When life saving treatments exist, but "out of reach"

While global market for biologics is exploding, Thailand faces a critical "innovation lag" where life-saving treatments like monoclonal antibodies (mAbs) group of medicine exists, but remain out of reach for the majority. The primary barrier is clear: unaffordable pricing.

In the USA, local manufacturers are filling this gap by developing biosimilars—interchangeable, affordable versions of original mAbs once patents expire. However, in Thailand, this movement is still in its infancy. The lack of affordable biosimilar keeping them off the hands of public-sector patients.

As a manufacturer with mAb production capabilities, our goal is to identify "potential molecules" where the gap between US biosimilar availability and Thai registration is widest, and the health impact is highest. To prioritize our pipeline, I engineered **Thai mAb Opportunity Index (TMOI)** using these four variables:

1. **Global Commercial Success** (top 20 revenue)
2. **Clinical Impact**
3. **NLEM gap**
4. **Biosimilar availability gap**

The methodology is detailed on the next page, with full TMOI calculations on page 6.

Pembrolizumab (a critical cancer-fighting mAb) costs approximately

$8,000 (~฿272,000) per round.

Patients often require treatment every 3–6 weeks for up to 2 years.

"For an average Thai worker, a single round can exceed several months of salary, making it a "luxury" rather than a right."

mAbs indications including:

Targeted **Cancer** *destruction with fewer side effects.*

Halting the progression of **Rheumatoid Arthritis**.

Managing severe **SLE** *and autoimmune conditions.*

Providing relief for patients with life-threatening **Asthma**.

1. Global Commercial Success of mAbs

Rank	Drug_name	Total Biosimilar (TH 2025)
1	Pembrolizumab	0
2	Dupilumab	0
3	Risankizumab	0
4	Daratumumab	0
5	Ustekinumab	3
6	Nivolumab	0
7	Adalimumab	9
8	Ocrelizumab	0
9	Secukinumab	1
10	Vedolizumab	0
11	Emicizumab	0
12	Durvalumab	0
13	Denosumab	4
14	Faricimab	0
15	Pertuzumab	2
16	Ravulizumab	0
17	Guselkumab	0
18	Ixekizumab	0
19	Tocilizumab	1
20	Omalizumab	0

Data source: pharmashots.com, FDA Purple Book Nov 2025

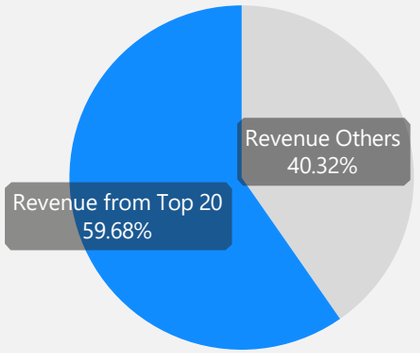
Why the "Top 20" Revenue List Matters?

MAbs in the Top 20 are signaling immense clinical demand and a high level of physician trust worldwide.

To identify the opportunity gap in my analysis, I cross-reference these targets with the data from US FDA Purple Book to count the number of biosimilars. The data was grouped into two categories, divided by colors:

Black molecules mean they do not have biosimilar registered in Thailand, which present a monopoly waiting to be disrupted.

More details on biosimilar are on page 5



How significant are these Top 20 molecules?

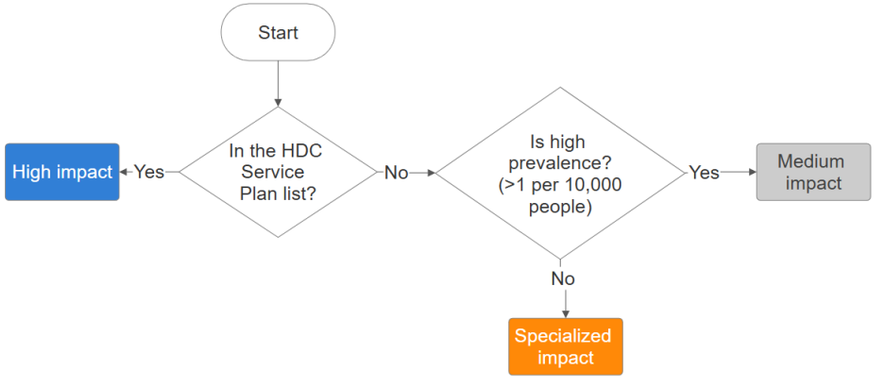
In 2024, while the total global mAb revenue reached approximately $256.6, the revenue from these top 20 molecules alone combined for **60%** of the entire market's value.

Top 20 revenue: $15.3B, Total mAb revenue $256.6B (2024)
Data source: pharmashots.com

2. Clinical Impact

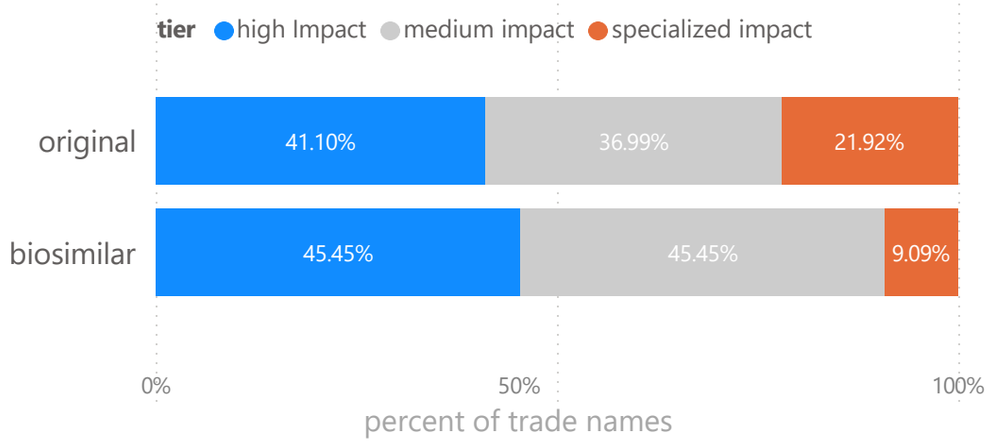
How impactful each mAbs are?

To ensure our production strategy aligns with national priorities, I have categorized mAb indications into three tiers using a clinical decision tree. This classification is grounded in data from the Thai Heath Data Center (HDC) and the MOPH's official Service Plans. For molecules with multiple indications, I have classified them according to their highest-tier indication.



High impact: In Thai Health Data Center (HDC) service plan list e.g. Cancer, Stroke, Ischemic Heart Disease, Chronic Kidney Disease
Medium impact: Not rare disease (>10,000 case/year) chronic disease e.g. Rheumatoid Arthritis, Psoriasis, SLE
Specialized impact: Specialized/Rare Diseases with lower prevalence e.g. Ebola infection, hereditary angioedema

Ratio of Impact tiers | Original v.s. Biosimilar



The data proves my categorization is effective. As you can see, the proportion of specialized mAbs is significantly smaller in the biosimilar market compared to originators. Why is this?

From a business perspective, the risk is higher for rare diseases. Manufacturers naturally prioritize high-impact areas (Tier 2 and 3) where the large patient volume justifies the high cost of biologic production.

3. NLEM gap

What is NLEM?

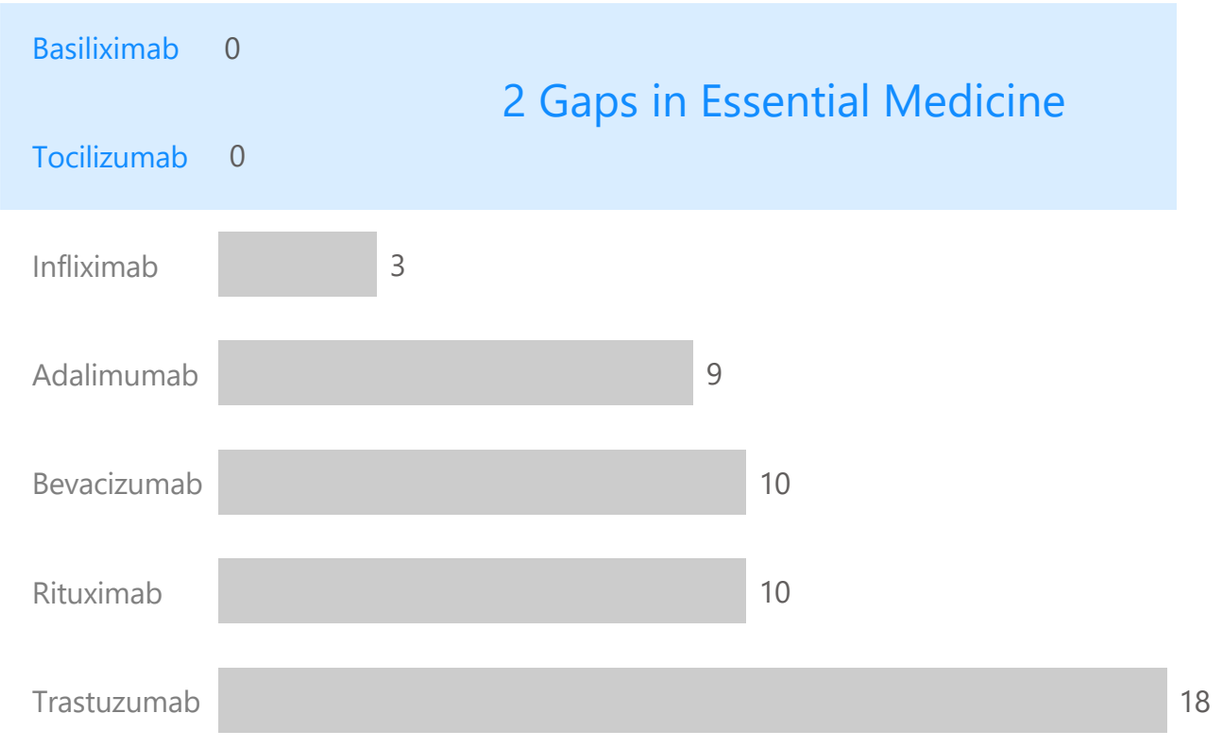
The National List of Essential Medicines (NLEM) in Thailand is the “optimum list” of fundamental treatments. It serves as the official reference for reimbursement across public health insurance scheme

Why inclusion is the ultimate goal?

For mAb, being listed on the NLEM is a game-changer for accessibility. Because, the list promotes the evidence-based and rational use of high-cost medicines across the national medical supply chain.

2 mAbs in the NLEM list have no biosimilar registered yet, leaving big gaps in the market.

Number of registered Biosimilars from Thai FDA



Data source: Thai National Drug Information, searched DEC 2025
Thai FDA, scraped DEC 2025

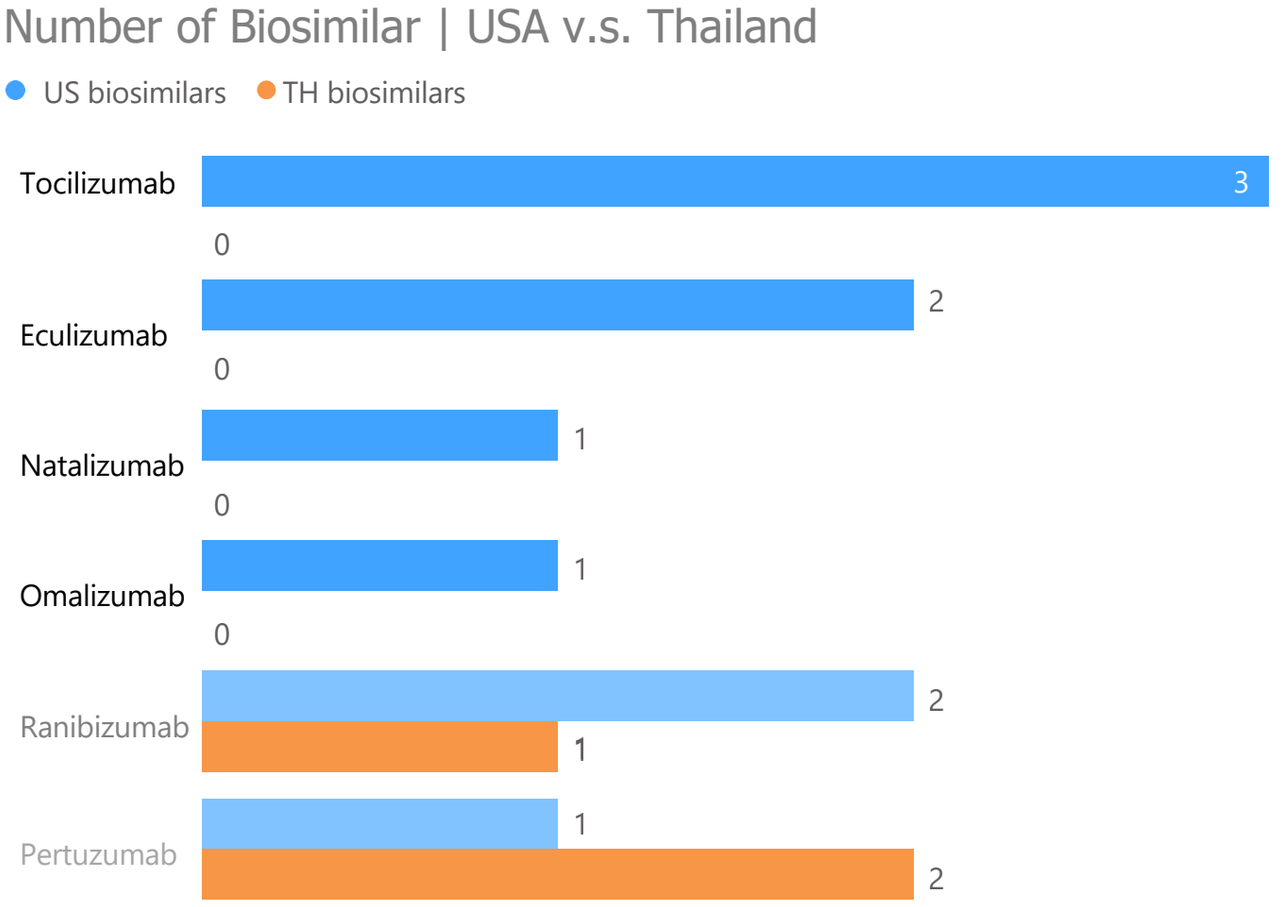
4. Biosimilar availability gap

In our model, we analyze the number of biosimilars in each market with two opposing objectives:

1. The US Market: Here, the more biosimilars available, the better. A high count int the US serves as a clinical and legal signal: it proves the molecule has high utilization, physician acceptance, and the patent has officially expired in the US *(which "likely" to be expired in Thailand)*

2. The Thai Market: In contrast, we look for molecules with low to zero competition in Thailand. The fewer the biosimilars currently registered, the higher our potential for market share dominance.

Moreover, many high-revenue mAbs currently have zero biosimilars in both the US and Thailand. This usually indicates that the originator's patent remains active. For our strategy, we avoid these molecules.



Data source: FDA Purple Book Nov 2025
Thai FDA, scraped DEC 2025

Thai mAb Opportunity Index (TMOI)

Thai mAb Opportunity Index (TMOI) is a 10-point scale indicates a potential molecules of market entry. This model prioritized molecules with high demand that lack biosimilar competition in Thai market. Formulation and scoring are shown below:

Variable	Scored Value
1. World Top 20 Revenue	2 pts if yes 0 pts if No
2. High-Impact Disease	3 pts if High impact 2 pts if Medium impact 1 pt if Specialized impact
3. NLEM Status	2 pts if NO 0 pts if YES
4. Biosimilar Gap	3 pts if US Yes; TH No 2 pts if US Yes; 1-2 biosimilar TH 1 pt if US No; TH No or 3 TH 0 pts else

TMOI = Rev + Tier + NLEM Gap + Biosimilar gap

The "Potential molecules" for 2026

Molecule	TMOI Score	Primary Indication	Analyst's Note
Tocilizumab	10/10	Rheumatoid arthritis	High clinical demand, multiple US biosimilars available.
Omalizumab	7/10	Severe asthma	A multi-billion dollars global market with a significant gap (0 biosimilars) in Thai.
Pertuzumab	7/10	Breast cancer	The trend is co-formulation. (Pertuzumab + Trastuzumab)

What should we do next?

We should prioritize these three molecules for comprehensive feasibility and production studies. This includes a deep research of the technical requirements for local manufacturing and a specialized regulatory strategy for Thai FDA filing.