

MERCK

STRATEGY PROPOSAL

Presented by Elena Publie, Alejandro Rodríguez, Luana Rocha, Martina Ramosaco, Adriana Sánchez, Francisco Rivas and Soren Schmid.

MERCK & CO., INC.



COMPANY OVERVIEW

ACTIVITY, ORGANIZATION AND
ANALYTICAL TOOLS



MERCK

ACTIVITY

HEALTH SOLUTIONS, MEDICINES
AND ANIMAL HEALTH





ROBERT M. DAVIS, CEO OF MERCK



COMPANY ORGANISATION

LEADERSHIP STYLE AND CORPORATE BODIES

SWOT ANALYSIS

SIZE & PORTFOLIO

CHINA'S PRESENCE

KEYTRUDA

TECHNOLOGY

STRATEGIC ALLIANCE

EMERGING MARKETS

STRENGTHS

WEAKNESSES

OPPORTUNITIES

THREATS



DEPENDENCY ON
KEYTRUDA AND U.S.

DIGITAL DEVELOPMENT

PATENTS

STRONG COMPETITORS

REGULATIONS US, EU

BARGAINING POWER OF CLIENTS

HIGH, ESPECIALLY FOR HEALTH
INSURANCE COMPANIES

BARGAINING POWER OF SUPPLIERS

HIGH, API'S PROVIDE COMPLEX
CHEMICAL FORMULAS THAT
REQUIRE EXPERTISE

THREAT OF NEW ENTRY

LOW, HIGH BARRIERS TO
ENTRY

THREAT OF SUBSTITUTION

GENERALLY LOW

INTENSITY OF COMPETITION

HIGH COMPETITIVITY BETWEEN FEW
COMPETITORS





FINANCIAL RATIOS

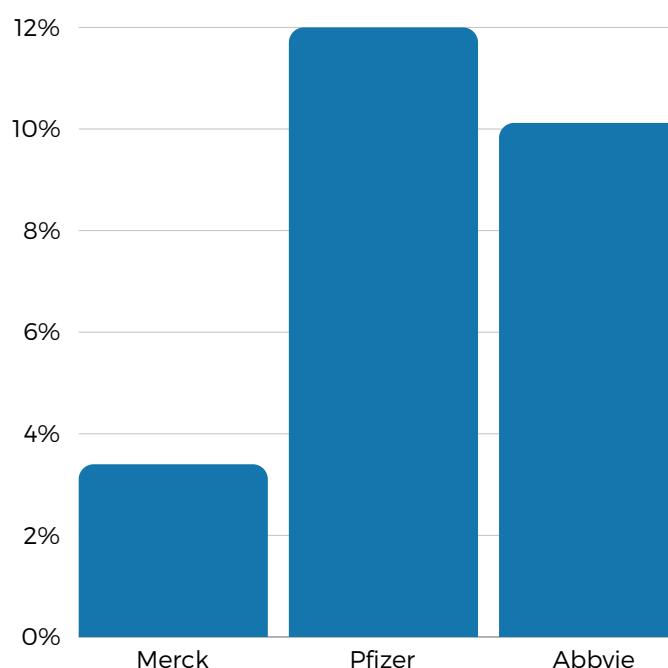
FINANCIAL ANALYSIS AND
COMPARISON OF THE COMPANY
THROUGH RATIOS

abbvie

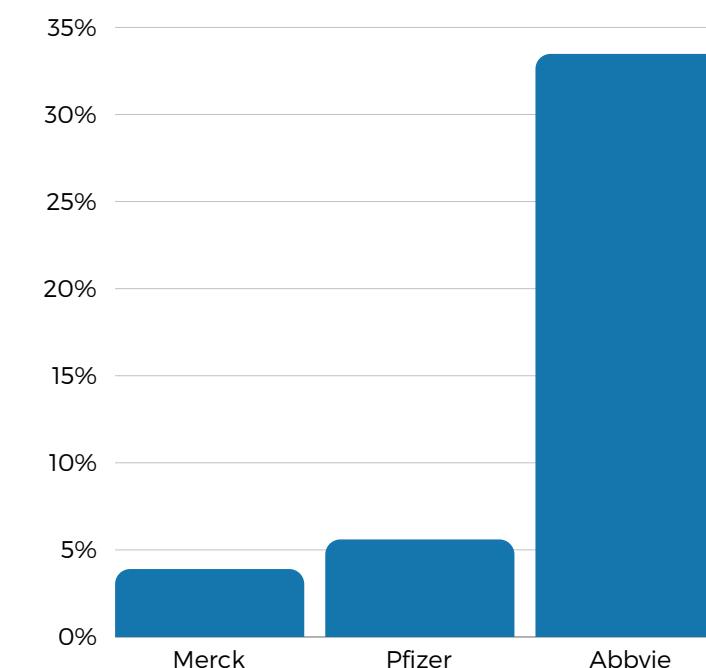


PROFITABILITY

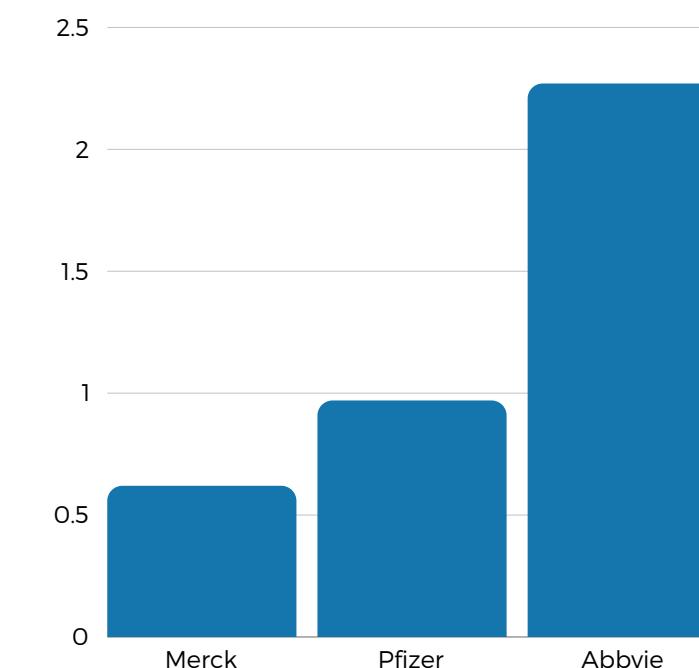
Return on sales



Return on equity



Earnings per share

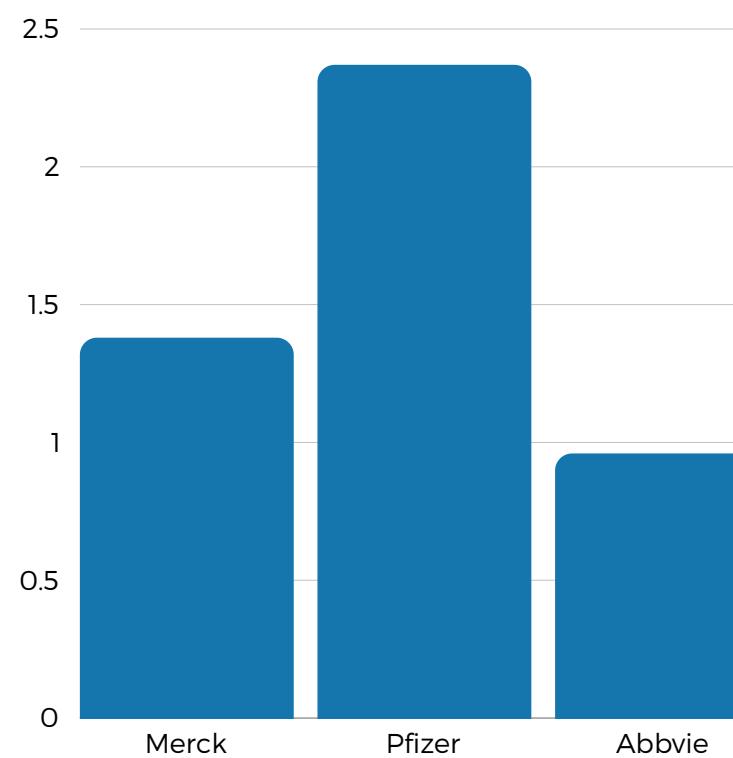


Without the acquisition of Prometheus:

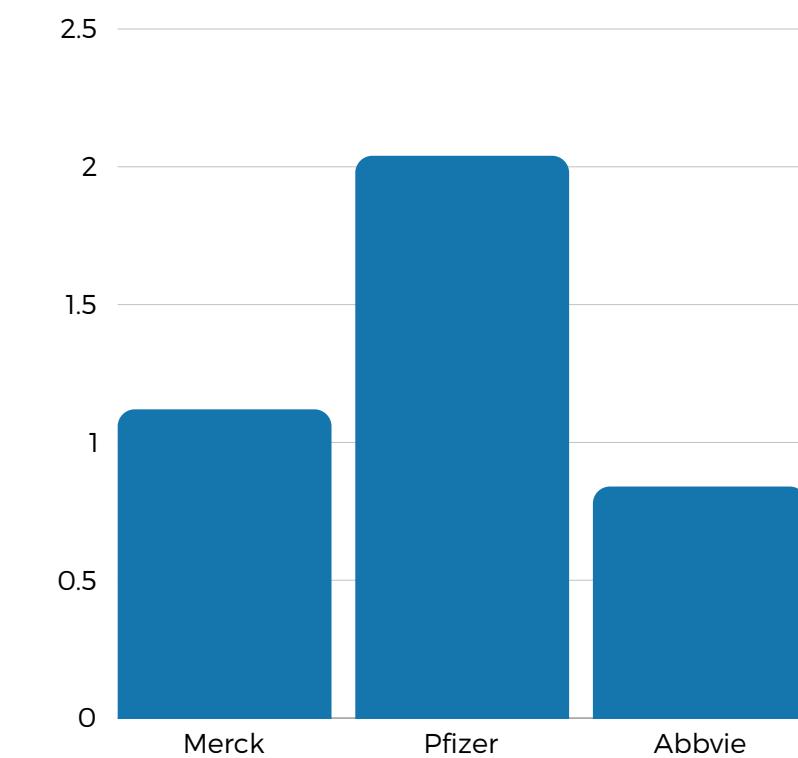
- Return On Sales: 25.5%
- Return On Equity: 28%

LIQUIDITY

Current Ratio

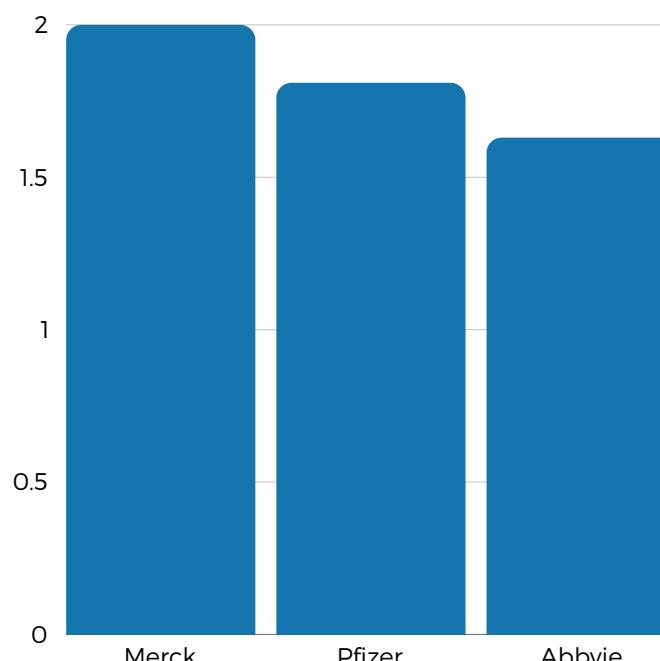


Quick Ratio

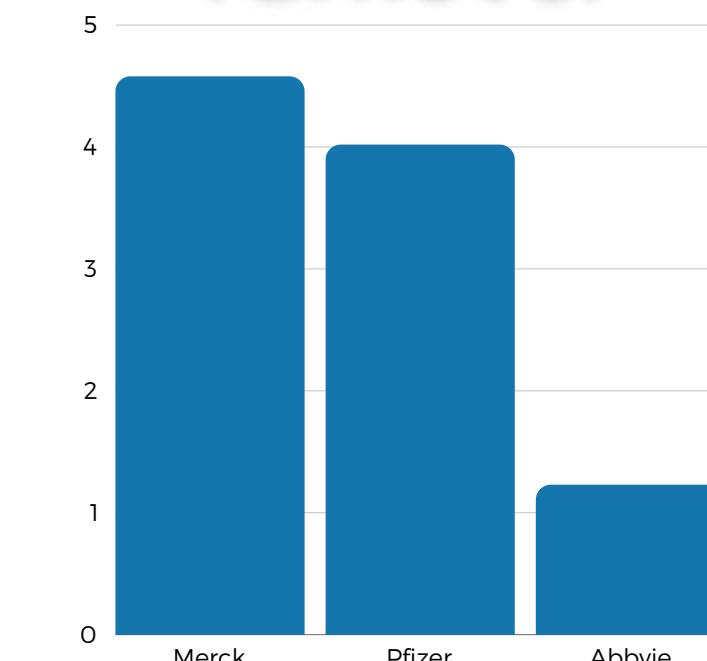


ACTIVITY

Inventory Turnover



Accounts Receivable Turnover

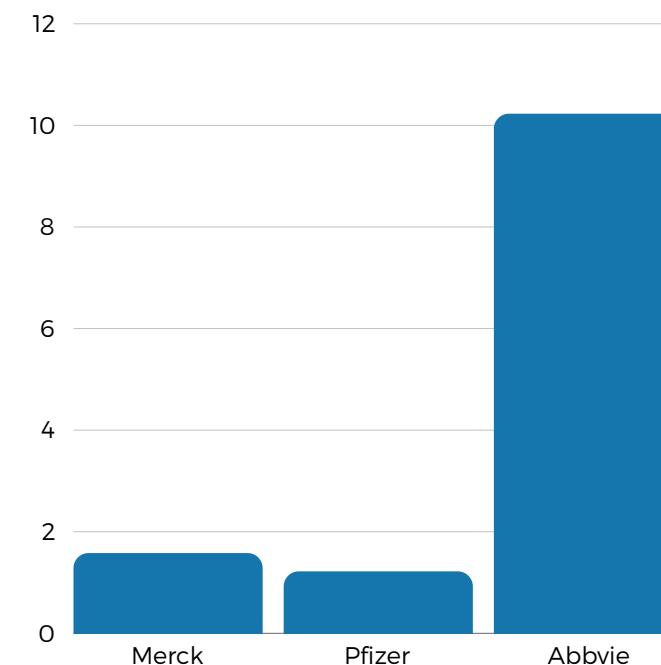


LEVERAGE

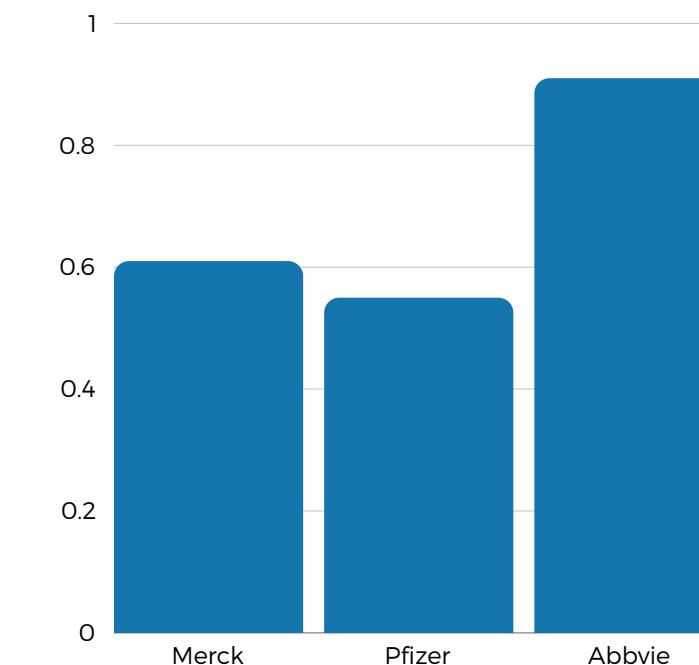
\$ Abbvie unusual debt to equity is because of \$6.5B repurchase of common stock.

\$ Big Treasury Stock across the three firms

Debt to Equity



Debt to Assets

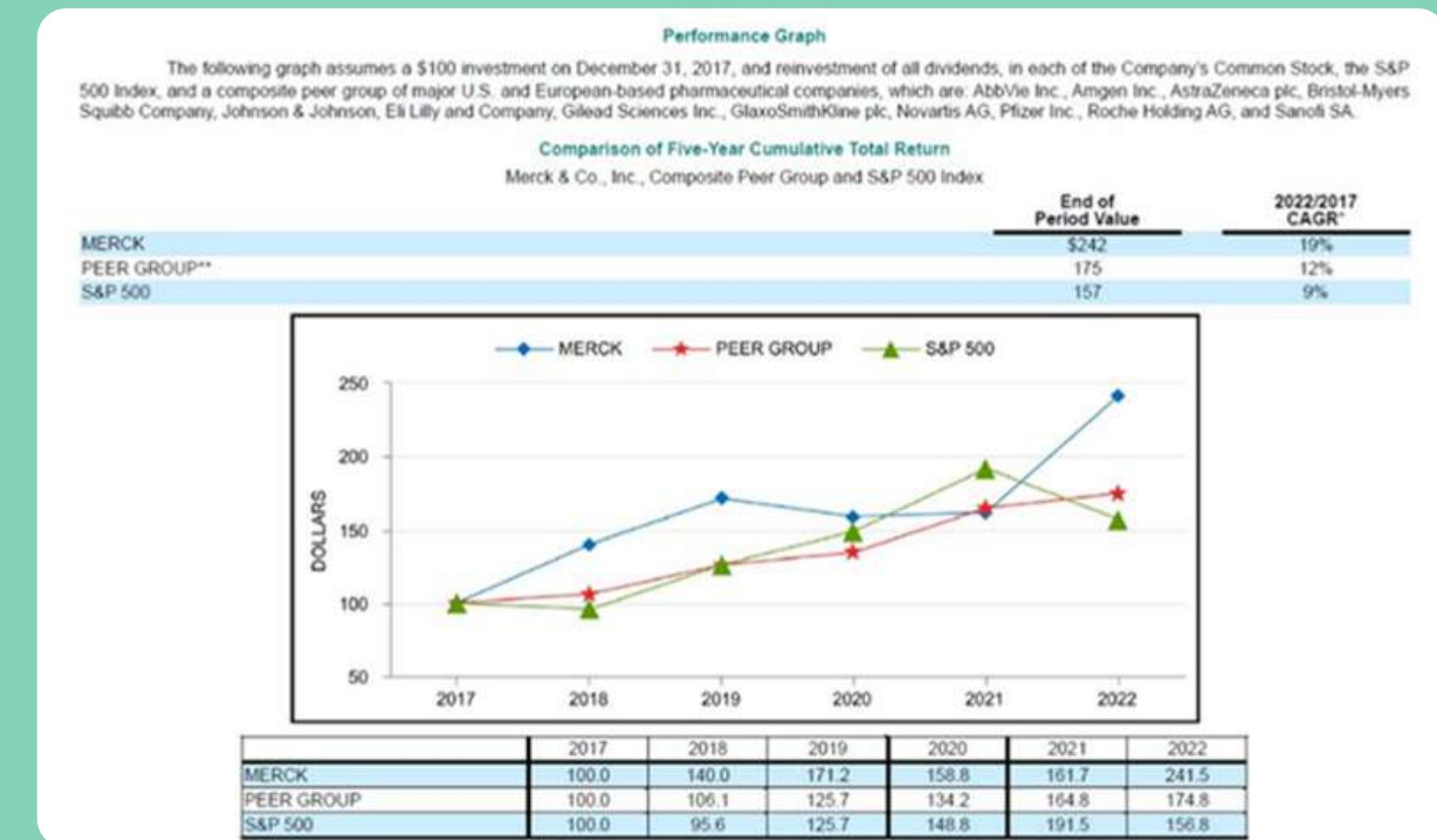


STOCK PERFORMANCE

1) Merck (orange) performance in return % compared to Abbvie (green), Pfizer (blue) and J&J (black).

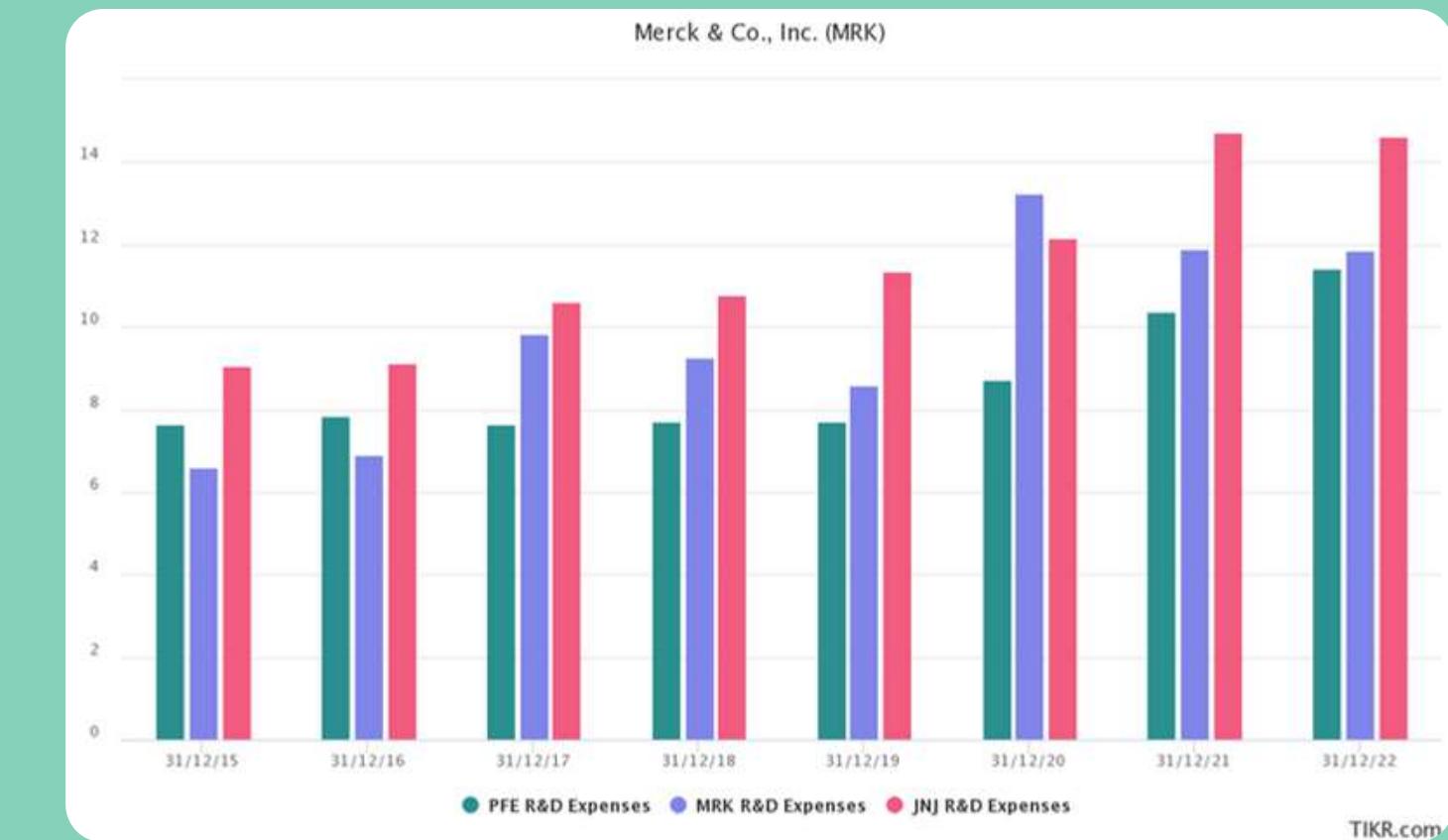


2) Merck performance compared to an index of competitors and the S&P500 since 2017.

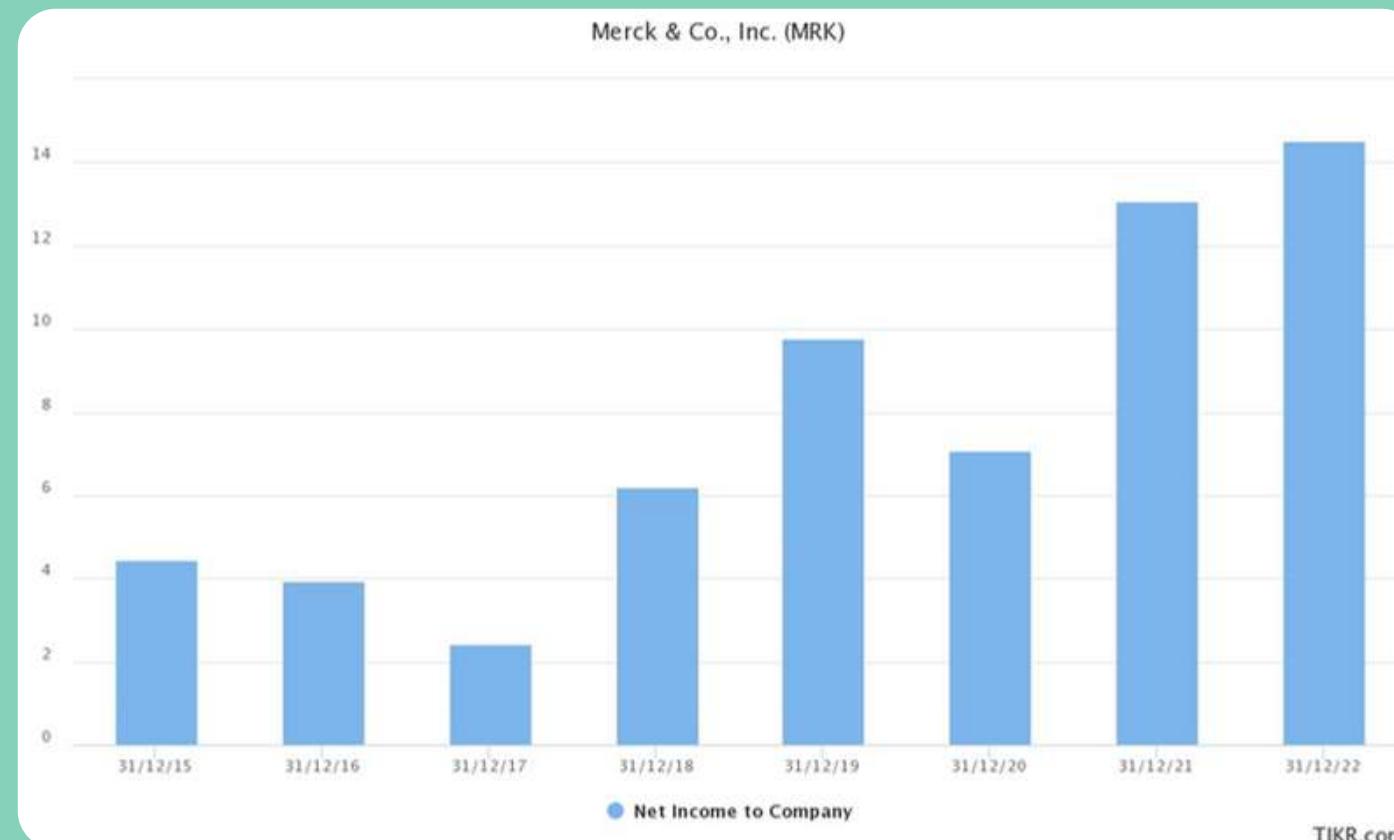


3) Merck R&D expenses from 2015 comparison.

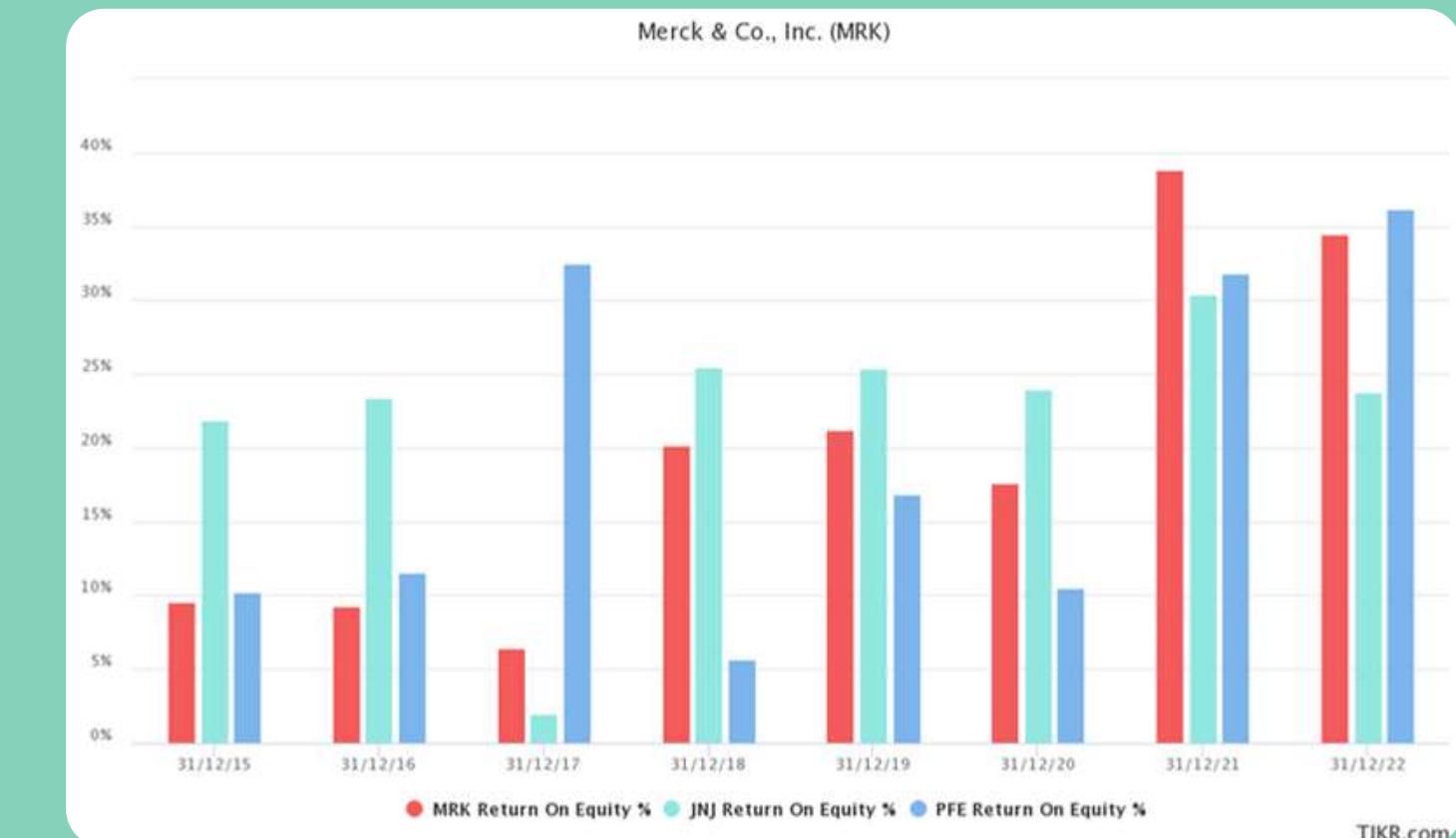
R&D AND COMPANY GROWTH



4) Merck Net Income evolution since 2015.



5) Merck ROE evolution since 2015 comparison.





INDUSTRY VALUE CHAIN

TASKS THAT MERCK PERFORMS TO
PRODUCE VALUABLE PRODUCTS

INBOUND LOGISTICS

RAW MATERIAL SOURCING:
CHEMICALS, AS WELL AS NATURAL INGREDIENTS SUCH AS PLANTS, SEEDS, FUNGI AND FRUITS, ARE USED AND SOURCED USUALLY GLOBALLY

OPERATIONS

QUALITY CONTROL
RAW MATERIAL INSPECTION: QUALITY CONTROL BEGINS AT THE TIME THAT THE RAW MATERIALS ARE ACQUIRED, WHICH INVOLVES INSPECTION AND TESTING

OUTBOUND LOGISTICS

DISTRIBUTION:
GOODS MANUFACTURED AT PRODUCTION SITES
WHOLESALE DISTRIBUTORS SUCH AS PHARMACIES, WHO SELL BOTH AT RETAIL AND MAIL ORDER

TRANSPORTATION:
GOODS CAN BE SHIPPED BY SEA OR RAILROAD IN DEDICATED REFRIGERATED CONTAINERS.

ORDER FULFILMENT:
ENSURE THAT THEIR GOODS HAVE BEEN SAFELY AND EFFICIENTLY TRANSPORTED THROUGH THE USE OF THIRD PARTY LOGISTICS COMPANIES



MARKETING & SALES

MARKET RESEARCH:
INTERVIEWS, FOCUS GROUPS AND CASE STUDIES.

PRODUCT PROMOTION:
DIRECT-TO-CONSUMER ADVERTISING, SUCH AS ADS AND HELP SEEKING ADS. PHYSICIAN DETAILING

WHAT IS THE PROBLEM?

MERCK'S DEPENDENCY ON
THE U.S MARKET AND THEIR
LACK OF INNOVATION



PROPOSED ACTIONS

- INNOVATING BY INTRODUCING AI TO DEVELOP NEW DRUGS AND REDUCE COSTS.
- ENTERING EMERGING MARKETS SUCH AS INDIA, INDONESIA AND CHINA.



MERCK



INTRODUCTION TO AI



MERCK

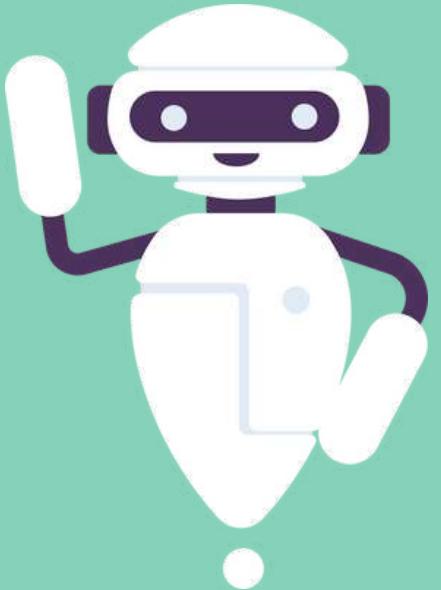
TYPES OF ML

Supervised Learning

The system is trained on past data with the aim of finding labels on a set of data with the same structure.

Uses of SL

- Drug Discovery
- Predictive Maintenance
- Quality Control
- Disease Diagnosis and Prognosis
- Predictive Modeling for Clinical Trials



Unsupervised Learning

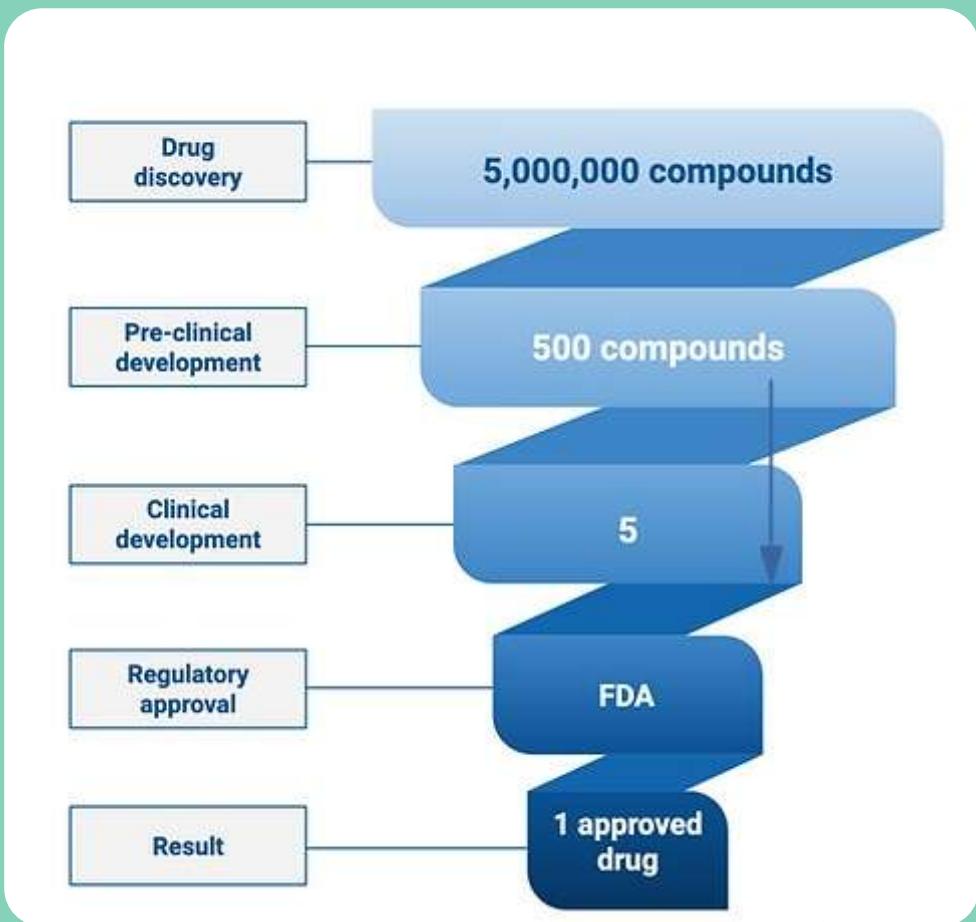
The system is not provided with training data. The aim of this is to uncover hidden associations, structures and patterns.

Uses of USL

- Clustering.
- Dimensionality Reduction.
- Anomaly Detection.
- Association Rule Mining.
- Topic Modeling.

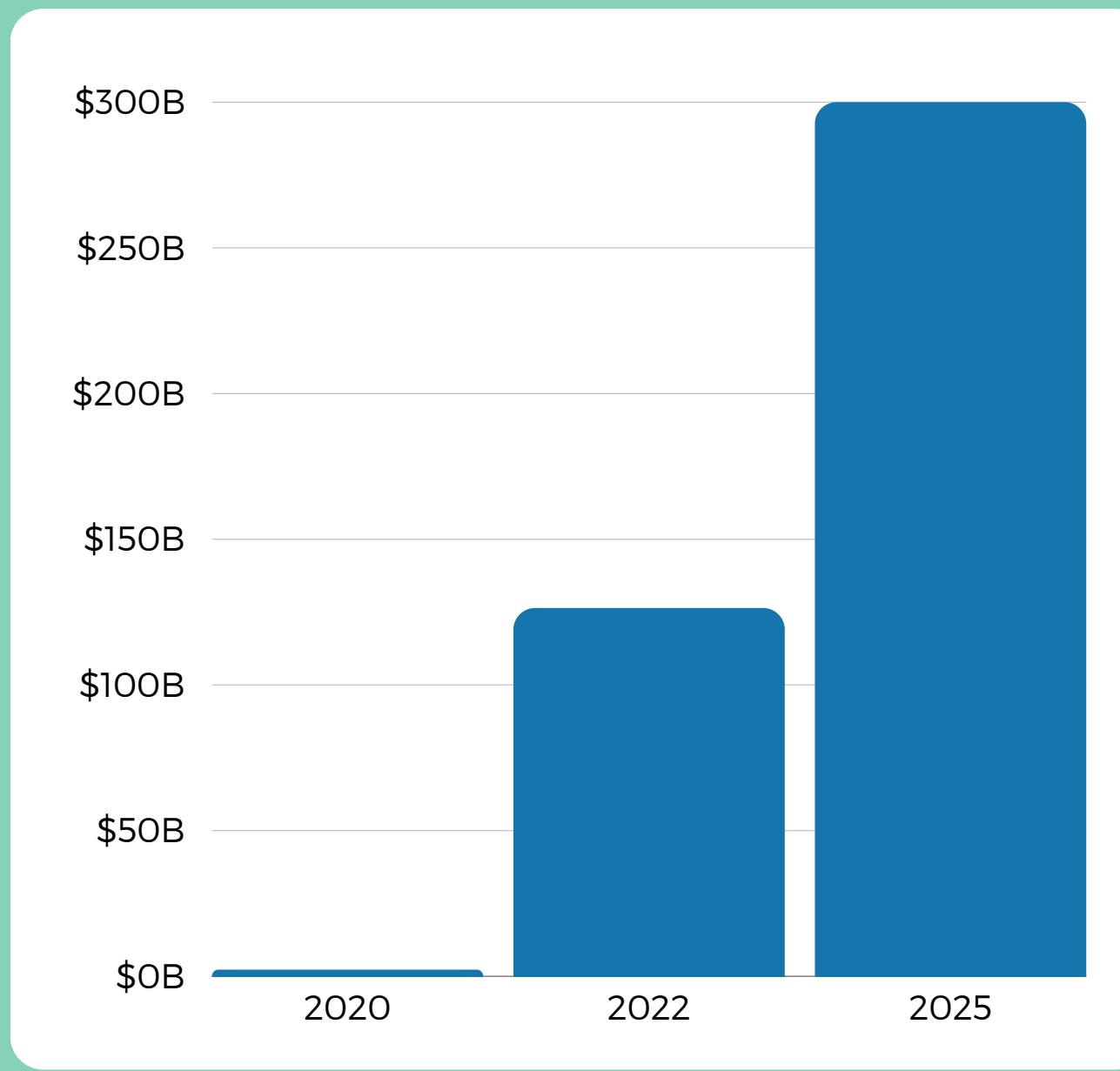
AI & INDUSTRY

10 years + \$2.6B = 1 new drug

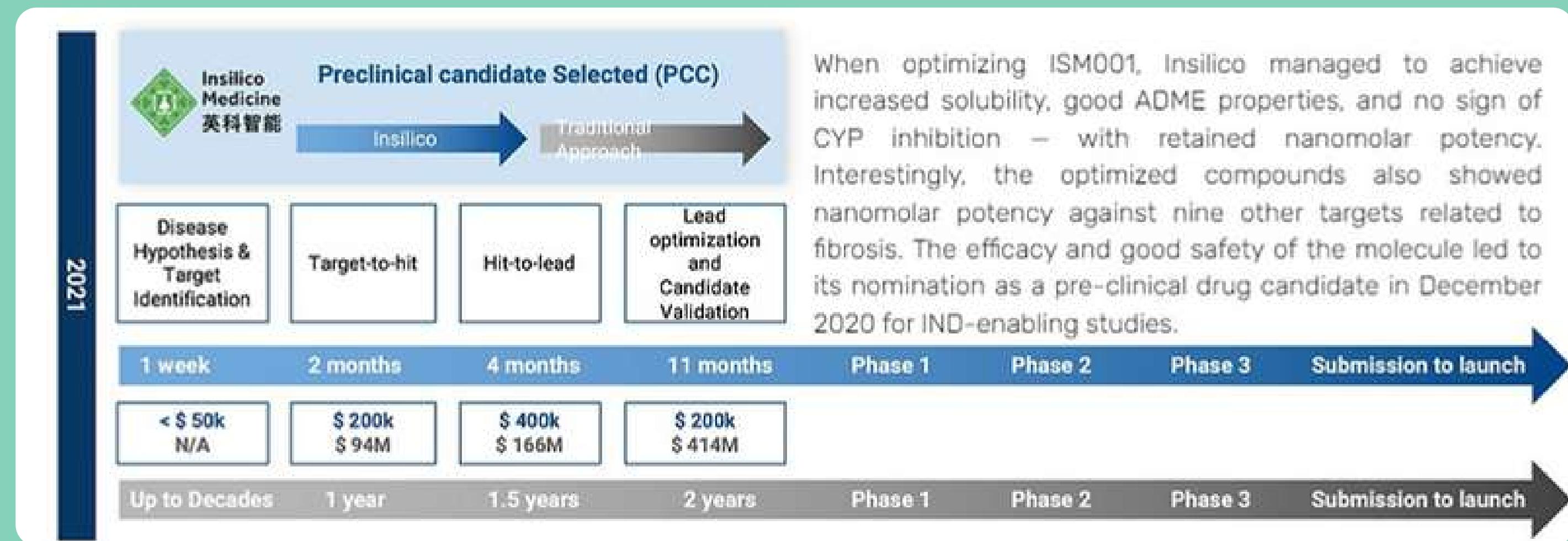


+700 companies working to develop AI-driven pharmaceutical technology

Growth of AI related investments in the Pharma Industry



INSILICO MEDICINE CASE



Insilico Medicine managed to go from Disease Hypothesis & Target Identification to Candidate Validation in just 11 months.



Total Expenditure of \$850K compared to the \$700M following traditional techniques.

KEYTRUDA PROBLEM

Product Sales

Total Company sales, including sales of the Company's top pharmaceutical products, as well as sales of animal health products, were as follows:

	2022	2021	2020
Total Sales	\$ 59,283	\$ 48,704	\$ 41,518
Pharmaceutical	52,005	42,754	36,610
Keytruda	20,937	17,186	14,380
Gardasil/Gardasil® 9	6,897	5,673	3,938
Lagevrio	5,684	952	—
Januvia/Janumet	4,513	5,288	5,276
ProQuad/M-M-R II/Variavax	2,241	2,135	1,878
Bridion	1,685	1,532	1,198
Alliance revenue - Lynparza ⁽¹⁾	1,116	969	725
Alliance revenue - Lenvima ⁽¹⁾	876	704	580
RotaTeq	783	807	797
Simponi	706	825	838
Animal Health	5,550	5,568	4,700
Livestock	3,300	3,295	—
Companion Animals	2,250	2,273	—
Other Revenues ⁽²⁾	1,728	382	—

⁽¹⁾ Alliance revenue represents默克's share of profits, which are product sales net of cost of sales and commercialization costs.

⁽²⁾ Other revenues are primarily comprised of miscellaneous corporate revenues, including revenue hedging activities, as well as revenue from third-party manufacturing arrangements.



AI USES

1) AI for Drug Discovery:

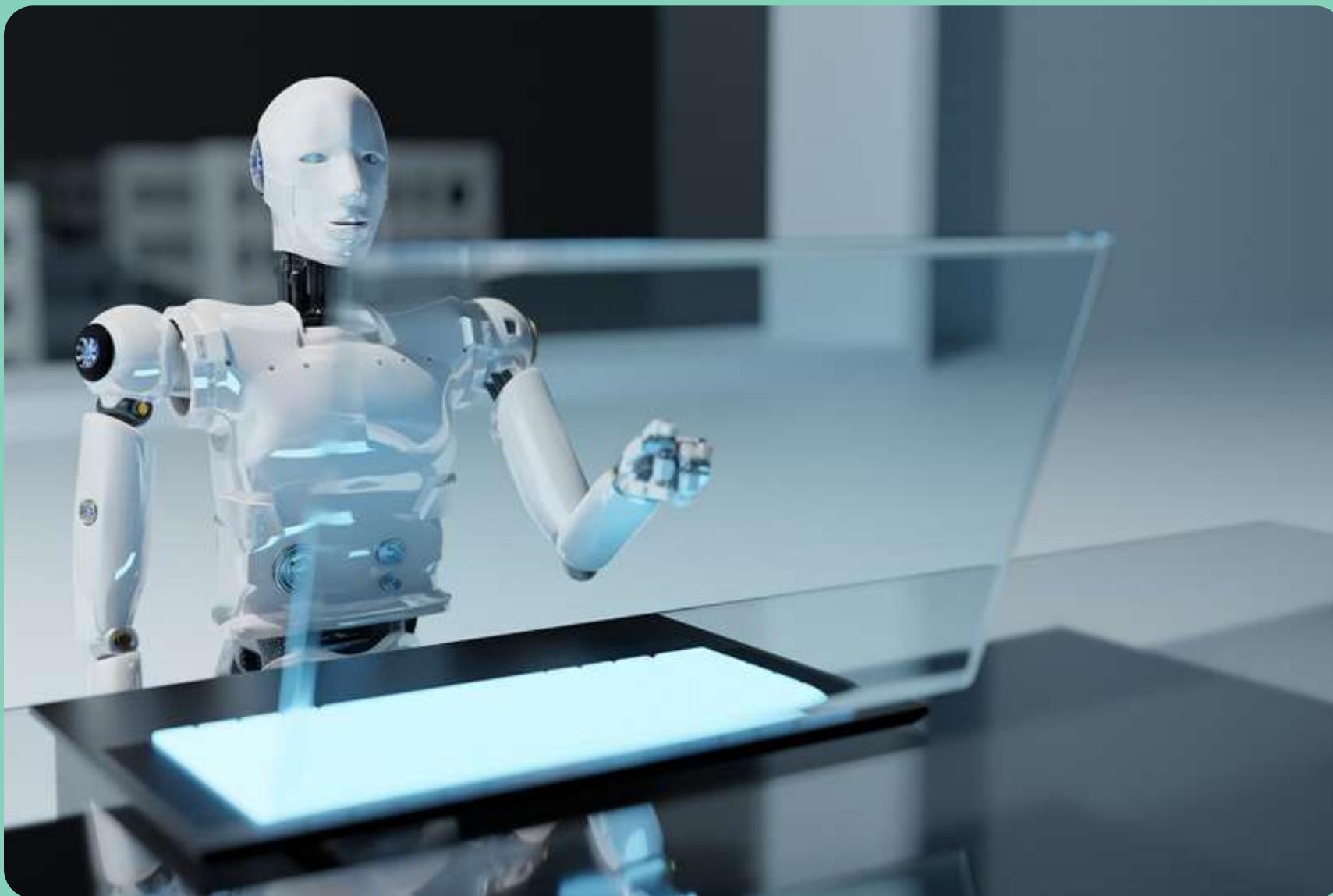
- Target Identification
- Virtual Screening
- Structure-Activity Relationship Modeling
- De Novo Drug Design
- Drug Repurposing
- Toxicity Prediction

2) AI for Drug Delivery:

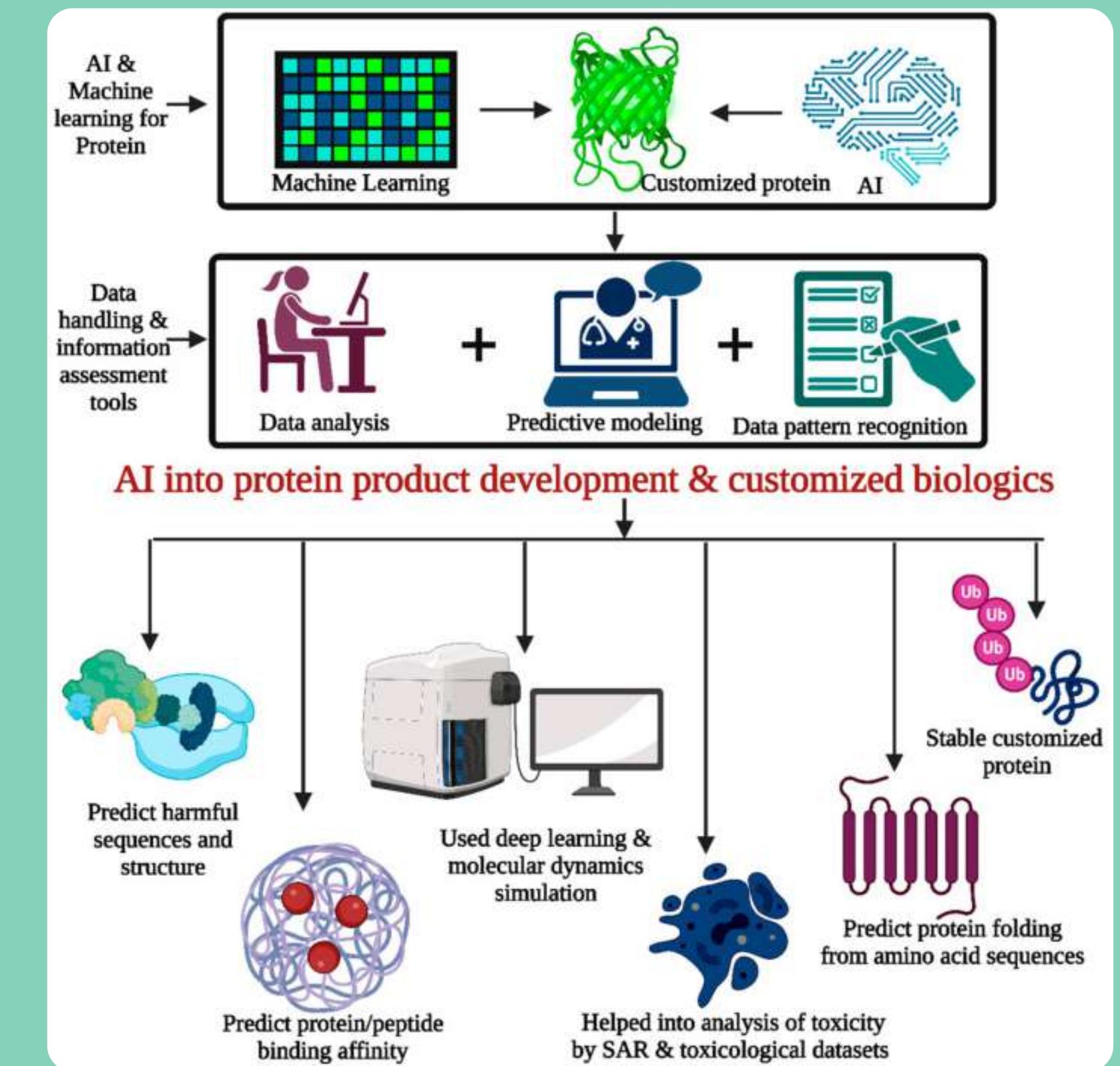
- AI and big data integration in pharmaceuticals
- AI algorithms analyse large datasets
- Simulating formulation processes
- Early identification of risks



3) AI in Medical Devices



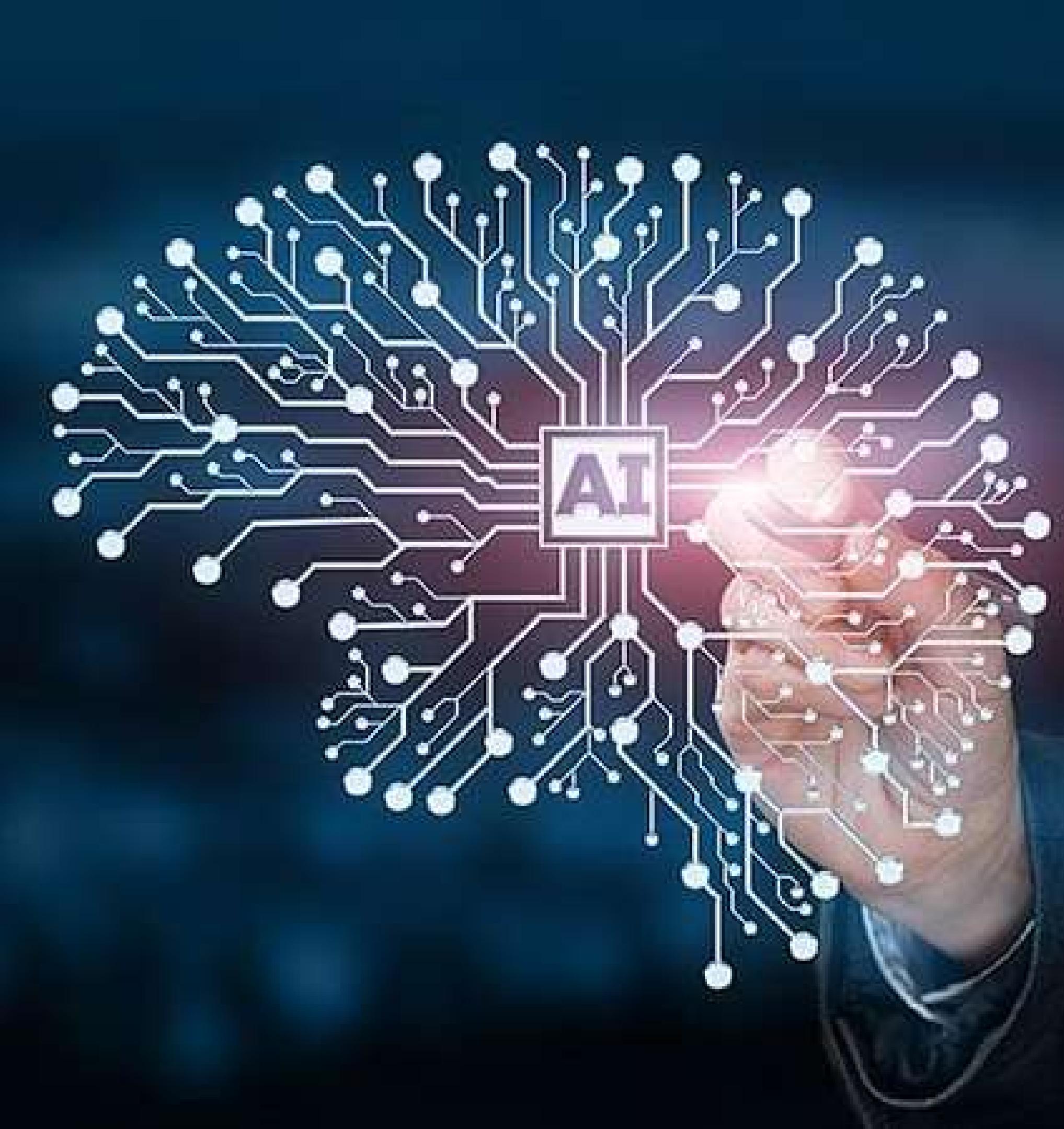
- Diagnostic Assistance
- Remote Monitoring
- Wearable Devices
- Prosthetics and Rehabilitation
- Surgical Assistance
- Medication Management



4) Biologic Product Development

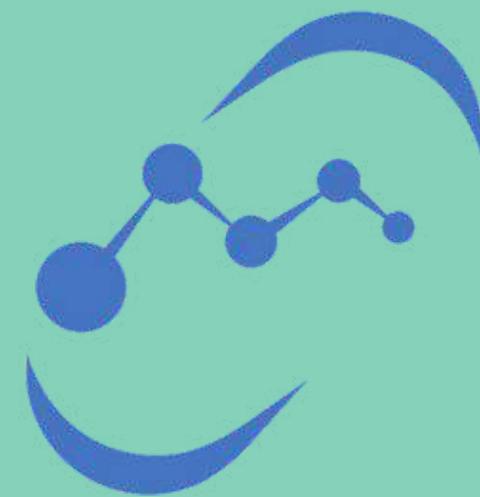
AI Limitations

- Lack of Transparency
- Limited, Erroneous and Biased Data
- Inability to Incorporate New Data
- Ethical Considerations
- Complexity of Biological Systems
- Clinical Particularities





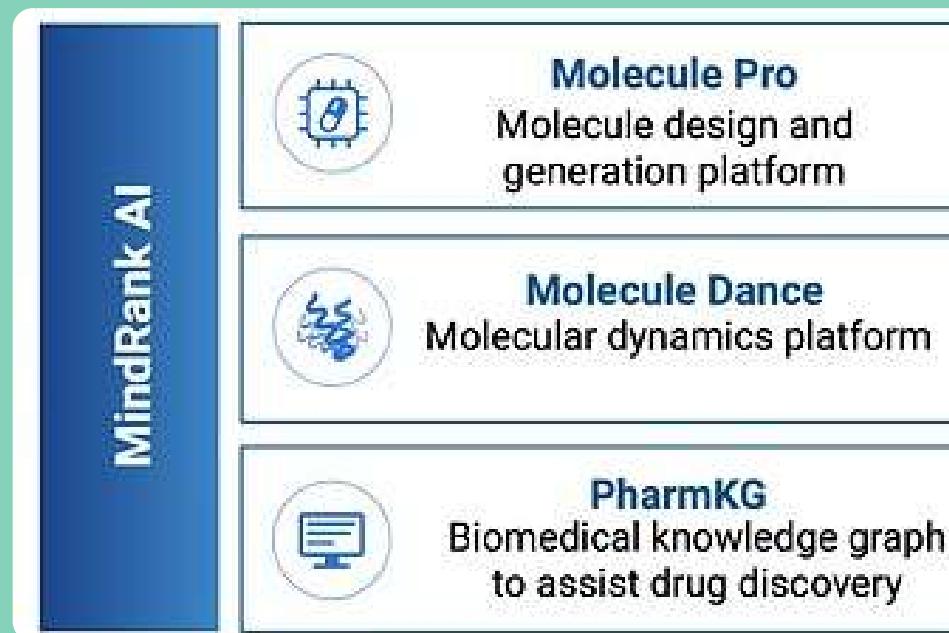
MERCK AI ACTION PLAN



德睿智药
MindRank AI

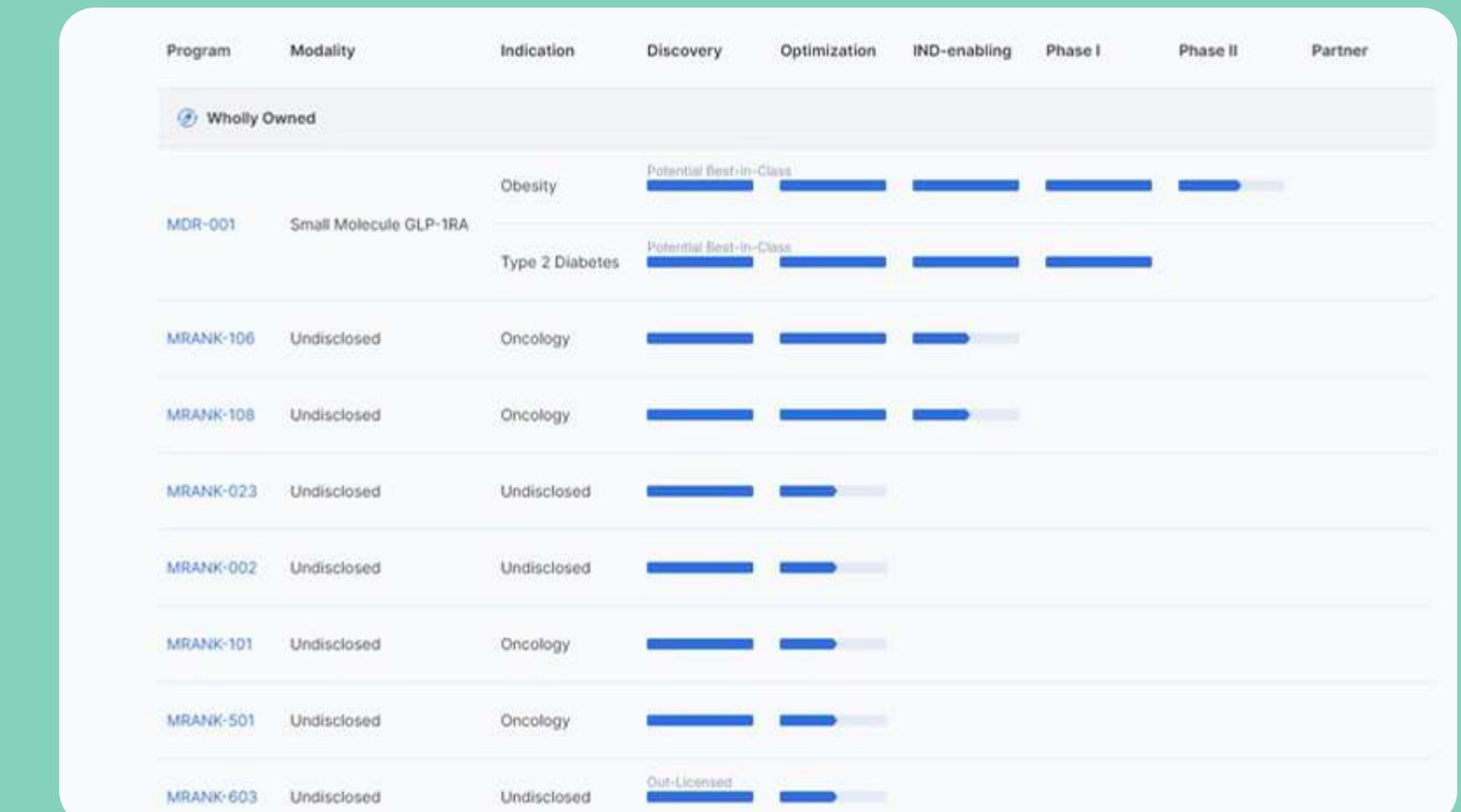


What is MindRank



The company aims to accelerate the drug discovery process and deliver small molecule drugs with desirable potency, efficacy and safety profiles:

1) MindRank Pipeline: Oncology and Diabetes



INVESTMENT NEEDED & R&D PROJECTIONS

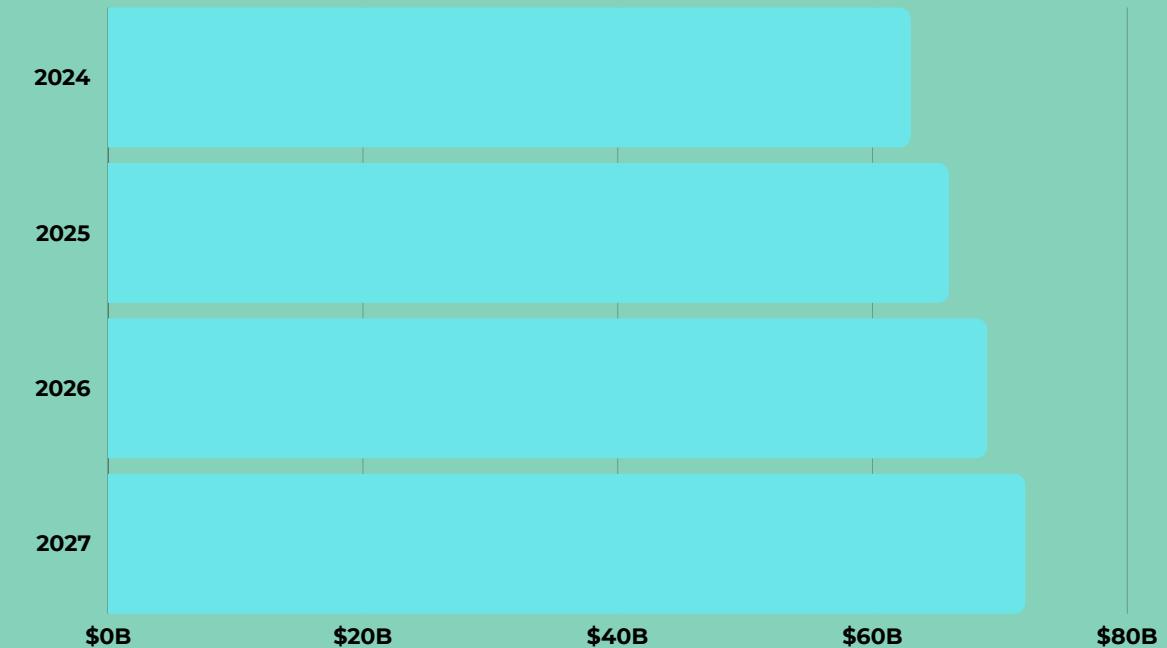
MindRank Partnership



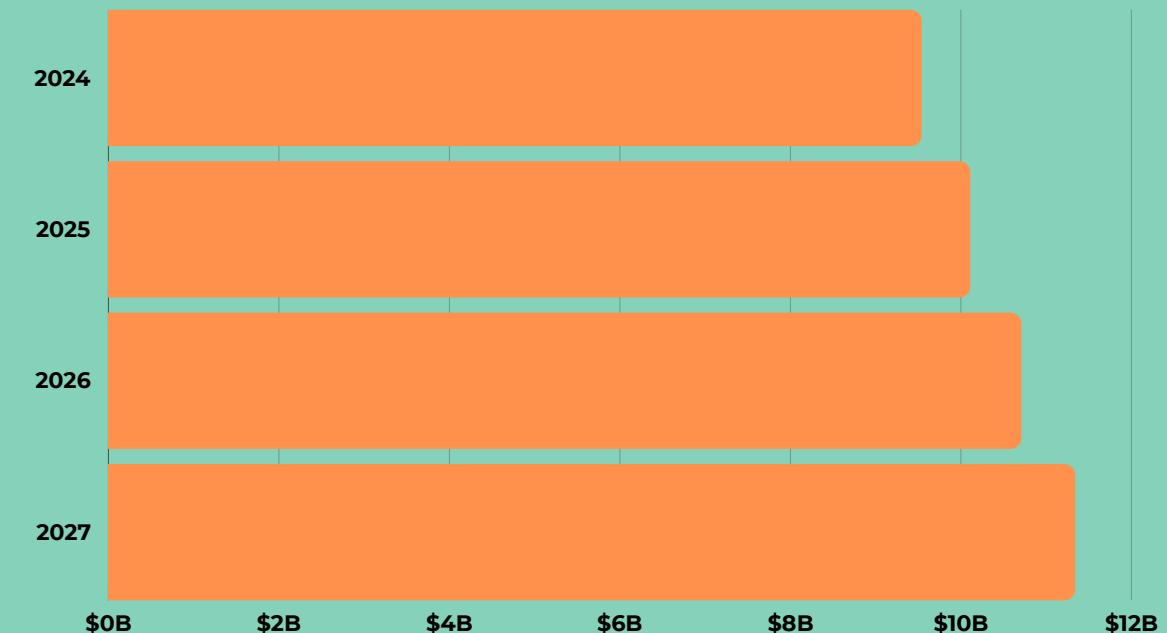
Strategic Alliance:

- 5-year exclusivity
- \$15 billion total investment:
 - \$7B in 2024 → \$57B in Treasury Stock
 - \$8B distributed in the following 4 years
- Cons:
 - ROE and Cash availability will worsen in the short-term
 - Possibility that the partnership fails

Total Revenue



R&D



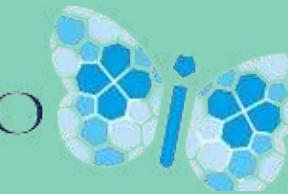


LOW RETURN ON SALES

$$\text{RETURN ON SALES} = \frac{\text{NET INCOME}}{\text{NET SALES}} = 3.40\%$$

ACQUIRED

Prometheus
Biosciences

IMAGO  BIOSCIENCES

R&D COST

AI CAN HELP MERCK REDUCE ITS R&D EXPENSES BY:

- ANALYSING LARGE AMOUNT OF DATA AND INTERPRETING IT, REDUCING TIME AND RESOURCES.
- ANALYSING PATTERNS AND TRENDS, AND THEREFORE MAKE PREDICTIONS AND INFORMED DECISIONS.
- REDUCE THE RISK OF COSTLY MISTAKES.

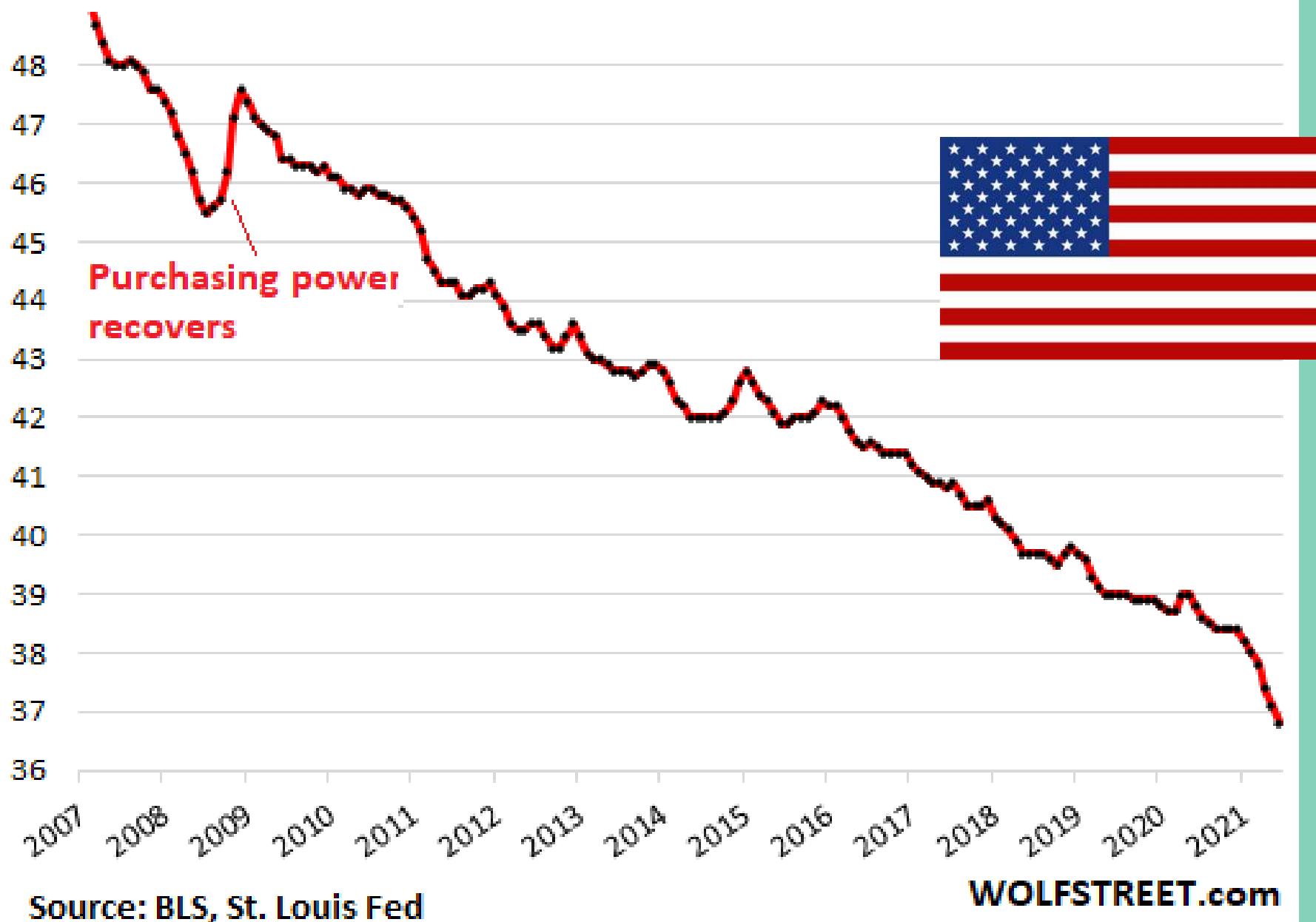


ENTERING EMERGING MARKETS



"Purchasing Power of Consumer Dollar"

Index value, not seasonally adjusted



Decrease in purchasing power of the USD and thus of the American population.

New US serialization requirements: how will they impact the pharma supply chain?

As new serialization requirements come into force later this year, they pose significant challenges for companies along the pharma and biotech supply chain.

Hiripty Bairu · August 21, 2023

Drugmakers set strategy for legal fight against US pricing regulation

By Patrick Wingrove and Michael Erman

May 9, 2023 12:21 PM GMT+2 · Updated 7 months ago



HEALTH CARE · AUG 23, 2023

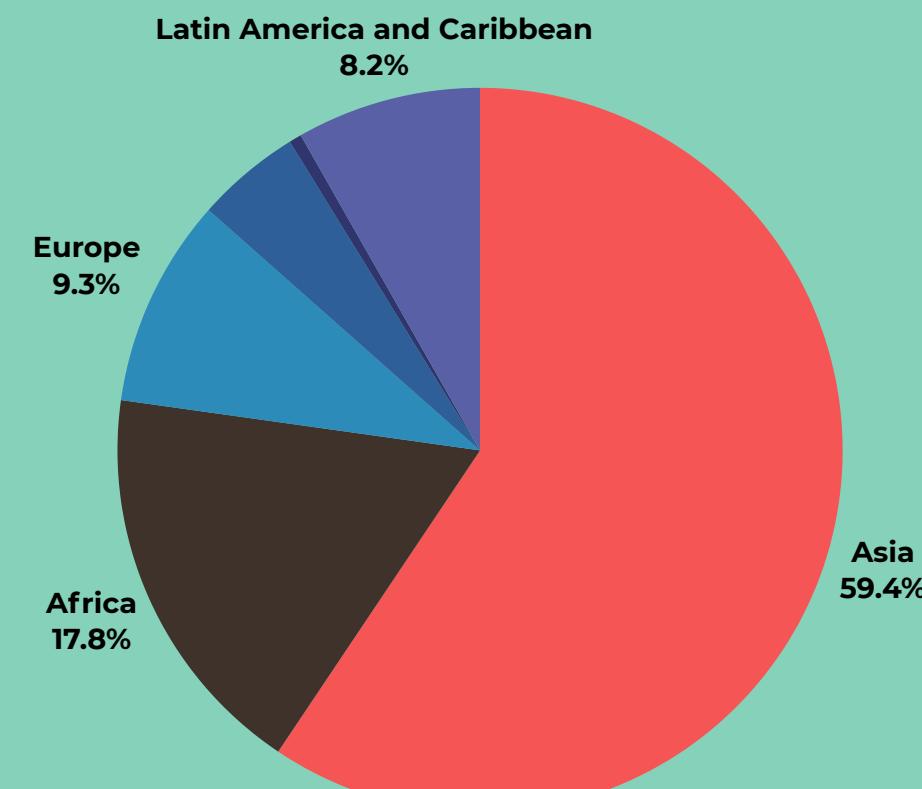
Pharma Giant Threatens To Delay Drugs Over New Price Controls

A pharmaceutical company could slow-walk research on medicines Americans need in response to Biden's recently enacted federal price regulations.

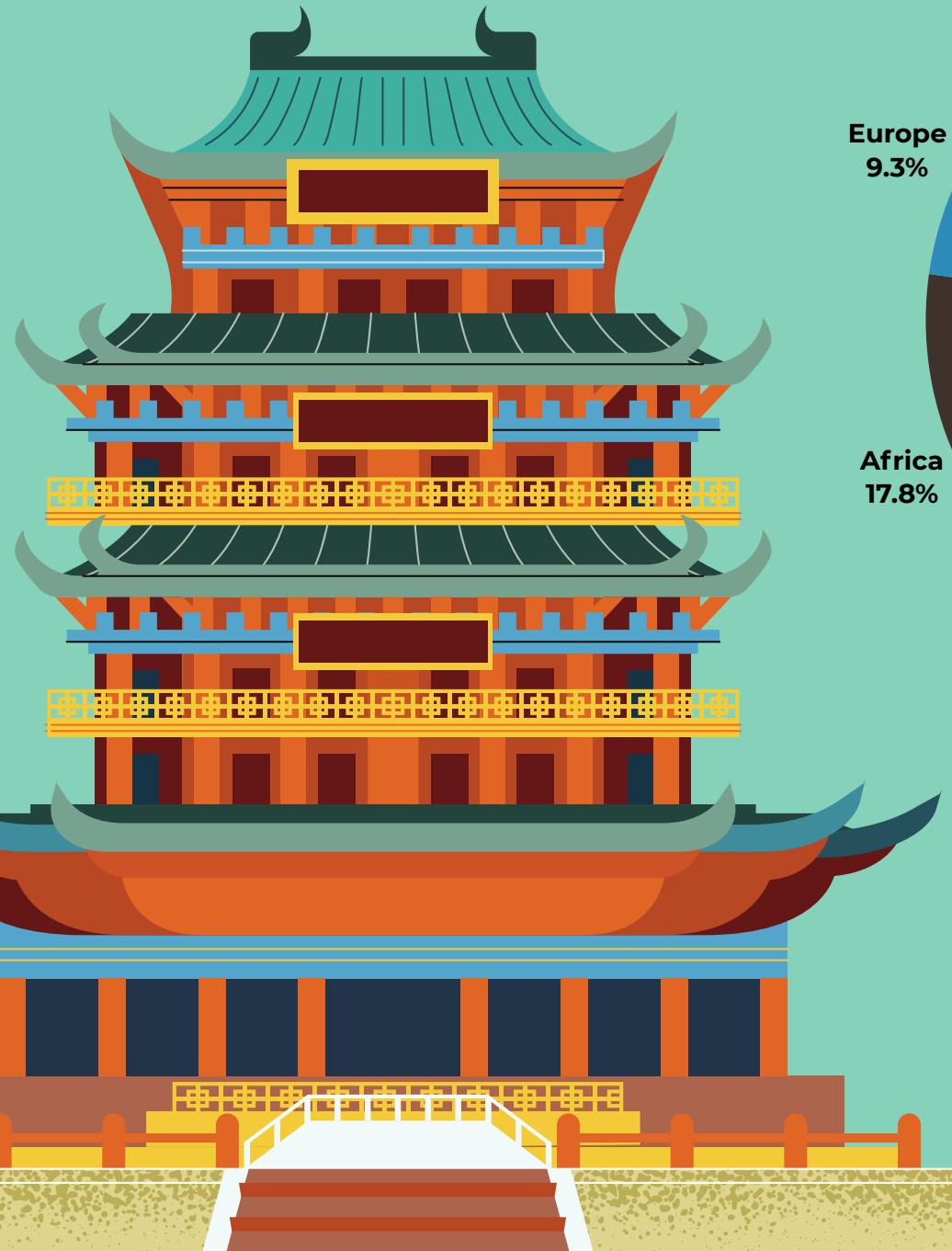
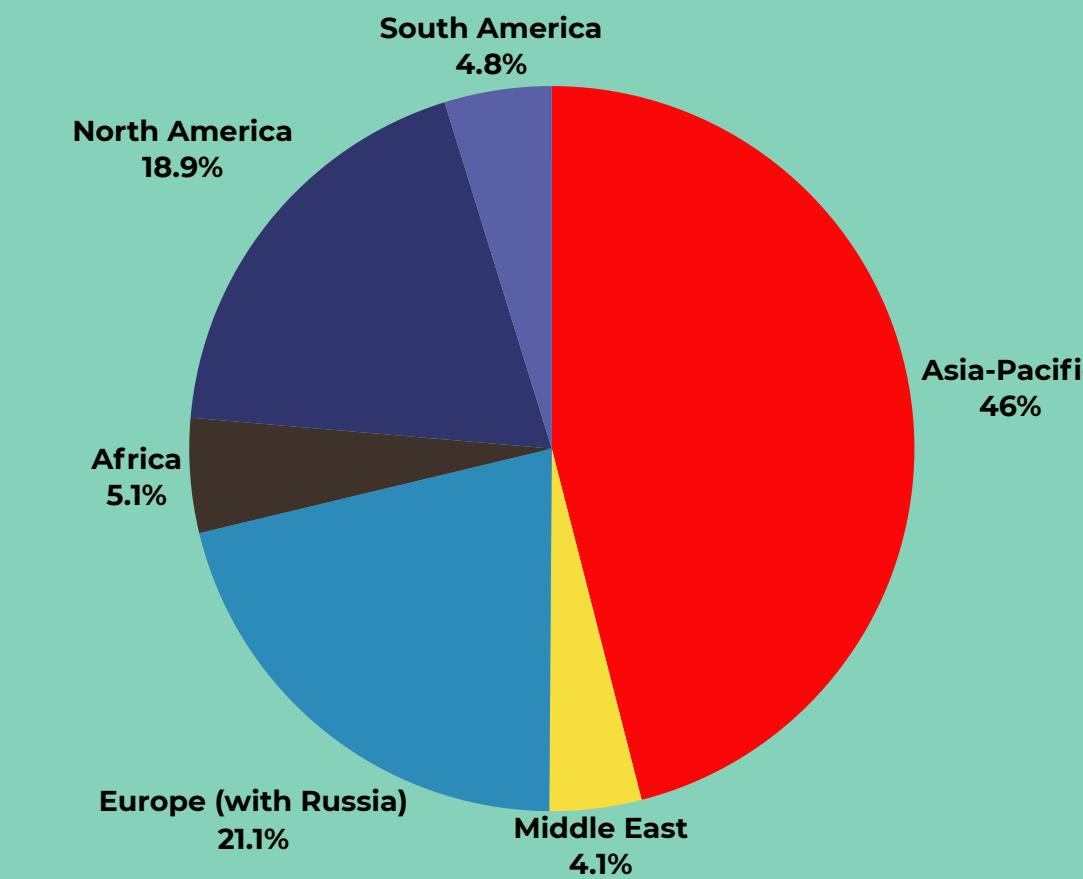
Growing regulations on the pharmaceutical industry in the U.S.

ASIA IS THE WORLD'S BIGGEST MARKET

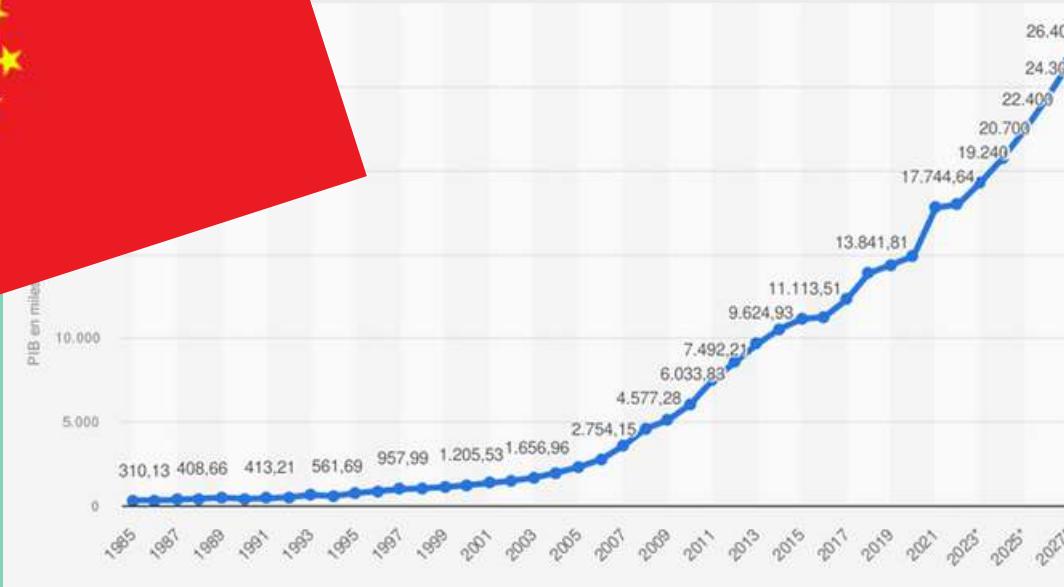
Global share of population 2023



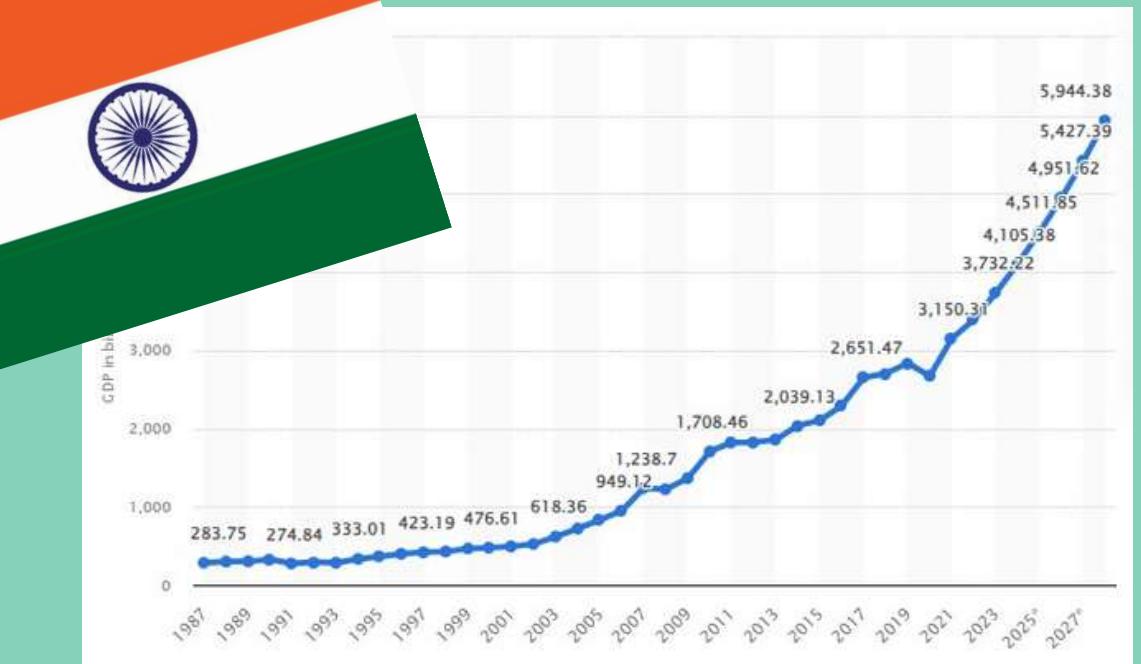
Global share of GDP 2023



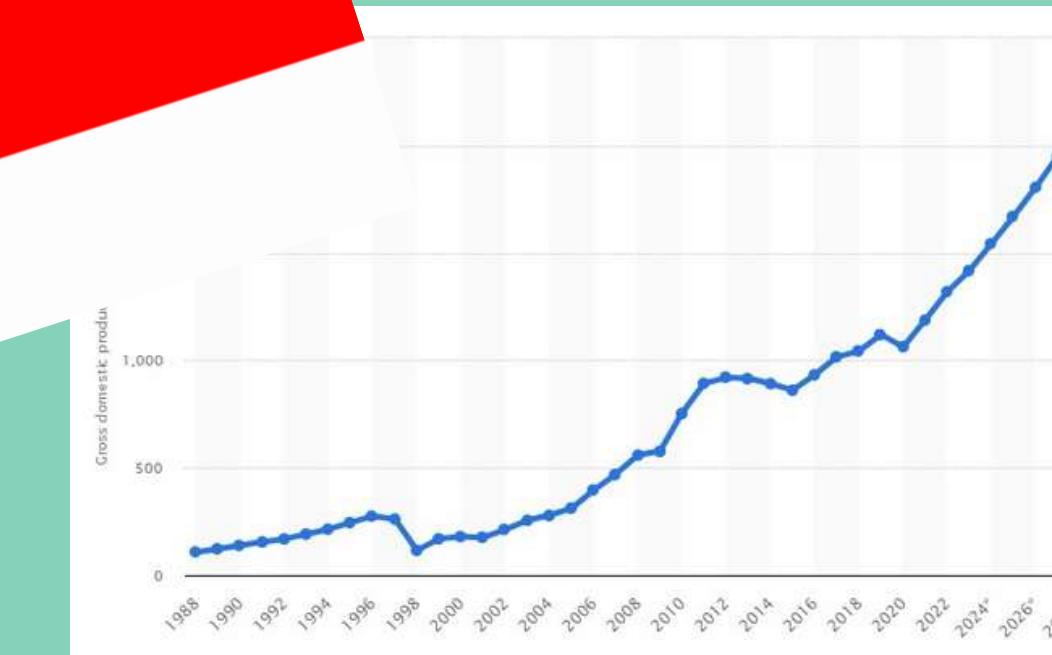
ALL EXPERIENCING THE BIGGEST PERCENTUAL GDP GROWTH IN THEIR HISTORY



China GDP per Capita (PPP) 1985-2027

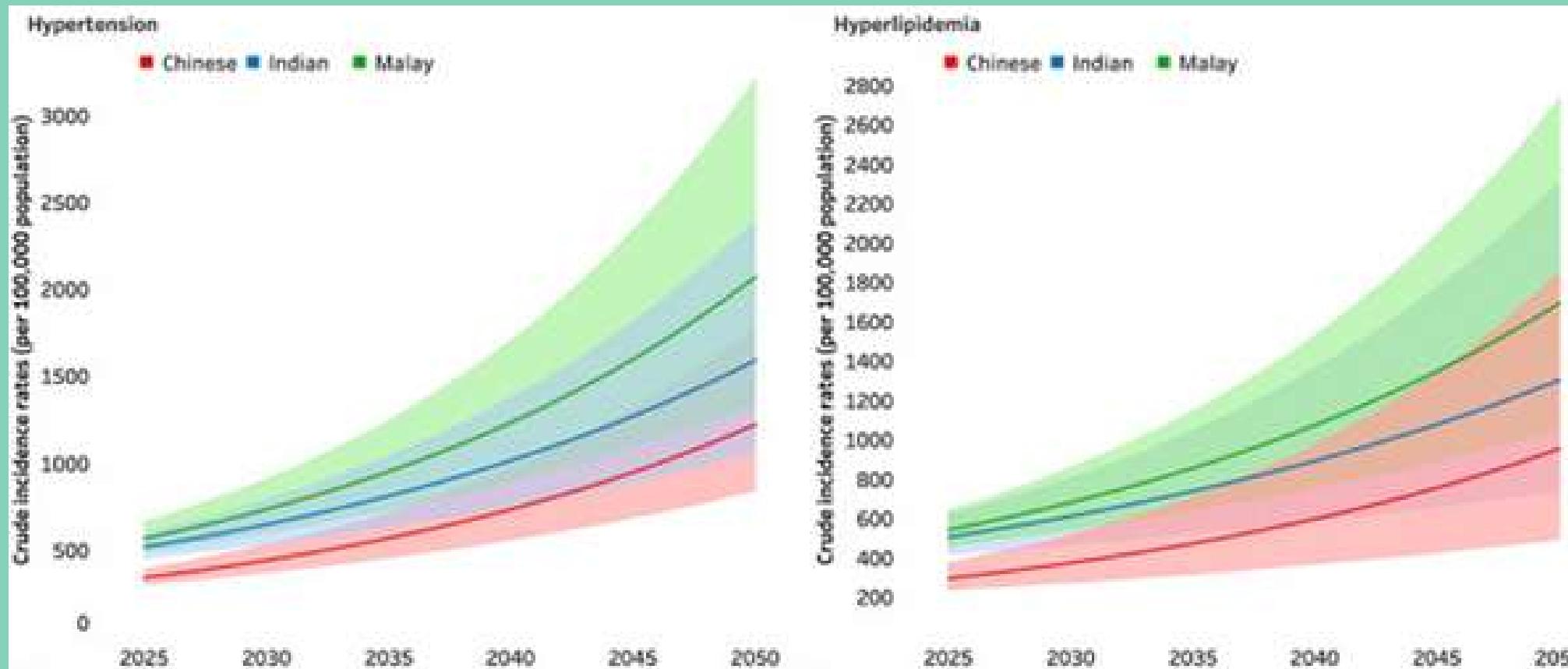
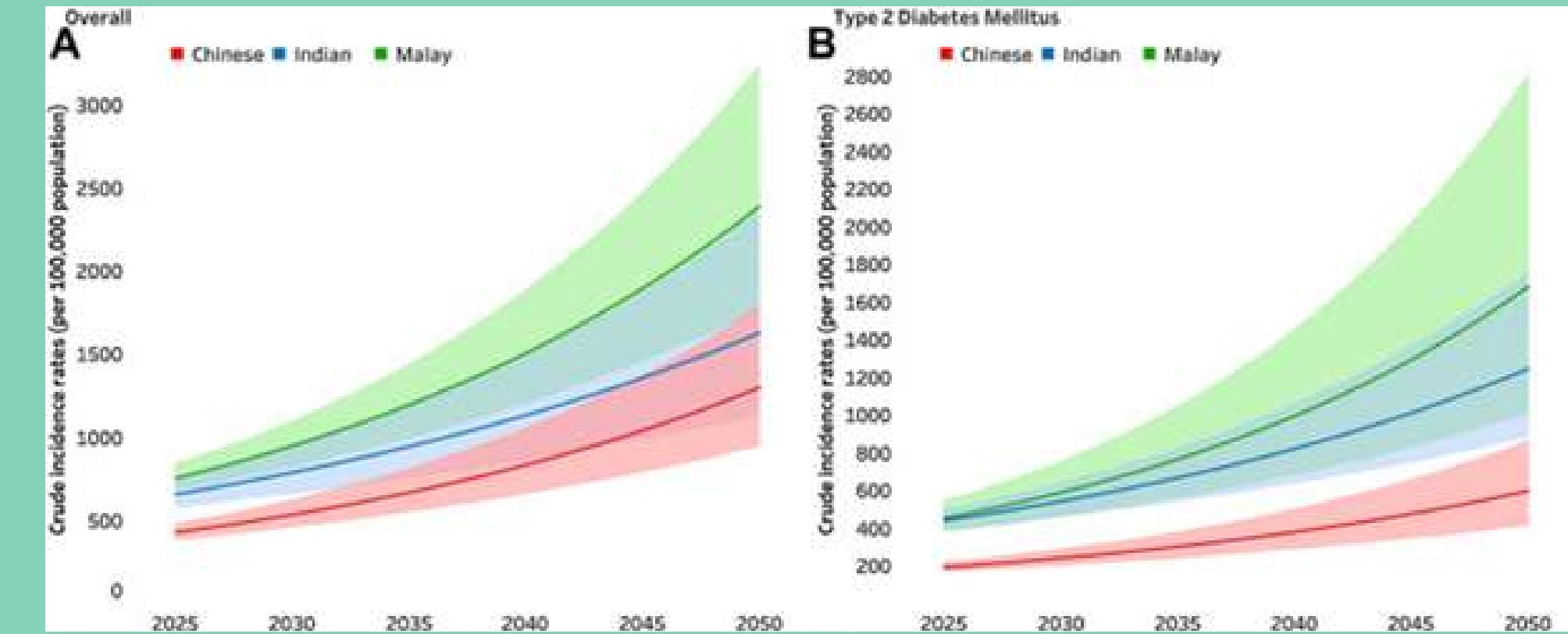


India GDP (PPP) 1987-2027

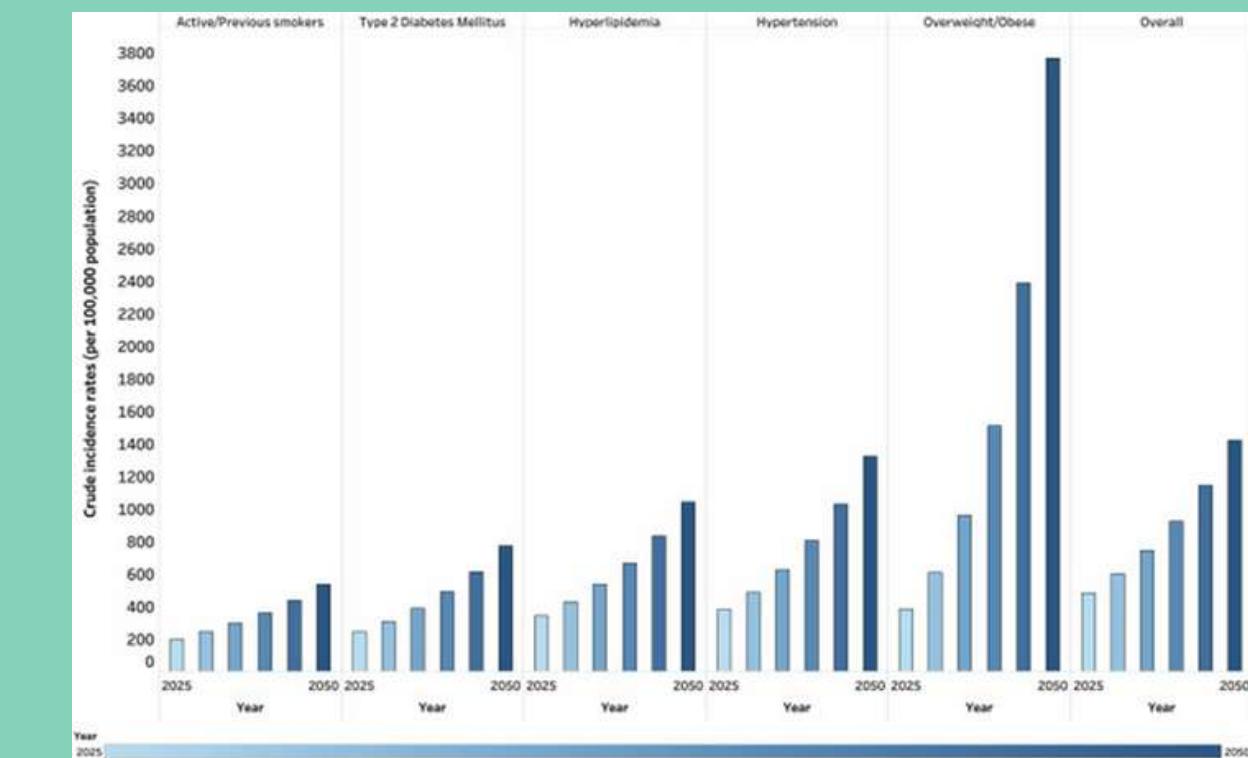


Indonesia GDP (PPP) 1988-2028

COMPARISON IN THE INCREASE OF DIFFERENT METABOLIC DISEASES 2025-2050



-Incidence of acute myocardial infarction in Singapore.



ACTION PLAN FOR EMERGING MARKETS

- 1 - BUILDING RELATIONSHIPS WITH GOVERNMENTS, AND GAINING THE TRUST OF LOCAL PHARMACIES/HOSPITALS.
- 2 - CREATING MANUFACTURING FACILITIES IN THE REGION.
- 3- ENGAGING IN CUSTOMIZED AWARENESS CAMPAIGNS.
- 4- INTRODUCE KEYTRUDA AND DIABETES- RELATED DRUGS SINCE THE TREND SUGGESTS BIG INCREASE IN DEMAND.



DEVELOPMENT PLAN



Manufacturing Plant in Medan, Indonesia

Plan & Estimated Costs:

- 800,000 sqf terrain in the outskirts of Medan → \$538.56M
- Build the plant → \$1B
- It will be taken from Treasury Stock.



Why Indonesia?

- Strategic Position
- Cheap Manpower and day to day Supplies
- Capturing talent from the leading technological universities: Nanyang Institute of Technology



SALES PLAN

Pricing Strategy:

- Adjusted price of the cost of Keytruda financed by the patient.
- US price as reference → \$1906 yearly
- 2.37% of the annual country GDP per capita.
- Prices by country:
 - India: \$220 yearly.
 - Malaysia: \$889 yearly.
 - China: \$559 yearly.
 - Indonesia: \$380 yearly.
- Our main challenge → Governments funding and negotiations.

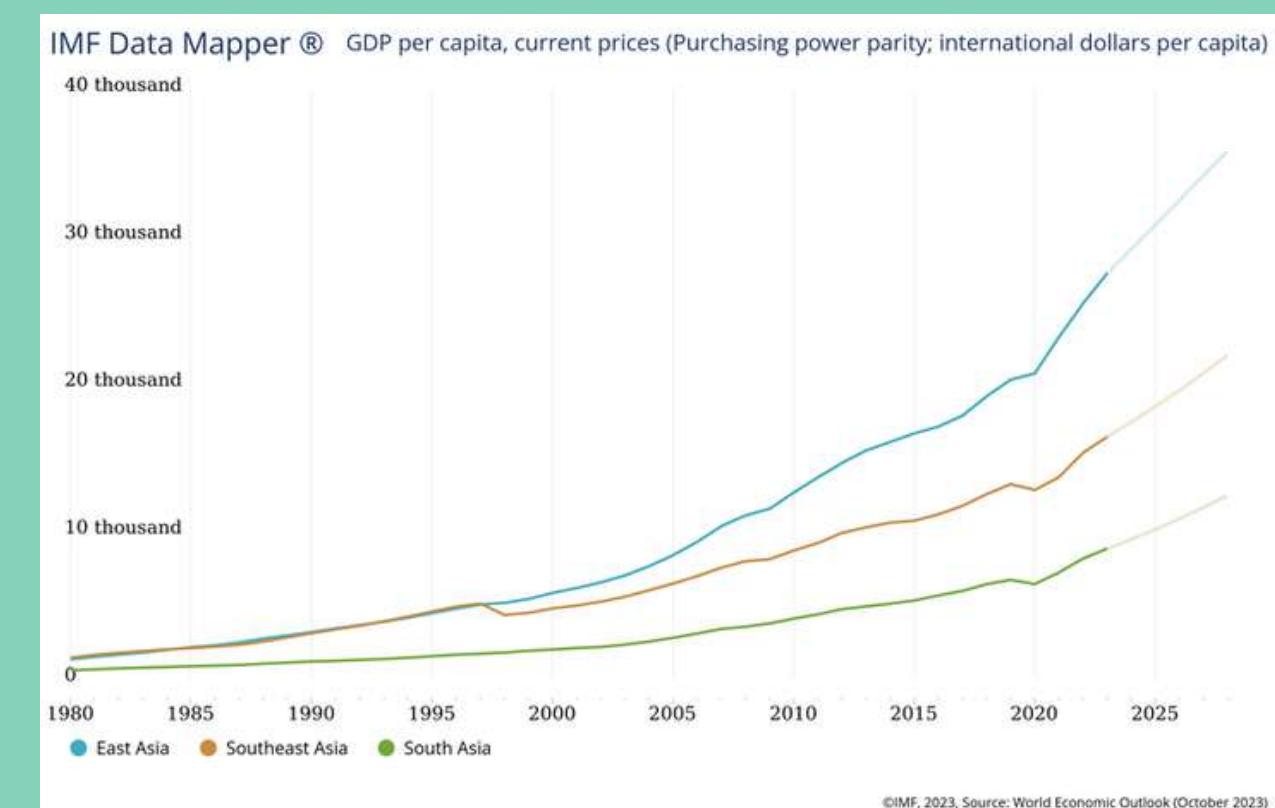
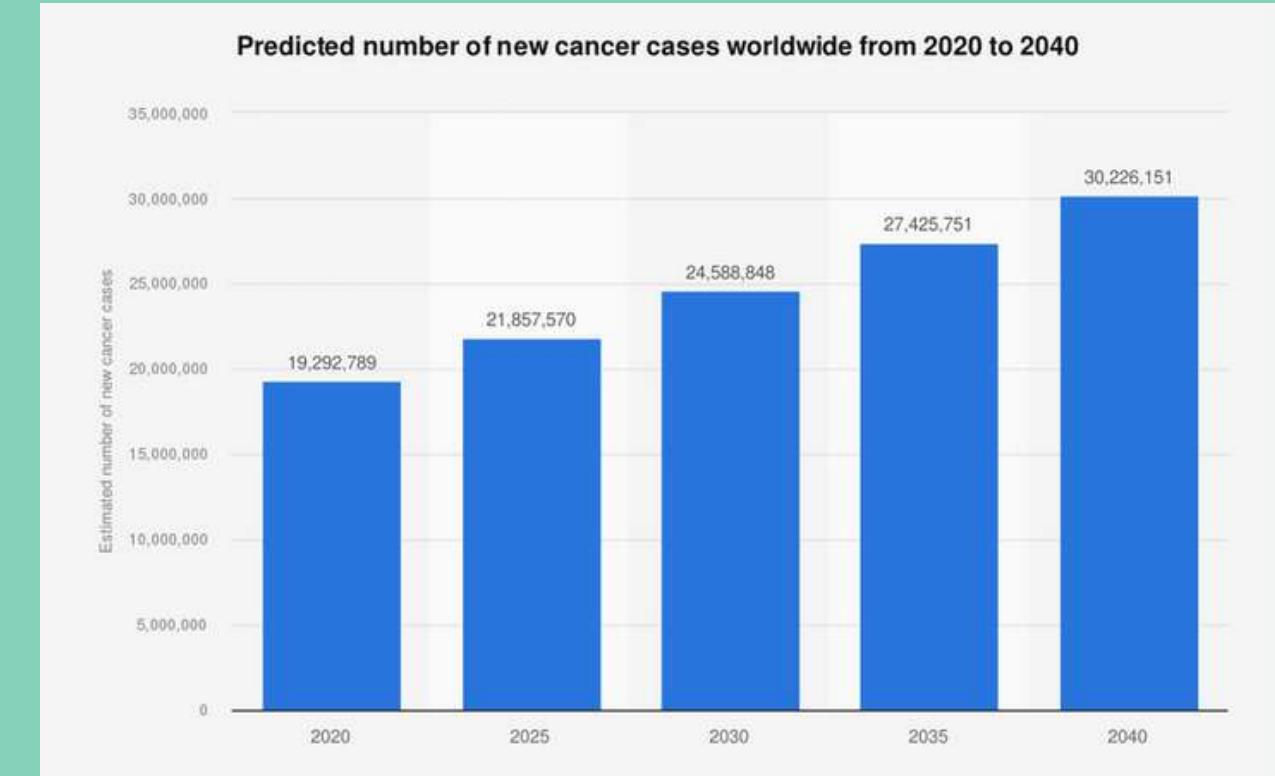


SALES PLAN

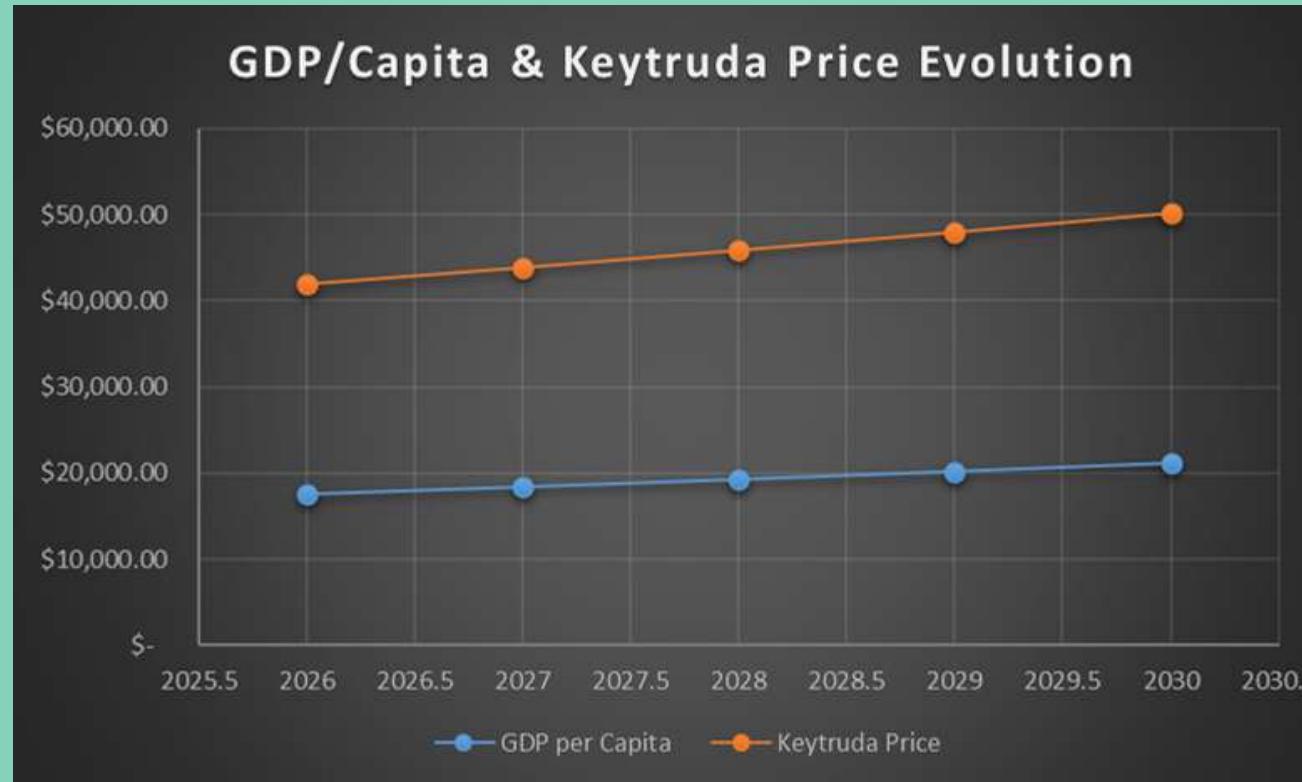
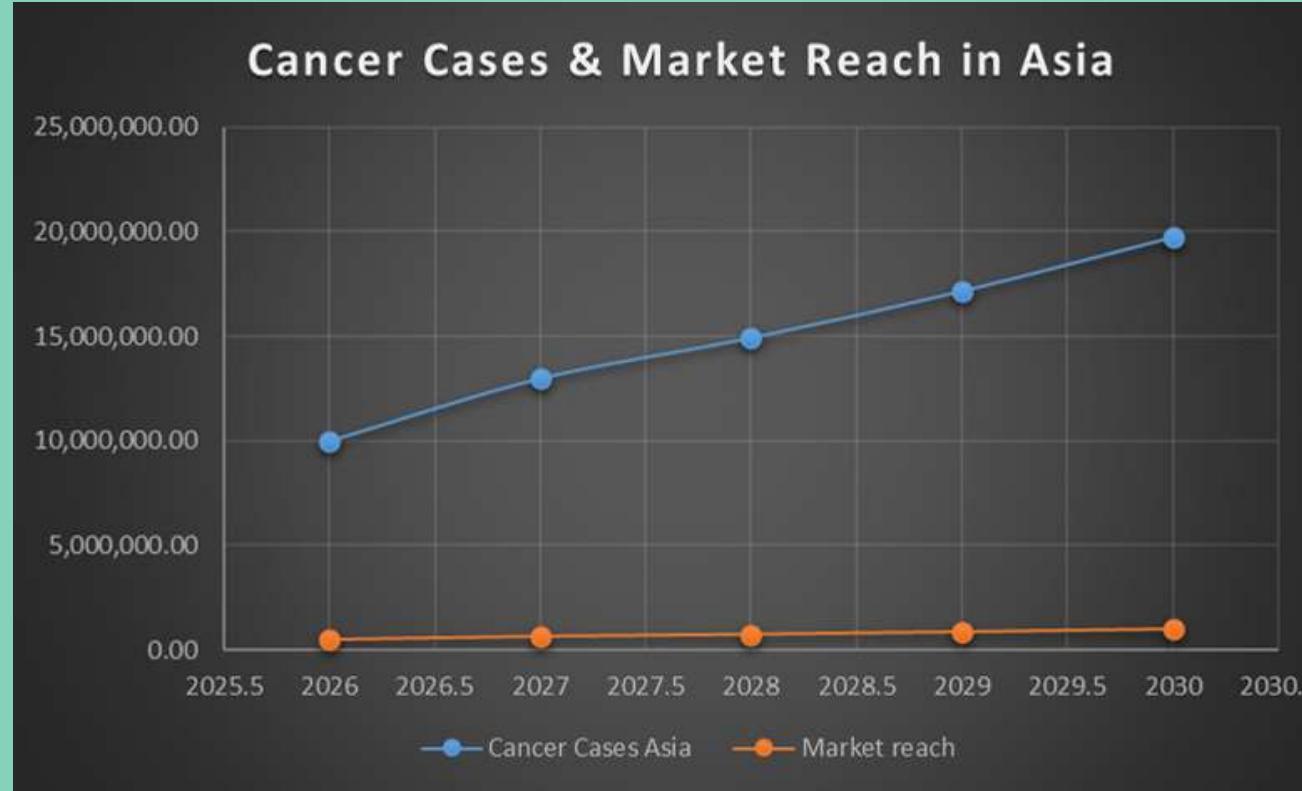
Projected Revenue:

Key Measures:

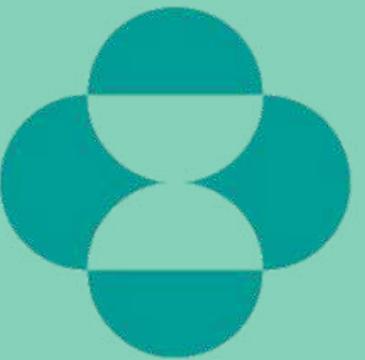
- Real Keytruda Cost US → \$192k
- This is 2.38 times the US GDP per capita
- We adjust this amount the our target region GDP per capita
- Target region GDP per capita → \$17,600
- Total cancer cases in 2023 → 20M
- Estimated market reach → 10%
- Real Keytruda cost adjusted → \$41.8k
- Development plan and agreements with governments will take 2 years at least



ESTIMATED NUMBERS 2026-2030



THANK YOU



MERCK