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Investing in Fertility and Longevity: A Path to Health Security and Global Economic Growth

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ABSTRACT

Background: Global demographic shifts declining fertility rates and increasing life expectancy threaten economic growth and health security. Aging populations and shrinking workforces risk straining public resources and destabilizing societies.

Objectives: This white paper explores how targeted investments in fertility and healthy longevity can bolster resilience, enhance productivity, and promote sustainable economic growth.

Methods: A narrative review synthesizes data from international organizations (OECD, World Bank, IMF), peer-reviewed literature, and expert analyses to evaluate trends and policy responses across different regions.

Results: Findings show that pro-fertility policies, healthcare innovation, and social investments improve workforce vitality and reduce healthcare burdens. Healthy aging and increased fertility contribute to long-term economic security and better social outcomes.

Discussion: Coordinated strategies that support reproductive health and extend health span can generate demographic dividends, attract investments, and foster innovation.

Conclusion: Investing in fertility and longevity is a strategic imperative that enhances health security, sustainable development, and global economic prosperity.

Keywords: Fertility Decline; Healthy Longevity; Health Security; Economic Growth; Demographic Change; Health Policy; Innovation in Healthcare; Digital Health; Reproductive Health; Aging Population

Introduction

Global demographic trends are undergoing a profound shift: fertility rates are falling while life expectancy rises. Many nations now face below-replacement fertility, meaning too few births to sustain population size [1]. The OECD reports that average fertility in its member countries halved from 3.3 children per woman in 1960 to about 1.5 by 2022 [2] far below the ~2.1 needed for generational replacement. As a result, populations are aging rapidly. By 2050, one in three people worldwide will be over 60 years old [3]. These twin trends of low fertility and increased longevity carry high stakes for both health security and economic prosperity. Experts warn that without intervention, shrinking and aging populations could pose "enormous challenges" to economies, strain health systems, and even alter geopolitical power balances [1]. This white paper reviews why strategic investments in fertility and healthy longevity are vital to counter these challenges. We draw on data from Dr. Allama ELMEHDI's analyses and a broad range of global sources in health economics, policy innovation, and digital health. We outline how boosting fertility (through supportive policies and innovations) and extending healthy lifespans can strengthen health security – i.e. the resilience of health and social systems – and fuel sustainable global economic growth. Key concepts, evidence, and policy approaches are discussed, along with financing and innovation mechanisms that can help achieve these goals.

Method

This review adopts a narrative approach, synthesizing insights from diverse sources on fertility, longevity, and economic development. We surveyed Dr. Allama ELMEHDI's LinkedIn publications and commentaries – including reflections on events like the 10th UAE Reproductive Symposium – as well as recent research and reports from international organizations (OECD, World Bank, IMF, IHME), academic literature, and industry analyses. Relevant data on demographic trends, health outcomes, economic indicators, and policy responses were collected. We also included perspectives from health economics and digital health innovation globally. No new primary data were generated; rather, the aim is to integrate existing evidence from reputable sources to provide a comprehensive overview. By reviewing both quantitative findings (e.g. fertility and mortality rates, economic impact estimates) and qualitative insights (policy case studies, expert opinions), we derive a set of results and recommendations on investing in fertility and longevity. This method ensures a multi-faceted understanding suitable for decision-makers and the public.

Results

Declining Fertility and Economic Risks

Fertility rates have fallen sharply in most of the world. Global fertility dropped from about 5 children per woman in 1950 to ~2.3 today and is projected to sink below 2.1 by mid-century [4] by 2100, an estimated 97% of countries will have sub-replacement fertility [1]. Consequently, many nations will experience population decline and an older age structure. The number of people over 65 per 100 working-age people will double (from ~30 to ~59 on average) across OECD countries by 2060 [2]. Fewer births mean fewer future workers, consumers, and innovators, which risks economic stagnation or contraction. In the words of an IMF analysis, "fewer births and smaller populations naturally mean fewer workers, savers, and spenders, potentially sending an economy into contraction" [4]. A shrinking youth cohort also must support a swelling retired population, straining pension and health care systems [2]. Public expenditures on elderly care are set to surge, posing fiscal challenges for governments. Moreover, low fertility and aging together can dampen productivity and innovation, since an older workforce tends to work and invest less and may contribute fewer new ideas [4]. Some researchers even link demographic decline to reduced national influence and security – historically, slow population growth has been associated with diminished military and economic clout [4]. These results indicate that unabated fertility decline could undermine both economic vitality and aspects of national security.

However, there are also Counterpoints

A smaller population might free up resources in the short term (e.g. less spending on childrearing, potentially higher female labor participation and savings rates). Indeed, past demographic transitions yielded a temporary "demographic dividend" that boosted per capita income in some countries [4]. Yet such gains are typically transient. The new data suggest that without policy intervention, the long-term trajectory of persistent low fertility is overwhelmingly negative for economic growth – a conclusion reinforced by the unprecedented scope of global aging now underway [1]. A "low-fertility future" is likely to leave many societies with dwindling youth bases supporting large elderly populations, a scenario already being described as a "fertility crisis" or "demographic crisis" in media and policy circles [5].

Rising Longevity and Healthspan

At the same time, life expectancy gains mean people are living longer than ever. Global average lifespan rose from ~52 years in 1960 to over 72 years by 2020, and is projected to keep rising (barring unexpected reversals). By 2050, one-third of the world's population will be over 60 [3]. Longevity is a great achievement, but it brings health and economic complexities. If those extra years are spent in good health, older individuals can remain productive and independent. If not, societies face higher burdens of chronic disease and disability. Currently, non-communicable diseases (NCDs like heart disease, diabetes, cancer) already cause over 70% of deaths worldwide [3]. As populations age, preventable disease burdens could intensify without adequate investment in health. An unhealthy aging population would drive up healthcare costs and dependency, further straining health security (the ability of health systems to cope with needs) and public finances. On the other hand, investing in "healthy longevity" yields major benefits. A 2024 World Bank report projects that bold action to promote healthy aging in developing countries could save 150 million lives by 2050 and extend many more lives, while also generating "enormous economic value" through healthier lifestyles, higher productivity, and lower social support costs [3].

In essence, keeping people healthier longer means they can contribute to the workforce longer, need fewer medical interventions, and rely less on social services, easing the fiscal load. For example, delaying the onset of chronic diseases by even a few years (through prevention and early treatment) significantly increases an individual's lifetime productivity and reduces healthcare expenditures [6]. Indeed, research in the economics of longevity finds that "living longer in better health leads to a significant increase in working life and lifetime production" [6,7]. The concept of a "longevity dividend" suggests that societies can reap economic gains if they invest in health innovations that compress morbidity and enable older citizens to remain active and financially secure. It is also noteworthy that fertility and longevity are interlinked markers of public health. Fertility rates often reflect underlying health status and socio-economic conditions. Dr. Carmen Messerlian, a Harvard public health expert, notes that "fertility is one of the biggest markers of longevity and health span. It's directly tied to how long you're going to live and how many diseases you'll get as your age." Consequently, "investing in fertility today means securing the economic and societal future of entire nations"

[8]. This viewpoint underscores that reproductive health and lifespan health are two sides of the same coin: both need investment to ensure a robust population. Healthier, more fertile populations create a virtuous cycle of stable demographics and economic growth, whereas ill health and very low fertility portend a vicious cycle of decline.

Innovation and Economic Growth

The results of our review also highlight that innovation – in policy, healthcare, and technology – is pivotal to tackling these demographic challenges. Many countries have recognized the problem and started to respond. For instance, numerous nations are experimenting with pro-family policies: "Nations are deploying baby bonuses, subsidized childcare and parental leave to try to reverse rapidly declining fertility rates", notes The Guardian, although such measures alone have so far had limited success [5]. Clearly, new approaches are needed. Experts suggest multifaceted support systems to effectively remove barriers to parenthood. According to the OECD, "facilitating parenthood decisions requires comprehensive and reliable support to families – including affordable housing, family policies that help reconcile work and family life, and policies that promote women's access to quality jobs and career progression" [2]. In other words, investing in fertility isn't simply about cash incentives; it means building an environment where raising children is compatible with economic security and career goals, especially for women. Societies that have high female education and workforce participation tend to have lower fertility, so to boost birth rates, policymakers are focusing on improving work-life balance (flexible work arrangements, parental leave for both mothers and fathers), childcare availability, housing affordability for young families, and cultivating optimism about the future for young adults [5]. These social investments can gradually improve fertility rates by addressing the root causes of why people forego or delay having children (such as cost of living, job insecurity, or lack of support).

On the longevity side, innovation is enabling healthier aging. Advances in medicine and digital health are expanding preventive care and disease management for older populations. For example, technologies from telemedicine to AI-driven health monitoring are helping manage chronic conditions and extend seniors' independence. The World Economic Forum's 2025 report on the longevity economy highlights emerging solutions – from modernized pension systems and new financial products, to innovations in long-term care and lifelong learning – that can transform the aging of society into an engine for economic resilience [9]. It identifies opportunities such as flexible retirement models, support for informal caregivers, and retraining programs for older workers as ways to keep economies productive even as the age structure shifts [9]. As Mercer's CEO noted, "People living longer is a sign of progress... By investing in innovative financial models and supporting life-long skill building, we can help shape a future in which people thrive at any age and businesses and economies remain resilient to changing demographics." [9]. There is also a growing private-sector recognition of the opportunities in the "silver economy" and femtech/reproductive tech sectors.

Global investors are increasingly funding companies in fertility and longevity innovation. In the fertility tech arena, venture capital investments worldwide jumped from about $132 million in 2012 to $823 million in 2021, spanning solutions like improved IVF techniques, egg freezing, AI-based embryo selection, and fertility benefits platforms [10]. This rapid growth signals confidence that technological innovation can help address infertility and enable would-be parents to have children. Likewise, the market for products and services catering to older adults ("longevity market") is expanding fast – projected to grow from around $5.3 trillion in 2023 to $8 trillion by 2030, according to some financial analysts [11,12]. From preventative therapeutics that "delay the onset of chronic diseases and add decades to lifespan" [13], to AI-driven care coordination for seniors, these innovations not only improve health outcomes but also represent a new economic growth frontier. In short, investing in health innovation is doubly beneficial: it directly enhances fertility and longevity outcomes (improving health security) and creates new economic sectors and jobs (fueling growth).

Discussion

The findings above paint a clear picture: investing in fertility and longevity is not a luxury, but a necessity for future health security and economic stability. The demographic imbalances of low birth rates and aging populations threaten to slow economic growth, overwhelm health systems, and reduce the resilience of nations. Conversely, proactive investment in people's reproductive health and lifelong health can turn these challenges into opportunities. From a health economics perspective, such investments yield high returns. Healthier, younger populations drive productivity, while healthier older populations reduce strain on public resources. As Dr. Allama ELMEHDI and other health economists emphasize, prevention pays off. "There's a deep economic argument for improving public health when populations are healthier, economies function better," notes Dr. Messerlian [8]. Preventing infertility and chronic diseases today avoids far higher costs tomorrow and preserves human capital. For example, every dollar spent on maternal and child health or NCD prevention can save multiple dollars in future healthcare costs and generate additional economic output through a more capable workforce [3]. In low-income countries, tackling issues like malnutrition and lack of prenatal care will both reduce infertility and improve longevity, thereby breaking cycles of poverty. In high-income countries, investing in assisted reproduction technologies, family-friendly policies, and healthcare for the elderly will help sustain population size and productivity.

In all contexts, investing in human health across the life course underpins economic development. Health security, broadly defined, is also strengthened by these investments. Typically, "health securi-

ty" refers to protecting populations from infectious disease outbreaks and health emergencies. But it can be extended to mean the security of having a robust, self-sustaining health system and workforce. A country with a balanced age structure and healthy citizens is more resilient to shocks – whether pandemics or economic crises – because its health and social support systems are not overburdened. The Lancet/IHME demographic forecasts explicitly warn governments to "plan for emerging threats to economies, food security, health, the environment, and geopolitical security" from demographic changes [1]. Declining working-age populations could jeopardize everything from military recruitment to innovation capacity. Thus, boosting fertility (or supplementing it via immigration where appropriate) and ensuring healthy aging are as vital to national security as they are to economic policy. For instance, some countries are already adjusting immigration policies to offset workforce decline [1,4], while also seeking to elevate birth rates. These efforts must be coupled with strengthening health systems (training more healthcare workers, investing in preventive care) so that a larger elderly cohort does not overwhelm healthcare delivery. In essence, a strategy of "demographic resilience" – maintaining a steady supply of healthy, skilled individuals across generations – is now integral to national planning.

Innovating Global Economy and Financing

Achieving these goals will require innovative approaches to economic and financing models at both national and global levels. Traditional funding streams may be insufficient to cover the upfront costs of, say, expanded child subsidies or overhauling eldercare infrastructure. Therefore, new financing mechanisms are being explored. International institutions like the World Bank are prioritizing healthy longevity and are "ready to support countries on this journey with knowledge and financing" [3]. This includes lending for health system strengthening, social protection programs (like insurance schemes for informal workers and aging populations), and even results-based financing where investments are tied to health outcomes. At a global scale, one can envision coalitions or funds focused on demographic challenges – similar to global health security funds, but aimed at bolstering reproductive health services and age-friendly communities around the world. Public-private partnerships are also key. The private sector can be incentivized to invest in solutions like affordable childcare centers, age-tech startups, or workplace wellness programs through tax breaks and impact investment frameworks. For example, employers have begun offering fertility benefits and family planning support to attract talent, recognizing that aiding employees' reproductive goals can improve retention and productivity [14]. Likewise, insurers and pension funds are innovating with products that encourage healthy living (rewarding preventative care) to reduce long-term payouts [7]. Digital health and data innovation play a supportive role across these efforts. Telehealth and mobile health platforms can extend medical advice and monitoring to underserved regions, improving maternal health and chronic disease management remotely. Big data and AI can identify at-risk individuals (e.g. women with high-risk pregnancies or seniors at risk of hospitalization) and prompt early interventions.

A notable example is the push for open data in fertility science: breaking down data silos could accelerate research on infertility causes and improve IVF success rates [8]. As Dr. ELMEHDI and peers advocate, sharing knowledge and technology globally – whether it's IVF best practices or geriatric care models – enables collective innovation. In fact, international collaboration should be a cornerstone: countries can learn from each other's policy experiments (what has or hasn't boosted birth rates), and jointly invest in research on longevity (such as new vaccines for diseases of aging or Gero protective drugs). The demographic challenges are global in scope, so pooling resources and expertise will yield faster progress than isolated actions. It is important to recognize potential ethical and social considerations as well. Any pro-fertility policy must respect individual rights – the goal is to empower people to have the number of children they desire, not to pressure them. Similarly, longevity interventions should strive to improve quality of life, not just extend years for the sake of it. Equity is crucial: both fertility services and longevity-promoting care should be accessible to all segments of society, or else we risk widening inequalities (for instance, only the wealthy affording IVF or anti-aging therapies).

Thus, policymakers should embed principles of equity and choice when crafting initiatives. Fortunately, many fertility and health policies (like universal healthcare, education for girls, or parental leave laws) synergistically advance human rights and demographic objectives at once. In summary, the discussion underscores that investing in fertility and longevity is a multi- dimensional endeavor – spanning economic policy, healthcare delivery, societal norms, and technological innovation. Success will require political will and long-term thinking (looking beyond election cycles to generational outcomes). The evidence reviewed provides a strong business case and moral case for such investment. When asked to "reconcile" the demands of investors for quick returns versus the need for societal investments, Dr. Messerlian's response resonates: if we don't act now, we will fail our grandchildren – if older generations die off without a younger generation to replace them, economies will collapse [8]. In the end, the prosperity of future generations quite literally depends on the investments we choose to make in people's health and ability to form families today.

Conclusion

The demographic writing is on the wall: nearly every country is headed toward an older and, in many cases, smaller population. This trajectory poses serious threats to economic growth, fiscal sustainability, and the wellbeing of societies. Yet it is not an inevitable doom – it is a call to action. By investing in fertility and healthy longevity, we can build a better-secured health future and a thriving global economy. Such investments include enacting family-friendly policies to en-

courage and support those who wish to have children, and allocating resources to health systems and innovations that help people age in good health. The evidence is clear that these steps will pay dividends in the form of a more robust workforce, lower healthcare costs, and greater societal resilience. Crucially, this is a long-term strategy. Governments and stakeholders must take a farsighted view, as the benefits of reversing demographic decline or improving population health accumulate over decades. Fortunately, each step taken now – be it funding a new childcare program, expanding access to fertility treatments, introducing anti-smoking legislation, or deploying a digital health tool for seniors – brings us closer to a sustainable equilibrium. Acting now can "shape a healthier, equitable, and more productive future" for all [3]. Conversely, inaction or delay will only compound the challenges, making them harder and costlier to address later. In conclusion, the path to health security and economic growth in the 21st century runs through strategic investments in our most fundamental asset: human capital.

By nurturing the beginnings of life (through fertility and reproductive health) and safeguarding the length and quality of life (through longevity and health span initiatives), we ensure that the global community can prosper. Policymakers, industry leaders, and civil society must collaborate on this agenda. With innovation, adequate financing, and commitment, we can turn the demographic trial of our time into an opportunity – forging a future where all generations are healthier, more secure, and economically productive. The time to invest in that future is now.

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