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Teen pregnancy in rural western Kenya: a public health issue

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ABSTRACT

Rates of teenage pregnancy remain high in sub-Saharan Africa. The KEMRI Health and Demographic Surveillance System provided the sampling frame for a survey. Analysis focused on 1,952 girls aged 13–19 years. Over a third (37.2%; $n = 727$) were sexually active and 23.3% ($n = 454$) had ever been pregnant. Adjusted odds of reporting a history of pregnancy were greater for older compared to younger teens, teens who were ever married or cohabiting compared to those who were single, teens with a primary education or less compared to those with a higher level of education, and teens who experienced partner violence in the last 12 months. Three-quarters of teens pregnant in the last 12 months did not want to get pregnant ($n = 190$); only 64.2% ($n = 122$) answered yes to using any family planning method. Teen pregnancy and its consequences are serious public health issues. Higher education levels are a crucial component to address the problem.

Introduction

The 1994 International Conference on Population and Development (ICPD) emphasized that governments need to support adolescents in their basic needs as well as aspirations and eliminate practices that do not contribute to the development and empowerment of children. The ICPD put forth two objectives on the topic of reproductive health in adolescents: '(1) to address adolescent sexual and reproductive health issues, including unwanted pregnancy, unsafe abortion, and sexually transmitted infections (STIs), including HIV/AIDS, through the promotion of responsible and healthy reproductive and sexual behaviour… and (2) to substantially reduce all adolescent pregnancies'(UN Populations Fund, 2014). Pregnancy among adolescent girls less than 18 years of age is likely to show the greatest increase over the next 20 years in sub-Saharan Africa. In fact, the top five countries with the greatest projected absolute increases are all in sub-Saharan Africa: Nigeria (9.2 million), United Republic of Tanzania (3.7 million), Democratic Republic of the Congo (3.3 million), Uganda (2.5 million) and Kenya (2.3 million) (Loaiza, 2013).

Despite country agreements to international charters and conferences like the ICPD, rates of teen pregnancy remain high in economically developing countries. Dynamics such as gender inequality, preference for boys over girls for schooling as well as poverty and humanitarian crises together work

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to encourage adolescent pregnancy (Juma, Askew, Alaii, Bartholomew, & van den Borne, 2014; Loaiza, 2013; Were, 2007).

It is important to understand more about teenage fertility for many reasons. For instance, adolescent mothers more often experience complications during pregnancy and, because of less exposure to prenatal care services, are less equipped to deal with the complications (Loaiza, 2013; Taffa, Omollo, & Matthews, 2003). In addition, children born to very young mothers are normally predisposed to higher risks of illness and death (Loaiza, 2013), which is a serious public health problem. Importantly, teen childbearing reduces human capital; not only do the teenage mothers have lower school attendance and higher drop-out rates, but their children also have lower levels of school achievement (Karra, 2012). The 2014 Kenya Health and Demographic Survey (KHDS) (Kenya National Bureau of Statistics, 2010) reports that pregnancy rates rapidly increase from age 15 (3.2%) to 19 (39.9%) years (Kenya National Bureau of Statistics, 2015). While the percentage of teenagers who began childbearing declined from 23% in the 2003 KDHS to 18% in the 2008–2009 KDHS (Kenya National Bureau of Statistics, 2010), there was no change in the 2014 KHDS report (Kenya National Bureau of Statistics, 2015). The purpose of the present study was to determine among western Kenyan teenage girls: (1) the proportion who reported a history of pregnancy and the proportion who reported an unwanted pregnancy in the last 12 months; (2) demographic and risk factors associated with those who reported a history of pregnancy and demographic and risk factors associated with those who reported an unwanted pregnancy; and (3) contraceptive methods used by those with an unwanted pregnancy in the last 12 months.

Methods

Study location and population

Since September 2001, the United States Centers for Disease Control and Prevention (CDC) in collaboration with the Kenya Medical Research Institute (KEMRI) have been operating a Health and Demographic Surveillance System (HDSS) within the KEMRI/CDC Health and Demographic Surveillance Area (HDSA) in Siaya County, Kenya. The HDSA covers three areas, Asembo, Gem, and Karemo, and provides general demographic and health information, as well as disease and intervention information, in western Kenya. The study was conducted in the Gem part of the HDSA, which is located about 20 km northeast of Lake Victoria in Siaya County, formerly Nyanza Province. Persons living there are predominately of Luo ethnicity, and their major economic activity is subsistence farming (Odhiambo et al., 2012). Females comprise approximately half (52.5%) the population (KEMRI/CDC, 2012).

Design

Two cross-sectional surveys evaluating HIV risk behaviours, HIV sero-status factors, and HIV prevention interventions were conducted. The HDSA in Gem served as a sampling frame of all the registered housing compounds (14,501 in 2010). A random sample of 4,000 compounds was selected through a community-based simple random approach. Using the random sample, two cross-sectional surveys were carried out in the area (Round 1: March 2011 to September 2012; Round 2: January 2013 to February 2014). This analysis focuses only on the Round 1 cross-sectional survey because some teen girls in the Round 1 survey also participated in the Round 2 survey.

HIV risk behavioural survey

A pre-coded, structured questionnaire was administered using a computer-assisted personal interview (CAPI) immediately before HIV testing and counseling to avoid influencing responses since some of the questions asked about past HIV testing. The questionnaire targeted all persons in the household meeting the inclusion criteria. Inclusion criteria were age ≥13 years, resident of Gem, and willing to give informed consent to participate in the survey. The age criterion represented the lower age limit for voluntary HIV testing in Kenya. Trained field staff used the HDSS randomly selected compound

list to identify eligible household members for an interview. Interviews were offered to the selected individuals and all interviews were conducted in the home.

Measures

Two dependent variables were constructed using responses to interview questions. Pregnancy history was based on positive responses to the question, 'Have you ever been pregnant?'. Unwanted pregnancy in the past 12 months was assessed with positive responses to the question, 'Have you been pregnant in the last 12 months?' and if yes, positive responses to the question, 'When you got that pregnancy, had you wanted to get pregnant?'.

Independent variables were: age group; marital status; currently in school; highest level of education; partner violence in last 12 months; had older partner; number of sexual partners in last 12 months; condom use at last sex; if knew partner had a sexually transmitted disease, would say no to sex; partner substance use before last sex; forced sex in last 12 months; had sex to get money to buy items for menstrual periods; previously HIV tested; and self-reported HIV positive test result. Self-reported HIV status was available at health service centers throughout the area as HIV testing has been carried out across the population in previous years.

Ethics

All persons were informed about the study objectives and were informed that the information they provided would be kept private, that they could choose not to participate, and that they would not be identified when the information was reported. Consent was obtained from teenage girls aged 13–17 years if they were independent mature minors (living with a consensual sexual partner, pregnant or already a mother). For girls aged 13–17 years who were not mature minors, parental consent and child assent was required. Consent forms and study questionnaires were administered in a language best understood by the participant (English, Kiswahili or Dholuo). A bar of soap was offered to participants as a token of appreciation for their participation. The study protocol, consent forms, and data collection instruments were reviewed and approved by the KEMRI local and national Ethical Review Committees.

Analysis

We conducted descriptive analyses to characterize the sample. Bivariate and multivariate analyses were used to determine factors associated with having had a history of pregnancy and having had an unwanted pregnancy in the last 12 months. Unadjusted and adjusted (aOR) odds ratios (OR) and 95% confidence intervals (CI) were calculated. Frequencies and percentages were used to describe the family planning methods used by teenage girls with unwanted pregnancies in the last 12 months. All analyses were done using SAS version 9.3 (SAS Institute, Cary NC).

Results

A total of 15,300 participants were surveyed, of whom 6094 were male and thus excluded. A total of 1952 girls aged 13–19 years were identified for analysis. Of these girls, 37.2% (n = 727) were sexually active. Just 18.1% (n = 1952) of all teenage girls reported their highest level of eduation as greater than primary school (Table 1). Of those sexually active teenage girls previously tested for HIV and who reported results (n = 636), 3.5% self-reported testing positive for HIV.

Nearly a quarter of teenage girls (23.3%; n = 454) had a history of pregnancy. Bivariate analysis showed that the odds of a history of pregnancy among sexually active girls were significantly higher for participants: aged 17–19 years (OR = 6.8, CI = 3.4, 13.4) and 15–16 years (OR = 2.7, CI = 1.3, 5.5) compared to 13–14 years; who had less than a primary education (OR = 2.8, CI = 1.9, 4.1) and who had only completed primary school (OR = 4.1, CI = 2.6, 6.4), compared to having more than a primary education;

Table 1. Characteristics of teenage girls in study Round 1of the HDSS (*n* = 1952), rural western Kenya, 2011.

	N (%)
Age group	
13–14	605 (31.0)
15–16	576 (29.5)
17–19	771 (39.5)
Marital status	
Single	1601 (82.1)
Married-monogamous	299 (15.3)
Married-polygamous	23 (1.2)
Cohabiting	3 (.2)
Divorced	8 (.4)
Widowed	14 (.1)
Highest level of education	
<Primary	1381 (70.8)
Primary completed	217 (11.1)
>Primary	354 (18.1)
Ever pregnant	
Yes	454 (23.3)
No	1496 (76.6)
Sexually active	
Yes	727 (37.2)
No (everyone else)	1224 (62.7)

Note: HDSS refers to Health and Demographic Surveillance System. Some categories may not add to 1952 due to non-response.

and who experienced partner violence in the last year (OR = 20.2, CI = 4.9, 83.5). Odds of teenage girls with a history of pregnancy were significantly higher for participants whose marital status was ever married/cohabiting (OR = 14.0, CI = 9.4–21.0) compared to single. Finally, odds were higher for teen girls who had a positive HIV test result (OR = 3.5, CI = 1.0, 11.8) (Table 2). Of the 727 sexually active teen girls, 4.3% (*n* = 31) reported attempting to terminate a pregnancy.

Table 2. Demographic and factors associated with history of pregnancy among sexually active teenage girls, rural western Kenya, 2011 (*n* = 727).

	Ever pregnant			
	No N = 273 (37.5)	Yes N = 454 (62.5)		
	N (%)	N (%)	OR (95% CI)	aOR (95% CI)
Median age (IQR)	17 (3)	18 (2)	1.49 (1.3, 1.6)	
Age group				
13–14	35 (12.8)	12 (2.6)	Ref	Ref
15–16	79 (28.9)	72 (15.9)	2.7 (1.3, 5.5)	1.9 (.7, 4.9)
17–19	159 (58.2)	370 (81.5)	6.8 (3.4, 13.4)	3.8 (1.5, 9.4)
Marital status				
Single	237 (86.8)	145 (31.9)	Ref	Ref
Ever married/cohabiting/widowed/divorced	36 (13.2)	309 (68.1)	14.0 (9.4, 21.0)	8.9 (5.6, 14.1)
Highest level of education				
<Primary	126 (46.1)	249 (54.9)	2.8 (1.9, 4.1)	2.2 (1.4, 3.5)
Primary Complete	48 (17.6)	136 (30.0)	4.1 (2.6, 6.4)	2.3 (1.3, 4.1)
>Primary	99 (36.3)	69 (15.2)	Ref	Ref
Partner violence in 12 months				
Yes	2 (.7)	59 (13.0)	20.2 (4.9, 83.5)	9.1 (1.2, 68.8)
No	271 (99.3)	395 (87.0)	Ref	Ref
HIV positive test result[†]				
Yes	3 (1.4)	19 (4.6)	3.5 (1.0, 11.8)	2.9 (.7, 12.2)
No	217 (98.6)	397 (95.3)	Ref	Ref

Note: OR, Odds ratio; aOR, Adjusted odds ratio; CI, Confidence interval.
[†]Of those tested with no missing *n* = 636.

Multivariable analysis showed that the adjusted odds of teenage girls with a history of pregnancy were significantly higher for participants: aged 17–19 years (aOR = 3.8, CI = 1.5, 9.4) compared to 13–14 years; whose marital status was ever married/cohabiting (aOR = 8.9, CI = 5.6, 14.1) compared to single; who had less than a primary education (aOR = 2.2, CI = 1.4, 3.5) or who had only completed primary school (OR = 2.3, CI = 1.3, 4.1) compared to having more than a primary education; and who experienced partner violence in the last year (OR = 9.1, CI = 1.2, 68.8) (Table 2).

Among teenage girls pregnant in the last 12 months (n = 255), 74.5% (n = 190) did not want the pregnancy. Bivariate analysis showed that only two factors were associated with an unwanted pregnancy. The odds of having an unwanted pregnancy were higher for teenage girls who were single (OR = 12.1, CI = 4.22, 34.60) compared to girls who were ever married or cohabiting and the odds of having an unwanted pregnancy were lower for teen girls who had two or more sexual partners in the last 12 months (OR = .39, CI = .18, .81) compared to one sexual partner. Reporting an unwanted pregnancy was not associated with self-reported HIV test results (Table 3).

In multivariable analysis, the only factor significantly associated with an unwanted pregnancy among participants was marital status. The adjusted odds of teenage girls reporting an unwanted pregnancy were higher for those who were single (aOR = 15.0, CI = 3.7, 60.3) compared to ever married or cohabiting (Table 3).

Among teen girls with an unwanted pregnancy in the last 12 months, 64.2% (n = 122/190) used any of a list of family planning methods including 'other' for themselves or their partners in the last 12 months. The most frequently chosen option by the 122 respondents was condoms (70.5%) followed by injections (19.7%) (Table 4). Sixty-eight of 190 (35.8%) teenage girls did not answer 'yes' to using any of the family planning methods including 'other', most were aged 18–19 years (64.7%), had less than primary school education (60.3%), and were single (55.9%). Eighty-eight percent (n = 168) reported that they did want to use family planning methods in the future (17 reported they did not and 5 chose don't know or refused to answer). Of the 17 teenage girls who reported they did not want to use family planning methods in the future, 76.5% (n = 13) had less than a primary school education.

Discussion

Teenage pregnancy is an important issue due to the potential adverse impact on the mother and the child's health and to the large negative individual and social consequences that result from curtailment of the girl's education and societal loss of human resources. In our analysis of teenage girls in rural western Kenya, 23.3% had a history of pregnancy. This is similar to the 2014 KDHS results that reported 25% of Kenyan women age 25–49 had given birth by age 18 years (Kenya National Bureau of Statistics, 2015). Nearly three-quarters of the teen girls surveyed reporting a pregnancy in the last 12 months indicated that the pregnancy was unwanted. HIV infection is a serious risk for this group (Amornkul et al., 2009; Mdodo et al., 2016). Among sexually active teenage girls, 3.5% reported testing positive for HIV.

Four factors were associated with a history of pregnancy among sexually active teenage girls in multivariable analysis in our study: older age group; ever married/cohabiting; lower level of education; and partner violence. The adjusted odds of having had a history of pregnancy were nearly four times as high for older teens (aged 17–19 years) as for young teens (aged 13–14 years). This result is in line with other studies that show the percentage of teens who become pregnant increases rapidly with age. For instance, in the 2014 KHDS, pregnancy rates increased from about 3% among those aged 15 years to 40% among those aged 19 years (Kenya National Bureau of Statistics, 2015). This may be due to the reduced supervision by parents and other adults (Juma et al., 2014) and/or more time for sexual experiences. In addition, cultural practices can also play a role in prompting risky sexual behaviours such as sleeping arrangements and ceremonies where teens are not well supervised (Juma et al., 2014; Njue, Voeten, & Remes, 2009). Finally, the maturation process where the girl becomes more independent, possibly moving out of her parents' home, likely plays a large role in the increasing frequency of pregnancy with age. In this survey, the adjusted odds of having a history of pregnancy were nearly nine times as high for participants whose marital status was ever married/cohabiting compared

Table 3. Demographic and risk factors associated with teenage girls with an unwanted pregnancy in the last 12 months, rural western Kenya, 2011 (n = 255).

	Pregnant in last 12 months (n = 255)			
	Pregnancy wanted?			
	No N = 190 74.5%	Yes N = 65 25.5%		
	N (%)	N (%)	OR (95% CI)	aOR (95% CI)
Age group				
13–14	5 (2.6)	1 (1.5)	Ref	Ref
15–16	35 (18.4)	9 (13.9)	.78 (.08, 7.52)	2.7 (.2, 40.4)
17–19	150 (79.0)	55 (84.6)	.54 (.06, 4.77)	2.8 (.2, 37.9)
Marital status				
Single	84 (44.2)	4 (6.2)	12.1 (4.22, 34.6)	15.0 (3.7, 60.3)
Other	106 (55.8)	61 (93.8)	Ref	Ref
Currently in school				
Yes	22 (11.6)	0 (.0)	N/A	N/A
No	168 (88.4)	65 (100.0)	N/A	N/A
Highest level of education				
Less than primary	101 (53.2)	39 (60.0)	.43 (.17, 1.10)	.8 (.3, 2.4)
Primary complete	53 (27.9)	20 (30.8)	.44 (.16, 1.21)	.9 (.3, 3.2)
More than primary	36 (18.9)	6 (9.2)	Ref	Ref
Sexual partner violence in last 12 months				
Yes	22 (11.6)	10 (15.4)	.72 (.32, 1.61)	1.6 (.6, 4.6)
No	168 (88.4)	55 (84.6)	Ref	Ref
Older sexual partner				
Yes	123 (65.4)	43 (67.2)	.92 (.51, 1.69)	.8 (.4, 1.8)
No	65 (34.6)	21 (32.8)	Ref	Ref
Number of sexual partners in the last 12 months				
1	63 (33.9)	13 (20.3)	Ref	Ref
2	63 (33.9)	19 (29.7)	.68 (.31, 1.50)	1.5 (.5, 4.3)
>2	60 (32.3)	32 (50.0)	.39 (.18, .81)	1.0 (.4, 2.7)
Condom use at last sex				
Yes	95 (50.0)	31 (47.7)	1.10 (.62, 1.93)	1.1 (.5, 2.2)
No	95 (50.0)	34 (52.3)	Ref	Ref
If knew partner had an STI would say no to sex				
Yes	139 (79.9)	49 (77.8)	1.13 (.56, 2.28)	1.4 (.6, 3.3)
No	35 (20.1)	14 (22.2)	Ref	Ref
Partner substance use before last sex				
Yes	23 (14.4)	7 (11.9)	1.25 (.50, 3.08)	1.4 (.5, 4.1)
No	137 (85.6)	52 (88.1)	Ref	Ref
Forced sex in last 12 months				
Yes	23 (12.1)	6 (9.2)	1.35 (.53, 3.49)	1.6 (.5, 5.3)
No	167 (87.9)	59 (90.8)	Ref	Ref
Had sex to get money to buy items for menstrual periods				
Yes	6 (3.2)	1 (1.5)	2.11 (.25, 17.9)	.7 (.05, 8.9)
No	182 (96.8)	64 (98.5)	Ref	Ref
HIV tested				
Yes	184 (97.3)	64 (98.5)	.57 (.07, 5.01)	N/A
No	5 (2.7)	1 (1.5)	Ref	N/A
HIV positive test result (of those tested)				
Yes	8 (4.4)	4 (6.7)	.65 (.19, 2.24)	1.4 (.2, 8.8)
No	172 (95.6)	56 (93.3)	Ref	Ref

Note: OR, Odds ratio; aOR, Adjusted odds ratio; CI, Confidence interval; STI, Sexually transmitted infection.

to single. The large difference between teenage girls who were single and those who were married/ cohabiting in terms of unwanted pregnancy can be explained by community norms surrounding childbirth, which strongly influence women to be married before childbearing. Education was also a

Table 4. Teenage girls with an unwanted pregnancy in the last 12 months who answered 'yes' to using any of the family planning options (*n* = 122), rural western Kenya, 2011.

Family planning method	Yes N (%)
Sterilization	0 (.0)
Pill	6 (4.9)
IUD	0 (.0)
Injections	24 (19.7)
Implants	1 (.8)
Male condoms	86 (70.5)
Natural methods (e.g. safe days)	2 (.2)
Withdrawl	0 (0)
Traditional herbs	0 (.0)
Female condoms	2 (.2)
Other	15 (12.3)

Note: The total does not add to 122 because teenage girls could choose more than one family planning method option.

factor impacting teen pregnancy. The adjusted odds of a history of pregnancy were more than twice as high for teenage girls who had less than a primary education and teenage girls who had just a primary education compared to teenage girls who had more than a primary education. This is likely due to a variety of different factors that act separately and together to push teenage girls out of school and toward early sexual activity, including, but not limited to: cultural preference to educate boys over teenage girls; lack of sanitary towels and private places to attend to menstrual hygiene at school; school teacher harassment; transportation challenges to and from school; responsibilities at home to care for siblings and do chores; and lack of money for school fees and incidentals (Oruko et al., 2015). Partner violence was also associated with a history of teen pregnancy among the study participants. The adjusted odds of a history of teen pregnancy were nine times as high among teenage girls who experienced partner violence in the last 12 months compared to those who did not. This indicates gender power inequity and likely impacts on the ability to refuse sex and use contraceptive methods like condoms. A South African study found that pregnant teenage girls were significantly more likely to have experienced forced sex and were more frequently beaten compared to teenage girls who were not pregnant (Jewkes, Vundule, Maforah, & Jordaan, 2001). Moreover, other studies have shown that women in abusive relationships are less likely to be able to negotiate condom or diaphragm use with partners (Wingood & DiClemente, 1997).

Three-quarters of the teen participants reporting pregnancy during the last 12 months did not want the pregnancy. We identified only being single to be significantly associated with unwanted pregnancy for these teens. Other studies in Kenya have found that single women are more likely than married or formerly married women to report unintended pregnancies (Ikamari, Izugbara, & Ochako, 2013).

Use of family planning methods is important for sexually active teenage girls who want to avoid pregnancy. Among teens pregnant in the last 12 months with an unwanted pregnancy, just 64% reported that they used a family planning method in the last 12 months. Among the remaining 36%, most were older teens, had less than a primary school education, and were single. When asked if they wanted to use family planning methods in the future, most reported yes. It is noteworthy that of the 17 teenage girls who reported they did not want to use family planning methods in the future, most had less than a primary school education, which again emphasizes the importance of a general education in making critical decisions about one's health and well-being (Vandermoortele, 2000). In an earlier study of teenage pregnancies in Busia District, Kenya, just 18% of adolescents, both those who were sexually active and those who were not, used contraceptives (Were, 2007).

Our study is subject to several limitations. First, HIV test results were based on self-reported results. Second, some potentially important variables were not included in our analysis because they were not included in the survey (e.g. age at marriage, parental influence on girl's behaviour). Third, the data are 5–6 years old, thus conditions may have changed. Finally, there may have been social desirability bias;

the percent of teenage girls who reported being sexually active (37.2%) and the percent of teenage girls who reported ever being pregnant (23.3%) may be low due to under reporting. The strength of our study is that it reports on teenage pregnancy in an area of Kenya with the highest HIV prevalence in the country.

In conclusion, while HIV infection is a large public health issue in developing countries like Kenya, teenage pregnancy and the associated lack of education, as well as partner violence among teen girls are the more important public health issues. The reason for this is that both HIV prevention and HIV treatment require basic skills in understanding information (e.g. how HIV is transmitted, ways to protect oneself from infection) and acting on it (e.g. negotiating with partners, adhering to medication). A basic education, in addition to providing exposure to HIV prevention and health information, provides knowledge of research and negotiation skills that can help individuals find and use information, translate knowledge into behaviour change, and plan for the future (Vandermoortele, 2000). Low educational attainment and lack of family and community support leave teenage girls vulnerable to violence and abuse, including rape, engaging in sex for gifts, transportation, or incidentals and ultimately pregnancy. Raising a child to reach their full potential is a challenging task for even the most educated and prepared persons. A teenage girl is unlikely to have the parenting skills to raise fully capable and actualized children, especially daughters. An educated mother by extension can be considered a 'vaccine' for not only HIV but for a host of other health issues (Vandermoortele, 2000). Educating teenage girls before they become mothers is a public health imperative. While this may be difficult in areas where the culture has historically under-valued teenage girls for the contributions they can make to society apart from child-rearing, it has been done. A study based in Malawi found that cash transfers conditional on keeping teenage girls (aged 13 to 22 years) in schools reduced HIV and STI prevalence and high-risk sexual behaviours (Baird, Garfein, McIntosh, & Özler, 2012). It may be possible to slowly incorporate discussion of teen girls' education into disease prevention and health promotion programs like HBCT and PMTCT to change the status quo. The subject could be embedded in a family wellness framework which focuses on a family's responsibility to advance their children's and family's health and well-being (Rotheram-Borus, Swendeman, & Flannery, 2009).

Disclaimer

The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the United States Centers for Disease Control and Prevention.

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Disclosure statement

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