Addressing the Public's Concerns About Human Immunodeficiency Virus Transmission in Health-Care Settings

Eileen M. Gentry; Glen Nowak, PhD; Charles T. Salmon, PhD; Barbara Gerbert, PhD; Thomas Bleecker, PhD; Gloria J. Colclough; Marcie L. Cynamon; Linda Sanders; Janine M. Jason, MD

Background: The 1990 report of a cluster of patients infected with the human immunodeficiency virus (HIV) associated with a Florida dentist with acquired immunodeficiency syndrome attracted considerable media coverage and legislative attention. A number of polls found that the public favored mandatory HIV-antibody testing of health-care workers. The Centers for Disease Control and Prevention, Atlanta, Ga, conducted a two-phase study to understand how public concerns regarding potential HIV transmission in health-care settings can be addressed by the medical and public health communities.

Methods: Sixteen focus group discussions in nine US cities were conducted to explore the public's perceptions, concerns, and behavioral responses regarding HIV transmission in health-care settings. Using this information, a questionnaire was developed and administered to a nationwide probability telephone sample of 1150 adults.

Results: Concern about contracting HIV in health-care settings was highest for emergency department treatment and lowest for treatment by a personal physician. Two factors directly related to patient care, ie, the health-care professional's willingness to discuss acquired immunodeficiency syndrome and the presence of acquired immunodeficiency syndrome educational materials in the waiting room, were considered useful factors for determining potential risk of transmission of HIV in a health-care setting.

Conclusions: Public concern about the potential for HIV transmission in health-care settings remains high. Active steps on the part of health-care professionals, such as providing educational materials and initiating discussions about infection control procedures and about HIV and acquired immunodeficiency syndrome, could likely have positive effects in terms of alleviating these concerns.

(Arch Intern Med. 1993;153:2334-2340)

From the Research and Evaluation Branch, National AIDS Information and Education Program (Mss Gentry and Colclough and Drs Nowak and Jason), and National Center for Health Statistics (Ms Cynamon), Centers for Disease Control and Prevention, Department of Health and Human Services, Public Health Service, Atlanta, Ga; School of Public Health, Emory University, Atlanta, Ga (Dr Salmon); Division of Behavioral Sciences, School of Dentistry and Center for AIDS Prevention Studies, University of California, San Francisco (Drs Bleecker and Gerbert); and Survey Research Unit, Department of Biostatistics, School of Public Health, University of North Carolina, Chapel Hill (Ms Sanders).

THE 1990 REPORT of a cluster of patients infected with human immunodeficiency virus (HIV) associated with a Florida dentist with acquired immunodeficiency syndrome (AIDS)[1-3] attracted considerable media coverage and legislative attention. A number of studies and public opinion polls, conducted both before and after the Florida incident, found that most people favored mandatory HIV-antibody testing of health-care workers, mandatory disclosure of those test results to patients, and restrictions of medical activities performed by HIV-infected health-care workers (Louis Harris and Associates, March 1991; Gallup, May and June 1991. *New York Times*, June 1991; *Los Angeles Times*, June 1991).[4-6] These polls did not, however, provide insight into why the public wanted mandatory HIV-antibody testing of all health-care workers, or investigate how the public assesses potential transmission risk in health-care settings. The Centers for Disease Control and Prevention, Atlanta, Ga, conducted a two-phase study, using qualitative and quantitative research techniques, to investigate these issues. The first phase consisted of focus group research, the results of which were used to both direct the second phase, a national survey of the general public, and help understand and interpret its quantitative findings. Results are presented from this two-phase study that provide insights

See Methods on next page

METHODS

PHASE 1: FOCUS GROUP RESEARCH

Between August 26 and September 4, 1991, focus group discussions were conducted in nine US cities to explore the general public's perceptions, concerns, and behavioral responses regarding HIV transmission in health-care settings. The nine cities were Atlanta, Ga; San Francisco and Sacramento, Calif; Phoenix, Ariz; Louisville, Ky; Akron, Ohio; Rochester, NY; Cedar Rapids, Iowa; and Fort Lauderdale, Fla. Focus groups are a widely used qualitative research technique that involve 1- to 2-hour structured discussions with groups of eight to 12 people at a central interview location.[7] The discussions, led by professional moderators, allowed participants to freely express their opinions and beliefs regarding the subject matter, and permitted in-depth exploration of the themes and ideas brought out in the course of those discussions.

A systematic recruitment process, conducted by telephone, was used to form focus groups that were stratified with respect to age, gender, race, frequency of seeking health-care, and perceptions regarding the level of risk of HIV infection in a health-care setting. Each group thus consisted of eight to 10 people who were similar in terms of demographics, health-care use, and risk perceptions. Anyone living in a household in which any person worked as a health-care professional, in an AIDS-related field, or in advertising or market research was not allowed to participate. Anyone who lived in a household in which anyone did volunteer work for any AIDS-related organization was also ineligible for participation, as was anyone living in a household in which someone had participated in a focus group in the last 12 months. A more detailed description of the methods used and results are provided elsewhere (unpublished data) and available from us on request. A total of 155 adults 24 to 65 years of age participated in the focus groups, with the discussions addressing participants' knowledge and perceptions regarding HIV and AIDS prevalence and HIV transmission; their knowledge, beliefs, and concerns regarding HIV and AIDS in health-care settings; their personal concerns regarding the transmission of HIV by health-care professionals; HIV-antibody testing of health-care workers and patients; and ways health-care professionals could reduce transmission fears. All sessions were audiotaped, and the transcripts used to identify and understand participants' perceptions and concerns regarding these issues. As in all qualitative research, the focus group data served to identify the range and types of beliefs and opinions held by participants rather than to provide a quantitative assessment of the prevalence of a particular belief or opinion.

Several common themes emerged from the content analyses of the focus group discussions: participants were generally knowledgeable about the primary ways in which HIV is transmitted, but less knowledgeable about HIV transmission in health-care settings; knowledge and awareness of the cluster of infections related to the dentist in Florida appeared to have heightened concerns regarding HIV transmission from health-care professionals; participants generally favored mandatory HIV-antibody testing of health-care workers and disclosure of results to patients, but were uncertain what protection such measures provided and whether practice restrictions should be placed on HIV-infected health-care professionals; and, participants used a variety of environmental and situational factors to assess their personal risk of contracting HIV in health-care settings. Most participants also believed that health-care professionals, especially surgeons, should know the HIV status of patients and supported mandatory HIV-antibody testing of hospital and surgical patients. They were less inclined, however, to support mandatory HIV-antibody testing prior to receiving dental treatment or routine medical examinations.

PHASE 2: GENERAL POPULATION SURVEY

Based on the focus group research and previous survey research on the topic, 38 questionnaire items were developed to quantify the themes that emerged from the focus groups.

A nonstratified three-stage probability sample, using a modified Waksberg[8] cluster design, of adults aged 18 years and older in the 48 contiguous states was generated for telephone interviewing. One adult in each household was randomly selected for an interview lasting approximately 18 minutes. Data were collected between October 24 and November 20, 1991. Up to 11 call attempts were made during various times of weekdays, weeknights, and weekends. The overall response rate was 67% (unpublished data, 1991), yielding a sample size of 1150.

The gender and race characteristics of respondents closely mirrored those of the US adult population, while persons aged 35 to 54 years were somewhat overrepresented (**Table 1**). To reduce variable sampling errors and limit potential biases due to survey nonresponse,[9] prior to analyses the data were weighted to reflect the probabilities of selection at the second and third stages of sampling and poststratified by age, race, gender, and geographic region using 1990 census figures.[10] All estimates and SEs provided in this article were calculated using these sample weights and should be, therefore, representative of the US population. Statistical analyses were conducted using SAS[11] and SESUDAAN[12] computer programs. Statistical differences were determined using a z test for difference between proportions. Data presented by gender, race, age, and education were adjusted for each of the other three using the direct method of standardization.[13] Unless otherwise stated, statistical comparisons are for whites with nonwhites, 18 to 34 years old with 55 years and older, and those with high school or less education with those who had attended or graduated from post–high school educational programs, including college.

into how public concerns regarding potential HIV transmission in health-care settings can be addressed by the medical and public health communities.

RESULTS

HEALTH-CARE WORKER CONTACT AND AWARENESS OF ISSUES

Eighty-seven percent of respondents had been examined or treated by a physician in the past year, with 66% reporting two or more physician contacts during that time period. Similarly, 76% had been examined or treated by a dentist in the past year, 54% reported two or more times. Ninety-two percent of respondents had heard or read about US cases of HIV transmission from a dentist or physician to a patient. Only 24%, however, said they had heard or read about any US cases of HIV transmission from a patient to a dentist or physician.

Overall, 19% of the respondents reported they knew "a lot" about HIV and AIDS in general, 53% said "some," and 28% reported knowing "little" or "nothing." When asked to estimate how much they knew about the transmission of HIV in health-care settings, 14% reported knowing "a lot," 44% said "some," and 42% reported knowing "little" or "nothing." Older respondents and those with high school or less education were most likely to report knowing little or nothing about HIV or its transmission in health-care settings.

CONCERN

Almost 50% of the population reported being "very" or "somewhat" concerned about contracting HIV in general (**Table 2**). Sixty-two percent said their level of concern had not changed compared with the previous year, while 32% reported that their level of concern had increased.

Table 1. Gender, Race, and Age Distributions of the Unweighted Sample Respondents Compared With the Weighted Sample

	Sample Size	Percent Distributions	
		Unweighted Sample	Weighted Sample
Gender			
Male	540	47.0	47.9
Female	610	53.0	52.1
Race			
White	968	84.2	82.1
Nonwhite	182	15.8	17.9
Age, y			
18-34	395	34.3	37.8
35-54	474	41.2	33.9
55+	281	24.4	28.3

Concern about contracting HIV in various health-care settings was highest for being treated in emergency departments and lowest for being treated by their own physicians (Table 2). Further, respondents were more concerned about contracting HIV from dental or medical instruments than about contracting it from treatment by their dentist or physician. In all situations, concern was inversely related to level of education, and concern among nonwhites was significantly higher than among whites ($P \leq .001$) (Table 2).

TESTING OF HEALTH-CARE WORKERS

Ninety-one percent of the respondents believed patients have a right to know the HIV serostatus of health-care workers who treat them, and 96% believed health-care professionals have a right to know whether their patients are infected with HIV. Eighty-seven percent said health-care professionals should be tested for the HIV-antibody, and 21% of those believed the decision to be tested should be voluntary. Fifty-six percent "strongly" or "somewhat" agreed that mandatory HIV-antibody testing would ensure that infected health-care professionals would not infect their patients. This finding was significantly higher among those with high school education or less (61.3% vs 47.9% for college graduates, $P \leq .001$). The results also indicated that 60% of the respondents who favored HIV-antibody testing of health-care professionals believed this would ensure that HIV-infected health-care professionals would not infect their patients, whereas 31% of those who did not favor testing held this belief ($P \leq .001$). Overall, 61% "strongly" or "somewhat" agreed that monitoring procedures, such as equipment sterilization or use of disposable gloves, would ensure safety, with no significant demographic differences. Similarly, persons who favored testing were just as likely to agree that monitoring would ensure safety (61%) as those who did not favor testing (68%). Sixty-four percent "strongly" or "somewhat" agreed that mandatory HIV-antibody testing would discourage health-care professionals from engaging in risky behaviors in their personal lives. This belief was significantly higher in nonwhites (74.3%), those with high school education or less (69.5%), persons 55 years and older (71.9%), and those who favored testing (67.7%).

RISK ASSESSMENT AND PERCEPTION

Ninety-two percent said that if they went to a dentist, they would look to see if precautions were being taken to prevent the transmission of HIV; 90% would look for precautions at a physician's office. Twenty-nine percent indicated they had talked to a health-care professional about the procedures used to prevent transmission of HIV in health-care settings. College graduates were significantly more likely to have talked to a health-care professional (42%) than those with a high school education or less

Table 2. Percent Responding 'Very' or 'Somewhat' Concerned About Contracting HIV in Certain Settings by Select Demographic Groups*

	Source of Concern, Percent† (±95% Confidence Interval)					
		From Instruments§		Treated by Your§		Treated in an Emergency Department§
	In General‡	Dental	Physician	Dentist	Physician	
Gender						
Male	49.7 (5.2)	61.7 (5.0)	61.0 (5.0)	44.2 (5.4)	41.5 (5.2)	67.4 (4.7)
Female	46.7 (4.6)	59.2 (4.7)	57.5 (4.9)	39.0 (4.7)	38.5 (4.6)	69.2 (4.7)
Race						
White	44.4 (4.0)	57.9 (4.0)	56.3 (4.0)	37.4 (4.0)	36.3 (4.0)	66.1 (3.8)
Nonwhite	69.9 (7.9)	74.3 (7.6)	76.2 (8.1)	64.0 (8.6)	60.2 (8.5)	80.2 (7.3)
Age, y						
18-34	55.9 (6.2)	62.4 (6.1)	61.1 (6.0)	46.3 (6.2)	44.5 (6.2)	71.6 (5.5)
35-54	50.0 (5.3)	61.4 (5.1)	59.0 (5.3)	37.9 (5.4)	39.2 (5.5)	68.9 (5.2)
55+	34.2 (7.0)	57.7 (7.3)	58.7 (7.4)	39.6 (7.2)	33.3 (7.4)	63.7 (7.6)
Education						
High school or less	52.7 (5.5)	66.6 (5.3)	65.6 (5.3)	50.3 (5.8)	45.6 (5.7)	72.9 (5.0)
Some college	52.8 (6.5)	60.8 (6.8)	59.5 (6.8)	38.7 (6.6)	41.4 (6.5)	66.6 (6.4)
College or above	34.4 (6.0)	51.9 (6.7)	49.7 (6.5)	30.8 (5.8)	28.7 (5.7)	62.3 (6.4)
Total	48.7 (3.7)	61.0 (3.6)	60.0 (3.7)	42.4 (3.7)	40.6 (3.7)	68.7 (3.4)

*Gender figures adjusted by race, age, and education; race figures adjusted by gender, age, and education; age figures adjusted by gender, race, and education; and education figures adjusted by gender, race, and age. HIV indicates human immunodeficiency virus.

†Percents may not add to 100 due to less than .5% "No opinion" or "Don't know" responses.

‡"How concerned are you personally about getting the AIDS [acquired immunodeficiency syndrome] virus?"

§"Please tell me if you are personally very concerned, somewhat concerned, a little concerned, or not at all concerned about the possibility of getting the AIDS virus from (being)...."

Table 3. Percent Responding That Items Were Useful for Determining Their Risk of Acquiring Human Immunodeficiency Virus in Health-Care (HC) Settings by Age and Education*

	Demographic Group, Percent† (±95% Confidence Interval)						
	Age Group, y			Education Level			
Item‡	18-34	35-54	55+	High School or Less	Some College	College and Above	Total
Office cleanliness	76.0 (5.3)	78.1 (4.6)	87.1 (4.8)	81.1 (4.5)	80.6 (5.0)	76.2 (5.7)	79.5 (2.9)
HC worker's willingness to discuss AIDS	82.2 (4.1)	78.2 (4.5)	76.0 (6.4)	82.9 (4.2)	79.8 (4.7)	72.2 (5.8)	79.2 (2.7)
Brochures in waiting room	68.8 (5.4)	64.1 (5.4)	76.7 (5.6)	74.8 (4.8)	69.9 (5.6)	60.9 (6.3)	69.1 (3.3)
Time HC worker known	57.6 (5.8)	60.6 (5.4)	70.8 (6.1)	63.1 (5.4)	64.1 (5.9)	55.3 (6.6)	62.0 (3.3)
Other patients	57.5 (6.1)	55.6 (5.4)	61.2 (7.4)	62.9 (5.3)	54.3 (5.9)	54.3 (6.4)	58.7 (3.5)
HC worker's physical appearance	43.1 (5.9)	52.8 (5.6)	56.0 (7.6)	55.8 (5.8)	54.0 (6.5)	35.3 (6.0)	50.6 (3.7)
Office neighborhood	36.5 (5.7)	36.8 (5.3)	47.3 (7.2)	46.1 (5.6)	34.9 (6.2)	29.8 (5.8)	38.9 (3.5)
HC worker's marital status	33.0 (5.5)	37.5 (5.3)	42.9 (6.9)	42.5 (5.3)	35.2 (6.4)	30.6 (6.2)	37.2 (3.5)

*Age figures adjusted by race, gender, and education; and education figures adjusted by gender, race, and age.

†Percents may not add to 100 due to "No opinion" and "Don't know" responses.

‡"Please tell me which of the following are useful in helping you decide if you are at risk for getting the AIDS [acquired immunodeficiency syndrome] virus at a physician or dentist's office. How about...."

(19%, $P \leq .001$). Of those who had not discussed these issues, 30% had thought about having such a discussion, and 25% said they would feel uncomfortable initiating such a discussion. The proportion interested in discussing HIV transmission was highest among nonwhites (38% vs 26% for whites, $P < .001$), and those 18 to 34 years old (34% vs 21% for those 55 years and older, $P < .001$). Those 18 to 34 years old were significantly more likely to express discomfort at initiating a discussion on this topic (32%) than those 55 years and older (16%, $P < .001$), and persons with a high school education or less (29%) were significantly more likely than college graduates (18%, $P < .001$) to indicate that initiating such a discussion would make them uneasy.

Respondents were asked whether or not a number of different hypothetical environmental and situational factors, which were derived from the focus group results, "help you decide if you are at risk for getting the AIDS virus in a health-care setting." Nearly all respondents believed that the use of disposable gloves and needles (96.8%), the use of "clean" equipment (94.4%), and knowing the health-care professional's HIV status (91.2%) were helpful factors for determining personal risk in the health-care setting. Knowing the health-care professional's marital status and the neighborhood location of the medical office were reported as helpful by more than one third of the population; the health-care worker's physical appearance and that of other patients treated by the health-care professional were reported as helpful by more than half of the respondents (**Table 3**). In almost every case, these items were more likely to be cited by persons with a high school education or less and those 55 years and older (Table 3). Two factors directly related to patient care, ie, the health-care professional's willingness to discuss AIDS and the presence of AIDS educational materials in the waiting room, were considered helpful by 79% and 69% of respondents, respectively. The proportion reporting these items as helpful was highest among respondents with a high school education or less (Table 3).

When asked about the likelihood of contracting HIV from HIV-infected health-care professionals, respondents perceived transmission to be most likely from dentists and surgeons. The percent responding "very" or "somewhat" likely was 70% for an HIV-infected dentist and 69% for an HIV-infected surgeon, compared with 53% for both an HIV-infected physician or a nurse. Nonwhites and persons 55 years and older were most likely to hold these perceptions, although the differences were not significant. The perception that transmission from HIV-infected health-care professionals was "very" or "somewhat" likely was significantly higher among those with a high school education or less than among those who attended college (80% vs 60% for an HIV-infected dentist; 78% vs 62% for an HIV-infected surgeon; 66% vs 41% for an HIV-infected physician; and 65% vs 49% for an HIV-infected nurse, $P<.001$). Overall, 47% "strongly agreed" and 20% "somewhat agreed" that it would be "unethical for a health-care professional who knows they are infected with HIV to continue treating patients."

Forty-two percent said "definitely yes" or "it depends" when asked if they would continue seeing their dentist if they knew he or she was treating HIV-infected patients (**Table 4**). Fewer would continue seeing their dentist if the dentist personally was infected with HIV. Whites, college graduates, and those aged 18 to 34 years were most likely to continue seeing their dentist in either of these conditions (Table 4). Although the proportion reporting they would continue seeing their physician in each of these situations was higher than that for a dentist, the demographic associations were similar (**Table 5**).

Table 4. Distribution of Responses for Questions About Continuation of Health Care in Certain Situations by Select Demographic Groups*

	Situation,† Percent‡ (±95% Confidence Interval)					
	Dentist Treating HIV Patients			Dentist Is HIV Infected		
	Yes	Depends	No	Yes	Depends	No
Gender						
Male	24.8 (4.4)	14.5 (3.5)	57.8 (5.0)	16.3 (3.9)	13.4 (3.5)	68.3 (4.7)
Female	28.3 (4.3)	18.6 (4.0)	48.1 (4.9)	17.8 (3.6)	11.5 (3.1)	64.4 (4.5)
Race						
White	27.9 (3.3)	17.7 (3.1)	50.0 (3.8)	17.9 (2.9)	12.4 (2.5)	64.9 (3.6)
Nonwhite	16.1 (7.2)	11.3 (4.8)	70.8 (8.1)	10.3 (5.4)	10.7 (5.0)	76.9 (6.9)
Age, y						
18-34	29.6 (5.5)	15.5 (4.1)	51.9 (5.7)	21.1 (4.9)	11.3 (3.8)	63.3 (5.7)
35-54	32.6 (4.9)	20.5 (4.5)	44.7 (5.6)	18.4 (4.2)	19.5 (4.9)	58.9 (5.8)
55+	15.7 (5.3)	13.2 (5.1)	63.2 (7.2)	9.6 (2.1)	4.9 (2.5)	80.0 (5.4)
Education						
High school or less	18.1 (4.4)	15.1 (4.6)	62.2 (5.5)	12.9 (4.0)	11.2 (3.6)	71.7 (5.1)
Some college	32.1 (6.2)	15.4 (5.3)	49.6 (6.6)	21.4 (5.1)	13.0 (4.6)	62.3 (6.0)
College or above	32.0 (5.8)	23.1 (5.2)	40.9 (6.3)	17.0 (4.5)	13.9 (4.4)	64.1 (6.2)
Total	25.7 (3.1)	16.7 (2.7)	53.6 (3.7)	16.6 (2.5)	12.3 (2.5)	67.5 (3.5)

*Gender figures adjusted by race, age, and education; race figures adjusted by gender, age, and education; age figures adjusted by gender, race, and education; and education figures adjusted by gender, race, and age. HIV indicates human immunodeficiency virus.

†"If you knew that your dentist was treating patients who had the AIDS [acquired immunodeficiency syndrome] virus, would you continue to see this dentist?"; "If your dentist had the AIDS virus but was well enough to treat patients, would you continue to see this dentist?"

‡Percents may not add to 100 due to "Don't have a dentist" or "Don't know" responses.

Table 5. Distribution of Responses for Questions About Continuation of Health Care in Certain Situations by Select Demographic Groups*

	Situation,† Percent‡ (±95% Confidence Interval)					
	Physician Treating HIV Patients			Physician Is HIV Infected		
	Yes	Depends	No	Yes	Depends	No
Gender						
Male	37.2 (4.8)	13.5 (3.7)	47.5 (5.3)	22.0 (4.0)	12.3 (3.4)	64.2 (4.8)
Female	39.8 (4.7)	16.0 (3.7)	40.7 (4.4)	22.7 (4.0)	14.3 (3.2)	58.5 (4.5)
Race						
White	40.1 (3.6)	16.1 (3.0)	41.2 (3.7)	23.4 (3.3)	13.9 (2.7)	59.4 (3.7)
Nonwhite	24.6 (7.7)	8.5 (4.5)	63.9 (8.3)	14.0 (6.1)	10.0 (4.7)	74.7 (7.1)
Age, y						
18-34	41.8 (5.7)	13.9 (4.0)	42.4 (5.7)	26.9 (5.4)	14.1 (4.1)	55.6 (5.9)
35-54	47.1 (5.7)	13.7 (3.5)	37.1 (5.4)	26.3 (5.0)	14.9 (3.8)	55.6 (5.7)
55+	23.7 (5.9)	16.6 (6.0)	54.3 (7.5)	10.6 (4.0)	9.6 (4.0)	77.4 (5.5)
Education						
High school or less	26.2 (4.7)	15.8 (4.6)	56.0 (5.7)	17.1 (4.3)	12.7 (4.0)	67.4 (5.2)
Some college	41.5 (6.2)	13.0 (4.9)	43.3 (6.5)	25.4 (5.2)	13.9 (4.6)	58.7 (6.2)
College or above	51.0 (6.3)	18.5 (5.1)	27.1 (5.0)	24.4 (5.5)	16.0 (4.8)	55.1 (6.2)
Total	37.5 (3.3)	14.9 (2.7)	45.0 (3.5)	21.8 (2.9)	13.4 (2.5)	62.0 (3.5)

*Gender figures adjusted by race, age, and education; race figures adjusted by gender, age, and education; age figures adjusted by gender, race, and education; and education figures adjusted by gender, race, and age. HIV indicates human immunodeficiency virus.

†"If you knew that your dentist was treating patients who had the AIDS [acquired immunodeficiency syndrome] virus, would you continue to see this dentist?"; "If your dentist had the AIDS virus but was well enough to treat patients, would you continue to see this dentist?"

‡Percents may not add to 100 due to "Don't have a dentist" or "Don't know" responses.

COMMENT

Our data indicate that the level of public concern, as reported in previous studies (Louis Harris and Associates, March 1991; Gallup, May and June 1991; *New York Times*, June 1991; *Los Angeles Times*, June 1991),[4-6,14-18] about the potential for HIV transmission in health-care settings remains high. Indeed, almost a third of the population indicated that their level of concern had increased in the past year, reiterating the need for medical and public health communities to address issues related to HIV transmission in health-care settings.

The research undertaken here also offers a number of insights into patient concerns about HIV transmission in health-care settings. First, the focus group discussions and survey results provide a sense of perspective. As the survey results show, public concern about contracting HIV from being treated by their personal physician or dentist is lower than their concern about contracting HIV in general. In health-care settings, HIV transmission concerns are lessened by familiarity with a health-care provider, and heightened by less familiar or personal objects or places, such as medical and dental instruments or emergency departments. The degree of concern, however, is not constant across demographic categories. Nonwhites and less well educated respondents appear to be the most concerned about HIV transmission in health-care settings.

Second, the focus group discussions and survey results provide considerable insight into public sentiment regarding HIV-antibody testing of health-care professionals. Both suggest that one factor contributing to the sentiment is a desire for steps that "guarantee" that HIV will not be transmitted in a health-care setting. Thus, while most focus group participants had difficulty articulating how mandatory HIV-antibody testing of health-care professionals would eliminate or reduce transmission risks, they nonetheless supported its implementation. Similarly, despite the fact there are no guaranteed ways to prevent HIV transmission, half the survey respondents believed that HIV-antibody testing of health-care workers would "guarantee" patient safety in health-care settings. In line with the focus group discussions, an even larger proportion believed that mandatory HIV-antibody testing would alter health-care workers' personal life behaviors. Finally, the survey results suggest that most of the public believes that monitoring equipment sterilization and office procedures is as effective as mandatory HIV-antibody testing of health-care professionals when it comes to reducing HIV transmission risk to patients.

Nonwhites and less well educated respondents appear to be the most concerned about HIV transmission in health-care settings

Although almost twice as many people appear to be

discussing HIV and AIDS with health-care professionals than reported in a 1988 study,[5,16] the majority of survey respondents had not discussed HIV transmission with a health-care professional. Since the survey results suggest that virtually all patients are looking to see if health-care professionals are taking precautions to prevent HIV transmission, HIV-related discussions appear to offer an opportunity to educate patients.

While the data indicate that most people have some idea of how HIV transmission risks are reduced in health-care settings, they also highlight areas where patient knowledge is lacking. For example, most people recognize the importance of infection-control precautions such as the use of disposable gloves and needles and proper sterilization of equipment. However, many people are using unreliable and invalid indicators, including physical appearance and office location, to assess the risk of HIV transmission in health-care settings. How individuals use information gleaned from these informal indicators (ie, to allay their concerns or to justify a desire to switch physicians) is beyond the scope of this study. However, we do know that roughly half of the respondents indicated that they would switch health-care providers if their dentist or physician was treating HIV-infected patients, suggesting that these informal indicators being used by patients may signify an even larger, and perhaps more urgent, public health concern. At a minimum, these findings suggest that educational efforts that encompass HIV transmission as well as the procedures health-care professionals use to prevent HIV transmission are necessary not only to increase public understanding of HIV transmission in health-care settings, but also to combat and reduce unfounded patient fears and anxieties.

The value of such public and patient education is further supported by the associations among demographics, knowledge, and concern as well as by respondents' interest in discussing HIV transmission with health-care professionals and desire for educational brochures. For example, nonwhites and less well educated survey respondents had both the greatest concern and the lowest self-reported HIV knowledge levels. Further, most survey respondents, particularly the less well educated, indicated that a health-care professional's willingness to discuss HIV and the availability of HIV/AIDS educational brochures in the waiting room would help them decide if they were at risk for contracting the HIV in a health-care setting.

Overall, the data presented here suggest that there are steps that members of the health-care community can take to address concerns related to HIV transmission in health-care settings. Whereas public opinion poll findings can foster the impression that mandatory HIV-antibody testing is the only productive response to HIV transmission in health-care settings, our studies indicate that active steps on the part of health-care professionals, such as acknowledging patients' HIV transmission fears, maintaining visible infection control procedures, providing educational materials, and initiating discussions about infection control procedures, are warranted to alleviate patient concerns. At the same time, broader educational efforts, such as public service or information campaigns, can serve to encourage patients to discuss infection control and HIV transmission with their health-care providers, thereby providing a direct mechanism for alleviating concerns and improving the quality of patient-physician interaction.

Accepted for publication February 26, 1993.

This work was conducted by the National AIDS Information and Education Program, Centers for Disease Control and Prevention.

Reprint requests to the National AIDS Information and Education Program, Centers for Disease Control and Prevention, Mailstop E-59, 1600 Clifton Rd NE, Atlanta, GA 30333 (Ms Gentry).

REFERENCES

1. Centers for Disease Control. Possible transmission of human immunodeficiency virus to a patient during an invasive dental procedure. *MMWR Morb Mortal Wkly Rep.* 1990;39:489-493.
2. Centers for Disease Control. Update: transmission of HIV infection during an invasive dental procedure—Florida. *MMWR Morb Mortal Wkly Rep.* 1991;40: 21-27.
3. Centers for Disease Control. Update: transmission of HIV infection during invasive dental procedures—Florida. *MMWR Morb Mortal Wkly Rep.* 1991;40: 377-381.
4. Gerbert B, Maguire B, Hulley S, Coates T. Physicians and acquired immunodeficiency syndrome. *JAMA.* 1989;262:1969-1972.
5. Gerbert B, Maguire B, Spitzer S. Patients' attitudes toward dentistry and AIDS. *J Am Dent Assoc.* 1989;16S-21S.
6. Blendon, RJ, Donelan K, Knox, RA. Public opinion and AIDS: lessons for the second decade. *JAMA.* 1992;267:981-986.
7. Basch CE. Focus group interviews: an underutilized research technique for improving theory and practice in health education. *Health Educ Q.* 1987;14:411-448.
8. Waksberg J. Sampling methods for random digit dialing. *J Am Stat Assoc.* 1978;74:40-46.
9. Kalton G. *Compensating for Missing Survey Data: Research Report Series.* Ann Arbor, Mich: Institute for Social Research, University of Michigan; 1983.
10. Gentry EM, Kalsbeek WD, et al. The behavioral risk factor surveys, II: design, methods, and estimates from combined state data. *Am J Prev Med.* 1985;1: 9-14.
11. SAS Institute Inc. *SAS User's Guide: Statistics.* 5th ed. Cary, NC: SAS Institute Inc; 1985:956.
12. Shah BV. *SESUDAAN: Standard Errors Program for Computing of Standardized Rates From Sample Survey Data.* Research Triangle Park, NC: Research Triangle Institute; 1981. Publication RTI/52501 00-01S.
13. Fleiss JL. The standardization of rates. In: *Statistical Methods for Rates and Proportions.* New York, NY: John Wiley & Sons Inc; 1973.
14. Gerbert B, Maguire B, Sumser J. Public perception of risk of aids in health care settings. *AIDS Educ Prev.* 1991;3:322-327.
15. Gerbert B, Bleecker T, Miyasaki C, Maguire B. Possible health care professional-to-patient HIV transmission. *JAMA.* 1991;265:1845-1848.
16. Gerbert B, Maguire B, Coates TJ. Are patients talking to their physicians about AIDS? *Am J Public Health.* 1990;80:467-469.
17. Lo B, Steinbrook R. Health care workers infected with the human immunodeficiency virus: the next step. *JAMA.* 1992;267:1100-1106.
18. Samaranayake LP, McDonald KC. Patient perception of cross-infection prevention in dentistry. *Oral Surg.* 1990;69:457-460.