Chapter 5

Administering the Survey of Chiropractic Practice

Obtaining lists of licensed chiropractors within each state was necessary before the NBCE could select chiropractors to complete the Survey of Chiropractic Practice. All states and the District of Columbia were contacted and asked to provide a list. Most states immediately complied with the NBCE request. Several states required additional contacts before a list was sent to NBCE. The state of Hawaii never provided an official state list. A partial list of chiropractors was obtained for the state of Hawaii and was used to invite survey participation.

Once state lists were obtained, names of those not residing in the state were excluded from the list. The total number of in-state licensed chiropractors from the state lists was 74,045. State lists contain inaccuracies including incorrect addresses, names of deceased and retired chiropractors. These issues were addressed and noted before and while obtaining survey data.

Survey Results by State

Defining and Calculating Standard Error

Sample sizes were determined on a per-state basis so that the accuracy of the inferences made from the data from each state would be approximately the same. This was accomplished by using the standard error equation, an abbreviation for the standard error of estimate, shown below:

Standard Error Equation: $SE = (SD / Nft^{1/2}) * (1 - Nft / Stateft)^{1/2}$

SE: The **standard error** of estimate is a numeric value indicating the accuracy of the sample mean as an estimator of the population mean. It is calculated by dividing the standard deviation by the square root of the sample size and multiplying this value by the square root of the finite population correction term, i.e., this latter multiplication adjusts for sampling from a finite population. (With a goal of achieving a 5.0% standard error per state, the standard error for the nation would be approximately 1.0%.)

SD: The **standard deviation** is a measure of variability, spread, or dispersion of a set of scores around their mean value. (For SD values associated with the scales used in the survey, see SD definition near the end of this chapter.)

State	Norig	Nmail	Nft	Npt	Ndec	Ndcl	Nnpra	Nndel	%acc	%Resp	Stateft	wt	%ft	SE	VR
Alabama	647	202	56	3	0	4	0	12	37.1	28.1	483	8.63	12	6.3	4
Alaska	212	170	42	2	1	9	0	18	42.4	25.1	124	2.94	34	6.3	1
Arizona	1,882	211	40	12	0	7	1	31	43.1	20.2	827	20.68	5	7.7	2
Arkansas	473	195	57	3	0	13	1	27	51.8	29.8	267	4.68	21	5.9	2
California	12,423	219	26	8	0	8	1	19	28.3	12.4	5,210	200.37	0.5	9.8	1
Colorado	1,683	209	55	11	0	7	1	18	44.0	27.9	1,006	18.29	5	6.6	4
Connecticut	813	203	34	12	0	11	1	15	36.0	17.9	379	11.14	9	8.2	1
Delaware	149	145	30	3	0	3	0	3	26.9	21.1	115	3.82	26	7.8	2
Dist. Col.	42	39	7	3	0	2	0	4	41.0	19.4	18	2.63	38	14.9	0
Florida	4,302	214	40	9	0	10	2	14	35.0	19.7	2,294	57.36	2	7.8	0
Georgia	2,480	211	35	10	1	3	0	27	36.0	17.5	1,142	32.63	3	8.3	1
Hawaii	132	132	25	6	1	5	1	17	41.7	20.2	60	2.40	42	7.6	2
Idaho	487	193	54	7	0	7	0	26	48.7	29.0	280	5.18	19	6.1	1

Column legend (rotated headers):
- Norig — Chiropractors on original list provided by state
- Nmail — Surveys mailed
- Nft — Full-time respondents
- Npt — Part-time / Retired
- Ndec — Deceased
- Ndcl — Declined participation
- Nnpra — Not in practice
- Nndel — Non-deliverable
- %acc — % Nmail accounted for
- %Resp — % Responded
- Stateft — Estimated full-time in each state
- wt — Weight given a state
- %ft — Nft as % of Stateft
- SE — Estimated maximum standard error
- VR — Validation respondents

Table 5.1 Response by State

Chapter
5

State	Norig	Nmail	Nft	Npt	Ndec	Ndcl	Nnpra	Nndel	%acc	%Resp	Stateft	wt	%ft	SE	VR
Illinois	3,653	209	34	4	0	4	0	19	29.2	16.6	2,036	59.89	2	8.5	4
Indiana	996	202	49	7	2	9	0	15	40.6	25.4	595	12.15	8	6.8	0
Iowa	1,317	204	55	9	0	7	0	13	41.2	28.2	862	15.68	6	6.5	6
Kansas	868	205	53	2	0	4	1	15	36.6	26.2	613	11.57	9	6.6	2
Kentucky	732	203	53	5	0	8	2	20	43.3	27.0	441	8.32	12	6.4	6
Louisiana	531	200	48	9	1	15	1	23	48.5	25.4	263	5.47	18	6.5	2
Maine	343	191	47	4	0	6	2	18	40.3	25.4	209	4.45	22	6.4	1
Maryland	865	205	39	5	0	13	1	6	31.2	19.6	527	13.52	7	7.7	1
Massachusetts	1,501	207	28	7	0	9	0	18	30.0	14.0	678	24.21	4	9.3	3
Michigan	2,398	212	32	8	0	5	0	12	26.9	15.7	1,346	42.07	2	8.7	1
Minnesota	2,319	209	43	7	0	9	2	17	37.3	21.5	1,278	29.73	3	7.5	3
Mississippi	266	187	46	3	0	2	0	15	35.3	25.0	185	4.03	25	6.4	0
Missouri	1,768	205	41	11	0	7	2	19	39.0	21.4	906	22.10	5	7.6	0

Column descriptions:
- Norig: Chiropractors on original list provided by state
- Nmail: Surveys mailed
- Nft: Full-time respondents
- Npt: Part-time / Retired
- Ndec: Deceased
- Ndcl: Declined participation
- Nnpra: Not in practice
- Nndel: Non-deliverable
- %acc: % Nmail accounted for
- %Resp: % Responded
- Stateft: Estimated full-time in each state
- wt: Weight given a state
- %ft: Nft as % of Stateft
- SE: Estimated maximum standard error
- VR: Validation respondents

Table 5.1 Response by State, continued

State	Norig	Nmail	Nft	Npt	Ndec	Ndcl	Nnpra	Nndel	%acc	%Resp	Stateft	wt	%ft	SE	VR
Montana	326	189	55	2	1	1	0	16	39.7	29.6	239	4.35	23	5.9	5
Nebraska	444	195	60	6	0	3	0	22	46.7	31.7	293	4.88	20	5.8	3
Nevada	585	203	26	9	0	5	0	37	37.9	13.4	198	7.60	13	9.1	1
New Hampshire	329	191	40	9	0	8	2	18	40.3	22.2	171	4.27	23	6.9	2
New Jersey	2,905	213	44	5	0	5	1	17	33.8	21.3	1,775	40.35	2	7.4	0
New Mexico	206	173	55	9	0	10	3	29	61.3	34.2	107	1.94	51	4.7	2
New York	4,590	214	37	9	0	15	2	15	36.4	18.2	2,177	58.85	2	8.1	0
North Carolina	1,515	208	55	8	0	9	0	9	38.9	27.5	1,029	18.70	5	6.6	2
North Dakota	223	180	77	1	1	6	0	15	55.6	43.3	172	2.23	45	4.2	3
Ohio	2,090	214	47	7	0	11	1	17	38.8	22.8	1,183	25.18	4	7.1	2
Oklahoma	751	195	49	4	1	10	0	18	42.1	25.8	449	9.16	11	6.7	1
Oregon	1,215	200	59	7	0	10	0	17	46.5	30.6	771	13.06	8	6.3	3
Pennsylvania	3,622	214	47	1	0	10	0	14	33.6	22.1	2,364	50.31	2	7.2	0

Table 5.1 Response by State, continued

Chapter 5

Chapter 5

State	Norig	Nmail	Nft	Npt	Ndec	Ndcl	Nnpra	Nndel	%acc	%Resp	Stateft	wt	%ft	SE	VR
Rhode Island	187	180	31	4	0	2	0	6	23.9	17.6	135	4.35	23	7.9	0
South Carolina	1,042	200	29	7	1	9	1	20	33.5	15.2	451	15.55	6	9.0	2
South Dakota	324	190	79	2	1	6	0	10	51.6	42.2	261	3.31	30	4.7	4
Tennessee	904	202	51	4	0	8	1	12	37.6	25.9	607	11.89	8	6.7	5
Texas	4,426	214	44	5	1	7	0	24	37.9	21.2	2,404	54.64	2	7.5	2
Utah	681	202	54	9	0	6	1	24	46.5	28.1	391	7.24	14	6.3	1
Vermont	169	158	30	4	1	6	0	21	39.2	19.6	82	2.73	37	7.3	0
Virginia	1,179	208	62	4	0	7	0	17	43.3	30.4	812	13.10	8	6.1	2
Washington	2,106	210	35	3	0	14	0	11	30.0	16.9	1,170	33.43	3	8.3	3
West Virginia	247	183	50	5	1	3	0	11	38.3	28.2	176	3.53	28	6.0	0
Wisconsin	570	199	53	5	0	3	0	7	34.2	27.3	444	8.38	12	6.4	2
Wyoming	127	122	33	5	0	3	1	5	38.5	28.4	89	2.70	37	6.9	5
Total	74,045	9839	2271	304	14	364	32	853	39.0	23.9	43,813	N/A	N/A	1.0	100

Column labels:
- Norig — Chiropractors on original list provided by state
- Nmail — Surveys mailed
- Nft — Full-time respondents
- Npt — Part-time / Retired
- Ndec — Deceased
- Ndcl — Declined participation
- Nnpra — Not in practice
- Nndel — Non-deliverable
- %acc — % Nmail accounted for
- %Resp — % Responded
- Stateft — Estimated full-time in each state
- wt — Weight given a state
- %ft — Nft as % of Stateft
- SE — Estimated maximum standard error
- VR — Validation respondents

Table 5.1 Response by State, continued

Nft:	The **number of full-time** chiropractors returning surveys.
Stateft:	The estimated number of **full-time** chiropractors in each state.
½:	The **square root**.
(1 - Nft/Stateft)^{½}:	**The square root of the finite population correction term.**

To achieve a goal of a 5% standard error per state, the sample size for each state was doubled in anticipation of receiving about a 50% rate of return.

In some states, the actual number of licensed chiropractors was less than twice the number required to have a 5% standard error. In those states, surveys were mailed to each licensed chiropractor residing in the state in order to reduce the standard error as much as possible.

In the states with the largest populations of chiropractors, sample sizes were increased to further reduce the standard errors.

Selection Process

The selection of chiropractors to participate in the study was made on a state-by-state basis. In states having relatively few licensed chiropractors, every chiropractor on the supplied state list who resided in the state was requested to participate in the study (to reduce standard errors as previously stated). In states with large numbers of licensed chiropractors, a sequential selection process was utilized. The actual sequence depended on the population of chiropractors and the number to be selected from that population.

For example, in Alabama, the total number of chiropractors on the list provided by the state (after non-residents were removed from the list) was 647 and the desired number to mail was 202. Using a random selection function, 202 chiropractors were electronically selected, grouped, and added to the final selection database.

Utilizing procedures appropriate to selecting the correct number of participants from each state, 9,839 were chosen from the state lists that contained 74,045 names.

Pre-Notification

Pre-notification was an important step in the administration of the questionnaire. Previous studies on survey techniques have concluded that survey response rates are highest when those selected for participation:

- receive preliminary notification and request for participation;
- perceive the research to be of value;
- are informed that the research is to be conducted by one or more recognized and respected organizations.

Higher response rates ensure less potential bias in the inferences made from survey data. Previous comparable studies have also suggested that preliminary communication with selected participants results in a timely return of completed surveys.

With the NBCE survey, a preliminary survey postcard was considered the most cost-effective method of preliminary notification. The NBCE mailed a pre-survey postcard (Appendix B) to all who were selected to participate. The postcard informed those selected of the upcoming survey and emphasized the importance of their participation.

Distributing and Tracking the Survey

Within 7 to 10 days of distributing pre-survey postcards which informed individuals of their selection to participate in the survey, selectees were contacted via telephone. Phone calls were made by a professional calling company that had been instructed concerning the nature of the survey and those selected to participate. Individual offices were called requesting that the doctor complete the survey. The initial phone calls to all of the individuals required about 2 weeks. At the conclusion of the 2 weeks, all of those who had not responded online to the survey were once again called by this professional calling service. This resulted in approximately 900 individuals completing the survey online.

All of the approximately 8,900 individuals who had not completed the survey online were sent a printed survey with a cover letter (Appendices C and E). The cover letter requested that individuals complete the survey and return the completed survey to the National Board of Chiropractic Examiners within 3 weeks of receipt.

For tracking purposes, each survey was numbered. This process enabled the NBCE to determine who had returned a survey and who required follow-up contact. NBCE noted the names of all individuals who completed surveys and individuals who did not complete a survey.

About 2 weeks after mailing surveys, NBCE then employed three telephone callers to contact individuals in every state who had not completed a survey either online or in a paper and pencil form. This calling extended over a 3-week period during which a major effort was made to contact via telephone every individual who had not provided a response. From this extensive calling, notes were made of the responses given to NBCE including the following: practicing part-time, retired, deceased, no longer practicing, declined participation, and non-deliverable.

Increasing the Rate of Response

In lieu of monetary compensation, the NBCE offered to furnish participants with a summary of the survey results, to issue news releases (Appendix G) to participants' local newspapers noting their participation in a significant research project, and to list participants' names in the resulting project report (Appendix H). The NBCE mailed the news releases and published participants' names in this report only if these requests were affirmatively indicated by the respondent on the survey form.

Chapter
5

Identifying Active Full-time Practitioners

Question 6 of the survey asked participants the number of hours per week they practiced. Only the responses of those who indicated 20 or more hours of weekly practice were included in the survey report.

Conducting the Survey of Non-Respondents

To assess whether non-respondents had the same demographic characteristics and practiced the same way as participants who completed the survey, telephone calls were made to two or more non-respondents in each state. Of the approximately 160 who agreed to complete the survey, 100 actually completed the survey online. A comparison of these respondents with the 2,271 who completed the survey earlier, found these 100 chiropractors to have the same demographic characteristics as the 2,271 who had completed the survey earlier.

Survey Response Results

Of the 9,839 pre-survey letters originally sent, 2,271 individuals practicing 20 or more hours per week completed the survey online or in a printed form; survey results were based upon the responses from these individuals. Additionally, 304 indicated that they were either in part-time practice or were retired; 14 were identified as deceased; 364 declined to participate; and 853 could not be located through postal delivery. In order to conduct the survey of non-respondents, the NBCE contacted selected non-respondents and requested that they complete the survey online. Of the contacted non-respondents, 100 were full-time and completed a survey after they were contacted via telephone. Thus, of the 9,839 selectees, 3,838 (39.0%) were initially accounted for; additionally, 100 validation respondents were full-time practitioners, totaling 3,938 or 40.0%.

Determining Percentages from Responses on 5-point Scales

To determine percentages from responses on the 5-point scales, including time spent in professional functions, patient gender, and ages of patients, the midpoints of the percentage ranges were utilized. For example, if a respondent marked the "1-25%" choice, this was converted to 13%. In like manner, the "26-50%" answer choice was converted to a midpoint value of 38%; "51-75%" to 63%; and "76-100%" to 88%. Means were then scaled within each question so that they totaled 100%.

The Weighting Factor

Table 5.1[1] contains information summarizing and describing the survey responses. These tables of figures represent counts of surveys mailed to individuals based upon original mailing addresses; in some cases surveys were forwarded.

Chapter
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[1]   To save space, values in Table 5.1 include only 1 or 2 decimal places. In actuality, all values were computed to several decimal places.

Of particular interest is the *weighting* given to each response. For example, in the state of Alabama, there were an estimated 483 full-time licensed chiropractors. Of those 483, 56 chiropractors completed and returned the survey. The weighting given to Alabama is 8.63 because 56 times 8.63 equals 483, the estimated total number of full-time chiropractors. The weighting factor was necessary in order to have the combined (individual states and District of Columbia) data represent the national population. (Except where otherwise noted, all of the summary information in this document was based upon weighted data.)

The following abbreviations were used in the tables presented:

Norig: Number of chiropractors listed on the **original list** provided to the NBCE by state licensing boards. (Names appearing on two or more state lists were only included on the list for the participant's state of residence; duplicate names were deleted from all other lists.)

Nmail: Number of pre-survey postcards **mailed**.

Nft: Number of **full-time** chiropractors who returned surveys.

Npt: Number of **part-time** chiropractors who completed an online survey or a printed survey or indicated that they were retired.

Ndec: Response indicating selected chiropractor was **deceased**.

Ndcl: Number who **declined** participation via telephone or mail.

Nnpra Number indicating they were not in practice.

Nndel: Number of **non-deliverable** pre-survey postcards and surveys.

%acc: Percentage accounted for. [2]

    %acc = [(Nft + Npt + Ndec + Ndcl + Nnpra + Nndel) / Nmail] * 100

%Resp Percentage of respondents.

    %Resp = Nft / [Nmail - (Npt + Ndec + Nnpra)] * 100

Stateft: Estimated number of full-time chiropractors in each state. [3]

    Stateft = Nft / (Nft + Npt + Ndec + Ndcl + Nnpra + Nndel) * Norig

Chapter

5

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[2] As indicated in the formula for calculating this percentage, this includes any type of response in which the status of the selected individual was identified. In formulas, an asterisk (*) denotes multiplication.

[3] This is likely an over-estimate of the number of full-time practitioners since it is probable that a large proportion of the survey forms sent to part-time, retired, deceased, and non-practicing chiropractors was not returned to the NBCE.

wt:	**Weight** (or emphasis) given to each survey within a state when computing national summary statistics.
	(wt = Stateft / Nft)
%ft:	Nft as **percent** of Stateft.
	(%ft = Nft / Stateft *100)
SE:	The **standard error of estimate** is a numeric value indicating the accuracy of the sample mean as an estimator of the population mean. It is calculated by dividing the standard deviation by the square root of the sample size and adjusting for sampling from a finite population. (With a goal of achieving a 5.0% standard error per state, the standard error for the nation would be approximately 1.0%.)
	$SE = (SD/Nft^{1/2}) * (1 - Nft/Stateft)^{1/2}$

	SD:	**The standard deviation of responses to a survey question.** For questions reported in the study as a percent, the maximum SD is 50. (This value is the largest standard deviation of any within the Survey of Chiropractic Practice. Thus, this is an upper bound of the standard deviation. This is the value reported on a per state basis.)
		For the *Risk* scale having possible values of 0 to 4, the largest standard deviation is 1.4.
		For the *Frequency* scale having possible values of 0 to 5, the largest standard deviation is 2.2.
		For the *Importance Value* having a possible range of 0 to 20, the maximum standard deviation is 6.0.
		For the number of *Passive Adjunctive* treatments used by practitioners, possible values could range from 0 to 22. The largest standard deviation is 4.3.
		For the number of *Active Adjunctive* treatments used by practitioners, possible values could range from 0 to 7. The largest standard deviation is 1.5.
		For *Health Promotion/Wellness Care*, possible values could range from 0 to 8. The largest standard deviation is 1.6.
	(1-Nft/Stateft)^{1/2}:	The square root of the finite population correction term.

VR:	Number of chiropractors returning post-deadline surveys after validation survey telephone contact. (These were "Validation Respondents".)

Sampling Design and Response Rate by State

Table 5.1 on the pages that follow indicates information on a state-by-state basis regarding the states and survey respondents.