



Centre de Recherches Médicales de Lambaréné
Fondation Internationale de l'Hôpital Albert Schweitzer

Malaria Control Tools

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CERMEL



Control of malaria

"To reduce malaria transmission to a level where it is no longer a public health problem "

CDC.gov/malaria

Interventions and delivery

Prevention

- Insecticide-treated nets (ITNs)
- Indoor residual spraying (IRS)
- Larval control and other vector control interventions
- Intermittent preventive treatment of malaria in pregnant women (IPTp)
- Intermittent preventive treatment of malaria in infancy (IPTi)
- Mass drug administration and Mass fever treatment

CDC. gov/malaria

Interventions and delivery

Prevention

Insecticide-treated nets (ITNs)

- Barrier + Insecticide (ITNs > UTNs)
- ITNs kill and repel mosquitoes
- reduce malaria illness, severe disease, and death.
- reduce all causes death by about 20% in children under 5.
- 50% coverage = reduced mosquitoes and length of life
- Protection for the entire community

CDC.gov/malaria

Interventions and delivery

Prevention

Indoor residual spraying (IRS)

- kills mosquitoes on the sprayed surface after they have fed.
- IRS prevents transmission of infection to other persons.
- IRS is effective when the coverage is high (> 80% of households in an area).

CDC.gov/malaria

Interventions and delivery

Prevention

Larval Control

- Intends to eliminate mosquitoes before they can transmit malaria
- Larval habitats may be small, widely dispersed, and transient
- Source reduction, chemical larviciding, biological control
- Effectiveness is generally weak

CDC.gov/malaria

Interventions and delivery

Prevention

Other Vector Control Interventions

- Area Spraying
- Personal Protection Measures
- Sterile Male Release
- Genetic Modification of Malaria Vectors

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Interventions and delivery

Prevention

Intermittent Preventive Treatment in Pregnancy

- Changes of immune systems during pregnancy and placenta for parasites to bind.
- IPTp is curative dose of an effective antimalarial drug (currently SP).
- Each routine antenatal care visit, starting in the second trimester

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Interventions and delivery

Prevention

Intermittent Preventive Treatment During in Infancy (IPTi)

- SP-IPTi reduce clinical malaria and anemia in under 1
- SP-IPTi through the EPI at 10 weeks, 14 weeks, and about 9 months of age, regardless of their malaria infection status.
- entomological inoculation rate ≥ 10) Pfdhps 540 mutation of $\leq 50\%$
- < 6 million cases of malaria and save tens of thousands of lives every year in Africa

CDC.gov/malaria

Interventions and delivery

Prevention

- Mass screening and treatment (MSAT)
 - Mass fever treatment (MFT)

Interventions and delivery

Case management (diagnosis and treatment) of patients with malaria

- Microscopy and rapid diagnostic tests
- Uncomplicated malaria-outpatient basis
- Severe malaria – Hospitalization
- Artemisinin-based combination treatments, (AL and AS-AQ)
- Quinine and AS parenteral

CDC, 2012,

WHO, 2015

Achievements

- 40-fold increase in spending on malaria commodities US\$ 40 million in 2004 to US\$ 1.6 billion in 2014.
- Malaria commodities accounted for 82 % of international malaria spending in 2014
- ITNs responsible for 63 % of total commodity spending, followed by ACT (25 %), RDTs (9 %) and IRS(3 %).

Cibulskis, 2016

Achievements

- Much of the increase was driven by international funding
- 78 % of malaria programme funding in 2014
- Most directed to the WHO African Region (82 %).

Cibulskis, 2016

Malaria report-WHO 2015

Achievements

- infection prevalence in children age 2-up-to-10 across endemic Africa
- PR2-10: year 2000 = 33%, 95% interval (31–35%); year 2015 = 16%, (14–19%)
- Three-quarters of this decline occurring after 2005.

Bhatt, 2015

Achievements

- 187 (132–259) million clinical cases of malaria in 2015
- Case incidence declined by 40%
- from 321 (253–427) per 1000 persons per annum in 2000 to 192 (135–265) per 1000 persons p.a. in 2015,
- All but one of the 43 mainland endemic countries meeting the target of reversing incidence trends by 2015
- 19 (17-25) achieving >50% decline, and 7 (6-7) declining by > 75%

Bhatt, 2016

Achievements

- Marked shift in the distribution of exposure level
- Population exposed to hyper- or holo-endemic malaria falling from 33% (30-37%) to 9% (5-13%)
- population of stable endemic Africa experiencing very low transmission
- PR2-10 (less than 1%) has increased six-fold since 2000
- 121 (110-133) million people living in settings where elimination campaigns can be considered.

Bhatt, 2015

Achievements

- ITNs were by far the most important intervention across Africa,
- An estimated 68 (62-72)% of the declines in PR seen by 2015 .
- ACT and IRS contributed 19 (15-24)% and 13 (11-16)% respectively,
- Both ACT and IRIS had larger proportional contributions where their coverage was high
- Proportional contributions do not necessarily reflect the effectiveness of each tool

Bhatt 2015

Achievements

- Interventions averted 663 (542–753) million clinical cases since 2000
- 68 (62-73)%, 22 (17-28)% and 10 (5-14)% were contributed by ITNs, ACTs, and IRS, respectively
- Driven primarily by how early and the scale of deployment

Bhatt, 2015

Perspectives

- RTS,S/AS01 received a positive scientific opinion from EMA for immunization of children aged 6 weeks to 17 months against malaria.
- RTS,S/AS01 showed efficacy of 30-60% in children aged 5-17 months at the time of first vaccination
- Lower VE in infants when vaccine was co-administered with other EPI vaccines
- VE wanes rapidly
- WHO recommends pilots implementation for effectiveness, feasibility and safety in children 5-17 months

Agnandji, 2015 ; WHO, 2015

Perspectives

- RTS,S/AS01 vaccine's short-term efficacy could potentially be integrated into elimination strategies
- Low malaria incidence
- High antimalarial drug resistance
- Southeast Asian
- And may be sub-Saharan Africa?.

Gosling 2016

Perspectives

- Once the malaria epidemiologic transition in sub-Saharan Africa became obvious
- malaria control strategies including the proposed programmatic use of RTS,S/AS01 should have been re-examined.
- Alternative uses of the vaccine outside the EPI in sub-Saharan Africa should have been explored.

Gosling, 2016

Perspectives

- Proof that malaria can be controlled
- It is possible to identify areas where elimination is a target
- But poorest countries, areas within a country remain highly affected and effort must be increased
- Resurgence or Elimination?



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THANKS