



# Longevity & Metabesity USA Special Case Study

Analysis and Policy Implications

Joint Special Analytical Case Study  
Between Aging Analytics Agency  
and Targeting Metabesity 2019

"Longevity & Metabesity: USA Special Case Study" is an open-access analytical report produced by Aging Analytics Agency and Targeting Metabesity 2019 that examines the links between metabesity, Longevity and the USA's current health shortfalls, including low health-adjusted life expectancy (HALE) and the large gap between HALE and life expectancy, despite its extremely high per-capita healthcare expenditures. The analytical report also charts a variety of tangible policy recommendations that could enable the United States to neutralize its enormous health vs wealth deficit to the benefit of its citizens and economy.



The USA currently has a gap between Healthy-Adjusted Life Expectancy (HALE) and un-adjusted life expectancy of **10 years**, compared to just 6.7 years in Singapore. Meanwhile, its HALE is 7.7 years less than Singapore, 6.3 years behind Japan and 5 years behind Switzerland. Its life expectancy at birth lags behind 25 countries, and yet its healthcare expenditures are the highest among all developed countries in the world. It is clear that these issues are not a result of science, technology or medicine, but of policy. This report seeks to analyze specific policy initiatives that can turn the USA's health deficit around, transforming the challenge of aging into the opportunity of Healthy Longevity.

<b>Health Spending Growing:</b> 5.5% per Year	<b>Life Expectancy Ranked:</b> #25 Globally	<b>Healthcare Efficiency:</b> #54 Globally	<b>HALE and Life Expectancy Gap:</b> 10 Years
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### Metabesity, Longevity and Health

Aging itself is largely a metabolic condition. As we get older, the day-to-day operations of metabolism inflict damage on human cells and organs. Moreover, as this damage accumulates, metabolism itself is thrown into disarray and these things are no longer coordinated with each other, causing metabolism to malfunction further and inflict even the more damage. This constellation of interconnected metabolic dysfunctions is called "metabesity".

Among the many signs of metabolic discoordination is a buildup of visceral fat, which may be partly a symptom and partly a cause of aging. Aging, therefore, along with diabetes, cardiovascular and neurodegenerative diseases, and cancer, is itself an additional component of metabesity. It is also well known that lifestyle similarly contributes to the same metabolic dysfunction and to signs of premature aging. Thus, given how intimately connected are aging, metabesity and disease, seeking to address the metabolic roots of various diseases might also lead us to discover methods for improving the aging process itself, with positive ramifications for everything from obesity to arthritis.

### The GAP Between USA Health and Wealth: High Healthcare Expenditure, Low Health-Adjusted Life Expectancy (HALE)

Despite having the highest healthcare spending in the world (18% of GDP), the USA is a complete outlier in terms of life expectancy at birth, Health-Adjusted Life Expectancy, and healthcare efficiency. Other countries are maintaining a much higher state of Healthy Longevity with much lower rates of spending. This is not due to inherent genetic differences - the USA is simply not implementing the right policies to spend their healthcare dollars in effective ways.

### The Needed Shift from Sick Care to Precision Health

As humans live longer, chronic disease has emerged as not only a leading cause of death, but an expensive one. One in three adults worldwide suffer from two or more chronic conditions. Mental illness also compounds chronic disease, making it much more expensive. Rising healthcare costs make it clear that the current reactive care model is unsustainable. The United States needs a new approach that shifts away from "sick care" to a model of empowering overall health and wellness, providing patients with access to proactive care that identifies risk and manages chronic disease early to prevent escalation and deterioration.

### Policy Implications: National Government Strategy to Narrow GAP Between Life Expectancy and Health-Adjusted Life Expectancy

The USA holds the greatest share of the multi-trillion dollar global Longevity economy and the majority share of global Longevity Industry companies and players. It is a nation equipped with all the resources necessary to become a global leader in Longevity, Preventive Medicine and Precision Health, and National Healthy Longevity, but lacks national prioritization by its federal government, and a strategy to unite the activities of its Longevity, Artificial Intelligence and Preventive Medicine industry ecosystems to work in synergy, rather than in discoordination. An increase in Healthy Longevity, would be of universal benefit for both the American economy and society. It would decrease the burden of the old on the young, create a reinvigorated workforce and consumer market, and have innumerable benefits to the USA economy as a whole, and put the country in a position to become a global Longevity leader, leveraging scientific progress for the betterment of all society.

Scanning the following QR code with your mobile phone will give you access to the 40-page digital teaser of the report on the Aging Analytics Agency website. The full-length analytical report will be officially released following the close of the Targeting Metabesity conference on October 16th, 2019, and will feature comprehensive coverage of the conference, summaries of key presentations and talks, major conclusions reached during panel discussions, and the main Longevity policy takeaways from the conference.



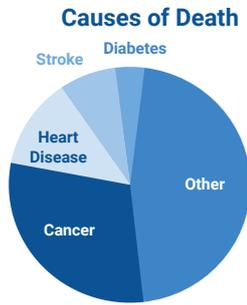
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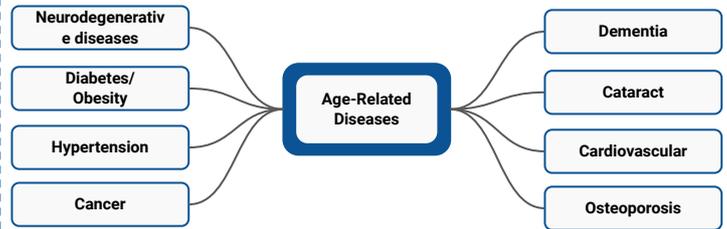
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# Links Between Longevity, Metabesity and Disease



Over 50% of deaths are from obesity-related chronic diseases

The prevalence of the metabesity, a cluster of cardiovascular risk factors associated with obesity and insulin resistance, is dramatically increasing with aging



## Singapore

HALE: 76.2

HALE GAP: 6.7

Life Expectancy: 82.9

Healthcare Efficiency Rank: #2

Healthcare Spending: 4.5% GDP

## United States

HALE: 68.5

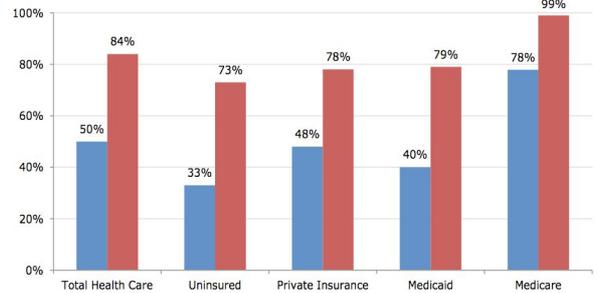
HALE GAP: 10.0

Life Expectancy: 78.5

Healthcare Efficiency Rank: #25

Healthcare Spending: 18% GDP

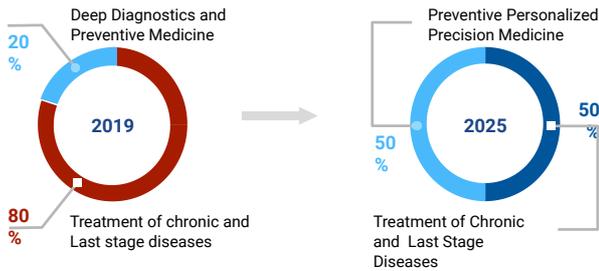
## People with Chronic Conditions Account for 84% of National Health Care Dollars and 99% of Medicare Spending



■ Percentage of Non-institutionalized Population with ≥ 1 Chronic Condition ■ Percentage of Spending on People with Chronic Condition(s)

# The Shift from Sick Care to Preventive Medicine and Precision Health

## Paradigm Shift from Treatment to Prevention



## Preventive Treatment

- Gene therapies
- Cell therapies
- Tissue engineering
- Small molecules & biologics
- Natural mimetics of validated geroprotectors
- Genetically engineered cell therapies
- 3D bioprinting
- Microbiome engineering

## Precision Diagnostics

Digital avatar visualizes a combination of biomarkers and other diagnostic results

**Collect your data today:**

- Blood samples
- Biomarker analysis
- Database of personal biomedical data stored on blockchain

**Future benefits:**

- Data driven analysis of biomarkers dynamics over time
- Analyse the changes in your digital avatar
- Personalized interventions

## Accelerating the Development of Precision Health through AI

**AI-Driven Precision Diagnostics**

- Multi-Omic Sequencing
- Continuous monitoring powered by Big Data Analytics
- Continuous monitoring of health state based on changes in biomarkers of aging

**AI-Driven Advanced Prognostics**

- AI-driven prognostics
- Advanced biomarker-based prognostics
- AI-driven predictive prognostics based on personalized multi-omics

**Personalised Treatment Optimization**

- AI-driven *in silico* personalised treatment optimization
- AI-driven personalised *in vivo* drug optimization
- Treatment optimization based on patient genetics

**AI-Driven Preventative Treatment**

- Maintenance state of precision health through preventative medicine
- AI-based predictions of optimal drug combination

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