

# Forecasting Through Simulation: The International Futures (IFs) Way



Singapore  
IRAHSS 2010

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# Pop Quiz: What do these question sets have in common?

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  - ◆ In a continent where the average adult has had 3 years of formal education and 600 million live on less than \$2 per day, how rapidly can we advance well-being?



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  - ◆ How democratic might China (now at 3) be when its economy is larger than those of the US and Europe?



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  - ◆ How democratic might China (now at 3) be when its economy is larger than those of the US and Europe?
3. The level of carbon dioxide in the global atmosphere is now 390 parts per million and many call for that to be held to 450 (even 350).
  - ◆ What impacts will there be when the world passes 450 about 2030 (according to the IFs base case) ? How do we avoid 550 in 2100?



# What they have in common:

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1. They are fundamentally important questions for the future of sustainable human development (and therefore of risk).
2. They require long-term, multi-issue, global perspective.
3. They require a great breadth of theoretical and empirical insight to explore.
4. We need tools to study such questions (hurrah for RAHS).

Let's talk about International Futures (IFs), a tool to explore human development patterns across the world and throughout the century.



# The IFs mission

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Sustainable human development requires:

Human Development/Freedom	Poverty reduction, education, health
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Peace and Security/Social Fairness	Reasonable income distribution; good governance



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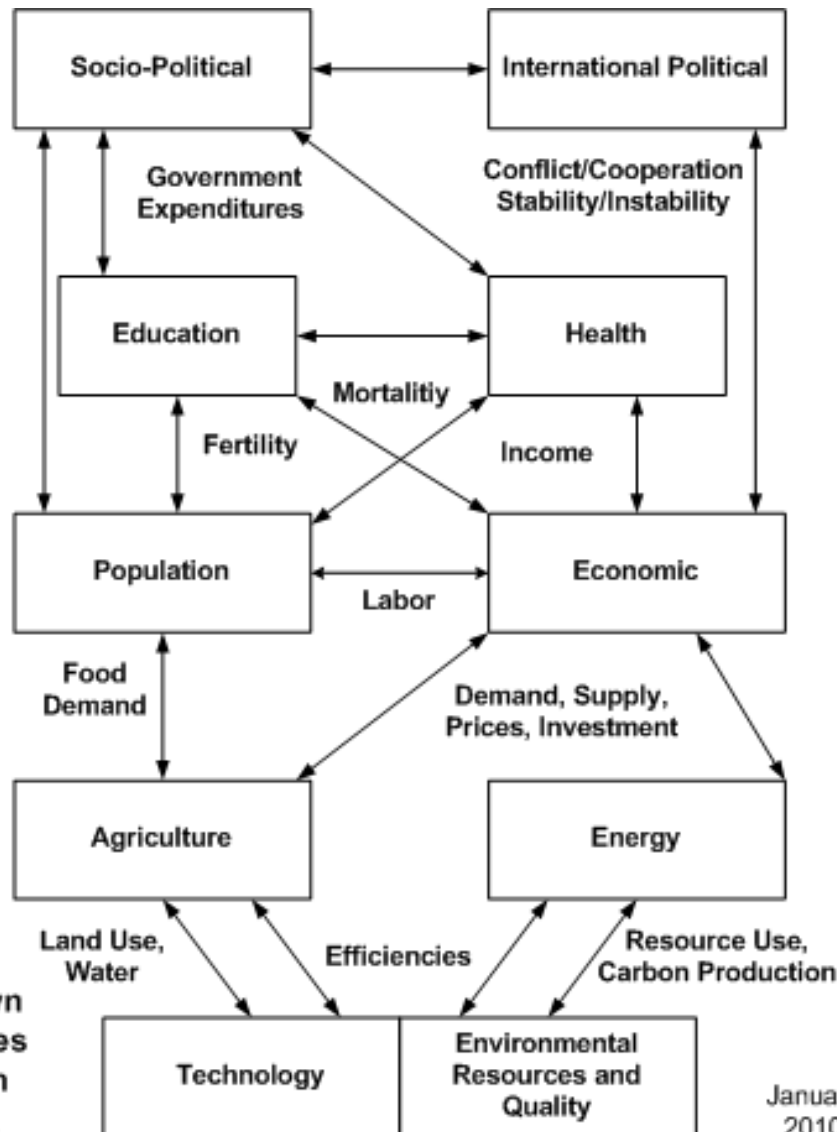
Human Development/Freedom	Poverty reduction, education, health
Peace and Security/Social Fairness	Reasonable income distribution; good governance
Sustainable Material Well-Being	Protecting the earth for future generations

IFs mission: Create and make widely available the best possible quantitatively-based system for analyzing long-term, interacting global issues concerning sustainable human development





# International Futures (IFs): The approach



“If at first the idea is not absurd, then there is no hope for it.” Albert Einstein

Links shown are examples from much larger set

January 2010



# International Futures (IFs): The project

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1. International Futures (IFs) developed over 30+ years
  - ◆ Integrated multi-issue, long-term model; data and theory-based
    - Over 1700 data series (183 countries)
    - Builds on best practice theory of many fields
  - ◆ Tool for “thinking about the future”



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## 2. Available: [www.ifs.du.edu](http://www.ifs.du.edu) (download and web-based)

- ◆ Easy to use—fully interactive
- ◆ Widely used, including the UNEP’s GEO 4, EU projects, US NIC
- ◆ Noncommercial and open: free to all



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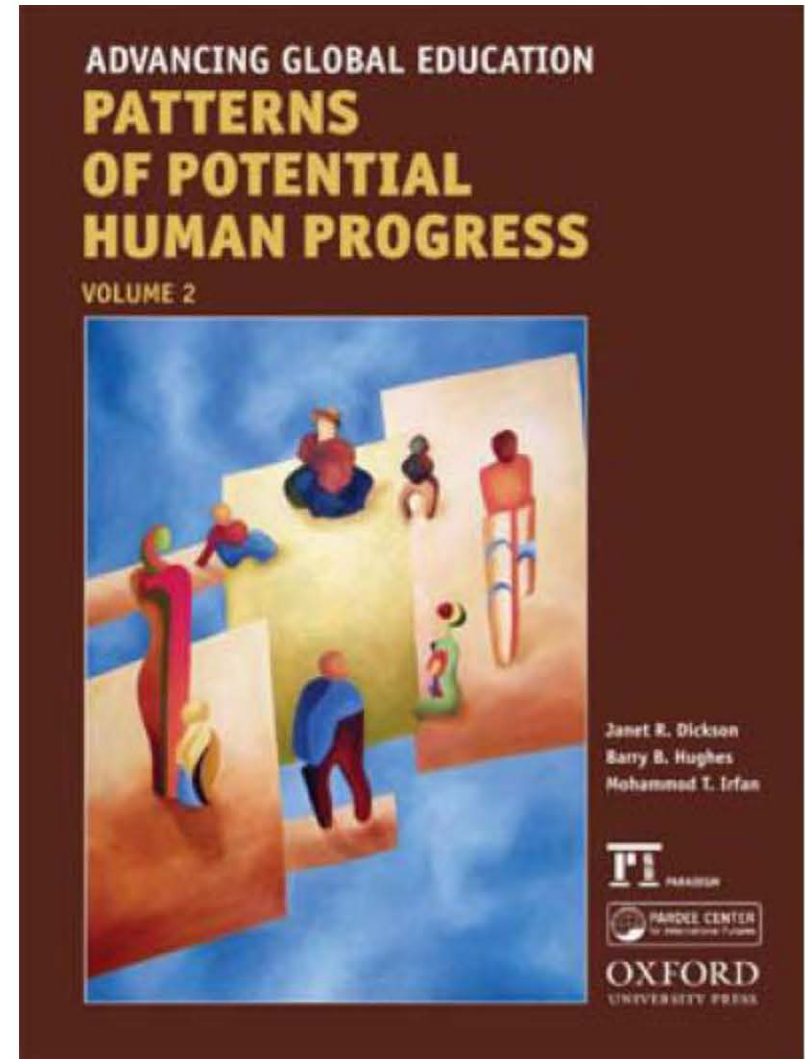
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## 3. Flagship Series: *Patterns of Potential Human Progress*

- ◆ *Reducing Global Poverty (released 2008)*
- ◆ *Advancing Global Education (released 2009)*
- ◆ *Improving Global Health (forthcoming 2010)*
- ◆ *Building Global Infrastructure (forthcoming 2011)*
- ◆ *Strengthening Global Governance (forthcoming 2012)*

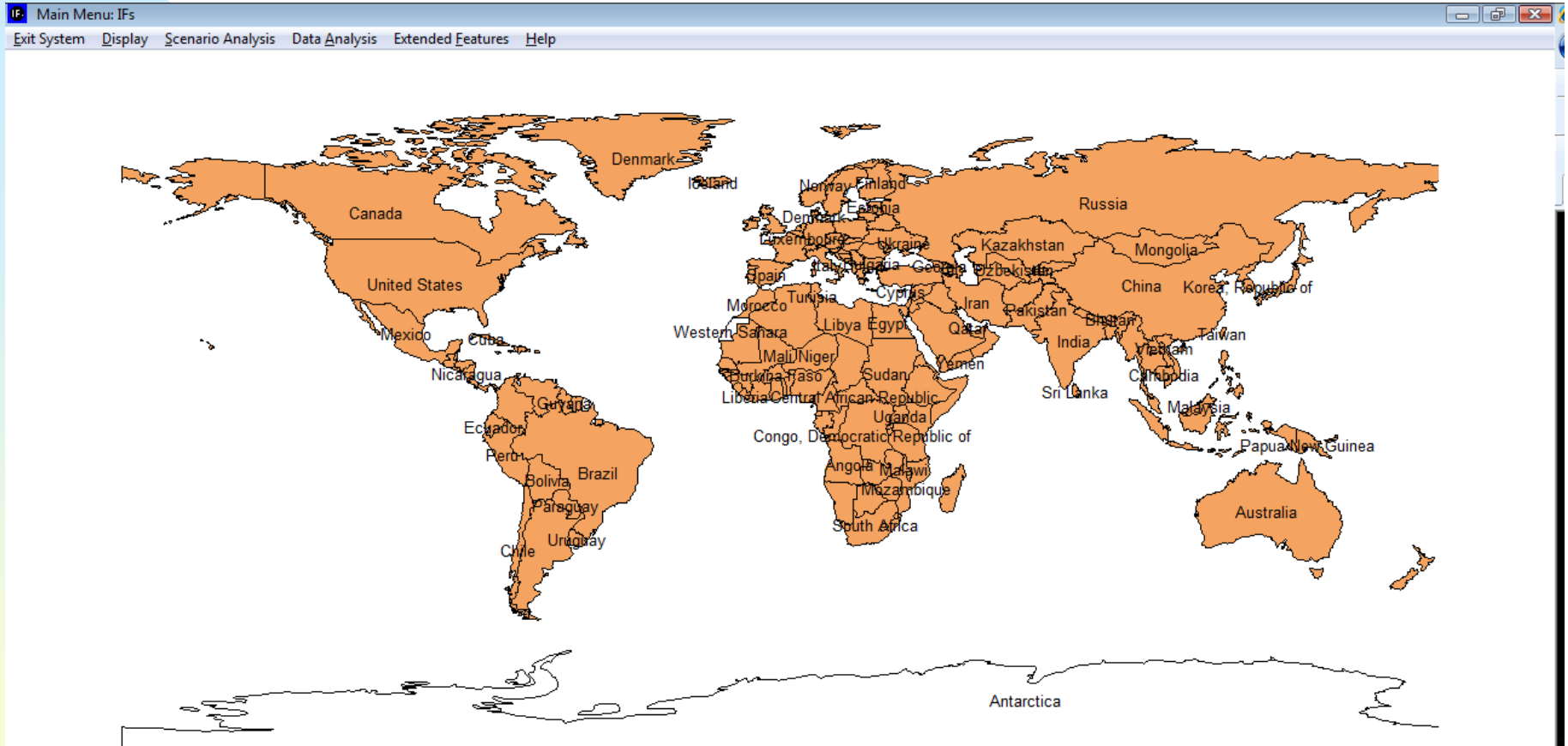


# International Futures (IFs): The PPHP volumes



# What we do with the IFs system:

(1) Data analysis, (2) Forecasting (display), (3) Scenario analysis



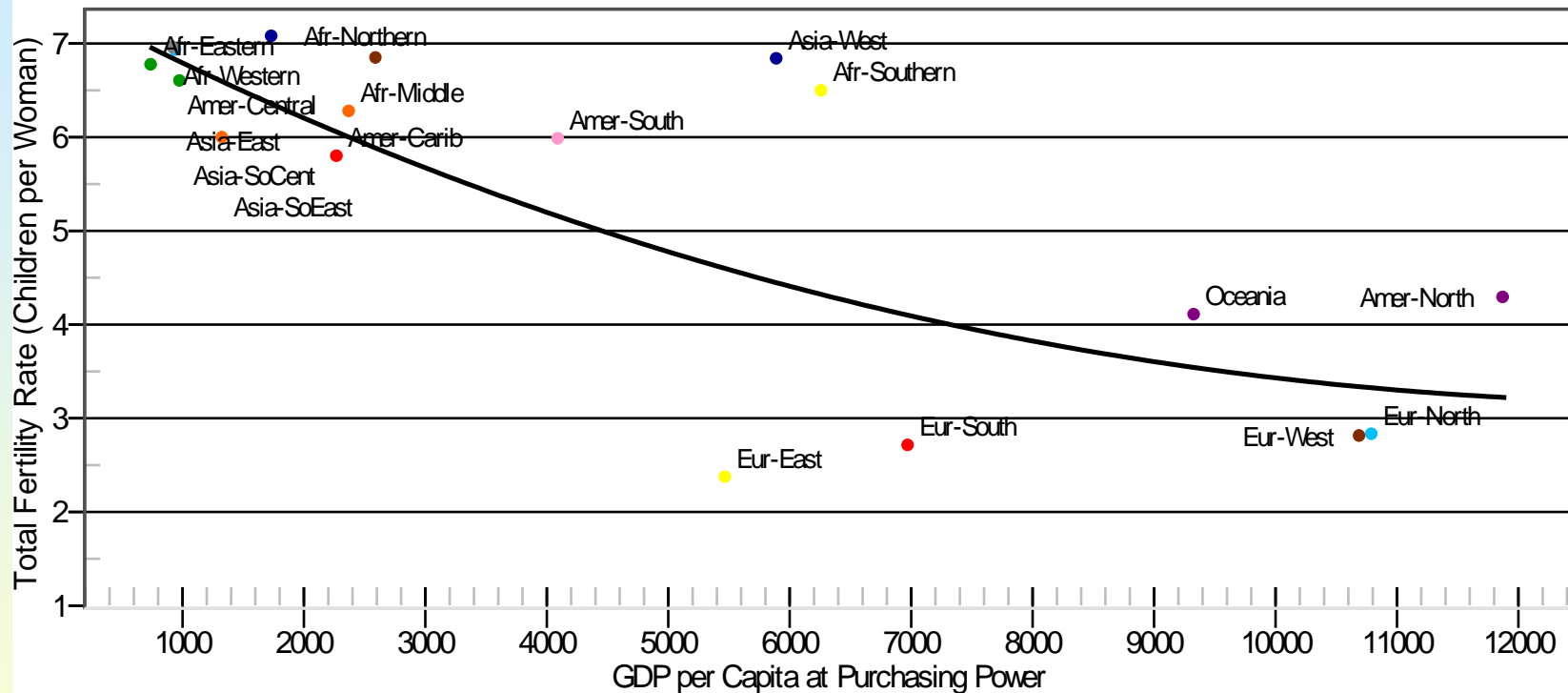
If you wish primarily to explore possible futures of a particular country, click on that country (right-click for features that help you control the map, including zooming).

To access the full functionality of IFs, including creating multi-country displays in specific issue areas, building new scenarios, and analyzing historic data, use the menu options.

Remember that you can select the Help option or touch the F1 key at any time.

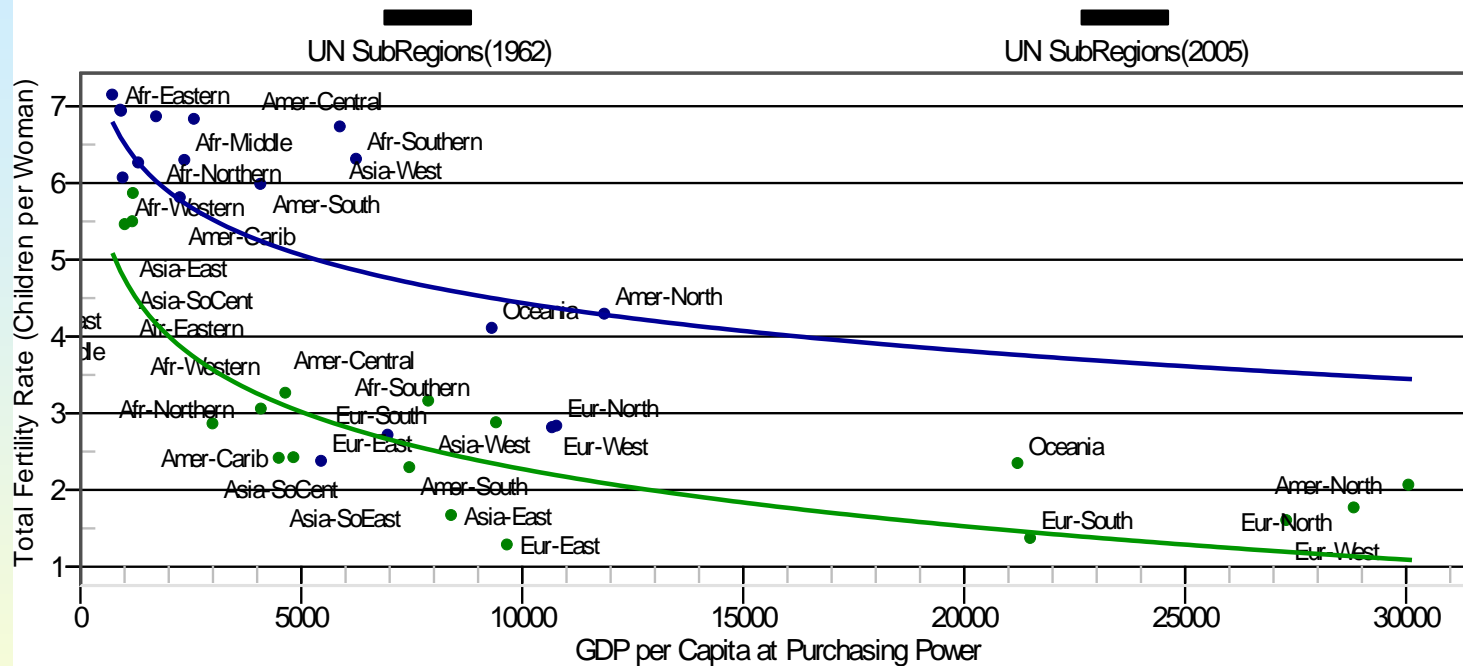
# The IFs system: Data analysis

## Fertility relative to income in 1962 by region



# The IFs System: Data Analysis

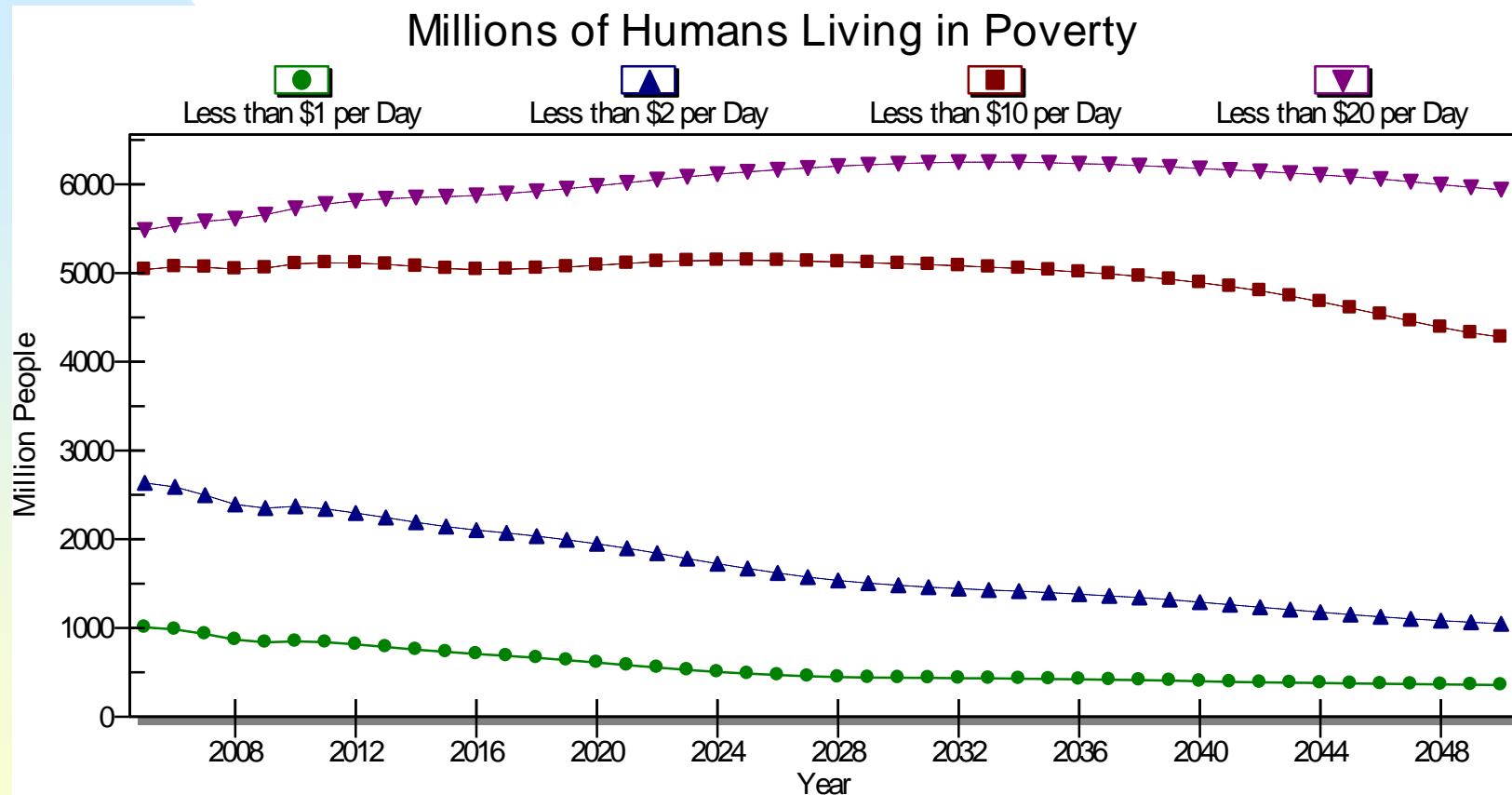
## Fertility relative to income in 1962 by region





# The IFs system: Forecasting poverty

## Let's look beyond the MDGs — Multiple levels to 2050



# Pop Quiz: What can we do about such poverty?

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1. Reduce fertility
2. Increase female labor
3. Increase savings/investment
4. Spend more on education
5. Spend more on health
6. Improve governmental effectiveness
7. Reduce corruption
8. High Economic Freedom
9. Spend more on infrastructure
10. Develop renewable energy
11. Spend more on R&D
12. Reduce trade protectionism
13. Increase rich to poor transfers

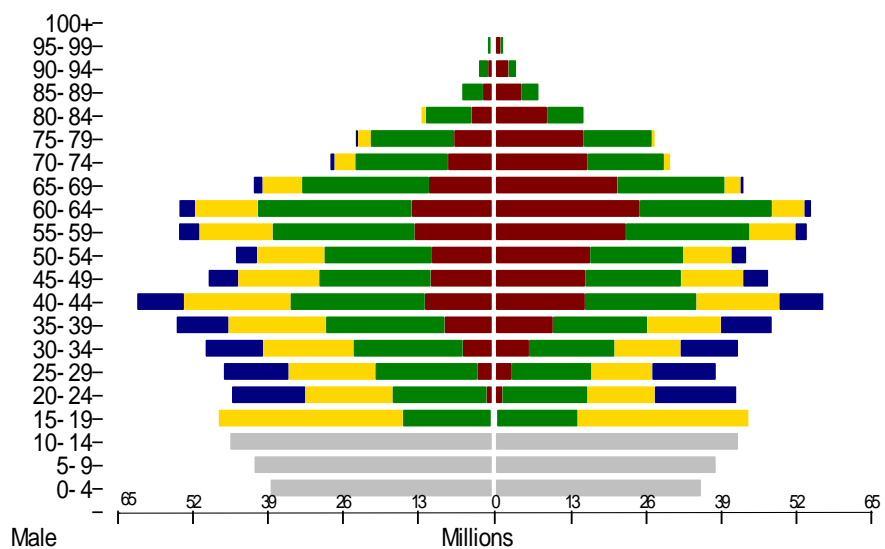


# The IFs system: Forecasting education

## China and Europe in 2030 —well-educated — and stable?

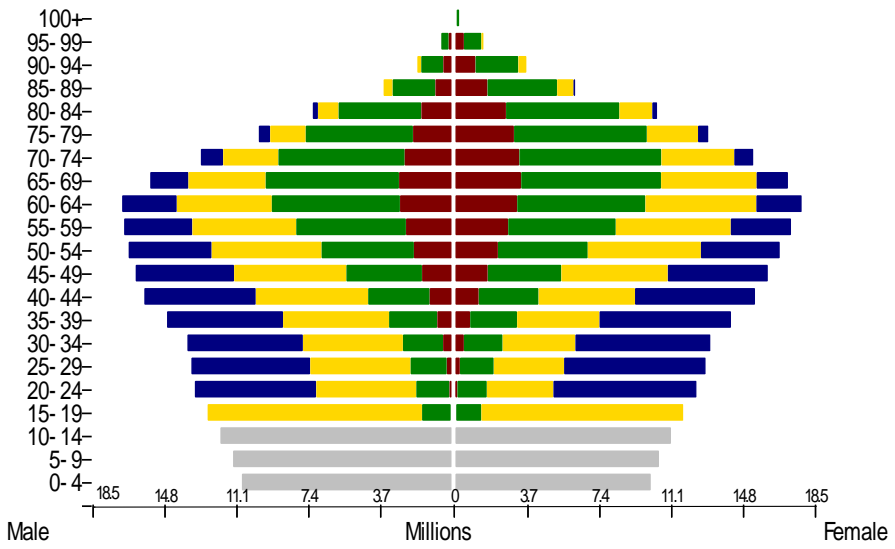
Human Capital Distribution for China in Year 2030 [Base Case]

- Children
- No education or incomplete primary education
- Completed primary education only
- Completed through secondary education
- Completed through tertiary education



Human Capital Distribution for EU27 in Year 2030 [Base Case]

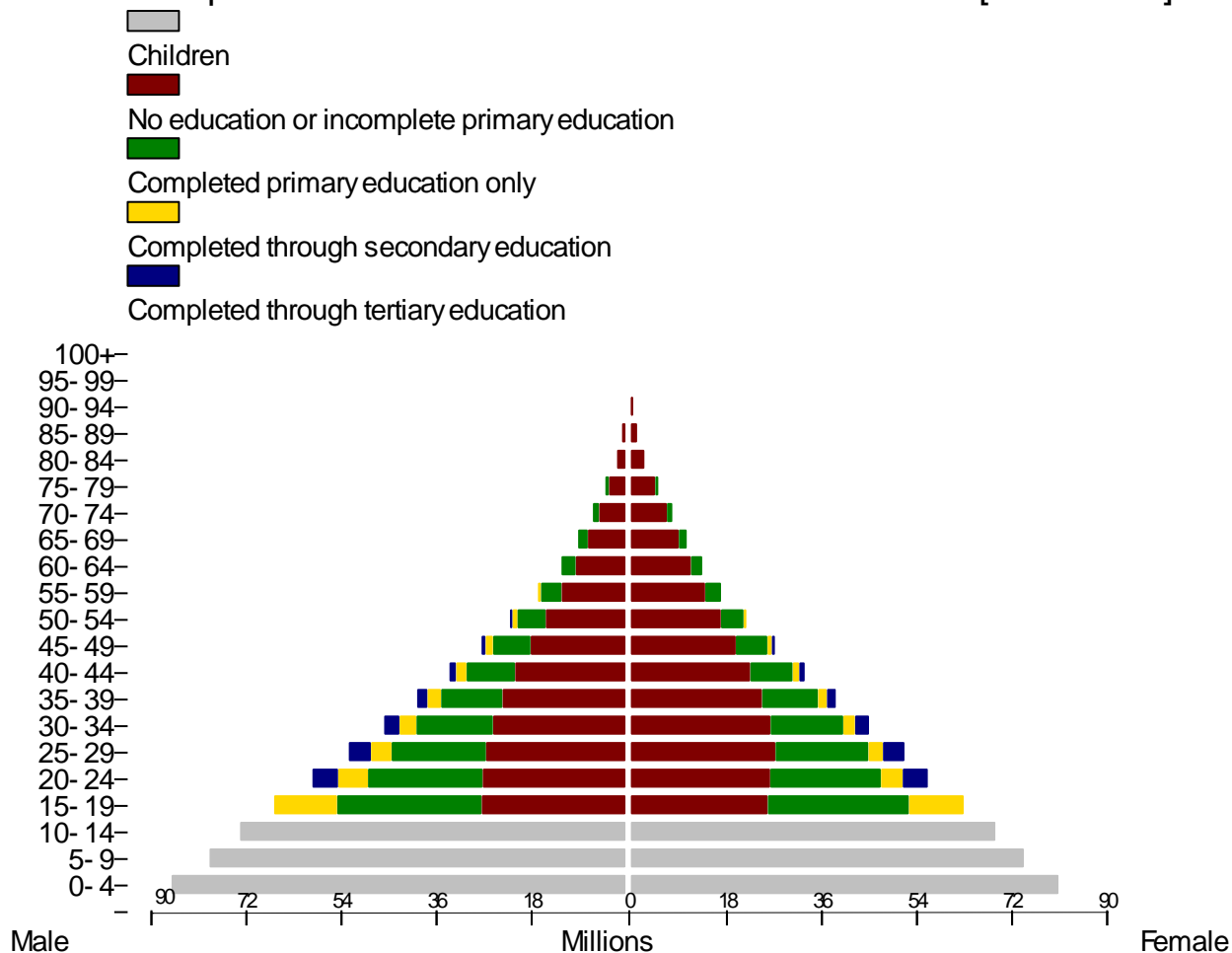
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# The IFs system: Forecasting education

## Sub-Saharan Africa in 2030 — still struggling

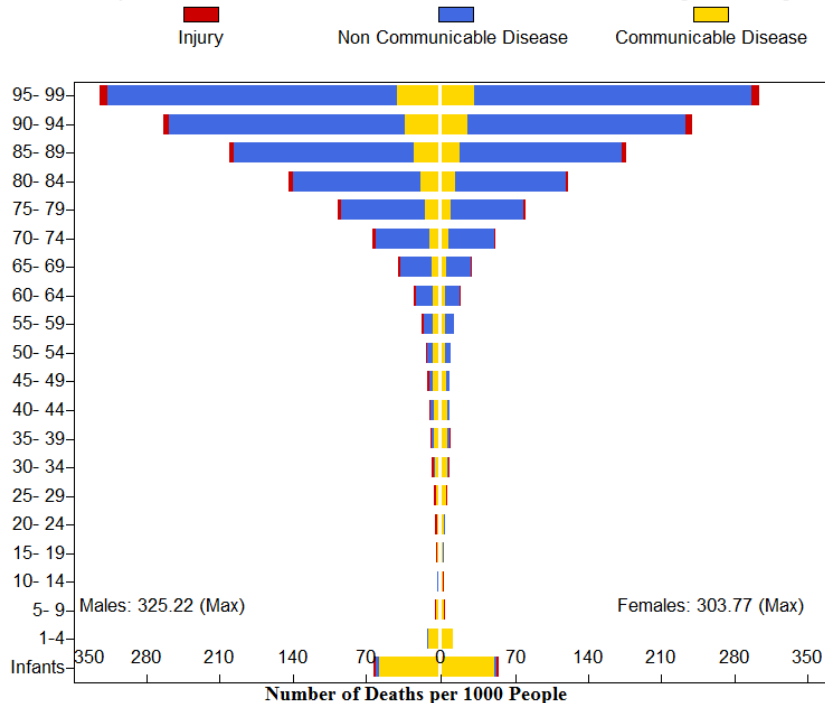
Human Capital Distribution for Afr-SubSahar in Year 2030 [Base Case]



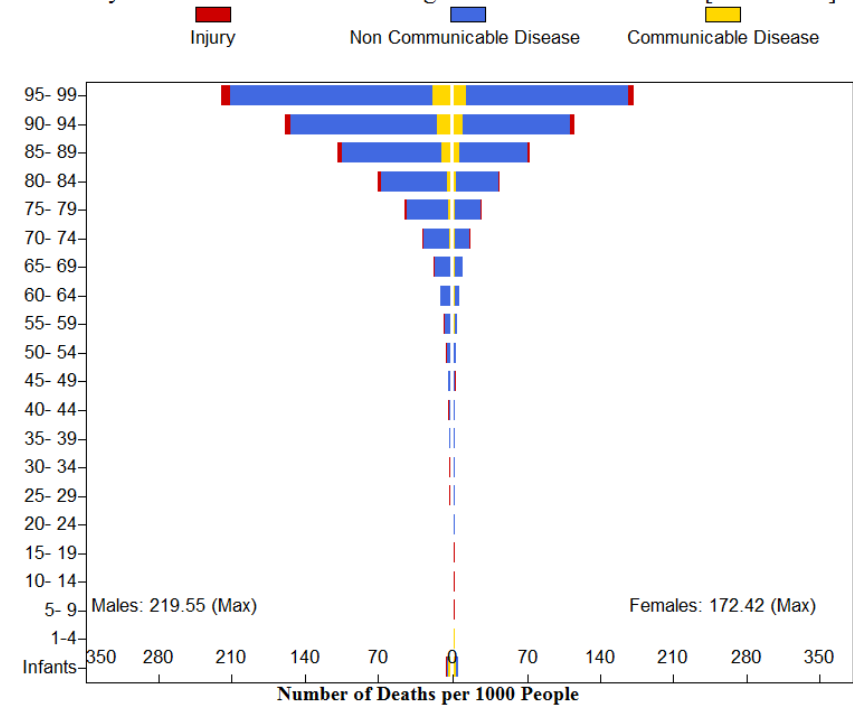
# The IFs system: Forecasting health

## Communicable and noncommunicable disease burdens in 2020

Mortality Distribution for WHO1 Sub-Saharan Africa in Year 2020 [Base Case]



Mortality Distribution for WHO7 High Income in Year 2020 [Base Case]

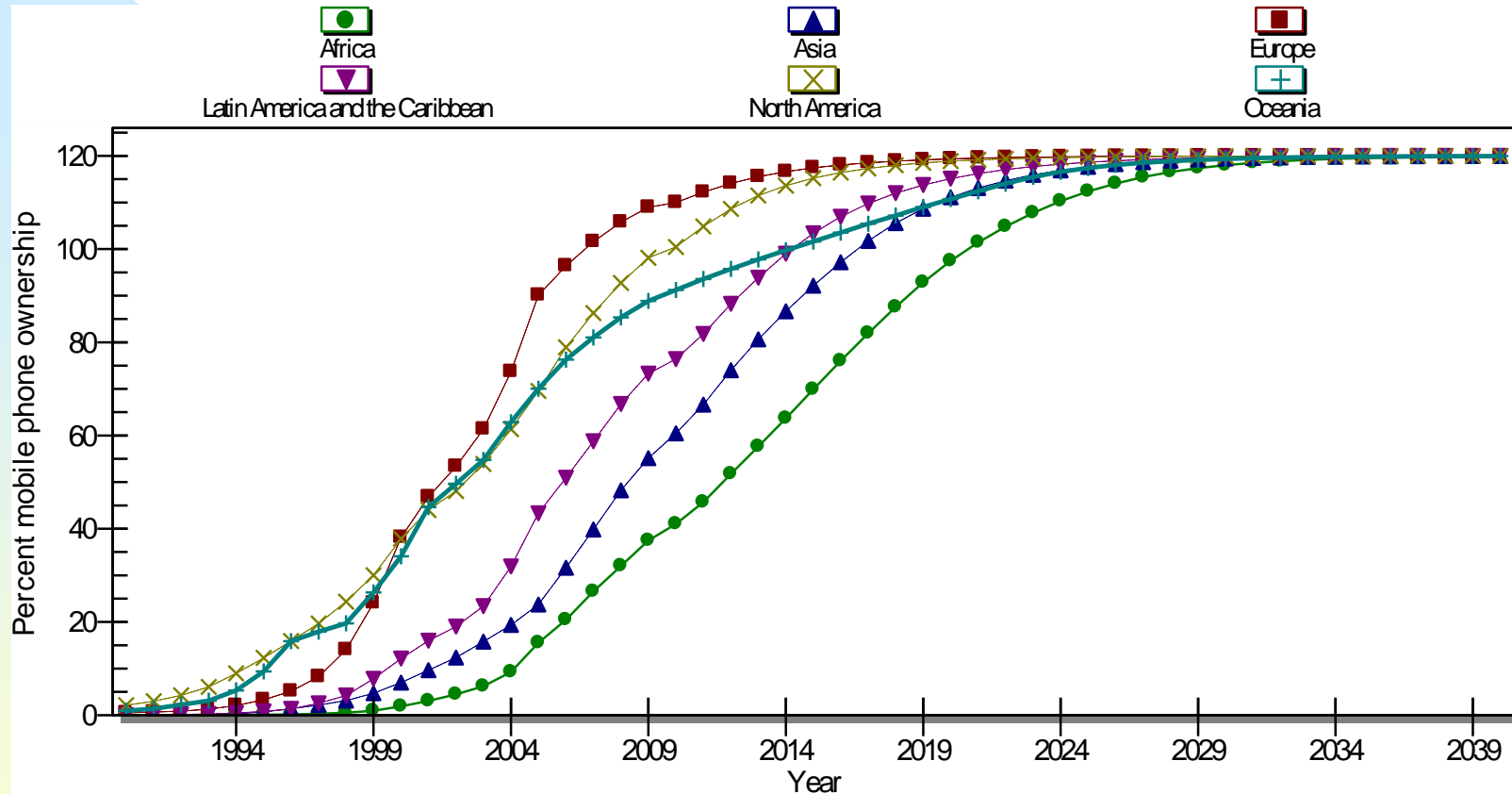


The difference between life expectancy of 60 years and 82 years.



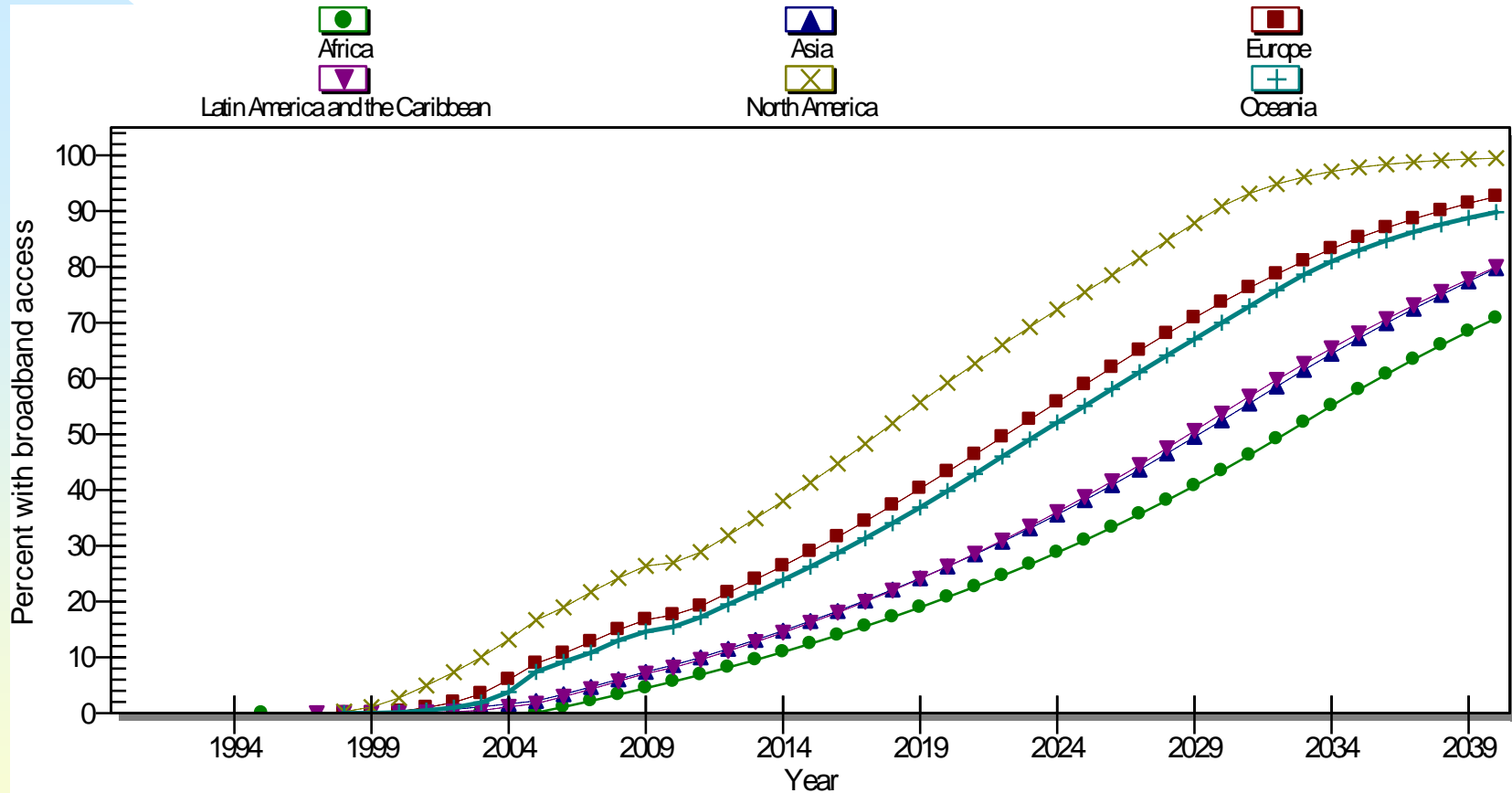
# The IFs system: Forecasting infrastructure

## The ICT mobile revolution underway



# The IFs system: Forecasting infrastructure

## The ICT broadband revolution taking off



"The future is always present, as a promise, a lure, and a temptation."

Karl Popper



# The IFs system: Scenario analysis

## Looking for leverage on extreme poverty: no silver bullet

### Millions living in extreme poverty: sub-Saharan Africa

	2015	2050
Base Case	280	260
1. Reduce fertility	273	170
2. Increase female labor	280	258
3. Increase savings/investment	293	241
4. Spend more on education	279	232
5. Spend more on health	279	245
6. Improve governmental effectiveness	278	232
7. Reduce corruption	279	237
8. High Economic Freedom	279	243
9. Spend more on infrastructure	279	244
10. Develop renewable energy	280	254
11. Spend more on R&D	279	256
12. Reduce trade protectionism	280	264
13. Increase rich to poor transfers	265	180
All Domestic Combined	270	57





# The IFs system: Forecasting instability/conflict

## Bringing this back to more traditional risk analysis

IFs Performance and Risk Analysis - Higher Rank means greater risk

Continue Using Countries/Regions Using Absolute Evaluation

Countries or Regions

Congo, Democratic Repub

Select Year

2020

Click on variable name to get options for additional information.

Select File:

0 - Working File, based on IFSBASE.RUN

Income per Capita: 0.36

	Value	Alert Level	Goal Level	Min Level	Max Level	Rank	Weighting
<b>Governance Character</b>							
Corruption	2.13	3	7	0	10	8	
Effectiveness	1.18	1.5	2.5	0	5	7	
Democracy	6.34	7	14	0	20	35	
Freedom	4.67	5	11	2	14	27	
<b>Performance: Security</b>							
Instability	0.69	0.1	0.05	0	1	2	
Internal war	0.7	0.1	0.05	0	1	17	
<b>Performance: Economy</b>							
Poverty Level	0.52	0.2	0.03	0	1	10	
Inequality	0.47	0.45	0.35	0	1	40	
Resource Export Dependence	51.36	20	5	0	1000	12	
Rate of per capita Growth	1.72	1.5	3	-100	100	38	
<b>Performance: Health</b>							
Infant Mortality	89	50	15	0	1000	4	
Life Expectancy	51.36	60	70	0	125	3	
Malnutrition	25.27	10	3	0	100	17	
HIV Prevalence Rate	1.16	1.5	0.2	0	100	26	
<b>Performance: Education</b>							
Primary Net Enrollment	61.26	60	80	0	100	12	
Adult Education Years	3.66	2	5	0	100	26	
<b>Risk Driver: Population</b>							
Youth Bulge	51.24	47.5	35	0	100	4	
Elderly Bulge	2.55	16	10	0	100	176	
Urbanization Rate	3.28	5	3	-100	100	24	
<b>Risk Driver: Environment</b>							
Water use/Renewable	0	0.4	0.2	0	1	175	
Climate Change	-2.12	-5	5	-100	100	64	
<b>Risk Driver: International</b>							
Power Transition		0	0				
<b>Summary Measure</b>	<b>34.62</b>						

# In conclusion: Using IFs to support long-range analysis of human development (and risk)

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## Some of the things we do:

- ◆ Integrate
  - Population, economy, food, energy, education, health, environment, socio-political change
- ◆ Drill down
  - Over 1700 data series and hundreds of forecast variables
  - 183 countries (grouped as desired)
- ◆ Scenario analysis
  - “Unfolding of the Great Recession”
  - “Sustainability First”

IFs mission: Create and make widely available the best possible quantitatively-based system for analyzing long-term, interacting global issues concerning sustainable human development [www.ifs.du.edu](http://www.ifs.du.edu)

“All models are wrong, but some are useful.” Unknown

