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Aging and Neurological Diseases - Needs for Rehabilitation

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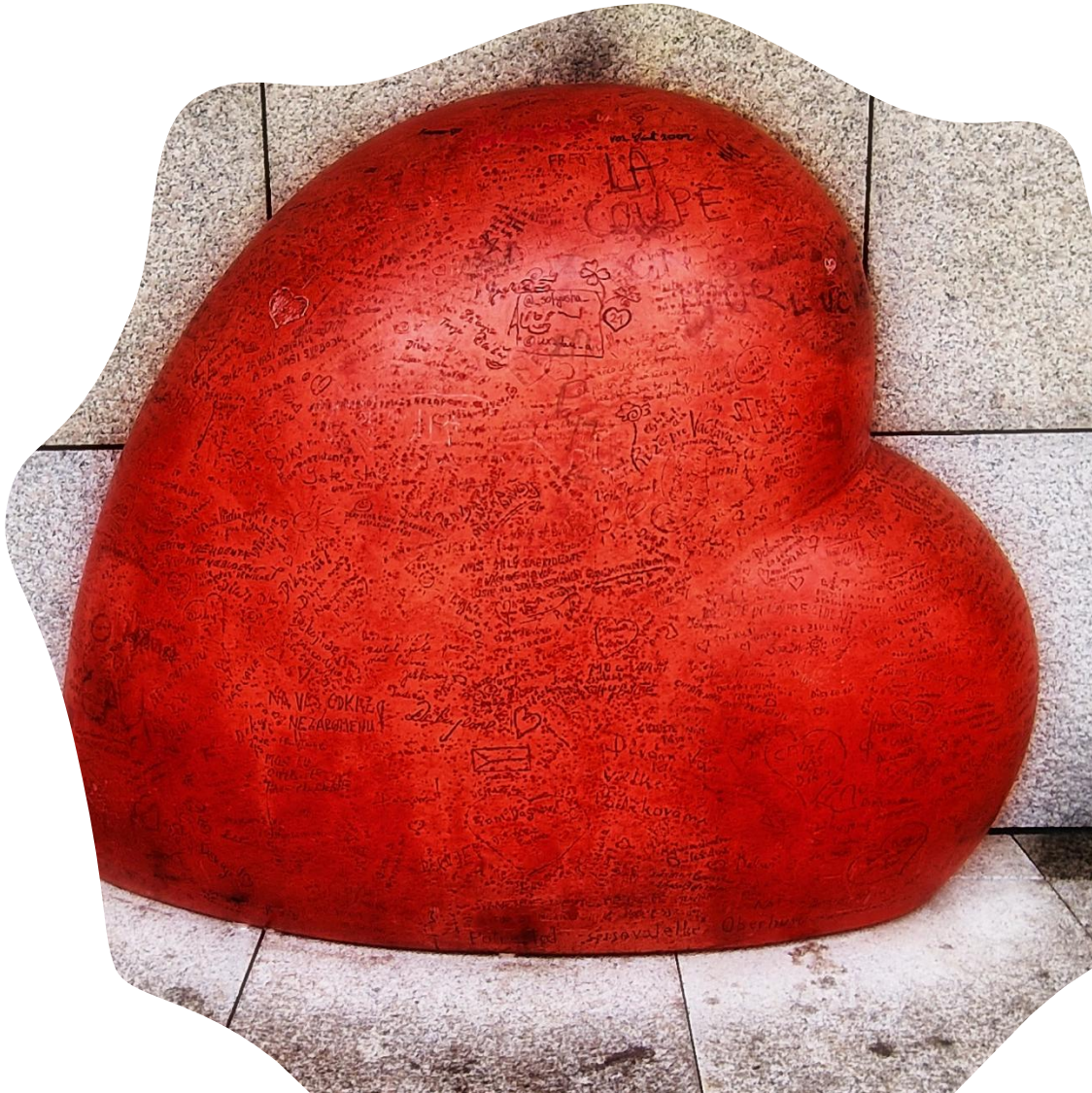
31.3-4.4.2025, BIP course: Neurological physical therapy, University of Thessaly, Greece

Content

- Aging as a global phenomenon
- Aging and functional ability
- The need of neurological rehabilitation



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Life expectancy

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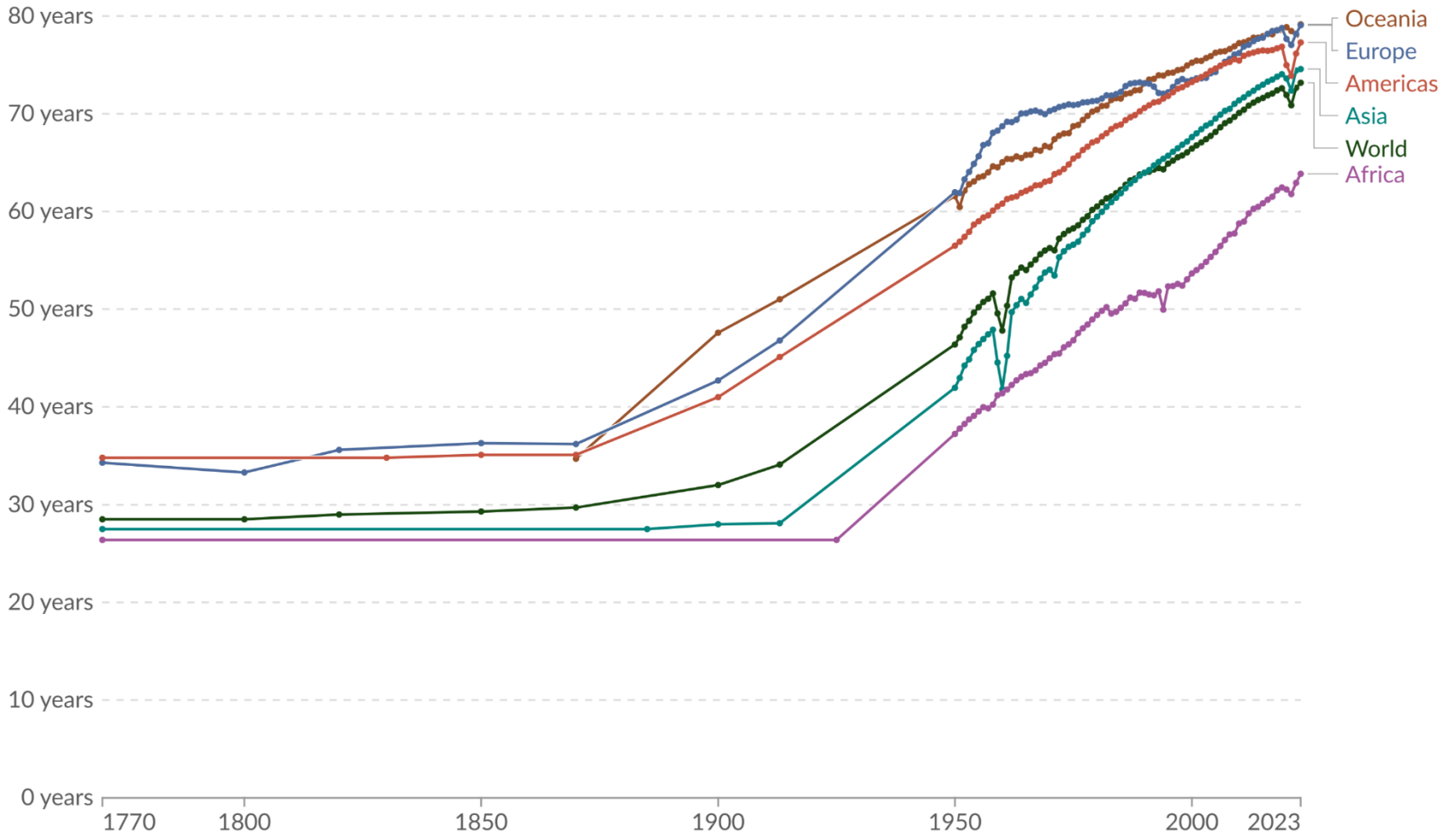
Life expectancy

The period life expectancy[1] at birth, in a given year.

Our World in Data



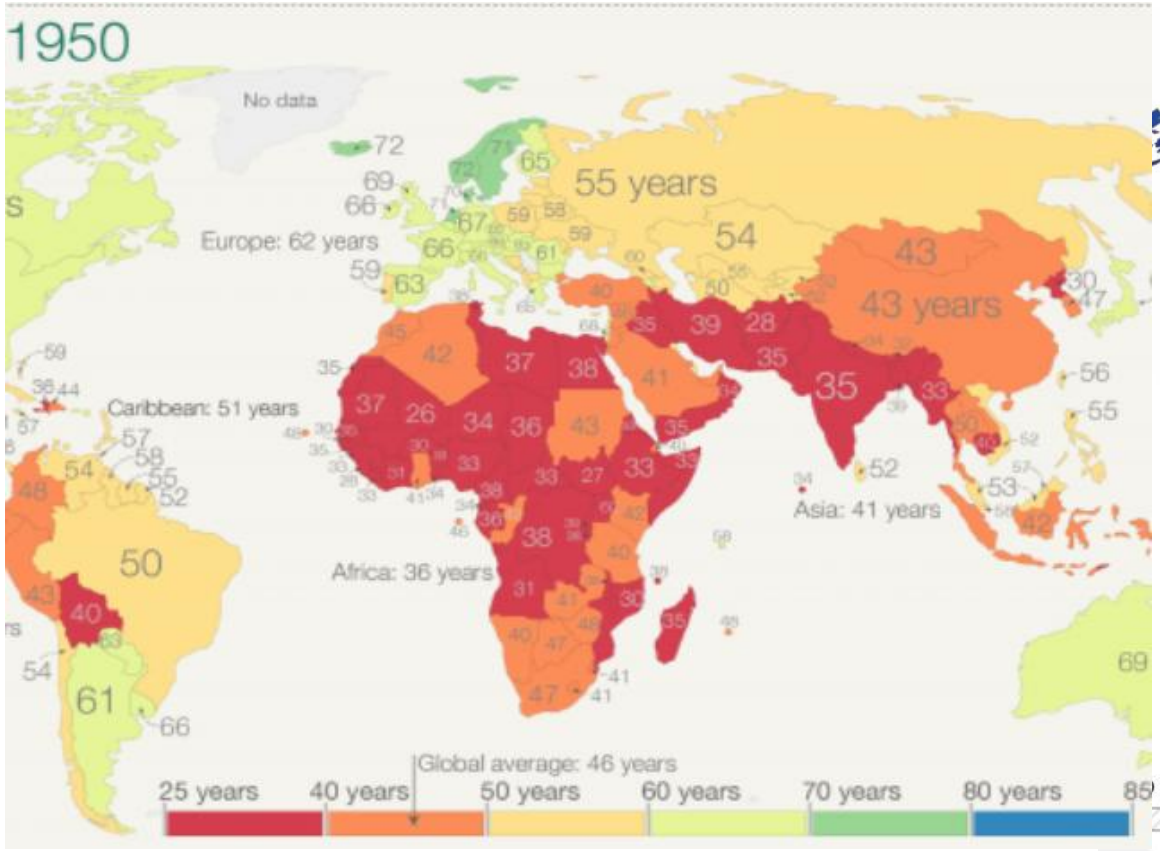
Data source: UN WPP (2024); HMD (2024); Zijdeman et al. (2015); Riley (2005)

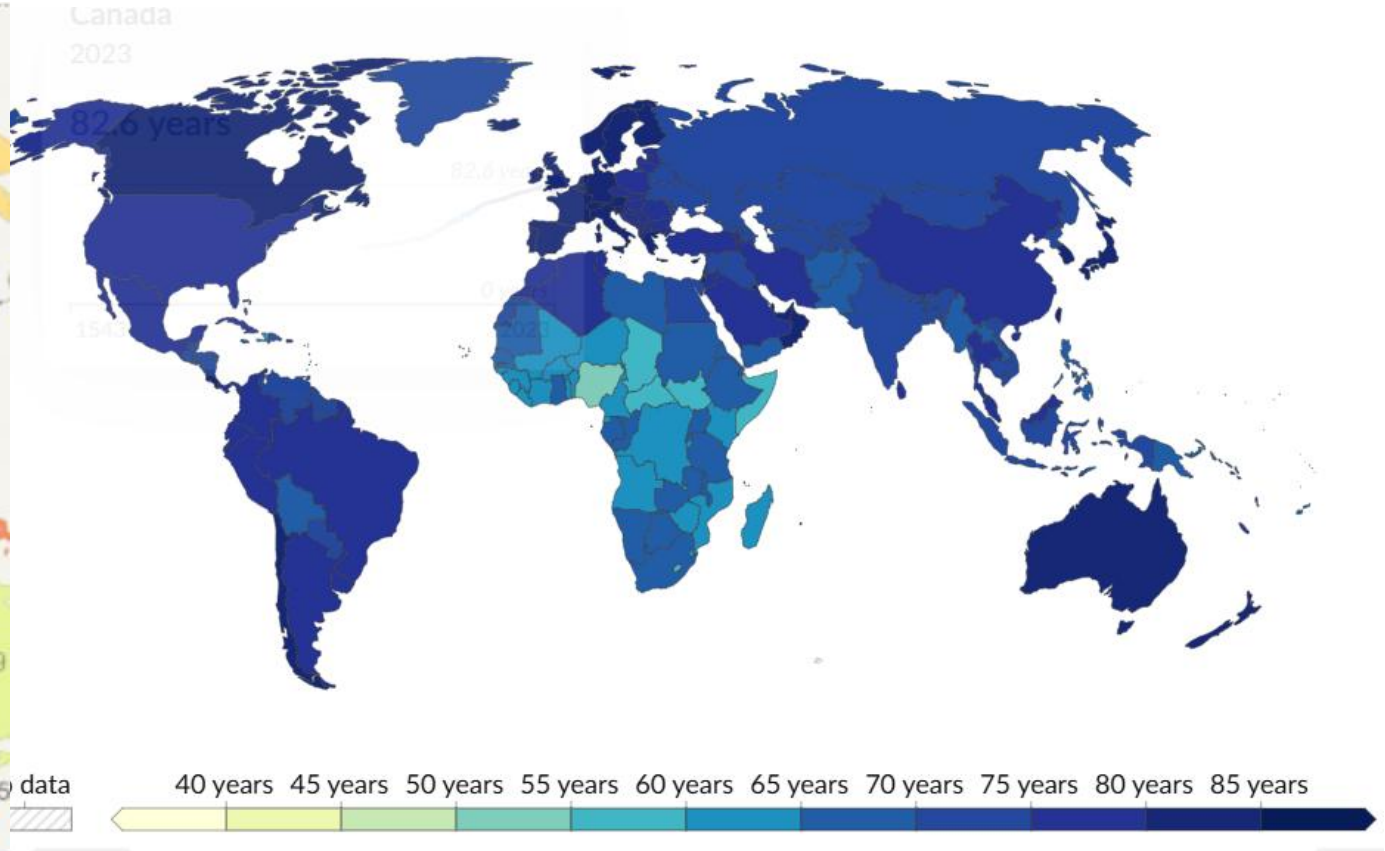
OurWorldinData.org/life-expectancy | CC BY

1. Period life expectancy: Period life expectancy is a metric that summarizes death rates across all age groups in one particular year. For a given year, it represents the average lifespan for a hypothetical group of people, if they experienced the same age-specific death rates throughout their whole lives as the age-specific death rates seen in that particular year. Learn more in our articles: "Life expectancy" – What does this actually mean? and Period versus cohort measures: what's the difference?

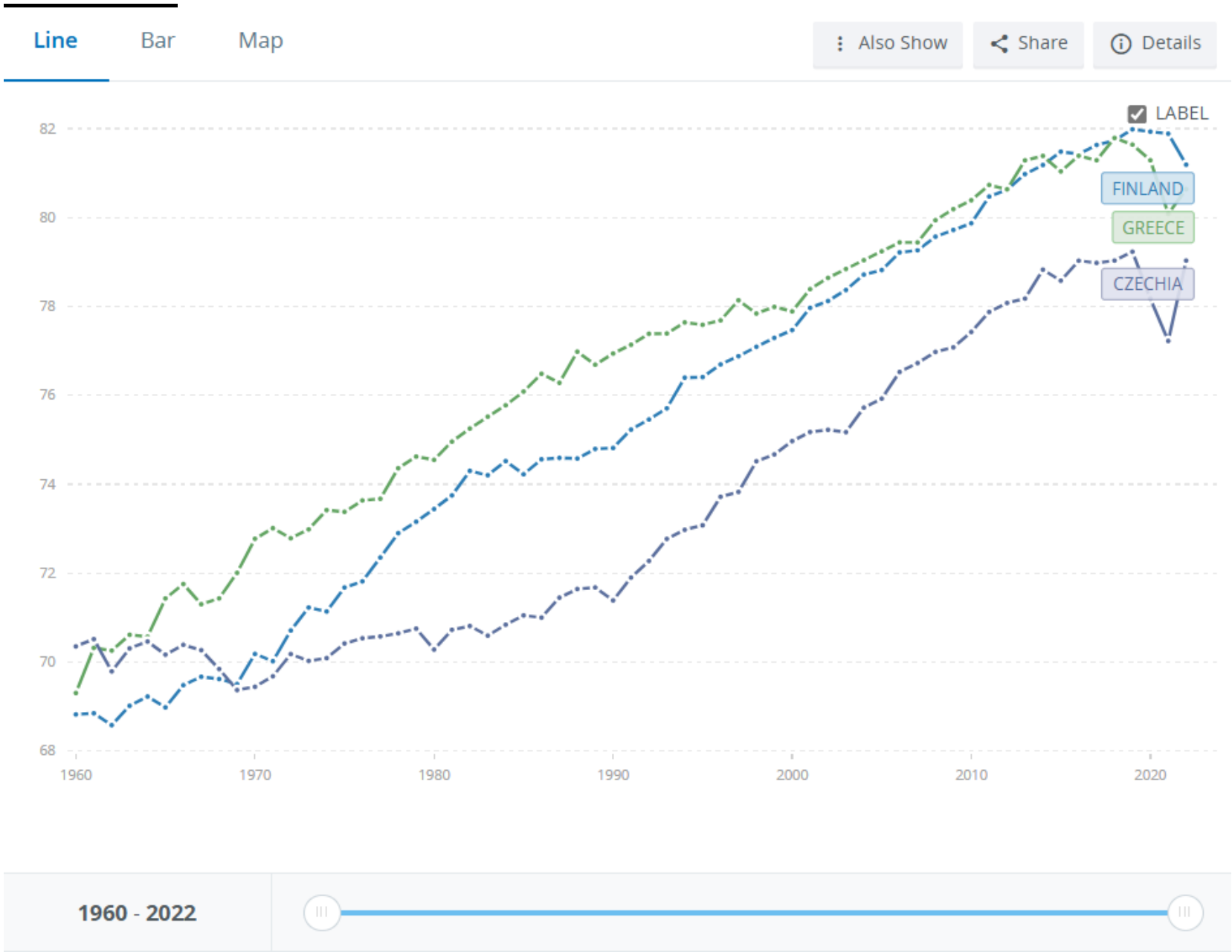
(https://ourworldindata.org/life-expectancy)

Global perspective: Life expectancy in a year 1950 and 2023





(Max Roser (2018) - “Twice as long – life expectancy around the world” Published online at OurWorldInData.org. Retrieved from: 'https://ourworldindata.org/life-expectancy-globally' [Online Resource])



Life expectancy at birth, total (years) - Finland, Czechia and Greece

Finland: 81 yeas
Czechia: 79 years
Greece: 81 years

In a year 2022

(Life expectancy at birth, total (years) - Finland, Greece, Czechia | Data)

Life expectancy at birth, total (years) - Finland, Czechia and Greece

Finland: 81 yeas
Czechia: 79 years
Greece: 81 years

In a year 2022

(Life expectancy at birth, total (years) - Finland, Greece, Czechia | Data)

Life expectancy at birth, male (years) - Finland, Czechia and Greece

(Life expectancy at birth, male (years) - Finland, Greece, Czechia | Data)

Life expectancy at birth, female (years) - Finland, Czechia and Greece

(Life expectancy at birth, female (years) - Finland, Greece, Czechia | Data)

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World population aging

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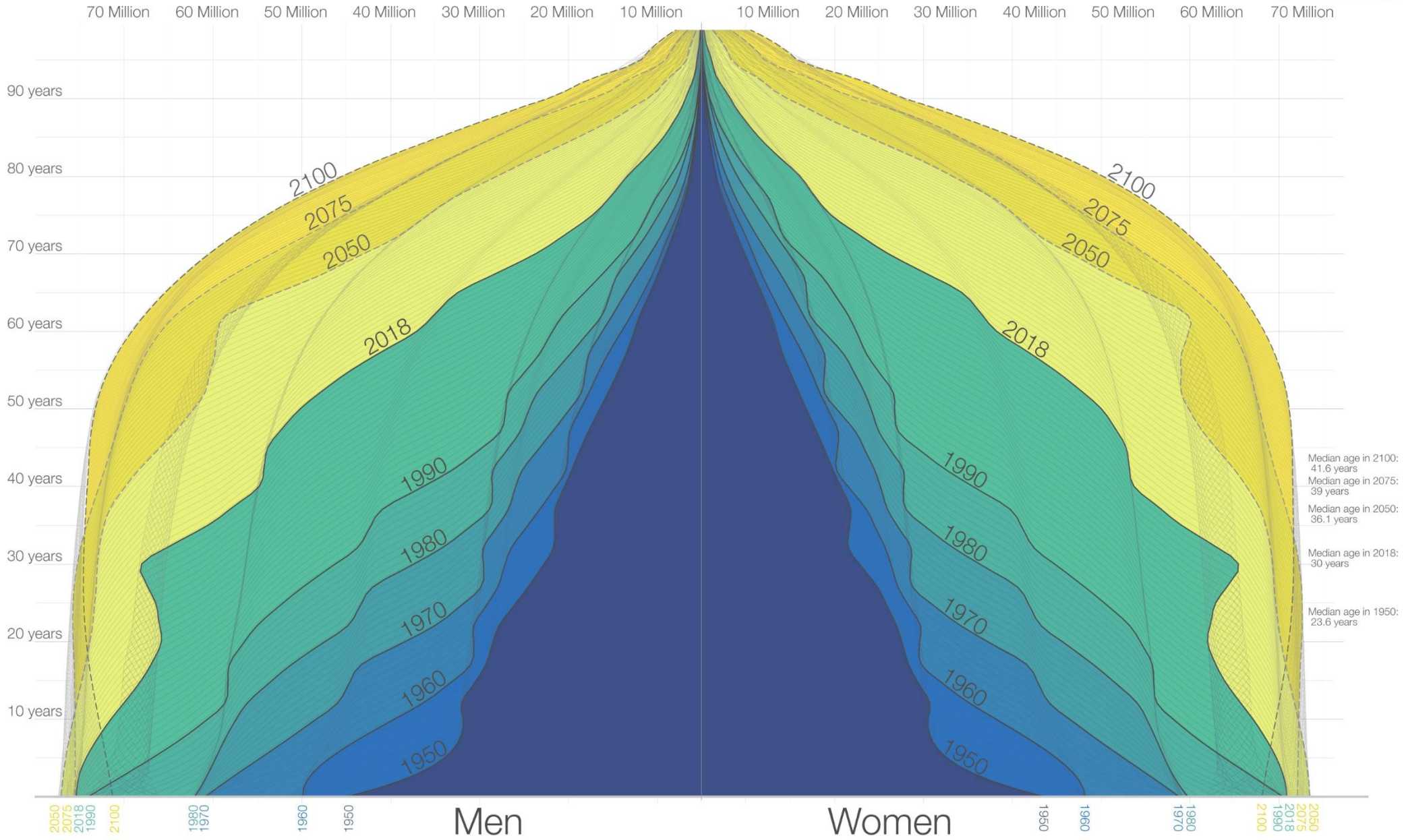
The Demography of the World Population from 1950 to 2100

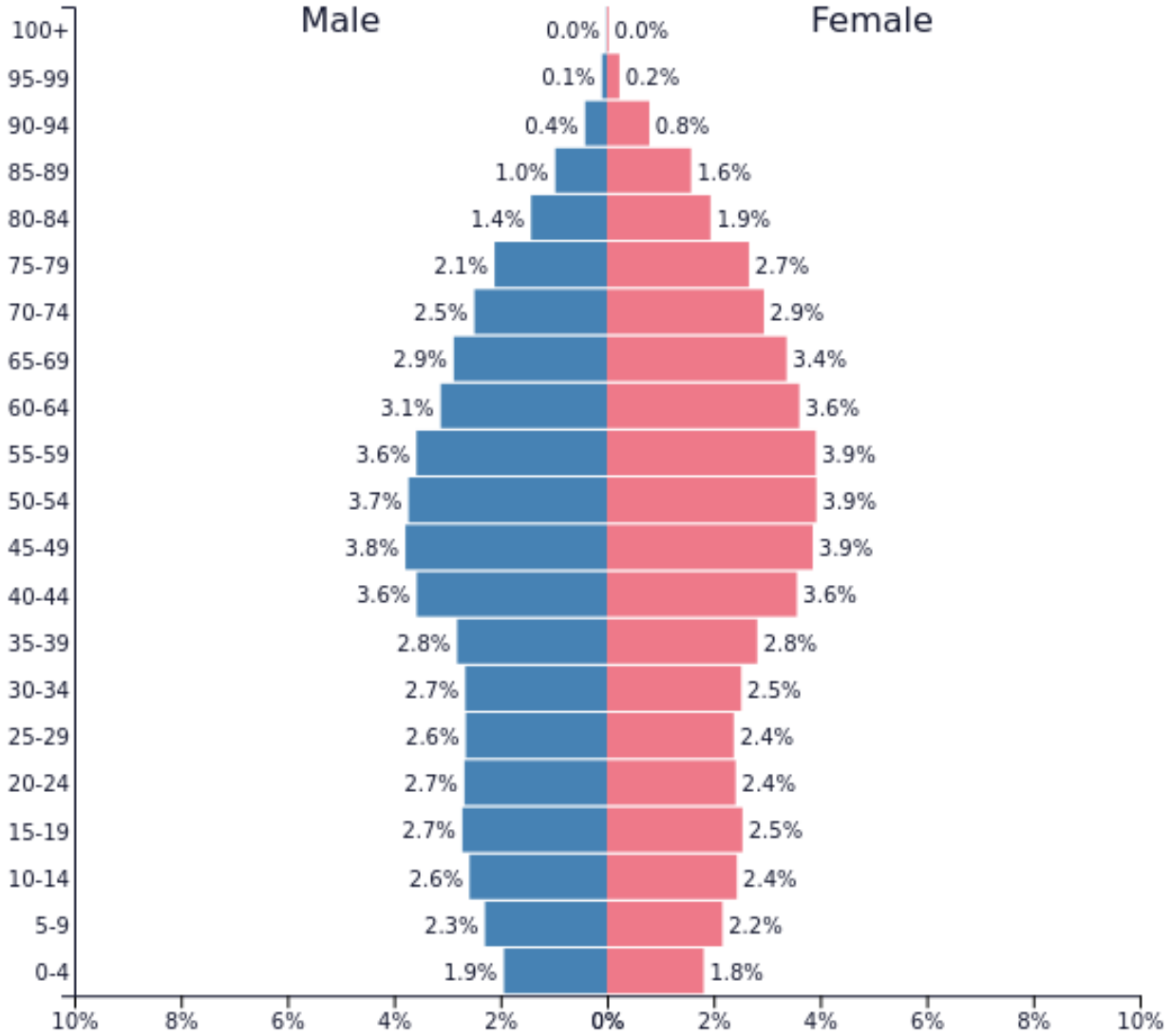
Shown is the age distribution of the world population – by sex – from 1950 to 2018 and the *UN Population Division*'s projection until 2100.

Our World in Data



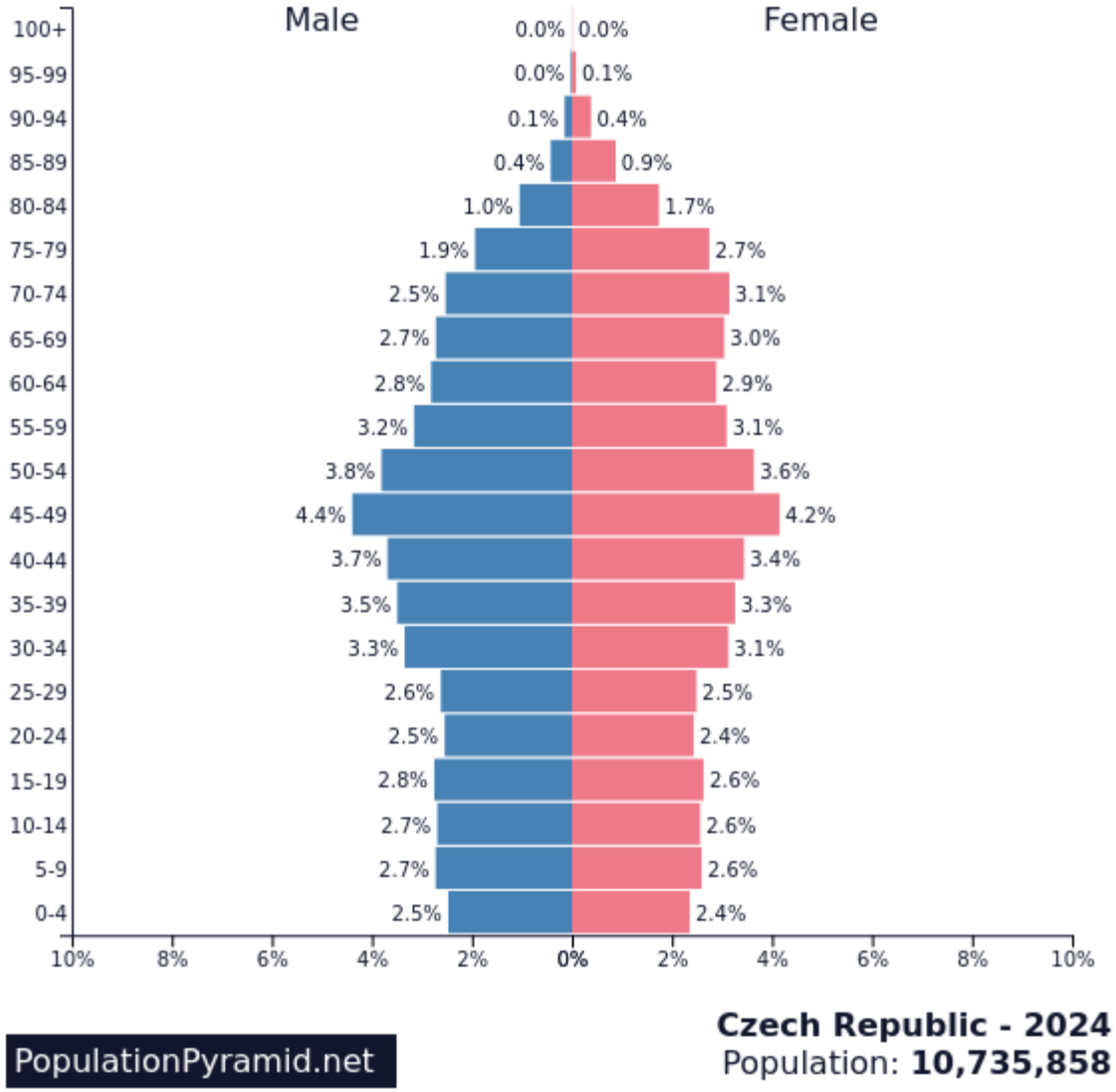
Data source: United Nations Population Division – World Population Prospects 2017; Medium Variant.
The data visualization is available at OurWorldinData.org, where you find more research on how the world is changing and why.

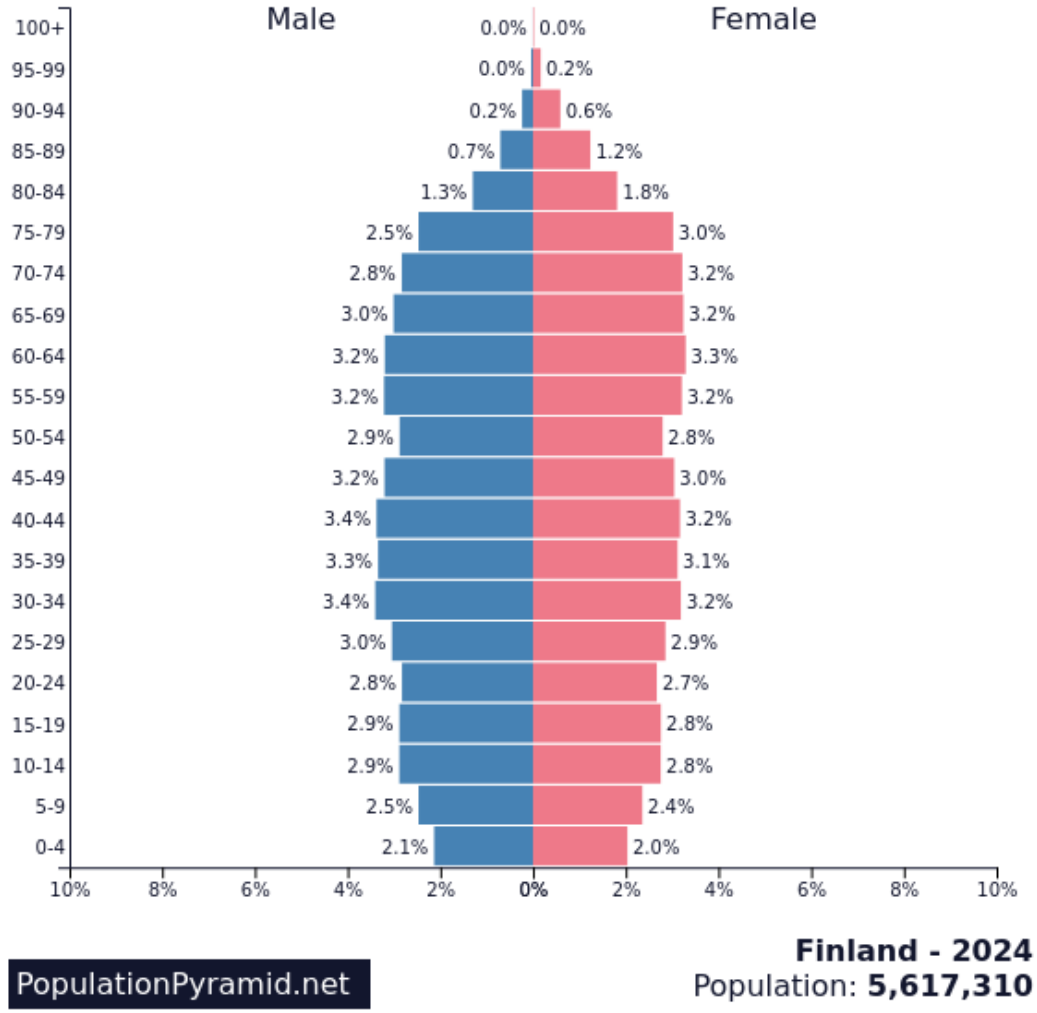
(https://ourworldindata.org/global-population-pyramid)



31.3.2025 Marja Äijö, Savonia-UAS

Age pyramids





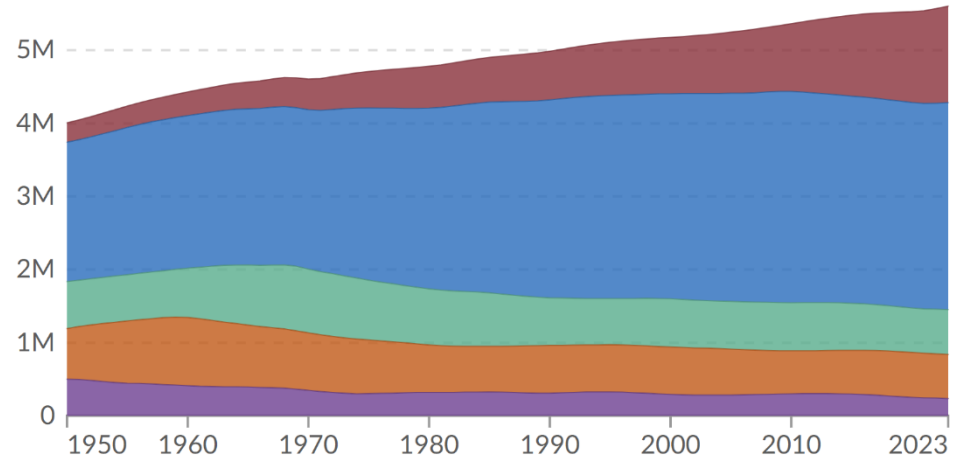
(Population of Czech Republic 2024 - PopulationPyramid.net & Population of Finland 2024 - PopulationPyramid.net)

Population by age group

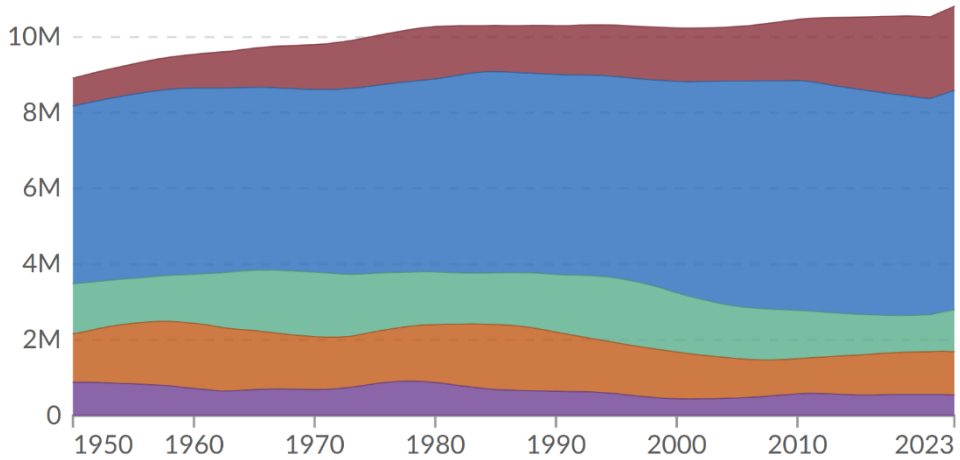
Our World in Data

Ages 15-24 Ages 25-64 Ages 5-14 Ages 65+ Under-5s

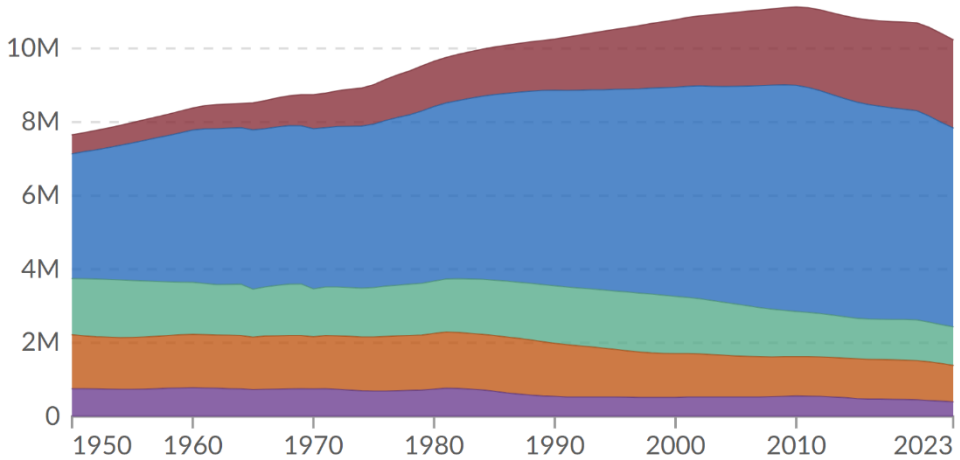
Finland



Czechia



Greece



Data source: UN, World Population Prospects (2024)

OurWorldinData.org/population-growth | CC BY

(Population by age group)

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Aging, functional ability and neurological disorders

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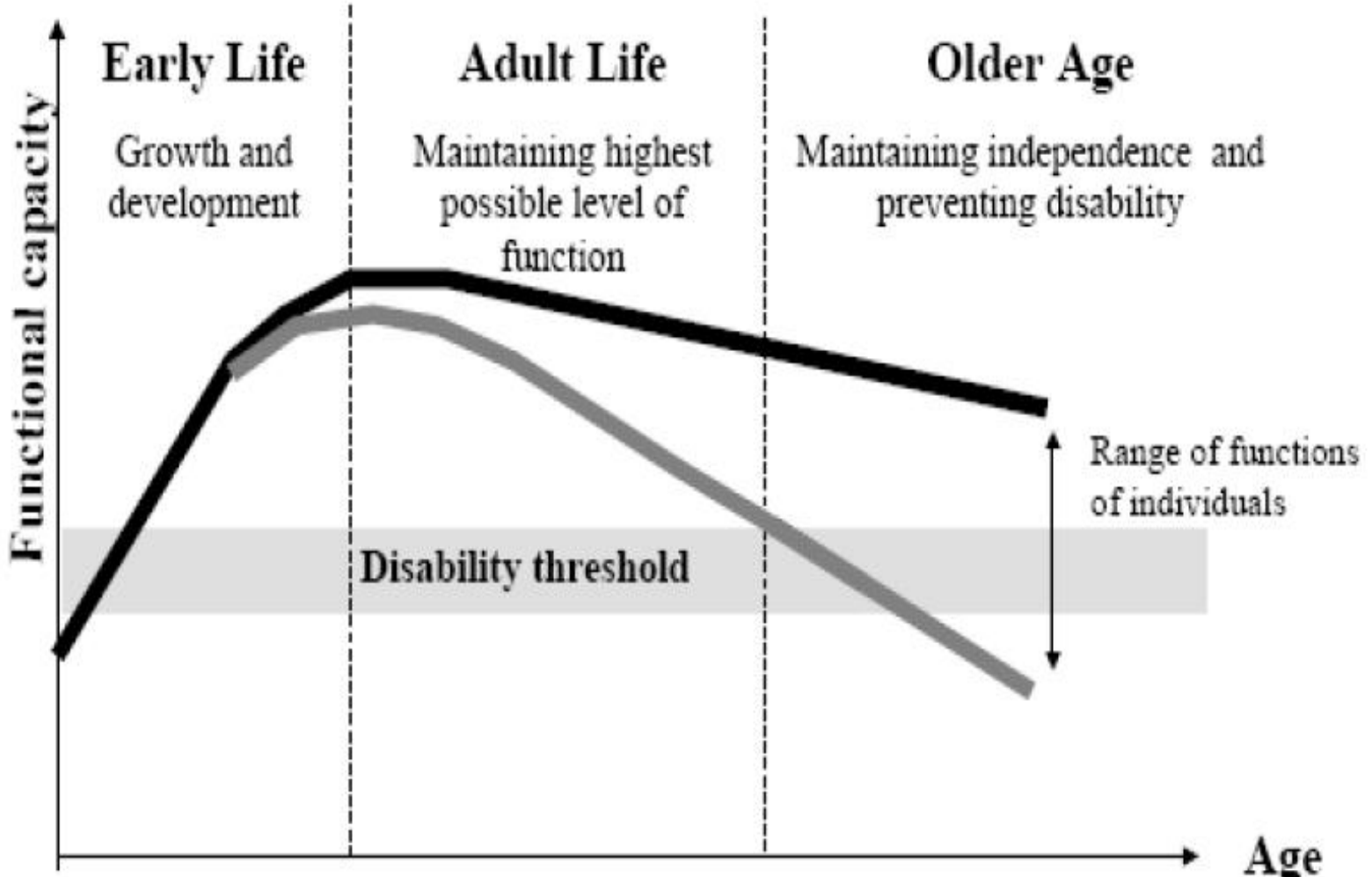
Functional Capacity over the Life Course



(World Health Organisation, Ageing and Life Course Programme, 2000, activeageing@who.int)

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Epidemiology of neurological diseases in older adults

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[b] *Inserm U1153, Epidemiology of Ageing and Neurodegenerative diseases, université de Paris, Paris, France*
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INFO ARTICLE

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Neurological diseases

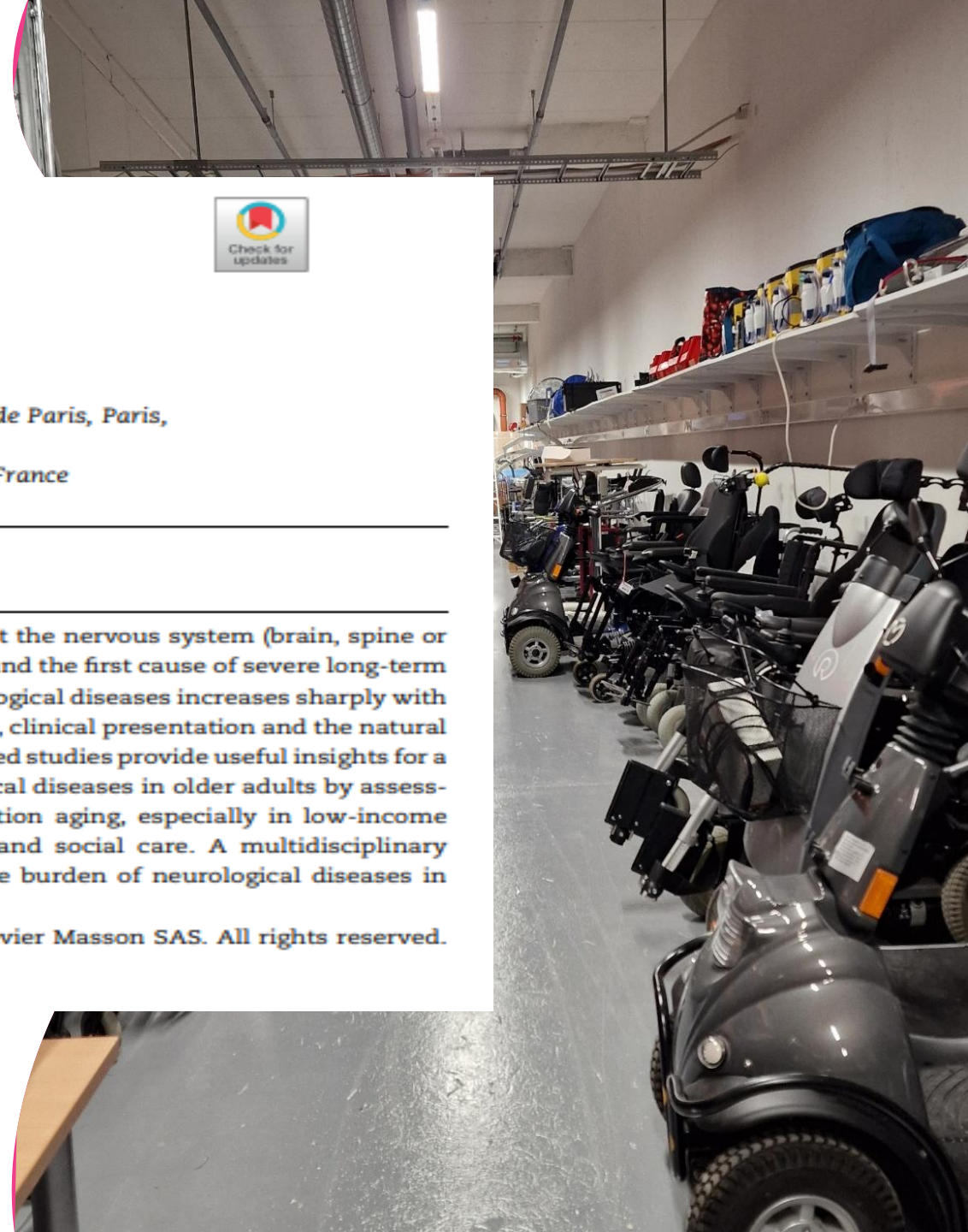
ABSTRACT

Neurological diseases refer to the diseases that target the nervous system (brain, spine or nerves). They are the second leading cause of death, and the first cause of severe long-term disability in the world. The prevalence of most neurological diseases increases sharply with age, and age also modulates the impact of risk factors, clinical presentation and the natural course of these diseases. Longitudinal population-based studies provide useful insights for a better understanding of the specificities of neurological diseases in older adults by assessment of a wide range of risk factors. Rapid population aging, especially in low-income countries, presents challenges in terms of health and social care. A multidisciplinary approach is necessary to find solutions to tackle the burden of neurological diseases in older adults.

Epidemiology of **neurological diseases** in **older adults**.

Dumurgier J, Tzourio C.

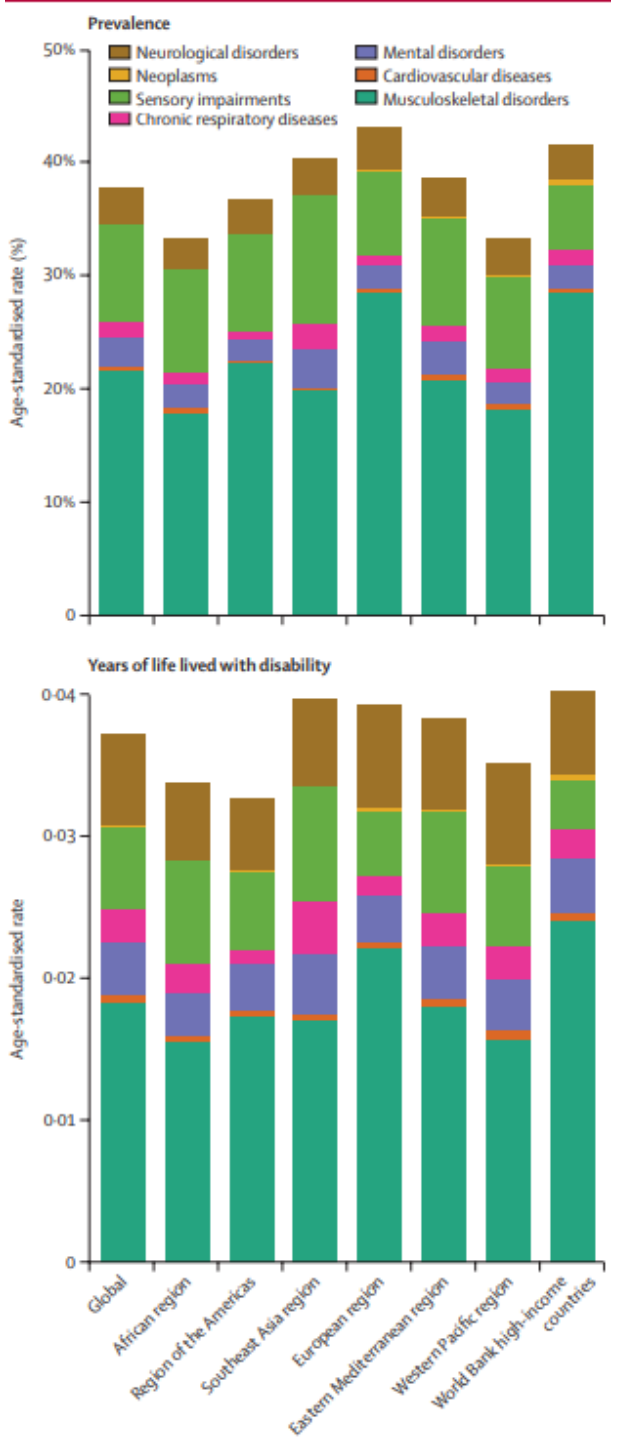
Rev Neurol (Paris). 2020 Nov;176(9):642-648. doi: 10.1016/j.neurol.2020.01.356. Epub 2020 Mar 4.



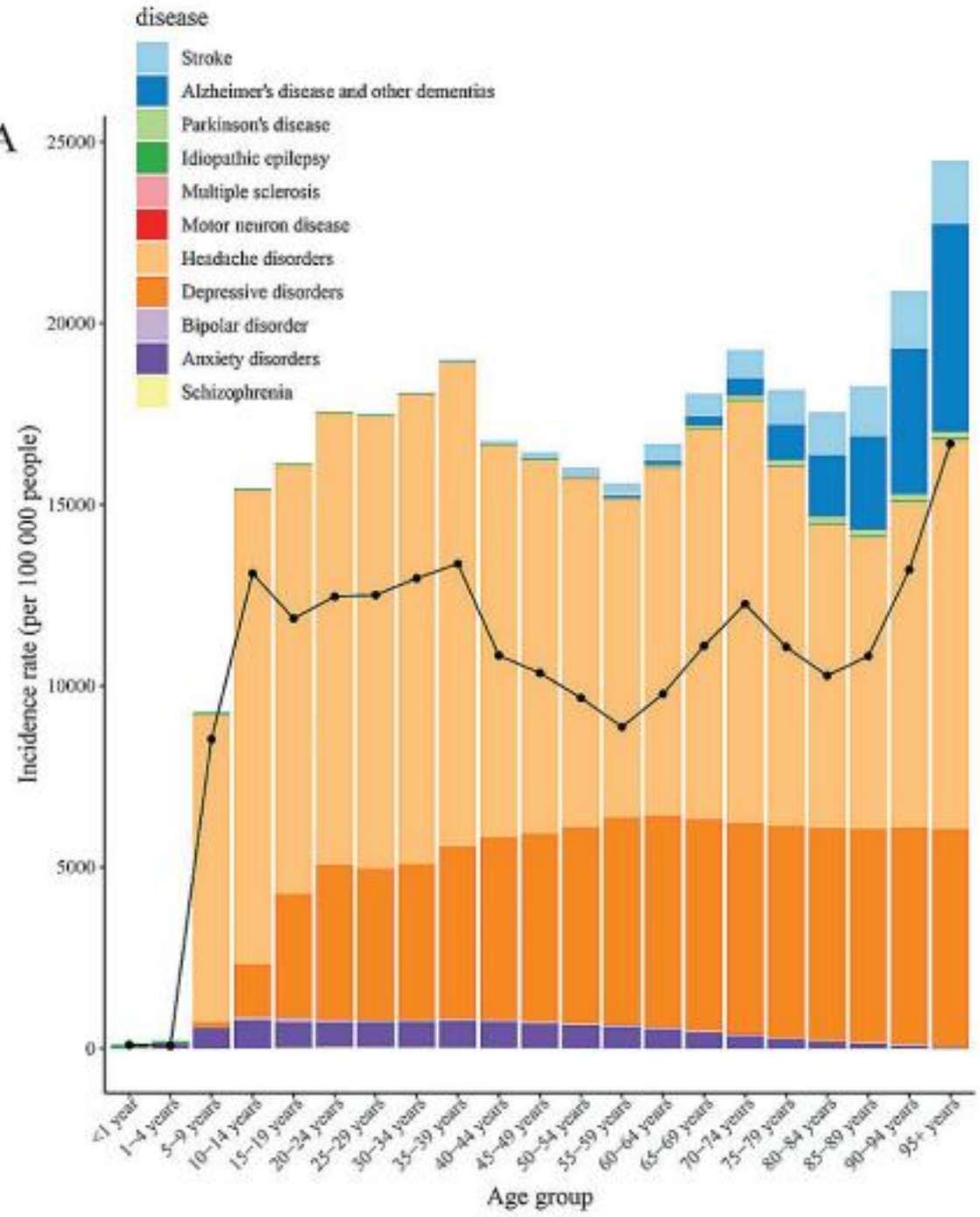
Global estimates of the **need** for **rehabilitation based** on the **Global Burden of Disease study 2019**: a **systematic analysis** for the **Global Burden of Disease Study 2019**.

Cieza A, Causey K, Kamenov K, Hanson SW, Chatterji S, Vos T.

Lancet. 2021 Dec 19;396(10267):2006-2017. doi: 10.1016/S0140-6736(20)32340-0. Epub 2020 Dec 1.



The incidence of neurological disorders and its main subtypes among different age groups.



Global, **regional**, and **national burden** of **neurological disorders** in **204 countries** and **territories worldwide**.

Huang Y, Li Y, Pan H, Han L.

J Glob Health. 2023 Nov 29;13:04160. doi: 10.7189/jogh.13.04160.

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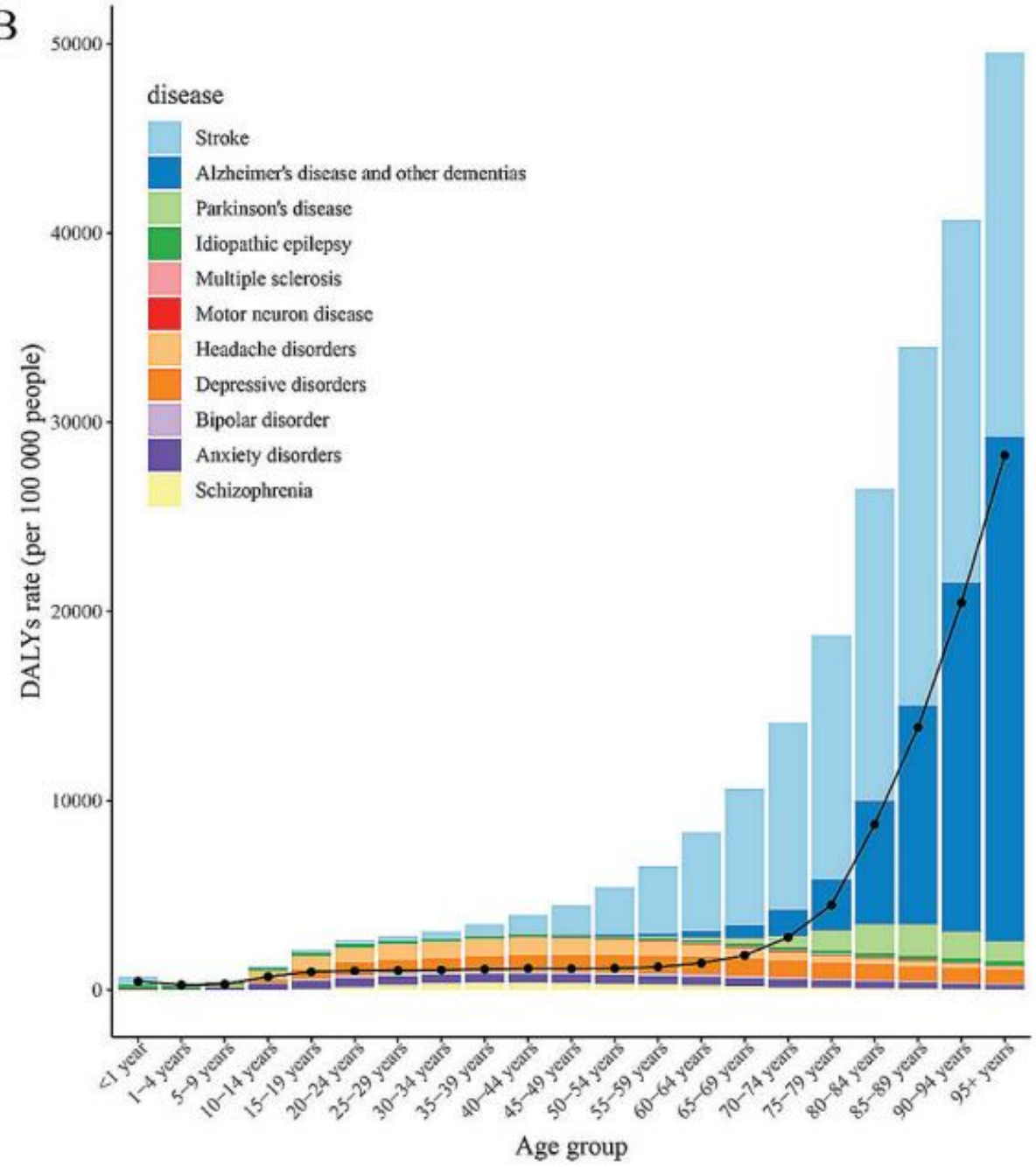
DALY rates of neurological disorders and its main subtypes among different age groups.

DALYs=disability-adjusted life-years



Global, **regional**, and **national burden** of **neurological disorders** in **204 countries** and **territories worldwide**.

Huang Y, Li Y, Pan H, Han L.

J Glob Health. 2023 Nov 29;13:04160. doi: 10.7189/jogh.13.04160.

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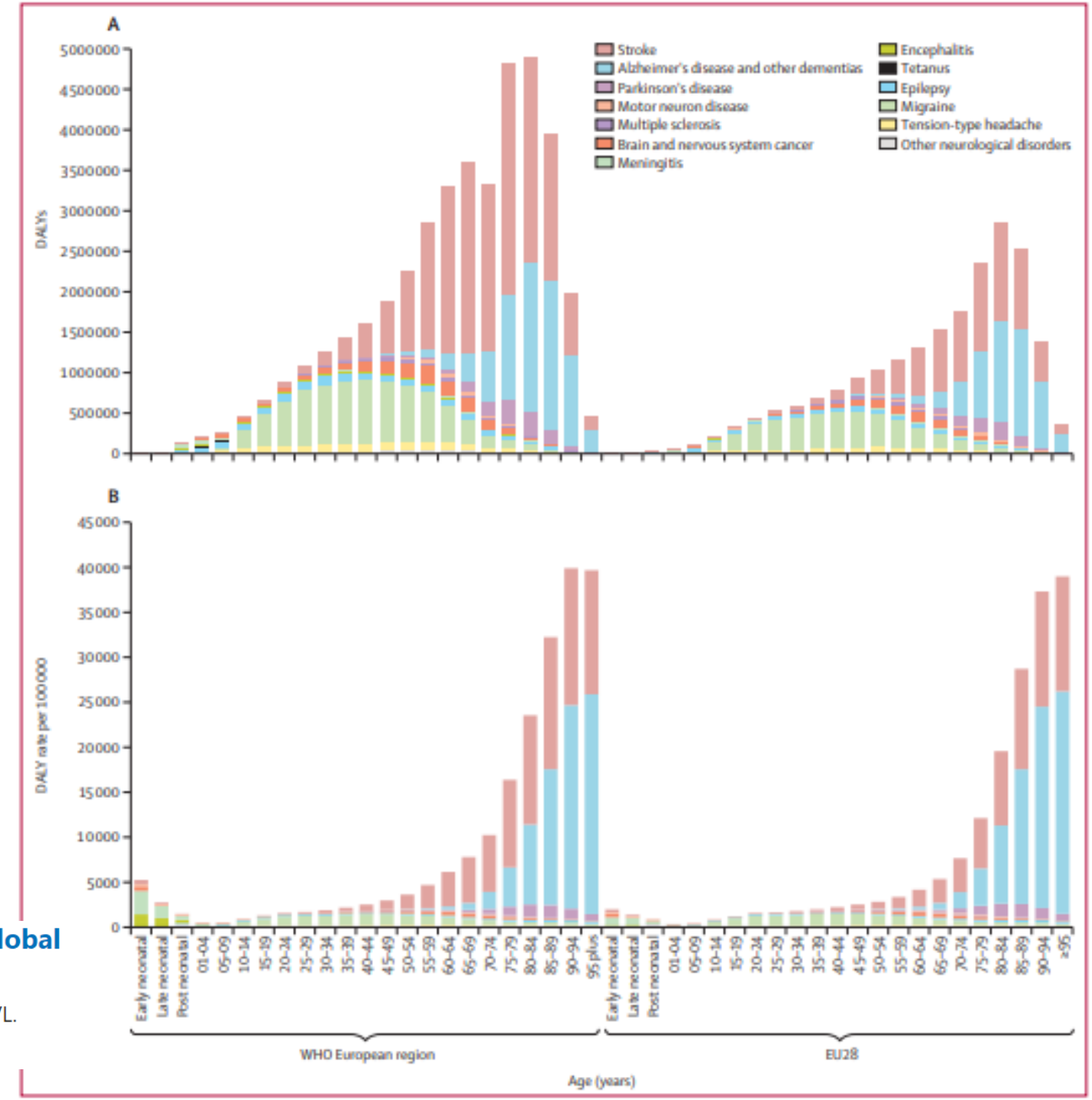
EU28 and WHO European region DALYs
Total number of DALYs (A) and age-standardised DALY rates (B) by age group including both sexes in 2017.
DALYs=disability-adjusted life-years.
EU28=the 27 countries in the EU plus the UK



The **burden** of **neurological diseases** in **Europe**: an **analysis** for the **Global Burden of Disease Study 2017**.

Deuschl G, Beghi E, Fazekas F, Varga T, Christoforidi KA, Sipido E, Bassetti CL, Vos T, Feigin VL.

Lancet Public Health. 2020 Oct;5(10):e551-e567. doi: 10.1016/S2468-2667(20)30190-0.

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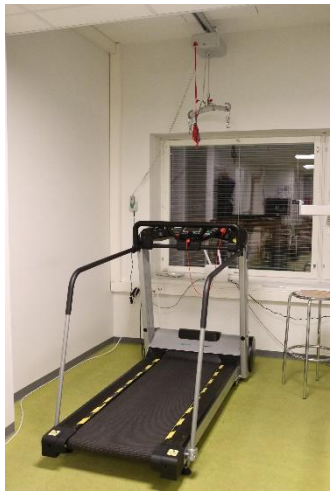
1. Robot-assisted for example Gait Trainer GT I

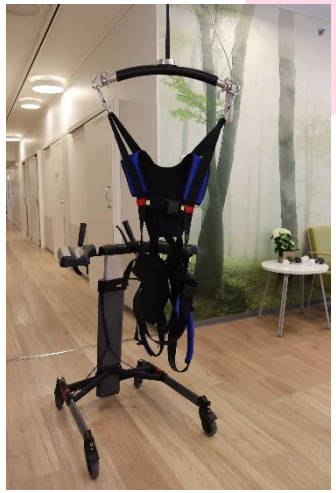
2. Wearable device -For example, Lokomat and exoskeleton

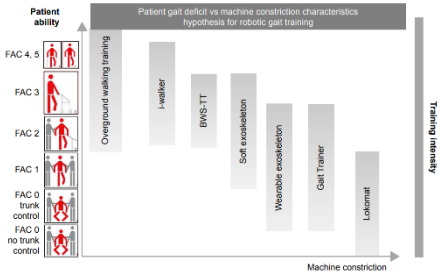
3. Weighted walking/ -treadmill training

4. Weighted gait training on a harness wheel

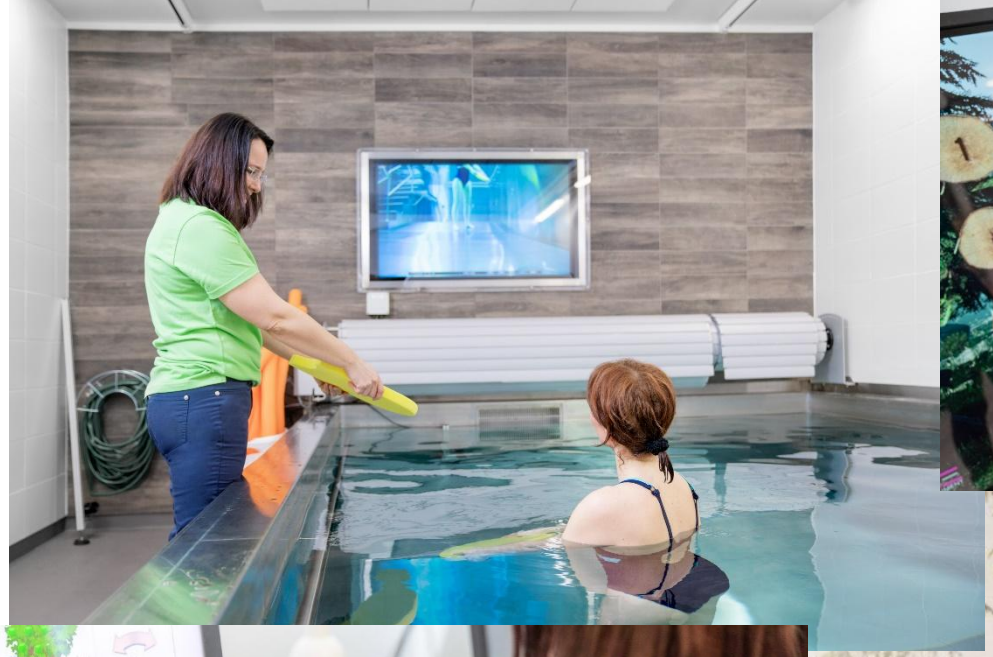
5. Assisted training for example rollator or walking stick

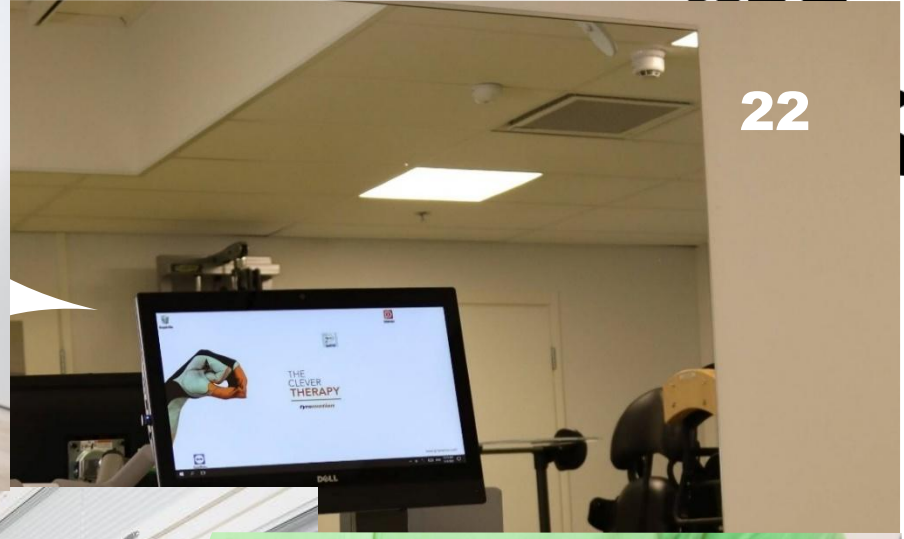






(Morone et al. 2017. Robot-assisted gait training for stroke patients: current state of the art and perspectives of robotics. Neuropsychiatric Disease and Treatment 13 1303–1311.)




THE
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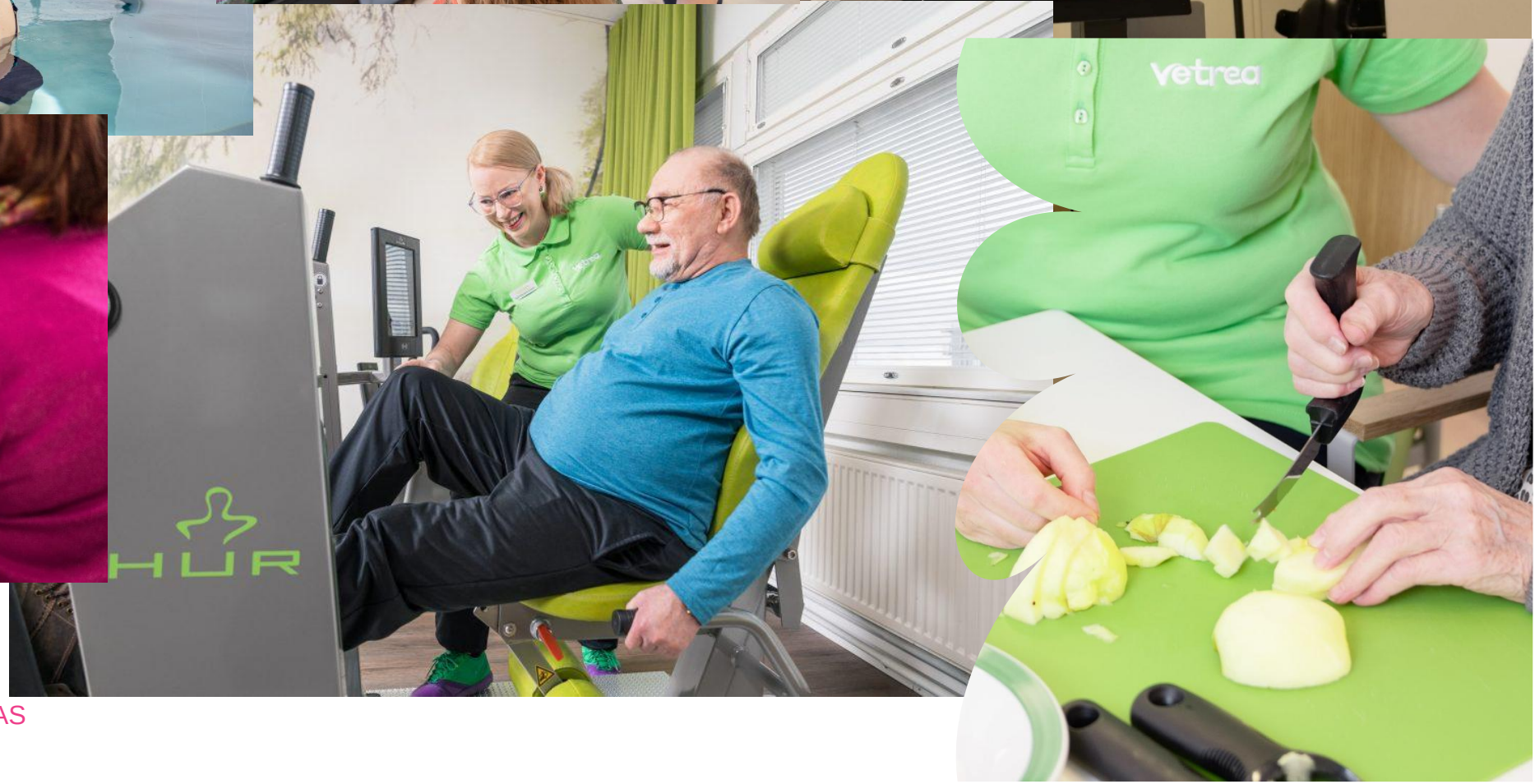
THERAPY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LIFESTYLE MEASURES FOR **prevention of cognitive decline**

The FINGER model is based on scientific evidence from the FINGER study, showing that simultaneous lifestyle measures in five areas can help prevent and delay the development of cognitive decline.

(https://fbhi.se/the-finger-model/)

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Summery

- The ageing population
- Life expectancy has increased, but ….
- Among older adults' neurological disorders are common and they live longer with disorders
- Rest of the life-long process
- There is a need of rehabilitation among older adults living with neurological disorders

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