Chapter 5

Administering the Survey of Chiropractic Practice

Obtaining lists of licensed chiropractors within each state was necessary before the NBCE could contact chiropractors to complete the Survey of Chiropractic Practice. All states and the District of Columbia were asked to provide a list. Most states immediately complied with the NBCE request but several states required additional contact before they sent their lists. The states of Delaware and Hawaii each provided an official state list, but they did not include addresses. An extensive search of the internet to obtain addresses for chiropractors in these states was conducted and those found were used to invite survey participation. Maine provided a state list which contained many chiropractic assistants who were identified and removed from the selection process. Mississippi provided a list with no license numbers, requiring an extensive search of the FCLB website to connect names to license numbers. Where successful, names were used to invite Mississippi survey participation. New York provided an official state list but the majority of names did not include addresses. Survey participation was obtained from a sample of those for whom the state provided addresses.

Once state lists were obtained, names of those not residing in the state as well as those with expired licenses, when provided, were excluded. Random selection was made from individuals with local addresses and active license numbers. The total number of in-state licensed chiropractors from the state lists was 72,187. In general, state lists contained inaccuracies including incorrect addresses, names of deceased and retired chiropractors, and chiropractic assistants. These issues were considered before and while obtaining survey data and are reflected in Table 5.1.

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:	$SE = (SD / N_{ft}^{1/2}) * (1 - N_{ft} / State_{ft})^{1/2}$
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. The goal was to achieve an approximately 1% standard error for the nation.)
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 for each scale near the end of this chapter.)
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)$^{1/2}$:	**The square root of the finite population correction term**.

[*]   The standard error per state varied due to the numbers who responded by state and the proportion within the state who responded.

Selection Process

The identification 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 the standard error per state 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 598 and the desired number to mail was 204. Using a random selection function, 204 chiropractors were electronically identified, grouped, and added to the final selection database.

Utilizing procedures appropriate to selecting the correct number of participants from each state, 10,000 were chosen from the state lists that contained 72,187 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 more 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 to all who were selected to participate. The postcard informed those selected of the upcoming survey and emphasized the importance of their participation. The postcard asked the individual to complete the survey online. Due to a printing error, everyone selected to participate in the study was sent a second postcard.

Distributing and Tracking the Survey

Approximately two months after postcards were mailed, the printed Survey of Chiropractic Practice was mailed with a cover letter to all selectees who had not completed a survey online. The cover letter described the importance of selectees' participation and explained the option of completing the survey in a printed form or online.

About three weeks after surveys were mailed, the NBCE used the services of a professional calling company. Individual offices were called requesting that the doctor complete the survey. The initial phone calls to all of the individuals required about two weeks. At the conclusion of the two weeks, all of those who had not responded to the survey either online or in the printed format were once again called by this calling service. During this extensive calling, notes were made of the responses given including the following: practicing part-time, retired, deceased, no longer practicing, declined participation, and non-deliverable.

The postcards, the printed survey with a cover letter, and the calls which followed resulted in 1,547 who completed the survey: 569 online and 978 in the printed form.

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 to participants' local newspapers noting their participation in a significant research project, and to list participants' names in the resulting project report (Appendix C). The NBCE mailed the news releases and published participants' names

Chapter

5

in this report only if these requests were affirmatively indicated by the respondent on the survey form.

Identifying Active Full-time Practitioners

The sixth question 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. This resulted in 1,379 participants used for the current survey.

Conducting the Survey of Non-Respondents

To assess whether non-respondents had the same demographic characteristics as participants who previously completed the survey, telephone calls were made to two or more non-respondents in each state. Of the approximately 98 who agreed to complete the survey, 39 actually completed the task. A comparison of these validation respondents with the 1,379 who completed the survey earlier, found these 39 chiropractors to have the same and differing demographic characteristics from the 1,379.

A comparison of the original participants with the sample of non-respondents showed the following similarities in demographic characteristics: both groups have the same proportions in various practice settings and in office roles as *sole proprietors*, as *partners*, and as *associates/employees*; the two groups of respondents spend the same proportion of their professional time in *patient care and education*, *documenting care*, and in *business management*; the proportion of patients they see is the same by gender and by age categories; the same percentage of each group have hospital staff privileges and approximately the same proportion provide chiropractic care to military personnel. The ethnicity of the two groups is the same and the groups are proportionately representative of the same colleges.

In contrast, the original participants and the sample of non-respondents differ as follows: the original sample has been in practice longer; they see more patients, and work fewer hours per week; a higher proportion of the original sample live in cities and proportionately fewer live in rural areas. A smaller proportion of the original sample have bachelor's degrees but a higher proportion take radiographs and use plain film.

In consideration of the similarities and differences in the demographic characteristics of the two groups, the 2014 sample and the data they provided were considered valid and reported herein as such.

Survey Response Results

Of the 10,000 pre-survey letters originally sent, 1,379 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, 274 indicated that they were either in part-time practice or were not practicing; two were identified as deceased; 478 declined to participate; and 1,119 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, 39 were full-time and completed a survey after they were contacted via telephone. Thus, of the 10,000 selectees, 3,252 (32.5%) were initially accounted for; additionally, 39 validation respondents were also included in the accounting process totaling 3,291 or 32.9% for whom we made an accounting.

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), 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 responses to questions 20, 21, and 22 were converted in this manner.

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.

Of particular interest is the *weighting* given to each response. For example, in the state of Alabama, there were an estimated 447 full-time licensed chiropractors. Of those 447, 28 chiropractors completed and returned the survey. The weighting given to Alabama is 15.95 because 28 times 15.95 equals 447, 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.)

Chapter

5

---

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.

The following abbreviations were used in the tables presented in this chapter:

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 individuals to whom pre-survey postcards were **mailed**.
Nft:	Number of **full-time** chiropractors who returned surveys.
Npt:	Number of **part-time** chiropractors who completed a survey.
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 + Ndcl + Nndel/2) / (Nft + Npt + Ndec + Ndcl + Nnpra + Nndel)] * Norig**
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. (The goal was to achieve a 1.0% standard error for the nation). $SE = (SD/Nft^{1/2}) * (1 - Nft/Stateft)^{1/2}$

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 new formula, used for the first time with the 2014 data, includes the assumptions that all who declined to participate and one-half of those who could not be reached by postal delivery are currently in full-time practice.

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 largest 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.

(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*.)

Chapter

5

Sampling Design and Response by State

Table 5.1 on the pages that follow indicates information on a state-by-state and national basis.

State	Norig	Nmail	Nft	Npt	Ndec	Ndcl	Nnpra	Nndel	%acc	%Resp	Stateft	wt	%ft	SE	VR
Alabama	598	204	28	2	0	13	1	33	37.7	13.9	447	15.95	6.3	9.1	1
Alaska	246	186	23	1	0	10	3	18	29.6	12.6	188	8.17	12.2	9.8	2
Arizona	1675	208	15	2	0	8	7	19	24.5	7.5	1067	71.16	1.4	12.8	2
Arkansas	506	196	28	0	0	12	2	20	31.6	14.4	408	14.57	6.9	9.1	1
California	11785	216	28	4	0	11	3	23	31.9	13.4	8625	308.04	0.3	9.4	1
Colorado	1739	208	23	2	0	6	1	28	28.8	11.2	1246	54.19	1.8	10.3	0
Connecticut	852	204	28	5	0	5	4	17	28.9	14.4	599	21.40	4.7	9.2	0
Delaware	156	156	21	0	0	7	1	37	42.3	13.5	110	5.23	19.1	9.8	1
District of Columbia	32	32	5	0	0	2	0	5	37.5	15.6	25	5.07	19.7	20.0	2
Florida	4497	213	17	3	0	9	4	24	26.8	8.3	2998	176.35	0.6	12.1	1
Georgia	2527	208	15	1	0	8	6	17	22.6	7.5	1694	112.91	0.9	12.9	2
Hawaii	233	184	18	4	0	6	2	57	47.3	10.1	141	7.81	12.8	11.0	1

Table 5.1 Response by State

Column descriptions:
- Norig: Chiropractors on original list provided by state
- Nmail: Surveys mailed
- Nft: Full-time respondents
- Npt: Part-time
- 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

State	Norig	Nmail	Nft	Npt	Ndec	Ndcl	Nnpra	Nndel	%acc	%Resp	Stateft	wt	%ft	SE	VR
Idaho	533	196	23	4	0	9	4	38	39.8	12.2	349	15.15	6.6	10.1	0
Illinois	3874	212	28	2	0	10	7	27	34.9	13.8	2696	96.29	1.0	9.4	1
Indiana	1030	206	36	1	0	17	2	13	33.5	17.7	888	24.67	4.1	8.2	0
Iowa	1490	208	37	4	0	14	8	15	37.5	18.9	1118	30.20	3.3	8.1	1
Kansas	876	206	34	2	0	12	3	16	32.5	16.9	706	20.77	4.8	8.4	2
Kentucky	771	204	24	0	0	15	2	28	33.8	11.9	592	24.68	4.1	10.0	2
Louisiana	612	201	26	8	0	8	1	15	28.9	13.5	438	16.84	5.9	9.5	2
Maine	465	194	25	2	0	5	3	45	41.2	13.2	305	12.21	8.2	9.6	0
Maryland	702	204	22	2	0	5	2	18	24.0	11.0	516	23.44	4.3	10.4	0
Massachusetts	1305	208	30	2	0	7	6	26	34.1	15.0	919	30.63	3.3	9.0	1
Michigan	2350	208	31	7	0	13	3	16	33.7	15.7	1746	56.31	1.8	8.9	0
Minnesota	2571	208	29	3	1	12	4	12	29.3	14.5	1981	68.31	1.5	9.2	0
Mississippi	286	188	22	0	0	13	2	26	33.5	11.8	218	9.90	10.1	10.1	0

Column descriptions:
- Norig: Chiropractors on original list provided by state
- Nmail: Surveys mailed
- Nft: Full-time respondents
- Npt: Part-time
- 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

Chapter
5

Table 5.1 Response by State, continued

Chapter
5

State	Norig	Nmail	Nft	Npt	Ndec	Ndcl	Nnpra	Nndel	%acc	%Resp	Stateft	wt	%ft	SE	VR
Missouri	1941	208	32	2	0	8	7	19	32.7	16.1	1413	44.15	2.3	8.7	0
Montana	338	192	34	2	0	12	1	20	35.9	18.0	274	8.07	12.4	8.0	1
Nebraska	563	196	41	3	0	8	2	18	36.7	21.5	454	11.06	9.0	7.4	1
Nevada	516	196	21	4	0	8	3	21	29.1	11.1	358	17.03	5.9	10.6	0
New Hampshire	344	190	21	0	0	9	2	28	31.6	11.2	252	12.01	8.3	10.4	0
New Jersey	2846	208	20	3	0	5	2	24	26.0	9.9	1950	97.50	1.0	11.1	0
New Mexico	429	194	25	2	0	10	5	25	34.5	13.4	304	12.17	8.2	9.6	1
New York	1134	206	31	4	0	10	1	21	32.5	15.4	872	28.12	3.6	8.8	1
North Carolina	1599	208	29	1	0	13	4	24	34.1	14.3	1216	41.94	2.4	9.2	0
North Dakota	345	190	43	1	0	8	2	19	38.4	23.0	286	6.65	15.0	7.0	0
Ohio	2334	208	36	1	0	11	2	20	33.7	17.6	1901	52.79	1.9	8.3	0
Oklahoma	773	204	28	3	0	17	1	26	36.8	14.0	598	21.35	4.7	9.2	0
Oregon	1317	208	41	3	0	11	3	14	34.6	20.3	1079	26.32	3.8	7.7	0

Column descriptions:
- Norig — Chiropractors on original list provided by state
- Nmail — Surveys mailed
- Nft — Full-time respondents
- Npt — Part-time
- 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
Pennsylvania	3581	212	29	5	0	15	3	16	32.1	14.2	2738	94.43	1.1	9.2	2
Rhode Island	195	182	22	2	0	5	3	9	22.5	12.4	150	6.81	14.7	9.8	1
South Carolina	1071	206	20	1	0	3	2	24	24.3	9.9	750	37.49	2.7	11.0	1
South Dakota	374	192	50	1	0	14	2	12	41.1	26.5	331	6.63	15.1	6.5	1
Tennessee	1203	208	16	2	0	6	6	42	34.6	8.0	718	44.90	2.2	12.4	1
Texas	4372	212	24	3	0	5	1	7	18.9	11.5	3552	148.01	0.7	10.2	1
Utah	736	204	32	2	1	5	3	14	27.9	16.2	568	17.75	5.6	8.6	1
Vermont	180	180	19	4	0	9	1	28	33.9	10.9	124	6.52	15.3	10.6	0
Virginia	1216	208	23	6	0	9	2	26	31.7	11.5	829	36.05	2.8	10.3	2
Washington	2124	208	26	4	0	12	4	17	30.3	13.0	1568	60.30	1.7	9.7	0
West Virginia	254	186	29	3	0	11	2	20	34.9	16.0	195	6.74	14.8	8.6	0
Wisconsin	551	196	42	2	0	9	3	21	39.3	22.0	440	10.48	9.5	7.3	1
Wyoming	140	140	29	1	0	8	0	11	35.0	20.9	121	4.19	23.9	8.1	1
Total	72,187	10,000	1379	126	2	478	148	1119	32.5	14.2	53641	N/A	N/A	1.3	39

Table 5.1 Response by State, continued

Chapter
5

Chapter
5