B. COLLECTIONS OF INFORMATION EMPLOYING STATISTICAL METHODS

B1. Respondent Universe and Sampling Methods

An important objective of this project is to determine the factors influencing the implementation of CDC's 2003 Dental Infection Control Guidelines. The study units of interest for this project consist of all private dental practices providing patient care located in the United States. To obtain the desired information for this project, we intend to conduct a survey of a probability sample of 6,500 private dental practices. However, since there isn't a comprehensive national list of dental practices, we propose to use a comprehensive and up-to-date national database of dentists in active private practice as a frame to select the dental practices for the survey. The target population for this survey, therefore, consists of dentists currently in private practice in all 50 states and Washington D.C.

The sampling frame for this survey will be the American Dental Association's (ADA) Master File, a comprehensive, dynamic database of dentists in the United States. The Master File contains both ADA members and non-members. An *active dentist* database containing those dentists who are actively practicing and treating patients at least part time and who are owners or co-owners of their practice will be extracted from the ADA Master File. To avail this project of the advantage of the ADA Master File and collaboration with the dental profession's leading association, the prime contractor on this project, RTI, has subcontracted the sample selection and data collection activities to the ADA Survey Center.

Some of the new items added to the 2003 CDC Infection Control Guidelines target activities associated with surgical procedures. In order to assure that we collect data that reflects the application of the new infection control practices to these procedures, we propose to over sample Oral Surgeons and Periodontists for this study because these specialties would be expected to have reason to follow the new guidelines associated with surgical procedures in their daily practices. Therefore we proposed to stratify the sampling frame by specialty and to select a stratified systematic random sample (employing a randomly selected starting point in the list of dentists in each stratum and then a systematic selection thereafter (every "n^{th}" case) of 6,500 dentists from the ADA Master File to provide expected proportional distributions by state, census region, age, gender, race/ethnicity, and specialty. Table B.1.1, in the Proportional Allocation columns, shows the proportional distribution of the sample by specialty. However, we have proposed over-sampling two specialties: (1) Oral Surgery and (2) Periodontology to provide 500 completed interviews and yield greater precision of estimates within each of the two specialties. Table B.1.1, Proposed Selection columns, gives the proposed sample proportional distribution by specialty for the proposed design in which the Oral Surgeons and Periodontists are sampled at a disproportionately higher rate.

We expect to achieve an overall response rate of at least 70 percent, which will yield an estimated 4,550 completed questionnaires. In our experience, this will be a large enough number to obtain adequate national, regional, and specialty quantitative information to

statistically analyze in the report. Some examples of comparisons between items in these domains are discussed below.

Table B.1.1. Expected Distribution of Selected Practices by Specialty Assuming (1) Proportional Allocation (based on distribution of all active private practitioners), and (2) Proposed Sample Design

		Proportional Allocation		Proposed Selection	
Stratum	**Primary specialty**	**Number**	**Percent**	**Number**	**Percent**
1	**General Practice**	5,254	80.82	4,521	69.42
1	**Orthodontics and Dentofacial Orthopedics**	369	5.68	308	4.74
1	**Pediatric Dentistry**	168	2.59	140	2.15
1	**Endodontics**	157	2.41	131	2.02
1	**Prosthodontics**	107	1.65	90	1.38
1	**Public Health Dentistry**	13	0.20	11	0.17
1	**Oral and Maxillofacial Pathology**	8	0.13	7	0.11
1	**Oral and Maxillofacial Radiology**	2	0.03	1	0.02
2	**Oral and Maxillofacial Surgery**	240	3.69	715	11.00
3	**Periodontics**	182	2.81	715	11.00
	Total	6,500	100.00	6,500	100.00

We will send questionnaires to the sample of 6,500 dentists. We will ask the responding dentist to answer questions regarding dental infection control in the practice and we will ask for the number of owners or co-owners in the practice. The number of owners/co-owners in the practice will be used to adjust the probability of selection for multiple owner practices by dividing the selection weight by the number of owners. Based on an expected 70 percent response rate, we expect that 4,550 dentists will respond. During data collection, we will record as “ineligible” the dentists who indicate that they are retired or are no longer in active practice. Some questionnaires may be returned by the Postal Service as undeliverable. Dentists with undeliverable questionnaires will be assigned an “unknown eligibility” status. Table B.1.2 shows the expected distribution of responding practices by region. Table B.1.3 shows the expected distribution of responding practices by specialty.

Table B.1.2 Expected Distribution of Responding Practices by Region (based on distribution of owner dentists)

Region	Number	Percent
New England	266	5.85
Middle Atlantic	752	16.53
South Atlantic	717	15.76
East South Central	234	5.14
East North Central	736	16.18
West North Central	297	6.53
West South Central	406	8.92
Mountain	296	6.51
Pacific	846	18.59
Total	4,550	100.00

Table B.1.3 Expected Distribution of Responding Practices by Specialty

Primary specialty	Number	Percent
General Practice	3,067	69.41
Orthodontics and Dentofacial Orthopedics	216	4.75
Pediatric Dentistry	98	2.15
Endodontics	92	2.02
Prosthodontics	63	1.38
Public Health Dentistry	8	0.18
Oral and Maxillofacial Pathology	5	0.11
Oral and Maxillofacial Radiology	1	0.02
Oral and Maxillofacial Surgery	500	10.99
Periodontics	500	10.99
Total	4,550	100.00

Since some types of dentists may respond at different rates than others, we will use the demographic, geographic, and specialty characteristics of dentists obtained from the ADA's sampling frame to create weighting classes that include groups of dentists with differing response rates. Based on the stratification and sample allocation plan, we will assign a sample weight to each of the 6,500 dentists. Within weighting classes, we will then adjust the sampling weights for unknown eligibility by the factor equal to the ratio of the weight-sum of all sample dentists and the weight-sum of the sample dentists with known eligibility (eligible or ineligible). We will then adjust the weights for non-response. Within weighting classes, we will adjust the unknown eligibility adjusted weights for non-response by the factor equal to the ratio of the weight-sum of all known eligible dentists and the weight sum of all responding eligible dentists. The non-response adjusted weights will be used for all analyses.

Table B.1.4 shows confidence intervals for various domain sizes and distribution proportions assuming a 95 percent significance level and a 1.25 unequal weighting design effect.

Table B.1.4. Confidence Intervals for Various Domain Sizes and Proportions assuming 95 Percent Significance Level and 1.25 Unequal Weighting Design Effect

Distribution Proportion	Number of Responding Dentists in Domain				
	4,550	3,165	1,000	500	100
1%	(0.7%, 1.4%)	(0.7%, 1.5%)	(0.5%, 2.0%)	(0.4%, 2.6%)	(0.1%, 8.6%)
5%	(4.3%, 5.8%)	(4.2%, 5.9%)	(3.7%, 6.7%)	(3.2%, 7.6%)	(1.9%, 12.7%)
10%	(9.1%, 11.0%)	(8.9%, 11.2%)	(8.1%, 12.3%)	(7.4%, 13.4%)	(5.0%, 18.9%)
15%	(13.9%, 16.2%)	(13.7%,16.4%)	(12.7%, 17.6%)	(11.8%,18.9%)	(8.7%, 24.7%)
25%	(23.6%, 26.4%)	(23.4%, 26.7%)	(22.1%, 28.1%)	(21.0%, 29.5%)	(16.6%, 35.7%)
35%	(33.5%, 36.6%)	(33.2%, 36.9%)	(31.8%, 38.4%)	(30.5%, 39.8%)	(25.3%, 46.2%)
50%	(48.4%, 51.6%)	(48.1%, 51.9%)	(46.5%, 53.5%)	(45.1%, 54.9%)	(39.1%, 60.9%)
65%	(63.4%, 66.5%)	(63.1%, 66.8%)	(61.6%, 68.2%)	(60.2%, 69.5%)	(53.8%,74.7%)
75%	(73.6%, 76.4%)	(73.3%, 76.6%)	(71.9%, 77.9%)	(70.5%, 79.0%)	(64.3%, 83.4%
85%	(83.8%, 86.1%)	(83.6%, 86.3%)	(82.4%, 87.3%)	(81.1%, 88.2%)	(75.3%, 91.3%)
90%	(89.0%, 90.9%)	(88.8%, 91.1%)	(87.7%, 91.9%)	(86.6%, 92.6%)	(81.1%, 95.0%)
95%	(94.2%, 95.7%)	(94.1%, 95.8%)	(93.3%, 96.3%)	(92.4%, 96.8%)	(87.3%, 98.1%)
99%	(98.6%, 99.3%)	(98.5%, 99.3%)	(98.0%, 99.5%)	(97.4%, 99.6%)	(91.4%, 99.9%)

Table B.1.5 provides selected comparisons between some likely important domains and shows the size of differences that can be detected with 80 percent power with a two-tailed test at a 95 percent significance level at the maximum variance level for the domains with a dichotomous variable whose value is actually split at 50 percent. Smaller differences will be detected with similar power and level of significance for variables that have less variance.

The table shows the maximum size of the difference between selected subgroups (domains) of dentists that the proposed sample design will have sufficient power to detect at the 95 percent significance level. For example, we will have 80 percent power at a 95 percent significance level to detect differences in a response (expressed as a dichotomous proportion) between General Practice dentists (n = 3,165) and Oral and Maxillofacial surgeons (n = 500) equal to 6.7 percent or smaller. A second example is in the comparison between Oral Surgeons (n = 500) and Periodontists (n = 500) in which we have the power to detect differences as large as 8.8 percent or smaller with 80 percent power at a 95 percent significance level. We will also have 80 percent power at a 95 percent significance level to detect differences in responses (expressed as a dichotomous proportion) between dentists in the South Atlantic region (n = 717) and dentists in the East South Central (n = 234) equal to 10.4 percent or smaller.

Table B.1.5. Maximum Detectable Differences between Selected Domains at 80 Percent Power and 95 Percent Significance Level for a Two-Tailed Test When Actual Item Value is 50 Percent

First Domain		Second Domain		Maximum Detectable Difference When Item Value is 50 Percent
Name	Number of Responding Dentists	Name	Number of Responding Dentists	
General Practice Specialty	3,165	Oral and Maxillofacial Surgery Specialty	500	6.7%
General Practice Specialty	3,165	Orthodontics and Dentofacial Orthopedics	216	9.7%
Oral and Maxillofacial Surgery Specialty	500	Periodontics Specialty	500	8.8%
Oral and Maxillofacial Surgery Specialty	500	Orthodontics and Dentofacial Orthopedics	216	11.2%
Pacific Region	846	Middle Atlantic Region	752	6.9%
Pacific Region	846	West South Central Region	406	8.4%
Pacific Region	846	East South Central	234	10.2%
South Atlantic Region	717	West South Central Region	406	8.6%
South Atlantic Region	717	East South Central	234	10.4%

B2. Procedures for the Collection of Information

RTI is the prime contractor with overall responsibility for this one-time survey that will be mailed to a stratified systematic random sample of 6,500 U.S. dentists chosen from a universe of approximately 160,000 active practicing dentists. Actual sample selection and survey conduct will be performed through a subcontract with the ADA Survey Center. The ADA will mail advance letters **(Attachment C3)** to the sampled dentists explaining the nature and purpose of the study in order to solicit their participation. One week later, a cover letter and questionnaire **(Attachment C4)** will be sent to respondents for self-administration. Thank you/Reminder postcards **(Attachment C6)** will be sent two weeks after the initial mailing to promote participation. A second mailing of a follow-up letter, cover letter and questionnaire **(Attachment C5)** will be sent to non-respondents one month after the reminders are sent. Another round of thank you/reminder postcards will be sent two weeks following the second mailing. Those who have not responded after

three months will receive a telephone call from the ADA Survey Center, utilizing a telephone script **(Attachment C7),** the nature of which will be determined by the response rate. If the response rate is more than 50 percent after the second mailing, the telephone call will serve as another reminder. There is potential for a third mailing of the cover letter and questionnaire if the respondents contacted by telephone do not have a copy of the instrument. If the response rate is less than 50 percent after the second mailing, the respondent will be asked to complete the questionnaire over the telephone. The interviewer will read the questions from the instrument to the respondent and record the answers.

B3. Methods to Maximize Response Rates and Deal with Nonresponse

The ADA Survey Center will execute an initial mailing to all dentists in the sample (members and nonmembers) with a complete and up-to-date address. The ADA updates addresses as it gains new address information from its surveys or members. A follow-up mailing will be conducted with non-respondents after six weeks. Thank you/Reminder postal cards will be sent two weeks following each mailing to increase the response rate. After the second questionnaire mailing, an attempt will be made to contact the remaining non-respondents by telephone. Directory assistance and/or Internet searches will be used to obtain new telephone numbers for those numbers that are found to be incorrect. Depending upon the response rate at that time, those who have not yet responded will be reminded to do so by mail. If the response rate is below 50 percent at the time of the telephone follow-up, the contacted dentists will be asked to provide their answers to the questions over the telephone. We expect to achieve at least a 70 percent overall response rate.

B4. Test of Procedures or Methods to be Undertaken

After receipt of OMB clearance, a small pilot study will be utilized to test the instrument and the planned survey procedures. The pilot study will sample up to nine dentists not included in the larger sample of 6,500. Dental staff members at the CDC and ADA have already completed the questionnaire informally to offer suggestions on the content of the instrument and response categories, and the time needed to complete it. In addition, RTI project staff members have already answered the survey questions to identify and correct inconsistencies and other errors within the questionnaire. The instrument will be subject to further revision based on the results of the pilot study. If non-trivial revisions are necessary, changes to the instrument will be submitted to OMB before the data collection begins to ensure approval.

B5. Individuals Consulted on Statistical Aspects and Individuals Collecting and/or Analyzing Data

CDC: Staff from the Division of Oral Health, National Center for Chronic Disease Prevention and Health Promotion, are responsible for overall CDC monitoring of the project as well as review of all contractor deliverables including the sampling

specifications, survey instrument, letters to the sampled dentists, OMB supporting document, and survey report. Contacts at CDC are:

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Contractor: Staff of the Research Triangle Institute have overall technical responsibility of the implementation of this study. The RTI person responsible for designing the sampling methodology, determining appropriate sample size, developing methods to maximize response rates and to handle non-response issues, and conducting the statistical analysis is Donald R. Akin, M.S.

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The American Dental Association's (ADA's) Survey Center has been engaged through subcontract to be responsible for selecting the sample of dentists, printing and mailing all letters and questionnaires to be sent to the sample of dentists, monitoring the initial mail out and follow-ups to the sample of dentists, monitoring response to the initial mail out and follow-ups, keying and verifying responses to the survey, and supplying a clean electronic data file with ADA standard study variables for the sample attached. The contact persons at the ADA Survey Center are:

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