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## Amending the Law for Licensing Medical Practitioners of China in 2021: A Commentary

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### ABSTRACT

The Law for Licensing Medical Practitioners of the People's Republic of China, enacted in 1999, was amended in 2021. This commentary reviews the key points of the amendment and raises doubts as to one of its points. Specifically, we argue that the minimum education level required to take the physicians' licensing examination should be set to completion of a bachelor degree, instead of a vocational diploma or junior college graduation as in the 2021 amendment. China adopted a system of multi-tiered medical education more than 70 years ago. This policy has resulted in a threshold of entry-level medical education far below the global standards. The highly heterogeneous education background of physicians in China has led to low standards of practicing physicians, which in turn have significantly negative impacts on the health care market. We illustrate changes over time in the educational distribution and regional distribution of practicing physicians in China, and present reasons to improve entry-level educational standards, by setting the physician licensing threshold at an appropriate level. This will not only improve the overall quality of physicians but will also help address equity and efficiency issues in the health care market.

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China; licensing; medical education; physician supply

### Introduction

Among the various health service providers, physicians are the most important part of the health care market, and their quality plays a determining role in the health system. The licensing examination for medical practitioners is of great significance to guarantee the quality of physicians and consequent health care services. Since the 1950s, the primary job of the health care system in China is to address a desperate shortage in the health workforce and satisfy the increasing demand for health care.<sup>1</sup> To address this problem, China adopted a multi-tiered medical education system to train doctors, which resulted in a part of the practicing physicians receiving no tertiary degree-oriented medical education.<sup>2</sup>

With the development of medical education reform, China enacted its first Law for Practicing Medical Practitioners since 1999, which allowed “medical students” with only a secondary vocational diploma (SVD) to take the medical examination and therefore become practicing physicians. As of 2002, 41% of practicing physicians only had an SVD in China.

In January 2021, the Committee meeting of the National People's Congress amended the “The Law for Licensing Medical Practitioner” for the first time since its implementation in 1999, aiming to improve the quality of physicians and equity in the health care market. The major amendments include: (1) In order to be consistent with other legislations on professional regulation, the current title “Practicing Physician” is simply replaced by “Physician.” (2) The amendments further clarify the physicians' duties and obligations, as well as the legal rights and remuneration of physicians. The amendments also stipulate the criminal liability for disrupting health care facility and the market. (3) The minimum education-level of the licensing examination is re-set to a vocational diploma or junior college level in the amendment, rather than a secondary vocational diploma previously. In addition, the amendments make improvements on the registration of the examination. (4) The training of primary care providers, in particular the general practitioners, will be strengthened. (5) The amendments include the lessons and experiences of the prevention and controlling strategy of SARS-COV-19.

We endorse these amendments except that we believe the minimum education-level of the licensing examination of physicians' qualifications should be set to a bachelor degree. In the following sections, we first present the structure and distribution of practicing physicians' educational level in China based on the data from the Health Statistical Yearbook of China. We then give a number of reasons to explain why the threshold for the physician qualification examination should be set at the bachelor level.<sup>3</sup>

### The Structure and Distribution of Physicians' Medical Education

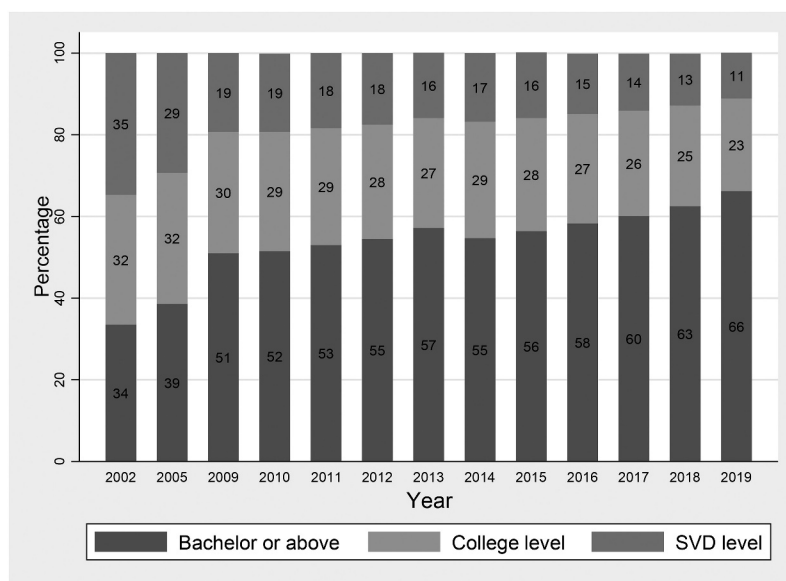
The current physician mix in medical education originating from a multi-tiered medical education system will inhibit quality development of a health care system. Figure 1 illustrates the annual changes of physicians' educational distribution in China from 2002 to 2019. In general, the proportion of physicians with a bachelor degrees or above had been increasing over the years, and the share of physicians with vocational diploma and SVD or below has decreased, even though this "inappropriate" pipeline of medical education remained as a non-trivial component of the training system. There were still 34% of practicing physicians with vocational college diplomas or below in 2019.

Admission to medical school is highly competitive in China and is based on the students' scores in the national college entrance examination (NCEE). The National Education Department sets the enrollment scores for medical bachelor programs much higher

than vocational diploma programs at junior medical colleges. The quality of admitted students, indicated by their academic performance, between these two programs are significantly different. In 2018, the undergraduate admission rate was 43.3%, which implies that those students admitted into junior medical colleges were ranked below the top 43.3% students taking the NCEE.<sup>4</sup>

There are also remarkable differences in the teaching quality and resources between two streams of medical programs. A junior medical college student needs to take only 3 years of study, with very limited practical training. This may result in insufficient medical training, especially given the fact that these students may not have solid academic foundations through their high school study. By contrast, a student in a medical bachelor program usually needs to take around 5 years of medical training, including more rigorous training in laboratory and clinical settings, and needs to complete a thesis as the partial fulfillment of the requirements for the degree.

The high heterogeneity in educational background of medical students has led to significant heterogeneity in quality and distribution of practicing physicians in China. For example, the quality and quantity of practicing physicians are unequally distributed between urban and rural areas in China,<sup>2,5,6</sup> and high-quality physicians (with a bachelor degree or above) are concentrated in urban areas. Table 1 shows the relationship between education levels and physicians' job choices (including assistant physicians) between urban and rural areas in China. In urban areas, 27% of the practicing physicians



**Figure 1.** The annual changes of number of practicing physicians from 2002 to 2019 in China. Note: SVD—Secondary vocational diploma

**Table 1.** Education level and physicians' job choices (including assistant physicians) between urban and rural in 2019.

Education level	Urban (%)		Rural (%)	
	Hospital	Community health center	Township hospital	Village clinic
Master or doctor	20.8	3.4	0.2	-
Bachelor	52.3	48	23.9	2.9
College	20.1	33.4	44	22.5
SVD	6.5	13.8	29.8	70.7
High school or below	0.4	1.4	2	3.8

Sources: Health Statistical Yearbook of China (2020)

Note: SVD—Secondary vocational diploma

at hospitals and 48.6% at community health centers had vocational diplomas or below in 2019. In rural areas, 75.8% of the practicing physicians at township hospitals and 97% at community health centers had vocational diplomas or below. Practicing physicians with a bachelor degree or above were more concentrated in urban hospitals. Therefore, residents in rural areas may not have equal access to quality services as those in urban areas.

### Unifying Primary Medical Education at Bachelor-level

The review conference of China's Congress amended the Law for Practicing Physicians to upgrade the eligibility for the examination of physician qualification from secondary education to non-bachelor tertiary education. However, this incremental approach in a medical standards setting will only accumulate long-term mistakes, and aggregate economic and health costs. Given the complexity of health care at present and rapid development in medical education and technology, we strongly argue that it is reasonable to unify medical education at a bachelor level as soon as possible. We present our reasons in the following sections.

### Entry-level Standards for Physicians around the World

Although there are large variations in medical education and training across countries, the minimum standards for entry-level medical education require bachelor-degree training. Some countries, such as Australia, Philippines, and the USA, even require medical student to enter the graduate-level medical program before they can attend the licensing examinations.<sup>7</sup> In the US, in order to be eligible for the United States Medical Licensing Examination (USMLE), candidates require a bachelor degree (4 years), and a four-year graduate degree from medical schools.<sup>8</sup> Medical practice is allowed after completing an accredited residency program (3–7 years). Therefore, it takes around 11 years of training to become a primary care physician and over 13 years to become a surgeon in the United States.

In Thailand, a developing country, the entry-level medical education was set at bachelor-level training a half-century ago.<sup>9</sup> The Thai undergraduate medical program (entry-level medical education) takes 6 years to finish and is usually divided into three stages: the first year for basic education, the 2nd–3rd years for basic medical education, and the 4th–6th years for clinical training.<sup>9,10</sup> This raises a question why China, a country more developed than Thailand, would keep such an odd medical education system and allow all graduates with different training periods and different talents to become doctors. The shortage of health workforce and urgent need to improve population health were the initial reasons for developing this system of medical education and training, but they are no longer the main issues China is facing today.

### Oversupply of Medical Students

China has the largest education system for health workforce in the world. According to the statistics of medical schools from 2014 to 2018, the number of medical graduates in China increased by 5.6 million in total, but the size of the health workforce increased by only 2.1 million. Even though there is a certain proportion of workforce attrition, it is still difficult to explain the huge gap of the whole market between supply and employment of medical graduates. One possible explanation is that some less-educated medical students did not enter into the health sector and created an oversupply of medical graduates.

Moreover, the number of medical students enrolled each year at junior medical colleges and secondary schools was much higher than that at medical bachelor programs or above. For example, in 2018, the number of medical students enrolled in tertiary medical schools was 855,000, of which 611,000 were enrolled in vocational college diploma programs. In addition, there were 390,000 students enrolled in SVD programs. This supply pattern not only affected the quality of medical education but also led to an increasing imbalance in the supply and demand of health workforce.<sup>11</sup> The oversupply of

graduates with secondary vocational education and vocational education further resulted in the distortion of specialty mix (inadequate numbers of well-trained primary care physicians) and increased intensive competition among medical graduates in physicians' market.

We have reasons to believe that, on the same scale, the stock of practicing physicians in China is no longer less than that in any other comparable countries. There is a known positive association between health expenditure per capita and the number of medical doctors per 10,000 people, which reflects the fact that how much you spend is related to how many employees the system hires. We examined the number of physicians in China from the perspective of international comparison based on the WHO data.<sup>12</sup> Figure 2 suggests that the provision of practicing physician in China is relatively adequate among all nations.

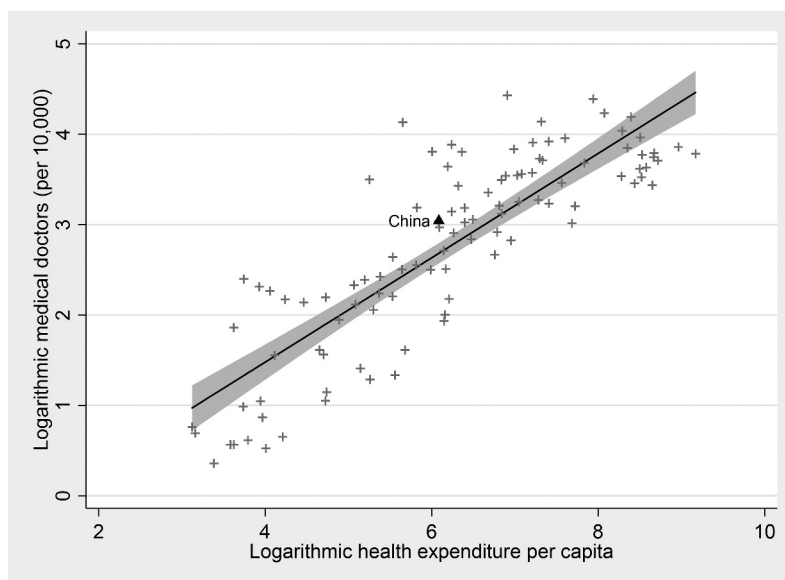
### **The Long-term Costs of Multi-tiered Medical Education System on Healthcare Market**

According to Hsieh & Tang's paper in 2019, the health care market in which physicians have remarkable differences in their education, imposes additional searching and information costs to the seeking of quality doctors who can provide better services from patients' perspective.<sup>2</sup> As doctors with higher educational background tend to practice in urban areas, they are also more likely to be employed by larger hospitals. This has caused a deterioration of human resources in rural areas and at primary health care facilities. Based on the model developed by Akerlof in the 1970s,<sup>13</sup> physicians' ability cannot be observed, which means physicians' remuneration does not depend on the quality of services they

provide. The regulated market pays all the doctors an average level of wage, so there is a lack of motivation for high-quality medical students to enter the health care market since they would expect better payments. Doctors would also have less incentives to receive further medical education and to invest in their human capital. In the long run, a multi-tiered medical education system will contribute to twofold harms in both equity and efficiency of the health care market.

### **Difficulties in Amending and Implementing the Law**

Generally speaking, legislation and the judicial system require a relatively stable set of expectations of the law for its implementation. In order to maintain stability, it cannot be abrogated or amended discretionarily before the social contexts change significantly once the law for physicians goes into effect. Therefore, any amendment of the law must follow a rigorous procedure, from submission to the consideration of the draft law, then to the vote and adoption, and to the promulgation and implementation of the law, which will take time. For example, the law for practicing physicians of the People's Republic of China was passed by the Committee of the Congress in 1998, while its first amendment came twenty-three years later in 2021. The economic development of China has made extraordinary achievements during this period, with its GDP growing from 7.97 trillion yuan to 82.7122 trillion yuan in the last two decades and an increase of about 937%,<sup>14</sup> and thus significant changes have taken place in health demands and health care market. There is an urgency to amend the law to normalize the medical education system even though the process of amendment will be slow.



**Figure 2.** International comparison of health workforce.

There are also obstacles for the enactment and implementation of the 2021 amendment. According to data from the Health Statistical Yearbook of China in 2019,<sup>15</sup> there are over one million medical students currently enrolled in vocational diploma colleges. The career development and transition for these medical students and the impact on their faculties and related personnel need to be carefully considered, otherwise any reforms will be seen as costs of their interests and thus resisted.

## Conclusion

We are delighted to see that the Congress in China finally promoted the recent amendments on the Legislation of Practicing Physician after a long time. However, we argue that the educational eligibility for examination of the physicians' qualification in China is still far below the international standard. It is easy to do monetary (capital) easing because the central bank can soak up excessive liquidity, while it is hardly possible to take back human capital of physicians already formed in a health care market. Therefore, we highly recommend that China improve the entry-level medical education standards, which implies setting the threshold at bachelor level for the examination of physician's qualification, instead of junior college level as in the recent amendment. This will not only improve the quality of the physicians but also will help to address equity and efficiency issues in the health care market in China.

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## Disclosure of Potential Conflicts of Interest

No potential conflict of interest was reported by the author(s).

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## Authors' Contributions

C.T. conceived the idea of this project, J.J. applied for the dataset, C.T., Y.G. and J.J. further analyzed the data and wrote the paper, Y.G. and G.L. revised the manuscript.

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