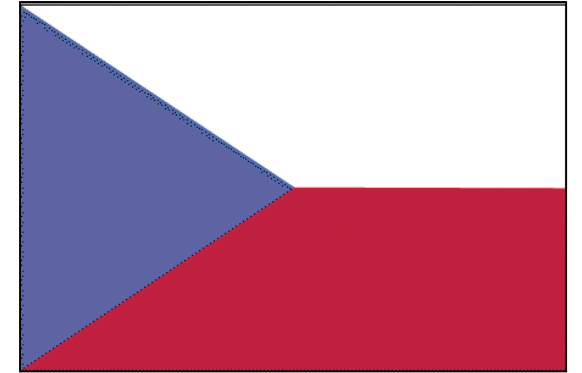


The Value of Universal Vaccination

David E. Bloom
Harvard School of Public Health

CEE Tour: Vaccines Mean Health, Health Means Wealth

Prague, Czech Republic
February 20th, 2007



What we will cover today.....

- The links between health and wealth
- The value of vaccines
- The rate of return from immunization programs
- How the new perspective on vaccination applies to the Czech Republic

Main take-home message



**Immunization programs
can be highly cost beneficial
for promoting both the health
and wealth of nations**

The state of global public health



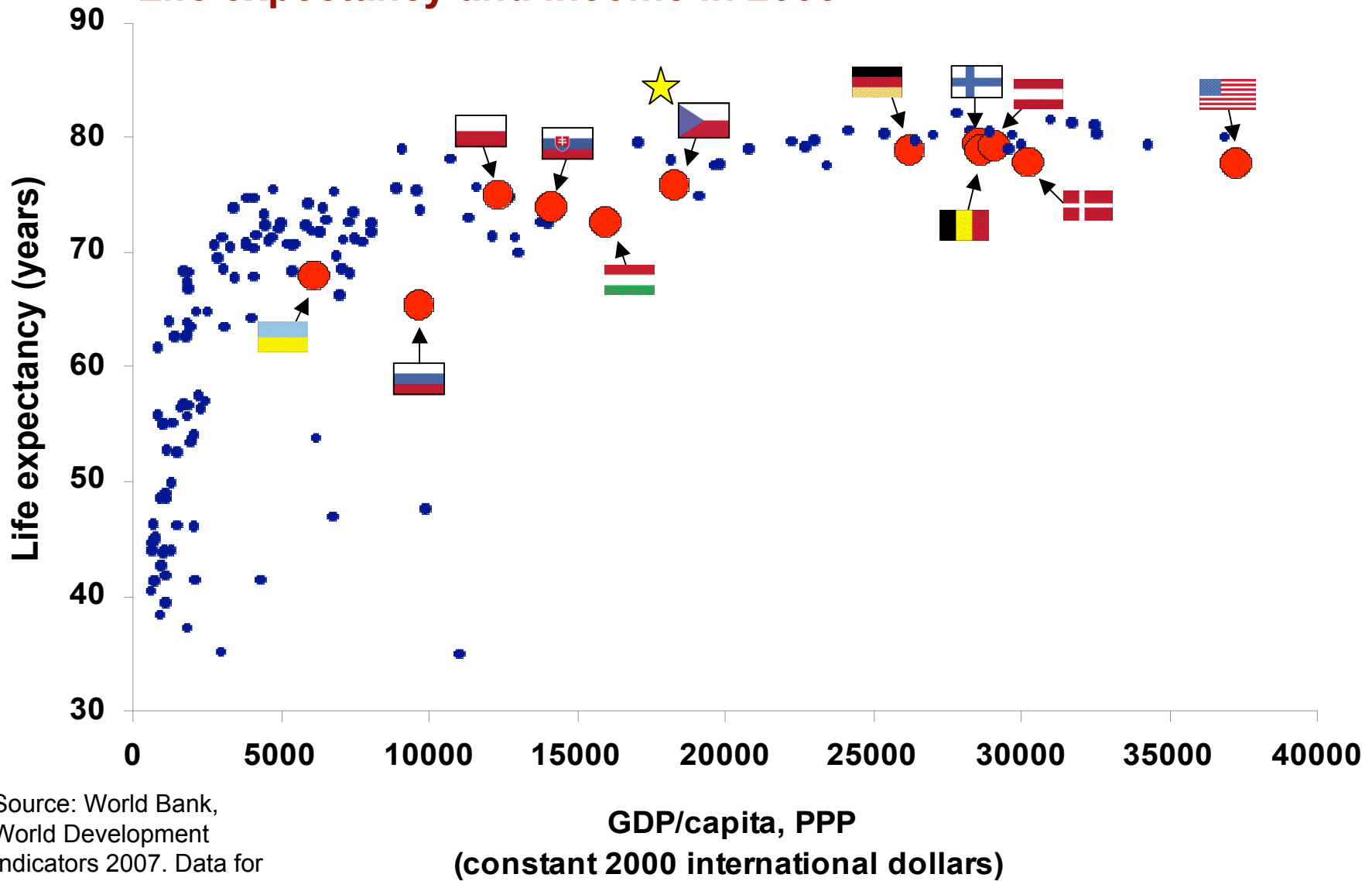
Why spend money on health?

- The classic justifications:
 - Moral, ethical, humanitarian
 - Basic human right
 - Vital social goal
 - Health is not a pure private good

Why spend money on health?

- A new argument:
 - Moral, ethical, humanitarian
 - Basic human right
 - Vital social goal
 - Health is not a pure private good
 - **Public health is crucial to building strong economies**

Life expectancy and income in 2005



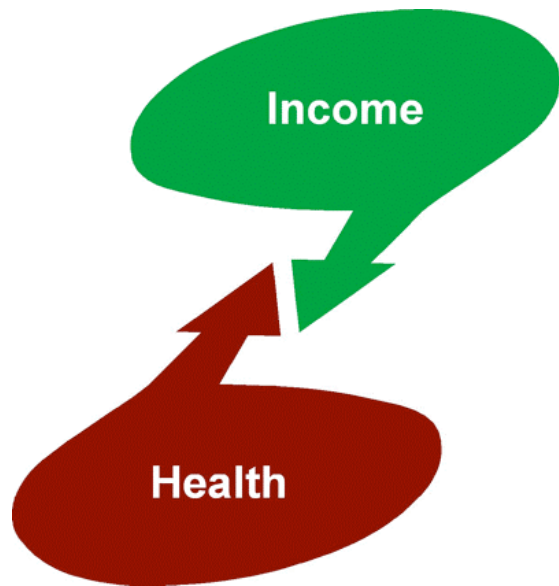
Source: World Bank, World Development Indicators 2007. Data for 2005.

Wealth to health



- The traditional story
 - Better nutrition
 - Better access to clean water
 - Better sanitation
 - More access to better health care

From health to wealth



- The rest of the story
 - Improved productivity
 - Greater returns from education
 - Increased investment rates
 - A demographic dividend

Turbo-charging the economy



A 10 year gain in life expectancy translates into nearly 1 additional percentage point of annual growth of income per capita

Health to wealth: so what?

1. A new paradigm for the economic evaluation of vaccinations
2. Two data analyses
 - Rate of return to investment: GAVI
 - Rate of return to investment: the Philippines
3. The 'birth dearth' and population aging in the Czech Republic

Valuing vaccines – old paradigm

- Costs
 - Direct costs of vaccination
 - Indirect costs of vaccination
- Outcomes/Benefits
 - Averted illnesses and death among those immunized (i.e. DALYs)
 - Averted medical care and time costs

But what about the following?

- Healthy children...
 - ✓ Fit and educated
 - ✓ More productive workers
 - ✓ Pain and suffering avoided
- Parents and grandparents...
 - ✓ Healthier and better able to work
 - ✓ Anxiety avoided
- Society...
 - ✓ Herd immunity; decreased antibiotic resistance
 - ✓ Demographic dividend

A broader perspective

■ Children

- Cognitive development
- Educational attainment
- Physical and neurological development
- Future labor productivity
- Averted downstream infections
- Avoided pain and suffering

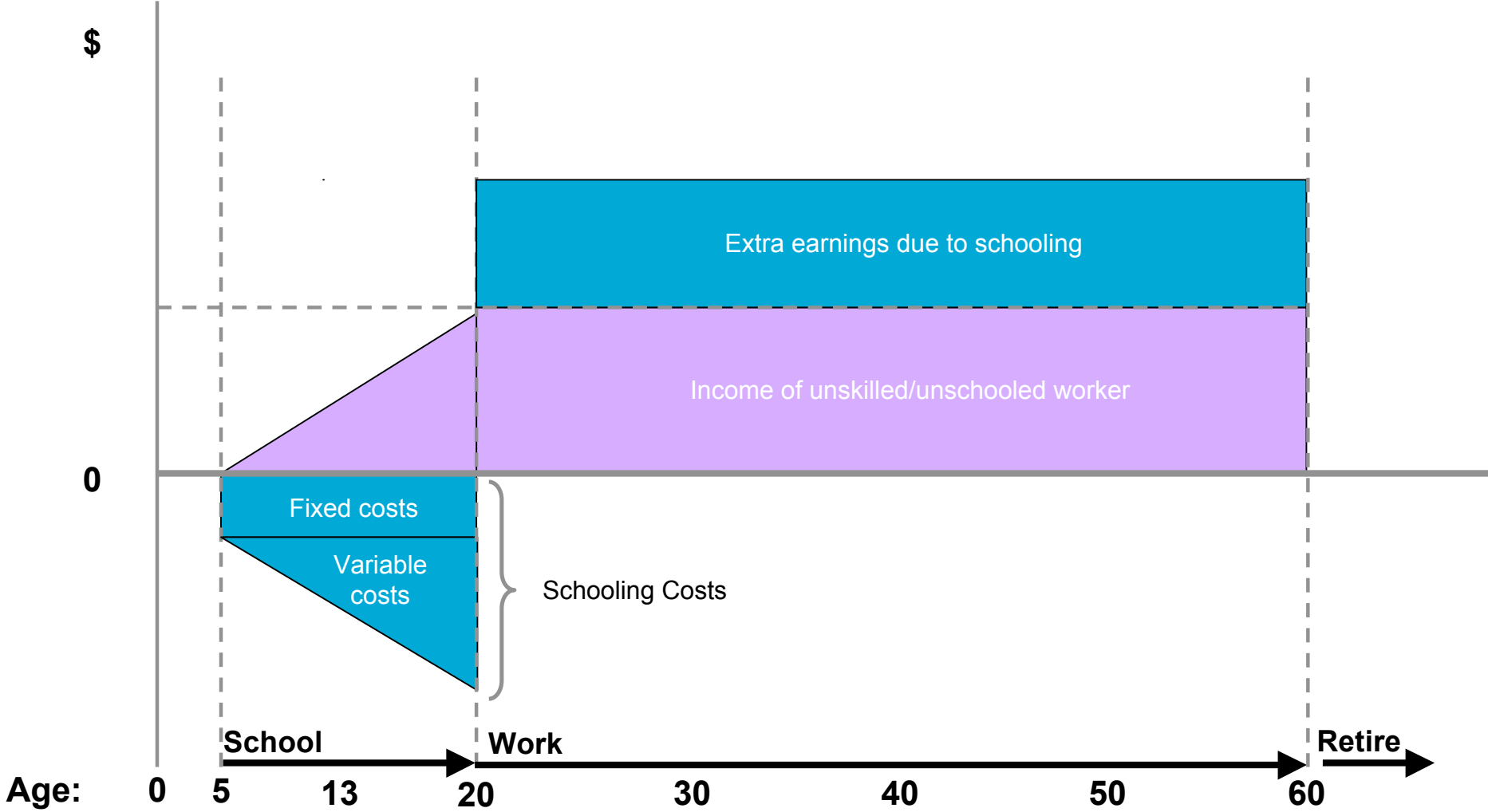
■ Parents

- Adult health and productivity
- Avoided anxiety

■ Society

- Decrease in antibiotic resistance
- Fertility control
- Savings rates
- Foreign direct investment
- Reducing inequality

Lifetime earnings trajectory: with schooling



Nobel Prizes for human capital



Gary Becker

“Expenditures on education, training, medical care... produce human, not physical or financial, capital...you cannot separate a person from his or her knowledge, skills, health, or values the way it is possible to move financial and physical assets while the owner stays put”

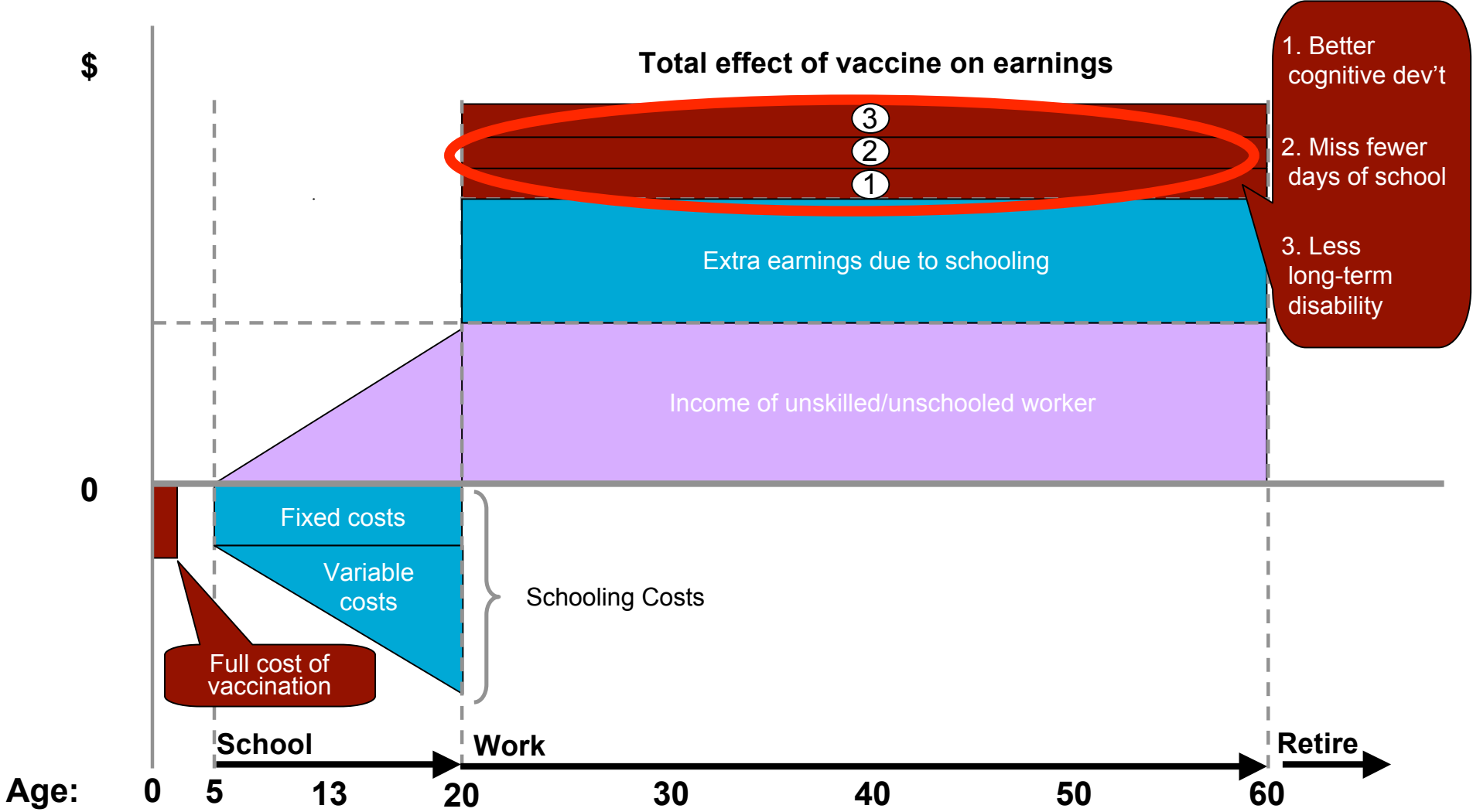


TW Schultz

“Truly, the most distinctive feature of our economic system is the growth in human capital.

“Without it, there would be only hard, manual work and poverty except for those who have income from property.”

Lifetime earnings trajectory: with childhood vaccination



GAVI: childhood immunization

- The proposal
 - Traditional vaccination package (polio, diphtheria, pertussis, tetanus, and measles)
 - Underused vaccines (*Haemophilus influenzae* type b (Hib), hepatitis B, and yellow fever)
 - New vaccines (pneumococcal disease, rotavirus, and meningococcus)
- The cost
 - \$US13 billion for 75 low-income countries during 2005-2020

GAVI: The power of productivity

A drop of pure gold

“ A group of researchers attempts to estimate the economic benefits of vaccination.

Reuters
Oct 13th 2005
From *The Economist* print edition

12% in 2005

18% in 2020

Philippines: cognitive development

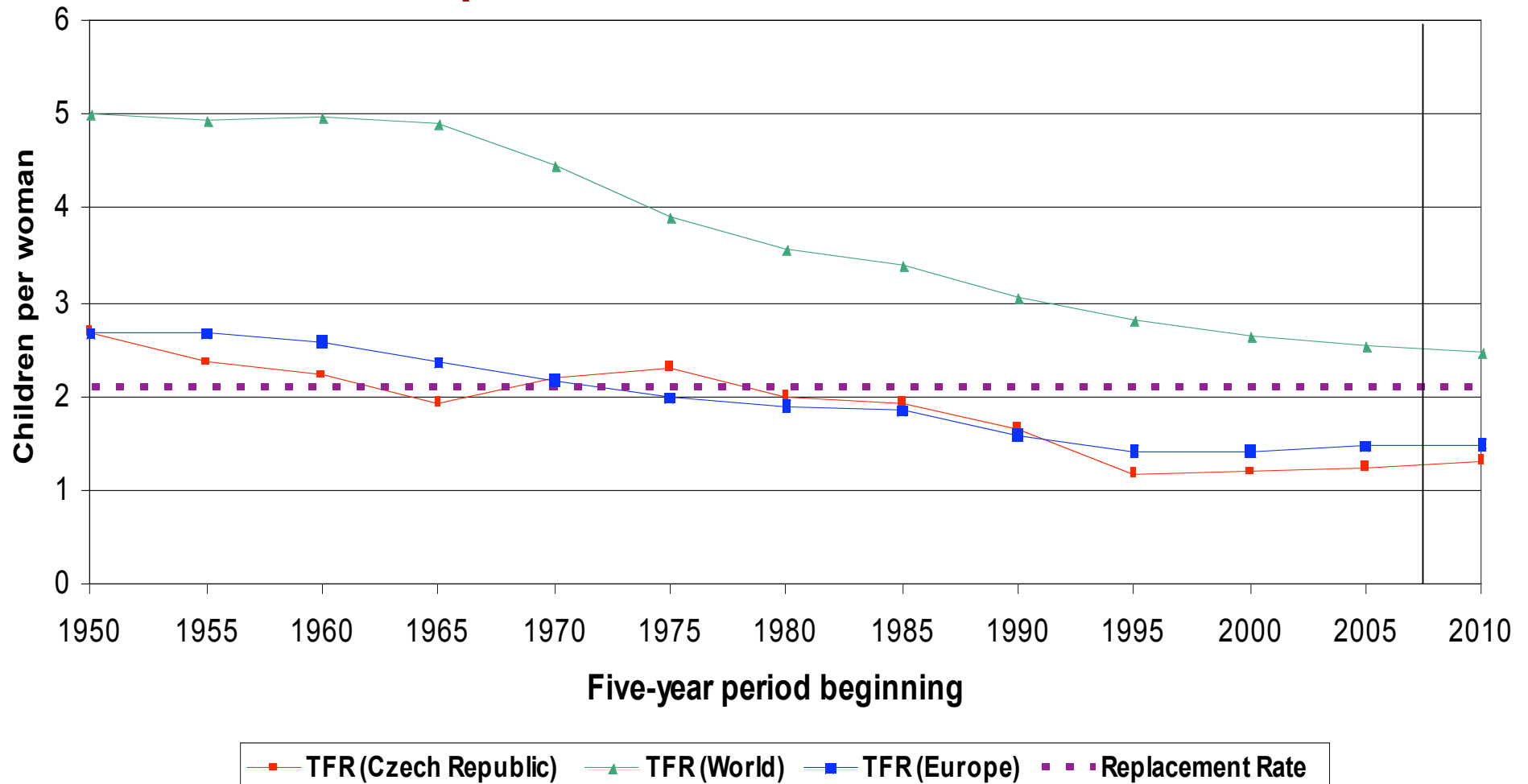


Cognitive development improvements generate an estimated rate of return to investment in a basic immunization program of 21%

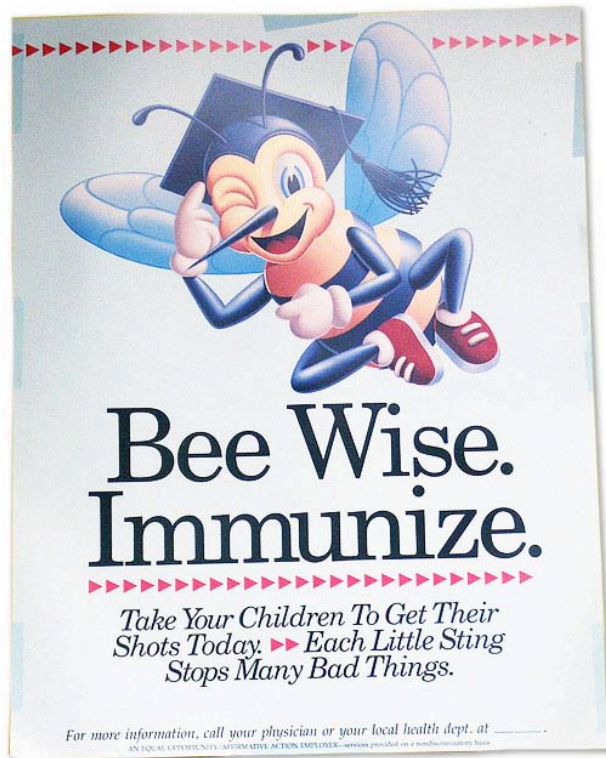
Vaccines – a first-class investment

- The value of vaccines
 - A handsome rate of return
 - Important for growth, poverty reduction, and reducing global income inequality
- Rates of return comparable with those from education
 - Primary: 19%
 - Secondary: 13%
 - Higher: 11%

Czech Republic and the 'birth dearth'



In conclusion...



- A good start...
 - A new paradigm
 - Impressive early applications
- ...but we need to know more
 - Include full range of benefits
 - Provide policymakers with robust and accurate analysis