The Global Plan for Artemisinin Resistance Containment (GPARC)

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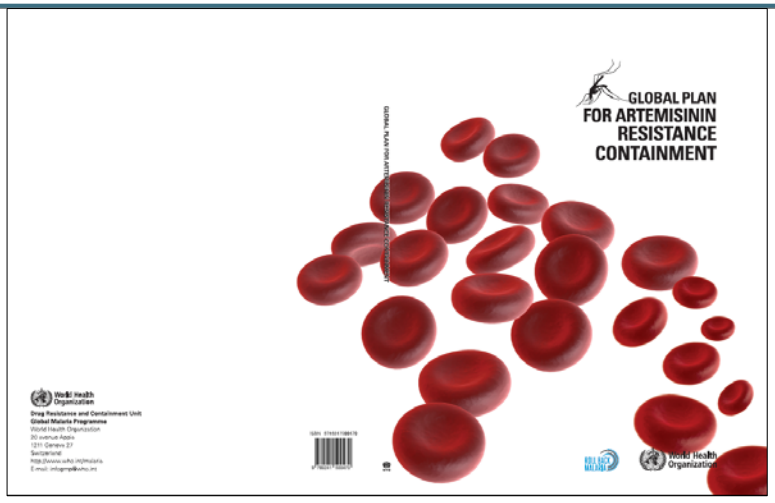
Dr Pascal Ringwald
Drug Resistance and Containment Unit

World Health Organization

ROLL BACK MALARIA

GPARC launch – 12 January 2011



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Global Plan for Artemisinin Resistance Containment (GPARC)

Goal: Protect ACTs as an effective treatment for falciparum malaria

- Define priorities to contain and prevent artemisinin resistance (AR)
- Motivate actions and provide clear accountabilities for key stakeholders
- Mobilize resources to fund AR containment and prevention
- Increase collaboration and coordination on AR containment activities
- Define governance mechanisms and indicators to assess progress

Developed with input from ~100 partners across RBM partnership
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GPARC action pillars

Contain or eliminate artemisinin resistance where it already exists
Prevent artemisinin resistance where it has not yet appeared

1. Stop the spread of resistant parasites
2. Increase monitoring & surveillance to evaluate the AR threat
3. Improve access to diagnostics & rational treatment with ACTs
4. Invest in artemisinin resistance-related research

5 Motivate action and mobilize resources

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GPARC builds on existing control and elimination efforts, with focus on interventions unique to AR

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GPARC recommendations customized locally (by Tier) based on degree of AR threat

Endemic country to evaluate its level of AR risk and apply recommendations to design a containment or prevention plan

Tier 1	Areas with credible evidence of artemisinin resistance
Tier II	Areas with significant inflows of people from Tier I areas, including those immediately bordering Tier I
Tier III	Areas with no evidence of artemisinin resistance and limited contact with Tier I areas

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GPARC: summary of recommendations by Tier

Tier III	Tier II	Tier I
Good Control	Intensified & accelerated control	Intensified & accelerated control to universal coverage
More routine monitoring	Intensified monitoring, esp. on border near foci	Intensified monitoring, esp. around foci
Eliminate monotherapies & poor-quality drugs	Actively eliminate monotherapies & poor-quality drugs	Aggressively eliminate monotherapies & poor-quality drugs
	Lower transmission; focus on mobile & migrant populations	Lower transmission; focus on mobile & migrant populations
		Consider ACD, MSAT, FSAT or MDA

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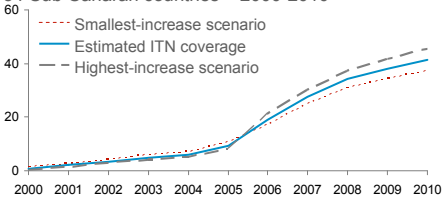
I. Stop the spread of resistant parasites

Preventive measures to reduce transmission – current status

Use of vector control increasing, but room for improvement

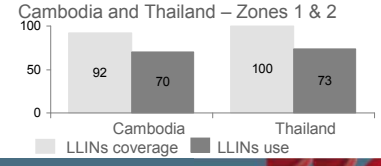
% households protected by vector control (ITN and/or IRS)

34 Sub-Saharan countries – 2000-2010



% coverage achieved in containment project

Cambodia and Thailand – Zones 1 & 2



Reducing transmission to stop survival & spread of resistant parasite

- Contains resistant parasites where they emerge
- Prevents spread to new areas
- Reduces potential impact if resistance were to take hold
- Is especially important among mobile/migrant populations likely to transport resistant parasites

Challenges

- Lack of perfect set of tools for SEA
- Mobile and migrants don't have good access to malaria prevention/treatment services
- Behavior of mobile/migrant population not well understood to design intervention programs

Source: *Saving lives with malaria control: counting down to the Millennium Development Goals*, Geneva, Roll Back Malaria, 2010
http://www.who.int/malaria/diagnosis_treatment/arcp/villageworkers/en/index.html

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II. Increase monitoring and surveillanc

Evaluate the artemisinin resistance threat – current status

Routine ACT therapeutic efficacy data unavailable in many endemic countries

Regular drug monitoring to evaluate AR threat

- Ensures countries are using the appropriate 1st line treatment
- Provides an understanding of the of extent artemisinin resistance
- Allows timely identification of new AR foci

Challenges

- Logistically difficult in some settings
- Missing tools: no in vitro test or molecular marker available
- Not feasible in areas of very low transmission
- Not always conclusive; host factors can confound results

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Source: WHO database on antimalarial drug efficacy monitoring by country (referenced August 2010)

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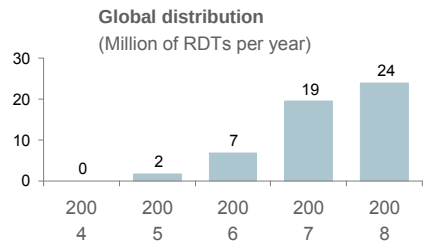
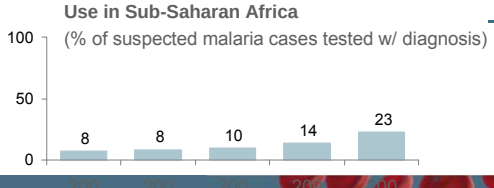
III. Improve access to diagnostics and A

Consistent and accurate diagnostic testing – current status

Increasing availability and use of RDTs





Increased use of diagnostic testing

- Limits the use of antimalarials to treat non-malaria fevers (esp. as transmission declines) which
  - puts partner drugs at risk
  - wastes valuable ACTs
- Helps track number of malaria cases
- Enables confirmation of suspected treatment failures

Challenges

- Distribution and inventory management
- Variability in RDT quality and performance
- Many providers / patients unaware of harm of treating non-malaria cases with ACTs
- No good models for RDT use in informal private sector

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Source: Geneva, World Health Organization, Global Malaria Programme data, 2010

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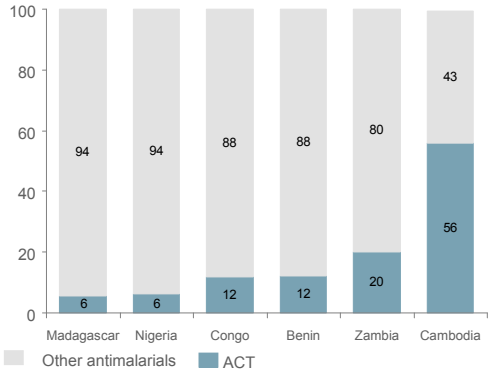
III. Improve access to diagnostics and AC

Access to affordable, quality-assured ACTs – current status

ACTs: 1st line treatment in most countries; but not used consistently yet

Distribution of antimalarial by type (%)



ACTs reduce the risk of AR development

Mutual protection provided by two drugs reduces risk of AR

Full course of ACT leads to

- Rapid clearance of parasites
- Resolution of symptoms
- Reduction of gametocyte carriage to limit transmission

Challenges

- **Access in public sector:** recurrent stock outs, limited geographic access to public health facilities, etc.
- **Access in private sector:** high price of ACTs, poor regulation and enforcement mechanisms, etc.

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Source: ACTwatch Outlet Survey Reports (Baseline as of 2008) Copyright © 2010 by Population Services International

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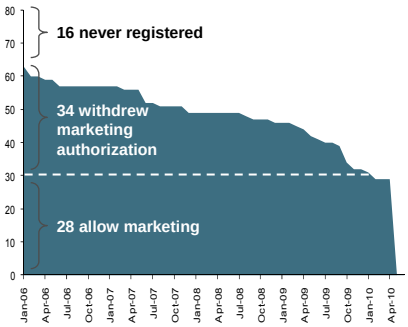
III. Improve access to diagnostics and AC

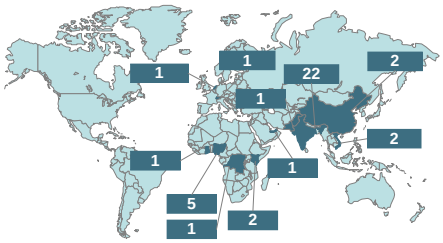
Removal of oral artemisinin-based monotherapies – current status

28 countries still allow marketing of monotherapies...

Countries providing marketing authorization[1]
(as of Sept 2010)



... and 39 companies still known to produce monotherapies



Oral artemisinin-based monotherapies believed to contribute to AR development and spread

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[1] Countries/territories which have adopted ACTs as 1st-line treatment policy
Source: http://www.who.int/malaria/marketing_of_oral_artemisinin_monotherapies/en/index.html

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III. Improve access to diagnostics and AC

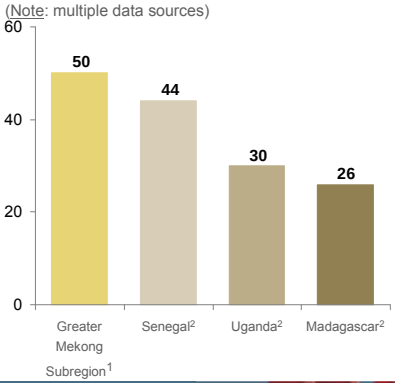
Removal of substandard and counterfeit drugs – current status

Prevalence of substandard and counterfeit drugs in endemic countries

Substandard and counterfeit antimalarials

% of samples that did not meet requirements (QC test)

(Note: multiple data sources)



Use of poor-quality drugs may contribute to resistance

- Drugs with insufficient levels of artemisinin derivates may allow resistant parasites to survive and multiply

Challenges

- Limited data on prevalence of poor-quality drugs in endemic countries
- Difficult to track origin or sources
- Variety of causes, each needing different response (negligence, insufficient human / financial resources, deliberate action)
- Hard to verify ACT quality and authenticity at provider or retailer level

1: *Survey of the Quality of Selected Antimalarial Medicines Circulating in Madagascar, Senegal, and Uganda*, Washington, The United States Pharmacopeia Convention, 2009 ;
2: Newton P.N. et al, (2008), A collaborative epidemiological investigation intro the criminal fake artesunate trade in South East Asia, *PLoS Med*, 5(2):209-219

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IV. Invest in AR-related research

Category	GPARC priority
Laboratory research	**Enable faster detection of resistance, e.g.** • Molecular basis of AR • Associated genotypes and phenotypes
Research & Development	**Ensure availability of new treatments, e.g.** • New antimalarials • New transmission blocking formulations • New diagnostic tools for mass screening
Applied & field research	**Determine if new or existing tools applied in novel ways can help manage AR, e.g.** • Epidemiological and transmission reduction tools • Effectiveness of multiple 1st line therapies to delay resistance
Operational research	**Improve effectiveness of tools and programs in the field, e.g.** • Scalable models for reaching mobile and migrant populations • Behavioral patterns explaining consumption of monotherapy
Mathematical modeling	**Predict the spread and impact of artemisinin resistance, including the impact of interventions intended to manage it**

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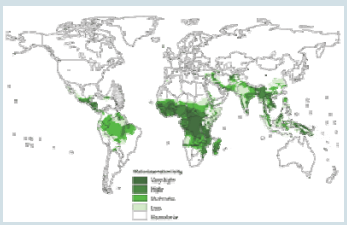
V. Motivate action and mobilize resources

GPARC success requires the support of many stakeholders

GPARC: rallying cry for all members of Roll Back Malaria Partnership

Malaria-Endemic Countries



NGOs and implementation partners
International & local NGOs, CBOs

malaria NO MORE, PATH, psi, Clinton Foundation

Research and academia

FIND, EANMAT, GAVI

Funding agencies and bi-laterals

The Global Fund, Bill & Melinda Gates Foundation, United Nations Foundation, CDC, USAID, NetGhana, DFID, wellcome trust, NIAID, NORAD

Multilaterals

UNDP, ADB, unicef

Private sector

World Economic Forum, ExxonMobil, Sumitomo Chemical, Yara, Vestergaard Frandsen, Bayer, P&G, sanofi aventis, GSK, Novartis, Johnson & Johnson

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V. Motivate action and mobilize resources

Proposed areas of involvement by constituency

	Global policy & norms	Surveillance & reporting	Contain. & implement.	Resource mobilization	Advocacy & political engagement	Research	Local policy & regulation	Emergency response
Endemic countries Tier I, II & III	✓	✓	✓	✓	✓	✓	✓	✓
Multilaterals WHO - GMP	✓	✓	✓	✓	✓	✓[1]	✓	✓
Multilaterals WHO Regional & Country offices	✓	✓	✓	✓	✓		✓	✓
Multilaterals all other			✓	✓	✓			✓
Research & academia		✓		✓	✓	✓		
NGOs International & local NGOs, CBOs			✓	✓	✓			✓
Private sector		✓	✓	✓	✓	✓		✓
Funding agencies and bi-laterals		✓	✓	✓	✓	✓	✓	✓

✓ Primary ✓ Secondary

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1. Research conducted by WHO-TDR