

Socioeconomic status inequity in inpatient service utilization based on need among migrants: Evidence from a national study in China

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Abstract

Background: Providing equal treatment for those who have the same need for healthcare, regardless of their socioeconomic and cultural background, has become a shared goal among policymakers who strive to improve healthcare. This study aims to identify the socioeconomic status (SES) inequities in inpatient service utilization based on need among migrants by using a nationally representative study in China.

Methods: The data used in this study was derived from the 2014 National Internal Migrant Population Dynamic Monitoring Survey collected by the National Health Commission of China. The sampling frame for this study was taken using the stratified multistage random sampling method. All provincial urban belt and key cities were stratified, and 119 strata were finally determined. We used logistic regression method and Blinder-Oaxaca decomposition and calculated the concentration index to measure inequities of SES in inpatient service utilization based on need. Sample weights provided in the survey were applied in all the analysis and all standard errors in this study were clustered at the strata level.

Results: The total number of the migrants who needed inpatient service told by doctors was 7,592, of which, 1,667 (18.75% of total population) unmet the inpatient service need. Results showed that inpatient service utilization concentrated among high-SES migrants (Concentration Index: 0.036, $p < 0.001$) and the decomposition results suggested that about 44.16% of the total SES gap in inpatient service utilization could be attributed to the gradient effect. After adjusting for other confounding variables, those had high school degree and university degree were more likely to meet the inpatient services need, and the OR values were 1.48 (95% CI 1.07, 2.03, $p = 0.017$) and 2.04 (95% CI 1.45, 2.88, $p = 0.001$), respectively. The OR values for Quartile 3 and Quartile 4 income groups was 1.28 (95% CI 1.01, 1.62, $p = 0.044$) and 1.37 (95% CI 1.02, 1.83, $p = 0.035$), respectively.

Conclusion: This study observed an inequity in inpatient service utilization where the utilization concentrates among high SES migrants. It is important for policy makers to be aware of them and more intervention should be conducted.

Background

According to the World Health Organization (WHO) [1], the key goal of the universal health coverage (UHC) is to ensure that everyone receive the health care they need. Providing equal treatment for those who have the same need for healthcare, regardless of their socioeconomic and cultural background, has become a shared goal among policymakers who strive to improve healthcare. However, millions of people, especially migrants, do not have the adequate access to health-care services they need [1]. Migrants face many obstacles in accessing essential health care services due to factors such as language barriers, a lack of inclusive health policies, and inaccessible public services [2]. The WHO has been promoting the health of migrants and committed to adequately address health needs for migrants. A WHO framework for migrant health has recognized the urgent need for the health sector to address the impact of migration on health effectively [2].

China has experienced the largest migration during the past three decades, with the number of migrants increased from 230 million in 2011 to 244 million in 2017, which constituted 18% of the total population of China [3]. Internal migrants, in Chinese literally “floating population”, which is defined as those who have left their hometowns to live and work in a new place for more than one month but do not have a local ‘Hukou’ (registered residence) at the new location [4]. Since 1980s, the rate of urbanization has increased dramatically in China which is due to internal rural-to-urban migration [5]. However, migrants are known to be marginalized in China, because of the Hukou system. Although the internal migrants have made an important contribution to urban economic growth and social stability, their health status and health service utilization have not received due attention. Comparing with local residents, the migrants face higher unmet health care need and poorer quality care [2, 6]. The challenge for China is how to promote economic growth and develop wealth while reducing inequality among migrants. Addressing the health care needs of migrants can improve their health status, facilitate social integration, and contribute to economic development [7]. During the past two decades, China implemented several national healthcare development plans [8] to improve healthcare access and equality with many challenges and successes. National Health Commission of the People’s Republic of China (NHC-PRC) has started an initiative called ‘Equal Access to Public Health Services among Migrants’ since 2013, to improve access to public health service especially the utilization of health service.

Equity in health can only be attained if persons with the same level of healthcare needs receive equal level of care, regardless of their socioeconomic status (SES). However, little evidence exists on the SES inequities in health service utilization among internal migrants in China. To date, published studies have mostly been divided into three categories. The first is about the difference and comparison of the utilization of health services between the migrants and the local residents [6, 9, 10]. Second, most studies on the internal migrants are based on regional data [11-15], and there were few studies using a nation-wide data about the migrants. More importantly, most of the studies focused on the influencing factors of the utilization of health services of the migrants, but few explored from the perspective of health need [13, 16, 17]. Although SES equity is very important for migrants in access to healthcare services, there is a shortage of studies explored the SES inequities in inpatient service utilization among internal migrants in China, especially based on the need of inpatient service. In order to fill these gaps, this study was performed to explore the SES inequities in inpatient service utilization based on need among the internal migrants in China, in order to quantify SES roles in healthcare utilization inequity as a guide for health policy makers and draw public policy implications to further reform the health care systems.

Methods

Due to technical limitations, the Methods section is only accessible as a download in the supplementary files section.

Results

The participants enrolled in 2014 National Internal Migrant Population Dynamic Monitoring Survey were 200,937, of which, around 3.82% had the inpatient service need. According to the Table 1, the total number of the migrants who needed inpatient service diagnosed by doctors was 7,592, of which, 1,667 (18.75% of total population) did not use the inpatient services (unmet inpatient service need) and 5,925 (81.25% of total population) had used the inpatient services. Of the 7,592 participants, about two-thirds (n=5,461) were female. The mean age was 32 years old. Most of the migrants had middle school degree (45.65% of total population), were Han Chinese (92.92% of total population) and had been married (94.70% of total population). About 97.31% had at least one child; 82.46% were registered as having a rural 'Hukou' and 76.90% had established the health records in the local residence. Regarding health insurance, 50.90% were covered by the NCMS, 6.41% and 25.19% were covered by the URBMI and UEBMI, respectively, while 17.50% had no social health insurance. The majority of the migrants was across province migration (66.87%) and has willingness for long-term residence (63.02%). In terms of geographic region, the proportion of migrants in eastern region was the highest (77.90%), followed by western (15.05%), while central regions had the lowest proportion (7.05%). In general, we found that there were statistically significant differences in socioeconomic status, gender, age, marital status, number of children, duration of migration, and regions by whether met inpatient services needs using chi-square tests.

Figure 2 plotted the concentration curves for probability of inpatient service utilization among migrants in the previous 12 month. A significant distribution of inpatient service utilization based on need concentrated among high-SES migrants was observed (CI: 0.036, $P<0.001$).

Table 2 showed the association between SES indicators and met inpatient healthcare services need among migrants. Model 1 presented the disparities in met inpatient services need in different SES without covariate adjustment. Compared with migrants who had primary school or below degree, those had middle school degree, high school degree, and university degree were more likely to meet the inpatient services need, and the OR values were 1.72 (95% CI 1.33, 2.22, $p<0.001$), 2.15 (95% CI 1.63, 2.85, $p<0.001$), and 2.76 (95% CI 2.11, 3.62, $p<0.001$), respectively. Regarding economic status, compared with the migrants from lowest economic group, the odds of inpatient service utilization when needed were significantly higher among those with higher economic group. The OR values for each income group from the richest to the poorer was 1.41 (95% CI 1.14, 1.76, $p=0.002$), 1.62 (95% CI 1.34, 1.97, $p<0.001$), and 1.67 (95% CI 1.25, 2.22, $p<0.001$), respectively. In Model 2, we included the two SES indicators at the same time and adjusted for other confounding variables. Both the coefficients of education and income were attenuated compared with model 1. Specifically, compared with migrants who had primary school or below degree, those had high school degree and university degree were more likely to meet the inpatient services need, and the OR values were 1.48 (95% CI 1.07, 2.03, $p=0.017$) and 2.04 (95% CI 1.45, 2.88, $p=0.001$), respectively. For migrants who had middle school degree, the OR was greater than 1, but it is not statistically significant. Regarding economic status, after adjusting for other confounding variables, the OR values for Quartile 3 groups and Quartile 4 groups was 1.28 (95% CI 1.01, 1.62, $p=0.044$) and 1.37 (95% CI 1.02, 1.83, $p=0.035$), respectively.

Figure 3 showed the composition of the self-reported reasons for unmet inpatient service need, of which the most important was economic difficulties (605, 36%), followed by the feeling unnecessary (574, 34%).

Table 3 presented the BO decomposition results. The probabilities of inpatient service utilization when needed were 84.8% for high-SES migrants and 77.2% for low-SES. Both endowments effect and gradient effect were significant in logistic decompositions, 55.84% of the gap between the two groups could be attributed to differences in the distribution of explanatory variables included in the model. About 44.16% of the total SES difference in inpatient service utilization could be attributed to gradient effect.

Discussion

Healthcare utilization based on need is a key indicator to assess the operation of a country's healthcare system, and any barriers of access to healthcare should be identified and then eliminated [33]. It is important to assess equity in meeting health services need rather than accessing to healthcare, since access simply denotes an opportunity to receive healthcare, while meeting need mean utilizing the opportunity. One of the objectives of UHC is equity in access to healthcare services, which means 'everyone who needs these services should get them, not just those who can pay for them [34]. By analyzing the SES inequities in inpatient service utilization based on need among the migrants is vital to develop targeting measures, so as to better meet the health services need of the migrants. Using the National Internal Migrant Population Dynamic Monitoring Survey dataset in 2014, we found that the rate of unmet inpatient service need among migrants was 21.96%, which was higher than 17.1% of general population [35], implying the migrants still face many barriers in accessing essential health care than the local residents. CI has been widely used in the health inequity literature. This study found that CI was significantly larger than 0 and the CC lying over the line of equality, meaning inpatient service utilization concentrated more among the high SES group. Socioeconomic inequality in the use of healthcare, i.e., the high SES group having a higher probability of healthcare utilization when needed, is a persistent in low- and middle- income countries [36]. Our results are similar to previous studies on general healthcare utilization in China [37, 38].

We found the two SES indicators, including economic status and educational attainment, are statistically significant. Our study indicated that low economic status of internal migrants was a key barrier to accessing inpatient service. Compared with those in the low-economic status group, internal migrants with higher economic status were more likely to utilize inpatient service when they had an inpatient service need, which was consistent with the top self-reported reason shown in Figure 3 (economic hardship, 36.29%) for unmet inpatient service need among internal migrant. Previous studies have shown that the risk of unmet inpatient service of the poor people was significantly higher than that of non-poor people [24], both in the permanent residents and the migrants [4, 39]. There are several possible reasons for this finding. First, migrants with higher economic status in China have higher payment capacity, and hence, they were more likely to use inpatient services when in need. In contrast, most of the migrants abandon hospitalization because of poor affordability [40]. Second, most of those with low economic status are those rural-to-urban migrants. The primary goal of migration among this population is in

search of economic opportunities in urban areas. Thus, they tend to focus on their economic conditions only, and usually do not prioritize their own health [2]. Even if they needed inpatient health services, going to hospital would cost them a fortune. Despite the nearly universal medical insurance coverage in China, economic status remains the dominant barrier to healthcare services utilization [25, 41, 42], including outpatient and inpatient services, and lead to inequity in general health care utilization [38, 40, 43]. This phenomenon is even more severe among the internal migrants. This study also suggests that low educational attainment is associated with unmet inpatient service need among internal migrants, which is consistent with other studies [16, 44-46]. One possible interpretation for this finding is that the internal migrants with higher education usually received more knowledge and awareness about the importance of inpatient service use, and thus tend to use inpatient services when they have a need.

Consistently, the results of BO decomposition also show that migrants with high SES have higher probability of meeting inpatient service need. About 55.84% gap in unmet inpatient service need between low and high SES can be explained by difference in the levels of observable characteristics. The “gradient effect”, which is considered as “discrimination” in previous studies, reflects inequity here. The decomposition results suggest that about 44.16% of the total SES gap in inpatient service utilization could be attributed to the gradient effect. Namely, SES inequity could account for around 44% in unmet inpatient service need among migrants. Migrants with lower SES may choose to delay or resist the need of inpatient services since meeting the need of inpatient services often means high medical expenses. Improving social and economic resources of low SES migrants would be helpful for reducing the barriers of unmet inpatient need. To be specific, policy makers should develop pro-poor health insurance scheme in migrants with low economic status. Also, future interventions might consider using health education focusing on migrants with low level of education. It is worth mentioning that popular and easy ways should be conducted to intervene for migrants with low educational attainment and improve their use of inpatient service when in need. For example, a better form of health education on migrants is peer education. Those low education migrants with similar age profile, gender and economic status can have common topics of discussion, and thus share information, so as to amplify the effect of “peer effect”.

Although previous studies have shown that high-SES is a protective factor in using public health service among the migrants [12, 16, 17, 47-49], few explored from the perspective of inpatient services need among internal migrants in China. The present study also has several limitations. First, the utilization of inpatient services is self-reported, thus, recall bias might exist. Second, due to the lack of the information on the use of outpatient services, we cannot analyze the utilization of full health services of migrants. Third, most of migrants using inpatient services are female. The reasons of inpatient services for female may be childbirth, which might lead less inequity for childbirth. Finally, although we have controlled the inpatient service need, we are unable to further adjust other variables relating health due to the limitations of our dataset, such as comorbidities or clinical risk factors.

Conclusion

In conclusion, this study observes an inequity in meeting inpatient service needs among migrants where the utilization concentrates among those with high SES. The migrants with higher economic status and educational attainment are both more inclined to utilize inpatient services when needed. The findings imply that more interventions should be conducted. A mix of pro-poor health insurance schemes and a post-discharge medical finance aids might be useful to improve the inpatient service use when needed among the migrants with low economic status. In addition, a health education about the importance of inpatient service use when needed for those with low educational attainment might be helpful.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data and materials

The datasets are open to all of the potential users online.

[<http://www.chinaldrk.org.cn/wjw/#/data/classify/population/yearList>].

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

CCZ and ZC conceived the idea and polished the manuscript. YW coded and analyzed data and wrote the manuscript. ZJ, YF, XT, and LD participated in interpretation of the data. All authors read and approved the final manuscript.

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Abbreviations

SES: socioeconomic status; UHC: universal health coverage; WHO: World Health Organization; NHC-PRC: National Health Commission of the People's Republic of China; PPS: probability proportional to size; PCA: Principal Component Analysis; NCMS: New Rural Cooperative Medical Scheme; UEBMI: Urban Employee Basic Medical Insurance; URBMI: Urban Resident Basic Medical Insurance; CI: Concentration Index; CC: Concentration Curve; BO: Blinder-Oaxaca; OR: Odds Ratio

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Tables

Table 1 Characteristics of the migrants who need to be hospitalized by doctor's diagnosis, China (n=7,592)

Characteristics	Total N (%)	Inpatient services		p-value
		Met need N (%)	Unmet need N (%)	
Total	7592	5925 (81.25)	1667 (18.75)	
Socioeconomic status				
Educational attainment				<0.001
Primary school or below	1106 (12.48)	721 (10.66)	385 (20.37)	
Middle school	3544 (45.65)	2725 (45.17)	819 (47.74)	
High school	1499 (21.42)	1226 (22.12)	273 (18.37)	
University or above	1443 (20.45)	1253 (22.05)	190 (13.52)	
Economic status				<0.001
Quartile 1	1927 (18.26)	1363 (16.93)	564 (23.99)	
Quartile 2	2227 (26.27)	1724 (25.70)	503 (28.74)	
Quartile 3	1565 (22.21)	1286 (22.97)	279 (18.94)	
Quartile 4	1873 (33.26)	1552 (34.40)	321 (28.34)	
Controlled variables				
Gender				<0.001
Female	5461 (78.82)	4670 (83.87)	791 (56.92)	
Male	2131 (21.18)	1255 (16.13)	876 (43.08)	
Age	32.31	31.25	36.90	<0.001
Marital status				<0.001
Married	7120 (94.70)	5649 (96.21)	1471 (88.19)	
Single	472 (5.30)	276 (3.79)	196 (11.81)	
Number of children				<0.001
0	195 (2.69)	126 (2.01)	69 (5.60)	
1	4070 (50.72)	3340 (53.04)	730 (40.69)	
≥2	3327 (46.59)	2459 (44.95)	868 (53.71)	
Ethnic group				0.943
Han	6915 (92.92)	5396 (92.91)	1519 (92.99)	
Ethnic minority	677 (7.08)	529 (7.09)	148 (7.01)	
Health records				0.103
Yes	5648 (76.90)	4396 (76.25)	1252 (79.74)	
No	1944 (23.10)	1529 (23.75)	415 (20.26)	
Hukou				0.423
Urban	1301 (17.54)	1041 (17.84)	260 (16.22)	
Rural	6291 (82.46)	4884 (82.16)	1407 (83.78)	
Health insurance				0.318
No insurance	1066 (17.50)	844 (18.00)	222 (15.34)	
NCMS	4447 (50.90)	3433 (50.04)	1014 (54.60)	
URBMI	551 (6.41)	410 (6.51)	141 (5.98)	
UEBMI	1528 (25.19)	1238 (25.45)	290 (24.08)	
Movement area				0.077
Across province	3650 (66.87)	2867 (67.60)	783 (63.71)	
Across city	2330 (23.23)	1838 (23.00)	492 (24.23)	
Across county	1612 (9.90)	1220 (9.40)	392 (12.05)	
Duration of migration (year),	4.30	3.98	5.66	<0.001
Plans for long-term residence(> 5 years)				0.195
Yes	5072 (63.02)	3940 (62.59)	1132 (64.85)	
No	740 (9.60)	565 (9.31)	175 (10.84)	
Not decided yet	1780 (27.39)	1420 (28.10)	360 (24.31)	
Regions				<0.001
East	3286 (77.90)	2716 (79.23)	570 (72.12)	
Central	1632 (7.05)	1219 (6.70)	413 (8.61)	
West	2674 (15.05)	1990 (14.07)	684 (19.27)	

Note: The percent in parentheses were weighted with sampling weights provided in the survey; NCMS: New Rural Cooperative Medical Scheme; UEBMI: Urban Employee Basic Medical Insurance; URBMI: Urban Resident Basic Medical Insurance. Quartile 1 was the poorest and Quartile 4 was the richest.

Table 2 Association between socioeconomic status and receivers of inpatient services among migrants who need them, China

Characteristics	Model 1 (No covariates)			Model 2 (Covariates)		
	OR (SE)	95% CI	P	OR (SE)	95%CI	P
Socioeconomic status						
Educational attainment						
Primary school or below	Ref.			Ref.		
Middle school	1.72 (0.23)	1.33, 2.22	<0.001	1.21 (0.16)	0.93, 1.57	0.154
High school	2.15 (0.31)	1.63, 2.85	<0.001	1.48 (0.24)	1.07, 2.03	0.017
University or above	2.76 (0.38)	2.11, 3.62	<0.001	2.04 (0.36)	1.45, 2.88	0.001
Economic status						
Quartile 1	Ref.			Ref.		
Quartile 2	1.41 (0.16)	1.14, 1.76	0.002	1.15 (0.14)	0.90, 1.47	0.250
Quartile 3	1.62 (0.16)	1.34, 1.97	<0.001	1.28 (0.16)	1.01, 1.62	0.044
Quartile 4	1.67 (0.24)	1.25, 2.22	<0.001	1.37 (0.20)	1.02, 1.83	0.035

Note: Standard error in parentheses all clustered at strata; Sample weights applied; CI indicated confidence interval; Model 2 were adjusted for gender, age, marital status, number of children, ethnic group, health record, Hukou type, health insurance, movement area, duration of migration and willingness for long-term residence of more than 5 years and region.

Table 3 BO decomposition of the inpatient service utilization when needed among migrants (n = 7,592)

	Coef. (SE)	95% CI	Contrib. (%)	P
Predicted probability				
High SES	0.848 (0.017)	0.816, 0.881	-	<0.001
Low SES	0.772 (0.014)	0.744, 0.779	-	<0.001
Difference in predicted probability				
Total gap	0.077 (0.016)	0.046, 0.107	100	<0.001
Due to endowments effect	0.043 (0.011)	0.022, 0.064	55.84	<0.001
Due to gradient effect	0.034 (0.013)	0.009, 0.059	44.16	0.008

Note: Regressions and decompositions are weighted with sampling weights provided in the survey. Standard error in parentheses all clustered at strata.

Figures

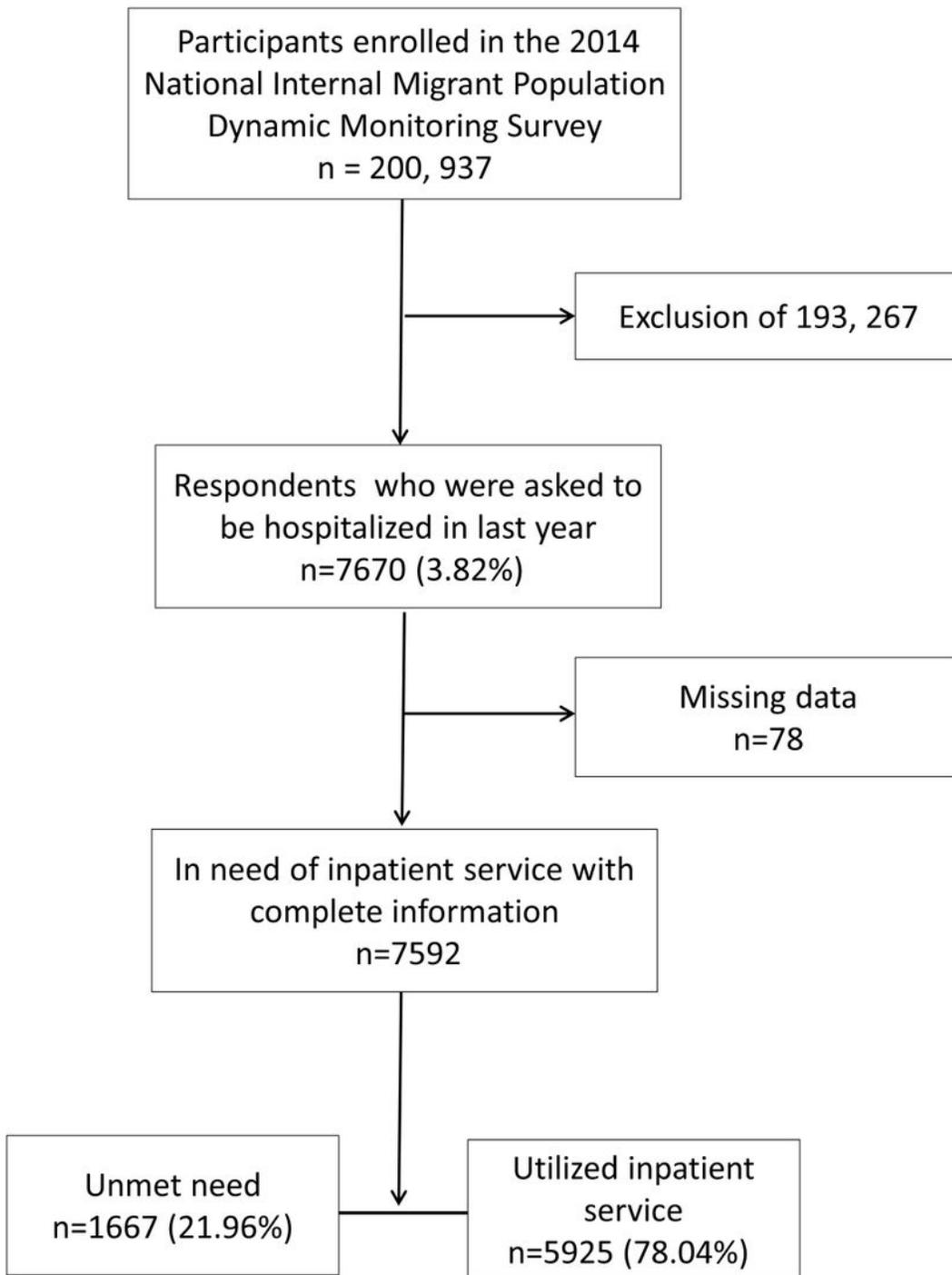


Figure 1

Flow chart of sample selection

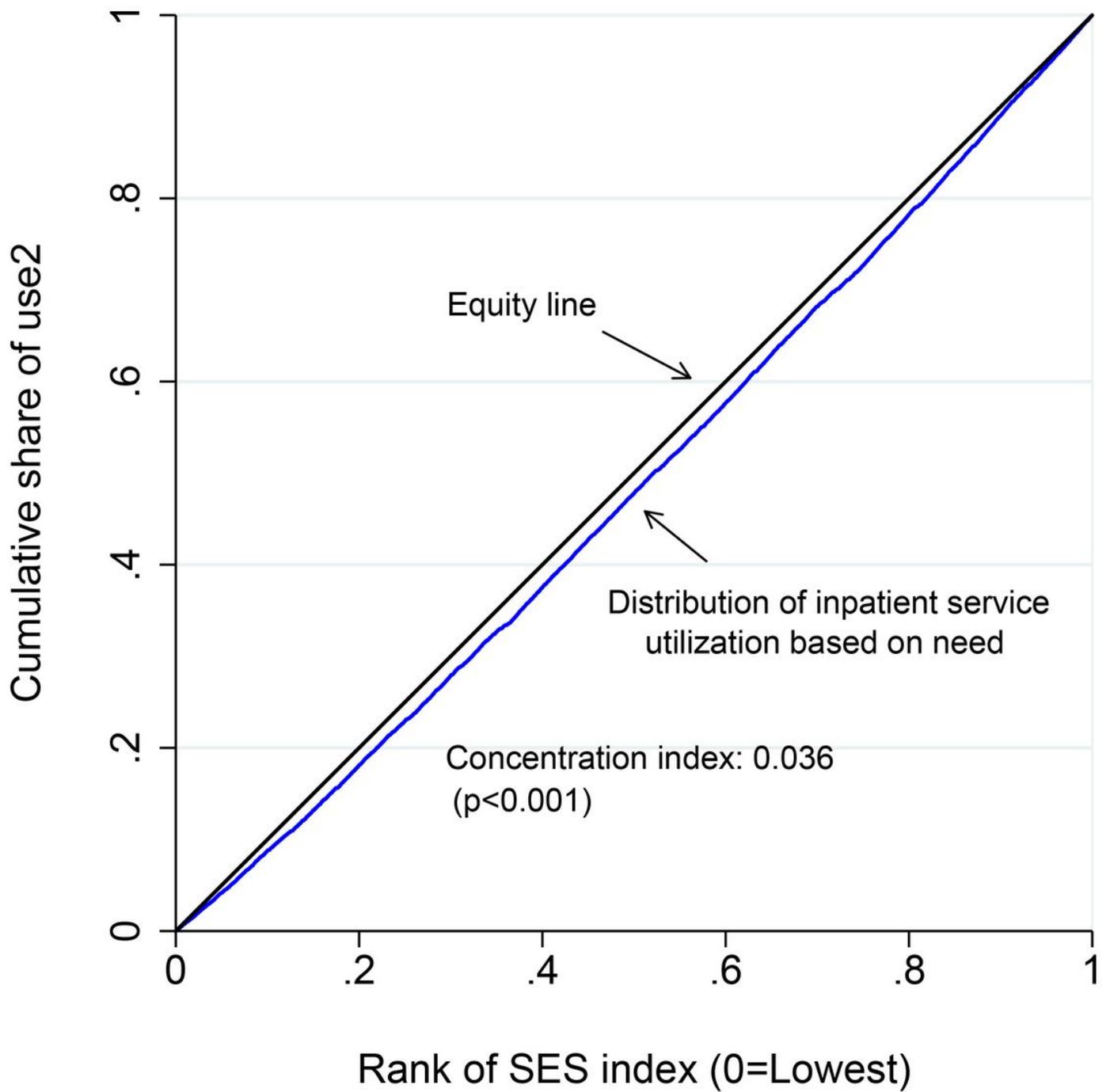


Figure 2

Concentration curves for probability of inpatient service use among migrants

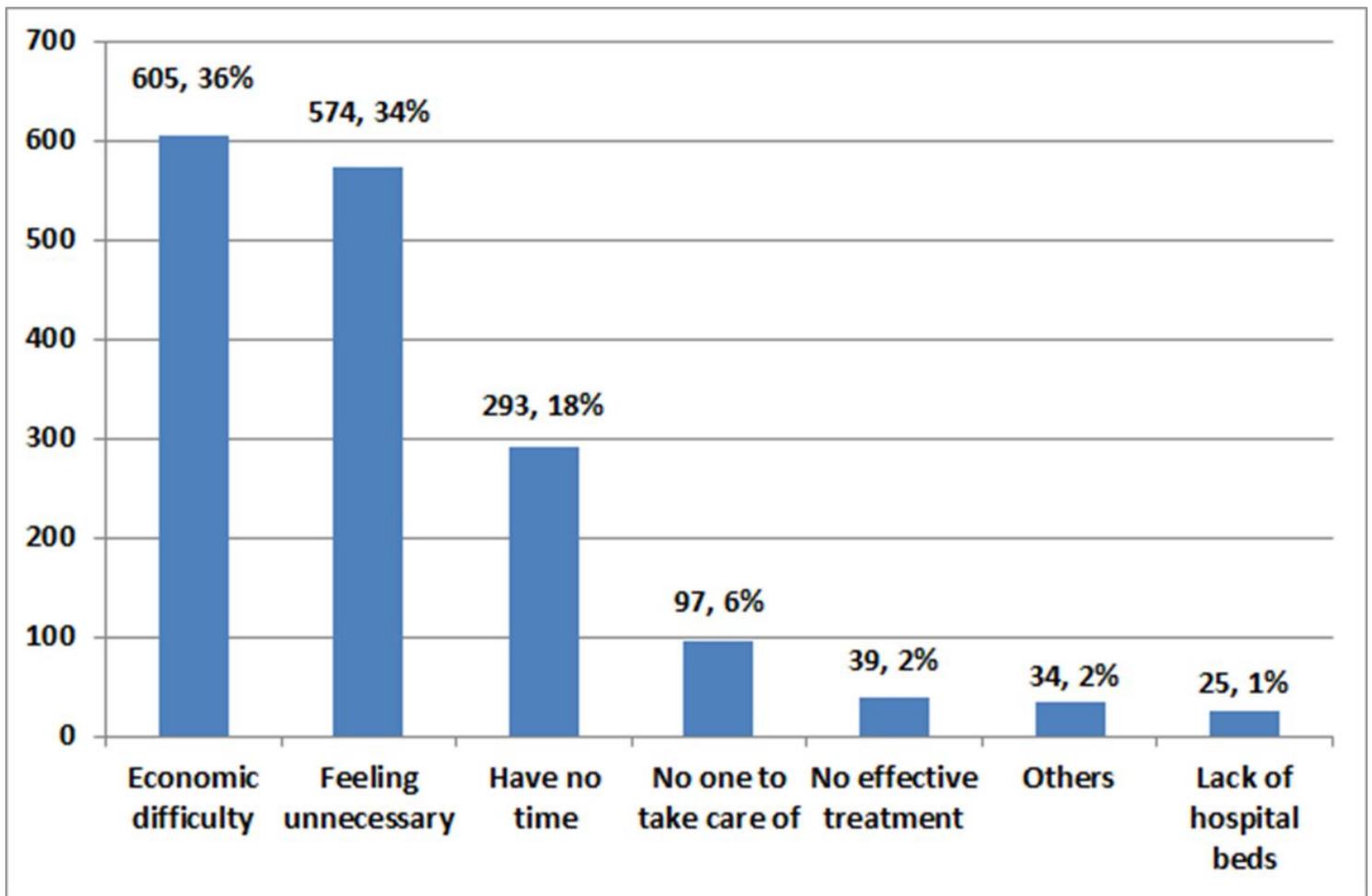


Figure 3

Self-reported reasons for unmet inpatient service need among the migrants

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Methods.docx](#)
- [SupplementaryAppendixTableA1.docx](#)