Pharmaceutical Sector and Online Consumer Medication Information Systems - an International Perspective

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Introduction, Background and Problem

The Pharmaceutical Sector (PS) is a multi-faceted, interconnected and interdependent structure. Online Consumer Medication Information Systems (OCMIS) form an integral part of the PS and need excellent need excellent characteristics in order to benefit its users. [1]. Nevertheless, OCMIS have been characterized in the past as incomprehensible [2], incomplete, inaccurate, misrepresented, and even potentially harmful [3].

Material and Methods

On the example of Chile, an emerging middle-income country, a semi-qualitative, multi-layered Structural Analysis and Information Flow Model (SAIFM) was developed for the PS based on literature reviews and expert interviews. OCMIS within the PS were benchmarked for number of products, update rate, information models, interoperability standards, medication types (see Figure 1), search capabilities, recommender systems, and georeferencing.

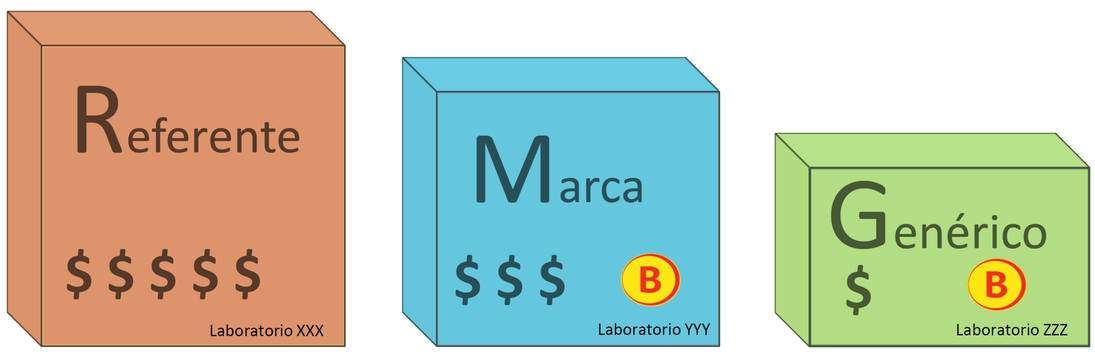

Figure 1 – The 3 types of medications in Chile: Reference (R), Brand (M) and Generic (G), the last two can be Bioequivalent (B).

Results

Four Abstraction Layers (AL) were considered within the SAIFM (see Figure 2): governance (3 governmental entities), production ≈350 hospitals, ≈3.000 pharmacies, ≈40.000 practitioners, ≈2.500 pharmacists) and patient. Both limited control and information flow within and between AL were detected. Subsequently 8 web-based OCMIS were benchmarked and presented heterogeneity in data quality, update rates and number of products (see Table 1). This creates an information asymmetry for medication quality, -availability and -pricing.

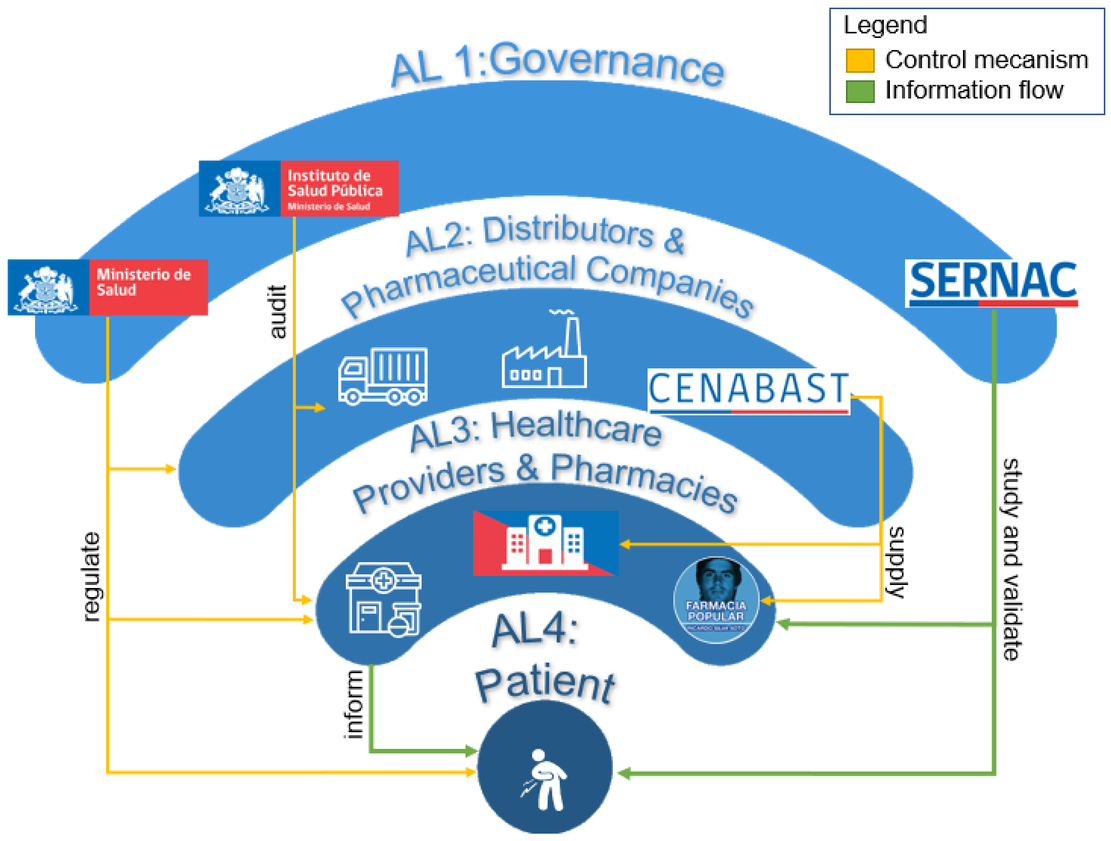

Figure 2 – Structural Analysis and Information Flow Model (SAIFM) with control (yellow) and information (green) pathways between Abstraction Layers. SAIFM includes Governance (Public Entities), Distributors and Pharmaceutical Companies, Healthcare Providers (public: Hospital, Family Healthcare Center (CESFAM) and private: clinics) & Pharmacies (public: „Farmacia Popular“ and private: chains (including franchise) and independent pharmacies) and finally, on an individual level, the patient.

Platform	Category	Affiliation	# of products	Update Rate	Standarized Data Model	Bioequivalence (B)	Referenc (R)	Brand (M)	Generic (G)	Search by (brand) product	Search by principal active Susbtance	Price information	Showing Alternative Products	Georefence
Salcobrand	Price comparator	Private	2658	Unknown	No	Yes	No	No	No	Yes, limited to Salcobrand portfolio	Yes, extra search field	Yes	No	No
MINSAL - Tufarmacia	National Price observatory	Public	3300	1 day – 3 months	Yes	Yes, but not for alternatives	Yes	No	No	Yes, in associated pharmacies	Yes	Yes, limited to colaborating pharmacies	Yes, but limited symbology	Yes
Pharol	Online Pharmacy	Private	1121	Unknown	Unknown	Yes	No	No	No	Yes, limited to Pharol portfolio	Yes	Yes, limited to Pharol	Yes	Not necessary (shipment)
Farmazon	Online Pharmacy	Private	3043	Unknown	Unknown	Yes	No	No	No	Yes, limited to Farmazon portfolio	Yes	Yes, limited to Farmazon	Yes	Not necessary (shipment)
Cruz Verde - Buscador de Medicamentos	Medication Information source	Private	5211	Unknown	Unknown	Yes	No	No	No	Yes, limited to Cruz Verde portfolio	Yes, extra search field	No	No	No
SERNAC - Informacion de precios	Price observatory	Public	539	Monthly	No	Yes	No	No	No	Yes	No	Yes, limited to certain farmacies	No	No
CENABAST - Lista de medicamentos	Distributor for the public sector	Public	1065	Monthly	No	Yes	No	No	No	No	No	Yes, limited to CENEBAST portfolio	No	No
Instituto de Salud Publica	National Drug Register	Public	9403	Unknown	Unknown	Yes	Yes	No	No	Yes, vendor independant	Yes	No	No	No

Table 1 – Benchmarking of Online Consumer Medication Information Systems (OCMIS).

Conclusions

- Information flow between stakeholders is currently limited by isolated and non standardized information models resulting in an information asymmetry.
- A reference implementation based on a neutral, interoperable and standard-based information model could alleviate information asymmetry amongst stakeholders regarding available products and medication types.

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