Global Health and Vaccines from a donor perspective
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The Global Health Problem

**Burden:**
6 m annual AIDS, TB, malaria deaths
1.7m annual child deaths due to VPDs

**Uptake & Coverage:**
5 years for US Drug launch to peak sales;
20 years and counting since Safe Motherhood Initiative to 55% coverage

**10/90 Medical Research:**
$70 billion annual medical research;
<10% for the diseases causing 90% of global morbidity / mortality
Proven Successes in Global Health – case studies

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Proven Successes in Global Health – common elements

Snapshot of the Foundation

**What We Focus On**
- What affects the most people?
- What has been neglected?
- Where can we make the greatest impact?

**How We Focus**
- Form critical partnerships.
- Take big risks.
- Find scalable, sustainable solutions.
- Leverage science and technology.

**Our Program Areas**

- **50%** Global Health Program
- **25%** Global Development Program
- **5%** United States Program

**Our Approach to Giving**

1. Develop Strategy
2. Make Grants
3. Measure Progress
4. Adjust Strategy
Foundation criteria for focus diseases and conditions

**Burden:**
Diseases and conditions that cause the greatest illness and death in developing countries.

**Inequity:**
Diseases and conditions that represent the greatest inequities in health between developed and developing countries.

**Gaps in attention:**
Diseases and conditions that receive inadequate attention and resources.
Foundation Global Health Priorities

Global Health Burden

Our Areas of Focus

- **Infectious Diseases**
  - Malaria
  - Tuberculosis
  - Diarrheal Illness
  - Pneumonia

- **HIV/AIDS**

- **Family Health**
  - Nutrition
  - Maternal, neonatal, child
  - Family planning

- **Vaccine Preventable Diseases**
  (e.g. Polio)

- **Communicable diseases not addressed**
  by the foundation – 3%

- **Non-communicable conditions** – 47%

- **Injuries** – 12%

38% of the global health burden
The Foundation’s Strategic Approach to Global Health

1. Creating & Improving Health Interventions
   - Research and development to:
     - Develop new health technologies, tools, and strategies, including conducting clinical trials
     - Modify existing technologies

2. Accelerating Access to Interventions
   - Product introduction, including mechanisms for financing, procurement, delivery, and access
   - Large-scale demonstrations of health interventions, including effectiveness trials and operational research
   - Facilitating widespread access, through:
     - Advocacy
     - Financing mechanisms
     - Public health leadership development
     - Evidence to guide decision-making
     - Initiatives to improve product delivery and demand
A Call for the Decade of Vaccines

- Call to donors, governments, private sector to advance global immunization goals
- Committed $10 billion over 10 years
- Efforts for vaccine discovery, development, delivery
- Potential to save 8 million child lives by 2020 with existing vaccines
- Insufficient to address global immunization needs – others must join
Global causes of child deaths

Robert E. Black,¹ Simon Cousens,² Hope L. Johnson,¹ Joy E. Lawn,³ Igor Rudan,⁴ Diego G. Bassani,⁵ Prabhat Jha,⁵ Harry Campbell,⁴ Christa Fischer Walker,¹ Richard Cibulskis,⁶ Thomas Eisele,⁷ Li Liu¹ and Colin Mathers⁸ for the Child Health Epidemiology Reference Group of the World Health Organization and UNICEF.
Lancet, in press
Global burden of acute respiratory infections

- Pneumonia: 2 M child deaths < 5 years of age each year.
- Pneumococcal disease: 1.6 M deaths each year, 1 M of which are children under age 5.

(Source: WHO. World Health Statistics 2009.)
Enteric and Diarrheal Disease Burden

- Neutrial causes: 37%
- Others: 17%
- AIDS: 2%
- Measles: 4%
- Malaria: 7%
- Diarrhea: 16%
- Pneumonia: 17%
- Neonatal causes: 37%

Annual U-5 Mortality: 875
Annual deaths (’000s): 1600

Breakdown by pathogen:
- Rotavirus: 31%
- Unknown, co-infection and others: 36%
- Vibrio cholerae: 1%
- Campylobacter: 5%
- Shigella: 1%
- EPEC: 14%
- ETEC: 9%
- Typhoid fever: 1%
- Undernutrition: 20%

Annual deaths ('000s):
- Typhoid fever: 400
- Undernutrition: 1600
- Unknown, co-infection and others: 875
- Vibrio cholerae: 1%
Routine use of 7-valent pneumococcal conjugate vaccine (PCV-7) has resulted in substantial health benefits

Invasive pneumococcal disease in children under 5, USA

- > 30M children safely and effectively vaccinated
- Routine use in U.S. has virtually eliminated serious childhood pneumococcal disease caused by serotypes included in the vaccine
- Indirect effects are pronounced among adults and children

Pilishvilli, JInfDiseases 2010
Pneumococcal vaccine significantly improves child survival in the Gambia

All-cause mortality was decreased by 16% (95% CI 2-38%) in children vaccinated with 9-valent pneumococcal vaccine

7 deaths were prevented for every 1000 children vaccinated

Acceleration of rotavirus vaccine adoption by Rotavirus Vaccine Program (RVP) is predicted to save 1.4M lives

Number of lives saved by rotavirus vaccine with and without accelerated introduction

- Estimated incremental lives saved: 1.4 Million
- Lives saved with acceleration
- Lives saved without acceleration (optimistic scenario)

Rotavirus Vaccine Program (RVP) is one of the several Accelerated Development and Introduction Plans (ADIPs) funded by GAVI to speed uptake and introduction of new vaccines. The RVP program is carrying out this mission in a number of ways:

- Redesign product and packaging to fit existing cold chains
- Support PII/PIII efficacy trials in developing countries
- Build investment case and show cost effectiveness of rotavirus vaccine
- Improve demand forecasts
- Increase evidence base: burden of disease
- Advocate for quick, sound decisions

RVP is only focusing on speeding adoption. Amount and equity of uptake will largely be determined by EPI coverage in individual countries

Source: Rotavirus Vaccine Program (Rotavirus ADIP): 1. Draft Version January 2006 2. Adapted from Rheingans et. al 2005 (unpublished) and Parashar 2003; Range: 0.9 to 2.3 Million Lives Saved 3. Adapted from Rheingans et.al. 2005 (unpublished) and Parashar 2003: 130 hospitalizations and outpatient visits avoided per 1000 infants vaccinated
Illustrative coverage of childhood vaccines in developing countries

- Sri Lanka (98%)
- China (97%)
- Mexico (98%)
- Brazil (98%)
- Bangladesh (95%)
- Pakistan (92%)**

- Ethiopia (81%)
- Indonesia (77%)

- India (66%)
- S Africa (67%)
- Nigeria (54%)

BASIC (BCG, DTP3, Polio, Measles)
BASIC + full HepB
BASIC + full HepB + MCV2
BASIC + full HepB + MCV2 + Hib
BASIC + full HepB + MCV2 + Hib + Rota
BASIC + full HepB + MCV2 + Hib + Rota + Pneumo

Source: WHO / UNICEF Immunisation Coverage Estimates, WHO Vaccine Schedule List. ** Pakistan does not have HepB coverage
Status of Global Pneumococcal Vaccine Introductions, 2009

PCV Access as of September 2009

www.preventpneumo.org
Foundation response: Push & Pull Mechanisms to jumpstart better products, increased uptake

- Product Development Partnerships
- Initiatives to increase uptake
PDPs for product development

- HIV Vaccine Enterprise
- Medicines for Malaria Venture (MMV)
- Malaria Vaccine Initiative (MVI)
- PATH Vaccine Solutions (PVS)
- Aeras (TB Vaccines)
- Global Alliance for TB Drug Development (GATB)
- IVI/PDVI
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<td>GAVI, PATH</td>
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Source: Image and source text copyright 2009, Bill & Melinda Gates Foundation
Foundation response: Support global efforts to prevent and treat diarrheal disease

Sub-initiatives:

» Enteric disease vaccines
» Therapeutics.
» Epidemiology and burden assessment
» Disease biology and mechanisms
» EDD-Nutrition
» [Water] Sanitation and Hygiene.
Foundation response – Support global efforts to prevent & treat pneumonia and diarrhea

- GAVI support for access to Hib and pneumococcal vaccines in the developing world

- “Push” and “Pull” funding for new and better vaccines
  - $80M of direct funding for pneumococcal vaccine R&D
  - $50M in Advance Market Commitments to attract additional manufacturers to the pneumococcal vaccine arena