Evaluation of Inpatient Clinical Training in AIDS Care

Ping-Chuan Hsiung,* Shan-Chwen Chang,1,2 Yu-Ying Lin

Background: Studies of outpatient clinical training in AIDS care have shown positive effects on residents’ knowledge, attitudes and intentions. In this study, residents’ knowledge, attitudes and intentions regarding the care of HIV-infected patients were used as outcome measures to evaluate the effectiveness of a 1-month residency training in an AIDS inpatient unit.

Methods: From April 2000 through April 2001, 33 internal medicine residents completed pretest–posttest questionnaires evaluating changes in their knowledge, attitudes and intention to care for HIV-infected patients. Of these 33 residents, 25 participated in a posttest interview, reflecting on their learning experience during the 1-month clinical rotation.

Results: At the posttest, residents were significantly more accurate in assessing HIV-associated risk (p < 0.001), and were significantly more knowledgeable about the necessary protective equipment to prevent HIV transmission (p < 0.01). Residents were significantly less concerned about the risk of infection (p < 0.01) and interpersonal concerns (p < 0.05). Residents’ reluctance to care for HIV-infected patients was significantly lower (p < 0.05), as was their tendency to avoid invasive procedures or treatment of HIV-infected patients (p < 0.001). Residents designated after their training were more likely to practice universal precautions and less likely to be afraid and to stereotype HIV-infected patients. They also reported gaining insight into HIV diseases and patients’ multifaceted needs, and appreciating the importance of teamwork in AIDS care.

Conclusion: A 1-month AIDS residency training can effectively enhance residents’ HIV-related knowledge, attitudes and intention to care for patients infected with HIV. [J Formos Med Assoc 2006;105(3):220–228]

Key Words: AIDS, clinical training, HIV

The advent of more effective treatment for patients infected with the human immunodeficiency virus (HIV) in this decade has changed this disease from an often fatal to a chronic but increasingly manageable illness. During the course of illness, patients with HIV infection are likely to be actively treated by residents in internal medicine, family medicine and in a primary care setting. Failure to incorporate HIV-related training into internal medicine programs results in students’ and residents’ being inadequately prepared for the patient population they might face. Therefore, professional medical organizations, such as the American Board of Internal Medicine, have asserted that information about HIV/AIDS and its treatment must be incorporated into internal medicine training.

Research largely conducted in the United States has revealed several issues of concern related to care of patients with HIV infection. For example, medical residents have reported a lack of confidence in taking care of HIV-infected patients.

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Family medicine physicians not caring for HIV/AIDS patients reported a lack of knowledge about HIV/AIDS care. In addition, a cross-sectional survey showed that the level of personal fear was negatively correlated with number of years of training. In that study, however, the intention to treat HIV-infected patients did not differ significantly by training level.

Changing negative attitudes towards HIV/AIDS presents an important challenge to health care educators and administrators wanting to promote changes in health care providers’ practice behaviors. A study from Taiwan suggested that positive attitudes toward HIV-infected patients among internal medicine residents enhanced their intention to care for HIV-infected patients. This result is congruent with behavioral theories predicting that attitude, perceived norms and self-efficacy are three primary determinants of intention, which is considered the immediate precursor to behavior.

Studies in both the US and Taiwan indicated a need for adequate interventions to promote both physicians’ intention and competence to care for HIV-infected patients since strong intention implies physicians’ likelihood to actually care for HIV-infected patients. Most educational interventions tested to date have been primarily didactic training programs, including lectures, discussion groups with or without video, role-play, and patients with AIDS as guest speakers. In general, educational interventions have improved health care professionals’ knowledge of HIV/AIDS and some attitudes toward HIV-infected patients. However, anxiety and fears about HIV infection are relatively resistant to change.

The few studies on the impact of clinical training have found that medical residents benefited from working with HIV-infected patients in the outpatient setting. Although having more clinical contact with AIDS outpatients was associated with residents’ intention to provide AIDS primary care in the future, this association did not hold for AIDS inpatients. Many residents in that study also expressed concern about the adequacy of their training in ambulatory AIDS care, which suggests the necessity to provide comprehensive training to adequately prepare residents to work with patients representing the whole spectrum of HIV diseases. Therefore, not only are more clinical training opportunities needed for physicians, but the training content should also be tailored to fit physicians’ needs.

Currently, HIV/AIDS-related content is widely provided in lectures to medical students in Taiwan. A yearly HIV/AIDS conference allows health care professionals to exchange and update information related to HIV/AIDS clinical and treatment issues. After graduation from medical schools, only a few internal medicine residents have the opportunity to receive HIV-related clinical training. With the rapidly increasing number of HIV-infected patients in Taiwan (from 9 in 1984 to 7522 in January 2005), the training of more confident and clinically competent internal medicine residents will be crucial to the availability of quality care for HIV/AIDS patients.

The purpose of this study was to evaluate the effectiveness of a 1-month residency-training intervention in an AIDS inpatient unit on internal medicine residents’ knowledge, attitudes and intentions to care for HIV-infected patients. The authors hypothesized that residents would be more knowledgeable, have more positive attitudes, and have greater intention to care for HIV-infected patients after receiving training in the AIDS unit. The training experiences of residents were documented through pretest and posttest questionnaires and in-depth interviews.

**Methods**

**Setting**

The study setting was a university hospital providing comprehensive therapy and services for most HIV-infected patients in Taiwan. This hospital has a 37-bed, integrated inpatient unit with 20 beds specifically designated for AIDS care. During the study period, the average rate of bed occupancy was 83.75%. A 1-month rotation in this unit was established in 1994 for first- or second-
year internal medicine residents. During the rotation, residents provide primary care to HIV/AIDS patients under the close supervision of faculty tutors specializing in infectious diseases and HIV/AIDS care. Residents also participate in weekly meetings to discuss AIDS-related studies in multidisciplinary journals, research efforts, and team care with nurses, social workers and volunteers.

Design and participants
This one-group study used a pretest–posttest, mixed-method design (questionnaires and individual interviews) to gather data from April 2000 to April 2001. After the hospital approved the study, participants were recruited from 110 first- and second-year internal medicine residents rotating at the hospital. Of the 39 residents with a rotation in the AIDS unit during the study, 36 agreed to participate. Signed informed consent was obtained from all participants, who completed pretest and posttest questionnaires during the first 2 days of and after completion of their rotations, respectively. Individual in-depth interviews lasting 40 minutes were conducted after completion of the posttest questionnaires. Interviews were tape-recorded and transcribed verbatim, without identifying information to reduce the chance of bias in our analysis of the narrative data. Sample questions were: “What most impressed you during this 1-month rotation?” and “What have you learned during this 1-month rotation?”

Instrument
The instrument included four questionnaires (i.e. demographic questionnaire, knowledge scale, attitude scale, intention scale) as previously described.8

Demographics
The demographic information collected included participants’ personal characteristics (age, gender, year of residency training), attendance at HIV-related lectures as medical students and residents, and experience caring for HIV-infected patients.

Knowledge
A 52-item scale was used to assess residents’ general knowledge about HIV/AIDS (9 items), universal precautions (5 items), preventing HIV transmission in the workplace (7 items), assessing HIV-associated risk (18 items), and necessary protective equipment to prevent HIV transmission (13 items). Total scores were computed by tallying the number of correct responses. Higher scores indicated greater understanding of HIV and AIDS. Internal consistency (Cronbach’s $\alpha = 0.67$) was acceptable for this scale.

Attitudes
A 17-item scale with four subscales was used to assess attitudes toward HIV-infected patients. The subscales included supportive attitudes (6 items), attitudes about taking care of HIV-infected patients (5 items), attitudes about risk of infection (3 items), and attitudes about interpersonal concerns (3 items). Responses were scored on a 7-point Likert-type scale from 1 (strongly disagree) to 7 (strongly agree). After reversing the negative items, higher scores indicated more positive attitudes. The internal consistency of these subscales (Cronbach’s $\alpha = 0.83, 0.84, 0.66$ and 0.65, respectively) was acceptable.

Intentions
A 4-item scale was used to assess residents’ intention to care for HIV-infected patients. Questions included willingness to provide care to HIV-infected patients, tendency to prefer not to provide care to HIV-infected patients, tendency to voluntarily provide care to HIV-infected patients, and tendency to avoid implementing invasive procedures on HIV-infected patients. Responses were scored on a 7-point Likert-type scale from 1 (strongly disagree) to 7 (strongly agree). After reversing the negative items, higher scores indicated greater intention.

Data analysis
The quantitative data of three participants were removed from analysis because only their pretest questionnaires were completed. Pretest and posttest differences were analyzed using two-tailed,
paired t test to analyze pretest to posttest changes. Data were analyzed using SPSS version 12.0 (SPSS Inc, Chicago, IL, USA) for Windows.

Open coding and constant comparison were used to analyze interview transcripts. Transcripts were read line by line, and conceptual code names were given to sentences or paragraphs that described the experimental groups' experiences in caring for HIV/AIDS patients. Examples of conceptual code names were “comparing current experience with previous thoughts”, “assumptions about HIV-infected patients” and “unfamiliarity with and discomfort in interacting with HIV-infected patients”. These coded sentences and paragraphs were then compared and contrasted for similarities and differences. By grouping similar inductively derived concepts into categories, six themes emerged from the data describing residents’ HIV/AIDS caring experiences.

Results

Demographic characteristics
The mean age of the final sample (n = 33) was 27.3 ± 1.9 years (range, 25–33) (Table 1). Of these 33 participants, 69.7% reported attending HIV/AIDS-related lectures as medical students, and 81.8% as residents. The number of AIDS patients cared for at posttest was significantly greater than the number at pretest. Due to scheduling difficulties, only 25 of the 36 participants completed interviews.

Questionnaire results on knowledge, attitudes and intentions
In comparison with their pretest scores, participants had significantly higher posttest scores in knowledge (p < 0.001). Specifically, at posttest, participants more accurately assessed HIV-associated risk (p < 0.001) and had more knowledge about necessary protective equipment to prevent HIV transmission (p = 0.005) than at pretest. In general, participants had higher posttest scores in attitudes and intention than at pretest. As for attitudes, residents were less concerned at posttest than at pre-test about the risk of HIV infection (p = 0.007), and they also had fewer interpersonal concerns (p = 0.031). In terms of intention, residents disagreed more at posttest than at pretest that they preferred not to care for HIV-infected patients if given the choice (p = 0.014) and disagreed more that they would resist implementing invasive procedures on HIV-infected patients (p < 0.001) (Table 2).

Table 1. Demographic characteristics of participants (n = 33)

<table>
<thead>
<tr>
<th>Demographic characteristic</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>27 (81.8)</td>
</tr>
<tr>
<td>Female</td>
<td>6 (18.2)</td>
</tr>
<tr>
<td>Age (yr)</td>
<td></td>
</tr>
<tr>
<td>21–25</td>
<td>7 (21.2)</td>
</tr>
<tr>
<td>26–30</td>
<td>24 (72.7)</td>
</tr>
<tr>
<td>31–35</td>
<td>2 (6.1)</td>
</tr>
<tr>
<td>Year of residency</td>
<td></td>
</tr>
<tr>
<td>R1</td>
<td>22 (66.7)</td>
</tr>
<tr>
<td>R2</td>
<td>11 (33.3)</td>
</tr>
<tr>
<td>Previous attendance at HIV/AIDS lectures</td>
<td></td>
</tr>
<tr>
<td>As medical students</td>
<td>23 (69.7)</td>
</tr>
<tr>
<td>As residents</td>
<td>27 (81.8)</td>
</tr>
<tr>
<td>Number of AIDS patients cared for (pretest)</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>11 (33.3)</td>
</tr>
<tr>
<td>1–5</td>
<td>20 (60.6)</td>
</tr>
<tr>
<td>6–10</td>
<td>2 (6.1)</td>
</tr>
<tr>
<td>Number of AIDS patients cared for (posttest)</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0 (0)</td>
</tr>
<tr>
<td>1–5</td>
<td>1 (3.0)</td>
</tr>
<tr>
<td>6–10</td>
<td>21 (63.6)</td>
</tr>
<tr>
<td>11–15</td>
<td>8 (24.2)</td>
</tr>
<tr>
<td>16–20</td>
<td>2 (6.1)</td>
</tr>
<tr>
<td>&gt; 20</td>
<td>1 (3.0)</td>
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</tbody>
</table>

Interview findings on impact of the HIV/AIDS caring experience
Reflecting on their experience in the AIDS unit, participants acknowledged six changes: decreased stereotyping of HIV-infected patients, new insights into HIV diseases, decreased level of fear, enhanced practice of universal precautions, expanded understanding of patients’ multifaceted needs, and appreciating the importance of teamwork.
Decreased stereotyping of HIV-infected patients
Contact with AIDS patients during the training helped to remove preconceived notions about them: What surprised me most was that patients were not as horrible as I thought. In the past, I thought they were weird drug addicts, but I realized that they are the same as ordinary people since I came to this [AIDS] unit. The stereotypical views [of AIDS patients] made me think that they are different from other people, but I did not find any difference after caring for them (R32).

In the beginning, you would feel uncomfortable because you are not a homosexual. Before I came here, my mind was filled with a lot of nonsense and I was a little bit scared. For example, would they make sexual advances towards me? Then I found it is not as I thought. They are quite polite (R13).

New insights into HIV diseases
The clinical training provided residents with opportunities to recognize signs, symptoms, and complications of HIV infection. This experience contributed to their perceived competence in clinical diagnosis and self-protection: I think residents should come to this [AIDS] unit if they have the opportunity because the number of AIDS patients is increasing. If you didn’t come to this unit, your learning would be confined to textbook knowledge. You cannot actually see [in books] what these patients are really like. [The training here] would familiarize you with AIDS patients, and it would be easier to make a diagnosis (R29).

There are some advantages to better understanding [AIDS]. On the one hand, it benefits your self-protection. On the other hand, you could easily recognize AIDS patients in the emergency room or in other units (R19).

Participants were surprised that AIDS could be so well managed, that patients could have a good quality of life, and to learn that AIDS is not necessarily fatal, but can be managed as a chronic disease: I have a better understanding of current [HIV/AIDS] treatments. I didn’t know that AIDS could be well controlled and I didn’t know some of the latest developments in the field of HIV. Here, I learned new knowledge about the treatment and symptoms of bacterial infections that are rare in other patients. I would think of AIDS if I saw similar symptoms (R20).

The prognosis is not as bad as I thought. I used to think it was really horrible, that [the patient’s health would] rapidly go downhill and he couldn’t be saved.

<table>
<thead>
<tr>
<th>Table 2.</th>
<th>Comparison of pretest and posttest scores on knowledge, attitudes and intentions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (pretest)</td>
</tr>
<tr>
<td>Knowledge (range: 0–52)</td>
<td>39.55</td>
</tr>
<tr>
<td>General knowledge (range: 0–9)</td>
<td>7.33</td>
</tr>
<tr>
<td>Universal precautions (range: 0–5)</td>
<td>4.00</td>
</tr>
<tr>
<td>Workplace transmission (range: 0–7)</td>
<td>7.00</td>
</tr>
<tr>
<td>Risk assessment (range: 0–18)</td>
<td>13.97</td>
</tr>
<tr>
<td>Necessary equipment (range: 0–13)</td>
<td>7.24</td>
</tr>
<tr>
<td>Attitudes (range: 1–7)</td>
<td></td>
</tr>
<tr>
<td>Supportive</td>
<td>5.21</td>
</tr>
<tr>
<td>Care for</td>
<td>3.81</td>
</tr>
<tr>
<td>Risk of infection</td>
<td>3.42</td>
</tr>
<tr>
<td>Interpersonal concerns</td>
<td>3.76</td>
</tr>
<tr>
<td>Intentions (range: 1–7)</td>
<td></td>
</tr>
<tr>
<td>Willing to care</td>
<td>4.45</td>
</tr>
<tr>
<td>Prefer to care</td>
<td>3.55</td>
</tr>
<tr>
<td>Voluntarily care</td>
<td>3.82</td>
</tr>
<tr>
<td>Implement intrusive procedures</td>
<td>3.12</td>
</tr>
</tbody>
</table>

*Paired two-tailed t test.
This is the biggest change [in my own knowledge] since I came here (R14).

**Decreased level of fear**
Before caring for AIDS patients, residents experienced emotional stress because they feared becoming infected. However, having contact with AIDS patients reduced their level of fear: Even with 7 years’ medical education about AIDS-related knowledge, I still felt quite scared before coming here. There is a need for actual experience to make you feel that they [AIDS and non-AIDS patients] are the same. The feeling of fear would decrease after real contact [with AIDS patients] (R26).

Some participants also indicated that both their increased understanding of the disease and the contacts helped to ease their fear: I think people are coming to understand this disease more and more. Perhaps previously it was the lack of understanding that led to fear. Like myself, I only understood a small part [of the disease] before I came to this [AIDS] unit. I didn’t understand a lot. After understanding it, you would know that it [AIDS] is just an infectious disease, a viral infection (R25).

**Enhanced practice of universal precautions**
Many participants remarked that they did not have the habit of wearing gloves when they were in contact with blood. Training in the AIDS unit made them realize the importance and necessity of being well protected: I used to not wear gloves while drawing blood. I just couldn’t do it with gloves. Since I came here [AIDS unit], I told myself that from now on, I had better wear gloves when drawing blood. Because you couldn’t tell who is and who isn’t an HIV-infected patient. In fact, the faculty had taught us the concept [of wearing gloves]. But it takes your actual experience to convince yourself of the necessity to wear gloves (R29).

Participants also indicated that they paid more attention to protection while treating AIDS patients: Here [AIDS unit], everyone [the health care staff] would pay extra attention, because all the patients have AIDS. The disease could be transmitted through blood and body fluids. Perhaps the rotation in this [AIDS] unit would make you be more careful than before (R34).

Other health care professionals with less experience or knowledge about HIV/AIDS-related issues could also benefit from the residents’ AIDS training by their teaching and/or role modeling how to distinguish between proper and unnecessary protection: I have learned two critical things in this unit. One is the understanding of universal precautions. The second is that the transmission of HIV is not as easy as I thought. It is common for physicians to be really scared even after completing their medical education. Many physicians came to me first before providing consultations; they asked me how they might be infected. They don’t know about it. Actually I did not know these things until I came to this [AIDS] unit. Some physicians thought that they might become infected if they touched an AIDS patient. A psychiatrist who had an oral ulcer asked me whether he could interview a patient. The psychiatrist was afraid that the patient’s saliva might put him at risk of infection (R19).

Once I heard an EKG technician ask if he needed to wear gloves to take a piece of paper that had been touched by an AIDS patient. It might sound ridiculous, but I think I might have had similar [doubts] before coming to this [AIDS] unit (R16).

**Expanded understanding of patients’ multifaceted needs**
Participants expressed that caring for AIDS patients should not be limited to the disease, but also include psychologic and social aspects: I have a much deeper understanding of caring for HIV/AIDS patients. My previous understanding was based on textbook knowledge. I didn’t understand much about the patients’ inner world. Since I came here and understand more in depth, I realized that patients’ psychology, inner feelings and struggles are also quite important in their treatment. My experience can be a bridge for the general public, especially since AIDS continues to be unacceptable in our society. At least I can share my understanding and experience with others that patients are not as horrible as we thought. Our acceptance will be beneficial to their treatment (R36).

I think the care we provide here is different from other units. The care is not limited to the disease of
AIDS, but also includes the patients, their families, and their social relations. They [nurses and social workers] spend more time talking with patients and trying to understand them better. I think these patients seem to be more isolated, not like patients in other units whose families visit them. I always see them alone here [AIDS unit] (R31).

Appreciating the importance of teamwork
The teamwork approach in the AIDS unit impressed participants: It [working in AIDS unit] let me experience the atmosphere of teamwork. In other places, the doctors, nurses, and social workers tend to focus on their own work. Here, I can see team collaboration while caring for a patient. Discussions are not limited to patients’ disease process but include their financial situation, mental status, social relations, etc. The treatment focus is not narrowed to the patients’ infections (R22).

Volunteers and nurses are devoted. They actively care for patients, converse with them and provide emotional support. Clinical treatment is really like teamwork. There is a need for cooperation from the whole group (R24).

The most valuable memory for me is the relationship between the physicians and nurses here. Everyone got along very well. We collaborated with each other instead of focusing on our own work (R32).

Team members help me to better understand patients since I seldom have much time to converse with them. Even when I ask, I might not get the answers I want from patients. Teamwork benefits my work. The teamwork here is very impressive. Honestly, it is very important (R29).

Discussion
In this study, internal medicine residents had the opportunity to closely interact with HIV-infected patients during the 1-month training in the AIDS unit. This training improved residents’ HIV-related knowledge and attitudes, and increased their intentions to provide AIDS care. Our findings of positive effects of clinical training in AIDS care on residents’ knowledge, attitudes and intentions are in agreement with previous reports. The residents’ improved accuracy in assessing HIV-related risk and knowledge of necessary protective equipment to prevent HIV transmission seemed to provide the basis for their attitudinal change of being less concerned about risk of infection and interpersonal concerns at posttest.

Since attitude has been identified as a primary determinant of intention, the attitudinal change of participants in this study impacted their intentions to care for HIV/AIDS patients. Specifically, residents showed significantly less reluctance to care for HIV-infected patients at posttest, and there was a significant reduction in their tendency to avoid invasive procedures or treatments on HIV-infected patients. Behavioral theories predict that intention is the immediate precursor of a specific behavior (i.e. actually taking care of HIV-infected patients). Thus, enhanced intention to care for HIV-infected patients is a crucial indicator of effective interventions aimed at promoting health care professionals’ practice behaviors.

This study has some limitations. First, although the participants demonstrated changes in knowledge, attitudes and intentions after the 1-month AIDS training, these changes were measured by self-report; the inherent self-protection bias in self-reported data must be taken into consideration. In addition, we lacked objective measures of actual behavior (e.g. by direct observation). Future research is needed to determine the correlation of self-reported intentions to care for AIDS patients with actual engagement with such patients.

Despite the limitations, our findings are also notable in the following ways. First, although the participants demonstrated changes in knowledge, attitudes and intentions after the 1-month AIDS training, these changes were measured by self-report; the inherent self-protection bias in self-reported data must be taken into consideration. In addition, we lacked objective measures of actual behavior (e.g. by direct observation). Future research is needed to determine the correlation of self-reported intentions to care for AIDS patients with actual engagement with such patients.
Inpatient training in AIDS care

tients to elicit an emotional response. In the present study, residents who provided direct care to HIV/AIDS patients for a month not only increased their HIV-related knowledge, but also changed their attitudes and intentions to treat HIV/AIDS patients. This 1-month intervention of working directly with HIV/AIDS patients had the desired effect of improving residents’ attitudes toward AIDS patients. In contrast, the brief interventions used in other studies did not have this effect.

Second, the residents’ quotes provide convincing narrative illustrating the benefits of hands-on AIDS care experiences. The participants reported in the interviews that they gained knowledge of HIV diseases (clinical manifestations, diagnostic sensitivity, disease management) and of preventing transmission, as well as a better understanding of patients and their illness experiences. The participants stressed in their interviews that treating HIV/AIDS patients involved not only managing HIV diseases, but also considering the emotional and psychosocial aspects of patient care. This suggests that their interactions with the patients helped them to develop an empathic understanding of patients’ illness experiences and a deeper appreciation of the devoted teamwork required for the clinical care of HIV-infected patients. They also reported a reduced level of fear and stereotypical impressions of HIV-infected patients. These comments were also reflected in their change of knowledge, attitudes and intentions as reported on the questionnaire.

Third, our findings also have significant implications for the quality of AIDS care. Accurately assessing HIV risk and applying proper protective equipment to prevent HIV transmission are crucial for residents’ self-protection and ability to educate patients, their families and fellow health care professionals. The participants reported that the AIDS training enhanced their clinical competence in diagnosing and treating HIV diseases. This perception of clinical competence is crucial to the quality of care for HIV/AIDS patients. The increased sensitivity to patients gained from the AIDS training might enable residents to make a greater contribution to the early diagnosis and proper treatment of HIV/AIDS in their future careers as internal medicine physicians. Reluctance to use invasive procedures on HIV-infected patients declined after the 1-month training, with implications that these patients will more likely receive treatments based on their clinical needs rather than biased by the physician’s fear of exposure to HIV or prejudice. The increased intention to care for HIV-infected patients also promotes greater accessibility to HIV care.

Acknowledgments

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