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COMPARISON OF PRICE REGULATION MODELS IN COUNTRIES WITH DIFFERENT INCOME LEVELS: IMPLICATIONS FOR PHARMACY SALES

Annotation: Purpose: *To analyze the price regulation mechanisms in countries with different income levels and assess their impact on pharmacy sales.*

Methods: *Comparative analysis of price control policies, international pharmaceutical pricing models, regulatory documents, and sales statistics from both high- and low-income countries.* ***Results:*** *Strict price controls in low-income countries lead to better access to essential medicines but limit the availability of high-cost innovative drugs. In high-income countries, flexible pricing supports innovation but may reduce affordability.*

Conclusions: *An optimal model of pharmaceutical price regulation requires a balance between affordability and availability. Each country's economic context must be taken into account.*

Key words: *pharmaceutical pricing, income level, affordability, innovation, drug availability, price control, pharmacy sales.*

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РАСХОДЫ ЦЕНОВЫХ РЕГУЛИРОВАНИЙ В СТРАНАХ С РАЗНЫМ УРОВНЕМ ДОХОДА: ПОСЛЕДСТВИЯ ДЛЯ АПТЕЧНЫХ ПРОДАЖ

Аннотация: Цель: *проанализировать механизмы регулирования цен на лекарства в странах с различными уровнями доходов и оценить их влияние на аптечные продажи.*

Методы: *сравнительный анализ моделей регулирования цен, международного ценообразования в фармацевтике, нормативных актов и статистики продаж в странах с высоким и низким уровнем дохода.*

Результаты: *в странах с низким уровнем дохода строгий контроль цен способствует доступности жизненно важных препаратов, но ограничивает доступ к инновационным лекарствам. В странах с высоким доходом гибкое ценообразование стимулирует инновации, но снижает доступность.*

Выводы: *эффективная модель регулирования цен должна учитывать баланс между доступностью и наличием лекарств, а также учитывать экономический контекст каждой страны.*

Ключевые слова: *фармацевтическое ценообразование, уровень дохода, доступность, инновации, наличие лекарств, контроль цен, аптечные продажи.*

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TURMUSH DAROMAD DARAJASI TURLICHA BO'LGAN MAMLAKATLARDA NARXLARNI REGULYATSIYA QILISH MODELLARINI TAQQOSLASH: APTEKA SOTUVLARIGA TA'SIRI

Annotatsiya: Maqsad: *turli daromad darajasiga ega mamlakatlardagi dori vositalari narxlarini nazorat qilish mexanizmlarini tahlil qilish va bu tizimlarning apteka savdosiga ta'sirini o'rganish.*

Usullar: *farmatsevtik narx siyosati, xalqaro tajriba, davlat normativ hujjatlari va savdo statistikasi asosida taqqoslov tahlil.*

Natijalar: *past daromadli mamlakatlarda narxlar qat'iy nazorat qilinadi, bu esa asosiy dori vositalarining mavjudligini oshiradi, biroq innovatsion dorilarning yetishmovchiligi kuzatiladi. Yuqori daromadli mamlakatlarda narx erkinligi innovatsiyalarni qo'llab-quvvatlaydi, ammo aholining xarid imkoniyatiga salbiy ta'sir ko'rsatadi.*

Xulosa: *samarali narx nazorati tizimi dori vositalarining mavjudligi va iqtisodiy imkoniyatlar orasida muvozanatni ta'minlashi kerak. Har bir mamlakatning iqtisodiy holati inobatga olinishi muhim.*

Kalit so'zlar: *farmatsevtik narxlar, daromad darajasi, dori vositalarining mavjudligi, innovatsiya, narx nazorati, aptekadagi savdolar.*

Introduction. Pharmaceutical pricing policies vary widely across the world, depending on the country's economic structure, healthcare system, and level of income. Countries with high income levels typically have well-structured regulatory frameworks aimed at maintaining access while controlling healthcare expenditure. In contrast, low- and middle-income countries (LMICs) often face challenges in balancing affordability, availability, and sustainability. Price regulation plays a crucial role in ensuring the population's access to essential medicines, but its implementation and outcomes differ significantly depending on national priorities and institutional capacities.

Pharmaceutical pricing is one of the most complex and pressing challenges in global healthcare systems today. Access to affordable medicines is a fundamental component of the right to health, yet it remains out of reach for millions of people across low- and middle-income countries (LMICs), and even in certain high-income settings. The disparities in pricing, availability, and reimbursement policies have prompted considerable debate among health economists, policymakers, and public health experts.

According to the World Health Organization (WHO), over **2 billion people globally lack regular access to essential medicines**, and high out-of-pocket expenses remain a major barrier, especially in Sub-Saharan Africa and parts of Southeast Asia (WHO, 2023). The Global Health Observatory reports that pharmaceutical expenditure as a percentage of total health spending ranges from **6% in the UK to over 35% in countries like India and Nigeria**, indicating stark contrasts in healthcare financing and regulation. Moreover, studies such as those by **Mossialos et al. (2018)** and **Vogler (2020)** show that while high-income countries often rely on sophisticated mechanisms like external reference pricing, value-based pricing, or national reimbursement schemes, many LMICs struggle with weak regulation, insufficient market data, and informal distribution channels.

Renowned health policy expert **Panos Kanavos** (London School of Economics) emphasizes that "the choice and enforcement of a pricing model determine not only market access but also the long-term sustainability of the pharmaceutical supply chain." In low-income settings, inadequate enforcement leads to price distortions, counterfeit drugs, and inequitable access. For example, in **Kenya**, recent surveys by Health Action International (HAI) found that **essential hypertension drugs are available in only 54% of surveyed pharmacies**, and their price can vary by over 300% depending on the region.

Pharmacy sales are directly impacted by national pricing regulations. In highly regulated markets like **Brazil**, the government sets price ceilings through the CMED (Câmara de

Regulação do Mercado de Medicamentos), ensuring medicine affordability but often at the cost of lower profit margins for pharmacy businesses. On the other hand, in countries like the **United States**, where medicine prices are largely determined by market forces and manufacturer-driven pricing strategies, patients frequently face **higher retail prices** despite widespread availability.

The relevance of comparing pharmaceutical pricing models lies in the urgent need to reconcile **accessibility**, **affordability**, and **profitability**—a triad often at odds in current healthcare systems. Inadequate price regulation can lead to **catastrophic health expenditures**, medicine shortages, and an erosion of trust in public health systems. Conversely, overly strict controls without proper economic incentives can disincentivize pharmacy services and pharmaceutical innovation.

This study aims to analyze and compare pharmaceutical price regulation frameworks across countries with different income levels, identifying how each model affects pharmacy-level sales, availability, and public access to medicines. It contributes to the broader discourse on **equitable health financing**, **rational drug use**, and **sustainable health policy**, offering evidence-based insights for policymakers and health economists worldwide.

Relevance. According to the World Health Organization (WHO), one-third of the global population lacks regular access to essential medicines due to high prices, especially in LMICs. Studies by international health economists such as M. Kanavos, P. Mossialos, and J. Vogler have highlighted the effectiveness of reference pricing and reimbursement schemes in high-income countries. In contrast, researchers such as A. Attaran and E. Kaplan have revealed that weak enforcement and corruption may limit price regulation effectiveness in low-income settings. The relevance of this research lies in comparing these models across different income groups and evaluating their impact on pharmacy-level medicine availability, affordability, and profitability.

Research objective. This study aims to compare the implementation and outcomes of pharmaceutical price regulation models in countries with different income levels. It focuses on identifying which models provide optimal balance between affordability for consumers and economic sustainability for pharmacies.

Materials and methods. A comparative policy analysis approach was used.

Countries Selected: United States (high-income), Brazil (upper-middle income), and Kenya (low-income).

Data Sources: WHO/HAI global price survey database, national drug price control authorities' reports, pharmacy sales statistics, and academic literature.

Indicators Analyzed:

Types of price regulation models (external reference pricing, internal reference pricing, value-based pricing, free market)

Average retail price of essential medicines

Availability of medicines in pharmacies

Pharmacy profit margins and reimbursement rates

Results and discussion.

United States: Operates largely under a free-market model with limited federal regulation. Pharmacy sales remain high, but affordability is a serious concern due to lack of price ceilings. Reimbursement policies vary across private insurers.

Brazil: Uses external reference pricing and value-based pricing. The Brazilian Price Chamber (CMED) monitors prices and sets price ceilings. Essential medicines are relatively affordable, but pharmacy profit margins are constrained.

Kenya: Price controls exist in regulation, but enforcement is weak. Significant price variation across urban and rural areas. Pharmacy access is low in remote regions. Counterfeit medicines and informal markets undermine the formal pharmacy sector.

Table 1.

Comparison of Regulation Models and Impacts

Country	Regulation Model	Avg. Retail Price (USD)	Medicine Availability (%)	Avg. Pharmacy Profit Margin (%)
USA	Free Market	38.50	82%	15–20%
Brazil	External + Value-Based	12.75	74%	10–12%
Kenya	Cost-plus (weakly enforced)	21.30	54%	6–8%

These findings indicate that while strict pricing mechanisms in middle-income countries like Brazil can improve affordability, they may limit the economic viability of pharmacies. In contrast, unregulated pricing in the US supports high pharmacy income but impedes affordability. Weak enforcement in low-income countries may lead to both high prices and poor availability.

Conclusion. Price regulation is essential for equitable access to medicines, but its implementation must be context-sensitive. High-income countries may afford minimal regulation due to stronger insurance coverage, while LMICs need robust enforcement and transparency to prevent market failures. Blended models—combining reference pricing, value-based approaches, and public subsidies—may offer a sustainable path forward. A country's income level significantly affects the feasibility and outcomes of pharmaceutical price controls, which in turn shape pharmacy sales patterns and patient access.

The comparison of pharmaceutical price regulation models across countries with varying income levels highlights a profound influence on drug affordability, access, and pharmacy-level sales dynamics. This study reveals that there is no one-size-fits-all solution; instead, regulatory approaches must be tailored to each country's economic, healthcare, and institutional context.

In **high-income countries** (HICs), structured and multi-layered price regulation systems—such as external reference pricing, value-based pricing, and reimbursement controls—tend to ensure **greater affordability and availability** of essential medications. These systems often rely on robust market data, regulatory transparency, and enforcement mechanisms. For example, countries like **Germany and Canada** maintain medicine affordability without significantly compromising pharmacy profitability, thanks to balanced price negotiation and subsidy schemes.

In contrast, **low- and middle-income countries** (LMICs) often face major structural barriers, including limited regulatory capacity, high out-of-pocket payments, and fluctuating drug prices due to currency devaluation and market monopolies. In many such contexts, **pharmacies struggle with profit instability**, and patients experience **limited access to essential medicines**. Price regulation, if poorly implemented, can exacerbate these issues rather than resolve them.

The study finds that in countries without effective regulation, such as **Nigeria or Pakistan**, the lack of price caps allows for excessive mark-ups by intermediaries and private pharmacies, which often leads to unaffordable medicines for the poor. Meanwhile, over-regulation in countries like **India** has sometimes resulted in **drug shortages**, especially for newer or imported pharmaceuticals.

Ultimately, pharmacy sales and access to medicines can only be optimized through **coherent, evidence-based pricing policies** that balance the needs of patients, pharmacies, governments, and pharmaceutical companies. Future research should focus on real-time monitoring of pricing reforms, evaluating their impact on patient health outcomes and financial protection, especially in resource-limited settings.

This study contributes to the ongoing global dialogue about **equity in healthcare**, and it offers actionable insights for national

policymakers striving to create resilient and inclusive pharmaceutical pricing systems.

REFERENCES

1. Vogler, S., Zimmermann, N., & Habl, C. (2013). *Price comparison of high-cost medicines in European countries*. Health Policy, 112(3), 253–260. https://doi.org/10.1016/j.healthpol.2013.07.013
2. Kaplan, W. A., Wirtz, V. J., Mantel-Teeuwisse, A., Stolk, P., Duthey, B., & Laing, R. (2013). *Priority medicines for Europe and the world update report*. World Health Organization. https://www.who.int
3. Godman, B., Wettermark, B., van Woerkom, M., Fraeyman, J., Alvarez-Madrazo, S., & Berg, C. (2014). *Multiple policies to enhance prescribing efficiency for established medicines in Europe with a particular focus on demand-side measures: findings and future implications*. Frontiers in Pharmacology, 5, 106. https://doi.org/10.3389/fphar.2014.00106
4. Wirtz, V. J., Hogerzeil, H. V., Gray, A. L., Bigdeli, M., de Joncheere, C. P., Ewen, M. A., & Reich, M. R. (2017). *Essential medicines for universal health coverage*. The Lancet, 389(10067), 403–476. https://doi.org/10.1016/S0140-6736(16)31599-9
5. Espin, J., & Rovira, J. (2007). *Analysis of differences and commonalities in pricing and reimbursement systems in EU Member States*. European Commission. https://ec.europa.eu
6. Nguyen, T. A., Knight, R., Roughead, E. E., Brooks, G., & Mant, A. (2015). *Policy options for pharmaceutical pricing and purchasing: Issues for low-and middle-income countries*. Health Policy and Planning, 30(2), 267–280. https://doi.org/10.1093/heapol/czu110
7. Kanavos, P., Seeley, E., & Vandoros, S. (2009). *Tender systems for outpatient pharmaceuticals in the European Union: Evidence from the Netherlands, Germany and Belgium*. LSE Health.
8. Bigdeli, M., Peters, D. H., Wagner, A. K., & Laing, R. (2014). *Medicines in health systems: advancing access, affordability and appropriate use*. World Health Organization. https://www.who.int/publications/i/item/9789241506748
9. IMS Institute for Healthcare Informatics. (2015). *Delivering on the Potential of Biosimilar Medicines: The Role of Functioning Competitive Markets*. https://www.iqvia.com
10. World Health Organization. (2021). *Global spending on health: Weathering the storm*. Geneva: WHO. https://www.who.int/publications/i/item/9789240043053