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Public Health Care Financing Policy and Welfare Economics: An Analysis of Punjab's Sehat Sahulat Program in light of Global Markets

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Abstract: This paper examines international public health insurance (PHI) models through a theoretical lens, visualizing cross-country data (2010- 2020) on the Universal Health Coverage (UHC) Index, out-of-pocket (OOP) expenditure, catastrophic spending, and poverty to empirically test Kenneth Arrow's uncertainty framework. The correlations demonstrates that countries with stronger risk pooling—such as Germany, France, Thailand, and Turkey—achieve high UHC scores with minimal household impoverishment, validating Arrow's prediction that unregulated OOP reliance amplifies financial risk. Building on this comparative foundation, the paper develops a case study of Punjab's Sehat Sahulat Program (SSP), situating it within Arrow's framework and the broader tradition of welfare economics. The study pursues objectives of analyzing the global rationale for PHI adoption, evaluate impacts on equity and access, identify challenges, benchmark SSP against international reformers, and integrate cross-cutting themes of digitization, climate resilience, gender equity and overall SDGs. Findings show Pakistan and other low income countries trapped in a high-OOP, low-UHC quadrant with persistent catastrophic expenditures, poverty effects, and fragmented schemes, while reform-driven middle-income countries shows tangible gains through deeper and broader coverage. To address these gaps, the paper proposes an Integrated Evaluation Matrix and an AI–Climate–Gender (ACG) resilient framework for PHI, contributing policy recommendations to strengthen fiscal commitment, expand service depth and breadth, and institutionalize risk pooling. These reforms are vital to advancing UHC, ensuring equity, and enabling PHI to deliver sustainable welfare gains in the low middle incomes countries and especially Pakistan.
Keywords: Health financing, Universal Health Coverage (UHC), Sehat Sahulat Program (SSP), Public Health Insurance (PHI), Out of Pocket Expenditure (OOP), Welfare Economics, Arrow's theory of Uncertainty, Risk Pooling, Climate Change, Gender, Digital Health.

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1. Introduction

The welfare economics of public health supports human well-being, enhances societal productivity, and strengthens the effective deployment of social capital. Access to basic needs—such as a balanced diet, hygienic practices, and suitable shelter—forms the foundation of a healthy life cycle. Recognizing this, governments across the world allocate budgets and legal frameworks to strengthen healthcare delivery as a driver of socioeconomic progress. Human capital[1], a central determinant of national income, is closely tied to the health and welfare of individuals; conversely, improvements in population health reinforce economic performance. In 1960s, Gary Becker's theory of human capital[2], alongside Schultz's pioneering work (1961), provides the theoretical grounding for analyzing healthcare as a form of investment. Health facilities, much like "normal goods[3]," exhibit rising demand with increasing income, and health services follow this economic pattern.

Investment in healthcare has therefore captured the attention of economists and policymakers alike. As a merit good[4], healthcare requires state intervention to correct market failures, generate positive externalities, and prevent exploitation by private providers. In practice, most countries rely on a mix of public and private insurance systems to guarantee uninterrupted health services. For example, the United States relies heavily on private insurance, while countries such as the United Kingdom, Denmark, Norway, New Zealand, Germany, Canada, and Taiwan[5], along with some low-income nations in Sub-Saharan Africa, recognize healthcare as a fundamental human right and provide universal

[1] Schultz, T. W. (1961). *Investment in Human Capital.* American Economic Review.
[2] Soares, R. R. (2015). Gary Becker's contributions in health economics. *Journal of Demographic Economics*, *81*(1), 51-57.
[3] Normal goods are goods for which demand increases as consumer income rises.
[4] A merit good is a good that is socially desirable and tends to be under-consumed if left to the free market, often warranting government provision or subsidy.
[5] Firmansyah. (2024). Health insurance and public health: Analyzing the impact of financing and policy on healthcare access. *Jurnal Riset Kualitatif dan Promosi Kesehatan, 3*(1), 41–49. Wajahat. (2020). Public Financial Management and the SDGs a case study of Business Accounting and Finance, Government College University, 10, Jan, 2020 – 05 Aug, 2025.

or subsidized coverage through public financing and social insurance models. Historical precedents, such as Otto von Bismarck's 1883 Health Insurance Law[6], demonstrate the enduring value of risk pooling and insurance in ensuring equitable access to care. Today, Germany maintains a statutory health insurance system covering the majority of its population, comparable in function to Medicaid in the United States.

The economics of healthcare also highlight the importance of risk pooling in the face of clinical uncertainty and expenditure shocks. Health insurance mitigates out-of-pocket expenditures by distributing risk, thereby stabilizing household welfare. This also make parallel with health economics principles, which highlight that optimal consumption occurs when marginal benefits equal marginal costs, both at the individual and systemic level. Globally, such frameworks have informed healthcare reforms and have been integrated into sustainable development efforts, particularly under the United Nations' Sustainable Development Goals (SDGs). Goal 3 of the SDGs places health at the center of global development, emphasizing universal access, improved quality of care, and reduced inequalities. The increasing role of digitization and artificial intelligence (AI) in health systems, along with cross-cutting themes such as gender and climate change, further shape the evolving setting of public health insurance policy.

In Pakistan, these global policy debates take on a critical dimension. The country faces persistent challenges of low health coverage, inadequate infrastructure, and high out-of-pocket expenditures that push millions into poverty each year. While healthcare expenditure remains low around 0.9% of the total GDP, with a PSDP budget of Rs. 103.5 billion, pertaining the gaps as the WHO guidelines suggest that the health spending must be **around 5% of GDP**[7], this leading to gaps remain in ensuring equitable, transparent, and efficient access. The health

[6] Busse, R., Blümel, M., Knieps, F., & Bärnighausen, T. (2017). Statutory health insurance in Germany: A health system shaped by 135 years of solidarity, self-governance, and competition. *The Lancet, 390*(10097), 882–897. https://doi.org/10.1016/S0140-6736(17)31280-1

[7] Ministry of Finance, Government of Pakistan. (2025). *Pakistan economic survey 2024–25*. Retrieved from Ministry of Finance website: https://www.finance.gov.pk/survey_2025.html

infrastructure aids 1,696 hospitals and 5,434 basic health units[8], although critical health indicators continue to raise alarms, such as an infant mortality rate of 50.1 per 1,000 births (2023) and a life expectancy of 67.6 years[9]. Pakistan's experience during the COVID-19 pandemic demonstrated resilience in crisis response, yet systemic weaknesses continue to constrain universal coverage.

Punjab's healthcare initiatives are supported out through the Punjab Health Initiative Management Company (PHIMC), focusing mainly on providing health coverage and easing the financial burden of medical expenditures for beneficiaries. The Universal Health Insurance Program/Sehat Sahulat Program is currently being implemented under the Public Sector Development Program (PSDP). For the fiscal year 2025, the PSDP allocation for this project is set at Rs 54 million, aimed at decreasing out-of-pocket healthcare expenses for vulnerable sectors of the population, utilizing a combination of both public and private service delivery. The developments in the health insurance program have resulted in substantial government savings of thirty-three billion rupees[10].

PHIMC's coverage has now been extended to more than 34 million families in 2024, encompassing around 360 public and private hospitals, with successful treatment provided to 9.3 million patients. It aspires to advance the goals of Universal Health Coverage (UHC) outlined in Pakistan's National Health Vision 2016–2025[11] (World Health Organization, 2016–2025). However, several other challenges persist: limited grassroots penetration, uneven access to private hospitals, denial

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[8]**World** Bank. (2023). *World Development Indicators*. World Bank. https://databank.worldbank.org/source/world-development-indicators

[10] Punjab Health Initiative Management Company. (2024, July 29). *14th meeting of the Standing Committee of the Cabinet on Universal Health Insurance held on July 29, 2024*. PHIMC. Retrieved [date you accessed it], from https://phimc.punjab.gov.pk/node/1201

[11] Government of Pakistan & World Health Organization. (2016). ***National Health Vision Pakistan 2016–2025***. Retrieved from https://extranet.who.int/countryplanningcycles/sites/default/files/planning_cycle_repository/pakistan/national_health_vision_2016-25_30-08-2016.pdf

of treatment, informal demands for cash, lack of transparency, and restrictions on coverage for critical medicines and life-threatening conditions. These limitations highlight the urgent need for benchmarking and reform, particularly in resource-constrained contexts where tools such as the Poverty Means Test (PMT)[12] score play a crucial role in targeting beneficiaries.

The motivation for this research is rooted in analyzing the global public health insurance models, evaluating their equitable and efficient structures to ensure cost-effectiveness, while also connecting these systems with overarching themes such as gender, climate, and data governance mechanisms to mitigate issues of information asymmetry and moral hazard. It also aims to develop a comparative analysis of successful PHI models across the world and drafting recommendations for Pakistan to roll out such models across the country- developing the case study of Sehat Sahulat program[13]. This addresses the equity concerns ensuring vertical and horizontal effectiveness and fairness. Global research on health insurance is extensive, but studies focusing on lower-middle-income countries—especially at the sub-national level in Punjab—are limited, emphasizing the need for this analysis. Accordingly, the research examines, the economic challenges of Punjab's Sehat Sahulat Program, and its capacity to address risk pooling, adverse selection, and fiscal space. Drawing on theoretical constructs from the Kenneth Arrow's work on uncertainty and expected utility[14], along with theories of moral hazard,

[12] The **Poverty Means Test (PMT) score** is a proxy indicator that estimates a household's welfare status based on observable characteristics to determine eligibility for social assistance programs.

[13] Ali, F., Idrees, R.N., Shakil, M.H. *et al.* Impact assessment of Sehat Sahulat Program: a qualitative study of the government of Pakistan. *Qual Quant* (2025). https://doi.org/10.1007/s11135-025-02317-1

[14] Arrow, K. J. (1963). "Uncertainty and the welfare economics of medical care." *American Economic Review, 53*(5), 941–973

principal-agent dynamics, and the public good nature of health[15], the study situates SSP within broader debates on health financing reforms.

The objectives of the study are fivefold: (i) to analyze the rationale for adopting public health insurance around the world; (ii) to assess its fiscal sustainability; (iii) to evaluate its impact on equity, access, and health outcomes; (iv) to identify governance and implementation challenges globally; and (v) to benchmark SSP against international best practices (vi) to link the emerging cross cutting themes of digitization, climate and gender with public health insurance models. The ultimate aim is to provide policy recommendations for strengthening Pakistan's health financing system, advancing UHC, and ensuring that public health insurance delivers meaningful welfare gains across society. Unlike previous studies that only describe SSP, this paper frames it explicitly within Arrow's uncertainty framework and evaluates fiscal, governance, and equity presentation.

2. Research Gap

2.1. Structural and theoretical gaps in health financing research

The literature on health financing reveals persistent gaps that hinder evidence-based reform. Limited attention has been given to how macroeconomic conditions, intersectoral dynamics, and institutional capacities shape reforms, alongside insufficient evidence on risk-pooling effectiveness, fiscal space expansion, and the alignment of international aid with national priorities. Political economy factors—including regime shifts, private sector influence, and competing policy agendas—remain underexplored, despite their critical role in shaping universal health coverage[16]. Equity assessments are also narrow, often restricted to taxation and insurance, overlooking hybrid arrangements in emerging

[15] Schramme T. Health as Complete Well-Being: The WHO Definition and Beyond. Public Health Ethics. 2023 Jul 27;16(3):210-218. doi: 10.1093/phe/phad017. PMID: 38333767; PMCID: PMC10849326.

[16] Whyle, E.B., Olivier, J. A socio-political history of South Africa's National Health Insurance. *Int J Equity Health* **22**, 247 (2023). https://doi.org/10.1186/s12939-023-02058-3

economies where multiple funding streams generate both progressive and regressive effects. Moreover, social health insurance programs face unresolved challenges of informal sector inclusion, long-term financial sustainability, and integration with broader financing strategies, all of which demand stronger governance frameworks to address risks of moral hazard, adverse selection, and inequitable outcomes, hindering the efficiency of achieving Universal health coverage (UHC)[17]. This paper addresses this by situating Pakistan's Sehat Sahulat Program within Arrow's framework of uncertainty and welfare economics, showing how structural and theoretical blind spots manifest in practice and how they can be addressed through multispectral reforms.

2.2. Empirical evidence of these gaps across regions and program

While health financing has improved globally, there are still problems with how impoverishment due to out-of-pocket (OOP) expenses is measured. Different countries practice different methods to assess poverty, making comparisons difficult[18]. Evidence is also thin on how differences in prepaid contributions and social security systems shape financial protection, while methodological weaknesses exists in addressing missing household survey data. In sub-Saharan Africa, fragmented financing structures undermine both equity and efficiency, yet little research identifies effective risk-pooling strategies, integration of frameworks, or sustained OOP reduction. China's experience similarly exposes inequities: OOP spending remains regressive despite expanded insurance, with insufficient analysis of how benefit package design, rural–urban disparities, and consumption patterns mediate protection outcomes. Mental health care, moreover, is rarely examined in relation to insurance reforms, as most studies assess service utilization without probing how

[17] Universal health coverage (UHC) means that *all people have access to the health services they need, when and where they need them, without financial hardship* (World Health Organization, 2019).

[18] S. Docrat, D. Besada, S. Cleary, C. Lund, "The impact of social, national and community-based health insurance on health care utilization for mental, neurological and substance-use disorders in low- and middle-income countries: a systematic review," Health Economics Review, 2020. https://doi.org/10.1186/s13561-020-00268-x.

scheme design links to financing and mental health outcomes[19]. Even the New Cooperative Medical Scheme, while improving service use, reveals persistent provincial and income-based inequities, with inadequate inquiry into how reimbursement rates, regional governance, and long-term protection mechanisms interact to reinforce or alleviate these divides. Collectively, these gaps underscore the need for context-sensitive, equity-driven research that integrates fragmented systems, addresses marginalized populations, and incorporates political economy insights to build more sustainable financing reforms. This research paper addresses this by empirically benchmarking SSP against cross-country UHC, OOP, and poverty indicators, highlighting how Pakistan's outcomes deviate from international reform capabilities.

2.3. Governance shows why reforms succeed or fail

Recent transformations in health financing highlight the growing role of governance and evidence-informed policy-making as determinants of reform trajectories. Beyond technical design of economics principles, the success of financing models increasingly depends on how governments mobilize institutional capacity, regulate provider incentives, and align reforms with broader socio-political programs[20]. China's late-2000s transition is a critical illustration: abandoning a rigidly centralized and bureaucratic framework, it adopted an insurance-driven universal coverage model that was reinforced by structural hospital reforms, signaling a recalibration of state roles from direct provider to strategic purchaser and regulator. This governance shift not only extended coverage but also rectified tensions between efficiency, equity, and sustainability, underscoring that historical trajectories shape the distributive consequences of reforms[21]. Situating contemporary health policies within such governance transitions is consequently essential to understanding

[19] M. Chen, W. Chen, Z. Yu-xin, "New evidence on financing equity in China"s health care reform - A case study on Gansu province, China," BioMed Central, 2012

[20]Zhou, Q., Liu, G.G. & Krumholz, S. Is Chinese National Health Insurance Effective in the Face of Severe Illness? A Perspective from Health Service Utilization and Economic Burden. *Soc Indic Res* **132**, 1307–1329 (2017). https://doi.org/10.1007/s11205-016-1330-5

[21] J. Kutzin, "Anything goes on the path to universal coverage? No.," World Health Organization, 2012. https://doi.org/10.2471/blt.12.113654

their long-term implications for equity, system resilience, and health outcomes[22]. This paper addresses this by analyzing how weak institutional design and fragmented governance limit SSP's effectiveness, illustrating lessons from successful reforms in international best practices.

2.4. PHI design shows the conceptual blind spots

While public health insurance (PHI) is often presented as a pathway to equity and universal coverage, moving beyond its scope to the underlying principles of equity, efficiency, and sustainability in health systems, empirical evidence endorses that its effectiveness critically depends on the underlying institutional and conceptual design. Countries with comprehensive PHI schemes sometimes underperform because they neglect the principles to address Arrow's foundational insights on uncertainty, asymmetric information, and risk-pooling, weak incentive alignment persist, undermining both fiscal sustainability and service delivery[23]. While equity remains crucial, the analytical trial lies in operationalizing it—designing mechanisms that redistribute resources across income groups, regions, and risk pools without undermining fiscal sustainability.

For instance, systems that prioritize broad enrollment targets without robust mechanisms for provider accountability or cost containment often experience escalating expenditures with limited gains in health outcomes. Similarly, insurance models that focus narrowly on financial protection but overlook structural inequities in service distribution continue regional and class-based disparities. Thus, the paradox arises that even apparently comprehensive PHI systems can reinforce inefficiencies and inequities when the conceptual foundations of health economics—risk pooling, expected utility under uncertainty, and the public good nature of health—

[22] A. Maeda, E. Arajo, C. Cashin, J. Harris, N. Ikegami, M. R. Reich, "Universal Health Coverage for Inclusive and Sustainable Development: A Synthesis of 11 Country Case Studies," None, 2014. https://doi.org/10.1596/978-1-4648-0297-3

[23] D. Erlangga, S. Ali, K. Bloor, "The impact of public health insurance on healthcare utilisation in Indonesia: evidence from panel data," Springer Science+Business Media, 2019. https://doi.org/10.1007/s00038-019-01215-2

are not adequately embedded in policy design[24]. Health financing research neglects the interface between design, governance, and political economy, which explains determined failures of PHI in LMICs despite reforms.

This paper addresses this by representing how SSP's inpatient-only design reflects these blind spots and by proposing an incorporated framework that links fiscal sustainability, governance, and equity with modern stressors such as AI, climate shocks, and gender inequities.

3. Theoretical backing of the public health insurance models:

3.1. Strong conceptual model for the public health insurance model:

Kenneth Arrow[25] (1963) showed that healthcare markets are fundamentally different from standard competitive markets due to uncertainty and unequal access to information. Illness is unpredictable, and medical knowledge is distributed unevenly among doctors, insurers, and patients. These characteristics lead to market failures, resulting in inefficiencies in unregulated private markets.

Arrow outlined key market failures – discussed in the context of SSP:

He identified several structural failures that make health care markets fundamentally different from other markets. These failures are central to understanding why government intervention, particularly through health insurance, is necessary — and why programs like Punjab's Sehat Sahulat Program (SSP) struggle to deliver on their potentials.

1. **Uncertainty and Incomplete Markets**

The theory postulates the illness is uncertain and catastrophic, yet private markets cannot insure against correlated, high-cost risks. SSP insures

[24] D. A. Osei, F. Masiye, F. Tediosi, G. Fink, "Purchasing for high-quality care using National Health Insurance: evidence from Zambia," Health Policy and Planning, 2023. https://doi.org/10.1093/heapol/czad022

[25] Arrow, K. J. (1978). Uncertainty and the welfare economics of medical care. In *Uncertainty in economics* (pp. 345-375). Academic Press.

inpatient hospitalization but excludes outpatient and preventive care, where most uncertainty lies. This leaves households exposed to shocks that Arrow argued require collective risk pooling.

Implication:

SSP structurally underperforms because it insures only the visible, high-cost segment while leaving the bulk of health uncertainty unmanaged — violating Arrow's principle that social insurance must cover systemic risk.

2. **Asymmetric Information**

Providers hold more information than patients and insurers, leading to supplier-induced demand, over-treatment, and inefficiencies. SSP's panel hospitals often overbill, exaggerate diagnostics, or induce admissions, with weak monitoring enabling rent-seeking.
Implication: SSP fails structurally because it expanded insurance without structuring governance capacity to counteract informational rents.

Figure 1 in Appendices

3. **Adverse Selection**

Arrow identified that if enrollment is optional or uneven, high-risk individuals dominate pools, driving up costs and undermining sustainability. SSP is universal in theory, but in practice, awareness and access are uneven. Utilization is focused among higher-risk and urban populations, creating imbalances.

Implication: SSP underperforms because it fails to secure broad, balanced participation and does not effectively integrate informal sector households into a sustainable pool.

4. **Moral Hazard**

Insurance reduces the direct cost of care, promising higher utilization, sometimes unnecessary. Evidence points to repeated claims,

overutilization in tertiary hospitals, and unnecessary admissions, while preventive care is ignored since it is not covered.

Implication: SSP structurally underperforms because it amplifies hospital-based over-treatment while leaving under-provision of preventive care unchecked — producing cost escalation with limited health gains.

5. **Externalities and the Public Good Nature of Health**

Health services, especially preventive ones, generate positive externalities (e.g., herd immunity, productivity). Left to markets, these services are under-provided. SSP is treatment-oriented, focused on curative inpatient services, while high-return preventive interventions like immunization, maternal health, and early screening remain underfunded.

Implication: SSP underperforms because it ignores the externality logic: by prioritizing curative care over preventive public goods, it misallocates resources and perpetuates systemic inefficiencies.

Collectively, these factors warrant government action through regulation, subsidies, or public insurance. Public health insurance[26] is justified on five bases: (1) risk pooling through universal coverage, (2) equity by incorporating the poor and those in informal employment, (3) efficiency by distributing costs across the tax base, (4) regulatory measures to alleviate information disparities, and (5) acknowledgment of health as a public good that provides wide social benefits.

Overall implications to SSP

Consequently, the SSP demonstrates both the enduring relevance and the limits of Arrow's framework. The program was conceived to address market failures through public risk pooling and equity-driven coverage, yet its design and implementation leave the central failures unresolved. Uncertainty is only partially managed, asymmetric information enables

[26] Fischer, T., Frölich, M., & Landmann, A. (2023). Adverse selection in low-income health insurance markets: Evidence from an RCT in Pakistan. *American Economic Journal: Applied Economics*, *15*(3), 313-340.

systemic overbilling, adverse selection skews utilization, and moral hazard inflates costs. Preventive services and other positive externalities remain neglected, further weakening overall system efficiency. SSP therefore validates Arrow's diagnosis of why health markets fail but also reveals that correcting these failures requires more than insurance enrollment. Without adequate fiscal space, institutional capacity, and governance reforms, public health insurance risks reproducing the very inefficiencies it was meant to solve.

3.2.Other Foundational Theories

These theories provide the intellectual backbone for understanding why health insurance is both necessary and effective in Pakistan:

Theory	Application to Public Health Insurance Models
Welfare Economics Theory[27]	Health insurance generates positive externalities and acts as a public good. State intervention is warranted to correct market failures like imperfect information, adverse selection, and moral hazard. Catastrophic health expenditures push million into poverty annually, validating the need of such and other programs as instruments of social welfare.
Risk Pooling and Risk Sharing Theory	It highlights that small private pools fails under high-risk concentration, whereas universal schemes spread costs across populations to ensure sustainability. Public health insurance operationalizes this by pooling government funds to protect weak households and reduce individual fiscal shocks.
Rawlsian Approach[28]	Access to healthcare is a basic right, positioning SSP not merely as welfare but as a distributive social justice and equity device.

[27] Pigou, A. C. (1920). *The economics of welfare*. London: Macmillan.
[28] Bommier, A., & Stecklov, G. (2002). Defining health inequality: why Rawls succeeds where social welfare theory fails. *Journal of health economics*, *21*(3), 497-513.

These theoretical traditions deepen the rationale. However, these theories often assume strong fiscal and administrative capacity, which Pakistan (Punjab's health sector) lacks, creating a theory–practice gap.

3.3.**Economic and Health Insurance Models**

Different models of health insurance contextualized for Pakistan:

Model	**Relevance to Pakistan**
Bismarck Model (Social Health Insurance)[29]	Funded via payroll taxes. Coverage is limited (~5% of formal sector).
Beveridge Model (National Health System)[30]	Funded through general taxation, aiming for universal coverage. SSP approximates this model but remains incomplete.
Private Insurance Market Model	Voluntary, premium-based insurance. Limited to middle/high-income groups due to affordability constraints.

These economic and insurance models offer further context. The Bismarck model is inapplicable beyond Pakistan's small formal sector, while the Beveridge model provides a closer analogue to SSP but suffers from fiscal constraints and weak tax compliance, likewise the case is with the private insurance remains regressive, catering only to elites. Thus, Pakistan's hybrid system borrows elements without fully comprehending the strengths of any model, raising sustainability crises.

3.4. **Behavioral and Institutional Theories**

[29] Tulchinsky TH. Bismarck and the Long Road to Universal Health Coverage. Case Studies in Public Health. 2018:131–79. doi: 10.1016/B978-0-12-804571-8.00031-7. Epub 2018 Mar 30. PMCID: PMC7149836.
[30] Beveridge, W. (1942). *Social insurance and allied services (The Beveridge Report)*. London: His Majesty's Stationery Office.

These explain the operational inefficiencies and governance challenges:

Theory	Pakistan Context
Information Asymmetry	Patients and providers know more than insurers, leading to overbilling, fraud, and inefficiencies in SSP panel hospitals **(Akerlof, 1970).**
Public Choice Theory[31] (PCT)	Insurance policy design influenced by political motives and donor preferences; SSP expansion sometimes aligns with electoral promises.
Institutional Theory[32]	Strong governance and monitoring are crucial. Weak institutional capacity in Pakistan leads to leakage, inequity, and sustainability challenges.

These theories also expose why performance lags. Akerlof's information asymmetry manifests in SSP hospitals through overbilling and fraud. PCT explains why developments align with electoral cycles rather than actuarial logic. Institutional theory endorses the idea that without enforcement and accountability, even well-planned schemes leak resources and fail to protect the vulnerable. Finally, **recognizing health as a public good[33] (non-rival and non-excludable)** e.g., **vaccination, epidemic control, maternal care** highlights services the market systematically underprovides. Pakistan's struggles with polio and maternal mortality exemplify why public financing is crucial, but also why weak delivery systems challenge returns.

4. Approach of the research paper:

[31] Buchanan, J. M., & Tullock, G. (1962). *The calculus of consent: Logical foundations of constitutional democracy*. Ann Arbor: University of Michigan Press.

[32] **Institutional Theory** explains how organizational structures, practices, and behaviors are shaped by formal rules, social norms, and cultural expectations within their institutional environment, emphasizing legitimacy, conformity, and the influence of established institutions

[33] Ziegler, S., Srivastava, S., Parmar, D. *et al.* A step closer towards achieving universal health coverage: the role of gender in enrolment in health insurance in India. *BMC Health Serv Res* **24**, 141 (2024). https://doi.org/10.1186/s12913-023-10473-z

This research utilizes a theoretical, descriptive and comparative design based on Kenneth Arrow's analysis of healthcare market failures. Rather than testing causal hypotheses econometrically, the paper aims to **illustrate how theoretical predictions manifest in real-world program design and results**, making it exploratory by nature.

Although it primarily focuses on conceptual frameworks, it integrates empirical data through secondary sources to illustrate trends in health system performance and financial protection. The dataset encompasses the years 2000 to 2022 and includes three categories of countries, high, middle and low income countries (the UK, Germany, France, USA, Netherlands, Thailand, Mexico, Turkey, Rwanda, Ghana, India, Bangladesh, Pakistan, Sri Lanka, Iran, and Indonesia)—facilitating both global assessments and specific insights for Pakistan. The analysis focus on three dimensions of UHC (i) service coverage, (ii) financial protection (iii) equity implications.

These visualizations directly respond to the research objectives:

- Linking **UHC and OOP trends**, the paper assesses SSP's effectiveness in reducing household financial burden.
- By tracking **poverty and CHE shifts**, the analysis demonstrates the inequalities prevailing in the society due to the inadequate health coverage.
- By benchmarking **Pakistan against international reformers**, the study situates SSP within broader policy lessons.

5. Scope and data quality considerations:

Some data gaps hinders robust analysis, with UHC Service Coverage Index data ending in 2018 and OOP data only available until 2020, limiting continuity in time-series assessment. While the study adopts a descriptive approach grounded in welfare economics rather than causal inference, concerns remain about harmonization across global repositories, uneven national reporting, and the omission of informal and non-monetary payments. Moreover, indicators like the UHC Service Coverage Index capture service availability and use but ignores the care

quality, highlighting the need for more comprehensive metrics for policy design.

The results are contextualized within Arrow's theoretical model, allowing for a combination of empirical findings and conceptual discussions related to public health insurance and government intervention in healthcare markets.

Indicator name	Short Form	Definition	Source
1. Financial hardship: population pushed below a relative poverty line by household health expenditures - 60% of median daily per capita consumption or income (%, national, rural, urban)	Population with impoverishing health expenditures, at a relative poverty line (60% of median daily per capita consumption or income)	The percentage of the population for whom the total household expenditure or income, inclusive of health-related spending, meets or exceeds the poverty threshold, while the total consumption expenditure or income, excluding health expenses, falls below that threshold. Household consumption or income, health expenditures, and the relative poverty threshold are all assessed based on their daily per capita values. To derive representative figures per individual, the household's sample weight is multiplied by the size of the household; if the sample is self-weighting, only the household size is utilized as the weight. The relative poverty line, which varies by country, is established at 60% of the median daily per capita consumption or income in each nation. This measure highlights the relationship between SDG target 1.2, which aims to eradicate poverty globally, and SDG target 3.8, which focuses on achieving Universal Health Coverage.	Global Health Observatory (WHO)[34]

[34] World Health Organization. (n.d.). *Global Health Observatory data repository*. World Health Organization. https://www.who.int/data/gho

Financial hardship: increase in poverty gap due to household health expenditures, expressed as a proportion of the $3.20 a-day poverty line	Poverty gap due to out-of-pocket health spending, expressed as a proportion of the 2011 PPP $3.20 a day poverty line	The rise in the poverty gap resulting from household health expenditures aligns with the increase in the average shortfall of consumption or income from a poverty line due to household health expenses. This increase in the average shortfall is represented as a percentage of the poverty line. Household consumption or income, health-related expenditures, and poverty lines are all expressed in terms of their daily per capita values. To derive representative figures per person, the household's sample weight, multiplied by the number of people in the household, is utilized. If the sample is self-weighting, then only the household size is considered as the weight. The international poverty line, set at $3.20 a day per capita in 2011 purchasing power parity (PPP), is referenced (denoted as $3.20-a-day). This line reflects the common benchmark used for evaluating national poverty levels in lower-middle-income nations. International poverty lines are adjusted to local currency units (LCUs) using the 2011 PPP exchange rates and consumer price indices (CPIs).	Global Health Observatory (WHO)
Out-of-	OOP%CH	Share of current health	Global

pocket expenditure as percentage of current health expenditure (CHE) (%)	E	expenditure funded from household out-of-pocket payments	Health Observatory (WHO)
Universal Health Coverage Index	UHC – Index	Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases, non-communicable diseases and service capacity and access, among the general and the most disadvantaged population). The indicator is an index reported on a unit less scale of 0 to 100, which is computed as the geometric mean of 14 tracer indicators of health service coverage. These 14 indicators span reproductive, maternal, newborn, and child health; infectious diseases and non-communicable diseases; as well	Sustainable Development Goals[35]

[35] United Nations, Department of Economic and Social Affairs, Statistics Division. (2024, January 8). *Universal Health Coverage (UHC) service coverage index [Official estimate]*. United Nations. https://data.who.int/indicators/i/3805B1E/9A706FD

		as health system capacity, including both infrastructure and workforce. By assessing service delivery for general and marginalized populations—such as services for family planning, antenatal care, immunization, and disease treatment—this index provides a standardized, evidence-based approach for evaluating health coverage.	

Financial hardship: population with household expenditures on health greater than 10% of total household expenditure or income (SDG 3.8.2) (%, national, rural, urban)	Population with household health expenditures greater than 10% of total household expenditure or income (SDG 3.8.2)	The proportion of the population with household expenditure on health exceeding 10% of total household expenditure or income.	
Health infrastructure: provincial hospitals, density per 100 000 population	Density of provincial hospitals	Number of provincial hospitals from the public and private sectors, per 100,000 population.	Global Health Observatory (WHO)
Pakistan Health Budget	% of GDP	% of GDP	Economic Survey of Pakistan 2024- 25[36]

[36] Economic Adviser's Wing. (2019–2024). *Pakistan economic survey*. Ministry of Finance, Government of Pakistan. https://www.finance.gov.pk

Punjab Health Budget	In millions	Expenditure done on health sector	Punjab Budget 2024-25[37]
Health Key Indicators		1. Prevalence of HIV 2. Neonatal mortality rate 3. Maternal mortality ratio 4. Life expectancy at birth 5. Infant mortality 6. Incidence of TB 7. Immunization	World Bank Development Indicators [38] UNICEF[39]

6. Financing versus household impact

UHC OOP Catastrophic Link

Cross-country evidence in figure.2 shows a strong negative correlation between UHC performance and out-of-pocket (OOP) reliance illustrating Arrow's prediction that the countries with stronger pooling, Germany, France, and the UK sustain UHC scores above 80 with OOP below 15%, reflecting robust risk pooling under social or tax-based insurance. By contrast, Pakistan, Bangladesh, and India exhibit UHC scores below 60 alongside OOP levels exceeding 50%, exposing households to catastrophic expenditures. This reliance on direct payments systematically drives vulnerability, as seen in Bangladesh, Ghana, and pre-Ayushman Bharat India, where large shares of households exceed the 10% threshold

[37] Government of Punjab. (2018–2025). *Punjab budget documents: Health sector allocations*. Finance Department, Government of the Punjab. https://finance.punjab.gov.pk

[38] World Bank. (n.d.). *World development indicators*. The World Bank. https://databank.worldbank.org/source/world-development-indicators

[39] UNICEF. (n.d.). *Data warehouse*. United Nations Children's Fund. https://data.unicef.org

for catastrophic spending. Effective risk pooling through prepayment schemes thus proves critical for insulating households from financial shocks.

Figure 2nd in the Appendices

6.1. Insurance Depth, Breadth, and Poverty Impact

Beyond service coverage, the design of public health insurance (PHI) determines its impact on poverty reduction. France, Germany, and the UK report negligible health-induced impoverishment, while reform-driven programs in Thailand[40], Turkey[41], and Mexico demonstrate substantial declines in poverty after broadening and deepening their coverage. Conversely, Pakistan continues to show widening poverty gaps due to shallow risk pooling, limited benefit packages, and exclusion of vulnerable groups. Comparative lessons reveal that universal health coverage alone is insufficient: only insurance models that align coverage breadth (population included) and depth (services provided) with financial sustainability can meaningfully reduce poverty risks.

Figure 3rd in the Appendices

6.2.Equity Dimension:

The effect of healthcare expenses on the poverty gap is influenced by both the coverage breadth (the population included) and the coverage depth (the benefits provided) of PHI. Thailand and Turkey—where insurance encompasses a broad spectrum of preventive and curative services—show little to no increase in poverty gaps. In contrast, Ghana's National Health

[40] Tangcharoensathien, V., Pitayarangsarit, S., Patcharanarumol, W., Prakongsai, P., Sumalee, H., Tosanguan, J., & Mills, A. (2013). Promoting universal financial protection: how the Thai universal coverage scheme was designed to ensure equity. *Health Research Policy and Systems*, *11*(1), 25.

[41] Ökem, Z. G., & Çakar, M. (2015). What have health care reforms achieved in Turkey? An appraisal of the "Health Transformation Programme". *Health Policy*, *119*(9), 1153-1163.

Insurance Scheme and Mexico's Seguro Popular[42] mitigate catastrophic risks but still have limitations due to narrow service offerings. Pakistan continues to experience rises in the poverty gap, revealing structural weaknesses in risk pooling, limited benefits, and exclusion issues.

By examining indicators of financial risk protection alongside UHC and OOP trends, it becomes clear that universal coverage alone, without robust financial pooling mechanisms, is inadequate. Effective PHI models mitigate both catastrophic expenses and poverty risks by ensuring alignment of coverage breadth, benefit depth, and financial stability. This systematically tests how PHI financing shifts household risk**.**

7. From Catastrophic Spending to Impoverishment: A Continuum of Financial Risk

The relationship between these three variables: poverty head count %, poverty gap increase %, and Pop. >10% health spending %, reflects precisely the failures Arrow (1963) identified: unregulated reliance on OOP amplifies uncertainty, asymmetric information, and adverse selection, leaving households exposed to health shocks.

Figure 4th in the Appendicies

7.1. South Asia: Persistent Vulnerability

Comparative evidence shows that weak or partial public health insurance (PHI) systems expose South Asian households to the full continuum of financial risk. Bangladesh, with minimal insurance coverage, records the highest levels of catastrophic expenditure and poverty impact, reflecting its dependence on OOP payments. Pakistan, despite the Sehat Sahulat Program, shows only marginal improvements because of shallow risk pooling and exclusion errors. India's Ayushman Bharat demonstrates that expanded insurance can reduce poverty-driven health shocks, but uneven implementation curtails its overall effectiveness. The lesson is clear,

[42] García-Díaz, R., Sosa-Rubi, S. G., Serván-Mori, E., & Nigenda, G. (2018). Welfare effects of health insurance in Mexico: The case of Seguro Popular de Salud. *PloS one*, *13*(7), e0199876.

fragmented reforms cannot break the poverty–health cost cycle without deeper and broader insurance integration.

7.2. Emerging Middle-Income Reformers: Tangible Gains

Countries like Thailand, Turkey, and Mexico illustrate how comprehensive PHI reforms translate into measurable reductions in catastrophic spending, poverty gaps, and impoverishment. Thailand's Universal Coverage Scheme cut catastrophic spending to ~5% and poverty impact below 1%, proving the transformative effect of tax-financed pooling. Turkey (~6%; ~0.7%) and Mexico (~9%; ~1.2%) achieved steady improvements, though Mexico still struggles with rural disparities and fiscal strain. Ghana remains constrained by financing and enrollment challenges, showing that partial schemes cannot deliver the same poverty-protection outcomes.

7.3. High-Income Systems: Near-Universal Protection vs. Fragmentation

Mature tax-based and social insurance systems in the UK and Germany virtually eliminate health-induced impoverishment (~0.1%) and keep catastrophic spending minimal (~2%). By contrast, the US illustrates how fragmented, market-driven insurance—even with Medicaid and Medicare—leaves households exposed (~11% catastrophic spending; ~1.5% poverty effect). The contrast underscores that financial protection depends less on income level and more on the structure, inclusiveness, and stability of insurance arrangements.

8. Linking Universal Health Coverage and Financial Protection: Insights from Public Health Insurance Models

The Universal Health Coverage (UHC)[43] Service Coverage Index, which aligns with SDG Indicator 3.8.1. UHC includes aspects like service availability, quality, and accessibility, this analysis highlights financial protection due to the following reasons:

[43] World Health Organization. (2024, January 8). *UHC service coverage index*. https://data.who.int/indicators/i/3805B1E/9A706FD

- The WHO categorizes financial protection as a fundamental component of UHC.
- Public health insurance (PHI) models are designed to pool risk and reduce out-of-pocket expenditures.
- In lower-middle-income countries (LMICs), healthcare costs frequently drive families into poverty.

Figure 5th in the Appendices

Universality of UHC Index:

PHI initiatives such as the Punjab's SSP use the UHC Index to assess if financial protection strategies are improving access, plummeting out-of-pocket spending, and progressing equity. However, most studies examine service delivery or financing in isolation, limiting a holistic understanding of UHC progress. The Index captures service availability and access but overlooks the depth of financial protection and the equity of public health insurance design, creating a blind spot where coverage may expand numerically yet still expose households to impoverishment.

Comparative evidence from Thailand and Mexico shows that integrating risk-pooling with redistributive financing can transform UHC outcomes, while Arrow's warning about uncertainty and asymmetric information underscores why poorly designed insurance cannot deliver true welfare gains. Against this backdrop, this research uses the UHC Index as a standardized, globally recognized metric but addresses its limitations by contextualizing findings with poverty and catastrophic spending indicators, thereby bridging the gap between access and financial protection.

Figure 6, illustrates trends in the UHC Index from 2000 to 2021 for twelve countries, underscoring disparities in access. Countries with high incomes like the UK, Germany, France, the US, and the Netherlands sustain high indices (approximately 79–80), which indicates strong healthcare and insurance infrastructures. Middle-income nations such as Thailand, Mexico, and Turkey reveal significant progress—Thailand's index increased from 43 to 80, and Mexico's rose from 56 to 75—

demonstrating the impact of public insurance in broadening coverage[44]. Low-income countries including Rwanda, Ghana, India, and Bangladesh are making slow but steady advancements (for instance, Rwanda's index increased from 19 to 49, India from 30 to 63, and Bangladesh from 23 to 52), showing gradual access improvements for marginalized groups.

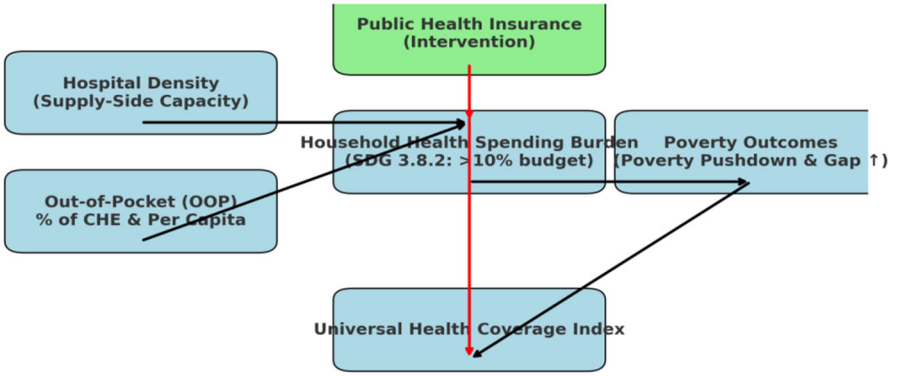
Comparative data reinforces this focus. Countries like Bangladesh and Thailand have made strides in UHC, yet some households still face impoverishment due to healthcare costs, indicating deficiencies in financial protection. Pakistan displays a downward trend in UHC alongside ongoing poverty repercussions, reflecting systemic issues within its PHI framework. In contrast, Germany and France uphold high levels of UHC with minimal poverty effects, showcasing the success of their well-established insurance and tax-funded systems.

In conclusion, the data highlight an inverse relationship between the expansion of UHC and its impact on poverty. For LMICs, improving PHI necessitates not only broader service coverage but also robust financial protection systems. Public health insurance models serve as vital mechanisms for promoting UHC, especially in nations moving from limited to nearly universal coverage.

Figure 6th in the Appendices

8.1. Rational Link to Insurance Models

[44] Mathauer, I., Vinyals Torres, L., Kutzin, J., Jakab, M., & Hanson, K. (2020). Pooling financial resources for universal health coverage: options for reform. *Bulletin of the World Health Organization*, *98*(2), 132–139. https://doi.org/10.2471/BLT.19.234153



Contextual Model: Public Health Insurance & Financial Protection

8.2. Comparative Typology of PHI for LMICs

Model	Key Features	Strengths	Challenges
Beveridge[45] (Tax-Funded, Universal)	Universal coverage financed by taxation; state-owned providers **Case studies:** UK (NHS), Spain, Italy, Nordic states	Free at point of service; equity; low admin costs; high patient satisfaction	Long wait times; limited choice; funding pressures; bureaucracy
Bismarck (Social Insurance) [46]	Compulsory insurance via "sickness funds"; financed by employer–employee payroll contributions	High-quality care; broad provider choice; short waits; efficiency via competition	High admin costs; aging population pressures; complex fund management

[45] Cichon, M., & Normand, C. (1994). Between Beveridge and Bismarck: Options for health care financing in Central and Eastern Europe. *World Health Forum, 15*(4), 323–328. https://iris.who.int/bitstream/handle/10665/45367/WHF_1994_15(4)_p323-328.pdf

[46] Scholz, W. (2015). Financing social security out of contributions: About origins, present discussions and prospects of a success story. *International Social Security Review*, *68*(4), 3-24.

	Case studies: Germany, France, Japan, Belgium, Switzerland		
National Health Insurance (NHI)[47]	Single-payer insurance with private providers; universal access through taxation and contributions **Case studies:** Canada, south Korea, Taiwan, France, Japan	Administrative simplicity; equity in access; strong bargaining power; high-quality care	Risk of underfunding; delays; weak innovation incentives; rural inequities
Private Health Insurance	Voluntary, premium-based insurance; competitive providers **Case studies:** USA (pre-ACA), Gulf states	Innovation; consumer choice; advanced technology access	Exclusion of poor; high OOP costs; inequity
Community-Based Health Insurance (CBHI)	Local pooling by households/NGOs; donor and government subsidies **Case studies:** Rwanda, Ghana, Ethiopia[48], India (rural)	Inclusion of marginalized groups; local ownership; rural access gains	Limited scalability; reliance on community participation; sustainability issues

[47] Nghiem, S., Graves, N., Barnett, A., & Haden, C. (2017). Cost-effectiveness of national health insurance programs in high-income countries: A systematic review. *PLoS One*, *12*(12), e0189173.

[48] Yilma, Z., Mebratie, A., Sparrow, R., Dekker, M., Alemu, G., & Bedi, A. S. (2015). Impact of Ethiopia's community based health insurance on household economic welfare. *The World Bank Economic Review*, *29*(suppl_1), S164-S173.

Mixed / Hybrid	Combines compulsory savings (Medisave), insurance (MediShield Life), and government subsidies Singapore	Efficient; fiscally sustainable; promotes personal responsibility	Higher OOP for middle class; gaps in some services

9. Developing the rationale for public health insurance programs for Pakistan:

9.1. Market Failures and the Case for PHI

The creation and execution of public health insurance in Pakistan are shaped by structural, economic, and institutional dynamics. With out-of-pocket (OOP) spending exceeding 50% of total health expenditure, the system reflects the market failures identified by Arrow (1963), where uncertainty, asymmetric information, and adverse selection undermine the viability of private insurance and necessitate state intervention to protect households from catastrophic costs.

Empirical evidence further shows that from 2010 to 2018 the catastrophic health expenditure defined as the share of households incurring health spending above 10% of income has risen across multiple demographic groups—adults only (20–59), adults with children or adolescents, multigenerational households, adults with older parents, older adults (>60), and mixed elder–adult households[49], in figure 7.

Figure 7th in the Appendices

[49] **World Health Organization. (n.d.).** *Population with household expenditures on health greater than 10% of total household expenditure or income (SDG 3.8.2)*. Global Health Observatory data repository. Retrieved September 8, 2025, from https://www.who.int/data/gho/data/indicators/indicator-details/GHO/population-with-household-expenditures-on-health-greater-than-10-of-total-household-expenditure-or-income-(sdg-3-8-2)-(-)

Figure 8th in the Appendices

Simultaneously, from 2010 to 2022, out-of-pocket (OOP) expenses as a proportion of current health expenditure (CHE) showed a gradual decline, indicating some advancements in minimizing direct costs. This trend highlights how escalating OOP payments both deepen financial vulnerability and push families below the poverty line. This out of pocket cost reduces the efficiency of social capital.

This concurrent trend suggests that while initiatives like the Sehat Sahulat Program (SSP) have begun to transition healthcare financing towards pooled insurance models, the coverage's extent and depth remain limited, leaving specific demographics more vulnerable. Thus, unlike countries that supports this observation: nations such as Thailand, through its Universal Coverage Scheme (2001), and Turkey, via its Health Transformation Program, successfully decreased both OOP spending and catastrophic health expenses by broadening mandatory, tax-funded, or social health insurance systems that prioritized inclusivity and fairness. For Pakistan, the implication is evident—public health insurance has the capacity to alleviate household financial strain, but ongoing expansion, enhanced governance, and integration with primary healthcare are vital to replicate the achievements seen in global examples and make significant strides towards UHC.

9.2.**Fragmentation and Fiscal Federalism**

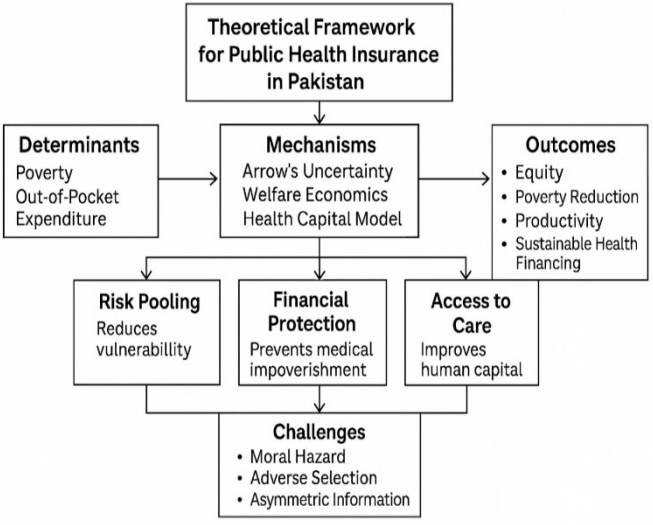
Moreover, frameworks driven by donors that align with Global Health Governance Theory[50] aid in funding programs and guiding policies, while the existence of various fragmented schemes—such as ESSI, SSP, and different provincial initiatives—indicates a lack of coordination that hampers effective coverage. Concerns regarding financial sustainability are ongoing, especially within the context of fiscal federalism.

9.3.**Supply-Side Inefficiencies**

[50] Ng NY, Ruger JP. Global Health Governance at a Crossroads. Glob Health Gov. 2011 Jun 21;3(2):1-37. PMID: 24729828; PMCID: PMC3983705.

Key components of public health insurance in Pakistan, which encompass risk pooling and sharing, financial protection, and access to quality healthcare, strive to mitigate individual risk, avert poverty from health crises, and guarantee fair healthcare distribution, though inefficiencies on the supply side in panel hospitals pose ongoing issues. Market failures like moral hazard[51], adverse selection, and information imbalances further highlight the need for regulatory supervision and government involvement.

9.4. **Theoretical Rationale for Reform**



Theoretical foundations referencing Arrow's uncertainty and welfare economics emphasize the unpredictable nature of health issues and the importance of government intervention to rectify market failures, while concepts such as risk aversion, the pooling and distribution of risk, expected utility, moral hazard, principal-agent relationships[52], public goods, and health capital collectively position insurance as a mechanism for security, fairness, and economic productivity within Pakistan's setting.

9.5. Beyond Numerical Expansion of UHC

[51] Moral hazard describes a scenario where one party is more inclined to take risks or behave less carefully because the adverse outcomes of their behavior will be suffered, either completely or partly, by another party.

[52] A principal-agent relationship occurs when one individual (the principal) assigns decision-making power to another individual (the agent), whose actions may not completely correspond with the interests of the principal, leading to possible challenges related to asymmetric information and misaligned incentives.

Pakistan's health insurance environment comprises multiple models, including government-funded programs like the Sehat Sahulat Program (SSP), social health insurance (ESSI), private corporate plans, and community-based NGO initiatives, all influenced by supply-demand dynamics, opportunity costs, and externalities—both positive, such as improved productivity and reduced disease transmission, and negative, such as service overuse. Despite gradual improvements in the Universal Health Coverage (UHC) index—from 33 in 2010 to 43 in 2018—the country remains in a high out-of-pocket (OOP)–low UHC quadrant, reflecting persistent structural flaws in health financing. OOP spending, though modestly reduced from 67.7% to 56.2% of total health expenditure, continues to expose households to financial vulnerability and poverty-related risks. Following the 18th Amendment, provinces like Punjab assumed responsibility for health service delivery, enabling more targeted policy interventions. By 2023–24, 7.1 million people received treatment under SSP; however, the program's inpatient-only coverage and limited benefit packages constrain meaningful financial protection, underscoring the urgent need for a comprehensive public health insurance framework.

Figure 9th in the Appendices

10. HEALTHCARE SYSTEM IN PAKISTAN: A REVIEW OF PUNJAB

10.1. Pakistan's Health System: Progress and Gaps

Pakistan's health budget has increased over the period of time but its relative to GDP ratio presents a different case study, that the overall situation is not much viable such that it allocates less than 1% of its GDP to health—ranking among the lowest in South Asia. Although there have been gradual advancements in infrastructure, workforce, and health indicators, the system continues to grapple with ongoing challenges: inadequate funding, substantial out-of-pocket expenses, unequal access, and poor service quality in rural regions.

Figure 10th in the Appendicies

Furthermore, the GDP of punjab for health is substantially increased post 2010, the 18th amendemnet, making the province responsible for the key indicators[53]. This amendment made it the responsibility of Punjab to oversee crucial health indicators, such as service delivery, accessibility, and equity in healthcare. As a result, the province acquired greater independence in the planning, funding, and execution of health policies, allowing for more focused interventions and localized strategies to meet specific needs. This transition also highlighted the importance of provincial governance in maintaining accountability and efficiency in resource use within the health sector. 7.1 million People received medical treatment under Universal health Insurance Program during 2023-24[54].

Figure 11th in the Appendicies

11. Discussion:

11.1. The Need for a Public Health Insurance System in Pakistan

Out-of-pocket (OOP) expenses, while slightly decreased from 67.7% to 56.2% of total health spending, still remain considerable and cannot solely be linked to the limited extent of the Sehat Sahulat Program (SSP), which only began operations in Punjab in 2020. This highlights the pressing necessity for a comprehensive public health insurance (PHI) system that reallocates financial risk from households to collective funding mechanisms, safeguarding vulnerable communities from devastating health-related costs.

11.2. Persistent Poverty Issues Despite Reduced OOP

Although there has been a slight decline in out-of-pocket (OOP) spending, health vulnerabilities related to poverty continue to be a concern, with the percentage of households living below the poverty line rising from 1.49%

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[53] Government of Punjab, Finance Department. (2024, June 10). ***Budget FY 2024–25*** [PDF]. Government of Punjab. **https://finance.punjab.gov.pk/system/files/WP24-25.pdf**

[54] Government of Punjab, Finance Department. (2024, June 10). *Budget FY 2024–25* [PDF]. Government of Punjab. https://finance.punjab.gov.pk/system/files/WP24-25.pdf

in 2010 to 2.41% in 2013. Existing financing systems do not offer sufficient financial security, leaving larger families, elderly individuals, and low-income households at risk. An inclusive framework for public health insurance (PHI) is crucial to guarantee fair access to healthcare and shield these vulnerable groups from health-related financial hardship.[55]

Figure 12th in the Appendices

11.3. Limited UHC Progress Lacks Adequate Risk Protection

The data shows that Pakistan's total density of district/rural hospitals is extremely low—0.37 per 100,000 population in 2010, declining slightly to 0.35 in 2013[56]. This limited health infrastructure indicates a severe gap in physical access to healthcare in rural areas, compounding the already high out-of-pocket (OOP) spending and vulnerability to catastrophic health expenditure (CHE). Current social health protection programs like SSP cover primarily inpatient care, leaving outpatient services largely unprotected. Inadequate facilities and narrow insurance coverage together underscore that PHI in Pakistan is largely theoretical, highlighting the urgent need for a well-structured, comprehensive system that expands both coverage and infrastructure to mitigate health-related poverty[57].

Figure 13th in the Appendices

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[55] World Health Organization. (2023, September 18). *Tracking universal health coverage: 2023 global monitoring report.* World Health Organization https://iris.who.int/bitstream/handle/10665/374059/9789240080379-eng.pdf?sequence=1

[56] World Health Organization. (n.d.). *Health infrastructure: Hospitals, density per 100,000 population*. Global Health Observatory. Retrieved September 8, 2025, from https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-density-per-100-000-population-hospitals

[57] World Bank. (2021). Pakistan development update: Reviving fiscal space for health. Washington, DC: World Bank.

11.4. Low Fiscal Commitment as an Obstacle to UHC

Pakistan's minimal health investment (~1% of GDP) contrasts sharply with OECD norms (7–10%) and the levels required for meaningful coverage. Insufficient fiscal commitment constrains the expansion of SSP and other PHI initiatives, forcing households to rely on OOP spending and exacerbating financial vulnerability. Sustainable PHI requires increased government allocation and efficient resource utilization to ensure comprehensive risk coverage and progress toward UHC.

Figure 14th in the Appendiceis

11.5. Persistent Catastrophic Health Expenditures

Figure 1 Poverty Gap Increase % vs UHC Index

Catastrophic health expenditure (CHE) in Pakistan increased from 4.5% to 13.1% between 2015–16 and 2018–19, with impoverishment effects rising simultaneously. Slight reductions in OOP spending are insufficient to protect vulnerable households, large families, and older adults. Comprehensive PHI, through pooled risk mechanisms and expanded benefit packages, could substantially reduce CHE and prevent health-related financial distress among lower-income populations[58].

Figure 15th in the Appendices

12. Health Outcomes and Workforce:

The Universal Health Insurance Program, funded under the Public Sector Development Program (PSDP)[59], has received an allocation of Rs. 54 million for FY2025[60], aimed at providing coverage for 34 million families across 360 hospitals. Nonetheless, significant challenges such as financing

[58] Dr. Ramzan Shahid, & Shehreen Amina. (2025). Analyzing the Impact of Government Expenditures on Health Sector in Pakistan: Challenges, Opportunities and Policy Reforms. *Journal of Religion and Society*, *4*(01), 338–347. Retrieved from https://islamicreligious.com/index.php/Journal/article/view/215

[59] Rudiger, A. (2016). Human rights and the political economy of universal health care: designing equitable financing. *Health and human rights*, *18*(2), 67

[60] Pakistan Economic Survey 2024–25. (2025). Ministry of Finance, Government of Pakistan. Retrieved from https://www.finance.gov.pk/survey_2025.html

limitations, quality of services, and issues concerning maternal and child health persist.

These insights highlight the pressing need for a comprehensive public health insurance system in Pakistan. The data indicates that while some progress has been achieved, public health insurance models, particularly the Sehat Sahulat Program, are still nascent and lacking in depth. The inadequate fiscal investment coupled with limited coverage hinders the system's ability to produce the intended financial protection and poverty alleviation results. A transition towards risk sharing, enhanced coverage, and increased fiscal support is necessary to tackle the health financing issues faced by the populace. Reinforcing public health insurance will be vital in reducing out-of-pocket expenses, curbing catastrophic spending, and ensuring equitable access to healthcare, thereby improving financial protection and alleviating poverty in the future.

Workforce: 319,572 physicians, 54,123 dentists, 138,391 nurses, 49,554 midwives/LHVs, and 24,584 pharmacists—though their distribution is uneven

Outcomes: Life expectancy averages 67.6 years, with infant mortality at 50 per 1,000 live births (whereas the regional average is about 30), and DPT3 immunization rates at 86%.

Figure 16th in the Appendices

13. Obstacles in the Implementation of the Sehat Sahulat Program

Despite the Sehat Sahulat Program (SSP) having high aspirations, it encounters notable difficulties in its execution. Low utilization is attributed to insufficient public awareness, a lack of enrolled facilities, and administrative shortcomings. Certain districts exhibit enrollment deficits ranging from 22% to 74%, with only one hospital catering to thousands of families. Additionally, the SSP's emphasis on inpatient services overlooks outpatient care, which constitutes nearly 80% of catastrophic health expenditures (CHE). To offer comprehensive financial protection, it is crucial to extend coverage to include outpatient and preventive care. These findings are limited by data constraints (like SCI data only

available until 2018), dependence on general indicators, and a descriptive methodology; therefore, they should be viewed as contextual evidence backing theoretical assertions rather than definitive causal evidence.

13.1. Dynamics of Health Insurance and Policy Implications

The landscape of health insurance in Pakistan is characterized by fragmentation, with insufficient coverage extending beyond public programs like SSP and the Employees Social Security Institutions. Private and corporate insurance primarily caters to the formal employment sector, leaving a considerable portion of the middle class and informal workers without coverage. Although SSP has successfully broadened access, it grapples with issues regarding sustainability, governance, and instances of service denial[61]. Endorsed by international organizations such as the World Bank, WHO, and IMF, the SSP is pivotal to the pursuit of UHC in Pakistan. To enhance its effectiveness, there is a need for sustainable funding, improved targeting through Proxy Means Tests (PMT), capacity development of service providers, and strengthened cooperation among government, private sectors, and civil society organizations.

14. Health insurance policy – a roadmap to achieve sustainable development goals (2030):

14.1. Health Insurance as a Mechanism for Risk Pooling and Equity

PHI in Pakistan, exemplified by the Sehat Sahulat Program (SSP)[62] in Punjab and KPK, functions not merely as a financial buffer but as a device for systematic risk redistribution, addressing structural inequities in healthcare access. By protecting households from catastrophic out-of-pocket expenditures—responsible for pushing millions into poverty annually (SDG 1)—SSP operationalizes the principles of Arrow's uncertainty framework and welfare economics**,** transforming individual health risks into collective coverage. Targeted intrusions for women in underserved areas advance gender equality (SDG 5), while mitigating

[61] Saleem, S. (2023). Power, politics, and public health: understanding the role of healthcare expenditure in shaping health outcomes in Pakistan for policy enhancement. *Politica*, *2*(1), 58-72.

[62] Majeed, R., Feroz, H., Khan, I., & Ahmad, N. (2024). Allocation And Efficiency Of Sehat Sahulat Program. *Journal of Management & Social Science*, *1*(4), 105-120.

health shocks enhances workforce productivity and sustains economic stability in informal sectors (SDG 8). Furthermore, by covering the poorest 40% and leveraging multi-stakeholder partnerships (government, donors, WHO, World Bank)[63], SSP demonstrates how coordinated policy design can maximize equity, efficiency, and fiscal leverage (SDG 10 & 17).

Province / Region:	Current Status	Families Covered
Islamabad	Universal	249,177
AJK	Universal	1,341,888
GB	Below Poverty and Universal	363,692
Punjab	Below Poverty and Universal	31,705,290
Khyber Pakhtunkhwa	Universal	9,353,009
Tribal Districts	Universal	1,342,537
Balochistan	NIL	-
Tharparkar (District)	Universal	313,436
Rest of Sindh	NIL	-
Total:		**44.66 million**

Source: Ministry of National Health Services, Regulations & Coordination

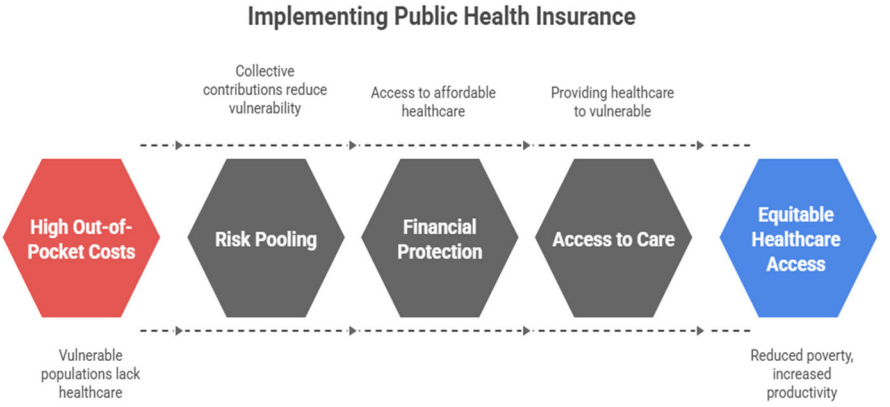
14.2. **Catalyzing Broader Development through Health Coverage**

Beyond direct protection, health insurance serves as a strategic enabler of systemic development. By improving population health, it catalyzes gains in nutrition (SDG 2), educational outcomes (SDG 4), and preventative public health infrastructure (SDG 6), while buffering climate-related health shocks (SDG 13). Critically, a well-structured PHI framework also produces dynamic externalities[64]: healthier populations reduce intergenerational poverty traps, foster human capital accumulation, and enhance social cohesion. In this sense, Pakistan's public health insurance emerges not just as a safety net, but as a policy lever linking micro-level financial protection with macro-level sustainable development**,**

[63] United Nations Statistics Division. (n.d.). *SDG country profile: Pakistan—Goal 3: Ensure healthy lives and promote well-being for all at all ages*. United Nations. Retrieved September 5, 2025, from https://unstats.un.org/sdgs/dataportal/countryprofiles/pak#goal-3

[64] Punjab Government. (n.d.). *A comparison of Punjab and South Punjab: Regional SDGs indicators*. SDGs Punjab. Retrieved September 5, 2025, from https://drive.google.com/file/d/1Jk0tuWexqxFRp3Zu2XYu2mIUXm0R-vir/view

demonstrating that strategic design and governance can transform health spending into a multiplier for SDG achievement[65].



15. Justification for Evaluating Public Health Insurance Transitions

In recent decades, there has been a significant rise in the implementation of social health insurance (SHI), national health insurance (NHI), and community-based health insurance (CBHI) systems, particularly in low- and middle-income countries (LMICs). These public health insurance frameworks have emerged as vital approaches to broaden coverage, pool risks, and mobilize funds more fairly, reflecting a move away from direct payments to pooled prepayment systems[66]. Given the varied experiences and contexts, it is crucial to perform a thorough review of the evidence regarding the effects and challenges associated with these transitions to gain a clearer understanding of real outcomes and systemic vulnerabilities (S. Docrat et al., 2020).

[65] Banerjee, A., E. Duflo, and R. Hornbeck. 2014. "Bundling Health Insurance and Microfinance in India: There Cannot Be Adverse Selection If There Is No Demand." American Economic Review 104 (5): 291–97.
[66] Banerjee, A., E. Duflo, and R. Hornbeck. 2014. "Bundling Health Insurance and Microfinance in India: There Cannot Be Adverse Selection If There Is No Demand." American Economic Review 104 (5): 291–97.

Assessing transitions in public health insurance is essential due to the varied and sometimes contradictory evidence regarding their efficacy. Although many studies indicate greater service usage and improved financial security, there are ongoing disparities in equity, care quality, sustainability, and health results. Differences in the design of programs, adherence to implementation, and governance frameworks restrict the applicability of findings, highlighting the need for analyses tailored to specific contexts (Darius Erlangga et al., 2019). Investigating these transitions offers policymakers practical insights by pinpointing potential obstacles and critical success elements, such as the impact of supplementary insurance, effective regulatory oversight, and alignment with primary insurance systems. This information aids in making informed decisions amidst complex health financing reforms, promoting adaptable approaches to local conditions while reducing unintended effects like unequal benefit distribution or systemic financial risks (Elahe Askarzade et al., 2024).

15.2. Types and Mechanisms of Public Health Insurance Financing

(i). Social Health Insurance (SHI)

Social Health Insurance systems in numerous low- and middle-income countries (LMICs) gather risks through compulsory contributions linked to payroll, enhancing access while raising concerns about equity due to uniform or regressive rates and challenges associated with the informal economy[67]. Implementation is further complicated by administrative difficulties, governance issues, and vested interests; debates surrounding SHI in South Africa exemplify these political and technical challenges (McIntyre, 2003). Research indicates that SHI tends to benefit wealthier populations when there are insufficient exemptions for those in need,

[67] A. Asante, N. Man, V. Wiseman, "Evaluating Equity in Health Financing Using Benefit Incidence Analysis: A Framework for Accounting for Quality of Care," Applied Health Economics and Health Policy, 2020. https://doi.org/10.1007/s40258-020-00597-2

underscoring the importance of engaging stakeholders to balance technical feasibility with political practicality[68].

(ii). National Health Insurance (NHI)

National Health Insurance programs finance healthcare at a national level via taxation to improve risk-sharing and work towards universal coverage. The success of these programs relies on robust institutions and political will. Nepal's NHI Program suffers from low enrollment, high dropout rates, and political interference[69] (Khanal et al., 2023), while Pakistan's Sehat Card Plus has made strides in inpatient services but struggles with underfunding and inequities (Siddiqi et al., 2024). China exhibits broader coverage and enhanced benefits; however, it continues to deal with high out-of-pocket expenses (Chen et al., 2017).

(iii). Community-Based Health Insurance (CBHI)

Community-Based Health Insurance plans are voluntary and managed by communities, aiming to assist informal sector workers by pooling local risks (Docrat et al., 2020). They boost the utilization of services among rural and marginalized groups but face challenges like limited risk pooling, high dropout rates, and weak regulatory frameworks[70]. Continued out-of-pocket spending limits financial protection, indicating that CBHI serves as a partial remedy that needs to be integrated with national policies and supported by subsidies for long-term sustainability (Nguyen et al., 2023).

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[68] . Tangcharoensathien, W. Patcharanarumol, A. Kulthanmanusorn, N. Saengruang, H. Kosiyaporn, "The Political Economy of UHC Reform in Thailand: Lessons for Low- and Middle-Income Countries," Taylor & Francis, 2019. https://doi.org/10.1080/23288604.2019.1630595

[69] G. N. Khanal, B. Bharadwaj, N. Upadhyay, T. Bhattarai, M. Dahal, R. Khatri, "Evaluation of the National Health Insurance Program of Nepal: are political promises translated into actions?," Health Research Policy and Systems, 2023. https://doi.org/10.1186/s12961-022-00952-w

[70] O. Tayo-Ladega, T. Abdullahi, K. Islam, "Factors Militating Against Public Health Financing In Nigeria: An Empirical Review," None, 2021. https://doi.org/10.46281/AIJMSR.V7I2.1073

16. Health Financing Policy Shifts and Equity Outcomes

16.1. Measuring Equity in Health Care Financing Equity assessment in health care financing commonly utilizes instruments like the Kakwani index[71] and benefit incidence analysis to examine the distribution of financial responsibilities and advantages among various socioeconomic groups. The Kakwani index[72] evaluates the progressivity of health care financing by comparing payments as a fraction of income or consumption across different income groups. A positive Kakwani index signifies progressivity, in which wealthier individuals contribute disproportionately more, whereas negative values indicate regressivity, imposing a heavier burden on those who are poorer (Mingsheng Chen et al., 2017).

16.2. Benefit Incidence and Equity in Health Financing

Benefit incidence analysis examines how healthcare advantages—through usage or financial assistance—are allocated among different socioeconomic groups, determining if policies genuinely promote equity. Attaining true fairness necessitates both progressive funding and services targeted at the poor, yet many low- and middle-income countries (LMICs) face challenges in these areas. Ongoing out-of-pocket costs, uniform contribution rates, and inadequately targeted subsidies worsen inequities, hindering reform initiatives (S. Cinaroglu, 2020). Furthermore, assessing equity is made difficult due to varied methodologies, data constraints, and specific contextual socioeconomic elements, highlighting the importance of detailed, context-aware analyses to effectively evaluate equity results and inform policy measures (Asante et al., 2016).

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[71] **Kakwani, N. C. (1977).** *Measurement of tax progressivity: An international comparison.* The Economic Journal, 87(345), 71–80. https://doi.org/10.2307/2231833

[72] An index that assesses the progressivity of a health financing system by contrasting the distribution of healthcare expenses with the distribution of income. It is calculated as the difference between the concentration index of healthcare expenses and the Gini coefficient of income. A positive Kakwani index signifies progressive financing (indicating that the wealthy contribute a larger portion relative to their income), whereas a negative value indicates regressivity (suggesting that the less affluent face an unequal burden).

16.3. Integrated Evaluation Matrix for Public Health Insurance (SSP) – Linking Market Failures to Observable Indicators

Dimension	Indicators	Market Failure	Sources
Coverage & Enrollment	- % of eligible population enrolled - Enrollment trends by income, gender, region	Adverse Selection	Case studies: **Bangladesh Health Insurance Program**, **Rwanda Mutuelles de Santé**
Financial Protection	- Out-of-pocket (OOP) spending reduction - Catastrophic health expenditure incidence - Poverty impact due to health spending	Moral Hazard	Case studies: **Thailand Universal Coverage Scheme**
Utilization & Access	- Number of inpatient/outpatient services used - Regional/urban-rural utilization gaps	Information Asymmetry	Case studies: **India Rashtriya Swasthya Bima Yojana**, **Philippines PhilHealth**
Equity & Inclusivity	- Enrollment by socioeconomic quintile - Access among marginalized groups	Externalities & Equity	Case studies: **Rwanda, Ghana NHIS**
Quality of Care	- Patient satisfaction scores -OECD Health Care Quality Indicators (HCQI) - Treatment outcomes		Case studies: **Thailand UCS**, **Philippines PhilHealth**

	and readmission rates		
Cost Efficiency & Sustainability	- Average cost per beneficiary - Cost per treatment type vs benchmark - Administrative cost ratio		**Health Policy & Planning**
Behavioral & Preventive Impact	- Use of preventive services (screening, vaccination) - Health-seeking behavior change		Case studies: **Mexico Seguro Popular**, **Thailand UCS**

16.4. Evidence on Equity Impact of Policy Shifts

Research indicates that there is a consistent bias favoring wealthier individuals when it comes to healthcare benefits, especially for hospital and specialized services, while primary care tends to be utilized more by poorer populations. Nevertheless, out-of-pocket expenses[73] are regressive, discouraging lower-income individuals from using services and putting families at risk of significant financial burdens (Mingsheng Chen et al., 2017). Inadequately constructed exemption policies and waivers further diminish financial protection. Even in countries like Turkey, reforms alleviate some inequalities but continue to impose heavy pressures on at-risk groups (Cinaroglu, 2020). For financing to be effectively equitable, it is vital to design benefit packages thoughtfully, provide targeted subsidies, and implement strategies to reduce direct payments, ensuring that coverage effectively protects the most disadvantaged (Asante et al., 2016).

17. Impact of Public Health Insurance on Health Care Utilization

[73] Direct household spending on health services at the time of use encompasses expenses for consultations, diagnostic tests, medications, procedures, and various medical supplies that are not covered by insurance or any prepayment arrangements; substantial out-of-pocket costs significantly contribute to financial difficulties and catastrophic health expenditures (WHO, 2010).

17.1. Increased Access and Utilization Outcomes

Public health insurance programs have shown their role in enhancing health care utilization, particularly regarding outpatient visits, inpatient admissions, and mental health service usage. Systematic reviews indicate that participation in SHI, NHI, and CBHI systems in LMICs generally corresponds with increased access to various health services, including rehabilitation and management for diagnosed mental health conditions, showcasing improved access among those who are insured (S. Docrat et al., 2020).

National health insurance initiatives in Zambia reflect potential rises in facility visits and access to expensive treatments, indicating that expanding insurance can eliminate financial and systemic barriers to healthcare (Darius Erlangga et al., 2019). Similarly, in Vietnam, the expansion of compulsory public health insurance led to higher enrollment and utilization of health services among low- and middle-income populations, highlighting improved financial protection that facilitates access[74].

18. AI–Climate–Gender Resilience Model for Public Health Insurance (ACG-Resilience Model)

AI & Data Governance → Alleviate Asymmetry and Moral Hazard, Enhance Pooling Efficiency

Arrow's central issue revolves around information: patients, providers, and payers hold unequal information at varying stages of care and claim processes. Contemporary AI technology can mitigate these discrepancies across three areas:

(i) Eligibility & targeting (minimizing errors in inclusion and exclusion),

[74] C. Nguyen, M. P. Nguyen, L. D. P. Luc, "How public health insurance expansion affects healthcare utilizations in middle and low-income households: an observational study from national cross-section surveys in Vietnam," BMC Public Health, 2023. https://doi.org/10.1186/s12889-023-15500-6

(ii) Utilization management (identifying upcoding and supplier-induced demand)
(iii) Claims integrity (fraud, waste, and abuse).

Growing evidence suggests that AI-aided anomaly detection and predictive analytics enhance the detection of fraud and improve claims processing, which safeguards pooled resources and bolsters actuarial balance thereby facilitating wider, more equitable benefits without significantly increasing premiums or taxes (a clear welfare improvement).

In Pakistan's SSP, key use-cases include: a centralized individual-level ID to connect encounters and claims; pre-payment risk assessment to foresee high-cost scenarios; and post-payment analytics to recover financial leakages—each of these significantly diminishes information rents that threaten pooling (Arrow's issue) and creates financial flexibility for preventive and outpatient care (your focus for reform). Aligning these technologies with WHO and WB UHC financial-protection objectives ensures that advancements translate into equity-aligned enhancements, rather than just cost reductions.

19. Climate Shocks → Systemic Risk That Requires Enhanced, Shock-Responsive Pooling

The effects of climate change bring correlated shocks (such as heat waves, floods, and outbreaks of vector-borne diseases) that disrupt traditional actuarial assumptions and can destabilize shallow insurance pools. Pakistan's recent situation—where health risks due to flooding surged—demonstrates the necessity for larger, more diverse pools featuring contingent financing, which are more beneficial than fragmented safety nets[75]. The Lancet Countdown[76] (2024) highlights increasing climate-related health challenges in Pakistan, reinforcing the theoretical arguments

[75] Anjum, G., & Aziz, M. (2025). Climate change and gendered vulnerability: A systematic review of women's health. *Women's Health (London), 21,* 17455057251323645. https://doi.org/10.1177/17455057251323645

[76] K. Hanson et al., "The Lancet Global Health Commission on financing primary health care: putting people at the centre," Elsevier BV, 2022. https://doi.org/10.1016/s2214-109x(22)00005-5

for designing climate-responsive benefits (like addressing heat-related illnesses and preventing water- and vector-borne diseases), establishing pre-positioned payments for providers, and incorporating catastrophe layers or reinsurance at a national level to stabilize SSP during crises. Within Arrow's framework, climate raises uncertainty; from a welfare standpoint, social insurance is superior to out-of-pocket expenses in the face of correlated risks. Incorporating climate variables into SSP's actuarial models and reserving a climate contingency fund within the pool puts this rationale into action.

20. Gender Responsiveness → Address Systematic Gaps in Access and Financial Protection

Gender disparities in healthcare needs, income stability, and employment create predictable structural inequities: women encounter higher out-of-pocket costs for sexual and reproductive health/maternal services, reduced access to employer-based insurance, and barriers to seeking care—compromising the equity goals of UHC and breaching welfare-maximizing allocations within budget constraints[77]. Current global assessments indicate that progress on financial protection is lagging, particularly impacting women; integrating gender-responsive financing and benefit design is now a crucial component of WB/WHO/UHC2030 initiatives (such as prioritizing coverage for sexual and reproductive health services, eliminating point-of-use fees, gathering gender-disaggregated data, and providing targeted subsidies). Empirical studies have also indicated that public or insurance coverage can enhance the utilization of maternal and newborn health services—an area where Pakistan is falling short—making a strong case for including explicit gender considerations in SSP budgets and benefits[78] (antenatal care, delivery, postnatal care, family planning, and non-communicable disease

[77] Forman, R., Ambreen, F., Shah, S. S. A., Mossialos, E., & Nasir, K. (2022). Sehat sahulat: a social health justice policy leaving no one behind. *The Lancet Regional Health-Southeast Asia*, *7*.

[78] [78] Ziegler, S., Srivastava, S., Parmar, D., … & others. (2024). A step closer towards achieving universal health coverage: The role of gender in enrolment in health insurance in India. *BMC Health Services Research, 24,* 141. https://doi.org/10.1186/s12913-023-10473-z

screenings for women), alongside regular gender-disaggregated tracking of catastrophic expenses.

20.1. Operational Implications for SSP (Inferred from Theory):

Pillar I: Information → AI: Regard AI analytics and a centralized beneficiary ledger as essential components of pooling infrastructure (Arrow): eligibility assessments, fraud detection, and utilization reviews to minimize leakages and extend preventive/outpatient coverage within a constrained financial framework.

Pillar II: Uncertainty → Climate Layering: Introduce a catastrophic reinsurance component and climate-triggered purchasing regulations (for instance, temporary tariff increases, mobile healthcare clinics) to ensure continued access during correlated shocks (aligning with systemic-risk insurance concepts).

Pillar III: Equity → Gender Budgeting: Formally establish gender-responsive benefits and fee waivers (for SRH/maternal and child health), mandate the collection of gender-disaggregated financial-protection metrics, and align with UHC/WB gender strategies to guarantee that pooled funds yield outcomes that are desirable from a distributional perspective.

Figure 17th in the Appendices

Outcomes the "3Es":

PHI performance must be evaluated along three dimensions: **Equity** (who benefits), **Efficiency** (cost-effective use of pooled funds), and **Resilience** (capacity to maintain services and financing under systemic shocks). The ACG model predicts that enhancements in these outcomes are **multiplicative**: gains in one pillar increase returns to investments in the others (e.g., AI reduces fraud, freeing fiscal space for resilience layers; gender-sensitive targeting increases pool diversity, improving actuarial balance).

Policy suggestions include:

1. Integrating climate risks into actuarial and budgetary assessments[79].
2. Creating contingency or catastrophe funds and parametric insurance reserves to safeguard primary insurance pools.
3. Making sure maternal, reproductive, and child health services are included in coverage and monitored with sex-disaggregated data[80].
4. Enhancing enrollment and outreach for women via mobile registration and female community workers.
5. Stipulating gender-sensitive reporting and establishing respectful maternity and gender-based violence referral processes among contracted providers.

International Best Practices

- India – The Ayushman Bharat Digital Mission incorporates AI-enhanced digital health records to broaden financial protection[81].
- Estonia – A nationwide electronic health record system linked with insurance improves overall system efficiency and continuity of patient care.
- Rwanda – Community-based insurance connected to mobile payment solutions increases affordability and uptake.

These examples demonstrate how AI and digitalization promote inclusive, efficient, and equitable public health insurance frameworks.

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[79] Kurowski, C. (2022, September 15). *Putting people at the center: Lancet Global Health Commission on financing primary health care* [Presentation]. World Bank. https://www.worldbank.org

[80] World Health Organization. (n.d.). *Universal health coverage*. World Health Organization. Retrieved September 4, 2025, from https://www.who.int/health-topics/universal-health-coverage#tab=tab_1

[81] Sharma, R. S., Rohatgi, A., Jain, S., & Singh, D. (2023). The Ayushman Bharat Digital Mission (ABDM): making of India's digital health story. *CSI transactions on ICT*, *11*(1), 3-9.

21. **Data Governance as a Core Pillar of Public Health Insurance**

Arrow's (1963) perspective on information asymmetry emphasizes the importance of data governance in public health insurance. Effective governance of health data minimizes uncertainty, deters fraud, enhances targeting, and protects pooled resources, ultimately improving both efficiency and fairness. From a welfare economics standpoint, clear and interoperable data systems decrease transaction costs and facilitate redistributive measures for at-risk populations. In the context of Pakistan's Sehat Sahulat Program[82] (SSP), existing systems—such as CNIC-linked enrollment, computerized management information systems (CMIS), and third-party administrators—represent significant advances, yet issues like fragmentation, poor interoperability, and inadequate data quality hinder efforts to provide equitable protection, conduct gender-disaggregated or climate-sensitive studies, and foster trust in the program.

International evidence indicates that data governance is not merely a technical consideration but is crucial for achieving universal health coverage. The examples of Estonia's nationwide electronic health records and Rwanda's mobile-based enrollment reveal how secure, interoperable systems can enhance accountability and ensure continuity of services (Nguyen et al., 2023). For Pakistan, this necessitates the establishment of a national framework for health data governance featuring unique patient identifiers, interoperability among provinces, and analytics that prioritize privacy, such as pseudonymization[83] and role-based access. By aligning data reforms with AI-driven fraud detection and predictive analytics, SSP can effectively tackle Arrow's asymmetry issue, minimize financial

[82] Housawi, A., & Lytras, M. D. (2025). Data governance in healthcare organizations. In *Next Generation eHealth* (pp. 13-32). Academic Press.
[83] Malviya, S. (2025). AI-Powered Data Governance for Insurance: A Comparative Tool Evaluation. *International journal of data science and machine learning*, *5*(01), 280-299

leakages, and guarantee that pooled resources provide authentic financial protection and equity[84].

22. Challenges in the public health insurance models:

Challenges in Policy Design to Improve Equity

I. **Unequal Financing:** Flat rate[85] contributions place a heavier burden on low-income families, thereby perpetuating disparities, as demonstrated by public health insurance systems in China (Chen et al., 2017).
II. **Targeting Health Packages**: Comprehensive health packages may lead to unsustainable expenses, while overly narrow packages do not address the population's needs. It is vital to implement targeted subsidies and strong exemption measures for fairness (Tangcharoensathien et al., 2019).
III. **Political Economy Obstacles**: Deep-seated interests, limitations in governance, and gaps in administrative capacity hinder equitable reforms, as evidenced by scenarios in South Africa and Zambia (Gilson, 2003).

Efficiency and Sustainability in Health Financing Reforms

I. **Cost Management & Strategic Purchasing**: Integrated payment models, which merge capitation with performance-based incentives[86], simultaneously boost efficiency, quality, and access (Hanson et al., 2022).
II. **Sustainability Challenges:** Ongoing underfunding, fragmented risk pools, and dependence on out-of-pocket expenses jeopardize the long-term sustainability of reforms (Dhungana, 2023).

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[84] You, Z., Wang, Y., & Xiao, Y. (2025). Analysing the Suitability of Artificial Intelligence in Healthcare and the Role of AI Governance. *Health Care Analysis*, 1-33.
[85] The health financing system where every member contributes a uniform premium or contribution, irrespective of their income or financial capacity, which can create a regressive effect as those with lower incomes face a relatively heavier burden.
[86] B. Cielo, M. Santillan, V. D. Claro, "Effect of a case-capped, fee-for-service payment mechanism on accessibility and affordability of health care," None, 2024. https://doi.org/10.1093/haschl/qxae004

III. **Governance & Capacity**: Commitment from political leaders, strengthening institutions, unified risk pooling, and resilient governance are crucial for achieving sustainable and equitable results.

Financial Protection and Risk Pooling[87]

I. **Primary Objective**: Health insurance aims to lessen catastrophic[88] and poverty-inducing expenses through prepayment and collective risk sharing (Stabile & Thomson, 2014).
II. **Fragmentation Challenges:** Disjointed systems restrict cross-subsidization and equity, necessitating cohesive regulation and supervision.
III. **Innovation & Adaptation**: Digital processing of claims, measures for accountability, and engagement from stakeholders help address inefficiencies and enhance protection (Khanal et al., 2023; Uzochukwu et al., 2018).

Influence of Political Will and Stakeholder Interests

The dynamics among political figures, bureaucratic entities, and interest groups play a critical role in shaping policy directions and the outcomes of reforms. Challenges frequently emerge from pushback by vested interests, political meddling, and insufficient accountability, complicating equity-focused reform efforts (Lucy Gilson, 2003).

The experience in Thailand illustrates how ongoing political dedication, effective leadership, and negotiation among stakeholders facilitated the successful extension of the Universal Coverage Scheme. In contrast, in numerous settings, political division, patronage systems, and fragile governance frameworks hinder reforms and lead to systemic inefficiencies (Viroj Tangcharoensathien et al., 2019).

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[87] J. Kutzin, "Anything goes on the path to universal coverage? No.," World Health Organization, 2012. https://doi.org/10.2471/blt.12.113654
[88] A. Wagstaff, "Measuring financial protection in health," None, 2008. https://doi.org/10.1596/1813-9450-4554

Methodological Issues in Evaluating Health Financing Reforms

I. The evaluation of reforms is complicated by variations in context, a range of study designs, issues with data quality, and difficulties in establishing causality due to confounding factors, resulting in many observational studies that diminish the relevance of policies[89].
II. While benefit and financing incidence analyses offer valuable insights, they fail to account for informal payments and non-financial obstacles, highlighting the necessity for mixed-s and longitudinal studies[90].

Insufficient Emphasis on Quality and Health Outcomes

I. Evaluations often prioritize coverage metrics, yet there is frequently a lack of direct connections between financing reforms and health outcomes or care quality[91].
II. Enhancing integrated medical-behavioral care has shown to improve outcomes for specific populations, underscoring the importance of incorporating quality measures in reforms.
III. Neglecting quality can increase access without producing health improvements.

Equity and Access Challenges Not Resolved by Coverage Expansion

[89] D. Erlangga, M. Suhrcke, S. Ali, K. Bloor, "The impact of public health insurance on health care utilisation, financial protection and health status in low- and middle-income countries: A systematic review," PLoS ONE, 2019. https://doi.org/10.1371/journal.pone.0219731
[90] A. Asante, J. Price, A. Hayen, S. Jan, V. Wiseman, "Equity in Health Care Financing in Low- and Middle-Income Countries: A Systematic Review of Evidence from Studies Using Benefit and Financing Incidence Analyses," Public Library of Science, 2016. https://doi.org/10.1371/journal.pone.0152866
[91] D. A. Osei, F. Masiye, F. Tediosi, G. Fink, "Purchasing for high-quality care using National Health Insurance: evidence from Zambia," Health Policy and Planning, 2023. https://doi.org/10.1093/heapol/czad022

I. Merely expanding coverage does not eliminate disparities; issues such as informal payments, geographical inequities, and supply-side constraints continue to exist[92].
II. Additional investments in infrastructure, workforce, and governance are crucial to convert financing advancements into equitable outcomes.

Global Issues in Public Health Insurance

I. Approximately 2 billion people experience financial difficulties, and healthcare costs push 1 billion individuals into poverty.
II. Low- and middle-income countries (LMICs) face shortages of healthcare workers and burnout, which negatively impacts care quality and access.
III. Marginalized groups, particularly those in rural locations, encounter systemic barriers that hinder progress towards universal health coverage (UHC).
IV. Disjointed insurance systems weaken service delivery, diminish efficiency, and obstruct coordination.

Challenges in Pakistan's Public Health Insurance Framework

I. There is limited coverage and accessibility, with around 42% of the population lacking health insurance and over 50% without essential primary care, predominantly affecting rural and low-income communities[93].
II. The healthcare system suffers from insufficient infrastructure, featuring only 1.1 physicians per 1,000 individuals, along with deficiencies in facilities and equipment, particularly in rural regions.

[92] T. C. Okech, S. L. Lelegwe, "Analysis of Universal Health Coverage and Equity on Health Care in Kenya," Canadian Center of Science and Education, 2015. https://doi.org/10.5539/gjhs.v8n7p218
[93] Sharma, J., Pavlova, M., & Groot, W. (2025). Challenges and Opportunities for Universal Health Coverage in South Asia: A Scoping Review. *Asia Pacific Journal of Public Health*, *37*(1), 7-16.

III. Financial limitations and inadequate resource distribution are evident, with funding shortages and low utilization of the Sehat Sahulat Program, leading to restricted outpatient and emergency services[94].
IV. Governance and administrative challenges persist, including understaffed departments, weak coordination between federal and provincial levels, and inefficiencies that impede policy execution.

23. Global Solutions for Challenges in Public Health Insurance

Expand Coverage and Access

- Broaden the Sehat Sahulat Program (SSP) to encompass outpatient, emergency, and rural healthcare, along with mobile and online registration to enhance participation.
- Consolidate provincial initiatives into a national risk pool to spread risk and promote fairness**.**

Strengthen Financial Protection and Sustainability

- Establish progressive financing and pooled-risk strategies to lower out-of-pocket costs[95].
- Introduce reinsurance and actuarial-based premium determination to maintain affordability and fiscal health[96].
- Implement performance-based financing and results-driven budgeting to align incentives with the quality of services provided[97].

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[94] Ahmad, M., & Waqar, Z. (2025). Towards Sustainable Health Systems: Insights From Pakistan's Spatial Data Infrastructure. In *Exploring Pillars of Sustainability for Modern Age Improvements* (pp. 373-390). IGI Global Scientific Publishing.
[95] A health financing strategy in which the release of funds is dependent on confirmed attainment of established results or performance goals, thereby aligning incentives with outcomes instead of merely focusing on inputs.
[96] D. Erlangga, M. Suhrcke, S. Ali, K. Bloor, "The impact of public health insurance on health care utilisation, financial protection and health status in low- and middle-income countries: A systematic review," PLoS ONE, 2019.
https://doi.org/10.1371/journal.pone.0219731

Enhance Provider Payment Mechanisms

- Shift towards hybrid payment approaches that blend capitation with performance rewards, especially for primary and rural healthcare[98].
- Encourage preventive and chronic care through bundled or outcome-focused payment structures[99].

Mitigate Market Failures and Information Asymmetry

- Employ digital enrollment, biometric verification, and smart cards to monitor usage and avert adverse selection and moral hazard[100].
- Utilize data analytics and public reporting to boost transparency, accountability, and resource allocation.

Strengthen Governance and Institutional Capacity

- Create a central regulatory body responsible for standards, pricing, and quality assurance.
- Improve coordination across provinces for claims auditing, fraud detection, and interoperability.
- Encourage public involvement and community oversight to build trust and credibility.

Targeted Equity Interventions

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[97] A health financing strategy in which the release of funds is dependent on confirmed attainment of established results or performance goals, thereby aligning incentives with outcomes instead of merely focusing on inputs.

[98] H. Barroy et al., "Public Financial Management as an Enabler for Health Financing Reform: Evidence from Free Health Care Policies Implemented in Burkina Faso, Burundi, and Niger," Health systems and reform, 2022. https://doi.org/10.1080/23288604.2022.2064731

[99] B. R. Dhungana, "Government Health Expenditure and Policy for Public Health Outcomes: A Systematic Literature Review," MedS Alliance Journal of Medicine and Medical Sciences, 2023. https://doi.org/10.3126/mjmms.v3i6.66615

[100] T. C. Okech, S. L. Lelegwe, "Analysis of Universal Health Coverage and Equity on Health Care in Kenya," Canadian Center of Science and Education, 2015. https://doi.org/10.5539/gjhs.v8n7p218

- Channel benefits and subsidies to underserved groups, including women, low-income communities, and rural populations.
- Design differentiated benefit packages based on information regarding poverty, morbidity, and service usage.
- Test gradual reforms with ongoing evaluation utilizing quasi-experimental methods (e.g., Difference-in-Differences) to guide broader implementation.

Integrate Preventive Health and Broader Development Goals

- Include preventive services like vaccinations and screenings in insurance benefits.
- Align public health insurance reforms with broader Sustainable Development Goals (SDGs), such as health, education, gender equality, and poverty alleviation, to enhance overall development impact.

Tracing the International Health Regulations (IHR) Index:

- It has specifically related 15 core capacities, the tool developed by the **World Health Organization (WHO)** to assess countries' preparedness for global health threats[101], assessing it would help the PHI models to adapt accordingly.

Integration of Emerging Themes (AI, Climate, Gender) into the Fundamental Framework of PHI

Building upon Arrow's (1963) observation that healthcare is influenced by uncertainty and disparities in information, and upon arguments related to welfare and equity concerning risk sharing and financial protection, we position AI, climate resilience, and gender responsiveness as fundamental

[101] These core capacities help nations meet the requirements set by the **International Health Regulations (2005)**, which are designed to help the global community prevent, protect against, control, and respond to public health risks that could spread internationally.

levers—not mere additions—that directly tackle the market failures identified in your analysis.

- **Enhancing Financial Protection:** Implement progressive financing methods and pooled risk funds to lower out-of-pocket expenses; for instance, Thailand's Universal Coverage Scheme offers extensive coverage through general taxation.
- **Increasing Healthcare Workforce:** Focus on training, hiring, and retaining healthcare personnel; support task-shifting initiatives similar to those in Rwanda's community health worker program.
- **Addressing Health Inequities:** Direct interventions towards marginalized populations, including those in rural areas, women, and low-income groups; utilize digital health technologies such as telemedicine and mobile health applications.
- **Boosting System Efficiency:** Establish integrated health information systems; encourage public-private partnerships to improve service delivery while ensuring quality.
- **Summary of Key Findings:** Reforms in health financing generally lead to positive effects on service utilization and financial protection, with equity enhancements being contingent on context, governance, and political economic factors[102].
- **Effective Policy Recommendations:** Fortify risk pooling through integrated, progressive approaches; ensure swift reimbursement for providers; implement hybrid payment models that combine capitation with performance incentives; strengthen political commitment, engage stakeholders at multiple levels, and enhance accountability frameworks.
- **Leverage Technology and Innovation**: Implement telemedicine, AI analytics, and integrated digital health records to enhance service delivery, predict demand, and identify inefficiencies. Use digital platforms to increase public awareness, enrollment, and preventive health behaviors.

[102] Goniewicz, K., Burkle, F. M., & Khorram-Manesh, A. (2025). Transforming global public health: climate collaboration, political challenges, and systemic change. *Journal of Infection and Public Health*, *18*(1), 102615.

Figure 18th in the Appendices

Solutions Specific to Pakistan

- **Broaden Coverage and Access:** Extend the Social Safety Program (SSP) to include outpatient, emergency, and rural care; consider mobile registration and online enrollment.
- **Strengthen Infrastructure:** Expand the number of hospitals, clinics, and beds; hire and train more health professionals.
- **Improve Financial and Resource Allocation**: Increase funding, ensure its effective usage, and adopt performance-based financing to boost the quality of services.
- **Improve Governance and Monitoring:** Enhance coordination between federal and provincial levels; employ digital tracking for claims and fraud; establish transparent accountability systems.
- **Leverage Technology:** Implement telemedicine, digital health records, and mobile applications; utilize AI analytics for predicting demand, optimizing resources, and detecting fraud.

24. Future Research Directions:

Future research on public health insurance in Pakistan should focus on generating causal evidence of its impact on utilization, financial protection, and health outcomes using longitudinal and quasi-experimental designs, linking administrative claims with household surveys to capture heterogeneity across socioeconomic, geographic, and demographic groups. Studies should examine equity implications for marginalized populations, assess the effectiveness of targeted subsidies and differentiated benefit packages, and evaluate governance mechanisms, regulatory oversight, and transparency measures in shaping provider behavior, efficiency, and patient satisfaction. Research should also explore the integration of emerging technologies such as AI, telemedicine, and digital health records to optimize resource allocation, reduce information asymmetry, and improve preventive care uptake. Long-term fiscal sustainability under various financing scenarios, the macroeconomic and developmental spillovers of insurance reforms, and the behavioral effects on preventive health and treatment adherence warrant

investigation. Comparative studies with LMICs, alongside the development of integrated data systems and advanced analytic techniques, can guide context-specific policy adaptations, scalable implementation strategies, and evidence-based decision-making to maximize equity, efficiency, and population health benefits.

25. Conclusion:

This study has shown that public health financing models across the world helped to improve the poverty dynamics and the health indicators, these observations are extrapolated for the case study of the Sehat Sahulat Program (SSP). It plays a crucial role in the larger effort to decrease out-of-pocket costs, enhance financial protection, and progress toward Universal Health Coverage (UHC). By placing Pakistan's experience in the context of broader theoretical frameworks such as Kenneth Arrow's principles of uncertainty, welfare economics, risk pooling, and equity, the research illustrates that public health insurance transcends mere welfare support, acting instead as a vital response to significant market failures. Comparative insights from nations like Thailand, Turkey, Mexico, and Germany indicate that sustainable health insurance reforms achieve the greatest success when underpinned by strong fiscal backing, transparent governance, and the integration of both preventive and curative health services. In contrast, Pakistan's focus on limited inpatient coverage, accompanied by low healthcare spending (approximately 1% of GDP), fragmented governance, and variable access, underscores the discrepancy between ambition and actuality.

Moreover, the analysis highlights emerging issues—like gender disparities, climate-related health risks, and the transformative impact of digitalization and AI—that need to be integrated into Pakistan's insurance framework for reforms to remain pertinent in a rapidly changing environment. Incorporating maternal and child health services, enhancing resilience against climate disruptions, and leveraging technology for fraud detection, predictive analytics, and improved accessibility can significantly boost the SSP's efficacy. The potential of the program lies in its capacity to transform from a politically motivated safety net into a comprehensive public health insurance model that is fair, efficient, and financially sustainable.

Ultimately, health is not only a societal asset but also an economic necessity: healthier populations enhance human capital, increase productivity, and foster inclusive growth. Therefore, for Pakistan, the SSP poses both a challenge and an opportunity. If restructured with enhanced financing, improved integration, and a dedication to equity, it could become a foundation of national development and a benchmark for other lower-middle-income nations facing similar challenges. In conclusion, the future of healthcare financing in Pakistan rests on evolving the SSP from a fragmented initiative into a solid, universal, and sustainable health protection system that significantly advances the objectives of UHC and the Sustainable Development Agenda 2030.

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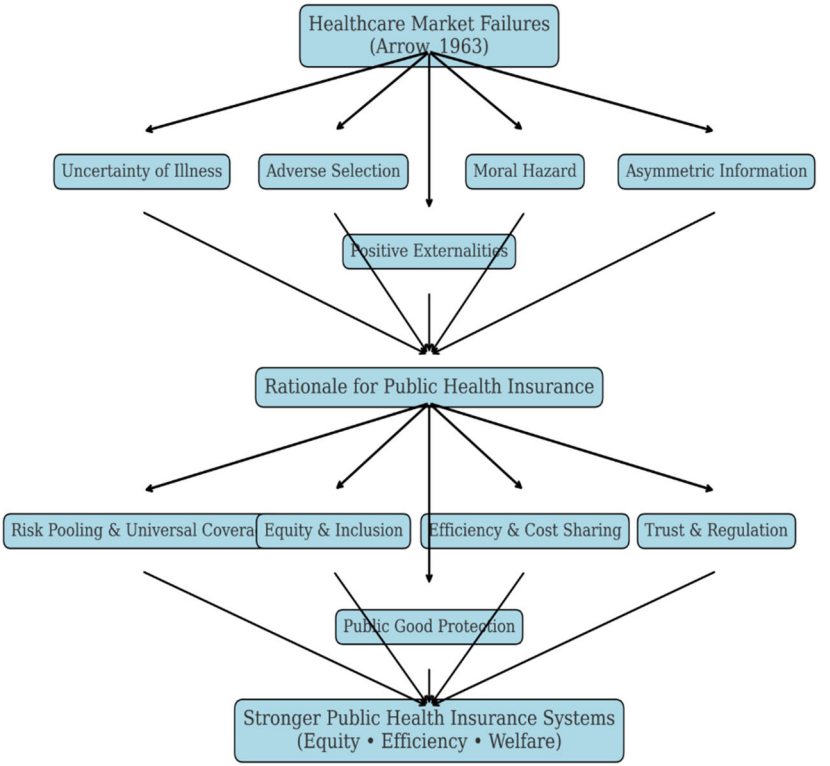
Appendices



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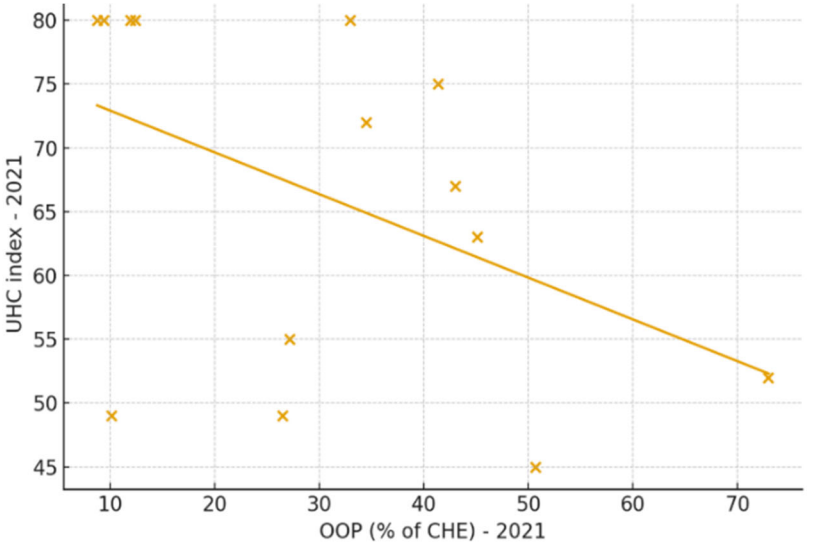

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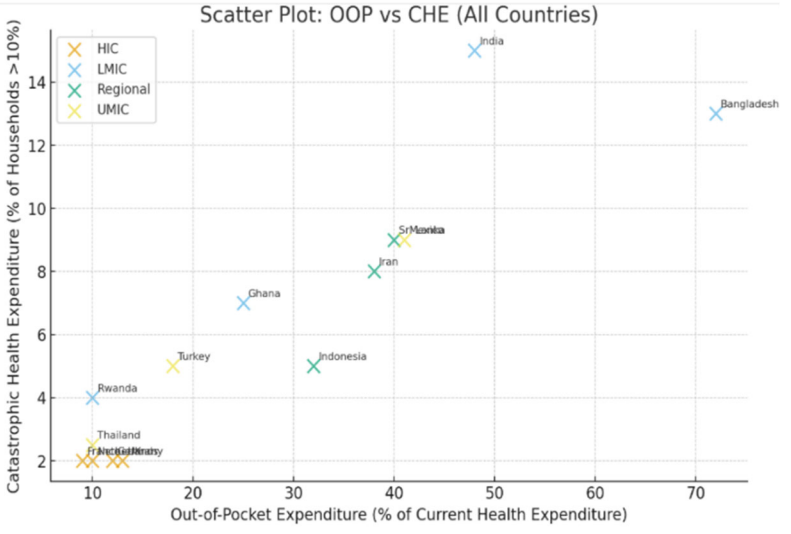

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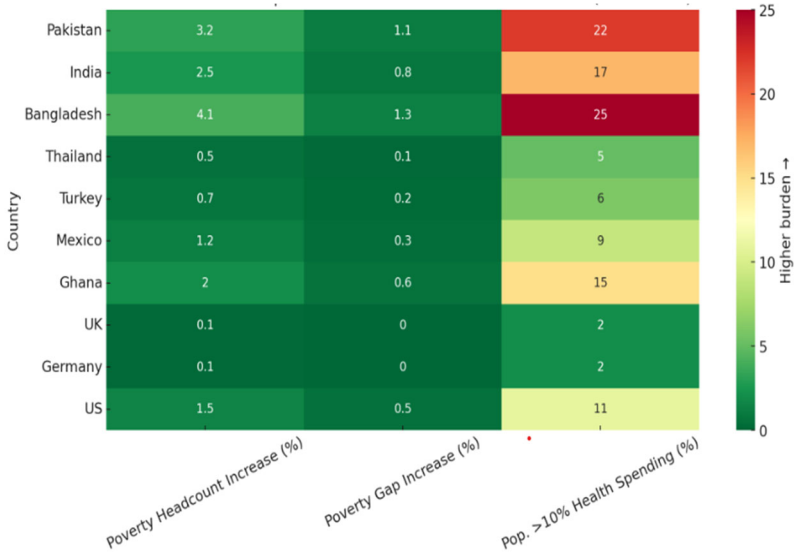

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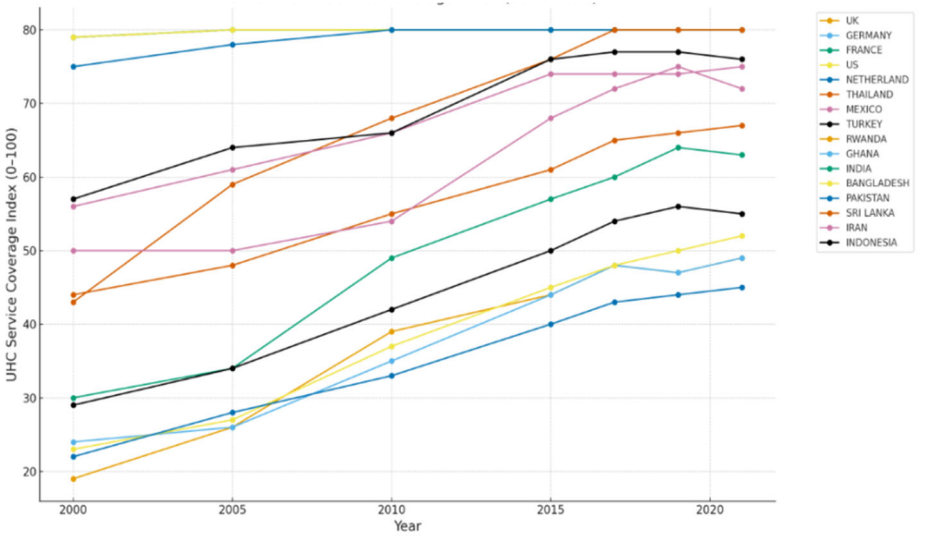

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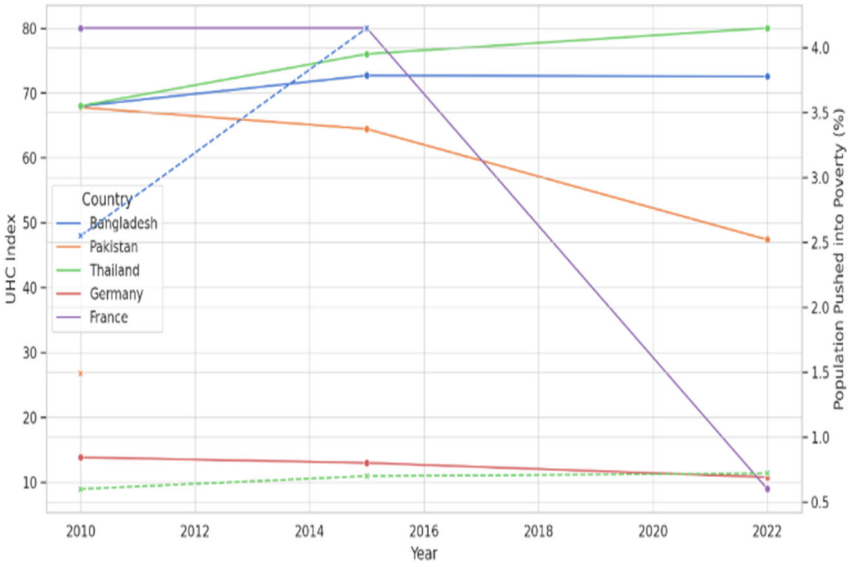

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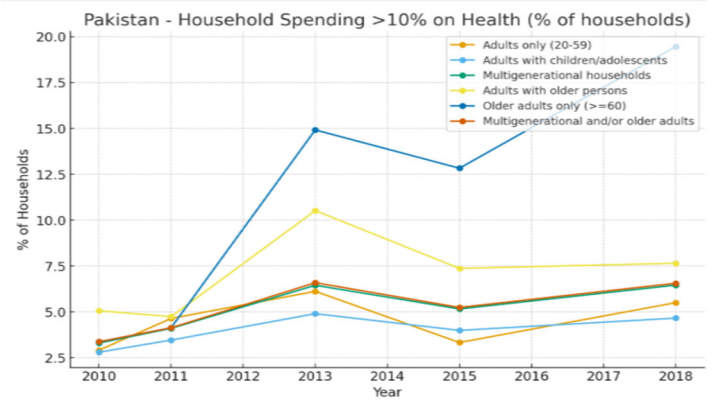

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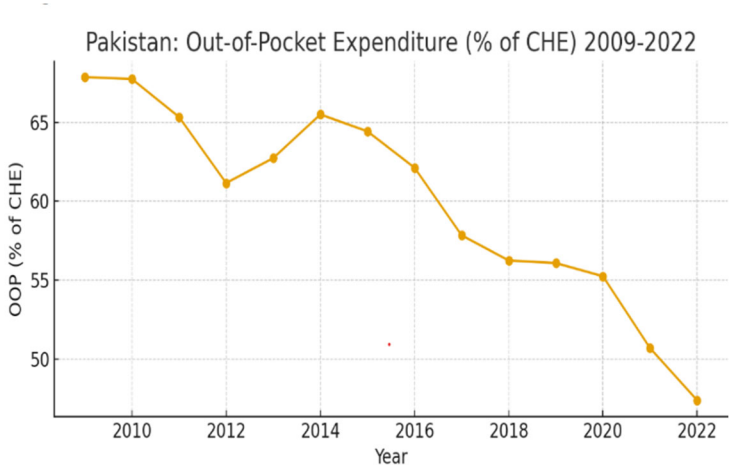

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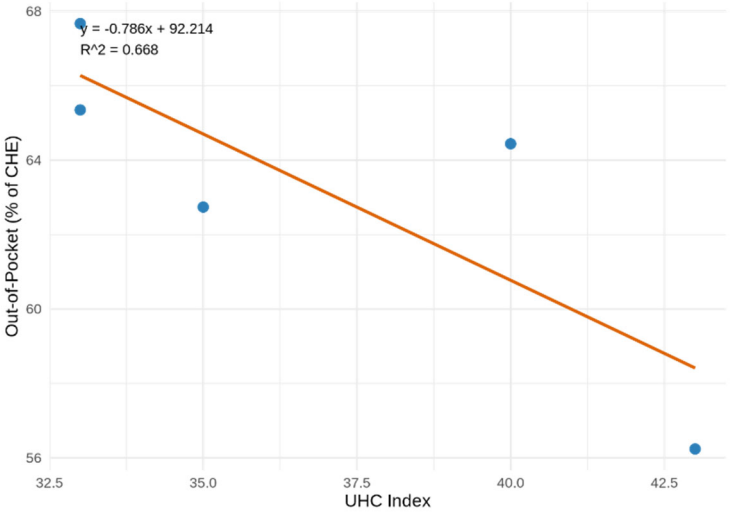

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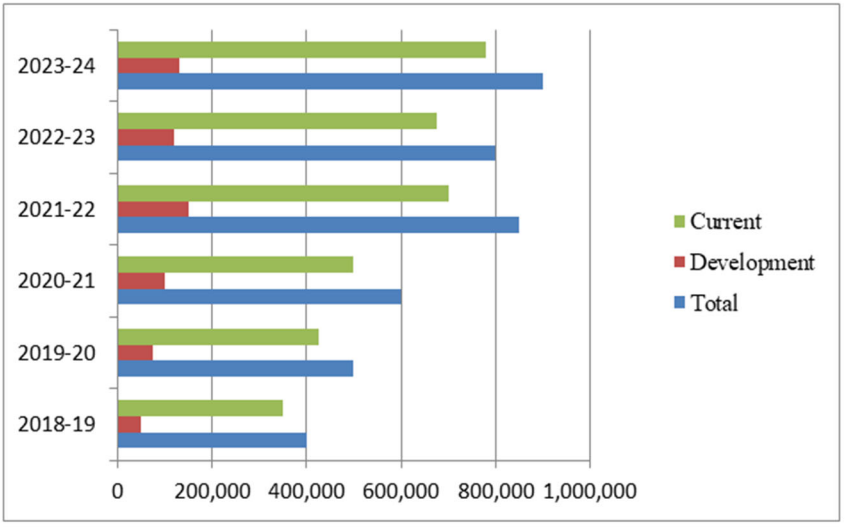

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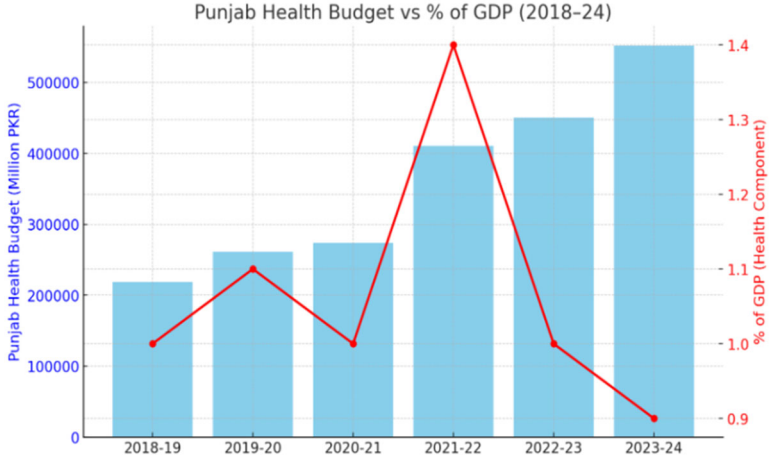

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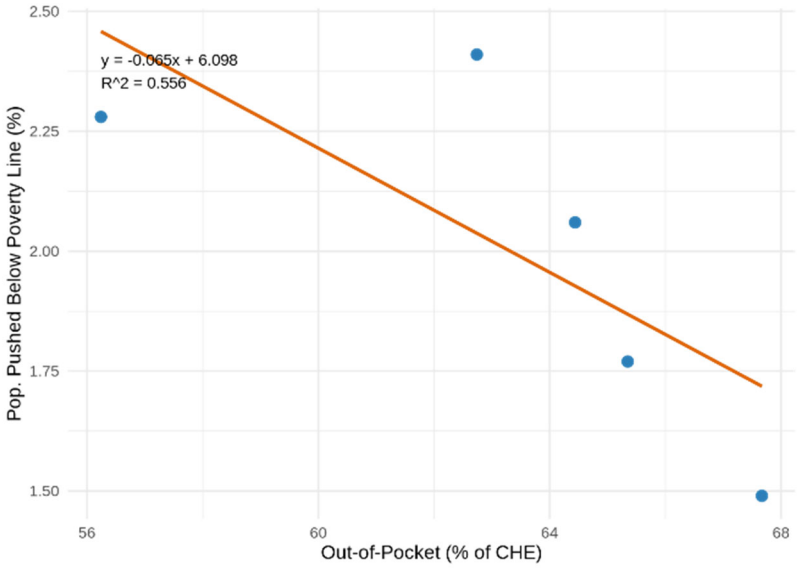

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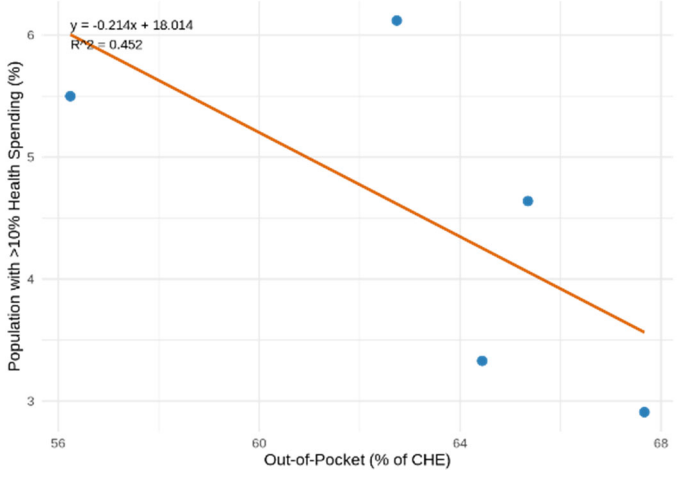

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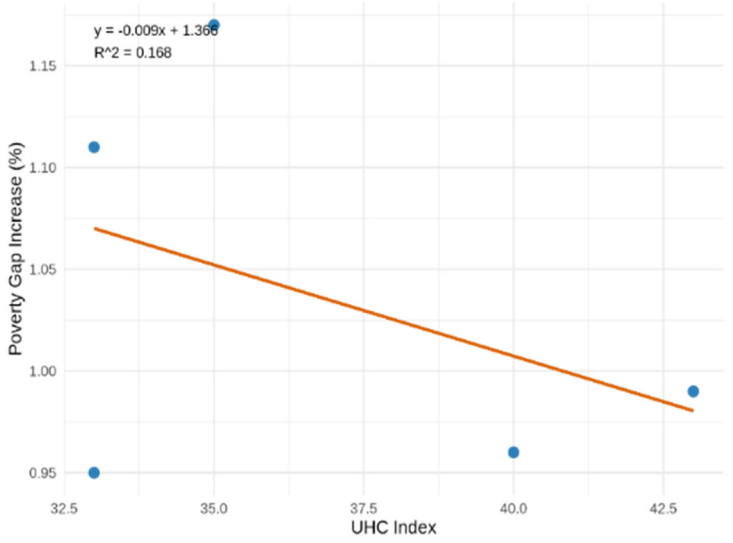

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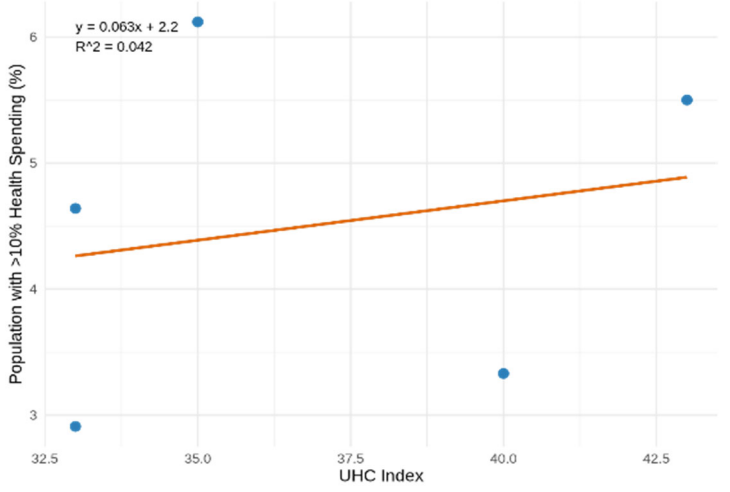

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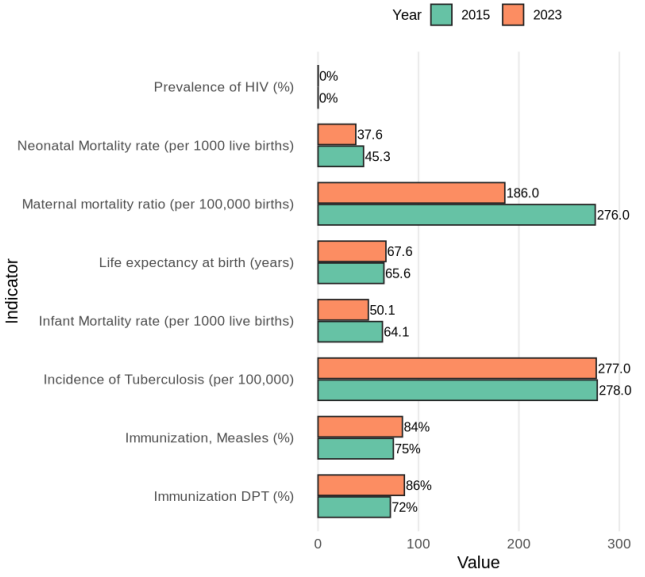

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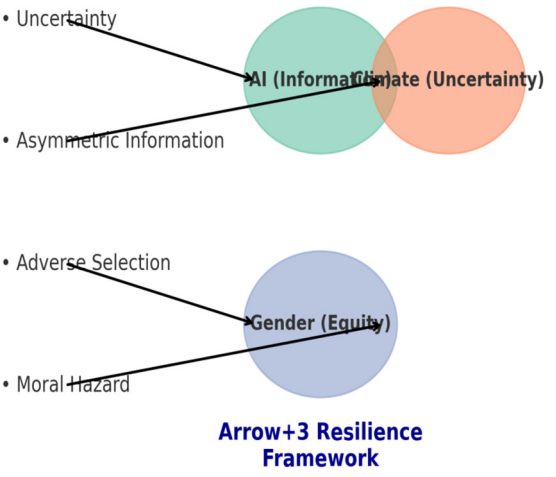

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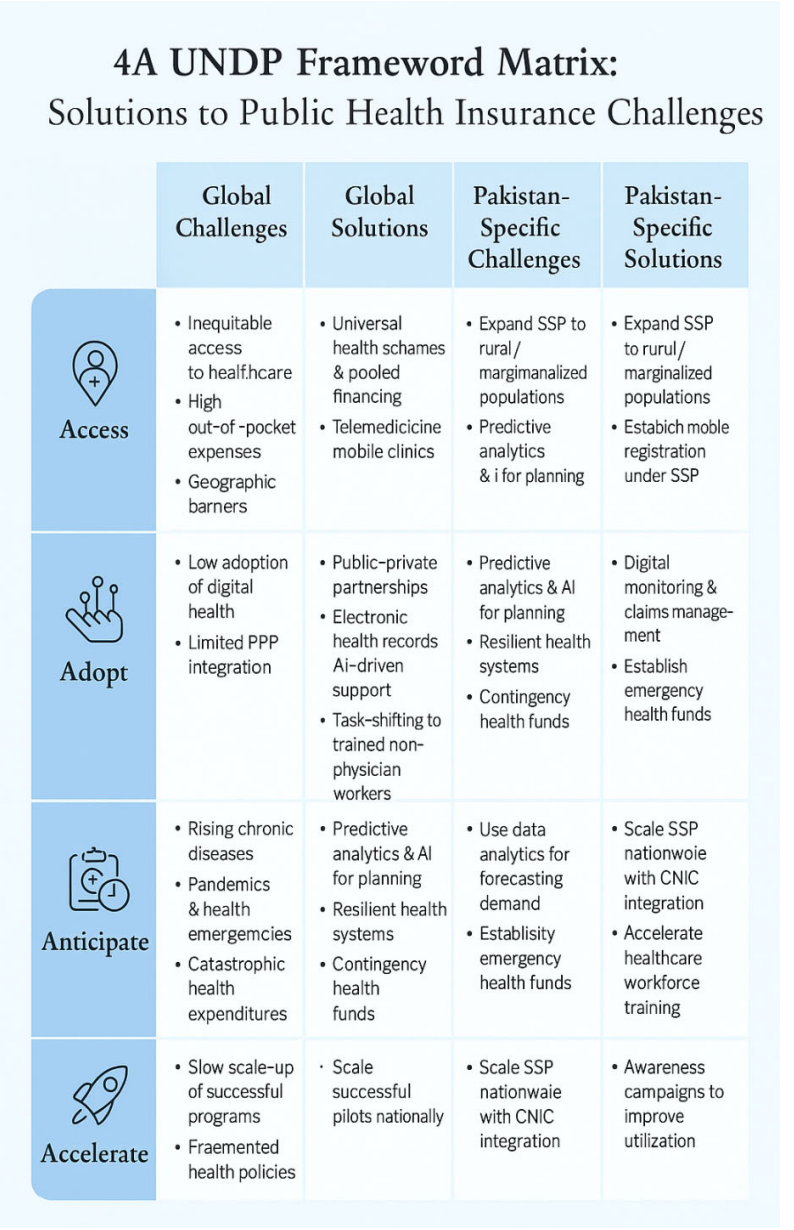

4A UNDP Frameword Matrix:
Solutions to Public Health Insurance Challenges

	Global Challenges	Global Solutions	Pakistan-Specific Challenges	Pakistan-Specific Solutions
Access	• Inequitable access to healf.hcare • High out-of -pocket expenses • Geographic barners	• Universal health schames & pooled financing • Telemedicicine mobile clinics	• Expand SSP to rural / margimanalized populations • Predictive analytics & i for planning	• Expand SSP to rurul / marginalized populations • Estabich moble registration under SSP
Adopt	• Low adoption of digital health • Limited PPP integration	• Public-private partnerships • Electronic health records Ai-driven support • Task-shifting to trained non-physician workers	• Predictive analytics & Al for planning • Resilient health systems • Contingency health funds	• Digital monitoring & claims manage-ment • Establish emergency health funds
Anticipate	• Rising chronic diseases • Pandemics & health emergemcies • Catastrophic health expenditures	• Predictive analytics & Al for planning • Resilient health systems • Contingency health funds	• Use data analytics for forecasting demand • Establisity emergency health funds	• Scale SSP nationwoie with CNIC integration • Accelerate healthcare workforce training
Accelerate	• Slow scale-up of successful programs • Fraemented health policies	· Scale successful pilots nationally	• Scale SSP nationwaie with CNIC integration	• Awareness campaigns to improve utilization

Figure 18th