

Developing a Conceptual Model to Select Indicators for the Assessment of Adolescent Health and Well-Being

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Introduction

For the past thirty years, public health professionals and clinical program directors involved in developing and managing health programs for adolescents have monitored the health status of youth to evaluate the impact of program interventions on a variety of health outcomes. Their efforts have been hindered, however, by the lack of population-based data relevant to adolescents and by the lack of well-defined and measurable indicators of adolescent functional and mental health status.

In the 1990's, attention to fiscal accountability and quality assurance in the health care and public health fields refocused interest on the need for valid performance indicators for adolescent health. The situation became even more acute with time because, despite the expected contractions in funding, adolescents today continue to account for higher proportions of childhood morbidity, mortality and health care costs than any other group (with the exception of newborns), further supporting the necessity of monitoring adolescent health. In their 1998 report, Ozer, Brindis, Millstein, Knopf, and Irwin¹ attributed most of the observed adolescent morbidity and mortality to preventable risk factors. High rates of adolescent mortality from injuries, unintended pregnancy and birth, sexually transmitted diseases, substance abuse, mental health issues, untreated severe dental conditions, and nutritional disorders were only some of the issues demanding attention.

The transition to managed care for privately and publicly insured youth and the implementation of welfare reform in the late 1990's brought a sense of urgency for timely and appropriate data to monitor the impact of these policy changes and to make the case that additional resources had to be allocated to meet the health needs of adolescents. The 1990's also brought an explosion in information technology and, as a consequence, greatly increased data availability. Researchers produced numerous reports on child and adolescent health indicators,

providing ready access to a wide range of isolated facts about youth. At the same time, research in the area of adolescent development greatly expanded our understanding of factors influencing adolescent health. This research demonstrated that not only do currently available data reports inadequately address the complexity of the issues facing adolescents, but neither do they shed sufficient light on the underlying causes and possible points of preventative intervention.

Within this context, it is clear that to fulfill their health policy and planning responsibilities, public health professionals need an expanded set of scientifically valid, population-based indicators of adolescent health. These would include well-defined measures of functional and mental health status, measures to document protective characteristics and/or assets associated with positive outcomes, data on risk factors associated with negative outcomes, and information on the contextual conditions (family, school and community) that impact these factors.

This paper, the first in a series of three, presents the historical context for the use of health indicators in maternal and child health with a focus on adolescent health; describes the state of recent efforts to monitor the health and well-being of adolescents and their families; identifies the limitations of those efforts; and presents a framework for a new approach to adolescent health assessment. The second paper in the series² reviews the most well-studied and articulated conceptual frameworks for positive adolescent development and behavior that are informing the evolution of new assessment tools and indicators; compares these approaches; reviews and synthesizes the evidence for, and scientific validity of, adolescent health indicators that are emerging today; and makes recommendations for the most promising approaches. The third, and final, paper³ proposes a framework for future efforts in the field and the development of a more comprehensive set of indicators.

National Health Indicator Efforts—The Historical Context

A series of publications and changes in public policy initiated national health indicator efforts. Among the earliest, the United States Public Health Service published its first national health agenda in 1979, *Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention*⁴. Among the report's five goals, however, only two addressed adolescent health. Ten years later, the Institute of Medicine released *The Future of Public Health*⁵, which was sharply critical of public health agencies for their lack of attention to the core public health

functions of assessment, policy development and assurance. That same year, the Omnibus Budget Reconciliation Act of 1989 (OBRA 89)⁶ directed the federal Maternal and Child Health Bureau (MCHB) to report annually on 18 health indicators measuring a subset of the *Healthy People* objectives as a way to monitor its use of Title V Maternal and Child Health Block Grant dollars. In turn, MCHB required state Maternal and Child Health agencies receiving Title V block grant dollars to report their annual progress in meeting these objectives. Eight of these 18 indicators were specific to adolescents. Although OBRA 89 requirements signaled increased federal attention to health monitoring, however, there was still no federal mandate to use these reports as a guide for program planning and resource allocation⁷.

In 1992, the Federal Legislature passed the Government Performance and Results Act (GPRA)⁸ and assigned responsibility for its implementation to the Office of Management and Budget (OMB). OMB, in turn, mandated that all federal programs implement GPRA to monitor program effectiveness. In 1997, in order to comply with GPRA, MCHB developed a set of 18 performance indicators to be included in its Annual Title V Report to the legislature, as part of the budget process⁹. MCHB also required states to comply with this reporting requirement. As shown in Table 1, Column 1, only two of the 18 performance indicators were specific to adolescents (although six other performance indicators include adolescents as part of a larger age group).

Two years later, in 1999, MCHB added a mandate to the Title V grant guidelines requiring state grantees to report on 18 **needs** indicators, of which three were specific to youth and five included youth as part of broader categories¹⁰ (Table 1, Column 2). The needs indicators, which assessed the status of the MCH population, differed from the performance indicators, which evaluated the effectiveness of MCH programs. In July of 2000, all 50 state Title V agencies were required to use the needs **and** performance indicators as the basis for proposals for a five-year plan to improve the health of women and children in their jurisdictions. States were allowed to select additional indicators of need, and many state adolescent health directors used this process to help focus attention on adolescents.

Monitoring Clinical Services for Adolescents

Clinical service delivery systems have also been under pressure to monitor health status and outcomes as a way to assess the quality of managed care. In 1993, the National Committee

for Quality Assurance (NCQA), with input from large purchasers of employment-based health insurance, managed care organizations, insurance companies, public health professionals, and clinicians, developed the Health Plan Employer Data and Information Set (HEDIS)¹¹. HEDIS 2000¹², the most recent version of the assessment tool, includes a set of standardized measures for quality of care, member access and satisfaction, membership, utilization, finance, health plan management, and activities. As shown in Table 1, Column 3, none of the quality measures measure adolescent health status or outcomes and only three apply specifically to adolescents and even those are limited to process measures. Wherever possible, measures were developed which mirrored the *Healthy People 2000* objectives¹³ so that HP 2000 could be used as the standard for comparison for these measures. MCHB required states to also comply with this reporting requirement.

Table 1. Comparison of Currently Recommended Measures Relevant to Adolescents

PERFORMANCE MEASURE	TITLE V Performance Indicators	TITLE V Needs Indicators	HEDIS Commercial	HP 2010 Critical Objectives for Youth
ADOLESCENT SPECIFIC				
The rate per 100,000 of deaths due to suicide in youth ages 14 through 17	X			X
The birth rate (per 1,000) for teenagers ages 15 through 17	X			X (pregnancy rate)
Teen Immunization			X	
Teen well-care visits			X	
Tobacco use		X		X
Initiation of sexual activity		X		X (abstinence)
Chlamydia		X	X	X
ALL AGE GROUPS				
Initiation of prenatal care		X	X	
Annual dental visit, ages 4-21 years				
Children’s access to primary care physicians			X	
Advising smokers to quit			X	
Reported and confirmed physical abuse		X		
Rate of nonfatal intentional injuries		X		X
Health Insurance status		X		
Deaths due to motor vehicle crashes in 1-14 year olds	X			X
The percent of State SSI beneficiaries less than 16 years old receiving rehabilitative services from the State Children with Special Health Care Needs (CSHCN) Program	X			
The degree to which the State CSHCN Program provides or pays for specialty and subspecialty services, including care coordination, not otherwise accessible or affordable to clients	X			
The percent of CSHCN in the State with a “medical home”	X			
Percent of CSHCN in the State CSHCN program with a source of insurance for primary and specialty care	X			
Percent of children without health insurance		X		
Percent of potentially Medicaid eligible children who have received a service paid by the Medicaid Program	X			
Patient Satisfaction - Pediatric CAPHS Scales			X	

National Health Indicator Reports and Surveys on Children and Youth

With the increased availability of data and information systems, a number of nationally representative, comprehensive reports and surveys have been produced within the past ten years that focus on the health and well-being of youth (or youth as a subgroup of the general population). This section of the paper reviews the contents of those reports and surveys, discussing their strengths and limitations. Summaries of the adolescent health indicators that were included in the most recent national indicator reports, along with an international report for comparison and three major adolescent-specific national surveys, can be found in Appendix A.

Current Indicators Reports

Healthy People 2010¹⁴ includes more than 100 specific adolescent and young adult health objectives, with a subset of 21 critical objectives selected for special focus. This is the first time that a Healthy People report has given this population such a prominent role. Several of the objectives subdivide the youth into age groups of 10-14, 15-19, and 20-24, in recognition of the developmental differences that must be considered when developing different interventions for youth of different ages. However, of the 21 critical objectives, six measure mortality, four relate to negative outcomes of sexual activity, eight describe other negative risky behaviors, and two relate to mental health. The scope of the indicators selected is limited by the data sources used, which primarily consist of national birth and death records, communicable disease morbidity data, and the Youth Risk Behavior Survey. None of these address strengths and adolescent functional status in other than traditional health domains. As a result, most states that use the critical objectives will probably continue to focus their monitoring efforts on youth in traditional ways, necessitating additional monitoring approaches to create a more comprehensive and balanced approach to defining health outcomes for adolescents.

Health, United States, 2000, Adolescent Health Chartbook is part of the 24th report on the nation's health status, *Health, United States, 2000*¹⁵, which is produced annually by the Centers for Disease Control and Prevention and the National Center for Health Statistics, with the National Committee on Vital and Health Statistics serving as the report's reviewer. The Chartbook raises indicator reporting by the federal government to a new level because it includes many more sub-groupings to document disparities in health status and access to care, a major goal for the report. The report contains text and graphs on a large number of indicators of health

status, including data on major causes of mortality and morbidity and topics such as injury, reproductive health, health care utilization, and risk behaviors. The authors have gone beyond the use of vital records and communicable disease data by using morbidity data from hospital and emergency room utilization reports and national surveys on self-reported behavior and health status. Trend data are displayed graphically by year of age and gender, and in some cases, race, ethnicity, family composition and family income.

The Chartbook explores the connections between health status, poverty, family composition, and race/ethnicity. The data illustrate adolescent health transitions by age for population sub-groups, an important advance in presenting data that tell a story and can mobilize communities and professionals to action. Despite the unusual amount of detail, though, the Chartbook defines health narrowly, continues to concentrate on threats to health, and presents goals largely in terms of reducing problems, rather than noting the protective factors that have been documented to promote healthy growth and development.

Trends in the Well-Being of America's Children and Youth 2000 is the fifth edition of a timely, encyclopedic presentation of nationally available data on this population, prepared for the Department of Health and Human Services¹⁶. It presents information on 89 indicators within the domains of population, family, neighborhood, economic security, health conditions, health care, social development, behavioral health, teen fertility, education, and achievement. The report makes use of more than 20 data sources, including nationally available data collected by federal agencies, 11 national surveys, and specific studies published in peer reviewed journals. Of the 53 indicators specific to adolescents, 13 measure positive assets or attributes assessed primarily through two surveys: *Monitoring the Future* and *The National Longitudinal Study on Adolescent Health*. Indicators are presented as trend graphs by age groups, race, ethnicity, and gender. A short narrative describes the key findings for each indicator. Census data from the current population survey are used to present recent trends in family structure and socio-economic status, including housing and food security.

Despite this tremendous effort, the authors acknowledge a number of limitations, some of which are relevant to youth. These include few or no valid indicators for mental health, family dynamics, community context, homelessness, abuse, neglect, violent crime, learning disabilities, or institutionalized care. The report does not disaggregate data to the state or local level. In

addition, many of the population and SES indicators either relate to the entire population under age 18 or report on groups that include both children and adolescents. Except for indicators based on birth or death records, data on racial/ethnic groups are limited primarily to ‘whites,’ ‘Blacks,’ and sometimes, ‘Hispanics’ due to the sample size limitations for other ethnic groups in the other data sources.

America’s Children: Key National Indicators of Well-Being 2001 is the fifth report by the Interagency Forum on Child and Family Statistics, a collaborative effort by 20 Federal agencies¹⁷. It consists of a subset of indicators that were included in *Trends in the Well-Being of America’s Children and Youth 2000*. As is true of the parent document, this report takes a much broader view of health than does the Chartbook. It includes the domains of economic security, health, behavior, social environment, and education. Each year two special features are included: this years’ includes asthma prevalence and the percentage of youths 16 years or older who worked at some time during the academic year. Each indicator is introduced with a paragraph describing its negative consequences. Graphs for each indicator show trends, while some show breakdowns by age, region or race/ethnicity. A discussion accompanies each graph, describing its epidemiology. The conclusion of each section includes a discussion of efforts needed to stimulate the development of new and more comprehensive indicators. For example, under the section on health, the need for validated measures for childhood disability, mental health issues, and early childhood development is noted. For those interested in adolescents, however, this report has limited use because many of the indicators are described for all youth under age 18 or other large age groupings. Furthermore, as in true of most federal reports, the focus is on problems and risk behaviors, not on strengths and assets. It is promising, though, that the special section on volunteerism for youth does point to a potential interest in the use of more positive indicators in the future, data permitting.

Health and Health Behavior Among Young People: *Health Behavior in School-aged Children (HBSC): a WHO Cross-National Study International Report* is part of an international effort to assess the health and well-being of youth and to monitor progress towards meeting goals for improving health across the world¹⁸. The report is based on a sample of 120,000 youth in 28 countries. The most recent report covers seven domains and includes 23 specific measures, including family and peer relations, school environment, socio-economic inequalities, exercise, leisure-time activities, eating habits, dental care, dieting, substance use,

and sexual behavior. Each chapter of the report is written by a different author with a special interest and expertise in that specific area. Literature reviews are included that describe the rationale for the measure and its significance. Statistical analyses includes correlations between responses in different parts of the report; for example, relating dietary practices to the socio-economic status of parents.

New measures and scales are continuously created and edited, based on the most current research. For example, a new measure is being tested to assess socio-economic status (SES) because single indicators, such as parental occupation, were not found to be predictive of positive health and social outcomes across countries. Three questions are used to create a new SES scale: owning a family car, having one's own bedroom, and traveling on family vacations. High SES, as defined by this measure, was related to positive health behavior, a sense of happiness, and feelings of confidence. Data are presented by country, age and gender.

The principal limitation of the report is that it uses cluster sampling (i.e. school surveys of the entire population of a selected group of schools), rather than a random sample of students in a randomly selected group of schools. Thus, findings may not be generalizable or comparable in terms of SES and racial/ethnic mix across countries and cultures. Other limitations include the fact that only in-school youth are sampled and data on the family structure and community context indicators are not included, thus limiting the type of predictive and correlational analyses that can be conducted linking health outcomes with these factors.

Recent National Surveys of Adolescents

The Youth Risk Behavior Survey (YRBS), developed in 1990 by the Centers for Disease Control and Prevention¹⁹, was created in response to the limitations of existing population-based data sets that attempted to provide data on health risk behaviors among youth. The survey, targeted for 7th, 9th, and 11th graders, was specifically designed to explore the behavioral risk factors associated with the most important causes of mortality and morbidity in youth and adults. The survey concentrates on behaviors related to four areas: intentional and unintentional injuries; risks associated with unintended pregnancies and sexually transmitted diseases; tobacco, alcohol, violence and other risk-taking behavior; and cardiovascular disease (dietary habits and physical activity). Thirty-three states and 16 large cities now administer this survey biannually to representative samples of youth. Most states use the YRBS because the

instrument is widely respected as valid and reliable, and the data are comparable to a national sample. The acknowledged limitations of this survey are that the sample is limited primarily to in-school youth and therefore does not include the highest risk youth. Other biases include the fact that participation in most states is voluntary, so samples are not representative of youth in other states nor of youth living within states that do collect YRBS data. Furthermore, the racial/ethnic groupings are limited to ‘whites,’ ‘Blacks,’ and ‘Hispanics,’ due to the small sample sizes of other ethnic groups. Another limitation is that there are no ways to ascertain whether or not there is under- or over-reporting by the youth of their risk-taking behaviors. Furthermore, very few positive behaviors associated with desirable outcomes are included, and they do not include questions related to adolescents’ strengths and assets. Finally, descriptive data does not contain information on socio-economic status, family structure, or other factors that could help to explain the underlying nature and context of the behaviors described.

The Monitoring the Future Study 2000, funded by the National Institute on Drug Abuse, is conducted annually by the Institute for Social Research at the University of Michigan²⁰. This survey is the latest in a continuing series intended to assess the changing lifestyles, values, and preferences of American youth. Each year since 1980, approximately 50,000 students in 8th, 10th and 12th grade from approximately 420 public and private secondary schools have been surveyed (12th graders since 1975, and 8th and 10th graders since 1991). In addition, follow-up questionnaires are mailed to a sample of the graduating class for a number of years after their initial participation. The study collects detailed information on tobacco, alcohol and drug use, attitudinal correlates of drug use, positive attitudes, and life experiences. Measures are presented by grade, gender and race/ethnicity. Limited sample size does not allow analyses by state or local jurisdictions nor by categories other than ‘whites,’ ‘Blacks,’ and, sometimes, ‘Hispanics.’ No data are collected on socio-economic status or other neighborhood, community, and/or family factors which might be related to the outcomes being monitored.

The National Longitudinal Study of Adolescent Health (Add Health), funded by the Institute of Child Health and Human Development (NICHD) and 17 other federal agencies, has two components: (1) a school-based survey of adolescents and (2) an in-home survey of adolescents and their parents²¹. The school-based survey includes questions related to health-related behaviors of adolescents in grades 7-12, whereas the in-home survey includes a more extensive look at a sub-sample of adolescents from the schools participating in the school survey.

This survey over-samples particular racial/ethnic groups, siblings, twins, unrelated adolescents in the same household, and those living in single-parent homes. The Add Health study is longitudinal, with adolescents interviewed a second time at a one-year interval. Instead of relying on respondents' memories and reconstructions of past events, it is thus possible to directly measure the influence of their experiences on their behaviors and consequences. Self-administered computer-based tools are used for the more sensitive topics covered in the in-home survey.

Add Health postulates that families, friends, schools, and communities can either influence healthy choices or lead to unhealthy, destructive behaviors. Data to support or refute this theory were collected from adolescents themselves, from their parents, siblings, friends, romantic partners, fellow students, and school administrators. The study collects data to use in exploring the influences of adolescents' individual attributes and the environmental influences on health and health-related behavior in areas such as diet, physical activity, health service use, morbidity, injury, violence, sexual behavior, contraception, sexually transmitted infections, pregnancy, suicidal intentions/thoughts, substance use, and runaway behavior. Data are also collected on such attributes as height, weight, development, mental health status (focusing on depression, the most common mental health problem among adolescents), and chronic or disabling conditions. Pre-existing databases provide information about neighborhoods and communities. With data from so many sources, new types of analyses are possible, involving the individual and combined affects of environmental surroundings and social context on health status. This family of surveys significantly advances efforts to obtain data on the positive attributes of youth, their families, and their communities, while recognizing the interrelationships that are key to well-being.

The Add Health in-school survey is limited in the amount of data related to SES, so the impact of these factors on adolescent well-being and functioning cannot be fully measured. While it does focus on positive outcomes, the survey collects relatively little data on negative outcomes, so analyses of attitudes and behaviors and their relationship to negative outcomes are limited. However, the in-home survey has extensive information on family, school, community, interpersonal relationships, and outcomes and assets (both positive and negative). Possible limitations include the potential bias of those families who would be willing to accept this

component due to the sensitive nature of the questions and the time required of the adolescent, siblings and parent(s).

Summary of Strengths and Limitations of Current Indicator Reports and Surveys

In general, the four major national indicator reports reviewed here have begun to adopt a broader view of child and adolescent health and well-being. They recognize the importance of including domains outside of the traditional health indicators of mortality and negative health outcomes, such as trends in socio-economic status of children and their families, educational achievement, and risk-taking behaviors. All reports showed trends and provided discussions of the rationale for choosing that specific indicator. Correlations between health outcomes, gender, race/ethnicity, and, in one report, SES, are beginning to appear in the newer reports. However, most continue to focus on individual level risks, without consideration of family and community context. The socio-economic data are included in a separate section and the relationship between these factors with the specific indicators included under each domain is not elucidated. For example, what indicators are impacted by household type, poverty, or increasing diversity and how do they influence behavior? Overall, the range of data in these sections on family and population is not adequate to provide the context for the range of indicators addressed in the reports. The WHO report, in contrast, concentrates on fewer indicators but takes a more in-depth look at contextual factors.

However, apart from the traditional health indicators of risky behavior, mortality and negative morbidities, we find that data on demographics, family structure, neighborhood characteristics and economic security are still minimal for the adolescent age group. When present, this data are not described in a way that makes it possible to correlate these factors with health status and well-being. Summaries primarily discuss the epidemiology of the outcome and continue to focus on negative messages. Small sample sizes limit the number of racial/ethnic groups for which we can analyze the data, as well as the ability to assess effects at the level of individual states or local jurisdictions. Qualitative data and the narratives that put the statistics in context are rarely included. As a result, the numbers do not tell a story that youth advocates and policy makers can use to develop cost-effective programs that promote the well-being of youth. Even more troubling, they may mask problems because the data do not tell the whole story.

Identifying the Gaps

Inconsistency of Definitions and Measures

As illustrated in Appendix A, most of the indicator reports do use the same definitions for the traditional indicators of mortality and morbidity. These reports draw their basic indicator data from the same sources: National Birth and Death records, mandatory Communicable Disease Reports from the CDC, Census Data, YRBS, Add Health, Monitoring the Future, and program data from other government agencies. However, where they are trying to break new ground, such as creating indicators based on questions from available national surveys, they are inconsistent. Specifically, varying definitions abound for indicators of dietary habits, levels of physical activity, reported health status or symptoms, and measures of positive youth development and family strengths. Further, where newer questions are being added to surveys to attempt to create new measures, there is inconsistency across the instruments being used. While it may be common to go from diverse definitions to universal understanding, the lack of up-front coordination among researchers results in a tremendous level of unnecessary duplication of effort. We are left with a lack of standardization that would allow for comparisons across different samples of adolescents, as well as a lack of joint efforts to create validated and reliable tools. Thus, advancing efforts to improve the types of common indicators and their measurement requires a national coordinating effort, which would be of significant help to researchers across the country.

Incorporating Indicators of Community Context

A large and growing body of research, in both the U.S. and Europe, has shown that family, social, and community contexts substantially influence adolescents' mental and physical well-being²², yet U.S. indicator reports rarely address these areas comprehensively. This next section will briefly review some of the evidence supporting a broader more contextual view of the adolescent, as well as an approach to selecting indicators that potentially could be incorporated in future data collection efforts. We summarize some of the promising research that substantiates the importance of developing a new framework for monitoring adolescent health that emphasizes the importance of context and assets. Readers should note that the second paper of this series focuses in more detail on the conceptual bases for the development of new

indicators in the areas of positive individual assets, the role of social capital (family and community assets), and tools currently in use for assessing these variables.

The Community Risk Assessment Approach

The 1990's have brought a resurgence of interest in the socio-economic and community determinants of health. Brewster²³ examined the influence of communities and local opportunities on adolescent behavior. Researchers found that young women's reproductive behaviors were influenced by community-level factors including the level of social integration, community SES, population composition, and employment opportunities available to them. Young women were more likely to delay intercourse and to use contraception during their first intercourse in communities where opportunities, social integration, and community-level SES were higher. The major factors influencing young women's sexual behavior—knowledge of reproductive processes, perceptions about access to contraceptives, and expectations about adult life—are all influenced by the social and economic characteristics of communities.

In a review of the literature, Blum²⁴ concluded that ethnicity, race, and family structure account for very little of the explained variance in adolescent health risk behavior. This would suggest that community characteristics may offer more in the way of explanation. Brewster also found that race differences in the risk of first intercourse actually reflected differences in access to economic resources and exposure to successful role models. She found that African-American and white teenage women responded similarly to structural constraints and opportunities in their communities.

Community Assets and Social Capital

A related area of growing interest is that of assessing community capacity or community assets. This movement has grown from a parallel trend toward recognizing the importance of environmental, social, and community level factors in promoting health and well-being, and, consequently, the need to involve the “community “ to solve identified problems. This is often coupled with initiatives for community-based approaches to promote social change and economic development, deliver services, and address the needs of people in poverty²⁵. In the health area, it has come to the fore to address intransigent, multi-dimensional problems such as infant mortality, HIV/AIDS and substance abuse.

Chaskin²² suggests the following definition:

“Community capacity is the interaction of human, organizational, and social capital existing within a given community that can be leveraged to solve collective problems and improve or maintain the well-being of a given community. It may operate through informal social processes and/or organized efforts by individuals, organizations and the networks of association among them and between them and a broader system of which the community is a part.”

Meyer²⁶ has suggested that capacity be measured by the existence of commitment, skills, resources, and problem-solving abilities in the community. Others stress the participation of *individual* community members in a process of relationship building, community planning, decision making and action²⁷. Still others focus on building the capacity of community agencies²⁸ or on the theory of empowerment and the “community’s ability to pursue its chosen purposes and course of action”²⁹. The degree to which adolescents participate in constructive community activities is considered a key indicator of community capacity²².

Social capital as applied to children and youth emphasizes the role of family and community strengths and supports that mitigate against adverse circumstances and promote positive outcomes. Furstenburg³⁰ followed 252 children of an original cohort of teenage mothers in Baltimore and found that social capital—as measured by family cohesion, mother’s educational expectations for her child, the presence of biological father, shared activities between mother and child, and parents’ knowledge of their child’s friends—was associated with a decreased risk of pregnancy.

Kretzman and McKnight³¹ propose an approach that involves the identification of structural and organization community assets such as churches, recreation facilities, libraries, etc. These assets are identified by community health coalitions. Members work together to identify and map assets, including a listing of existing programs and the strengths of individuals. As part of the process, individuals make commitments to work together to promote the further development of these assets.

Focus on Building Strengths: The Youth Development Model and Individual Assets

Another deficiency in current indicator reports is the incorporation of indicators of positive youth development and individual assets. This approach focuses on identifying characteristics that are associated with positive youth outcomes and the successful transition to adulthood, as well as program interventions that can support the development of those characteristics. The second paper in this series will discuss this area in depth so only a brief summary is included here.

Major proponents of the Youth Development Model^{32,33,34} argue that problem-oriented programs have not effectively reduced targeted risky behaviors because they did not examine the underlying social and psychological characteristics of youth that are essential for positive, health-promoting behavior and behavior change. Labeling individuals as ‘high-risk’ based on population-level data stigmatizes youth and ignores findings from longitudinal research that shows that from 50 to 70% of youth become productive and caring adults despite the negative characteristics of their early childhood and adolescent experiences³⁵. Research using the Youth Development approach suggests that certain personality characteristics, particularly resiliency⁴²,⁴⁴ developmental assets³⁶ and social context⁴² do have some relationship to creating fewer negative outcomes.

Proposed Framework and Content

In reviewing available indicator reports in the context of the broader body of research on youth outcomes, it is clear that most have not been guided by any research-based conceptual framework or by any framework of newer theoretical models. Current reports do not provide the information needed to assess how changes in the health care system and community level interventions have affected today’s youth. In addition, the indicators in these reports are generally measured at the individual level and are grouped by the domains defined by professional or agency lines, focusing primarily on the negative aspects of adolescent behavior.

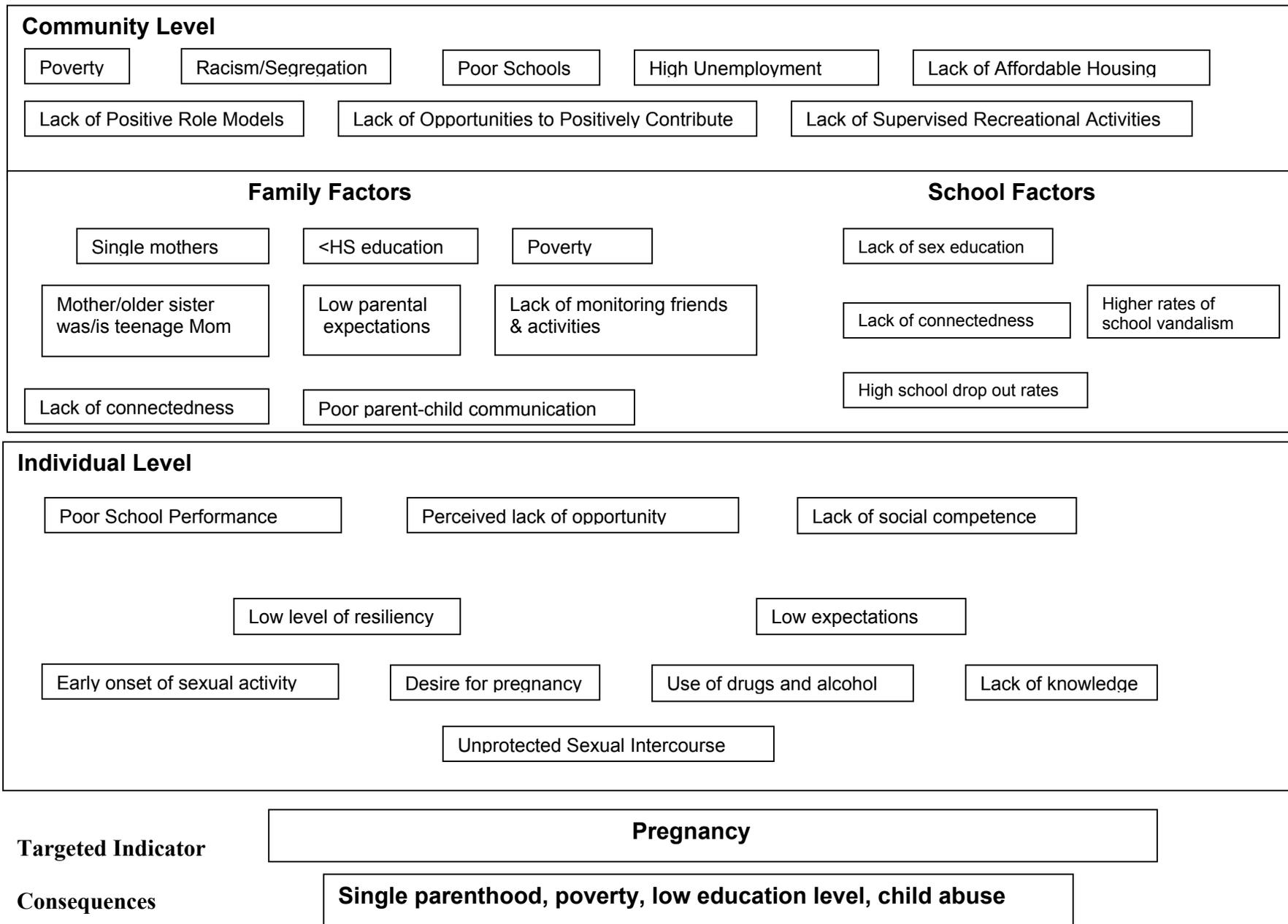
As discussed in this paper, this approach does not take into account the interrelationship of the adolescent within the family, the school and the community, nor does it provide enough data on precursors and consequences to inform health planning and policy. In order to be useful in developing more effective interventions, reports on the health and well-being of youth must

include enough information on targeted outcomes to allow for an analysis of the site-specific problem, leading to the development of appropriate interventions for that particular community.

One way to approach the selection of indicators within a contextual framework is to construct a problem analysis diagram for the indicator under consideration. Such a diagram takes into account the factors that have been shown through research to be either causally related or strongly associated with the indicator in question. These factors are recorded in a linear way to provide clues to the possible causal pathways for an identified problem and thus the specific points to which an intervention could be targeted.

Table 2 is an example of a problem analysis diagram constructed for teen pregnancy. It includes selected factors that have been shown to be associated with the occurrence of teen pregnancy or one of its precursors³⁷. The diagram includes factors that are specific to the individual, family, school, and community. Constructing such a diagram allows one to explore and clarify the relationships among risks and causal factors and the possible pathways through which positive or negative outcomes are realized. Arrows can be added to show the relationships and direction of associations between factors.

Table 2. Adolescent Pregnancy Problem Analysis Diagram*



We posit that to understand the nature of teen pregnancy issues in any given community, data on all of these factors need to be reviewed and analyzed. In order to accomplish this aim, we propose an indicator framework that presents the adolescent within a multi-dimensional context. Such a framework would include the traditional domains of physical and mental health, safety, education, behavior and economic security, but with added contextual sub-domains, i.e. the individual, the family, the school and the community.

This approach also incorporates within each domain and sub-domain the notion of including indicators of risks/adverse outcomes and protective factors/assets. This would serve a number of functions, including an understanding of whether a problem was particular to an individual or part of a complex set of issues that should be approached with a family, school or community focused intervention. These data would also be useful for research on the relative impact of context on selected indicators.

Example for teen pregnancy

A report using the contextual framework for teen pregnancy might consist of the indicators displayed in Table 3. Ideally the indicator report would provide data that could be used by community planning groups, policy makers or researchers to construct their own community specific problem analysis diagrams. The participants in such a process could then identify interventions that might be appropriate to the particular circumstances of that community. This would entail reviewing the research literature for proven interventions to address negative outcomes or promote positive outcomes. Depending upon local resources the group could choose among potential interventions. The indicator data would then be collected over time to monitor progress and to evaluate the particular intervention activities.

Table 3. Contextual Framework for Youth Indicators: Teen Pregnancy Example

Domain: General and Reproductive Health		
Lead Indicator: Rate per 1000 of pregnancies of teens <18		
Unit of Measurement	Assessment Measures	
	Risks and Adverse Outcomes	Protective Factors and Assets
Individual	% Teens with early initiation of sex* % Teens with older sexual partners* % Teens without adequate knowledge of contraception*	% Sexual abstinence* % Sexually active using contraception* % High life expectations* % High resiliency scores % High level social competence % Participating in school-based extracurricular activities*
Family	% Teens in single parent home* % Mothers and/or sisters of teens who were teen parents % Parents of teens with less than a high school education* % Housing transience for families with teens	% High level of cohesiveness* % High level of communication* % High expectations for kids* % High level of monitoring and involvement*
School	Rates of incidents of vandalism % Students receiving a free lunch* % High School Dropouts*	% Schools with sex education programs % Kids who feel school/teachers are caring* % Schools with supervised after-school activities % Schools with school-based or school-linked family planning services
Community and Neighborhood	% Below poverty* % Non-white population* % Unemployed * % Adults with less than a high school education* % Literacy % Affordable housing * % Affordable family planning clinics	% Service learning programs % Meaningful volunteer opportunities % Mentoring opportunities % Supervised recreational activities

* Data items that do appear in one or more of the current reports or surveys.

As Table 3 makes clear, none of the most recent reports or instruments contain much of this information, although there are some items that have been incorporated into instruments and used in studies of particular populations and could be incorporated into existing national surveys, such as the YRBS. As a result, in order to prepare such a report policy analysts and program planners interested in teen pregnancy have to access multiple reports from different agencies and organizations that conduct primary data collection in order to create a comprehensive picture of the problem.

Criteria for the Selection of Indicators

Before selecting indicators, one should identify the audience for the report and agree on a set of criteria to be used to determine its content. As community planning groups select indicators at multiple individual, family, school, and community levels, they need guidance in selecting the most appropriate criteria to use in choosing indicators for their efforts. Table 4 summarizes suggested criteria and covers a range of issues from the availability, validity and reliability of the data to a particular community. Through this effort, communities may discover that additional data collection is needed and that it could be collected at the local level. Other communities may find that the local level data they want may not be available and that they must rely on national and/or state level data as the point of comparison.

Table 4: Criteria for Selecting, Evaluating and Developing New Indicators

1. The indicator is quantifiable (a numerator and denominator are specified). Rates and numbers can be generated.
2. A data source or data collection instrument can be identified. Rates and numbers can be generated. A data source or data collection instrument can be identified.
3. Reliable data are used; data items from questionnaires have been subject to test/re-test reliability measures.
4. Where possible, indicator definitions are comparable to those included in national or state reports or national survey results.
5. Data can be disaggregated by age, gender, race/ethnicity, and/or income.
6. An appropriate geographic unit is specified and geographic differences (i.e. a particular city or neighborhood) can be analyzed.
7. Data on associated risk factors are available.
8. For each indicator or topic area, family, school, and/or community data that links these contexts with particular indicators are available.
9. Indicators selected have been validated in a similar populations to the one in which they will be applied.
10. Indicators have been shown by research to be linked to the outcomes of interest.
11. Data can be collected and reported in a timely manner.
12. Trend data for at least five years are or will be available.
13. The target audience considers this indicator to be important.
14. The costs of data collection are sustainable.
15. A summary that integrates the data to present a profile or “tell a story” can be developed.

Summary and Recommendations

Public health and medical professionals, policy makers, school, and communities need a comprehensive, accessible system for monitoring adolescent health and well-being at local, state, regional and national levels so they can identify, document, and address existing and emerging adolescent needs. A national policy to promote the health and well-being of adolescents can only emerge from a set of well-delineated goals, objectives, and indicators. These indicators must be capable of documenting the range of adolescent health needs among the increasingly diverse sub-populations that comprise America's adolescents. This is especially important to ensure that adolescents are healthy and that disparities based on race or income are eliminated. Although much progress has been made in expanding the scope of national indicator reports, they still do not adequately describe the status of the adolescent population.

Current national reports are limited in their ability to disaggregate data by the number of race/ethnic categories, by geographic specificity for state or local use, or by adequate information on income or health insurance status so that the impact of these factors can be assessed. To remedy this, resources need to be identified to over-sample particular groups and to provide local areas with resources to use validated survey tools at the state or local level to obtain adequate samples for their populations. Further questions on income and health insurance need to be added to population-based data sources, such as birth records, to allow assessment of the impact of insurance on access to care.

A second major gap in current reports is the inconsistent definitions of the newer indicators in areas such as physical fitness, nutrition, behaviors, and psychological characteristics. The task to reach a consensus would take a national effort bringing together experts in each particular areas to review the research and identify the resources to include them in national survey instruments. Consensus would also require survey developers to include agreed upon questions/indicators in their survey instruments.

A third deficiency, as has been discussed in this paper, is that current reports do not include many measures of social context. This is being overlooked despite the increasing body of research that has identified the specific individual, family, school, and community risks associated with poor outcomes as well as those assets that are associated with improvement in observed negative outcomes. Nor do existing reports adequately relate measures of social

context to either positive or negative outcomes for youth. Data on these factors are available from newer surveys (i.e. the Add Health survey) that could be used to construct such measures and also provide data for a family of indicators related to particular outcomes.

We recognize that many of the existing deficiencies outlined in this paper are the result of (1) a lack of sufficient development of validated measures to test new conceptual frameworks, (2) the delay in changing large national data collection efforts, and (3) the necessity of creating sufficient consensus on the utility of incorporating these additional indicators into existing representative national data sets. Revising existing surveys or expanding sample size requires significant resources and willpower. This change can only be supported by the continuation of current research efforts to document the associations that these factors have with health and social outcomes.

Those responsible for public health and the needs of adolescents must engage policy makers to develop a system capable of monitoring adolescent health status and needs not only for the population as a whole, but also for sub-populations disaggregated by gender, age, race/ethnicity, geographic region, family, school, and community characteristics. The system should allow for the monitoring of a set of consistently defined indicators of adolescent health and well-being. It should also be capable of reflecting the short and longer term effects of changes in health, educational, economic and social policies, as well as identifying emerging issues. It must place numbers in the epidemiological contexts that give meaning by explaining who, what, why, where, and how these issues relate to the adolescent.

The system must also ensure that the findings are user-friendly and can be easily conveyed to the public. It must be capable of engaging adolescents, their families, and their communities to improve and increase personal healthy behaviors. It must have the capacity to inform and engage policy makers in the solution of identified problems, and in the evaluation of the effectiveness of those solutions.

The development of such a system is feasible. Sufficient research has already been completed to support the inclusion of the type of measures illustrated in this paper. Increased support for current research efforts aimed at identifying positive strengths and the evaluation of interventions aimed at building these strengths can produce an expanded set of valid measures. The presentation of these indicators in a contextual framework, with the inclusion of both

positive and negative measures, can and should be initiated through the expansion of currently funded surveys.

Measuring the Positives: Review of Positive Indicators and Guidelines for their Use

NAHIC conducted a comprehensive review and analysis of approaches to and measures of positive youth development. In these papers, based on work supported by the W.T. Grant Foundation, NAHIC staff compared the theoretical frameworks of the primary schools of thought in this arena, and examined the domains and constructs of the variables utilized by each. The papers also identify potential pitfalls of inappropriate use of these measures, and offer recommendations for using positive indicators.

This is one of four papers in a series funded by the W.T. Grant Foundation. A brief and two other papers, *Assessing the 'Multiple Processes' of Adolescent Health: Youth Development Approaches* and *Bridging the Gap: Next Steps in Developing and Using Indicators to Improve Adolescent Health*, are available online at:

http://nahic.ucsf.edu/index.php/data/article/measuring_the_positives_review_of_positive_indicators_and_guidelines/ .

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Appendix A: Summaries of Recent Adolescent Health Indicators

Indicator	HP 2010 Teen Obj	Health US 2000 Teens	Child Trends 2000	America's Children 2001	WHO 2000	YRBS	Monitoring the Future	Add Health
Population Characteristics								
Basic demographics- age, race, residence,		X	X	X		X		X
Immigrant status			X					X
Country of origin			X					X
Foreign born generation			X					X
Language proficiency			X	X				
Family structure		X	X	X				X
Household composition		X	X	X	X			X
Fertility rates by age group			X					
% births to unmarried by age group			X	X				
Economic								
Residential stability by age			X					
Report housing problems			X	X				
Overcrowded housing-immigrants			X					
Residential instability			X					
Living in poor neighborhoods by demographics and family structure			X					
Living in poverty by family structure, race, foreign born, generation in US		X	X	X				
Median family income by family structure			X					
Income inequality			X					

Appendix A: Summaries of Recent Adolescent Health Indicators

Indicator	HP 2010 Teen Obj	Health US 2000 Teens	Child Trends 2000	America's Children 2001	WHO 2000	YRBS	Monitoring the Future	Add Health
Wealth score					Own car, own room, family vacation			
Sources of income			X					
Parental employment <6-17, 18			X	X				X
Youth unemployment		X						X
Youth employment while at school				X				X
Single parent household		X	X					X
Number of siblings			X					X
Detached Youth age 16-19			X					
Food Security			X	X				
Child support nonpayment								
Receiving govt. assistance for food			X					
Welfare dependence			X					

Appendix A: Summaries of Recent Adolescent Health Indicators

Indicator	HP 2010 Teen Obj	Health US 2000 Teens	Child Trends 2000	America's Children 2001	WHO 2000	YRBS	Monitoring the Future	Add Health
Health - general status and function								
General health status <18			X	X	X			X (have energy, seldom sick, easy to heal)
Daily Activities								X detailed list
Experience symptoms					X			X (includes emotional problems)
Use of device for physical activity								X
Medication use					X			
Rates of chronic illness			X	Asthma				X (includes disability)
Percent acute and chronic conditions			X					
Activity limitations		X	X	X				X
Adequate sleep by age			X					X # hours
Mental status	X depressed by disability							X emotional upset, depression

Appendix A: Summaries of Recent Adolescent Health Indicators

Indicator	HP 2010 Teen Obj	Health US 2000 Teens	Child Trends 2000	America's Children 2001	WHO 2000	YRBS	Monitoring the Future	Add Health
Health- Mortality								
Adolescent death rates	X	X	X	X				
MVC Crash deaths	X (also alcohol or drug related)	X	X	X				
Youth homicides	X		X					
Suicide attempt or intent	X	X	X			X		X (includes peers, family)
Youth suicides	X		X					
Firearm related deaths in teens		X	X	X				
Health- diet and exercise								
Adolescents overweight	X		X			X		
Specific dietary practices					Selected foods	Fruit and veggies, fatty foods		Detailed list
Dieting					X	X		X
Participation in physical activities		X	X			X		X
Regular physical activity	X (vigorous)		X		2X per week			X
Stretching or strengthening exercises						X		
Participation on sports teams						X		
Dental		X (caries)	X (caries)					X (caries braces)

Appendix A: Summaries of Recent Adolescent Health Indicators

Indicator	HP 2010 Teen Obj	Health US 2000 Teens	Child Trends 2000	America's Children 2000	WHO 2000	YRBS	Monitoring the Future	Add Health
Health- reproductive								
Teen birth rate		X	X (and repeat births)	X			X	
Teen pregnancy	X		X			X		X (includes details of hx of all pregs)
Teen Abortion			X			X		
HIV/AIDS in teens	X	X	X					
STD's	x	X	X					X
LBW for teen births		X						
Infant Mortality (by mother's age)		X						
Healthcare access								
Health Insurance coverage		X	X	X			X	
% With no source of health care				X			X	
ER visits by cause		X						
Hospital discharges		X						
Health care visits		X						X (includes last visit and not going when ill)
Reproductive health visits			X (and repeat births)		X (includes FP, PNC, STD)			

Appendix A: Summaries of Recent Adolescent Health Indicators

Indicator	HP 2010 Teen Obj	Health US 2000 Teens	Child Trends 2000	America's Children 2001	WHO 2000	YRBS	Monitoring the Future	Add Health
Barriers to care								X
Dental Health visits					X			X
Mental Health visits	X % needing care in RX							X (includes Substance Abuse)
Education								
Parents education			X			X		X (includes entire household)
High School completion			X	X		X		
High School dropout rate		X	X			X		
Math and reading scores			X	X		X		
% taking high level HS courses			X					
School absenteeism grades 8 and 12			X			X		X (all grades, including truancy)
% youth who read for fun			X			X		
English language proficiency			X			X		
College experience			X			X		
Youth neither enrolled in school or working			X	X		X		
Youth 25-29 completing higher education			X	x		X		
Satisfaction with school					x			X
Connectedness to school								X
Relationships								X (Teachers, students)

Appendix A: Summaries of Recent Adolescent Health Indicators

Indicator	HP 2010 Teen Obj	Health US 2000 Teens	Child Trends 2000	America's Children 2001	WHO 2000	YRBS	Monitoring the Future	Add Health
Percent with school problems			x			X		X
Grades for /English, Math, History, Science				Achievement tests				X
Amount of effort for school								X
Number of years at current school								X
Health education								X (detailed list of areas covered)
Disciplinary actions								X

Appendix A: Summaries of Recent Adolescent Health Indicators

Indicator	HP 2010 Teen Obj	Health US 2000 Teens	Child Trends 2000	America's Children 2001	WHO 2000	YRBS	Monito ring the Futur e	Add Health
Social Development								
Life Goals teens			X				X	
Positive view of self/self esteem							X	X (coordinat- ed, proud, satisfied, physically fit)
Peer Approval			X				X	X (socially accepted,
Peer relations-time with friends					X			X
Feel safe								X (in school & neigh- borhood)
Religiosity teens			X				X	X
Youth voting			X					
Youth participation in volunteer activities				X				
Neighborhood quality of life								X
Participation in school- based extracurricular activities								X (detailed list)
Student computer use			X					
Leisure time activities			X (TV)		TV, computer games			X (TV)

Appendix A: Summaries of Recent Adolescent Health Indicators

Indicator	HP 2010 Teen Obj	Health US 2000 Teens	Child Trends 2000	America's Children 2001	WHO 2000	YRBS	Monitoring the Future	Add Health
Social Development cont.								
Closeness with parents			X		Easy communication			X (parental caring, feel loved)
Parents activities with children			X (5-17)					X (detailed list)
Conflicts with parents								X
Parents involved with school			X					X
Relationship with siblings								X
Low risk index			X					X
Social/Behavioral Risks/Safety								
Children in foster care <18			X					
Abuse and neglect by age			X					
Physical fighting teens	X		X			X		X
Youth committing crimes			X	X				
Weapon carrying teens	X	X				X		
Experience of violence		X	X	X		X		X (incl exposure to)
Seat belt use teens	X		X			X		X
Motorcycle helmet use						X		X
Bicycle helmet use						X		X
Race on bike, skateboard, other vehicle								X
Assorted risks								X (tattoo, piercing)

Appendix A: Summaries of Recent Adolescent Health Indicators

Indicator	HP 2010 Teen Obj	Health US 2000 Teens	Child Trends 2000	America's Children 2001	WHO 2000	YRBS	Monitoring the Future	Add Health
Social/Behavioral Risks/Substance Use								
Steroid Use						X	X	
Cigarette smoking	X	X	X	X	X	X	X	X
Smokeless tobacco use			X			X	X	
Access to cigarettes						X		
Parental smoking								X
Alcohol Use	X (binging)	X	X	X	X	X	X	X
Exposure to drunk driving	X					X		
Driving after drinking						X		X (includes other drugs)
T,A,D use on school property						X		
Alcohol related problems								X
Peers attitudes towards drugs			X				X	
Perceived risks of drug use							X	
Perceived harmfulness and availability of T,A,D							X	
All illicit Drug Use	X (past month)		X	X		X (by time period)	X	X
Injection drug use						X		X
Inhalant use			X			X		X
Hallucinogens			X				X	X
Cocaine use			X			X	X	X
Marijuana use		X	X			X	X	X

Appendix A: Summaries of Recent Adolescent Health Indicators

Indicator	HP 2010 Teen Obj	Health US 2000 Teens	Child Trends 2000	America's Children 2001	WHO 2000	YRBS	Monitoring the Future	Add Health
Social/Behavioral Risks/Substance Use								
Sexual Experience	X (abstinence)	x			X			X (includes sexual orientation)
Nature of romantic/sexual relationships								X
Use of contraceptives	X (or abstinent)		X		x			X
Ages of sexual initiation			X					X
Percent sexually active			X			X		X
Forced sex								X
Number sexual partners								X
Exchanged sex for drugs								X
Risky sexual behaviors			X			X		X
Sex education						X		X
Condom use						X		X
Number of sex partners						X		X
Sex with alcohol or drugs						X		X
Perceived risk for STD/preg								X (AIDS, other)
Self efficacy for birth control use								X
Peer attitudes								X
Parental attitudes								X
Knowledge								X (risks, protective factors)