

Methods for Weighting the 2008 Auglaize County Assessment Data

Data from sample surveys have the potential for bias if there are different rates of response for different segments of the population. In other words, some subgroups of the population may be more represented in the completed surveys than they are in the population from which those surveys are sampled. If a sample has 25% of its respondents being male and 75% being female, then the sample is biased towards the views of females (if females respond differently than males). This same phenomenon holds true for any possible characteristic that may alter how an individual responds to the survey items.

In some cases, the procedures of the survey methods may purposefully over-sample a segment of the population in order to gain an appropriate number of responses from that subgroup for appropriate data analysis when investigating them separately (this is often done for minority groups). Whether the over-sampling is done inadvertently or purposefully, the data needs to be weighted so that the proportioned characteristics of the sample accurately reflect the proportioned characteristics of the population. In the 2008 Auglaize County survey, a weighting was applied prior to the analysis that weighted the survey respondents to reflect the actual distribution of Auglaize County based on age, sex, race, and income.

Weightings were created for each category within sex (male, female), race (White, Non-White), Age (7 different age categories), and income (7 different income categories). The numerical value of the weight for each category was calculated by taking the percent of the Auglaize County within the specific category and dividing that by the percent of the sample within that same specific category. Using sex as an example, the following represents the data from the 2008 Auglaize County Survey and actual values based on the 2000 Census.

<u>Sex</u>	<u>2008 Auglaize Survey</u>		<u>2000 Auglaize County Census</u>		<u>Weight</u>
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	
Male	265	50.189394	22,889	49.1064341	0.978423
Female	263	49.810606	23,722	50.8935659	1.021742

In this example, it shows that there was a slightly larger portion of males in the sample compared to the actual portion in Auglaize County. The weighting for males was calculated by taking the percent of males in Auglaize County (based on Census information) (49.1064341%) and dividing that by the percent found in the 2008 Auglaize County sample (50.189394%) [$49.1064341/50.189394 =$ weighting of 0.978423 for males]. The same was done for females [$50.8935659/49.810606 =$ weighting of 1.021742 females]. Thus females' responses are weighted heavier by a factor of 1.021742 and males' responses weighted less by a factor of 0.978423.

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This same thing was done for each of the 18 specific categories as described above. For example, a respondent who was Male, White, in the age category 35-44, and with a household income in the \$50-\$75k category would have an individual weighting of 1.458343 [0.978423 (weight for males) x 1.022562 (weight for White) x 1.40306 (weight for age 35-44) x 1.038884 (weight for income \$50-\$75k)]. Thus, each individual in the 2008 Auglaize County sample has their own individual weighting based on their combination of age, race, sex, and income. See next page for each specific weighting and the numbers from which they were calculated.

Multiple sets of weightings were created and used in the statistical software package (SPSS 14.0) when calculating frequencies. For analyses done for the entire sample and analyses done based on subgroups other than age, race, sex, or income – the weightings that were calculated based on the product of the four weighting variables (age, race, sex, income) for each individual. When analyses were done comparing groups within one of the four weighting variables (e.g., smoking status by race/ethnicity), that specific variable was not used in the weighting score that was applied in the software package. In the example smoking status by race, the weighting score that was applied during analysis included only age, sex, and income. Thus a total of eight weighting scores for each individual were created and applied depending on the analysis conducted. The weight categories were as follows:

- 1) **Total weight** (product of 4 weights) – for all analyses that did not separate age, race, sex, or income.
- 2) **Weight without sex** (product of age, race, and income weights) – used when analyzing by sex.
- 3) **Weight without age** (product of sex, race, and income weights) – used when analyzing by age.
- 4) **Weight without race** (product of age, sex, and income weights) – used when analyzing by race.
- 5) **Weight without income** (product of age, race, and sex weights) – used when analyzing by income.
- 6) **Weight without sex or age** (product of race and income weights) – used when analyzing by sex and age.
- 7) **Weight without sex or race** (product of age and income weights) – used when analyzing by sex and race.
- 8) **Weight without sex or income** (product of age and race weights) – used when analyzing by sex and income.

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Category	Auglaize Sample	%	2000 Census Data	%	Weighting Value
Sex:					
Male	265	50.189394	22,889	49.1064341	0.978423
Female	263	49.810606	23,722	50.8935659	1.021742
Age:					
20-24	20	3.809524	2,350	7.240348769	1.900592
25-34	48	9.142857	5,777	17.79893397	1.946758
35-44	85	16.190476	7,373	22.71620914	1.40306
45-54	95	18.095238	6,360	19.59515667	1.08289
55-59	51	9.714286	2,154	6.636472872	0.683166
60-64	47	8.952381	1,751	5.394830083	0.602614
65-74	79	15.047619	3,253	10.0224913	0.666052
75-84	76	14.476190	2,492	7.677850695	0.530378
85+	24	4.571429	947	2.917706504	0.638248
Race:					
White	516	96.992481	46611	99.18078134	1.022562
Other	16	3.007519	385	0.819218657	0.27239
Household Income					
Less than \$10,000	25	5.285412	926	5.309328594	1.004525
\$10k-\$15k	41	8.668076	1,070	6.134969325	0.707766
\$15k-\$25k	73	15.433404	2,207	12.65409094	0.819916
\$25k-\$35k	64	13.530655	2,400	13.76067886	1.017
\$35k-\$50	78	16.490486	3,675	21.0710395	1.277769
\$50k-\$75k	101	21.353066	3,869	22.18336105	1.038884
\$75k or more	91	19.238901	3,294	18.88653174	0.981685
<p>Note: The weighting ratios are calculated by taking the ratio of the proportion of the population of Auglaize County (determined from 2000 Census data) in each subcategory by the proportion of the sample in the Auglaize County survey for that same category.</p>					