Reducing HIV-Related Stigma in Health Care Settings: A Randomized Controlled Trial in China

Li Li, PhD, Zunyou Wu, PhD, Li-Jung Liang, PhD, Chunqing Lin, PhD, Jihui Guan, MD, Manhong Jia, MD, Keming Rou, BS, and Zhihua Yan, MS

Objectives. The objective of the intervention was to reduce service providers' stigmatizing attitudes and behaviors toward people living with HIV.

Methods. The randomized controlled trial was conducted in 40 county-level hospitals in 2 provinces of China between October 2008 and February 2010. Forty-four service providers were randomly selected from each hospital, yielding a total of 1760 study participants. We randomized the hospitals to either an intervention condition or a control condition. In the intervention hospitals, about 15% of the popular opinion leaders were identified and trained to disseminate stigma reduction messages.

Results. We observed significant improvements for the intervention group in reducing prejudicial attitudes ($P < .001$), reducing avoidance intent towards people living with HIV ($P < .001$), and increasing institutional support in the hospitals ($P = .003$) at 6 months after controlling for service providers' background factors and clinic-level characteristics. The intervention effects were sustained and strengthened at 12 months.

Conclusions. The intervention reduced stigmatizing attitudes and behaviors among service providers. It has the potential to be integrated into the health care systems in China and other countries. (*Am J Public Health.* 2013;103:286–292. doi:10.2105/AJPH.2012.300854)

China's health care system has been challenged by an epidemic of contagious diseases in recent years, including severe acute respiratory syndrome, avian flu, and HIV/AIDS.[1–3] For people living with HIV (PLH), antiretroviral therapy has significantly prolonged survival. As HIV infection has evolved into a chronic disease, health care systems have had to transition from palliative care to comprehensive management.[4–6] More and more PLH require regular medical check-ups and routine health care.[4] In 2003, the Chinese government launched a national policy, "Four Free and One Care," to increase access to free HIV testing and antiretroviral therapy. The new policy has dramatically increased the number of PLH receiving treatment and care, but it has also challenged the capacity of China's primary care settings and providers.[7,8]

HIV-related stigma and discrimination pose a major barrier for HIV prevention and care worldwide.[9–12] It has emerged in various forms in health care settings, including refusal of care, suboptimal services, excessive precautions, isolation, mandatory testing, breach of confidentiality, humiliation, and blaming,[11,13,14] which discourage people from seeking HIV testing and counseling and accessing treatment and care.[15–17] Misconceptions about the disease, fears related to its incurability, and prejudice toward risky behaviors have been identified as contributing factors for stigmatizing and discriminatory responses.[10,18–20] In health care settings, concerns about occupational infection and a lack of self-protection knowledge and support have also been associated with service providers' stigmatizing attitudes and behaviors.[21,22]

Despite the negative impact of HIV/AIDS-related stigma, a limited number of intervention studies have been aimed at reducing HIV/AIDS stigma.[23] Previous stigma-reduction interventions among service providers used traditional approaches, including education and skill building.[24–27] These strategies targeting only individuals were not sufficient for behavior change, because providers' discriminative behaviors are largely influenced by structural barriers, such as a lack of institutional support for AIDS care and access to universal precaution supplies.[28] In addition, social norms and environment play an important role in the stigmatizing attitudes reported by service providers.[29] To address HIV-related stigma among providers, strategic interventions should target structural factors and social norms for behavioral change.[14,28–31]

The intervention described in this article, White Coat, Warm Heart (WW), integrated behavioral- and structural-level components. The behavioral-level components were built on the diffusion of innovation theory. According to this theory, new behavioral trends are most efficiently established when a critical mass of popular opinion leaders (POLs) have adopted and endorsed the new trend.[32,33] Guided by this framework, we identified and trained about 15% of the POLs among the service providers to disseminate stigma reduction messages within their medical community. To address structural-level barriers, we provided universal precaution supplies to all participating hospitals. The objective was to reduce service providers' stigmatizing attitudes and behaviors and to increase their comfort level when working with PLH in primary health care settings.

METHODS

This randomized controlled trial was conducted in 40 county-level hospitals in 2 provinces of China from October 2008 to February 2010. Yunnan province, which is located in far southwestern China, had the highest HIV prevalence in the country as a result of drug use. Fujian province, which is on the southeast coast of mainland China, however, was characterized by a low HIV prevalence with mainly sexual transmission. We included the 2 provinces for better representation of the country because HIV rates vary in diverse regions. County-level hospitals were included in the study because they were advanced regional medical centers within easy access for many

Chinese residents. Many HIV infection cases in rural areas were first detected in county-level hospitals. Providers in county-level hospitals interacted with PLH by providing regular testing and treatment. In addition, they also provided trainings for providers working in township and village facilities.

The trial was registered in the Clinical Trials.gov Protocol Registration System (NCT01052415). At the time of the study, Yunnan province had 129 county hospitals, and Fujian province had 85. We worked with provincial Centers for Disease Control and Prevention to select a total of 40 county hospitals (20 in each province) of the 214 county hospitals in the 2 provinces by means of a random number table. The hospitals were matched into pairs within each province by (1) type of the hospital (general or specialized) as the primary matching factor, (2) size of the hospital (number of beds and number of staff) as the secondary matching factor, and (3) HIV-related services (number of HIV cases, whether antiretroviral therapy is provided, and history of occupational exposure) as the tertiary matching factor. After baseline assessment, we randomized each pair of hospitals to either the WW intervention condition or the control condition. Because the hospitals were located in different counties, the distance between the intervention and control hospitals was far enough to avoid potential contamination.

A systematic sampling approach was applied in each hospital to randomly select provider participants from a publicly available hospital staff roster. We included in the study only providers who had regular contact with patients, including doctors, nurses, and lab technicians. We preset the sample ratios of doctors, nurses, and lab technicians at 50%, 45%, and 5%, respectively, to reflect the ratio of medical staff at the county hospitals. The service providers had to be aged 18 years or older to participate. When approaching participants, research staff followed standardized scripts to explain the purpose of the study, procedures, voluntary participation, potential risks, and benefits. Written informed consent was obtained with a refusal rate of 3%. We found no significant difference in terms of refusal rates between intervention and control conditions. Forty-four service providers were randomly sampled from each of the 40 hospitals, resulting in a total of 1760 provider participants.

Description of White Coat, Warm Heart Intervention

To ensure regional relevancy and sustainability, health educators from both provincial and district disease control centers implemented the WW intervention. In each province, 4 to 5 facilitators received extensive training on research ethics, facilitator role, intervention principles and delivery, session-by-session content flow, and protocol for emergency situations. Ongoing preparation activities included coached practice of selected intervention sessions and didactic presentations on related topics.

We used 2 approaches to identify POLs in each intervention hospital. First, during the baseline assessment, providers were asked to nominate 3 coworkers who were considered to be the most popular and influential. Second, hospital gatekeepers and department heads were asked to recommend individuals who regularly interacted with others and were regarded as popular among peers in the hospital. These POLs were not necessarily a subset of the randomly selected providers participating in the assessment. With informed consent, we recruited and trained 20 to 25 POLs from each of the 20 intervention hospitals, yielding a total of 456 POLs for this project.

The POLs attended 4 group sessions over a 1-month period and 3 reunion sessions after the initial training. The sessions usually lasted about 1.5 hours in a conference room of the hospital. The 4 sessions covered (1) complying with universal precaution procedures and ensuring occupational safety, (2) fighting against stigma and improving the provider–patient relationship, (3) taking actions and making efforts to care for patients, and (4) overcoming difficulties and building up a better medical environment. The intervention incorporated group discussion, games, and role-play to encourage full participation of trainees. Trained POL providers were inspired to serve as behavior change endorsers and disseminate intervention messages to their coworkers. The intervention messages were predesigned and consistent across hospitals because the descriptions of the 4 intervention sessions were the core messages to be delivered. Interactive techniques were used to help the POLs practice and refine their skills to effectively deliver the messages to other providers in the hospital. POLs established goals for engaging in informal conversations with coworkers between weekly sessions. The target audience could be any service providers in the hospitals, not necessarily those who participated in the study. The conversational outcomes were reviewed and discussed at subsequent sessions. The reunion activities focused on group solidarity, problem solving, and skill building through a new set of interactive games and activities to reinforce POLs' continued efforts. The participation rate for the intervention activities was about 95%.

POLs were not identified or trained for the hospitals in the control group. However, both intervention and control hospitals received standard information packages on general safety in medical procedures and the same amount of universal precaution supplies (e.g., disposable sharps containers, medical disposable clothes, waterproof aprons, protective goggles, and rubber gloves) from the Chinese Center for Disease Control and Prevention.

Assessments and Follow-Ups

The intervention outcome was evaluated at baseline and at 6- and 12-month follow-up assessments. At baseline and at each follow-up assessment, all participating providers completed self-administered paper-and-pencil questionnaires independently in a private room, with a trained interviewer available to answer questions. The questionnaire consisted of 167 questions and took an average of 30 to 45 minutes to complete. Participants were compensated 50 yuan (US $7.70) for each assessment. The follow-up rate was higher than 99% across all study sites, and we observed no significant difference in attrition rate between the intervention conditions (Figure 1).

Outcomes

We developed a measure of general prejudicial attitude toward PLH on the basis of the 12-item priority stigma indicator defined in the *HIV/AIDS-Related Stigma and Discrimination Indicators: Development Workshop Report*.[34] In this study, we adapted 8 items from the original scale, scored from 1 ("strongly agree") to 5 ("strongly disagree"). Example items included

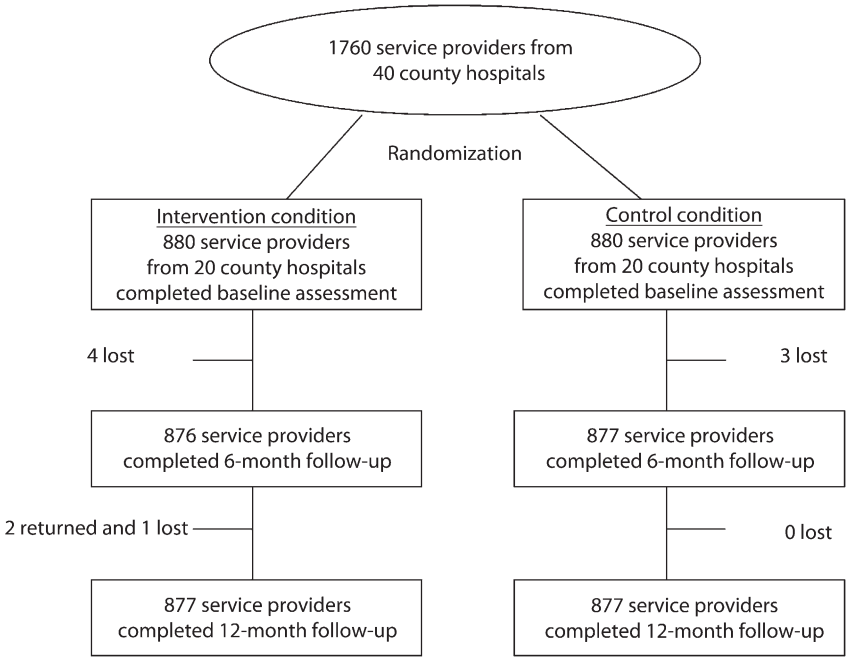

FIGURE 1—Flow of study participants: White Coat, Warm Heart Intervention Trial; Yunnan and Fujian Provinces, China; October 2008–February 2010.

"People who got HIV/AIDS through sex or drug use got what they deserved" and "AIDS is a punishment for bad behavior." Some items were reversed so that a higher score indicated a higher degree of prejudicial attitude (Cronbach's $\alpha = .75$). The scale was pilot tested in our pilot study to ensure culture relevancy.[29]

We developed a scale, modified from Herek's work,[35] to measure providers' avoidance intent in 8 hypothetical situations involving potential contact with PLH. Example statements for this scale included "If HIV-positive patients visit the hospital, you are willing to provide all service needed" and "If you worked with HIV-positive patients, you would provide the same quality of care to them that you provide to other patients." The responses to each statement ranged from 1 ("strongly agree") to 5 ("strongly disagree"). Some items were reverse-scored so that a higher score indicated a higher potential of avoidance behavior when providing service to PLH (Cronbach's $\alpha = .84$). This scale was also pilot tested in our previous study.[21]

To measure participants' perceived institutional support from the hospital, we developed a 14-item scale on the basis of a similar scale used with service providers in China.[21,28] Participants were asked about the availability of support related to infection protection and HIV care in their hospitals, including universal precaution supplies, postexposure prophylaxis materials and procedures (e.g., antiretroviral therapy drugs, concurrent disinfection, medical insurance, and psychological counseling for occupational exposure), and accessibility to HIV information and training. Sample items included "There are always sterile rubber gloves available at your hospital when you need them for work" and "You would have sufficient health insurance coverage if you were infected with HIV in your job." We calculated this measure by summing yes responses, with a higher number indicating better perceived institutional support in the hospital (Cronbach's $\alpha = .80$).

In addition to these measures, we also included variables for respondents' demographic information such as age, gender, professional category (doctor or other), and prior contacts with PLH (yes or no).

Statistical Analysis

Our proposed sample size of 880 service providers (44 providers per hospital × 20 hospitals) per intervention condition was powered to examine intervention effects of the 3 primary outcome measures. This sample size provided 80% power at a .05 level of significance to detect a standardized effect size of .30, which Cohen[36] considered a medium effect size. We carried out power calculation in 2 steps. First, we calculated the needed sample size for service provider outcomes,[37] assuming 80% power, a type I error of .05 for a 2-sided test, repeated measurements taken at baseline and at 6- and 12-month follow-ups, an attrition rate of 10% between follow-ups, and a 1st-order autoregressive correlation structure on repeated measurements. Next, we inflated the needed sample size using the variance inflation factor to account for nesting of service providers within hospitals.

We used an intent-to-treat approach to analyze intervention effects. Baseline differences between intervention and control were tested using the χ^2 and t tests (or Wilcoxon signed-rank test) for categorical and continuous variables, respectively. We generated plots of means over time for the outcome measures to graphically examine the time trend and used mixed-effects regression models with hospital-level random effects to assess the intervention effect on the outcome measures. Covariates included age, gender, occupation, prior contact with PLH, province, number of hospital beds (≤ 200, 201–500, > 500), reported HIV cases (none, 1–10, > 10), group (control or intervention), visit (baseline or 6- or 12-month follow-up), and group × visit interaction. The models also included hospital-level random effects to account for dependence within hospitals and a 1st-order autoregressive covariance structure to account for repeated observations per provider. All statistical analyses were carried out with SAS version 9.2 (SAS Institute, Inc., Cary, NC), and all of the graphs were generated using R (R Development Core Team, Vienna, Austria).[38]

RESULTS

At baseline, 18 (45%) clinics had 200 or fewer hospital beds, and 3 clinics had more than 500 hospital beds; 17 clinics reported no HIV cases and 7 clinics reported at least 10 HIV cases. More than 65% of the service

providers were women, and the average age of providers was about 38 years. Of providers, 48% in the control group and 50% in the intervention group were doctors. More than 55% of the service providers had prior contact with PLH. We observed no significant differences for clinic- and provider-level characteristics at baseline. We also observed comparable levels of prejudicial attitude, avoidance intent, and institutional support across the 2 intervention conditions (Table 1).

Time Trends

Figure 2 presents the means (±SE) of (a) prejudicial attitude, (b) avoidance intent, and (c) institutional support measures at baseline and at 6- and 12-month follow-up assessments.

Figure 2a shows that the mean reductions in prejudicial attitude reported by providers in the intervention were 2.72 (13% reduction from baseline) and 4.63 (22.1% reduction from baseline) at the 6- and 12-month follow-ups, respectively, whereas those in the control group were less than 5%. Figure 2b shows that a slight increase in avoidance intent over time was observed in the control group, whereas a decline in the level of avoidance intent over time was observed in the intervention group. Similarly, service providers in the intervention group reported, on average, an increasing trend in reported institutional support, whereas those in the control group reported a slight decreasing trend in institutional support.

TABLE 1—Demographic and Background Characteristics by Group at Baseline: White Coat, Warm Heart Intervention Trial; Yunnan and Fujian Provinces, China; October 2008–February 2010

Characteristic	Control (n = 20), No. (%) or Mean ±SD (Range)	Intervention (n = 20), No. (%) or Mean ±SD (Range)	*P*
Clinic characteristics			
Beds			.825
≤ 200	9 (45)	9 (45)	
201–500	10 (50)	9 (45)	
> 500	1 (5)	2 (10)	
Reported HIV cases			.099
None	8 (40)	9 (45)	
1–10	6 (30)	10 (50)	
> 10	6 (30)	1 (5)	
Provider characteristics			
Gender: female	611 (69.4)	577 (65.6)	.084[a]
Age, y			.096
≤ 35	417 (47.4)	376 (42.7)	
36–45	316 (35.9)	330 (37.5)	
≥ 46	147 (16.7)	174 (19.8)	
Mean	38.74 ±63.74	37.44 ±8.16	.548[b]
Profession			.391[a]
Doctor	424 (48.2)	442 (50.2)	
Nurse, technician, other	456 (51.8)	438 (49.8)	
Prior contacts with people living with HIV[a]	510 (58.0)	494 (56.1)	.457[a]
Primary measures at baseline			
Prejudicial attitude	20.8 ±4.5 (8-37)	21.0 ±4.4 (8-40)	.397[b]
Avoidance intent	18.5 ±4.2 (8-32)	18.7 ±4.2 (8-39)	.366[b]
Institutional support	12.0 ±2.7 (0-15)	11.9 ±2.9 (1-15)	.790[b]

Note. For the control and intervention groups, no. of beds = 20, n = 880 providers.
[a]χ^2 or Fisher's exact test.
[b]Two-group *t* test or Wilcoxon signed-rank test.

Intervention Effects

Table 2 presents the results for the 3 primary outcome measures from the mixed-effects regression models. Overall, we observed significant intervention effects on all 3 outcome measures. Compared with the control group, the invention group showed a significantly higher reduction in prejudicial attitude at 6 months (estimated difference in reduction from baseline between intervention and control = 2.400; SE = 0.220; $P < .001$) and the estimated difference in improvement became larger at the 12-month follow-up (estimated difference = 3.774; SE = 0.267; $P < .001$) after controlling for age, gender, occupation, prior contacts with PLH, province, number of hospital beds, and number of HIV cases reported. We also found that prejudicial attitude was associated with a provider with no prior contacts with PLH ($P = .001$), province ($P = .007$), and more HIV cases reported ($P = .003$). Furthermore, the intervention group showed a significantly higher reduction in avoidance intent (estimated difference = 1.097; SE = 0.174; $P < .001$) and a significantly higher increase in institutional support (estimated difference = 0.390; SE = 0.131; $P = .003$) at 6 months after controlling for the same set of selected covariates. The intervention effects on avoidance intent and institutional support were sustained and strengthened at 12 months. We also found providers' prior contacts with PLH to be associated with lower avoidance intent ($P < .001$) and higher institutional support ($P = .011$). We conducted 2 further sensitivity analyses, one with POL status as an additional fixed effect and the other with a matched pair as a random effect in the final model, and found that the estimated intervention effects remained.

DISCUSSION

This study was the first large-scale intervention trial to our knowledge to assess the efficacy of an intervention confronting stigma and discrimination in primary health care settings in China. Results showed improved attitudinal and behavioral outcomes of the WW intervention with potential confounders controlled. This trial demonstrated that a reduction in stigmatizing attitudes and behaviors could be achieved among service providers

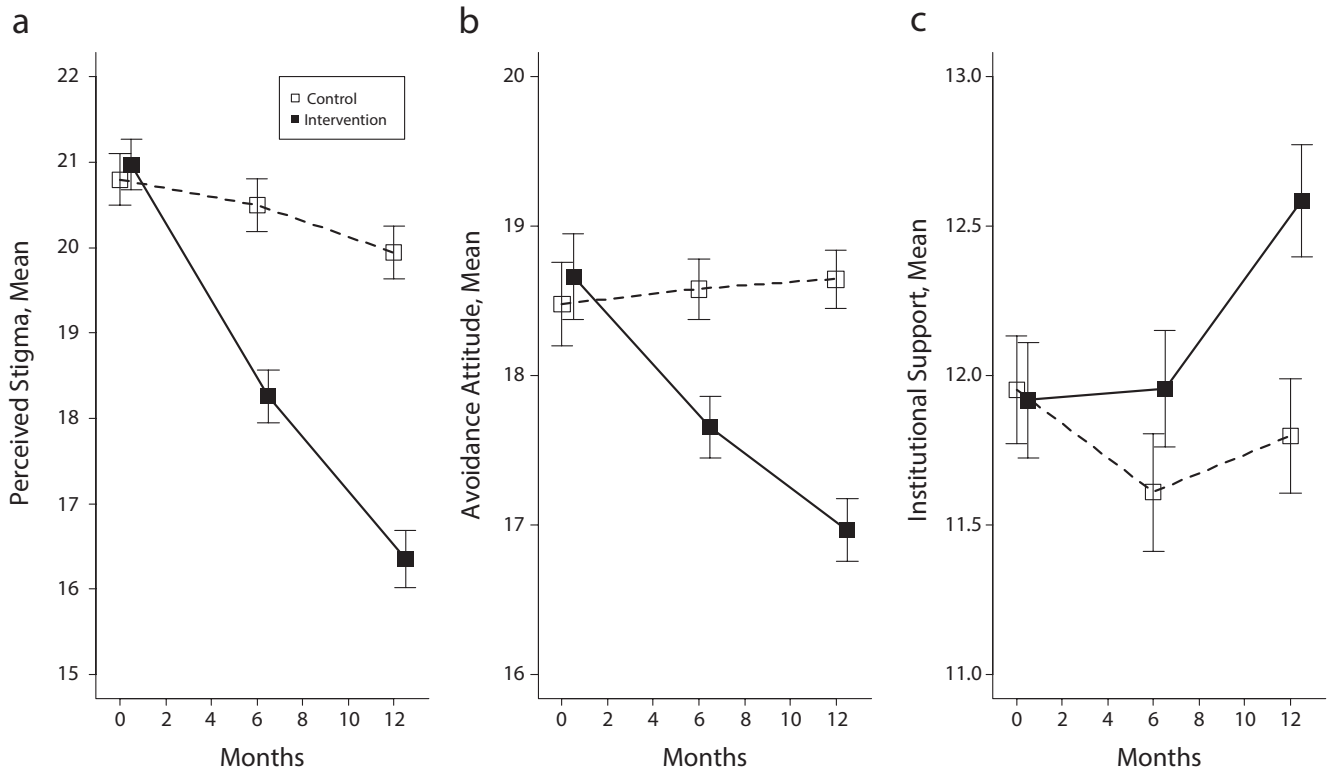

FIGURE 2—Plots of means (±2 SE) over time for (a) prejudicial attitude, (b) avoidance intent, and (c) institutional support: White Coat, Warm Heart Intervention Trial; Yunnan and Fujian Provinces, China; October 2008–February 2010.

with an intervention implemented in health care settings. Although the study was conducted in China, it could serve as a propitious model for stigma reduction programs in other countries.

In our previous observational study, we uncovered a deficiency in structural support, especially in hospitals serving nonurban populations such as county and township hospitals and village clinics.[28] In this trial, however, although we introduced structural change by making universal precaution supplies accessible to all participating hospitals, we observed significant differences in attitudinal and behavioral changes when comparing the intervention condition with the control condition. This finding was supported by existing literature showing that removal of environmental barriers alone was not sufficient for individual behavioral change.[9,39] Better outcomes would be achieved with an intervention combining structural and individual behavior components rather than a similar mirror condition that provided only 1 of these components.

We learned several lessons during the implementation of the POL intervention. First, development of the intervention message was vital. The 4 intervention messages used in this project were designed on the basis of findings from our previous studies and reflected real-world challenges experienced by service providers in China. Instead of providing only factual information or imposing personal prejudices on PLH,[40] the WW intervention focused on self-protection and occupational safety. The service providers indicated that the intervention appropriately covered key issues relevant to their daily practice. Second, identifying POLs in the target population was critical. The POLs in our study were considered

TABLE 2—Results From Mixed-Effects Regression Models: White Coat, Warm Heart Intervention Trial; Yunnan and Fujian Provinces, China; October 2008–February 2010

	Baseline		6-Month Change From Baseline		12-Month Change From Baseline	
Outcome Measures	Estimated Difference (SE)	*P*	Estimated Difference (SE)	*P*	Estimated Difference (SE)	*P*
Prejudicial attitude	0.493 (0.319)	.122	−2.400 (0.220)	< .001	−3.774 (0.267)	<.001
Avoidance intent	0.314 (0.236)	.184	−1.097 (0.174)	< .001	−1.856 (0.208)	<.001
Institutional support	−0.057 (0.279)	.838	0.390 (0.131)	.003	0.817 (0.160)	<.001

Note. Estimated difference = intervention − control. All models included the following covariates: age, gender, occupation, prior contacts with people living with AIDs, province, number of hospital beds (≤ 200, 201–500, > 500), and reported HIV cases in the hospital (none, 1–10, > 10). The group × visit interactions were significant for all 3 measures ($P < .001$). These models also included clinic-level random effects to account for dependence within clinics and a first-order autoregressive covariance structure to account for repeated observations for each provider.

popular, trustworthy, and influential by their coworkers; they cared about their hospital and were willing to make the effort to improve quality of service for their patients. POLs with these characteristics were effective change agents in stigma reduction within their professional community. Third, it was essential for POLs to learn skills and techniques for effective communication. For example, POLs were taught to use the project logo as a conversation starter to advocate for the project among colleagues, and they were also encouraged to use real-life examples to link the intervention contents to benefits for their audience. The efficacy of the intervention could conceivably be attributed to these constitutive designs and implementation strategies.

The efficacy of the WW intervention has widespread significance that could go beyond HIV-related stigma reduction in health care systems. Our previous research identified that service providers' stigmatizing attitudes could manifest with patients with other characteristics as well, and avoidance intent towards PLH was highly negatively correlated with general patient satisfaction with service providers of the hospital.[41] With reduced HIV-related discrimination and an increased sense of equal treatment for all patients, we anticipate that provider–patient interaction would be enhanced and the quality of service in primary care settings would be improved not only for PLH but for all patients in general.

We identified some limitations of our study. First, the data collected were only from county-level hospitals in 2 provinces, so caution must be used in generalizing the findings to other geographic locations and other hospital levels. Second, because the outcome measures relied entirely on self-reported data, social desirability bias could be an issue. Specifically, information on whether quality or access to care for PLH was improved after the intervention was lacking.

Despite these limitations, we have demonstrated that the WW intervention was not only feasible, but also efficacious. As the demand for HIV treatment and care increases, providers are under great pressure to deliver adequate services. The WW intervention has the potential to meet this need in the Chinese health care system and serve as an effective model strategy in other countries. The findings from this study will be disseminated through the Chinese Center for Disease Control and Prevention to policymakers at various administrative levels of the health care system in China. The intervention manual and implementation experiences will be shared with interested organizations and agencies around the world. ■

About the Authors

Li Li, Li-Jung Liang, and Chunqing Lin are with the Semel Institute for Neuroscience and Human Behavior, Center for Community Health, University of California at Los Angeles. Zunyou Wu, Keming Rou, and Zhihua Yan are with the National Center for AIDS/STD Control and Prevention, Chinese Center for Disease Control and Prevention (CDC), Beijing, China. Jihui Guan is with the Fujian Provincial CDC, Fuzhou, China. Manhong Jia is with the Yunnan Provincial CDC, Kunming, China.

Correspondence should be sent to Li Li, PhD, UCLA Semel Institute, Center for Community Health, 10920 Wilshire Boulevard, Suite 350, Los Angeles, CA 90024 (e-mail: lililili@ucla.edu). Reprints can be ordered at http://www.ajph.org by clicking the "Reprints" link.

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Contributors

L. Li and Z. Wu oversaw the design and implementation of the trial and the writing of the article. L.-J. Liang and C. Lin participated in statistical analysis, data management, interpretation of the results, and writing of the Data Analysis and Results sections. C. Lin also participated in the writing of the introduction and Discussion sections. J. Guan, M. Jia, K. Rou, and Z. Yan were responsible for study implementation in the field. All authors contributed to the preparation of the article and approved the final draft. The corresponding author had full access to all data in the study and final responsibility for preparing and submitting results for publication.

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Human Participant Protection

This study was approved by the institutional review boards of the University of California, Los Angeles, and the National Center for AIDS/STD Control and Prevention, Chinese Center for Disease Control and Prevention. Participants provided written informed consent.

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