

Pharmaceutical Pricing and Access Policies: A Study on the Impact of Physicians' Imperfect Adherence to Prescribing Guidelines

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Abstract

The rising costs of prescription drugs present a major challenge to healthcare systems, leading many payers to adopt risk-sharing or managed entry agreements to mitigate financial uncertainties. This study introduces an analytical framework that incorporates physicians' imperfect adherence to prescribing guidelines in the design of such agreements. Physicians are categorized into three groups based on their adherence levels, impacting the decision-making of both public payers and pharmaceutical manufacturers. Using a Stackelberg game framework, we model the interactions where the manufacturer first sets the drug price, and the payer subsequently determines access conditions to maximize net monetary benefit (NMB). Our findings reveal that deviations from prescribing guidelines significantly alter equilibrium outcomes, influencing optimal pricing, coverage thresholds, and stakeholder incentives. We also examine how different risk-sharing mechanisms interact with physician behavior, shaping payer expenditures, manufacturer profits, and patient access. These insights underscore the necessity of accounting for prescribing heterogeneity in pharmaceutical pricing policies to ensure cost-effective and equitable access to medications.

Keywords

Pharmaceutical pricing, physician adherence, risk-sharing agreements, Stackelberg game, access policy

Biographies

Rezvan Shahabbasi is a PhD candidate in Management Science at Ivey Business School, Western University. Her research focuses on healthcare operations, pharmaceutical pricing, and policy design, applying decision science, big data, and machine learning techniques to address challenges in healthcare systems. She holds an MBA and has prior experience as a data analyst in the FMCG industry. Rezvan is passionate about using analytical models to inform data-driven decisions and improve public health outcomes.

Prashant Chintapalli is an Assistant Professor in the Management Science area at Ivey Business School. He earned his PhD from UCLA Anderson School of Management and previously held an appointment at the Indian Institute of Management Bangalore. His research focuses on operational challenges in emerging economies, especially food supply chains, developing models that address resource constraints, social responsibility, capacity, pricing, and inventory decisions.

Gregory S. Zaric is a Professor of Management Science at Ivey Business School and cross-appointed in Epidemiology and Biostatistics at Western University. He serves as Academic Director of Ivey's MSc and MMA programs and is Editor-in-Chief of Health Care Management Science. A Canada Research Chair in Health Care Management Science, his research applies analytics to health policy, health economics, pharmaceutical risk-sharing, and ICU resource planning.