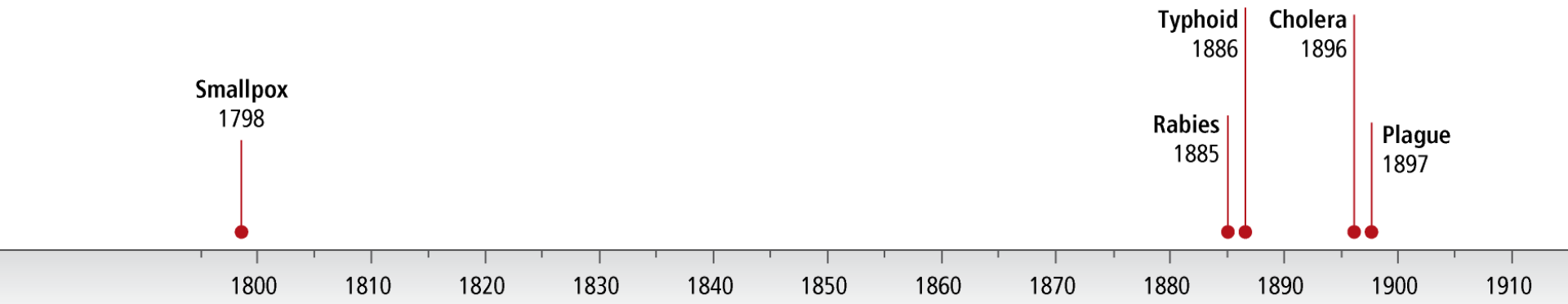
Harnessing the power of vaccines using the public and private sector: A 21st century model for international development

Dr. Seth Berkley, CEO GAVI Alliance

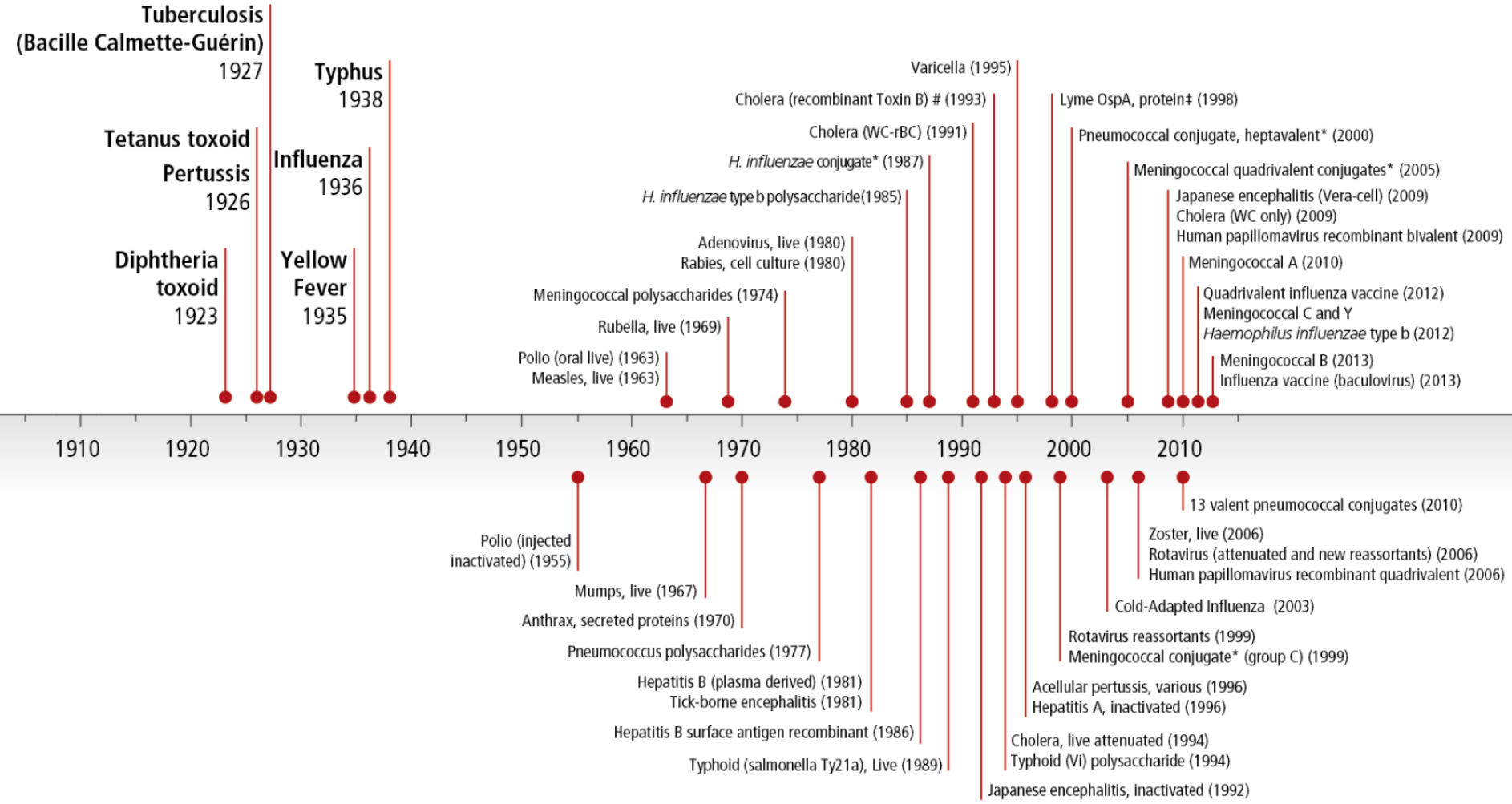
Wellcome Trust – Cambridge Centre for Global Health Research Inaugural Lecture

Cambridge, 2 May 2013

Vaccine development timeline: 1798-1910



Vaccine development timeline: 1910-



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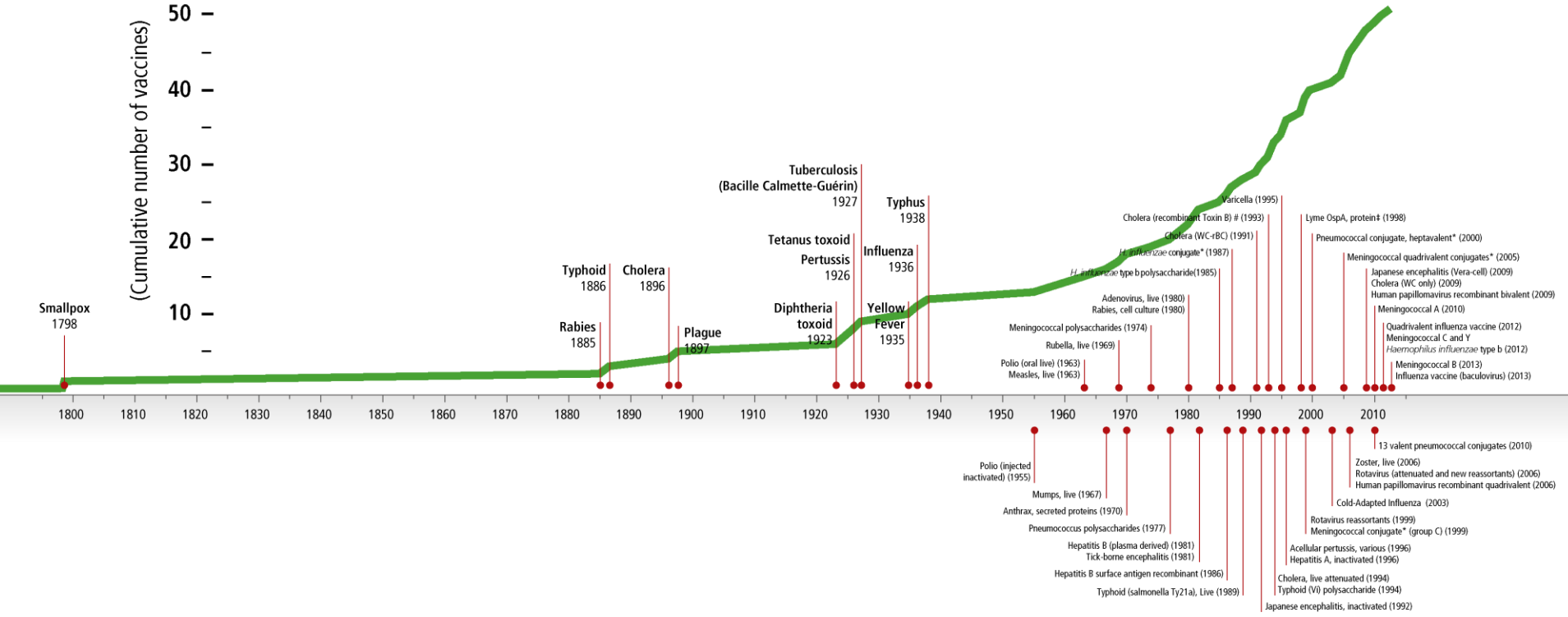
Cumulative number of vaccines developed



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Unprecedented results from vaccines: 1980-2010

	1980	2010	Change
Global population	*4,424,952*	*6,852,721*	*+54%*
Diphtheria cases:	97,511	4,187	**-95%**
Measles cases:	4,211,431	327,368	**-92%**
Pertussis cases:	1,982,355	156,675	**-92%**
Polio cases:	52,795	1,348	**-97%**
Tetanus cases:	114,251	4,925	**-95%**

Source: WHO Global and regional immunization profile; 2011

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GAVI mission and strategic goals 2011–2015

To save children's lives and protect people's health by increasing access to immunisation in poor countries

1 The vaccine goal
Accelerate the uptake and use of underused and new vaccines

2 The health systems goal
Contribute to strengthening the capacity of integrated health systems to deliver immunisation

3 The financing goal
Increase the predictability of global financing and improve the sustainability of national financing for immunisation

4 The market shaping goal
Shape vaccine markets to ensure adequate supply of appropriate, quality vaccines at low and sustainable prices

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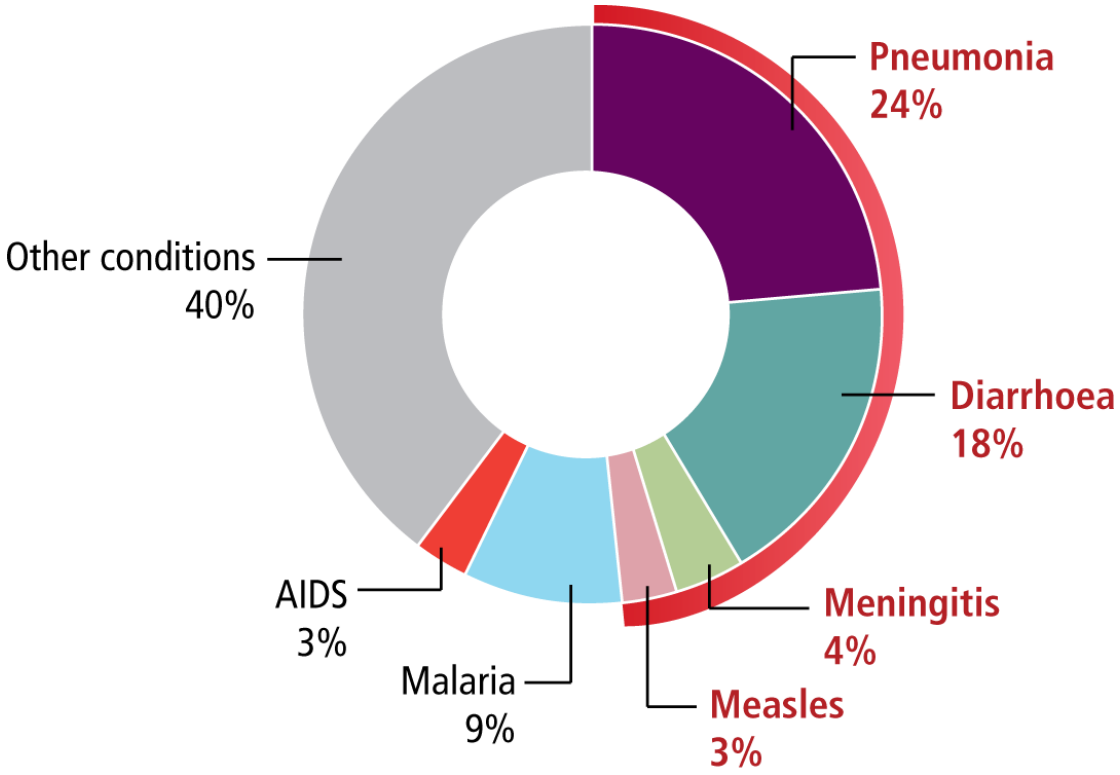
Infectious causes of child deaths 1–59 months GAVI-eligible countries – 2010 estimates



Source: CHERG, WHO and UNICEF 2012

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2013 Measles rubella

2013 HPV

2011 Meningitis A

2009 Pneumococcal

2008 Rotavirus

2007 Measles

2006 Pentavalent

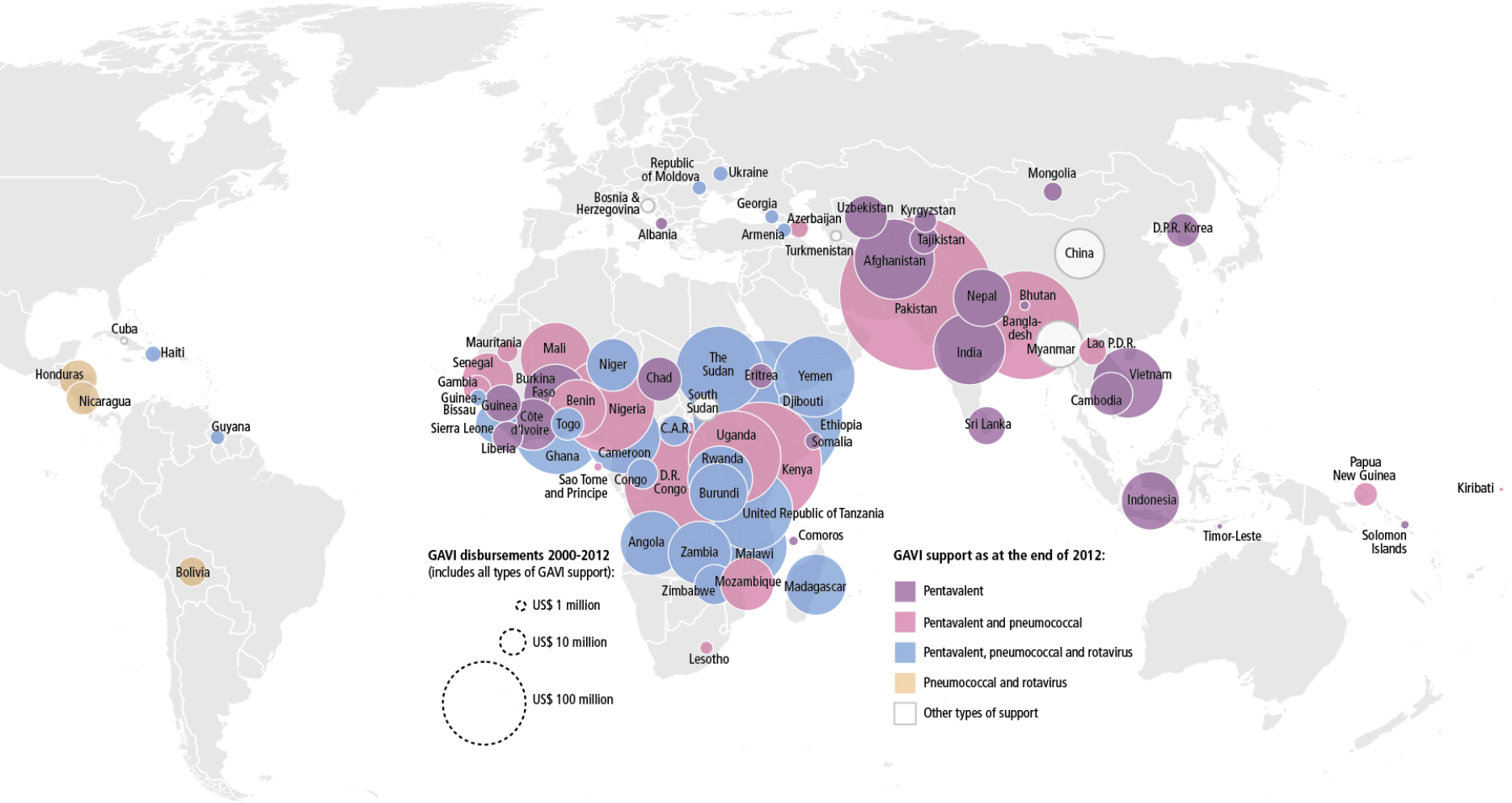
2002 Hib

2001 Yellow fever

2001 Hepatitis B

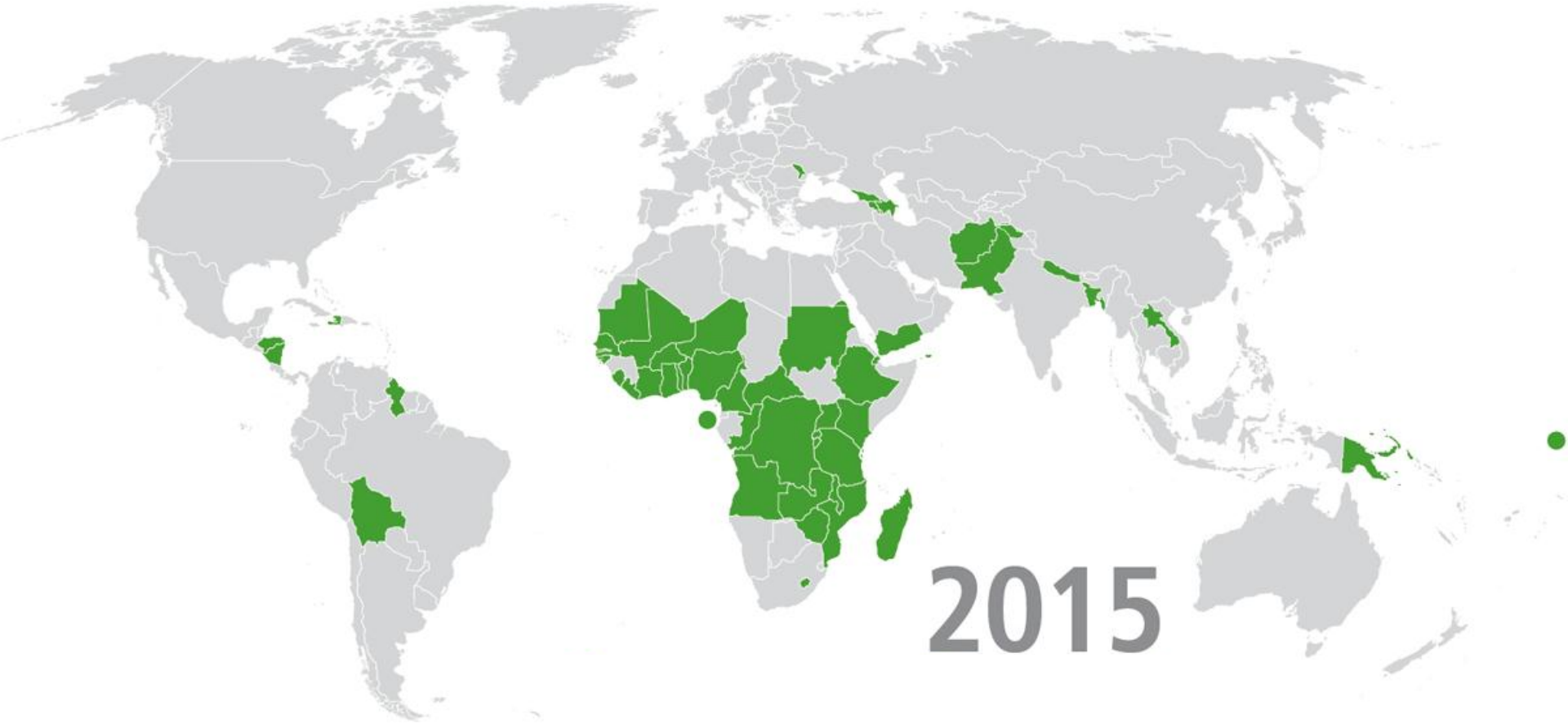
GAVI supports the world's poorest countries

Type and value of support, 2000–2012



Source: GAVI Alliance , 2012

GAVI support for pneumococcal vaccine



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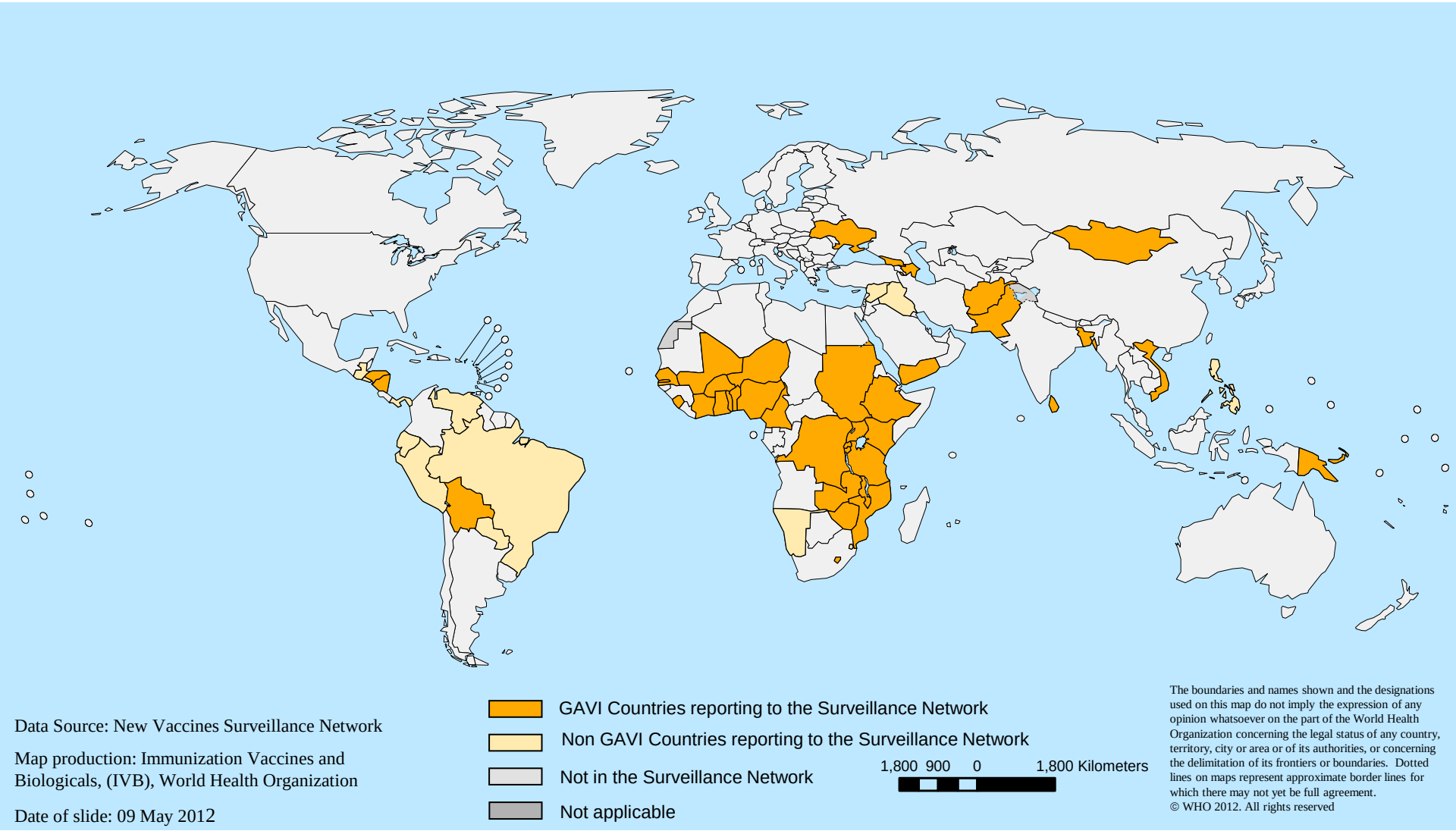
IB-VPD Surveillance Network



Data Source: New Vaccines Surveillance Network

Map production: Immunization Vaccines and Biologicals, (IVB), World Health Organization

Date of slide: 09 May 2012

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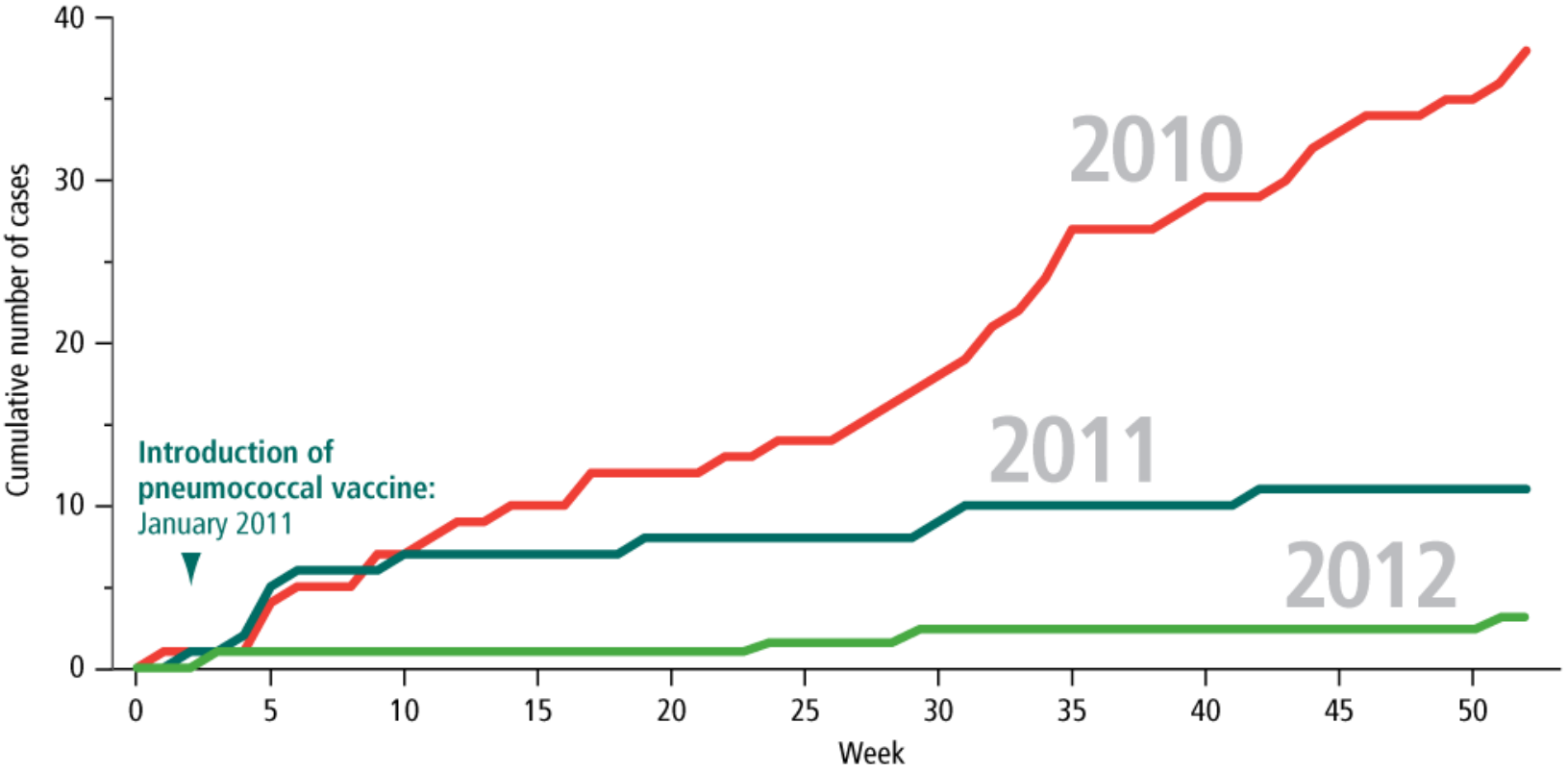
Early impact of pneumococcal vaccine in Kenya

Cumulative admissions of children under five for invasive pneumococcal disease, Kilifi District Hospital



Source: Pneumoccocal Conjugate Vaccine Impact Study Kilifi.
http://www.kemri-wellcome.org/pcvis-current%20disease%20surveillance

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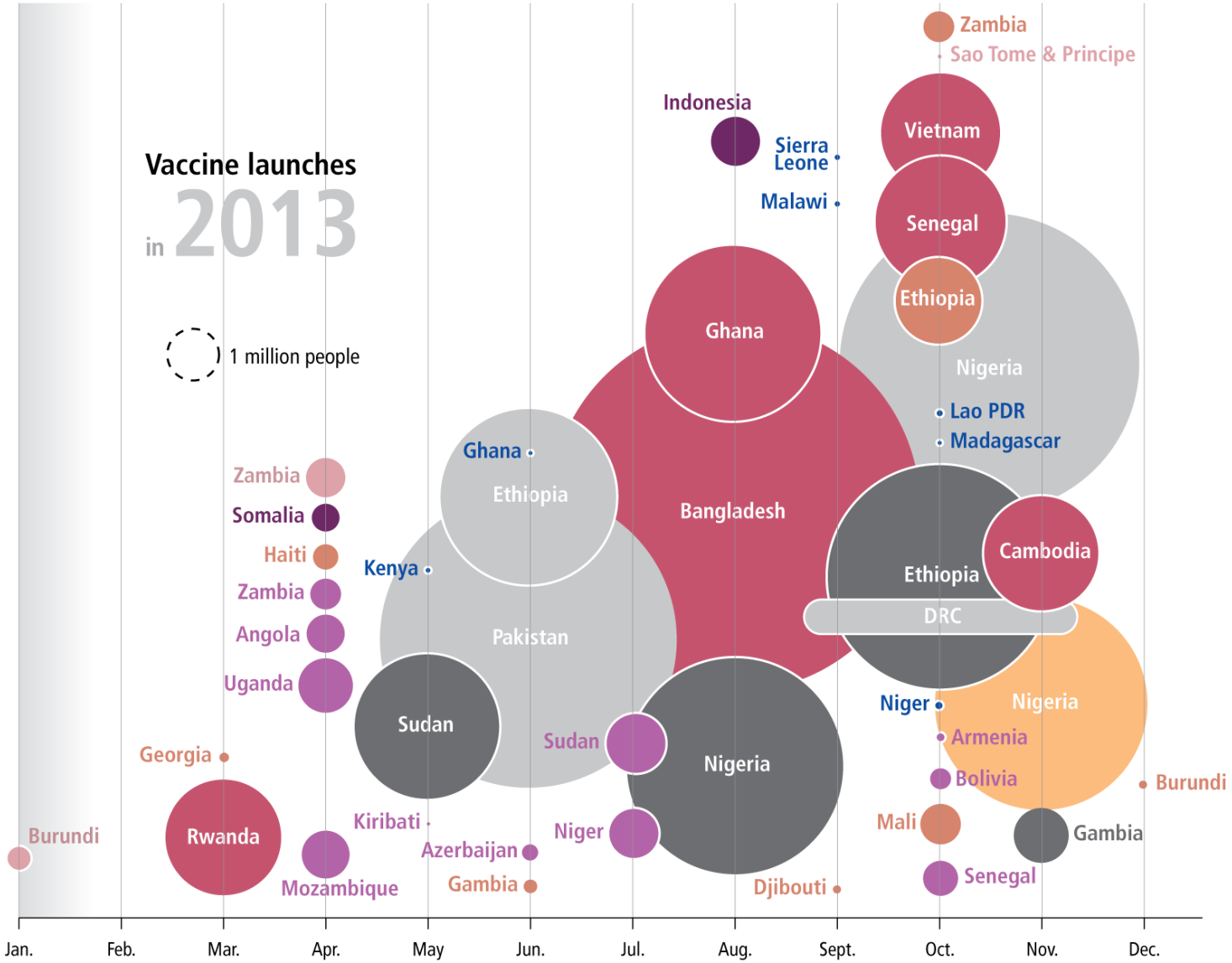

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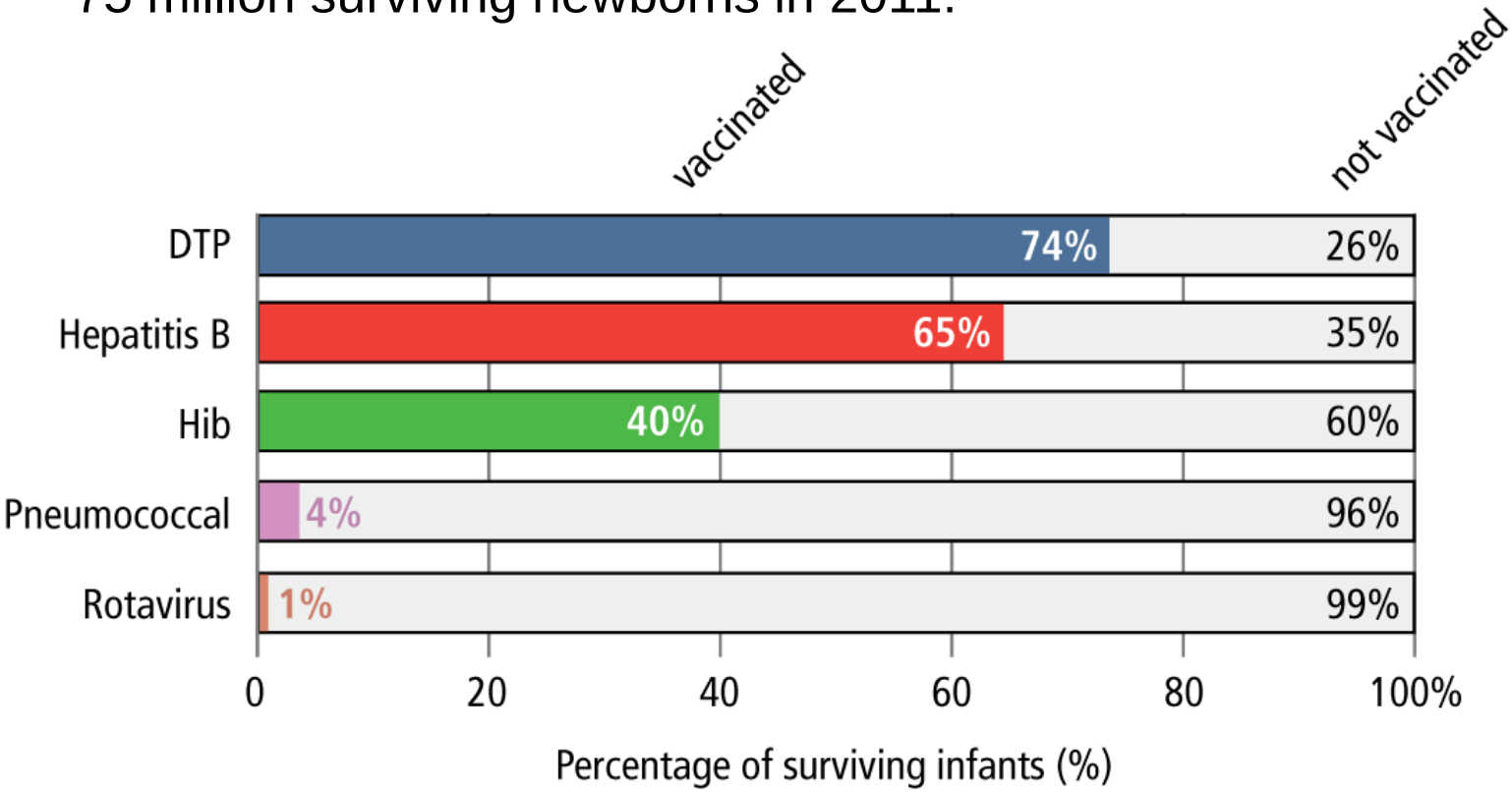
100,000,000
people

Taking stock: the immunisation gap (73 GAVI-supported countries)

75 million surviving newborns in 2011:

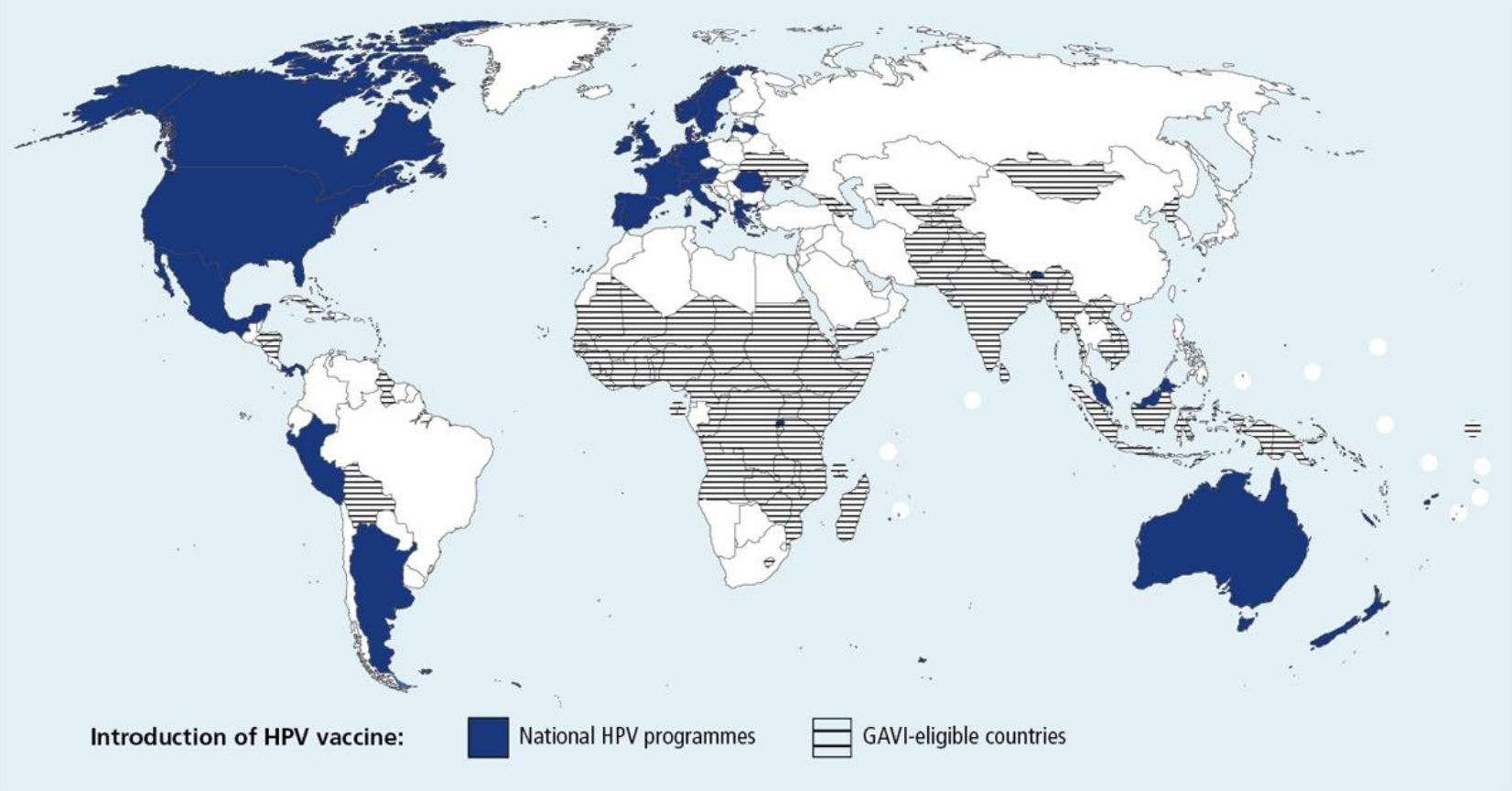


Note: Coverage refers to the final dose of each vaccine.

Sources: WHO/UNICEF coverage from July 2012; United Nations, Department of Economic and Social Affairs, Population Division (2011). World Population Prospects: The 2010 Revision, CD-ROM Edition.
Country income categories (World Bank) as of July 2012 (2011 GNI per capita)

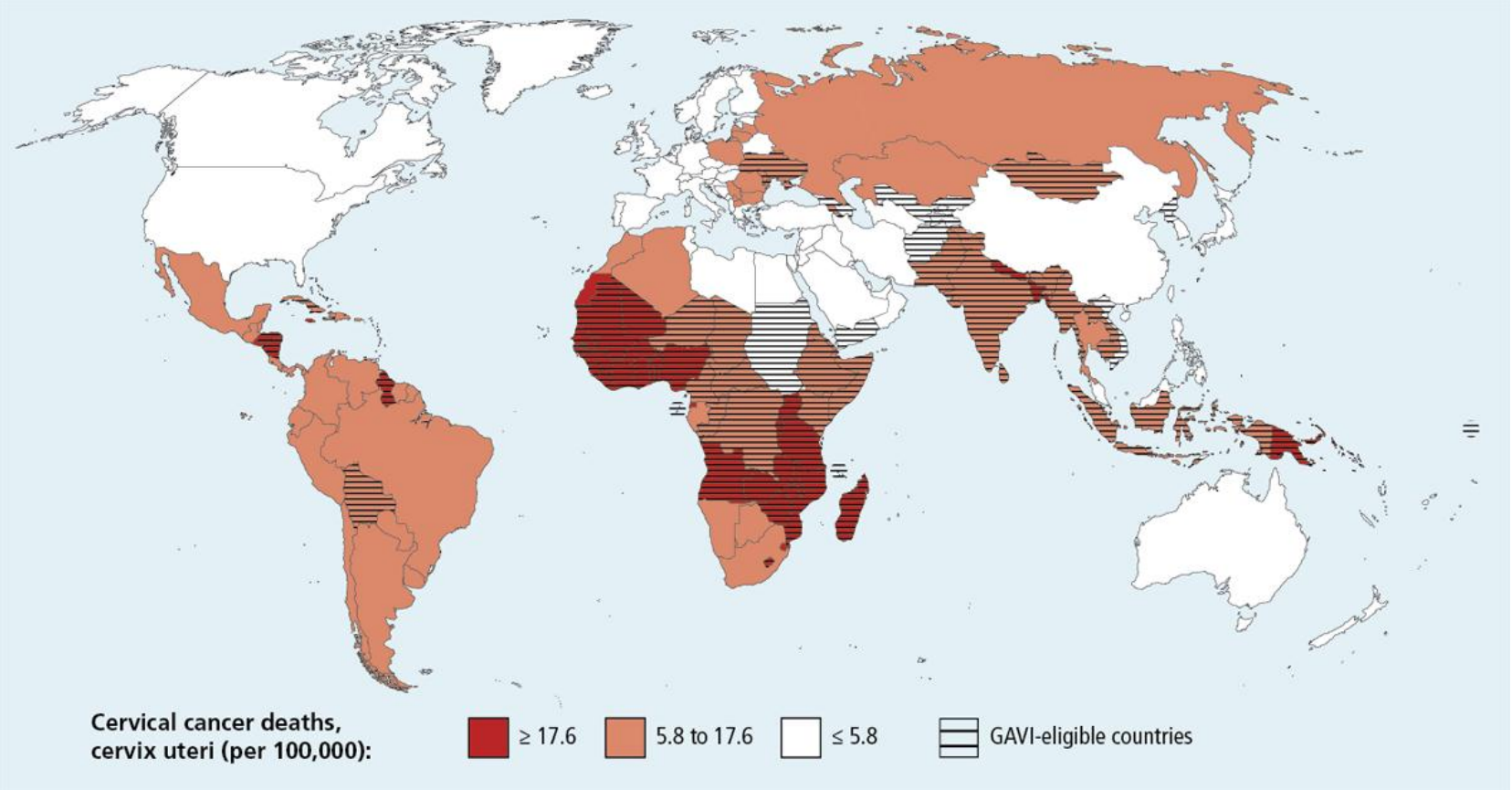
Introduction of HPV vaccine

Status: prior to GAVI



Source: Courtesy of Progress in Cervical Cancer Prevention:
The CCA Report Card, August 2011

Cervical cancer mortality



Source: Globocan 2008, International Agency for Research on Cancer.
Courtesy of Progress in Cervical Cancer Prevention:
The CCA Report Card, August 2011

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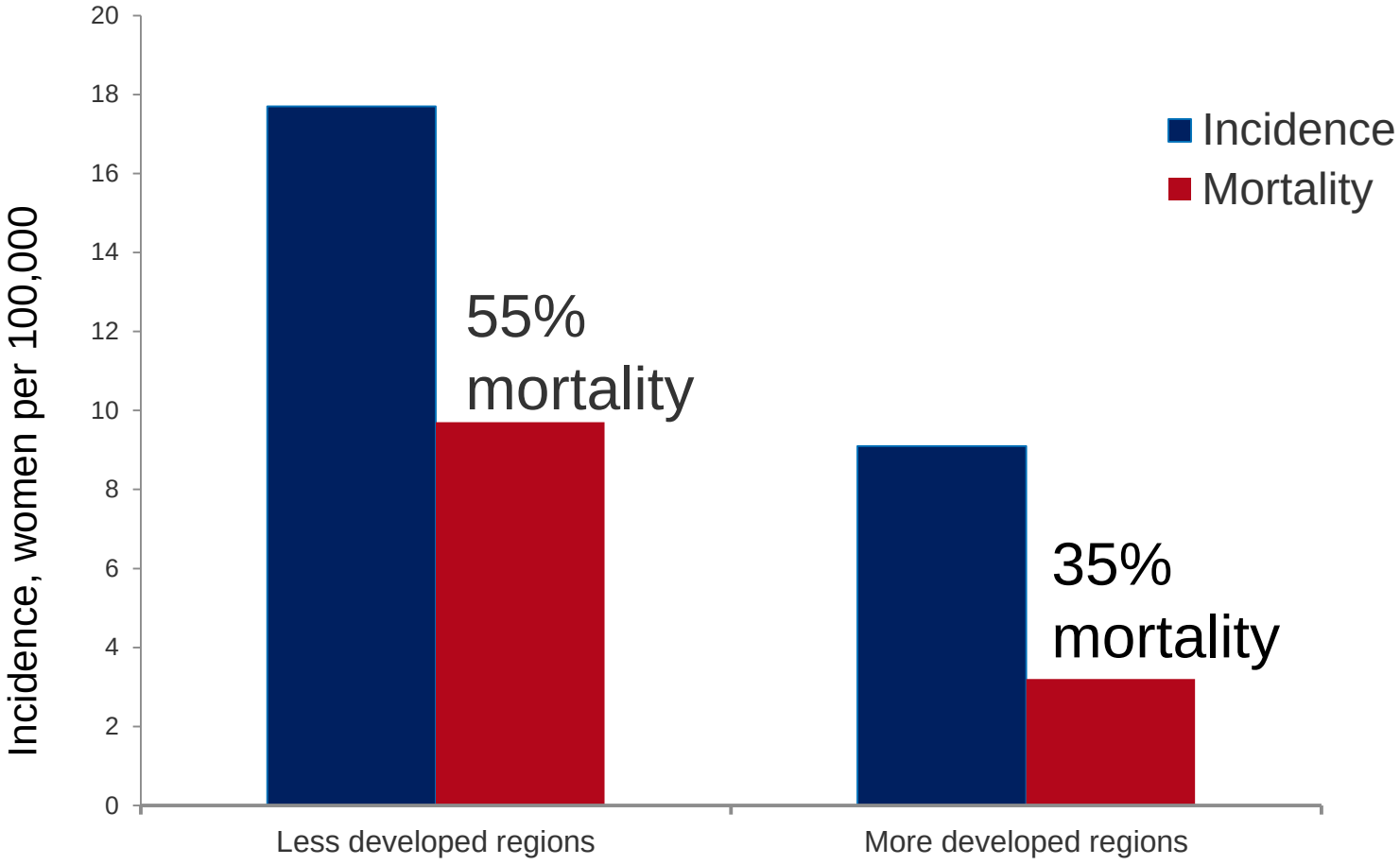
Higher incidence and mortality from cervical cancer in less developed regions

Comparison of cervical cancer incidence and mortality less developed vs more developed regions



Source: adapted from GLOBOCAN 2008, accessed March 2013

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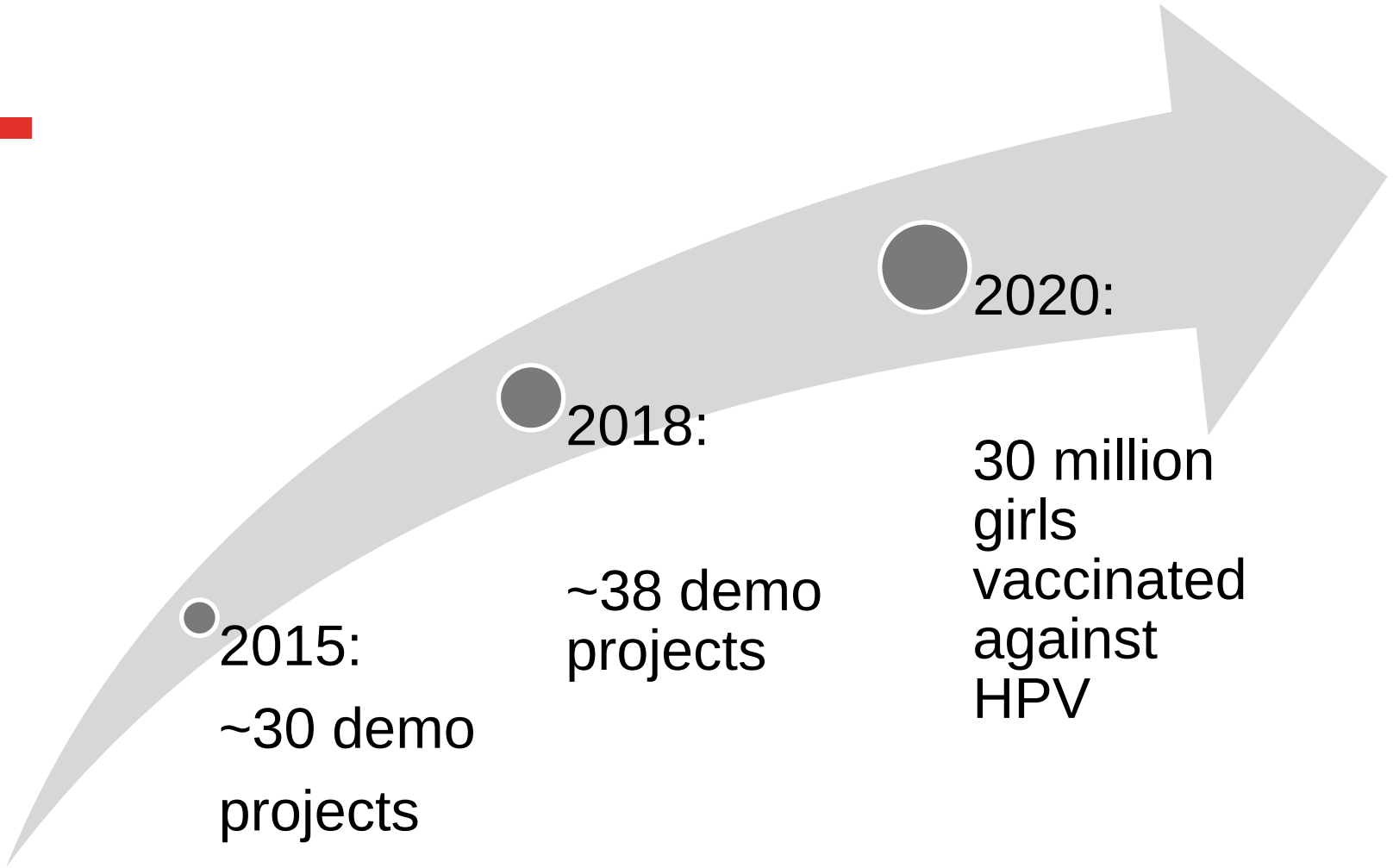
Over 30 million girls vaccinated with HPV vaccine by 2020



Source: GAVI Alliance, SDFv7

GAVI Alliance: a partnership

unicef

World Health Organization

THE WORLD BANK

BILL & MELINDA GATES foundation

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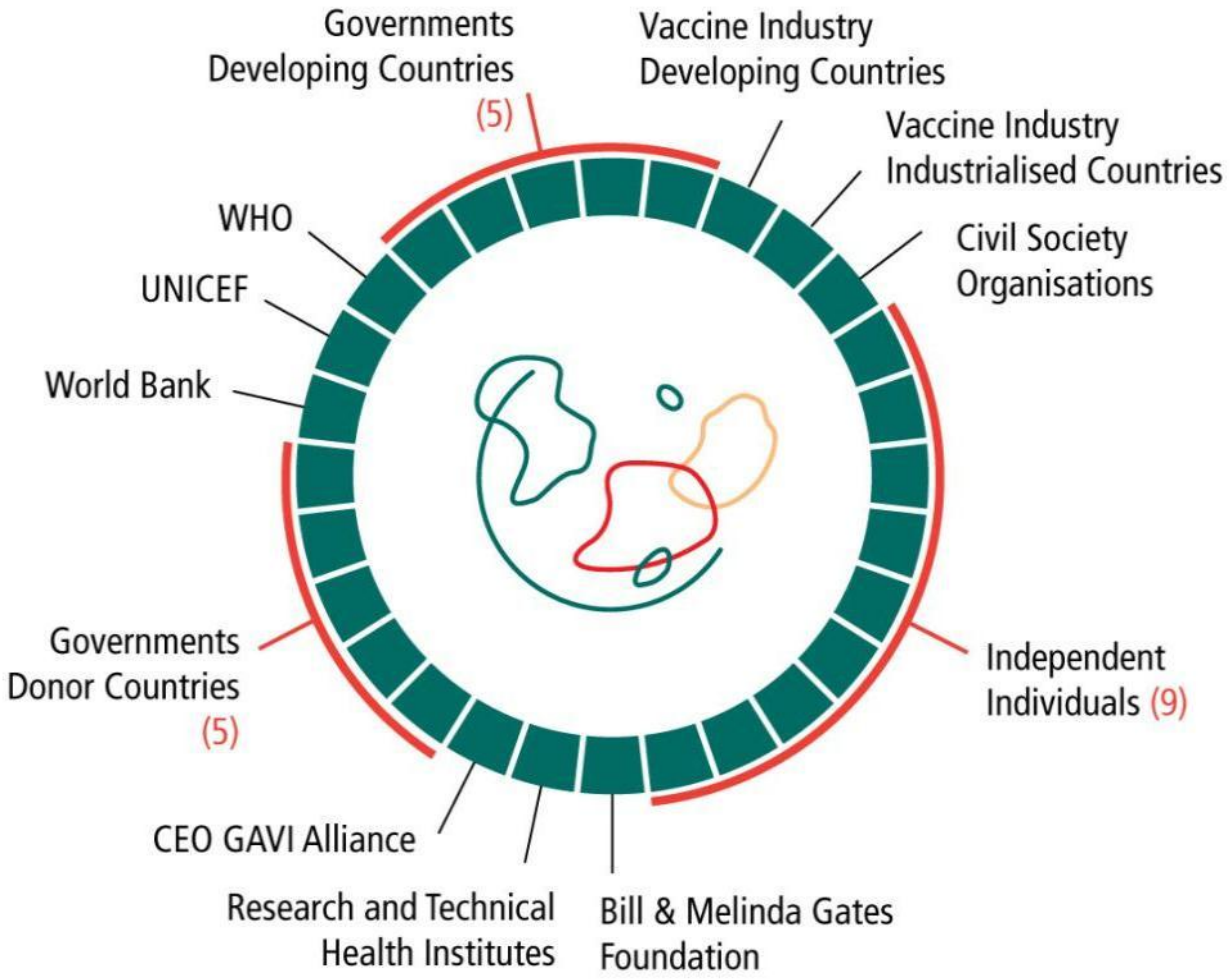
The GAVI Alliance: 21st century model of development

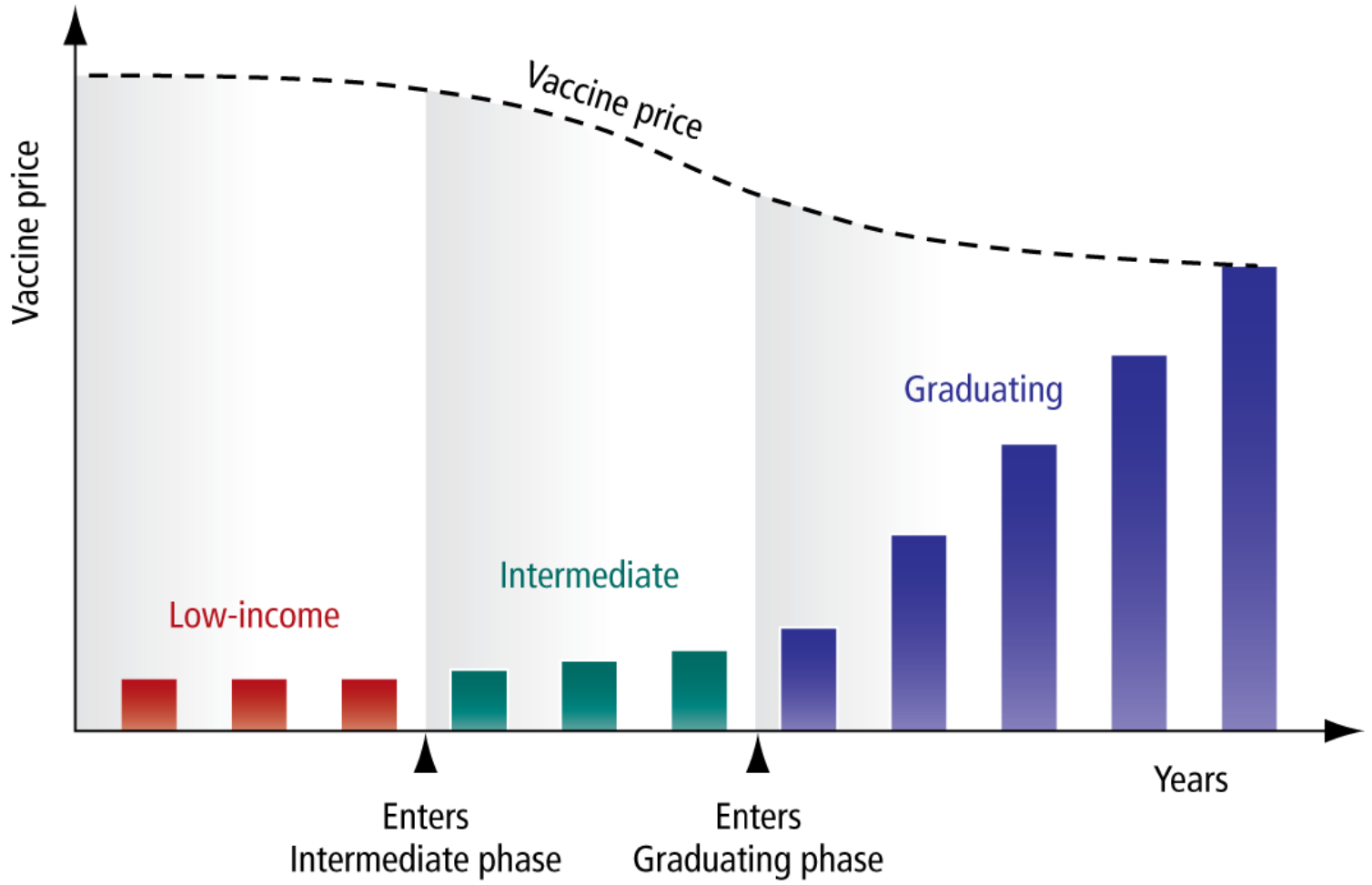


Innovative partnerships

Resetting…

- The way we think of development – public private partnership models
- The way we do development – market-shaping, innovative financing, etc.
- The “donor recipient” model – sustainability, ownership/co-financing
- Catalysing the introduction of new technologies

How the co-financing policy works



Source: GAVI Alliance 2012

Projected vaccine costs as a share of projected public spending on health, 2015

New Co-financing Categories	Per capita government spending on health	Government spending on health as % of government spending	Government spending as % of GDP	Vaccines as % of government spending on health	
				2010	2015
Low income	$14.83	10.0%	25.0%	4.2%	6.3%
Intermediate	$35.84	9.1%	31.2%	1.5%	2.2%
Graduating	$107.43	8.7%	37.0%	0.5%	**0.6%**

Data Sources: World Bank/ WHO National Health Accounts/ GAVI Demand Forecast
Note: Eritrea, India, Korea D.R., Somalia and Zimbabwe excluded from analysis

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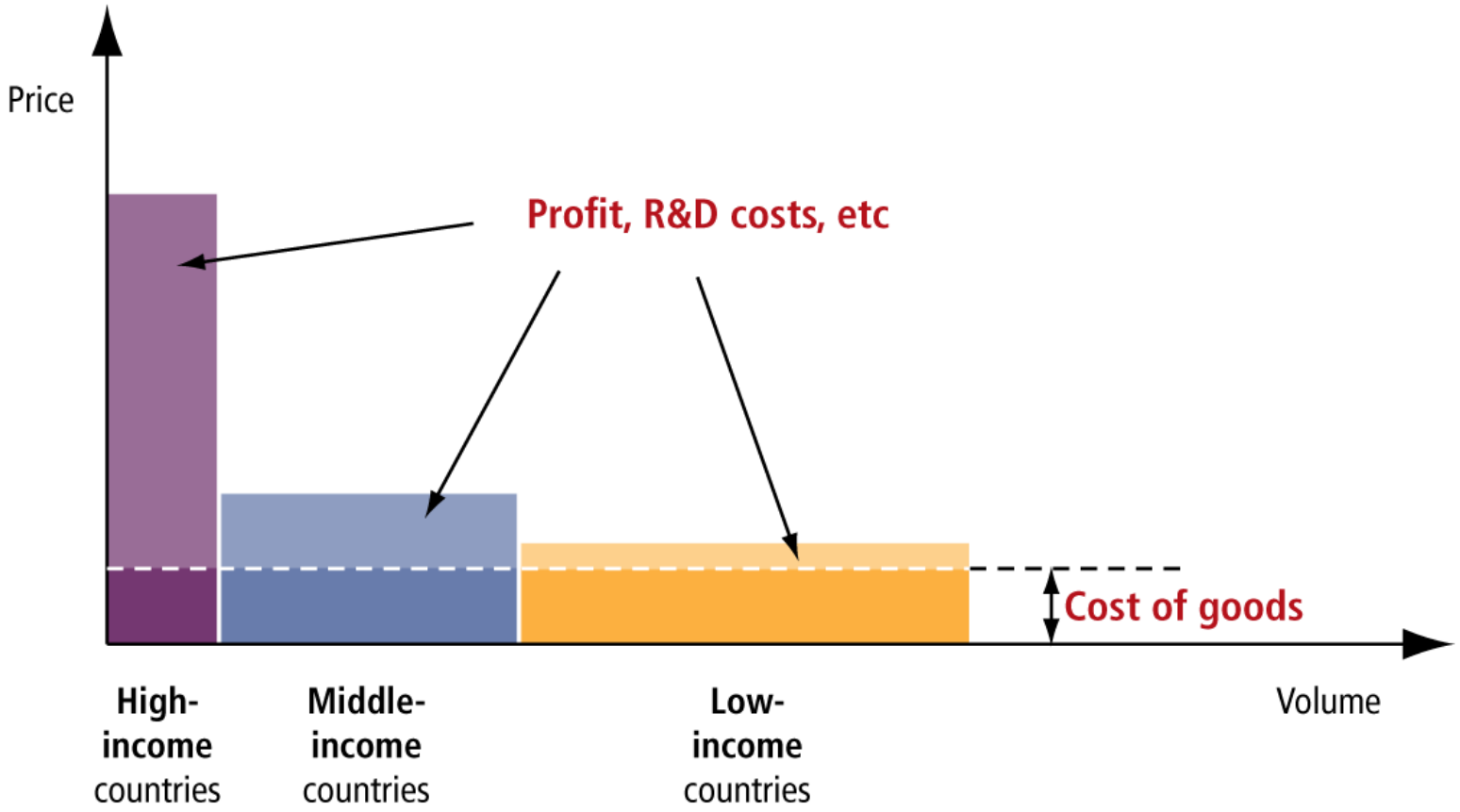
Ramsey pricing



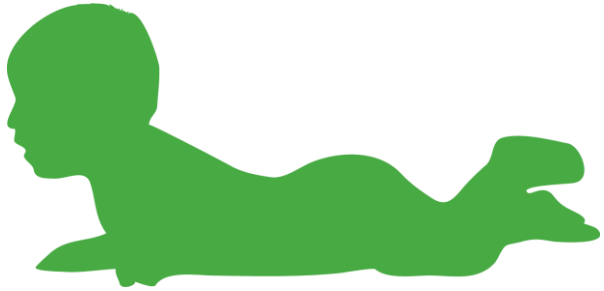
Source: GAVI Alliance, 2012

GAVI countries
birth cohort

Non-GAVI countries
birth cohort

2012
global birth cohort:

135 million



GAVI countries birth cohort:

80 million

Source: GAVI Alliance, 2012

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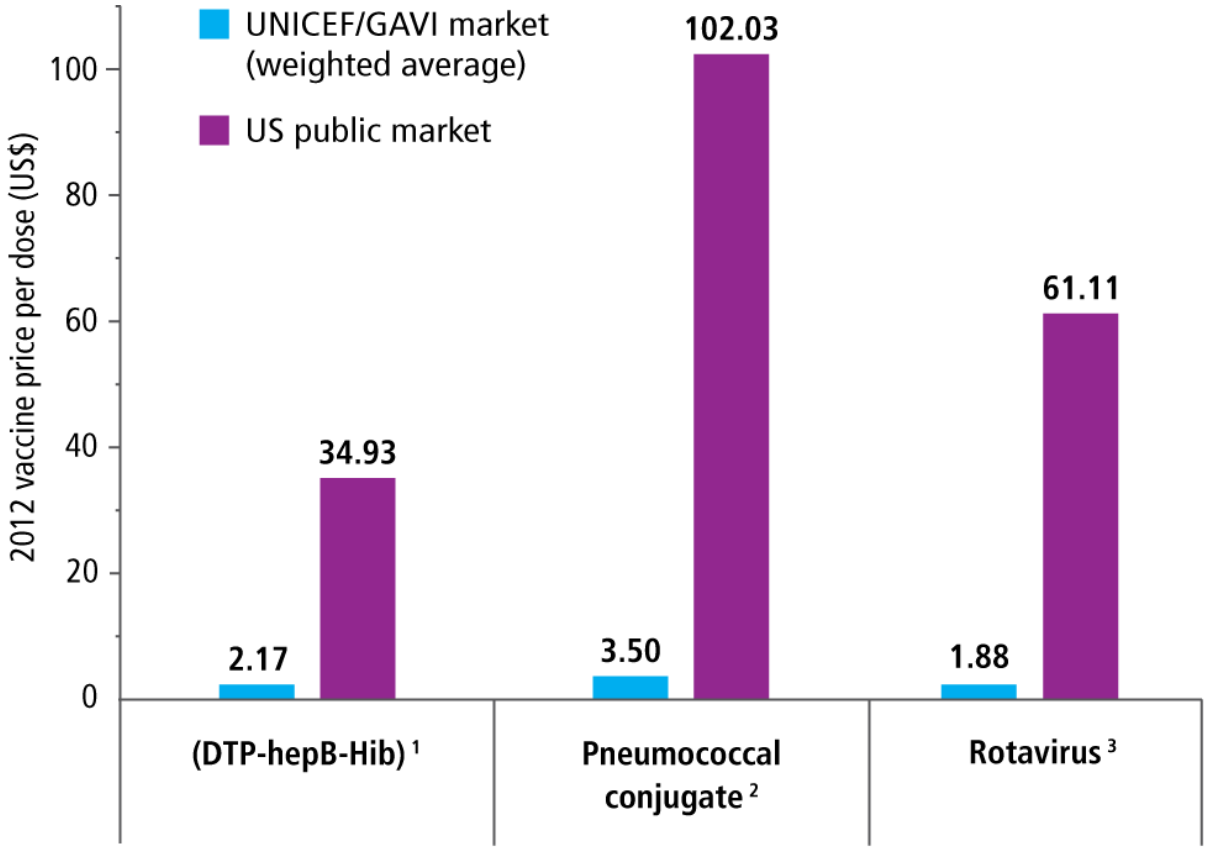
Changing the mindset of the vaccine manufacturing industry

Tiered pricing



1 The UNICEF/GAVI price is the weighted average across suppliers and presentations of pentavalent vaccine and reflects the cost of whole-cell pertussis vaccine; the US public market price is lowest total price per dose for separate DTP, hepB and Hib vaccines and reflects the cost of acellular pertussis vaccine.

2 The UNICEF/GAVI price is the tail price under the Advanced Market Commitment (AMC); the US public market price is for 13-valent vaccine.

3 The UNICEF/GAVI price is the weighted average assuming 3-dose equivalence; the US public market price is the average assuming 3-dose equivalence.

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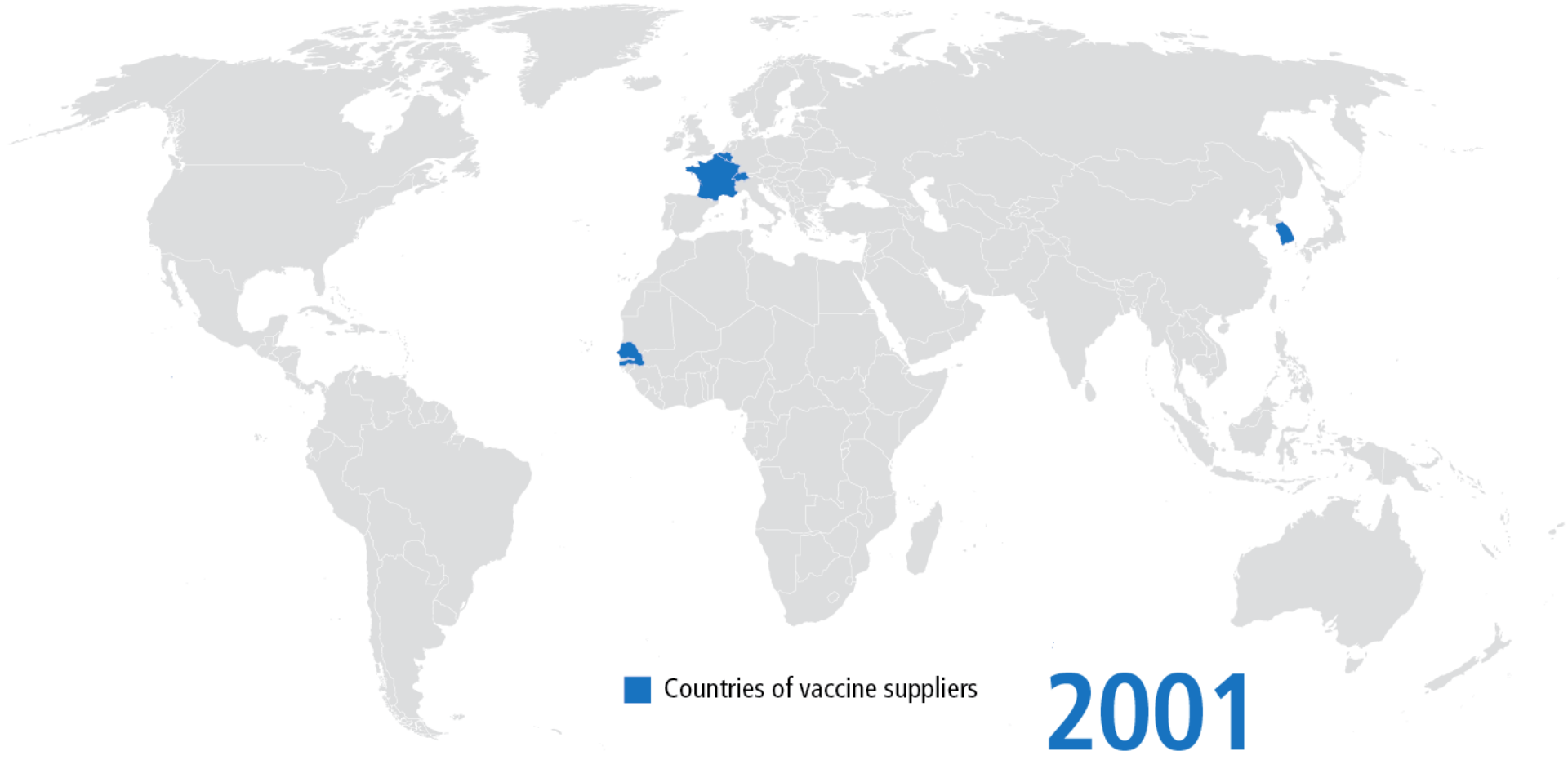
Vaccine supply

2001 – Vaccine supply:
5 suppliers from 5 countries



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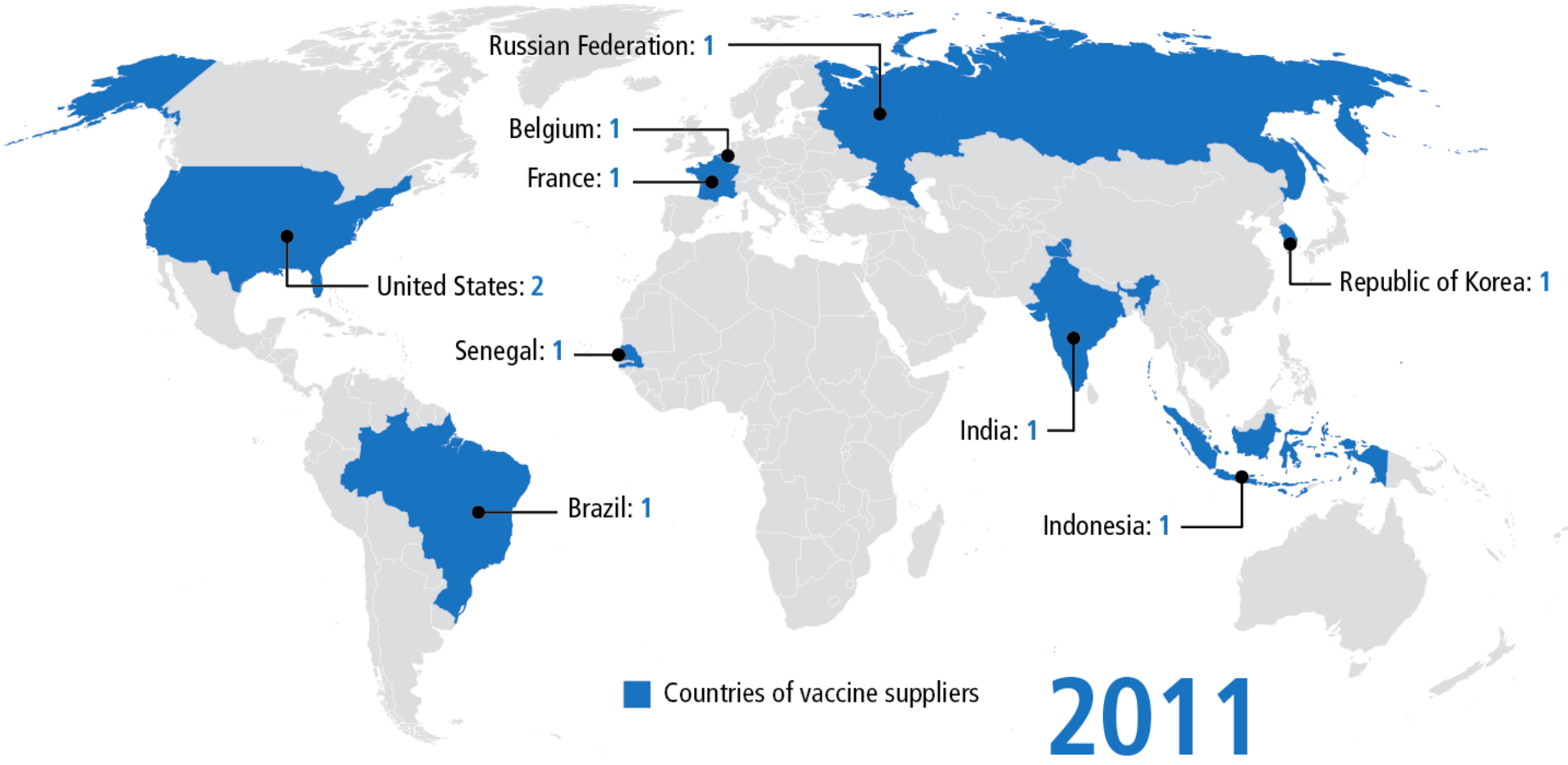
Vaccine supply

2012 – Vaccine supply:
10 suppliers from 9 countries



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GAVI's innovative finance mechanisms are redefining funding for development

IFFIm converts long-term government commitments into immediately available cash resources by issuing "vaccine bonds" on the capital markets. This accelerates the availability and predictability of funds – enabling GAVI to double its spending on immunisation programmes

AMC accelerates the development and manufacture of vaccines for developing countries at affordable prices. In an AMC, donors commit funds to guarantee vaccine prices

The GAVI Matching Fund is a private sector engagement programme designed to leverage funds, resources and expertise from the private sector

2012 **Performance-based financing**

2009 **Health system funding platform**

2005 **Health system strengthening**

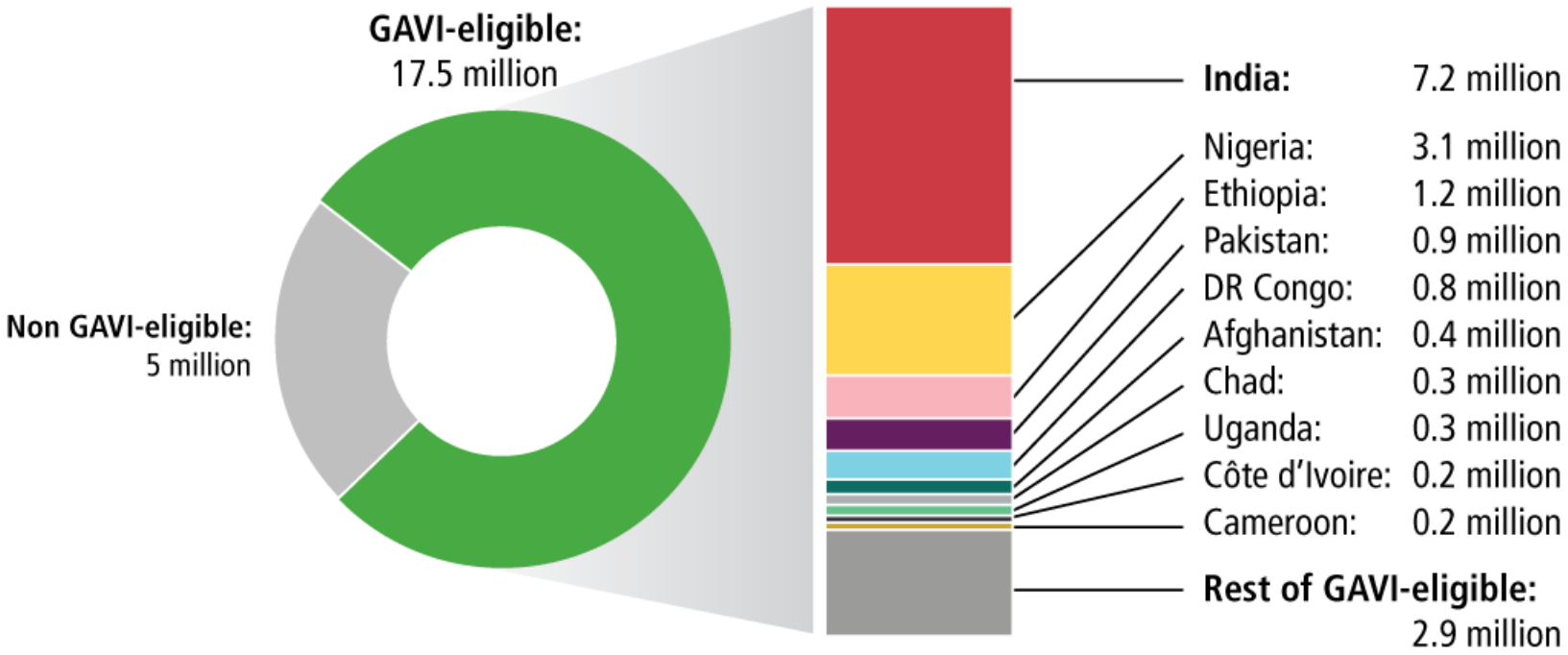
2001 **Injection safety support**

GAVI catalyses the new partnerships and the introduction of new technologies

GAVI Challenges

More than 22 million children still unimmunised

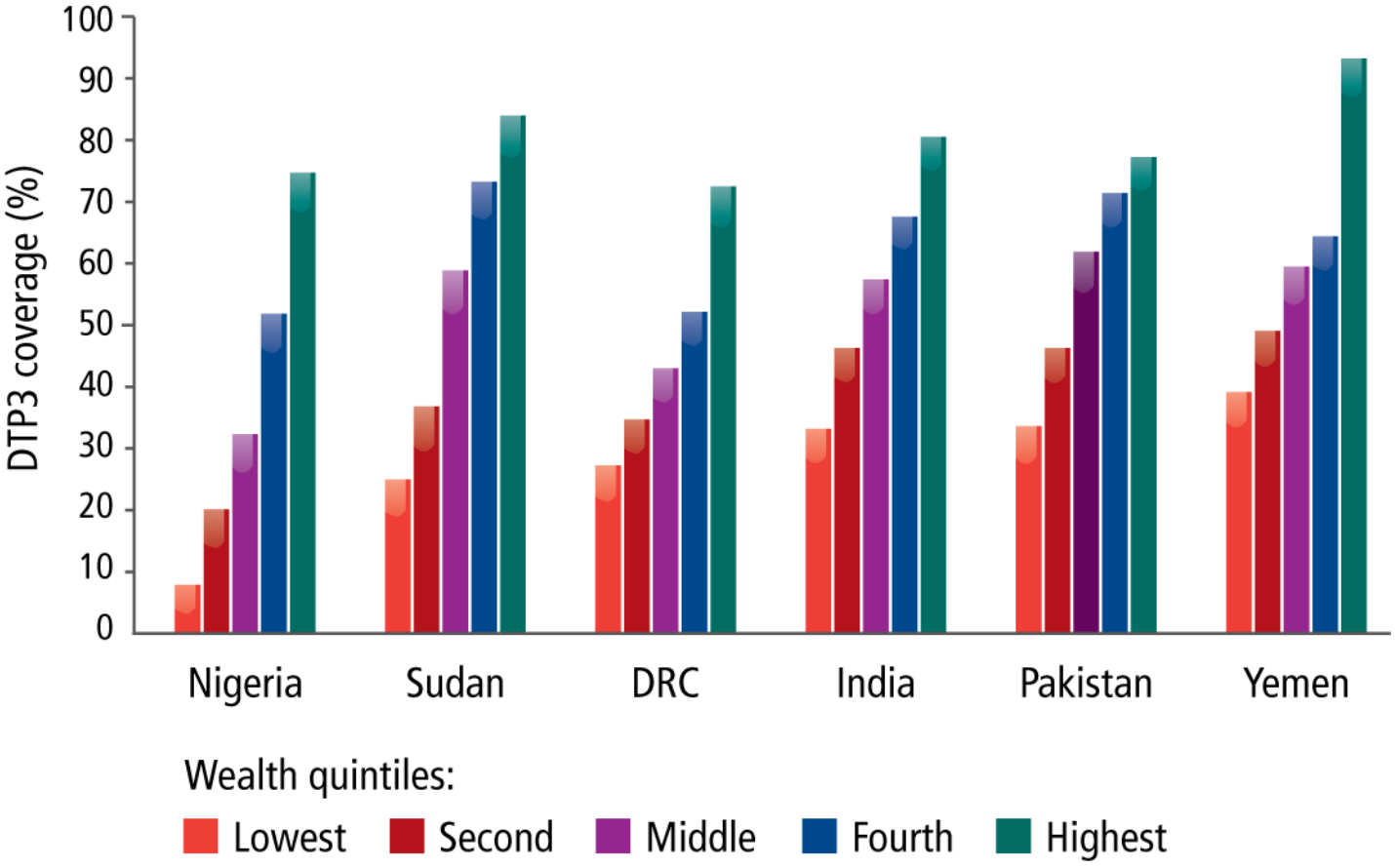
Global number of under-five children unimmunised with 3 doses of DTP, 2011



Note: Revised figures for 2011 (July 2012)
Source: WHO/UNICEF vaccine coverage estimates (July 2012)

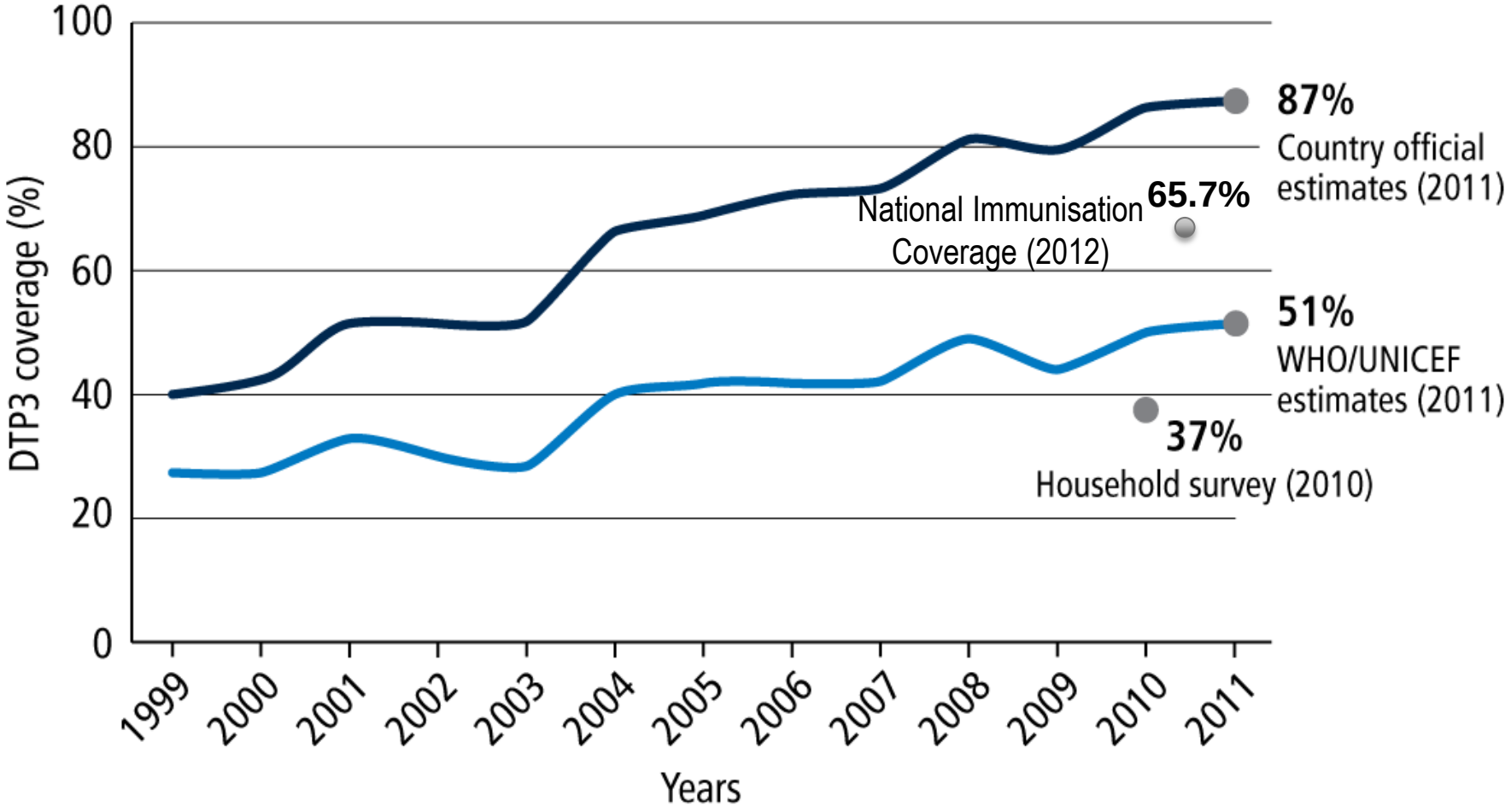
GAVI challenges: Reaching the hardest to reach

Patterns of DTP 3 vaccination coverage across wealth quintiles since 2005



Source: DHS and MICS data (since 2005)
Courtesy: Save the Children UK, 2012

The challenge of rigorous data - DTP3 coverage: Ethiopia



Source: WHO/UNICEF vaccine coverage estimates (July 2012)

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GAVI challenges: potential solutions for improved data

Improved denominator estimates:

- Vital registration, regular conduct of censuses; satellite imagery, small area analysis of household survey.

Innovation in use of biomarkers, technology and triangulation:

- Development of integrated surveillance tools that would allow measurement of impact across multiple programs

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Vaccine supply chain: seeking efficiencies

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Cost effective improvements to supply chain management

- Improving stock management through digital technology platforms
- Accelerate the introduction of standards for technology that will help with tracking and tracing vaccines: e.g. 2-d bar codes
- Learn from open source systems: e.g. Geocaching

New vaccines?

Malaria vaccine?
Inactivated polio vaccine?
Cholera vaccine?
Cancer vaccines?
Malaria vaccine?
Dengue vaccine?
Tuberculosis vaccine?
HIV vaccine?

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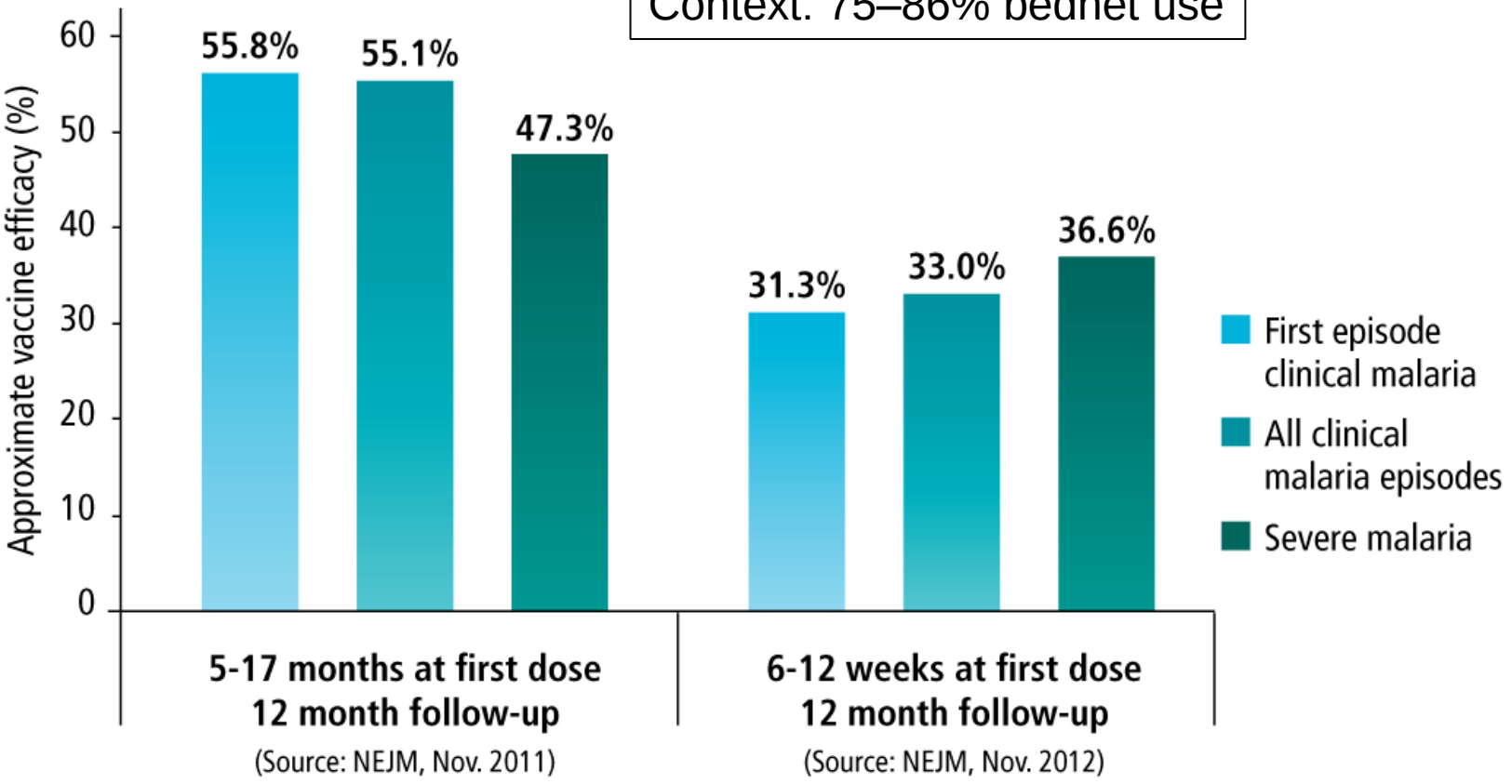
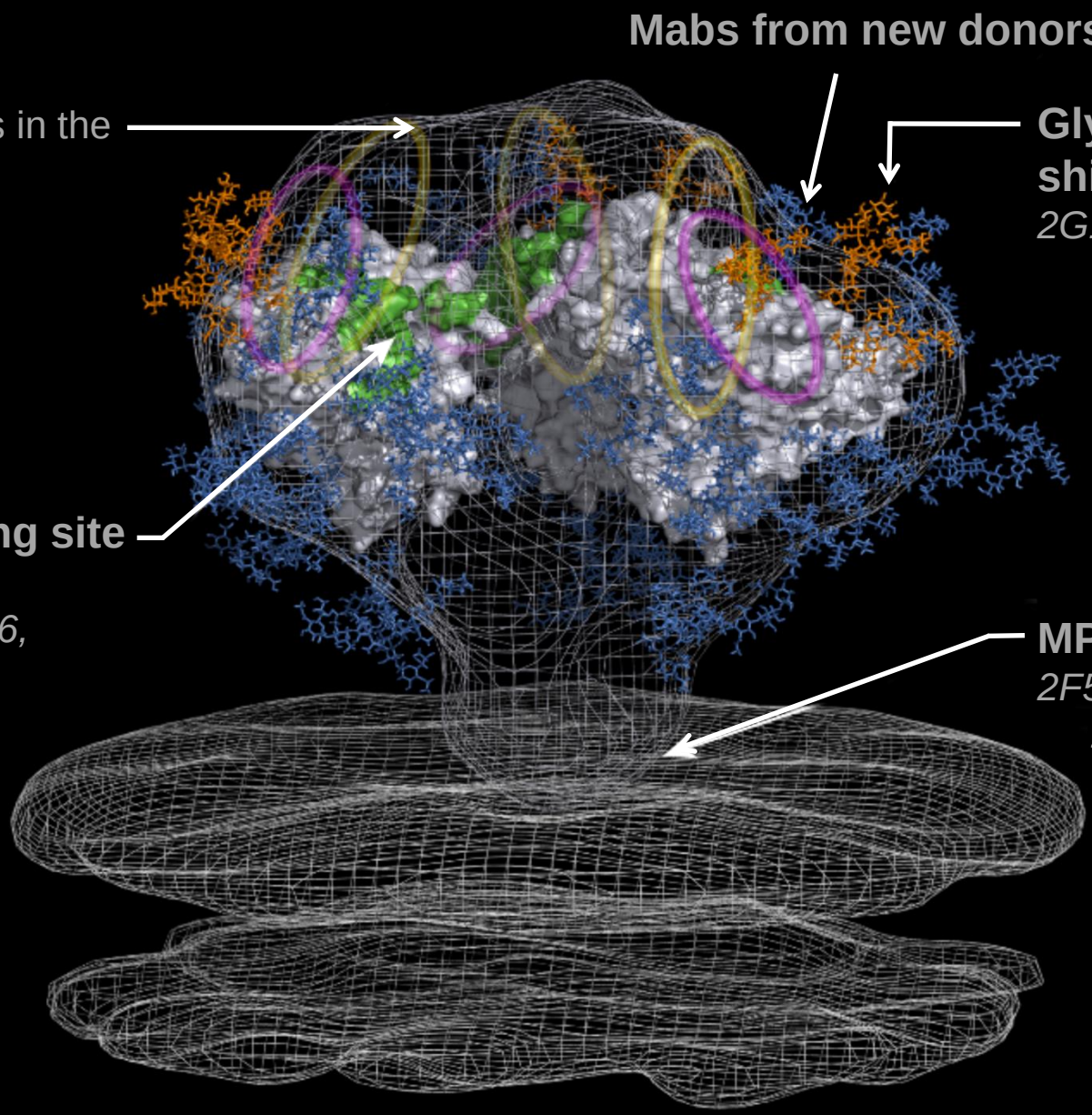
Malaria vaccine Phase 3 evaluation

Context: 75–86% bednet use



With new antibodies, **new targets**



Source: Schief, W.R. et al.. Curr Opin HIV AIDS. 2009 Sep; 4(5):431-40.

Cancer vaccines

Hepatitis B
Human papillomavirus
Helicobacter pylori?
Epstein-barr?
???

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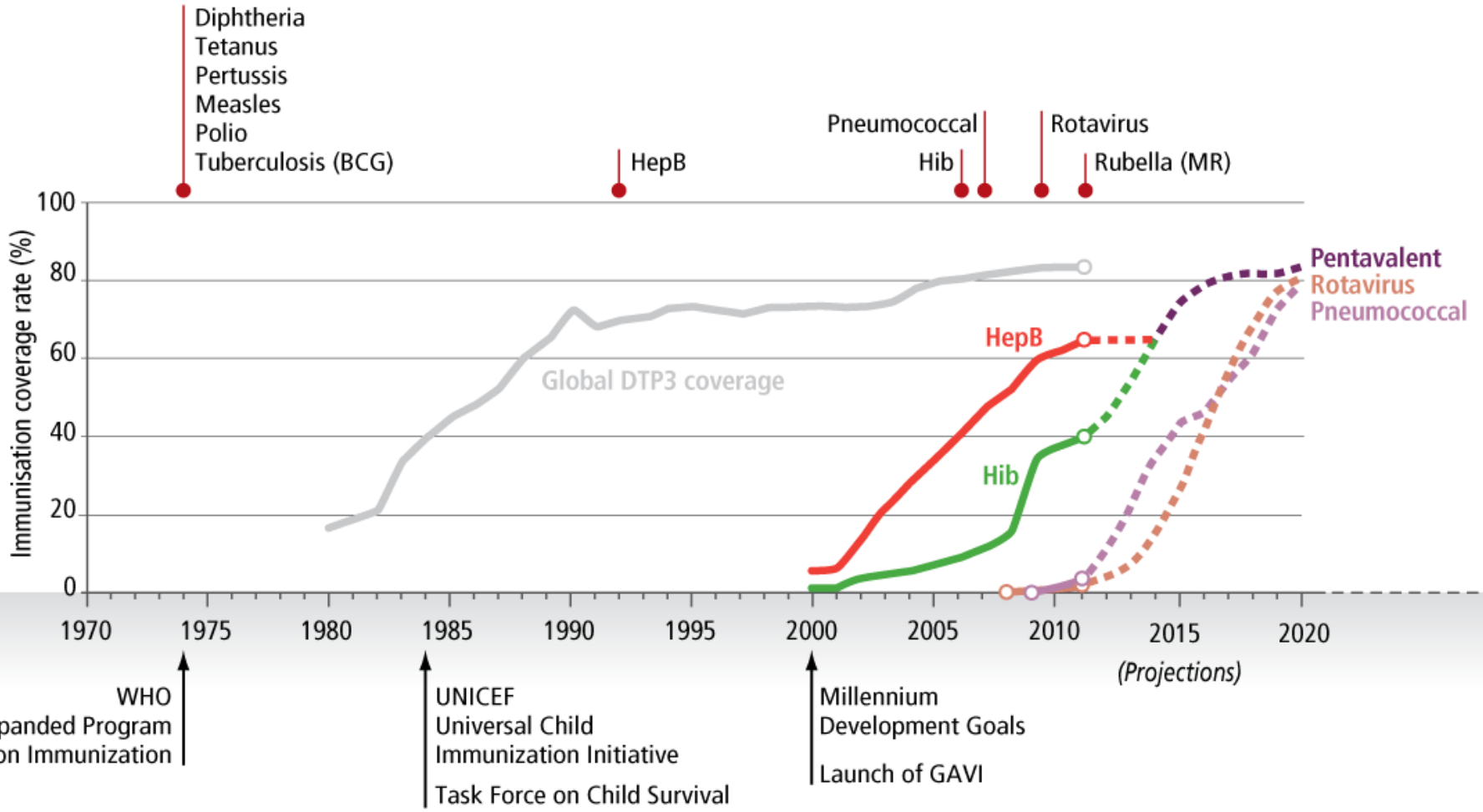
A short history of immunisation milestones

WHO vaccine recommendations and GAVI country coverage rates



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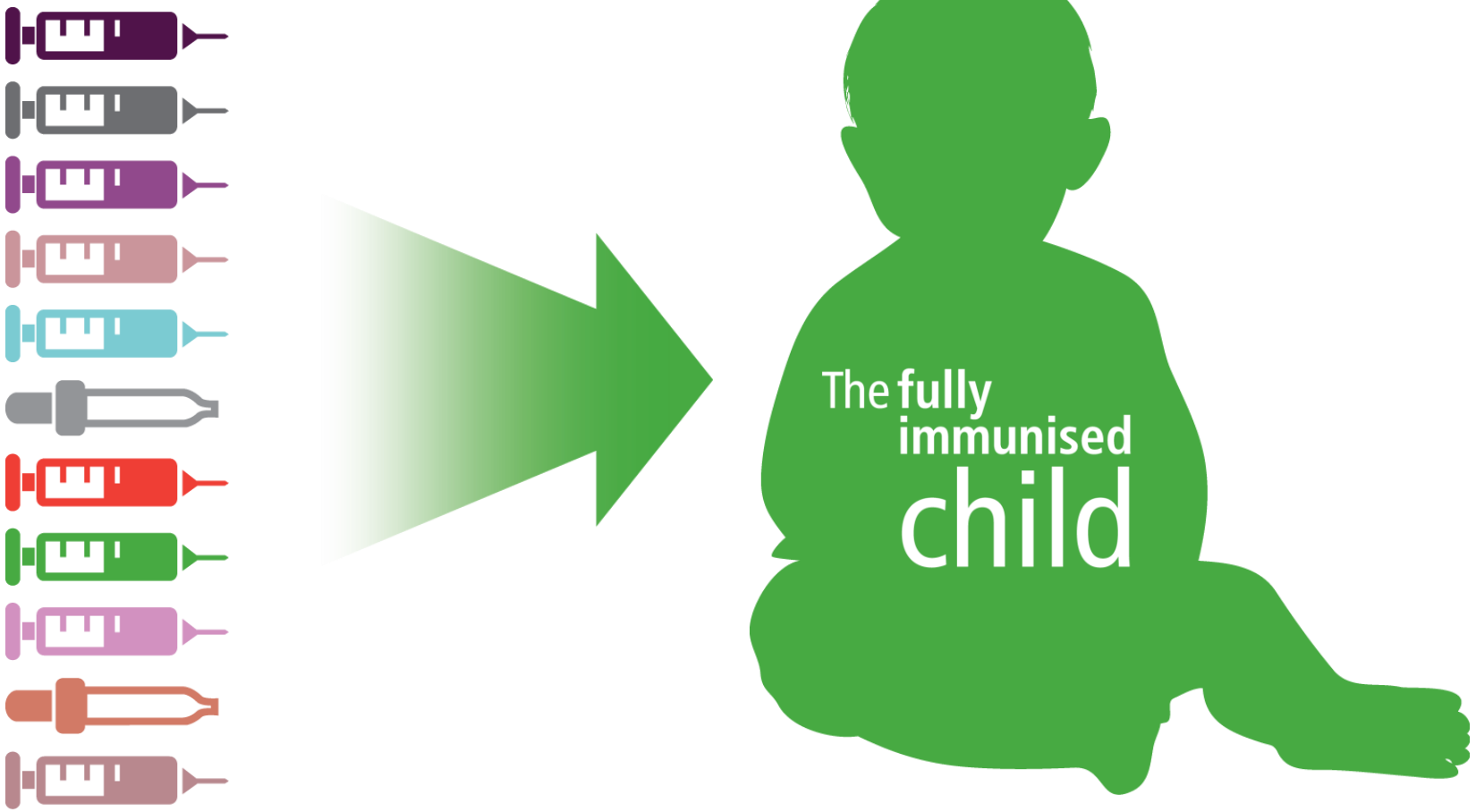

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Approximately
50%
in 2030
Approximately
10%
of children will be fully immunised
in 2015

Thank you

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