

Original article

Health Access and Status of Adolescents and Young Adults Using Youth Employment and Training Programs in an Urban Environment

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Abstract

Purpose: To describe the health status and access to healthcare of adolescents and young adults disconnected from traditional education and work settings. The health status of these disconnected youth is largely unknown, although it is suspected to be quite poor. Most information about the health of youth in the United States relies on school-based samples.

Method: In-person interviews with 1037 adolescents and young adults (aged 16–24 years) enrolled in an employment and training program in Baltimore were used to measure access to health services and health status in four domains: violent behavior, mental health, substance use, and reproductive health. Differences in healthcare access and health status by age and gender were examined. In addition, youth in the employment and training sample are compared with Baltimore youth in school and of comparable ages, as measured by the Youth Risk Behavior Surveillance System.

Results: Nearly 50% of young adults in the employment and training program were found to lack health insurance, and about 20% reported a time when they needed medical care but did not receive it. Youth in the program exhibited notable health status concerns, often exceeding the risk prevalence of students in school. In particular, adolescents and young adults disconnected from traditional employment and work settings were more likely to be in physical fights, to smoke cigarettes, and to use marijuana than their in-school counterparts. In-school youth were more likely to have considered harming themselves and to have made a suicide plan in the last year.

Conclusions: Given high levels of health risk among youth disconnected from traditional education and work settings, adolescent health providers must increasingly pay attention to integrating health promotion and disease prevention strategies into youth employment and training programs, where sizable numbers of these youth can be reached. © 2008 Society for Adolescent Medicine. All rights reserved.

Keywords:

Adolescents; Young adults; Health outcomes; Employment and training

Considerable research highlights the many challenges faced by minority adolescents and young adults in the United States who live in impoverished communities. Recent national statistics indicate that public schools graduate only about 70% of their students, with this figure dropping to less than 60% in many urban areas that serve large

numbers of minority youth [1]. The negative consequences of school dropout for future income and life chances are well documented by researchers [2,3]. High school dropouts are also more likely to have health problems, with research indicating that dropouts live between 6 to 9 years less than high school graduates [4]. Dropouts also have higher rates of cardiovascular illnesses, diabetes, and other chronic diseases than high school graduates, and their annual healthcare costs are twice as high [5,6]. Furthermore nearly 80% of school dropouts require government healthcare assistance upon reaching adulthood [7,8].

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Although previous research provides a detailed description of the social, economic, and health consequences of school dropouts, there is surprisingly little research on the health status of adolescents and young adults disconnected from traditional education and work settings. Most research examining adolescent and young adult health status relies on school-based populations. For example, the National Longitudinal Study of Adolescent Health (Add Health) examines health-related behaviors and social contexts among a nationally representative sample of adolescents recruited while in school [9]. Similarly the Centers for Disease Control and Prevention's biannual Youth Risk Behavior Surveillance System (YRBSS) focuses on school-based populations of adolescents enrolled in public and private schools [10]. Clearly the heavy reliance on school-based populations provides a narrow view of the health of adolescents and young adults in urban environments, given the large numbers of out-of-school youth in these environments.

One population that can provide insight into the health status of out-of-school youth are individuals in employment and training programs. A recent Educational and Testing Service report [11] describes several national employment and training programs, including The Job Corps, Youth Build USA, the Center for Employment Training, and Youth Corps. In 2000, the United States Department of Labor, recognizing the need to provide resources to communities with large numbers of adolescents and young adults disconnected from school and the labor force, awarded Youth Opportunity (YO) grants totaling more than \$1 billion to 36 high-poverty areas [12]. These 36 communities were among the most economically distressed in the nation, characterized by high dropout and unemployment rates, and several other negative social, economic, and health indicators.

Baltimore City opened five YO Centers in the East and Westside Empowerment Zones of the City. Empowerment Zones are designated areas of pervasive poverty, unemployment, and general distress [13]. According to 2000 Census Data, the poverty rates in the East and Westside Empowerment Zones were 34% and 37%, respectively, compared with 23% for Baltimore City overall [14]. The five YO Centers provide comprehensive social and educational services including graduation equivalency diploma (GED) classes, support for college enrollment, resume building, and job placement. Out of school youth aged 16–24 years living in the East and Westside Empowerment Zones are eligible to enroll in the YO Centers.

This study has three objectives. The first is to describe the access to healthcare and health of program participants enrolling in the five Baltimore City YO Centers. The second is to examine whether there are differences within this population between older and younger participants and between males and females in access to healthcare and health status in four domains: violent behavior, mental health, substance use, and reproductive health. The third objective

is to compare a subset of participants in the YO program to youth who are in school in Baltimore City on health measures related to violent behavior, mental health, substance use, and reproductive health.

Method

Study design

We used a cross-sectional design with a nonequivalent comparison group to address our study objectives. From May 2002 through December 2005, a total of 1730 adolescents and young adults (aged 16–24 years) enrolled in the five YO Centers; all of these individuals were eligible to complete health screens. Health screens were conducted with 1024 (60%) of these newly enrolling YO members as part of the program's intake process to assess participants' needs and to deliver services accordingly. Of these respondents, 312 were aged 16–17 years; these individuals form the subset whose health status is compared with that of in-school adolescents aged 16–17 years.

Two Baltimore City Health Department (BCHD) Adolescent and Reproductive Health Division employees rotated among the five YO sites and used laptop computers to conduct computer-assisted health screens with YO members. YO counselors referred new YO members to the BCHD employees. BCHD employees completed health screens immediately after meeting the new YO member or scheduled a time for screen completion. All screens were conducted within 4 weeks of members' enrollment. Before completing a health screen, the YO member signed an informed consent form approved by the Baltimore City Health Department and The Johns Hopkins University Institutional Review Boards.

The comparison group used to address our third study objective was drawn from Youth Risk Behavior Surveillance System (YRBSS) respondents. The YRBSS assesses health-risk behaviors through biannual surveys with public and private school students in grades 9–12. In 2003, in addition to the YRBSS national survey, several state and local education agencies conducted surveys among students in grades 9–12; Baltimore was one local survey site. A total of 1564 students completed the 2003 YRBSS in Baltimore City. A subsample of 678 individuals 16–17 years old are included in these analyses as a comparison group to the younger segment of the YO population. Students completed self-administered surveys during one class period and recorded responses on a computer-scannable booklet or answer sheet. Parental consent was obtained before survey completion [15].

Measures

The Baltimore City Health Department approached Johns Hopkins University's Center for Adolescent Health (CAH) to design a health screening tool for new YO en-

rollees. The CAH collaborated with YO leadership and staff, the Baltimore City Health Department, and the CAH Youth Advisory Committee to develop the health screen. The measures that we used from the health screening tool are described below.

Demographic measures

Two variables are covariates in this study, namely, gender (male vs. female) and age (<18 years vs. ≥18 years).

Healthcare access and health status measures. We examine healthcare access and health status in five domains: (a) use of healthcare services, (b) violent behavior, (c) mental health, (d) substance use, and (e) reproductive health.

Use of healthcare services. There are six measures of healthcare service access; these pertain to whether the individual: (1) had health insurance; (2) had a usual place to go for medical care; (3) received a medical checkup in the last 12 months; (4) received a dental checkup in the last 12 months; (5) received an eye examination in the last 12 months; and (6) ever thought he or she should receive medical care but did not. Questions in the health screen are from the 2001 National Health Interview Survey (NHIS) [16] (variables 1–5) and the Add Health Survey [9] (variable 6).

Violent behavior. Five measures pertain to violent behavior; these pertain to whether the individual had: (1) carried a weapon in last 30 days; (2) ever been in a physical fight; (3) been in a physical fight in last 12 months; (4) ever been forced to have sexual relations; and (5) been hit or slapped by a boyfriend or girlfriend in last 12 months. All questions in the health screen measuring these variables are from the 2001 YRBSS [17].

Mental health. Three questions measure mental health; these apply to whether the individual had: (1) considered harming her- or himself in the last 12 months; (2) made a suicide plan in the last 12 months; and (3) ever witnessed a homicide. Questions to address variables 1 and 2 are from the 2001 YRBSS. Question 3, determining homicide exposure, is constructed by the study investigators.

Substance use. Four measures pertain to substance use; these ask whether the individual has: (1) smoked in the last 30 days; (2) drank [alcohol] in the last 30 days; (3) experiences problem drinking; and (4) used marijuana in last 30 days. Questions to assess variables 1, 2, and 4 are from the 2001 YRBSS. The four-item CAGE Inventory assesses variable 3, namely, problem drinking. The four items ask about cutting down drinking, annoyance by criticism of drinking, guilty feeling about one's drinking, and ever having a drink first thing in the morning to steady one's nerves or to eliminate a hangover. Affirmative responses to two or more CAGE items is believed to indicate problem drinking [18].

Reproductive health. Three measures address reproductive health; these ask about: (1) age at first intercourse; (2) whether the individual had first intercourse before age 13 years; and (3) used a condom during last intercourse. Questions assessing these variables are from the 2001 YRBSS.

Statistical analyses

Descriptive analyses summarize the demographic characteristics of study participants. All dependent variables are dichotomous (yes, no) with the exception of age of first intercourse, for which we create a continuous variable. We use χ^2 tests of association to examine the bivariate associations between the dichotomous health measures and the demographic variables and analysis of variance to examine the bivariate association between age of first intercourse and the two demographic covariates.

Analyses comparing an out-of-school population (YO members) and in-school population (Baltimore YRBSS) are limited to individuals 16–17 years old from both samples to create comparable samples. Analyses comparing the two populations are conducted for all measures present in both the YO health screen and YRBSS Baltimore survey. All YRBSS results present weighted data [19]; statistical tests comparing YO members and the YRBSS population also use the YRBSS weights.

A two-tailed value of $\alpha = .05$ defines statistical significance for all analyses. Data are analyzed using SPSS version 11.0 (SPSS Inc., Chicago, IL).

Results

Sample characteristics

Table 1 presents demographic characteristics of the YO sample. Of the 1024 study participants, about 98% are African-American. A slight majority of respondents (51.8%) are female. The mean age of respondents is 19.2 years, with 68% being 18 years or older. At the time of the study, 24.8% report that they are working part- or full-time. Of the YO members, 19% had completed high school or obtained a GED. In the year before completing the health screen, 9% of YO members had had surgery, and 19% had stayed overnight in a hospital.

Characteristics of the YO and YRBSS 16–17-year-old individuals sampled are also presented in Table 1. There are 312 YO members aged 16–17 years, of whom 97% are African-American. The mean age of these respondents is 16.6 years, and slightly less than half of this sample (48.9%) are female. There are 678 Baltimore YRBSS respondents aged 16–17 years, of whom 91.1% are African-American. The mean age of these YRBSS respondents is 16.4 years, and slightly more than half (53.9%) are female.

Table 1
Characteristics of YO and Baltimore YRBSS study populations

Sample characteristic	Overall YO sample (n = 1024)	YO sample aged 16–17 years (n = 312)	YRBSS sample aged 16–17 years (n = 678)
African-American (%)	97.6	97.1	91.1
Female gender (%)	51.8	48.9	53.9
Age, years (mean, SD)	19.16 (1.87)	16.59 (.49)	16.44 (.50)
≥18 years (%)	67.8		
Working part- or full-time	24.8		
Completed high school or GED (%)	19		
Had surgery in the last 12 months (%)	9		
Overnight hospital stay in last 12 months (%)	19		

GED = graduation equivalency diploma; YO = Youth Opportunity; YRBSS = Youth Risk Behavior Surveillance System.

Use of healthcare services

Table 2 summarizes YO members' healthcare access and status, along with their health risks. Across the entire YO sample, approximately 62% of respondents indicate that they have health insurance. More females than males report having insurance (68.8% females vs. 53.3% males, $p < .01$), and younger participants are more likely to have insurance compared with older participants (80.4% < 18

years vs. 53.8% ≥18 years, $p < .01$). Slightly more than three-quarters of the sample (78.3%) report having a usual place to go for medical care, with females more likely than males to have a usual place for care (86.9% vs. 68.8%, $p < .01$). Younger participants are more likely to have a usual place compared with older participants (87.6% vs. 73.8%, $p < .01$). Overall 71.7% of YO participants report having a medical checkup in the last 12 months, and again females

Table 2
Health access and health status among YO members, by gender and age (N = 1024)

Health access/status variable	Overall (%)	Male (%)	Female (%)	<i>p</i>	<18 Years (%)	≥18 Years (%)	<i>p</i> Value
Use of healthcare services							
Had health insurance (n = 1012)	61.7	53.3	68.8	<.01	80.4	53.8	<.01
Usual place to go for medical care (n = 1012)	78.3	68.8	86.9	<.01	87.6	73.8	<.01
Medical check-up in last 12 months (n = 1020)	71.6	63.1	79.5	<.01	73.6	70.7	.37
Dental checkup in last 12 months (n = 1020)	33.5	35.6	31.6	.18	41.4	30	<.01
Eye examination in last 12 months (n = 1017)	36.6	39.5	33.8	.06	42.3	34	.01
Ever thought should receive medical care but did not (n = 1017)	17.8	17.2	18.3	.68	14.2	19.5	.04
Violent behavior							
Carried weapon in last 30 days (n = 837)	19.8	22.7	17.1	.04	21.4	19.2	.45
Ever been in physical fight (n = 1018)	88.8	92.4	85.4	<.01	90.4	88	.28
Been in physical fight in last 12 months (n = 912)	49.8	49.9	49.7	1.0	58.7	45.3	<.01
Ever been forced to have sexual relations (n = 1018)	10.8	5.7	15.5	<.01	8.3	12	.08
Hit or slapped by boy/girlfriend in last 12 months (n = 1021)	12.4	12.4	12.5	1.0	9.2	14	.03
Mental health							
Considered harming oneself in last 12 months (n = 882)	7	5.1	8.7	.02	6.1	7.4	.51
Made suicide plan in last 12 months (n = 875)	3.7	2.7	4.6	.20	2.7	4.6	.20
Ever witnessed homicide (n = 995)	25.2	35.4	16	<.01	21.6	27	.07
Substance use							
Smoked in last 30 days (n = 1020)	44.4	48.8	40.1	.01	38.5	47	.02
Drank alcohol in last 30 days (n = 1020)	62	65.3	54.7	<.01	52.5	66.5	<.01
Of those who drank in last 30 days, problem drinking (n = 632)	14.5	16.9	11.6	.09	8.6	16.8	.02
Used marijuana in last 30 days (n = 1009)	42	50.9	33.8	<.01	44.8	40.8	.24
Reproductive health							
Age at first intercourse (mean, SD) (n = 1012)	13.94	13.28	14.59	<.01	13.53	14.11	<.01
Had first intercourse before age 13 (n = 1012)	20	29.4	9.9	<.01	23.9	18.4	.09
Used a condom during last intercourse (n = 993)	63.4	68	59.1	<.01	72.7	59	<.01

YO = Youth Opportunity.

are more likely than males (79.5% vs. 63.1%, $p < .01$). There are no significant differences by age.

Only about one-third of respondents (33.5%) report having had a dental examination in the last 12 months, with younger participants more likely than older ones (41.4% vs. 30%, $p < .01$), but with no differences apparent between males and females. Rates of eye examinations are similarly low. A little more than one-third of respondents (36.6%) report an eye examination in the last 12 months, and again younger participants have higher rates than older ones (42.3% vs. 34%, $p = .01$). Nearly one-fifth of respondents (17.8%) report that there has been a time when they thought they should receive medical care but did not, with younger participants less likely than older ones to report this problem (14.2% vs. 19.5%, $p < .05$).

Violent behavior

Overall one-fifth (19.8%) of YO members report carrying a weapon in the last 30 days, with more males than females reporting this behavior (22.7% males vs. 17.1% females, $p < .05$). Of the respondents, 89% report ever having been in a physical fight; and males are more likely than females to report this experience (92.4% vs. 85.4%, $p < .01$). With regard to recent experience with fighting, just under half the sample (49.8%) report having been in a physical fight in the last 12 months, with younger respondents more likely to have responded affirmatively than older ones (58.7% vs. 45.3%, $p < .01$). In addition 11% of respondents report having been forced to have sexual relations, with females more likely to respond affirmatively than males (15.5% vs. 5.7%, $p < .01$). The share of participants reporting having been hit or slapped by a boyfriend or girlfriend in the last 12 months is slightly higher than for forced sexual relations (12.4%), and older respondents are

more likely to have been hit or slapped than are younger ones (14% vs. 9.2% $p < .05$).

When YO members aged 16–17 years are contrasted with Baltimore YRBSS respondents aged 16–17 year, they are more likely to have been in a physical fight in the past 12 months than are YRBSS respondents (53.8% vs. 41.2%, $p < .01$). Table 3 summarizes the health status among both YO and YRBSS participants.

Mental health

Of the YO participants, 7% report that they have seriously considered hurting themselves in the last 12 months; with males less likely to have responded affirmatively than females (5.1% vs. 8.7%, $p < .05$). A total of 4% of participants report having made a suicide plan in the last 12 months. Among the participants, males are significantly more likely than females to have witnessed a homicide (35.4% vs. 16%, $p < .01$).

When 16–17-year-old YO members are compared with the in-school Baltimore YRBSS sample, they are less likely to have seriously considering harming themselves in the last 12 months than YRBSS respondents (6.5% vs. 13.1%, $p < .01$). YO members are also less likely to have made a suicide plan in the last 12 months (3% vs. 9.8%, $p < .01$).

Substance use

Of the YO members, 44% report having smoked in the last 30 days, with males significantly more likely to smoke than females (48.8% vs. 40.1%, $p = .01$) and members more than 17 years of age more likely to smoke than younger members (47% of members ≥ 18 years vs. 38.5% of those < 18 years, $p < .05$). A total of 62% of the sample report consuming alcohol in the last 30 days, with males more likely to drink alcohol than females (55.3% vs. 44.7%, $p < .01$).

Table 3

Health status among adolescent YO members (N = 312) and Baltimore YRBSS participants (N = 682)

Health status variable	YO members aged 16–17 years			YRBSS participants aged 16–17 years			<i>p</i> Value
	Sample size	N	% Yes	Sample size	N	% Yes	
Violent behavior							
Carried weapon in last 30 days	297	65	21.9	668	181	26.9	.10
In physical fight in last 12 months	305	164	53.8	659	270	41.2	<.01
Ever forced to have sexual relations	308	26	8.4	679	57	7.7	.71
Hit or slapped by boy/girlfriend in last 12 months	309	29	9.4	681	77	12.2	.20
Mental health							
Considered harming oneself in last 12 months	309	20	6.5	678	89	13.1	<.01
Made suicide plan in last 12 months	305	9	3	676	65	9.8	<.01
Substance use							
Smoked in last 30 days	306	123	40.2	647	76	11.8	<.01
Drank alcohol in last 30 days	307	195	63.5	636	226	36.3	<.01
Used marijuana in last 30 days	307	143	46.6	652	186	29.4	<.01
Reproductive health							
Had first intercourse before age 13	246	60	24.4	488	116	24.1	.93
Age at first intercourse, years (mean, SD)	247	13.6 (2.0)	—	488	13.8 (1.6)	—	.14
Used a condom during last intercourse	291	214	73.5	473	349	73.5	1.0

YO = Youth Opportunity; YRBSS = Youth Risk Behavior Surveillance System.

01) and older youth more likely to drink than younger youth (52.5% vs. 66.5%, $p < .01$). Among respondents who report drinking in the last 30 days, 14.5% experience problem drinking. Younger respondents are less likely to experience problem drinking than older ones (8.6% vs. 16.8%, $p < .05$). Overall, 42% of respondents report using marijuana in the last 30 days, and males are more likely to report marijuana use than females (50.9% vs. 33.8%, $p < .01$).

Compared with Baltimore youth of the same age who are in school, YO members are more likely to have smoked cigarettes in the last 30 days, and in fact YO participants are almost four times as likely to smoke than YRBSS respondents (40.2% vs. 11.8%, $p < .01$). YO members are also more likely to report alcohol use in the last 30 days compared with YRBSS respondents (63.5% vs. 36.3%, $p < .01$) and also more likely to report marijuana use in the last 30 days (46.6% vs. 29.4%, $p < .01$).

Reproductive health

The average age at first intercourse was 13.9 years among YO participants. Male participants initiated sex earlier than females (13.3 for males vs. 14.6 for females, $p < .01$). Younger members initiated sex earlier than older members (13.5 for <18 years old vs. 14.1 for ≥ 18 years, $p < .01$). Of the respondents, 20% report having their first intercourse before age 13 years, and again males are more likely to be very early initiators than females (29.4% male vs. 9.9% female, $p < .01$). Among YO participants, 63% report using a condom during their last intercourse, with males reporting higher condom use than females (68% males vs. 59.1% females, $p < .01$) and younger participants reporting higher condom use than older ones (72.7% for those aged <18 years vs. 59% for those ≥ 18 years, $p < .01$). When younger YO members are compared with in-school youth, their sexual behavior and condom use mirror patterns found in the YRBSS.

Discussion

Findings from this study indicate that adolescents and young adults disconnected from traditional education and work settings have considerable health risks, often exceeding those in in-school and national samples. Furthermore, within the program population, young adults show higher levels of health risk than adolescents, and males generally show higher levels of health risk than females.

Adolescents and young adults in the YO program were found to have access to routine healthcare roughly similar to that of adolescents and young adults in a national sample examined by the National Health Interview Survey [20,21]. This is notable, as access to a regular source of care can positively influence YO members' healthcare use. On the contrary, whereas slightly more than 90% of NHIS respondents <18 years of age report having health insurance, just over 80% of our <18 -year-old sample has health insurance.

The 18–24-year-old YO sample is even less likely to have insurance; only 53% of these participants have insurance compared with nearly 70% of similarly aged NHIS respondents. The absence of health insurance among 18–24-year-old YO members likely contributes to our finding that about one-fifth of these individuals think there was a time in the last year when they needed medical care but did not receive it [22,23]. An additional finding is that male program participants are also substantially less likely to have a routine medical provider compared with female program participants, a finding that has been observed in other studies [24,25].

Our findings show high levels of violence among the YO adolescent participants. Just over half of the YO participants (54%) report being in a fight in the last year, a rate that exceeds the reports of in-school youth (41%). The most pronounced difference between YO participants and in-school adolescents pertains to tobacco and marijuana use. Program youth aged 16–17 years report smoking cigarettes/tobacco in the last month nearly four times as often as in-school youth. This pattern is consistent with the National Survey on Drug Use and Health's (NDUH) comparison of out-of-school and in-school 18–24-year-olds, which found that out-of-school youth, particularly African-American youth, were more likely to smoke than their in-school counterparts [26]. Similarly NDUH findings showed that African-American 18–24-year-olds who were out of school were more likely to have used illicit drugs in the last 30 days than adolescents and young adults in school. However the magnitude of difference in illicit drug use—specifically marijuana—between program and in-school populations in our study is nearly double that found in the NDUH. This may result in part from the greater availability of illicit drugs in the urban population that we surveyed.

Study strengths and limitations

This is one of only a few published reports examining the healthcare access and health status of out-of-school adolescents and young adults [26–28]; and, to our knowledge, it is the first to focus on adolescents and young adults within employment and training programs. Moreover our analyses indicate that youth in these programs have high levels of health risk. There are limitations to this study, however. Information for this study was obtained through face-to-face interviews. Given the sensitive nature of many study variables, respondents may have been less likely to indicate certain responses than if we had conducted an anonymous self-administered survey. Thus the prevalence of the study variables that asked about sensitive behavior may underestimate the true prevalence in the program population, suggesting that differences between program youth and other youth may be more extensive than uncovered in this examination.

Our sample is specific to a low-income urban context in Baltimore and is predominantly African-American. Furthermore, YO program participants from two impoverished

areas are compared with a sample of in-school youth representative of the entire city. We also lack demographic data on YO members who did not complete health screens at enrollment, raising the possibility that those individuals who completed the screens are not representative of the entire YO program population. Thus caution must be used in generalizing our findings to other settings and populations. In addition, given our recruitment through an employment and training program, our findings may not be generalizable to young people disconnected from school and the workplace who are not engaged in such training programs.

We are also limited in our ability to explain the finding that in-school adolescents were more likely to have considered harming themselves and made a suicide plan in the last year. One explanation is that in-school adolescents place greater pressure on themselves to succeed or are exposed to greater peer pressure than their out-of-school counterparts. Another possibility is that our data underrepresent true risk for poor mental health among YO participants because these individuals were less likely to report these outcomes in our face-to-face administration format.

Implications and future directions

Our study findings are of concern, as many chronic diseases such as cardiovascular disease, diabetes, and human immunodeficiency virus have their antecedents in adolescence and young adulthood. For example, our study findings that adolescents and young adults disconnected from traditional school and work settings smoke at higher rates than their in-school counterparts is of concern, as this behavior typically tracks into adulthood, placing an individual at risk for a host of negative health outcomes.

School-based interventions have successfully prevented and treated health risk behaviors, including violent behavior, substance use, and unsafe sexual behavior [29,30]. There are also successful examples for addressing health risks among specific adolescent and young adult subgroups, such as individuals in the juvenile justice system [31,32], those who are in foster care [33], and teenage mothers [34]. Our findings suggest that health promotion and disease prevention need to be incorporated squarely into another setting—namely, youth employment and training programs—given the increasingly large numbers of adolescents and young adults using these programs to gain economic self-sufficiency. Findings from a recent Center for Law and Social Policy survey of 145 youth employment programs validate the importance of integrating health promotion and disease prevention into employment and training programs, as staff surveyed at these programs perceived several health risks (including poor mental health, substance use, and teenage pregnancy) as barriers to program completion [35].

The integration of health promotion into employment and training programs could include completing a health screen as part of each young person's intake process to

identify risk behavior. Health promotion activities could also be integrated into activities already in place at employment and training sites. For example, the East Baltimore YO program holds monthly “Sister Circle” and “Brother-to-Brother” group sessions, during which members discuss topics including self-esteem and career goals. A health promotion and disease prevention curriculum could easily be incorporated into these groups, as the goals of such a curriculum are similar to the overall goals of employment and training programs—specifically, removing barriers to a healthy, productive lifestyle.

Youth employment experts contend that addressing participants' multiple health and social needs will improve participants' health and will increase the likelihood of program completion, thus facilitating participants' economic self-sufficiency. We believe that adolescent health researchers, as well as individuals in city and state public health departments, must increasingly focus their attention on integrating health promotion and disease prevention strategies into youth employment and training programs, given the sizable number of adolescents and young adults in these programs who are not reached through school-based interventions. In particular, given the much higher rates of cigarette smoking and marijuana use in our out-of-school sample, health promotion and disease prevention activities focused on these risk behaviors should be prioritized.

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References

- [1] Swanson C. Who graduates? Who doesn't? A statistical portrait of public high school graduation, class of 2001. Washington, DC: The Urban Institute, Education Policy Center, 2004.
- [2] Lever N, Sander M, Lombardo S, et al. A drop-out prevention program for high-risk inner-city youth. *Behav Modif* 2004;28:513–27.
- [3] Miller C, Porter K. Barriers to employment among out-of-school youth. *Child Youth Serv Rev* 2007;29:572–87.
- [4] Wong M, Shapiro M, Boscardin W, Ettner S. Contribution of major diseases to disparities in mortality. *N Engl J Med* 2002;347:1585–92.
- [5] Muennig P. Health returns to education interventions. Paper presented at the Symposium on the Social Costs of Inadequate Education. New York: Columbia University, 2005.
- [6] Lantz P, House J, Lepkowski J, et al. Socioeconomic factors, health behaviors, and mortality: Results from a nationally representative prospective study of US adults. *JAMA* 1998;279:1703–8.
- [7] Rouse C. The labor market cost of an inadequate education. Paper presented at the Symposium on the Social Costs of Inadequate Education. New York: Columbia University, 2005.
- [8] Boisjoly J, Harris K, Duncan G. Initial welfare spells: Trends, events, and duration. *Soc Sci Rev* 1998;72:466–92.

- [9] Bearman P, Jones J, Udry J. The National Longitudinal Study of Adolescent Health: Research design [Online]. Available at: <http://www.cpc.unc.edu/projects/addhealth/design.html>. Accessed September 21, 2007.
- [10] Centers for Disease Control and Prevention. 2005 Youth Risk Behavior Survey [Online]. Available at: www.cdc.gov/yrbss. Accessed September 20, 2007.
- [11] Barton P. One-third of a nation: Rising dropout rates and declining opportunities. Princeton, NJ: Educational Testing Service, 2005.
- [12] United States Department of Labor Employment Training Administration. Youth Opportunity (YO) movement fact sheet. Washington, D.C., 2000.
- [13] General Services Administration. Empowerment Zones Program: Catalog of Federal Domestic Assistance. Washington, DC: General Services Administration, 2002.
- [14] Maryland Department of Planning. Empowerment Zone Analysis. Baltimore, MD: Maryland Department of Planning, 2002.
- [15] Grunbaum J, Kann L, Kinchen S, et al. Youth risk behavior surveillance—United States, 2003. *MMWR* 2004;53:1–96.
- [16] Centers for Disease Control and Prevention. 2001 National Health Interview Survey. Hyattsville, MD: Division of Health Interview Statistics, National Center for Health Statistics, 2003.
- [17] Grunbaum J, Kann L, Kinchen S, et al. Youth risk behavior surveillance—United States, 2001. *MMWR* 2002;51:1–64.
- [18] Mayfield D, McLeod G, Hall P. The CAGE questionnaire: Validation of a new alcoholism screening instrument. *Am J Psychiatry* 1974; 131:1121–3.
- [19] Centers for Disease Control and Prevention. Methodology of the Youth Risk Behavior Surveillance System. *MMWR* 2004;53:1–13.
- [20] Pleis J, Lethbridge-Cejku M. Summary health statistics for U.S. adults: National Health Interview Survey, 2005. Bethesda, MD: National Center for Health Statistics, Vital Health Statistics, 2006.
- [21] Bloom B, Dey A, Freeman G. Summary health statistics for U.S. children: National Health Interview Survey, 2005. Bethesda, MD: National Center for Health Statistics, Vital Health Statistics, 2006.
- [22] Buchmueller T, Grumbach K, Kronick R, Kahn J. The effect of health insurance on medical care utilization and implications for insurance expansion: A review of the literature. *Med Care Res Rev* 2005;62:3–30.
- [23] Ayanian J, Weissman J, Schneider E, et al. Unmet health needs of uninsured adults in the United States. *JAMA* 2000;284:2061–9.
- [24] Callahan S, Cooper W. Gender and underinsurance among young adults in the United States. *Pediatrics* 2004;113:291–7.
- [25] Marcell A, Klein J, Fischer I, et al. Male adolescent use of healthcare services: Where are the boys? *J Adolesc Health* 2002;30:35–43.
- [26] Office of Applied Studies. Results from the 2002 National Survey on drug use and health: National findings. DHHS Publication No. SMA 03-3836, NHSDA Series H-22/. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2003.
- [27] Aloise-Young P, Cruickshank C, Chavez E. Cigarette smoking and perceived health in school dropouts: A comparison of Mexican American and non-Hispanic white adolescents. *J Pediatr Psychol* 2002;27: 497–507.
- [28] Kogan S, Luo Z, Murry V, Brody G. Risk and protective factors for substance use among African-American high school dropouts. *Psychol Addict Behav* 2005;19:382–91.
- [29] Cuijpers P. Effective ingredients of school-based drug prevention programs: A systematic review. *Addict Behav* 2002;27:1009–23.
- [30] Mytton J, DiGuseppi C, Gough D, et al. School-based violence prevention programs. *Arch Pediatr Adolesc Med* 2002;156: 752–62.
- [31] Kelly P, Owen S, Peralez-Dieckman E. Health interventions with girls in the juvenile justice system. *Women's Health Issues* 2007;17: 227–36.
- [32] Lawrence J, Crosby R, Belcher L, et al. Sexual risk reduction and anger management interventions for incarcerated male adolescents: A randomized controlled trial of two interventions. *J Sex Educ Ther* 1999;24:9–17.
- [33] Racusin R, Maerlender A, Sengupta A, et al. Psychosocial treatment of children in foster care: A review. *Commun Ment Health J* 2005; 41:199–221.
- [34] Letourneau N, Stewart M, Barnfather A. Adolescent mothers: Support needs, resources, and support-education interventions. *J Adolesc Health* 2004;35:509–25.
- [35] Harris L. Learning from the youth opportunity experience. Washington, DC: Center for Law and Social Policy, 2006.