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## Assessing Health System Provision of Adolescent Preventive Services: The Young Adult Health Care Survey

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**BACKGROUND.** Adolescents often do not receive recommended preventive counseling and screening services. Few measures are available to assess health care system performance in this area.

**OBJECTIVE.** Develop a reliable, valid, and feasible method for measuring adherence to consensus guidelines for adolescent preventive counseling and screening services.

**METHODS.** The 45-item Young Adult Health Care Survey (YAHCS) was tested with a diverse group of commercially and publicly insured adolescents enrolled in managed care organizations ( $n = 4,060$ ). Psychometric, bivariate, and multivariate analyses were conducted to assess the reliability, validity, and patterns of variation in the preventive care measurement scales derived from the YAHCS.

**RESULTS.** YAHCS measurement scales demonstrated strong construct validity (mean factor loading = 0.64) and reliability (mean Cronbach's  $\alpha = 0.77$ ). Average preventive counseling and screening scores ranged from 18.2% for discussing risky behavior topics to 50.4% for discussing diet, weight, and exercise topics. Adolescent demographic, health care use, and payer factors explained a small

amount of variation across adolescent scores on YACHS scales (mean  $R^2 = 0.086$ ). Females and older teens were more likely to report private time with providers and counseling and screening on topics related to sex. Overall, the odds of receiving preventive counseling and screening for adolescents who reported having private time with providers, engaging in risky behaviors, or both were higher than for adolescents who did not meet privately or report risky behaviors (private visit OR, 3.60; 95% CI, 2.91–4.47; risky behaviors OR, 2.02; 95% CI, 1.62–2.52).

**CONCLUSIONS.** The YAHCS provides a feasible, reliable, and valid method for assessing adherence to adolescent preventive services guidelines. It differentiates among varied aspects of preventive care provided to adolescents and is promising as a potential measure of health plan and provider quality. Improved performance on the YAHCS would indicate progress toward the achievement of Healthy People 2010 goals.

**Key words:** adolescent; preventive; health care; quality; measurement; survey (Med Care 2001;39:478–490)

Never before has the national focus on assessing and improving health care quality been stronger.<sup>1</sup> With the 1997 passage by the United States Congress of the State Child Health Insurance

Program (S-CHIP), commitment has been building to ensure that children and adolescents are included in national, state, and local efforts to measure and report on health care quality. In

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particular, the expansion in health insurance coverage to adolescents made possible by S-CHIP creates an unprecedented opportunity to assess and improve preventive health care services for America's nearly 40 million adolescents.<sup>2-5</sup>

Health behaviors, such as alcohol use and drunk driving, sexual activity, depression, suicide, smoking, violence, and guns are the primary causes of morbidity and mortality among adolescents.<sup>5-7</sup> Preventive counseling and screening on these and other health risk topics are the centerpiece of adolescent preventive services guidelines.<sup>8-10</sup> Common components in adolescent preventive services guidelines set forth by the American Medical Association (AMA), American Academy of Pediatrics (AAP), American Academy of Family Physicians (AAFP), and the US Maternal and Child Health Bureau (MCHB) include:

1. Periodic adolescent health care visits specifically focused on preventive screening and counseling.
2. Private and confidential care whereby adolescents can meet privately with providers with assurances of confidentiality.
3. Education and counseling on behavioral, emotional, and medical risks to health. This includes encouraging good health habits (eg, healthy eating, physical activity) and providing guidance on avoiding risky behaviors (eg, smoking, alcohol use and drunk driving, unprotected sexual activity, ignoring or reacting inappropriately to negative emotions, use of drugs, violence, and guns).
4. Screening, early identification and referrals for behavioral, emotional, and medical risks. This includes screening for smoking, alcohol use, sexual activity, depression, street drug use, involvement in or victim of violence or abuse, access to and use of guns, and unsafe practices such as infrequent helmet and seatbelt use or driving in a car with a driver who has been drinking alcohol.

In addition, studies demonstrate that adolescents trust health care providers. Adolescents are interested and willing to talk with providers about recommended preventive counseling and screening topics, especially during private, confidential health care visits.<sup>11-20</sup> Yet, for many reasons, including teen access barriers to care and provider training and incentives, few adolescents receive recommended comprehensive preventive counseling and screening

services on key topics such as alcohol use, depression, sexual activity, smoking, injury prevention, physical activity, and diet.<sup>5,11-15,19,21-45</sup>

Among other strategies, performance measurement can be a powerful component of efforts to improve preventive services for adolescents.<sup>5,21,30</sup> Experts and consumers emphasize the importance of adolescent preventive care as a top priority for health care system accountability and performance reporting, and point to the current lack of measurement methods.<sup>46,2</sup> Although the rate at which adolescents have yearly well visits is being used by the National Committee for Quality Assurance (NCQA) as a national indicator of quality for health maintenance organizations,<sup>47</sup> this measure provides no information about the provision of preventive counseling and screening. It also fails to take into account the fact that preventive services are often provided outside the context of well visits.<sup>24,25</sup>

The Young Adult Health Care Survey (YAHCS) was developed to complement existing performance measurement methods. This 45-item survey was designed to provide a parsimonious, comprehensive, and actionable assessment of adherence to adolescent preventive counseling and screening guidelines. Based on findings that adolescents are the most valid source of data about the provision of preventive counseling and screening services, the YAHCS is administered directly to adolescents.<sup>48-56</sup> The YAHCS was developed for potential use as a method for assessing and comparing health plan and provider adherence to guidelines as well as a tool for educating adolescents about their health care and for evaluating quality improvement efforts. In this paper, we report on a study of the reliability and validity of the YAHCS.

## Methods

### Development and Testing of the Young Adult Health Care Survey

The YAHCS was developed using a multistage process that began with the identification of preventive care guidelines set forth by the US Preventive Health Services Task Force and in the AMA, AAP, AAFP, and MCHB preventive services guidelines. Consensus preventive care topics included in the AMA, AAP, AAFP, and MCHB guidelines were identified for potential inclusion

in the YAHCS. Some common topics were eliminated from consideration due to evidence that adolescents do not validly or reliably report on these topics.<sup>48</sup> In addition, based on input from an expert panel focused on quality indicators for children's health care, a set of items related to adolescent experience and communication with providers were considered.<sup>57</sup> The topics retained for development of the YAHCS measurement scales include (Table 3):

1. Counseling on health behaviors, such as smoking, alcohol use, sexual activity, diet, weight, exercise, and on emotional health and relationship issues.
2. Screening for health behavior topics and other possible health risks to adolescents such as violence, guns, and safety practices
3. Private and confidential visits.
4. Helpfulness of counseling provided in understanding the risks of smoking and alcohol, birth control, and how to prevent HIV/AIDS and sexually transmitted diseases.
5. Communication (provider listens, explains things clearly, spends enough time). These items were drawn from the draft Consumer Assessment of Health Plans Adolescent Survey<sup>64</sup> and focused on adolescent's experiences with health plans.

Additional items were included in the YAHCS to gather descriptive information for quality improvement purposes, community health assessment, and S-CHIP evaluation. These items focus on the following:

- Adolescent self-report of smoking, alcohol use, sadness/depression, sexual activity, and seat belt use. These items were adapted from the Center for Disease Control and Prevention's Youth Risk Behavior Surveillance Survey<sup>7</sup>.
- Use of health care services (time since last visit, setting where teen goes for care, knowledge of where to go for private and confidential care).
- Demographics (age, school grade, gender, racial affiliation).

In-depth cognitive testing of the draft survey was conducted with 35 adolescents representing different socioeconomic groups, resulting in adjustments to the design, formatting, and wording of survey items. Readability analyses indicate that the YAHCS survey items are written at the 6th to

8th grade reading level and cognitive testing confirmed the readability of the YAHCS across adolescents with a range of educational levels.

The YAHCS was administered to adolescents aged 14 to 18 who were enrolled in managed care health plans. Although guidelines recommend beginning counseling and screening with people as young as age 11, the YAHCS was administered to adolescents aged 14 to 18 because younger teens may report less reliably about the provision of some preventive services.<sup>48,54,58,59</sup> Consistent with the Society for Adolescent Medicine's Guidelines for Adolescent Health research and the US federal regulations "Protection of Human Subjects" (45 CFR 46), informed consent procedures were used consisting of a prenotification letter asking for a waiver of documentation of parental permission and adolescent assent at the time of survey administration.<sup>60,61</sup>

The YAHCS was administered to 3 samples of publicly insured adolescents and 3 samples of commercially insured adolescents. Five of these samples were of adolescents enrolled in 1 of 5 different managed care health plans in urban settings, 2 were in northern California, 2 in southern California, and 1 in New York. Three of these plans were not-for-profit and 2 were for-profit health maintenance organizations. The sixth sample was of publicly insured adolescents enrolled in 1 of several managed care health plans in the state of Florida. Mail and telephone administration was used for 3 sites each. (Table 1)

Among the 12 health plans that responded to a public call by the Foundation for Accountability (FACCT) for managed care field trial sites, these 5 health plans and the Florida state agency were selected based on their interest in preventive care for adolescents, technical capacity in providing enrollment and administrative data required to draw the sample for the YACHS, sufficient numbers of enrolled adolescents who could meet the survey eligibility criteria, and ability to participate within the financial constraints of the project. Selection was also guided by the goal to have both commercial and publicly insured adolescents equally represented in the study.

Before sampling, adolescents from each of the 6 sites were categorized into 4 different use groups based on services received in the last 12 months and documented in the administrative records:

1. Adolescents who had a well visit within the past year as defined by the NCQA<sup>62</sup>.

TABLE 1. Description of Samples, by Site

Site	Geographic Location	Insurance Type for Sampled Adolescents	Number of Adolescent Sampled	Mode of Administration	Proportion Who Had an NCQA-defined Well Visit (%)
A	Northern California	Commercial	605	Telephone	43.0
B	Southern California	Commercial	675	Mail	100
C	Southern California	Public	532	Mail	NA*
D	Western New York	Commercial	600	Telephone	98.0
E	Northern California	Public	805	Mail	8.3
F	Florida	Public	843	Telephone	55.0

\*Site C was only able to provide information about whether a teen had any kind of visit in the last 12 months and was not able to provide information about specific visits that occurred.

- Adolescents who had another type of visit during which preventive counseling and screening was expected to occur. This included adolescents who had an ICD-9-CM, CPT coded visit that was judged by an expert panel to likely include preventive counseling by a primary care provider<sup>63</sup> (eg, visits related to birth control, substance abuse, and adolescent development), or both.
- Adolescents who had any other type of health care use (except hospitalization).
- Adolescents who had no health care visit in the past 12 months.

To ensure that an adequate number of teens who had health care visits at which preventive counseling and screening are expected to occur were represented in the overall sample, 4 of the 6 sites randomly selected adolescents who had been continuously enrolled for 12 months (allowing for a 1 month gap in enrollment) and who had a well visit or other type of preventive visit in the past 12 months (groups 1 and 2) (average  $n = 681$ ). The remaining 2 sites, both of which served publicly funded adolescents, were not able to identify enough teens to meet the continuous enrollment, visit sampling requirements, or both. One of these sites sampled all adolescents for whom they had contact information and who had any type of visit in the last 12 months (no continuous enrollment or visit requirement) ( $n = 532$ ). The final site sampled any current enrollee who had been enrolled for 12 months (allowing for a 1-month gap in enrollment), regardless of their health care use ( $n = 805$ ). (Table 1)

Overall, 58.2% of the adolescents sampled had a well visit within the past 12 months. For the

remainder of teens sampled, 21.4% had another type of visit where preventive counseling and screening might have been expected to occur, 6.7% had other types of visits (except hospitalization), and 13.7% had no visits recorded by their health plan. Note that over 80% of the teens in this latter group reported having seen a health care provider in the past 12 months.

Altogether, 4,060 adolescents were sampled (1,767 telephone and 2,293 mail). In total, 6.45% of parents refused to allow their adolescent to participate (12.4% for telephone administration and 1.9% for mail,  $P < 0.001$ ). Once contacted by phone, 7.2% of adolescents did not assent to the YAHCS. By mail, 1.4% of teens asked that the YAHCS not be mailed to them.

An average of 40.3% of adolescents whose parents waived authorization responded. The response rate was 57.8% by telephone (range, 52.6–60.2%) and 43.3%, 37.2%, and 13.2% for the 3 sites using mail administration. The overall response rate was similar to or higher than that of other adolescent survey-based studies.<sup>64</sup> The distribution between those sampled and those who responded did not vary on most factors. However, both males and younger adolescents were somewhat less likely to respond to the YAHCS (Table 2).

Using adolescent level responses to the YAHCS, factor analysis was conducted to assess the construct validity of the YAHCS quality measurement scales. A scree test was used to determine the number of factors to extract.<sup>65</sup> An oblique rotation was evaluated, using a promax method. The reliability of survey scales was evaluated using Cronbach's alpha measure of internal consistency. Multivariate linear regression was used to evaluate the

TABLE 2. Characteristics of Teens Sampled and Survey Respondents

Characteristic	Proportion of Adolescents Sampled N = 4060 (%)	Proportion of Adolescents Responding N = 1531 (%)
Male	47.5	42.8
Female	52.5	57.2
Teen ages 14–16 years old	38.7	42.3
Teen ages 16–19 years old	61.3	57.7
Reported racial affiliation		
White	NA	48.2
Black	NA	12.0
Hispanic	NA	13.7
Asian	NA	18.5
Native Hawaiian, Pacific Islander or American Indian	NA	1.94
More than one group	NA	5.7
Medicaid insurance	58.5	57.2
Commercially insured	41.5	42.8
Had a NCQA defined well visit recorded by health plan	58.2	57.3
Had another type of prevention oriented visit recorded by health plan	21.4	23.2
Had any other type of visit	6.7	6.9
Had no visit recorded by health plan	13.7	12.6
Adolescent reported seeing doctor or other provider in past 12 months	NA	94.5
Adolescent reported a regular or routine visit in past 21 months	NA	88.5

\*NA = not available. Due to coding errors and lack of available data, Site 3 is not included in the analysis by visit type.

explanatory power of various factors on variation in scores on YAHCS measurement scales across individual adolescents. Analysis of variance (ANOVA) and  $\chi^2$  tests were used to assess the significance of observed differences in scores across health plan samples and various adolescent subgroups within and across health plan samples. Using relative odds-ratio calculations, the concurrent validity of the YAHCS was examined by determining the presence and strength of hypothesized associations between adolescent receipt of preventive services and the reported health care experiences and behaviors of teens.

**Results**

**Validity and Reliability of Measures**

Eight factors emerged from the factor analysis (Table 3):

1. Counseling and screening on smoking and alcohol use.
2. Counseling and screening on other risk behavior topics (drug use, helmet use, drunk driving, steroids use, violence, guns, abuse).
3. Counseling and screening on sexual activity.
4. Counseling and screening on diet, weight, and exercise.
5. Counseling and screening on emotional health and relationship issues.
6. Provision of private and confidential care.
7. Helpfulness and reported effect of counseling.
8. Communication and overall rating of care.

Although factor analysis was complicated by the fact that a few of the preventive counseling and screening topics included in the YACHS fit conceptually with more than 1 factor (eg, suicide could be assigned to risky behavior or emotional health), a strong factor structure emerged for the YAHCS measurement scales. The average factor



TABLE 3. YAHCS Measures: Content, Scores, Internal Consistency, and Factor Loading from Oblique, Proximax Rotation

YAHCS Measure	Average Scores (range across six samples)	Internal Consistency Reliability (range across six samples)	Factors (average item loading)
1. <b>Preventive screening and counseling on risky behaviors:</b> Average proportion saying "yes" to ten items about whether provider(s) discussed/screened on smoking, alcohol use, helmet use, drunk driving, chewing tobacco, street drugs, steroid pills, sexual/physical abuse, violence, guns.	18.2% (8.3%–26.3%)*	0.87 (0.83–0.89)	Factor 1: Smoking and alcohol (0.59) Factor 2: Other health risk topics (0.53)
2. <b>Preventive screening and counseling on sexual activity and STD's:</b> Average proportion saying "yes" to four items about whether provider(s) discussed/screened on birth control, condoms and prevention of HIV/AIDS and STDs.	36.4% (18.7%–48.5%)*	0.84 (0.81–0.86)	Factor 3: Sex and STDs (0.76)
3. <b>Preventive screening and counseling on weight, healthy diet and exercise.</b> Average proportion saying "yes" to three items.	50.4% (39.8%–64%)*	0.70 (0.56–0.74)	Factor 4: Weight, diet and exercise (0.75)
4. <b>Preventive screening and counseling on emotional health and relationship issues:</b> Average proportion saying "yes" to six items about whether provider(s) discussed/screened for feeling sad or depressed, school performance, friends, suicide and sexual orientation.	23% (13.4%–30.9%)*	0.72 (0.68–0.75)	Factor 5: Emotional health (0.55)
5. <b>Private and confidential care:</b> Average proportion reporting that they had a private and/or confidential visit.	52.6% (42.3%–71.2%)*	0.68 (0.53–0.74)	Factor 6: Private and confidential care (0.72)
6. <b>Helpfulness of counseling:</b> If they got counseling, mean score on six items asking about the helpfulness of counseling on selected topics: cigarettes, alcohol, condoms/HIV, birth control.	66.7% (59.3%–72%)*	NA (Not all teams responded to these items.)	
7. <b>Communication and experience:</b> Mean score on seven items asking about helpfulness of office staff, overall rating of care and whether doctor/other providers listen carefully, explain things clearly, respect, you, spend enough time.	74.2% (62%–82.1%)*	0.78 (0.72–0.84)	Factor 7: Experience of care: (0.60)

\*Differences across plans significant;  $P < 0.001$ .

TABLE 4. Associations Among YAHCS Survey Items

Association Questions	Odds Ratio (N = 1528)
Odds that a teen had a private visit is greater if teen reports knowing of a place to go without parents knowing about it?	2.09 95% CI (1.70–2.58)
Odds of a provider talking with teen about a minimal set of prevention topics is greater if teen reports having had a private visit?	3.60 95% CI (2.91–4.47)
Odds of a provider talking with teen about a minimal set of prevention topics is greater if teen reports one or more of the associated risk behaviors?	2.02 95% CI (1.62–2.52)
Odds that teen reports that a provider spent enough time with them is greater if a provider talked with teen about one or more core prevention topics?	1.19 95% CI (0.96–1.45)
Odds that teen reports that a provider listens carefully to them is greater if a provider talked with teen about one or more core prevention topics?	1.59 95% CI (1.23–2.05)
Odds that a provider talked with teen about risks of smoking is greater if teen smokes?	2.09 95% CI (1.48–2.68)
Odds that a provider talked with teen about preventing HIV/AIDS is greater if teen is sexually active?	2.38 95% CI (01.9–2.97)
Odds that a provider talked with teen about birth control is greater if teen is sexually active?	4.27 95% CI (3.4–5.4)
Odds that a provider talked with teen about drinking greater if teen drinks?	1.19 95% CI (0.88–1.6)
Odds that a provider talked with teen about feeling sad or depressed is greater if teen reports significant sadness?	2.58 95% CI (1.90–2.97)
Odds that a provider talked with teen about drinking is greater if a provider also talked to teen about feeling sad/depressed?	4.58 95% CI (3.3–6.3)
Odds that a provider talked with teen about drinking is greater if a provider also talked to teen about HIV/AIDS?	11.05 95% CI (7.97–15.31)
Odds that a provider talked with teen about drinking is greater if a provider also talked to teen about smoking?	22.7 95% CI (16.4–31.4)
Odds that teen drinks is greater if they also smoke?	6.72 95% CI (5.00–9.00)
Odds that teen drinks is greater if they are also sexually active?	4.2 95% CI (3.3–5.4)
Odds that teen smokes is greater if they are also sexually active?	6.23 95% CI (4.6–8.4)

loading for survey items across the 8 factors was 0.64 (range, 0.53–0.75) (Table 3).

For purposes of further analysis, these 8 factors were used to create 7 measurement scales (Table 3). Factors 1 and 2 are combined into 1 measurement scale to represent counseling and screening on a more complete range of risky behavior topics. The resulting scale demonstrated strong internal consistency reliability (Cronbach's alpha = 0.87) as did each of the other 6 measurement scales (Cronbach's alpha range, 0.68–0.84) (Table 3).

To assess the concurrent validity of the YAHCS measurement scales, expected associations among

YAHCS items and scales were examined. Four hypotheses were evaluated:

1. The odds of receiving preventive counseling and screening are greater for adolescents who indicate that they had a private visit with a health care provider.
2. The odds of receiving preventive counseling and screening are greater for adolescents who report engaging in risky health behaviors.
3. The odds of reporting that their doctor and/or other health care providers listened to them carefully are greater for adolescents who also report having received preventive counseling and screening.



TABLE 5. Results of Regression Analysis Assessing Explanatory Power of Socioeconomic and Other Variables on YAHCS Quality Measures

Dependent Variables: YAHCS Quality Measures Scores (0–100 Scale)						
	Risky Behavior (R <sup>2</sup> = 0.04)	Sexual Activity (R <sup>2</sup> = 0.09)	Diet and Exercise (R <sup>2</sup> = 0.06)	Emotional Health (R <sup>2</sup> = 0.03)	Private, Confidential Care (R <sup>2</sup> = 0.16)	CAHPS: Experience of Care (R <sup>2</sup> = 0.14)
Quality measure constant	22.7	44.15	63.68	26.63	79.55	80.50
Age	B = 3.34 P = 0.02	B = -9.70 P = 0.000	B = 5.51 P = 0.01	B = 5.72 P = 0.71	B = -18.41 P = 0.000	B = 2.74 P = 0.02
Gender	B = -2.47 P = 0.09	B = 12.88 P = 0.000	B = -0.35 P = 0.87	B = 2.78 P = 0.06	B = 6.75 P = 0.003	B = -3.00 P = 0.008
African American	B = 5.62 P = 0.02	B = 16.25 P = 0.000	B = 9.2 P = 0.01	B = 4.53 P = 0.08	B = 10.27 P = 0.01	B = -0.10 P = 0.96
Hispanic	B = -2.22 P = 0.34	B = 2.99 P = 0.40	B = 5.5 P = 0.12	B = -1.25 P = 0.61	B = -3.23 P = 0.39	B = -2.27 P = 0.21
Asian	B = -1.92 P = 0.39	B = -2.17 P = 0.53	B = -2.66 P = 0.44	B = -5.62 P = 0.02	B = -16.46 P = 0.000	B = -2.27 P = 0.000
Payer	B = -1.71 P = 0.34	B = -0.32 P = 0.91	B = -9.90 P = 0.000	B = -0.145 P = 0.94	B = -11.33 P = 0.000	B = -1.05 P = 0.45
Mode	B = -8.68 P = 0.000	B = -15.49 P = 0.000	B = -15.50 P = 0.000	B = -7.74 P = 0.000	B = -17.79 P = 0.000	B = -9.48 P = 0.000
Type of visit	B = -2.09 P = 0.24	B = -9.4 P = 0.001	B = -8.12 P = 0.03	B = -2.36 P = 0.20	B = -9.6 P = 0.001	B = 0.73 P = 0.60

Definition of variables: Age: 1 = 14–15, 0 = 16–19; Gender: 1 = female, 0 = male; African American: 1 = African American, 0 = not African American; Hispanic: 1 = Hispanic, 0 = not Hispanic; Payer: 1 = Public Sector Insurance Coverage 0 = Commercial Insurance Coverage; Administration Mode: 1 = Mail, 0 = telephone; Type of visit: 1 = NCQA defined well visit, 0 = no NCQA defined well visit.

4. The odds of receiving preventive counseling and screening on certain topics are greater for adolescents who report that providers talked with them about other prevention topics.

In this study, 69% of adolescents reported 1 or more of 5 common risky behaviors:

- 34.7% reported having tried smoking or currently smoke.
- 25% reported drinking alcohol regularly and 38% of these reported binge drinking.
- 33.3% reported having had sex.
- 47.5% reported sadness/depression in past year.
- 16% reported infrequent or no seatbelt use.

The proportion of adolescents reporting these risk behaviors is commensurate with those observed in national studies using the Youth Risk Behavior Surveillance Survey, particularly rates of smoking, alcohol use, and sexual activity.<sup>5,7</sup>

As hypothesized, adolescents reporting participation in 1 or more of these risky behaviors were more likely to report receiving counseling and screening on 1 or more related prevention topics (63.1% vs. 45.9%) (Table 4). It should be noted that although 63.1% of adolescents who reported 1 or more risky behaviors were counseled on 1 or more of these topics, only 38% were counseled on 2 or more and only 2.1% of teens were counseled on all topics (smoking, alcohol use, sexually transmitted diseases, birth control, sadness/depression, drunk driving).

As expected, results indicate that adolescents were more likely to report counseling on key prevention topics if they had spent private time with their doctor or other health care provider (Table 4). Specifically, 70.9% of teens who had private time with their provider reported talking with providers about 1 or more key topics compared with 40.4% of those without private time during their visit. Adolescents were also more

likely to report having had a private visit if they reported knowing of a place to get health care without their parents knowing about it (67.1% vs. 49.4%) (Table 4).

In addition, adolescents who reported that their providers usually or always listened to them carefully were more likely to get counseling on key prevention topics compared with those who reported that their provider never or only sometimes listened carefully to them (66% vs. 55%) (Table 4).

Finally, although few adolescents received preventive counseling and screening on each of a core set of topics (smoking, alcohol, sexual activity, depression, safety), adolescents who reported that providers talked with them about certain topics were more likely to also indicate that providers talked with them about other preventive counseling topics. For instance, the odds that an adolescent reported having received counseling on drinking alcohol was much greater if they also reported that providers talked with them about smoking (58.0% vs. 5.7%) (Table 4).

### Application of the YAHCS Measurement Scales

The 7 YAHCS measurement scales were evaluated to begin to assess whether they meet minimal criteria for use in comparing performance across health plans. Baseline criteria that could be evaluated in this study include:

1. Measurement scales represent aspects of health care where there is a need and opportunity for improvement.
2. Variation in measurement scale scores for individual adolescents are not largely accounted for by demographic and other potentially nonquality related factors out of the control of the health care system (eg, age and gender of adolescents).
3. YAHCS measurement scales discriminate among health care plans.

Commensurate with other studies, results indicate a substantial need for improving performance in adolescent preventive services.<sup>21-34</sup> Overall, care is observed to be approximately 20% to 50% of optimal for preventive counseling and screening services. Specifically, across all 6 samples, average adolescent scores on the preventive counseling and screening measurement scales ranged from a low of 18.2% for counseling and screening on risky

behaviors to a high of 50.4% for counseling and screening on diet, weight, and exercise. Scores were 36.4% for counseling and screening on sex, 23% for counseling and screening on emotional health and relationship issues, and 52.6% on private and confidential care.

Adolescents who did receive preventive counseling often reported that it was helpful in understanding the risks of certain behaviors (Table 3). Also, in this study, most adolescents reported good communication with providers (Table 3). However, only 40% of adolescents indicated that providers always spent enough time with them.

Multivariate linear regression analysis was performed to assess the degree to which variations in adolescent level YAHCS measurement scale scores were explained by demographic characteristics or other potentially nonquality related factors. Using the YAHCS measurement scale scores as dependent variables, independent variables included in the analysis were: age of adolescent, gender, racial affiliation, payer (commercial or public), survey administration mode (mail or telephone), and type of health care visit (NCQA defined well visit or other).

As shown in Table 5, age, gender, racial affiliation, payer, type of visit, and survey mode variables account for only a small portion of variation across adolescent reported provision of preventive services. Nonetheless, significant effects were observed on 1 or more of the YAHCS measurement scales for age, gender, African American or Asian racial affiliation, payer, mode of survey administration, and type of health care visit. Most notably, after controlling for other factors, females and older adolescents were more likely to have had private time with providers and to have received counseling and screening on topics related to sexual activity.

Adolescents for whom health plans reported a NCQA defined well visit in the past 12 months were not more likely to receive counseling and screening on risky behaviors, sexual activity and sexually transmitted diseases or emotional health and relationship issues. In fact, when compared with adolescents with any other type of visit, teens having NCQA defined well visits had lower scores on counseling and screening related to diet, weight, and exercise, and on private and confidential visits. In addition, scores observed for mail versus telephone administration of the YAHCS remained significantly different after controlling for other variables. This mode effect is attenuated and in some cases eliminated when additional variables indicative of quality care are included in

the regression analysis (eg, provider use of health checklists, private visit). This suggests that the observed mode effect may in part be a proxy for the fact that quality of care may be lower in sites where a mail survey administration protocol was used. However, this study does not allow conclusions to be drawn about the impact of mode. A follow-up study on mode effect is currently underway.

Although significant variations in the YAHCS scores are observed across the 6 samples for each of the 7 YAHCS measurement scales (Table 3), variations in the sampling, response rates, and modes of survey administration limit our ability to fairly compare these scores across all 6 samples. However, fair comparisons can be made between health plans if the following 3 conditions are met: 1) teens included in the denominator for the quality measures had similar types of health care visits; 2) the same mode of administration is used; and 3) adolescents are enrolled through the same payer within the managed care organization. In this study, only 2 of the 6 sites met this criterion for comparison. In these sites, only commercially insured teens who had a preventive visit in the last 12 months were sampled and a telephone mode of administration was used. Future studies will be needed to evaluate the ability of the YAHCS scales to discriminate among health plans and providers within a single health care market.

### Limitations

Our study was unable to fully explain variations in scores observed according to whether an adolescent completed the YAHCS by phone or mail. Evaluation of the observed differences in scores across health plan samples is beyond the scope of this paper. Furthermore, given that teens were sampled from 3 states only, and in a limited number of managed care health plans within those states, these findings may not be generalizable to the US population of teens enrolled in managed care plans.

Another limitation of this study is the low-response rate in 1 of the 6 samples (13.2%). It should be noted that this lowest response rate site was located in an inner city where low responses to surveys are a common problem. This lower than expected response rate also may have been due to the high proportion of non-English speaking persons in the population, or to limitations in the

survey administration process. Specifically in this site, 70% of the sample did not receive a follow-up phone call to remind the adolescent to return the survey because of nonexistent or bad phone numbers. However, except for this site, our overall response rates were commensurate with adolescent surveys administered in a similar way.<sup>64</sup>

Finally, although the YAHCS measurement scales provide comprehensive information about the provision of adolescent preventive services, they do not measure provider skill and effectiveness in preventive counseling and screening or associated outcomes. It should be noted that although the YAHCS provides much more information than does simply measuring the occurrence of a preventive care visit, the scales are still conservative measures of quality for adolescent preventive care.

### Summary and Conclusion

Results of this analysis indicate that the YAHCS is feasible to use for standardized assessments of performance in the area of adolescent preventive counseling and screening. Participating sites were able to identify adolescents qualifying for the YAHCS, and the survey administration protocols used yielded acceptable response rates in 5 out of 6 samples.

Analyses indicate that the YAHCS has strong construct validity for purposes of measuring adherence to national guidelines and that the 7 quality measurement scales have high internal consistency reliability. Expected relationships between and among the YAHCS items and scales emerged and further support the validity of the YAHCS quality measurement scales.

Results point to significant opportunities for improvement in performance in the area of adolescent preventive counseling and screening. A small portion of variation in scores were explained by variations in the demographic characteristics of adolescents and other variables, indicating that the variation in scores may be due to real differences in adherence to adolescent preventive services guidelines.

Although this study did not investigate the effectiveness of strategies to increase the provision of adolescent preventive services, lessons did emerge that suggest specific improvement strategies. Findings indicate that ensuring confidential and private care is likely to significantly increase the provision of preventive counseling and screen-

ing. In turn, educating adolescents about places they can receive confidential health care services when they need it can increase the probability that teens will seek and receive private care.

Results show that providers may systematically target preventive counseling and screening to certain types of adolescents according to their age, gender, racial affiliation, socioeconomic or risk behavior status. As such, encouraging providers to not only selectively counsel and screen teens, but to also provide preventive counseling and screening to all adolescents, may result in improvements in care. In addition, encouraging providers to both elicit and listen carefully to adolescents concerns and questions is important.

Finally, results from this study verify expectations that preventive counseling and screening is not more likely to occur in the context of NCQA defined well visits. It also occurs during other health care visits, perhaps on an opportunistic basis. As such, if the YAHCS is used to evaluate performance, sampling adolescents regardless of whether they had a well visit is suggested, to give health plans and providers credit for taking advantage of all opportunities they might have to provide preventive counseling and screening services to adolescents.

The YAHCS is strongly aligned with adolescent preventive care guidelines set forth by the AMA, AAP, AAFP, and MCHB as well as with the Healthy People 2010 goals and objectives.<sup>66</sup> As such, performance on the YAHCS measurement scales can be used to indicate the level of adherence to guidelines and progress toward meeting the nation's health goals. Although additional evaluation is required and is underway, the YAHCS measurement scales meet minimal criteria for use in comparing performance across health plans when a comparable sample of teens are identified. It may also be appropriate for use in evaluating national initiatives such as S-CHIP and a wide range of adolescent preventive care quality improvement initiatives.<sup>2</sup> For a copy of the YAHCS and more information about the development, testing, and recommended administration and scoring of the YAHCS, contact Dr. Bethell.

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