

Methods: School Health Policies and Programs Study 2006

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ABSTRACT

BACKGROUND: The School Health Policies and Programs Study (SHPPS) 2006 examined 8 components of school health programs: health education, physical education and activity, health services, mental health and social services, nutrition services, healthy and safe school environment, faculty and staff health promotion, and family and community involvement. All 8 components were assessed at the state, district, and school levels. Two components, health education and physical education and activity, also were assessed at the classroom level.

METHODS: Computer-assisted telephone interviews or self-administered mail questionnaires were completed by state education agency personnel in all 50 states plus the District of Columbia and among a nationally representative sample of school districts ($n = 538$). Computer-assisted personal interviews were conducted with personnel in a nationally representative sample of elementary, middle, and high schools ($n = 1103$), with a nationally representative sample of teachers of required health education classes or courses ($n = 912$), and with a nationally representative sample of teachers of required physical education classes or courses ($n = 1194$).

RESULTS: This article provides a detailed description of the development of the questionnaires; sampling; data collection; and data cleaning, weighting, and analysis.

CONCLUSIONS: SHPPS 2006 is the largest and most comprehensive study of school health programs ever conducted. Fielding a study of this magnitude provides many challenges, and several recommendations for future studies emerged from the experience.

Keywords: data collection; interviews; questionnaires; schools; surveys; telephone surveys.

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The School Health Policies and Programs Study (SHPPS) 2006 was conducted by the Division of Adolescent and School Health (DASH), National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention (CDC) through a contract with Macro International Inc. (Calverton, MD). SHPPS 2006 examined 8 components of school health programs: health education, physical education and activity, health services, mental health and social services, nutrition services, healthy and safe school environment, faculty and staff health promotion, and family and community involvement.

SHPPS was previously conducted in 1994 and 2000. All 3 studies share many methodological characteristics. SHPPS 2006, however, introduced the development of questionnaire modules at the district and school levels to facilitate better access to the most knowledgeable respondents, the use of computer-assisted telephone interviewing (CATI) technology at the state and district levels, and the inclusion of new questions on crisis preparedness and response, physical school environment, and school climate.

This article describes how SHPPS 2006 was planned and conducted. Information is provided on the development of the questionnaires; sampling; data collection; and data cleaning, weighting, and analysis. Challenges are identified and recommendations are made for future studies.

DEVELOPMENT OF THE QUESTIONNAIRES

A total of 23 questionnaires were produced for SHPPS 2006. For 5 school health program components—health services, mental health and social services, nutrition services, healthy and safe school environment, and faculty and staff health promotion—3 questionnaires were produced, 1 each for the state, district, and school levels. For 2 components—health education and physical education and activity—4 questionnaires were produced, 1 each for the state, district, school, and classroom levels. Questions on the eighth component—family and community involvement—were integrated into the questionnaires measuring the 7 other school health program components.

In contrast to SHPPS 2000, the state and district questionnaires for 2006 were designed to be administered via CATI technology. As in SHPPS 2000, however, the school and classroom questionnaires were designed to be administered via computer-assisted personal interview (CAPI).

Development of the questionnaires began in summer 2004 and took 12 months to complete. The process began with an item-by-item review of the SHPPS 2000 questionnaires and the data generated by each response option. Content experts at CDC provided input on each questionnaire to ensure the content was

up to date. CDC identified 3 new topics for inclusion in the questionnaires: crisis preparedness and response, physical school environment, and school climate, and a comprehensive literature review was conducted on each. In addition, in September 2004, 3 expert panels were convened—1 for each of these new topics—to identify questions for inclusion. (See Appendix 2 of this issue of the *Journal of School Health*). Results from the expert panels were summarized and used as guides for developing the final questionnaires.

After the revision of existing items and addition of new items, all the draft SHPPS questionnaires were distributed to a nationwide list of reviewers for feedback; these reviewers represented federal agencies, national associations, foundations, and universities. (See Appendix 2 of this issue of the *Journal of School Health*). Their comments were incorporated into the questionnaires.

In parallel with the national review, cognitive interviews were conducted with staff from 7 districts and 6 schools. These cognitive interviews were designed to ensure that new and significantly revised items on all district-, school-, and classroom-level questionnaires were understood as intended. Because the state-level survey was to be a census conducted among a small pool of respondents, cognitive interviews were not conducted with state-level respondents to avoid biasing their eventual responses. After each questionnaire item was administered to district and school staff, follow-up questions were asked to ascertain the respondents' understanding of the item and/or the response options. Based on the cognitive interviews, the questionnaires were revised further.

After the items were finalized, each questionnaire was examined to determine whether it should be divided into modules. A questionnaire was modularized if it took longer than 20-30 minutes to complete or covered such a wide range of topics that a single respondent might not have sufficient knowledge to complete it. Modules were based on content to ensure that normally only 1 respondent would be needed to complete a specific module. Modularization required the reordering of some questionnaires to allow related questions to be grouped. Three district-level questionnaires (health education, physical education and activity, and healthy and safe school environment) and 3 school-level questionnaires (physical education and activity, health services, and healthy and safe school environment) were modularized (Tables 1 and 2); no state- or classroom-level questionnaires were modularized.

The purpose, intended respondents, and method of data collection for all state-, district-, school-, and classroom-level questionnaires are summarized in Table 3. The specific content of the questionnaires is described in more detail in other articles in this issue of the *Journal of School Health*. To obtain a copy of

Table 1. District-Level Questionnaire Modules, SHPPS 2006

Component	Module Content
Health education	Module 1—standards and guidelines Module 2—elementary school instruction Module 3—middle or junior high school instruction Module 4—senior high school instruction Module 5—staffing and staff development, collaboration, promotion, evaluation, and health education coordinator
Physical education and activity	Module 1—standards and guidelines Module 2—elementary school instruction Module 3—middle or junior high school instruction Module 4—senior high school instruction Module 5—students with disabilities, use of protective gear, physical activity and discipline, staffing and staff development, collaboration, promotion, evaluation, interscholastic sports coaches, and physical education coordinator
Healthy and safe school environment	Module 1—district configuration, general school environment, violence prevention, tobacco-use prevention, alcohol-use prevention, illegal drug-use prevention, and injury prevention and safety Module 2—physical school environment Module 3—crisis preparedness, response, and recovery Module 4—school climate, foods and beverages sold outside of the school meal program, and district assistance to schools

Table 2. School-Level Questionnaire Modules, SHPPS 2006

Component	Module Content
Physical education and activity	Module 1—standards, guidelines, and objectives; required physical education; instructional content; student assessment; use of protective gear; physical activity and discipline; students with disabilities; facilities; staffing and staff development; collaboration and promotion; intramural activities and physical activity clubs; community use of school facilities; and physical education coordinator Module 2—interscholastic sports
Health services	Module 1—student health records, required immunizations, tuberculosis testing, procedures for student medication, approach to students or staff with HIV or AIDS, Medicaid, school-based health centers, promotion, and screening Module 2—school nurse staffing and collaboration, educational requirements, and other health services staffing and collaboration Module 3—facilities and equipment, standard precautions, injury reports, illness reports, health services provision, other services, services at other sites, and health services coordinator
Healthy and safe school environment	Module 1—general school environment, violence prevention, tobacco-use prevention, alcohol-use prevention, illegal drug-use prevention, and injury prevention and safety Module 2—physical school environment Module 3—crisis preparedness, response, and recovery; school climate; physical activity; foods and beverages sold outside of the school meal program; and school health councils

the SHPPS 2006 questionnaires, visit the SHPPS Web site at www.cdc.gov/shpps.

SAMPLING

Education agencies for all 50 states and the District of Columbia (considered a state for the purposes of this study) were invited to participate in SHPPS 2006, and thus, no sampling was needed at the state level. Nationally representative samples of public school districts, public and private schools, and classes or courses covering required health instruction or physical education were selected.

Sampling Frame

The sampling frame used for district and school sampling was compiled from district and school files obtained from Quality Education Data (QED).¹ The National Center for Education Statistics' Common Core of Data² and the Private School Universe

Survey³ were used to obtain data on grade composition and enrollment and to confirm the QED information.

Initially, eligible districts were defined as all local education agencies in the frame. These included regional supervisory unions in places where local school boards provided only funding and limited guidance on curriculum. Eligible schools were defined as all public schools, Catholic schools, and other private schools. For sampling purposes, Catholic and other private schools not represented by a district were assigned to the public school district in which they were physically located.

Data at the ZIP code level from Census Summary File 3⁴ were used to divide districts equally into 4 strata based on 2 levels of urbanicity (rural or urban) and 2 levels of socioeconomic status (high or low poverty). To ensure that the division was equal, cut-offs at the median were used. Thus, if the percentage of the rural population in a ZIP code exceeded the median percentage rural for all ZIP codes, then the

Table 3. Questionnaire Purpose, Intended Respondents, and Data Collection Method, by Level, SHPPS 2006

	State	District	School	Classroom
Purpose	To describe state-level policies and programs specific to the school health program component, with an emphasis on policy	To describe district-level policies and programs specific to the school health program component, with an emphasis on policy	To describe school-level policies and programs specific to the school health program component, with an emphasis on practices	To describe instructional content and teaching practices used in teaching required health instruction and physical education
Intended respondents	State-level person responsible for (or most knowledgeable about) the component (eg, the state physical education coordinator)	District-level person responsible for (or most knowledgeable about) the component (eg, the superintendent)	School-level person responsible for (or most knowledgeable about) the component (eg, the school nurse)	Teachers who provided required health instruction and physical education within an elementary school class or middle school or high school course
Data collection method	CATI with paper questionnaire follow-up	CATI with paper questionnaire follow-up	CAPI	CAPI

CAPI, computer-assisted personal interview; CATI, computer-assisted telephone interview.

ZIP code was considered rural, and all other ZIP codes were considered urban. Similarly, if the percentage of the population living below the federal poverty guideline level in a ZIP code exceeded the median percentage living below the poverty level for all ZIP codes, the ZIP code was considered high poverty; all other ZIP codes were considered low poverty. Each district in a ZIP code was assigned to the same stratum.

After each ZIP code was assigned to a stratum, ZIP codes sharing the same stratum were combined into geographically compact primary sampling units (PSUs). PSUs were required to meet both minimum and maximum size limitations to ensure that the requirements for an equal probability sample were met and to minimize the impact of PSUs that were selected with certainty on weighting and variance estimation. A total of 5520 PSUs were created containing 13,694 districts and 98,831 schools.

District Sample

The district sample was selected in 1 stage through the sampling of PSUs. PSUs were sampled with equal probability, with the probability of selection for each 1 calculated as the number of PSUs selected from its stratum divided by the total number of PSUs in that stratum. The district sample was defined as all districts in the sampled PSUs. The probability of selection for a school district was the same as the probability of selection for its PSU. The only exception to this was for the 24 districts funded by CDC/DASH, which were pulled out to form their own stratum and were selected with certainty or a probability of 1.0, before the sampling of any PSUs. In total, 312 PSUs were sampled containing 820 districts (including the 24 districts selected with certainty).

Before and during recruitment, some sampled districts were determined to be ineligible because they

were no longer in operation, served no students, served only special education students, were too small to represent the district as a separate entity from the school, or served only vocational education students who received primary education services from schools in other districts. Most of these districts were replaced with districts from a neighboring PSU within the same stratum.

School Sample

All schools were categorized according to type, level, and enrollment size, and then assigned to 1 of 12 strata based on these categories. Type was defined as either public or nonpublic. Level was defined as elementary school, middle school, or high school using a 2-step process. First, all grades in each school were identified and used to assign the school to at least 1 “core” level (among the 3 levels described). A school was assigned to the “core” elementary school level if it contained any of grades kindergarten (K) through 4, the “core” middle school level if it contained grades 7 or 8, and the “core” high school level if it contained grades 10, 11, or 12.

After a “core” level or levels were assigned to each school, the remaining grades were examined. If a school had been assigned to the “core” elementary school level and also contained grades 5 and/or 6, it remained assigned to the elementary school level and was represented once in the sampling frame. Similarly, if a school had been assigned to the “core” middle school level and also contained any of grades 5, 6, or 9, the school remained assigned to the middle school level and was represented once in the sampling frame. If a school had been assigned to the “core” high school level and also contained grade 9, the school remained assigned to the high school level and was represented once in the sampling frame. When more than 1 “core” level had

been assigned to a school, the remaining grades were split among the assigned "core" levels and the school was represented in the sampling frame according to the number of "core" levels contained in the school. For example, if a school contained grades K-8, grade 5 was assigned to the elementary school level and grade 6 was assigned to the middle school level, and the school was represented twice in the sampling frame, once as an elementary school and once as a middle school.

Enrollment size was defined as small or large. If the enrollment of a school exceeded the median enrollment of all schools in its school level, the school was considered large. All other schools were considered small.

The school sample was selected in 2 stages. In the first stage, a subsample of PSUs was selected from the PSUs selected for the district sample. This subsample was drawn using systematic sampling with the probability of selection proportional to size. The measure of size was based on the sampling rate for selecting schools and the number of schools in each stratum.

In the second stage, schools were selected with stratified random sampling within each of the subsampled PSUs. To do this, each school was assigned to 1 of 6 strata formed by combining the school-level and school-size categories. Then, within each of the 6 strata, schools were allocated to the school-type classification and selected in proportion to their representation in the school frame. An approximately equal number of schools were selected per PSU. In total, 1458 schools were sampled.

Because schools could be represented in the sampling frame more than once (based on school-level assignment), they could be sampled more than once. When this occurred, 1 school level was sampled with equal probability to participate in the study. This reduced respondent burden, thereby increasing the likelihood that the school would agree to participate.

Before and during recruitment, some sampled schools were determined to be ineligible because they contained only pre-K grades or postsecondary school grades, were alternative schools, provided services only to students who received primary services in another eligible school, provided services primarily to special education students, or were operated by the US Department of Defense or Bureau of Indian Affairs. To minimize distortions in the selection probabilities, these schools usually were replaced by schools from the same PSU.

Classroom Sample

Classroom sampling was required for only 2 components: health education and physical education and activity. Elementary schools generally have a class structure based on grade, whereas middle schools and high schools have a course structure.

This means that in elementary schools required instruction on health topics and required physical education usually occurs as part of the curriculum for each (or a particular) grade, not as separate courses of study (even if these subjects are taught by a specialist and not the regular classroom teacher). In contrast, required instruction on health topics and required physical education are offered as separate courses of study in middle schools and high schools. Consequently, different sampling methods were used to select the classroom samples in elementary schools and in middle and high schools.

During recruitment of elementary schools, the school contact identified the grades in which required instruction on health topics or required physical education was taught. When 1 or 2 grades were identified, all were considered eligible. When 3 or more grades were identified, 2 grades were sampled with equal probability. Then, all the teachers or specialists who provided required instruction on health topics or required physical education in those grades were identified and 1 teacher or specialist from each grade was sampled with equal probability. Usually, this meant that the regular classroom teacher served as the respondent for the health education component and a physical education specialist served as a respondent for the physical education and activity component.

During recruitment of middle schools and high schools, the school contact identified all required health education courses and physical education courses. All were considered eligible for sampling. For each required course, 1 teacher was selected with equal probability. Then, 1 section of this course taught by this teacher was selected with equal probability to be the focus of the classroom-level health education or physical education and activity interview. In total, 967 elementary school classes and middle school and high school courses were sampled for the health education component, and 1260 were sampled for the physical education and activity component.

Response Rates

Response rates for SHPPS 2006 were calculated for each of the 4 study levels: state, district, school, and classroom (Table 4). Among the 820 districts sampled, 6 districts were deemed ineligible before the start of data collection and were replaced. An additional 98 were deemed ineligible after the start of data collection and were not replaced. Among the remaining 722 districts, 74.5% ($n = 538$) completed at least 1 module of 1 district-level questionnaire. Districts had varying degrees of participation by module and component (Table 5). Districts also could be deemed ineligible for a module or component if they did not provide that particular service (eg, no school nutrition services program).

Table 4. Response Rates, SHPPS 2006

	Number of Eligible Agencies or Staff	Number of Responding Agencies of Staff*	% of Responding Agencies or Staff
State	51	51	100.0
District	722	538	74.5
School	1416	1103	77.9
Classroom health education	967	912	94.3
Classroom physical education	1260	1194	94.8

*Completed at least 1 questionnaire module.

Among the 1458 schools sampled, 64 were deemed ineligible before the start of data collection and were replaced. An additional 42 were deemed ineligible after the start of data collection and were not replaced. Among the remaining 1416 schools, 77.9% (n = 1103) completed at least 1 module of 1 school-level questionnaire. As at the district level, schools had varying degrees of participation by module and component (Table 6).

Among the 967 elementary school classes and middle school and high school courses sampled for the health education component, 94.3% (n = 912) completed the questionnaire. Among the 1260 classes or courses sampled for the physical education and activity component, 94.8% (n = 1194) completed the questionnaire.

DATA COLLECTION

Recruitment of States, Districts, and Schools

In June 2005, the recruitment of states began with a request for a letter of support from every state education agency and/or state department of health. States also were asked to provide a list of respondents for each state-level questionnaire. Recruitment of districts and schools began in September 2005. District-level recruitment involved seeking the district's approval for the study, identifying the respondent for each of the district-level questionnaires and modules, identifying questionnaires and modules not applicable to the district, and seeking the district's approval to contact selected schools (if any) within the district about their participation. School-level recruitment involved seeking the school's approval for the study; identifying the respondent for each of the school-level questionnaires and modules and classroom-level questionnaires; identifying questionnaires and modules not applicable to the school; scheduling a date for data collection; and developing an interview schedule that minimized burden on school staff, avoided disruption of regular school schedules, and maximized the efficiency of each data collector's time.

Data Collection at the State and District Levels

State- and district-level contacts identified respondents for each component and module of the questionnaires. Their contact information was forwarded

Table 5. Summary of District-Level Participation, SHPPS 2006

Module	Number of Eligible Districts	Number of Ineligible Districts	Number of Responding Districts	% of Responding Districts
Health education—overall	720*		459 [†]	63.8
Health education module 1	720	2	404	56.1
Health education module 2	697	25	393	56.4
Health education module 3	695	27	364	52.4
Health education module 4	663	59	326	49.2
Health education module 5	720	2	402	55.8
Physical education and activity—overall	720*		453 [†]	62.9
Physical education and activity—module 1	720	2	395	54.9
Physical education and activity—module 2	703	19	410	58.3
Physical education and activity—module 3	698	24	377	54.0
Physical education and activity—module 4	664	58	329	49.5
Physical education and activity—module 5	719	3	386	53.7
Health services	710	12	449	63.2
Mental health and social services	702	20	445	63.4
Nutrition services	705	17	455	64.5
School policy and environment—overall	720*		461 [†]	64.0
Healthy and safe school environment—module 1	720	2	425	59.0
Healthy and safe school environment—module 2	720	2	424	58.9
Healthy and safe school environment—module 3	720	2	424	58.9
Healthy and safe school environment—module 4	720	2	417	57.9
Faculty and staff health promotion	715	7	461	64.5

*Number of districts eligible to complete at least 1 module in that component.

[†]Number of districts that completed at least 1 module in that component.

Table 6. Summary of School-Level Participation, SHPPS 2006

Module	Number of Eligible Schools	Number of Ineligible Schools	Number of Responding Schools	% of Responding Schools
Health education	1338	78	920	68.8
Physical education and activity—overall	1394*		998 [†]	71.6
Physical education and activity—module 1	1394	22	984	70.6
Physical education and activity—module 2	1037	379	646	62.3
Health services	1397*		1029 [†]	73.7
Health services—module 1	1397	19	1,020	73.0
Health services—module 2	1282	134	906	70.7
Health services—module 3	1304	112	926	71.0
Mental health and social services	1315	101	873	66.4
Nutrition services	1338	78	944	70.6
Healthy and safe school environment—overall	1416*		1025 [†]	72.4
Healthy and safe school environment—module 1	1416	0	1013	71.5
Healthy and safe school environment—module 2	1415	1	992	70.1
Healthy and safe school environment—module 3	1416	0	1003	70.8
Faculty and staff health promotion	1282	134	849	66.2

*Number of schools eligible to complete at least 1 module in that component.

[†]Number of schools that completed at least 1 module in that component.

to a call center staffed with trained interviewers. One week before interviewers called the respondents to schedule and conduct telephone interviews, the respondents were sent a letter of invitation and packet of study-related materials. The letters informed recipients they had been identified as the person best able to answer questions about policies and programs in their state or district on 1 or more of the school health program components examined in SHPPS. The packet included information about how to contact the call center to complete the interview(s), a study fact sheet, outlines of the topics that would be asked about during the interview(s), a consent document, and a copy of the relevant questionnaire(s). Respondents were told that the questionnaire(s) could be used in preparation for their telephone interview or completed and returned if self-administration was preferred.

Telephone interviews with state- and district-level respondents began in January 2006. In April 2006, telephone interviewing ceased, and most of the remaining state- and district-level data collection occurred via a mail survey because of the challenges faced in reaching respondents and the respondents' requests to self-administer the questionnaires. All remaining respondents were mailed paper questionnaires and return envelopes; however, interviewers remained available for any respondents who chose to contact the call center. Recruiters followed up with respondents by telephone to ensure the questionnaires were received and to answer questions.

At the end of the data collection period (October 2006), 84.3% of the completed state-level questionnaires were completed via telephone interviews and 15.7% as paper questionnaires. At the district level, 61.2% of the completed questionnaires had at least 1 module completed via telephone and 78.4% had at least 1 module done as a paper questionnaire.

Data Collection at the School and Classroom Levels

Between February and May 2006, trained interviewers visited each school and conducted school- and classroom-level interviews via CAPI technology. Occasionally, all scheduled interviews could not be conducted when a data collector was visiting a school. In these cases, a data collector usually was sent back to the school to complete the data collection. In the few situations where this was not possible, a paper questionnaire was sent directly to the school- or classroom-level respondent along with a return envelope. In addition, for 34 schools not able to successfully schedule on-site data collection, questionnaires were mailed to the principal or contact person asking them to complete as many as possible. At the school level, less than 3% of questionnaires were completed on paper.

DATA CLEANING, WEIGHTING, AND ANALYSIS

The CATI and CAPI data collection systems contained built-in edit checks to limit out-of-range or invalid entries. Upon completion of data collection, the individual variables, skip patterns, and overall contents of each record were thoroughly examined for each dataset. This examination was particularly necessary at the state and district levels because of the number of records generated from paper questionnaires and manually entered into the CATI system. At the school and classroom levels, this was necessary because the CAPI system allowed interviewers to override potential data errors. Each record was reviewed, and errors were corrected (if possible) based on other data in the same record. If it was not clear what the correct answer should be, the variable in question, but not the entire record, was deleted. Therefore, denominators for each estimate vary slightly.

Weighting

State-level estimates are based on a census and are not weighted. District-, school-, and classroom-level data are based on representative samples and are weighted to produce national estimates.

District Weights. The base district weight, or sampling weight, was computed as the inverse of the selection probability. Base district weights were adjusted for nonresponse using a simple ratio adjustment based on sums of weights. The weight adjustment classes were the 4 strata defined by urbanicity and socioeconomic status plus the extra stratum composed of the DASH-funded districts selected with certainty.

Because districts responded to 1 or more of the 7 questionnaires representing 1 of 7 school health program components (eg, health education), each component had an independent response status. Therefore, the adjustment for nonresponse was calculated separately by component. In addition to the 7 component-specific weights, an overall weight was computed across components for use in analyses that merged data from 2 or more components.

The district weights were trimmed to reduce the variation in weights that can lead to inflated variances. The adjusted weights were trimmed at the 95th percentile, with trimmed weights spread across the remaining cases in the adjusting class. Trimming was performed independently within each nonresponse adjustment class and for each component. As a final step, the trimmed district weights were poststratified to control totals. Poststratum cells coincided with the 4 first-stage strata defined by urbanicity and socioeconomic status. A ratio adjustment was used, computed within strata. Note that although the weights for each component were poststratified independently, they shared a common set of control totals.

School Weights. The base school weight was computed as the inverse of the selection probability defined as the product of 3 factors: the original probability of selection of the PSU, the combined probability of selection of the subsample of PSUs and schools, and the probability of selection of a school level when a school was assigned to more than 1 "core" level.

Base school weights were adjusted for nonresponse using a simple ratio adjustment based on sums of weights. The weight adjustment classes were defined using a propensity-weighting method. With this method, the probability that a given school would participate is modeled as a function of school characteristics using logistic regression; then, the predicted response probability is used to define adjustment classes homogeneous in response probabilities. For the logistic regression model of response probability, predictors included district- and school-level strata and census region. The nonresponse adjustment was calculated separately by component,

and 1 overall adjustment was calculated for cross-component analyses. Therefore, the logistic regression model was fitted individually for each component.

The school weights were trimmed to reduce the variation in weights that can lead to inflated variances. As a final step, the trimmed school weights were poststratified to control totals obtained from the sampling frame.

Classroom Weights. Two classroom weights were computed. The first, a school-level classroom weight, was created for aggregate estimates of classroom characteristics at the school level. The second, a course-level classroom weight, was created for estimating course-level characteristics directly.

The base weight for the school-level classroom weight was computed as the inverse of the school selection probability. This weight was then adjusted for nonresponse at the grade or course level for each component. A school was considered to be responding if a response was provided for any grade or course in that school.

The base weight for the course-level classroom weight was computed as the school weight adjusted for nonresponse as described above, multiplied by a weight factor that accounted for both selection and nonresponse at the grade or course level. The weight factor was computed as the ratio of required grades or courses present in a school to the number of responding grades or courses in a school. This weight factor is mathematically equivalent to the selection probability for the grade or course multiplied by a within-school, nonresponse adjustment at the grade or course level.

Both classroom base weights were trimmed at the 95th percentile, with trimmed weights spread across the remaining cases for each component. As a final step, the school component of each classroom weight was adjusted to counts of eligible schools via a simple component-level ratio adjustment based on sums of weights. This poststratification step ensured consistency between estimates based on school-level classroom weights and estimates based on school weights. As no control totals exist for schools that may not qualify for the classroom-level data collection (eg, offer no required physical education classes), the overall school population figures were adjusted on the basis of eligibility rates.

Analysis

Variances were estimated using generalized linearized variance estimators. This method of computing variances takes into account the complex nature of the sampling design. SUDAAN⁵ was used to compute standard errors for key variables for each of the 16 district-, school-, and classroom-level questionnaires. Shown in Appendix 1 of this issue of the *Journal of*

School Health are the estimated standard errors associated with observed estimates for each of the 16 questionnaires. Approximate standard errors for any estimate can be obtained by either (a) locating on the appropriate figure the intersection of the x- and y-axes on the predicted value line or (b) inserting the estimate of interest into the estimated regression equation shown on each figure for the appropriate questionnaire.

To analyze changes between SHPPS 2000 and SHPPS 2006, many variables from SHPPS 2000 were recalculated so that the denominators used for both years of data were defined identically. In most cases, this denominator included all states, districts, schools, or classrooms, rather than a subset of states, districts, schools, or classrooms. As a result of this recalculation, percentages previously reported for SHPPS 2000 might differ from those reported in this issue of the *Journal of School Health*. Only estimates from 2000 and 2006 based on this same denominator should be compared.

Because state-level data are based on a census, statistical tests for differences between 2000 and 2006 are not appropriate. Therefore, this issue of the *Journal of School Health* highlights changes over time meeting at least 1 of 2 criteria: (1) the difference was greater than 10 percentage points or (2) the 2006 estimate increased by at least a factor of 2 or decreased by at least half as compared with the 2000 estimate. At the district, school, and classroom levels, *t* tests were used to compare prevalence estimates for SHPPS 2000 and SHPPS 2006. However, to account for multiple comparisons, this issue of the *Journal of School Health* only highlights changes over time meeting at least 2 of 3 criteria: (1) a *p* value less than .01 from the *t* test, (2) a difference greater than 10 percentage points, or (3) the 2006 estimate increased by at least a factor of 2 or decreased by at least half as compared with the 2000 estimate. A *p* value less than .01 was used as the sole criterion for reporting on statistically significant differences based on means and medians between 2000 and 2006. Note that not all variables meeting these criteria are presented.

DISCUSSION

The design of SHPPS 2006 was based very closely on the design for SHPPS 2000. One significant change was the migration from self-administered state- and district-level paper questionnaires to CATI interviews. While it was anticipated that this change would enhance state- and district-level data collection by reducing the burden on respondents, many respondents ultimately completed a self-administered paper questionnaire. Throughout the course of state- and district-level data collection, many respondents stated they actually preferred to complete the ques-

tionnaires on paper. The paper questionnaires allowed them to complete the questions over time, rather than all at once, and they also allowed respondents to consult with colleagues more readily, if necessary. In addition, many respondents said that to prepare for the interview, they had to complete the paper questionnaire anyway, and thus, it was more efficient to send that in and forgo the additional burden of a CATI interview. Given the outcome of the state- and district-level data collection for SHPPS 2006, the next SHPPS might offer state- and district-level respondents the option of completing the questionnaires either on paper or via Web-based administration. This type of mixed-mode administration would provide the most flexibility to respondents and might reduce the level of effort required to obtain sufficient response rates.

The length of the questionnaires also needs to be considered. While every effort was made to ask only the most essential questions in SHPPS 2006, some modules required as much as 50 minutes to complete, particularly if the respondent had a comprehensive program to describe. This may just be too much time to ask of respondents who have multiple and competing demands on their daily schedule. In contrast, SHPPS clearly has become the primary source of data on school health programs nationwide, and more and more agencies and organizations depend on SHPPS to generate data critical for program planning, evaluation, monitoring, and advocacy. While 1 of the original goals of SHPPS was to minimize the number of surveys that states, districts, and schools are asked to complete on various aspects of their school health programs and policies, it is also possible that there are limits to how much 1 survey can successfully measure.

While SHPPS 2006 had the largest district- and school-level samples of any SHPPS study, further increases in sample size, particularly at the school level, should be considered. Doing so would allow more analyses by school level, school type, school size, urbanicity, socioeconomic status, and other demographic variables of interest to policy makers. It is also important, however, to balance increased precision and analytic possibilities with the increases in resources that would be required. SHPPS is already a costly study and it is important that its costs do not exceed its benefits to the field of school health.

To date, SHPPS has been conducted every 6 years since 1994, and current plans are to conduct the next SHPPS in 2012. While educational institutions are more likely to change at an evolutionary than a revolutionary pace, significant events such as passage of No Child Left Behind⁶ or the 2004 Child Nutrition and WIC Reauthorization Act⁷ (ie, school wellness policies), the obesity epidemic, and terrorism and violence can bring fairly rapid change to

our nation's schools. If SHPPS were conducted more often, it might be able to provide better baseline data and subsequent updates on the educational response to the most important issues facing our society.

As with previous versions of SHPPS, SHPPS 2006 is subject to limitations. First, respondents were asked only to report whether certain policies existed or programs or services were provided. Data were not always collected on the quality of these policies, programs, or services. It is possible, therefore, that a policy could exist but not reflect best practices, or a program or service could be "provided" but not accessible to all students or of poor quality.

In addition, as with any study that relies on self-report, it is possible that the data reflect some amount of overreporting or underreporting and actual lack of knowledge. For example, a content analysis of written policies may have resulted in different findings because self-report relies on both the knowledge of the respondents and their interpretation of existing policies. A study of the reliability and validity of the SHPPS 2000 questionnaires found that "although the correspondence between survey questions and policies generally was good, several threats to validity were identified. For example, ... respondents had to determine if specific policies fit within more general survey questions."⁸ Ambiguities are inherent to any discussion of policy and practice. The wording of a particular policy may not have corresponded directly to questions on the SHPPS questionnaires and would, therefore, have been subject to the respondent's interpretation.

In addition, for all SHPPS 2006 questionnaires, "policy" was defined as "any law, rule, regulation, administrative order, or similar kind of mandate issued by the state board of education, state legislature, or other state agency with authority over schools." However, for some respondents, actions dictated by federal or state law might not have been considered "policy" per se. In the SHPPS 2000 study of reliability and validity,⁸ 10-15% of respondents reported difficulty understanding and applying the

definition of policy. The most common problem respondents had was the inappropriate consideration of federal laws when reporting on state policy and the consideration of federal and state laws when reporting on district policy.

Content analysis of actual policy, observation of actual practice, and environmental sampling may appear to be obvious solutions to problems of interpretation and reporting. These methodologies are extremely costly, however, particularly when conducted as part of a study of the size of SHPPS, and they may themselves be subject to unmeasurable bias and inaccuracies. More methodological studies examining how best to measure complex policies and programs as well as studies to understand better how to improve response rates are warranted and will only enhance the quality of future SHPPS.

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