

# Foregone Health Care Among Adolescents

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**P**HYSICIANS' OPPORTUNITIES TO address adolescents' health needs depend on adolescents at risk of health problems seeking care. Health care for emotional problems, substance use, and risk-associated sexual behaviors is particularly important since major causes of adolescent morbidity and mortality are related to motor vehicle injuries, interpersonal violence, suicide, alcohol and tobacco use, and sexual behaviors.<sup>1,2</sup> Physicians have opportunities to screen adolescents for behaviors associated with potential negative health outcomes and for health problems during routine health care<sup>3</sup> and visits precipitated by adolescents' concerns. Both depend on adolescents having access to and using health care services.

Previous research shows that a variety of social and economic factors influence access to and use of health services by children and adults.<sup>4-6</sup> Although frameworks for studying health care utilization differ, most recognize the importance of an individual's predisposition to use services (eg, related to demographic characteristics, family size, and beliefs), ability to secure services (eg, health insurance, availability of health care, and transportation issues), and level of need or illness (eg, perceived symptoms, general state, and diagnoses).<sup>5-8</sup> Previous research specific to or including adolescents has shown that insurance status, income, usual source of care, race/ethnicity, and perceptions of health care settings and professionals influence health care utilization among youth.<sup>9-15</sup>

**Context** No annual national population estimates exist of the numbers of adolescents who think they need but do not receive health care or their risk of health problems.

**Objective** To describe the proportion of adolescents who report foregone health care each year and the influence of sociodemographic factors, insurance status, past health care, and health risks/behaviors on foregone care.

**Design** Cross-sectional analyses of data from wave 1 of the National Longitudinal Study of Adolescent Health, conducted during 1995.

**Setting** In-home interviews conducted throughout the United States.

**Participants** Of 27 000 adolescents in grades 7 through 12 who were invited to participate, 20 746 (76.8%) completed the in-home interview.

**Main Outcome Measure** Reported foregone health care in the preceding year by individual and family characteristics, insurance status, past health care, health/behavior risk factors, and symptoms.

**Results** On average, 2268 (18.7%) of 12 079 adolescents reported foregone health care within the past year. Factors associated with decreased risk of foregone care included continuous private or public insurance (adjusted relative risk [95% confidence interval], 0.64 [0.50-0.82] to 0.82 [0.70-0.96]), and having a physical examination within the past year (0.87 [0.78-0.97] for male and 0.79 [0.70-0.88] for female adolescents). Factors associated with increased risk of foregone care included older age (1.12 [1.06-1.15] for male), minority race/ethnicity (1.25 [1.06-1.46] to 1.50 [1.30-1.73]), single-parent home (1.31 [1.18-1.46] for female), and disability (2.03 [1.61-2.52] for male and 1.66 [1.20-2.10] for female). Adolescents participating in the following behaviors were more likely to report foregone care than those who did not: daily cigarette use (26.0% vs 16.8%; 1.34 [1.16-1.55]), frequent alcohol use (30.3% vs 18.1%; 1.34 [1.11-1.62] for male), and sexual intercourse (25.1% vs 15.1%; 1.23 [1.09-1.39] for male and 1.39 [1.23-1.56] for female). From 32.4% to 38.2% of adolescents with symptoms suggesting health problems reported foregone care (1.61 [1.13-2.26] to 2.03 [1.81-2.28]).

**Conclusions** Our study suggests that adolescents who forego care are at increased risk of physical and mental health problems. Efforts to improve adolescent health through health care should address factors influencing foregone care.

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Within the context of research on health care utilization, there has been relatively little focus on foregone health care. This may be an important omission when trying to understand health care utilization during adolescence. We know that adolescents' decisions about seeking health care are complex, particularly for the types of sensitive health issues linked to adolescent morbidity and mortality, and that factors influ-

encing care-seeking are in part related to unique developmental issues. For example, adolescents report that con-

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cerns about privacy influence their willingness to seek health care and, in contrast to adults' concerns about privacy, adolescents worry about disclosure of sensitive health information to their parents.<sup>16-19</sup> A recent survey found that among adolescents who report a history of not getting needed health care, the leading reason was that they did not want their parents to know, followed by financial or insurance reasons.<sup>20,21</sup> In addition, despite emerging biological maturity, adolescents may lack the cognitive or psychosocial maturity to effectively use health care systems during a time when they are developing increased autonomy.<sup>22</sup>

To determine the potential importance of foregone health care among adolescents, several gaps in our knowledge need to be addressed. First, the number of adolescents who forego health care on an annual basis is not known. Most national population estimates of unmet health needs among adolescents have been limited by reliance on data from parents or other adult family members<sup>9-14</sup> who may not be fully aware of adolescents' health needs or decisions to forego health care for sensitive health issues.<sup>23</sup> Previous studies that have directly asked adolescents about unmet health needs have been regional studies and/or limited by use of measures for foregone care that do not specify a time interval.<sup>18-21,24</sup> Second, we do not know if adolescents who forego care are the "worried well" or at risk of real health problems. Third, comparisons between factors that are associated with foregone health care and general health care utilization among adolescents have not been performed. If factors predicting foregone health care are substantially different than factors predicting general health care utilization, then policies aimed solely at improving general utilization among adolescents may not effectively reduce foregone care.

The National Longitudinal Study of Adolescent Health (Add Health) provides opportunities to begin to address these gaps in our existing knowledge.<sup>25</sup> The main objectives of this study

are to define a national population estimate of annual foregone health care among adolescents, their risk of health problems, and reasons for foregone care. In addition, this study describes the influence of sociodemographic factors, family characteristics, insurance status, previous health care, behaviors with risk of negative health outcomes, and symptoms suggestive of serious physical or mental health problems on adolescents' report of foregone health care within the past year and makes comparisons between factors influencing foregone care vs having a physical examination in the past year.

## METHODS

### Study Population

All procedures for Add Health were approved by the University of North Carolina Institutional Review Board on Research Involving Human Subjects.

A stratified nationally representative sample of all public and private high schools in the United States was drawn from the Quality Education Database in April 1994. Schools were selected with probability proportional to size across broad strata based on region, urbanicity, school type (public, private, and parochial), and racial composition. For each of the 80 primary sampling strata, a school or school pair spanning grades 7 through 12 was recruited to participate in the study. Seventy percent of the originally selected schools agreed to participate. Replacement schools were recruited within each community. In total, 79% of all schools contacted participated in the study.

Throughout the fall of 1994, school questionnaires were administered to all students attending participating schools; 77% of students enrolled at the start of the school year participated in the study, including approximately 4000 students who were not on earlier school rosters but who were attending school in the fall. In total, 90 118 in-school questionnaires were completed. From the students who completed an in-school questionnaire, 27 000 individuals were selected for a 90-minute in-home inter-

view. Approximately 220 students were selected from each school pair, irrespective of size, to form a main core sample of approximately 17 600 (80 × 220). In addition to individuals selected for the main sample, special oversamples of race/ethnic groups, disabled youth, and individuals eligible for participation in a behavior-genetic sample were selected for in-home interviews.

Wave 1 in-home interviews were conducted during 1995. Of the 27 000 adolescents invited to participate in the in-home interview, 20 746 (76.8%) completed the interview. Of those completing the interview, 12 102 represented the main core sample, and the remainder represented adolescents from oversampled subgroups (TABLE 1). The sample for this study consists of all adolescents who completed the wave 1 in-home Add Health interview.

### Interview Procedures

After obtaining written parental consent and adolescent assent, adolescent in-home interviews were conducted using Computer-Assisted Personal Interview and Audio Computer-Assisted Self-Interviewing technology.<sup>26</sup> Adolescents listened to all potentially sensitive questions through earphones and directly entered their responses into a laptop computer, thereby minimizing potential for interviewer or parental effects on their responses. In addition, 1 parent in each household completed a written questionnaire that included questions about the adolescents' insurance status.

### Measures of Independent Variables

**Individual Factors.** Age was computed from date of birth. Race/ethnicity was measured by self-identification and was coded "Hispanic" if participants identified themselves at least in part to be Hispanic, white, African American, and other. Verbal ability was assessed using a modified Peabody Picture Vocabulary Test.<sup>27</sup>

**Family Characteristics.** A socioeconomic status (SES) score for each par-

ent was computed based on the sum of 5-point ordinal rankings of education and occupation (low to high) as reported by the adolescent participant; family SES was coded as the maximum score of either parent. Families with only 1 parent living in the home were designated “single-parent” families.

**Insurance Status.** Based on parent/guardian questionnaire responses, insurance status was coded as “private” if the adolescent had individual or group private coverage (such as Blue Cross or Cigna) or used a prepaid health plan (such as a health maintenance organization or the Civilian Health and Medical Program of the Uniformed Services [CHAMPUS]). Insurance status was coded as “public” if the adolescent had Medicare (from Social Security) or Medicaid coverage. Interrupted vs continuous coverage was determined by response to the following question: “In the past 12 months, has there been a time when (name) had no health insurance?”

**Past Health Care.** Responses to “When did you last have a physical exam by a doctor or nurse?” were dichotomized to less than a year ago vs 1 or more years ago.

**Health/Behavior Risk Factors.** Height and weight were measured at the time of interview, from which body mass index (BMI) was calculated (weight in kilograms divided by height in meters squared). Participants were considered overweight if their BMI was greater than or equal to 2 SDs above the sample mean (31.4 kg/m<sup>2</sup> for male and 30.9 kg/m<sup>2</sup> for female participants) and underweight if their BMI was less than or equal to 2 SDs below the sample mean (13.6 kg/m<sup>2</sup> for male and 13.5 kg/m<sup>2</sup> for female participants). Level of sports activity was measured by response to “During the past week, how many times did you play an active sport, such as baseball, softball, basketball, soccer, swimming or football?” with responses ranging from 0 to 5 or more times per week. Presence of disability was measured by response to “Do you have difficulty using your hands, arms, legs, or feet because of a permanent physical condition?” Participants who reported

ever smoking at least 1 cigarette every day for 30 days were considered to have a history of regular smoking. Participants who reported “getting drunk or very, very high on alcohol” at least 1 day a week over the past 12 months were considered frequent alcohol users. Participants who responded affirmatively to “Have you ever had sexual intercourse? When we say sexual intercourse, we mean when a male inserts his penis into a female’s vagina” were considered sexually active.

**Symptoms Suggesting Health Problems.** Participants were asked about

symptoms over the preceding 12 months. Those who reported 1 or more of the following symptoms almost every day or every day were considered to be at high risk of serious mental or physical health problems: headache, a stomachache or upset stomach, cold sweats, feel physically weak for no reason, sore throat or cough, feeling really sick, dizziness, or chest pain. Participants who reported crying almost every day or every day were considered to be at high risk of mental health problems. Participants who reported painful or very frequent urination (dys-

**Table 1.** Percentage of US Adolescents Reporting Physical Examination or Foregone Health Care in Past Year by Individual Factors, Family Characteristics, Insurance Status, and Past Health Care\*

	Total, No. (%)	Physical Examination in Past Year, % (95% CI)†	Foregone Care in Past Year, % (95% CI)†
<b>Individual factors</b>			
Sex			
Male	6137 (50.7)	67.4 (65.2-69.6)	18.1 (16.8-19.5)
Female	5965 (49.3)	66.4 (64.4-68.6)	19.4 (18.1-20.7)
Age, y			
<15	4050 (33.5)	68.3 (65.8-70.9)	14.0 (12.5-15.4)‡
≥15	8052 (66.5)	66.2 (63.9-68.5)	21.2 (20.1-22.3)
Race/ethnicity			
White	7885 (65.2)	67.7 (65.4-70.1)‡	17.2 (16.1-18.3)‡
African American	1816 (15.0)	69.7 (67.0-72.4)	22.7 (20.1-25.5)
Hispanic	1482 (12.3)	61.9 (58.1-65.8)	20.6 (17.9-23.1)
Other	918 (7.6)	62.6 (59.4-65.8)	21.1 (17.8-24.4)
Vocabulary score			
PPVT ≤85	2085 (17.2)	62.1 (59.0-65.3)‡	18.5 (16.0-20.9)
PPVT 86-115	7990 (66.0)	67.4 (65.5-69.4)	19.3 (18.2-20.5)
PPVT >115	2027 (16.8)	69.8 (66.7-72.9)	16.8 (15.1-18.6)
<b>Family characteristics</b>			
Family SES			
Low	4394 (36.3)	62.1 (59.8-64.2)‡	20.8 (19.0-22.8)‡
Mid	4323 (35.7)	66.8 (64.1-69.5)	18.4 (16.9-19.9)
High	3385 (28.0)	73.4 (71.2-75.7)	16.5 (15.2-17.8)
Family composition			
Single-parent home	9259 (76.5)	65.4 (63.1-67.7)	21.9 (20.3-23.7)‡
2-Parent home	2843 (23.5)	67.4 (65.4-69.4)	17.8 (16.7-18.8)
<b>Insurance status</b>			
Continuous private	7539 (71.1)	69.8 (67.5-72.1)‡	17.0 (15.9-18.1)‡
Continuous public	997 (9.4)	70.1 (66.7-73.4)	15.7 (12.1-19.3)
Interrupted private	174 (1.6)	66.5 (59.1-73.9)	18.6 (11.8-25.3)
Interrupted public	521 (4.9)	63.6 (59.0-68.2)	22.3 (18.6-26.1)
No insurance	1374 (13.0)	55.6 (52.2-58.9)	23.9 (21.4-26.5)
<b>Past health care</b>			
Examination in past year	8103 (67.0)	Not applicable	17.4 (16.3-18.5)‡
No examination in past year	3999 (33.0)	Not applicable	21.5 (20.0-22.9)
Overall	12 102 (100)	66.9 (65.1-68.8)	18.7 (17.7-19.8)

\*CI indicates confidence interval; PPVT, Peabody Picture Vocabulary Test; and SES, socioeconomic status.  
 †Percentages and 95% CIs from weighted core sample to correct for stratified sampling design and yielding estimates that are representative of the national adolescent population.  
 ‡Significant differences by bivariate logistic regression analyses at P≤.001.

uria) almost every day or every day were considered to be at high risk of genitourinary tract problems, including sexually transmitted infections.

**Measure of Dependent Variable**

Foregone health care was measured by response to “Has there been any time over the past year when you thought you should get medical care, but did not?”

**Statistical Analyses**

Data were prepared using SAS Version 6.12 software (SAS Institute Inc, Cary, NC) and statistical analyses were performed using STATA Release 5.0 software (Stata Corp, College Station, Tex). Descriptive statistics were computed for the core sample weighted to correct for the stratified sampling design, yielding estimates that are representative of the national adolescent population. Multivariate analyses were performed using a theoretically derived model constructed from variables hypothesized to

influence foregone health care because of their association with health care utilization in existing literature. Risk factors for health problems were selected to represent common health-protective and health-compromising domains in this age group. Because of interactions between sex and several independent variables (eg, level of sports activities, frequency of crying, frequency of painful urination), multivariate analyses were performed separately for males and females.

Logistic regression analyses using unweighted data from the entire sample, with all independent and stratifying variables simultaneously entered into the regression model, produced adjusted odds ratios (ORs).<sup>28,29</sup> We elected to simultaneously enter all variables into the regression model because stepwise models that incrementally enter only a portion of the known-to-be important variables are misspecified; this may produce biased equations and parameter esti-

mates.<sup>30</sup> Because adjusted ORs may overestimate risk ratios greater than 1 and underestimate risk ratios less than 1 when main outcomes are common (>10%), adjusted relative risk (aRR) and 95% confidence intervals (CIs) were calculated to better represent true risk ratios.<sup>31</sup> Thus, the aRR represents the association of each independent variable with the dependent variable after accounting for the influence of all other independent variables.

**RESULTS**

**Participants**

The mean (SD) age of the participants was 15.9 (1.8) years with approximately equal representation from grades 7 through 12. Participants were predominantly white (white, 65.2%; African American, 15.0%; Hispanic, 12.3%; and other, 7.6%) with approximately equal representation from all SES groups. Nearly one fourth (23.5%) lived in a single-parent home. During the 12 months preceding the interview, 71.1% of participants had continuous private insurance, 9.4% had continuous public insurance, 1.6% had interrupted private insurance, 4.9% had interrupted public insurance, and 13.0% had no insurance (TABLE 1).

The mean (SD) BMI was 22.5 (4.47) for male and 22.2 (4.37) kg/m<sup>2</sup> for female participants. On average, participants reported playing an active sport 2 to 3 times a week. Approximately 3% of participants reported a significant physical disability. Behaviors associated with potential negative health outcomes were reported by many participants: 38.3% reported a history of vaginal intercourse, 21.6% reported a history of daily cigarette use, and 5.7% reported alcohol intoxication at least weekly during the preceding year. Approximately 13% of participants reported physical symptoms, 1.8% reported crying, and 1.4% reported dysuria at least several times a week over the preceding year, suggesting high risk of physical or mental health problems (TABLE 2).

**Foregone Health Care in Past Year**

On average, 2268 (18.7%) of 12 079 adolescents reported at least 1 time over the

**Table 2.** Percentage of US Adolescents Reporting Physical Examination or Foregone Health Care in Past Year by Risk of Health Problem and Risk-Associated Behaviors

	Total, No. (%)	Physical Examination in Past Year, % (95% CI)*	Foregone Care in Past Year, % (95% CI)*
<b>Risk factors for health problem</b>			
Overweight	544 (4.5)	62.5 (58.1-67.0)	21.6 (17.1-26.1)†
Middleweight	11 174 (92.3)	67.7 (65.8-69.7)	18.7 (17.7-19.7)
Underweight	384 (3.2)	49.7 (44.4-55.1)	16.6 (11.2-21.9)
High sports activity level	3029 (25.0)	76.1 (73.4-78.8)†	17.8 (16.0-19.5)
Low sports activity level	9073 (75.0)	63.8 (61.9-65.9)	19.1 (18.0-20.2)
Disabled	316 (2.6)	66.7 (61.1-72.4)	34.9 (28.2-41.7)†
Nondisabled	11 770 (97.4)	67.1 (65.1-68.9)	18.3 (17.4-19.3)
<b>Behaviors with health risks</b>			
Frequent smoking	2579 (21.6)	63.8 (61.7-66.0)†	26.0 (24.2-27.7)†
Infrequent/no smoking	9388 (78.5)	67.9 (65.8-70.1)	16.8 (15.7-17.8)
Frequent alcohol use	692 (5.7)	62.0 (57.1-67.1)	30.3 (26.0-34.5)†
Infrequent/no alcohol use	11 410 (94.3)	67.2 (65.3-69.2)	18.1 (17.1-19.1)
Sexually active	4571 (38.3)	68.7 (66.8-70.6)	25.1 (23.8-26.4)†
Not sexually active	7367 (61.7)	66.1 (63.7-68.6)	15.1 (14.0-16.1)
<b>Symptoms of health problem</b>			
Frequent physical symptoms	1536 (12.7)	66.5 (63.1-69.9)	32.4 (30.2-34.6)†
Infrequent/no physical symptoms	10 565 (87.3)	67.0 (65.1-68.9)	16.7 (15.7-17.8)
Frequent crying	214 (1.8)	68.9 (62.4-75.4)	38.5 (31.7-45.4)†
Infrequent/no crying	11 888 (98.2)	66.9 (64.9-68.8)	18.4 (17.4-19.4)
Frequent dysuria	164 (1.4)	66.9 (57.5-76.3)	38.2 (29.4-47.0)†
Infrequent/no dysuria	11 918 (98.6)	67.0 (65.1-68.9)	18.5 (17.5-19.4)
Overall	12 102 (100)	66.9 (65.1-68.8)	18.7 (17.7-19.8)

\*Percentages and 95% confidence intervals (CIs) from weighted core sample to correct for stratified sampling design and yielding estimates that are representative of the national adolescent population.  
 †Significant differences by bivariate logistic regression analyses at P≤.001.



past year when they thought they should get medical care, but did not (Table 1). Uninsured adolescents were more likely to report foregone care than adolescents with continuous private or public insurance (23.9% vs 17.0% vs 15.7%, respectively) and interruption of insurance attenuated this relationship. Adolescents with lower-SES families were more likely to report foregone care than adolescents from higher-SES families (20.8% vs 16.5%). Adolescents who did not have an examination in the past year were more likely to report foregone care compared with adolescents who did (21.5% vs 17.4%).

Older adolescents were more likely to report foregone care compared with younger adolescents (21.2% for adolescents >15 years vs 14.0% for adolescents <15 years) and minority adolescents were more likely to report foregone care than white adolescents (African American [22.7%] vs Hispanic [20.6%] vs white [17.2%]). Adolescents who lived in a single-parent home were more likely to report foregone care than adolescents living in a 2-parent home (21.9% vs 17.8%).

Adolescents participating in behaviors that place them at risk of negative health outcomes were more likely to re-

port foregone care than adolescents not participating in risk-associated behaviors (Table 2). Adolescents who had a history of daily smoking were more likely to forego care than adolescents who did not (26.0% vs 16.8%), and adolescents who frequently used alcohol were more likely to forego care than those who did not (30.3% vs 18.1%). One fourth of sexually active adolescents reported foregone care in comparison to only 15.1% of those who were not sexually active. In addition, disabled adolescents and adolescents experiencing symptoms suggestive of serious physical or mental health prob-

**Table 3.** Adjusted Relative Risk (aRR) for Report of Physical Examination and Foregone Care Within Past Year Among Male and Female US Adolescents by Individual Factors, Family Characteristics, Insurance Status, Health Risks/Behaviors, and Symptoms (N = 20 746)

Independent Variables	Physical Examination, aRR (95% CI)*		Foregone Care, aRR (95% CI)*	
	Male	Female	Male	Female
Individual factors†				
Age	0.99 (0.95-1.00)	1.00 (0.98-1.01)	1.12 (1.06-1.15)‡	1.04 (1.00-1.08)
Race/ethnicity				
African American	1.02 (0.95-1.07)	1.05 (0.98-1.11)	1.25 (1.06-1.46)‡	1.50 (1.30-1.73)‡
Hispanic	0.98 (0.90-1.05)	0.97 (0.87-1.06)	1.15 (0.94-1.39)	1.27 (1.04-1.54)‡
Other	0.98 (0.92-1.03)	0.97 (0.90-1.03)	1.31 (1.08-1.58)‡	1.34 (1.13-1.58)‡
Vocabulary score	1.00 (1.00-1.00)	1.00 (1.00-1.00)	1.00 (1.00-1.01)	1.01 (1.00-1.01)
Family characteristics§				
Family SES	1.02 (1.02-1.03)‡	1.02 (1.01-1.02)‡	1.00 (0.97-1.02)	1.00 (0.97-1.02)
Single-parent home	1.00 (0.96-1.03)	1.02 (0.98-1.06)	1.05 (0.91-1.20)	1.31 (1.18-1.46)‡
Insurance status				
Continuous private	1.11 (1.06-1.17)‡	1.16 (1.09-1.22)‡	0.82 (0.70-0.96)‡	0.78 (0.67-0.90)‡
Continuous public	1.13 (1.08-1.18)‡	1.23 (1.18-1.27)‡	0.73 (0.59-0.89)‡	0.64 (0.50-0.82)‡
Interrupted private	1.07 (1.00-1.13)‡	1.04 (0.95-1.11)	0.90 (0.70-1.15)	0.97 (0.78-1.21)
Interrupted public	1.18 (1.09-1.25)‡	1.20 (1.04-1.31)‡	0.64 (0.38-1.07)	0.70 (0.48-1.01)
Past health care				
Physical examination in past year	Not applicable	Not applicable	0.87 (0.78-0.97)‡	0.79 (0.70-0.88)‡
Health risk/behaviors¶				
Overweight	0.97 (0.90-1.04)	0.89 (0.81-0.97)‡	0.90 (0.70-1.13)	1.27 (1.03-1.55)‡
Underweight	0.82 (0.65-0.98)‡	0.86 (0.77-0.95)‡	0.87 (0.46-1.59)	1.13 (0.84-1.50)
Sports activity level	1.10 (1.09-1.11)‡	1.09 (1.07-1.11)‡	1.07 (1.02-1.11)‡	1.01 (0.95-1.08)
Disabled	1.00 (0.90-1.09)	1.05 (0.94-1.14)	2.03 (1.61-2.52)‡	1.66 (1.30-2.10)‡
Frequent smoker	0.91 (0.86-0.95)‡	1.00 (0.96-1.04)	1.34 (1.18-1.52)‡	1.34 (1.16-1.55)‡
Frequent alcohol use	0.97 (0.90-1.03)	1.02 (0.93-1.10)	1.34 (1.11-1.62)‡	1.28 (0.95-1.72)
Sexually active	1.07 (1.04-1.11)‡	1.07 (1.04-1.11)‡	1.23 (1.09-1.39)‡	1.39 (1.23-1.56)‡
Symptoms#				
Frequent symptoms	0.99 (0.93-1.04)	1.01 (0.96-1.07)	1.89 (1.64-2.17)‡	2.03 (1.81-2.28)‡
Frequent crying	0.93 (0.58-1.20)	1.00 (0.92-1.08)	1.65 (0.71-3.31)	1.72 (1.34-2.18)‡
Frequent dysuria	0.93 (0.73-1.11)	1.04 (0.90-1.16)	1.54 (0.92-2.45)	1.61 (1.13-2.26)‡

\*Adjusted relative risk and 95% confidence intervals (CIs) representing relationship between independent variable and physical examination or foregone care within past year while controlling for all other independent variables in table and sample stratifying variables.

†Age: continuous, young to old; race/ethnicity reference group is white; and vocabulary score: continuous low to high.

‡Adjusted RR (aRR) is statistically significant (confidence intervals exclude 1).

§Socioeconomic status (SES): continuous low to high; single-parent home comparison: vs 2-parent homes.

||Insurance status comparison: vs no insurance.

¶Overweight comparison: vs middleweight; underweight comparison: vs middleweight; sports activity level comparison: 5 times a week vs less; disabled comparison: vs nondisabled; smoking comparison: daily smoking for 30 days vs less; alcohol comparison: intoxication at least 1 d/wk for a year vs less; and sexually active comparison: vs not sexually active.

#Symptom comparison: almost every day or every day for a year vs less.

**Table 4.** Reasons US Adolescents Report They Have Not Received Needed Health Care (n = 2351)\*

Reasons for Foregone Health Care	Adolescents Reporting This Reason, Mean % (95% CI)†
Nonaccess problem	
Didn't want parents to know	11.5 (10.0-13.0)
Afraid of what the physician would say or do	15.5 (13.7-17.3)
Thought the problem would go away	63.3 (61.1-65.5)
Access problem	
Didn't know whom to see	7.5 (6.1-8.8)
Had no transportation	7.8 (6.3-9.4)
No one available to go along	3.6 (2.6-4.5)
Parent or guardian would not go	11.7 (10.2-13.3)
Difficult to make an appointment	8.9 (7.4-10.4)
Couldn't pay	14.0 (12.4-15.6)
Other	8.6 (7.2-10.0)

\*Participants reporting foregone care were permitted more than 1 response for reasons for foregone care, and therefore sum does not equal 100%.

†Mean percentage and 95% confidence intervals (CIs) from weighted core sample to correct for stratified sampling design and yielding estimates that are representative of the national adolescent population.

lems were approximately twice as likely to report foregone care as adolescents in the comparison groups.

Multivariate analyses showed that the associations of age, race/ethnicity, family composition, insurance status, past examination, disability, risk factors/behaviors, and symptoms suggestive of serious mental or physical health problems with foregone health care persisted while controlling for all other factors (TABLE 3). The only significant association found in bivariate analyses that did not remain significant in multivariate analyses was the relationship between family SES and foregone care.

**Reasons for Foregone Health Care**

Among the 2351 participants who reported foregone care, the most frequently reported reason was “thought the problem would go away” (63.3%) (TABLE 4). Other reasons for foregone care were fear of what the physician would say or do (15.5%), inability to pay (14.0%), concerns about confidentiality (11.5%), parent/guardian would

not go with participant for care (11.7%), and difficulty making an appointment (8.9%).

Multivariate analyses were performed to assess the association of socio-demographic and individual factors, family factors, insurance status, health risks/behaviors, and symptoms with reasons for foregone health care among adolescents who reported foregone care. Reasons for foregone care were coded as either nonaccess or access issues. Responses of didn't want parents to know, afraid of what the doctor would say or do, and thought the problem would go away were coded as nonaccess issues because they imply ambivalence about seeking health care. Responses of didn't know whom to see, no transportation, no one available to go along, parent/guardian would not go, difficulty making an appointment, and couldn't pay were coded as access issues because they imply a decision to seek health care was followed by difficulties gaining access to a clinical site.

Adolescents with continuous private insurance or who were actively involved in sports were less likely to report access reasons (aRR [95% CI], 0.80 [0.68-0.92] and 0.95 [0.91-0.99], respectively) and more likely to report nonaccess reasons for foregone care (aRR [95% CI], 1.12 [1.07-1.17] and 1.02 [1.00-1.03], respectively) than comparison groups. Adolescents with continuous public insurance were more likely to report nonaccess reasons for foregone care compared with uninsured adolescents (aRR [95% CI], 1.10 [1.05-1.15]).

Adolescents in single-parent families were more likely to report access reasons (aRR [95% CI], 1.16 [1.03-1.29]) and less likely to report nonaccess reasons for foregone care (aRR [95% CI], 0.93 [0.88-0.97]) compared with adolescents in 2-parent homes. Female adolescents, adolescents with frequent physical symptoms suggesting serious physical or mental health problems, and adolescents with frequent dysuria were more likely to report access reasons for foregone care than comparison groups (aRR [95% CI], 1.14 [1.02-1.26], 1.14 [1.00-1.30], and 1.37 [1.00-1.77], respectively).

**Comparing Factors Influencing Having a Physical Examination vs Foregone Care in Past Year**

On average, an estimated 66.9% of adolescents reported having had a physical examination within the previous 12 months. Adolescents who were white or African American, with higher verbal skills, with higher SES families, or with insurance were more likely to report having a physical examination than comparison groups (Table 1). Adolescents who reported high levels of sports activities were more likely to report an examination compared with those with low sports activities (76.1% vs 63.8%), and infrequent or nonsmokers were more likely to report an examination than adolescents with a history of regular cigarette use (67.9% vs 63.8%) (Table 2).

Comparison of factors that were shown by multivariate analyses to have independent effects on having had an examination and reported foregone care show that insurance influences both outcome variables in the expected direction; insured adolescents were more likely to report an examination and were at decreased risk of foregone care (Table 3). However, insurance status was the only individual or family factor found with this pattern. Age, race/ethnicity, and presence of 1 vs 2 parents in the home were not associated with having an examination but were associated with foregone care. Socio-economic status continued to be associated with having an examination but not foregone care. The presence of health risks/behaviors or symptoms concerning health problems had varying associations with having an examination and foregoing care and not always in the expected pattern. For example, sexually active adolescents were both more likely to report having had an examination and more likely to report foregone care than those who were nonsexually active.

This study was not designed to assess the influence of source of usual care on having an examination or foregone care. However, since participants who reported an examination in the past year

were less likely to report foregone care compared with participants who did not, further analyses were performed to explore the relationship between site of examination (ie, private physician's office, community health center, school, hospital, or some other place) and reported foregone care. Multivariate analyses failed to show an independent effect of site of examination on foregone care.

## COMMENT

Our findings suggest that every year 1 of 5 adolescents feel that they should get health care but do not. These adolescents are at increased risk of real health problems. Many adolescents who forego health care are participating in behaviors placing them at increased risk for short- and long-term negative health outcomes or have symptoms suggesting they may have serious emotional or physical health needs. If health care professionals are to address major causes of adolescent morbidity and mortality, strategies are needed to decrease foregone care.

The risk for foregone care is clearly diminished when adolescents have continuous private or public health insurance. Independent of insurance status and in contrast to factors influencing having an examination in the past year, older male adolescents, minority adolescents, female adolescents who live in single-parent homes, disabled youth, and adolescents participating in risk-associated behaviors or experiencing symptoms suggesting serious health problems are at increased risk for foregone care. This supports the conclusions of others that insurance is important but not alone sufficient to ensure use of health care services.<sup>32-34</sup> In Canada, where there is universal health insurance, from 40% to 60% of adolescents who are worried about issues such as emotional problems, birth control, alcohol use, or sexually transmitted infections have not consulted a physician or nurse even though they would like to.<sup>35</sup> Together these findings confirm that factors influencing adolescents to forego health care are complex and suggest that some are distinct

from factors influencing general use of health care services.

Reasons that adolescents forego health care need to be viewed within a developmental context. Among adolescents who forego care, 15% report that this is in part because a parent or guardian will not go or no one is available to go with them, and 12% report that it is partly because they do not want their parents to know. This reflects the developmental complexities of parent-child relationships during adolescence. On one hand, many adolescents want parents to be involved in health care, depend on parents for transportation, and need their parents' consent to obtain health care. On the other hand, some adolescents have important health issues that they want to keep private<sup>16-21</sup> and certain types of medical care can be provided without parents' consent.<sup>36</sup> All adolescents have the developmental task of learning to become responsible for their own health and health care and developing a private relationship with their physician as they approach adulthood. Difficulties negotiating the health care system may in part be due to adolescents' relative inexperience as consumers of health care.

Strategies to reduce foregone health care among adolescents must consider these developmental issues. Professional organizations support increasing adolescents' access to health services in general and confidential health services when needed, because of concerns about adolescents' unmet health care needs.<sup>37-39</sup> Approaches that have been suggested to increase adolescents' access to health care include increasing the availability of convenient, affordable, and developmentally appropriate health services. This includes ensuring that private, confidential health services are available for sensitive health issues, thereby encouraging adolescents to seek and receive needed health care for concerns related to substance use, sexual behaviors, and mental health. Our results suggest that these strategies have the potential to increase clinicians' opportunities to address issues related to major causes of adolescent morbidity and mortality by

decreasing the numbers of adolescents who forego health care.

Several potential limitations of this study should be noted. Self-report data has inherent limitations; however, adolescent reports of their own health care behaviors are probably at least as accurate as adult reports of adolescent health care behaviors and probably more accurate in regard to foregone care. Measures for symptoms associated with risk of health problems were oriented toward chronic conditions rather than acute conditions. The reliability of our measure for foregone care is unknown, and health concerns associated with specific episodes of foregone care were not assessed. However, concerns associated with a single episode of foregone care might not be critically important among at-risk adolescents; if a depressed adolescent foregoes care for a minor illness, an opportunity to diagnose depression is missed. Finally, this study used a school-based design and the results may not apply to out-of-school youth.

Despite these potential limitations, our findings highlight the importance of a comprehensive approach to increasing adolescents' use of health care services. The newly enacted State Children's Health Insurance Programs represent an important step toward achieving the goal of continuous insurance for all adolescents. However, insurance alone does not ensure that adolescents will receive needed health care. Adolescents who choose to forego health care are of particular concern because they appear to be at disproportionately high risk of having health problems. Factors that influence adolescents to forego care must be considered when designing systems to address adolescents' unique health needs.

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