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REVIEW

China's migrant population and health

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Abstract

Population flow brings vitality to China's economy and society, while at the same time it also impacts traditional social structures and culture. In recent years, with the gradual disappearance of the "demographic dividend" and the advancement of economic structural transformation and upgrading, there have been changes to China's population flow that are worth of noting. In particular, the changing health status of China's migrant population has attracted the attention of scholars. Because non-migrant and migrant populations have significant behavioral and lifestyle differences, and because living environments and the provision and utilization of medical and health care services differ, the health status of the two populations are different. Young migrants are more prone to mental health problems than young non-migrants, while migrant women of childbearing age are likely have reproductive health problems than local women. The health status of young and middle-aged migrants will deteriorate with the extension of their flowing time. For elderly migrants, social support has a positive effect on health status. At present, China's migrant population is threatened by infectious diseases, chronic non-infectious diseases and mental illnesses, while the supply of basic public health services is insufficient. Therefore, health work for migrant populations should occur against the backdrop of the "Comprehensive Health", with this being used as a guideline. At the same time, health planning should make use of social integration and health promotion, equalization of basic public health care services, "Internet +", and other schemes to improve the health status of the migrant population.

Keywords Migrant population · Floating population · Physical health · Mental health · Health changes · Influencing factors

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1 The overall health status of the migrant population in China

1.1 Changing trends of China's migrant population

According to the Sixth National Population Census (2011), China's migrant populations totals 260 million people. Population flow brings vitality to the Chinese economy, and also impacts traditional social structures and culture. Before the reform and opening-up, China's household registration policy made it difficult for Chinese people to move freely. In 1984, the "Notice of the State Council on the Issue of Rural Population Entering Towns", released by the State Council, loosened controls over the population, and rural people began to enter small and medium-sized cities and towns to live and obtain employment. From 1982 to 1990, the size of China's migrant population increased from 6.7 million to 21.35 million, with an average annual growth rate of around 7%. During the 20 years from 1990 to 2010, the migrant population grew rapidly with an average annual growth rate of approximately 12%. By 2010, China had a migrant population of 223.43 million people. However, since 2010, the rate of growth of the migrant population has slowed. During the years 2010 to 2014, the growth rate of the migrant population dropped to about 3% annually (Duan et al. 2008; National Bureau of Statistics of China 2011, 2012, 2013, 2014, 2016a, b). Since the reform and opening-up began, the labor force in China has flowed mainly from rural to urban areas and from central and western regions to economically developed areas in the east.

As the "demographic dividend" has gradually disappeared while economic structural transformation and upgrading has moved forward in recently years, new trends in China's population movement have appeared: First, the overall scale of the flow of people has continued to decline. In 2016, the floating population was 245 million people, a decrease of 1.71 million from the end of the previous year (National Health and Family Planning Commission of the People's Republic of China, 2018). The most recent *China Migrant Population Development Report 2018* shows that, compared to 2016, the migrant population in 2017 decreased by 820,000. One of the main reasons for the decrease in migrant population size is the reform of the household registration system that has allowed some migrants to become "citizens" (registered residents) of the urban areas where they now live. The return of some migrants to their hometowns has also contributed to the decline. Second, the overall level of urbanization in China population has increased rapidly, and China's population has become more concentrated in urban areas. In 2016, China's urban population accounted for 57.35% of the total population. There are significant concentrations of population alongside rivers, in coastal areas and along railway lines. Agglomerations of population in major metropolitan areas have continued to grow. The proportion of cross-provincial migration has declined year to year, while the proportion of cross-city migration within the same province has steadily increased. At the same time, the average time migrants remain in inflow areas has continued to increase, and the stability of migrant populations has increased. Finally, the proportion of female migrants

has increased, and the gender ratio of migrant populations has become more equal. While the overall trend of family units migrating together is obvious, the proportion of married couples who moved together to a new place has declined slightly in the past two years. The demand for public services and social security for migrants is growing rapidly. Migrants in the youngest generation have less connection than their parents with their places of origin or outflow areas. In addition, along with their growing up, these new migrants are tend to stay at the new city and have families in the future. The proportion of migrants consuming goods and services like housing, maternity services, medical care and elderly care in inflow areas is continuously rising. These changes are creating new challenges for the departments tasked with managing and providing services to migrant populations.

In response to the development of the migrant population, the Chinese government has proposed a new type of people-centered urbanization, and a deepening of the reform of the household registration system in order ensure that all Chinese citizens have equal access to public services and benefits. Several State Council documents including the "National Population Development Plan (2016–2030)", "13th Five-Year Plan for Health and Wellness Plan", and "Program to Promote 100 Million Non-Residents in Urban Settlement" and others have set out clear and specific requirements to facilitate better management of migrant populations.

1.2 Changes in the health status of the migrant population

International research about migration find that laborers who are healthier have a stronger willingness and ability to float and migrate. The health status of people in their home country before migrating is generally better than the health status of local residents in the country to which these people later immigrate. Here are reasons about the effect of health migration: first, self-selection, individuals with better health condition are more likely to choose to immigration. Second, government regulation: in some countries or regions, only immigrants with good health status will be allow to enter the broad or get a working permission. Finally, due to the high cost of health service bill and culture reasons, some immigrants choose to return to their hometown when they have diseases. This intrinsic selectivity produces a healthy immigrant effect. However, as the immigrants work and live in the country to which they immigrated, their health advantages gradually weaken, and their health status gradually converges with that of local residents. Even worse, the health status of the immigrants becomes worse than the health conditions of residents of their home country.

In China, there is a lack of research on the overall health status of the migrant population. Moreover, because the studies that do exist have focused on different population groups that have varied migration experiences and have migrated for differing periods of time, the findings of the studies vary. For example, Zhang (2018) used the 2015 China Comprehensive Social Survey (CGSS) as a data source to show that both migrant and non-migrant populations in China are generally in good health condition. Another study shows that the health status of migrant populations

is better than that of non-migrant populations because of the "healthy immigration" and the "Salmon bias" hypotheses (Qi et al. 2012). In general, as the length of time of the migration period increases, the overall health status of migrant populations that begin with better health tends to decrease. The lessening or in some cases disappearance of the health advantages of migrants reflects the unequal access migrants and local residents have to available social resources.

Based on the bio-psycho-social medical model advanced by modern medicine, there are four main types of factors affecting population health: biological genetic factors, environmental factors, behavioral and lifestyle factors, and healthcare service factors. A survey of the causes of death produced by the World Health Organization in 2008 found that 50% of deaths were caused by behavioral and lifestyle factors, 30% by environmental factors, and 10% each by biological genetic factors and healthcare services factors. In general, the factors affecting the health status of migrant populations include: demographic characteristics, culture and language ability, socio-economic conditions, social security levels, and behaviors and lifestyles. Demographic factors include age, gender, marital status, education level and related items. With respect to socio-economic factors, personal income level, family income status and family structure have an impact on health. Behavior and lifestyle significantly affect the health of migrants; for example, the health risks of smoking have been widely confirmed. However, the findings of Chinese scholars with respect to the impact of social security factors are not consistent. In addition to factors noted above, family medical expenditures and access to health care services, medical decisions and health awareness, and personal living environments also have significant impacts on the health status of migrant populations.

2 The health status of migrant population sub-groups

Numerous previous studies have focused on the health status of particular groups within the migrant population. Studies have examined migrant adolescents and their mental health issues, changes in the health status of young and middle-aged migrants, and the reproductive health status of migrant women. Today, research is targeting the health issues facing elderly migrant populations. In particular, the structural characteristics of elderly populations as they pertain to potential health risks are being studied (Song and Zhang 2018).

2.1 The health status of the adolescent migrant population

Adolescent migrant populations consist of groups of youths between the ages of 11 and 25 who have migrated to urban areas to study, or in some cases youths who have dropped out of school and doing some unskilled work (Qin 2014). As China has become increasingly more urbanized in recent years, the size, direction, structures and requirements of migrant populations have changed significantly. One of the key changes is the tendency of migrants to live in family units. The number of migrant adolescents who live with their parents while studying

or working in inflow area has greatly increased. Adolescents are going through a period of rapid physical and psychological changes as they become young adults. Migrant adolescents must also cope with the influences of migration and migrant life as they go through these changes with the result that many migrant youths experience mental health problems. A recent study has shown that migrant adolescents are more likely to have minor psychological problems than non-migrant adolescents, and that migrant female adolescents are significantly more likely than migrant males to have psychological problems (Zhao et al. 2018). It has also been determined that psychologically troubled migrant youths are more likely to be from incomplete families, such as single parent family, or other families that children are not living with both of their birth parents. In contrast, young migrants who are living with their birth parents together seems have less psychological problems. Furthermore, in the case of migrant teenagers living with their families in inflow areas, the educational level of parents is positively related to the mental health of the teenagers. Young migrants are removed from the cultural influences of their hometowns, and live freely in urban areas surround by urban life. They do not have access to the social support networks available to urban residents, and in some cases, are separated from urban residents by language barriers and cultural differences. These factors make it difficult for young migrants to integrate into urban life. At the same time, the influence of the family unit on a young migrant cannot be ignored. Migrant family parents do not have sufficient time to spend with their children. Parent–child relationships are often not close enough, and migrant teenagers may lack a sense of belonging and attachment (Shao 2006). These teenagers are more likely to experience psychological and behavioral problems (Hong et al. 2016). Incomplete family structures leave young migrants lacking a sense of security. These young people tend to be strongly defensive and can exhibit aggressive behavior. Even worse, as they enter adulthood, undesirable personality characteristics may develop, with troubled young people becoming emotionally unstable, indifferent, unmotivated and rebellious (Chen et al. 2011). Such individuals can, to some extent, impact social stability. Data on juvenile delinquency in China show that both the numbers and proportion of crimes committed by the migrant population are trending upward. This is more likely to be the case in densely populated urban areas (Duan et al. 2013).

Studies of major health problems and health seeking behaviors of migrant adolescents by Yu and others scholars in Shanghai (Yao and Zhang 2016) find that most migrant adolescents do not view health needs as their highest priority. Stress, anxiety, feelings of inferiority, irritability, and emotional instability are all common among migrant adolescents. Young migrants lack stable relationship networks, and often receive insufficient parental care and education. Lack of education is also barrier to their accessing health-related information.

International and domestic research have confirmed that the social status of the family and the quality of interpersonal networks both have an impact on adolescent psychological health (Yao and Zhang 2016; Xiao 2012). In terms of psychological health, migrant adolescents with lower social status are at a disadvantage. On the contrary, a good family background can provide better material and cultural conditions for migrant children, thus promoting their mental health. Moreover, healthy

interpersonal networks positively affect adolescent mental health and generally have a greater impact on family mental health than family social status.

2.2 Status of reproductive health of migrant women of childbearing age

The health issues of female migrants are an important part of the research on the health of the migrant population (Zhang 2014). Research on the reproductive health status of women of childbearing age covers four key aspects: unintended pregnancies, induced abortions, reproductive system diseases and maternal health care.

According to data from Guangdong Province, among 2006 female migrants aged 15–35, 975 of them had sexual behavior. In these 975 migrants, 651 of them had an abortion, which occupied 66.8%. During these 651 women, 75.7% of them did not use any contraception method ever, which total 493 individuals (Huang et al. 2004). In Shenzhen, 22% of married migrant women of childbearing age are suffering from vaginitis; this proportion is higher than that of Shenzhen resident married women of childbearing age suffering from vaginitis. Due to the increase of premarital sexual activity and the low proportion of contraceptive usage among migrant populations, the proportion of unintended pregnancies and the abortion rate of migrant women of childbearing age are both relatively high. Furthermore, migrant women show more positive results in cervical disease screenings, and have low visitation rates (Wang et al. 2009; Fang et al. 2003; Lou et al. 2001; Huang et al. 2005). Many women are shy and unwilling to consult medical professionals about reproductive health issues, and this is the main reason for the low rate of medical treatment. Additionally, some migrant women of childbearing age become sex workers, or suffer from sexual abuse, forced to be prostitution, the threat of disease is higher than that of non-migrant women populations. In terms of access to maternal health care, the situation for migrant women of childbearing age compares unfavorably to that of non-migrant urban residents (Tian and Liu 2006).

In recent years, maternal perinatal management for migrant women has begun to get more attention, yet the understanding of the pre-pregnancy health status of women of childbearing age is insufficient. The former Institute of Science and Technology of the National Health and Family Planning Commission conducted a study of healthy women of childbearing age who participated in the free national pre-pregnancy physical examination from 2010 to 2013 (Xu et al. 2016). It was found that the proportion of migrant women of childbearing age who felt work, economic and relationship pressures was significantly higher than the proportion of non-migrant women of childbearing age experiencing the same pressures. The rate of preterm birth, spontaneous abortion and placental abruption were higher for migrant women of childbearing age than for non-migrant urban resident women of childbearing age.

2.3 The health of young and middle-aged migrant populations

China's migrant population is dominated by young laborers. Some scholars believe that the health status of China's migrant population is better than that of local residents in the places to which migrants inflow. Other scholars believe that the migrant

population is in a weak position and faces relatively high health risks. Their health status is worse than that of local residents in the inflow areas (He and Ren 2014; Qi et al. 2014). These two views are most likely based only on the results of cross-sectional studies and do not take into consideration the changes of health status of migrant populations over time. Foreign scholars studying international immigrants have found that people with better health conditions have greater willingness and ability to move and migrate. Therefore, when immigrants arrive in the country of immigration, their health status is better than local residents who were born in that country. As time goes by, this advantage gradually diminishes, and the health status of immigrants eventually becomes worse than that of the resident population of the immigrant country. These changes are quite likely related to environmental changes, increased pressure, inaccessible or insufficient social support, institutional and structural barriers, cultural adaptation barriers, and lack of access to legal aid (Wu 2010).

The Institute of Health Science Research, Renmin University of China used the "2015 Youth Migrant Population Health Questionnaire" to analyze the trends and identify factors that may influence the body mass index of young migrants (Guo 2017). The results show that the overweight/obesity ratio of the resident populations was 18.9%, while the ratio of migrant populations showed a tendency to change over time. The overweight/obesity ratio for migrants who had lived in inflow areas less than 1 year was lower than that of resident populations. For migrants who had lived for 1–5 years in inflow areas, the overweight/obesity ratio was close to that of the local population; however, the overweight/obesity ratio for migrants who had lived for 5 years or more in inflow areas reached 27.8%, and this was much higher than that of local populations. This upward trend of the overweight/obesity ratio for migrants is related to the health knowledge and awareness of migrant populations and their lifestyles. It is also related to the fact that migrant populations cannot fully participate in social security and medical services programs for urban residents. Therefore, the health status of the young and middle-aged migrants declines as the time living in inflow areas increases.

2.4 Health status of the elderly migrant population

In recent years, the proportion of migrants who are elderly has increased steadily due to greater mobility that allows families to migrate together. According to the *China Migrant Population Development Report 2018*, in the three years since 2015, the overall size of the migrant population has declined each year, while the number of elderly migrants has continued to rise. This development has resulted in academics paying greater attention to the health status of the elderly migrant populations.

Studies have shown that the self-evaluated health status of elderly migrants is better than that of non-migrant elderly (Guo 2017; Du and Guo 2015). This result may be because younger seniors, aged 60–64, account for 50% of the elderly migrant population. Moreover, migration behavior is a self-selective process. Older people with better health are more likely to choose to migrate with their children, in order to be available to care for grandchildren, or to work or do business. Active social participation and adequate social support have a positive effect on the mental health

and self-evaluated health of the elderly. Studies have also shown that, when it comes to maintaining mental health, elderly migrants receive the most social support from their spouses, followed by friends, and finally from their children (Hu and Zhou 2013).

In addition to elderly migrants who care for their grandchildren or simply enjoy retirement, there are many elderly migrant workers in the elderly migrant population. The physical condition of this group is acceptable, but their mental health level is low. It is not only lower than that of local residents of the same age, but even lower than the national average (Jiang et al. 2007). This can be attributed to a number of factors. Elderly migrants in the workforce are often poorly educated and are mostly engaged in unskilled, low-end jobs or informal employment. Additionally, they have limited incomes and insufficient social security support. As they grow older, they may fall into poverty. Physical diseases and psychological disorders are the key reasons for suicides amount elderly migrants (Huang and Liu 2013) Social support can alleviate the negative effects of stress on mental health, as evidenced by previous studies (Wu, Duan and Zhu 2016).

Elderly migrants are a group with high demands for health care services. This group needs more health education services; there is still much room to improve health awareness among elderly migrants.

3 The main health challenges facing migrant populations in China

Some of the health challenges that migrant populations face are similar to those faced by residents in the migrant inflow areas. However, due to the movement of the population, migrants face specific challenges that impact migrant populations in China. Some scholars believe that both contagious and infectious diseases have become major problems affecting the health of migrants (Du 2016). Poor living environments, living in groups, lack of health awareness and other factors are also pertinent to these challenges. Tuberculosis and AIDS are the gravest of the contagious disease threats faced by migrants. As China's economy and society have developed, the threat of chronic non-communicable diseases to the migrant population has also increased. In addition, the mental health issues of migrant populations associated with the stresses of moving have begun to receive more attention from academic institutions and relevant government departments. Although the occupational injuries such as pneumoconiosis and occupational poisoning that migrants suffer from are frequently reported, epidemiological studies of these occupational hazards are rare. In fact, migrants do not have the same access that residents in inflow areas have to basic public health services and this is one of the factors influencing the health of the migrant population.

3.1 Challenges from contagious diseases such as tuberculosis and AIDS

The incidence of tuberculosis is much more common among migrant populations than it is among resident populations of inflow areas. For example, the

registration ratio of migrants seeking treatment for active pulmonary tuberculosis is 27.4/100,000 in Beijing's Chaoyang district, while the ratio of Beijing residents seeking the same treatment is 7.9/100,000 (He et al. 2013). A tuberculosis project undertaken by the Fujian Province Global Fund found that the registration ratio of migrants for active pulmonary tuberculosis was 77.84/100,000, also significantly higher than the registration ratio of 38.89/100,000 for the local population (Du et al. 2013). The incidence of drug-resistant tuberculosis among migrant populations is also more common than it is among resident populations of inflow areas. In 2008 in Shenzhen, 5.59% of migrant tuberculosis patients resisted drug treatments, while the resistance rate for the resident population was only 1.25%. In Chongqing, an epidemiological study of tuberculosis in the migrant population showed that the proportion of migrants registered for tuberculosis treatment increased year by year from 2009 to 2014, standing at 4.0% in 2009 and reaching 9.4% in 2014 (Su et al. 2016). Zhejiang province is an important area for migrant inflows in eastern China. According to Chen et al. (2014), between the years 2005 and 2011 in Zhejiang province, the number of migrants seeking treatment for active pulmonary tuberculosis increased by 60.34% and the number seeking treatment for smear-positive tuberculosis increased 24.78%. The annual increase rates were 1.98% and 1.71%, respectively. Moreover, the number of migrants who suffer from tuberculosis and are HIV positive is also on the rise (Chen et al. 2014).

AIDS is a sexually transmitted disease that poses a serious threat to the health of all human beings. Studies (Xu et al. 2017) show that population mobility is an important factor affecting the prevalence of sexually transmitted diseases such as AIDS (Leyva-Flores et al. 2014). In Changzhou city, Jiangsu province, test results in 2012–2013 found the detection rate of HIV virus antibodies to be 0.5% for 800 sex workers (Wang et al. 2014a). In the Pudong New Area of Shanghai, 481 female migrants volunteered to be tested and the group was found to have an HIV positive rate of 0.416% (Wang et al. 2014b). In Kunshan city, Jiangsu province, researchers surveyed 300 men who had sex with other men (MSM), 238 of them are migrants, which occupied 79.33% of this group. Among these 300 men, 5.33% tested HIV positive (Wang et al. 2011). A similar survey in the Dongcheng district of Beijing showed that the HIV antibody detection rate among the MSM group was 12.94% (Zhao et al. 2014).

3.2 Challenges from chronic non-communicable diseases

Although the main threats to migrant populations are from infectious diseases, risks from chronic non-communicable diseases cannot be ignored. At this time, however, chronic disease prevention and control programs for the migrant population are virtually non-existent (Wang and Wang 2014). Monitoring data from the Institute of Chronic Diseases of the Hubei Provincial Center for Disease Control and Prevention showed that, among 1724 migrants, the prevalence of hypertension was 16.5% and the prevalence of diabetes was 4.4%. Both findings are consistent with the prevalence of these conditions among the national migrant population (He et al. 2016; Chinese Center for Disease Control and Prevention, Prevention of Chronic Non-communicable Diseases 2015; China State Council 2016). Another analysis made by Wang and Wang (2014) regarding to chronic diseases

and risk factors for China's migrant population in 2012 found that chronic disease risk factors among Chinese migrants aged 18–59 are very common (including such risks as smoking, drinking alcoholic beverages, insufficient intake of fruits and vegetables, lack of exercise, and being overweight or obese). Furthermore, these risk factors also present a clustering trend. The prevalence of the various risk factors is close to that of urban residents (Wang and Wang 2014), and in some cases, the risks for migrants exceed those for local residents. Over time, potential risks become actual chronic health problems, and the burdens these diseases create are dealt with mainly by the rural medical insurance system. It can be seen that the need for efforts to prevent and control chronic diseases among migrant populations is urgent. The risk of chronic diseases becoming more prevalent over time is high, and it is likely that China's public health and medical care systems will face enormous challenges in the future.

3.3 The challenge of insufficient access to basic public health services

Migrant populations generally have inadequate, unequal access to basic public health services in urban inflow areas and this fact has plagued public health efforts to serve migrants. Although service provision for migrants has greatly improved since measures to equalize access to basic public health services were introduced in 2009, the mobility of migrant populations remains the main obstacle for government departments trying to implement the National Basic Public Health Service Regulations. The basic public health security level of the migrant population will have a direct impact on the effectiveness of the country's new medical reforms. The situation of the migrant population will also affect China's implementation of the "Plan for Healthy China 2030" and the progress towards achieving national health goals.

Studies have shown that migrant populations have low levels of access to basic public health services. However, the coverage of vaccination services for migrants has basically reached the national standard. With respect to the maintaining of health records, the provision of health education, and health examination services, migrants have moderate levels of coverage. Migrants have the lowest coverage level for chronic disease management services (China State Council 2016). Chen et al. (2017) have shown that, in order to ensure that the public health service funds are sufficient and available for all, the government use a payment method called "first-prepaid, post-settlement". In this method, the government first allocates certain funds to the basic level service department, such as community hospitals based on budget. Basic level service department could use money first and doing fee settlement afterwards. It is a more flexible method for public health expenditure. However, due to the particularity of migrant population, local government couldn't fully grasp the movements and scale of migrant population, which make it hard to achieve the equalization of basic public health services. In specific, migrant population has a lower rate of usage of basic public health services than local residents. Also, the high mobility of migrants make it hard for government to know the accurate basic health services requirements of them, which may lead to a lack of useful services particularly for migrant population and wrongfully financial investment. If these issues are not resolved, and are combined instead with problems caused by rapid population aging and the risks of chronic diseases becoming more prevalent,

the unequal access of migrant populations to public health services may become more problematic.

The "Plan for Healthy China 2030" clearly calls for focusing on rural areas and primary care, promoting the equalization of basic public services in the healthcare field, maintaining the public welfare of basic medical and health services, gradually narrowing the differences in basic health services and health inequality between urban and rural areas, regions and populations, and achieving universal health care coverage and promoting social equity. In addition, the plan also proposes the equalization of basic public health services, so that basic public health services are equal for urban and rural residents. Of special concern is the need to equalize basic public health services for migrants, and to achieve the goal of "health for all and all for health".

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