# Dataset Integrity Check for the Teen-Longitudinal Assessment of Bariatric Surgery (Teen-LABS) Inge et al. Publication

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# Contents

# 1 Standard Disclaimer

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 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. It is thus not our policy to resolve every discrepancy that is observed in an integrity check. Specifically, we do not attempt to resolve minor or inconsequential discrepancies with published results or discrepancies that involve complex analyses, unless NIDDK Repository staff 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 footnotes to the integrity check those instances in which our secondary analyses produced results that were not fully consistent with those reported in the target publication.

# 2 Study Background

Teen-LABS proposes that bariatric surgery is more beneficial to extremely obese patients when it's done during the adolescent years instead of adulthood. By using duration of obesity as the moderating variable, the Teen-LABS study estimates the risks and benefits of bariatric surgery among adolescent patients in comparison with adult patients. At least 200 adolescent bariatric patients were recruited from four centers and underwent gastric bypass surgery between 2007 and 2012. Post-surgery data and biospecimens were obtained at pre-determined points during a 24 month period. Study examined changes in body weight, coexisting conditions, cardiometabolic risk factors, and weight-related quality of life as well as postoperative complications through 3 years after the gastric bypass procedure.

# 3 Archived Datasets

All the SAS data files, as provided by the Data Coordinating Center (DCC), are located in the Teen-LABS folder in the data package. For this replication, variables were taken from the "ef.sas7bdat", "sqop.sas7bdat", "cdi.sas7bdat", "anth.sas7bdat", and "short.sas7bdat" datasets.

# 4 Statistical Methods

Analyses were performed to duplicate results for the data published by Inge et al. [1] in The New England Journal of Medicine in 2016. To verify the integrity of the dataset, descriptive statistics were computed.

# 5 Results

For Table 1 in the publication [1], Demographic, Anthropometric, and Procedural Characteristics of the Participants were examined. Table A lists the variables that were used in the replication and Table B compares the results calculated from the archived data files to the results published in Table 1. The results of the replication are nearly an exact match to the published results.

# 6 Conclusions

The NIDDK repository is confident that the Teen-LABS Year 4 data files to be distributed are a true copy of the study data.

# 7 References

[1] Inge, T.H., Courcoulas, A.P., Jenkins, T.M., Michalsky, M.P., Helmrath, M.A., Brnadt, M.L., Harmon, C.M., Zeller, M.H., Chen, M.K., Xanthakos, S.A., Horlick, M., Buncher, C.R., and the Teen-LABS Consortium. "Weight Loss and Health Status 3 Years after Bariatric Surgery in Adolescents". New England Journal of Medicine (2016) 374(2):113-123.

Table A: **Variables used to replicate Table 1**: **Demographic, Anthropometric, and Procedural Characteristics of the Participants**

| **Table Variable** | **dataset.variable** |
|---|---|
| Age | sqop. surgdat, sqop.visit, and ef.dob |
| Sex | ef.sex |
| Race or ethnic background | ef.race |
| Hispanic ethnic background | ef.ethn |
| Household income | cdi.pcghincome and cdi.visit |
| Caregiver level of education | cdi.pcgeduc and cdi.visit |
| Baseline weight | anth.wgt1 and anth.visit |
| Baseline height | anth.hgt1 and anth.visit |
| Baseline BMI | anth.wgt1, anth.hgt1, and anth.visit |
| Year 3 weight | anth.wgt1, short.swgtkg, anth.visit, and short.visit |
| Year 3 height | anth.hgt1 and anth.visit |
| Year 3 BMI | anth.wgt1, short.swgtkg, anth.hgt1. anth.visit, and short.visit |
| Gastric Bypass vs. Sleeve Gastrectomy | sqop.surg, sqop.sga, and sqop.visit |

**Table B:** Comparison of values computed in integrity check to reference article Table 1 values

| Characteristic | All Participants (N=228) Manuscript | All Participants (N=228) DSIC | Diff. (N=0) |
|---|---|---|---|
| Age-yr* | 17±1.6 | 16±1.6 | 1±0 |
| Age group-no. (%)* | | | |
| 13-15 yr | 66 (29) | 65 (28) | 1 (1) |
| 16-17 yr | 94 (41) | 91 (40) | 3 (1) |
| 18-19 yr | 68 (30) | 72 (32) | 4 (2) |
| Sex-no. (%) | | | |
| Female | 171 (75) | 171 (75) | 0 (0) |
| Male | 57 (25) | 57 (25) | 0 (0) |
| Race or ethnic background-no. (%) | | | |
| White | 164 (72) | 164 (72) | 0 (0) |
| Black | 50 (22) | 50 (22) | 0 (0) |
| Asian | 1 (<1) | 1 (<1) | 0 (0) |
| American Indian or Alaskan native | 1 (<1) | 1 (<1) | 0 (0) |
| More than one race or ethnic background | 12 (5) | 12 (5) | 0 (0) |
| Hispanic ethnic background-no. (%) | 16 (7) | 16 (7) | 0 (0) |
| Household income-no./total no. (%) | | | |
| <$25,000 | 83/218 (38) | 83/218 (38) | 0/0 (0) |
| $25,000-$49,999 | 44/218 (20) | 44/218 (20) | 0/0 (0) |
| $50,000-$74,999 | 38/218 (17) | 38/218 (17) | 0/0 (0) |
| ≥$75,000 | 53/218 (24) | 53/218 (24) | 0/0 (0) |

| Characteristic | All Participants (N=228) Manuscript | All Participants (N=228) DSIC | Diff. (N=0) |
|---|---|---|---|
| Caregiver level of education-no./total no. (%) | | | |
| Less than high school | 23/221 (10) | 23/221 (10) | 0/0 (0) |
| High-school graduate | 68/221 (31) | 68/221 (31) | 0/0 (0) |
| Some college | 89/221 (40) | 89/221 (40) | 0/0 (0) |
| College graduate | 41/221 (19) | 41/221 (19) | 0/0 (0) |
| Mean weight (95% CI) | | | |
| Baseline-kg | 149 (145 to 153) | 149 (145 to 153) | 0 (0 to 0) |
| 3 Yr-kg | 108 (103 to 113) | 109 (104 to 114) | 1 (1 to 1) |
| Absolute change-kg | -41 (-45 to -37) | -41 (-44 to -37) | 0 (1 to 0) |
| Percent change | -27 (-29 to -25) | -27 (-29 to -25) | 0 (0 to 0) |
| Mean height (95% CI) | | | |
| Baseline-cm | 167.9 (166.7 to 169.1) | 167.9 (166.7 to 169.1) | 0 (0 to 0) |
| 3 Yr-cm | 168.3 (166.9 to 169.7) | 168.3 (166.9 to 169.7) | 0 (0 to 0) |
| Absolute change-cm | 0.51 (0.23 to 0.80) | 0.54 (0.25 to 0.83) | 0.03 (0.02 to 0.03) |
| Percent change | 0.31 (0.14 to 0.48) | 0.32 (0.15 to 0.49) | 0.01 (0.01 to 0.01) |
| Mean BMI (95% CI) | | | |
| Baseline | 53 (51 to 54) | 53 (51 to 54) | 0 (0 to 0) |
| 3 Yr | 38 (37 to 40) | 38 (37 to 40) | 0 (0 to 0) |
| Absolute change | -15 (-16 to -13) | -15 (-16 to -13) | 0 (0 to 0) |
| Percent change | -28 (-30 to -25) | -28 (-30 to -25) | 0 (0 to 0) |

*The continuous age value was calculated based on surgery date and date of birth

| Characteristic | Gastric Bypass (N=161) Manuscript | Gastric Bypass (N=161) DSIC | Diff. (N=0) |
|---|---|---|---|
| Age-yr* | 17±1.5 | 17±1.5 | 0±0 |
| Age group-no. (%)* | | | |
| 13-15 yr | 42 (26) | 42 (26) | 0 (0) |
| 16-17 yr | 71 (44) | 68 (42) | 3 (2) |
| 18-19 yr | 48 (30) | 51 (32) | 3 (2) |
| Sex-no. (%) | | | |
| Female | 126 (78) | 126 (78) | 0 (0) |
| Male | 35 (22) | 35 (22) | 0 (0) |
| Race or ethnic background-no. (%) | | | |
| White | 119 (74) | 119 (74) | 0 (0) |
| Black | 35 (22) | 35 (22) | 0 (0) |
| Asian | 1 (1) | 1 (1) | 0 (0) |
| American Indian or Alaskan native | 0 | 0 | 0 |
| More than one race or ethnic background | 6 (4) | 6 (4) | 0 (0) |
| Hispanic ethnic background-no. (%) | 15 (9) | 15 (9) | 0 (0) |
| Household income-no./total no. (%) | | | |
| <$25,000 | 51/156 (33) | 51/156 (33) | 0/0 (0) |
| $25,000-$49,999 | 31/156 (20) | 31/156 (20) | 0/0 (0) |
| $50,000-$74,999 | 28/156 (18) | 28/156 (18) | 0/0 (0) |

| Characteristic | Gastric Bypass (N=161) Manuscript | Gastric Bypass (N=161) DSIC | Diff. (N=0) |
|---|---|---|---|
| ≥$75,000 | 46/156 (29) | 46/156 (29) | 0/0 (0) |
| Caregiver level of education-no./total no. (%) | | | |
| Less than high school | 11/157 (7) | 11/157 (7) | 0/0 (0) |
| High-school graduate | 47/157 (30) | 47/157 (30) | 0/0 (0) |
| Some college | 67/157 (43) | 67/157 (43) | 0/0 (0) |
| College graduate | 32/157 (20) | 32/157 (20) | 0/0 (0) |
| Mean weight (95% CI) | | | |
| Baseline-kg | 151 (146 to 156) | 151 (146 to 156) | 0 (0 to 0) |
| 3 Yr-kg | 109 (104 to 115) | 110 (105 to 116) | 1 (1 to 1) |
| Absolute change-kg | -42 (-47 to -38) | -42 (-47 to -38) | 0 (0 to 0) |
| Percent change | -28 (-30 to -25) | -28 (-30 to -25) | 0 (0 to 0) |
| Mean height (95% CI) | | | |
| Baseline-cm | 167.5 (166.2 to 168.9) | 167.5 (166.2 to 168.9) | 0 (0 to 0) |
| 3 Yr-cm | 168.3 (166.7 to 169.8) | 168.3 (166.7 to 169.8) | 0 (0 to 0) |
| Absolute change-cm | 0.54 (0.20 to 0.88) | 0.54 (0.20 to 0.88) | 0 (0 to 0) |
| Percent change | 0.32 (0.12 to 0.53) | 0.32 (0.12 to 0.53) | 0 (0 to 0) |
| Mean BMI (95% CI) | | | |
| Baseline | 54 (52 to 55) | 54 (52 to 55) | 0 (0 to 0) |
| 3 Yr | 39 (37 to 41) | 39 (37 to 41) | 0 (0 to 0) |
| Absolute change | -15 (-17 to -14) | -15 (-16 to -14) | 0 (1 to 0) |
| Percent change | -28 (-31 to -25) | -28 (-30 to -26) | 0 (1 to 1) |

*The continuous age value was calculated based on surgery date and date of birth

| Characteristic | Sleeve Gastrectomy (N=67) Manuscript | Sleeve Gastrectomy (N=67) DSIC | Diff. (N=0) |
|---|---|---|---|
| Age-yr* | 17±1.7 | 16±1.7 | 1±0 |
| Age group-no. (%)* | | | |
| 13-15 yr | 24 (36) | 23 (34) | 1 (2) |
| 16-17 yr | 23 (34) | 23 (34) | 0 (0) |
| 18-19 yr | 20 (30) | 21 (32) | 1 (2) |
| Sex-no. (%) | | | |
| Female | 45 (67) | 45 (67) | 0 (0) |
| Male | 22 (33) | 22 (33) | 0 (0) |
| Race or ethnic background-no. (%) | | | |
| White | 45 (67) | 45 (67) | 0 (0) |
| Black | 15 (22) | 15 (22) | 0 (0) |
| Asian | 0 | 0 | 0 |
| American Indian or Alaskan native | 1 (1) | 1 (1) | 0 (0) |
| More than one race or ethnic background | 6 (9) | 6 (9) | 0 (0) |
| Hispanic ethnic background-no. (%) | 1 (1) | 1 (1) | 0 (0) |
| Household income-no./total no. (%) | | | |
| <$25,000 | 32/62 (52) | 32/62 (52) | 0/0 (0) |
| $25,000-$49,999 | 13/62 (21) | 13/62 (21) | 0/0 (0) |
| $50,000-$74,999 | 10/62 (16) | 10/62 (16) | 0/0 (0) |
| ≥$75,000 | 7/62 (11) | 7/62 (11) | 0/0 (0) |

| Characteristic | Sleeve Gastrectomy (N=67) Manuscript | Sleeve Gastrectomy (N=67) DSIC | Diff. (N=0) |
|---|---|---|---|
| Caregiver level of education-no./total no. (%) | | | |
| Less than high school | 12/64 (19) | 12/64 (19) | 0/0 (0) |
| High-school graduate | 21/64 (33) | 21/64 (33) | 0/0 (0) |
| Some college | 22/64 (34) | 22/64 (34) | 0/0 (0) |
| College graduate | 9/64 (14) | 9/64 (14) | 0/0 (0) |
| Mean weight (95% CI) | | | |
| Baseline-kg | 144 (136 to 152) | 144 (136 to 152) | 0 (0 to 0) |
| 3 Yr-kg | 105 (96 to 113) | 105 (96 to 113) | 0 (0 to 0) |
| Absolute change-kg | -38 (-44 to -31) | -37 (-44 to -30) | 1 (0 to 1) |
| Percent change | -26 (-30 to -22) | -26 (-30 to -21) | 0 (0 to 1) |
| Mean height (95% CI) | | | |
| Baseline-cm | 168.7 (166.1 to 171.2) | 168.7 (166.1 to 171.2) | 0 (0 to 0) |
| 3 Yr-cm | 168.5 (165.1 to 171.9) | 168.5 (165.1 to 171.9) | 0 (0 to 0) |
| Absolute change-cm | 0.44 (-0.12 to 1.00) | 0.53 (-0.03 to 1.08) | 0.09 (0.09 to 0.08) |
| Percent change | 0.25 (-0.07 to 0.57) | 0.30 (-0.01 to 0.62) | 0.05 (0.06 to 0.05) |
| Mean BMI (95% CI) | | | |
| Baseline | 50 (48 to 52) | 50 (48 to 52) | 0 (0 to 0) |
| 3 Yr | 37 (34 to 39) | 37 (34 to 39) | 0 (0 to 0) |
| Absolute change | -13 (-15 to -11) | -13 (-15 to -11) | 0 (0 to 0) |
| Percent change | -26 (-30 to -22) | -26 (-30 to -22) | 0 (0 to 0) |

*The continuous age value was calculated based on surgery date and date of birth

# Attachment A: SAS Code

```
/*************************************************************************

 STUDY NAME:  NIDDK - Teen_Labs 4 Year Upload
 PROGRAM LOCATION: /prj/niddk/ims_analysis/Teen_Labs/prog_initial_analysis/teen_labs_4year_dsic.sas
 SOFTWARE:  SAS v9.4 Unix
 PROGRAMMER:  Laura Bowen
 ORIGINAL REQUEST SOURCE: email from Corey DelVecchio 5/26/2020
 PROGRAM FUNCTION: DSIC review for Teen_Labs 4 Year Upload data submission. Replicating
                   /prj/niddk/ims_analysis/Teen_Labs/private_orig_data/TeenLABS_4YearUpload/TeenLABS_4Year_Documents/ Inge et
                   al_Weight Loss and Health Status 3 Years after Bariatric Surgery.pdf


 NOTES:


*************************************************************************/

*************************************************************************;
*     SYSTEM OPTIONS                                                    *;
*************************************************************************;
options noovp ;

*************************************************************************;
***  FORMATS                                                            *;
*************************************************************************;
proc format;

  value racef
     1='White or Caucasian'
     2='Black or African-American'
     3='Asian'
     4='American Indian or Alaska Native'
     5='Native Hawaiian or other Pacific Islander'
     6='Other'
     7='Unknown'
     8='More than one race'
     ;

  value agef
    low-12 = '<13'
    13-15 = '13-15'
    16-17 = '16-17'
    18-19 = '18-19'
    ;
```

```
  value incf
    1.1 - 1.3 = '<25,000'
    2 = '25,000-50,000'
    3 = '50,000-75,000'
    4,5,6 = '75,000+'
    ;

  value educf
    1='Less than high school'
    2='Some high school (grades 9-12, no diploma or GED)'
    3='Some home-schooling (grades 9-12, no diploma or GED)'
    4='General Equivalency Degree (GED)'
    5='Graduated from high school'
    6='1 to 2 years of college,  no degree yet'
    7='3 or more years of college, no degree yet'
    8='Graduated from a 2-year college, business or vocational school, or got an Associates degree'
    9='Graduated from a college university and obtained a Bachelors degree (BS, BA)'
    10='Some graduate school courses'
    11='Masters degree'
    12='Professional degree: Ph.D., Psy.D., Ed.D. M.D., DDS, LLB, LLD, JD etc.'
    ;

  value educ2f
    1,2,3='Less than high school'
    4,5='Graduated from high school'
    6,7,8='Some College'
    9,10,11,12='College Graduate'
    ;


*************************************************************************;
*   FILEREFS AND CIMPORTS                                               *;
*************************************************************************;
libname origdata "/prj/niddk/ims_analysis/Teen_Labs/private_orig_data/TeenLABS_4YearUpload/TeenLABS_4Year_Data/";


data anth;
  set origdata.anth;
run;

data ef;
  set origdata.ef;
run;

data sqop;
  set origdata.sqop;
run;

data cdi;
  set origdata.cdi;
```

```
run;

data short;
  set origdata.short;
run;


*******************************************************************************;
*   MAIN TITLES                                                                *;
*******************************************************************************;
title ' NIDDK - Teen_Labs 4 Year Upload Data';
title2 "Saved as: %sysfunc(getoption(sysin))";


*******************************************************************************;
*** Combine Data                                                            ***;
*******************************************************************************;

data _NULL_;
  set ef;
  by id_new;
  if ^(first.id_new and last.id_new) then abort;
run;


proc freq data = sqop;
  table visit * surg * sga / missing list;
  title4 'SQOP';
run;


data sqop;
  set sqop;
  by id_new;
  if visit = 99;
run;


data cdi;
  set cdi;
  if visit = 1;
run;

proc sort data = cdi;
  by id_new;
run;

data _NULL_;
  set cdi;
  by id_new;
   if ^(first.id_new and last.id_new) then abort;
```

```
run;


data anth1;
  set anth;
  if visit=1;
run;

data _NULL_;
  set anth1;
  by id_new;
   if ^(first.id_new and last.id_new) then abort;
run;

data anth3;
  set anth;
  if visit=36;
run;

data _NULL_;
  set anth3;
  by id_new;
   if ^(first.id_new and last.id_new) then abort;
run;

data short;
  set short;
  if visit=36;
run;

data _NULL_;
  set short;
  by id_new;
   if ^(first.id_new and last.id_new) then abort;
run;


*** gather variables ***;
data all;
  merge ef    (in=inEF keep = id_new dob sex race ethn)
        sqop  (in=inS  keep = id_new surg sga SURGDAT rename=(SURGDAT=sqop_surgdat))
        cdi   (in=inCD keep = id_new PCGHINCOME PCGEDUC)
        anth1 (in=inA1 keep = id_new wgt1 hgt1 rename=(wgt1=baseline_weight hgt1=baseline_height))
        anth3 (in=inA3 keep = id_new wgt1 hgt1 rename=(wgt1=yr3_weight hgt1=yr3_height))
        short (in=inSH keep = id_new SWGTKG)
        ;

  by id_new;

  length type_cat $13;
  length type $6;
```

```
  if (surg=1) and (sga ne 1) then type = 'Bypass';
  else if surg=5 then type = 'Sleeve';
  else type = ' ';

  if type in ('Bypass','Sleeve') then type_cat = 'Bypass+Sleeve';
  else type_cat = ' ';

  sqop_surgage = floor((datepart(sqop_surgdat) - datepart(dob)) / 365.25);

  if baseline_weight < 0 then baseline_weight = .;

  if yr3_weight > 0 then year3_weight = yr3_weight;
  else if SWGTKG > 0 then year3_weight = SWGTKG;
  else year3_weight = .;

  absolute_change = year3_weight - baseline_weight;
  percent_change = absolute_change / baseline_weight * 100;

  if baseline_height < 0 then baseline_height = .;

  if yr3_height < 0 then year3_height = .;
  else year3_height = yr3_height;

  absolute_changeh = year3_height - baseline_height;
  percent_changeh = absolute_changeh / baseline_height * 100;

  bmi_baseline = baseline_weight / baseline_height / baseline_height * 10000;
  bmi_year3 = year3_weight / year3_height / year3_height * 10000;

  absolute_changeb = bmi_year3 - bmi_baseline;
  percent_changeb = absolute_changeb / bmi_baseline * 100;

run;


proc freq data = all;
   table type * surg * sga
         year3_weight * SWGTKG * yr3_weight
         percent_change * absolute_change * year3_weight * baseline_weight
         percent_changeh * absolute_changeh * year3_height * baseline_height
         /missing list;
   format  sqop_surgage  agef.
           ;
   title4 'Check creation of variables';
run;


*************************************************************************;
*** Frequencies - Bypass Only                                         ***;
*************************************************************************;
```

```
proc means data = all n mean clm stddev;
  where (type = 'Bypass');
  var sqop_surgage;
title4 'Bypass Only';
run;


proc freq data = all;
   where type = 'Bypass';
   table type * sqop_surgage
         sex
         race
         ethn
         /missing list;
   format  sqop_surgage   agef.
           race           racef.
           ;
   title4 'Bypass Only';
run;


proc freq data = all;
  where (type = 'Bypass') and (PCGHINCOME in (1.1,1.2,1.3,2,3,4,5,6));
  table PCGHINCOME / missing list;
  format PCGHINCOME    incf.;
  title4 'Bypass Only';
  title5 'Based on Visit = 1';
run;

proc freq data = all;
  where (type = 'Bypass') and (PCGEDUC ne .);
  table PCGEDUC / missing list;
  format PCGEDUC   educ2f.;
  title4 'Bypass Only';
  title5 'Based on Visit = 1';
run;

proc means data = all n mean clm stddev;
  where (type = 'Bypass') AND (baseline_weight > 0);
  var baseline_weight;
  title4 'Bypass Only';
  title5 'Based on Visit = 1';
run;

proc means data = all n mean clm stddev;
  where (type = 'Bypass') AND (year3_weight > 0);
  var year3_weight;
  title4 'Bypass Only';
  title5 'Based on Visit = 3';
run;
```

```
proc means data = all n mean clm stddev;
  where (type = 'Bypass') AND (absolute_change ne .);
  var absolute_change
      percent_change
      ;
  title4 'Bypass Only';
  title5 'Based on Visits = 1 and 36';
run;

proc means data = all n mean clm stddev;
  where (type = 'Bypass') AND (baseline_height > 0);
  var baseline_height;
  title4 'Bypass Only';
  title5 'Based on Visit = 1';
run;

proc means data = all n mean clm stddev;
  where (type = 'Bypass') AND (year3_height > 0);
  var year3_height;
  title4 'Bypass Only';
  title5 'Based on Visit = 3';
run;

proc means data = all n mean clm stddev;
  where (type = 'Bypass') AND (absolute_changeh ne .);
  var absolute_changeh
      percent_changeh
      ;
  title4 'Bypass Only';
  title5 'Based on Visits = 1 and 36';
run;


proc means data = all n mean clm stddev;
  where (type = 'Bypass') AND (bmi_baseline > 0);
  var bmi_baseline;
  title4 'Bypass Only';
  title5 'Based on Visit = 1';
run;

proc means data = all n mean clm stddev;
  where (type = 'Bypass') AND (bmi_year3 > 0);
  var bmi_year3;
  title4 'Bypass Only';
  title5 'Based on Visit = 3';
run;

proc means data = all n mean clm stddev;
  where (type = 'Bypass') AND (absolute_changeb ne .);
  var absolute_changeb
```

```
      percent_changeb
      ;
  title4 'Bypass Only';
  title5 'Based on Visits = 1 and 36';
run;


*************************************************************************;
*** Frequencies - Sleeve Only                                         ***;
*************************************************************************;

proc means data = all n mean clm stddev;
  where (type = 'Sleeve');
  var sqop_surgage;
title4 'Sleeve Only';
run;

proc freq data = all;
   where type = 'Sleeve';
   table type * sqop_surgage
         sex
         race
         ethn
          /missing list;
   format  sqop_surgage   agef.
           race           racef.
           ;
   title4 'Sleeve Only';
run;

proc freq data = all;
  where (type = 'Sleeve') and (PCGHINCOME in (1.1,1.2,1.3,2,3,4,5,6));
  table PCGHINCOME / missing list;
  format PCGHINCOME    incf.;
  title4 'Sleeve Only';
  title5 'Based on Visit = 1';
run;

proc freq data = all;
  where (type = 'Sleeve') and (PCGEDUC ne .);
  table PCGEDUC / missing list;
  format PCGEDUC   educ2f.;
  title4 'Sleeve Only';
  title5 'Based on Visit = 1';
run;

proc means data = all n mean clm stddev;
  where (type = 'Sleeve') AND (baseline_weight > 0);
  var baseline_weight;
  title4 'Sleeve Only';
  title5 'Based on Visit = 1';
```

```
run;

proc means data = all n mean clm stddev;
  where (type = 'Sleeve') AND (year3_weight > 0);
  var year3_weight;
  title4 'Sleeve Only';
  title5 'Based on Visit = 36';
run;

proc means data = all n mean clm stddev;
  where (type = 'Sleeve') AND (absolute_change ne .);
  var absolute_change
      percent_change
      ;
  title4 'Sleeve Only';
  title5 'Based on Visits = 1 and 36';
run;

proc means data = all n mean clm stddev;
  where (type = 'Sleeve') AND (baseline_height > 0);
  var baseline_height;
  title4 'Sleeve Only';
  title5 'Based on Visit = 1';
run;

proc means data = all n mean clm stddev;
  where (type = 'Sleeve') AND (year3_height > 0);
  var year3_height;
  title4 'Sleeve Only';
  title5 'Based on Visit = 36';
run;

proc means data = all n mean clm stddev;
  where (type = 'Sleeve') AND (absolute_changeh ne .);
  var absolute_changeh
      percent_changeh
      ;
  title4 'Sleeve Only';
  title5 'Based on Visits = 1 and 36';
run;

proc means data = all n mean clm stddev;
  where (type = 'Sleeve') AND (bmi_baseline > 0);
  var bmi_baseline;
  title4 'Sleeve Only';
  title5 'Based on Visit = 1';
run;

proc means data = all n mean clm stddev;
  where (type = 'Sleeve') AND (bmi_year3 > 0);
  var bmi_year3;
```

```
  title4 'Sleeve Only';
  title5 'Based on Visit = 36';
run;

proc means data = all n mean clm stddev;
  where (type = 'Sleeve') AND (absolute_changeb ne .);
  var absolute_changeb
      percent_changeb
      ;
  title4 'Sleeve Only';
  title5 'Based on Visits = 1 and 36';
run;


*************************************************************************;
*** Frequencies - Bypass and Sleeve                                   ***;
*************************************************************************;

proc means data = all n mean clm stddev;
  where (type_cat = 'Bypass+Sleeve');
  var sqop_surgage;
title4 'Bypass and Sleeve';
run;

proc freq data = all;
   where type_cat = 'Bypass+Sleeve';
   table sqop_surgage
         sex
         race
         ethn
         /missing list;
   format  sqop_surgage   agef.
           race           racef.
           ;
   title4 'Bypass and Sleeve';
run;

proc freq data = all;
  where (type_cat = 'Bypass+Sleeve') and (PCGHINCOME in (1.1,1.2,1.3,2,3,4,5,6));
  table PCGHINCOME / missing list;
  format PCGHINCOME    incf.;
  title4 'Bypass and Sleeve';
  title5 'Based on Visit = 1';
run;

proc freq data = all;
  where (type_cat = 'Bypass+Sleeve') and (PCGEDUC ne .);
  table PCGEDUC / missing list;
  format PCGEDUC   educ2f.;
  title4 'Bypass and Sleeve';
  title5 'Based on Visit = 1';
```

```
run;

proc means data = all n mean clm stddev;
  where (type_cat = 'Bypass+Sleeve') AND (baseline_weight > 0);
  var baseline_weight;
  title4 'Bypass and Sleeve';
  title5 'Based on Visit = 1';
run;

proc means data = all n mean clm stddev;
  where (type_cat = 'Bypass+Sleeve') AND (year3_weight > 0);
  var year3_weight;
  title4 'Bypass and Sleeve';
  title5 'Based on Visit = 36';
run;

proc means data = all n mean clm stddev;
  where (type_cat = 'Bypass+Sleeve') AND (absolute_change ne .);
  var absolute_change
      percent_change
      ;
  title4 'Bypass and Sleeve';
  title5 'Based on Visits = 1 and 36';
run;

proc means data = all n mean clm stddev;
  where (type_cat = 'Bypass+Sleeve') AND (baseline_height > 0);
  var baseline_height;
  title4 'Bypass and Sleeve';
  title5 'Based on Visit = 1';
run;

proc means data = all n mean clm stddev;
  where (type_cat = 'Bypass+Sleeve') AND (year3_height > 0);
  var year3_height;
  title4 'Bypass and Sleeve';
  title5 'Based on Visit = 36';
run;

proc means data = all n mean clm stddev;
  where (type_cat = 'Bypass+Sleeve') AND (absolute_changeh ne .);
  var absolute_changeh
      percent_changeh
      ;
  title4 'Bypass and Sleeve';
  title5 'Based on Visits = 1 and 36';
run;

proc means data = all n mean clm stddev;
  where (type_cat = 'Bypass+Sleeve') AND (bmi_baseline > 0);
  var bmi_baseline;
```

```
  title4 'Bypass and Sleeve';
  title5 'Based on Visit = 1';
run;

proc means data = all n mean clm stddev;
  where (type_cat = 'Bypass+Sleeve') AND (bmi_year3 > 0);
  var bmi_year3;
  title4 'Bypass and Sleeve';
  title5 'Based on Visit = 36';
run;

proc means data = all n mean clm stddev;
  where (type_cat = 'Bypass+Sleeve') AND (absolute_changeb ne .);
  var absolute_changeb
      percent_changeb
      ;
  title4 'Bypass and Sleeve';
  title5 'Based on Visits = 1 and 36';
run;
```