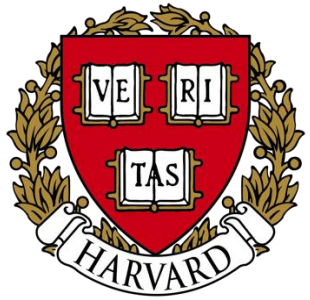

Università Bocconi
MILANO

Artificial Intelligence and the Interests of Humanity

William Fisher

October 2024

OpenAI

OpenAI's mission is to ensure that artificial general intelligence (AGI)—by which we mean highly autonomous systems that outperform humans at most economically valuable work—benefits all of humanity. We will attempt to directly build safe and beneficial AGI, but will also consider our mission fulfilled if our work aids others to achieve this outcome. To that end, we commit to the following principles:

AI Summit, November 1-2, 2023

- Australia
- Brazil
- Canada
- Chile
- China
- European Union
- France
- Germany
- India
- Indonesia
- Ireland
- Israel
- Italy
- Japan
- Kenya
- Korea
- Netherlands
- Nigeria
- Philippines
- Rwanda
- Saudi Arabia
- Singapore
- Spain
- Switzerland
- Turkey
- Ukraine
- United Arab Emirates
- United Kingdom
- United States of America

AI Summit, November 1-2, 2023
"The Bletchley Declaration"

"[W]e affirm that, for the good of all, AI should be designed, developed, deployed, and used, in a manner that is safe, in such a way as to be human-centric, trustworthy and responsible. We welcome the international community's efforts so far to cooperate on AI to promote inclusive economic growth, sustainable development and innovation, to protect human rights and fundamental freedoms, and to foster public trust and confidence in AI systems to fully realise their potential."

Part I: What are the “interests of humanity”?

Conditions that Enable Human Flourishing

1) **Life**

Conditions that Enable Human Flourishing

1) Life
2) **Health**

- WHO Constitution: "[T]he enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being."

Conditions that Enable Human Flourishing

1) Life
2) Health
3) **Autonomy**

- Mill;
- Emerson;
- Rawls;
- Kateb;
- Dworkin

Conditions that Enable Human Flourishing

1) Life
2) Health
3) Autonomy
4) **Engagement**

a) "Meaningful work" (Marx);
b) Political democracy (Commonwealthmen; Tocqueville; Arendt; Sunstein)
c) Semiotic democracy (Frankfurt School; Fiske; Balkin; Lessig; Katyal)

Conditions that Enable Human Flourishing

1) Life
2) Health
3) Autonomy
4) Engagement
5) **Self-expression**

- Kant;
- Hegel;
- T.H. Green

Conditions that Enable Human Flourishing

1) Life
2) Health
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4) Engagement
5) Self-expression
6) **Competence**

- Deci & Ryan;
- Seligman;
- Utman;
- Schwartz

Conditions that Enable Human Flourishing

1) Life
2) Health
3) Autonomy
4) Engagement
5) Self-expression
6) Competence
7) **Affiliation**

- Nussbaum;
- Helliwell & Putman

Conditions that Enable Human Flourishing

1) Life
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5) Self-expression
6) Competence
7) Affiliation
8) **Privacy**

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Augmented by access to education

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Implication: To the maximum extent practicable, all persons in the world should be provided affordances of these sorts. When fostering and managing AI, we should try to achieve a sustainable condition of equal access to the preconditions of a good life.

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  - We have failed to achieve sustainability in this sense, not just because of lack of resolve, but because it is impossible


SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS

The Sustainable Development Goals Report 2023: Special edition

Towards a Rescue Plan for People and Planet

Halfway to the deadline for the 2030 Agenda, the SDG Progress Report; Special Edition shows we are leaving more than half the world behind. Progress on more than 50 per cent of targets of the SDGs is weak and insufficient; on 30 per cent, it has stalled or gone into reverse. These include key targets on poverty, hunger and climate. Unless we act now, the 2030 Agenda could become an epitaph for a world that might have been.

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- We should not abandon the goal of sustainability – but we need a more practicable and morally attractive conception
- Proposal: Sustainability = A mode of living on the planet that both (a) is consistent with principles of distributive justice and (b) can be maintained indefinitely

Components of Sustainability

Many such modes are conceivable, involving different combinations of three variables:

a) Number of people on the planet;

b) Relationships that those people have with the natural environment;

c) Degree of equality among the people

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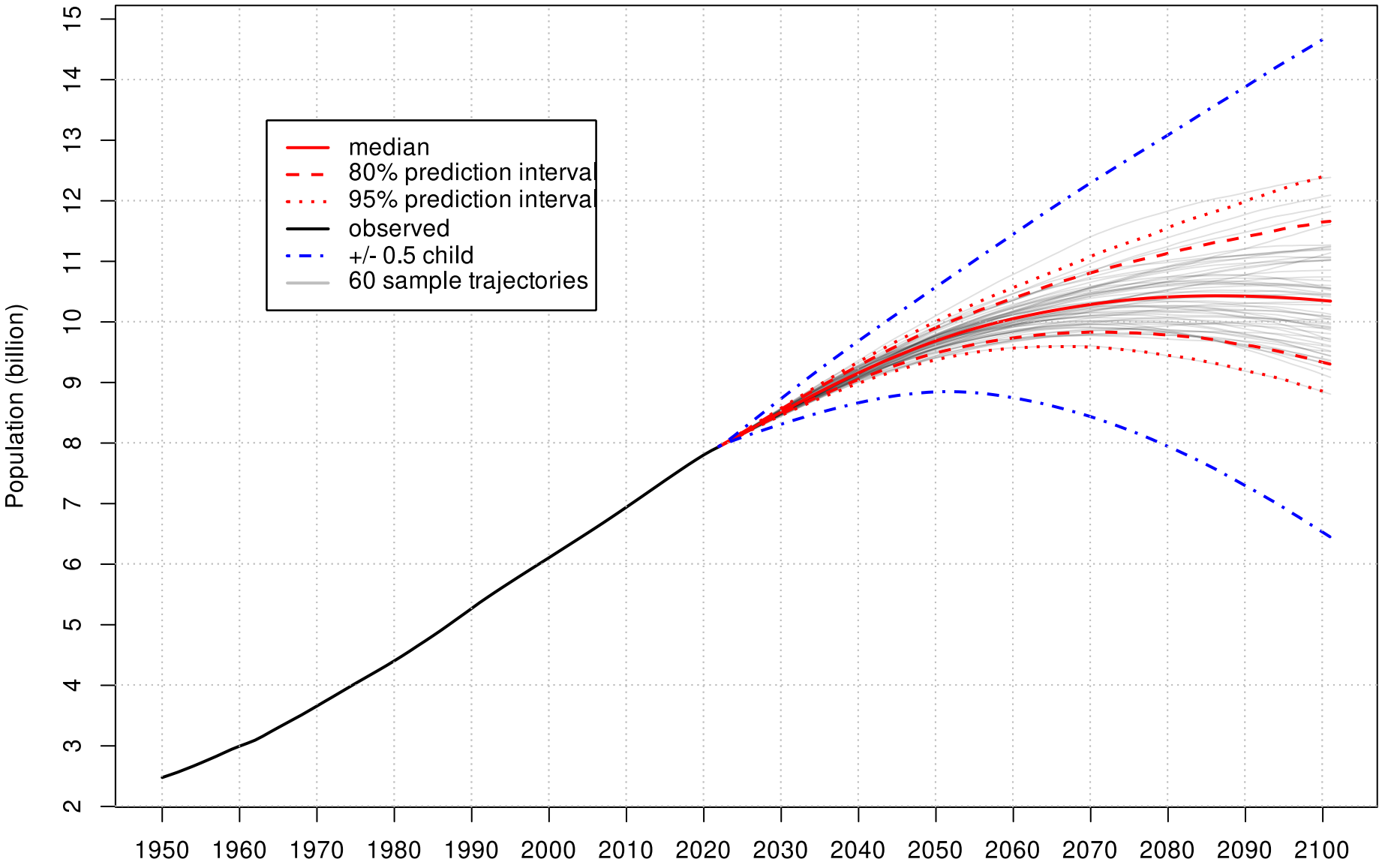
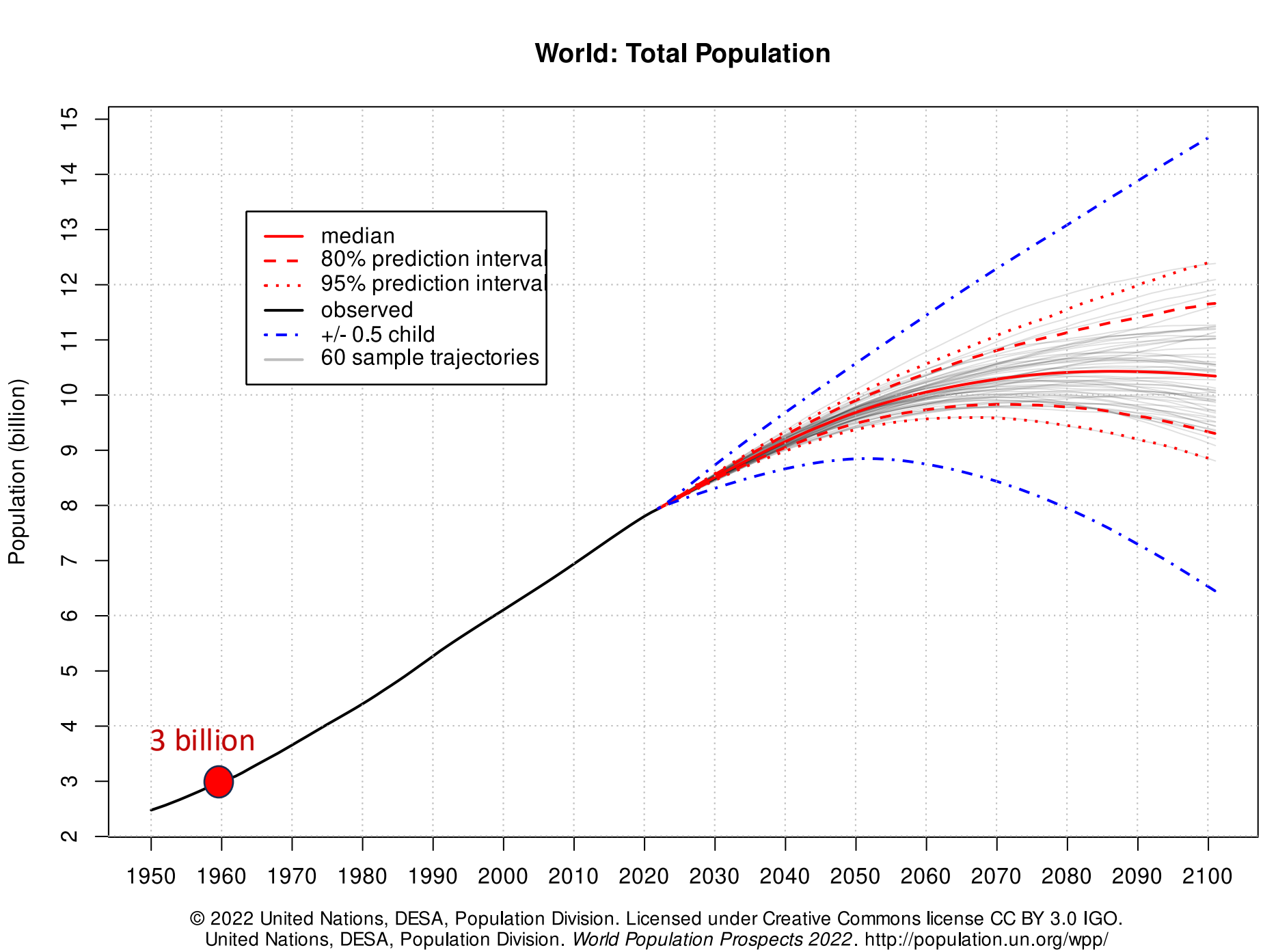
Here is one plausible combination….

a) Number

World: Total Population



United Nations, DESA, Population Division. *World Population Prospects 2022*. http://population.un.org/wpp/



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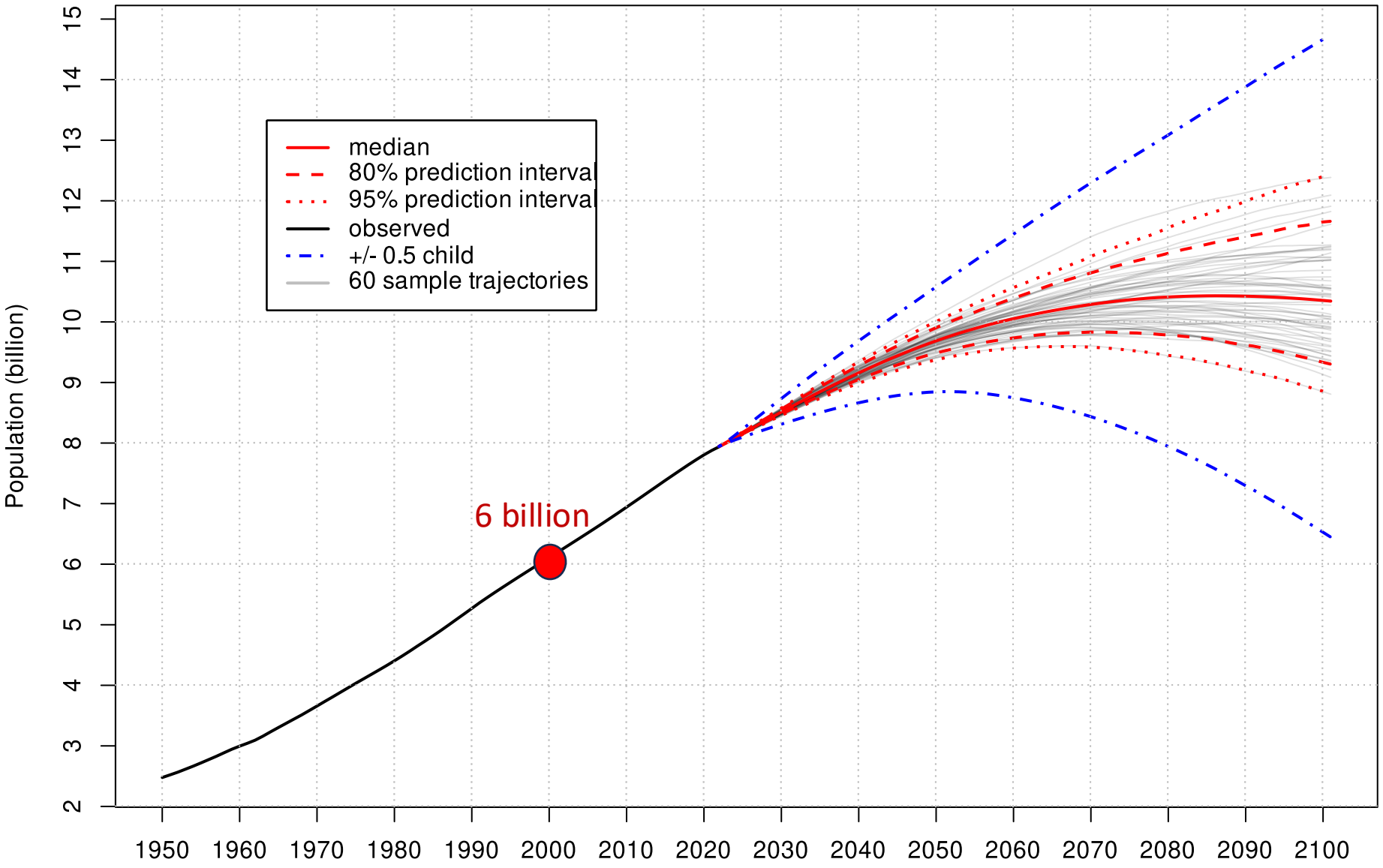

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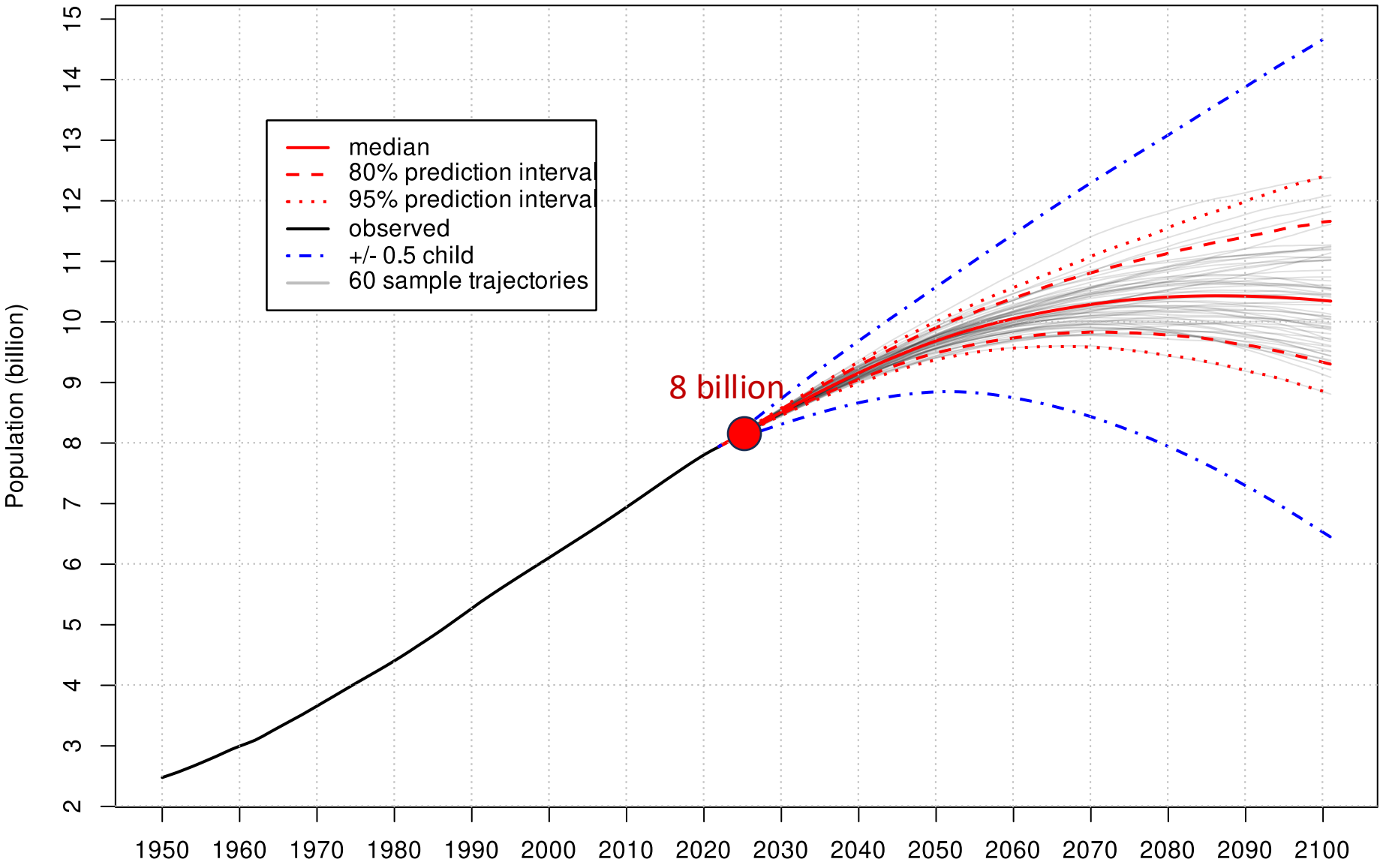

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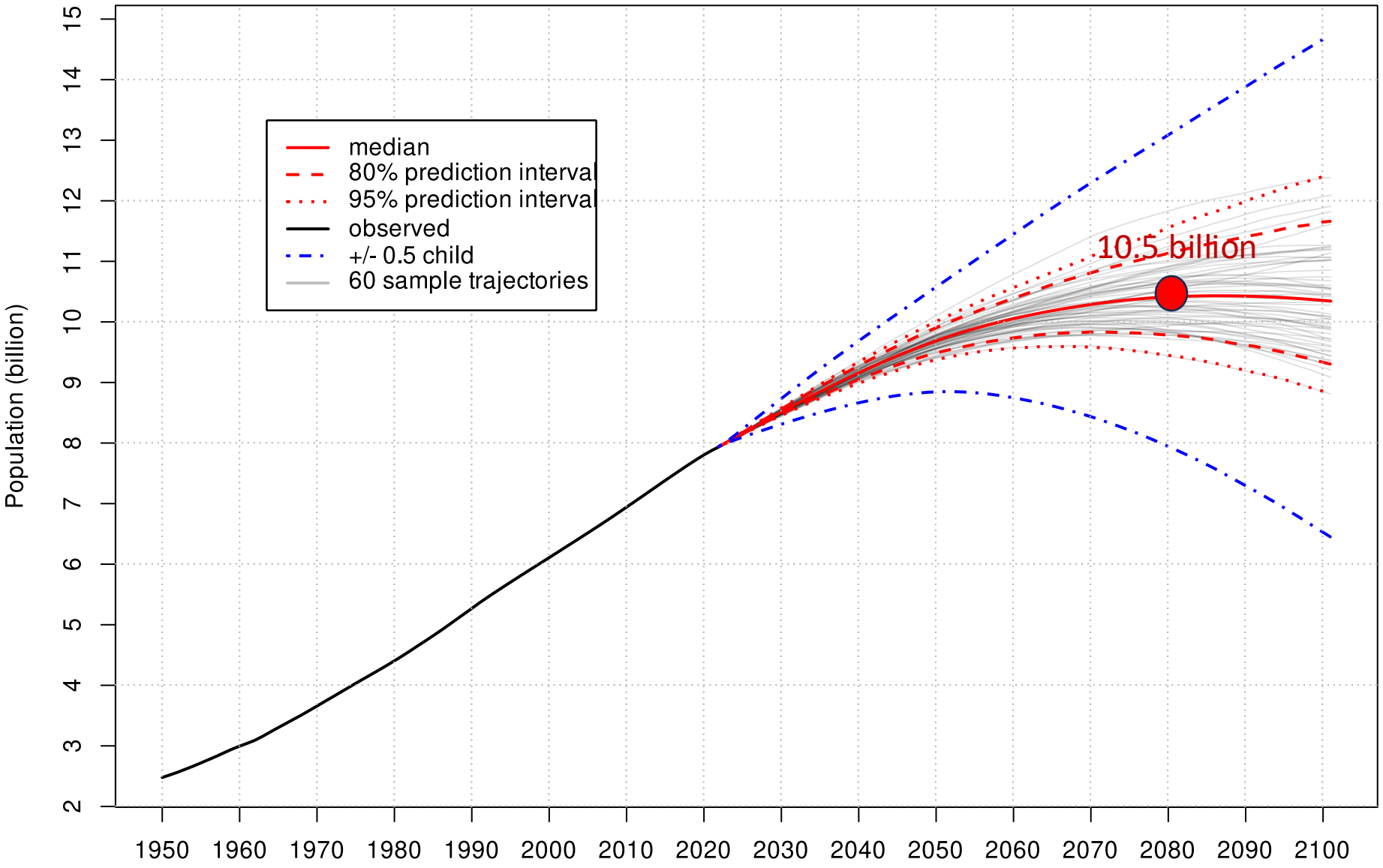

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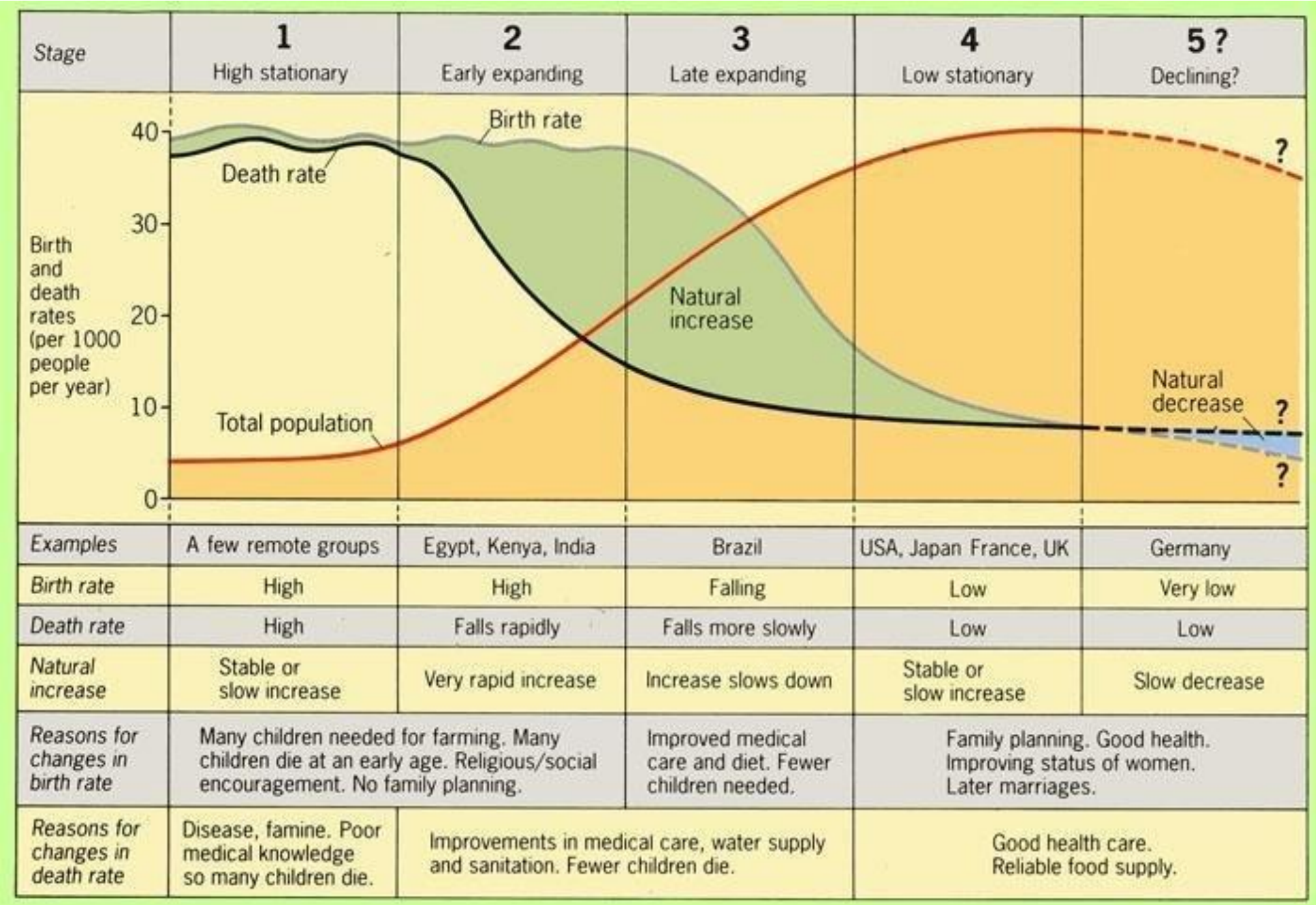
Source: "Special Volume 2015: A Global Public Health Curriculum"



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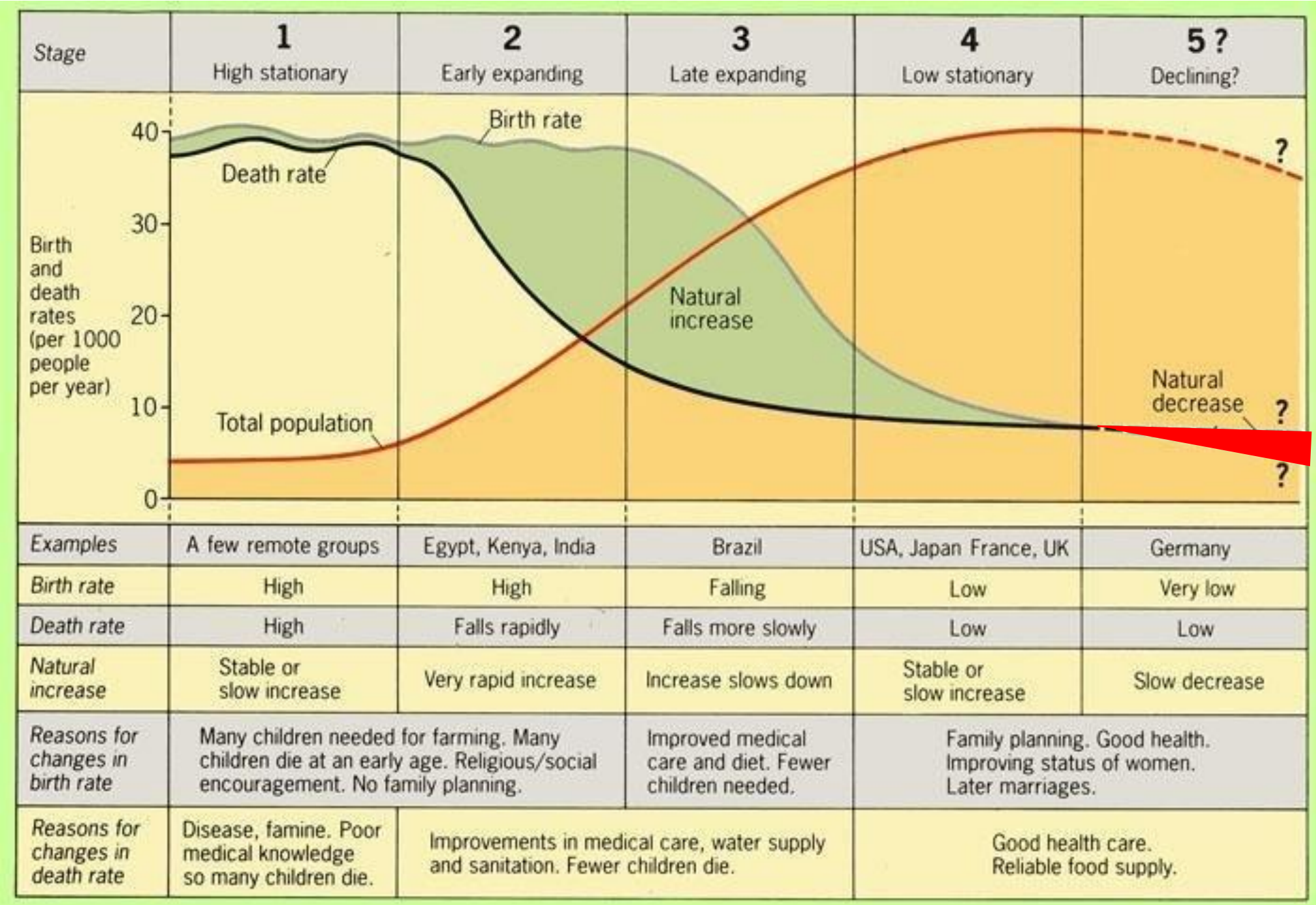

Stage	1 High stationary	2 Early expanding	3 Late expanding	4 Low stationary	5 ? Declining?
Examples	A few remote groups	Egypt, Kenya, India	Brazil	USA, Japan France, UK	Germany
Birth rate	High	High	Falling	Low	Very low
Death rate	High	Falls rapidly	Falls more slowly	Low	Low
Natural increase	Stable or slow increase	Very rapid increase	Increase slows down	Stable or slow increase	Slow decrease
Reasons for changes in birth rate	Many children needed for farming. Many children die at an early age. Religious/social encouragement. No family planning.		Improved medical care and diet. Fewer children needed.	Family planning. Good health. Improving status of women. Later marriages.	
Reasons for changes in death rate	Disease, famine. Poor medical knowledge so many children die.	Improvements in medical care, water supply and sanitation. Fewer children die.		Good health care. Reliable food supply.	

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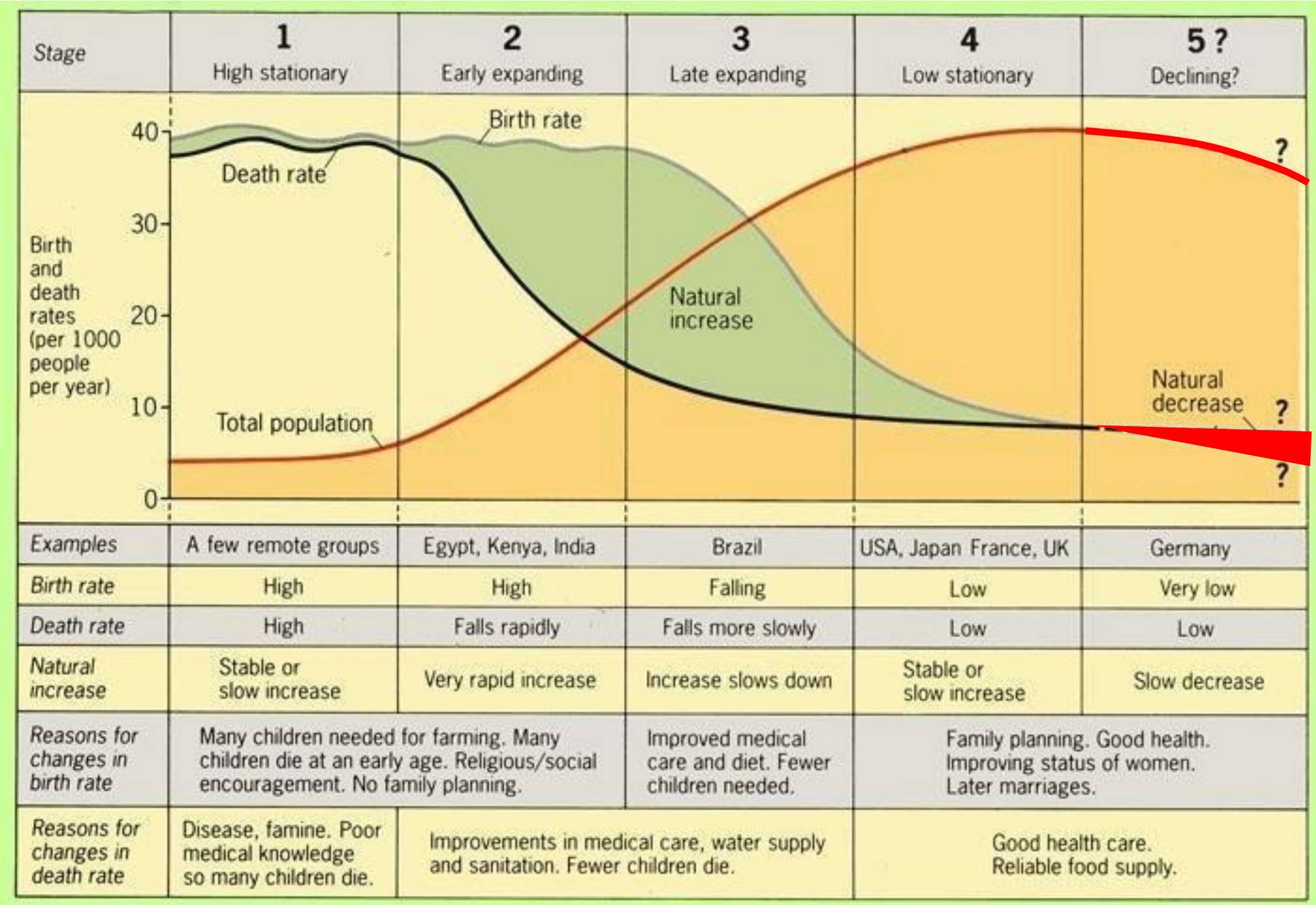
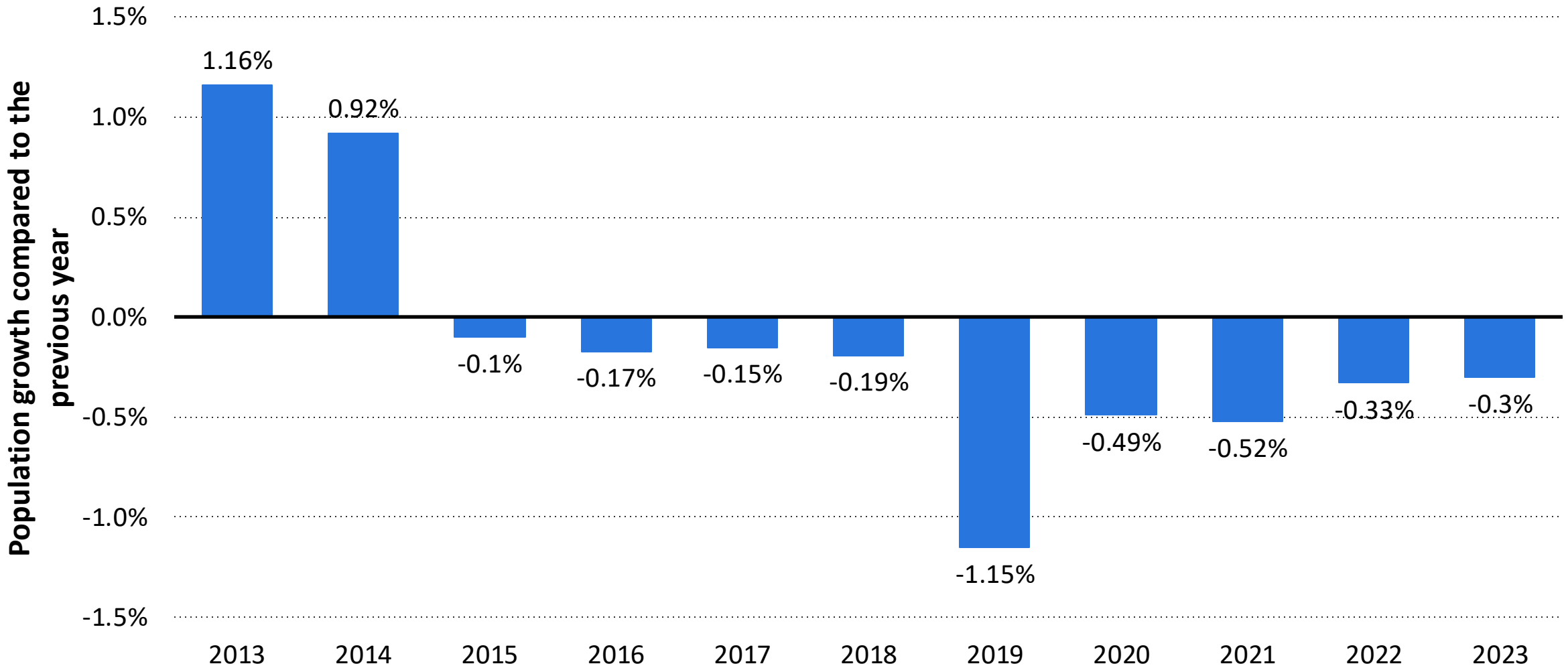


Italy: Population growth from 2013 to 2023

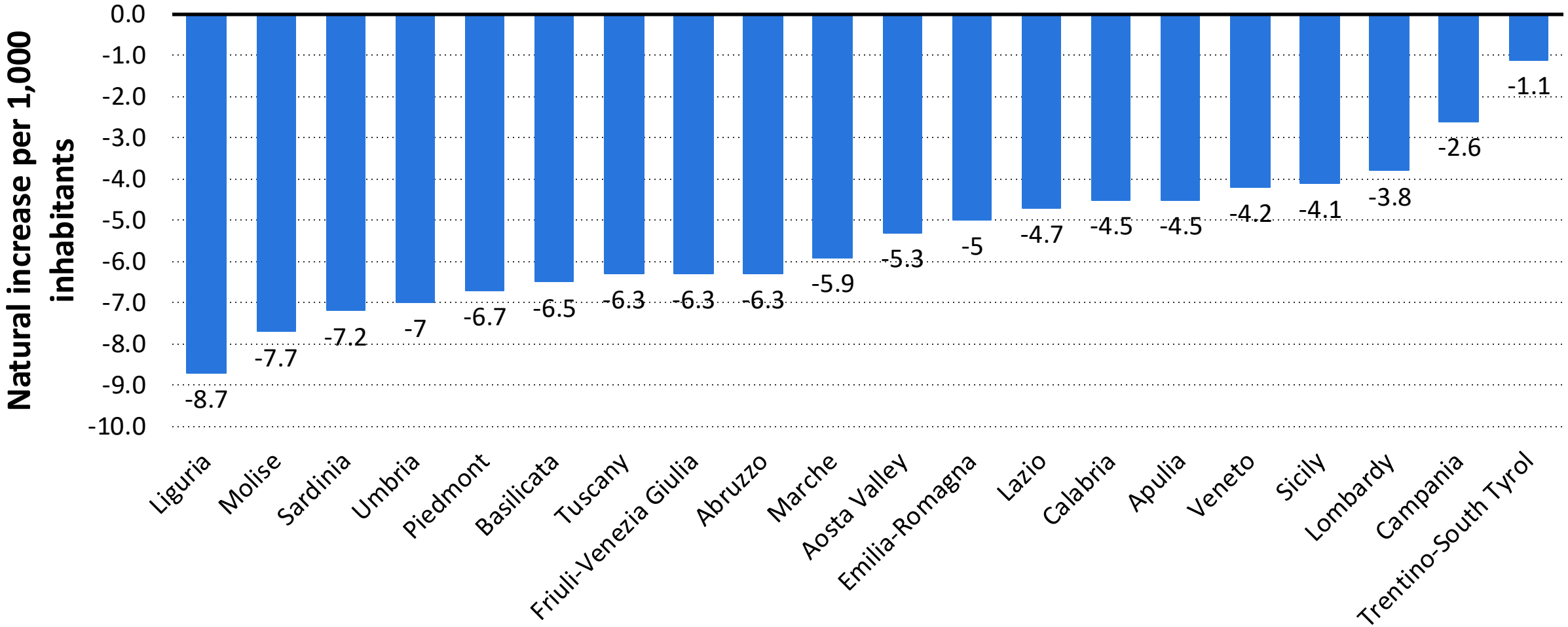


Note(s): Italy; 2013 to 2023

Further information regarding this statistic can be found on page 8.

Source(s): World Bank; ID 270465

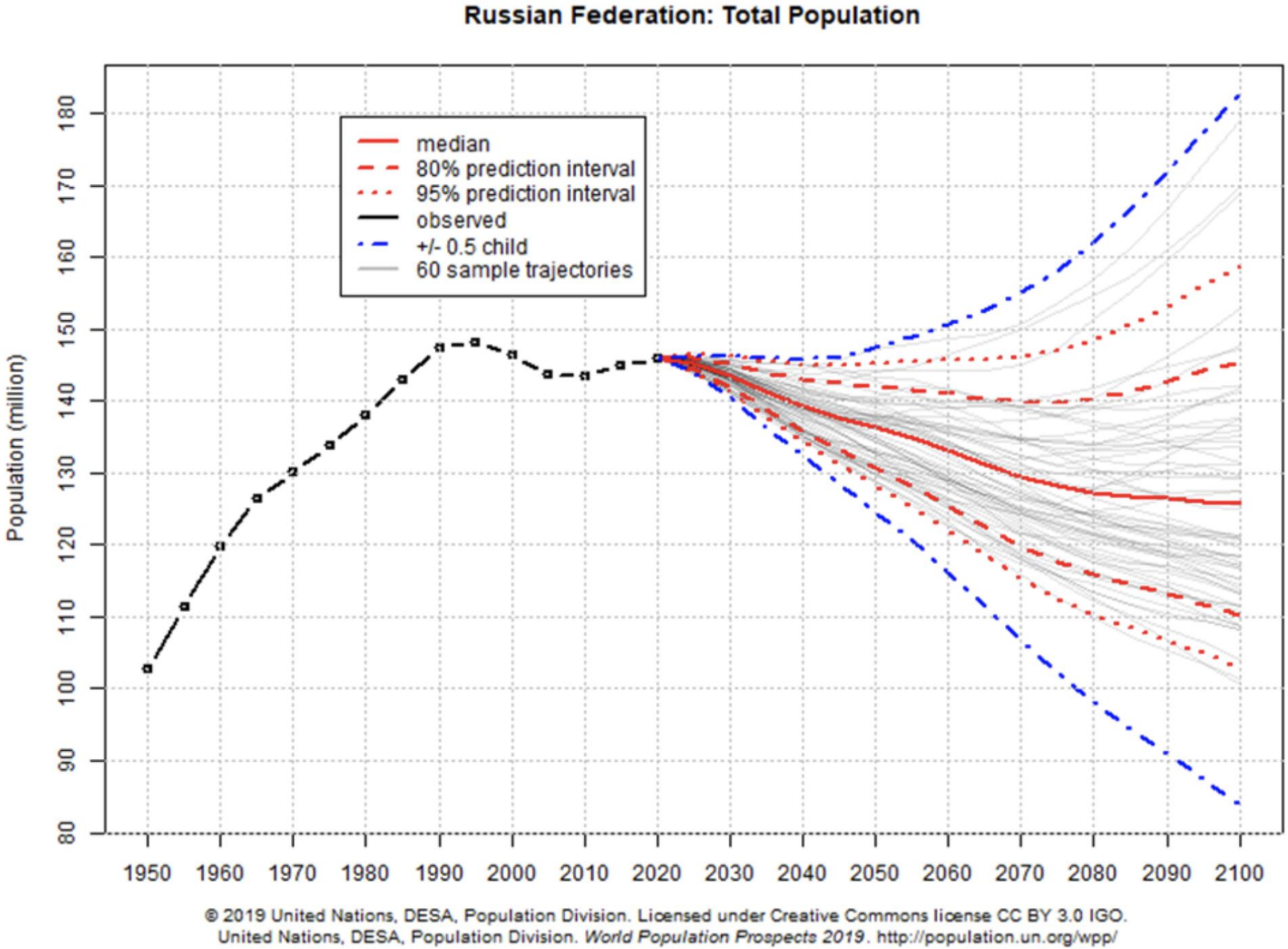
Natural growth rate of population in Italy in 2023, by region



Note(s): Italy; As of 2023

Further information regarding this statistic can be found on page 8.

Source(s): Istat; ID 568650



Source: https://warontherocks.com/2020/02/russian-demographics-and-power-does-the-kremlin-have-a-long-game/

Proposed Russian legislation (September 28, 2024)

"Lawmakers have proposed a ban on "propaganda of conscious refusal to bear children," Vyacheslav Volodin, the speaker of the lower house of parliament and an ally of President Vladimir Putin, said in a post on Telegram on Tuesday….

"In July, Kremlin spokesman Dmitry Peskov called Russia's declining birth rate 'catastrophic for the future of the nation.'…

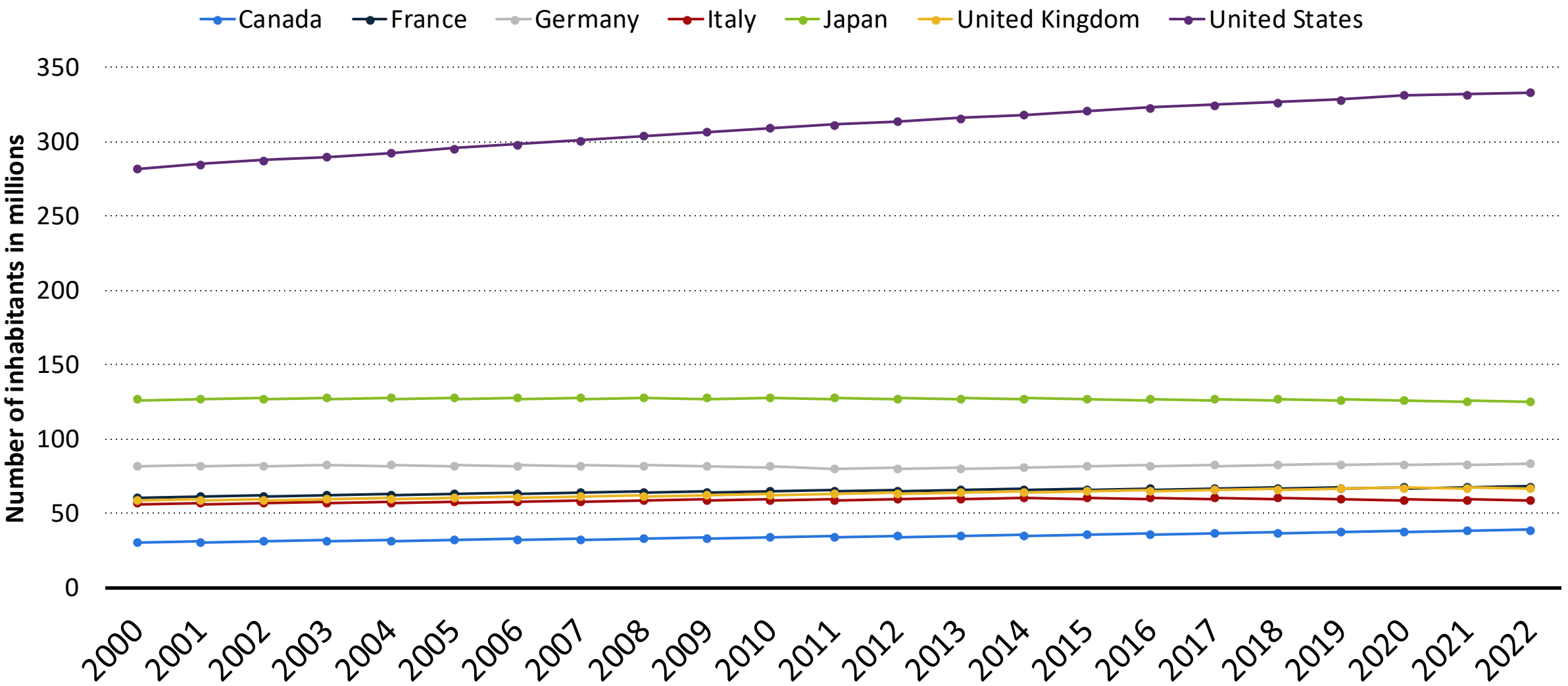
"The bill would tackle what Volodin said was the promotion of the "ideology of childlessness" and the "childfree movement" on the internet, in the media, in movies and even in advertisements, citing what he said where frequent online displays of "disrespect for motherhood and fatherhood, aggression toward pregnant women and children, and members of large families."

It will come with heavy fines, he said, of up to $4,300 for individuals and more than $53,000 for legal entities. "A close-knit and large family is the basis of a strong state," Volodin added.

"'A woman's purpose is to procreate — this is an absolutely unique natural gift,' Putin said in March. Earlier this month, he said the government was creating conditions for women to achieve professional success while remaining 'the real soul of a large family.' Combining the two is no easy task, the Russian leader said, 'but our women know how to do it and remain beautiful, gentle and charming under such stress.'"

Source: https://www.nbcnews.com/news/world/russia-proposes-ban-child-free-lifestyle-rcna172616

Number of inhabitants in G7 countries from 2000 to 2022, by country



Note(s): Worldwide, Canada, France, Germany, Italy, Japan, United Kingdom, United States; 2000 to 2022

Further information regarding this statistic can be found on page 8.

Source(s): World Bank; ID 1372441

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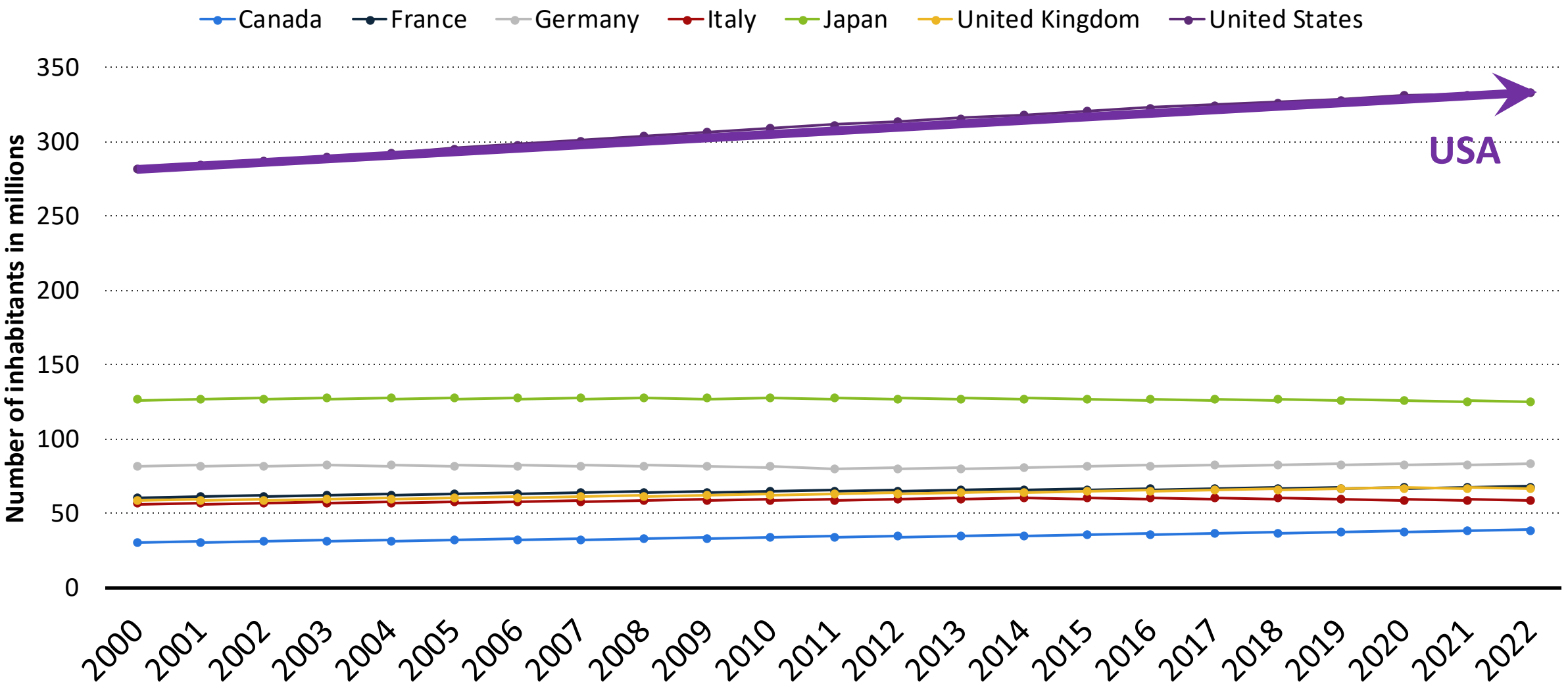

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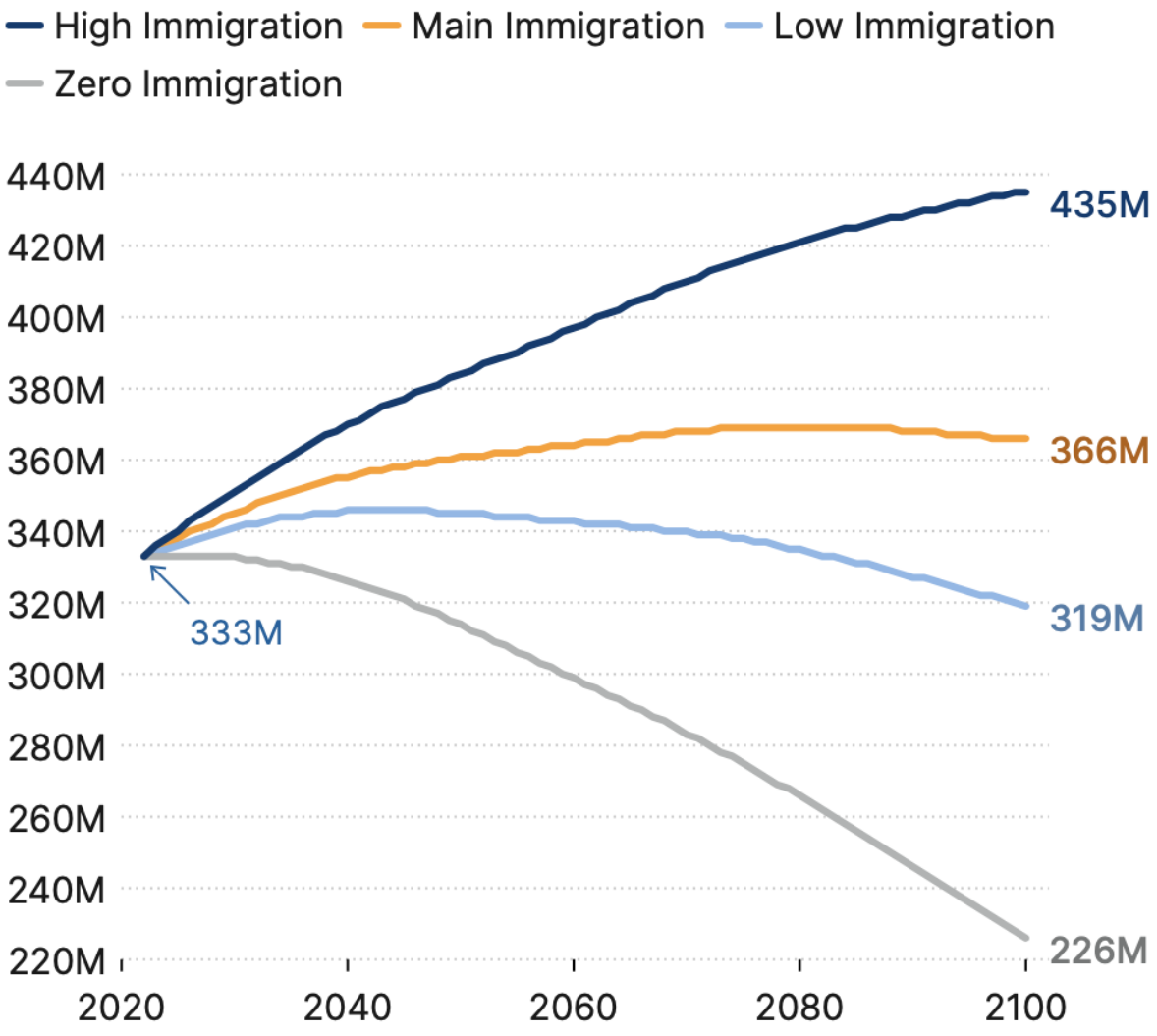
Projected annual US population size, 2022-2100

Alternative immigration scenarios



Source: William H. Frey analysis of US Census Bureau projections, released November 9, 2023

Brookings Metro

Source: https://www.brookings.edu/articles/new-census-projections-show-immigration-is-essential-to-the-growth-and-vitality-of-a-more-diverse-us-population/

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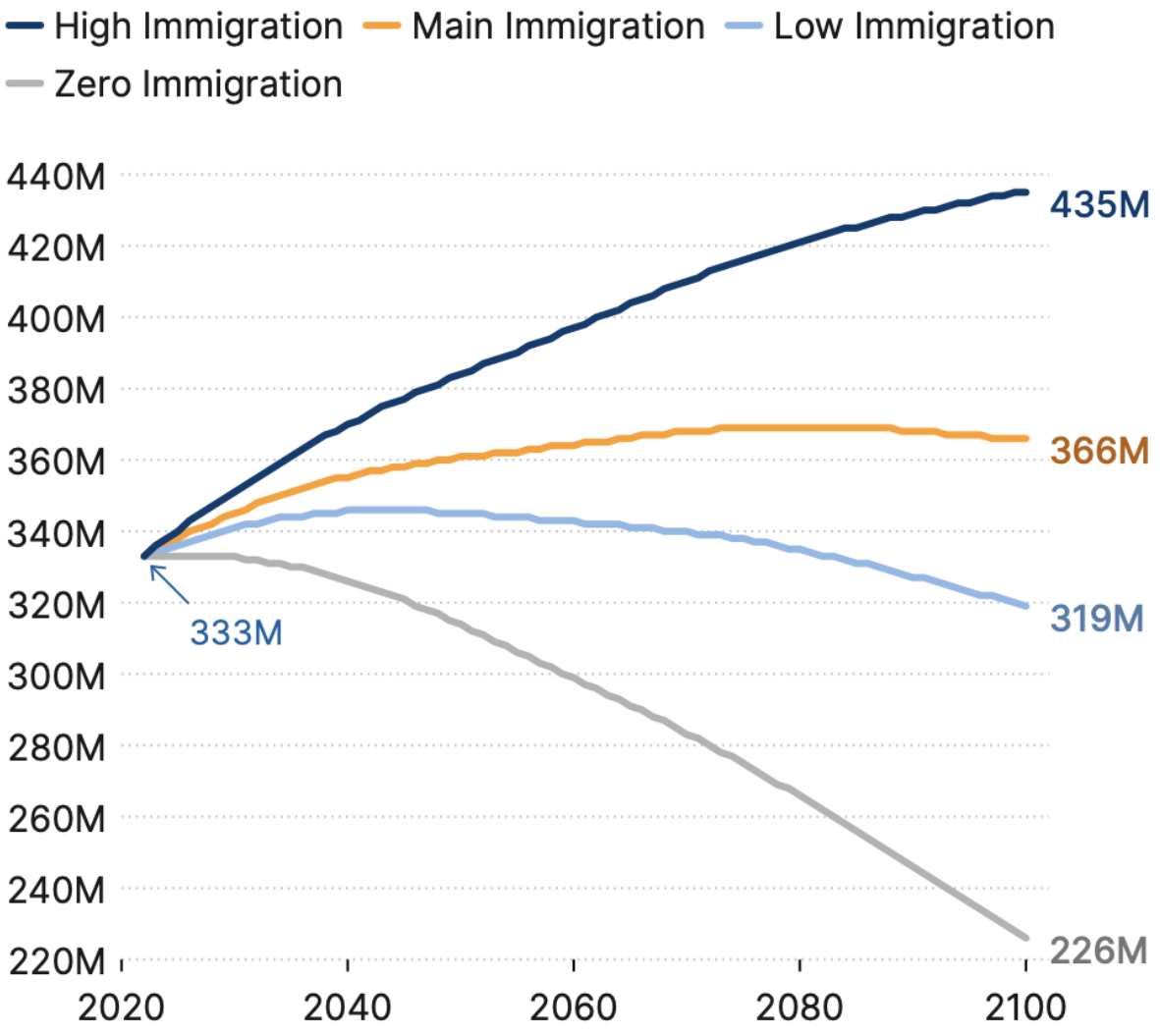


Source: William H. Frey analysis of US Census Bureau projections, released November 9, 2023

Brookings Metro

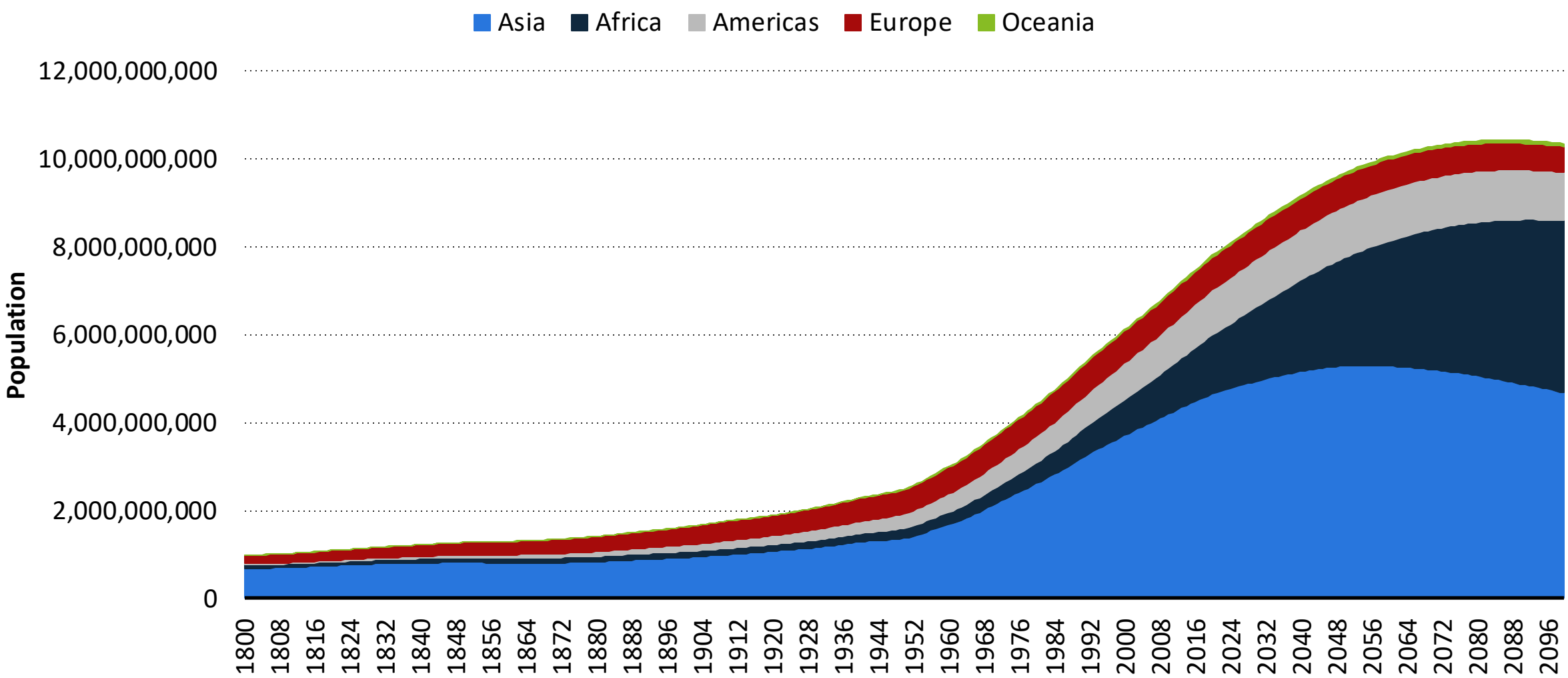
The "high" immigration scenario, which assumes a consistent annual net immigration of roughly 1.5 million people per year—a level only occasionally approached in the recent past.

The "main" immigration scenario—the one most consistent with recent history, apart from the immediate pre- and post-pandemic years. This assumes annual net immigration levels between 850,000 and 980,000 people.

The "low" immigration scenario assumes a trajectory of between 350,000 and 600,000 net migrants annually, which occurred during the latter years of the Trump presidency, though still higher than during the pandemic.

Source: https://www.brookings.edu/articles/new-census-projections-show-immigration-is-essential-to-the-growth-and-vitality-of-a-more-diverse-us-population/

Population of the world's continents from 1800 to 2021, with estimates until 2100



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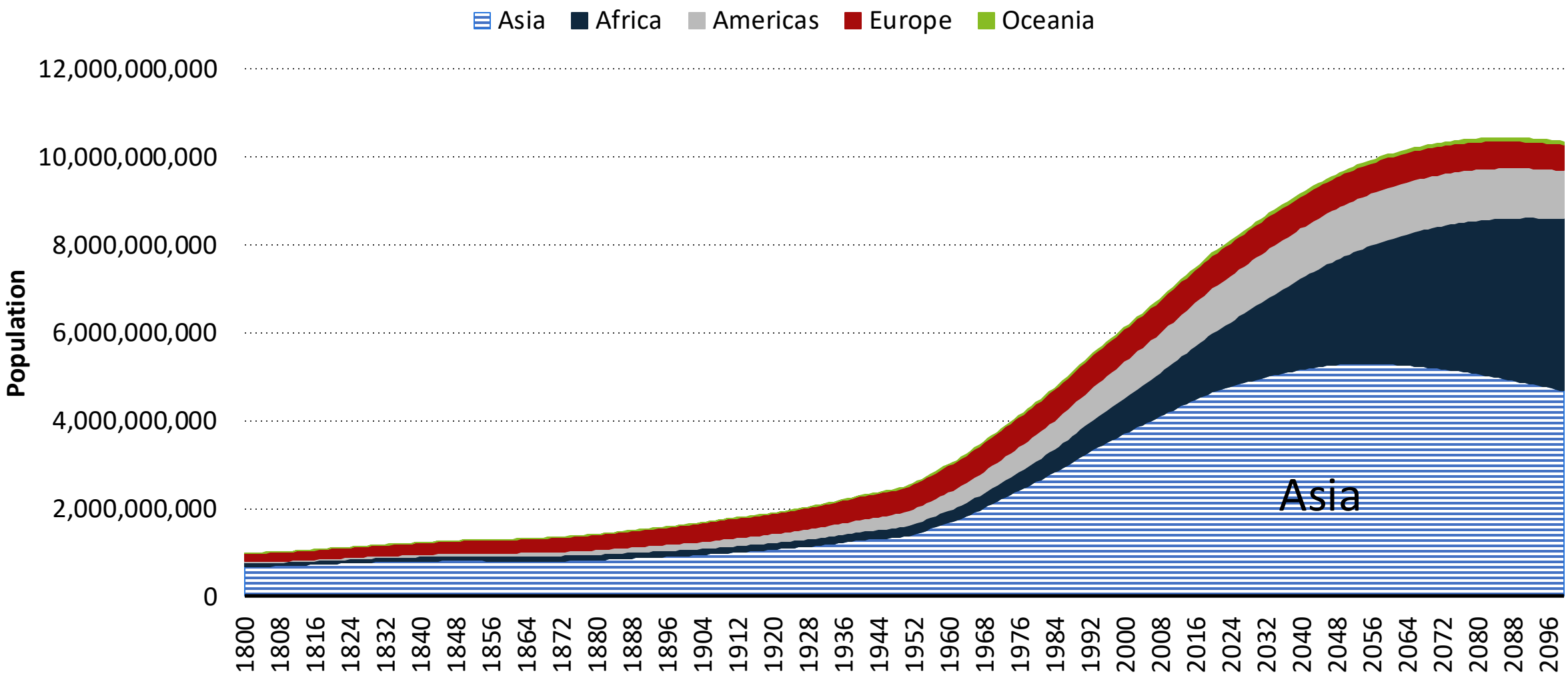

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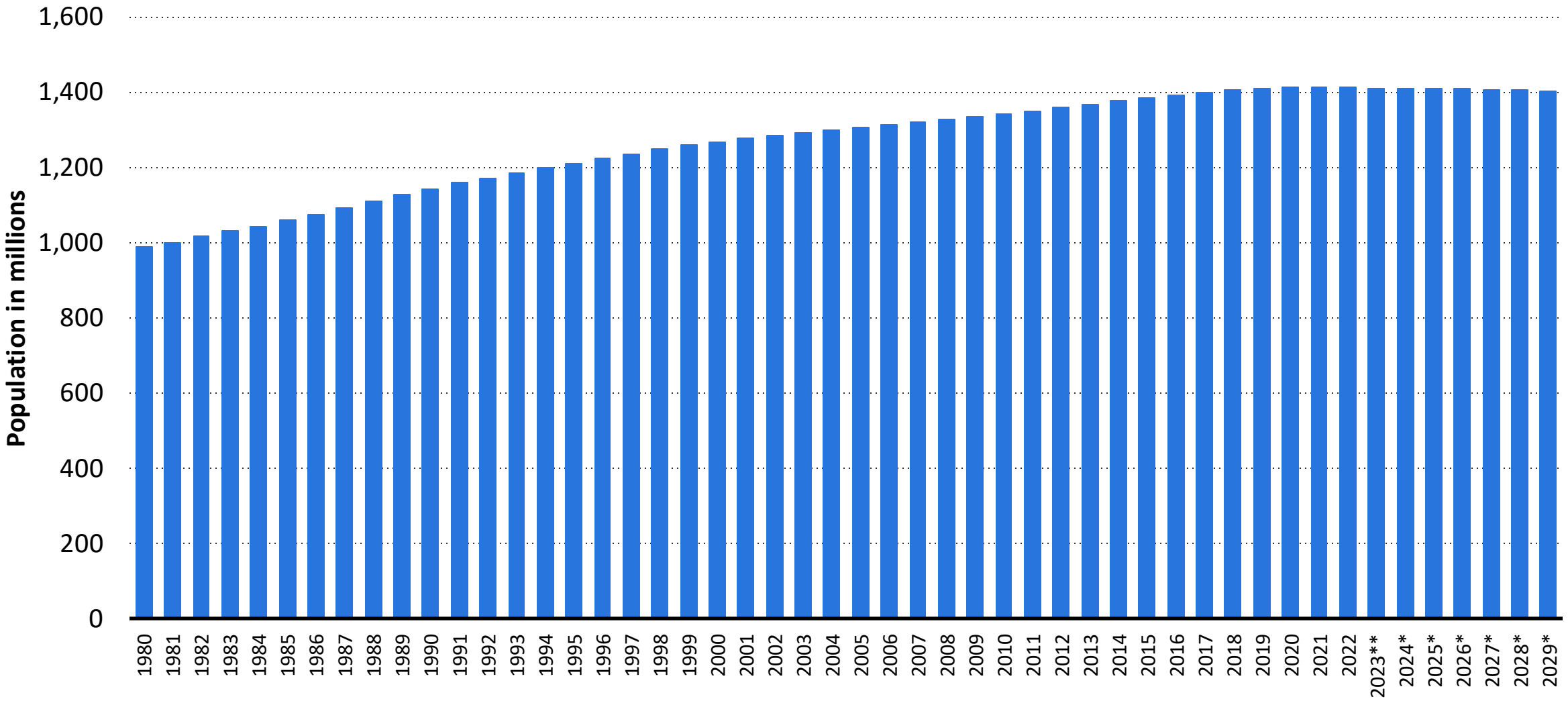
Total population of China from 1980 to 2023 with forecasts until 2029 (in millions)



Note(s): China; 1980 to 2023

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Source(s): IMF; CEIC; National Bureau of Statistics of China; ID 263765

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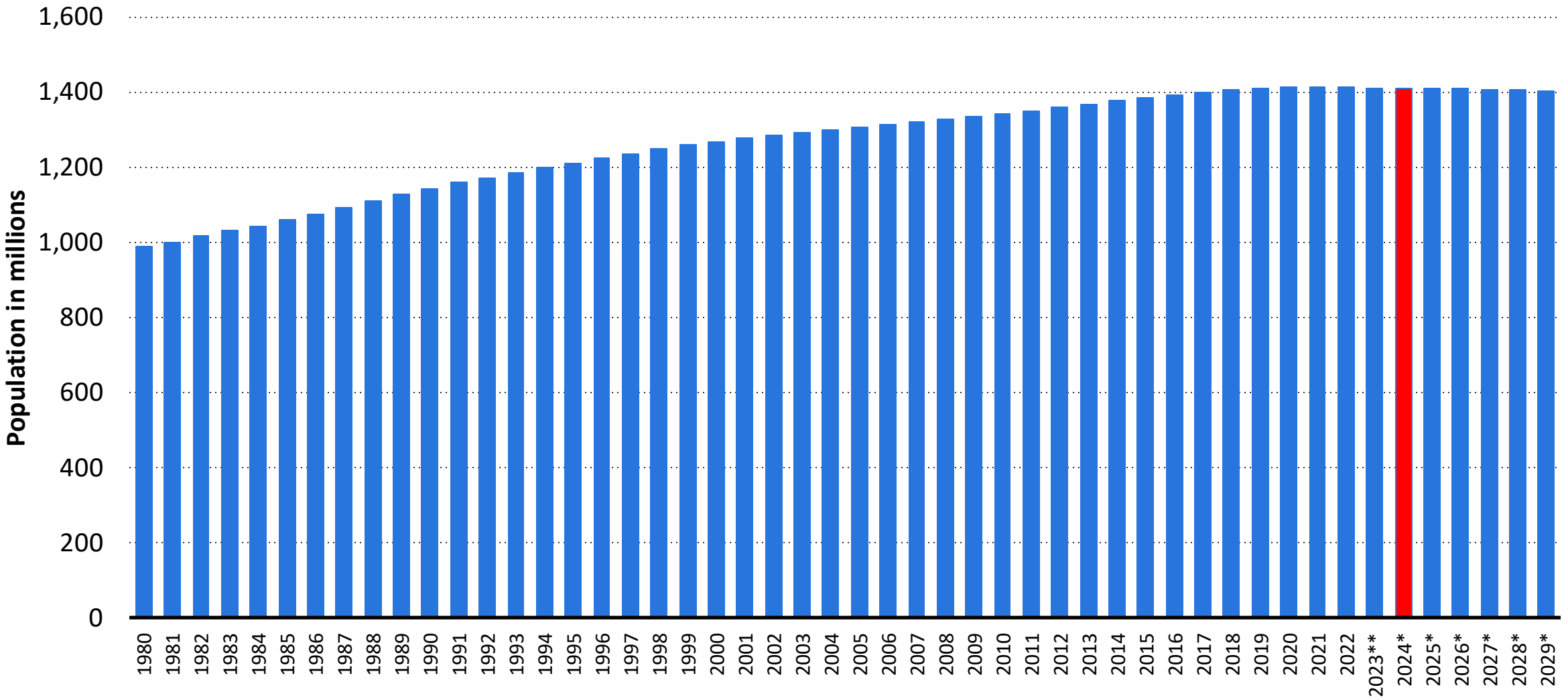

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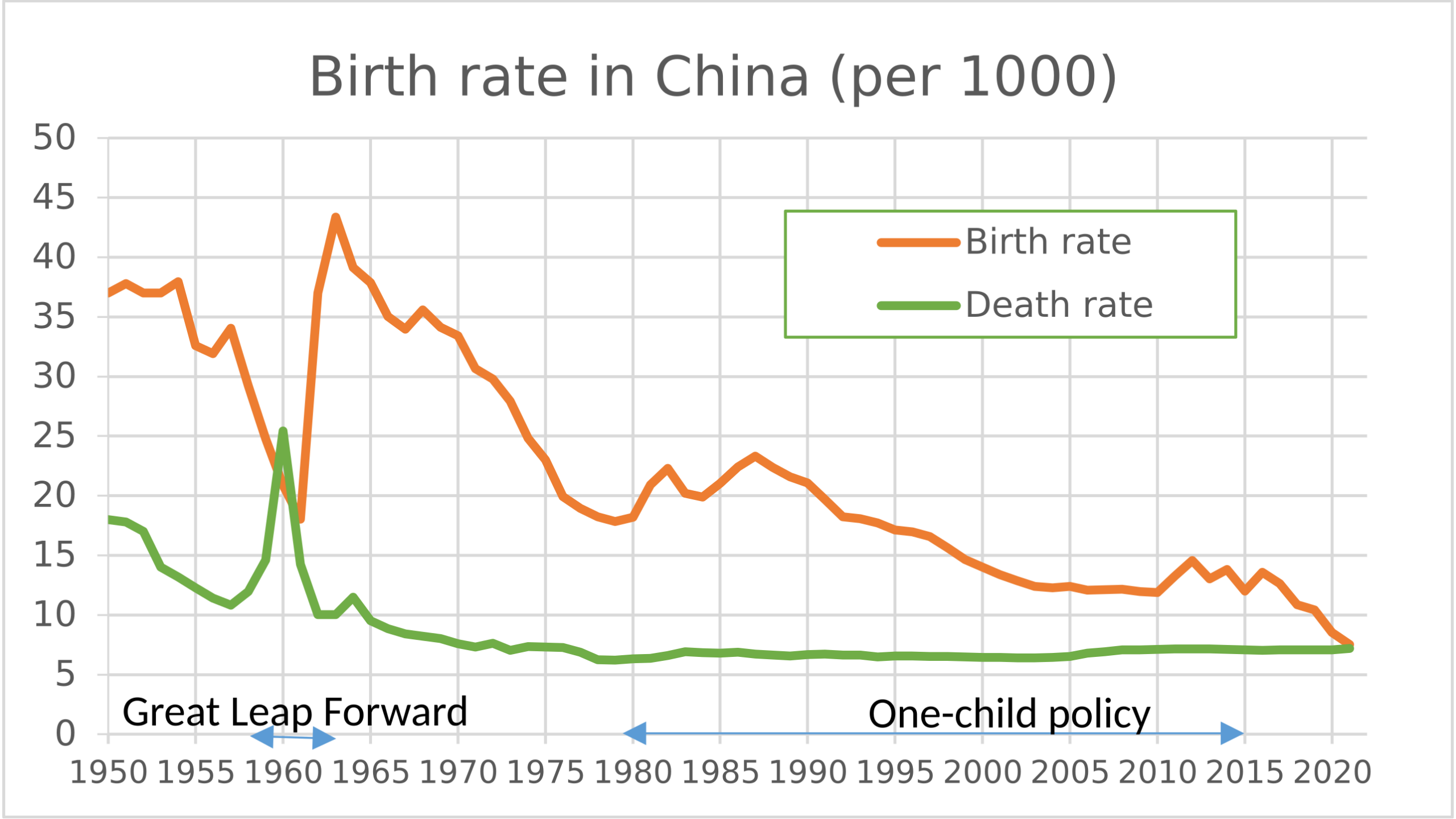
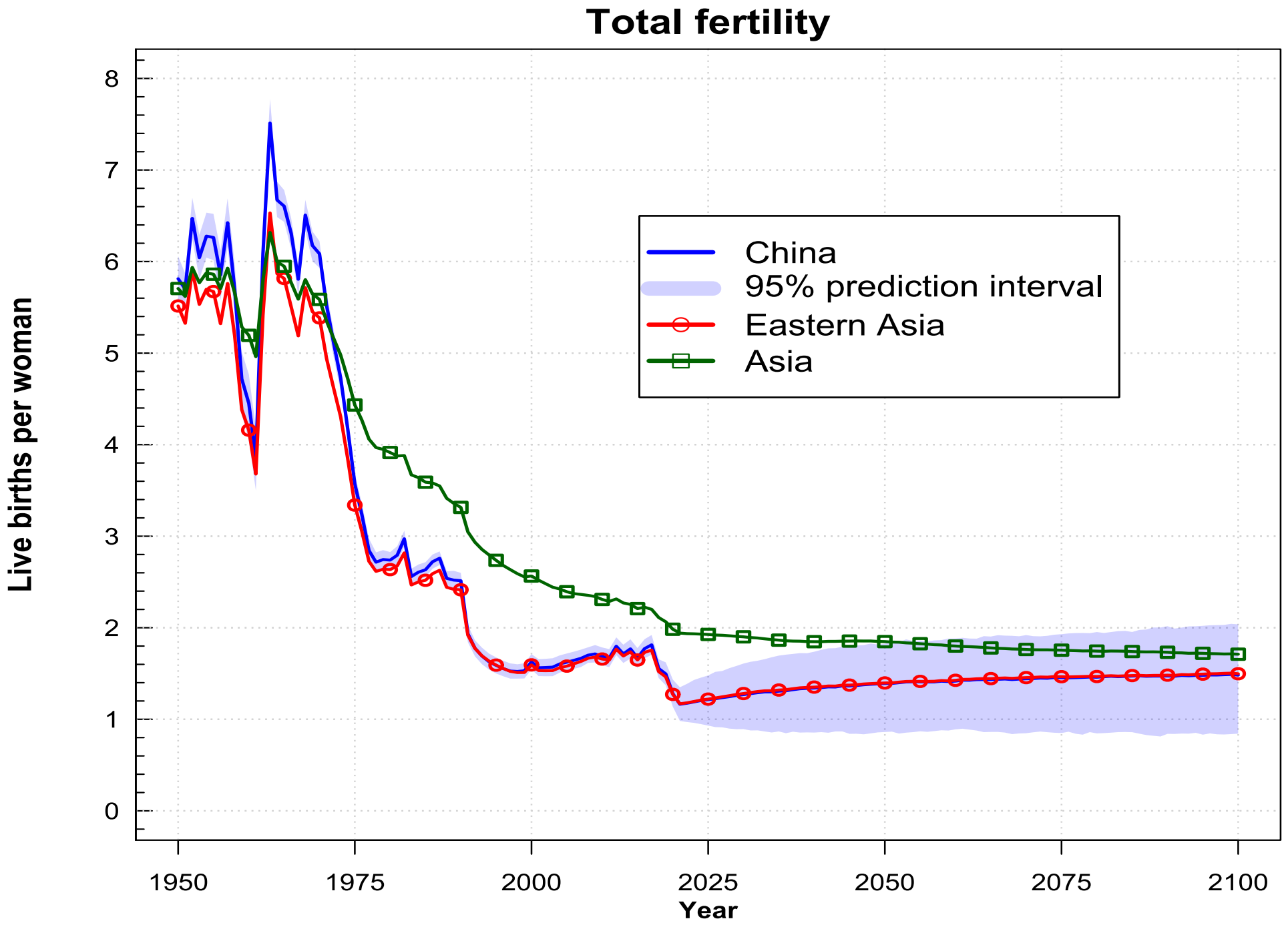
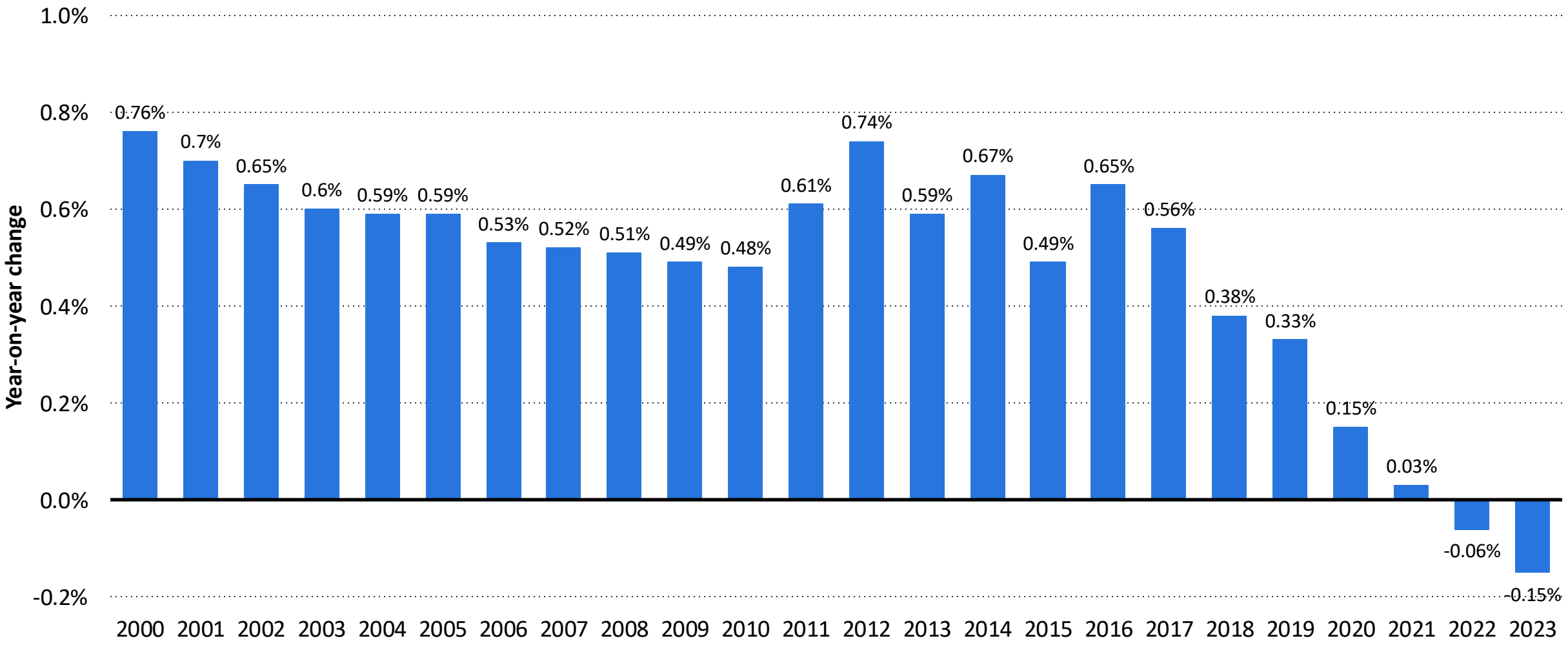

Birth rate in China (per 1000)
50
45
40
35
30
25
20
15
10
5
0
1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020
Birth rate
Death rate
Great Leap Forward
One-child policy

Impact of Compulsory Reduction in Fertility in China



Source: https://population.un.org/wpp/Graphs/DemographicProfiles/Line/913

Population growth in China from 2000 to 2023



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Further information regarding this statistic can be found on page 8.

Source(s): National Bureau of Statistics of China; ID 270129

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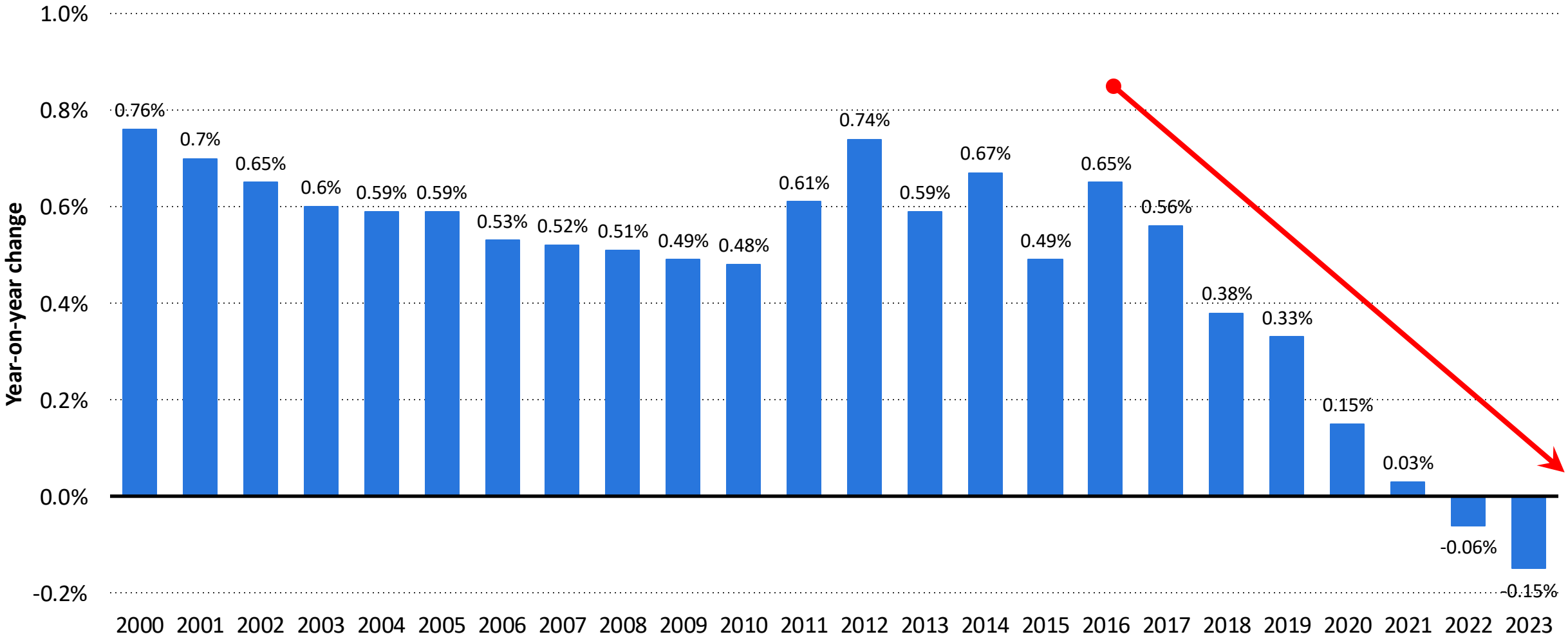


Note(s): China; 2000 to 2023

Further information regarding this statistic can be found on page 8.

Source(s): National Bureau of Statistics of China; ID 270129

Propaganda artwork in Miyun, a district of Beijing, depicting a couple with three children and including slogans promoting childbearing.

Andrea Verdelli for The New York Times, https://www.nytimes.com/2024/10/08/world/asia/china-women-children-abortions.html

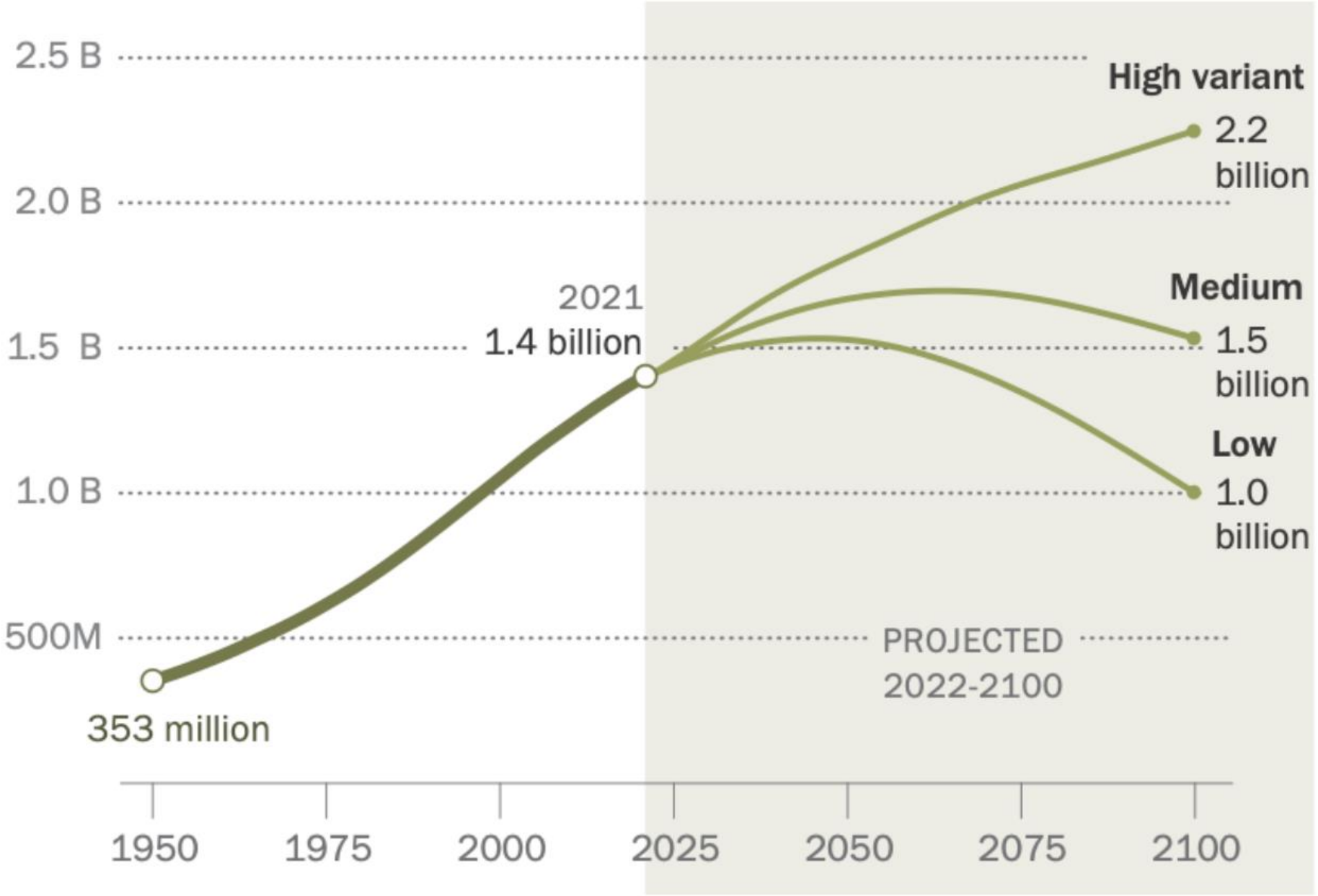
“Officials are not just going door to door to ask women about their plans. They have partnered with universities to develop courses on having a “positive view of marriage and childbearing.” At high-profile political gatherings, officials are spreading the message wherever they can….

“At the very least, the in-your-face approach makes it harder for women to tune out calls by China’s leader, Xi Jinping, to get married and have babies. To some, it is outright invasive; on social media, women have complained about being approached by neighborhood officials, including some who they said called to ask the date of their last menstrual cycle.

“Mr. Xi, who has overseen a crackdown on feminist activism, has said that promoting childbirth as a national priority is one step toward ensuring that women “always walk with the party.” (The country’s total fertility rate, a measure of the number of children a woman is expected to have over her lifetime, is among the world’s lowest. The rate is estimated at around 1.0, compared to 1.62 in the United States last year.)”

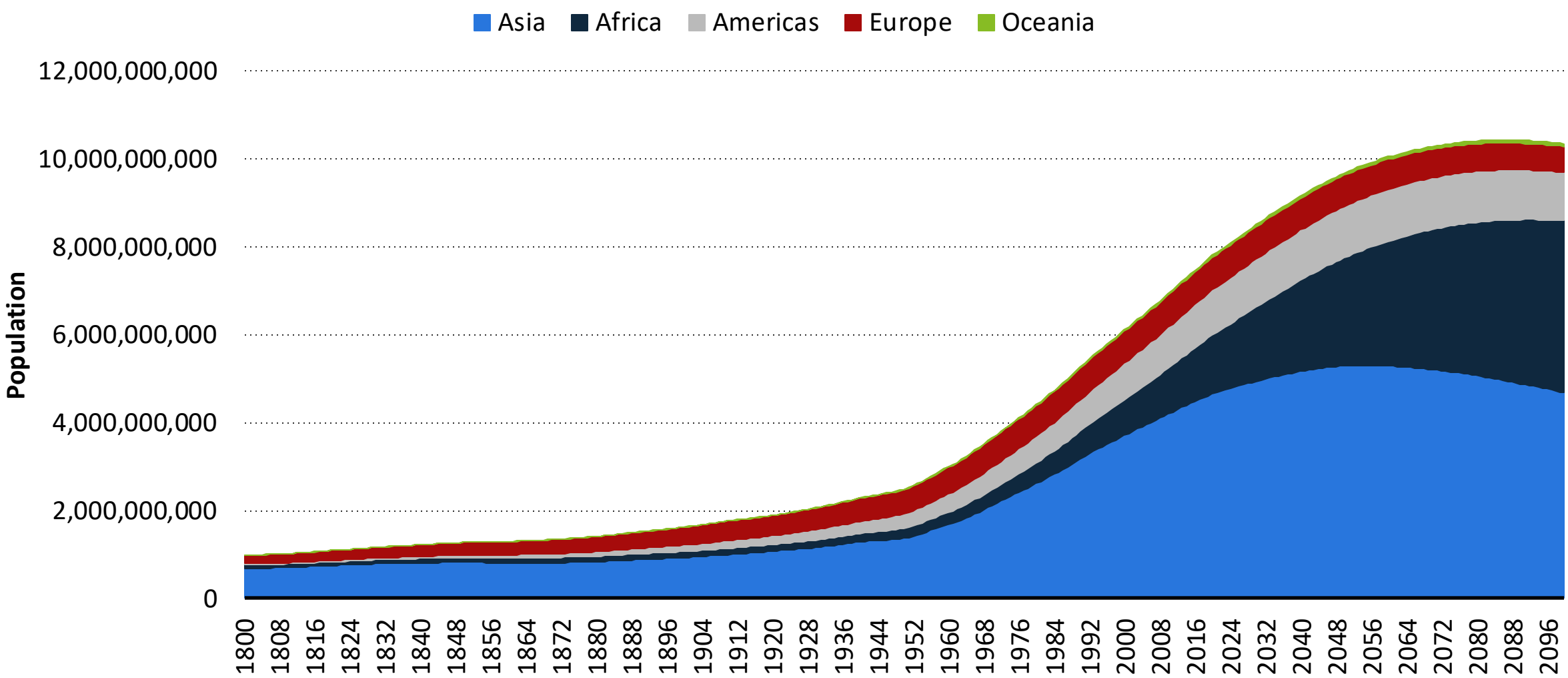
Sourec: https://www.nytimes.com/2024/10/08/world/asia/china-women-children-abortions.html

Population of India



Source: https://www.pewresearch.org/short-reads/2023/02/09/key-facts-as-india-surpasses-china-as-the-worlds-most-populous-country/ft_2023-02-09_india-population_01-png/

Population of the world's continents from 1800 to 2021, with estimates until 2100

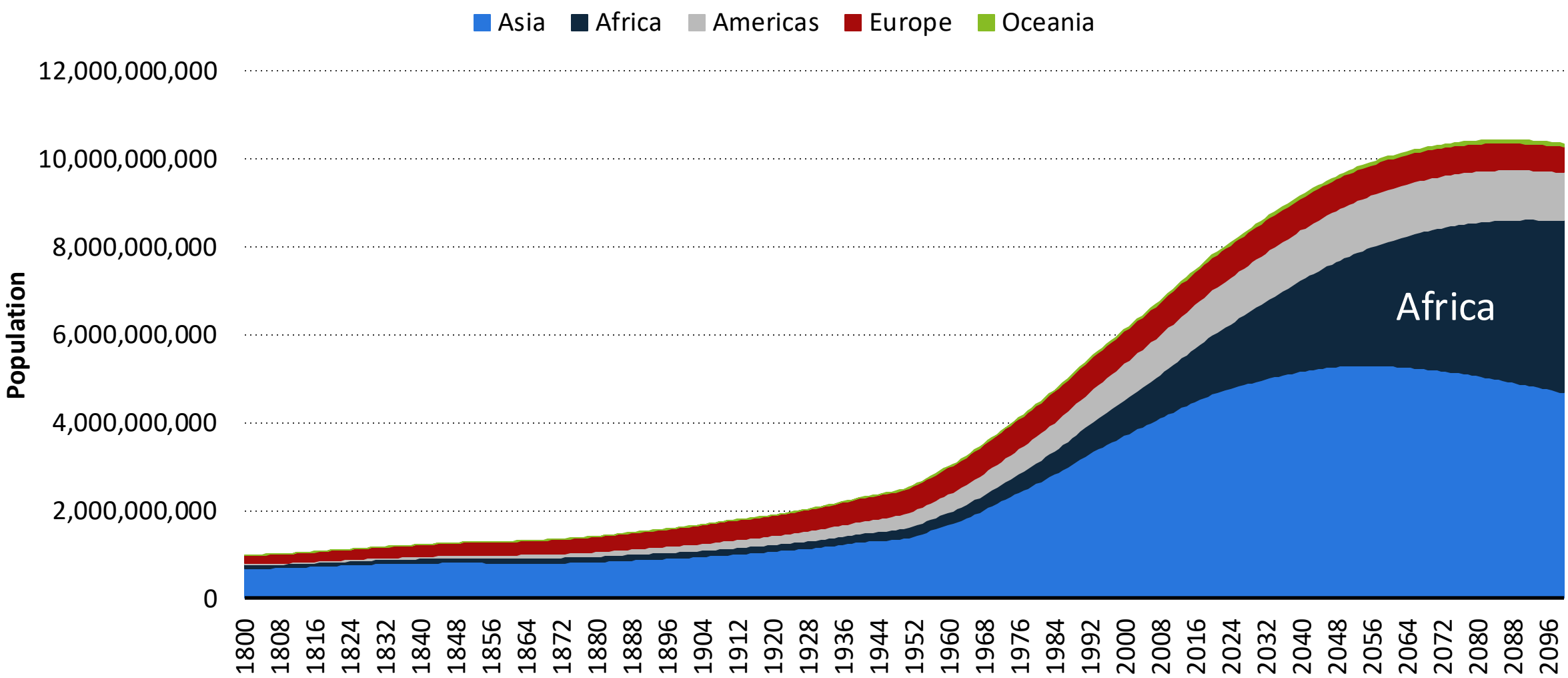


Note(s): Worldwide; 1800 to 2021

Further information regarding this statistic can be found on Page 4.

Source(s): United Nations Department of Economic and Social Affairs (UN DESA); Gapminder; ID 997040

Population of the world's continents from 1800 to 2021, with estimates until 2100

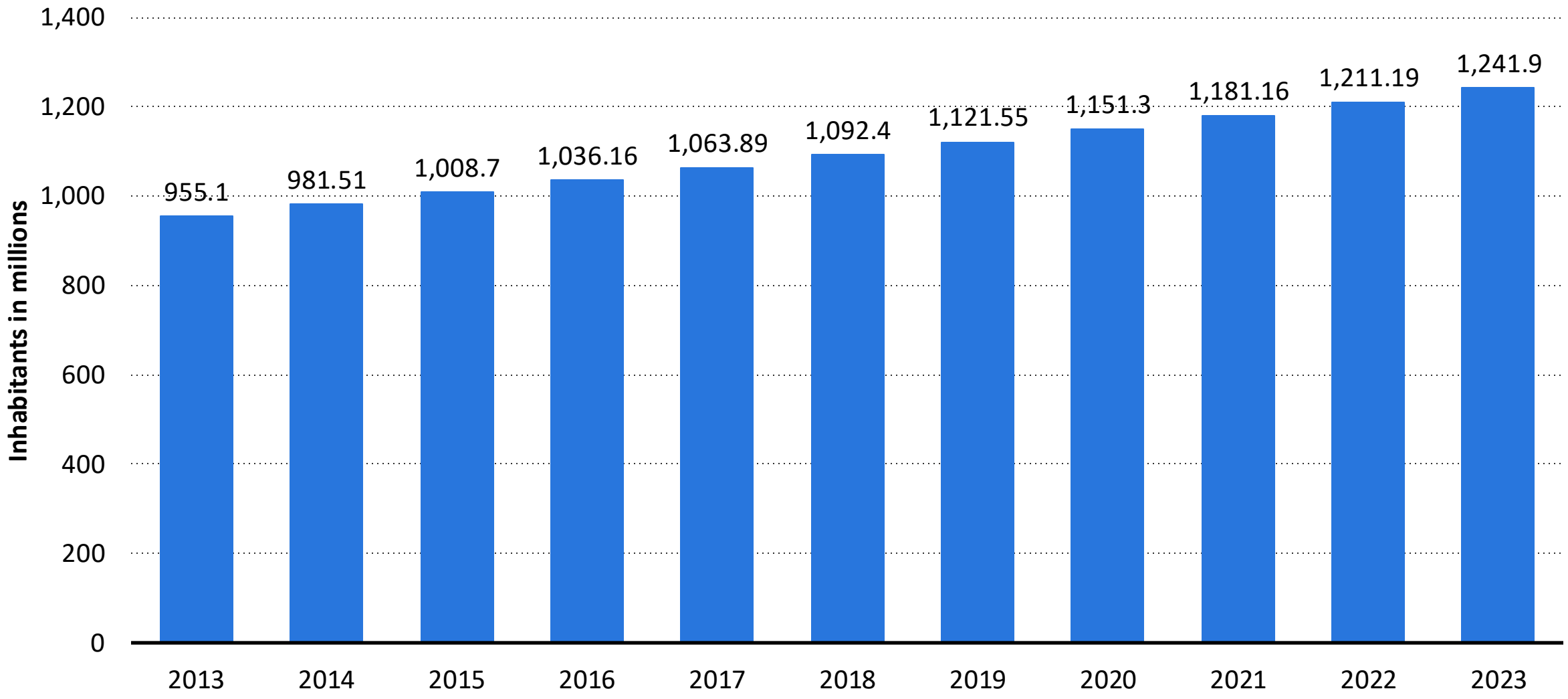


Note(s): Worldwide; 1800 to 2021

Further information regarding this statistic can be found on Page 4.

Source(s): United Nations Department of Economic and Social Affairs (UN DESA); Gapminder; ID 997040

Sub-Saharan Africa: Total population from 2013 to 2023 (in million inhabitants)

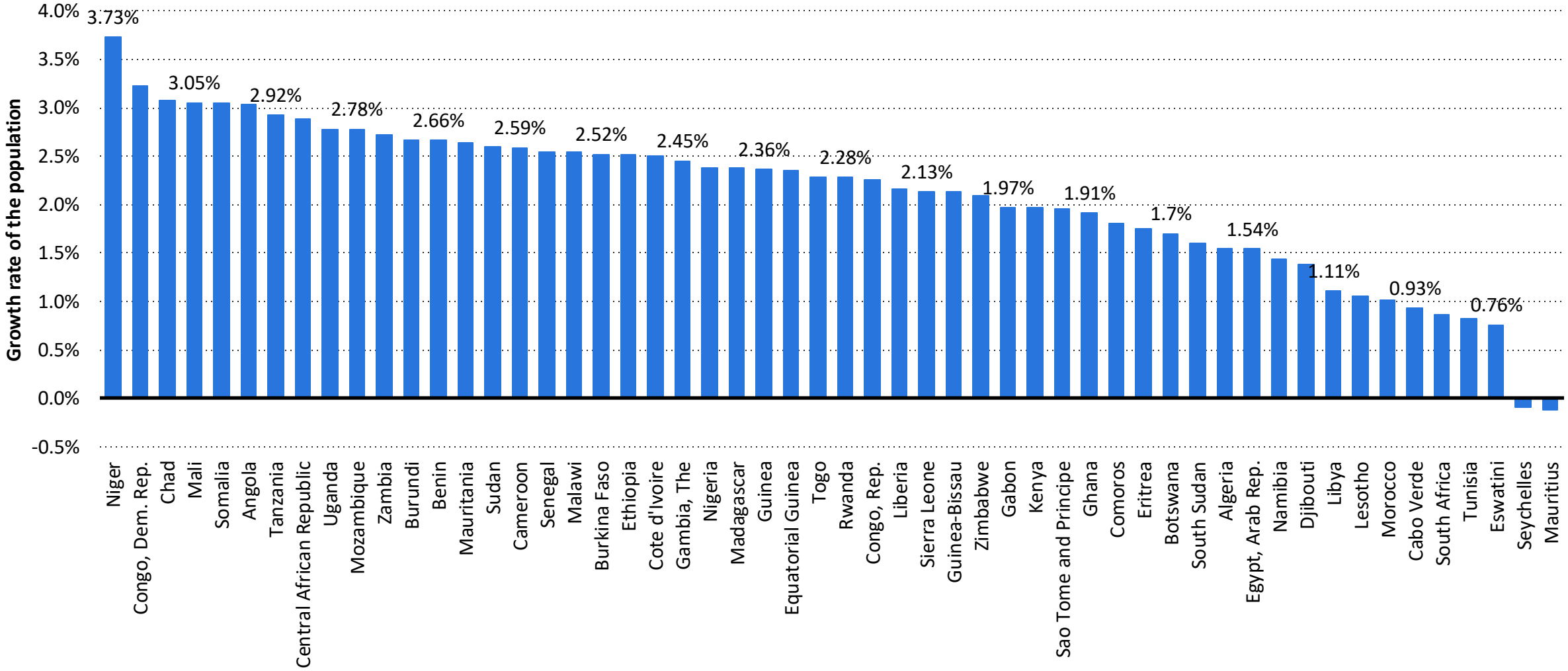


Note(s): Africa

Further information regarding this statistic can be found on page 8.

Source(s): World Bank; ID 805605

Growth rate of the population of Africa in 2023, by country (compared to the previous year)



Note(s): Africa; 2023

Further information regarding this statistic can be found on page 8.

Source(s): World Bank; United Nations Department of Economic and Social Affairs (UN DESA); ID 1227666

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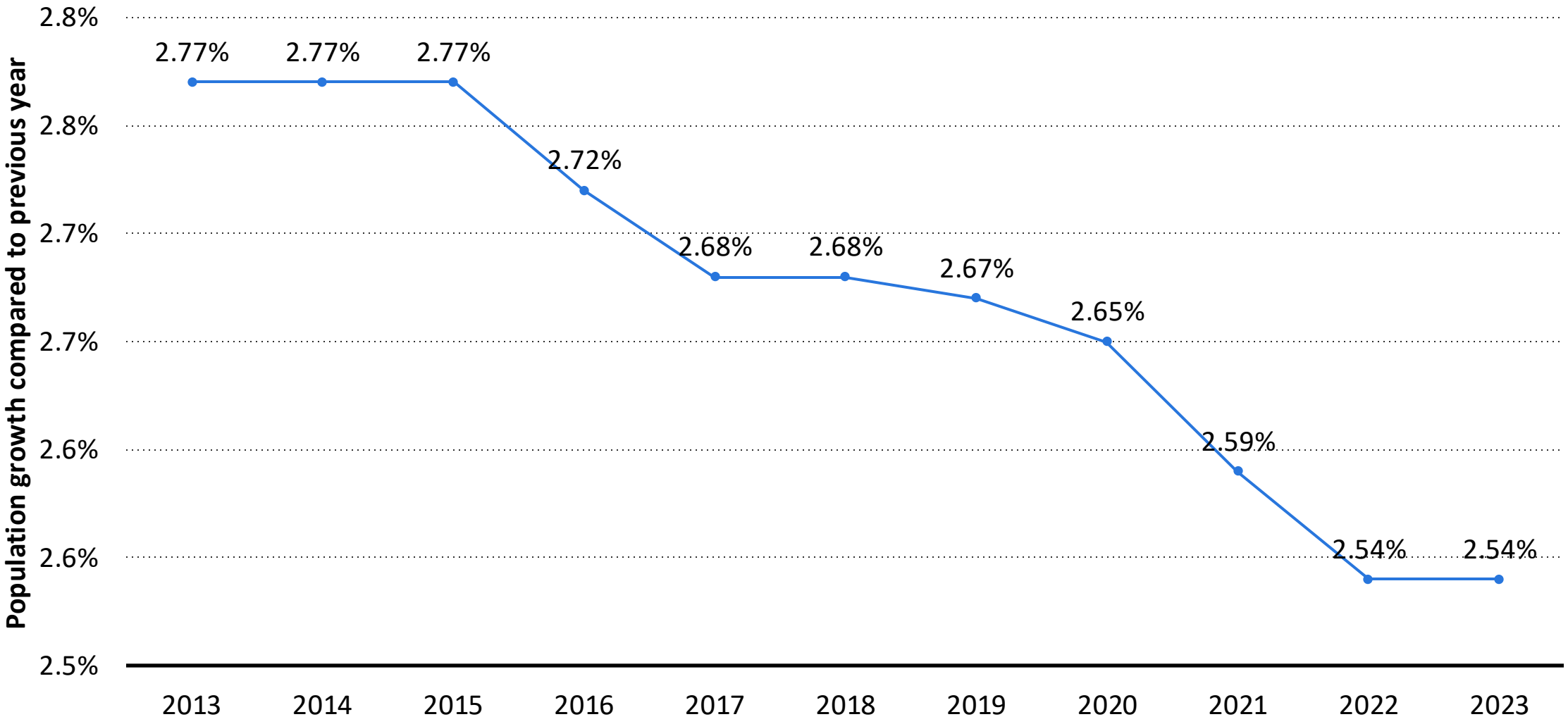
Sub-Saharan Africa: Population growth from 2013 to 2023 (compared to previous year)

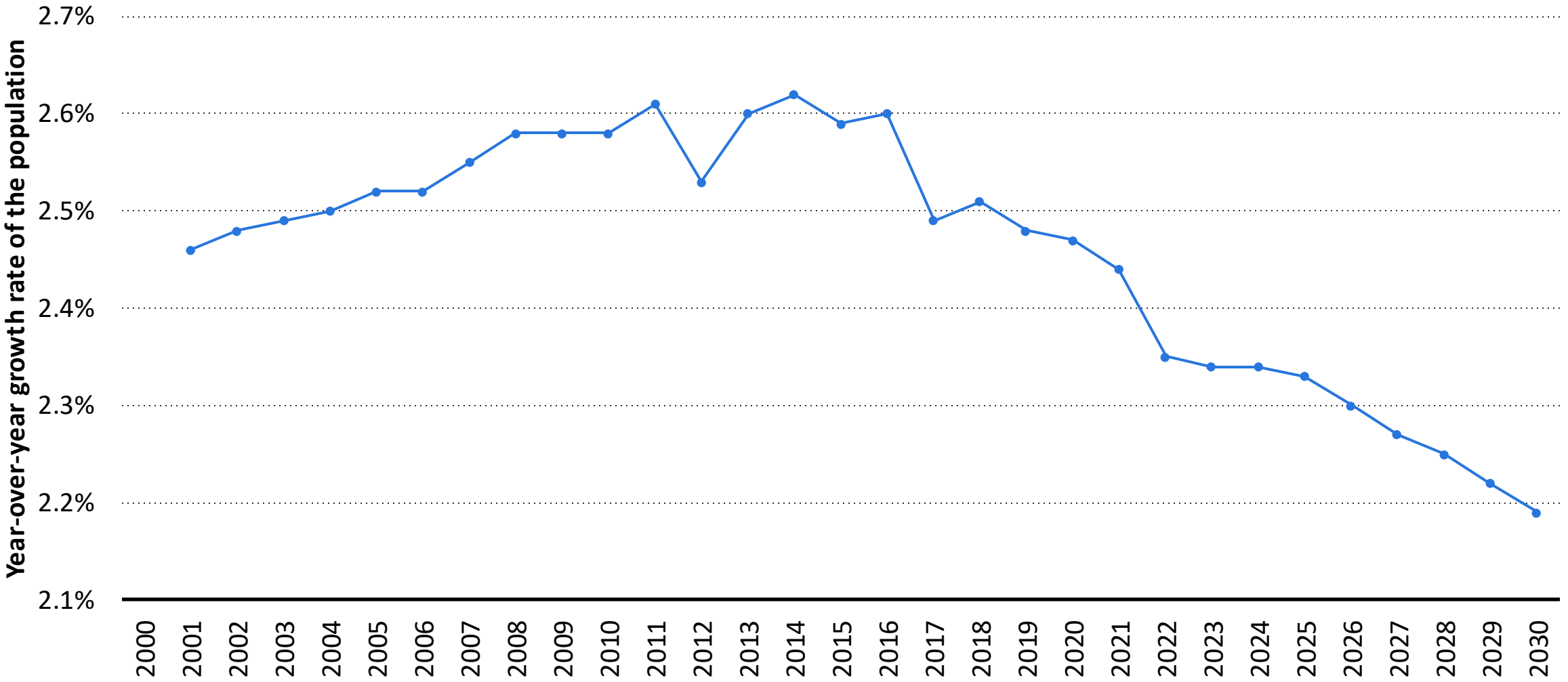


Note(s): Africa

Further information regarding this statistic can be found on page 8.

Source(s): World Bank; ID 805619

Population growth rate in Africa from 2000 to 2030



Note(s): Africa; 2000 to 2030

Further information regarding this statistic can be found on page 8.

Source(s): United Nations Department of Economic and Social Affairs (UN DESA); OWID; ID 1224179

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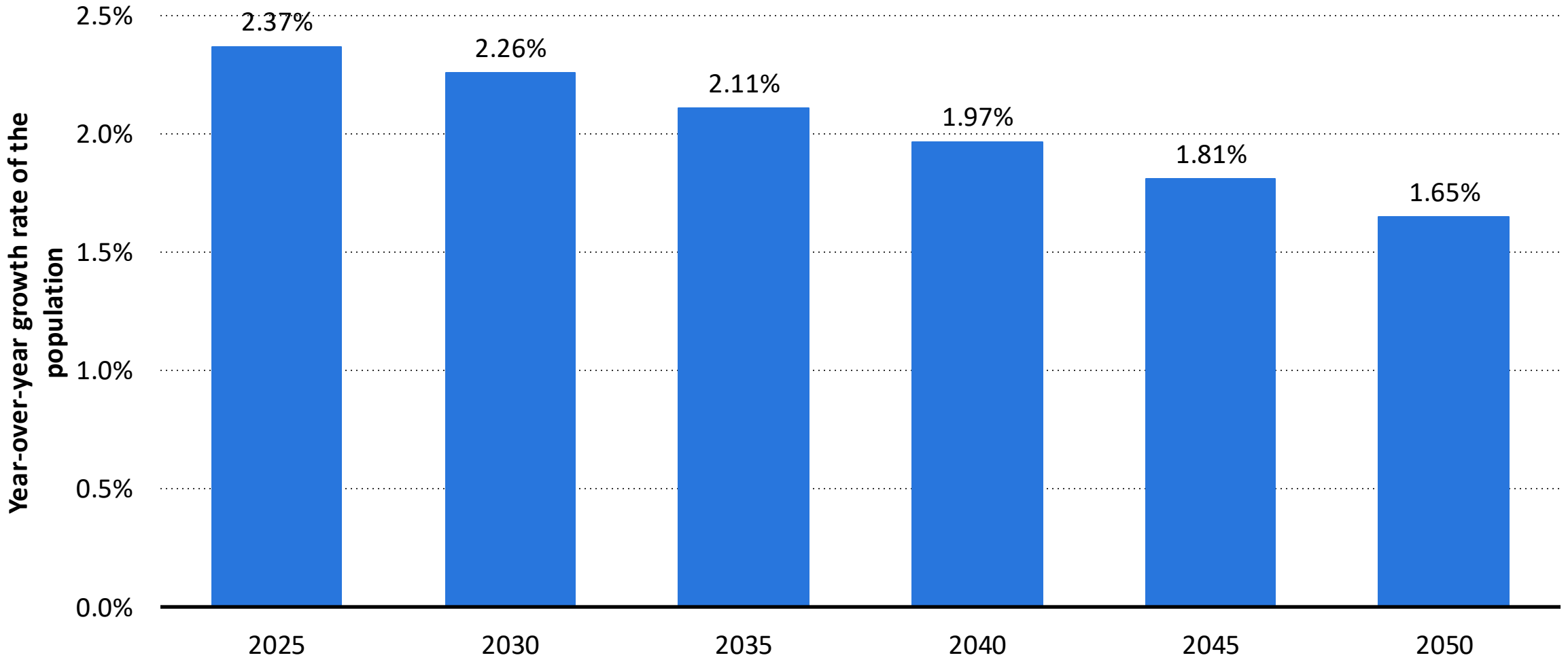
Forecast of the population growth rate in Africa from 2025 to 2050



Note(s): Africa; 2025 to 2050

Further information regarding this statistic can be found on page 8.

Source(s): Worldometer; United Nations Department of Economic and Social Affairs (UN DESA); ID 1224222

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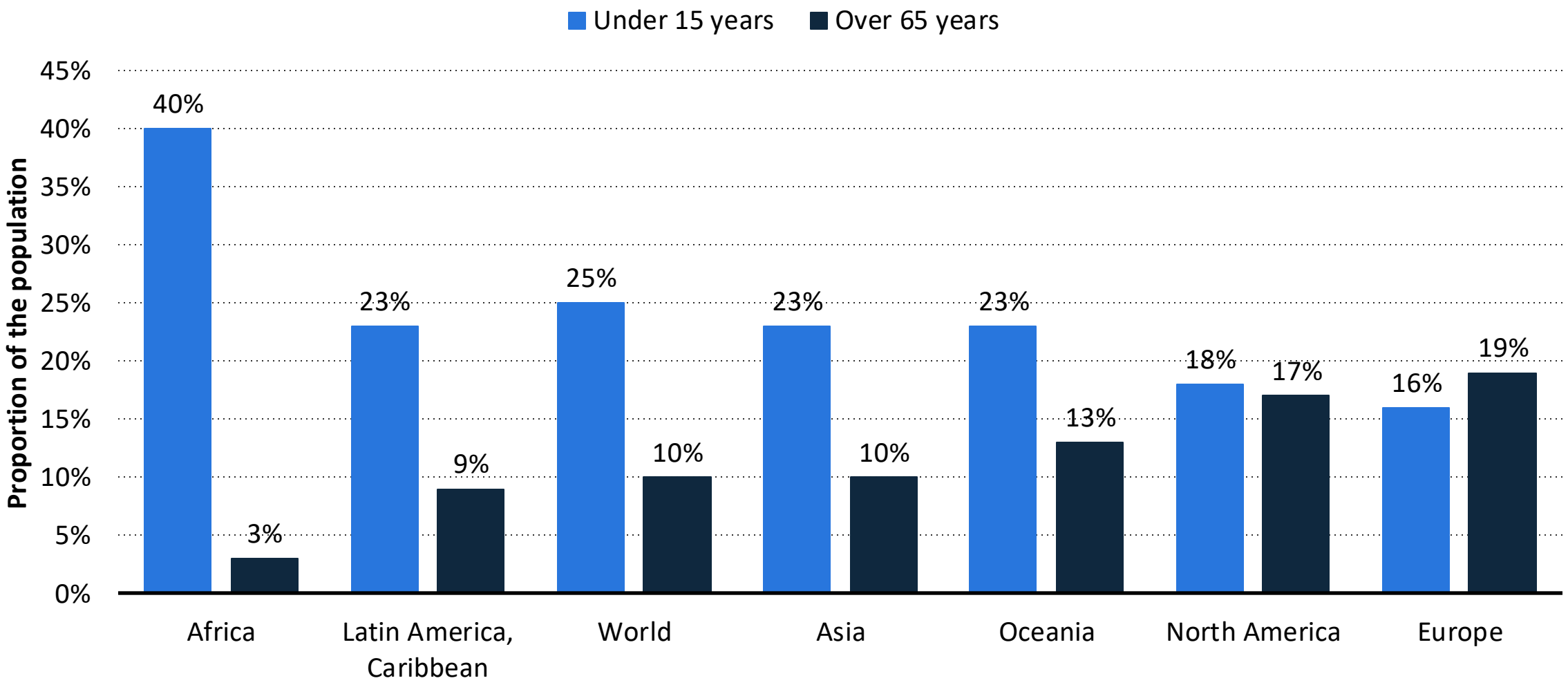
Proportion of selected age groups of world population and in regions in 2023



Note(s): Worldwide; mid-2023

Further information regarding this statistic can be found on page 8.

Source(s): Population Reference Bureau; ID 265759

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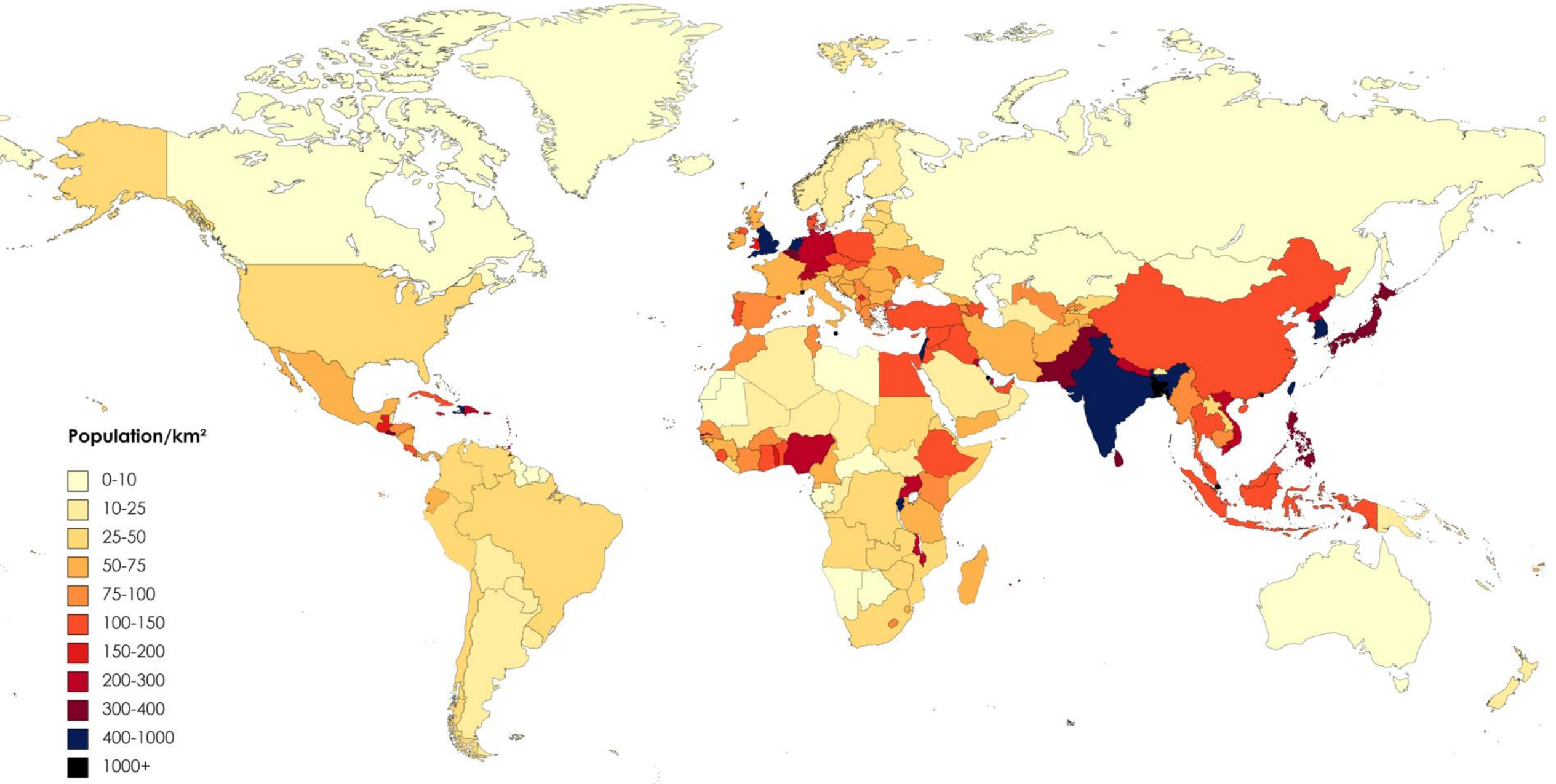
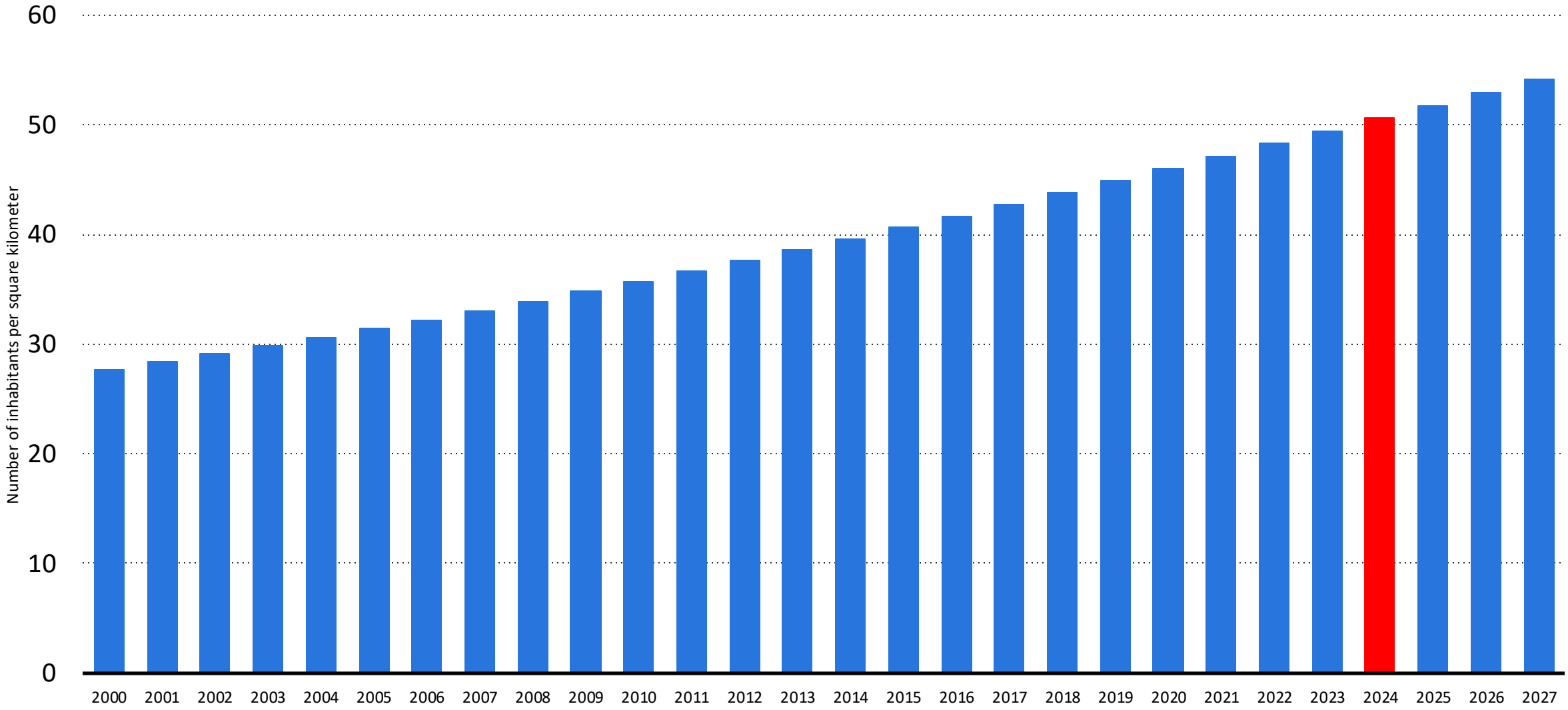
Population density (people per square kilometre) by country in 2023



https://en.wikipedia.org/wiki/Population_density#/media/File:PopulationDensityMapPerSquareKilometre.png

Population density in Africa from 2000 to 2027 (inhabitants per square kilometer)

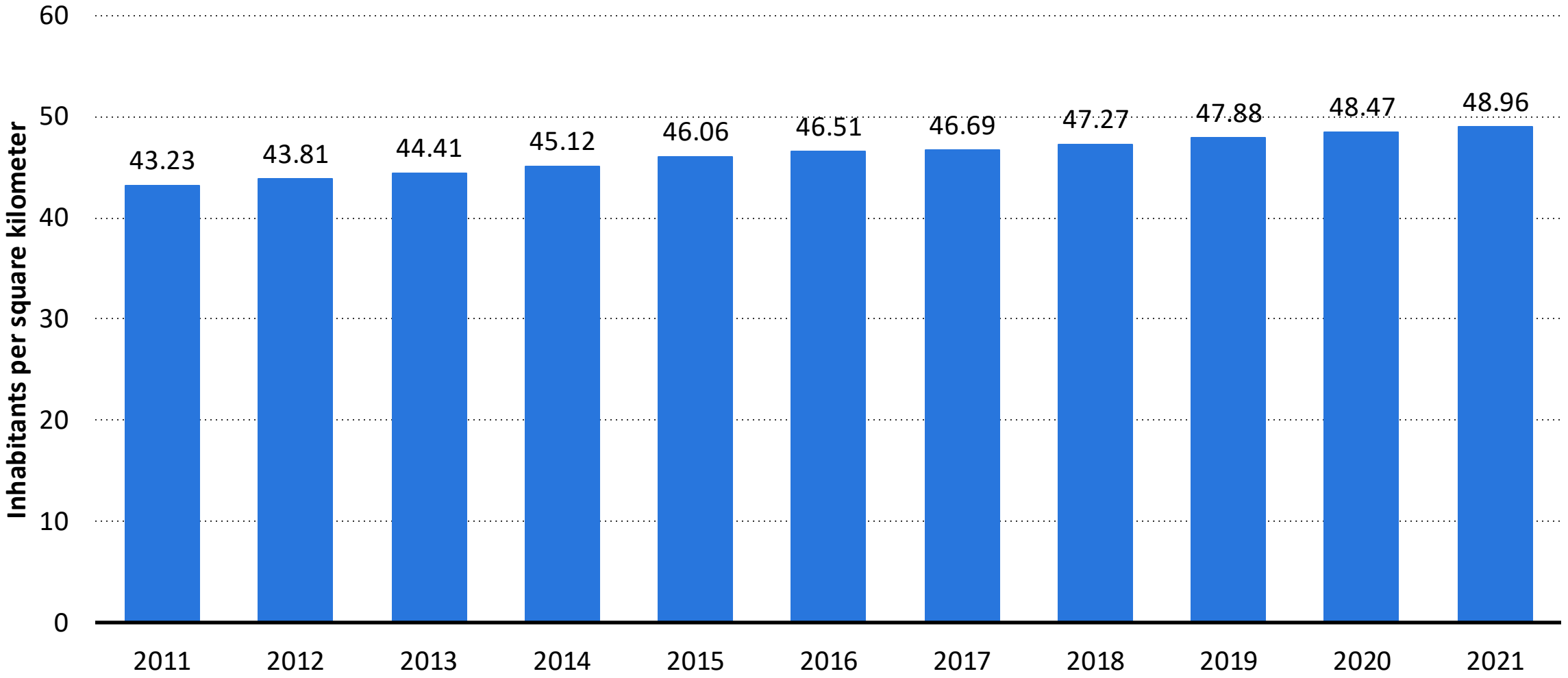


Note(s): Africa; 2000 to 2027

Further information regarding this statistic can be found on page 8.

Source(s): United Nations Department of Economic and Social Affairs (UN DESA); ID 1225875

South Africa: Population density from 2011 to 2021 (inhabitants per square kilometer)

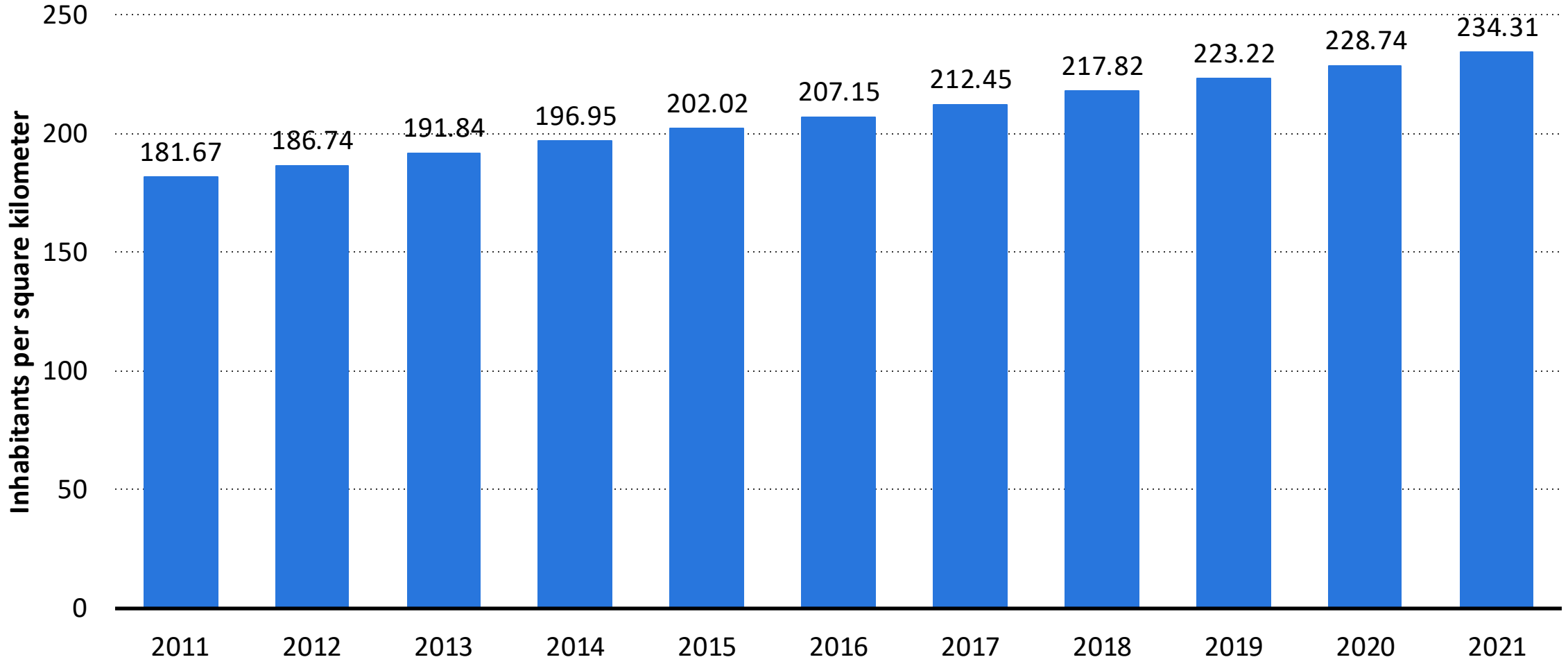


Note(s): South Africa; 2011 to 2021

Further information regarding this statistic can be found on page 8.

Source(s): World Bank; ID 971524

Nigeria: Population density from 2011 to 2021 (inhabitants per square kilometer)

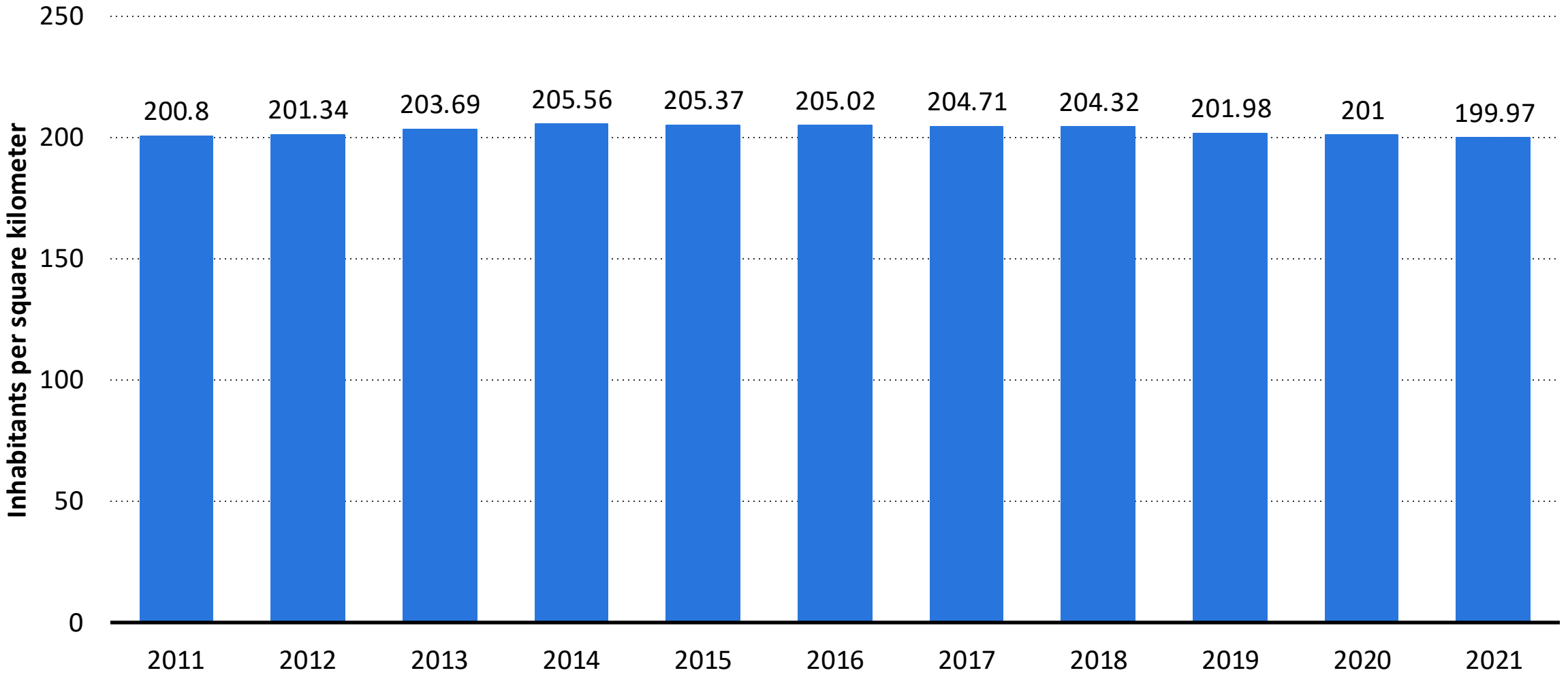


Note(s): Nigeria; 2011 to 2021

Further information regarding this statistic can be found on page 8.

Source(s): World Bank; ID 971507

Italy: Population density from 2011 to 2021 (inhabitants per square kilometer)

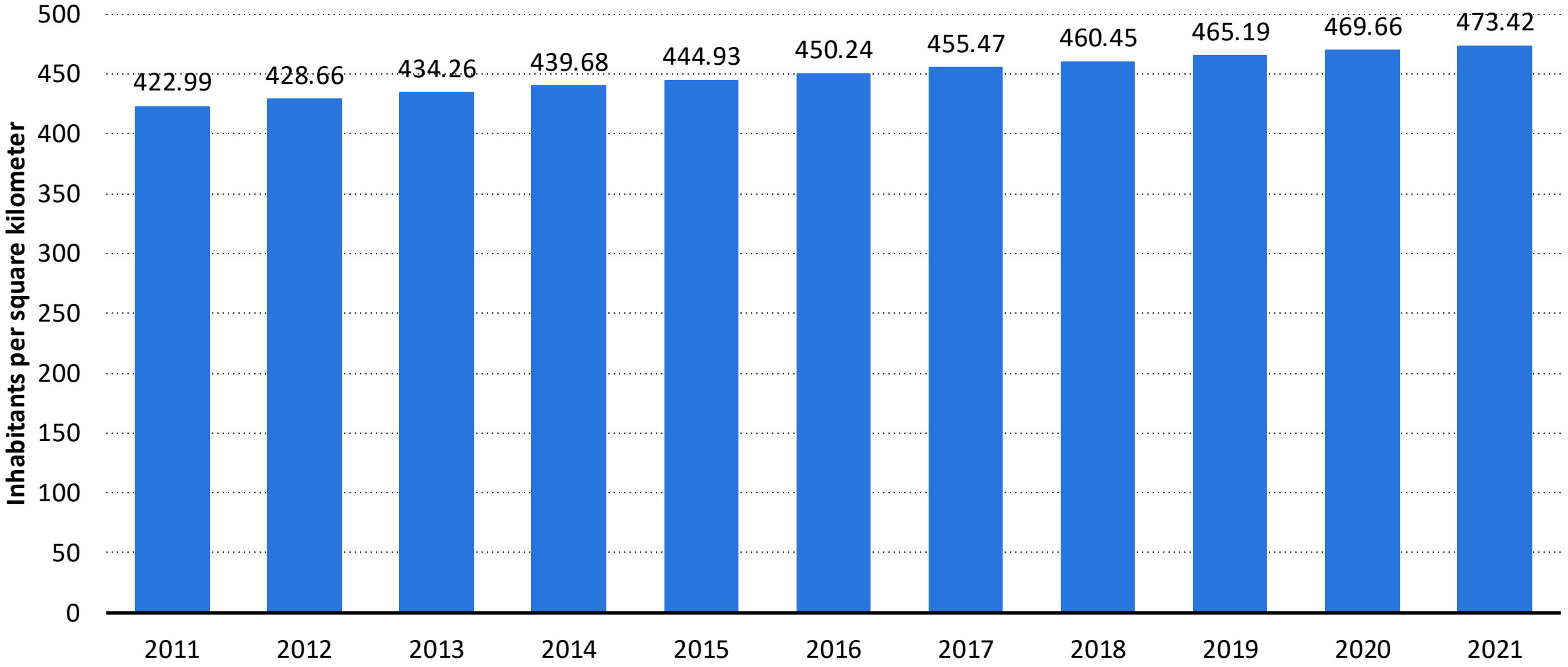


Note(s): Italy; 2011 to 2021

Further information regarding this statistic can be found on page 8.

Source(s): World Bank; ID 270469

India: Population density from 2011 to 2021 (inhabitants per square kilometer)

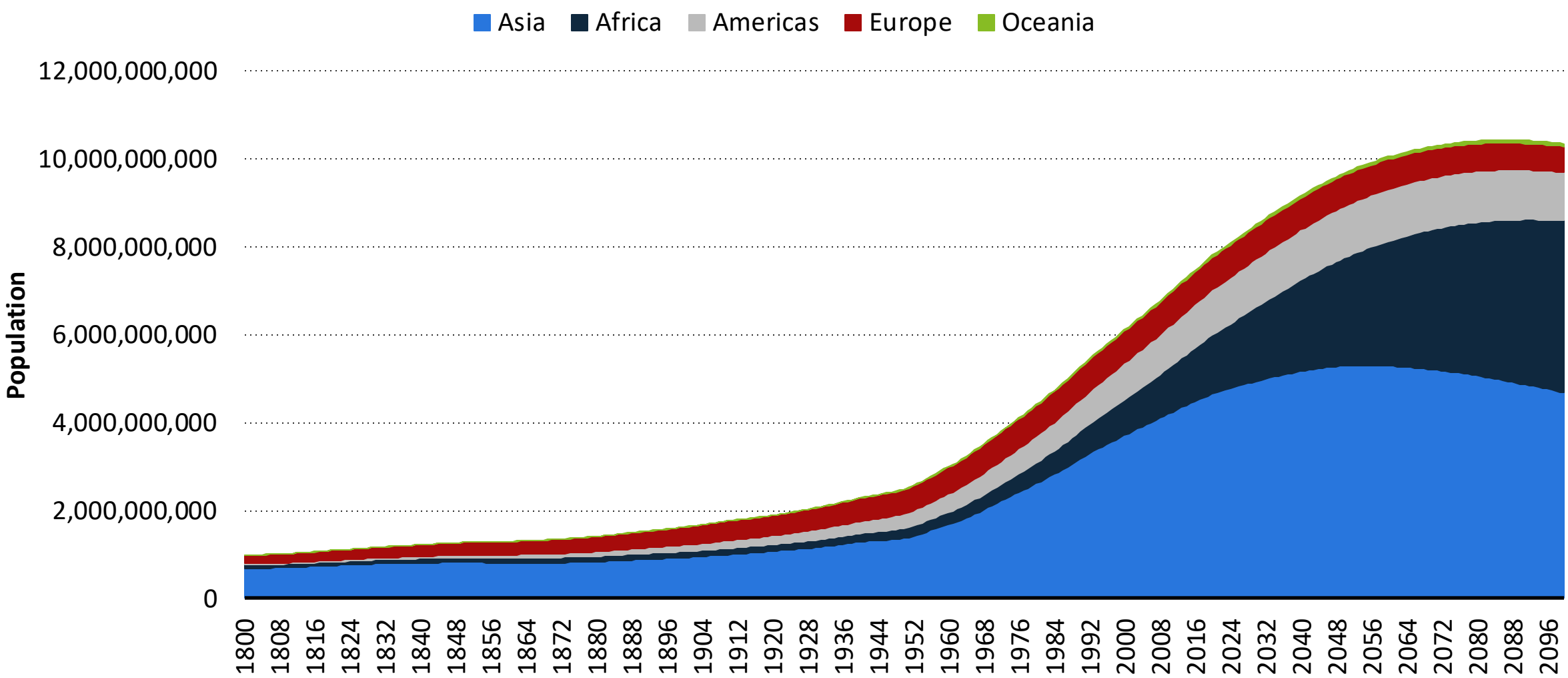


Note(s): 2011 to 2021

Further information regarding this statistic can be found on page 8.

Source(s): World Bank; ID 271311

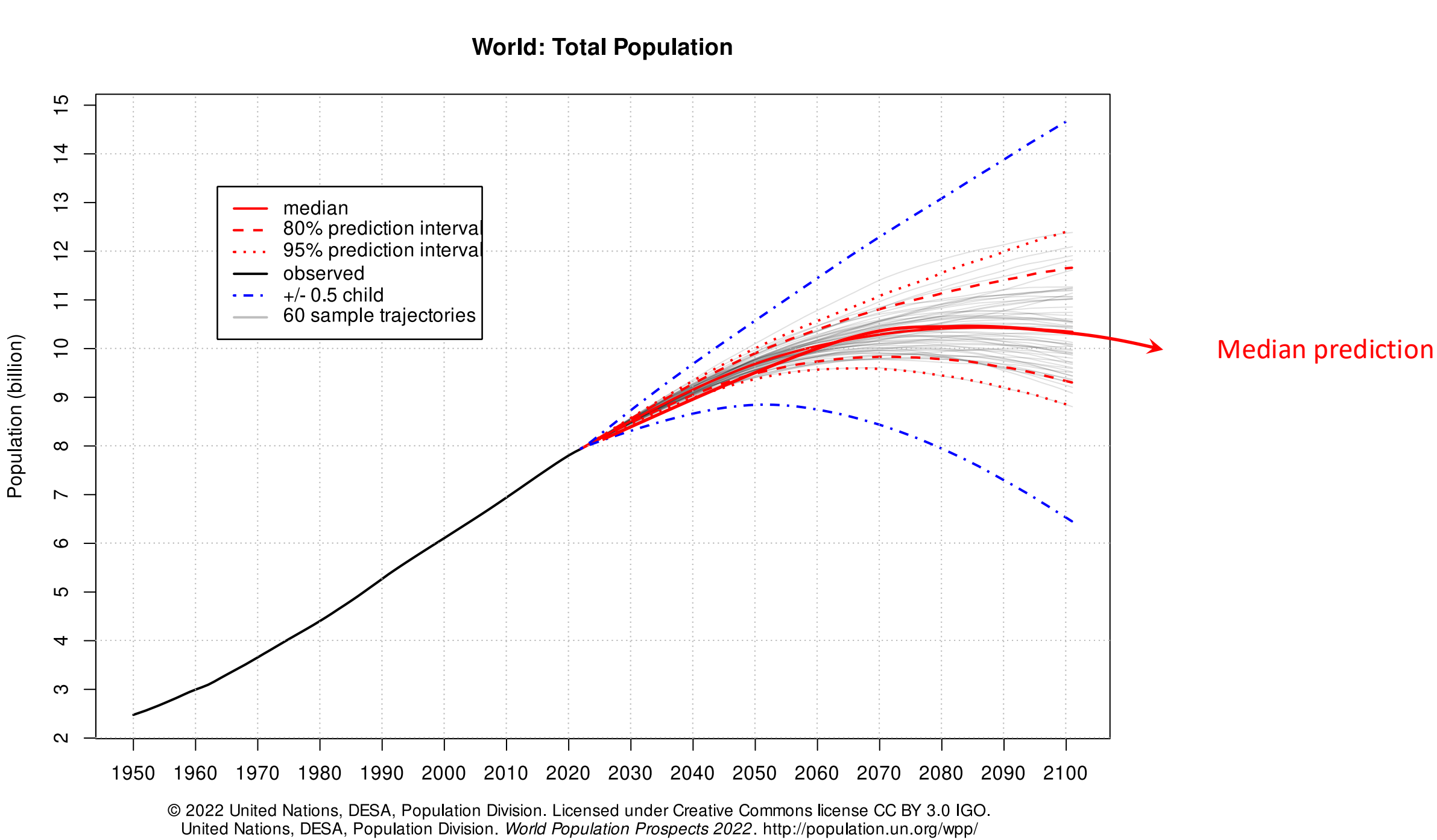
Population of the world's continents from 1800 to 2021, with estimates until 2100



Note(s): Worldwide; 1800 to 2021

Further information regarding this statistic can be found on Page 4.

Source(s): United Nations Department of Economic and Social Affairs (UN DESA); Gapminder; ID 997040


World: Total Population
median
80% prediction interval
95% prediction interval
observed
+/- 0.5 child
60 sample trajectories
Population (billion)
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1950
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
Median prediction
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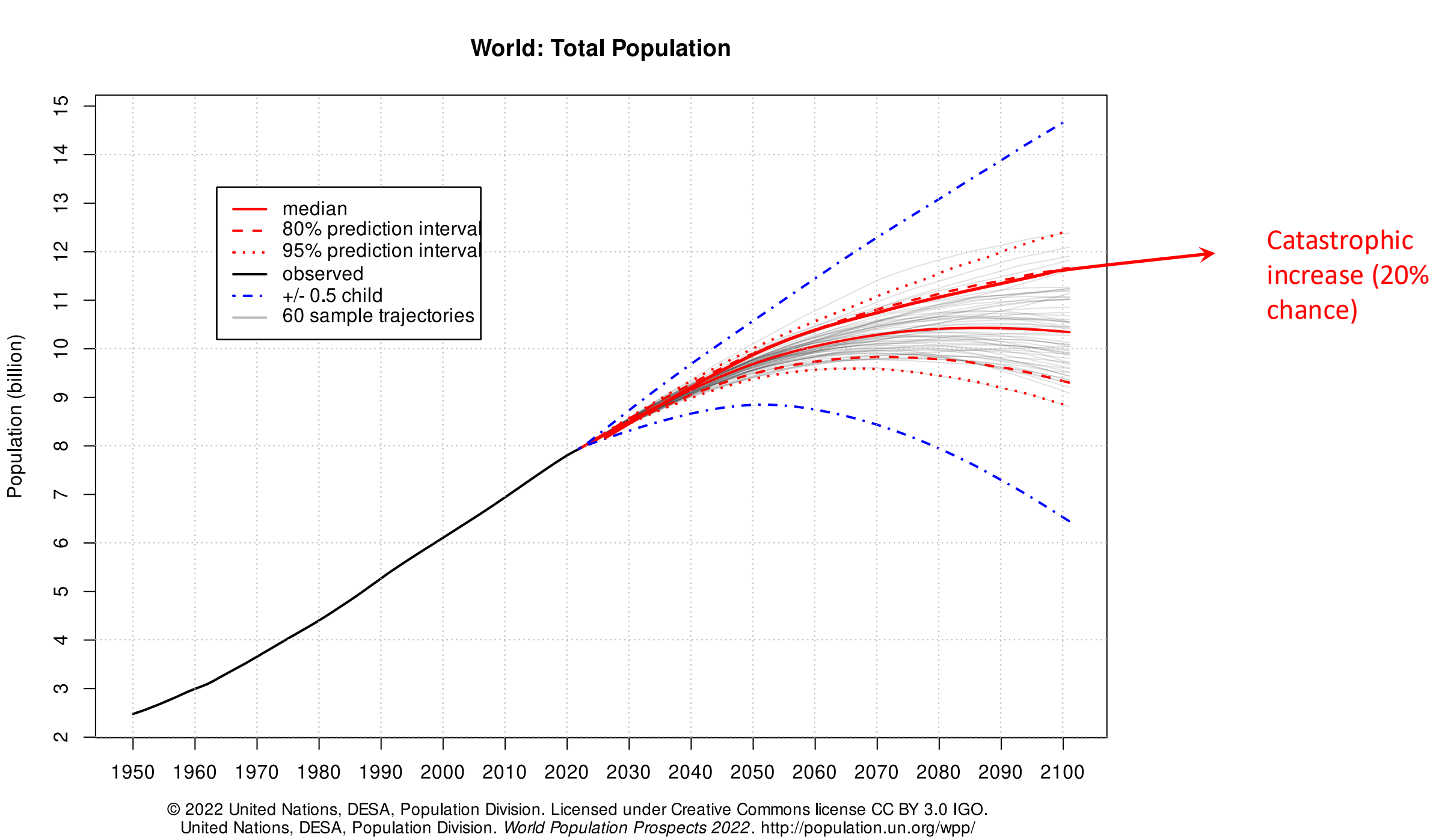
United Nations, DESA, Population Division. *World Population Prospects 2022*. http://population.un.org/wpp/


World: Total Population
Population (billion)
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1950
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
median
80% prediction interval
95% prediction interval
observed
+/- 0.5 child
60 sample trajectories
Catastrophic increase (20% chance)
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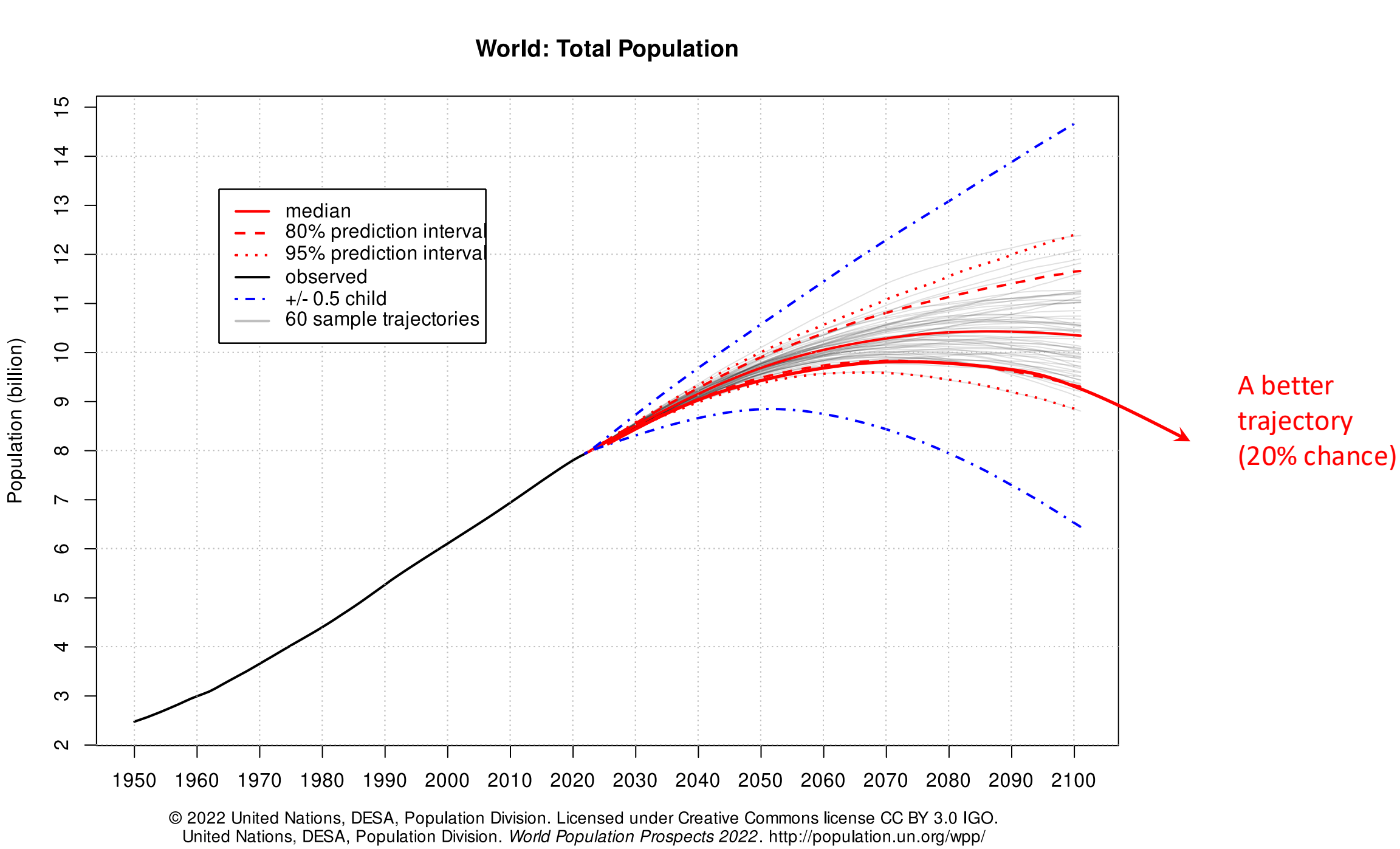
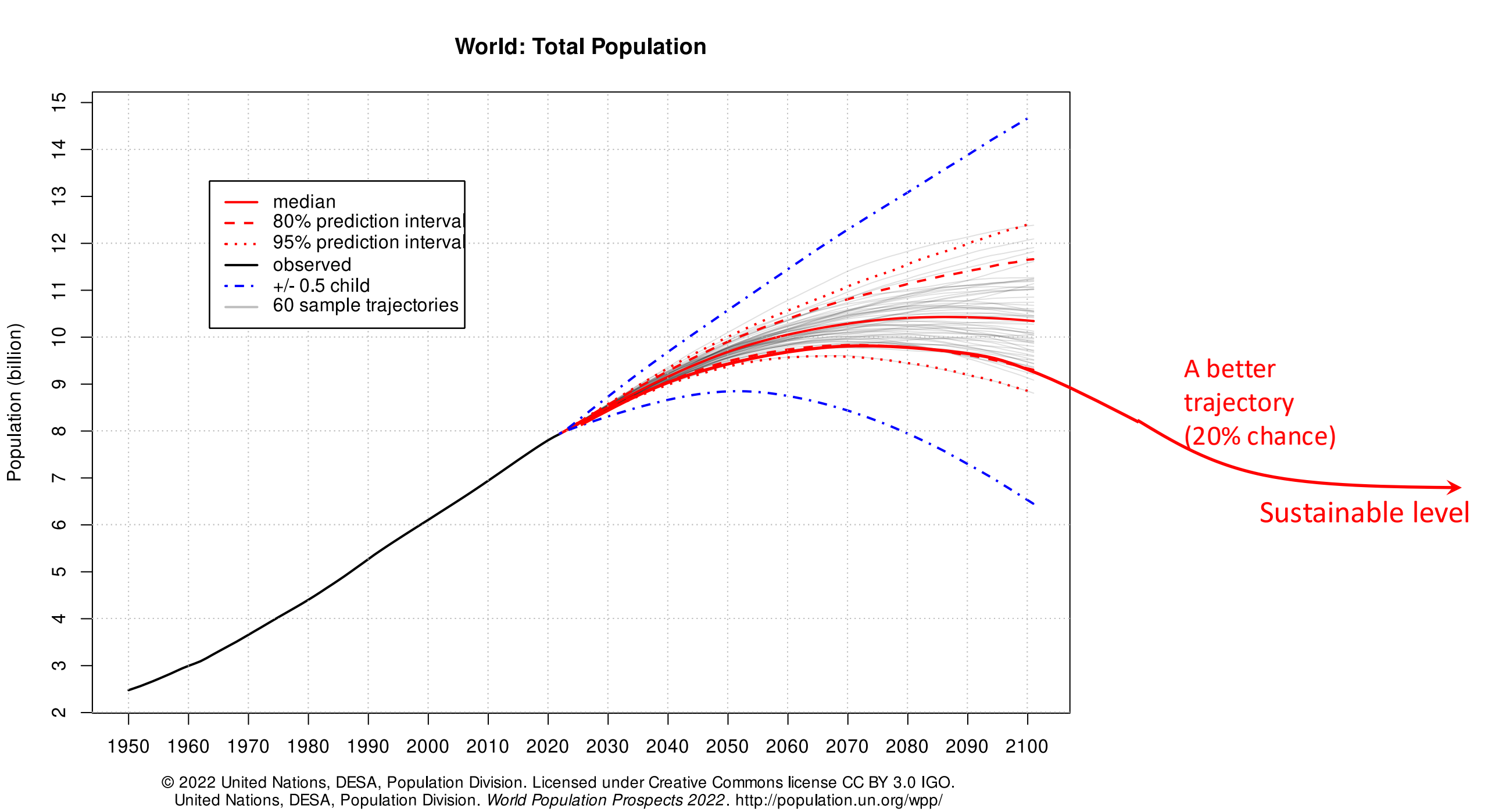
United Nations, DESA, Population Division. World Population Prospects 2022. http://population.un.org/wpp/



United Nations, DESA, Population Division. *World Population Prospects 2022*. http://population.un.org/wpp/



United Nations, DESA, Population Division. *World Population Prospects 2022*. http://population.un.org/wpp/

a) Number

b) Relationship to Natural Environment

1. Climate

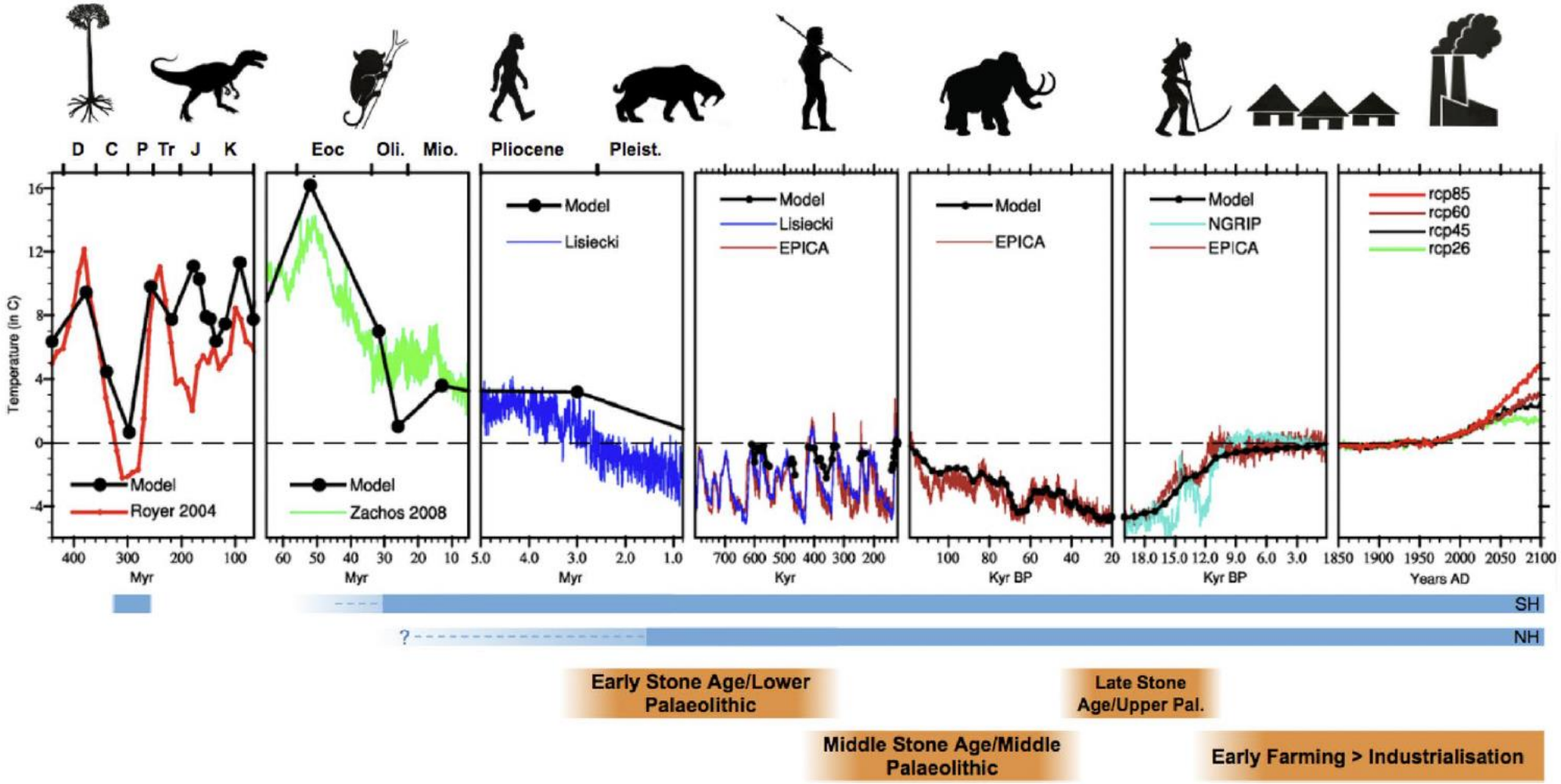


Fig. 1 Global annual mean temperature variation of the Earth through time (last 400 million years) predicted by the Hadley Centre Coupled Climate Model version 3 (HadCM3), compared with geologically derived estimates of temperature variability over the same period [the Royer et al. 2004 temperature record, the Zachos et al. 2008; Lisiecki and Raymo 2005 benthic oxygen isotope stack, as well as the EPICA and NGRIP ice core records; Jouzel et al. 2007 and NGRIP Members 2004. Geological epochs include the Devonian (D), Carboniferous (C) Permian (P), Triassic (Tr), Jurassic (J) Cretaceous (K), Eocene (Eoc), Oligocene (Oli.), Miocene (Mio), Pliocene and Pleistocene (Pleist.)] Future predictions of temperature change are based on HadCM3 simulations using different Representative Concentration Pathways (RCPs). Horizontal blue lines represent geological evidence for ice sheets in the northern (NH) and southern (SH) hemispheres. Major evolutionary characteristics and events over the last 400 million years represented by cartoon silhouettes

Source: Haywood et al., "What can Palaeoclimate Modelling do for you?," Earth Systems and Environment (2019)

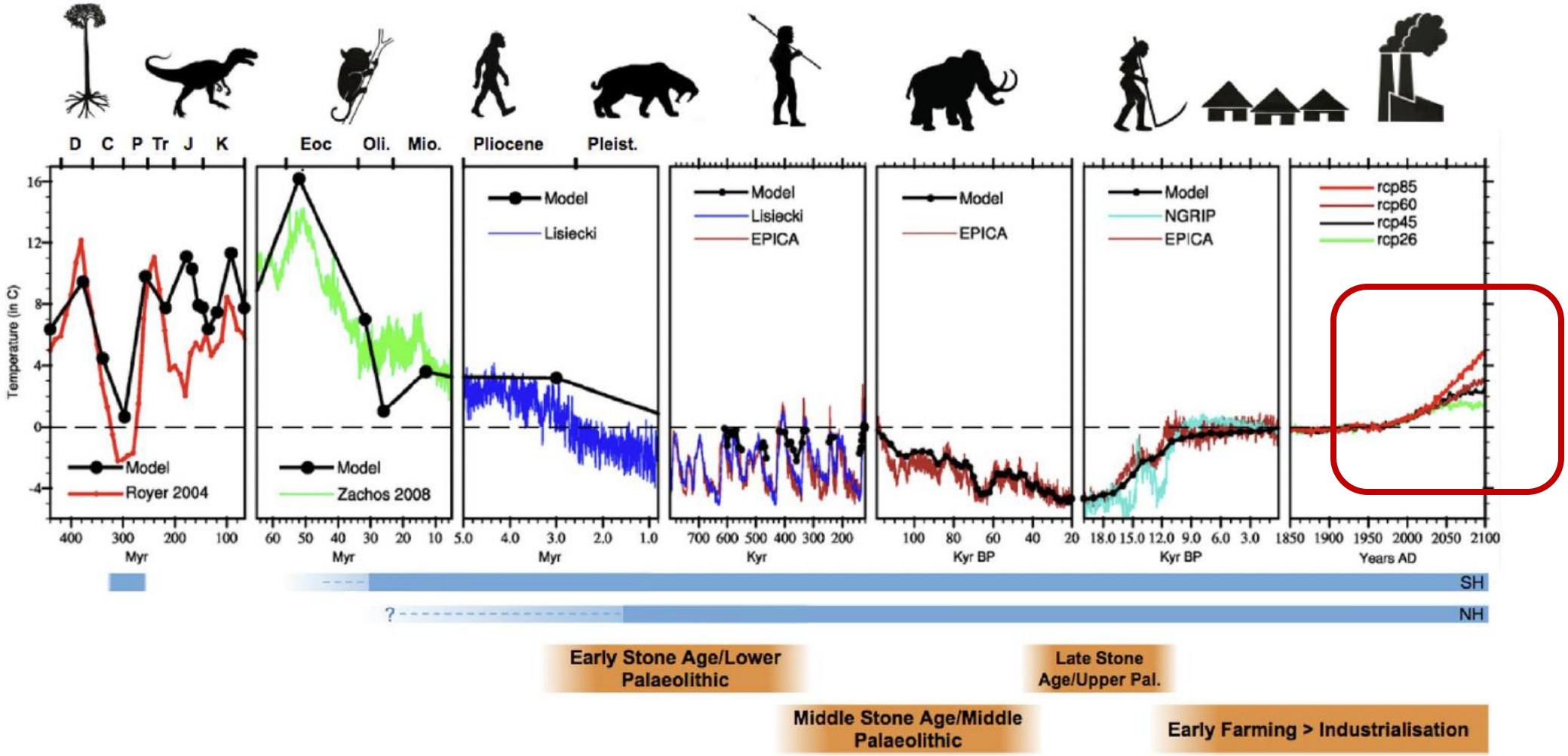


Fig. 1 Global annual mean temperature variation of the Earth through time (last 400 million years) predicted by the Hadley Centre Coupled Climate Model version 3 (HadCM3), compared with geologically derived estimates of temperature variability over the same period [the Royer et al. 2004 temperature record, the Zachos et al. 2008; Lisiecki and Raymo 2005 benthic oxygen isotope stack, as well as the EPICA and NGRIP ice core records; Jouzel et al. 2007 and NGRIP Members 2004. Geological epochs include the Devonian (D), Carboniferous (C) Permian (P), Triassic (Tr), Jurassic (J) Cretaceous (K), Eocene (Eoc), Oligocene (Oli.), Miocene (Mio), Pliocene and Pleistocene (Pleist.)] Future predictions of temperature change are based on HadCM3 simulations using different Representative Concentration Pathways (RCPs). Horizontal blue lines represent geological evidence for ice sheets in the northern (NH) and southern (SH) hemispheres. Major evolutionary characteristics and events over the last 400 million years represented by cartoon silhouettes

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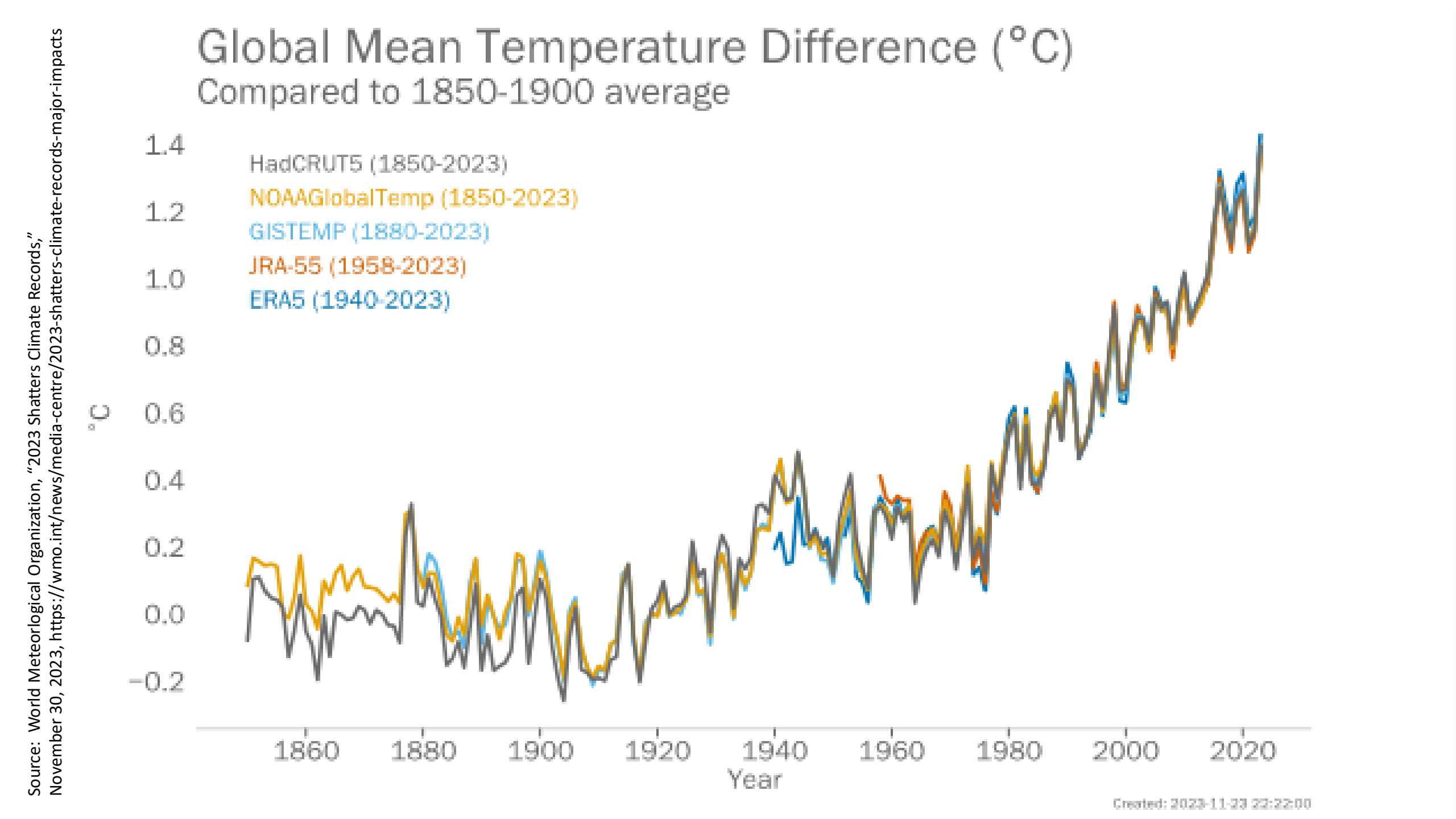
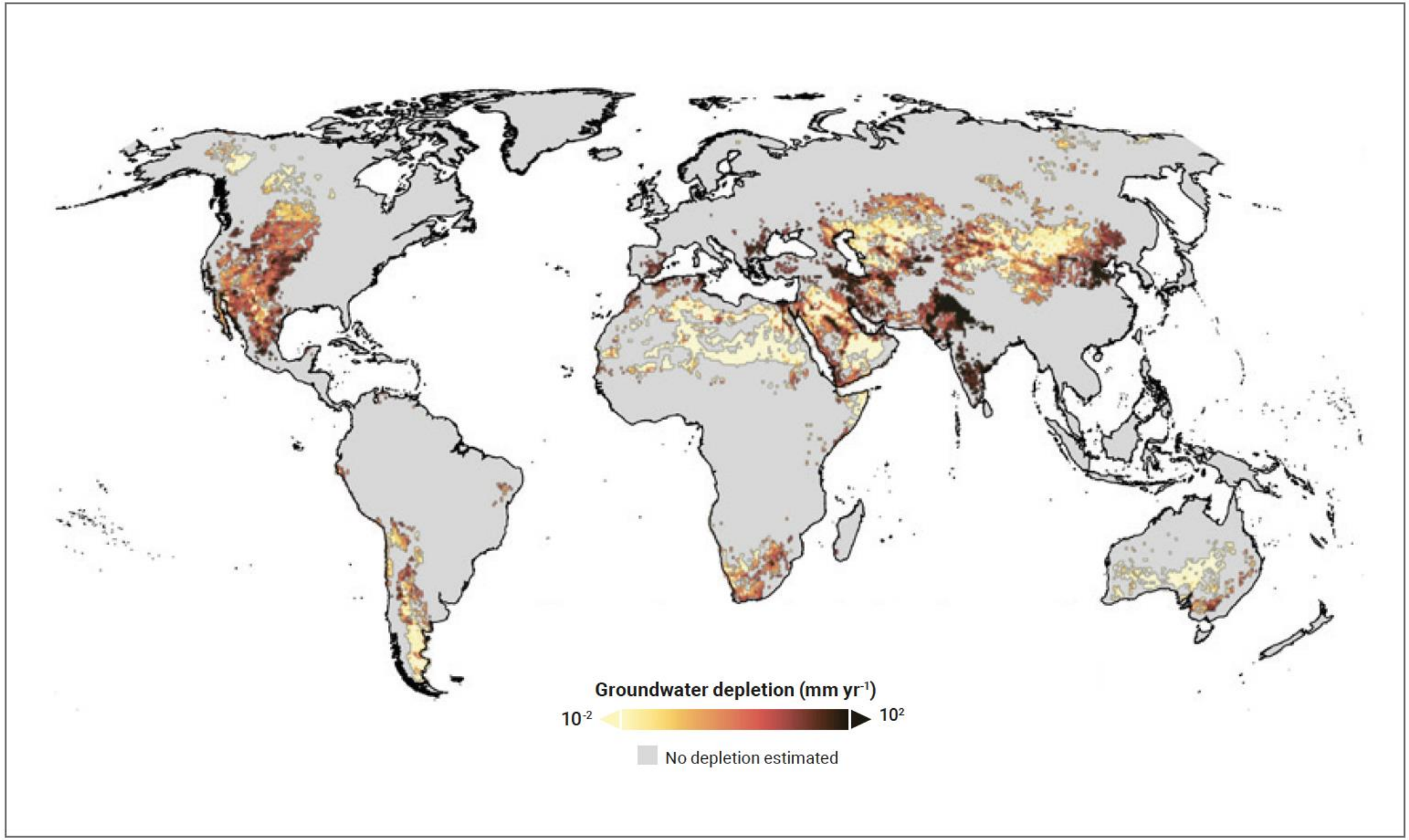


Source: World Meteorlogical Organization, "2023 Shatters Climate Records," November 30, 2023, https://wmo.int/news/media-centre/2023-shatters-climate-records-major-impacts

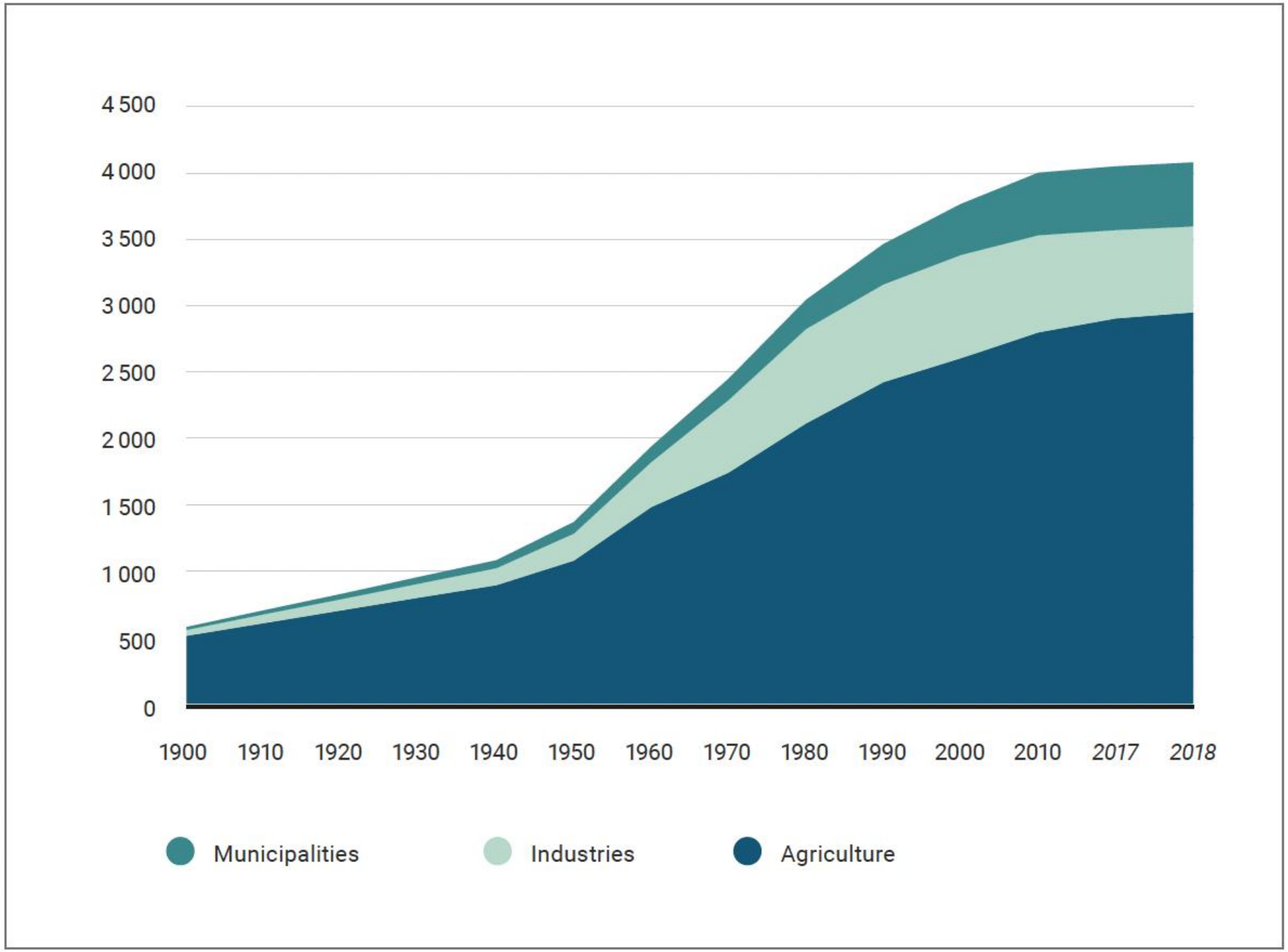
Figure P.5 Groundwater depletion rates



Source: Adapted from United Nations (2022a, fig 6.3, p. 95).

Figure P.1

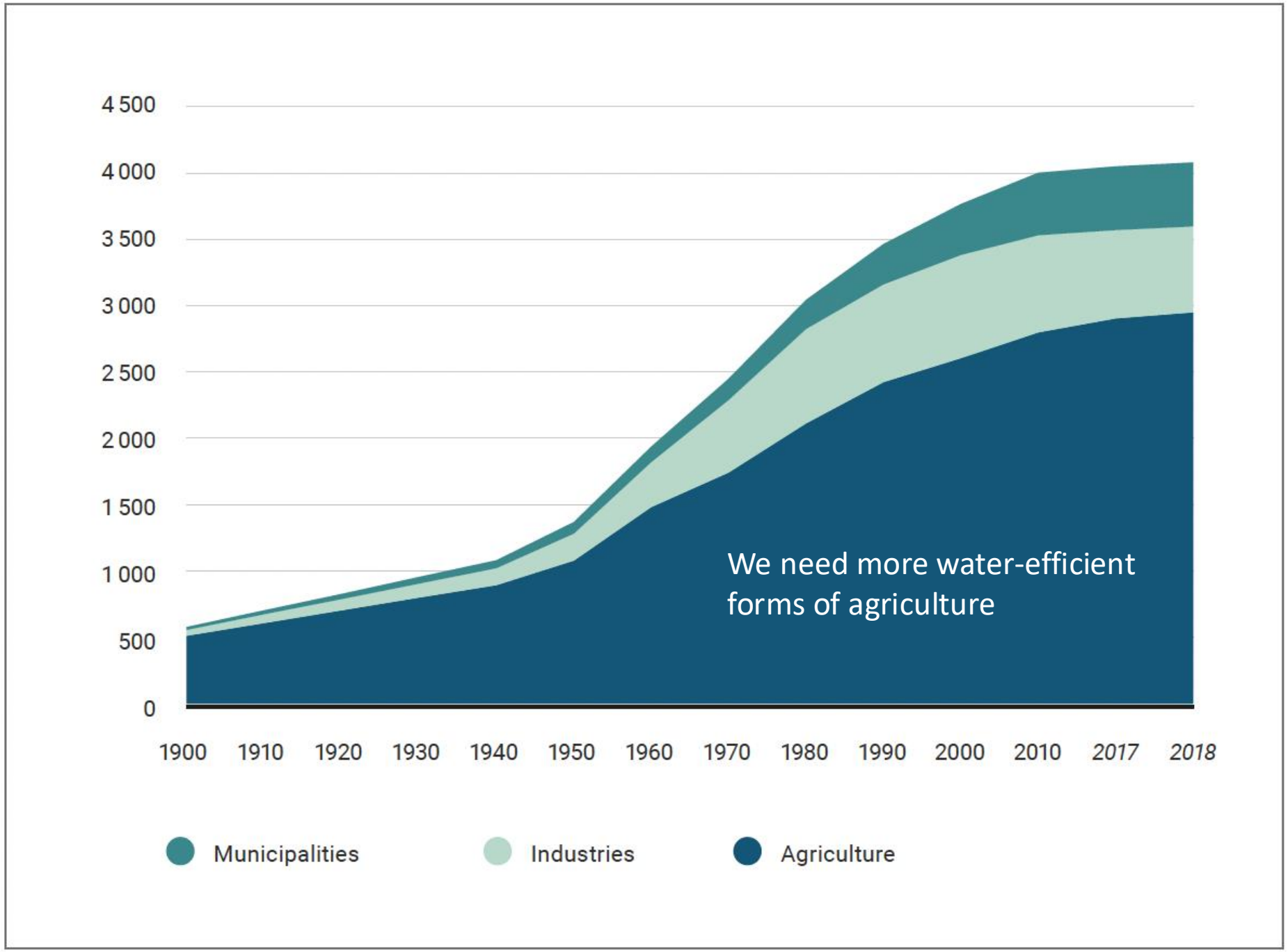
Evolution of global water withdrawals, 1900–2018 (km³/year)



Source: FAO (2022, fig. 1.23, p. 71, based on AQUASTAT).

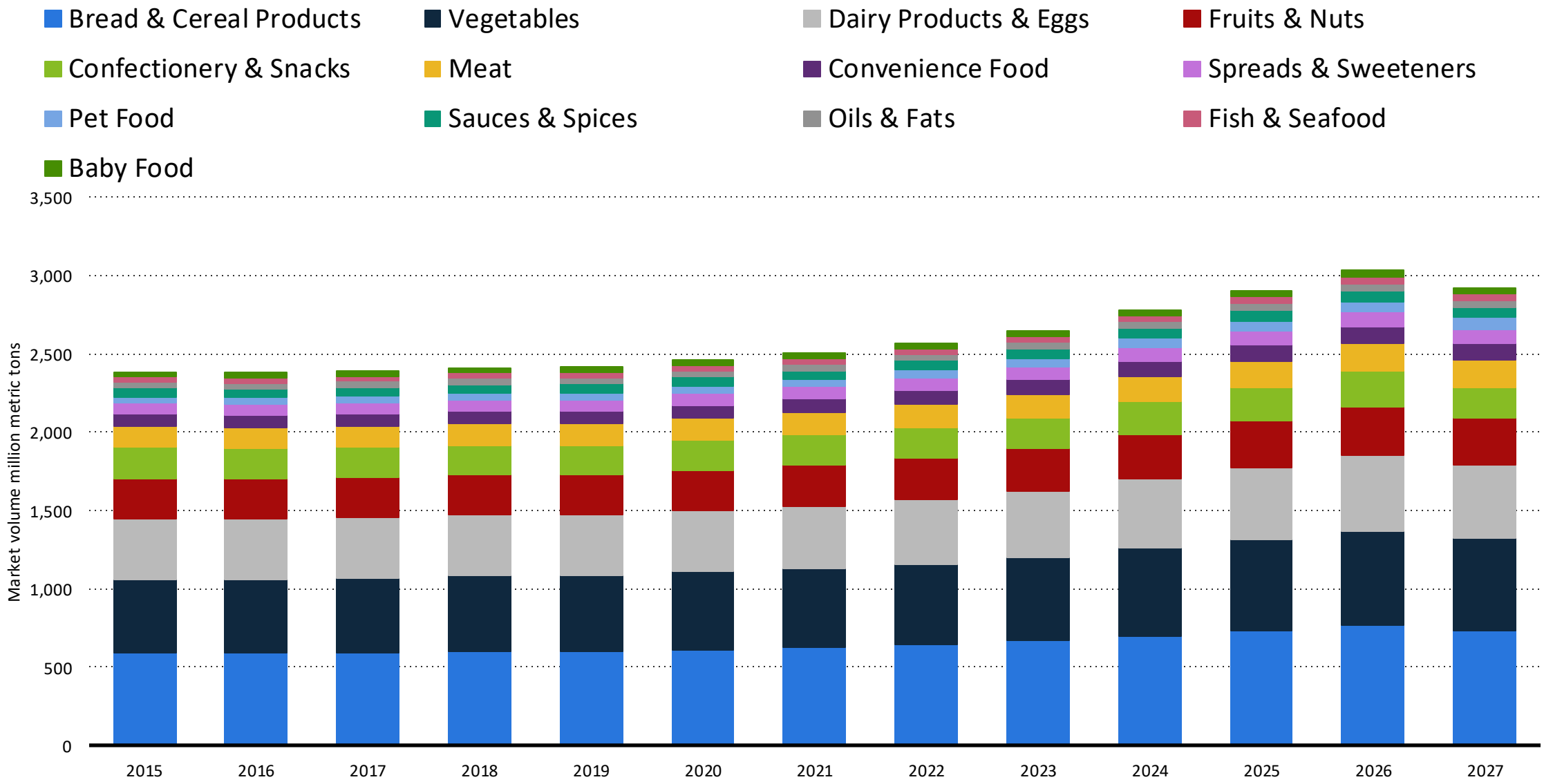
Figure P.1

Evolution of global water withdrawals, 1900–2018 (km³/year)



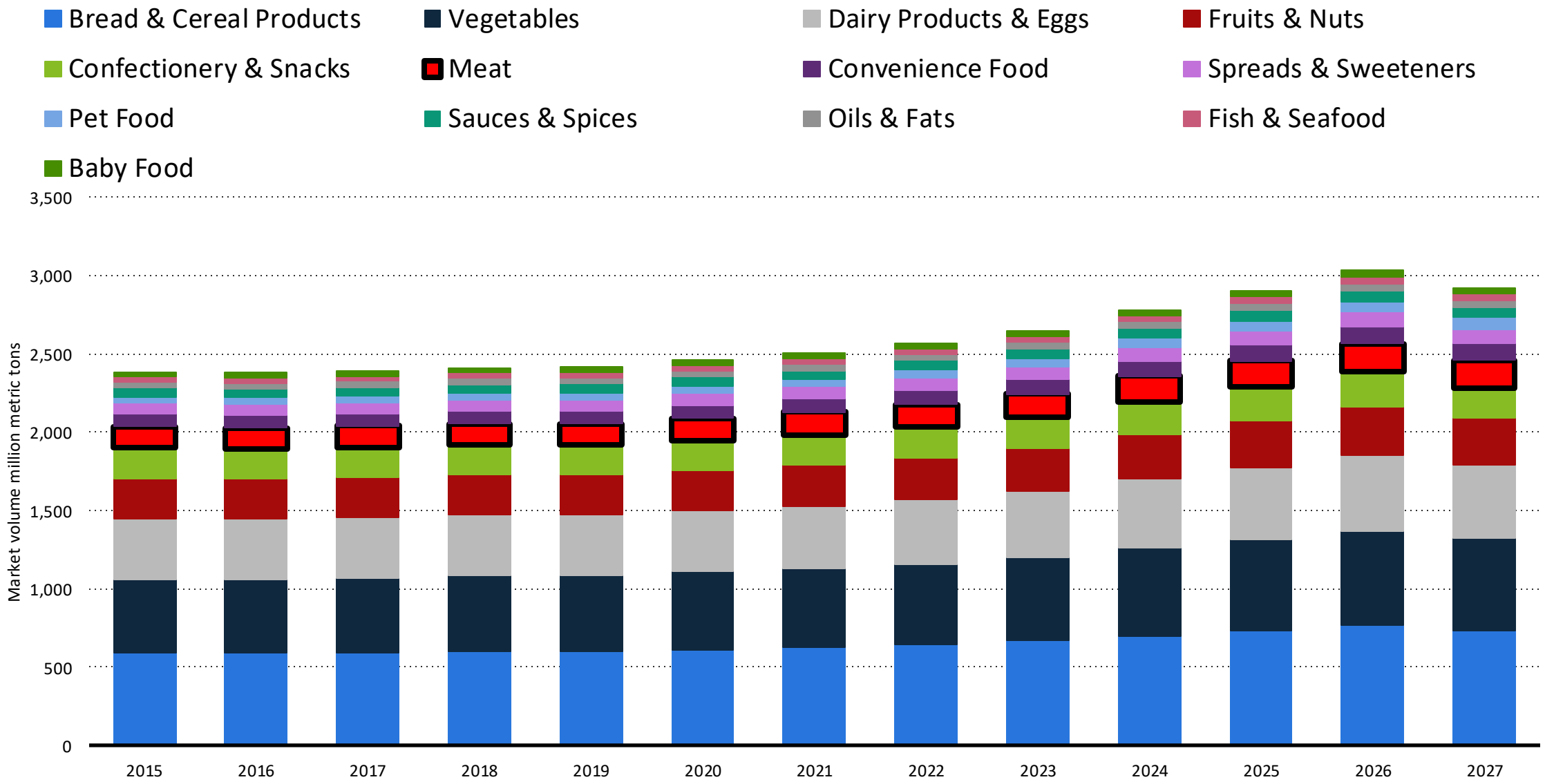
Source: FAO (2022, fig. 1.23, p. 71, based on AQUASTAT).

Global food consumption from 2015 to 2027, by food product group (in million metric tons)



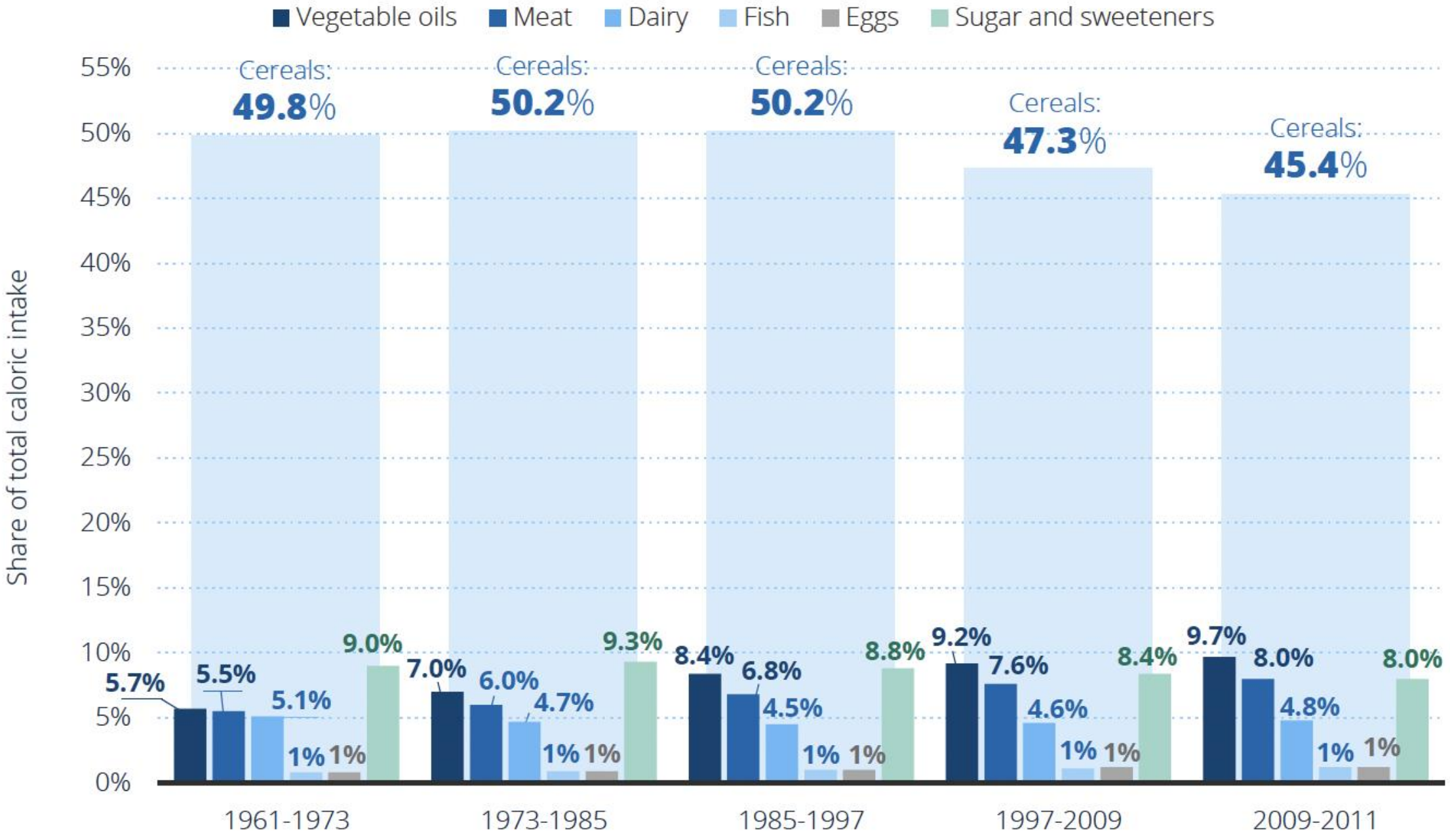
Source(s): Statista Consumer Market Insights; Statista; ID 1298375

Global food consumption from 2015 to 2027, by food product group (in million metric tons)

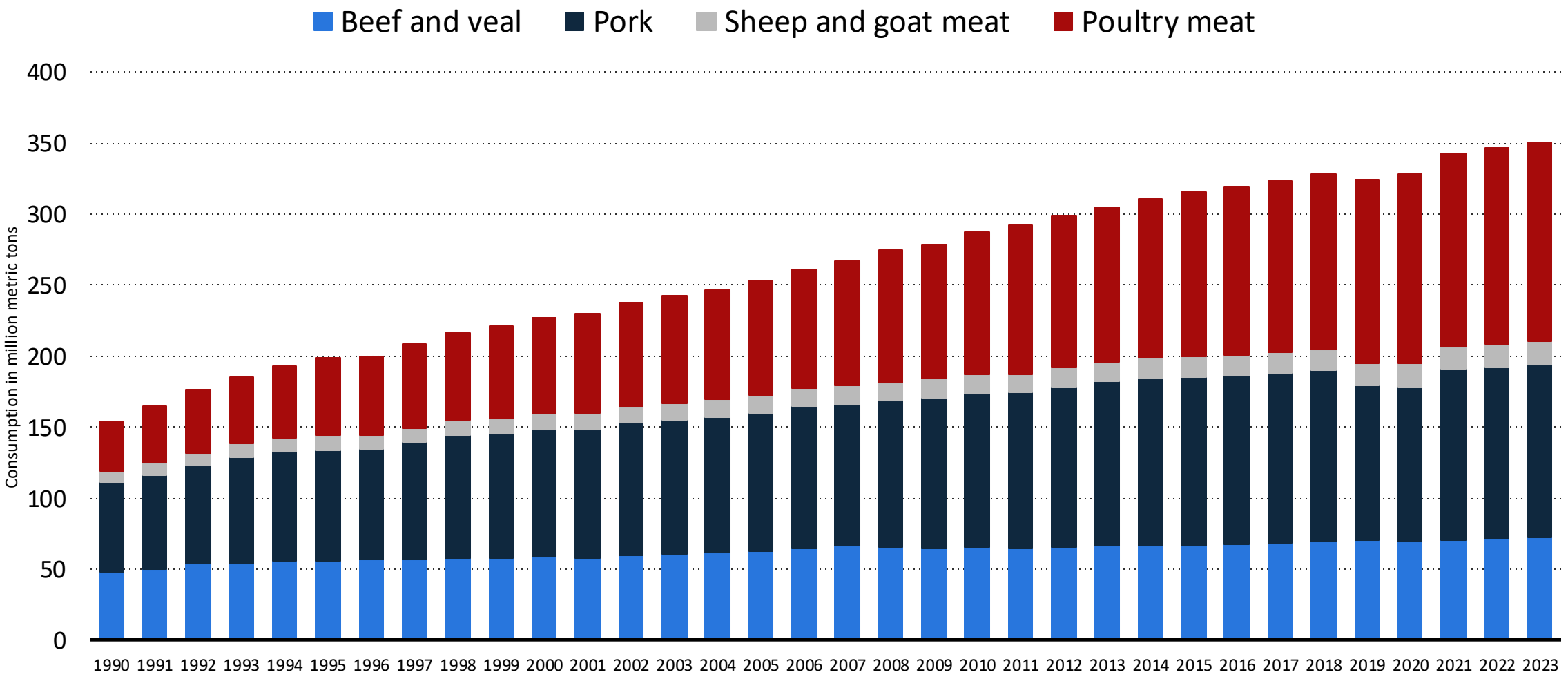


Source(s): Statista Consumer Market Insights; Statista; ID 1298375

Share of per capita caloric intake worldwide



Meat consumption worldwide from 1990 to 2023, by meat type* (in million tons)



Note(s): Worldwide; 1990 to 2021

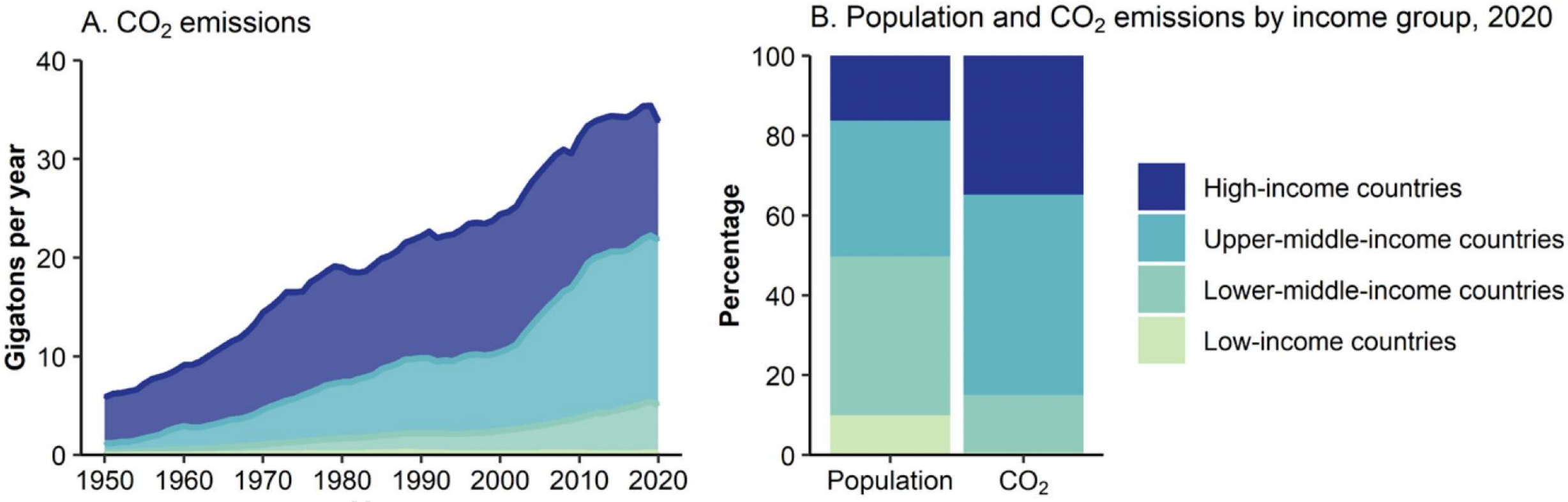
Further information regarding this statistic can be found on page 8.

Source(s): OECD; FAO; ID 274522

b) Relationship to Natural Environment

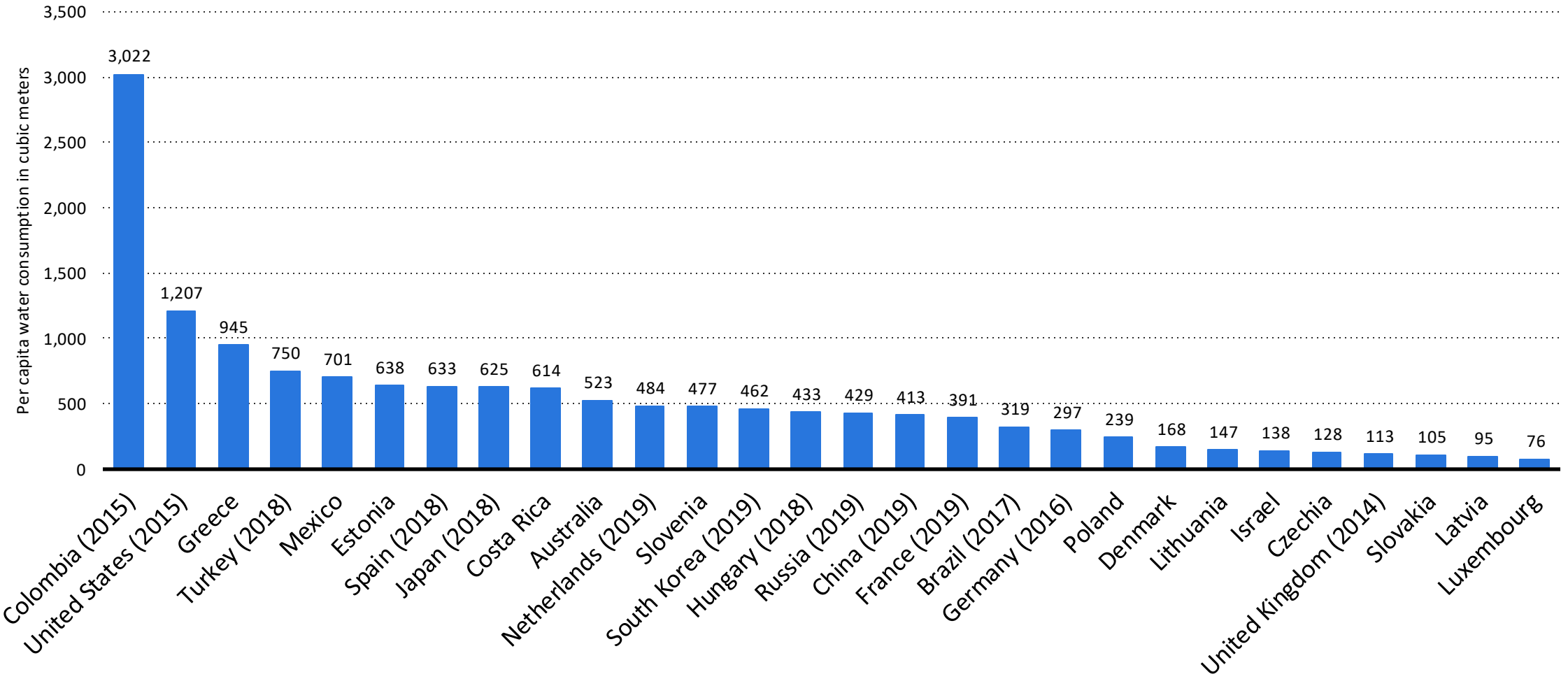
c) Degree of Inequality

Annual total and per-capita CO2 emissions, 1950-2020, and distribution of global population and CO2 emissions, 2020, by income group



Source: https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/undesa_pd_2022_policy_brief_population_growth.pdf

Water withdrawals per capita worldwide as of 2020, by select country (in cubic meters per inhabitant)



Note(s): Worldwide; 2020*

Further information regarding this statistic can be found on page 8.

Source(s): OECD; ID 263156

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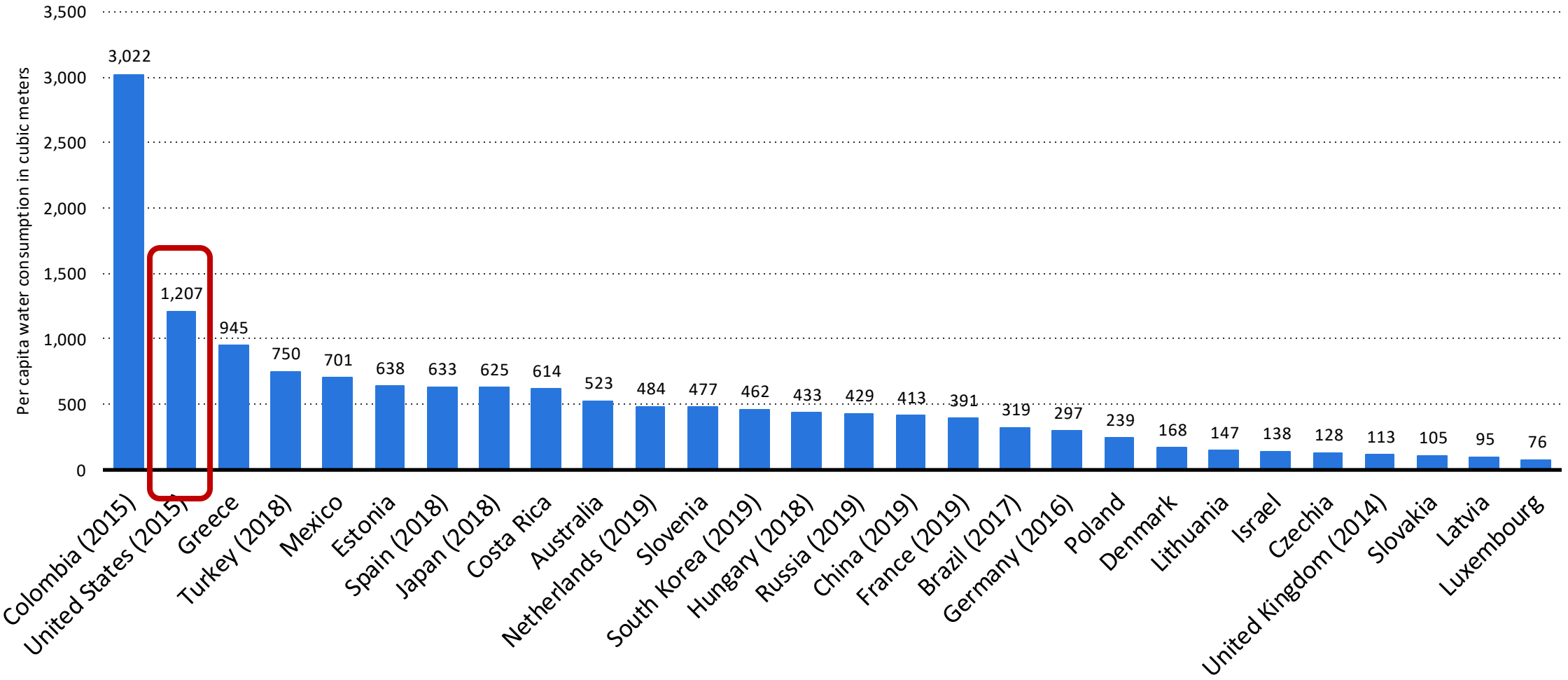
Water withdrawals per capita worldwide as of 2020, by select country (in cubic meters per inhabitant)

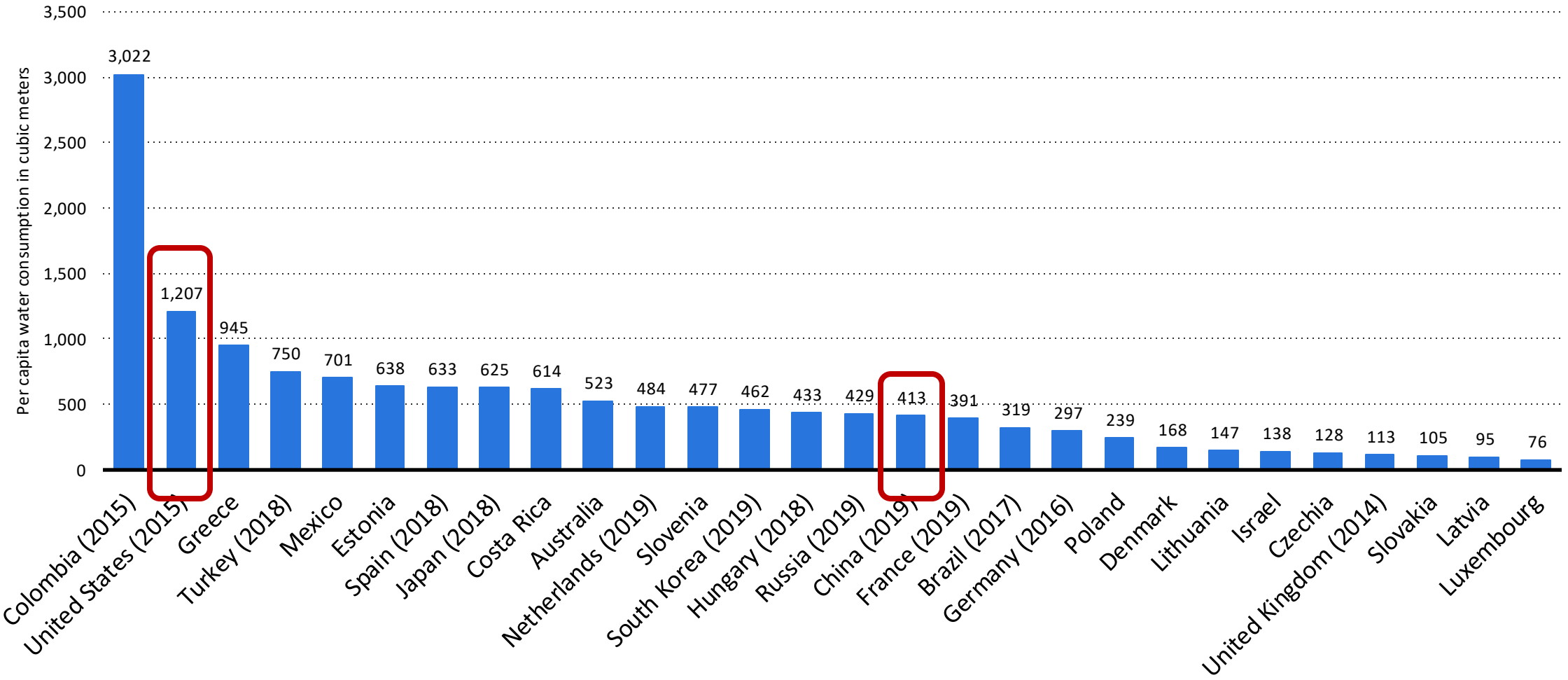


Note(s): Worldwide; 2020*

Further information regarding this statistic can be found on page 8.

Source(s): OECD; ID 263156

Water withdrawals per capita worldwide as of 2020, by select country (in cubic meters per inhabitant)



Note(s): Worldwide; 2020*

Further information regarding this statistic can be found on page 8.

Source(s): OECD; ID 263156

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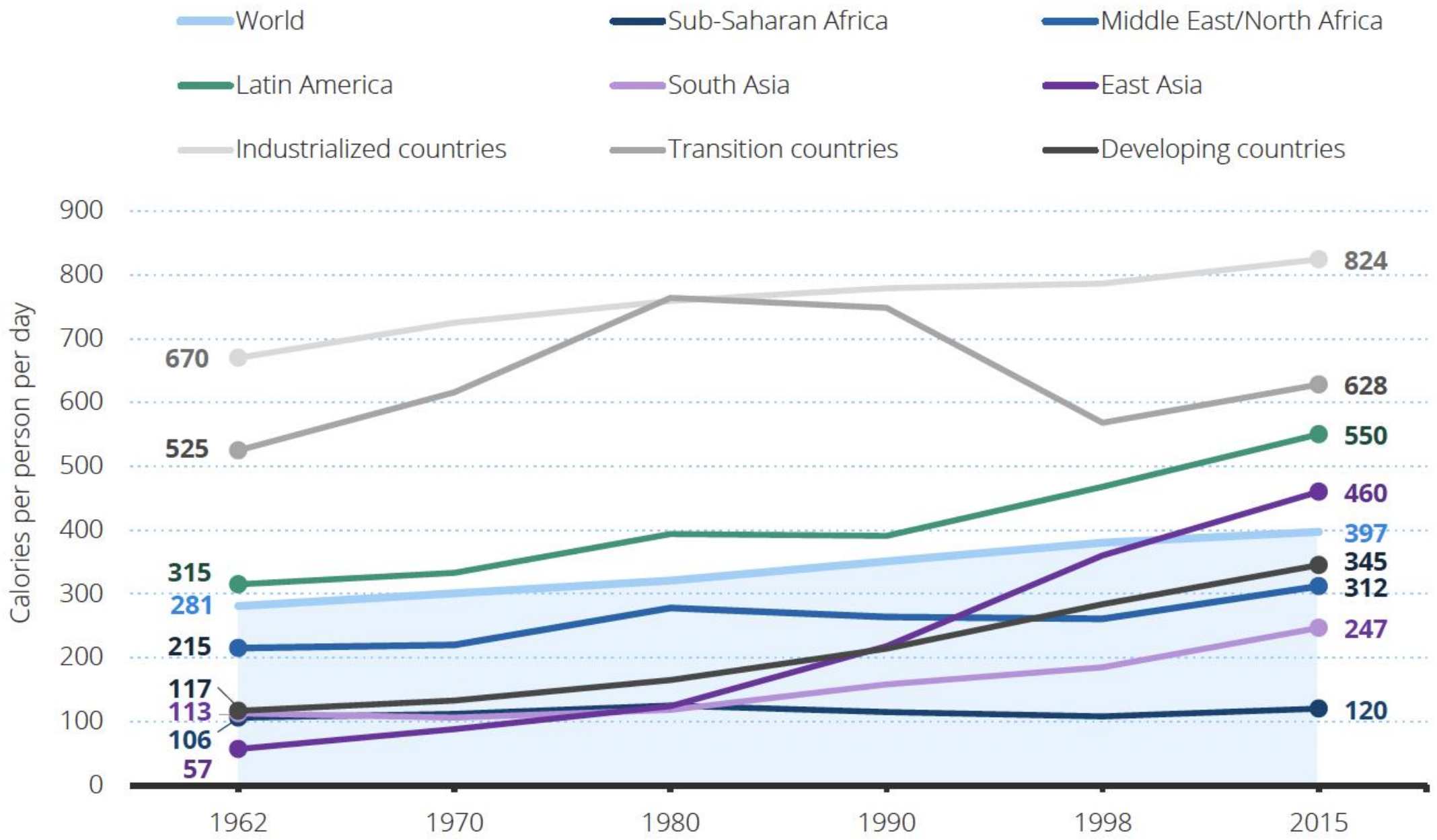
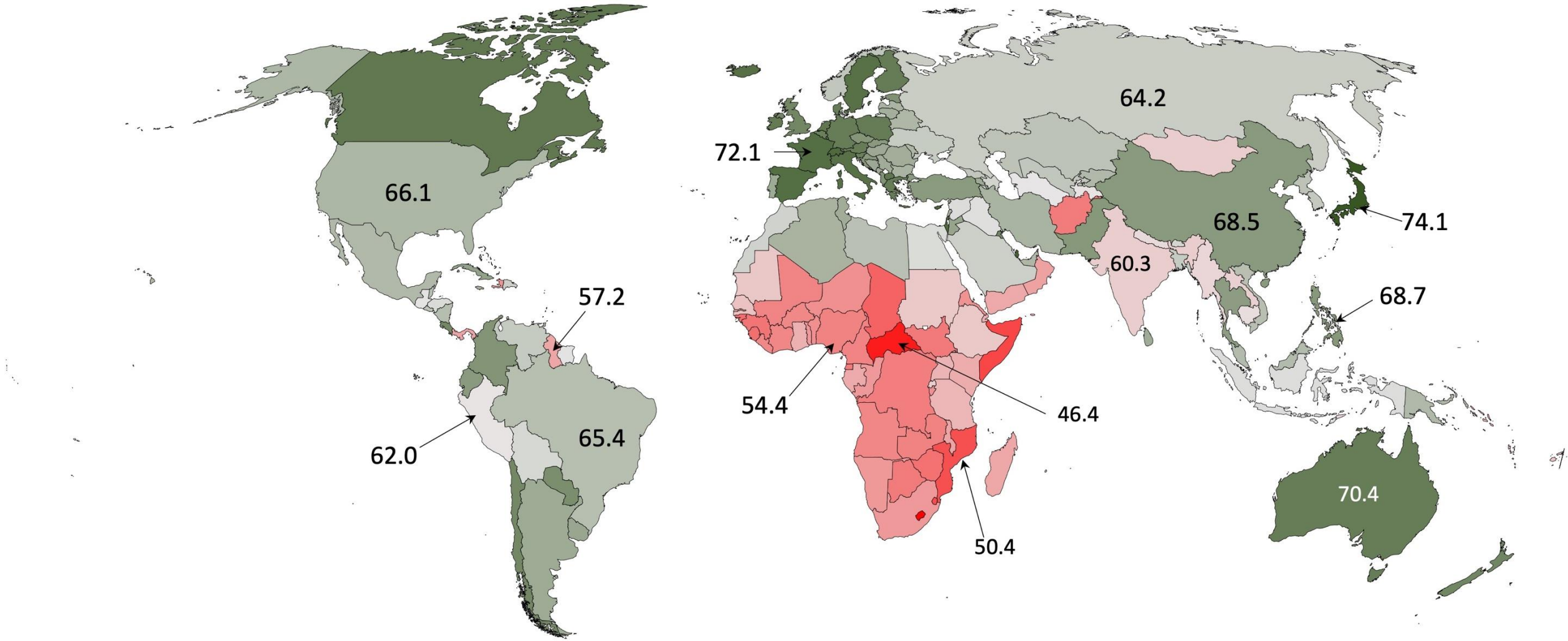
Calories Obtained from Livestock Products, by Region



Healthy Life Expectancy (HALE) at Birth (2019)



Proposed Conception of Sustainability

a) Allow the number of people on the planet to decline to aprx. 5 billion;

b) Minimize adverse impact of people on the natural environment;

c) Reduce global inequality on all dimensions of human flourishing

Part II: How might AI either corrode or promote the “interests of humanity”?

Widely assumed that corrosion is most likely

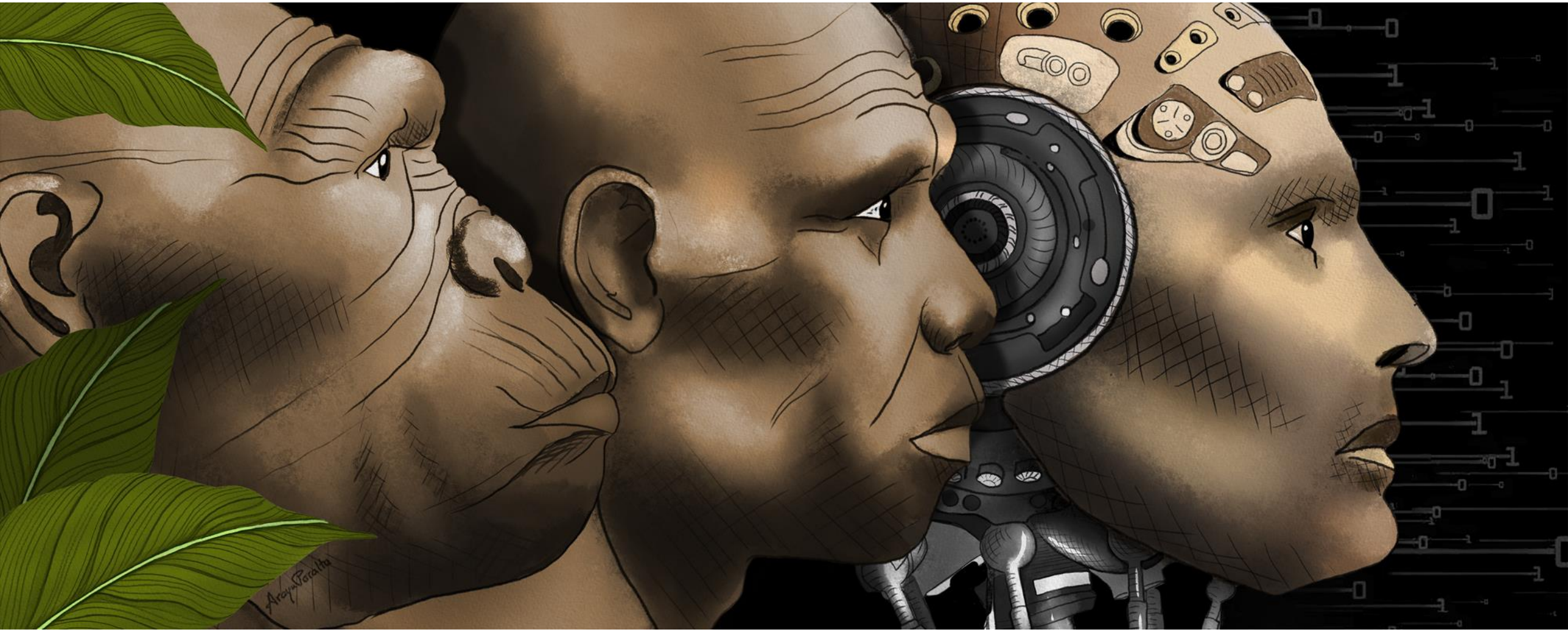
Widely assumed that corrosion is most likely

Source: https://www.bostonglobe.com/arts/2017/11/12/honolulu-walking-and-texting-can-cost-you-but-boston-phone-zombies-roam-free/0Xux8FnjNhS9wGDDUMXOdM/story.html

Widely assumed that corrosion is most likely

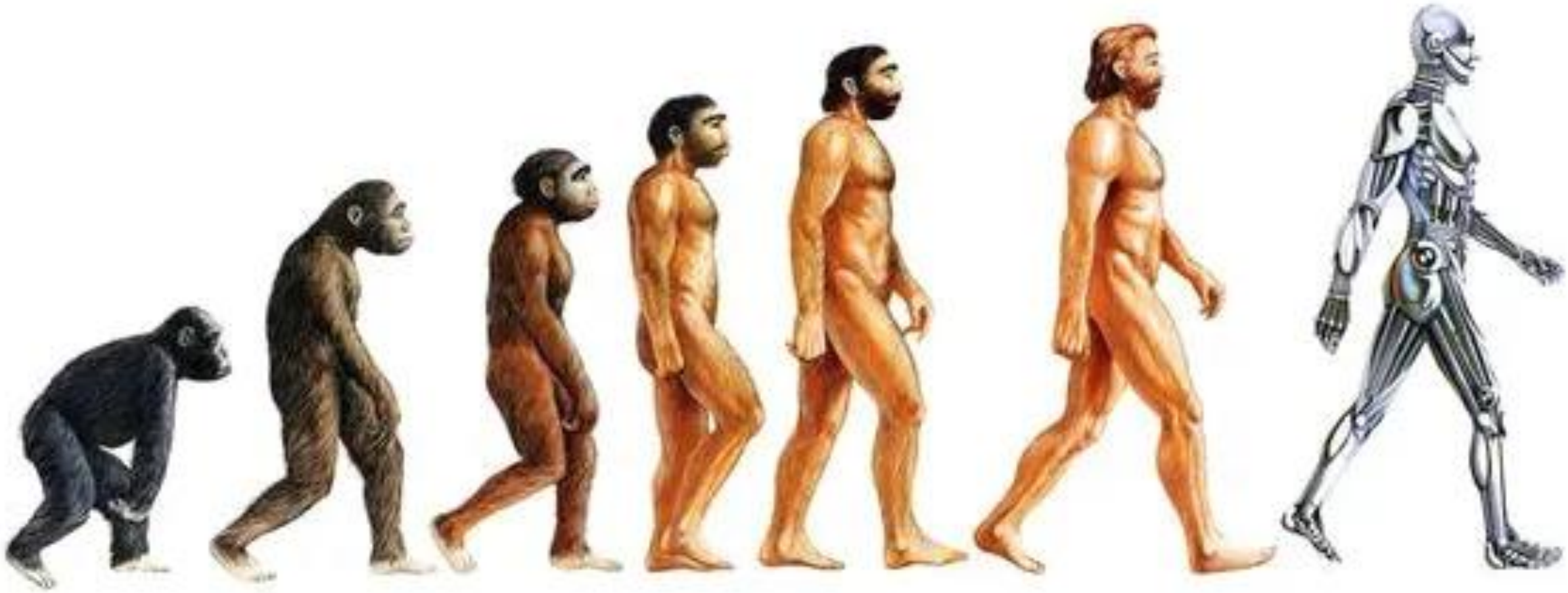
Widely assumed that corrosion is most likely

Widely assumed that corrosion is most likely



Miquel Casas, “The technological singularity and the transhumanist dream” (2020)

Widely assumed that corrosion is most likely



Posthumanism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LEX ET IUSTITIA

Conditions that Enable Human Flourishing

1) Life
2) Health
3) Autonomy
4) Engagement
    a) Meaningful work
    b) Political democracy
    c) Semiotic democracy
5) Self-expression
6) Competence
7) Affiliation
8) Privacy

Conditions that Enable Human Flourishing

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Uses of AI in Healthcare

- Medical Imaging

Uses of AI in Healthcare

- Medical Imaging

2019: FDA Approves "Zebra Medical Vision's AI triage tool for intracranial hemorrhage. Called HealthICH, the software product reviews non-contrast head CT scans to highlight potential bleeds for radiologist review. According to the company, the tailor-made neural network is capable of generating these alerts in spite of smaller bleed sizes and more common artifacts, such as metal, that are observed within a patient's brain."
Source: https://www.mobihealthnews.com/content/north-america/aidoc-zebra-medical-vision-announce-510k-clearances-ai-image-analysis-software

Uses of AI in Healthcare

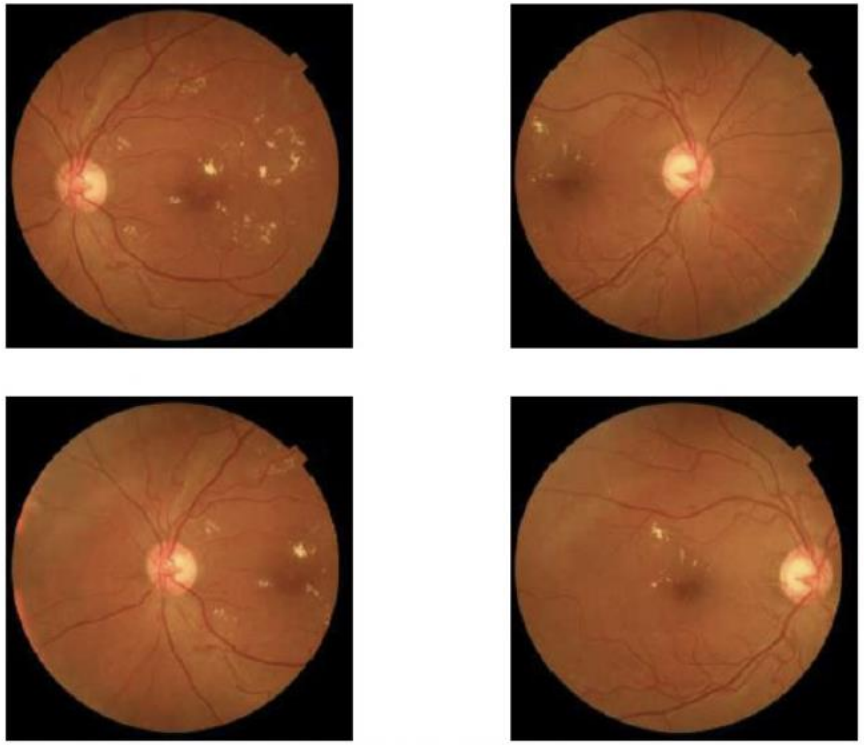
- Medical Imaging

Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools

Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools



IDx-DR (www.eyediagnosis.net/idx-dr-eu) is an innovative software based on an I.A. -Artificial Intelligence, which detects early and automatically diagnoses signs of Diabetic Retinopathy through retinal images. It is indicated to be used by ophthalmologists during their clinical practice in the automatic detection of more than mild diabetic retinopathy (mtmDR) in adults (over 22 years old) diagnosed with diabetes who have not previously been diagnosed with Diabetic retinopathy.

Demonstration: IDX.mp4

Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools

IBM Watson for Oncology is software as a service (SaaS) that delivers an advanced ability to analyze the meaning and context of structured and unstructured data in clinical notes and reports, easily assimilating key patient information written in plain English. By combining attributes from the patient's file with clinical expertise from Memorial Sloan Kettering, external research, and data, Watson for Oncology identifies and ranks potential treatment plans and options.

Supporting evidence for each option is also provided as Watson for Oncology draws from an impressive corpus of information, including Memorial Sloan Kettering's curated literature and rationale, as well as almost 15 million pages of text. For consideration, Watson for Oncology also supplies supporting evidence in the form of administration information, as well as warnings and toxicities for each drug.

Source: https://www.ibm.com/docs/en/announcements/watson-oncology?region=CAN

Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools

IBM Watson for Oncology, software as a service, is a cognitive computing decision support system that:

•Analyze patient data against thousands of historical cases and insights gleaned from working thousands of hours with Memorial Sloan Kettering Cancer Center physicians and other analysts.

•Provide treatment options to help oncology clinicians make informed decisions. These treatment options are supported by literature curated by Memorial Sloan Kettering, and over 300 medical journals and 200 textbooks, resulting in almost 15 million pages of text.

•Evolve with the fast-changing field of oncology through periodic training provided by Memorial Sloan Kettering.

Source: https://www.ibm.com/docs/en/announcements/watson-oncology?region=CAN

Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools

Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools
- General Diagnostic Tools

Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools
- General Diagnostic Tools

Med-PaLM is a large language model (LLM) designed to provide high quality answers to medical questions. Our second version, Med-PaLM 2, is one of the research models that powers MedLM– a family of foundation models fine-tuned for the healthcare industry. MedLM is now available to Google Cloud customers who have been exploring a range of applications, from basic tasks to complex workflows.

Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools
- General Diagnostic Tools

Med-PaLM harnesses the power of Google's large language models, which we have aligned to the medical domain and evaluated using medical exams, medical research, and consumer queries. Our first version of Med-PaLM, preprinted in late 2022 and published in *Nature* in July 2023, was the first AI system to surpass the pass mark (>60%) in the U.S. Medical Licensing Examination (USMLE) style questions. Med-PaLM also generates accurate, helpful long-form answers to consumer health questions, as judged by panels of physicians and users.

Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools
- General Diagnostic Tools

We introduced Med-PaLM 2 at Google Health's annual event, The Check Up, in March 2023. Med-PaLM 2 was the first to reach human expert level on answering USMLE-style questions. According to physicians, the model's long-form answers to consumer medical questions improved substantially.

Source: https://sites.research.google/med-palm/
Video: https://youtu.be/k_-Z_TkHMqA

Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools
- General Diagnostic Tools

Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools
- General Diagnostic Tools
- Predictive Analytics

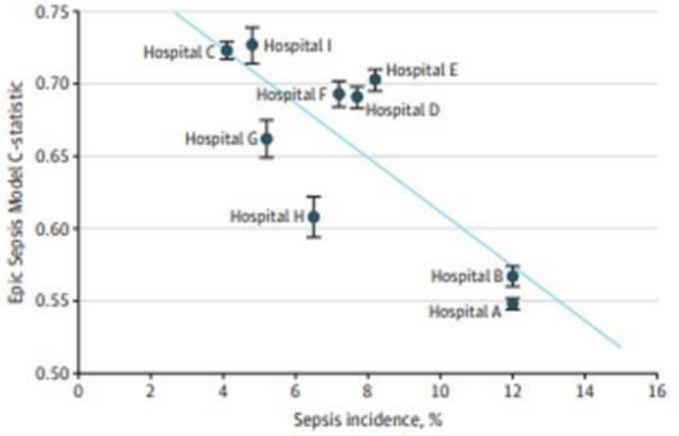
Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools
- General Diagnostic Tools
- Predictive Analytics

EPIC Sepsis Prediction Model 9 Hospitals in U.S.

Staffed Beds	# Hospitals (Code)	# Encounters	# (%) Met Sepsis-3 Criteria	# Hrs from Presentation to Clinical Recognition	# Death (% of Sepsis-3 Cases)
< 100	3 (G, H, I)	108,594	5,988 (5.5)	2.9	483 (8.1)
101-200	3 (D, E, F)	193,323	14,992 (7.8)	2.3	1,612 (10.8)
201-500	2 (B, C)	270,925	18,924 (7.0)	5.35	3,084 (16.3)
< 500	1 (A)	233,875	28,148 (12.0)	8.30	4,762 (16.9)

Figure. Association Between Hospital-Level Sepsis Incidence and Epic Sepsis Model C-Statistic Across 9 US Hospitals in a Network



Lyons et al JAMA April 3, 2023

Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools
- General Diagnostic Tools
- Predictive Analytics

Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools
- General Diagnostic Tools
- Predictive Analytics
- Robotic Surgery

Uses of AI in Healthcare

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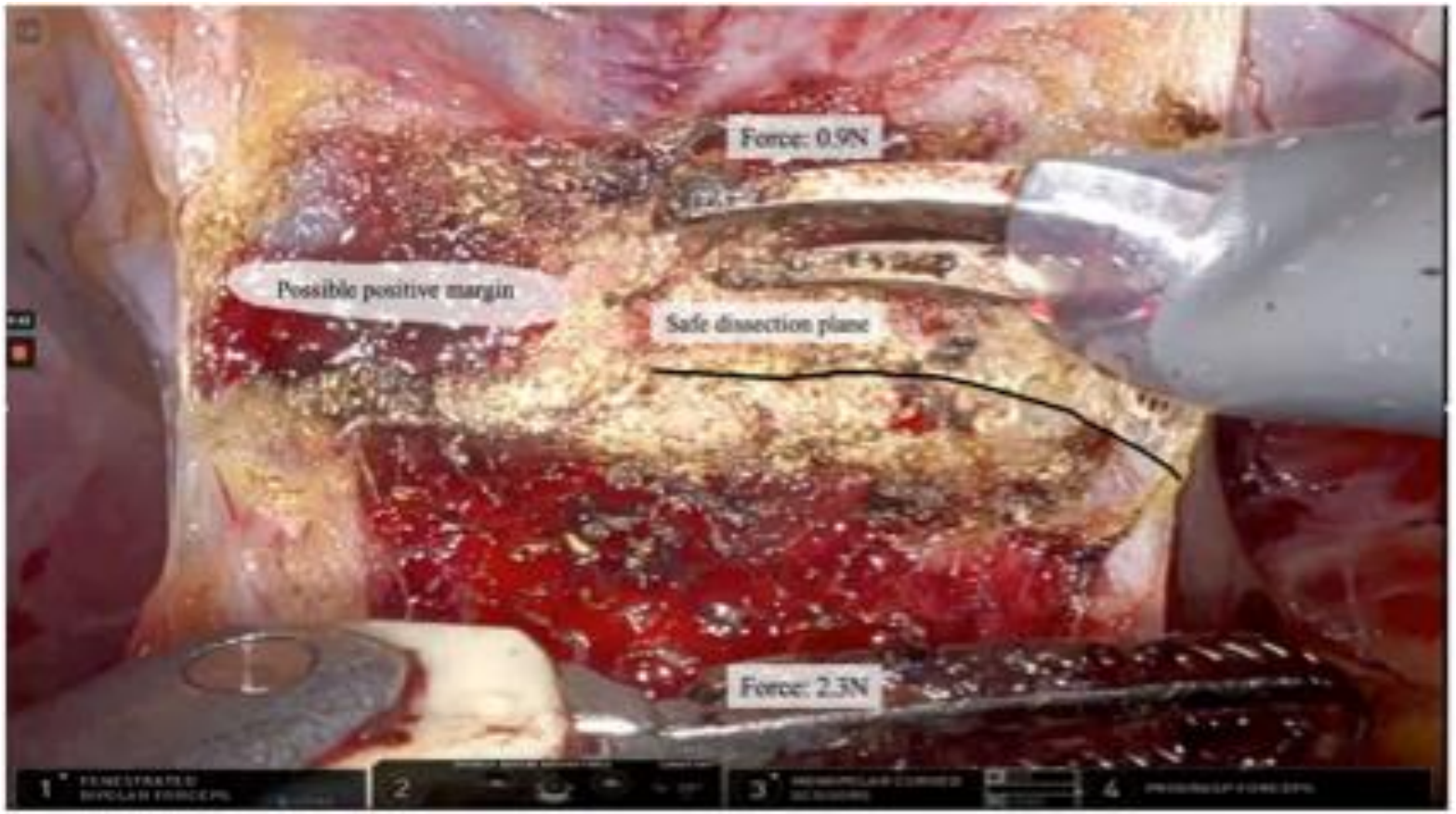

"Intelligent Assistance"

Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10907451/pdf/11701_2024_Article_1867.pdf

Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools
- General Diagnostic Tools
- Predictive Analytics
- Robotic Surgery

Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools
- General Diagnostic Tools
- Predictive Analytics
- Robotic Surgery
- Drug Discovery

Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools
- General Diagnostic Tools
- Predictive Analytics
- Robotic Surgery
- Drug Discovery

"AI can assist in multiple stages of drug discovery. Pharma startup Verseon, for instance, uses AI to optimize molecules and to understand the interactions between drugs and genes in aging and degeneration, says Ed Ratner, head of machine learning applications. Viswa Colluru, the CEO and founder at Enveda Biosciences, a startup that mines natural compounds, says they apply several types of AI algorithms to predict the structure and function of unknown compounds from mass spectrometry and high-throughput screening data. Some researchers use AI to design proteins from scratch. One of the most obvious advantages is speed. Aliper, of Insilico, says that although it can take years and tens of millions of dollars to nominate a preclinical drug candidate, his company used AI across several stages to nominate ISM001-055, their drug candidate for idiopathic pulmonary fibrosis, in 18 months for $2.6 million."

Source: Matthew Hutson, "AI for drug discovery is booming, but who owns the patents?," 41 Nature Biotechnology 1494 (2023)

Uses of AI in Healthcare

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Uses of AI in Healthcare

- Medical Imaging
- Disease-Specific Diagnostic Tools
- General Diagnostic Tools
- Predictive Analytics
- Robotic Surgery
- Drug Discovery
- Antimicrobial resistance

Conditions that Enable Human Flourishing

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Conditions that Enable Human Flourishing

Hazards of Disinformation

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A photo circulating across social media platforms falsely claims to show Kamala Harris posing with Sean "Diddy" Combs. This image reappeared following the rapper's indictment for sex trafficking, racketeering, and other serious charges. However, the photo has been altered; the original, taken in 2001, actually depicts the current US vice president alongside talk show host Montel Williams, with whom she had a brief relationship.

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Hazards of Disinformation

"Russian disinformation peddlers are targeting Harris-Walz campaign with fake videos, Microsoft says" NBC News, September 18, 2024

"Some of the disinformation comes in the form of two videos that have been disseminated since late August, Microsoft said. One purports to show two Black men or boys kicking the shoes of a bloodied, crying white woman or girl who wears a Trump shirt. No one's face is shown…"

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Potential Benefits of Information Filtering

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Potential Benefits of Information Filtering

To fight the spread of misinformation and provide people with more reliable information, Meta partners with independent third-party fact-checkers that are certified through the non-partisan International Fact-Checking Network (IFCN). We don't think a private company like Meta should be deciding what's true or false, which is exactly why we have a global network of fact-checking partners who independently review and rate potential misinformation across Facebook, Instagram and WhatsApp. Their work enables us to take action and reduce the spread of problematic content across our apps.

Since 2016, our fact-checking program has expanded to include more than 90 organizations working in more than 60 languages globally. The focus of the program is to address viral misinformation – particularly clear hoaxes that have no basis in fact. Fact-checking partners prioritize provably false claims that are timely, trending and consequential.

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Potential Benefits of Information Filtering

We use a number of signals to predict content that might be misinformation, and surface it to fact-checkers.

For example, we use feedback from our users who flag content they see in their Feed as being potentially false. We also look at other user patterns, like people commenting and saying that they don't believe a certain post.

We also use machine learning models to continuously improve our ability to predict misinformation. We feed ratings from our fact-checking partners back into this model, so that we get better and better over time at predicting content that could be false.

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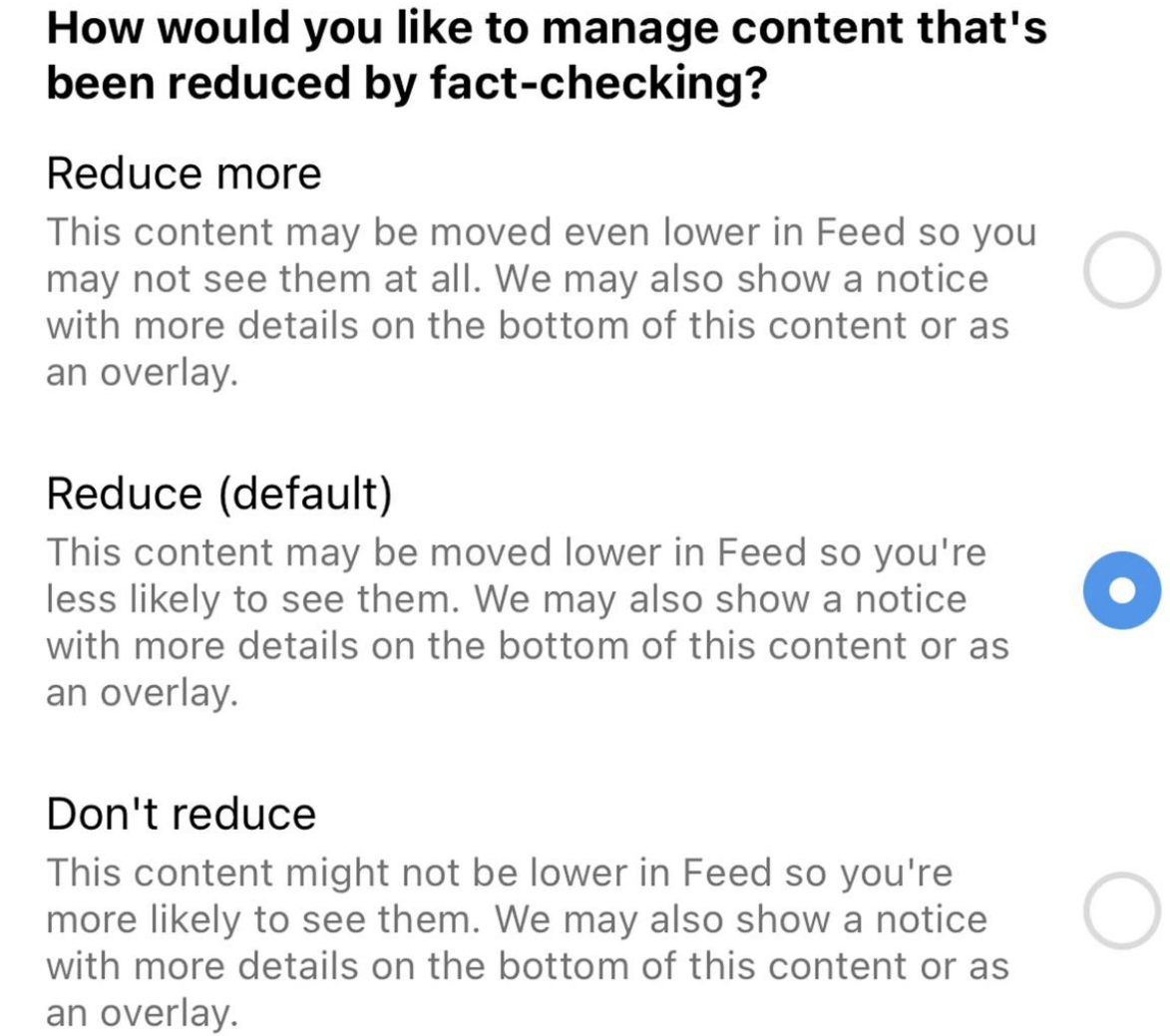
Potential Benefits of Information Filtering



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Voting Aid Applications

Conditions that Enable Human Flourishing

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Voting Aid Applications

"In Europe, tens of millions of people already use web-based Voting Aid Applications (VAA) to get answers to their questions about candidates and parties. For this summer's 2024 European parliament elections, the Dutch website StemWijzer asked respondents 30 questions about their views on immigration policy, expansion of the EU, rights of member states, and abortion. StemWijzer then showed which political parties' policies most closely match the respondent's answers. Its sister website, Vote Match Europe, lists the political parties in each European country that are most aligned. These voting expert systems are wildly popular, creating an incentive for every candidate and political party to answer the questions so they can be matched to voters. StemWijzer, which started out on paper and diskettes in the late 1980s, had 9.1 million visitors last year. Germany's Wahl-o-Mat has been used 130 million times for elections at every level of government."

Source: https://www.fastcompany.com/91165050/how-ai-chatbots-could-improve-civic-engagement-in-the-2024-election

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Voting Aid Applications

European University Institute - Robert Schuman Centre for Advanced Studies

New Voting Advice Application for the 2022 Italian general elections launched

This tool is useful both for voters when making an electoral decision and for researchers interested in understanding political behaviour.

Source: https://www.fastcompany.com/91165050/how-ai-chatbots-could-improve-civic-engagement-in-the-2024-election

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Voting Aid Applications

navigatore politico 2022

Quotidiano Nazionale

Quale partito politico è il TUO partito?

Sei curioso di sapere quale dei partiti principali in competizione per le elezioni politiche Italiane del 2022 corrisponde meglio alle tue opinioni e preferenze politiche?

Il **Navigatore Politico 2022** ha la risposta... Clicca sul pulsante qui sotto e scopri qual è!

Source: https://www.fastcompany.com/91165050/how-ai-chatbots-could-improve-civic-engagement-in-the-2024-election

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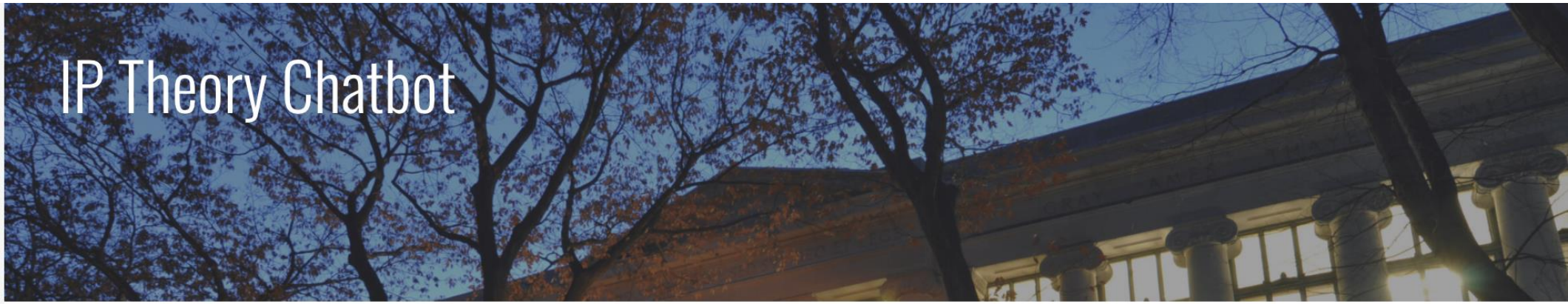

IP Theory Chatbot

This page provides you access to a prototype Chatbot that you can use to explore theories of intellectual property. A few things you should know before using this tool:

It is built upon ChatGPT, which is a product of the company, Open AI. As a result, the tool is only available for use in the countries where ChatGPT is supported. Most countries in the world are now on that list — but unfortunately not all.

To use the tool, you must have an account with OpenAI. If you do not already have one, you can sign up for a free account when you first visit the Chatbot. Bear in mind that the privacy protections associated with all AI platforms, including those produced by OpenAI, remain uncertain, and OpenAI has been known to use transcripts of searches from free accounts for training purposes. Thus, you should probably not insert any personal information in the questions you ask in the tool.

Next, you should not think of the tool as an encyclopedia or oracle. Like all current large language models, it sometimes gets things wrong or "hallucinates" — i.e., makes things up. So you should treat all of its responses with caution. Before relying on its responses to your questions, you should check the sources listed in its replies and ensure that they support its claims.

The set of materials upon which the model was trained consists of Professor Fisher's bibliography of IP theory, which is available at https://182.fab.mwp.accessdomain.com/ip-theory/. Most of those materials use the English language. However, the tool is designed to answer questions in other languages as well. Users whose primary language is not English might experiment with using other languages when employing it.

To access the tool, use the following link: https://chatgpt.com/g/g-SdKSuBgqm-prof-fisher-s-ip-theory-chatbot.

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NYT Exchange on the Ethics of purchasing AI-generated art:

My friends and I use a website for tabletop role-playing games (think Dungeons & Dragons). When making a character for a "Lord of the Rings" game, I found what looked to be the perfect piece online: a Celtic-looking warrior in the style of Alphonse Mucha.

We attempt to attribute art whenever we can, and anything that's only for purchase we either avoid or pay for. This particular piece seems to be available only in an Etsy shop, where the creator apparently uses A.I. prompts to generate images. The price is nominal: a few dollars. Yet I cannot help thinking that those who make A.I.-generated art are taking other artists' work, essentially recreating it and then profiting from it.

I'm not sure what the best move is. One justification for A.I. art is that humans create the A.I. prompts that produce the images, so the resulting pieces are novel works. That seems wrong. I could bring an A.I.-generated image that I like to a human artist and ask them to "rehumanize" it for me. But that doesn't feel right either.

https://www.nytimes.com/2024/09/27/magazine/ai-art-profit-ethics.html

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There's a sense in which A.I. image generators — such as DALL-E 3, Midjourney and Stable Diffusion — make use of the intellectual property of the artists whose work they've been trained on. But the same is true of human artists. The history of art is the history of people borrowing and adapting techniques and tropes from earlier work, with occasional moments of deep originality….

As forms of artificial intelligence grow increasingly widespread, we need to get used to so-called ''centaur'' models — collaborations between human and machine cognition. When you sit through the credits of a Pixar movie, you'll see the names of hundreds of humans involved in the imagery you've been immersed in; they work with hugely sophisticated digital systems, coding and coaxing and curating. Their judgment matters. The same might be true, on a smaller scale, of the fellow who sold you this digital file for a nominal fee. Maybe he had noodled around with an assortment of detailed prompts, generated lots of different images and then variants of those images and, after careful appraisal, selected the one that was most like what he was hoping for. Should his effort and expertise count for nothing? Plenty of people, I know, view A.I. systems as simply parasitic on human creativity and deny that they can be in the service of it. I'm suggesting that there's something wrong with this picture.

https://www.nytimes.com/2024/09/27/magazine/ai-art-profit-ethics.html

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NYT Exchange on the Ethics of purchasing AI-generated art:

As an artist, I could not disagree more with the Ethicist about the legitimacy of A.I.-generated art. I have spent thousands of hours in the studio, studying, working and going for a B.F.A. and an M.F.A. I have sought out artists to study with. Most nights in school I was in the studio working until 11 or 12, while also taking early morning classes. I studied anatomy in depth, passing all my exams on that subject. Then I worked for years to pay off all of those loans. I have worked hard to increase the depth of my skill and knowledge for over 50 years. Anyone taking the A.I. shortcut is stealing from me! — *Bepe*

https://www.nytimes.com/2024/10/02/magazine/leave-us-presidential-election-ethics.html

Conditions that Enable Human Flourishing

1) Life
2) Health
3) Autonomy
4) Engagement
   a) Meaningful work
   b) Political democracy
   c) Semiotic democracy
5) **Self-expression**
6) Competence
7) Affiliation
8) Privacy

NYT Exchange on the Ethics of purchasing AI-generated art:

I am an illustrator and educator. My work has been published in The New York Times. With every cell of my body, I disagree with the Ethicist's answer to the value of generative A.I. art. My work was scraped by one of the popular tools, so I don't see this as a centaur model, but as clear copyright theft. There are two clear problems with generative A.I. art: 1) The use of the expressive art of living/working artists (see the recent European Union study on this use of work as copyright infringement), and 2) This is not how images are made. No visual artist thinks of a sentence and a picture appears. There is no human judgment present because each word in a prompt is part of a word/image pair — that's the beating heart of your machine. It is a zombie nostalgia maker (it is not pulling from our imagination, but rather the road traveled) to create exploitive products and nothing resembling cultural production. It is ironic that the Ethicist mentions the list of creatives in the credits of a Pixar movie; the richest companies on the planet are unleashing A.I. tools in order to obliterate those workers. This movement is not offering the tools of creativity to the world; it's encouraging technological feudalism. — *Joe*

https://www.nytimes.com/2024/10/02/magazine/leave-us-presidential-election-ethics.html

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AI Tools for Artistic Enhancement

"Style Transfer: AI systems such as Prisma and DeepDream allow artists to apply the styles of famous painters or artistic movements to their own works. This enables them to explore different artistic perspectives and create visually striking compositions.

"Colorization and Image Restoration: AI tools like ColorizeIt and DeOldify assist in colorizing historical black-and-white photographs or restoring damaged images. They analyze color patterns and enhance image quality, preserving and revitalizing cultural heritage.

Image Upscaling and Detail Enhancement: AI-powered image upscaling tools, such as Topaz Gigapixel AI and Waifu2x, improve the resolution and details of images. This empowers artists to enlarge their works for large-scale prints or digital displays while maintaining sharpness and clarity."

Source: https://artificialpaintings.com/blog/2024/06/05/ai-tools-for-artists-empowering-creativity-with-technology/

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Sustainability

A mode of living on the planet that both (a) is consistent with principles of distributive justice and (b) can be maintained indefinitely

Achieved through adjustments of:

a) Number of people on the planet;

b) Relationships that those people have with the natural environment;

c) Degree of equality among the people

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AI can increase power consumption and exacerbate threats to the environment

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AI can increase power consumption and exacerbate threats to the environment

The Washington Post
Democracy Dies in Darkness

tfishe

Microsoft deal would reopen Three Mile Island nuclear plant to power AI

The owner of the shuttered Pennsylvania plant plans to bring it online by 2028, with the tech giant buying all the power it produces.

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AI Can Contribute to Offsetting Climate Change

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AI Can Contribute to Offsetting Climate Change

- Measuring rates of damage or improvement
- Optimize transmissions of electricity through grids
- Facilitate preventive maintenance, thus minimizing down time
- Facilitate identification of more energy-efficient chemical processes
- Manage grid-interactive buildings

Sources: https://news.un.org/en/story/2023/11/1143187; https://www.climatechange.ai/blog/2023-10-08-grants-zeonet; https://www.sciencedirect.com/science/article/pii/S2666546822000489?via%3Dihub; https://www.climatechange.ai/blog/2022-10-03-grants-icenet;

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AI Can Help Manage Water Consumption

- Facilitate more efficient water resource management systems
- Optimized groundwater management
- Improve responses to emergencies

Sources: https://www.sciencedirect.com/science/article/abs/pii/S0195925520307939; https://www.bgr.bund.de/EN/Themen/Wasser/Aktuelles/2023-04_kimodis_en.html; https://www.nature.com/articles/s44221-023-00069-6

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AI Can Help Manage Production and Consumption of Food

- Reduce Uses of Pesticides and Antibiotics
- Improve Efficiency of the Food-Supply Chain
- Reduce Food Waste

Sources: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10137586/pdf/foods-12-01654.pdf; https://www.sciencedirect.com/science/article/pii/S1877050921018111 ; https://www.forbes.com/sites/forbestechcouncil/2023/07/20/the-role-of-ai-in-creating-a-more-sustainable-food-system/?sh=3a15c5fd2841

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Inequality of Generative AI Platforms

Manifestations:

1) The quality of the prose generated by ChatGPT in English is better than the quality of the prose it generates in any other language
2) The quality of the information generated by ChatGPT when queried in English may be better than the quality it generates in any other language
3) ChatGPT is increasingly aligned with the values of English speakers

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3) ChatGPT is increasingly aligned with the values of English speakers

Causes (tentative)

1) The content of the databases on which ChatGPT has (thus far) been trained is biased toward the English language and English-speaking people
2) The value-alignment process favors the values of the people who initially refined the model
3) Bilingual and multilingual users tend to employ English, thus reinforcing the biases through usage and feedback

Jill Walker Rettberg, “ChatGPT is multilingual but monocultural, and it’s learning your values”

(December 6, 2022), https://jilltxt.net/right-now-chatgpt-is-multilingual-but-monocultural-but-its-learning-your-values/

Dataset	Quantity (tokens)	Weight in training mix	Epochs elapsed when training for 300B tokens	Weight
Common Crawl (filtered)	410 billion	60%	0.44	0.73
WebText2	19 billion	22%	2.9	5.5
Books1	12 billion	8%	1.9	4
Books2	55 billion	8%	0.43	0.72
Wikipedia	3 billion	3%	3.4	3

The Common Crawl is a *lot* of scraped web data. WebText2 is webpages that have been shared in Reddit posts that have received at least three upvotes. Books1 and Books2 are not specified, but people have suggested the Gutenberg library, BookCorpus (free, self-published books) and libgen as possibilities. Finally, the Wikipedia means the English-language Wikipedia, not all of them. The Quantity (tokens) shows how much is in each dataset, but they’re not equally weighted. Here is a table showing the relative weighting.

Jill Walker Rettberg, “ChatGPT is multilingual but monocultural, and it’s learning your values”

(December 6, 2022), https://jilltxt.net/right-now-chatgpt-is-multilingual-but-monocultural-but-its-learning-your-values/

Step 1

Collect demonstration data, and train a supervised policy.

A prompt is sampled from our prompt dataset.

A labeler demonstrates the desired output behavior.

This data is used to fine-tune GPT-3 with supervised learning.

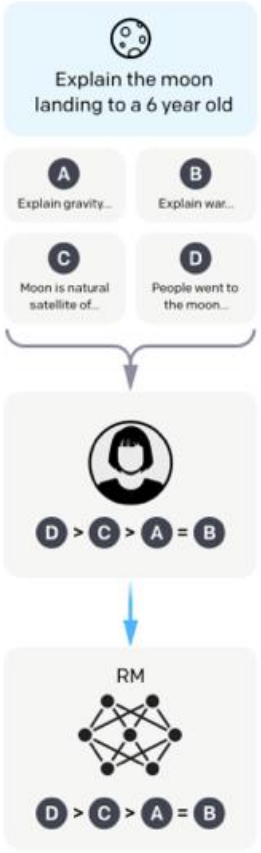
Step 2

Collect comparison data, and train a reward model.

A prompt and several model outputs are sampled.

A labeler ranks the outputs from best to worst.

This data is used to train our reward model.



Step 3

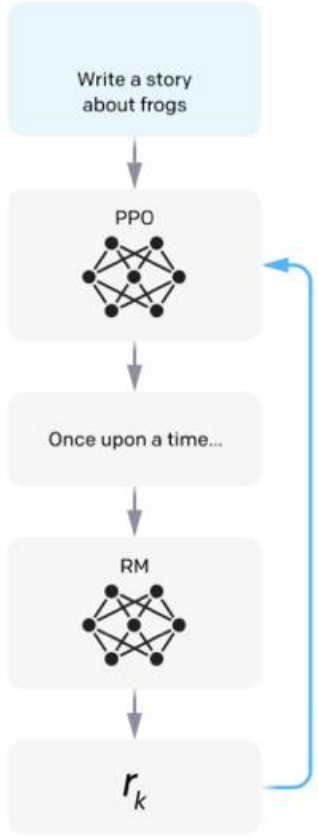
Optimize a policy against the reward model using reinforcement learning.

A new prompt is sampled from the dataset.

The policy generates an output.

The reward model calculates a reward for the output.

The reward is used to update the policy using PPO.



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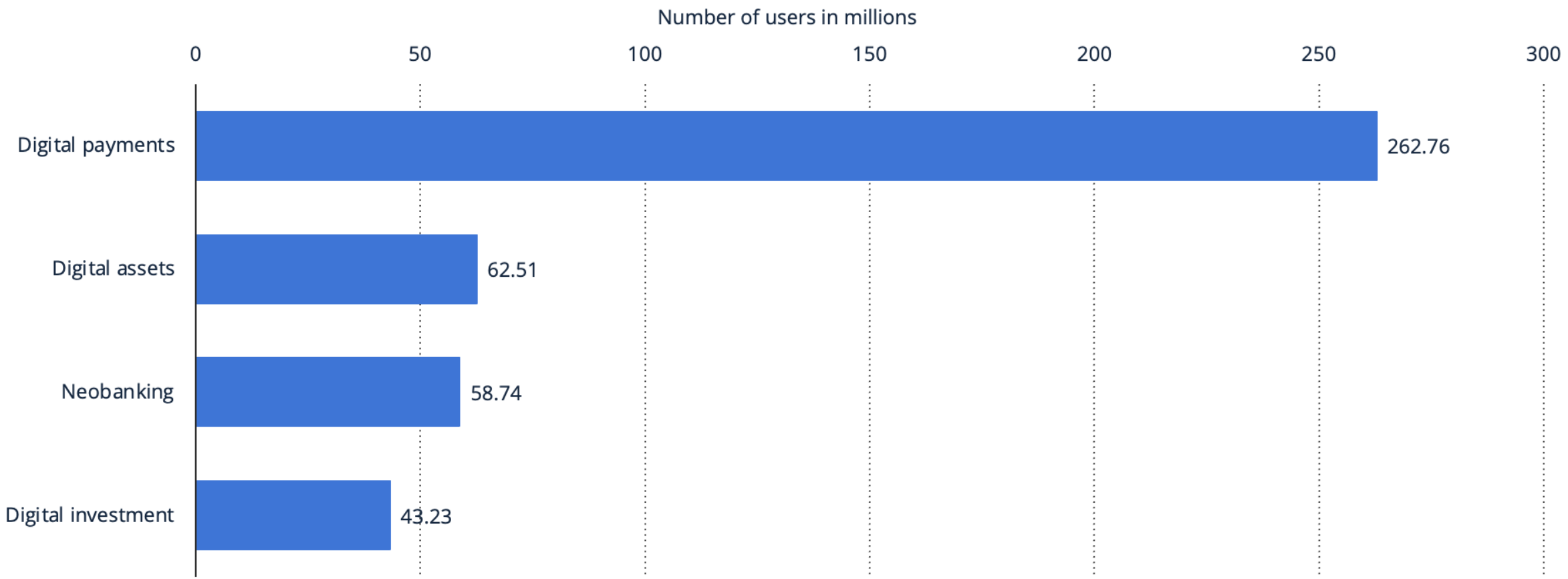
AI-based fintech services can increase equality in access to financial services in developing countries

- Banking services (e.g., Neobanks)
- P2P lending services
- Robo Investment advisors
- Affordable insurance policies
- Payment systems

Number of fintech users in Latin America in 2023, by segment (in million users)

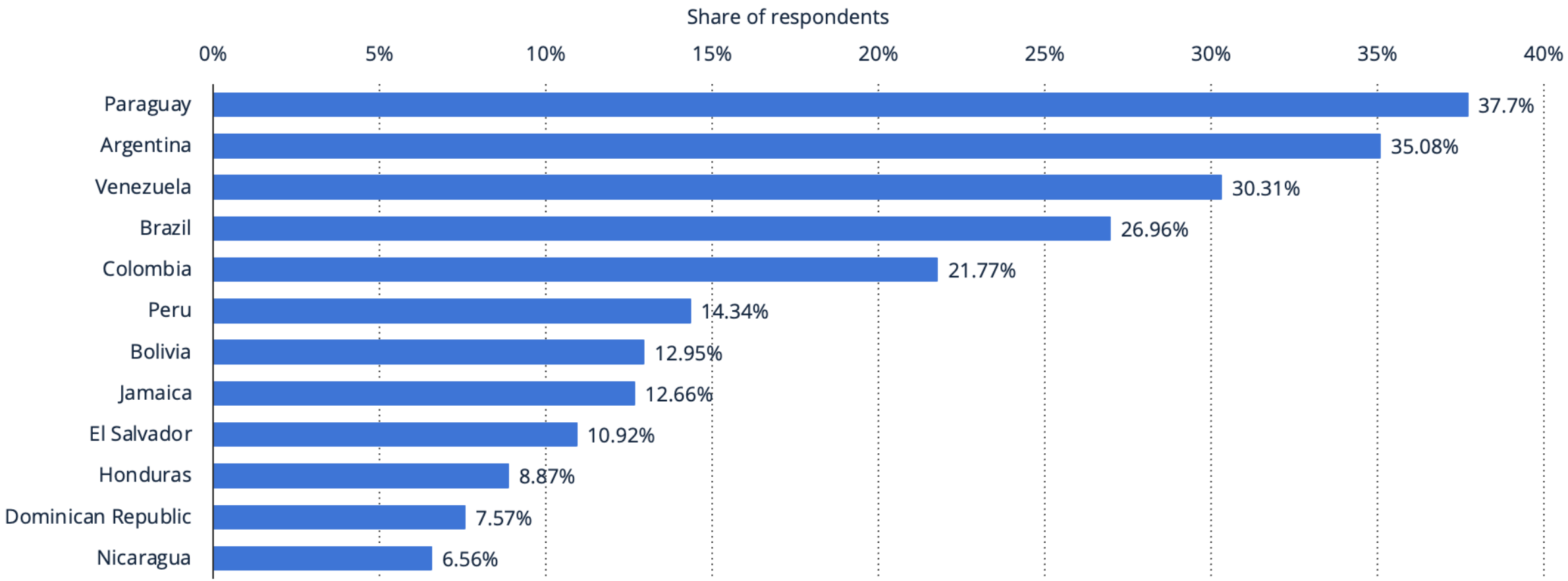
Number of fintech users in Latin America in 2023, by segment



Description: In 2023, over 427 million people used fintech in Latin American and the Caribbean. The majority of users in South-, Central America and the Caribbean, over 262 million, used digital payments in 2023. The second-largest segment of fintech usage was digital assets, with more than 62.5 million users. Read more
Note(s): 2023
Source(s): Statista; Statista Digital Market Insights

Share of adult population who use mobile money service in Latin America in 2021, by selected countries

Population using mobile money services in Latin America 2021, by select countries



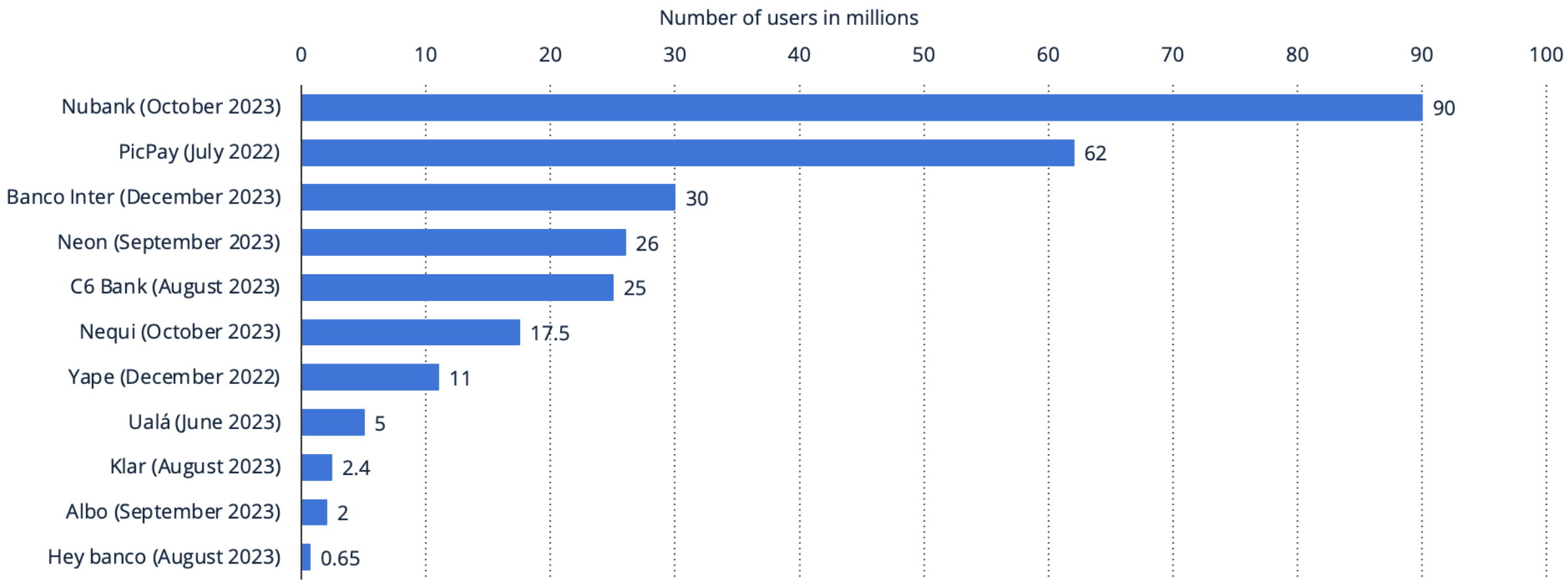
Description: Paraguay and Argentina were some of the countries with the highest usage of mobile money services in Latin America and the Caribbean in 2021. In these countries, more than 35 percent of the population aged 15 years or older had mobile money accounts. Dominican Republic and Nicaragua were the countries with the lowest share of adult population with mobile money accounts. Read more

Note(s): August to November 2021; approx. 1,000 per country; 15 years and older; Entire civilian, noninstitutionalized population; The figures shown are from a global survey held every 3 years. The data for 2021 is the most recent available as of the mid of 2022.

Source(s): World Bank

Number of users of selected digital banks in Latin America in 2023 (in millions)

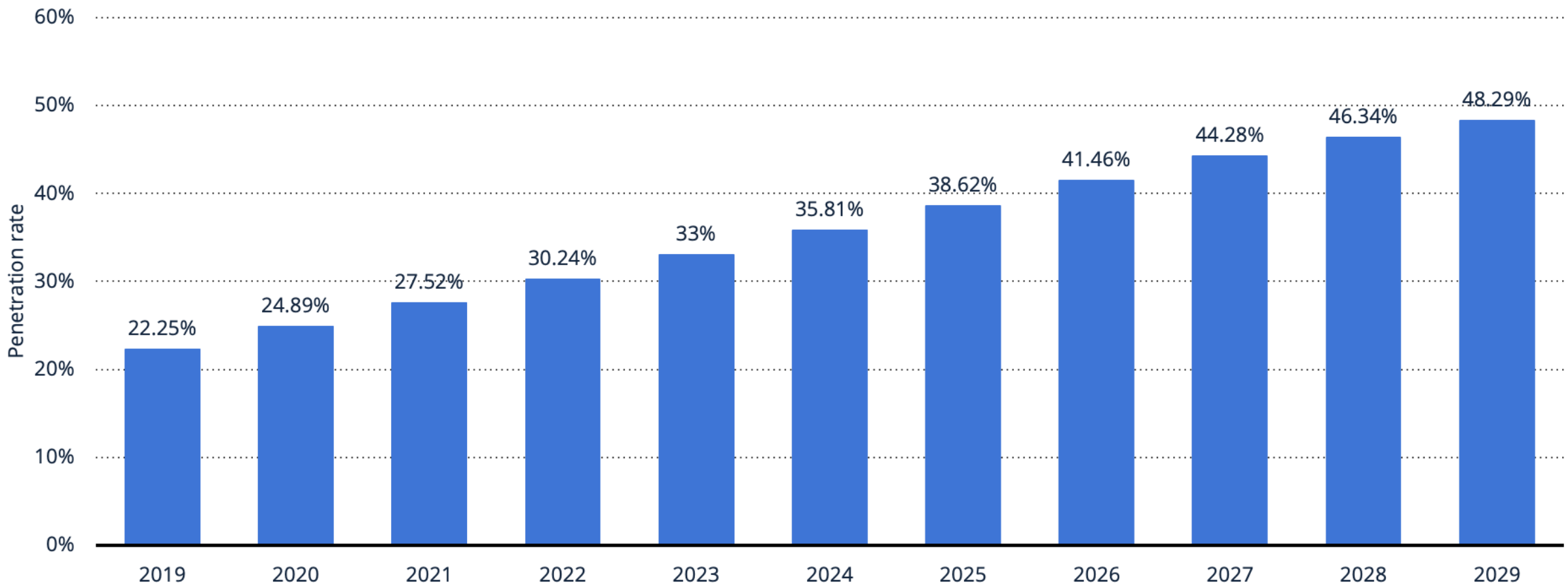
Number of users at selected digital banks in Latin America 2023



Description: In 2023, Nubank was the digital bank with the most users in Latin America, among the solutions depicted. As of October 2023, around 90 million people adopted the Brazilian neobank. It was followed by PicPay, with 62 million users as of July 2022. Banco Inter ranked third, with roughly 30 million users at the end of 2023. Read more
Note(s): 2023
Source(s): Statista; Various sources (websites, reports, press releases)

Online banking penetration in Latin America from 2019 to 2023, with forecasts from 2024 to 2029

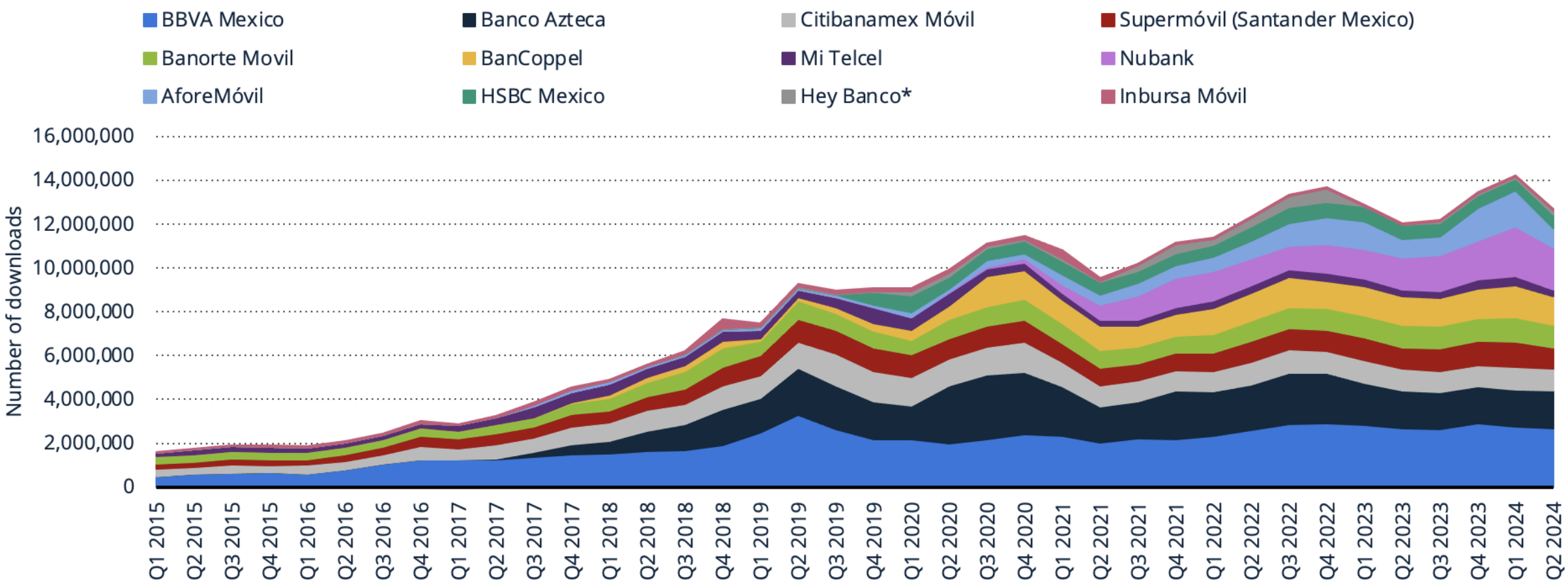
Online banking penetration in Latin America 2019-2023, with forecasts to 2029



Description: Online banking penetration in Latin America increased gradually between 2019 and 2023. In 2019, the penetration rate stood at 22.25 percent, which increased to 33 percent in 2023. According to Statista, online banking penetration in the region will increase further in the following years, reaching 48.29 percent in 2029. Read more
Note(s): Central and South America; 2019 to 2023
Source(s): Statista; World Bank

Leading banking apps in Mexico from 1st quarter 2015 to 2nd quarter 2024, by number of downloads

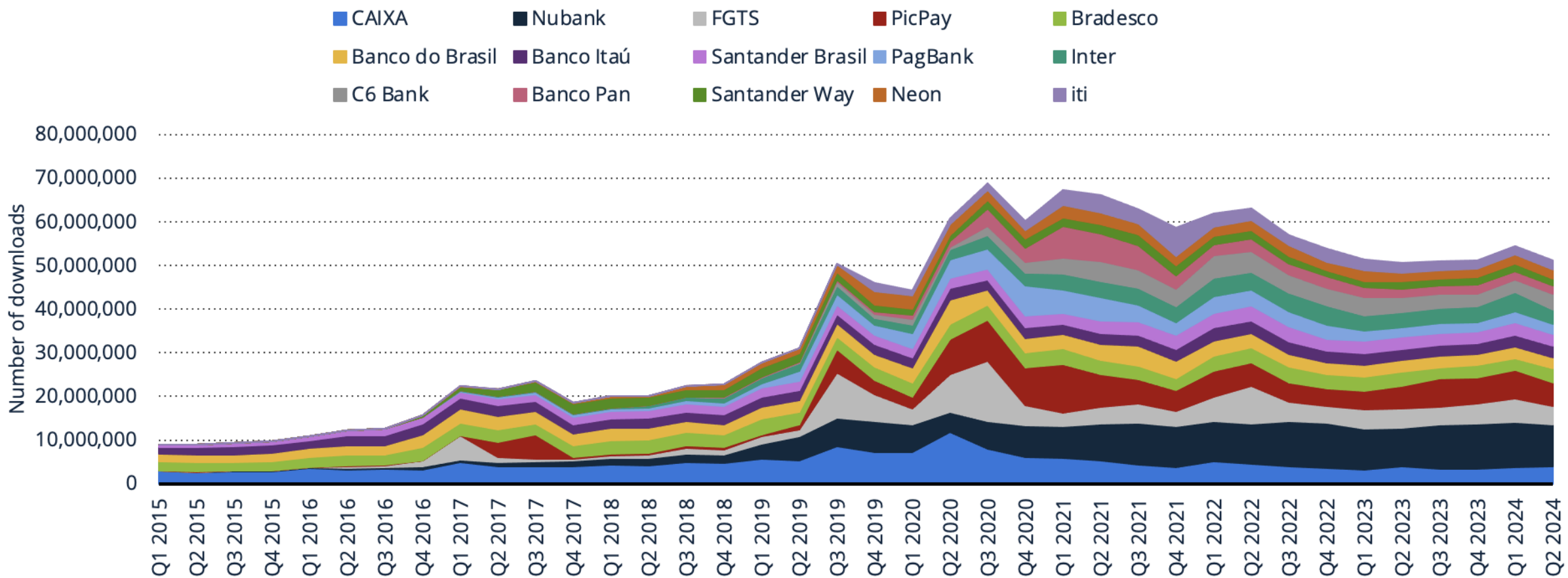
Key banking apps in Mexico 2015-2024, by quarterly downloads



Description: The number of BBVA Mexico app downloads were higher than any other banking app downloads in Mexico not only in the second quarter of 2024, but during the whole observed period. Banco Azteca followed both in terms of quarterly and overall downloads. Santander's SuperMóvil, Banorte Mobile, and BanCoppel were also among the five most widely downloaded banking apps. Read more
Note(s): Mexico; Q1 2015 to Q2 2024
Source(s): AppMagic; Statista

Leading banking apps in Brazil from 1st quarter 2015 to 2nd quarter 2024, by number of downloads

Key banking apps in Brazil 2015-2024, by quarterly downloads



Description: The number of Nubank downloads in Brazil were higher than any other banking app downloads in every quarter between 2022 and 2024. With this increasing trend, Nubank became the banking app with the highest number of overall downloads between 2015 and 2024. Read more
Note(s): Brazil; Q1 2015 to Q2 2024
Source(s): AppMagic; Statista

AI-based fintech services can increase equality in access to financial services in developing countries

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- P2P lending services
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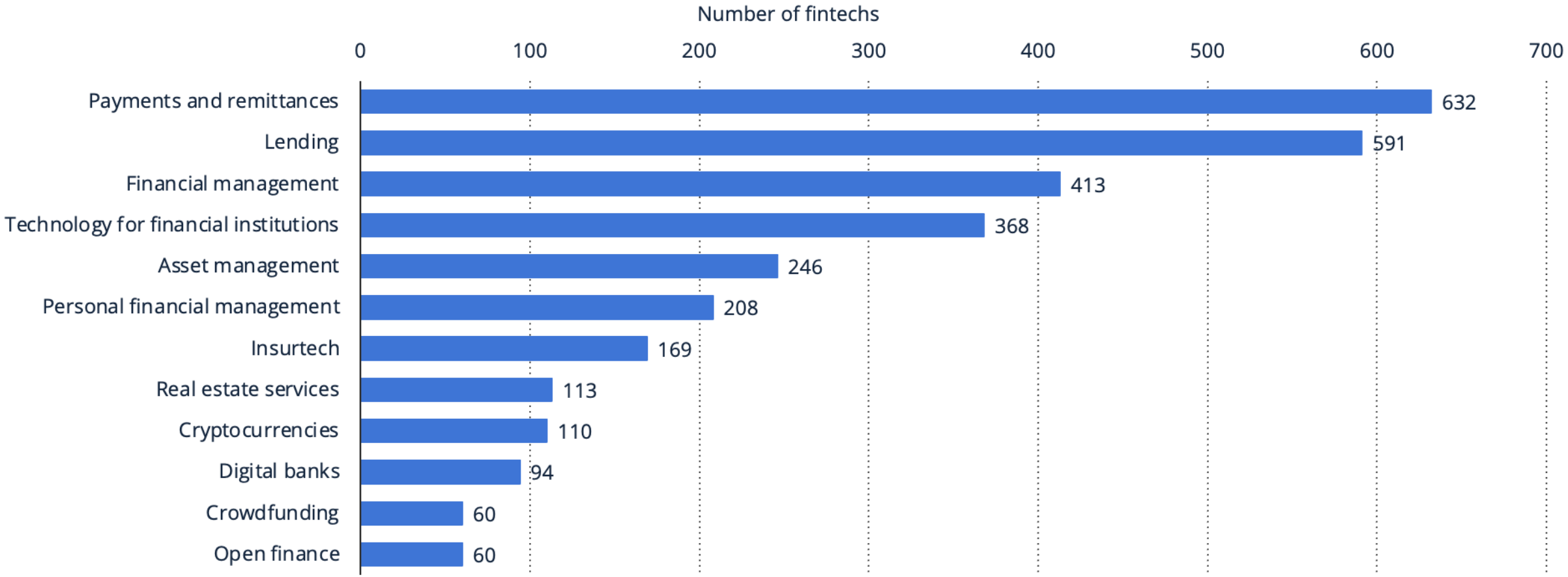
AI-based fintech services can increase entrepreneurial opportunities in developing countries

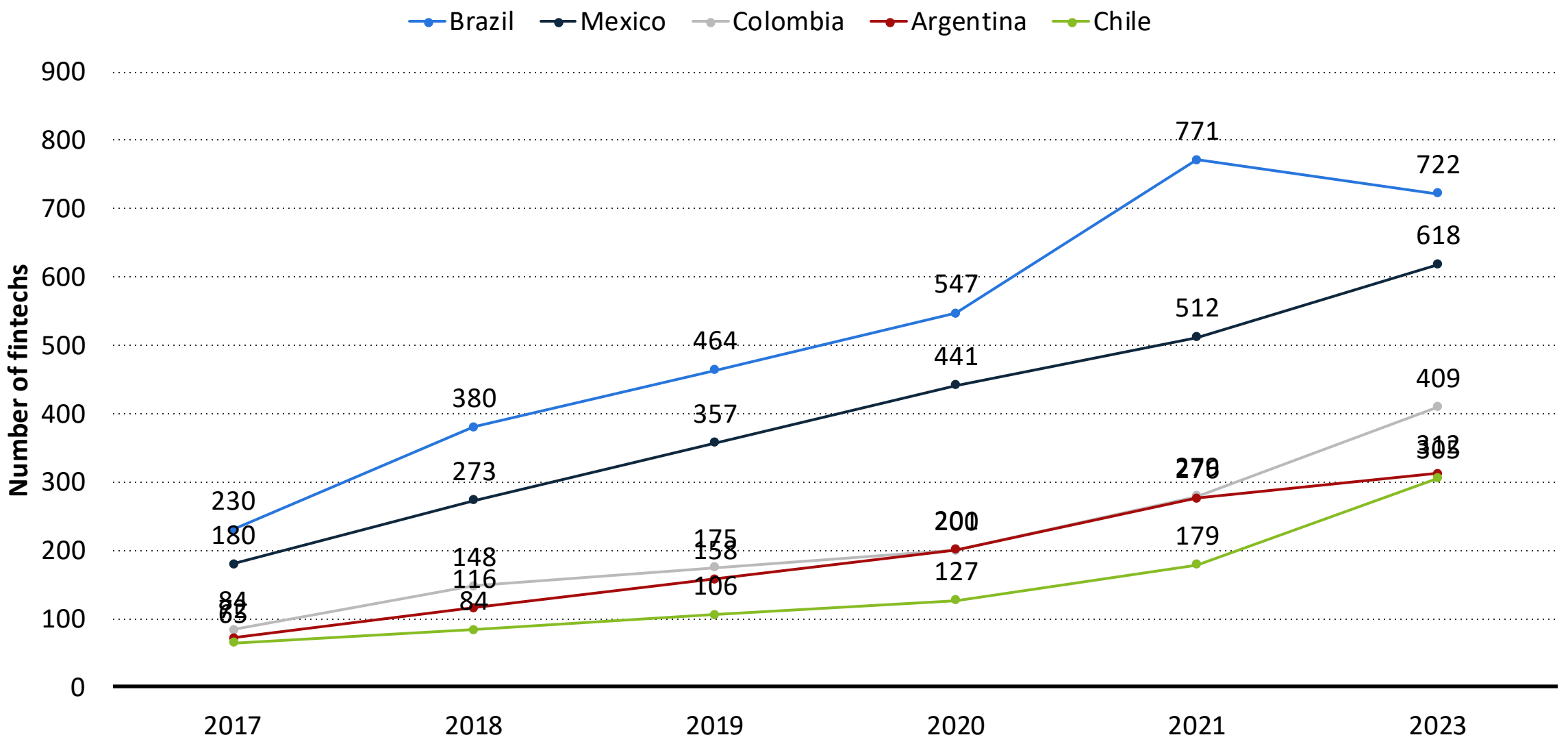
Number of fintech startups in Latin America in 2023, by business segment

Number of fintechs in Latin America 2023, by segment



Description: In 2023, 632 fintech startups offered solutions in the payments and remittances segment in Latin America, making it the segment with the highest number of businesses in the region. The lending segment followed, with 591 companies. Read more
Note(s): LAC; 2023; 3,069 fintech startups
Source(s): Finnovista; Inter-American Development Bank

Growth of fintechs in Latin America between 2017 and 2023, by country



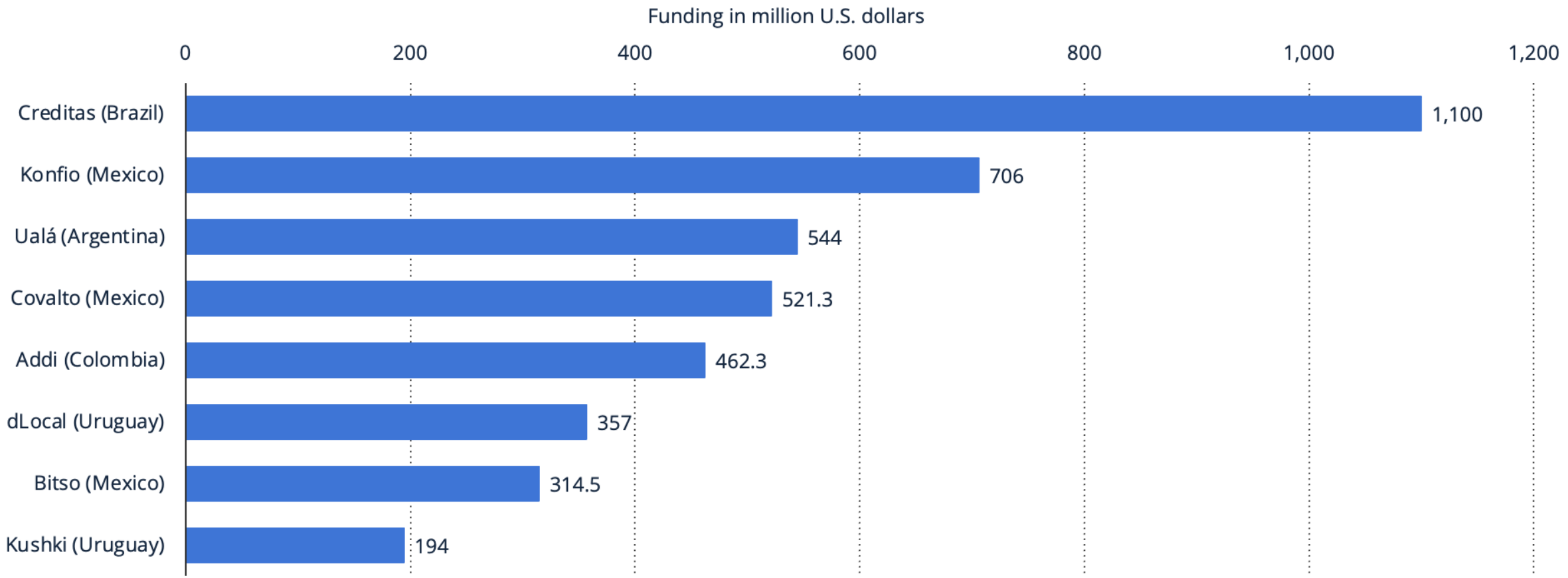
Note(s): Argentina, Brazil, Chile, Colombia, Mexico; 2017 to 2023

Further information regarding this statistic can be found on page 8.

Source(s): Inter-American Development Bank; Finnovista; Latam Fintech; ID 1341094

Funding of selected fintech companies in Latin America as of July 2024 (in million U.S. dollars)

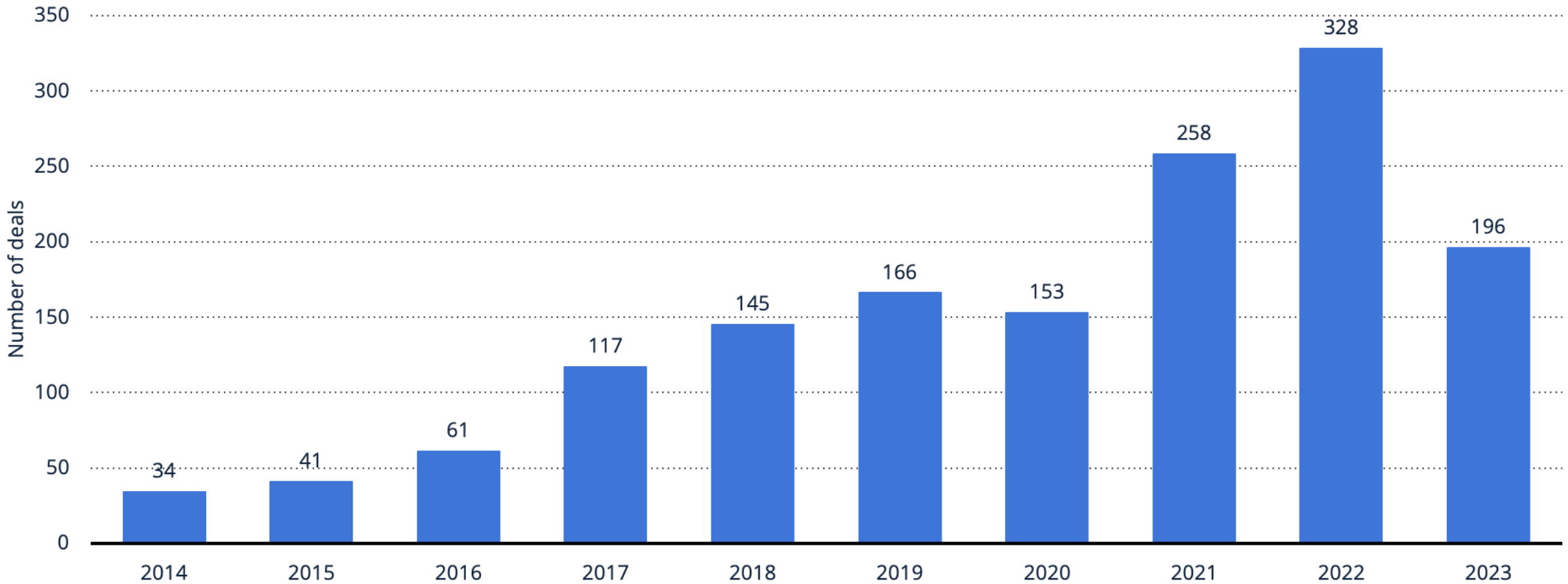
Funding of selected fintechs in Latin America 2024



Description: As of July 2024, Creditas attracted investments amounting to 1.1 billion U.S. dollars. This online financial platform is based in Brazil and specializes in consumer loans. Konfio, a Mexico-based fintech company, received 706 million U.S. dollars worth of funding. Read more
Note(s): LAC; July 2024
Source(s): CrunchBase; Statista

Number of venture capital fintech deals in Latin America from 2014 to 2023

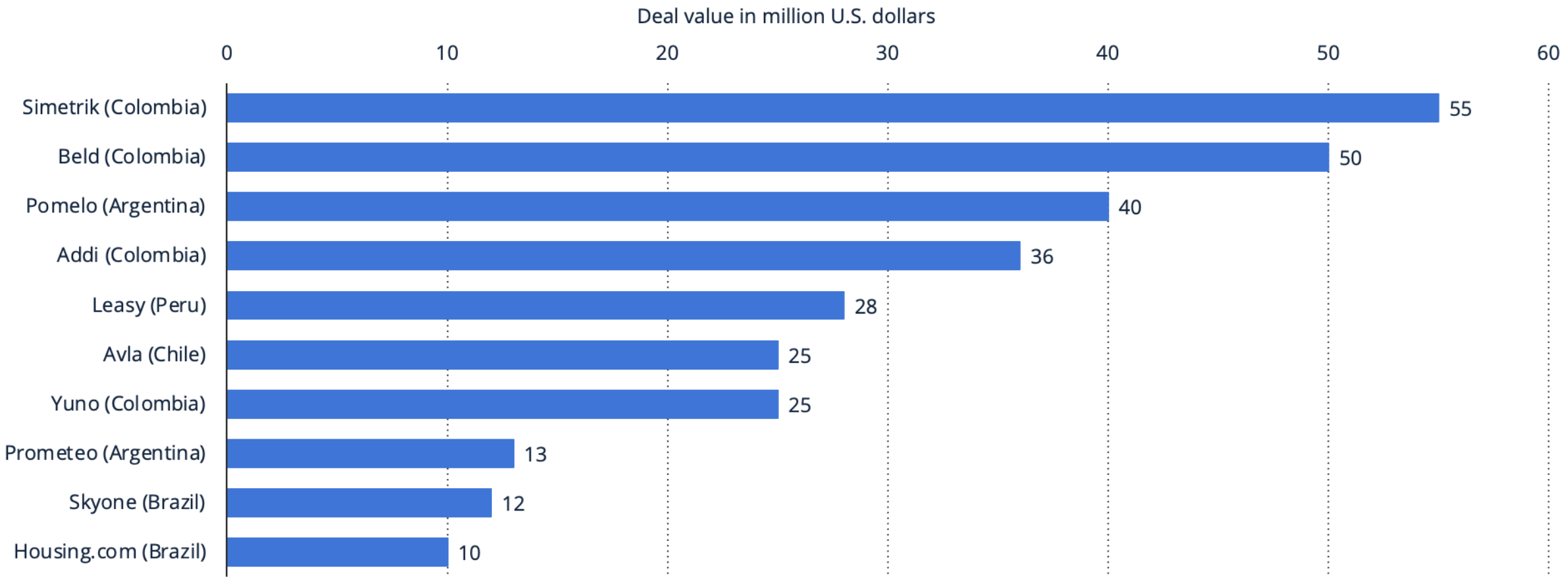
Number of VC fintech deals in Latin America 2014-2023



Description: The number of venture capital deals targeted at fintech startups in Latin America dropped sharply in 2023, after a period of gradual increase between 2014 and 2022. In 2023, a total of 196 fintech deals were closed in Latin America, down from 328 a year earlier. Read more
Note(s): LAC; 2014 to 2023
Source(s): LAVCA

Value of the largest fintech deals in Latin America in 1st quarter 2024 (in million U.S. dollars)

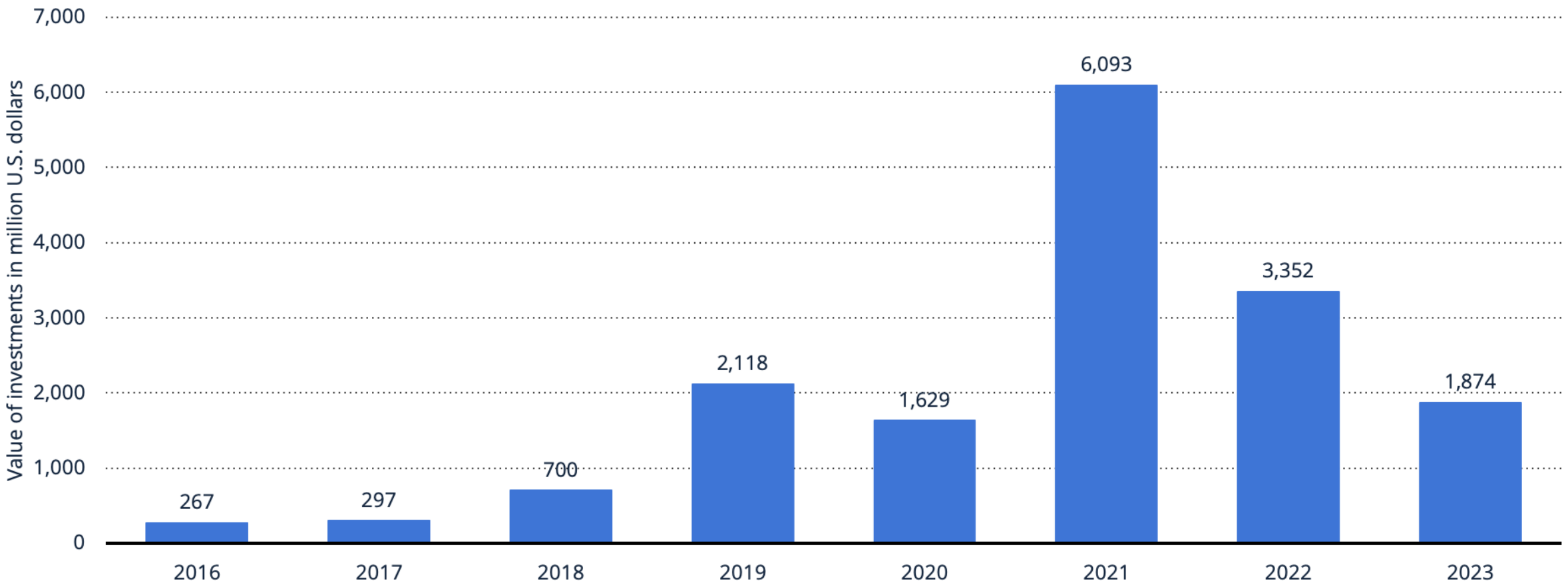
Largest fintech deals in Latin America 2024



Description: Simetrik was the largest fintech deal in Latin America in the first quarter of 2024. The Colombian fintech company, which automates financial and accounting control, raised 55 million U.S. dollars in a Series B funding round. Read more
Note(s): Central and South America; Q1 2024
Source(s): FinTech Global

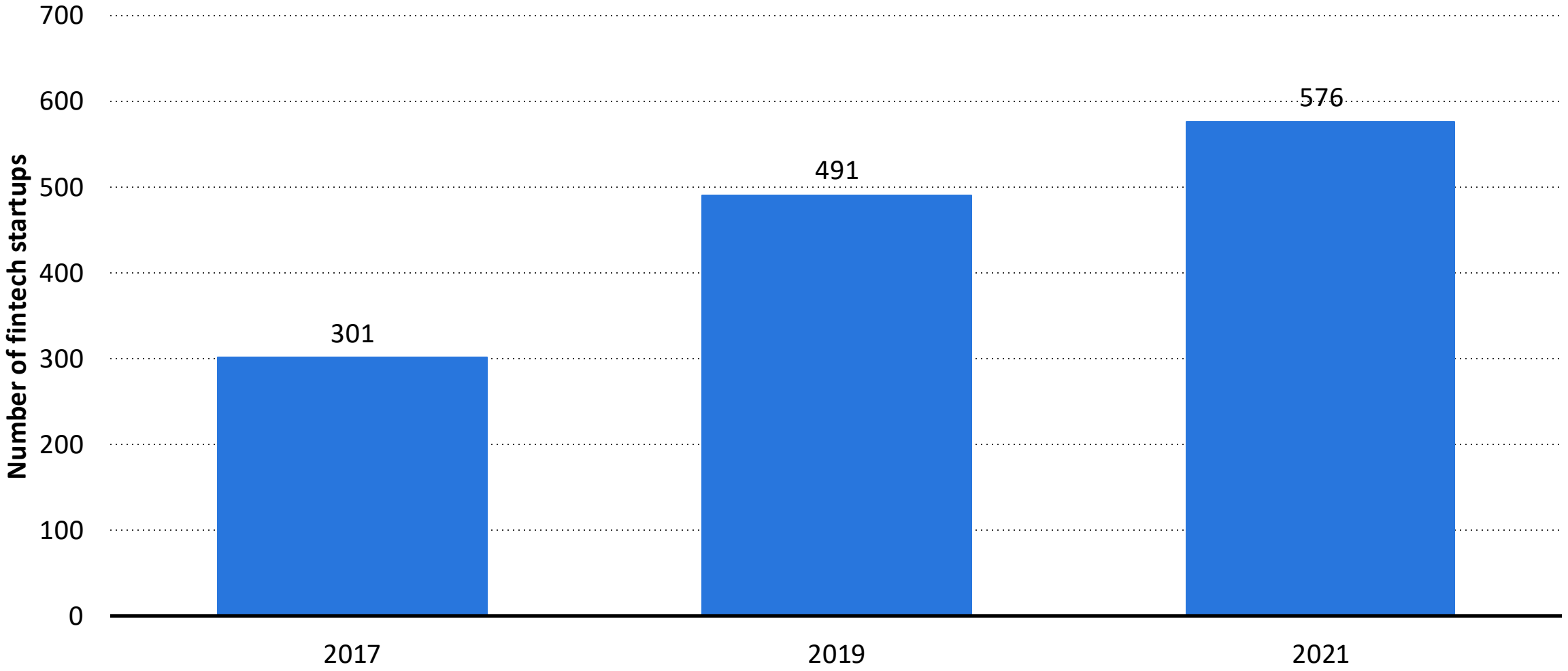
Value of venture capital fintech investment in Latin America from 2016 to 2023 (in million U.S. dollars)

Value of VC fintech investment in Latin America 2016-2023



Description: In 2023, the value of venture capital (VC) investment targeted at fintech startups in Latin America amounted to roughly 1.87 billion U.S. dollars, a sharp decrease compared to the previous year. VC investment in fintech peaked in 2021, with an investment value of over six billion U.S. dollars. Read more
Note(s): LAC; 2014 to 2023
Source(s): LAVCA

Number of fintech startups in Africa from 2017 to 2021

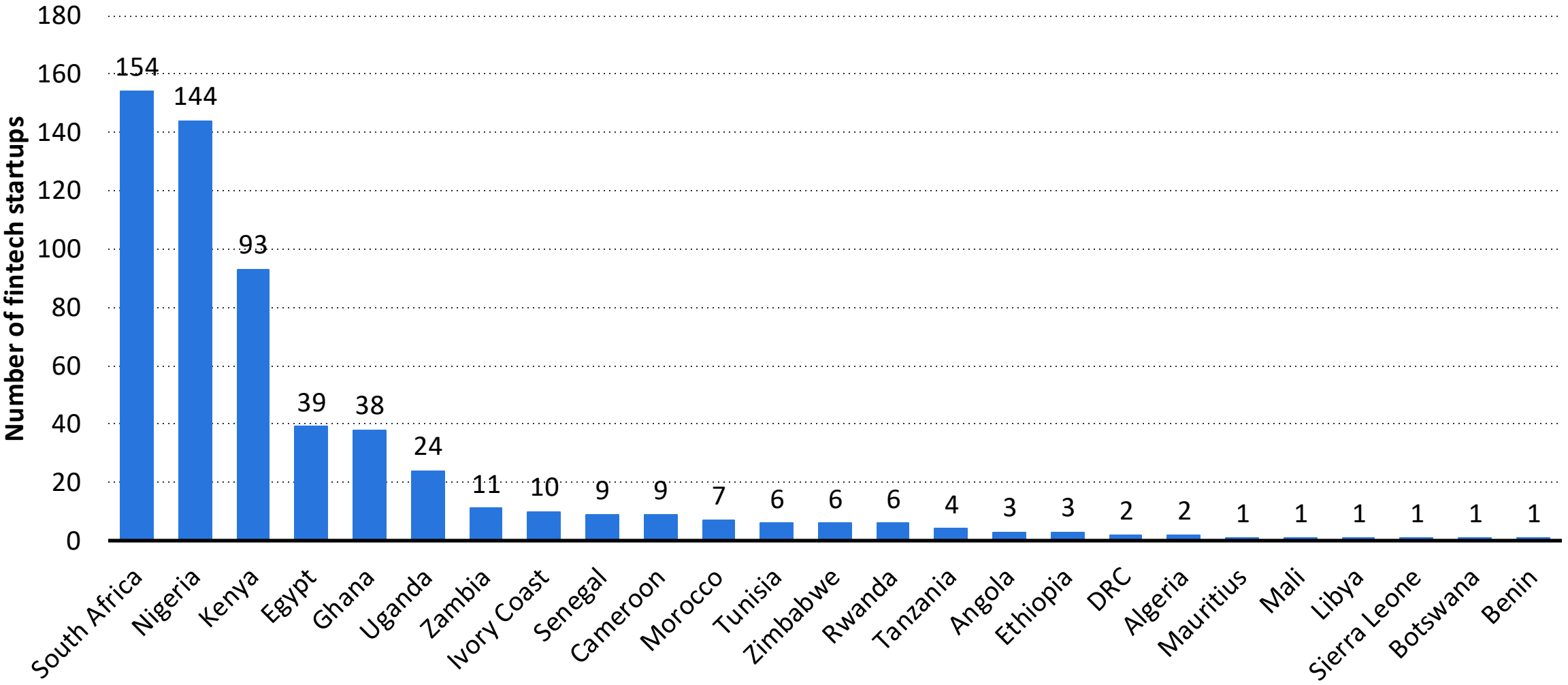


Note(s): Africa

Further information regarding this statistic can be found on page 8.

Source(s): Disrupt Africa; ID 1249957

Number of fintech startups in Africa as of H1 2021, by country



Note(s): H1 2021

Further information regarding this statistic can be found on page 8.

Source(s): Disrupt Africa; ID 1252512

Fintech Startups in Africa in 2023

Egypt-based MNT-Halan raised the biggest round of 2023, securing US$260 million in equity funding in February and reaching a post-money valuation of about US$1 billion.

MNT-Halan started out as a ride-hailing service before expanding into a super app. Today, the platform provides e-commerce offerings, business loans, consumer finance, payments and buy now, pay later (BNPL) services, among other things. The fintech and e-commerce startup boasts a substantial customer base of more than 1.5 million active monthly users and claims it has so far disbursed more than US$2.5 billion worth of loans. MNT-Halan is now looking to expand internationally after solid growth in Egypt and plans to use the proceeds to develop its product offering.

Source: https://fintechnews.africa/43166/fintechafrica/10-african-startups-dominate-75-of-fintech-equity-africa-funding-in-2023/

Fintech Startups in Africa in 2023

After MNT-Halan, TymeBank is the African fintech startup that secured the second largest equity funding round of 2023. In May, the startup announced a US$77.8 million pre-Series C round to fuel its expansion into Southeast Asia and its entry into Vietnam.

TymeBank is a South African digital banking startup part of the Tyme Group of companies headquartered in Singapore. The holding company focuses on designing, building and operating digital banks for emerging markets.

Launched in South Africa in 2019, TymeBank offers a transactional bank account with zero or low monthly fees and a savings product to its customers, most of whom are onboarded via physical locations. The startup is said to be one of the world's fastest-growing digital banks, with over 8.5 million customers.

Source: https://fintechnews.africa/43166/fintechafrica/10-african-startups-dominate-75-of-fintech-equity-africa-funding-in-2023/

Fintech Startups in Africa in 2023

Following TymeBank, Moove is the fintech startup that raised the third largest equity funding round of 2023, according to Afridigest. In August, the startup announced that it had secured US$28 million equity, alongside US$10 million in venture debt. This followed US$38 million in previously undisclosed funds raised over the prior 12-month period.

Founded in 2020, Moove is a mobility fintech startup that aims to democratize access to financial services for mobility entrepreneurs. It does this by embedding its alternative credit scoring technology onto ride-hailing, logistics, mass transit, and instant delivery platforms, using proprietary performance and revenue analytics to underwrite customers. Moove operates in 13 markets across Africa, the Middle East, Europe and Asia, and is Uber's largest vehicle supply partner across the region. The startup claims over 12,000 customers.

Moove said at the time that it would use the proceeds to expand globally with plans to launch multiple new products and a goal to reach profitability.

Source: https://fintechnews.africa/43166/fintechafrica/10-african-startups-dominate-75-of-fintech-equity-africa-funding-in-2023/

Fintech Startups in Africa in 2023

At the fourth and fifth positions are Cash Plus, a Moroccan payment startup which raised US$60 million in October, and M-Kopa, a Kenyan microfinancing startup which secured US$55 million in May.

Cash Plus is a fintech entity and financial network in Morocco on a mission to reshape the country's financial panorama. The company boasts five brands, 3,600 points-of-sale (POS), and over 1 million digital wallet users. M-Kopa, meanwhile, is a fintech platform that provides digital financial services to underbanked consumers by leveraging data to combine digital micropayments with the Internet of Things (IoT) technology. With operations in Kenya, Uganda, Nigeria and Ghana, M-Kopa's platform has provided over US$1 billion in credit and enabled 3 million customers to access smartphones, solar power systems, digital loans and health insurance.

Source: https://fintechnews.africa/43166/fintechafrica/10-african-startups-dominate-75-of-fintech-equity-africa-funding-in-2023/

Fintech Startups in Africa in 2023

The five other fintech startups part of the top ten rounds of 2023 are Lula (US$35 million, Series B), LemFi (US$33 million, Series A), Peach Payments (US$31 million, Series A), Nomba (US$30 million, pre-Series B) and Stitch (US$25 million, Series A extension).

Lulalend is a South African digital lender that's building a suite of products addressing the challenges faced by small and medium-sized enterprises in managing their finances; LemFi is a Nigerian startup that offers a multi-currency account for immigrants to hold, send, and receive money; Peach Payments is a South African startup providing a toolkit for merchants to accept, manage and make payments via mobile and the web; Nomba is a licensed payment service provider in Nigeria that serves more than 300,000 businesses; and Stitch is a South African startup providing an end-to-end payments solution.

Source: https://fintechnews.africa/43166/fintechafrica/10-african-startups-dominate-75-of-fintech-equity-africa-funding-in-2023/

Sustainability

A mode of living on the planet that both (a) is consistent with principles of distributive justice and (b) can be maintained indefinitely

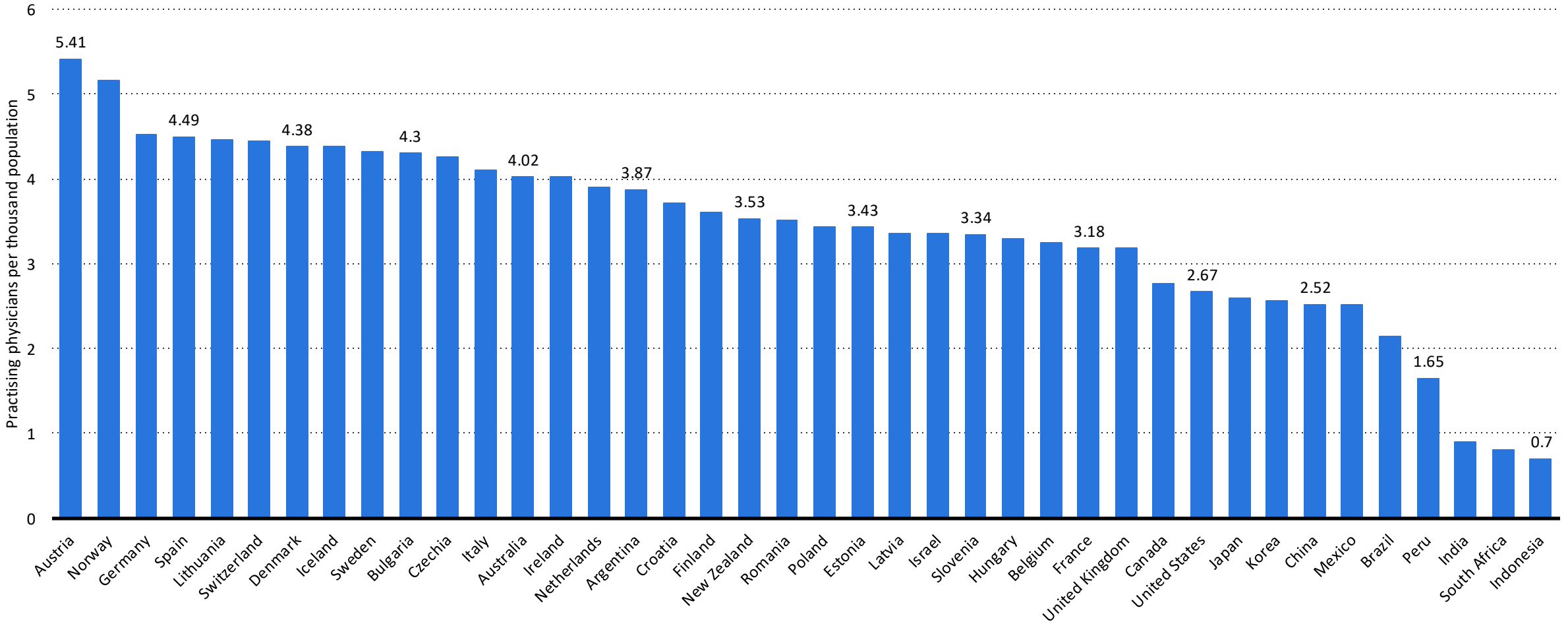
Achieved through adjustments of:

a) Number of people on the planet;

b) Relationships that those people have with the natural environment;

c) Degree of equality among the people

Physician density in select countries as of 2021 (per 1,000 population)



Note(s): Worldwide; practising physicians

Further information regarding this statistic can be found on page 8.

Source(s): OECD; ID 268162

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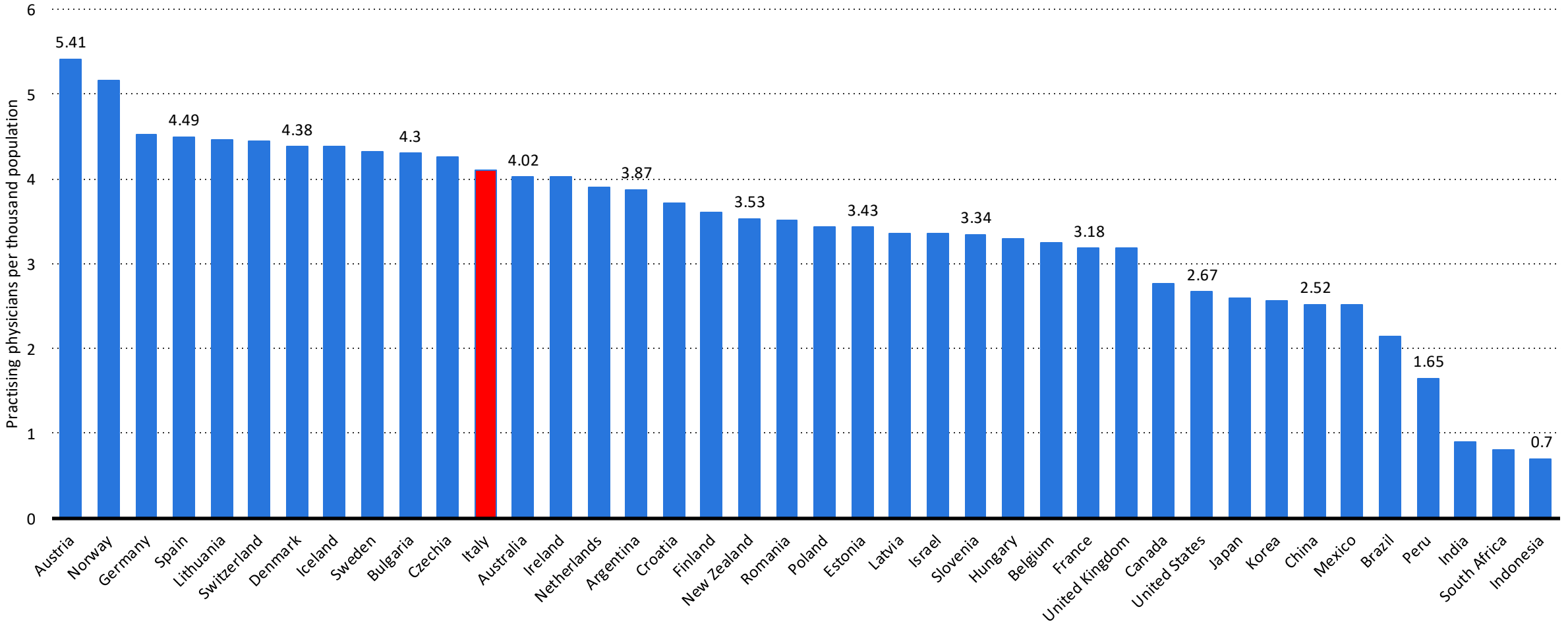

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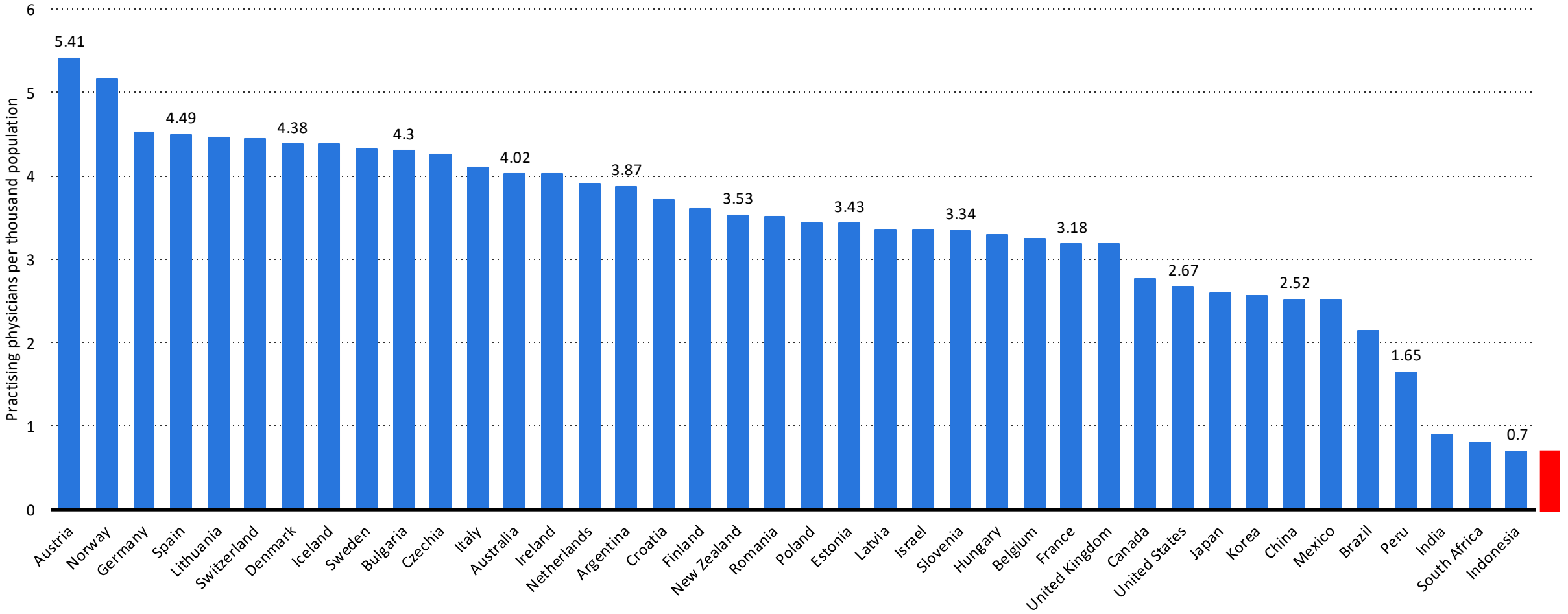

Philippines: 0.7

Note(s): Worldwide; practising physicians

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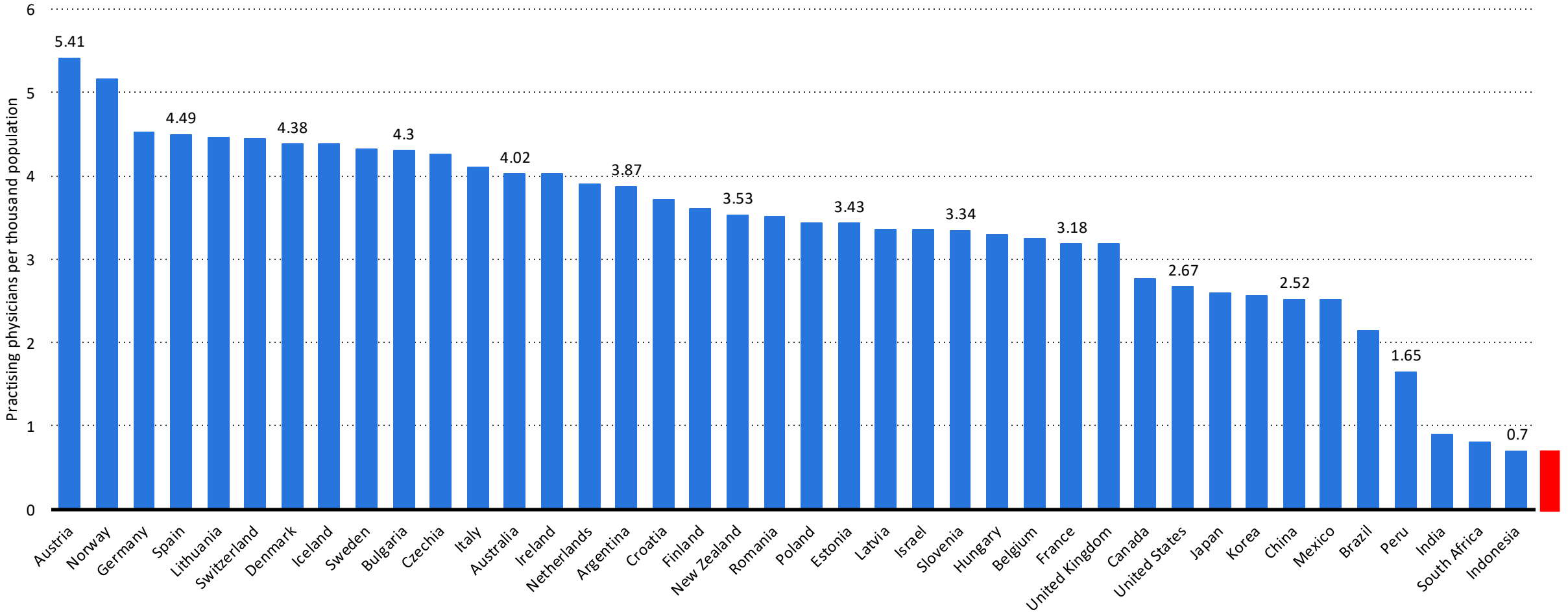

Philippines: 0.7

Most countries in Africa: less than 0.3

Note(s): Worldwide; practising physicians

Further information regarding this statistic can be found on page 8.

Source(s): OECD; ID 268162

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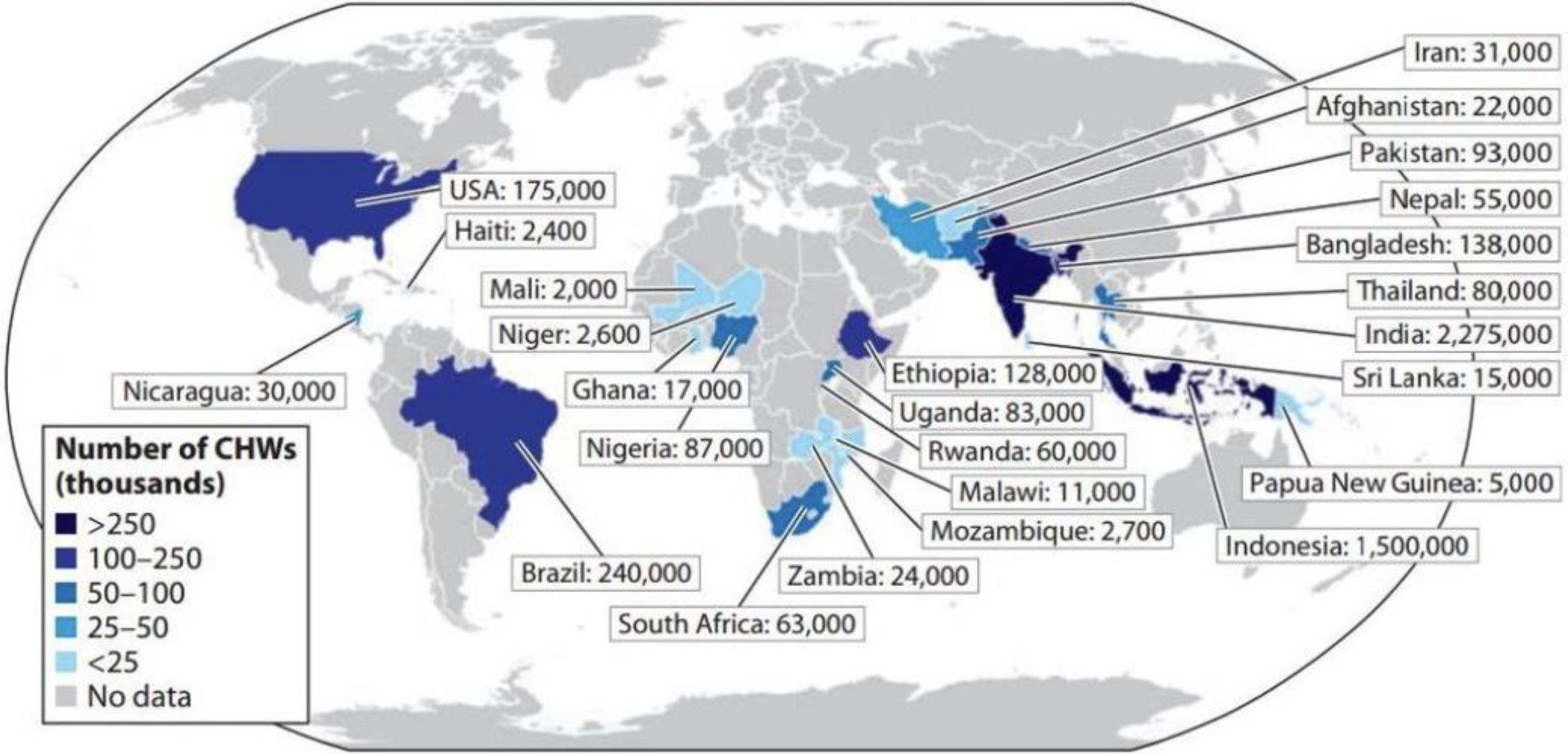
Community Health Workers

Lay health workers who:

- live in the area they serve;
- are primarily based in the community (as opposed to a health facility);
- belong to the formal health system (i.e., are managed by the government or an NGO);
- perform tasks related to health care delivery; and
- have received organized training but may not have received formal or paraprofessional certification or tertiary education degree.

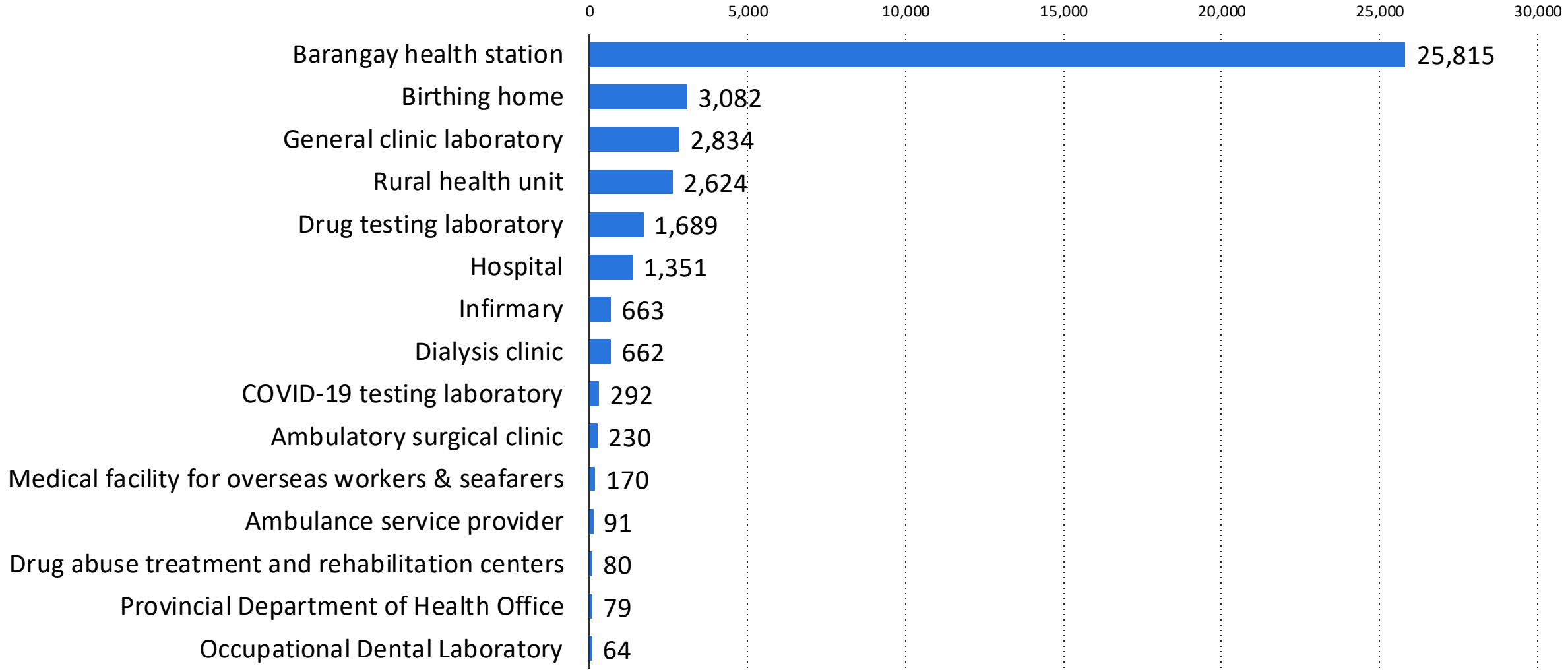
Most CHWs operate in rural areas. Typically, they periodically travel from house to house, checking the health status of residents, identifying illnesses, and, when appropriate, providing advice, vaccines, or drugs.

Figura 2. Stima del numero di community health workers in alcuni paesi[3]



Source: https://www.saluteinternazionale.info/2019/03/community-health-workers/.

Number of health facilities in the Philippines as of January 2024, by type



Note(s): Philippines; as of January 2024

Further information regarding this statistic can be found on page 8.

Source(s): DOH (Philippines); ID 1447054

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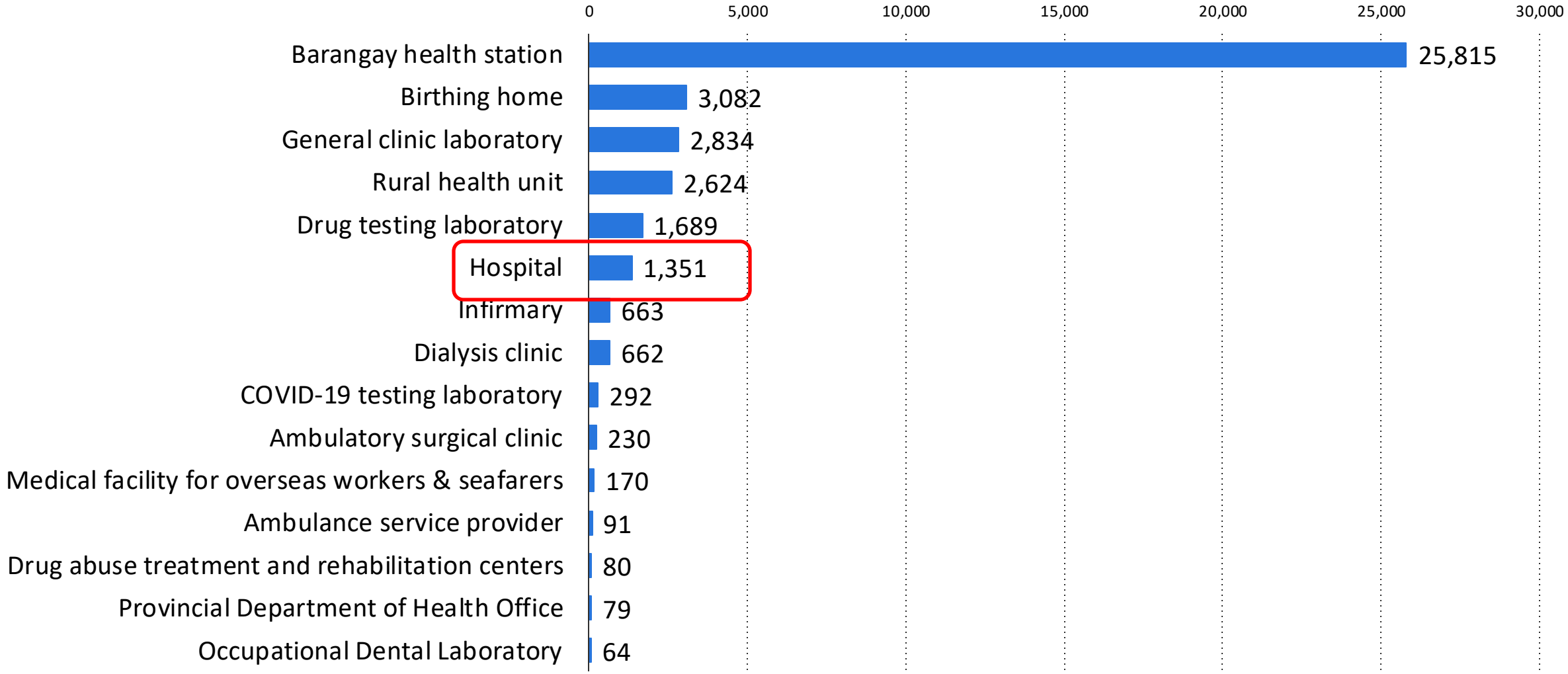

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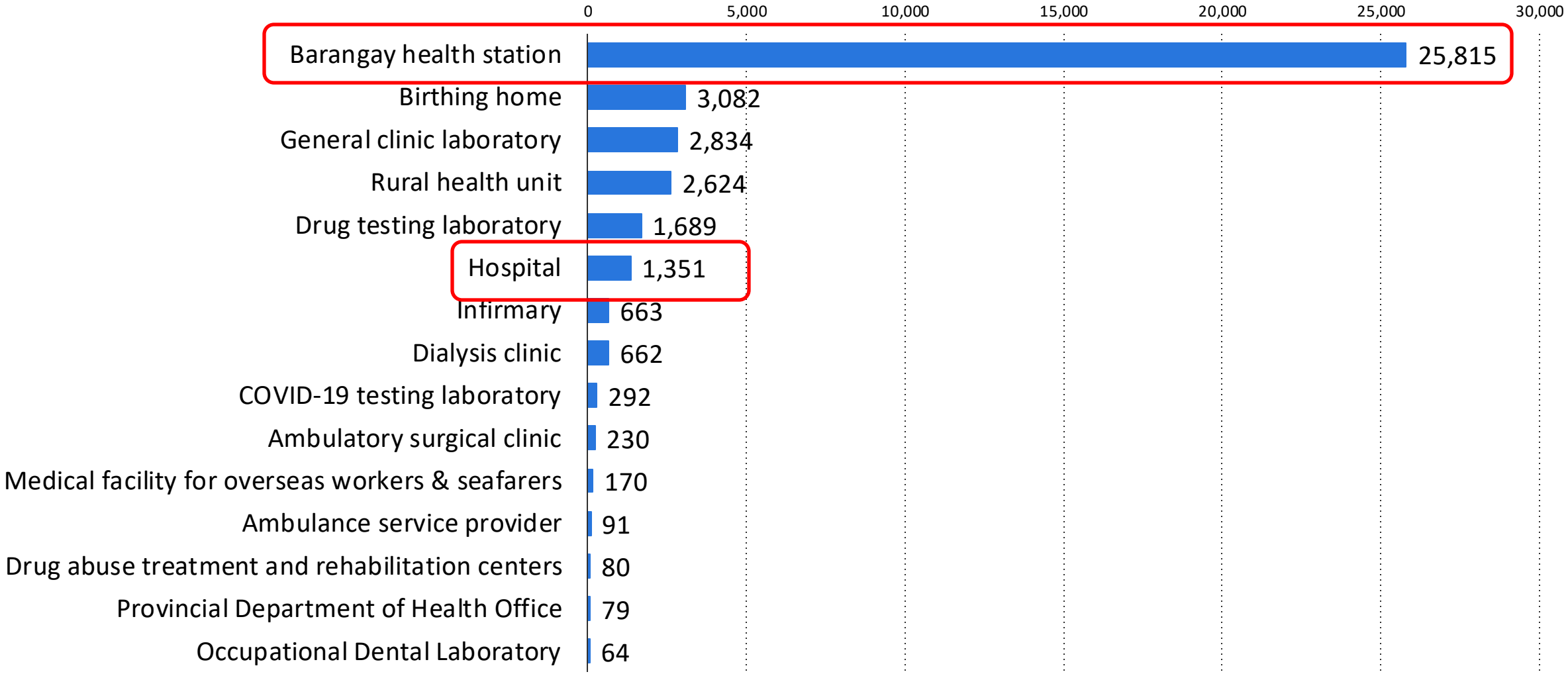

Note(s): Philippines; as of January 2024

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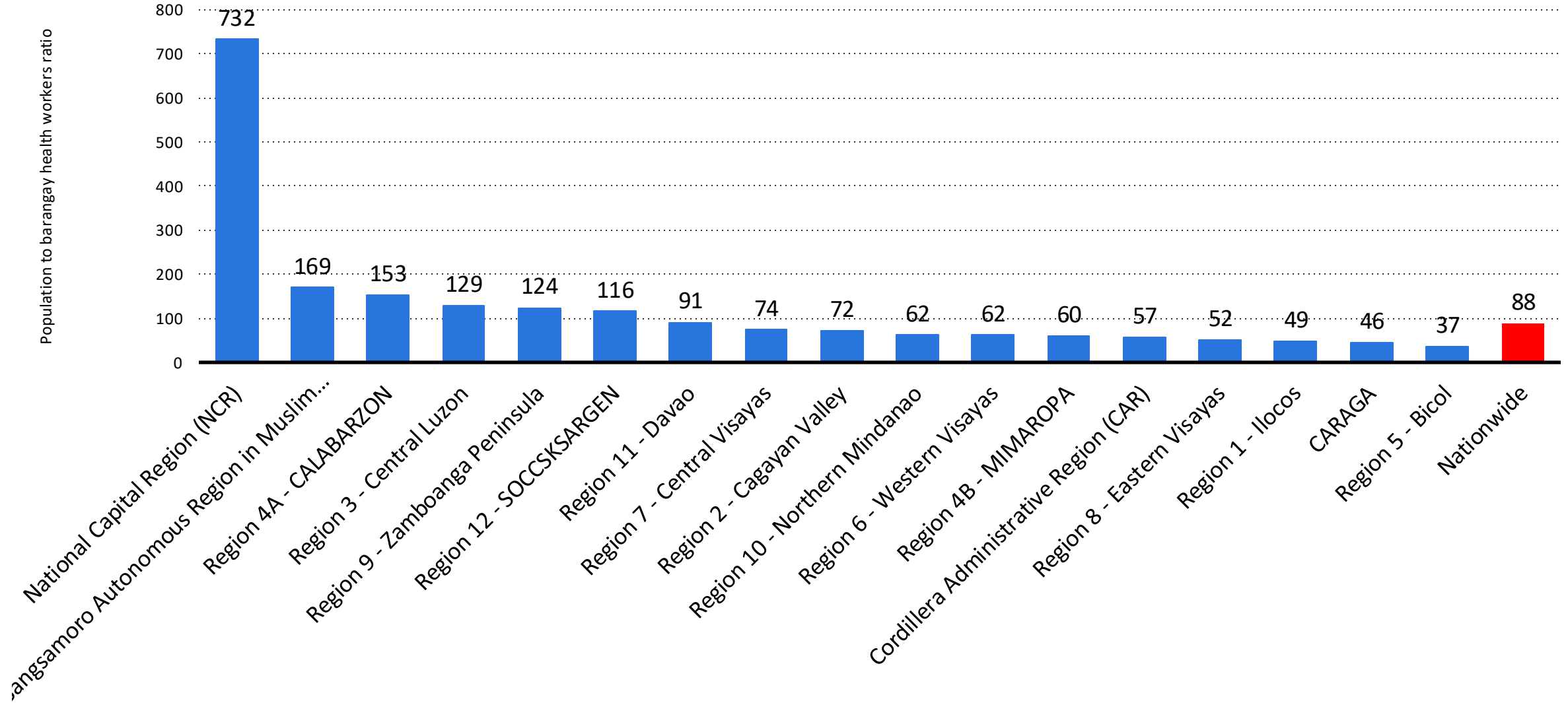
Ratio of the population in relation to active barangay health workers in the Philippines in 2022, by region



Note(s): Philippines; 2022

Further information regarding this statistic can be found on page 8.

Source(s): DOH (Philippines); ID 1370633

Sources: https://www.pivotworks.org/blog/marking-one-year-of-mobile-technology-for-community-health-workers/; https://tipglobalhealth.org/smartphones-an-essential-tool-to-empower-community-health-workers/; https://lwala.org/digitizing-kenyas-community-health-workforce/

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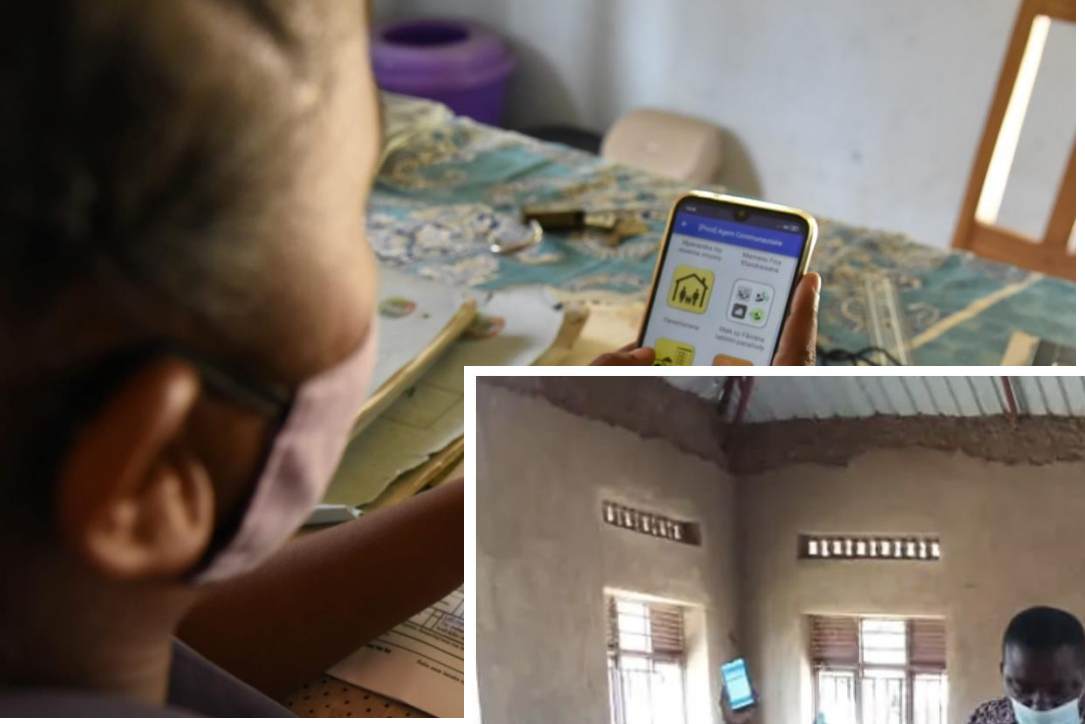

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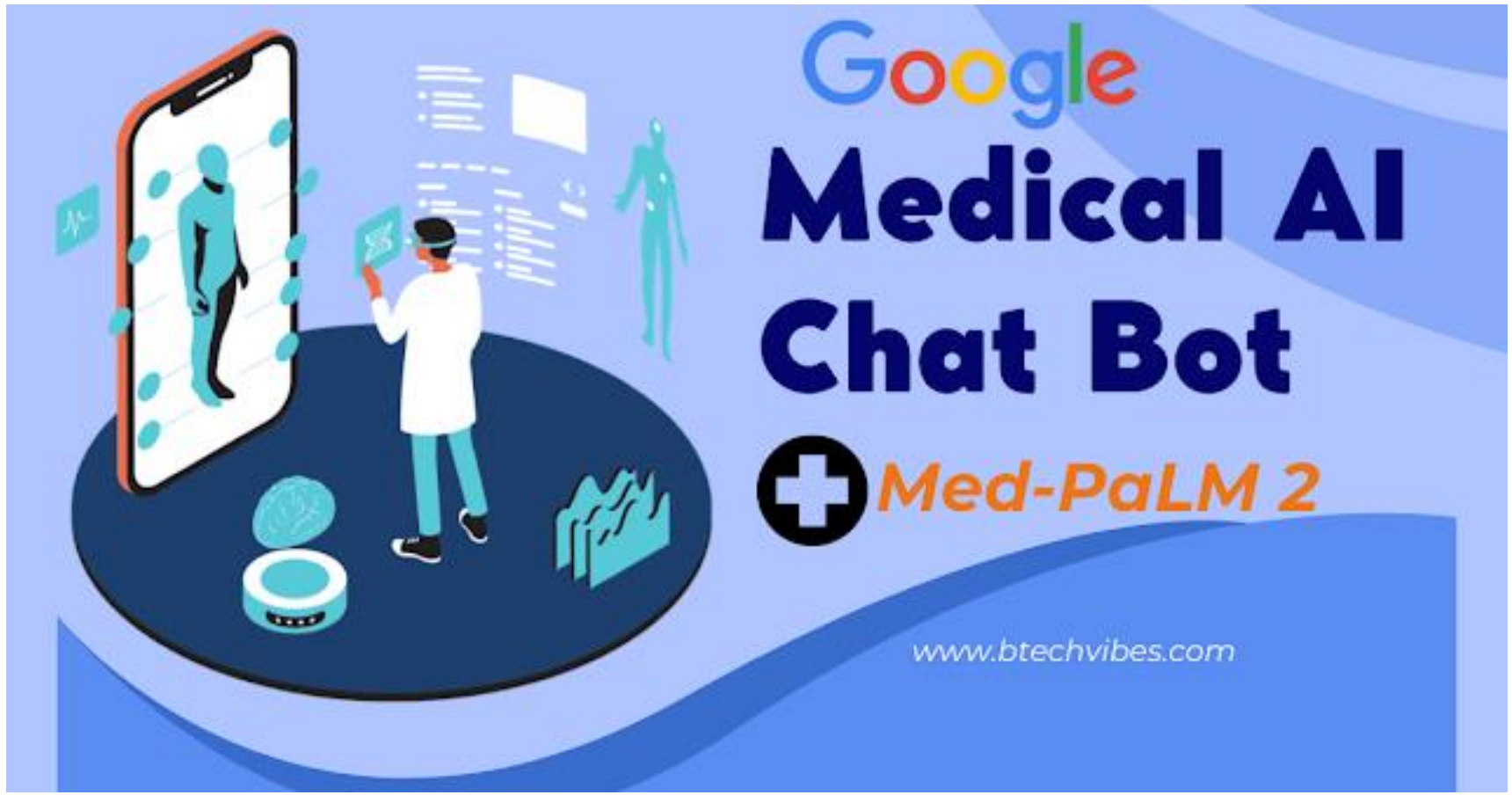
Acceptability Testing of a Mobile Application to Improve Immunization Status Monitoring and Compliance in Selected Barangay Health Centers in Iligan City

[1]Geraldine Ridad, [2]Gabriel Joseph Esporsado, [3]Abdulrauf Garangan, [4]Art Brian Escabarte and [5]Omar Khayyam Usman,
[1,2,3,4]College of Nursing, Mindanao State University- Iligan Institute of Technology, Iligan City, Philippines
[5]Amigu.co, Iligan City, Philippines


Google
Medical AI
Chat Bot
Med-PaLM 2
www.btechvibes.com

Google is taking a different approach with its LLM [Large Language Model] chatbot Med-PaLM, which pulls from a massive data set of real questions and answers from patients and providers, as well as medical licensing exams, stored in various databases. When researchers at Google tested Med-PaLM's performance on different "axes," including alignment with medical consensus, completeness and possibility of harm, in a preprint study, its answers aligned with medical and scientific consensus 92.6 percent of the time. Human clinicians scored 92.9 percent overall. Chatbot answers were more likely to have missing content than human answers were, but the answers were slightly less likely to harm users' physical or mental health.[8]

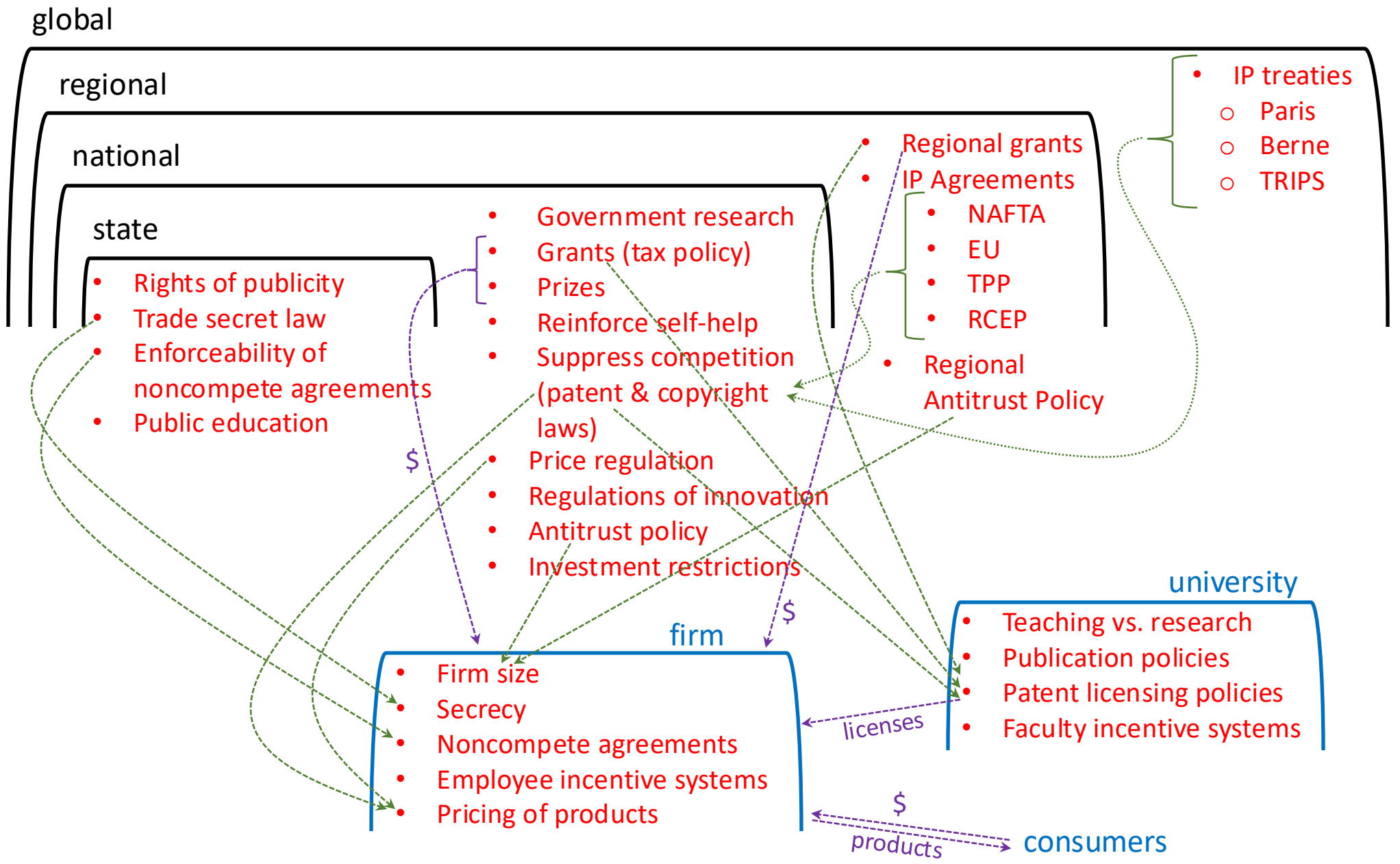
Source: Sara Reardon, "AI Chatbots Can Diagnose Medical Conditions at Home. How Good Are They?," Scientific American, March 31, 2023.

Part III: How might we manage AI -- to augment its potential benefits and minimize its potential harms?

Management of the pace and direction of innovation

Red = rules or policies; Green = lines of influence; purple = tangible benefits

Governments



Civil Society

Management of the pace and direction of AI

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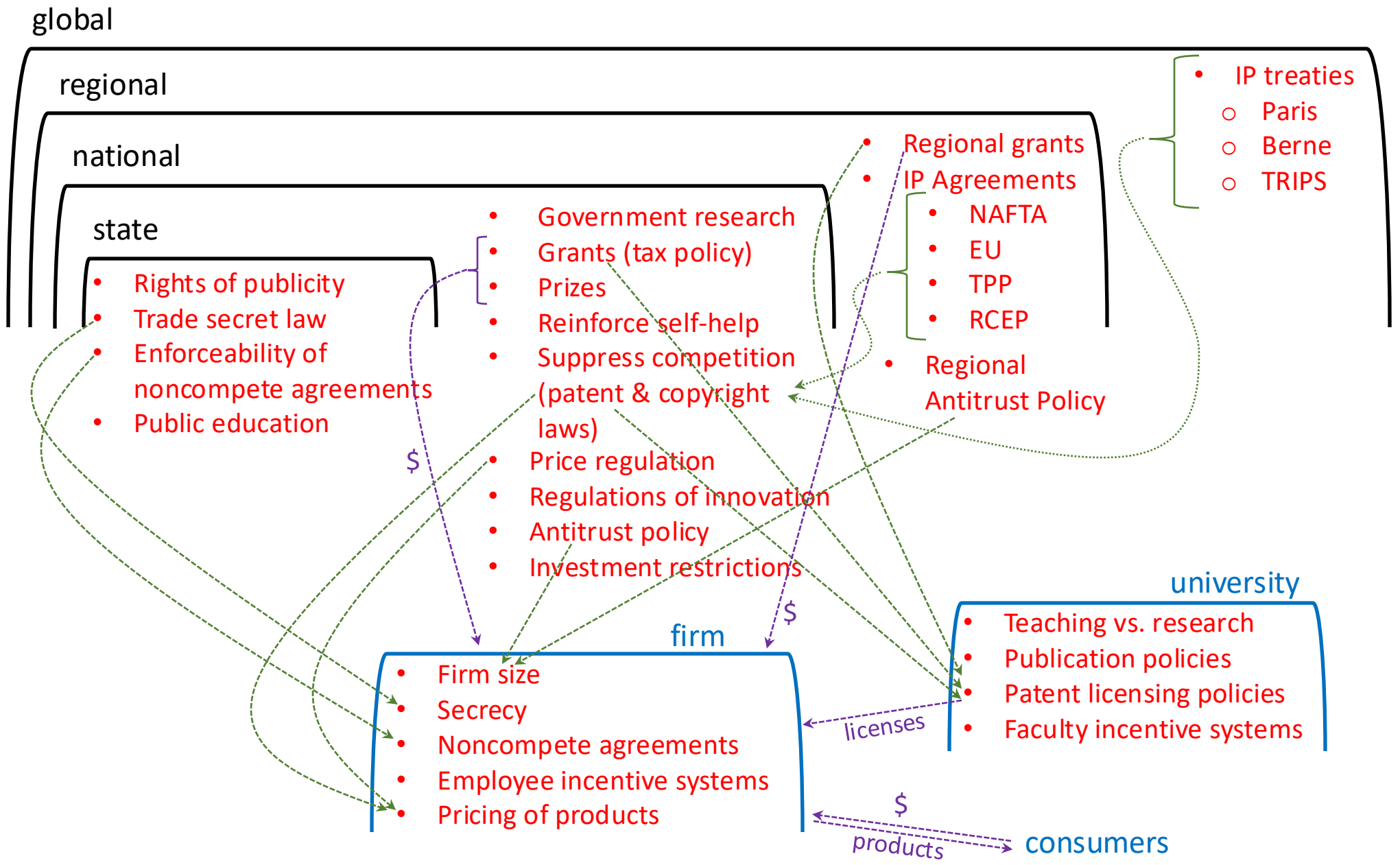

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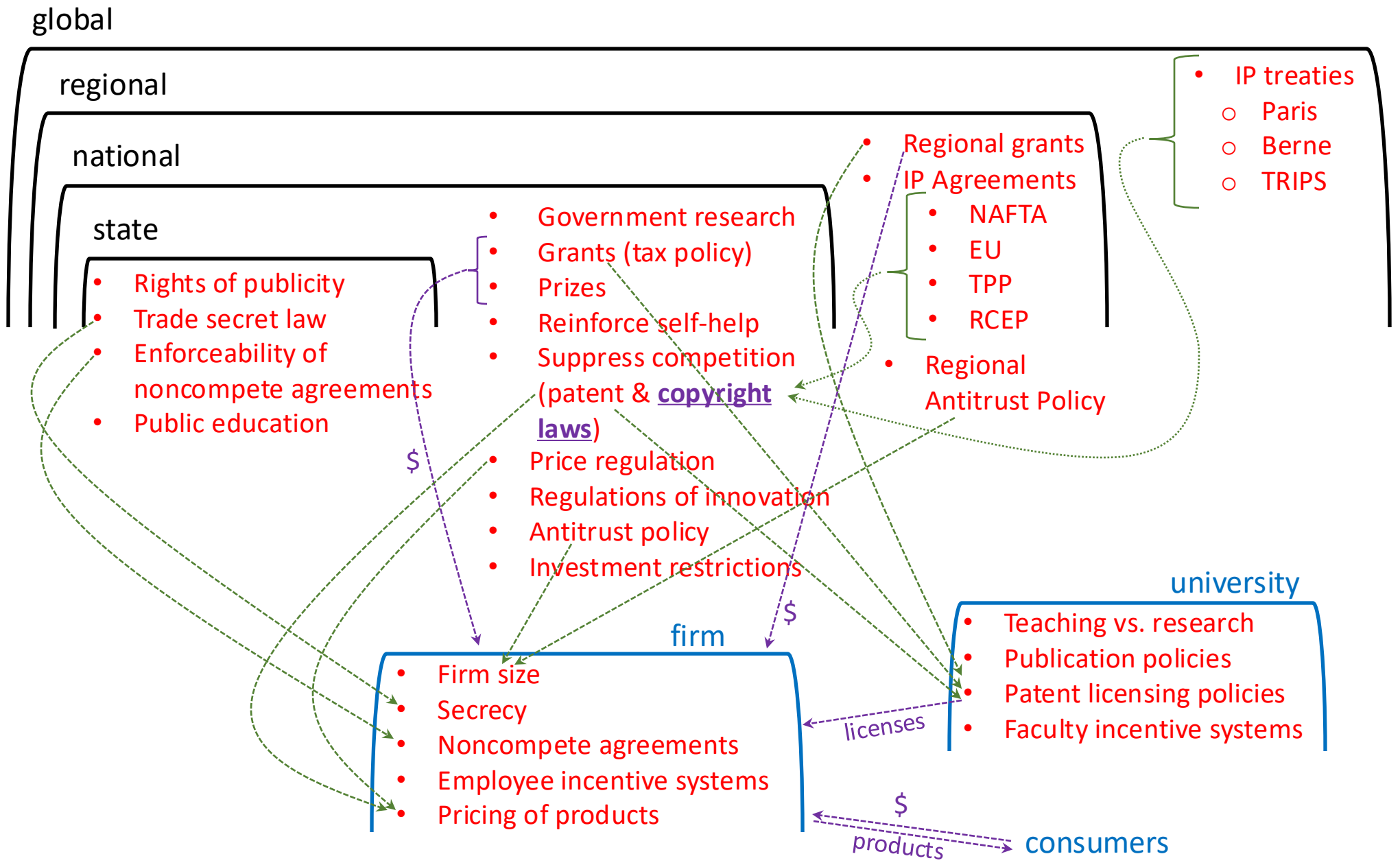

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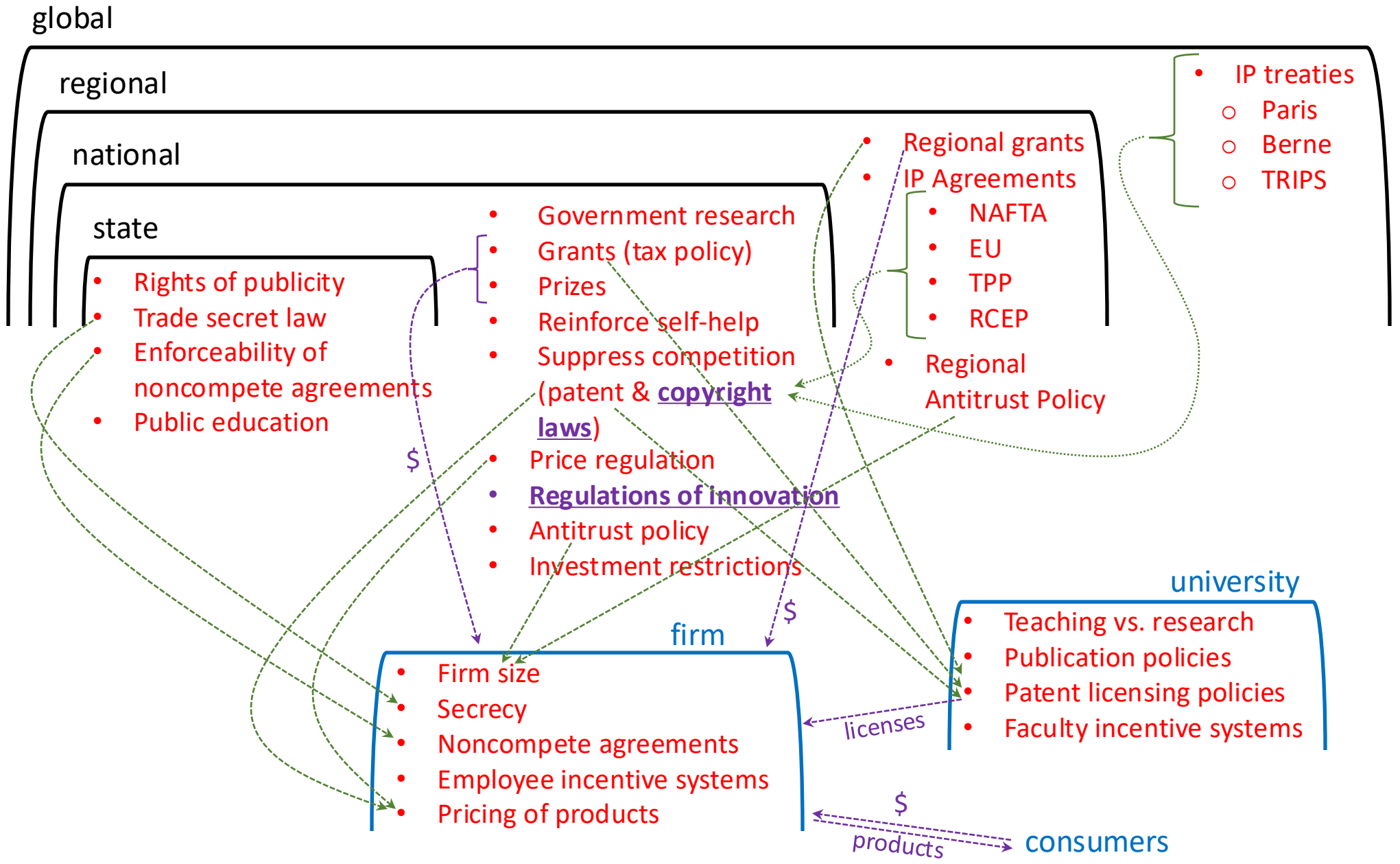

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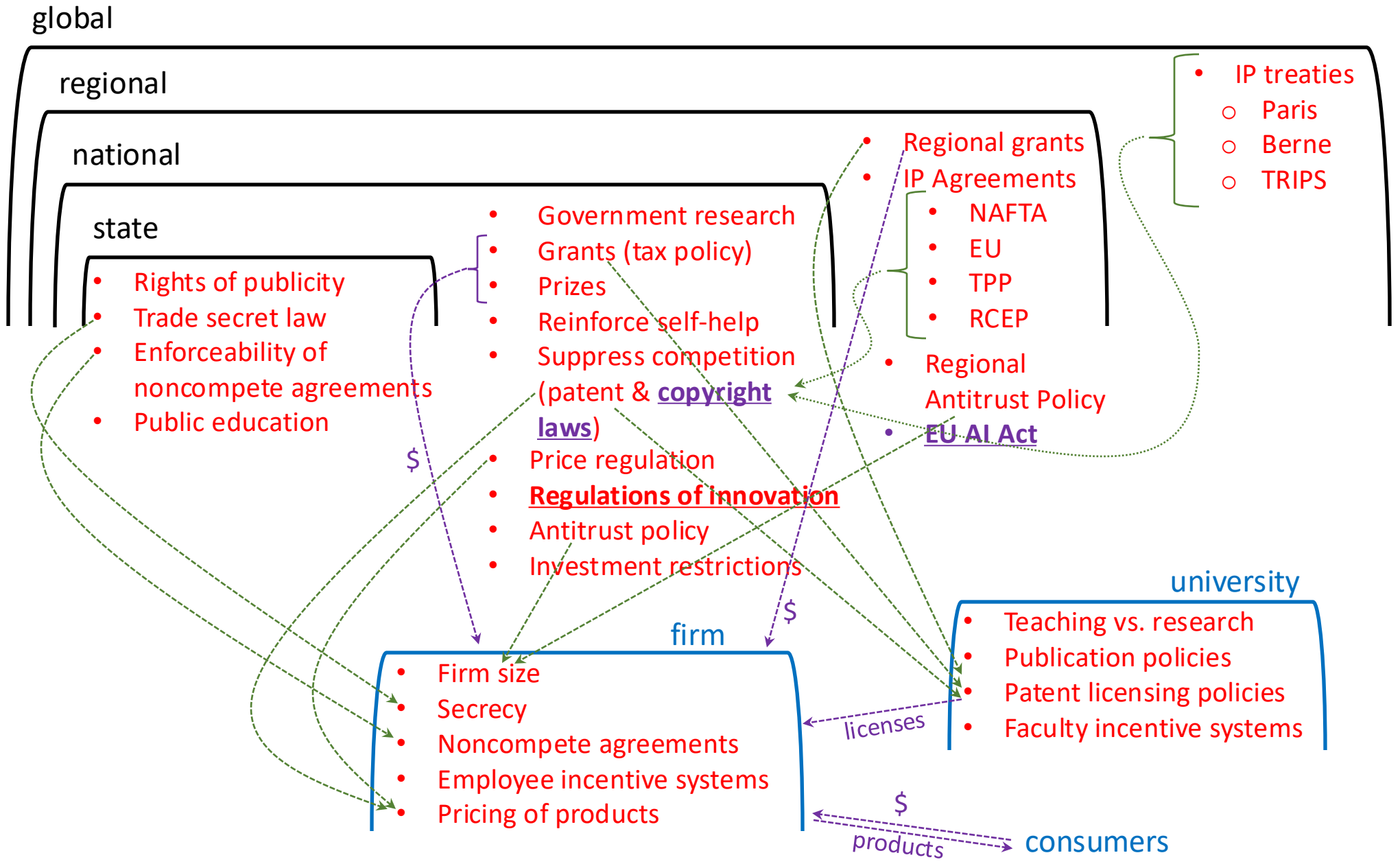

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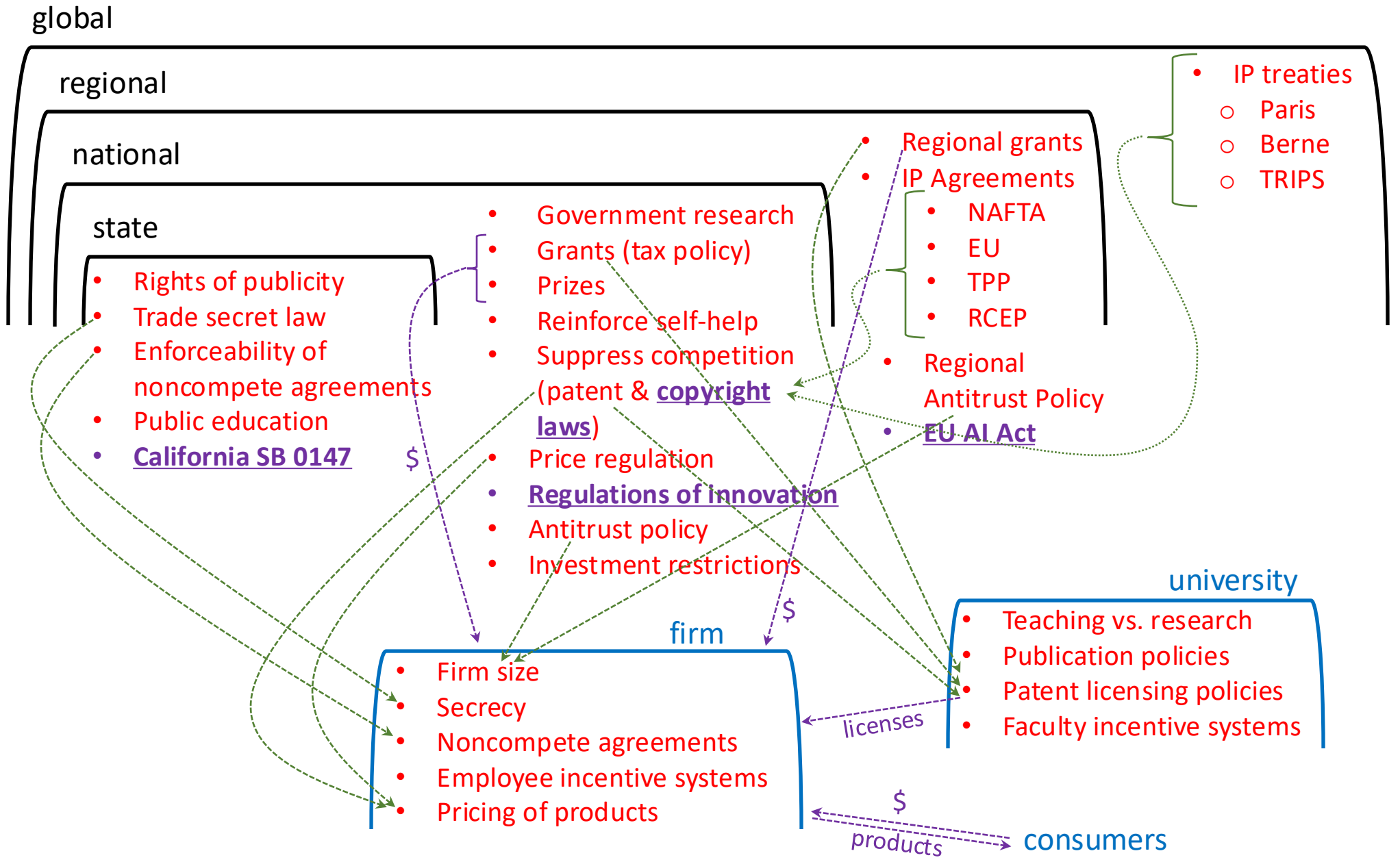

Civil Society

Governmental Management of AI

Advantages:

- Investigative power
- Coercive power

Governmental Management of AI

Advantages:

- Investigative power
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Disadvantages:

Governmental Management of AI

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Disadvantages:

- Slow

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Disadvantages:

- Slow
- Limited technical competence

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Disadvantages:

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E.g., CA SB 1047 would have required all Large-scale AI models to include a “kill switch”

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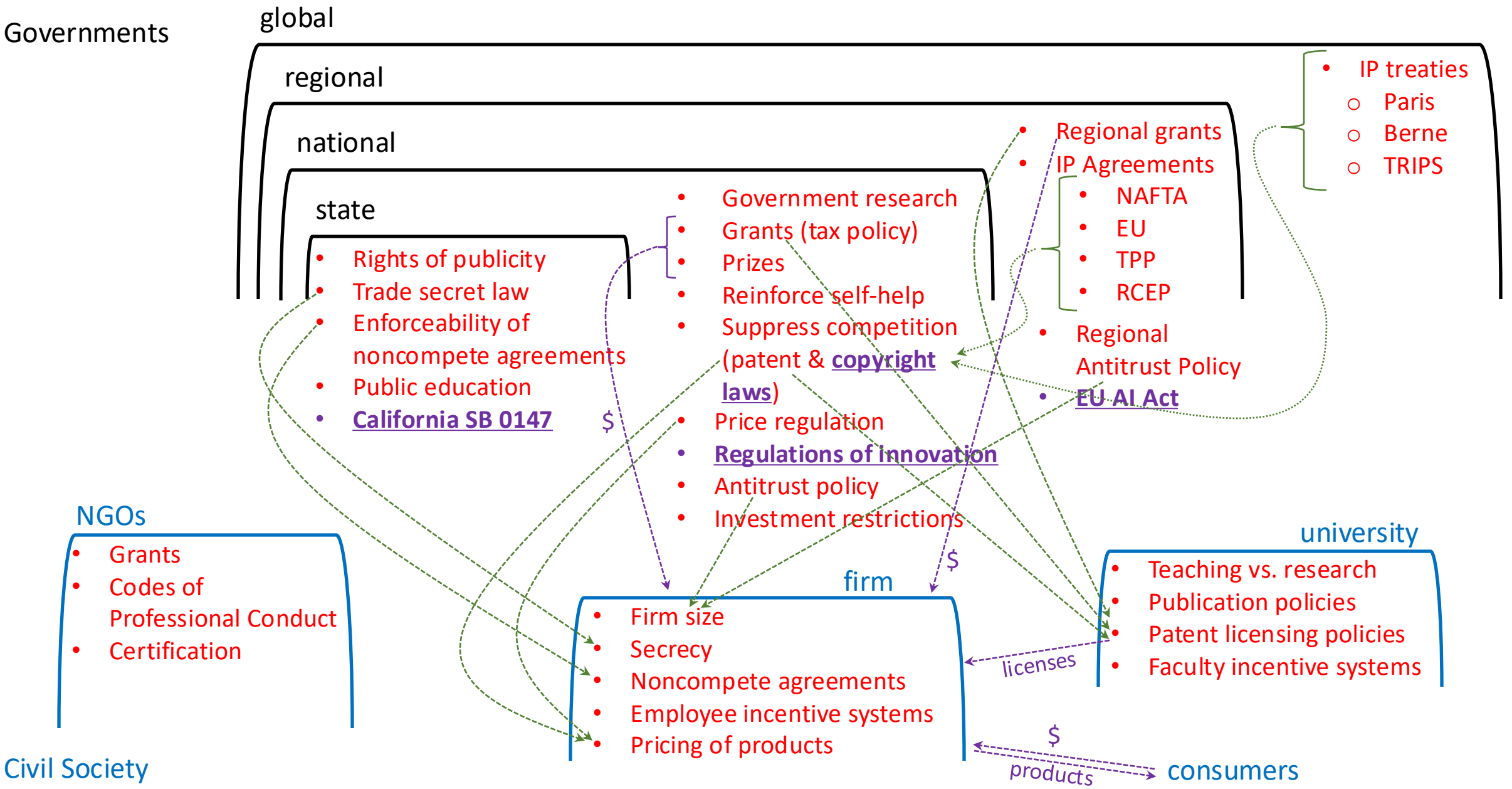

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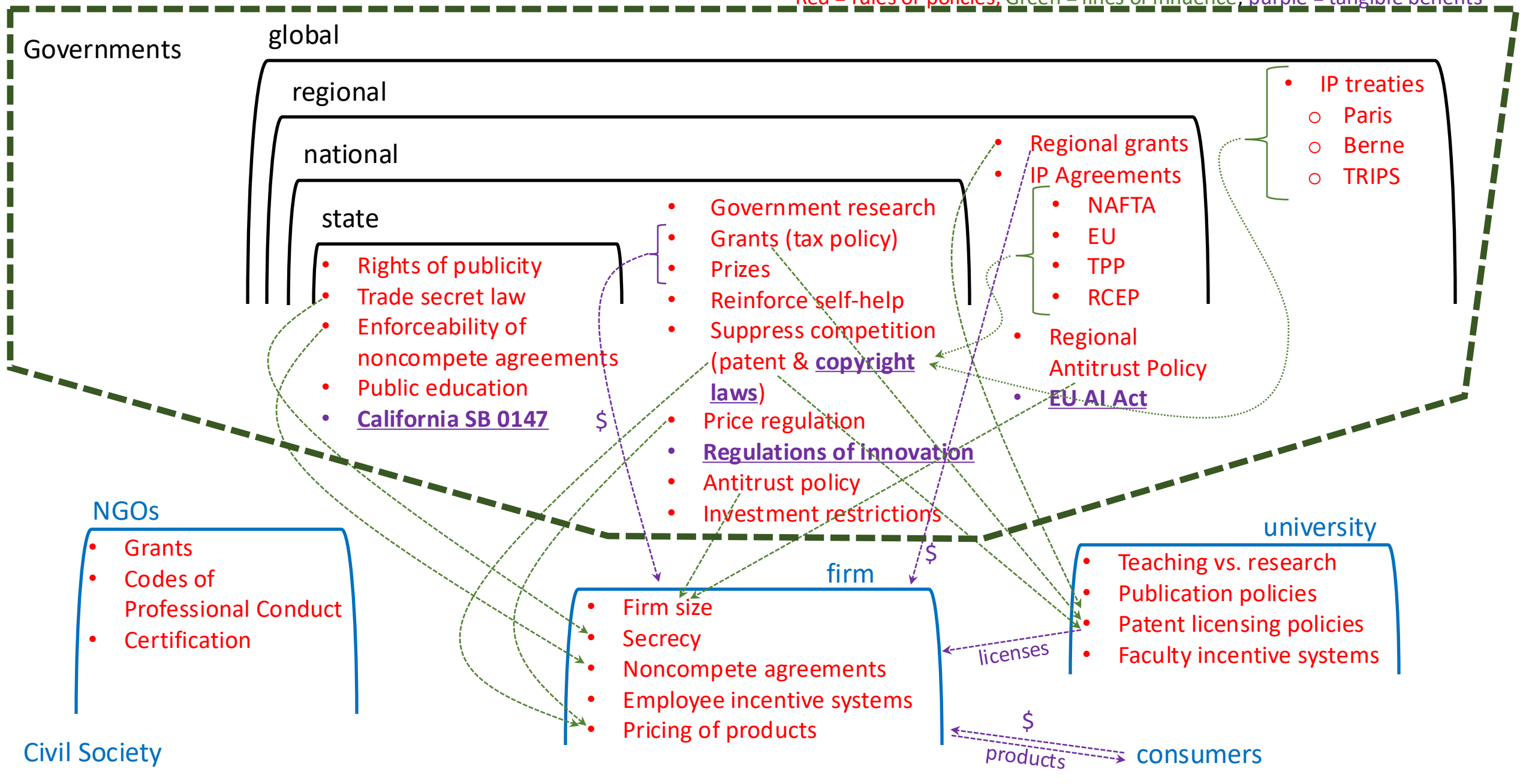

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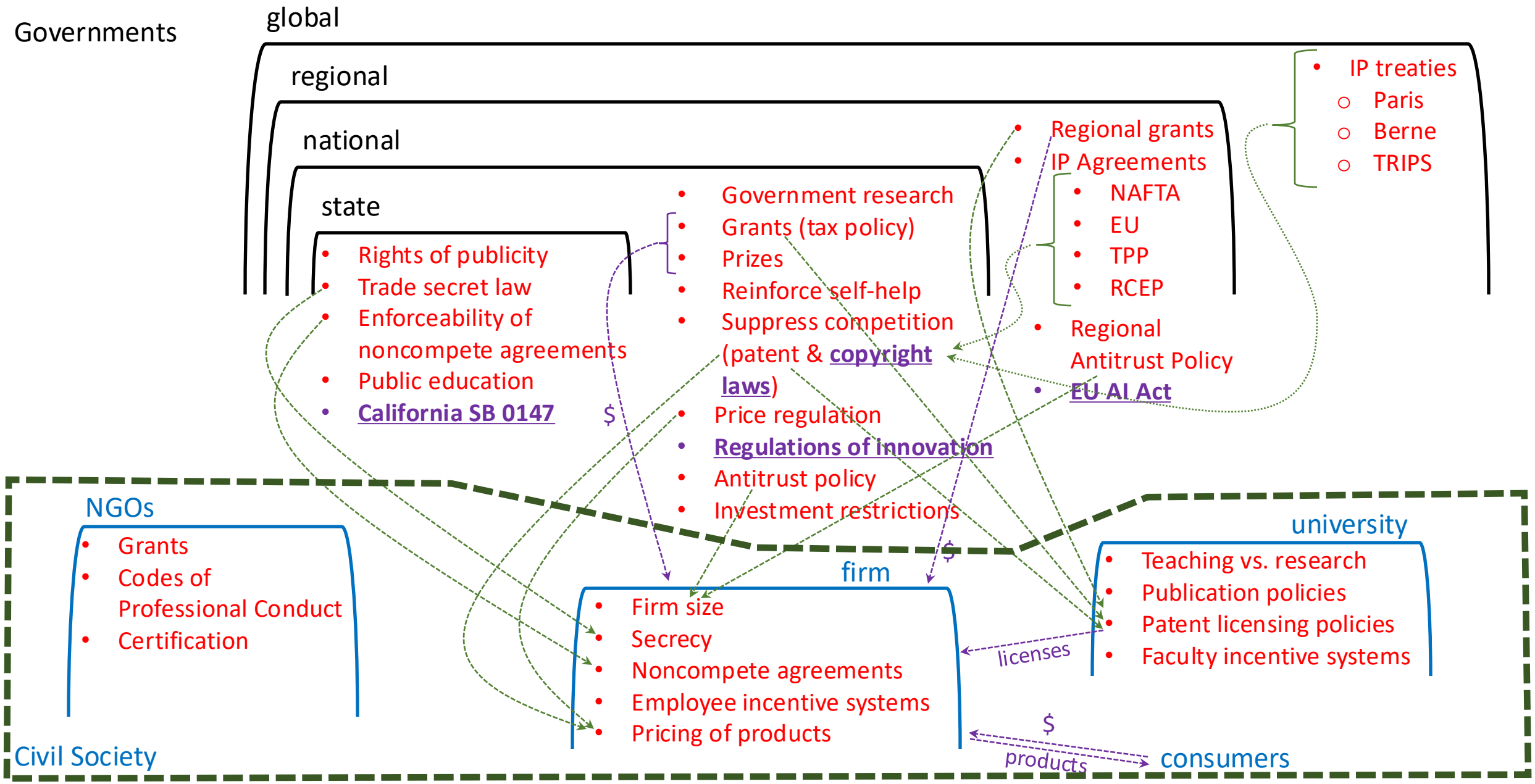

Proposal

- Limited reliance on governments to manage AI
  a) Mandatory disclosure rules
  b) IP protection for the fruits of AI
  c) No injunctive relief for use of copyrighted material in training data
- Increased reliance on the institutions of civil society
  a) Photojournalists' Code of Ethics
  b) Medical Codes of Ethics
  c) "Best Practices" for generative AI

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- Model builders must reveal:
  - Contents of data set used for training
  - Specific works used in prompts
  - How the algorithms were designed and tuned
  - Results of tests for safety and bias
- Producers and distributors of materials prepared with the assistance of AI must label them

Current Attribution Requirements

- China Interim AI Guidelines (August 2023)
  - Generative AI systems must disclose that their products were produced through the use of AI
- EU AI Act (December 2023; effective in 2025)
  - Generative AI systems must disclose that their products were produced through the use of AI
- USA does not yet have a general attribution requirement
  - “No Fakes Act” (pending) would forbid ”the production of a digital replica without the consent of the applicable individual or rights holder”

No Fakes Act (USA)

(c) Liability.—

(1) IN GENERAL.—Any person that, in a manner affecting interstate or foreign commerce (or using any means or facility of interstate or foreign commerce), engages in an activity described in paragraph (2) shall be liable in a civil action brought under subsection (d) for any damages sustained by the individual or rights holder injured as a result of that activity.

(2) ACTIVITIES DESCRIBED.—An activity described in this paragraph is either of the following:

(A) The production of a digital replica without consent of the applicable individual or rights holder.

(B) The publication, distribution, or transmission of, or otherwise making available to the public, an unauthorized digital replica, if the person engaging in that activity has knowledge that the digital replica was not authorized by the applicable individual or rights holder.

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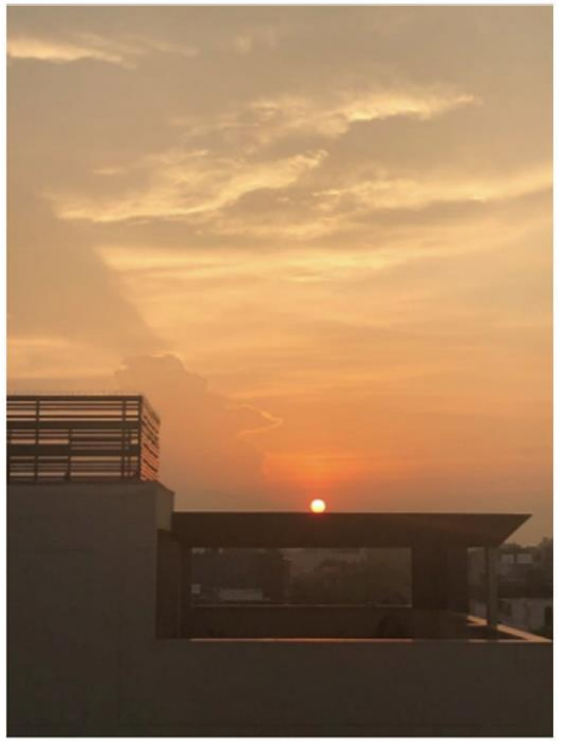

Mr. Sahni's Original Photograph (base image)

Vincent Van Gogh's *The Starry Night* (style image)

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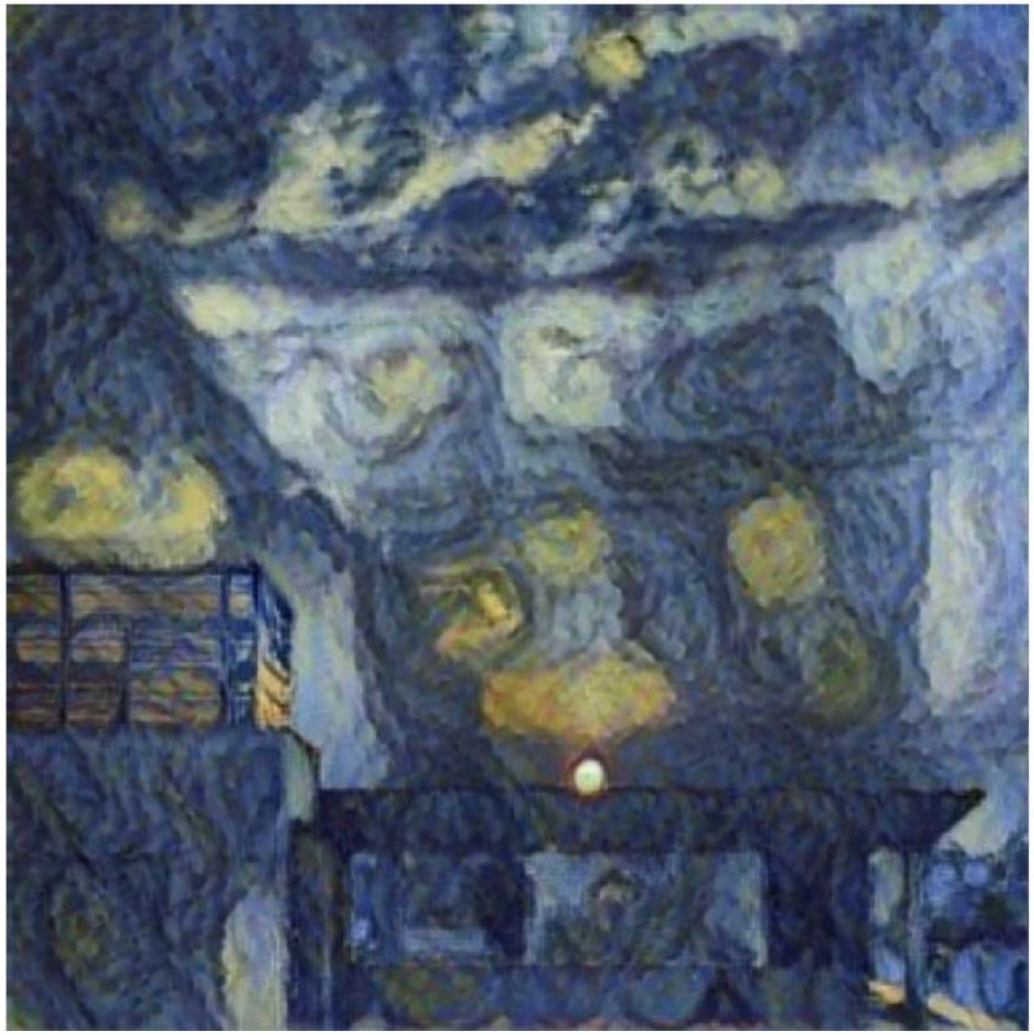

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Reasons:

- Avoid forfeiture of potential social benefits
- Transaction costs and royalty stacking will prevent socially beneficial licensing arrangements

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National Press Photographers Association: Code of Ethics

1) Be accurate and comprehensive in the representation of subjects.
2) Resist being manipulated by staged photo opportunities.
3) Be complete and provide context when photographing or recording subjects. Avoid stereotyping individuals and groups. Recognize and work to avoid presenting one's own biases in the work.
4) Treat all subjects with respect and dignity. Give special consideration to vulnerable subjects and compassion to victims of crime or tragedy. Intrude on private moments of grief only when the public has an overriding and justifiable need to see.
5) While photographing subjects do not intentionally contribute to, alter, or seek to alter or influence events.
6) Editing should maintain the integrity of the photographic images' content and context. Do not manipulate images or add or alter sound in any way that can mislead viewers or misrepresent subjects.
7) Do not pay sources or subjects or reward them materially for information or participation.
8) Do not accept gifts, favors, or compensation from those who might seek to influence coverage.
9) Do not intentionally sabotage the efforts of other journalists.
10) Do not engage in harassing behavior of colleagues, subordinates or subjects and maintain the highest standards of behavior in all professional interactions.

- Source: https://nppa.org/resources/code-ethics

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National Press Photographers Association: Code of Ethics

Visual Integrity

To photograph means to write with light. Visual journalists must attain and maintain the highest ethical standards in order to be considered *the best of photojournalism.* The last year has seen tremendous technological growth in the areas of artificial intelligence in the most common software applications we use.

The use of AI generative tools to create, add, remove, expand or alter images or videos in any way is expressly prohibited. The content of a photograph or video clip – what is seen and what is not seen, what is heard and what is not heard – is locked at the moment it is recorded.

Source: https://bop.nppa.org/2024/visual-integrity/#:~:text=The%20use%20of%20AI%20generative,the%20moment%20it%20is%20recorded.

Proposal

- Limited reliance on governments to manage AI
  a) Mandatory disclosure rules
  b) IP protection for the fruits of AI
  c) No injunctive relief for use of copyrighted material in training data
- Increased reliance on the institutions of civil society
  a) Photojournalists' Code of Ethics
  b) Medical Codes of Ethics
  c) "Best Practices" for generative AI

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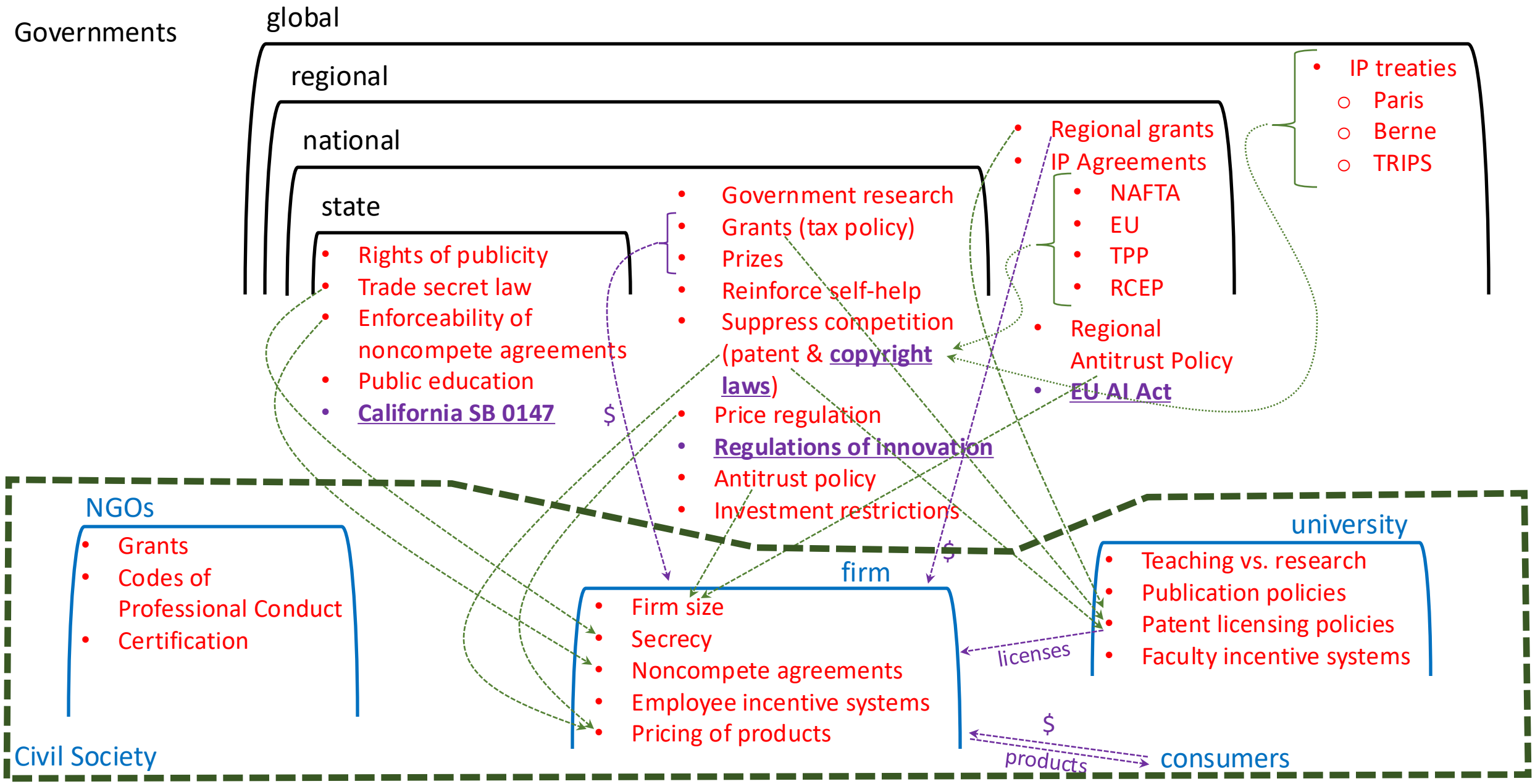
Management of the pace and direction of AI

Red = rules or policies; Green = lines of influence; purple = tangible benefits



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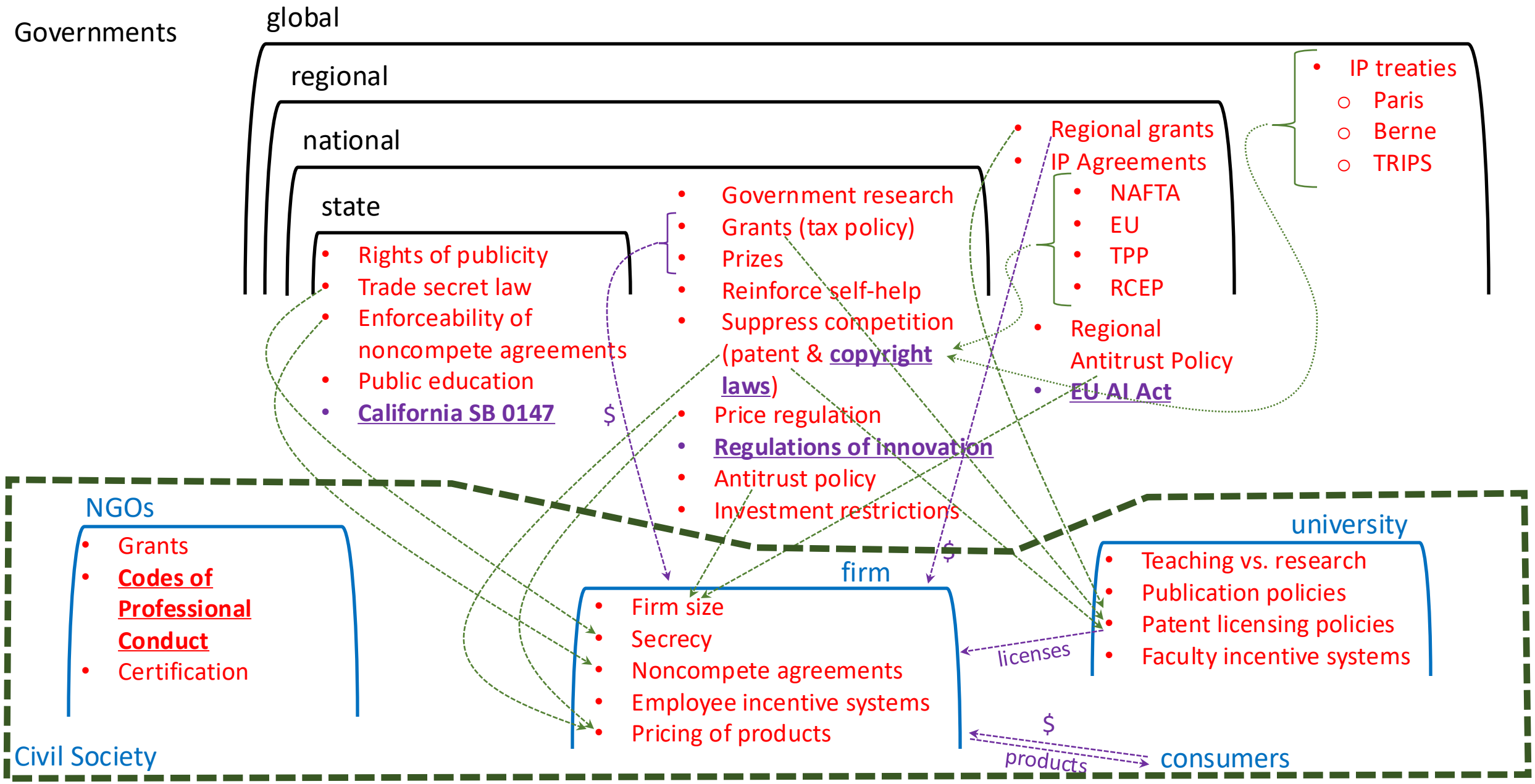
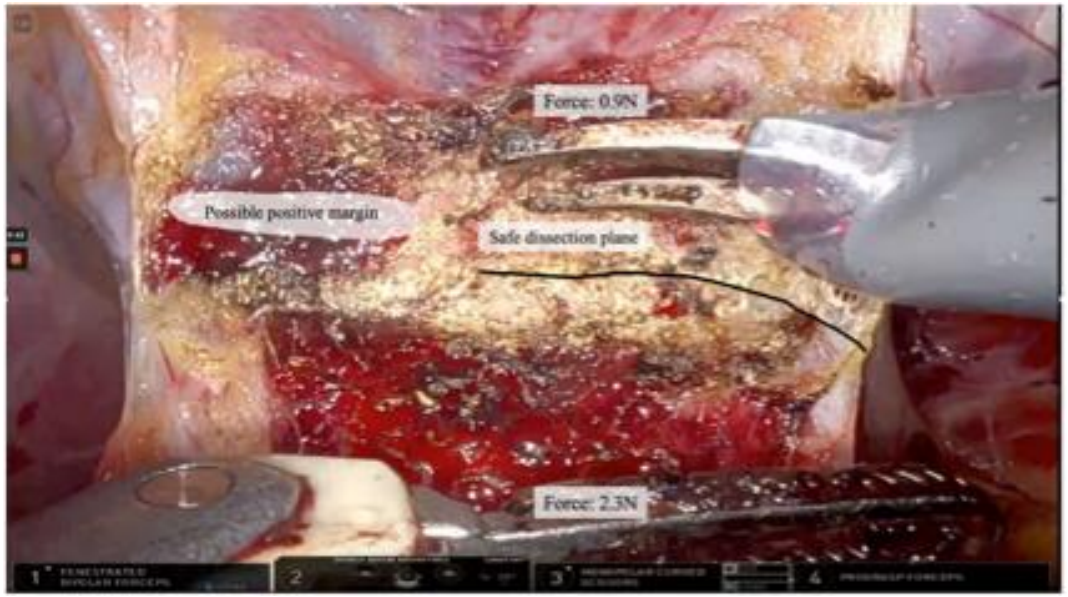


Tort Liability

Tort Liability



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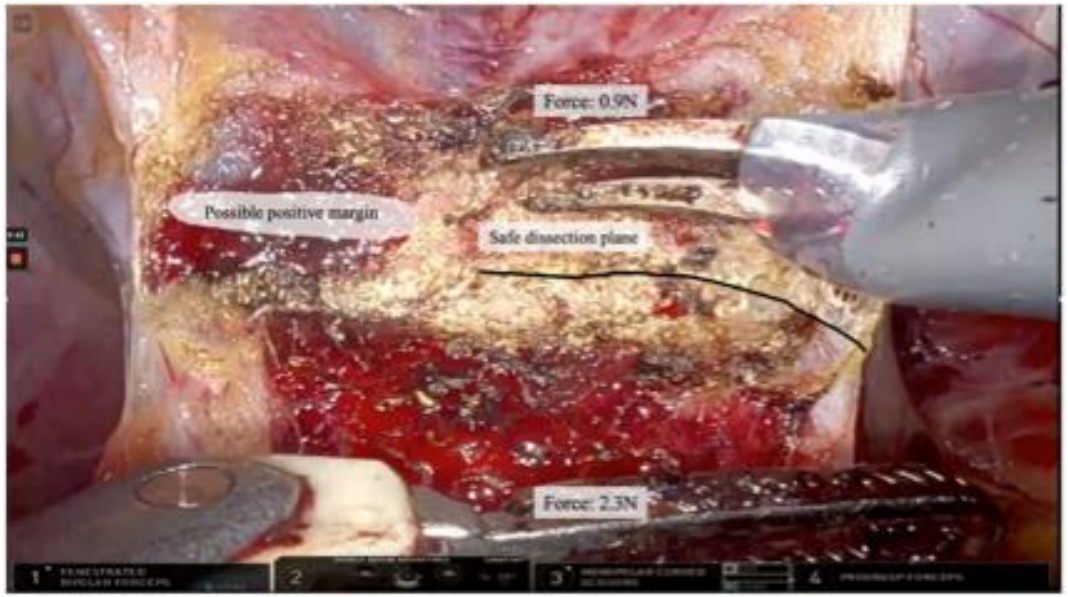

Patient

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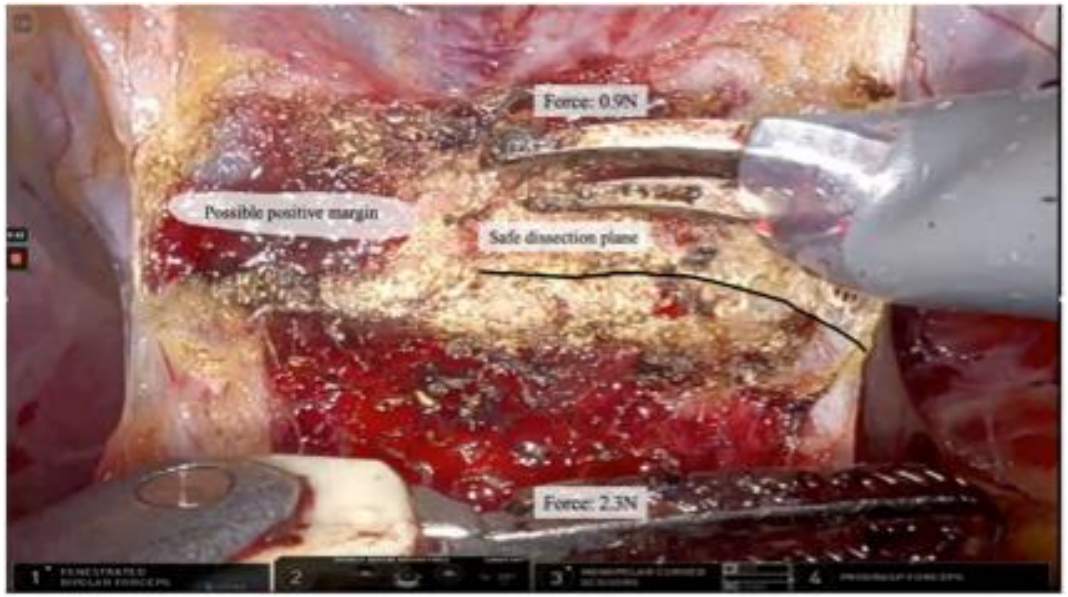

Healthcare Provider

Patient

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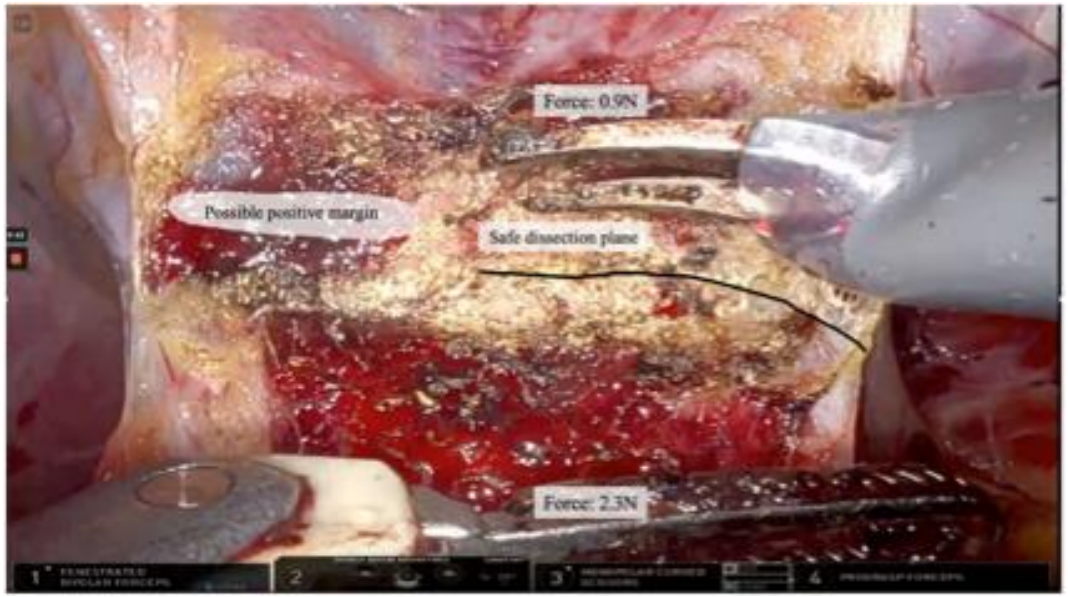


Healthcare Facility

Healthcare Provider

Patient

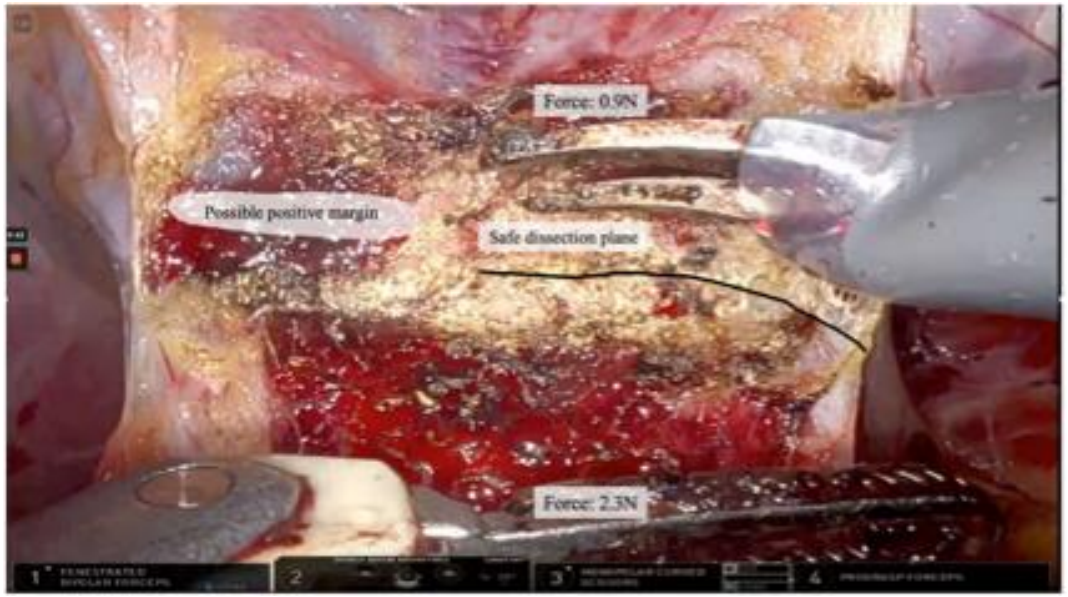
Tort Liability

AI Developer

Healthcare Facility

Healthcare Provider

Patient



Tort Liability

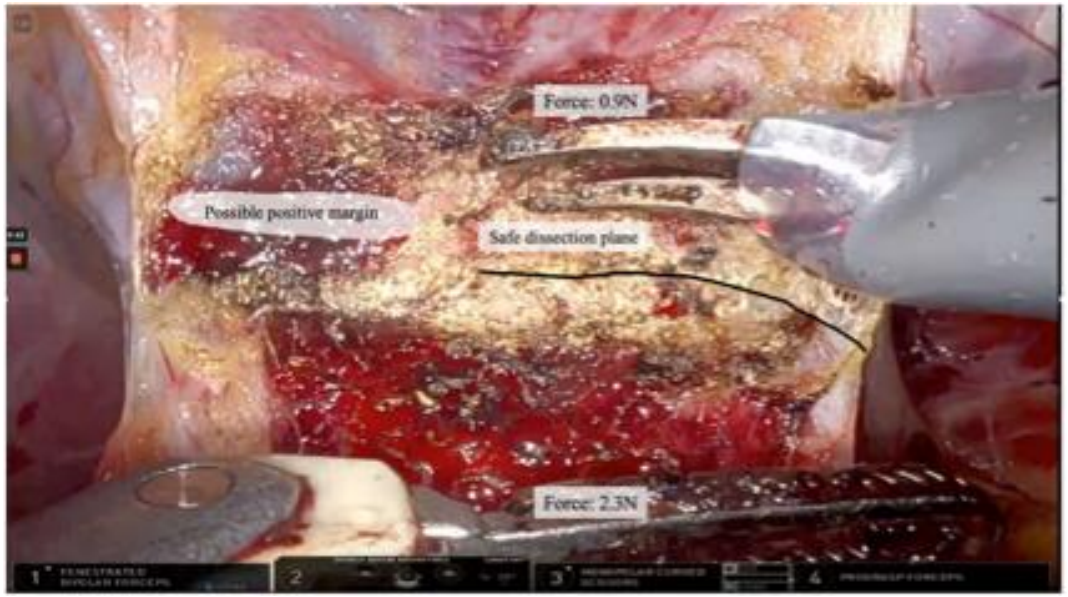
Legal Relationships

AI Developer

Healthcare Facility

Healthcare Provider

Patient



Tort Liability

Legal Relationships

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license

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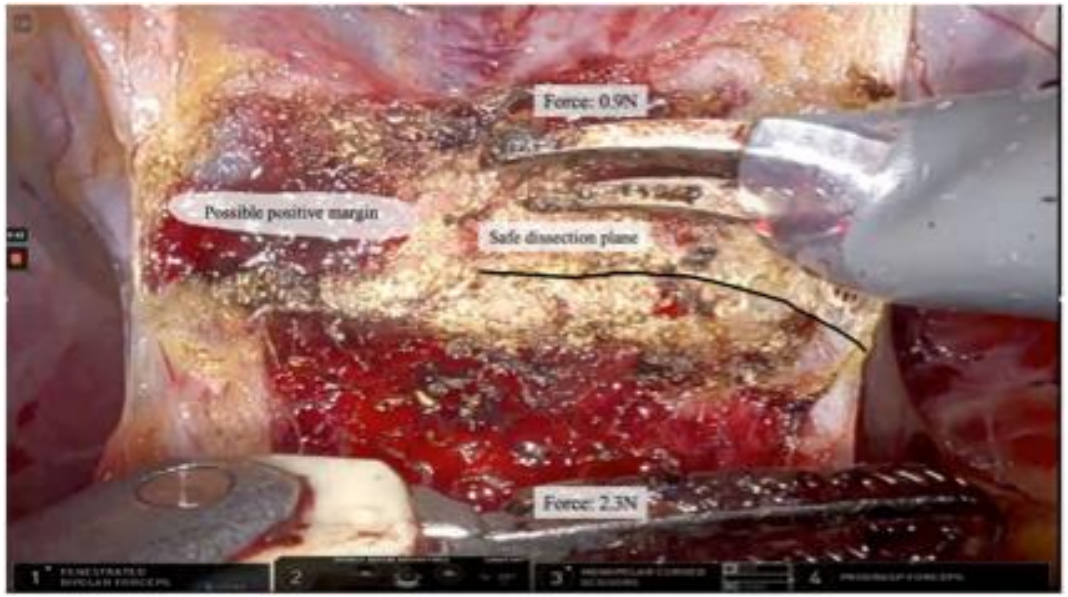

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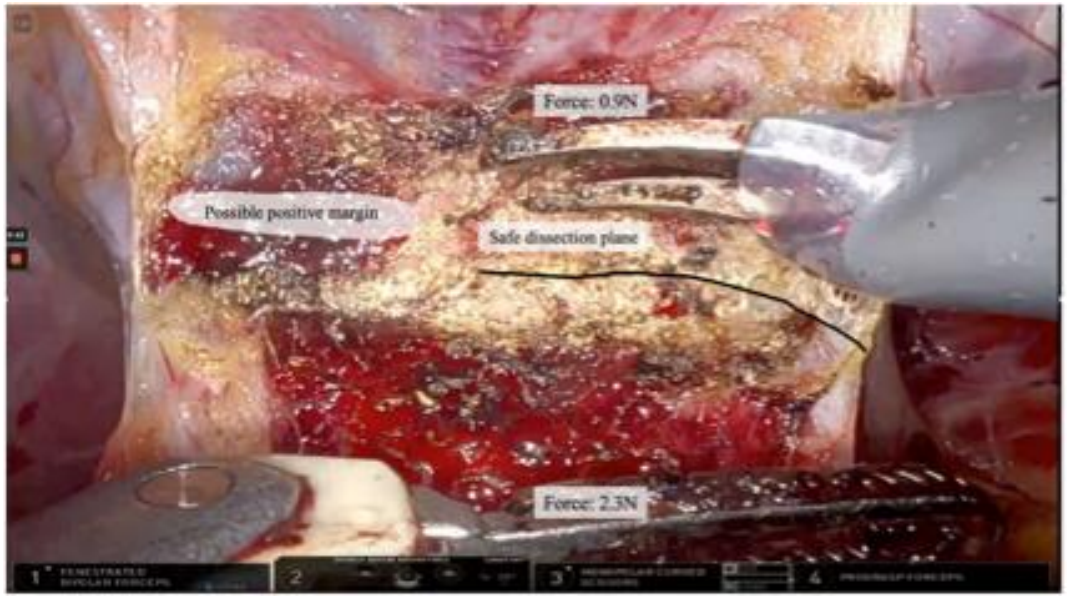

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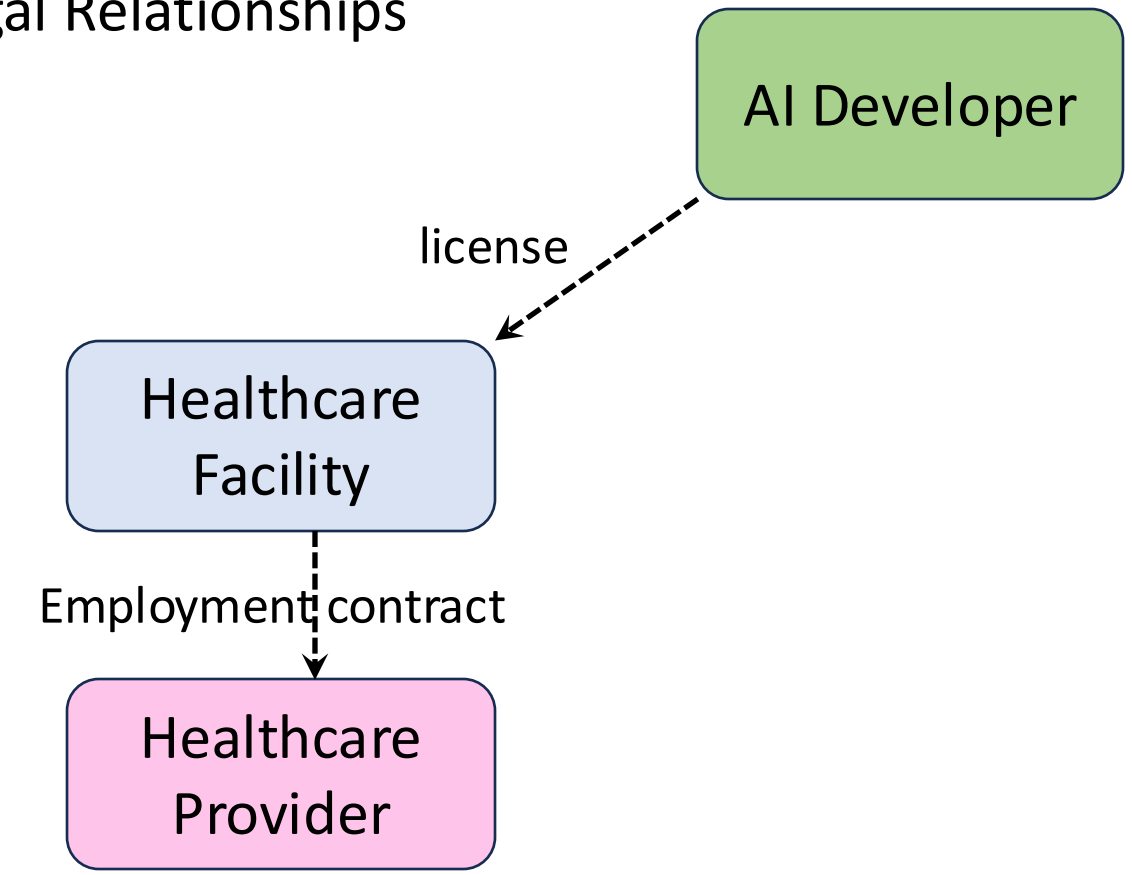

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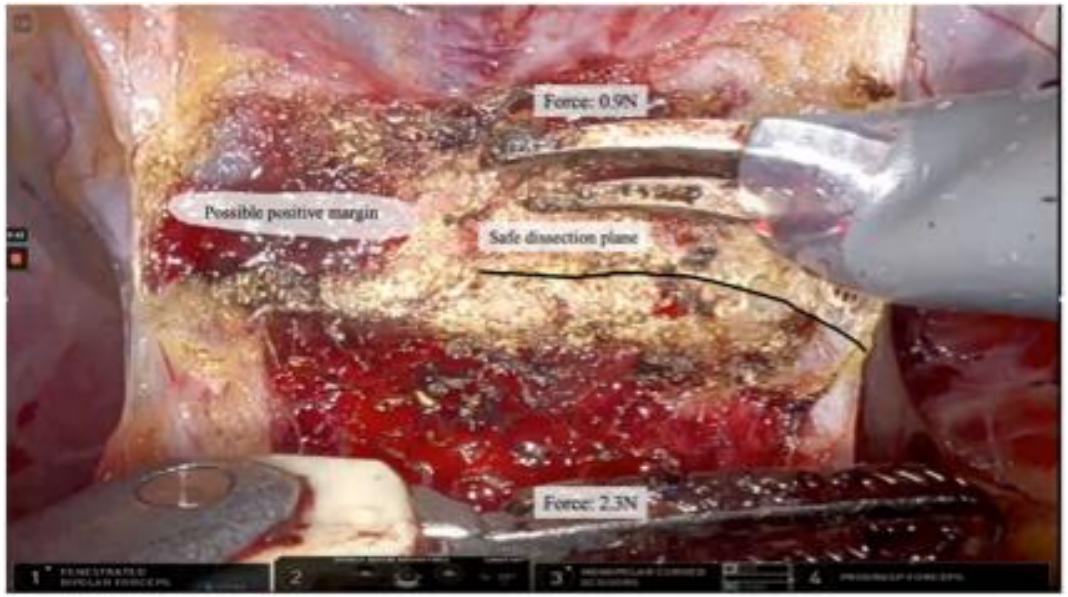

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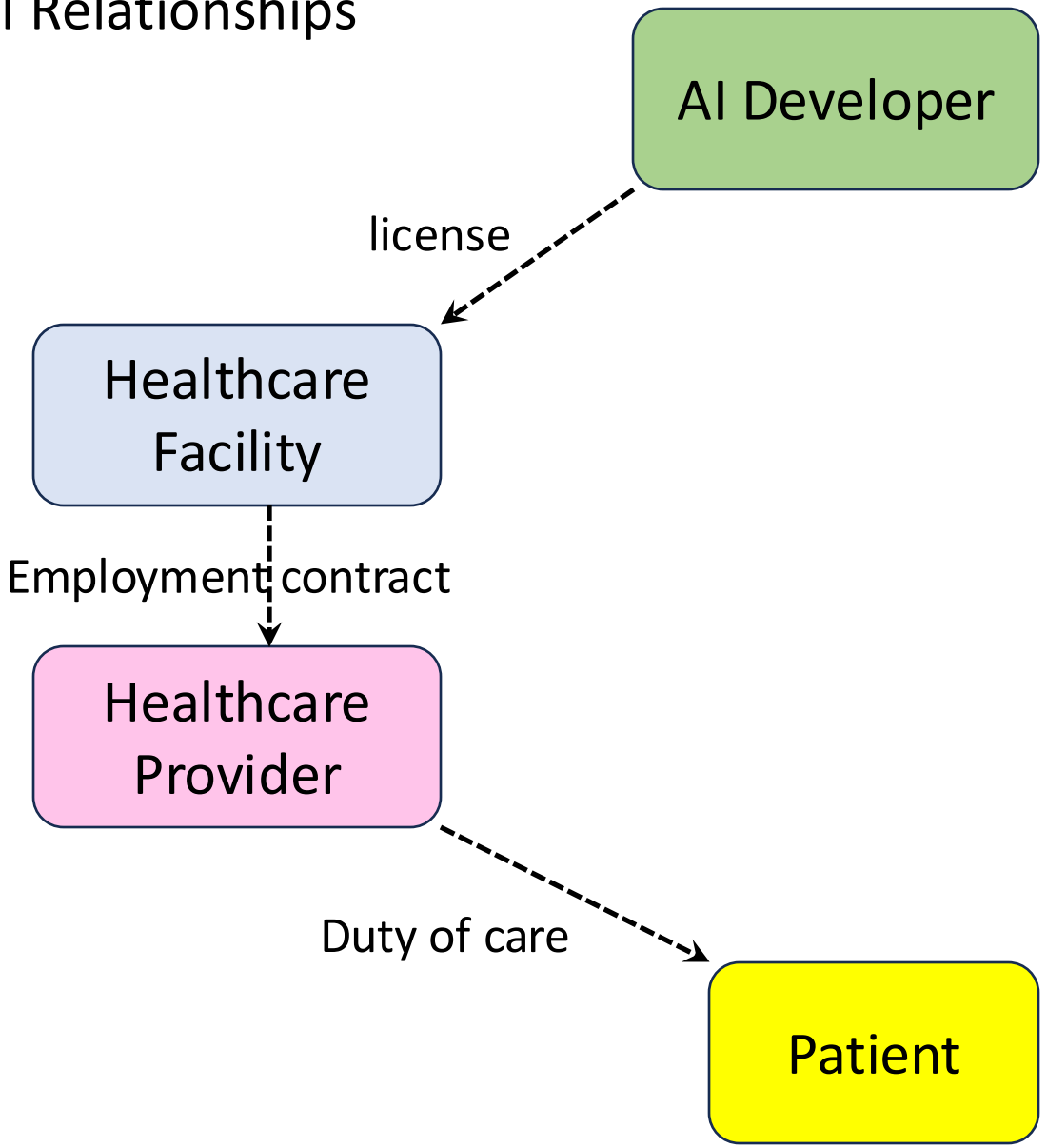

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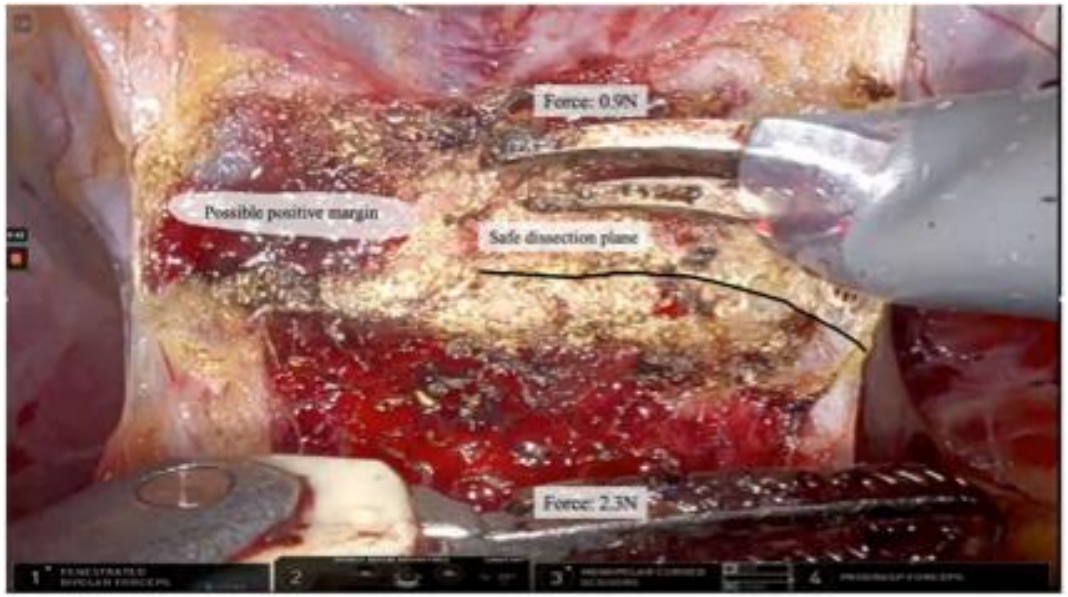

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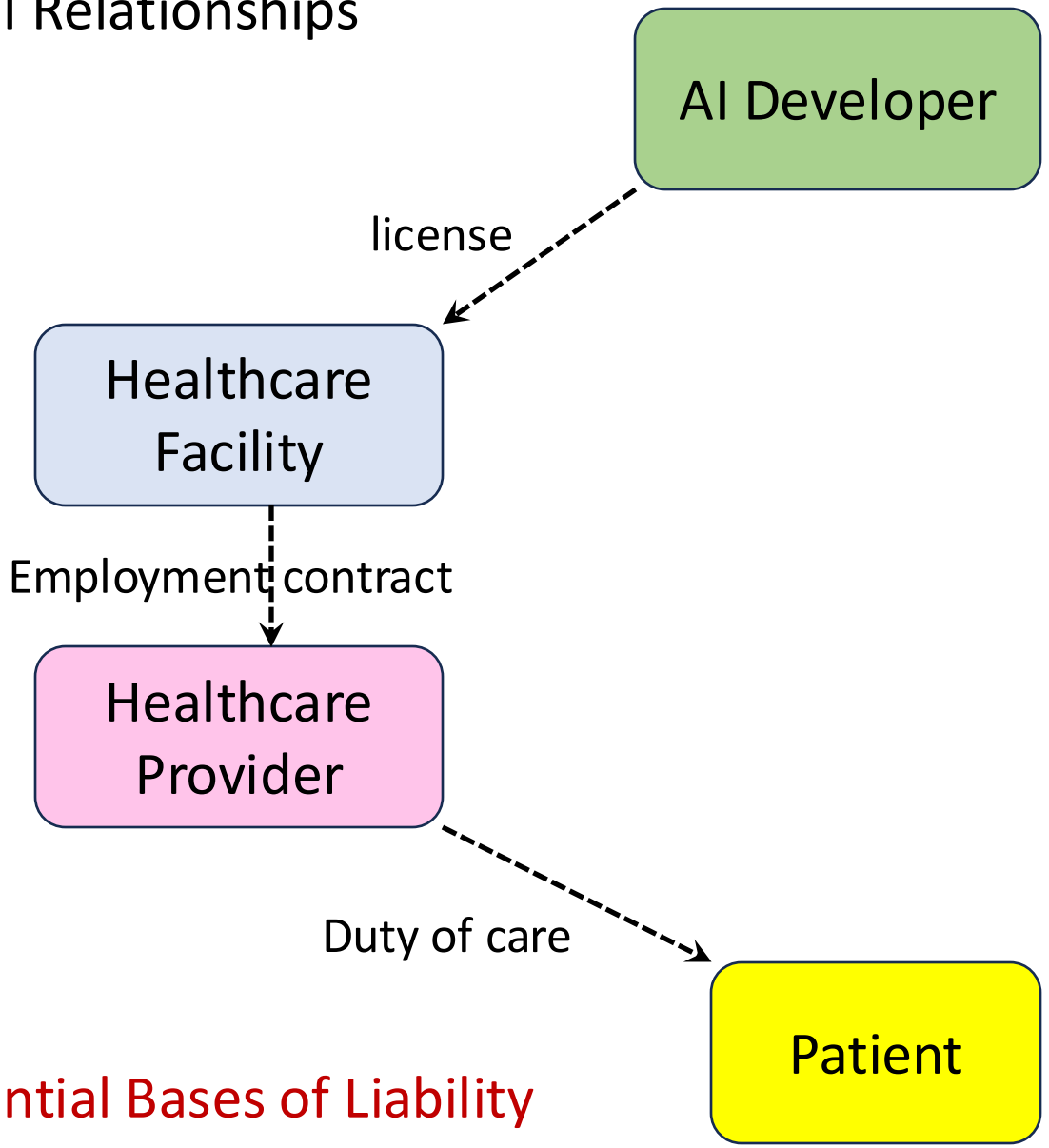

Potential Bases of Liability

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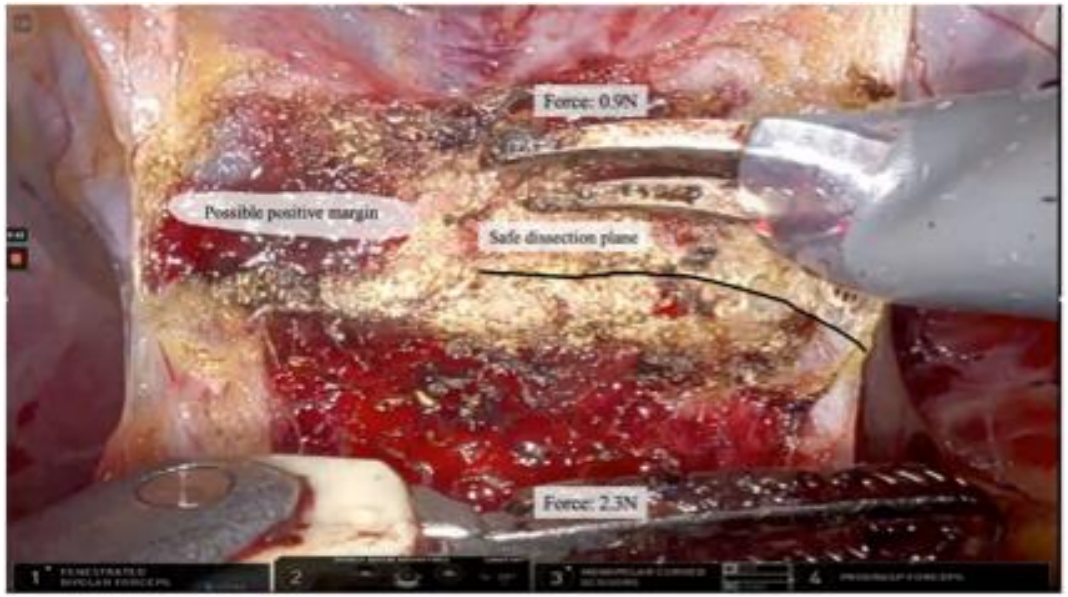

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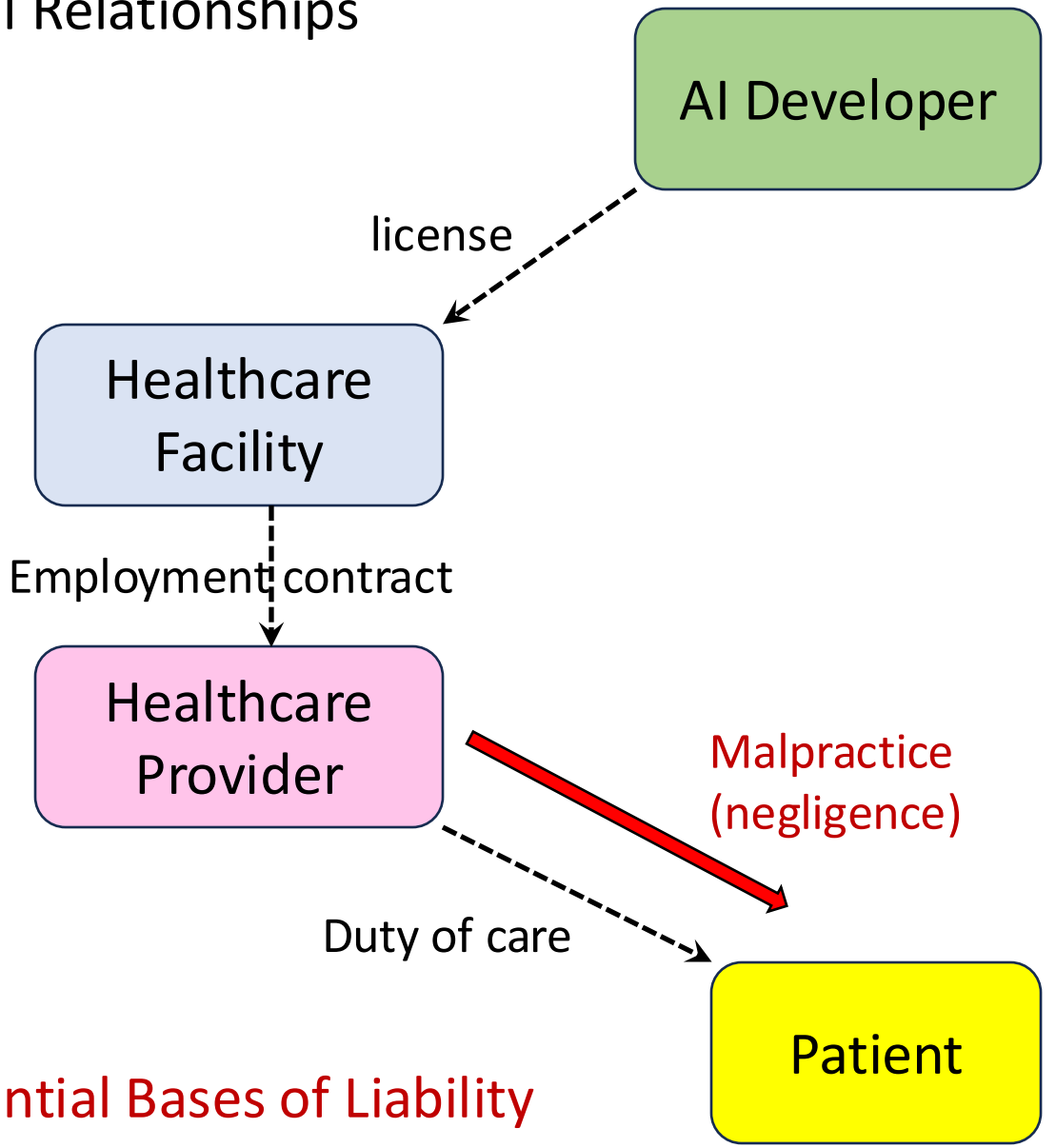

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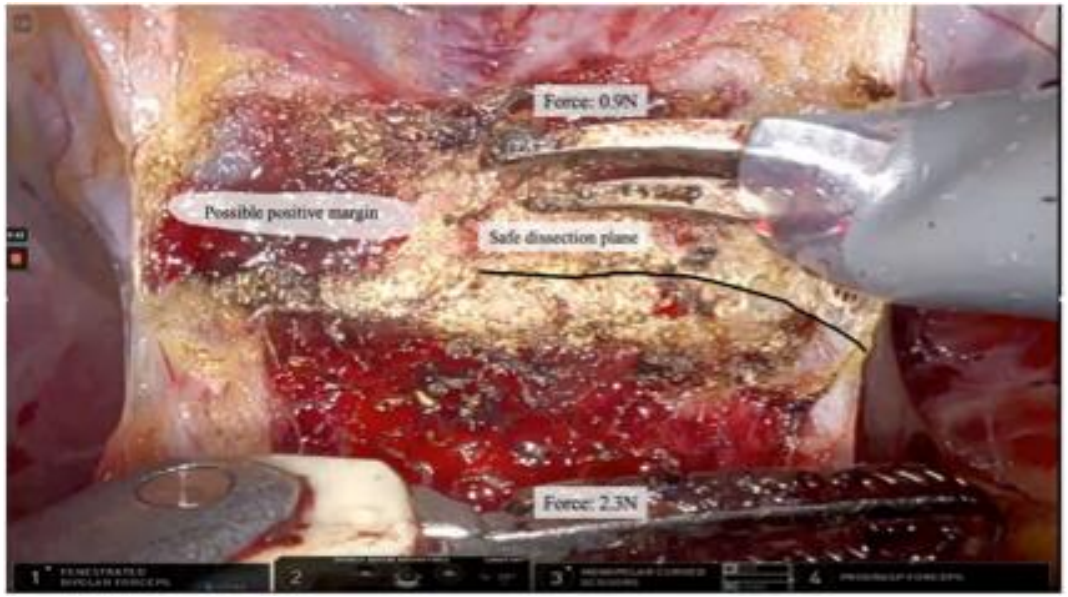

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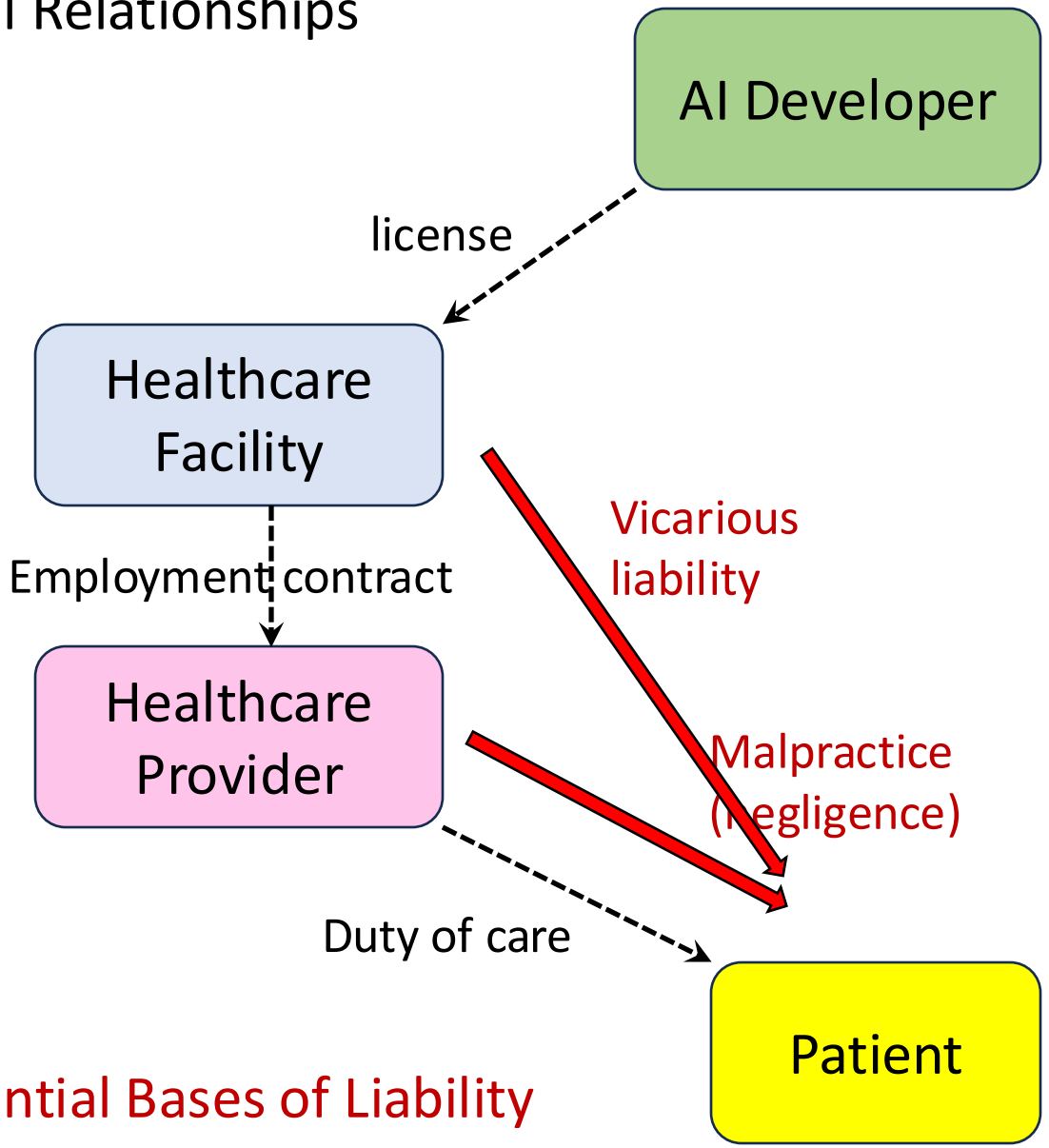

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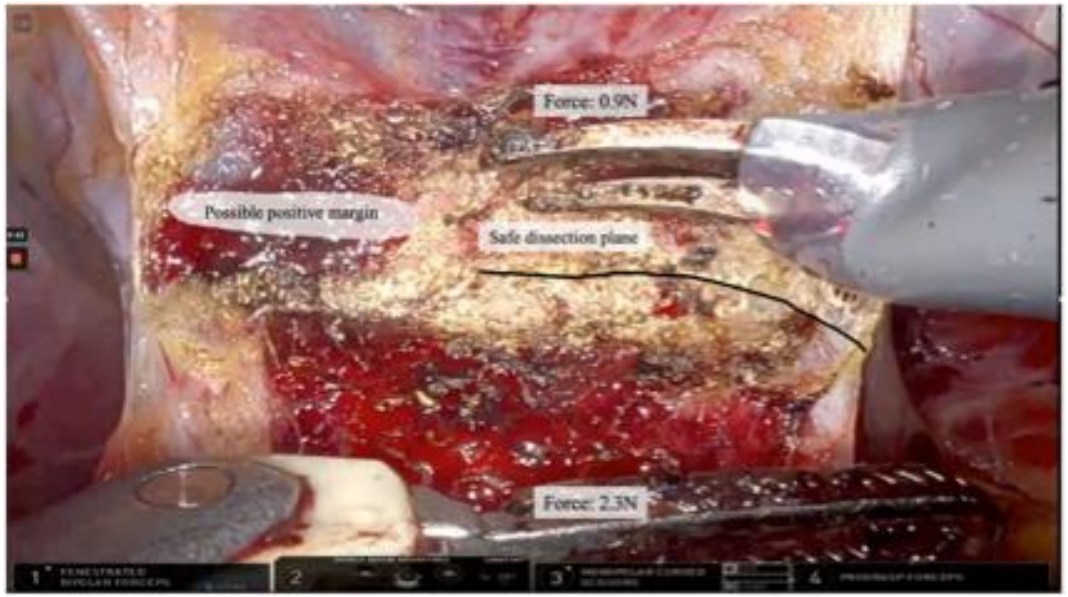

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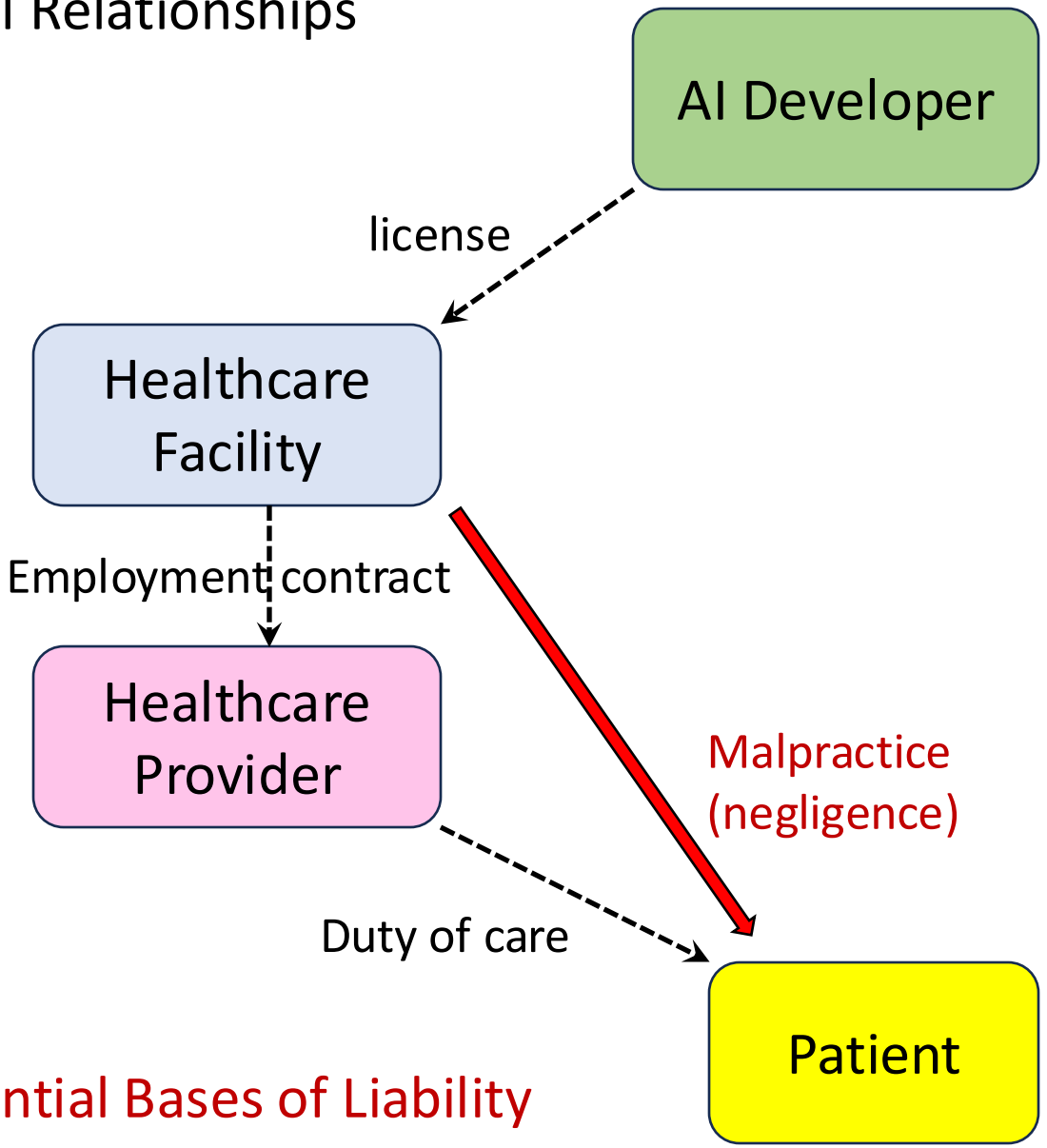

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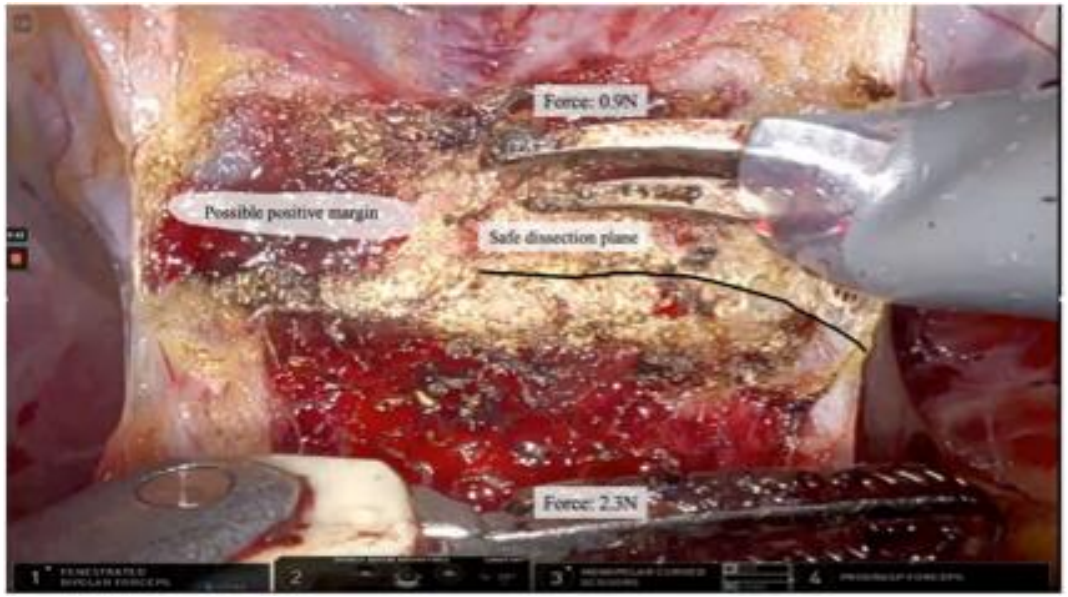

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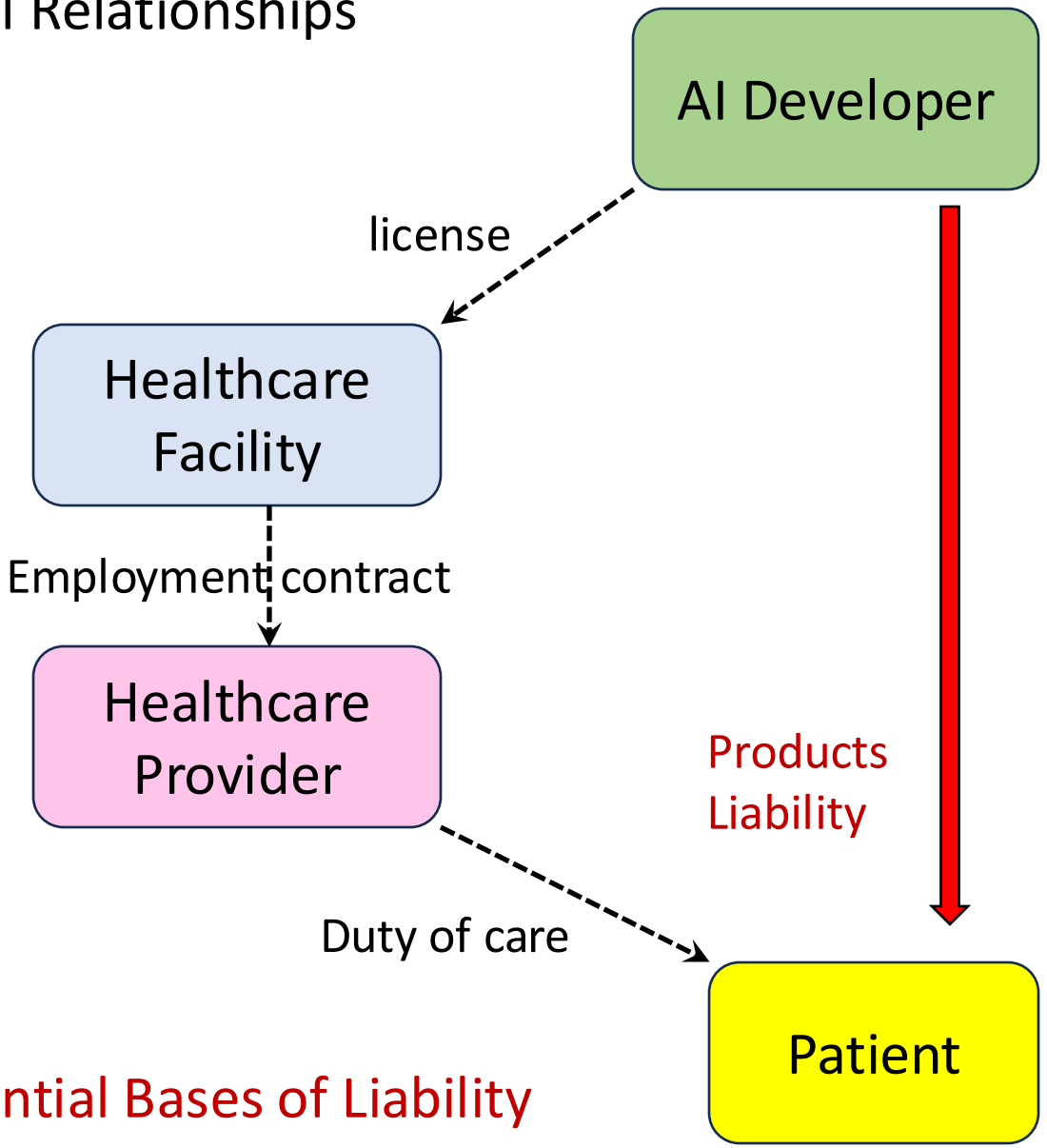

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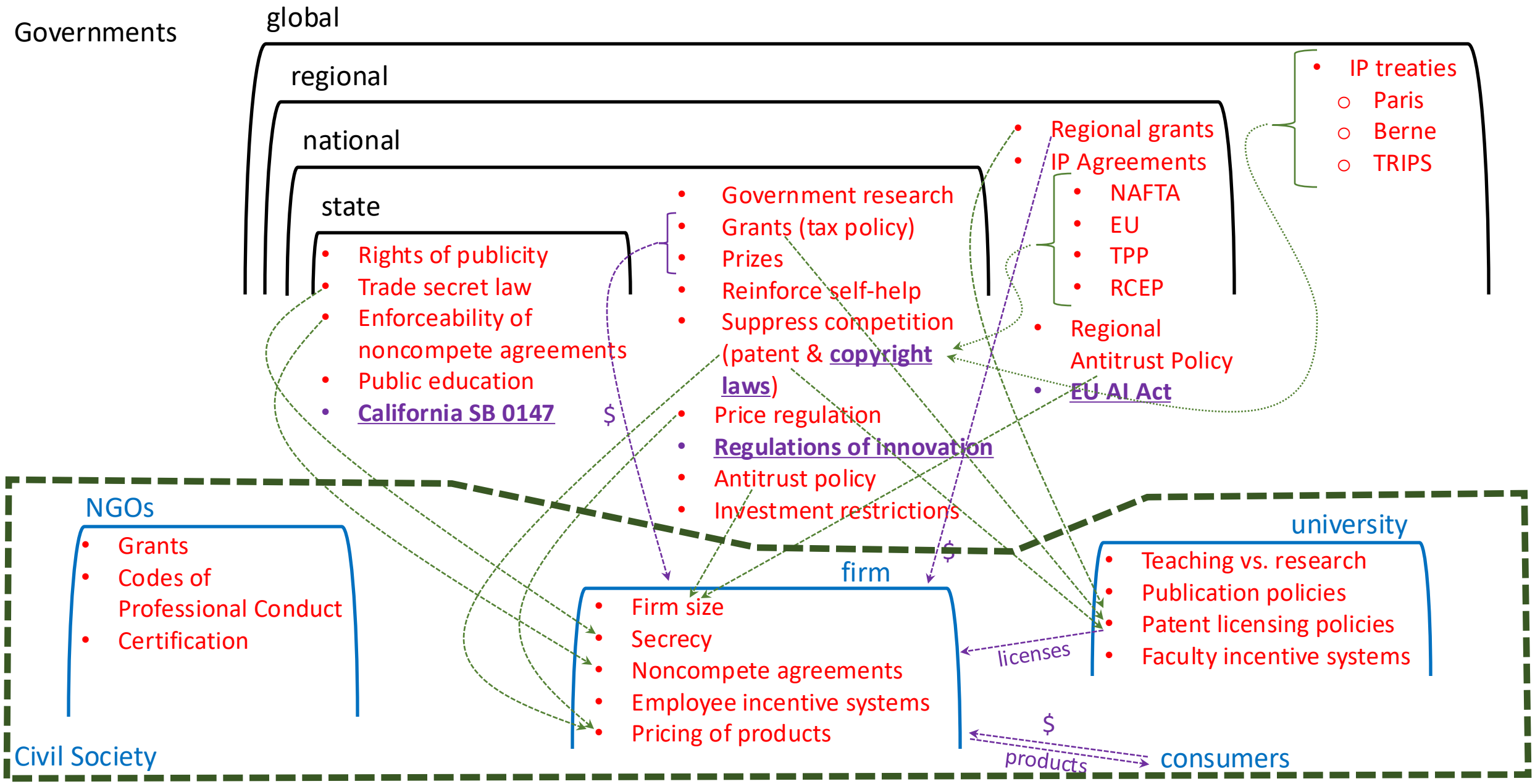

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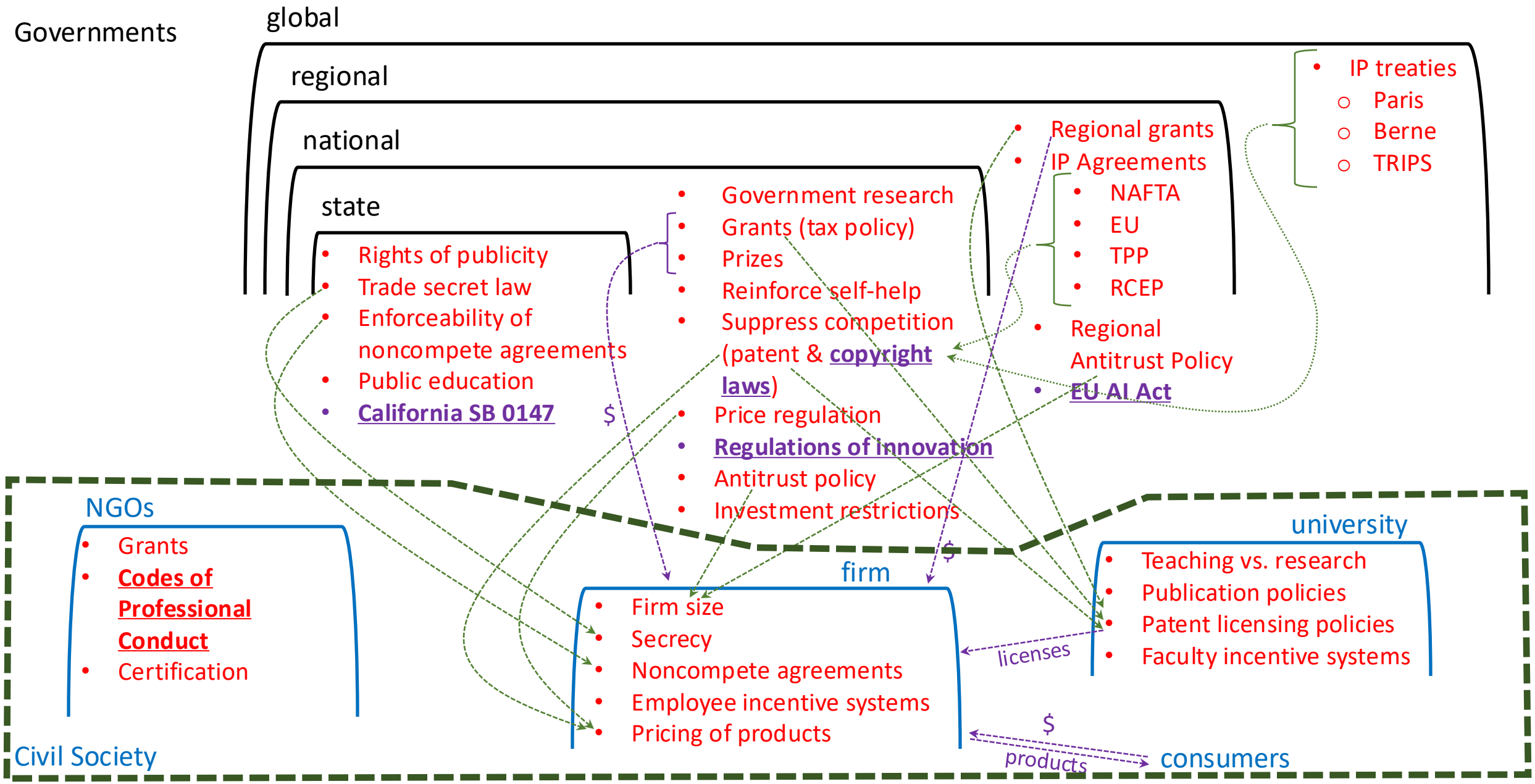

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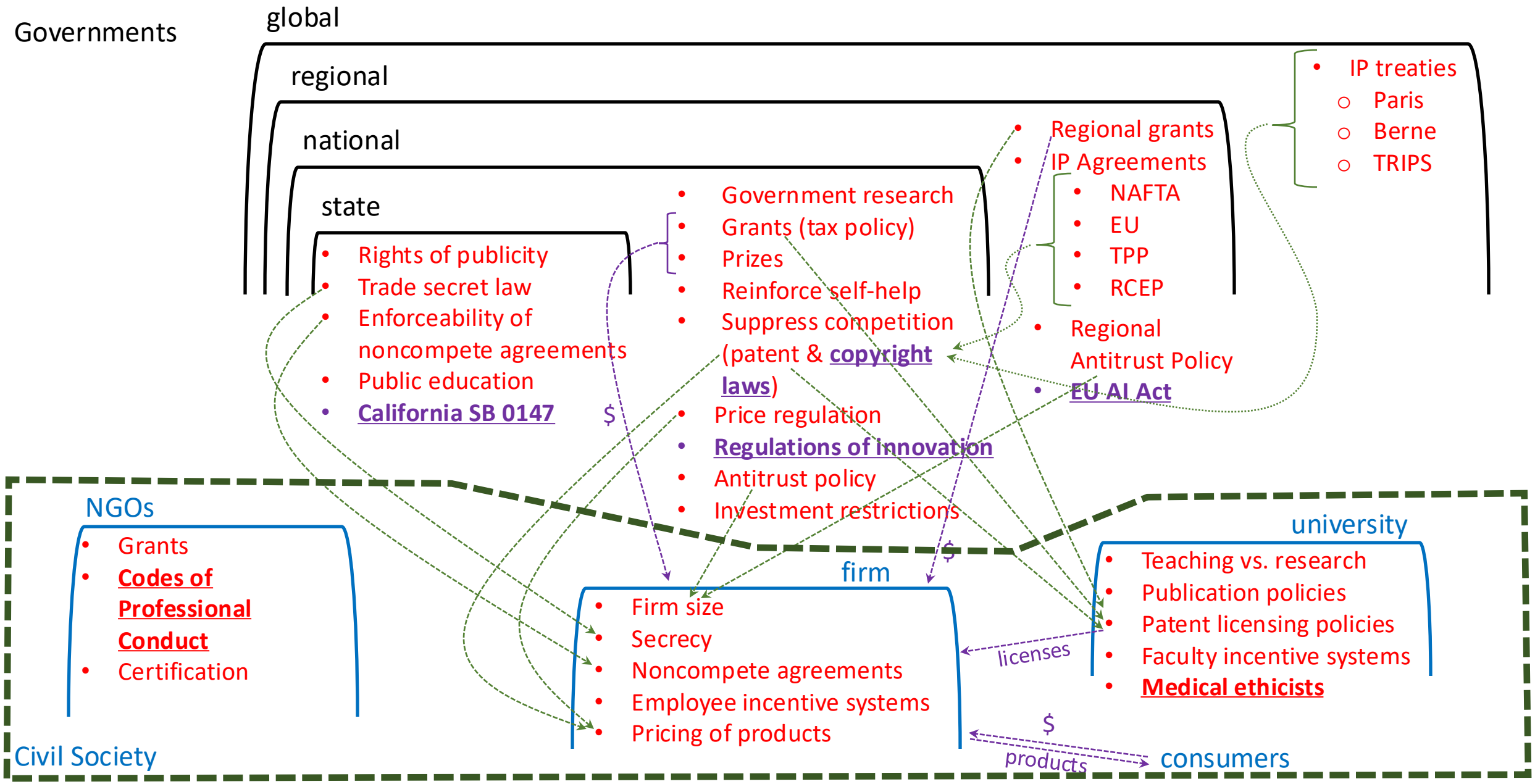

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Workshop on AI “Best Practices” (Harvard, April 22, 2024): Companies

Annmarie Bridy
Google

Jordan Gimbel
Microsoft

Olena Ripnick-O’Farrell
Meta

Sonia Cooper
Microsoft

Dave Kumar
Meta

Tom Rubin
Open AI

Caleb Donaldson
Google

Katherine Lee
Google Deepmind

Hailey Schoelkopf
EleutherAI

Workshop on AI “Best Practices” (Harvard, April 22, 2024): Companies

Janel Thamkul
Anthropic

Heather Whitney
Open AI

Fred von Lohmann
Open AI

Eric Wallace
Open AI

Workshop on AI “Best Practices” (Harvard, April 22, 2024): NGOs

A.J. D’Amico
Knight Foundation

Alexander Macgillivray
Obama and Biden administrations

Stanley Pierre-Louis
Entertainment Software Association

Nathan Eagle
Granted AI

Dean Marks
Coalition for Online Accountability

Wendy Seltzer
Tucows

Avijit Ghosh
Hugging Force

Cullen Miller
Spawning

Mitch Singer
Digital 360 Ventures

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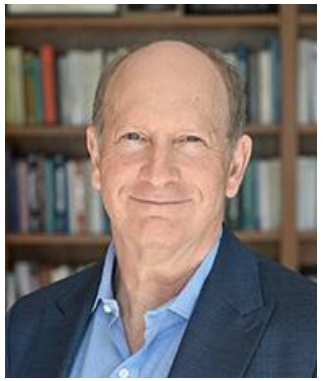

Doron Weber
Sloan Foundation

Workshop on AI “Best Practices” (Harvard, April 22, 2024): Academics

Chris Bavitz
Harvard

A. Feder Cooper
Cornell

Greg Leppert
Harvard

Oren Bracha
Univ. of Texas

Kyle Courtney
Harvard

Shayne Longpre
MIT

Louise Castricato
Brown

Jack Cushman
Harvard

Seth Neel
Harvard

Workshop on AI “Best Practices” (Harvard, April 22, 2024): Academics

Ruth Okediji
Harvard

Pam Samuelson
Berkeley

Martha Whitehead
Harvard

Eleonora Rosati
Stockholm Univ.

Stuart Shieber
Harvard

Jonathan Zittrain
Harvard

Mathew Sag
Emory

Ben Sobel
Cornell

Draft of "Best Practices" for Generative AI (May 2024)
[drafted by William Fisher; not to be attributed to the participants in the workshop]

Inputs: When using materials to train or tune a model, the developer of a generative AI system should abide by the following principles:

(1) Attribution

The developer should either:

(a) make publicly available enough information concerning the identity and contents of the databases used to train the model to enable a reasonable person to ascertain whether a particular work has been included in the databases; or

(b) make publicly available a system that provides a prompt accurate response to any person who asks whether a particular work has been included in the databases

(2) Use the best available commercially reasonable technology to prevent memorization of copyrighted materials[3]

(3) Implement in advance the opt-out procedure (below)

Opt Out Procedure:

(1) *The holder of the copyright in a work should be able at any time to declare that work to be off-limits for the purpose of training and tuning AI models.*

To exercise this right, the party should:

(a) register work in question in a registry available to all database developers; and

(b) provide the registry with sufficient information to enable AI model developers to perform the operations described below

Responsibilities of model developers with respect a work subject to a copyright-based opt-out order:

(a) Prospective Exclusion: All developers should remove the work from the databases used to train or tune their models in the future, unless and until the copyright owner formally withdraws the opt-out order

(b) Feasible Retroactive Exclusion: All developers should strive to minimize the role played by the work in extant models by either:

(i) Using best available commercially reasonable technology to "unlearn" the extant model;[4] or

(ii) Using best available commercially reasonable similarity filters or instance-attribution filters to prevent the model from generating products that are substantially similar to the work in question[5]

(2) *A party whose personally identifiable information is contained in contained in any work used to train or tune a model should be able at any time to insist that such information be rendered unavailable to the public*

To exercise this right, the party should notify the developer of the model in question

Responsibilities of model developers with respect a work subject to a PII-based opt-out order:

(c) Prospective Exclusion: All developers should remove the PII from the databases used to train or tune their models in the future

(d) Feasible Retroactive Exclusion: All developers should strive to purge extant models of the PII by either:

(iii) Using best available commercially reasonable technology to "unlearn" the extant model; or

(iv) Using best available commercially reasonable technologies to prevent the model from making the PII available to users of the model

(3) *All parties should abide by the decisions rendered by an arbitration system designed to resolve controversies concerning opt-out rights*

Outputs: When adjusting a model to regulate the kinds of materials it can produce, the developer of a generative AI system should abide by the following principles:

(1) Use the best available commercially reasonable technology to limit the set of permissible prompts in order to minimize the capacity of users to employ the system in ways that generate outputs that infringe copyrights[6]

(2) Use the best available commercially reasonable technology to watermark the outputs of the model[7]

Levelling the Playing Field

A for-profit model builder should ensure that all other model builders have equal access to the databases it uses to train and tune models.

(a) If a for-profit model builder obtains a license to use a particular work or database for model training, it must ensure that the work or database is available to all other model builders on the same terms ("most favored nation" principle)

(b) If a for-profit model builder has exclusive access to a database and uses the contents of that database to train its model, it must license that database to all other model builders on Fair, Reasonable, and

A nonprofit model builder should ensure that all other nonprofit model builders have equal access to the databases it uses to train and tune models.

(a) If a nonprofit model builder obtains a license to use a particular work or database for model training, it must ensure that the work or database is available to all other nonprofit model builders on the same terms ("most favored nation" principle)

(b) If a nonprofit model builder has exclusive access to a database and uses the contents of that database to train its model, it must license that database to all other nonprofit model builders on Fair, Reasonable, and Nondiscriminatory terms.

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