# Introduction to Economic History : Capital, Inequality, Growth

*(Master APE & PPD)*

*(EHESS & Paris School of Economics)*

Thomas Piketty

Academic year 2026-2027

# Lecture 4: The Great Transformation: State Capacity, Public Expenditures, Human Capital & the Rise of the Social State

# Roadmap of the lecture

- K. Polanyi & The « Great Transformation » (1944)
- The Great Transformation: the Rise of the Social-Fiscal State, the New Property Regime & the Gradual Decomodification of the Economy (Rise of Education, Health & Other Public Services)
- Human Capital & the Uneven Rise of the Social State Across World Regions 1800-2025
- Human Capital & the Rise of Productivity & Prosperity
- The Uneven Rise of the Fiscal State 1800-2025
- The Rise of the Fiscal State & the Rise of Progressive Taxation
- Public Revenue and Expenditure & the Question of Public Debt: Wealth Taxes & Public Debt Removal after WW2

# Short Bibliography

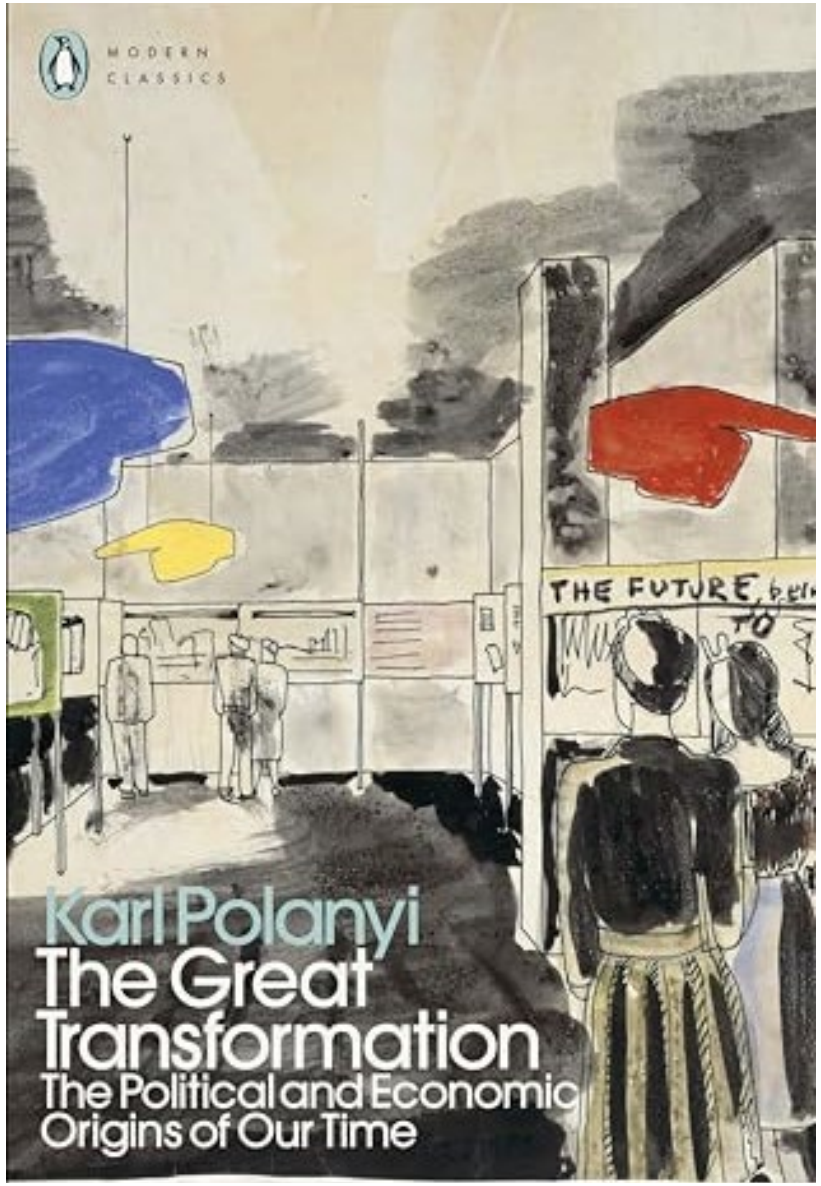

- K. Polanyi, The Great Transformation. The Political and Economic Origins of our Time, 1944
- P. Lindert, Growing Public - Social Spending and Economic Growth since the 18th Century, 2004
- C. Goldin, The Human Capital Century and American Leadership: Virtues of the Past, Journal of Economic History 2001
- ***N. Bharti et al, "Human Capital, Unequal Opportunities and Productivity Convergence: A Global Historical Perspective 1800-2100", WIL WP 2025** (Journal of Public Economics, 2026) (World Human Capital Expenditure Database)

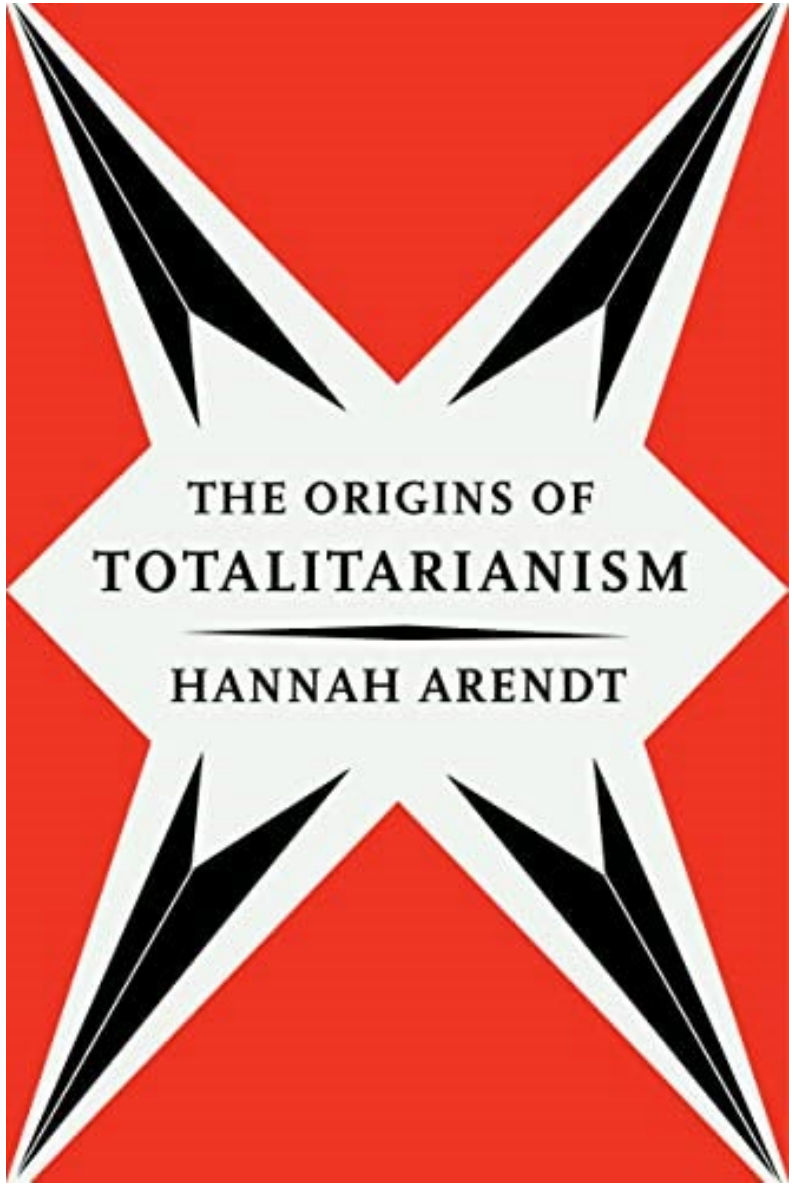
# K. Polanyi and the « Great Transformation » (1944)

- **K. Polanyi, *The Great Transformation: The Political and Economic Origins of our Time* (1944)**: the 19$^{c}$ capitalist system was inherently unstable; this finally led to the self-destruction on European societies in 1914-1945 & the death of 19c economic liberalism and laissez-faire ideology
- Hungarian economic historian, took refuge in London 1933 & NYC 1940-1944
- 19c regime: sacralisation of market system and private property + generalized competition between individuals and between European nations-states
→ very unequal & unstable system, both within and between countries
→ wars, revolutions, monetary chaos, fascism
- Key pb = **myth of self-regulated markets for labor, land and money**

The solution is democratic socialism, i.e. the “social embeddedness of markets” (market economy with democratic regulation of the markets for labor, land and money/capital) (but the book focuses mostly on historical analysis)
(+over-optimistic view of pre-industrial restrictions on labor mobility?)

# The Great Transformation: from Polanyi 1944 to Arendt 1951



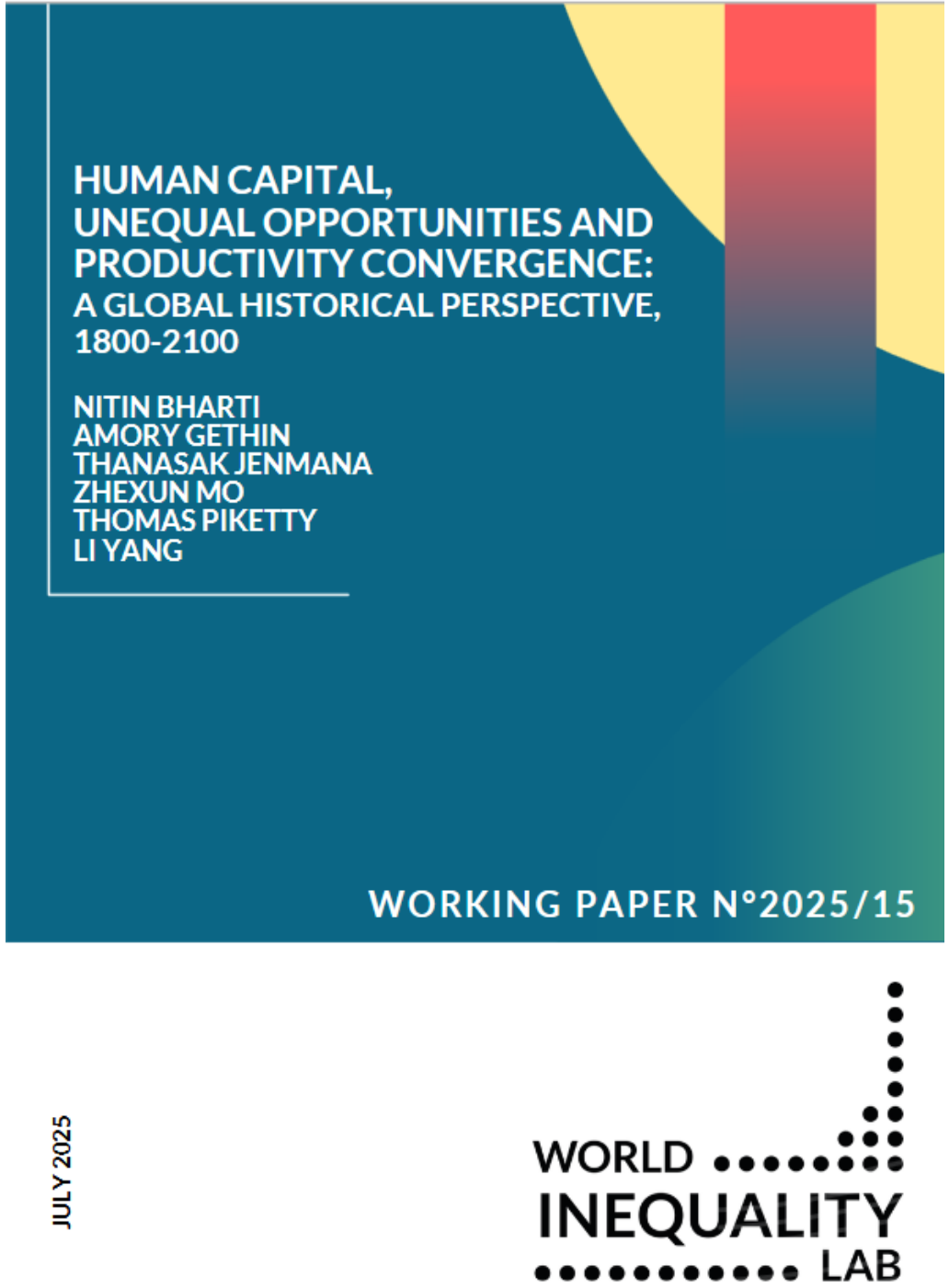



- **H. Arendt, The Origins of Totalitarianism, 1951**:
same basic premises as Polanyi 1944: generalized market competition 1815-1914 led to self-destruction of European nation-states in 1914-1945
- Arendt stresses **the need for post-national federations to regulate globalized capitalism** = what colonial British & French empires did in a hierarchical way; what Bolsheviks and Nazis did in a totalitarian manner; what the US do in a constitutional & relatively democratic manner
- **European social-democratic nation-states were too small to control & regulate global economic forces**. European social-democratic parties (SPD, Labour, French socialists, etc.) were internationalist in their discourse but not in their political project (nation-centered, lack of federalist dimension).
- This 1951 analysis seems quite relevant for 2026-2027…

- O. Rosenboim, ***The Emergence of Globalism. Visions of World Order in Britain and the United States 1939-1950***. Princeton UP 2017
- Between colonial empires and the cold war: new federal visions of world orders emerge (UN 1945: less ambitious version of these discusions)
- **UK movement Federal Union**: very active in 1938-1940
- April 1940 meeting in Paris between British & French economists to prepare a possible federal union between Britain, France and beyond
- **But wide disagreements about the economic content of federal union**:
- Beveridge, Wooton: social insurance, federal progressive tax on high incomes and inheritance (*Socialism and Federation*, 1941)
- Robbins: ok for federal progressive taxation in case the free movement of labour and trade within the federation is not sufficient to reduce inequality
- Hayek: the only objective of the federation must be to constitutionalize property rights & prevent redistribution (*The Road to Serfdom*, 1944; *Law, legislation and liberty*, 1982; pro-Pinochet in 1973-1990)

## The Great Transformation 1910-1950: the Rise of the Social-Fiscal State, the New Property Regime & the Gradual Decomodification of the Economy

- The « Great Transformation » rests on several pillars:
- **The Rise of the Social-Fiscal State**: less than 10% of GDP in all countries until World War 1, up to 40-50% of GDP in 2025 in Nordic-Western Europe & around 30-35% at the world level (stabilisation since 1980s-1990s, but no sign of reversal or of a come-back to pre-WW1 level)
- **The New Property Regime**: Large Rise of Public Property over 1910-1950 period (& to some extent of Social Property, i.e. Worker-Managed Firms or Codetermination) (but sharp reversal since 1980s-1990s, especially in Western countries) (see next Lecture)
- **The Gradual Decommodification of the Economy**: Rise of Education, Health & Public Services (outside the capitalist logic) (very partial, with some signs of reversals since 1980s-1990s, and also some signs of rising demand for further decommodification: education, health, culture, transport, energy, food, etc.)




# Human Capital & the Uneven Rise of the Social-Fiscal State 1800-2025

(1) This paper builds a new historical database on **public expenditure and its components, and particularly human capital expenditure (% GDP)** covering the entire world (divided into 57 core territories: 48 main countries + 9 residual regions) **over the 1800-2025 period.** Including both public and private education & health expenditure

# whce.world

World Human Capital Expenditure Database


Thammasat University, opened in 1934, was the first public university in Thailand. Photo: National Archives of Thailand. (1934).

(2) **We find a large rise of education and health expenditure (as % GDP) in every world region in the long run**

**We also find very large and persistent inequality in access to education and health between poor and rich countries, with little improvement in recent decades**

E.g. per-school-age-individual public education expenditure in Subsaharan Africa ≈ 3% of Europe/North America level in 2025 in PPP terms (vs 6% in 1980 and 4% in 1950) (gap is even worst in MER)

(3) **We also discuss the implications of our historical findings for the future**

**We find a large impact of education/health on productivity growth 1800-2025** (especially for public education, and especially for poor countries) **and we show that increased expenditure could lead to global productivity convergence by 2100 (around 100€/hour in all world regions)**

See forthcoming GJP scenarios for more detailed analysis of future trajectories (taking into account within-country inequality, structural transformation between sectors, etc.)

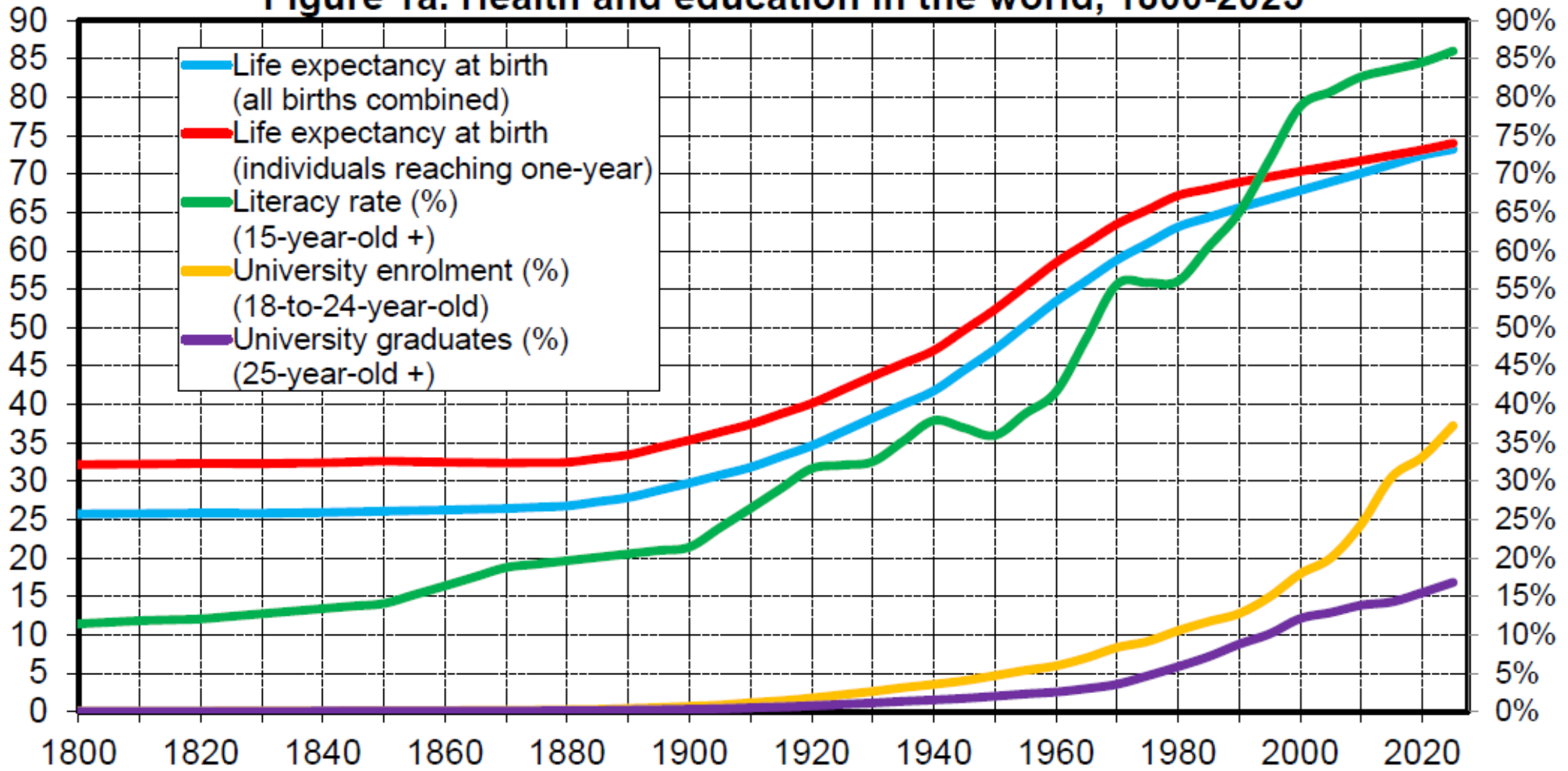
# Relation to the Literature

**(i) Large literature on public expenditure in the long run**
**Mostly focuses on Western countries**
Lindert 1994, 2004, 2021 on rich countries since 1800

(ii) **Recent historical work covering more & more countries in & outside the West**
Bharti and Yang 2024 on China and India since late 19c
Gethin 2024 at global level since 1980

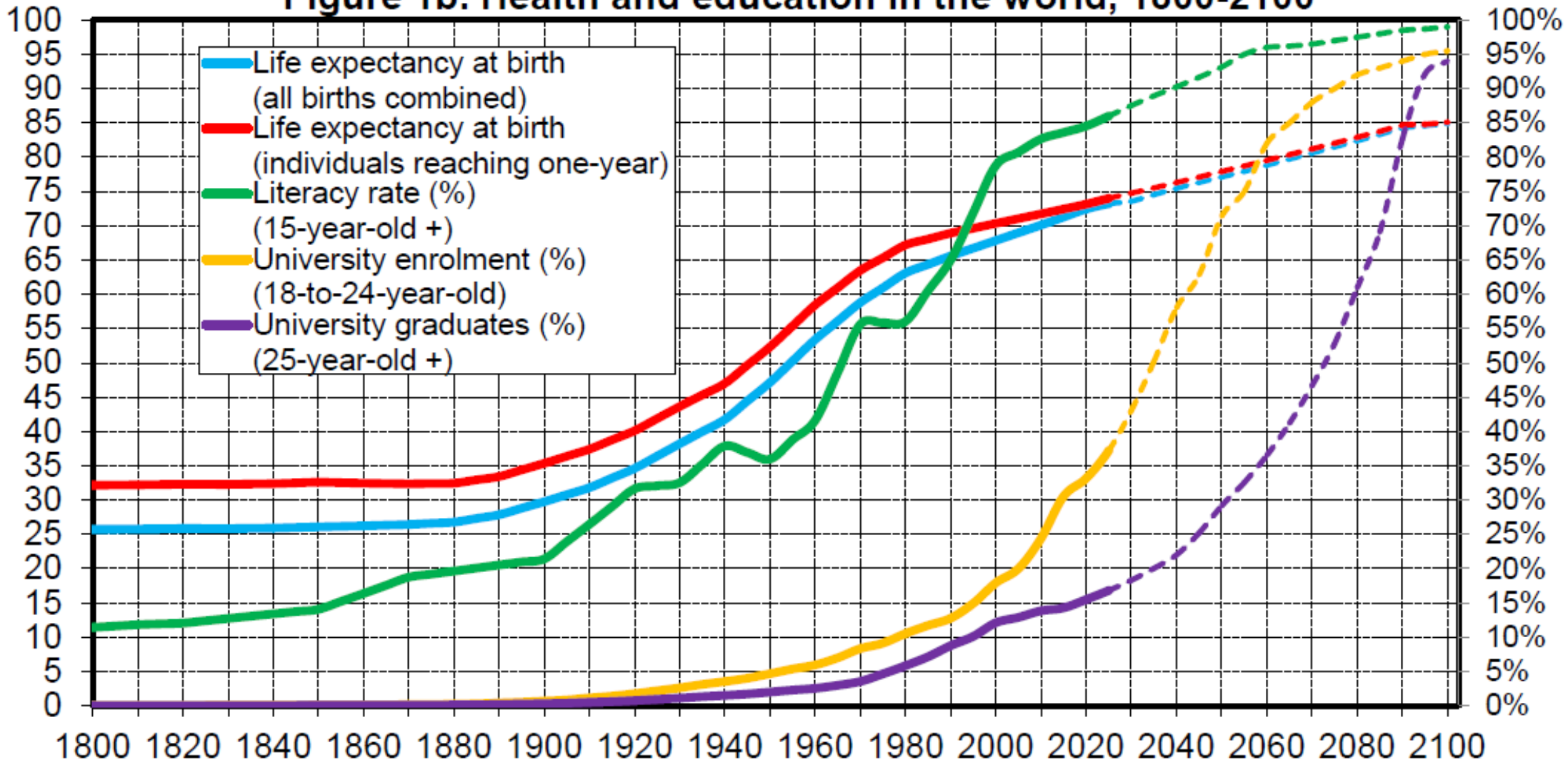
**But no attempt so far to provide consistent historical estimates at the global level:** key contribution of this paper, using new budgetary sources and archival material

## Figure 1a. Health and education in the world, 1800-2025




**Interpretation**. Life expectancy increased from an average of 26 years in the world in 1800 to 73 years in 2025. Life expectancy for those living to age 1 rose from 32 years to 74 years (because infant mortality before age 1 decreased from 20% in 1800 to less than 1% in 2025). The literacy rate for the 15-year-olds-and-over rose from 12% to 86%. University enrolment for the 18-to-24-year-olds rose from less than 1% to 37%. The proportion of university graduates for the 25-year-olds-and-over rise from less than 1% to 17%. **Sources and series**: wid.world

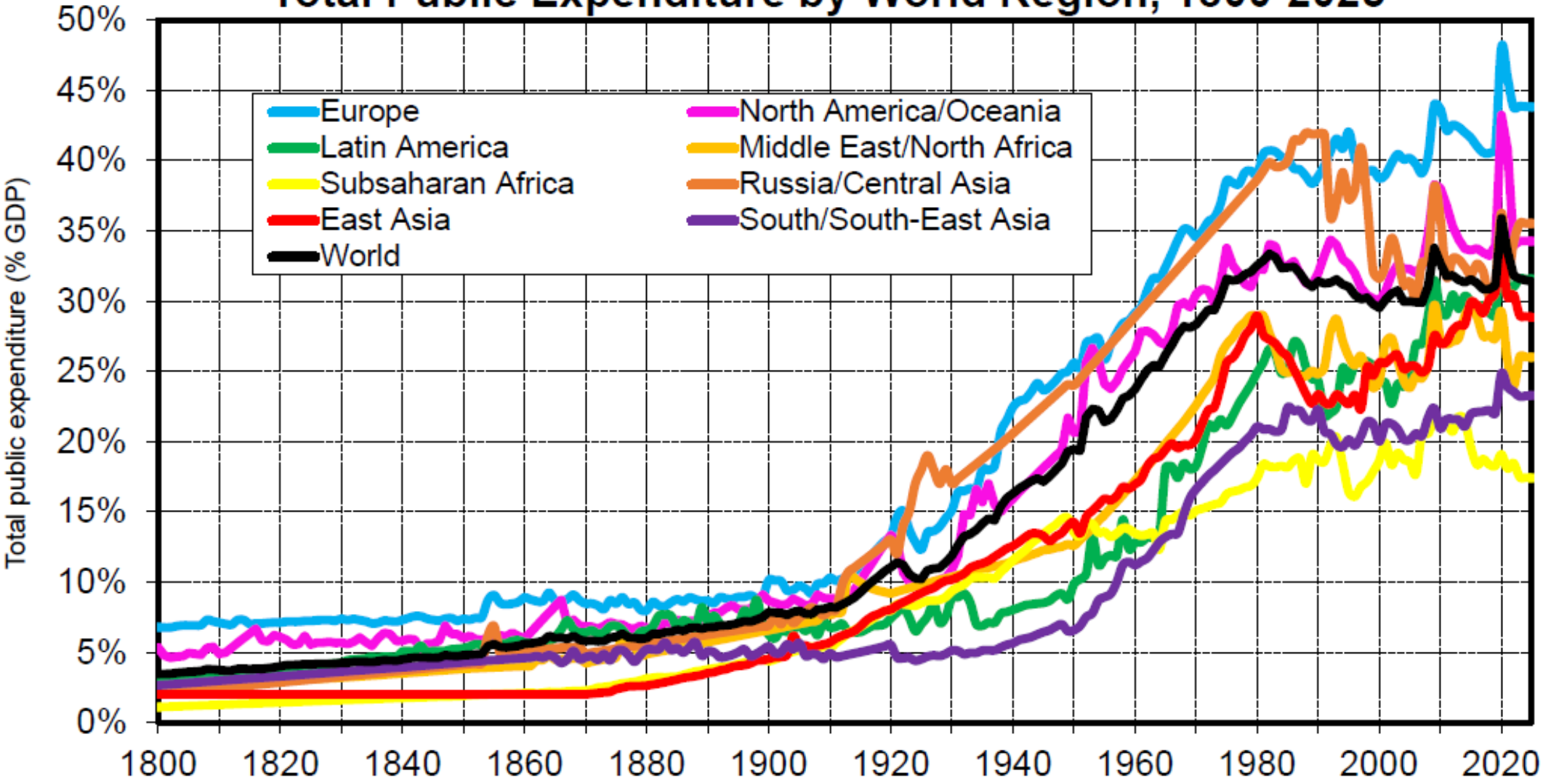
## Figure 1b. Health and education in the world, 1800-2100




**Interpretation**. Assuming that past trends continue in the future, life expectancy could reach about 85 years worldwide by 2100, while literacy rates, university enrolments rates and proportions of university graduates could reach 95% or more. As time passes and quantitative improvements continue, the key question will increasingly become the quality of health care and education provision. **Sources and series**: wid.world

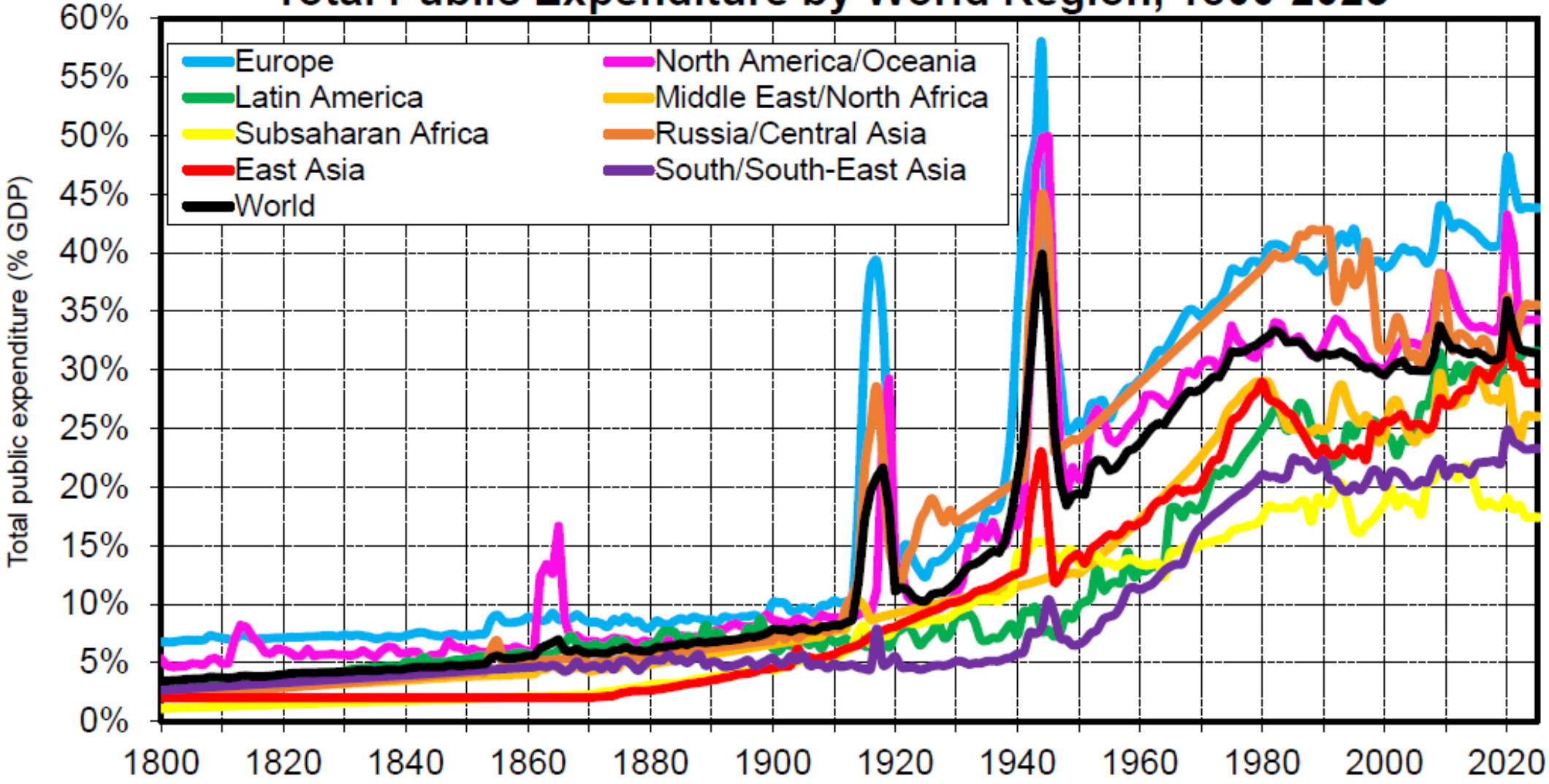
| **The World Human Capital Expenditure Database (WHCE): Geographical Coverage**<br>(57 core territories = 48 main countries + 9 residual regions) | |
|---|---|
| **East Asia** (5) | China, Japan, South Korea, Taïwan<br>Other EASA |
| **Europe** (11) | Britain, Denmark, France, Germany, Italy, Netherlands,<br>Norway, Spain, Sweden, Other W.EUR, Other E.EUR |
| **Latin America** (6) | Argentina, Brasil, Chile, Colombia<br>Mexico, Other LATAM |
| **Middle East/<br>North Africa** (8) | Algeria, Egypt, Iran, Morocco, Saudi<br>Arabia, Turkey, UAE, Other MENA |
| **North America/<br>Oceania** (5) | USA, Canana, Australia, New Zealand<br>Other NAOC |
| **Russia/<br>Central Asia** (2) | Russia<br>Other RUCA |
| **South/South-East<br>Asia** (9) | Bengladesh, India, Indonesia, Myanmar, Pakistan,<br>Philipinnes, Thailand, Vietnam, Other SSEA |
| **Sub-Saharan<br>Africa** (11) | DR Congo, Ethiopa, Kenya, Ivory Coast, Mali, Niger,<br>Nigeria, Rwanda, Sudan, South Africa, Other SSAF |
| Interpretation. The World Human Capital Expenditure Database (WHCE) provides data series for 57 core territories (48 main countries + 9 residual regions, which we define using fixed 2025 borders) covering the entire world over the 1800-2025 period. The database includes series on public expenditure and revenue and their components, expressed as % of GDP. It also includes series on private education & health expenditure and age-adjusted education and health expenditure. Over the recent decades (1980-2025), we provide similar series for 216 core countries and jurisdictions (168 of which define the 9 residual regions), again with fixed 2025 borders, and with additional decompositions (e.g. for primary, secondary and tertiary education). All series are also available and will be regularly updated in the World Inequality Database (wid.world). | |

# Total Public Expenditure by World Region, 1800-2025



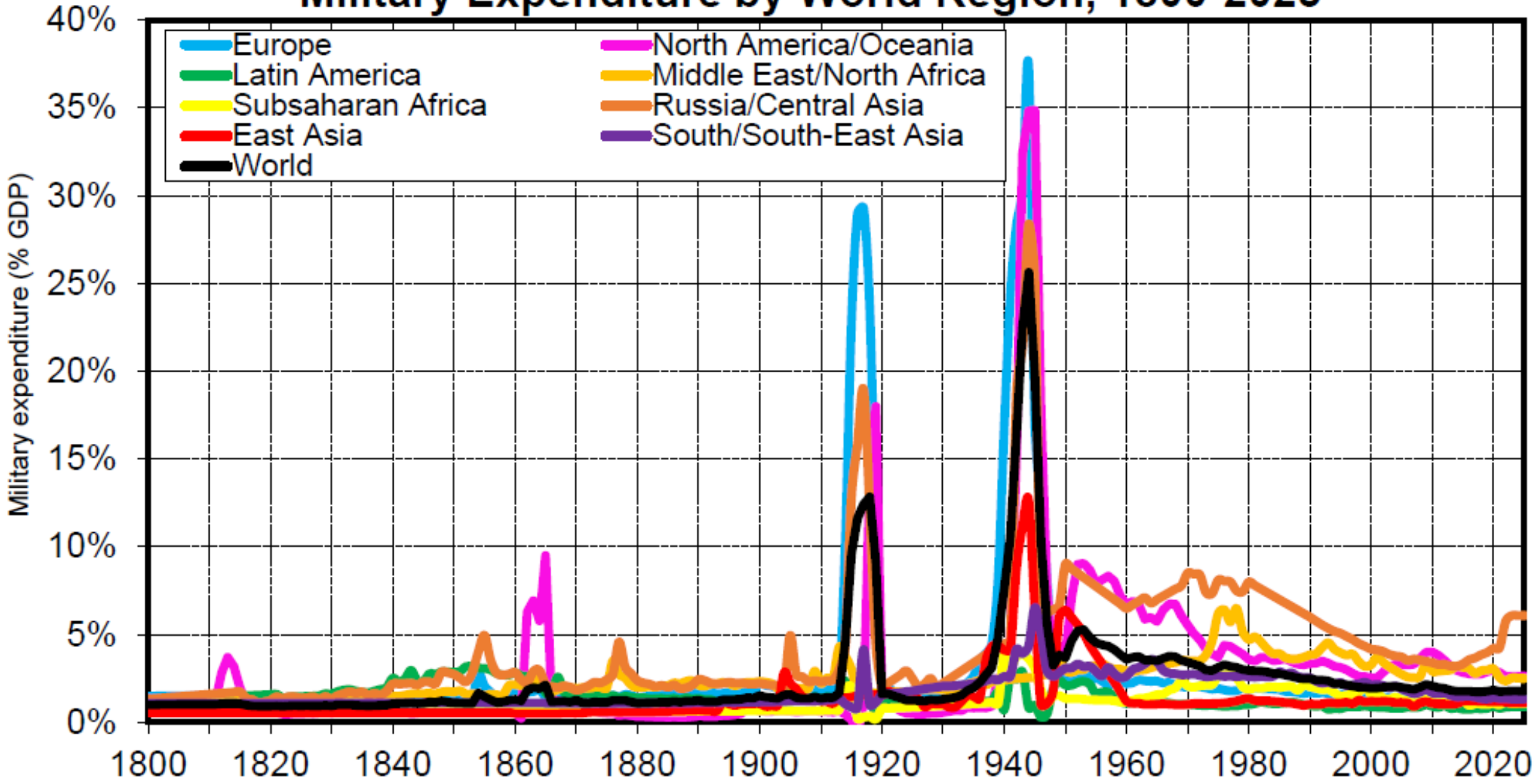

**Interpretation**. Total public expenditure rose from about 3% of global GDP in 1800 to about 31% in 2025, with large regional variations. Total public expenditure includes all expenditures by all public administrations (including central and local government, social security funds, etc.), except interest payments (and except exceptional expenditure during world wars). **Sources and series**: wid.world

# Total Public Expenditure by World Region, 1800-2025




**Interpretation**. Total public expenditure rose from about 3% of global GDP in 1800 to about 31% in 2025, with large regional variations and major spikes around WW1 and WW2. Total public expenditure includes all expenditures by all public administrations (including central and local government, social security funds, etc.), except interest payments. **Sources and series**: wid.world

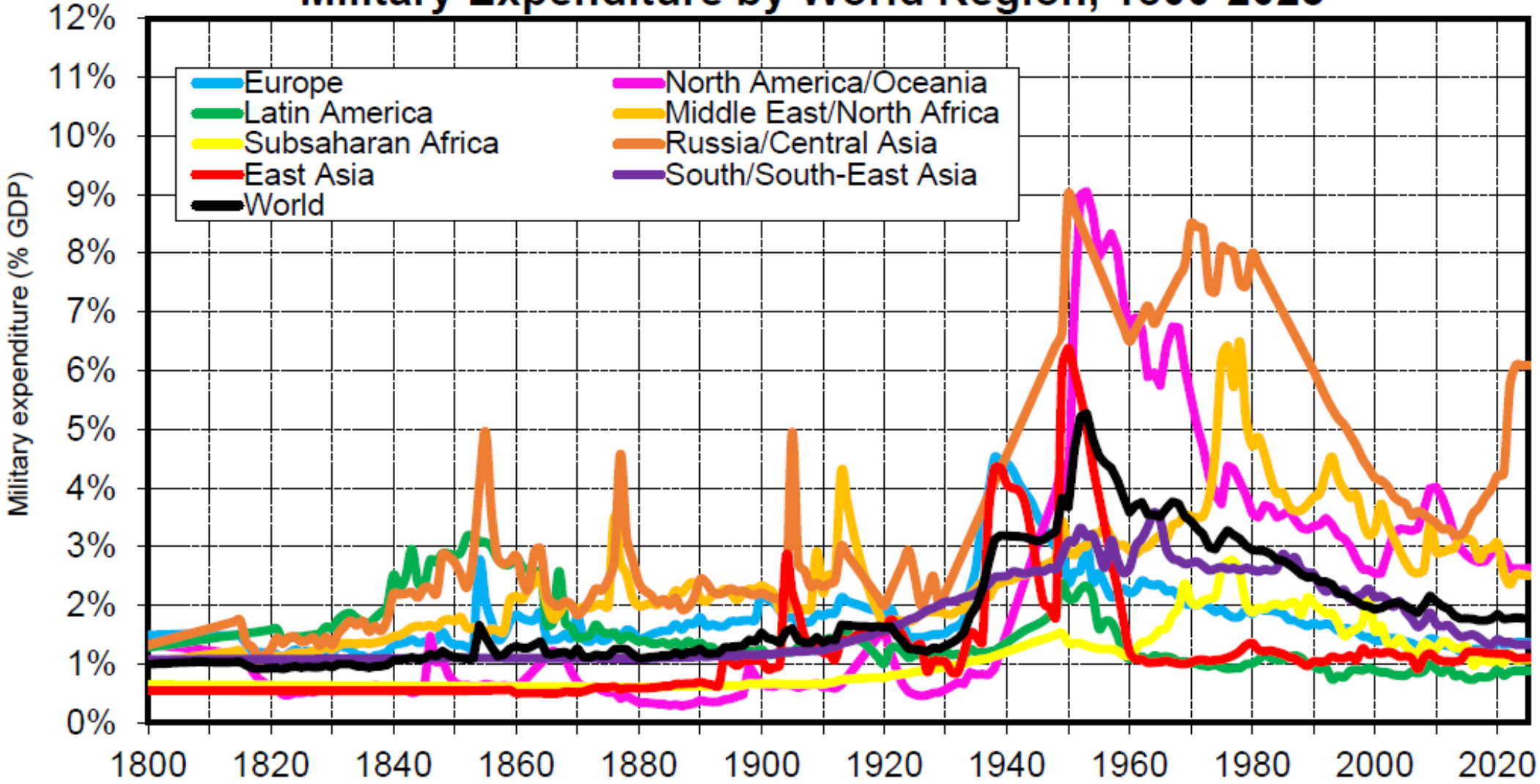
# Military Expenditure by World Region, 1800-2025




**Interpretation**. In most world regions, military expenditure has generally oscillated around 1-2% of GDP, with major spikes during world wars (20-30% of GDP or more) and very high levels in USA-USSR during the cold war (5-10% of GDP).

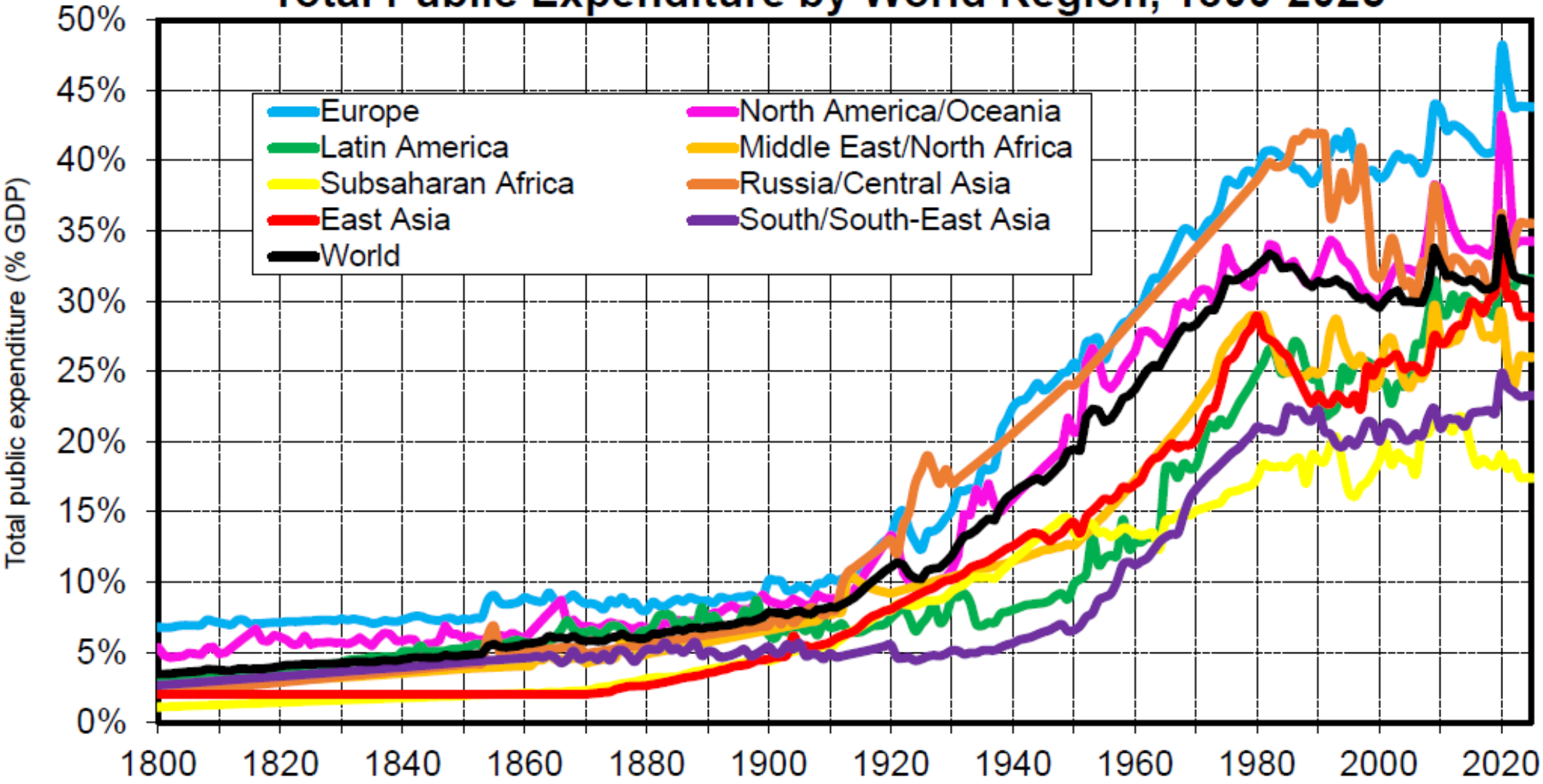
**Sources and series**: wid.world

# Military Expenditure by World Region, 1800-2025



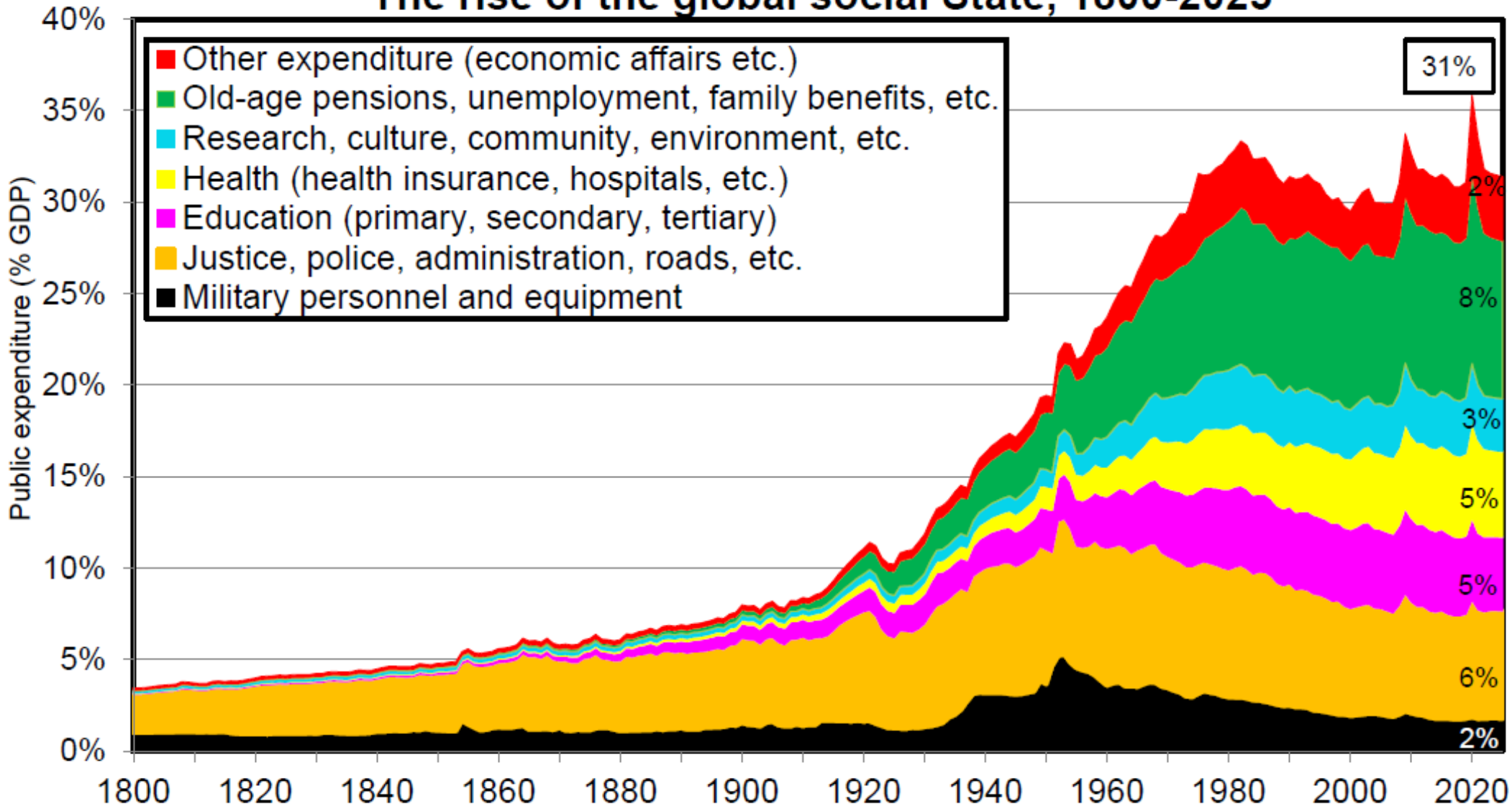

**Interpretation**. After excluding exceptional military expenditure during world wars, we find that military expenditure has generally oscillated around 1-2% of GDP in most world regions over the 1800-2025 period, with unusually high levels in USA-USSR during the cold war (5-8% of GDP). **Sources and series**: wid.world

# Total Public Expenditure by World Region, 1800-2025



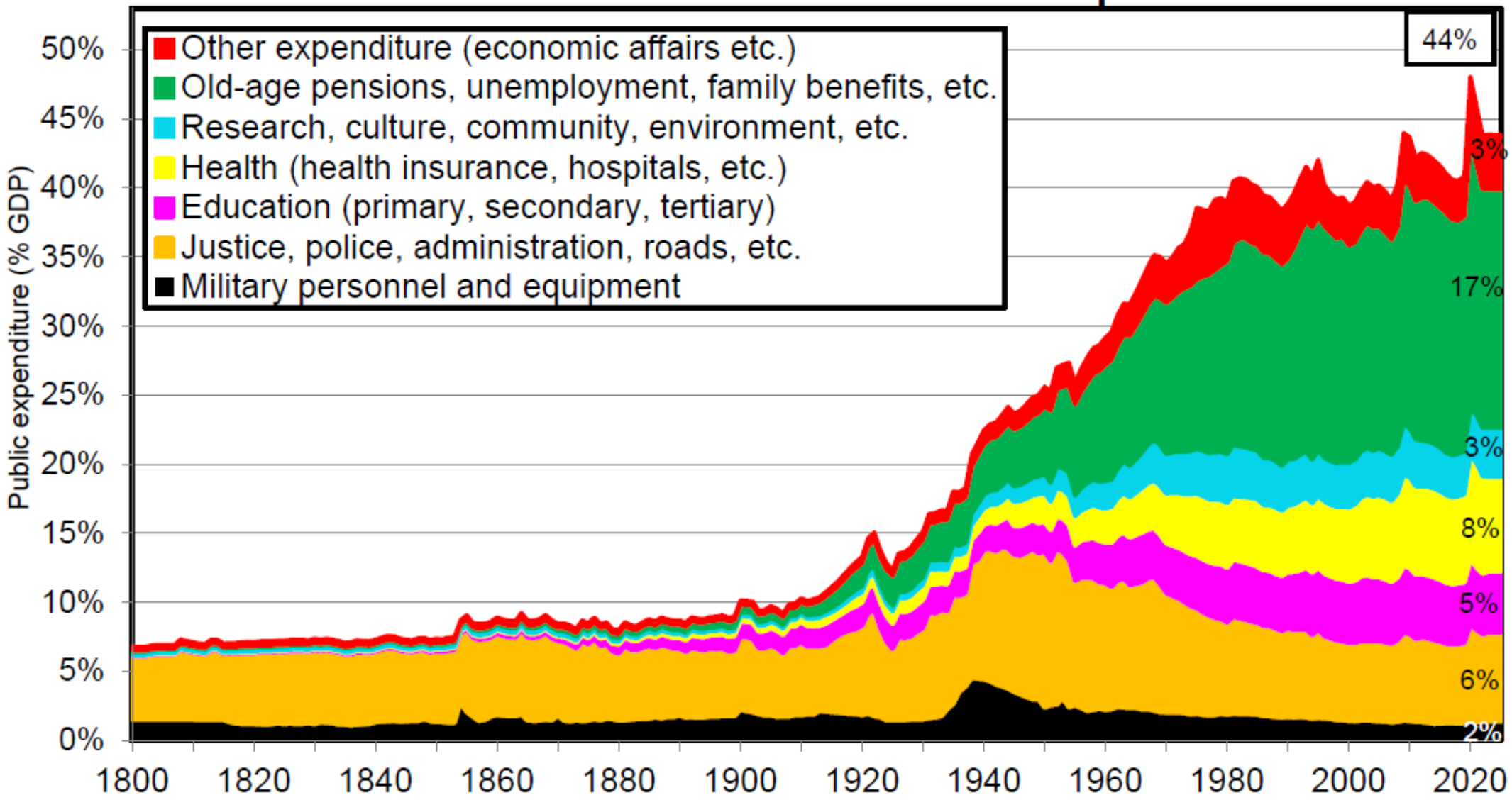

**Interpretation**. Total public expenditure rose from about 3% of global GDP in 1800 to about 31% in 2025, with large regional variations. Total public expenditure includes all expenditures by all public administrations (including central and local government, social security funds, etc.), except interest payments (and except exceptional expenditure during world wars). **Sources and series**: wid.world

# The rise of the global social State, 1800-2025



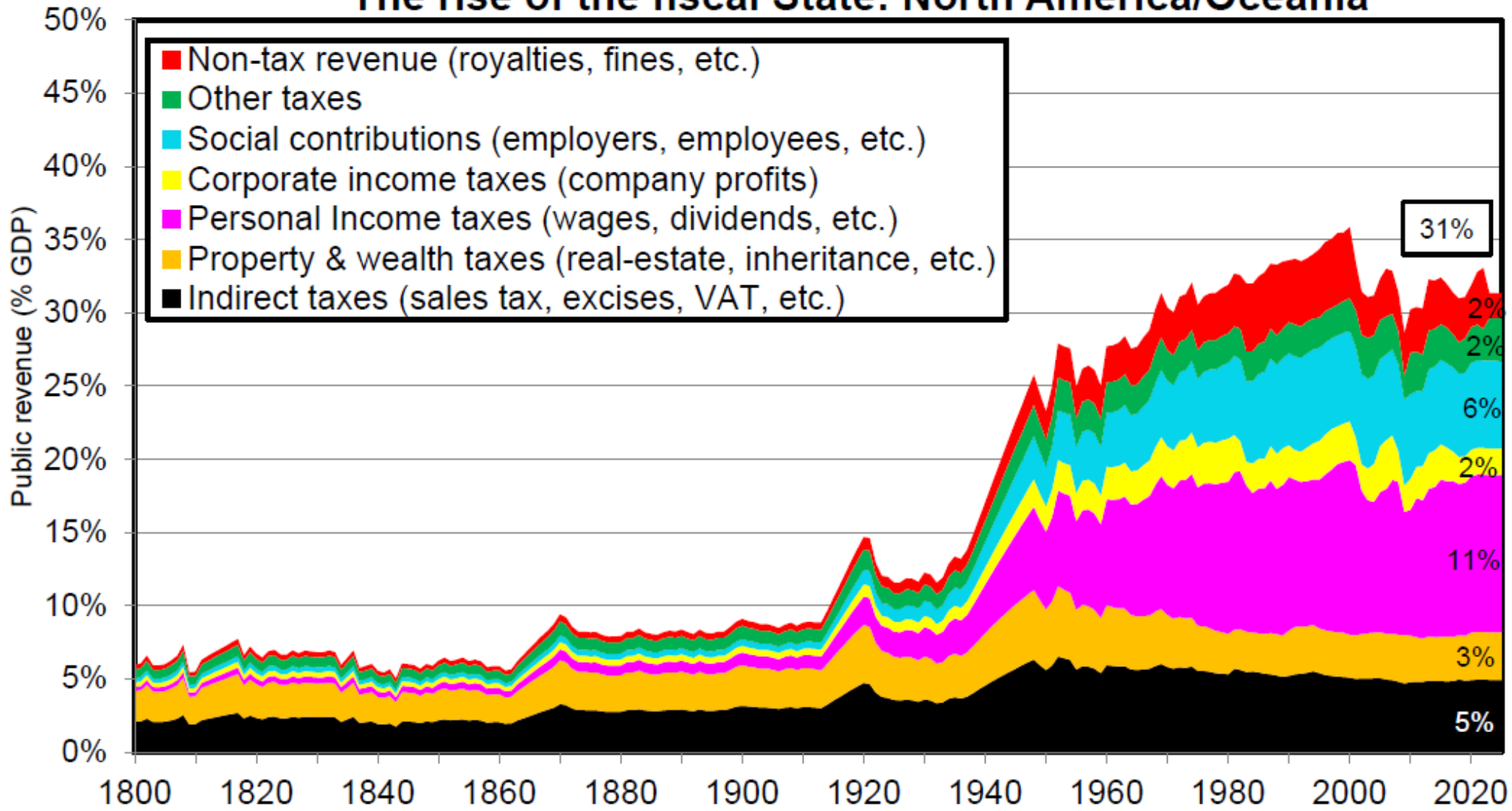

**Interpretation.** In 2025, total public expenditure amounts to about 31% of global GDP (PPP), including about 2% for military expenditure, 6% for general public services (justice, police, general administration, roads, etc.), 5% for education, 5% for health, 3% for research, culture/recreation/religion, community services (water, light, etc.), environmental protection (waste, biodiversity, etc.), 8% for social protection (old-age pensions, unemployment, family benefits, maternity, sick-leave, safety nets, etc.) and 2% for other expenditures (economic affairs excluding roads and basic infrastructures included in general public services). **Sources and series**: wid.world

# The rise of the social State: Europe



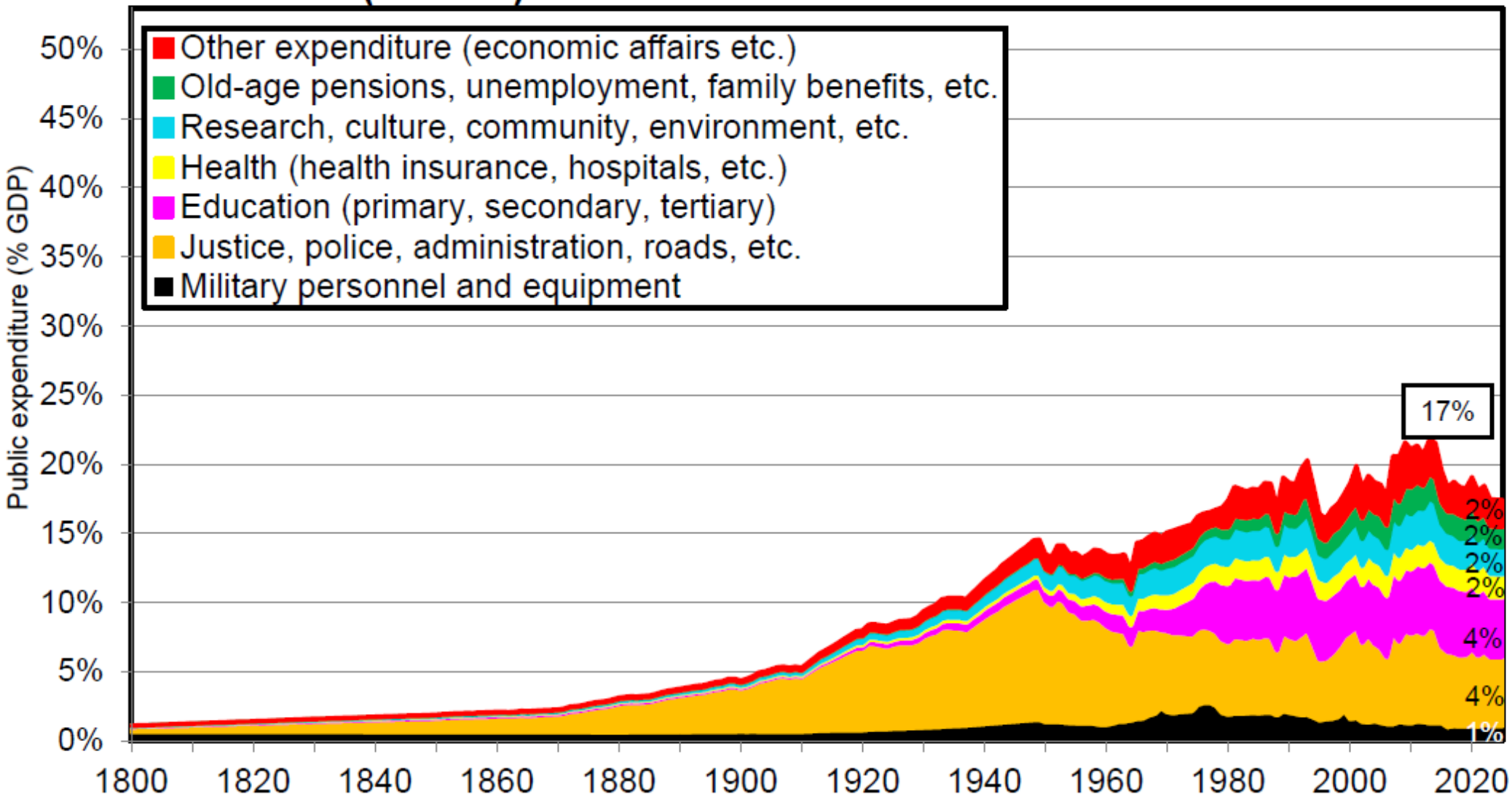

**Interpretation.** In 2025, total public expenditure amounts to about 44% of GDP in Europe, including about 2% for military expenditure, 6% for general public services (justice, police, general administration, roads, etc.), 5% for education, 8% for health, 3% for research, culture/recreation/religion, community services (water, light, etc.), environmental protection (waste, biodiversity, etc.), 17% for social protection (old-age pensions, unemployment, family benefits, maternity, sick-leave, safety nets, etc.) and 3% for other expenditures (economic affairs excluding roads and basic infrastructures included in general public services). **Sources and series**: wid.world

# The rise of the fiscal State: North America/Oceania



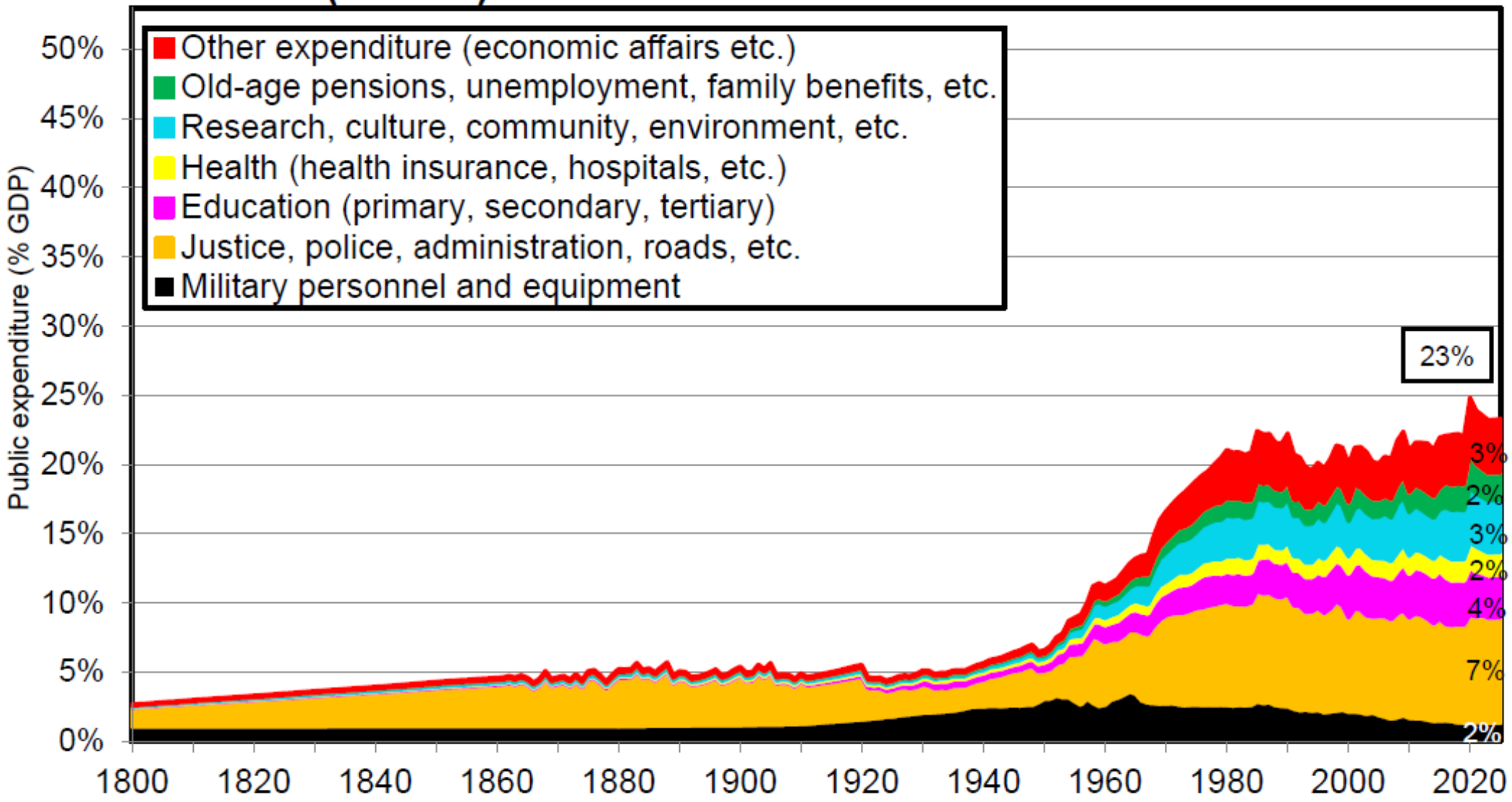

**Interpretation.** In 2025, total public revenue amounts to about 31% of GDP in North America/Oceania, including 5% for indirect taxes (sales taxes, excises, etc.), 3% for property and wealth taxes (annual taxes on real estate & other property, inheritance taxes, etc.), 11% for personal income taxes (taxes on household income: wages, dividends, etc.), 2% for corporate income taxes (taxes on company profits), 6% sor social contributions (employers, employees, self-employed), 2% for other taxes and 2% for non-tax revenue (royalties, fines, etc.). **Sources and series**: wid.world

# The (limited) rise of the social State: Subsaharan Africa



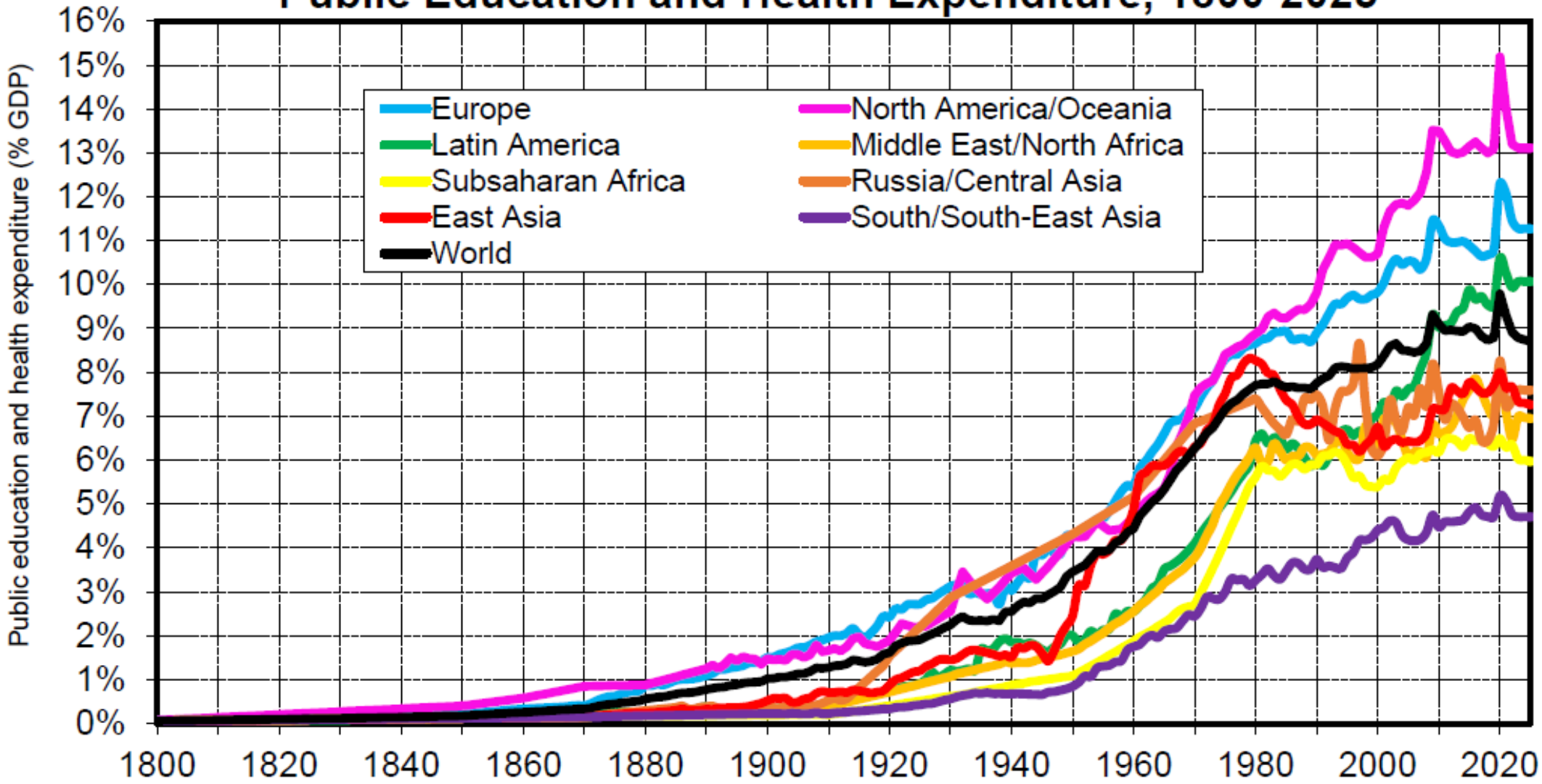

**Interpretation.** In 2025, total public expenditure amounts to about 17% of GDP in Subsaharan, including about 1% for military expenditure, 4% for general public services (justice, police, general administration, roads, etc.), 4% for education, 2% for health, 2% for research, culture/recreation/religion, community services (water, light, etc.), environmental protection (waste, biodiversity, etc.), 2% for social protection (old-age pensions, unemployment, family benefits, maternity, sick-leave, safety nets, etc.) and 2% for other expenditures (economic affairs excluding roads and basic infrastructures included in general public services). **Sources and series**: wid.world

# The (limited) rise of the social State: South/South-East Asia



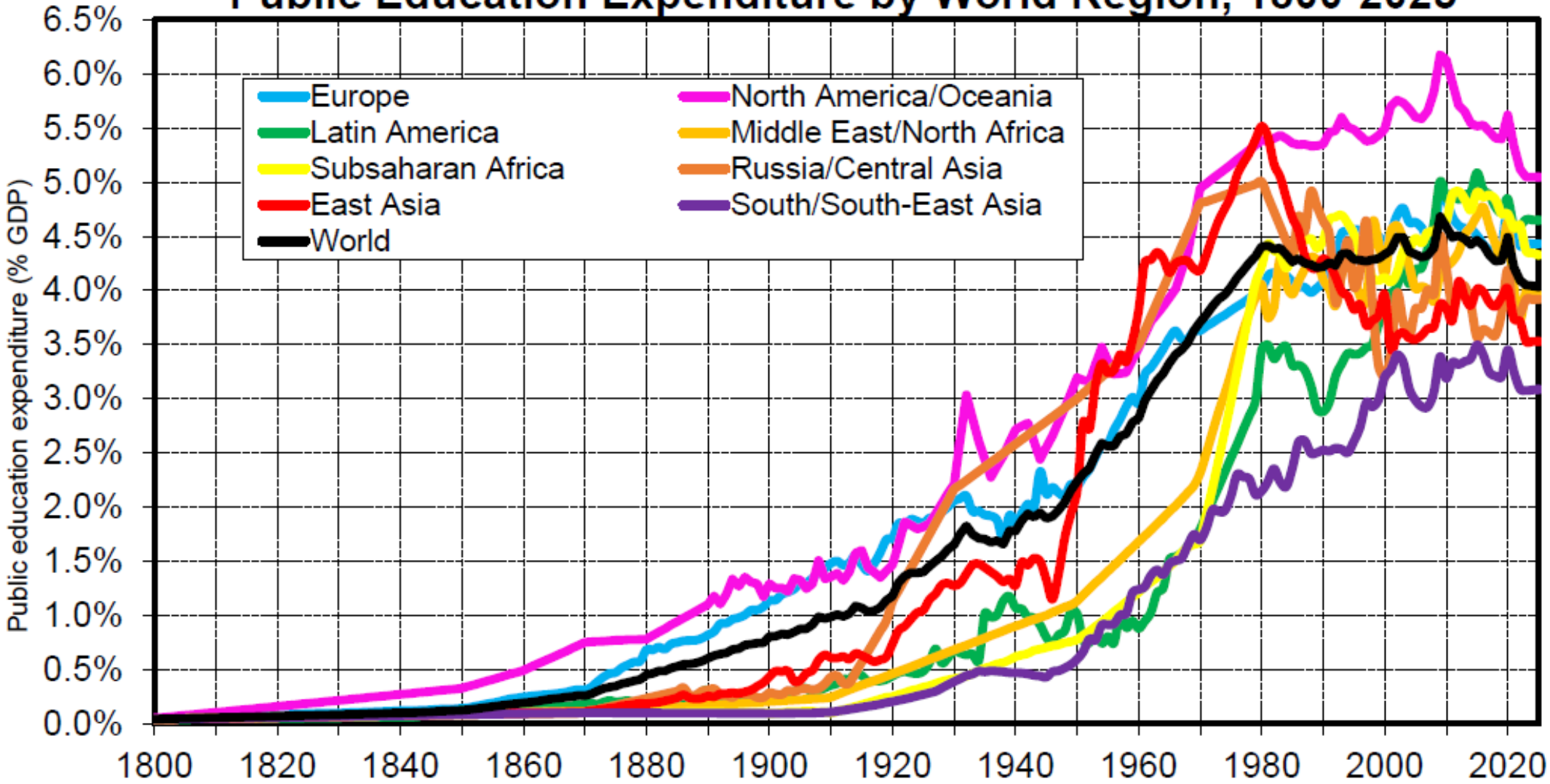

**Interpretation.** In 2025, total public expenditure amounts to about 23% of GDP in South & South-East Asia, including about 2% for military expenditure, 7% for general public services (justice, police, general administration, roads, etc.), 4% for education, 2% for health, 3% for research, culture/recreation/religion, community services (water, light, etc.), environmental protection (waste, biodiversity, etc.), 2% for social protection (old-age pensions, unemployment, family benefits, maternity, sick-leave, safety nets, etc.) and 3% for other expenditures (economic affairs excluding roads and basic infrastructures included in general public services). **Sources and series**: wid.world

# Public Education and Health Expenditure, 1800-2025



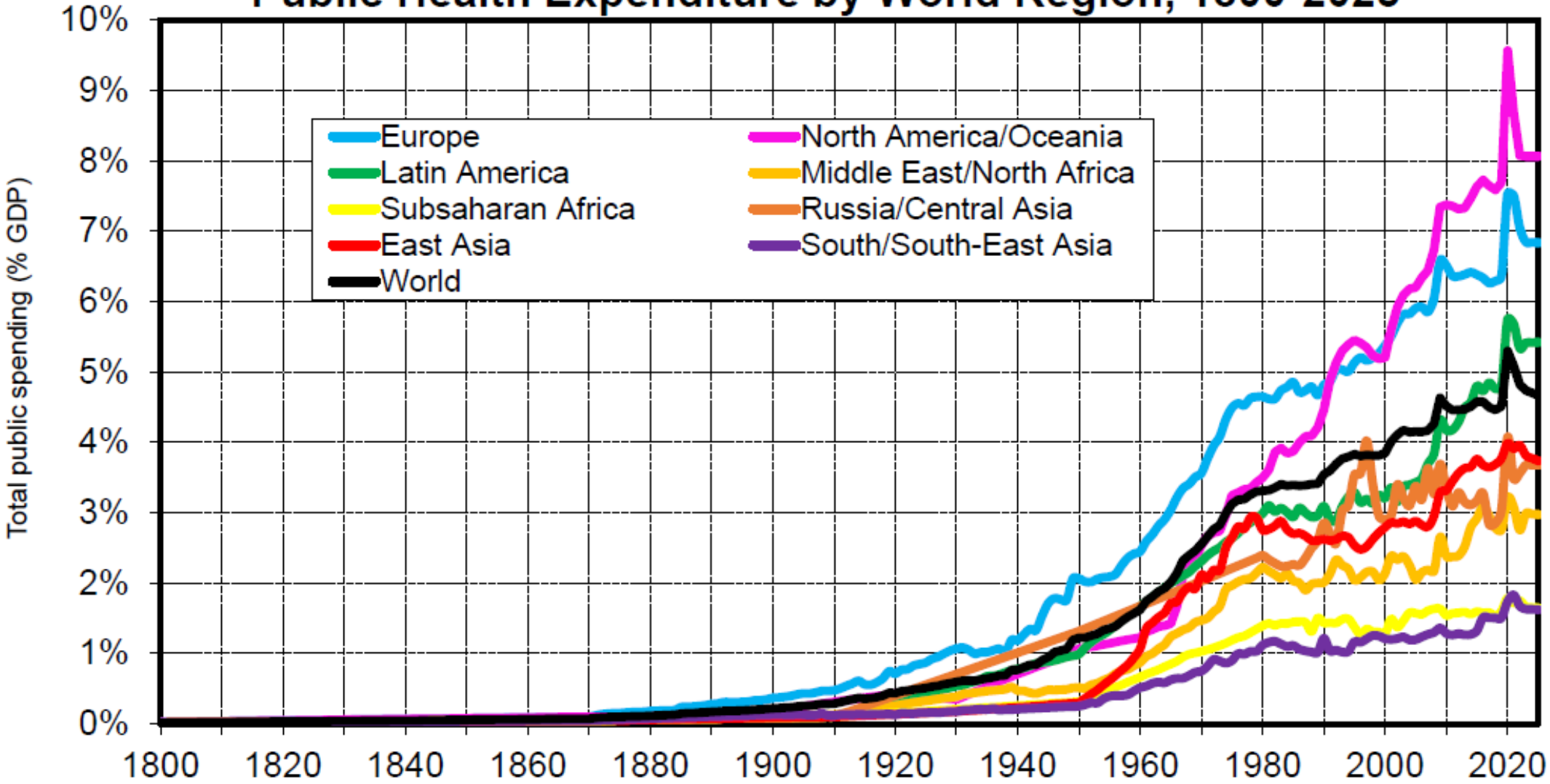

**Interpretation**. Public education and health expenditure rose from less than 1% of GDP before 1900 to about 9% of GDP in 2025 at the global level, with large regional variations (from about 5-6% of GDP in South & South East Asia and Subsaharan Africa to 11-14% of GDP in Europe and North America/Oceania). **Sources and series**: wid.world

# Public Education Expenditure by World Region, 1800-2025



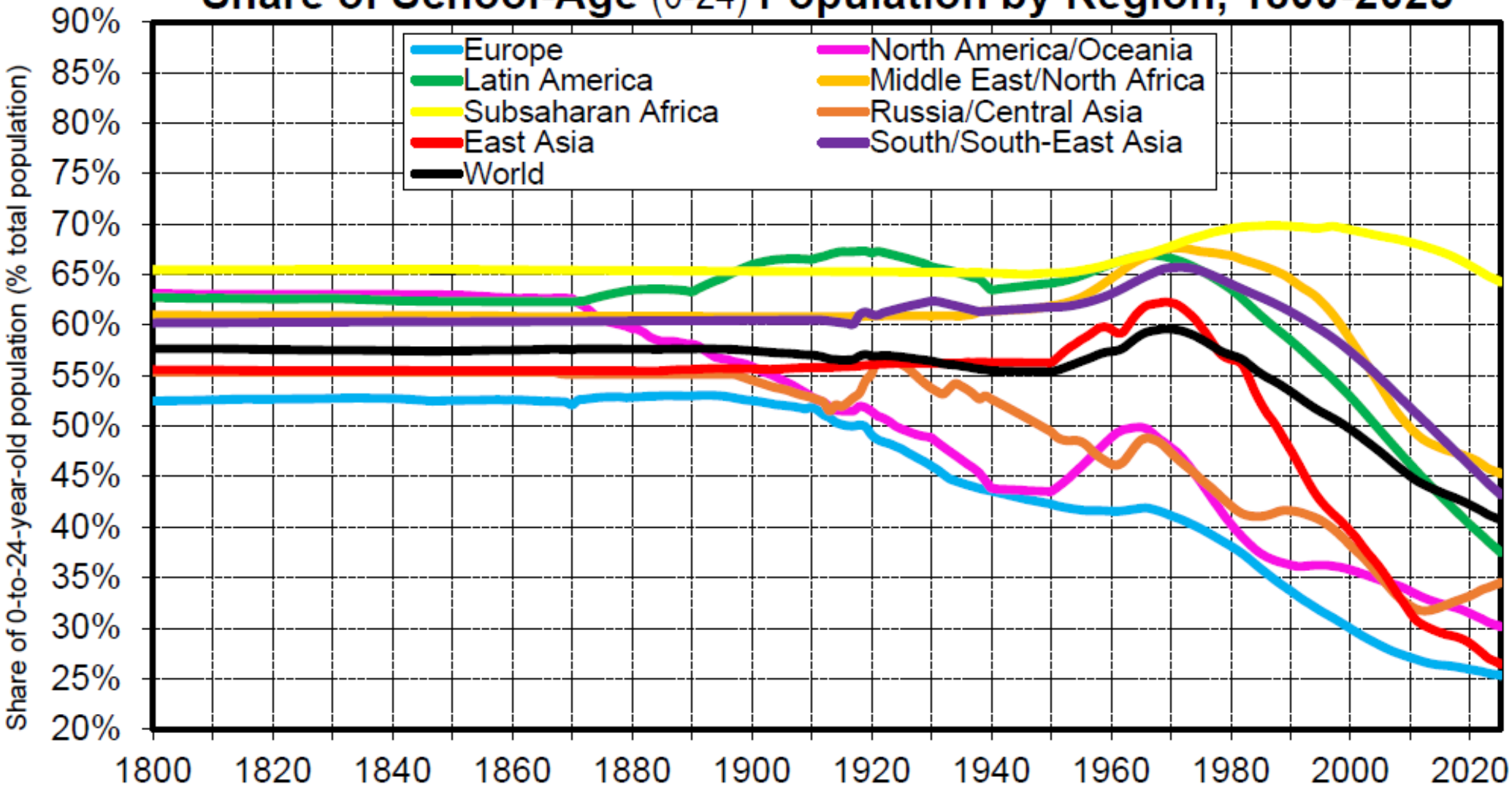

**Interpretation**. Public education expenditure rose from less 1% of GDP before 1900 to about 4-4.5% of GDP at the global level in 2025, with surprisingly similar levels in many world regions, including Europe and Subsaharan Africa. However the share of school-age population in total population varies widely across regions (e.g. it is more than 2.5 times as large in SSAF than in Europe). It is therefore critical to look at age-corrected education expenditures in order to make meaningul comparisons. **Sources and series**: wid.world

# Public Health Expenditure by World Region, 1800-2025




**Interpretation**. Public health expenditure was less than 0.5% before 1900 and is about 5% of GDP in 2025, with enormous variations across world regions, from 1-2% of GDP in South & South-East Asia and Subsaharan Africa to 7-8% of GDP in Europe and North America/Oceania. These very large gaps are partly due to different age structures (with a much larger old-age population share in richer countries). Like for education, one needs to analyze age-corrected health expenditure in order to make proper comparisons. **Sources and series**: wid.world

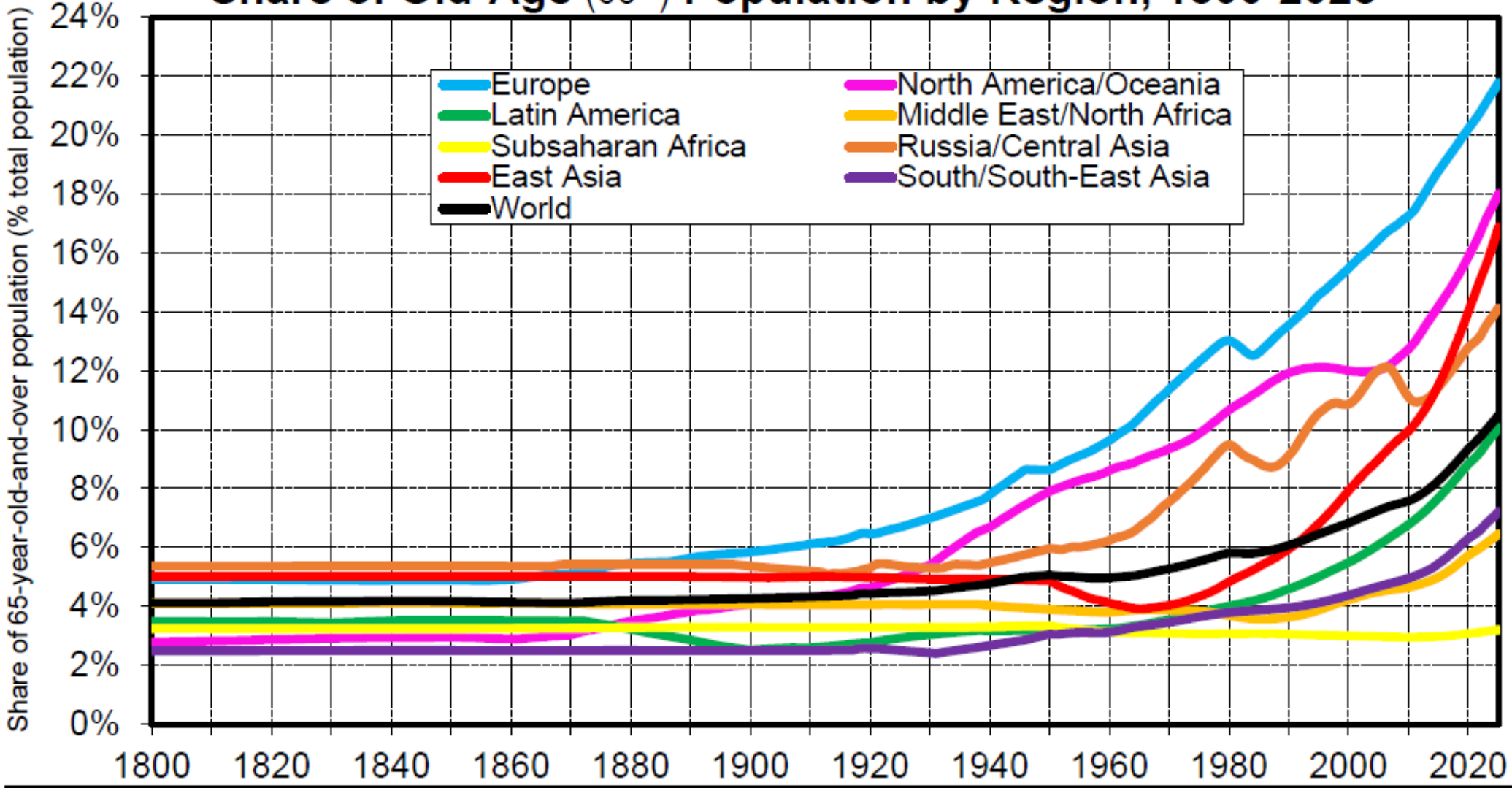
# Share of School-Age (0-24) Population by Region, 1800-2025




**Interpretation**. The share of school-age population (0-to-24 year-old) varies enormously across world regions in 2025, from 23% in East Asia and 25% in Europe to 64% in Subsaharan Africa. Given that most of education expenditures are devoted to this age group, critical to include some age adjustement in order to evaluate the impact of education expenditure.

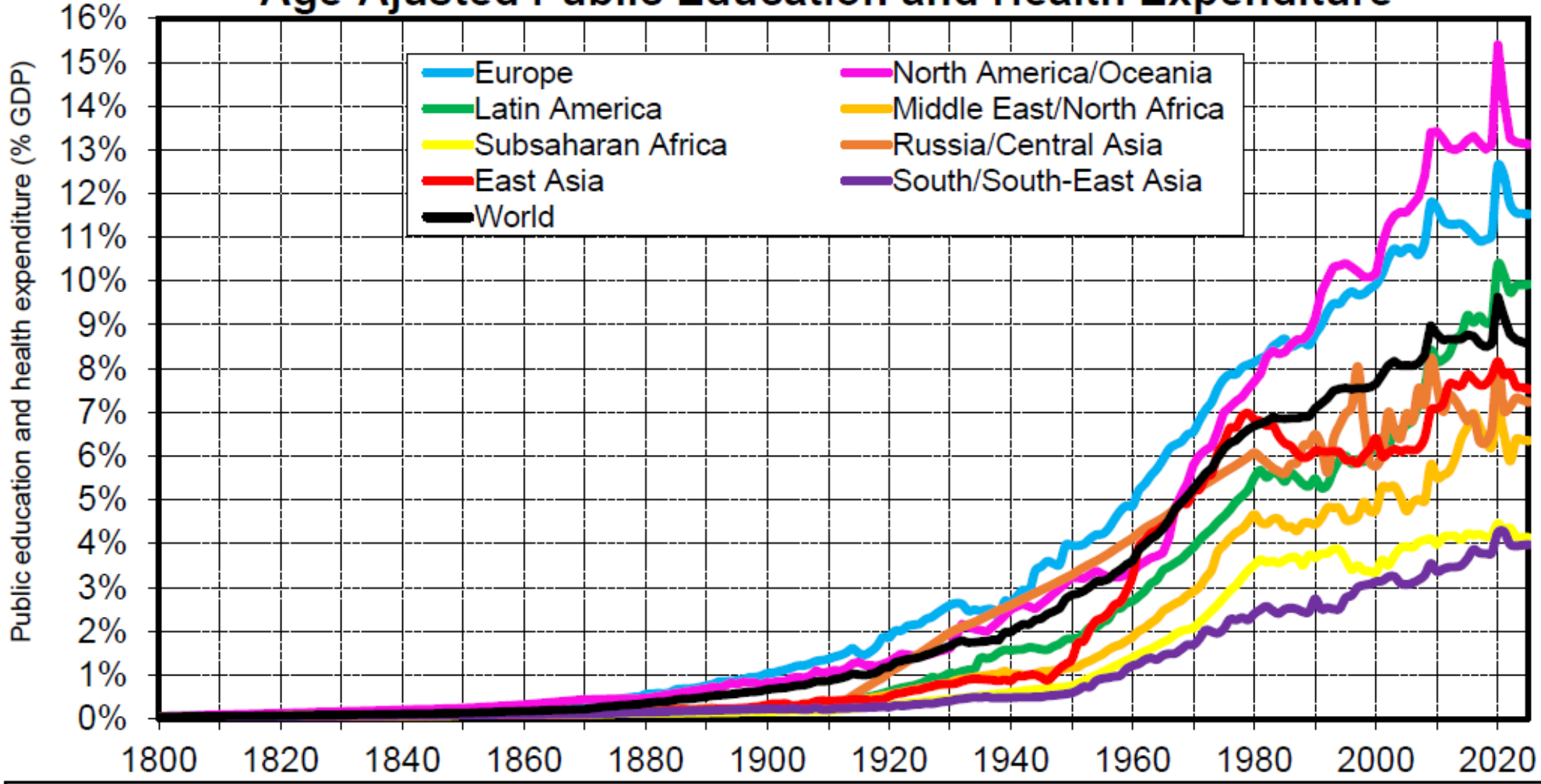
**Sources and series**: see wid.world

# Share of Old-Age (65+) Population by Region, 1800-2025



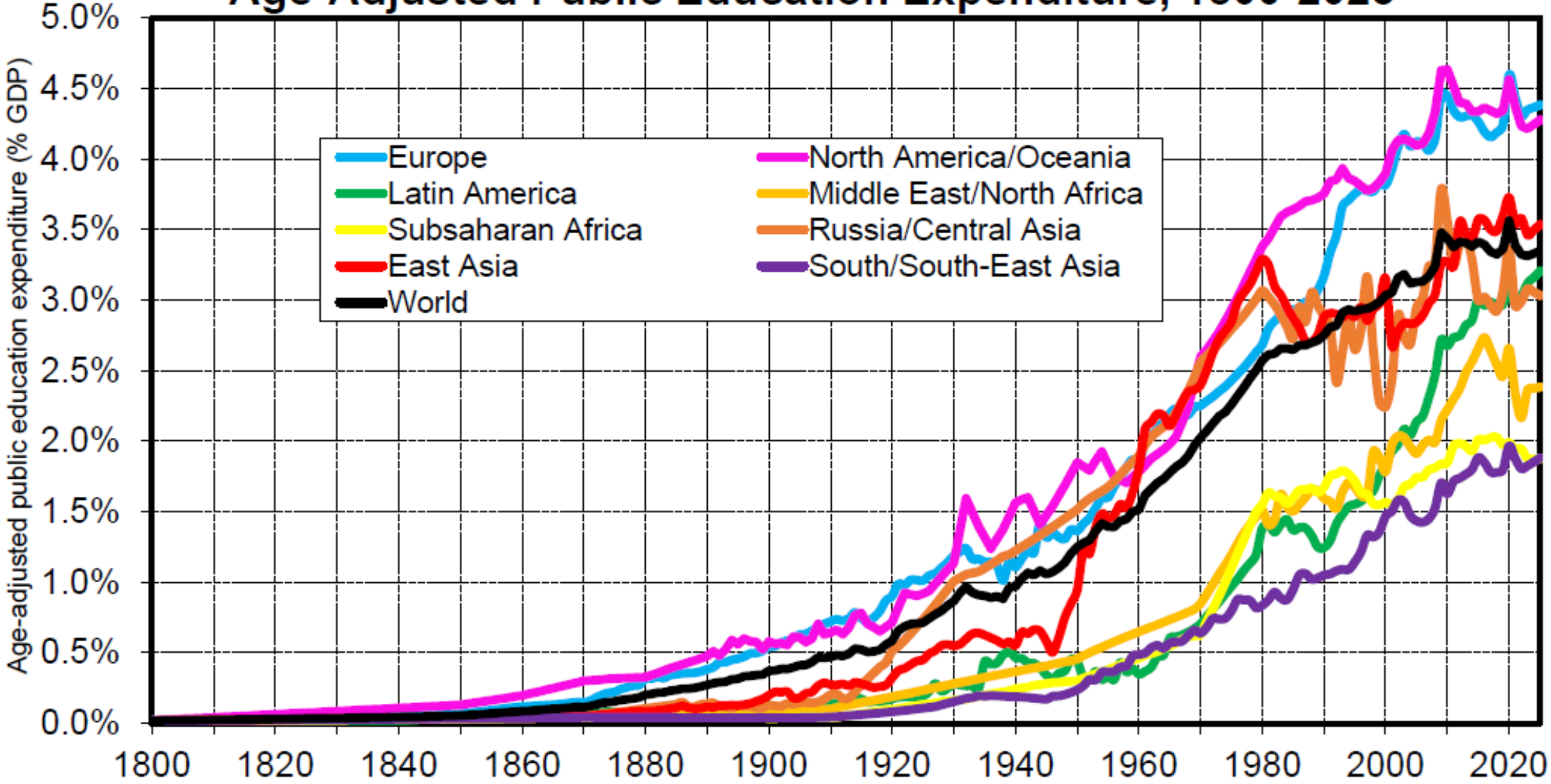

**Interpretation**. The share of old-age population (65-year-old-and-over) varies enormously across world regions in 2025, from 3% in Subsaharan Africa to 22% in Europe. Given that the per capita health expenditure received by this age group is substantially larger than that received by indiviuals aged 0-to-64 (on average about 3 times larger in recent decades) is critical to include some age adjustement in order to evaluate the impact of health expenditure. **Sources and series**: see wid.world

# Age-Ajusted Public Education and Health Expenditure



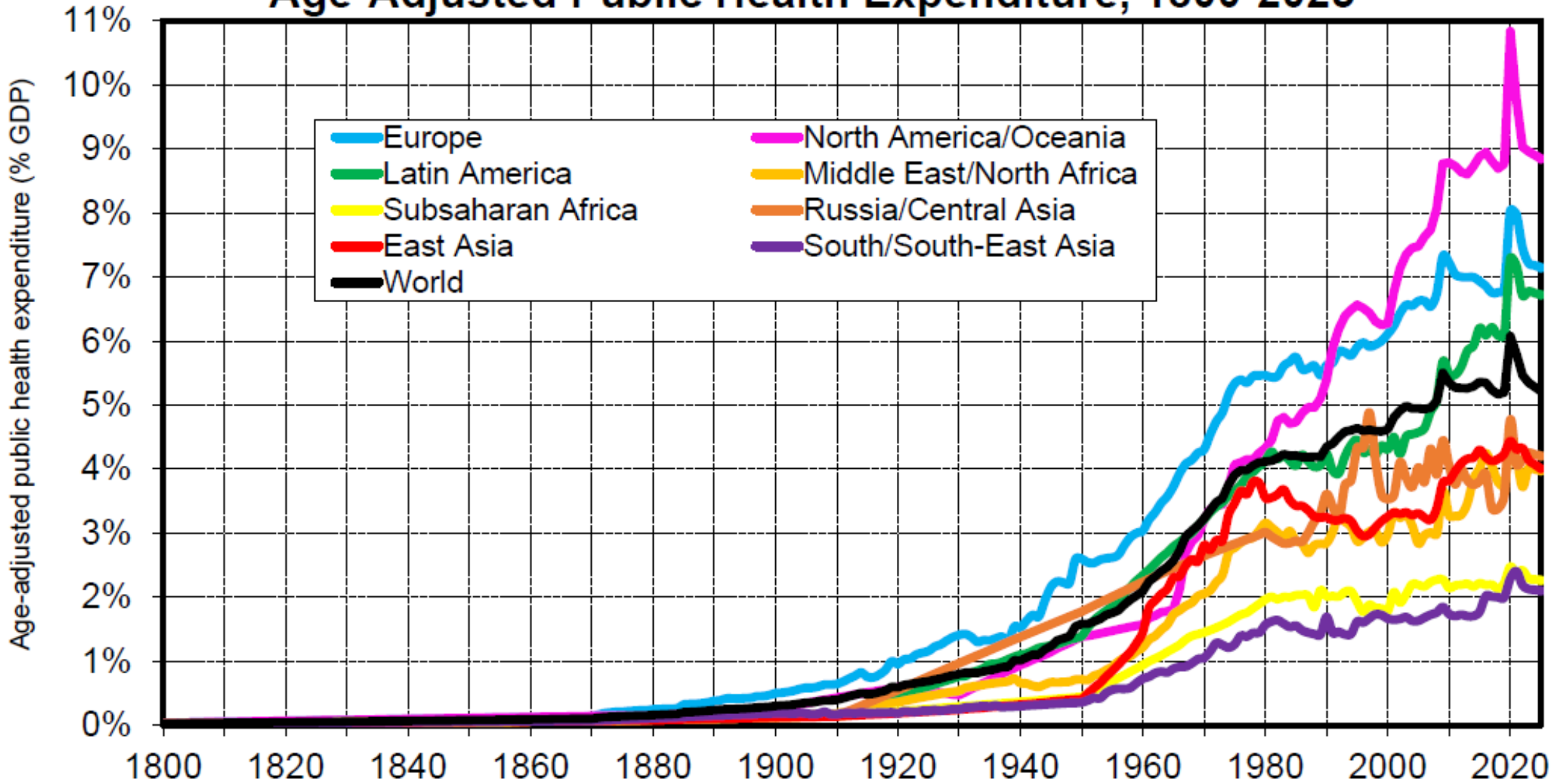

**Interpretation**. Total age-adjusted public education and health expenditure has increased from less than 1% of GDP before 1900 to 9% of GDP in 2025 at the global level, with very large gaps between regions, from 4% of GDP in South & South-East Asia and Subsaharan Africa to 12-13% in Europe and North America/Oceania. The gaps are somewhat larger after age adjustement, as the unequalizing impact of education adjustment more than counterbalances the equalizing impact of health adjustment (especially for SSAF). **Sources and series**: wid.world

# Age-Adjusted Public Education Expenditure, 1800-2025



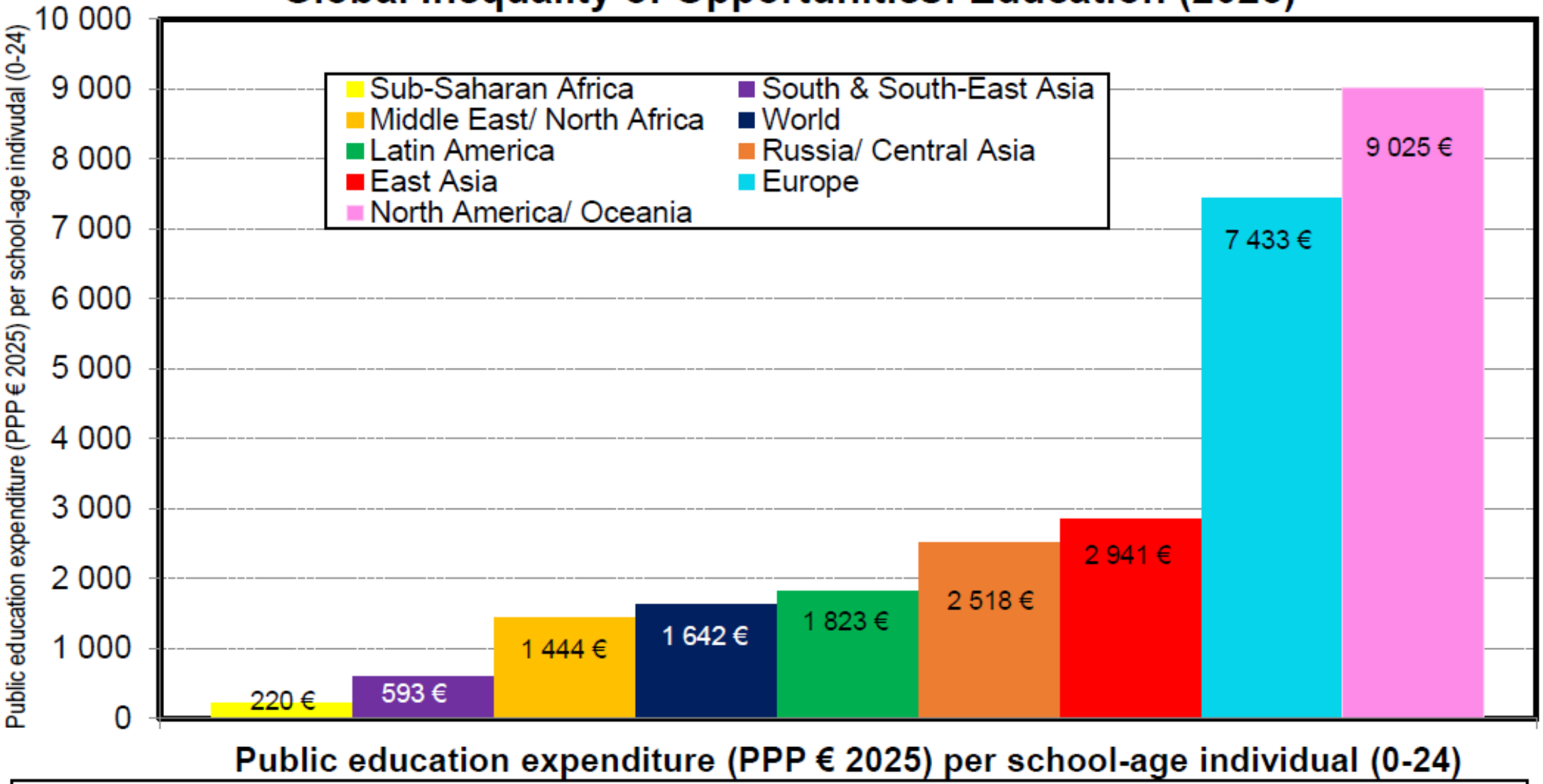

**Interpretation**. Adjusting for the age structure, i.e. assuming that the share of school-age population (0-to-24-year-old) is equal to 25% in all countries-years (≈ Europe 2025) and keeping the same per-school-age-individual expenditure as in observed country-year, we find that public education expenditure varies from about 2% of GDP in Subsaharan Africa and South & South-East Asia to about 4.5% of GDP in Europe and North America/Oceania. **Sources and series**: wid.world

# Age-Adjusted Public Health Expenditure, 1800-2025



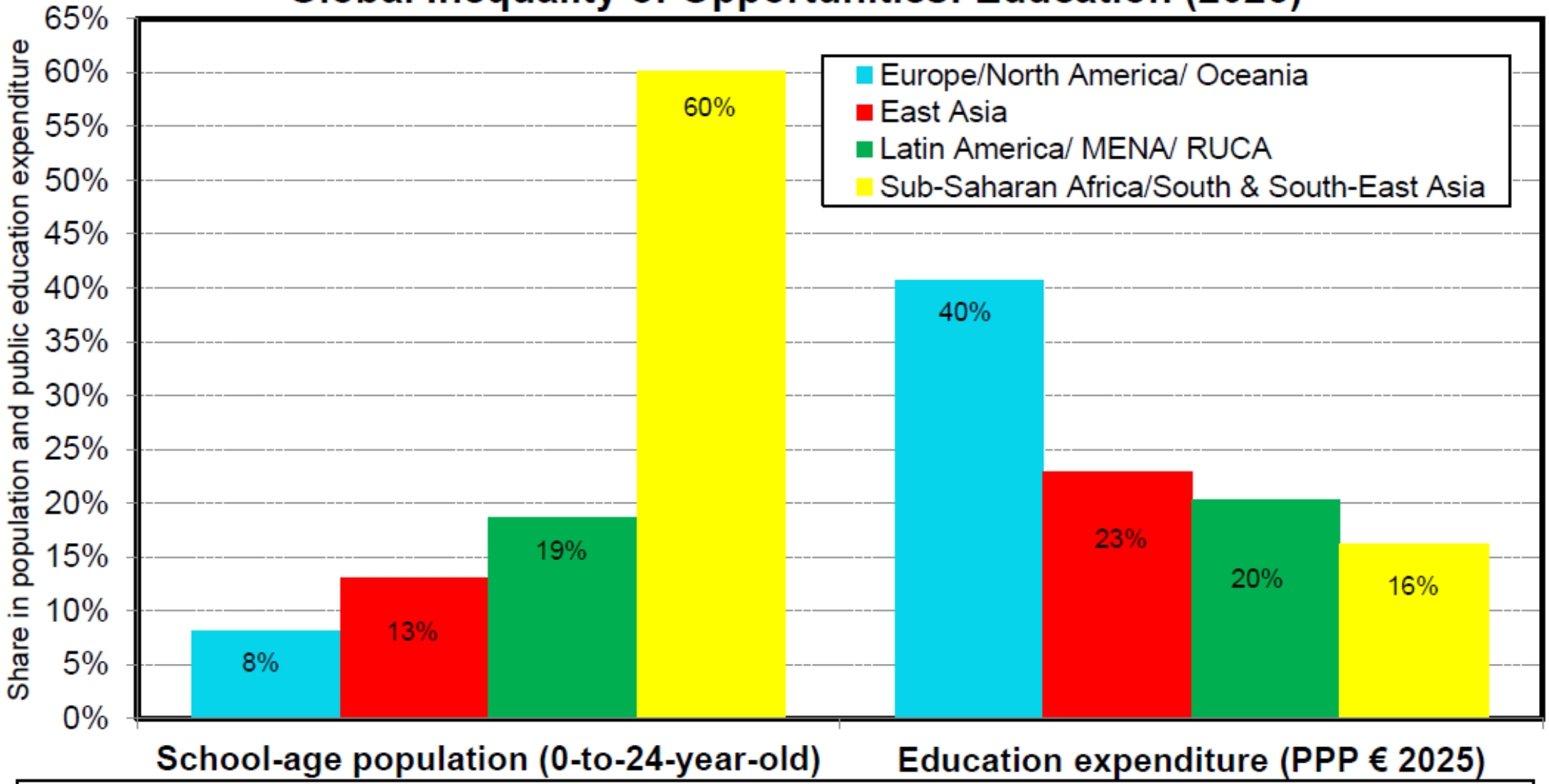

**Interpretation**. Adjusting for the age structure, i.e. assuming that the share of old-age population (65-year-old+) is equal to 25% in all countries (≈Europe 2030) and taking into account that average per capita health expenditure is on average about 3 times larger for old-age individuals than for the rest of the population, we find that public health expenditure varies from about 2% of GDP in Subsaharan Africa and South & South-East Asia to about 8-9% of GDP in Europe and North America/Oceania. **Sources and series**: wid.world

# Global Inequality of Opportunities: Education (2025)



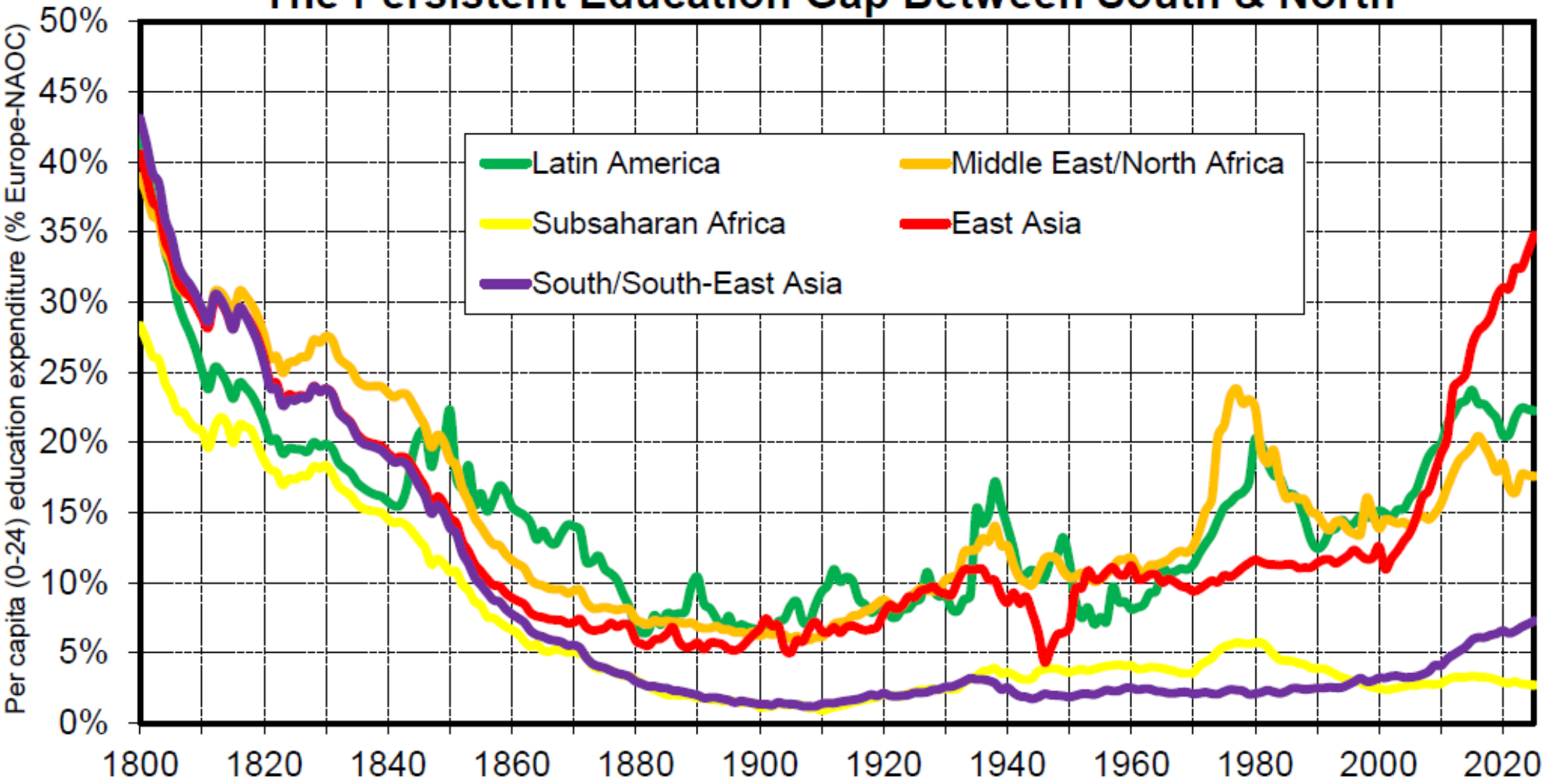

**Interpretation**. In 2025, average public education expenditure per school-age individual (0-to-24-year-old) varies enormously across world regions, from 220€ in Subsaharan Africa to 9025€ in North America/Oceania (PPP € 2025), i.e. a gap of almost1 to 50. If we were using MERs (maket exchange rates) rather than PPPs (purchasing power parities), the gaps would be 2-3 times larger. **Sources & series**: wid.world

# Global Inequality of Opportunities: Education (2025)



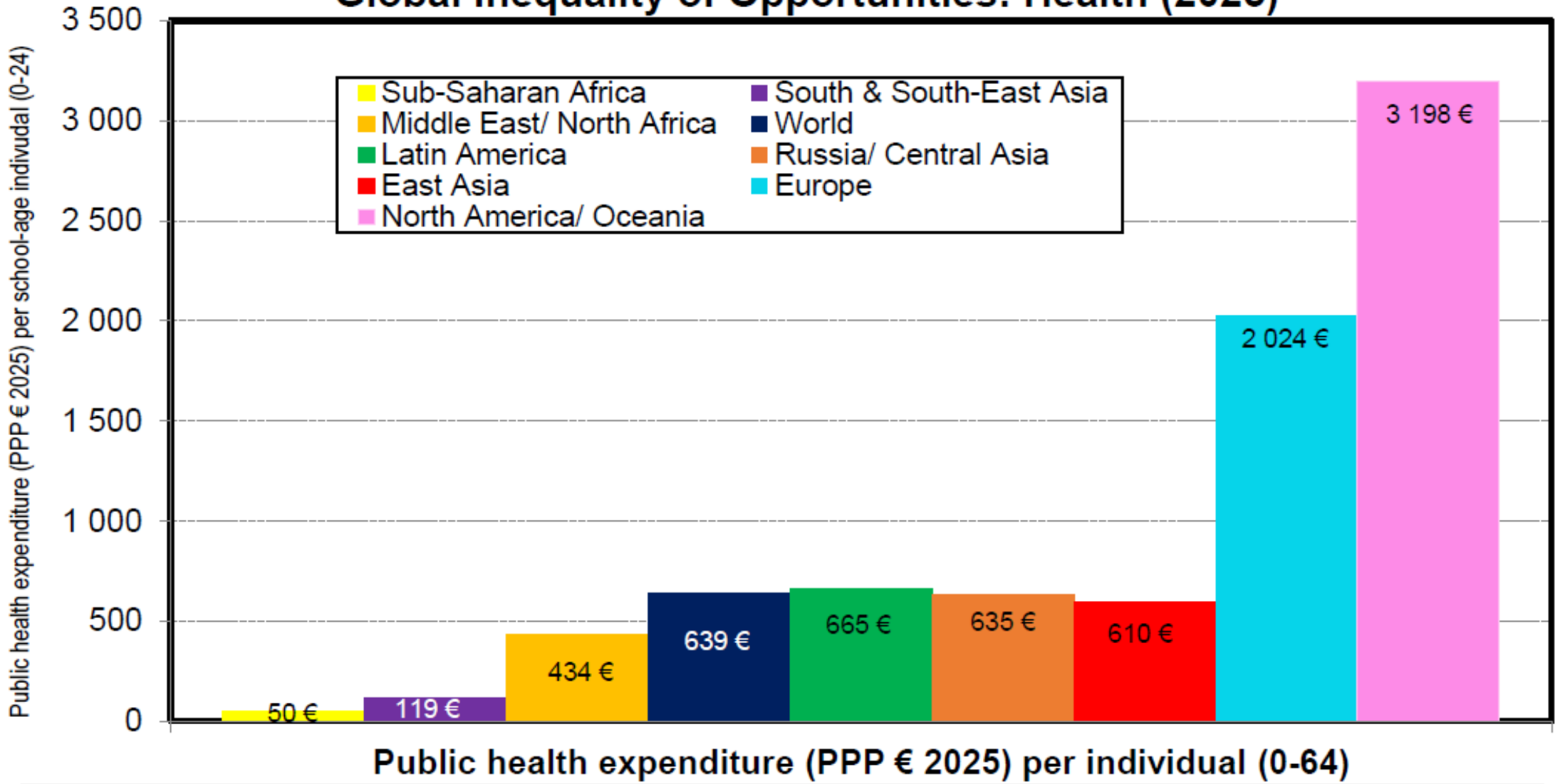

**Interpretation**. In 2025, Europe and North America/Oceania host 8% of the world school-age population (0-to-24-year-old) and benefit from 40% of the world public education expenditure (measured in PPP € 2025). In contrast, Subsaharan Africa and South & South-East Asia host 60% of the global school-age population and benefit from 16% of the global education expenditure. **Sources & series**: wid.world

# The Persistent Education Gap Between South & North



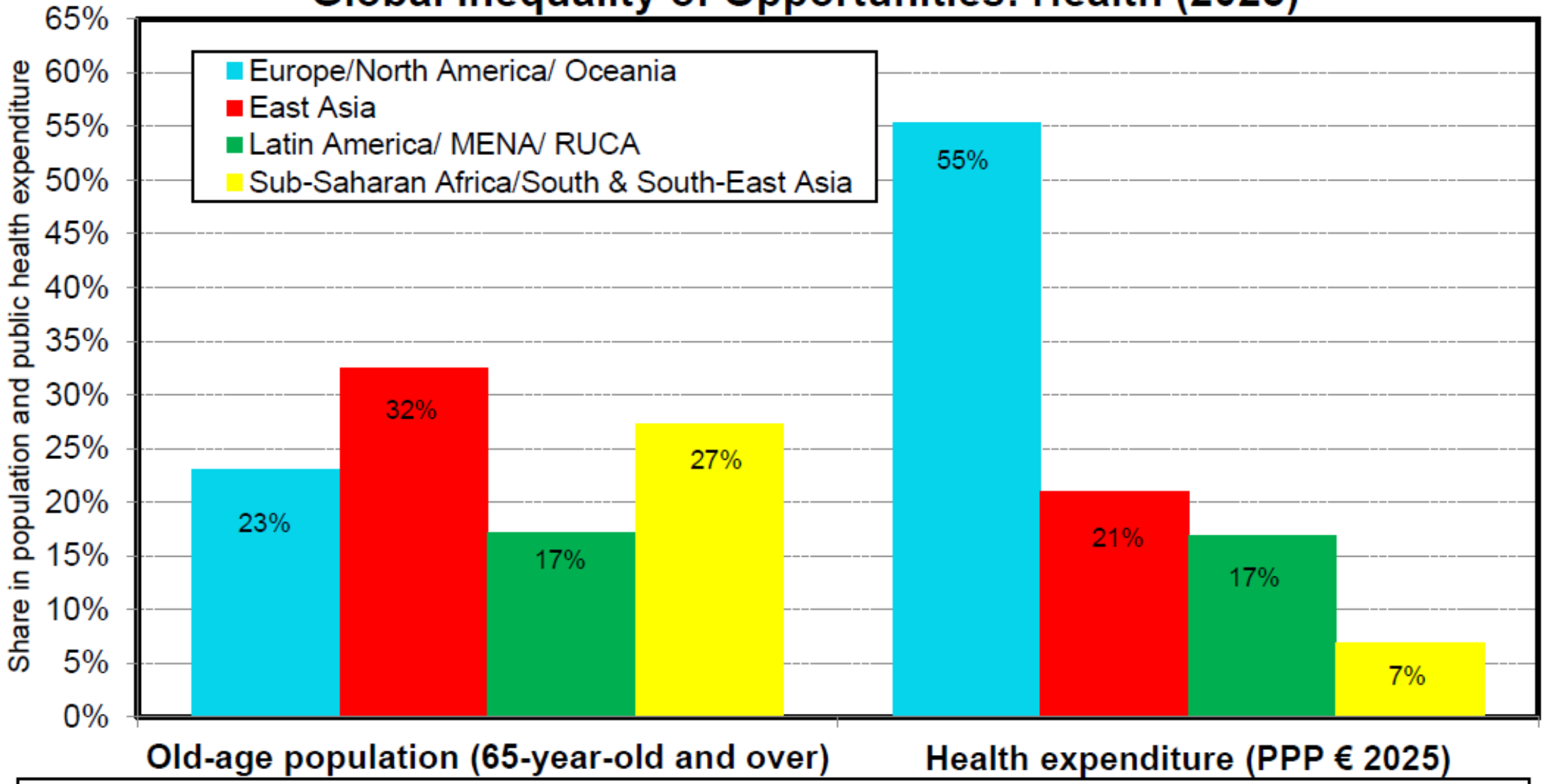

**Interpretation**. Except in early 19th century (when education expendiure was very small everywhere), average public education expenditure per school-age individual (0-to-24-year-old) has always been much smaller in most world regions as compared to Europe/North America Oceania average (PPP). The situation improved in East Asia in recent decades, but the gap remains very large for Subsaharan Africa (with average expenditure equal to 3% of Europe/NAOC average in 2025) and South/South-East Asia (7% ). **Sources and series**: wid.world

# Global Inequality of Opportunities: Health (2025)



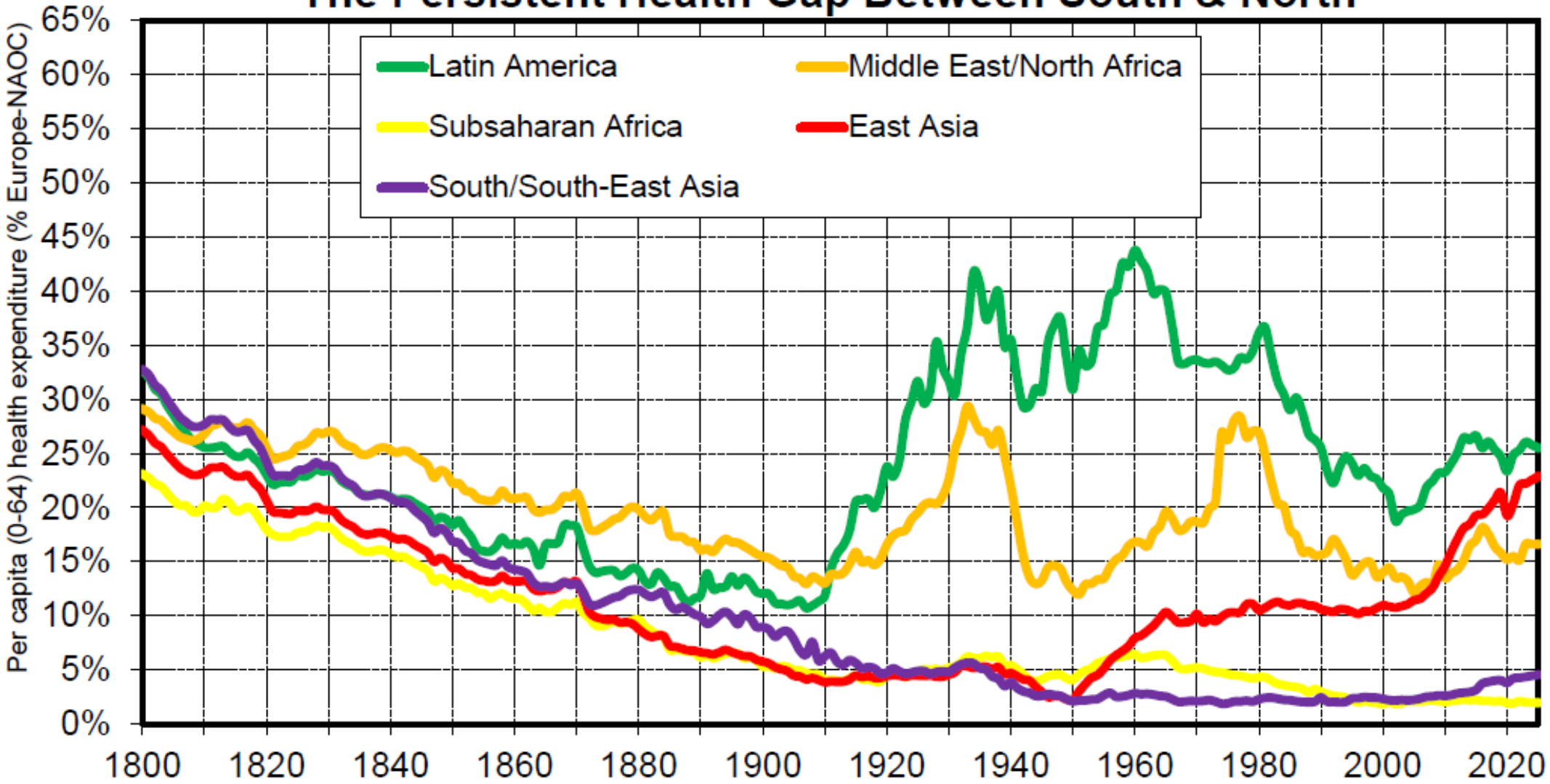

**Interpretation**. In 2025, average public health expenditure per individual aged 0-to-64-year-old) (assuming that older individuals receive 3 times this amount) varies enormously across world regions, from 50€ in Subsaharan Africa to 3 198€ in North America/Oceania (PPP € 2025), i.e. a gap of about 1 to 60. If we were using MERs (maket exchange rates) rather than PPPs (purchasing power parities), the gaps would be 2-3 times larger. The gaps would also be also larger in the absence of an age correction. **Sources & series**: wid.world

# Global Inequality of Opportunities: Health (2025)



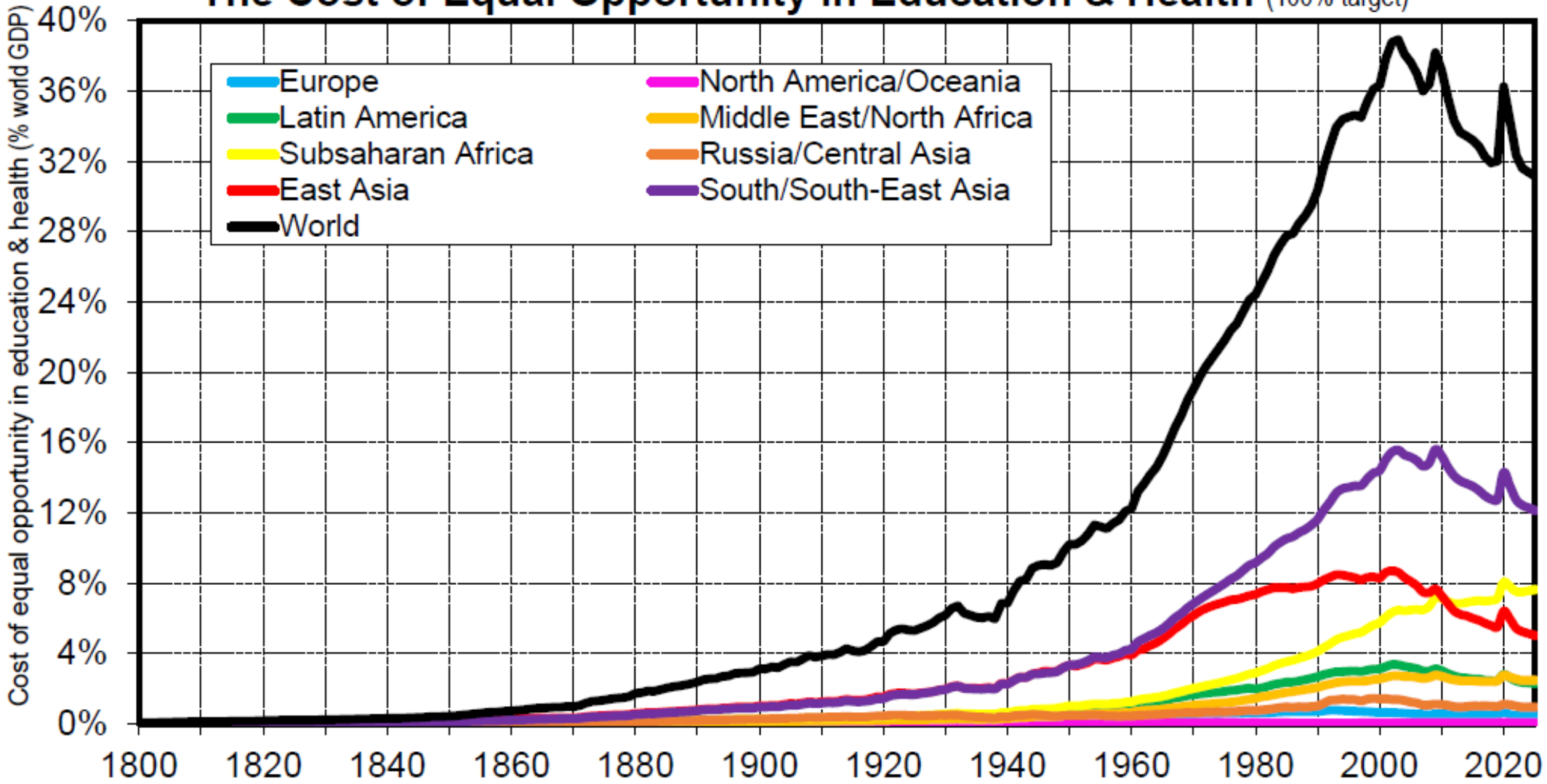

**Interpretation**. In 2025, Europe and North America/Oceania host 23% of the world old-age population (65-year-old +) and benefit from 55% of the world public health expenditure (measured in PPP € 2025). In contrast, Subsaharan Africa and South & South-East Asia host 27% of the global old-age population and benefit from 7% of the global health expenditure. **Sources & series**: wid.world

# The Persistent Health Gap Between South & North



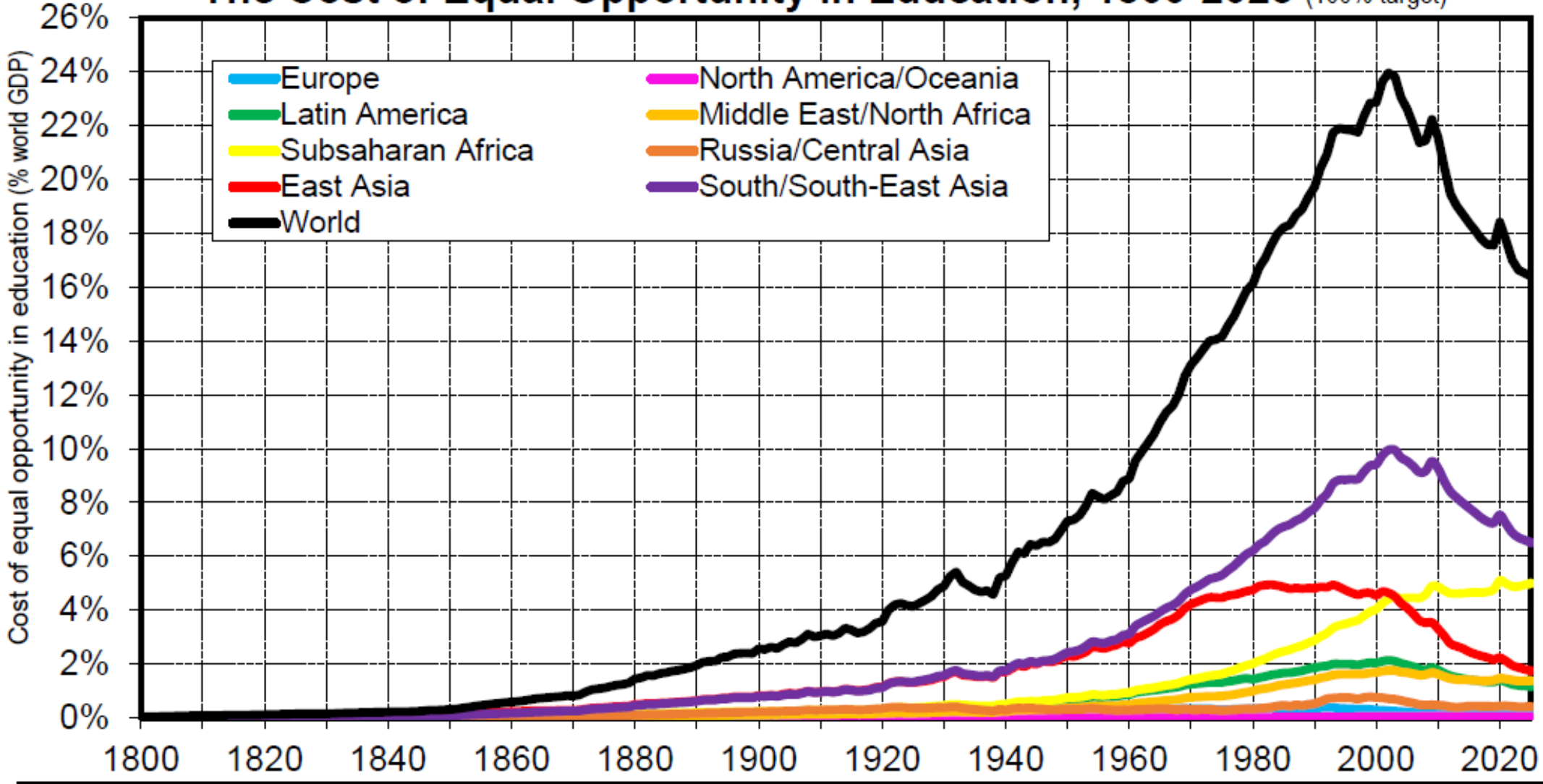

**Interpretation**. Average public health expenditure per capita (0-to-64-year-old) (assuming older individuals receive 3 times this level) has always been much smaller in most world regions as compared to the Europe/North America/Oceania averag (PPP). The situation has improved in East Asia in recent decades (and the gap has always been smaller in Latin America and MENA), but the gap remains enormous for Subsaharan Africa (2% of Europe-NAOC average in 2025) and South/South-East Asia (5%). **Sources and series**: wid.world

# The Cost of Equal Opportunity in Education & Health (100% target)



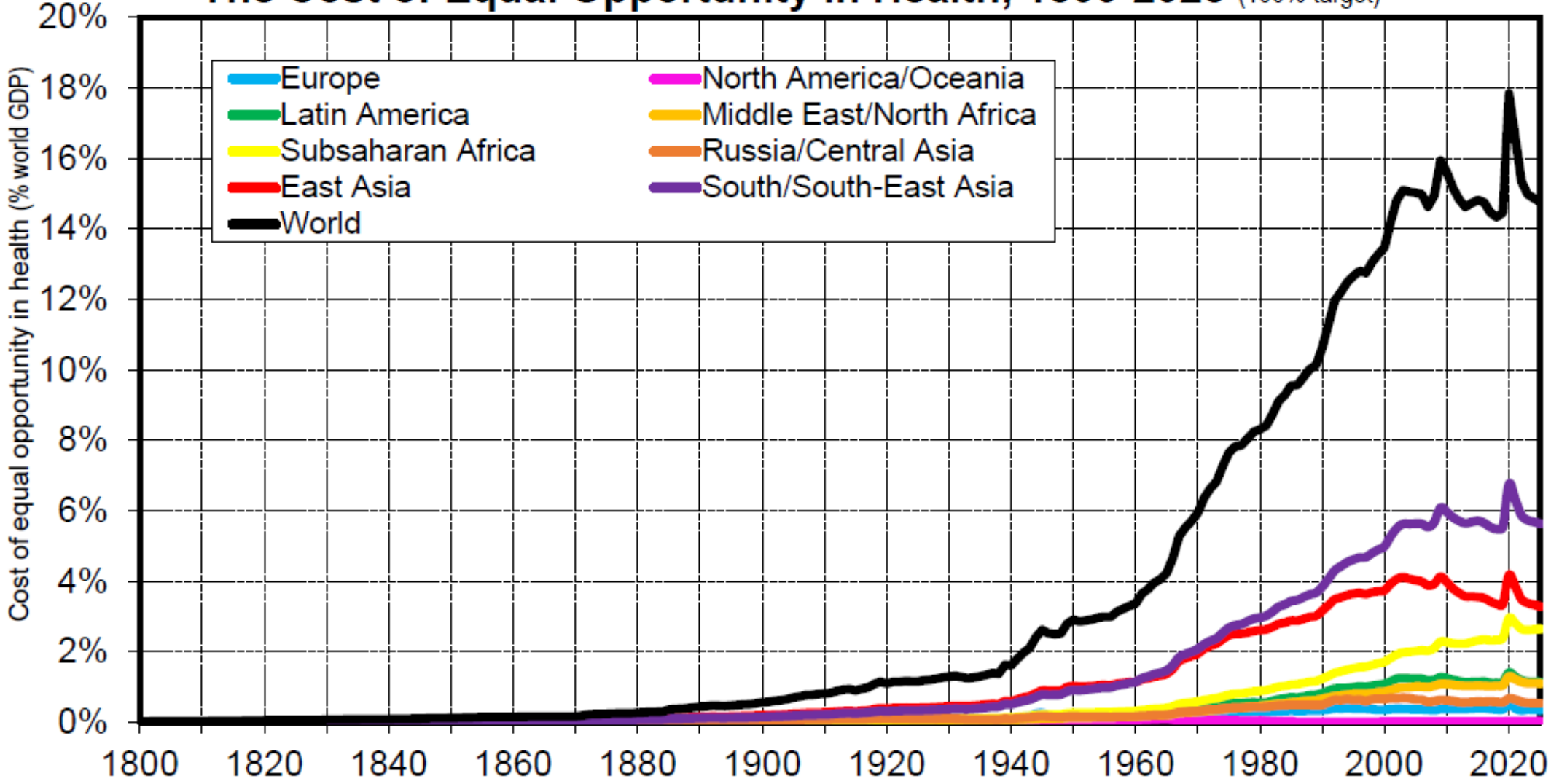

**Interpretation**. Assume that we raise per capita (age-adjusted) education and health expenditure to the same level as Europe/NAOC average (in PPP terms) in all countries where it is lower. In 2025, the cost would be 32% of world GDP, including 12% for South & South-East Asia, 5% in East Asia and 8% for Subsaharan Africa. The cost would have been much lower in the 19th century or in the early 20th century (as health expenditure was relatively lower at the time). **Sources and series**: wid.world

# The Cost of Equal Opportunity in Education, 1800-2025 (100% target)



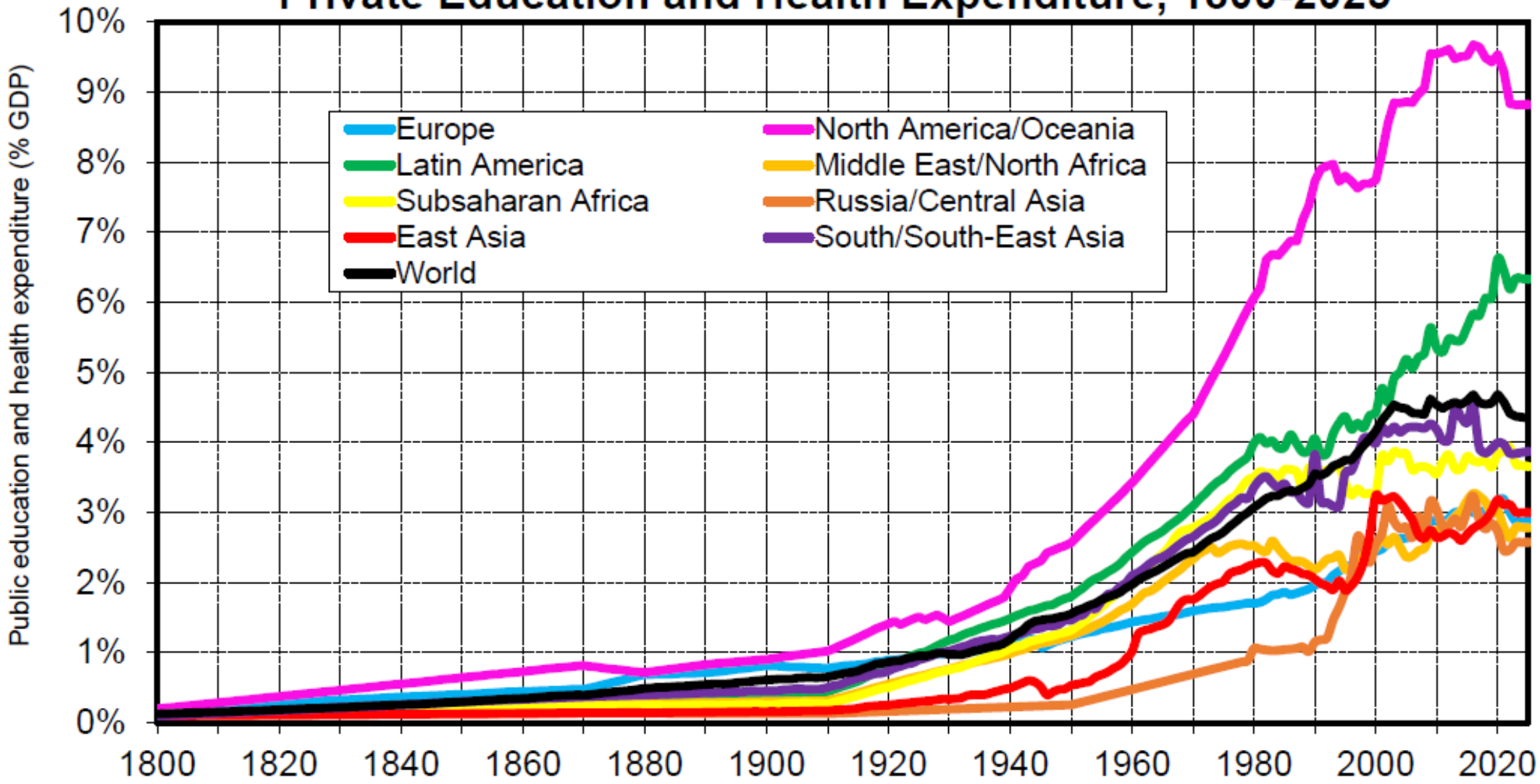

**Interpretation**. Assume that we raise average education expenditure per school-age individual (0-24) to the same level as Europe/NAOC average (in PPP terms) in all countries where it is lower. In 2025, the cost would be 16% of world GDP, including 7% for South & South-East Asia and 5% for Subsaharan Africa. The cost would have been much lower in the 19th century or in the early 20th century (as education expenditure was relatively lower at the time) and might have allowed for faster productivity convergence. **Sources and series**: wid.world

# The Cost of Equal Opportunity in Health, 1800-2025 (100% target)



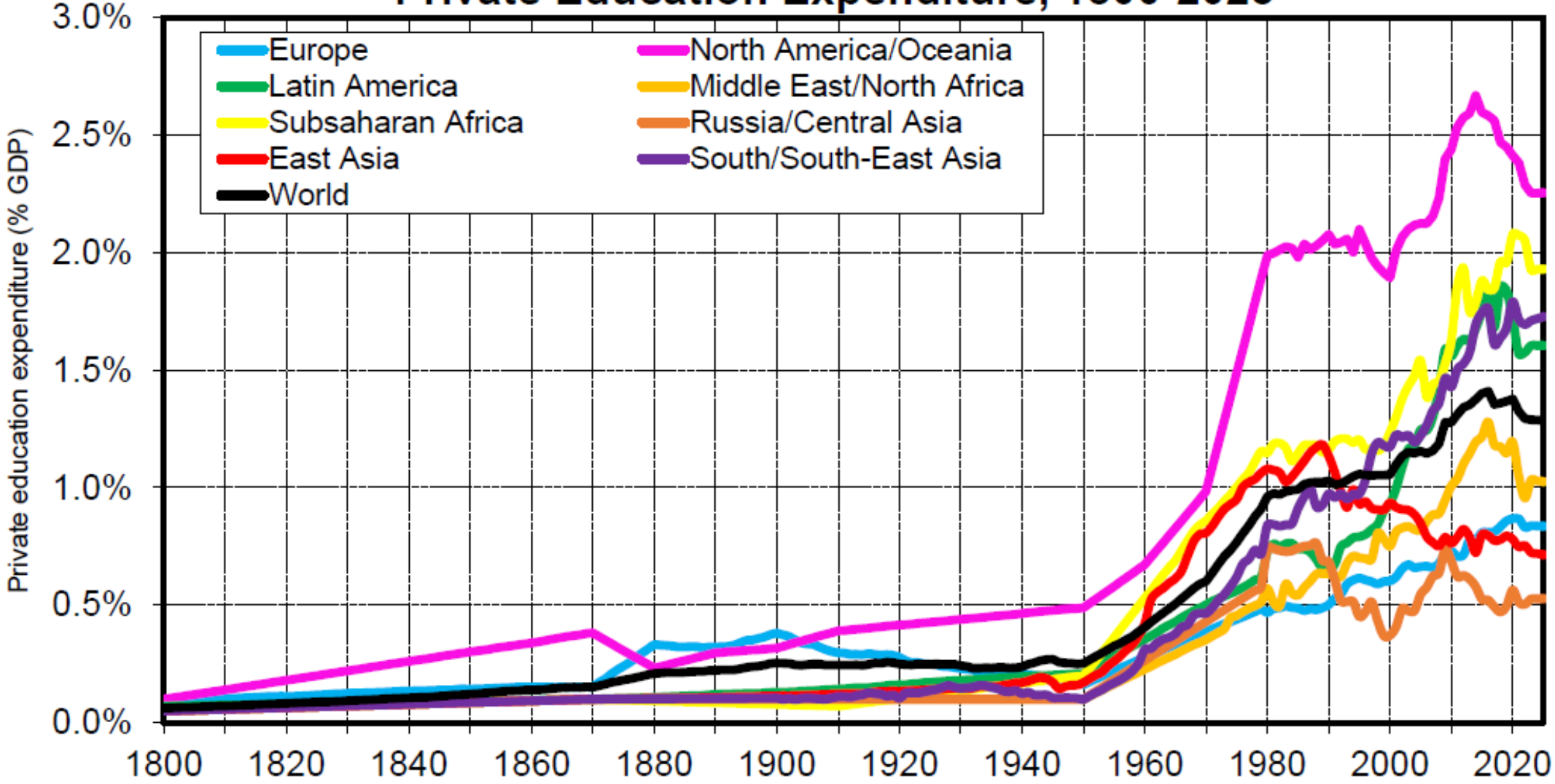

**Interpretation**. Assume that we raise average health expenditure per capita (0-to-64-year-old) to the same level as Europe/NAOC average (in PPP terms) in all countries where it is lower. In 2025, the cost would be 15% of world GDP, including 6% for South & South-East Asia, 3% in East Asia and 3% for Subsaharan Africa. The cost would have been much lower in the 19th century or in the early 20th century (as health expenditure was relatively lower at the time). **Sources and series**: wid.world

# Private Education and Health Expenditure, 1800-2025



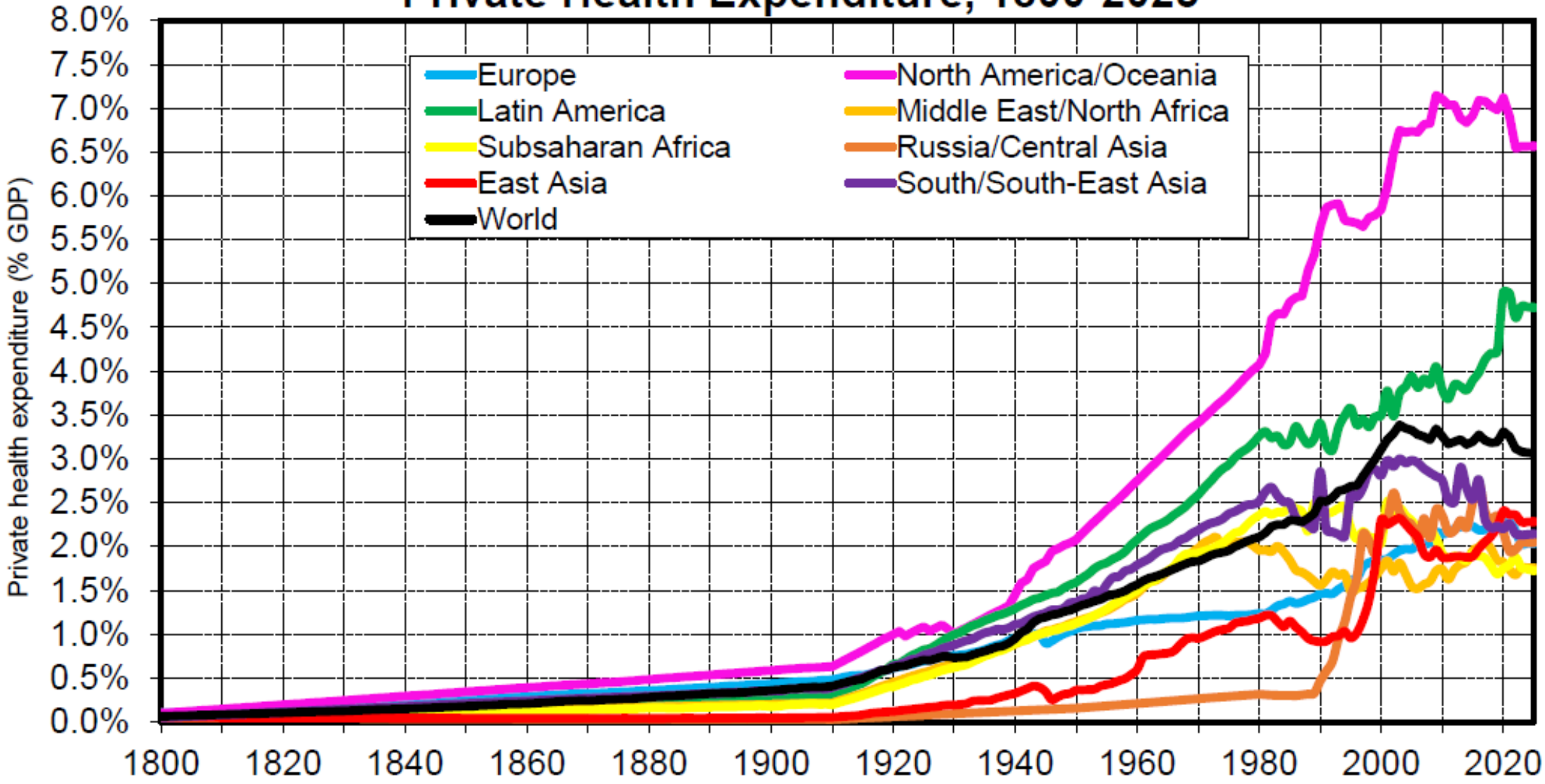

**Interpretation**. Private education and health expenditure has increased substantially in recent decades and represents about 4.5% of GDP at the global level in 2025, with enormous variations across world regions, from about 9% in North America/Oceania to 6% in Latin America, 4% in South & South-East Asia and Subsaharan Africa and 3% in Europe, East Asia, Russia/Central Asia and Middle East/North Africa. **Sources and series**: wid.world

# Private Education Expenditure, 1800-2025



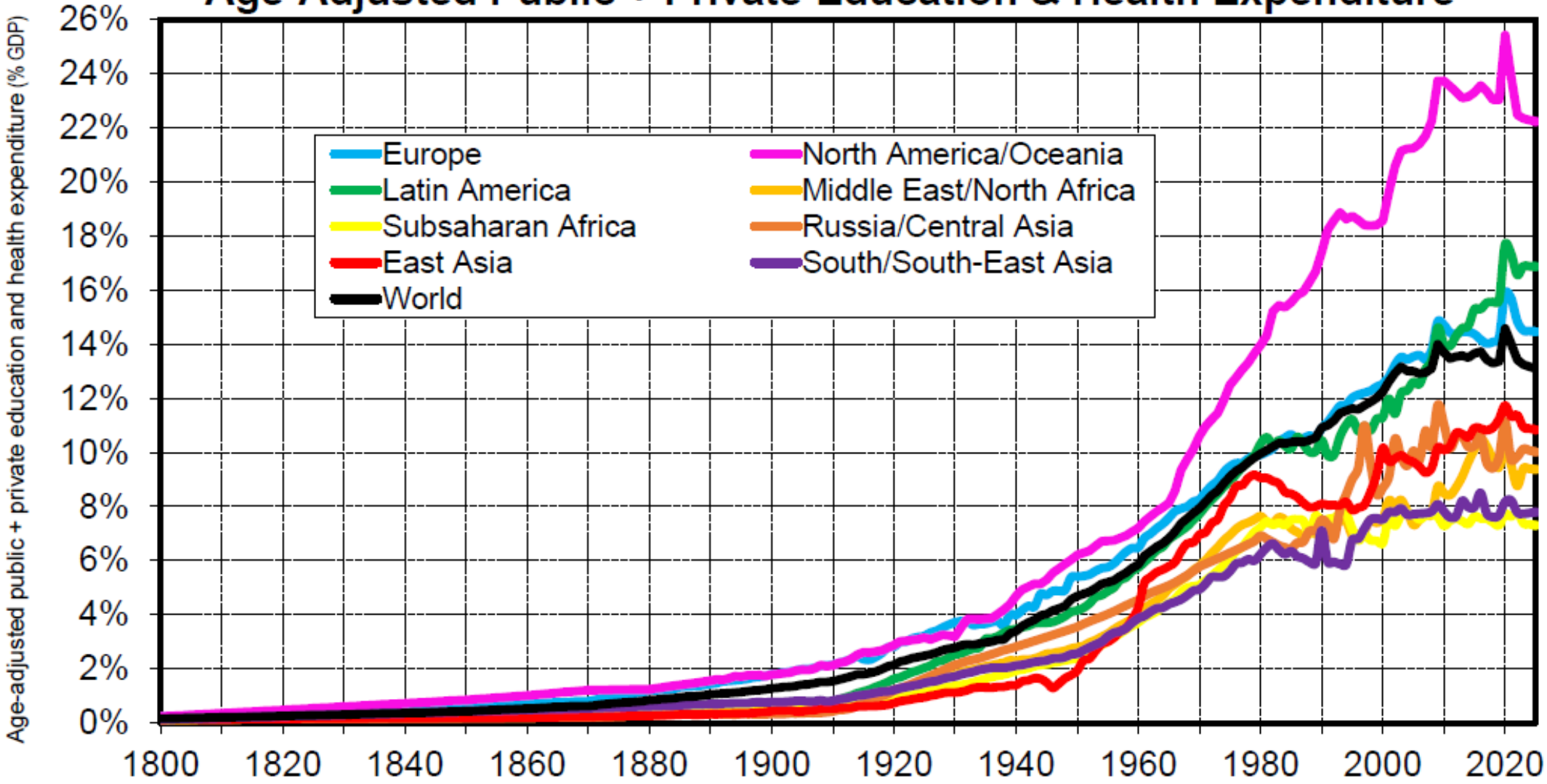

**Interpretation**. Private education expenditure has increased substantially in recent decades, particularly in North America/Oceania, South & South East Asia, Subsaharan Africa and Latin America. At the global level, they represent 1.3% of GDP in 2025, i.e. about 24% of total public + private education expenditure (5.3% of GDP). **Sources and series**: wid.world

# Private Health Expenditure, 1800-2025



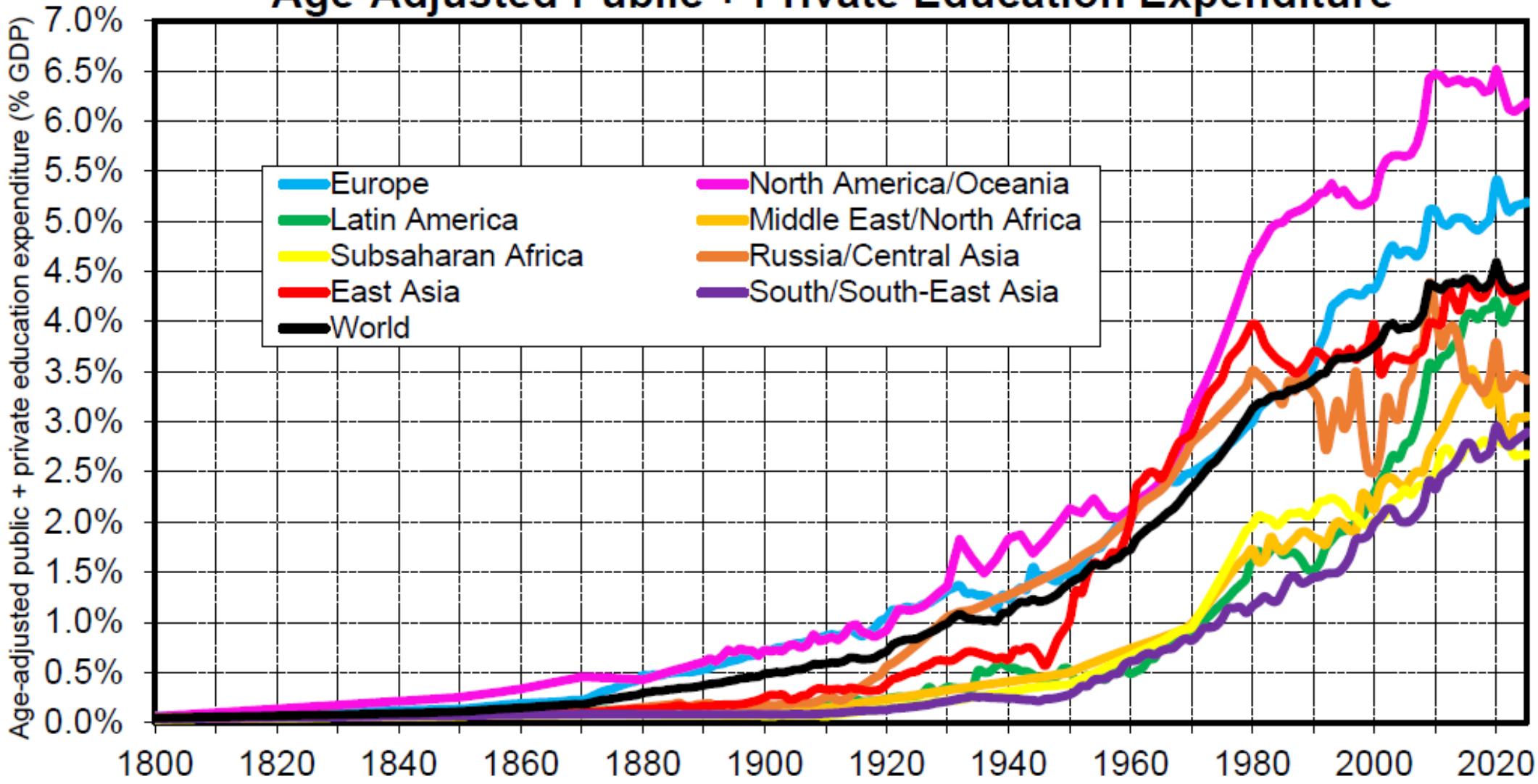

**Interpretation**. Private health expenditure has increased substantially in recent decades in North America/Oceania, and to allesser extent in Latin America. At the global level, they represent 3.1% of GDP in 2025, i.e. about 40% of total public + private education expenditure (7.8% of GDP). **Sources and series**: wid.world

# Age-Adjusted Public + Private Education & Health Expenditure



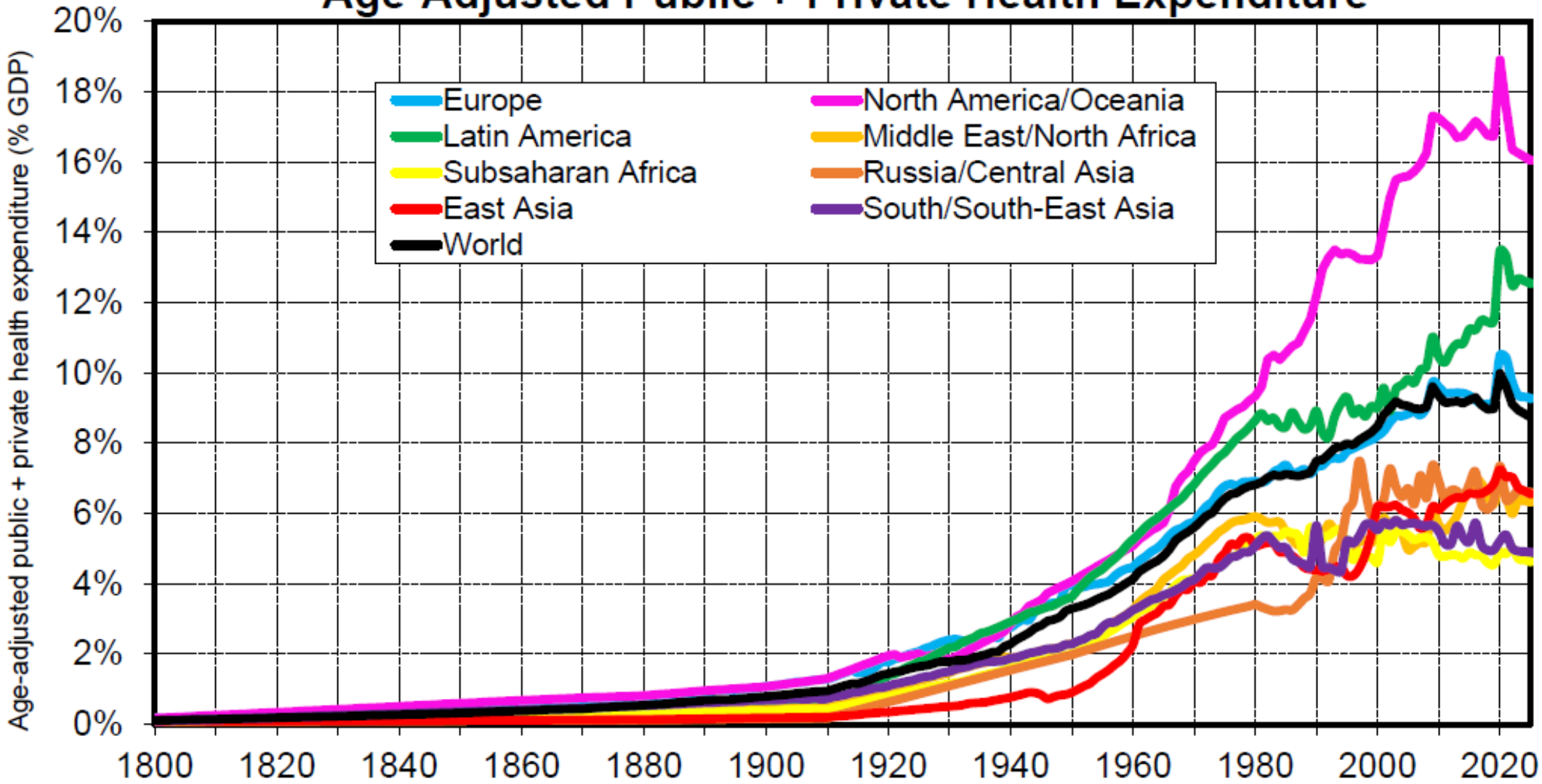

**Interpretation**. Total age-adjusted public and private education and health expenditure has increased from less than 1% of GDP before 1900 to about 14% of GDP in 2025 at the global level, with large gaps between regions, from about 8% of GDP in South & South-East Asia and Subsaharan Africa to about 23% in North America/Oceania. **Sources and series**: wid.world

# Age-Adjusted Public + Private Education Expenditure



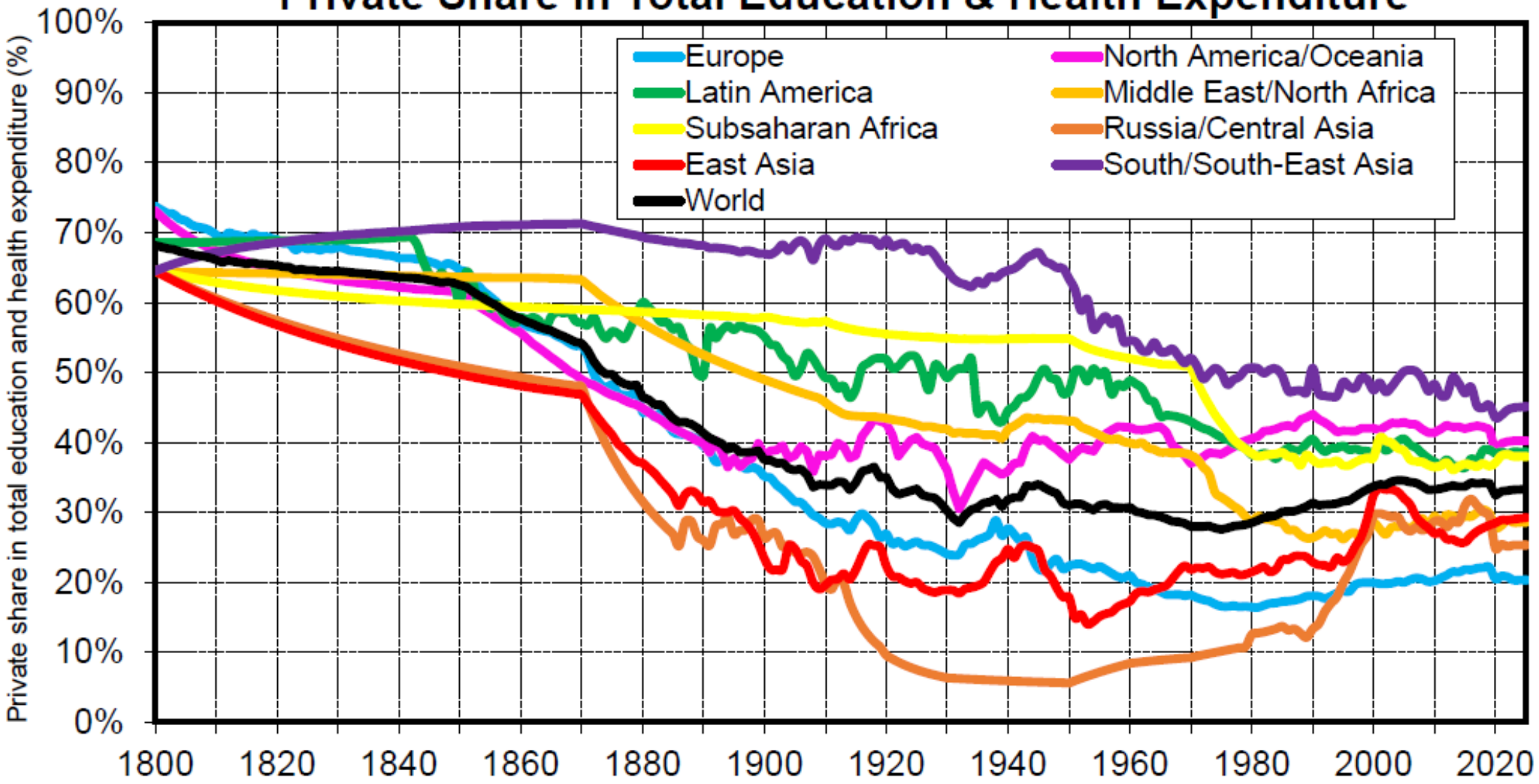

**Interpretation**. Total age-adjusted public and private education expenditure has increased from less than 1% of GDP before 1900 to about 4.5% of GDP in 2025 at the global level, with large gaps between regions, from about 2.5% of GDP in South & South-East Asia and Subsaharan Africa to about 6-6.5% in North America/Oceania. **Sources and series**: wid.world

# Age-Adjusted Public + Private Health Expenditure

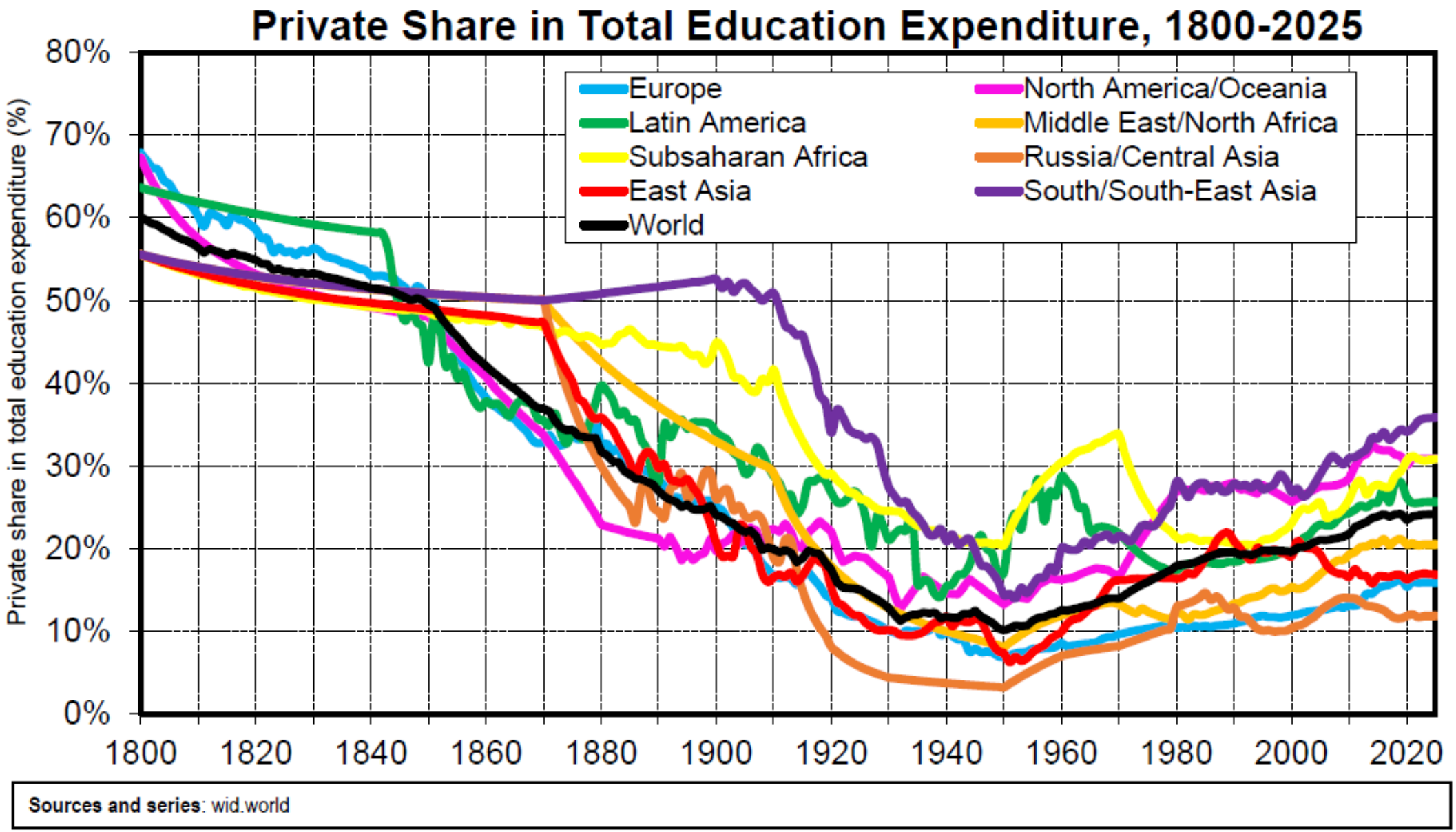



**Interpretation**. Total age-adjusted public and private health expenditure has increased from less than 1% of GDP before 1900 to about 9% of GDP in 2025 at the global level, with large gaps between regions, from about 4-5% of GDP in South & South-East Asia and Subsaharan Africa to about 16% in North America/Oceania. **Sources and series**: wid.world

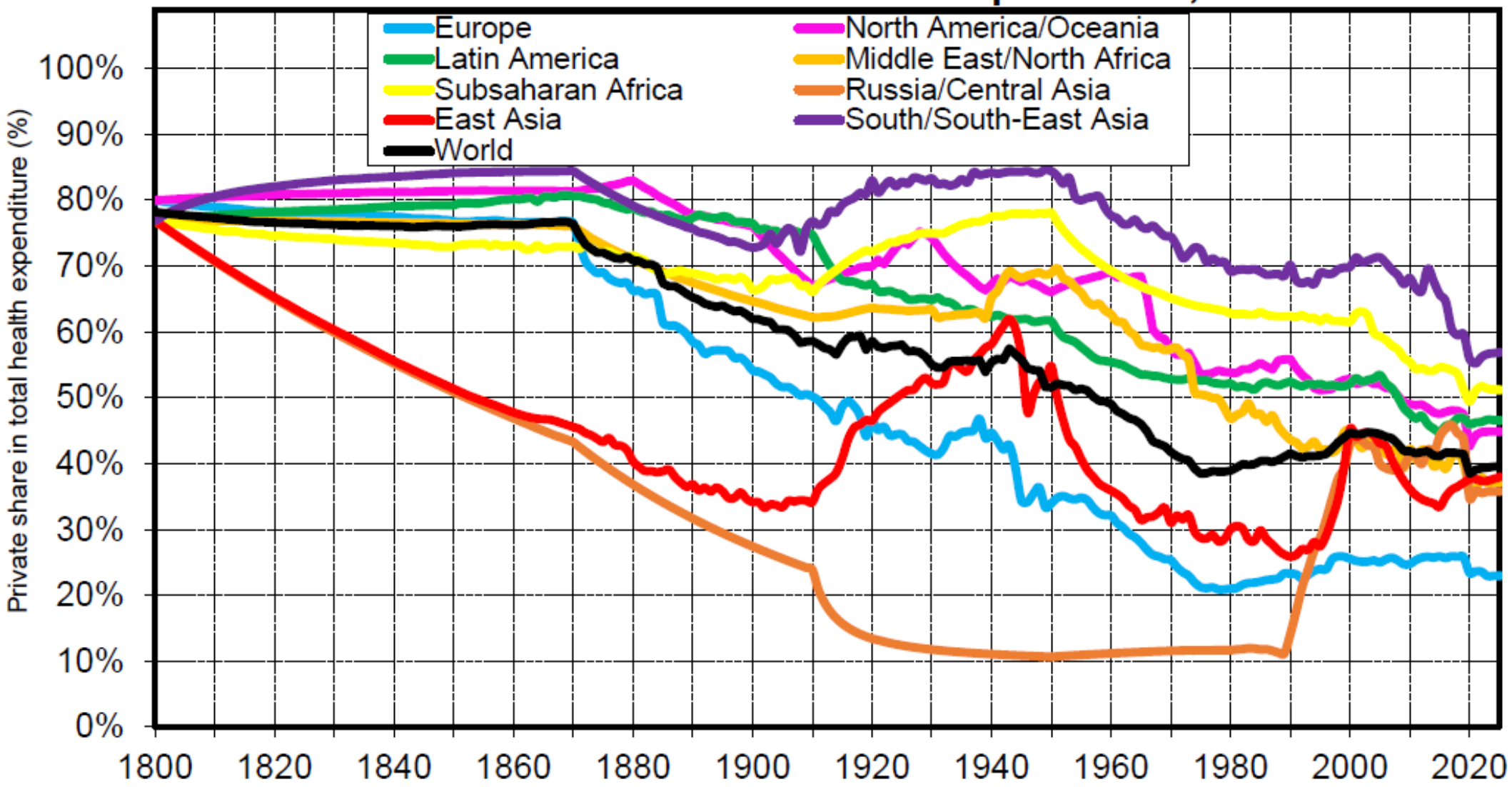
# Private Share in Total Education & Health Expenditure




**Sources and series**: wid.world


Private Share in Total Education Expenditure, 1800-2025
Private share in total education expenditure (%)
80%
70%
60%
50%
40%
30%
20%
10%
0%
1800
1820
1840
1860
1880
1900
1920
1940
1960
1980
2000
2020
Europe
North America/Oceania
Latin America
Middle East/North Africa
Subsaharan Africa
Russia/Central Asia
East Asia
South/South-East Asia
World
Sources and series: wid.world

# Private Share in Total Health Expenditure, 1800-2025




**Sources and series**: wid.world

# Human capital $h_{it}$: key driver of productivity growth $g_{it}$

Simple linear specification 1800-2025: $\mathbf{g_{it} = g_0 + a\, h_{it} + \epsilon_{it}}$

with: $g_{it} = (y_{it} - y_{it-1})/y_{it-1}$ = growth rate of labor productivity $y_{it}$
$h_{it}$ = human capital expenditure as a fraction of GDP
(public + private education and health expenditure)

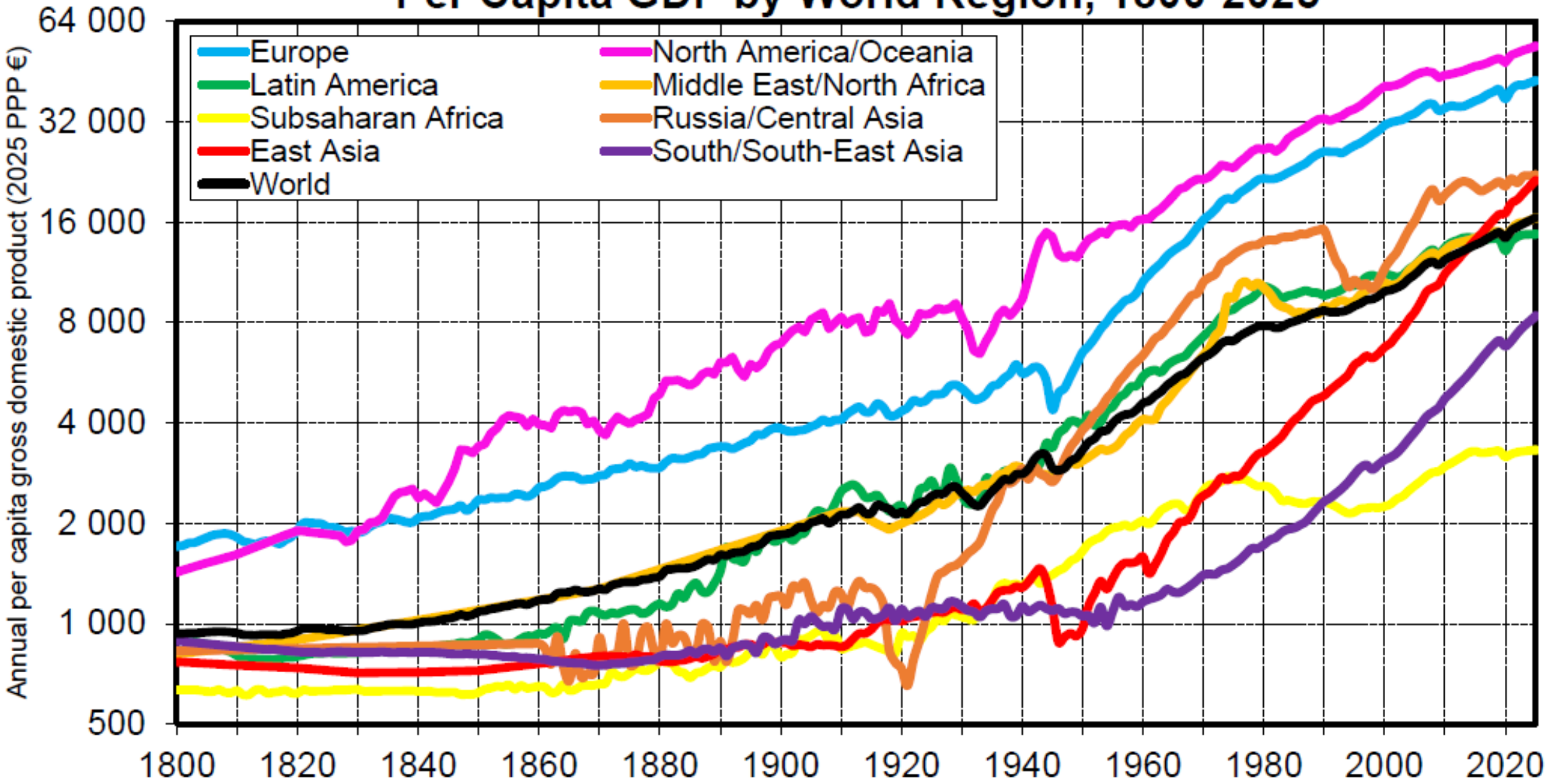
→ **a≈0,1** (as high as 0.2+ for poor countries & public education)

E.g. if h↑ from 10% to 11%, then g ↑ by 0.1% (say from 1% to 1.1%/year).

Consistent with micro studies: 10% return to education

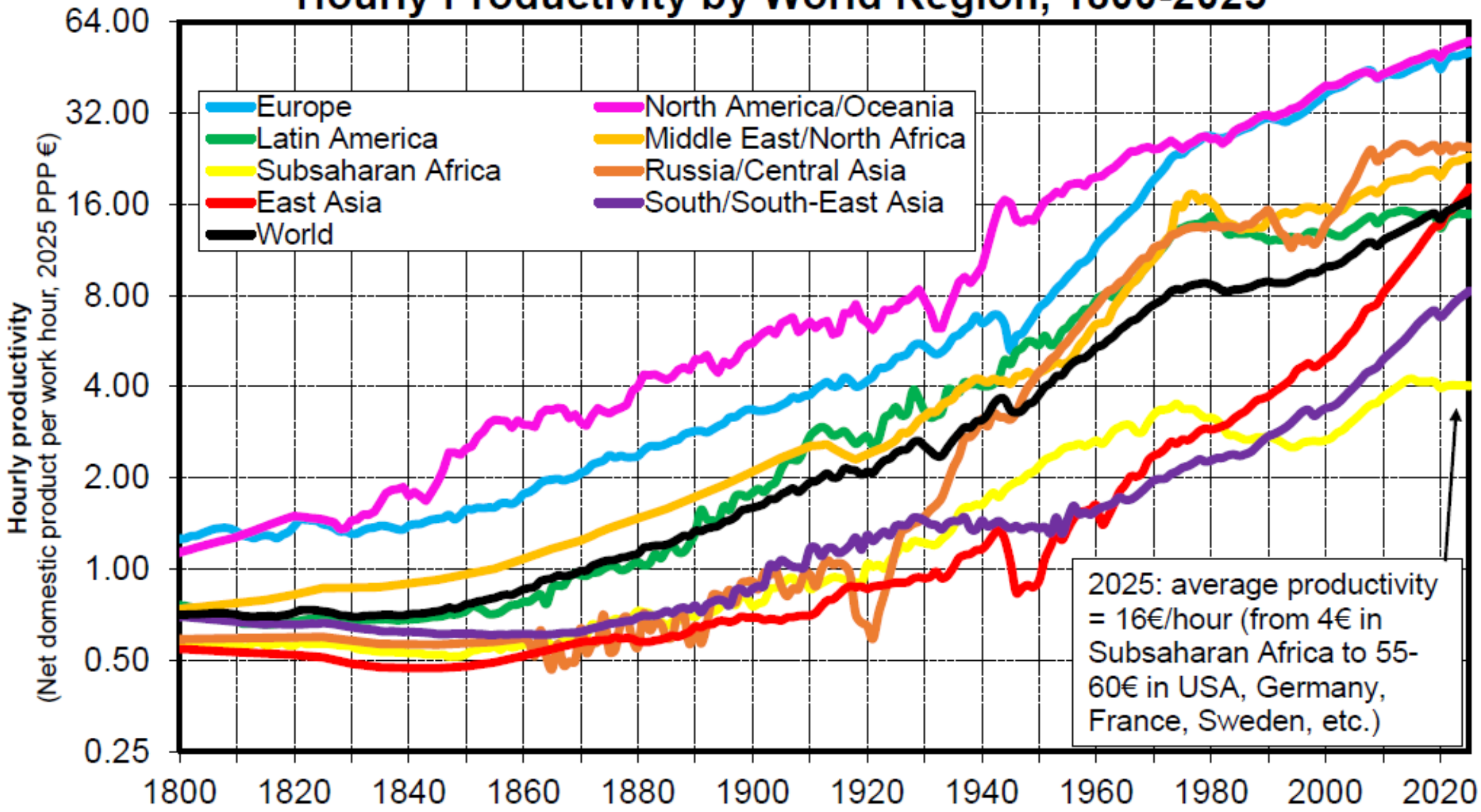
(Also consistent with historical evidence: Goldin, The Human Capital Century and American Leadership, JEH 2001)

# Per Capita GDP by World Region, 1800-2025



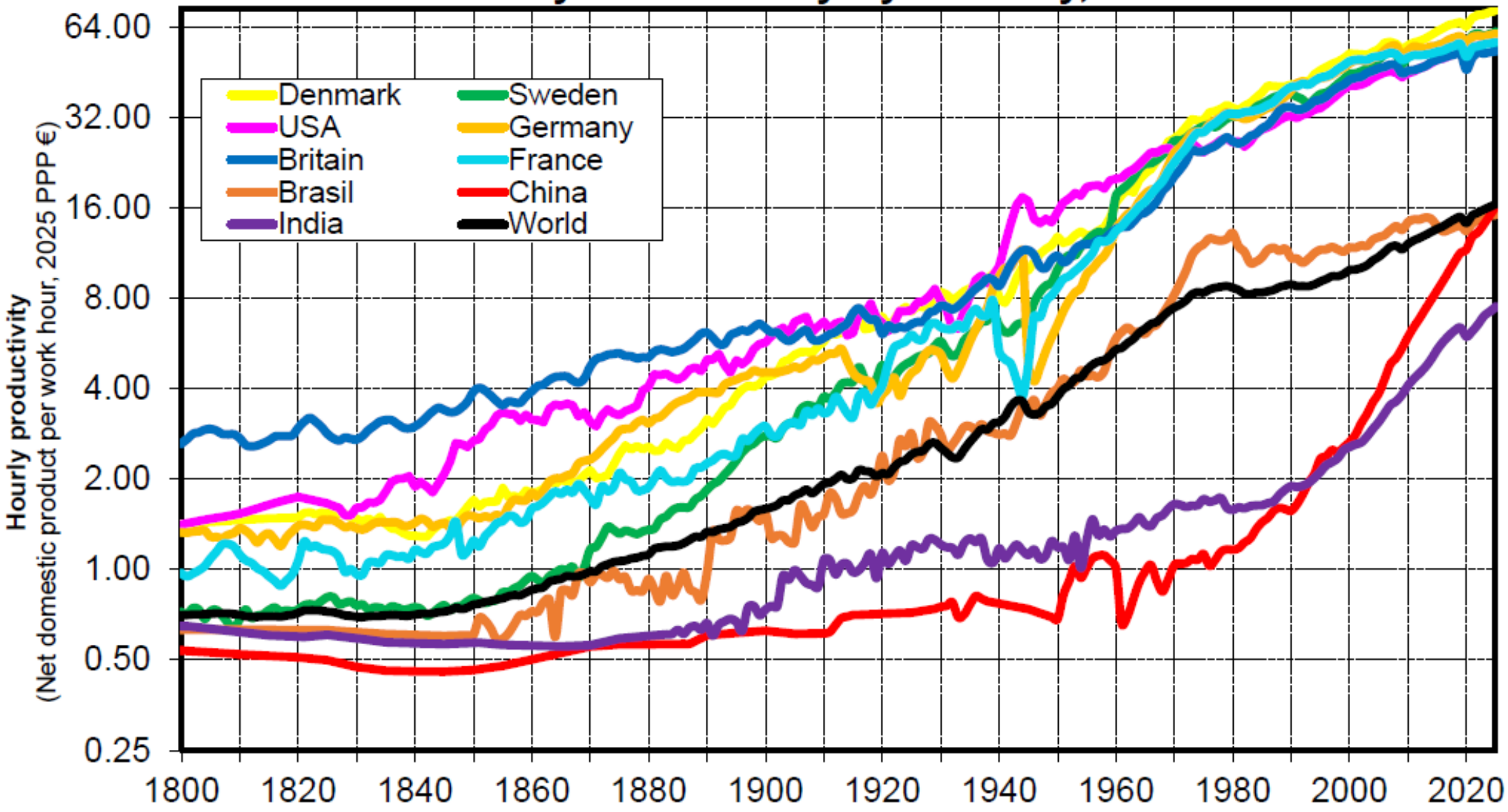

**Interpretation**. Expressed in 2025 PPP €, annual per capita gross domestic product (GDP) rose from about 900€ in 1800 to 16 000€ in 2025 at the global level. I.e. it was multiplied by about 18, which corresponds to average annual real growth rate of 1,3% per year, with large variations over time and across regions. In 2025, per capita GDP varies between about 3 000€ on average in Subsaharan Africa and about 40 000-50 000€ in Europe and North America/Oceania (i.e. a gap from 1 to 15). **Sources and series**: see wid.world

# Hourly Productivity by World Region, 1800-2025



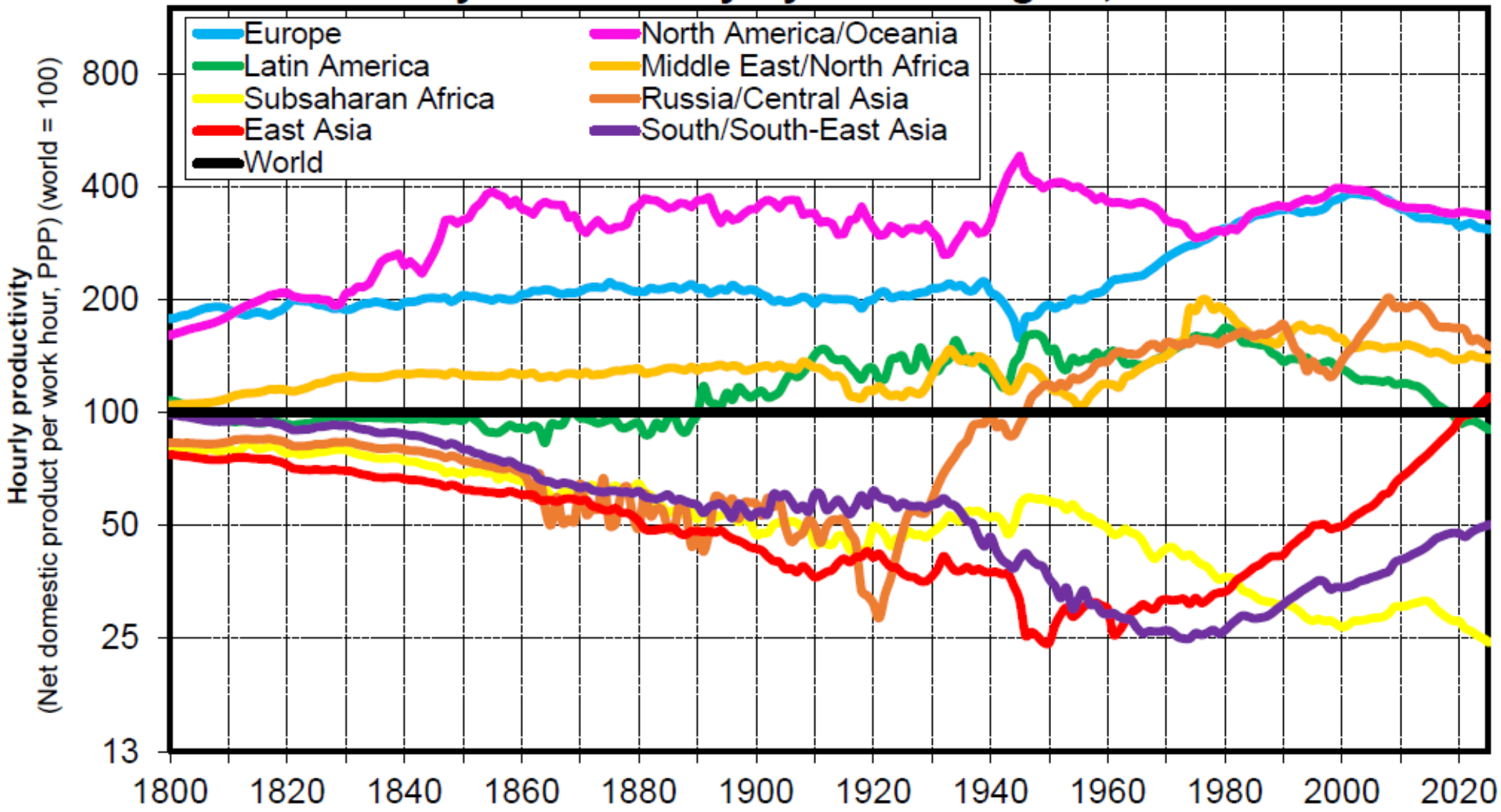

**Interpretation**. Expressed in 2025 PPP €, hourly productivity (as defined by net domestic product by economic labour hour) rose from about 0.7€ in 1800 to 16€ in 2025 at the global level. I.e. it was multiplied by about 24, which corresponds to average annual real growth rate of 1,4% per year, with large variations over time and across regions. **Sources and series**: see wid.world

# Hourly Productivity by Country, 1800-2025



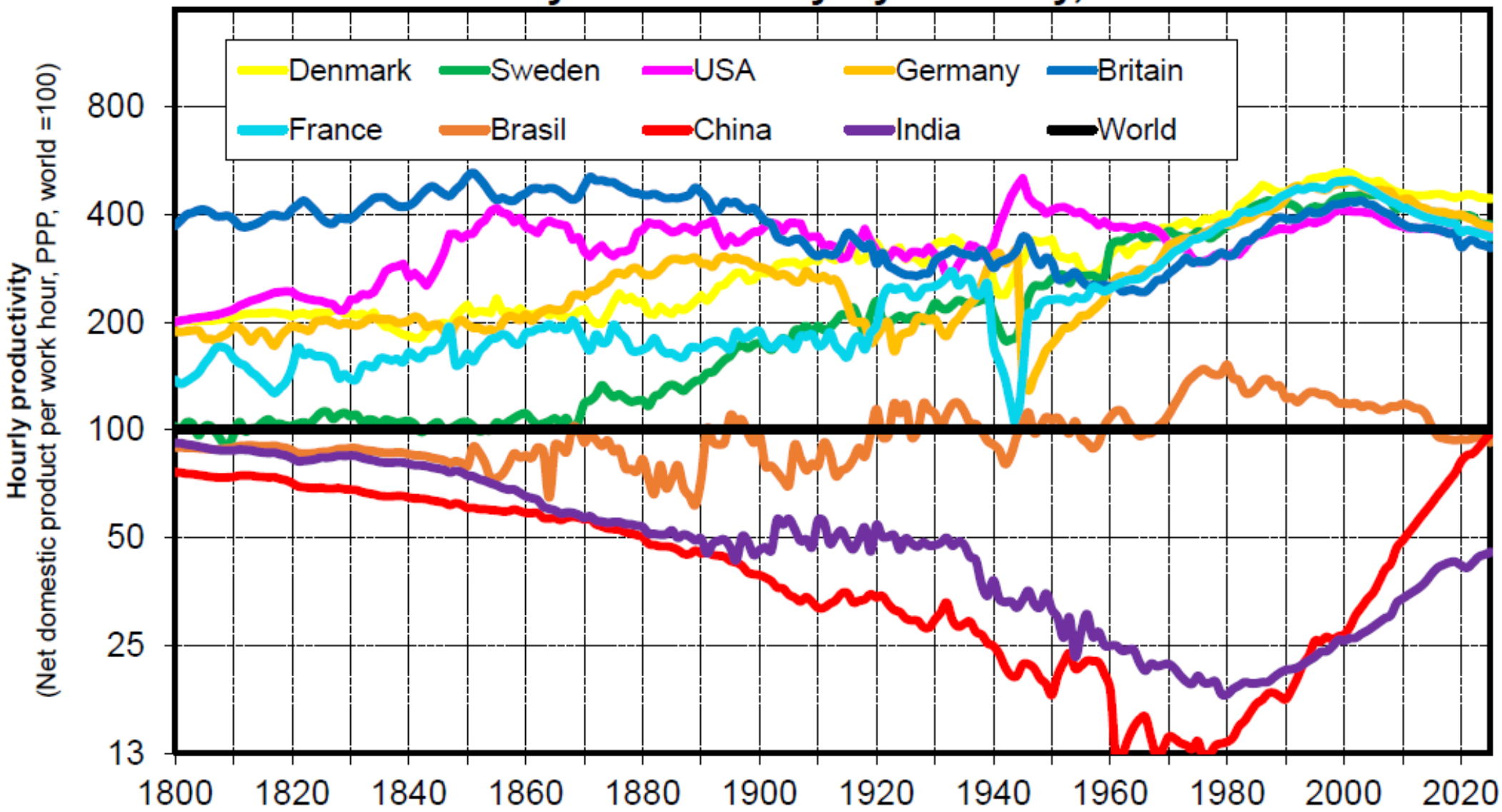

**Interpretation**. Between 1800 and 1900, Britain was the country in the world with the highest productivity (NDP per work hour), before being replaced by the USA between 1900 and 1970. Since 1970, Europe's highest productivity countries (incl. Denmark, Sweden, Germany, France, Britain) are on par with the USA (around 55-60€/hour, vs 16€ for world average and 7€ in India) . **Sources and series**: see wid.world

# Hourly Productivity by World Region, 1800-2025




**Interpretation**. The inequality in hourly productivity (net domestic product per work hour) between world regions rose between 1800 and 1950 and has started to decline since 1950-1960, but with large geographical variations. In 2025, productivity is close to world average in East Asia but only 50% of world average in South & South-East Asia and 25% of world average in Subsaharan Africa. **Sources and series**: see wid.world

# Hourly Productivity by Country, 1800-2025




**Interpretation**. Between 1800 and 1900, Britain was the country in the world with the highest productivity (NDP per work hour), before being replaced by the USA between 1900 and 1970. Since 1970, Europe's highest productivity countries (incl. Denmark, Sweden, Germany, France, Britain) are on par with the USA (around 400% of world average, vs less than 50% in India) . **Sources and series**: see wid.world

## Productivity Growth by World Regions (1800-2025)

| Annual real growth rate of productivity (hourly NDP) | 1800-2025 | 1800-1910 | 1910-1950 | 1950-1990 | 1990-2025 |
|---|---|---|---|---|---|
| East Asia | 1.6% | 0.2% | 0.7% | 3.6% | 4.6% |
| Europe | 1.7% | 1.0% | 1.7% | 3.7% | 1.4% |
| Latin America | 1.3% | 1.2% | 1.7% | 2.0% | 0.6% |
| Middle East/ North Africa | 1.5% | 1.1% | 1.4% | 3.0% | 1.4% |
| North America/ Oceania | 1.7% | 1.6% | 2.1% | 1.8% | 1.6% |
| Russia/ Central Asia | 1.7% | 0.4% | 3.9% | 3.1% | 1.4% |
| South/South-East Asia | 1.1% | 0.5% | 0.4% | 1.8% | 3.2% |
| Sub Saharan Africa | 0.9% | 0.4% | 2.4% | 0.6% | 1.1% |
| **World** | **1.4%** | **0.9%** | **1.7%** | **2.2%** | **1.8%** |

**Interpretation**. Productivity (as defined by net domestic product per hour of economic labour) has been multiplied by about 24 at the global level between 1800 and 2025 (from about 0.7€/h in 1800 to about 16€/h in 2025) (PPP 2025 €). This corresponds to an average annual real growth rate of 1.4%. Productivity growth has increased from 0.9% over the 1800-1910 period to 1.6% over 1910-1950 and 2.3% and 1.8% over 1950-1990 and 1990-2025. **Sources and series**: wid.world

## State Capacity and the Early Productivity Gap, 1800-1840

| | Hourly Productivity 1800-1820 (net domestic product per work hour) (20-year-averages) (log) | | Annual Growth Rate of Hourly Productivity 1800-1840 (computed over previous 20 years) | |
|---|---|---|---|---|
| Total Public Expenditure (% GDP) (averages over previous 20 years) | 13.328*** | | 0.032*** | |
| (s.e.) | (0.751) | | (0.011) | |
| Incl. Basic Public Services (Justice, Police, Administration, Roads, etc.) | | 17.303*** | | 0.039*** |
| (s.e.) | | (0.936) | | (0.014) |
| Incl. Military Expenditure | | -4.020 | | -0.014 |
| (s.e.) | | (3.298) | | (0.038) |
| R2 | 0.34 | 0.37 | 0.01 | 0.01 |
| N.obs | 627 | 627 | 627 | 627 |

**Interpretation**. In 1800-1820, countries with higher state capacity (as proxied by total public expenditure) also have higher productivity. A rise in public expenditure by 1% of GDP is associated with a 13.3% rise in GDP. Given that public expenditure varies at the time from 1-2% of GDP in the poorest world regions to about 7% in Europe, this implies that the state capacity gap can explain as much as 60-80% of the productivity gap (about 1 to 2 at the time). Higher state capacity is also associated to higher growth rates over the 1800-1840 period. Both effects seem to be driven by basic public services rather than by military expenditure.

## The Impact of Human & Social Capital Expenditure on Productivity Growth, 1800-2025

| | Annual Growth Rate of Hourly Productivity (net domestic product per work hour) (computed over previous 20 years) | | | | |
|---|---|---|---|---|---|
| Total Public Expenditure (% GDP) (averages over previous 20 years) | 0.054*** | 0.048*** | | | |
| (s.e.) | (0.001) | (0.001) | | | |
| Incl. Human & Social Expenditure | | | 0.113*** | 0.053*** | 0.046*** |
| (s.e.) | | | (0.006) | (0.006) | (0.006) |
| Incl. Military Expenditure | | | 0.029** | -0.047*** | 0.006 |
| (s.e.) | | | (0.012) | (0.011) | (0.011) |
| Incl. Social Protection Expenditure | | | -0.037*** | 0.006 | -0.021** |
| (s.e.) | | | (0.006) | (0.006) | (0.008) |
| Incl. Other Expenditure | | | -0.001 | 0.009 | -0.014 |
| (s.e.) | | | (0.015) | (0.016) | (0.014) |
| Country Fixed Effects | NO | YES | YES | YES | YES |
| Capital-Output Ratio | NO | YES | YES | YES | YES |
| Period Fixed Effects | NO | NO | NO | YES | YES |
| Region x Period Fixed Effects | NO | NO | NO | NO | YES |
| Countries Covered | ALL | ALL | ALL | ALL | ALL |
| R2 | 0.14 | 0.21 | 0.23 | 0.33 | 0.53 |
| N.obs | 10602 | 10602 | 10602 | 10602 | 10602 |

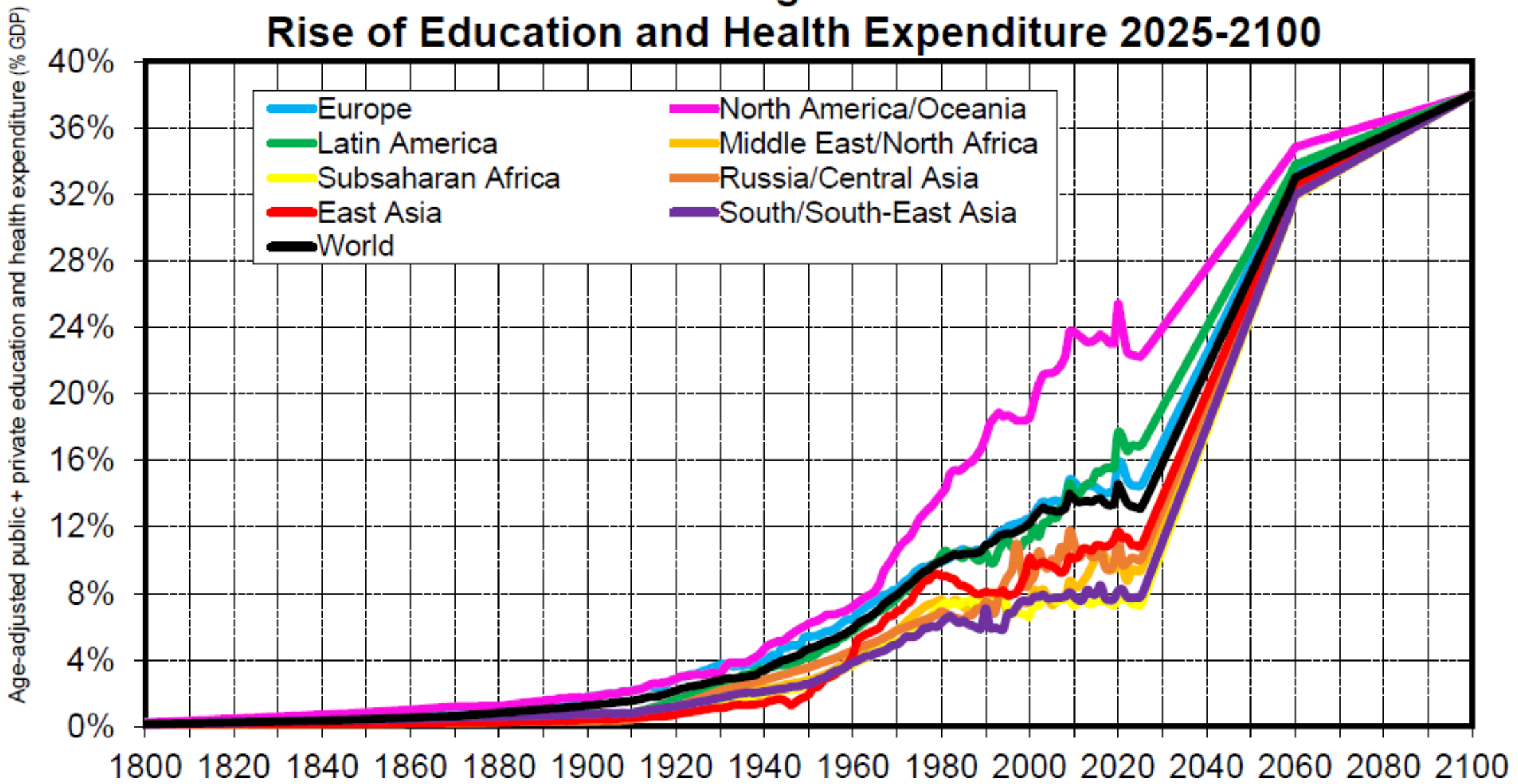
**Interpretation.** Over the 1800-2025 period, countries with higher public expenditure also have higher productivity growth. When public expenditure rises by 1% of GDP (e.g. from 10% to 11% of GDP), annual productivity growth increases by about 0.05% (e.g. from 1% to 1.05% per year). The effect is driven by human & social capital expenditure, including basic public services (justice, police, administration, roads, etc.), public human capital expenditure (education, health), and other human & social capital expenditure (research, culture, community, environment, etc.). It also holds after the inclusion of country fixed effects, capital-output ratio and region x period fixed effects (8 world regions interact 6 periods: 1800-1840, 1840-1880, 1880-1910, 1910-1950, 1950-1990, 1990-2025). Other categories of public expenditure have no robust significant impact on productivity growth.

## The Impact of Human Capital Expenditure on Productivity Growth, 1800-2025: Education vs Health Expenditure, Public vs Private Expenditure

| | Annual Growth Rate of Hourly Productivity (net domestic product per work hour) (computed over previous 20 years) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Total Human Capital Expenditure (% GDP) (averages over previous 20 years) (s.e.) | 0.099*** (0.004) | 0.086*** (0.004) | 0.166*** (0.005) | | | | | | |
| Incl. Education (s.e.) | | | | 0.244*** (0.019) | | | | | |
| Incl. Health (s.e.) | | | | 0.040*** (0.008) | | | | | |
| Incl. Public Expenditure (s.e.) | | | | | 0.159*** (0.006) | | | | |
| Incl. Private Expenditure (s.e.) | | | | | 0.017* (0.010) | | | | |
| Incl. Public Education (s.e.) | | | | | | 0.420*** (0.013) | 0.336*** (0.014) | 0.850*** (0.025) | 0.155*** (0.045) |
| Country Fixed Effects | NO | YES | YES | NO | NO | NO | YES | YES | YES |
| Capital-Output Ratio | NO | YES | YES | NO | NO | NO | YES | YES | YES |
| Region x Period Fixed Effects | NO | NO | NO | NO | NO | NO | NO | NO | YES |
| Countries Covered | ALL | ALL | POOR | ALL | ALL | ALL | ALL | POOR | POOR |
| R2 | 0.07 | 0.17 | 0.22 | 0.08 | 0.08 | 0.09 | 0.16 | 0.22 | 0.49 |
| N.obs | 10602 | 10602 | 8743 | 10602 | 10602 | 10602 | 10602 | 8743 | 8743 |

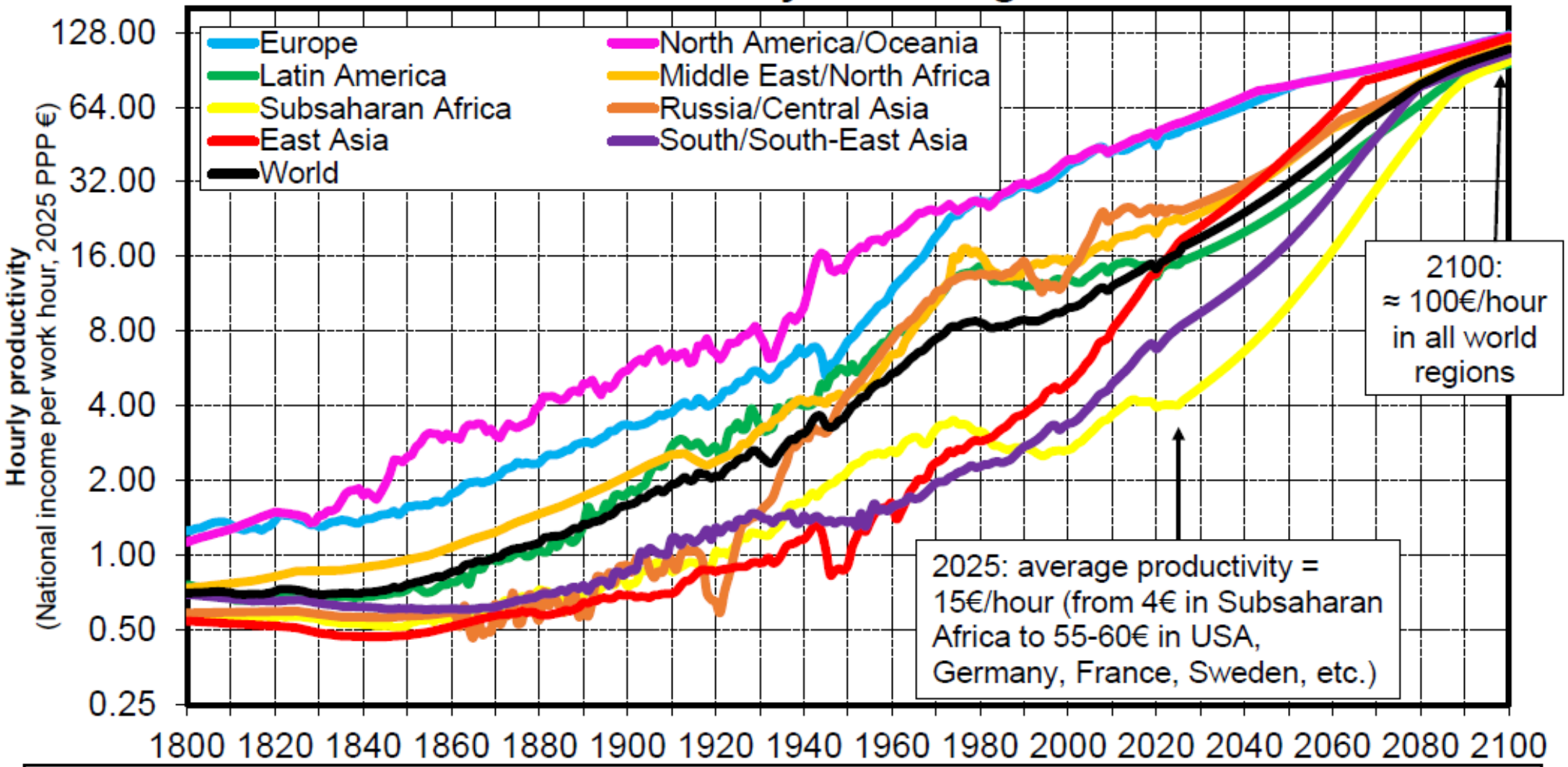
**Interpretation**. When (age-adjusted) human capital expenditure (public and private education and health expenditure) expressed as % of GDP increases by 1% (e.g. from 10% to 11% of GDP), annual productivity growth increases by about 0.1% (e.g. from 1% to 1.1% per year). I.e. the annual rate of return to human capital investment is about 10% (consistent with micro studies). The return is higher for education than for health and for public expenditure than for private expenditure. It is even larger for poor countries (productivity < 10€ PPP 2025/hour) and for public education. This effect also holds after the inclusion of country fixed effects, capital-output ratio and region x period fixed effects (8 world regions interact 6 periods: 1800-1840, 1840-1880, 1880-1910, 1910-1950, 1950-1990, 1990-2025).

# Global Convergence Scenario:
# Rise of Education and Health Expenditure 2025-2100



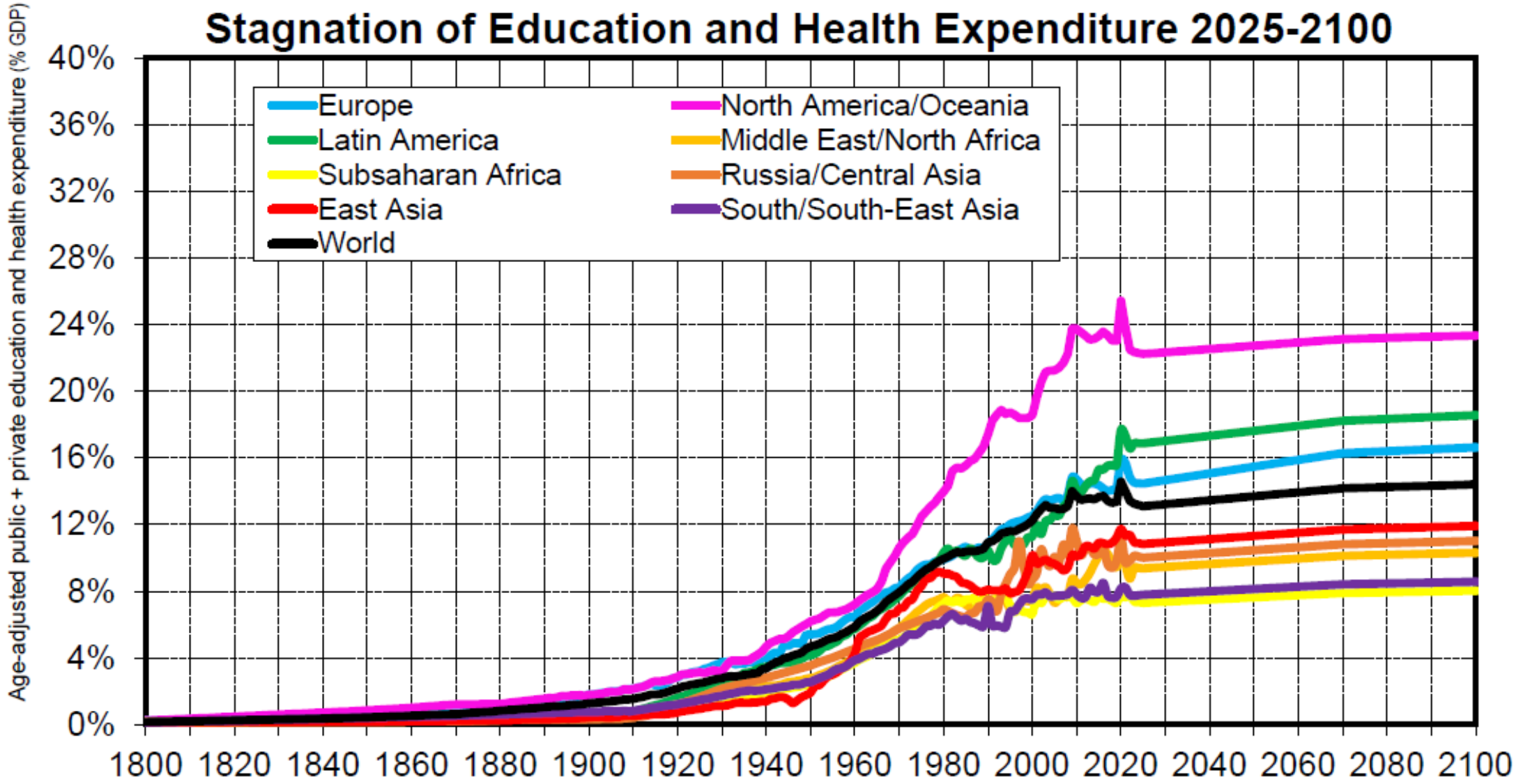

**Interpretation**. In the "global-convergence" scenario, total age-adjusted public and private education and health expenditure is projected to converge toward 38% of GDP in all world regions by 2100. **Sources and series**: wid.world

# Global Convergence Scenario:
# Rise of Productivity in All Regions 2025-2100



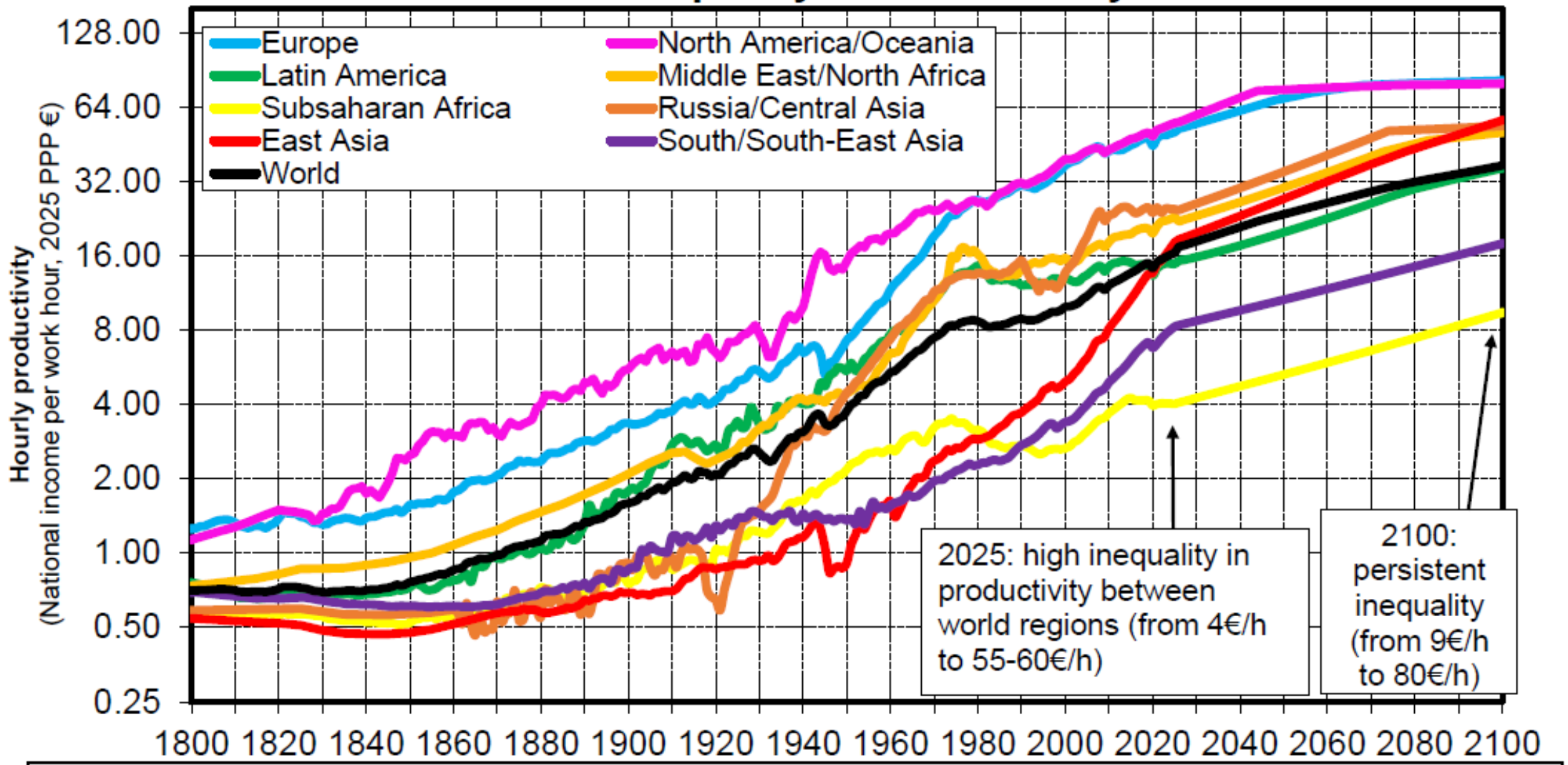

**Interpretation**. Under the "global convergence" scenario, productivity growth rates are projected to rise substantially in 2025-210, so that all regions converge to about 100-120€/hour by 2100. This involves in particular a large acceleration of productivity growth in Subsaharan Africa (4.4% per year over 2025-2100 period, i.e. the same as in East Asia 1990-2025). **Sources and series**: see wid.world

# Business-as-Usual Scenario: Stagnation of Education and Health Expenditure 2025-2100




**Interpretation**. In the "business-as-usual" scenario, total age-adjusted public and private education and health expenditure is projected to stabilize (as a share of GDP) in all world regions during the 2025-2100 period. **Sources and series**: wid.world

# Business-As-Usual Scenario: Persistent Inequality in Productivity 2025-2100




**Interpretation**. Under the "business-as-usual" scenario (stagnation of education and health expenditure), inequality in hourly productivity is projected to remain very high between world regions by 2100. In particular, productivity in 2100 would be only 9€/hour in Subsaharan Africa.
**Sources and series**: see wid.world

## Simulations for Productivity Growth (2025-2100)

| | Productivity 2025 (hourly NDP) (PPP € 2025) | Business-as-Usual Scenario | | Global Convergence Scenario | |
|---|---|---|---|---|---|
| | | Productivity growth rate 2025-2100 | Productivity 2100 (PPP € 2025) | Productivity growth rate 2025-2100 | Productivity 2100 (PPP € 2025) |
| East Asia | **18.1** | 1.5% | **56.6** | 2.6% | **121.8** |
| Europe | **50.6** | 0.6% | **81.9** | 1.2% | **124.9** |
| Latin America | **14.8** | 1.2% | **36.2** | 2.5% | **95.8** |
| Middle East/ North Africa | **22.9** | 1.1% | **50.5** | 2.1% | **112.6** |
| North America/ Oceania | **55.1** | 0.5% | **79.6** | 1.1% | **123.5** |
| Russia/ Central Asia | **24.7** | 1.0% | **53.7** | 2.0% | **109.5** |
| South/South-East Asia | **8.3** | 1.0% | **17.9** | 3.4% | **104.9** |
| Sub Saharan Africa | **4.0** | 1.1% | **9.4** | 4.4% | **98.1** |
| **World** | **16.5** | **1.1%** | **37.1** | **2.6%** | **109.6** |

**Interpretation**. In the "business-as-usual" scenario (frozen human capital expenditure), productivity growth in 2025-2100 is projected to decline as compared to 1900-2025 (1.1% vs 1.8% at the world level). In the "global convergence" scenario (rising human capital expenditure), simulated productivity growth rates accelerate and all regions converge to about 100-120€ in hourly productivity by 2100.
**Sources and series**: wid.world

# Human Capital & Inequality: Summing Up

- **In spite of large & successful historical increase in education and health expenditure since 1900, access to education and health remains extremely unequal between South and North**

- E.g. per-school-age-individual public education expenditure in Subsaharan Africa ≈ 3% of Europe/North America level in 2025 in PPP terms (vs 6% in 1980 and 4% in 1950)

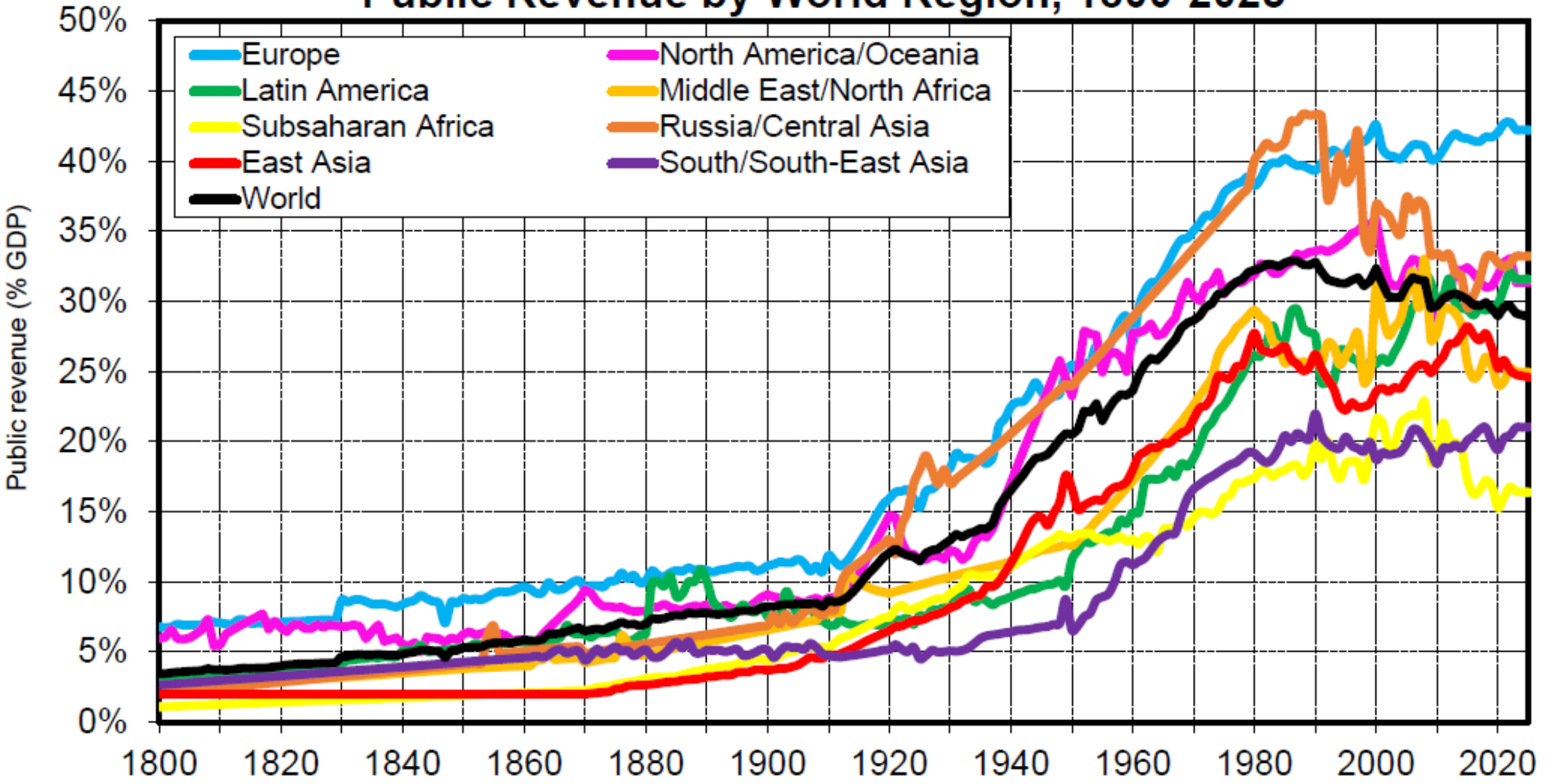
- With higher human capital expenditure in global South since 1900 or 1950, global productivity convergence would already be achieved in 2025. If we start now it can be achieved by 2100.

- Human capital expenditure has a huge a positive impact on productivity growth, especially public education, and especially in the poorest countries
- **Real-world governments may not be perfect, but as they stand they appear to be more efficient in the South than in the North** in order to transform human capital expenditure into productivity
- A large global justice fund aimed at financing human capital expenditure can deliver global productivity convergence, with productivity around 100€/hour in all world regions by 2100
- **To be further analyzed in GJP scenarios, together with within-country inequality of income and wealth, structural transformation across sectors, planetary habitability etc.**

# The Rise of the Fiscal State 1800-2025

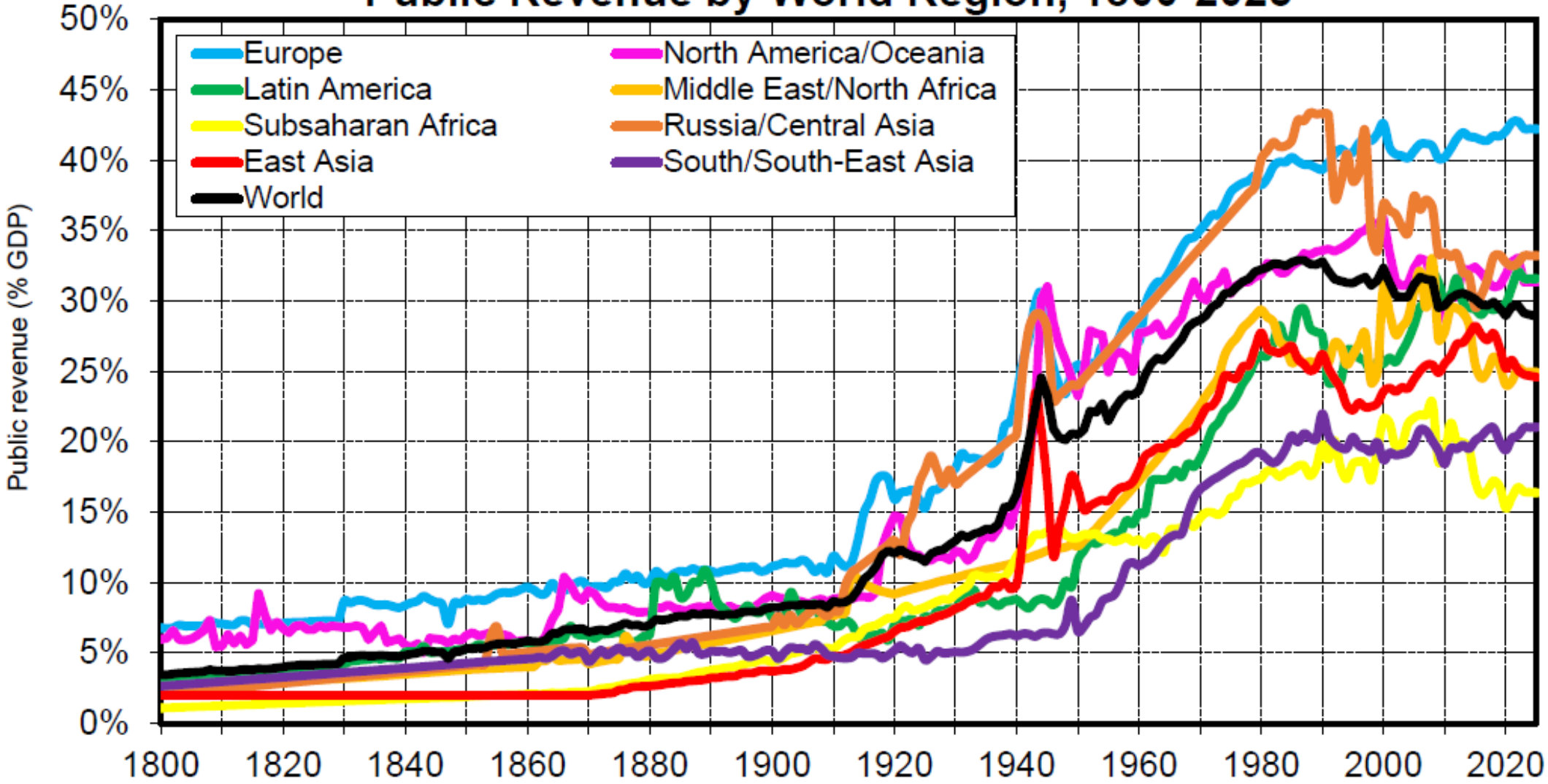
- **The rise of the social state could not have happened without the rise of the fiscal state**: less than 10% of GDP in tax revenues in all countries until World War 1, up to 40-50% of GDP in 2025 in Nordic-Western Europe & around 30-35% at the world level
- **This was made possible by the rise of new forms of taxation**, including social contributions and **progressive taxation of income and wealth**, **which played a key role to enhance the political acceptability of higher tax revenues for lower-income and middle-income groups**
- **Conversely, the decline of tax progressivity since the 1980s-1990s has come with the stabilization of tax revenues & the rise of public debt**: will the resulting debt crisis be addressed by the return of progressive taxation, or the return of inflation, or both?

# Public Revenue by World Region, 1800-2025




**Interpretation**. Public revenue includes all tax revenue and non-tax revenue (royalties, fines, etc.) collected by all levels of government (central and local government, social security funds, etc.), except exceptional revenue during world wars.
**Sources and series**: wid.world

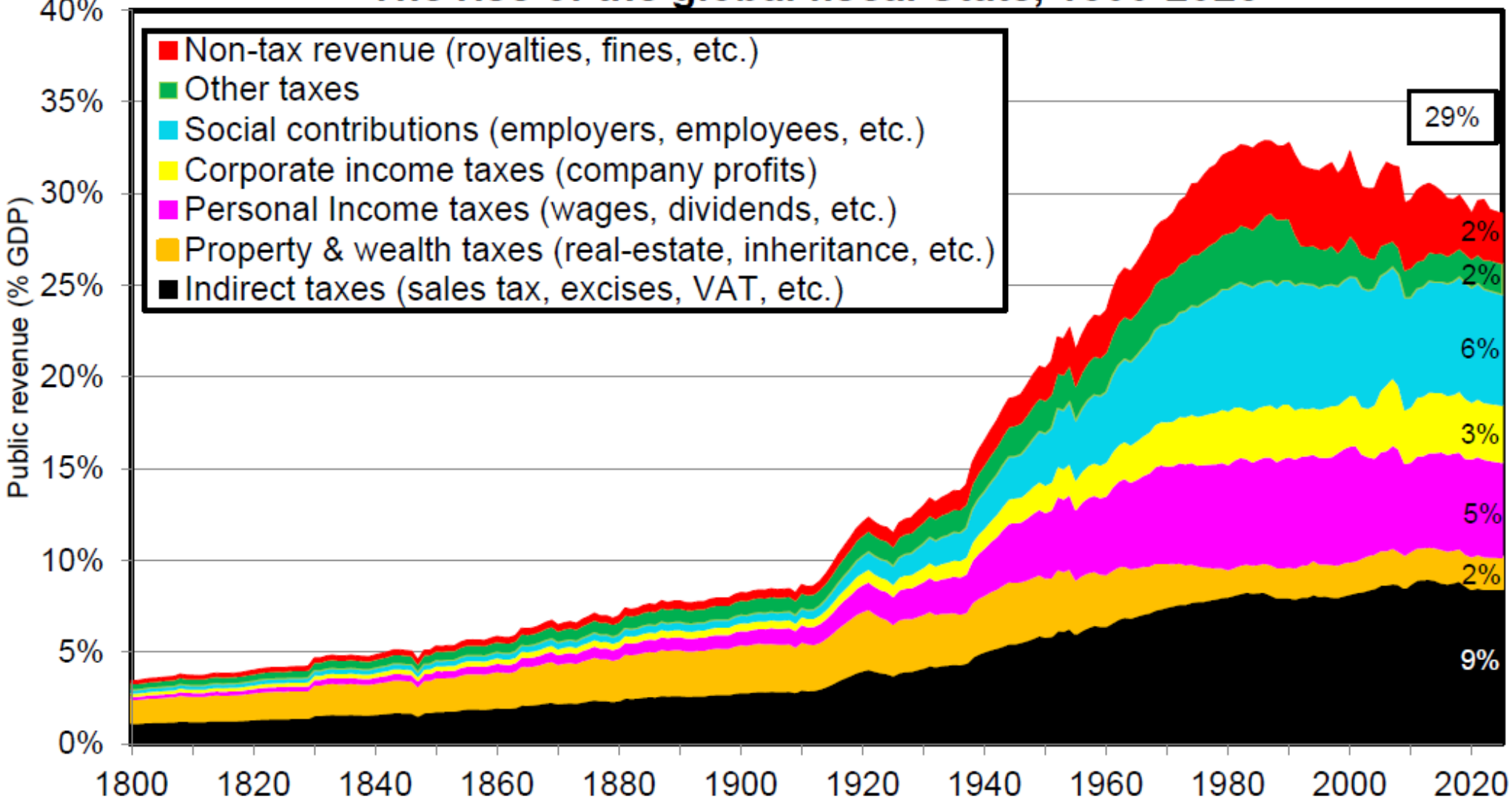
# Public Revenue by World Region, 1800-2025




**Interpretation**. Public revenue includes all tax revenue and non-tax revenue (royalties, fines, etc.) collected by all levels of government (central and local government, social security funds, etc.).

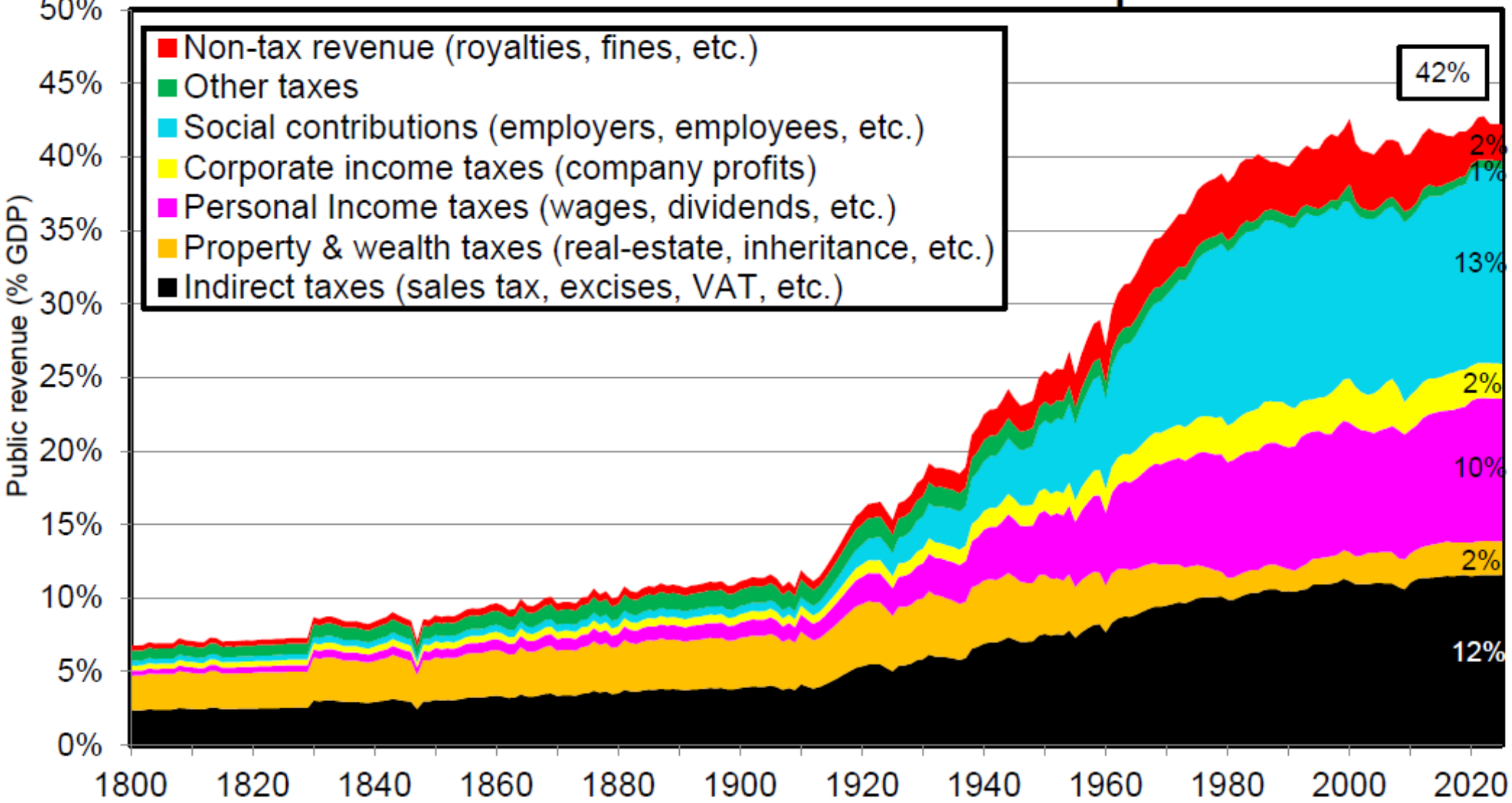
**Sources and series**: wid.world

# The rise of the global fiscal State, 1800-2025



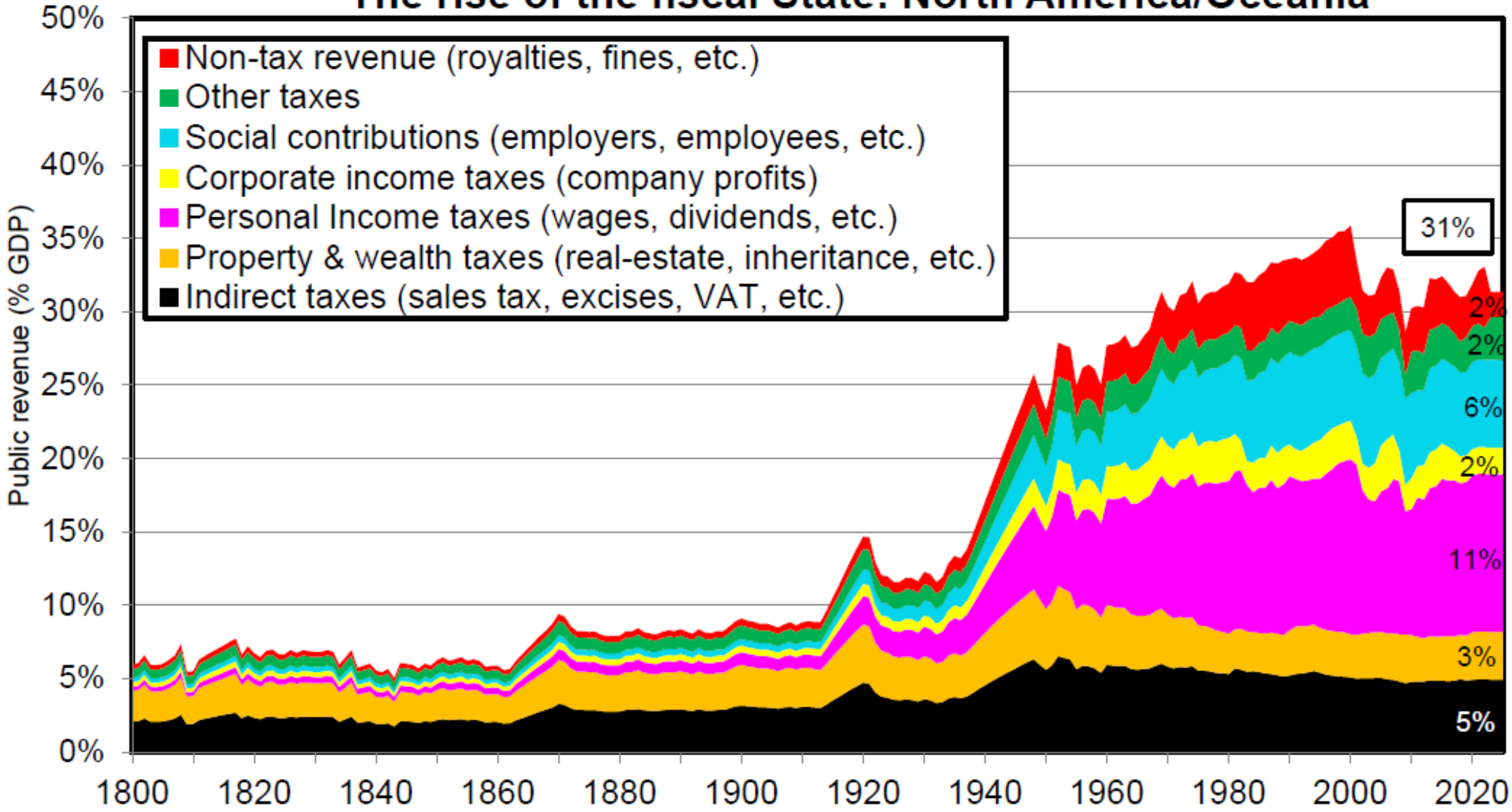

**Interpretation.** In 2025, total public revenue amounts to about 29% of global GDP (PPP), including 9% for indirect taxes (sales taxes, excises, VAT, etc.), 2% for property and wealth taxes (annual taxes on real estate and other property, inheritance taxes, etc.), 5% for personal income taxes (taxes on household income: wages, dividends, etc.), 3% for corporate income taxes (taxes on company profits), 6% sor social contributions (employers, employees, self-employed), 2% for other taxes and 2% for non-tax revenue (royalties, fines and other non-tax compulsory payments, excluding government sales of goods and services (e.g. university tuitions), which are included in private expenditure). **Sources and series**: wid.world

# The rise of the fiscal State: Europe



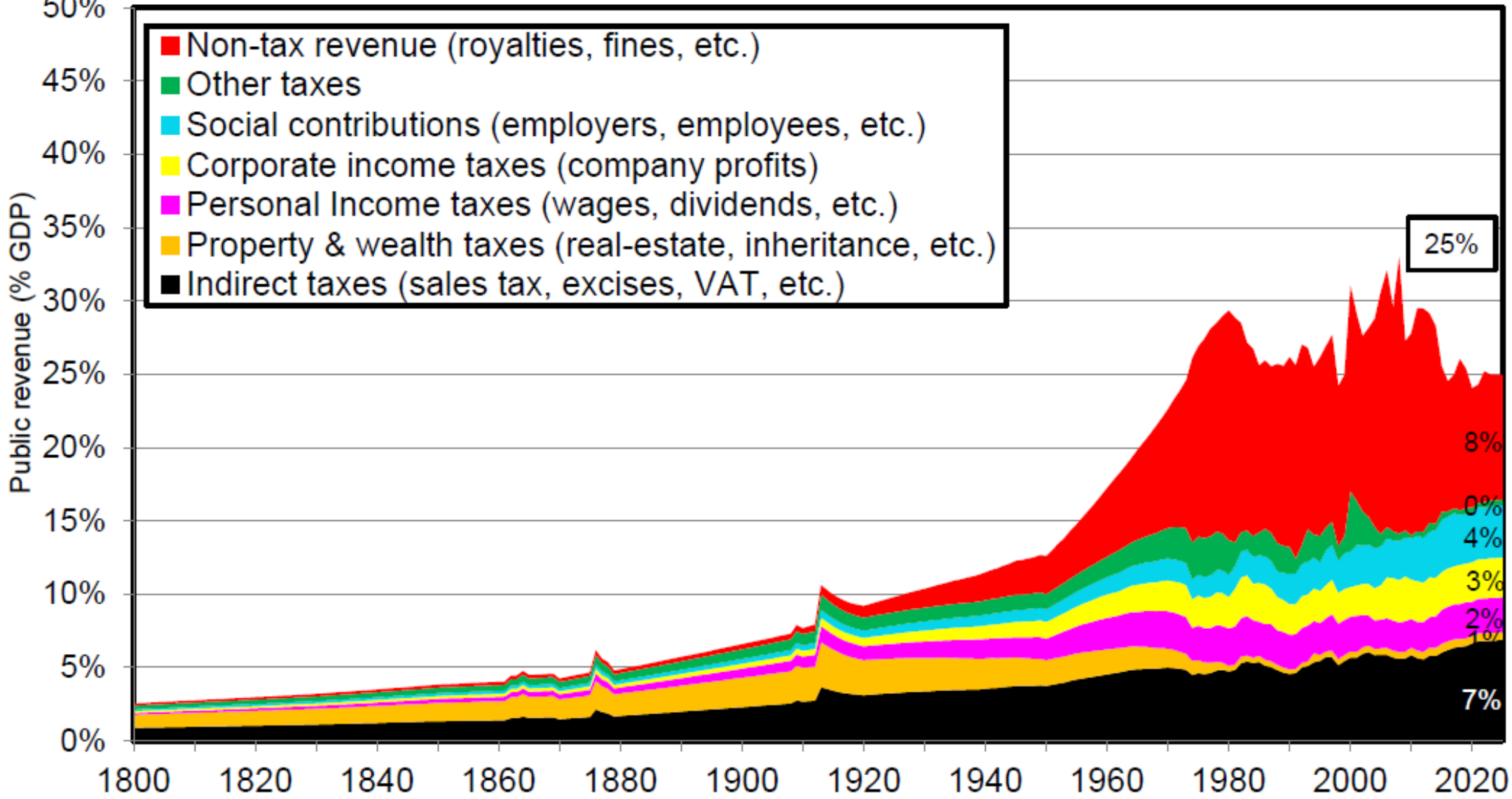

**Interpretation.** In 2025, total public revenue amounts to about 42% of GDP in Europe, including 12% for indirect taxes (sales taxes, excises, VAT, etc.), 2% for property and wealth taxes (annual taxes on real estate and other property, inheritance taxes, etc.), 10% for personal income taxes (taxes on household income: wages, dividends, etc.), 2% for corporate income taxes (taxes on company profits), 13% sor social contributions (employers, employees, self-employed), 1% for other taxes and 2% for non-tax revenue (royalties, fines, etc.). **Sources and series**: wid.world

# The rise of the fiscal State: North America/Oceania



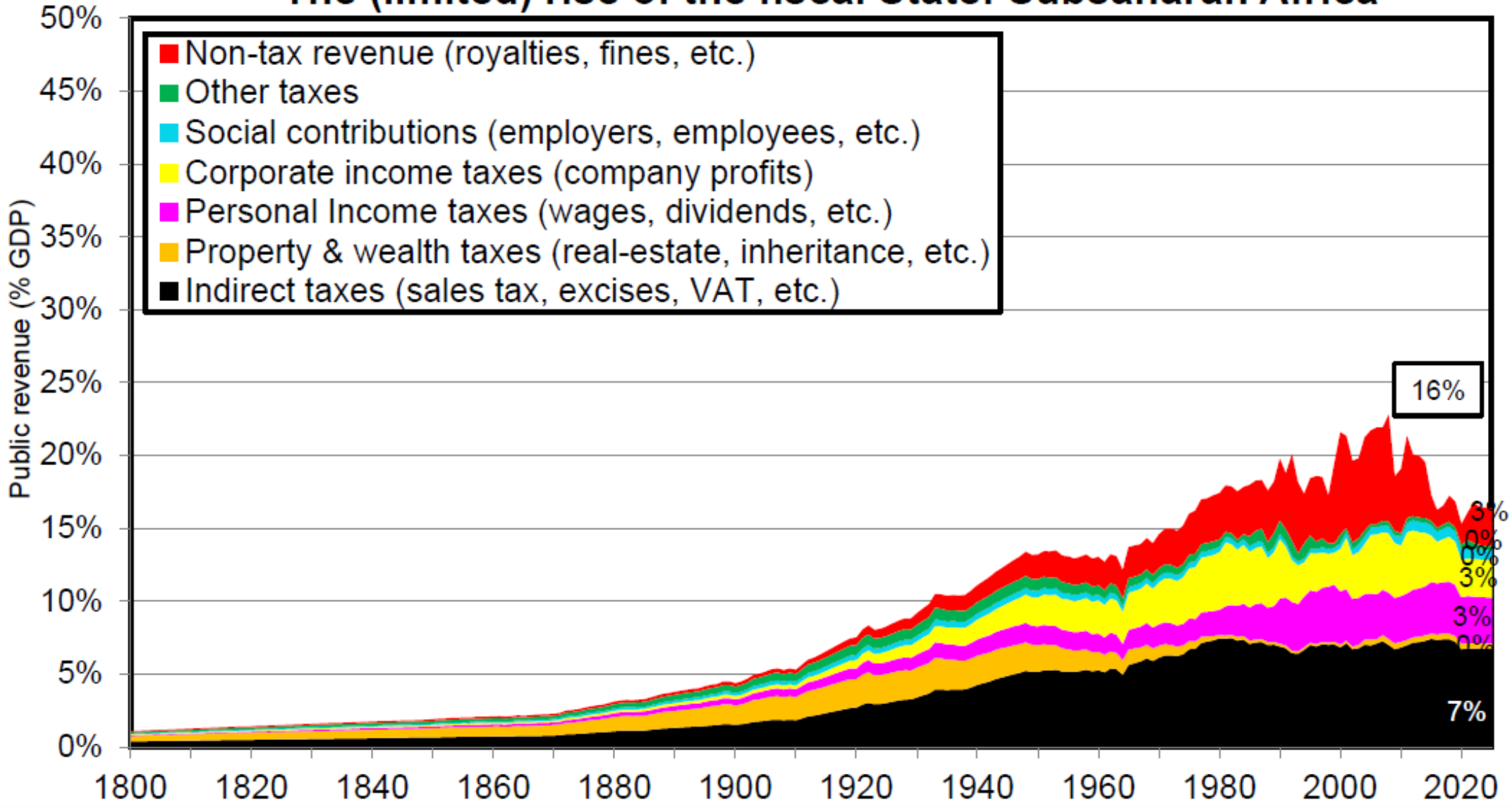

**Interpretation.** In 2025, total public revenue amounts to about 31% of GDP in North America/Oceania, including 5% for indirect taxes (sales taxes, excises, etc.), 3% for property and wealth taxes (annual taxes on real estate & other property, inheritance taxes, etc.), 11% for personal income taxes (taxes on household income: wages, dividends, etc.), 2% for corporate income taxes (taxes on company profits), 6% sor social contributions (employers, employees, self-employed), 2% for other taxes and 2% for non-tax revenue (royalties, fines, etc.). **Sources and series**: wid.world

# The rise of the fiscal State: Middle East/North Africa



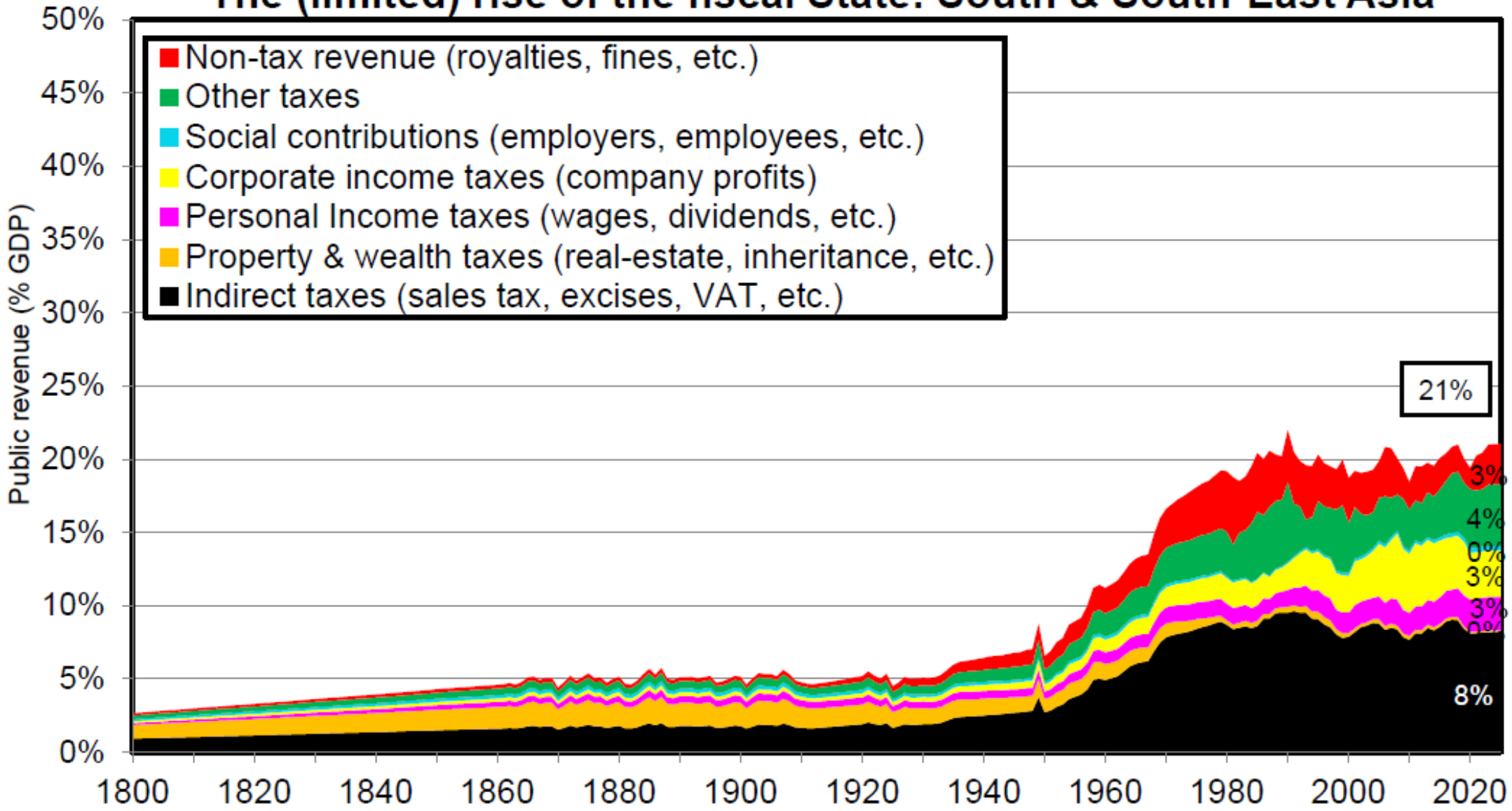

**Interpretation.** In 2025, total public revenue amounts to about 25% of GDP in MENA, including 7% for indirect taxes (sales taxes, excises, VAT, etc.), 1% for property and wealth taxes (annual taxes on real estate and other property, inheritance taxes, etc.), 2% for personal income taxes (taxes on household income: wages, dividends, etc.), 3% for corporate income taxes (taxes on company profits), 4% sor social contributions (employers, employees, self-employed), 0% for other taxes and 8% for non-tax revenue (royalties, fines, etc.). **Sources and series**: wid.world

# The (limited) rise of the fiscal State: Subsaharan Africa




**Interpretation.** In 2025, total public revenue amounts to about 16% of GDP in Subsaharan Africa, including 7% for indirect taxes (sales taxes, excises, etc.), 0% for property and wealth taxes (annual taxes on real estate and other property, inheritance taxes, etc.), 3% for personal income taxes (taxes on household income: wages, dividends, etc.), 3% for corporate income taxes (taxes on company profits), 0% sor social contributions (employers, employees, self-employed), 0% for other taxes and 3% for non-tax revenue (royalties, fines, etc.). **Sources and series**: wid.world

# The (limited) rise of the fiscal State: South & South-East Asia




**Interpretation.** In 2025, total public revenue amounts to about 21% of GDP in South & South-East Asia, including 8% for indirect taxes (sales taxes, excises, etc.), 0% for property & wealth taxes (annual taxes on real estate & other property, inheritance taxes, etc.), 3% for personal income taxes (taxes on household income: wages, dividends, etc.), 2% for corporate income taxes (taxes on company profits), 0% sor social contributions (employers, employees, self-employed), 4% for other taxes and 3% for non-tax revenue (royalties, fines, etc.). **Sources and series**: wid.world

# During 20c, the Rise of the Fiscal State Came with the Rise of Progressive Taxation of Income & Wealth

- **Progressive taxation of top income & wealth during 20c contributed to make the rise of the fiscal state acceptable for the lower and middle income groups, and also to reduce the long-run concentration of property** (less accumulation at the top, but more accumulation within middle class)
- **Rise of progressive taxation was accelerated by WW1 & WW2**, but also by other events, including Bolshevik revolution (huge impact on European politics), the Great depression (major impact in the US). The role of wars as such should not be exagerrated (& wars were themselves partly due to inequality).
- **Key role of long-run ideological changes and socio-political mobilization**:
  1909-1910 People's Budget in Britain (fall of House of Lords)
  1911 constitutional change in Sweden (end of hyper-censitary regime)
  1913 constitutional amendment in the US (rising demand for redistribution)
  Rise of progressive taxation in Japan also started much before WW1, etc.

# Some progressive tax projects in 18th century France

**Graslin : progressive tax on income**
(*Essai analytique sur la richesse et l'impôt* , 1767)

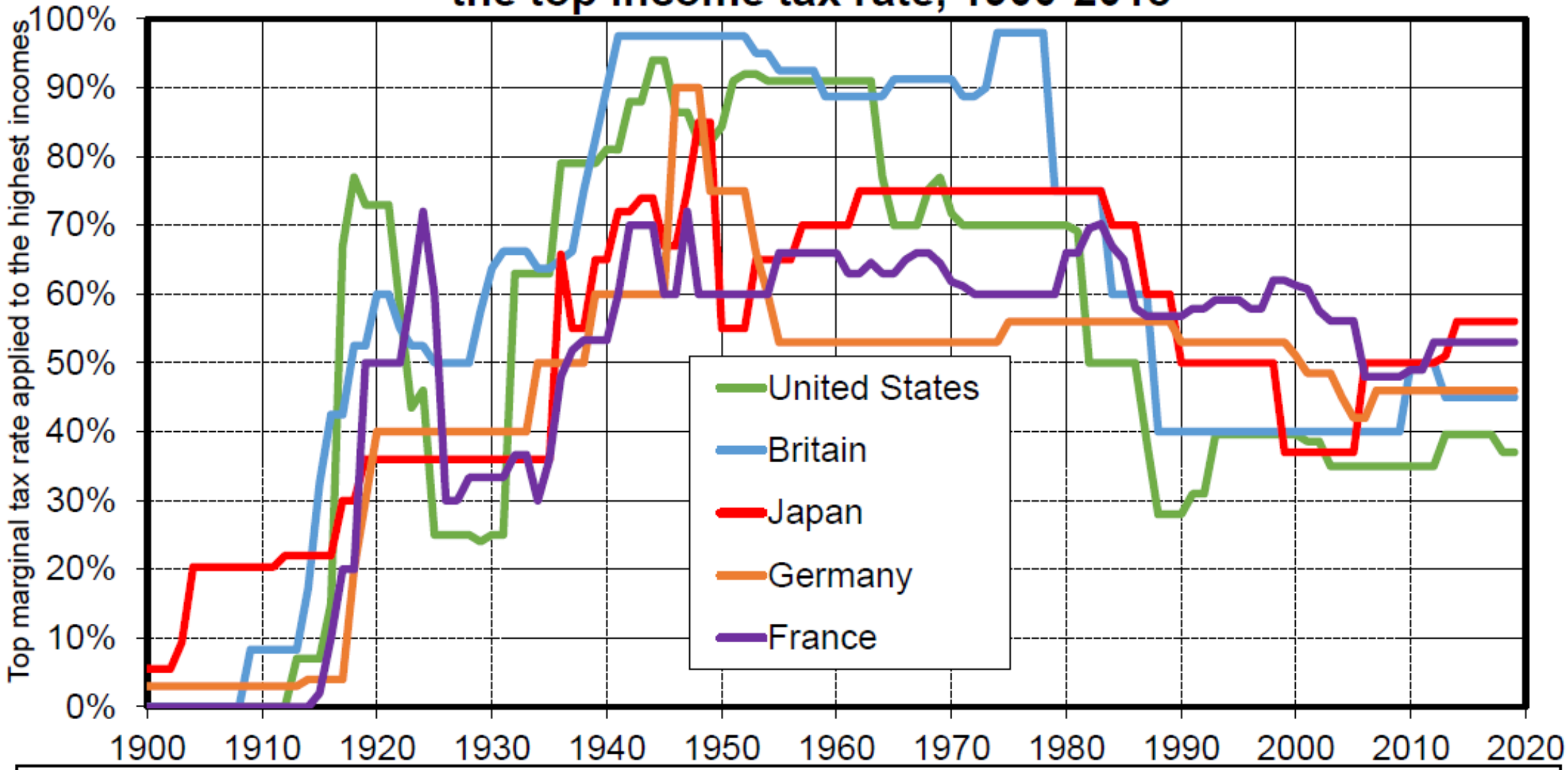
| Multiple of average income | Effective tax rate |
|---|---|
| 0,5 | 5% |
| 20 | 15% |
| 200 | 50% |
| 1300 | 75% |

**Lacoste : progressive tax on inheritance**
*(Du droit national d'hérédité, 1792)*

| Multiple of average wealth | Effective tax rate |
|---|---|
| 0,3 | 6% |
| 8 | 14% |
| 500 | 40% |
| 1500 | 67% |

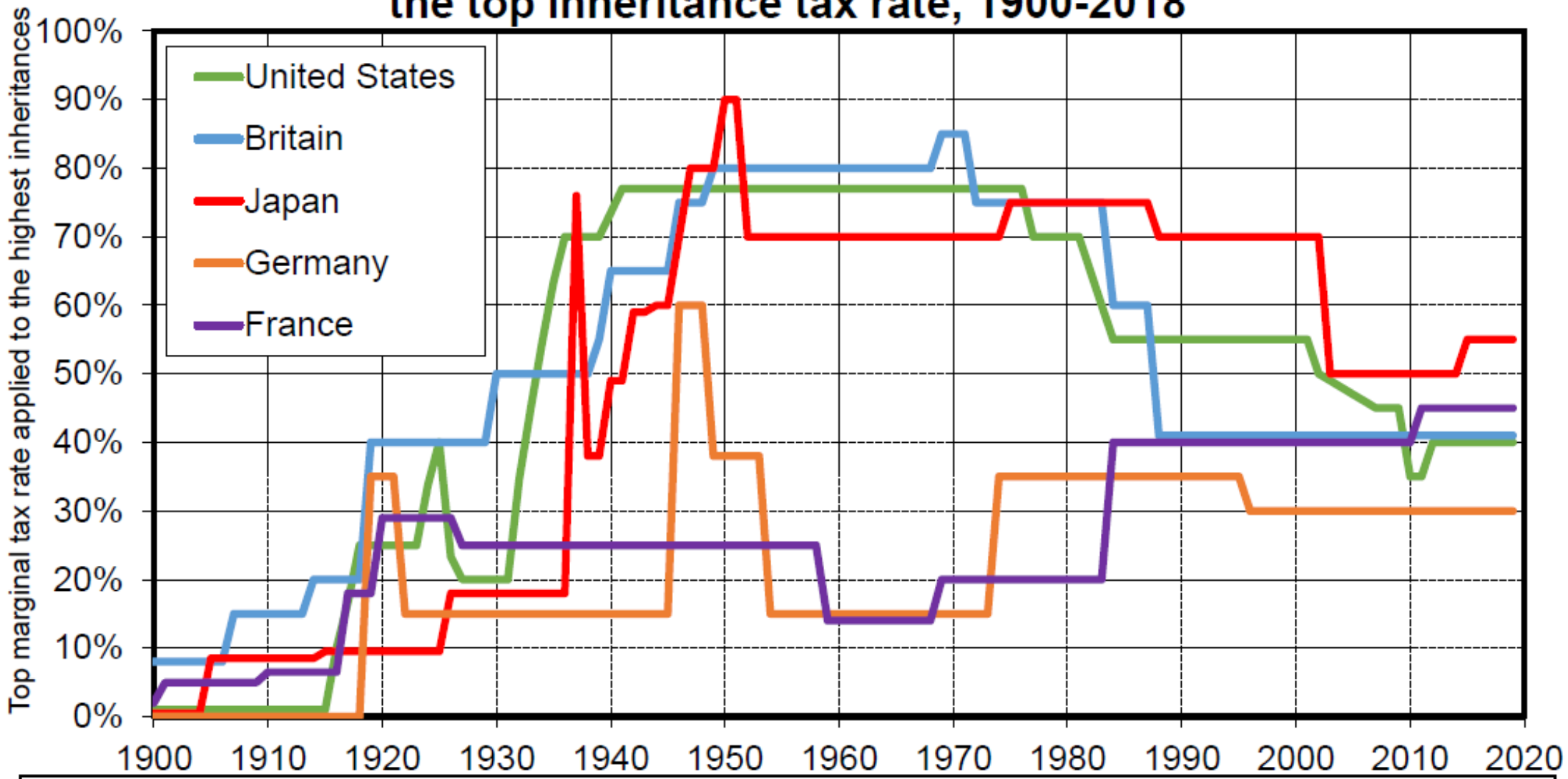
**Interpretation.** In the progressive income tax project presented by Graslin in 1767, the effective tax rate rose gradually from 5% for an annual income of 150 livres tournois (about half of average per adult income at the time) to 75% for an annual income of 400000 livres (about 1300 times average income). One observes a comparable progressivity with the progressive inheritance tax project presented by Lacoste in 1792. **Sources:** see piketty.pse.ens.fr/ideology (table 3.1).

# The invention of progressive taxation: the top income tax rate, 1900-2018



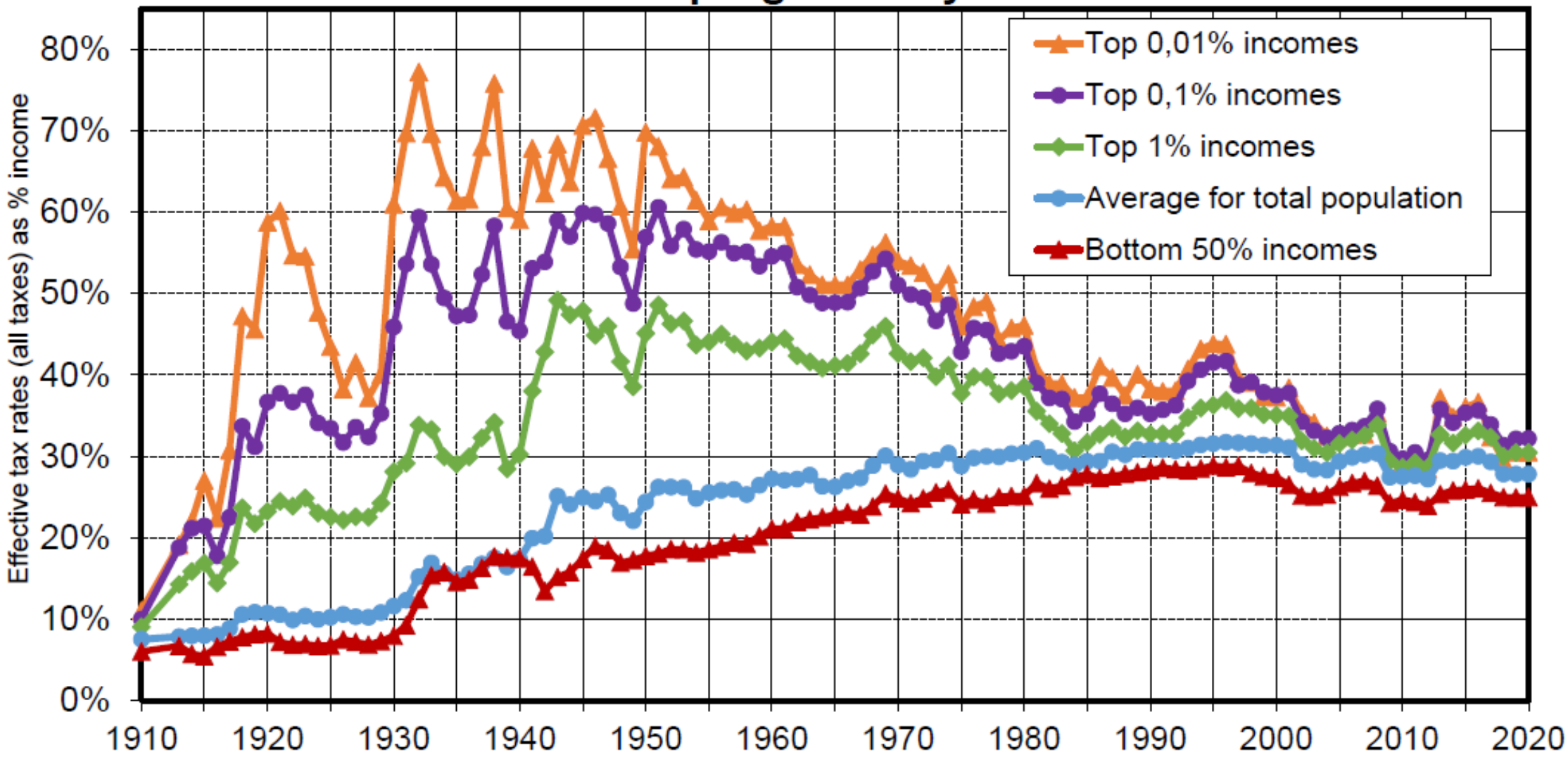

**Interpretation**. The marginal income tax rate applied to the highest incomes was on average 23% in the U.S. from 1900 to 1932, 81% from 1932 to 1980 and 39% from 1980 to 2018. Over these same periods, the top rate was equal to 30%, 89% and 46% in Britain, 26%, 68% and 53% in Japan, 18%, 58% and 50% in Germany, and 23%, 60% and 57% in France. Progressive taxation peaked in mid-century, especially in the U.S. and in Britain. **Sources and series**: see piketty.pse.ens.fr/ideology (figure 10.11).

# The invention of progressive taxation: the top inheritance tax rate, 1900-2018



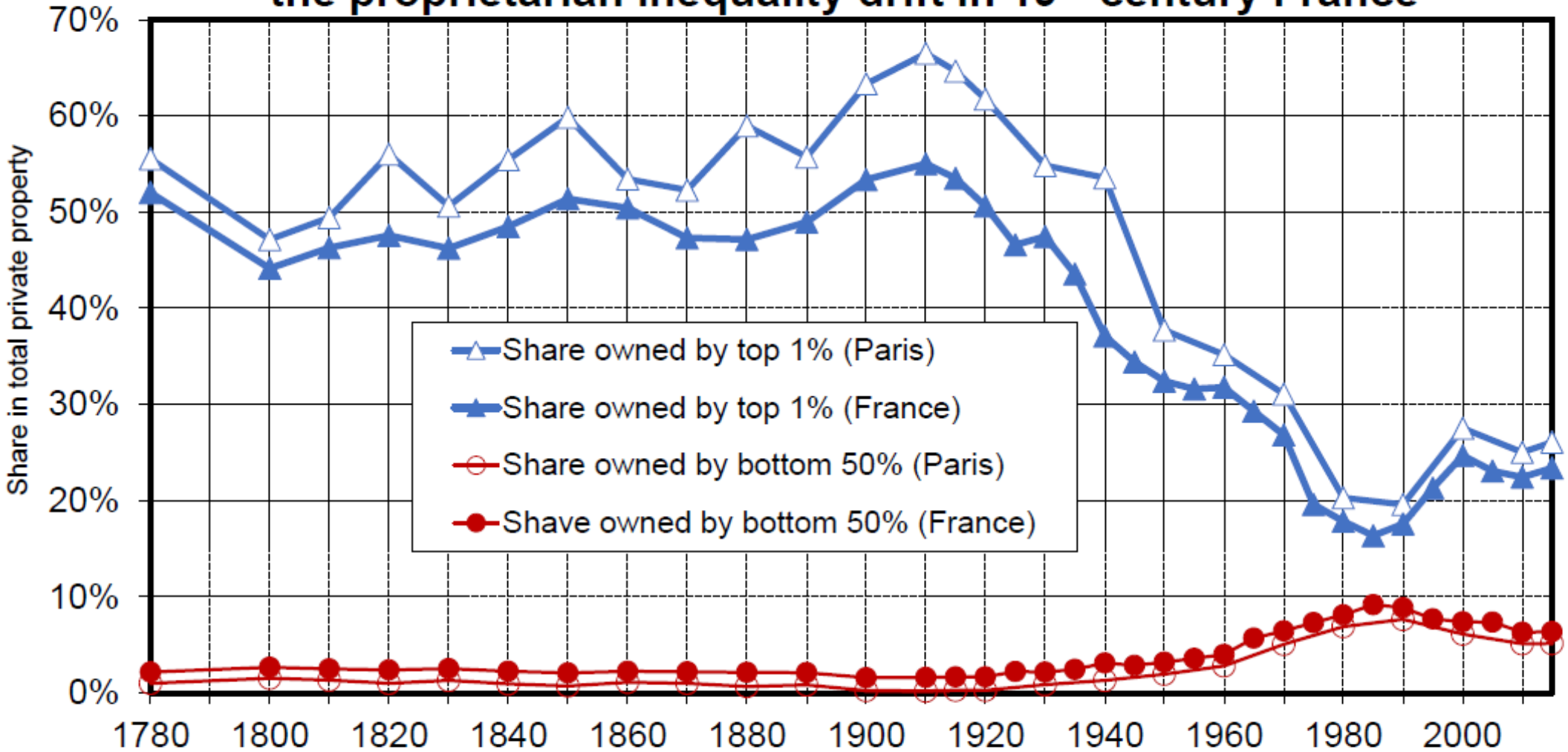

**Interpretation**. The marginal inheritance tax rate applied to the highest inheritances was on average 12% in the U.S. from 1900 to 1932, 75% from 1932 to 1980 and 50% from 1980 to 2018. Over these same periods, the top rate was equal to 25%, 72% and 46% in Britain, 9%, 64% and 63% in Japan, 8%, 23% and 32% in Germany, and 15%, 22% and 39% in France. Progressivity was maximal in mid-century, especially in the U.S. and in Britain. **Sources and series**: see piketty.pse.ens.fr/ideology (figure 10.12).

# Effective rates and progressivity in the U.S. 1910-2020




**Interpretation**. From 1915 to 1980, the tax system was highly progressive in the U.S., in the sense that effective tax rates paid by the highest income groups (all taxes included, and as % of pretax income) was significantly larger than the average effective tax rate paid by the the total population (and particularly by the bottom 50% incomes). Since 1980, the tax system has not been very progressive, with little differences in effective tax rates across groups. **Sources and series**: see piketty.pse.ens.fr/ideology (figure 10.13).

# The failure of the French Revolution: the proprietarian inequality drift in 19th century France




**Interpretation**. In Paris, the richest 1% owned about 67% of total private property in 1910 (all assets combined: real, financial, business, etc.), vs. 49% in 1810 and 55% in 1780. After a small drop during the French Revolution, the concentration of property rose in France (and particularly in Paris) during the 19th century and until World War 1. In the long run, the fall in inequality occurred following the world wars (1914-1945), rather than following the Revolution of 1789. **Sources and series**: see piketty.pse.ens.fr/ideology (figure 4.1)..

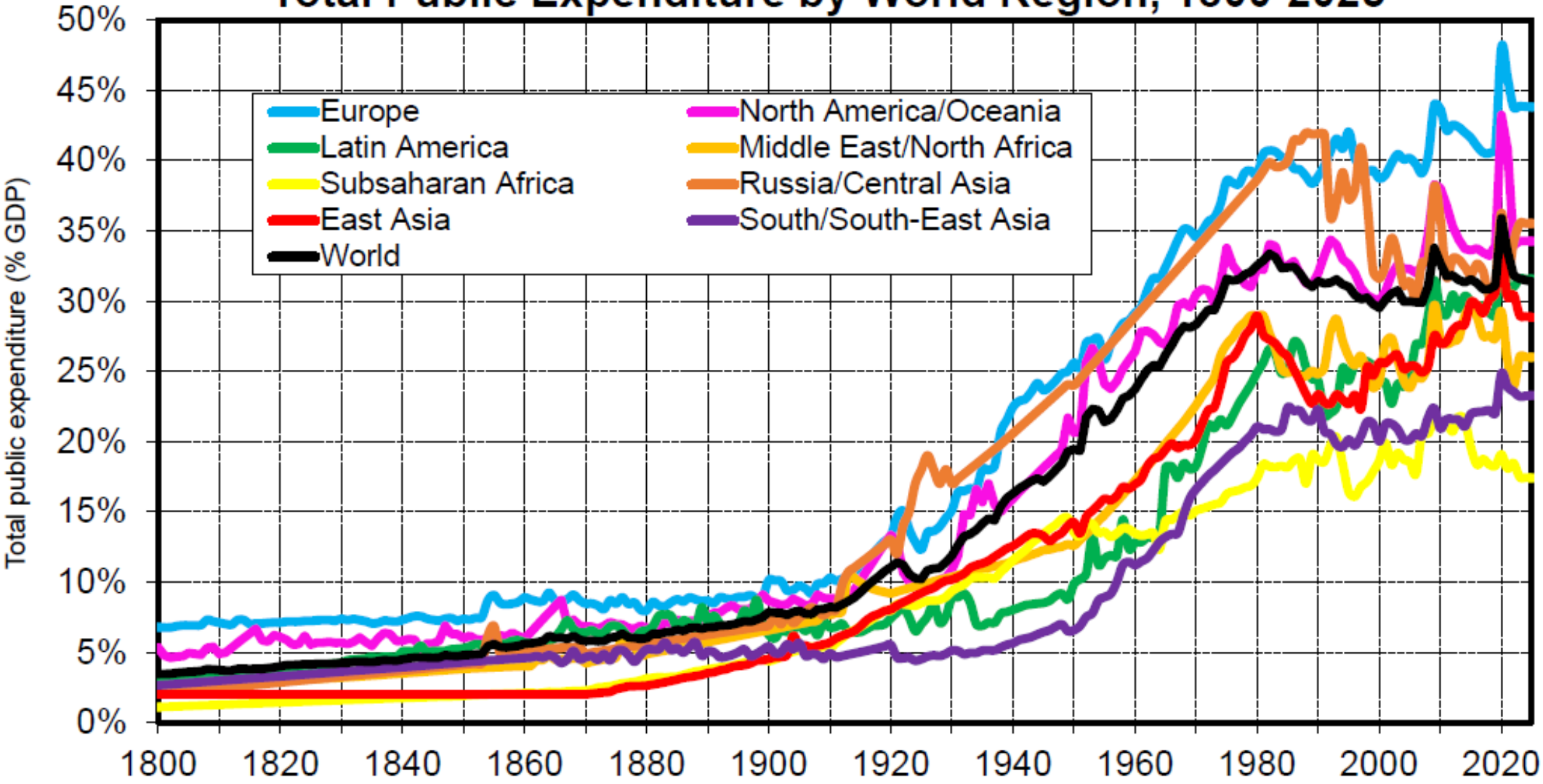
# Public Revenue and Expenditure & the Question of Public Debt

- **In the long-run, the rise in public expenditure has been approximately matched by the rise of public revenue**
- **Except in wartime**: major rise in public debt, major political issue in postwar periods: the removal of public debt via exceptional wealth taxes (& inflation) played a key role in the « Great Transformation » of the 20th century
- **Except also in times of large distributional conflict**: when equitable taxation between social classes appears to be out-of-reach, then the flight toward high public debt can be the easiest option

  France before 1789 → **abolition of tax privileges of the aristocracy**

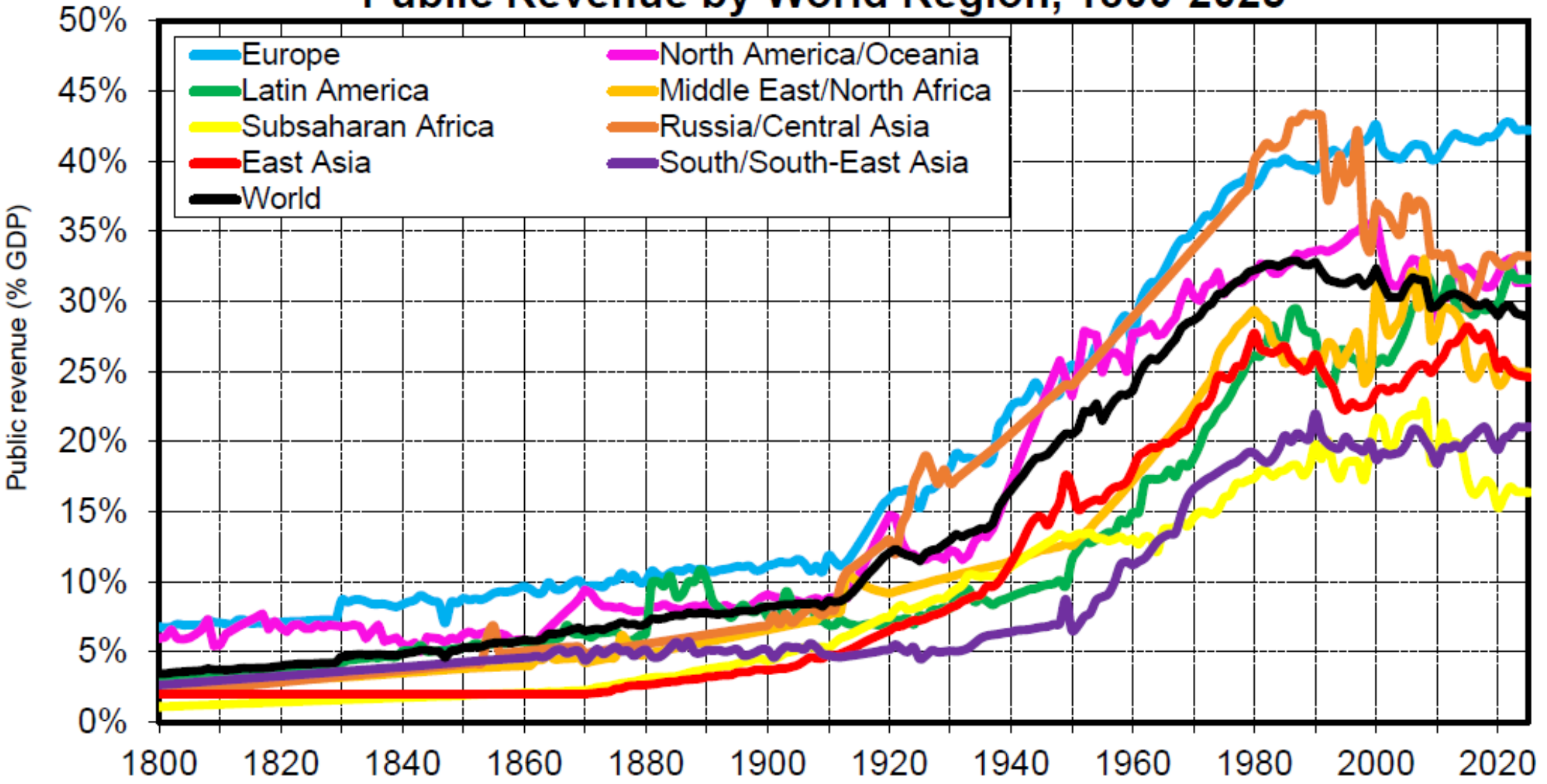
  Today at the world level →**abolition of tax privileges of billionnaires?**

# Total Public Expenditure by World Region, 1800-2025



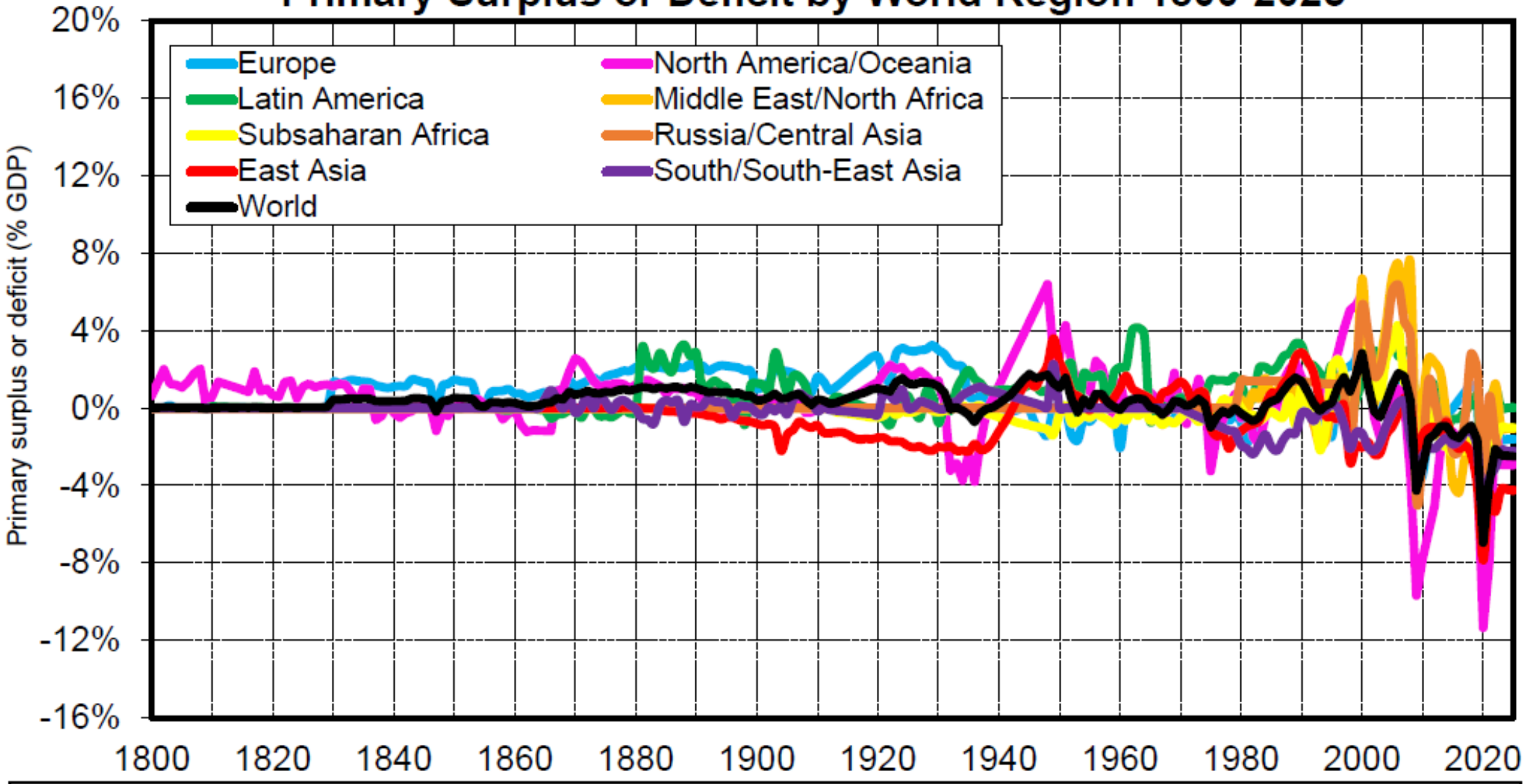

**Interpretation**. Total public expenditure rose from about 3% of global GDP in 1800 to about 31% in 2025, with large regional variations. Total public expenditure includes all expenditures by all public administrations (including central and local government, social security funds, etc.), except interest payments (and except exceptional expenditure during world wars). **Sources and series**: wid.world

# Public Revenue by World Region, 1800-2025



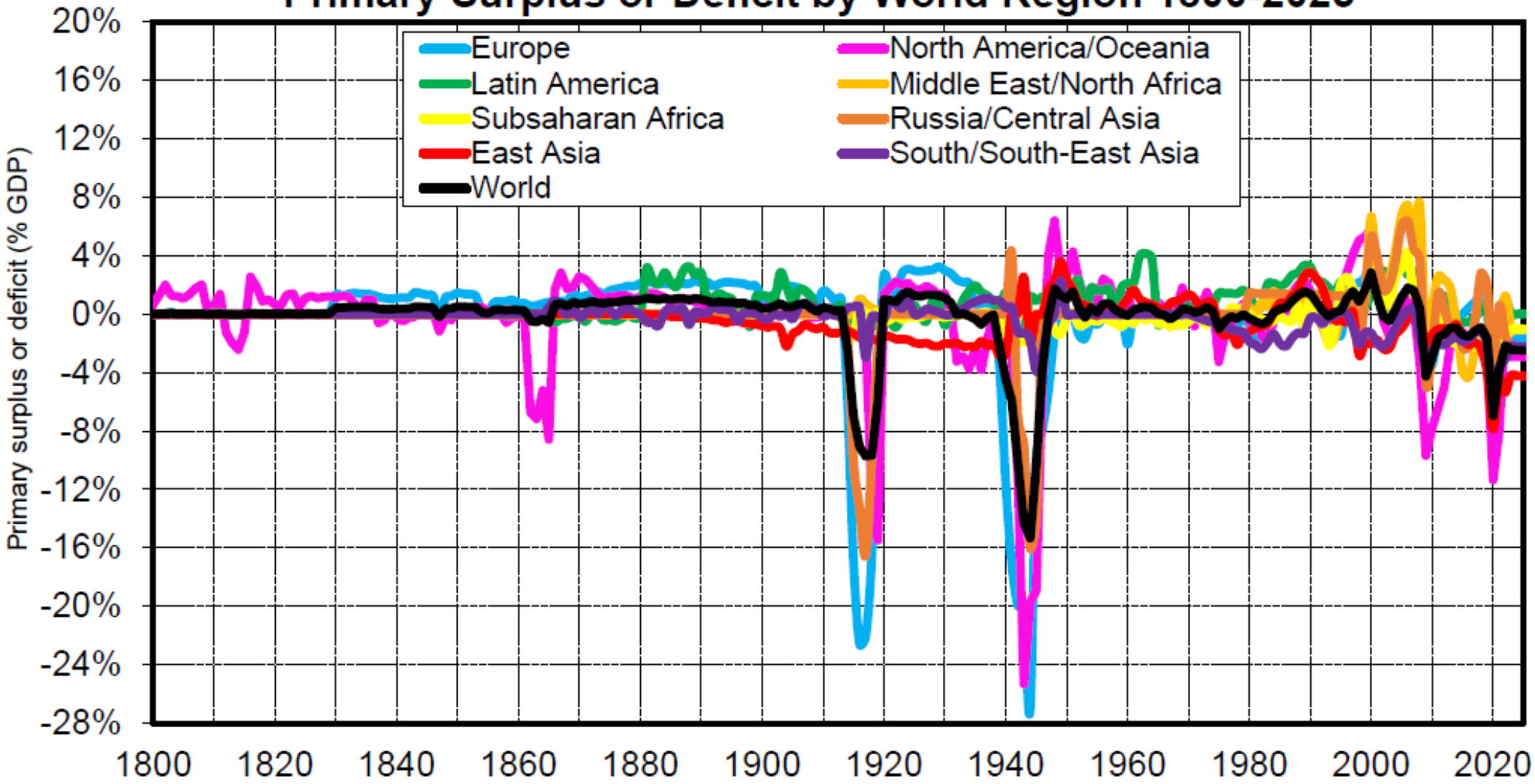

**Interpretation**. Public revenue includes all tax revenue and non-tax revenue (royalties, fines, etc.) collected by all levels of government (central and local government, social security funds, etc.), except exceptional revenue during world wars.
**Sources and series**: wid.world

# Primary Surplus or Deficit by World Region 1800-2025



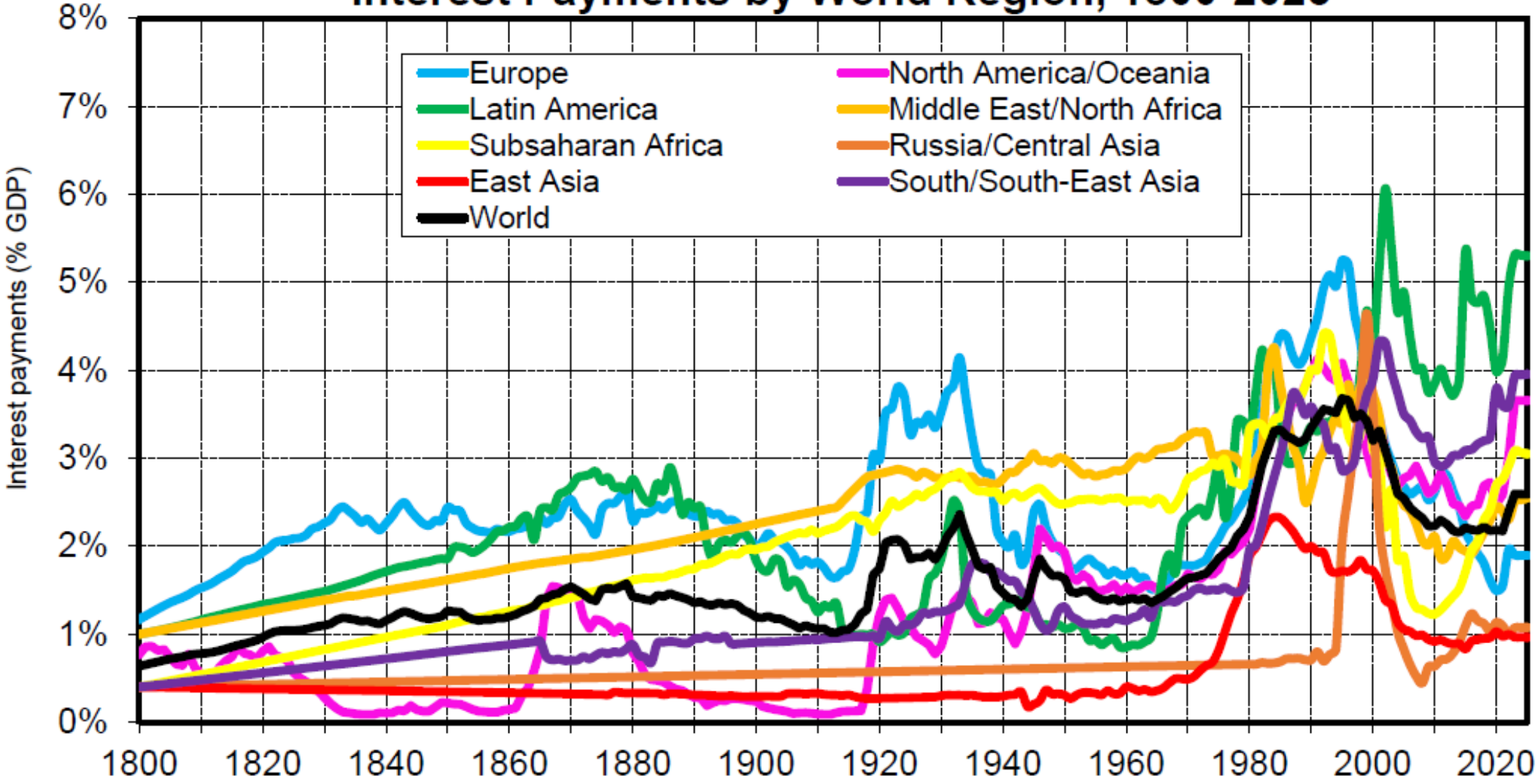

**Interpretation**. Primary surplus/deficit = Public revenue - Public expenditure (excluding exceptional revenue and expenditure during world wars). **Sources and series**: wid.world

# Primary Surplus or Deficit by World Region 1800-2025



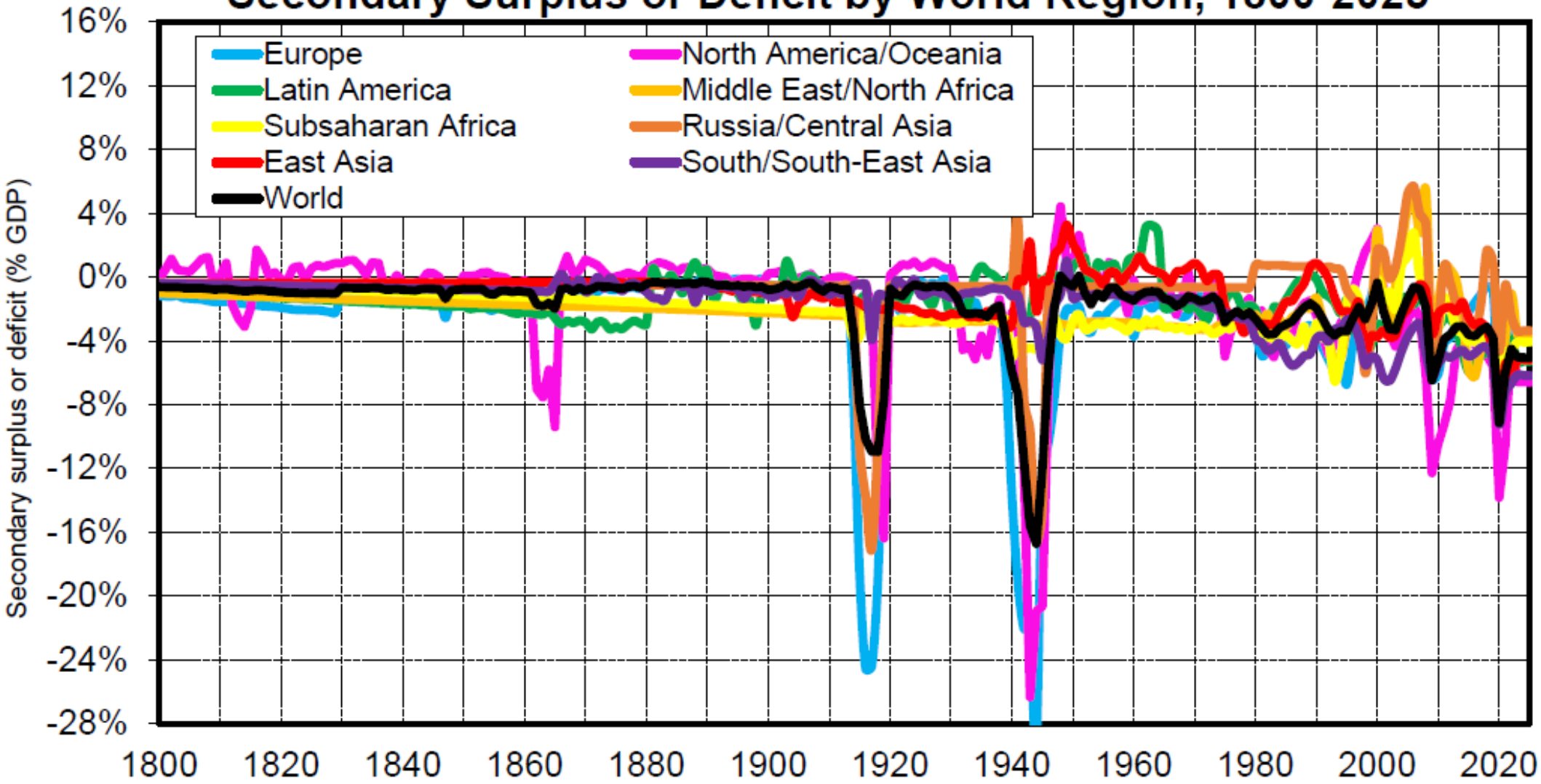

**Interpretation**. Primary surplus/deficit = Public revenue - Public expenditure.
**Sources and series**: wid.world

# Interest Payments by World Region, 1800-2025

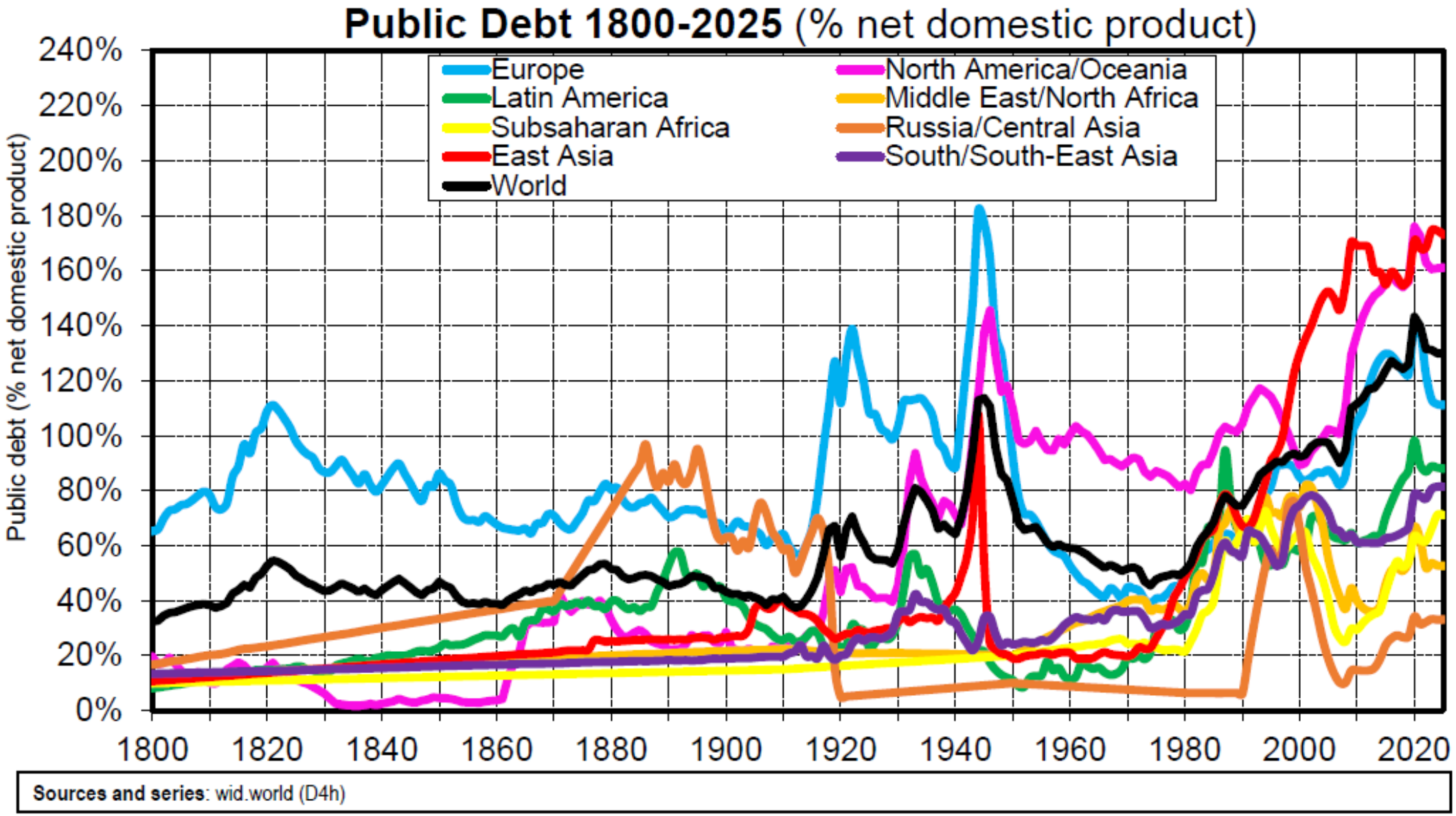



**Interpretation**. Government interest payments represent about 2.5% of world GDP in 2025.
**Sources and series**: wid.world

# Secondary Surplus or Deficit by World Region, 1800-2025




**Interpretation**. Secondary surplus/deficit = Public revenue - Public expenditure - Interest payments.
**Sources and series**: wid.world


Public Debt 1800-2025 (% net domestic product)
Public debt (% net domestic product)
240%
220%
200%
180%
160%
140%
120%
100%
80%
60%
40%
20%
0%
1800
1820
1840
1860
1880
1900
1920
1940
1960
1980
2000
2020
Europe
North America/Oceania
Latin America
Middle East/North Africa
Subsaharan Africa
Russia/Central Asia
East Asia
South/South-East Asia
World
Sources and series: wid.world (D4h)

**A quick reminder: the simple arithmetic of public debt accumulation can become explosive very quickly, especially if interest rates go up**

- Primary deficit = $P_t = E_t - R_t$ = Public expenditure – Public revenue
- Secondary deficit = $S_t = r_t D_t + E_t - R_t = P_t + r_t D_t$
  (= Primary deficit + Interest payments $I_t = r_t D_t$)
- Stock of public debt = $D_{t+1} = D_t + S_t = (1+r_t)D_t + P_t$
- All expressed as a fraction of GDP: $p_t = P_t/Y_t$, $s_t = S_t/Y_t$, $d_t = D_t/Y_t$, $i_t = I_t/Y_t$

$$\mathbf{d_{t+1} = ((1+r_t)d_t + p_t)/(1+g_{t+1}) = (d_t + s_t)/(1+g_{t+1})}$$

(with $1+ g_{t+1} = Y_{t+1}/Y_t$ = nominal growth of GDP, i.e. inflation + real growth)

- **Steady-state public debt-GDP ratio $d_t \rightarrow d=p/(g-r) = s/g$**

(with p = primary deficit, s = secondary deficit, g = nominal growth rate, r = nominal public debt interest rate)

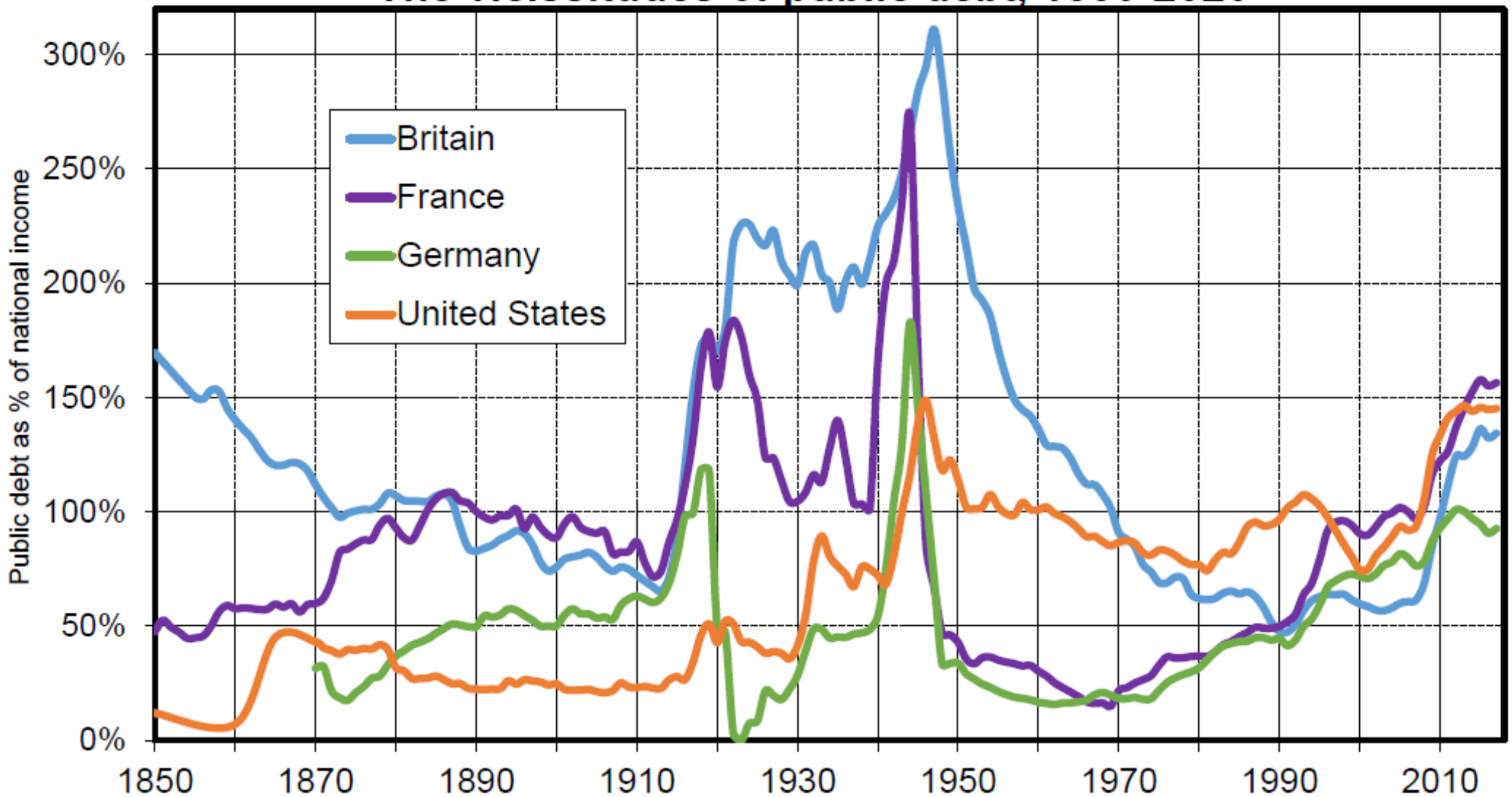
- **$d_t \rightarrow d=p/(g-r) = s/g$**
- If secondary deficit s=3% & nominal growth g=5% (real growth + inflation), then public debt d → 60% (Maastricht Treaty 1992)
- **If r<g, then one can have primary deficits forever and stabilize the debt**
- E.g. if r=3%, g=5%, s=3%, then in steady-state d=60%, i=1.8%, p=1.2%, i.e. one can have a permanent primary deficit of 1.2% and stabilize debt at 60%
- **But if r>g then one needs primary surpluses forevery to stabilize the debt**
- E.g. if r=5%, g=3%, s=3%, then d=100%, i=5%, p=-2%, i.e. one needs a primary surplus of 2% in order to stabilize the debt at 100%

**→ Public debt accumulation is a very unstable process. It can easily derail & lead to explosive paths and exceptional solutions (progressive wealth taxes and/or inflation** = regressive wealth tax), both in postwar contexts and more generally in contexts with high distributional conflict

# The removal of 20c public debt: inflation & exceptional wealth taxes

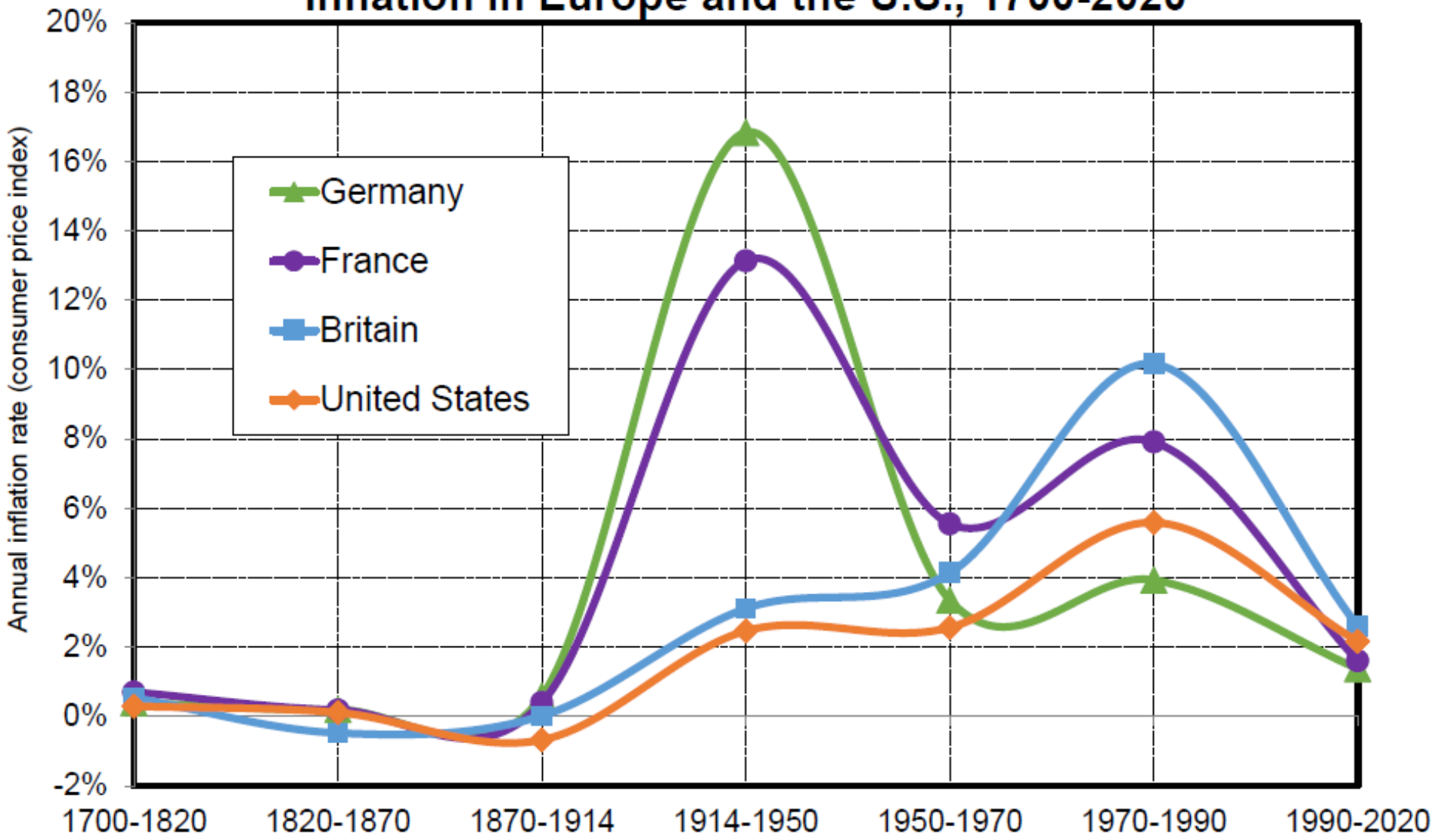
- In 1945-1950, public debt was about 200%-300% of national income in Britain, France and Germany.
  In effect, between 1914 and 1945, private wealth holders have put a large part of their assets into public debt in order to finance the war.
- This large public debt was never repaid to bond holders
- **Britain: gradual erosion by inflation 1945-1980**
- **France: very fast erosion by inflation in 1945-1950**
- **Germany: monetary reform + exceptionnal progressive taxes of large private wealth** were put in place in 1949-1952
  **→ very fast reduction of public debt (<20% national income in 1950s-1960s), without the negative distributional consequences of inflation (≈ regressive wealth tax)**

# The vicissitudes of public debt, 1850-2020




**Interpretation**. Public debt rose strongly after each world war and reached between 1500% and 300% of national income in 1945-1950, before falling sharply in Germany and France (debt cancellations, high inflation) and more gradually in Britain and the U.S. (moderate inflation, growth). Public assets (especially real estate and financial assets) have fluctuated less strongly over time and generally represent around 100% of national income. **Sources and series**: see piketty.pse.ens.fr/ideology (figure 10.9).

# Inflation in Europe and the U.S., 1700-2020




**Interpretation**. Inflation was quasi-null in the 18th-19th centuries, before rising in the 20th century. It is about 2% per year since 1990. Inflation was particularly high in Germany and France between 1914 and 1950, and to a lesser extent in Britain, France and the U.S. during the 1970s. **Note**. German inflation reached 17% per year between 1914 and 1950 without taking into account the hyper-inflation of 1923. **Sources and series**: see piketty.pse.ens.fr/ideology (figure 10.10).

- **Germany's public debt removal 1949-1953: limited inflation** (much more moderate than Germany 1920s or France 1945-1949), but **monetary reform**, **exceptionnal wealth taxes** (up to 50% on top wealth), and **foreign debt cancellation** (London 1953, final cancellation 1991)
- See L. Hughes, *Shouldering the Burdens of Defeat: West Germany and the Reconstruction of Social Justice*, U. N.Carolina Press 1999
- See Galogre-Vila et al, « The economic consequences of the 1953 London Debt Agreement », EREH 2018
- **Large levies (one-off taxes) on private capital** (up to 90% on top wealth) were **also used in Japan 1946-1947** in order to reduce large public debt
- See Eichengreen, « The Capital levy in theory and practice », in Dornbush-Draghi, Public debt management: theory and history, CUP 1990
- **See P. Brassac, Taxing Wealth & Enrichment: Lessons from 1945 French ISN, 2026**

**→ the fast removal of public debt following WW2 was a big success in Germany, Japan, France, etc.: it facilitated post-war growth by giving more fiscal capacity for investment in public infrastructure, education, health, etc.**

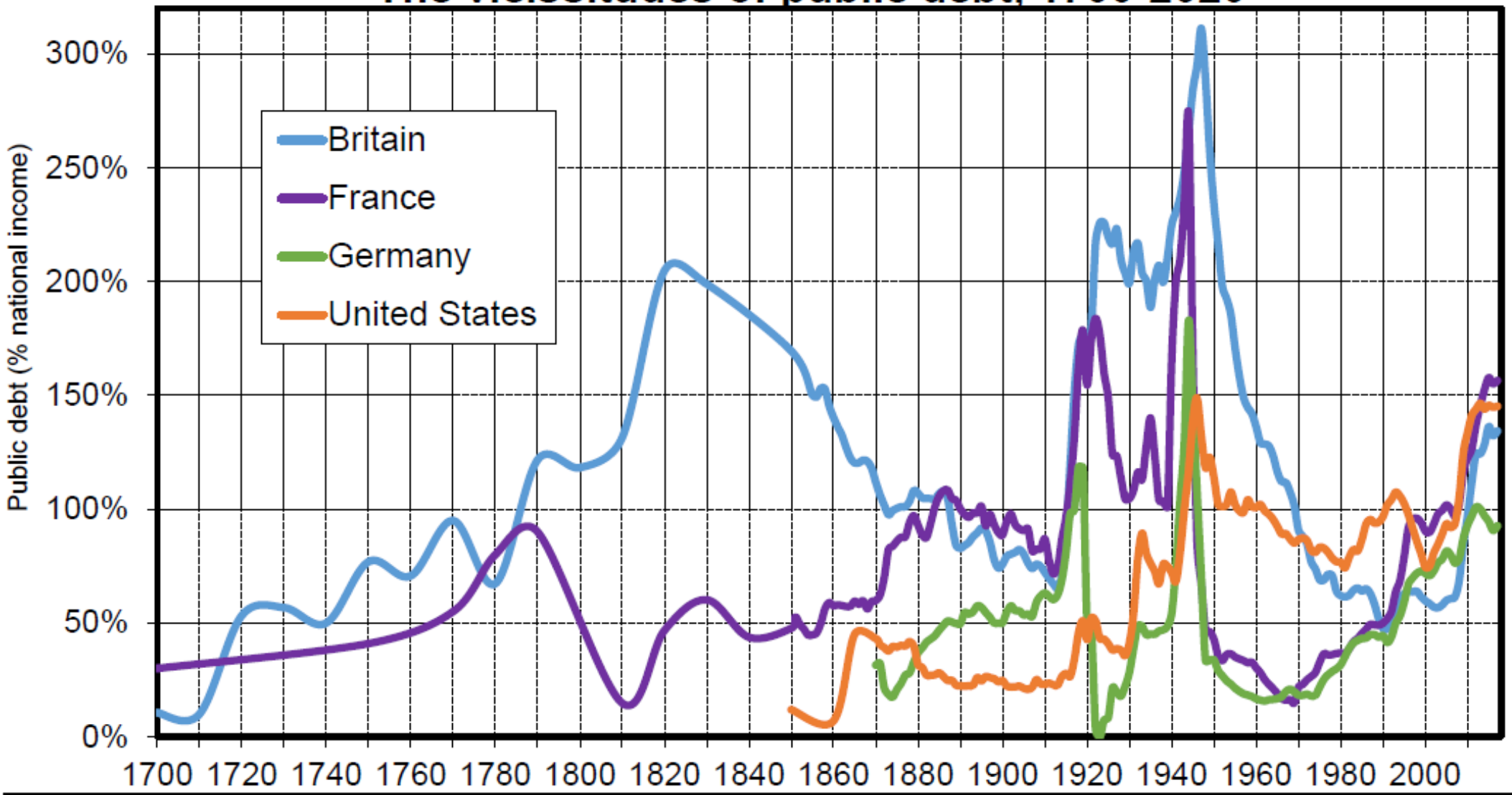
| *Prélèvement sur le patrimoine* (wealth levy) | | *Contribution sur l'enrichissement* (enrichment levy) | |
|---|---|---|---|
| Threshold (F) | Rate | Threshold (F) | Rate |
| 200,000 | 3% | 50,000 | 5% |
| 500,000 | 4% | 150,000 | 10% |
| 2,000,000 | 5% | 300,000 | 20% |
| 5,000,000 | 7.5% | 500,000 | 25% |
| 10,000,000 | 10% | 1,000,000 | 40% |
| 25,000,000 | 12.5% | 2,000,000 | 60% |
| 75,000,000 | 15% | 3,000,000 | 80% |
| 150,000,000 | 17.5% | 5,000,000 | 100% |
| 300,000,000 | 20% | | |

Note: Average net wealth per adult stood at around 120,000 francs as of mid–1945 (cf. Piketty and Zucman, 2014).

Table 1: 'National Solidarity Levy' Tax Rates

- **A very different historical experiment with large public debt: Britain 1815-1914.** Over 200% of national income in public debt in 1815. Gradually repaid by primary budget surplus during 1815-1914 period. Possible but slow.
- **Did not prevent industrial investment & development** (Ricardo, 1817)… **but contributed to rising inequality** (transfer from taxpayers to top wealth holders)
- See R. Barro, "Are governement bonds net wealth?", JPE 1974 : in a representative agent model, rational agents should anticipate that they will pay more taxes in the future if today's public deficit increase, so they save more in order to make reserves (for themselves or their successors) so as to pay these taxes in the future → the timing of taxes is irrelevant, « debt neutrality » ( « Ricardian equivalence »)
- See also R. Barro « Governement spending, interest rates, prices and budget deficits in the UK 1701-1918 », JME 1987 ; G. Clark, «Debt, deficits and crowding out: England 1727-1840", EREH 2001
- Pb: these works neglect the fact that public debt also has huge distributional consequences (whether it is repaid or not), and that this matters for accumulation and growth. **I.e. full debt repayment in 19c Britain was highly beneficial to top wealth holders** (see Marx 1848 & Amoureux 2014), **while debt cancellation in mid-20c Europe & Japan contributed to the emergence of a more inclusive developt model**

# The vicissitudes of public debt, 1700-2020




**Interpretation**. During the 18th century, public debt was quickly rising in France and Britain (without even taking into account *charges et offices*). It was quickly reduced during the Revolution in the case of France (assignats, banqueroute des deux tiers), but rose strongly following revolutionary and napoleonic wars in the case of Britain (where debt was very gradually reduced after a century of primary budget surpluses between 1815 and 1914). **Sources and series**: see piketty.pse.ens.fr/ideology (figure S10.9).

# Conclusion of Lecture 4

- **The Great Transformation (1910-1950)** involves a large rise of the social-fiscal state, a new property regime & the gradual decomodification of the economy (rise of education, health & other public services outside the capitalist logic)
- **Partial reversal since 1980s-1990s** (Neoliberal Order after New Deal Order), but only partial (social-fiscal state is still much larger in 2025 than in 1910: 30-50% of GDP vs less than 10% before WW1).
- **Neoliberal order seems to come to an end in the 2020s**: return of state since 2008 & 2020 crisis, rising inequality & social unrest, new rivalries over territories & ressources, mounting pressure from global South over climate justice & reparations