Updating SSPs' Population and Human Capital Projections – Data Release

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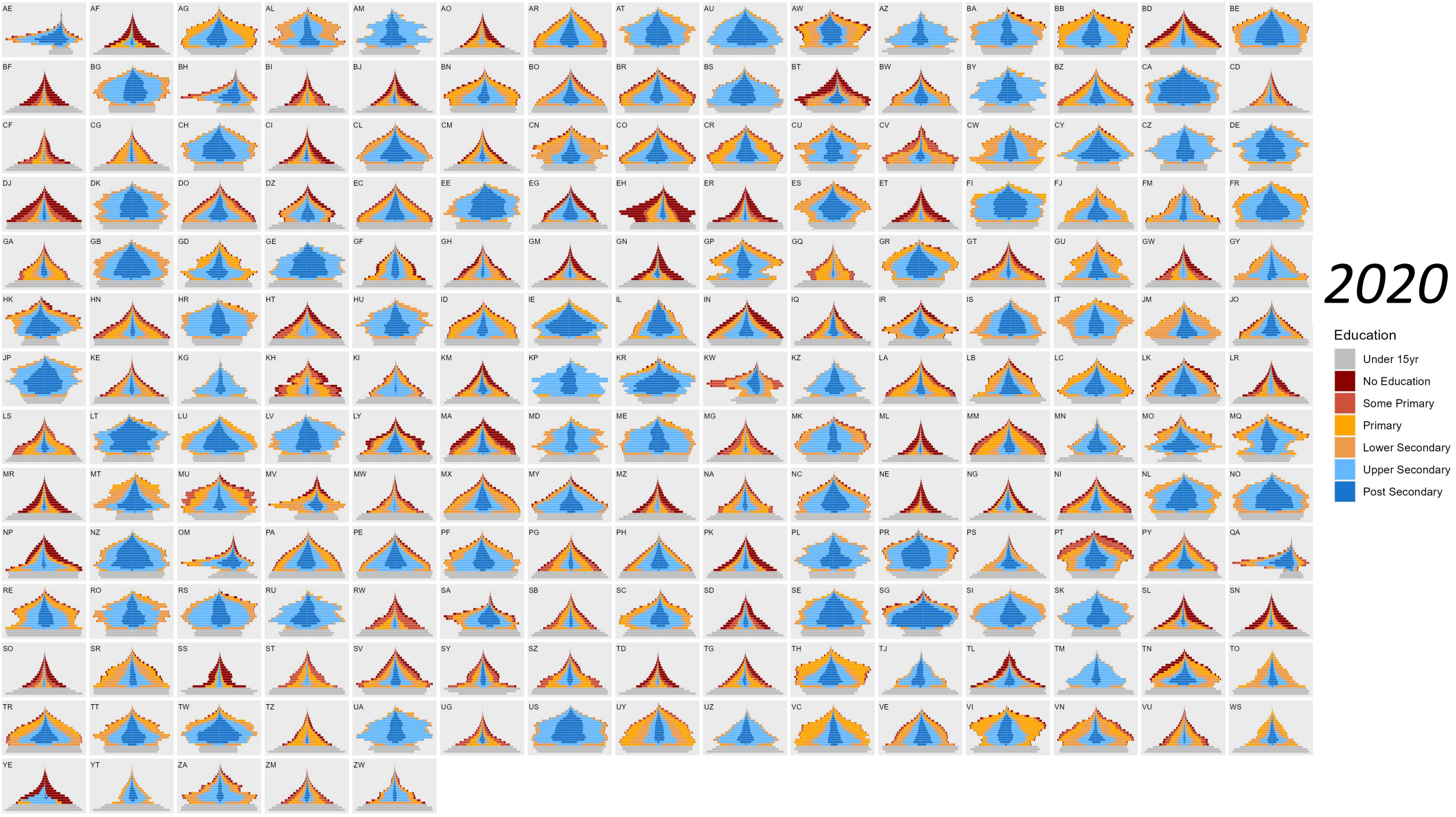
Past Global Population and Human Capital Projection Model

- 1970-2000 (Reconstruction); Lutz, Goujon, KC, and Sanderson, *2007*
- 2000-2050 KC, Barakat, Goujon, Skirbekk, Sanderson, and Lutz, *2010*
- 2010-2100 KC et al. (Data and Methods/SSPs) – *WIC2013* in Lutz, Butz and KC, (eds.) 2014
- 2015-2100 KC et al. (Data and Methods) – *WIC2018* in Lutz, Goujon, KC, Stonawski, & Stilianakis (eds.), 2018
- 1950-2015 Speringer, Goujon, KC, et al, 2019
- KC et al. – **WIC2023** [https://doi.org/10.5281/zenodo.7767425]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GA GB GD GE GF GH GM GN GP GQ GR GT GU GW GY
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LS LT LU LV LY MA MD ME MG MK ML MM MN MO MQ
MR MT MU MV MW MX MY MZ NA NC NE NG NI NL NO
NP NZ OM PA PE PF PG PH PK PL PR PS PT PY QA
RE RO RS RU RW SA SB SC SD SE SG SI SK SL SN
SO SR SS ST SV SY SZ TD TG TH TJ TL TM TN TO
TR TT TW TZ UA UG US UY UZ VC VE VI VN VU WS
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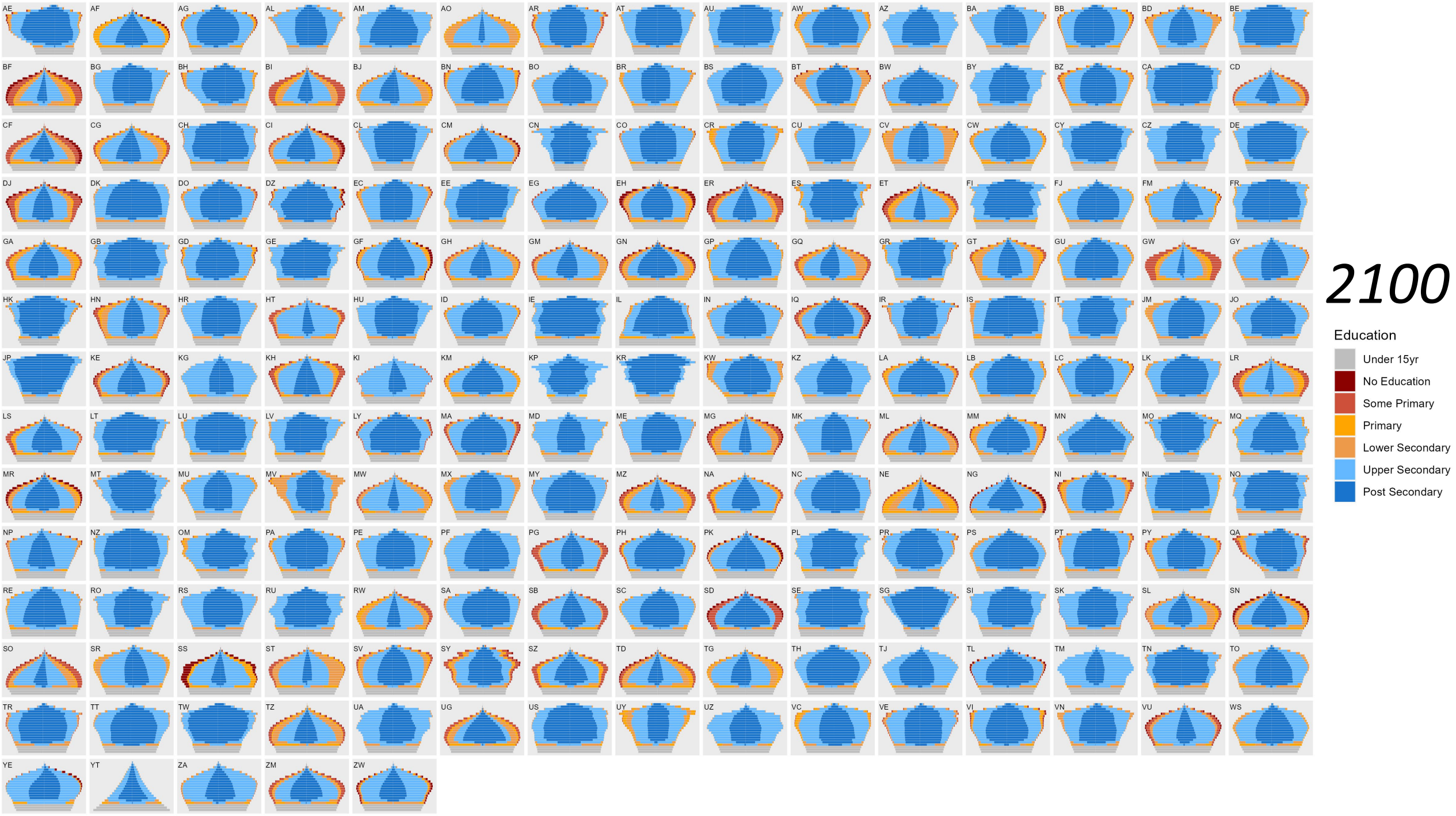
2020
Education
Under 15yr
No Education
Some Primary
Primary
Lower Secondary
Upper Secondary
Post Secondary



2100

Education

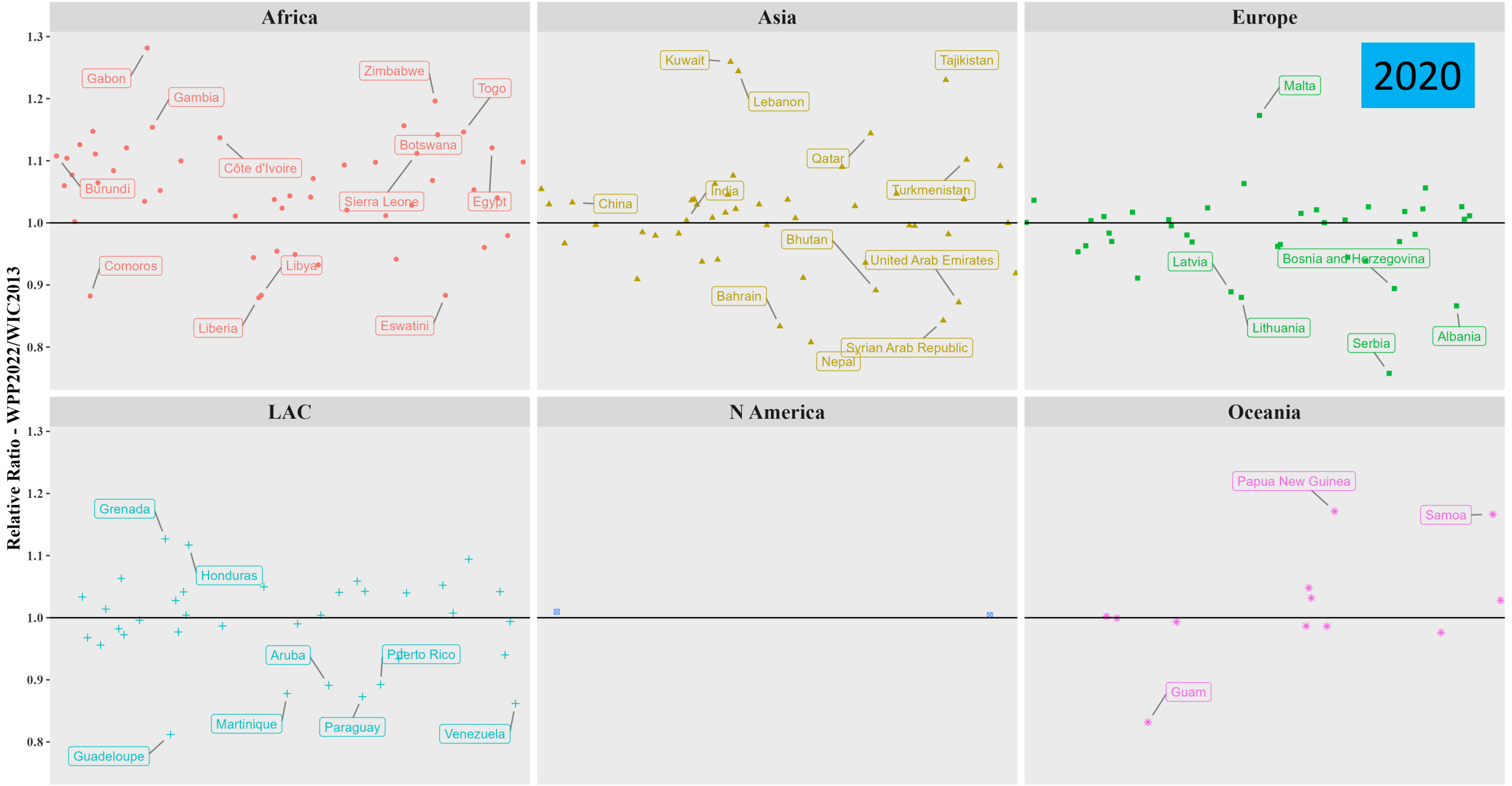
- Under 15yr
- No Education
- Some Primary
- Primary
- Lower Secondary
- Upper Secondary
- Post Secondary

Why Update?

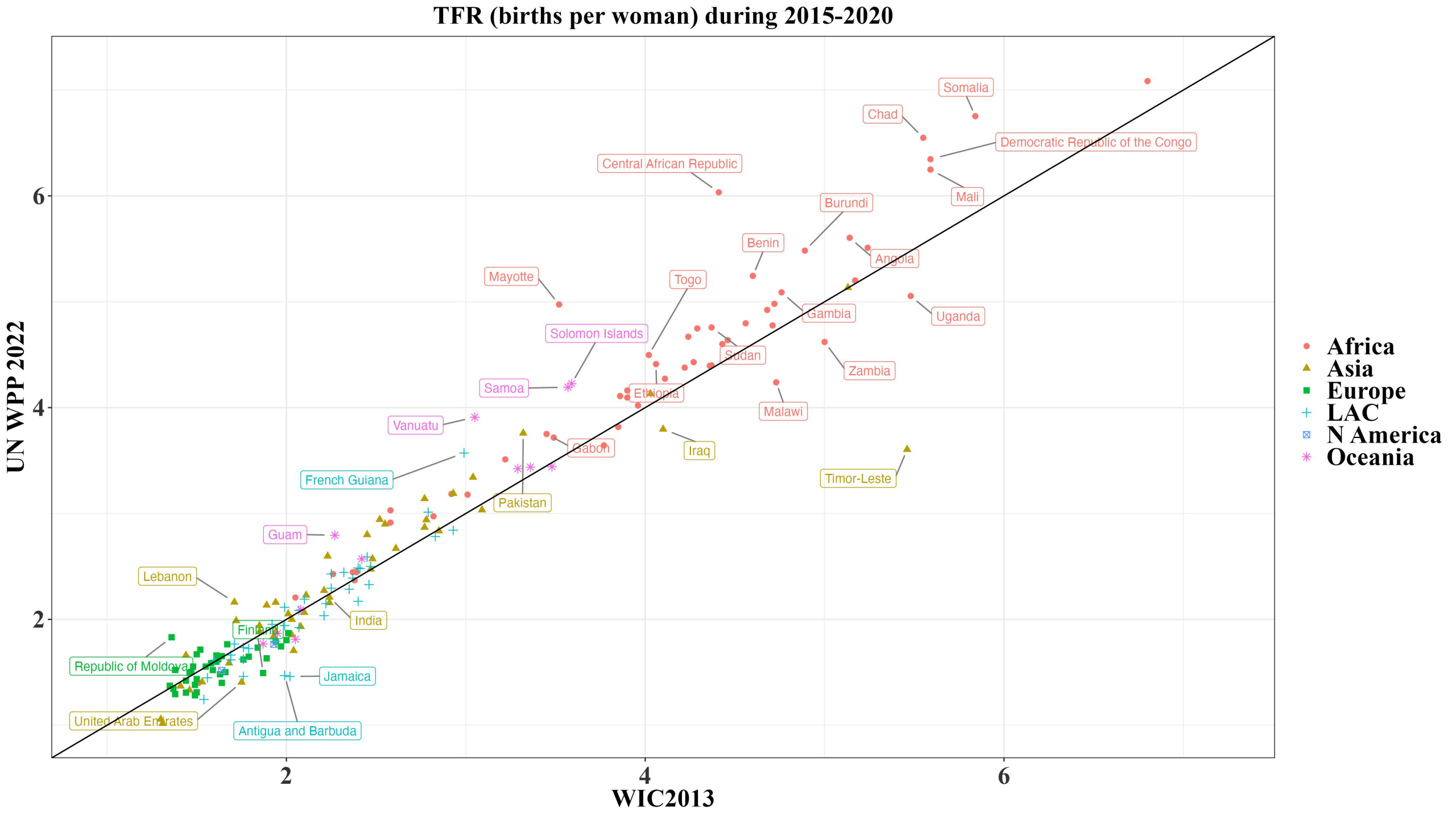
- 5-year period (WIC2013, WIC2018, WIC2023)

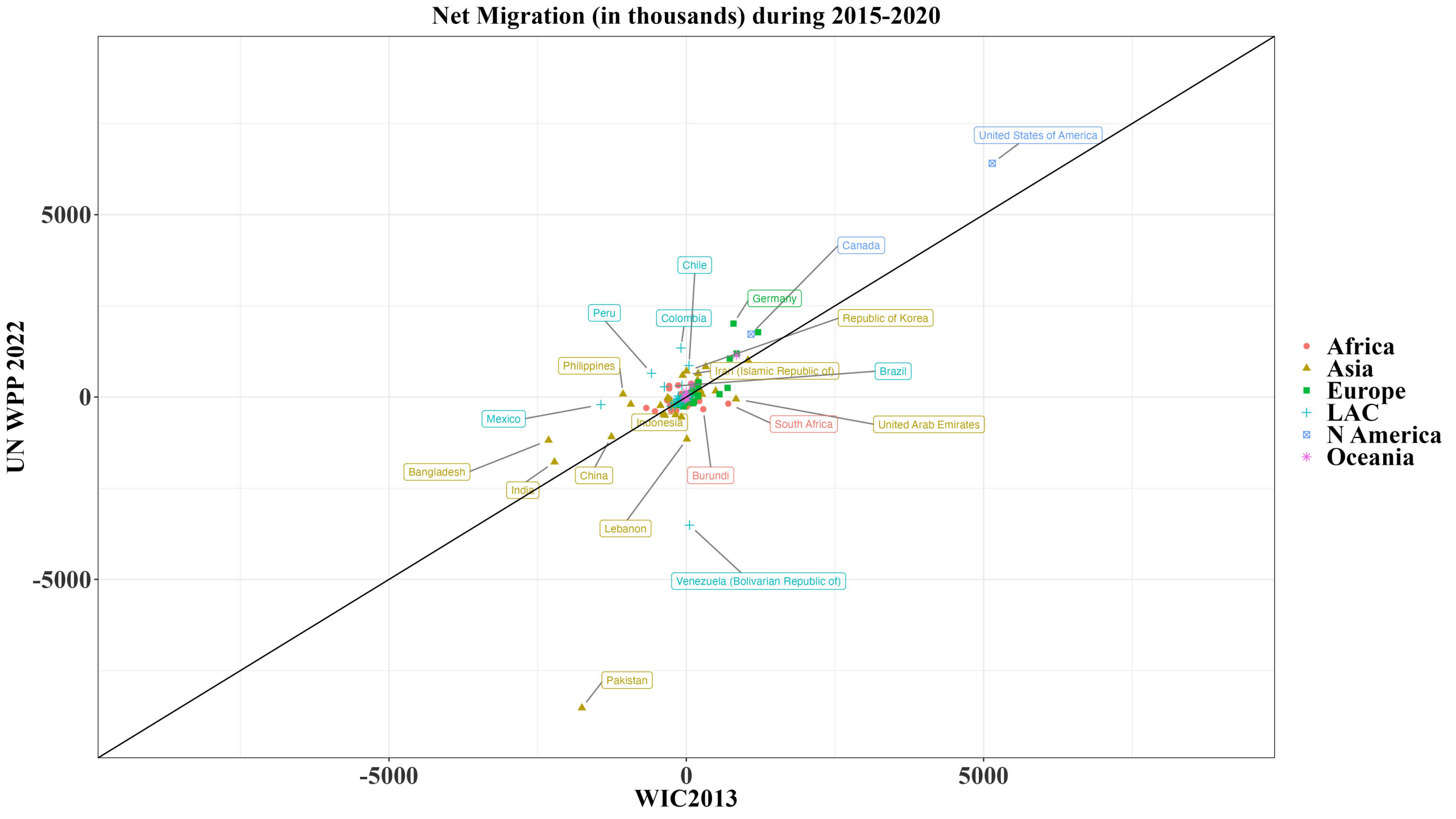
- Initial Population structure
- Fertility
- Mortality
- Migration
- Education Attainment Transitions

Ratio of Population between WPP2022 and WIC2013




Life expectancy at birth (in years) during 2015-2020
Male
Female
UN WPP 2022
WIC2013
50
60
70
80
90
French Polynesia
China
Brunei Darussalam
Mexico
Belize
India
Libya
Venezuela (Bolivarian Republic of)
Viet Nam
United States Virgin Islands
Senegal
Nepal
Rwanda
Afghanistan
Mauritania
Madagascar
Syrian Arab Republic
Botswana
Guinea-Bissau
Sierra Leone
United States Virgin Islands
South Africa
Senegal
Nepal
Botswana
Rwanda
India
Fiji
Afghanistan
Malawi
Mauritania
Madagascar
Zambia
Sierra Leone
Lesotho
Africa
Asia
Europe
LAC
N America
Oceania


TFR (births per woman) during 2015-2020
UN WPP 2022
WIC2013
2
4
6
Somalia
Chad
Democratic Republic of the Congo
Central African Republic
Mali
Burundi
Benin
Angola
Mayotte
Togo
Gambia
Uganda
Solomon Islands
Sudan
Zambia
Samoa
Ethiopia
Malawi
Vanuatu
Gabon
Iraq
French Guiana
Timor-Leste
Pakistan
Guam
Lebanon
India
Finland
Republic of Moldova
Jamaica
United Arab Emirates
Antigua and Barbuda
Africa
Asia
Europe
LAC
N America
Oceania


Net Migration (in thousands) during 2015-2020
UN WPP 2022
WIC2013
5000
0
-5000
-5000
0
5000
United States of America
Canada
Chile
Germany
Peru
Colombia
Republic of Korea
Philippines
Iran (Islamic Republic of)
Brazil
Mexico
Indonesia
South Africa
United Arab Emirates
Bangladesh
China
Burundi
India
Lebanon
Venezuela (Bolivarian Republic of)
Pakistan
Africa
Asia
Europe
LAC
N America
Oceania

Update Summary

- Updated with UN's WPP2022 (Population, Fertility, and Mortality), UN's International Migration Stock 2020 data and Abel and Cohen (2022), DHS, NSOs, etc.
- Keeping long term assumptions mostly intact + COVID19
- Refined education distribution and transitions and updated baseline data for 23 countries
- Mortality Differential by education
- Fertility Differential by education
- Added education-specific bilateral migration flows [NEW] + Ukraine
- Re-modelled

Demographic Scenarios for SSPs (2013)

Wittgenstein Centre

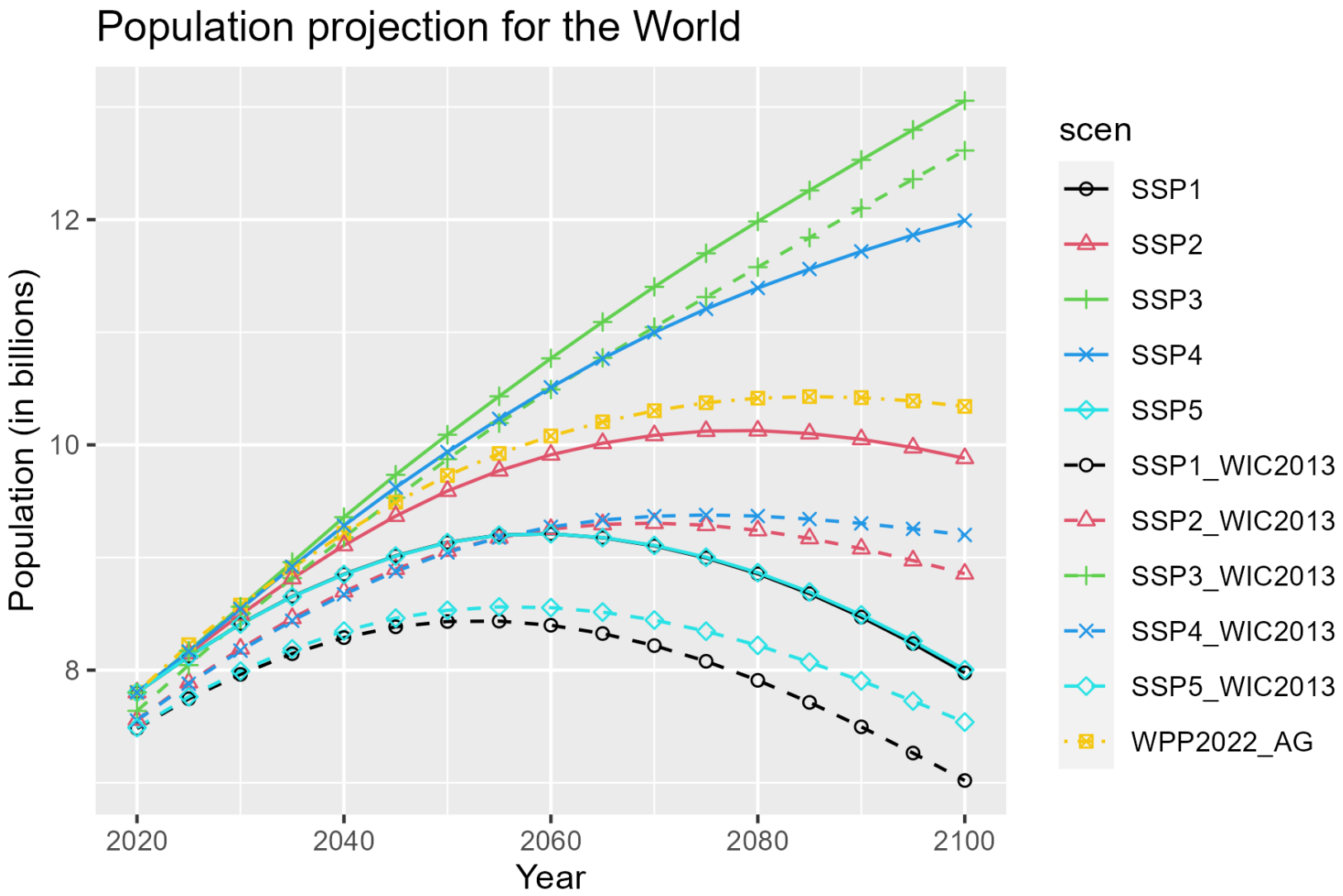
	Country Groupings	Fertility	Mortality	Migration	Education
SSP1 Rapid Development	***HiFert***	Low	Low	Medium	High (FT-GET)
	LoFert	Low	Low	Medium	High (FT-GET)
	Rich-OECD	Medium	Low	Medium	High (FT-GET)
SSP2 Medium	***HiFert***	Medium	Medium	Medium	Medium (GET)
	LoFert	Medium	Medium	Medium	Medium (GET)
	Rich-OECD	Medium	Medium	Medium	Medium (GET)
SSP3 Stalled Development	***HiFert***	High	High	Low	Low (CER)
	LoFert	High	High	Low	Low (CER)
	Rich-OECD	Low	High	Low	Low (CER)
SSP4 Inequality	***HiFert***	High	High	Medium	CER-10%/GET
	LoFert	Low	Medium	Medium	CER-10%/GET
	Rich-OECD	Low	Medium	Medium	CER/CER-20%
SSP5 Conventional Development	***HiFert***	Low	Low	High	High (FT-GET)
	LoFert	Low	Low	High	High (FT-GET)
	Rich-OECD	High	Low	High	High (FT-GET)

Sour

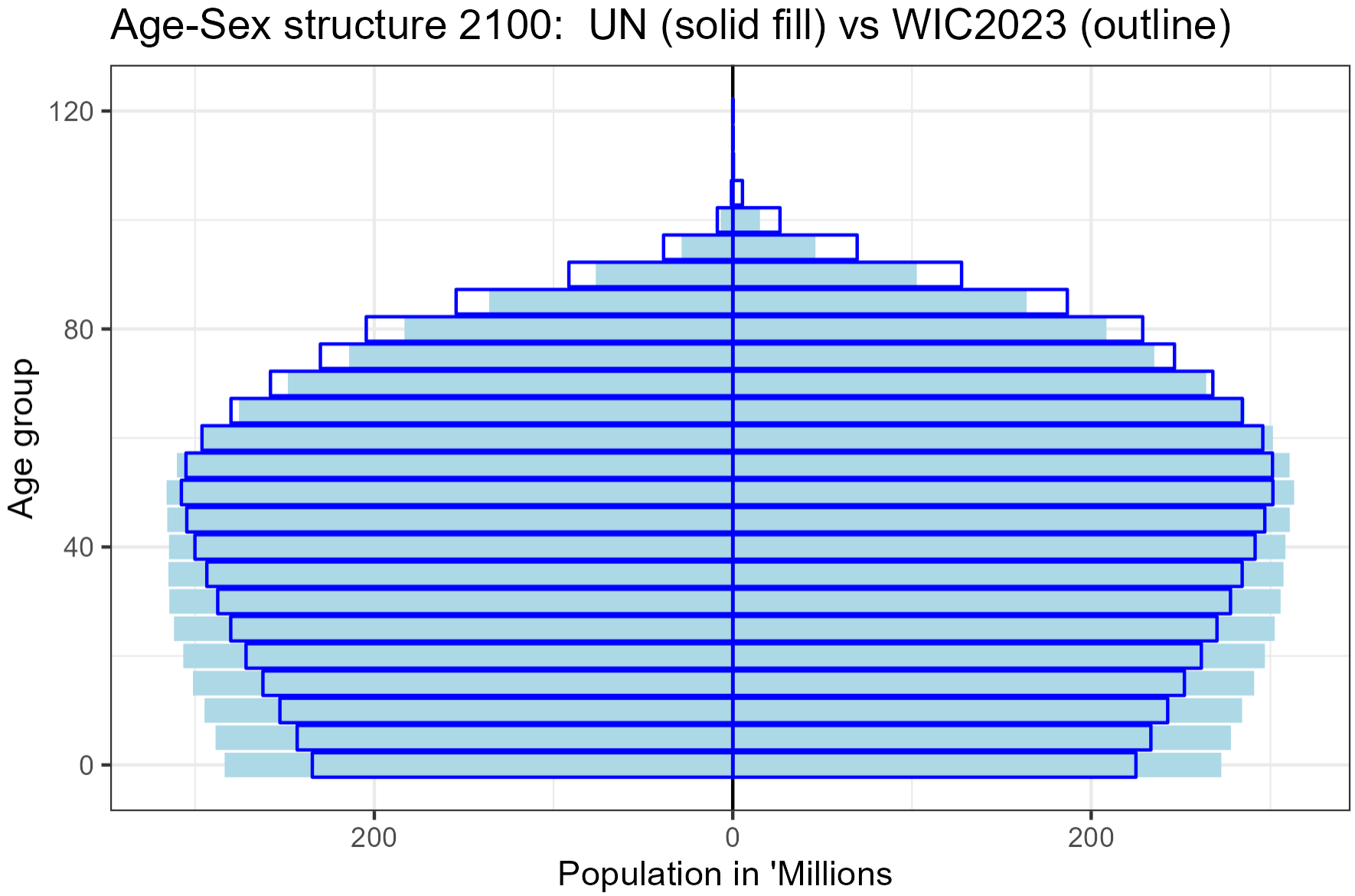
Shared Socioeconomic Pathways (SSPs) for Climate Change research community (KC and Lutz, 2014)

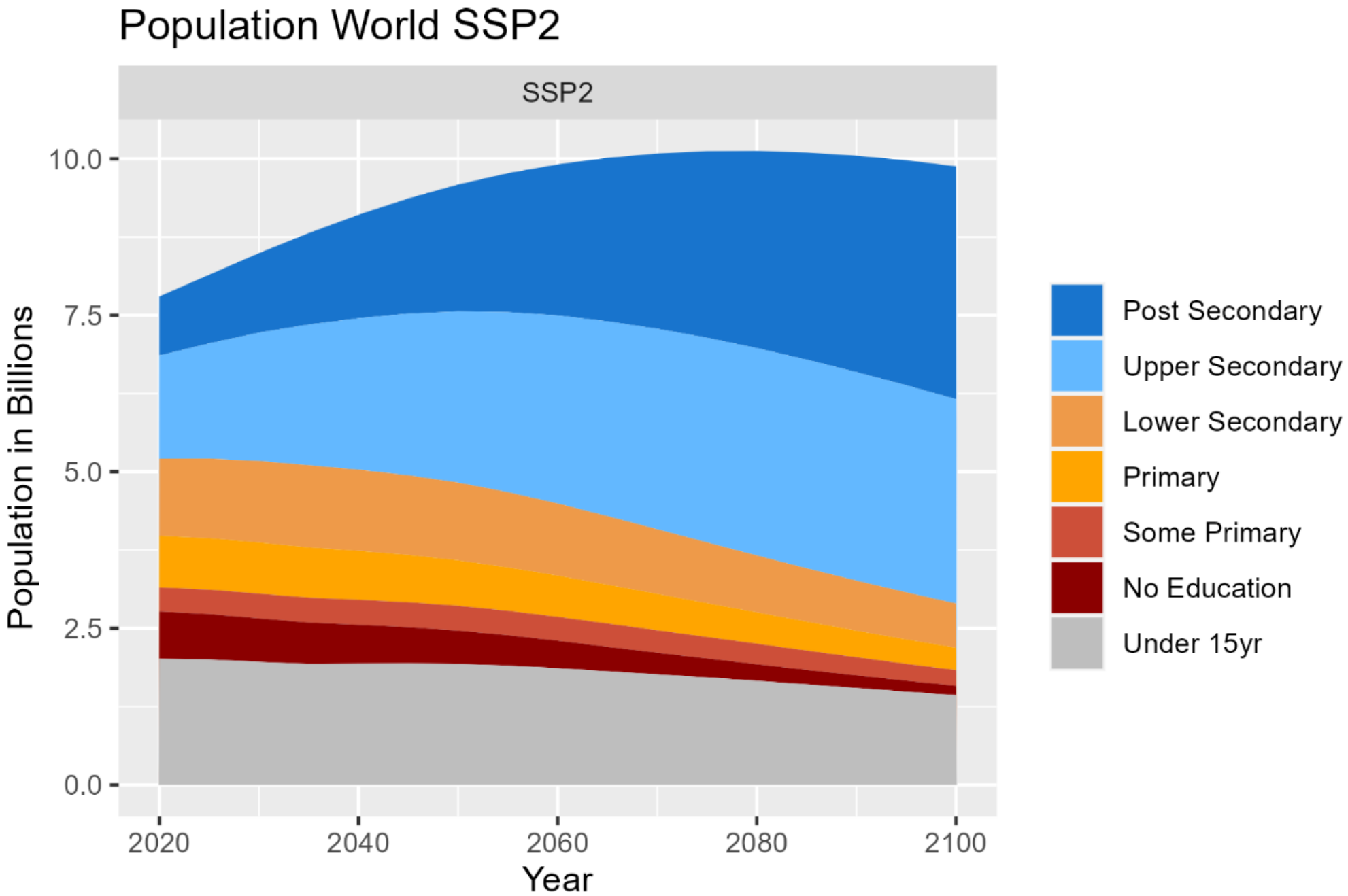
		SSP 1 Rapid Development		SSP 2	SSP 3 Stalled Development	SSP 4 Inequality		SSP 5 Conventional Development	
Country Groupings									
		HFert	LoFert			HFert	LoFert	HFert	LoFert
Population									
	Fertility	Low	Low10	Med	High	High	Low	Low	Low10
	Mortality	Low		Med	High	High	Med	Low	
	Migration	Med		Med	Low	Med		High	
Education		High (SDG-GET)		Med (GET)	Low (CER)	CER-10%/GET		High (SDG-GET)	

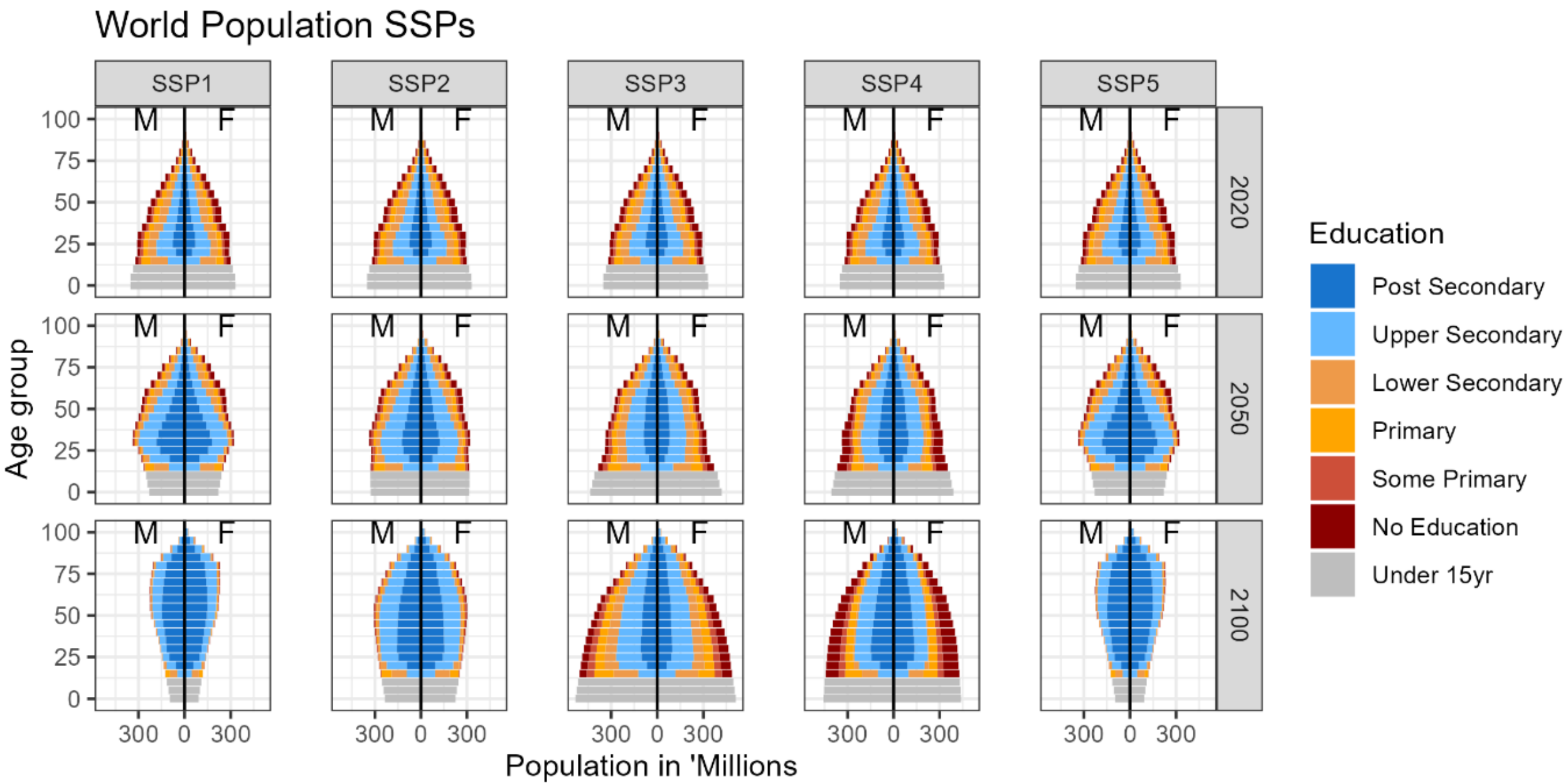
Global Population – Various Scenarios



Age Sex structure - 2100




Population World SSP2
SSP2
Population in Billions
10.0
7.5
5.0
2.5
0.0
2020
2040
2060
2080
2100
Year
Post Secondary
Upper Secondary
Lower Secondary
Primary
Some Primary
No Education
Under 15yr


World Population SSPs
SSP1
SSP2
SSP3
SSP4
SSP5
2020
2050
2100
M
F
100
75
50
25
0
Age group
300
0
300
Population in 'Millions
Education
Post Secondary
Upper Secondary
Lower Secondary
Primary
Some Primary
No Education
Under 15yr

Releases

- WIC Data Explorer (indicators with graphs and tables + R-package wcde2023 to download the data)
  - http://dataexplorer.wittgensteincentre.org/wcde-v3/ [Finalizing last bits]
- 4 Technical IIASA working papers [1Main, 2Migration; Forthcoming: 3Mortality, & 4Fertility]
- Zenodo Release V13 (input and output data including all calc. steps) https://zenodo.org/records/10618931

Next

- Back projection (1950-2015) – Ongoing (phase I of 2 completed – 2 more months)
- Open for collaboration
  - Running alternative scenarios – 0mig_SSP2/dblmig_SSP2/CER_SSP2/SDG+_SSP2; projection until 2500
  - Integrating projections with other models (feedback)
    - Impact of climate change (e.g. Migration)
    - Air pollution on mortality
- Sub-national SSPs
  - India – 35 states by urban/rural (age, sex, and education) [Forthcoming]

Conclusion

- Update – new features and corrections (COVID – Syrian – Ukraine crisis)
- Multidimensional population and human capital model as a melting pot of demography
- Projection is an outcome of a scenario – therefore, projection cannot be wrong – projection is not a forecast
- How you generate scenario defines the quality of a projection
- Our attempt is to define a medium scenario as a forecast, which itself is dynamic as it also depends on forces (e.g. climate change) that we cannot predict with comfortable degree of certainty
- Population heterogeneity such as education helps refine our assumptions – but in due time new sources of population heterogeneity might emerge
- Sub-national (urban-rural; degree of urbanization)
- More country-specific analysis need to feed in the global model

References

- K.C., S., Dhakad, M., Potančoková, M., Adhikari, S., Yildiz, D., Mamolo, M., Sobotka, T., Zeman, K., Abel, G., Lutz, W., and Goujon, A. (2024). Updating the Shared Socioeconomic Pathways (SSPs) Global Population and Human Capital Projections. IIASA Working Paper. Laxenburg, Austria: WP-24-003. https://pure.iiasa.ac.at/19487
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- Adhikari, S. and K.C., S. (Forthcoming). Global Fertility Projection Differentials by Educational Attainment IIASA Working Paper