

PESTALTO INTERNATIONAL HEALTH SERVICES

A Division of Pestalto Environmental Health Services Inc.

MOSQUITO LARVICIDING

MALARIA MOSQUITO MANAGEMENT

Part 2

Successful Urban Malaria Control Program Characteristics

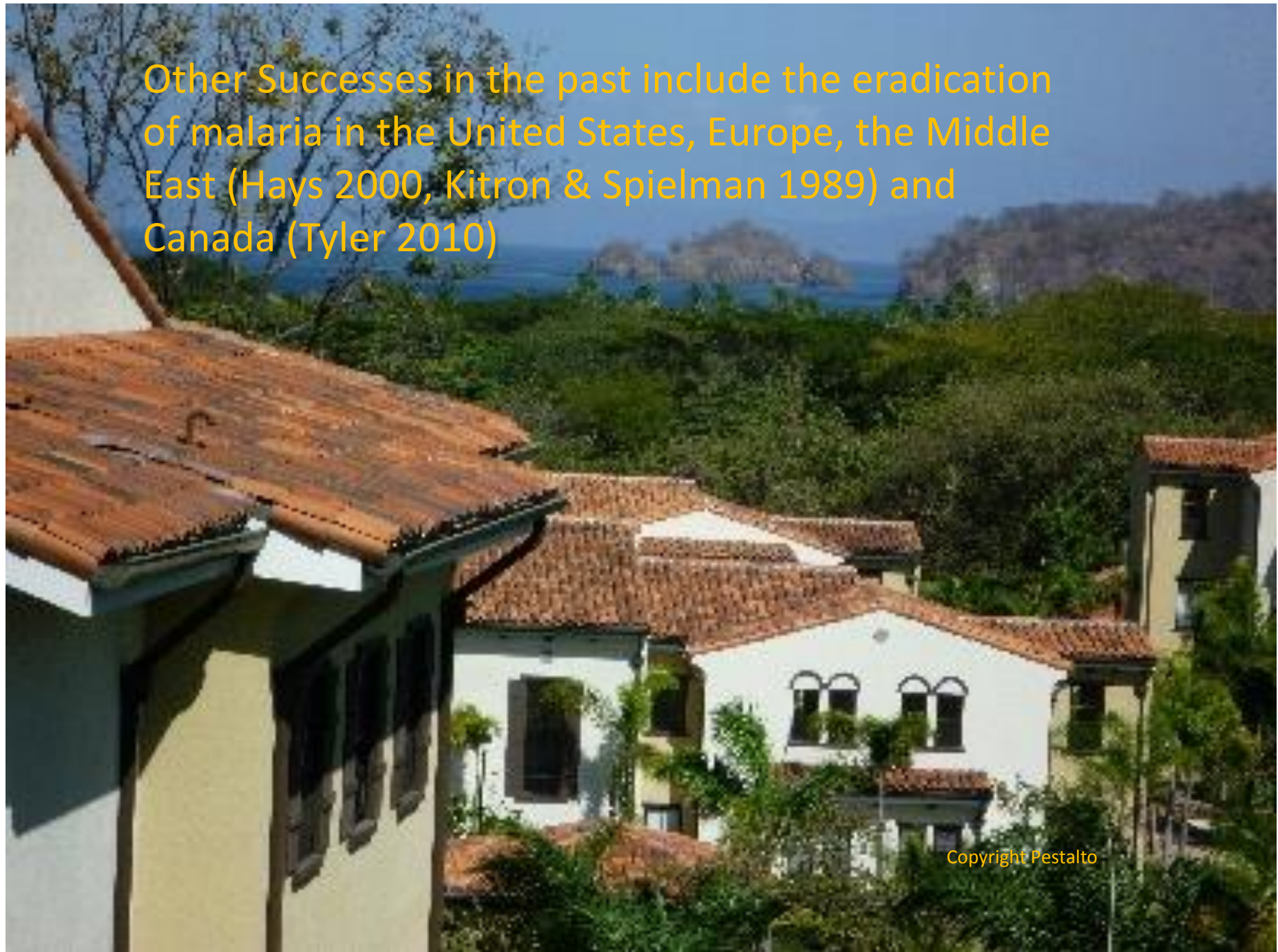
DE CASTRO et al. 2004

- Environmental management a central feature
 - Mosquito Surveillance, Larviciding & Drainage
- Packages of interventions adaptively tuned to minimize number of malaria cases per year
- 3 to 5 years required before a given package exhibited a high level of performance
- Program staff contained people knowledgeable about clinical aspects of malaria, ecology, epidemiology, entomology and hydrology
- The implementation strategies were specific to particular localities
- **Diagnosis and treatment of malaria cases, use of bed nets and chemical insecticides were a necessary but not sufficient set of components to ensure a sustainable program**



Other Successes in the past include the eradication of malaria in the United States, Europe, the Middle East (Hays 2000, Kitron & Spielman 1989) and Canada (Tyler 2010)

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REASONS FOR RESURGANCE OF MALARIA OVER THE PAST 50 YEARS

- End of the colonial period & political stability
- Infrastructure and financing was not uniformly sustained
- Adverse economic conditions and policies of decentralization resulted in the deterioration of health systems
- Chemotherapy was the only anti-malaria intervention left in place
- Drug resistance

CURRENT INITIATIVES



USAID
FROM THE AMERICAN PEOPLE



President's Malaria Initiative



LONG LASTING INSECTICIDE TREATED NETS

A mother and her child test out their ITN in Rufiji District, [Tanzania](#). To increase the likelihood that these life-saving commodities will be used, nets come in a variety of shapes, colors, and sizes to meet consumer preferences.

PROBLEMS WITH NETS

- Many huts have limited space not conducive to the use of one or more nets
- Only pregnant women and young children are provided with the nets; most of the population not protected
- Restricts people to dwellings and limits economic and social activities from 6 to 6
- Bed nets are stifling with 110°F and high humidity during the malaria season and not conducive to sleep



INDOOR RESIDUAL SPRAYING

A sprayer practices his technique on a wall in Zanzibar during a training session, where IRS, in combination with other malaria control efforts, has contributed to a dramatic reduction in the number of confirmed cases of malaria in young children.

Source: Karie Atkinson/USAID

PROBLEMS WITH INDOOR SPRAYING

- Only homes are treated and not other structures with malaria mosquitoes
- Some malaria vectors have been observed to feed outside of dwellings
- Not all dwellings are treated





WOMEN AND YOUNG CHILDREN & MEDICAL TREATMENT OF INFECTED PEOPLE


A worker reviews medicine stock cards at the Chainama Clinic in Lusaka, Zambia. Monitoring stocks of drugs is essential to avert shortages and overstocking, and is especially important for drugs such as ACTs, which are expensive and have a short shelf life. PMI supports training of pharmacy workers to carry out routine monitoring of drug supplies.

A photograph of a person standing in a hallway with green doors and pillars. The person is wearing a dark shirt and pants, and is looking towards the right. The hallway is brightly lit, and there are several steps leading up to a door on the right. The text is overlaid on the image in red.

PROBLEMS WITH MEDICATIONS

- ❖ Resistance develops to new medications relatively quickly
- ❖ Prophylactic treatments only for pregnant women and children under 5 years; large proportion of the population not protected including immigrants
- ❖ Black market medicines of low concentration therefore useless and promote resistance
- ❖ Limited availability
- ❖ Not used properly
- ❖ Not transported properly

UN Global Malaria Action Plan Role Back Malaria



RBM Partnership was launched in 1998 by WHO, UNICEF, UNDP and the World Bank, in an effort to provide a coordinated global response to the disease. The RBM Partnership is led by the [Executive Director](#), and served by a [Secretariat](#) that is hosted by the World Health Organization in Geneva, Switzerland. The Secretariat works to facilitate policy coordination at a global level.

PROGRAM COMPONENTS ROLE BACK MALARIA

- Long Lasting Insecticide Treated Nets
 - Nets, nets & more nets
- Indoor Residual Sprays
- Drug Treatments
 - Preventative with pregnant women & children
- Minor Mention of Mosquito Larviciding as an Option



World Health
Organization

GOALS

PRESIDENT'S MALARIA INITIATIVE

REDUCE DEATH FROM MALARIA BY 50%

More recently – Eliminate Malaria by 2015

ROLE BACK MALARIA

ERADICATE MALARIA BY 2015

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CONCLUSION & DISCUSSION

Fillinger et al. 2009

- Vector control with microbial larvicides and insect treated bed nets combined resulted in a two-fold reduction in new malaria infections compared to ITNs alone
Thus, the expansion to IVMM to include anti-larval measures to ITN programs can provide substantial additional protection against the malaria parasites.
- The “current best practices” of malaria control has several long-term weaknesses:
 1. Over-reliance on drugs and insecticides targeting adult mosquitoes and the likelihood that the development of resistance will threaten the future efficacy of malaria control (N’Guessan et al. 2007).
 2. Behavioural changes in humans, with people less inclined to sleep under ITNs when vector populations decline.
 3. Behavioural changes in mosquito adults in response to personal protection measures, e.g. earlier biting – before bed time, outdoor biting (Geissbühler et al. 2007’, Killeen et al. 2006).
 4. Over-reliance on a single vector control tool that will be less effective than integrated vector management at reducing vector populations