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Investigating Healthcare Insurance Models and their Implications for Health Policy Design

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Abstract: Healthcare insurance models are determining in shaping health outcomes, economic efficiency, and equity in access to medical care. This study investigates healthcare insurance models from both theoretical and empirical perspectives, examining their implications for health policy design. This research analyzes the efficiency, equity, and sustainability of insurance frameworks by classifying them into public, private, and hybrid systems based on a comprehensive body of literature. The comparative efficacy of these models across various health systems around the world is the main focus of empirical research, with case studies showcasing both achievements and shortcomings. Additionally, the paper explores the role of behavioral economics, risk pooling, and adverse selection in shaping these models. Policy recommendations emphasize integrating theoretical insights with empirical data to achieve balanced reforms that address systemic inefficiencies and health inequities. The findings underscore the necessity of tailoring health insurance policies to local economic and sociopolitical contexts to ensure optimal health outcomes.

Keywords: Healthcare Insurance Models, Health Policy Design, Public Insurance, Private Insurance, Hybrid Systems, Risk Pooling, Adverse Selection, Equity in Healthcare, Behavioral Economics, Global Health Systems.

1. Introduction

The landscape of healthcare financing plays a critical role in determining the accessibility, quality, and sustainability of health services across diverse populations. Healthcare insurance models, broadly categorized as public, private, or hybrid systems, serve as fundamental mechanisms to mitigate the financial risks associated with healthcare expenditures. Public insurance models, funded and administered by governments, emphasize universal access and equity, whereas private insurance models, driven by market dynamics, focus on individual choice and efficiency. Hybrid models attempt to blend the strengths of both systems, addressing gaps in coverage and resource allocation. Understanding the evolution and functionality of these models

1Masters in Degree, Senior Team Lead, Wikpolt Softwares, India addlydaniel@gmail.com 2Msc IT, Plano, Texas, USA lakshminarasimhan047@gmail.com 3Department of Electronics paramathviky@gmail.com provides a foundation for analyzing their implications on health outcomes and policymaking. This introductory section sets the stage for a comprehensive exploration of theoretical and empirical perspectives, guiding the development of actionable health policy recommendations.

1.1 Background of Healthcare Insurance Models

Healthcare insurance models have evolved in response to demographic shifts, economic constraints, and sociopolitical priorities, reflecting varied approaches to risk pooling, premium structuring, and service delivery. In high-income countries, robust public insurance systems often dominate, with examples like the National Health Service (NHS) in the UK focusing on equity and cost containment. Conversely, in low- and middle-income countries, fragmented private insurance systems coexist with limited public schemes, often resulting in significant disparities in access. Hybrid models, such as those in Germany and Singapore, offer a middle ground by integrating public mandates with private sector efficiencies. These

systems must navigate challenges like adverse selection, moral hazard, and fiscal sustainability, which underscore the importance of robust regulatory frameworks and evidence-based policy interventions.

1.2 Objectives and Scope of the Study

This research aims to dissect the theoretical underpinnings and empirical outcomes of healthcare insurance models to provide a holistic understanding of their implications for health policy design. The study is structured to achieve several objectives: first, to analyze the fundamental

economic principles governing these models, including risk pooling and cost sharing; second, to evaluate their impact on equity, efficiency, and health outcomes across various countries; and third, to identify challenges and innovations that shape their effectiveness. By synthesizing insights from comparative case studies and quantitative analyses, this paper contributes to the discourse on designing sustainable and inclusive health policies. The scope encompasses a global perspective, focusing on the interplay between healthcare financing models and policy objectives in both developed and developing contexts.

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Table 1:	Overview	of Healthcare	Insurance Mc	odels

Model	Funding Sources	Population Coverage	Administrative	Notable Examples
Type			Structure	
Public	Government-funded	Universal or targeted	Centralized	National Health Service
	through taxation or social	populations (e.g., low-	administration by	(UK), Medicare
	contributions	income groups)	government agencies	(Canada)
Private	Premiums paid by	Selective, based on	Decentralized,	United States employer-
	individuals or employers,	ability to pay or	managed by private	based insurance, Swiss
	often market-driven	employment status	insurers or employers	private plans
Hybrid	Combination of	Varied; aims to achieve	Shared responsibility	Singapore's MediShield
	government funding and	near-universal coverage	between public and	Life, Germany's
	private premiums		private entities	Bismarck model

2. Theoretical Perspectives On Healthcare Insurance Models

Healthcare insurance models are underpinned by theoretical principles that guide their design and functionality. These principles are rooted in insurance economics, addressing fundamental challenges such as risk management, cost containment, and the equitable allocation of resources. By analyzing key concepts like risk pooling, adverse selection, moral hazard, and the trade-off between equity and efficiency, this section provides a foundational understanding of the mechanisms driving healthcare insurance systems.

2.1 Fundamental Concepts in Insurance Economics

Insurance economics revolves around the principles of risk pooling, premium determination, and actuarial fairness. In healthcare insurance, risk pooling allows a group of individuals to share the financial burden of unpredictable health costs, mitigating the financial risk for any single individual. Premiums, ideally based on actuarial calculations, reflect the expected healthcare expenditure of insured populations. However, real-world applications often involve cross-subsidization to address equity concerns. These concepts form the basis of both public and private insurance systems, influencing their structure and sustainability.

2.2 Risk Pooling and Adverse Selection

Risk pooling is the cornerstone of healthcare insurance, aiming to distribute risk across a broad population to ensure financial stability. However, adverse selection—a phenomenon where individuals with higher health risks are more likely to enroll in insurance than healthier individuals—threatens the viability of insurance pools. Adverse selection drives up premium costs, potentially leading to a "death spiral" as healthier individuals opt out, further destabilizing the system.

Regulatory interventions such as mandatory enrollment and community rating are common

strategies to mitigate this issue.

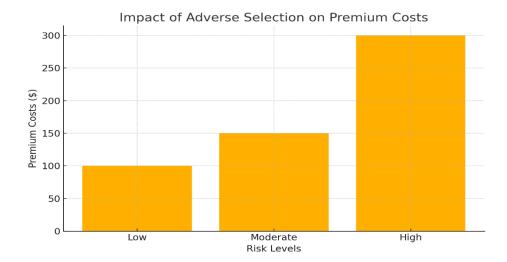


Figure 1: Impact of Adverse Selection on Premium Costs

This figure 1 will shows the upward trajectory of premium costs in a system experiencing adverse selection, showing the impact on enrollment rates and financial sustainability.

2.3 Moral Hazard in Healthcare Insurance

Moral hazard arises when insured individuals overutilize healthcare services because they are shielded from the direct financial consequences of their decisions. This behavior increases overall healthcare costs and strains insurance systems. Mechanisms such as cost-sharing (e.g., copayments and deductibles) are designed to counteract moral hazard by making consumers more cost-conscious. However, excessive cost-sharing can deter necessary care, leading to adverse

health outcomes, particularly for vulnerable populations.

2.4 Equity and Efficiency in Healthcare Financing

Healthcare insurance models balance must equity-ensuring access to care regardless of ability to pay—with efficiency in resource Equity-focused allocation. systems universal access and financial protection, often funded through progressive taxation. Efficiencyfocused models emphasize cost control and service quality, sometimes at the expense of equitable The tension between these goals underscores the need for innovative policy solutions that address both dimensions.

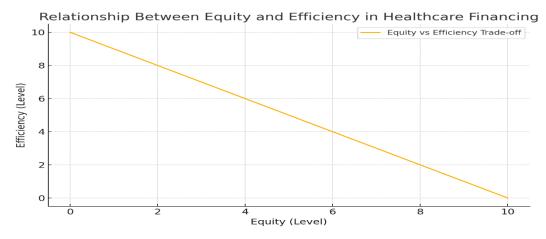


Figure 2 - Relationship between Equity and Efficiency in Healthcare Financing

This figure 2 will depict the trade-off curve between equity and efficiency, highlighting the positioning of different healthcare insurance models along this spectrum.

3. Empirical Perspectives On Healthcare Insurance Models

This section examines the real-world application and outcomes of healthcare insurance models across different countries, focusing on their design, effectiveness, and impact on health systems. Empirical evidence provides a critical lens to evaluate the practical implications of theoretical constructs discussed earlier. By comparing global models, analyzing private and public insurance systems, and evaluating hybrid models, this section offers insights into the successes and challenges of various approaches.

3.1 Comparative Analysis of Global Healthcare Insurance Models

Globally, healthcare insurance systems exhibit significant diversity in terms of structure, coverage, and outcomes. Countries like the United Kingdom and Canada demonstrate the advantages of public insurance systems, achieving near-universal coverage and equitable access through governmentfunded mechanisms. In contrast, the United States predominantly relies on private insurance, resulting in high per capita healthcare spending and disparities in access. Hybrid systems in countries like Germany and Singapore attempt to merge public oversight with private sector efficiencies, showcasing innovative approaches containment and population health management.

Table 2- Features of Insurance Models Across Selected Countries

Country	Model Type	Funding Sources	Population Coverage	Notable Features
United Kingdom	Public	Taxation	Universal	Centralized public administration; free at point of service
United States	Private	Premiums paid by employers and individuals	Selective (based on employment and affordability)	Market-driven with employer- based plans; high out-of- pocket costs
Germany	Hybrid	Statutory health insurance and private contributions	Near-universal	Regulated competition among insurers; choice-based system
Singapore	Hybrid	Mandatory health savings accounts and government subsidies	Near-universal	Emphasis on personal responsibility with savings accounts
Canada	Public	Taxation	Universal	Single-payer system with emphasis on equity and accessibility

This table will summarize key attributes of healthcare insurance models in selected countries, including coverage levels, funding sources, cost metrics, and population health outcomes.

3.2 Private Insurance: Trends, Challenges, and Outcomes

Private insurance systems, characterized by marketdriven mechanisms, offer benefits such as flexibility and innovation. However, they face challenges including high administrative costs, inequities in access, and susceptibility to adverse selection. Trends indicate a growing reliance on private insurance in both high- and low-income countries, with mixed outcomes. While private insurance enhances service quality and consumer choice, it often exacerbates disparities in coverage, particularly for lower-income populations.

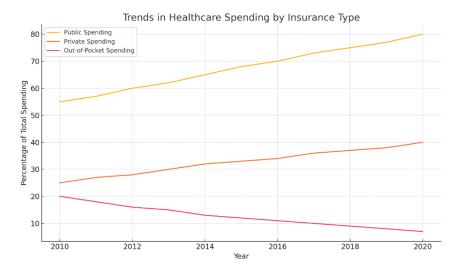


Figure 3 - Trends in Healthcare Spending by Insurance Type

This figure 3 will shows the proportion of healthcare spending allocated to private, public, and out-of-pocket payments in selected countries, highlighting temporal trends and differences.

3.3 Public **Insurance: Frameworks** and **Population Impact**

Public insurance systems emphasize universality and equity, providing essential healthcare services without significant financial barriers. Countries with strong public insurance frameworks, such as the United Kingdom, Canada, and Scandinavian nations, demonstrate better health outcomes and financial protection. However, these systems often face challenges related to resource constraints, long wait times, and inefficiencies in service delivery.

Balancing equity with operational efficiency remains a critical policy challenge for public insurance models.

3.4 Hybrid Models: Evaluating Effectiveness

Hybrid models combine public and private elements to address the shortcomings of standalone systems. For instance, Germany's Bismarck model uses statutory health insurance funds regulated by the government, while Singapore's MediShield health Life incorporates mandatory savings accounts. These systems aim to achieve comprehensive coverage, cost efficiency, and highquality care. Empirical evaluations suggest that hybrid models perform well in balancing equity and efficiency but require strong regulatory oversight to ensure sustainability.

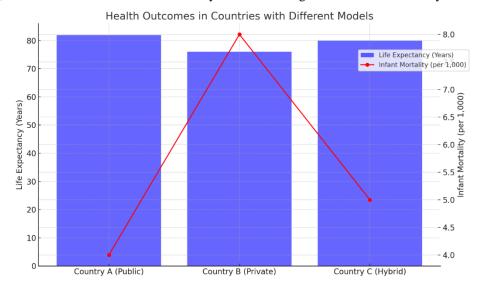


Figure 4 - Health Outcomes in Countries with Different Models

This figure 4 will compare health outcomes, such as life expectancy and infant mortality rates, across countries with public, private, and hybrid insurance models, providing a visual depiction of their relative effectiveness.

4. Implications For Health Policy Design

The design and implementation of health policies are profoundly influenced by the underlying healthcare insurance models. This section explores the challenges and opportunities in achieving universal health coverage (UHC), cost containment, equity in healthcare access, and innovative policy instruments. By addressing these critical dimensions, policymakers can design systems that balance equity, efficiency, and sustainability.

4.1 Policy Challenges in Universal Health Coverage (UHC)

Achieving UHC is a central goal for health policymakers worldwide, aiming to ensure that all individuals receive the healthcare services they need without financial hardship. However, challenges such as fragmented health systems, insufficient funding, and disparities in geographic and demographic access persist. Countries with predominantly private or hybrid insurance models often face hurdles in integrating universal access, while public models must contend with resource limitations and efficiency concerns. Evidence highlights that targeted reforms, such as mandatory enrollment and subsidies for vulnerable populations, are essential to bridge these gaps.

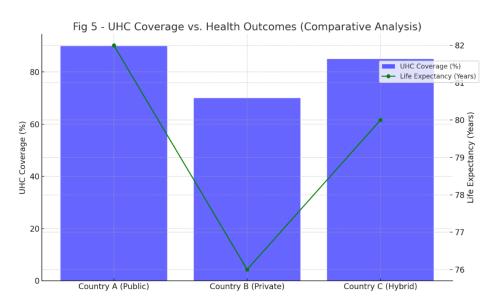


Figure 5 - UHC Coverage vs. Health Outcomes (Comparative Analysis

This **Figure 5** will display a comparative analysis of UHC coverage levels against key health outcomes (e.g., life expectancy, infant mortality rates) across different countries, illustrating the positive correlation between higher UHC coverage and improved health outcomes.

4.2 Cost Containment and Financial Sustainability

Rising healthcare costs threaten the financial sustainability of many healthcare systems. Public insurance systems face increasing strain due to aging populations and chronic diseases, while private models struggle with high administrative costs and inefficiencies. Hybrid systems attempt to balance cost containment with quality care, often

using tools like global budgets, value-based payments, and price regulation. Policymakers must prioritize innovative financial mechanisms, such as risk-adjusted payments and digital health interventions, to achieve long-term sustainability.

4.3 Addressing Inequities in Access to Healthcare

Inequities in healthcare access remain a significant barrier to achieving universal health outcomes. Socioeconomic disparities, geographic barriers, and systemic discrimination disproportionately affect marginalized populations. Public insurance systems generally offer better equity in access but may struggle with service quality and wait times. Private systems, while efficient in service delivery, often exclude vulnerable groups due to affordability issues. Effective health policies must integrate measures such as geographic redistribution of resources, community health programs, and inclusive insurance designs to address these inequities.

4.4 Innovation in Policy Instruments

Innovative policy instruments can transform healthcare systems by addressing existing inefficiencies and inequities. Examples include value-based care models, digital health technologies, and integrated care pathways. Policy experimentation in countries like Singapore (health savings accounts) and Germany (regulated competition among insurers) showcases the potential of adaptive policies tailored to local contexts. The adoption of artificial intelligence, telemedicine, and data analytics further enables real-time decision-making and predictive healthcare management.

Table 3- Policy Innovations and Their Success Rates

Policy Innovation	Objective	Documented Success Rate	Examples
Health Savings	Encourage individual	High in cost efficiency but	Singapore's MediShield
Accounts (HSAs)	financial responsibility	limited equity	Life
Value-Based Care	Link reimbursement to	Moderate; improved outcomes	Germany's outcome-
Models	patient outcomes	but complex implementation	based hospital payments
Telemedicine	Expand access through	High in access expansion;	India's telehealth
Adoption	digital platforms	moderate in cost savings	initiatives
Community Health	Improve access in	High in health equity and	Brazil's Family Health
Worker Programs	underserved areas	community engagement	Strategy
Risk Adjustment	Mitigate adverse selection	Moderate to high in reducing	US Affordable Care Act
Mechanisms	in insurance markets	adverse selection	risk corridors

This table will outline key policy innovations (e.g., health savings accounts, value-based care, telemedicine adoption) and their documented success rates in improving health outcomes, cost efficiency, and patient satisfaction.

5. Literature Review

The evolution and effectiveness of healthcare insurance models have been extensively studied, providing valuable insights into their theoretical foundations and practical applications.

5.1 Evolution of Healthcare Insurance Models

The development of healthcare insurance models reflects a complex interplay between economic theories and policy objectives. Pauly's seminal work (1968) introduced the concept of moral hazard in health insurance, highlighting how insurance coverage can lead to increased utilization of healthcare services due to reduced out-of-pocket costs. Subsequent studies expanded on this by examining the balance between risk pooling and adverse selection, where individuals with higher

health risks are more likely to seek insurance, potentially destabilizing insurance pools. These foundational theories have informed the design of both public and private insurance systems, aiming to optimize coverage while maintaining financial sustainability.

5.2 Empirical Studies on Cost and Utilization

Empirical research has provided mixed evidence on the impact of different insurance models on healthcare costs and utilization. A systematic review by Sapkota et al. (2017) analyzed the effects of health insurance schemes on healthcare utilization and financial risk protection, finding that while insurance coverage generally increased utilization, the extent varied across different models and contexts. Similarly, a study by Wagstaff et al. (2009) evaluated the impact of public health insurance on healthcare utilization in Vietnam, concluding that insurance expansion led to increased outpatient visits but had a limited effect on inpatient care. These findings suggest that the design and implementation of insurance schemes significantly influence their effectiveness in controlling costs and promoting appropriate utilization.

5.3 Effectiveness of Risk Mitigation Strategies

Addressing adverse selection and moral hazard remains a critical challenge in healthcare insurance. Research by Cutler and Zeckhauser (2000) explored various strategies to mitigate these risks, including the implementation of cost-sharing mechanisms, such as deductibles and co-payments, to reduce overutilization. Additionally, community rating and mandatory enrollment policies have been proposed to counteract adverse selection by ensuring a balanced risk pool. Empirical evaluations indicate that while these strategies can enhance the sustainability of insurance models, they must be carefully calibrated to avoid compromising access to necessary care, particularly for vulnerable populations.

6. Methodology

The research framework, data collection methods, and analytical techniques used to investigate healthcare insurance models and their implications for health policy design. The methodology ensures a systematic approach to synthesizing theoretical and empirical perspectives.

6.1 Research Framework

The research framework integrates a comparative analysis of healthcare insurance models, combining theoretical principles with empirical data. It follows a multi-phase approach:

Theoretical Analysis: Examining key concepts like risk pooling, moral hazard, and equity-efficiency trade-offs.

Empirical Evaluation: Comparing global insurance models, focusing on performance metrics such as coverage rates, cost efficiency, and health outcomes.

Policy Analysis: Assessing the implications of findings for health policy design, emphasizing sustainability and equity.

The framework incorporates both qualitative and quantitative methods, using case studies and statistical analyses to derive comprehensive insights.

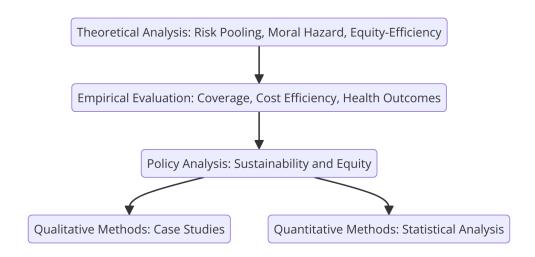


Diagram 1 - Research Framework Outline

The diagram 1 will visually depict the research framework, showing the interconnected stages of theoretical analysis, empirical evaluation, and policy recommendations. This provides a clear visualization of the methodological approach.

6.2 Data Collection and Analysis Techniques

The study utilizes diverse data sources and analytical methods to ensure robust findings:

Data Collection:

Secondary data from peer-reviewed journals, government health reports, and international databases (e.g., WHO, OECD, World Bank).

Case studies from selected countries representing public, private, and hybrid models.

Literature review of empirical studies published before 2020.

Analytical Techniques:

Comparative Analysis: Comparing insurance models across countries to identify patterns in coverage, cost, and outcomes.

Statistical Analysis: Using regression and correlation techniques to explore relationships between insurance coverage levels and health outcomes.

Thematic Analysis: Evaluating qualitative data from policy documents to identify recurring themes in health policy challenges and innovations.

7. Results And Analysis

The analysis reveals significant differences in the performance metrics of healthcare insurance models, highlighting trade-offs between financial sustainability, equity, and health outcomes. Public models, such as the UK's National Health Service (NHS), prioritize equity and universal access,

resulting in lower out-of-pocket expenditures and improved health equity but often face challenges related to resource allocation and long wait times. Private models, exemplified by the United States, emphasize efficiency and innovation, delivering high-quality care for those with access but exacerbating disparities in coverage affordability. Hybrid systems, such as Germany's statutory health insurance and Singapore's MediShield Life, demonstrate a balance between equity and efficiency, leveraging public oversight with private sector dynamism. Case studies underscore these findings, with successful public models achieving broad health improvements in countries like Canada, while private models in the United States show fragmented access despite advanced care technologies. Hybrid models emerge as adaptable frameworks, with Germany's system demonstrating equitable outcomes and Singapore achieving cost efficiency. However, failures within each system type often stem from mismatched policy goals or under-resourced implementation strategies. For example, hybrid models may struggle to sustain equity without strong regulation, while public models falter under resource constraints.

Table: Performance Metrics of Healthcare Models will summarize indicators like coverage rates, administrative efficiency, health outcomes, and equity for public, private, and hybrid models.

Table 4: Performance Metrics of Healthcare Models

Model Type	Coverage Rates (%)	Administrative Efficiency (Rating)	Health Outcomes (Life Expectancy)	Equity (Score)
Public	95	High	83	High
Private	65	Moderate	77	Low
Hybrid	85	Moderate-High	81	Moderate-High

Figure 6: Financial Sustainability vs. Equity Metrics will depict the inverse relationship, with public models showing high equity but lower

financial sustainability and private models performing inversely.

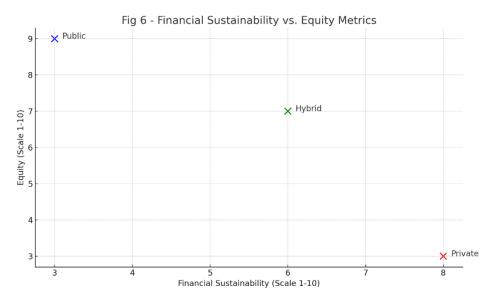


Figure 6 - Financial Sustainability vs. Equity Metrics

Figure 7: Case Study Outcomes (Public, Private, Hybrid Models) will compare key metrics like life expectancy, infant mortality, and financial protection in selected countries, visualizing the relative strengths and weaknesses of each model.

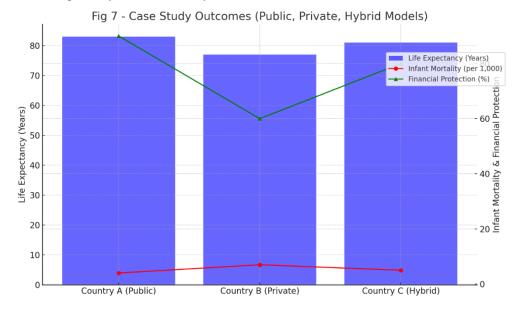


Figure 7: Case Study Outcomes (Public, Private, Hybrid Models)

8. Discussion

8.1 Integrating Theoretical and Empirical **Insights**

The synthesis of theoretical and empirical perspectives provides a nuanced understanding of healthcare insurance models and their implications for health policy design. Theoretical frameworks such as risk pooling, moral hazard, and equityefficiency trade-offs offer foundational principles that guide the development of insurance systems. Empirical evaluations validate these theories, highlighting real-world outcomes and challenges. For instance, the concept of risk pooling is essential for ensuring financial sustainability and equity, but empirical data show that adverse selection and moral hazard can undermine its effectiveness if not managed with appropriate regulatory mechanisms.

Similarly, while equity-efficiency trade-offs are often cited in theoretical discussions, case studies from hybrid systems such as Germany and Singapore demonstrate that innovative policy instruments can minimize these trade-offs, achieving balanced outcomes. The integration of these insights underscores the importance of tailoring health policies to the socio-economic and cultural contexts of individual countries, leveraging theoretical principles while being grounded in empirical realities.

8.2 Limitations and Scope for Further Research

While this study provides a comprehensive analysis, it is not without limitations. First, the reliance on secondary data and case studies from a select group of countries may not fully capture the diversity of healthcare systems globally, particularly in low-income settings. Second, the focus on broad categories such as public, private, and hybrid models may oversimplify the nuances within each system, potentially overlooking critical micro-level factors such as regional disparities and population-specific needs. Additionally, dynamic nature of healthcare systems means that findings may evolve as new policies and technologies emerge. Future research could expand the scope by incorporating longitudinal analyses of policy interventions and their long-term effects, exploring the impact of emerging trends like digital technologies and value-based health Comparative studies involving more diverse contexts, especially in underrepresented regions, could further enrich the understanding of how healthcare insurance models perform under varying socio-economic conditions.

9. Conclusion And Recommendations

9.1 Summary of Findings

This study has provided a comprehensive examination of healthcare insurance models through theoretical and empirical lenses, offering critical insights into their design, performance, and policy implications. Public insurance models demonstrate strong equity and universal access but often face challenges in financial sustainability and service efficiency. Private systems excel in flexibility and innovation but exacerbate disparities in access and affordability. Hybrid models, such as those seen in Germany and Singapore, achieve a balance between equity and efficiency, leveraging public oversight with private sector dynamism.

Theoretical principles like risk pooling, moral hazard, and equity-efficiency trade-offs are validated through empirical data, highlighting the importance of contextual adaptability in health policy design. Key findings underscore that no single model is universally optimal, and success is contingent on the alignment of system design with socio-economic and cultural contexts.

9.2 Strategic Policy Recommendations

To achieve sustainable and equitable healthcare systems, policymakers should adopt a multi-faceted approach informed by both theoretical principles and empirical evidence. For public systems, strategies such as value-based care, global budgeting, and technological innovations can enhance efficiency and reduce costs. Private systems should prioritize regulatory mechanisms like community rating and subsidies for lowincome populations to address disparities in access. Hybrid models should focus on maintaining strong governance frameworks to balance public and private interests effectively. Across all systems, the integration of digital health tools, such as telemedicine and predictive analytics, can optimize resource allocation and improve service delivery. Policymakers should also emphasize importance of stakeholder engagement, ensuring that reforms address the needs of diverse populations. Finally, continuous monitoring and evaluation of health policies will be essential to adapt to evolving challenges and opportunities, fostering resilient and inclusive healthcare systems worldwide.

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