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How do Socioeconomic Factors Shape Health Inequalities?

-- A Multilevel Analysis of Access to Healthcare in Middle-income Cities in China

Lu Liu

University of Glasgow, England, UK

ABSTRACT

BACKGROUND: Globally, more than half of the population still lacks access to basic health care, and economic status is one of the key factors influencing this. Morbidity and mortality rates of non-communicable diseases (NCDs) and the low survival and high disability rates of out-of-hospital cardiac arrest (OHCA) are closely related to inequitable allocation of healthcare resources. OBJECTIVE: To analyse the broad impact of socio-economic factors on the health of the population, especially the health disparities caused by regional inequalities in the allocation of healthcare resources in Shaoxing, and to explore the challenges to health equity in China. METHODS: Based on China's 2020 census data, Zhejiang Province statistical data, Shaoxing City Statistical Yearbook, Shaoxing City prehospital emergency care quality control indicators, and public information of the Health and Wellness Committee. RESULTS: Yuecheng District is economically more developed, with 9 general hospitals, 12,723 health technicians, 4,844 medical practitioners, 87.95 beds/per 10,000 people, 61.58 doctors/per 10,000 people, and a pre-hospital emergency response time of 7′30′′ to 7′58′′ in the urban area. Xinchang County has a low economic income and a large gap between urban and rural per capita income, with 4,337 health technicians, 1,492 practicing physicians, and a prehospital emergency response time of 12′43′′ to 22′9′′. CONCLUSIONS and RECOMMENDATIONS: Economic factors are the core drivers of inequality in regional medical resource allocation, with higher-income regions having more concentrated and better-configured medical resources. Economic levers are used to regulate regional healthcare resource allocation, reduce health disparities, and promote equitable and sustainable health development.

KEYWORDS

Health Equity; Health Inequalities; Universal Health Coverage; Social Determinants of Health; Health Service Accessibility; Healthcare Resources; Urban-Rural Income Disparities; Non-Communicable Diseases; Sudden Cardiac Arrest; Ageing; Emergency Response Time.

1. INTRODUCTION

The United Nations General Assembly (UNGA) adopted the Millennium Declaration introducing universal health coverage (UHC) as early as 2000, but the process has been slow to evolve. In 2021, WHO reported that some 4.5 billion people did not have adequate access to essential health services(‘Tracking universal health coverage 2023 global monitoring report’, 2023), and the 2021 COVID-19 pandemic further undermined access to essential services in 92 % of countries(Third round of the global pulse survey on continuity of essential health services during the COVID-19 pandemic. Interim report, 2022). Therefore, the 2030 Sustainable Development Goals (SDGs) place renewed emphasis on providing quality primary health care for all, and access to safe, effective, quality and affordable essential medicines and vaccines for all(Primary health care on the road to

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universal health coverage: 2019 monitoring report, 2020). China released the 'Outline of the Healthy China 2030' plan in 2015 to fulfil a large international commitment to the 2030 SDGs, aiming to achieve universal health coverage and promote social equity.

According to the Institute for Health Metrics and Evaluation (IHME), non-communicable diseases (NCDs) have been the major global burden of disease for the past 30 years. The Global Burden of Disease 2021 report states that at least 43 million people will die from NCDs in 2021, and of the 18 million premature deaths (under 70 years of age), 82 % of premature deaths will occur in economically less-developed regions(Global Burden of Disease 2021: Findings from the GBD 2021 Study, 2024). Similarly, mortality from cardiovascular disease is very high in these regions.

Low survival from sudden cardiac arrest (OHCA) is strongly associated with unequal distribution of health resources. The Pan-Asian Resuscitation outcomes Study (PAROS) noted that survival from sudden cardiac arrest varies widely between developing and developed countries, with a 24-fold difference between North America, Asia, and Europe, and with survival rates ranging from 1.1% to 26.1%(Ong et al., 2015). With the development of industrialisation, urbanisation and population ageing, the disease spectrum of the Chinese population has been changing, and the continued high prevalence of NCDs has brought about an increasingly prominent imbalance and inadequacy of development in the field of health and wellness. 2022 The China Cardiac Arrest and Cardiopulmonary Resuscitation (CACR) Report points out that the current incidence rate of OHCA in the seven major geographic regions of China, as seen through the emergency medical services (EMS), is 95.7/per 100,000 population. The patient survival discharge/30 d survival rate is 1.2%, and the rate of good neurological prognosis is 0.8%(Zheng et al., 2023). Cardiogenic disease (76.1%) remains the main cause of cardiac arrest. The low rate of bystander CPR, long response time of the prehospital EMS system, and the hierarchy of the quality of prehospital EMS are the key factors affecting patient survival and disability

Among the social determinants of health economic factors are one of the key influences and the level of per capita income of the population directly affects health behaviours. This study aims to validate the association between socioeconomic factors and healthcare accessibility, thereby enriching the health equity theoretical framework. The health equity gap between urban and rural individuals in Shaoxing City is specifically analysed by quantifying the healthcare services, and optimisation strategies are proposed. It provides empirical evidence to promote the optimisation of healthcare resource layout and enhancement of health equity in middle-income cities and gives a Chinese approach for WHO to explore the achievement of health equity and universal health coverage plan.

2. LITERATURE REVIEW

Health inequity is an avoidable health inequality between populations within and between countries. Among the social determinants, policy regimes, legal norms, and economic incomes profoundly determine the rights and resources enjoyed by individuals in society. Social determinants, such as policy institutions, legal norms, and economic income, profoundly determine the rights and resources available to individuals in society, which in turn affects the health habits and knowledge of different income groups and ultimately influences the risk of disease and health-related events such as healthcare behaviors. A study in the United Kingdom found that mortality rates for men and women were three times higher in less economically developed areas than in other areas(Marmot, 2020). These deaths could have been 'avoided' through the deployment of healthcare and public health measures. These deaths could have been 'avoided' through the deployment of healthcare and public health measures.

Fifteen years ago, China began exploring a healthcare system to achieve universal health coverage. Firstly, the reform of medical insurance was completed, so that more urban or rural residents of different income levels could join the medical insurance scheme, and at the same time reduce the

proportion of individual medical expenditure. However, as cities continue to grow in size, they face many challenges in terms of inequality in terms of healthcare accessibility and quality of healthcare services(Meng et al., 2015). However, there remains the issue of urban-rural health disparities. In 2018, the health services survey in one of China's developed provinces shows that rural suburban areas have the highest incidence of CHE (25.51%), while urban communities have the lowest incidence of CHE (6.78%). Improving socio-economic level may be one of the effective interventions to reduce the risk of CHE and narrow the inequality of CHE(Luo et al., 2023). In addition, inequality in healthcare accessibility is another challenge in achieving universal health coverage. In China, as a developing country moving towards aging, the prevention and treatment of chronic non-communicable diseases in the elderly is urgent. According to the China Health and Ageing Tracking and Surveillance Survey (CHARLS), the prevalence of multiple NCDs is higher in rural areas (58.3%) than in urban areas (50.4%)(Ma, He and Xu, 2020). This fact is related to the social and economic backwardness of rural areas and poorer public services.

The serious consequences of health inequalities are also reflected in the great variation in survival rates from OHCA worldwide. The International Liaison Committee on Resuscitation (ILCOR) reports that even in developed countries such as the United States and Europe, there is a more than two-fold difference in pre-hospital EMS response times (5-11mins), and a nearly seven-fold difference in 30-day survival rates for OHCA treated by EMS (3.1%-20.4%)(Kiguchi et al., 2020). Further analysis by the European Resuscitation Council in 2021 found that only 32% of the European region had an EMS response time of 10 minutes or less, with an overall OHCA survival rate of 8%. Of these, Denmark, Germany, Spain and Sweden had higher survival rates (16%, 13.2%, 13%, 11.2%, respectively), while England, Ireland and France were below 8% (7.9%, 6%, 4.9%, respectively)(Gräsner et al., 2021).Differences in the availability and structure of healthcare services are strongly associated with survival and outcomes after cardiac arrest. 1-minute delay in starting CPR for OHCA patients or a 2-minute delay in EMS response to the scene will result in poorer outcomes(Wissenberg et al., 2013).

3. METHODOLOGY

Database: WHO, Global Burden of Disease (GBD) database, China 2020 census data, Zhejiang Provincial Bureau of Statistics data, Shaoxing City Statistical Yearbook, Shaoxing City prehospital emergency care quality control indicators, and Health and Wellness Committee publicly available data.

Theory: A combination of urban-rural comparative analysis and policy text research was used to focus on the core contradiction between resource allocation and health equity. Quantifying the key differences in the availability of urban and rural health service utilization. Analyzing the equity in resource distribution: class and number of hospitals, type and number of medical personnel, health outcome disparities, emergency response times.

4. RESULTS

With a GDP of $779.114 billion in 2023, Shaoxing ranks in the top 30 cities in China. Based on a resident population of 5,394,000, Shaoxing's GDP per capita is about $20577. According to the World Bank, the current GDP per capita in a wide range of the world is around of $20,000. Therefore, analysing the impact of socio-economic factors on the equity of healthcare resource allocation in Shaoxing City will be informative for most middle-income countries and regions around the world.

According to the results of the seventh population census of Zhejiang Province, the population aged 65 years and above accounted for 13.27% of the total population of the province, totalling 8,566,300 people (2022). Among them, about 10.32% are in urban areas and 20.90% in rural areas, with the

aging of the population in the countryside significantly higher than in the cities. However, in the past 10 years or so, the life expectancy of people aged 65 and above has been lower for rural residents than for urban residents, with a difference of about 1-1.53 years(Chen et al., 2025). economic income inequality is the main factor contributing to the inequality economic income inequality is the main factor contributing to the inequality in life expectancy between urban and rural populations. At the end of 2023, there were 35,184 medical beds in Shaoxing, with 79.3 medical beds per 10,000 people and 47.8 doctors per 10,000 people. This far exceeds the national average (about 64 beds and 32 doctors/per 10,000 people nationwide) and is close to the level of Shanghai City (85 beds/per 10,000 people) and Hangzhou City (81 beds/per 10,000 people). There are 2,981 health institutions (including 907 village health rooms), 106 hospitals, and 646 health centres and community health service centres.

1) Economic Income Differences among Shaoxing's Districts (Fig.1)

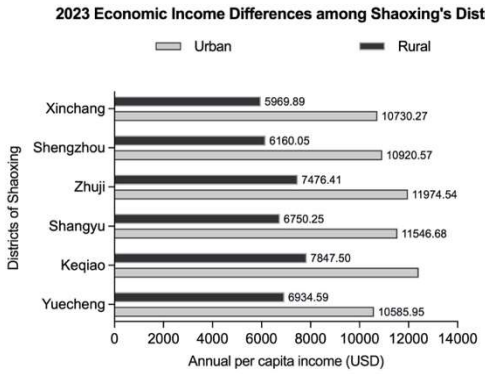

Fig. 1 2023 Economic Income Differences among Shaoxing's Districts

According to data from the Shaoxing Statistical Yearbook, the per capita disposable income of the entire population of Shaoxing City in 2023 was $ 9892.15. The urban population averaged $ 11408.46 while the rural population averaged $ 6928.78, with the income of the urban population being 1.65 times that of the rural population. Xinchang County made the largest gap between urban and rural disposable income per capita, $10730.27 vs. $5969.89 (a difference of 1.80 times); Yuecheng District made the smallest gap, $10585.95 vs. $ 6934.59 (a difference of 1.53 times).

2) Differences in accessibility of medical services among Shaoxing’s Districts

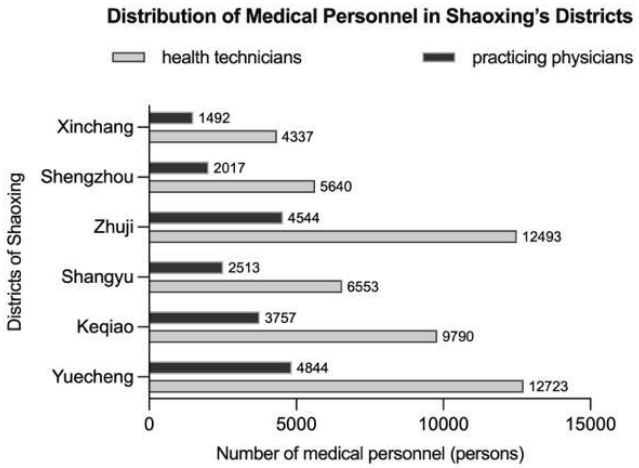

Fig. 2 Distribution of Medical Personnel in Shaoxing's Districts

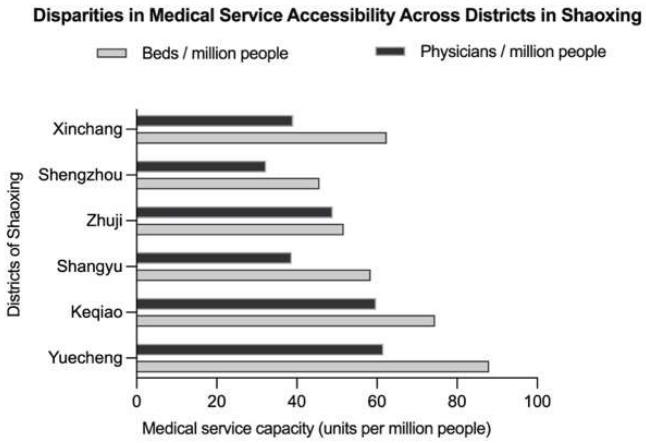

Fig. 3 Disparities in Medical Service Accessibility Across Districts in Shaoxing

Yuecheng District is significantly ahead of other districts in terms of medical resources. With nine general hospitals, 12,723 health technicians, 4,844 practicing physicians, 87.95 beds/ per 10,000 people and 61.58 physicians/ per 10,000 people, it has a stronger allocation and higher concentration of medical resources (Fig.2). The gap between Xinchang County's medical and health service coverage and other districts and counties is large. The total number of health technicians is only 1/3 of that of Yuecheng District, the number of practicing physicians and the total number of health institutions are the lowest in the city, only 39.02 physicians/ per 10,000 people, with poorer accessibility of medical services (Fig.3).

3) Differences in prehospital emergency response times by region in Shaoxing City

There are large differences in prehospital emergency response times between urban and rural areas. In Yuecheng District, the annual prehospital emergency response time was stable at 7′30′′ to 7′58′′in the urban area, while it was generally between 11′48′′to 14′08′′ in rural areas. In Keqiao District, the annual prehospital emergency response time was centred on 7′34′′ to 8′55′′ in the urban area, while in the rural area it was as long as between 13′14′′and 16′35′′. (Fig.4)

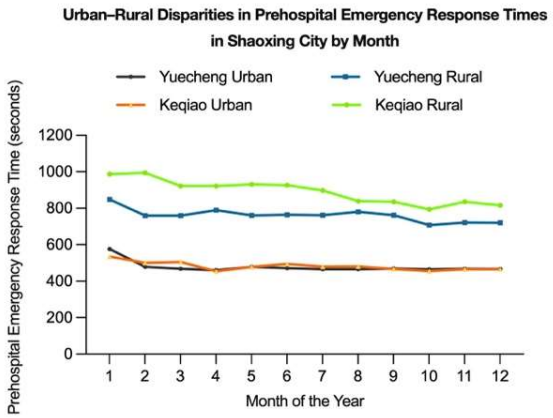

Fig. 4 Urban- Rural Differences in Prehospital Emergency Response Times in Shaoxing City by Month

The response time of pre-hospital emergency care in peripheral counties is insufficient: the average response time in the central area (Yuecheng + Keqiao) was between 11′05′′and 12′24′′, which was better than that in other counties; the response time of pre-hospital emergency care in Xinchang County was between 12′43′′and 22′9′′ in the whole year, and in August it was 22′09′′ (the longest

in the whole city), and the overall response time was much higher than that in other areas(Fig.5), which highlights the problem of the weakness of emergency care network(Fig.5).

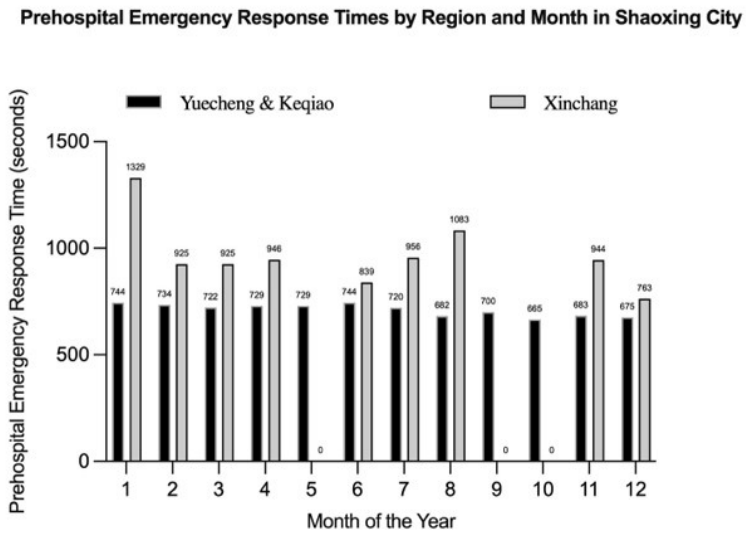

Fig. 5 Prehospital Emergency Response Times by Region and Month in Shaoxing City

5. DISCUSSION

Deeper structural factors of health inequality include widening economic disparities and lack of primary healthcare resources. The concentration of quality healthcare resources in urban areas and economic disadvantages limit access to healthcare resources in rural areas, while disparities in financial investment result in a lag in the upgrading of rural facilities. A study on socio-economic inequality and unequal utilisation of health services among patients with non-communicable diseases in the Pearl River Delta region of China noted that it was noted that hypertension, as a chronic non-communicable disease, usually requires more frequent visits to the clinic and longer-term contact with health facilities than other diseases. And socio-economic inequality contributes the most to the differences in outpatient rescue. And socio-economic inequality contributes the most to the differences in outpatient rescue and inpatient treatment behaviour among this group of patients(Liu et al., 2021). In China, where NCD patients are characterised by multiple morbidities, health inequalities due to differences in economic level are further widened. According to CHARLS data, the estimated prevalence of chronic diseases among middle-aged and elderly people in China is 44.46% (8,705/19,520), and the prevalence of ≥2 chronic diseases is about 17.10% (3,338/19,520), with a higher proportion of ≥3 chronic diseases in less economically developed regions(Liu et al., 2023).

Regional differences in the prevalence of NCDs are closely related to the number of healthcare institutions, the ratio of doctors and nurses, and the equity of health financial expenditures. The inequality in accessibility of healthcare services between urban and rural areas in Shaoxing City is mainly affected by the unbalanced economic development of districts and counties, the unequal distribution of healthcare resources, and the large difference in per capita income. Medical resources in high-income areas of Shaoxing City are more concentrated and better configured. Yuecheng District and Keqiao District, as the most economically developed areas, are significantly ahead in terms of total and per capita healthcare resources, and their regional economic advantages promote investment in healthcare infrastructure and attract high-quality talents, forming a positive 'resource-economy' cycle. Xinchang County and Shengzhou City have the lowest economic incomes, and rank lowest in terms of total healthcare resources (4,337 healthcare technicians in Xinchang, 5,640 in Shengzhou) and per capita (39.02 doctors per 10,000 people in Xinchang, 32.31 in Shengzhou), which shows the dual dilemmas of lagging economy and insufficient healthcare coverage, as well as the large gap between the per capita disposable incomes of urban and rural residents, restricting their

ability to purchase healthcare services. At the same time, economic factors magnify the problem of inequality in emergency service capacity. The response time of pre-hospital emergency services in rural areas and peripheral counties is significantly higher than that in the central urban area, and Xinchang County is at the bottom of the list in terms of a number of indicators (number of health technicians, medical practitioners, and institutions), resulting in a weak emergency service network, with a pre-hospital emergency service response time of 22′9′′ far exceeding that of other counties, which has a serious impact on the availability of health services for the residents of the rural and peripheral areas.

6. CONCLUSION

Social determinants of health (SDH) affect people from birth to death(Braveman and Gottlieb, 2014). Among them, economic factors are one of the underlying causes of inequity in health levels by influencing the accessibility of healthcare services and the construction of their quality in different regions, and inequality in healthcare resource allocation in Shaoxing is essentially a mapping of economic inequality in public health. There are huge differences in healthcare resource allocation worldwide, with more than half of the global population still lacking access to basic healthcare services('Tracking universal health coverage 2023 global monitoring report', 2023). The UHC initiative is significant for economically disadvantaged regions, but at the same time achieving health equity in these regions is a huge challenge.

Zhejiang Province has been exploring the establishment of an integrated healthcare service system in the form of a 'county medical community' since 2021, which will radiate urban quality healthcare resources to rural areas to reduce health disparities in basic public health services. Shaoxing City will carry out the 'Saving Around Us' project in 2023-2024, adding 20 new standardised first aid stations and 130 AEDs to improve emergency response capacity. However, the core of health equity governance should also include effective action on health inequalities and their social determinants, and economically disadvantaged regions need additional resources and action. For example: establishing a compensation mechanism for medical resources, promoting the prioritisation of financial investment to areas with weak resources, and focusing on shortening the response time for pre-hospital emergency care in less-developed areas; improving talent incentive policies, increasing the proportion of senior-level medical and nursing staff in rural areas, and narrowing regional differences in the quality of care; and ultimately, realising sustainable and qualitative health equity.

7. FUTURE

With the development and innovation of information technology, the '5G+AI' telemedicine platform can be promoted in the future in order to realise universal health coverage as soon as possible and reduce health inequalities. It can realize remote real-time consultation, enhance the remote coverage of high-quality diagnostic and treatment resources in economically underdeveloped areas, and reduce the economic burden of patients' cross-district medical care; real-time monitoring and analysis of the health data of wearable devices of elderly patients in rural areas, AI early warning of outliers and timely triggering of remote medical care interventions, so as to optimize the management of chronic non-communicable diseases and reduce the incidence of adverse events; intelligent analysis of the distribution of AED devices and the allocation of resources for pre-hospital emergency care, real-time matching of patients' needs and optimization of emergency care. Intelligent analysis of the distribution of AED devices and pre-hospital emergency resources allocation, real-time matching of patient demand and optimisation of emergency dispatch performance, shortening the response time of pre-hospital emergency care, and improving the efficiency and quality of treatment.

As Dr Tandesay, Director-General of WHO, said, 'Saving lives, protecting the right to health, and bringing hope to desperate places. Providing equitable access to health services and responding

effectively to emergencies is critical to the overall health and well-being of populations. Health equity is the starting point for the ultimate achievement of 'health for all' through resource orientation, scientific and technological empowerment and social mobilisation.

REFERENCES

[1] Braveman, P. and Gottlieb, L. (2014) 'The Social Determinants of Health: It's Time to Consider the Causes of the Causes', Public Health Reports®, 129(1_suppl2), pp. 19–31. Available at: https://doi.org/10.1177/0033354914 1291S206.

[2] Chen, Yongguo et al. (2025) 'Exploring urban–rural inequities in older adults life expectancy: a case study in Zhejiang, China for health equity', Frontiers in Public Health, 13, p. 1439857. Available at: https://doi.org/10.3389/fpubh.2025.1439857.

[3] Global Burden of Disease 2021: Findings from the GBD 2021 Study (2024). Seattle, WA: nstitute for Health Metrics and Evaluation (IHME), p. 24. Available at: https://www.healthdata.org/research-analysis/library/global-burden-disease-2021-findings-gbd-2021-study.

[4] Gräsner, J.-T. et al. (2021) 'European Resuscitation Council Guidelines 2021: Epidemiology of cardiac arrest in Europe', Resuscitation, 161, pp. 61–79. Available at: https://doi.org/10.1016/j.resuscitation.2021.02.007.

[5] Kiguchi, T. et al. (2020) 'Out-of-hospital cardiac arrest across the World: First report from the International Liaison Committee on Resuscitation (ILCOR)', Resuscitation, 152, pp. 39–49. Available at: https://doi.org/10.1016/j.resuscitation.2020.02.044.

[6] Liu, Y. et al. (2021) 'The changes in socioeconomic inequalities and inequities in health services utilization among patients with hypertension in Pearl River Delta of China, 2015 and 2019', BMC Public Health, 21(1), p. 903. Available at: https://doi.org/10.1186/s12889-021-10879-6.

[7] Liu, Y. et al. (2023) 'Correlation between Regional Differences in Disability and Health Resources in Middle-Aged and Elderly People'. Available at: https://doi.org/10.21203/rs.3.rs-3493830/v1.

[8] Luo, Y. et al. (2023) 'Toward Universal Health Coverage: Regional Inequalities and Potential Solutions for Alleviating Catastrophic Health Expenditure in the Post-poverty Elimination Era of China', International Journal of Health Policy and Management, p. 1. Available at: https://doi.org/10.34172/ijhpm.2023.7332.

[9] Ma, X., He, Y. and Xu, J. (2020) 'Urban–rural disparity in prevalence of multimorbidity in China: a cross-sectional nationally representative study', BMJ Open, 10(11), p. e038404. Available at: https://doi.org/10.1136/bmjopen-2020-038404.

[10] Marmot, M. (2020) 'Health equity in England: the Marmot review 10 years on', BMJ, p. m693. Available at: https://doi.org/10.1136/bmj.m693.

[11] Meng, Q. et al. (2015) People's Republic of China health system review. Edited by A. Mills and Viroj Tangcharoensathien. Manila, Philippines: World Health Organization, Regional Office for the Western Pacific.

[12] Ong, M.E.H. et al. (2015) 'Outcomes for out-of-hospital cardiac arrests across 7 countries in Asia: The Pan Asian Resuscitation Outcomes Study (PAROS)', Resuscitation, 96, pp. 100–108. Available at: https://doi.org/10.1016/j.resuscitation.2015.07.026.

[13] Primary health care on the road to universal health coverage: 2019 monitoring report (2020). World Health Organization, p. 168. Available at: https://iris.who.int/handle/10665/344057.

[14] Third round of the global pulse survey on continuity of essential health services during the COVID-19 pandemic. Interim report (2022). WHO/2019-nCoV/EHS_continuity/survey/2022.1. World Health Organization 2022, p. 54. Available at: https://www.who.int/publications/i/item/WHO-2019-nCoV-EHS_continuity-survey-2022.1.

[15] 'Tracking universal health coverage 2023 global monitoring report' (2023) global monitoring report [Preprint].

[16] Wissenberg, M. et al. (2013) 'Association of National Initiatives to Improve Cardiac Arrest Management With Rates of Bystander Intervention and Patient Survival After Out-of-Hospital Cardiac Arrest', JAMA, 310(13), p. 1377. Available at: https://doi.org/10.1001/jama.2013.278483.

[17] Zheng, J. et al. (2023) 'Incidence, process of care, and outcomes of out-of-hospital cardiac arrest in China: a prospective study of the BASIC-OHCA registry', The Lancet Public Health, 8(12), pp. e923–e932. Available at: https://doi.org/10.1016/S2468-2667(23)00173-1.