

Mandatory HIV testing in China: the perception of health-care providers

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Summary: Health-care providers in China are facing an exponential increase in HIV testing and HIV-positive patients. A total of 1101 service providers were recruited to examine attitudes toward people living with HIV/AIDS (PLWHA) in China. Logistic regression models were used to assess factors associated with providers' attitudes toward mandatory HIV testing. Providers were most likely to endorse mandatory HIV testing for patients with high-risk behaviour and for all patients before surgery. Over 43% of providers endorsed mandatory testing for anyone admitted to hospital. Controlling for demographics, multivariate analyses indicated that providers with higher perceived risk of HIV infection at work, higher general prejudicial attitudes toward PLWHA, and previous contact with HIV patients were more likely to endorse mandatory HIV testing for anyone admitted to hospital. Results underscore the importance of implementing universal precautions in health-care settings and call attention to social and ethical issues associated with HIV/AIDS control and treatment in China.

Keywords: acquired immunodeficiency syndrome, China, health personnel, HIV, mandatory testing

INTRODUCTION

Mandatory HIV testing is a controversial issue. It stimulates arguments between controlling the spread of HIV infection and preservation of individual rights. Proponents of mandatory HIV testing believe that early detection and treatment may medically benefit infected individuals.^{1,2} At the population level, some argue for protecting the many at the cost of possibly harming a few, especially in regions with a serious HIV/AIDS epidemic.^{3,4} Wu⁵ and Wu *et al.*⁶ have argued that the recent implementation of an HIV routine screening programme for high-risk groups in China benefits both those found to be infected and those at risk of becoming infected, which reflects the public health principle of protecting the uninfected while minimally harming those who are infected. Others argue that testing a patient against his or her will may result in the violation of ethical as well as legal code.⁷ In addition to ethical and legal concerns, if patients at risk for HIV become aware that they could be tested without their consent, they may avoid

contact with health-care professionals, which could result in a net public health loss.^{8,9}

Despite the heated debate over mandatory HIV testing, many countries are currently operating mandatory testing programmes, mostly for subgroups in a population. D'Amelio *et al.*'s¹⁰ global review of HIV testing legislation revealed that 27% of the 121 countries evaluated have legislative measures in place mandating HIV testing for vulnerable populations (e.g. commercial sex workers, men who have sex with men, injecting drug users). Other countries have legislation requiring mandatory HIV testing for populations considered potentially vulnerable, such as immigrants (17% of the 121 countries), prisoners (5%), and health personnel (14%).¹⁰

Mandatory HIV testing has also been a contentious issue from the perspective of health-care providers. Surgical societies in several countries have recommended mandatory HIV tests before elective surgery,¹¹⁻¹⁴ and many studies conducted among health-care providers showed the endorsement of mandatory HIV testing for patients before elective surgery. In a study conducted in Western Australia, 39% of the doctors believed that HIV testing before elective surgery should be mandatory for all patients, while 53% felt it should be mandatory for high-risk groups.¹⁵ In a survey of health-care professionals in Washington State (USA), 45% of participants supported

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mandatory HIV testing for all hospital admissions.¹⁶ In a Singapore study, 81% of doctors supported mandatory testing of high-risk groups to prevent the spread of HIV.¹⁷

Proponents contend that mandatory HIV testing, especially among high-risk patients, would protect providers from infection through accidental exposure,^{11,18} clarify patient prognosis,² improve diagnosis of infectious diseases,¹⁹ and allow opportunities for individual counselling with regard to HIV prevention.² Opponents contend that mandatory HIV testing may result in jeopardized patient care because of perceived fear on the part of providers.²⁰ There is no evidence showing that knowledge of HIV status reduces the risk of HIV transmission to surgical staff through accidental exposure.¹² Current research does suggest that health-care providers' attitudes and practice regarding HIV testing are important because they can influence the quality of services provided.²¹⁻²³

By the end of 2005, an estimated 650,000 people in China were living with HIV/AIDS (PLWHA), 75,000 of whom had developed AIDS.²⁴ Implementation of the 'Four Frees and One Care' policy mandates access to free HIV testing and free antiretroviral (ARV) treatment to AIDS patients in rural China. This profound shift in China's national policy places greater responsibility on health-care providers in the areas of testing, counselling, diagnosis, and treatment of a large number of PLWHA.^{6,24} To date, however, few systematic studies have been conducted to examine providers' attitudes toward mandatory HIV testing in health-care settings in China.²⁵

We explore health-care providers' attitudes toward mandatory HIV testing for different patients and various factors associated with providers' attitudes toward mandatory HIV testing in health-care settings. In the light of these findings, we offer suggestions to help policy-makers design more targeted interventions to help health-care providers deliver better services to PLWHA in China.

METHODS

Study site, participants, and procedures

This study collected data from three different sites in a southwestern province in China. The study participants consisted of service providers who were currently working at general public health-care facilities in the area. Public health-care facilities in China are organized on six different levels: national, provincial, city/prefecture, county hospitals, township hospitals, and village health clinics. Generally, hospitals at higher levels serve a broader region and are more likely to have technologically advanced equipment and a more highly educated staff. Such hospitals have the capacity and resources to perform more sophisticated operations and are therefore also more likely to attract more patients.

In order to obtain a representative sample, we gathered staffing information from hospitals and clinics in the three study sites before sampling. We randomly selected three provincial hospitals, four city/prefecture hospitals, 10 county hospitals, 18 township health clinics, and 54 village

clinics. The ratio of doctors to nurses in each hospital was used as our sampling scheme, and hospital laboratory technicians were over-sampled to allow for adequate representation in the analysis. A total of 1101 randomly selected service providers participated in the self-administered survey between January and August 2005, with less than an 8% refusal rate. All survey data were collected anonymously.

Study protocol, survey instruments, and informed consent forms and procedure were reviewed and approved by the Institutional Review Boards (IRB) of the University of California and China Centers for Disease Control and Prevention. Individual informed consent was obtained prior to participation in the survey, and a \$10 gift was given to study participants for their participation.

Measures

The Health Professional Survey, developed specifically for this project, contained a total of 172 questions assessing participants' demographics, medical training, experience, and attitudes and behaviour towards AIDS patients and PLWHA in general. Table 1 summarizes the questions and scales used in this study.

Mandatory HIV testing endorsement among providers was assessed for three distinct patient groups: for all patients with high-risk behaviour, for all patients before an operation, and for everyone admitted to the hospital. Responses to each statement ranged from 1 (strongly agree) to 5 (strongly disagree). The responses were dichotomized to agree (1) or disagree (0) for bivariate and multivariate analyses. Mandatory HIV testing endorsement for everyone admitted to the hospital was considered the main dependent variable.

General prejudicial attitude was measured based on the 12-item priority stigma indicator defined in the *HIV/AIDS-related Stigma and Discrimination Indicators Development Workshop Report*.²⁶ In the present study, we adapted nine items from the original scale, scored from 1 (strongly agree) to 5 (strongly disagree). The directions of some items were reversed so that the higher score indicates a higher degree of general prejudicial attitude. Acceptable consistency reliability was supported by an α value of 0.75.

Perceived structural support was measured by the 10 items listed in Table 1. The original responses for each statement were 1 (yes), 2 (no), or 3 (not sure). We revised the original scale to 0 (no), 1 (not sure), or 2 (yes) and developed a continuous scale in which higher numbers indicate higher levels of perceived institutional support. The inter-item reliability of this scale is acceptable with a value of Cronbach's α at 0.70.

Perceived infection risk at work was constructed by the combination of three questions. Survey participants responded to each of the three questions with a response category ranging from 0 (not possible) to 3 (high possibility). In this scale, a higher number was associated with higher perceived risk of HIV infection at work (Cronbach's $\alpha = 0.70$).

Knowledge of HIV/AIDS was formed by 10 questions; these questions have been used, together or separately, in

Table 1 Health professional survey questions and scales used

Mandatory HIV testing

- There should be mandatory HIV testing for patients with high-risk behaviours
- There should be mandatory HIV testing for all patients before an operation
- There should be mandatory HIV testing for everyone admitted to the hospital

General prejudicial attitude

- People who got HIV/AIDS through sex or drug use got what they deserved
- AIDS is a punishment for bad behaviour
- People who behave promiscuously should be blamed for AIDS
- PLWHA should have the right to marry
- You feel afraid of PLWHA
- You would feel ashamed if someone you know got HIV/AIDS
- You would feel ashamed if someone in your family got HIV/AIDS
- You would not buy from a food vendor who has HIV/AIDS
- You would not share eating utensils with a PLWHA because you are afraid of HIV infection

Perceived structural support

- There are always sterile rubber gloves available at your health-care facility when you need them
- There are always sterile needles available at your health-care facility when you need them
- There is always rubbing alcohol available at your health-care facility when you need it
- There are always disposal containers available at your health-care facility when you need them
- A working autoclave is always available for daily use at your health-care facility
- There are always written HIV/AIDS treatment regimens available at your work site
- There is HIV testing available for patients coming in for HIV testing at your health-care facility
- Providers working at your health-care facility, who have a needle stick incident, have access to free HIV testing
- There are AIDS treatments available for HIV patients at your health-care facility
- You would have sufficient health insurance coverage if you were infected by HIV on your job

Perceived infection risk at work

- The possibility of having a dirty needle stuck into your skin on your job
- If you had a dirty needle stuck into your skin on the job, the likelihood that you would become infected with HIV
- If you provide medical care to HIV-positive patients, the likelihood that you would become infected with HIV

HIV knowledge

- Is AIDS curable?
- Can HIV be transmitted through pregnancy?
- Can HIV be transmitted through childbirth?
- Can HIV be transmitted through breast-feeding?
- Can mosquitoes transmit HIV?
- Can HIV be transmitted through daily contact, such as sharing public bathrooms?
- Can HIV transmission be stopped by more nutrient intake?
- Can physical exercise stop HIV transmission?
- Is an HIV vaccine already available?
- Are patients with sexually transmitted diseases more likely to get HIV?

many HIV studies to measure HIV-related knowledge. For each item, the response was coded as 1 (correct answer) or 0 (incorrect answer or unknown). The scale for HIV/AIDS knowledge was constructed as a sum of all 10 items.

Demographic information of the providers included age, gender, ethnicity (Han or minority), medical education (less than associate degree, associate degree, or medical degree/higher), level of care (provincial/city, county or township/village), professional category (doctor, nurse, or laboratory technician), personal contact with PLWHA (yes or no), and HIV-related training status (yes or no).

Data analysis

All analyses were performed using SAS statistical software (SAS Institute, Inc., Cary, NC, USA). Descriptive statistics were performed to assess the relationships between providers' mandatory HIV testing endorsement and their demographics, medical education, level of care, profession, personal contact with PLWHA, and HIV-related training

experiences. Pearson correlation coefficients were calculated to assess the relationship between mandatory HIV testing endorsement and general prejudicial attitude, perceived structural support, perceived risk at work, and HIV knowledge. Further, a series of multiple regression analyses were conducted to examine associations between mandatory HIV testing endorsement, general prejudicial attitude, and perceived structural support; controlling for the simultaneous effects of participants' age, gender, ethnicity, medical education, personal contact with PLWHA, the level of care, and perceived risk of HIV infection.

RESULTS

The study participants were primarily female (74.4%) and of Han ethnicity (72.2%). Approximately 26% of the respondents were younger than 30 years and 29% were 41 years old or older. More than 40% of the sample came

Table 2 Providers' characteristics and endorsement of mandatory HIV testing (n=1101)

Provider characteristics	Mandatory HIV testing endorsement (%)		
	For patients with high-risk behaviour (91.4%)	For patients before an operation (82.1%)	For everyone admitted to the hospital (43.4%)
Age (years)			
29 or younger	89.6	82.1	42.9
30–35	91.7	81.1	40.1
36–40	93.4	86.9	50.8
41 or older	92.0	80.3	43.3
Gender			
Male	89.7	82.6	42.9
Female	91.9	81.9	43.5
Ethnicity			
Han	92.1	80.9	41.5*
Minority	90.0	85.3	49.2
Medical education			
Lower than associate medical degree	90.4	75.6*	40.2
Associate medical degree	92.2	80.6	43.8
Medical degree or higher	92.1	93.7	47.5
Level of care			
Provincial or city hospital	89.3*	89.3*	47.1*
County hospital	96.0	88.5	47.1
Township or village clinic	87.6	58.8	30.8
Profession			
Doctor	90.8	80.1*	43.6
Nurse	93.2	81.8	45.3
Lab technician	86.7	94.3	34.3
Personal contact with HIV+ patients			
Contact	91.2	92.4*	51.1*
No contact	91.6	73.7	37.1
HIV-related training			
Training	91.2	82.5	44.7
No training	92.5	80.9	40.3

* $P < 0.05$

Table 3 Correlation coefficients between mandatory HIV testing endorsement and providers' attitudes, perception, and knowledge (n=1101)*

Provider attributes	Mandatory HIV testing endorsement	
	Correlation coefficient	P value
General prejudicial attitudes	0.16	<0.0001
Perceived structural support	0.03	0.36
Perceived risk at work	0.17	<0.0001
HIV knowledge	-0.02	0.42

*Mandatory HIV testing is in regard to everyone admitted to the hospital

from provincial or city hospitals, and slightly more than one-half of all participants were doctors. Among all participants, 45% reported having personal contact with HIV-positive individuals, and 68% reported receiving HIV-related training.

Providers' characteristics and endorsement of mandatory HIV testing are presented in Table 2. Providers reported

high levels of mandatory HIV testing endorsement for patients with high-risk behaviour (91.4%) and for all patients before an operation (82.1%). About 43% of the providers reported that everyone admitted to the hospital should be given mandatory HIV testing. Providers working at a township or village clinic were significantly less likely to endorse mandatory HIV testing for all patients (30.8%), compared with providers working in provincial or county hospitals (47.1%; $P < 0.05$). In addition, providers who reported personal contact with HIV-positive patients were significantly more likely to endorse mandatory HIV testing for all patients admitted to the hospital (51.1%), compared with providers with no contact (37.1%; $P < 0.05$).

Correlation coefficients between mandatory HIV testing endorsement and providers' attitudes, perception, and knowledge are presented in Table 3. Providers' endorsement of mandatory HIV testing for everyone admitted to the hospital was significantly correlated with their general prejudicial attitudes ($r = 0.16$; $P < 0.0001$) and their perceived risk at work ($r = 0.17$; $P < 0.0001$).

Table 4 Logistic regression examining providers' predictors of mandatory HIV testing endorsement (n=1101)*

Provider predictors	Adjusted Odds ratio	95% confidence limits		P value
		Lower	Upper	
Ethnicity (minority as referent)	0.81	0.61	1.07	0.13
Level of care (referent, township/village clinic)				
Provincial/city hospital	1.20	0.82	1.74	0.34
County hospital	1.40	0.98	2.00	0.06
Contact with HIV+ patients	1.58	1.20	2.08	0.001
General prejudicial attitudes	1.63	1.30	2.03	<0.0001
Perceived risk at work	1.65	1.31	2.08	<0.0001

*Mandatory HIV testing is in regard to everyone admitted to the hospital

For multiple regression analyses, a full model consisting of all provider characteristics and potential predictors of mandatory HIV testing endorsement were first considered in the model. Second, variables significantly associated with mandatory HIV testing endorsement in the bivariate analyses (Tables 2 and 3) were considered. Third, variables that remained significant in the multiple regression analyses were retained in the final model, adjusting for ethnicity and level of care. The results of the final multiple logistic regression model examining providers' predictors of mandatory HIV testing endorsement are presented in Table 4. Controlling for providers' ethnicity and their level of care, providers with higher prejudicial attitudes were significantly more likely to endorse mandatory HIV testing for everyone admitted to the hospital (odds ratio [OR]=1.63; $P<0.0001$). Similarly, providers reporting higher perceived risk at work were significantly more likely to endorse mandatory HIV testing (OR=1.65; $P<0.0001$), and providers who had direct contact with HIV patients were significantly more likely to endorse mandatory HIV testing for everyone admitted to the hospital (OR=1.58; $P=0.001$).

DISCUSSION

China is going through important HIV/AIDS policy reforms, including implementation of the 'Four Frees and One Care' national policy, offering free antiretroviral treatment to rural residents and urban residents without insurance, free voluntary counselling and testing, free prevention of mother-to-child transmission, and free schooling for children in HIV/AIDS-affected families.²⁴ As China advances new treatments and interventions to combat HIV/AIDS, it also faces ethical and social issues related to the epidemic. After over two decades of efforts to control HIV/AIDS, the need to focus on the proper training of health-care providers in implementing HIV/AIDS testing, treatment, and prevention programmes has become increasingly evident.

We found that health-care providers perceive mandatory HIV testing as a self-protection strategy out of fear of infection risk at work. Perceptions of occupational risk and fear of contagion and death have been reported as a factor related to HIV stigma in health care.^{27,28} Previous studies

have demonstrated that fear of infection risk can be reduced by accurate information and training, and fear of occupational exposure, such as needle stick injury can be reduced by adherence to appropriate control procedures, such as universal precautions.^{29,30} If health-care providers could correctly and consistently adopt universal precautions, then identifying patients with HIV infection might seem less important.^{31,32} Moreover, we found that service providers with general prejudicial attitudes towards patients with HIV/AIDS were significantly more likely to endorse mandatory HIV testing. Again, our finding underscores the importance of providing sufficient training for health-care providers at all levels. Further training, including the implementation and reinforcement of universal precautions in health care, should be a priority for China in the coming years.

In this study, about 43% of providers reported endorsing mandatory HIV testing for everyone admitted to the hospital, whereas 91.4% reported patients with high-risk behaviours should be given mandatory HIV testing. This discrepancy underscores providers' misperception about being 'high risk' and HIV positive. Research has shown that when providers choose whom to test for HIV, most providers tended to screen patients with acknowledged HIV risk factors and younger patients, but many patients with hidden high-risk behaviours were missed.³³ Consequently, providers' perceived risk-based HIV testing failed to detect the majority of HIV-infected persons in medical care settings.³⁴ Universal precaution in health care requires the health-care provider to assume the blood and certain body fluids of all patients to be potentially infectious and to act accordingly. Health-care providers' assessment of 'high-risk' groups and associations with their perceived risk for infection could be a potential barrier for effectively implementing universal precaution procedures in China.

Health-care providers' attitudes toward mandatory HIV testing should be interpreted in the social context.³⁵ Traditionally, Chinese society has focused on the collective interest over individual rights, with the individual being expected to do what is necessary to protect society. Health-care providers' perception of mandatory HIV testing reflects this attitude and is, in part, the reason that mandatory HIV tests have been carried out for some high-risk groups or those suspected of being infected. It is clear that, in such practices, the individual's right to

privacy is undermined by the perceived needs and the collective benefit of public health. As Western scholars and researchers have introduced new medical treatments and interventions to China, they have also triggered ongoing debates about individual rights and public health responsibilities. As China makes progress in HIV prevention and treatment, the country will continue to face social and ethical challenges associated with the HIV/AIDS epidemic.

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