

ECSPANSE



ENUMERATION OF CHILD STATE-LEVEL PHYSICAL ACTIVITY & NUTRITION SURVEILLANCE EFFORTS

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EXECUTIVE SUMMARY

Public health practitioners seeking to control the epidemic of obesity, physical inactivity, and unhealthful eating and dieting behavior among U.S. children often lack complete and systematic data on behaviors and attitudes among youth. The research project described in this report was conducted in response to CDC PERT #01-009ccd. The project had four main goals: 1) To enumerate and evaluate all current survey activities and surveillance systems gathering data on individual behaviors and attitudes related to nutrition, physical activity, sedentary behavior, and weight status among school-age children being conducted by state departments of health and education; 2) To enumerate and evaluate all relevant instruments and methodologies from the published literature that pertain to surveys of behaviors and attitudes related to nutrition, physical activity, sedentary behavior, and weight status among school-age children ; 3) To summarize and integrate the information from goals 1 and 2 and to provide the CDC with a set of recommendations that could be used to evaluate and improve surveillance at the state and national levels; and 4) To disseminate a summary of the information to state health and education departments and other stakeholders. The overarching objective was to provide information that would be useful in assessing gaps in data collection that could inform expand and strengthen state-based surveillance systems. In addition to providing a detailed description of methods used and results of state surveys, state interviews, and published literature findings, the report includes several detailed compendiums. For the state surveys these compendiums make it possible to look up: what specific states are doing in this area, which surveys cover which specific sub-topics, and how surveys are administered. For the published literature, the compendium include a bibliography of abstracted articles, details on administration and pre-testing by abstracted article, an index by survey with information on reported reliability/validity, and an index of surveys used in the published literature by topic area/domain and by specific sub-topics of interest. The full report including compendiums will be available at <http://go.tufts.edu/ecpanse>.

Key personnel at the state departments of health and education were contacted. Ninety-five percent of relevant surveys of school age youth, other than the YRBS, were obtained. Telephone interviews were conducted to collect detailed information on the surveys identified. Relevant surveys reported in the published literature between 1997-2002 (inclusive) were identified using a search strategy of the major health-related databases; this strategy was developed in conjunction with a library specialist. An author on each relevant article was asked to provide copies of relevant surveys. Additional information on the surveys reported in the published literature was obtained from the articles themselves. All surveys were abstracted by 2 members of the research team using a survey abstraction form developed for this project. The project's scope was such that information regarding knowledge in the topic areas of interest was not collected unless it was coincident with other information; dietary assessment instruments were also not included.

State interviews were conducted with at least one person in all 50 states; in 47 states at least one respondent from each the Department of Health and Education was

interviewed. Of the 165 surveys identified by state respondents, 46 (28%) were surveys other than the Youth Risk Behavior Surveillance System (YRBS) that were related to the topics of interest (i.e., attitudes and behaviors related to nutrition, weight status, physical activity or sedentary behavior). Of the 45 main surveys abstracted (1 was not sent to us), 37 surveys covered nutrition, 37 surveys covered physical activity, 28 surveys covered sedentary behavior, and 18 surveys covered weight status. Of the relevant surveys identified, surveys were most frequently administered in grades 6, 8, and 11. The least frequently surveyed grades were the early elementary grades of K-3, which were covered by only 7-19% of surveys. Most (87% of surveys) were self-administered paper surveys, and were administered statewide (82% of surveys), although only 35% were administered annually or every other year; 33% had only been used once. Based on our telephone interviews with key informants in state departments of public health and education, many benefits of surveillance in these topic areas were noted. In particular, the ability to obtain baseline data and to design programs or interventions was reported by 60% and 45% of respondents, respectively. Other frequently reported benefits were using data to track trends, to compare regional and national data, to monitor and evaluate programs, and to advocate for change. A number of important barriers to surveillance were also identified: competing demands in schools (45% of respondents) and gaining access to schools (33% of respondents). Other barriers frequently noted were state agency resource constraints (30%), survey content and length (27%), student-specific barriers to obtaining accurate data (23%), and other constraints affecting accuracy of the data (23%).

Excluding the YRBS, thirty-three states covered at least one of the four topic areas. Nine covered at least one domain from every area. An assessment of state coverage of these topic areas indicated that nutrition topics were queried most frequently by states followed by physical activity, and sedentary behavior. With the exception of weight status for which attitudes/perceptions was the most frequently queried domain (45% of states), behavior was the most frequently queried domain for nutrition (85% of states) physical activity (85% of states), and sedentary behavior (67% of states). A modest number of states also assessed nutrition knowledge (39% of states), nutrition attitudes/perceptions (42% of states) and weight status attitudes/perceptions (45% of states).

In the domain of nutrition behavior, the most frequently queried sub-topics were consumption of specific foods (67% of abstracted surveys) and breakfast (46% of abstracted surveys). In the domain of nutrition attitudes/perceptions, children's food preference was the most commonly queried sub-topic; 16% of abstracted surveys included at least one question on this sub-topic. The most commonly surveyed sub-topic in the physical activity topic area was participation in sports and physically active hobbies. Other frequently queried topics were participation in school physical education (40% of surveys) and participation in physical activity that caused sweating and hard breathing (51% of surveys). In the topic area of sedentary behavior, the most frequently queried category was TV watching, specifically duration of TV watching (60% of surveys). The second and third most frequently queried categories were computer duration and video game duration; 23% and 21%, respectively. In the area of weight status attitudes/perceptions the most frequently queried topics were self-perception of

body weight status (28% of surveys) and weight satisfaction (38% of surveys). In the domain of weight status behavior there was an almost exclusive focus on weight control and disordered eating behaviors, 24% and 26% of surveys, respectively.

With respect to the published literature, we abstracted 130 articles that described the administration of a survey which contained the relevant topic areas and domains of behavior and attitudes/perceptions. From the 130 identified articles, we obtained 123 survey instruments, including multiple instruments reported in a single study, as well as several instruments that were identified in multiple articles. Among those articles that reported racial make-up, 68.5% were predominantly Caucasian samples and 12.6% were samples of a single non-Caucasian racial/ethnic group; 60% were targeted to a population in a specific region, 11% were statewide, 5% were multi-state, 13% were national in scope, and for 11% the locale was not reported. Elementary/middle school and middle/high school were the most commonly covered grade categories, accounting for 70% of the surveys reported in the published literature.

Overall, 41 surveys included items on nutrition, 61 surveys included items on physical activity, 14 surveys included items on sedentary behavior, and 39 surveys included items on weight status. Of the four topic areas and two domains systematically evaluated, physical activity behavior was the most frequently covered while sedentary behavior was the least frequently studied and reported upon. Furthermore, there were no surveys identified that covered attitudes and perceptions toward sedentary behavior. Overall, the domain of behavior was more frequently studied than the domain of attitudes and perceptions. Weight status was most frequently queried in the domain of attitudes/perceptions, whereas physical activity was the most commonly assessed area in the domain of behavior. Most surveys covered more than one topic area. The body of the report includes detailed information regarding the specific sub-topics covered in each topic area.

Our evaluation of validity and reliability of surveys reported in the literature was hampered by difficulties in establishing individual survey instruments and variability in how this information was reported. Overall, validity and reliability was often not reported, or reported superficially. Similar constraints existed for state surveys. This area needs to be strengthened in order to improve our confidence that survey instruments measure what they purport to measure.

In conclusion, despite a fair amount of activity at the state level in nutrition, physical activity, sedentary behavior and weight status, important gaps were identified. Early elementary school children, grades 1-3 are under-studied. Given that the extent of surveillance activities were quite variable from state to state, states with more comprehensive activities could serve as models nationally. The published literature was also identified as an extremely useful knowledge base from which to draw survey instruments as well as sampling strategies. Sedentary behavior, in particular, represents an important area of expansion for state surveys and the published literature is a rich source of survey items and methodologies. The apparent limited validation and reliability testing of surveys represents an area in need of improvement. CDC might serve as a

clearinghouse for researchers and state governments; making parts of this report available may provide a starting point in state personnel and researchers' access to information on surveys that have been validated.

State-level personnel are well aware of the tremendous benefits of surveillance in these areas. They also raised a number of realistic cautions: access to schools, issues of confidentiality, resource constraints, and the like. Since the contract to support this effort was awarded there has been an explosion of interest in obesity, with a particular focus on children, as a vulnerable and particularly impressionable group. National leadership, and the essential support of the CDC, could substantially expand state surveillance in the areas of nutrition, physical activity, sedentary behavior and weight status.

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A. INTRODUCTION

Public health practitioners seeking to control the epidemic of obesity, physical inactivity, and unhealthful eating and dieting behavior among U.S. children often lack complete and systematic data on behaviors and attitudes among youth. A focus on behaviors and attitudes is important because it has been shown that interventions grounded in behavioral theory are more likely to be effective. As such, a sound understanding of pre-behavioral determinants, such as knowledge, beliefs, and attitudes, is essential. State-based surveillance of these factors is a critical component of efforts to reverse current trends and to target state resources to problem areas. Understanding where individuals are positioned in terms of attitudes and perceptions will aid in tailoring programs and interventions to have maximum impact.

The research project described in this report was conducted in response to CDC PERT #01-009ccd. The project had four main goals: 1) To enumerate and evaluate all current survey activities and surveillance systems gathering data on individual behaviors and attitudes related to nutrition, physical activity, sedentary behavior, and weight status among school-age children being conducted by state departments of health and education; 2) To enumerate and evaluate all relevant instruments and methodologies from the published literature that pertain to surveys of behaviors and attitudes related to nutrition, physical activity, sedentary behavior, and weight status among school-age children; 3) To summarize and integrate the information from goals 1 and 2 and to provide the CDC with a set of recommendations that could be used to evaluate and improve surveillance at the state and national levels; and 4) To disseminate a summary of the information to state health and education departments and other stakeholders. The end goal was that the information would be used in assessing gaps in data collection in expanding and strengthening state-based surveillance systems.

At approximately the same time the current project was funded (October, 2001), two related projects at the Harvard School of Public Health (HSPH), “Toward Comprehensive Nutrition and Physical Activity Surveillance”, and an Obesity Prevention Network Surveillance Work Group, were funded as well. A series of meetings were held to coordinate efforts between our project and the efforts to be undertaken at HSPH. The OPN Surveillance Work Group served our project in an advisory role, in addition to our own project advisory group. Members of the Surveillance Workgroup included individuals from the CDC, HSPH, several universities, and a number of state Departments of Health. Our project advisory group members were Maria Bettencourt, Jean Wiecha, Patricia Crawford, Jeanne Goldberg, M. Barton Laws, Ruth Palombo, Scott Ratzan, Elizabeth Richardson, Patty Freedson, Thomas Robinson, Donald Sweeney, and William Potts-Datema (Appendix A). We relied on these individuals for feedback on our contact letters to key personnel at state Departments of Health and Education, the initial packet sent to key personnel, and the survey abstraction form.

Current national surveillance systems do not systematically collect information on nutrition, physical activity, sedentary behavior and weight status for youth of all ages. Many states, however, are conducting state and regional surveys of youth in addition to the national surveillance systems. Understanding the scope and limitations of current surveys and surveillance systems will assist in the critical evaluation of current methodologies and in the development of recommendations on how to improve and expand surveillance at the state level. The research described in this report represents an important step towards understanding these mechanisms by identifying and evaluating the tools being used at the state level and in the published literature.

B. METHODS: STATE-BASED DATA

B.1. Development of Project Survey Instrument

We developed a telephone survey instrument for interviews with key personnel at state Departments of Health and Education. The survey development process began with an initial meeting of the project team to brainstorm about all relevant information that should be captured in the survey. The draft instrument developed by the project team was then shared with members of the Epidemiology/Biostatistics Working Group of the Boston Obesity Nutrition Research Center (BONRC) during their monthly seminar. Feedback received during this meeting was incorporated into the survey instrument. The survey process was then pre-tested in five states: Arkansas, Delaware, Indiana, Maine, and Nebraska. Based on suggestions and responses during the pre-test, our survey form and introductory letter were modified slightly. Improvements that were made included giving respondents more room to write in their responses and modifying the letter to include a “due date” for response to the survey. A copy of the final survey instrument can be found in Appendix D.

B.2. Identification of Key Personnel at State Departments of Health & Education

The following strategy was used to identify and contact key personnel in state Departments of Health and Education. First, an email was sent to all state Commissioners of Health and Education to alert them to our project. Next, a joint packet from Drs. Aviva Must (principal investigator on the Tufts project) and Karen Peterson (principal investigator on the HSPH project) was sent to the commissioners in each state (Appendix B). The packet included a letter of introduction/support from Dr. James Marks, then Director of the National Center for Chronic Disease Prevention & Health Promotion, a letter signed jointly by Drs. Must and Metallinos-Katsaras that explained the details of the project, and a grid on which the respondent was asked to provide the names(s) of individual(s) in their organization that they believed would be able to provide detailed information on surveys and surveillance activities related to nutrition, physical activity, sedentary behavior, and weight status in various age groups. In states where insufficient or no information was obtained, we conducted web searches and consulted membership directories to locate potential respondents.

B.3. Surveying Key Personnel at State Departments of Health & Education

These initial search strategies resulted in a list of potential contacts from each state. Each contact was then sent a packet that included a cover letter from Dr. William Dietz, Director of the Division of Nutrition and Physical Activity at CDC, a cover letter from the principal investigators, and a short questionnaire that asked the respondent to identify relevant surveys from their organization (Appendix C). In developing this packet, we received input from the Harvard group, individual members of our project advisory group, and members of the OPN Surveillance Work Group, a group of state health personnel and public health academics funded by the CDC through the Harvard Obesity Prevention Research Center. Each respondent was asked to mail us copies of all survey instruments identified. If a survey instrument had not yet been received by the time of the telephone interview, the key informant was asked again for a copy during the interview. Numerous additional attempts were made to obtain all reported surveys. As a result over 95% of requested surveys were obtained. The mailings were done in waves to manage the flow of material from the states.

Once the completed questionnaire was received from each respondent, a telephone interview was scheduled. The goal of the interview was to obtain detailed information on the surveys identified. Interviews were generally scheduled via email and were conducted over the telephone by the project manager or project assistant. In some instances, responses were provided by email when it was more convenient for the respondent.

B.4. Summary and Analysis of Information Obtained from Key Informant Interviews

All surveys obtained from the state contacts were abstracted using a survey abstraction form that was developed for this project. An initial survey abstraction form was drafted after reviewing several surveys, from both the published literature and individual states, and receiving input from our advisory panel. This draft form was pre-tested by several members of our group using four of the surveys from the published literature. These survey instruments were received from the researchers (usually the corresponding author on the published article) who were contacted. Based on this pre-test, categories on the form were revised and a final form was developed. Two members of the research team abstracted each survey; abstractions were reviewed and the pair who had done the abstraction adjudicated any discrepancies. In cases where consensus could not be reached, a senior researcher made the final decision. Data from the survey abstraction forms were entered into Microsoft Access (Microsoft Corporation, Redmond, WA). Data from the survey abstraction were then merged with data from the key informant interviews. A copy of the form is provided as Appendix E.

Surveys that included knowledge of nutrition, physical activity, sedentary behavior, or weight status were obtained **only** as part of our attempts to gather other surveys. Because we turned up a large amount of information about knowledge, we have included it in our summary tables. The information on knowledge, however, is **not** complete, because it was obtained only when it was co-incident with our target material. For this reason and because knowledge was not a domain of focus for this project, we have elected to simply provide the material we encountered, but not to discuss it further.

All open-ended questions were reviewed and classified into meaningful categories. We also categorized the grades in school covered by the surveys reported into elementary, middle, and high school, assuming elementary school represented grades 1-5, middle school included grades 6-8, and high school included grades 9-12.

C. RESULTS: STATE-BASED DATA

C.1. Summary Results from State Interviews

Table F1 in appendix F displays a list of the state Departments of Health (DOH) and Education (DOE) that responded to the survey (Appendix F). An interview regarding survey and surveillance activities was conducted with at least one person in all 50 states; in 47 states at least one respondent from each the Department of Health and Education was interviewed. In three states only personnel from DOE responded to our interview request. A total of 165 surveys were identified by the state respondents. Of these, 46 (28%) were surveys other than the Youth Risk Behavior Surveillance System (YRBS) that were related to the topics of interest (i.e., attitudes and behaviors related to nutrition, weight status, physical activity or sedentary behavior); 21 (13%) were related to our survey topic area but were either surveys in which the parent was the respondent, surveys that were used as part of focus groups, surveys that were in development, or surveys that included only self-reported height and weight; 44 (27%) were YRBS; and 54 (33%) were not related to our topic areas. Of the 46 relevant surveys it should be noted that for 1, state personnel did not send us a copy of the survey instrument and for 1 survey we were sent a copy however no interview was completed. Therefore, results pertaining to the actual instrument abstractions are based on 45 surveys, and those pertaining to the interview data are based on 45 surveys, but the mapping is not 1:1.

The surveys identified in each state are shown in Table F2 (Appendix F). If a survey was administered in slightly different versions based on age of the respondent they were abstracted separately. Thus, in the detailed description of the survey abstraction results (Tables 11-14), the results are based on 57 survey abstractions. In Appendix G, if the state and title of the survey are the same (but grade listed is different), it is essentially the same survey. The results in Appendix G are presented both by survey and by sub-topic area. Appendix H (State Survey Profiles) provides detailed information obtained from the key informant interviews and Appendix I gives contact information for each of the respondents. Appendix J provides a list of surveys that were mentioned by respondents but were not relevant to the scope of this project.

The following is a summary of the information gleaned in the key informant interviews. When possible, results are presented in two formats: with the total number of states that provided relevant surveys as the denominator (n=32 states) and with the total number of interviews conducted as the denominator (n=45).

C.1.a. Purpose of Survey

Respondents were asked to explain the purpose of the survey about which they were being interviewed. Some respondents provided detailed information, whereas other responses were very general. All responses were reviewed and categorized for summary purposes. Tables 1a & 1b show the classification developed from the open-ended question as well as the frequency of responses within each category. Categories are not mutually exclusive because a single survey could cover more than one content area. Table 1a depicts the frequency with which states reported conducting surveys for specific purposes. Thirty-eight percent of states conducted surveys to assess nutrition behavior and/or physical activity behavior. States also frequently conducted surveys to assess general health status/risk and protective factors (31% of states) and nutrition attitudes (25% of states). Table 1b depicts these frequencies by survey. The four most commonly reported domains on these surveys were nutrition behavior (34% of surveys), physical activity behavior (32% of surveys), general health status (26% of surveys),

and nutrition attitudes (21% of surveys). It is noteworthy that the main purpose of some of the surveys that included questions addressing one or more of our topic areas were tobacco and drug use. This suggests versatility in using resources to access information on important, though unrelated, public health issues.

Table 1a. Reported Purpose of State Surveys: Results by State^{1,2}

Purpose	N (%) N=32
Nutrition Behavior	12 (38%)
Nutrition Knowledge	4 (12%)
Nutrition Attitudes	8 (25%)
Physical Activity Behavior	12 (38%)
General Health Status/Risk and Protective Factors	10 (31%)
Tobacco & Drug Use	6 (19%)
Program/Intervention Design	7 (22%)
Program Evaluation	6 (19%)
Physical Activity Attitudes	4 (12%)
Fruit/Vegetable Consumption Behavior	2 (6%)
Environment	2 (6%)
Weight Status/Obesity Prevention	1 (3%)
Surveillance	2 (6%)

¹ Non-YRBS surveys; denominator only includes those states with relevant surveys whose staff were interviewed

² Categories not mutually exclusive

Table 1b. Reported Purpose of State Surveys: Results by Survey^{1,2}

Purpose	N (%) N=45
Nutrition Behavior	16 (36%)
Nutrition Knowledge	4 (9%)
Nutrition Attitudes	10 (22%)
Physical Activity Behavior	15 (33%)
General Health Status/Risk and Protective Factors	12 (27%)
Tobacco & Drug Use	7 (16%)
Program/Intervention Design	7 (16%)
Program Evaluation	6 (13%)
Physical Activity Attitudes	6 (13%)
Fruit/Vegetable Consumption Behavior	2 (4%)
Environment	2 (4%)
Weight Status/Obesity Prevention	1 (2%)
Surveillance	2 (4%)

¹ Non-YRBS surveys

² Categories not mutually exclusive

C.1.b. Program Evaluation

When specifically asked whether the survey was used to evaluate a particular program, 38% (n=12) of states reported using surveys in the evaluation of a particular program. Twenty nine percent (n=13) of the relevant survey instruments were used in this manner. We were not able to ascertain whether program evaluation was the primary purpose of the survey, however.

C.1.c. Frequency of Data Collection

Tables 2a & 2b below provide the reported frequency with which surveys were administered. Table 2a shows that of states that administered relevant surveys 44% had surveys that were administered once, 22% of states had surveys that were administered every other year, and 15% had survey instruments which were administered less frequently. About one-third of surveys were only used once (table 2b), while for 39% periodic usage was reported; this ranged from annually to once every three years.

Table 2a. Frequency of Survey Administration: Results by State^{1,2}

Frequency	N (%) N=32
Annually	5 (16%)
Every other year	7 (22%)
Every three years	2 (6%)
Twice, as pre/post evaluation tools	3 (9%)
Once	14 (44%)
Other	9 (28%)

¹ Non-YRBS surveys, denominator only includes those states with relevant surveys whose staff were interviewed.

² Categories not mutually exclusive

Table 2b. Frequency of Survey Administration: Results by Survey¹

Frequency	N (%) n=45
Annually	5 (11%)
Every other year	11 (24%)
Every three years	2 (4%)
Twice, as pre/post evaluation tools	4 (9%)
Once	15 (33%)
Other	8 (18%)

¹ Non-YRBS surveys

² Categories not mutually exclusive

C.1.d. Geographic Coverage of Data Collection

Tables 3a & 3b describe the geographic coverage of state surveys. Eighty-eight percent of states had at least one survey with statewide data collection, and 16% had surveys with data collection limited to a local area (Table 3a). Over 80% of surveys were used statewide (Table 3b). Only 13% of surveys were used in a specific region or local area in the state.

Table 3a. Geographic Coverage of Surveys: Results by State^{1,2}

Coverage	N (%) N=32
Statewide	28 (88%)
Specific Region/County	1 (3%)
Local	5 (16%)
Other	2 (6%)

¹ Non-YRBS surveys, includes only states with relevant surveys whose staff were interviewed.

² Categories not mutually exclusive

Table 3b. Geographic Coverage of Surveys: Results by Survey¹

Coverage	N (%) N=45
Statewide	37 (82%)
Specific Region/County	1 (2%)
Local	5 (11%)
Other	2 (4%)

¹ Non-YRBS surveys

C.1.e. Method of Data Collection

Tables 4a & 4b depict the distribution of reported data collection methods used for state surveys. Since some surveys used more than one method of data collection, these categories are not mutually exclusive. Most (97%) states (Table 4a) used surveys which were entirely or in part self-administered using paper surveys (i.e., not computerized). Only 9% of states used surveys which included a group or interview administered component. A very similar pattern was observed when the results were viewed by survey (Table 4b).

C.1.f. Pre-Testing of Survey

The vast majority (91%) of surveys were reported to have been pre-tested before implementation. One survey was not pre-tested, and for three of the surveys (7%) the respondents did not know whether it had been pre-tested. Respondents were also asked to describe the pre-testing process for each of the relevant surveys. These open-ended responses were then classified by the research team into one of the following categories: “fully” pre-tested (meaning that the entire instrument was pre-tested), “partially” pre-tested, or pre-testing process unknown. Of the 41 surveys for which pre-testing had been reported, 19 (46%) were reported to have been “fully” pre-tested, 18 (44%) were “partially” pre-tested, and for 4 (10%) surveys no pre-testing was reported.

Table 4a. Survey Administration Methods: Results by State

Method of Data Collection	N (%) N=32
Self-administered (paper survey)	31(97%)
Self-administered (computer-assisted)	1 (3%)
Group administered	3 (9%)
Interviewer administered	2 (6%)
Telephone	1 (3%)
Other	1 (3%)

¹ Non-YRBS surveys, includes only states with relevant surveys whose staff were interviewed; categories not mutually exclusive

Table 4b. Survey Administration Methods: Results by Survey¹

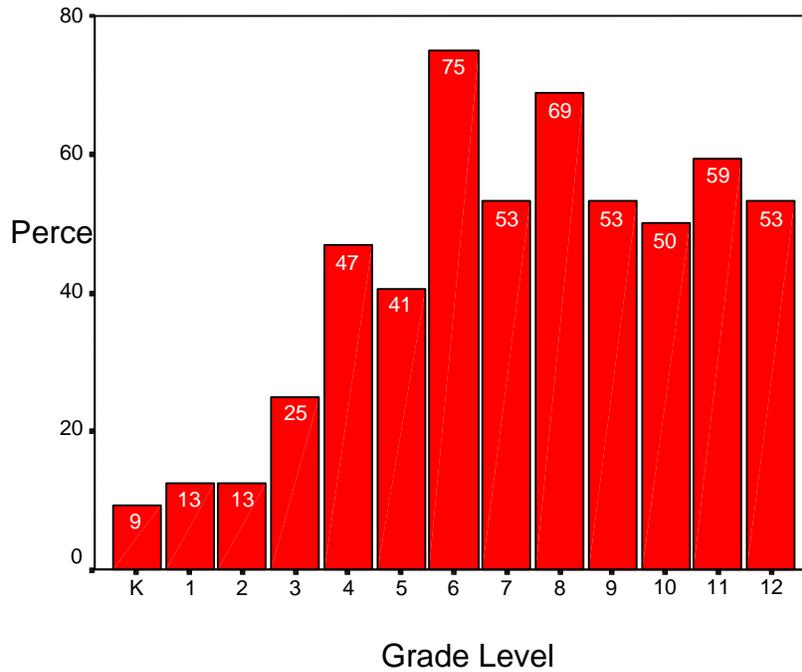
Method of Data Collection	N (%) N=45
Self-administered (paper survey)	39 (87%)
Self-administered (computer-assisted)	2 (4%)
Group administered	3 (6%)
Interviewer administered	2 (4%)
Telephone	3 (6%)
Other	1 (2%)

¹ Non-YRBS surveys. Categories not mutually exclusive

C.I.g. Grades Covered by Surveys

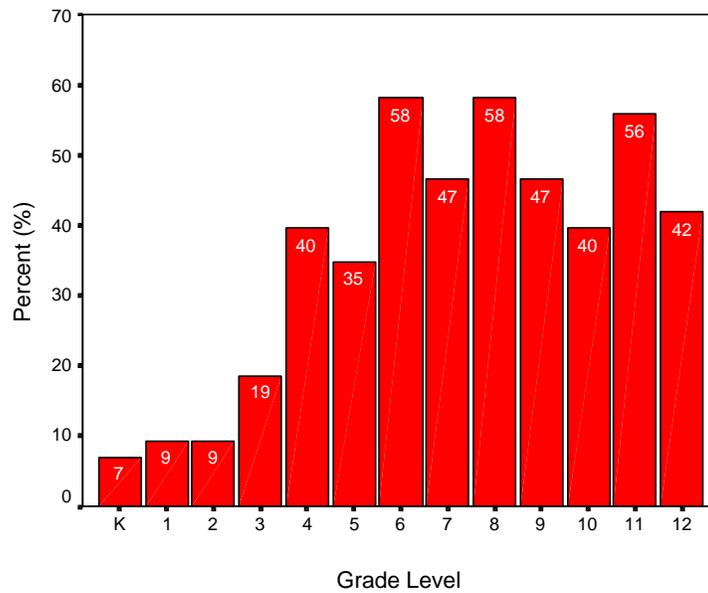
Figures 1a & 1b show the distribution of grades surveyed by state respondents. These categories are not mutually exclusive because a specific survey could be administered to more than one grade. States most frequently reported administering surveys in grades 6 and 8 (Figure 1a); 75% and 69% of states respectively. States administered such surveys to high school students (Figure 1a) at moderate frequency (between 50% and 59% of states). A much lower percentage of states administered relevant surveys in grades K-2 (9-13% of states).

**Figure 1a. Overall Distribution of Grades Surveyed in non-YRBS surveys:
Results by State (N=32)¹**



¹ Categories not mutually exclusive because surveys could have been utilized for more than 1 grade.

**Figure 1b. Overall Distribution of Grades Surveyed in non-YRBS surveys:
Results by Survey (N=45)**



¹ Categories not mutually exclusive because surveys could have been utilized for more than 1 grade.

Of the relevant surveys identified (Figure 1b), surveys were most frequently administered in grades 6, 8, and 11. The least frequently surveyed grades were the early elementary grades of K-3, which were covered by only 7-19% of surveys.

C.1.i. Sociodemographic Data Collected by State Surveys

Ninety-eight percent of state respondents reported that surveys were administered to both male and female children and adolescents, with only one survey targeting females only. Over three-quarters (77%) of surveys included questions on race/ethnicity and 20% of surveys included questions on socioeconomic status.

C.1.j. Sampling Methods Used

The vast majority (98%) of surveys were reported to be administered to a sample. Only one instrument was used to survey an entire target population. For those that obtained a sample, Tables 6a & 6b depict the distribution of sample types. When the results are viewed by state (Table 6a), 22 states (69%) had surveys that used convenience sampling and 15 states (47%) had surveys that used random samples. Similar results were found when data were expressed by survey (Table 6b) with most surveys using convenience samples (56% of surveys), and fewer (40%) using random samples.

Table 6a. Sampling Procedure for State Surveys: Results by State^{1,2}

Type of Sample	N (%) N=32
Random	15 (47%)
Convenience	22 (69%)
Program Utilization	1 (3%)
Census	1 (3%)

¹ Non-YRBS surveys, includes only states with relevant surveys whose staff were interviewed.

² Categories not mutually exclusive

Table 6b. Sampling procedure for state surveys: Results by Survey¹

Type of Sample	N (%) N=45
Random	18 (40%)
Convenience	25 (56%)
Program Utilization	1 (2%)
Census	1 (2%)

¹ Non-YRBS surveys

C.1.k. Assessment of Reliability or Validity of Survey Instrument

Respondents were asked in a single question to report whether any reliability or validity assessment of the survey instrument had been undertaken. Thus, it is not possible to discern whether the assessments were for reliability or validity, the nature of these assessments, or which items were evaluated. For thirty-one surveys (69%) it was reported that some assessment of the reliability or validity had been undertaken, for 10 (22%) it was not known if there had been any reliability/validity assessment, and for 4 (9%) it was reported that there was no reliability/validity assessment of the survey instrument.

C.1.l. Perceived Benefits & Barriers

Respondents were asked open-ended questions about their perceptions of the benefits and barriers of designing and implementing these surveys and surveillance systems. Perceptions regarding benefits and barriers were queried separately. See Appendix D for actual question phrasing.

The open-ended responses were then classified into discrete categories (Tables 8 & 9). Because more than one benefit or barrier could be reported by a particular respondent, response categories are not mutually exclusive. The sample sizes (n=70) for these two questions were higher because they also include those respondents whose state’s data collection was via only the YRBS. Although the YRBS is a survey activity that fell within this project description, CDC already has detailed information on this surveillance system. Nonetheless, this project offered an opportunity to obtain some important qualitative information on perceived benefits and barriers.

Many benefits of such surveys and surveillance systems were noted; 58 out of the 70 state respondents who answered this question (83%) reported at least one benefit; 12 (17%) said there was no benefit and one did not answer the question. Table 8 provides the frequency with which specific benefits were identified among those describing at least 1 benefit (N=58). The two most commonly reported benefits were to obtain baseline data and to design programs or interventions, reported by 60% and 45% of respondents, respectively. Other frequently reported benefits were using data to track trends, to compare regional and national data, to monitor and evaluate programs, and to advocate for change.

Table 8. Perceived Benefits of State Survey/Surveillance Efforts by DOH and DOE Respondents who Identified a Relevant Survey (both YRBS and non-YRBS)^{1,2}

BENEFITS	
Response Category	N (%) N=58
To obtain baseline data	35 (60%)
To track trends, compare regional to national data	12 (21%)
To design programs/interventions	26 (45%)
For program monitoring and evaluation	8 (14%)
For advocacy	8 (14%)

¹ Only among those who identified a benefit

² Categories not mutually exclusive because respondents could identify > 1 benefit.

Various barriers to developing and implementing these surveys were noted (Table 9). Of the 70 respondents, 66 noted at least 1 barrier (94%) and 4 noted no barrier (6%). Table 9 provides the frequency with which specific barriers were identified among those noting at least 1 barrier (n=66). The two most commonly reported barriers were competing demands in schools (45% of respondents) and gaining access to schools (33% of respondents). Other barriers frequently noted were state agency resource constraints (30%), survey content and length (27%), student-specific barriers to obtaining accurate data (23%), and other constraints affecting accuracy of the data (23%).

Table 9. Perceived Barriers of State Survey/Surveillance Efforts by DOH and DOE Respondents who Identified a Relevant Survey (both YRBS and non-YRBS)^{1,2}

BARRIERS	
Response Category	N (%) N=66
DOH/DOE resource constraints	20 (30%)
Access to schools	22 (33%)
Competing demands in schools (academic and other)	30 (45%)
Parental consent, institutional approval, and confidentiality	13 (20%)
Survey content and length	18 (27%)
Student specific barriers to obtaining accurate data	15 (23%)
Other constraints affecting accuracy of the data (data quality)	15 (23%)
No barriers	1 (1.5%)
No comment	2 (3%)

¹ Only among those who identified a barrier.

² Categories not mutually exclusive because respondents could identify > 1 barrier.

C.2. Summary Results from State Survey Abstractions

C.2.a. General Coverage of Topics and Domains

Of the 45 main surveys abstracted, 37 surveys covered nutrition, 37 surveys covered physical activity, 28 surveys covered sedentary behavior, and 18 surveys covered weight status. Coverage of topic areas (i.e. nutrition, physical activity, sedentary behavior and weight status) and domains (i.e. knowledge, behavior and attitudes/perceptions) by the number of states administering non-YRBS surveys and by the number of non-YRBS surveys administered by states are presented in Tables 10a and 10b, respectively. Data were stratified by grade level.

Table 10a. Number of States that Administered Non-YRBS State Surveys Covering Topic and Domain Areas of Interest by Grade (N=33)^{1,2}

School Type	Nutrition			Physical Activity			Sedentary Behavior			Weight Status		
	B	A/P	K	B	A/P	K	B	A/P	K	B	A/P	K
Elementary	13	9	10	15	7	1	12	0	0	4	8	3
Middle	21	11	8	20	5	5	17	0	1	7	12	3
High	19	10	7	17	2	4	14	0	0	11	14	3
Total # of states	28	14	13	28	8	5	22	0	1	12	15	3
% of states	85%	42%	39%	85%	24%	15%	67%	0	3%	36%	45%	9%

¹ K= knowledge; B = behavior; A/P = attitudes and perceptions.

² Categories are not mutually exclusive

Of the four topic areas of nutrition, physical activity, sedentary behavior, and weight status, nutrition topics were queried by a greater number of states administering non-YRBS surveys (Table 10a). The physical activity topic area was queried frequently by states. For all topic areas except weight status a greater number of states administered surveys that included questions for the behavior domain than either of the other two domains of knowledge and attitudes/perceptions. Eighty-five percent of the states included questions for physical activity behavior as well as for nutrition behavior, 67% of states included questions for sedentary behavior (behavior), and 36% of states included questions for weight status behavior. A modest number of states also assessed nutrition knowledge (39%), nutrition attitudes/perceptions (42%) and weight status attitudes/perceptions (45%),

There were more states that assessed the topic area-domain combinations of nutrition behavior, nutrition attitudes/perceptions, physical activity knowledge, physical activity behavior, and sedentary behavior (behavior) among middle school students than among other grade levels (Table 10a). A fewer number of states examined these same five topic area-domains among elementary students compared to the other grades. Conversely, more states assessed nutrition knowledge and physical activity attitudes/perceptions among elementary students compared to middle or high schools students. A greater number of states assessed weight status behavior and attitudes/perceptions among high school students than among middle school or elementary school students.

When coverage of topic areas was examined by survey (Table 10b), a greater number of surveys addressed the topic areas of nutrition and physical activity than sedentary behavior and weight status. Behavior was the domain most frequently queried in three of the four topic areas, with 80% of surveys covering nutrition and physical activity behavior, and 60% of surveys covering sedentary behavior (behavior). For weight status, 31% of surveys covered the behavior domain and 38% of surveys covered the attitudes/perceptions domain. Nutrition and physical activity topic areas were queried at moderate frequency at the elementary school level, while sedentary behavior and weight status were queried much less often. Although at both the middle and high school levels, nutrition and physical activity were queried most frequently, sedentary behavior (behavior) and weight status were also queried at moderate frequency.

Table 10b. Number of Non-YRBS State Surveys Covering Topic and Domain Areas of Interest by Grade (N=45)^{1,2}

School Type	Nutrition			Physical Activity			Sedentary Behavior			Weight Status		
	B	A/P	K	B	A/P	K	B	A/P	K	B	A/P	K
Elementary	16	11	12	16	7	4	12	0	0	3	7	3
Middle	25	10	10	27	6	5	20	0	1	10	14	3
High	23	9	8	22	2	4	17	0	0	12	15	3
Total # of surveys	36	16	16	36	10	6	27	0	1	14	17	3
% of surveys	80%	36%	36%	80%	22%	13%	60%	0	2%	31%	38%	7%

¹ Numbers tabulated represent number of relevant state surveys within each domain and grade. K= knowledge; B = behavior; A/P = attitudes and perceptions.

² Categories are not mutually exclusive

Table F3 (Appendix F) shows the nutrition, physical activity, sedentary behavior and weight status domains and grades covered (non-YRBS surveys) by individual state. Excluding the YRBS, thirty-three states covered at least one of the four topic areas. Nine covered at least one domain from every area: California, Connecticut, Georgia, Indiana, Massachusetts, Oregon, Texas, Washington and West Virginia. California, Georgia, and Texas were the only three states that had surveys that covered at least one domain in all four target areas for all three grade levels (i.e. elementary, middle, and high-school).

C.2.b. Specific Sub-Topics for each Target Area and Domain

Table 11 depicts the number of state non-YRBS surveys with at least one question for each specific nutrition sub-topic within each domain. Note that the number of surveys included in these tables was 57 because, as described previously, if a survey was administered in slightly different versions based on age of the respondent they were abstracted separately. In the domain of behavior, the most frequently queried sub-topics were consumption of specific foods (67% of abstracted surveys) and breakfast (46% of abstracted surveys). Other topics frequently queried were type of meal eaten at lunch and supplement use. In the domain of nutrition attitudes/perceptions, children’s food preference was the most commonly queried sub-topic; 16% of abstracted surveys included at least one question on this sub-topic. A few surveys queried students on parental/peer influence, barriers to consuming a healthy diet and reasons for eating healthy foods. Intentions to engage in certain food-related behaviors and food fears/regrets were rarely queried.

Table 11. Frequency of Occurrence of Nutrition Sub-Topics within Each Domain on Non-YRBS State Surveys¹

DOMAIN	SUB-TOPIC	Number of Surveys (N=57)
<i>Behavior</i>	Consumption of specific foods	38
	Look at food labels when making food choices	7
	Type of meal eaten at lunch	15
	Breakfast consumption	26
	Reasons for choosing specific foods for snacks or meals	4
	Responsibility for self-preparation of food	7
	Frequency of eating out	6
	Supplement use	12
	Specific food avoidance	3
<i>Attitudes/Perceptions</i>	Intentions to engage in certain behaviors	1
	Self-perceived barriers to consuming a healthy diet	5
	Self-perceived reasons of importance of eating healthy foods	5
	Self rating of own diet compared to peers	3
	Self-rated importance of certain health-related issues	2
	Self-rated importance of various factors that influence food selection	3
	Food preferences	9
	Perceived competence/self-efficacy	4
	Food fears/regrets	1
	Parental/peer influence	6
<i>Knowledge²</i>	Nutrition knowledge	21

¹ If ≥1 question pertaining to a specific sub-topic were on a survey, the survey was counted as covering that sub-topic

² Only if the information was coincident with target domains

Table 12 depicts the number of state surveys with at least one question for each specific physical activity sub-topic within each domain. The most commonly surveyed sub-topic was participation in sports and physically active hobbies. States most commonly conducted surveys that asked about the frequency (58% of surveys) with which children engaged in these activities; however, the setting and type of these activities were also queried with moderate frequency (28% and 21% of surveys, respectively). Other frequently queried topics were participation in school physical education (40% of surveys) and participation in physical activity that caused sweating and hard breathing (51% of surveys). Physical activity behaviors relating to work, transportation, chores, or physical activity with family members were rarely queried. In the domain of physical activity attitudes and perceptions, the most commonly queried sub-topic was “perceived barriers to getting physical activity” and this was only queried in 11% of abstracted surveys. Few surveys included questions on other aspects of attitudes and perceptions.

Table 12. Frequency of Occurrence of Physical Activity Sub-Topics within Each Domain on Non-YRBS State Surveys¹

DOMAIN	SUB-TOPIC	Number of Surveys (N=57)
<i>Behavior</i>	Exercise, sports, & physically active hobbies (yes/no)	6
	▪ Type	12
	▪ Intensity	2
	▪ Setting	16
	▪ Frequency	33
	▪ Duration	9
	P.A. related to transportation (yes/no)	0
	▪ Type	1
	▪ Intensity	1
	▪ Frequency	2
	▪ Duration	1
	P.A. related to work (yes/no)	0
	▪ Type	0
	▪ Intensity	0
	▪ Frequency	0
	▪ Duration	0
	P.A. related to chores/household (yes/no)	0
	▪ Type	0
	▪ Frequency	2
	▪ Duration	4
	P.A. with family (yes/no)	1
	▪ Type	1
	▪ Intensity	0
	▪ Frequency	1
	▪ Duration	0
	Participation in school P.E.	23
Participation in sport with weight requirement	0	
Transportation to school	4	
Frequency of P.A. sufficient to cause breathing hard & sweating	29	
Behavior during recess	3	
Activity after school	1	
Program/facility access	2	
<i>Attitudes/Perceptions</i>	Self-perceived activity level relative to peers	1
	Self-perceived importance of P.A.	2
	Perceived competence/self-efficacy	4
	Self-esteem	0
	P.A. preference	2
	Reasons for being active	4
	Perceived benefits of P.A. or P.E.	1
	Perceived barriers to getting P.A.	6
	Attitudes towards P.A.	3
	Sweat attitudes	0
	Peer influence	4
	Intentions to increase P.A. in future	3
Parental support/encouragement/involvement	5	
<i>Knowledge²</i>	P.A. knowledge	6

¹ If ≥1 question pertaining to a specific sub-topic was on a survey, the survey was counted as covering that sub-topic

² Only if the information was coincident with target domains

Table 13 depicts the number of state surveys with at least one question for each specific sedentary behavior sub-topic within each domain. The most frequently queried category was TV watching, specifically duration of TV watching; 60% of surveys had one or more questions on this sub-topic. The second and third most frequently queried categories were computer duration and video game duration; 23% and 21%, respectively. Again in both of these aforementioned cases, duration rather than frequency was the focus of the questions. Homework/studying duration as well as leisure time reading duration were queried with moderate frequency (16% and 12% of surveys, respectively), whereas the categories of when TV is viewed, family limits on TV watching, sedentary behavior after school, and weekend activity were rarely queried.

Table 13. Frequency of Occurrence of Sedentary Behavior Sub-Topics within Each Domain on Non-YRBS State Surveys¹

DOMAIN	SUB-TOPIC	Number of Surveys (N=57)
<i>Behavior</i>	Television viewing	
	▪ Frequency	3
	▪ Duration	34
	Video game use	
	▪ Frequency	1
	▪ Duration	12
	Video tape use	
	▪ Frequency	0
	▪ Duration	2
	Computer use	
	▪ Frequency	1
	▪ Duration	13
	Homework/studying	
	▪ Frequency	1
	▪ Duration	9
	Leisure reading	
	▪ Frequency	0
	▪ Duration	7
	Music listening	
	▪ Frequency	0
▪ Duration	1	
When is television viewed	2	
Family limits placed on TV viewing	2	
Sedentary after school	0	
Sedentary on weekends	0	
<i>Attitudes/Perceptions</i>	Reasons for liking television	0
	Self-perceived benefits of watching less TV	0
	Self-perceived benefits to watching less TV	0
<i>Knowledge²</i>	Sedentary behavior knowledge	1

¹ If ≥ 1 question pertaining to a specific sub-topic were on a survey, the survey was counted as covering that sub-topic

² Only if the information was coincident with target domains

Table 14 summarizes the number of state surveys with at least one question for each specific weight status sub-topic within each domain. This is the only topic area in which the domain of attitudes and perceptions was queried more frequently than was behavior. In this domain the most frequently queried topics were self-perception of body weight status (28% of surveys) and weight satisfaction (38% of surveys). In the domain of weight status behavior there was an almost exclusive focus on weight control and disordered eating behaviors, 24% and 26% of surveys, respectively. With the exception of weight worries, adult or peer influences on weight, and frequency of dieting, which were covered on few surveys, none of the other sub-topics under the behavior domain areas were represented on state surveys.

Table 14. Frequency of Occurrence of Weight Status Sub-Topics within Each Domain on Non-YRBS State Surveys¹

DOMAIN	SUB-TOPIC	Number of Surveys (N=57)
<i>Behavior</i>	Weight control behaviors	14
	Behaviors associated with disordered eating	15
	Emotional eating	0
	Attempts to gain muscle or weight	0
	Media influence	0
	Weight teasing	0
	Weight worries	3
	Peer influences on eating or weight	1
	Adult influences on eating or weight	2
	Eating for health	0
	Weight maintenance	0
	Frequency of dieting	1
<i>Attitudes/Perceptions</i>	Self-perception of body weight status	16
	Somatotypes	0
	Measures of body esteem	0
	Physical appearance self-concept	0
	Ideal weight status	4
	Weight preoccupation	2
	Perception of what a healthy weight/size is	0
	Reasons for or results of weight loss or gain	1
	Desired vs. Perceived wt. And difference	0
	Weight satisfaction	22
	Weight worries	1
	Media influence	0
	Perceived competence/self-efficacy	0
Fear of eating	0	
<i>Knowledge²</i>	Weight status knowledge	3
	Self-reported height	22
	Self-reported weight	22

¹ If ≥ 1 question pertaining to a specific sub-topic were on a survey, the survey was counted as covering that sub-topic

² Only if the information was coincident with target domains

D. METHODS: PUBLISHED LITERATURE

D.1. Literature Search

The goal of our literature search was to identify published and unpublished articles that surveyed children on their behaviors and attitudes towards nutrition, physical activity, sedentary behavior, and weight status. We did not seek out dietary assessment questionnaires, unless they were embedded within an instrument relevant to topic areas of interest to this project. Surveys that included knowledge of nutrition, physical activity, sedentary behavior, or weight status were obtained **only** as part of our attempts to gather other surveys. Because we acquired a large amount of information about knowledge, we have included it in our summary tables. The information on knowledge, however, is **not** complete, because it was obtained only when it was coincident with our target material. For this reason, we have elected to simply provide the material we reviewed, but not to discuss it further.

A draft list of search terms for querying selected databases was generated. A library specialist was consulted to ensure that our search strategy was feasible and complete. An example of a search strategy with final key words is provided as Appendix K. Next, a thorough search of the literature for papers published between 1997 and 2002 was conducted. The following databases were searched: Infotrac (Information Access Company, Foster City CA), Medline, HealthStar, PsychInfo and Cumulative Index to Nursing and Allied Health Literature (CINAHL) (Ovid Technologies, New York, NY). The CAB Abstract Database was used to search conference proceedings, and dissertations. The Tufts Health Sciences Library provided consultative support and a special access code that allowed our search strategies to be kept active, which facilitated search modification and updates.

D.2. Article Abstraction

Titles and abstracts of all articles identified from our literature search were reviewed for relevance. Those that were clearly not pertinent were dropped from the list; those that were relevant or questionable were retained. Copies of all articles were obtained in full. All references were downloaded into the *EndNote* reference management program (ISI ResearchSoft Berkeley, CA).

To generate an initial data abstraction form, the senior researchers and project manager read a sample of articles and drafted an initial data abstraction form. This form gathered basic information regarding the study population, when and how it was implemented, the broad areas covered, and whether the instrument used consisted wholly or in part of existing surveys or survey modules. This form was also used to record any reported evaluation of validity and reliability, and if so, present whether this information was provided internally or as a reference to another publication or publications. The form was then pilot-tested on five articles by members of the research team, revisions made, and a final form generated (Appendix L). A trained member of the research team then abstracted all relevant articles. Information from the article abstraction forms was entered into Microsoft Access (Microsoft Corporation, Redmond, WA).

D.3. Abstraction of Surveys from the Published Literature

An author on each relevant article (usually the corresponding author) from our literature review was contacted via email and requested to provide copies of any relevant surveys

mentioned in the article. Authors were contacted up to three times to request the survey. An initial survey abstraction form was developed after reviewing several surveys and receiving input from our advisory panel. This draft form was pre-tested by several members of our group using four of the surveys received from the researchers contacted. Based on this pre-test, categories on the form were revised and a final form was developed (Appendix E). Two members of the research team abstracted each survey; abstractions were reviewed and the pair who had done the abstraction adjudicated any discrepancies. In cases where consensus could not be reached, a senior researcher made the final decision. Data from the survey abstraction forms were entered into Microsoft Access (Microsoft Corporation, Redmond, WA).

The range of grades and ages covered by the surveys were abstracted from the published articles. We then categorized the grades into elementary, middle, and high school, assuming elementary school represented grades 1-5, middle school included grades 6-8, and high school included grades 9-12. For a study that included 2nd, 4th and 6th grades, we considered the grade range to be 2 to 6. To map ages to grade levels where grade information was not provided, we assumed that an average age between 11 and 13 years represented middle school, while an average age below 11 years or above 13 years represented elementary and high school, respectively.

Racial/ethnic composition was summarized with multiple items on the abstraction form. First, surveys that were race/ethnicity-specific were so noted, and the specific racial/ethnic category surveyed was abstracted. For surveys that were not race/ethnicity-specific, we considered the study population to be “predominantly non-white” if white children represented less than 50% of the study population. For survey populations that were predominantly non-white, the racial/ethnic groups represented were abstracted; percentages were obtained when that information was included in the published report of the survey.

Geographic location of the survey population was categorized as national, statewide, multi-state, specific region/county/locality, or unknown (when this information was not reported).

Information on response rate was included in most of the articles reviewed. When the authors reported a response rate, that rate was tabulated. We did not attempt to calculate response rate for this report because of the wide variability in the relevant information reported by study authors.

Reliability and validity of the survey instruments used were reported in a small proportion of studies. When these measures were reported within the published article, or when a reference to reliability or validation studies was provided, we considered this information to be present. An exception was made to reports that noted only “face validity” or “content validity.” Although these validation activities represent important early steps in the development of a survey, they are not by themselves generally regarded as evidence that an instrument is valid. When reliability and/or validity were not mentioned (or when limited to face or content validity only), we considered this information “not reported.” We did not attempt to evaluate the quality of the reliability or validity testing, nor did we differentiate whether reliability and validity assessments were undertaken in the same population or in a different one. In general, the level of information available in the published papers was not sufficient to make an informed independent assessment of quality of the validity and reliability efforts.

The designation of pre-testing of surveys was handled in a similar manner. If the published article indicated that pre-testing was undertaken for some or all parts of the survey, that survey was considered “pre-tested.” Where this information was not provided, we indicated that pre-testing was not reported.

E. RESULTS: PUBLISHED LITERATURE

E.1. Summary Results from Article Abstraction

Through our literature search and references of applicable articles, we identified 458 articles that described the development, validation or administration of surveys with questions on behaviors and attitudes towards nutrition, physical activity, weight status and sedentary behavior among school-age children. Based on review of abstracts for relevance, we deemed 261 articles potentially relevant for our inquiry and obtained copies of all of them. From these we abstracted 130 articles that described the administration of a relevant survey instrument. The remaining articles described development or validation of the survey instrument and are included in the bibliography (Appendix M), but were not abstracted. From the 130 identified articles, we obtained 123 survey instruments, including multiple instruments reported in a single study, as well as several instruments that were identified in multiple articles. Our detailed bibliography (Appendix N) provides the first author and citation reference for 130 articles that used survey instruments in the target areas of interest.

One of the difficulties we encountered was establishing what constituted an “individual” survey. Many survey instruments were an amalgam of more than one identifiable instrument. For others, there may have been embedded instruments or partial instruments that were not readily identifiable as such. The users of this document are cautioned that there may be surveys nested within surveys that we have not identified. Furthermore, in many cases, authors indicated that some of the individual items were modified or adapted. Appendix O (O.1 and O.2) provides detailed information on the sub-topics covered within surveys reported in published articles, organized in three formats.

E.2. Summary Results from Survey Abstraction

Detailed information on the 130 published articles can be found in Appendix N. Appendix N provides specific information (sample size, grade levels, race, region, response rate, and reported reliability and validity) for each survey as reported in a published article. As indicated above, multiple survey instruments may have been included in a single article and individual surveys may have been reported in more than one published article. Sample sizes ranged widely, from 24 to 123,132. Of the 130 reports included (one report did not specify the sample size), 31.8% of surveys had a sample size that exceeded 2000 respondents. Response rate was reported in only 34.6% of articles. Among those articles that reported a response rate, the mean (SD) response rate was 78.1% (14.0%), suggesting a high degree of variability. For almost all surveys (97.7%), the racial/ethnic composition of respondents was provided. Among those articles that reported racial make-up, 68.5% were predominantly Caucasian samples and 12.6% were samples of a single non-Caucasian racial/ethnic group. Regional focus was typical of surveys in the published literature. Of the 130 articles obtained, 60% were targeted to a population in a specific region, 11% were statewide, 5% were multi-state, 13% were national in scope, and for 11% the locale was not reported.

Table 15 provides the distribution of grade levels covered by surveys reported. Elementary/middle school and middle/high school were the most commonly covered grade categories. These two categories accounted for 70% of the surveys reported in the published literature. Approximately one-third of articles (30%) reported that the survey instrument had been pre-tested prior to its use.

Table 15. Distribution of Grade Levels Covered by Surveys Reported in the Published Literature (1997-2002)

Grade Levels Covered	Articles (n=130) (%)
Elementary only	1 (0.8)
Middle school only	16 (12.3)
High school only	6 (4.6)
Elementary/Middle	45 (34.6)
Middle/High	46 (35.4)
Elementary/Middle/High	16 (12.3)

E.2.a. General Coverage of Topics and Domains

Selected attributes of articles that report on surveys are provided in Table 16. Overall, 41 surveys included items on nutrition, 61 surveys included items on physical activity, 14 surveys included items on sedentary behavior, and 39 surveys included items on weight status. (Numbers do not add up because a survey could cover more than one topic area-domain.). Of the four topic areas and two domains systematically evaluated, physical activity behavior was the most frequently covered, reflected both in terms of unique surveys that addressed this domain/area as well as the number of citations. Sedentary behavior was the least frequently studied and reported upon. Furthermore, there were no surveys identified that covered attitudes and perceptions toward sedentary behavior. Overall, the domain of behavior was more frequently studied than the domain of attitudes and perceptions. Weight status was most frequently queried in the domain of attitudes/perceptions, whereas physical activity was the most commonly assessed area in the domain of behavior. Most surveys covered more than one topic area. Because the information we obtained on knowledge was not comprehensive (see methods), it is provided in Appendix M only and not discussed further.

Table 16. Frequency of Uniquely Identified Survey Instruments (#citations) in the Published and Unpublished Literature (1997-2002)

Domain	Nutrition	Physical Activity	Sedentary Behavior	Weight Status
Behavior	33(50)	43(79)	14(24)	18(33)
Attitudes/Perceptions	18(28)	26 (45)	0	34(68)
Knowledge ¹	22(25)	8(9)	0	2(3)

¹ Knowledge items were included only if the information was coincident with target areas

Behaviors related to nutrition were addressed in 33 surveys represented by 50 articles (tabulated in Appendix O1). Of these surveys, the Children’s Eating Attitudes Test (chEAT), Growing Up Today Survey (GUTS), and Minnesota Adolescent Health Survey were reported most frequently. Many surveys were conducted in more than one grade level category. Middle school was the most popular target grade level category: 94% of published surveys included middle school grades, 68% included high school grades, and 40% targeted elementary school

grades. Only one survey, the Food Preference Questionnaire, focused solely on elementary school grades. Validation was reported for the chEAT, Food Checklist, Gimme 5 Study, Health Behavior Questionnaire, Jump in Action Survey, Knowledge, Attitudes, and Behavior Survey for Pathways, PACE+ Dietary Fat Screening Measure, Physical Activity Questionnaire, and Revised Personal Lifestyle Questionnaire, representing 22% of published surveys in this area. Reliability was reported for 42% of published surveys.

Eighteen discrete surveys as reported in 28 published articles which addressed the area of nutrition attitudes and perceptions were identified (Appendix O1). The Children's Eating Attitudes Test (chEAT), which we considered to cover perceptions and attitudes, as well as behaviors in nutrition, was reported most frequently. Many of the surveys spanned more than one grade level category: 15 (54%) surveys were conducted among elementary-school aged children, 25 (89%) were conducted among middle school-aged children and 13 (46%) were conducted among high school-aged youth. Of the 28 articles in this area, 18 (61%) reported that the instrument had been evaluated for reliability and 8 (29%) reported that the instrument had been validated.

Physical activity behavior was a well-explored survey topic for school-aged children, with 79 identified citations which covered 43 surveys (Appendix O1). Several surveys were the subject of five publications. These surveys included the Growing Up Today Study, Minnesota Adolescent Health Survey, Physical Activity Recall (7-day), and the Project Eat Survey. Four separate publications based on the Youth Risk Behavior Survey (YRBS) items were identified in the area of physical activity behavior. Several of the studies in this area surveyed a very large number of school-aged children, including Add Health (n=17,766), American Indian Adolescent Health Survey (n=13,454), Connecticut Health Check Survey (n=31,861), Growing Up Today Study (n=16,114), Minnesota Adolescent Health Survey (n=123,132), Physical Activity Recall (7-day) (n=14,000), and YRBS (n=16,862). Elementary-school aged children were surveyed in 43% of published articles, middle-school aged children in all but two publications (97%), and high-school aged teens were queried in 53% of articles. Reliability and validity assessments were infrequently made. Further, they were rarely undertaken on the same surveys. Assessment of validity was slightly less common (24%) than was assessment of reliability (28%).

Attitudes and perceptions in the area of physical activity were addressed by 26 surveys identified in 45 published articles (Appendix O1). Survey instruments most frequently used include Harter's Self-Perception Profile for Children, the National Children and Youth Fitness Study, and a questionnaire of influences on physical activity reported by Saunders et al (1997). Elementary-school aged children were studied in 25 (56%) survey articles, middle-school aged children in 41 (91%) survey articles, and high-school aged children were included in 15 (33%) survey articles. Only 7 of the 45 publications (16%) indicated that an instrument had been validated; reliability was reported to have been assessed in 15 articles (33%).

Sedentary behavior was covered more frequently than attitudes and perceptions: 24 publications with 14 surveys were identified. As summarized in Appendix O1, several instruments were used three or more times: Physical Activity Recall and Media Use, Project Eat Survey, and the Self-Administered Physical Activity Checklist (SAPAC). Add Health and Connecticut Health Check Survey each queried large numbers of children: 17,766 and 31,861 youth, respectively. Of the 24 published reports, 42% included elementary school-aged children, 96% included middle school-aged children, and 46% included high-school aged children. Thirty-three percent of articles reported that validation was undertaken and for 25% of reports reliability

was assessed. No publications that included a survey which addressed attitudes and perceptions regarding sedentary behavior were identified.

The domain of attitudes and perceptions regarding weight status was well covered in the survey literature on school-aged youth. Our search strategy identified 68 reports based on 34 individual instruments. The Body Esteem Scale (5 articles), the Children's Eating Attitudes Test (6 articles), and the Growing Up Today Study (5 articles) were the most frequently implemented surveys (Appendix O1). Somewhat surprisingly, this domain was explored with questions targeted to elementary-school aged children for 54% of surveys reported. Middle-school and high-school aged children were queried on attitudes and perception regarding weight status on 94% and 66% of published reports, respectively. Twenty-six percent of articles reported that validity was assessed; 43% reported that reliability was assessed.

Behaviors related to weight status were less frequently explored than attitudes and perceptions (Table 16). As detailed in Appendix N, 18 discrete surveys were reported in 33 published articles. The Eating Disorder Inventory for Children (EDI-C) and Growing Up Today Study were included in the largest number of published reports (5 articles each). Elementary school-aged children were studied in 15 (45%) of survey reports, middle school-aged children in 32 (97%) of survey reports, and high school-aged children were included in 26 (79%) of survey reports. Of the studies reviewed, 27% reported that the instrument had been validated, and 30% indicated that reliability had been assessed.

The following sections (E.2.b.–E.2.e.) summarize the information obtained from the surveys reported on in the published literature for each area (nutrition, physical activity, sedentary behavior, and weight status) for the domains of behavior and attitudes/perceptions. The surveys and their sub-topics are tabulated in Appendix O. In Appendix O1, the survey sub-topics are listed for each survey, in Appendix O2, the sub-topics are provided with a listing of which surveys include one or more items on each sub-topic.

E.2.b. Nutrition

Table 17 depicts the frequency of surveys with at least one question for a specific nutrition sub-topic within each domain. In the domain of nutrition behavior, consumption of specific foods (28% of surveys) and consumption of breakfast (11% of surveys) were the most common sub-topics queried. Other sub-topics covered with moderate frequency included responsibility for food preparation, type of food eaten at lunch, frequency of eating out, and avoidance of specific foods. Use of food labels and supplement use was queried on only one instrument. In the area of attitudes and perceptions regarding food and nutrition, food preference (11% of surveys) and perceived competence and self-efficacy (9% of surveys) were the most frequently covered sub-domains. Intentions to engage in specific food-related behaviors and attitudes about the importance of eating healthy foods were queried with moderate frequency. Sub-topics less well covered included barriers to consuming a healthy diet, respondent's diet compared to his or her peers, and factors influencing food selection.

Table 17. Frequency of Occurrence of Nutrition Sub-Topics within Each Domain for Surveys in the Published Literature¹

DOMAIN	SUB-TOPIC	Number of Surveys (N=123)
<i>Behavior</i>	Consumption of specific foods	34
	Look at food labels when making food choices	0
	Type of meal eaten at lunch	5
	Breakfast consumption	13
	Reasons for choosing specific foods for snacks or meals	0
	Responsibility for self-preparation of food	6
	Frequency of eating out	4
	Supplement use	1
	Food fears/regrets	0
	Specific food avoidance	3
<i>Attitudes/Perceptions</i>	Intentions to engage in certain behaviors	8
	Self-perceived barriers to consuming a health diet	2
	Self-perceived reasons of importance of eating healthy foods	6
	Self rating of own diet compared to peers	0
	Self-rated importance of certain health-related issues	4
	Self-rated importance of various factors that influence food selection	0
	Food preferences	13
	Perceived competence/self-efficacy	11
	Food fears/regrets	2
<i>Knowledge²</i>	Nutrition knowledge	27

¹ If ≥1 question pertaining to a specific sub-topic were on a survey, the survey was counted as covering that sub-topic

² Only if the information was coincident with target domains

E.2.c. Physical Activity

As reflected in Table 18, the topic area of physical activity has been quite extensively covered in surveys of school-aged children. In the domain of physical activity behavior, the most heavily surveyed aspect relates to specific exercises, sports or physically active hobbies (36% of surveys). Questions regarding type, setting, frequency and duration were commonly queried. Intensity of specific activities was less frequently sought. An item to reflect overall frequency of activity that results in hard breathing and/or sweating was asked with high frequency (15% of surveys). Questions about physical education (PE class) in school was asked with more frequency (15% of survey), than at recess (3%) or after school (7%). Other areas with less frequent mention were physical activity for transportation, physical activity in relation to work and chores, and the degree of access to programs and facilities.

Attitudes and perceptions around physical activity was a frequent area of inquiry. Attitudes towards physical activity (19% of surveys), perceived competence and self-efficacy (17% of surveys) were the most commonly queried areas. Other areas of moderate to frequent inclusion were self-perceived activity level relative to peers, perceived importance of and perceived barriers to getting physical activity, perceived benefits of physical activity and physical education, parental support, reasons for being active, peer influence, and intention to increase physical activity in the future.

Table 18. Frequency of Occurrence of Physical Activity Sub-Topics within Each Domain for Surveys in the Published Literature¹

DOMAIN	SUB-TOPIC	Number of Surveys (N=123)
<i>Behavior</i>	Exercise, sports, & physically active hobbies (yes/no)	44
	▪ Type	28
	▪ Intensity	5
	▪ Setting	21
	▪ Frequency	33
	▪ Duration	27
	P.A. related to transportation (yes/no)	7
	▪ Type	2
	▪ Intensity	1
	▪ Frequency	3
	▪ Duration	4
	P.A. related to work (yes/no)	2
	▪ Type	0
	▪ Intensity	1
	▪ Frequency	0
	▪ Duration	2
	P.A. related to chores/household (yes/no)	11
	▪ Type	3
	▪ Frequency	8
	▪ Duration	10
	P.A. with family (yes/no)	2
	▪ Type	0
	▪ Intensity	0
	▪ Frequency	2
	▪ Duration	0
Participation in school P.E.	18	
Participation in sport with weight requirement	3	
Transportation to school	2	
Frequency of P.A. sufficient to cause breathing hard & sweating	18	
Activity during recess	4	
Activity after school	8	
Program/facility access	7	
<i>Attitudes/Perceptions</i>	Self-perceived activity level relative to peers	13
	Self-perceived importance of P.A.	8
	Perceived competence/self-efficacy	21
	Self-esteem	2
	P.A. preference	4
	Reasons for being active	6
	Perceived benefits of P.A. or P.E.	9
	Perceived barriers to getting P.A.	7
	Attitudes towards P.A.	23
	Sweat attitudes	3
	Peer influence	11
	Intentions to increase P.A. in future	8
	Parental support/encouragement/involvement	13
<i>Knowledge²</i>	P.A. knowledge	11

¹ If ≥1 question pertaining to a specific sub-topic were on a survey, the survey was counted as covering that sub-topic

² Only if the information was coincident with target domains

E.2.d. Sedentary Behavior Domain

We conceptualized sedentary behavior as screen usage (TV, videos, computers), homework/studying, music listening, and leisure reading (Table 19). Items regarding television-viewing behavior dominated (23% of surveys). Only a few areas were queried other than frequency and duration of specific sedentary behaviors. Attitudes and perceptions about sedentary behavior were not captured surveys of school-aged children.

Table 19. Frequency of Occurrence of Sedentary Behavior Sub-Topics within Each Domain for Surveys in the Published Literature¹

DOMAIN	SUB-TOPIC	Number of Surveys (n=123)
<i>Behavior</i>	Television viewing	28
	▪ Frequency	7
	▪ Duration	28
	Video game use	13
	▪ Frequency	4
	▪ Duration	14
	Video tape use	6
	▪ Frequency	1
	▪ Duration	7
	Computer use	6
	▪ Frequency	3
	▪ Duration	6
	Homework/studying	12
	▪ Frequency	4
	▪ Duration	11
	Leisure reading	8
	▪ Frequency	7
	▪ Duration	7
	Music listening	4
	▪ Frequency	3
▪ Duration	4	
When is television viewed	1	
Family limits placed on television viewing	2	
Sedentary after school	2	
Sedentary on weekends	0	
<i>Attitudes/Perceptions</i>	Reasons for liking television	0
	Self-perceived benefits of watching less TV	0
	Self-perceived benefits to watching less TV	0
<i>Knowledge²</i>	Sedentary behavior knowledge	1

¹ If ≥1 question pertaining to a specific sub-topic were on a survey, the survey was counted as covering that sub-topic

² Only if the information was coincident with target domains

E.2.e. Weight Status

In the domain of weight status behavior, the sub-topics most often included were weight control behaviors (23% of published surveys), behaviors associated with disordered eating (18% of published surveys), and frequency of dieting (13% of published surveys)(Table 20). Influence by parents and peers on weight status behaviors were asked with moderate frequency. Other

areas covered included emotional eating, attempts to gain muscle or weight, weight teasing, weight worries, and media influences on behaviors related to weight.

Items that tapped attitudes and perceptions regarding weight status behavior were included on many surveys. The most frequently queried sub-topic was self-perception of weight status which was included on 25% of published surveys. Weight satisfaction (14% of surveys), and physical appearance self-concept were also queried with moderate frequency (11% of surveys). Other areas of moderately frequent inquiry included ideal weight status, weight preoccupation, somatotypes, and measures of body esteem (7-8% of surveys).

Although we did not attempt to gather information on knowledge for any topic area, we did note surveys that included items for self-report of height and weight. Of the surveys obtained with at least one other item of relevance to our objectives, 18 (15% of surveys) also included questions to obtain self-reported height and weight.

Table 20. Frequency of Occurrence of Weight Status Sub-Topics within Each Domain in Surveys in the Published Literature¹

DOMAIN	SUB-TOPIC	Number of Surveys (n=123)
<i>Behavior</i>	Weight control behaviors	28
	Behaviors associated with disordered eating	22
	Emotional eating	6
	Attempts to gain muscle or weight	6
	Media influence	5
	Weight teasing	8
	Weight worries	5
	Peer influences on eating or weight	11
	Adult influences on eating or weight	10
	Eating for health	1
	Weight maintenance	1
Frequency of dieting	16	
<i>Attitudes/Perceptions</i>	Self-perception of body weight status	31
	Somatotypes	9
	Measures of body esteem	9
	Physical appearance self-concept	14
	Ideal weight status	10
	Weight preoccupation	10
	Perception of what a healthy weight/size is	1
	Reasons for or results of weight loss or gain	3
	Desired vs. Perceived weight	1
	Weight satisfaction	17
	Weight worries	6
	Media influence	3
Perceived competence/self-efficacy	3	
Fear of eating	3	
<i>Knowledge²</i>	Weight status knowledge	6
	Self-reported height	18
	Self-reported weight	18

¹ If ≥1 question pertaining to a specific sub-topic was on a survey, the survey was counted as covering that sub-topic

² Only if the information was coincident with target domains

F. DISCUSSION

In this project we assessed the frequency with which the topic areas of nutrition, physical activity, sedentary behavior, and weight status were assessed by surveys reported in the published literature as well as by state departments of health and education over the period 1997-2002. Our assessment was limited to our target population of school-aged children. As expected, when we compare the frequency of uniquely identified surveys which address the target areas of nutrition, physical activity, sedentary behavior and weight status in the published literature with the state surveys/surveillance systems (non-YRBS), overall, there are a greater number of surveys in the published literature than identified in the states. In fact, for every topic area a greater number of published surveys were identified in each the topic areas.

In terms of relative emphasis of the four topic areas, in both the states and in the published literature the most frequently covered area was physical activity, although for states nutrition was similarly covered. On the other hand, the least frequently covered topic areas for the state surveys and the published literature were different. For states, weight status was least frequently surveyed, whereas in the published literature the least frequently surveyed was sedentary behavior. As noted previously, the degree of detail varied somewhat across topic areas and may partially account for the relative levels of coverage observed. Nonetheless, the contrasts between the state surveys and those in the published literature are valid. In both the published literature and in the state surveys, behavior was the most frequently covered domain in the topic areas of nutrition, physical activity and sedentary behavior. In the area of weight status, both the published literature and the state surveys placed a greater emphasis on attitudes and perceptions. There appears to be a relatively greater number of surveys in the published literature that address the domain of attitudes/perceptions in these topic areas than in the state surveys/surveillance systems, however.

In terms of the differences in the specific topics covered by the state surveys versus the published literature, the following are examples of some noteworthy divergence in focus. In the topic area of nutrition, in the state surveys there were a greater number of surveys that addressed breakfast consumption than the published literature. Also, states frequently asked about supplement use, an item rarely covered in surveys in published literature. In addition, there were no published surveys that queried use of food labels, whereas at the state level this was asked with moderate frequency. Conversely, nutrition attitudes regarding intentions to engage in certain behaviors, and perceived competence and self-efficacy were more frequently covered in the published literature than in state surveys.

In the topic area of physical activity behavior, in general, physical activity related to transportation or household chores, as well as activity after school and program/facility access, were more frequently queried in the published literature than in the state surveys/surveillance systems. On the other hand, relative to the overall number of surveys in this topic area, the states conducted a greater number of surveys with question(s) related to frequency of physical activity sufficient to cause breathing hard and sweating. In the domain of attitudes and perceptions, notable topics for which there were a greater number of surveys in the published literature were self-perceived activity level relative to peers, perceived competence/self efficacy, perceived benefits of physical activity and attitudes towards physical activity.

In the area of sedentary behavior, for almost every topic, the published literature yielded a greater number of surveys than the state survey/surveillance systems. There are two notable exceptions to this; duration of TV viewing and duration of computer use were queried more frequently by state surveys/surveillance systems than in the published literature.

Topics related to weight status were queried more frequently in surveys in the published literature. The only two exceptions were weight satisfaction and self-reported weight and height; these were emphasized to a greater extent in the states than the published literature.

Several limitations of the information presented in this report are noteworthy: completeness, assessment of validity and reliability, and timeliness. For both the published literature and the state surveys/surveillance systems, our inclusion criteria for surveys were broad; surveys were “counted” in specific topic areas if there was one or more questions on the survey. Thus, the degree to which a specific construct was completely and accurately represented was not assessed. In the state surveys/surveillance systems, validation was self-reported, and many of the key informants reported not knowing whether validation was conducted. Further, social desirability may have resulted in an overestimate of this report; it was not feasible to verify this information. For these reasons, we elected not to include our information on the results on validity of state surveys/surveillance systems related to these topic areas. For the published literature, we are confident that our search strategy was thorough, and for journals covered by the major databases, our search was complete. For the state level information, we cannot verify that we identified all relevant activities. Although we contacted at least one person in each state, there were several key informants who were non-respondents to our efforts. Furthermore, given the staff turnover in state public health, especially over the last several years when funding has been particularly problematic, it is possible that not all key informants were knowledgeable about all pertinent survey activities or specifics regarding survey development and implementation. Thus, some pertinent survey activities may have been overlooked.

Evaluation of validity and reliability of the surveys identified in the published literature was problematic for a number of reasons. First, as detailed previously, many of the surveys administered consist of multiple parts, some of which are identifiable surveys themselves. Where it was possible, we evaluated the validity and reliability for identifiable parts separately. In some cases, subsections were not clearly described as such, and parts of the survey may have been subjected to evaluation of validity or reliability and other parts not. Distinguishing these is often not possible from the information included in the report.

A second pervasive problem is the sparseness of the information provided regarding assessment of validity and reliability. When this is included within the published article which used the survey, the level of information provided is quite limited. Journal editors are often responsible for the brevity of this information, but nonetheless, the information needed by the reader to make an independent assessment of this aspect is often lacking. For example, in an evaluation of criterion validity for a physical activity behavior measure, the report may not include details on the population used for the validation effort, the sample size, the protocol for the validation study, or an assessment of the quality of the “gold standard”. One of the most commonly implemented surveys used in studies of weight status was introduced in its “long form” in the early 1980’s, with an external report published regarding its reliability. To our knowledge no validation of the instrument was undertaken. Several years later, a “short form” was developed. The short version was subjected to reliability testing and “validated” against the long form. Thus, if one looks at studies using these items, the short form is “valid” and the long form has not been “validated.” Clearly the short version is not more valid than the longer one.

When an external report on a survey’s validity assessment is available, a candid appraisal of its relevance to the current application is rarely offered. Although the report may contain substantial detail of what was done and on whom, discussion of how the current version of the instrument was modified and how well the validation sample matches the current effort is omitted. Further, upon reading the conclusions of some of these secondary validation and

reliability studies, guarded language is common: “inconsistent responses...problematic”, “certain scales need refining”, “caution should be exercised when using in preadolescent children”, “virtually no agreement”; these comments underscore the fundamental idea that validity and reliability studies are not by themselves evidence of validity and reliability. Additionally, in some cases (e.g., research reported as part of doctoral dissertations), the external validations are difficult to obtain.

Even when validity or reliability have been evaluated and found to be adequate, caution is still appropriate. Validated items may have been adapted or modified; levels of validity are also specific to context, so that even moving an item’s placement may affect degree of validity. In addition, low-to- moderate levels of validity are often identified as evidence that the instrument is valid. The extent to which a measure, such as a survey item, is correlated with the “gold standard” construct it purports to reflect will influence its ability to identify significant associations. For example, if a physical activity survey measure is poorly correlated with daily physical activity (measured by accelerometry, for instance) its observed association to other variables of interest will be weakened.

Furthermore, due to variability in the ability of these measures to accurately capture different domains of behavior and attitudes, the relative importance of different aspects of behavior can be distorted. Finally, it does not appear that validity and reliability efforts that have been undertaken are always reported in the published literature. This conclusion is based on the observation that different applications of the “same” survey did not produce consistent reports of reliability and validity. Several possible explanations of this inconsistency are possible. This may be a simple oversight, may reflect authors’ differing assessments of the quality or relevance of the evaluation relative to their undertaking, or may reflect that different parts of some of these multi-part survey efforts are implemented in some applications and not in others. In sum, even with so-called validated measures, a thoughtful assessment of prior evaluations of validity and reliability should be undertaken relative to the intended application of the instrument.

This effort addresses areas of intense interest in the public health community at present, due to the dramatic increases in childhood overweight. The period covered in this report, 1997-2002, captures activity in state departments of health and education as the magnitude of the problem and its antecedents in the early stages of awareness. These activities have been on the increase more recently, a trend that is likely to continue to the extent that funding is available. It will be important to keep the information provided in this report up-to-date.

G. FUTURE DIRECTIONS

The current epidemic of obesity among school-age children will likely result in renewed interest in surveillance. We identified a fair amount of activity at the state level in nutrition, physical activity, sedentary behavior and weight status. More than two-thirds of surveys identified at the state level were YRBS, a survey that occurs predominantly at the high school level. Of the non-YRBS surveys, elementary-school aged children, especially in grades 1-3, were the least likely to be surveyed. Although the cognitive abilities of elementary-school aged children preclude extensive survey activities, this age group is especially important in terms of habit formation. Although YRBS has already been expanded to include middle schools in approximately 10 states and several big-city school districts, consideration of further expansion of YRBS activities to upper elementary school and all middle school grades might be considered. Some states, such as California, Georgia, and Texas, are engaged in several data collection activities and do target the elementary-school aged children. Useful models from these states could guide future activities in other less active states.

The published literature represents an extremely useful knowledge base from which to draw survey instruments as well as sampling strategies. The large number of individual surveys in all topic areas and domains represent a good starting point for state-level activities. In particular, states could borrow from surveys used in the published literatures in the domains of attitudes and perceptions and sedentary behavior given that current state survey activities less frequently tap this domain. As states and locales adopt weight screening in schools, it will be essential to capture ancillary information on weight-related behaviors and attitudes. In addition, sedentary behavior is increasingly recognized as a key behavioral risk indicator, and may be an important area of expansion for state surveys in order to identify and intervene in children at risk.

Of particular concern is the apparent limited validation and reliability testing of surveys reported in the published literature. For both validity and reliability, the issue is not “whether or not”, but the degree to which the instrument is valid or reliable, and in which populations and settings. As these self-reported measures become increasingly important for surveillance as well as for program evaluation, their validity is of pressing importance. We would encourage journal editors and their reviewers to insist that this information is provided in adequate detail for the reader to make an independent evaluation. Given the pressures for conciseness this may be an unrealistic recommendation. Alternatively, given the importance of using the validated and reliable measures, CDC might serve as a clearinghouse for researchers and state governments; making parts of this report available may provide a starting point in state personnel and researchers’ access to information on surveys that have been validated. Those in state government developing surveys and surveillance systems could examine specific references cited in order to determine the extent to which a survey has been validated in their area and domain of interest. In addition, there appears to be a need for technical assistance to state government personnel in assessing the degree to which “validation” implies that a specific survey instrument is an accurate reflection of the construct being investigated.

State-level personnel are well aware of the tremendous benefits of surveillance in these areas. They also raised a number of realistic cautions: access to schools, issues of confidentiality, resource constraints, and the like. Since the contract to support this effort was awarded there has been an explosion of interest in obesity, with a particular focus on children as a vulnerable and particularly impressionable group. Our interviews with individuals working in state government provide justification for guarded optimism. Although our knowledge base is far from complete, substantial research efforts are reflected in a moderately mature literature in these areas, especially nutrition and physical activity. National leadership, and the essential support of the

CDC, could substantially expand state surveillance in the areas of nutrition, physical activity, sedentary behavior and weight status.