

Charting the Etanercept Journey: Tracing Cost Dynamics in Poland's Off-Patent Market from Reference Drug Rivalry to Biosimilar Monopoly

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Supplementary material S1

Materials and methods

Study design and setting

This study aimed to evaluate ETN price evolution while covering the timeframe of biosimilar market presence, both in the period of market competition between the reference drug (Enbrel, Pfizer, authorization date 28.04.2010) and two biosimilars (Benepali (SB4, Samsung Bioepis, authorization date 14.01.2016) and Erelzi (GP2015, Sandoz GmbH, authorization date 23.06.2017)), and in the period of re-monopolization (by Erelzi).

We analyzed the exact tender-derived drug prices offered to hospitals, rather than regional or national estimates, between November 2017 and December 2023. The first biosimilar was available from July 1, 2016 (Benepali), while the second (Erelzi) was first reimbursed from November 1, 2017 [13]. During

the analyzed period, ETN was available for patients with rheumatoid arthritis (RA), psoriatic arthritis (PsA), ankylosing spondylitis (AS), non-radiographic axial spondyloarthritis (nr-axSpA), juvenile idiopathic arthritis (JIA) and psoriasis (PsO). Over 99% of the market share is dedicated to RMDs.

In Poland, access to biologics is achieved through qualification into public payer funded drug programs dedicated to a specific disorder. In general, drug programs are characterized by stringent reimbursement criteria (i.e. inclusion norms, effectiveness evaluation) and a set list of drugs for a specific indication. Drug programs are available in hospitals holding respective contracts with the public payer (NHF, National Health Fund). The budget for drug programs is primarily limited by contract size. Purchase costs for biologics incurred by hospitals are covered by the NHF. Theoretically, if therapy is less expensive, the hospital can treat a greater number of patients. The basis for the purchase of biologics are tenders at the hospital level. The price is the main decisive criterion in tenders. In the case of reference biologics and their biosimilars, physicians are required to use the drug selected in a tender (mandatory switching). Intravenous medications are commonly administered in hospitals, while subcutaneous medications may be administered in both hospital and outpatient settings. In Poland, access to biological treatment is primarily hospital-based, whether through inpatient services or hospital-based outpatient clinics. Medication is free and administered on-site (intravenous formulations) or provided for self-administration at home (subcutaneous formulations, like ETN) during outpatient visits. However, the number of physicians who can prescribe biological drugs is limited and translates into restricted access to therapy when comparing with other countries.

This analysis included 473 tenders for ETN purchase in pre-filled syringes or automatic injectors. Until August 2021, three ETN drugs were reimbursed by the public payer. From September 2021 to June 2022, only Enbrel and Erelzi were covered by public healthcare, while the period from July 2022 marks Erelzi market monopoly [13]. Enbrel 50 mg is currently still only available for PsO patients, representing <1% of the market. Full description of study design and setting in the supplementary material.

Tender data do not cover the period from July 1, 2016 to October 31, i.e. the competition time between the reference drug and the first biosimilar drug (Benepali). Within this time, during the first 6 months, the market share of biosimilars was <1% and only began to slowly grow from 2017. ETN price in the

initial period of competition, both for the reference agent and biosimilar, was primarily driven by a regulatory mechanism, i.e. a 25% reduction relative to the official price due to the loss of exclusivity and entry of the first equivalent. As we previously showed [5], the average annual cost of ETN therapy in the first year of competition was only 7% lower, with a decline by 30% in the second year. It was only after the second biosimilar drug entered the market that strong competition and further price drop began at the tender level.