

Migration and Gender in China's HIV/AIDS Epidemic

M. Giovanna Merli, Min Hein, Jack DeWaard, Sara Hertog
Department of Sociology and Center for Demography and Ecology
University of Wisconsin, Madison

China is still a low HIV prevalence country. There are an estimated 650,000 HIV cases corresponding to 0.05 percent of the adult population. HIV infections are so far concentrated in relatively well-defined population subgroups, such as injecting drug users, former plasma and blood donors and female sex workers (FSWs) and their clients. Injecting drug users and former commercial blood and plasma donors currently contribute about 55% of all infections while 44% of infections are among female sex workers, their clients and partners of HIV+ individuals. In 2005, 49% of new cases were attributed to heterosexual contact (MOH, UNAIDS and WHO 2006).

Despite current low HIV prevalence, concerns about a growing and more widespread epidemic persist in China. The resurgence of other sexually transmitted diseases (STD) (Chen Z. et al. 2007; Parish et al. 2003) and changing sexual norms that accompany China's rapid pace of social and economic change (Farrer 2002; Sigley and Jeffreys 1999) suggest that the potential exists for a generalized HIV epidemic in China.

Rural-to-urban migration is frequently identified as an issue of special concern for the spread of HIV in China because of its magnitude and the well established association between mobility and the spread of HIV in other societies (Hunt 1989; Pison et al. 1993; Nunn et al. 1995; Decosas et al. 1995; Lurie et al. 1997; Lurie et al. 2003; Coffee et al. 2007). In 2003, the number of rural migrants residing in Chinese urban areas was estimated at 140 million, equivalent to 30% of the rural labor force (Huang and Zhang 2005). Chinese rural migrants have been identified as a likely reservoir of high risk behaviors, and potential bridges of HIV infection between the urban and rural populations (Hong et al. 2006; Tucker et al. 2005; Anderson et al. 2003; du Guerny et al. 2003; Gill, Chang and Palmer 2002; Kaufman and Jing 2002; Zhang and Ma 2002).

Experiences of social exclusion, long separations from their families and their primary social networks, and institutional barriers that keep them in a position of second class citizens (Solinger 1999) are factors expected to lead rural migrants, to adopt risky sexual behaviors upon arrival to their urban destinations.

The empirical record on the link between migration and risk behaviors in China is mixed. Some studies of Chinese rural migrants' adaptations to their experience of social isolation suggest multiple sexual partnerships, patronage of commercial sex, especially among the most mobile migrants (Li et al. 2004), injecting drug use (Yang, Derlega and Luo 2005), and a higher vulnerability to STD infection (Li et al. 2004; Yang 2005) among migrants compared with their urban peers. However, the results of multiple studies call into question the association between migrant status and HIV risk. According to data from the Chinese Health and Family Life Survey (CHFLS), male migrants to urban areas show levels of risky sexual activity that are only marginally higher than those displayed by their urban non-migrant counterparts (Parish et al. 2003). He et al. (2006) found that of 986 sexually active male migrants recruited from venues employing migrants in Shanghai, 11.5 percent reported ever having sex with a commercial sex worker but only 3.2 percent reported engaging in commercial sex since migration to

Shanghai. A study of male migrant and non-migrant urban workers in Eastern China failed to find any significant difference in the prevalence of syphilis between the two groups (Hesketh et al. 2005). In a large population-based sample in Southwest China, Yang et al. (2005) found that rural migrants had a significantly higher prevalence of HIV-related risk behaviors than urban residents, both sexual and drug using, but no difference was found between rural migrants and urban residents in the prevalence of HIV/STDs. Although studies of migration and HIV/STD risk have for the most part, focused on male migrants, recent work indicates that gender plays an extremely important role in modifying the association between migration status and risk behaviors. Because of inequalities in education and job training, female rural migrants are at a disadvantage relative to their male peers (Huang 2001). They are channeled overwhelmingly into low-status occupations and are disproportionately concentrated in the service and entertainment sectors (Fan 2000; 2003). The thrust for entertainment workers to engage in prostitution or the chance to be forced into prostitution are strong (Liao, Schensul and Wolffers 2003). Wang et al (2004) found that female migrants in Beijing and Nanjing working in entertainment establishments (barbershops, massage parlors, bathhouses, dancing hall, nightclubs, bars) were twice more likely to engage in risky sexual behaviors than female migrants working in other types of service establishments (e.g. restaurant, hotel, retail shop, stall, construction and domestic service). Female migrants tend to be younger than male migrants; 63 percent of female migrants in the 2000 census were between the ages of 15 and 29, compared to 52 percent of male migrants, and more likely to be unmarried (Liang and Ma 2004). Female migrants also maintain a close link to their communities of origin. Many expect to return home when they reach marriageable age (Fan 2003; Liao et al. 2003).

A recent analysis of survey data in Southwest China (Yang and Xia 2006) revealed that the difference in prevalence of risk behaviors between rural migrants and urban residents was due to a disproportionately high prevalence of casual and commercial sex among female migrants, compared to both urban residents and male migrants. The higher prevalence of these behaviors among female migrants was explained by their disproportionate representation in the service sector, especially in entertainment venues, an occupation which places them at high risk of engaging in prostitution. Prostitution is associated with high prevalence of STDs or reports of STD history (Lau et al., 2002; Ruan et al., 2006; Zhong et al., 2002; Ding et al., 2005) because of higher risk of exposure to infected clients, low rates of condom use and incomplete knowledge of risk behaviors (van den Hoek et al., 2001; Chen X. et al., 2005; Hesketh et al., 2005; Xia and Yang, 2005; Wang et al., 2005).

In this paper, we aim to better understand the HIV risks specific to rural female migrants in China and to explore the relationship between gender, migration and prostitution in contributing to the spread of HIV. Many studies which have sought to understand HIV and STD disease acquisition and transmission in China have relied on an epidemiological approach, which emphasizes the identification of individual risk factors that increase the likelihood of disease in one group relative to another. We recognize that, in addition to individual risk factors, the distribution of STD and HIV in a population is further dependent upon the organization of sexual partnering, population-level factors (e.g. population composition; HIV prevalence), and the underlying macro-social, structural forces which determine individual risk, in a context where the state has

withdrawn from the regulation of individual lives and social and economic forces are shaping the way in which groups and individual interact sexually. We rely on the perspectives of epidemiology and of the social sciences to understand HIV risks of female migrants in China and the implications of female migration and sexual behavior for the spread of HIV.

To understand the risk of acquiring HIV/STD faced by rural female migrants in China and explore the relationship between gender, migration and prostitution and its implications for the spread of HIV, we implement a bio-behavioral macrosimulation model of the spread of HIV/AIDS (Palloni and Lamas 1991). The model was originally developed to describe the course of the HIV/AIDS epidemic in Sub-Saharan Africa. It was recently modified to represent the Chinese regime of sexual relations (Merli, Hertog, Wang and Li 2007), to accommodate multiple scenarios of sexual activity and sexual mixing (Hertog 2007) and to model migration between rural and urban areas (Merli and Hertog 2007). For the purposes of our present objective, we will modify the model to enable a more dynamic modeling of migration, prostitution and HIV infection.

The macrosimulation model is essentially a two-sex cohort component population projection with multiple states and multiple flows designed to simulate the effect of various demographic, biological and behavioral risk factors on the heterosexual spread of HIV. Modeling begins with the creation of six distinct populations. First the model defines the populations of urban males, urban females, rural males and rural females. Next, it defines a given fraction of the urban and rural female populations as prostitutes, who do not have regular non-commercial partners, but with whom men may seek contact in addition to their relationships with non-prostitute partners. Currently the model simulates entry into the prostitute population for 2 percent of rural and urban women age 15-39 in each simulation cycle, consistent with an estimated 6 million prostitutes ages 15-39 in China today (Horizon Market Research and Futures Group Europe 2002; Yuan et al. 2002). Prostitution is an absorbing state. The only mechanism to exit this population is death. The modifications of model structure and specifications we plan to introduce will enable modeling of the process of renewal of the prostitute population, cycling of women out of prostitution, transitions of female migrants in and out of prostitution, return migration of female migrants, and multiple types of sexual partnerships for prostitutes, both commercial and non-commercial.

Demographic (fertility, mortality, migration) and behavioral input parameters governing the spread of the epidemic (rate of partner change, condom use, etc.) will be extracted from a wide range of existing data, including China's most recent census completed in 2000 and the China Health and Family Life Survey (CHFLS), the first nationally representative survey of adult sexual behavior to have been conducted in China. Behavioral inputs driving the simulation of the dynamics of the prostitute population will be informed by the findings of qualitative work undertaken to explore the determinants of prostitution by the first author and Chinese colleagues among Shanghai female sex workers. Conditional on timely completion of an ongoing survey of sexual behavior and sexual networks among Shanghai residents, rural migrants and female sex workers, spearheaded by the first author, preliminary analysis of these data will provide a wide variety of input parameters that describe the relationship between female migration, prostitution and HIV in China.

Scenario analyses will yield a range of possible outcomes consistent with variations in the relationship between female migration and prostitution, which is the focus of our current work. Our results will improve knowledge of the epidemiological relevance of Chinese migrants for the spread of HIV/AIDS, shed further light on the complex process of migration in China and identify an important gender dimension of HIV/AIDS vulnerability in China.

References

- Anderson, A.F., Z. Qingsi, X. Hua, and B. Jianfeng. 2003. "China's floating population and the potential for HIV transmission: a social-behavioral perspective." *AIDS Care* 15(2):177-185.
- Chen, X., Yin, Y., Liang, G., Gong, X., Li, H., Pomeroy, G., et al. 2005. Sexually transmitted infections among female sex workers in Yunnan, China. *AIDS Patient Care and STDs*, 19(12), 853-860.
- Chen, Zhiqiang, Guocheng Zhang, Xiangdong Gong, Charles Lin, Xing Fao, Guojun Liang, Xiaoli Yue, Xiangsheng Chen, Myron S. Cohen. 2007. "Syphilis in China: Results of a national surveillance programme." *The Lancet* 369:132-369.
- Coffee Megan, Mark N. Lurie and Geoffrey P. Garnett. 2007. "Modelling the impact of migration on the HIV epidemic in South Africa." *AIDS*. 21:343-350.
- Decosas, J. F. Kane, J. K. Anarfi, K.D.R. Sodji, H.U. Wagner. 1995. "Migration and AIDS." *The Lancet* 346:826-8.
- Ding, Yanpeng et al. 2005. "HIV Infection and Sexually Transmitted Diseases in Female Commercial Sex Workers in China." *Journal of Acquired Immune Deficiency Syndrome* 38, no. 3: 314-19.
- du Guerny, Jacques, Lee-Nah Xsu and Cao Hong. 2003. *Population movement and HIV/AIDS. The case of Ruili, Yunnan, China*. UNDP South East Asia HIV and Development Programme. August 2003.
- Fan, C. Cindy. 2000. "Migration and gender in China," in *China Review 2000*, C.M. Lau and J. Shen, eds. Hong Kong: Chinese University Press, pp. 423-454.
- Fan, C. Cindy. 2003. "Rural-urban migration and gender division of labor in China," *International Journal of Urban and Regional Research*. 27(1):24-47.
- Farrer, James. 2002. *Opening Up: Youth Sex Culture and Market Reform in Shanghai*. Chicago: University of Chicago Press.

- Gill, Bates, Jennifer Chang and Sarah Palmer. 2002. "China's HIV Crisis." *Foreign Affairs* 81(2).
- Hertog, Sara. 2007. Heterosexual Behavior Patterns and the Spread of HIV/AIDS: The Interacting Effects of Rate of Partner Change and Sexual Mixing. *Sexually Transmitted Diseases*. August 30, 2007.
- Hesketh T., L. Li, X. Ye, H. Wang, M. Jiang, A Tomkins. 2005. "HIV and syphilis in migrant workers in eastern China." *Sexually Transmitted Infections* 82:11-14.
- Hong, Y., B. Stanton, X. Li, H. Yang, D. Lin, X. Fang, J. Wang, and R. Mao. 2006. "Rural to Urban Migrants and the HIV Epidemic in China." *AIDS and Behavior* 1-10.
- Horizon Market Research and Futures Group Europe. 2002b. *2001 Behavioural Surveillance Survey in Yunnan and Sichuan. Sex Workers Report*. December 2002.
- Huang, Y. 2001. "Gender, hukou, and the occupational attainment of female migrants in China (1985–1990)." *Environment and Planning* 33(2):257-279.
- Huang, Ping and Zhang Shaohua. 2005. "Internal migration in China: Linking it to development." Paper presented at the Regional Conference of Migration and Development in Asia, Lanzhou China 14-16 March 2005.
- Hunt, C. W. 1989. "Migrant labor and sexually transmitted disease: AIDS in Africa." *Journal of Health and Social Behavior*. 30:353-373.
- Kaufman, Joan and Jun Jing. 2002. "China and AIDS – The time to act is now." *Science* 296 (28 June 2002):2339-2340.
- Lau, J., Tsui, H., Siah, P., & Zhang, K. 2002. A study on female sex workers in southern China (shenzhen): HIV-related knowledge, condom use, and STD history. *AIDS Care*, 14(2), 219-233.
- Li Xiaoming, Xiaoyi Fang, Danhua Lin, Rong Mao, Jing Wang, Lesley Cottrell, Carole Harris, and Bonita Stanton. 2004. "HIV/STI risk behaviors and perceptions among rural-to-urban migrants in China." *AIDS Education and Prevention* 16(6):538-556.
- Liang, Zai and Zhongdong Ma. 2004. "China's floating population: New evidence from the 2000 Census." *Population and Development Review* 30:467-488.
- Liao, S.S., J. Schensul, and I. Wolffers. 2003. "Sex-related health risks and implications for interventions with hospitality women in Hainan, China." *AIDS Education and Prevention*. 15(2):109-121.

Lurie, Mark, Harrison A, Wilkinson D, Abdool Karim SS. 1997. "Circular migration and sexual networking in rural South Africa: Implications for the spread of HIV and other sexually transmitted diseases." *Health Transition Review*, 1997; Suppl. 3 to Vol. 7:15-24.

Lurie, Mark N., Brian G. Williams, Kangelani Zuma, David Mkaya-Mwamburi, Geoff Garnett, Adriaan W. Sturm, Michael Sweat, Joel Gittelsohn, and Salim Abdool Karim. 2003. "The impact of migration on HIV-1 transmission in South Africa." *Sexually Transmitted Diseases* 30:149-156.

Merli, M. Giovanna, Sara Hertog, Bo Wang and Jing Li. 2006. "Modeling the spread of HIV/AIDS in China: The role of sexual transmission." *Population Studies* 60(1):1-22.

Merli, M. Giovanna and Sara Hertog. 2007. "Masculine sex ratios, migration and the spread of HIV in China." Unpublished manuscript. University of Wisconsin, Madison.

MOH, UNAIDS and WHO. 2006. People's Republic of China Ministry of Health, Joint UN Program on HIV/AIDS and World Health Organization (WHO). 2006. *2005 Update on the HIV/AIDS Epidemic and Response in China*. Beijing: National Center for AIDS/STD Prevention and Control.

Nunn, A. J., H.U. Wagner, A. Kamali, J.F. Kengeya-Kayondo, and D. W. Mulder. 1995. "Migration and HIV-1 Seroprevalence in a rural Ugandan population." *AIDS* 9:503-506.

Palloni, Alberto and Luis Lamas. 1991. "The Palloni approach: A duration-dependent model of the spread of HIV/AIDS in Africa." *The AIDS Epidemic and its Demographic Consequences*. New York: United Nations and Geneva: WHO.

Parish, William, Edward O. Laumann, Myron S. Cohen, Suiming Pan, Heyi Zheng, Irving Hoffman, Tianfu Wang, and Kwai Hang Ng. 2003. "Population-based study of Chlamydial infection in China: A hidden epidemic." *JAMA* 289(10):1265-1273.

Pison, G. B. Le Guenno, E. Lagarde, C. Enel, and C. Seck. 1993. "Seasonal migration: A risk factor for HIV infection in rural Senegal." *Journal of Acquired Immune Deficiency Syndromes* 6(2): 196-200.

Ruan, Y., Cao, X., & Qian, H. 2006. Syphilis among female sex workers in southwestern China: Potential for HIV transmission. *Sex Transm Dis.* 33(12): 719-723.

Sigley, Gary and Elaine Jeffreys. 1999. On 'sex' and 'sexuality' in China: A conversation with Pan Suiming, *Bulletin of Concerned Asian Scholars* 31(1):50-58.

Solinger, Dorothy. 1999. *Contesting Citizenship: Peasants, Migrants, the State, and the Logic of the Market in Urban China*. Berkeley and Los Angeles: University of California Press.

Tucker, J.D., G.E. Henderson, T.F. Wang, Y.Y. Huang, W. Parish, S.M. Pan, X.S. Chen and M.S. Cohen. 2005. "Surplus Men, Sex Work, and the Spread of HIV in China." *AIDS* 19(6):539-47.

van den Hoek, Anneke, Fu Yuliang, Nicole H.T.M. Dukers, Chen Zhiheng, Feng Jiangting, Zhang Lina and Zhang Xiuxing. 2001. "High prevalence of syphilis and other sexually transmitted diseases among sex workers in China: Potential for fast spread of HIV." *AIDS* 15:753-759.

Wang, B., Li, X., Stanton, B., Yang, H., Fang, X., Zhao, R., et al. 2005. Vaginal douching, condom use, and sexually transmitted infections among Chinese female sex workers. *Sex Transm Dis*, 32(11), 696-702.

Wang J, Yang H, Li X, Stanton B, Fang X, Lin D, Mao R. 2004. "Venue patterns of HIV-related sexual behaviors and perceptions among female migrant workers." Paper presented at the International Conference on AIDS, July 11-16, 2004.

Xia, Guomei and Xiushi Yang. 2005. "Risky sexual behavior among female entertainment workers in China: Implications for HIV/STD prevention intervention." *AIDS Education and Prevention* 17(2):143-156.

Yang, Xiushi. 2005. "Does where we live matter? Community characteristics and HIV/STD prevalence in Southwestern China." *International Journal of STD and AIDS*, 16(1): 31-37.

Yang, Xiushi. 2006. "Temporary migration and HIV risk behaviors in China." *Environment and Planning* 38(8) A: 1527-1543

Yang, Xiushi, Valerian J. Derlega and Huasong Luo. 2005. "Migration, behavior change, and HIV/STD risks in China." Paper presented to the IUSSP meetings, Tours, France, August 2005.

Yang Xiushi and Guomei Xia. 2006. "Gender, migration, risky sex and HIV infection in China." *Studies in Family Planning* 37(4):241-250.

Yuan Jianhua, Xu Yi, Jiang Tao, Wang Mei, Li Yaqing, Liu Kejun, Qu Shuquan, Bai Yue, Wang Lingyun, Lori Bollinger, Neff Walker, He Jingling, and George Ionita. 2002. *The Socioeconomic Impact of HIV/AIDS in China*. August 2002.
<http://www.51condom.com/english/resources/Ourreports/SocEc%20Impact%20study.pdf>

Zhong, N., Lu, Y., & Wang, F. 2002. Syphilis surveillance among 3,939 prostitutes. *China Tropical Medicine*, 2, 100-101.