

# Malaria Research & Development

## An Assessment of Global Investment



# Presentation Outline

- Malaria R&D Alliance Background
- Study Background and Methodology
- Findings
  - Who Funds Malaria R&D?
  - Where Does the Funding Go?
  - How is Funding Allocated?
  - Current vs. Past Funding
  - Funding in Perspective

# Background - Malaria R&D Alliance

- No single organization, agency or company can alone harness the necessary resources
- No one “magic bullet” approach, complex problem needs attack from multiple angles
- Several organizations
- Research critical
- Malaria R&D Advocacy Meeting  
29-30 March, 2004
- Symphony, not cacaphony

# Malaria R&D Funding Study Objective

- The Malaria R&D Alliance's primary motivation for undertaking this study is to create a credible understanding of current global investment in malaria research and development and to benchmark it

# Malaria R&D Funding Study

- Study largely funded by the PATH Malaria Vaccine Initiative (MVI) with contributions from Medicines for Malaria Venture (MMV) and Gates Malaria Partnership
- Joint project management: MMV & MVI
- Survey design, implementation supported by APCO Worldwide & The Chartis Group

# Funding Study Advisory Group

- Catherine Davies, Wellcome Trust
- Jan van Erps, Roll Back Malaria Partnership
- Gabrielle Bushman Fitzgerald, Bill & Melinda Gates Foundation
- Jennifer Kates, Kaiser Family Foundation
- Wen Kilama, African Malaria Network Trust
- Wil Milhous, Walter Reed Army Institute of Research
- Mary Moran, London School of Economics
- Nina Schwalbe, Global Alliance for TB Drug Development

# Study Methodology

- Online survey instrument
- The survey instrument was emailed to 186 organizations
- Survey responses were accepted for 9 weeks
- Significant follow-up was made with high priority respondents (those groups believed to manage or donate more than \$1 million in malaria R&D per year)

# Contact list

- The contact list includes the following key players involved in malaria R&D:
  - ▶ Donors & Funders
    - ▶ Government Agency
    - ▶ Multilateral
    - ▶ Private Philanthropic
  - ▶ Funding Managers
    - ▶ PPPs or NGOs
    - ▶ Multilateral
    - ▶ Researchers & Developers
    - ▶ R&D Entity: Self Funded
    - ▶ R&D Entity: Externally Funded

# Survey Participants: 79 in total

- Africa Malaria Network Trust
- Albert Einstein College of Medicine
- Amani Medical Research Centre
- Australian Army Malaria Institute
- BHP Billiton
- Bill & Melinda Gates Foundation
- Biotechnology Center, University of Yaoundé I
- CSL Limited
- Drugs for Neglected Diseases Initiative
- Ellison Medical Foundation
- EuropeAID Cooperation Office
- European & Developing Countries Clinical Trials Partnership
- European Commission
- European Malaria Vaccine Development Consortium
- European Malaria Vaccine Initiative
- ExxonMobil Foundation
- Fogarty International Center
- Foundation for Innovative New Diagnostics
- Foundation for The National Institutes of Health
- Genvec
- GlaxoSmithKline
- Howard Hughes Medical Institute
- Institute for OneWorld Health
- Institute of Tropical Medicine (Belgium)
- Institute of Tropical Medicine (Sao Paulo)
- International Clinical Epidemiology Network
- John D. and Catherine T. MacArthur Foundation
- Johns Hopkins Malaria Research Institute
- Kenya Medical Research Institute
- Kintampo Health Research Center
- London School of Hygiene & Tropical Medicine
- Malaria Research Center (India)
- Malaria Vaccine and Drug Testing Center
- Maxygen
- Medical Research Council
- Medicines for Malaria Venture
- Multilateral Initiative on Malaria
- National Center for Research Resources
- National Heart, Lung, and Blood Institute
- National Institute For Medical Research (Tanzania)
- National Institute For Medical Research (UK)
- National Institute of Allergy and Infectious Diseases
- National Institute of Child Health & Human Development
- National Science and Technology Development Agency
- Netherlands Ministry for Development Cooperation
- Pan American Health Organization
- PATH Malaria Vaccine Initiative
- Pfizer
- Research Initiative on Traditional Antimalarial Methods
- Rockefeller Foundation
- Roll Back Malaria Partnership
- Royal Tropical Institute
- Sir Dorabji Tata Centre for Research in Tropical Diseases
- South African Medical Research Council
- Special Programme for Research and Training in Tropical Diseases
- St. George's Hospital Medical Schools
- Sudanese Environment Conservation Society
- Swedish Research Council
- Swiss Agency for Development & Cooperation
- Swiss Tropical Institute
- Tropical Diseases Research Center
- Tropical Medical Research Institute
- United Kingdom Department for International Development
- United States Agency for International Development
- United States Centers for Disease Control
- United States Department of Defense
- University of Buea Faculty of Health Sciences
- University of Ibadan College of Medicine
- University of Khartoum, Institute of Endemic Diseases
- University of Mississippi
- University of Nebraska
- University of North Carolina
- University of Pennsylvania
- University of Washington
- Wanxing Biopharmaceuticals
- Wellcome Trust
- World Bank
- World Health Organization: Initiative for Vaccine Research
- World Health Organization: Roll Back Malaria Department
- Yale University

# Survey Focus

- Captured most recent funding data (2004)
- **Broken down into 6 R&D funding categories**
  - ▶ Basic research
  - ▶ Antimalarial drug discovery and development
  - ▶ Vaccine development and vaccine trials
  - ▶ Vector control research
  - ▶ Development of malaria diagnostics
  - ▶ Implementation research
- Original source funding (disbursements rather than commitments)
- Intramural vs. extramural
- Opinion questions

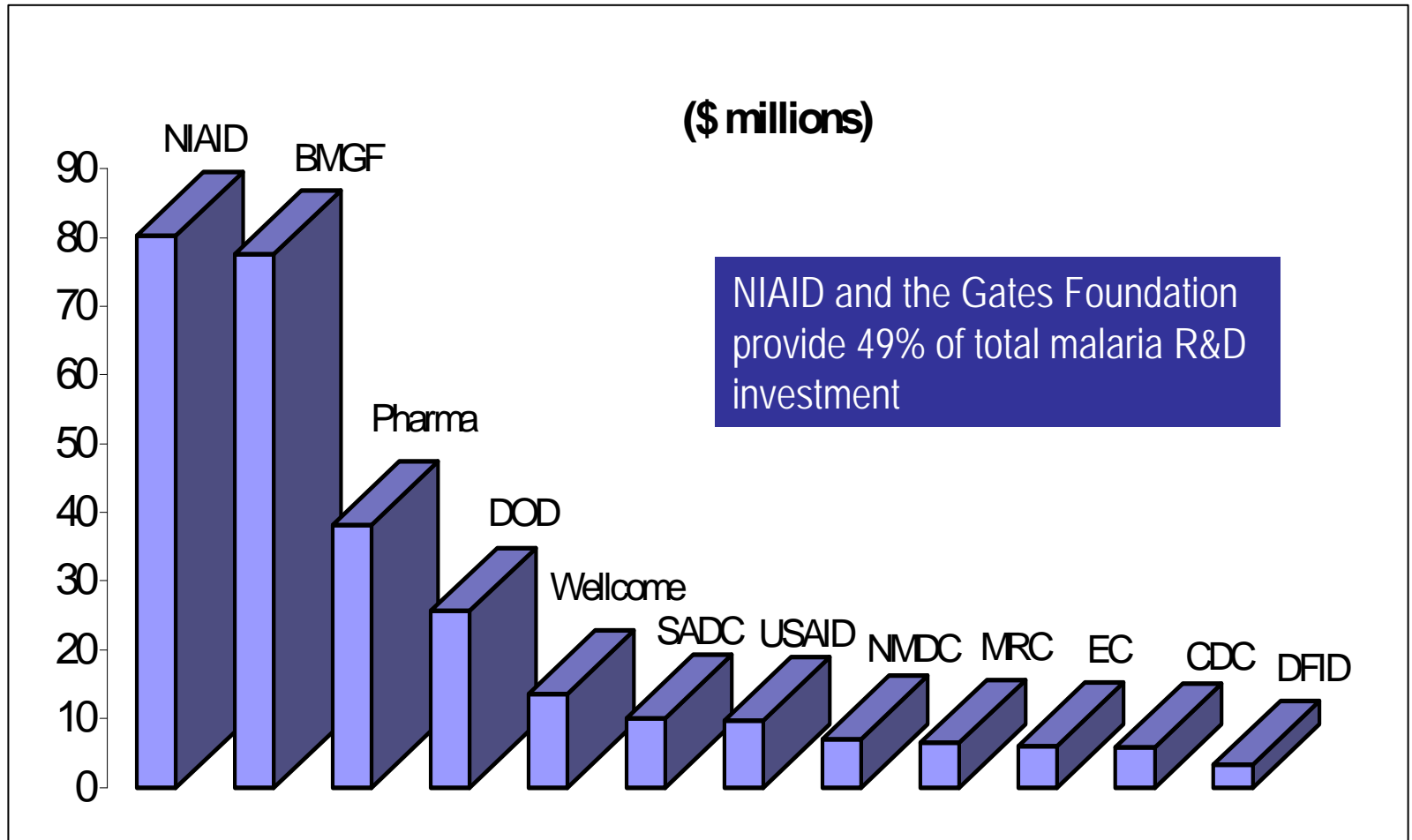
# Challenges & Limitations

Although a sound methodology was employed for conducting this study, there are potential limitations associated with the survey and data, which include:

- Non-response
- Double-counting
- Incorrectly reported data
- Inconsistently classified data
- Type of financial data provided
- Valuation of in-kind and intramural contributions
- Fiscal year difference
- Time lags in funding process

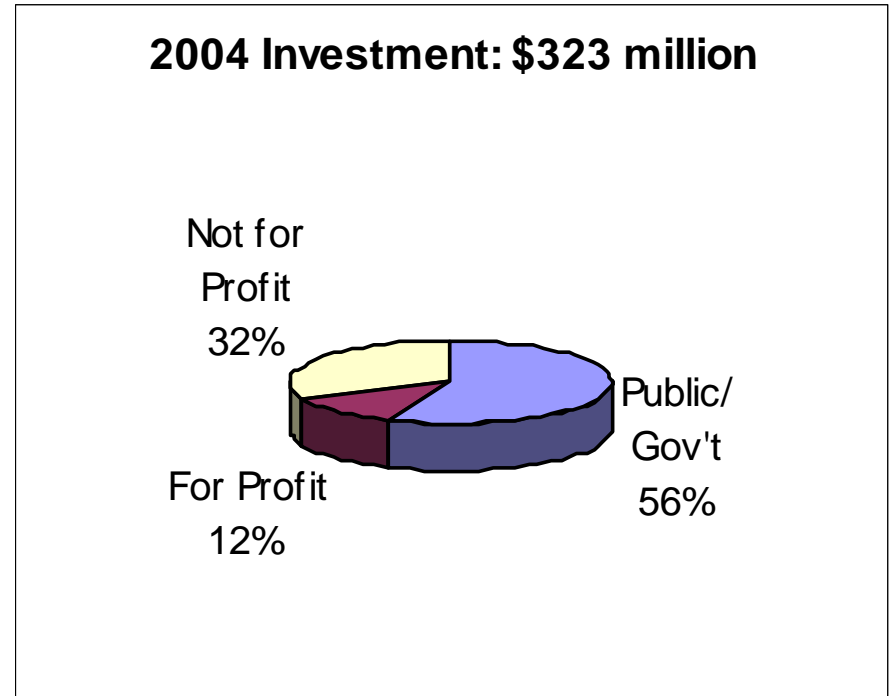
# Who Funds Malaria R&D?

# 12 Largest Funders of Malaria R&D



# Funding by Type

- Public sector is largest investor in malaria R&D
  - Provided \$182.5 million, 56% of the total investment
- Not-for-profit
  - Contributed \$101.7 million, 32% of the total investment
- For-profit
  - Provided \$39.2 million, 12% of the total investment



# Funding Comparison

## Total Health R&D and Malaria R&D Funding by Sector

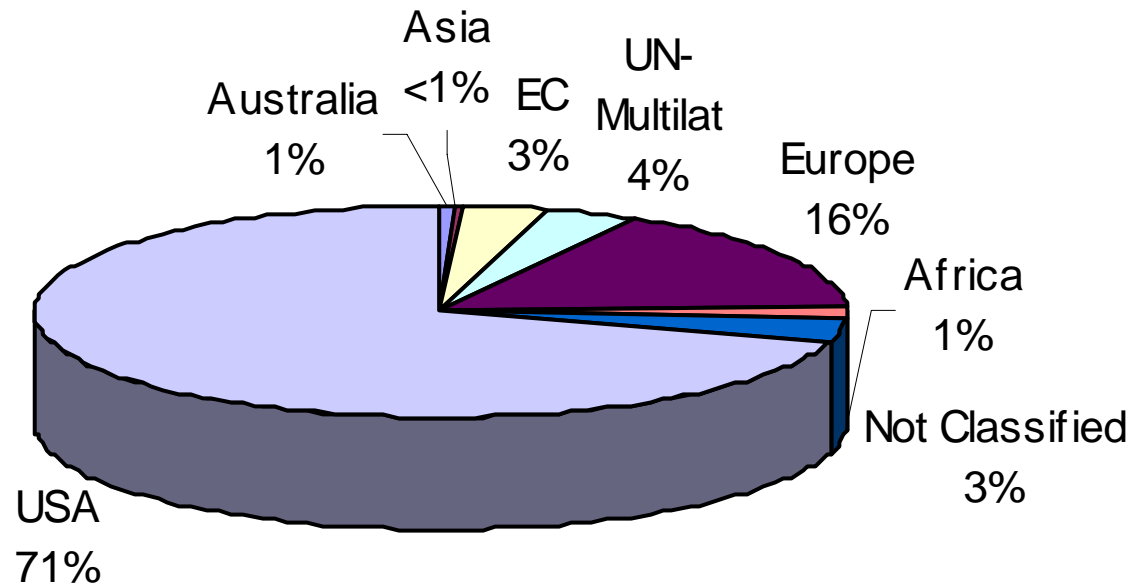
Sector	All Health-Related R&D <sup>a</sup>	Malaria R&D <sup>b</sup>
For-Profit	48%	12%
Public	44%	56%
Not-For-Profit	8%	32%

<sup>a</sup> From GFHR's *Monitoring Financial Flows for Health Research 2004*, p. 15

<sup>b</sup> Calculated from survey data

# Government Funding by Region/Country

2004 Total Government Investment: \$182.5 Million



# Where Does the Funding Go?

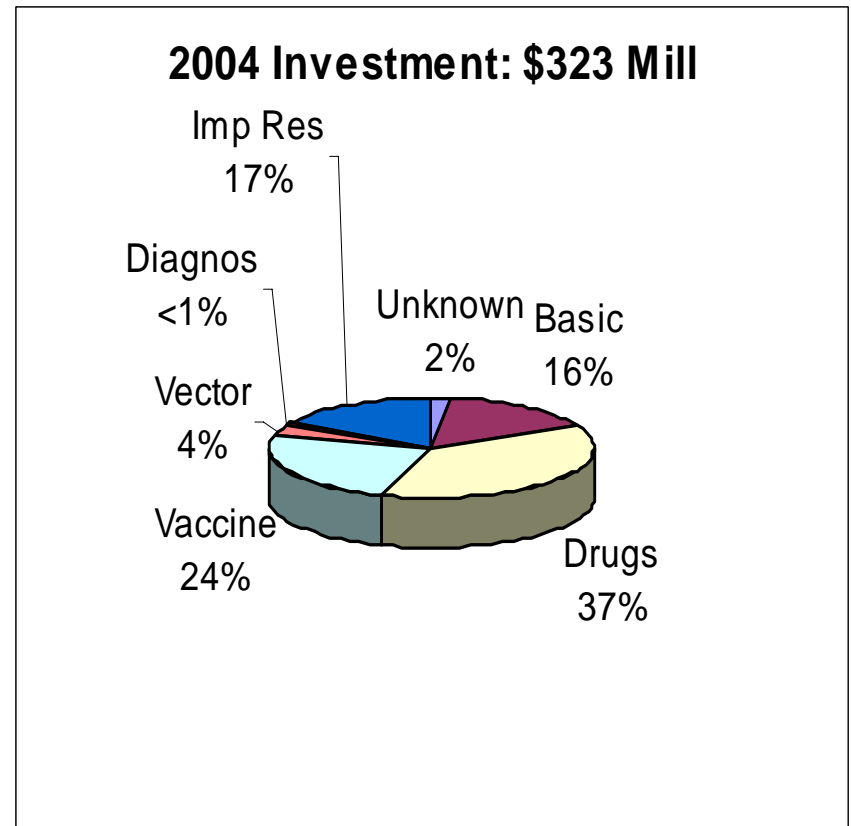
# Funding Managers

*34% of extramural funding or 24% of total investment was channeled through PPPs*

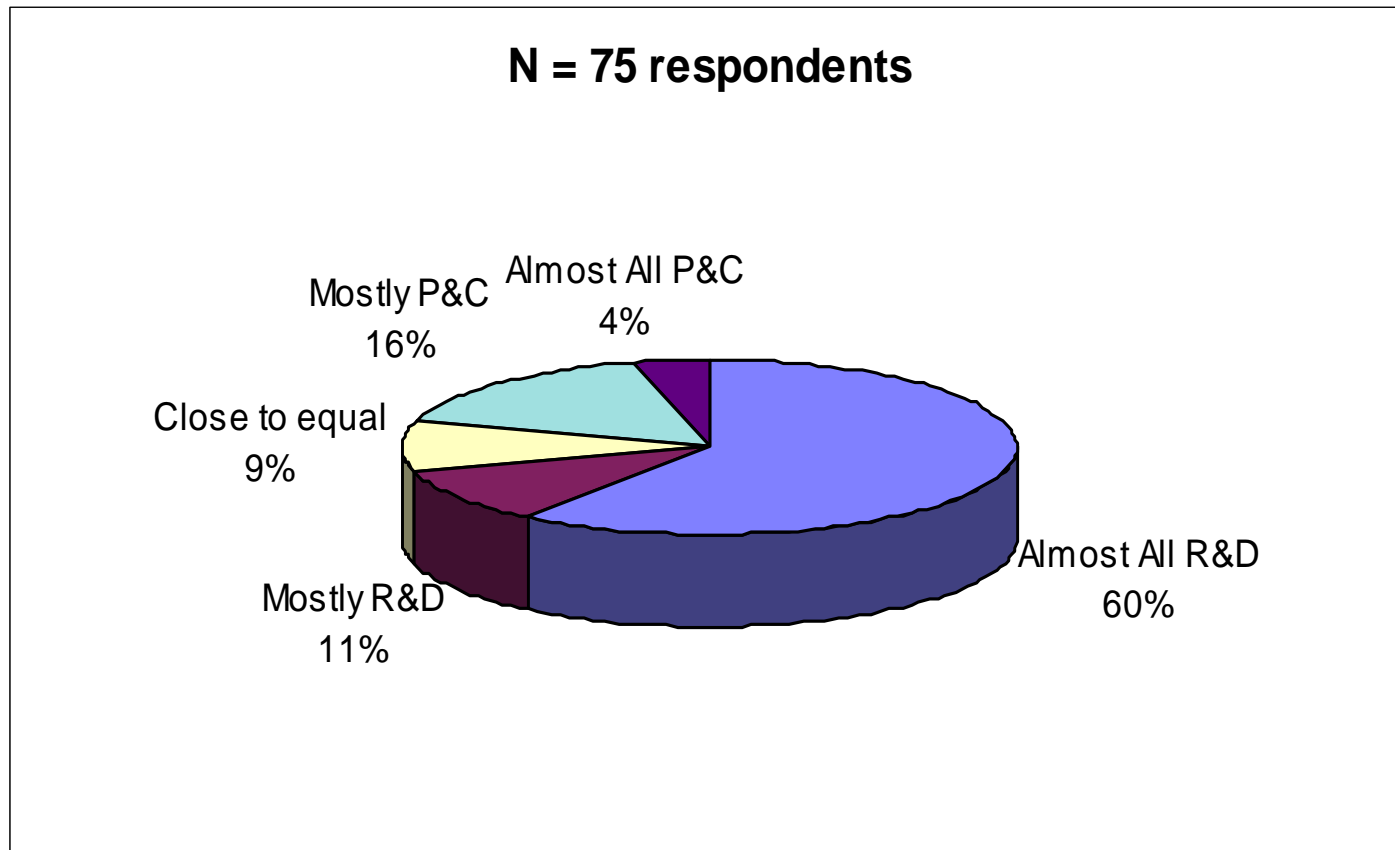
Survey Entity	Funding Received (\$ millions)
Medicines for Malaria Venture	28
PATH Malaria Vaccine Initiative	25
TDR	13
Multilateral Initiative on Malaria	4
Africa Malaria Network Trust	3
Drugs for Neglected Diseases Initiative	2
European Malaria Vaccine Development Consortium	2
Institute for OneWorld Health	1
World Health Organization: Initiative for Vaccine Research	0.5
European & Developing Countries Clinical Trials Partnership	0.5
<b>Total:</b>	<b>79</b>

# Total 2004 Investment by R&D Category

- Antimalarial **drug** discovery and development received \$120.2 million
- **Vaccine** development and vaccine trials received \$78.7 million
- **Implementation** research received \$54.6 million
- **Basic** research received \$50.8 million
- **Vector control** research received \$11.9 million
- Development of malaria **diagnostics** received \$718,000



# Funding of R&D vs. Prevention and Control



# Current vs. Past Funding

- Current investment in malaria R&D in 2004 is \$323 million
- According to the study, *Malaria Research: An Audit of International Activity*, the Wellcome Trust reported an investment of \$119.1 million (adjusted for 2004 dollars) in 1993  
*Investment from pharmaceutical and biotech companies was not included*
- Real funding for malaria R&D has increased by an estimated \$166 million between 1993 and 2004, with real growth at 8.3% per year, after accounting for biomedical R&D inflation.

# Disease Burden & R&D Spending

Condition	Global Disease Burden <sup>a</sup> (million DALYs)	Total Global Disease Burden	Deaths <sup>a</sup> (millions)	Total Global Deaths	R&D Funding (millions)	R&D Funding per DALY
Cardiovascular	148.190	9.9%	16.733	29.3%	\$9,402 <sup>b</sup>	\$63.45
HIV/AIDS	84.458	5.7%	2.777	4.9%	\$2,049 <sup>b</sup>	\$24.26
<b>Malaria</b>	<b>46.486</b>	<b>3.1%</b>	<b>1.272</b>	<b>2.2%</b>	<b>\$288<sup>b</sup></b>	<b>\$6.20</b>
Tuberculosis	34.736	2.3%	1.566	2.7%	\$378 <sup>b</sup>	\$10.88
Diabetes	16.194	1.1%	0.988	1.7%	\$1,653 <sup>b</sup>	\$102.07
Dengue	0.616	0.0%	0.019	0.0%	\$58 <sup>b</sup>	\$94.16

<sup>a</sup> DALY and death statistics are 2002 data, from WHO, *World Health Report 2004*

<sup>b</sup> Estimate for 2001-2002 funding from Lewison, G., et al., 2004, "Outputs and Expenditures on Health Research in Eight Disease Areas, 1996-2001," GFHR Forum 8, Mexico City. The authors use a bibliometric approach to estimate R&D funding and the paper has not been published in a peer review journal.

<sup>c</sup> 2001 data, from GFHR, *Monitoring Financial Flows for Health Research: 2004*

**Malaria R&D  
Alliance**

# Disease Burden & R&D Spending

- R&D funding average for all conditions is \$71.07 per DALY.
- Were malaria funded at the average rate for all conditions, it would receive over \$3.3 billion in annual R&D funding; it currently receives about 9% of that amount.

# New Chemical Entities Approved (1975-1999)

*Low Funding Results in Few Scientific Breakthroughs*

Therapeutic Area	Approved NCEs 1975 – 1999		NCEs per million DALYs <sup>a</sup>	Drug Sales per DALY <sup>a</sup>
	#	% of total		
Total for All Therapeutic Areas	1,393	100%	1.01	\$148
Tuberculosis	3	0.2%	0.11	\$11
Malaria	4	0.3%	0.10	\$5
HIV/AIDS	26	1.9%	0.37	\$44
Respiratory (non-infectious)	89	6.4%	1.44	\$307
Cardiovascular	179	12.8%	1.25	\$283

<sup>a</sup> Trouiller cites DALY data from WHO *World Health Report 1999*, and 1999 drug sales data

# Summary of Key Findings

- 12 entities contributed 88% of total investment
- 24% of total investment channeled through PPPs
- Governments & foundations provided 88% of total
- NIAID & BMGF funded 49% of total
- Drug research 37%, vaccines 24%, diagnostics <1%
- Real growth of \$166 million or 8.3%/yr--but started low
- All diseases equal, malaria R&D investment would be \$3bn/yr

# Report



Malaria Research & Development  
An Assessment of Global Investment

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- For Printed Copy:  
[alennon@malariavaccine.org](mailto:alennon@malariavaccine.org)

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