

Investment Digest

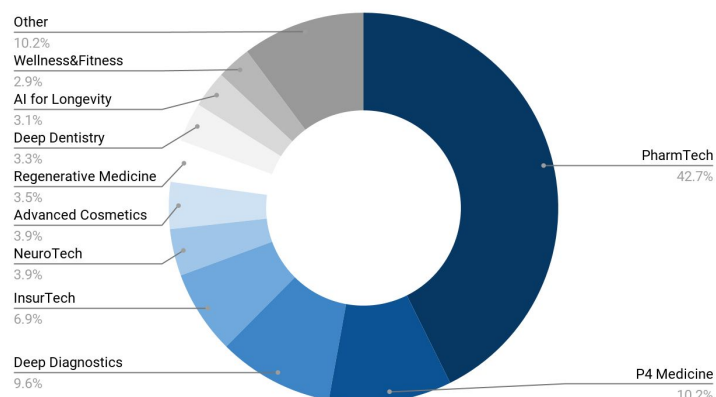
Longevity Industry Q3 2021



This **Investment Digest** summarizes key observations in the private equity and venture capital ecosystem of the rapidly evolving and exponentially growing Longevity Industry. **Aging Analytics Agency** in cooperation with **InvestTech Advanced Solutions** have assembled information about key industry trends, more than 23,000 longevity companies, 50 leading investors, and more than 600 longevity-focused publicly traded corporations. It outlines the major investment rounds and relevant R&D trends, illustrating the industry's traction and readiness of institutional investors to potentially acquire the most successful startups.

Find open access **140 page report** via [the link](#).

Distribution of Public Companies by Longevity Sectors



Among 490 Longevity-focused public companies, PharmTech, P4 Medicine and Deep Diagnostics are the most represented sectors by number of companies.

Some of the key takeaways from this digest include:

- As a result of aging and the upcoming Silver Tsunami, there has been an increase in interest in the Longevity industry. Currently, the size of the market is estimated at \$25 trillion.
- Region wise, the US is an absolute industry leader. By the percentage of longevity-focused companies (61.5%), it is far ahead of Europe (17.3%), and Asia (9.8%).
- Despite a small number of companies, investments in longevity-focused companies in China and India have increased (and so has the size of the companies).
- In 2021, 15 Longevity companies successfully closed their IPOs and raised \$6.16B. The largest companies by market capitalization are Affirm Holdings, Sana Biotechnology, Clover Health, Oscar Health and Recursion Pharmaceuticals.

The Global Longevity Market is Estimated at \$25 trillion in 2021

23,000+ companies
(incl. 490 listed companies)

1,000+ R&D hubs

9,000+ investors

1,000+ financial institutions

100+ governments

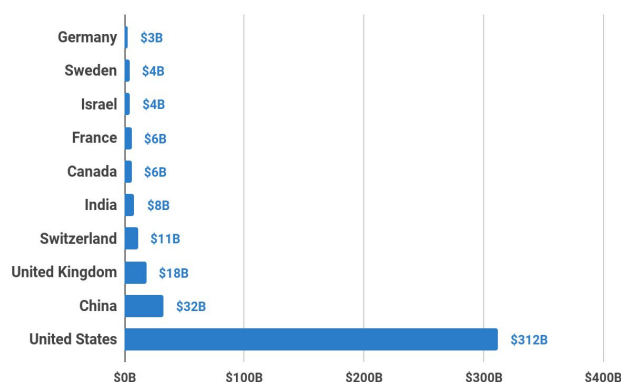
160 subsectors

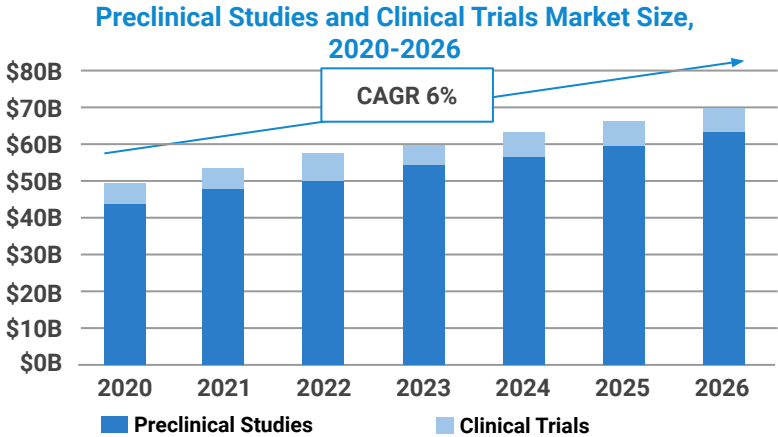
Cumulative Capitalization Dynamics, Q1-Q3 2021

The Longevity Industry has been actively growing over the last few years and is projected to evolve in the same trend. As of end Q3 2021, the market capitalization of 490 publicly traded companies was 5.26 trillion USD. Technologically, publicly-traded longevity-focused companies are similar to other companies in the sector what means that their market capitalization growth can approximate the dynamics of the whole industry.



Total Investments by Countries





3.4%
Global GDP Growth
in 2021

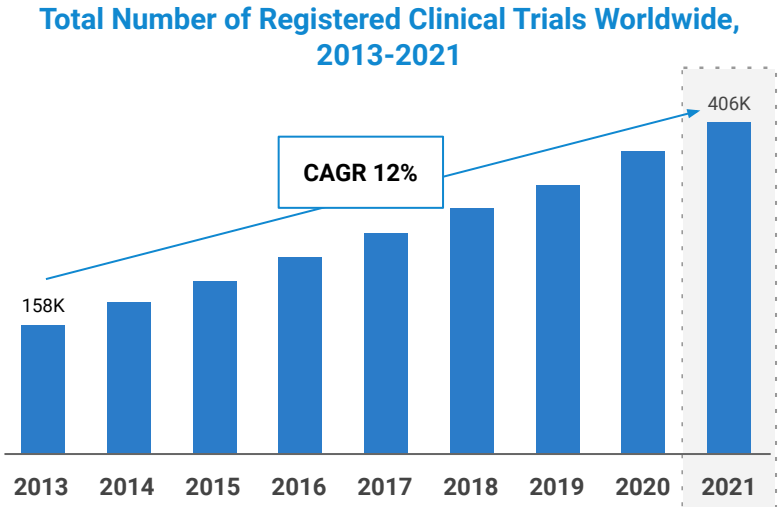
3.7%
Global Spending
Growth on Pharma
R&D in 2021

0.24%
Life Expectancy
Growth in 2021

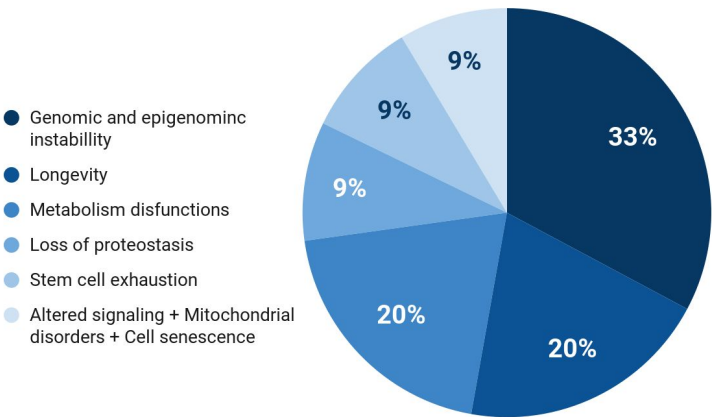
Sources: Grand View Research, Statista, IMF, Macrotrends

The global **Preclinical Studies and Clinical Trials Market Size** accounted for **\$48.8B** in 2020 and is projected to grow an average **CAGR of 6%** from 2020 till 2026 to reach **\$70.5B**. Despite increasing interest in recent years, the industry remains underestimated and has high growth potential.

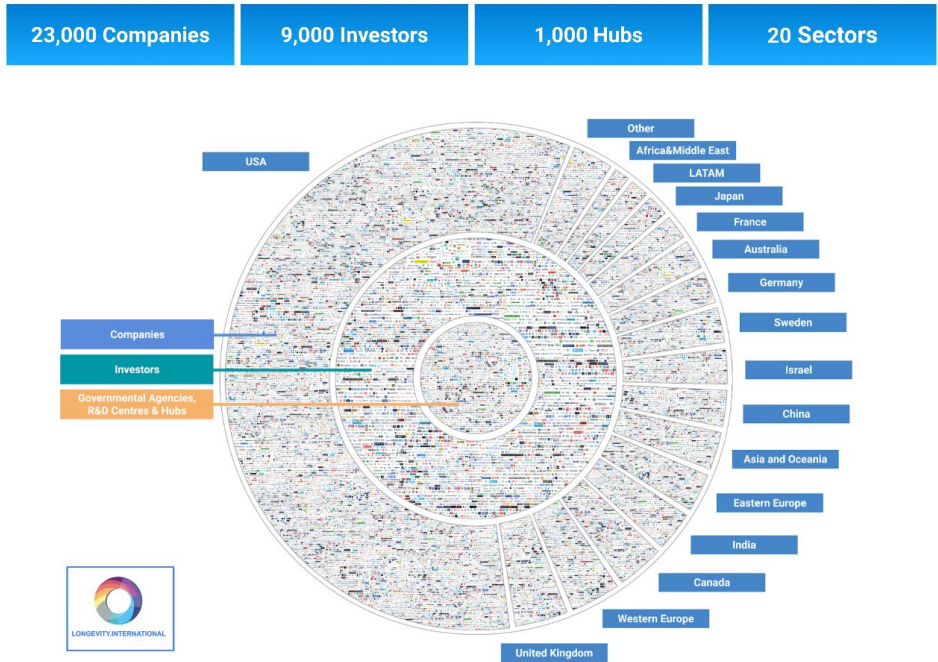
The key market drivers include **rising life expectancy and disposable income; increased R&D spending of new drugs** by pharmaceutical companies. Due to high competition, companies are looking to **diversify their product portfolio with specialty drugs**. Additional **demand for clinical and preclinical services arises** because more pharmaceutical companies outsource large parts of R&D, primarily to clinical research organizations, to reduce costs.



Distribution of Clinical Trials by Category, %



GLOBAL LONGEVITY ECOSYSTEM 2021



DOCUMENT INTENDED EXCLUSIVELY FOR QUALIFIED PROFESSIONAL COUNTERPARTIES

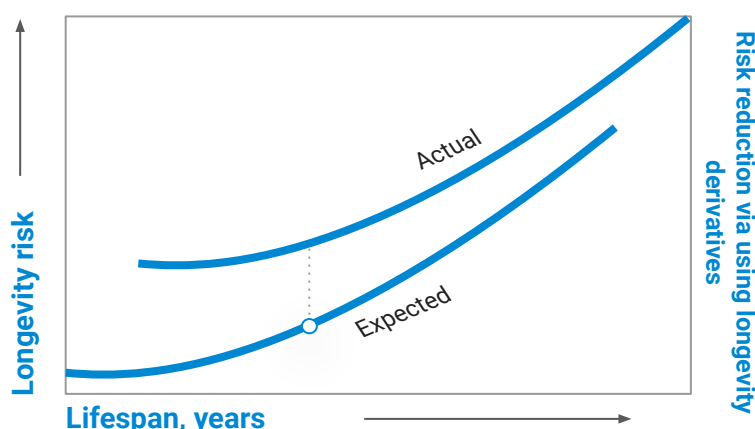
Extended lifespan raises challenges regarding how individuals manage their wealth. It also causes the **Longevity Risk** which arrives due to inaccurate predictions of the level of mortality rate and numbers of retirees.

Problems
<ul style="list-style-type: none"> • Inaccurate predictions of mortality level rate and numbers of retirees • Solvency II Regulation requires that insurance companies measure and evaluate the Longevity risk and, as a result, increase the capital level required for the Longevity risk hedging • The absence of optimized and accurate Longevity-related financial instruments

Solutions
<ul style="list-style-type: none"> • Hedging Longevity risks with financial instruments based on biological age that cover more longevity risk than traditional longevity hedging instruments • Engineering and valuation of a next generation of the Longevity derivatives • Providing insurance companies with tradable hedging instruments

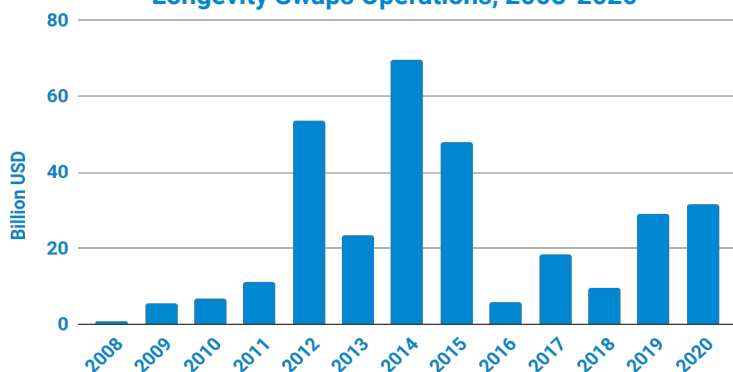
Longevity Derivatives 1.0
<p>The players of life insurance markets use Longevity instruments tied to chronological age. Underlying assets are related to chronological age, for instance, mortality indexes.</p>

Longevity Derivatives 2.0
<p>Financial derivatives tied to biological age and human-validated biomarkers of aging that can prove efficiency in decreasing the Longevity risk.</p>



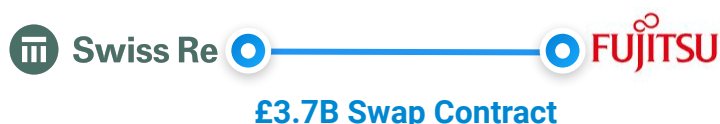
In order to optimize the existing hedging solutions for entities exposed to the Longevity risks, Deep Knowledge Group has developed the so-called Longevity Derivatives 2.0. These derivatives are a uniquely engineered financial instrument explicitly designed for risks arising due to the unpredictability of Longevity and mortality dynamics. Our instrument is based on the advanced Longevity- and mortality-related indices, which allows it to outperform classical chronological hedging instruments.

Longevity Swaps Operations, 2008-2020



Source: Artemis, Longevity Derivatives

The Biggest Longevity Risk Transfer Deal in 2021



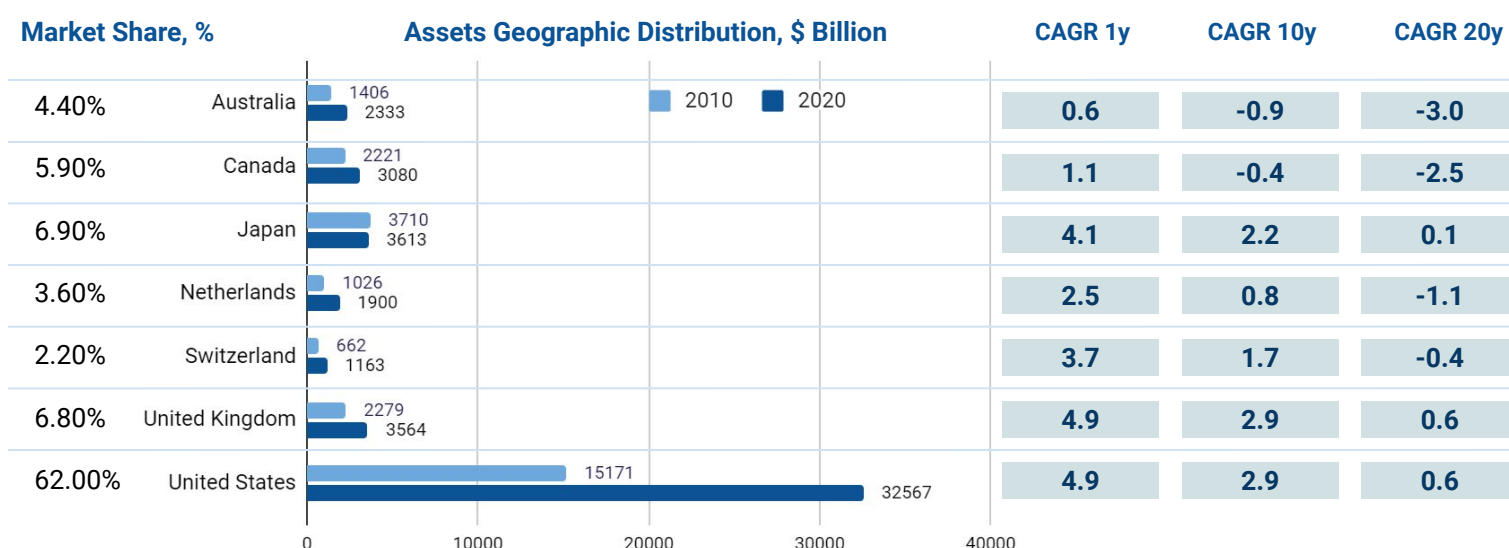
The graph at the right depicts the dynamics of Longevity swaps' operations. During the period of 2008-2020, deals for the amount of \$ 313 billion had been struck. The amount of new operations correlates with life insurance market size. About 95,77 % of longevity swap deals belong to 3 countries: UK (53,49%), the Netherlands (25,09%) and USA (17,19%).

One of the biggest deals using longevity swap was signed in May 2021 between **Swiss Re as an arbitrageur** and **The Trustee of the ICL Group Pension Plan**, a **Fujitsu** pension scheme, **as a hedger**. This longevity risk transfer insured **£3.7 billion of hedgers' liabilities** and covers pensions in payment for approximately 9,000 members.

Biomarkers-based Financial Solutions

- + Biological age Financial derivatives Development
- + Longevity and Mortality Indices Development (HALE/QALE)
- + Longevity Insurance Programs & Risk Modelling
- + Valuation and Due Diligence for Longevity- and Pharma-related companies

The proliferation of digital medical data, including from wearables, implies the ability to obtain high frequency medical information with the potential for a new generation of Longevity biomarkers-derived financial instruments. **The aim of Deep Knowledge Group is to use digital medical data in order to create Longevity derivatives using our AI algorithms.** We also set a goal to identify and assess various financial solutions that would be based on diseases-related biomarkers as well.



Longevity Derivatives Ecosystem



Deutsche Bank has launched a longevity risk index in hope it will increase liquidity within the market. The company said the Longevity Experience Options was meant to provide a standardised approach to further hedge longevity risk.

J.P.Morgan

JP Morgan developed LifeMetrics, a toolkit for measuring and managing longevity and mortality risk. LifeMetrics allow pension funds to calibrate and protect the longevity linked risk of their beneficiaries.



Deep Longevity is developing explainable artificial intelligence systems to track the rate of aging at the molecular, cellular, tissue, organ, system, physiological, and psychological levels.

Haut.AI

Haut.AI provides an AI-powered SaaS platform for pharma companies. Their platform allows to collect, store, manage and analyse skin health-related data using machine learning algorithms.

Find Out More

If you want to find out more about Longevity-tied financial instruments, please contact us via:

