Use of IRS in South Africa and the LSDI

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Introduction

- Although low transmission, malaria remains one of the top 3 diseases in South Africa
- SA is on southern fringe of malaria distribution in Africa
- Low altitude area of
  - KwaZulu-Natal
  - Limpopo Province
  - Mpumalanga

Historical use of IRS in South Africa

- History before 1905 is unknown
- First control efforts in 1910 advocated quinine, screens and bednets
- Anti-larval measures in 1924
- 1933 kerosene-pyrethrum mixture sprayed inside houses and marked the start of indoor spraying
- 1946 DDT used for house spraying and larviciding

- 1996 DDT replaced by pyrethroid
- 1999 *An. funestus* resistant to pyrethroids
- 2000 back to DDT
- Lowest number of cases in history

Background

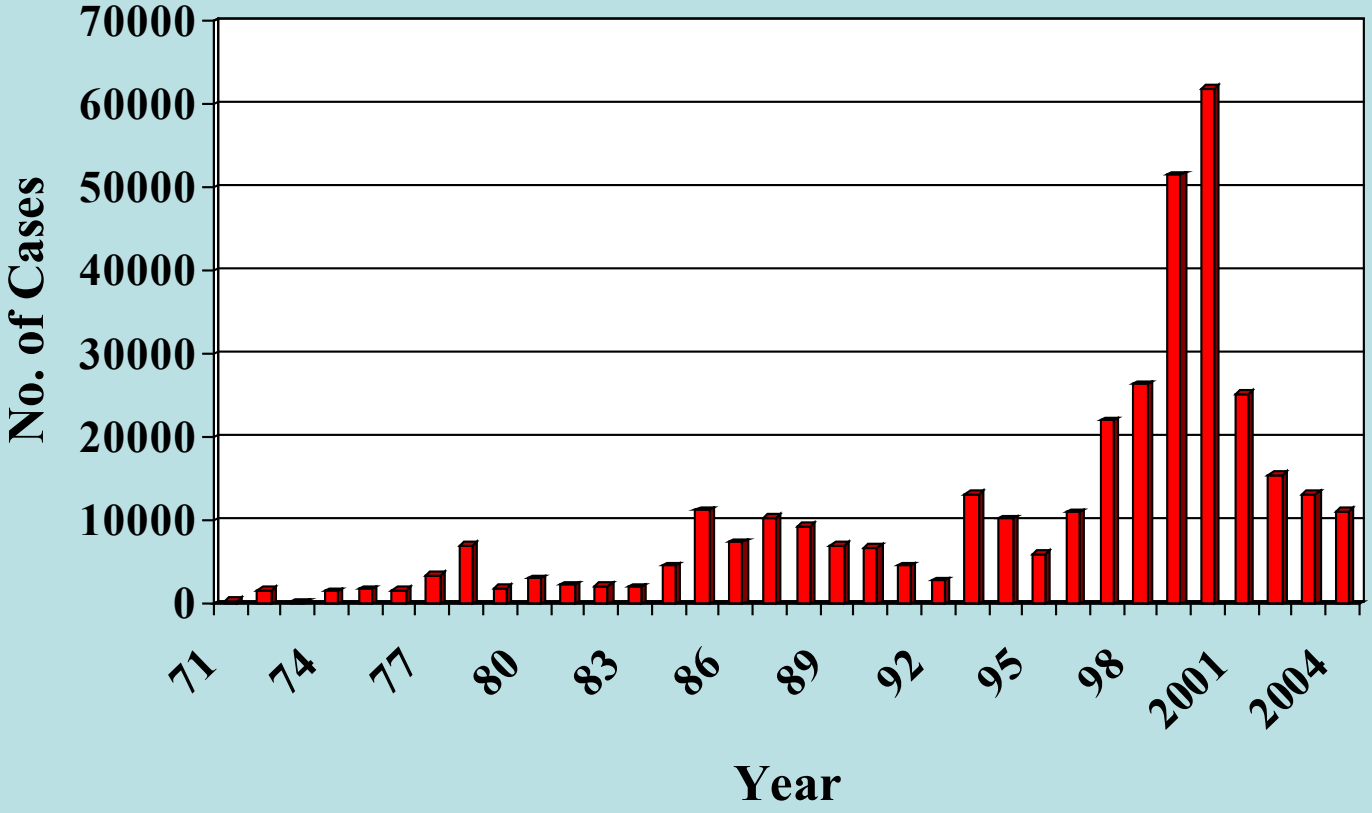
Mosquito vectors

- 2 major species complex
  - *An. gambiae* complex
  - *An. funestus* complex (eliminated 1974)
- Main malaria vector is *An. arabiensis*
- Of secondary importance is *An. funestus* (eliminated 2003)

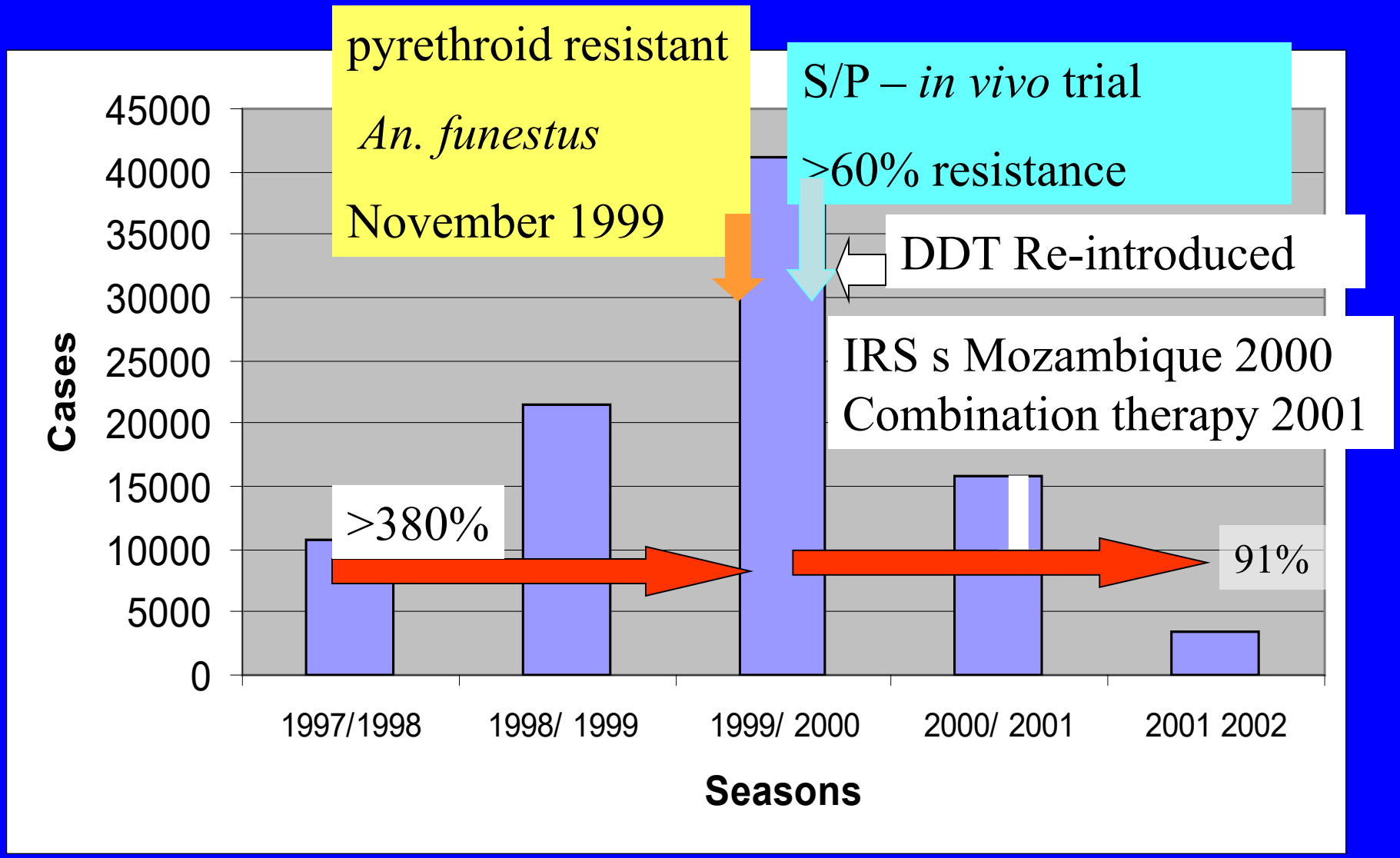
Parasite Species

- Main parasite is *Plasmodium falciparum*

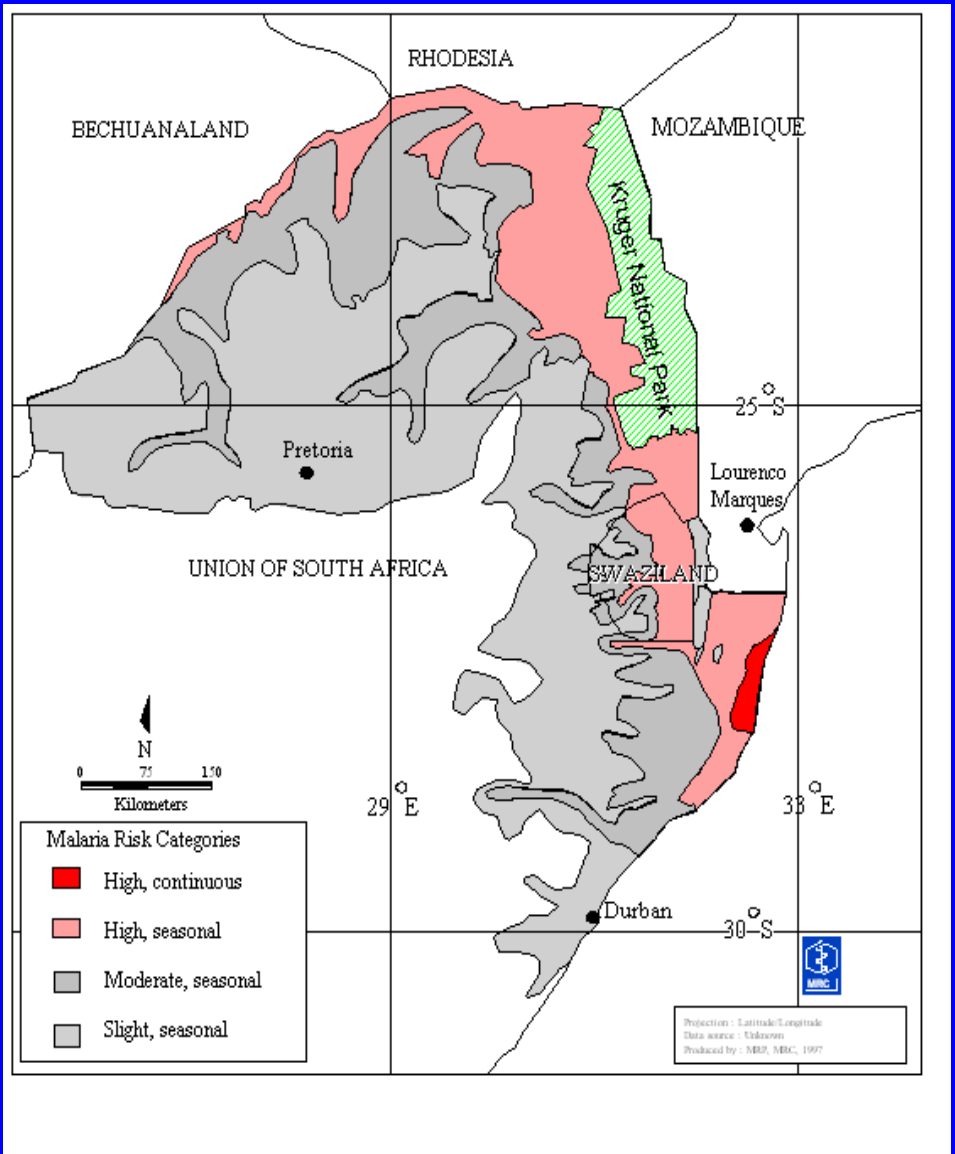
Trend in Reported Cases



The Last Epidemic in KwaZulu-Natal



- Major gains have been made in controlling malaria
- Encourage agriculture and tourism
- For the past 60+ years have had efficient malaria control strategies but malaria still remains a problem



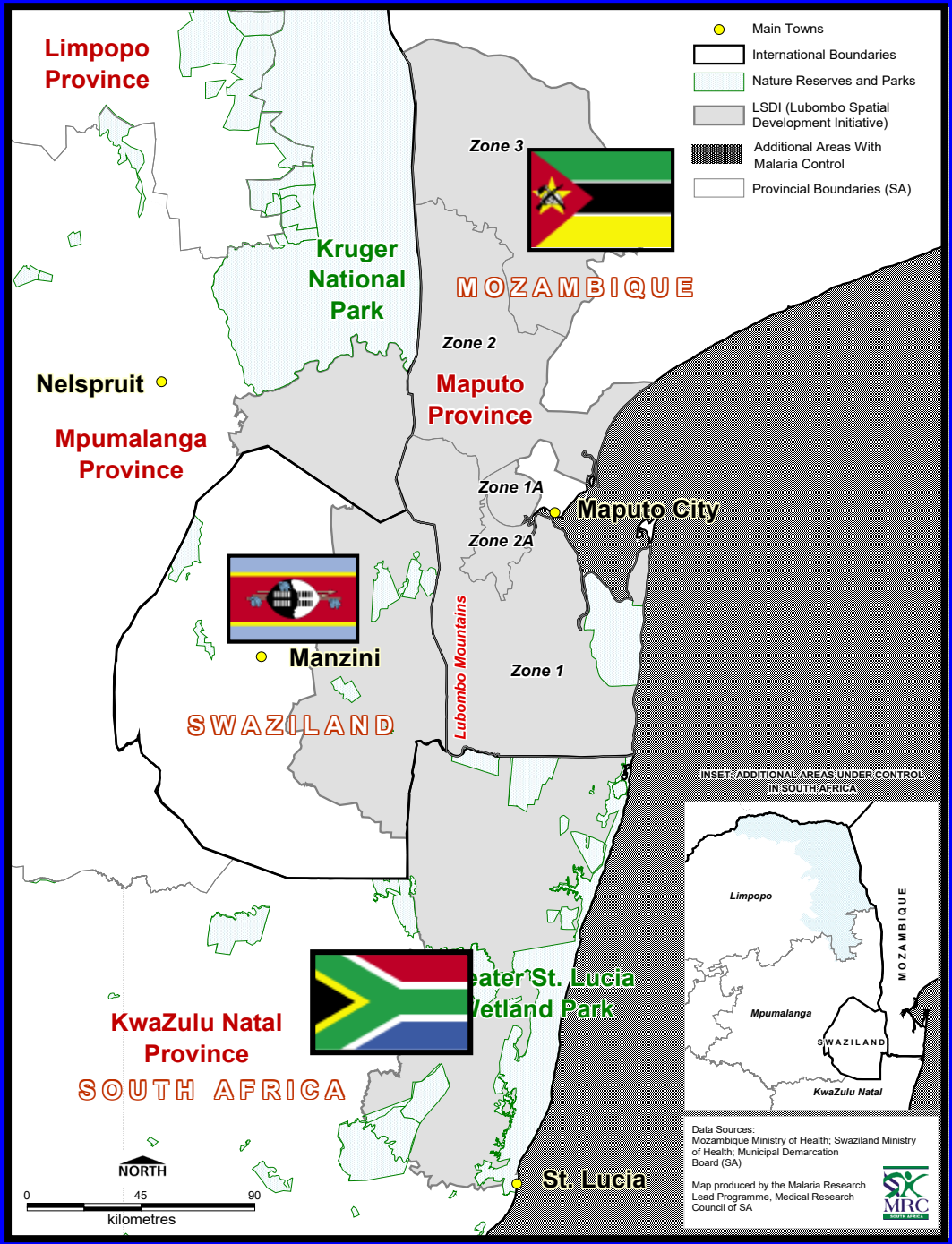
Malaria Risk in SA in 1938 Prior to Control

Lubombo Spatial Development Initiative

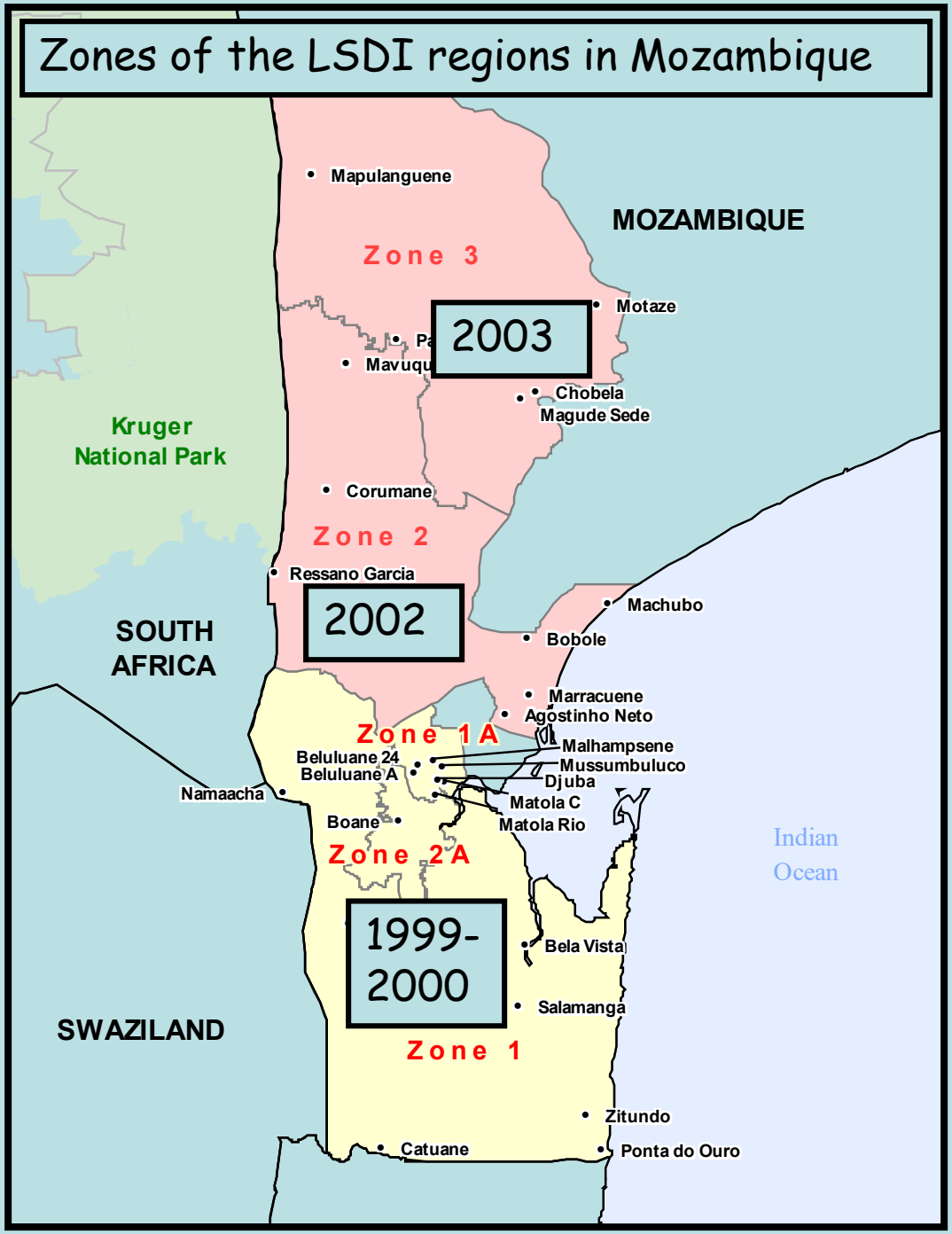
- Malaria is not a country specific problem but a regional one
- Only way to improve malaria situation was to assist neighbouring countries
- Down-stream effect
- LSDI was set up – Moz, SW, SA
- LSDI is trilateral initiative aimed at developing the region for agriculture and tourism

LUBOMBO
Spatial Development Initiative

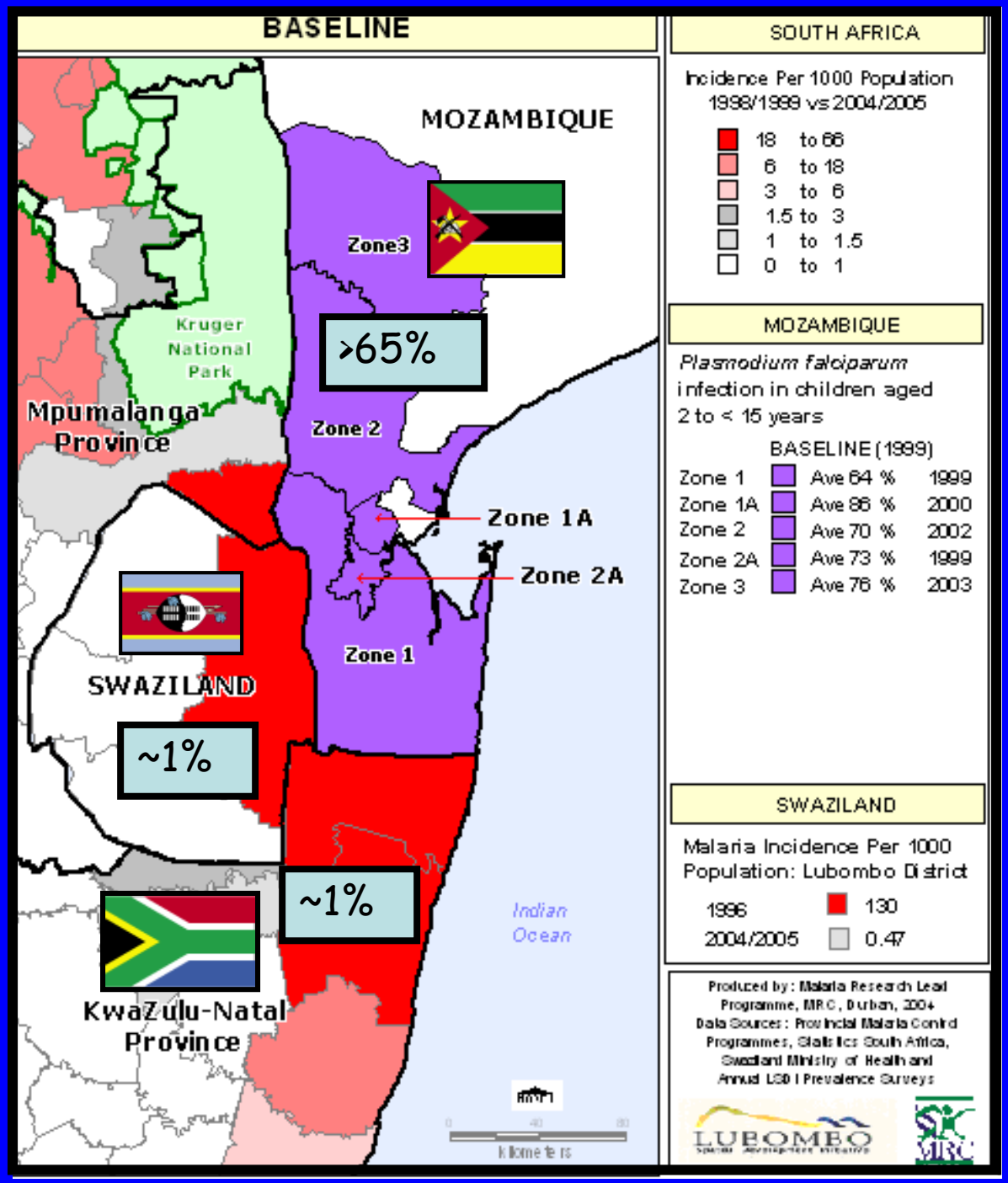
- Malaria recognized impediment to development
- Co-ordinated malaria control initiated in 2000 in the 3 countries
  - Indoor spraying
  - Combination therapy


Main Towns
International Boundaries
Nature Reserves and Parks
LSDI (Lubombo Spatial Development Initiative)
Additional Areas With Malaria Control
Provincial Boundaries (SA)
Limpopo Province
Kruger National Park
Zone 3
MOZAMBIQUE
Zone 2
Maputo Province
Nelspruit
Mpumalanga Province
Zone 1A
Maputo City
Zone 2A
Lubombo Mountains
Zone 1
Manzini
SWAZILAND
INSET: ADDITIONAL AREAS UNDER CONTROL IN SOUTH AFRICA
Limpopo
MOZAMBIQUE
Mpumalanga
SWAZILAND
KwaZulu Natal
eater St. Lucia
Wetland Park
KwaZulu Natal Province
SOUTH AFRICA
NORTH
0
45
90
kilometres
St. Lucia
Data Sources:
Mozambique Ministry of Health; Swaziland Ministry of Health; Municipal Demarcation Board (SA)
Map produced by the Malaria Research Lead Programme, Medical Research Council of SA
MRC

OUTH AFRICA



control programme implemented in stages -starting in the southern most district of Mozambique



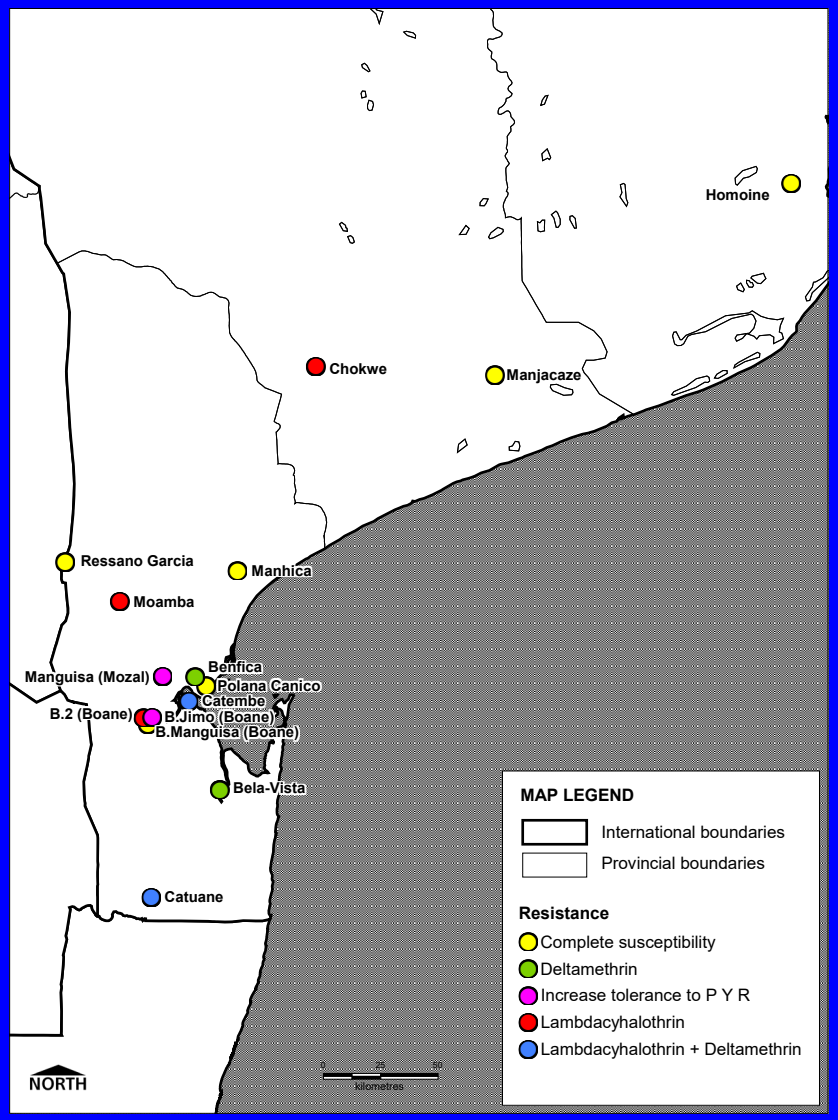
- Prevalence levels initially were around 1% in KZN, 1% in Swaziland and over 60% in Mozambique.

OUTH AFRICA

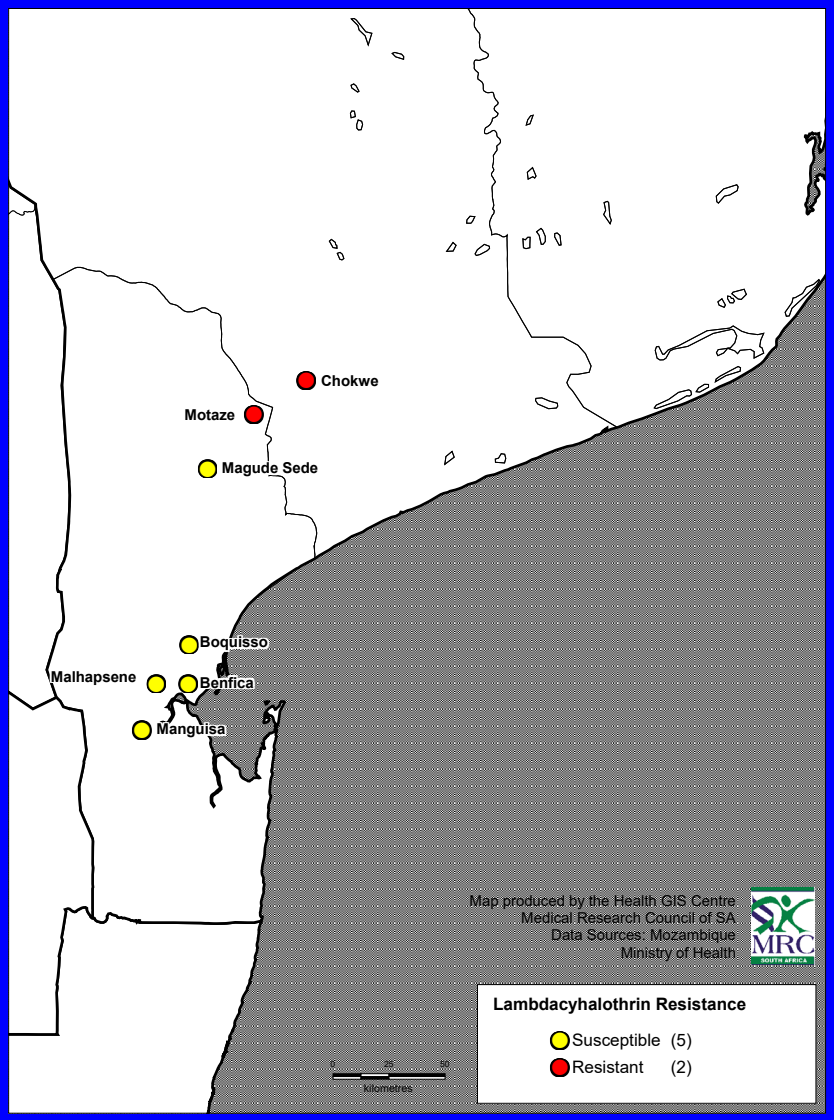
MAPPING INSECTICIDE RESISTANCE

Insecticide Resistance
SOUTHERN MOZAMBIQUE

2000 / 2001



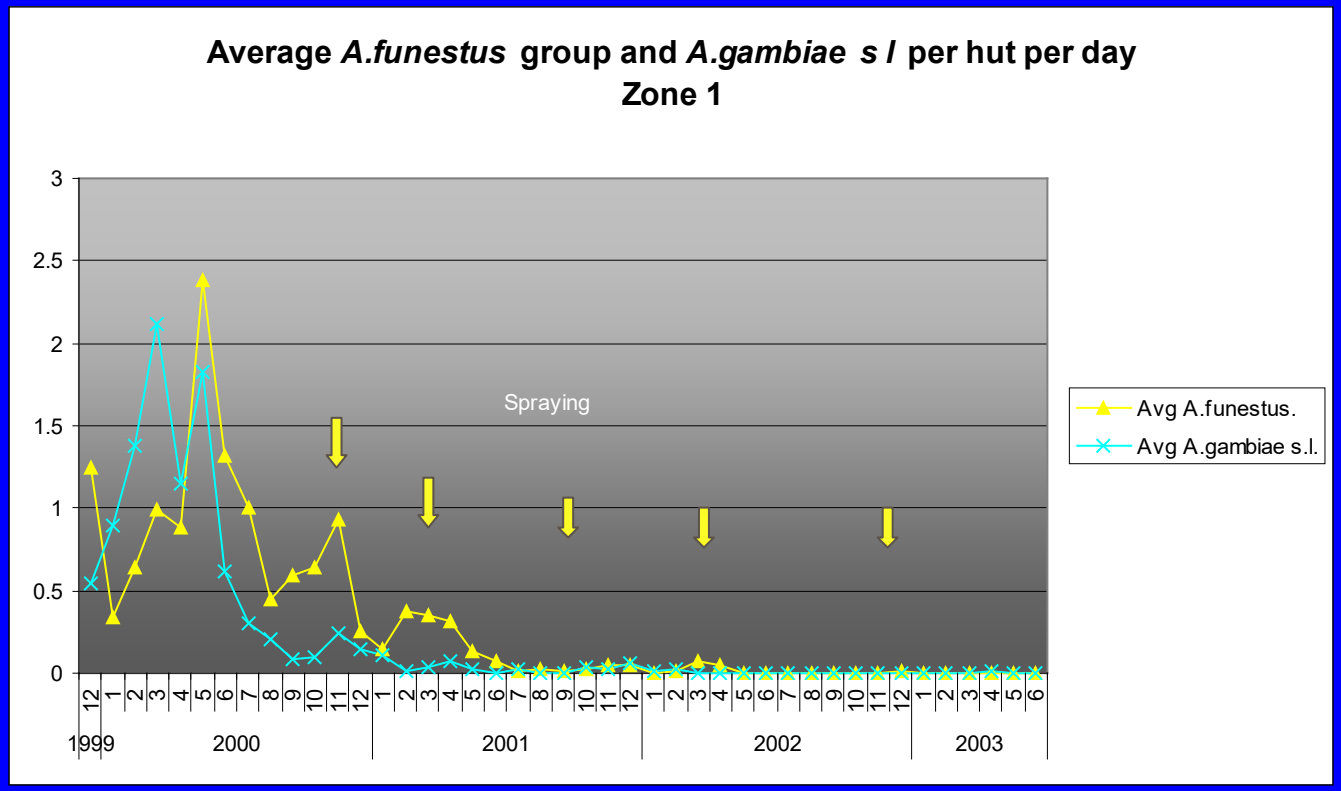
2003 / 2004



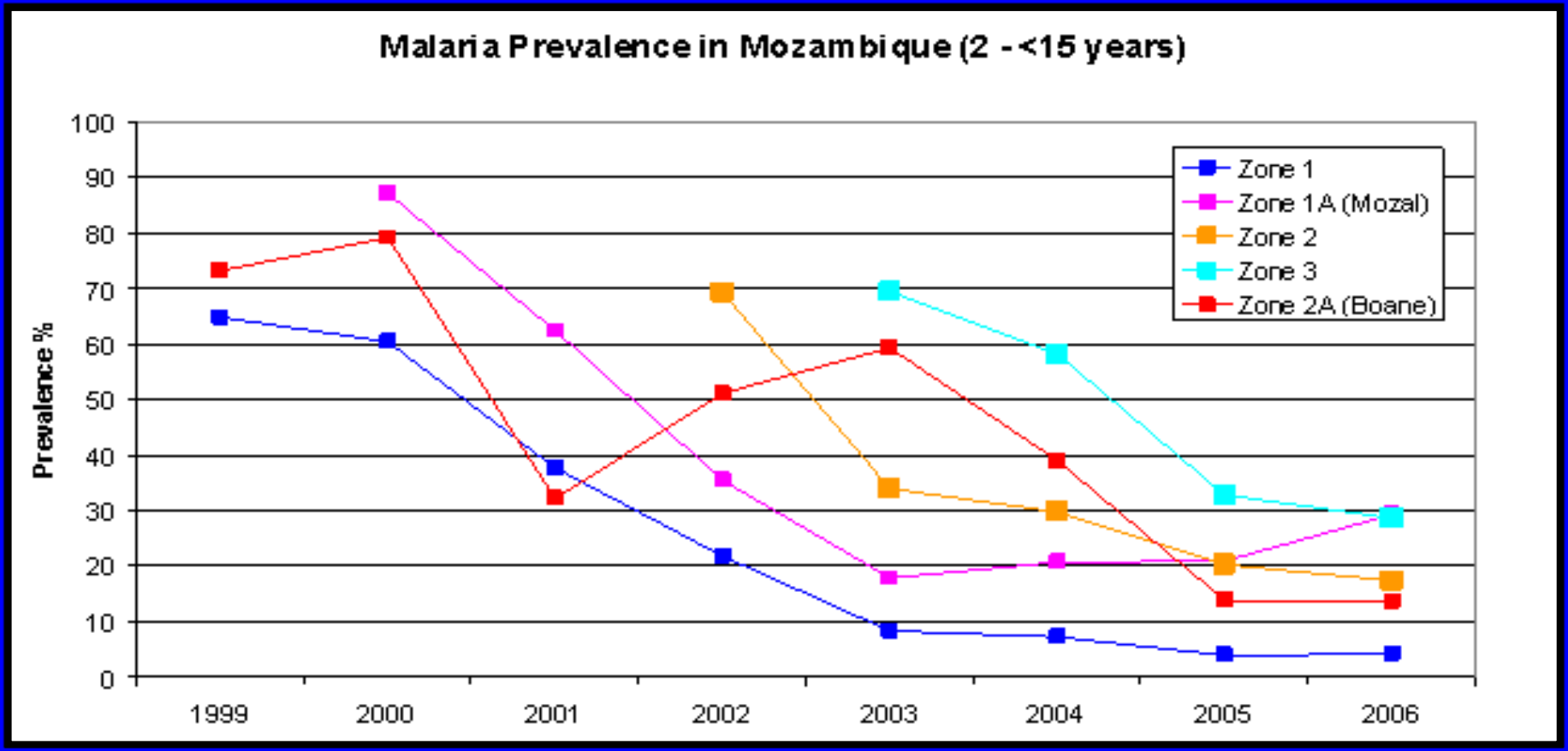
All fixed structures were sprayed.

Window traps were placed in selected houses in sentinel site to monitor mosquito density.

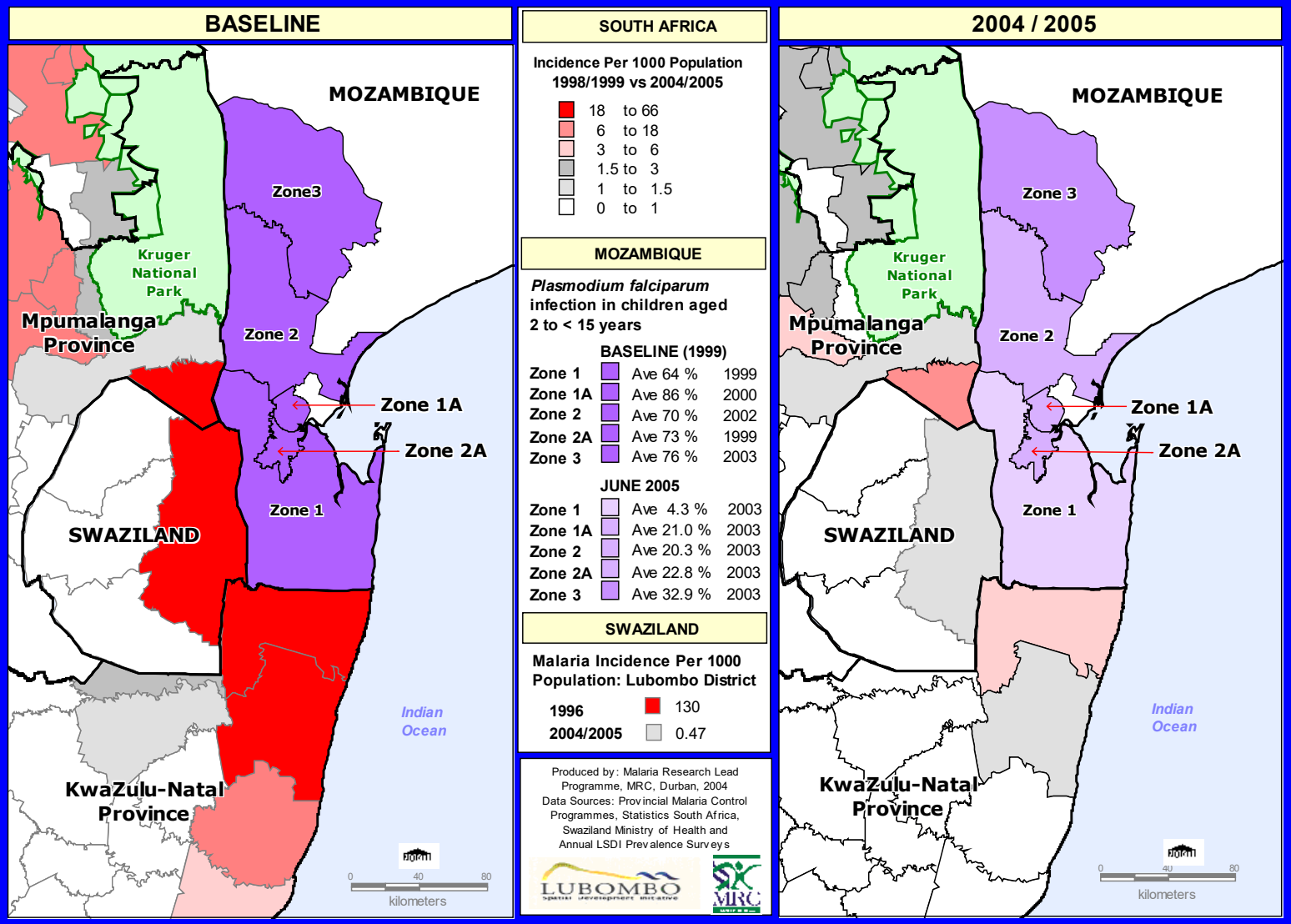
Impact of IRS on Vectors



Impact of IRS on Prevalence



Regional Malaria Reduction



Population protected 4.7M, Structures sprayed 1.8M, contiguous control area 100,000 km^2

Achievements

- In the region, huge reductions in malaria were recorded
- In the neighbouring countries malaria incidence on the increase but in LSDI area it decreased
- St Lucia and surrounds are now classified as “malaria free”
- Project has had such an impact that infected persons are scarce in South Africa and Swaziland

Conclusions

- The LDSI malaria control programme shows that with effective vector control and antimalarials, malaria can be controlled.
- Furthermore, the LSDI has shown that regional control efforts are more effective than county-specific initiatives

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