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Economic issues of generic medicines: a literature review and implications for Morocco

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ABSTRACT

Introduction: Rising pharmaceutical expenditure is a major challenge for the sustainability of health systems. Generic medicines are an important lever for controlling costs, stimulating competition and improving access to treatment. However, their economic effect depends on pricing and reimbursement policies, prescribing and substitution mechanisms, the degree of competition, supply tensions, and the trust of professionals and patients.

Objective: To analyse the main economic issues associated with generic medicines in the recent literature, to identify the mechanisms through which they influence prices, pharmaceutical expenditure and financial accessibility, and to discuss the implications for Morocco.

Methods: A structured literature review was conducted from 1 January 2015 to 10 August 2026 in Scopus and PubMed. The Scopus query identified 855 documents (743 articles and 112 reviews), and a consolidated selection of 100 PubMed references was added. After merging, 955 records were deduplicated by title normalisation; 55 duplicates were removed, leaving 900 unique references. An initial title-based screening was applied according to economic, pharmaceutical-policy, access, prescribing and substitution criteria.

Results: After deduplication, 900 unique references were examined by title. Of these, 439 were excluded and 461 were retained for abstract and/or full-text verification.

Conclusion: Generic medicines represent a major lever for pharmaceutical sustainability, but their effectiveness depends on an integrated policy combining price, competition, reimbursement, prescribing, substitution, quality and availability. For Morocco, the ongoing extension of universal health coverage reinforces the relevance of such a strategy.

Keywords: generic medicines; health economics; drug prices; pharmaceutical expenditure; financial accessibility; reimbursement; competition; prescribing; substitution; Morocco.

1. Introduction

Controlling pharmaceutical expenditure has become a central concern of health policy. Therapeutic innovation, population ageing, the rising burden of chronic disease and the expansion of health coverage are placing growing pressure on public budgets, health insurers and households. In this context, the availability of generic medicines after loss of exclusivity is one of the main mechanisms for stimulating competition and lowering drug prices [1].

However, the presence of a generic on the market does not automatically guarantee a durable reduction in spending. Savings depend in particular on the number of market entrants, market structure, pricing and reimbursement policies, substitution rules and prescribing behaviour. The effect of competition on prices has been directly documented: the entry of several generic competitors after loss of exclusivity is associated with a decrease in the average price of competing medicines [2]. Conversely, insufficient competition, shortages and market concentration can contribute to substantial price increases for certain generics [3, 4].

Beyond price, generics can provide broader societal value by freeing up resources for other health interventions and by improving access to treatment [5]. However, real-world accessibility also depends on reimbursement arrangements and out-of-pocket costs. Recent work shows that generics can sometimes be less expensive when purchased outside insurance coverage, highlighting the complexity of the relationship between list price, reimbursement and the cost actually borne by the patient [6].

Prescribing and substitution policies also play a decisive role. International experience shows that generic prescribing, substitution and competition policies can increase the use of generics, but certain therapeutic classes with a narrow therapeutic index require a more nuanced approach and appropriate clinical oversight [7, 8, 9].

In the MENA region, generic medicine policies remain strongly supply-oriented: price caps, reference pricing and tendering. Demand-side policies, such as generic prescribing and substitution, remain less systematic and are rarely mandatory [10].

Morocco is a particularly relevant setting. The pricing-system reform adopted in 2013 was followed by a favourable evolution of the generic segment: between 2015 and 2018, generic sales volumes grew on average by 3.5% per year and their revenue by 5.1% per year, while the volume of the corresponding originator products showed a negative average trend [11]. Other Moroccan studies have shown that the introduction of generics contributed to a reduction in the average cost of antiepileptic drugs despite an increase in their consumption [12].

Prescribing nonetheless remains a major challenge. Recent studies conducted in Marrakesh and Casablanca show that generic prescribing remains variable across departments and practitioners and depends on professional, perceptual and organisational factors [13, 14]. The question of bioequivalence and trust in generic quality also remains relevant in the Moroccan context [15].

The overall objective of this study is therefore to analyse the economic issues associated with generic medicines in the literature published between 2015 and August 2026 and to discuss the implications for the Moroccan pharmaceutical system. The specific objectives are to examine the effect of generics on prices, savings and expenditure; the role of competition; the impact of reimbursement and out-of-pocket costs; the influence of prescribing and substitution; and the implications for pharmaceutical policy, access and local production.

2. Methods

2.1. Study design and period

This is a structured literature review based on a bibliographic search in Scopus and PubMed. Interbase deduplication and initial title-based screening were carried out on the whole working corpus. However, systematic verification of abstracts and full-text assessment of the retained references remain to be completed. The results are therefore presented as a structured synthesis with a partially completed PRISMA process, and not as a finished systematic review. The period considered runs from 1 January 2015 to 10 August 2026.

2.2. Scopus strategy

In Scopus, the final query was: TITLE-ABS-KEY (("generic medicine" OR "generic medicines" OR "generic drug" OR "generic drugs") AND ("cost saving" OR "cost savings" OR "price competition" OR "generic competition" OR "pharmaceutical expenditure" OR affordability OR "generic prescribing" OR "generic substitution")) AND PUBYEAR > 2014 AND PUBYEAR < 2027, limited to articles and reviews. This strategy identified 855 documents: 743 articles and 112 reviews. The main subject areas were Medicine (n = 684), Pharmacology, Toxicology and Pharmaceutics (n = 234), Health Professions (n = 96), Biochemistry, Genetics and Molecular Biology (n = 46), and Economics, Econometrics and Finance (n = 43).

2.3. PubMed strategy

In PubMed, the main query combined the MeSH term "Drugs, Generic" and the expressions "generic drug(s)" and "generic medicine(s)" in title/abstract with economic terms such as "Drug Costs", "Economics, Pharmaceutical", price, cost, affordability, reimbursement, pharmaceutical expenditure and cost saving. The period was limited to 1 January 2015 - 10 August 2026.

This broad economic query identified 1,587 references. Thematic sub-queries retrieved 339 references for price/competition, 760 for savings/expenditure, 495 for accessibility/reimbursement/out-of-pocket costs, 330 for prescribing/substitution, and 10 for generics + Morocco. These sub-corpora overlap and are not additive. In addition, a selection of 100 PubMed citations was compiled from the most directly relevant results and merged with Scopus for deduplication. This selection does not correspond to the final number of included studies, which can only be determined after abstract verification and full-text assessment.

2.4. Reference management and PRISMA process status

The 855 Scopus references and the 100 pre-selected PubMed references were merged into a working corpus of 955 records. Interbase deduplication was performed by title normalisation, followed by verification of near-identical matches. Fifty-five duplicates were identified (53 exact matches after title normalisation and 2 near-identical matches), leaving 900 unique references. An initial screening was then performed on titles according to the protocol's inclusion/exclusion criteria. As the result copies provided did not contain full abstracts, this screening cannot be presented as a complete title/abstract screening; potentially relevant references were therefore conservatively retained for abstract and/or full-text verification.

2.5. Inclusion and exclusion criteria

Original articles, reviews, economic and pharmacoeconomic analyses, and policy studies addressing prices, costs, savings, expenditure, reimbursement, accessibility, competition, prescribing or substitution of generic medicines were considered potentially eligible. Studies unrelated to medicines, purely pharmacological or galenic studies without an economic dimension, publications outside the study period, and duplicates were excluded. Moroccan publications without a direct generics focus may be retained as contextual references when their content sheds light on financing, access, reimbursement or the pharmaceutical industry.

2.6. Variables of interest

The variables planned for extraction are: country, study type, therapeutic class, policy studied, number of products or patients, price, costs, savings, expenditure, reimbursement, out-of-pocket costs, accessibility, market share or generic penetration, prescribing, substitution, and main pharmaceutical policy implications.

2.7. Consolidated table of Scopus and PubMed searches

Table 1 summarises the numbers obtained in each database and for each thematic axis, along with their methodological interpretation.

Table 1. Consolidated Scopus and PubMed searches.

Axis	Updated Scopus	PubMed	Interpretation
Main economic corpus	855	1,587 (broad query); 100 references pre-selected for consolidation	955 records in the working corpus before deduplication
Document type	743 articles; 112 reviews	Articles/reviews per search filters	55 duplicates removed; 900 unique references
Price / competition	Included in final query	339	Analytical sub-axis
Savings / expenditure	Included in final query	760	Analytical sub-axis
Accessibility / reimbursement	Included in final query	495	Analytical sub-axis
Prescribing / substitution	Included in final query	330	Analytical sub-axis
Generics + Morocco	Earlier targeted search: 42	10	National context; manual selection

Methodological note: Scopus and PubMed figures should not be compared as yield rates, since several queries do not use exactly the same fields, descriptors or levels of specificity. For the selection process, 855 Scopus references and 100 pre-selected PubMed references were merged, 55 interbase duplicates were removed, and 900 unique references were then examined by title.

3. Results

3.1. Updated Scopus corpus

The finalised Scopus query identified 855 documents over the period 2015-2026, including 743 articles (86.9%) and 112 reviews (13.1%). The corpus is mainly indexed in Medicine (n = 684), Pharmacology, Toxicology and Pharmaceutics (n = 234) and Health Professions (n = 96), with a further 46 documents in Biochemistry, Genetics and Molecular Biology and 43 in Economics, Econometrics and Finance. This structure confirms the multidisciplinary nature of the topic, at the interface of medicine, pharmacy, health economics and pharmaceutical policy.

Among the particularly relevant recent studies are the South Korean analysis by Son [16] on the role of the number of entrants and price variance in reducing pharmaceutical expenditure, the study by Répásy et al. [17] on the long-term effect of generic competition on the Hungarian statin market, and the systematic review by Alqawasmeh et al. [18] on facilitators and barriers to the use of generic and biosimilar medicines in the Middle East and North Africa. Recent data on medicine accessibility in low- and middle-income countries further reinforce the case for integrating availability and financial accessibility into economic analysis [19].

Examination of the final Scopus batch (documents 801 to 855) confirms the consistency of the selected axes. It includes the systematic review by Gothe et al. [20] on the impact of generic substitution on health and economic outcomes, work on the potential savings associated with therapeutic substitution [21], substitution and prescribing policies, price competition, and patient and professional perceptions. The systematic review by Colgan et al. [22] highlights in particular the role of perceptions and trust, while Hassali and Wong [23] discuss the difficulties of implementing substitution policies in low- and middle-income countries.

3.2. Size and structure of the PubMed corpus

The main PubMed economic query identified 1,587 references over the study period. The thematic breakdown reveals four main clusters: price/competition (339 references), savings/expenditure (760), accessibility/reimbursement/out-of-pocket costs (495), and prescribing/substitution (330). The sub-corpus explicitly linked to Morocco comprises 10 references. These categories overlap substantially and should therefore not be added together.

3.3. Prices and competition

The literature confirms that generic competition is an important mechanism for price reduction. Kesselheim et al. [1] identify the arrival of generics after loss of exclusivity as one of the main drivers of price decline in the United States. Nguyen et al. [2] show directly that an increase in the number of generic competitors is associated with a reduction in the average price after loss of exclusivity.

However, the opposite effect can occur when competition declines. Saltiel and Finnefrock [3, 4] describe episodes of very large price increases for several generics in a context of weak competition, shortages or small market size. These observations highlight that the mere existence of generic status does not guarantee a low price: the competitive structure of the market remains decisive.

3.4. Savings and expenditure

Generics can produce direct savings through lower prices, but their societal value may exceed these savings alone by freeing up resources and broadening access to treatment [5]. The literature also shows that savings depend on prescribing volume and on the price differential actually passed on to the payer or patient.

In Morocco, Bimegdi et al. [11] show that following price revisions, generic sales volumes grew on average by 3.5% per year between 2015 and 2018 and their revenue by 5.1%. Cherkaoui et al. [12] observe, for antiepileptic drugs, an increase in consumption accompanied by a decrease in the average cost per defined daily dose, an evolution partly attributed to the introduction of generics.

3.5. Accessibility, reimbursement and out-of-pocket costs

The relationship between generics and financial accessibility is mediated by reimbursement systems. Lalani et al. [6] show that, in certain contexts, patients can obtain generics at a lower price outside their insurance, revealing that the cost paid depends as much on coverage mechanisms as on the market price. International comparisons also show wide diversity in reimbursement and price-regulation mechanisms [24].

Recent literature also draws attention to the fact that a generic can remain difficult to access when administrative or insurance-related barriers persist, even after it reaches the market [25]. In the Moroccan context, this dimension will need to be examined alongside the extension of health coverage and out-of-pocket cost issues.

3.6. Prescribing and substitution

The PubMed sub-query on prescribing/substitution identified 330 references. The literature shows that substitution must be analysed jointly with the clinical properties of the medicine. Immunosuppressants, levothyroxine and certain antiepileptic drugs are frequently cited as situations requiring particular vigilance during product changes [7, 8, 9].

At the policy level, Shrestha et al. [26] emphasise that generic prescribing depends on regulation, prescriber habits, trust and educational strategies. More recent data also show that institutional procurement mechanisms and national policies can alter substitution behaviour [27]. In Morocco, Zaoui et al. [13] studied the place of generics in hospital prescriptions in Marrakesh, while Traore et al. [14] analysed the determinants of their prescription by general practitioners in Casablanca.

3.7. Moroccan PubMed sub-corpus

The PubMed search explicitly targeting generic medicines and Morocco identified 10 publications over the period 2015-31 July 2026. Among the most directly relevant are Bimegdi et al. [11] on price reform and the private market, Cherkaoui et al. [12] on the costs and consumption of antiepileptic drugs, Zaoui et al. [13] on hospital prescribing, and Traore et al. [14] on the determinants of prescribing in general practice.

Other publications are useful as context: Zaoui and Fadili [15] on bioequivalence, Lachhab et al. [28] on the drug formulary and hospital procurement, and Cherif Chefchaouni et al. [29] on national pharmaceutical industry capacity and the strong penetration of generics.

3.8. Consolidation of the PubMed selection (100 references)

The PubMed selection comprises 100 citations and complements the broader bibliographic exploration. It contributes references directly focused on international generic competition, market entry, policies promoting their use, primary-care prescribing, substitution and financial accessibility. Notable studies include Gaudette et al. [30], Mostafa et al. [31], Bayram et al. [32], Beall et al. [33], Nguyen et al. [2], Dylst et al. [5] and Gothe et al. [20]. After merging with Scopus, this selection took part in deduplication and initial title screening; the retained references still require systematic verification of abstracts and, where necessary, full texts.

3.9. Deduplication and initial screening

The working corpus comprised 955 references (855 Scopus and 100 pre-selected PubMed). Interbase deduplication identified 55 duplicates, or 5.8% of the initial corpus, leaving 900 unique references. Title screening led to the exclusion of 439 references (48.8% of unique references). The main reasons were the absence of a central role for generic medicines in the title (n = 393), studies focused solely on biosimilars (n = 25), and clinical or technical studies on generics without an economic, pharmaceutical-policy or utilisation dimension (n = 21). In total, 461 references (51.2%) were retained for abstract verification and, where necessary, full-text assessment.

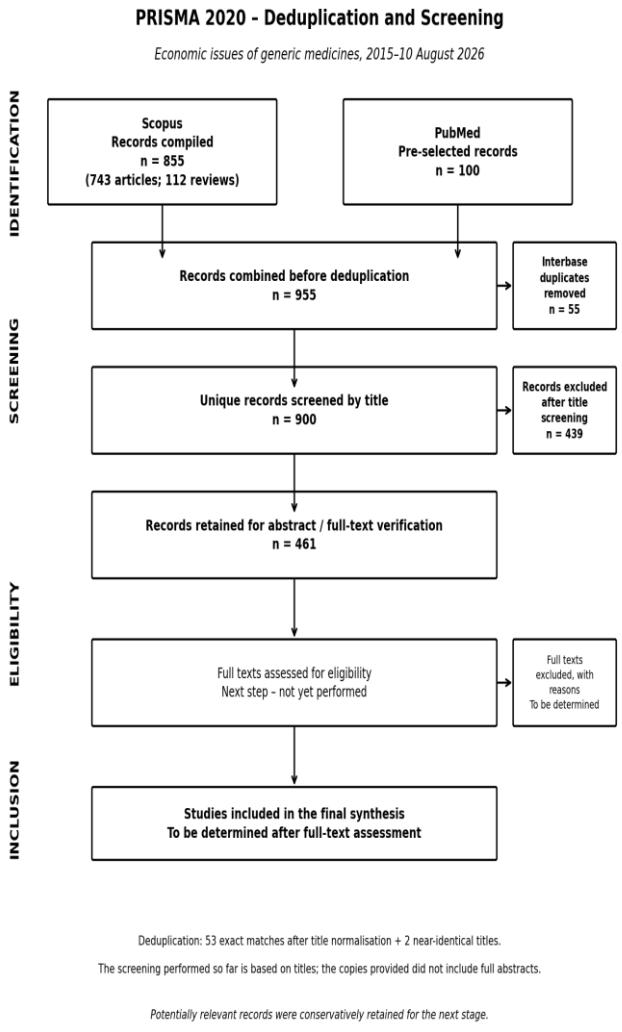

Figure 1. PRISMA 2020 flow diagram of deduplication and initial screening, Scopus-PubMed. The screening performed at this stage is based on titles; verification of abstracts and full-text assessment are the next steps.

4. Discussion

Analysis of the full Scopus corpus, supplemented with PubMed data, broadens the bibliographic coverage and helps to better structure the underlying economic mechanisms. The first mechanism is competitive: the entry of generics after loss of exclusivity can reduce prices, but the magnitude and durability of this decrease depend on the number of entrants and market concentration [1, 2]. The existence of substantial price increases for certain generics in situations of weak competition or shortage confirms that generics policy should not target low prices alone, but also durable competition and supply security [3, 4].

The second mechanism concerns savings. Generics reduce unit costs, but their real contribution to total expenditure depends on volumes and market penetration. The societal value of generics may also include broader access and the possibility of reallocating resources to other health needs [5].

The third mechanism concerns financial protection. The PubMed data show that the cost actually borne by the patient depends on reimbursement rules, intermediaries and, at times, the purchasing channel. Thus, the existence of a cheaper generic does not guarantee that the economic benefit is fully passed on to the patient [6]. This issue is particularly relevant for Morocco in the context of the extension of health insurance coverage.

The fourth mechanism is behavioural and organisational. Generic prescribing and substitution can increase generic penetration, but they depend on trust, information, incentives and the perception of clinical risk. The Moroccan findings of Zaoui et al. [13] and Traore et al. [14] suggest that a pricing policy alone will not be sufficient to optimise the use of generics.

For Morocco, the findings converge towards an integrated policy comprising at least five dimensions: (1) coherent price-setting and reimbursement rules; (2) maintaining competition that remains attractive enough to prevent market exit; (3) prescribing by international non-proprietary name and regulated substitution where appropriate; (4) strengthening trust through quality, bioequivalence and information; and (5) support for a competitive and secure local production capacity.

This synthesis is based on 855 Scopus references and a selection of 100 PubMed citations. Deduplication of the working corpus identified 55 duplicates, and initial title screening retained 461 references for further verification. The main remaining methodological limitation is the absence of

full abstracts in the copies provided, which prevents this stage from being considered a completed title/abstract screening. The next phase must therefore verify the abstracts and full texts of the 461 retained references, document the reasons for exclusion at the eligibility stage, and determine the final number of included studies.

5. Conclusion

Generic medicines are an important lever for controlling pharmaceutical expenditure and improving access, but their economic impact depends on a set of interdependent mechanisms: competition, price, availability, reimbursement, prescribing, substitution and trust. The integration of PubMed confirms that these dimensions are widely represented in the recent literature.

In Morocco, the available data show a favourable evolution of the generics market following the pricing reform and a potential contribution to lowering the average cost of certain therapeutic classes. However, optimising their economic impact will require a comprehensive approach combining regulation, financing, prescribing practices, quality and national industrial capacity.

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