

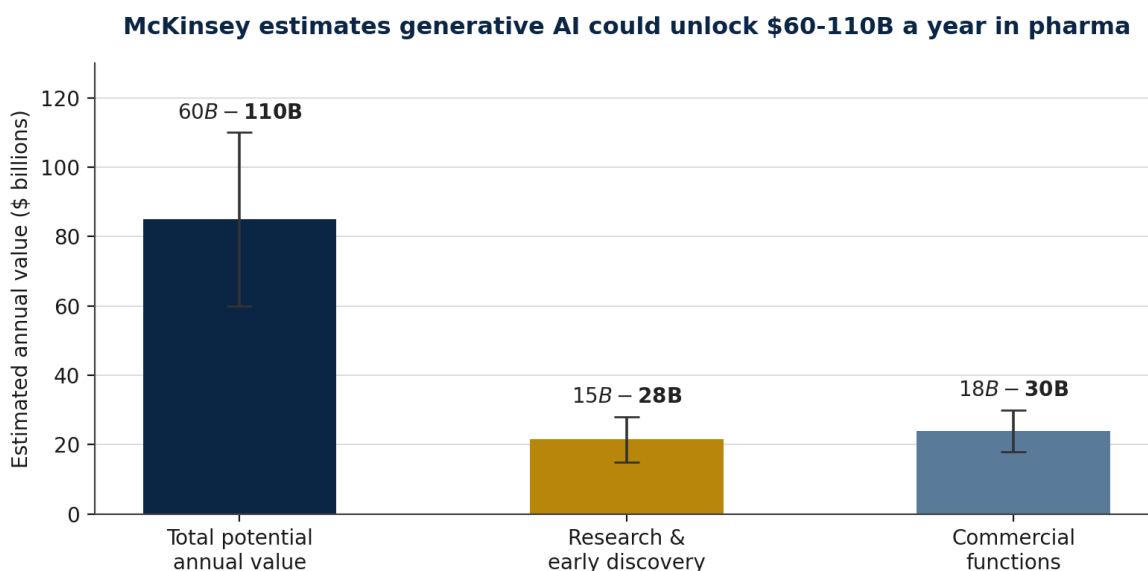
Is Biopharma Ripe for Deflation?

Alan Vanderborcht | KYBORA Founder and CEO | July 2026

For three decades, biopharma has operated on a simple premise: therapies are expensive because they are hard to make. Discovery is slow, trials are costly, manufacturing is exacting, and regulatory approval takes years. Scarcity of successful drugs, not demand, has kept prices high. That premise is weakening.

Supply side growth through technology implementation

Artificial intelligence is now impacting every stage of the biopharma value chain. It improves productivity at each stage resulting in greater output at less cost. McKinsey estimates that generative AI alone could unlock \$60 billion to \$110 billion in annual value across the pharmaceutical and medtech industries, the equivalent of 2.6 to 4.5 percent of annual revenue, with \$15 billion to \$28 billion of that coming from research and early discovery alone.



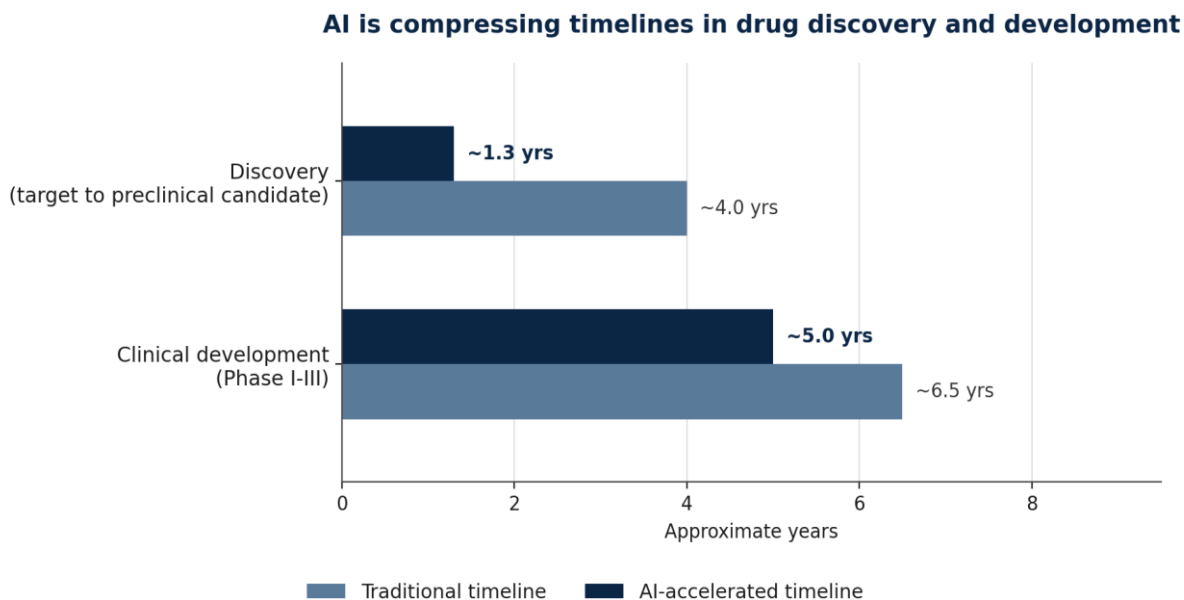
Source: McKinsey Global Institute / McKinsey & Company, "Generative AI in the Pharmaceutical Industry: Moving from Hype to Reality," 2024. Total equals 2.6%-4.5% of annual pharma and medtech revenues.

Figure 1. McKinsey Global Institute / McKinsey & Company, "Generative AI in the Pharmaceutical Industry: Moving from Hype to Reality," 2024.

The clearest gains so far are in discovery. Traditional target-to-preclinical-candidate work has typically taken three to five years. AI-assisted discovery is compressing that into a matter of months in the most advanced cases. Insilico Medicine's INS018_055, described as the first drug candidate to have its molecule designed by AI, was conceived, optimized, and moved into the clinic in roughly eighteen months, at a disclosed cost of approximately six million dollars, and reported statistically significant Phase IIa results for idiopathic pulmonary fibrosis in February 2026.

The same logic is reaching clinical trials, historically the most expensive and time-consuming part of drug development. A comprehensive review of AI applications in clinical research found that AI integration has

accelerated trial timelines by 30 to 50 percent while reducing costs by as much as 40 percent, largely through better patient identification and predictive trial design. Manufacturing is following a similar path, with industry surveys pointing to production efficiency gains in the range of 20 to 30 percent from AI-driven process optimization and automated quality control. Regulatory and commercialization work, long a matter of manual documentation and negotiation, is also being compressed by tools that speed submissions and identify market access pathways earlier in development.



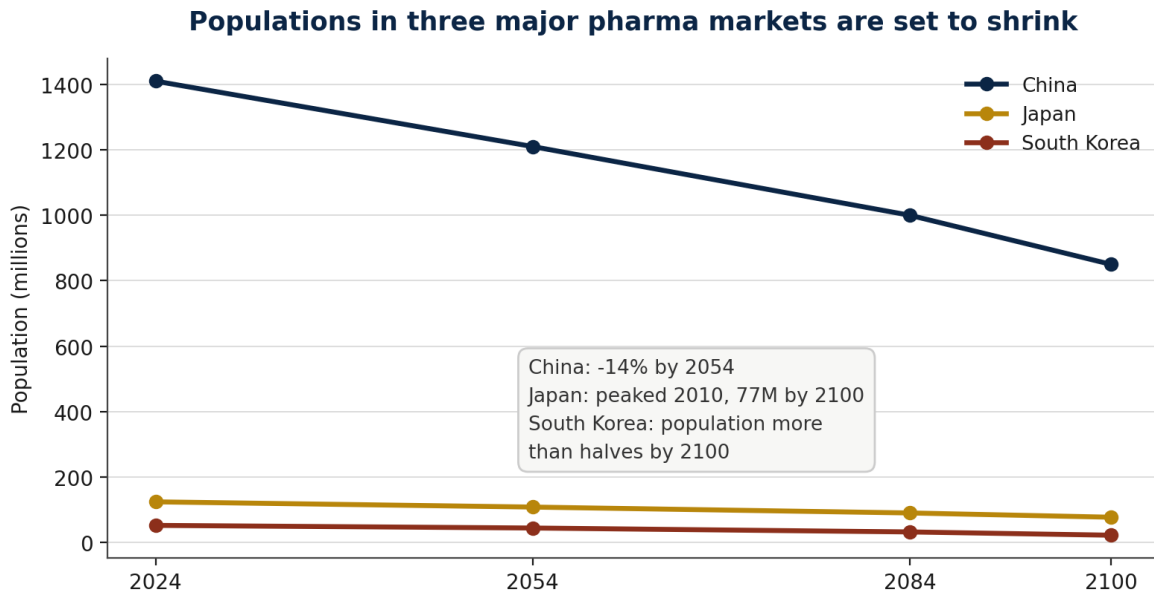
Sources: McKinsey, "Generative AI in the Pharmaceutical Industry" (2024) and "Scaling gen AI in the life sciences industry"; Insilico Medicine INS018_055 case (AI-designed candidate, Phase IIa, 2026). Ranges are illustrative midpoints.

Figure 2. McKinsey & Company, 2024; Insilico Medicine INS018_055 case (Phase IIa, 2026). Ranges are illustrative midpoints.

None of these gains is dramatic in isolation. Applied together across the full chain from molecule to market, they compound into something structural: an industry capable of bringing more therapies to patients at a lower cost per therapy than at any point in its history.

Demographics curb long-term demand

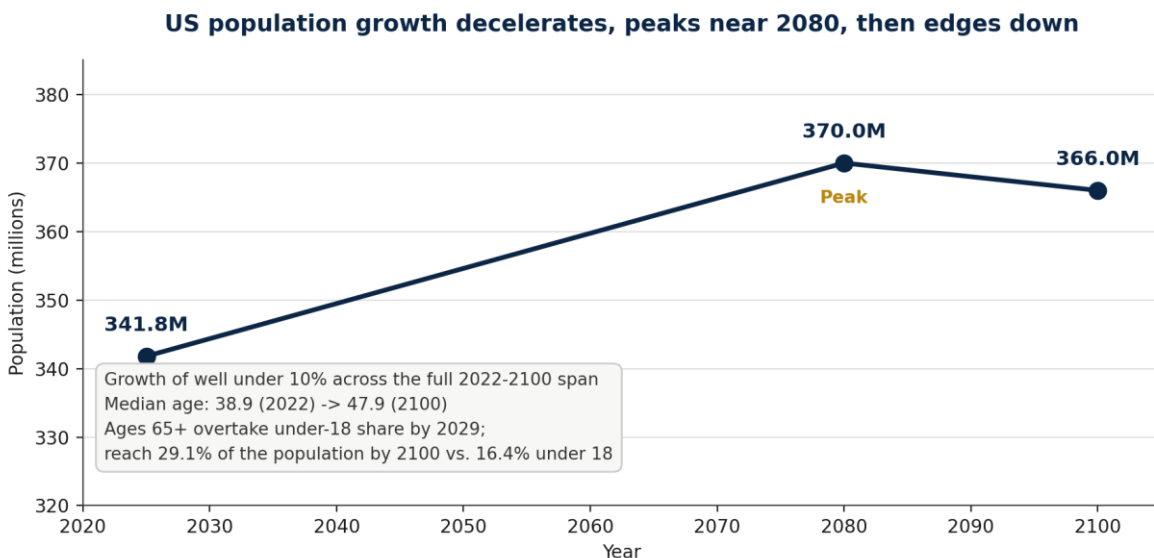
Supply growth would ordinarily be unambiguously good news, and in most respects it still is. But it collides with a demand-side reality. According to the United Nations' 2024 World Population Prospects, population size has already peaked in sixty-three countries, including China, Germany, Japan, and Russia, roughly half of them in Europe. China's population is projected to fall by close to 14 percent between 2024 and 2054. Japan, which peaked in 2010, is expected to decline from 124 million today to 77 million by the end of the century. South Korea, with the lowest fertility rate in the world at 0.73 births per woman, is projected to see its population more than halve by 2100.



Source: UN, World Population Prospects 2024 (medium variant), as summarized by Our World in Data, July 2024. Endpoints reflect UN/OWID reported figures; intermediate points interpolated for illustration.

Figure 3. UN, World Population Prospects 2024 (medium variant); Our World in Data, July 2024.

The same pattern is now reaching the market that matters most to biopharma economics. The United States accounts for roughly 53 percent of the global prescription drug market, by far the largest of any single country, so its demographic trajectory carries outsized weight. The population reached 341.8 million in July 2025. The Census Bureau's own long-range projections, published in 2023, show growth continuing only modestly from here: the population is expected to peak at nearly 370 million around 2080 and then edge down to about 366 million by 2100, an increase of under 10 percent across the full span from 2022. The population is also aging quickly.

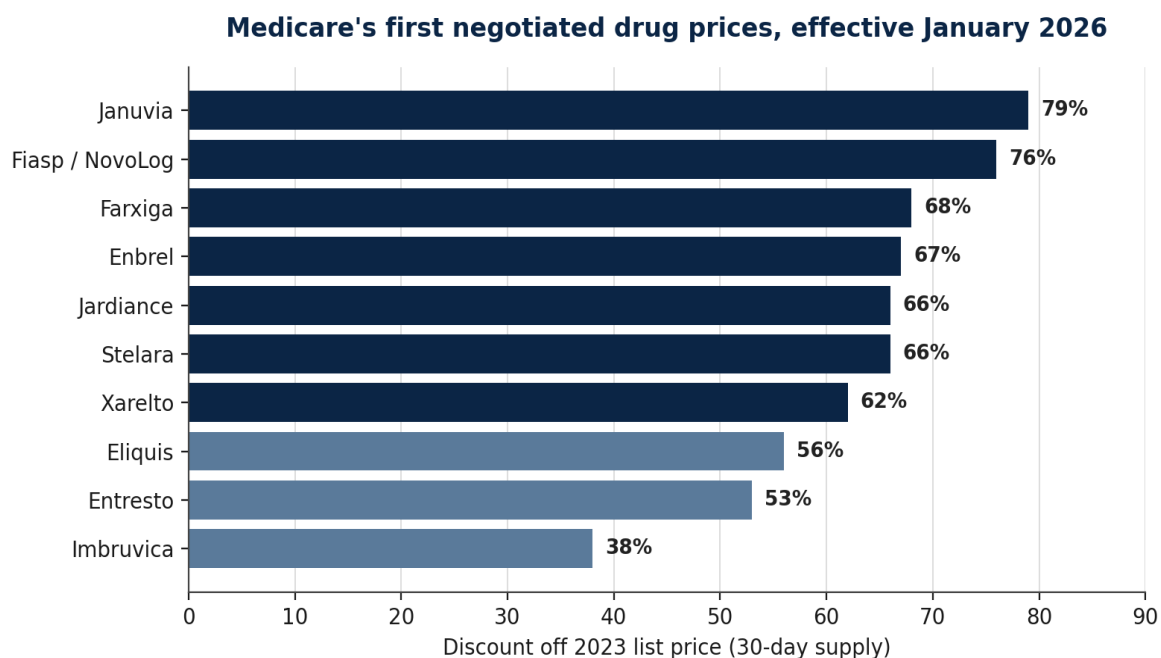


Source: US Census Bureau, 2023 National Population Projections (main series), and Vintage 2025 Population Estimates. 2025 figure is the Census Bureau's actual estimate; 2080 and 2100 are projections. Points interpolated for illustration only where noted.

Figure 4. US Census Bureau, 2023 National Population Projections (main series) and Vintage 2025 Population Estimates. US share of global prescription drug market from Statista, 2024.

Pricing pressure is already visible

The pharma industry opened the door to price negotiation when they agreed to the Inflation Reduction Act. Under the Act, Medicare negotiated its first set of drug prices in 2024, effective January 2026. The results were significant: discounts ranging from 38 percent for Imbruvica to 79 percent for Januvia off 2023 list prices, producing an estimated \$6 billion, or roughly 22 percent, in aggregate savings across the ten selected drugs had the new prices applied a year earlier. More drugs will be added to the negotiation list in subsequent rounds.



Source: Centers for Medicare & Medicaid Services (CMS), Medicare Drug Price Negotiation Program, negotiated prices for initial price applicability year 2026 (all 10 selected drugs shown).

Figure 6. Centers for Medicare & Medicaid Services, Medicare Drug Price Negotiation Program, negotiated prices for initial price applicability year 2026.

The supply side reinforces this rather than offsetting it. AI is not simply making existing categories of drugs cheaper to produce. It is widening the aperture of what biopharma can build at all, from small molecules and biologics to cell and gene therapies, mRNA platforms, and modalities that barely existed a decade ago. Each of these is a new avenue of supply layered on top of the ones that came before, arriving into a patient base in the world's largest markets that is flattening or shrinking rather than growing. More categories of therapy, addressing the same or a declining number of patients, is the textbook setup for oversupply relative to demand.

What does this mean for strategy

We are not suggesting that drug prices will collapse next year. Regulatory cycles are long, AI adoption across large pharmaceutical organizations remains uneven, and pricing has always been shaped as much by payer negotiation and policy as by underlying cost. But the direction of travel deserves to be taken seriously. An industry whose economics have rested on scarcity is watching that scarcity erode from the supply side, just as demographic tailwinds in several of its largest markets turn into headwinds on the demand side, while government increased price negotiation apply pressure from a third direction entirely.

The companies that recognize this early, and that build a strategy around a world of more abundant, AI-accelerated therapeutic supply rather than the scarcity model of the last thirty years, will be the ones that shape the next phase of the industry rather than be reshaped by it. Simply producing more of what the industry already makes, faster and cheaper, will not be enough in markets where the patient population is flat or shrinking. The companies that prevail will be the ones that use this new abundance of supply to create markets that do not yet exist: new indications, new modalities, new geographies, and new ways of reaching patients who are underserved today rather than merely competing harder for the patients already being treated. The question worth asking is not whether biopharma will feel this pressure. It is which companies will be first to price, structure, and compete as though those changes are already here, and which will go further and use abundant supply to build the demand of tomorrow.

Sources

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