



Forecasting long-term trends in O-D passenger markets

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www.iata.org/pax-forecast www.iata.org/economics

7th January 2015, Cranfield

To represent, lead and serve the airline industry



My previous lecture was rather sceptical

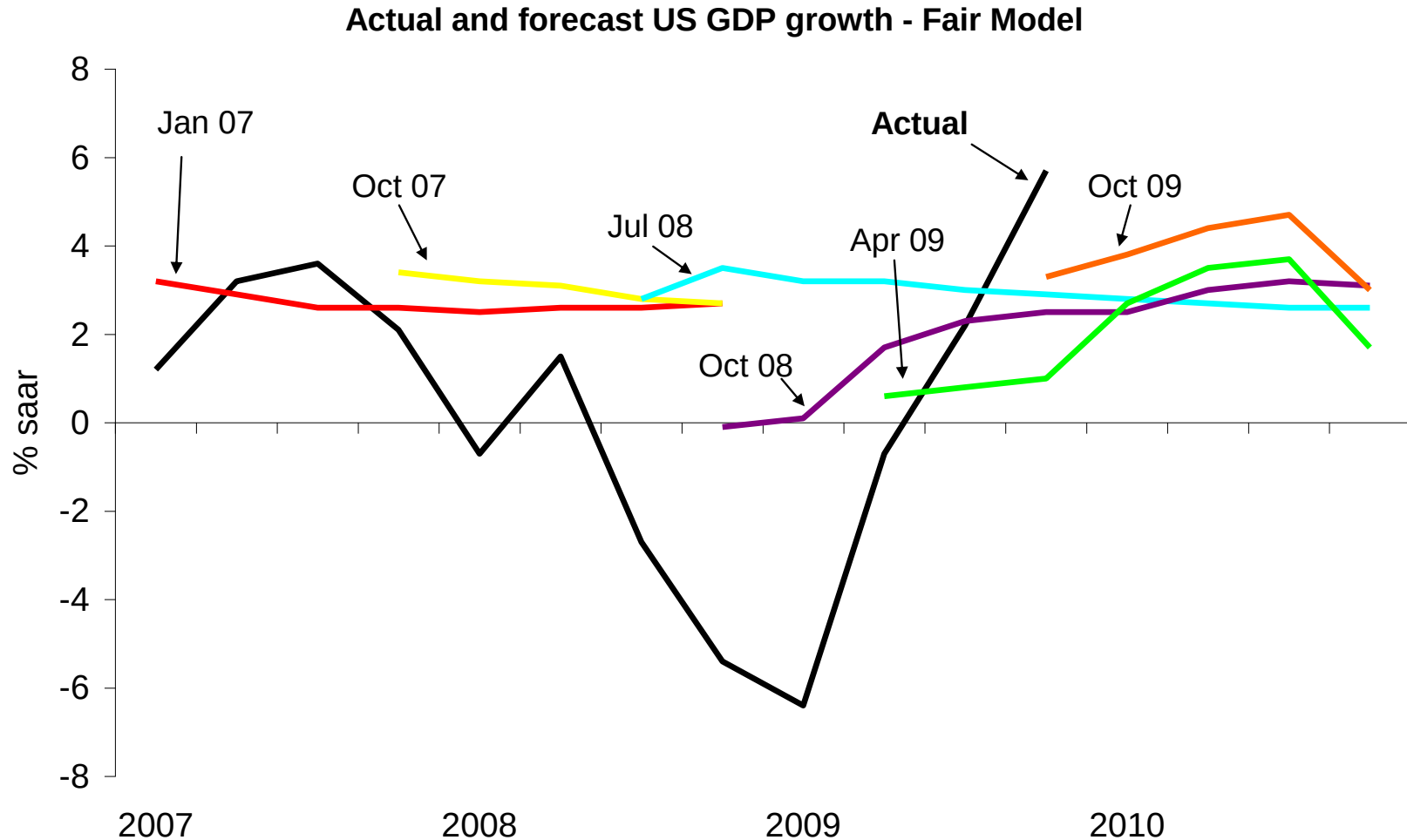
MATT



*'I used to be an economic forecaster
but it was all so hit and miss'*

Source: The Daily Telegraph

As short-term forecasts fail just when needed



Source: Fair Model, Datastream

But decisions about the future still required



New forecast service:

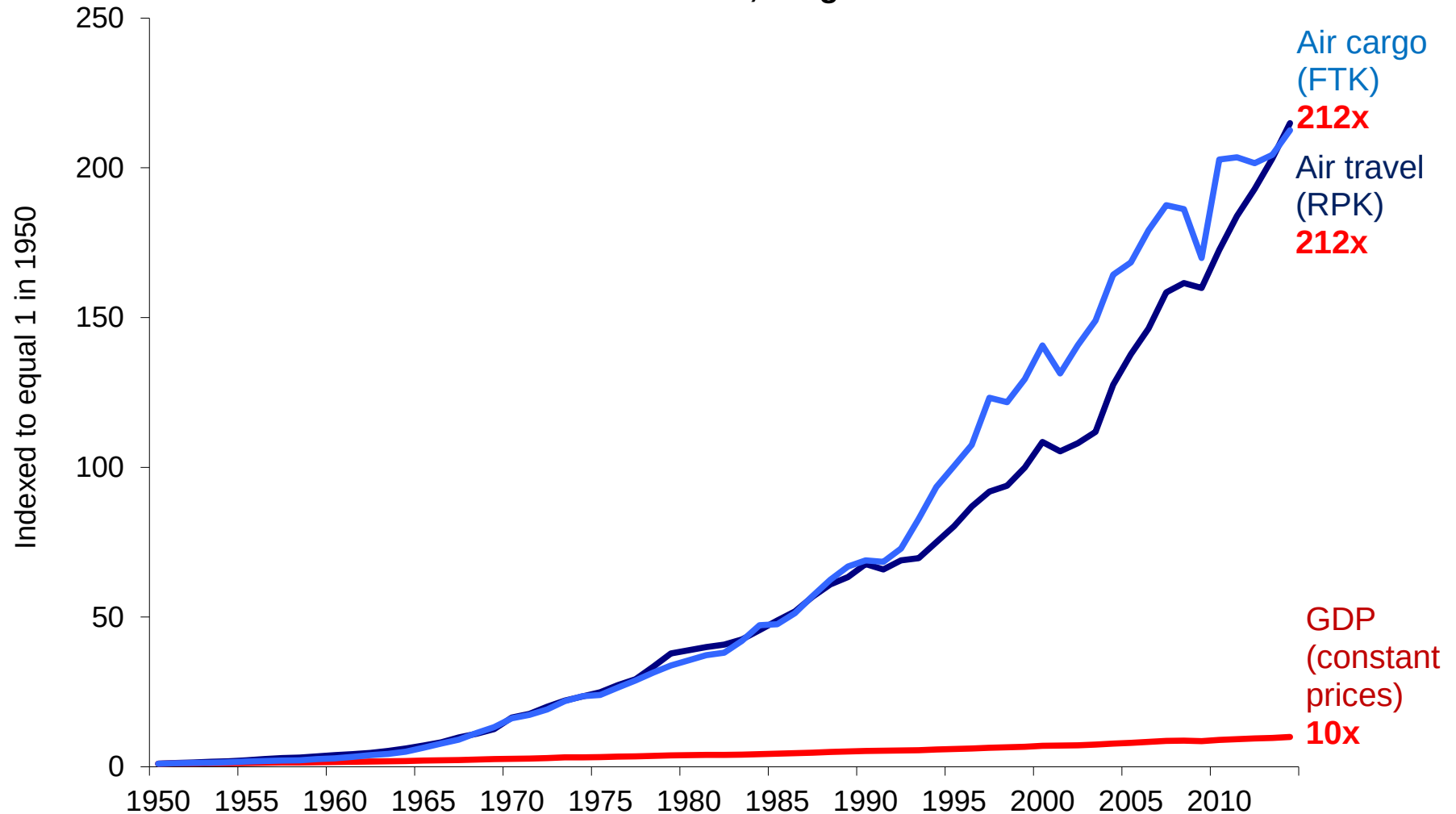
- 4,000 O-D country-pairs
- JV with IATA and Tourism Economics
- Global, country reports, web-tool

For more information:

- www.iata.org/pax-forecast
- David Oxley, IATA, oxleyd@iata.org
- David Goodger, Tourism Economics, dgoodger@tourismeconomics.com

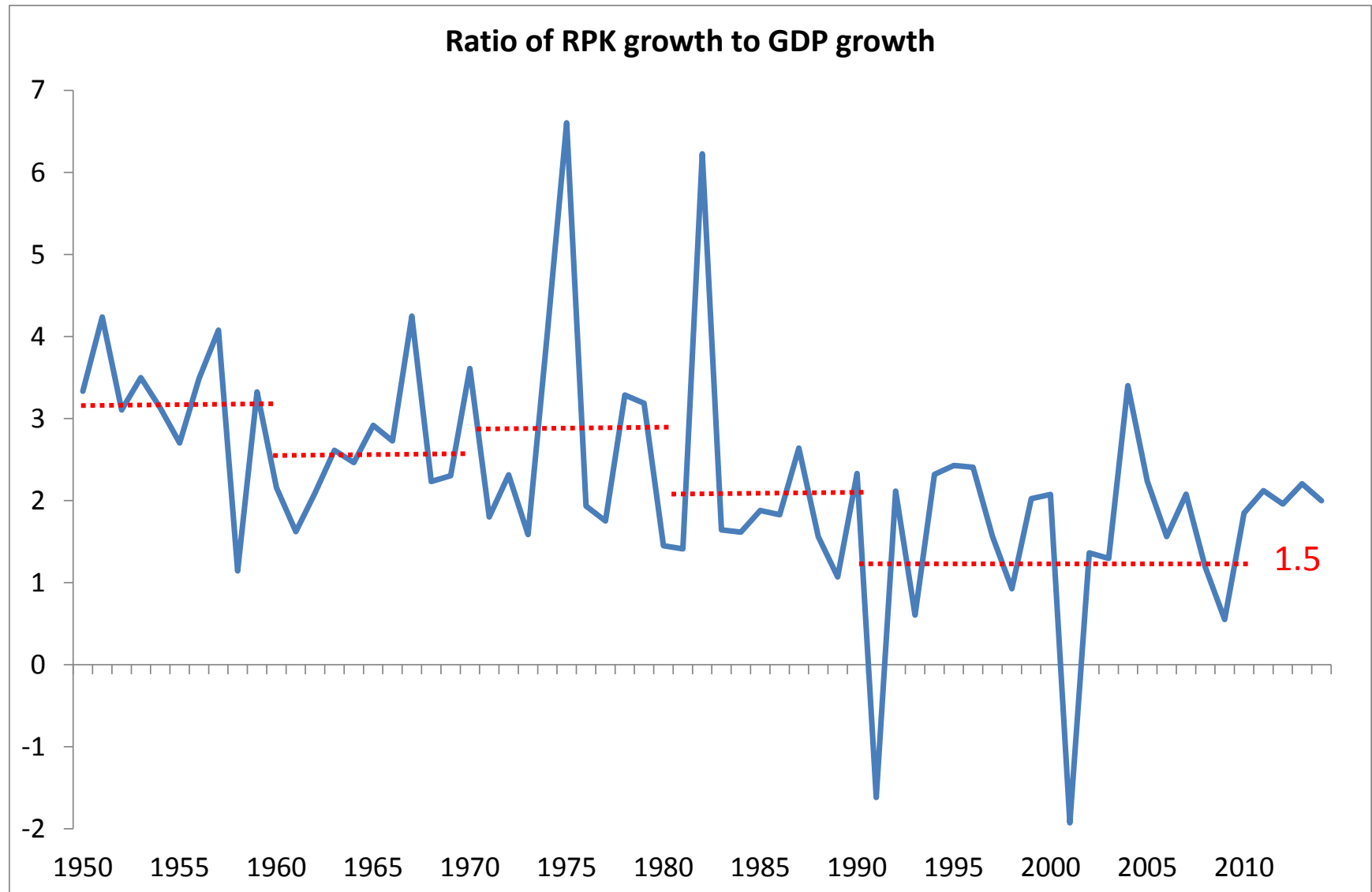
So how should we model air travel demand?

World scheduled air travel, freight and world real GDP



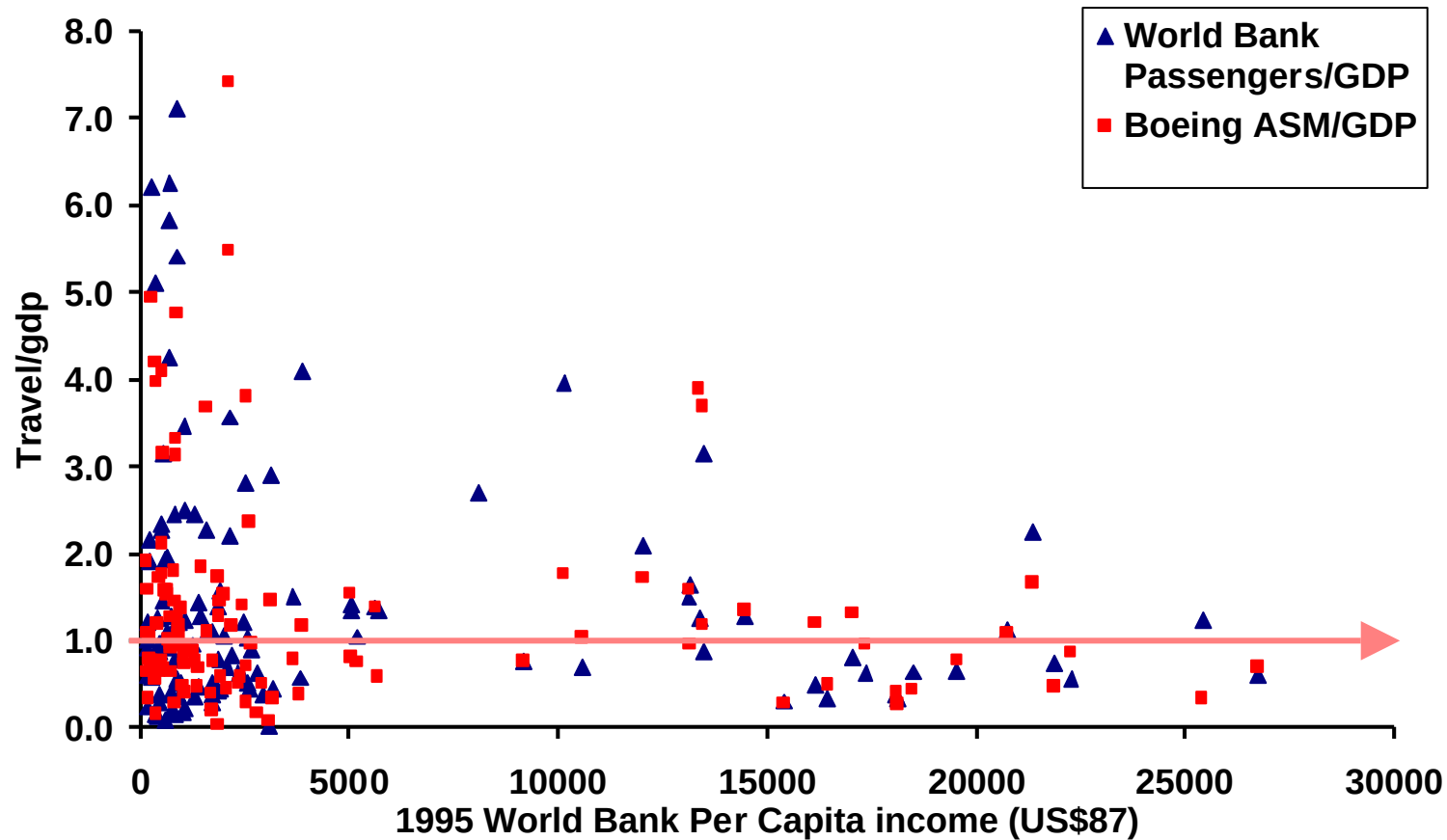
Source: IATA, ICAO, Haver

Is $RPK = GDP^{1.5}$ the best modelling approach?



Source: IATA/Tourism Economics 'Air Passenger Forecasts'

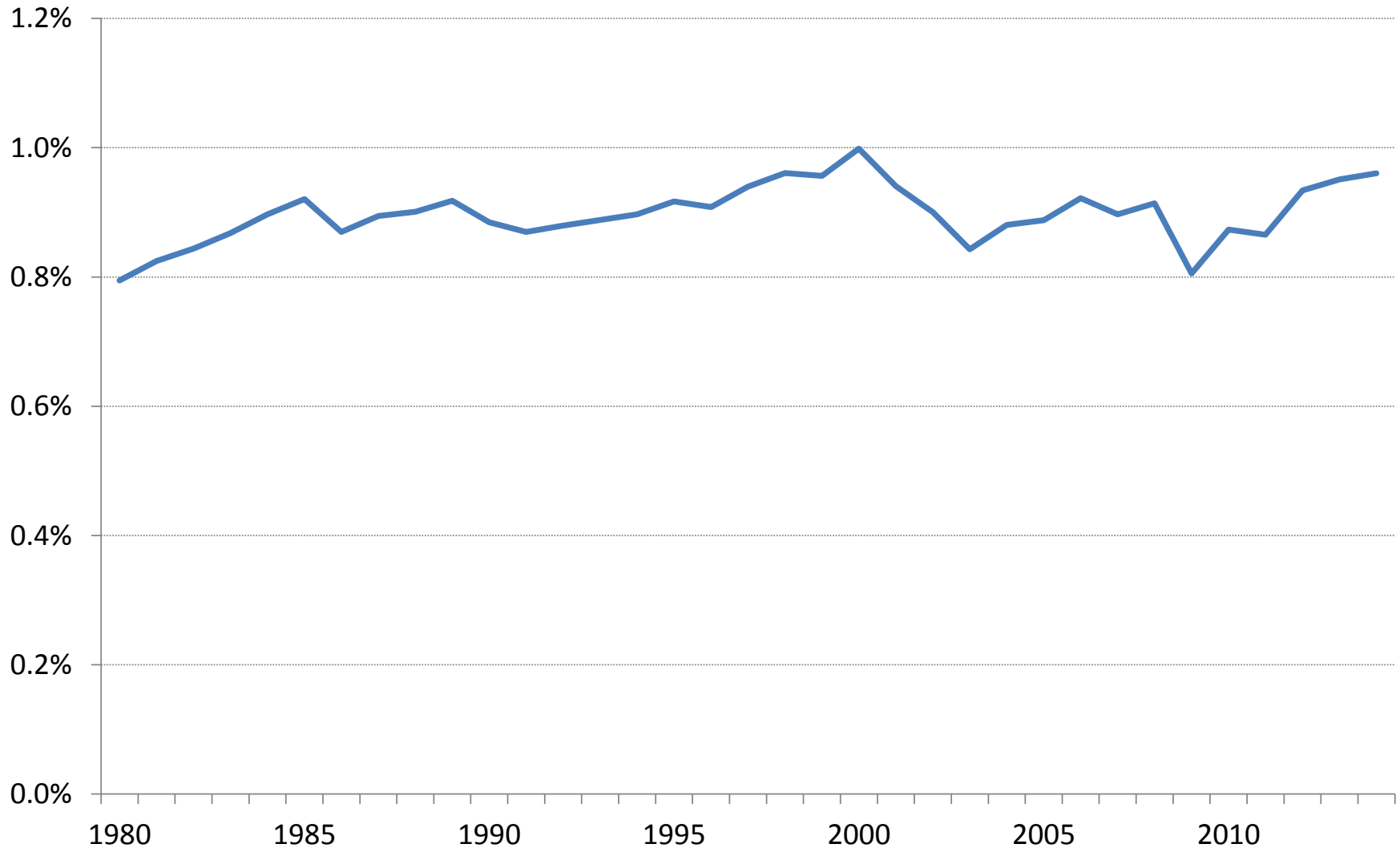
But real travel share does not rise with income



Source: This slide is borrowed from Bill Swan http://cyberswans.com/Airline_Industry_Publications.html

And nominal share does not rise over time

Spending on air transport as a % of world nominal GDP



Source: IATA/Tourism Economics 'Air Passenger Forecasts'

Bill Swan's conclusions

Cross-sectional data: Travel Share not rising with incomes:

- Travel Share of GDP measured as ASK/GDP ratio
- Data shows small negative correlation with per-capita income
- No acceleration of travel share after joining middle class

Time-series data confirmed pattern:

- Growth of Travel Share was independent of growth of GDP
- Based on Country-by-Country data

Conclusion:

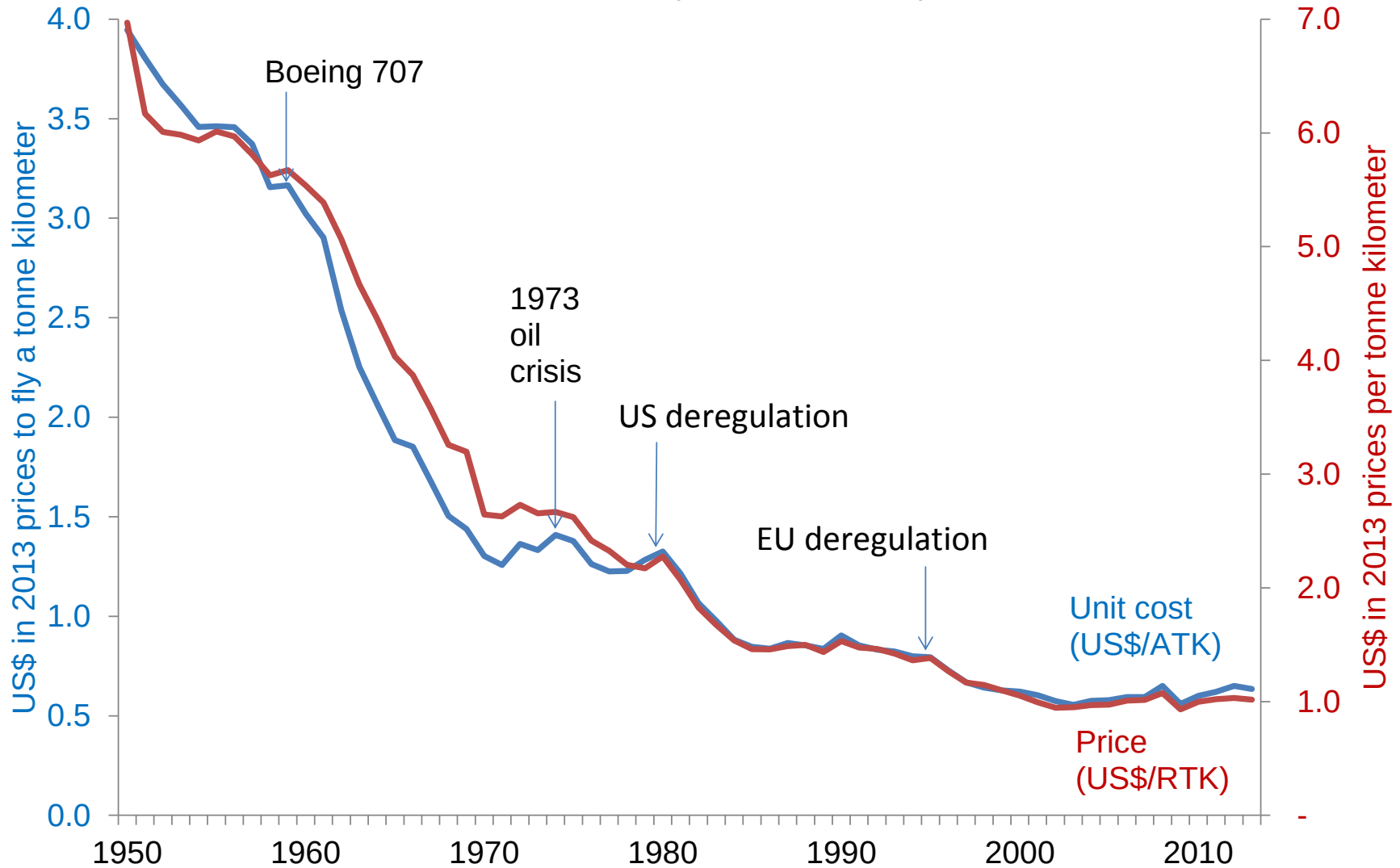
- Travel grows linearly with GDP growth
- Remaining 1/3 of travel growth is “something else”

Useful question: “*What Else?*”

Source: This slide is borrowed from Bill Swan http://cyberswans.com/Airline_Industry_Publications.html

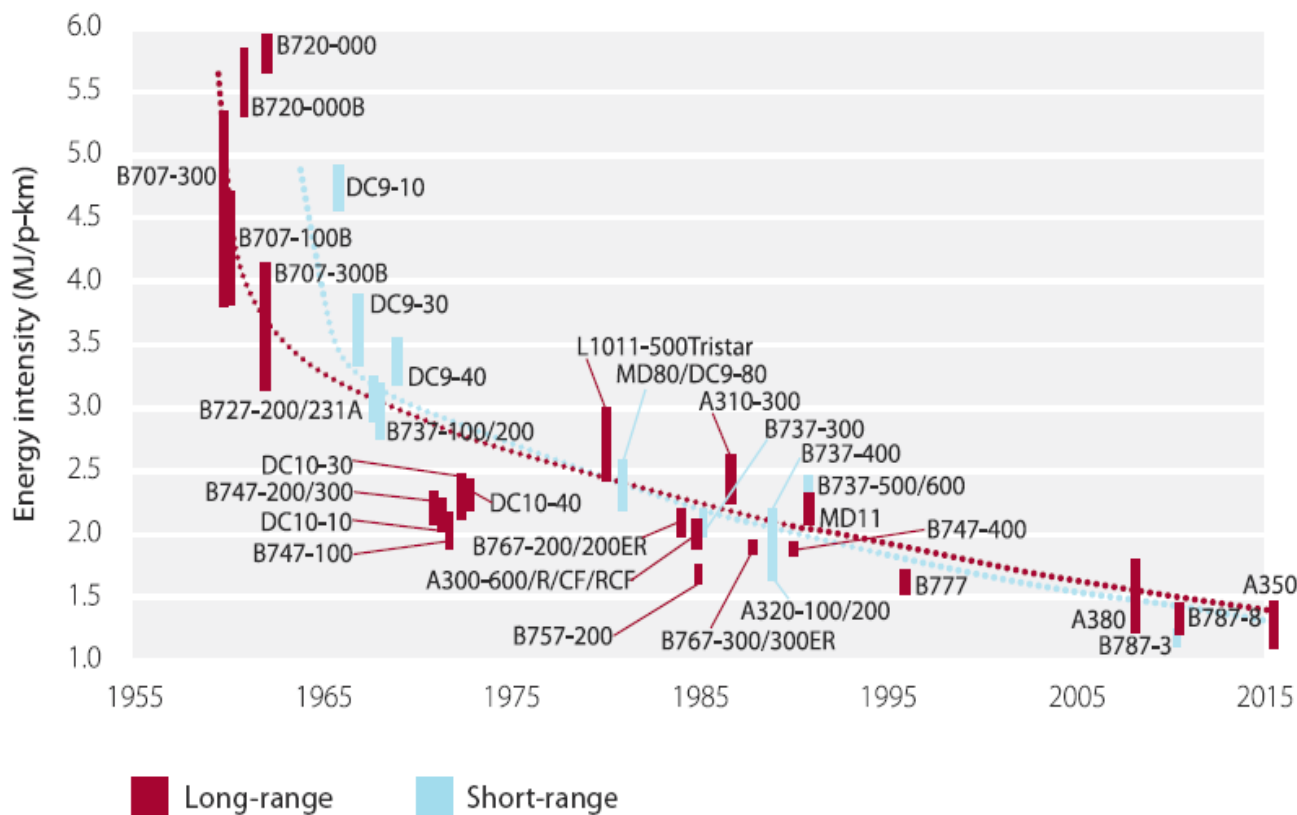
Falling transport costs part of 'what else'

Unit cost and the price of air transport



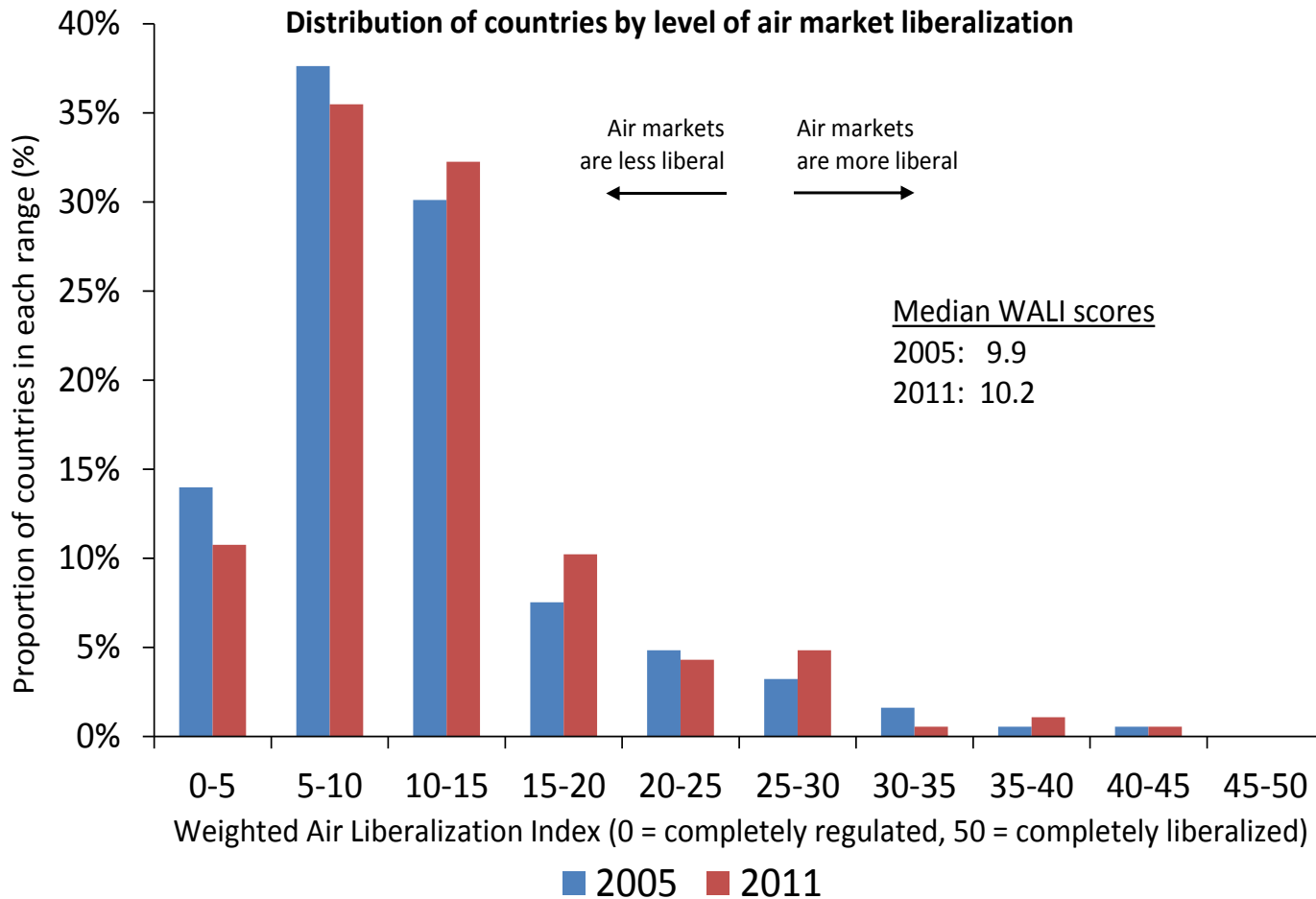
Source: IATA/Tourism Economics 'Air Passenger Forecasts'

Improving technology is a major cost driver



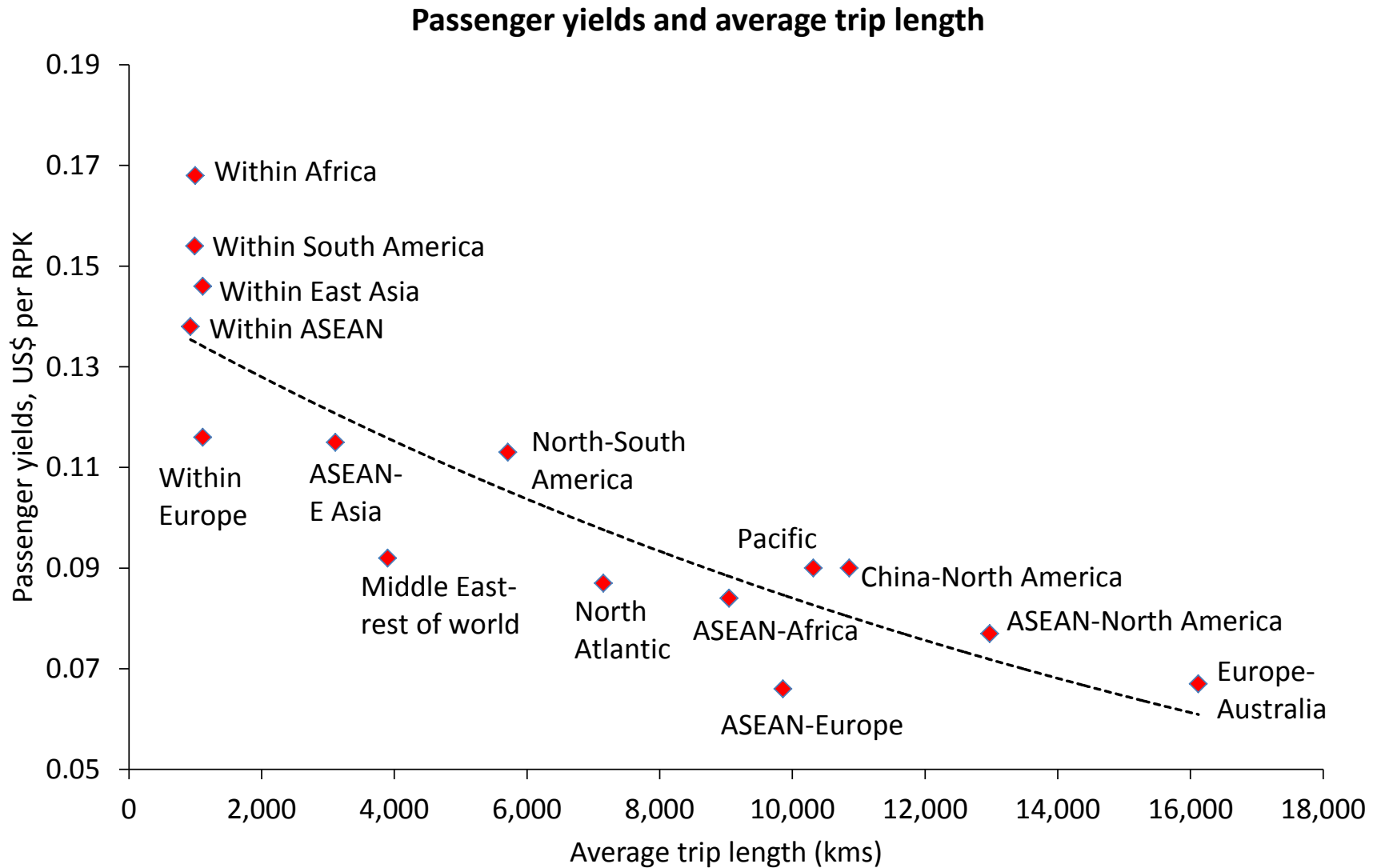
Source: IATA/Tourism Economics 'Air Passenger Forecasts'

And constraints on competition are also key



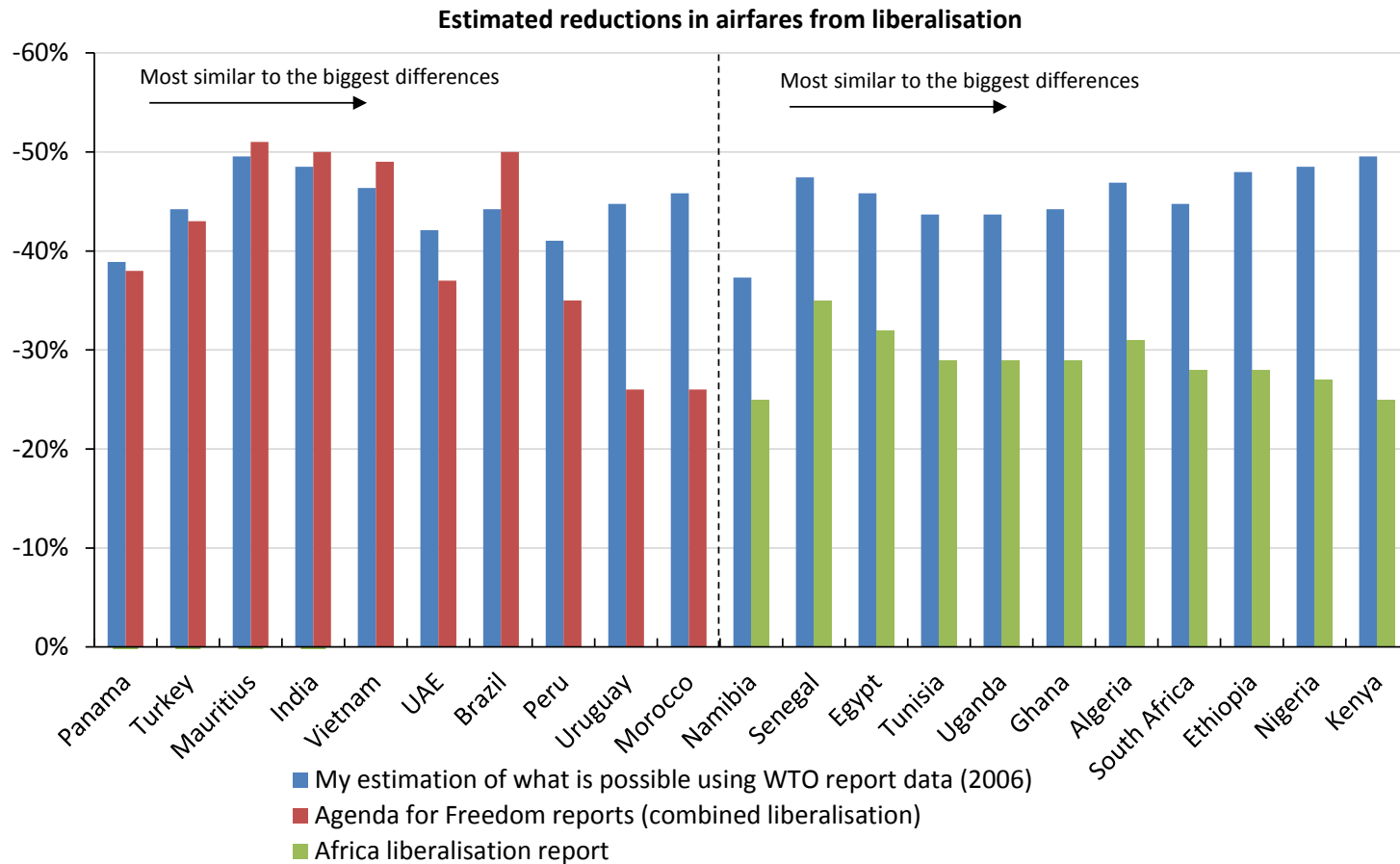
Source: IATA/Tourism Economics 'Air Passenger Forecasts'

Scope for lower fares on a number of markets



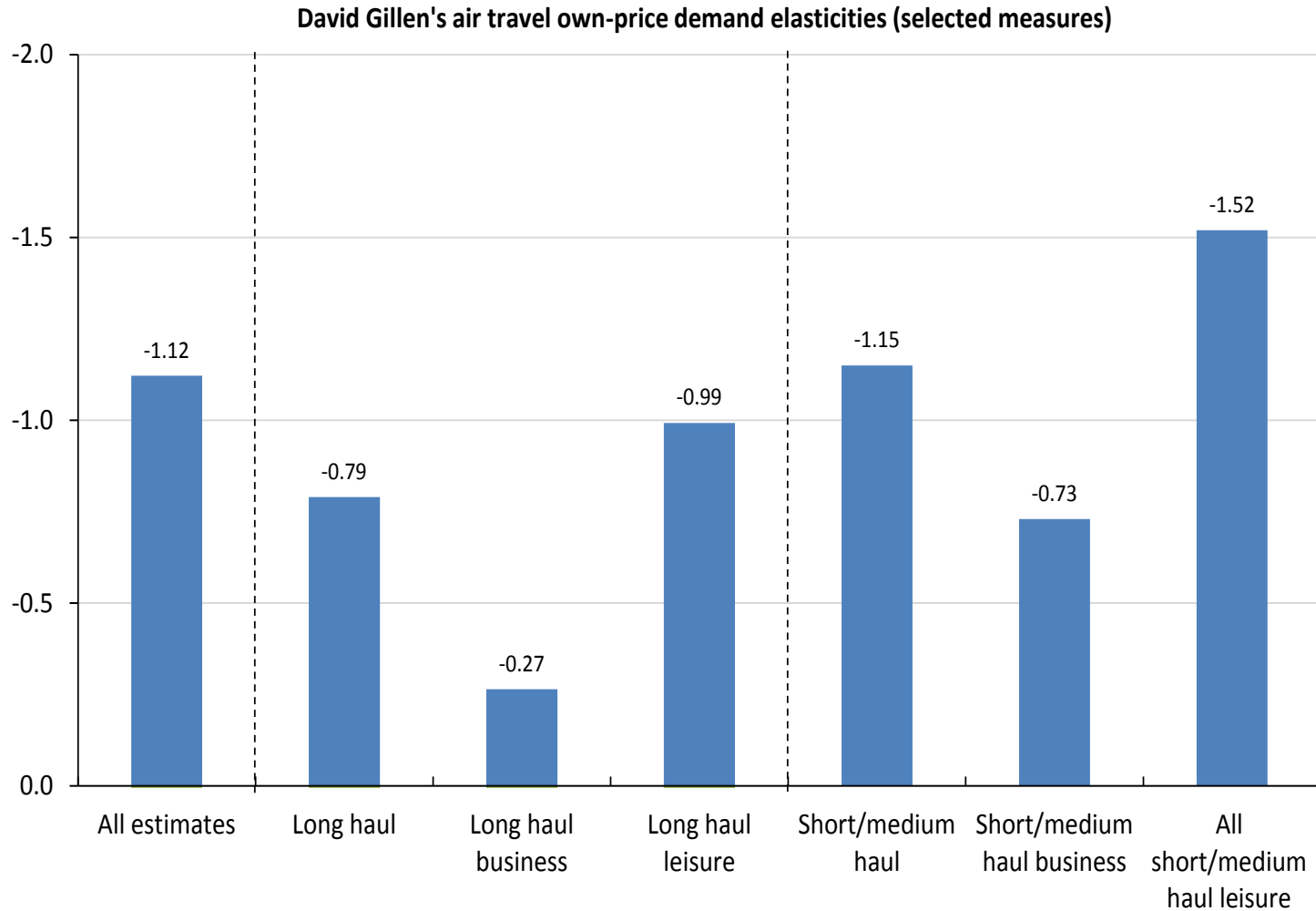
Source: IATA/Tourism Economics 'Air Passenger Forecasts'

Travel costs could fall 30-50% on liberalization



Source: IATA/Tourism Economics 'Air Passenger Forecasts'

And price elasticities vary significantly



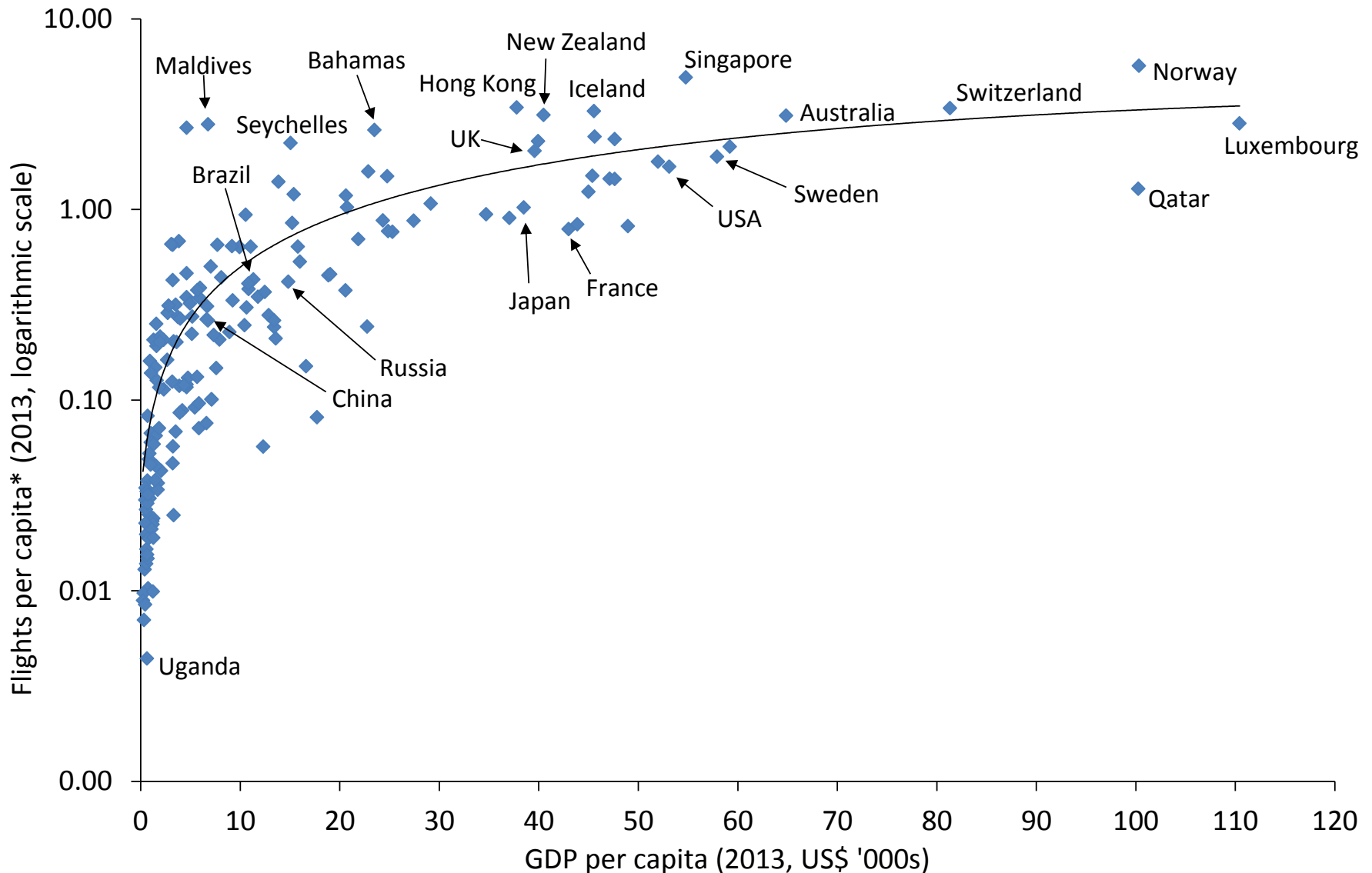
Source: IATA/Tourism Economics 'Air Passenger Forecasts'

Living standards matter (not aggregate GDP)

	Trips/ year/ person	Months before next trip
Low-income	0.04	300
Middle-income	0.29	41
High-income	1.48	8
Below US\$20K per person	0.27	44
Above US\$20K per person	1.80	7

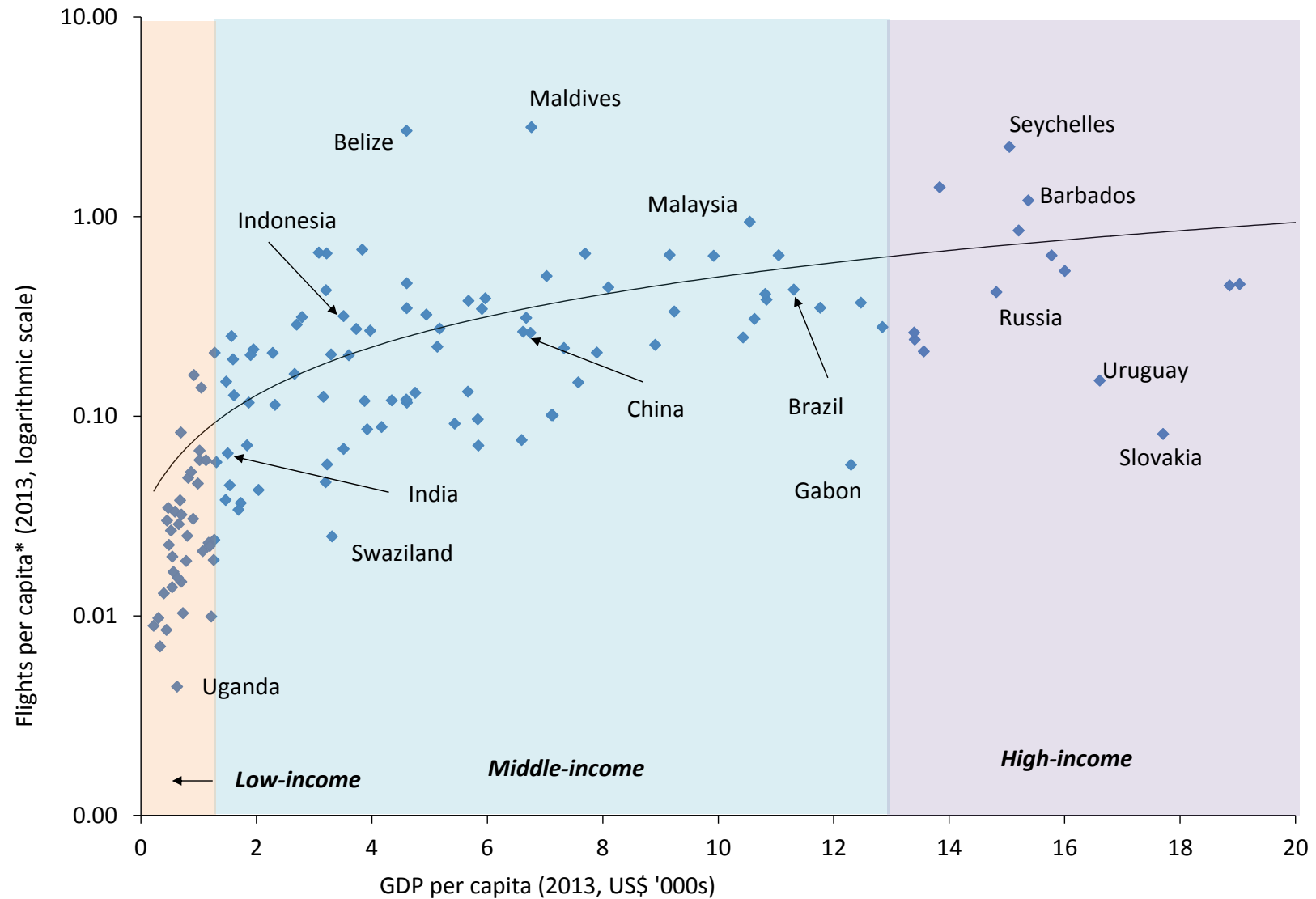
Source: IATA/Tourism Economics 'Air Passenger Forecasts'

There is a relationship but not the usual one



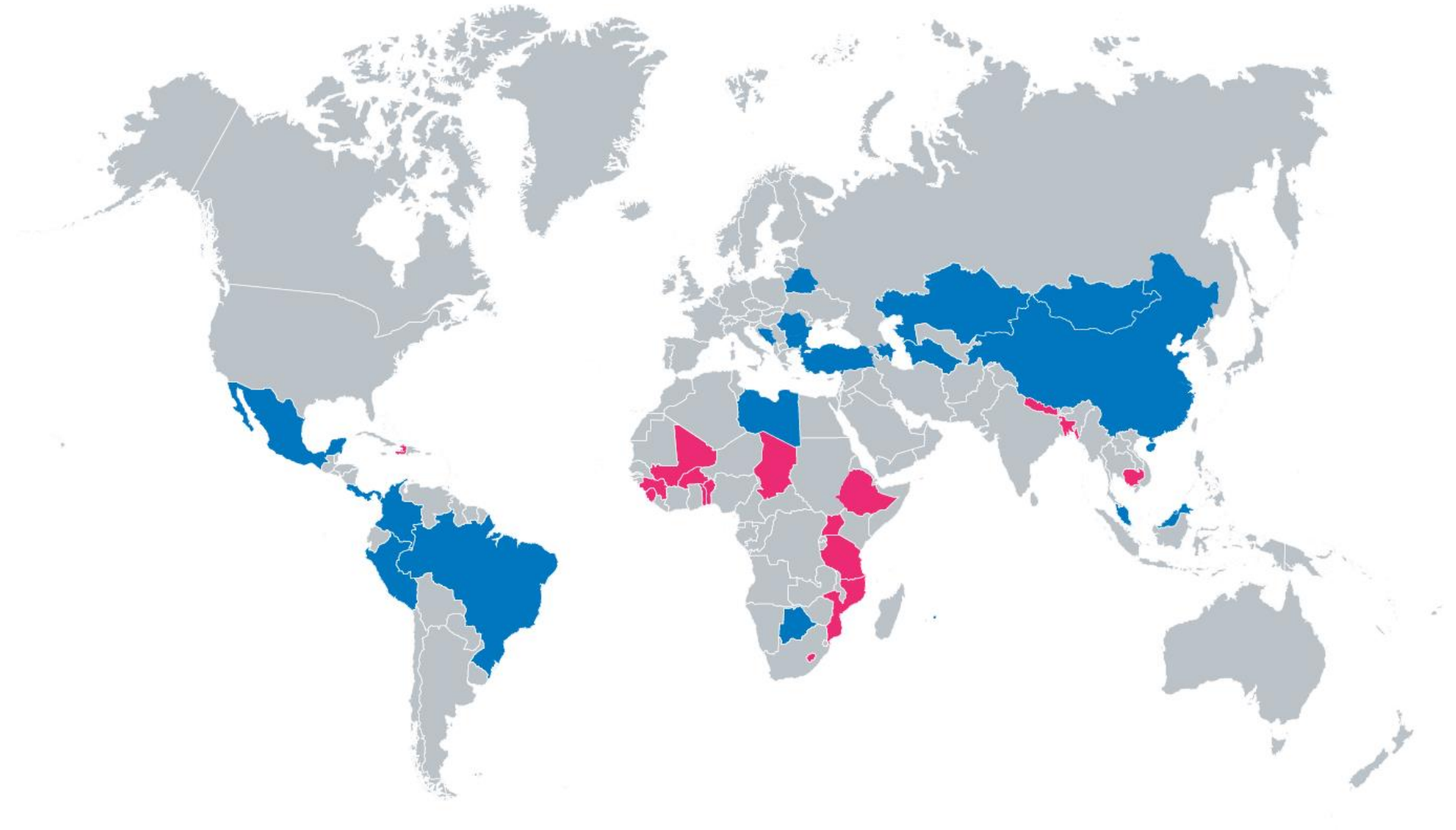
Source: IATA/Tourism Economics 'Air Passenger Forecasts'

They are certainly key for emerging markets



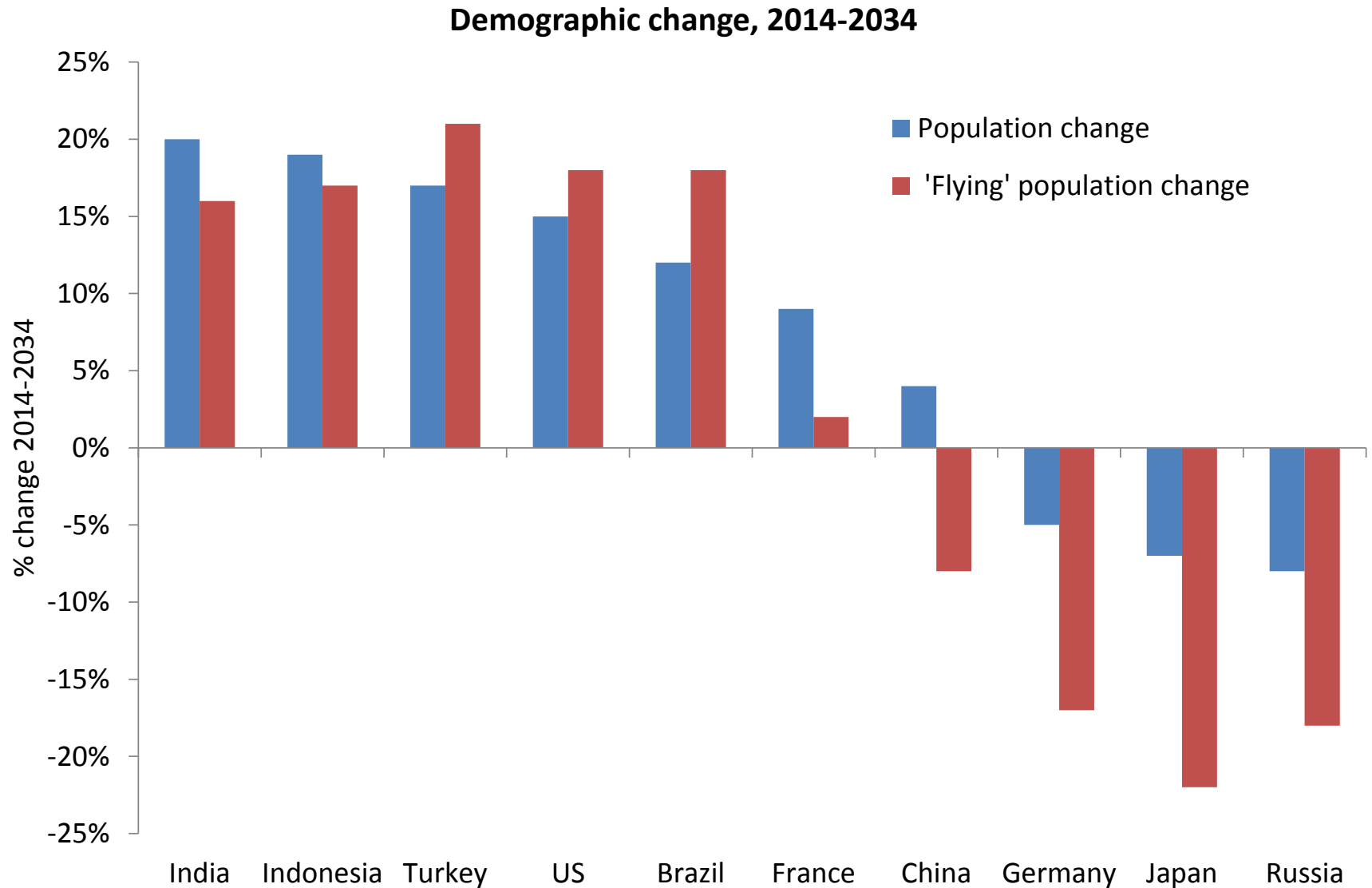
Source: IATA/Tourism Economics 'Air Passenger Forecasts'

Countries becoming 'middle' or 'high' income



Source: IATA/Tourism Economics 'Air Passenger Forecasts'

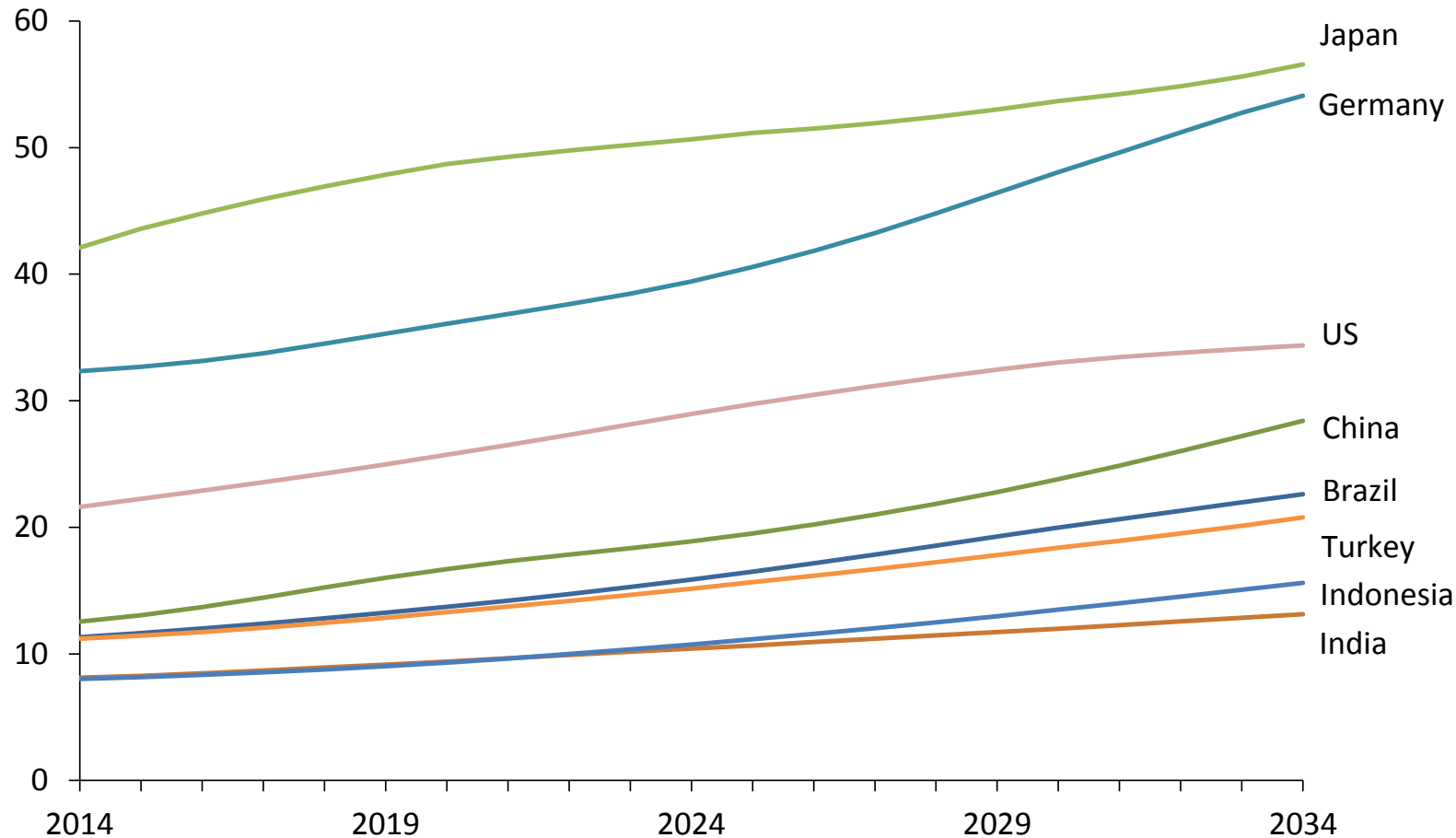
Demographics are important to get right



Source: IATA/Tourism Economics 'Air Passenger Forecasts'

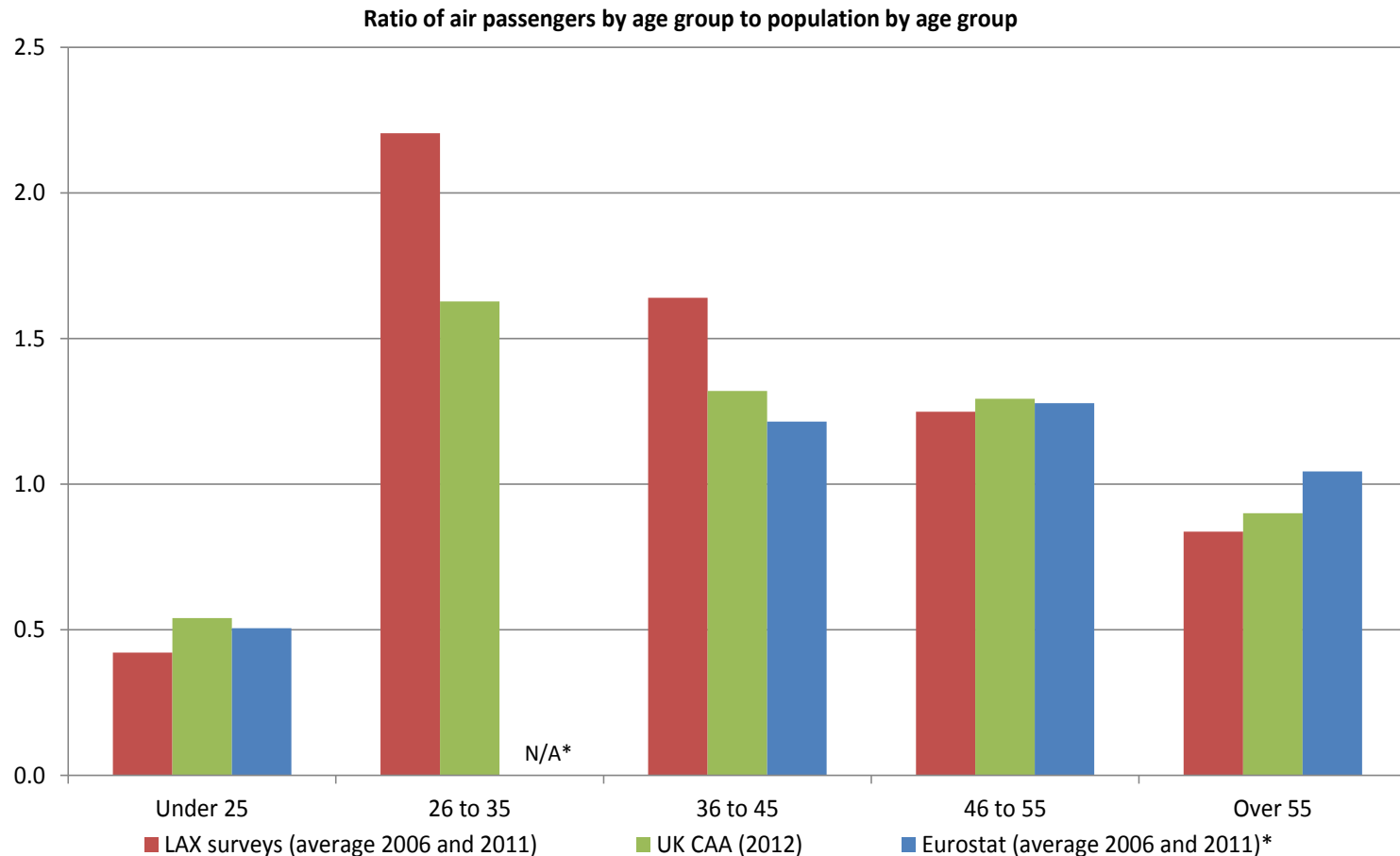
Emerging market population much younger

Old-age dependency ratio, %
(65+/15-64)



Source: IATA/Tourism Economics 'Air Passenger Forecasts'

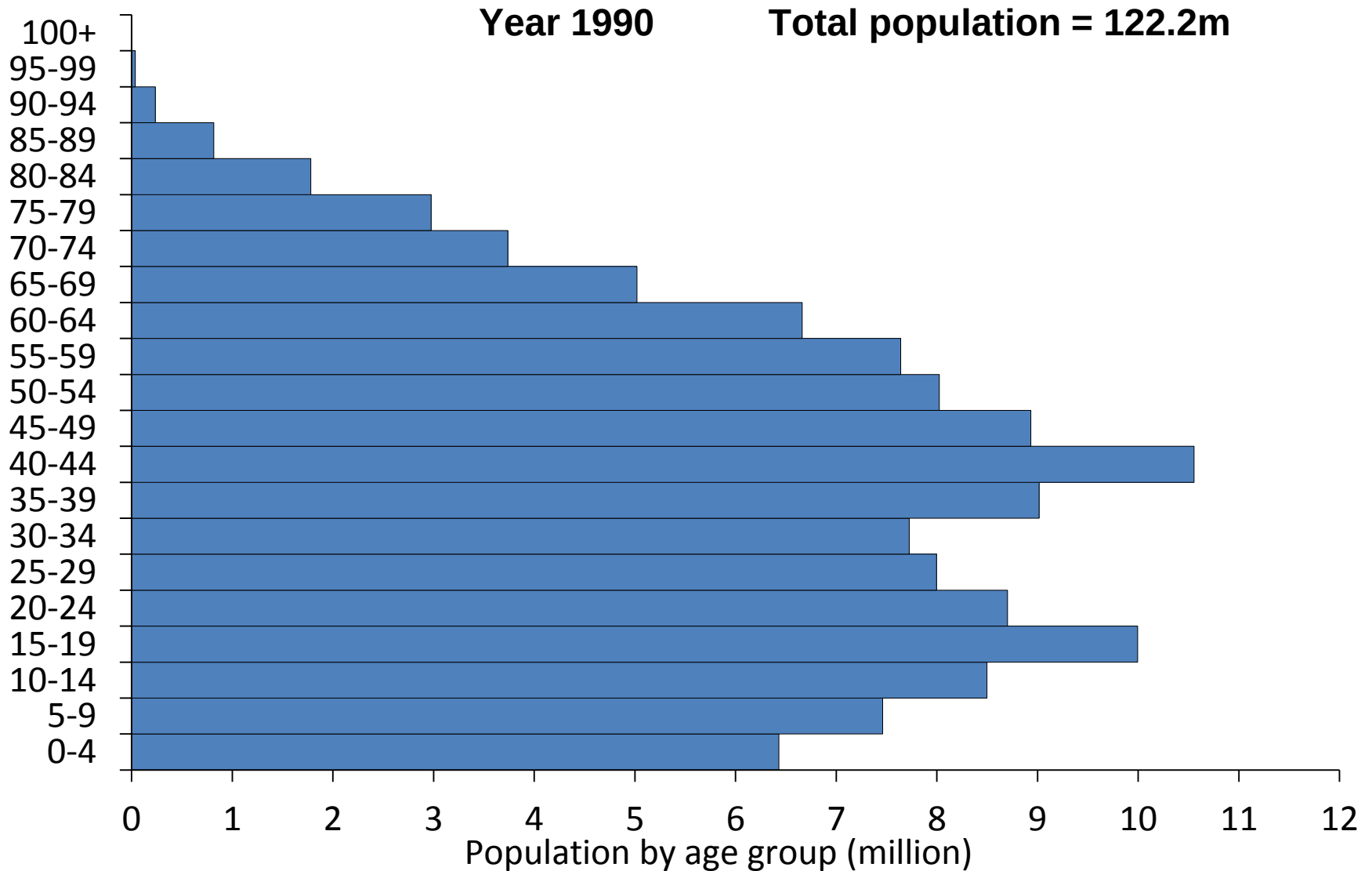
Working-age population makes more trips



* Note: the Eurostat data shown in the 36 to 45 age group are actually for the wider 25-44 age group

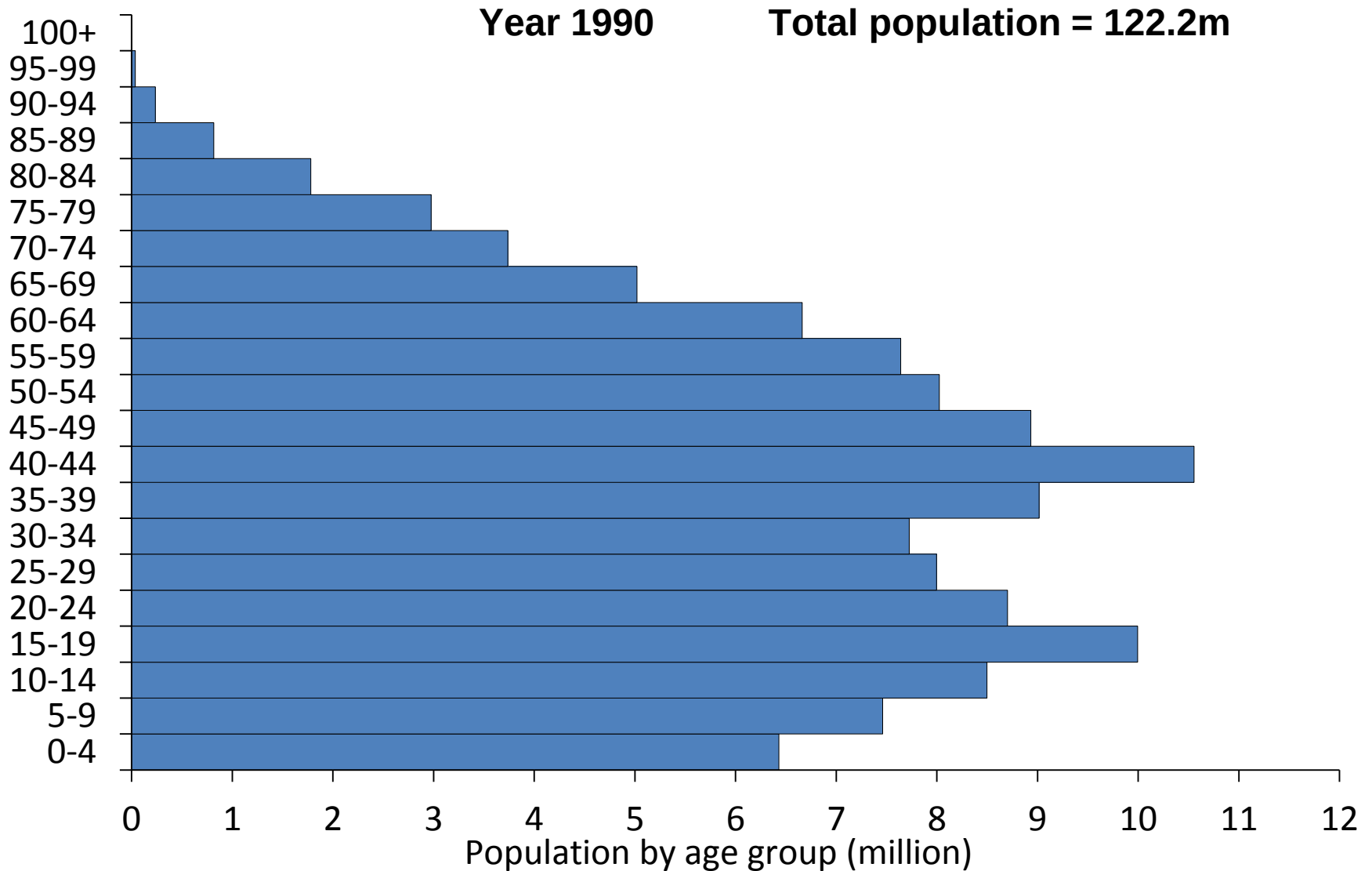
Source: UK CAA

Looking at the example of Japan



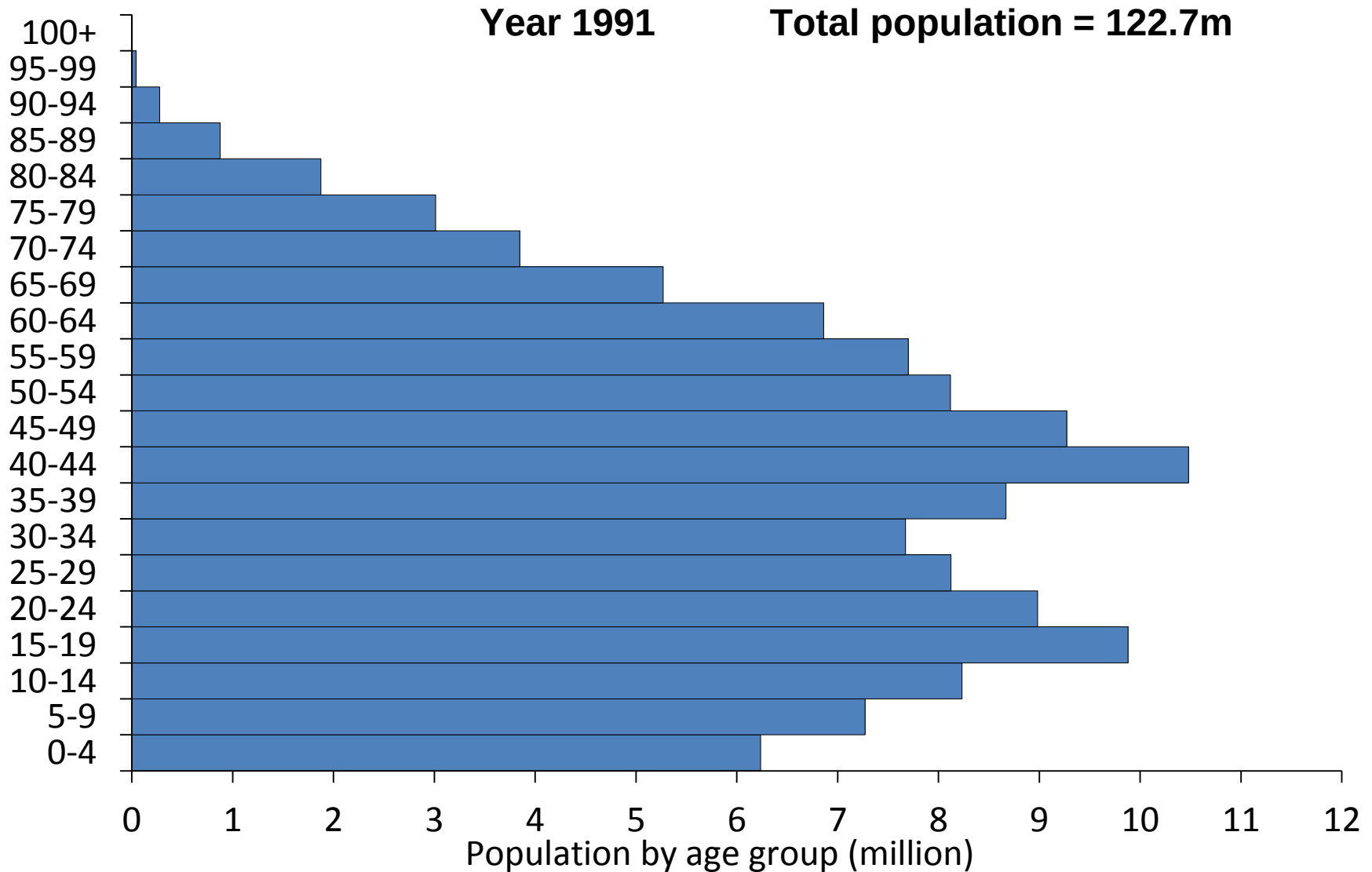
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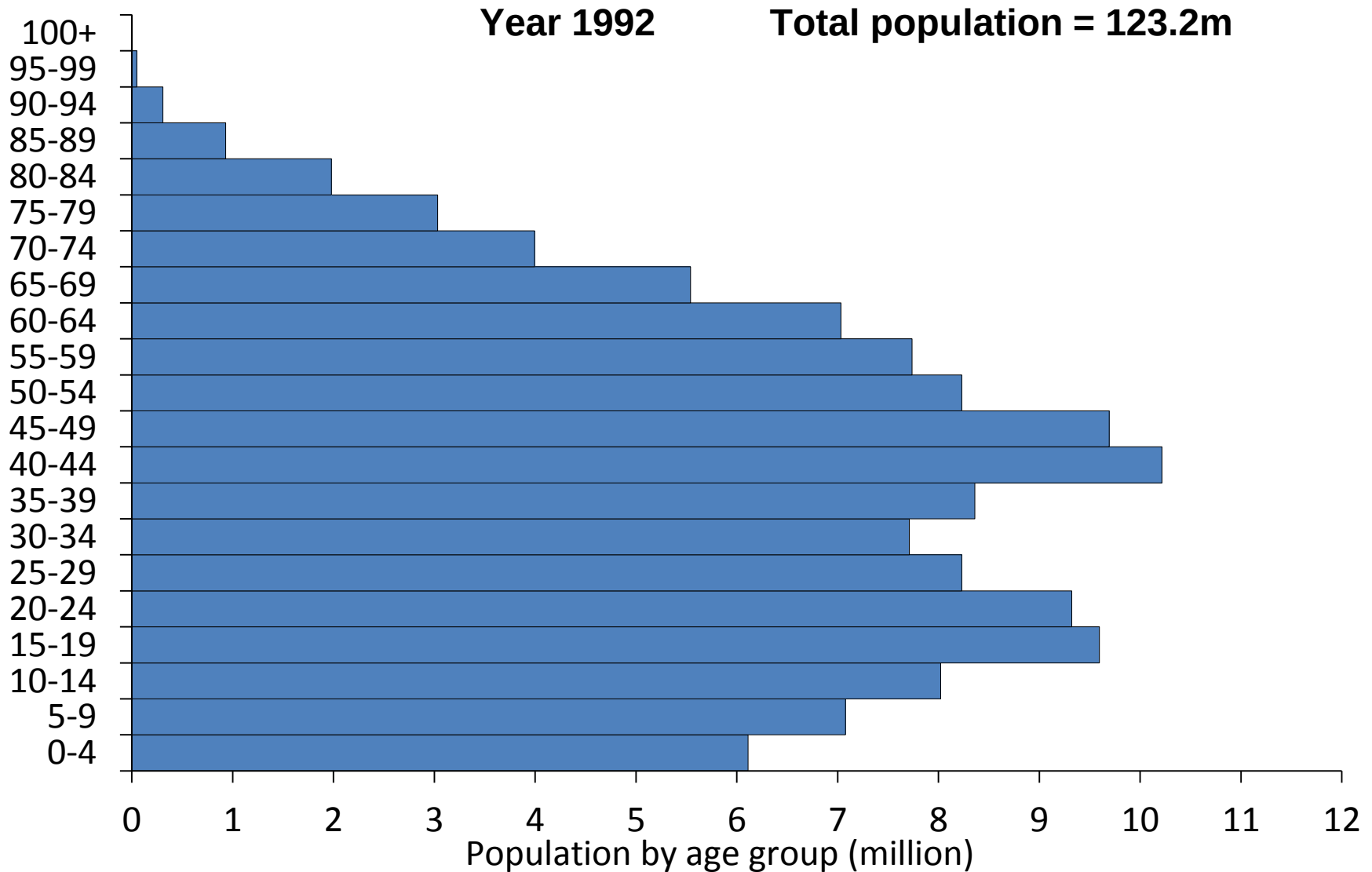
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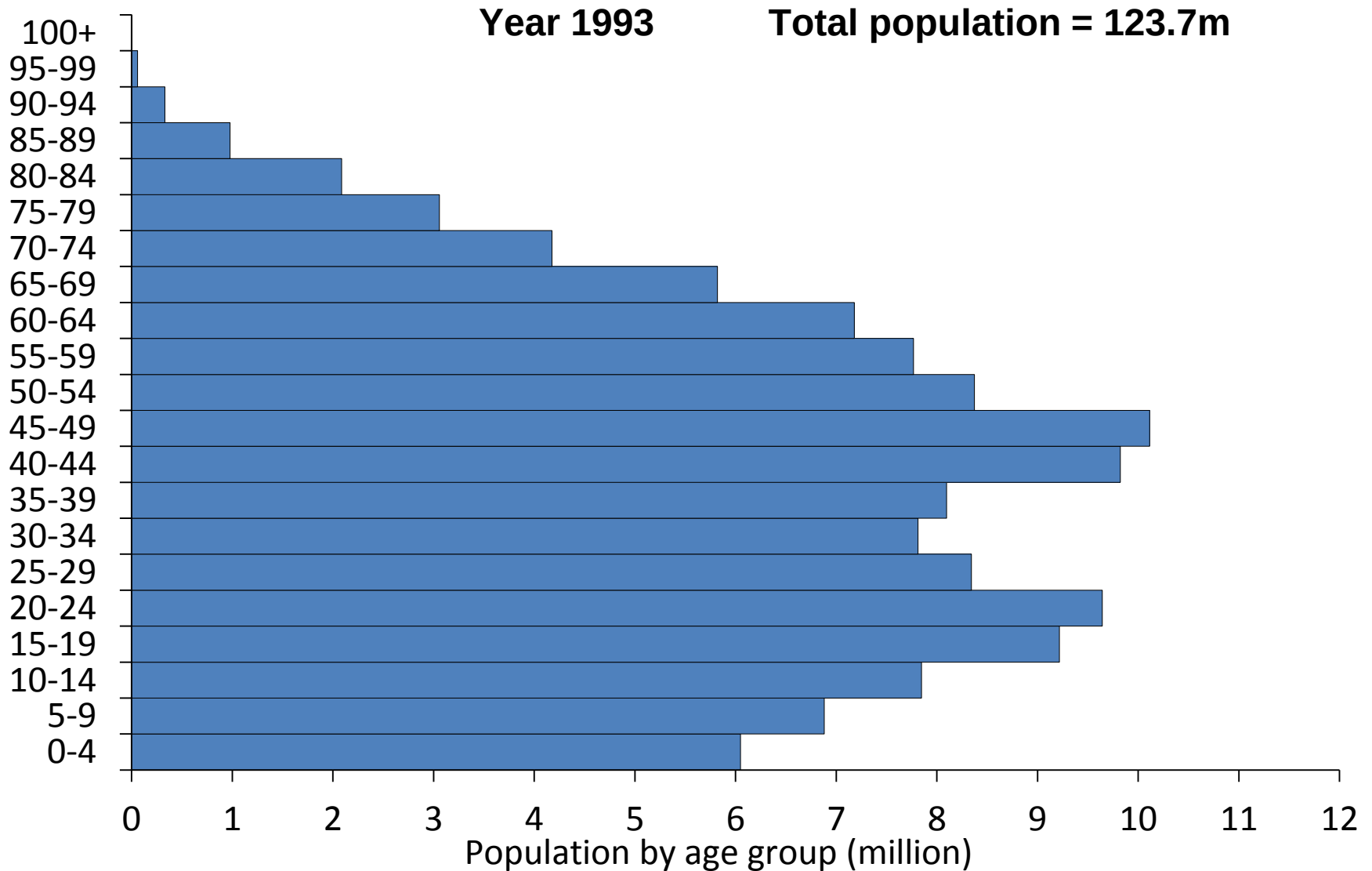
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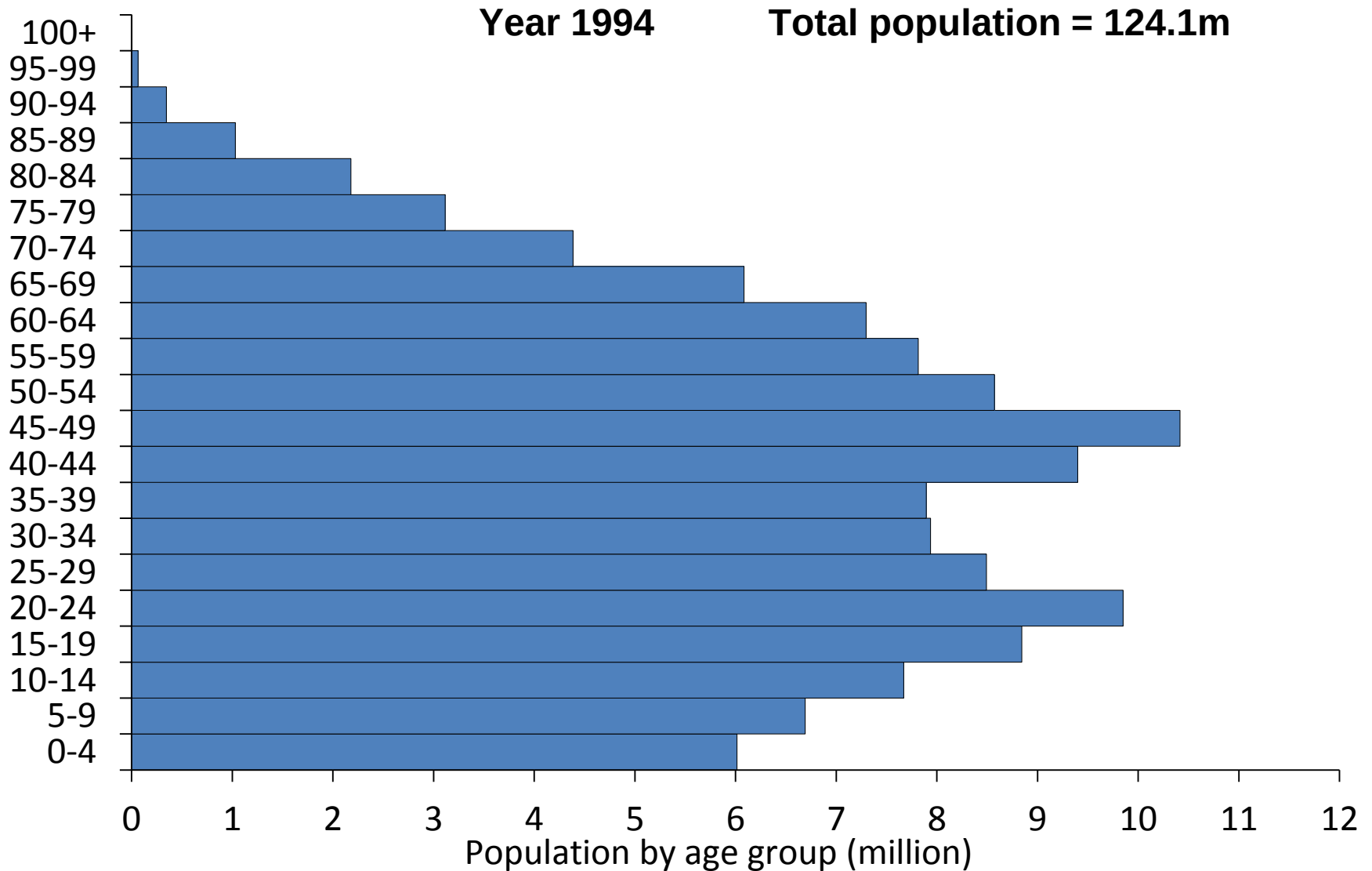
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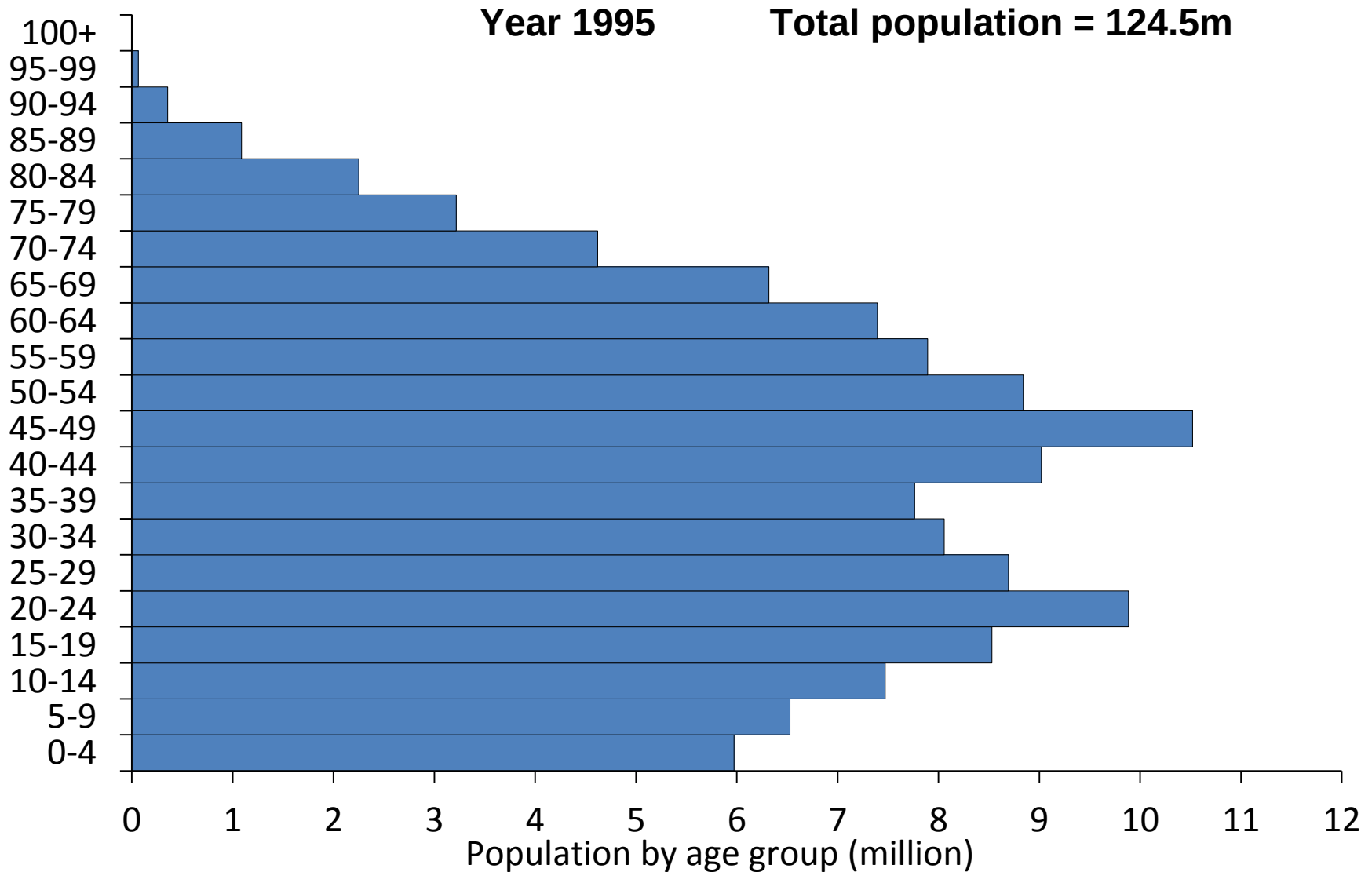
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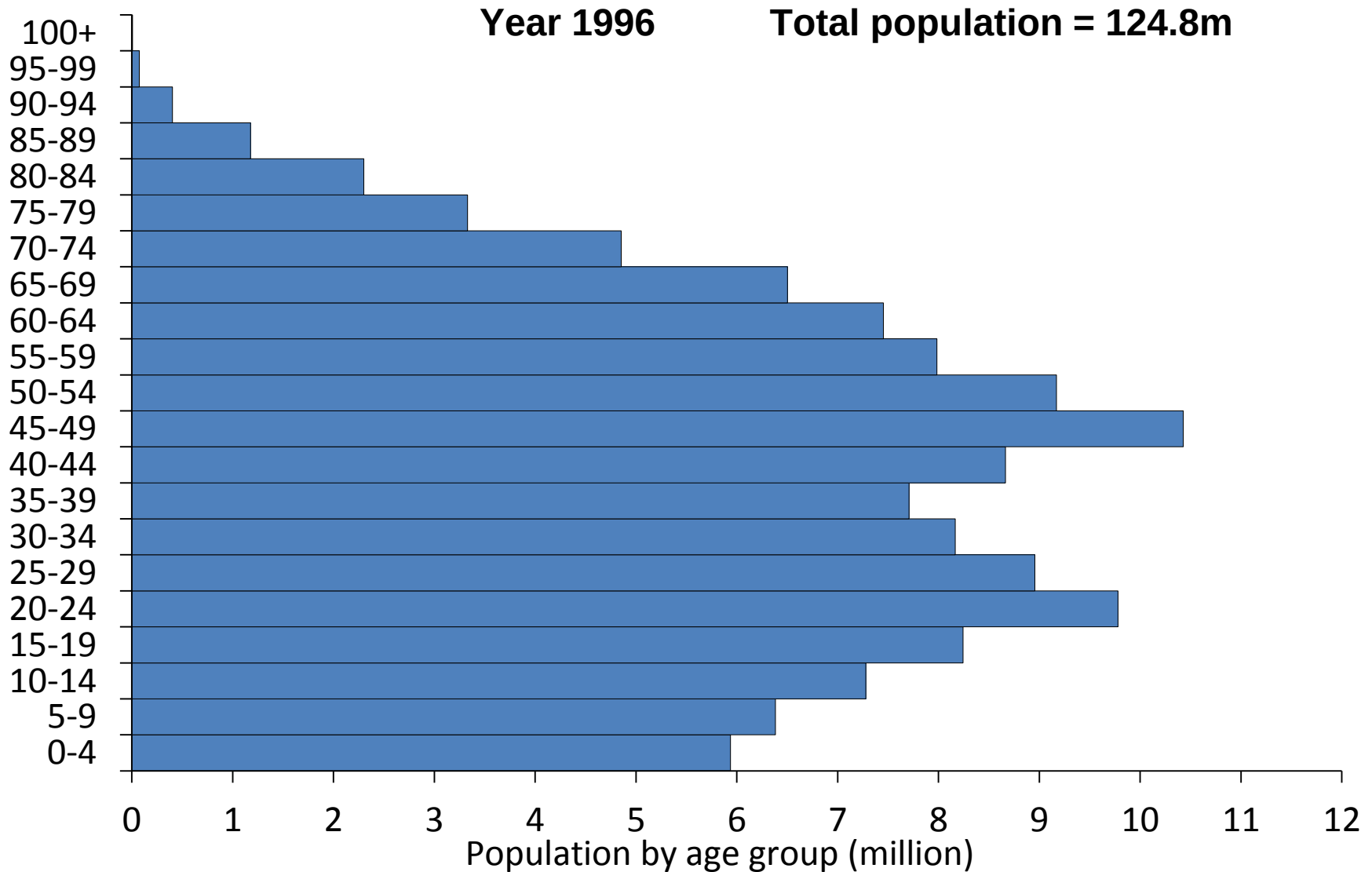
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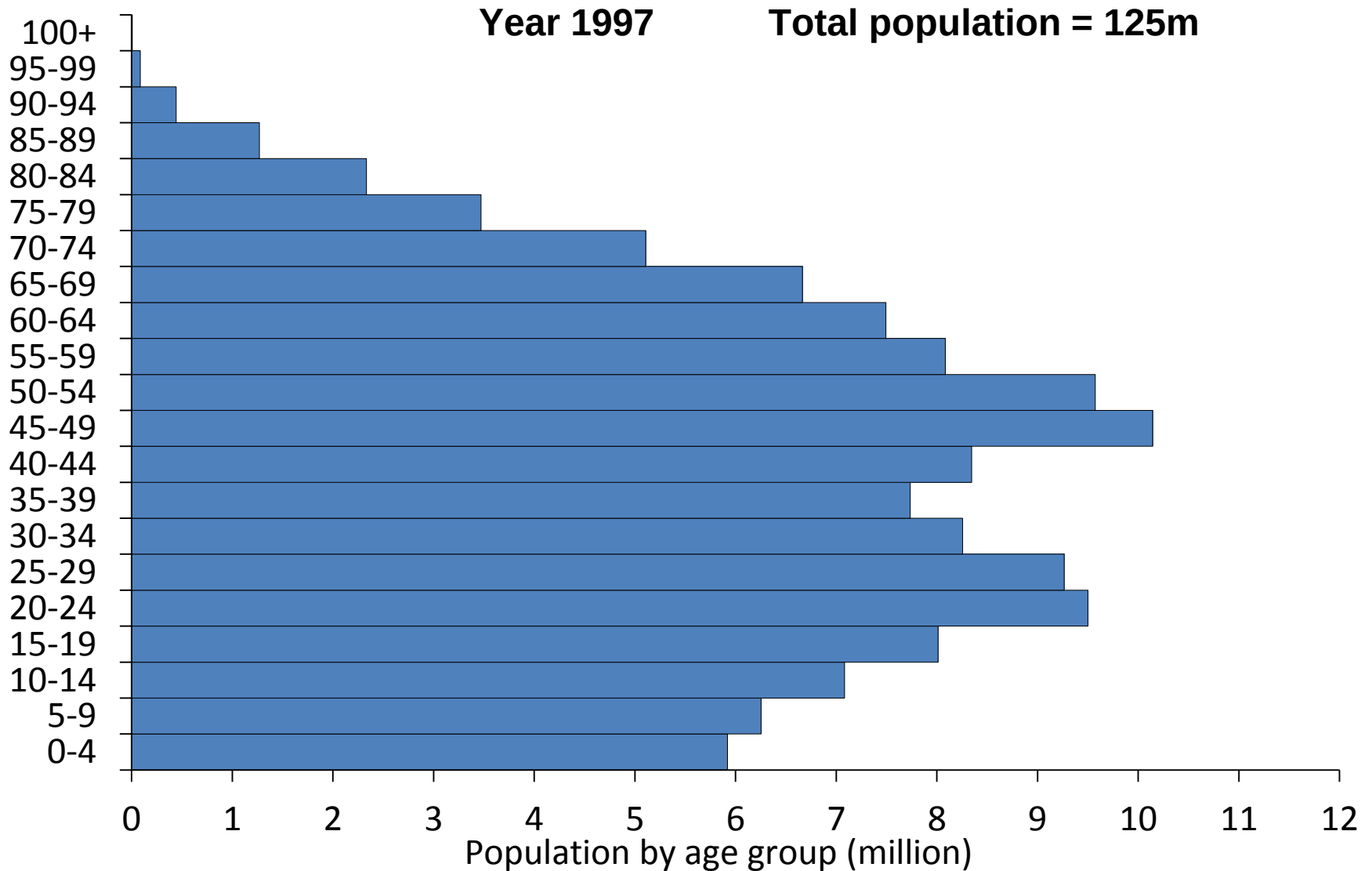
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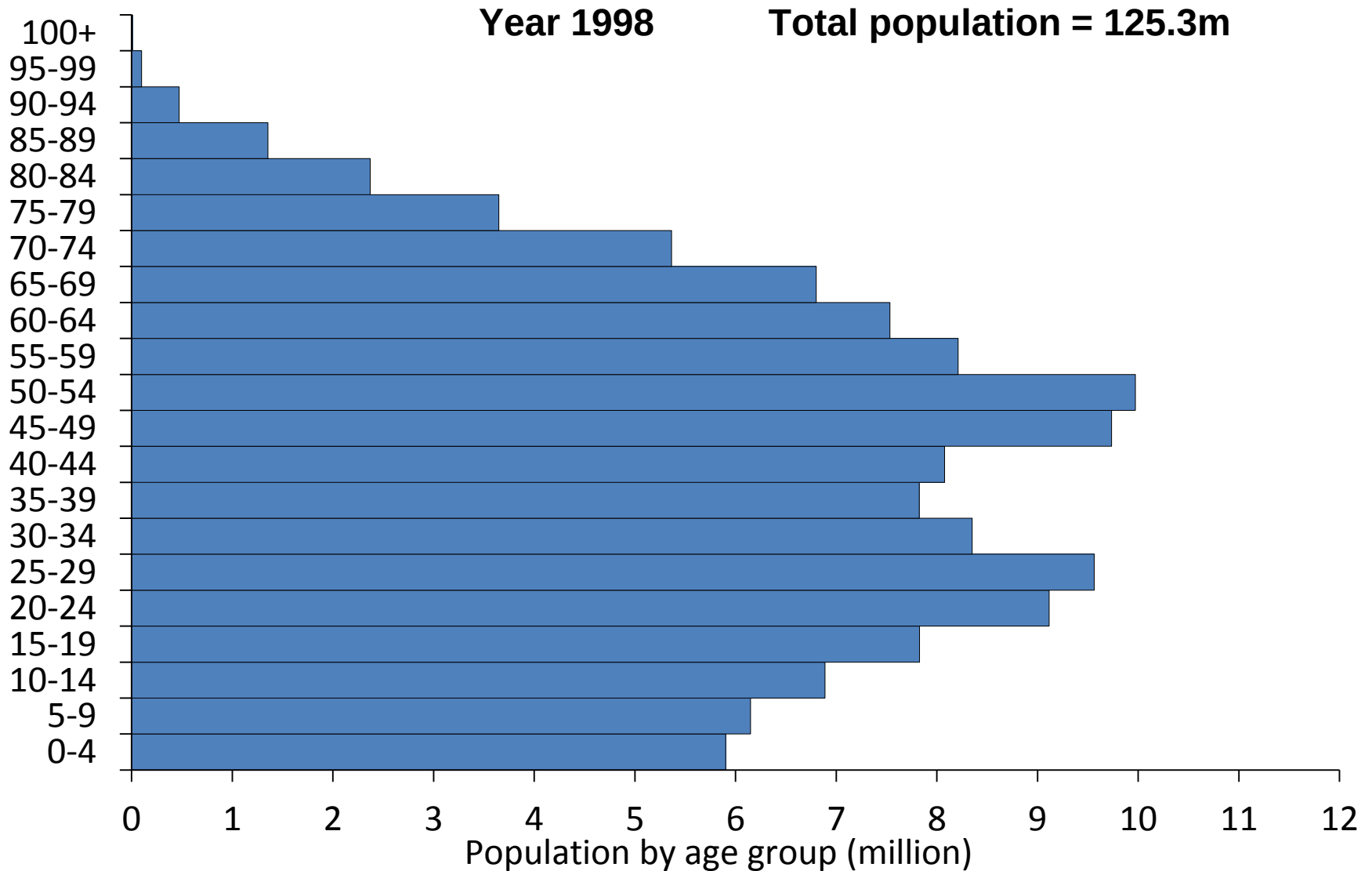
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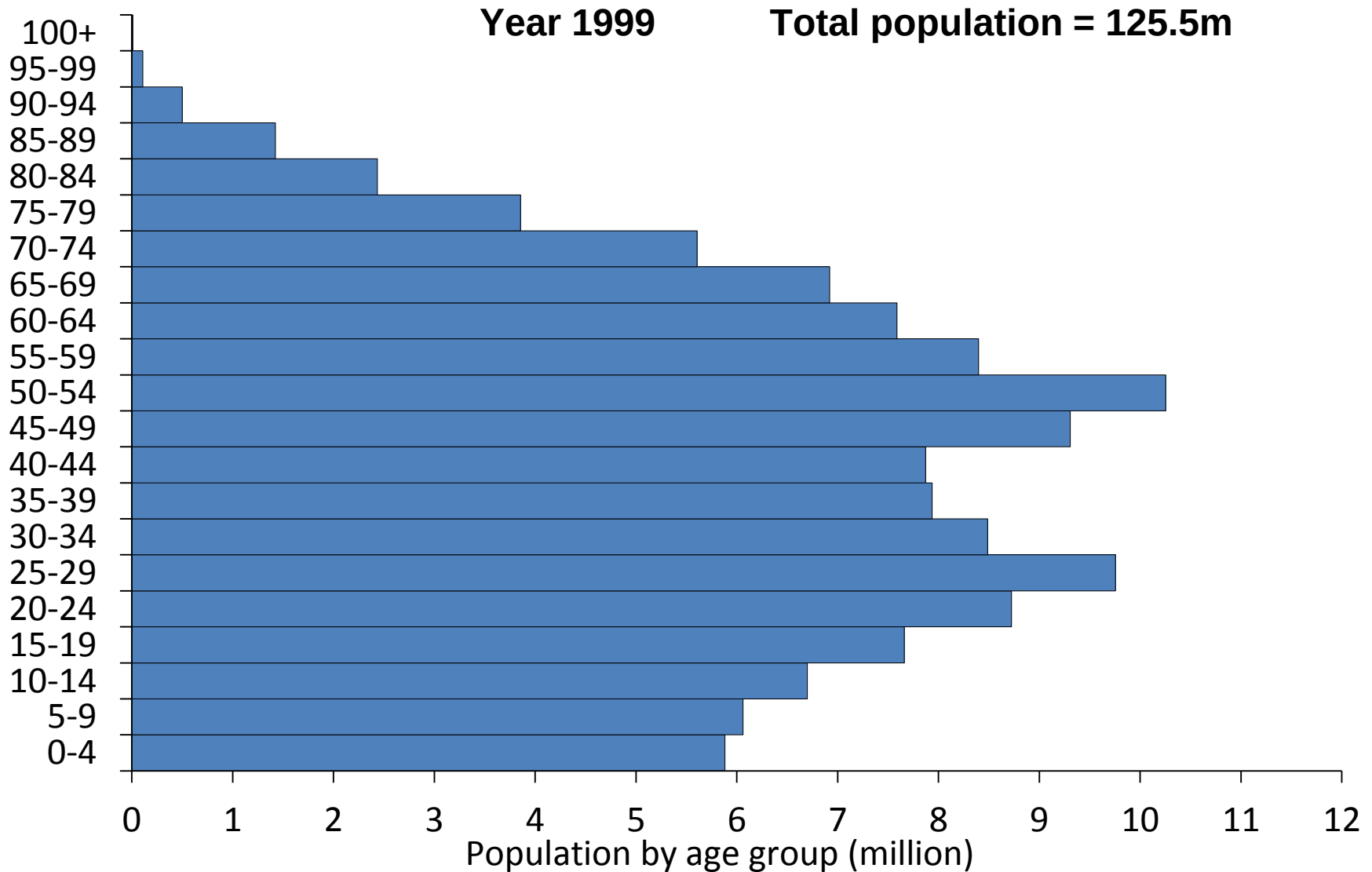
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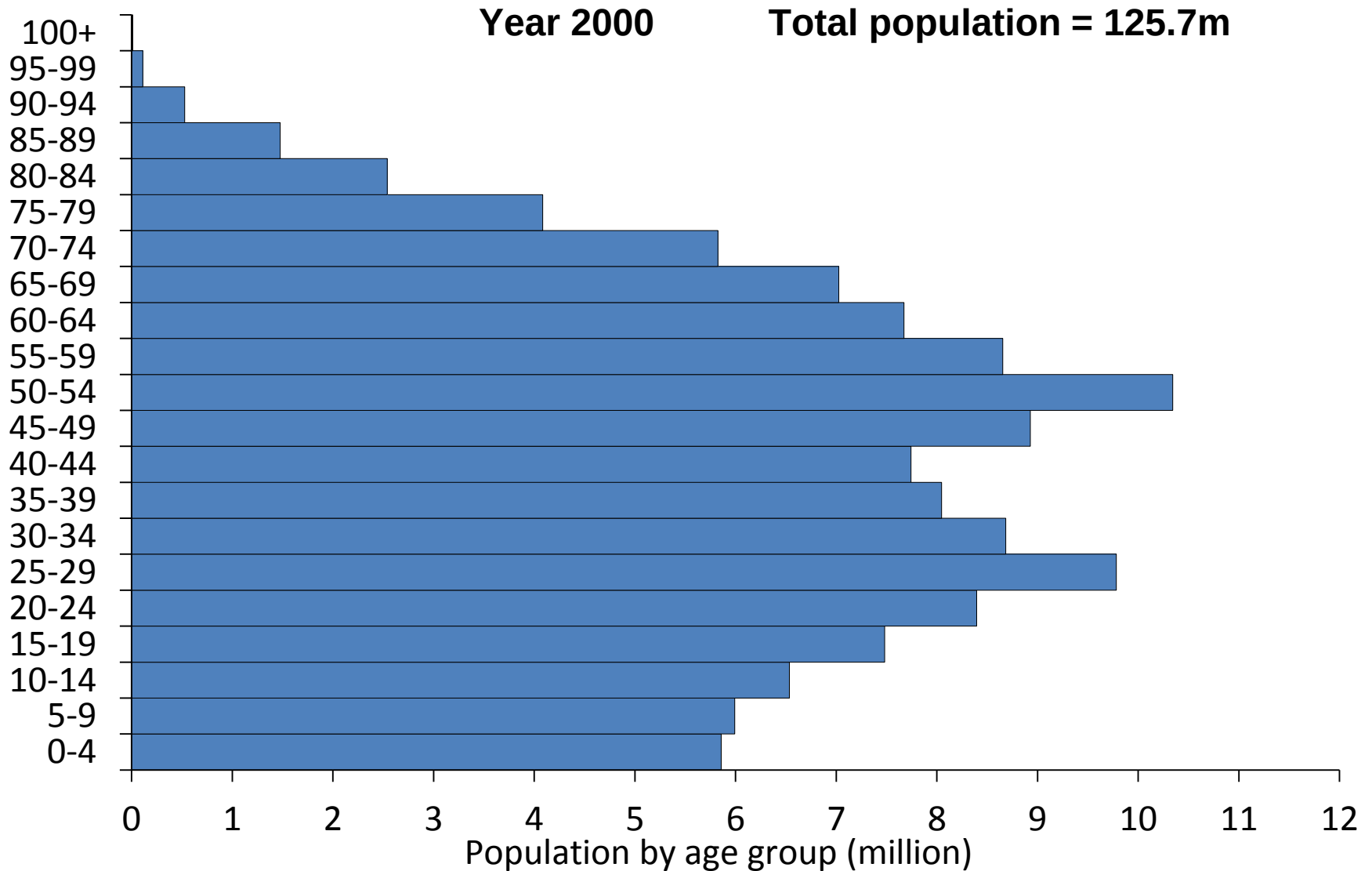
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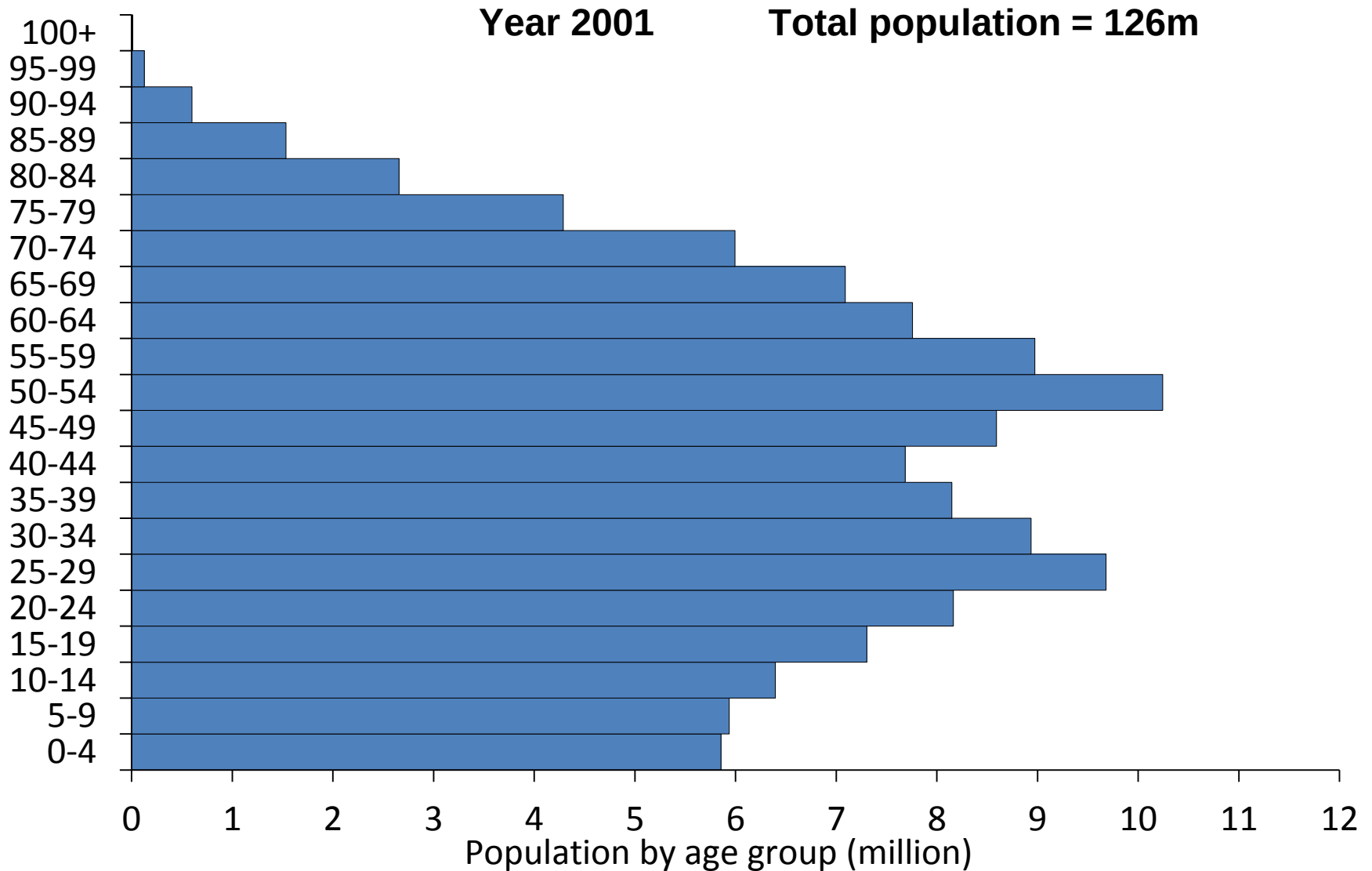
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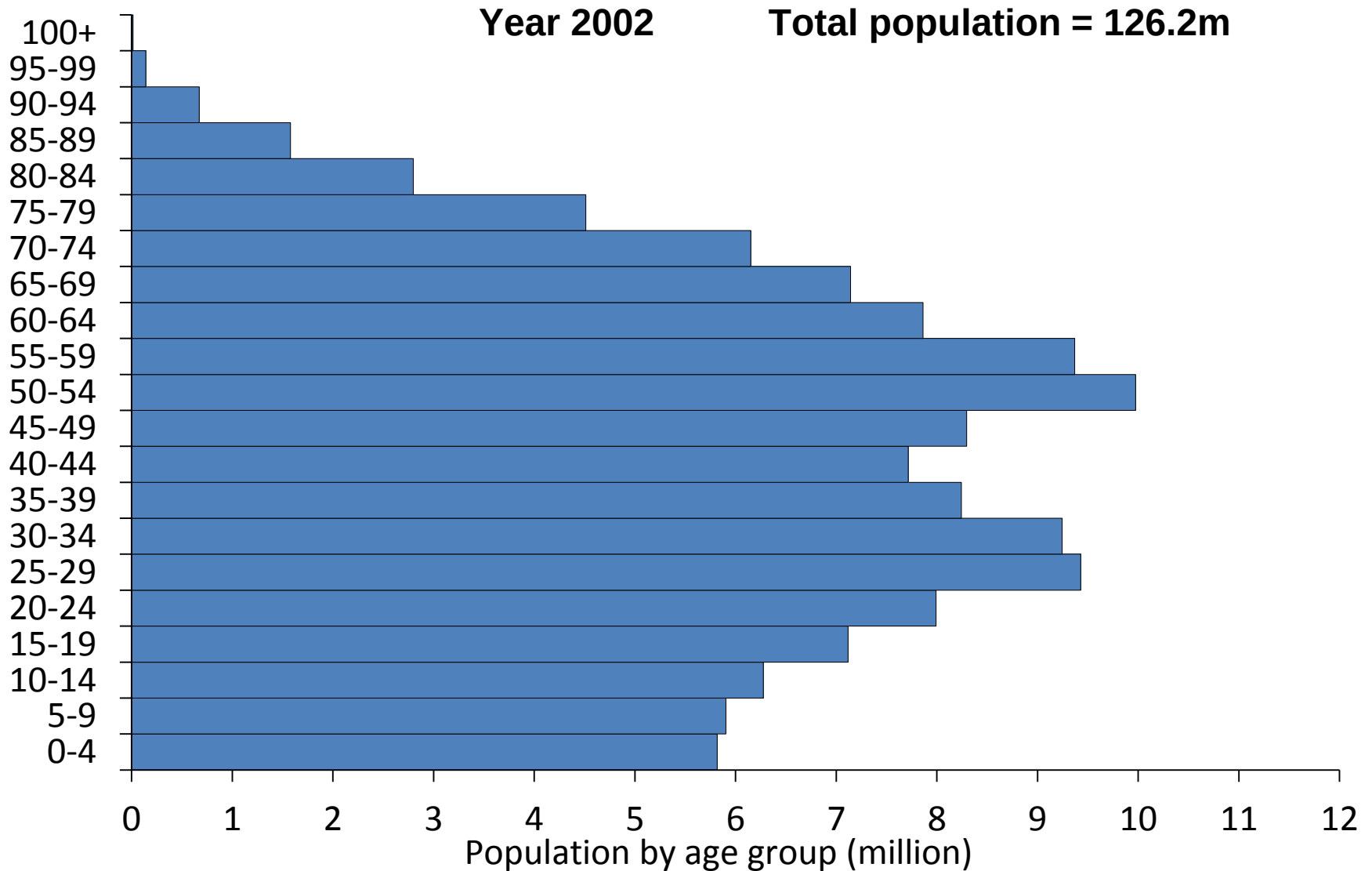
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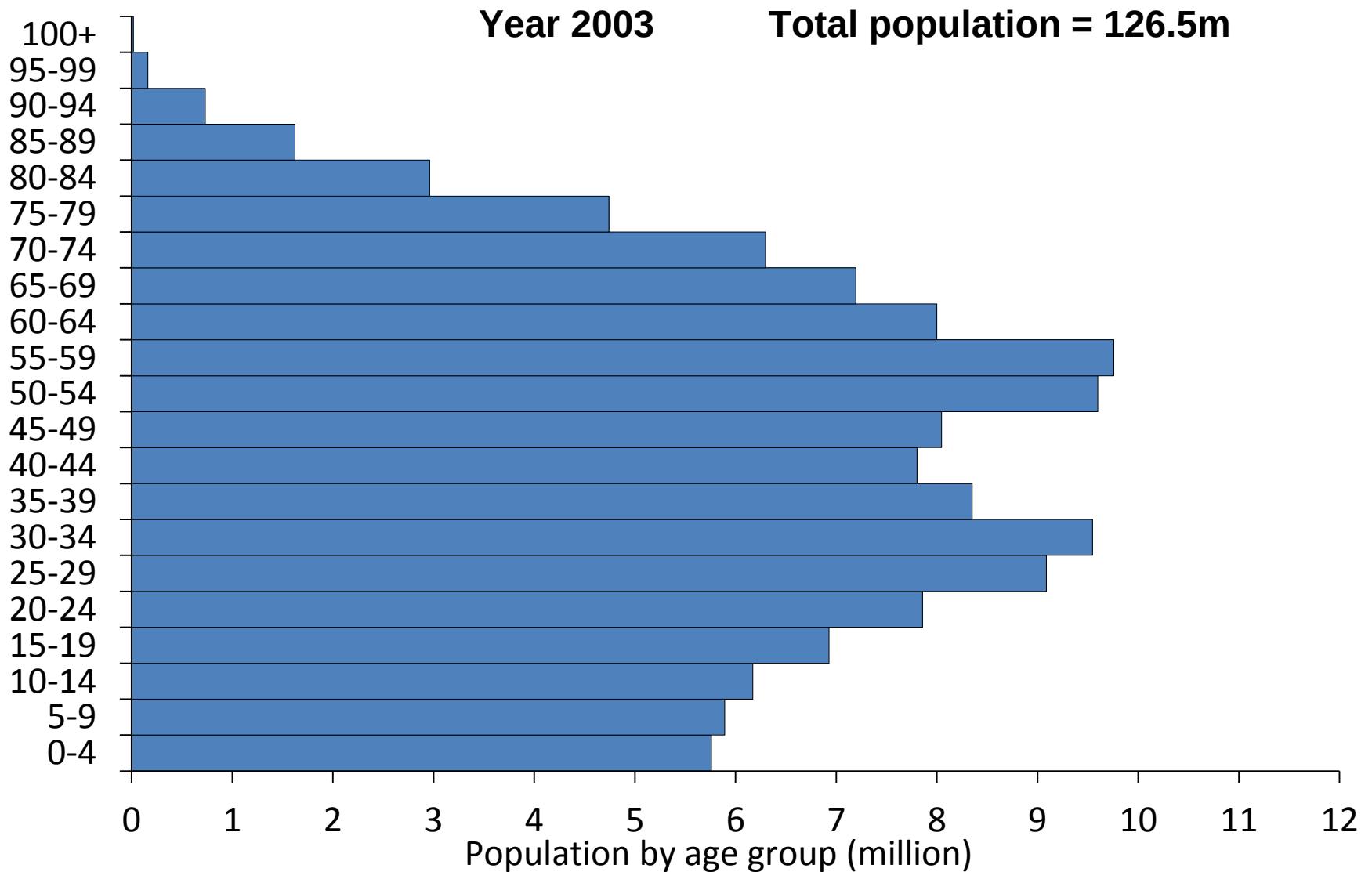
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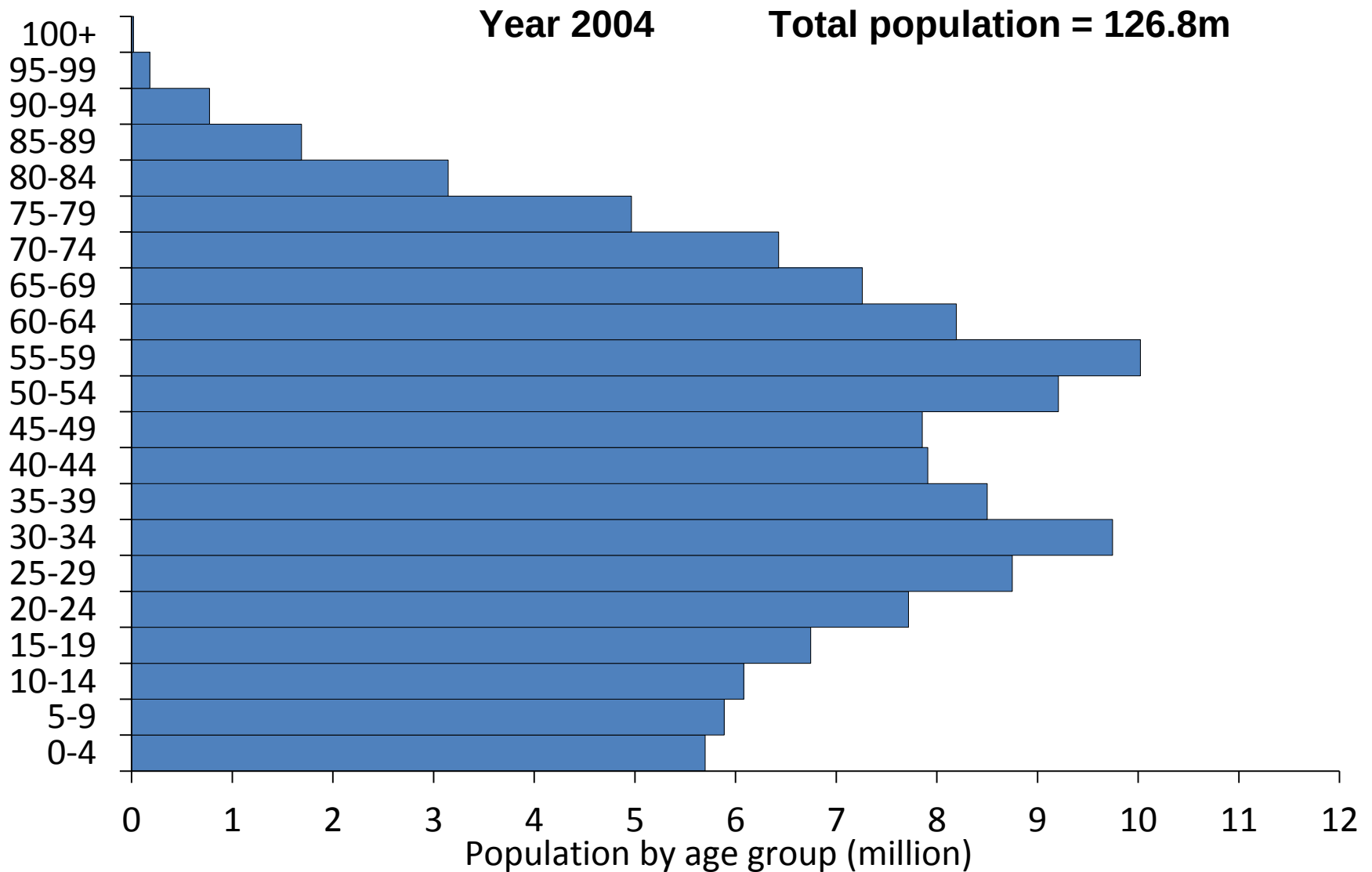
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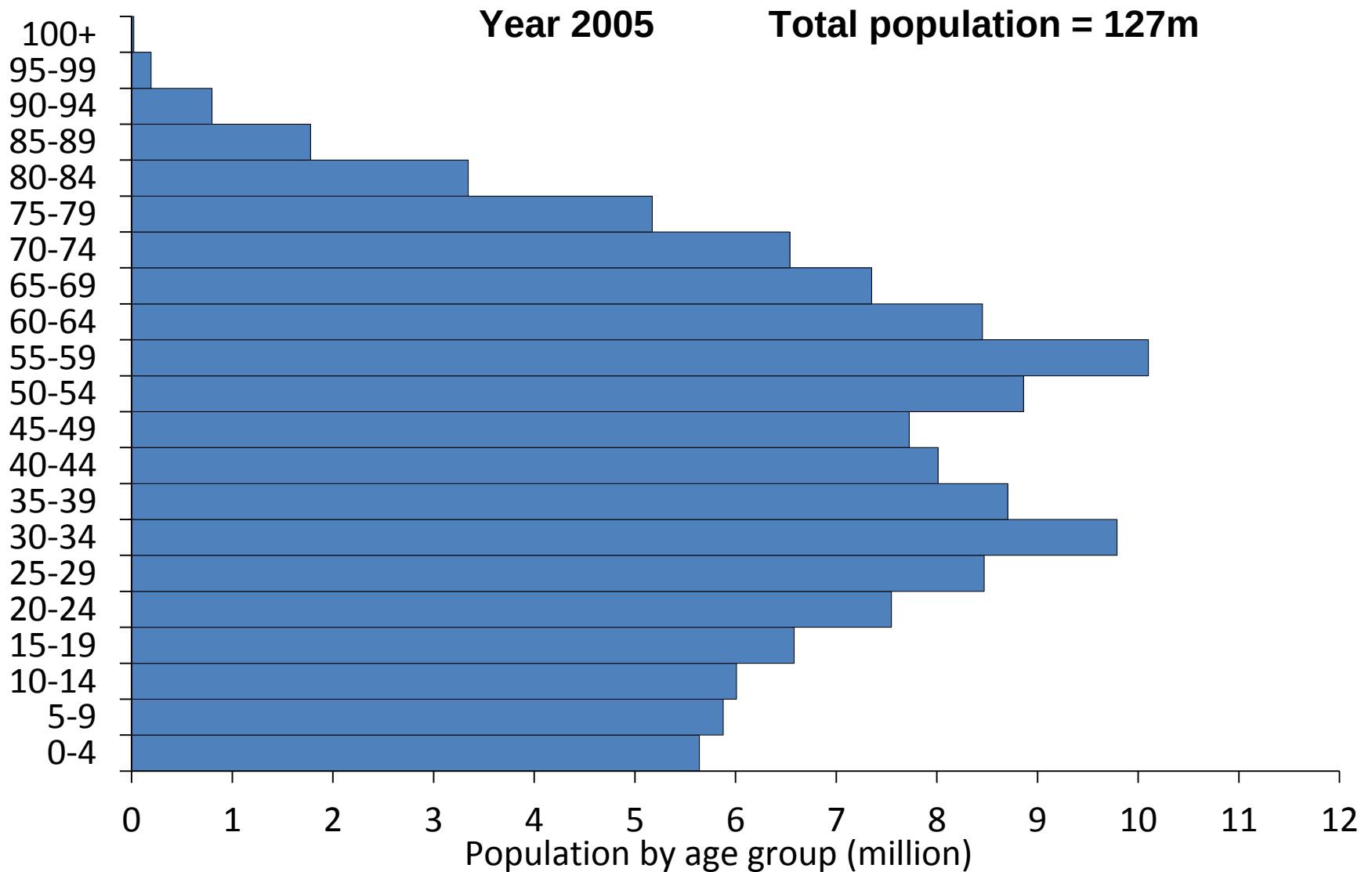
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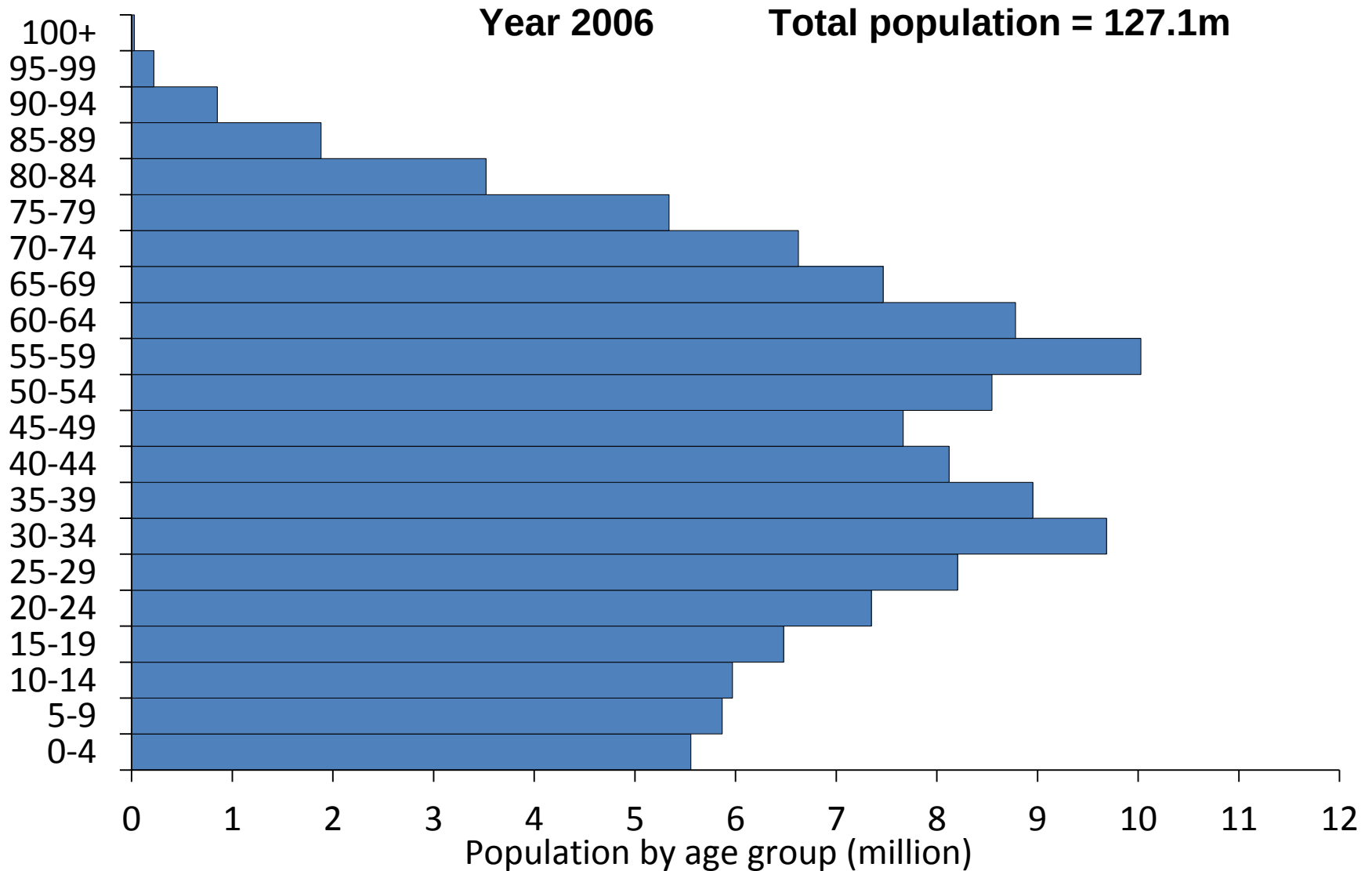
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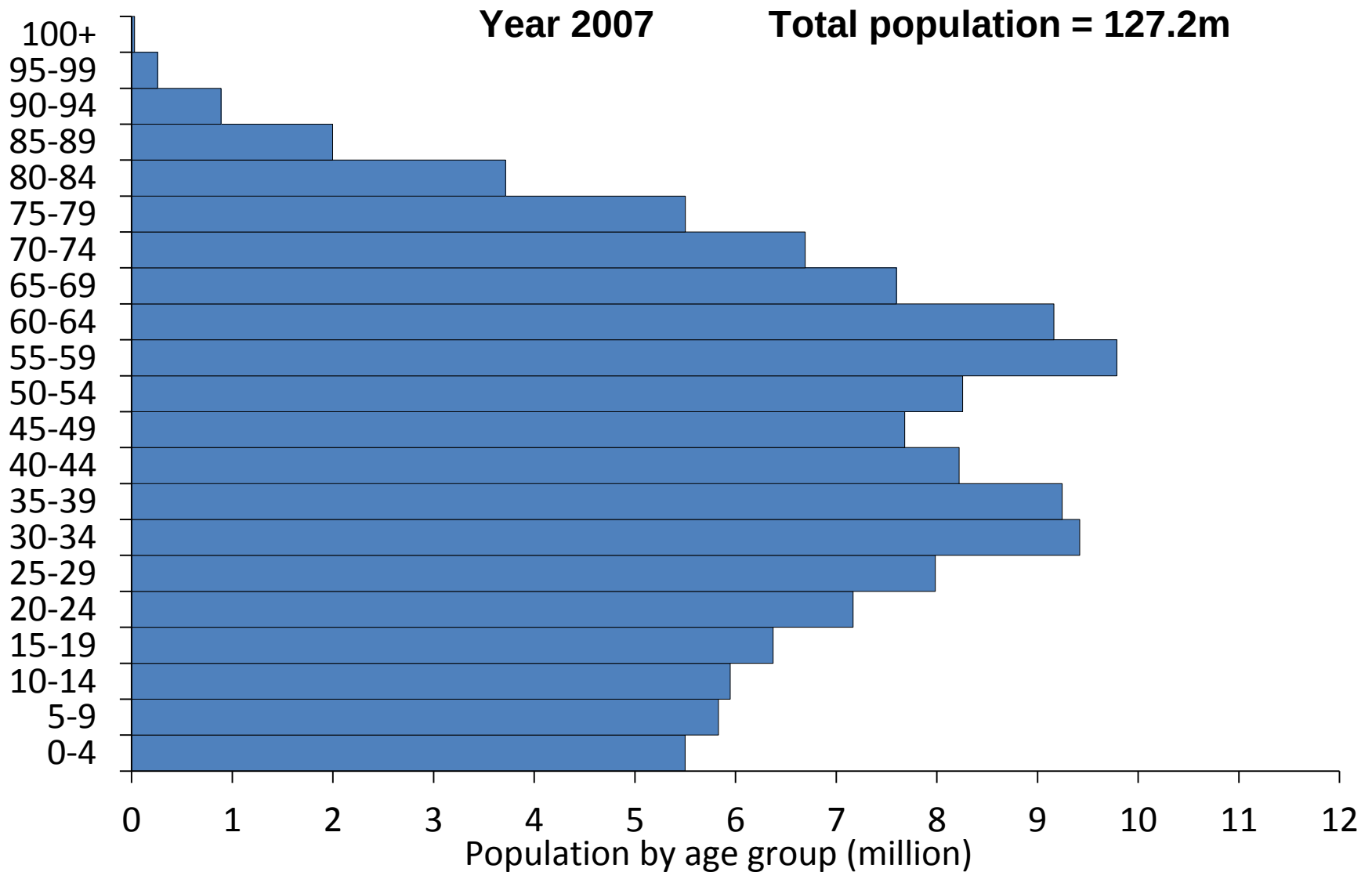
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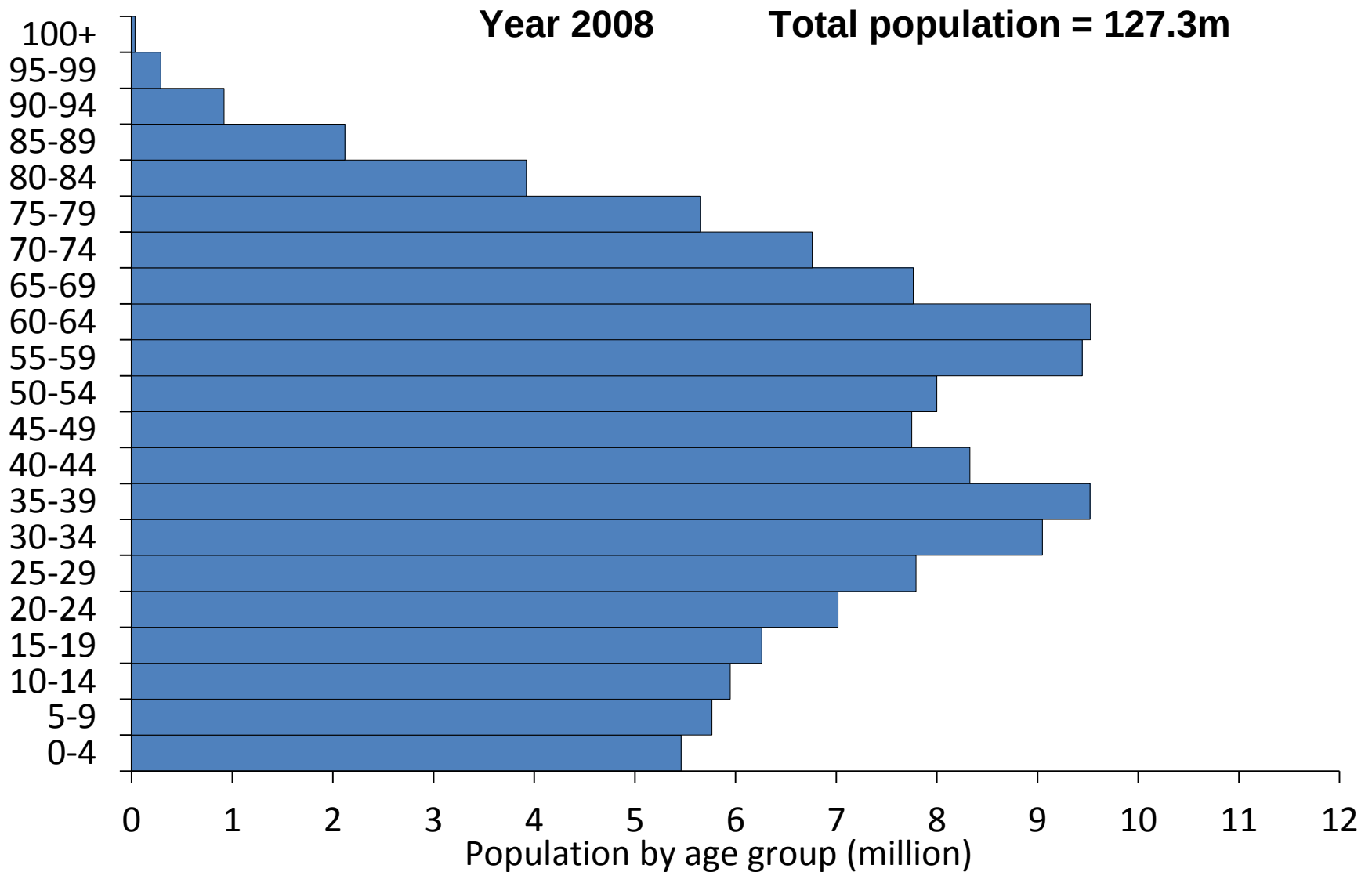
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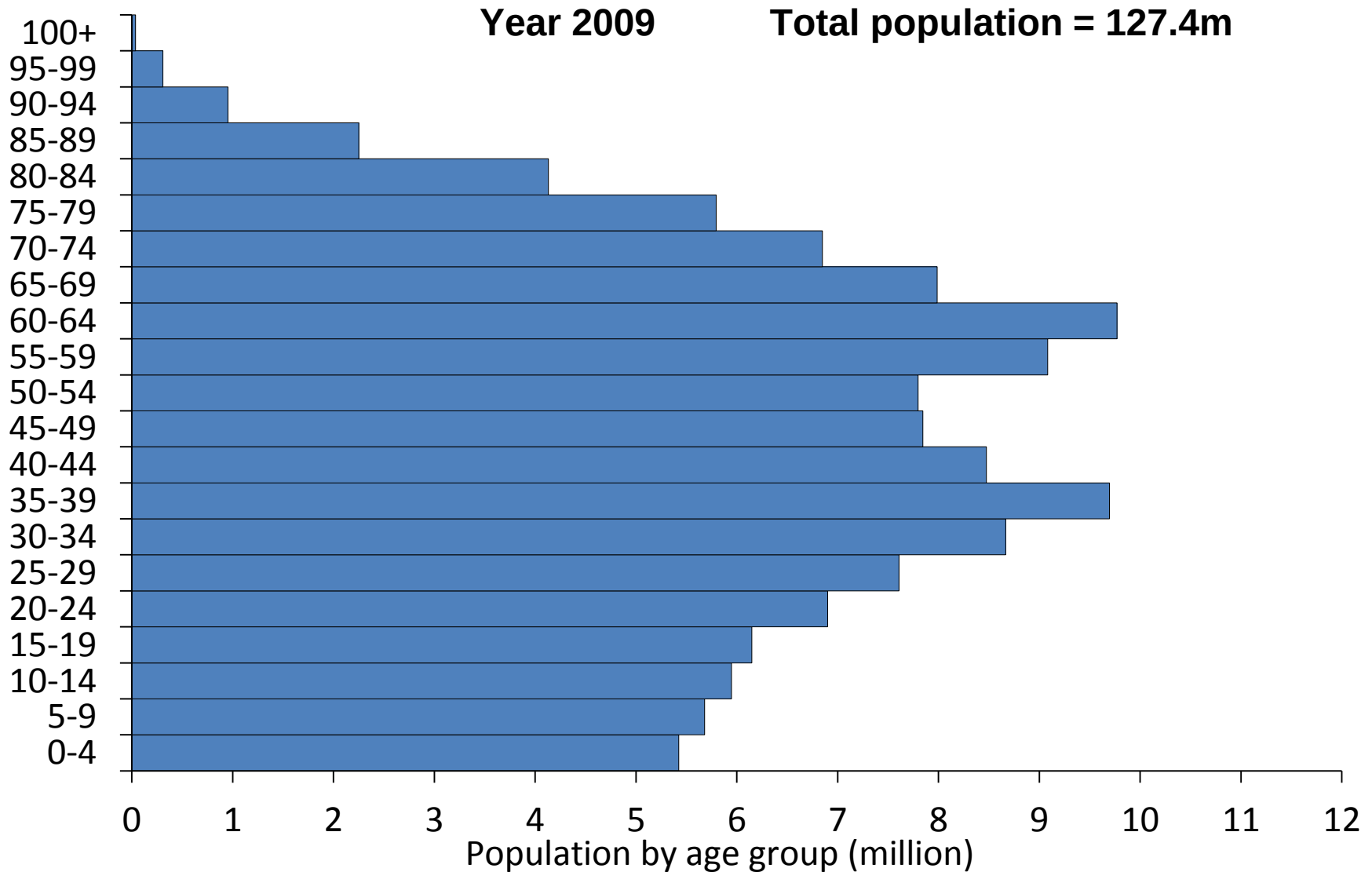
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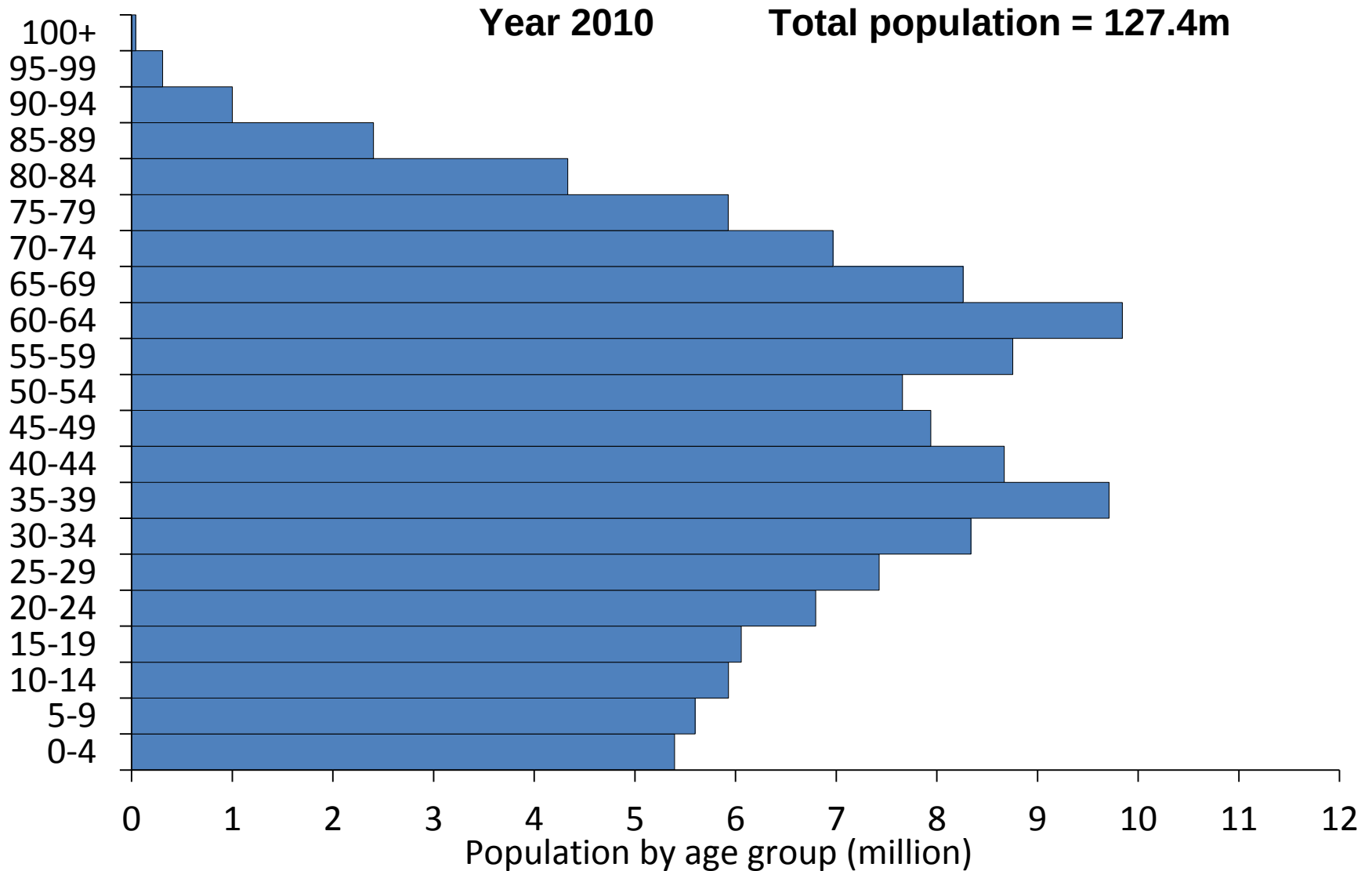
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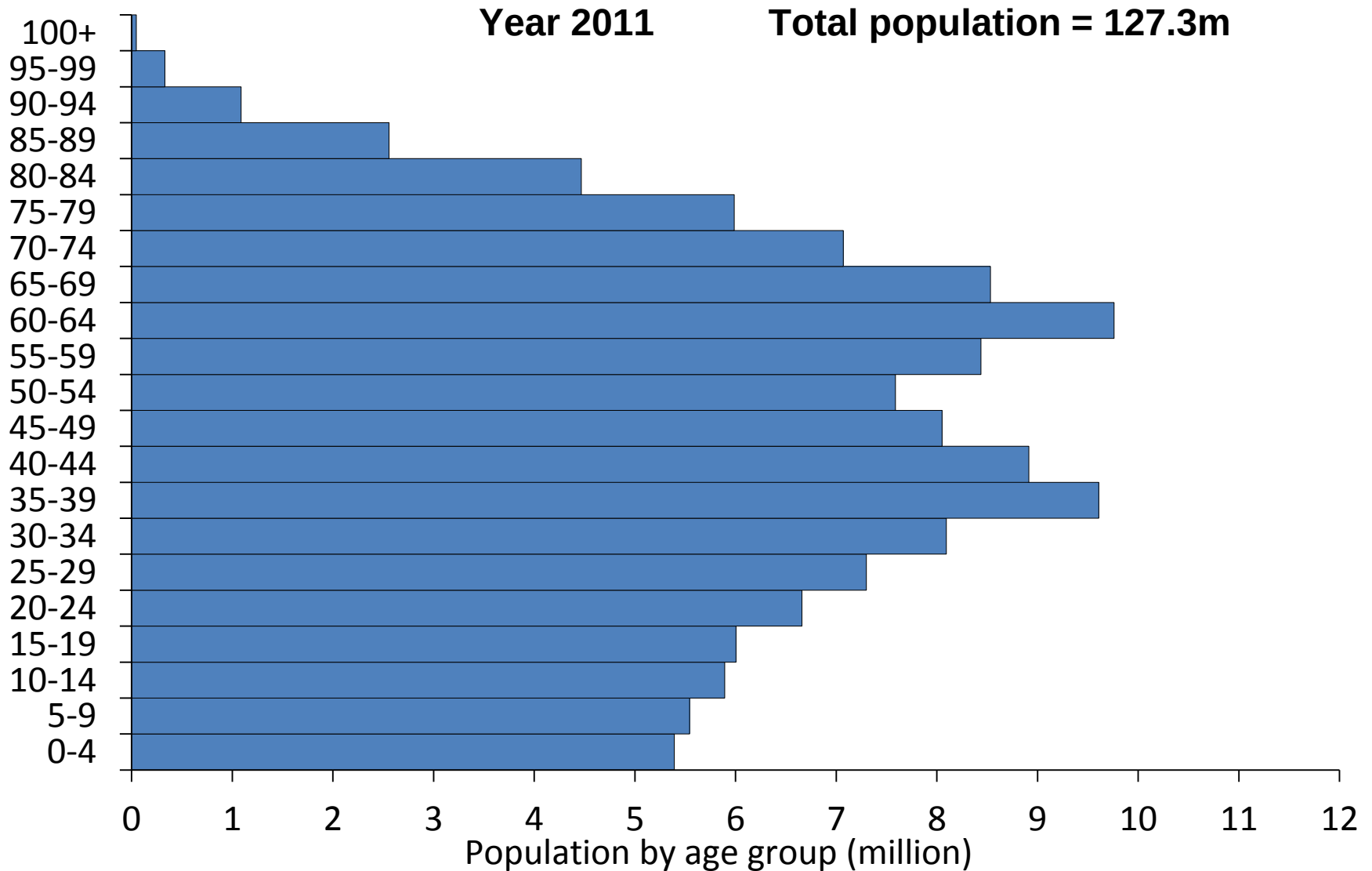
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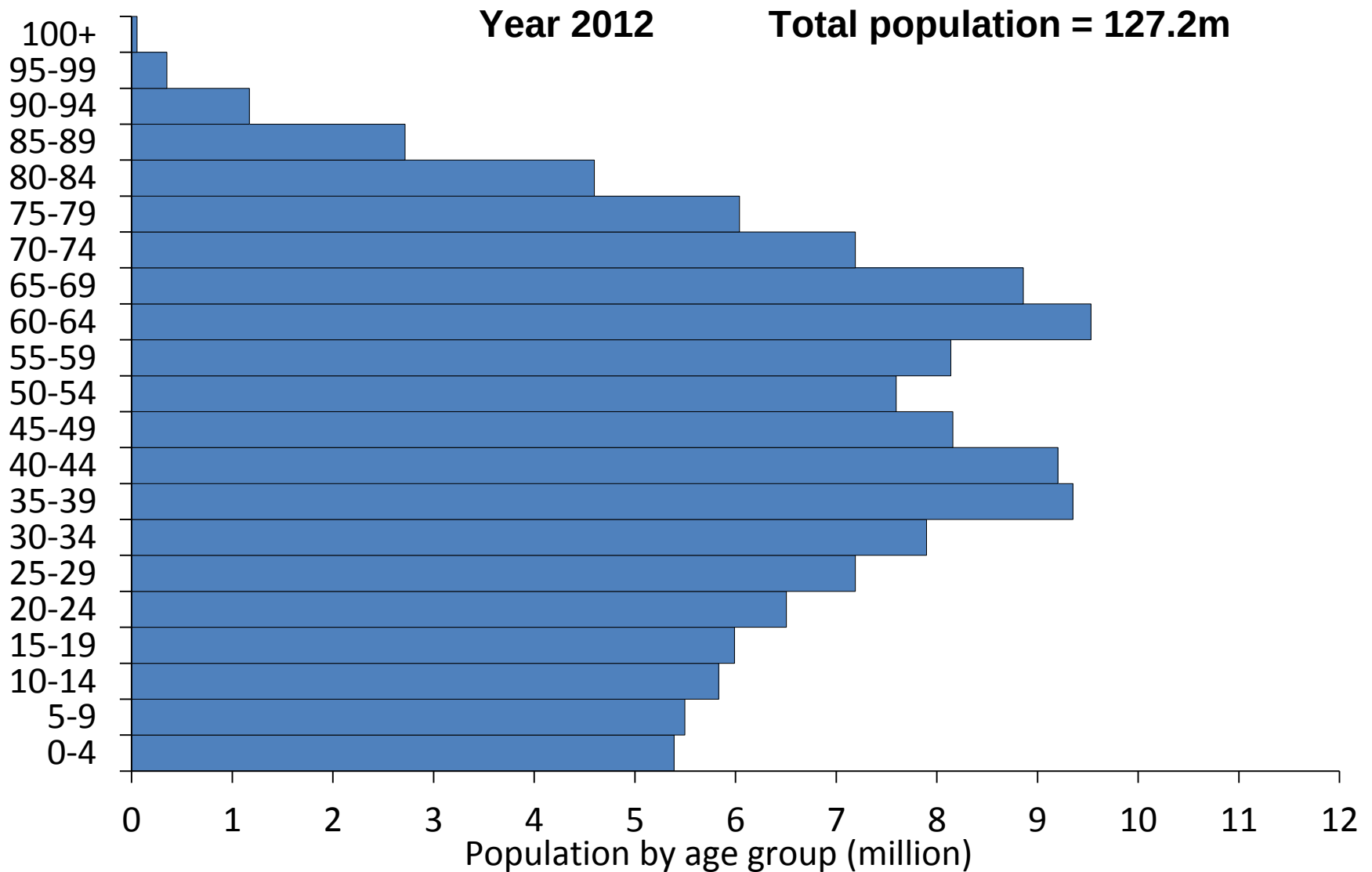
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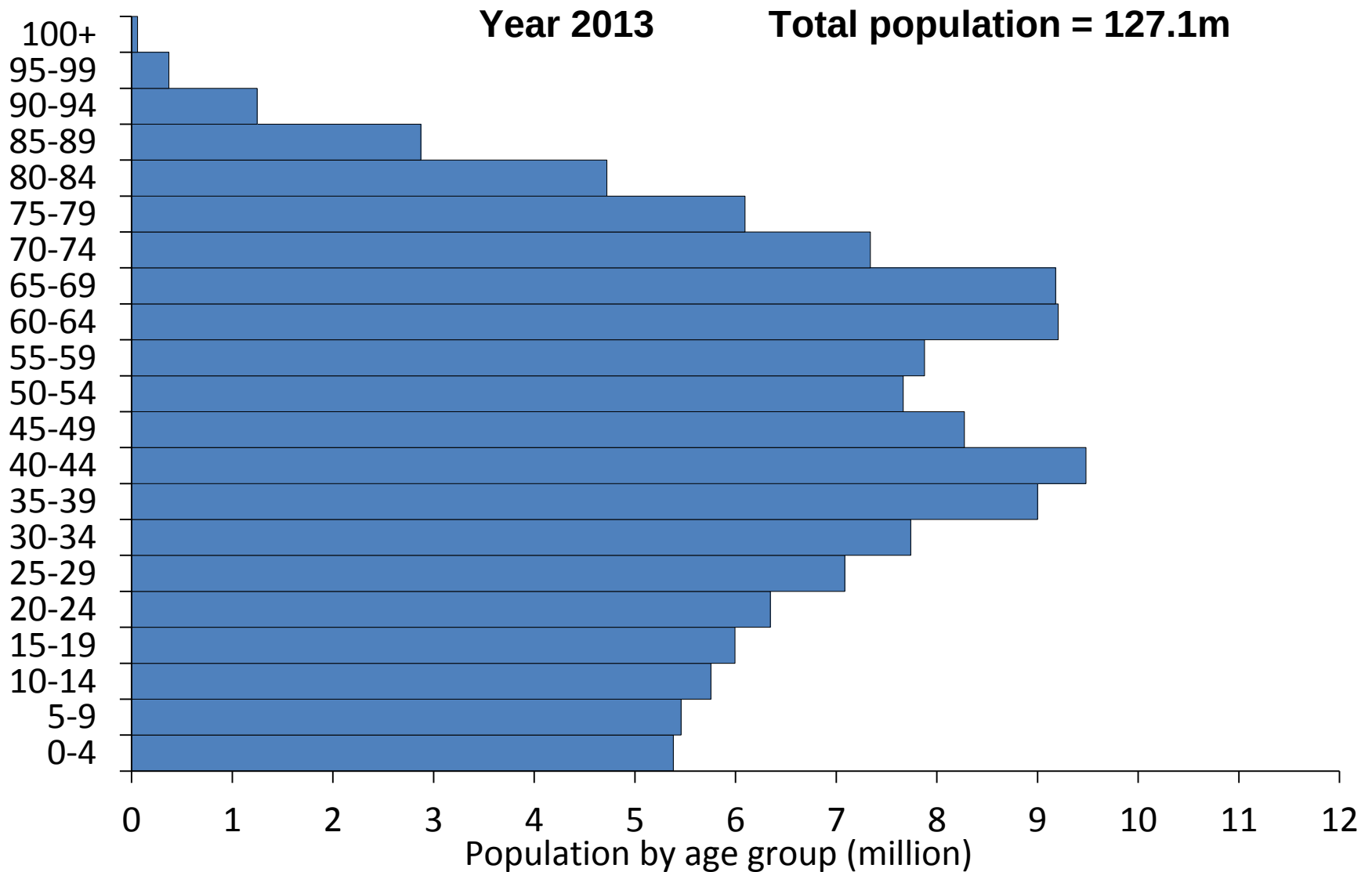
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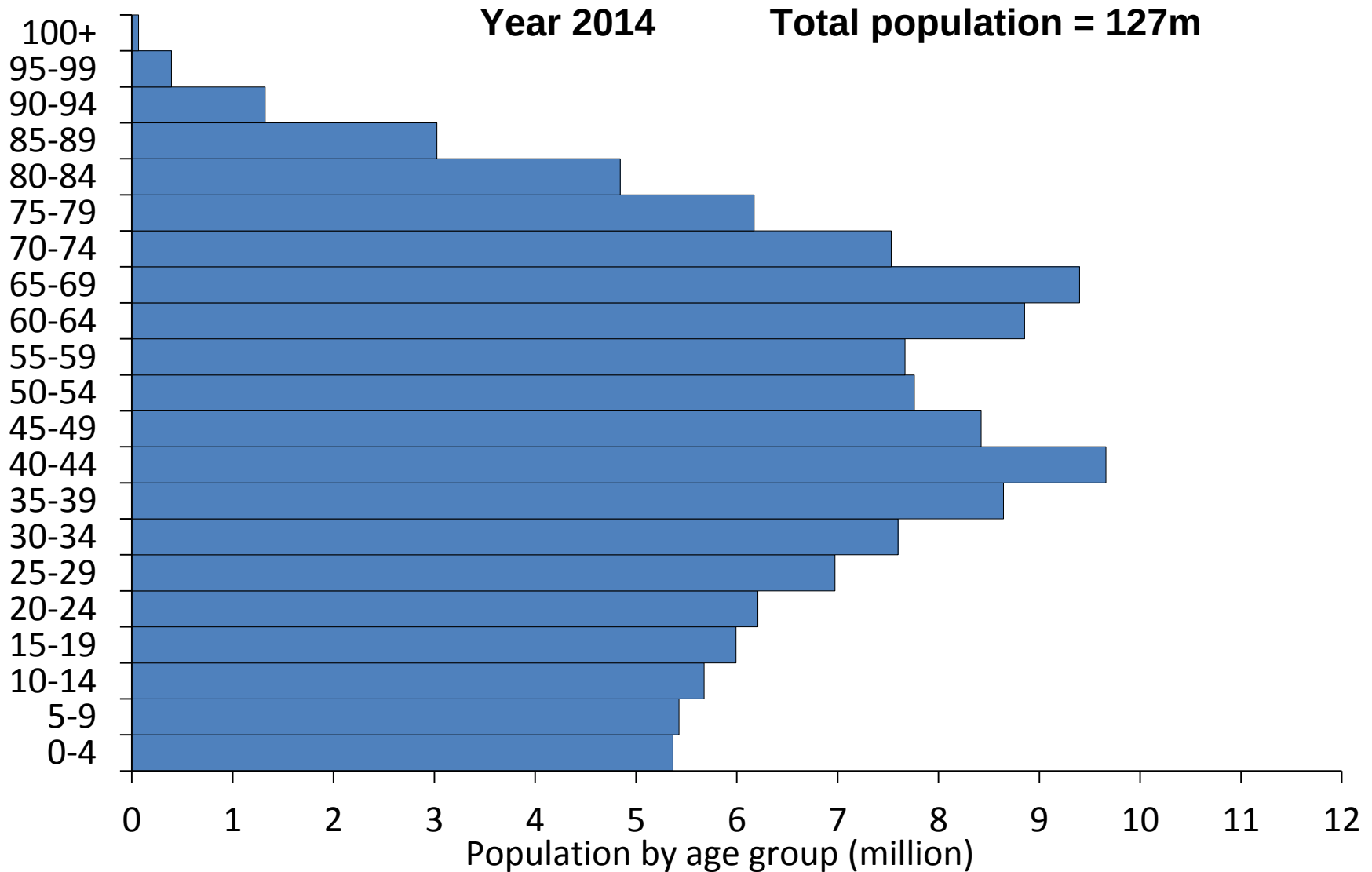
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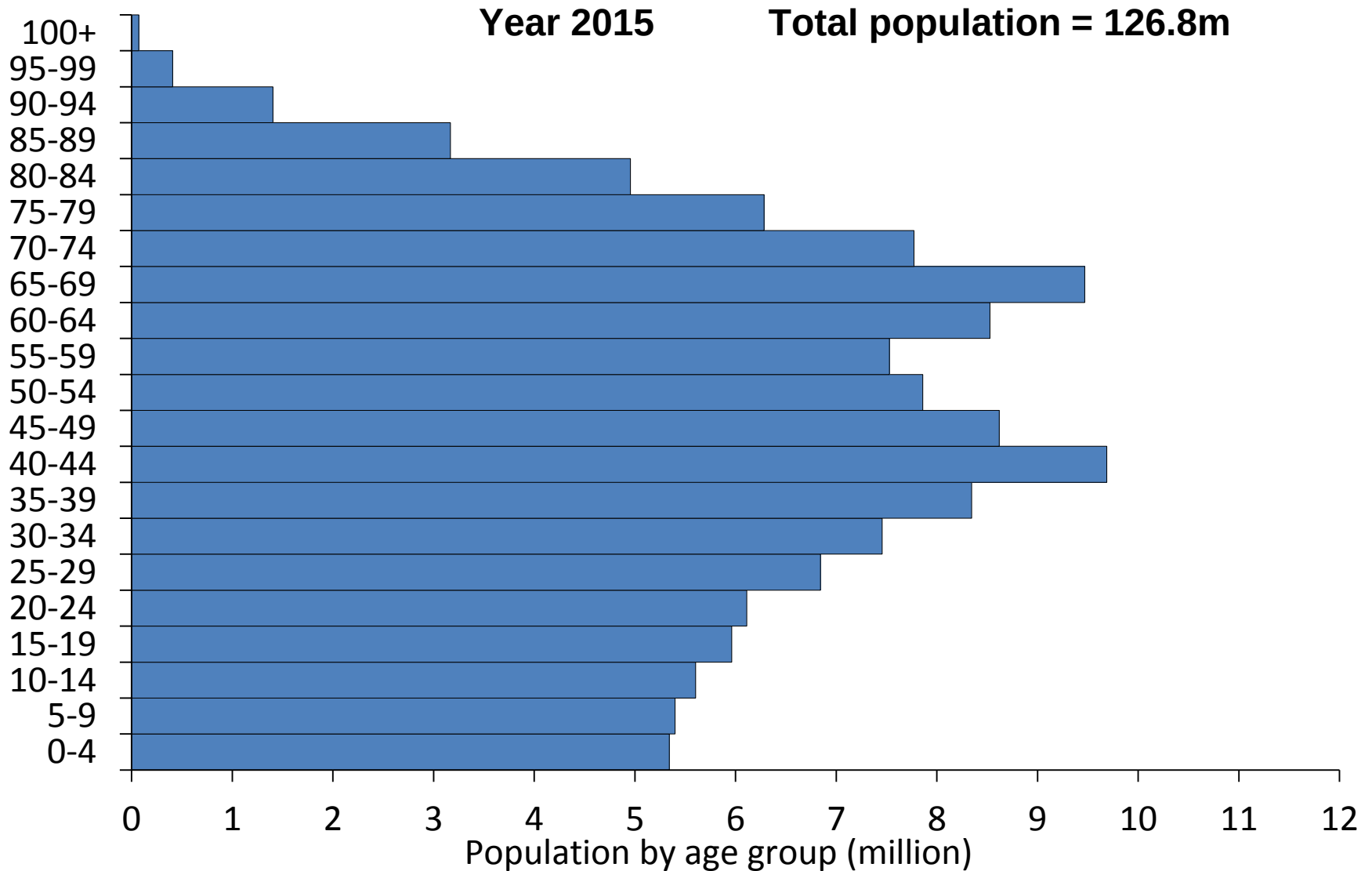
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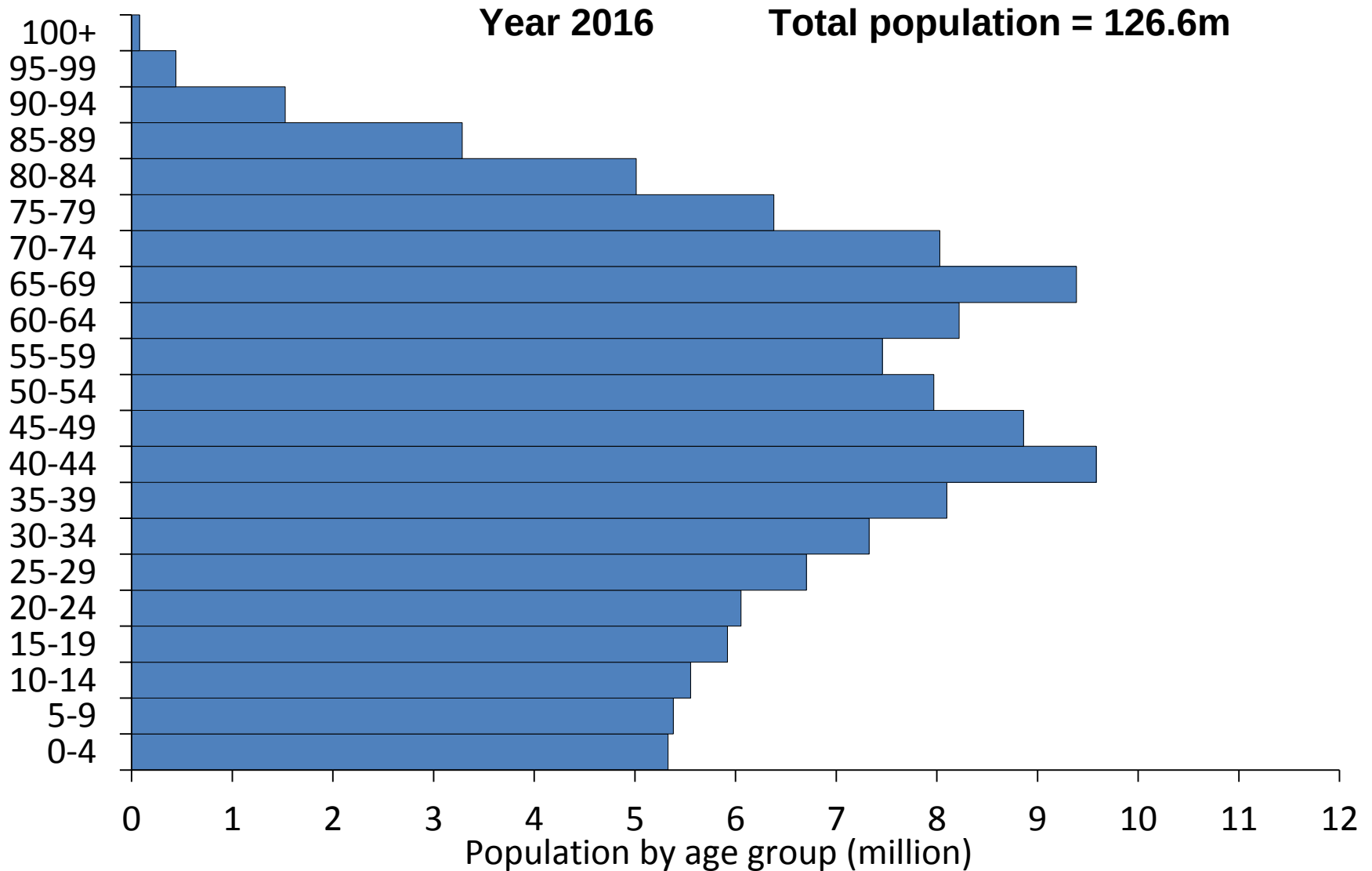
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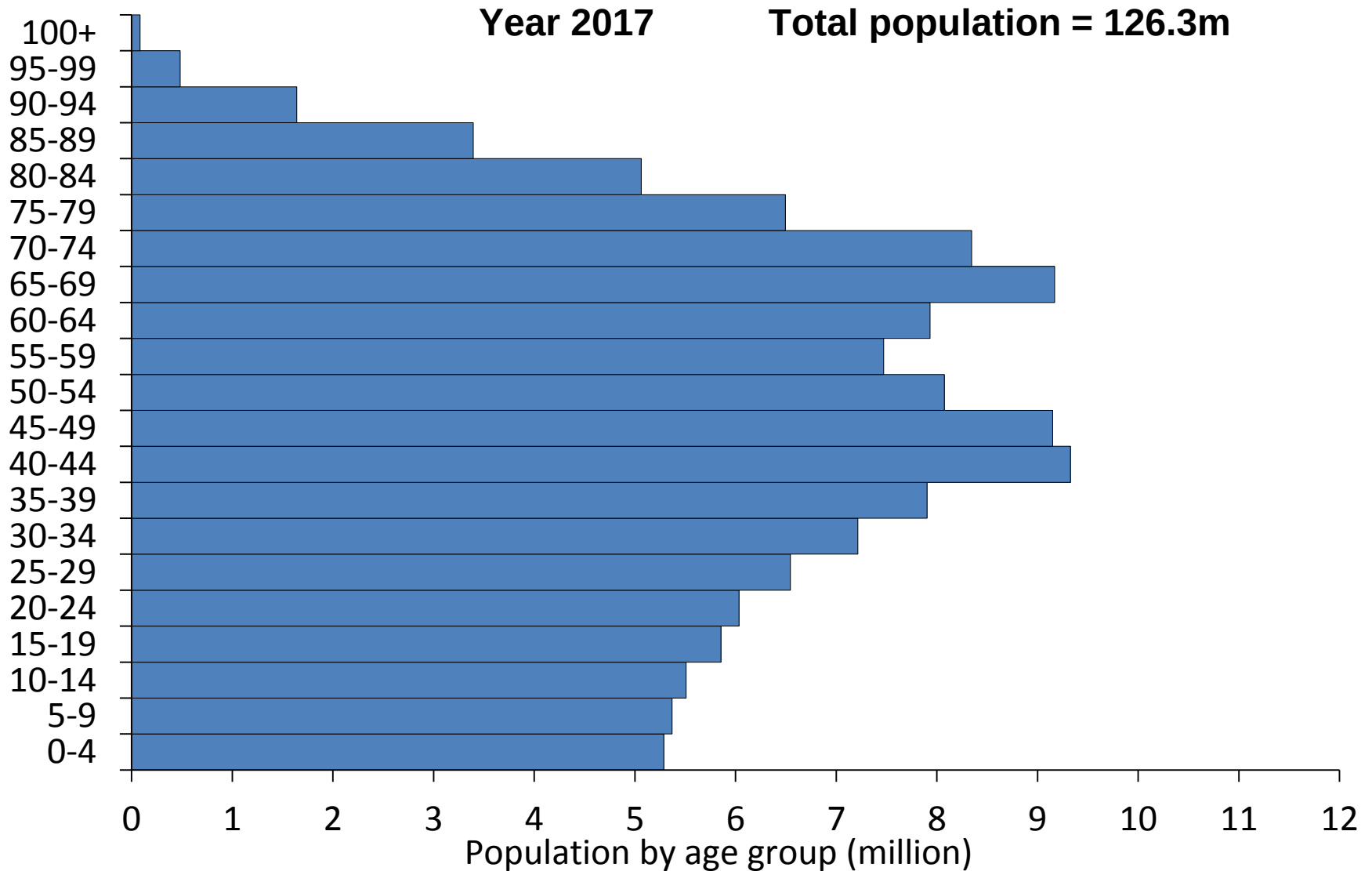
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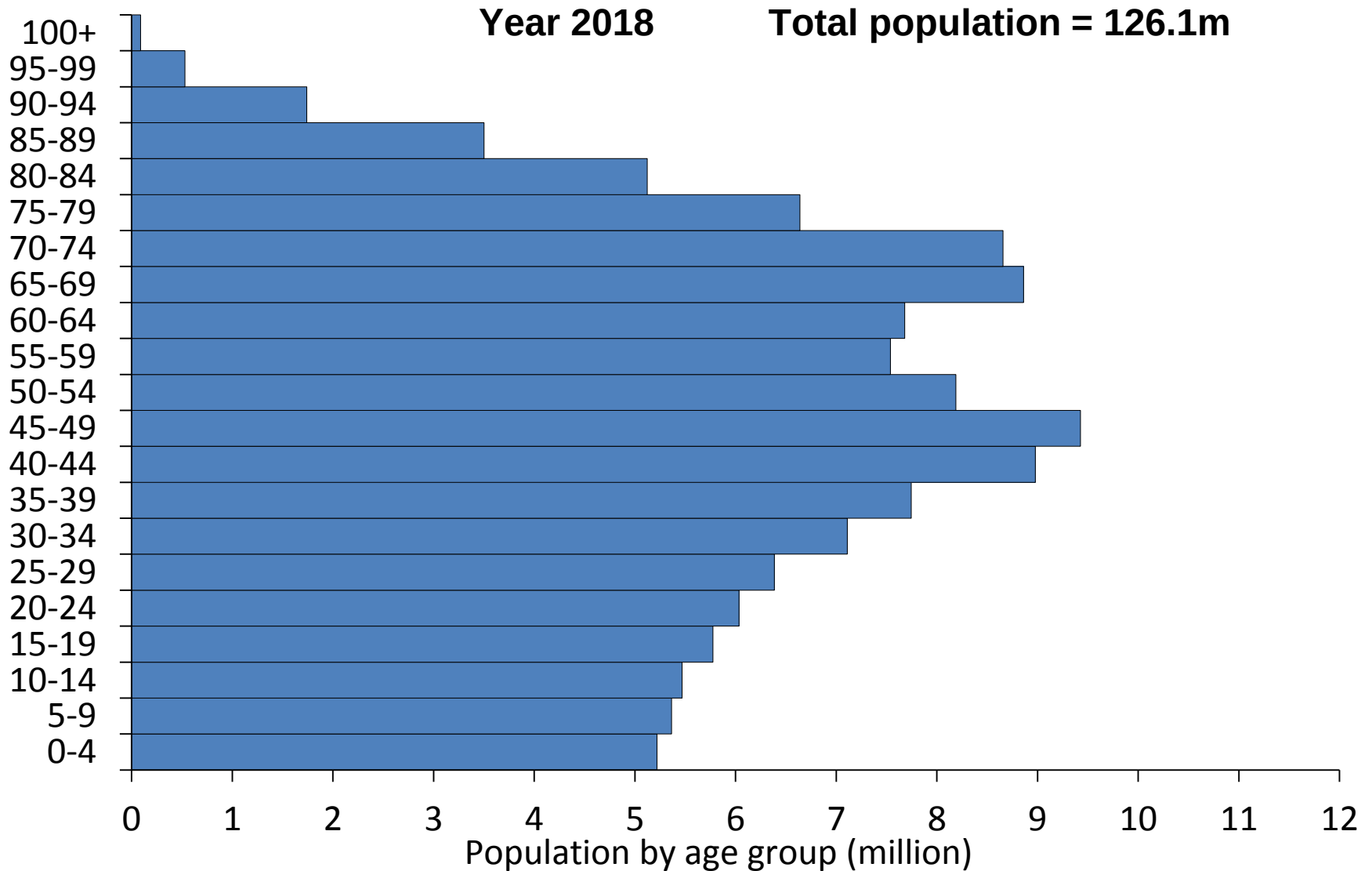
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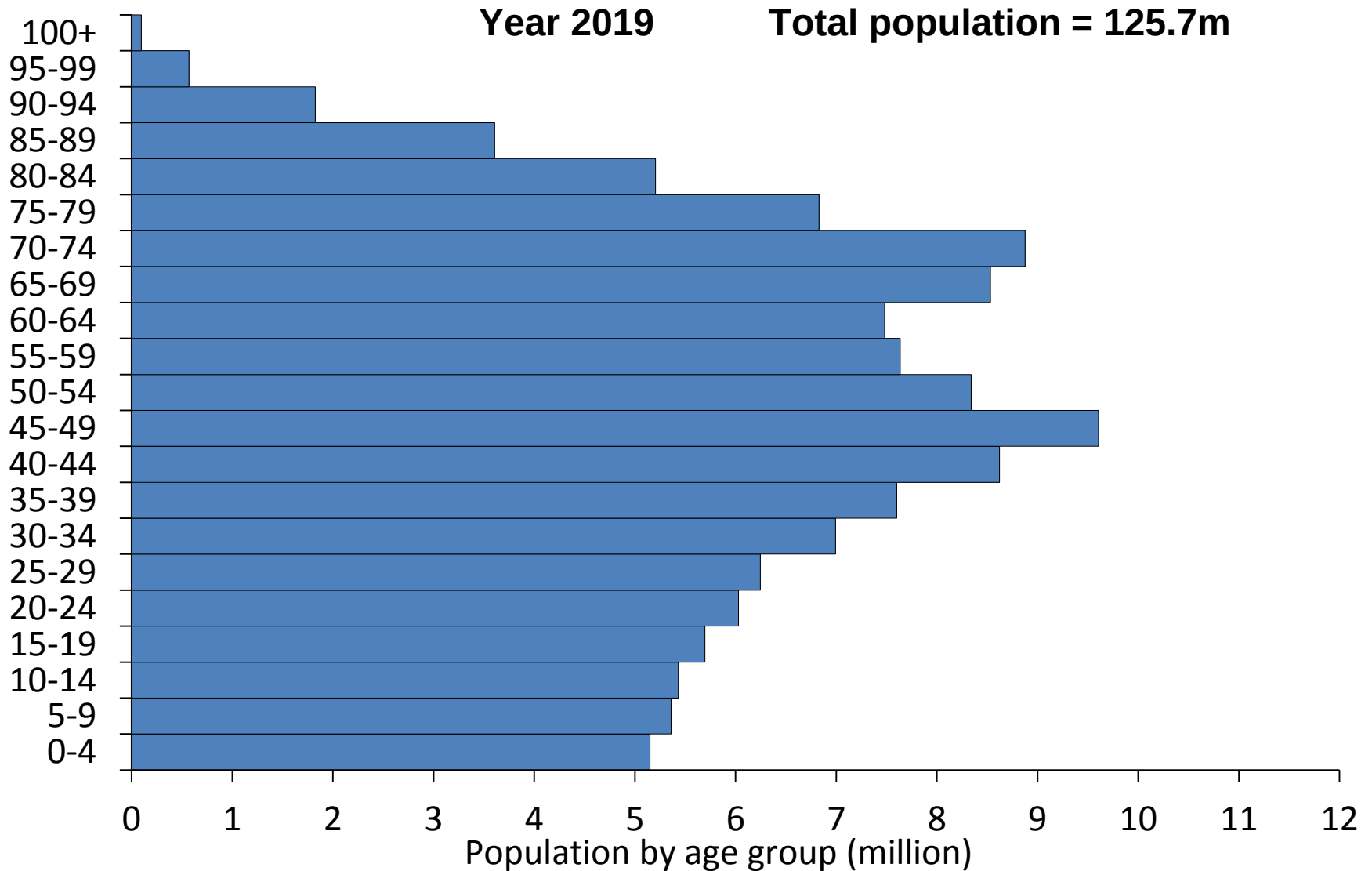
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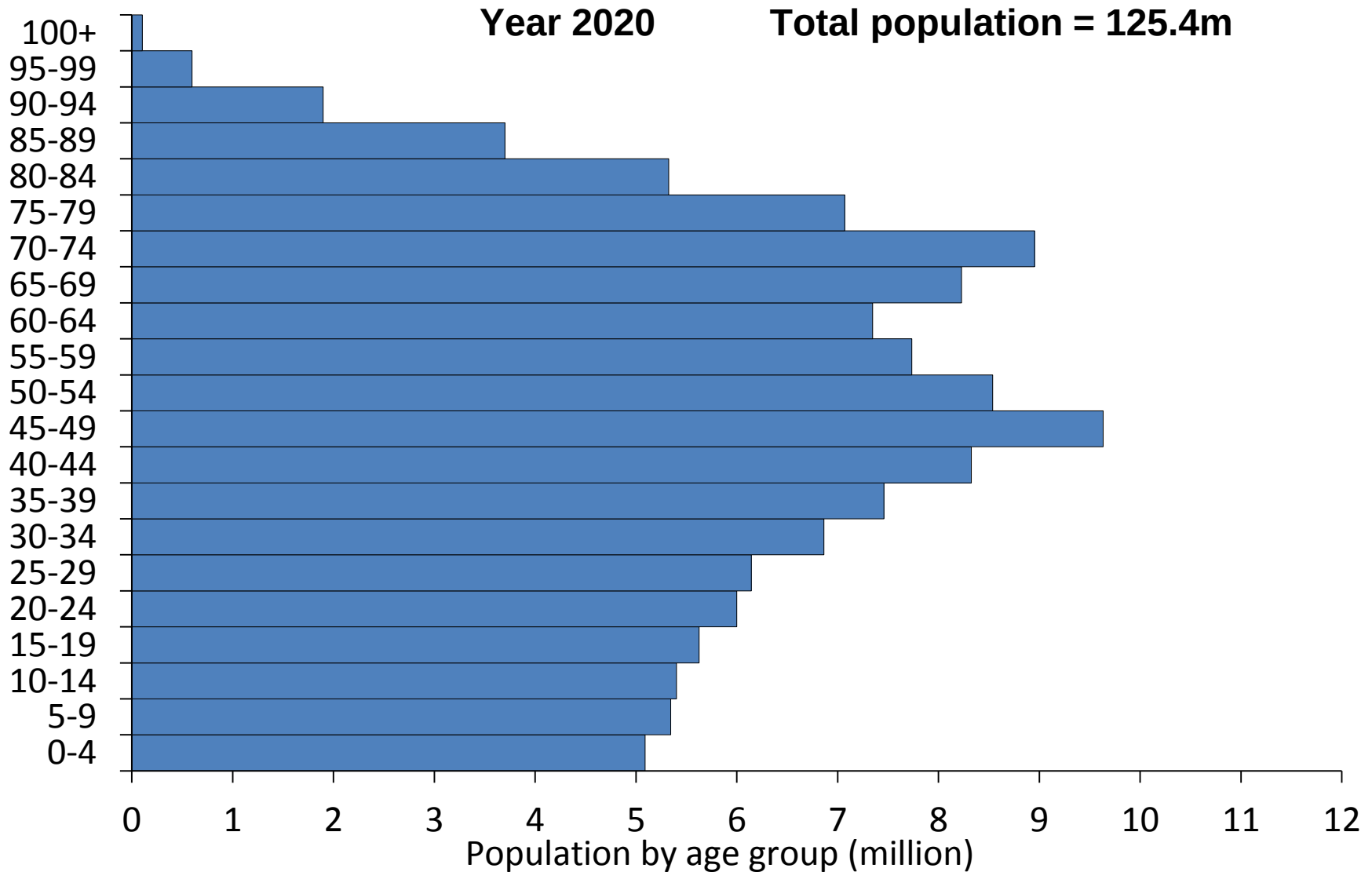
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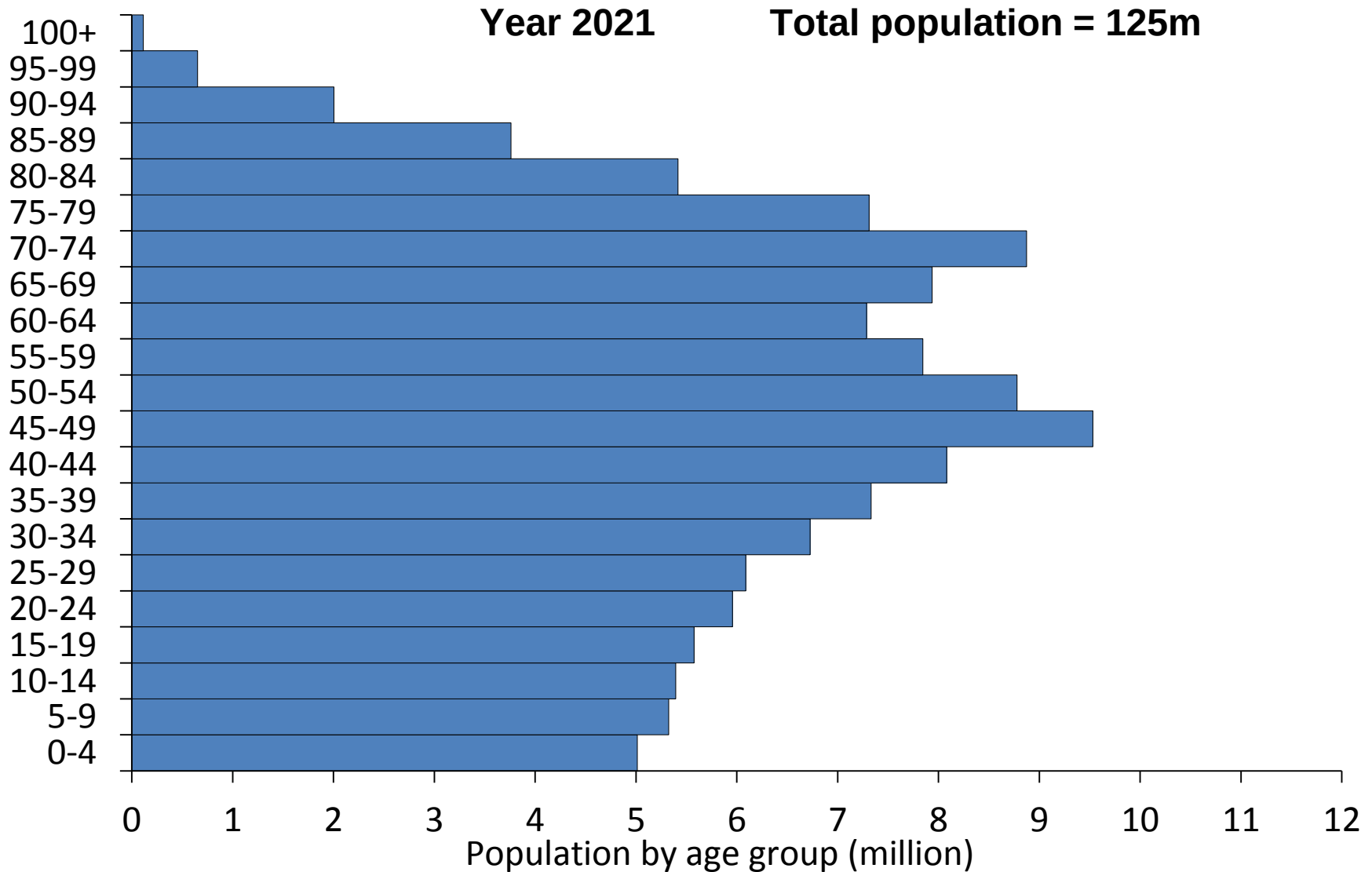
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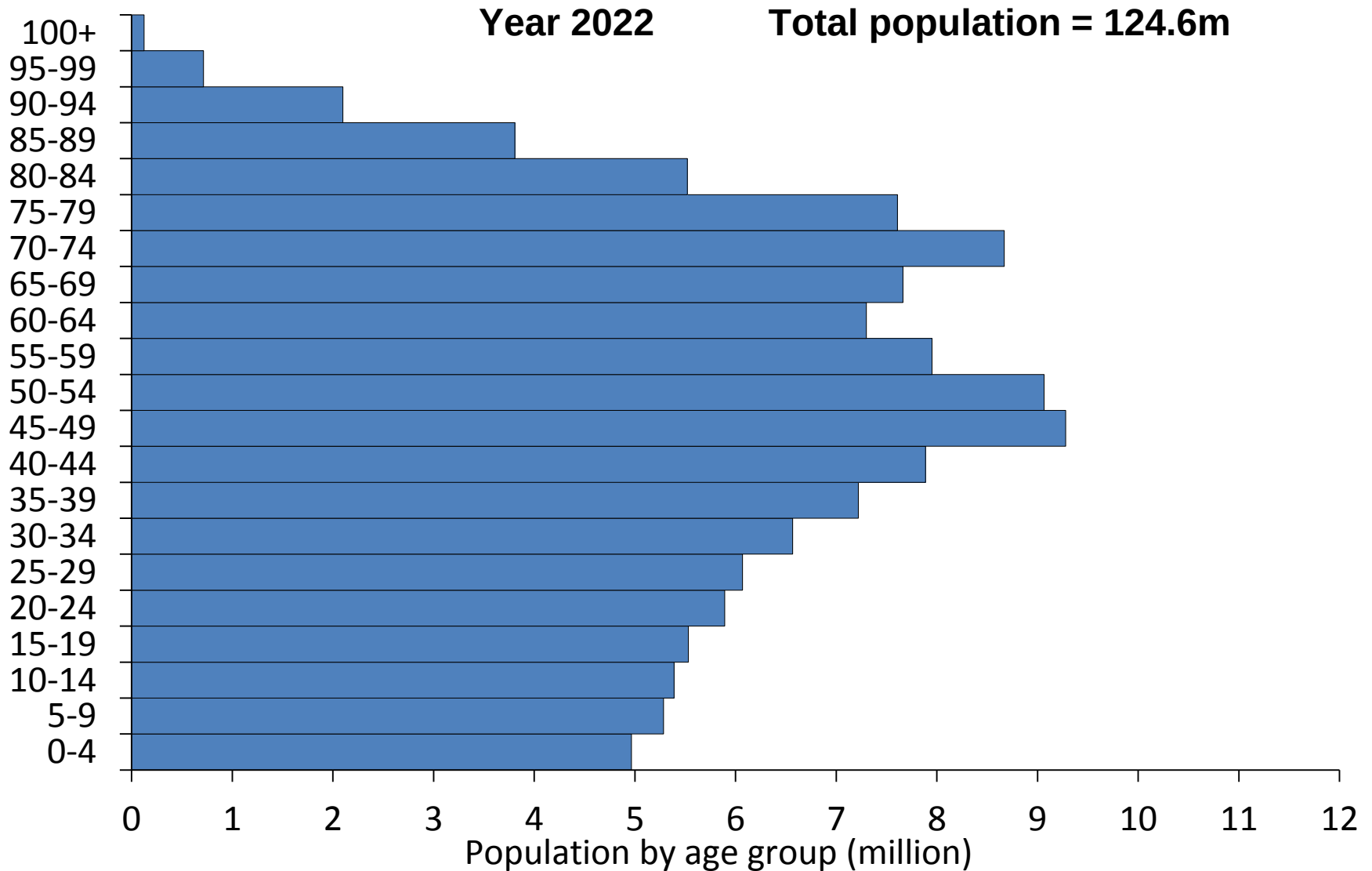
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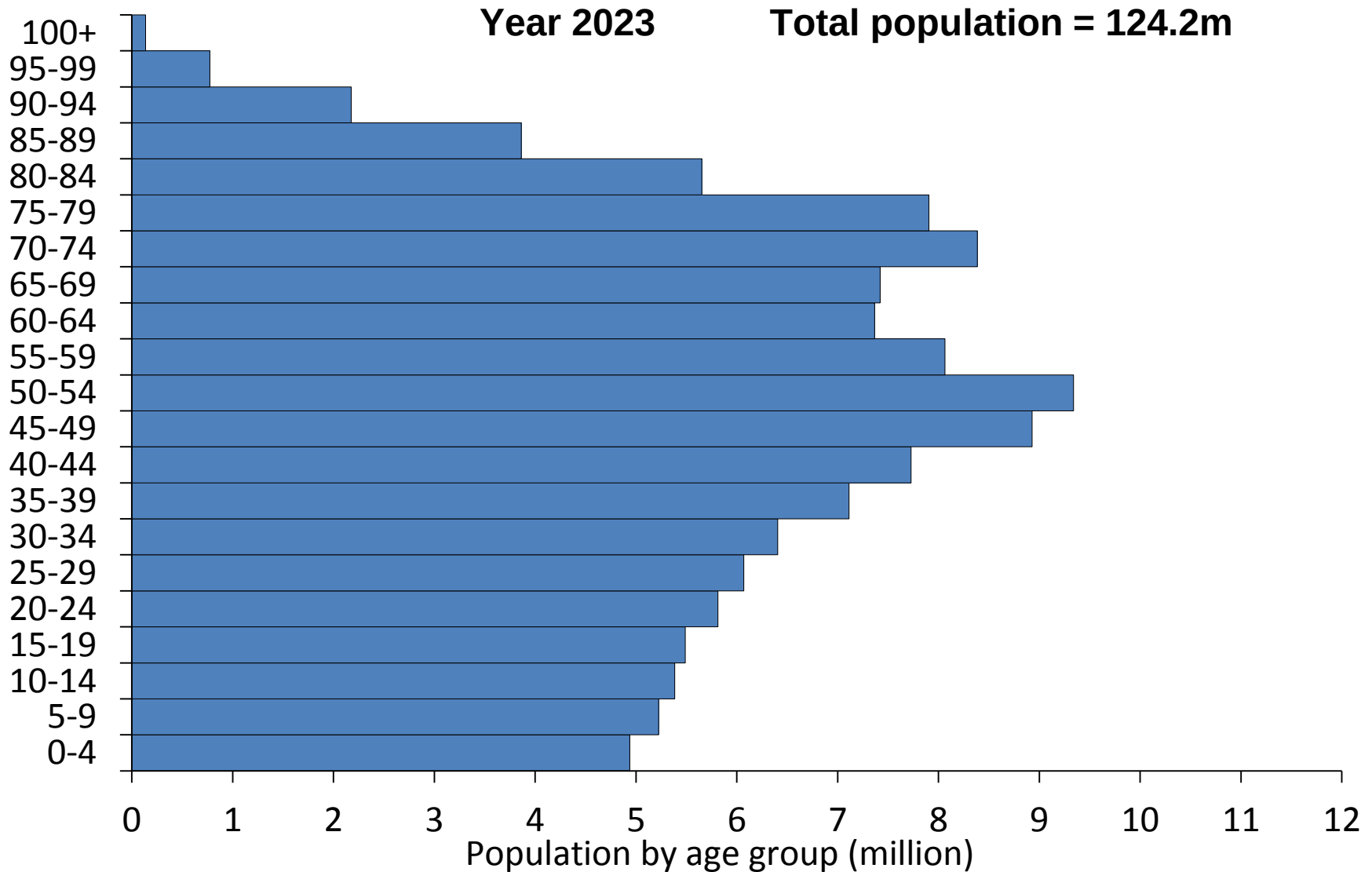
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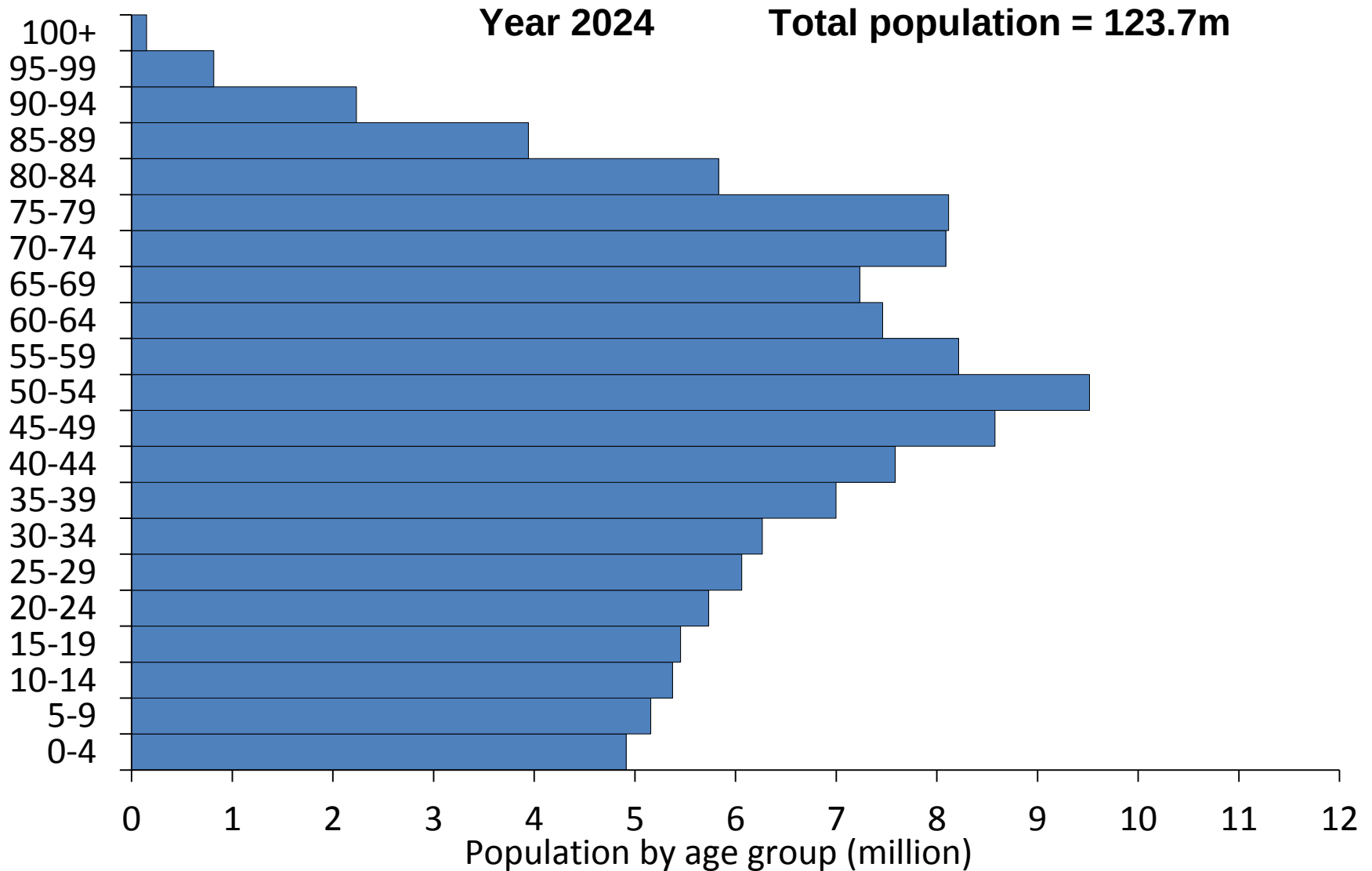
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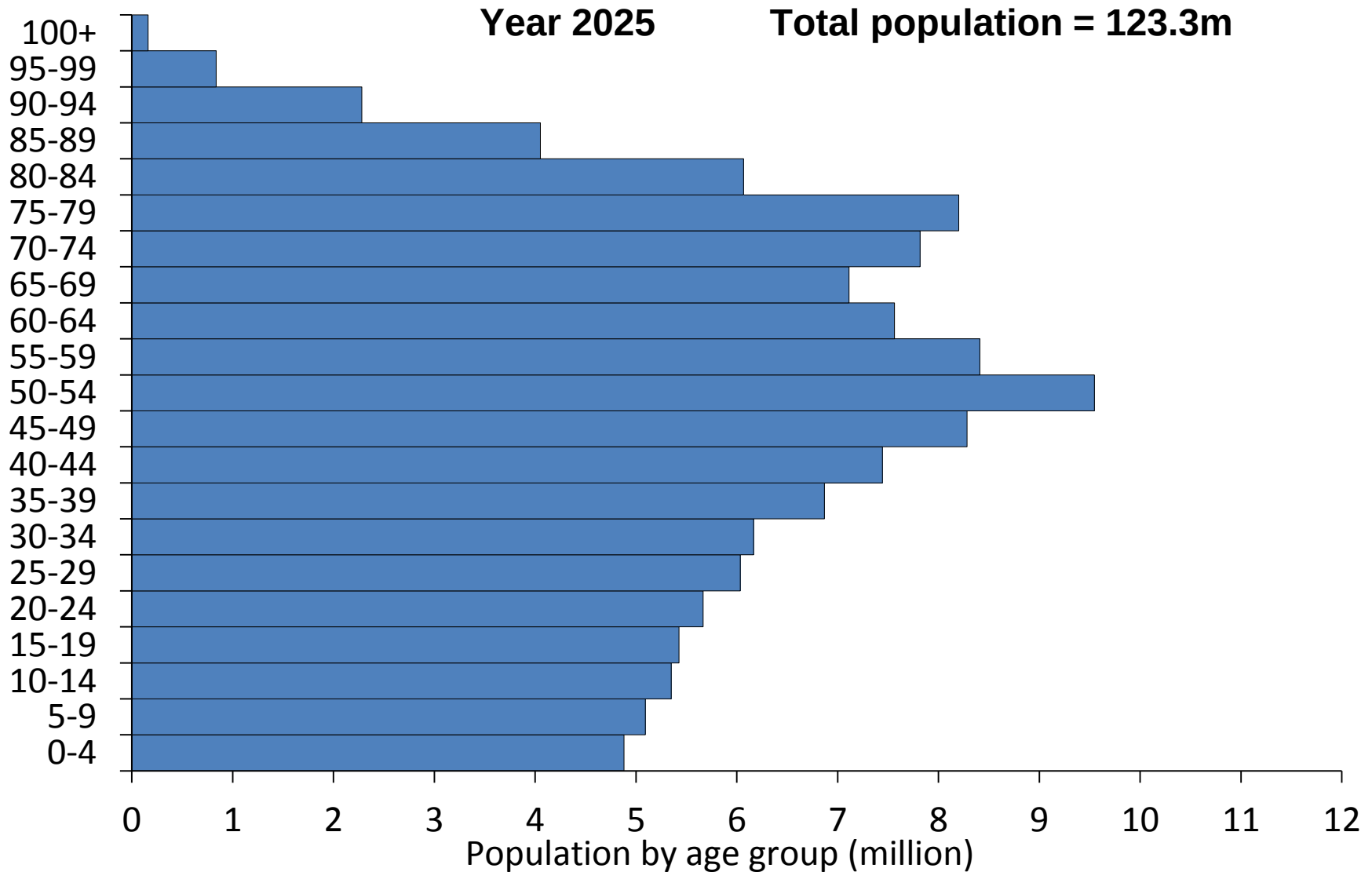
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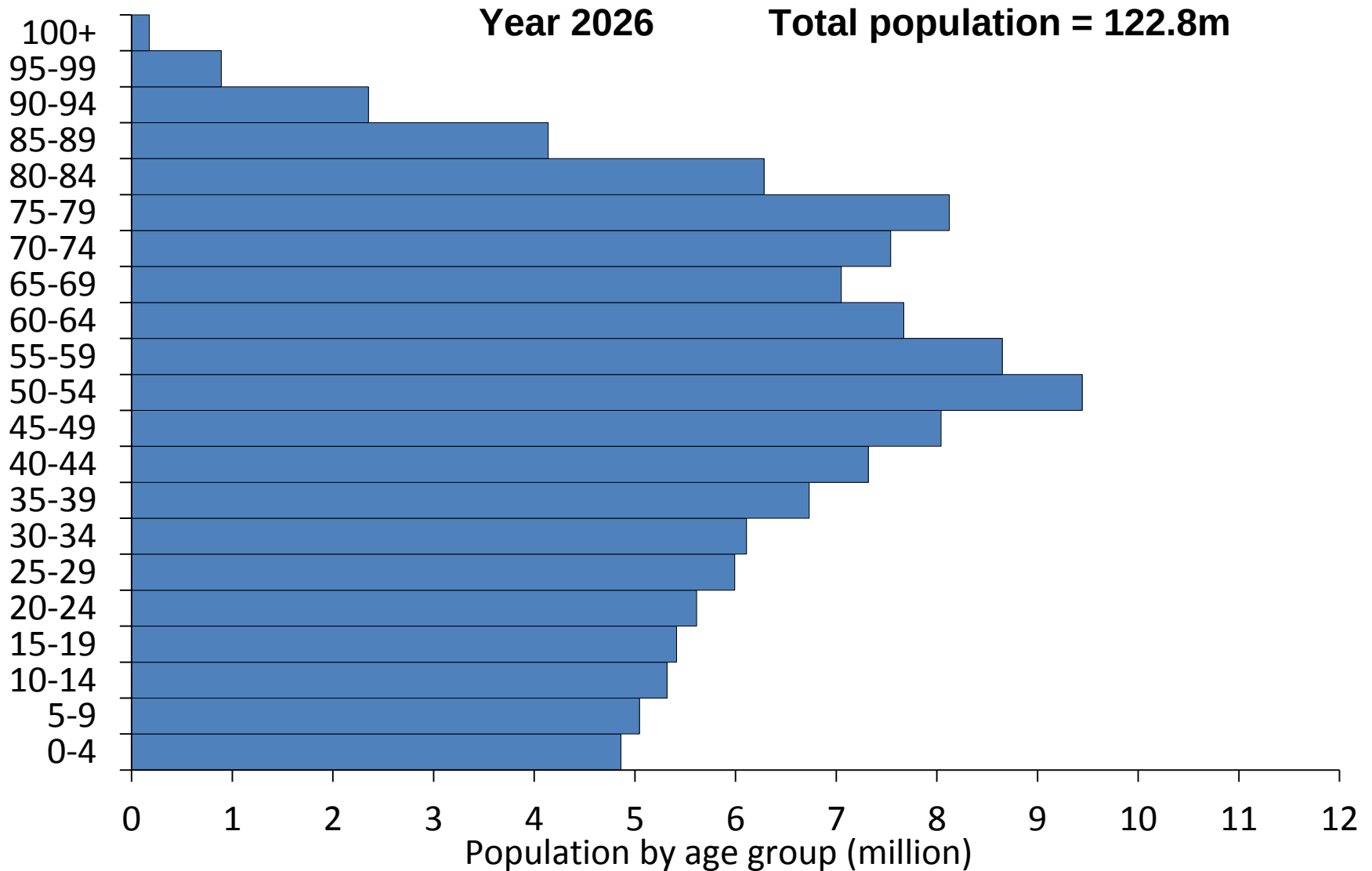
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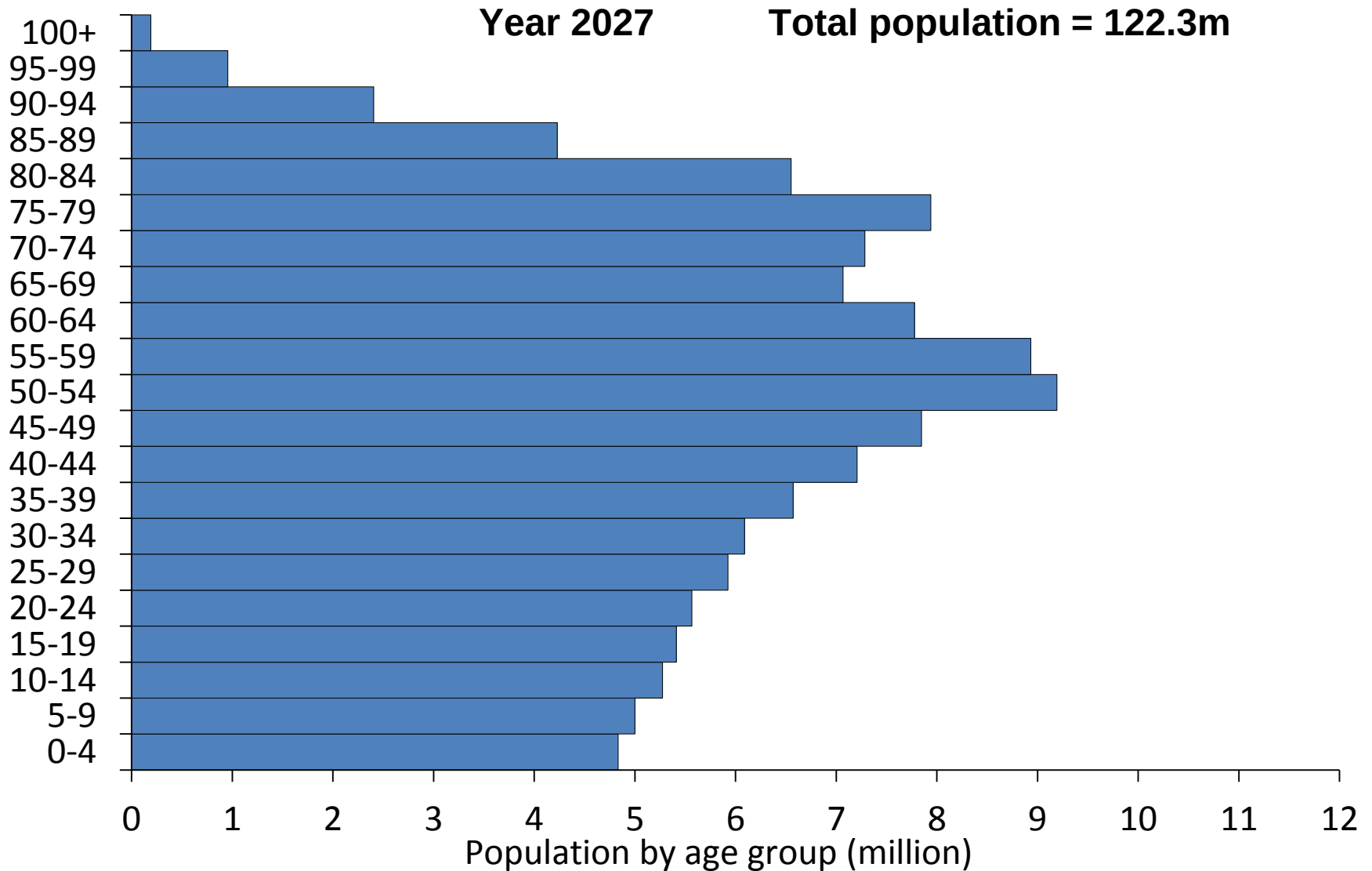
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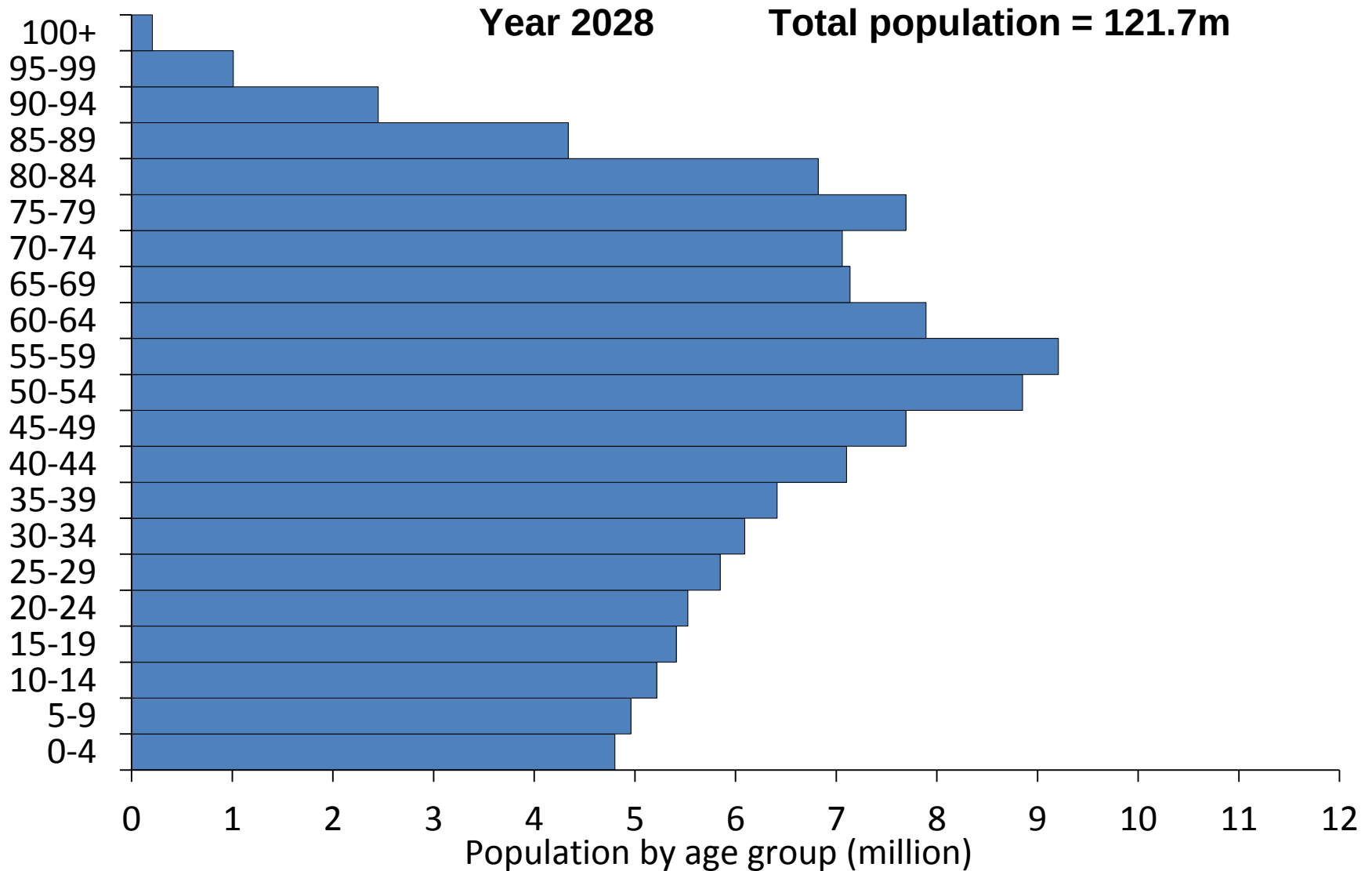
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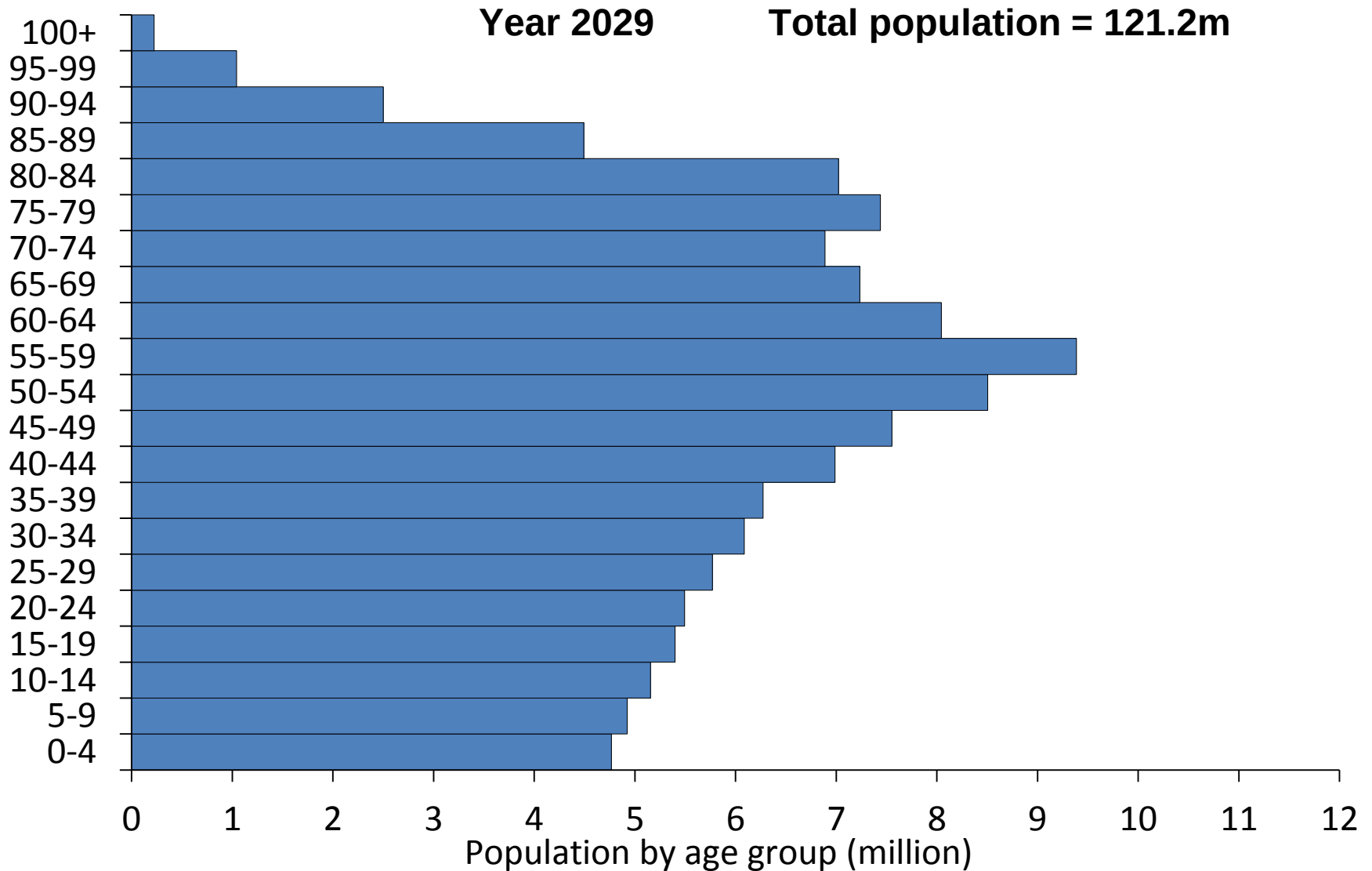
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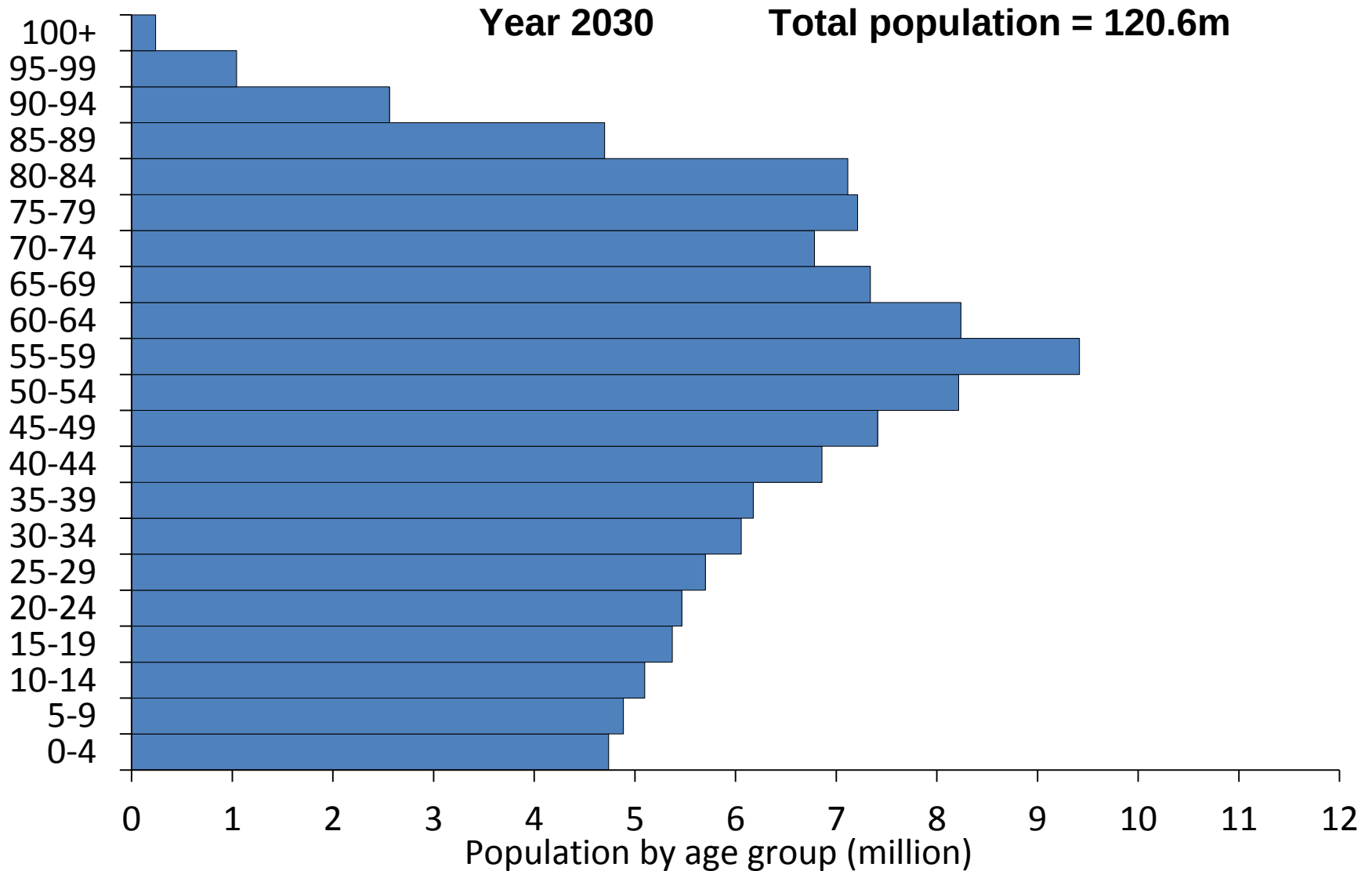
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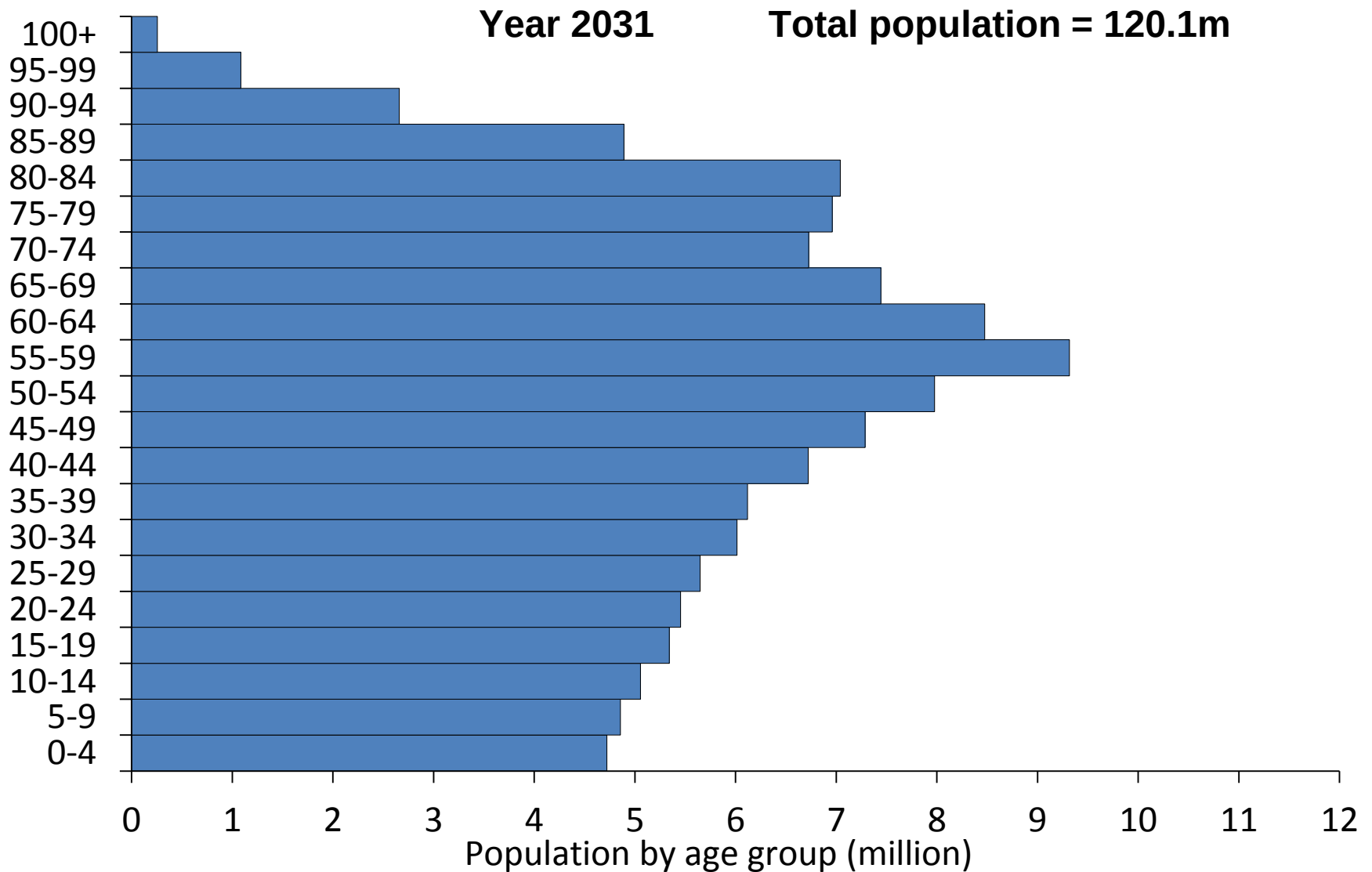
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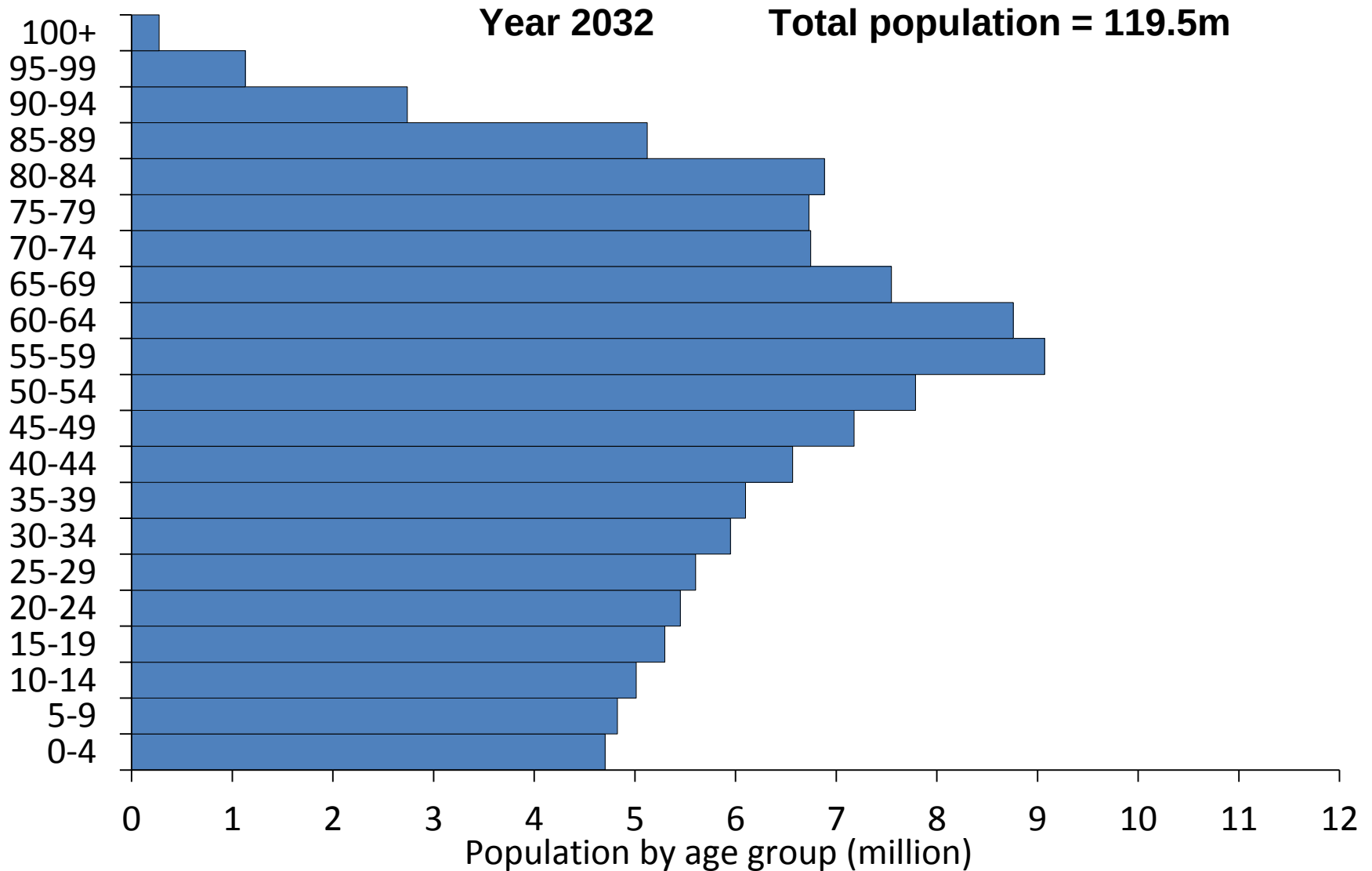
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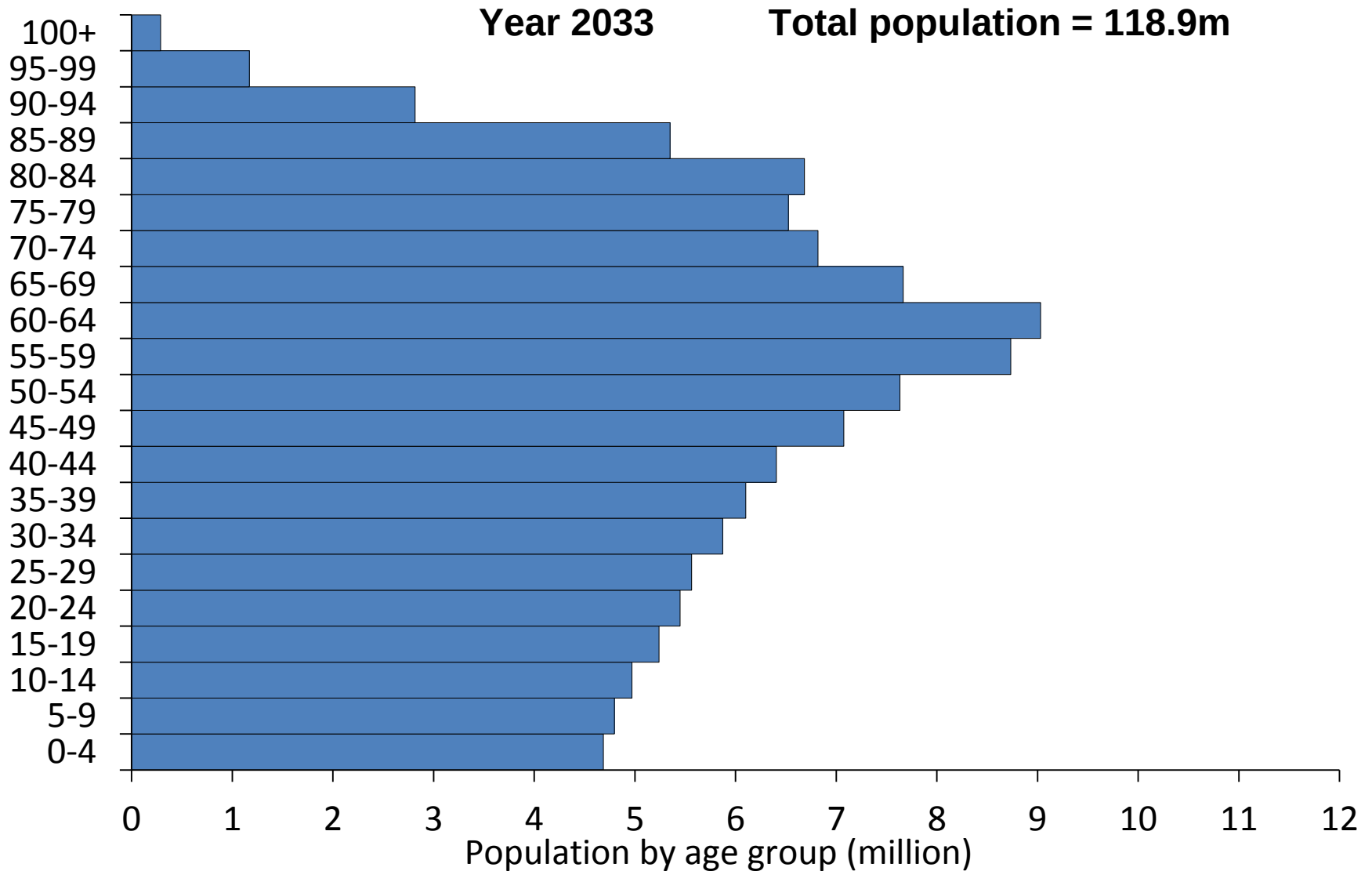
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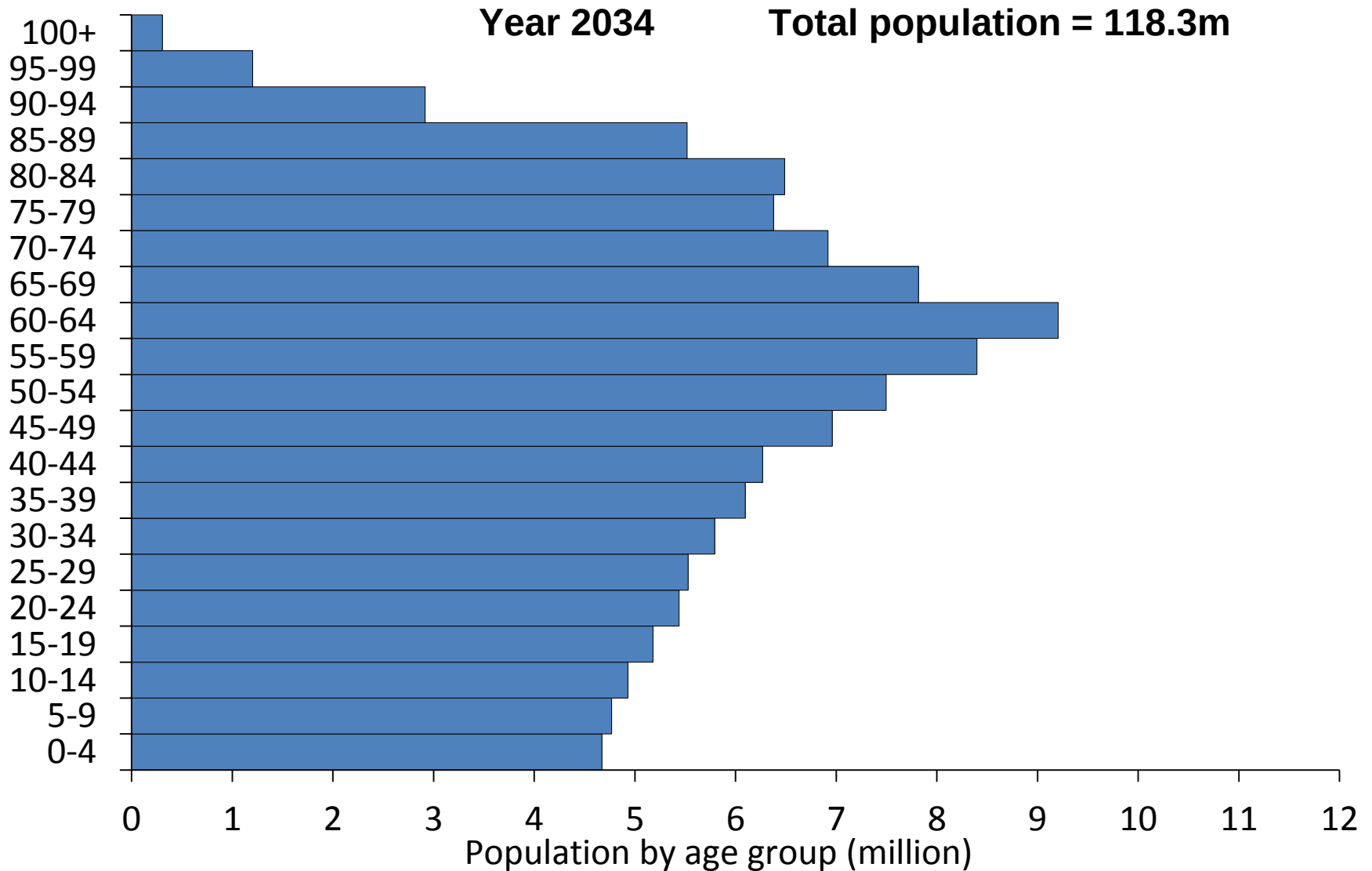
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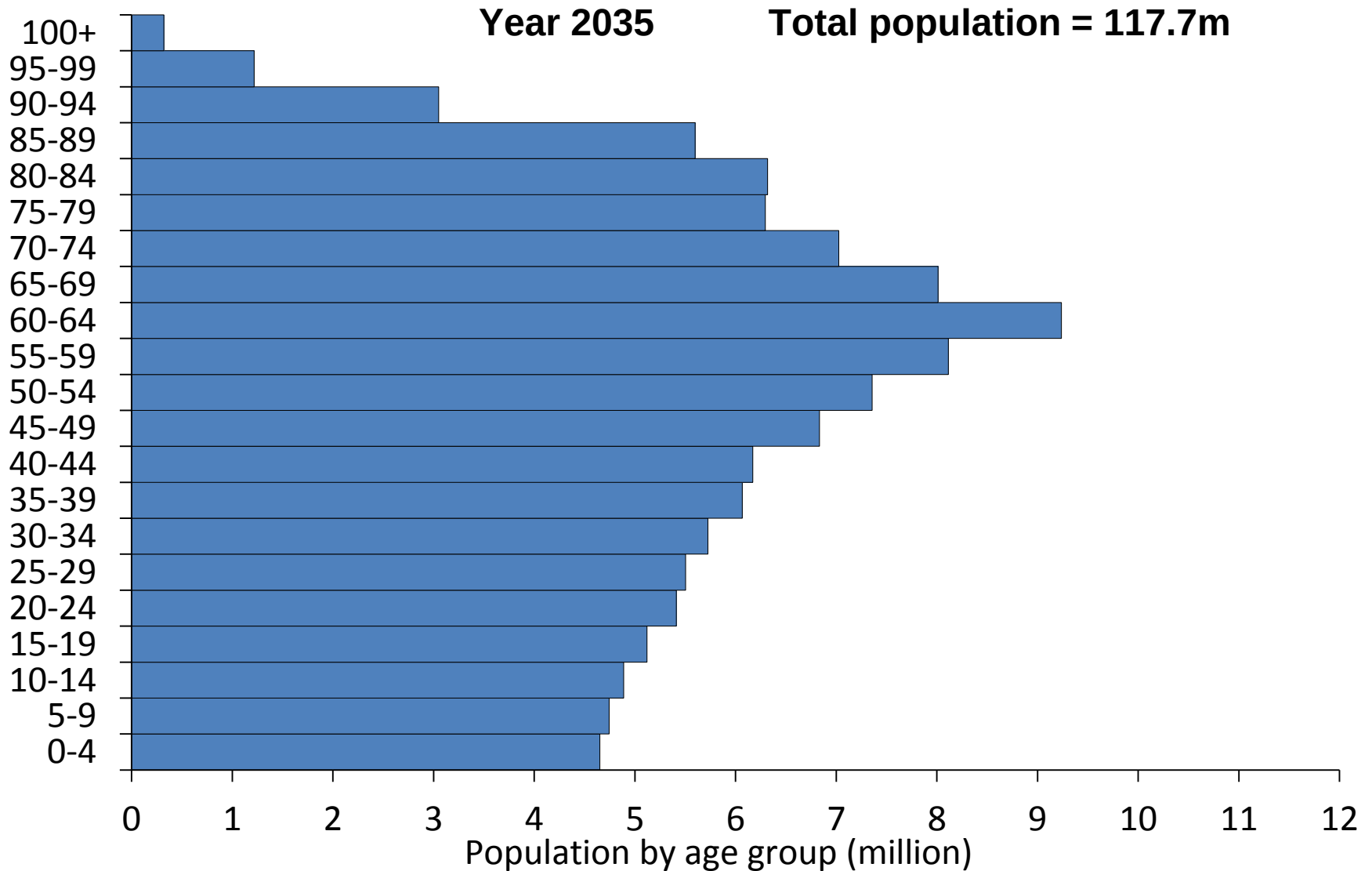
Source: UN

Looking at the example of Japan



Source: UN

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Source: UN

Trade ‘openness’ also matters for air travel

The top 20		The bottom 20		The G7 and selected emerging markets		
Country	Trade intensity	Country	Trade intensity	Rank*	Country	Trade intensity
Hong Kong	437.6	Brazil	27.9	71	Germany	85.8
Singapore	352.9	United States	30.2	97	Mexico	64.5
Luxembourg	326.6	Pakistan	31.2	98	Canada	64.1
Seychelles	209.4	Central African Rep.	33.1	104	Turkey	60.6
Hungary	197.4	Nigeria	33.1	106	United Kingdom	60.3
Ireland	196.9	Sudan	33.2	109	Italy	58.3
United Arab Emirates	189.7	Venezuela	33.4	110	France	58.3
Slovak Republic	187.9	Argentina	33.4	116	India	55.5
Swaziland	184.4	Colombia	37.7	121	Russia	50.8
Estonia	179.2	Japan	37.8	122	Indonesia	50.5
Malta	178.2	Myanmar	38.4	125	China	48.6
Belgium	171.6	Benin	39.1	137	Japan	37.8
Maldives	167.7	Cuba	39.9	145	United States	30.2
Lithuania	166.6	Martinique	41.2	146	Brazil	27.9
Czech Republic	162.1	Egypt	41.2			
Vietnam	157.0	Cameroon	42.0			
Netherlands	155.5	Australia	42.2			
Slovenia	152.2	Burundi	43.4			
Malaysia	151.3	Peru	45.4			
Thailand	147.2	Iran	47.5			

Source: IATA/Tourism Economics ‘Air Passenger Forecasts’

Natural and cultural assets matter too

The highest 20		The bottom 20		The G7 and selected emerging markets		
Country	Index level	Country	Index level	Rank*	Country	Index level
United States	141.5	Haiti	61.1	1	United States	141.5
Switzerland	141.0	Lesotho	65.6	3	United Kingdom	139.5
United Kingdom	139.5	Burundi	68.4	4	Canada	135.0
Canada	135.0	Sierra Leone	70.4	7	Germany	133.0
Australia	135.0	Chad	70.6	10	Japan	130.7
Spain	134.2	Swaziland	73.6	11	France	130.2
Germany	133.0	Guinea	75.9	12	Brazil	127.7
Sweden	132.7	Moldova	76.1	13	China	127.4
Austria	131.2	Kuwait	78.6	14	Italy	126.4
Japan	130.7	Mozambique	78.9	15	Mexico	125.7
France	130.2	Burkina Faso	79.1	21	India	118.2
Brazil	127.7	Yemen	79.6	27	Turkey	115.9
China	127.4	Benin	80.1	31	Indonesia	114.2
Italy	126.4	Madagascar	80.1	70	Russia	100.7
Mexico	125.7	Bangladesh	81.1			
Netherlands	124.4	El Salvador	81.1			
Malaysia	123.4	Algeria	81.4			
Belgium	122.7	Mali	82.1			
Portugal	121.2	Paraguay	82.4			
Korea, Republic Of	118.7	Kazakhstan	82.6			

Source: WEF Travel and Tourism Competitiveness Index – human, cultural and natural resources sub-index

The TE-IATA econometric model

- Equations follow a standard Error Correction Mechanism (ECM) structure involving both short-run growth dynamics and convergence to longer-run level terms
- The levels relationships are crucial to the twenty-year outlook
- Short-run dynamics follow the current expected economic cycle and largely include economic drivers
- A primary driver of long-run levels is income and the share of population able to afford travel
- Other structural factors will also be accommodated within the long-run equation

Short-run equation

Passengers between country AA and country BB

$$\begin{aligned} D(\text{LN}(\text{PAXAABB})) = & x * D(\text{LN}(\text{GDP}, \text{AA})) + (1-x) * D(\text{LN}(\text{GDP}, \text{BB})) \\ & + y * (x * \text{LN}(\text{UP}, \text{AA} / \text{UPAVE}, \text{BB}) + (1-x) * \text{LN}(\text{UP}, \text{BB} / \text{UPAVE}, \text{BB})) \\ & + z * (x * D(\text{LN}(\text{RXAABB})) - (1-x) * D(\text{LN}(\text{RXAABB}))) \\ & + z1 * D(\text{LN}(\text{RXTOUR}, \text{AA})) + z2 * D(\text{LN}(\text{RXTOUR}, \text{BB})) \\ & + a * D(\text{LN}(\text{PRAABB})) \\ & - 0.5 * (\text{LN}(\text{PAXAABB}(-1)) - \text{LN}(\text{LRAABB}(-1))) \end{aligned}$$

GDP

Unemployment

Exchange rate

Relative RX

Price

ECM

Assumed GDP elasticity = 1

x – share of travel from country AA on AABB flow (from TDM)

y – elasticity of unemployment (0.1)

z – elasticity of own nominal exchange rate (0.3)

z1, z2 – elasticity of cross exchange rate (nominal)

ECM coefficient of 0.5 ensures rapid convergence to long-run (90% in 3 years)

LRAABB = long-run relationship

Long-run equation components

Air passenger volumes are modelled according to the following, split overall travel population factors and bilateral route factors

Overall travel population factors

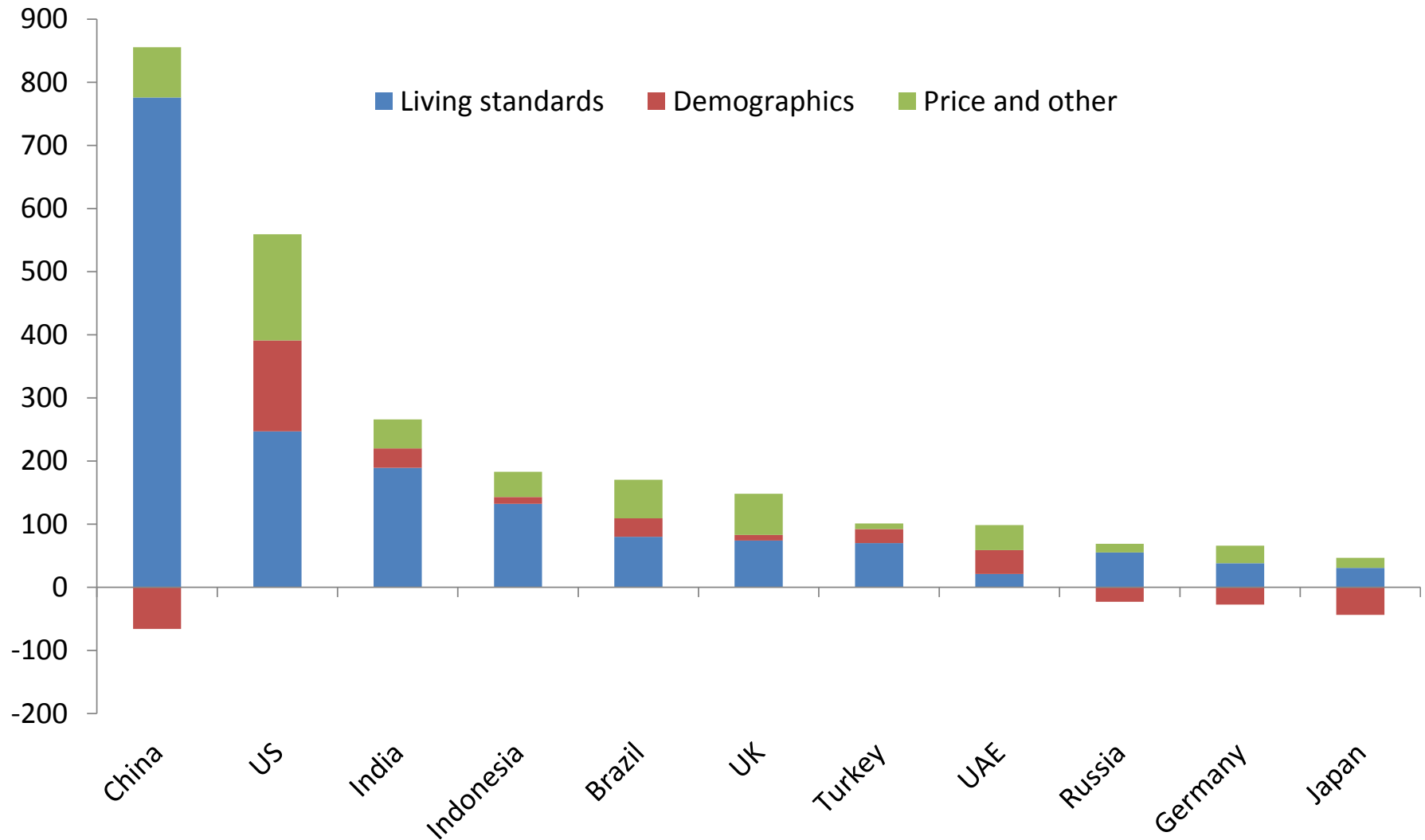
- GDP per capita / wealth effects
- Population and demographics
- Trade linkages

Bilateral route factors

- Exchange rates
- Air fares (includes dynamics of greater access)
- Destination attractiveness (share of rising outbound)
- Visa facilitation measures

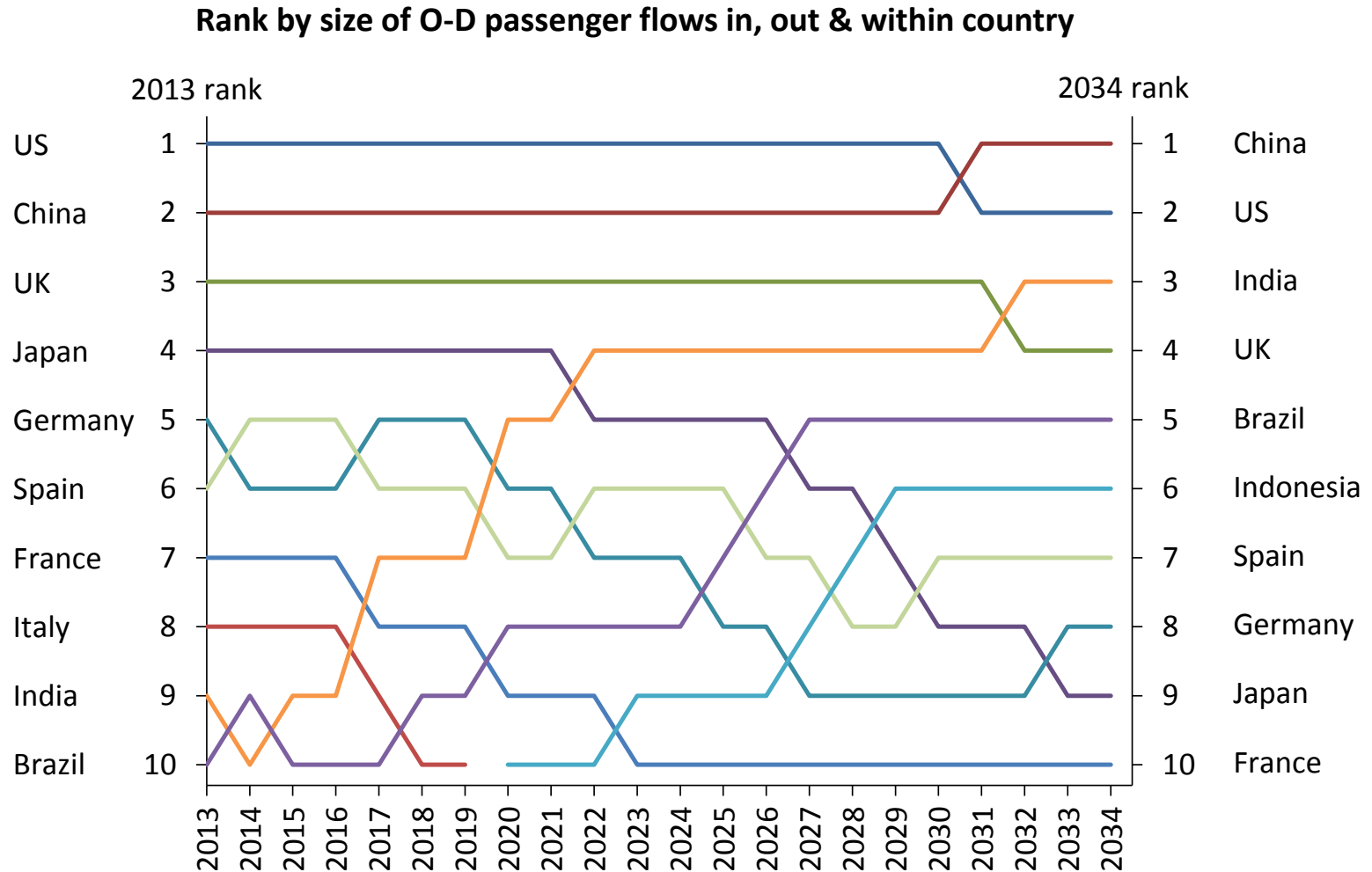
Adding up to differing outlooks for 2014-2034

Drivers of additional passenger numbers, million



Source: IATA/Tourism Economics 'Air Passenger Forecasts'

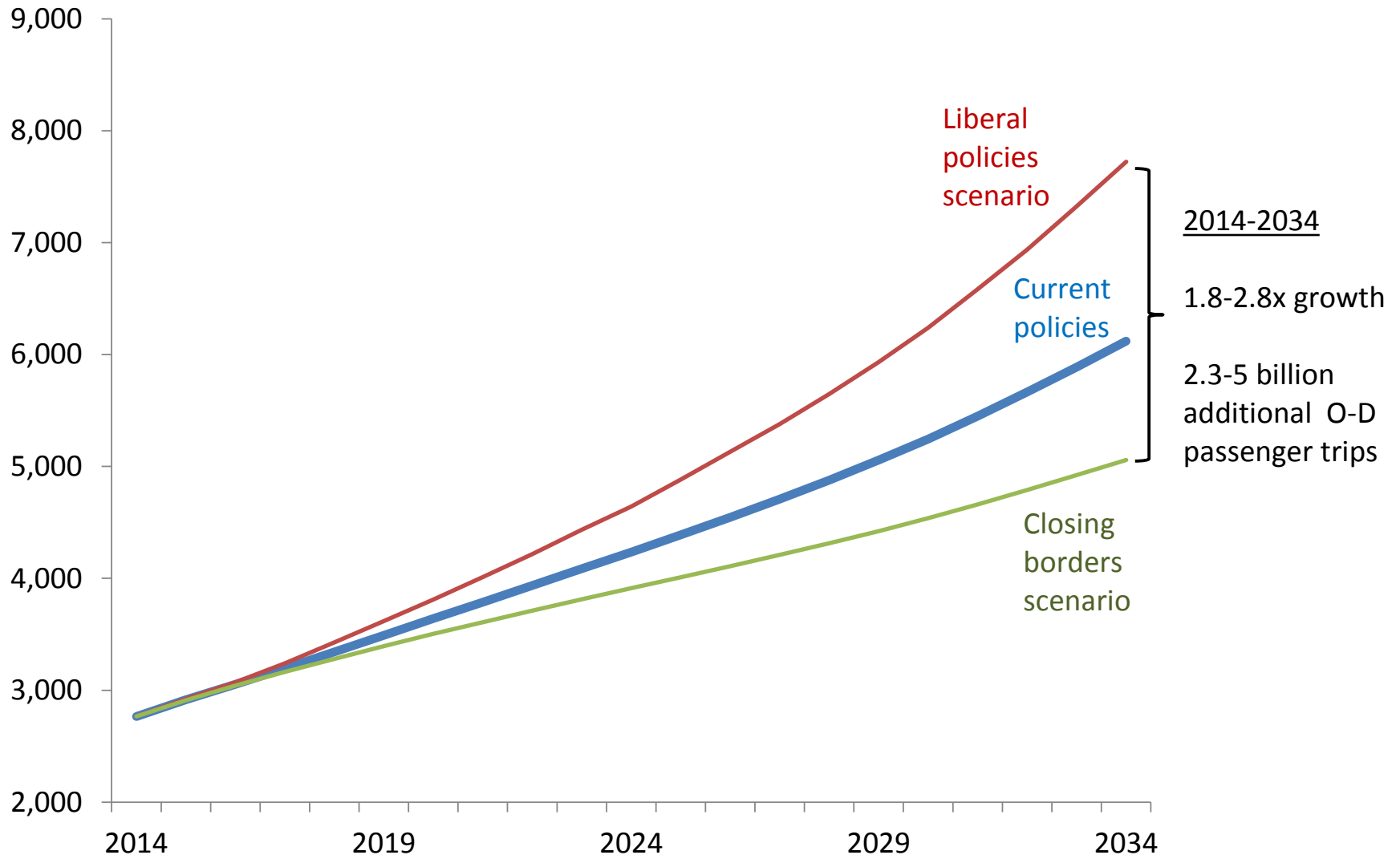
Resulting in much change over next 20 years



Source: IATA/Tourism Economics 'Air Passenger Forecasts'

Uncertainty can also be explored

Outlook for worldwide O-D passenger trips, million



Source: IATA/Tourism Economics 'Air Passenger Forecasts'

For more information....



New forecast service:

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- Global, country reports, web-tool

For more information:

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