

### *Do institutions participating in NSSE have enough respondents to adequately represent their population?*

#### **Purpose**

Institutions participating in NSSE can choose from three survey administration modes: for the paper or web+ mode, a random sample of first-year and senior students are invited to take the survey, while beginning in 2010, web-only administrations are offered a census of all first-year and senior students. Since not all students are invited to participate in NSSE (as in the case of paper and web+ modes), and not all students that are invited elect to do so, it is important to consider sampling error when understanding and interpreting NSSE results. Sampling error is defined as error that “is the result of collecting data from only a subset, rather than all, of the members of the sample frame” (Dillman, 2007, p. 196). For NSSE, the sample frame consists of all of the first-year and senior students at a participating institution. A large degree of sampling error limits the precision of the estimates about the population provided by the survey. Therefore, it is important to examine the sampling error for institutions participating in NSSE. If there is a high degree of sampling error for NSSE institutions, this could impact the usefulness of NSSE results. Various guidelines are available for determining an acceptable sampling error precision level, ranging from 3% to 10%, with 5% being the most common (Salant & Dillman, 1994). Sampling error can be calculated using the [sampling error calculator](#) on NSSE website.

#### **Data**

Each NSSE institutional report includes estimates of sampling error, described for institutions as “an estimate of the margin by which the *true* score on a given item could differ from the reported score” (NSSE, 2010, 2011). NSSE provides these estimates of sampling error for first-year and seniors students for each institution that participates. Estimates are also provided for comparison groups. This study uses sampling error estimates from U.S. institutions that participated in NSSE 2010 or NSSE 2011 administrations. For institutions participating in both 2010 and 2011, only the sampling error information for the 2011 administration is included in the analysis. All together, first-year sampling error information was available for 1007 institutions, and senior sampling error information was available for 1014 institutions. The number of institutions differs because not all NSSE participants have both first-year and senior students.

#### **Methods**

Descriptive statistics including mean, median, minimum values, and maximum values were generated for first-year and senior sampling errors for all NSSE 2010/2011 institutions. Results are provided in Table 1 below. Since different administration modes yield different sampling error distributions, the results are tabulated for each administration mode separately. The sampling error values were then recoded into ranges to examine patterns in frequencies. The results of this recode are provided in Table 2 and Table 3 below.

**Table 1: Descriptive Statistics for Institutional Sampling Error Characteristics, NSSE 2010-2011**

	First-Year Sampling Error				Senior Sampling Error			
	Paper (n=39)	Web-only (n=850)	Web+ (n=118)	Total (n=1007)	Paper (n=39)	Web-only (n=855)	Web+ (n=120)	Total (n=1014)
Mean	12.86%	6.23%	7.71%	6.66%	11.84%	5.80%	6.79%	6.15%
Median	12.49%	5.46%	6.57%	5.77%	10.05%	5.12%	5.97%	5.29%
Minimum	5.45%	.00%	3.32%	.00%	5.39%	1.12%	2.90%	1.12%
Maximum	24.19%	25.70%	24.09%	25.70%	35.17%	53.34%	28.34%	53.34%

**Table 2: Frequencies for Institutional Sampling Error – First-Year, NSSE 2010-2011**

Sampling Error Range	Paper			Web-only			Web+			Total		
	N	Valid %	Cumulative %	N	Valid %	Cumulative %	N	Valid %	Cumulative %	N	Valid %	Cumulative %
Less than 2%	0	0	0	17	2.0	2.0	0	0	0	17	1.7	1.7
2 to less than 3%	0	0	0	55	6.5	8.5	0	0	0	55	5.5	7.1
3 to less than 4%	0	0	0	139	16.4	24.8	4	3.4	3.4	143	14.2	21.4
4 to less than 5%	0	0	0	145	17.1	41.9	20	16.9	20.3	165	16.4	37.7
5 to less than 6%	2	5.1	5.1	131	15.4	57.3	24	20.3	40.7	157	15.6	53.3
6 to less than 7%	0	0	0	113	13.3	70.6	17	14.4	55.1	130	12.9	66.2
7 to less than 8%	3	7.7	12.8	74	8.7	79.3	12	10.2	65.3	89	8.8	75.1
8 to less than 9%	2	5.1	17.9	53	6.2	85.5	9	7.6	72.9	64	6.4	81.4
9 to less than 10%	3	7.7	25.6	37	4.4	89.9	14	11.9	84.7	54	5.4	86.8
10% or higher	29	74.4	100.0	86	10.1	100.0	18	15.3	100.0	133	13.2	100.0
<b>Total</b>	<b>39</b>	<b>100.0</b>		<b>850</b>	<b>100.0</b>		<b>118</b>	<b>100.0</b>		<b>1007</b>	<b>100.0</b>	

Table 3: Frequencies for Institutional Sampling Error – Senior, NSSE 2010-2011

Sampling Error Range	Paper			Web-only			Web+			Total		
	N	Valid %	Cumulative %	N	Valid %	Cumulative %	N	Valid %	Cumulative %	N	Valid %	Cumulative %
Less than 2%	0	0	0	30	3.5	3.5	0	0	0	30	3.0	3.0
2 to less than 3%	0	0	0	100	11.7	15.2	1	.8	.8	101	10.0	12.9
3 to less than 4%	0	0	0	148	17.3	32.5	11	9.2	10.0	159	15.7	28.6
4 to less than 5%	0	0	0	136	15.9	48.4	24	20.0	30.0	160	15.8	44.4
5 to less than 6%	1	2.6	2.6	136	15.9	64.3	25	20.8	50.8	162	16.0	60.4
6 to less than 7%	3	7.7	10.3	93	10.9	75.2	20	16.7	67.5	116	11.4	71.8
7 to less than 8%	2	5.1	15.4	75	8.8	84.0	15	12.5	80.0	92	9.1	80.9
8 to less than 9%	6	15.4	30.8	40	4.7	88.7	10	8.3	88.3	56	5.5	86.4
9 to less than 10%	5	12.8	43.6	27	3.2	91.8	4	3.3	91.7	36	3.6	89.9
10% or higher	22	56.4	100.0	70	8.2	100.0	10	8.3	100.0	102	10.1	100.0
<b>Total</b>	<b>39</b>	<b>100.0</b>		<b>855</b>	<b>100.0</b>		<b>120</b>	<b>100.0</b>		<b>1014</b>	<b>100.0</b>	

## Results and Discussion

As suggested in the tables, most institutions participating in NSSE do not have a high amount of sampling error. Because a few institutions with very high sampling error may be skewing the mean, it is helpful to examine the median values. All together, the median sampling error for first-years and seniors is only 5.77% and 5.29%, respectively. This suggests an acceptable level of sampling error (Salant & Dillman, 1994). Specifically, web-only institutions yield the lowest sampling errors, with the median being 5.46% and 5.12% for first-years and seniors, respectively. The sampling errors for Web+ institutions are slightly higher (median is 6.57% and 5.97% for first-years and seniors). However, sampling errors for paper schools are relatively high, with median being 12.49% and 10.05% for first-years and seniors, respectively.

Furthermore, the frequencies of sampling error ranges in Table 2 and Table 3 also reveal the same pattern. For first-year sampling error, 37.7% of all NSSE 2010/2011 institutions had a sampling error of less than 5%, while only 13.2% had a sampling error of 10% or higher. For senior sampling error, 44.4% of all NSSE 2010/2011 institutions had a sampling error of less than 5%, while only 10.1% had a sampling error of 10% or higher. In particular for web-only institutions, 41.9% first-years and 48.4% seniors had a sampling error of less than 5%; while only 10.1% first-years and 8.2% seniors had a sampling error of 10% or higher. For web+ institutions, 20.3% first-years and 30% seniors had a sampling error of less than 5%; while only 15.3% first-years and 8.3% seniors had a sampling error of 10% or higher. However, for paper institutions, no institution had a sampling error of less than 5%; while 74.7% first-years and 56.4% seniors had a sampling error of 10% or higher.

In the 2010 NSSE administration, the Center for Postsecondary Research, in cooperation with the Center for Survey Research, began census sampling procedures for any institutions using the web-based survey instrument. The results of this study show that census sampling could reduce sampling error significantly, since the web-only institutions have lower sampling error than web+ and paper schools.

## References

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