Report from the Global Malaria Programme

Malaria Policy Advisory Committee
Geneva, Switzerland

Pedro L. Alonso
10 April 2019
**The Global Targets**

**Vision: A world free of malaria**

<table>
<thead>
<tr>
<th>Goals</th>
<th>Milestones</th>
<th>Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2020</td>
<td>2025</td>
</tr>
<tr>
<td>1. Reduce malaria mortality rates globally compared with 2015</td>
<td>&gt;40%</td>
<td>&gt;75%</td>
</tr>
<tr>
<td>2. Reduce malaria case incidence globally compared with 2015</td>
<td>&gt;40%</td>
<td>&gt;75%</td>
</tr>
<tr>
<td>3. Eliminate malaria from countries in which malaria was transmitted in 2015</td>
<td>At least 10 countries</td>
<td>At least 20 countries</td>
</tr>
<tr>
<td>4. Prevent re-establishment of malaria in all countries that are malaria-free</td>
<td>Re-establishment prevented</td>
<td>Re-establishment prevented</td>
</tr>
</tbody>
</table>
We are likely to meet the GTS 2020 elimination targets but **not** the morbidity and mortality targets.

The world increasingly divided into 2 distinct groups.
Number of malaria cases worldwide, 2000–17

Cases

(millions)


Global Malaria Programme
Number of malaria deaths worldwide, 2000–17

Deaths


Global Malaria Programme
## Malaria cases by WHO Region, 2017

### Estimated malaria cases by WHO region, 2017

Estimated cases are shown with 95% upper and lower CI. Source: WHO estimates.

<table>
<thead>
<tr>
<th></th>
<th>African (000)</th>
<th>Americas (000)</th>
<th>Eastern Mediterranean (000)</th>
<th>South-East Asia (000)</th>
<th>Western Pacific (000)</th>
<th>World (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lower 95% CI</strong></td>
<td>184 500</td>
<td>880</td>
<td>3 630</td>
<td>8 560</td>
<td>1 395</td>
<td>202 800</td>
</tr>
<tr>
<td><strong>Estimated total</strong></td>
<td><strong>200 500</strong></td>
<td><strong>976</strong></td>
<td><strong>4 410</strong></td>
<td><strong>11 290</strong></td>
<td><strong>1 857</strong></td>
<td><strong>219 000</strong></td>
</tr>
<tr>
<td><strong>Upper 95% CI</strong></td>
<td>243 600</td>
<td>1 128</td>
<td>5 560</td>
<td>14 840</td>
<td>2 399</td>
<td>262 000</td>
</tr>
</tbody>
</table>

**Estimated P. vivax**

<table>
<thead>
<tr>
<th></th>
<th>African</th>
<th>Americas</th>
<th>Eastern Mediterranean</th>
<th>South-East Asia</th>
<th>Western Pacific</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lower 95% CI</strong></td>
<td>19</td>
<td>648</td>
<td>1 162</td>
<td>2 881</td>
<td>330</td>
<td>5 720</td>
</tr>
<tr>
<td><strong>Estimated total</strong></td>
<td><strong>701</strong></td>
<td><strong>723</strong></td>
<td><strong>1 366</strong></td>
<td><strong>4 200</strong></td>
<td><strong>523</strong></td>
<td><strong>7 510</strong></td>
</tr>
<tr>
<td><strong>Upper 95% CI</strong></td>
<td>2 197</td>
<td>843</td>
<td>1 773</td>
<td>5 900</td>
<td>774</td>
<td>9 900</td>
</tr>
</tbody>
</table>

**Proportion of P. vivax cases**

- 0.3% in African
- 74.1% in Americas
- 31.0% in Eastern Mediterranean
- 37.2% in South-East Asia
- 28.1% in Western Pacific
- 3.4% in World

*CI: confidence interval; P. vivax: Plasmodium vivax; WHO: World Health Organization.*
## TABLE 6.3.
Estimated number of malaria deaths by WHO region, 2010–2017

*Source: WHO estimates.*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>African</td>
<td>555 000</td>
<td>517 000</td>
<td>489 000</td>
<td>467 000</td>
<td>446 000</td>
<td>432 000</td>
<td>413 000</td>
<td>403 000</td>
</tr>
<tr>
<td>Americas</td>
<td>480</td>
<td>450</td>
<td>400</td>
<td>400</td>
<td>300</td>
<td>320</td>
<td>460</td>
<td>630</td>
</tr>
<tr>
<td>Eastern Mediterranean</td>
<td>8 070</td>
<td>7 280</td>
<td>7 340</td>
<td>6 750</td>
<td>8 520</td>
<td>8 660</td>
<td>8 160</td>
<td>8 300</td>
</tr>
<tr>
<td>European</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>South-East Asia</td>
<td>39 800</td>
<td>32 800</td>
<td>28 400</td>
<td>21 800</td>
<td>24 100</td>
<td>25 200</td>
<td>25 600</td>
<td>19 700</td>
</tr>
<tr>
<td>Western Pacific</td>
<td>3 770</td>
<td>3 340</td>
<td>3 850</td>
<td>4 600</td>
<td>4 420</td>
<td>2 860</td>
<td>3 510</td>
<td>3 620</td>
</tr>
<tr>
<td>World</td>
<td>607 000</td>
<td>561 000</td>
<td>529 000</td>
<td>500 000</td>
<td>483 000</td>
<td>469 000</td>
<td>451 000</td>
<td>435 000</td>
</tr>
<tr>
<td>World (children aged under 5 years)</td>
<td>444 600</td>
<td>405 000</td>
<td>371 000</td>
<td>344 000</td>
<td>322 000</td>
<td>302 000</td>
<td>283 000</td>
<td>266 000</td>
</tr>
</tbody>
</table>

*WHO: World Health Organization.*
Funding for malaria by channel (US$), 2010–17

Funding for malaria control and elimination 2010–2017, by channel (constant 2017 US$)

Sources: ForeignAssistance.gov, United Kingdom Department for International Development, Global Fund, NMP reports, OECD creditor reporting system database, the World Bank Data Bank and WHO estimates.


US$ 3.1 billion invested in 2017 | US$ 6.6 billion needed by 2020 to reach the GTS targets
ITN ownership and coverage (Sub-Saharan Africa), 2010–17

Percentage of population at risk with access to an ITN and sleeping under an ITN, and percentage of households with at least one ITN and enough ITNs for all occupants, sub-Saharan Africa, 2010–2017 Source: ITN coverage model from MAP.

ITN: insecticide-treated mosquito net; MAP: Malaria Atlas Project.

http://www.map.ox.ac.uk/
In the WHO African Region, the percentage of the population at risk protected by IRS declined from 10.1% (80 million) in 2010 to a low of 5.4% (51 million) in 2016, before rising to 6.6% (64 million) in 2017.
Pregnant women protected by IPTp (Sub-Saharan Africa), 2010–17

FIG. 3.5.

Data received from 35 countries for IPTp1 and 2, and from 33 countries for IPTp3.
Children protected by SMC in the Sahel, 2017

- 15 million children treated in 2017; of these, 53% received the recommended 4 doses
- 13.6 million children yet to be reached
Median percentage of febrile children by treatment seeking behaviour, sub-Saharan Africa, 2015–2017

Sources: Nationally representative household survey data from DHS and MIS.

CHW: community health worker; DHS: demographic and health survey; MIS: malaria indicator survey.

* Respondents can select more than one source of care for one episode of fever.

* CHW data are based on 13 countries: Burundi, Chad, Ghana, Liberia, Madagascar, Malawi, Mali, Mozambique, Nigeria, Rwanda, Senegal, Togo and Uganda.
Progress and Achievements

Malaria Threats Map

• Online mapping platform that harmonizes the display of data for:
  • *Anopheles* spp. malaria vector insecticide resistance
  • *P. falciparum* hrp2/3 gene deletions
  • *P. falciparum* and *P. vivax* antimalarial drug efficacy and drug resistance

• 13,350 unique visitors this year; average 2000 visits per month

who.int/malaria/maps/threats
Download the app for an interactive experience with the report’s country data:

- [App Store (iOS devices)](#)  |  [Google Play (Android devices)](#)
Getting back on track

- New response launched by WHO and RBM Partnership at high-level event in Maputo (Nov 2018)
- Initial focus on the 10 + 1 highest burden countries
- Lessons learned will be applied to other countries with a high burden of malaria
11 countries account > 70% of the global malaria burden

Estimated country share of total malaria cases in the 11 highest burden countries, 2017

- Nigeria (31%)
- Democratic Republic of the Congo (25%)
- Mozambique (11%)
- India (3%)
- Uganda (3%)
- Burkina Faso (3%)
- Ghana (4%)
- Niger (4%)
- Cameroon (4%)
- Mali (4%)
- United Republic of Tanzania (4%)
- Others (3%)

Global Malaria Programme
Of the 11 highest burden countries, only India achieved a reduction in malaria cases.
Malaria on the rise in 10 highest burden African countries

An estimated **3.5 more malaria cases** in the 10 highest burden countries in 2017 compared to the previous year.
Expected change in malaria case incidence if on target to meet GTS milestones for 2020 versus estimated change in case incidence between 2015 and 2017. Source: WHO estimates.

- United Republic of Tanzania, 100.6%
- Uganda, 99.8%
- Ghana, 99.2%
- Mozambique, 98.4%
- Democratic Republic of the Congo, 97.6%
- Niger, 96.8%
- Mali, 96.3%
- Nigeria, 95.8%
- Cameroon, 95.7%
- Burkina Faso, 95.4%

Funding levels fall far below estimated needs

GTS investment targets for the period 2016–2020 and estimated levels of investment in 2016 and 2017

- 2016: $2.9 billion
- 2017: $3.1 billion
- 2018: $4.9 billion
- 2019: $5.4 billion
- 2020: $6.6 billion

GTS resource needs vs. Amount invested
How to respond to the challenge?

- No new transformative tools to reach the field in the next 5 years
- Population growth
- Likely worsening of biological threats
- *Status quo* is not an option

A problem to be solved, not simply a task to be performed.

---

Global Malaria Programme

World Health Organization
An urgent and credible response

Four key mutually reinforcing response elements

- Best global guidance
- Political commitment
- Strategic use of information
- Coordinated response

Impact

Global Malaria Programme

World Health Organization
Guiding principles

1. Country-owned, country-led, and aligned with the GTS, the health-related Sustainable Development Goals (SDGs), national health goals, strategies and priorities;

2. Focused on high-burden settings;

3. Able to demonstrate an impact, with an aggressive approach to reducing mortality while ensuring progress is on track to reach the GTS targets for reducing malaria cases.

4. Characterized by packages of malaria interventions, optimally delivered through appropriate channels, including a strong foundation of primary health care.
Progress towards elimination (2010-2017)

Number of countries that were malaria endemic in 2000 with fewer than 10, 100, 1000 and 10,000 indigenous malaria cases in 2010 and 2017. Source: NMP reports.

- Fewer than 10,000: 46 countries in 2017
- Fewer than 1,000: 33 countries in 2017
- Fewer than 100: 26 countries in 2017
- Fewer than 10: 22 countries in 2017

NMP: national malaria programme.
The “E-2020 initiative”

- Special initiative formed by WHO in 2017 to support 21 malaria-eliminating countries in “getting to zero” by 2020
- Annual global forum brings together malaria programme managers from E-2020 countries
- 3rd global forum to be held in China from 18-20 June
Malaria cases in E-2020 countries, 2017

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.
Ten E-2020 countries on track to reach the GTS elimination target by 2020

<table>
<thead>
<tr>
<th>WHO region</th>
<th>Country</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>Algeria</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Botswana</td>
<td>1150</td>
<td>2989</td>
</tr>
<tr>
<td></td>
<td>Cabo Verde</td>
<td>48</td>
<td>423</td>
</tr>
<tr>
<td></td>
<td>Comoros</td>
<td>1143</td>
<td>3230</td>
</tr>
<tr>
<td></td>
<td>Eswatini</td>
<td>350</td>
<td>724</td>
</tr>
<tr>
<td></td>
<td>South Africa</td>
<td>4323</td>
<td>22517</td>
</tr>
<tr>
<td>Americas</td>
<td>Belize</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Costa Rica</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Ecuador</td>
<td>1191</td>
<td>1275</td>
</tr>
<tr>
<td></td>
<td>El Salvador</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Mexico</td>
<td>551</td>
<td>736</td>
</tr>
<tr>
<td></td>
<td>Paraguay</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Suriname</td>
<td>76</td>
<td>40</td>
</tr>
<tr>
<td>Eastern Mediterranean</td>
<td>Iran (Islamic Republic of)</td>
<td>81</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>Saudi Arabia</td>
<td>272</td>
<td>177</td>
</tr>
<tr>
<td>South-East Asia</td>
<td>Bhutan</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Nepal</td>
<td>2754</td>
<td>3829</td>
</tr>
<tr>
<td></td>
<td>Timor-Leste</td>
<td>148</td>
<td>36</td>
</tr>
<tr>
<td>Western Pacific</td>
<td>China</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Malaysia</td>
<td>266</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>Republic of Korea</td>
<td>602</td>
<td>436</td>
</tr>
</tbody>
</table>

Certified malaria-free by WHO
- On track, less than 100 indigenous cases
- Somewhat off track, between 100 and 999 indigenous cases
- Off track, more than 1000 indigenous cases
WHO malaria-free elimination certifications

- Countries that achieve at least 3 consecutive years of zero indigenous cases can apply for an official WHO certification of malaria elimination
- Two countries reached this milestone in 2018: Paraguay and Uzbekistan
- Argentina and Algeria are seeking the WHO certification in the spring of 2019 (decision expected in June)
Significant progress in reducing malaria in the Greater Mekong Subregion (GMS)

- Latest WHO bulletin (Dec 2018) shows a major decline in cases and deaths in the GMS between 2012 and 2017:
  - 75% reduction in malaria cases
  - 93% reduction in malaria deaths

- In 2018, progress in reducing *P. falciparum* malaria – the primary target in view of drug resistance:
  - Thailand (-28%)
  - Myanmar (-30%)
  - Cambodia (-28%)
Malaria cases in the GMS (2012-2018)

Confirmed Cases

Deaths

Source: WHO subregional database
Strategic Advisory Group on malaria eradication

• **Purpose of the SAGme:**
  • Analyze future scenarios for malaria
    o Biological, technical, socioeconomic, political and environmental determinants
    o Potential products of innovation
  • Provide advice to WHO on the feasibility, expected cost and potential strategies of malaria eradication over the ensuing decades
Setting the Prerequisites for Malaria Eradication

- **GTS 2030**
  Subnational strategies to get back on track to meet 2030 milestones

- **OTHER DISEASES**
  Achieve and reflect on eradication of polio

- **NEW TOOLS**
  Develop new tools to attack malaria in the most difficult places

- **REGIONS**
  Establish and achieve national and regional elimination goals

- **RESEARCH**
  Resolve bottlenecks through operational and implementation research

- **CAPACITY**
  Develop a national and global malaria workforce

- **FINANCING**
  Make key investments in strengthening people-centred health systems

- **HEALTH SYSTEMS**
  Develop new tools to attack malaria in the most difficult places

- **OTHER PRIORITIES**
  Build investment cases for contribution to other national priorities

- **LEADERSHIP**
  Countries take ownership of malaria elimination and eradication

Global Malaria Programme
New guidelines for malaria vector control

The new guidelines:

- consolidate more than 20 sets of WHO recommendations and good practice statements in a single resource
- cover 4 categories of intervention:
  - Core interventions
  - Supplementary interventions
  - Personal protection measures
  - Other interventions with potential public health value
- intended as a “living document”
  - Input sought from our stakeholders at: vcguidelines@who.int
Norms & Standards
Why did GMP review its policy making process?

- Perceived lack of transparency and lengthy process
- Inconsistencies in review standards
- Sub-optimal use of GMP output at country level
Analytical framework, 7 focus areas were identified

- **Upstream**
  - Academics, Donors, Innovators
  - Manufacturers
  - Regulatory Authorities
  - WHO Bodies
  - 1 Policy Pathways
    - 1a Entry Point
    - 1b Review Standards
    - 1c Roles & Responsibilities
    - 1d Process Sequence
  - 2 Review of Evidence
  - 3 WHO Bodies Composition

- **Perceived lack of transparency and lengthy process**

- **Downstream**
  - Procurers
  - Technical Partners
  - Implementers
  - Countries
  - 4 Policy Products
  - 5 Dissemination Mechanisms & Network
  - 6 Prioritisation Framework
  - 7 Operational Execution

- Sub-optimal use of WHO output at country level
GMP Advisory bodies structure

- **WHO Director-General**
  - Malaria Policy Advisory Committee (MPAC)
  - Malaria Elimination Oversight Committee (MEOC)
  - Malaria Elimination Certification Panel (MECP)
- **GMP Secretariat**
  - GMP Guidelines Development Group (GDG) + ad hoc ERGs
  - Malaria Vaccine Advisory Committee (MALVAC) w/ IVB
  - Other ad hoc technical consultations
  - Vector Control Advisory Group (VCAG) w/ NTD/PQ
  - Strategic Advisory Group on malaria eradication
  - Malaria Elimination Oversight Committee (MEOC)
Vector control advisory group (VCAG)

- Clarified processes:
  - Updated terms of reference
  - SOPs for VCAG applicants
  - Roles / responsibilities clearly defined between NTD, PQT-VC and GMP
  - Overview of products under VCAG review developed
- Streamlined running of meetings: option for off-cycle reviews
- Improved communications: new website and regular updates
VCAG: next steps

• Update / revise 2 key documents to align with revised policy-making process:
  • The evaluation process for vector control products
  • How to design vector control efficacy trials
• Further diversify VCAG membership
New malaria compendium

- Aims to simplify access for the end user by providing all WHO policy recommendations on malaria in one document
  - Includes only recommendations that have been approved by the Guideline Review Committee
  - Lists accompanying handbooks, manuals, information notes and policy briefs
The urgent need for new tools and strategies

- With current diagnostic tools and available drugs – no one should be dying of malaria
- Our tools for prevention are only moderately efficacious:
  - We do not have optimal drugs for chemoprevention
  - Current vector control tools are imperfect
  - achieving permanent reductions of vectorial capacity is not (yet) within our reach
  - We do not have a highly efficacious vaccine
- We face biological challenges
- The performance of health systems, including surveillance
RTS,S Malaria Vaccine Implementation Programme (MVIP)

THE RTS,S JOURNEY: KEY MILESTONES

- **1984–1997**: Early development of RTS,S
- **2009–2014**: Efficacy proven through large-scale clinical trial
- **2016**: WHO recommends phased introduction in selected areas
- **2017**: Ghana, Kenya, Malawi announced as MVIP partners

2004: Efficacy first shown in young children
2015: European Medicines Agency issues positive opinion
2016: Funding for MVIP secured

PROVEN RESULTS

Children receiving four doses of RTS,S experienced significant reductions in malaria and malaria-related complications, in comparison with those who did not receive RTS,S.

- Clinical malaria: 4 in 10 fewer cases
- Severe malaria: 3 in 10 fewer cases
- Severe malaria anaemia: 6 in 10 fewer cases
- Blood transfusion: 3 in 10 fewer cases
- Malaria hospitalization: nearly 4 in 10 fewer cases
RTS,S Malaria Vaccine Implementation Programme (MVIP)
• Vaccine introductions imminent
  • Ghana and Malawi targeting 23 April, Kenya expected soon after
  • At least 360,000 children to be vaccinated in the intervention areas across the 3 countries

• Proposed framework for policy decision on RTS,S endorsed by SAGE on 3 April
  • Clarifies how and when data collected through the programme will be utilized to inform a policy recommendation on wider use of the vaccine