

**Implosions, Explosions:
Population Trends to 2050
based on a logistic model of fertility
with other factors held constant**

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Model:

Forecasts were made to the year 2050 using the PDE Population Development Software, essentially a spread-sheet model that calculates populations (male and female) grouped in 5-year age cohorts in 5-year time steps.

PDE Population Projection Software. Laxenburg, Austria: World Population Program, International Institute for Applied Systems Analysis (IIASA), 1994. Available at: <http://www.iiasa.ac.at/Research/POP/pub/software>

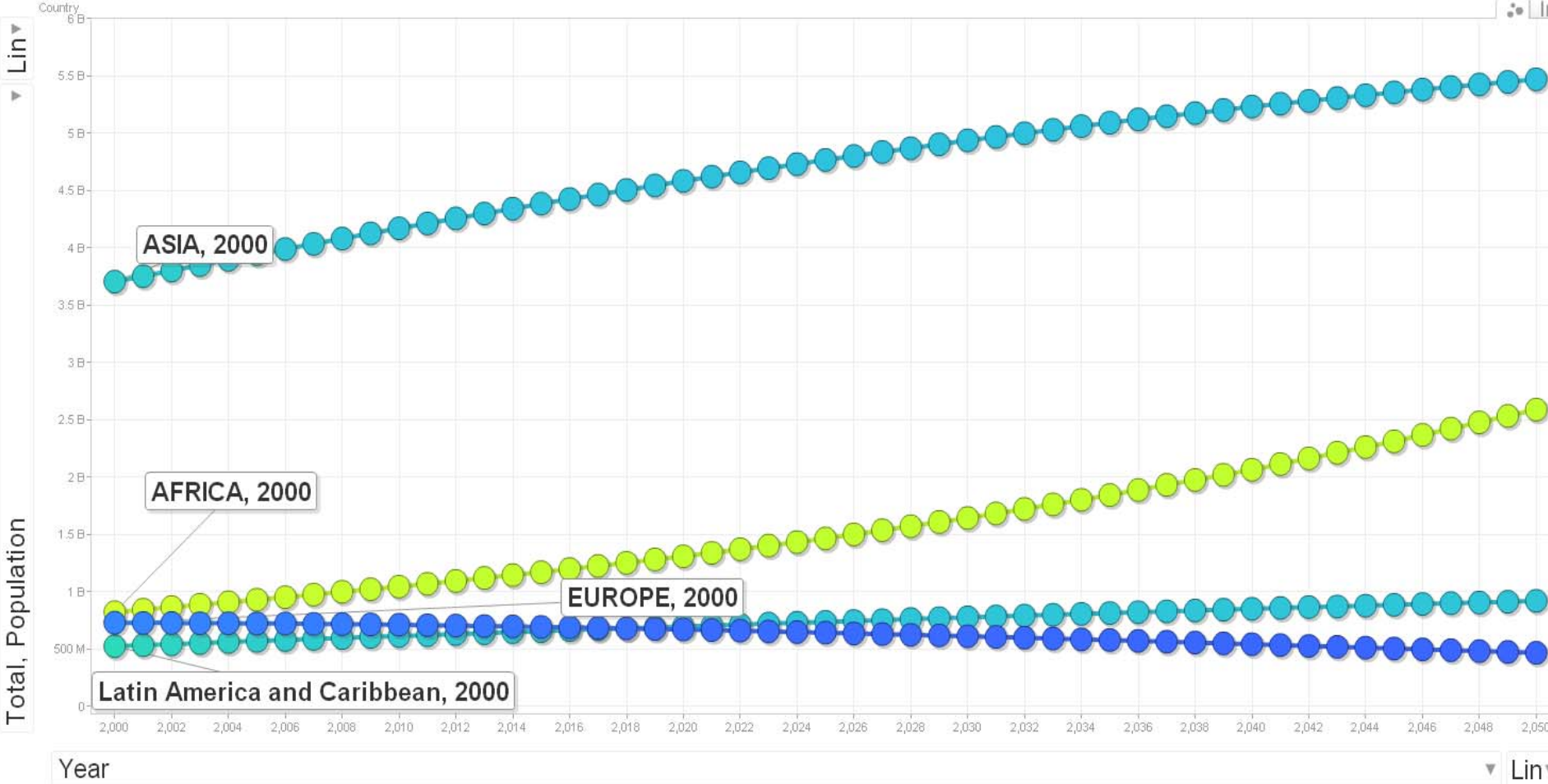
Assumptions:

- Starting population (at year 2000): UN data

United Nations, Department of Economic and Social Affairs, Population Division (2007). *World Population Prospects: The 2006 Revision. CD-ROM Edition - Extended Dataset in Excel and ASCII formats* (United Nations publication, Sales No. E.07.XIII.7).

- Fertility Rate: Predicted with outputs from the application of our own logistic model to historical (UN and other) data on fertility
- Mortality: Assumed to be constant, value at yr 2000 UN data. As most populations expect increasing longevity, this makes our forecasts conservative (low). However, some countries have experienced falling longevity (mainly for males) due to HIV (Southern Africa) or factors such as alcoholism, smoking, and stress (Russia).
- Migration: Ignored for now. Data to establish trends are hard to obtain.
- Time Interval: 2000 to 2050. Obviously, beyond 20-30 years, uncertainty grows due to possible changes in fertility, mortality, and migration.

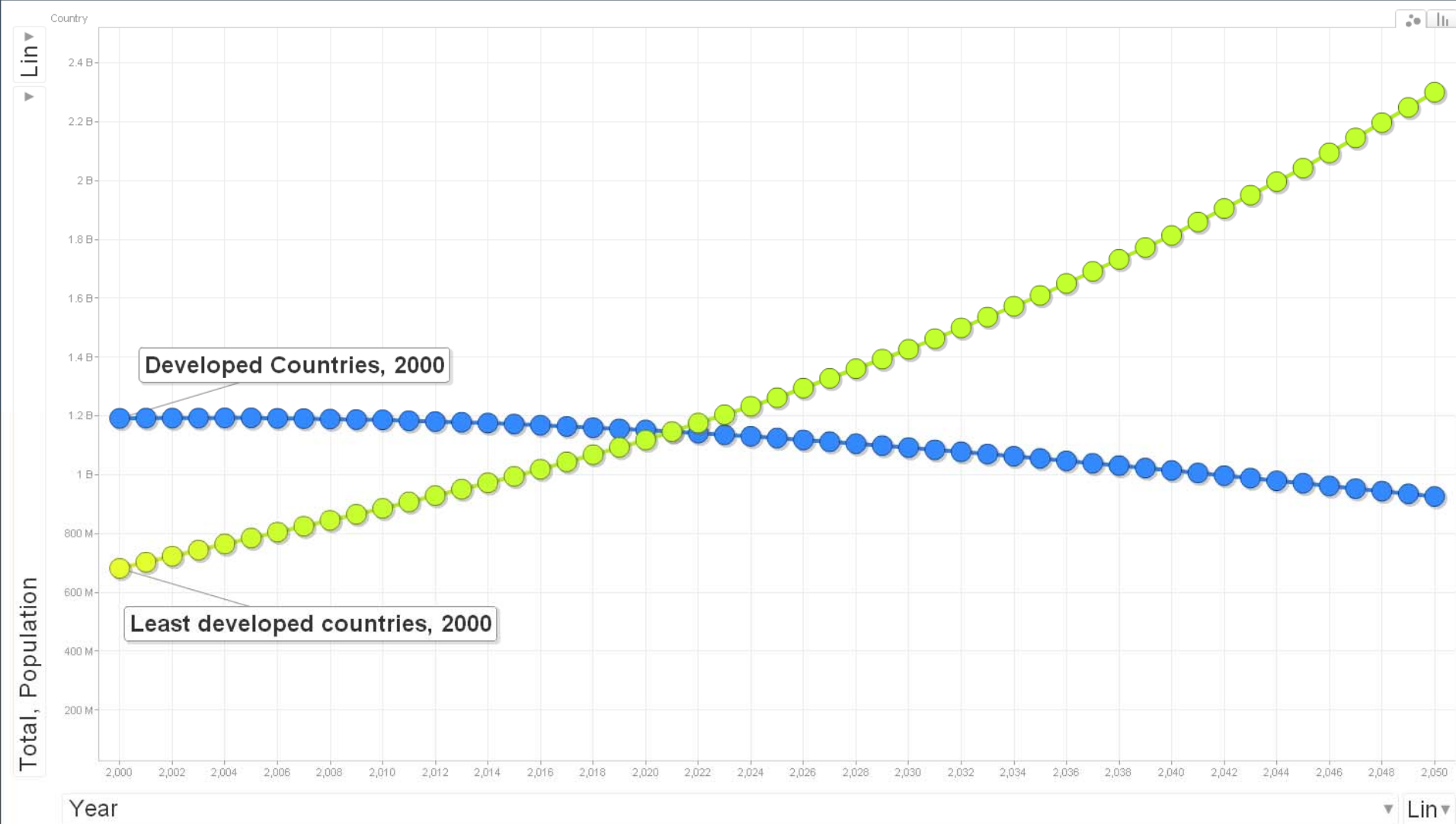
Globally, similar absolute growth in Asia and Africa, but steepest growth in Africa (tripling); Latin America & Caribbean grow while Europe declines



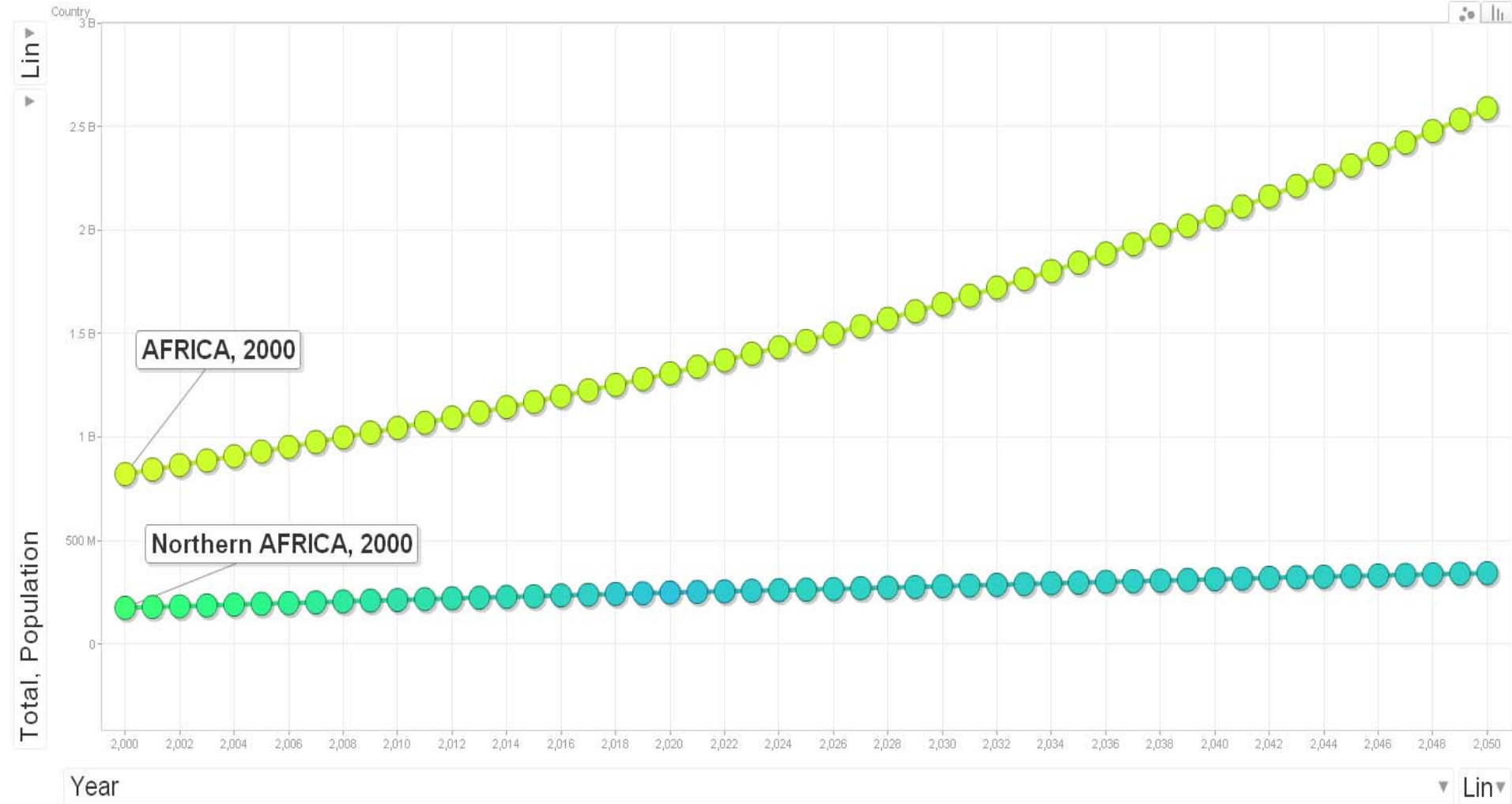
Developed Countries



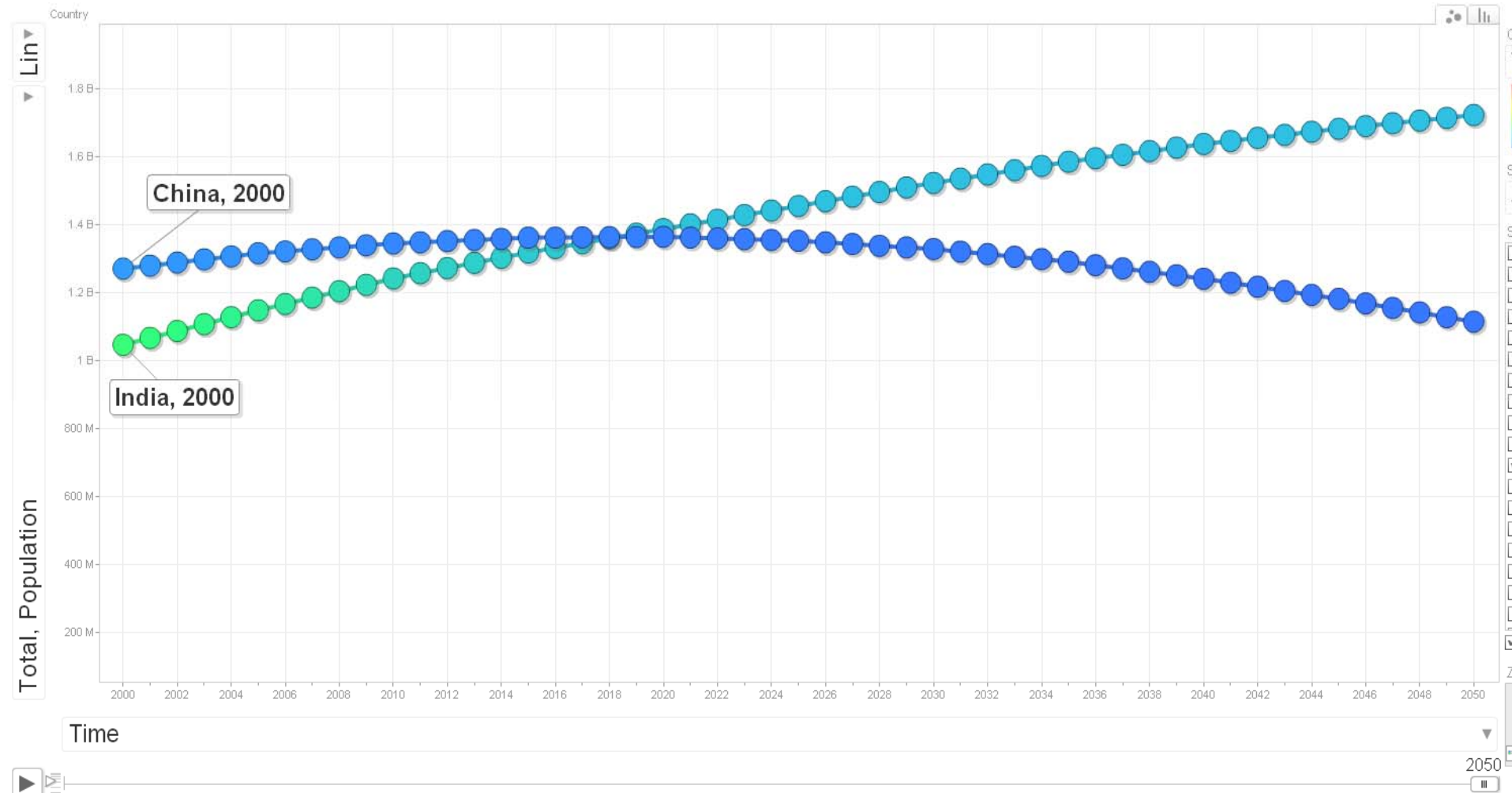
Least Developed Countries



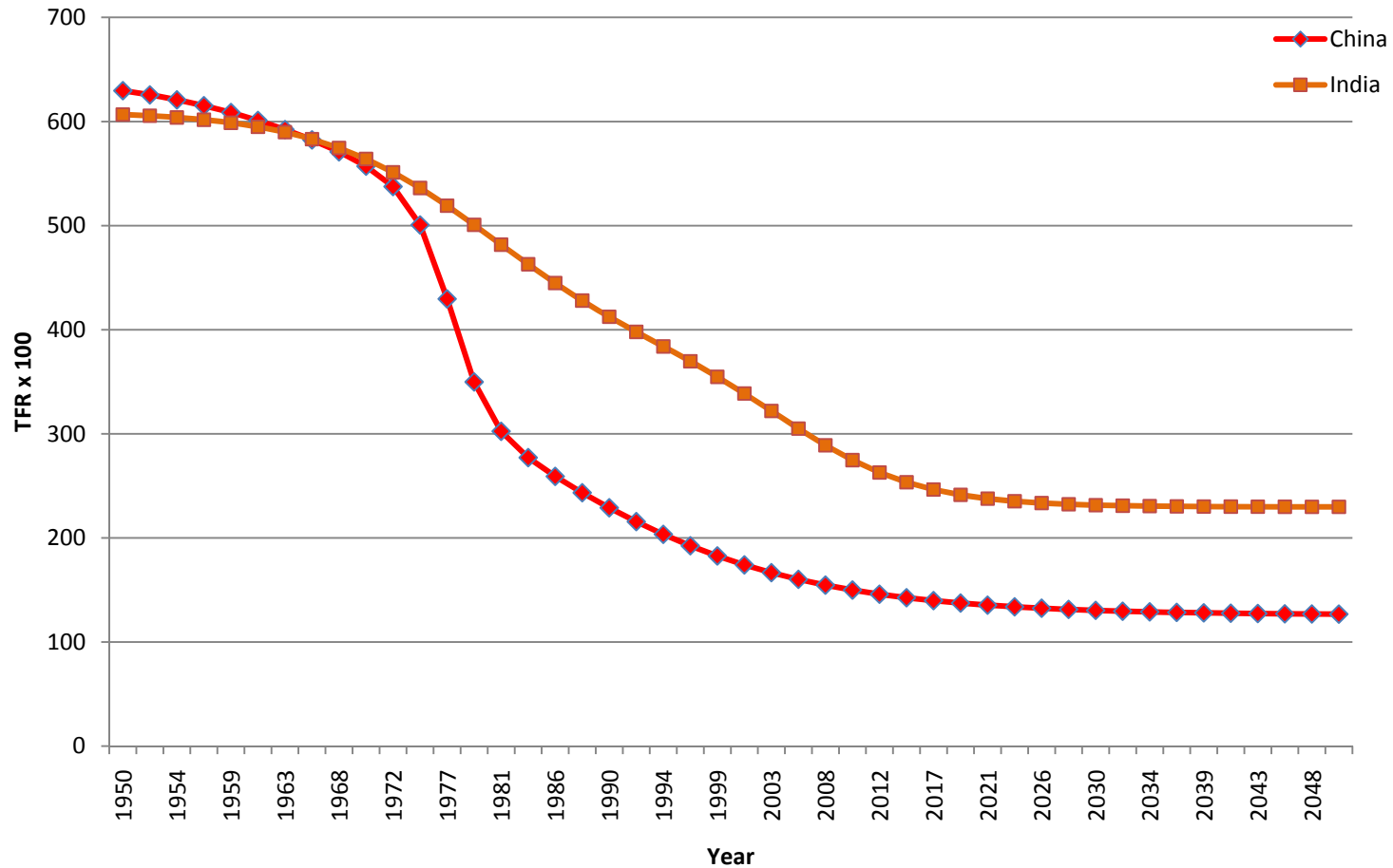
Within Africa, Northern Africa grows more slowly than sub-Saharan Africa



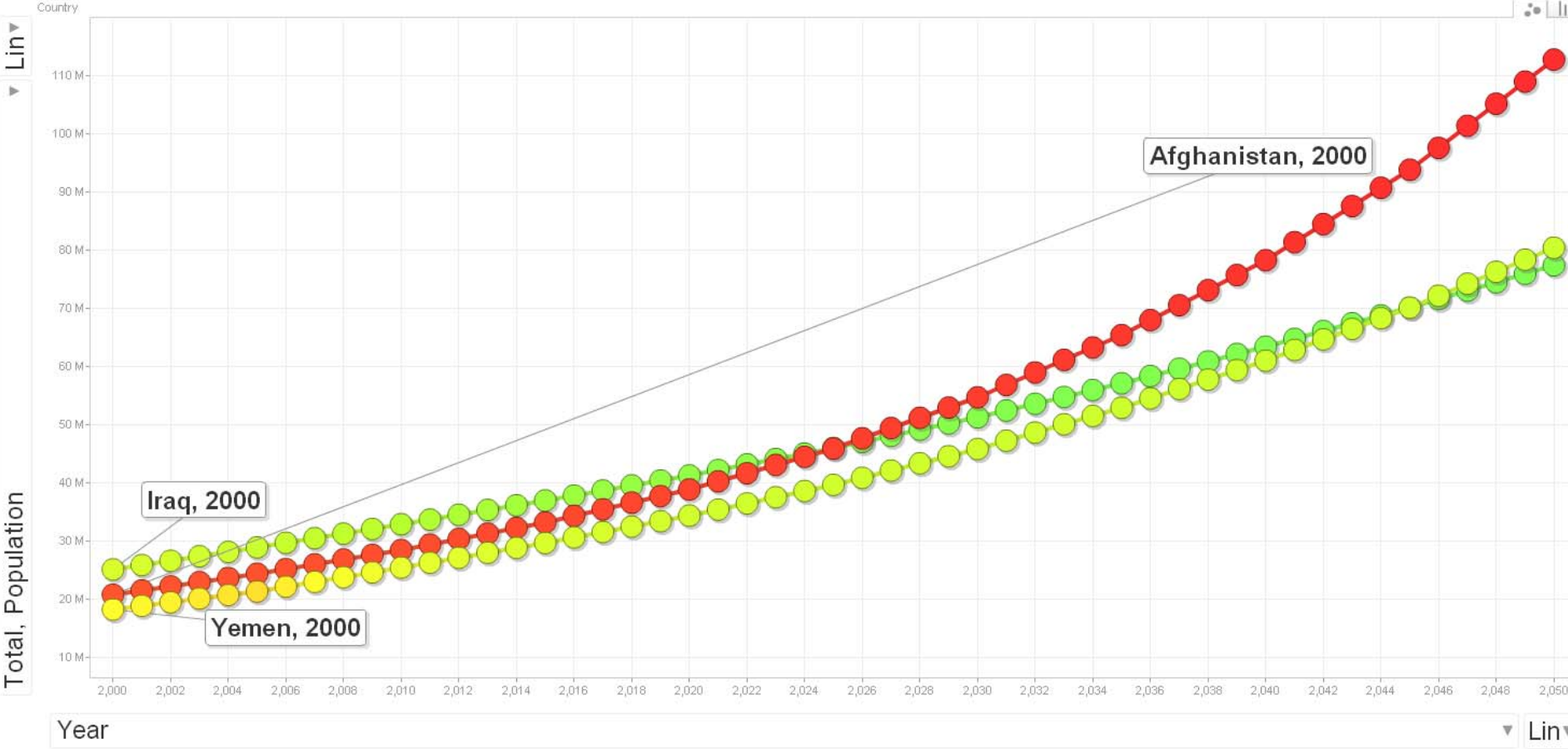
About 2020 India surpasses China as the most populous nation
TFR in China drops to 1.2 (far below replacement of (~2.1) by 2050
while in India TFR levels at 2.2 above, replacement.



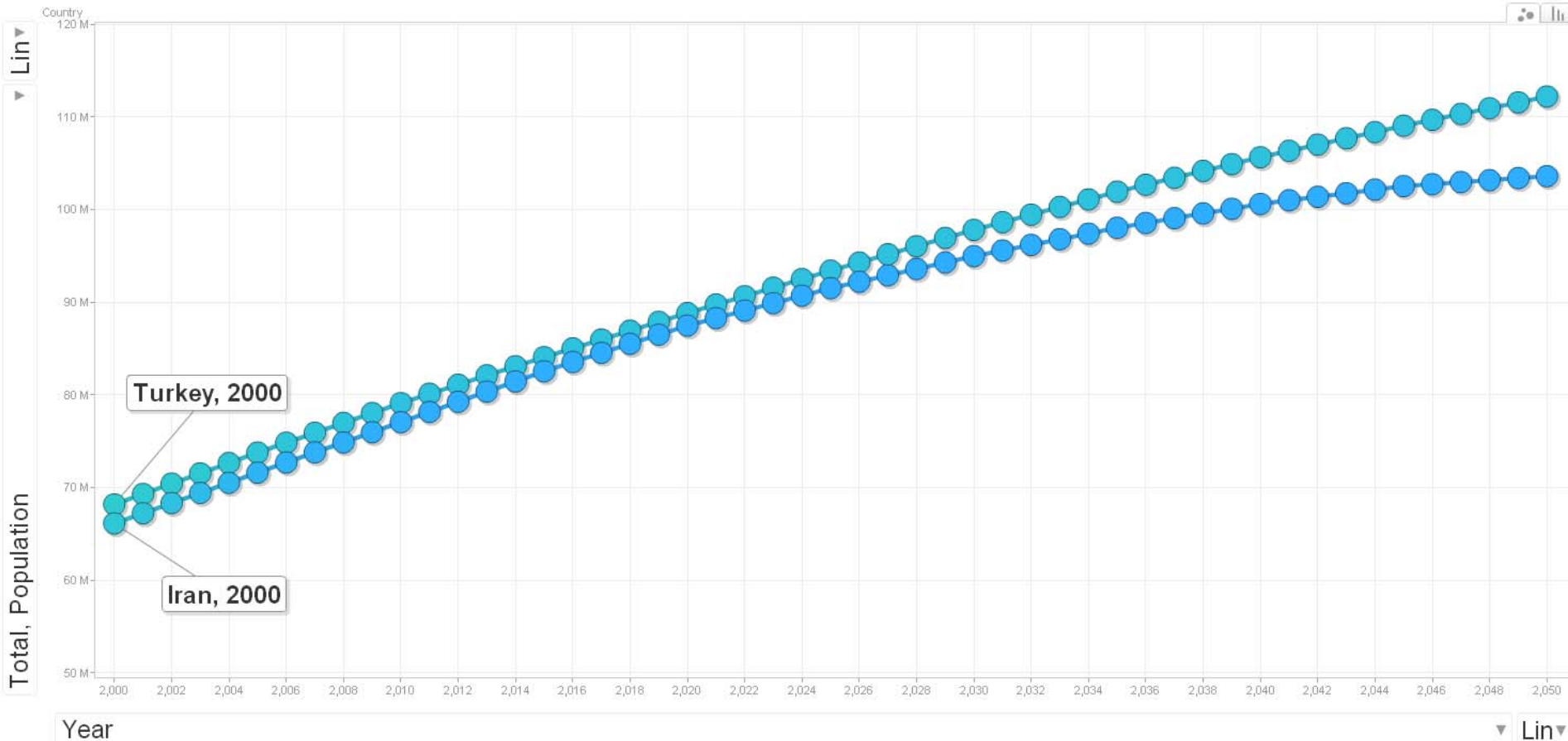
Projected declines in total fertility rate for India & China Later, lesser declines leads to India's overtaking China



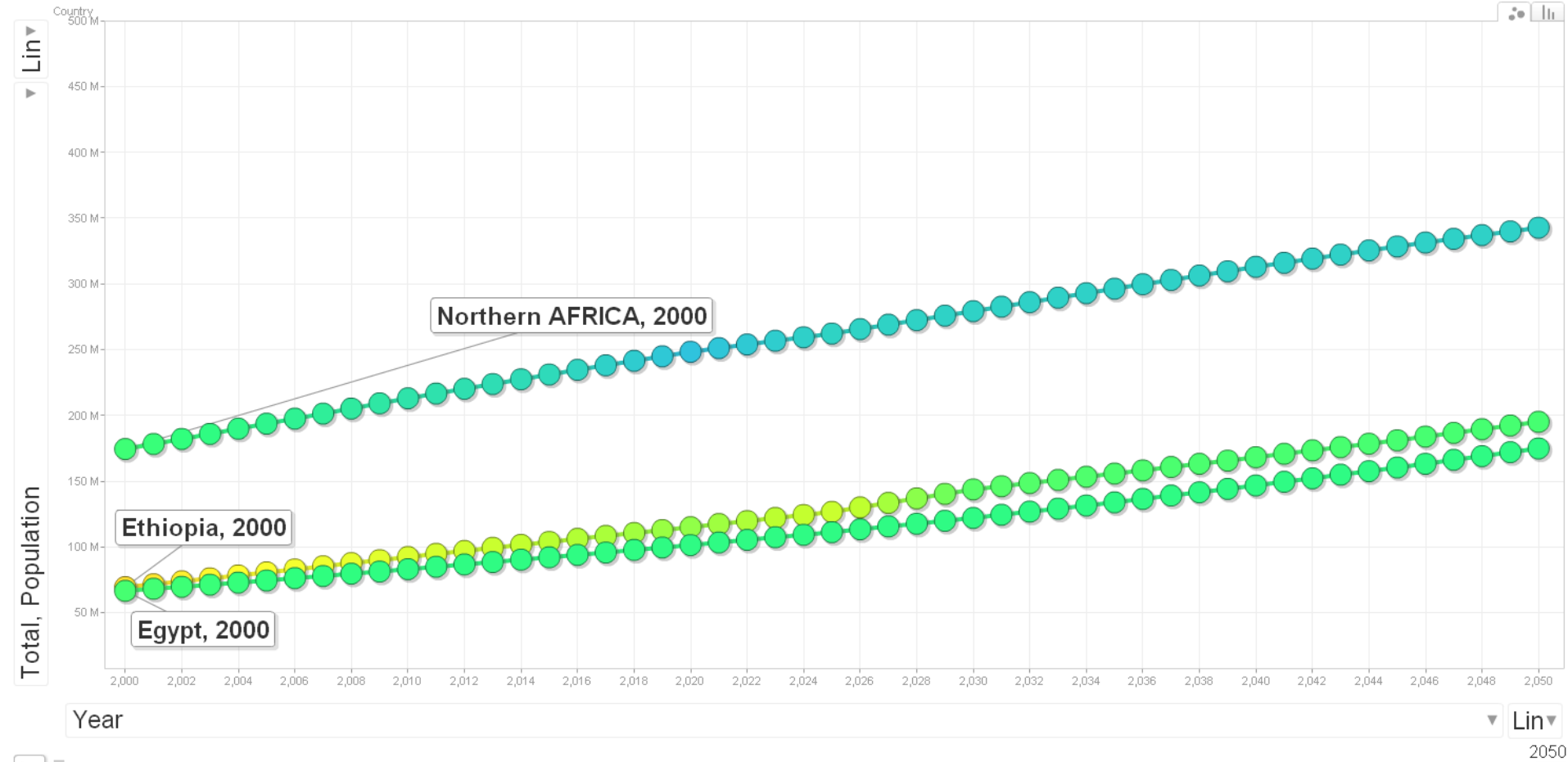
Among countries with steepest growth are Afghanistan, Iraq, and Yemen, which quadruples from about 20 to about 80 million. If Afghanistan maintains its historically high fertility, it will pass 100 million.



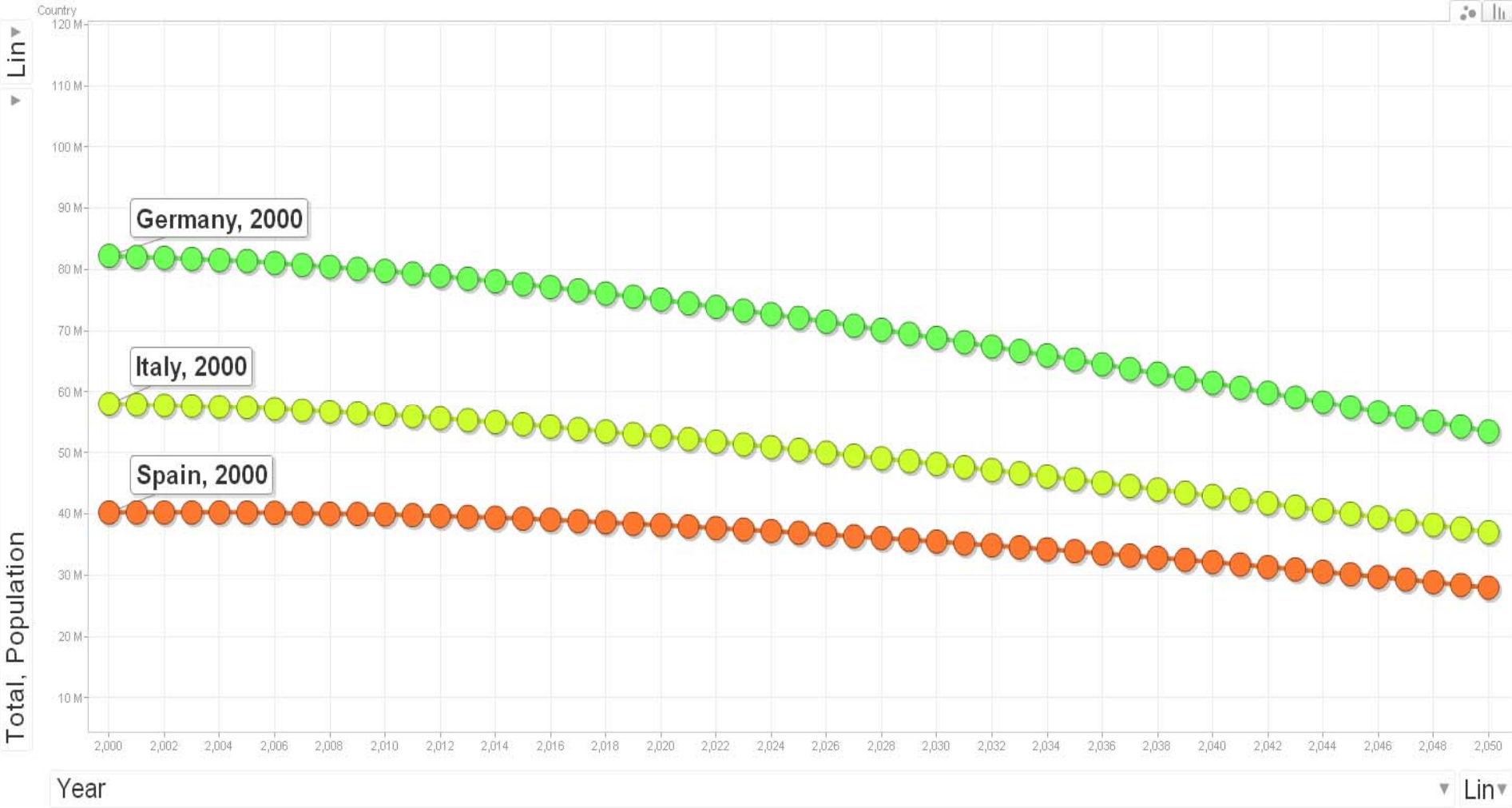
Some already quite large countries continue large absolute growth even with declining fertility owing to momentum of youthful populations. For example, Turkey and Iran pass 100 million.



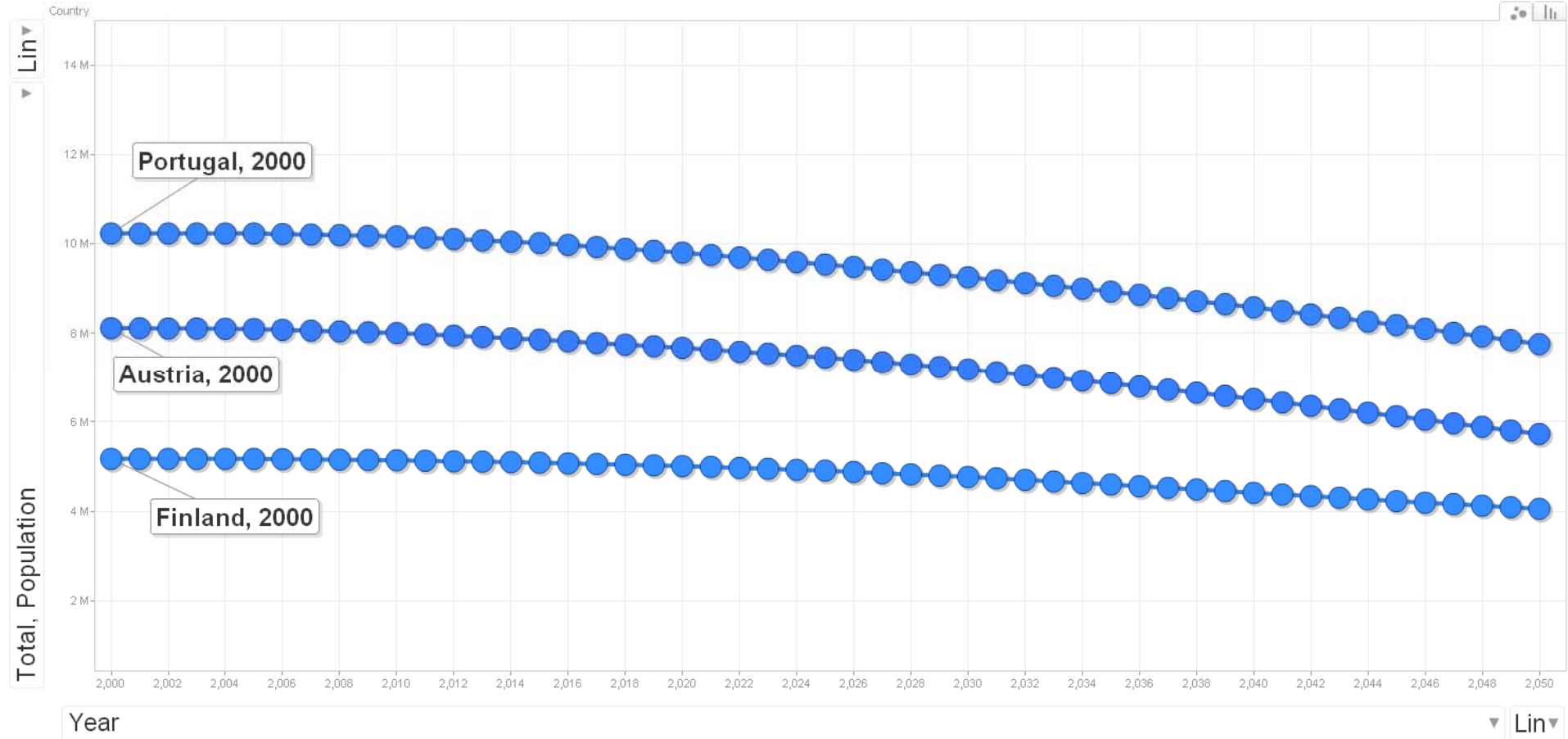
Northern Africa roughly doubles in numbers, of whom more than 150 million are Egyptians. Ethiopia approaches 200 million.



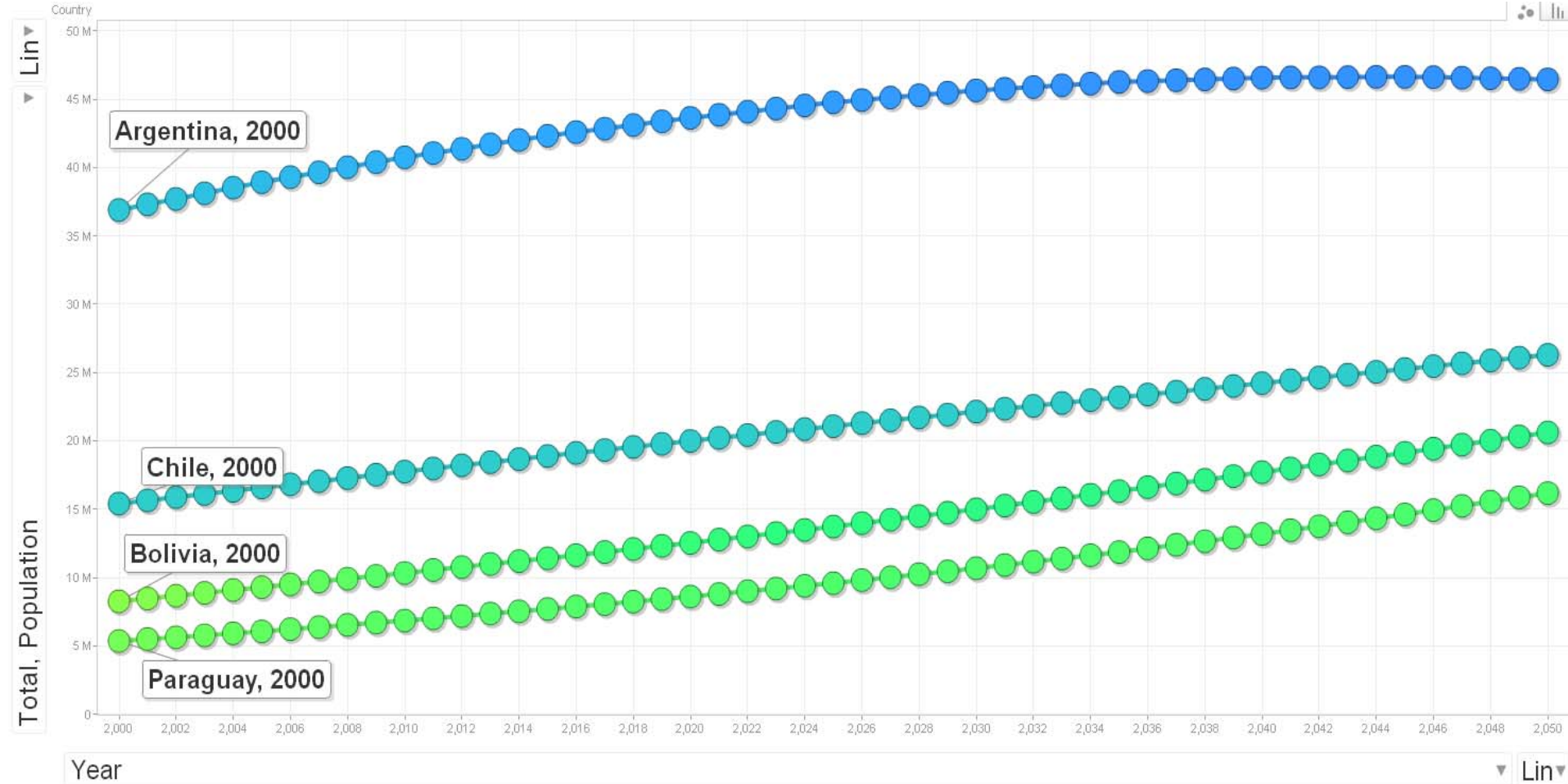
Meanwhile populations of European countries plummet.
Germany, Italy, and Spain lose about 1/3 of their native populations.



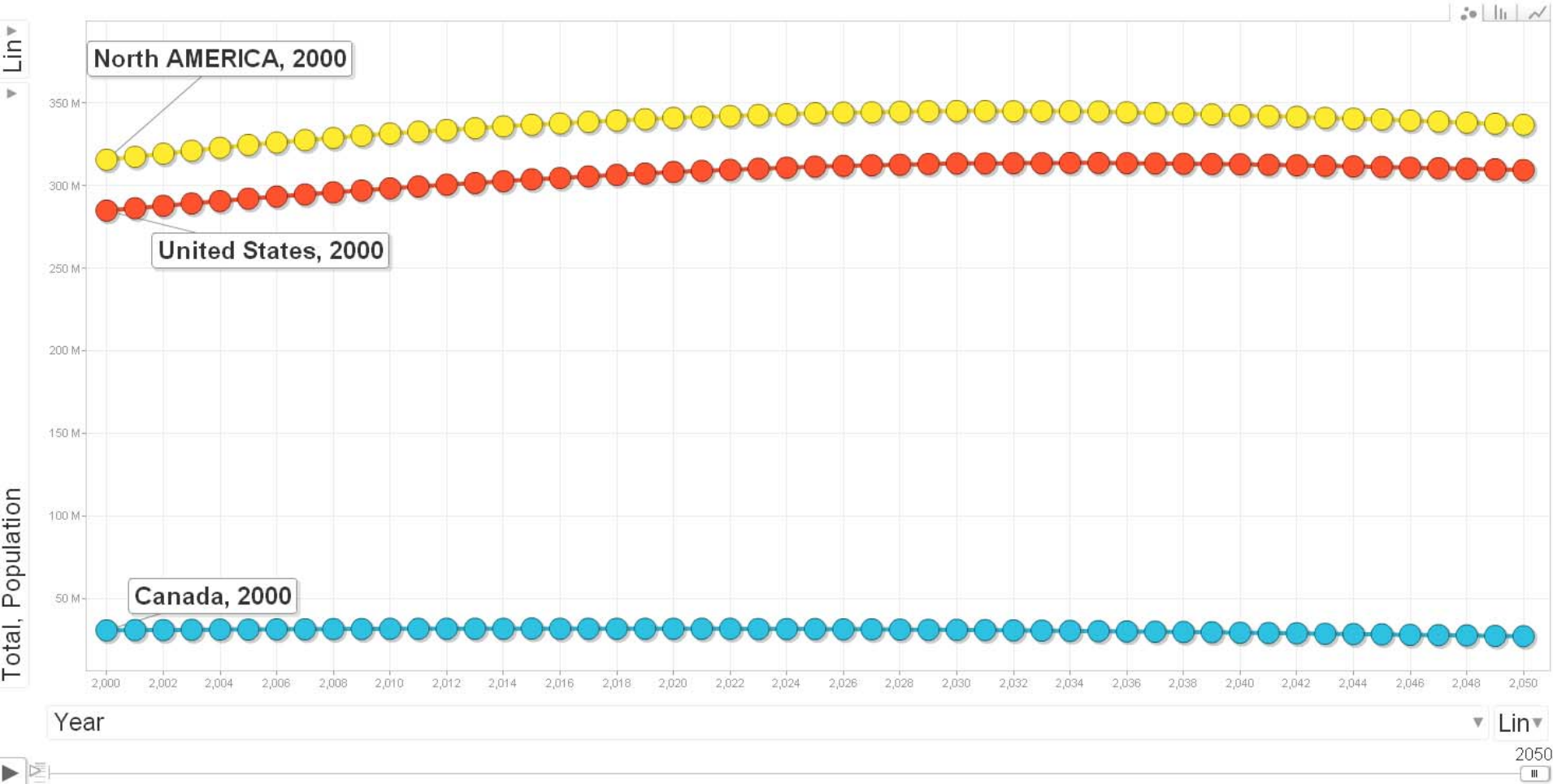
Smaller European nations also shrink



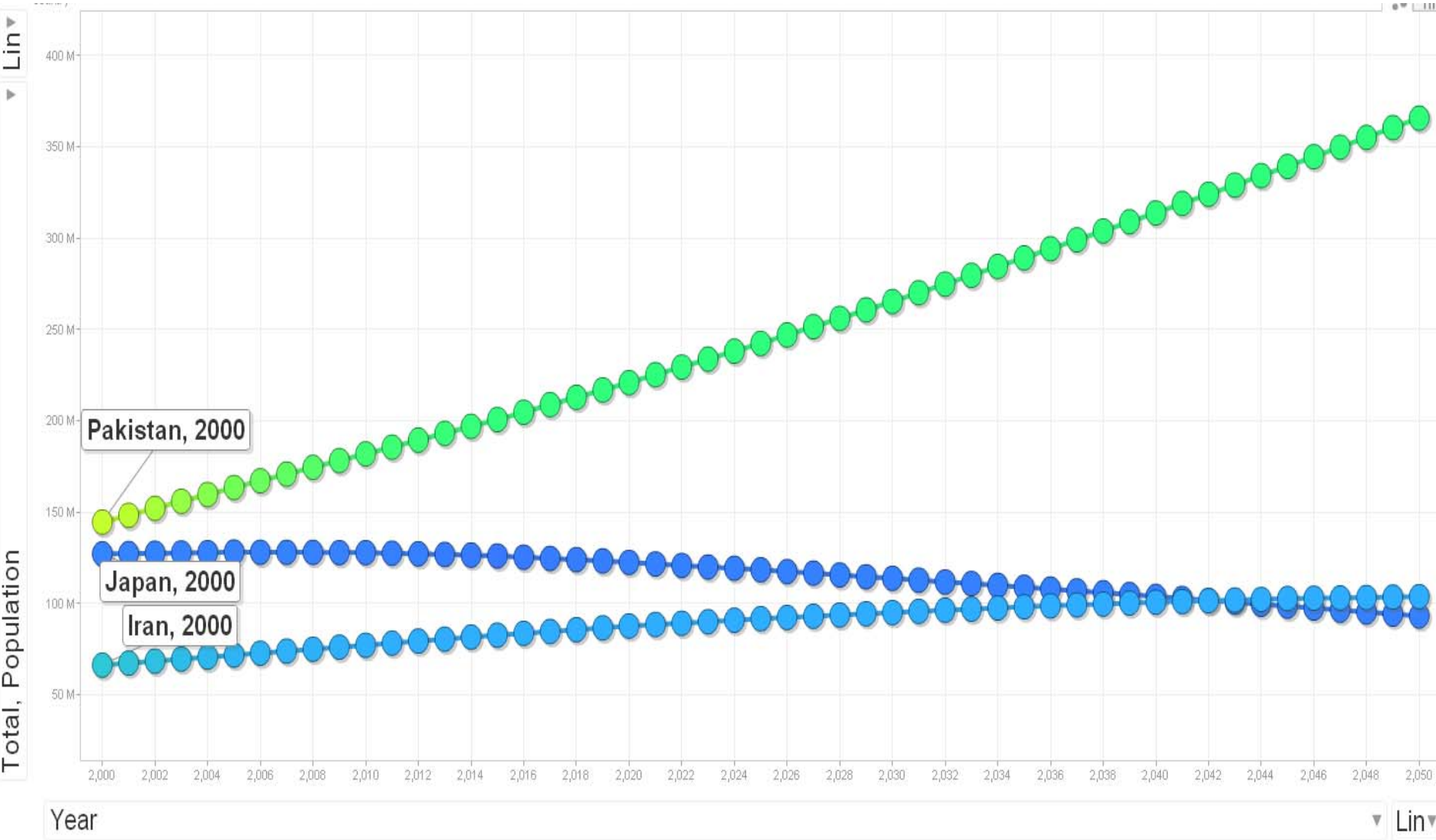
In South America the countries with larger native American populations grow faster, a phenomenon we dub the “reconquista” as the conquistadores are diluted



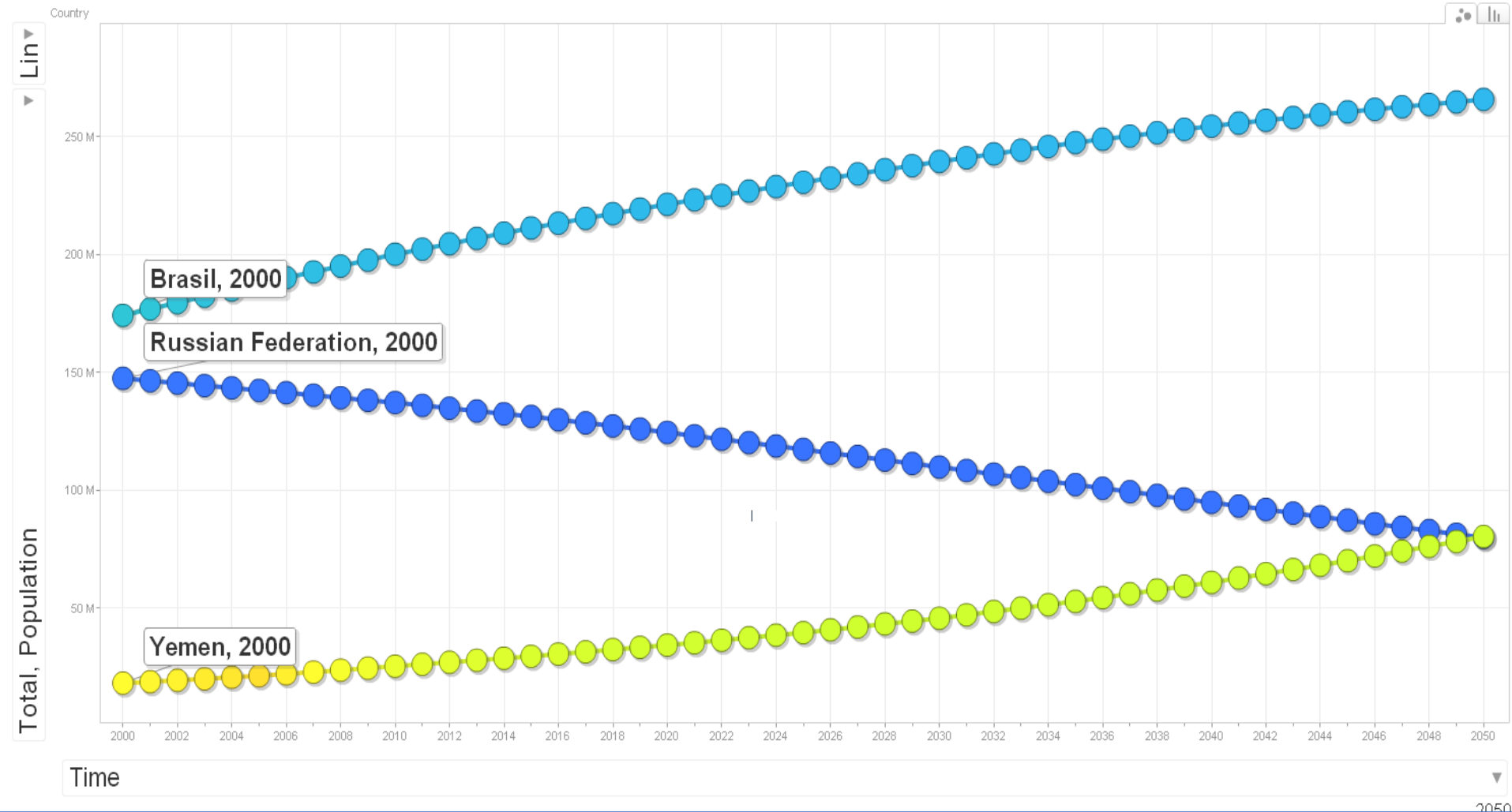
In North America, the US grows for a couple more decades and then declines, as does Canada



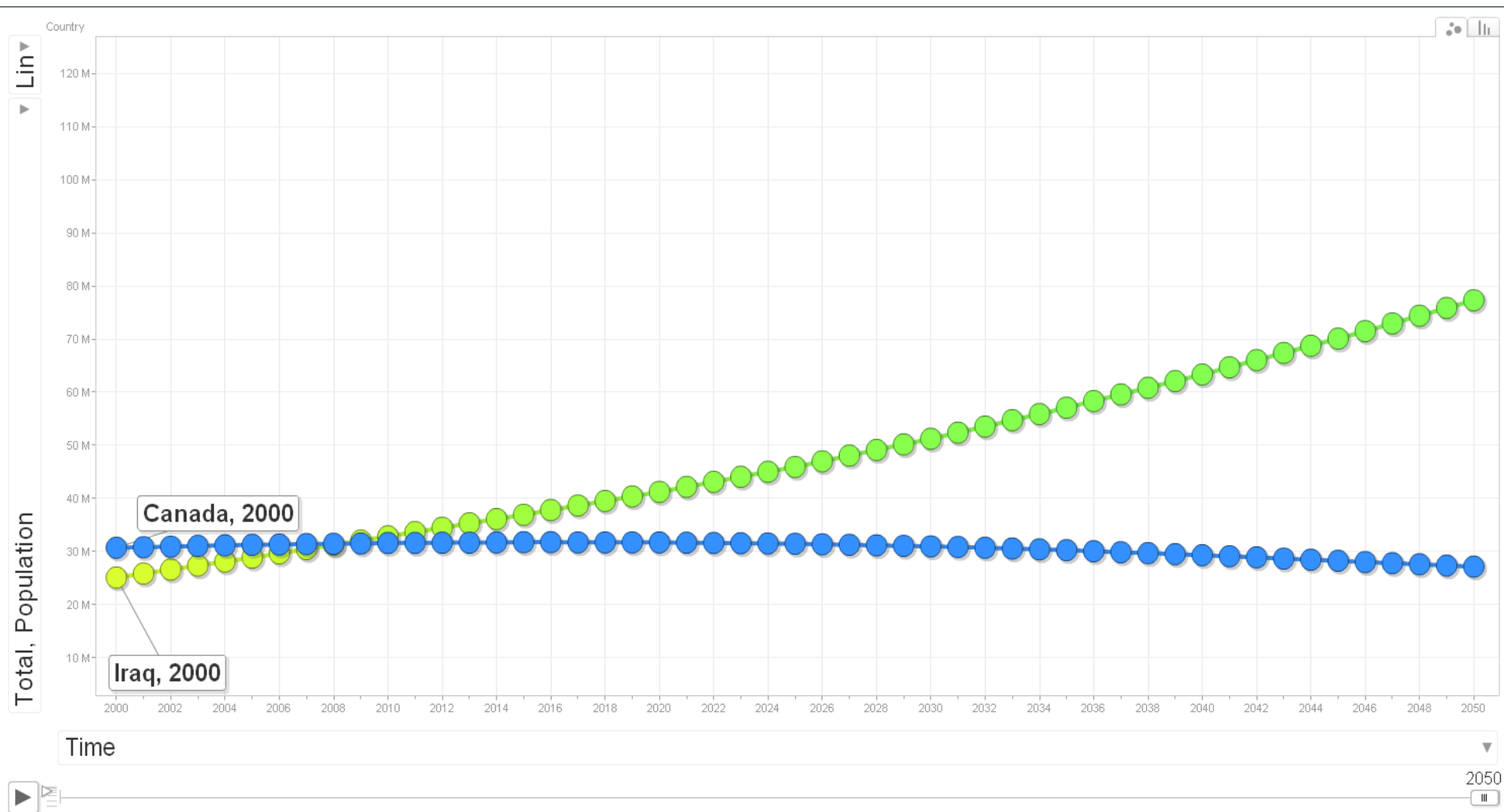
Asia's net growth sums widely contrasting experiences. In spite of falling fertility rates, Pakistan contributes enormous growth, while Iran grows & then plateaus. Japan sinks steadily, by a third. China, as shown earlier, begins to shrink in the 2020s.



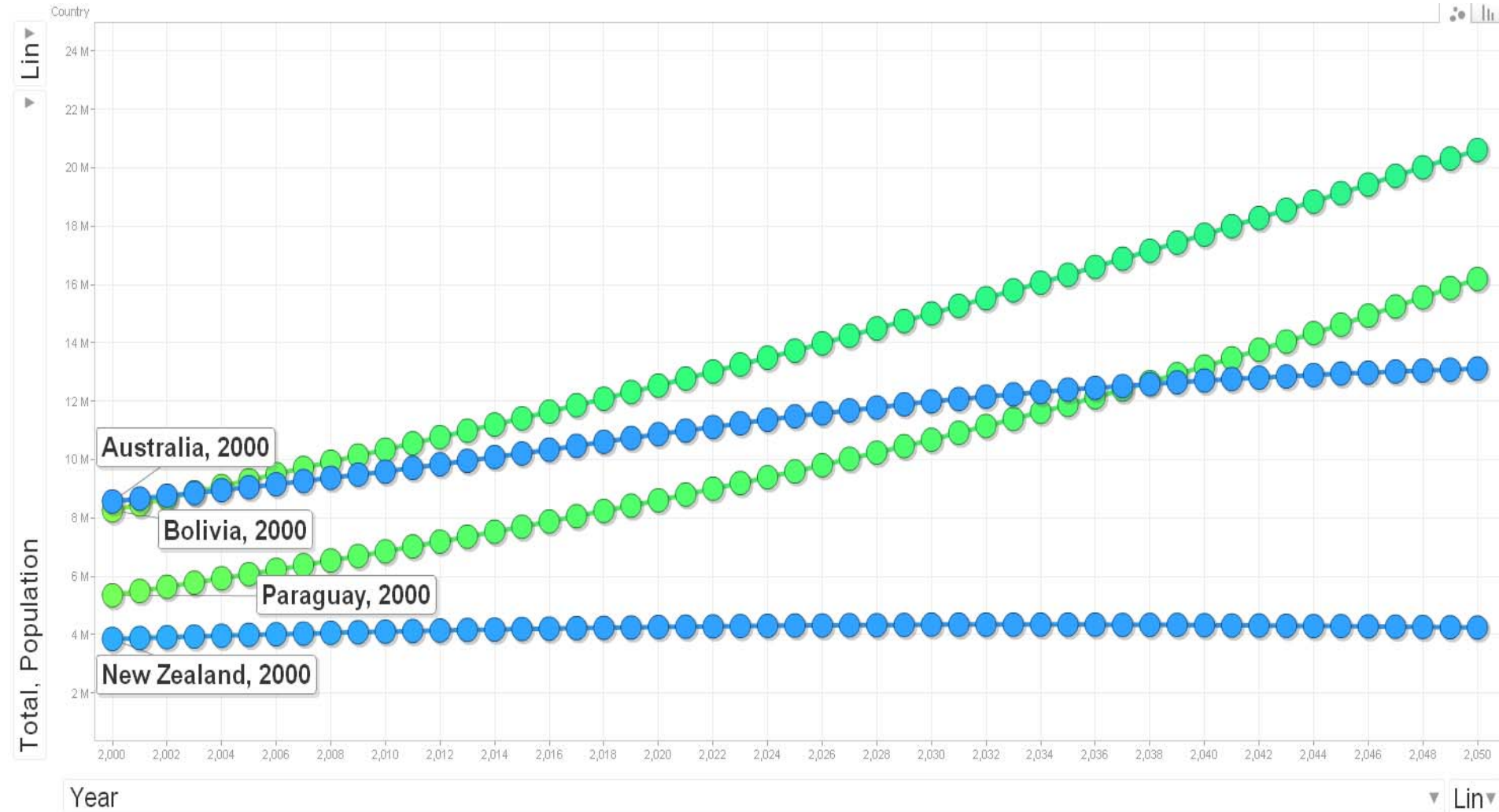
Overall, the prospect is world of contrast, explosions and implosions. Brazil and Yemen explode while Russia implodes. Russia (17 million sq km) and Yemen (.5 million sq km) converge in population around 2050.



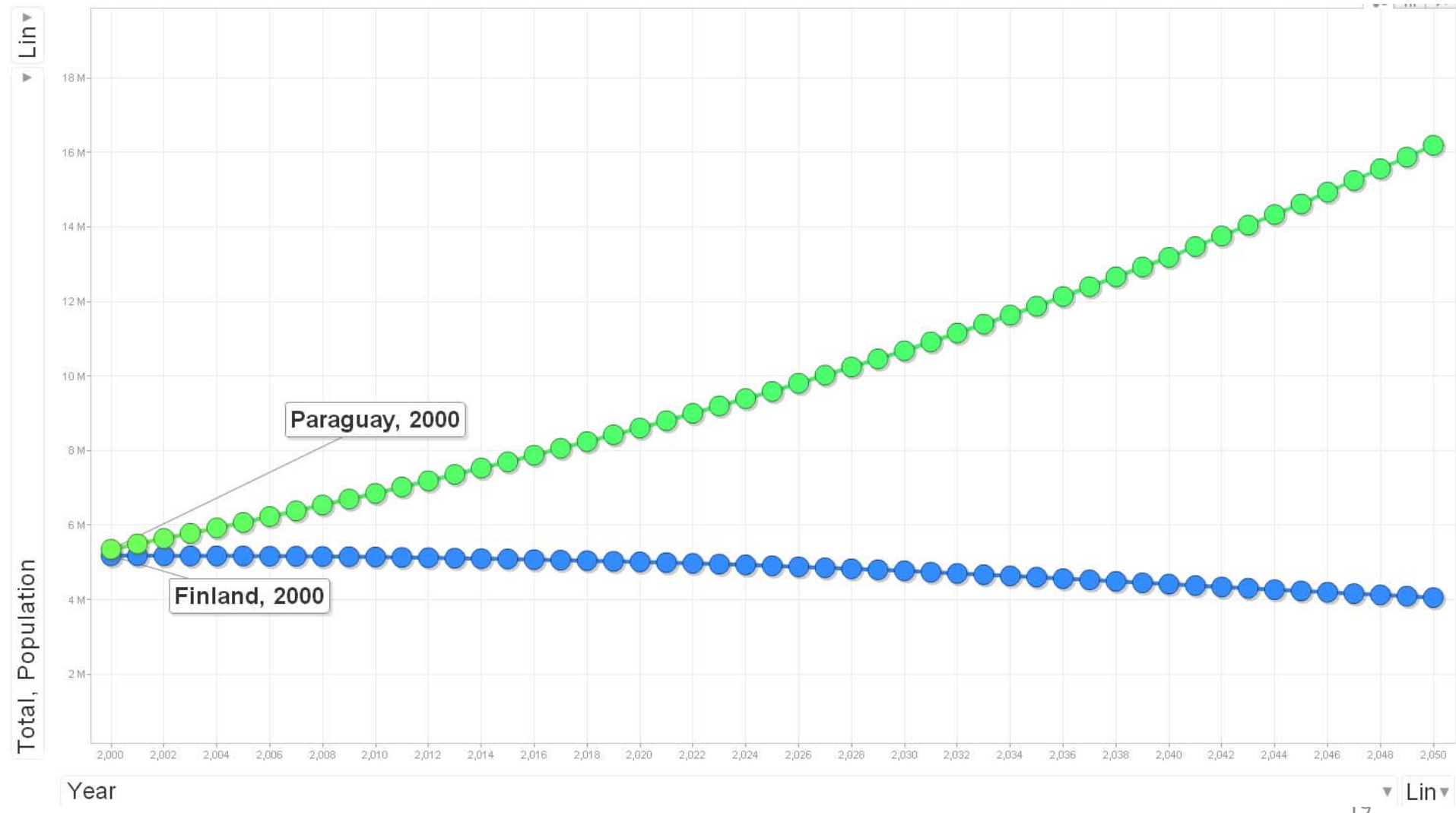
Nations trade places. Around now Iraq is surpassing Canada in population, and Iraqis will more than double Canadians by 2050.



Countries like Bolivia and Paraguay will be increasing quite steadily, and opening large gaps in numbers over countries like Australia and New Zealand.



In 2000 Paraguay and Finland had almost identical populations of about 5M, while by 2050 Paraguayans will be 4 times as numerous as Finns.



- Summary

Explosions in Sub-Saharan Africa and some Asian countries, including Islamic nations such as Yemen and Pakistan as well as India.

Implosions by 2050 in all OECD countries with the exception of Turkey. All except Turkey will have a TFR < 2.0 and hence declining or imploding populations.

Implosion in China.

Conclusion: Enormous pressures for international migration.