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Investment Research

Longevity weekly pulse #13: How AI and humanoid robots will reshape aging societies

Transformational Innovation Opportunities (TRIO): Longevity

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- Global aging demographics and declining birthrates are straining labor markets, with BCG predicting a USD 10 trillion GDP risk by 2030 due to worker shortages. China, facing a 24.5 million labor deficit, and the US are investing in humanoid robots to fill workforce gaps in manufacturing, health care, and elder care. AI and robotics aim to address these challenges, with simple-task robots (2B) handling factory and service jobs, while advanced models (2C) may later support health care and households.
- Humanoid robots like Tesla's Optimus will perform repetitive or dangerous tasks, while AI-powered devices assist in caregiving including fall detection and medication management. Robotic surgery is expanding across medical specialties, with a 36% annual growth rate. AI also accelerates drug discovery, personalized medicine, and diagnostics by analyzing genomic data and predicting health risks, improving efficiency and patient outcomes in preventative and chronic disease care.
- AI is streamlining clinical trials, and speeding up patient enrollment, as well as aiding in regulatory tasks. It enables real-time health monitoring, early disease detection, and tailored treatments by processing biomarkers and medical imaging. Future advancements may include AI-powered diagnostics and next-gen medical devices, further revolutionizing health care delivery and extending "healthspan" through proactive, data-driven interventions.

Source: Getty images, UBS

Our view in summary

The convergence of longevity and AI-driven humanoid technology is transforming economies, health care, and labor markets. Aging populations and workforce shortages—projected to risk USD 10 trillion in global GDP by 2030—are accelerating demand for automation. Humanoid robots, from simple task-based models in factories to advanced general-purpose assistants, will address labor gaps in manufacturing, health care, and elder care. AI is already revolutionizing medicine, enhancing drug discovery, robotic surgery, and preventative care through real-time diagnostics and personalized treatments. While current applications focus on efficiency, the next decade will see AI and robotics expand into broader commercial and caregiving roles, reshaping industries and improving quality of life. The future hinges on scaling these innovations to meet societal needs.

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Figure 1 - "Longevity" Global Equity Focus List

Company	US Symbol	Weight	Currency	Price	ISIN	F-share Symbol
Eli Lilly & Co.	LLY	11.50%	USD	778.08	US5324571083	
Abbott Laboratories	ABT	6.00%	USD	138.08	US0028241000	
Johnson & Johnson	JNJ	6.00%	USD	152.19	US4781601046	
AbbVie	ABBV	5.50%	USD	185.55	US00287Y1091	
Boston Scientific Corp.	BSX	5.50%	USD	104.12	US1011371077	
Intuitive Surgical	ISRG	5.50%	USD	523.08	US46120E6023	
AstraZeneca	AZN	5.00%	GBp	70.54	GB0009895292	AZNCF
UnitedHealth Group Inc.	UNH	5.00%	USD	305.62	US91324P1021	
Novartis AG	NVS	4.50%	CHF	118.83	CH0012005267	NVSEF
Novo Nordisk	NVO	4.50%	DKK	70.73	DK0062498333	NONOF
Stryker Corporation	SYK	4.50%	USD	386.46	US8636671013	
Thermo Fisher Scientific	TMO	4.50%	USD	404.37	US8835561023	
DexCom Inc.	DXCM	4.00%	USD	87.57	US2521311074	
Roche Holding AG	RHHBY	4.00%	CHF	40.79	CH0012032048	RHHVF
Merck & Co.	MRK	3.50%	USD	80.32	US58933Y1055	
AIA Group	AAGIY	3.00%	HKD	36.10	HK0000069689	AAIGF
Danaher Corporation	DHR	3.00%	USD	197.47	US2358511028	
Ventas Inc.	VTR	3.00%	USD	63.35	US92276F1003	
Welltower	WELL	3.00%	USD	154.25	US95040Q1040	
Haleon	HLN	2.50%	GBp	10.49	GB00BMX86B70	HLNCF
Alcon	ALC	2.00%	CHF	87.21	CH0432492467	
MetLife	MET	2.00%	USD	79.66	US59156R1086	
NN Group NV	NNGRY	2.00%	EUR	32.42	NL0010773842	NNGPF

Source: Factset, UBS as of 2 July 2025

**Potential trading restrictions. This is a copy of the Global Equity Focus List "Longevity." As selections may change, we recommend visiting the UBS WM CIO portal (which also lists the analysts responsible for the selections and the thematic benchmark), or contacting your advisor for the latest update.*

Thoughts of the week

The intersection of longevity and AI/humanoid technology is reshaping societal demands, health care systems, and economic models. As global populations age and lifespans extend, the need for AI-driven solutions and humanoid assistants is accelerating to address challenges in elder care, health care efficiency, and quality of life. Aging demographics and falling birthrates are having an indubitable impact on the global labor force. According to forecasts by Boston Consulting Group (BCG) by 2030 at least USD 10 trillion in global GDP could be at risk due to global labor imbalances, primarily worker shortfalls in major manufacturing economies. For example, BCG estimates that China, the world's factory, will suffer a labor shortfall of 24.5 million workers compared to a surplus of 55-73 million workers in 2020. We believe labor shortages as well as rising labor markets are a key reason that China and US are investing in humanoid robot development propelled by recent advancements in AI and processing power.

Humanoid robots, able to walk and see, may be capable of single simple tasks; however, for widespread commercial application, their efficiency will will need to exceed that of human workers—a milestone that is likely to be reached within this decade. Simple task (2B) robots will be employed on factory floors to sort objects or move components to assembly lines or from automated guided vehicles (AGVs). Tesla's CEO Elon Musk plans to use his Optimus robots at Tesla electric vehicle plants to replace blue-collar labor in "boring, repetitive, or dangerous tasks." He also intends to sell these robots to third parties for similar applications. Beyond the factory floor, 2B robots may be employed for simple tasks in fast-food restaurants, logistics, policing, security, and surveillance. More advanced, general-purpose humanoid robots (2C models), capable of understanding commands and making decisions, may be the core global total addressable market (TAM) growth driver beyond 2030 and may be found in an array of environment, including hospitals, health care, retail, and households. As more people live longer, we anticipate care-giving labor shortages. Until general purpose humanoid robots emerge, these gaps will likely be filled with AI-powered devices like smart home systems and therapeutic companions supporting independent living by managing medications, detecting falls, and providing cognitive stimulation.

One area where robotic application in health care is very real is in robotic surgery which can enhance a surgeon's precision, dexterity, and control in performing complex procedures. Originally limited to urology and gynecology, its applications now span cardiac, colorectal, gastrointestinal, and neurologic specialties. According to the International Federation of Robotics World Robotics 2024 report, the market for new medical robots, based on their sample of firms, reached 6,200 units and grew even faster, with a 36% year-over-year increase. We believe the industry is on the cusp of broader adoption, owing to a confluence of genAI-accelerated adoption and rising consumer demand.

AI is also proving to be a game-changer in other areas of health care, driving efficiency and innovation. In drug innovation it can help drug developers save time and money with many Contract Research Organizations (CROs) using AI for administrative tasks including drafting proposals and regulatory documents, as well as speeding up patient enrollment and improving trial retention. In preventative medicine, AI is being used for early detection, personalized treatments, and drug discovery. By analyzing genomic data, biomarkers, and medical imaging Ai can predict health risks and tailor interventions, significantly improving "healthspan" (healthy old age). For example, in drug discovery AI can identify aging-related targets (genes like AKT1 and CDK1) and accelerate development of longevity-promoting therapies. AI can also monitor elderly health in real time, enabling proactive care and reducing hospitalizations. The rising demand for screening for chronic diseases and expanded diagnostic needs is seeing AI play a crucial role in streamlining workflows. It can convert vast amounts of patient monitoring data into actionable insights, improving diagnoses and treatment decisions. Real-time analysis can help flag high-risk patients, such as those likely to experience a cardiac event. While most AI applications today focus on efficiency, there's significant potential for further commercial innovation of AI-powered diagnostics, personalized treatment tools, and next-gen medical devices, thereby further improving patient outcomes and paving the way for groundbreaking advancements in health care.

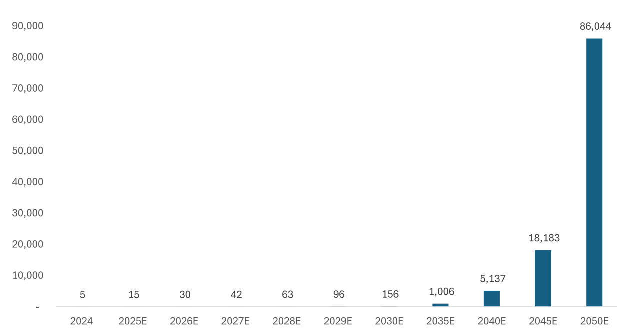
Quotes of the week

"Artificial intelligence (AI) technologies, including machine learning (ML), can help harness large amounts of data to better understand factors related to aging and Alzheimer's disease and Alzheimer's disease-related dementias (AD/ADRD). NIA is interested in supporting infrastructure, data resources, and research that leverages artificial intelligence to improve the health and well-being of older adults."
National Institute on Aging (NIA), 20 March 2025

"The promise of artificial intelligence in medicine is to provide composite, panoramic views of individuals' medical data; to improve decision making; to avoid errors such as misdiagnosis and unnecessary procedures; to help in the ordering and interpretation of appropriate tests; and to recommend treatment."
Dr. Eric Topol, author of "Deep Medicine: How Artificial Intelligence can make Healthcare Human Again."

Chart of the week

Figure 1 - Global humanoid market demand
Unit: thousands



Source: UBS, as of July 2025

Risk Table

Company	Risks
Abbvie	ABBV faces similar ESG issues to its pharmaceutical peers, most notably product liability risk and a societal focus on drug pricing and access. We believe ABBV has the systems and protocols in place to manage these and other ESG issues. In light of recently announced US tariffs, ABBV faces the risk of tariffs on imported finished goods and any related tariffs imposed by foreign countries on US exports.
Abbott	We note the recent emergence of litigation related to ABT's infant nutritional products and the related negative impact on ABT's market value. While this litigation is in the early stage of adjudication, we believe the liability will ultimately be manageable for ABT. ABT faces similar ESG issues to other medical device companies, including product liability risk. We believe ABT maintains the systems and protocols to adequately manage ESG issues. Risks to our thesis include a sustained slowing in ABT's end-markets and competitive pressures on ABT's market share. In light of recently announced US tariffs, ABT faces the risk of tariffs on imported finished goods and any related tariffs imposed by foreign countries on US exports.
AIA Group	Risks include adverse government regulations across its key markets in Asia, a prolonged low interest rate environment, and disruption from non-traditional businesses.
Alcon	Key risks include failure of pipeline products; new or tougher competition; legal threats including product liability cases; access, reimbursement and pricing challenges; a shifting political and regulatory environment; currency and interest rates. Alcon-specific risks include: 1) inability to trade patients up to multifocal intra-ocular lenses and 2) further intangible asset impairments. In light of recently announced US tariffs, Alcon faces the risk of tariffs on imported finished goods and any related tariffs imposed by foreign countries on US exports.
AstraZeneca	Key risks include access, reimbursement and pricing challenges, new competition including generic drugs, legal threats including product liability cases, a shifting political and regulatory environment, failure of pipeline products, currency, and interest rates. AstraZeneca specific risks include: 1) a slowdown in the Chinese business (13% of revenues) driven by government investigations; 2) greater impact of US Part D redesign and IRA vs peers given its US oral oncology portfolio (Calquence, Lynparza, Tagrisso); 3) more onerous Volume-based procurement ((VBP) related sales pressure; 4) new product launches particularly in oncology could also miss market expectations driven by increased competition; 5) and greater than expected sales erosion following patent expirations (upcoming patent expiries: Farxiga, Soliris, Brilinta, and Lynparza). In light of recently announced US tariffs, AZN faces the risk of tariffs on imported finished goods and any related tariffs imposed by foreign countries on US exports.
Boston Scientific	From an ESG perspective, BSX faces similar issues to other medical device companies, including product liability and litigation risk. BSX has experienced material litigation liabilities in its recent past. We believe the company has increasingly focused on managing these risks and has improved the key processes and systems needed to manage its product liability risks. In light of recently announced US tariffs, BSX faces the risk of tariffs on imported finished goods and any related tariffs imposed by foreign countries on US exports.
Danaher	DHR faces similar ESG-related issues as other life sciences/tools companies, with modest product liability risks. We believe that DHR's emphasis on quality through its DBS culture enables the company to manage these issues. In light of recently announced US tariffs, DHR faces the risk of tariffs on imported goods and inputs and any related tariffs imposed by foreign countries on US exports.
Dexcom	DXCM faces similar ESG issues to other medical device companies, notably product quality and access. We believe DXCM has the policies in place to address these ESG issues. In light of recently announced US tariffs, DXCM faces the risk of tariffs on imported goods and inputs and any related tariffs imposed by foreign countries on US exports.
Eli Lilly	We think the main risks for LLY are pipeline failures, particularly its oral obesity drug orfoglipron, for which LLY will show pivotal data later in 2025. While we view gradual price erosion as in line with forecasts, more severe pricing pressure is a potential risk. LLY also faces various industry risks, including potential onerous regulatory/legislative changes. LLY faces similar ESG risks to its biopharma peers, in particular potential product safety and access concerns. In light of recently announced US tariffs, LLY faces the risk of tariffs on imported finished goods and inputs and any related tariffs imposed by foreign countries on US exports.
Haleon	Key risks are unfavorable currency effects, lower-than-anticipated organic growth, change of consumer trends, and ongoing overhang from stake disposal, with Pfizer still owning a significant part of the capital. In light of recently announced US tariffs, Haleon faces the risk of tariffs on imported finished goods and inputs and any related tariffs imposed by foreign countries on US exports.
Intuitive Surgical	Volatility in surgical procedure volumes could affect short-term growth. In addition, cyclical pressure on hospital capital budgets could affect the short-term demand for new da Vinci robots. We note, however, that surgical robots are a critical competitive differentiator for hospital systems, and we view any pressure on hospital capital budgets as temporary, likely resulting in negligible impact on ISRG's long-term growth. We believe ISRG maintains the appropriate systems to manage the typical ESG issues facing medical technology companies. In light of recently announced US tariffs, ISRG faces the risk of tariffs on imported goods and inputs and any related tariffs imposed by foreign countries on US exports.
Johnson & Johsnon	JNJ's main ESG issue has been product litigation, specifically around its opioid and talc products. We acknowledge that JNJ has been more exposed to high-profile product liability cases than many of its peers in recent years. We believe these cases have informed JNJ's overall ESG approach in recent years and that JNJ is implementing systems to manage these and other ESG issues. In light of recently announced US tariffs, JNJ faces the risk of tariffs on imported goods and inputs and any related tariffs imposed by foreign countries on US exports.
Merck & Co	From an ESG perspective, MRK faces similar product liability and access risks faced by the entire pharmaceutical industry. We believe MRK maintains adequate systems and procedures to manage these and other ESG issues. In light of recently announced US tariffs, MRK faces the risk of tariffs on imported goods and inputs and any related tariffs imposed by foreign countries on US exports.
MetLife, Inc.	Risks: 1) lower long-term interest rates, which would impact the company's domestic operations, especially the Retirement business; 2) a rise in adverse claims in the group's Insurance business; 3) changes in NAIC regulation around statutory reserve and capital requirements.
NN Group	Key risks include lower interest rates, large falls in equity markets, adverse claim experience in both the life and P&C divisions, adverse regulatory changes, and unit-linked litigations, adverse development in real estate, and increases in mortgage spreads, lower shareholder return due to lower capital ratios.

Company	Risks
Novartis	Key risks include access, reimbursement and pricing challenges, new competition including generic drugs, legal threats including product liability cases, a shifting political and regulatory environment, failure of pipeline products, currency, and interest rates. Novartis-specific risks include 1) worse commercial success for key product assets; 2) more aggressive generic erosion for Entresto and other drugs that are facing loss of exclusivity in the coming years; 3) price/volume competition for Cosentyx given competitor new launches; and 4) reduced expectations for cardiovascular launches (e.g., Leqvio and pelacarsen); 5) the inability for the company to reach its medium-term margin targets. In light of recently announced US tariffs, Novartis faces the risk of tariffs on imported finished goods and any related tariffs imposed by foreign countries on US exports.
Novo Nordisk	Key risks include access, reimbursement and pricing challenges, new competition including generic drugs, legal threats including product liability cases, a shifting political and regulatory environment, failure of pipeline products, currency, and interest rates. Given Novo's reliance on GLP-1 drugs for growth, any slowdown in their prescription volumes, significant price cuts, or further supply challenges would be a risk to earnings forecasts. An additional risk is adverse clinical data for follow-on obesity drugs such as CagriSema. In light of recently announced US tariffs, Novo faces the risk of tariffs on imported finished goods and any related tariffs imposed by foreign countries on US exports.
Roche	Key risks include access, reimbursement and pricing challenges, new competition including generic drugs, legal threats including product liability cases, a shifting political and regulatory environment, failure of pipeline products, currency, and interest rates. Roche specific risks include: 1) lower market penetration for Vabysmo with Eylea 8mg competitor launch, 2) increased competition for Ocrevus from Kesimpta and BTK inhibitors in multiple sclerosis; 3) increased competition in HER2 (Herceptin, Perjeta, Kadcyla) from new entrants. In light of recently announced US tariffs, Roche faces the risk of tariffs on imported finished goods and any related tariffs imposed by foreign countries on US exports.
Stryker	Similar to its medical device peers, SYK faces potential product liability litigation risk. Beyond that, SYK faces ESG risks similar to other health care product companies. We believe SYK has the resources and processes to manage ESG dynamics. In light of recently announced US tariffs, SYK faces the risk of tariffs on imported goods and inputs and any related tariffs imposed by foreign countries on US exports.
Thermo Fisher	We believe TMO faces similar issues to other LST companies, but lower product liability risk than medical device and biopharmaceutical companies, since most of TMO's products are used in research and not implanted into or ingested by humans. We believe TMO has the systems to effectively manage ESG issues. In light of recently announced US tariffs, TMO faces the risk of tariffs on imported goods and inputs and any related tariffs imposed by foreign countries on US exports.
UnitedHealth	Risks include higher medical costs, eventual slowing and potential volatility in UNH's OptumHealth business, particularly its value-based care assets, and increased government regulation.
Ventas	Risks include fluctuating rates, operating costs, rising new capacity, and a COVID resurgence.
WellTower	Upside/downside risks include rising/ falling FFO (Funds From Operations) growth rates, rising/falling interest rates, the impacts of COVID-19, and increased/decreased health care facility consolidation.

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Companies mentioned in this report (3 07 2025):

AIA Group (1299 HK - , HK$72.35), AbbVie (ABBV US - , $189.28), Abbott Laboratories (ABT US - , $134.44), Alcon (ALC SW - , CHF69.74), AstraZeneca (AZN LN - , p10,204.00), Boston Scientific Corp. (BSX US - , $104.32), Danaher Corporation (DHR US - , $203.20), DexCom Inc. (DXCM US - , $82.93), Haleon (HLN LN - , p373.10), Intuitive Surgical (ISRG US - , $544.47), Johnson & Johnson (JNJ US - , $156.01), Eli Lilly & Co. (LLY US - , $780.67), MetLife (MET US - , $80.65), Merck & Co. (MRK US - , $80.93), NN Group NV (NN NA - , €56.32), Novartis AG (NOVN SW - , CHF96.80), Novo Nordisk (NOVOB DC - , DKK437.90), Roche Holding AG (ROG SW - , CHF257.60), Stryker Corporation (SYK US - , $395.28), Thermo Fisher Scientific (TMO US - , $429.33), UnitedHealth Group Inc. (UNH US - , $308.55), Ventas Inc. (VTR US - , $62.93), Welltower (WELL US - , $152.77)

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