

# Smoking Behavior of US Youths: A Comparison Between Child Welfare System and Community Populations

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Cigarette smoking among US youths persists as a critical public health problem. Notably, 80% to 90% of adult smokers initiate smoking by age 18 years.<sup>1-3</sup> Trends in smoking behavior among youths have not paralleled the steady decline evident among adult smokers.<sup>2</sup> Tobacco use is related to more than 400 000 US deaths per year, and direct medical costs attributable to smoking total more than \$50 billion in the United States annually.<sup>1,4</sup> The public health importance of tobacco use is underscored by the Obama administration's prioritization of smoking prevention and cessation.<sup>5</sup>

Youths involved with the child welfare system (CW) face unique experiences that may put them at elevated risk for smoking compared with youths without similar experiences.<sup>6,7</sup> Youths enter the CW system as a result of case investigations conducted by local child protective services agencies. This population includes both youths receiving services in their homes and those in out-of-home care. The lives of CW-involved youths are characterized by problems such as child abuse, neglect, poverty, domestic violence, and parental substance abuse.<sup>8</sup> Although CW cases are typically referred on the basis of parent behavior, these youths are also at high risk for mental health disorders, substance use, and other psychosocial problems.<sup>6,8-10</sup> However, we are unaware of any studies examining cigarette smoking among CW youths in comparison with community samples to determine whether a difference in smoking-prevalence risk exists for these youths. It is important to determine whether CW-involved youths are at higher risk for smoking so that targeted prevention and intervention strategies can be developed.

Among community youths, studies have demonstrated that some subgroups (e.g., age, gender, race/ethnicity, region) are at higher risk for both lifetime and current smoking.<sup>2</sup> Boys are more likely to initiate smoking, but they smoke more infrequently than girls do.<sup>2,11,12</sup> Racial/ethnic minority youths smoke less than

do their White peers.<sup>11-13</sup> Parent education and family structure are associated with lifetime, current, and regular smoking, with youths from households of lower socioeconomic status smoking at higher rates.<sup>14-17</sup>

Smoking is also linked to emotional well-being, including internalizing and externalizing behaviors and parent-child closeness. Depression is related to increased smoking behavior.<sup>18-23</sup> Engaging in delinquent acts is associated with increased youth smoking.<sup>11,15,24</sup> Youths who report having a close relationship with their parents are less likely to be regular smokers.<sup>25</sup>

Several longitudinal studies have connected youth smoking with behavioral outcomes in adolescence and adulthood. Early-onset smokers are 3 times more likely by grade 12 to regularly use tobacco and marijuana, use hard drugs, sell drugs, have multiple drug problems, drop out of school, and engage in stealing and other delinquent behaviors.<sup>26</sup> In addition, long-term emotional and physical health—such as

**Objectives.** We compared rates of smoking for 2 groups of youths aged 12 to 14 years: those involved in the child welfare system (CW) and their counterparts in the community population. We then investigated factors associated with smoking for each group.

**Methods.** We drew data from 2 national-level US sources: the National Survey of Child and Adolescent Well-Being and the National Longitudinal Study of Adolescent Health. We estimated logistic regression models for 3 binary outcome measures of smoking behavior: lifetime, current, and regular smoking.

**Results.** CW-involved youths had significantly higher rates of lifetime smoking (43% vs 32%) and current smoking (23% vs 18%) than did youths in the community population. For CW-involved youths, delinquency and smoking were strongly linked. Among youths in the community population, multiple factors, including youth demographics and emotional and behavioral health, affected smoking behavior.

**Conclusions.** Smoking prevalence was notably higher among CW-involved youths than among the community population. In light of the persistent public health impact of smoking, more attention should be focused on identification of risk factors for prevention and early intervention efforts among the CW-involved population. (*Am J Public Health.* 2011;101:2342–2348. doi:10.2105/AJPH.2011.300266)

reduced adult life satisfaction, more severe nicotine dependence, and higher smoking quantities—are associated with youth smoking.<sup>27,28</sup>

Our purpose in the current study was to investigate whether CW-involved youths were at greater risk for smoking than were community youths and to determine whether factors associated with smoking behavior were similar among both populations. We focused explicitly on early adolescence because smoking initiation occurs most often between the ages of 12 and 14 years,<sup>29,30</sup> and early smokers face greater risk of later negative outcomes. We examined 3 distinct measures of smoking behavior: lifetime, current, and regular smoking. Each of these outcomes has a unique public health impact, and investigating them together provides a comprehensive picture of smoking across the 2 youth populations. We expected smoking rates to be higher for CW-involved youths than for community youths. Although there is a dearth of previous research on factors related to smoking behavior in the CW

population, we expected some similarities between the groups, with demographic characteristics, family structure, and emotional and behavioral health being associated with smoking among CW-involved youths.

## METHODS

We drew data from 2 US national samples: a CW sample, the National Survey of Child and Adolescent Well-Being (NSCAW), and a community sample, the National Longitudinal Study of Adolescent Health (Add Health). The NSCAW examined the experiences of children and families involved in the CW system, with baseline data collected from 2000 to 2001.<sup>31</sup> The NSCAW used stratified, 2-stage cluster sampling to select sampling units (usually a county) from a national sampling frame. This approach resulted in child-level data collected in 96 counties from 36 states. A detailed NSCAW description can be found elsewhere.<sup>31</sup> The present study used baseline data. Add Health is a nationally representative, school-based sample of adolescents in the 7th through 12th grades, with baseline data collected during the 1994–1995 academic year. The Add Health primary sampling frame included all high schools in the United States that had an 11th grade and a minimum of 30 students. The final sample included 134 schools varying in size from fewer than 100 students to more than 2000 students. For the present study, we used data from the wave 1 survey.

Several factors mitigate our concern about the 6-year difference between baseline data collections. First, there was a general decline in smoking behavior throughout the 6-year time span in question,<sup>2</sup> so it would be expected that NSCAW's smoking rates in 2000 were lower than were Add Health's smoking rates in 1994, making our approach conservative with regard to CW risk. Second, previous studies have combined youths' smoking behavior data over the same time period for both lifetime smoking and current smoking.<sup>12</sup> Finally, tobacco policy changed little during this time span.

The 2 studies generated national estimates for CW-involved youths (NSCAW) and community youths (Add Health). We defined the current study samples to consist of youths aged 12 to 14 years at the time of first interview,

whose caregiver also participated, and for whom sample weights were available. The NSCAW sample size was 740; the Add Health sample size was 4472. We found no significant differences between those with missing data and those with complete data; thus, we only included cases with complete data.

## Measures

**Smoking behavior.** We examined 3 outcomes of interest: lifetime, current, and regular smoking. We based each variable on youths' self-reports and coded them as binary. We based lifetime smoking on responses to the NSCAW question "In your whole life, on how many days have you smoked a cigarette?" and coded the variable as "yes" if the youth reported smoking any days, and on the Add Health question "Have you ever tried cigarette smoking, even just 1 or 2 puffs?" which we also coded as yes/no. Consistent with research in this area, we operationalized current smoking on the basis of whether the youth had smoked in the last 30 days: "In the last 30 days, on how many days did you smoke a cigarette?" (NSCAW) and "During the past 30 days, on how many days did you smoke cigarettes?" (Add Health), with both being coded as "yes" if the youth had smoked at all in the previous 30 days. Finally, regular smoking included only those youths who had smoked in the last 30 days. Those who had smoked on 20 or more days in the last 30 days were coded as regular smokers.

**Demographics.** We included gender, age, and race/ethnicity in the analyses. We included 2 household measures: parent/caregiver education, coded in years of completed schooling on the basis of the highest education level obtained, and household structure, a binary measure indicating the presence of 2 parents/caregivers. In the NSCAW sample, 70% of youths resided in their homes. The remaining 30% were in out-of-home placements, including foster or kinship care, or group/other residential care.

**Emotional and behavioral health.** We used 3 indices of emotional and behavioral health: perceived parental closeness, depression, and delinquency. For parental closeness, the youths in both studies were asked 2 questions about their relationship with their parent or caregiver (hereafter referred to as parent): (1) "How close

do you feel to your mother/father/caregiver/etc.?" (2) "How much do you think he/she cares about you?" The items were scored on a 5-point Likert scale ("Not at all" to "A lot"). We combined and averaged the items, with the measure of closeness ranging from "not at all close" to "very close." If the adolescent lived with 2 parents, we averaged support across both. If the adolescent lived in a single-parent household or other household arrangement, only the resident parent was included.

Depression was measured with clinical assessment scales. In NSCAW, depression was measured with the Children's Depression Inventory long form, consisting of 27 self-report items<sup>32</sup> (Cronbach's  $\alpha=0.88$  in this study). In Add Health, depression was measured with the 19-item modified version of the Center for Epidemiologic Studies Depression Scale (CES-D).<sup>33</sup> The full CES-D consists of 20 items that assess depression symptoms for the previous week. Add Health used 16 of the 20 items as originally worded, plus 2 items whose wording was slightly altered from the original CES-D, and 1 item added by Garrison et al.<sup>34</sup> for an adolescent adaptation. The modifications do not meaningfully affect the internal structure of the measure<sup>35</sup> (Cronbach's  $\alpha=0.87$  in this study). Both the Children's Depression Inventory and the CES-D are psychometrically sound instruments for the measurement of adolescent depressive symptoms.<sup>32,36,37</sup> However, because the measures were not identical, we determined that the best comparison across the 2 samples would be based on clinical cutoffs for depression. The clinical cutoff score for depression on the CES-D was 16<sup>36</sup>; the clinical cutoff for depression on the Children's Depression Inventory was 66.<sup>32</sup> Thus, we considered depression a dichotomous variable indicating not depressed or depressed.

Finally, delinquency was assessed with 11 questions that were identical across the studies. Items included whether youths had engaged in the following behaviors: damaged property, shoplifted, ran away, stole something worth less than \$50, stole something worth \$50 or more, burglarized, stole a car, used or threatened to use a weapon, sold drugs, or participated in a group fight. Youths reported how often during the past 6 months (NSCAW) or past

12 months (Add Health) they had participated in these activities. Each delinquent act was coded as 0, did not participate, or 1, participated, and the final delinquency measure was a summated scale. For more direct comparability, the Add Health scale was divided in half to proxy a 6-month delinquency score. The Cronbach's  $\alpha$  for the delinquency scale was 0.81 in the present NSCAW sample and 0.76 in the present Add Health sample.

### Statistical Analysis

Both NSCAW and Add Health have complex survey data, and both include adjustments for the stratification and clustering design as well as individual grand sample weights. Accounting for the complex designs allows for generalization back to the national population of youths in the CW (NSCAW) and national (Add Health) populations of US adolescents. We used logistic regression to assess factors associated with each of the outcomes—lifetime, current, and regular smoking. We used Stata version 10<sup>38</sup> (StataCorp LP, College Station, TX) to analyze data separately for each data set, accounting for the complex designs and using appropriate sample weights. We used *t* tests to compare prevalence rates across the groups. We used Stata's Spost package<sup>39,40</sup> to calculate estimated probabilities.

## RESULTS

As shown in Table 1, the NSCAW (*n*=740) and Add Health (*n*=4472) samples had similarities as well as differences. For example, the gender and age distributions of the groups were similar, as were levels of depression and delinquency. Both samples were racially/ethnically diverse, with the NSCAW having lower proportions of Whites and higher proportions of Blacks, Hispanics, and "other" minorities. Household characteristics—education and structure—were significantly different between the 2 samples. Only 32% of CW-involved youths lived in a 2-parent household, compared with 73% in the community, and the average household education was just under 12 years for CW-involved youths, compared with almost 14 years for the community sample.

Smoking rates differed significantly between the 2 groups, with a greater proportion of

**TABLE 1—Demographic Characteristics, Emotional and Behavioral Health, and Smoking Prevalence Among Youths Aged 12–14 Years: United States, Community Population (1994–1995) vs Child Welfare Population (2000–2001)**

	Community Youths ( <i>n</i> = 4472), Proportion (95% CI) or Mean (SE)	Child Welfare Youths ( <i>n</i> = 740), Proportion (95% CI) or Mean (SE)	Range	<i>P</i>
<b>Independent variables</b>				
Female	0.51 (0.49, 0.53)	0.56 (0.48, 0.64)	0–1	
Age, y	13.38 (0.66)	13.02 (0.78)	12–14	
White	0.70 (0.63, 0.77)	0.51 (0.42, 0.60)	0–1	<.001
Black	0.13 (0.08, 0.19)	0.27 (0.19, 0.36)	0–1	<.001
Hispanic	0.11 (0.07, 0.15)	0.15 (0.08, 0.22)	0–1	<.01
Another race	0.05 (0.03, 0.07)	0.07 (0.04, 0.10)	0–1	<.05
Parent education, y	13.93 (2.46)	11.57 (2.47)	0–20	<.001
2-parent household	0.73 (0.69, 0.76)	0.32 (0.25, 39)	0–1	<.001
Parental closeness	4.72 (0.50)	4.28 (0.97)	1–5	<.001
Depression	0.14 (0.13, 0.16)	0.14 (0.09, 0.20)	0–1	
Delinquency	0.81 (0.96)	0.95 (1.94)	0–11	
<b>Frequency of smoking</b>				
Lifetime smoked	0.32 (0.30, 0.35)	0.43 (0.36, 0.51)	0–1	<.001
Currently smoked	0.18 (0.16, 0.19)	0.23 (0.16, 0.30)	0–1	<.01
Regularly smoked (among smokers)	0.35 (0.30, 0.39)	0.37 (0.18, 0.56)	0–1	

Note. CI = confidence interval. Data on community youths taken from National Longitudinal Study of Adolescent Health; data on child welfare youths taken from National Survey of Child and Adolescent Well-Being. Weighted means are presented.

NSCAW youths reporting lifetime smoking relative to the Add Health sample (43% vs 32%, respectively). Similarly, a greater proportion of CW-involved youths currently smoked (23% vs 18%, respectively). However, among youths who currently smoked, we found no significant difference in the frequency of smoking.

### Factors Associated With Smoking Behavior

**Lifetime smoking.** Table 2 presents odds ratios from the multivariate analyses to determine factors associated with lifetime smoking. Gender was significantly related to lifetime smoking among community youths, with girls having higher odds of smoking than boys had; however, this association was not found among CW-involved youths. In both populations, older youths were more likely to have ever smoked. Black youths were significantly less likely to have ever smoked than were White youths in both groups, and Hispanic and other racial/ethnic minority youths were significantly less likely to have smoked than were Whites

among the general population. For CW-involved youths, parent education was not associated with lifetime smoking, but among community youths, those with more educated parents reported a significantly reduced likelihood of lifetime smoking compared with those whose parents had completed less schooling. Family/household structure was marginally associated with lifetime smoking for CW-involved youths and strongly associated with lifetime smoking for community youths: those who lived in dual-parent households had a reduced likelihood of lifetime smoking.

The influence of emotional and behavioral health on lifetime smoking differed substantially between the populations. Among CW-involved youths, delinquency was the sole behavioral indicator of lifetime smoking behavior: the odds of lifetime smoking increased as CW-involved youths were increasingly delinquent. By contrast, each emotional and behavioral health indicator was significantly associated with lifetime smoking among community youths: those who reported greater levels of parental closeness had significantly

**TABLE 2—Odds Ratios From Logistic Regressions of Smoking Outcomes Among Youths Aged 12–14 Years: United States, Community Population (1994–1995) vs Child Welfare Population (2000–2001)**

	Community Population			Child Welfare Population		
	Lifetime Smoking, OR (95% CI)	Current Smoking, OR (95% CI)	Regular Smoking, OR (95% CI)	Lifetime Smoking, OR (95% CI)	Current Smoking, OR (95% CI)	Regular Smoking, OR (95% CI)
Female	1.24** (1.01, 1.52)	1.46*** (1.12, 1.90)	0.74 (0.50, 1.10)	1.30 (0.63, 2.67)	2.19* (0.96, 4.96)	1.52 (0.31, 7.45)
Age	1.46† (1.26, 1.69)	1.45† (1.19, 1.77)	1.22 (0.86, 1.73)	1.96† (1.38, 2.79)	1.95*** (1.21, 3.16)	1.48 (0.69, 3.17)
Black	0.29† (0.22, 0.38)	0.28† (0.19, 0.40)	0.23† (0.11, 0.47)	0.33** (0.12, 0.88)	0.29*** (0.11, 0.73)	0.33 (0.07, 1.50)
Hispanic	0.41† (0.28, 0.59)	0.40† (0.26, 0.61)	0.47** (0.26, 0.86)	0.76 (0.29, 2.03)	0.24* (0.05, 1.21)	0.04** (0.01, 0.48)
Other race	0.62** (0.39, 0.99)	0.59** (0.35, 0.97)	1.45 (0.40, 5.22)	1.88 (0.52, 6.74)	0.47 (0.12, 1.83)	1.61 (0.26, 10.06)
Parent education	0.93† (0.89, 0.97)	0.92*** (0.88, 0.97)	0.92** (0.86, 0.98)	1.01 (0.79, 1.17)	1.01 (0.85, 1.19)	1.19 (0.88, 1.63)
2-parent household	0.79** (0.63, 0.99)	0.82 (0.64, 1.06)	0.51** (0.30, 0.87)	0.54* (0.28, 1.06)	0.45** (0.20, 1.00)	1.25 (0.36, 4.40)
Parental closeness	0.67† (0.54, 0.82)	0.76*** (0.64, 0.91)	0.72 (0.48, 1.09)	0.85 (0.56, 1.30)	0.68 (0.42, 1.11)	1.03 (0.53, 2.02)
Depression	1.58† (1.21, 2.07)	1.66† (1.28, 2.15)	1.95** (1.16, 3.27)	1.34 (0.49, 3.67)	0.95 (0.32, 2.89)	3.63 (0.72, 18.30)
Delinquency	2.56† (2.30, 2.84)	2.35† (2.13, 2.61)	1.31† (1.13, 1.51)	1.92† (1.36, 2.70)	1.79† (1.39, 2.31)	1.08 (0.84, 1.38)
No.	4472	4472	773	740	740	163

Note. CI = confidence interval; OR = odds ratio. Data on community youths taken from National Longitudinal Study of Adolescent Health; data on child welfare youths taken from National Survey of Child and Adolescent Well-Being. Non-Hispanic White is the reference group. Parent/caregiver education is in years. Parental closeness is continuous. Depression is binary, using clinical cutoff for Center for Epidemiologic Studies Depression Scale (community youths) and Children's Depression Inventory (child welfare youths). Delinquency is continuous and is measured in 6-month increments.

\* $P < .1$ ; \*\* $P < .05$ ; \*\*\* $P < .01$ ; † $P < .001$ .

reduced odds of lifetime smoking. Conversely, community youths who measured above the clinical threshold for depression were significantly more likely to have ever smoked. At higher levels of delinquency, community youths had increased odds of lifetime smoking.

**Current smoking.** Gender, age, and race/ethnicity were each significantly associated with current smoking. Boys, younger adolescents, and racial/ethnic minority youths were less likely to have smoked recently in both the CW and community populations. In addition, parental education remained significantly associated with current smoking for community youths, whereas household structure was significantly associated with current smoking among CW-involved youths: those who resided in dual-parent households had lower odds of current smoking.

Associations of emotional and behavioral health with current smoking were nearly parallel to those with lifetime smoking. Delinquency had the only significant association with current smoking for CW-involved youths. However, among youths in the community, parental closeness, depression, and delinquency were all strongly associated with current smoking.

**Regular smoking.** In the community population, Black and Hispanic youths had lower

odds of regular smoking compared with their White peers. Household characteristics were significantly associated with regular smoking in community youths: those whose parents had higher levels of education and who lived in dual-parent households had lower odds of regular smoking. None of these individual or household characteristics were significantly associated with regular smoking among CW-involved youths.

Similar to the other smoking behaviors, depression and delinquency were significantly associated with regular smoking among community youths. Youths who were depressed had increased odds of regular smoking compared with those who were not depressed; and, as youths engaged in more delinquent acts, the odds of regular smoking increased. However, neither depression nor delinquency was significantly associated with regular smoking among CW-involved youths.

### Postregression Estimated Probabilities

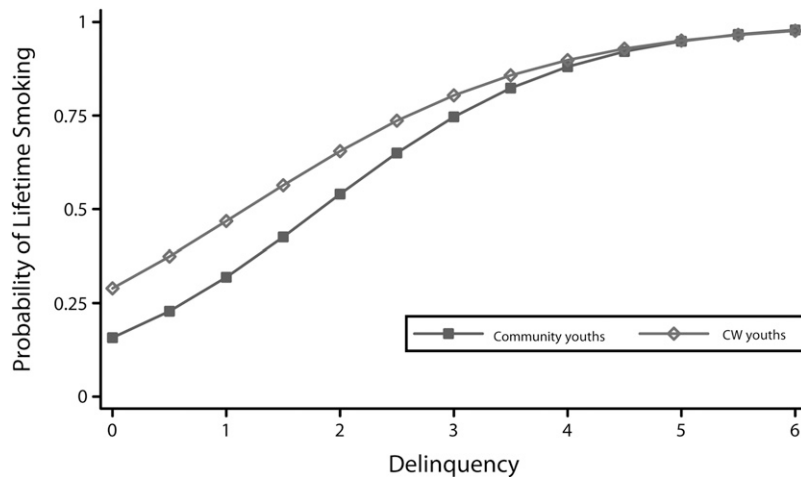
To more fully understand the effects of the factors most strongly related to lifetime and current smoking (i.e., delinquency and family structure), we explored those associations more closely. For delinquency, we plotted the estimated probabilities of lifetime smoking for

CW-involved youths compared with the community population (Figure 1). At lower levels of delinquency, CW-involved youths had higher probability of lifetime smoking than did community youths; but, as delinquency increased, the group difference diminished, and it faded entirely at 4 or more delinquent events.

Delinquency displayed a somewhat different effect when we examined current smoking behavior. As shown in Figure 2, CW-involved youths had a marginally higher probability of current smoking than did community youths at the lowest levels of delinquency. However, as delinquency increased, the estimated probabilities of current smoking among community youths actually surpassed those of CW-involved youths.

Finally, we probed the associations of parent education and family structure with smoking for both groups. Because CW-involved youths are often of lower socioeconomic position than are community youths, we wanted to determine whether CW involvement was serving as a proxy for disadvantage, or whether distinct differences existed for CW-involved youths. To do this, we estimated probabilities of smoking for each group, matching parental education at 12 years with single-parent households. For





Note. CW = child welfare. Data on community youths taken from National Longitudinal Study of Adolescent Health; data on child welfare youths taken from National Survey of Child and Adolescent Well-Being.

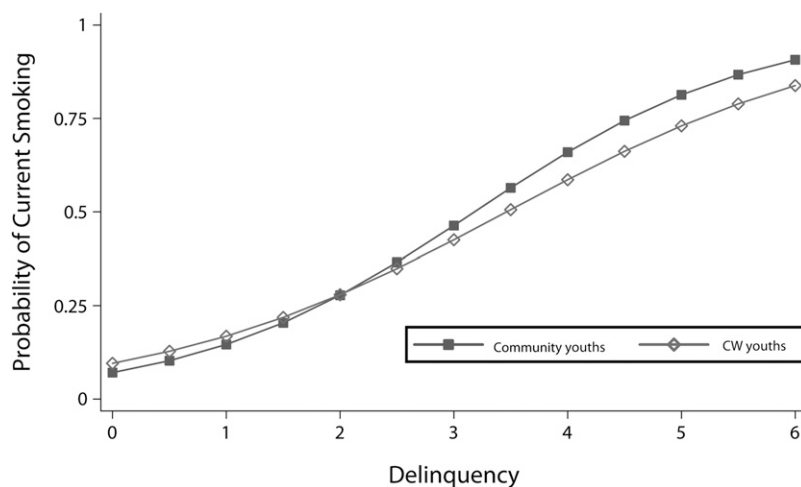
**FIGURE 1—Estimated probabilities of lifetime smoking, by delinquency among youths aged 12–14 years: United States, community population (1994–1995) vs child welfare population (2000–2001).**

lifetime smoking, CW-involved youths in single-parent households, with an average of a high-school education, had a 0.500 probability of having ever smoked, compared with 0.345 among community youths. The results for current smoking were similar: CW-involved youths had a 0.206 probability of current

smoking, compared with 0.160 among community youths in single-parent households.

## DISCUSSION

Cigarette smoking is a critical public health concern that has both proximal and distal



Note. CW = child welfare. Data on community youths taken from National Longitudinal Study of Adolescent Health; data on CW youths taken from National Survey of Child and Adolescent Well-Being.

**FIGURE 2—Estimated probabilities of current smoking by delinquency among youths aged 12–14 years: United States, community population (1994–1995) vs child welfare population (2000–2001).**

negative consequences for youths. The proportion of youths who have smoked at least once in the last month has remained relatively stable for the last decade, suggesting that efforts such as those undertaken by Healthy People 2010 have not achieved their intended success in reducing smoking. In the present study, we examined data from 2 nationally representative US samples and found that CW-involved youths had significantly higher rates of lifetime and current smoking than did youths in the community population. Establishing smoking prevalence for CW-involved youths may help to anticipate the specific level of need for smoking-focused prevention and intervention programs.

Our results for community youths are consistent with previous research in this area: girls are more likely to smoke than are boys, Whites more than non-Whites, and youths with emotional and behavioral challenges more than those without such challenges.<sup>2,11–13</sup> In addition, stable families are protective for smoking.<sup>14–17</sup> Most of these patterns did not hold among CW-involved youths, indicating the need for research to identify explanatory mechanisms for smoking behaviors in this high-risk group.

For CW-involved youths, the primary factor associated with lifetime and current smoking was delinquency. Engaging in 1 or 2 delinquent acts had a stronger effect—for both lifetime smoking and current smoking—for CW-involved youths than for community youths. To prevent smoking among the CW population, CW case-management practices should attend not only to parental behavior (a primary focus of CW systems) but also to youth delinquency. By effectively responding to the first signs of delinquency, prevention efforts provided as an element of CW services may forestall negative health behavior outcomes for CW-involved youths.

Family structure is important for all youths, and this is a particular risk for CW-involved youths. Residing in 2-parent households significantly reduced lifetime and current smoking for CW-involved youths; yet, two thirds of these youths were living in single-parent homes. This finding is consistent with a previous finding that inner-city youths who resided in 2-parent families had lower lifetime smoking rates than did those who lived in single-parent homes.<sup>11</sup> The authors of that study suggest that residing in a dual-parent home

serves as a protective factor for vulnerable youths. Youths residing in single-parent households often have less parental monitoring,<sup>41</sup> which is often linked to delinquency,<sup>42</sup> an association that should be explored in future research efforts.

Finally, regular smoking prevalence did not differ between CW and community youths; however, the factors associated with regular smoking did. Specifically, although child demographics, family background, and emotional and behavioral health affected regular smoking among community youths, none of those characteristics affected regular smoking among CW-involved youths. This finding highlights the paucity of empirical information we have about the factors associated with smoking behavior in this vulnerable group of young adolescents. Additional interpersonal or structural risk factors should be identified in future studies. We considered the notion that most CW-involved youths reside in households of lower socioeconomic status, which may be characterized by more tolerance for smoking and an environment that is less supportive of quitting smoking.<sup>43,44</sup> However, in the case of CW-involved youths, there are arguably other contextual factors to consider, particularly those that accompany child maltreatment (e.g., trauma, placement inconsistency, parental substance use).

In addition to further research on the factors related to smoking among CW-involved youths, targeted prevention for CW youths should be undertaken. The CW system may be an ideal venue in which to disseminate and implement evidence-based smoking prevention programs. For example, most CW systems are required to deliver home-based services.<sup>45</sup> Home visitation models have proven effective at reducing health risks and promoting better child development<sup>46</sup> as well as reducing risks of child neglect.<sup>47</sup> Working within the home provides an opportunity for service providers to directly influence parents and youths regarding health behaviors. Although we know of no current smoking prevention or cessation programs targeted to the CW population, this context should be considered for future prevention efforts.

### Limitations

Some limitations of this study warrant consideration. First, the cross-sectional nature of the analyses hinders the ability to make causal

inferences or to perform a longitudinal examination of the factors associated with youth smoking behavior. Second, not all variables in the 2 data sets were identical. However, both included empirically sound assessments of the constructs of interest, and we carefully considered comparability in our formulation and analyses. Third, the studies do not include a measure of parental smoking, an indicator of youth smoking.<sup>25</sup> Finally, the NSCAW and Add Health studies draw from 2 distinct populations. However, we carefully considered comparability of the samples and noted that several advantages of the 2 data sets—both are nationally representative for their populations, include youths of the same age, and have similar emotional and behavioral health measures—offer a unique opportunity to examine how similar factors operate for 2 different groups with regard to tobacco smoking, a critically important public health outcome.

### Conclusions

The prevalences of lifetime and current smoking are significantly higher among CW-involved youths than among community population youths. Youth smoking has a strong influence on adolescent and adult physical and emotional health,<sup>48</sup> so the higher rates of smoking among CW-involved youths are particularly distressing. The relative lack of evidence regarding the causes of those higher rates highlights the need for further research to improve the long-term health of youths and to reduce the tobacco-related burden on the health care system. In particular, researchers should investigate contextual factors unique to youths involved with the CW system that may lead to and sustain smoking behaviors, thereby improving our understanding of health behaviors and helping to direct prevention and early intervention efforts. This is particularly critical because every new adolescent smoker today increases smoking prevalence on average for several additional decades,<sup>27,48</sup> exacting costly individual and societal tolls.

Tobacco prevention remains at the top of Healthy People 2020<sup>49</sup> and of President Obama's health agenda.<sup>5</sup> It is both timely and critical for us to better understand the antecedents of smoking for all youths, but especially for CW-involved youths, who are at high risk for smoking and subsequent negative health outcomes. ■

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### Contributors

D.L. Fettes drafted the article and conducted the analyses. G.A. Aarons reviewed the article. Both authors participated in conceptualizing ideas, interpreting findings, editing the article, and reviewing drafts of the article.

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### Human Participant Protection

This study protocol was approved by the institutional review board of the University of California, San Diego.

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