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Institutional Assembly under Constraints: Pathways to Universal Health Coverage in Brazil, Rwanda, and China

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Perspective

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Perspective

INTRODUCTION

The global consensus on universal health coverage (UHC) centers on the principle that everyone should have access to quality health services without facing financial hardship. Two classical models have long guided efforts to achieve this goal. The Beveridge model, exemplified by the United Kingdom, relies on general taxation to finance publicly provided care, ensuring access free at the point of use (Bhattacharya *et al.*, 2013). The Bismarck model, used in countries such as Germany and France, is based on employment-linked social insurance, with services delivered primarily by private providers (Bhattacharya *et al.*, 2013). However, these models were developed in high-income settings with strong fiscal capacity, formal labor markets, and mature administrative systems — conditions that differ significantly in developing countries. Constrained fiscal capacity challenges the expansion of fully tax-funded systems, and large informal sectors limit the feasibility of payroll-based social insurance. Administrative fragmentation further complicates coverage expansion and service provision. As a result, UHC is rarely achieved through the direct adoption of classical models in their pure forms in developing countries.

This paper examines how developing countries pursue UHC under these constraints through a comparative analysis of Brazil, Rwanda, and China. These countries offer representative examples from South America, sub-Saharan Africa, and Asia — home to a substantial global population with pressing health needs and limited financial resources. Brazil established a tax-funded public system that guarantees free access at the point of use, although limited public financing has allowed a sizable private sector to operate alongside it (Marten *et al.*, 2014). Rwanda extends coverage primarily through a subsidized community-based health insurance system to reach informal and low-income populations under strong central stewardship (Nyandekwe *et al.*,

2014). China combines payroll-funded insurance for formal-sector workers with publicly subsidized residence-based schemes covering the broader population, implemented through a decentralized administrative structure under central planning in which local governments play a central role (Burns and Liu, 2017).

These cases suggest that UHC in developing countries is shaped less by the adoption of established models than by what we term *institutional assembly under constraints* — a process in which health systems are constructed through selective borrowing from classical frameworks combined with institutional innovation rooted in historical legacy, bounded by fiscal capacity, labor-market structure, and administrative reach. While these approaches can expand coverage, they also generate lasting tensions, such as segmentation, sustainability pressures, and uneven service delivery, that each health system continues to manage.

UHC PROGRESS AND EVALUATION

Figure 1 presents the progress of UHC service coverage from 2000 to 2021, using the index from the World Health Organization (WHO). Brazil consistently scores the highest: its modern health system, established in the late 1980s, guarantees free care for all citizens. China and Rwanda began major reforms around a decade later but have experienced more substantial growth, especially China. China's service coverage has expanded significantly over the past two decades, surpassing the Asian regional average and ultimately catching up with Brazil by 2021. Rwanda, similarly, shows marked progress in coverage, particularly since the early 2000s.

[Figure 1 about here]

While these advancements are notable, it is important to recognize that service coverage

alone does not provide a complete picture of a health system's effectiveness. A holistic evaluation must also account for financial risk protection, health improvement, and public satisfaction, which are widely recognized as core goals of health systems and are reflected in major health system performance frameworks (Roberts *et al.*, 2008; WHO, 2000). The following sections examine in detail both the organizational structures of these systems and how they have achieved, or fallen short of, their shared objectives. Table 1 previews the key features of the three health systems.

[Table 1 about here]

BRAZIL

Brazil's health system draws heavily on Beveridge-style elements — tax-based financing, government stewardship, and a strong public service delivery platform — while also accommodating a sizable private sector. Before the late 1980s, Brazil's health system primarily served the formally employed through contracts with private sector providers, leaving the majority reliant on an inconsistent mix of public and charitable services (Couttolenc *et al.*, 2013). The establishment of the Brazilian Unified Health System (Sistema Único de Saúde; SUS) under the 1988 Constitution marked a pivotal shift in the country's efforts towards UHC. Embedded in the constitutional framework, SUS redefined health from an employment-linked benefit into a universal right of citizenship and a state responsibility, guaranteeing free health services at all levels of care for everyone upon delivery (Marten *et al.*, 2014). It is publicly administered, with federal, state, and municipal governments sharing responsibility. This decentralized design of the system enables localized control and service provision, but its effectiveness is constrained by limited public funding: the government's contribution to total health spending remains much lower than that observed in OECD countries and many middle-income peers (Araujo *et al.*, 2022).

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In practice, while SUS establishes universal entitlement to care, variations in service quality and access persist across regions and facilities, driving higher-income households to seek private healthcare alternatives (Pacheco Santos *et al.*, 2018). Operating in parallel with SUS, the private sector offers services not covered by the public system and generally provides faster access and better amenities. The younger and wealthier profile of private health plan enrollees contributes to the substantial role of private healthcare financing.

This dualized structure shapes performance across financial risk protection, health improvement, and public satisfaction. Despite progress toward UHC, financial protection remains a major challenge in Brazil, with many households still burdened by high out-of-pocket (OOP) spending. Medications, primarily purchased from the private sector, account for most of these expenses, especially among poorer households (Araujo and Coelho, 2021). Meanwhile, SUS has improved health outcomes with the expanded healthcare infrastructure and access, including large increases in medical consultations and primary care utilization, which helped reduce unnecessary hospitalizations (Couttolenc *et al.*, 2013; de Abreu *et al.*, 2007; Macinko and Lima-Costa, 2012; Malta *et al.*, 2010). However, quality of care remains a concern due to the high rate of preventable adverse events and frequent adverse drug reactions (Mendes *et al.*, 2009). According to a global survey conducted in 2023, only 43% of Brazilians trust the health system to provide the best care, below the global average of 51% (IPSOS, 2023a). The public dissatisfaction is partly rooted in weak incentives to improve care quality and persistent inequalities between public and private services (Paim *et al.*, 2011).

These patterns suggest that while a Beveridge-style commitment to free, tax-funded access can guarantee broad coverage, its effectiveness depends on the state's fiscal and administrative capacity to deliver consistent service quality. Brazil's experience illustrates how such a

commitment, when implemented under persistent fiscal constraint, can sustain universal entitlement in principle while triggering segmented provision and reinforcing unequal access in practice.

RWANDA

Rwanda's health system draws selectively on the Beveridge model, adopting strong state stewardship while financing care through subsidized community-based insurance and donor support. In the aftermath of the 1994 genocide, the system was severely underfunded and heavily reliant on donor funding and OOP payments, resulting in poor service quality and low utilization, particularly in rural areas. The government therefore prioritized health as a pillar of national reconstruction but faced two structural constraints: a large informal sector that limited the feasibility of payroll-based social insurance, and low fiscal capacity that constrained the expansion of a fully tax-funded public system.

Rwanda's response was the Community-Based Health Insurance (CBHI, or *Mutuelles de Santé*), which became mandatory in 2006 and covers over 90% of the population (Nyandekwe *et al.*, 2014). Rather than relying on general taxation, the system is built on insurance-based pooling with household contributions complemented by government subsidies and donor support. It therefore departs from classical Beveridge financing while preserving strong state stewardship over contribution structures, implementation, and service oversight. Premiums have been scaled by wealth since 2010, with loan packages or full subsidies provided to the lower-income households. In 2015, the insurance management was centralized to enhance risk pooling and financial stability. As of 2022, Rwanda's healthcare expenditure outpaced that of neighboring

countries, with per capita spending of 76.8 USD, accounting for 7.9% of its GDP — considerably higher than the 2.9-4.4% observed in Tanzania, Uganda, and Ethiopia (The World Bank, 2025).

Rwanda's CBHI system has enhanced financial protection by reducing catastrophic health expenditures and OOP payments for households (Shimeles, 2010). The system has also improved equity through stratified premiums and generated broader socioeconomic benefits, including better educational outcomes for children in insured families (Chirwa *et al.*, 2021; Strobl, 2017; Woode, 2017). Beyond financial protection, the CBHI system has contributed to substantial gains in life expectancy and reductions in infant mortality—achievements UNICEF has described as "one of the most significant in human history" (Newey, 2019; The World Bank, 2025). This progress results from increased healthcare utilization and improved service quality facilitated by CBHI, though socioeconomic disparities in healthcare access persist (Kpienbaareh *et al.*, 2019; Liu *et al.*, 2019; Saksena *et al.*, 2011; Shimeles, 2010). Public trust in healthcare has also risen markedly, with citizens reporting the highest level of confidence in their healthcare facilities worldwide (Wellcome Global Monitor 2018, 2019).

Yet these achievements are accompanied by emerging challenges to the long-term sustainability of Rwanda's model. The system's reliance on external financing creates structural vulnerability, as recent disruptions to donor flows have increased pressure on domestic resources to sustain coverage. At the same time, Rwanda faces an epidemiological transition toward non-communicable diseases, which require sustained long-term management and place additional demands on service capacity. Rwanda therefore illustrates that a state-coordinated, subsidized insurance model can achieve broad inclusion under constraints, but remains vulnerable to long-term sustainability risks in financing and adapting to evolving health needs.

CHINA

China's health system has expanded through a set of schemes covering different population groups, built on centralized guidance with decentralized financing and administration. These schemes combine Bismarck-style payroll financing for formal-sector workers with publicly subsidized, residence-based insurance for the broader population. Prior to the 1990s, coverage was fragmented and tied to work units in urban areas and rural collectives, much of which collapsed during economic reforms, leaving large segments of the population uninsured (Burns and Liu, 2017). Rebuilding coverage in a country of China's scale and regional diversity made uniform centralized implementation infeasible. In response, the central government pursued a strategy of national policy direction combined with local implementation, allowing schemes to be financed, administered, and adapted to local fiscal and administrative conditions.

Over the following two decades, China launched a sequence of insurance reforms (Gruber *et al.*, 2025). The Urban Employee Basic Medical Insurance (UEBMI) was introduced in 1998 for formal-sector urban workers, funded through payroll contributions. Coverage expanded to rural residents through the New Cooperative Medical Scheme (NCMS) in 2003, and to the remaining uncovered urban residents through the Urban Resident Basic Medical Insurance (URBMI) in 2008. NCMS and URBMI were financed by individual premiums and government subsidies, with gradual rollout across counties of varying fiscal capacity (Burns and Liu, 2017). In 2009, the two schemes were integrated into Urban and Rural Residents Basic Medical Insurance (URRBMI) (Milcent, 2018). The national coverage rate of social health insurance increased from less than 30% in 2003 to over 95% since 2011, achieving near-universal health insurance coverage (Yip *et al.*, 2019).

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As health coverage expanded, OOP spending declined and the risk of catastrophic health expenditures fell, while enhanced outpatient and medication coverage improved the management of chronic conditions (Liu *et al.*, 2021; Shi *et al.*, 2025; Zhang and Zhu, 2024). The reforms similarly contributed to substantial improvements in population health (Gruber *et al.*, 2023; Huang and Gan, 2017; Lei and Lin, 2009; Li and Zhang, 2013; Lu *et al.*, 2012). Furthermore, China has experienced rising public satisfaction and perceived fairness in healthcare, driven by improved financial protection and accessibility (Zhu *et al.*, 2022).

However, the same institutional features that facilitated rapid expansion have also generated persistent fragmentation within the system. Because insurance schemes are administered and financed at the local level, considerable variation remains in benefit design, reimbursement rates, and service availability across regions. In addition, the system remains heavily hospital-centered, with weaker development of primary care services. Although insurance expansion has narrowed gaps in some health outcomes across provinces (Meng *et al.*, 2019), expanded coverage has not uniformly translated into access to high-quality and continuous care, and disparities across regions and socioeconomic groups persist (Jian *et al.*, 2019; Li *et al.*, 2025). China's experience therefore suggests that decentralized, insurance-based expansion can achieve near-universal coverage, but may produce uneven service delivery when system integration and quality improvement lag behind coverage growth.

DISCUSSION

This paper examines how Brazil, Rwanda, and China have pursued UHC through distinct processes of institutional assembly under constraints. Rather than adopting classical health system models, each country has produced a system shaped by its own structural conditions and historical

legacies. These paths reflect different ways of negotiating fundamental trade-offs (Bhattacharya et al., 2013). Policymakers must navigate the health system trilemma — the tension among health, wealth, and equity — where progress in one dimension often comes at the cost of another. As countries move beyond the initial stages of universal coverage expansion, managing these tensions becomes increasingly critical. This requires robust evidence on institutional and financial arrangements that can contain costs without compromising quality or fairness, such as risk-pooling mechanisms, strategic provider payment reforms, and regulated market-based approaches. Table 2 provides an evidence-based overview of how these systems perform against the shared goals of financial risk protection, health improvement, and public satisfaction.

[Table 2 about here]

The varied experiences of Brazil, Rwanda, and China suggest that the wholesale adoption of traditional models is rarely feasible, and pinpointing a single correct trajectory towards UHC is unlikely, particularly given countries' differing political contexts, policy priorities, and the specific challenges they are facing. Three implications follow from this comparison. For health policy, these cases highlight that effective coverage expansion depends on designing policies that align with existing fiscal capacity, labor-market structure, and administrative arrangements. When policies exceed these constraints, they often fall short of their intended goals. For health systems development, these cases suggest that fragmented and decentralized starting points need not be viewed only as obstacles. They can also serve as pragmatic building blocks for expanding coverage, with consolidation and integration pursued gradually as administrative and fiscal capacity develop. For institutional theory on health systems, this analysis suggests that the classical Beveridge–Bismarck typology, while useful for organizing comparative inquiry, has limited explanatory power in developing-country contexts. The concept of institutional assembly under constraints

offers a complementary framework by shifting attention from classifying health systems to explaining how they are constructed: countries selectively combine elements of classical frameworks with inherited institutional arrangements under fiscal, administrative, and labor-market constraints.

Recognizing that successful strategies are context-specific, future research should adopt a comparative framework that builds on the concept of institutional assembly under constraints and captures a wider array of national experiences. This can help identify reform pathways that align with local governance institutions, fiscal realities, demographic profiles, and the evolving role of the private sector. Furthermore, building institutional learning systems through routine data collection, transparent performance evaluation, and adaptive policy feedback will be essential to support iterative, evidence-informed progress toward sustainable universal health coverage.

REFERENCES

Araujo, E. C. and Coelho, B. D. P. (2021), 'Measuring financial protection in health in Brazil: Catastrophic and poverty impacts of health care payments using the latest National Household Consumption Survey', *Health Systems & Reform*, **7**(2): e1957537.

Araujo, E. C., Medici, A. and Lobo, M. S. (2022), 'Efficiency and sustainability of public health spending in Brazil', *The Brazilian Journal of Health Economics*, **14**(Suppl.1): 86–95.

Bhattacharya, J., Hyde, T. and Tu, P. (2013), *Health economics*. London, United Kingdom: Bloomsbury Publishing.

Burns, L. R. and Liu, G. G. (2017), *China's Healthcare System and Reform*. Cambridge University Press.

Cao, S., Yi, L. X. and Yu, C. (2024), 'Competitive bidding in drug procurement: evidence from China', *American Economic Journal: Economic Policy*, **16**(3): 481–513.

Chirwa, G. C., Suhrcke, M. and Moreno-Serra, R. (2021), 'Socioeconomic inequality in premiums for a community-based health insurance scheme in Rwanda', *Health Policy and Planning*, **36**(1): 14–25.

Couttolenc, B. F., Gragnolati, M. and Lindelow, M. (2013), *Twenty years of health system reform in Brazil: an assessment of the Sistema Único de Saúde (English).* Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/909701468020377135/Twenty-years-of-health-system-reform-in-Brazil-an-assessment-of-the-sistema-unico-de-saude.

de Abreu, D. M. X., César, C. C. and França, E. B. (2007), 'The relationship between deaths that are avoidable with adequate health care and the implementation of the Unified Health System in Brazil', *Revista Panamericana De Salud Publica = Pan American Journal of Public Health*, **21**(5): 282–291.

Gruber, J., Lin, M., Yang, H. and Yi, J. (2025), 'China's social health insurance in the era of rapid population aging', *JAMA Health Forum*, **6**(4): e251105.

Gruber, J., Lin, M. and Yi, J. (2023), 'The largest insurance program in history: Saving one million lives per year in China', *Journal of Public Economics*, **226**: 104999.

Huang, F. and Gan, L. (2017), 'The impacts of China's Urban Employee Basic Medical Insurance on healthcare expenditures and health outcomes', *Health Economics*, **26**(2): 149–163.

Huang, W. and Liu, H. (2023), 'Early childhood exposure to health insurance and adolescent outcomes: Evidence from rural China', *Journal of Development Economics*, **160**: 102925.

IPSOS (2023a), *IPSOS global health service monitor 2023: A 31-counry global survey*. https://www.ipsos.com/sites/default/files/ct/news/documents/2023-09/Ipsos-Global-Health-Service-Monitor-2023-WEB.pdf.

IPSOS (2023b), 'Public opinion on the health care system in Brazil as of 2023'. Statista.

Jian, W., Figueroa, J., Woskie, L., Yao, X., Zhou, Y., Li, Z., Li, C., Yao, L. and Yip, W. C. (2019), 'Quality of care in large Chinese hospitals: An observational study', *BMJ Quality & Safety*, **28**(12): 963–970.

Kpienbaareh, D., Atuoye, K. N., Ngabonzima, A., Bagambe, P. G., Rulisa, S., Luginaah, I. and Cechetto, D. F. (2019), 'Spatio-temporal disparities in maternal health service utilization in Rwanda: What next for SDGs?', *Social Science & Medicine*, **226**: 164–175.

Lei, X. and Lin, W. (2009), 'The New Cooperative Medical Scheme in rural China: does more coverage mean more service and better health?', *Health Economics*, **18**(S2): S25–S46.

Li, L., Guo, B., Liu, C. and Yao, Q. (2025), 'Trends and determinants of healthcare-induced poverty in China 2013-2019', *Health Policy and Planning*, **40**(6): 625–640.

Li, X. and Zhang, W. (2013), 'The impacts of health insurance on health care utilization among the older people in China', *Social Science & Medicine*, **85**: 59–65.

Liu, C., Liu, Z., Nicholas, S. and Wang, J. (2021), 'Trends and determinants of catastrophic health expenditure in China 2010–2018: a national panel data analysis', *BMC Health Services Research*, **21**(1): 526.

Liu, K. (2016), 'Insuring against health shocks: Health insurance and household choices', *Journal of Health Economics*, **46**: 16–32.

Liu, K., Subramanian, S. V. and Lu, C. (2019), 'Assessing national and subnational inequalities in medical care utilization and financial risk protection in Rwanda', *International Journal for Equity in Health*, **18**: 51.

Lu, C., Liu, Y. and Shen, J. (2012), 'Does China's Rural Cooperative Medical System achieve its goals? Evidence from the China Health Surveillance Baseline Survey in 2001', *Contemporary Economic Policy*, **30**(1): 93–112.

Macinko, J., Dourado, I., Aquino, R., Bonolo, P. de F., Lima-Costa, M. F., Medina, M. G., Mota, E., de Oliveira, V. B. and Turci, M. A. (2010), 'Major expansion of primary care in Brazil linked to decline in unnecessary hospitalization', *Health Affairs*, **29**(12): 2149–2160.

Macinko, J. and Lima-Costa, M. F. (2012), 'Horizontal equity in health care utilization in Brazil, 1998–2008', *International Journal for Equity in Health*, **11**(1): 33.

Malta, D. C., Duarte, E. C., Escalante, J. J. C., Almeida, M. F. de, Sardinha, L. M. V., Macário, E. M., Monteiro, R. A. and Morais Neto, O. L. de (2010), 'Avoidable causes of infant mortality in Brazil, 1997-2006: Contributions to performance evaluation of the Unified National Health System', *Cadernos De Saude Publica*, **26**(3): 481–491.

Marten, R., McIntyre, D., Travassos, C., Shishkin, S., Longde, W., Reddy, S. and Vega, J. (2014), 'An assessment of progress towards universal health coverage in Brazil, Russia, India, China, and South Africa (BRICS)', *The Lancet*, **384**(9960): 2164–2171.

Mendes, W., Martins, M., Rozenfeld, S. and Travassos, C. (2009), 'The assessment of adverse events in hospitals in Brazil', *International Journal for Quality in Health Care*, **21**(4): 279–284.

Meng, Q., Mills, A., Wang, L. and Han, Q. (2019), 'What can we learn from China's health system reform?', *BMJ*, **365**: l2349.

Milcent, C. (2018), *Healthcare Reform in China: From Violence to Digital Healthcare*. Cham: Springer International Publishing.

National Health Commission (2022), *China Health Statistical Yearbook 2022*. Beijing: China Union Medical University Press.

National Health Commission (2024), *China Health Statistical Yearbook 2023*. China Statistics Press.

Newey, S. (2019), 'From horror to health: How Rwanda rebuilt itself to become one of Africa's brightest stars', *The Telegraph*, 8 June. https://www.telegraph.co.uk/global-health/climate-and-people/horror-health-rwanda-rebuilt-become-one-africas-brightest-stars/ [1 May 2025].

Nyandekwe, M., Nzayirambaho, M. and Baptiste Kakoma, J. (2014), 'Universal health coverage in Rwanda: Dream or reality', *The Pan African Medical Journal*, **17**: 232.

Pacheco Santos, L. M., Millett, C., Rasella, D. and Hone, T. (2018), 'The end of Brazil's More Doctors programme?', *BMJ*, **363**: k5247.

Paim, J., Travassos, C., Almeida, C., Bahia, L. and Macinko, J. (2011), 'The Brazilian health system: History, advances, and challenges', *The Lancet*, **377**(9779): 1778–1797.

Roberts, M., Hsiao, W., Berman, P. and Reich, M. (2008), *Getting Health Reform Right: A Guide to Improving Performance and Equity*. Oxford University Press. https://academic.oup.com/book/7510 [22 March 2024].

Saksena, P., Antunes, A. F., Xu, K., Musango, L. and Carrin, G. (2011), 'Mutual health insurance in Rwanda: Evidence on access to care and financial risk protection', *Health Policy*, **99**(3): 203–209.

Shi, J., Yang, W. and Yuan, Y. (2025), 'Cover more for less: Targeted drug coverage, chronic disease management, and medical spending', *Journal of Development Economics*, **172**: 103399.

Shimeles, A. (2010), 'Community based health insurance schemes in Africa: The case of Rwanda', *Gothenburg University Working Paper*. https://gupea.ub.gu.se/handle/2077/23064 [18 February 2024].

Strobl, R. (2017), 'Does health insurance reduce child labour and education gaps? Evidence from Rwanda', *Journal of Development Studies*. Taylor & Francis Journals, **53**(9): 1376–1395.

The World Bank (2025), ‘World Bank Open Data’. Washington, D.C.: The World Bank. https://data.worldbank.org/.

Tikkanen, R., Osborn, R., Mossialos, E., Djordjevic, A. and Wharton, G. A. (2020), ‘International Health Care System Profiles --Brazil’, *The Commonwealth Fund*. https://www.commonwealthfund.org/international-health-policy-center/countries/brazil [5 May 2025].

United Nations (2023), ‘UN SDG Indicators Database’. https://unstats.un.org/sdgs/dataportal/database [22 March 2024].

Wagstaff, A., Flores, G., Hsu, J., Smitz, M.-F., Chepynoga, K., Buisman, L. R., van Wilgenburg, K. and Eozenou, P. (2018), ‘Progress on catastrophic health spending in 133 countries: a retrospective observational study’, *The Lancet Global Health*, **6**(2): e169–e179.

Wellcome Global Monitor 2018 (2019),. Gallup. https://wellcome.org/reports/wellcome-global-monitor/2018 [9 March 2024].

WHO (2000), *The world health report 2000*. Geneva: World Health Organization. https://www.who.int/publications-detail-redirect/924156198X [22 March 2024].

Woode, M. E. (2017), ‘Parental health shocks and schooling: The impact of mutual health insurance in Rwanda’, *Social Science & Medicine*, **173**: 35–47.

Yi, H., Miller, G., Zhang, L., Li, S. and Rozelle, S. (2015), ‘Intended and unintended consequences of China’s zero markup drug policy’, *Health Affairs*, **34**(8): 1391–1398.

Yip, W., Fu, H., Chen, A. T., Zhai, T., Jian, W., Xu, R., *et al.* (2019), ‘10 years of health-care reform in China: progress and gaps in Universal Health Coverage’, *The Lancet*, **394**(10204): 1192–1204.

Zeng, W., Rwiyereka, A. K., Amico, P. R., Ávila-Figueroa, C. and Shepard, D. S. (2014), ‘Efficiency of HIV/AIDS health centers and effect of community-based health insurance and performance-based financing on HIV/AIDS service delivery in Rwanda’, *The American Journal of Tropical Medicine and Hygiene*, **90**(4): 740–746.

Zhang, X. and Zhu, K. (2024), ‘Catastrophic health expenditure associated with non-inpatient costs among middle-aged and older individuals in China’, *Frontiers in Public Health*, **12**: 1454531.

Zhu, Y., Li, Y., Wu, M. and Fu, H. (2022), ‘How do Chinese people perceive their healthcare system? Trends and determinants of public satisfaction and perceived fairness, 2006–2019’, *BMC Health Services Research*, **22**(1): 22.

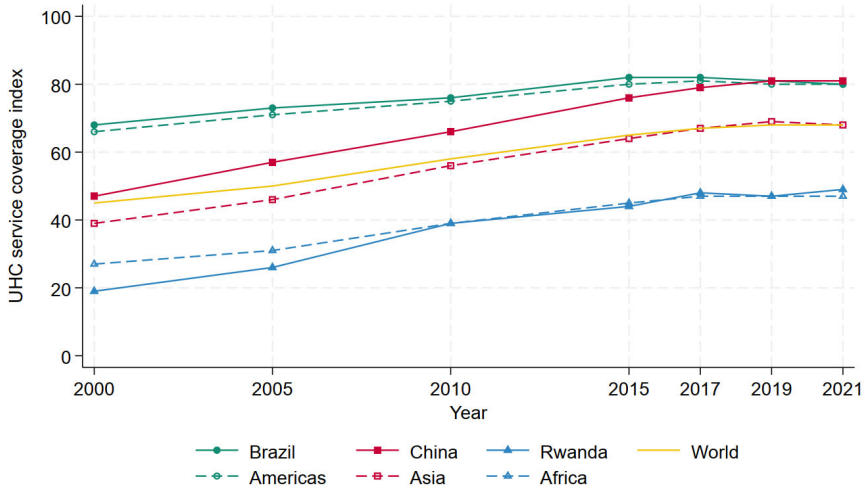

Figure 1. UHC Service Coverage Progress in Brazil, Rwanda, and China

Notes: This figure shows the UHC Service Coverage Index from 2000 to 2021 for Brazil, Rwanda, and China, as well as the world average and the regional averages for the Americas, Africa, and Asia. UHC Service Coverage Index is a composite measure developed by the WHO to track coverage of essential health services across 14 tracer indicators, including reproductive, maternal, and child health, infectious and non-communicable diseases, and service capacity and access. Data Source: https://data.who.int/indicators/i/3805B1E/9A706FD.

Table 1. Key Features of Health Systems in Brazil, Rwanda, and China

	Brazil	Rwanda	China
Financing	General taxation (federal, state, municipal)	General taxation + household premiums + donor support	Payroll contributions + individual premiums + government funding and subsidies
Insurance Structure	Unified public system (SUS)+ optional private insurance	Community-Based Health Insurance (CBHI)	Multiple publicly managed schemes for employees and residents
Delivery	Emphasis on primary care and preventive services; private sector fills gaps in access and amenities	Strong emphasis on primary care through community health workers	Hospital-centered healthcare delivery system
Provider Ownership	Predominantly public providers, with growing private sector participation	Public hospitals dominate; private and faith-based providers supplement	Predominantly public hospitals; private sector growing but still limited
Government Role	Strong stewardship and regulation; decentralized delivery with shared responsibilities across levels	Strong centralized planning and coordination	Strong centralized planning + decentralized implementation by local governments
Equity Tools for UHC	Free care for all residents; targeted programs for underserved groups	Wealth-based premium subsidies	Subsidies for low-income groups, catastrophic coverage, and tiered benefits

Table 2. Performances of Health Systems in Brazil, Rwanda, and China

Country	Goals of health systems	Performance
Brazil	Financial risk protection	• 75% of Brazilians relied exclusively on SUS by 2018, while 25% had private health insurance (Tikkanen *et al.*, 2020). • Household surveys showed reduced unmet healthcare needs and financial barriers (Couttolenc *et al.*, 2013). • Over 10 million Brazilians (4.87% of population) were pushed into poverty annually due to OOP payments in 2017-2018, exceeding global (2.5%) and Latin America and the Caribbean (1.8%) averages (Araujo and Coelho, 2021).
	Healthcare access and health status	• Primary care use rose by 85% from 1998 to 2013 (Araujo and Coelho, 2021). • Unnecessary hospitalizations were reduced (Macinko *et al.*, 2010). • Life expectancy increased from 66 to 76 years between 1990 and 2023, while maternal mortality fell from 140 to 67 per 100,000 live births (The World Bank, 2025). • Avoidable mortality declined significantly (de Abreu *et al.*, 2007; Malta *et al.*, 2010). • Medical consultations per capita increased by 70% in the first decade after the SUS's establishment (Couttolenc *et al.*, 2013).
	Public satisfaction	• According to a global survey conducted in 2023, only 43% of respondents trusted the Brazilian health system to provide the best care, below the global average (51%) and other middle-income countries like India (75%), Thailand (62%), and Colombia (45%) (IPSOS, 2023a). • Over 80% believe many people cannot afford quality care and that doctor wait times are too long (IPSOS, 2023b). • Individuals with private coverage report better access and higher utilization compared to those relying solely on the public system (Paim *et al.*, 2011).

Rwanda	Financial risk protection	• Share of households spending over 10% of income on health dropped from 2.35% in 2005 to 1.15% in 2016 (United Nations, 2023). • Number of people at risk of catastrophic surgical care fell from 64% in 2005 to 17% in 2022 (The World Bank, 2025). • Wealth-based disparities in CBHI spending narrowed after 2010 premium reform replaced flat rate with stratified premiums (Chirwa *et al.*, 2021). • Children in insured households are less likely to engage in income-generating activities or household chores and tend to achieve better educational outcomes (Strobl, 2017; Woode, 2017).
	Healthcare access and health status	• Healthcare utilization increased and unmet need reduced through CBHI coverage (Saksena et al., 2011; Shimeles, 2010). • Socioeconomic disparities in healthcare access and utilization remain to be addressed (Kpienbaareh *et al.*, 2019; Liu *et al.*, 2019). • Life expectancy increased from 42 years in 1995 to 68 years in 2023, while infant mortality rates dropped from 126 to 31 per 1,000 live births (The World Bank, 2025). • HIV incidence among individuals aged 15–49 declined from 6.7 to 0.4 per 1,000 uninfected people between 1995 and 2022 (The World Bank, 2025). • Each 1% increase in CBHI use was associated with 3.7% more HIV/AIDS prevention of mother-to-child transmission and 2.5% more voluntary HIV/AIDS counseling and testing services (Zeng et al., 2014).
	Public satisfaction	• Rwandans reported the highest level of trust in their healthcare system worldwide, with 97% expressing confidence in hospitals and health clinics (*Wellcome Global Monitor 2018*, 2019). • Healthcare quality satisfaction rose significantly from 65% in 2008 to 82% in 2018 (Kpienbaareh *et al.*, 2019; Liu *et al.*, 2019). • High confidence attributed to improved health outcomes, transparent communication and reporting, and CBHI system's foundational role (*Wellcome Global Monitor 2018*, 2019).

China	Financial risk protection	• OOP contributions to total health spending dropped from 59.0% in 2000 to 37.5% in 2009, and 27.6% in 2021 (National Health Commission, 2022). • The pharmaceutical procurement and pricing reforms reduced the drug expenditure, but increased other expenses (Cao *et al.*, 2024; Yi *et al.*, 2015). • The risk of catastrophic health expenditure decreases, though disparity across socioeconomic status remains (Li *et al.*, 2025). • Enhanced coverage of expensive outpatient services for chronic conditions, a major driver of medical impoverishment (Shi *et al.*, 2025). • Health insurance coverage increased non-medical consumption and helped maintain investments in children's human capital during health shocks (Liu, 2016). • Exposure to health insurance in early life has significant positive impact on health and educational outcomes in adolescence (Huang and Liu, 2023). • Higher rate of catastrophic health expenditures and medical impoverishment persist despite universal coverage, partially due to rapid increase in service costs (Wagstaff *et al.*, 2018)
	Healthcare access and health status	• Life expectancy at birth rose from 72 years in 2000 to 78 years in 2023, and under-five mortality dropped from 37 to 6 per 1,000 live births (The World Bank, 2025). • Public insurance schemes reduced illness likelihood, improved life expectancy, and enhanced mental health through increased healthcare utilization (Gruber *et al.*, 2023; Huang and Gan, 2017; Lei and Lin, 2009; Li and Zhang, 2013; Lu *et al.*, 2012). • Maternal mortality gap between urban and rural areas narrowed from 40.3 deaths per 100,000 live births in 2000 (69.6 in rural areas and 29.3 in urban areas) to 2.3 per 100,000 in 2022 (16.6 in rural areas and 14.3 in urban areas) (National Health Commission, 2024). • Health disparities across provinces with varying per capita GDP levels declined markedly (Meng *et al.*, 2019).
	Public satisfaction	• Public satisfaction rose from 57.8% to 77.3% between 2006 and 2013, and perceived fairness in healthcare increased from 49.8% to 72.0% (Zhu *et al.*, 2022).