Colorado Healthy Schools Smart Source:

Summary of Validity and Reliability Evidence

Andrea Pulskamp, Christine Williams, Sarah Forbes, Amy Dyett, & Amanda Strickland

The Colorado Education Initiative

June 2017

This research was supported by grants from Kaiser Permanente Colorado. The authors would like to thank the educators who completed Smart Source for their participation. The authors also wish to acknowledge and thank Kate Allison, Ph.D. and Emily Love, Ph.D. for their assistance in the development of this study.

Table of Contents

Overview

Colorado Healthy Schools Smart Source (Smart Source) is a comprehensive inventory of best practices related to health and wellness designed to inform improvements in school, district, and state policies and practices that positively impact student health and academic outcomes. In the state of Colorado, Smart Source serves as the only school-level health and wellness data collection effort to provide data back to schools and districts while also yielding aggregate data at the regional- and state-level. The purpose of this report is to present a case for the validity and reliability of Smart Source inventory by providing a review of relevant literature and previously existing related instruments; an overview of tool development, including pilot testing and results; and a summary of additional validity and reliability evidence based on analysis of Smart Source and other related data.

Importance of Health in Schools

Schools are increasingly promoting student health as an important contributor to academic achievement (Basch, 2010). Research across education, public health, and other social science disciplines demonstrates that physically and emotionally healthy students are more likely to be better learners and successful adults (Bradley & Greene, 2013; Michael, Merlo, Basch, Wentzel, & Wechsler, 2015). Recognizing the relationship between health and education, the Centers for Disease Control and Prevention (CDC) developed the Coordinated School Health (CSH) approach to guide schools in systematically and comprehensively addressing student health in the United States (Allensworth & Kolbe, 1987). Because the CSH was not widely accepted by educators, the CDC collaborated with ASCD, formerly known as the Association of Supervision and Curriculum Development, and other education and health experts to further develop a cross-sector approach to health in schools. This collaboration resulted in a unified framework known as the Whole School, Whole Community, Whole Child (WSCC) model (CDC, 2014c; Lewallen et al., 2015). The WSCC model consists of 10 components: 1) health education, 2) physical education and physical activity, 3) nutrition environment and services, 4) health

services, 5) counseling, psychological, and social services, 6) social & emotional climate, 7) physical environment, 8) employee wellness, 9) family engagement, and 10) community involvement.[1] The primary difference between the CSH and WSCC models is the expansion of two CSH components—healthy and safe school environment and family/community involvement—into four distinct WSCC components. This adjustment provides a greater emphasis on both the psychosocial and physical environment, as well as the distinct roles of families and community organizations in schools.

Importance of Evaluation and Measurement of School Health Efforts

The WSCC model promotes a coordinated, integrated, and systematic approach across all components in which health and education professionals work together to improve student outcomes through the implementation of health and wellness practices and policies (CDC, 2014c; Lewallen et al., 2015). Although the WSCC model provides an opportunity for such an approach, schools vary in their adoption, implementation, and evaluation of comprehensive health and wellness strategies (Brener et al., 2006). Comprehensive assessments of school health practices and policies are therefore needed to ensure that schools have a process by which they can assess relative strengths and gaps of school health efforts, inform improvements, and evaluate their success in implementing improvements (Basch, 2011).

CDC's School Health Index (SHI), the only nationally available tool assessing school-level health and wellness systems, is a voluntary assessment and planning tool with items addressing each of the components of the WSCC model (CDC, 2014b; Brener et al., 2006). Though effective for guiding decisions around school and district health efforts, successful implementation of the SHI is largely dependent on staff capacity, budgetary resources, administrator support (Pearlman, Dowling, Bayuk, Cullinen, & Thacher, 2005; Staten et al., 2005), and involvement of an external facilitator (Austin, Fung, Cohen-Bearak, Wardle, & Cheung, 2006). Serving exclusively as a self-assessment instrument to be

[1] The CSH model included eight components: 1) health education, 2) physical education, 3) nutrition services, 4) health services, 5) counseling, psychological, and social services, 6) healthy and safe school environment, 7) health promotion for staff, 8) family/community involvement.

completed by a school team, SHI data are not aggregated at the state or national level to provide meaningful comparisons for school and district leaders, policy makers, researchers, and funding organizations (Brener et al., 2006; CDC, 2014b). The CDC conducts two separate surveillance efforts among selected schools for the purpose of yielding state- and national-level school health data: the School Health Profiles (CDC, 2015b) and the School Health Policies and Practices Study (SHPPS; CDC, 2015a). While these large-scale survey efforts are important to capture trends in school health, neither disseminate school-level results to educators (Brener et al., 2006; Kann, Brener, & Wechsler, 2007; Foti, Balaji, & Shanklin, 2011). Furthermore, though the SHI and SHPPS both align with the WSCC model, efforts to match nationally representative SHPPS data to items found in the SHI are limited given the differences in tool development (Brener et al., 2006).

Purpose of Smart Source

Smart Source was developed by The Colorado Education Initiative (CEI), Colorado Department of Education (CDE), Colorado Department of Public Health and Environment, and Kaiser Permanente to address gaps in existing tools while also minimizing the burden of data collection on schools. Through stakeholder input sessions, focus groups, and informal interviews with school district staff and other school health experts, Colorado educators consistently indicated that schools and districts were asked to participate in numerous duplicative efforts to assess health policy and practice and did not receive actionable data back from these tools. Additionally, focus group and interview participants noted that the existing assessments were too cumbersome to complete and contained topics that were not relevant to their work in schools. As a result, many Colorado schools represented in these conversations either did not assess their school health efforts or they did so by creating their own assessments, preventing meaningful comparisons to other schools. Smart Source sought to address this input by:

- creating a comprehensive tool that is more objective and easier for schools to complete;

- yielding comparison data for schools and districts and other school health partners (e.g., funders, researchers, state agencies, non-governmental organizations) to inform resource allocation and policy decisions;
- providing schools and districts with meaningful reports that summarize school-level data alongside comparisons to guide health and wellness efforts; and
- streamlining multiple tools of school health that previously existed in the state to reduce the burden on schools and provide consistency in measures across participating schools.

As part of this streamlining, CEI integrated 17 key items from the CDC's School Health Profiles to meet its minimal measurement requirements and ensure Colorado schools were not approached separately to participate in the School Health Profiles data collection effort. Additionally, CEI coordinated with key funders and partners through a collective impact model to have Smart Source replace similar assessments, supporting consistent data collection across the state. For example, Smart Source became the required assessment for the Healthy School Champions Program, which recognizes Colorado schools for their success in school health. CEI also worked with Colorado school districts that previously administered their own assessments to help them implement Smart Source and prevent disparate data collection efforts across the state.[2]

As a comprehensive assessment of school health, Smart Source is grounded in the WSCC model with items that align with each of the model's components. However, because the WSCC model was not yet released at the time of Smart Source tool finalization in 2013, components on Smart Source represent a hybrid of the CSH and WSCC models with additional items addressing cross-cutting

[2] CEI decided not to include items on Smart Source that already existed in mandated data collections. For instance, items about the school meal program (beyond the number of minutes provided) were not included as this information is collected via federal and state processes by the Office of School Nutrition at CDE.

strategies and features that allow for effective school health efforts (e.g., a school wellness team) (see Table 1 for a description of each Smart Source component).[3]

Table 1. Components of Smart Source

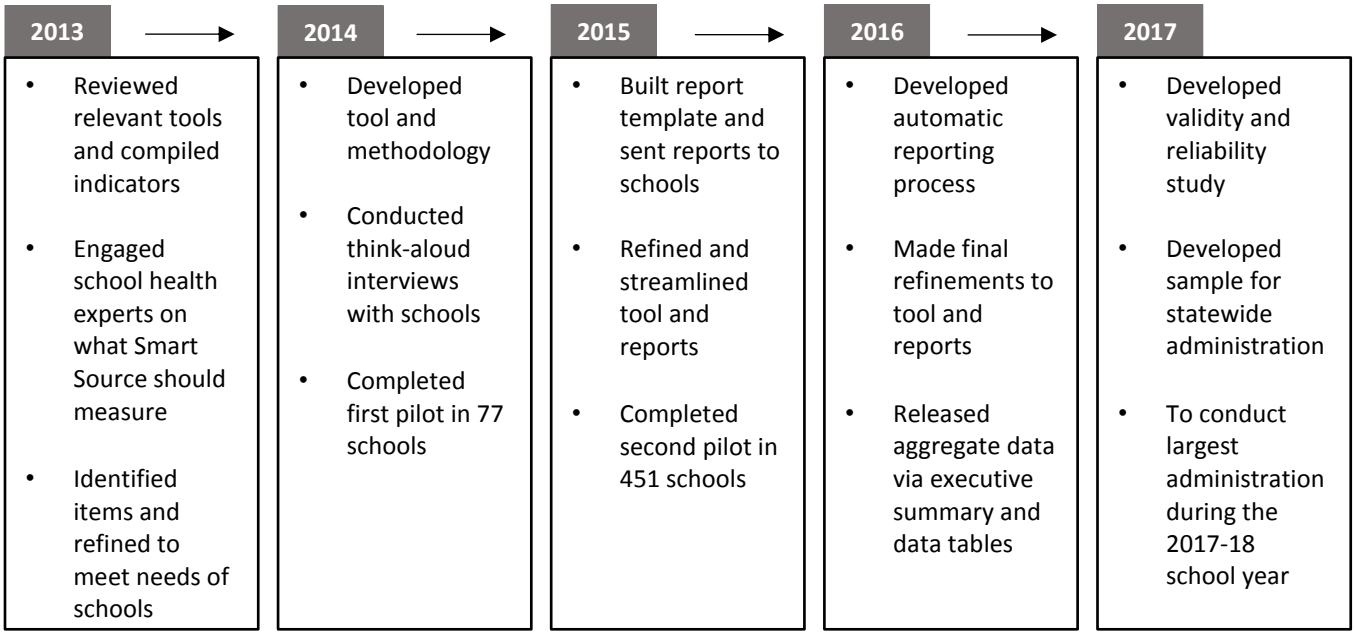
Component	Source	Description[4]
General Health Policies and Practices	N/A	Items assess cross-component practices that support the implementation of school health efforts and their integration into policies, systems, and culture. Example include having a wellness team and using data to make decisions.
Nutrition	CSH WSCC	Assessment of nutrition practices encompassing time allotted for meals, access to healthy foods/beverages, prohibition of unhealthy foods/beverages, and nutrition education.
Physical Education/ Physical Activity	CSH WSCC	Items assess components of the Comprehensive School Physical Activity Program (CSPAP), alignment with the Colorado Academic Comprehensive Physical Education Standards, and professional development of physical education teachers.
Health Education	CSH WSCC	Assessment of instruction towards making healthy choices, alignment with the Colorado Academic Comprehensive Health Education Standards, and professional development of health education teachers.
Health Services	CSH WSCC	Items assess management of student health needs, screening and referral practices, and access to and training of school nurses and support staff.
Counseling, Psychological, and Social Services	CSH WSCC	Assessment of counseling, psychological, and social services provided to students that help address social, emotional, and behavioral health needs, and alignment with the Colorado Framework for School Behavioral Health Services.
Healthy and Safe School Environment	CSH WSCC	Items assess crisis preparedness and response, aspects of school climate that promote a safe and engaging environment, and safety and accessibility of the physical environment.
Family, Community, and Student Involvement	CSH WSCC	Assessment of engagement within the school community, such as student co-creation, communication with families to promote healthy behaviors at home, and partnership with community-based organizations.
Staff Health Promotion	CSH WSCC	Items assess practices and policies that promote a healthy work environment for staff, including having a staff wellness team, programs for improving staff physical and mental health, and screening and referral practices.

[3] The current Smart Source tool is available at http://www.coloradoedinitiative.org/our-work/health-wellness/smart-source/

[4] All items contained within each component of Smart Source align with the current national model for school health, the Whole School, Whole Community, Whole Child model (WSCC). Current efforts are underway through Colorado's Healthy Schools Collective Impact to update the state of research further supporting these components, compiling findings into a guide to be released by 2018.

The following sections of this study discuss the development of Smart Source. Figure 1 serves as a high-level summary of this process, highlighting primary activities conducted between 2013 and 2017.

Figure 1. Overview of Smart Source Development



Tool Development

In spring 2013, as an initial step in the development of Smart Source, CEI and its partners (Appendix A) conducted a scan of existing health policy and practice tools (Appendix B), including their costs and benefits, legislative contexts or mandates, and whether they are publicly available. To guide this understanding, an advisory council consisting of school and district representatives, researchers, evaluators, funders, state agency representatives, and other school health and safety experts convened monthly to provide input and guidance on the Smart Source tool development process (Appendix C). Simultaneously, CEI conducted over 30 informal interviews with key school health experts representing offices at CDE, school health organizations in Colorado (e.g., Colorado Youth Matter, RMC Health, Rocky Mountain Prevention Research Center), and other state and national-level organizations (e.g., Florida Department of Education, American Academy of Pediatrics) to identify the content Smart Source should measure and determine whether existing tools could be adapted for Colorado.

Items from twenty assessments of school health were compiled to inform the content of the Smart Source tool. Conditions for inclusion were 1) the intended respondent(s) were school staff answering on behalf of the school, 2) the content assessed one or more of the CSH model components, and 3) items were general and comprehensive (e.g., not too specific to one component, and generalizable to Colorado rather than specific to one jurisdiction).[5] In partnership with a local research consulting firm, the 900 resulting items in this compilation were organized, categorized, and removed based on several criteria: 1) relevant to school health practice and policy, 2) measuring legislatively mandated reporting requirements, 3) assessing school-level indicators (rather than individual- or district-level), 4) objective (i.e., yielding verifiable information versus broad interpretation and personal judgement), and 5) sensitive (i.e., capturing meaningful variation overtime). For example, the following item was excluded from further consideration due to its subjectivity and failure to address a specific practice or policy: "Our physical, emotional, academic and social school climate is safe, friendly, and student-centered." Smart Source instead includes the item: "Does your school administer a survey to assess perceptions of school climate with the following: a) Students b) Teachers c) Other staff d) Parent/Guardians" to help schools understand whether they should consider assessing perceptions of school climate.

The remaining 609 items were shared with the advisory council to provide recommendations to help further prioritize items for inclusion, including:

- selecting only the most objective items among duplicative sets of items;
- consolidating items that measure similar constructs (e.g., grouping items assessing school food policies); and

[5] As tool development for Smart Source spanned both of CDC's adoptions of the CSH model and the subsequent WSCC model, the nine components within Smart Source are a hybrid between the CSH and WSCC, but all included items align with the WSCC.

- eliminating items that were overly specific and therefore a poor fit, given the goals of creating a tool that is feasible and yielding state-level data to inform policy decisions and resource allocation. For example, items assessing the efforts of food service staff to reduce the fat, sugar, and calories in meals, such as "spoon[ing] solid fat from chilled meat and poultry broth before use" (School Health Index; CDC, 2014b) were removed.

From there, 352 items remained and web-based surveys specific to each component of Smart Source were sent to content experts and the advisory committee to further cull the pool of items. Between 14 and 30 experts reviewed items within each content area, ranking them based on importance for assessment within a given component. The experts' rankings resulted in 265 indicators, all of which were consistently prioritized across the group. The advisory council then worked to group these indicators within each Smart Source component to decrease the burden on school respondents, resulting in a tool with numerous matrix items that combine multiple related indicators as sub-items and easily allow the respondent to answer items without having to read duplicative text. Following this consolidation, the final pilot tool had a total of 82 items measuring the 265 prioritized indicators of school health.

Prior to the 2014-15 pilot of Smart Source in schools throughout Colorado, CEI staff conducted five think-aloud interviews with school staff who would serve as site coordinators—those who oversee completion of the Smart Source inventory in their schools—to understand how respondents interpreted items, how they would facilitate completion of an item to which they did not readily know the answer, and how long it would take a school to complete the inventory.[6] These think-aloud interviews resulted in minor edits to a small number of items across the tool. For example, in the item "Does your school use the following personnel to support school safety on a regular basis?", the sub-item "local police" was

[6] Think-aloud interviews, a type of cognitive interview, are a qualitative data collection method in which participants think out loud as they perform a specified task (e.g., completing the Smart Source inventory). See Appendix D for the specific protocol used by CEI.

replaced with "local law enforcement" as rural schools noted that only cities have police forces and instead, they would work with the sheriff's office or highway patrol. [7]

The Smart Source tool includes separate versions for elementary, secondary, and combined schools, as slightly different practices and policies exist depending on the grades served. [8] The vast majority of all possible items (88%) are included in all three versions—a core set of indicators measuring universal best practices. As an example of the minor differences between tools, the elementary tool includes an item on recess practices, while the secondary tool assesses availability of interscholastic sports. Since combined schools serve both elementary and secondary grades, the combined tool includes all possible items in Smart Source.

Smart Source Administration

Pilot Recruitment and Participation

Smart Source was first piloted between October 2014 and January 2015 in 77 of Colorado's 1,765 K-12 public schools (4.4%), including 40 elementary schools, 32 secondary schools, and 5 combined schools. CEI recruited schools by requesting participation from districts and schools with which CEI had an existing relationship and targeted outreach to yield a diverse group of participating schools based on various characteristics, such as district size, region, school level (i.e., elementary, secondary, and combined), and setting (e.g., urban, rural).[9] Schools that participated in the first pilot were given $300 for the time and effort required to provide feedback on the items and process.

A similar recruitment strategy was applied to a second pilot of 451 K-12 public schools (25.2% of Colorado schools representing 41.7% of Colorado districts), between October 2015 and January 2016,

[7] This item was subsequently removed from the tool following the 2014-15 pilot as rural schools and urban elementary schools provided feedback about not having a need to regularly use security guards, school resource officers, or local law enforcement to support school safety and therefore, the item was deemed irrelevant for many schools in Colorado.

[8] Combined schools are schools that serve at least one elementary (K-5) and one secondary (6-12) grade. Examples include K-8 and K-12 schools.

[9] To learn about CDE's regions visit https://www.cde.state.co.us/cdeedserv/rgmapage.

which allowed for analysis of aggregate data at the state and regional levels, and by district size. The schools that participated in the second pilot, of which 67 also participated in the first pilot, included 226 elementary schools, 175 secondary schools, and 50 combined schools from rural, urban, and suburban communities. Schools that participated in the second pilot were also given $300 as an incentive. The majority of the data included in the remainder of this report reflect this second pilot, which was larger and more representative of statewide characteristics, including region, school level, district size, free and reduced price lunch (FRL) percentage, and truancy rate, than the first pilot.

As shown in Table 2, schools that participated in the second pilot ranged in size from 15 to 4,070 students (*M* = 513), and districts represented ranged from 37 to 90,234 students (*M* = 10,202). More than half (58.6%) of the sample represented districts from outlying town settings with populations between 1,001 and 7,000 persons (*n* = 22, 29.3%) or remote areas with populations less than or equal to 1,000 persons (*n* = 22, 29.3%).[10] The sample was reflective of the state overall, with an average FRL eligibility rate of 45.1%, truancy rate of 2.1%, and graduation rate of 78.7%. This pilot group of schools are compared to all Colorado schools in Table 2.

[10] To learn more about CDE's setting categories visit https://www.cde.state.co.us/cdereval/rvdefine.

Table 2. 2015-16 Sample and State Demographic Data

	Smart Source Pilot		Colorado	
Variable	*M*	*n* (%)	*M*	*n* (%)
District[a]		75 (41.7%)		180 (100%)
District Size (range 37-90,234)[b]	10,073		4,834	
District Setting				
Denver metro		11 (14.6%)		15 (8.3%)
Outlying city		7 (9.3%)		13 (7.2%)
Outlying town		22 (29.3%)		49 (27.2%)
Remote		22 (29.3%)		86 (47.8%)
Urban-suburban		13 (17.3%)		17 (9.4%)
School[c]		451 (25.2%)		1,792 (100%)
School Size (range 15-4,070)	513		485	
FRL Eligibility (%)	45.1		41.8	
Truancy (%)	2.1		2.4	
Graduation[d] (%)	78.7		78.9	
Type				
Elementary		226 (50.1%)		885 (49.4%)
Secondary		175 (38.8%)		671 (37.4%)
Combined		50 (11.1%)		236 (13.2%)

[a] Number of districts excludes Colorado BOCES (*n* = 5) and detention center (*n* = 1).
[b] Ranges represent Smart Source sample.
[c] The *n* of 1,792 for Colorado schools excludes detention centers and schools categorized as early childhood (*n* = 60).
[d] Only schools that include the 12th grade are included in graduation rate (*n* = 95 for the Smart Source sample).

Tool Refinement

Following both pilot administrations, items identified by respondents as problematic through item analyses (e.g., item difficulty and non-response), focus groups, and follow-up interviews were flagged for refinement by content experts, which included school and district representatives. This input from content experts was facilitated by a worksheet for each component highlighting: 1) the problematic item(s), 2) CEI's recommendation for removal/modification, 3) the rationale for the recommendation, 4) an opportunity for the identified expert to approve or disapprove the recommendation, 5) an opportunity to suggest other modifications, and 6) as relevant, new items

suggested through feedback. For gathering feedback from content experts, in-person meetings were convened when possible, but one-on-one calls or emails were used as needed. Prior to constructing new items based on suggested indicators, CEI staff researched the evidence base for the proposed practice or policy, determined whether any other tools measure that indicator, and developed or modified item(s) consistent with the Smart Source tool. Once finalized items were approved by content experts, they were included in the Smart Source instrument.

As an example of tool modification using the process outlined above, following the second Smart Source pilot, the counseling, psychological, and social services component was restructured with consultation from school mental health experts to improve alignment with the Colorado Framework for Behavioral Health Services and item interpretation (The Colorado Education Initiative, 2013). As an example, item difficulty for the item "Does your school assess all students (e.g., conduct a universal screening) at least once annually to identify their social, emotional, and behavioral health needs?" was lower than expected based on knowledge and experience of content experts. Due to this discrepancy, a question around interpretation of this item was included in the protocol for follow up interviews with pilot participants. Findings from these interviews indicated lacking comprehension of the term "universal screening", specifically for mental health. Therefore, a detailed definition that included examples of specific universal screening tools was written by content experts and added into the item. With this refinement and others, the newly drafted component was finalized through multiple rounds of feedback from content experts prior to its integration into the Smart Source instrument. Following the 2016-17 administration, an "off year" in which 131 schools participated, data were analyzed to assess the performance of the Smart Source tool, including the refined counseling, psychological, and social services component. Analyses were conducted for item difficulty and for non-response in addition to a review of relevant feedback collected within the tool. Based on this investigation, no further adjustments to the tool counseling, psychological, and social services component were deemed

necessary. CEI will continue to monitor response data for this component and the entirety of the tool following the 2017-18 administration and beyond.

Although the pilot process has concluded and CEI will limit changes to the tool to ensure longitudinal consistency, it is critical that Smart Source continues to be responsive to emerging best practices and changes in both state and federal law. As an example of the latter, CEI staff anticipate adding an item to the tool to address the federal legislation Local School Wellness Policy Implementation Under the Healthy, Hunger-Free Kids Act of 2010 (2016), which requires all schools to assess the implementation and progress of their district's local wellness policy. If Smart Source does not serve as the evaluation required under this legislation, new assessments will emerge, thereby further burdening schools with additional tools. The new local wellness policy item, along with any future additions, will be drafted by CEI and reviewed by content experts until consensus around the final version is achieved. Furthermore, CEI will conduct brief think-aloud interviews specific to the proposed new item(s) with school and/or district staff. If additional adjustments are needed, a modified draft will again be presented to content experts for final approval. Following administration of the refined tool, CEI will review respondent feedback collected within the instrument and conduct item analyses to check performance of the new item(s).

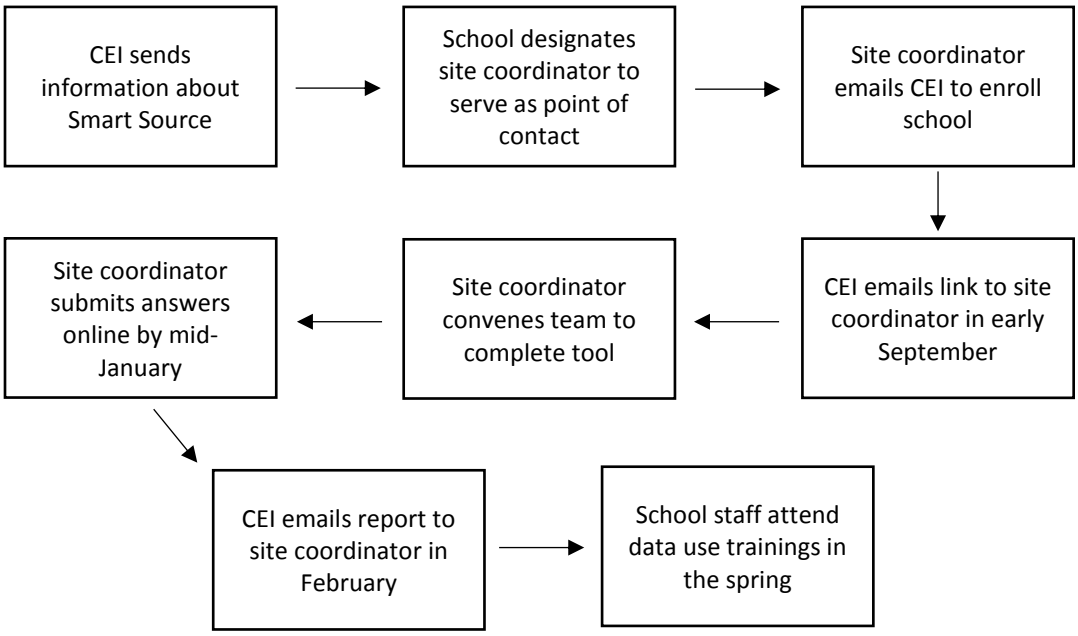
Administration Process and Methodology

Participation in Smart Source is voluntary and free. Once schools are identified for recruitment, outreach occurs in the summer prior to school year administration, which takes place between September and mid-January (see Figure 2 for an outline of the Smart Source administration process).[11] When deciding to participate, schools designate a site coordinator to oversee the completion and

[11] Any Colorado K-12 school is eligible to participate in Smart Source. During the 2015-16 administration, to coordinate with the CDC's School Health Profiles (SHP), CEI additionally utilized the SHP sample for Colorado schools to guide recruitment. For the 2017-18 administration, CEI will employ a stratified random sample of schools based on region and district size.

submission of the tool and to serve as CEI's point of contact. CEI recommends that participating schools complete the inventory as a team to increase the reliability of the data and to generate buy-in for assessing school health efforts. As outlined in the in-tool instructions for each component, input from administrators, physical education teachers, health educators, school nurses, school counselors, food service staff, members of school wellness teams, students, parents, and community partners is strongly encouraged. A paper version of the online instrument is available to help facilitate group input and the site coordinator is instructed to gather all responses and input them into the online version of Smart Source. Throughout the administrative process, CEI provides technical assistance to schools, such as enrolling schools, sending reminder emails, and re-opening prematurely submitted surveys.

Figure 2. Summary of Smart Source Administration Process



Following the pilot phase, results from surveys and follow-up interviews indicated many schools desired an "off year" from assessing their health efforts, citing that changes to school health practices and policies likely do not occur within one year. Therefore, Smart Source will henceforth be administered during school years beginning with odd numbers (e.g., 2015-16, 2017-18) in which active

recruitment takes place to yield more representative state, regional, and district data. During even-numbered school years, the tool will remain available to interested schools, though less participation is anticipated. The decision to move active administration to a biennial cycle was also made to better coordinate with Healthy Kids Colorado Survey (HKCS), the state's student-level assessment of health attitudes and behaviors (Colorado Department of Public Health & Environment, 2015a). While they are distinct surveys, CEI recommends that secondary schools administer HKCS in tandem with Smart Source, so they can more deeply understand how school-level practices and policies affect their students.

Reporting

In February following each Smart Source administration, school-level reports generated through an automated database are provided to schools, showing how responses aligned with best practices and how they compared to district, region, and state aggregates (where possible).[12] Comparisons are reported as the percentage of schools reporting best practices within the designated district, region, and state. District-level reports are also available to districts with participation from at least five schools from one or more school levels. Additionally, for schools that frequently work together in a collective that spans district boundaries (e.g., Boards of Cooperative Educational Services, or BOCES), a report aggregating the results from the participating schools within that group is available.

For each of the three report types, CEI returns two documents: a summary graphic report and a detailed spreadsheet.[13] The graphic report provides a high-level summary of results from select items using figures and tables that can be easily be shared with stakeholders. The spreadsheet serves as a comprehensive data table that includes all possible data for all items on Smart Source. Trend data are provided in the spreadsheet for schools and districts that have participation across multiple years to

[12] To release state and regional comparisons, at least five schools from any given school level (i.e., elementary, secondary, combined) must participate to protect the confidentiality of participating schools.
[13] For sample reports and publicly available Smart Source data, visit http://www.coloradoedinitiative.org/our-work/health-wellness/smart-source/

compare responses over time. In addition to the detailed instructions included within each report type around interpretation and recommended data use, CEI offers free data use trainings via webinars and in-person sessions throughout the spring semester.

Similar to the tool development process, the creation of Smart Source reports was user-centered and driven by educator input. Following each pilot, feedback was collected from participants specifically about reports and data use through surveys and follow-up interviews. These suggestions led to various improvements, such as simplifying data visualizations, framing data towards action, including trend data, and offering a report for select schools within a collective upon request.

In addition to returning school- and district-level reports, CEI publicly disseminates Smart Source data at the state and regional levels through presentations, newsletters, and its website. For instance, CEI released an executive summary following the 2015-16 administration along with data tables that aggregated results at the state and regional level and by district size.[14] CEI also developed a one-page overview highlighting differences by district size.[15]

Additional Validity and Reliability Evidence

In addition to providing a detailed review of the tool development, pilot administration, and current methodology, results from various analyses are shared below to further support the validity and reliability of the Smart Source inventory. Specifically, the following hypotheses—informed by school health research, best practices, and expertise—were explored to assess whether the tool's results aligned with previously accepted patterns in school health and whether it remained stable over time, and results are provided below:

[14] The district-size aggregate represents data combined at the state level, not individual district results.
[15] The 2015-16 Executive Summary, state and regional data tables, and district size overview are available online at http://www.coloradoedinitiative.org/our-work/health-wellness/smart-source/

1) Comparisons of Smart Source results across key district and school characteristics, including district setting, district size, and school level (i.e., elementary or secondary), align with previously observed patterns;
2) Schools with wellness teams experience greater positive impacts from Smart Source participation, as measured by an end-of-year CEI program evaluation survey, given their existing structure to examine and act on Smart Source results; and
3) Responses to Smart Source items measuring relatively stable indicators (i.e., physical environment characteristics) do not substantially change between the 2014-15 and 2015-16 Smart Source administrations.

These hypotheses were prioritized given the availability of data and capacity to conduct corresponding analyses. As noted above, Smart Source was designed to be an inventory rather than a traditional perception survey, and therefore, the components within the tool are not considered survey constructs. Items within each of these components can be—and often are—unrelated to one another, and therefore other reliability analyses, such as a test of internal consistency (e.g., Cronbach's alpha), have not been conducted.[16] A fourth hypothesis was planned to assess the extent to which Smart Source results align with results from CDE's Report Card March data collection, specifically related to data on the presence of school wellness teams. Upon further investigation, however, CEI determined this analysis would not accurately assess validity, given numerous differences between Smart Source and Report Card March. For instance, Report Card March is a data collection facilitated primarily through school districts rather than directly with schools. Additionally, Report Card March data are pre-populated with the previous year's responses, potentially resulting in less change in the results from year to year. In general, the results included below provide evidence that Smart Source is accurate in its

[16] CEI will continue to assess opportunities to expand upon the validity and reliability analyses presented in this document and as appropriate, update this report with additional findings.

measurement, since its results align with patterns found in previous research, upon which these hypotheses were determined.

Comparisons by School/District Characteristics

To test the first hypothesis, Smart Source responses were examined by various school and district characteristics, including district setting, district size, and school level, and as shown below, overall results aligned with previously observed patterns in school health. First, exploring Smart Source results by district setting showed that schools located in rural communities (defined as remote districts through CDE's setting categories) have the least access to a qualified school nurse, which previous research has also shown (Ramos, Fullerton, Sapien, Greenberg, & Bauer-Creegan, 2014)—only 18% of these remote schools have a school nurse present at their buildings for more than 20 hours per week, compared to 45% across all Smart Source participating schools. Additionally, schools in remote settings are the least likely to report having programming or partnerships to provide safe routes to schools (13% in remote schools compared to 42% across the state)—an expected result given national trends in walking and bicycling to schools (National Center for Safe Routes to School, 2013).

Also in line with previous school health research (McCarthy, Kelly, & Reed, 2000), Smart Source results indicate that schools in medium or large districts have greater access to half- and full-time health staff (i.e., school nurses, psychologists, social workers) as compared to schools in small districts.[17] Among the cited examples, the greatest disparity exists in half- to full-time access to school psychologists, occurring in 51% of schools in large districts, 46% of schools in medium districts, and only 5% of schools in small districts. Additionally, schools in small districts are the most likely to partner with community organizations, such as health departments, social service agencies, and health clinics. For example, 73% of schools in small districts partner with health departments, compared to 53% of schools

[17] District size categories are defined as the following: small districts have less than 1,201 students, medium districts have between 1,201 and 25,000 students, and large districts have greater than 25,000 students.

in medium districts, and 30% of schools in large districts. This trend aligns with anecdotal evidence demonstrating how schools in small districts, likely situated in smaller communities, have increased networking across local organizations.

Smart Source results by school level are highlighted in Table 3 below. Elementary schools are more likely than secondary schools to offer physical activity opportunities before the school day and in the classroom, and a higher percentage of elementary schools provide a school-wide approach to support student social and emotional learning—results that also align with prior research (Kohl & Cook, 2013, p. 35; Spaulding, Horner, May, & Vincent, 2008). Additionally, a higher percentage of secondary schools allow student purchasing of snack foods and beverages and teach sexual health education compared to elementary schools, as previous studies have highlighted (Finkelstein, Hill, & Whitaker, 2008; Colorado Youth Matter, 2012).

Table 3. 2015-16 Smart Source Comparisons by School Level[18]

Item	Elementary Frequency (*n*=225)	Secondary Frequency (*n*=175)
Elementary schools are more likely to implement the following:		
Offer physical activity breaks in classrooms	96.0%	60.6%
Provide a school-wide approach to support student social and emotional learning	92.9%	72.4%
Engage with parent organization to discuss school health needs and strategies	71.7%	43.9%
Offer physical activity opportunities before the school day	63.6%	48.0%
Host school health activities for families	56.6%	36.6%
Secondary schools are more likely to implement the following:		
Prohibit harassment based on a student's sexual orientation or gender identity	59.8%	94.2%
Have written policy prohibiting harassment and bullying (including cyber-bullying)	80.9%	92.0%
Teach sexual health education	45.3%	79.4%
Collect suggestions from students about school culture and climate	56.9%	70.1%
Allow student purchasing of snack foods or beverages on school grounds	22.6%	66.3%

[18] Combined schools, serving both elementary and secondary grades, were not included in this analysis.

Comparisons by Presence of School Wellness Team

As part of the second analysis, CEI administered an end-of-year health and wellness survey in spring 2016 to evaluate several of its programs, including Smart Source. Responses from 205 Smart Source site coordinators were compared to examine differences between schools with and without wellness teams. Because the presence of a wellness team reflects a commitment to school health and provides a structure for implementing school health efforts (CDC, 2014a), respondents from schools with wellness teams were expected to self-report more long-term positive impacts of Smart Source. The data supported this hypothesis, as a higher percentage of schools with wellness teams reported that Smart Source helped their school implement more evidence-based school health policies and practices (85%) compared to those without wellness teams (72%). Wellness team schools were also more likely to report that Smart Source has improved student health outcomes than schools without teams (85% and 78%, respectively). Additionally, schools with wellness teams are more likely to use Smart Source data, especially to evaluate effectiveness of health policies and practices—73% of schools with wellness teams report using data in this way, compared to 53% of schools without wellness teams.

Comparisons Across 2014-15 and 2015-16 Smart Source Results

To test the third hypothesis, responses on items measuring relatively stable indicators about schools' physical environments, such as guardrails on stairways and sufficient lighting, were compared between 65 schools that participated in both 2014-15 and 2015-16 Smart Source administrations. Because these Smart Source items relate to physical features of school, some of which would require a substantial amount of construction and resources to modify, these items were anticipated to change very little between the two administrations to provide evidence of the reliability of the Smart Source

tool. For each of these items, the vast majority of schools provided the same response over the two administrations, with an average rate of agreement of 84%, thus supporting the hypothesis.[19]

Guidelines for Use

As noted above, a primary intended use of Smart Source is to guide school-level health and wellness efforts, and CEI program evaluation results indicate that participating in Smart Source helps schools address health in a variety of ways (see Table 4 for the reported outcomes of Smart Source participation). The most commonly identified effects of Smart Source are providing useful data about health efforts, equipping staff to make more informed decisions about school health, increasing knowledge about school heath, and improving schools' abilities to evaluate their health efforts.

Table 4. Reported Outcomes for Smart Source Participation[20]

Participating in Smart Source:	Percentage of Favorable Responses (*n*=205)
Provided my school with useful data about our health policies and practices	95.6%
Equipped me to make more informed decisions that benefit students at my school	94.6%
Increased my knowledge about the comprehensiveness of school health	92.6%
Improved my school's ability to effectively evaluate health and wellness	91.2%
Increased my knowledge about the importance of health policy and practice data	84.3%
Had a positive impact on student health outcomes at my school	83.4%
Helped my school implement more evidence-based school health policies and practices	82.4%
Led to health and wellness being more integrated in my school culture	77.5%
Encouraged me to utilize other types of health and wellness data	77.5%

[19] CEI hopes to conduct more longitudinal analyses moving forward, such as qualitative follow-up site visits and/or interviews with schools that had substantial change in their Smart Source responses over time, and is interested in funding opportunities to support these analyses.

[20] Results are taken from the evaluation of Smart Source within CEI's health and wellness survey, administered in spring 2016 to school staff who participated in Smart Source in 2015-16.

In addition to schools and districts, Smart Source data have utility for additional stakeholders, such as state agencies, local public health agencies, non-profits, universities, and funders that can access publicly available Smart Source data or data shared by schools and districts. CEI recommends that, where possible, these organizations partner with schools and districts at the local level to support school health efforts. As such, all relevant stakeholders are encouraged to engage with Smart Source data to identify general gaps in school health, inform decisions regarding resource allocation, make the case for policy change, garner support for school health programs, and evaluate the reach and impact of policies and practices.

Since Smart Source represents only a single data collection at the school level, schools and districts should triangulate their Smart Source results with other data sources to capture a more complete picture of school health and wellness. Related data available at the individual level (i.e., students or staff) include HKCS, climate surveys, student and teacher perception surveys, discipline data, and attendance data. Extending beyond the school building, schools can access state and county data about childhood health, including the Child Health Survey and Kids Count (Colorado Department of Public Health & Environment, 2015a, 2015b; Colorado Children's Campaign, 2016). When choosing other data sources to examine in conjunction with Smart Source results, CEI recommends schools and districts begin with those already at their disposal to minimize burden. Similarly, CEI recommends that future evaluations or legislation use Smart Source when possible to streamline school health assessments.

Lastly, CEI advises against the use of Smart Source for evaluating school and district personnel, measuring accountability, assigning scores based on health and wellness efforts, or in high stakes decisions.[21] Smart Source is a formative tool, supporting the learning of schools and districts, and should

[21] The completion of Smart Source is a required application component for the Healthy School Champions recognition program at CEI. Actual responses on Smart Source are not ranked and do not contribute to the scoring of applicants, which is exclusively based on content provided in the narrative application and letters of support.

not serve as a summative assessment. Furthermore, to maintain quality data, participants should not experience any pressure to respond inaccurately.

Next Steps

Looking ahead, CEI prepares for its largest Smart Source administration to date in 2017-18, to then be subsequently administered on a biennial basis to obtain state-level data about the health policies and practices in place in Colorado schools. In addition to its continued coordination with school-level health and wellness surveys (e.g., School Health Profiles, district-level assessments), Smart Source will expand its partnership with the HKCS by coordinating in the recruitment of schools, streamlining communication, and promoting the use of data from both efforts as complementary by providing schools with a complete picture of their school's health. Furthermore, in partnership with staff at Colorado State University and the University of Colorado Denver, CEI staff plan to explore research questions about the role of schools in addressing mental health by using data from both Smart Source and HKCS. These findings will be available in early 2018.

As previously discussed, CEI will integrate new items into Smart Source for the 2017-18 administration that will meet the requirements of the Healthy, Hunger-Free Kids Act of 2010 for schools to assess the implementation of their district's local wellness policy (2016). Furthermore, CEI staff are exploring how Smart Source might be able to meet the needs assessment requirement outlined in the Every Student Succeeds Act (2016), the federal reauthorization of the Elementary and Secondary Education Act of 1965.

CEI will also provide an immediate report to participating schools during the 2017-18 administration, returned within one week of their Smart Source submission. As final reports with comparison data are not available until February, this report will help schools prioritize their health efforts in the interim by identifying where a given school has gaps in best practices across all Smart

Source components. This report type is user-centered and informed by participant feedback collected during the pilot phase.

Lastly, many Smart Source indicators have been identified for shared measurement by Colorado Healthy Schools Collective Impact, a group of leading organizations committed to improving student health outcomes by systematically supporting schools in their health and wellness efforts, including through consistent data collection. As an example of this statewide coordination, a growing number of Colorado school health funders required their grantee schools to participate in Smart Source in the 2016-17 school year instead of other disparate survey efforts often required in the past.

References

Allensworth, D. D., & Kolbe, L. J. (1987). The comprehensive school health program: Exploring an expanded concept. *Journal of School Health*, *57*(10), 409-412. doi:10.1111/j.1746-1561.1987.tb03183.x.

Austin, S. B., Fung, T. T., Cohen-Bearak, A., Wardle, K., & Cheung, L. W. Y. (2006). Facilitating change in school health: A qualitative study of schools' experiences using the School Health Index. *Preventing Chronic Disease 3*(2), 1-8. Retrieved from https://dash.harvard.edu/bitstream/handle/1/4582587/1564114.pdf?sequence=1.

Basch, C. E. (2010). Healthier students are better learners: A missing link in school reforms to close the achievement gap. Equity Matters. Research Review No. 6. Retrieved from http://files.eric.ed.gov/fulltext/ED523998.pdf.

Basch, C. E. (2011). Healthier students are better learners: A missing link in school reforms to close the achievement gap. *Journal of School Health*, *81*(10), 593-598. doi:10.1111/j.1746-1561.2011.00632.x

Bradley, B. J., & Greene, A. C. (2013). Do health and education agencies in the United States share responsibility for academic achievement and health? A review of 25 years of evidence about the relationship of adolescents' academic achievement and health behaviors. *Journal of Adolescent Health*, *52*(5), 523-532. Retrieved from http://dx.doi.org/10.1016/j.jadohealth.2013.01.008.

Brener, N. D., Pejavara A., Barrios, L. C., Crossett, L., Lee, S. M., McKenna, M., Michael, S., & Wechsler. (2006). Applying the School Health Index to a nationally representative sample of schools. *Journal of School Health*, *76*(2), 57-66. doi 10.1111/j.1746-1561.2006.00069.x.

Centers for Disease Control and Prevention. (2014a). Forming a school health team. Retrieved from: https://www.cdc.gov/HealthyYouth/SHI/Training/10-Resources/docs/Team.pdf

Centers for Disease Control and Prevention. (2014b). School Health Index: A self-assessment and planning guide. Retrieved from https://www.cdc.gov/healthyschools/shi/pdf/middle-high-total-2014.pdf.

Centers for Disease Control and Prevention. (2014c). Whole School, Whole Community, Whole Child (WSCC): A collaborative approach to learning and health. Retrieved from https://www.cdc.gov/healthyschools/wscc/wsccmodel_update_508tagged.pdf.

Centers for Disease Control and Prevention. (2015a). Results from the School Health Policies and Practices Study 2014. Retrieved from https://www.cdc.gov/healthyyouth/data/shpps/pdf/shpps-508-final_101315.pdf.

Centers for Disease Control and Prevention. (2015b). School Health Profiles 2014: Characteristics of health programs among secondary schools. Retrieved from https://www.cdc.gov/healthyyouth/data/profiles/pdf/2014/2014_profiles_report.pdf

Colorado Children's Campaign. (2016). *Kids Count.* Retrieved from http://www.coloradokids.org/data/kidscount/2016kidscount/

Colorado Department of Public Health and Environment. (2015a). Child Health Survey. Retrieved from http://www.chd.dphe.state.co.us/Resources/mchdata/CHS/CHS2015FINAL12_16_14.pdf

Colorado Department of Public Health & Environment. (2015b). Healthy Kids Colorado Survey. Retrieved from https://www.colorado.gov/cdphe/hkcs

Colorado Education Initiative. (2013). Colorado Framework for School Behavioral Health Services. Retrieved from http://www.coloradoedinitiative.org/resources/schoolbehavioralhealth/

Colorado Youth Matter. (2012). Colorado Sex Education Snapshot: 2012 Update. Retrieved from: http://www.coloradoyouthmatter.org/images/stories/pdf/snapshot_update.pdf

Elementary and Secondary Education Act of 1965, As Amended by the Every Student Succeeds Act-Accountability and State Plans, 81 Fed. Reg. 86076 (November 29, 2016) (to be codified at 34 C.F.R. pts. 200, 299). Retrieved from https://www.gpo.gov/fdsys/pkg/FR-2016-11-29/pdf/2016-27985.pdf

Finkelstein, D. M., Hill, E. L., & Whitaker, R. C. (2008). School food environments and policies in US public schools. *Pediatrics*, *122*(1), 251-259. doi: 10.1542/peds.2007-2814.

Foti, K., Balaji, A., & Shanklin, S. (2011). Uses of Youth Risk Behavior Survey and School Health Profiles data: Applications for improving adolescent and school health. *Journal of School Health*, *81*(6), 345-354. doi:10.1111/j.1746-1561.2011.00601.x.

Kann, L., Brener, N. D., & Wechsler, H. (2007). Overview and summary: School health policies and programs study 2006. *Journal of School Health*, *77*(8), 385-397. doi:10.1111/j.1746-1561.2007.00226.x.

Kohl, H.W., & Cook, H. D. (Eds.). (2013). *Educating the student body: Taking physical activity and physical education to school.* Washington (DC): National Academies Press.

Lewallen, T. C., Hunt, H., Potts-Datema, W., Zaza, S., & Giles, W. (2015). The Whole School, Whole Community, Whole Child model: A new approach for improving educational attainment and healthy development for students. *Journal of School Health*, *85*(11), 729-739. doi:10.1111/josh.12310.

Local School Wellness Policy Implementation Under the Healthy, Hunger-Free Kids Act, 81 Fed. Reg. 50151 (July 29, 2016) (to be codified at 7 C.F.R. pts. 210, 220). Retrieved from https://www.gpo.gov/fdsys/pkg/FR-2016-07-29/pdf/2016-17230.pdf

McCarthy, A. M., Kelly, M. W., & Reed, D. (2000). Medication administration practices of school nurses. *Journal of School Health, 70*(9), 371-376. doi:10.1111/j.1746-1561.2000.tb07277.x

Michael, S. L., Merlo, C. L., Basch, C. E., Wentzel, K. R., & Wechsler, H. (2015). Critical connections: Health and academics. *Journal of School Health*, *85*(11), 740-758. doi:10.1111/josh.12309.

National Center for Safe Routes to School. (2013). Trends in walking and bicycling to school from 2007 to 2012. Retrieved from: http://saferoutesinfo.org/sites/default/files/Trends_in_Walking_and_Bicycling_to_School_from_2007_to_2012_FINAL.pdf

Pearlman, D. N., Dowling, E., Bayuk, C., Cullinen, K., & Thacher, A. K. (2005). From concept to practice: Using the School Health Index to create healthy school environments in Rhode Island elementary schools. *Preventing Chronic Disease*, *2*(1), 1-16.

Ramos, M. M., Fullerton, L., Sapien, R., & Greenberg, C. (2014). Rural-urban disparities in school nursing: Implications for continuing education and rural school health. *The Journal of Rural Health*, *30*(3), 265-274. doi: 10.1111/jrh.12058

Spaulding, S. A., Horner, R. H., May, S. L., & Vincent, C. G. (2008). Implementation of school-wide PBIS across the United States. Retrieved from: http://www.pbis.org/evaluation/evaluation_briefs/nov_08_%282%29.aspx.

Staten, L. K., Teufel-Shone, N. I., Steinfelt, V. E., Ortega, N., Halverson, K., Flores, C., & Lebowitz, M. D. (2005). The School Health Index as an impetus for change. *Preventing Chronic Disease*, *2*(1), 1-9.

Appendix A. Smart Source Tool Informants

School District and Boards of Cooperative Educational Services (BOCES) Contributors	
School District/BOCES	**Role(s)**
Academy 20 School District	Counselor
Adams 12 School District	Superintendent; School Wellness Coordinator; Coordinated School Health Manager
Archuleta School District	Principal; Prevention Coordinator
Aurora Public Schools	Instructional Coach for the Arts and Physical Education; Teacher; 5th Gear Kids Coordinator
Boulder Valley School District	Director of Health; Health and Wellness Coordinator; Director of Health Services
Brighton School District 27J	Healthy Schools Coordinator
Buffalo School District	Family & Consumer Sciences Teacher
Canon City Schools	Regional Wellness Coordinator
Centennial R-1	Data Coach; PE Teacher
Center School District	Counselor
Cripple Creek-Victor School District RE-1	Wellness Coordinator
Denver Public Schools	Manager, Healthy Schools Team; Health Specialist; School Health Specialist; Instructional Leadership Team Member
Dolores RE-4	Principal
Douglas County School District	Healthy Schools, Successful Students Coordinator; Assistant Coordinator for HSSS
Durango 9-R	District Nurses; Health Education Consultant
Englewood Public Schools	Wellness Coordinator
Falcon 49 School District	District Wellness Coordinator
Fremont County School Districts	Assistant Regional Wellness Coordinators
Greeley 6 School District	Director of Nutrition Services
Harrison School District	Grant Manager, Healthy Schools Colorado; IB Coordinator/Literacy Coach; 2nd Grade Teacher
Jeffco Public Schools	Healthy Schools Coordinator; Health Education Specialist
Lake County School District	Health & Wellness Coordinator

Lewis Palmer School District	Director of Nutritionals Services
Mancos School District	Director of Student Nutrition; Registered Nurse
Manitou Springs School District 14	Director of Instruction; Executive Director, Partners for Healthy Choices
Morgan County School District	Math Teacher
Poudre School District	District Wellness Coordinator; School Wellness Specialist
Pueblo 60 School District	Dance Teacher
San Juan BOCES	PE Curriculum Grant Coordinator; Coordinator for Safe Schools
Santa Fe Trail BOCES	Data Management Tech
St. Vrain Valley School District	School Wellness Coordinator
Thompson School District	District Wellness Coordinator; Wellness Specialist; Teacher
Weldon Valley School District	Superintendent
Westminster 50 School District	Wellness Coordinator
Woodland Park RE-2	Physical Education Teacher
Other Contributing Organizations	
Organization	**Role(s)**
9Health Fair	Director of the Education Program
Action for Healthy Kids	Regional Field Manager; State Coordinator
Colorado Association for Health, Physical Education, Recreation and Dance	Executive Director
Colorado Association for School-Based Health Care	Director of Engagement and Policy
Colorado Department of Education	Chief Information Officer; Director, Health and Wellness; Title V Program Manager' Physical Education Specialist' Brain Injury Health Consultant; Healthy School Champions Coordinator; Office of School Nutrition; School Nurse Director
Colorado Department of Public Health and Environment	Director, Epidemiology, Planning and Evaluation; Director of Youth and Young Adult Initiatives; Public Health Planner; SBHC Program Coordinator; School Health Specialist; Youth Health Specialist; Worksite Wellness Manager; School Based Health Centers
Colorado Health Institute	Researcher
Colorado School of Public Health	Student

Colorado Youth Matter	Manager of Community Programs
Denver Museum of Nature & Science	School Partnership's Coordinator
LiveWell Colorado	Vice President of Policy; TA Manger
Planned Parenthood of the Rocky Mountains	Education Program Manager
Random Acts of Kindness Foundation	Vice President; Communications Director
RMC Health	Professional Development Consultants
The Colorado Health Foundation	Senior Public Policy Officer; Program Officer; Communications Manager
Tri-County Health Department	Strategic Partnerships Manager; School Liaison; Chronic Disease Prevention Coordinator
UC Health	Health and Wellness Specialist
Weld County Department of Public Health	Registered Dietitian and Health Communication Specialist; Health Educator
Western Dairy Association	Senior Director, School Health and Wellness Programs
Boys and Girls Club of La Plata County	Health & Physical Education Director
Center for Research Strategies	President
Children's Hospital Colorado	Manager of Healthy Kids Program
Colorado Children's Campaign	Vice President of Public Affairs
Colorado Children's Immunization Coalition	CEO
Colorado School Safety Resource Center	Director
Columbia University	Professor
Healthy People Project	CEO
Kaiser Permanente	Physician; Integrated Arts Manager
Metro Community Provider Network	School-Based Health Program Manager
National Center for School Engagement	Co-Director
OMNI Institute	Regional Prevention Consultant
Rocky Mountain Prevention Research Center	Associate Director
San Juan Basin Health Department	Healthy Living Program Manager
State Board of Education	Member

The Colorado Education Initiative	Director, Health and Wellness; Coordinator, Health and Wellness
U.S Environmental Protection Agency	Region 8 Lead
University of Colorado Springs	Evaluator
University of Colorado Denver	Project Manager, Integrated Nutrition Education Program

Appendix B. Other Instruments Used in Tool Development

Other Instruments Used in Tool Development			
Sponsoring Organization	**Tool Name**	**Components**	**Website**
Centers for Disease Control and Prevention	School Health Index	• Health education • Physical education • Health services • Nutrition services • Counseling, psychological and social services • Healthy school environment • Health promotion for staff • Family/Community involvement	https://www.cdc.gov/healthyschools/shi/index.htm
	School Health Policies and Practices Study	• Health education • Physical education and activity • Health services • Mental health and social services • Nutrition services • Healthy and safe school environment • Faculty and staff health promotion • Family and community involvement	https://www.cdc.gov/healthyyouth/data/shpps/index.htm
	School Health Profiles	• School health education requirements and content • Physical education and physical activity • Practices related to bullying and sexual harassment • School health policies related to tobacco-use prevention and nutrition • School-based health services • Family engagement and community involvement • School health coordination	https://www.cdc.gov/healthyyouth/data/profiles/index.htm
Colorado Department of Education & The Colorado Education Initiative	Healthy School Champions Score Card	• Health education • Physical education • Health services • Nutrition services • Counseling, psychological and social services • Healthy school environment • Health promotion for staff • Family/Community involvement	http://www.coloradoedinitiative.org/wp-content/uploads/2017/05/ScoreCard2012.pdf
Rocky Mountain Prevention Research Center	School Environment and Policy Survey	• Physical activity • Nutrition	http://www.ucdenver.edu/academics/colleges/PublicHealth/research/centers/RMPRC/resources/Pages/ToolsandData.aspx
	DPS Wellness Assessment Tool	• Physical activity • Nutrition	http://www.ucdenver.edu/academics/colleges/PublicHealth/research/centers/RMPR

			C/resources/Documents/Elementary%20DPS%20Assessment%20Tool%20101310%20ar%20esb.pdf
	School Health Profiles Supplement	• Physical activity and nutrition	*No longer available*
Alliance for a Healthier Generation	Healthy Schools Inventory	• Nutrition • Physical activity • Physical education • School employee wellness policies • Before and after school programs	https://schools.healthiergeneration.org/6_step_process/assess_your_school/about_the_inventory/
YES Project/ Bridging the Gap; University of Illinois & University of Michigan	School Health Policies and Practices Questionnaire	• Nutrition • Physical activity • Physical education • Wellness policies	http://www.bridgingthegapresearch.org/
Center for the Study and Prevention of Violence	Safe Communities Safe Schools	• Parent/Community involvement • Discipline policy • School climate • School crime and violence • Reporting/monitoring • School safety and security • Crisis management • At-risk student assessment and referral • Student resources • Information sharing	http://www.colorado.edu/cspv/safeschools/surveys.html
ASCD	Whole Child School Improvement Tool	• Safety • Engagement • Support • Challenge • Sustainability	http://www.ascd.org/whole-child.aspx
Yale Rudd Center for Food Policy and Obesity	WellSAT	• Physical activity • Nutrition	http://www.wellsat.org/
State of Florida	Healthy District Assessment	• Health education • Physical education • Health services • Nutrition services • Counseling, psychological and social services • Healthy school environment • Health promotion for staff • Family/Community involvement	http://www.safehealthyschoolsfl.org/Home.aspx

State of Maine	School Policies and Environments Inventory	• Bullying • Harassment • Sexual harassment	http://www.coloradoedinitiative.org/wp-content/uploads/2017/05/Maine-School-Policies-and-Environments-Inventory.pdf
State of Michigan	Healthy School Action Tools	• Health education • Physical education • Health services • Nutrition services • Counseling, psychological and social services • Healthy school environment • Health promotion for staff • Family/Community involvement	http://www.mihealthtools.org/hsat/default.asp?tab=previewtools
Portland Public Schools	Wellness Survey	• Physical activity • Nutrition	https://www.pps.net/wellness
American Academy of Pediatrics	School Health Services Assessment Tool	• School health services	https://schoolhealthteams.aap.org/public/content.cfm?m=11&id=11&startRow=1&mm=0&parentMenuID=0
RMC Health	Healthy Schools Colorado Database	• Physical education • Nutrition • Health Services	http://www.coloradoedinitiative.org/wp-content/uploads/2017/05/HSSS-Database-2013-2014.pdf
National Center for School Engagement	Policy and Practice Assessment	• School climate • Bullying • Student engagement • Discipline	http://www.coloradoedinitiative.org/wp-content/uploads/2017/05/PolicyandPracticeAssessmentSample-PFFC.pdf
Colorado Youth Matter	Sexual Health Questions from CYM Assessment	• Sexual health	*No longer available*

Appendix C. Members of Advisory Council

Smart Source Advisory Council			
First Name	**Last Name**	**Role**	**Organization/District**
Amy	Dillon	School Health Initiatives	Colorado Department of Public Health and Environment
Amy	Dyett	Director, Initiatives	Colorado Education Initiative
Ashley	Juhl	Epidemiologist	Colorado Department of Public Health and Environment
Becky	Labbo	Evaluator	RMC Health
Bridget	Beatty	Coordinator of Health Strategies	Denver Public Schools
Brigitte	Mutter	Assistant Director of Assessment	Boulder Valley School District
Cheryl	Kelly	Researcher	University of Colorado, Colorado Springs
Corina	Lindley	Sr. Manager Community Health	Kaiser Permanente
Elaine	Belansky	Associate Director	Rocky Mountain Prevention Research Center
Finessa	Ferrell	Director of Health and Wellness	Colorado Education Initiative
Heather	Hauswirth	Senior Consultant	Colorado Department of Education
Jan Rose	Petro	Director of Data Services	Colorado Department of Education
Jenna	Patnaik	Researcher	University of Colorado at Denver
Kaia	Gallagher	President	Center for Research Strategies
Katrina	Ruggles	School Counselor	Center Consolidated Schools 26 JT
Kelci	Price	Director, Research and Evaluation	Colorado Health Foundation
Lisa	Montagu	Director of Health and Education	The Piton Foundation
Marcia	Bohannon	Deputy Chief Information Officer	Colorado Department of Education
Sarah	Forbes	Research Associate	Colorado Education Initiative
Sarah	Mathew	Director of Health and Wellness	Colorado Department of Education
Sharon	Murray	President	RMC Health
Tristan	Sanders	Project Manager	Kaiser Permanente
Yee-Ann	Cho	Vice President, Initiatives	Colorado Education Initiative

Appendix D. Think-Aloud Protocol

INTRODUCTION

- Begin by thanking them for taking the time to participate in the think-aloud.
- "Before we get started going through the Smart Source tool, I want to briefly remind you about the purpose of Smart Source and review the goals of this interview."
- "As you may know, the purpose of Smart Source is three-fold: (1) to reduce the burden on schools to collect and report health and wellness data by decreasing duplicative data collection efforts; (2) to build a consistent and accessible data system in order to better measure, track, and understand the health of our schools; and (3) finally, to promote health and wellness within schools throughout Colorado by increasing the number of districts and schools using data to inform decisions related to health and wellness and by recognizing exemplar schools and districts in order to replicate best practices."
- "I want to acknowledge upfront that thinking aloud may be new and unfamiliar and seem strange at first, but please know that there are no wrong answers or ways to respond. We are only interested in knowing what is going through your mind when you read each question. Since thinking aloud can seem weird, I want to start with a warm-up question to introduce you to the think-aloud process…"
    - "Try to visualize the place where you live, and think about how many windows there are in that place. As you count the windows, tell me what you are seeing and thinking about." (Willis, 1994)
- "Like you just did for the warm-up question, we want to hear your thoughts about each of the items that we're about to review. We are particularly interested in:
    - Whether you know the answer and/or how to find the answer to the question
    - The steps you would take to find the information requested (including the person or people you would contact to ask for help)."
- "We want to use this session to merely help us determine how well our items are functioning, so it's okay if you do not know the answers to all of the questions I just listed—we want to know if that's the case, but we also want to know your best guess about how to access the information if possible."
- If we are recording the interview, explain that we are only doing that in order to help us remember responses and reactions. Finally, ask them if they have any questions before getting started.

ITEM REVIEW

After the introduction, proceed to reviewing each item and asking follow-up questions as needed. After the respondent reads each survey question aloud and answers, the interviewer then asks for other, specific information relevant to the question, or to the specific answer given (see Willis, et al., 1999). In general, the interviewer "probes" further into the basis for the response. Below is a list of cognitive probe categories, and an example of each:

Comprehension/Interpretation (if it seems like the respondent is confused about the wording): What does the term _____ mean to you? Any suggestions for language improvements?
Paraphrasing: Can you repeat the question I just asked in your own words?
Confidence Judgment: How sure are you that _____ ?
Recall Probe: How do you remember that _____?
Specific Probe: Why do you think that _____?
General Probes: How did you arrive at that answer? Was that easy or hard to answer? I noticed that you hesitated— tell me what you were thinking.

Take notes as you proceed through the cognitive interview, paying special attention to items that confuse respondents, language that seems to be misinterpreted, or items where respondents respond in a manner inconsistent with their beliefs about the construct(s) you are measuring (They are responding in the opposite direction that you would guess that they would respond).