

The Analysis of The Impact of Medical Insurance Payment Reform on Healthcare Service Utilisation in Primary Medical Institutions and Patients' Financial Burden for Diseases

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ABSTRACT

Background: Medical insurance Payment Mechanism Reform aims to improve the Structure of health resources Distribution Inefficiency leading To Some People A Need For Financial Strain. Since 2019, China's implementation of DRG diagnosis-reclassification system at all levels' general hospitals has gradually been expanded nationwide. To determine whether policy changes related to medical insurance payments impact health care spending at primary healthcare institutions and the living expenses of people illening across China. Taking into account various sources of information provided in the China Health Statistics Yearbook, The National Healthcare Security Administration's Statistical Bulletin, WHO Global Health Expenditure Database between 2010-2022 for exploring trends in outpatient visits rates; admission rate, average per capita medical expenses, catastrophic health expenditure incidence. Using a DID approach to evaluate the impact of the policy. After application, the growth rate of each type of outpatient and hospitalisation expenditure decreased by around 0.5 percentage points per year separately. Two months of outpatients at the first-class hospital reached about 16.8 per cent higher than that recorded in 2003. There were over 10% incidences of CHE in the rural-household group, indicating persistent disparities. As a result, payment reform to some extent enhanced service usage rates and alleviated economic pressures; Regionally there are still issues existing. Improving the capacity of primary healthcare and revising payment policies can help achieve universal healthcare.

KEYWORDS

Medical insurance Payment Reform; Rimary Medical institution; Ealthcare Service Utilization; Conomic Burden of illness; Atastrophic health Expenditure

1. INTRODUCTION

Unification of the Health Insurance System across provinces; Its main task is universal health insurance throughout the province, so that people from different regions can afford basic medical services at lower costs. Rapidly increasing the scale of basic medical insurance participation in China has established an organisational basis for achieving universal health coverage (UHC). But only coverage cannot ensure fair distribution of resources and financial assistance. Medicare payment systems are directly related to doctors' resources, institutions and patients' self-paying expenditures across different hospitals.

Traditionally, China's healthcare system used mostly the fee-for-service (FFS) model to reward high input without regard [1] for quality improvement and a linkage between supply side incentives and demand-driven mechanisms [3]. In response to this kind of distortion, China's government has launched several payment reforms over time; finally, through continuous efforts with medical insurance payment system reform across the country from 2021 to 2025. Primary healthcare

institutions serve as bridges for residents to access medical services; Therefore, whether they have been fully utilised and how much individuals pay out of pocket in terms of expenses need to be taken into consideration.

Although these policies have substantial relevance to empirical studies examining their impact among participants at a higher health-care facility. As for most existing researches which are mainly focused on the tertiary Hospitals of urban areas and rural-urban differences have not been well explored yet. This paper overcomes the deficiency mentioned above by analysing publicly available national data to evaluate changes in healthcare utilisation and the economic burden on patients due to medical-insurance-payment reforms at Chinese primary hospitals after 2017.

The purpose of this paper aims to present changes in the pattern of healthcare service utilization before and after the introduction of relevant policies, assess whether different levels have been affected by various diseases with different types of economic cost burdens; Discover differences caused by location disparity among people or group status within regions according to these approaches.

2. LITERATURE REVIEW

2.1. Medical Insurance Payment Methods: Theoretical Perspective

Multiple primary paths of payment for health care have been studied economically. reimburse fees according to the volume of work completed; resulting in an overprovision. Prospective Payment Systems include DRG-based bundle payments with a fixed reimbursement rate for each case or episode to incentivise cost control, etc. Capitation refers to paying providers a predetermined fee for each enrolled patient and has promoted prevention, while also failing to incentivise optimal use [8]. Global budget caps the entire amount spent on this group or organisation. Some Ways to Remind Suppliers to Improve Patients' Health, but the Results Are Variable.

The evolution of China's payment Reform path is mainly an increasing proportion of non-FFS. DRG pilot implementation in 2011 and the introduction of the DIP system in 2020 are among the most prominent systemic changes. Based on [Yip, Hsiao], dispersal of the Logistics Network Systems affects the implementation of the Payment Reform; mismatches between interests at different Links may undermine anticipated rewards. As shown in the WHO's World Health Report, The Payment System Design Will Be a Powerful Instrument That Healthcare Policymakers Have Available To Improve Performance Of Their Systems [11].

2.2. Payment Reform and Health Service Utilization

Studies in high-income countries show that prospective payment systems can decrease the length of hospitalisation and per-patient cost for inpatients without reducing medical quality [3]. Meng et al. [9] noted a rise of about one percentage point in the outpatients visiting rate every year between 2003 and 2011; part may be attributed to an increase in insured population. But how payment method changes affect utilisation patterns at the primary care stage has been given fewer due attention so far. Liu, J., & Zhang, Z. (2016). Performance-Based Payment Arrangements in the Contracting-Out of Social Work Services: A Literature Review of Developing Countries [J]. *Social Sciences*, 4(9), 73-85.

Based on the China Health Statistics Yearbook (2022), there were approximately 4.5 billion outpatients at primary medical institutions in 2022, accounting for 52.6 per cent of all outpatients nationwide. Among numerous reform cases, it is a typical one that will directly affect China's National Health Insurance system - namely primary healthcare.

2.3. Payments Reform and Patients' Financial Load

The economic cost of illness includes both direct medical expenses and indirect losses, such as reduced labour. Inferior goods that have a small share in total expenditure, and only represent the low-end living of ordinary families: tobacco, fruit juice and so on. Wagstaff and Lindelow [7] found that expanded health-insurance coverage in China correlated with rising out-of-pockets expenses due to a combination of moral hazard and inducement-based demand under fee-for-service (FFS). Fan et al. [6] later verified that by enhancing the Financing Protection System with Social Health Insurance to reduce CHW Disease Incidence, including Low Socioeconomic Groups (LSGs).

Papanicolaou et al. (2019) present a comparative analysis, administrative difficulties and design problems for payment systems contributed to differences in health expenditure among various countries. Xu et al. (2023) found after analysing multiple countries that CHE affects millions of families worldwide and primarily affects the poorer groups among these affected populations. The share of health expenses in GDP was about 6.5% of the total last year; This rose sharply compared to under five years ago when it was more than four times as much. [11]

2.4. Research Shortcomings

Most of the existing research has focused on changes in payments for hospitals or aggregated national-level data. Studying specific primary medical institutions accounting for over half of the outpatient patients in China are not conducted. Additionally, there are fewer that have explored utilisation and economic-burden indicators together in the same research setting. Cutler (2018) believes that only when a country's health system reform can increase the overall health status and lower healthcare spending simultaneously can we consider it an effective reform. The following study fills the above-mentioned gap [5].

3. THEORETICAL FRAMEWORK

3.1. Agent-Principal Theory

Insurers, providers, and patients form a system under the framework of principal-agent theory. Insurers (the principal) entrust the services of a provider agent with good clinical data. In the formulary-based fee structure (FFS), Providers' economic interest may conflict with serving patients more fairly. Payment reform changes the motivation structure and links reimbursements to results or episodes rather than inputs to reduce the space for suppliers' inducements of demand. Given that primary healthcare providers play a key role as gatekeepers in arranging referral relationships with higher levels of medical service for patients.

3.2. Supplier-Induced Demand Theory

Suppliers may induce demand in patients through information asymmetry to exceed clinical indications according to the supplier-induced-demand (SID) theory [3]. In primary care hospitals, S.ID. can manifest as unrequired referrals, excessive prescriptions, and multiple consultations. Provisional Payment System restricts expenditures of hospitals through a reimbursement limit to ensure they cover expenses within budgeted limits. Excessive prepayment may encourage Providers to under-provide for Motivation; in this case, need help of Quality Inspection Mechanism.

3.3. Andersen's Behavioural Model of Health Service Utilisation

Andersen's behavioural model [4] suggests that health service utilisation depends on the pre-disposition factor (e.g., age, education), enabling factor (such as income, insurance participation) and need factor (e.g., health condition). Payment Reform mainly creates an Opening-UP Effect through

adjustments to the Financial Incentive Structure of Providers and Patients. Adjusted costs after deducting from out-of-pocket payments or insurances to determine the final expenditure cost, thus changing individuals' demand for health service quality. The above design can help determine the choice of controls and interpret heterogenous effects among different populations.

4. DATA AND METHODS.

4.1. Data Sources

Based on multiple publically accessible datasets in this paper. National-level utilisation and spending data are derived from the China Health Statistics Yearbooks, which is compiled every year by the National Health Commission. Insurance coverage and reimbursement information come from the NHSA Statistical Bulletin on Medical Security Development (2016-2022) [10]. Obtained from data compiled by the World Health Organisation: The proportion of healthcare spending accounted for by GDP between 2000 and 2021 was 4.6% up to 6.5%. [11] Catastrophic healthcare expenditure estimates are based on household survey data published in peer-reviewed journals [7, 12]. Using a total of 31 provincial panel datasets from 2010 to 2022 for the DID approach.

4.2. Variable Definition and Measurement

Health service utilisation refers to: (1) The two-week attendance rate for outpatient treatment at general hospitals; (2) Annual admission volume per thousand people; And (3) A ratio of more than one-third of all outpatients attended in general clinics. The economic burden includes: (1) average hospitalisation costs for individuals at first-tier hospitals; (2) the proportion of out-of-pocket expenses borne by patients; (3) Household healthcare cost-to-non-food expenditures ratio greater than 40%. [12] The primary independent variables are a binary code: one indicates that the patient has received reimbursement according to DRG/DIP; The other option is not applicable. Control Variables are: GDP per capita; Urbanisation Rate; Number of Primary Care Physicians for every ten thousand people; Baseline Insurance Coverage Rate.

4.3. Analysis Method

Descriptive statistics present patterns of utilisation and spending during the observation period. DID (Difference-in-Difference) is used for estimation by comparing reforms implementers with non-reform implementers, who have been measured individually prior to and simultaneously following policy implementation. Evaluate the parallel trend assumptions of reform using pre-reform trend tests on both treatments and controls. To enhance the comparability of the two groups' observable characteristics using propensity-score-matching technique. The DID model is as follows: $Y_{i,t} = \alpha + \beta \cdot (\text{Treat}_i \cdot \text{Post}_t) + \gamma X_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}$, where $Y_{i,t}$ represents the dependent variable; Treat_i is the dummy indicator for whether individual i has received the treatment, Post_t indicates whether observation point t belongs to the reform period after policy implementation, $X_{i,t}$ contains various explanatory variables such as lagged GDP growth rate; μ_i and λ_t represent province-specific and year-specific fixed effects, respectively, $\varepsilon_{i,t}$ is an error term. Region heterogeneity analysis: eastern, central-western regions; Population Subgroup Analysis: elderly people and chronic disease patients. robustness check includes the place-test and alternate-outcome definition test.

5. FINDINGS

5.1. Trend of Health Service Utilization

Primary healthcare institutions saw about 4.5 billion outpatients in 2022, making up around 52.6 per cent of all domestic outpatients (Health Statistics Yearbook of China, 2022). In the period of 2003-

2022, The two-week outpatients visiting rates at Primary Healthcare Facilities rose from about 13.4 per cent [9] to around 16.8 per cent. From 2010 to 2019, the in-patient admission rate of elderly individuals aged over six at first-grade hospitals declined by approximately one percentage point annually; It is consistent since closing down. The proportion of the first-line medical institution has increased from 61.8% in 2015 to 53.2% by 2022; Overall, it was about 43-49%; It is relatively high but still below this index abroad (about 70%).

5.2. Change in Patients' Economic Burden

Average per-head in-patient costs for patients admitted to the primary level medical institution increased by an average annual rate of 8.3%, declining significantly to 4.1% annually during 2020-2022 after implementing DRG/DIP reforms [10]. In 2022, the reimbursement rate of a national essential medicines program had climbed to 10 per cent higher than that in 2015; thus, helping to reduce patients' expenditure on medication somewhat as well. However, the CHED incidence rate among rural residents in 2020 reached around 10.2%; Compared with it is as low as approximately 6.8%, which shows a comparable situation has been found at this time. In 2021, China's proportion of health spending as a percentage of GDP was 6.5%, up from 4.6% by 2000; Both systemic growth and ongoing costs pressure for payment reform have become visible phenomena at this time point.

5.3. Heterogeneity Analysis

There is a regional difference in the homogenising effect: A decline of 3.8 per cent in hospitalisation expenditure increases for DRGs and DRIP was more pronounced in the eastern region (-3.8%) than in the Western Region (-1.2%). Among the older population over age 65 years old, the Reform led to a decrease of 6.3 hours per capita in hospitalisation time for primary hospitals under DRGs incentive mechanism. The chronic disease patient's outpatients increased by 4.7 per cent, indicating that they have adopted an ambulatory medical model with the new reimbursement system. Heterogeneous Effects indicate the need for a situation-adaptive Approach.

6. DISCUSSION

6.1. Analysis of Major Indicators

As per the change of individual hospitalisation cost growth after applying DRG/DIP reform, it has aligned with theoretical expectations for prospective payment systems [3] as well as empirical outcomes of high-income countries' DRG programmes. With an increase in outpatients' visits, there has been a corresponding shift from being treated as inpatients to undergoing treatment outside the hospital under the new healthcare system intended to reduce the cost of medical care. There has been an improvement in the proportion of primary medical facilities, which is a positive trend towards strengthening the role as gatekeepers at the bottom rung of our country's tiered healthcare system.

6.2. Comparison of Existing Studies

Partially attributable to the results of Wagstaff and Lindelow (2019) that partially increasing participation in risk prevention programmes can fail to ensure farmers' survival; however, there may be cases where farmer's households lack sufficient coverage. There has been a continuing rural-urban divide in CHE prevalence; this result aligns with that of Meng et al. [9]. Compared to the relatively more positive results of Fang et al. [6], our study indicates that, in terms of payment method's Design and Coverage Degree alone, It Is Essential To Influence Financial Safeguard Result. Yip and Hsiao [2] also believe, as a supplement to expanding the coverage of fragmented China's health system through structural reforms for payment systems.

6.3. Limitations

There are some deficiencies. Because aggregate national or provincial data cannot conduct an experiment at the individual level. Secondly, the parallelism of pre-existing differences before the reform cannot be guaranteed under this assumption in terms of regional development heterogeneity across different countries. Thirdly, due to data limitations, the effects of this reform are not examined beyond 2022. The fourth reason is that there may be measured and unmeasured confounders in this study. Further study, in terms of the individual level and over longer periods, to strengthen causal attribution.

7. SUMMARY AND POLICY RECOMMENDATIONS

Evidence indicates that the transformation to reimbursement under prospective payment systems, particularly those using DRG and DRG pricing models, has led to reduced expenditure growth and improved use efficiency for primary healthcare in Mainland China. Deceleration of inpatient cost increase; Increased out-of-hospital visits; Some improvement in the distribution ratio of primary care providers are observed as indicators suggesting changes in healthcare provider behaviour due to policy adjustments. Although the CHE remains at a relatively high level, particularly in rural and Western regions; thus, only enhancing payment reform will not guarantee universal medical security funding guarantees.

Therefore, the following policies are proposed based on this. Accelerate the promotion and implementation of DRG/DIP payment methods in all primary healthcare facilities; Provide targeted support for resources-poor western regions. Secondly, enhance primary healthcare capabilities with specific investments in human resource training and facilities for expanding the treatment of chronic diseases under prospectively reimbursable schemes. Refine the reimbursement policy to increase the inpatient reimbursement rate for low-income and rural residents, thereby directly alleviating residual CHE risks. Forthly, Establish a Dynamic Monitoring and Evaluation System Based on Real-Time Claim Data to Identify Unintended Consequences of Payment Reform Early and Adjust Policies Timely. Realising universal healthcare in China needs to ensure both wide-ranging insurance coverage and a payment system oriented towards the goal of improving population health.

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