

# Chapter 5

## Administering the Job Analysis Survey

Procurement of a list of licensed chiropractic practitioners within the United States was necessary prior to the administration of the NBCE *Survey of Chiropractic Practice*. The most effective method of acquiring a list of currently licensed practitioners in each geographic area was to contact the licensing boards in each of the 50 states and the District of Columbia. Each area provided a list. The total number of licensed chiropractors from the state lists was 68,799.

State lists do contain inaccuracies including addresses that are not current. In addition, the total number of licensed chiropractors listed in Table 5.1 could be an overstatement of licensed practitioners as some individuals are licensed in more than one state, and their name may appear on the list of licensed chiropractors in each state in which they hold a license to practice.

### Obtaining Survey Results

#### 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:

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

**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 0.9%.)

**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, page 59 of this chapter.)

**Nft:** The **number of full-time** chiropractors returning surveys.

**Stateft:** The estimated number of **full-time** chiropractors in each **state**.

$\frac{1}{2}$ : The **square root**.

$(1 - Nft/Stateft)^{1/2}$ : 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 (determined by applying the formula presented on page 53) was doubled in anticipation of receiving approximately 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 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 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 Missouri, the total number of chiropractors on the list provided by the state was 1,629 and the desired number to mail was 235. Using a random selection function, 235 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, 10,189 were chosen from the state lists that contained 68,799 names.

### **Pre-Notification**

Pre-notification was an important step in the administration of the questionnaire. Previous studies on survey techniques conclude 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 also suggest that preliminary communication with selected participants results in a timely return of completed surveys.

With the NBCE survey, a preliminary survey letter was deemed 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 letter informed those selected of the upcoming survey and emphasized the importance of their participation in this “milestone study of chiropractic practice in the United States.”

The pre-survey postcards were marked “Address Correction Requested” in order to locate those selected. Forwarding the postcards was undesirable because of the

potential of upsetting the geographical balance and standard error estimates. In addition, acquiring current addresses for chosen participants was important.

A number of postcards returned with notations such as “deceased,” “moved,” “left no forwarding address,” or “unknown.” No alternative participants were selected to replace those individuals who could not be contacted since this inevitability was anticipated and accounted for in the initial sample selection.

### **Distributing and Tracking the Survey**

Within three weeks of distributing pre-survey postcards which informed individuals of their selection to participate in the survey, selectees were sent a cover letter and survey (Appendices C and D). The cover letter again stressed to the individual that the results of the survey would be used to prepare a comprehensive report describing the chiropractic profession and documenting future examination needs for the NBCE. The cover letter also re-emphasized that participation in the survey would be critical to the success of the study. Selectees were asked to return the completed survey to the National Board of Chiropractic Examiners within three 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 a follow-up contact. Two weeks after the survey return deadline, follow-up postcards were sent to those individuals who had not returned a survey (Appendix E). The follow-up postcard also instructed selectees who had not received a form to call an “800” telephone number and request that a survey be sent to them. The follow-up correspondence again stressed the importance of participation in the study.

### **Increasing the Rate of Response**

As previously stated, one of the greatest challenges in administering surveys of this proportion is gaining cooperation from the selectees. In addition to conveying the importance of the study and of the individual’s input, the NBCE took additional steps to ensure a timely and maximal response rate.

Recognizing that a significant block of time would be required for participants to complete the survey and that participants would be doing so without benefit of monetary compensation, the NBCE made every effort to keep the text as succinct yet thorough as possible. The final version of the survey was designed to require approximately 50 to 60 minutes to complete. To further facilitate questionnaire completion, a No. 2 pencil and a stamped, self-addressed envelope were supplied with each survey packet.

In lieu of monetary compensation, the NBCE offered to furnish participants with a summary of the survey results, to issue news releases (Appendix F) to participants’ local newspapers noting their participation in a significant research project, and to list participants’ names in the resulting project report (Appendix G). The NBCE mailed the news releases and published participants’ names in this report only if affirma-

tively indicated by the respondent on the survey form. Of the 2,167 respondents, a total of 1,101 news releases were distributed (396 of these contained multiple names), and a total of 1,704 names were published.

### **Identifying Active Full-time Practitioners**

Identifying those chiropractors engaged in active, full-time chiropractic practice was then necessary since this group was the target population for this study. Moreover, since the lists of licensed chiropractors did not provide this information, one of the initial questions of the survey addressed the current occupational status of participants.

Question 2 on the survey asked participants if they were currently involved in active full-time chiropractic practice. The survey did not specify any hourly requirements that defined full-time practice. Instead, individual practitioners determined if their practices were full-time. Only those surveys that indicated full-time practice status were included in subsequent analyses and final data computations.

Individuals who considered their practices to be part-time were instructed not to answer any further questions but to return the questionnaire in the postage-paid envelope.

### **Conducting the Survey of Non-Respondents (2003 Survey)**

To assess whether non-respondents would have responded the same as participants who completed the survey, telephone calls were made to two non-respondents in each state. Once contacted, 25 agreed to complete the survey, and 20 declined to participate. Of the non-respondents, 55 practitioners did not return the survey, nor did they return repeated telephone calls.

The telephone numbers for individuals randomly selected among the non-respondents in each state were obtained from long distance directory assistance, the Internet, and state chiropractic directories.

Of the 25 who agreed to respond to the survey, 20 chiropractors actually completed the survey and returned it to the National Board. A comparison of the two groups revealed no difference in demographic characteristics, except in the number of hours per week they were in chiropractic practice. Of the telephone survey respondents, 60% practiced at least 40 hours per week; in contrast, 31% of the actual sample of 2,167 practiced 40 or more hours per week.

### **Survey Response Results**

Of the 10,189 pre-survey letters and surveys originally sent, the following information was obtained: 2,167 were in full-time practice and returned the completed survey to the NBCE. Survey results were based upon the responses from these individuals. Additionally, 407 indicated that they were either in part-time practice or not full-time (out of practice for maternity, etc.); 16 were retired; 13 were identified as deceased; 8 declined to participate; and 759 could not be located through postal delivery. To conduct the survey of non-respondents, the NBCE contacted selected

non-respondents and requested that they fill out and return the survey even though the deadline had passed.

Thus, of the 10,189 selectees, 3,370 (33.0%) were accounted for. As previously reported in this chapter, a follow-up study was conducted of those who did not respond after having received a pre-survey letter, a survey, and a post-survey follow-up letter. Because these individuals had similar demographic characteristics to the 2,167 completing the survey, it was concluded that there was little or no bias based on participants' demographics.

### **Determining Percentages from Responses on 5- to 11-point Scales**

To determine percentages from responses on the 5- to 11-point scales, the midpoints of the percentage ranges were utilized. For example, in the five-point scale, 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%. This procedure resulted in the percentage data as indicated for the following sections of the survey instrument: *Workers' Compensation, Managed Care and Insurance, Time Spent in Professional Functions, Types of Patients, Chief Complaint and Etiology, and Treatment Procedures.*

### **The Weighting Factor**

Table 5.1 contains tabulation information detailing the survey responses. This table of figures represents counts of surveys mailed to states based upon original mailing addresses; in some cases surveys were forwarded if a person had moved and had a forwarding address out-of-state.

Of particular interest is the *weighting* given to each response. For example, in the state of Alabama, there were an estimated 426 full-time licensed chiropractors. Of those 426, 45 chiropractors completed and returned the survey. The weighting given to Alabama is 9.471 because 45 times 9.47 equals 426, the estimated total number of full-time chiropractors<sup>1</sup>. 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.)

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<sup>1</sup> To save space, values in Table 5.1 include only one or two decimal places. In actuality, all values were computed to several decimal places.

The following abbreviations were used in the tables presented:

<b>Norig:</b>	Number of chiropractors listed on the <b>original list</b> 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.)
<b>Nmail:</b>	Number of pre-survey letters and surveys <b>mailed</b> .
<b>Nft:</b>	Number of <b>full-time</b> chiropractors who returned surveys.
<b>Npt:</b>	Number of <b>part-time</b> chiropractors who returned pre-survey letters and surveys.
<b>Nret:</b>	Number of <b>retired</b> chiropractors who returned pre-survey letters and surveys.
<b>Ndec:</b>	Responses indicating selected chiropractor was <b>deceased</b> .
<b>Ndcl:</b>	Number who <b>declined</b> initial survey.
<b>Nndel:</b>	Number of <b>non-deliverable</b> pre-survey letters and surveys.
<b>%acc:</b>	Percentage accounted for <sup>a</sup> $\% = [(Npt + Nret + Ndec + Ndcl + Nndel + Nft) / Nmail] * 100$
<b>%resp</b>	$\% = Nft / [Nmail - (Npt + Nret + Ndec)]$
<b>Stateft:</b>	Estimated number of <b>full-time</b> chiropractors in each <b>state</b> <sup>b</sup> $Stateft = Nft / (Npt + Nret + Ndec + Ndcl + Nndel + Nft) * Norig$
<b>wt:</b>	<b>Weight</b> (or emphasis) given to each survey within a state when computing national summary statistics. $(wt = Stateft / Nft)$
<b>%ft:</b>	Nft as <b>percent</b> of Stateft $(\%ft = Nft / Stateft * 100)$

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<sup>a</sup> 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.

<sup>b</sup> This is likely an over-estimate of the number of full-time practitioners since it is probable that a high proportion of the survey forms and other correspondence sent to part-time, retired, and deceased chiropractors was not returned to the NBCE.

**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 0.9%.)

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

**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 obtained from the job analysis survey. Thus, this is an upper boundary of the standard deviation.)

For questions reported on a 0-4 scale (Frequency and Risk), the maximum SD is 1.4; for questions reported on a 0-16 scale (Importance = Frequency x Risk), the maximum SD is 5.9. For the number of adjunctive techniques used (0-16) the SD is 2.8; for the number of passive adjunctive care procedures used (0-25) the SD is 4.1; and for the number of adjunctive care procedures utilized (0-6) the SD is 1.5.

$(1-Nft/Stateft)^{1/2}$ : The square root of the finite population correction term

## Sampling Design and Response Rate by State

The following tables indicate information on a state-by-state basis regarding survey respondents. Please note that a more complete and accurate explanation of category headings and data precedes these tables.

State	Norig	Nmail	Nft	Npt	Nret	Ndec	Ndcl	Nndel	%acc	%Resp	Stateft	wt	%ft	SE
	Chiropractors on original list provided by state	Surveys mailed	Full-time respondents	Part-time respondents	Retired	Deceased	Declined participation	Non-deliverable	% Mail accounted for	% Responded	Estimated full-time in each state	Weight given a state	Nft as % of Stateft	Estimated maximum standard error
Alabama	606	206	45	14	1	0	0	4	31.1	23.6	426	9.47	11	7.0
Alaska	182	144	30	2	1	0	0	17	34.7	21.3	109	3.64	27	7.8
Arizona	1,723	238	46	10	0	0	0	15	29.8	20.2	1,116	24.27	4	7.2
Arkansas	458	196	44	9	1	0	0	14	34.7	23.7	296	6.74	15	7.0
California	11,984	251	41	18	1	0	0	15	29.9	17.7	6,551	159.79	1	7.8
Colorado	1,516	235	64	12	0	1	0	24	43.0	28.8	961	15.01	7	6.0
Connecticut	762	217	35	9	0	0	0	10	24.9	16.8	494	14.11	7	8.1
Delaware	119	119	17	2	0	0	0	20	32.8	14.5	52	3.05	33	9.9
Dist. Col.	27	27	4	2	0	0	0	4	37.0	16.0	11	2.70	37	19.8
Florida	3,705	245	47	11	1	0	0	7	26.9	20.2	2,638	56.14	2	7.2
Georgia	2,419	241	35	14	0	2	0	43	39.0	15.6	901	25.73	4	8.3
Hawaii	223	124	14	2	0	0	1	14	25.0	11.5	101	7.19	14	12.4
Idaho	352	185	41	4	0	0	0	23	36.8	22.7	212	5.18	19	7.0

Table 5.1. Response by State

## Sampling Design and Response Rate by State (Continued)

State	Norig	Nmail	Nft	Npt	Nret	Ndec	Ndcl	Nndel	%acc	%Resp	Stateft	wt	%ft	SE
	Chiropractors on original list provided by state	Surveys mailed	Full-time respondents	Part-time respondents	Retired	Deceased	Declined Participation	Non-deliverable	% Nmail accounted for	% Responded	Estimated full-time in each state	Weight given a state	Nft as % of Stateft	Estimated maximum standard error
Illinois	3,262	242	44	7	0	0	0	29	33.1	18.7	1,794	40.78	2	7.4
Indiana	803	216	46	4	1	0	0	5	25.9	21.8	660	14.34	7	7.1
Iowa	1,157	229	58	10	0	0	0	26	41.0	26.5	714	12.31	8	6.3
Kansas	714	213	68	5	1	0	0	12	40.4	32.9	565	8.30	12	5.7
Kentucky	658	208	50	11	0	0	0	8	33.2	25.4	477	9.54	10	6.7
Louisiana	490	202	37	2	0	2	0	9	24.8	18.7	363	9.80	10	7.8
Maine	271	167	33	5	0	0	0	8	27.5	20.4	194	5.89	17	7.9
Maryland	655	208	43	7	1	2	0	32	40.9	21.7	331	7.71	13	7.1
Massachusetts	1,399	231	46	18	0	0	0	13	33.3	21.6	836	18.17	6	7.2
Michigan	2,109	237	37	12	1	0	0	13	26.6	16.5	1,239	33.48	3	8.1
Minnesota	2,000	235	67	20	0	0	0	14	43.0	31.2	1,327	19.80	5	6.0
Mississippi	258	164	36	6	1	1	0	9	32.3	23.1	175	4.87	21	7.4
Missouri	1,629	235	69	18	1	1	1	23	48.1	32.1	995	14.42	7	5.8

Table 5.1. Response by State (Continued)

## Sampling Design and Response Rate by State (Continued)

State	Norig	Nmail	Nft	Npt	Nret	Ndec	Ndcl	Nndel	%acc	%Resp	Stateft	wt	%ft	SE
Montana	283	172	59	7	1	0	1	11	45.9	36.0	211	3.58	28	5.5
Nebraska	342	182	43	4	0	0	1	14	34.1	24.2	237	5.52	18	6.9
Nevada	458	193	48	7	0	0	0	22	39.9	25.8	286	5.95	17	6.6
New Hampshire	314	176	30	8	0	0	0	11	27.8	17.9	192	6.41	16	8.4
New Jersey	2,789	242	49	4	0	0	1	8	25.6	20.6	2,204	44.98	2	7.1
New Mexico	361	188	45	7	0	0	2	8	33.0	24.9	262	5.82	17	6.8
New York	4,989	247	37	10	1	0	0	9	23.1	15.7	3,238	87.53	1	8.2
North Carolina	1,252	230	53	12	0	0	0	15	34.8	24.3	829	15.65	6	6.6
North Dakota	217	150	58	4	1	0	0	9	48.0	40.0	175	3.01	33	5.4
Ohio	1,995	235	60	16	0	0	0	9	36.2	27.4	1,408	23.47	4	6.3
Oklahoma	702	213	0	0	0	0	0	11	34.7	27.2	531	9.49	11	6.3
Oregon	1,009	225	57	7	0	0	0	7	31.6	26.1	810	14.21	7	6.4
Pennsylvania	3,423	243	44	10	0	0	0	25	32.5	18.9	1,906	43.33	2	7.5

Table 5.1. Response by State (Continued)

## Sampling Design and Response Rate by State (Continued)

State	Norig	Nmail	Nft	Npt	Nret	Ndec	Ndcl	Nndel	%acc	%Resp	Stateft	wt	%ft	SE	
	Surveys mailed			Full-time respondents	Part-time	Retired	Deceased	Declined Participation	Non-deliverable	% Nmail accounted for	% Responded	Estimated full-time in each state	Weight given a state	Nft as % of Stateft	Estimated maximum standard error
Rhode Island	147	143	25	2	0	0	0	8	24.5	17.7	105	4.20	24	8.7	
South Carolina	724	212	24	6	0	1	0	31	29.2	11.7	280	11.68	9	9.8	
South Dakota	263	158	54	4	1	0	0	1	38.0	35.3	237	4.38	23	6.0	
Tennessee	748	216	29	8	0	0	0	18	25.5	13.9	394	13.60	7	8.9	
Texas	3,875	239	48	8	0	0	0	11	28.0	20.8	2,776	57.84	2	7.2	
Utah	527	202	41	5	0	0	0	8	26.7	20.8	400	9.76	10	7.4	
Vermont	216	156	22	6	0	1	0	38	42.9	14.8	71	3.22	31	8.9	
Virginia	1,195	228	39	5	0	1	0	30	32.9	17.6	621	15.93	6	7.8	
Washington	1,839	236	44	7	1	0	0	15	28.4	19.3	1,208	27.45	4	7.4	
West Virginia	210	156	37	3	0	0	0	10	32.1	24.2	155	4.20	24	7.2	
Wisconsin	1,333	229	45	10	0	1	1	13	30.6	20.6	857	19.04	5	7.3	
Wyoming	107	103	23	6	0	0	0	6	34.0	23.7	70	3.06	33	8.6	
Total	68,799	10,189	2,167	407	16	13	8	759	33.1	22.2	43,003			1.0	

Table 5.1. Response by State (Continued)

