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Health-Poverty Alleviation: Insights from China's Experience and Global Implications

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Abstract. This paper investigates the relationship between health and poverty alleviation, focusing on China's Health-Poverty Alleviation Program. Through comprehensive analysis, it reveals the strategies, achievements, and challenges in tackling the health-poverty issues. In this context, China's experience offers important insights for the global community, particularly in integrated multisectoral approaches and data-driven decision-making. Using empirical cases, this study illuminates how policies penetrate government hierarchies, reach grassroots populations, and shape health behaviors, revealing the "structure-behavior" black box in digital health governance. The results show that there are three challenges: tension between the digital divide and health equity, street-level bureaucracy issues, and gaps in governing social determinants. Accordingly, this study proposes three actionable recommendations: inclusive digital health policies, stronger grassroots support, and social support networks with digital health.

Keywords: Health-Poverty Alleviation, China's Experience, Multisectoral Collaboration, Global Implications

1. Introduction

For decades, poverty and poor health have reinforced each other, slowing progress toward global development. The World Health Organization has consistently highlighted how health lies at the heart of poverty reduction. When people fall ill, they face not only mounting medical costs but also lost income and diminished opportunities to lift themselves out of poverty. Recent joint monitoring by WHO and the World Bank paints a sobering picture: roughly 2 billion people worldwide still confront catastrophic health spending or are pushed into poverty by medical bills, a burden that hits low- and middle-income countries hardest, where health inequalities continue to grow [1]. Existing scholarship has systematically elucidated health-poverty reduction mechanisms from sociological, economic, and public health perspectives. The social determinants framework reveals the structural roots of health inequalities. In addition, the polycentric governance theory and Lipsky's street-level bureaucracy theory offer tools to analyze policy implementation [2]. Meanwhile, universal health

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coverage frameworks clarify how healthcare access affects poverty reduction outcomes. However, the impact of digital technology on healthcare accessibility is under-explored, with mechanisms for reducing information asymmetries and expanding geographic access still in a "black box," and scholars divided on whether it promotes health equity or widens the digital divide [3, 4]. The "structure-behavior" chain lacks micro-level analysis, offering little insight into how policies flow through hierarchies, reach communities, and affect health behaviors. Besides, causal links between digital health and poverty reduction are under-studied, as most research is descriptive and does not show how structural changes translate into behavioral outcomes. Therefore, this study explores how digital technology reshapes healthcare accessibility, thus revealing the mediating mechanisms and transmission chains from "policy-driven structural transformation" to "individual health behavior change." Focusing on multiple counties in Zhejiang Province, China, this study explores digital management of hypertension and diabetes via grounded theory and three-level coding of qualitative interviews with medical consortium staff, village clinic practitioners, and rural residents. Besides, it analyzes micro-level processes through which policies move through administrative hierarchies and affect health behaviors, highlighting the 'structure-behavior' black box in digital health governance and the interplay of digital access, street-level bureaucracy, and social determinants.

2. China's Health-Poverty Alleviation Program: strategies and implementation

2.1. Targeted support for the poor

China's targeted poverty alleviation strategy forms the cornerstone of its health-poverty initiatives. To strengthen digital healthcare and primary care services, the National Health Commission has implemented a series of policies. In 2018, the State Council issued the Opinions on Promoting the Development of Internet + Medical Health, enabling online consultations for common and chronic diseases. The following year, a pilot program for compact county-level medical communities was launched, aiming to establish a strong county level, vibrant township level, stable village level, and integrated up-down information connectivity.

This strategy uses data to sort households by need and income. According to Sen, development expands human capabilities and freedoms, and China's digital poverty program leverages IT to improve resource allocation and healthcare access for the poor [4]. Digital transformation enables a shift from "flood" to "precision" allocation, thus addressing market failures identified by Western development economics. In Jiashan County, Zhejiang, patients with chronic diseases can access primary care within 15 minutes, while the county's "Health Brain" platform links county hospitals, township health centers, and village clinics, enabling remote specialist consultations and chronic disease follow-ups through family doctor contracts. This digital precision mechanism exemplifies Ostrom's polycentric governance theory, thus illustrating how multiple decision centers coordinate effectively via integrated digital platforms [5].

For different types of diseases, the program adopted a classification-based treatment approach. Curable severe diseases received priority through designated hospitals and standardized treatment plans, while chronic diseases such as hypertension and diabetes were managed through AI-assisted systems and integrated clinics, improving access to care by location and cost. According to Marmot, health inequities stem from living conditions; the program applies this framework at the grassroots level by targeting vulnerable groups with digital precision measures [6, 7]. For serious and costly diseases, public funds, insurance, and social support help patients access necessary treatment.

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2.2. Multisectoral approaches to health and poverty

Through the use of digital platforms, China's multisectoral approach to health-poverty alleviation links government agencies, healthcare institutions, and community organizations, enabling real-time information sharing and coordinated governance [8]. Education remains a priority, with measures reducing costs for poor rural families and providing boarding. Higher school attendance has improved health literacy, and digital platforms facilitate coordination between education and health departments. In Jiashan County, Zhejiang, poverty projects combined health literacy with education, digitally tracking attendance and health, which gradually improved schooling and preventive care awareness, showing the potential of integrated, data-driven interventions.

Beyond education, access to safe water is another crucial aspect. Since 2015, the Ministry of Water Resources has implemented the National Rural Drinking Water Safety Consolidation and Promotion Projects, improving water quality in areas affected by fluorine and arsenic pollution through treatment, new water sources, and purification. To support these efforts, drinking water standards (T/CHES 18-2018) and the NRDWMN monitoring network, backed by digital systems, enable cross-departmental data sharing among water, environmental, and health authorities. As a result, in Jiashan County, these measures have reduced waterborne diseases. Similarly, sanitation has received sustained attention. Initially focused on cities and major transport hubs, the Patriotic Health Movement gradually expanded to rural areas. With the Health-Poverty Alleviation Program, initiatives like the "toilet revolution" now use digital platforms to coordinate efforts among health, agriculture, and housing authorities, tracking sanitation improvements and their health impact.

In addition, nutrition is a key component of health. China's National Nutrition Plan (2017-2030) aims to reduce malnutrition through programs such as Ying Yang Bao supplements and the Healthy Diet Campaign (HDC). Lawrence and Lorsch showed that effective coordination needs both specialization and integration. China's digital health governance maintains departmental expertise while using cross-cutting information systems for real-time coordination among health, education, agriculture, and social welfare [9, 10]. In rural areas, the promotion of Ying Yang Bao, coordinated through these digital systems linking clinics, schools, and community organizations, has helped reduce child malnutrition.

2.3. Health system strengthening through reform

Building on prior health-care reforms, China's Health-Poverty Alleviation Program utilized digital technology to develop a comprehensive system that goes beyond traditional bureaucratic limitations. According to Weber's classic analysis, modern administrative organizations are characterized by hierarchical authority, standardized procedures, and formal documentation [11]. However, China's digital health reform represents an innovative transformation of Weber's ideal-type bureaucracy: while maintaining the hierarchical structure necessary for efficient coordination, digital platforms shift the orientation from internal administrative control to public-facing service delivery, enabling the bureaucratic apparatus to directly serve citizens' health needs through transparent, accessible, and responsive digital interfaces [12, 13]. By reorienting the system toward public accessibility and real-time responsiveness to community health demands, this digital transformation mitigates a key limitation of traditional bureaucracy: its internal orientation and citizen alienation. Similarly, the National Compulsory Service Program, providing full funding for rural students' medical education, contributes to strengthening the health workforce. In Yuhang District, the program has strengthened local healthcare workers' skills, with AI technologies supporting more accurate diagnoses and case management in rural areas.

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3. Analysis of China's Health-Poverty Alleviation Program

3.1. Digital technology reshapes healthcare accessibility

Digital technology systematically reshapes healthcare accessibility in resource-constrained areas, addressing the long-standing challenge of geographic and economic barriers to medical services. As Penchansky and Thomas conceptualized in their seminal accessibility framework, healthcare access includes availability, accessibility, accommodation, affordability, and acceptability, which digital health interventions tackle through telemedicine networks, AI-assisted diagnosis, and integrated digital platforms [14-16]. Evidence of this can be seen in China's healthcare resource improvements: the number of beds in county hospitals within economically disadvantaged areas rose markedly, hospitals formed telemedicine links with tertiary institutions, and sophisticated medical devices like CT scanners became broadly accessible. In Zhejiang, better healthcare resources strengthened local hospitals, improving medical services for residents through digital connectivity.

3.2. Institutional policies driving individual behavior change

Institutional policies drive individual behavior change through the transmission chain from social structure transformation to micro-level behavioral adaptation, revealing how macro-level policy interventions translate into individual health outcomes. Based on the social-ecological framework, changes in health behavior occur across intrapersonal, interpersonal, organizational, community, and policy levels, illustrating that interventions at higher structural levels must ultimately influence individual behaviors [17, 18]. In practice, China's chronic disease control provides a clear example: hypertension control rates among the impoverished rose from 33.0% in 2019 to 45.4% in 2022, and diabetes control increased from 46.5% to 55.2%. In Jiashan District, better chronic disease management through institutional policy implementation improved residents' health behaviors and lowered complication risks.

3.3. Digital technology enabling population health benefits

By intervening in healthcare financing, service delivery, and health outcomes, digital technology helps mitigate the structural determinants of health poverty, thus generating population-level health benefits. As Marmot emphasized in the social determinants of health framework, health inequities arise from structural conditions, and digital health interventions address these determinants by improving healthcare access, reducing financial barriers, and enhancing treatment outcomes [6, 19]. China's Health-Poverty Alleviation Program demonstrates these benefits: out-of-pocket inpatient costs for the poor decreased from 2013 to 2018, treatment rates for curable severe diseases reached 99.8% by 2023, and social health insurance coverage reached 97.1% in 2018. In Jiashan District, program implementation significantly reduced medical financial burden, improving healthcare access for impoverished populations.

4. Challenges faced by China's Health-Poverty Alleviation Program

4.1. Digital divide and health equity tension

The digital divide creates health equity tension, as sustainability challenges reveal that the program heavily relies on continuous fiscal input, and with economic moderation, government resources may become constrained. This fiscal dependency creates a "digital divide" where regions with limited

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resources cannot fully access digital health services, threatening health equity [20]. As Whitehead argues, reducing health inequities requires interventions that extend beyond the health sector itself to address the underlying social determinants of health [21]. The limited medical insurance fund may be insufficient to cover long-term healthcare expenses, and the engagement of social actors remains constrained. Moreover, after the conclusion of programs, coordination mechanisms across departments may weaken. To address these challenges, it is essential to strengthen grassroots implementation support systems, ensuring equitable access to digital health services nationwide. In parts of Zhejiang, less government funding from slower growth has hurt long-term health-poverty projects.

4.2. Street-level bureaucracy dilemma and implementation deviation

The street-level bureaucracy dilemma may result in inconsistencies in program implementation, as assessment is complicated by contested indicators such as worsening self-reported health among the poor and rising chronic disease prevalence. Accordingly, frontline implementers face the challenge of reconciling standardized digital protocols with local contextual needs. Furthermore, real-world data are often fragmented, incomplete, or incompatible, making it difficult to isolate program effects from those of concurrent initiatives. To address these challenges, developing “digital health+” social support networks may help bridge the gap between standardized digital systems and local implementation realities. In Zhejiang Province, accurately measuring the independent impact of digital health interventions remains challenging due to interference from other factors.

4.3. Governance blind spots in social determinants

Despite overall improvements, significant health disparities persist between urban and rural areas, revealing governance blind spots in addressing social determinants of health. As Braveman and Gruskin establishes in their seminal work on defining equity in health, health inequities are not inevitable but result from avoidable, unjust differences that can be addressed through purposeful policy action [22]. The digital health reform has largely focused on medical service delivery, creating governance blind spots in addressing broader social determinants like housing, sanitation, and nutrition. The neonatal mortality rate, infant mortality rate, under-5 mortality rate, and maternal mortality rate show persistent urban-rural gaps. These inequalities threaten program achievements. Constructing inclusive digital health policies that integrate social determinants monitoring can address these blind spots. In Zhejiang, although overall health improved, urban-rural differences in health indicators remain.

5. Lessons from China’s experience for the global community

5.1. Multisectoral collaboration

For Southern countries facing similar resource constraints, China’s experience demonstrates that health improvements can be accelerated through coordinated multisectoral action even in contexts of limited fiscal capacity. As Whitehead contends, reducing health inequities requires interventions that reach beyond the health sector to address the underlying social determinants of health [21]. The Health-Poverty Alleviation Program exemplifies successful multisectoral collaboration, bringing together the National Health Commission, National Healthcare Security Administration, Ministry of Finance, and National Administration of Rural Revitalization. This coordinated approach addressed

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health challenges through multiple channels: medical security reduced financial barriers to care, public health services improved preventive care accessibility, and poverty alleviation initiatives tackled the social determinants of health.

5.2. Targeted and data-driven approaches

China's Health-Poverty Alleviation Program employed a rigorous targeting mechanism, beginning with precise identification of impoverished populations through household registration systems, medical records, and economic surveys. For countries in the Global South, the key transferable lesson is the importance of combining precise targeting with real-time data systems. The National Dynamic Monitoring System tracked health status, medical expenditures, and poverty outcomes in real time, enabling responsive adjustments to interventions. When early indicators suggested gaps in coverage or effectiveness, the system triggered automatic alerts and prompted corrective actions. Mobile health teams visited remote areas where fixed health facilities were inaccessible. Special programs addressed the health needs of elderly populations living alone, persons with disabilities, and families affected by catastrophic illness. In Jiashan County, the integration of economic status data with health records enabled predictive identification of households at risk of health-related impoverishment.

5.3. Equity and social inclusion

For nations confronting persistent health disparities, China's Health-Poverty Alleviation Program shows that pro-equity policies can produce significant health gains for marginalized groups. As Whitehead establishes in her seminal work on health equity, health inequities are not inevitable but stem from avoidable and unjust differences that can be addressed through purposeful policy action [21]. The program aimed to deliver health services to populations traditionally denied adequate care. Besides, the social inclusion dimension extended to ensuring that health improvements contributed to broader socioeconomic participation. By reducing health-related work limitations and enabling school attendance among healthier children, the program enhanced human capital development and created pathways for social advancement. This aligns with intergenerational mobility theory, which indicates that improvements in health equity can have multiplier effects across generations because healthier parents are better positioned to invest in their children's education and development.

6. Conclusion

This study reveals that health equity is central to global poverty reduction. In this context, China's Health-Poverty Alleviation Program illustrates how digital technology can break the cycle of poor health and poverty by moving policies via bureaucratic layers to reach the rural poor and reshape behaviors to improve health outcomes. To achieve lasting change, it is necessary to bridge policy and grassroots action and coordinate actors across sectors. However, the digital divide risks leaving the most vulnerable behind, street-level bureaucrats face resource constraints that hinder service delivery, and social determinants of health remain insufficiently integrated into digital governance, creating blind spots in addressing structural causes of health-related poverty.

In order to address these challenges, this study proposes three measures: inclusive digital health policies for poverty-related disparities, stronger grassroots support for health-poverty programs, and "digital health plus" social protection networks to tackle the multidimensional nature of health poverty. These recommendations support WHO's health equity goals and provide practical paths to

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achieve Sustainable Development Goals 1 and 3. Future research should examine how digital health interventions can adapt to diverse poverty contexts, ensuring that no one is left behind in the global health-poverty transition.

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