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Carine Milcent

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Chapter 5: Medical Staff

Prof. Carine MILCENT
Carine.milcent@psemail.eu
CNRS - PSE

Overview of supply

China has roughly 2.79 million licensed physicians, among which 90% have received some kind of training in western medicine in addition to Chinese traditional medicine. In terms of education level, in 2013, only around 28.5% of healthcare suppliers had bachelor degree or above, however an increase versus previous year (26.7%). One of the current goals of Chinese authorities is to reinforce this trend and to ensure sufficient access to skilled healthcare personnel. In this Chapter, we will see how the central state introduced reforms to cope with this goal and the challenges faced.

Still, compared to the developed countries, the shortage in healthcare professionals in China is gigantic. Qin et al. (2013)¹ compared five high-income countries, namely, Japan, Australia, Germany, the UK and the USA in 2008. The number of nurses per 1,000 people was around 10, in each of these five countries, while this ratio was only about 1.3 in China. In terms of physicians, the ratio ranged from 2 to 4 in the above-mentioned countries, to be compared with about 1.7 in China. The difference can be deemed to be quite weak. Actually, this figure hides a crucial difference. The term “doctor” in China issued to a large spectrum of medical qualification, from a very short training to a qualified doctors. With “more than 10 years of education and training” formation.

As an overview of the historical context, before 1980, the main purpose of the medical education system was to provide sufficient health professionals to the rural villages in order to provide medical assistant in rural areas, composed of 80% of the inhabitants. After 1980, China prioritized the steady development of its medical universities to provide sufficient qualified doctors to the health system overall.²

Besides, there are important disparities in healthcare access between the rural and urban areas.

Figure 1: Number of hospital beds and doctors in cities and counties 1952-2002 (in 10'000)

¹ Qin, X. and Li, L. and Hsieh, C-R (2013) «Too Few Doctors or Too wages? Labor supply of healthcare professionals in China» China Economic Review, 24(1)

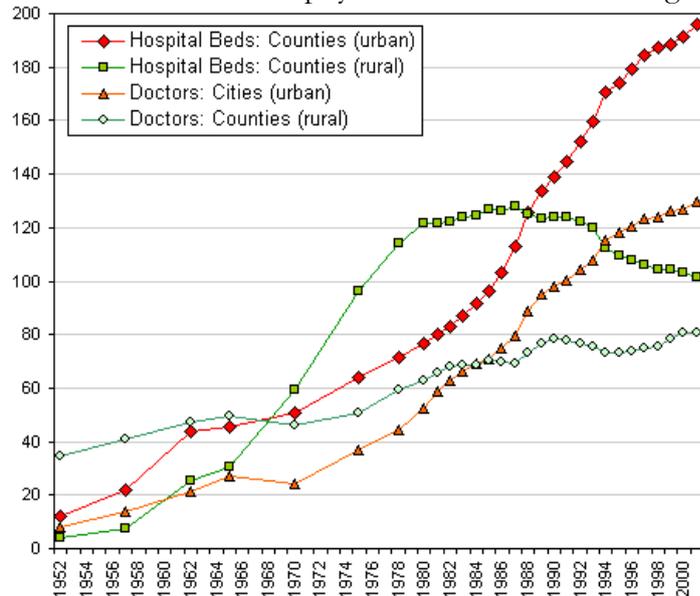
² Reformation of medical education in China.Xu D, Sun B, Wan X, Ke Y. Lancet. 2010 May 1; 375(9725):1502-4.

Source: China Statistical Yearbook, 2003, Table 21-36, p. 806.

Note 1: Before 1978 statistical data are questionable - particularly during the period of the Great Leap Forward and the Cultural Revolution.

Note 2: Doctors include traditional healers, university-trained doctors and physicians with a university certification.³

According to Figure 1, since the early 1980s the number of doctors and university-certified physicians in cities exceeded the number of doctors and physicians in the counties. The number of medical doctors and physicians in the counties stagnated or even declined since 1988.



According to the China Statistical Yearbook (2015), the number of hospital's beds was 5.33 millions. This figure was about 2.45 millions in 2005. The number of physicians for 1'000 population was 2.06 according to the Chinese Ministry of health (2013). In 2004, the urban-rural ratio in hospital beds per 10,000 of inhabitants was 2.2 and 2 in healthcare personnel employed, meaning that there are twice as many medical professionals in urban areas versus rural. Today, the disparities in geographical accessibility to hospitalisation between urban and rural areas, between different income levels of different regions, and between the eastern, western, or central China, have narrowed down considerably, but gaps still exist.⁴

Of course, these figures are an obvious consequence of the hospital organisation system, where big size and high-tech hospitals are located in urban areas. However, we will see in this chapter that it goes beyond in terms of implications. The quality of medical staff training is also considerably lower in rural areas and even worse in under-developed poor areas⁵. A study by Wang et al. (2005)⁶ found that 70 % of village doctors did not have any formal medical education. This study was based on data coming from 46 poor counties. The quality of health care services that patients receive by these low trained doctors is by definition lower than what would be provided by highly trained doctors.

³ http://www.china-profile.com/data/fig_health_1.htm
accessed September 2017

⁴ Zhang, H and Yuen, P. "Medical Savings Account Balance and Outpatient Utilization: Evidence from Guangzhou, China", *Social Science and Medicine*, 151 (2016)

⁵ MENG Q. (2007), *Developing and implementing equity-promoting health care policies in China*, A case study commissioned by the Health Systems Knowledge Network.

⁶ WANG F., & LUO W. (2005), Assessing spatial and non-spatial factors for healthcare access : towards an integrated approach to defining health professional shortage areas, *Health & Place*, vol. 11, n° 2, pp. 131-146.

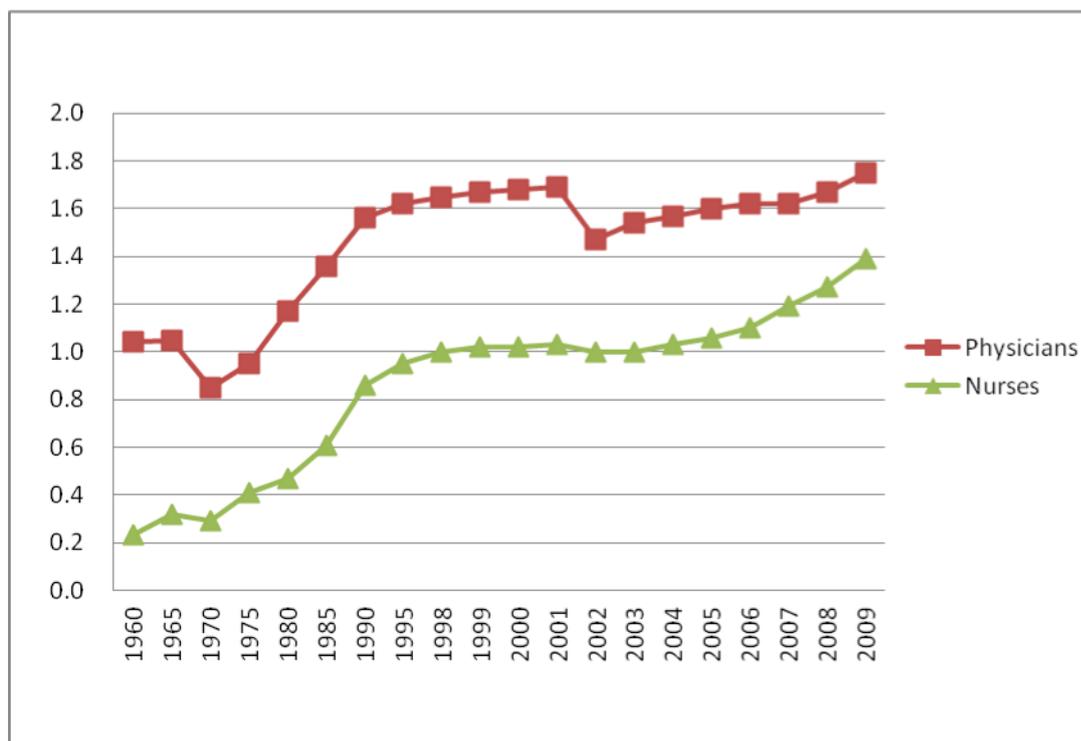
The patients' level of wealth and education emphasizes the urban/rural difference. Indeed, patients who are not aware of quality differences do not consider the choice for a better quality of healthcare with the inconvenience of a possible longer journey to access it.⁷

Doctors and nurses

China has far more doctor than nurses. This feature is very specific to the Chinese context, inherited from the Chinese history with the barefoot doctor system.

In 2005, the national ratio of doctors to nurses was only 1.4 to 1. Breaking it down between urban and rural areas, this ratio was 1.3 to 1 in urban areas and almost 2 to 1 in rural zones^{8,9}. Since then, the number of nurses has been increasing very quickly. By 2013, the number of licensed doctor reached 2.06 per 1,000 inhabitants, the number of licensed nurses reached 2.05 per 1000 inhabitants, getting close to a 1 to 1 ratio¹⁰.

Figure 1: Number of Nurses and Physicians per 1,000 in China, 1960-2009



Source: 2010 China Yearbook of Health Statistics.

Source: Qin, X. and Li, L. and Hsieh, C-R (2013) « Too Few Doctors or Too wages ? Labor supply of healthcare professionals in China » China Economic Review, 24(1)

⁷ Vedom J. and Cao H., (2011) « Health Care Access and Regional Disparities in China » Risques de santé en sociétés, 2011/1

⁸ Anand, S., Fan V., Zhang J., Zhang L., Ke Y., Dong Z., Chen L., China's human resources for health: quantity, quality, and distribution. 2008. The Lancet, Volume 372, Issue 9651, 1774 - 1781

⁹ Moe J., Chen S. Taylor, A., (2014) Initial Findings in a Landscaping Study of Healthcare Delivery Innovation in China, IPIHD Research Report 14-01

¹⁰ http://en.nhfpc.gov.cn/2014-06/25/content_19004549.htm

Accessed August 2016

Looking back to 1960, we overall observe a dramatic increase in the number of healthcare workers (Figure 1). This increase accelerated from the early 2,000's. However, there are still not enough healthcare workers to cater for China's immense population. The recent series of reforms from 2009 onwards support the objective to promote the recruitment and training of health workforce. China now has 1.65 million nurses but with a population of 1.3 billion and an ageing population, the country needs 5 million more nurses to catch up with the global standards.¹¹

In a paper from 2010, Yun, Jun and Anli, three members of a nursing faculty group in Shanghai, described the actual context of the nursing shortage in China.

« With a population of 1.3 billion people, China has 1.65 million nurses. To meet the global standards, it needs 5 million more nurses. 90% of China's nurses are prepared in what are called “associate degree programs” but these actually are the equivalent of high school level programs. Students usually are individuals who are not eligible for college. Many of these nurses have knowledge and skills equivalent to those of nurses' aides or technicians in the United States. About 7% hold what is called a diploma in nursing. Only 2% to 3% have college degrees, most of these at the Bachelor of Science level. Graduate education is in its infancy. In a country with twice as many physicians than nurses, and with a relatively low level of knowledge and skill among its nurses, it is usually a physician who stands at the patient's bedside when the patient is very ill.»

This picture is probably over pessimistic. However, it reflects the urge of a higher standard in nursing formation. It gives a global idea of the shortage and training challenges China has to face regarding its nurses.

Becoming a doctor

From 1949 to the 80's in rural areas

At the inauguration of the People's Republic of China in 1949, the country had only 40,000 doctors to care for a population of nearly 540 million. Most physicians were concentrated in cities, despite a low urbanization rate.

One of the first priority of the new power has been to put the emphasis of health work in rural areas¹². The “barefoot doctors” system was introduced in the mid-1960s. They were recruited amongst farmers with a secondary education level. They were trained by urban physicians for 3 to 6 months. These farmers received then a formation to meet the basic health needs of the rural inhabitants. With the CMS system, the barefoot doctors represented the Tier I of this three-tier system. Given their limited training, they provide preventive and basic health services to the rural inhabitants accounting for 80% of the whole population. They referred their patients to higher-level units (Tier II or above) if needed. Quite usually, they remained still engaged in farming activity.^{13,14,15}

¹¹ Yun H, Jie S, Anli J. (2010) « Nursing Shortage in China: State, Causes, and Strategy » *Nursing Outlook*. 58(3):122-128

¹² World Bank. 2010. Main report. China health policy notes ; no. 2.

¹³ Zhang DQ, Unschuld PU. China's barefoot doctor: past, present, and future. *Lancet* 2008; 372:1865–7.

¹⁴ Liu Y. The essential of primary health care and a review of its development in china. *Chin Health Econ* 2007; 26:11–5.

Applying both western and local remedies, barefoot doctors remarkably improved the population health at a very low cost.^{16, 17} In spite of the lack of training and equipment, the increase in life expectancy that can be observed from 1949 to 1980 is the fastest ever witnessed¹⁸. Life expectancy at birth rose from around 40 years in 1949 to 60.5 years in 1980.

With the economic reforms, the barefoot system was abolished. The existing barefoot doctors were offered the option to take a national exam. Those passing the exam became a *village doctors*. Those who failed could still carry on their activity, but without the doctor title. Later, they were called *village health aides*. In 1985, the Ministry of Health officially phased out support for barefoot doctors.¹⁹ That same year, the title 'barefoot doctor' was officially abandoned. About 0.64 million doctors who passed the qualifying examination obtained a certificate as village doctors²⁰.

The behaviour of the rural doctor changed at least in two main ways. First, village doctors started charging patients for the healthcare provided²¹. Rapidly, they adopted a fee-for-service payment system as was already commonly applied in cities. Because the CMS scheme collapsed (see Chapter 2), the cost was directly borne by rural Chinese inhabitants. Second, village doctors began to shift their focus to treatment of chronic conditions rather than preventive care²². Subsidies were implemented by central authorities and local authorities for their work on preventive health, anti-epidemic work, maternal and child health and other administrative affairs. But they were not enough to overcome the phenomenon, as they only represented from 5% to 10% of the village doctors income.^{23,24,25} More than that, health workers were forced to seek alternative sources of income for their survival. At the end, a fee-for-service system became the dominant way to pay village doctors.²⁶

¹⁵ Lin V, Guo Y, Legge D, Wu Q. Health policy in and for China. 1st ed. Beijing: Peking University Medical Press (PUMP); 2010.

¹⁶ Blumenthal D, Hsiao W. Privatization and its discontents—the evolving Chinese health care system. *N Engl J Med* 2005;353:1165–70.

¹⁷ Kong XZ, ed. Chapter 9 In: China's three dimensional of agro issues prospects report [in Chinese]. Beijing: China Modern Economic Publishing House; 2009.

¹⁸ Miller, N.G, K. Eggleston, and Q. Zhang (2011). "Understanding China's Mortality Decline under Mao: A Provincial Analysis, 1950–1980," Stanford University working paper, presented at the International Economics Association world congress in Beijing, July, 2011.

¹⁹ Zhang D, Unschuld P: China's Barefoot doctor: past, present, and future. *Lancet* 2008, 372: 1865-1867. 10.1016/S0140-6736(08)61355-0

²⁰ Youlong G, Wilkes A, Bloom G. Health human resource development in rural China. *Health Policy Plan.* 1997;12(4)

²¹ McConnell J. Barefoot no more. *Lancet.* 1993;341:1275.

²² Wang H, Zhang L, Yip W, Hsiao W. An experiment in payment reform for doctors in rural China reduced some unnecessary care but did not lower total costs. *Health Aff (Millwood).* 2011;30:2427–36.

²³ Shanlian Hu HD, Qian C, Liu X, Liu X. A study on rural doctor's health service and payment (in Chinese). *Chinese Primary Health Care.* 1994;8:7–9.

²⁴ Youlong Gong Fei Yan, Lingfang Feng. Village doctors' distribution, training and remuneration(in Chinese). *Chinese Rural Health Service Administration.* 1997;17:15-16.

²⁵ Airong Wang SC, Xueshan Feng, Lieping Chen, Tao Hong, Jingwen Huang. Analysis of rural doctors' pay level, pay structure, origin and influencing factors (in Chinese). *Acad Res* 2000;14:9–10.

²⁶ De Geyndt W, Zhao X, Liu S. From barefoot doctor to village doctor in rural China. Washington, D.C: World Bank; 1992.

Current situation in rural areas

Taking effect in 1999, the *law on Physicians* defined the training requirements for medical practice licenses. This law was adopted at the 3rd Meeting of the Standing Committee of the Ninth National People's Congress on June 26th, 1998. "The Doctors" referred to in this Law include licensed doctors and licensed assistant doctors.²⁷ It applies to medical workers who have, in accordance with the law, obtained the licenses of qualified doctors or qualified assistant doctors, registered and are employed in medical treatment institutions, disease-prevention institutions or healthcare institutions.

In Article 8, this law sets up a system of examination to determine the qualifications of doctors including licensed doctors and licensed assistant doctors. Standardized qualifications and skills are defined to pass the diploma for both categories, but the actual organization of examinations is left to the administrative departments for public health of the people's governments at or above the provincial level.

According to Article 9, to be a licensed doctor means at least,

- To be graduated from the faculty of medicine of a university and, under the guidance of a licensed doctor, worked on probation for at least one year in a medical treatment, disease-prevention or healthcare institution; or
- After obtaining the license for an assistant doctor, having reached the level of a graduate from the faculty of medicine of a university and worked for at least two years in a medical treatment, disease-prevention or healthcare institution; or
- Having reached the level of a graduate from the specialty of medicine of a polytechnic school and worked for at least five years in a medical treatment, disease-prevention or healthcare institution.

In Article 13 of the same law, the State authorities determine a system of registration for licensed doctors. A certified doctor has to apply for registration to the administrative department for public health of the local people's government at or above the county level.

This law thus implies a more homogeneous definition of what is meant by "to be a doctor". It highlights the fact that licenses and accreditations are important tools for policy makers to improve provider performance. Besides, it clearly shows the lack of qualification of the medical staff and the doctors before this period. It also emphasizes the fact that the qualification required by this law "to be a doctor" remains lower of what is required in the western countries.

For the *village doctors*, the authority also prioritized the development of formation and qualification. Some practice regulations were established. The minimum requirement for medical practice in village clinics was to pass the local examination held by the county health bureau and to obtain the Village Doctor Certification, while some village doctors could also pass the National Licensed (Assistant) Doctors Examination and become a licensed (assistant) doctor. By 2010, only a minority of the village doctors had passed the national examination: around 14.2%.²⁸

²⁷ http://www.npc.gov.cn/englishnpc/Law/2007-12/11/content_1383574.htm
Accessed September 2017

²⁸ Hipgrave D, Guo S, Mu Y, Guo Y, Yan F, Scherpbier R, Brixi H. Chinese-style decentralization and health system reform. *PLoS Med.* 2012;9(11).
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3491007/>
accessed September 2017

More accurately, a series of policies began in the 1990s to improve the quality of village doctors. In 1991, the MOH released the '1991-2000 National Education Plan of Village Doctors,' which required 80% of village doctors to reach the requirements of Systematization and Normalization. In 2002, the "2001-2015 Health Workforce Development Outlines" were published with specific goals: village doctors should obtain an educational degree of secondary school or above, and 85% of village doctors should pass the exam and get the assistant doctor license by the end of 2015. The "Village Doctors Practitioners Regulation" was published by the State Council in 2003, which particularly regulated the certification, practice, training and legal obligations of village doctors, establishing the first set of national regulations for village doctors. After the regulations were released, the number of village doctors quickly decreased to 0.8 million in 2003.

However, the implementation of the New Cooperative Medical System (NCMS) and some other factors led to a sharp increase in healthcare demand from rural residents. The number of healthcare workers in rural areas was subsequently increased, including 1 million village doctors at the end of the year 2011.^{29,30} Recently, there have been several new policies implemented regarding village doctors, mainly targeted at improving quality, strengthening management, and prioritizing public health services. Since the health reform of 2009, the Ministry of Health (MOH) has requested village doctors to provide both medical and public health services to rural residents.³¹ As a matter of fact, there was still no consistent or sufficient public funding to really impulse a change in the type of healthcare provided in the village clinics, although the village doctors could receive some compensation.³²

Medical Education Program

Doctors in medicine

The training of physicians in China has quite a complex organization, for both geographical and historical reasons. In theory, a physician from a rural area cannot work in an urban area. Nevertheless, seniority can be taken into consideration to make such transfer possible. As a physician from a level 3 hospital in Beijing puts it: « Here, all doctors have more or less a medicine diploma. They all are senior. »³³

Most of the case, the doctors educated to university level work in Level 3 hospitals where they are increasingly able to benefit from continuing education.

²⁹ Huiwen Xu, Weijun Zhang, Xiulan Zhang, Zhiyong Qu, Xiaohua Wang, Zhihong Sa, Yafang Li, Shuliang Zhao, Xuan Qi, Donghua Tian Longitudinal study of rural health workforce in five counties in China: research design and baseline description *Hum Resour Health*. 2013; 11: 17

³⁰ Ministry of Health. 2012 China Health Statistics Yearbook (In Chinese) Beijing: Beijing Union Medical University Press; 2012.

³¹ The Central People's Government of the People's Republic of China. The Guideline for Improving the Village Doctors by State Council. (In Chinese)
http://www.gov.cn/zwqk/2011-07/14/content_1906244.htm
accessed September 2017

³² Xu H, Zhang W, Zhang X, Qu Z, Wang X, Sa Z, Li Y, Zhao S, Qi X, Tian D
Longitudinal study of rural health workforce in five counties in China: research design and baseline description. *Human Resources Health*. 2013; 11:17.
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3656804/>
accessed September 2017

³³ Interview in Beijing, October 2015 (translated from Chinese).

For Level 2 healthcare institutions, doctors are in average under-qualified to attract the demand. While doctors at Level 2 hospitals are increasingly qualified with higher education degrees, many of them still leave with training that is roughly equivalent to taking a specialist subject at sixth-form, a specialist subject after the vocational high schools.

This situation is constantly evolving.

Table 1: Distribution of doctors and nurses by level of education, 2005

	Urban		Rural		Total	
	Doctors	Nurses	Doctors	Nurses	Doctors	Nurses
College or above	42.8%	3.0%	12.9%	0.7%	32.8%	2.5%
Secondary school	52.8%	90.4%	79.0%	89.2%	61.6%	90.0%
High school or less	4.4%	6.6%	8.1%	10.1%	5.6%	7.5%

In China, college level refers to bachelor's education or higher, while secondary school level includes secondary schools, secondary technical schools, and junior colleges.

Source: Ministry of Health. 2006 China human resources for health report. Beijing: Peking Union Medical Press, 2007 (in Chinese).³⁴

The Ministry of Health has launched a regulation for the Standardized Residency Training Program in the late 20th century that became effective from 2003.³⁵ Yet, the training quality varies from center to center.³⁶

As described by Anand et al (2008)³⁷, the medical education programs is extended with training ranging from one to eleven years. Three ranks need to be considered:

- Primary education (1 to 3 years) for training of village doctors as described above;
- Secondary education (2 to 3 years) for training of hospitals level 1 and hospitals level 2
- Tertiary education (3 to 11 years) for doctors who will work in secondary and tertiary hospitals. For this rank, there exists a sub-division based on the official degree received
 - 3-year bachelor's degree
 - 5-year bachelor's degree
 - 7-year or more master's or doctoral degrees

Today, the medical program with a high school level and a 3-year vocational training is being phased out. There is a political switch for a unique medical program with a university-level, 3-year program leading to a certificate.

The medical academic degree system in China is organized around a three-level degree system awarding bachelor, master and doctorate degrees. Medical universities provide a 5-year

³⁴ Anand, S., Fan V., Zhang J., Zhang L., Ke Y., Dong Z., Chen L., China's human resources for health: quantity, quality, and distribution. The Lancet, Volume 372, Issue 9651, 1774 - 1781

³⁵ Wang XY, Rodriguez AC, Shu MR. Challenges to implementation of medical residency programs in China: a five-year study of attrition from West China hospital. Acad Med 2010;85:1203-8

³⁶ Quantity or quality? Implications for postgraduate ... Quantity or quality? Implications for postgraduate medical training system in China. Yang Z QJM: An International Journal of Medicine Vol.170(2) : 169-170

³⁷ Anand, S., Fan V., Zhang J., Zhang L., Ke Y., Dong Z., Chen L., China's human resources for health: quantity, quality, and distribution. The Lancet, Volume 372, Issue 9651, 1774 - 1781

undergraduate medical curriculum for candidates who have completed high school education and passed the National Admission Examination.

In order to obtain a license to practice medicine, graduates must pass the National Medical Licensing Examination (NMLE) also known as the doctor licensing examination (DLE) and have hospital experience.³⁸

As similar, medical graduates with lower degrees are eligible to become licensed assistant doctors but they are subject to *i*) an internship in a hospital. The length of the internship depends on the degree obtained; *ii*) to pass the assistant doctor licensing examination (ADLE). A legal gateway exists for a licensed assistant doctor to become a licensed doctor. ADLE candidate can take the DLE after a period of time practicing that depends on his original degree.

Besides, standards of education is also is very variable from a geographical zone to another. It can be observed as well in clinics, township health centers or community health centers as from level 1 hospital to the high-tech level 3 hospital. The medical curriculum also varies from a Chinese university to another. Only the top 12 leading medical schools in China have been authorized by the Ministry of Education to develop a dedicated 8-year program with a limited number of students.³⁹

In addition, the training of physicians focuses on specialties. There is no general practitioner training as such. In western countries, medical training usually start with a very general training, with student choosing specialization only in the last years of their curriculum. In China, specialization starts from the second year. As hospitals are also organized by specialties, with little contact across departments, physicians tend to have a very fragmented assessment of their patients' health.

As a result, there is not dedicated physician's formation for out-patient. There is no general practitioner. Different types of specialists provide an out-patient's consultation. The patient has to choose which specialist will be the most relevant for his pathology. There is a too few mechanisms to steer the patient to the right specialist. This aspect of the healthcare system contributes to its inefficiency.

Nurses

As far as training for nurses is concerned, there exist 2 tiers:

- 2-year secondary education program corresponding to a training of hospitals level 1 and hospitals level 2. Then, graduate students have to pass the nursing certification examination;

³⁸ Wu, L., Wang, Y., Peng, X., Song, M., Guo, X., Nelson, H., & Wang, W. (2014). Development of a medical academic degree system in China. *Medical Education Online*, 19 (2014). <http://doi.org/10.3402/meo.v19.23141>
Accessed September 2017

³⁹ Wang LX. A comparison of metropolitan and rural medical schools in China. Which schools provide rural physicians? *Aust J Rural Health*. 2002;10:94–8

- 5-year secondary education program corresponding to a training of hospitals level 3. Medical graduates are then exempt from the nursing certification examination.

This low standard as for qualifying as a doctor or a nurse and the important variability in what is called a doctor may explain the widespread mistrust of doctor and medical staff in their skills and the strong preference of the demand for being seen in a level 3 hospitals. This situation may explain what we will see later in this book, with the overburden for tertiary hospitals and the importance of the queues and the long waiting lines in these hospitals.

Work status

“Civil servant” status

After obtaining the Doctor Licensing Examination (DLE), every young practitioner gets a job in a health institution or a health centre. He then becomes a salaried worker of this structure, being captive to it in some ways. Indeed, to be a doctor implies to register with one medical institution and only one. Getting a position in a public medical institution is associated to the *bianzhi* status that could be compared with the civil servant status in OECD countries with some specific advantages.

1. **Social security benefit:** Under the protection of *Bianzhi*, medical professionals can enjoy a stable salary, bonus and all kinds of social security benefits from the hospital for their whole life.
2. **Double career:** To be *bianzhi* implies a double career as a doctor in a public medical institution and as a cadre of the party. These two careers mutually feed themselves.
3. **Lifetime employment:** *Bianzhi* is also a kind of lifetime employment warranty for the medical professionals by government’s promise. Professionals cannot be fired by the hospital, even though they can quit by themselves.
4. **Juridical protection:** The medical liability insurance is under-developed. In such context, the *Bianzhi* status appears to be a protection against juridical pursuits. we will see later in this book that the relationship between doctors and patients have been shifting to a very tense one. This context may fuel patient-doctor relationship around rising medical violence.
5. **Publication:** Professionals can also take advantage of lots of academic and research opportunities, which are provided by the giant public hospital network. Today, the performance of medical doctors is mainly evaluated through the number of his publications.

Once a professional has left *bianzhi*, he have no chance to go back. This aspect may be part of the explanation of the doctor’s reluctance to quit the public sector in order to be recruited in the private sector.

Village doctor status

Medical workers in Township Health Centres (THCs) can be recruited by the government. They have *bianzhi* status and a certificate of permanent urban residence (*Chengzhen Hukou*). Then, they enjoy urban welfare. The situation for rural village doctors is quite different from the medical workers in the THCs. They have a certificate of permanent rural resident (*Nongcun Hukou*). They are still farmers and they are not registered in the official system with the identity of a civil servant. In China, the Household Registration System (*hukou*) prohibited the free migration of farmers to access the urban welfare system.⁴⁰ To become state employees, residential status (*hukou*) needs to be changed from rural to non-rural.⁴¹ As a result, village doctors cannot have the *bianzhi* status and the advantages associated to this status. They then worried about their welfare, especially the endowment insurance. Strictly speaking, village doctors are not a formal professional title. Historically, after the start of economic reforms, they have been self-employed temporary medical workers and agricultural workers. As already described, many started mimicking urban medical doctor strategies, by introducing fee-for-service payment and over-prescribing drugs and injections, inflating drug mark-ups.⁴² These changes can be seen as a response to inadequate remuneration and poor supervision.^{43,44} Recently, part of them have put under supervision of THCs. Their incomes are restricted and their working time is regulated.

In some areas, village doctors work and manage just are similar to an outreach worker of THCs. Administratively they cannot obtain the same advantages as a regular employee in THCs associated to the *bianzhi* status. The lack of legitimacy granted to village doctors by degreed health professionals is another barrier to defining their work roles and wage rate as workers in THCs.⁴⁵

All of the above took the shape of a vicious circle and explains the staff shortage in the primary health facilities in rural China.

Impact of the « *bianzhi* » status on mobility

We will see that the most impacts of the lack of “freedom of practice” is on

- The lack of enrollment in private activity
- Kickbacks and *bongbao*
- The age of personnel in private hospitals
- The level of quality in private hospitals

In China today, due to the *bianzhi* status, medical staff working in a public hospital has no possibility to work in parallel in another structure of the same municipality or elsewhere. Their professional registration number lies within a specific medical structure. In this context,

⁴⁰ Wang J, Su J, Zuo H, Jia M, Zeng Z. What interventions do rural doctors think will increase recruitment in rural areas: a survey of 2778 health workers in Beijing. *Hum Resour Health*. 2013;11:40.

⁴¹ Zhong Y. « Local Government and Politics in China: Challenges from Below » 2004 Armonk: M. E. Sharpe

⁴² Dong L, Yan H, Wang D. Drug prescribing indicators in village health clinics across 10 provinces of Western China. *Fam Pract*. 2011;28:63–7.

⁴³ Weiyuan C. China's village doctors take great strides. *Bull World Health Organ*. 2008;86:914–5.

⁴⁴ Henderson LN, Tulloch J. Incentives for retaining and motivating health workers in Pacific and Asian countries. *Hum Resour Health*. 2008;6:18.

⁴⁵ Huixuan Z., Zhang W., Zhang S., Wang F., Zhong Y., Gu L., Qu Z., Liang X., Sa Z., Wang X. and Tian D. “Health providers’ perspectives on delivering public health services under the contract service policy in rural China: evidence from Xinjian County » *BMC Health Services Research*. 2015. 15:75

individual doctors are tied to their healthcare institution. Working in a private healthcare institution means to renounce *bianzhi* status and in most situations, a permanent loss of this status.

For some academic researchers, the lack of “freedom of practice” for the medical staff is part of the problem of what is pointed out as being the doctors’ “immoral” behaviour. Behind this term, practices as treating patients with indifference, practicing defensive medicine, and receiving kickbacks and *hongbao* (bribery in the form of red envelopes containing cash) are pinpointed.⁴⁶

The current system in which doctors’ salary is regulated and fixed at a low level and the obligation to practice in a registered hospital and only in that particular hospital gives an incentive to medical staff to have this type of problematic behaviour from the medical staff. There is no example of such type of strict organisation in developed countries. In USA, medical doctors obviously enjoy both socioeconomic and technical professional autonomy because of minimal government involvement. In UK, the State directly manages the National Health Service, in which medical professionals are civil servants. However, doctors from NHS are still allowed to open private clinics and hospitals, and they are allowed to practice in both public and private medical service organizations simultaneously. In France, where physicians are highly regulated with a strong state intervention, medical doctors can still work in a private practice in parallel to their job in a public structure.

Some academic think tanks reckon that reforming in depth the *bianzhi* status would make it possible to improve the motivation and engagement of medical staff. The deputy director of the Institute of Economics and head of research in public policies from the Chinese Academy of Social Sciences (CASS), Hengpeng Zhu, explains that this status undermines the efficiency of hospitals and that it should be reformed or that its application should be limited⁴⁷. Currently, this status is offered not only to physicians but also to a large portion of the medical staff, including nurses. Over 85% medical professionals, both the doctors and nurses, have signed the contract with public hospitals in China.⁴⁸

Reforms have been implemented to make the system less rigid. Among the different experiments tested, there is the possibility for physicians to practice in another structure than the one where they are registered. This can be seen as a transition layer to the free practice model. On March 1st, 2011 the municipal Health bureau in Beijing implemented «the Tentative Measures of Practitioners’ Practicing in Several Points (Beijingshi Yishi Duodian Zhiye Guanli Banfa (Shixing)). These measures allow medical doctor to apply for practising in different medical institutions. So far, to be eligible, the doctor has to be:

- Physician-in charge or higher –ranking doctors
- All their practicing locations are within Beijing
- Applications should first finish their **duties** at the current institution⁴⁹

According to Yan (2014)⁵⁰, there were a total of 1,355 practicing doctors who registered a several-

⁴⁶ Yao Z. “The changing relationship between the Chinese urban medical profession and the state since the republican period: the perspective of the sociology of professions », *The Journal of Chinese Sociology*, 3(2), 2016.

⁴⁷ Interviews in Beijing, November 2015 (translated from Chinese).

⁴⁸ <https://healthintelasia.com/lack-talent-chinas-private-hospital-operators/>

⁴⁹ Liu, Wei. 2013. “Liberating doctors.” *Southern Weekly*, January 31.

⁵⁰ Yan, Gong. 2014. “Doctors’ several-point practice has breakthrough in Beijing.” *Health News*, January 21.

point practice in Beijing in November 2013. The number of practicing doctors was about 44,000 in this province-level municipality. These multi-sites doctors only accounted for approximately 3% of the total. This figure remains quite small. A plausible explanation is the disincentives exercised by the hospital authorities, *i)* using the third point « finish the duty » to justify the denial; *ii)* putting pressure on the amount of some financial compensations and promotion and career development.

According to academics from CASS and Fudan University, even if this is theoretically possible at experimental stage with the reforms, public hospital management and administration talk physicians out of it. Among the disincentives used, physicians mention a reduction of their bonus and impact on their career development.⁵¹

As a result, skilled doctors prefer to stay with high quality public hospitals instead of running independent clinics or working in/for a private hospitals due to the uninsured welfare and pension benefits, limited research resources, extremely complicated application procedures. This last point was widely described in Chapter 3, with the example of Yu Ying, former doctor employed in a very big level-3 public hospital on Beijing.

Another impact is the age of personnel in private hospitals⁵². Overall, the mandatory retirement age in China is 60 years for males and 55 years for females. Strictly speaking, medical workers, physicians as well as other categories, have to retire at that age and quit the healthcare public institution. For them, working in a private hospital becomes an opportunity, as they do not have to give up any advantage. According to Tang et al. (2014), 22.03% of physicians who practise in private hospitals are over the age of 60. Other authors also obtain similar result.^{53,54} It demonstrates that private hospitals have hired many elderly doctors that do not have the incentive to work in a public structure anymore. This fact may have an impact on the innovative medical techniques used in private hospitals. Indeed, according to evidence collected from developed countries, it seems that decreasing performance was associated with increasing years in practice for all outcomes assessed.^{55,56}

In parallel, the standard of performance and quality expected by patients has been increasing along with the standards of living. People demand skilled doctors and medical staff as well as high tech and innovative equipment. The concentration of the best skilled professionals in a small set of hospitals and the lack of mobility then contributes to congestion in highest level public hospitals.

Working Conditions

To introduce this section, I propose to recount the testimony of a Chinese doctor on the current

⁵¹ Interviews à Pékin et Shanghai, Novembre 2015 (traduit du chinois)

⁵² Tang C, Zhang Y, Chen L, Lin Y. (2014) « The growth of private hospitals and their health workforce in China: a comparison with public hospitals » Health Policy and planning. 2014 Jan;29(1):30-41

⁵³ Xu H, Huang J. Discussion about challenge and strategy for private hospital (Shi lun ming ying yi yuan de kun jing he dui ce). Journal of Chinese Community Doctors 2006;8:124.

⁵⁴ Xue D. The health workforce development of private hospital (Ming ying yi yuan ren cai dui wu jian she xian zhuang). China Health Human Resources 2008;5:21-2.

⁵⁵ Choudhry NK, Fletcher RH, Soumerai SB. Systematic review: the relationship between clinical experience and quality of health care. Annals of Internal Medicine 2005;142:260-73.

⁵⁶ Waljee JF, Greenfield LJ, Dimick JB, Birkmeyer JD. Surgeon age and operative mortality in the United States. Annals of Surgery 2006;244:353-62.

situation. Previously introduced Yu Ying, former doctor of a level-3 hospital, the *Peking Union Medical College Hospital*, is a key public figure and emblematic of the current situation of doctors in the healthcare system. She has created a Weibo account (Chinese equivalent of Twitter) that has now more than two million followers.⁵⁷ Her resignation, widely commented, was explained on the web.⁵⁸ She mentioned:

- The excessive workload and unreasonably long hours with 150 patients per day at some periods of the year;
- Patients travelling for more than 1500 km to get a consultation in this level-3 hospital;
- The mediation role of the doctor to avoid conflicts between patient and medical staff;
- A promotion system based only on publication and thus totally disconnected from the medical activity.

Salary, bribery and financial interest

According to the National Bureau of Statistics, the average salary of a physician amounts to 35'478 RMB per year, which shows a rather small gap with the average salary of any employee in urban areas (32 244 RMB). This salary is defined at national level, taking into account different factors, such as seniority and level of responsibilities⁵⁹.

According to Qin et al. (2013)⁶⁰, the shortage of healthcare professionals in China can be explained by the lack of financial attractiveness of medical careers, compared to other occupational categories. The government has reduced financial support for public healthcare institutions but at the same time has largely retained monopoly for the supply of healthcare. As a consequence, the majority of medical practitioners are dependent on public institutions. In China, public hospitals provide more than 90% of outpatient and inpatient healthcare services (Table 2). The majority of healthcare professionals, including physicians and nurses, are employees of public hospitals and receive payments on a salary basis, regulated by the government.⁶¹ Because of this context, the healthcare sector is not sensitive to market forces for fixing wages. Consequently, the mean earnings in the regulated health sector are being ranked among lowest in Chinese economy, comparable to what is observed in the also regulated educational sector.^{62,63}

Table 2: The comparison of public and private hospitals nationwide, 2013

	Public	%	Private	%	Total
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⁵⁷ The BMJ Blogs, 23/06/2015. <http://blogs.bmj.com/bmj/2013/09/11/liu-xu-et-al-chinese-doctors-leaving-public-hospitals-brain-drain-or-emancipation/>
Accessed September 2017

⁵⁸ Interviews in Beijing, November 2015 (translated from Chinese)

⁵⁹ Ran, Li-mei, et al. "An analysis of China's physician salary payment system." *Journal of Huazhong Univ Sciences Technology [Medicine Science]*, 2013. 33(2):309-314.

⁶⁰ Ibid Qin, X. and Li, L. and Hsieh, C-R (2013) « Too Few Doctors or Too wages ? Labor supply of healthcare professionals in China » *China Economic Review*, 24(1)

⁶¹ Ibid Qin, X. and Li, L. and Hsieh, C-R (2013) « Too Few Doctors or Too wages? Labor supply of healthcare professionals in China » *China Economic Review*, 24(1)

⁶² Source : 2005 China yearbook of labor statistics

⁶³ <http://www.scmp.com/news/china/article/1502551/doctors-paid-less-barbers-may-see-salaries-rise-china-mulls-increasing>
accessed September 2017

Number	13,396	54.22	11,313	45.78	24,709
Beds	3,865,385	84.42	713,216	15.58	4,578,601
Hospital personnel (10,000)	460.6	85.76	76.4	14.22	537.1
Health personnel (10,000)	383.9	86.76	58.6	13.24	442.5
Outpatients (100,000,000)	24.6	89.78	2.9	10.58	27.4
Inpatients (10,000)	12,315	87.92	1692	12.08	14,007

Source: National Health and Family Planning Commission 2014. The total number of outpatients do not equal the number of public hospitals added to the number of private hospitals. The same problem also occurs in the number of inpatients. The statistical report has the same problem⁶⁴

For Bloom et al. (2001)⁶⁵, the consistently low wage level in the healthcare sector forces many healthcare professionals, especially physicians, to seek compensation from other sources of revenue. Yet, as we saw in the previous paragraph, the *bianzhi* status prevents them from working in another institutions to achieve that goal.

Actually, many kinds of salary supplements and bonuses come and top up the base salary. A known sentence in Chinese is « Neike kao huikou, waike kao shoushu » meaning that physicians rely on commissions, surgeons rely on operations. According to a November 2013 study, salary supplements represent in average 45% of the base salary in level-3 hospitals⁶⁶, but these additional wages are obviously very heterogeneous. An article published in March 2014 by *China Medical News* reckons that the total salary of a physician working in a level-3 hospital in Beijing would reaching 180,000 RMB per month, up from 46,000 RMB base salary, when all extra income is taken into account (bonus from the hospital based on the number of patients treated, commission on drug and test prescriptions, plus all kind of briberies and moonlighting activities.^{67,68} He and Qian (2013)⁶⁹ also suggest that medical doctors are incentivized to prescribe profitable tests and overprescribe because of the correlation between hospital revenue and their bonus, which accounts officially for 50 to 60% of their payroll income. Actually, it can be even much more according to physicians from level-3AAA hospitals in Beijing.⁷⁰ They are fully aware of this correlation, even if the incentive is neither direct nor official.

Another perverse effect of this system is in patient prioritization. In a context of very long waiting lists, “red envelopes” enable some patients to go up in the queue. This is a widespread practice and it explains the tense relationship between the medical staff and their patients who feel racketed into giving a red envelope to be treated with decent waiting time. Today, 70% of doctors claim to have experienced violent disputes with their patients.

⁶⁴ Yao Z. “The changing relationship between the Chinese urban medical profession and the state since the republican period: the perspective of the sociology of professions », *The Journal of Chinese Sociology*, 3(2), 2016.

⁶⁵ Bloom G., Han L., and Li X. (2001). “How Health Workers Earn a Living in China.” *Human Resources for Health Development Journal*. 5(1):25-38.

⁶⁶ “The Global Hospital Management Survey – China (GHMS-China), Harvard Business School, November 2013. http://www.hbs.edu/faculty/conferences/2014-world-management-survey/Documents/GlobalHospital_Management_Survey_Horak.pdf accessed September 2017

⁶⁷ <http://www.chinesemedicalnews.com/2014/03/how-much-does-average-chinese-doctor.html> accessed September 2017

⁶⁸ <http://www.chinesemedicalnews.com/2014/03/dr-zhong-nanshan-whats-wrong-with.html> accessed September 2017

⁶⁹ He, J.A., Qian, J., 2013. « Hospitals' responses to administrative cost-containment policy in urban China: the case of Fujian Province. » *China Quarterly*. Vol 216: 946-969.

⁷⁰ Interview in Beijing. November 2016.

Zhu Hengpeng from the Chinese Academy of Social Sciences argued that the phenomenon that doctors rely on selling medicine and medical checking to increase their income partly results from the fact that the prices for their medical services were set by the government and they do not cover the deserved return for the doctors.⁷¹ The low income as a predictor of perverse economic incentive for physicians is also shown by He (2014).⁷²

Working time and workload

Supply side: The number of Communities Health Centres (CHCs) increased massively in few years. However, the demand kept going to consult in the level-3 hospitals providing the highest level of quality.

The number of hospitals with more than 800 wards rose from 488 in 2008 to 976 in 2011. According to the Roemer's law, any beds provided will always be filled. In the Chinese context, a recent study shows that this Roemer's law is deemed to be satisfied for the public high-tech hospital.⁷³

This increase occurred in a context of a too few number of physicians and even more of qualified doctors in medicine for the healthcare demand.

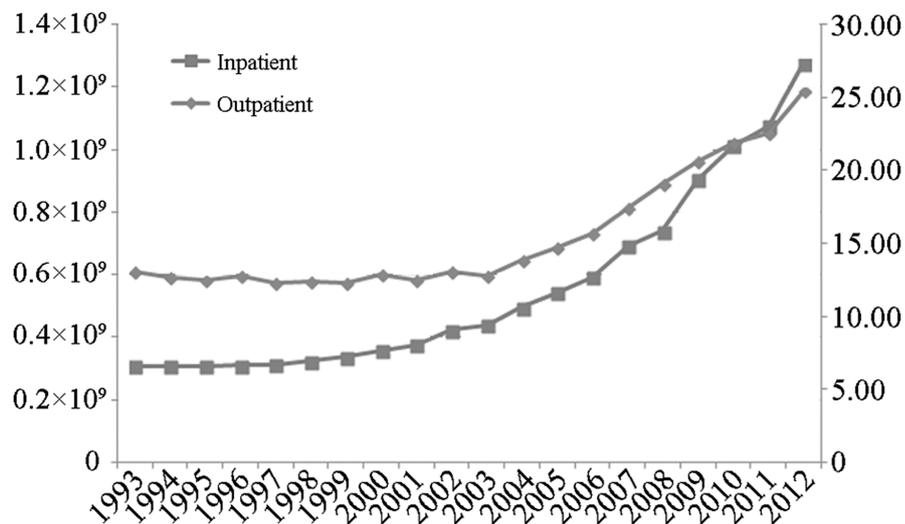
Demand side: As a result, the number of out-patients as well as in-patients increased over the same period. From 2007 to 2011, the in-patient admission number increased by 56% and the out-patient visit number increased by 33%. It has been estimated that 30% of the admissions are medically unjustified. The cost is approximated by calculation to be thirty-seven times more expensive for in-patient admissions than outpatient consultations. In addition, the in-hospital length of stay is, on average, twice longer in China than compared to an OECD country. Although it is on average, rubbing out geographical heterogeneity, these figures enable to understand the worrisome evolution of healthcare cost (Figure 2).

Figure 2 : In-hospital admissions and out-patient visits in hospitals, 1993–2012

⁷¹ <http://china.caixin.com/2016-08-25/100981795.html>
accessed September 2017

⁷² He A. "The doctor-patient relationship, defensive medicine and over-prescription in Chinese public hospitals: Evidence from a cross-sectional survey in Shenzhen city », (2014). *Social Science & Medicine*. vol 123 : 64-71

⁷³ Delamater PL, Messina JP, Grady SC, WinklerPrins V, Shortridge AM. Do more hospital beds lead to higher hospitalization rates? a spatial examination of Roemer's Law. *PLoS One*. 2013;8(2)



Source: Chinese Health Statistics Yearbook 2012.⁷⁴

Overload: For a physician in a level-3 hospital, 70 is the average number of visit per day. The figure can be much higher for a renowned hospital. It reaches 100 out-patient visits and hitting a peak of 200 visits certain days.⁷⁵ For Anzhen hospital, the number of out-patient visits was 2,41 million in 2014. This hospital is one of the 10 top hospitals. For the Beijing Children Hospital, Nie Xiaolu, a medical doctor, reckoned the number of outpatient visits reached 3.37 million in 2014.⁷⁶ « *Now, it is common to witness the waiting of more than 1'000 out-patients and her relatives for a visit since the early morning* »

This situation leads to incredibly long waiting times for patients, an increased workload for physicians and reduced consultation times, to less than 5 minute per patient, creating frictions between medical staff and patients.

In all hospitals I have had the opportunity to visit, physicians often mention a 2-minute consultation time dedicated to each patient.

A study carried out in Shaanxi province determined that doctors were spending less than one and a half minute with each patient. This results in turning patients and their family totally adamant. The New Yorker magazine quotes an American physician visiting the Beijing United Family Hospital, a level III hospital (with AAA status, implying a superior quality standard) and catering for many expatriate families in Beijing⁷⁷. “Joe Passanante, a doctor from Chicago who did a stint at Beijing United Family Hospital, told [the reporter] that he was once performing CPR on a woman when the parents of a girl with a fever walked into the room. “Here I am pushing on a dead person’s chest, trying to revive her, and they’re asking me to see their daughter,” he recalled”. In this article, the journalist also cited a physician

⁷⁴ Wang et al. « Comparison of Chinese inpatients with different types of medical insurance before and after the 2009 healthcare reform », 2014 , BMC Health Services Research 14:443

⁷⁵ Interviews in Beijing and Shanghai of Level III hospital physicians, February, November 2015 and December 2015 translated from Chinese).

⁷⁶ No more long queues in China's smart hospitals, August 2015, China Daily. http://www.chinadaily.com.cn/china/2015-08/05/content_21511189.htm accessed September 2017

⁷⁷ Beam, Ch. « Under the Knife _Why Chinese patients are turning against their doctors », Newyorker Magazine, August 2014. <http://www.newyorker.com/magazine/2014/08/25/under-the-knife> accessed September 2017

on his overload of work. “A leading radiologist in Shanghai told [the reporter] he’d heard that the record number of patients seen in a day is three hundred and fourteen. “That was at the Shanghai Children’s Hospital,” he said. “One doctor, 8 a.m. to 6 p.m., ten hours, two minutes per patient.”

However, whatever the audience _academic researchers, professional providers, or consumers_ there is a consensus. To queue or/and to be in a waiting list for a consultation in a level-3 hospital is preferred than to consult a doctor in a closer and without wait times healthcare center. From the list of benefits,

- The level of quality provided in the level-3 hospitals even for a consultation
- The all-in-one healthcare supply: a consultation, blood test, radiology, and so on. In the healthcare centers the healthcare supply is fragmented.

According to China’s Health Statistics Yearbook 2012, the number of patients visiting Chinese hospitals increased from 4 billion in 2005 to 6.2 billion in 2011, whereas inpatient admissions soared from 71 million in 2005 to more than double – 152 million in 2011. Meanwhile, the increase in the numbers of practicing physicians is far lower than necessary. Between 2008 and 2011, the number of doctors only increased by 170,000.⁷⁸

Publication

Since the late 80’s, the large size of hospitals in China use publishing in the Science Citation Index (SCI) as the main indicator for medical career evaluation, promotion and recognition. Most medical doctors are under pressure to publish as much articles as possible every year. This system is one chosen to evaluate the doctor in public hospitals. This system leads to doctors spending a part of their time writing articles. On one hand, it means less of their time to treat patients; on the other hand, writing articles is a way to push them to remain connected to the medical scientific improvement.

In a context of shortage of doctor in medicine, an evaluating system based on publication affects the quality of treatment and the doctor-patient relationship. Another consequence is on the reliability of database and trustworthy articles. This system pushes medical doctor to cheat, falsifying data. Firms of ghostwriters appeared on the market, growing rapidly.⁷⁹ This point was widely discussed in posts of medical doctor bloggers as Yu Ying.

Low social status

In western countries, medicine is a profession that implies prestige, high salaries. Conversely in China, this profession is bound with a low social status. McKinsey in 2012 found that “physicians [in China] report that their job satisfaction is quite low, averaging 4.3 out of 10, and only 20 percent of physicians are ‘satisfied’ with their job.” McKinsey also found the top three reasons why Chinese physicians are not happy were first “professional risks”; second, a “suboptimal level of compensation”; third, “low social status.”

A non-negligible part of the medical school graduates choose to pursue other professions as in pharmaceutical industries. The 12th Five Year Plan asserts a goal of training 150,000 new primary

⁷⁸ <http://www.worldcrunch.com/culture-society/why-becoming-a-doctor-in-china-is-no-longer-a-dream-job/china-doctor-medical-student-school/c3s9693/>
accessed September 2017

⁷⁹ Ye B., Liu J. « Inadequate evaluation of medical doctors in China » 2013. The lancet Vol 381

care physicians alone. This objective could be considered as realistic. Indeed, recently, there are approximately 600,000 graduated doctors a year. The problem is, of those an estimated 500,000 will never practice medicine.⁸⁰ Li Ling, a professor at the National Development Research Institute of Beijing University who is also China's medical reform expert, presents the same figures. "China trains about 600,000 medical students each year, but only about 100,000 of them actually become doctors."⁸¹

According to a survey of 61 major medical schools conducted by the Economic Observer, overall national admission scores for medical students have decreased in recent years. In an article of the *Financial Times* (2013), a student who wanted to study engineering had been re-oriented to medicine studies because of too low grades in his Southern China University. Except the prestigious medical schools, to recruit good students in medical school becomes a challenge.⁸² That enforces the gap in quality between the level-3 hospitals, which drain the brightest medical graduated students and the other health institutions.

Occupation changes

Family doctors, a possible future

The healthcare access is regulated in the sense that a patient cannot consult a physician outside of the municipality he resides if he wants to be fully reimbursed by the public insurance scheme. Nevertheless, he has the liberty to choose the physician he wants within his municipality. The concept of referring doctor as it exists in the UK or in France is at experimentation stage.

About family doctor formation, the 2009 reform introduced a specific formation, as explained above in this Chapter. However, most of the physicians including the community physicians do not have a special training. The Chinese medical educational system aims to train medical specialists.⁸³ Therefore, the ability of health centers to provide adequate family medicine is also a key of improvement of the quality of care to promote the primary health centers. Over the last decade, healthcare system policy focused on the introduction of General Practitioners formation.

In July 2011, the State Council published a document announcing the implementation of a referring doctor covering the entire country by 2020. This document targets the formation of 400'000 General Practitioners or Family doctor). It involves not only to attract young medical graduates to a career choice of family doctor but also to train the doctors' in-service working in village clinics or community clinics. The objective is to foster the skill of the medical staff working in village clinics or community clinics. Actually, this reform is not wholeheartedly supported by neither the medical staff nor the patient.

⁸⁰ <https://healthintelasia.com/where-chinas-best-doctors-go-will-patients-follow/>
accessed September 2017

⁸¹ <http://www.worldcrunch.com/culture-society/why-becoming-a-doctor-in-china-is-no-longer-a-dream-job/china-doctor-medical-student-school/c3s9693/>
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⁸² <http://www.ft.com/cms/s/0/35a081ae-2653-11e3-8ef6-00144feab7de.html>
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⁸³ Xu, J., Wang X., Li H., Zhang J., Pavlova M., Liu H. (2010) « Analysis of factors influencing the outpatient workload at Chinese health centres. » *BMC Health Services research* 10 :151

On the demand side, this reform deals with the need for confidence-building in the whole healthcare system. For a large part of the population, the expected healthcare quality can only be obtained in a level-3 hospital. The new hospital classification based on the equipment level and the medical staff skill level, introduced with the reform, emphasized this believe.

So far, the level of quality provided by the healthcare centres and clinics are still quite poor _the lacking medical training of the medical staff, the insufficient financial resources_ that contributes to the non-restoration of public confidence. However, the implementation of reform needs the support of the demand side.

On the supply side, the reform implies the support of the medical community. The government has to guarantee a sustainable referee doctor system, and the young graduates doctors have to trust it. The referee doctor formation did not exist few years ago. This career choice requires a visibility on career opportunities and career progressions. Working in public hospital presents advantages and benefits clearly established over time.

The difficulties to recruit referee doctors are increased by a deterioration in the image of doctor in the Chinese society. There are not considered anymore as « the elite of the society ». According to a 2011-survey, conducted by the Chinese Medical Doctor Association, 78% saw medical doctor career as a bad choice for their children. At Xiamen University, Doctor Wang reckoned amongst the first year of medical school student (the 2006 promotion), more than the half re-oriented their career to work with pharmaceutical companies, biotechnology companies.⁸⁴

Pilot experimentations: One of the pilot experimentations has been carried out in Haidian district, Beijing, from November 2015. According to the first results, the local doctors were willing to participate to the pilot. They received a referee doctor's training and they had to provide healthcare to a defined number of patients. Their wage was disconnected to the care performed on patients. On the demand side, people were more reluctant. The lack of freedom to choose the doctor was one of the obstacles.

Internet: These new developments of the healthcare system are highly overseen and considered by Internet companies. With the widespread of medical consultation on-line, the referee doctors could be a link to a more global system where the healthcare system would be organized in network. Wang Lei, CEO of Alibaba Health Information Technology (Ali Health), considers the implementation of a healthcare medical service network with a on-line access. The gatekeeper would be the referee doctor, supported by telemedicine services. It would be a online-to-offline (O2O) service⁸⁵.

⁸⁴ <http://www.ft.com/cms/s/0/35a081ae-2653-11e3-8ef6-00144feab7de.html#axzz3tzD25070>
accessed September 2017

⁸⁵ Blen Perez, « Ali Health to expand despite loss », *South China Morning Post*, 25 November 2015,

Prof. Carine MILCENT
Carine.milcent@psemail.eu
CNRS - PSE

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Prof. Carine MILCENT
Carine.milcent@psemail.eu
CNRS - PSE

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Prof. Carine MILCENT
Carine.milcent@psemail.eu
CNRS - PSE

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Prof. Carine MILCENT
Carine.milcent@psemail.eu
CNRS - PSE

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