cpu time 0.04 seconds

16 data st2fam; set in.st2;

NOTE: Data file IN.ST2.DATA is in a format that is native to another host, or the
file encoding

does not match the session encoding. Cross Environment Data Access will be
used, which
might require additional CPU resources and might reduce performance.

NOTE: There were 11218 observations read from the data set IN.ST2.

NOTE: The data set WORK.ST2FAM has 11218 observations and 7 variables.

NOTE: DATA statement used (Total process time):

real time 0.04 seconds
cpu time 0.01 seconds

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17 data st3screen; set in.st3;

NOTE: Data file IN.ST3.DATA is in a format that is native to another host, or the file encoding

does not match the session encoding. Cross Environment Data Access will be used, which might require additional CPU resources and might reduce performance.

NOTE: There were 17896 observations read from the data set IN.ST3.

NOTE: The data set WORK.ST3SCREEN has 17896 observations and 27 variables.

NOTE: DATA statement used (Total process time):

real time	0.06 seconds
cpu time	0.04 seconds

18 data labdata; set in.cbl;

NOTE: Data file IN.CBL.DATA is in a format that is native to another host, or the file encoding

does not match the session encoding. Cross Environment Data Access will be used, which might require additional CPU resources and might reduce performance.

NOTE: There were 12360 observations read from the data set IN.CBL.

NOTE: The data set WORK.LABDATA has 12360 observations and 11 variables.

NOTE: DATA statement used (Total process time):

real time	0.03 seconds
cpu time	0.03 seconds

19 data rx; set in.rx; * school randomization assignment: has studentid variable *;

NOTE: Data file IN.RX.DATA is in a format that is native to another host, or the file encoding

does not match the session encoding. Cross Environment Data Access will be used, which might require additional CPU resources and might reduce performance.

20

NOTE: There were 42 observations read from the data set IN.RX.

NOTE: The data set WORK.RX has 42 observations and 2 variables.

NOTE: DATA statement used (Total process time):

real time	0.01 seconds
cpu time	0.01 seconds

21 proc sort data=st2fam; by schoolid;

NOTE: There were 11218 observations read from the data set WORK.ST2FAM.

NOTE: The data set WORK.ST2FAM has 11218 observations and 7 variables.

NOTE: PROCEDURE SORT used (Total process time):

real time	0.03 seconds
cpu time	0.03 seconds

22 proc sort data=st3screen; by schoolid;

NOTE: There were 17896 observations read from the data set WORK.ST3SCREEN.

NOTE: The data set WORK.ST3SCREEN has 17896 observations and 27 variables.

NOTE: PROCEDURE SORT used (Total process time):

real time	0.03 seconds
cpu time	0.03 seconds

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```
23          proc sort data=labdata; by schoolid;
```

NOTE: There were 12360 observations read from the data set WORK.LABDATA.

NOTE: The data set WORK.LABDATA has 12360 observations and 11 variables.

NOTE: PROCEDURE SORT used (Total process time):

real time 0.03 seconds

cpu time 0.01 seconds

```
24          proc sort data=rx; by schoolid;
```

```
25
```

```
26          * merge in randomization assignment *;
```

NOTE: There were 42 observations read from the data set WORK.RX.

NOTE: The data set WORK.RX has 42 observations and 2 variables.

NOTE: PROCEDURE SORT used (Total process time):

real time 0.06 seconds

cpu time 0.01 seconds

```
27          data st2fam; merge st2fam rx; by schoolid; run;
```

NOTE: There were 11218 observations read from the data set WORK.ST2FAM.

NOTE: There were 42 observations read from the data set WORK.RX.

NOTE: The data set WORK.ST2FAM has 11218 observations and 8 variables.

NOTE: DATA statement used (Total process time):

real time 0.01 seconds

cpu time 0.01 seconds

```
28          data st3screen; merge st3screen rx; by schoolid; run;
```

NOTE: There were 17896 observations read from the data set WORK.ST3SCREEN.

NOTE: There were 42 observations read from the data set WORK.RX.

NOTE: The data set WORK.ST3SCREEN has 17896 observations and 28 variables.

NOTE: DATA statement used (Total process time):

real time 0.03 seconds

cpu time 0.03 seconds

```
29          data labdata; merge labdata rx; by schoolid; run;
```

NOTE: There were 12360 observations read from the data set WORK.LABDATA.

NOTE: There were 42 observations read from the data set WORK.RX.

NOTE: The data set WORK.LABDATA has 12360 observations and 12 variables.

NOTE: DATA statement used (Total process time):

real time 0.01 seconds

cpu time 0.01 seconds

```
30
```

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```
31      proc sort data=st2fam; by studentid;
```

NOTE: There were 11218 observations read from the data set WORK.ST2FAM.

NOTE: The data set WORK.ST2FAM has 11218 observations and 8 variables.

NOTE: PROCEDURE SORT used (Total process time):

```
real time          0.01 seconds
cpu time           0.01 seconds
```

```
32      data g6_st2 g7_st2 g8_st2; set st2fam;
33          if grade=6 then output g6_st2;
34          else if grade=7 then output g7_st2;
35          else if grade=8 then output g8_st2;
```

NOTE: There were 11218 observations read from the data set WORK.ST2FAM.

NOTE: The data set WORK.G6_ST2 has 6288 observations and 8 variables.

NOTE: The data set WORK.G7_ST2 has 0 observations and 8 variables.

NOTE: The data set WORK.G8_ST2 has 4930 observations and 8 variables.

NOTE: DATA statement used (Total process time):

```
real time          0.03 seconds
cpu time           0.01 seconds
```

```
36      proc sort data=st3screen; by studentid;
```

NOTE: There were 17896 observations read from the data set WORK.ST3SCREEN.

NOTE: The data set WORK.ST3SCREEN has 17896 observations and 28 variables.

NOTE: PROCEDURE SORT used (Total process time):

```
real time          0.04 seconds
cpu time           0.03 seconds
```

```
37      data g6_st3 g7_st3 g8_st3; set st3screen;
38          if grade=6 then output g6_st3;
39          else if grade=7 then output g7_st3;
40          else if grade=8 then output g8_st3;
```

NOTE: There were 17896 observations read from the data set WORK.ST3SCREEN.

NOTE: The data set WORK.G6_ST3 has 6358 observations and 28 variables.

NOTE: The data set WORK.G7_ST3 has 5225 observations and 28 variables.

NOTE: The data set WORK.G8_ST3 has 6313 observations and 28 variables.

NOTE: DATA statement used (Total process time):

```
real time          0.04 seconds
cpu time           0.03 seconds
```

```
41      proc sort data=labdata; by studentid;
```

NOTE: There were 12360 observations read from the data set WORK.LABDATA.

NOTE: The data set WORK.LABDATA has 12360 observations and 12 variables.

NOTE: PROCEDURE SORT used (Total process time):

```
real time          0.01 seconds
cpu time           0.01 seconds
```

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```

42      data g6_lab g7_lab g8_lab; set labdata;
43          if grade=6 then output g6_lab;
44          else if grade=7 then output g7_lab;
45          else if grade=8 then output g8_lab;
46

```

NOTE: There were 12360 observations read from the data set WORK.LABDATA.

NOTE: The data set WORK.G6_LAB has 6173 observations and 12 variables.

NOTE: The data set WORK.G7_LAB has 0 observations and 12 variables.

NOTE: The data set WORK.G8_LAB has 6187 observations and 12 variables.

NOTE: DATA statement used (Total process time):

```

real time          0.03 seconds
cpu time           0.01 seconds

```

```

47      data baseline_f; merge g6_st3(in=in1 rename=(bmipct=bmipct_i bmiz=bmiz_i
47      ! waist=waist_i))
48          g6_st2 g6_lab(rename=(glucose=glucose_i insulin=insulin_i))
49          g8_st3(in=in2 keep=studentid bmipct bmiz waist rename=(bmipct=bmipct_f
bmiz=bmiz_f
49      ! waist=waist_f))
50          g8_lab(keep=studentid glucose insulin rename=(glucose=glucose_f
insulin=insulin_f));
51          by studentid;
52          if in1 and in2; /* the final analysis dataset has students with both
grade 6 and
52      ! grade 8 data */
53                          /* n=4603 */
54          * deidentification of data described on page 3 of documentation notes
provided by
54      ! the D.C.C. *;
55
56      ***** Coding of Baseline Measures (6th grade) *;
57          if 30<bmipct_i<85 or bmipct_i=1 then bmige85_i=0;
58          else if bmipct_i>=85 or bmipct_i=3 then bmige85_i=1;
59          if 30<bmipct_i<95 or bmipct_i=1 then bmige95_i=0;
60          else if bmipct_i>=95 or bmipct_i=3 then bmige95_i=1;
61          format bmige85_i bmige85f. bmige95_i bmige95f.;
62
63          * recode values >upper limit, or <lower limit, to a constant equal to
exactly that
63      ! limit *;
64          * see forms for values of upper and lower limits *;
65          bmizscore_i=bmiz_i; if bmiz_i=3 then bmizscore_i=2.1; * upper limit
recoded *;
66          if bmiz_i=1 then bmizscore_i=-0.5; * lower limit recoded *;
67          waistcm_i=waist_i; if waist_i=3 then waistcm_i=97;* upper limit recoded
*;
68          if waist_i=1 then waistcm_i=57; * lower limit recoded *;
69
70          if glucose_i>=100 then fastglu100_i=1;
71          else if 0<glucose_i<100 then fastglu100_i=0;
72          if insulin_i>=30 then fastins30_i=1;
73          else if 0<insulin_i<30 then fastins30_i=0;
74

```

NOTE: There were 6358 observations read from the data set WORK.G6_ST3.

NOTE: There were 6288 observations read from the data set WORK.G6_ST2.

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NOTE: There were 6173 observations read from the data set WORK.G6_LAB.
 NOTE: There were 6313 observations read from the data set WORK.G8_ST3.
 NOTE: There were 6187 observations read from the data set WORK.G8_LAB.
 NOTE: The data set WORK.BASELINE_F has 4603 observations and 51 variables.
 NOTE: DATA statement used (Total process time):
 real time 0.04 seconds
 cpu time 0.04 seconds

```

75      data baseline_f; set baseline_f;
76      ***** Coding of Final Measures (8th grade) *;
77          if 30<bmipct_f<85 or bmipct_f=1 then bmige85_f=0;
78              else if bmipct_f>=85 or bmipct_f=3 then bmige85_f=1;
79          if 30<bmipct_f<95 or bmipct_f=1 then bmige95_f=0;
80              else if bmipct_f>=95 or bmipct_f=3 then bmige95_f=1;
81
82          * recode values >upper limit, or <lower limit, to a constant equal to
exactly that
82          ! limit *;
83          * see forms for values of upper and lower limits *;
84          bmizscore_f=bmiz_f; if bmiz_f=3 then bmizscore_f=2.1; * upper limit
recoded *;
85          if bmiz_f=1 then bmizscore_f=-0.5; * lower limit recoded *;
86          waistcm_f=waist_f; if waist_f=3 then waistcm_f=97;* upper limit recoded
*;
87          if waist_f=1 then waistcm_f=57; * lower limit recoded *;
88
89          if glucose_f>=100 then fastglu100_f=1;
90              else if 0<glucose_f<100 then fastglu100_f=0;
91          if insulin_f>=30 then fastins30_f=1;
92              else if 0<insulin_f<30 then fastins30_f=0;
93
94          diffbmige85=bmige85_f-bmige85_i;
95          diffbmige95=bmige95_f-bmige95_i;
96          diffbmizscore=bmizscore_f-bmizscore_i;
97          diffwaistcm=waistcm_f-waistcm_i;
98          diffglu100=fastglu100_f-fastglu100_i;
99          diffins30=fastins30_f-fastins30_i;
100         diffglu=glucose_f-glucose_i;
101
102         logins_i=log(insulin_i);
103         if insulin_f=0 then logins_f=log(1.2); *lowest positive insulin value of
insulin_f*;
104         else logins_f=log(insulin_f);
105         diffins=logins_f-logins_i;
106         diffins_untrans=insulin_f-insulin_i;
107

```

NOTE: Missing values were generated as a result of performing an operation on missing values.

Each place is given by: (Number of times) at (Line):(Column).

19 at 97:24 221 at 98:26 230 at 99:24 221 at 100:20 142 at 102:12
 103 at 104:17 229 at 105:19 229 at 106:28

NOTE: There were 4603 observations read from the data set WORK.BASELINE_F.
 NOTE: The data set WORK.BASELINE_F has 4603 observations and 68 variables.
 NOTE: DATA statement used (Total process time):
 real time 0.03 seconds
 cpu time 0.01 seconds

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```

108      data baseline_f; set baseline_f;
109          famhist=st2famhx1;
110          if st2famhx1=9 then famhist=.;
111          label bmige85_i='BMI ge 85th percentile, 6th gr'
112                bmige95_i='BMI ge 95th percentile, 6th gr'
113                famhist='1st deg fam hist diab'
114                bmige85_f='BMI ge 85th percentile, 8th gr'
115                bmige95_f='BMI ge 95th percentile, 8th gr'
116                bmizscore_i='BMI z-score, 6th gr'
117                waistcm_i='Waist circum in cm, 6th gr'
118                fastglu100_i='Fasting Glucose >=100, 6th gr'
119                fastins30_i='Fasting Insulin >=30, 6th gr'
120                bmizscore_f='BMI z-score, 8th gr'
121                glucose_i='Fasting Glucose, 6th gr'
122                insulin_i='Fasting Insulin, 6th gr'
123                glucose_f='Fasting Glucose, 8th gr'
124                insulin_f='Fasting Insulin, 8th gr'
125                waistcm_f='Waist circum in cm, 8th gr'
126                fastglu100_f='Fasting Glucose >=100, 8th gr'
127                fastins30_f='Fasting Insulin >=30, 8th gr'
128                diffbmige85='bmige85_f-bmige85_i'
129                diffbmige95='bmige95_f-bmige95_i'
130                diffbmizscore='bmizscore_f-bmizscore_i'
131                diffwaistcm='waistcm_f-waistcm_i'
132                diffglu100='fastglu100_f-fastglu100_i'
133                diffins30='fastins30_f-fastins30_i'
134                diffglu='glucose_f-glucose_i'
135                logins_i='Natural Log Transform of insulin, 6th gr'
136                logins_f='Natural Log Transform of insulin, 8th gr'
137                diffins='logins_f-logins_i'
138                diffins_untrans='insulin_f-insulin_i';
139      run;

```

NOTE: There were 4603 observations read from the data set WORK.BASELINE_F.

NOTE: The data set WORK.BASELINE_F has 4603 observations and 69 variables.

NOTE: DATA statement used (Total process time):

```

real time          0.01 seconds
cpu time           0.01 seconds

```

```

140
141      proc contents position; title "Variables in HEALTHY DSIC Analysis
Dataset"; run;

```

NOTE: PROCEDURE CONTENTS used (Total process time):

```

real time          0.28 seconds
cpu time           0.06 seconds

```

NOTE: The PROCEDURE CONTENTS printed pages 1-5.

```

142
143      *****;

```


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```

144      Title To replicate results in Table 1 ;
145      *****;
146      proc freq; tables assign*bmige85_i; run;

```

NOTE: There were 4603 observations read from the data set WORK.BASELINE_F.

NOTE: The PROCEDURE FREQ printed page 6.

NOTE: PROCEDURE FREQ used (Total process time):

real time 0.03 seconds

cpu time 0.01 seconds

```

147      proc freq; tables st3gend race_eth bmige85_i st2edu famhist; run;

```

NOTE: There were 4603 observations read from the data set WORK.BASELINE_F.

NOTE: The PROCEDURE FREQ printed page 7.

NOTE: PROCEDURE FREQ used (Total process time):

real time 0.18 seconds

cpu time 0.03 seconds

```

148
149      proc sort; by assign;

```

NOTE: There were 4603 observations read from the data set WORK.BASELINE_F.

NOTE: The data set WORK.BASELINE_F has 4603 observations and 69 variables.

NOTE: PROCEDURE SORT used (Total process time):

real time 0.03 seconds

cpu time 0.03 seconds

```

150      proc freq; by assign; tables (st3gend race_eth st2edu famhist )*
bmige85_i; run;

```

NOTE: There were 4603 observations read from the data set WORK.BASELINE_F.

NOTE: The PROCEDURE FREQ printed pages 8-15.

NOTE: PROCEDURE FREQ used (Total process time):

real time 0.45 seconds

cpu time 0.03 seconds

```

151
152      *****;
153      Title To replicate selected results in Table 2 ;
154      *****;
155      proc freq; by assign; tables bmige85_i bmige95_i fastglu100_i fastins30_i
156      bmige85_f bmige95_f fastglu100_f fastins30_f; run;

```

NOTE: There were 4603 observations read from the data set WORK.BASELINE_F.

NOTE: The PROCEDURE FREQ printed pages 16-19.

NOTE: PROCEDURE FREQ used (Total process time):

real time 0.10 seconds

cpu time 0.01 seconds

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```
157      proc means maxdec=4 n mean std stderr; class assign; var bmizscore_i
bmizscore_f; run;
```

NOTE: There were 4603 observations read from the data set WORK.BASELINE_F.

NOTE: The PROCEDURE MEANS printed page 20.

NOTE: PROCEDURE MEANS used (Total process time):

```
real time      0.03 seconds
cpu time       0.03 seconds
```

```
158      proc means maxdec=4 n mean std stderr; class assign; var waistcm_i
waistcm_f; run;
```

NOTE: There were 4603 observations read from the data set WORK.BASELINE_F.

NOTE: The PROCEDURE MEANS printed page 21.

NOTE: PROCEDURE MEANS used (Total process time):

```
real time      0.09 seconds
cpu time       0.01 seconds
```

```
159      proc means maxdec=3 n mean std stderr; class assign; var glucose_i
insulin_i glucose_f
159      ! insulin_f; run;
```

NOTE: There were 4603 observations read from the data set WORK.BASELINE_F.

NOTE: The PROCEDURE MEANS printed page 22.

NOTE: PROCEDURE MEANS used (Total process time):

```
real time      0.03 seconds
cpu time       0.01 seconds
```

```
160      proc means maxdec=3 n mean std stderr; class assign; var diffbmige85
diffbmige95
160      ! diffbmizscore diffwaistcm
161      diffglu100 diffins30 diffglu diffins_untrans; run;
```

NOTE: There were 4603 observations read from the data set WORK.BASELINE_F.

NOTE: The PROCEDURE MEANS printed page 23.

NOTE: PROCEDURE MEANS used (Total process time):

```
real time      0.03 seconds
cpu time       0.03 seconds
```

```
162
163
164      *****;
165      Title To replicate analyses of selected continuous outcomes in Table 2 ;
166      *****;
167      proc mixed data=baseline_f;
168      class studentid schoolid assign;
169      model diffbmizscore=assign bmizscore_i/solution ddfm=bw;
170      random int/sub=schoolid;
171      lsmeans assign /diff=control('0') cl; run;
```

WARNING: Class levels for studentid are not printed because of excessive size.

NOTE: Convergence criteria met.

NOTE: The PROCEDURE MIXED printed pages 24-26.

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NOTE: PROCEDURE MIXED used (Total process time):

real time	0.84 seconds
cpu time	0.09 seconds

```

172      proc mixed data=baseline_f;
173          class studentid schoolid assign;
174          model diffwaistcm=assign waistcm_i/solution ddfm=bw;
175          random int/sub=schoolid;
176          lsmeans assign /diff=control('0') cl; run;

```

WARNING: Class levels for studentid are not printed because of excessive size.

NOTE: 19 observations are not included because of missing values.

NOTE: Convergence criteria met.

NOTE: The PROCEDURE MIXED printed pages 27-29.

NOTE: PROCEDURE MIXED used (Total process time):

real time	0.35 seconds
cpu time	0.04 seconds

```

177      proc mixed data=baseline_f;
178          class studentid schoolid assign;
179          model diffins=assign logins_i/solution ddfm=bw;
180          random int/sub=schoolid;
181          lsmeans assign /diff=control('0') cl; run;

```

WARNING: Class levels for studentid are not printed because of excessive size.

NOTE: 229 observations are not included because of missing values.

NOTE: Convergence criteria met.

NOTE: The PROCEDURE MIXED printed pages 30-32.

NOTE: PROCEDURE MIXED used (Total process time):

real time	0.15 seconds
cpu time	0.07 seconds

```

182      proc mixed data=baseline_f;
183          class studentid schoolid assign;
184          model diffglu=assign glucose_i/solution ddfm=bw;
185          random int/sub=schoolid;
186          lsmeans assign /diff=control('0') cl; run;

```

WARNING: Class levels for studentid are not printed because of excessive size.

NOTE: 221 observations are not included because of missing values.

NOTE: Convergence criteria met.

NOTE: The PROCEDURE MIXED printed pages 33-35.

NOTE: PROCEDURE MIXED used (Total process time):

real time	0.35 seconds
cpu time	0.07 seconds

```

187
188          *****;
189      Title To replicate analyses of selected dichotomous outcomes in Table 2 ;

```

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```

190          *****;
191      data longf; set baseline_f;
192          array ge85s[2] bmige85_i bmige85_f;
193          array ge95s[2] bmige95_i bmige95_f;
194          array fg100s[2] fastglu100_i fastglu100_f;
195          array fi30s[2] fastins30_i fastins30_f;
196          do i=1 to 2;
197              bmige85=ge85s[i];
198              bmige95=ge95s[i];
199              fastglu100=fg100s[i];
200              fastins30=fi30s[i];
201              output;
202          end;
203          format bmige85 bmige95 fastglu100 fastins30;
204      run;

```

NOTE: There were 4603 observations read from the data set WORK.BASELINE_F.

NOTE: The data set WORK.LONGF has 9206 observations and 74 variables.

NOTE: DATA statement used (Total process time):

```

real time          0.04 seconds
cpu time           0.01 seconds

```

```

205      data longf; set longf;
206      time=i-1; run;

```

NOTE: There were 9206 observations read from the data set WORK.LONGF.

NOTE: The data set WORK.LONGF has 9206 observations and 75 variables.

NOTE: DATA statement used (Total process time):

```

real time          0.21 seconds
cpu time           0.06 seconds

```

```

207
208      /* proc print data=longf (obs=100); var schoolid studentid bmige85 bmige95
time i
208      ! diffbmige85; run; */
209
210      PROC GLIMMIX DATA=longf ;
211          CLASS studentid schoolid time;
212          MODEL bmige85(EVENT=LAST)=assign bmige85_i time /
213              DDFM=bw DIST=BINARY cl SOLUTION HTYPE=1,3;
214          random int/subject=schoolid;
215      run;

```

WARNING: Class levels for studentid are not printed because of excessive size.

NOTE: The GLIMMIX procedure is modeling the probability that bmige85='1'.

NOTE: Convergence criterion (PCONV=1.11022E-8) satisfied.

NOTE: Estimated G matrix is not positive definite.

NOTE: The covariance matrix is the zero matrix.

NOTE: The PROCEDURE GLIMMIX printed pages 36-38.

NOTE: PROCEDURE GLIMMIX used (Total process time):

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```

real time          0.70 seconds
cpu time           0.54 seconds

```

```

216      PROC GLIMMIX DATA=longf ;
217          CLASS studentid schoolid time;
218          MODEL bmige95(EVENT=LAST)=assign bmige95_i time /
219              DDFM=bw DIST=BINARY cl SOLUTION HTYPE=1,3;
220          random int /subject=schoolid;
221      run;

```

WARNING: Class levels for studentid are not printed because of excessive size.

NOTE: The GLIMMIX procedure is modeling the probability that bmige95='1'.

NOTE: Convergence criterion (PCONV=1.11022E-8) satisfied.

NOTE: Estimated G matrix is not positive definite.

NOTE: The covariance matrix is the zero matrix.

NOTE: The PROCEDURE GLIMMIX printed pages 39-41.

NOTE: PROCEDURE GLIMMIX used (Total process time):

```

real time          0.87 seconds
cpu time           0.51 seconds

```

```

222      PROC GLIMMIX DATA=longf ;
223          CLASS studentid schoolid time;
224          MODEL fastglu100(EVENT=LAST)=assign fastglu100_i time /
225              DDFM=bw DIST=BINARY cl SOLUTION HTYPE=1,3;
226          random int/subject=schoolid;
227      run;

```

WARNING: Class levels for studentid are not printed because of excessive size.

NOTE: Some observations are not used in the analysis because of: missing response values (n=238),

missing fixed effects (n=270), missing random effects (n=270), missing subject effects (n=270).

NOTE: The GLIMMIX procedure is modeling the probability that fastglu100='1'.

NOTE: Convergence criterion (PCONV=1.11022E-8) satisfied.

NOTE: The PROCEDURE GLIMMIX printed pages 42-44.

NOTE: PROCEDURE GLIMMIX used (Total process time):

```

real time          0.65 seconds
cpu time           0.51 seconds

```

```

228      PROC GLIMMIX DATA=longf ;
229          CLASS studentid schoolid time;
230          MODEL fastins30(EVENT=LAST)=assign fastins30_i time /
231              DDFM=bw DIST=BINARY cl SOLUTION HTYPE=1,3;
232          random int/subject=schoolid;
233      run;

```

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WARNING: Class levels for studentid are not printed because of excessive size.

NOTE: Some observations are not used in the analysis because of: missing response values (n=246), missing fixed effects (n=284), missing random effects (n=284), missing subject effects (n=284).

NOTE: The GLIMMIX procedure is modeling the probability that fastins30='1'.

NOTE: Convergence criterion (PCONV=1.11022E-8) satisfied.

NOTE: The PROCEDURE GLIMMIX printed pages 45-47.

NOTE: PROCEDURE GLIMMIX used (Total process time):

real time	0.70 seconds
-----------	--------------

cpu time	0.54 seconds
----------	--------------

234

235

236

237

NOTE: SAS Institute Inc., SAS Campus Drive, Cary, NC USA 27513-2414

NOTE: The SAS System used:

real time	13.00 seconds
-----------	---------------

cpu time	4.68 seconds
----------	--------------

Attachment 3

**SAS version 9.2 Output
for programming code submitted
for the replication of results
in Tables 1 and 2 of
Healthy Study Group, et al., *NEJM* 363(5)**

Variables in HEALTHY DSIC Analysis Dataset

18:50 Friday, April 29, 2011

The CONTENTS Procedure

Data Set Name	WORK.BASELINE_F	Observations	4603
Member Type	DATA	Variables	69
Engine	V9	Indexes	0
Created	Friday, April 29, 2011 06:50:40 PM	Observation Length	560
Last Modified	Friday, April 29, 2011 06:50:40 PM	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label			
Data Representation	WINDOWS_32		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information

Data Set Page Size	16384
Number of Data Set Pages	160
First Data Page	1
Max Obs per Page	29
Obs in First Data Page	12
Number of Data Set Repairs	0
Filename	C:\DOCUME~1\stan\LOCALS~1\Temp\SAS Temporary Files_TD344\baseline_f.sas7bdat
Release Created	9.0202M2
Host Created	XP_PRO

Alphabetic List of Variables and Attributes

#	Variable	Type	Len	Format	Label
28	assign	Num	8	BEST12.	Randomization Assignment
52	bmige85_f	Num	8		BMI ge 85th percentile, 8th gr
46	bmige85_i	Num	8	BMIGE85F.	BMI ge 85th percentile, 6th gr
53	bmige95_f	Num	8		BMI ge 95th percentile, 8th gr
47	bmige95_i	Num	8	BMIGE95F.	BMI ge 95th percentile, 6th gr
41	bmipct_f	Num	8	BEST12.	BMI Percentile
22	bmipct_i	Num	8	BEST12.	BMI Percentile
42	bmiz_f	Num	8		BMI Z-score
23	bmiz_i	Num	8		BMI Z-score
54	bmizscore_f	Num	8		BMI z-score, 8th gr

48	bmizscore_i	Num	8		BMI z-score, 6th gr
36	chol	Num	8		Cholesterol
27	dbp	Num	8	BEST12.	Diastolic Blood Pressure
58	diffbmige85	Num	8		bmige85_f-bmige85_i
59	diffbmige95	Num	8		bmige95_f-bmige95_i
60	diffbmizscore	Num	8		bmizscore_f-bmizscore_i
64	diffglu	Num	8		glucose_f-glucose_i
62	diffglu100	Num	8		fastglu100_f-fastglu100_i
67	diffins	Num	8		logins_f-logins_i
63	diffins30	Num	8		fastins30_f-fastins30_i

The CONTENTS Procedure

Alphabetic List of Variables and Attributes

#	Variable	Type	Len	Format	Label
68	diffins_untrans	Num	8		insulin_f-insulin_i
61	diffwaistcm	Num	8		waistcm_f-waistcm_i
69	famhist	Num	8		1st deg fam hist diab
56	fastglu100_f	Num	8		Fasting Glucose >=100, 8th gr
50	fastglu100_i	Num	8		Fasting Glucose >=100, 6th gr
57	fastins30_f	Num	8		Fasting Insulin >=30, 8th gr
51	fastins30_i	Num	8		Fasting Insulin >=30, 6th gr
44	glucose_f	Num	8		Fasting Glucose, 8th gr
33	glucose_i	Num	8		Fasting Glucose, 6th gr
3	grade	Num	8	BEST12.	Grade
35	hbalc	Num	8		HbA1c
37	hdl_chl	Num	8		HDL Cholesterol
20	height	Num	8	BEST12.	Height
45	insulin_f	Num	8		Fasting Insulin, 8th gr
34	insulin_i	Num	8		Fasting Insulin, 6th gr
38	ldl_chl	Num	8		LDL Cholesterol
66	logins_f	Num	8		Natural Log Transform of insulin, 8th gr
65	logins_i	Num	8		Natural Log Transform of insulin, 6th gr
6	race_eth	Num	8	BEST12.	Race/Ethnicity
26	sbp	Num	8	BEST12.	Systolic Blood Pressure
1	schoolid	Num	8	BEST12.	School ID
29	st2comp	Num	8		Information completed by
32	st2edu	Num	8		Highest household education
30	st2famhx1	Num	8		First degree family history of diabetes
31	st2famhx2	Num	8		Second degree family history of diabetes
25	st3cuff	Num	8	BEST12.	Cuff Size
4	st3fast	Num	8	BEST12.	Fasting Status
5	st3gend	Num	8	BEST12.	Gender
7	st3infall6	Num	8		In School Fall 6th Grade
9	st3infall7	Num	8		In School Fall 7th Grade
11	st3infall8	Num	8		In School Fall 8th Grade
8	st3inspr6	Num	8		In School Spring 6th Grade
10	st3inspr7	Num	8		In School Spring 7th Grade
12	st3inspr8	Num	8		In School Spring 8th Grade
15	st3reas1	Num	8		Parent Refused On-site
16	st3reas2	Num	8		Child Refused On-site

17	st3reas3	Num	8		Could Not Palpate Vein
18	st3reas4	Num	8		3 Tries With No Success
19	st3reas5	Num	8		Other Reason
14	st3succ	Num	8	BEST12.	Blood Draw Successful
13	st3tries	Num	8	BEST12.	Number of Blood Draw Tries
2	studentid	Char	12		Student ID
40	trig	Num	8		Triglycerides
39	vldl_chl	Num	8		VLDL Cholesterol
43	waist_f	Num	8	BEST12.	Waist
24	waist_i	Num	8	BEST12.	Waist

The CONTENTS Procedure

Alphabetic List of Variables and Attributes

#	Variable	Type	Len	Format	Label
55	waistcm_f	Num	8		Waist circum in cm, 8th gr
49	waistcm_i	Num	8		Waist circum in cm, 6th gr
21	weight	Num	8	BEST12.	Weight

The CONTENTS Procedure

Variables in Creation Order

#	Variable	Type	Len	Format	Label
1	schoolid	Num	8	BEST12.	School ID
2	studentid	Char	12		Student ID
3	grade	Num	8	BEST12.	Grade
4	st3fast	Num	8	BEST12.	Fasting Status
5	st3gend	Num	8	BEST12.	Gender
6	race_eth	Num	8	BEST12.	Race/Ethnicity
7	st3infall6	Num	8		In School Fall 6th Grade
8	st3inspr6	Num	8		In School Spring 6th Grade
9	st3infall7	Num	8		In School Fall 7th Grade
10	st3inspr7	Num	8		In School Spring 7th Grade
11	st3infall8	Num	8		In School Fall 8th Grade
12	st3inspr8	Num	8		In School Spring 8th Grade
13	st3tries	Num	8	BEST12.	Number of Blood Draw Tries
14	st3succ	Num	8	BEST12.	Blood Draw Successful
15	st3reas1	Num	8		Parent Refused On-site
16	st3reas2	Num	8		Child Refused On-site
17	st3reas3	Num	8		Could Not Palpate Vein
18	st3reas4	Num	8		3 Tries With No Success
19	st3reas5	Num	8		Other Reason
20	height	Num	8	BEST12.	Height
21	weight	Num	8	BEST12.	Weight
22	bmipct_i	Num	8	BEST12.	BMI Percentile
23	bmiz_i	Num	8		BMI Z-score
24	waist_i	Num	8	BEST12.	Waist
25	st3cuff	Num	8	BEST12.	Cuff Size
26	sbp	Num	8	BEST12.	Systolic Blood Pressure
27	dbp	Num	8	BEST12.	Diastolic Blood Pressure
28	assign	Num	8	BEST12.	Randomization Assignment
29	st2comp	Num	8		Information completed by
30	st2famhx1	Num	8		First degree family history of diabetes
31	st2famhx2	Num	8		Second degree family history of diabetes
32	st2edu	Num	8		Highest household education
33	glucose_i	Num	8		Fasting Glucose, 6th gr
34	insulin_i	Num	8		Fasting Insulin, 6th gr
35	hbalc	Num	8		HbA1c
36	chol	Num	8		Cholesterol

37	hdl_chl	Num	8		HDL Cholesterol
38	ldl_chl	Num	8		LDL Cholesterol
39	vldl_chl	Num	8		VLDL Cholesterol
40	trig	Num	8		Triglycerides
41	bmipct_f	Num	8	BEST12.	BMI Percentile
42	bmiz_f	Num	8		BMI Z-score
43	waist_f	Num	8	BEST12.	Waist
44	glucose_f	Num	8		Fasting Glucose, 8th gr
45	insulin_f	Num	8		Fasting Insulin, 8th gr
46	bmige85_i	Num	8	BMIGE85F.	BMI ge 85th percentile, 6th gr

The CONTENTS Procedure

Variables in Creation Order

#	Variable	Type	Len	Format	Label
47	bmige95_i	Num	8	BMIGE95F.	BMI ge 95th percentile, 6th gr
48	bmizscore_i	Num	8		BMI z-score, 6th gr
49	waistcm_i	Num	8		Waist circum in cm, 6th gr
50	fastglu100_i	Num	8		Fasting Glucose >=100, 6th gr
51	fastins30_i	Num	8		Fasting Insulin >=30, 6th gr
52	bmige85_f	Num	8		BMI ge 85th percentile, 8th gr
53	bmige95_f	Num	8		BMI ge 95th percentile, 8th gr
54	bmizscore_f	Num	8		BMI z-score, 8th gr
55	waistcm_f	Num	8		Waist circum in cm, 8th gr
56	fastglu100_f	Num	8		Fasting Glucose >=100, 8th gr
57	fastins30_f	Num	8		Fasting Insulin >=30, 8th gr
58	diffbmige85	Num	8		bmige85_f-bmige85_i
59	diffbmige95	Num	8		bmige95_f-bmige95_i
60	diffbmizscore	Num	8		bmizscore_f-bmizscore_i
61	diffwaistcm	Num	8		waistcm_f-waistcm_i
62	diffglu100	Num	8		fastglu100_f-fastglu100_i
63	diffins30	Num	8		fastins30_f-fastins30_i
64	diffglu	Num	8		glucose_f-glucose_i
65	logins_i	Num	8		Natural Log Transform of insulin, 6th gr
66	logins_f	Num	8		Natural Log Transform of insulin, 8th gr
67	diffins	Num	8		logins_f-logins_i
68	diffins_untrans	Num	8		insulin_f-insulin_i
69	famhist	Num	8		1st deg fam hist diab

The FREQ Procedure

Table of assign by bmige85_i

assign(Randomization Assignment)
bmige85_i(BMI ge 85th percentile, 6th gr)

Frequency			
Percent			
Row Pct			
Col Pct	BMI lt 8	BMI ge 8	Total
	5	5	
0	1164	1132	2296
	25.29	24.59	49.88
	50.70	49.30	
	50.37	49.39	
1	1147	1160	2307
	24.92	25.20	50.12
	49.72	50.28	
	49.63	50.61	
Total	2311	2292	4603
	50.21	49.79	100.00

The FREQ Procedure

Gender

st3gend	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	2175	47.25	2175	47.25
2	2428	52.75	4603	100.00

Race/Ethnicity

race_eth	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	2493	54.16	2493	54.16
2	830	18.03	3323	72.19
3	888	19.29	4211	91.48
4	392	8.52	4603	100.00

BMI ge 85th percentile, 6th gr

bmige85_i	Frequency	Percent	Cumulative Frequency	Cumulative Percent
BMI lt 85	2311	50.21	2311	50.21
BMI ge 85	2292	49.79	4603	100.00

Highest household education

st2edu	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	2310	51.67	2310	51.67
2	2161	48.33	4471	100.00

Frequency Missing = 132

1st deg fam hist diab

famhist	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	597	17.61	597	17.61
2	2794	82.39	3391	100.00

Frequency Missing = 1212

----- Randomization Assignment=0 -----

The FREQ Procedure

Table of st3gend by bmige85_i

st3gend(Gender)
bmige85_i(BMI ge 85th percentile, 6th gr)

Frequency			
Percent			
Row Pct			
Col Pct	BMI lt 8	BMI ge 8	Total
	5	5	
1	512	570	1082
	22.30	24.83	47.13
	47.32	52.68	
	43.99	50.35	
2	652	562	1214
	28.40	24.48	52.87
	53.71	46.29	
	56.01	49.65	
Total	1164	1132	2296
	50.70	49.30	100.00

----- Randomization Assignment=0 -----

The FREQ Procedure

Table of race_eth by bmige85_i

race_eth(Race/Ethnicity)
 bmige85_i(BMI ge 85th percentile, 6th gr)

Frequency			
Percent			
Row Pct			
Col Pct	BMI lt 8	BMI ge 8	Total
	5	5	
1	586	642	1228
	25.52	27.96	53.48
	47.72	52.28	
	50.34	56.71	
2	178	183	361
	7.75	7.97	15.72
	49.31	50.69	
	15.29	16.17	
3	284	211	495
	12.37	9.19	21.56
	57.37	42.63	
	24.40	18.64	
4	116	96	212
	5.05	4.18	9.23
	54.72	45.28	
	9.97	8.48	
Total	1164	1132	2296
	50.70	49.30	100.00

----- Randomization Assignment=0 -----

The FREQ Procedure

Table of st2edu by bmige85_i

st2edu(Highest household education)
 bmige85_i(BMI ge 85th percentile, 6th gr)

Frequency			
Percent			
Row Pct			
Col Pct	BMI lt 8	BMI ge 8	Total
	5	5	
1	541	606	1147
	24.30	27.22	51.53
	47.17	52.83	
	48.17	54.94	
2	582	497	1079
	26.15	22.33	48.47
	53.94	46.06	
	51.83	45.06	
Total	1123	1103	2226
	50.45	49.55	100.00

Frequency Missing = 70

----- Randomization Assignment=0 -----

The FREQ Procedure

Table of famhist by bmige85_i

famhist(1st deg fam hist diab)
 bmige85_i(BMI ge 85th percentile, 6th gr)

Frequency			
Percent			
Row Pct			
Col Pct	BMI lt 8	BMI ge 8	Total
	5	5	
1	108	200	308
	6.36	11.78	18.14
	35.06	64.94	
	12.40	24.18	
2	763	627	1390
	44.94	36.93	81.86
	54.89	45.11	
	87.60	75.82	
Total	871	827	1698
	51.30	48.70	100.00

Frequency Missing = 598

----- Randomization Assignment=1 -----

The FREQ Procedure

Table of st3gend by bmige85_i

st3gend(Gender)
bmige85_i(BMI ge 85th percentile, 6th gr)

Frequency			
Percent			
Row Pct			
Col Pct	BMI lt 8	BMI ge 8	Total
	5	5	
1	507	586	1093
	21.98	25.40	47.38
	46.39	53.61	
	44.20	50.52	
2	640	574	1214
	27.74	24.88	52.62
	52.72	47.28	
	55.80	49.48	
Total	1147	1160	2307
	49.72	50.28	100.00

----- Randomization Assignment=1 -----

The FREQ Procedure

Table of race_eth by bmige85_i

race_eth(Race/Ethnicity)
 bmige85_i(BMI ge 85th percentile, 6th gr)

Frequency			
Percent			
Row Pct			
Col Pct	BMI lt 8	BMI ge 8	Total
	5	5	
1	588	677	1265
	25.49	29.35	54.83
	46.48	53.52	
	51.26	58.36	
2	255	214	469
	11.05	9.28	20.33
	54.37	45.63	
	22.23	18.45	
3	213	180	393
	9.23	7.80	17.04
	54.20	45.80	
	18.57	15.52	
4	91	89	180
	3.94	3.86	7.80
	50.56	49.44	
	7.93	7.67	
Total	1147	1160	2307
	49.72	50.28	100.00

----- Randomization Assignment=1 -----

The FREQ Procedure

Table of st2edu by bmige85_i

st2edu(Highest household education)
bmige85_i(BMI ge 85th percentile, 6th gr)

Frequency			
Percent			
Row Pct			
Col Pct	BMI lt 8	BMI ge 8	Total
	5	5	
1	552	611	1163
	24.59	27.22	51.80
	47.46	52.54	
	49.64	53.93	
2	560	522	1082
	24.94	23.25	48.20
	51.76	48.24	
	50.36	46.07	
Total	1112	1133	2245
	49.53	50.47	100.00

Frequency Missing = 62

----- Randomization Assignment=1 -----

The FREQ Procedure

Table of famhist by bmige85_i

famhist(1st deg fam hist diab)
 bmige85_i(BMI ge 85th percentile, 6th gr)

Frequency			
Percent			
Row Pct			
Col Pct	BMI lt 8	BMI ge 8	Total
	5	5	
1	106	183	289
	6.26	10.81	17.07
	36.68	63.32	
	12.96	20.91	
2	712	692	1404
	42.06	40.87	82.93
	50.71	49.29	
	87.04	79.09	
Total	818	875	1693
	48.32	51.68	100.00

Frequency Missing = 614

----- Randomization Assignment=0 -----

The FREQ Procedure

BMI ge 85th percentile, 6th gr

bmige85_i	Frequency	Percent	Cumulative Frequency	Cumulative Percent
BMI lt 85	1164	50.70	1164	50.70
BMI ge 85	1132	49.30	2296	100.00

BMI ge 95th percentile, 6th gr

bmige95_i	Frequency	Percent	Cumulative Frequency	Cumulative Percent
BMI lt 95	1597	69.56	1597	69.56
BMI ge 95	699	30.44	2296	100.00

Fasting Glucose >=100, 6th gr

fastglu100_i	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1870	83.74	1870	83.74
1	363	16.26	2233	100.00

Frequency Missing = 63

Fasting Insulin >=30, 6th gr

fastins30_i	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2070	92.70	2070	92.70
1	163	7.30	2233	100.00

Frequency Missing = 63

BMI ge 85th percentile, 8th gr

bmige85_f	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1259	54.83	1259	54.83
1	1037	45.17	2296	100.00

To replicate selected results in Table 2 18:50 Friday, April 29, 2011

----- Randomization Assignment=0 -----

The FREQ Procedure

BMI ge 95th percentile, 8th gr

bmige95_f	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1686	73.43	1686	73.43
1	610	26.57	2296	100.00

Fasting Glucose \geq 100, 8th gr

fastglu100_f	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1718	76.63	1718	76.63
1	524	23.37	2242	100.00

Frequency Missing = 54

Fasting Insulin \geq 30, 8th gr

fastins30_f	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1990	88.76	1990	88.76
1	252	11.24	2242	100.00

Frequency Missing = 54

----- Randomization Assignment=1 -----

The FREQ Procedure

BMI ge 85th percentile, 6th gr

bmige85_i	Frequency	Percent	Cumulative Frequency	Cumulative Percent
BMI lt 85	1147	49.72	1147	49.72
BMI ge 85	1160	50.28	2307	100.00

BMI ge 95th percentile, 6th gr

bmige95_i	Frequency	Percent	Cumulative Frequency	Cumulative Percent
BMI lt 95	1613	69.92	1613	69.92
BMI ge 95	694	30.08	2307	100.00

Fasting Glucose >=100, 6th gr

fastglu100_i	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1882	84.21	1882	84.21
1	353	15.79	2235	100.00

Frequency Missing = 72

Fasting Insulin >=30, 6th gr

fastins30_i	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2086	93.63	2086	93.63
1	142	6.37	2228	100.00

Frequency Missing = 79

BMI ge 85th percentile, 8th gr

bmige85_f	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1250	54.18	1250	54.18
1	1057	45.82	2307	100.00

To replicate selected results in Table 2 18:50 Friday, April 29, 2011

----- Randomization Assignment=1 -----

The FREQ Procedure

BMI ge 95th percentile, 8th gr

bmige95_f	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1740	75.42	1740	75.42
1	567	24.58	2307	100.00

Fasting Glucose >=100, 8th gr

fastglu100_f	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1792	79.36	1792	79.36
1	466	20.64	2258	100.00

Frequency Missing = 49

Fasting Insulin >=30, 8th gr

fastins30_f	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2026	89.77	2026	89.77
1	231	10.23	2257	100.00

Frequency Missing = 50

To replicate selected results in Table 2 18:50 Friday, April 29, 2011

The MEANS Procedure

Randomization Assignment	N Obs	Variable	Label	N	Mean	Std Dev
0	2296	bmizscore_i	BMI z-score, 6th gr	2296	0.9161	0.9221
		bmizscore_f	BMI z-score, 8th gr	2296	0.8853	0.8810

1	2307	bmizscore_i	BMI z-score, 6th gr	2307	0.9293	0.9129
		bmizscore_f	BMI z-score, 8th gr	2307	0.8678	0.8739

Randomization Assignment	N Obs	Variable	Label	Std Error
0	2296	bmizscore_i	BMI z-score, 6th gr	0.0192
		bmizscore_f	BMI z-score, 8th gr	0.0184
1	2307	bmizscore_i	BMI z-score, 6th gr	0.0190
		bmizscore_f	BMI z-score, 8th gr	0.0182

To replicate selected results in Table 2 18:50 Friday, April 29, 2011

The MEANS Procedure

Randomization Assignment	N Obs	Variable	Label	N	Mean	Std Dev
0	2296	waistcm_i	Waist circum in cm, 6th gr	2289	74.9749	12.8080
		waistcm_f	Waist circum in cm, 8th gr	2294	78.9851	11.9930
1	2307	waistcm_i	Waist circum in cm, 6th gr	2300	75.1198	12.7459
		waistcm_f	Waist circum in cm, 8th gr	2304	78.6325	11.8815

Randomization Assignment	N Obs	Variable	Label	Std Error
0	2296	waistcm_i	Waist circum in cm, 6th gr	0.2677
		waistcm_f	Waist circum in cm, 8th gr	0.2504
1	2307	waistcm_i	Waist circum in cm, 6th gr	0.2658
		waistcm_f	Waist circum in cm, 8th gr	0.2475

To replicate selected results in Table 2 18:50 Friday, April 29, 2011

The MEANS Procedure

Randomization Assignment	N Obs	Variable	Label	N	Mean	Std Dev
0	2296	glucose_i	Fasting Glucose, 6th gr	2233	93.579	6.751
		insulin_i	Fasting Insulin, 6th gr	2233	13.363	12.339
		glucose_f	Fasting Glucose, 8th gr	2242	94.324	7.900
		insulin_f	Fasting Insulin, 8th gr	2242	17.399	13.324
1	2307	glucose_i	Fasting Glucose, 6th gr	2235	93.450	6.593
		insulin_i	Fasting Insulin, 6th gr	2228	13.144	10.639
		glucose_f	Fasting Glucose, 8th gr	2258	93.480	8.580
		insulin_f	Fasting Insulin, 8th gr	2258	16.949	15.269

Randomization Assignment	N Obs	Variable	Label	Std Error
0	2296	glucose_i	Fasting Glucose, 6th gr	0.143
		insulin_i	Fasting Insulin, 6th gr	0.261
		glucose_f	Fasting Glucose, 8th gr	0.167
		insulin_f	Fasting Insulin, 8th gr	0.281
1	2307	glucose_i	Fasting Glucose, 6th gr	0.139
		insulin_i	Fasting Insulin, 6th gr	0.225
		glucose_f	Fasting Glucose, 8th gr	0.181
		insulin_f	Fasting Insulin, 8th gr	0.321

To replicate selected results in Table 2 18:50 Friday, April 29, 2011

The MEANS Procedure

Randomization Assignment	N Obs	Variable	Label	N	Mean	Std Dev
0	2296	diffbmige85	bmige85_f-bmige85_i	2296	-0.041	0.337
		diffbmige95	bmige95_f-bmige95_i	2296	-0.039	0.320
		diffbmizscore	bmizscore_f-bmizscore_i	2296	-0.031	0.390
		diffwaistcm	waistcm_f-waistcm_i	2287	4.030	6.079
		diffglul100	fastglul100_f-fastglul100_i	2186	0.069	0.473
		diffins30	fastins30_f-fastins30_i	2186	0.039	0.326
		diffglu	glucose_f-glucose_i	2186	0.699	7.839
		diffins_untrans	insulin_f-insulin_i	2186	4.029	12.426
1	2307	diffbmige85	bmige85_f-bmige85_i	2307	-0.045	0.345
		diffbmige95	bmige95_f-bmige95_i	2307	-0.055	0.323
		diffbmizscore	bmizscore_f-bmizscore_i	2307	-0.062	0.405
		diffwaistcm	waistcm_f-waistcm_i	2297	3.493	5.971
		diffglul100	fastglul100_f-fastglul100_i	2196	0.049	0.469
		diffins30	fastins30_f-fastins30_i	2187	0.038	0.311
		diffglu	glucose_f-glucose_i	2196	0.023	8.592
		diffins_untrans	insulin_f-insulin_i	2188	3.814	14.155

Randomization Assignment	N Obs	Variable	Label	Std Error
0	2296	diffbmige85	bmige85_f-bmige85_i	0.007
		diffbmige95	bmige95_f-bmige95_i	0.007
		diffbmizscore	bmizscore_f-bmizscore_i	0.008
		diffwaistcm	waistcm_f-waistcm_i	0.127
		diffglul100	fastglul100_f-fastglul100_i	0.010
		diffins30	fastins30_f-fastins30_i	0.007
		diffglu	glucose_f-glucose_i	0.168
		diffins_untrans	insulin_f-insulin_i	0.266
1	2307	diffbmige85	bmige85_f-bmige85_i	0.007
		diffbmige95	bmige95_f-bmige95_i	0.007
		diffbmizscore	bmizscore_f-bmizscore_i	0.008
		diffwaistcm	waistcm_f-waistcm_i	0.125
		diffglul100	fastglul100_f-fastglul100_i	0.010
		diffins30	fastins30_f-fastins30_i	0.007
		diffglu	glucose_f-glucose_i	0.183

diffins_untrans insulin_f-insulin_i

0.303

The Mixed Procedure

Model Information

Data Set	WORK.BASELINE_F
Dependent Variable	diffbmizscore
Covariance Structure	Variance Components
Subject Effect	schoolid
Estimation Method	REML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Between-Within

Class Level Information

Class	Levels	Values
studentid	4603	not printed
schoolid	42	11 13 15 16 18 21 23 24 25 26 27 33 36 38 39 40 41 45 48 51 53 55 56 57 60 63 66 70 71 72 73 74 76 77 79 86 87 88 90 94 96 98
assign	2	0 1

Dimensions

Covariance Parameters	2
Columns in X	4
Columns in Z Per Subject	1
Subjects	42
Max Obs Per Subject	179

Number of Observations

Number of Observations Read	4603
Number of Observations Used	4603
Number of Observations Not Used	0

Iteration History

Iteration	Evaluations	-2 Res Log Like	Criterion
0	1	4115.30441025	
1	2	4105.88182285	0.00000000

To replicate analyses of selected continuous outcomes in Table 2

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The Mixed Procedure

Convergence criteria met.

Covariance Parameter Estimates

Cov Parm	Subject	Estimate
Intercept	schoolid	0.001071
Residual		0.1415

Fit Statistics

-2 Res Log Likelihood	4105.9
AIC (smaller is better)	4109.9
AICC (smaller is better)	4109.9
BIC (smaller is better)	4113.4

Solution for Fixed Effects

Effect	Randomization Assignment	Estimate	Standard Error	DF	t Value	Pr > |t|
Intercept		0.06685	0.01209	40	5.53	<.0001
assign	0	0.02752	0.01515	40	1.82	0.0769
assign	1	0	.	.	.	.
bmizscore_i		-0.1359	0.006064	4560	-22.41	<.0001

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
assign	1	40	3.30	0.0769
bmizscore_i	1	4560	502.24	<.0001

Least Squares Means

Effect	Randomization Assignment	Estimate	Standard Error	DF	t Value	Pr > |t|	Alpha	Lower	Upper
assign	0	-0.03103	0.01073	40	-2.89	0.0062	0.05	-0.05272	-0.00934
assign	1	-0.05855	0.01070	40	-5.47	<.0001	0.05	-0.08017	-0.03693

To replicate analyses of selected continuous outcomes in Table 2

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The Mixed Procedure

Differences of Least Squares Means

Effect	Randomization Assignment	Randomization Assignment	Estimate	Standard Error	DF	t Value	Pr > t	Alpha
assign	1	0	-0.02752	0.01515	40	-1.82	0.0769	0.05

Differences of Least Squares Means

Effect	Randomization Assignment	Randomization Assignment	Lower	Upper
assign	1	0	-0.05815	0.003107

The Mixed Procedure

Model Information

Data Set	WORK.BASELINE_F
Dependent Variable	diffwaistcm
Covariance Structure	Variance Components
Subject Effect	schoolid
Estimation Method	REML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Between-Within

Class Level Information

Class	Levels	Values
studentid	4589	not printed
schoolid	42	11 13 15 16 18 21 23 24 25 26 27 33 36 38 39 40 41 45 48 51 53 55 56 57 60 63 66 70 71 72 73 74 76 77 79 86 87 88 90 94 96 98
assign	2	0 1

Dimensions

Covariance Parameters	2
Columns in X	4
Columns in Z Per Subject	1
Subjects	42
Max Obs Per Subject	179

Number of Observations

Number of Observations Read	4603
Number of Observations Used	4584
Number of Observations Not Used	19

Iteration History

Iteration	Evaluations	-2 Res Log Like	Criterion
0	1	28805.72900680	
1	3	28743.57025603	0.00000029
2	1	28743.56721191	0.00000000

The Mixed Procedure

Convergence criteria met.

Covariance Parameter Estimates

Cov Parm	Subject	Estimate
Intercept	schoolid	0.7780
Residual		30.5365

Fit Statistics

-2 Res Log Likelihood	28743.6
AIC (smaller is better)	28747.6
AICC (smaller is better)	28747.6
BIC (smaller is better)	28751.0

Solution for Fixed Effects

Effect	Randomization Assignment	Estimate	Standard Error	DF	t Value	Pr > |t|
Intercept		16.6202	0.5360	40	31.01	<.0001
assign	0	0.4890	0.3202	40	1.53	0.1346
assign	1	0	.	.	.	.
waistcm_i		-0.1744	0.006476	4541	-26.93	<.0001

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
assign	1	40	2.33	0.1346
waistcm_i	1	4541	725.01	<.0001

Least Squares Means

Effect	Randomization Assignment	Estimate	Standard Error	DF	t Value	Pr > |t|	Alpha	Lower	Upper
assign	0	4.0230	0.2267	40	17.75	<.0001	0.05	3.5649	4.4811
assign	1	3.5340	0.2262	40	15.62	<.0001	0.05	3.0769	3.9911

To replicate analyses of selected continuous outcomes in Table 2

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The Mixed Procedure

Differences of Least Squares Means

Effect	Randomization Assignment	Randomization Assignment	Estimate	Standard Error	DF	t Value	Pr > t	Alpha
assign	1	0	-0.4890	0.3202	40	-1.53	0.1346	0.05

Differences of Least Squares Means

Effect	Randomization Assignment	Randomization Assignment	Lower	Upper
assign	1	0	-1.1361	0.1582

The Mixed Procedure

Model Information

Data Set	WORK.BASELINE_F
Dependent Variable	diffins
Covariance Structure	Variance Components
Subject Effect	schoolid
Estimation Method	REML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Between-Within

Class Level Information

Class	Levels	Values
studentid	4461	not printed
schoolid	42	11 13 15 16 18 21 23 24 25 26 27 33 36 38 39 40 41 45 48 51 53 55 56 57 60 63 66 70 71 72 73 74 76 77 79 86 87 88 90 94 96 98
assign	2	0 1

Dimensions

Covariance Parameters	2
Columns in X	4
Columns in Z Per Subject	1
Subjects	42
Max Obs Per Subject	179

Number of Observations

Number of Observations Read	4603
Number of Observations Used	4374
Number of Observations Not Used	229

Iteration History

Iteration	Evaluations	-2 Res Log Like	Criterion
0	1	6536.14089549	
1	2	6513.28241995	0.00000000

To replicate analyses of selected continuous outcomes in Table 2

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The Mixed Procedure

Convergence criteria met.

Covariance Parameter Estimates

Cov Parm	Subject	Estimate
Intercept	schoolid	0.003592
Residual		0.2564

Fit Statistics

-2 Res Log Likelihood	6513.3
AIC (smaller is better)	6517.3
AICC (smaller is better)	6517.3
BIC (smaller is better)	6520.8

Solution for Fixed Effects

Effect	Randomization Assignment	Estimate	Standard Error	DF	t Value	Pr > |t|
Intercept		1.4628	0.03172	40	46.12	<.0001
assign	0	0.05317	0.02429	40	2.19	0.0345
assign	1	0	.	.	.	.
logins_i		-0.5086	0.01139	4331	-44.65	<.0001

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
assign	1	40	4.79	0.0345
logins_i	1	4331	1993.23	<.0001

Least Squares Means

Effect	Randomization Assignment	Estimate	Standard Error	DF	t Value	Pr > |t|	Alpha	Lower	Upper
assign	0	0.3270	0.01720	40	19.01	<.0001	0.05	0.2922	0.3618
assign	1	0.2738	0.01716	40	15.96	<.0001	0.05	0.2392	0.3085

To replicate analyses of selected continuous outcomes in Table 2

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The Mixed Procedure

Differences of Least Squares Means

Effect	Randomization Assignment	Randomization Assignment	Estimate	Standard Error	DF	t Value	Pr > t	Alpha
assign	1	0	-0.05317	0.02429	40	-2.19	0.0345	0.05

Differences of Least Squares Means

Effect	Randomization Assignment	Randomization Assignment	Lower	Upper
assign	1	0	-0.1023	-0.00407

The Mixed Procedure

Model Information

Data Set	WORK.BASELINE_F
Dependent Variable	diffglu
Covariance Structure	Variance Components
Subject Effect	schoolid
Estimation Method	REML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Between-Within

Class Level Information

Class	Levels	Values
studentid	4468	not printed
schoolid	42	11 13 15 16 18 21 23 24 25 26 27 33 36 38 39 40 41 45 48 51 53 55 56 57 60 63 66 70 71 72 73 74 76 77 79 86 87 88 90 94 96 98
assign	2	0 1

Dimensions

Covariance Parameters	2
Columns in X	4
Columns in Z Per Subject	1
Subjects	42
Max Obs Per Subject	179

Number of Observations

Number of Observations Read	4603
Number of Observations Used	4382
Number of Observations Not Used	221

Iteration History

Iteration	Evaluations	-2 Res Log Like	Criterion
0	1	30158.26845337	
1	2	30011.13350166	0.00000005
2	1	30011.13291181	0.00000000

The Mixed Procedure

Convergence criteria met.

Covariance Parameter Estimates

Cov Parm	Subject	Estimate
Intercept	schoolid	2.8565
Residual		54.1901

Fit Statistics

-2 Res Log Likelihood	30011.1
AIC (smaller is better)	30015.1
AICC (smaller is better)	30015.1
BIC (smaller is better)	30018.6

Solution for Fixed Effects

Effect	Randomization Assignment	Estimate	Standard Error	DF	t Value	Pr > |t|
Intercept		46.2798	1.6429	40	28.17	<.0001
assign	0	0.5676	0.5709	40	0.99	0.3261
assign	1	0	.	.	.	.
glucose_i		-0.4953	0.01708	4339	-29.00	<.0001

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
assign	1	40	0.99	0.3261
glucose_i	1	4339	841.11	<.0001

Least Squares Means

Effect	Randomization Assignment	Estimate	Standard Error	DF	t Value	Pr > |t|	Alpha	Lower	Upper
assign	0	0.5263	0.4040	40	1.30	0.2002	0.05	-0.2903	1.3428
assign	1	-0.04134	0.4033	40	-0.10	0.9189	0.05	-0.8565	0.7738

To replicate analyses of selected continuous outcomes in Table 2

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The Mixed Procedure

Differences of Least Squares Means

Effect	Randomization Assignment	Randomization Assignment	Estimate	Standard Error	DF	t Value	Pr > t	Alpha
assign	1	0	-0.5676	0.5709	40	-0.99	0.3261	0.05

Differences of Least Squares Means

Effect	Randomization Assignment	Randomization Assignment	Lower	Upper
assign	1	0	-1.7214	0.5862

The GLIMMIX Procedure

Model Information

Data Set	WORK.LONGF
Response Variable	bmige85
Response Distribution	Binary
Link Function	Logit
Variance Function	Default
Variance Matrix Blocked By	schoolid
Estimation Technique	Residual PL
Degrees of Freedom Method	Between-Within

Class Level Information

Class	Levels	Values
studentid	4603	not printed
schoolid	42	11 13 15 16 18 21 23 24 25 26 27 33 36 38 39 40 41 45 48 51 53 55 56 57 60 63 66 70 71 72 73 74 76 77 79 86 87 88 90 94 96 98
time	2	0 1

Number of Observations Read	9206
Number of Observations Used	9206

Response Profile

Ordered Value	bmige85	Total Frequency
1	0	4820
2	1	4386

The GLIMMIX procedure is modeling the probability that `bmige85='1'`.

Dimensions

G-side Cov. Parameters	1
Columns in X	5
Columns in Z per Subject	1
Subjects (Blocks in V)	42
Max Obs per Subject	358

The GLIMMIX Procedure

Optimization Information

Optimization Technique	Newton-Raphson with Ridging
Parameters in Optimization	1
Lower Boundaries	1
Upper Boundaries	0
Fixed Effects	Profiled
Starting From	Data

Iteration History

Iteration	Restarts	Subiterations	Objective Function	Change	Max Gradient
0	0	1	43881.651346	2.00000000	364.0185
1	0	0	50780.932391	0.34801171	103.481
2	0	0	54736.21194	0.05774534	35.38984
3	0	0	55599.321666	0.00163666	25.3018
4	0	0	55625.813165	0.00000138	25.00309
5	0	0	55625.835622	0.00000000	25.00283

Convergence criterion (PCONV=1.11022E-8) satisfied.

Estimated G matrix is not positive definite.

NOTE: The covariance matrix is the zero matrix.

Fit Statistics

-2 Res Log Pseudo-Likelihood	55625.84
Generalized Chi-Square	10752.70
Gener. Chi-Square / DF	1.17

Covariance Parameter Estimates

Standard

Cov Parm	Subject	Estimate	Error
Intercept	schoolid	0	.

To replicate analyses of selected dichotomous outcomes in Table 2

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The GLIMMIX Procedure

Solutions for Fixed Effects

Effect	time	Estimate	Standard Error	DF	t Value	Pr > t	Alpha	Lower	Upper
Intercept		-3.7258	0.1103	40	-33.79	<.0001	0.05	-3.9486	-3.5029
assign		-0.00873	0.08921	40	-0.10	0.9225	0.05	-0.1890	0.1716
bmige85_i		5.8208	0.1004	9162	57.96	<.0001	0.05	5.6240	6.0177
time	0	0.8154	0.09491	41	8.59	<.0001	0.05	0.6237	1.0071
time	1	0	.	.	.	.	.	.	.

Type I Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
assign	1	40	0.29	0.5917
bmige85_i	1	9162	3358.96	<.0001
time	1	41	73.81	<.0001

Type III Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
assign	1	40	0.01	0.9225
bmige85_i	1	9162	3358.96	<.0001
time	1	41	73.81	<.0001

The GLIMMIX Procedure

Model Information

Data Set	WORK.LONGF
Response Variable	bmige95
Response Distribution	Binary
Link Function	Logit
Variance Function	Default
Variance Matrix Blocked By	schoolid
Estimation Technique	Residual PL
Degrees of Freedom Method	Between-Within

Class Level Information

Class	Levels	Values
studentid	4603	not printed
schoolid	42	11 13 15 16 18 21 23 24 25 26 27 33 36 38 39 40 41 45 48 51 53 55 56 57 60 63 66 70 71 72 73 74 76 77 79 86 87 88 90 94 96 98
time	2	0 1

Number of Observations Read	9206
Number of Observations Used	9206

Response Profile

Ordered Value	bmige95	Total Frequency
1	0	6636
2	1	2570

The GLIMMIX procedure is modeling the probability that bmige95='1'.

Dimensions

G-side Cov. Parameters	1
Columns in X	5
Columns in Z per Subject	1
Subjects (Blocks in V)	42
Max Obs per Subject	358

The GLIMMIX Procedure

Optimization Information

Optimization Technique	Newton-Raphson with Ridging
Parameters in Optimization	1
Lower Boundaries	1
Upper Boundaries	0
Fixed Effects	Profiled
Starting From	Data

Iteration History

Iteration	Restarts	Subiterations	Objective Function	Change	Max Gradient
0	0	1	43083.452746	2.00000000	426.9471
1	0	0	50930.357189	0.41444405	149.9023
2	0	0	58891.209275	0.11289199	53.00835
3	0	0	62839.6615	0.00964983	26.23541
4	0	0	63280.242081	0.00007740	23.64414
5	0	0	63284.315469	0.00000001	23.62013

Convergence criterion (PCONV=1.11022E-8) satisfied.

Estimated G matrix is not positive definite.

NOTE: The covariance matrix is the zero matrix.

Fit Statistics

-2 Res Log Pseudo-Likelihood	63284.32
Generalized Chi-Square	14125.84
Gener. Chi-Square / DF	1.54

Covariance Parameter Estimates

Standard

Cov Parm	Subject	Estimate	Error
Intercept	schoolid	0	.

To replicate analyses of selected dichotomous outcomes in Table 2

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The GLIMMIX Procedure

Solutions for Fixed Effects

Effect	time	Estimate	Standard Error	DF	t Value	Pr > t	Alpha	Lower	Upper
Intercept		-4.4052	0.1246	40	-35.35	<.0001	0.05	-4.6571	-4.1533
assign		-0.1861	0.09672	40	-1.92	0.0615	0.05	-0.3815	0.009416
bmige95_i		6.0135	0.1141	9162	52.71	<.0001	0.05	5.7898	6.2371
time	0	1.0526	0.1057	41	9.96	<.0001	0.05	0.8391	1.2662
time	1	0	.	.	.	.	.	.	.

Type I Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
assign	1	40	4.61	0.0378
bmige95_i	1	9162	2778.00	<.0001
time	1	41	99.13	<.0001

Type III Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
assign	1	40	3.70	0.0615
bmige95_i	1	9162	2778.00	<.0001
time	1	41	99.13	<.0001

The GLIMMIX Procedure

Model Information

Data Set	WORK.LONGF
Response Variable	fastglu100
Response Distribution	Binary
Link Function	Logit
Variance Function	Default
Variance Matrix Blocked By	schoolid
Estimation Technique	Residual PL
Degrees of Freedom Method	Between-Within

Class Level Information

Class	Levels	Values
studentid	4468	not printed
schoolid	42	11 13 15 16 18 21 23 24 25 26 27 33 36 38 39 40 41 45 48 51 53 55 56 57 60 63 66 70 71 72 73 74 76 77 79 86 87 88 90 94 96 98
time	2	0 1

Number of Observations Read	9206
Number of Observations Used	8850

Response Profile

Ordered Value	fastglu100	Total Frequency
1	0	7175
2	1	1675

The GLIMMIX procedure is modeling the probability that fastglu100='1'.

Dimensions

G-side Cov. Parameters	1
Columns in X	5
Columns in Z per Subject	1
Subjects (Blocks in V)	42
Max Obs per Subject	356

To replicate analyses of selected dichotomous outcomes in Table 2

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The GLIMMIX Procedure

Optimization Information

Optimization Technique	Newton-Raphson with Ridging
Parameters in Optimization	1
Lower Boundaries	1
Upper Boundaries	0
Fixed Effects	Profiled
Starting From	Data

Iteration History

Iteration	Restarts	Subiterations	Objective Function	Change	Max Gradient
0	0	6	42009.917543	1.27790191	0.000725
1	0	4	44989.986367	0.29650207	8.359E-6
2	0	2	45929.762312	0.03597021	0.000809
3	0	1	45993.952812	0.00150555	0.000516
4	0	1	45994.665105	0.00002226	1.125E-7
5	0	1	45994.671651	0.00000019	8.18E-12
6	0	0	45994.671707	0.00000000	2.383E-7

Convergence criterion (PCONV=1.11022E-8) satisfied.

Fit Statistics

-2 Res Log Pseudo-Likelihood	45994.67
Generalized Chi-Square	7439.91
Gener. Chi-Square / DF	0.84

Covariance Parameter Estimates

Cov Parm	Subject	Estimate	Standard Error
Intercept	schoolid	0.1572	0.04631

Solutions for Fixed Effects

Effect	time	Estimate	Standard Error	DF	t Value	Pr > |t|	Alpha	Lower	Upper
Intercept		-2.1500	0.1076	40	-19.97	<.0001	0.05	-2.3675	-1.9324
assign		-0.08728	0.1435	40	-0.61	0.5464	0.05	-0.3772	0.2027
fastglu100_i		3.5669	0.07888	8806	45.22	<.0001	0.05	3.4123	3.7216
time	0	-0.6367	0.07163	41	-8.89	<.0001	0.05	-0.7813	-0.4920

To replicate analyses of selected dichotomous outcomes in Table 2

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The GLIMMIX Procedure

Solutions for Fixed Effects

Effect	time	Estimate	Standard Error	DF	t Value	Pr > t	Alpha	Lower	Upper
time	1	0	.	.	.	.	.	.	.

Type I Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
assign	1	40	0.51	0.4780
fastglu100_i	1	8806	2044.89	<.0001
time	1	41	79.00	<.0001

Type III Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
assign	1	40	0.37	0.5464
fastglu100_i	1	8806	2044.90	<.0001
time	1	41	79.00	<.0001

The GLIMMIX Procedure

Model Information

Data Set	WORK.LONGF
Response Variable	fastins30
Response Distribution	Binary
Link Function	Logit
Variance Function	Default
Variance Matrix Blocked By	schoolid
Estimation Technique	Residual PL
Degrees of Freedom Method	Between-Within

Class Level Information

Class	Levels	Values
studentid	4461	not printed
schoolid	42	11 13 15 16 18 21 23 24 25 26 27 33 36 38 39 40 41 45 48 51 53 55 56 57 60 63 66 70 71 72 73 74 76 77 79 86 87 88 90 94 96 98
time	2	0 1

Number of Observations Read	9206
Number of Observations Used	8834

Response Profile

Ordered Value	fastins30	Total Frequency
1	0	8063
2	1	771

The GLIMMIX procedure is modeling the probability that fastins30='1'.

Dimensions

G-side Cov. Parameters	1
Columns in X	5
Columns in Z per Subject	1
Subjects (Blocks in V)	42
Max Obs per Subject	356

To replicate analyses of selected dichotomous outcomes in Table 2

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The GLIMMIX Procedure

Optimization Information

Optimization Technique	Newton-Raphson with Ridging
Parameters in Optimization	1
Lower Boundaries	1
Upper Boundaries	0
Fixed Effects	Profiled
Starting From	Data

Iteration History

Iteration	Restarts	Subiterations	Objective Function	Change	Max Gradient
0	0	1	41349.04112	2.00000000	291.0937
1	0	0	47959.174346	0.43084025	14.97171
2	0	3	51377.275616	2.00000000	0.009769
3	0	2	52015.982438	0.26164184	0.008736
4	0	1	52050.758983	0.01252680	0.003537
5	0	1	52051.326164	0.00035649	2.879E-6
6	0	1	52051.316003	0.00000197	8.76E-11
7	0	0	52051.315936	0.00000000	4.559E-7

Convergence criterion (PCONV=1.11022E-8) satisfied.

Fit Statistics

-2 Res Log Pseudo-Likelihood	52051.32
Generalized Chi-Square	6675.85
Gener. Chi-Square / DF	0.76

Covariance Parameter Estimates

Cov Parm	Subject	Estimate	Standard Error
Intercept	schoolid	0.02165	0.02721

Solutions for Fixed Effects

Effect	time	Estimate	Standard Error	DF	t Value	Pr > |t|	Alpha	Lower	Upper
Intercept		-2.8465	0.08919	40	-31.92	<.0001	0.05	-3.0267	-2.6662
assign		-0.07829	0.1106	40	-0.71	0.4830	0.05	-0.3018	0.1452
fastins30_i		4.5599	0.1189	8790	38.35	<.0001	0.05	4.3269	4.7930

To replicate analyses of selected dichotomous outcomes in Table 2

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The GLIMMIX Procedure

Solutions for Fixed Effects

Effect	time	Estimate	Standard Error	DF	t Value	Pr > t	Alpha	Lower	Upper
time	0	-0.8774	0.1066	41	-8.23	<.0001	0.05	-1.0926	-0.6621
time	1	0	.	.	.	.	.	.	.

Type I Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
assign	1	40	1.19	0.2812
fastins30_i	1	8790	1471.28	<.0001
time	1	41	67.76	<.0001

Type III Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
assign	1	40	0.50	0.4830
fastins30_i	1	8790	1470.98	<.0001
time	1	41	67.76	<.0001