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Understanding Teacher Supply, Challenges, Trends and Implications: A case Study of China

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ABSTRACT: *This paper examines teacher supply in China as part of a broader international study on teacher supply and retention. The key challenge in managing teacher supply in China is not a national "shortage" of teachers, but disparities in teacher distribution and quality. Rural areas struggle to attract and retain qualified teachers. This paper examines geographical disparities in teacher supply and the role of politics, culture and funding structures. Political and demographic factors, including universal education reforms and the one-child policy have influenced pupil and teacher numbers. As long as schools are able to meet the mandated class size requirements, large class sizes are not regarded as a shortage. How schools are funded can contribute to regional and provincial disparities in class sizes. At the primary and middle school, class sizes do not differ very much between rural and urban areas as schools are funded by local and central governments. Secondary schools in less developed provinces, on the other hand, experience larger class sizes, as they rely solely on local government funding. Despite some dissatisfaction with teachers' pay, teaching remains a sought-after profession. This can be attributed to the influence of Confucian values which emphasise respect for teachers and the importance of knowledge. The culture of respect for teachers and emphasis on discipline may also explain why large classes are tolerated. This case study highlights the importance of prestige and status of teaching in addressing teacher shortages. It also reminds us that the concept of "teacher shortages" is open to interpretation.*

Key words*: Cultural and political influence, perceptions of teaching in China, rural-urban disparities, teacher shortages, teacher supply.*

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1. Introduction

In most countries, education is recognised as a cornerstone of national progress. The United Nations underscores this by stating inclusive and equitable education as one of the 17 Sustainable Development Goals (Goal 4). And this requires a sufficient supply of suitable teachers. Ensuring a supply of qualified teachers is a key focus of education policy worldwide (United Nations Educational, Scientific and Cultural Organization,

Institute for Statistics [UNESCO-UIS], 2016). A number of policy interventions have been proposed and implemented to try to increase the supply of teachers.

Many developed and developing countries face significant challenges in recruiting and retaining suitable teachers (Dee & Goldhaber, 2017; Liu et al., 2021; See & Gorard, 2019; Sutcher et al., 2019; Zhang et al., 2022). These challenges are particularly severe for schools in rural and remote areas where the rough geographical terrain, poor infrastructure such as the lack of transport and communication and low economic development, make it difficult to attract and retain teachers (Jiang & Yip, 2024).

China, a country with a diverse geographical landscape, which has transformed to become the second largest economy in the world in just over four decades, provides an interesting case study of teacher supply (Department of Development Planning of the Ministry of Education, 2021). The Chinese education system is the largest state-run education system in the world (Textor, 2024). Since China's opening up, great importance has been attached to education with several reforms, from the enactment of the 9-year Compulsory Education Law in 1986 to the introduction of the Teachers' Law in 1993 and Regulations of Teacher Education in 1995 (Rao, 2020). These reforms along with the expansion of higher education in 1992/93 have led to an increase in the supply of secondary school teachers, especially women and those in less developed regions (Dai et al., 2021). Huge investments were made in education during this period, and the proportion of college-educated junior high school teachers (lower secondary) has increased significantly since 1990 from 27.1% to 97% according to the Teaching and Learning International Survey (TALIS) 2018 (OECD, 2019).

2. Purpose of the Study

This case study report considers the current teacher supply situation in China, to help shed light on the complexities of teacher supply worldwide, on the concept of a teacher shortage, and how cultural and political factors can influence the supply of teachers. We report on the trends in teacher and pupil numbers, the regional disparities, and the influence of historical and political events on teacher supply. We examined Chinese teachers' perceptions of those factors that attract and retain people in the teaching profession. (e.g., pay, status and working conditions). Data is drawn from government publications and interviews with in-service teachers, initial teacher education providers and academics. To get a better perspective of the teacher supply situation in China, some international comparisons were made with OECD and partner countries.

3. Background

Improving the quantity and quality of teachers is a global concern. Despite decades of policy interventions, teacher shortages have worsened in many OECD countries (OECD, 2024). The profession is apparently witnessing a decline in the number of people wanting to be teachers and a rise in attrition among those who initially choose teaching as a career.

According to TALIS 2018 (OECD, 2019), 23% of school principals reported that a shortage of qualified teachers has seriously impacted their schools' capacity to provide quality instruction. Countries in East Asia, such as Singapore, South Korea, Taiwan and China (Shanghai), are less likely to report severe impacts from teacher shortage (Figure 1). Only 9% of principals in Shanghai, China, reported severe impacts. These countries share a Confucian philosophical tradition that emphasises respect for educators. In these societies, teaching is traditionally considered a prestigious and esteemed profession, and teachers are relatively highly regarded.

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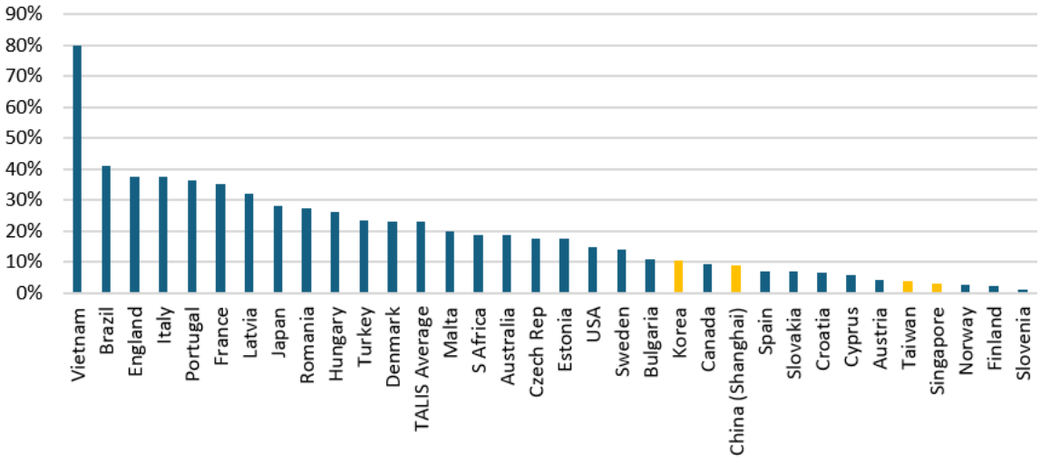

Figure 1. Percentage of principals reporting that shortage of qualified teachers was a big problem.
Source: OECD (2019). Teaching and Learning International Survey (TALIS)
Note: All data from TALIS refer to lower secondary teachers, where more complete data are available

Teachers in these Pacific Rim countries are more likely to report being valued by society and to have chosen teaching as a first-choice career (Figure 2), suggesting that teaching is an attractive vocation for most people. This perhaps explain why shortages are less likely to be experienced. However, there are exceptions. Vietnam and Japan, despite their Confucian influence, are among the countries that report being most severely affected by teacher shortages. In Japan only 30% of teachers felt valued, yet 80% chose teaching as their first-choice career. In Vietnam, 80% of schools report being severely affected by the shortage of qualified teachers, even though teachers in Vietnam are considered to be highly valued by society (Figure 2). This suggests that there are other factors at play besides culture, and the prestige of teachers.

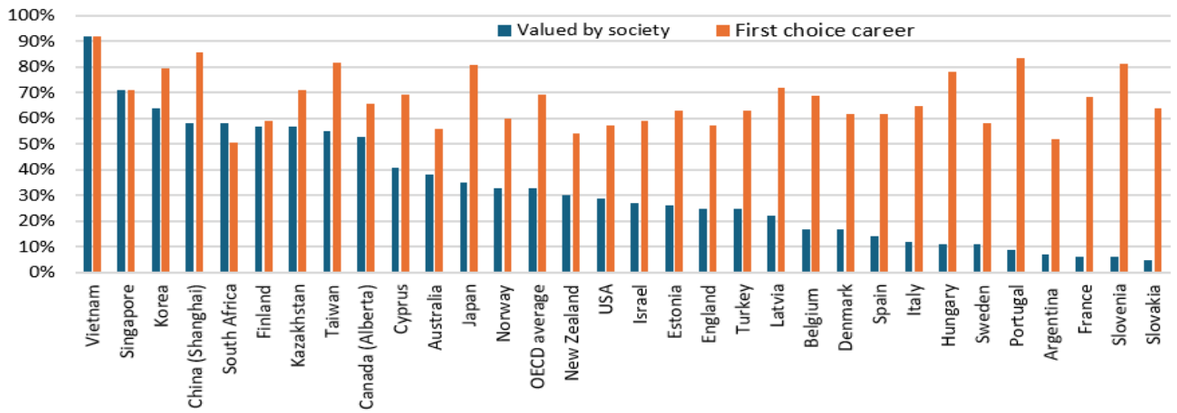

Figure 2. Teachers' perceptions of being valued and teaching as their first-choice career.
Source: OECD (2019). Teaching and Learning International Survey (TALIS).

Being valued is not enough by itself to attract people into teaching. In Finland, although teaching is a valued profession, only 59% of teachers indicated that it was their first-choice career, while in countries like Slovakia, Slovenia, France, Portugal and Hungary, less than 10% of teachers perceived themselves as being valued by society, but over 60% of teachers said they chose teaching as a first-choice career. The correlation between teachers' perceptions of being valued and their choice of teaching as a first career is 0.31, suggesting that only 9% of the variation in the choice of teaching can be explained by variation in teachers' perceptions of being valued.

The status and prestige of the teaching profession are often believed to be closely related to teachers' pay. In many East Asian countries, a high proportion of teachers report being satisfied with their salaries. However,

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in China, where a teacher shortage is rarely reported, only 36% of teachers in Shanghai express satisfaction with their pay. This is below the OECD average of 39% (Figure 3).

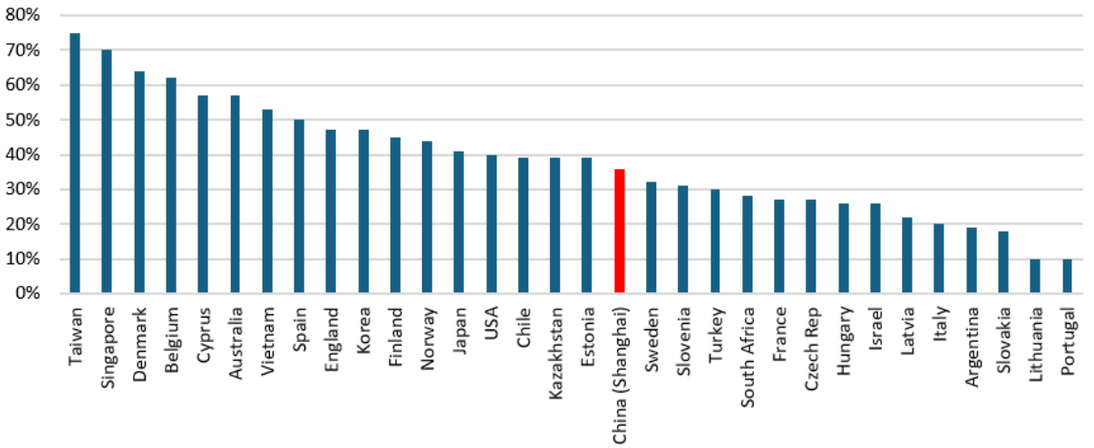

Figure 3. Percentage of teachers reported being satisfied with their salary.
Source: OECD (2019). Teaching and Learning International Survey (TALIS).

All of these figures highlight the complexity of factors influencing teacher supply. No one factor alone can explain teacher shortages (Gorard et al., 2024). For example, teachers' pay may not be associated with teacher job satisfaction, and teachers' status, in turn, may not influence people's choice of teaching as a career. Unfortunately, most research does not look at these factors in combination. Such prior research is therefore not helpful in informing policy and practice, and may well mislead. Based on the above figures, China is an excellent example to study with a very different cultural and political ideology from Western countries.

4. Methods Used in the Case Study

The research in this case study employs a mixed approach, including secondary data analysis, document analysis and semi-structured interviews with stakeholders (government officials, teacher educators and teachers).

4.1. Data

The secondary data were taken from government sources (see Table 1). While these data may be comprehensive in their coverage, we need to acknowledge the challenges in accessing them and the potential for political biases, which could reduce the integrity of the data. These data provided information about the pupil and teacher population in China, their geographical distribution and teachers' qualifications.

Table 1. Sources of secondary data.

Source	Data	Link
Ministry of Education (MOE)	Class sizes; regional class sizes; regional pupil-teacher ratios; teachers' educational qualifications; the number of ethnic minority teachers/female teachers	http://www.moe.gov.cn/jyb_sjzl/moe_560/2022/
National Bureau of Statistics (NBS)	Number of pupils/teachers; birth rates	https://data.stats.gov.cn/easyquery.htm?cn=C01
China Statistical Yearbook (NBS)	Pupil numbers in different regions; teacher numbers in different regions; average annual pay of teachers	http://www.stats.gov.cn/sj/ndsj
OECD Teaching and Learning Survey (TALIS)	Pupi and teacher numbers; teacher qualifications; teachers' motivation to be teachers; teachers' prestige; teachers' workload	

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Official policy documents relating to policies on teacher training and teacher recruitment - admissions criteria, incentives to attract teachers to teach in hard-to-staff areas, teachers' pay and workload conditions - were examined. These have implications for teacher recruitment and retention.

Given the wide regional disparity in teacher supply in China, a series of semi-structured in-depth interviews were also conducted with stakeholders to contextualise the teacher supply situation. Data from these sources supplemented data from official reports. Perspectives from individual stakeholders can help shed light on the discrepancies between publicly stated government policies and what appears to have happened in practice.

The interviewees were selected using purposive sampling through known contacts. They were selected for their experience and knowledge about teacher supply in China. Seven interviewees who agreed to talk to us were recruited. Four were females and three males. Our interviewees included the head of school for teacher training in a normal university (teacher training institutions), authoritative professors working closely with the governments, teacher education lecturer and educational practitioners (in-service teachers) (See Table 2).

Table 2. Profiles of interview participants.

	Roles
Interviewee 1	Research fellow at a university, focusing on the current problems in teacher supply and governments policies to address these problems
Interviewee 2	Lecturer of teacher education, working with pre-service teachers
Interviewee 3	Head of the Department of Primary Education at a normal university
Interviewee 4	Professor at a normal university, specialising in teacher education and teacher professional development
Interviewee 5	Classroom teacher working in a public secondary school in Shanghai
Interviewee 6	Classroom teacher working in a private secondary school in Nanjing
Interviewee 7	Professor at a normal university, with special expertise in teacher education

Although interview schedule protocols were developed, these served only as a guide, as we wanted to keep the interviews open-ended and exploratory. We tried to avoid being too over-prescriptive as it may prevent respondents from giving us information that we may not have thought of.

Data from the TALIS were also used for international comparisons, to give a better perspective of the issues discussed.

4.2. Trends in Teacher and Pupil Numbers in China

To analyse teacher supply in China, we examined trends in pupil and teacher numbers, pupil-teacher ratios, class sizes, and the regional distribution of pupils and teachers. This analysis considered how these factors relate to historical, political, and economic events.

Two key moments in China's history saw significant changes in teacher and pupil numbers, reflecting political shifts. The first occurred in 1949, after the establishment of the Chinese People's Republic under Mao Zedong, when education was brought under national control. For the first time in the history of China, education was not solely the prerogative of a privileged class. This period was marked by widespread literacy campaigns aimed at making more of the population literate (Chen, 2020). This period saw a dramatic increase in pupil population (Figure 4).

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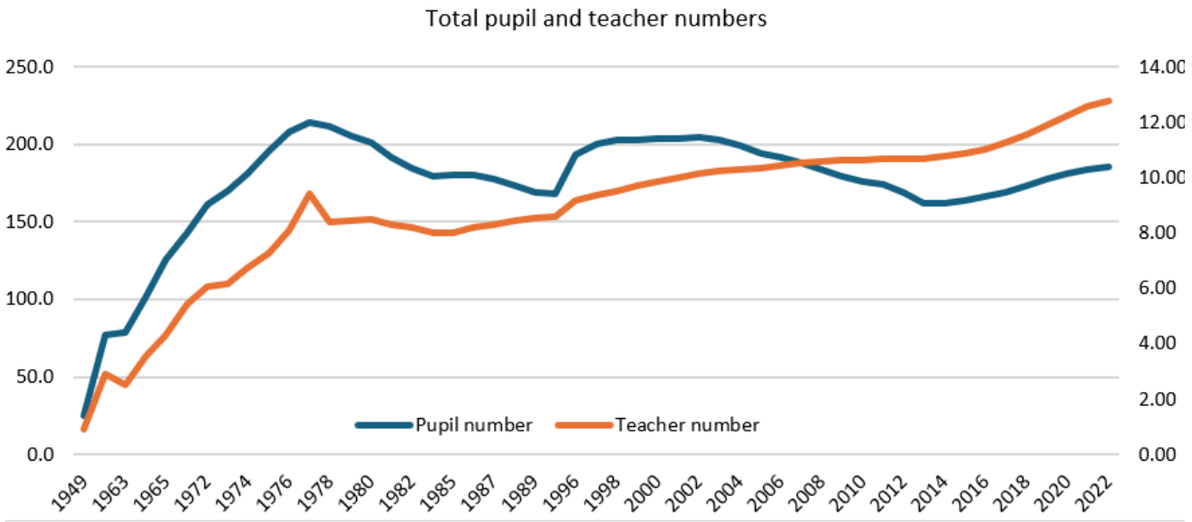

Figure 4. The number of pupils and teachers in China (in million).
Source: Ministry of Education [MOE] (2024a), Department of Planning (1985), pp. 184–185, 197, 213, 220. State Education Commission (1991), pp. 59, 66, 74, 76

A second significant change occurred between 1979 and 1985, coinciding with the introduction of the one-child policy in the late 1970s. During this time, pupil numbers declined while teacher numbers continued to rise, a trend that lasted until 2014 when pupil numbers started to rise again along with teacher numbers, driven by the gradual relaxation of the one-child policy, allowing some couples to have two or even more children (Feng et al., 2016). The policy was fully abolished in 2016, leading to a notable rise in pupil numbers, especially at the primary school level.

In line with changes in pupil numbers, teacher numbers also rose until the late 1970s, when they temporarily declined before increasing again. To cope with the surge in pupil numbers, individuals with only basic education were recruited as teachers, though many were untrained and under-qualified (Liao & Zhou 2018). Data from the Chinese Education Statistics Yearbook shows that no information in some ways was available for teachers' qualifications in 1978. In the 1980s, a policy to retrain these teachers and place them on the public payroll led many to move to large cities for better living conditions, causing a teacher shortage in rural areas. To address this, "supply" or temporary substitute teachers were employed as replacements.

After 1997, the situation improved in some ways when universities were allowed to charge fees. Teacher training universities (or Normal Universities) were given priority admissions to attract high performing students. In major cities, like Beijing and Shanghai, teaching became a preferred occupation when salaries elsewhere fluctuated substantially, and teaching was deemed to provide a stable income. Over the years, the salaries of teachers also rose, making teaching an attractive occupation. However, in 2018, international comparisons showed that only 36% of lower secondary teachers in Shanghai said they were satisfied with their pay (see above).

Corresponding to changes in pupil and teacher numbers, pupil-teacher ratios (PTRs) have also fluctuated (Figure 5). PTRs in the secondary sector followed a similar pattern to the primary sector although lagging behind by a few years, possibly the result of a ripple effect due to changes in pupil and teacher numbers a few years before. Overall, there are now fewer pupils per teacher in China than ever before.

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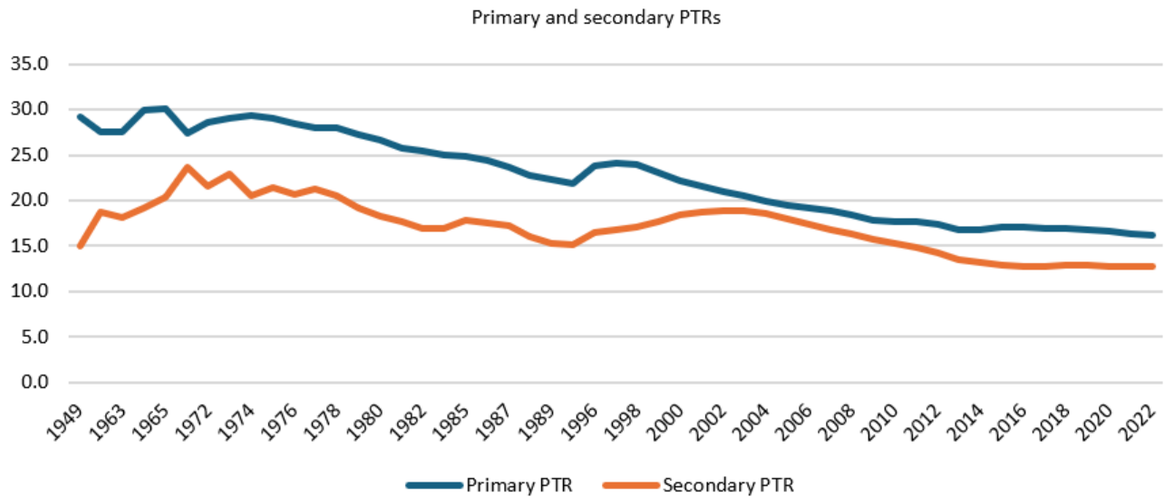

Figure 5. Pupil-teacher ratios across the phases.
Source: Ministry of Education [MOE] (2024a), Department of Planning (1985), pp. 184–185, 197, 213, 220. State Education Commission (1991), pp. 59, 66, 74, 76

International comparisons show that the PTR for lower secondary schools in Shanghai is 11.7 compared to the OECD (TALIS) average of 13.5 (Figure 6), while the national PTR for secondary schools in China is 12.9. There are regional differences in China, but still low PTRs overall.

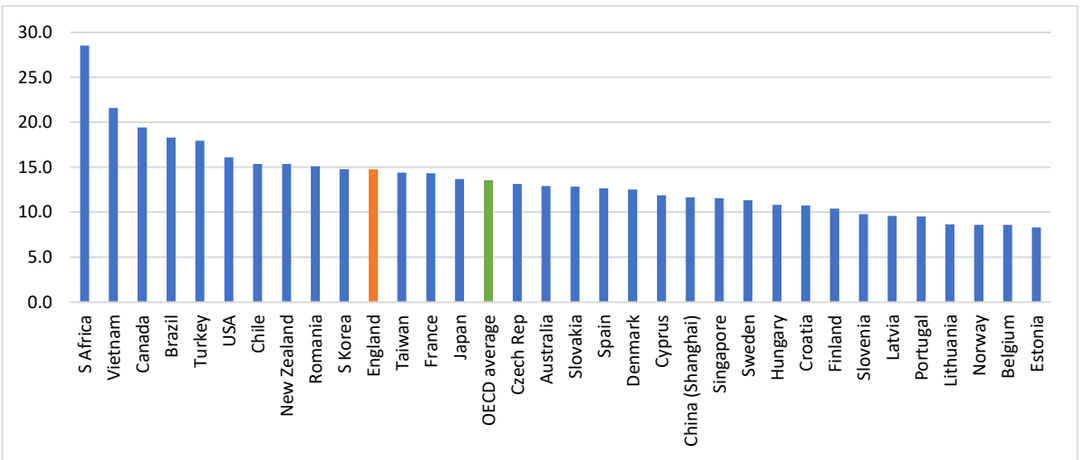

Figure 6.
Pupil-teacher ratios across OECD and partner countries (2018).
Source: OECD (2019). Teaching and Learning International Survey (TALIS).

4.3. Regional Disparities in Teacher Supply

China is a large country, and as such, the national data may not give a fully accurate picture of the teacher supply situation. The national increase in teacher numbers can mask regional differences. There are disparities in educational development between rural and urban areas and towns, and there are also provincial differences in teacher supply. Although large cities benefit from a better teacher supply, rural areas may face shortages and lower-quality teachers, a challenge obscured by national figures. One research fellow at a Chinese university expressed concerns about the uneven distribution of teachers across the country.

China does not suffer teacher shortage, thanks to the higher education expansion, but it faces challenges related to teacher quality and uneven distributions.

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Interviewee 1

However, Figures 7a and 7b show that pupil and teacher numbers in large cities and towns have been increasing steadily from 2015 to 2022, while those in rural areas have been in decline. But the two trends appear largely proportionate. The population is perhaps simply moving away from urban areas.

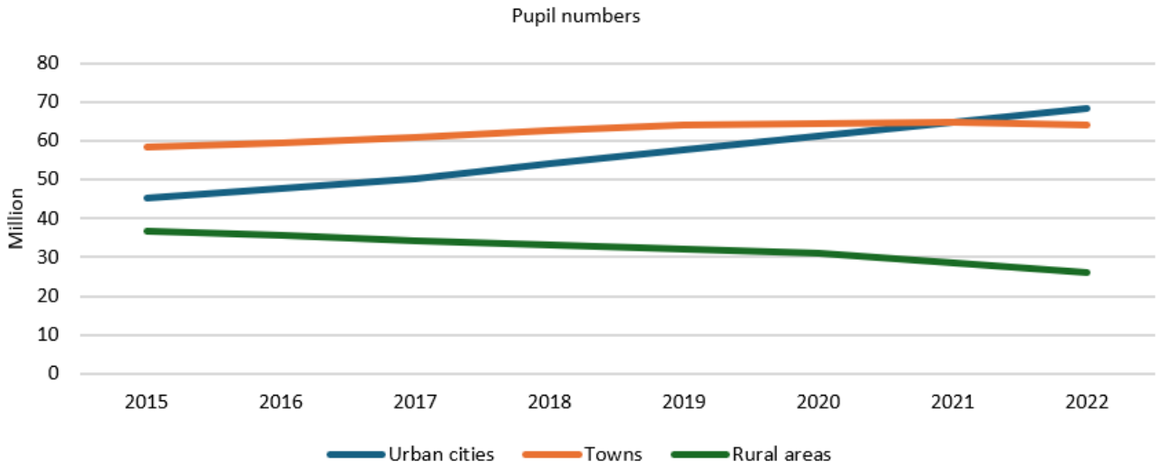

Figure 7a. Distribution of pupil teacher numbers across regions.
Source: Data from the China Statistical Yearbook *2015–2023* (NBS, 2015–2023).

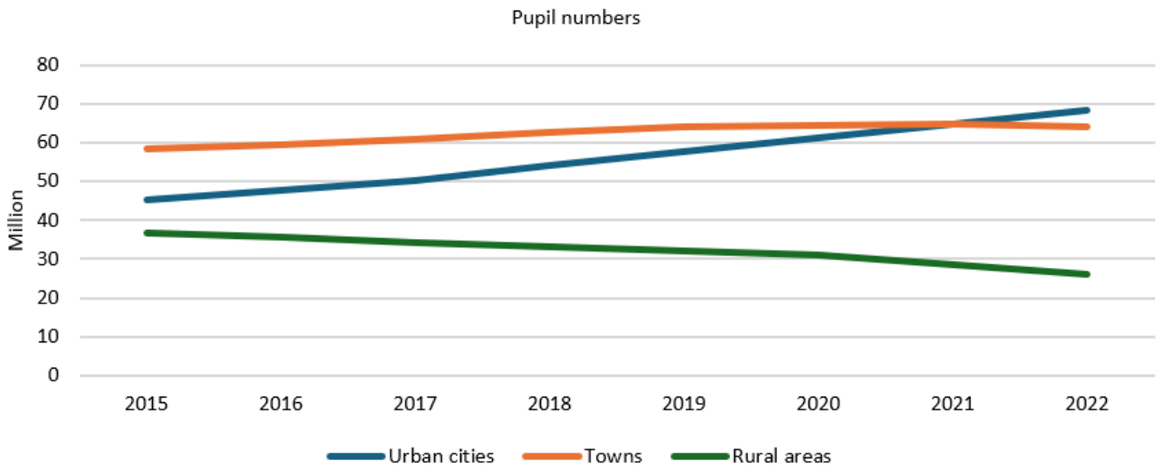

Figure 7b. Distribution of teacher numbers across regions**.**

In towns and cities, pupil numbers have risen, but teacher numbers have increased at an even faster rate, leading to a drop in PTR there (Figure 8). Rural areas have seen a rapid decline in pupil numbers, resulting in an even larger reduction in PTR.

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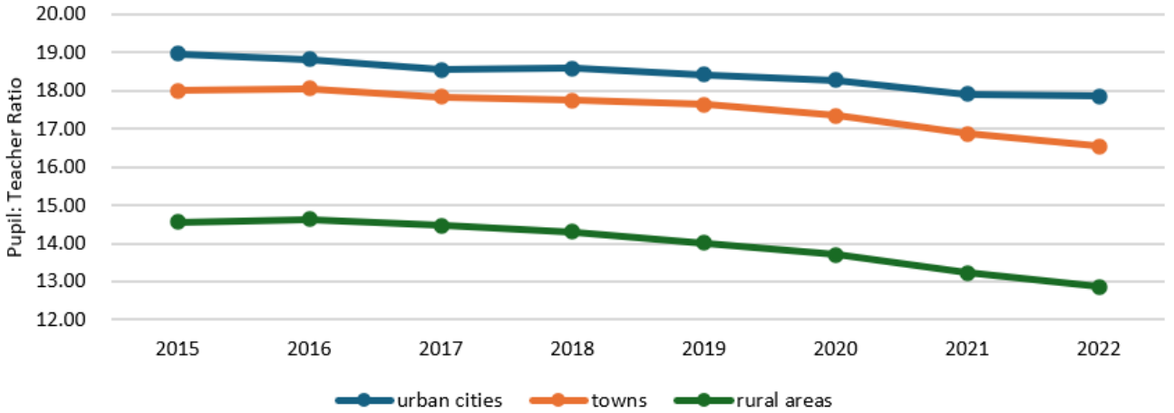

Figure 8. Pupil-teacher ratios in rural areas, towns and cities.
Source: Data from the China Statistical Yearbook *2015–2023* (NBS, 2015–2023).

Neither of these patterns should be interpreted as an indication of an over-supply of teachers. Responses from our informants suggest that the rural and remote areas are actually struggling to attract and recruit high quality teachers. Economic deprivation and lack of adequate infrastructure such as transportation and communication facilities (e.g. roads and rail-tracks, Wi-Fi access) have made these areas less appealing to prospective teachers. Experienced teachers are also less likely to stay because of competition with schools in the wealthier urban areas, which offer better salaries and working conditions (Ling et al., 2020).

> There are disparities in teacher resources between rural and urban areas and provinces in eastern and western parts of China.
> *Interviewee 1, a research fellow*

> In rural areas, the issue (teacher shortage) is the scarcity of teachers or long-term-serving teachers. Teachers in rural areas usually seek transfers to schools in urban areas after a few years because of their children and other family situations; and also schools in urban areas are recognised as better schools thanks to more resources including funding and teachers.
> *Interviewee 3, deputy head of the Department in a normal university*

Although poorer rural areas face challenges in attracting and retaining teachers, some argue that this still does not necessarily indicate a teacher shortage. As See et al. (2019) have argued, a shortage is not straightforward. Whether a 'shortage' exists depends on how the term is defined. To quote a professor at a normal university:

> There is not necessarily a teacher shortage in rural areas, as on some occasions, there are only one or two students in rural schools. On the other hand, some schools in metropolitan areas, such as Shanghai, have experienced teacher shortages in recent years, resulting in larger class sizes from 25 to 50 students per class.
> *Interviewee 7*

There are also wide provincial disparities in the distribution of teachers and pupils. And this is not simply about differences in the size of population. The economic wealth of the region also plays a part.

In the primary and middle schools (compulsory education), PTRs appear to be associated with the scale of the regional population (Figure 9a). For example, provinces with a small population, such as Tibet and Inner Mongolia, have lower PTRs despite being geographically remote areas where there are challenges in attracting teachers (MOE, 2024). Although Beijing and Shanghai are metropolitan, they are small provinces with a small population. PTRs are therefore lower in these areas. They are also economically more developed, hence attracting and retaining teachers is not a major issue. This is also reflected in the smaller class sizes in these two provinces (see section below on Class Sizes).

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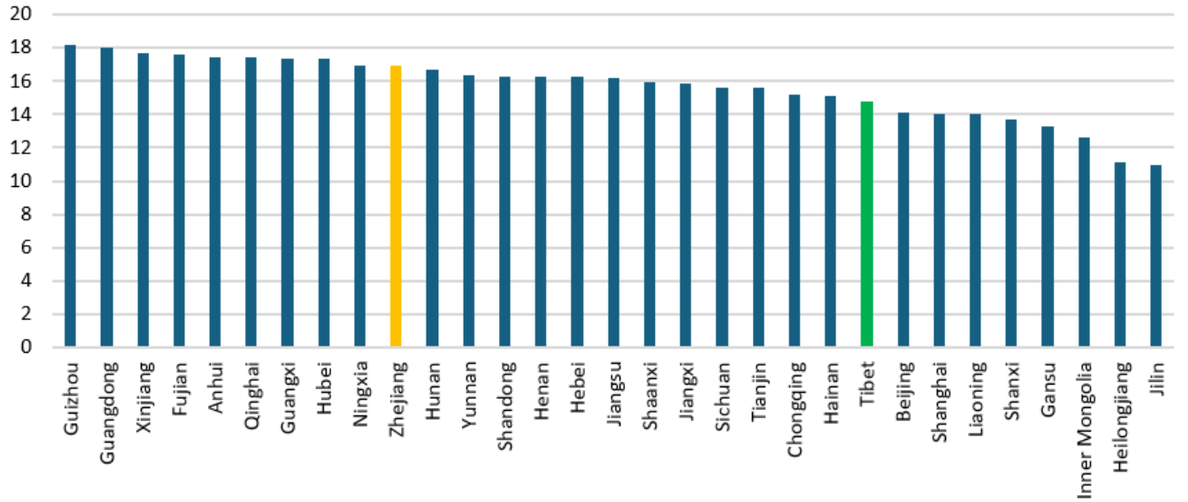

Figure 9a. Pupil-teacher ratios in primary schools by provinces.
Source: Data from the Education Statistical Data (MOE, 2024).

In senior high schools (secondary), PTRs are more closely related to the region's economic wealth. Wealthier areas, such as Shanghai, Beijing and Zhejiang, generally have lower PTRs, while less developed and more remote provinces like Jiangxi and Hunan, for example, typically have higher PTRs (Figure 9b). Inner Mongolia, although often conceived as a geographically challenging area, is one of the more economically developed provinces in China with an annual GDP per capita at ¥ 97,433, roughly £10,620 (1 CNY ≈ 0.11 GBP) (Textor, 2024), ranked 8th in the nation probably because of its rich reserves of coal, iron ore and other minerals. Secondary PTR in that region is one of the lowest in the country.

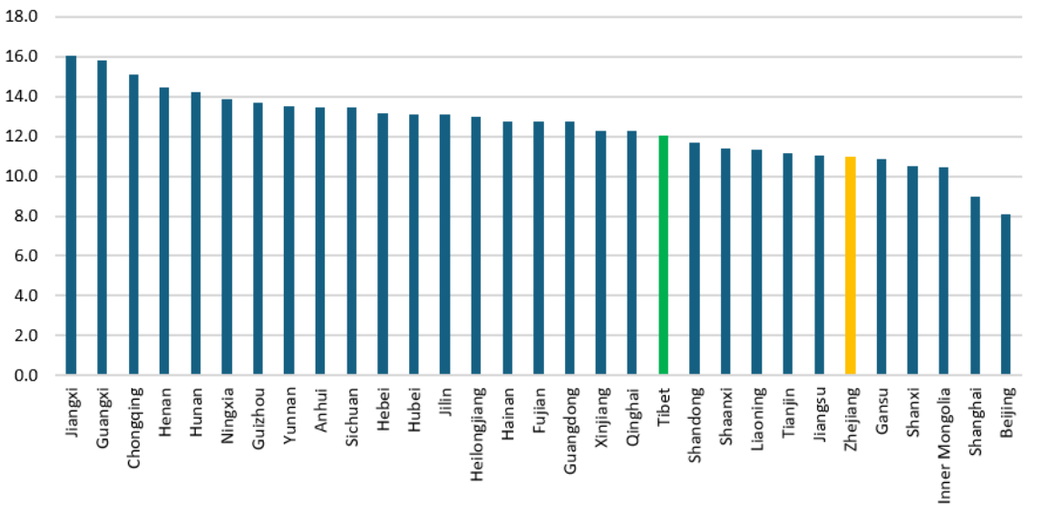

Figure 9b. Pupil-teacher ratios in secondary schools by provinces.
Source: Data from the Education Statistical Data (MOE, 2024).

Nevertheless, pupil-teacher ratios alone do not necessarily reflect the teacher supply situation. While PTR across all phases of education shows a healthy supply of teachers, class sizes tell a different story. In China, class sizes are generally large, especially in secondary schools although they have been declining over time (Figure 10).

In 2013, the average class size was 55 in middle schools and 60 in high schools, which is considered large by European standards. By 2022, both dropped to around 49. In contrast, class sizes in primary schools, have grown, from an average of 35 students in 2013 to 40 in 2022 despite falling PTRs. This suggests that not all

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available teachers were assigned to classrooms, a common practice in education systems where some teachers are allocated to support roles, specialised programmes (e.g., after-school activities), or administrative work outside of traditional classroom teaching.

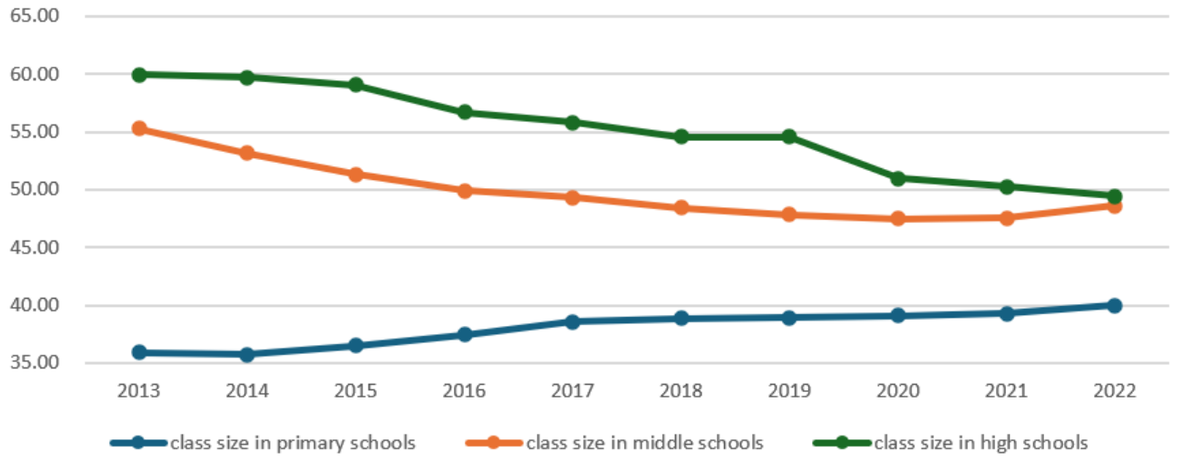

Figure 10. Class sizes by phase of education.
Note: Data from the Education Statistical Data (MOE, 2024).

Class sizes also vary significantly across regions within China (Figure 11), reflecting differences in pupil population as well as the economic and educational development of each area. Wealthier and more developed regions like Shanghai and Beijing tend to have smaller secondary school class sizes, probably due to a larger number of teachers. In contrast, primary school classes are smaller in less developed regions, such as Gansu, Jilin, Heilongjiang, and Jiangxi. This can be attributed not only to lower birth rates in these areas but also to lower attendance rates in compulsory education (Ayoroa et al., 2009).

Regional and provincial variations in class sizes are also driven by differences in funding. Primary and middle schools, where education is supposedly compulsory, receive financial support from both central and local governments, with the central government offering more subsidies to under-developed areas. In contrast, senior secondary education is solely funded by local governments, which are responsible for teachers' salaries and infrastructure. This explains the larger class sizes in secondary schools, especially in less developed provinces with limited budgets where the priority is prior compulsory education.

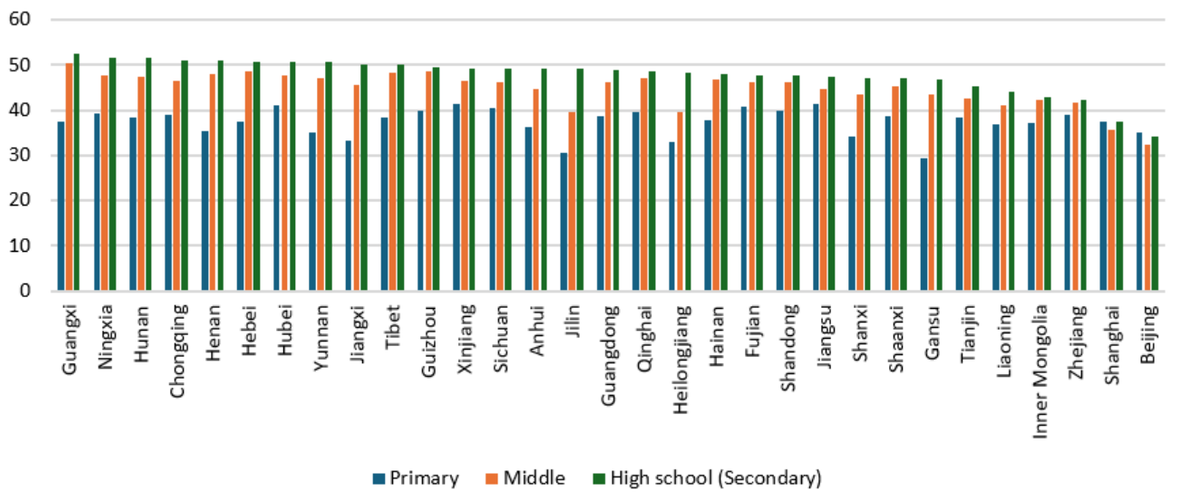

Figure 11. Class sizes by regions (2022).
Note: Data from the Education Statistical Data (MOE, 2023).

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For comparison, the average primary school class size in England was 26.7, and 22.4 in secondary schools in 2022/2023. Average class sizes in China are twice as large as those in England. While not advocating increasing class sizes in England, if we were to increase the class sizes in England to the level of that in China, England would not have a teacher supply problem. But in countries like the US and UK, large class sizes are often portrayed as a sign of teacher shortages.

As can be seen, PTRs and class sizes in China are determined by a number of factors, such as the size of the population in the province, economic wealth and development of the region and how schools are funded (e.g., by local government or by both local and central government). Hence, class sizes and PTRs vary by provinces and by phase of education.

In the following section, we examine how teacher numbers in China are planned, and how the number of teachers recruited each year is determined.

4.4. Planning For Teacher Numbers

China does not publish explicit information on how teacher supply and recruitment plans are formulated. According to one respondent, a professor at a teacher training university, enrolment quotas for initial teacher training are decided by the government based on forecasts of future teacher demand. These predictions involve factors such as birth rates, mortality rates, retirement, and teacher attrition. However, some commentators argue that these quotas are not solely determined by teacher demand. Instead, they may be influenced by a range of factors, including quotas set by the Ministry of Education (MOE), the university's capacity, local demographic trends, economic conditions, and the number of applicants in previous years ~~years~~ (Ministry of Education et al., 2018; Yikaojun, 2023).

Despite these criteria for quotas, there is actually no reliable data on teacher supply. Although passing the National Teacher Certificate Examination is officially required to become a teacher, this regulation is often not enforced. In practice, there is no official record of how many individuals enter teacher training or obtain qualifications. As one professor at a normal university noted:

> The Chinese government may need to enhance its supervision of teacher-related data. The planning department of the Ministry of Education, which is responsible for making prospective plans for Chinese education, has no idea about either how many individuals obtain Teacher Certificate each year or who might possess relevant data about this issue.

Interviewee 4

Given the lack of data, it is difficult to see how the government could plan for teacher supply.

> Unlike in many Western countries, gaining a teacher qualification in China is a relatively straightforward process. To teach in a state or government school, individuals only need to pass a teacher qualification examination (National People's Congress [NPC], 2021; State Council of the People's Republic of China, 1995). The minimum requirement to take this exam is a bachelor's degree in any subject.
>
> According to TALIS 2018 data, 99% of lower secondary teachers in Shanghai hold at least an ISCED level 6 (bachelor's degree). And 97% of lower secondary teachers reported having a teaching qualification (Figure 12). Local education departments, however, are allowed to adjust the requirements based on regional circumstances (National teacher certification examination, 2024).

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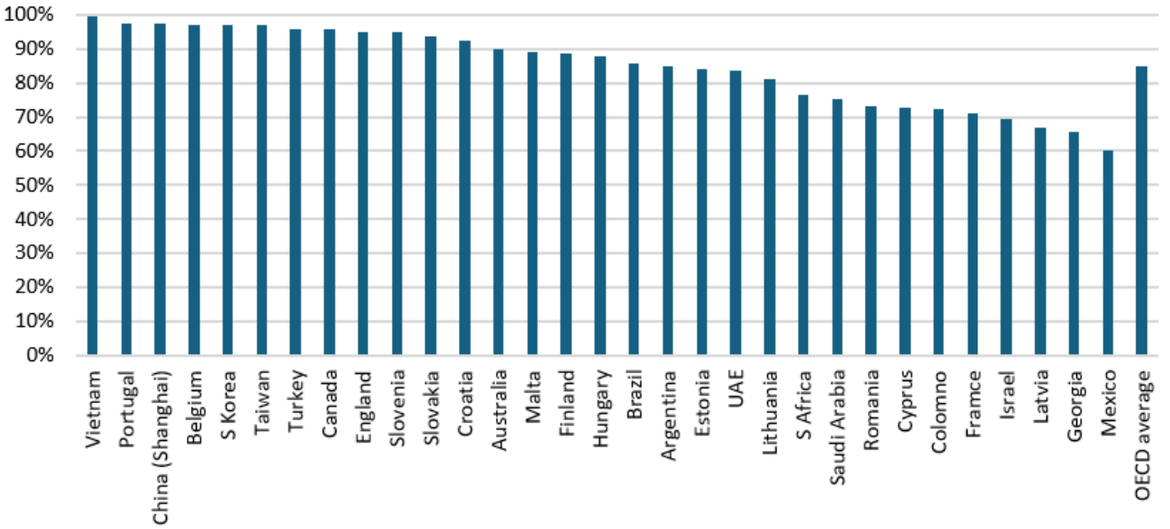

Figure 12. Percentage of teachers with a teaching qualification.
Note: Data from the TALIS 2018 Database (OECD, 2019).

> There is no obligation for prospective teachers to attend a teacher education university, although some academics noted significant differences in the quality of teachers trained in these institutions. As one deputy head of department at a teacher training university observed:
>
> I can distinguish teachers who have received formal teacher training when I visit schools, as they have learned how to teach and understand student's perspectives, making their teaching more than mere knowledge transfer. Others who lack formal training tend to focus on teaching contents.
> *Interviewee 3*

However, what is considered a "qualified" teacher is open to interpretation. For example, a teacher who has a teaching qualification in maths but is teaching physics would not be regarded as a qualified teacher in some countries as they are not considered qualified to teach the subject they have not been trained in.

4.5. Attracting Teachers to the profession

Although China does not report a shortage of teachers in general, there are challenges in attracting teachers to teach in some rural and remote areas. To attract individuals into teaching and, in particular, to less attractive regions, it is necessary to understand the factors that motivate them to pursue a career in teaching.

The TALIS 2018 data show that teachers in China (Shanghai) and Taiwan (Chinese Taipei) are attracted by job stability and employment security more so than their counterparts in other countries, such as, Finland and England, where other factors may be more important (Figure 13).

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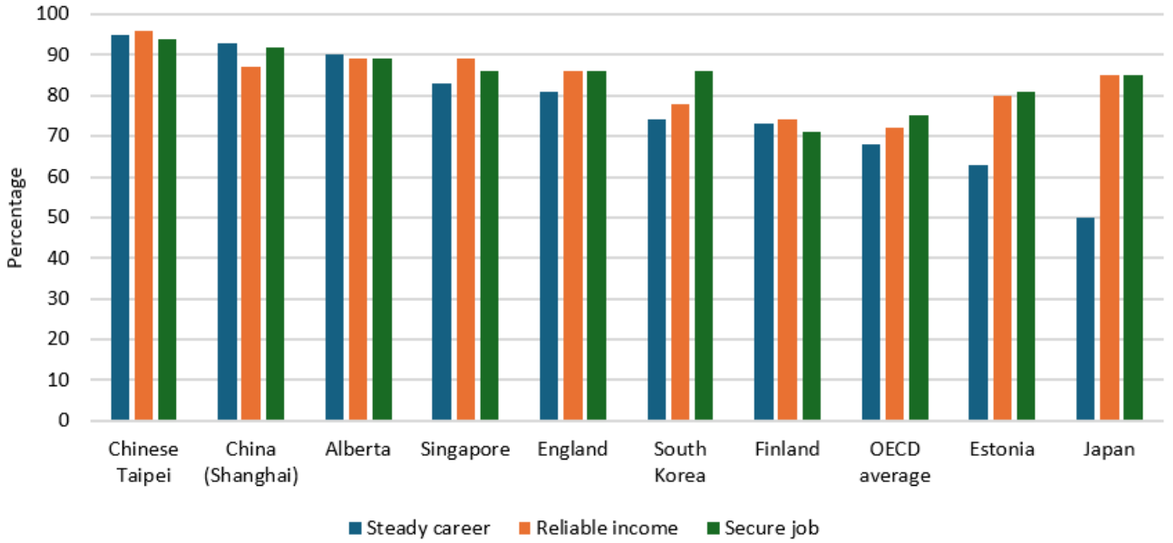

Figure13. Extrinsic motivation to be teachers (lower secondary).
Note: Data from the TALIS 2018 Database (OECD, 2019).

In China, teachers also place a relatively higher emphasis on ~~the~~ work-life balance, personal flexibility and desire to contribute to society that teaching offers compared to teachers in many other nations (Figure 14).

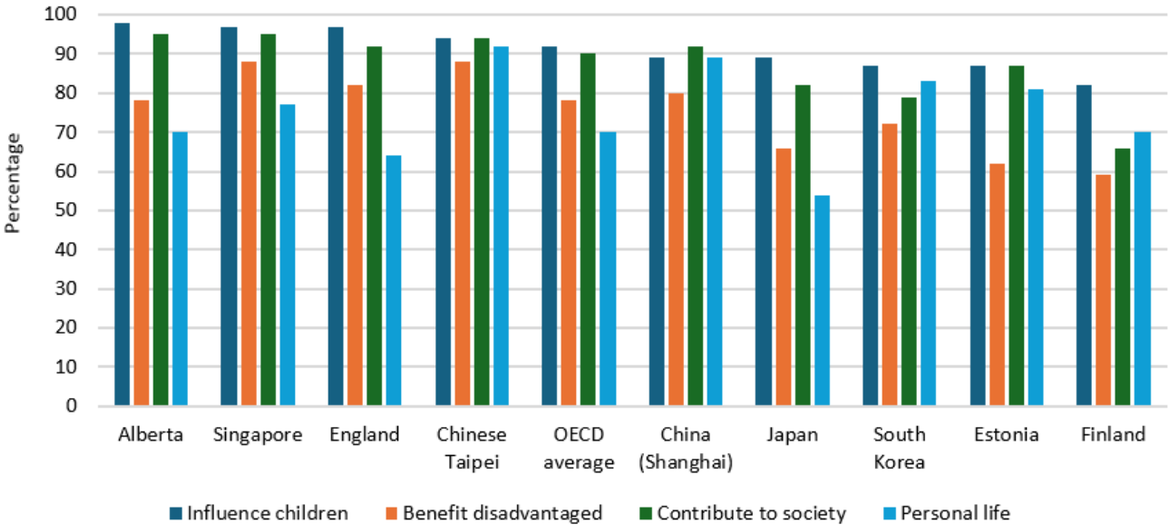

Figure 14. Intrinsic and altruistic motivation to be teachers (lower secondary).
Note: Data from the TALIS 2018 Database (OECD, 2019).

However, the TALIS survey included only teachers already in the profession. To attract more people into teaching, the views of those not yet in teaching should also be considered. Previous studies suggest that Chinese secondary students are attracted to teaching because of their interest in the subject, personality fit and opportunity to continue education (See et al., 2022). Those who are training to be teachers indicated that they are attracted to teaching because of their desire to contribute to society (Bakar et al., 2014; Lee et al., 2019; Lin et al., 2012; Ye et al., 2021), interest in their subject and desire to share knowledge with children (Htang, 2019).

The following section examines Chinese teachers' perceptions of pay, status and working conditions - factors known to be important in attracting and retaining teachers.

4.6. Chinese Teachers' Perceptions of Teachers' Pay

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Teachers' perceptions of pay can have implications for teacher supply. Pay in poorer regions of China tends to be lower than that in wealthier areas. In general, teachers' salaries in China are considered reasonable because the law stipulates that their pay cannot be lower than those of civil servants (NPC, 1995). According to China Statistical Yearbook 2023 (NBS, 2023), the average annual salary for teachers in 2022 was 124,022 RMB (about £13,562). While this is similar to pay in other industries, many teachers feel that it is not enough to support a family. One teacher in Shanghai shared:

> My colleagues often complain about low salaries, but they have no plan to resign. But I think teachers' salary is not high. For example, I earn 150,000 to 180,000 RMB per year (around £16,330 to £19,600). This amount may be sufficient for a single woman living with her parents, but is inadequate for a married man, who is responsible for supporting a whole family
> *Interviewee 5*

Though teachers' salaries are legally equal or above those of civil servants (NPC, 1995), in reality, teachers' actual salary can be much lower. As a school teacher in Nanjing told us, civil servants often receive extra benefits and bonuses, for example, welfare packages and incentives that are not available to teachers.

Salaries also vary by provinces. As shown in Figure 15, there is a wide disparity in pay (figures are based on 2022 teachers' salaries), ranging from 80,00 RMB (equivalent to £8,821) in Henan to 224,000 RMB (equivalent to £24,321 per year) in Shanghai.

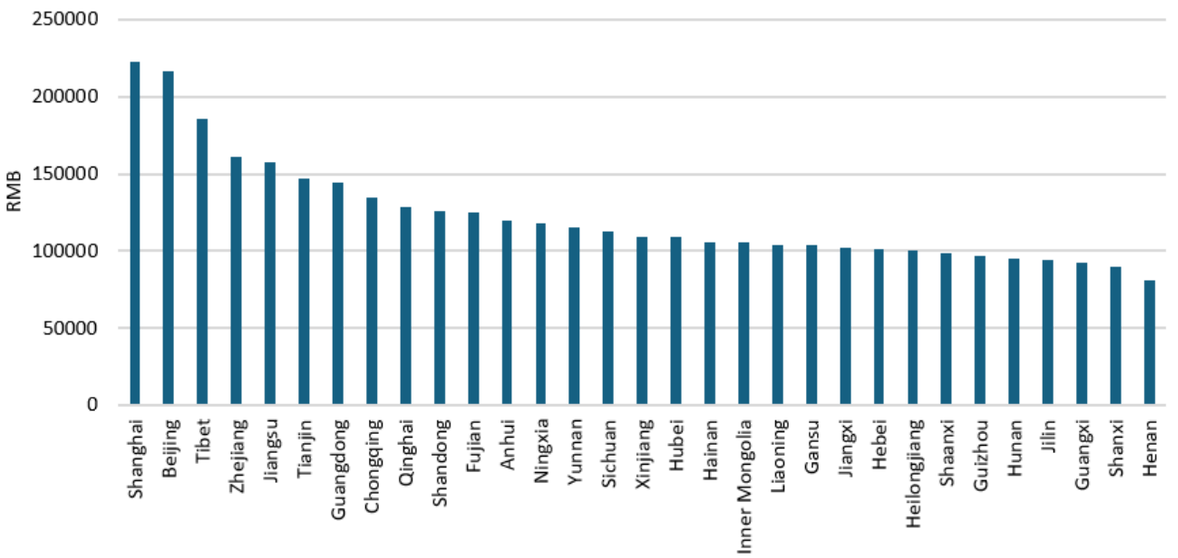

Figure 15. Average annual pay of teachers by provinces.
Note: Data from the China Statistical Yearbook 2023 (NBS, 2023).

Secondary class sizes and PTRs in Henan are among the largest in the country. This is perhaps a reflection of the shortage of teachers in the region due to the low pay. Shanghai and Beijing, on the other hand, may be small in terms of population, are among the wealthiest regions in China, and teachers there command a high pay. This is reflected in the lower PTRs and smaller class sizes.

Despite being paid the highest in China, international comparisons showed that teachers in Shanghai are less satisfied with their pay than their counterparts in England (see Figure 3 above). Dissatisfaction with pay is even stronger in rural areas where the pay is much lower. According to one respondent, the lower salaries of teachers in rural areas is a major challenge in attracting and retaining teachers.

> I think to attract more teachers working in rural areas, at least their salaries should be substantially increased. For example, if I earn 200,000 RMB (around £21,770) per year in Nanjing, you have to at least pay me 300,000 RMB (around £32,652) per year to attract me to teach in rural schools. If the salary

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is only a little higher, such as 210,000 RMB (around £22,860), I surely choose Nanjing, the place that is more developed and that I am more familiar with.

Interviewee 6, a teacher at a high school in Nanjing

Chinese teachers' perceptions of the status of the profession

Despite teachers' general dissatisfaction with their pay, the profession enjoys a high status and teachers are well-respected in society as one high school teacher explained:

> Teachers are popular and well-respected in China. I feel respected by students and parents. When I meet new friends, they will praise me as knowledgeable and intelligent when they know I am a teacher. Furthermore, teachers are also sought after in marriage matchmaking market.
>
> *Interviewee 6, high school teacher in Nanjing*

According to several interviewees, teaching is often regarded as a popular profession due to its perceived job security and stability, particularly in times of economic recession. As highlighted by an interviewee who is a lecturer at a teacher education college (Interviewee 2) and another who is a professor at a normal university (Interviewee 7), the profession's stability makes it an attractive career choice. Additionally, Interviewee 3, a deputy head of the Department of Primary Education at a normal university, emphasised that this perception is especially prevalent during periods of economic uncertainty.

Education in China is claimed to be significantly influenced by the teaching of Confucius. In Confucianism, teachers are held in high regard. In international comparisons, East Asian countries with Confucian influence ranked teaching most highly as a profession valued by society, policymakers and the media (Figure 16). Of course, Shanghai is not representative of teachers in China, so the data has to be interpreted with caution.

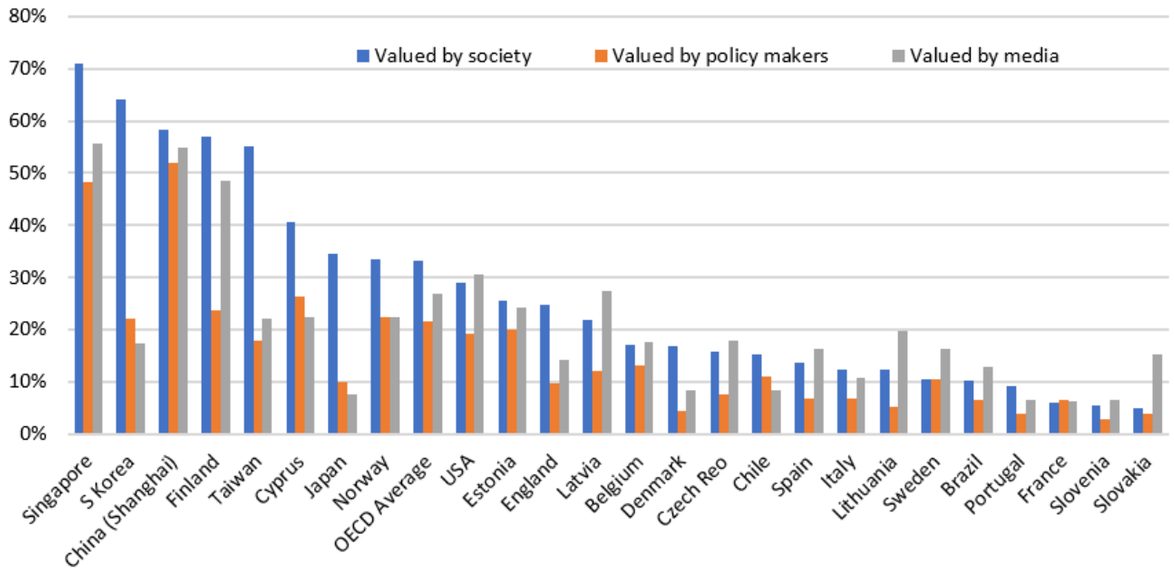

Figure 16. Percentage of teachers reporting being valued.

Note: All data from TALIS refer to lower secondary teachers, where more complete data are available (OECD, 2019).

Although teachers are held in high esteem by society (e.g., parents), not all teachers perceive teaching as a high-status occupation, as reflected by one middle school teacher in Shanghai:

> I don't feel I have a high social status, but people around me often think teachers have high reputation.

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Interviewee 5

Data from the Chinese Ministry of Education (Figure 5a, above) show that teacher numbers in rural areas have fallen from 2.7 million in 2015 to 2.1 million in 2022. This reduction is largely attributed to the relative low pay, perceived lower status of teachers (Cui et al., 2022) and unfavourable working conditions (Liu, 2021) in rural areas compared to urban areas. However, as already shown there has been a relative decline in pupil numbers in rural areas as well.

4.7. Chinese Teachers' Perceptions of Workload

Lower secondary teachers in Shanghai reported in the 2018 TALIS survey that they worked an average of 45.4 hours per week on tasks related to their job, slightly less than English teachers (46.9 hours per week) but well above the TALIS 2018 average of 38.4 hours. However, when we look at the total amount of time spent on specific tasks, teachers in Shanghai spend more time on 9/10 tasks (individual planning, teamwork, marking, counselling students, participation in school management, professional development, communication with parents, extra-curricular activities, and 'other' tasks) than teachers in England. The only activity they reportedly spend less time on than English teachers is general administrative work.

There are also considerable disparities in the workload of teachers in urban and rural areas. Rural teachers not only receive lower salaries than their counterparts in urban and developed areas, but also face heavier teaching workloads. According to a survey by Xu (2007), only 15% of teachers in county-controlled primary schools taught four or more classes compared to over 35% in village and township schools. Rural teachers also had higher weekly classroom hours than urban teachers, particularly in primary schools. For example, only 14% of teachers in village and township schools reported having 14 classroom hours or less per week, compared to 32% in city-controlled primary schools and 58.3% in county-controlled primary schools.

Anecdotal evidence from our informants suggests that teachers in China find their workload very heavy. Most teachers work long hours. As a deputy head of department at a normal university observed:

> Teachers have heavy workload, encompassing not only teaching but also other stuff such as report writing and document preparation for government evaluations. They also have long working hours, often extending from 8 a.m. to 8 or 9 p.m., sometimes even until 10 or 11 p.m. Teachers are usually prepared for such huge workload and long working time, because they have established the expectations on these when they were student teachers.
>
> *Interviewee 3*

One middle school teacher in Shanghai exemplified their working day as:

> I get to school at 7 a.m. and stay at school until 4.30 p.m. or 6 p.m. In addition to delivering classes, I have to attend meetings, offer tutoring to students, sometimes prepare administrative documents and participate in continuing professional development courses. After I come back home, I prepare my lessons or deal with class management stuff. Parents contact me via WeChat at night about a lot of different things. Therefore, I actually work into the night.
>
> *Interviewee 5*

A high school teacher in Nanjing also reported heavy workload with 9-10 working hours each day and 20 class hours of teaching every week.

> Teachers are required to be present at school, even on days without classes.
>
> *Interviewee 6*

4.8. Impact of Government Policies to Attract Teachers to Rural Areas

To encourage teachers to teach in the more remote and less developed areas of China, the Chinese government has offered a range of financial incentives for teacher training (Yue et al., 2018). Teachers are also provided with accommodation and living expenses. The government provide funding for university graduates (not necessarily from Normal universities) as a compensation for working in challenging areas.

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Among these incentives was the *Free Teacher Education programme (FTE)*, which provides tuition fee exemption, free accommodation and a monthly stipend to graduates (Qian et al., 2019). The condition was that recipients of the funding must return to their home province to work for six years. A UNESCO report suggests that between 2007 and 2017, around 80,000 teachers have returned to work in their home province, and 90% in the mid-west China provinces (Zhang, 2023). And since 2018, over 300,000 of the FTE graduates are teaching in schools in their home province and rural areas. However, some researchers found that the scheme was not as successful as publicised, because teachers still had negative perceptions of teaching in rural schools, and still preferred to teach in the cities (Qian et al., 2019).

Another scheme was the *Rural Teachers Support Plan (2015-2020)* aimed at improving the lives of teachers in rural areas where teachers were offered an average monthly subsidy of 284 RMB (equivalent to £31 a month), around 5% of the average monthly salary of primary school teachers (Jian, 2020) only while they are teaching in rural areas. Students were also offered tuition fee compensation and student loan reimbursement. The plan included building dormitories and apartments for teachers. There was also a mobile Education and Training Unit that provided onsite training for teachers – bringing training to teachers instead of teachers having to travel to teacher training institutions. Although the scheme saw an increase in the number of teachers and in living conditions as well as better professional development opportunities, researchers have noted disparities in policy effectiveness across provinces (Li, 2025). There were suggestions of bias in the way the policy was implemented by local governments, particularly in recruiting and training arts educators. A survey of teachers across 120 rural schools, found that while the programme had increased the number of teachers in rural schools, it did not generally attract high-quality teachers (Fu & Fan, 2018).

In 2013, the Chinese Ministry of Education introduced the *Rural Teacher Living Subsidy Policy (RTLSP)* to address teacher shortages in rural areas. The initiative provided living subsidies to teachers in high-poverty rural areas (Jiang & Yip, 2024). The subsidies vary depending on the level of hardship and living conditions. Additionally, graduates were offered tuition fee compensation and loan reimbursement if they took up teaching positions in rural schools.

Jiang and Yip's (2024) study, involving 859 rural teachers in three counties in the western part of China, found that the policy was successful in attracting student-teachers to rural schools in the short-term, but failed to retain them beyond three years. This aligns with finding in Western countries, where financial incentives alone are not sufficient to address long-term teacher shortages (See et al., 2020). The policy also increased interest among young people to teach in rural schools. However, the living subsidy was viewed as inadequate to offset the challenges and inconvenience of teaching in rural schools (Jiang & Yip, 2024). There was also resentment among teachers in township schools, who also work in rural schools, but were excluded from the subsidy despite facing similar challenges. Township schools are private schools in remote villages that charge very low tuition fees. They provide basic education to rural areas.

A small-scale study by Zhao et al. (2024) based on interviews with 15 teachers in Gansu province further highlighted the limitations of these policies. Teachers reported insufficient resources and lack of opportunities to engage in professional development. All of this undermined retention efforts.

To understand why most of these policies have limited success with retention of teachers, Jiang et al. (2023) examined the effects of hygiene factors (financial incentives, pay and personnel policy) and motivation factors (opportunities for career advancement, the working conditions and job satisfaction) on rural teachers' turnover intention. The study surveyed 973 teachers from poverty-stricken areas in Western China. The findings suggest that both hygiene and motivation factors are important in reducing turnover of rural teachers, but motivation factors have a stronger effect. Hygiene factors have a stronger effect on English language teachers than on other teachers. This is probably because English language teachers are paid more elsewhere. An English language ~~teachers'~~ teacher's salary needs to be above the market level to make it attractive for them to stay.

Others have attributed the difficulties in attracting and retaining teachers in poor rural areas to the wide salary gap between teachers in developed and less developed regions (Xue, 2018). Despite the financial incentives, the salary gap remains, not only in terms of the base salary, but also in terms of medical and other social security benefits. Even with the wage increase and other incentives, rural teachers still think that their pay is not enough to compensate them for their work and the working conditions (Cui et al., 2022). Besides the lower salary, rural postings are also seen as detrimental for career development. Our interviews collaborate with those in other studies. As one of our interviewees, a high school teacher in Nanjing, explained:

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> The salaries of teachers working in rural and distant areas are much lower than teachers working in urban cities. Even though the government provides additional subsidies for rural teachers, their salaries are still much lower. Besides low salaries, working in rural areas is not good for individuals' career development. People always want to work for their better future.
>
> *Interviewee 6*

To address this issue, the Chinese government has made experience in teaching in rural or disadvantaged schools a criterion for promotion **(**MOE & Ministry of Finance General Office, 2022). For those who seek promotion to be principals, priority is given to those who have worked in rural schools for more than three years. But this is only a short-term measure, as one of our interviewees observed:

> Some teachers who want a promotion will serve in rural schools, but they just stay for one or two years. They do not really have intrinsic motivation to work as a rural teacher. It is hard to say that such profit-oriented short-term teachers will provide more positive effects on rural students and schools than negative ones.
>
> *Interviewee 6*

4.9. Impact of Government Policies to Retain Teachers in Rural Areas

While the various policies have been effective in attracting teachers to rural areas, the effect on retention is less clear. As shown in the preceding section, the effects of these policies tended to be short term as disparities in salaries and benefits remain. Official statistics show that an increasing proportion of teachers moved out of rural areas between 2015 and 2022 (Figure 17a, b and c). The situation is particularly dire in the primary sector. In 2014 around 16.8% of primary teachers in village schools transferred out compared to 10.4% in township schools and 7.6% in city schools.

While the data show that the proportion of teachers in urban and towns/counties leaving school is lower in middle and senior high schools, the trend appears to be upward (Figures 17b and 17c). Only in 2020 (likely the result of Covid-19 pandemic) there was a drop in the proportion of teachers leaving. Several surveys have suggested that a high proportion of teachers in China have expressed an intention to leave teaching, but most are simply movement across schools or to cities rather than out of the profession entirely. Teaching is still an attractive profession although not in rural areas. A survey of over 10,000 rural teachers across 30 rural counties in Yunnan province revealed that nearly 80% of teachers expressed a desire to relocate to larger cities where salaries and working conditions are perceived as more favourable (Wang & Li, 2017).

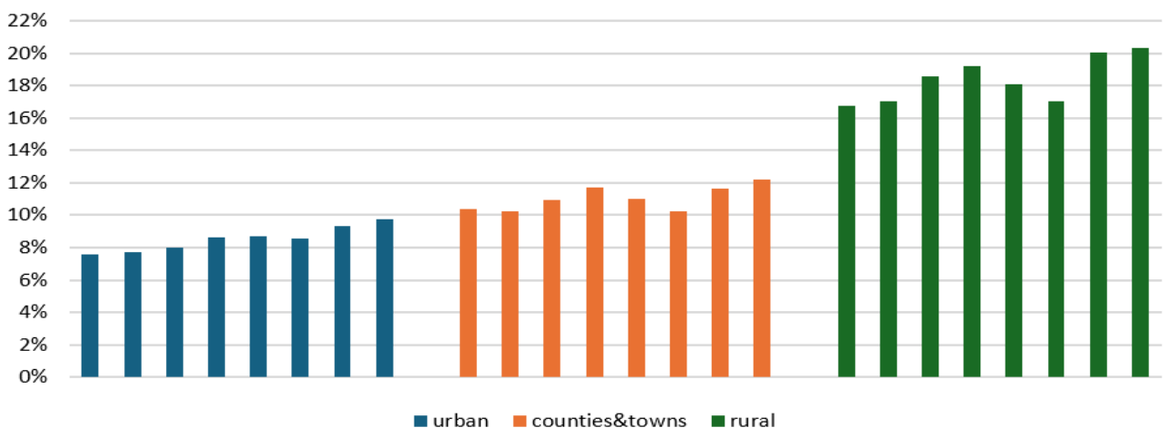

Figure 17a. Ratios of outgoing primary teachers to number at start of school year.
Note: Data from the China Statistical Yearbook 2015–2023 (NBS, 2015–2023).

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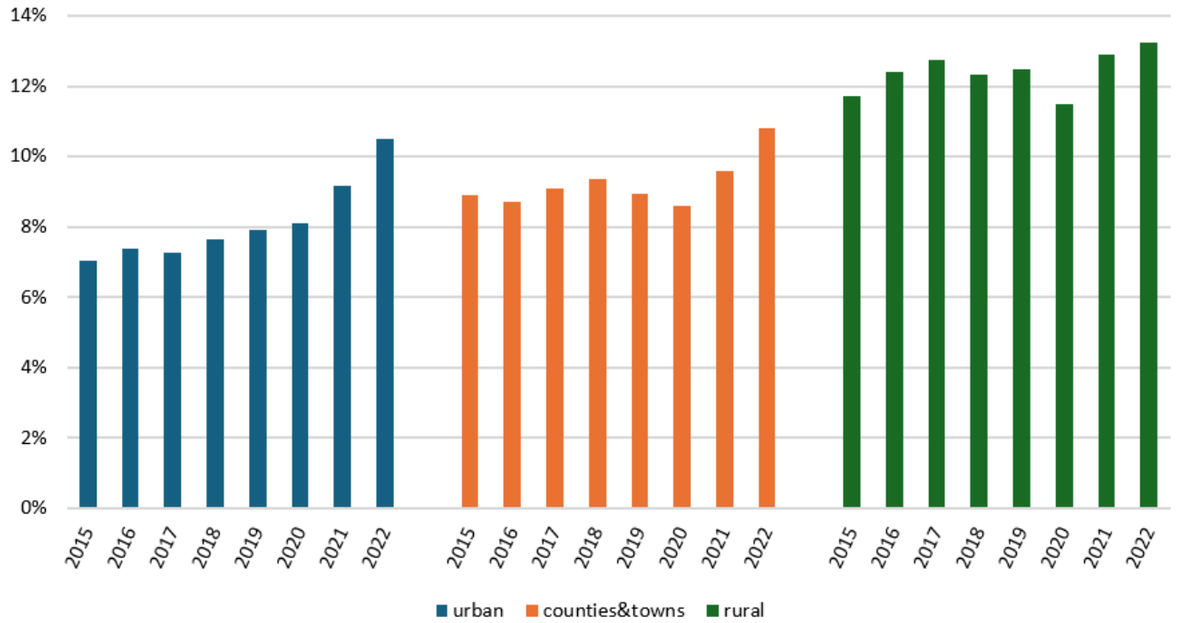

Figure 17b: Ratios of outgoing middle teachers to number at start of school year.
Note: Data from the China Statistical Yearbook 2015–2023 (NBS, 2015–2023).

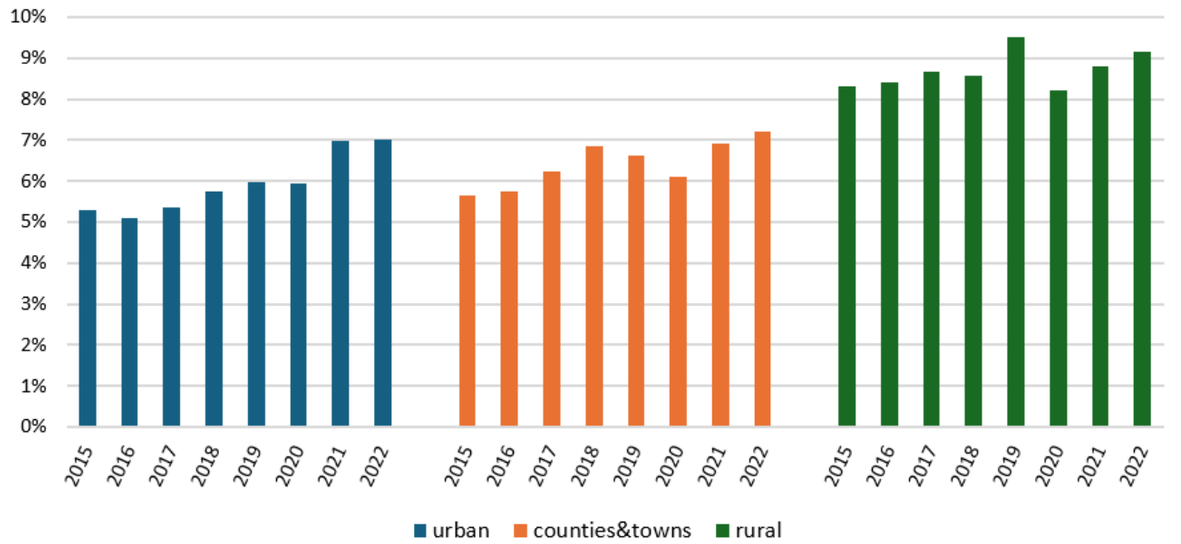

Figure 17c. Ratios of outgoing senior high teachers to number at start of school year.
Note: Data from the China Statistical Yearbook 2015–2023 (NBS, 2015–2023).

Government support programmes for rural schools have helped stem the flow to some extent. However, despite these incentives, the proportion of primary teachers leaving rural schools has consistently exceeded the number of teachers recruited over the years (Figure 18). Rural schools continued to lose more teachers than they recruit, contributing to reported ongoing teacher shortages. The challenges of teacher retention in rural areas highlight how economic factors often outweigh policy-driven incentives.

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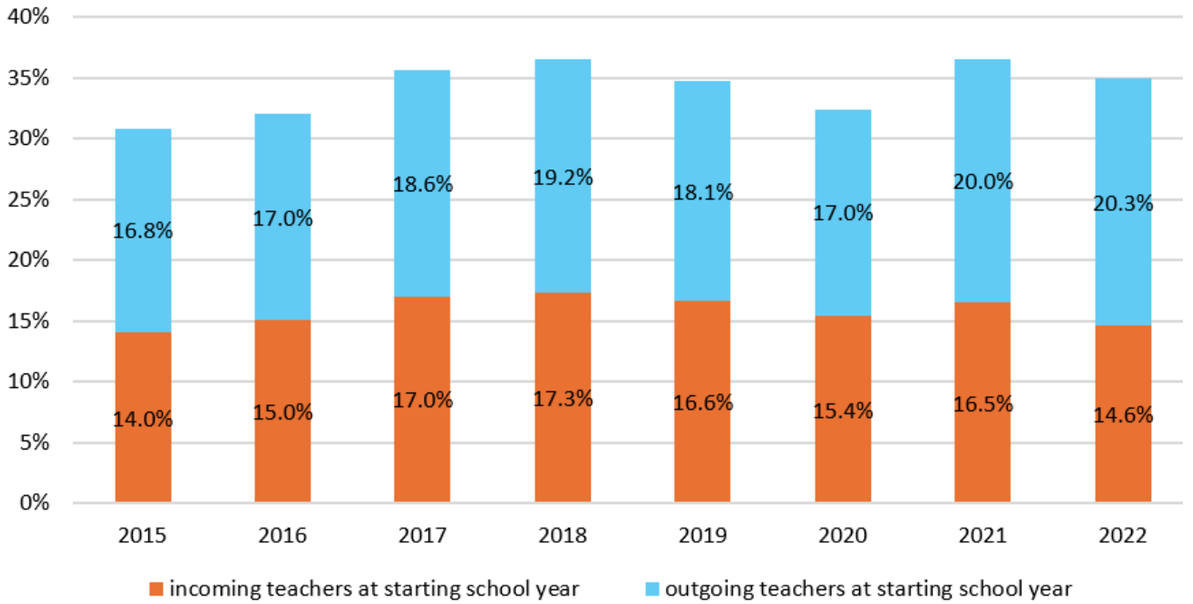

Figure 18. Differential proportions of teachers moving out compared to teachers moving in (rural primary schools).
Note: Data from the China Statistical Yearbook 2015–2023 (NBS, 2015–2023).

Another survey conducted by the East China Normal University from 2006 to 2008 involving 11,190 full-time teachers across nine provinces found that 60% of teachers expressed thoughts of leaving teaching (Ding, 2010). Two recent surveys with around 5,000 teachers reported that around 30% of teachers have thought of leaving the profession (Sun and Du 2023; Wang, 2023).

These surveys do not indicate actual attrition as people who say they are leaving often do not actually leave. As suggested by two of our interviewees, teachers usually tend to stay in the profession. Teachers may change schools or cities for the sake of their children's education or for better living conditions, but they do not leave the teaching position. Although they may complain about their work, they generally maintain a positive attitude towards teaching.

> Teacher retention rates are very high. In the first two years after I become a teacher, there were about 2 or 3 teachers who resigned in the school I am working in. These teachers did not leave the teaching profession but transferred to better schools. In the recent years, no teachers have left.

Interviewee 5, middle school teacher in Shanghai

Teacher retention rates are high, particularly among female teachers. Once they choose to be teachers, they tend to stay in the profession until retirement.

Interviewee 6, high school teacher in Nanjing

4.10. Other Shortages

So far, the discussion has been about geographical disparities in teacher numbers. Shortages in remote and rural schools are the most challenging issue in teacher supply facing China. However, there are also subject-specific shortages. For example, there is some shortage of English language teachers in primary schools. In junior high schools, shortages of teachers are found in subjects which are taught in English, such as biology, physics, chemistry and information technology (Yang et al., 2008). This shortage is particularly severe in rural areas. For example, in the western mountainous areas, there was only an average of one music teacher for 10 rural primary schools (National Education Supervision Group, 2008). In some cases, schools could not offer certain subjects due to a shortage of teachers.

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Our interviews with initial teacher training providers and academics also indicated shortages in music, art and science-related subjects, such as physics.

> There are some teacher shortages in certain subjects, such as Chemistry and Mathematics, in the school that I am working at. The school will hire part-time teachers or make an urgent teacher recruitment plan.
>
> *Interviewee 6, a high school teacher in Nanjing*

The difficulties in attracting teachers to rural areas due to the lower pay and poor working conditions are only part of the explanation for the shortages. Two of the interviewees suggested that insufficient number of teachers trained in these subjects as one reason. Another reason is that art and science are not popular subjects among young people.

> The possible reason for this could be the insufficient teachers trained in these subjects.
>
> *Interviewee 2, lecturer at a teacher education college*

> The cultivation of art teachers and science teachers requires higher professionalism in teacher training; on the other hand, Art and Science are not major subjects that young people would like to choose.
>
> *Interviewee 3, deputy head of the Department of Primary Education*

Additionally, there is also a disparity in the qualifications (and so perhaps the quality) of teachers in rural and urban areas. In rural primary schools, 87.3% of teachers in 2014 had a junior college education or above, while that in urban schools was 96.5%, representing an urban-rural gap of 9.2% point (MOE, 2015). In junior high school, 73.3% of teachers in rural areas had a bachelor's degree or above compared to 87.8% in urban areas, indicating a 14.5% urban-rural gap.

Besides the relatively low pay and heavier workload that drive teachers from rural to urban areas, rural teachers are also being poached by schools in urban areas. Urban schools are actively recruiting rural teachers with stronger academic qualifications, senior professional grades and a track record of teaching effectiveness (Lei & Xie, 2010; Peng & He, 2011). Despite their credentials, many rural teachers are employed as substitute teachers, with no job security, making it easy for them to be attracted by urban schools. Urban schools, on the other hand, are under pressure to increase the number of permanent teachers and the quality of their teaching workforce. To achieve this, they target and "poach" these highly qualified teachers.

The combination of pay disparities and active poaching by urban schools exacerbates teacher shortages in rural areas. This minimises the effect of government incentives despite efforts to improve the situation.

4.11. Synopsis

China does not report a national shortage of teachers in the way Western countries do. The large class sizes, averaging 50 pupils in middle and high schools and 40 in primary schools, considered large according to the standard used in many other countries, obscure underlying issues in teacher distribution and quality. Since schools generally meet government-mandated class size requirements, the large classes are not recognised by the government as a "shortage". Regional disparities in rural and remote areas reveal a complex situation.

The most pressing challenge in China's teacher supply is the imbalance between rural and urban areas. While urban schools benefit from better resources and staffing, rural schools face difficulties in attracting and retaining qualified teachers due to lower pay and less favourable working conditions. Some schools rely on part-time or temporary teachers, which technically fills vacancies but does not ensure teaching quality. As long as positions were filled, the situation was not regarded as a shortage. This reinforces the point that the definition of "shortage" is very much open to interpretation.

The number of teachers alone does not provide a complete picture of the teacher supply situation in schools. It is essential to consider the quality of teachers. In many Western countries, becoming a qualified teacher requires both an undergraduate degree and a teaching qualification. In China, teachers only need to pass a National Teacher Certificate Examination to qualify as a teacher. This requirement has not always been strictly enforced, and formal teacher training is not mandatory. This flexibility in qualification standards allowed teacher numbers to keep pace with student enrolment, but it raises concerns about the overall quality of instruction.

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5.Understanding the Teacher Supply Situation in China

5.1. Historical Events

China's teacher and pupil numbers are very much influenced by major political policies, which in turn, influenced population dynamics. The introduction of universal education in 1949, for example, saw a dramatic increase in the number of pupils receiving formal education, while the one-child policy in the 1980s led to a decline in pupil numbers. A resurgent in student enrolment began in 2014 as the one-child policy was gradually relaxed to allow couples to have two children.

In the early years of mass education expansion, fast-track, short-term training of teachers ensued, and many teachers were recruited with minimal training (U, 2004). In Shanghai, for example, politically marginalised individuals were employed as teachers to meet the rising demand.

5.2. Loose Definition of "Qualified Teachers"

Teacher numbers have been largely able to catch up with pupil numbers. This was possible because the criteria to be a teacher was not stringent especially in the early years of education expansion. For example, in the 1990s, teachers needed only to have a qualification one level above those they were teaching. It was only in recent years that all teachers needed to have at least an undergraduate degree. Even then, one only needs to take and pass a National Teacher Certification examination to be a qualified teacher without necessarily going through a teacher training programme at a university.

5.3. How Teachers Were Deployed

While many countries use class sizes and PTRs as indicators of teacher shortages, these metrics can be misleading as there is no standard measure of what is considered a large class or high PTR. PTR is a measure of the level of teaching resources available. Despite China's class sizes, its overall pupil:teacher ratios are relatively low (12.7 in secondary schools and 16.2 in primary schools). One explanation could be the use of non-classroom teachers to provide additional specialised support, a common practice in some education systems. For example, in urban and wealthier areas like Shanghai, schools have managed to maintain a relatively low pupil-to-teacher ratio overall by employing a substantial number of support teachers, subject specialists, and administrators who work with students outside of regular class hours. However, the qualifications and training of these additional staff members remain unclear. It is also unclear whether peripatetic teachers are included in the headcount. Further investigation will be needed. Singapore, South Korea and Japan are examples of such education systems with large class sizes and relatively low pupil-teacher ratios, and this will form part of future case studies.

5.4. Funding System

Teacher supply in China is also influenced by China's school funding structure, which, in part, explains the geographical disparities in teacher supply. Funding for compulsory education (primary and middle school) is provided by central governments, while secondary schools are financed by local governments. Consequently, the wealth of a region determines the number of teachers it can afford. This financial disparity exacerbates the rural-urban divide in teacher distribution.

5.5. Status of the Teaching Profession

Despite dissatisfaction with pay, 87% of Chinese teachers reported that teaching was their first-choice career, compared to only 59% of teachers in England. The Chinese attitude towards education is shaped by historical, cultural, and philosophical influences. Rooted in Confucianism, which emphasises respect for knowledge, discipline, and authority, education is highly valued. Teaching is regarded as a prestigious profession, and many educators see their work as an extension of their own learning and knowledge-sharing. International data show that 60% of teachers in Shanghai feel valued by society, compared to less than 30% in England. This reverence for the teaching profession may be more pronounced in rural areas, where access to education is seen as a privilege.

A study by Gorard et al. (2024) found that in countries where teachers feel undervalued, behavioural issues in schools are more prevalent. Intimidation and abuse of teachers are common factors among countries facing teacher shortages. In contrast, Chinese society's emphasis on respect for authority and discipline likely

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contributes to its ability to manage large classes. The cultural and societal ~~for~~ respect for teachers may help mitigate against the negative effects of overcrowded classrooms.

Monetary rewards, commonly used in developed western economies, may only serve as part of the solution. China's case and our international comparison study (Gorard et al., 2024) suggest that professional prestige and societal respect for teachers and teaching ~~are important factors~~ play a crucial role in influencing teacher retention and supply.

6. Conclusion

China's approach to teacher supply presents a unique case where large class sizes coexist with relatively low pupil-teacher ratios. While teacher numbers have largely kept pace with demand, disparities in teacher distribution and qualification standards remain a cause for concern. The cultural respect for teachers and societal emphasis on education may contribute to teacher retention, but addressing regional inequalities remains a major challenge in teacher supply for China. This case study also serves as a reminder of the ambiguity surrounding the concept of "teacher shortages".

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