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THE HEALTH AND ECONOMIC IMPACTS OF AN AGING POPULATION IN THE DEVELOPED COUNTRIES

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"Human adapts to changing circumstances"
(Charles Darwin)

ABSTRACT

The general concern of all developed countries today is the aging of the population. This is a growing trend, especially in developed countries, linked to increased life expectancy, driven by improved living conditions and connected to a declining birth rate. Aging is expressed statistically as a percentage of older generations compared to younger ones, or mathematically by counting the number of individual ages. The challenge of an aging population is twofold: on the one hand, there are the care needs, which increase with age, and, on the other, reduced income, coupled with a shrinking workforce, creates the problem of social burden. Thus, throughout this research, the study of environmental reality in developed countries is addressed through knowledge of the economic and health impacts on the population, based on knowledge of demographic evolution which, like all living phenomena, experiences a Darwinian process of adaptation to new economic and social conditions. The problems of aging involve not only physical frailty, but also mental functions and psychological traits that have a direct influence on personal attitude, and there are some stigmas against older people, such as lack of commitment or social participation, loneliness, and the development of symptoms of depression. The consequence manifests itself in physical and mental illnesses, in a form of modern determinism that modifies behavioral habits, which has an impact and repercussion in the environmental field, in particular, and the processes of globalization, in general.

Keywords: Environment, Development, Population, Health, economic impacts.

LA REALIDAD AMBIENTAL EN LOS PAÍSES DESARROLLADOS: UNA VISIÓN A TRAVÉS DE LOS IMPACTOS ECONÓMICOS Y DE SALUD DEL ENVEJECIMIENTO DE LA POBLACIÓN

RESUMEN

La preocupación general de todos los países desarrollados, en los momentos presentes, es el envejecimiento de la población. Se trata de un proceso creciente, especialmente en los países desarrollados, ligado al aumento de la esperanza de vida, generado por mejores condiciones de vida y conectado con un porcentaje decreciente de nuevos nacimientos. El envejecimiento se expresa estadísticamente como una proporción porcentual de generaciones mayores frente a jóvenes, o matemáticamente contando el número de edades individuales. El desafío de una población envejecida es doble: por un lado, están las necesidades de atención, que aumentan con el aumento de la edad, y, por otro, la reducción de los ingresos, junto con la disminución del número de trabajadores, crea el problema de la carga social. De este modo, a lo largo de la presente investigación se aborda el estudio de la realidad ambiental en los países desarrollados a través del conocimiento de los impactos económicos y de salud de la población, a parir del conocimiento de la evolución demográfica que, como todos los fenómenos vivos, experimenta un proceso darwiniano de adaptación a las nuevas condiciones económicas y sociales. Los problemas del envejecimiento implican no solo fragilidad física, sino también funciones mentales y los rasgos psicológicos que tienen una influencia directa en la actitud personal y existen algunos estigmas contra las personas mayores, como la falta de compromiso o participación social, la soledad y el desarrollo de síntomas de depresión. La consecuencia se manifiesta en enfermedades físicas y mentales, en una forma de determinismo moderno que modifica los hábitos de comportamiento, que tiene incidencia y repercusión en el ámbito medioambiental, en particular, y, los procesos de globalización, en general.

Palabras clave: Medioambiente, Desarrollo, Población, Salud, impactos económicos.

LA RÉALITÉ ENVIRONNEMENTALE DANS LES PAYS DÉVELOPPÉS: UN REGARD SUR LES IMPACTS ÉCONOMIQUES ET SANITAIRES DU VIEILLISSEMENT DE LA POPULATION

RÉSUMÉ

Le vieillissement de la population est aujourd'hui une préoccupation majeure pour tous les pays développés. Ce phénomène, en pleine expansion, notamment dans ces pays, est lié à l'allongement de l'espérance de vie, lui-même induit par l'amélioration des conditions de vie et la baisse du taux de natalité. Statistiquement, le vieillissement s'exprime en pourcentage des générations plus âgées par rapport aux plus jeunes, ou mathématiquement en dénombrant le nombre d'individus par tranche d'âge. Le défi posé par le vieillissement de la population est double : d'une part, les besoins en soins augmentent avec l'âge; d'autre part, la baisse des revenus, conjuguée à la diminution de la population active, engendre une charge sociale accrue. Cette recherche s'intéresse donc à cette réalité dans les pays développés en examinant les impacts économiques et sanitaires sur la population, en s'appuyant sur une compréhension de l'évolution démographique qui, comme tout phénomène vivant, subit un processus darwinien d'adaptation aux nouvelles conditions économiques et sociales. Les défis du vieillissement ne se limitent pas à la fragilité physique, mais incluent également le déclin cognitif et des caractéristiques psychologiques qui influencent directement les attitudes individuelles. S'y ajoutent certains préjugés associés aux personnes

âgées, tels qu'un manque perçu d'engagement ou de participation sociale, la solitude et l'apparition de symptômes dépressifs. Cela se manifeste par des maladies physiques et mentales, reflétant une forme de déterminisme moderne qui modifie les comportements et a des répercussions sur l'environnement en particulier, et sur les processus de mondialisation en général.

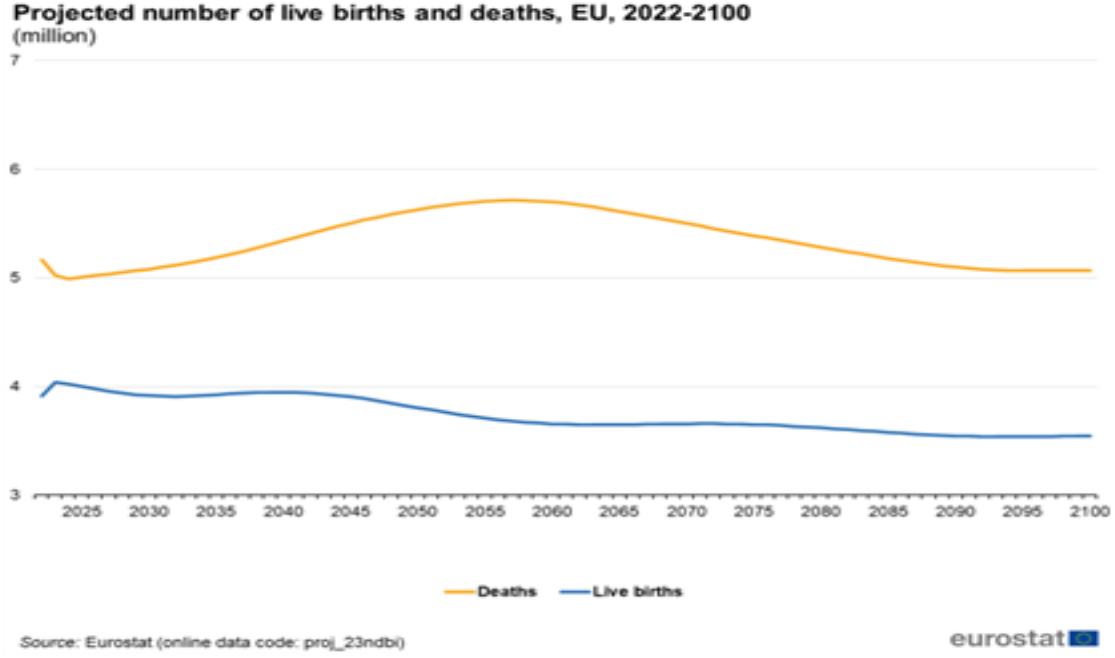
Mots-clés: Environnement, développement, population, santé, impacts économiques.

1. INTRODUCTION: THE NEW DEMOGRAPHIC EVOLUTION AND THEIR INCIDENCE IN THE ENVIRONMENT

Population development and distribution is an interdisciplinary, multi-level topic, not to be reduced to only statistics. It involves many issues, like geography, sociology, economy, health, medicine, psychology, neurology, politics. In this work paper we intend to focalize the interest on EU population, like a symbol of modern dynamism. In Europe the country with the higher ageism is Italy, like Japan in the East.

Geography is involved in explaining reasons according to the local situations and factors. Sociology finds its rule in the explanation of the reasons of population distribution by age, gender and lifestyle. The forces behind these changes include new birth control technologies, changes in labor market opportunities, and welfare-state policies. Governments try to afford the expanding challenge of ageism with several political means, but it is also a case of personal matter, a situation influenced by health, economy, society, culture, new habits, new events, like wars, innovative technology, even if the reasons could be both direct or indirect, conscious, and unconscious, influencing each other. The pillars of the demographic evolution involve these issues: The decreasing birth rates in all the developed world. An increasing ageism due to the amelioration of wellbeing and health care.

Figure 1. Births and deaths in EU. 2022-2100 projection.



Source: Eurostat (2021).

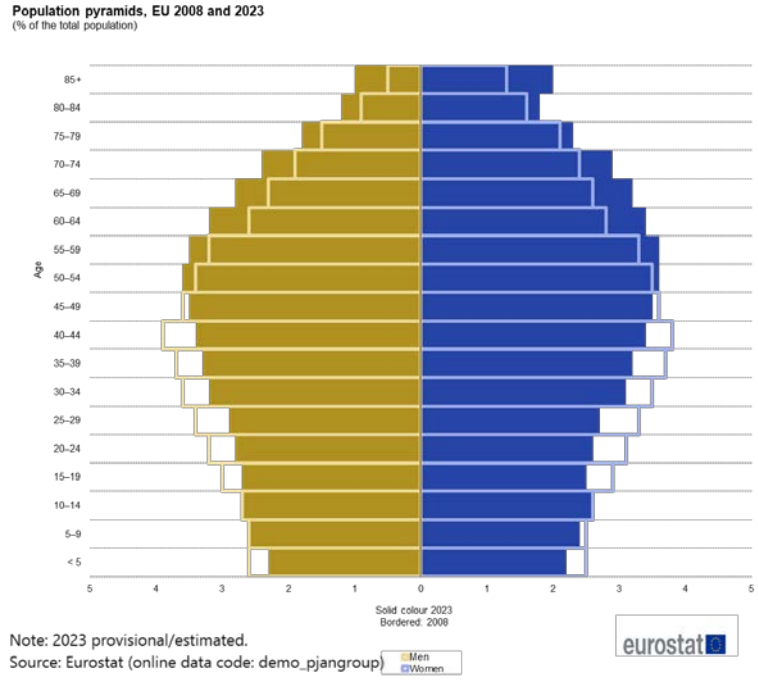
A positive consequence of low birth rates will be an amplified period of education-schooling. A negative consequence of ageism will be the declining workforce, with a major number of people depending on a marginal working population. If the positive effects on the young population improve, on the other hand, the negative effects on the elderly population will add up.

The elderly people will suffer more from health problems, with the growing use of medicines and need of care; lack of physical activity; less economic well-being, due to the dismissed work, with reduced revenues; lack of social interaction -loneliness- which generate depression. Governments must afford the necessity of political changes in the retirement system - and individuals need, not only public health insurance, but also a personal, private one. Neither States nor citizens are easily affording the new demographic trend of ageism (WHO, 2024).

2. THE WESTERN WORLD IS OLDER: IMPACT IN THE ENVIRONMENT

After recovering from a severe mortality crisis in the seventeenth century in Europe, especially due to the plague, life expectancy started to increase, thanks to the technical discoveries in food production and chemical innovation in medicine, well before the Industrial Revolution. Stelter (et al. 2021) suggests that elite groups were the first to experience mortality improvements 300 years ago, and individuals with higher social status already enjoyed lower mortality. Currently, population ageing is a major public health concern worldwide. Ageing itself is a complex and chronic process. This period is probably the most critical one in the modern age. Population started to increase after the end of WWII, enjoying peace after the end of war. The effect was an increasing number of births, named the "Baby Boomers" (born between 1946 and 1964). They started turning 65 in 2011, so becoming retired from work and engagements in the developed world.

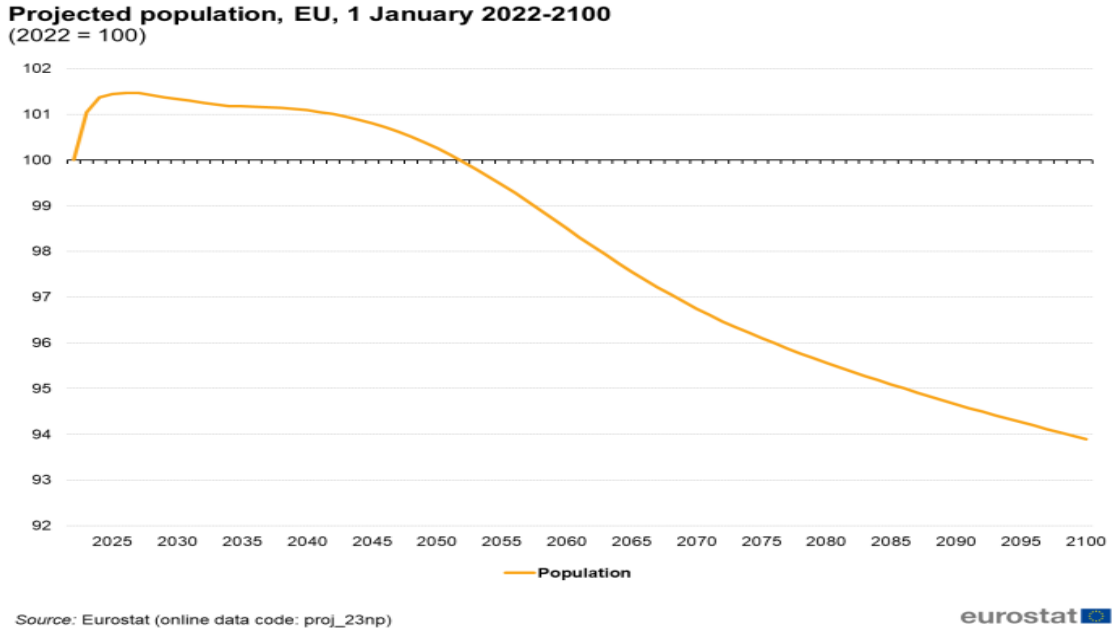
Figure 2. The ageing process from OECD data.



Source: Eurostat (2023).

People aged 80 years and over, are projected to rise to 64 million in EU by 2100. In 2100, there will be only five people of working age for every three elderly persons.

Figure 3. The future of EU population is impressive.



Source: Eurostat (2023).

The EU´s population has grown consistently for more than 50 years. It increased by 92,3 million people from 354,5 million in 1960 (counting the 27 current Member States) to 446.8 million on the first January 2022. On 1 January 2021, people aged 65 and above represented 20,8 % of the EU population. This represents an increase of 0,2 percentage points compared with 2020 (20,6%), and an increase of 0,6 percentage points compared with 2019 (20,2%). Equaled with a decade earlier, the share of older people went up by 3 percentage points (from 17,8 % in 2011). In 2021, there were just slightly more than three Europeans of working age for every European aged 65 or over, representing an old age dependency ratio of 32,5%. By 2050, about 30% of the European population will be over 65. In 2100 the number of centenarian women is projected to be almost three times higher than the number of centenarian men. There were over 962 million people over the age of 65 in 2017 in the world, and this population is growing at a 3% annual rate (World Bank, 2022). In 2021, life expectancy in the EU was estimated at 82.8 years for women and 77,2 years for men (Lee et al., 2022). The number of older people will increase dramatically during the 2010-2030 period. The older population in 2030 is projected to be twice as large as their counterparts in 2000. This will have a disastrous economic effect on the social security system, especially in the rich countries where the extension of life is ensured by high standards of well-being or in the countries with an assured and free public health protection (U.S. Centers for Disease Control and Prevention, CDC).

Table 1. Health expenses constantly raise, corresponding to the continuing aging process (Italy and Japan, two countries with highest aging indices).

Health Expenditure 2000-2021 (US$)						
Italy	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Current health expenditure per capita	2.810	3.003	2.911	3.062	3.350	3.066
Domestic general government health expenditure (% of current health expenditure)	73,74	73,86	73,74	75,93	75,46	...
Domestic private health expenditure (% of current health expenditure)	26,26	26,14	26,26	24,07	24,54	...

Health Expenditure 2000-2021 (US$)						
Japan	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Current health expenditure per capita	4.148	4.288	4.463	4.436	4.347	...
Domestic general government health expenditure (% of current health expenditure)	84,21	83,77	83,96	84,86	84,72	...
Domestic private health expenditure (% of current health expenditure)	15,79	16,23	16,04	15,14	15,28	...

Source: Own elaboration.

The United Nations have declared the Decade of Healthy Ageing (2021-2030) in a form of a "global collaboration, aligned with the last ten years of the Sustainable Development Goals, to improve the lives of older people, their families, and the communities in which they live". Governments, international and regional organizations, civil society, the private sector, academia and the media are encouraged to actively contribute to achieving the longest life, but also the healthiest one",..., "We can improve economic development, harness intergenerational knowledge, and create more equitable, healthier, and happy societies: a world for all ages" (Decade of Healthy Ageing).

In addition, the World Health Organization (WHO) has determined that ageing can be treated as a disease under the International Classification of Diseases (ICD-11). In this "diseased" state, the structures and functions of the cells degrade. The body's lack of balance eventually leads to a variety of ailments, such as chronic illnesses. People have begun to rely not only on chronological age (CA) to describe ageing, but also on biological age (BA) to define it, related to the body functioning. When the population over 65 years of age in a country exceeds 21%, it is called a "super-aged-society".

3. AGEING AND EMPLOYMENT: A NEW LOOK FROM AN ENVIRONMENTAL PERSPECTIVE

Population ageing will tend to lower both labor-force participation and savings rates, thereby raising concerns about a future slowing of economic growth. Progress, political fights, and economic boom resulted in assured paid retirement for workers, benefitting at old ages of saved social insurance; simply these benefits are not more sufficient for an increasing lengthening of life. With these effects, there is a need to extend the work commitment of older workers, who are experienced, motivated, and highly engaged. Yasin (1999) sustains that while older workers offer advantages to the workplace such as extensive experience and a low turnover, they are typically limited in certain abilities such as flexibility, acceptance of new technology, and ability to learn new skills, placing them at a disadvantage in the hiring process. At the opposite, Malul (2009) wrote that if our labor markets adapt to the new reality, it also brings more opportunities for active ageing and continued personal development.

Maintaining the productivity of older workers is not an easy task. However, if older workers are more educated and have improved their human capital through their work experience, job training, and acquisition of new skills, that are adequate for their jobs and tasks, after their formal education, they can stay productive. If older workers continuously develop their cultural capital after their formal education, by adapting to new technologies, having longer work experience, participating in on-the-job training, and equipping themselves with proper skills, their productivity might not necessarily be lower than that of younger workers. The estimation results also highlight that compared to younger workers, the older skilled workers can benefit significantly more from attaining and utilizing ICT skills and job training participation.

In light of the above, it can be stated that demographic aging is one of the most significant structural phenomena of the 21st century. Increased life expectancy, a sustained decline in birth rates, and changing lifestyles have shaped societies where the proportion of older people is growing rapidly. Traditionally, this process has been analyzed from biomedical, economic, or socio-labor perspectives. However, in recent years a complementary approach has emerged: the environmental perspective, which examines how ecological, urban, and organizational conditions influence the ability of older adults to remain active in the workforce and maintain a state of well-being. Thus, aging and the environment have a bidirectional relationship. As the World Health Organization has emphasized, active aging depends on the interaction between personal factors (health, skills, motivation) and environmental factors (infrastructure, public policies, organizational culture). From this perspective, the environment is not merely a backdrop, but a fundamental determinant of labor force participation in later life. In fact, several studies in environmental gerontology show that adapted work environments (ergonomic, accessible, with flexible schedules and low thermal or acoustic stress) prolong the tenure of older workers and reduce the incidence of chronic work-related diseases. Evidence indicates that prolonged exposure to polluted, noisy, or physically demanding environments accelerates processes of functional decline, while healthy environments promote physiological and cognitive resilience.

On the other hand, climate change introduces a new dimension to analysis. The increase in extreme temperatures, the greater frequency of

heat waves, and the degradation of air quality disproportionately affect older people, whose thermoregulatory system and respiratory capacity are more vulnerable. This has direct implications for sectors such as agriculture, construction, and transportation, where environmental exposure is high. Recent scientific literature indicates that the combination of population aging and climate stress can reduce productivity, increase absenteeism, and accelerate premature exit from the labor market. Therefore, climate adaptation policies must incorporate specific strategies for older workers, including environmental protection measures, job redesign, and technologies that mitigate exposure to environmental risks.

Paradoxically, the transition to more sustainable economies opens up opportunities for older people to enter the workforce. The circular economy, environmental management, energy efficiency, and environmental education all require professionals with experience, analytical skills, and accumulated knowledge. Sociological evidence shows that older workers bring key skills to emerging sectors: systems thinking, sound decision-making, and mentoring abilities. Furthermore, the digitalization of environmental processes (climate sensors, energy management systems, emissions monitoring platforms) allows people with physical limitations to perform supervisory, analytical, or consulting roles without direct exposure to adverse environmental conditions.

All of this requires inclusive and sustainable work environments, demonstrating a clear two-way benefit. Integrating an environmental perspective into the analysis of aging and employment not only promotes the health and productivity of older workers but also contributes to global sustainability. Organizations that adopt environmentally friendly practices (reducing pollutants, improving ventilation, providing natural lighting, and implementing advanced ergonomics), create safer environments for all age groups. Furthermore, promoting hybrid or flexible work models reduces commuting, decreases the carbon footprint, and facilitates continued employment for older adults with mobility limitations. Evidence from environmental psychology indicates that green and bioclimatic work environments improve emotional well-being, reduce stress, and strengthen intrinsic motivation essential factors for job retention in later life.

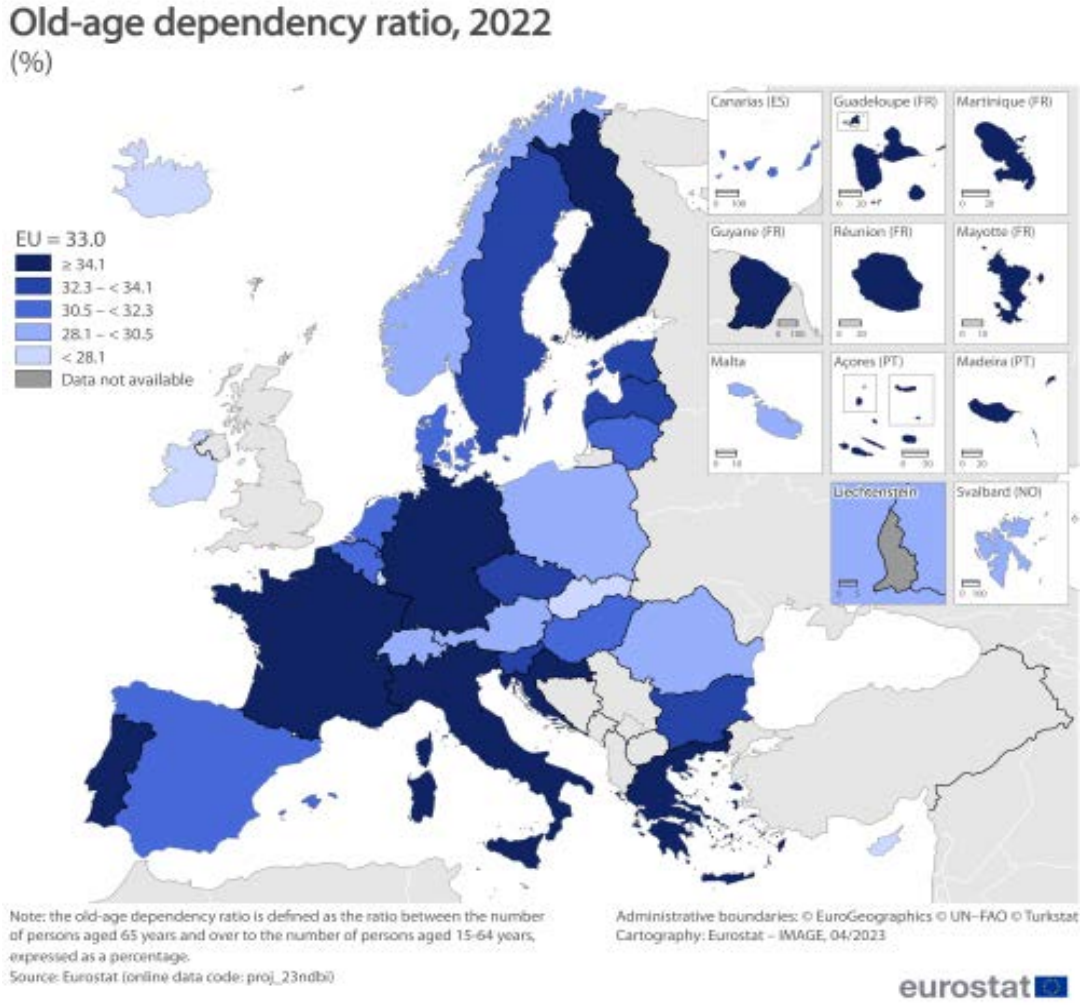
Thus, from an environmental perspective, aging and employment reveal that ecological and social sustainability are deeply interconnected. The challenge lies not only in extending working life, but also in ensuring that it takes place in healthy, resilient environments adapted to the needs of an aging population. Integrating environmental criteria into employment policies, workplace design, and urban planning is an essential strategy for building more inclusive and sustainable societies.

4. ENVIRONMENT, DEMOGRAPHICS AND WORK

Economic prosperity depends crucially on the size and quality of the workforce. Increased life expectancy combined with declining birth rates have caused many to worry about the cost of an ageing population. Ageing is costly. The impact of this transformation will be felt in every area of life, including economic growth, labor markets, taxation, the transfer of property, health, family composition, housing and migration. Ageing is linked to the fact that there are now 14 million more people in OECD countries who are not working or even looking for work, than in 2014, increasing the old-age dependency ratio, or the number of not working

people who depend on the others job, creating the phenomenon called social burden (Eurostat 2023). Around 2 in 3 people who reach older age are likely to require longer-term support and care from others to perform activities of daily living, such as eating, moving around, or bathing.

Figure 4. The ratio of non-working people in EU and in its overseas territories.



Source: Eurostat (2023).

The problem of work is twofold: on the one hand, advanced age pushes people out of work, on the other hand, redundancies do not free up jobs for young people; on the contrary, jobs decrease, so there are fewer workers, as well as much less employment occurs due to the advance of technology that takes away space from labor. That's 20 million fewer employees in OECD countries alone and 110 million fewer worldwide. The post-pandemic recovery has not yet eradicated unemployment, which is higher than pre-Covid in some parts of the world (OECD, 2024). The size of the working-age population is set to decline to more than a quarter by 2060 in almost all Southern, Central and Eastern European countries, especially in Italy, not to mention Japan and Korea. An aging population is an urgent challenge in South Korea. Korea's economy has been experiencing a drastic demographic shift toward an aged society where elderly citizens aged over 65 years will make up a third of its population in 2040-more than double from the 15% that was certified in 2019 (CIA, Fact Book) 2023). It is worth

noticing that becoming old, people have major needs, increased help from others, at the same time while their revenues are decreasing.

An old population is a loss for a State, since skills are dissolving. Years of school, years of experience are little by little lost, especially when retirement arrives too early. With retirement, also loneliness arrives. It must be reminded that elderly need socialization; without friends and family members, the temper weakens, the body suffers from lack of movement, and the brain loses liveliness. If depression arrives, it is more difficult to rediscover the joy of living.

In this way, the relationship between the environment, demographic dynamics, and employment constitutes one of the most relevant analytical frameworks for understanding the socioeconomic challenges of the 21st century. The acceleration of climate change, population aging, and the transformation of labor markets create a scenario in which ecological and social phenomena are deeply interconnected. From a scientific perspective, this conceptual triangle allows us to analyze how environmental conditions influence demographic structure and productive capacity, and how, in turn, demographic and labor market changes impact ecological sustainability. Contemporary societies are experiencing a simultaneous process of population aging, declining fertility, and increased life expectancy. These changes alter the composition of the workforce, increasing the proportion of older workers and reducing the number of young people entering the labor market. Therefore, demographic and gerontological literature shows that aging does not necessarily imply a reduction in productivity, but it does require adapted work environments. Factors such as functional capacity, thermoregulation, resistance to air pollutants, and tolerance to heat stress are modified with age. For this reason, the interaction between environmental conditions and aging is becoming increasingly relevant for employment planning.

It is important to remember that the environment is a fundamental determinant of health and work performance. Scientific evidence in environmental epidemiology demonstrates that prolonged exposure to air pollutants, extreme temperatures, noise, or toxic substances increases the risk of cardiovascular, respiratory, and metabolic diseases. These effects are especially significant in older workers, who exhibit greater physiological vulnerability due to the accumulation of exposures throughout their lives. The concept of the exposome, which encompasses all environmental exposures a person experiences from birth, allows us to understand how the interaction between environment and age influences employability. In sectors such as agriculture, construction, and transportation, the intensification of extreme weather events (heat waves, droughts, floods) directly affects work capacity and increases workplace accidents.

Climate change not only represents an environmental risk but also a structural factor that is reshaping labor markets. Reduced productivity due to heat stress, the loss of working hours in exposed sectors, and the need to adapt production infrastructure are phenomena widely documented in the scientific literature. However, the ecological transition also generates new employment opportunities. The expansion of renewable energies, the circular economy, waste management, ecosystem restoration, and energy efficiency demand diverse professional profiles. In this context, the accumulated experience of older workers can become a strategic resource, especially in tasks such as supervision, training, risk analysis, and environmental management.

In other hand, increasing urbanization intensifies the relationship between the environment and employment. Cities concentrate both environmental risks (pollution, heat islands, noise) and job opportunities. Research in environmental psychology and sustainable urban planning demonstrates that green, accessible, and bioclimatically designed urban environments improve well-being, reduce stress, and promote productivity. For an aging population, accessibility, sustainable mobility, and the environmental quality of workspaces are key elements for extending working life in healthy conditions. Integrating universal design principles and energy efficiency into work environments simultaneously contributes to social inclusion and mitigates environmental impact. All of this requires moving towards an integrated approach to public policies that address the external effects stemming from market failures. Thus, the interdependence between the environment, demographics, and employment demands public policies that address these areas jointly. Among the most relevant strategies are:

- Environmental adaptation of workplaces through improvements in ventilation, ergonomics, thermal control, and pollutant reduction.
- Promotion of active aging with continuing education programs and job redesign for older workers.
- Boosting the green economy by generating sustainable and resilient jobs.
- Sustainable urban planning that ensures healthy and accessible environments for all ages.

Scientific evidence indicates that integrated policies generate simultaneous benefits in productivity, public health, and ecological sustainability.

Thus, the combined analysis of the environment, demographics, and employment reveals a complex system in which ecological and social changes reinforce each other. The sustainability of future employment will depend on societies' ability to design resilient, inclusive, and environmentally responsible work environments. Understanding these interactions from a scientific perspective is fundamental to anticipating challenges, seizing opportunities, and building development models that harmonize human well-being and ecological balance.

With all this in mind, we can affirm that demographic changes require adjustments to health facilities and tax systems . Now the problem is this one: not only to live longer, but healthier. We have obtained a lengthening of life, but it is a double-edged sword. From one part, medicines are fighting illnesses, and, at the same time, they can corrode our organs, being external chemical elements. We know that some treatments could be good for some failings, and bad for others, or for the entire organism. Good prescriptions can become bad when in combination with different remedies, or when prescribed by specialists of different branches, considering only one part of the body. Thinking about holistic medicine is still futuristic. It is a fact that while life is prolonged, various infirmities or deficiencies are added, also because the elderly body absorbs food vital substances to a lesser extent.

Rifat Atun in Lancet (2015) warns against prolonging life, without an adaptation of physiological conditions to advancing age. The medicine is not able to prolong life, while maintaining an optimal state of health, so the number of years lived with infirmities, given by chronic, non-fatal diseases, increases. These are years burdened also by the weight of mental, neurological, respiratory, musculoskeletal disorders, that not only appear all over the world, but that will worsen more and more.

The rate of age-related morbidity decreases less than the mortality rate, to the point that, as studied by the Gates Foundation's Global Burden of Disease Study 2013, the number of people disabled by diseases will reach 765 million (Gates Foundation). An increased burden of mental, neurological, respiratory, and musculoskeletal disorders is apparent in many parts of the world, uptrends that can be expected to continue in many situations. And the paradox of our society is related to the welfare increase: if you can get sick from lack of food, you will get even sicker from excessive nutrition; in fact, the richer we get, the more we eat.

With well-being you will also get used to alcohol, sweets etc.,... We eat in company, we have fun with gastronomic festivals, we eat more and more often at restaurants which (even the best ones) use cheap and not always good techniques of preparation, preservation, and cooking. The consumption of food is almost exclusively delegated to large distribution centers. If this allows us a wide choice of food from all over the world, that, in counterpart, requires us to submit ourselves to preservatives and colorants that provide to attract consumers. We still do not know to what extent the additives, many of which are of new generation, can cause damage to the functioning of the body, because many of these are unknown to the majority of consumers, but, above all, because they are strictly modern phenomena. In any case, everything hurts when excessive. We know the troubles caused by sugar, salt, alcohol, smoking. Then there is also the complication of allergies that vary from person to person, and many are discovered when it is too late; often they can be fatal.

Perhaps the damages to the psychological components are greater. Many people know what hurts, but they do it anyway, just as they don't do what is good for them, even if they know it. The western style of life is a burden for national economies' health systems, new illnesses appear, more than those progressively eradicated. The classic scheme of the epidemiological transition describes changes in the causes of illness and death, along the process of economic development. The first empirical framework of the health transition includes environmental risks that vary as development progresses, ranging from risks in living places, communities, to global risk factors.

5. ENVIRONMENT: A CROSSROADS BETWEEN OLD AND NEW DISEASES

As the behaviours of the modern world become more complex, the so-called local or hygiene factors are decreasing and the incidence of chronic diseases, originating from diet and wrong behaviour is increasing (Smith, Ezzati (cit. 2005). Non-communicable diseases (NCDs) are on the rise, i.e. diseases produced by well-being, such as those produced by excessive eating, the abuse of alcohol, sugars, processed and preserved foods, manipulated through a series of steps. Non-communicable diseases (NCDs) are currently responsible for roughly 60% of all deaths and nearly half of

the loss of actual and effective life years, due to disability and death. If, on the one hand, nutrition allows a prolongation of life, dietary excesses translate into a qualitative deterioration of a quantitatively lengthened existence. The steps of food processing have repercussions in environmental, chemical and physical deteriorations, ranging from fertilization to transport pollution.

The stability of the organism functioning is regulated by an innate system of nutritional self-control, it only occurs that this self-control is incessantly over-excited by the economic availability, that makes us to go beyond the natural limits, surcharging the organs functions.

On the one hand, the intake of calories has increased, and on the other, calories expenditure is reduced, being machines or robots charged for human labor. The deus ex machina of this mechanism is advertising, and since, by nature, the body is essentially “lazy”, the path of gaining weight, to feel fatigue, decay, progressively increases, the more we live. The only solution that can be seen toward ageing without illnesses is to combat the diseases originated from "well-being" that corrode both the body and the mind. The public health care system is surcharged when free of charge, like in Italy (Governo Italiano, Ministero della Salute).

In order to reduce the excessive costs, the healthcare organizations should charge for the treatment of diseases produced by wrong behaviors, because free treatment only incentivizes harm, and those people don't pay private insurances. Certainly, to do this, an educational and informative basis is needed, starting from primary schools, to inform and give the necessary knowledge of the human organism functioning.

Epidemiology has helped to reduce the incidence of occupational diseases, foodborne illnesses and accident injuries, improving overall living standards in advanced countries (Mossialos, 2006). Contagious diseases continue to be the most important acute health problems in all countries, but in industrialized countries the causes of death are mainly attributable to non-contagious diseases. Supporting data say that in countries where the obesity rate is less than 50%, deaths, at the time of Covid 19, were at 10%, while they were 2,2 million out of a total of 2,5 at the end of February 2021 in countries where more than half of the population was overweight (WHO, 2021). Given that behavior and lifestyle are very important, epidemiology is increasingly used to study both their influence and the effects of preventive interventions in the context of health promotion. The causality of certain diseases can generally be linked to genetic factors, but more commonly, however, it is the result of an interaction between genetic and environmental factors. In this context, environment means any biological, chemical, physical, psychological or other factor that may have effects on health. A causal factor, on its own, is often neither necessary nor sufficient to induce disease; for example, tuberculosis can affect a host susceptible to genetic factors, if exposed to bacteria, but incisive external multipliers can be overcrowded housing, poverty, and malnutrition; the same elements apply to cholera when they increase the fragility to the vibrio that is ingested with unhealthy waters.

Therefore, the study of human diseases cannot be separated from the environmental conditions in which populations live, produce, and interact. Throughout history, changes in the environment (natural or induced by human activity) have modulated the emergence, spread, and persistence of infectious and non-communicable diseases. Understanding this interaction is

essential for interpreting past epidemiological patterns and anticipating present-day health challenges. In pre-industrial societies, diseases were closely linked to environmental factors such as water availability, air quality, the presence of vectors, and population density. Epidemics such as bubonic plague (caused by *Yersinia pestis*, it spread in densely populated urban environments with poor hygiene, where rats and fleas acted as reservoirs), cholera (associated with *Vibrio cholerae*, it spread in regions with contaminated water and deficient sanitation systems), or malaria (transmitted by *Anopheles* mosquitoes, it depended on warm, humid ecosystems that facilitated the vector's life cycle), developed in contexts where ecological conditions favored the proliferation of pathogens and vectors.

Similarly, with industrialization and urban development, the disease profile changed. The epidemiological transition reduced mortality from infectious diseases but increased the prevalence of chronic diseases linked to new types of environmental exposures. Air pollution, exposure to industrial chemicals, and changes in lifestyles have led to an increase in pathologies such as cardiovascular diseases, cancers associated with environmental pollutants, and chronic respiratory diseases such as asthma or COPD. Epidemiological evidence demonstrates that prolonged exposure to fine particulate matter (PM_{10} or $PM_{2.5}$), nitrogen dioxide, or volatile organic compounds increases the risk of morbidity and mortality, especially in vulnerable populations such as children, the elderly, or individuals with pre-existing conditions. All of this directly and indirectly influences climate change itself, which is one of the most influential environmental factors in contemporary epidemiology. Rising temperatures, altered precipitation patterns, and biodiversity loss are modifying the geographic distribution of vectors and pathogens, accelerating the spread of mosquito-borne diseases to latitudes previously free of these vectors (such as dengue, chikungunya, and Zika), the reemergence of zoonotic diseases (favored by deforestation and habitat fragmentation, which increase contact between wildlife and humans), and the rise in respiratory illnesses due to the increased frequency of forest fires and episodes of extreme pollution. These processes demonstrate that current diseases cannot be understood without considering global environmental transformations.

Meanwhile, rapid urbanization and global mobility have created environments where environmental and health risks are amplified. Megacities concentrate pollution, heat stress, and socio-environmental inequalities that affect health in distinct ways.

Furthermore, globalization facilitates the rapid spread of pathogens, as evidenced in recent pandemics. The interaction between human mobility, urban density, and environmental degradation creates a breeding ground for the emergence of new diseases. Thus, contemporary scientific evidence converges on the need to adopt integrated approaches such as One Health or Planetary Health, which recognize the interdependence between human, animal, and environmental health. These approaches emphasize that environmental degradation increases the likelihood of epidemic outbreaks, biodiversity loss reduces the ecological buffering capacity against pathogens, and climate change mitigation is also a public health prevention strategy. With all this in mind, the relationship between the environment, past diseases, and current diseases reveals a consistent pattern: ecological changes, whether natural or anthropogenic, profoundly shape human health. Historical epidemics, modern chronic diseases, and emerging threats share a common denominator: the influence of the environment.

Understanding this interdependence is essential for designing public health policies, prevention strategies, and development models that simultaneously protect human health and the integrity of the planet.

6. IN CONCLUSION

If society is continually changing, because men change, the social structures and civil infrastructures must change, like the political organizations. First of all, society requires an overcoming of discriminatory views towards older workers, and, generally, older people. Key employers and public policies can help facilitate career mobility that results in better employment choices at older ages, or increased employment retention through better job quality, health at the workplace, and training and skills transfer to the youngest ones, proving job flexibility choices and ensuring that government policy supports voluntary career mobility. Governments had to improve the design of public pensions. Policies must incentivize private savings for the oldest, when they are no longer able to live alone or in good health. Italy is an example of long median age, due to the improvement of the public health system, that has lengthened the average life expectancy, which has pulled a series of progressive infirmities, due to the difficulties of counteracting the psycho-physical decay, linked to advancing age, that is dragging an aggravation of health care costs. The extension of life span becomes an excessive challenge, allowed by economic well-being, as well as by social security effectiveness, but it has insurmountable limits, which are the ineluctable limits of life. It no longer makes sense to strive for the progressive lengthening of life, without taking into account the years of infirmity.

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