

Comparing Low-Income Disparities in Chronic Disease Health Education Between China and United States

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Abstract: Chronic disease management remains a significant public health challenge, with both China and the United States facing distinct challenges in delivering health education to low-income populations. This comparative analysis examines how these two different healthcare systems address health education disparities, focusing on institutional structures, delivery mechanisms, and accessibility. Through systematic review of previous research and policy documents from both countries, we analyze the strengths and limitations of each system's approach to chronic disease education. Our findings reveal that while each country has developed unique solutions - with China's extensive rural healthcare network and the US's community health center system - both face persistent challenges in reaching vulnerable populations. This analysis provides insights into how different healthcare systems address similar challenges in chronic disease education, contributing to the global dialogue on reducing health disparities.

Keywords: health education, Chronic disease, healthcare disparities, Low-income population, China-US Healthcare

1. Introduction

Chronic diseases, such as diabetes, hypertension, and cardiovascular diseases, are the main causes of morbidity and mortality among the world, which significantly impacting healthcare systems and individual's well-being. According to the World Health Organization (WHO), chronic diseases accounts for 71% of all global deaths, which low-income group suffers severe influence due to the limitations for getting health education and preventive care (WHO, 2022). While effective health education can significantly improve chronic disease management through lifestyle modification and early intervention, substantial disparities persist in how different healthcare systems address these challenges.

China and the United States, as the world's two largest economies with distinctly different healthcare systems, provide unique perspectives on addressing chronic disease education disparities. China's state-led three-tier healthcare system contrasts sharply with the United States' mixed public-private model, offering valuable insights into how different institutional approaches impact health education delivery. In China, the urban-rural divide significantly impacts healthcare access, with stark differences in health literacy rates - 9.49% among urban residents compared to 3.43% among rural residents. Meanwhile, the United States faces its own challenges in reaching low-income populations, with barriers including geographic isolation, socioeconomic factors, and varying education levels.

Previous research has extensively documented healthcare disparities within each country separately. However, limited comparative analysis exists examining how these two distinct healthcare systems address similar challenges in chronic disease education for low-income populations. The contrasting approaches of the world's largest developing country and the largest developed country provide a unique opportunity to understand how different institutional frameworks influence health education effectiveness.

This study addresses these research gaps by examining how these two major healthcare systems approach chronic disease education for low-income populations. We hypothesize that while both countries face similar challenges related to income-based disparities in health education access, their different healthcare systems have developed distinct solutions that merit comparative analysis. Understanding these systemic differences and their impacts has significant implications for global health policy, particularly as countries worldwide grapple with rising chronic disease burdens among low-income populations. This comparison of the world's two largest healthcare systems can provide valuable insights into the strengths and limitations of different approaches to health education delivery.

2. Overview of Healthcare Systems

2.1. System Organization

The healthcare systems in China and the United States exhibit fundamental structural differences that impact the accessibility and quality of chronic disease health education.

China operates a predominantly public healthcare system, with about 90% of hospitals being state-owned. The Chinese government plays a central role in financing and delivering healthcare services. Since the 1980s, China has implemented reforms to improve access and quality, though challenges persist, especially in rural areas. [1]. China has established universal coverage through Basic Medical Insurance (BMI) programs, such as the Urban Employee Basic Medical Insurance (UEBMI), Urban-Rural Resident Basic Medical Insurance (URRBMI), and New Rural Cooperative Medical Scheme (NRCMS) [2]. Despite these coverage efforts, rural populations face greater challenges due to insufficient healthcare infrastructure, lower provider quality, and limited health literacy. Chronic disease education is primarily integrated within primary healthcare institutions, public health initiatives, and community-based programs, but access disparities remain between urban and rural regions.

In contrast, the United States operates a market-driven healthcare system, characterized by a mix of public and private insurance coverage. Public hospitals constitute about 20% of the total, with the majority being private, for-profit, or non-profit institutions. Healthcare delivery is largely privatized, and services are funded by multiple sources, including private insurers and government programs like Medicare and Medicaid. [1]. But the main problem facing the U.S. health care industry right now is high costs and low coverage. In 2023, 63 percent of uninsured adults ages 18-64 reported being uninsured because they cannot afford insurance. Many people lack employer-provided coverage, and some, particularly low-income adults in states that did not expand Medicaid, remain ineligible for financial assistance. [3].

2.2. Resource Distribution

The distribution of healthcare resources in both China and the United States reveals a persistent urban-rural divide that directly impacts chronic disease education efforts. These disparities manifest in human resources, facilities, and technology access, creating a cascade of challenges for rural populations.

In China, the inequality in healthcare professionals is stark. A 2013 study revealed that urban areas had approximately 9.18 health professionals per 1,000 population, while rural areas had about 3.64 per 1,000. This indicates that urban regions have more than double the healthcare professionals compared to rural regions [4]. Several connected factors create this gap. First, economic reasons favor urban work, as rural healthcare workers earn much less than those in cities. Second, cities offer better career growth through training and research at academic medical centers that rural areas cannot match. Third, quality of life considerations—better schools for children and more job options for spouses—make urban areas more attractive to healthcare professionals.

The United States faces a growing divide in healthcare workforce distribution between urban and rural areas. Urban regions have a high concentration of both primary care physicians and specialists, while rural communities struggle with chronic shortages across most medical fields. This imbalance is worsening over time: between 2009 and 2017, the density of primary care physicians in urban counties increased by 20.8%, from 2.69 to 3.25 per 1,000 population. In contrast, rural counties experienced a decline of 0.3%, from 2.13 to 2.12 per 1,000 population, exacerbating the disparity in primary care access [5]. One notable exception is the higher per capita presence of emergency medical technicians (EMTs) and paramedics in rural areas, reflecting the need for emergency response capabilities where regular healthcare access is limited [6]. This rural healthcare workforce shortage stems from multiple factors including lower compensation, professional isolation, limited career advancement, and fewer resources for practice. The problem is partially mitigated by healthcare professionals with rural backgrounds, who are much more likely to return to rural practice—surveys show that 30-52% of providers who grew up in rural areas choose to practice there, compared to only 11% of doctors overall [7]. This highlights the importance of "pipeline" programs that support rural students pursuing healthcare careers. Without adequate healthcare providers, rural populations face significant barriers to receiving proper chronic disease education and ongoing care management, contributing to poorer health outcomes despite often having higher rates of chronic conditions

2.3. Funding Mechanisms

The healthcare systems of **China** and the **United States** differ significantly in their funding mechanisms, reflecting distinct approaches to financing and delivering healthcare services.

China's healthcare financing model has evolved significantly toward broader population coverage. In 2018, China spent 6.6% of its GDP on healthcare (RMB 5,912 billion or USD 1,665 billion), with funding distributed among government sources (28%), insurance schemes (44%), and direct patient payments (28%). [8]. The insurance component operates through two main programs with distinct funding structures. The Urban Employee Basic Medical Insurance (UEBMI) uses payroll contributions from both employers and employees to cover urban workers, reaching 316.8 million people. The Urban-Rural Resident Basic Medical Insurance (URRBMI) relies on individual premiums heavily subsidized by government funds to cover rural residents, self-employed individuals, children, students, and elderly citizens, extending protection to 897.4 million people.[8]. Despite China's achievement in extending basic coverage to over a billion citizens, the persistent 28% out-of-pocket payment rate indicates gaps in protection, particularly for chronic conditions requiring ongoing treatment. In response, the Chinese government has dramatically increased healthcare funding, tripling from RMB 482 billion in 2009 to RMB 1,640 billion in 2018. [9].

The United States employs a markedly different financing approach, with public funding constituting 45% of healthcare expenditure in 2017 (about 8% of GDP). Within this public spending, federal government contributions (28% of total healthcare spending) primarily support dedicated programs including Medicare, Medicaid, CHIP, and military health insurance. The U.S. financing system operates through parallel public and private channels. Public programs like Medicare (for older and disabled citizens) and Medicaid (for low-income individuals) rely primarily on tax revenues,

with Medicaid alone representing 20% of total healthcare spending in 2018. Alongside these public programs, private insurance funds 34% of health expenditures. In 2017, 67% of Americans had private insurance coverage, with the majority (55%) receiving it through employers and a smaller portion (11%) purchasing it individually.[10].

3. Health Education Delivery Models

Both China and the US provide chronic disease health education through a variety of delivery mechanisms, yet differences in institutional settings, provider roles, and technological integration shape disparities.

3.1. Institutional frameworks

China's chronic disease education operates through its three-tier healthcare system, with general practitioners (GPs) in community health centers and township facilities serving as the primary education providers. Each township health center has at least one doctor or GP, creating a wide geographic network with potential for broad population reach. This institutional structure emphasizes standardized information delivery through established community-based healthcare settings.

The United States employs a more diversified institutional approach, utilizing multidisciplinary teams that include nurses, physicians, dedicated health educators, and community health workers (CHWs). This team-based model distributes educational responsibilities across several roles rather than concentrating them with physicians. CHWs play a particularly important role in connecting formal healthcare institutions with community settings, delivering education in neighborhoods, homes, and community centers beyond traditional medical facilities.

In China, general practitioners (GPs) in community health centers are responsible for chronic disease management, but there is a severe shortage of trained primary care doctors. For example, each township health center has at least one doctor or general practitioner. But many primary care professionals switch to hospitals after gaining experience for higher salaries and better career prospects. In addition, in general, health professionals in primary care institutions have lower levels of education and professional qualifications than health professionals in hospitals, and it is difficult to gain the trust of residents [1].

3.2. Provider Roles

In China, primary healthcare institutions such as community health centers and township hospitals serve as the main venues for health education. These facilities provide standardized education programs developed at the national and provincial levels, with local implementation. Health education is integrated into routine care, with physicians and nurses delivering information during regular appointments and through dedicated chronic disease management programs. This integration into primary care creates a streamlined approach where health education becomes part of regular healthcare encounters. Township health centers organize regular education sessions for patients with common chronic conditions, providing group-based learning opportunities that maximize limited resources. [1]

The United States distributes chronic disease education across multiple provider types and settings. Hospitals, community health centers (CHCs), private practices, and specialty care centers all contribute to the education landscape. Community Health Centers play a particularly important role for low-income populations, with dedicated staff for preventive health education and disease management services.[3] The US model also incorporates non-medical settings, with education programs in schools, workplaces, community centers, and faith-based organizations. This approach

extends reach beyond patients already engaged with the healthcare system, potentially capturing at-risk individuals before they develop advanced disease.

3.3. Technology Integration

China has rapidly expanded digital health services to complement in-person education. Platforms like Ping An Good Doctor and various internet hospitals now provide virtual consultations, educational content, and chronic disease management support. These digital services help extend educational reach, particularly in areas with healthcare provider shortages. The growth of mobile health applications in China has been remarkable, with disease-specific management tools gaining popularity among urban populations. These platforms typically combine educational content with self-monitoring tools and physician communication channels, creating integrated disease management ecosystems.

4. Population Impact Analysis

4.1. Health Literacy Outcomes

Both China and the United States face significant health literacy challenges that disproportionately affect low-income populations, though these manifest differently in each country.

In China, income level strongly predicts health literacy outcomes. A 2008 national survey revealed that health literacy rates reached 9.49% among urban residents but only 3.43% among rural residents, where incomes are substantially lower[11]. This stark difference reflects how economic status influences access to education, quality healthcare, and health information. Low-income Chinese citizens not only have fewer opportunities to encounter health information but also typically receive less formal education, limiting their ability to understand and apply medical guidance. For chronic disease management, these literacy gaps translate into practical challenges—low-income patients often struggle to recognize warning signs, implement dietary changes, or adhere to medication regimens without clear, accessible education.

The United States shows a different pattern of health literacy disparities. The National Assessment of Adult Health Literacy found that more than one-third of American adults have limited health literacy skills, with significantly higher rates among those with lower incomes. This relationship between economic status and health literacy creates a troubling cycle—low-income individuals have greater difficulty understanding health information, leading to poorer health decisions, which can further strain limited financial resources. For chronic disease education specifically, research shows that low-income patients are less likely to understand their condition, follow treatment plans, or engage in preventive behaviors, even when information is technically available.

4.2. Cost And Access Barriers

Financial constraints create significant obstacles to chronic disease education for low-income populations in both countries, though through different mechanisms.

In China, despite near-universal insurance coverage, out-of-pocket costs remain a major barrier for low-income individuals. These expenses are particularly burdensome for chronic disease management, which requires ongoing medication and regular follow-up appointments. Low-income patients often delay seeking care until conditions worsen, missing critical opportunities for early education and intervention. Additionally, health education programs frequently receive inadequate funding in resource-limited regions where many low-income Chinese citizens live. When faced with health concerns, low-income patients often bypass local facilities to seek care at urban hospitals,

incurring additional costs and losing wages during travel—further discouraging preventive care and education[1].

In the United States, access to chronic disease education is closely tied to insurance status, which correlates strongly with income. Low-income individuals are more likely to be uninsured or underinsured, particularly in states that did not expand Medicaid under the Affordable Care Act. Without adequate coverage, many cannot afford preventive care, screenings, or formal disease management programs. Even with Medicaid coverage, low-income Americans often face challenges including limited provider networks, high co-payments for certain services, and difficulty taking time off work for appointments. These financial pressures lead many to prioritize immediate medical needs over educational services focused on long-term disease management.

4.3. Digital Divide

Technology offers potential solutions for chronic disease education but introduces new disparities related to income status.

The digital divide represents a growing concern in chronic disease education delivery. In China, low-income individuals have substantially reduced access to digital technologies. A 2020 assessment found that people from lower socioeconomic backgrounds were significantly less likely to have internet access or own mobile devices capable of accessing health applications and resources. This digital gap prevents many low-income Chinese citizens from benefiting from emerging telehealth and online education platforms that increasingly serve as primary channels for chronic disease information.

The United States faces a similar digital divide along income lines. While the U.S. has developed advanced digital health platforms and telehealth services, adoption among low-income populations remains limited due to several factors: the cost of devices and reliable internet service, digital literacy challenges, and lack of tailored content addressing the specific needs of economically disadvantaged communities. For chronic disease education, this creates a troubling scenario where innovative digital solutions disproportionately benefit middle and upper-income patients while potentially widening disparities for those with lower incomes who might benefit most from flexible, accessible education options.

5. Mutual Learning Opportunities

5.1. Complementary Healthcare Models

The United States and China have developed different approaches to serving low-income populations with chronic diseases that offer valuable lessons for each system.

The U.S. Community Health Center (CHC) network serves over 30 million Americans through Federally Qualified Health Centers, providing comprehensive care regardless of ability to pay. These centers combine medical treatment with education and social services, demonstrating success in improving chronic disease outcomes among low-income populations. China could adapt this model to expand community-based care, reduce hospital overcrowding, and improve chronic disease management in accessible settings.

China's three-tiered rural healthcare system—village clinics, township health centers, and county hospitals—ensures that even the poorest rural residents have healthcare access within their communities. The National Essential Public Health Services package provides free basic services including chronic disease screenings to all citizens. The U.S. could benefit from this structured approach to rural healthcare delivery as it addresses shortages in rural primary care and growing chronic disease burdens in economically disadvantaged communities.

5.2. Transferable Interventions

China could adapt the U.S. model of community health workers to strengthen chronic disease education in low-income areas. These workers effectively bridge cultural gaps and make health information accessible to vulnerable populations. China could expand village doctors' roles to include more formal chronic disease education, potentially increasing both reach and cultural relevance of health information.

The U.S. could learn from China's standardized public health service package that guarantees basic preventive services for all citizens regardless of income. Additionally, China's large-scale health literacy campaigns using multiple channels—traditional media, community events, and public spaces—reach low-income populations with limited healthcare access, an approach that could benefit underserved U.S. communities.

5.3. Policy Implications

China should increase funding for chronic disease education in primary care settings while implementing standardized training for rural providers. Expanding village doctors' responsibilities to include structured education, supported by appropriate compensation and training, could significantly improve health literacy among low-income rural residents.

The United States should expand Medicaid coverage for preventive health education and create financial incentives for providers serving low-income populations to deliver chronic disease education. Increasing investment in Community Health Centers would extend their reach into more underserved communities, while addressing transportation barriers through telehealth and mobile health units would improve access for low-income populations.

6. Conclusion

Our comparative analysis reveals that despite fundamentally different healthcare systems, both China and the United States struggle with delivering chronic disease health education to low-income populations. In both countries, socioeconomic status significantly impacts health literacy, access to educational resources, and ultimately, disease outcomes.

China's extensive rural healthcare network offers broad geographic coverage but suffers from quality gaps and resource limitations, particularly affecting the rural poor. The urban-rural divide in health literacy rates illustrates these persistent disparities. Conversely, the U.S. system features innovative approaches through community health workers and digital platforms, yet leaves significant gaps for uninsured and underinsured populations.

Each system offers valuable lessons for the other. China could benefit from adapting U.S. community-based education models while strengthening rural healthcare provider training. The U.S. could draw inspiration from China's efforts toward universal coverage while improving the affordability of chronic disease management education.

Addressing these disparities requires targeting both healthcare system barriers and broader social determinants of health. The persistence of these challenges in two very different healthcare systems suggests that meaningful progress requires comprehensive approaches that extend beyond traditional healthcare boundaries.

References

- [1] Wang, W. (2020). Comparison of chinese and american health care system. *Proceedings of the 2020 5th international conference on humanities science and society development (ICHSSD 2020)*. <https://doi.org/10.2991/assehr.k.200727.188>

- [2] Zhang, J., Zhao, D., & Zhang, X. (2024, October 3). *China's Universal Medical Insurance Scheme: Progress and perspectives BMC global and public health*. BioMed Central. <https://bmcbglobalpublichealth.biomedcentral.com/articles/10.1186/s44263-024-00096-9>
- [3] *In Focus: Integrating Community Health Workers Into Care Teams Commonwealth Fund*. (n.d.). <https://www.commonwealthfund.org/publications/2015/dec/focus-integrating-community-health-workers-care-teams>
- [4] Yang, L., Wang, H., & Xue, L. (2019, July 21). *What about the Health Workforce Distribution in rural China? an assessment based on eight-year data*. Rural and Remote Health. <https://www.rrh.org.au/journal/article/4978/>
- [5] Zhang, D., Son, H., & Shen, Y. (2020, October 28). *Assessment of changes in rural and Urban Primary Care Workforce in the United States from 2009 to 2017*. <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2772305>
- [6] *Distribution of U.S. Health Care Providers Residing in Rural and Urban Areas*. (n.d.). https://www.ruralhealthinfo.org/assets/1275-5131/rural-urban-workforce-distribution_nchw-2014.pdf
- [7] Committee, U. S. J. E. (2024a, January 30). *Addressing rural health worker shortages will improve population health and create job opportunities*. *Addressing Rural Health Worker Shortages Will Improve Population Health And Create Job Opportunities - Addressing Rural Health Worker Shortages Will Improve Population Health And Create Job Opportunities United States Joint Economic Committee*. <https://www.jec.senate.gov/public/index.cfm/democrats/2024/1/addressing-rural-health-worker-shortages-will-improve-population-health-and-create-job-opportunities>
- [8] *China International Health Care System Profiles Commonwealth Fund*. (n.d.-a). <https://www.commonwealthfund.org/international-health-policy-center/countries/china>
- [9] World Health Organization. (n.d.). *Health financing*. World Health Organization. https://www.who.int/china/health-topics/health-financing?utm_source=chatgpt.com
- [10] *United States International Health Care System Profiles Commonwealth Fund*. (n.d.-c). https://www.commonwealthfund.org/international-health-policy-center/countries/united_states
- [11] Liu, L., Qian, X., Chen, Z., & He, T. (2020, May 14). *Health literacy and its effect on chronic disease prevention: Evidence from China's Data*. BMC public health. <https://pmc.ncbi.nlm.nih.gov/articles/PMC7227325/>