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## Provider Perspectives on General Practice in Henan, China: a mixed-methods study

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2019-036240
Article Type:	Original research
Date Submitted by the Author:	09-Dec-2019
Complete List of Authors:	Zhu, Jiming; Tsinghua University, School of Medicine Ariana, Proochista; Oxford University, Nuffield Department of Medicine
Keywords:	PRIMARY CARE, EDUCATION & TRAINING (see Medical Education & Training), HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, PUBLIC HEALTH

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# Provider Perspectives on General Practice in Henan, China: a mixed-methods study

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## ABSTRACT

### Objective

Since 2011 China's central government has committed to establishing a new 'general practitioner' (GP)-centred primary care system. To this end there have been great efforts to train an additional 300,000 GPs by 2020. This paper examines the perspective of practitioners in Henan, China regarding general practice.

### Design

A mixed-methods approach using focus group discussions (FGDs), and structured questionnaires.

### Setting/Participants

Seven FGDs and responses to 1,887 questionnaires included medical students, primary care doctors and GP residents in Henan.

### Results

The three surveyed medical groups have some awareness of the attributes of general practice (e.g. comprehensiveness, first contact and coordination), but often misinterpret what being a GP entails. Five themes were identified through the FGDs and tested quantitatively for their prevalence with structured questionnaires. Firstly, the GPs' role as a comprehensive care provider was (mis)interpreted as an 'all-round doctor'. Secondly, the GP's responsibility as the first point of care was understood in two conflicting ways: private personal doctors of the rich and the powerful or village doctors for common people. Thirdly, referral was understood as simply guiding patients to appropriate departments within the hospital while the gatekeeping role was interpreted to involve GPs being peoples' health protectors rather than being also gatekeepers of specialty services. Traditional Chinese Medicine now further complicates the understanding of GPs. And lastly, the GPs' main responsibility was considered to be public health work.

### Conclusion

The misunderstandings of the roles and responsibilities of GPs render problematic the policy foundation of China's GP-centred primary care system. Pursuing the quantity of GPs on its own is meaningless, since the number needed depends on the delineated role of GPs. Top priority is to establish clarity about the GP role, which requires reforming the health delivery system to address issues with fragmented care, strategically taking into account the development of GPs with work delegation and substitution, and providing more clarity on the distinction between general practice and public health.

**Strengths and limitations of this study**

- Our methods use our own data rather than aggregated national official data (which may be misleading) – this study represents the first original-data investigation into the issue of general practice in China.
- A mixed methods approach is adopted so that the qualitative and quantitative elements are triangulated to explore many unknown unknowns regarding China's GPs who have already been one of the largest primary care doctor groups in the world.
- The investigation covers all the three medical groups relevant to general practice in China, so that a holistic picture is presented.
- Our focus on Henan Province in central China may preclude generalisation to the whole country, but the vast population of this province (around 100 million) and its diversity provide a substantive initial view to the kinds of issues that may arise regarding General Practice across other provinces.
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## INTRODUCTION

In 2011, China's State Council (the central government) formally launched its ambitious plan of establishing a system of general practice by 2020 with the aim of reaching at least two General Practitioners (GPs) per 10,000 population.<sup>1</sup> The plan involves training 300,000 GPs within ten years.<sup>2</sup> The rationale for this policy includes the tacit assumption that increasing the number of GPs will be a panacea for one of China's major health care problems.

China is not new to primary health care (PHC). Its influential barefoot doctor movement in the 1960s and 1970s served as an important inspiration for the Declaration of Alma-Ata.<sup>3,4</sup> However, with China's market-oriented reform since late 1970s, the barefoot doctor system gradually collapsed, and its healthcare evolved towards a system dominated by specialised hospital-based care. There are now a growing number of tertiary hospitals in China whose outpatient visits exceed ten or even twenty thousand per day. This tremendous burden has further fuelled the impetus to develop a GP system.

While there is substantial literature on China's barefoot doctors, there is a research gap on China's new GP system. Most articles, focusing on China's recent PHC initiative, tend to landscape the progress or provide a general account of China's newly-introduced GPs by using aggregated national official data – data that unfortunately are often misleading. There is a lack of rigorous, original investigations. Due to China's size, complexity and history, its official GPs may be considerably different, in terms of training, from their counterparts in high-income countries (Panel 1). Moreover, a fundamental factor affecting the viability of general practice in China is how General Practice is understood by prospective GPs. Our study focusses on how the three medical groups, together called the Policy Implementation Targets (PITs; Panel 1), understand the new GP system. If the PITs cannot agree on what being a GP entails, this compromises the policy foundation of China's GP aspirations. Our findings help inform priorities for establishing a viable GP system in China and may provide guidance for other countries embarking on a similar trajectory.

### Panel 1: Three GP training programmes and estimated expansion of GPs in China

A GP system requires sufficient practitioners, and China's major efforts have been focussed on rapid "production" of more GPs through three programmes. The first one is the Standardised Residency Training in General Practice (GP-SRT) that follows the international standards of GP training. Nationwide compulsory residency called the Standardised Residency Training (SRT) is new to China, and the GP-SRT is an important part of this. The SRT recruited its first cohort of residents (totalling 55,000) in late 2014 and around 10% of them (5,158) joined the GP-SRT.<sup>5</sup>

The second programme involves a Tuition-waived Rural-oriented Undergraduate Medical Programme (TRUMP). TRUMP sponsors medical students from rural China who in return assume GP positions in assigned township hospitals upon completion of their studies. The first cohort of TRUMP students (in total 5000 nationally) enrolled at medical schools in 2010 and were required to join the GP-SRT in 2015. Upon completion of the GP-SRT, they are required to work in township hospitals as GPs for three years.

The third programme is GP Transfer Training (GP-TT), mainly for township hospital doctors. The township hospitals 'doctors', many of whom do not even have a bachelor degree, were trained to be specialists. Doctors joining the GP-TT suspend their work to undertake full-time training for one year. Then they will get a certificate that allows them to be "transferred" to GPs. The central government has provided all 22 provinces in middle and western China with funding for this short-term training programme each year since 2010.

In the long run, China's newly-planned GPs will be trained through five years of undergraduate medical studies plus the rigorous three-year GP-SRT programme. The first two programmes above represent the long-term strategy of "producing" GPs through the 5+3 model. The third programme (GP-TT) is the interim plan. These three training programmes represent the GP capacity building efforts since the central government's formal launch of the ambitious plan in 2011. Accordingly, the trainees of these three programmes (TRUMP medical students, GP residents, and township hospital doctors) are defined in this study as **Policy Implementation Targets (PITs)** – the focus of our research.

Through these efforts, the number of China's officially-counted GPs has increased dramatically – almost 190,000 GPs in 2015 (Figure 1). If this trend is sustained, there will be more than 320,000 GPs by 2020, which means approximately 2.4 GPs per 10,000 people. The ambitious plan of training 300,000 GPs and having two to three GPs per 10,000 will therefore be achieved.

#### Figure 1 Here

The first nationwide cohort of GPs following international standards will finish their residency in late 2017. Accordingly, the vast majority of China's current 200 thousand GPs have been produced through the interim training programmes. Most of the township hospitals doctors trained through the GP-TT choose not to change their registration upon completion of the short-term GP training. After the training, they go back to work in the township hospitals as before, serving as internists, paediatricians, surgeons, etc., though the

government statistics count them as GPs (Figure 1). Since the current trend is driven largely by counting the number of these individuals as “GPs”, it is unlikely to truly hit the policy target.

## METHODS

### *Mixed method study design*

Contemporary GPs are very new to China, a large and diverse country with complex histories and traditions. As a new phenomenon, there are many unknowns and a dearth of reliable data about GPs that would allow us to conduct rigorous quantitative analysis. Our study employs a mixed methods approach deemed most appropriate to examine the breadth and depth of understanding of GPs by PITs in Henan.<sup>6 7</sup>

The participants of the study are the PITs in Henan Province. Henan is located in central China and represents the middle of China’s 31 provincial level jurisdictions in terms of economic development (Figure 2). As the second most populous province in China, Henan is one of the key loci for the GP capacity building. For instance, the TRUMP students in Henan, a single province, account for around 10% of the whole country’s TRUMP students.

### **Figure 2 Here**

Two rounds of fieldwork were carried out in Henan (Figure 3). The first round involved qualitative Focus Group Discussions (FGDs) with TRUMP medical students as well as the other PIT groups. However, for the purposes of this paper, we will include only the qualitative findings from the TRUMP group as they revealed similar themes with the other groups. Analysis of the qualitative findings informed the design of the quantitative questionnaires which was administered to each of the three PIT groups in the second round of fieldwork.

### **Figure 3 Here**

The quantitative data were analysed together with the further exploration of the qualitative materials. This allowed us to examine whether the findings from the qualitative and quantitative studies converge, diverge or relate and help strengthen the reliability and validity of our findings. In sum, the qualitative and quantitative elements are triangulated to inform answers to our research question and enhance the robustness of our investigation.<sup>8 9</sup>

### *Sampling*

For the qualitative study, we took a purposive sample of medical students in Henan in order to maximize variation.<sup>10 11</sup> The sampling continued until information saturation was achieved. In



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China, most medical schools provide training in western medicine, while some provide training in traditional Chinese medicine (TCM). Among all the medical schools in Henan participating in the TRUMP, there was only one TCM school – Henan University of Chinese Medicine (HUCM). To represent this proportion of medical students, HUCM was selected. For the remaining ‘western medicine’ schools, Xinxiang Medical University (XMU) was the most active participant of the TRUMP, accommodating around half of the TRUMP students in Henan. Accordingly, it was chosen and identified as a key institution to investigate TRUMP. Within the selected schools, the senior medical students were the preferred participants given their years of experience within the programme.<sup>12</sup>

The quantitative study was expanded to cover all three PIT groups because they are all relevant to the viability of GP in China. The entire first cohort of TRUMP students (enrolled in 2010 and due to graduate in 2015) in all the medical universities in Henan participating in the TRUMP were included. Similarly, all the GP-TT trainees in Henan from 2014 to 2015 were surveyed.

Henan has 24 tertiary hospitals responsible for its GP-SRT (Figure 4), which are the largest and best tertiary hospitals in Henan Province. Nine of them were randomly selected for the quantitative study (Figure 4), and all the GP residents in these nine hospitals were surveyed.

#### Figure 4 Here

#### *Analysis*

In the qualitative study, we used thematic analysis, drawing on principles of grounded theory.<sup>13</sup>

<sup>14</sup> To conduct the thematic analysis, all the FGDs, with the informed consent of participants, were recorded and transcribed in Chinese. The seven FGDs with medical students produced 589 minutes of audio recording (on average 84 minutes per FGD), which meant 171 pages of transcription (103,318 words in Chinese). All these data were uploaded into the NVivo 10 software, and the themes were coded and analysed. The analysis was conducted in English and whenever necessary the pieces of transcripts were translated from Chinese to English.

The coding framework and emerging themes were identified in an inductive and interactive process. JZ developed a preliminary coding framework after full familiarisation with the data, inspired by the attributes of general practice (widely discussed in the primary care literature) adapted to the Chinese context (such as consideration of TCM). Refining the framework involved constant comparison and discussion with PA. All the questions used for the quantitative survey were derived from these codes/themes and FGDs, and were tested at the beginning of the second-round survey (Figure 3) so that the questions were revised appropriately to be understood by the respondents in the same way they were understood by the researcher. In fact, the second-round survey also included further communications with relevant health officials, experts and previous interviewees – this allowed the interactive approach and the respondent validation of the qualitative study.<sup>15</sup> The coding framework continued to be fine-grained together with the second round of analysis (mainly quantitative analysis; Figure 3). This mixed methods approach is a ‘fusion’ of the qualitative and quantitative elements so that they ‘fulfil’ one another to reach reliability and robustness.”

Then quantitative data were cleaned and analysed using Stata 12. Standard summary statistics were reported about PITs' understanding of GPs. Chi-square statistics were used to test statistical significance of the consensus among the three groups.<sup>16-18</sup> This study is the first to use original primary data from all the three GP-related groups in China, to examine their characteristics and understanding of general practice through rigorous descriptive analysis and significance testing.

### ***Patient involvement statement***

This study does not involve patients. The research participants are medical students, primary care doctors and GP residents. All the participants for the FGDs signed the consent form, and the structured questionnaires have been anonymised. Please refer to the ethical clearance at the end of this manuscript.

## **RESULTS**

### ***Participant characteristics***

The qualitative investigation consists of seven FGDs covering all cohorts of TRUMP students at that time of fieldwork – three for those enrolled in 2010, two for those enrolled in 2011, one for those enrolled in 2012 and one for 2013 (Table 1).

**Table 1: Characteristics of student participants for the qualitative study**

	<b>Number of Participants</b>	<b>Number of FGDs</b>
<i>Medical schools</i>		
XMU	38	5
HUCM	12	2
<i>Cohorts/grades of medical students</i>		
Enrolled in 2010	25	3
Enrolled in 2011	13	2
Enrolled in 2012	6	1
Enrolled in 2013	6	1
<i>Gender</i>		
Male	27	
Female	23	
<i>Age</i>		
Born in 1989	4	
Born in 1990	17	

Born in 1991	10	
Born in 1992	10	
Born in 1993	5	
Born from 1994 to 1996	4	
<i>Rural or urban</i>		
Rural	42	
Urban	8	
<b>Total</b>	<b>50</b>	<b>7</b>

The number of participants for each FGD ranged from six to ten<sup>19</sup> and ensured a gender balance (Table 1). Moreover, as the TRUMP targets rural China, we over-sampled participants coming from rural areas. For the quantitative survey, there were 1,887 participants: 418 TRUMP medical students, 1349 GP-TT trainees and 120 GP resident doctors. The response rate of the TRUMP medical students (enrolled in 2010) was 92% (418 out of 455 completed the questionnaire). Among the respondents, 53% were males and the vast majority (90%) were from rural China.

The sample size of the GP-TT trainees was the largest among the three PIT groups: 1349 out of 1478 GP-TT trainees (response rate: 91%) participated in the survey. As Table 2 illustrates, the majority of GP-TT trainees (73%) were township hospital doctors. Also, there were more male than female trainees (58% versus 42%). The age of the trainees was hugely diverse. Most of them were in their 30's (44%) or 40's (32%). Some (16%) were in their 20's and a minority (7%) were in their 50's with 1% over 60.

**Table 2: Characteristics of GP-TT trainees for the quantitative study (n=1,349)**

	Number of GP-TT trainees	
<i>Health organisations where they work##</i>		
Township hospitals	934 (73%)	
Village clinics	101 (8%)	
Community healthcare centres	149 (12%)	
Community healthcare stations	81 (6%)	
Others	9 (1%)	
<i>Specialisation*</i>		
Clinical (western) medicine	(n=1,114)	1,114 (85%)
Internal medicine	394 (35%)	
Surgery	164 (15%)	
Obstetrics and gynaecology	138 (12%)	
Paediatrics	24 (2%)	

EENT (eye, ear, nose & throat)	17 (2%)	
Other specialties and invalid data	69 (6%)	
Missing data	308 (28%)	
TCM		161 (12%)
Dentistry		17 (1%)
Public health		25 (2%)
<i>Education</i>		
High school or below	4 (0.3%)	
Secondary vocational diploma	404 (30.7%)	
Vocational diploma	706 (53.7%)	
Bachelor	201 (15.3%)	
Master	1 (0.1%)	
Doctorate	0	
<i>Gender</i>		
Male	781 (58%)	
Female	555 (42%)	
<i>Age</i>		
20-29	214 (16%)	
30-39	566 (44%)	
40-49	419 (32%)	
50-59	91 (7%)	
60 above	11 (1%)	
<b>Total</b>	<b>1,349 (100%)</b>	

#Community healthcare centres are the urban counterparts of rural township hospitals. With China's fast urbanisation, some township hospitals automatically become community healthcare centres. The GP-TT programme is mainly for those doctors in township hospitals, while in implementation it may include doctors from other health organisations.

\*China's officially-recognised doctors are categorised into four 'practice categories': clinical (western) medicine, TCM, dentistry, and public health. Within the 'practice category' clinical medicine, there are 'practice scopes' such as internal medicine, surgery, paediatrics. The 'practice category' and 'practice scope' are both specified in a doctor's license. Our survey asks each participant to report his/her 'practice category' and 'practice scope' in the license.

1 For GP-TT trainees', most (85%) did not have a bachelor's degree (Table 2). Through the  
2 GP-TT, they were supposed to be "transferred" to be GPs. China's officially-recognised doctors  
3 were categorised into four practice categories: clinical (western) medicine, TCM, dentistry, and  
4 public health. These GP-TT trainees surveyed included all four of these categories. Most of them  
5 (85%) were clinical (western medicine) doctors, and 12% were TCM practitioners. Within the  
6 category of clinical medicine, 35% were internists, 15% were surgeons and 12% were  
7 obstetricians/gynaecologists (Table 2).  
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11 For GP residents, the response rate was 93% with 120 GP resident doctors completing the  
12 questionnaire. Among the respondents, 46% were males. Most were between 27-30 years old  
13 and had achieved a high educational level: 88% had a bachelor's degree and 12% held a master's  
14 degree.  
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18 Analysis of the qualitative findings revealed five themes: the nature of GPs as all-specialty  
19 doctors, GPs as first point of contact for care, GPs as gatekeepers, GPs as distinct from TCM  
20 practitioners, and GPs as distinct from Public Health specialists. Each theme along with the  
21 relevant qualitative and quantitative findings is presented below.  
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### 23 24 25 ***Theme 1 GPs as all-specialty doctors***

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28 The PITs interviewed tend to interpret GP literally according to the Chinese translation *Quan Ke*  
29 *Yi Sheng*. The last two characters, *Yi Sheng* mean doctor(s); the first character *Quan* means all;  
30 *Ke* means discipline, specialty or department (of a hospital). Accordingly, if the terminology GP  
31 in Chinese is literally translated back into English, it means "all-specialty doctor" or  
32 "all-department doctor". When medical students were asked what a GP is, a general confusion  
33 emerges as depicted by Quote 1 (Table 3).  
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37 Quantitative analysis confirms this common misunderstanding. Specifically, in China's current  
38 organisation of care, most doctors claim their specialty according to the hospital department  
39 where they work. Accordingly, GPs would be considered "all-department" doctors. Around 80%  
40 of PITs agree that GPs can work in most departments of a hospital (Table 4). There is no  
41 significant difference between the three PITs groups' opinions on this statement ( $p=0.884$ ).  
42 Similarly, PITs' understand GPs to be "all-specialty" doctors and general practice to be the  
43 combination of all the specialities. Consequently, around 85% of PITs are intimidated by the  
44 comprehensiveness required of GPs; the three PIT groups all think general practice is more  
45 challenging and needs longer training compared to specialist training ( $p=0.962$ ).  
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**Table 3: Selected quotations about what GPs are in China**

Quote No.	Quote	Source
1	<p><i>Participant 5, Male: GPs mean training us to be able to do internal medicine, surgery, etc. All the specialties...</i></p> <p><i>Participant 3, Female: (GPs) can deal with all the diseases.</i></p> <p><i>Participant 2, Female: Know a little about all the diseases.</i></p> <p><i>Participant 3, Female: But no expertise.</i></p> <p><i>Participant 5, Male: Be capable of treating every (disease)</i></p> <p><i>Participant 7, Male: Be capable of treating every, no matter what it is</i></p>	FGD 4, students enrolled in 2010 at XMU
2	<p><i>Participant 3, Female: I quite like reading foreign novels such as Jane Eyre and Gone with the Wind. Through those novels, (I find that) they have family doctors. I feel our country is copying them (i.e. high-income countries) in many aspects – of course those positive aspects. I think our GPs are copying their family doctors. But I think we need to wait until we turn better (in terms of financial capacity) and have the (economic) condition. Then we can be trained. Now even if it (the government) has trained us very well, there is no (appropriate) place to allocate us. Now our economic condition is limited, unlike foreign (developed) countries. They can hire this kind of doctors, while we cannot afford these family doctors. Our GPs are supposed to be like this in the future: like what has been written in foreign novels, I (one family doctor) is in charge of that family or the people in that area - their overall health. Our economic condition is still limited and still cannot reach that.</i></p>	FGD 2, students enrolled in 2011 at HUCM
3	<p><i>Participant 1, Male: Family doctors in China – there are few those family doctors.</i></p> <p><i>Participant 6, Female: Where are family doctors (to practise medicine)? At home?</i></p> <p><i>Participant 3, Male: (Family doctors are) the doctors hired solely by people who have economic capacity and serve them (the rich).</i></p> <p><i>Participant 1, Male: Basically there are few (in China).</i></p>	FGD 6, students enrolled in 2012 at XMU
4	<p><i>Participant 1, Male: To my knowledge, there are no GPs in the hospitals of Zhengzhou (the capital and the biggest city of Henan Province). From those I am in touch with, they feel, when they hear of GPs, they consider them to be village doctors.</i></p>	FGD 2, students enrolled in 2011 at HUCM

5	<p><i>Participant 2, Male: GPs have a guiding relationship (with patients). Assume one person goes to seek health care and he/she does not know what disease he/she has. Then (GPs' job is to) tell him/her what the disease is. Then tell (the patient that) I (the GP) cannot cure it and (you need to) go to find that certain...certain discipline's doctor (specialist) in the department (of a hospital) in the city. Then you will be given professional examination(s) by the medical equipment) for further treatment. That is a filtering role – distinguish between small and big diseases.</i></p> <p><i>Participant 3, Male: Right.</i></p> <p><i>Moderator: Since you understand it (the role of GPs) in this way, why do you want to treat rare and complicated diseases?</i></p> <p><i>Participant 3: Not rare and complicated diseases. (I) aim to make more patients, as much as treatment can, get treatment near home. It is relatively convenient.</i></p> <p><i>Moderator: Maybe your role (GP's role) is to treat common diseases. You just refer those you are not supposed to be able to treat.</i></p> <p><i>Participant 3: If so, now you do not need a doctor with a bachelor degree.</i></p> <p><i>Participant 5, Female: He means gradually expanding the scope of small diseases (that GPs can treat).</i></p> <p><i>Participant 3: If maintaining the status quo, there is no need to have doctors with a bachelor degree. The existing doctors in township hospitals are (qualified) enough to treat small diseases. (Those with) big diseases still need to go to a (big) hospital directly. Then this country's problem of poor access to and high expenses of health care still cannot be solved.</i></p> <p><i>Moderator: How do you define small diseases? To what extent?</i></p> <p><i>Participant 3: This can only, gradually...Actually, becoming a GP, what to say, the boundary is not very clear.</i></p>	FGD 5, students enrolled in 2013 at XMU
6	<p><i>Participant 6, Male: Currently guide doctors are not well managed. Now what we (GPs) are doing is equivalent to referral – essentially the same to guide doctors. (In the future) I plan to do guide doctor business – set up an independent company (to provide professional guide doctor services).</i></p>	FGD 7, students enrolled in 2010 at XMU
7	<p><i>Participant 1, Female: My home is close to our village's clinic. That clinic's doctor is more than 70 years old. He has a very high reputation in our village – all the patients, male and female, the old and the young, all go to him to seek health care. Paediatrics, obstetrics and gynaecology, he knows all. He relies on the experiences he has accumulated for so many years. When a patient comes, without using advanced medical equipment, he is able to diagnose the disease or narrow down the diagnosis to a very small scope – must be either this or that disease. I think he is awesome. When I</i></p>	FGD 1, students enrolled in 2010 at HUCM

	<p><i>find general practice, I think it is nice – learning both TCM and western medicine and after graduation I can be like him. When I opted for this discipline (general practice), I went to consult him. He told me this discipline was good – after graduation you could use either the knowledge of TCM or the knowledge of western medicine, or combine both. At least in rural regions or township (hospitals) – he knew I must go back to work in a township hospital – it would be very useful. Because after all it is impossible to employ only one mode (TCM or western medicine) to solve all the diseases.</i></p>	
<p><b>8</b></p>	<p><i>Participant 7, Female: The GPs at our place (my hometown), last time they told me you (after graduation and training) would do this – they went directly to villages, to people’s houses to (a male’s voice: fill in forms) check (family’s) information.</i></p> <p><i>Participant 1, Male: What you said is public health. Public health is not to treat diseases.</i></p> <p><i>Participant 6, Female: That’s prevention, prevention.</i></p> <p><i>Chaotic arguing which cannot be identified.</i></p> <p><i>Participant 3, Male: Does the GP essentially belong to public health?</i></p> <p><i>Participant 1, Male: No.</i></p> <p><i>Participant 5, Female: Different from that (public health).</i></p> <p><i>Participant 1, Male: You are a doctor, different from public health (practitioners). Public health, (you) randomly find a person (which means anyone) can do it – (public health is about) sending some questionnaires, surveys, etc.</i></p>	<p>FGD 3, students enrolled in 2011 at XMU</p>

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**Table 4: Diverse interpretations of general practice in China**

	<b>Medical students</b> (n=418)	<b>Township hospital doctors (GP-TT trainees)</b> (n=1349)	<b>Resident doctors</b> (n=20)	<b>PITs</b> (n=1887)	<b>Comparing three groups</b> <i>P-value</i> ( $\chi^2$ test, df=2)
<b>Theme I GPs as all-specialty doctors</b>					
General practice consists of all the specialties in medicine (%agreement and 95% confidence interval)	50 (45, 55)	84 (82, 86)	75 (62, 78)	76 (74, 78)	0.015
General practice is more difficult to learn and needs longer training compared to specialist training (%agreement and 95% confidence interval)	86 (83, 89)	88 (86, 90)	88 (77, 91)	87 (86, 89)	0.962
GPs are qualified to work in most departments of a hospital (%agreement and 95% confidence interval)	77 (73, 81)	76 (74, 78)	88 (75, 89)	77 (75, 79)	0.884
<b>Theme II GPs as first-contact care</b>					
GPs are family doctors (%agreement and 95% confidence interval)	54 (49, 59)	70 (68, 72)	55 (45, 63)	65 (63, 68)	0.232
GPs are private personal doctors (%agreement and 95% confidence interval)	14 (11, 17)	16 (14, 18)	18 (5, 27)	15 (14, 17)	0.568
GPs know everything but master nothing (%agreement and 95% confidence interval)	39 (34, 44)	29 (27, 31)	33 (24, 40)	31 (29, 34)	0.468
GPs are like barefoot doctors or village doctors (%agreement and 95% confidence interval)	14	26		22	0.012

	(11, 17)	(24, 28)	(4, 34)	(20, 24)	
<b>Theme III GPs as the “gate”</b>					
GPs are gatekeepers of residents’ health (%agreement and 95% confidence interval)	90 (87, 93)	97 (96, 98)	97 (94, 100)	95 (95, 96)	0.858
GPs’ one main responsibility is referral (%agreement and 95% confidence interval)	69 (65, 73)	69 (67, 71)	59 (49, 67)	68 (66, 70)	0.517
<b>Theme IV GPs vs. TCM practitioners</b>					
GPs can practise both western medicine and TCM (%agreement and 95% confidence interval)	54 (49, 59)	83 (81, 85)	41 (38, 56)	74 (72, 76)	0.003
GPs are the doctors specialising in combination of western medicine and TCM (%agreement and 95% confidence interval)	27* (23, 31)	62 (59, 65)	28 (20, 36)	52 (50, 54)	< 0.001
<b>Theme V GPs vs. Public Health Practitioners</b>					
GPs’ main responsibility is public health work (%agreement and 95% confidence interval)	60 (55, 65)	69 (67, 71)	69 (56, 74)	67 (65, 69)	0.723
GPs’ main role is prevention rather than diagnosis/treatment of diseases (%agreement and 95% confidence interval)	16 (12, 20)	38 (35, 41)	18 (8, 30)	32 (30, 34)	< 0.001

\*For the 43 TRUMP students at HUCM, 60% of them agree with this statement

### *Theme II GPs as first-contact care*

According to our findings, PITs understand that GPs are patients' first and regular contact, but this first-contact care is interpreted in two conflicting directions. The first-contact care, in the eyes of PITs, when applied to the rich and the powerful suggests GPs are privileged family or private personal doctors (Quote 2 and 3, Table 3). But this privilege is too good to be true for the common people, and when the first-contact care is applied to the general public, GPs are considered to represent the barefoot doctors or village doctors who lack expertise (Quote 4, Table 3).

The two extremes of understanding are quantitatively examined, as shown in Table 4. Fifteen percent of PITs consider GPs to be private personal doctors, while 22% think GPs are like barefoot doctors or village doctors. For interpreting GPs as barefoot or village doctors, the opinions of the three PIT groups differ ( $p=0.012$ ), with the township hospital doctors (26%) significantly more likely to hold this interpretation (Table 4). In addition, one third of the PITs think GPs have no concrete expertise, and they just know everything superficially.

### *Theme III GPs as gatekeepers*

Though China does not have a mature referral system (from GPs to specialists and from specialists back to GPs), many PITs are aware of GPs' referral and gatekeeping role. However, they understand the role differently. Some consider a GP's responsibility is to treat as many diseases as possible, including those beyond their capacity. The other is to just simply refer patients without any effort on their part. Participant 2 in Quote 5 (Table 3) above has this second opinion, while Participant 3 though seeming to agree with Participant 2, actually shows the first view. The view that GPs simply refer patients is more evident in Quote 6 (Table 3). In this case, guidance is more appropriate than referral for the role mentioned, and such "guide doctors" can be nurses.

The referral function also implies GPs' gatekeeping role. They serve as the "gate", and a gate is a barrier. According to the quantitative analysis, the vast majority of PITs (more than 90%;  $p=0.858$ ) think that GPs are the gatekeepers of peoples' health (Table 4), as this is clearly and widely promoted by the Chinese government. However, "the gatekeepers of residents' health" has two interpretations – it can mean that GPs are health protectors or the gatekeepers of the healthcare system. This either reflects the government's misunderstanding of GPs or its deliberate rhetoric to avoid directly associating the GPs' role as a barrier to directly accessing tertiary care. Accordingly, agreeing with this statement does not necessarily mean the PITs understand GPs' referral role appropriately. In fact, when directly asked whether they agree

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3 that one of the GPs' main responsibility is referral, the percentage of agreement reduces to  
4 less than 70% (Table 4).  
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#### 8 *Theme IV GPs vs. TCM practitioners*

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12 Some of our surveyed PITs think that general practice, as “all-specialty medicine”, includes  
13 TCM. This is further confused by the fact that in China's TCM universities, there is a  
14 discipline called “the combination of western medicine and TCM”. The TRUMP in Henan  
15 Province gives some quotas (though a relatively small proportion) to HUCM, which naturally  
16 connects “the combination of western medicine and TCM” with general practice. This  
17 decision, by the Henan health authority implies either its deliberate decision to connect  
18 China's general practice with TCM or weak regulation. As a result, medical students  
19 particularly at HUCM tend to think general practice is kind of equal to the combination of  
20 western medicine and TCM (Quote 7, Table 3).  
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27 The quantitative analysis confirms that some PITs associate general practice with TCM  
28 (Table 4). In particular, the township hospital doctors and the medical students in TCM  
29 medical universities are more likely to assert that GPs can practise both western medicine and  
30 TCM.  
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#### 34 *Theme V GPs vs. public health practitioners*

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38 According to our findings among the PIT's surveyed, more than 60% think that GPs' main  
39 responsibility is public health work (Table 4), as shown by Participant 7 in Quote 8 (Table 3).  
40 Some do not agree, such as Participant 1 who remind Participant 7 that “you are a doctor”  
41 which means you should do clinical work rather than paperwork. Nonetheless, Participant 1's  
42 understanding of public health is not appropriate either. Great caution is needed to decipher  
43 how they interpret public health. Meanwhile, most PITs, although asserting GPs' main  
44 responsibility is public health, do not agree that GPs' main role is prevention rather than  
45 diagnosis/treatment of disease (Table 4). However, township hospital doctors are more likely  
46 than the medical students or residents surveyed to consider a GPs main role to be prevention.  
47 It is fair to say that the PITs have a vague understanding of both general practice and public  
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## 55 **DISCUSSION**

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### *Health delivery system and fragmented care*

Some of the (mis)understandings of general practice are arguably a reflection of China's health delivery system and its fragmented care. The health delivery system is dominated by powerful hospitals and a specialist practice model. In this system, even China's primary care facilities (e.g. the township hospitals) follow a specialist practice model. Though they are not as specialised as tertiary hospitals, they usually have departments of internal medicine, surgery, paediatrics, obstetrics and gynaecology. Township hospital doctors are trained to be 'specialists' in these departments, despite most not even having a bachelor's degree (Table 2). Consequently, it is natural for medical students and doctors to establish their professional identities as a result of their experience in the specialised departments in which they are working, rather than as a substantive reflection of specialist training received.

In this system, most Chinese doctors with high levels of education are not independent practitioners. They work in the state-owned tertiary hospitals, as semi-civil servants. In other words, most doctors with high education levels in China are locked in a hospital setting rather than an office base. There are few role models of care outside of hospitals. One model people can imagine is a very tiny proportion of privileged personal doctors, who take care of the everyday health of very top officials. By contrast, the other realistic role model of care outside hospitals people can think of is the barefoot doctors or their successor, the village doctors.

Another complication of China's health delivery system is the lack of an established formal referral mechanism. Patients highly rely on self-referral. In this fragmented care system, tertiary hospitals compete with primary care institutions for patients, as China's health system is essentially still a fee-for-service model in which more patients mean more revenues. Embedded in this system, it is challenging to make sense of the referral and coordination demanded of GPs.

Many countries may have a similar problem of a lack of a primary care infrastructure, where primary care is based on an idealistic framework but the theoretical advantages cannot materialise.<sup>20</sup> In contrast, this situation is much better in the UK, which although does not specify the roles and responsibilities of GPs very clearly,<sup>21</sup> does have an established and recognised GP system. This system provides the role models through everyday practice recognised by the health professionals and the general public.

China's case now is the opposite. Theoretically, from medical school education to residency and then to being a primary care doctor, one's understanding of general practice should be increasingly better. Nonetheless, in China the primary care doctors are more likely to

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misinterpret general practice than the other two groups (Table 4). This phenomenon relates to the everyday work of China's primary care doctors – the more one has exposure to the work designated as so-called 'general practice' in real life, the more confused one gets. Here China's health delivery system and medical education form a vicious circle for the training of GPs. A holistic package of reforming the whole system is needed, and the increased number/percentage of GPs becomes valuable only when it is a natural result of strengthened primary health care.

### ***Work delegation and substitution***

Theoretically, it is easy to understand that comprehensiveness and first-contact care requires GPs to deal with a much larger variety of problems, while specialists focus in depth in one clinical domain. However, in practice, some work of GPs may inevitably overlaps with many specialists, especially from an international perspective. In the UK, the primary care doctors are GPs, while in the US they consist of family physicians (US equivalents of GPs), general internists, paediatricians, obstetricians and gynaecologists. Furthermore, many attributes of GPs such as comprehensiveness, continuity, first contact and coordination are all relative concepts - sometimes they do not necessarily and automatically distinguish GPs from specialists. For instance, some specialists with an office-based tradition in the US (such as some cardiologists and pulmonologists) actually identify themselves as primary care physicians,<sup>22</sup> and some research recognises the important contribution of specialists to primary care – in particular 58.2%, 43.8% and 42.3% of the care provided by cardiologists, gastroenterologists and pulmonologists, respectively, is classified into the category of principal care which has the evidence of continuity and comprehensiveness.<sup>23</sup> Conversely, GPs can work in tertiary hospitals. In Canada, 90% of the hospitalists (providing comprehensive care for inpatients) are GPs.<sup>24</sup>

Moreover, the broad care provided by GPs may overlap with allied health professionals such as nurses and community health workers. In the UK, the consultations in general practice undertaken by nurses increased from 21% in 1995 to 34% in 2006; more responsibilities previously undertaken by GPs are taken over by nurses.<sup>21</sup>

All in all, the work delegation and substitution indicates that there are potentially various combinations of health workforce (GPs, specialists, allied health professionals, etc.) to deliver PHC. Depending on these different combinations and different health delivery systems, different countries actually demand different things from general practice, as reflected by the large variation of the proportion of GPs as a percentage of each country's total number of doctors: UK 60%, Canada 51%, France 50%, Spain 37%, Netherland 33%, Finland 32%, Denmark 25%, USA 20%, Germany 19% and Sweden 10%.<sup>25 26</sup> No research so far has proposed a convincing gold standard establishing the 'ideal' proportion of GPs.

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5 Accordingly, it becomes so complex and confusing in China when such a large and diverse  
6 country in transition learns the “successful” experiences across various countries. Also, more  
7 special in China is the role of TCM. This paper does not want to enter the endless debate of  
8 western medicine vs. TCM or want to deny the potential huge contribution of TCM to PHC.  
9 We just find that at this stage TCM further compromises the understanding of general practice  
10 in China. Recognising the reality, instead of the obsession with GPs, it is probably better for  
11 China to develop its own multi-professional team-based approach to deliver PHC. The ‘team’  
12 can involve GPs, other generalist physicians, nurses, and even nurse practitioners (very new  
13 to China), etc. Obviously, this team-based approach can also accommodate TCM practitioners  
14 very well.  
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### 21 ***Public health and general practice***

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25 GPs are, first of all, qualified doctors. This is obvious in the high-income countries. However,  
26 the heterogeneity of GPs in China means that many GPs are “transferred” from the doctors in  
27 primary care facilities (e.g. township hospitals). In terms of education levels, they are more  
28 comparable to community health workers. However, they have worked for a long time as  
29 ‘doctors’ and through the work experiences some of them have arguably achieved the skills of  
30 being doctors, while others have not. Their qualifications as doctors vary greatly.  
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35 In addition to varied qualifications, China has paid special attention to public health,  
36 especially since the SARS incident in 2003. With the massive influx of funding from the  
37 central government, quite often the GPs provide the so-called “national basic public health  
38 services”. As a result, the doctors in primary care facilities, before the start of the GP  
39 movement, did see patients but now are busy with the “public health services” which consist  
40 of the work which could be largely undertaken by nurses and community health workers and  
41 partially by doctors and public health professionals. In other words, before they all functioned  
42 as doctors, but now they may function as doctors, public health professionals, nurses or  
43 community health workers. The heterogeneity of GPs and their everyday work contribute to  
44 the vague understanding of both public health and general practice in China.  
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51 Our findings suggest that China would benefit from clarifying that GPs are qualified doctors.  
52 This is the paramount identity of GPs. There is no risk of this identity changing in  
53 high-income countries at present. However, in the early years of the NHS, it had similar  
54 concerns, as argued by McKeown in 1962 in the Lancet:  
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*“But this change in role would be wholly out of keeping not only what the doctor wants from his career but with what the public wants from its doctor. His unique opportunity to influence the social situation has its base in public confidence that his is capable of treating the sick. If this were lost he would be reduced to the position of a rather badly trained social worker.” (p. 924)<sup>27</sup>*

## LIMITATION, POLICY IMPLICATION AND CONCLUSION

One limitation of this paper is that it only focuses on Henan Province, which may preclude generalisation to the whole country. However, it should be noted that Henan has a population of around 100 million, larger than most countries. If Henan were an independent country, it would host the 16<sup>th</sup> largest population among sovereign nations. This ‘case study’ provides at least an initial view of the kinds of issues that probably arise in crafting policies for General Practice in other provinces of China. In addition, this paper only provides a ‘supply-side’ perspective – it represents the views of medical providers. However, it is equally important to know patients’ attitude towards general practice (‘demand-side’ perspective) and their health care-seeking behaviours. However, our design is first to target relevant providers who are supposed to understand GPs best. If the PITs have such understandings/interpretations of what being a GP entails, as identified in the five themes, the perspectives of the general public should be even more diverse. The foundation of China’s GP-centred PHC workforce policy-making is problematic.

Based on our findings, we would argue that the top priority for China is to define the core functions of its GP workforce clearly and transparently. This may sound easy, but actually concerns every aspect of a viable GP system. The roles and responsibilities required of GPs cannot be specified in isolation. Specialists, nurses, community health workers, public health professionals, and TCM practitioners, among others, need to be coordinated. Especially, China should make sure that the paramount identity of GPs is firstly qualified doctors, and clarify pragmatically the distinction between general practice and public health. In addition, pursuing a particular indicator of policy success (e.g. the number of GPs) alone can be meaningless or even counterproductive. Inserting so-called GPs into the existing hospital- and specialist-dominated system can lead to chaos and confusion. We recommend efforts to be directed towards reform of the whole health delivery system and fragmented care towards one which more broadly strengthens PHC.

Recently, the World Bank has been promoting integrated health care in China. In particular, Anhui Province (another populous province in central China), which just received a huge



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3 World Bank loan, has been synthesising different levels of health facilities within a county.  
4 This model is pro-PHC and adopts a *de facto* multi-professional team-based approach. By  
5 applying the findings of this paper, we are helping Anhui's health reform. Also, we are  
6 working with various stakeholders to disseminate this study's results, in order to develop  
7 genuine GPs and strengthen PHC broadly.  
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17 **Figure 1: Number of GPs in China with a linear forecasting**

18 Data are from China Health and Family Planning Statistical Yearbook 2016, 2015, 2014 and  
19 2013.  
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26 **Figure 2: Henan Province (in red) in China in 2015**

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32 **Figure 3: Overview of mixed methods research**

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38 **Figure 4: 24 GP-SRT bases in Henan Province and 9 selected for the quantitative study**

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43 **Contributors:** Both authors jointly designed the study. JZ collected and analysed the data. JZ  
44 wrote the manuscript. PA actively participated in the whole research process, and revised the  
45 manuscript.  
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50 **Competing interests:** All authors have completed the ICMJE uniform disclosure form at  
51 [www.icmje.org/coi\\_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf) and declare: no support from any organisation for the  
52 submitted work; no financial relationships with any organisations that might have an interest  
53 in the submitted work in the previous three years; no other relationships or activities that  
54 could appear to have influenced the submitted work.  
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3 **Funding:** None  
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7 **Ethical Approval:** The study has been reviewed by, and received ethics clearance through,  
8 the University of Oxford Social Sciences and Humanities Inter-Divisional Research Ethics  
9 Committee (IDREC) – Ref No: SSD/CUREC1A/13-282. Medical students were informed that  
10 there would be no academic penalty for non-participation or withdrawal.  
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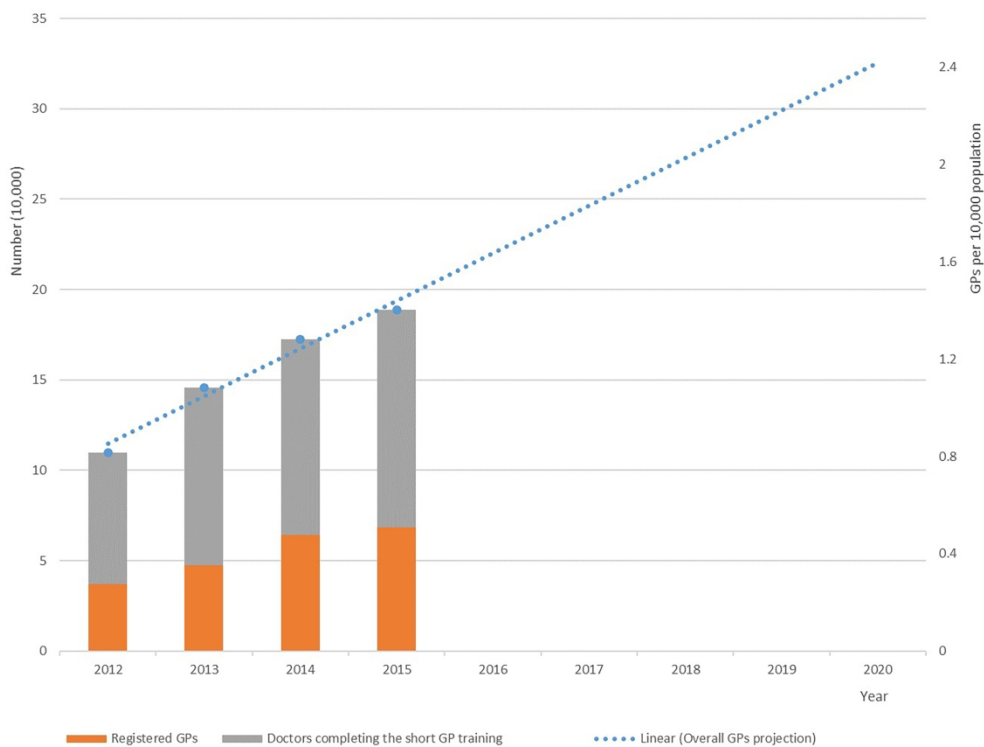
15 **Data sharing:** Participants (anonymised) gave informed consent for data sharing for the  
16 purpose of research. Code and data (both qualitative and quantitative elements) are available  
17 from the corresponding author.  
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21 **Transparency:** The lead author (JZ) affirms that the manuscript is an honest, accurate, and  
22 transparent account of the study being reported; that no important aspects of the study have  
23 been omitted; and that any discrepancies from the study as planned have been explained.  
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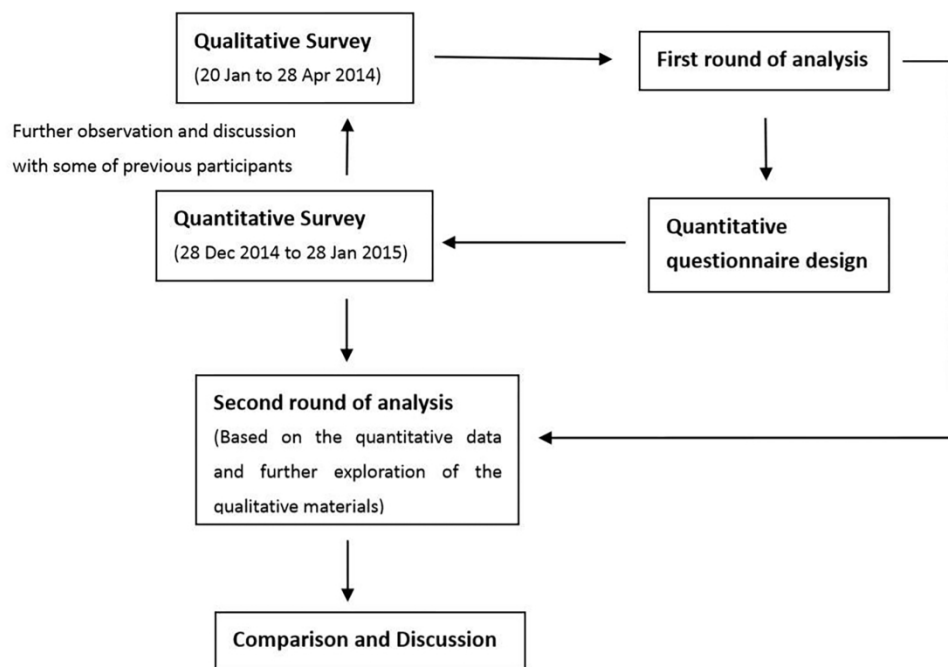
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	<b>Henan Province (% of total)</b>	<b>China</b>
Population (million)	94.8 (6.9%)	1,374.6
Health workforce (million)	0.77 (7.2%)	10.69
Gross Domestic Product (billion US Dollars)	544.3 (5.4%)	10083.9

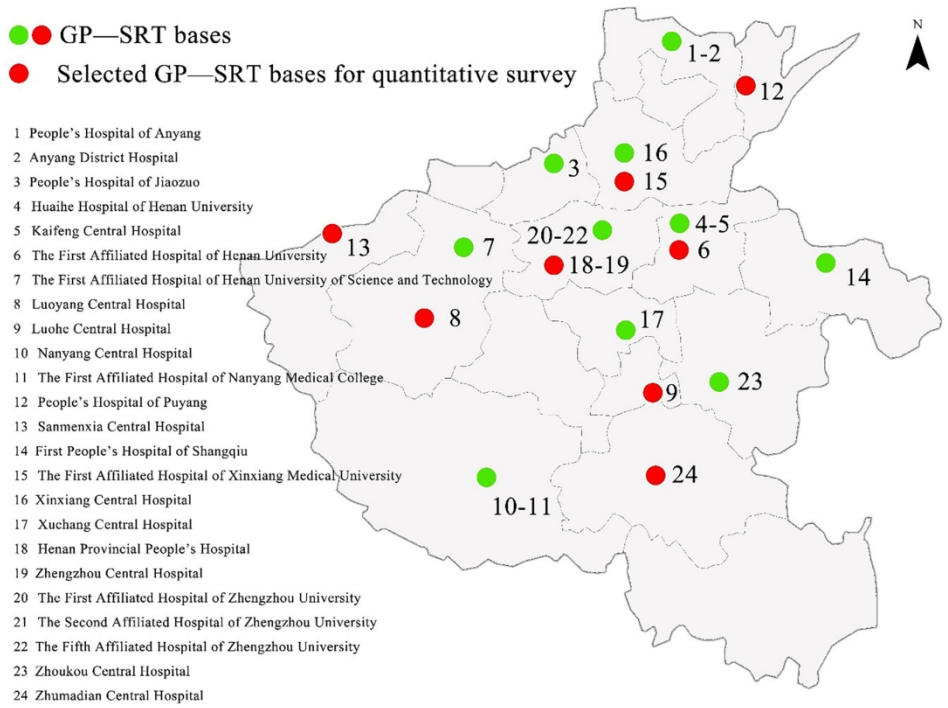
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# BMJ Open

## Provider Perspectives on General Practice in Henan, China: a mixed-methods study

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2019-036240.R1
Article Type:	Original research
Date Submitted by the Author:	17-Dec-2019
Complete List of Authors:	Zhu, Jiming; Tsinghua University, Research Center for Public Health, School of Medicine; Tsinghua Shenzhen International Graduate School, Institute for Hospital Management Ariana, Proochista; Oxford University, Nuffield Department of Medicine
<b>Primary Subject Heading</b>:	General practice / Family practice
Secondary Subject Heading:	Medical education and training, Health policy, Public health, Health services research
Keywords:	PRIMARY CARE, EDUCATION & TRAINING (see Medical Education & Training), HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, PUBLIC HEALTH

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# Provider Perspectives on General Practice in Henan, China: a mixed-methods study

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## ABSTRACT

### Objective

Since 2011 China's central government has committed to establishing a new 'general practitioner' (GP)-centred primary care system. To this end there have been great efforts to train an additional 300,000 GPs by 2020. This paper examines the perspective of practitioners in Henan, China regarding general practice.

### Design

A mixed-methods approach using focus group discussions (FGDs), and structured questionnaires.

### Setting/Participants

Seven FGDs and responses to 1,887 questionnaires included medical students, primary care doctors and GP residents in Henan.

### Results

The three surveyed medical groups have some awareness of the attributes of general practice (e.g. comprehensiveness, first contact and coordination), but often misinterpret what being a GP entails. Five themes were identified through the FGDs and tested quantitatively for their prevalence with structured questionnaires. Firstly, the GPs' role as a comprehensive care provider was (mis)interpreted as an 'all-round doctor'. Secondly, the GP's responsibility as the first point of care was understood in two conflicting ways: private personal doctors of the rich and the powerful or village doctors for common people. Thirdly, referral was understood as simply guiding patients to appropriate departments within the hospital while the gatekeeping role was interpreted to involve GPs being peoples' health protectors rather than being also gatekeepers of specialty services. Traditional Chinese Medicine now further complicates the understanding of GPs. And lastly, the GPs' main responsibility was considered to be public health work.

### Conclusion

The misunderstandings of the roles and responsibilities of GPs render problematic the policy foundation of China's GP-centred primary care system. Pursuing the quantity of GPs on its own is meaningless, since the number needed depends on the delineated role of GPs. Top priority is to establish clarity about the GP role, which requires reforming the health delivery system to address issues with fragmented care, strategically taking into account the development of GPs with work delegation and substitution, and providing more clarity on the distinction between general practice and public health.

**Strengths and limitations of this study**

- Our methods use our own data rather than aggregated national official data (which may be misleading) – this study represents the first original-data investigation into the issue of general practice in China.
- A mixed methods approach is adopted so that the qualitative and quantitative elements are triangulated to explore many unknowns regarding China's GPs, one of the largest primary care doctor groups in the world.
- The investigation covers all the three medical groups relevant to general practice in China so that a holistic picture is presented.
- Our focus on Henan Province in central China may preclude generalisation to the whole country, but the vast population of this province (around 100 million) and its diversity provide a substantive initial view to the kinds of issues that may arise regarding General Practice across other provinces.

## INTRODUCTION

In 2011, China's State Council (the central government) formally launched its ambitious plan of establishing a system of general practice by 2020 with the aim of reaching at least two General Practitioners (GPs) per 10,000 population.<sup>1</sup> The plan involves training 300,000 GPs within ten years.<sup>2</sup> The rationale for this policy includes the tacit assumption that increasing the number of GPs will be a panacea for one of China's major health care problems.

China is not new to primary health care (PHC). Its influential barefoot doctor movement in the 1960s and 1970s served as an important inspiration for the Declaration of Alma-Ata.<sup>3,4</sup> However, with China's market-oriented reform since late 1970s, the barefoot doctor system gradually collapsed, and its healthcare evolved towards a system dominated by specialised hospital-based care. There are now a growing number of tertiary hospitals in China whose outpatient visits exceed ten or even twenty thousand per day. This tremendous burden has further fuelled the impetus to develop a GP system.

While there is substantial literature on China's barefoot doctors, there is a research gap on China's new GP system. Most articles, focusing on China's recent PHC initiative, tend to landscape the progress or provide a general account of China's newly-introduced GPs by using aggregated national official data – data that unfortunately are often misleading. There is a lack of rigorous, original investigations. Due to China's size, complexity and history, its official GPs may be considerably different, in terms of training, from their counterparts in high-income countries (Box 1). Moreover, a fundamental factor affecting the viability of general practice in China is how General Practice is understood by prospective GPs. Our study focusses on how the three medical groups, together called the Policy Implementation Targets (PITs; Box 1), understand the new GP system. If the PITs cannot agree on what being a GP entails, this compromises the policy foundation of China's GP aspirations. Our findings help inform priorities for establishing a viable GP system in China and may provide guidance for other countries embarking on a similar trajectory.

### Box 1: Three GP training programmes and estimated expansion of GPs in China

A GP system requires sufficient practitioners, and China's major efforts have been focussed on rapid "production" of more GPs through three programmes. The first one is the Standardised Residency Training in General Practice (GP-SRT) that follows the international standards of GP training. Nationwide compulsory residency called the Standardised Residency Training (SRT) is new to China, and the GP-SRT is an important part of this. The SRT recruited its first cohort of residents (totalling 55,000) in late 2014 and around 10% of them (5,158) joined the GP-SRT.<sup>5</sup>

The second programme involves a Tuition-waived Rural-oriented Undergraduate Medical Programme (TRUMP). TRUMP sponsors medical students from rural China who in return assume GP positions in assigned township hospitals upon completion of their studies. The first cohort of TRUMP students (in total 5000 nationally) enrolled at medical schools in 2010 and were required to join the GP-SRT in 2015. Upon completion of the GP-SRT, they are required to work in township hospitals as GPs for three years.

The third programme is GP Transfer Training (GP-TT), mainly for township hospital doctors. The township hospitals 'doctors', many of whom do not even have a bachelor degree, were trained to be specialists. Doctors joining the GP-TT suspend their work to undertake full-time training for one year. Then they will get a certificate that allows them to be "transferred" to GPs. The central government has provided all 22 provinces in middle and western China with funding for this short-term training programme each year since 2010.

In the long run, China's newly-planned GPs will be trained through five years of undergraduate medical studies plus the rigorous three-year GP-SRT programme. The first two programmes above represent the long-term strategy of "producing" GPs through the 5+3 model. The third programme (GP-TT) is the interim plan. These three training programmes represent the GP capacity building efforts since the central government's formal launch of the ambitious plan in 2011. Accordingly, the trainees of these three programmes (TRUMP medical students, GP residents, and township hospital doctors) are defined in this study as **Policy Implementation Targets (PITs)** – the focus of our research.

Through these efforts, the number of China's officially-counted GPs has increased dramatically – almost 190,000 GPs in 2015 (Figure 1). If this trend is sustained, there will be more than 320,000 GPs by 2020, which means approximately 2.4 GPs per 10,000 people. The ambitious plan of training 300,000 GPs and having two to three GPs per 10,000 will therefore be achieved.

#### Figure 1 Here

The first nationwide cohort of GPs following international standards will finish their residency in late 2017. Accordingly, the vast majority of China's current 200 thousand GPs have been produced through the interim training programmes. Most of the township hospitals doctors trained through the GP-TT choose not to change their registration upon completion of the short-term GP training. After the training, they go back to work in the township hospitals as before, serving as internists, paediatricians, surgeons, etc., though the

government statistics count them as GPs (Figure 1). Since the current trend is driven largely by counting the number of these individuals as “GPs”, it is unlikely to truly hit the policy target.

## METHODS

### *Mixed method study design*

Contemporary GPs are very new to China, a large and diverse country with complex histories and traditions. As a new phenomenon, there are many unknowns and a dearth of reliable data about GPs that would allow us to conduct rigorous quantitative analysis. Our study employs a mixed methods approach deemed most appropriate to examine the breadth and depth of understanding of GPs by PITs in Henan.<sup>6 7</sup>

The participants of the study are the PITs in Henan Province. Henan is located in central China and represents the middle of China’s 31 provincial level jurisdictions in terms of economic development (Figure 2). As the second most populous province in China, Henan is one of the key loci for the GP capacity building. For instance, the TRUMP students in Henan, a single province, account for around 10% of the whole country’s TRUMP students.

### **Figure 2 Here**

Two rounds of fieldwork were carried out in Henan (Figure 3). The first round involved qualitative Focus Group Discussions (FGDs) with TRUMP medical students as well as the other PIT groups. However, for the purposes of this paper, we will include only the qualitative findings from the TRUMP group as they revealed similar themes with the other groups. Analysis of the qualitative findings informed the design of the quantitative questionnaires which was administered to each of the three PIT groups in the second round of fieldwork.

### **Figure 3 Here**

The quantitative data were analysed together with the further exploration of the qualitative materials. This allowed us to examine whether the findings from the qualitative and quantitative studies converge, diverge or relate and help strengthen the reliability and validity of our findings. In sum, the qualitative and quantitative elements are triangulated to inform answers to our research question and enhance the robustness of our investigation.<sup>8 9</sup>

### *Sampling*

For the qualitative study, we took a purposive sample of medical students in Henan in order to maximize variation.<sup>10 11</sup> The sampling continued until information saturation was achieved. In

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China, most medical schools provide training in western medicine, while some provide training in traditional Chinese medicine (TCM). Among all the medical schools in Henan participating in the TRUMP, there was only one TCM school – Henan University of Chinese Medicine (HUCM). To represent this proportion of medical students, HUCM was selected. For the remaining ‘western medicine’ schools, Xinxiang Medical University (XMU) was the most active participant of the TRUMP, accommodating around half of the TRUMP students in Henan. Accordingly, it was chosen and identified as a key institution to investigate TRUMP. Within the selected schools, the senior medical students were the preferred participants given their years of experience within the programme.<sup>12</sup>

The quantitative study was expanded to cover all three PIT groups because they are all relevant to the viability of GP in China. The entire first cohort of TRUMP students (enrolled in 2010 and due to graduate in 2015) in all the medical universities in Henan participating in the TRUMP were included. Similarly, all the GP-TT trainees in Henan from 2014 to 2015 were surveyed.

Henan has 24 tertiary hospitals responsible for its GP-SRT (Figure 4), which are the largest and best tertiary hospitals in Henan Province. Nine of them were randomly selected for the quantitative study (Figure 4), and all the GP residents in these nine hospitals were surveyed.

#### Figure 4 Here

#### *Analysis*

In the qualitative study, we used thematic analysis, drawing on principles of grounded theory.<sup>13</sup>  
<sup>14</sup> To conduct the thematic analysis, all the FGDs, with the informed consent of participants, were recorded and transcribed in Chinese. The seven FGDs with medical students produced 589 minutes of audio recording (on average 84 minutes per FGD), which meant 171 pages of transcription (103,318 words in Chinese). All these data were uploaded into the NVivo 10 software, and the themes were coded and analysed. The analysis was conducted in English and whenever necessary the pieces of transcripts were translated from Chinese to English.

The coding framework and emerging themes were identified in an inductive and interactive process. JZ developed a preliminary coding framework after full familiarisation with the data, inspired by the attributes of general practice (widely discussed in the primary care literature) adapted to the Chinese context (such as consideration of TCM). Refining the framework involved constant comparison and discussion with PA. All the questions used for the quantitative survey were derived from these codes/themes and FGDs, and were tested at the beginning of the second-round survey (Figure 3) so that the questions were revised appropriately to be understood by the respondents in the same way they were understood by the researcher. In fact, the second-round survey also included further communications with relevant health officials, experts and previous interviewees – this allowed the interactive approach and the respondent validation of the qualitative study.<sup>15</sup> The coding framework continued to be fine-grained together with the second round of analysis (mainly quantitative analysis; Figure 3). This mixed methods approach is a ‘fusion’ of the qualitative and quantitative elements so that they ‘fulfil’ one another to reach reliability and robustness.”

Then quantitative data were cleaned and analysed using Stata 12. Standard summary statistics were reported about PITs' understanding of GPs. Chi-square statistics were used to test statistical significance of the consensus among the three groups.<sup>16-18</sup> This study is the first to use original primary data from all the three GP-related groups in China, to examine their characteristics and understanding of general practice through rigorous descriptive analysis and significance testing.

### ***Patient involvement statement***

This study does not involve patients. The research participants are medical students, primary care doctors and GP residents. All the participants for the FGDs signed the consent form, and the structured questionnaires have been anonymised. Please refer to the ethical clearance at the end of this manuscript.

## **RESULTS**

### ***Participant characteristics***

The qualitative investigation consists of seven FGDs covering all cohorts of TRUMP students at that time of fieldwork – three for those enrolled in 2010, two for those enrolled in 2011, one for those enrolled in 2012 and one for 2013 (Table 1).

**Table 1: Characteristics of student participants for the qualitative study**

	<b>Number of Participants</b>	<b>Number of FGDs</b>
<i>Medical schools</i>		
XMU	38	5
HUCM	12	2
<i>Cohorts/grades of medical students</i>		
Enrolled in 2010	25	3
Enrolled in 2011	13	2
Enrolled in 2012	6	1
Enrolled in 2013	6	1
<i>Gender</i>		
Male	27	
Female	23	
<i>Age</i>		
Born in 1989	4	
Born in 1990	17	



Born in 1991	10	
Born in 1992	10	
Born in 1993	5	
Born from 1994 to 1996	4	
<i>Rural or urban</i>		
Rural	42	
Urban	8	
<b>Total</b>	<b>50</b>	<b>7</b>

The number of participants for each FGD ranged from six to ten<sup>19</sup> and ensured a gender balance (Table 1). Moreover, as the TRUMP targets rural China, we over-sampled participants coming from rural areas. For the quantitative survey, there were 1,887 participants: 418 TRUMP medical students, 1349 GP-TT trainees and 120 GP resident doctors. The response rate of the TRUMP medical students (enrolled in 2010) was 92% (418 out of 455 completed the questionnaire). Among the respondents, 53% were males and the vast majority (90%) were from rural China.

The sample size of the GP-TT trainees was the largest among the three PIT groups: 1349 out of 1478 GP-TT trainees (response rate: 91%) participated in the survey. As Table 2 illustrates, the majority of GP-TT trainees (73%) were township hospital doctors. Also, there were more male than female trainees (58% versus 42%). The age of the trainees was hugely diverse. Most of them were in their 30's (44%) or 40's (32%). Some (16%) were in their 20's and a minority (7%) were in their 50's with 1% over 60.

**Table 2: Characteristics of GP-TT trainees for the quantitative study (n=1,349)**

	Number of GP-TT trainees	
<i>Health organisations where they work##</i>		
Township hospitals	934 (73%)	
Village clinics	101 (8%)	
Community healthcare centres	149 (12%)	
Community healthcare stations	81 (6%)	
Others	9 (1%)	
<i>Specialisation*</i>		
Clinical (western) medicine	(n=1,114)	1,114 (85%)
Internal medicine	394 (35%)	
Surgery	164 (15%)	
Obstetrics and gynaecology	138 (12%)	
Paediatrics	24 (2%)	

EENT (eye, ear, nose & throat)	17 (2%)	
Other specialties and invalid data	69 (6%)	
Missing data	308 (28%)	
TCM		161 (12%)
Dentistry		17 (1%)
Public health		25 (2%)
<i>Education</i>		
High school or below	4 (0.3%)	
Secondary vocational diploma	404 (30.7%)	
Vocational diploma	706 (53.7%)	
Bachelor	201 (15.3%)	
Master	1 (0.1%)	
Doctorate	0	
<i>Gender</i>		
Male	781 (58%)	
Female	555 (42%)	
<i>Age</i>		
20-29	214 (16%)	
30-39	566 (44%)	
40-49	419 (32%)	
50-59	91 (7%)	
60 above	11 (1%)	
<b>Total</b>	<b>1,349 (100%)</b>	

#Community healthcare centres are the urban counterparts of rural township hospitals. With China's fast urbanisation, some township hospitals automatically become community healthcare centres. The GP-TT programme is mainly for those doctors in township hospitals, while in implementation it may include doctors from other health organisations.

\*China's officially-recognised doctors are categorised into four 'practice categories': clinical (western) medicine, TCM, dentistry, and public health. Within the 'practice category' clinical medicine, there are 'practice scopes' such as internal medicine, surgery, paediatrics. The 'practice category' and 'practice scope' are both specified in a doctor's license. Our survey asks each participant to report his/her 'practice category' and 'practice scope' in the license.

1 For GP-TT trainees', most (85%) did not have a bachelor's degree (Table 2). Through the  
2 GP-TT, they were supposed to be "transferred" to be GPs. China's officially-recognised doctors  
3 were categorised into four practice categories: clinical (western) medicine, TCM, dentistry, and  
4 public health. These GP-TT trainees surveyed included all four of these categories. Most of them  
5 (85%) were clinical (western medicine) doctors, and 12% were TCM practitioners. Within the  
6 category of clinical medicine, 35% were internists, 15% were surgeons and 12% were  
7 obstetricians/gynaecologists (Table 2).  
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11 For GP residents, the response rate was 93% with 120 GP resident doctors completing the  
12 questionnaire. Among the respondents, 46% were males. Most were between 27-30 years old  
13 and had achieved a high educational level: 88% had a bachelor's degree and 12% held a master's  
14 degree.  
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18 Analysis of the qualitative findings revealed five themes: the nature of GPs as all-specialty  
19 doctors, GPs as first point of contact for care, GPs as gatekeepers, GPs as distinct from TCM  
20 practitioners, and GPs as distinct from Public Health specialists. Each theme along with the  
21 relevant qualitative and quantitative findings is presented below.  
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### 23 24 25 ***Theme 1 GPs as all-specialty doctors***

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28 The PITs interviewed tend to interpret GP literally according to the Chinese translation *Quan Ke*  
29 *Yi Sheng*. The last two characters, *Yi Sheng* mean doctor(s); the first character *Quan* means all;  
30 *Ke* means discipline, specialty or department (of a hospital). Accordingly, if the terminology GP  
31 in Chinese is literally translated back into English, it means "all-specialty doctor" or  
32 "all-department doctor". When medical students were asked what a GP is, a general confusion  
33 emerges as depicted by Quote 1 (Table 3).  
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37 Quantitative analysis confirms this common misunderstanding. Specifically, in China's current  
38 organisation of care, most doctors claim their specialty according to the hospital department  
39 where they work. Accordingly, GPs would be considered "all-department" doctors. Around 80%  
40 of PITs agree that GPs can work in most departments of a hospital (Table 4). There is no  
41 significant difference between the three PITs groups' opinions on this statement ( $p=0.884$ ).  
42 Similarly, PITs' understand GPs to be "all-specialty" doctors and general practice to be the  
43 combination of all the specialities. Consequently, around 85% of PITs are intimidated by the  
44 comprehensiveness required of GPs; the three PIT groups all think general practice is more  
45 challenging and needs longer training compared to specialist training ( $p=0.962$ ).  
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**Table 3: Selected quotations about what GPs are in China**

Quote No.	Quote	Source
1	<p><i>Participant 5, Male: GPs mean training us to be able to do internal medicine, surgery, etc. All the specialties...</i></p> <p><i>Participant 3, Female: (GPs) can deal with all the diseases.</i></p> <p><i>Participant 2, Female: Know a little about all the diseases.</i></p> <p><i>Participant 3, Female: But no expertise.</i></p> <p><i>Participant 5, Male: Be capable of treating every (disease)</i></p> <p><i>Participant 7, Male: Be capable of treating every, no matter what it is</i></p>	FGD 4, students enrolled in 2010 at XMU
2	<p><i>Participant 3, Female: I quite like reading foreign novels such as Jane Eyre and Gone with the Wind. Through those novels, (I find that) they have family doctors. I feel our country is copying them (i.e. high-income countries) in many aspects – of course those positive aspects. I think our GPs are copying their family doctors. But I think we need to wait until we turn better (in terms of financial capacity) and have the (economic) condition. Then we can be trained. Now even if it (the government) has trained us very well, there is no (appropriate) place to allocate us. Now our economic condition is limited, unlike foreign (developed) countries. They can hire this kind of doctors, while we cannot afford these family doctors. Our GPs are supposed to be like this in the future: like what has been written in foreign novels, I (one family doctor) is in charge of that family or the people in that area - their overall health. Our economic condition is still limited and still cannot reach that.</i></p>	FGD 2, students enrolled in 2011 at HUCM
3	<p><i>Participant 1, Male: Family doctors in China – there are few those family doctors.</i></p> <p><i>Participant 6, Female: Where are family doctors (to practise medicine)? At home?</i></p> <p><i>Participant 3, Male: (Family doctors are) the doctors hired solely by people who have economic capacity and serve them (the rich).</i></p> <p><i>Participant 1, Male: Basically there are few (in China).</i></p>	FGD 6, students enrolled in 2012 at XMU
4	<p><i>Participant 1, Male: To my knowledge, there are no GPs in the hospitals of Zhengzhou (the capital and the biggest city of Henan Province). From those I am in touch with, they feel, when they hear of GPs, they consider them to be village doctors.</i></p>	FGD 2, students enrolled in 2011 at HUCM

5	<p><i>Participant 2, Male: GPs have a guiding relationship (with patients). Assume one person goes to seek health care and he/she does not know what disease he/she has. Then (GPs' job is to) tell him/her what the disease is. Then tell (the patient that) I (the GP) cannot cure it and (you need to) go to find that certain...certain discipline's doctor (specialist) in the department (of a hospital) in the city. Then you will be given professional examination(s) by the medical equipment) for further treatment. That is a filtering role – distinguish between small and big diseases.</i></p> <p><i>Participant 3, Male: Right.</i></p> <p><i>Moderator: Since you understand it (the role of GPs) in this way, why do you want to treat rare and complicated diseases?</i></p> <p><i>Participant 3: Not rare and complicated diseases. (I) aim to make more patients, as much as treatment can, get treatment near home. It is relatively convenient.</i></p> <p><i>Moderator: Maybe your role (GP's role) is to treat common diseases. You just refer those you are not supposed to be able to treat.</i></p> <p><i>Participant 3: If so, now you do not need a doctor with a bachelor degree.</i></p> <p><i>Participant 5, Female: He means gradually expanding the scope of small diseases (that GPs can treat).</i></p> <p><i>Participant 3: If maintaining the status quo, there is no need to have doctors with a bachelor degree. The existing doctors in township hospitals are (qualified) enough to treat small diseases. (Those with) big diseases still need to go to a (big) hospital directly. Then this country's problem of poor access to and high expenses of health care still cannot be solved.</i></p> <p><i>Moderator: How do you define small diseases? To what extent?</i></p> <p><i>Participant 3: This can only, gradually...Actually, becoming a GP, what to say, the boundary is not very clear.</i></p>	FGD 5, students enrolled in 2013 at XMU
6	<p><i>Participant 6, Male: Currently guide doctors are not well managed. Now what we (GPs) are doing is equivalent to referral – essentially the same to guide doctors. (In the future) I plan to do guide doctor business – set up an independent company (to provide professional guide doctor services).</i></p>	FGD 7, students enrolled in 2010 at XMU
7	<p><i>Participant 1, Female: My home is close to our village's clinic. That clinic's doctor is more than 70 years old. He has a very high reputation in our village – all the patients, male and female, the old and the young, all go to him to seek health care. Paediatrics, obstetrics and gynaecology, he knows all. He relies on the experiences he has accumulated for so many years. When a patient comes, without using advanced medical equipment, he is able to diagnose the disease or narrow down the diagnosis to a very small scope – must be either this or that disease. I think he is awesome. When I</i></p>	FGD 1, students enrolled in 2010 at HUCM

	<p><i>find general practice, I think it is nice – learning both TCM and western medicine and after graduation I can be like him. When I opted for this discipline (general practice), I went to consult him. He told me this discipline was good – after graduation you could use either the knowledge of TCM or the knowledge of western medicine, or combine both. At least in rural regions or township (hospitals) – he knew I must go back to work in a township hospital – it would be very useful. Because after all it is impossible to employ only one mode (TCM or western medicine) to solve all the diseases.</i></p>	
8	<p><i>Participant 7, Female: The GPs at our place (my hometown), last time they told me you (after graduation and training) would do this – they went directly to villages, to people’s houses to (a male’s voice: fill in forms) check (family’s) information.</i></p> <p><i>Participant 1, Male: What you said is public health. Public health is not to treat diseases.</i></p> <p><i>Participant 6, Female: That’s prevention, prevention.</i></p> <p><i>Chaotic arguing which cannot be identified.</i></p> <p><i>Participant 3, Male: Does the GP essentially belong to public health?</i></p> <p><i>Participant 1, Male: No.</i></p> <p><i>Participant 5, Female: Different from that (public health).</i></p> <p><i>Participant 1, Male: You are a doctor, different from public health (practitioners). Public health, (you) randomly find a person (which means anyone) can do it – (public health is about) sending some questionnaires, surveys, etc.</i></p>	FGD 3, students enrolled in 2011 at XMU

**Table 4: Diverse interpretations of general practice in China**

	<b>Medical students</b> (n=418)	<b>Township hospital doctors (GP-TT trainees)</b> (n=1349)	<b>Resident doctors</b> (n=20)	<b>PITs</b> (n=1887)	<b>Comparing three groups</b> <i>P-value</i> ( $\chi^2$ test, df=2)
<b>Theme I GPs as all-specialty doctors</b>					
General practice consists of all the specialties in medicine (%agreement and 95% confidence interval)	50 (45, 55)	84 (82, 86)	75 (62, 78)	76 (74, 78)	0.015
General practice is more difficult to learn and needs longer training compared to specialist training (%agreement and 95% confidence interval)	86 (83, 89)	88 (86, 90)	88 (77, 91)	87 (86, 89)	0.962
GPs are qualified to work in most departments of a hospital (%agreement and 95% confidence interval)	77 (73, 81)	76 (74, 78)	88 (75, 89)	77 (75, 79)	0.884
<b>Theme II GPs as first-contact care</b>					
GPs are family doctors (%agreement and 95% confidence interval)	54 (49, 59)	70 (68, 72)	55 (45, 63)	65 (63, 68)	0.232
GPs are private personal doctors (%agreement and 95% confidence interval)	14 (11, 17)	16 (14, 18)	18 (5, 27)	15 (14, 17)	0.568
GPs know everything but master nothing (%agreement and 95% confidence interval)	39 (34, 44)	29 (27, 31)	33 (24, 40)	31 (29, 34)	0.468
GPs are like barefoot doctors or village doctors (%agreement and 95% confidence interval)	14	26		22	0.012

	(11, 17)	(24, 28)	(4, 34)	(20, 24)	
<b>Theme III GPs as the “gate”</b>					
GPs are gatekeepers of residents’ health (%agreement and 95% confidence interval)	90 (87, 93)	97 (96, 98)	97 (94, 100)	95 (95, 96)	0.858
GPs’ one main responsibility is referral (%agreement and 95% confidence interval)	69 (65, 73)	69 (67, 71)	59 (49, 67)	68 (66, 70)	0.517
<b>Theme IV GPs vs. TCM practitioners</b>					
GPs can practise both western medicine and TCM (%agreement and 95% confidence interval)	54 (49, 59)	83 (81, 85)	41 (38, 56)	74 (72, 76)	0.003
GPs are the doctors specialising in combination of western medicine and TCM (%agreement and 95% confidence interval)	27* (23, 31)	62 (59, 65)	28 (20, 36)	52 (50, 54)	< 0.001
<b>Theme V GPs vs. Public Health Practitioners</b>					
GPs’ main responsibility is public health work (%agreement and 95% confidence interval)	60 (55, 65)	69 (67, 71)	69 (56, 74)	67 (65, 69)	0.723
GPs’ main role is prevention rather than diagnosis/treatment of diseases (%agreement and 95% confidence interval)	16 (12, 20)	38 (35, 41)	18 (8, 30)	32 (30, 34)	< 0.001

\*For the 43 TRUMP students at HUCM, 60% of them agree with this statement



### *Theme II GPs as first-contact care*

According to our findings, PITs understand that GPs are patients' first and regular contact, but this first-contact care is interpreted in two conflicting directions. The first-contact care, in the eyes of PITs, when applied to the rich and the powerful suggests GPs are privileged family or private personal doctors (Quote 2 and 3, Table 3). But this privilege is too good to be true for the common people, and when the first-contact care is applied to the general public, GPs are considered to represent the barefoot doctors or village doctors who lack expertise (Quote 4, Table 3).

The two extremes of understanding are quantitatively examined, as shown in Table 4. Fifteen percent of PITs consider GPs to be private personal doctors, while 22% think GPs are like barefoot doctors or village doctors. For interpreting GPs as barefoot or village doctors, the opinions of the three PIT groups differ ( $p=0.012$ ), with the township hospital doctors (26%) significantly more likely to hold this interpretation (Table 4). In addition, one third of the PITs think GPs have no concrete expertise, and they just know everything superficially.

### *Theme III GPs as gatekeepers*

Though China does not have a mature referral system (from GPs to specialists and from specialists back to GPs), many PITs are aware of GPs' referral and gatekeeping role. However, they understand the role differently. Some consider a GP's responsibility is to treat as many diseases as possible, including those beyond their capacity. The other is to just simply refer patients without any effort on their part. Participant 2 in Quote 5 (Table 3) above has this second opinion, while Participant 3 though seeming to agree with Participant 2, actually shows the first view. The view that GPs simply refer patients is more evident in Quote 6 (Table 3). In this case, guidance is more appropriate than referral for the role mentioned, and such "guide doctors" can be nurses.

The referral function also implies GPs' gatekeeping role. They serve as the "gate", and a gate is a barrier. According to the quantitative analysis, the vast majority of PITs (more than 90%;  $p=0.858$ ) think that GPs are the gatekeepers of peoples' health (Table 4), as this is clearly and widely promoted by the Chinese government. However, "the gatekeepers of residents' health" has two interpretations – it can mean that GPs are health protectors or the gatekeepers of the healthcare system. This either reflects the government's misunderstanding of GPs or its deliberate rhetoric to avoid directly associating the GPs' role as a barrier to directly accessing tertiary care. Accordingly, agreeing with this statement does not necessarily mean the PITs understand GPs' referral role appropriately. In fact, when directly asked whether they agree

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3 that one of the GPs' main responsibility is referral, the percentage of agreement reduces to  
4 less than 70% (Table 4).  
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#### 8 *Theme IV GPs vs. TCM practitioners*

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12 Some of our surveyed PITs think that general practice, as “all-specialty medicine”, includes  
13 TCM. This is further confused by the fact that in China's TCM universities, there is a  
14 discipline called “the combination of western medicine and TCM”. The TRUMP in Henan  
15 Province gives some quotas (though a relatively small proportion) to HUCM, which naturally  
16 connects “the combination of western medicine and TCM” with general practice. This  
17 decision, by the Henan health authority implies either its deliberate decision to connect  
18 China's general practice with TCM or weak regulation. As a result, medical students  
19 particularly at HUCM tend to think general practice is kind of equal to the combination of  
20 western medicine and TCM (Quote 7, Table 3).  
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27 The quantitative analysis confirms that some PITs associate general practice with TCM  
28 (Table 4). In particular, the township hospital doctors and the medical students in TCM  
29 medical universities are more likely to assert that GPs can practise both western medicine and  
30 TCM.  
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#### 34 *Theme V GPs vs. public health practitioners*

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38 According to our findings among the PIT's surveyed, more than 60% think that GPs' main  
39 responsibility is public health work (Table 4), as shown by Participant 7 in Quote 8 (Table 3).  
40 Some do not agree, such as Participant 1 who remind Participant 7 that “you are a doctor”  
41 which means you should do clinical work rather than paperwork. Nonetheless, Participant 1's  
42 understanding of public health is not appropriate either. Great caution is needed to decipher  
43 how they interpret public health. Meanwhile, most PITs, although asserting GPs' main  
44 responsibility is public health, do not agree that GPs' main role is prevention rather than  
45 diagnosis/treatment of disease (Table 4). However, township hospital doctors are more likely  
46 than the medical students or residents surveyed to consider a GPs main role to be prevention.  
47 It is fair to say that the PITs have a vague understanding of both general practice and public  
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## 55 **DISCUSSION**

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### *Health delivery system and fragmented care*

Some of the (mis)understandings of general practice are arguably a reflection of China's health delivery system and its fragmented care. The health delivery system is dominated by powerful hospitals and a specialist practice model. In this system, even China's primary care facilities (e.g. the township hospitals) follow a specialist practice model. Though they are not as specialised as tertiary hospitals, they usually have departments of internal medicine, surgery, paediatrics, obstetrics and gynaecology. Township hospital doctors are trained to be 'specialists' in these departments, despite most not even having a bachelor's degree (Table 2). Consequently, it is natural for medical students and doctors to establish their professional identities as a result of their experience in the specialised departments in which they are working, rather than as a substantive reflection of specialist training received.

In this system, most Chinese doctors with high levels of education are not independent practitioners. They work in the state-owned tertiary hospitals, as semi-civil servants. In other words, most doctors with high education levels in China are locked in a hospital setting rather than an office base. There are few role models of care outside of hospitals. One model people can imagine is a very tiny proportion of privileged personal doctors, who take care of the everyday health of very top officials. By contrast, the other realistic role model of care outside hospitals people can think of is the barefoot doctors or their successor, the village doctors.

Another complication of China's health delivery system is the lack of an established formal referral mechanism. Patients highly rely on self-referral. In this fragmented care system, tertiary hospitals compete with primary care institutions for patients, as China's health system is essentially still a fee-for-service model in which more patients mean more revenues. Embedded in this system, it is challenging to make sense of the referral and coordination demanded of GPs.

Many countries may have a similar problem of a lack of a primary care infrastructure, where primary care is based on an idealistic framework but the theoretical advantages cannot materialise.<sup>20</sup> In contrast, this situation is much better in the UK, which although does not specify the roles and responsibilities of GPs very clearly,<sup>21</sup> does have an established and recognised GP system. This system provides the role models through everyday practice recognised by the health professionals and the general public.

China's case now is the opposite. Theoretically, from medical school education to residency and then to being a primary care doctor, one's understanding of general practice should be increasingly better. Nonetheless, in China the primary care doctors are more likely to

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misinterpret general practice than the other two groups (Table 4). This phenomenon relates to the everyday work of China's primary care doctors – the more one has exposure to the work designated as so-called 'general practice' in real life, the more confused one gets. Here China's health delivery system and medical education form a vicious circle for the training of GPs. A holistic package of reforming the whole system is needed, and the increased number/percentage of GPs becomes valuable only when it is a natural result of strengthened primary health care.

### ***Work delegation and substitution***

Theoretically, it is easy to understand that comprehensiveness and first-contact care requires GPs to deal with a much larger variety of problems, while specialists focus in depth in one clinical domain. However, in practice, some work of GPs may inevitably overlaps with many specialists, especially from an international perspective. In the UK, the primary care doctors are GPs, while in the US they consist of family physicians (US equivalents of GPs), general internists, paediatricians, obstetricians and gynaecologists. Furthermore, many attributes of GPs such as comprehensiveness, continuity, first contact and coordination are all relative concepts - sometimes they do not necessarily and automatically distinguish GPs from specialists. For instance, some specialists with an office-based tradition in the US (such as some cardiologists and pulmonologists) actually identify themselves as primary care physicians,<sup>22</sup> and some research recognises the important contribution of specialists to primary care – in particular 58.2%, 43.8% and 42.3% of the care provided by cardiologists, gastroenterologists and pulmonologists, respectively, is classified into the category of principal care which has the evidence of continuity and comprehensiveness.<sup>23</sup> Conversely, GPs can work in tertiary hospitals. In Canada, 90% of the hospitalists (providing comprehensive care for inpatients) are GPs.<sup>24</sup>

Moreover, the broad care provided by GPs may overlap with allied health professionals such as nurses and community health workers. In the UK, the consultations in general practice undertaken by nurses increased from 21% in 1995 to 34% in 2006; more responsibilities previously undertaken by GPs are taken over by nurses.<sup>21</sup>

All in all, the work delegation and substitution indicates that there are potentially various combinations of health workforce (GPs, specialists, allied health professionals, etc.) to deliver PHC. Depending on these different combinations and different health delivery systems, different countries actually demand different things from general practice, as reflected by the large variation of the proportion of GPs as a percentage of each country's total number of doctors: UK 60%, Canada 51%, France 50%, Spain 37%, Netherland 33%, Finland 32%, Denmark 25%, USA 20%, Germany 19% and Sweden 10%.<sup>25 26</sup> No research so far has proposed a convincing gold standard establishing the 'ideal' proportion of GPs.

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5 Accordingly, it becomes so complex and confusing in China when such a large and diverse  
6 country in transition learns the “successful” experiences across various countries. Also, more  
7 special in China is the role of TCM. This paper does not want to enter the endless debate of  
8 western medicine vs. TCM or want to deny the potential huge contribution of TCM to PHC.  
9 We just find that at this stage TCM further compromises the understanding of general practice  
10 in China. Recognising the reality, instead of the obsession with GPs, it is probably better for  
11 China to develop its own multi-professional team-based approach to deliver PHC. The ‘team’  
12 can involve GPs, other generalist physicians, nurses, and even nurse practitioners (very new  
13 to China), etc. Obviously, this team-based approach can also accommodate TCM practitioners  
14 very well.  
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### 21 ***Public health and general practice***

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25 GPs are, first of all, qualified doctors. This is obvious in the high-income countries. However,  
26 the heterogeneity of GPs in China means that many GPs are “transferred” from the doctors in  
27 primary care facilities (e.g. township hospitals). In terms of education levels, they are more  
28 comparable to community health workers. However, they have worked for a long time as  
29 ‘doctors’ and through the work experiences some of them have arguably achieved the skills of  
30 being doctors, while others have not. Their qualifications as doctors vary greatly.  
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36 In addition to varied qualifications, China has paid special attention to public health,  
37 especially since the SARS incident in 2003. With the massive influx of funding from the  
38 central government, quite often the GPs provide the so-called “national basic public health  
39 services”. As a result, the doctors in primary care facilities, before the start of the GP  
40 movement, did see patients but now are busy with the “public health services” which consist  
41 of the work which could be largely undertaken by nurses and community health workers and  
42 partially by doctors and public health professionals. In other words, before they all functioned  
43 as doctors, but now they may function as doctors, public health professionals, nurses or  
44 community health workers. The heterogeneity of GPs and their everyday work contribute to  
45 the vague understanding of both public health and general practice in China.  
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51 Our findings suggest that China would benefit from clarifying that GPs are qualified doctors.  
52 This is the paramount identity of GPs. There is no risk of this identity changing in  
53 high-income countries at present. However, in the early years of the NHS, it had similar  
54 concerns, as argued by McKeown in 1962 in the Lancet:  
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*“But this change in role would be wholly out of keeping not only what the doctor wants from his career but with what the public wants from its doctor. His unique opportunity to influence the social situation has its base in public confidence that his is capable of treating the sick. If this were lost he would be reduced to the position of a rather badly trained social worker.” (p. 924)<sup>27</sup>*

## LIMITATION, POLICY IMPLICATION AND CONCLUSION

One limitation of this paper is that it only focuses on Henan Province, which may preclude generalisation to the whole country. However, it should be noted that Henan has a population of around 100 million, larger than most countries. If Henan were an independent country, it would host the 16<sup>th</sup> largest population among sovereign nations. This ‘case study’ provides at least an initial view of the kinds of issues that probably arise in crafting policies for General Practice in other provinces of China. In addition, this paper only provides a ‘supply-side’ perspective – it represents the views of medical providers. However, it is equally important to know patients’ attitude towards general practice (‘demand-side’ perspective) and their health care-seeking behaviours. However, our design is first to target relevant providers who are supposed to understand GPs best. If the PITs have such understandings/interpretations of what being a GP entails, as identified in the five themes, the perspectives of the general public should be even more diverse. The foundation of China’s GP-centred PHC workforce policy-making is problematic.

Based on our findings, we would argue that the top priority for China is to define the core functions of its GP workforce clearly and transparently. This may sound easy, but actually concerns every aspect of a viable GP system. The roles and responsibilities required of GPs cannot be specified in isolation. Specialists, nurses, community health workers, public health professionals, and TCM practitioners, among others, need to be coordinated. Especially, China should make sure that the paramount identity of GPs is firstly qualified doctors, and clarify pragmatically the distinction between general practice and public health. In addition, pursuing a particular indicator of policy success (e.g. the number of GPs) alone can be meaningless or even counterproductive. Inserting so-called GPs into the existing hospital- and specialist-dominated system can lead to chaos and confusion. We recommend efforts to be directed towards reform of the whole health delivery system and fragmented care towards one which more broadly strengthens PHC.

Recently, the World Bank has been promoting integrated health care in China. In particular, Anhui Province (another populous province in central China), which just received a huge

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3 World Bank loan, has been synthesising different levels of health facilities within a county.  
4 This model is pro-PHC and adopts a *de facto* multi-professional team-based approach. By  
5 applying the findings of this paper, we are helping Anhui's health reform. Also, we are  
6 working with various stakeholders to disseminate this study's results, in order to develop  
7 genuine GPs and strengthen PHC broadly.  
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17 **Figure 1: Number of GPs in China with a linear forecasting**

18 Data are from China Health and Family Planning Statistical Yearbook 2016, 2015, 2014 and  
19 2013.  
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26 **Figure 2: Henan Province (in red) in China in 2015**

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32 **Figure 3: Overview of mixed methods research**

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38 **Figure 4: 24 GP-SRT bases in Henan Province and 9 selected for the quantitative study**

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43 **Contributors:** Both authors jointly designed the study. JZ collected and analysed the data. JZ  
44 wrote the manuscript. PA actively participated in the whole research process, and revised the  
45 manuscript.  
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50 **Competing interests:** All authors have completed the ICMJE uniform disclosure form at  
51 [www.icmje.org/coi\\_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf) and declare: no support from any organisation for the  
52 submitted work; no financial relationships with any organisations that might have an interest  
53 in the submitted work in the previous three years; no other relationships or activities that  
54 could appear to have influenced the submitted work.  
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3 **Funding:** None  
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7 **Ethical Approval:** The study has been reviewed by, and received ethics clearance through,  
8 the University of Oxford Social Sciences and Humanities Inter-Divisional Research Ethics  
9 Committee (IDREC) – Ref No: SSD/CUREC1A/13-282. Medical students were informed that  
10 there would be no academic penalty for non-participation or withdrawal.  
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15 **Data sharing:** Participants (anonymised) gave informed consent for data sharing for the  
16 purpose of research. Code and data (both qualitative and quantitative elements) are available  
17 from the corresponding author. In addition, the survey questionnaires can be shared upon  
18 request.  
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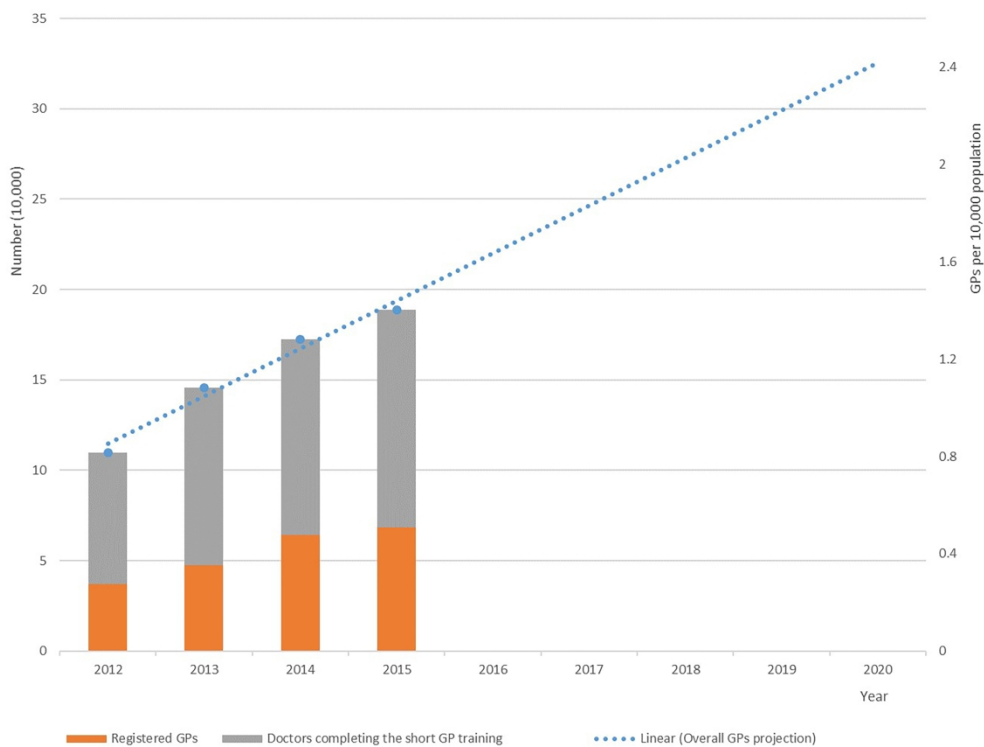
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23 **Transparency:** The lead author (JZ) affirms that the manuscript is an honest, accurate, and  
24 transparent account of the study being reported; that no important aspects of the study have  
25 been omitted; and that any discrepancies from the study as planned have been explained.  
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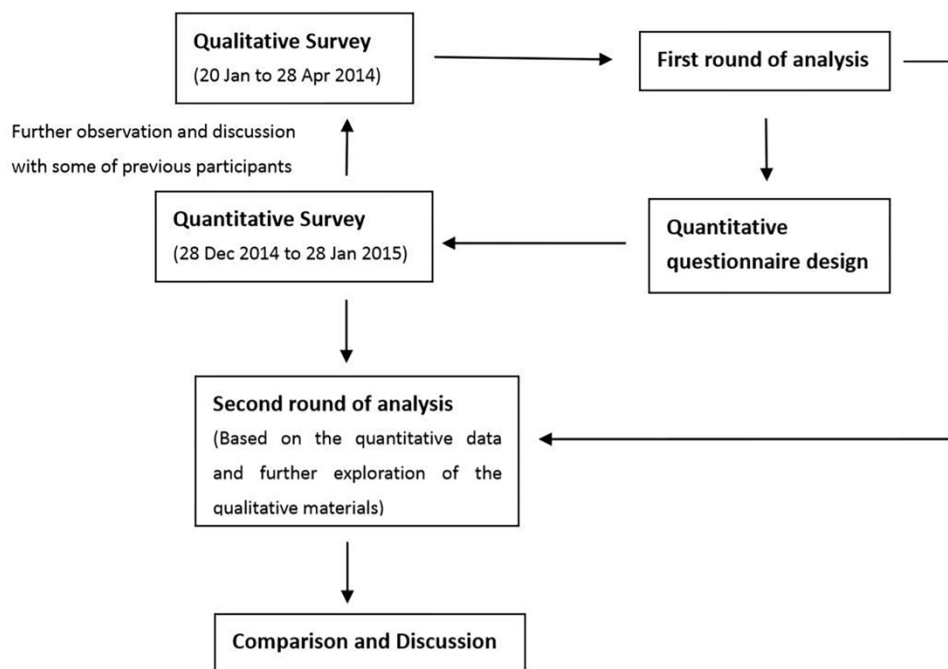
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	<b>Henan Province (% of total)</b>	<b>China</b>
Population (million)	94.8 (6.9%)	1,374.6
Health workforce (million)	0.77 (7.2%)	10.69
Gross Domestic Product (billion US Dollars)	544.3 (5.4%)	10083.9

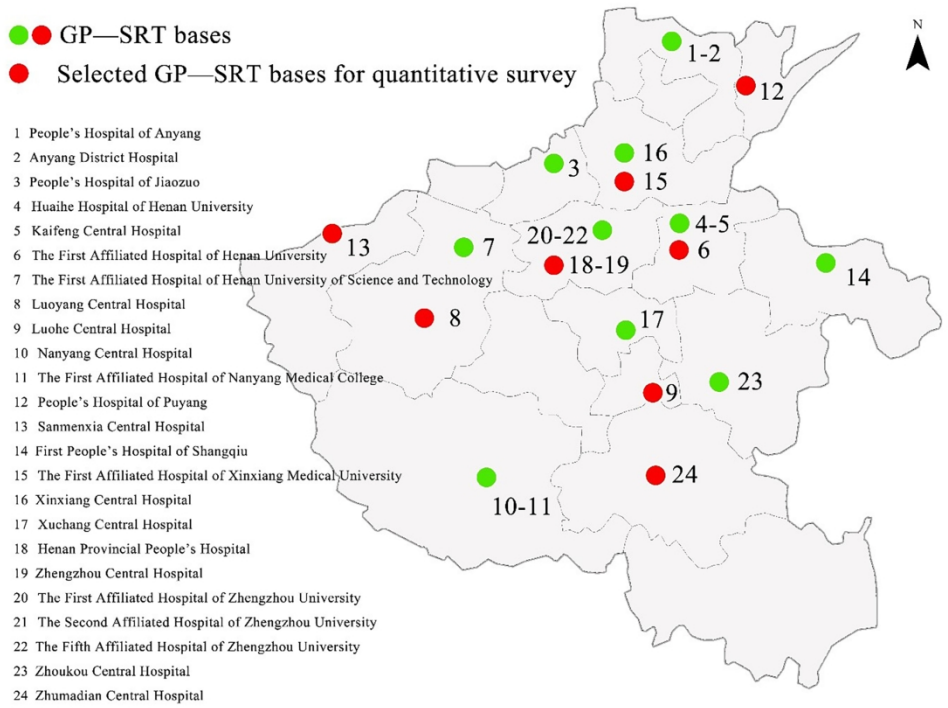
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