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A community perspective on young people's knowledge of HIV/AIDS in three African countries

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Abstract

Individual, household and community-level influences on young people's (15–24) knowledge of HIV/AIDS in three African countries (Burkina Faso, Ghana and Zambia) are explored. The focus of the analysis is on the roles of demographic, economic and behavioral dimensions of the community environment in shaping knowledge of HIV/AIDS. Data from Demographic and Health Surveys, collected independently for males and females in each of the countries, are analyzed. There are clear pathways through which the community environment shapes knowledge, and the community influences on knowledge vary greatly by country and gender. For young women, residences in communities with demographic and behavioral patterns that are indicative of greater opportunities are associated with increased knowledge of HIV/AIDS. The results highlight community-level factors that can be harnessed in the development of community-based interventions to improve knowledge of HIV/AIDS among young people, and reinforce the need to focus on the community environment in designing behavioral change interventions.

Keywords

HIV/AIDS; knowledge; adolescents; community

Introduction

Despite high levels of knowledge of HIV/AIDS among young people, previous studies have demonstrated deviation between knowledge and reported sexual behaviors (Glover et al., 2003; James, Reddy, Taylor, & Jinabhai, 2004). Previous studies have focused on the link between knowledge of HIV/AIDS and sexual behavior among young people, rather than on the factors that shape young people's knowledge of HIV/AIDS, and have ignored the influence of the wider social, economic and cultural environment. This paper seeks to understand the community-level factors associated with HIV/AIDS knowledge among young people in three culturally contrasting African countries: Burkina Faso, Ghana and Zambia, in order to identify entry points for community-based interventions that seek to prevent HIV transmission among young people through increasing levels of knowledge of HIV/AIDS.

Data and methods

The data used in this analysis are from the Demographic and Health Surveys (DHS) conducted in three study countries (Burkina Faso 2003, Ghana 2003 and Zambia 2001–2002). The DHS use a stratified multi-stage cluster sample design to collect nationally representative samples

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of women of reproductive age (15–45) and men (15–59). The samples for analysis are women and men aged 15–24, resulting in sample sizes of Burkina Faso (males, 1158; females, 3620), Ghana (males, 1478; females, 1628) and Zambia (males, 721; females, 2805). The DHS data provide the individual, household and community-level data for the analysis. Community factors are created from the DHS data; this entailed averaging individual data to the Primary Sampling Unit (PSU) level (the PSU denotes the community in this analysis) producing derived community-level factors.

The dependent variable for analysis is a continuous variable measuring young people's knowledge of HIV/AIDS. The index is based on seven questions, asked in each of the three countries: whether the respondent has heard of HIV/AIDS, knows that a healthy person can be HIV+, knows of mother-to-child transmission, and is aware of the any of four strategies to prevent HIV transmission: abstinence, using condoms, limiting the number of sexual partners, and faithfulness to one partner. The index was created by the summation of the answers to these seven questions, and thus ranges from 0 to 7, with 7 representing the highest level of knowledge.

A multilevel modeling technique was employed to account for the hierarchical structure of the data and to facilitate the estimation of community (PSU)-level influences on attitudes toward HIV/AIDS (Goldstein, 1995). Separate multilevel linear models are fitted for males and females in each of the three countries using the MLwiN software package (CMM, 2007). The variables to be entered into the models are grouped into individual/household and community variables (Table 1). Table 2 shows all the community-level variables that were considered in the analysis. Only those that were statistically significant in at least one country for one gender are presented in the final analysis. The analysis aimed to identify how the behaviors of older people in the community influenced the sexual behavior of young people. Community-level behavioral variables were thus created by aggregating individual responses from men and women aged over 35 in the community, and linking these by community identifier to the young people's data.

Results

Tables 3 and 4 show the results of the modeling of HIV knowledge among young people. Older (20–24) age was associated with an increased knowledge of HIV/AIDS among both males and females in Burkina Faso, and females in Zambia. As expected, knowledge of HIV/AIDS generally increased with education: although interestingly, there was no association between education and knowledge of HIV among males in Zambia. For both genders in all three countries there was a significant positive relationship between having heard of family planning methods and knowledge of HIV/AIDS. Female respondents in Burkina Faso and Zambia who had a child reported significantly higher levels of knowledge of HIV/AIDS. Among males and females in Burkina Faso, males in Ghana and females in Zambia those who reported exposure to media had significantly higher knowledge of HIV/AIDS. In Ghana, male and female respondents who reported that they had the final say in their own health decisions reported higher levels of knowledge of HIV/AIDS, a result that was also observed for females in Burkina Faso. Among Zambian males, being employed was associated with significantly lower knowledge of HIV/AIDS.

The community factors associated with the reporting of HIV/AIDS knowledge varied greatly by country and gender. For females in all three countries, residency in a community in which women aged over 35 had greater knowledge of HIV/AIDS was associated with increased knowledge of HIV/AIDS. Similarly for males in Burkina Faso and Ghana a positive association was found between the knowledge of men aged over 35 in the community and the knowledge reported by young men. The HIV/AIDS knowledge of females in Burkina Faso was also

significantly associated with the knowledge reported by men aged over 35 in their community; similarly, knowledge among young men in Ghana was associated with HIV/AIDS among women aged over 35 in their community. Young women in Ghana living in communities with a higher mean age at first sex among older women reported increased levels of HIV/AIDS knowledge. For young women in Zambia there was a positive relationship between the mean score on the AIDS attitudes index for older women and the reporting of HIV/AIDS knowledge. Associations between economic community characteristics and HIV/AIDS knowledge were found for males but not for females. In Ghana, residency in a community with higher levels of educational attainment among women was positively associated with HIV/AIDS knowledge, while in Burkina Faso a similar relationship was found with male education. In Zambia there was a positive relationship between the percentage of women in the community who were employed and HIV/AIDS knowledge among young men.

Residency in a community in which there was a higher mean age at first birth was associated with increased levels of HIV/AIDS knowledge among young men in Ghana and young women in Burkina Faso. A significant positive relationship between the mean age at marriage in a community and the reporting of HIV/AIDS knowledge exists for women in Burkina Faso. For young women in Ghana, residency in a community with more conservative gender attitudes was associated with lower levels of HIV/AIDS. A significant random intercept term remained for both genders in all countries after the inclusion of individual, household and community-level variables in the models, indicating that there remains unexplained community variation in the reporting of knowledge of HIV/AIDS.

Discussion

The results highlight several pathways through which the community environment may shape the HIV/AIDS knowledge of young people. Firstly, the knowledge and behaviors of older people (>35) have a clear influence on the HIV/AIDS knowledge of young people, suggesting that older people are acting as an important source of HIV/AIDS information for young people. Alternatively, these results may reflect the targeting of HIV/AIDS educational programs to communities of need; such that all individuals in the community have enhanced HIV/AIDS knowledge.

Living in a community in which women married later, had their first birth later, and initiated sex at an older age was associated with greater knowledge of HIV/AIDS, particularly among young women. The results point to the role of autonomy in shaping knowledge; communities in which women begin sexual activity, marriage and childbearing later and likely to be those communities where there are also more opportunities for women to accrue social capital through education and employment. Such communities may also afford women more opportunities to access education, health services and information. Only for males was there an association between community economics and knowledge of HIV/AIDS, indicating that for males economic opportunities are important in shaping their access to information and educational resources. There is also evidence for the effects of social exposure, wealth and autonomy at the individual and household level in shaping HIV/AIDS knowledge. Older individuals, those with higher levels of education, those who made their own health decisions and those exposed to media sources all had greater knowledge of HIV/AIDS.

There are several limitations to this analysis. Firstly, the analysis relies on self-reported HIV/AIDS knowledge data from young people. The DHS data, however, remains the only routinely collected and comparable data source on young people's knowledge of HIV/AIDS in Africa, and although the potential for misreporting of knowledge is acknowledged, the new information gained through this analysis far outweighs this potential bias. Secondly, the community-level variables used in the analysis are derived from individual-level data, due to

absence of comparable community-level data. As such, information on health facilities and ongoing educational and behavioral change activities in the community are missing from the analysis, an absence that is likely reflected in the significant random effects terms. Finally, the questions used to measure knowledge reflect international prevention messages, and may not reflect locally important aspects of knowledge. Although the use of standardized questions facilitates the comparison of knowledge across countries, more work is needed to understand locally relevant knowledge and prevention messages.

Conclusion

The results demonstrate the potential for knowledge of HIV/AIDS to be shaped by the environment in which an individual exists. The community-level factors shaping knowledge varied by gender and country; thus community-based interventions must be tailored not only to the specific cultural context, but must also recognize gender differences in behaviors and opportunities that exist within communities. The residual community variation in knowledge that exists in all settings points to the inability for such data to capture the full community effect on knowledge, and highlights the need for continued efforts to collect comprehensive community-level data that can be used to further the understanding of how the community environment shapes HIV/AIDS-related behaviors.

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References

- Center for Multilevel Modeling . Center for Multilevel Modeling; Bristol, UK: [Retrieved May 24, 2007]. from <http://www.cmm.bristol.ac.uk/>
- Glover EK, Bannerman A, Pence BW, Jones H, Miller R, Weiss E, et al. Sexual health experiences of adolescent in three Ghanaian towns. *International Family Planning Perspectives* 2003;29(1):32–40. [PubMed: 12709310]
- Goldstein, H. Multilevel statistical models. London: Edward Arnold; 1995.
- James S, Reddy SP, Taylor M, Jinabhai CC. Young people, HIV/AIDS/STIs and sexuality in South Africa: The gap between awareness and behavior. *Acta Pediatric* 2004;93:264–269.

Table 1
Distribution of individual, household and community variables included in final analysis.

	Burkina Faso		Ghana		Zambia	
	Males <i>n</i> =1158	Females <i>n</i> =3620	Males <i>n</i> =1478	Females <i>n</i> =1628	Males <i>n</i> =721	Females <i>n</i> =2850
Individual						
Age						
15–19	57.3	55.6	58.5	51.8	59.1	53.4
20–24	42.7	44.4	41.5	48.2	40.9	46.6
Education						
None	51.3	65.1	11.7	19.1	3.7	10.1
Primary	24.7	18.3	23.6	22.7	59.6	56.7
Secondary/Higher	24.0	16.6	64.6	58.1	36.5	32.2
Has a child	6.7	42.2	7.3	31.5	6.4	51.6
Has final say in own health	83.6	89.6	65.3	69.1	**	25.9
Currently employed	44.3	76.3	54.3	49.2	58.7	42.7
Exposure to media	77.8	73.4	87.7	81.2	63.5	49.7
Has heard of family planning methods	54.4	51.5	81.5	81.9	44.6	58.3
Household						
Ownership of assets	3.5 (1–5)	3.2 (1–5)	2.9 (1–5)	2.9 (1–5)	2.1 (1–5)	2.2 (1.3–5)
Community Demographic						
Mean age at first birth for women	19.7 (15–29)	19.8 (15–29)	20.1 (14–28)	20.1 (14–28)	18.2 (11–26)	18.3 (11–26)
Mean age at marriage for women	17.7 (13–24)	17.8 (12–24)	19.1 (11–31)	19.2 (11–31)	17.2 (11–29)	17.5 (11–29)
Economic						
Mean number of years education for men	2.6 (0–12)	2.9 (0–12)	7.1 (0–15)	7.5 (0.15)	6.9 (1–14)	6.9 (1–14)
Percentage of women currently employed	0.83 (0–1)	0.81 (0–1)	0.69 (0–1)	0.66 (0–1)	0.52 (0–1)	0.50 (0–1)
Mean number of years education for women	1.7 (0–9)	1.87 (0–9)	5.3 (0–13)	5.8 (0–13)	5.6 (0–13)	5.6 (0–13)
Behavioral						
Mean score on attitudes toward AIDS index for women aged over 35	0.7 (0–4)	0.7 (0–4)	1.8 (0–4)	1.7 (0–4)	0.8 (0–4)	0.89 (0–4)
Mean age at sex for women aged over 35	17.1 (13–22)	17.1 (13–22)	24.8 (9–24)	24.9 (9–24)	21.2 (12–27)	21.2 (12–27)

	Burkina Faso		Ghana		Zambia	
	Males <i>n</i> =1158	Females <i>n</i> =3620	Males <i>n</i> =1478	Females <i>n</i> =1628	Males <i>n</i> =721	Females <i>n</i> =2850
Mean score on knowledge of AIDS index for men aged over 35	4.2 (0–7)	4.1 (0–7)	3.9 (0–7)	4.0 (0–7)	4.4 (0–7)	4.4 (0–7)
Mean score on knowledge of AIDS index for men aged over 35	3.3 (0–7)	3.4 (0–7)	3.4 (0–7)	3.5 (0–7)	4.2 (0–7)	4.2 (0–7)

** Data on health care decisions not available for males in Zambia.

*** Binary variable measuring exposure to television, radio or newspaper.

**** Asset score ranges from 0 to 5, and is composed of ownership of radio, clock, television, motor vehicle, and bicycle.

Table 2
Operational definitions of community-level variables.

Community characteristic	Definition
Demographic	
Mean age at first birth for women	Mean age at first birth for women aged over 35 in the community
<i>Mean age at marriage for women</i>	Mean age at first marriage for women aged over 35 in the community
Mean number of children ever born	Mean number of children born to women aged over 35 in the community
Economic	
Percentage of men currently employed	Percentage of adult men currently employed in the community
<i>Mean number of years of education for men</i>	Mean number of years of education for adult men in the community
<i>Percentage of women currently employed</i>	Percentage of adult women currently employed in the community
<i>Mean number of years education for women</i>	Mean number of years of education for adult men in the community
Behavioral	
<i>Mean age at sex for women</i>	Mean age at first sex for all women aged over 35 in the community
Mean age at sex for men	Mean age at first sex for all men aged over 35 in the community
Sexual behavior of men	Percentage of men aged over 35 who report risky sex (sex with multiple partners with nonuse of condoms) in the last 12 months
Sexual behavior of women	Percentage of women aged over 35 who report risky sex (sex with multiple partners with non-use of condoms) in the last 12 months
HIV/AIDS <i>knowledge of men</i>	Mean score on knowledge of HIV/AIDS index for all men aged over 35 in the community. Index ranges from 0 to 7 and includes; having heard of AIDS, knowing a healthy person can be HIV+, knowledge of mother-to-child transmission, knowing that abstinence, condom use, limiting number of sexual partners and monogamy are ways to prevent HIV
HIV/AIDS <i>knowledge of women</i>	Mean score on knowledge of HIV/AIDS index for all women aged over 35 in the community. Includes same elements as for men
HIV/AIDS attitudes of men	Mean score on attitudes toward others with HIV for men aged over 35 in the community. Index includes in Burkina Faso and Ghana: would care for a relative with HIV, does not think HIV+ status should be kept a secret, believes a HIV+ teacher should be allowed to teach, and believes children should be taught about condoms. In Zambia does not include believes a HIV+ teacher should be allowed to teach
HIV/AIDS <i>attitudes of women</i>	Mean score on attitudes toward others with HIV for women aged over 35 in the community. Includes same elements as for men

Note: All variables in the table were tested in the analysis; those in italics were significant in at least one country and are thus presented in the final analysis.

Table 3
Multilevel linear regression model for HIV/AIDS knowledge among women aged 15–24 in three African countries.

	Burkina Faso	Ghana	Zambia
Individual			
Age 20–24	<i>0.228 (0.052)</i>	0.089 (0.065)	0.272 (0.050)
Education (None)			
Primary	<i>0.359 (0.059)</i>	0.120 (0.090)	<i>0.312 (0.071)</i>
Secondary/Higher	<i>0.934 (0.080)</i>	<i>0.538 (0.088)</i>	<i>0.860 (0.084)</i>
Has a child	<i>0.176 (0.054)</i>	<i>0.026 (0.071)</i>	<i>0.253 (0.051)</i>
Has final say in their own health	<i>0.263 (0.068)</i>	<i>0.163 (0.061)</i>	<i>0.008 (0.013)</i>
Currently employed	<i>0.045 (0.032)</i>	<i>0.056 (0.042)</i>	<i>0.042 (0.036)</i>
Exposure to media	<i>0.103 (0.026)</i>	<i>0.032 (0.028)</i>	<i>0.123 (0.024)</i>
Has heard of family planning methods	<i>0.240 (0.029)</i>	<i>0.149 (0.036)</i>	<i>0.119 (0.028)</i>
Household			
Ownership of assets	<i>0.351 (0.018)</i>	<i>0.158 (0.016)</i>	<i>0.197 (0.021)</i>
Community Demographic			
Mean age at first birth for women	<i>0.034 (0.016)</i>	0.028 (0.017)	−0.025 (0.015)
Mean age at marriage for women	<i>0.069 (0.022)</i>	0.026 (0.015)	0.025 (0.013)
Economic	—		
Mean number of years of education for men	0.035 (0.021)	0.076 (0.054)	0.063 (0.042)
Percentage of women currently employed	0.102 (0.060)	0.150 (0.081)	0.021 (0.016)
Mean number of years of education for women	0.172 (0.093)	0.078 (0.043)	0.049 (0.032)
Behavioral			
Mean score on attitudes toward AIDS index for women aged over 35	−0.114 (0.071)	30.010 (0.047)	<i>0.213 (0.059)</i>
Mean age at first sex for women aged over 35	−0.050 (0.031)	<i>0.050 (0.022)</i>	0.001 (0.002)
Mean score on knowledge of AIDS index for men aged over 35	<i>0.070 (0.022)</i>	−0.023 (0.038)	0.055 (0.031)
Mean score on knowledge of AIDS index for women aged over 35	<i>0.379 (0.034)</i>	<i>0.361 (0.043)</i>	<i>0.333 (0.038)</i>
Random Intercept Term	0.236 (0.016)	0.159 (0.075)	0.173 (0.058)

Note: Figures in italics are significant at the 5% level.

Table 4
Multilevel linear regression model for HIV/AIDS knowledge among men aged 15–24 in three African countries.

	Burkina Faso	Ghana	Zambia
Individual			
Age 20–24	<i>0.453 (0.073)</i>	0.105 (0.071)	0.158 (0.087)
Education (None)			
Primary	<i>0.275 (0.089)</i>	0.205 (0.116)	0.100 (0.220)
Secondary/Higher	<i>0.731 (0.115)</i>	<i>0.611 (0.121)</i>	0.457 (0.239)
Has a child			
Has final say in their own health	0.087 (0.094)	0.186 (0.072)	**
Currently employed	−0.137 (0.072)	0.128 (0.073)	−0.179 (0.088)
Exposure to media	<i>0.347 (0.092)</i>	<i>0.269 (0.106)</i>	0.166 (0.093)
Has heard of family planning methods	<i>0.532 (0.073)</i>	<i>0.499 (0.085)</i>	<i>0.339 (0.088)</i>
Household			
Ownership of assets	<i>0.241 (0.059)</i>	<i>0.146 (0.046)</i>	<i>0.274 (0.082)</i>
Community Demographic			
Mean age at first birth for women	−0.017 (0.021)	<i>0.049 (0.013)</i>	0.010 (0.023)
Mean age at marriage for women	0.025 (0.014)	0.038 (0.020)	0.024 (0.019)
Economic			
Mean number of years of education for men	<i>0.068 (0.026)</i>	0.030 (0.019)	0.035 (0.030)
Percentage of women currently employed	0.045 (0.328)	0.111 (0.194)	<i>0.365 (0.150)</i>
Mean number of years of education for women	0.054 (0.039)	<i>0.040 (0.019)</i>	−0.001 (0.030)
Behavioral			
Mean score on attitudes toward AIDS index for women aged over 35	0.021 (0.014)	0.051 (0.032)	0.074 (0.049)
Mean age at first sex for women aged over 35	0.058 (0.063)	0.054 (0.036)	0.048 (0.047)
Mean score on knowledge of AIDS index for men aged over 35	<i>0.599 (0.038)</i>	<i>0.279 (0.043)</i>	0.035 (0.030)
Mean score on knowledge of AIDS index for women aged over 35	0.009 (0.536)	<i>0.150 (0.048)</i>	0.050 (0.068)
Random Intercept Term	<i>0.213 (0.041)</i>	<i>0.158 (0.075)</i>	<i>0.379 (0.045)</i>

Note: Figures in italics are significant at the 5% level.

** Data on health care decisions not available for males in Zambia.