2006 SMART BRFSS MMSA Methodology

2006 Selected Metropolitan/Micropolitan Area Risk Trends from the BRFSS Creation of Metropolitan-level Weights Methodology

The Behavioral Risk Factor Surveillance System (BRFSS) Selected Metropolitan/Micropolitan Area Risk Trends (SMART) is a documented and verified subset of the 2006 BRFSS, which has been produced to provide some local area estimates. These local areas are identified as metropolitan or micropolitan statistical areas (MMSA), as defined by the Office of Management and Budget. The data set was produced by adding new analysis weights designed to correspond to the 2006 population estimates for each eligible MMSA. The additional weights were post-stratified to the MMSA level. The process by which these new weights were obtained is detailed in Appendix C, Weight Class Collapsing Rules.

Selected Areas

Typically, BRFSS data are used to produce state-level estimates. However, for the SMART project, BRFSS data were used to produce small-area-level estimates for MMSAs, as defined by the Bureau of the Census. On June 6, 2003, the Office of Management and Budget (OMB) issued new definitions for metropolitan statistical areas, micropolitan statistical areas, and metropolitan divisions. OMB periodically updates the list of MMSAs. The list of areas used for this analysis can be found at http://www.whitehouse.gov/omb/bulletins/fy05/b05-02_appendix.pdf. For more information about MMSAs, please visit http://www.census.gov/population/www/estimates/metroarea.html.

Respondents were associated with a particular MMSA on the basis of their county code. Missing county codes were imputed from a value included in the purchased telephone sample that represents the county most likely associated with the telephone number. MMSA-level estimates have been produced from the BRFSS data for 145 MMSAs that have met the weighting criteria (Appendix C) for the 2006 data year.

Appendix A: List of Variables Added to the 2006 Data

Data Documentation for the 9 Variables Added to the 2006 BRFSS Data

ADJMMSA MMSA-level post-stratification weight. This factor is multiplied by the design weight (_WT2) to get the final MMSA-level weight (_MMSAWT).

AGE_MMSA Age categories used to set up the initial weighting classes for the MMSA-level weights.

1 – 18–24
2 – 25–34
3 – 35–44
4 – 45–54
5 – 55–64
6 – 65+

AGE_M_F Age categories used in the final weighting classes for the MMSA-level weights.

1 – 18–24
2 – 25–34
3 – 35–44
4 – 45–54
5 – 55–64
6 – 65+
7 – 18–34
8 – 35–54
9 – 55+
10 – 18–44
11 – 45+
12 – 18–54
19 – 35+

RACE_MMS Race categories used to set up the initial weighting classes for the MMSA-level weights.

0 – Race not used
1 – White, non-Hispanic
2 – Nonwhite or Hispanic

RACE_M_F Race categories used in the final weighting classes for the MMSA-level weights.

0 – Race not used
1 – White, non-Hispanic
2 – Nonwhite or Hispanic

SEX_MMSA Sex categories used to set up the initial and final weighting classes for the MMSA-level weights (weight classes are never collapsed across sex category).

1 – Male
2 – Female

_MMSA MMSA code of the metropolitan, micropolitan statistical area, or metropolitan division, if appropriate, where the respondent lives. Metropolitan and micropolitan statistical areas and metropolitan divisions are defined by OMB in Bulletin No. 03-04 (http://www.whitehouse.gov/omb/bulletins/b03-04_attach.pdf).

_MMSANAM MMSA name of the metropolitan/micropolitan statistical area or metropolitan division, if appropriate, where the respondent lives. Metropolitan/micropolitan

statistical areas and metropolitan divisions are defined by OMB in Bulletin No. 03-04 (http://www.whitehouse.gov/omb/bulletins/b03-04_attach.pdf).

_**MMSAWT** The new MMSA-level weight. This is the weight to use when generating MMSA-level estimates (metropolitan or micropolitan statistical areas or metropolitan divisions) for questions that were asked of the whole sample.

Appendix B: List of the 145 MMSAs That Have MMSA-level Weights in 2006 BRFSS Data

Metropolitan/Micropolitan Statistical Area or Metropolitan Division Codes and Names

MMSA Number	MMSA Name
10420	Akron, OH Metropolitan Statistical Area
10740	Albuquerque, NM Metropolitan Statistical Area
10900	Allentown-Bethlehem-Easton, PA-NJ Metropolitan Statistical Area
11700	Asheville, NC Metropolitan Statistical Area
12060	Atlanta-Sandy Springs-Marietta, GA Metropolitan Statistical Area
12100	Atlantic City, NJ Metropolitan Statistical Area
12260	Augusta-Richmond County, GA-SC Metropolitan Statistical Area
12420	Austin-Round Rock, TX Metropolitan Statistical Area
12580	Baltimore-Towson, MD Metropolitan Statistical Area
12740	Barre, VT Micropolitan Statistical Area
12940	Baton Rouge, LA Metropolitan Statistical Area
13644	Bethesda-Gaithersburg-Frederick, MD Metropolitan Division
13740	Billings, MT Metropolitan Statistical Area
13820	Birmingham-Hoover, AL Metropolitan Statistical Area
13900	Bismarck, ND Metropolitan Statistical Area
14260	Boise City-Nampa, ID Metropolitan Statistical Area
14484	Boston-Quincy, MA Metropolitan Division
14740	Bremerton-Silverdale, WA Metropolitan Statistical Area
14860	Bridgeport-Stamford-Norwalk, CT Metropolitan Statistical Area
15540	Burlington-South Burlington, VT Metropolitan Statistical Area
15764	Cambridge-Newton-Framingham, MA Metropolitan Division
15804	Camden, NJ Metropolitan Division
16220	Casper, WY Metropolitan Statistical Area
16620	Charleston, WV Metropolitan Statistical Area
16700	Charleston-North Charleston, SC Metropolitan Statistical Area
16740	Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area
16940	Cheyenne, WY Metropolitan Statistical Area
16980	Chicago-Naperville-Joliet, IL-IN-WI Metropolitan Statistical Area
17140	Cincinnati-Middletown, OH-KY-IN Metropolitan Statistical Area
17460	Cleveland-Elyria-Mentor, OH Metropolitan Statistical Area
17820	Colorado Springs, CO Metropolitan Statistical Area
17900	Columbia, SC Metropolitan Statistical Area
18180	Concord, NH Micropolitan Statistical Area
19124	Dallas-Plano-Irving, TX Metropolitan Division
19380	Dayton, OH Metropolitan Statistical Area
19740	Denver-Aurora, CO Metropolitan Statistical Area
19780	Des Moines, IA Metropolitan Statistical Area
19804	Detroit-Livonia-Dearborn, MI Metropolitan Division
20100	Dover, DE Metropolitan Statistical Area
20500	Durham, NC Metropolitan Statistical Area
20764	Edison, NJ Metropolitan Division
21340	El Paso, TX Metropolitan Statistical Area
21604	Essex County, MA Metropolitan Division
21660	Eugene-Springfield, OR Metropolitan Statistical Area
22020	Fargo, ND-MN Metropolitan Statistical Area

MMSA Number	MMSA Name
22140	Farmington, NM Metropolitan Statistical Area
22180	Fayetteville, NC Metropolitan Statistical Area
22220	Fayetteville-Springdale-Rogers, AR-MO Metropolitan Statistical Area
23104	Fort Worth-Arlington, TX Metropolitan Division
24500	Great Falls, MT Metropolitan Statistical Area
24660	Greensboro-High Point, NC Metropolitan Statistical Area
24860	Greenville, SC Metropolitan Statistical Area
25180	Hagerstown-Martinsburg, MD-WV Metropolitan Statistical Area
25540	Hartford-West Hartford-East Hartford, CT Metropolitan Statistical Area
25860	Hickory-Lenoir-Morganton, NC Metropolitan Statistical Area
25900	Hilo, HI Micropolitan Statistical Area
25940	Hilton Head Island-Beaufort, SC Micropolitan Statistical Area
26180	Honolulu, HI Metropolitan Statistical Area
26420	Houston-Sugar Land-Baytown, TX Metropolitan Statistical Area
26580	Huntington-Ashland, WV-KY-OH Metropolitan Statistical Area
26900	Indianapolis, IN Metropolitan Statistical Area
27140	Jackson, MS Metropolitan Statistical Area
27260	Jacksonville, FL Metropolitan Statistical Area
27980	Kahului-Wailuku, HI Micropolitan Statistical Area
28060	Kalispell, MT Micropolitan Statistical Area
28140	Kansas City, MO-KS Metropolitan Statistical Area
28180	Kapaa, HI Micropolitan Statistical Area
28300	Keene, NH Micropolitan Statistical Area
28420	Kennewick-Richland-Pasco, WA Metropolitan Statistical Area
29740	Las Cruces, NM Metropolitan Statistical Area
29820	Las Vegas-Paradise, NV Metropolitan Statistical Area
30100	Lebanon, NH-VT Micropolitan Statistical Area
30300	Lewiston, ID-WA Metropolitan Statistical Area
30700	Lincoln, NE Metropolitan Statistical Area
30780	Little Rock-North Little Rock, AR Metropolitan Statistical Area
31084	Los Angeles-Long Beach-Glendale, CA Metropolitan Division
31140	Louisville, KY-IN Metropolitan Statistical Area
31180	Lubbock, TX Metropolitan Statistical Area
31700	Manchester-Nashua, NH Metropolitan Statistical Area
32820	Memphis, TN-MS-AR Metropolitan Statistical Area
33100	Miami-Fort Lauderdale-Miami Beach, FL Metropolitan Statistical Area
33340	Milwaukee-Waukesha-West Allis, WI Metropolitan Statistical Area
33460	Minneapolis-St. Paul-Bloomington, MN-WI Metropolitan Statistical Area
33540	Missoula, MT Metropolitan Statistical Area
34820	Myrtle Beach-Conway-North Myrtle Beach, SC Metropolitan Statistical Area
34980	Nashville-Davidson--Murfreesboro, TN Metropolitan Statistical Area
35004	Nassau-Suffolk, NY Metropolitan Division
35084	Newark-Union, NJ-PA Metropolitan Division
35300	New Haven-Milford, CT Metropolitan Statistical Area
35380	New Orleans-Metairie-Kenner, LA Metropolitan Statistical Area
35644	New York-White Plains-Wayne, NY-NJ Metropolitan Division
35980	Norwich-New London, CT Metropolitan Statistical Area
36140	Ocean City, NJ Metropolitan Statistical Area
36260	Ogden-Clearfield, UT Metropolitan Statistical Area
36420	Oklahoma City, OK Metropolitan Statistical Area
36500	Olympia, WA Metropolitan Statistical Area

MMSA Number	MMSA Name
36540	Omaha-Council Bluffs, NE-IA Metropolitan Statistical Area
36740	Orlando-Kissimmee, FL Metropolitan Statistical Area
37964	Philadelphia, PA Metropolitan Division
38060	Phoenix-Mesa-Scottsdale, AZ Metropolitan Statistical Area
38300	Pittsburgh, PA Metropolitan Statistical Area
38860	Portland-South Portland-Biddeford, ME Metropolitan Statistical Area
38900	Portland-Vancouver-Beaverton, OR-WA Metropolitan Statistical Area
39300	Providence-New Bedford-Fall River, RI-MA Metropolitan Statistical Area
39340	Provo-Orem, UT Metropolitan Statistical Area
39580	Raleigh-Cary, NC Metropolitan Statistical Area
39660	Rapid City, SD Metropolitan Statistical Area
39900	Reno-Sparks, NV Metropolitan Statistical Area
40060	Richmond, VA Metropolitan Statistical Area
40140	Riverside-San Bernardino-Ontario, CA Metropolitan Statistical Area
40484	Rockingham County-Strafford County, NH Metropolitan Division
40860	Rutland, VT Micropolitan Statistical Area
41180	St. Louis, MO-IL Metropolitan Statistical Area
41620	Salt Lake City, UT Metropolitan Statistical Area
41700	San Antonio, TX Metropolitan Statistical Area
41740	San Diego-Carlsbad-San Marcos, CA Metropolitan Statistical Area
41860	San Francisco-Oakland-Fremont, CA Metropolitan Statistical Area
42140	Santa Fe, NM Metropolitan Statistical Area
42420	Scottsbluff, NE Micropolitan Statistical Area
42540	Scranton--Wilkes-Barre, PA Metropolitan Statistical Area
42580	Seaford, DE Micropolitan Statistical Area
42644	Seattle-Bellevue-Everett, WA Metropolitan Division
43340	Shreveport-Bossier City, LA Metropolitan Statistical Area
43620	Sioux Falls, SD Metropolitan Statistical Area
44060	Spokane, WA Metropolitan Statistical Area
44140	Springfield, MA Metropolitan Statistical Area
45104	Tacoma, WA Metropolitan Division
45300	Tampa-St. Petersburg-Clearwater, FL Metropolitan Statistical Area
45780	Toledo, OH Metropolitan Statistical Area
45820	Topeka, KS Metropolitan Statistical Area
45940	Trenton-Ewing, NJ Metropolitan Statistical Area
46060	Tucson, AZ Metropolitan Statistical Area
46140	Tulsa, OK Metropolitan Statistical Area
47260	Virginia Beach-Norfolk-Newport News, VA-NC Metropolitan Statistical Area
47644	Warren-Farmington Hills-Troy, MI Metropolitan Division
47894	Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Division
48300	Wenatchee, WA Metropolitan Statistical Area
48620	Wichita, KS Metropolitan Statistical Area
48864	Wilmington, DE-MD-NJ Metropolitan Division
48900	Wilmington, NC Metropolitan Statistical Area
49180	Winston-Salem, NC Metropolitan Statistical Area
49340	Worcester, MA Metropolitan Statistical Area
49420	Yakima, WA Metropolitan Statistical Area
49660	Youngstown-Warren-Boardman, OH-PA Metropolitan Statistical Area
49740	Yuma, AZ Metropolitan Statistical Area

Appendix C: Weight Class Collapsing Rules

MMSA-level Weighting Methodology

On June 6, 2003, OMB issued new definitions for metropolitan statistical areas, micropolitan statistical areas, and metropolitan divisions (see http://www.whitehouse.gov/omb/bulletins/b03-04_attach.pdf). Respondents were assigned to an MMSA on the basis of their county codes. Missing county codes were imputed from a value included in the purchased telephone sample that represents the county most likely associated with the telephone number before the respondent identifies a county during data collection.

All respondents in cities were then assigned to age, race, and sex categories. If a respondent's age was missing, it was imputed by using the variable _IMPAGE available in the BRFSS public-use 2006 data file. If a respondent's race was missing, it was imputed by using the majority race for the MMSA in which the respondent lives. The six age categories were 18–24, 25–34, 35–44, 45–54, 55–64, and 65+. The two race categories were white, non-Hispanic, and nonwhite or Hispanic.

Within each MMSA, respondents were assigned to weighting classes on the basis of the age, race, and sex categories described above. Some states do not use race in post-stratification. For the MMSA in states that do not use race, only the age and sex groups were used to set up weighting classes. For the MMSA in states that do use race, all three groups were used to set up weighting classes. For the MMSA that cross state lines, the post-stratification variables used by the state in which the majority of the MMSA's population lives were used to set up weighting classes. Thus, MMSA that use race had 24 initial weighting classes, and MMSA that do not use race had 12 initial weighting classes.

Weighting classes with fewer than 19 sample members were collapsed in accordance with the following rules:

1. For those MMSA that used race in post-stratification, the race categories within a sex category are collapsed if at least 80% of the age categories in that race /sex cross-classification (i.e., 5 of 6 the age categories) have fewer than 19 members. In MMSA that used race to create the initial weighting classes, the number of weighting classes was thus reduced from 24 to 12 if race was collapsed for both sexes and from 24 to 18 if race was collapsed for only one sex.

2. The two youngest age categories in any age/sex or age/sex/race weighing class are collapsed if either contains fewer than 19 members. The same occurs for the two middle and the two oldest age categories in each remaining weighting class.

3. If either of the age/sex or age/sex/race categories have fewer than 19 members, then the age categories are collapsed until there are 19 members in some combination of the age categories listed in the variable AGE_M_F.

4. Weighting classes are not collapsed across sex [sexes? See comment above.].

5. An MMSA should not be included in the reweighting that still has weighting classes with fewer than 19 sample members after all collapsing rules have been applied. These MMSAs will be excluded from the 2006 SMART BRFSS.

There were 145 MMSA that had at least 500 respondents in the 2006 BRFSS and at least 19 sample members in all final weighting classes. See Appendix B in the Data Documentation for a list of these MMSA. Only the respondents in these MMSA were given an MMSA-level weight. To calculate the new MMSA-level weight, we applied a post-stratification adjustment factor to the

design weight (_WT2) and created the adjustment factor by taking the ratio of the total population over the sum of the design weights for each weighting class within each MMSA. The new MMSA-level weight (_MMSAWT) should be used to generate estimates in these 145 MMSA.

Example SUDAAN Code:

For example, suppose we want an estimate for the Atlanta-Sandy Springs-Marietta, Georgia, Metropolitan Statistical Area (MMSA code = 12060). Here is SAS/SUDAAN code that could be used to do this:

```
proc sort data=xxxx;
by _STSTR _SEQNO;
run;

proc descript data=xxxx filetype=sas design=wr;
nest _STSTR _SEQNO / missunit;
weight _MMSAWT;
subpopn _MMSA=12060 / name="Atlanta-Sandy Springs-Marietta, GA";
var (your analysis variable);
catlevel (the level of your analysis variable for which you want an estimate);
run;
```