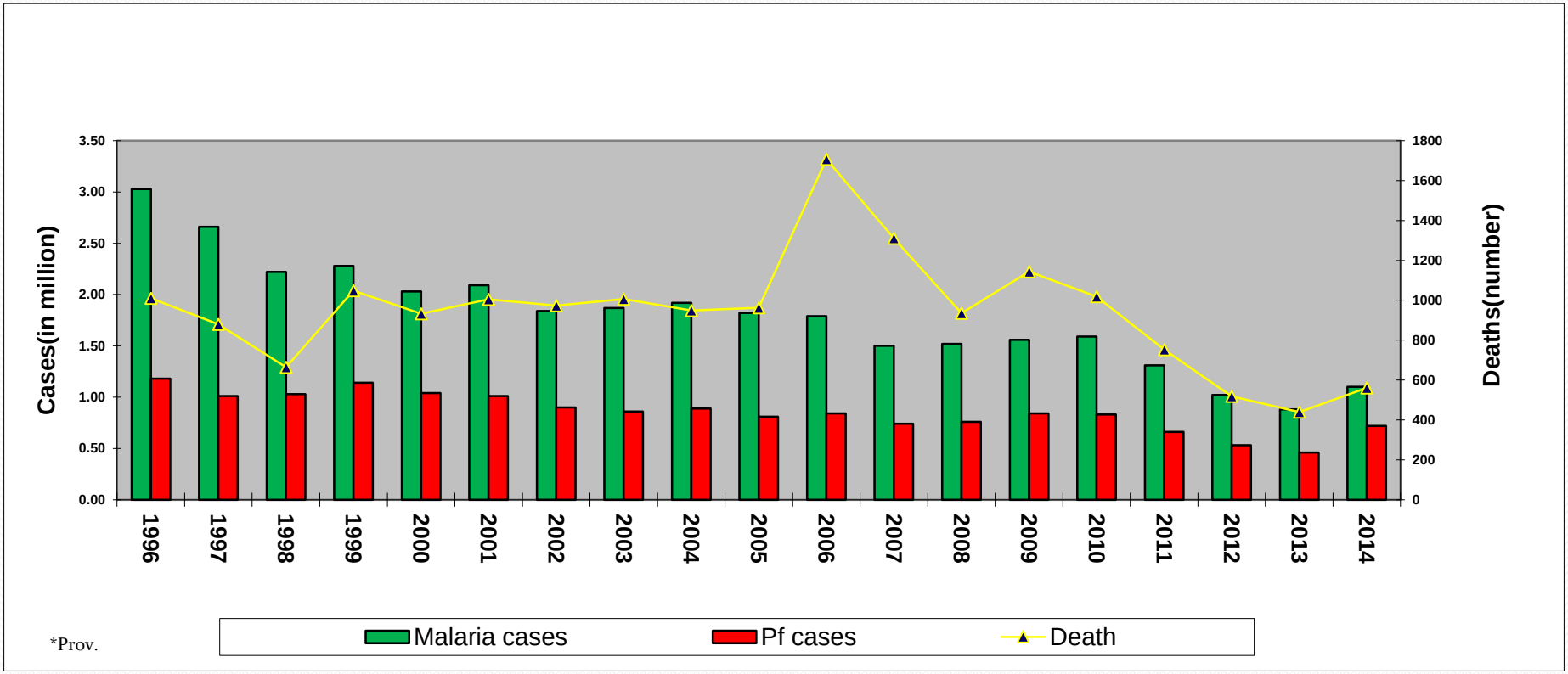
Challenges for control of vector borne diseases in an urban context

Dr. K. Ravi Kumar

What is the trend?

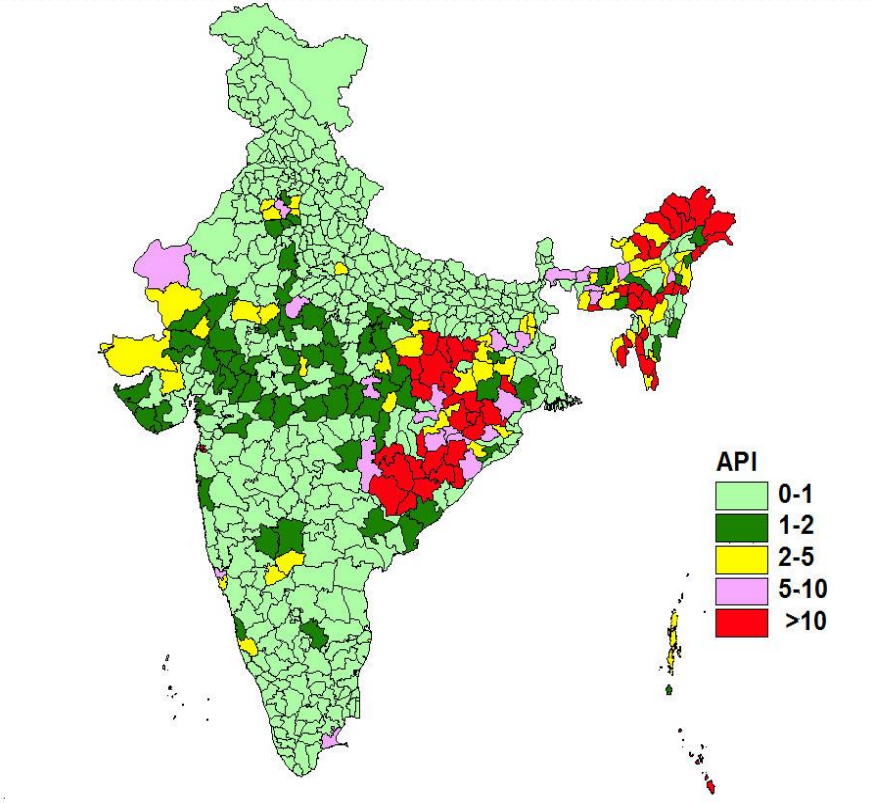


*Prov.

Trend..

- In 2014 1.1 million total cases and 7.2 lakh P.f cases. (12.4 crore blood smears)
- API =0.9, SPR=0.89, P.f % =65
- In 2014 there has been a 25 % increase in total malaria cases and 55 % increase in P.f cases.
- In 2015 also as on the end of May there is an increase of 6 % in total and 11 % in P.f cases.
- 356 deaths in 2015

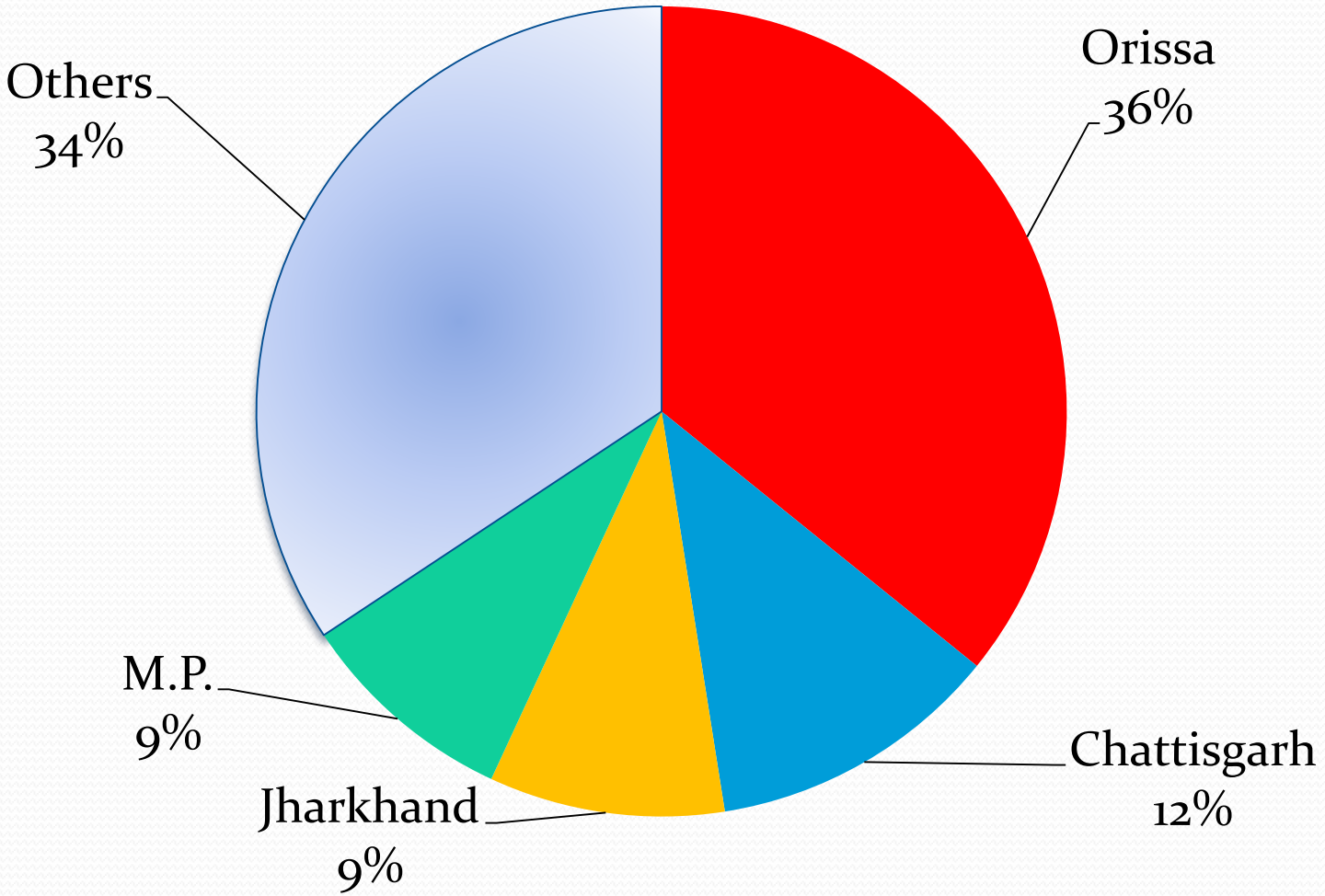
MALARIA ENDEMIC AREAS



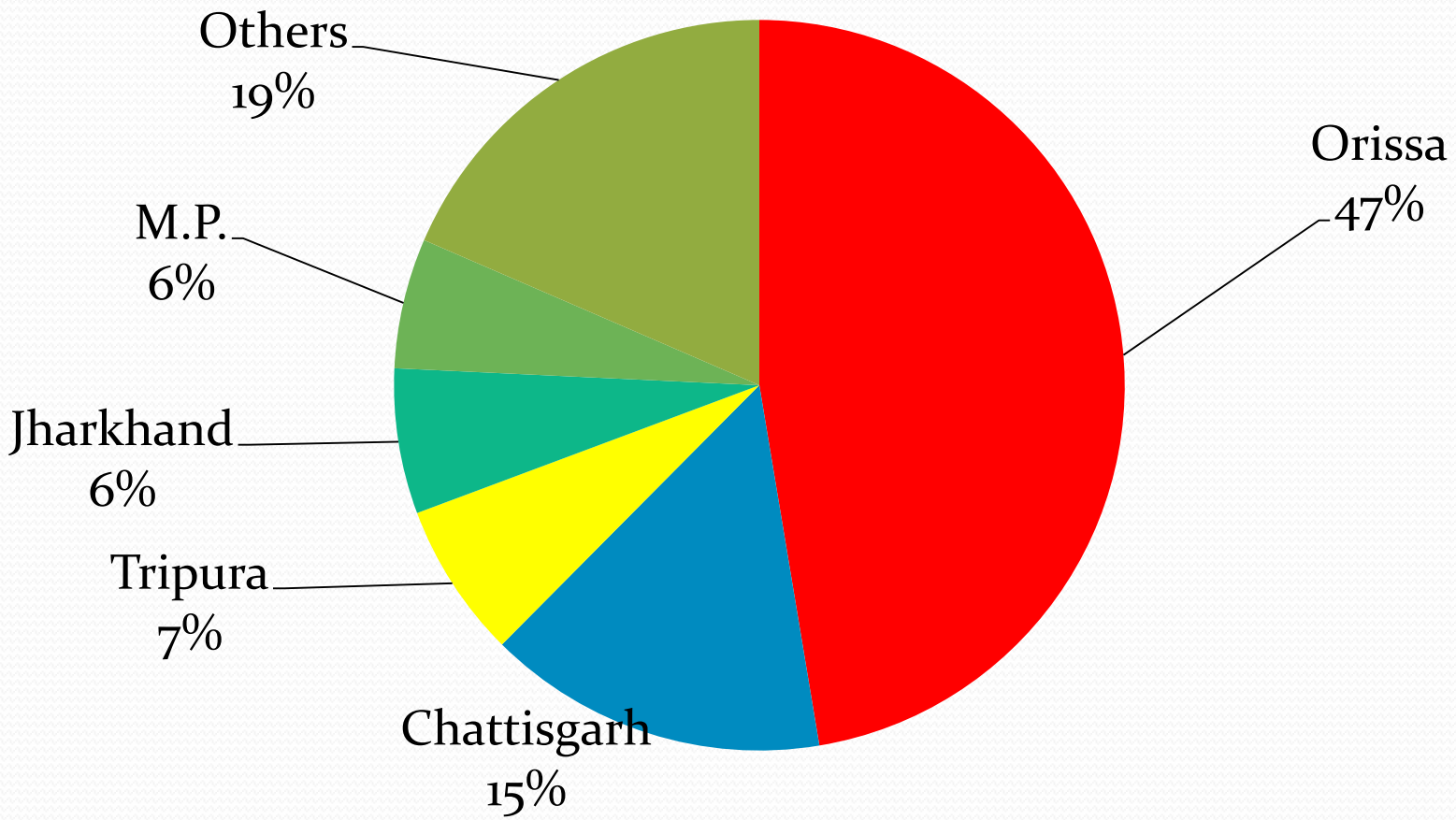
PERCENTAGE CONTRIBUTION OF POPULATION, MALARIA CASES, PF CASES AND DEATHS (Compared to the country total)				
States	% Population	% Malaria cases	% Pf cases	% Death
N.E. States	4	13	17	46
Other high endemic states*	42	67	77	43
Other	54	20	6	11

*Andhra, Chhattisgarh, Gujarat, Jharkhand, MP, Maharashtra, Orissa, Rajasthan

Where is it prevalent more in 2014?

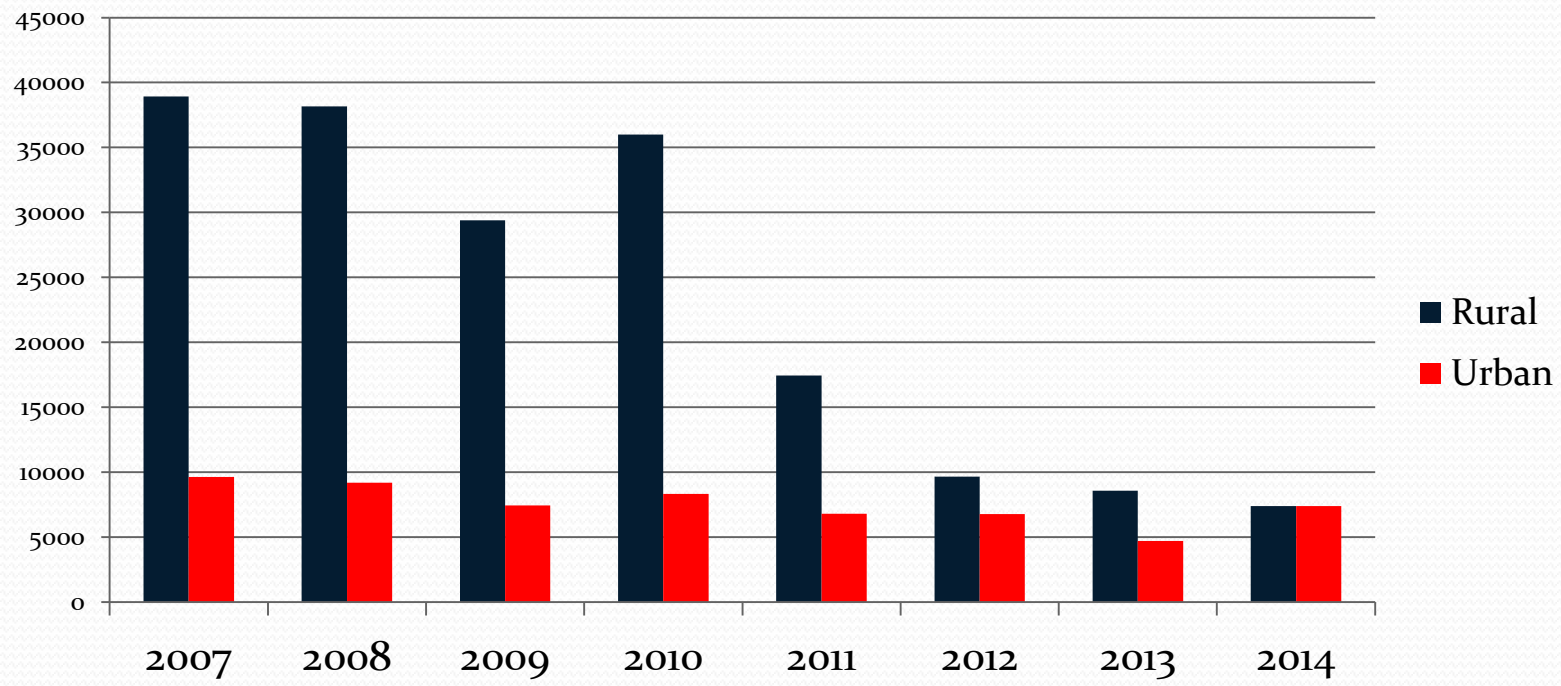


Where are the P.f cases in 2014

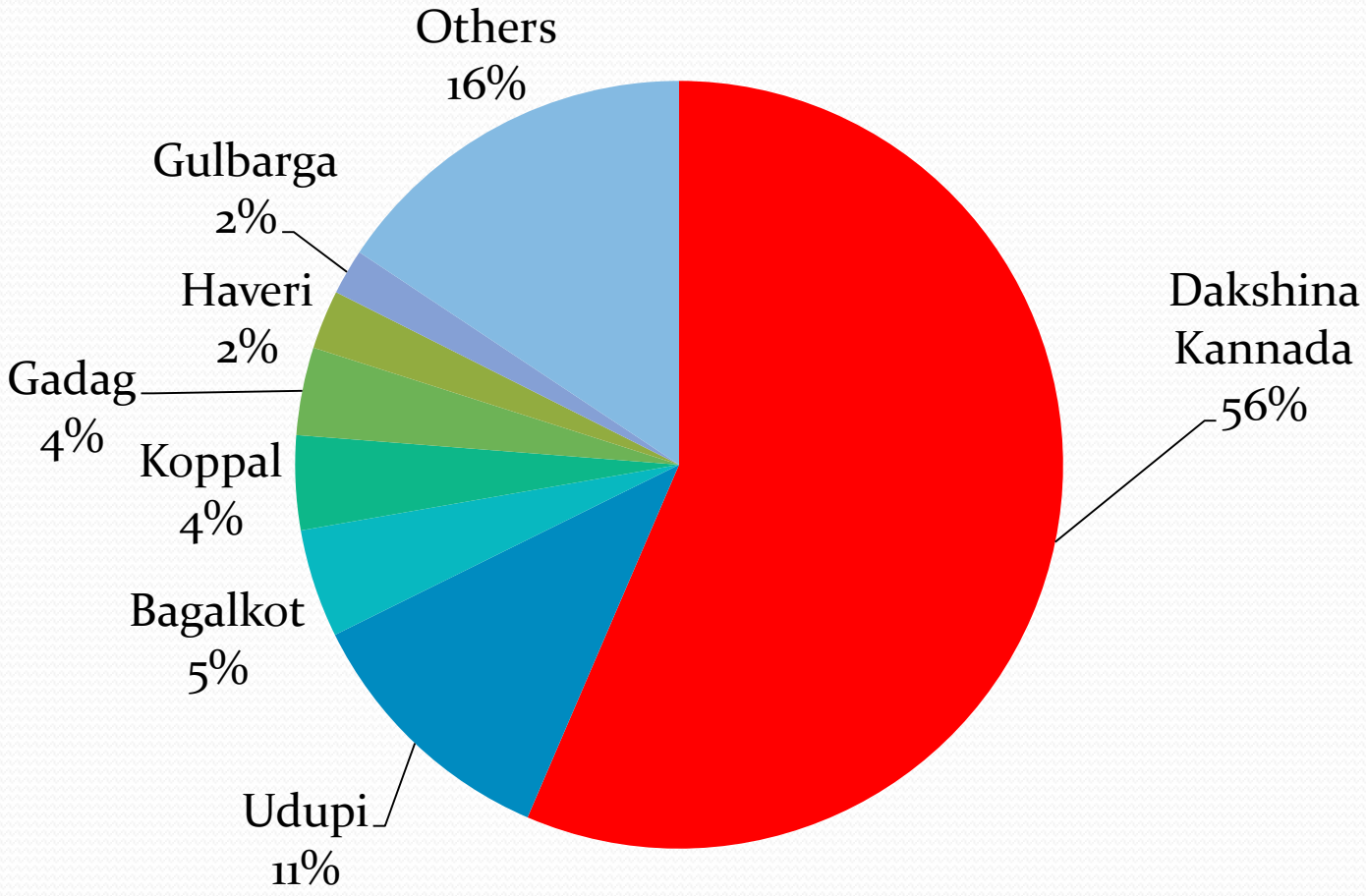


Urban or Rural ?

- 10 % of malaria cases from urban areas in the country
- 50 % in Karnataka

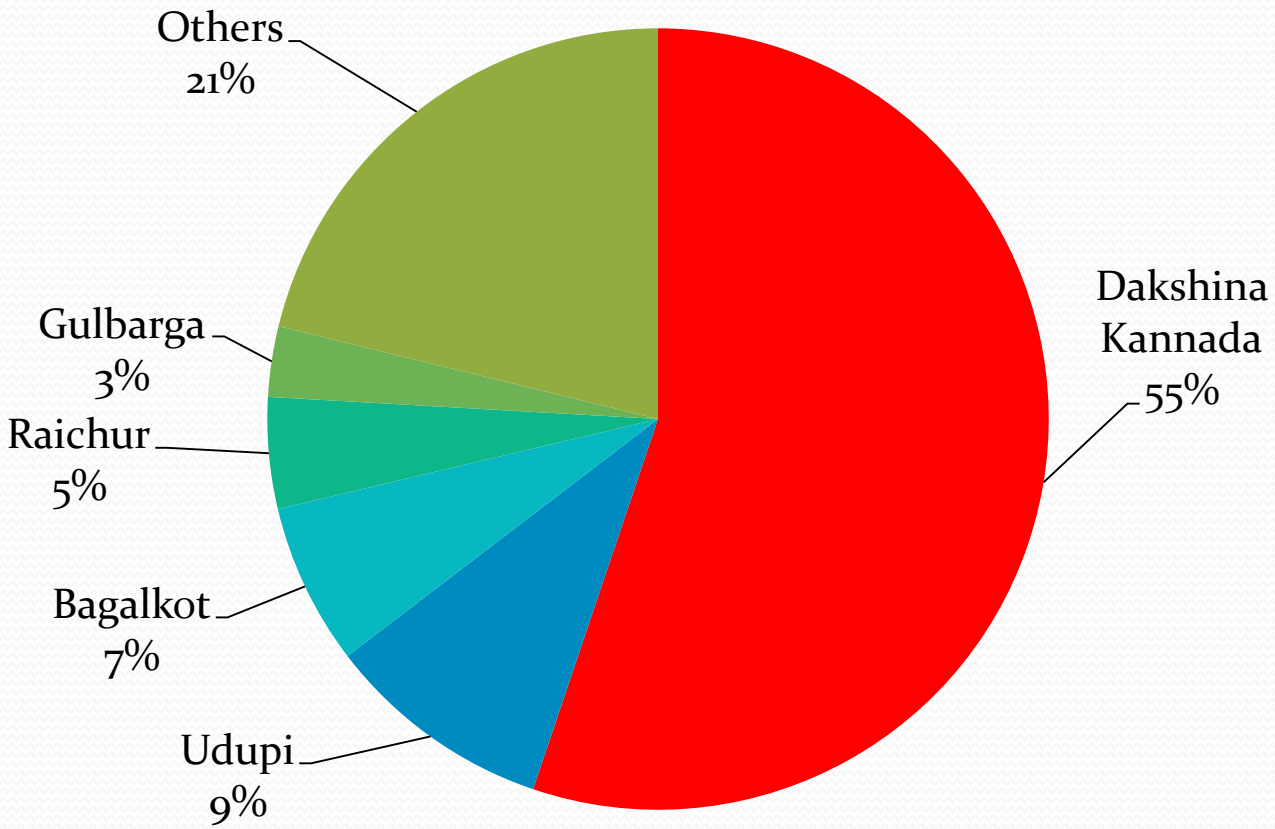


In Karnataka in 2014..



14,794 cases, 1329 P.f cases, only 2 deaths

In Karnataka, P.f cases in 2014..



Achievements

- Moving towards elimination

What are the Challenges??? Technical..

- Diagnosis and Monitoring
- Unpredictable nature of development of complications.
- Drug resistance
- Co-infections and co-morbidities
- Pregnancy
- Vivax and complications; Relapses

What are the challenges in urban?

- Poor infrastructure and low priority
- Ineffectiveness of insecticidal residual spray and dependence only on antilarval measures
- Single method has limitations and a combination of approaches is required.
  - Biocides
  - Insect growth regulators; Diflubenzeron
- Variety of breeding places of anophelines

What are the challenges?

- Construction activities:
  - Labourers
  - Increased breeding places
- Adherence to national guidelines of treatment
- Fake drugs
- Governance issues
- NUHM also has low priority for VBDs

Dengue and Chikungunya

Dengue in India

Year	2008	2009	2010	2011	2012	2013	2014
Confirmed cases	12561	15535	28292	18860	46902	75808	40425
Deaths	80	96	110	169	241	193	131

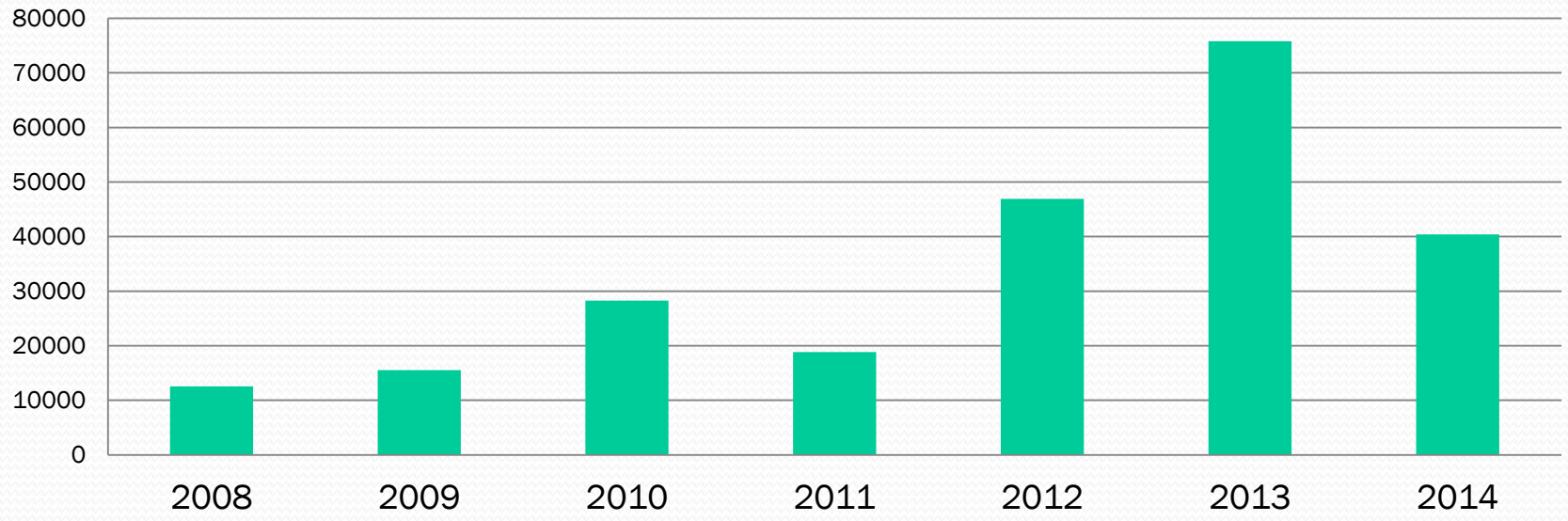
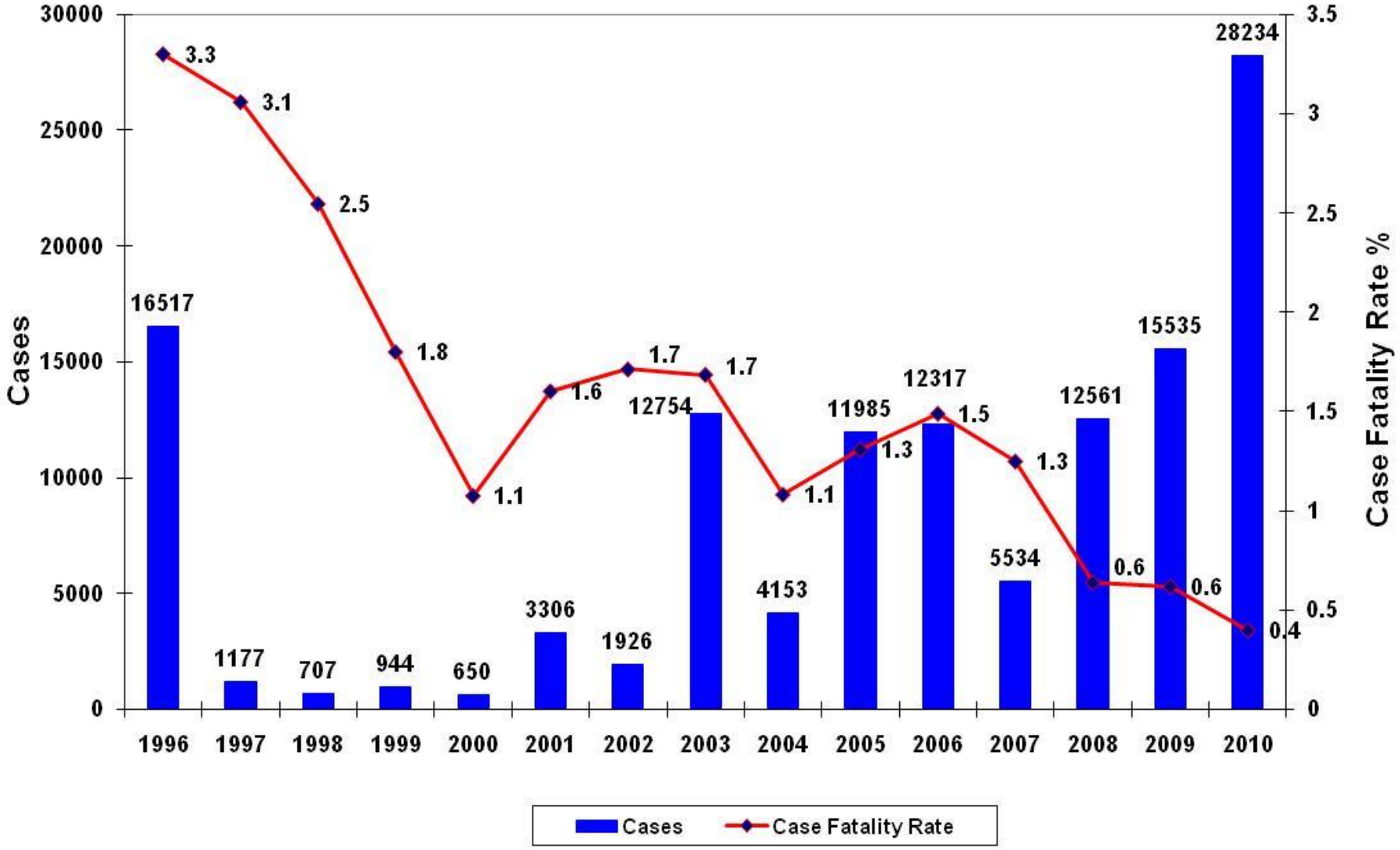
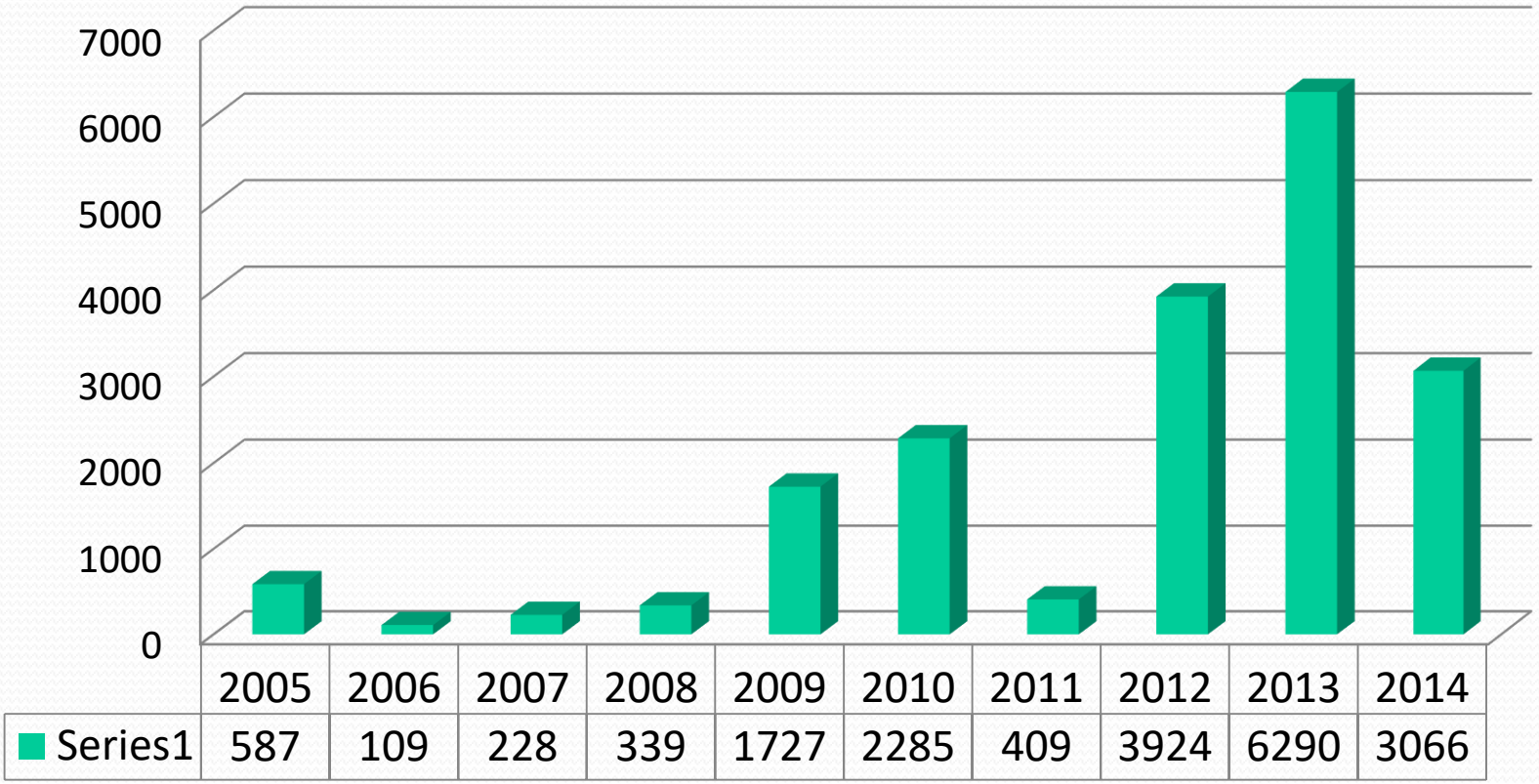


Fig-2 Dengue Morbidity Trend and Case Fatality Rate



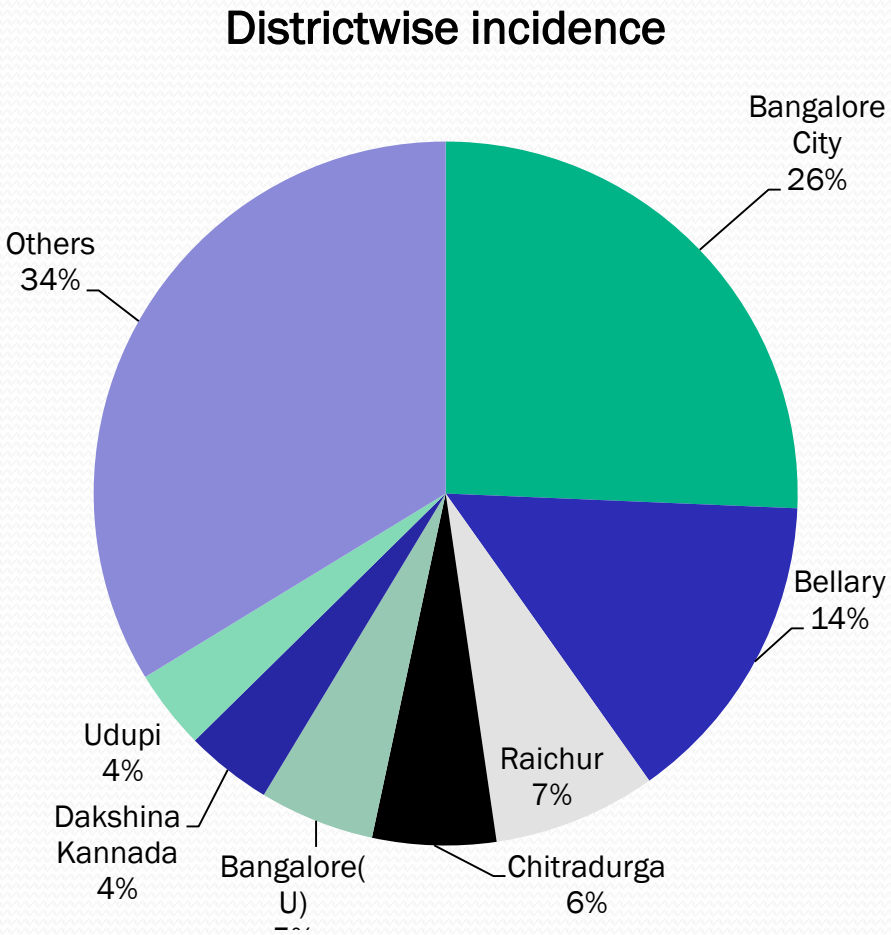
Dengue in Karnataka



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Series1	587	109	228	339	1727	2285	409	3924	6290	3066

Dengue incidence 2014

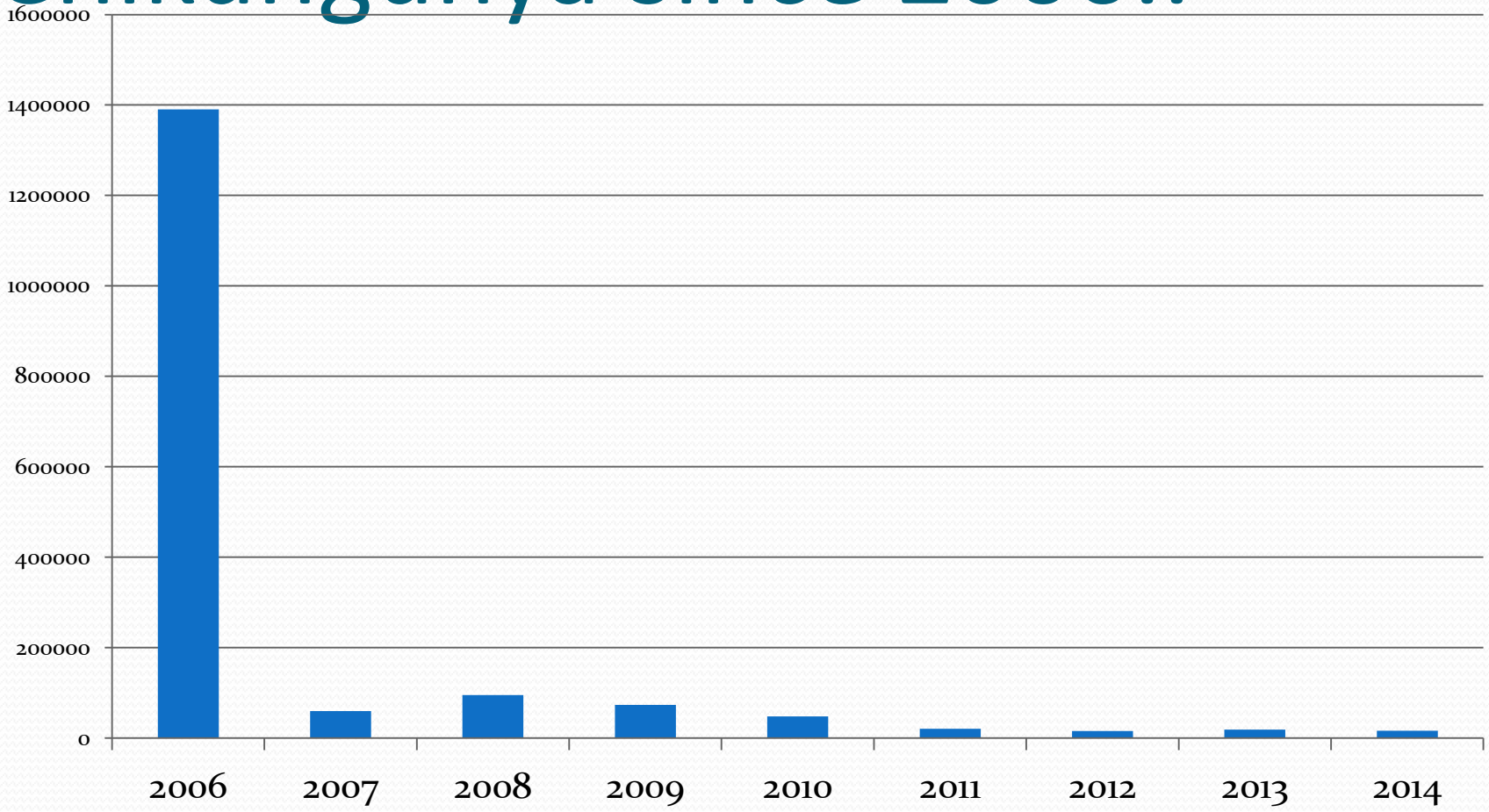
- Suspected Dengue fever cases 19696
- Blood samples tested 11834
- Confirmed cases 3066
  - ELISA 2732,
  - NS1 antigen 334



What about this year?

- As on 26 Oct, 31408 suspected cases
- 4215 confirmed cases
- 9 deaths
- Bengaluru, Bellary, and Udupi are worst affected

Chikungunya since 2006..



PREVENTION AND CONTROL

- No Vaccine available as of now.
- No specific treatment
  - Purely symptomatic
  - Non-salicylate analgesics and non-steroidal anti inflammatory drugs
- Surveillance for early detection of outbreak
- Vector Control
  - Adult vector measures
  - Anti-larval measures **(Source reduction)**
- Personal protective measures
- IEC

Challenges..

- Older age groups are being affected.
- What previously is essentially an urban disease is increasingly being rural also.
- Shortage of testing centers and diagnostic kits
- Shortage of platelets ????
- Poor knowledge and even poorer attitude regarding source reduction measures

Dengue vaccine ???

TABLE 1. Dengue vaccines in development (as of November 2012)

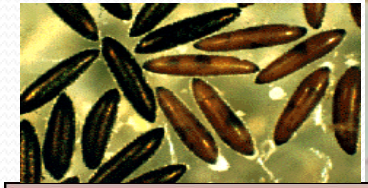
DEVELOPER	PRECLINICAL	PHASE 1	PHASE 2	PHASE 3
SANOFI PASTEUR				Currently conducting several Phase 3 trials on their ***live attenuated chimeric tetravalent vaccine***, developed using the yellow fever virus as a backbone, in Australia and in countries in Asia and Latin America.
NAVAL MEDICAL RESEARCH CENTER (U.S.)		A proof of concept Phase 1 trial for DEN1 vaccine has been completed for their ***plasmid DNA vaccine***. Five of 12 recipients of the high dose vaccine developed serum neutralizing antibodies to DENV-1. The vaccine is being reformulated with the novel adjuvant Vaxfectin to improve immunogenicity.		
U.S. NATIONAL INSTITUTES OF HEALTH (NIH)		Tested different monovalent dengue vaccine candidate vaccines to select those candidates with most favorable safety and immunogenicity profiles. TV003, the tetravalent vaccine formulation chosen for further evaluation, will begin Phase 2 trials in Thailand in flavivirus-experienced adults and children.		
BIOLOGICAL E (India)	Made seed lots at scale of their ***live attenuated tetravalent vaccine*** (licensed NIH vaccine) and are reviewing their clinical development strategy.			
BUTANTAN (Brazil)			Has produced clinical lots of their ***live attenuated tetravalent vaccine*** (licensed NIH vaccine). They have received approval to begin Phase 2 testing of this product in flavivirus-naïve and flavivirus-experienced adults in Brazil.	
PANACEA BIOTECH (India)	Has produced different lots of their ***live attenuated tetravalent vaccine*** (licensed NIH vaccine) formulation and completed stability testing on these lots.			
VABIOTECH (Vietnam)	Has started production of monovalent seed lots for their ***live attenuated tetravalent vaccine*** (licensed NIH vaccine). When those have completed safety testing, they will formulate the vaccine. Currently developing their clinical trial plan.			
INVIRAGEN (Acquired by Takeda)			Entered Phase 2 clinical trials in Puerto Rico, Colombia, Singapore and Thailand for their ***live attenuated tetravalent vaccine***. In addition, rapid immunization strategies and needleless administration are being investigated.	
MERCK		Has completed a proof of concept Phase 1 trial of the recombinant ***subunit protein vaccine*** adjuvanted with Alum developed at Hawaii Biotech. They are conducting a Phase 1 trial of the ***tetravalent vaccine*** adjuvanted with ISCOM in Australia.		
GLAXOSMITHKLINE		Currently in Phase 1 proof of concept testing of a ***purified inactivated vaccine*** given with novel adjuvants, originally developed by the Walter Reed Army Institute for Medical Research (U.S.), and conducting a Phase 1 study to evaluate novel methods of vaccine administration. Has signed a research agreement to develop this vaccine with Brazil's Oswaldo Cruz Foundation.		



Aedes Mosquito












© 2003 Stephen L. Doggett


CDC/James Gathany

AEDES LARVAE






TRISAKTHI
SALT
ALLAYAM
Colgate
Active
Salt








FOR INDUSTRIAL USE
PIDILITE












© R & Pugh


26 7 2004






26 7 2004


26 7 2004



Tap Pits as Breeding sites










21/02/2008


04/01/2007
























04/01/2007


04/01/2007

Lymphatic Filariasis

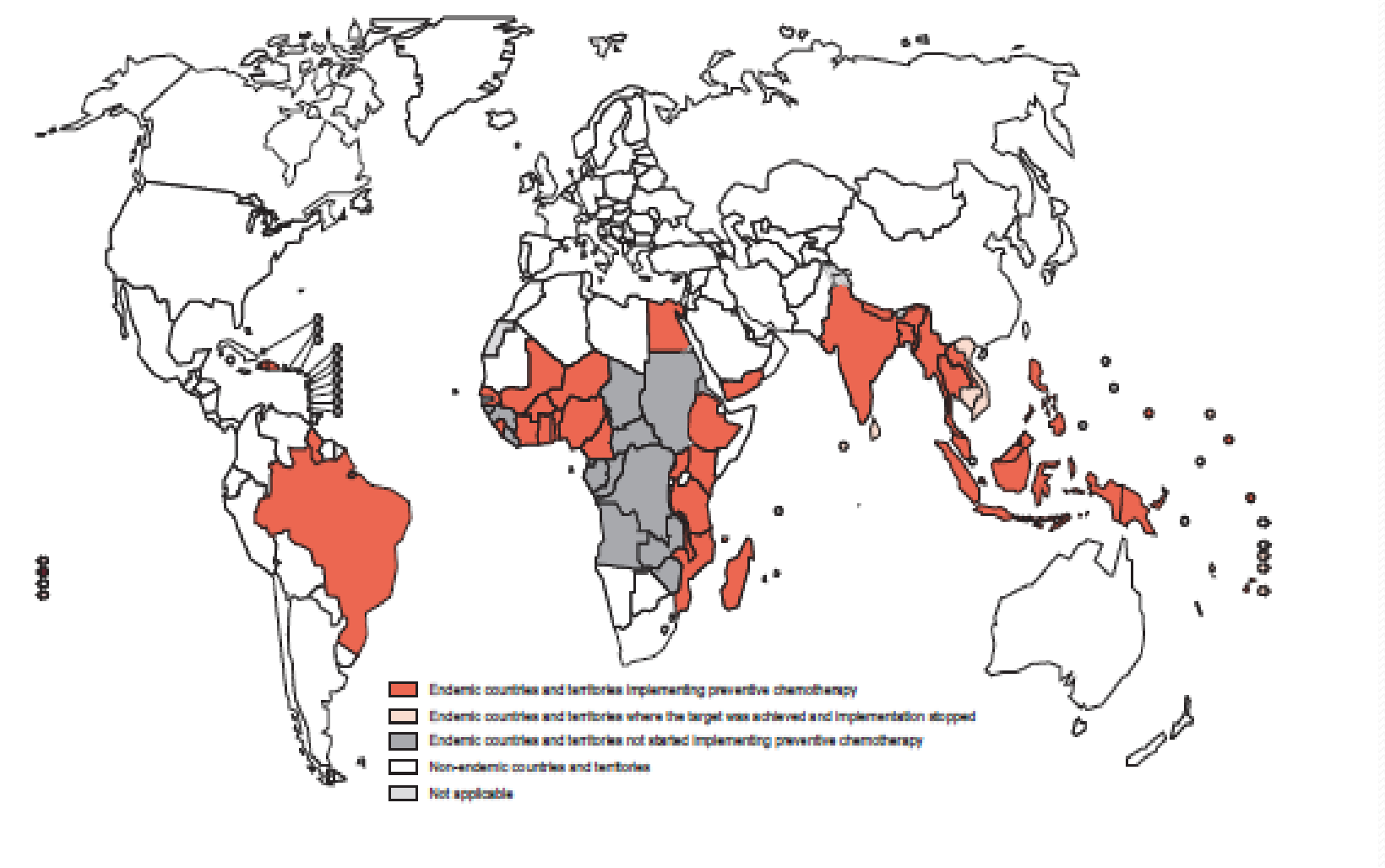




Wucheria bancrofti in blood



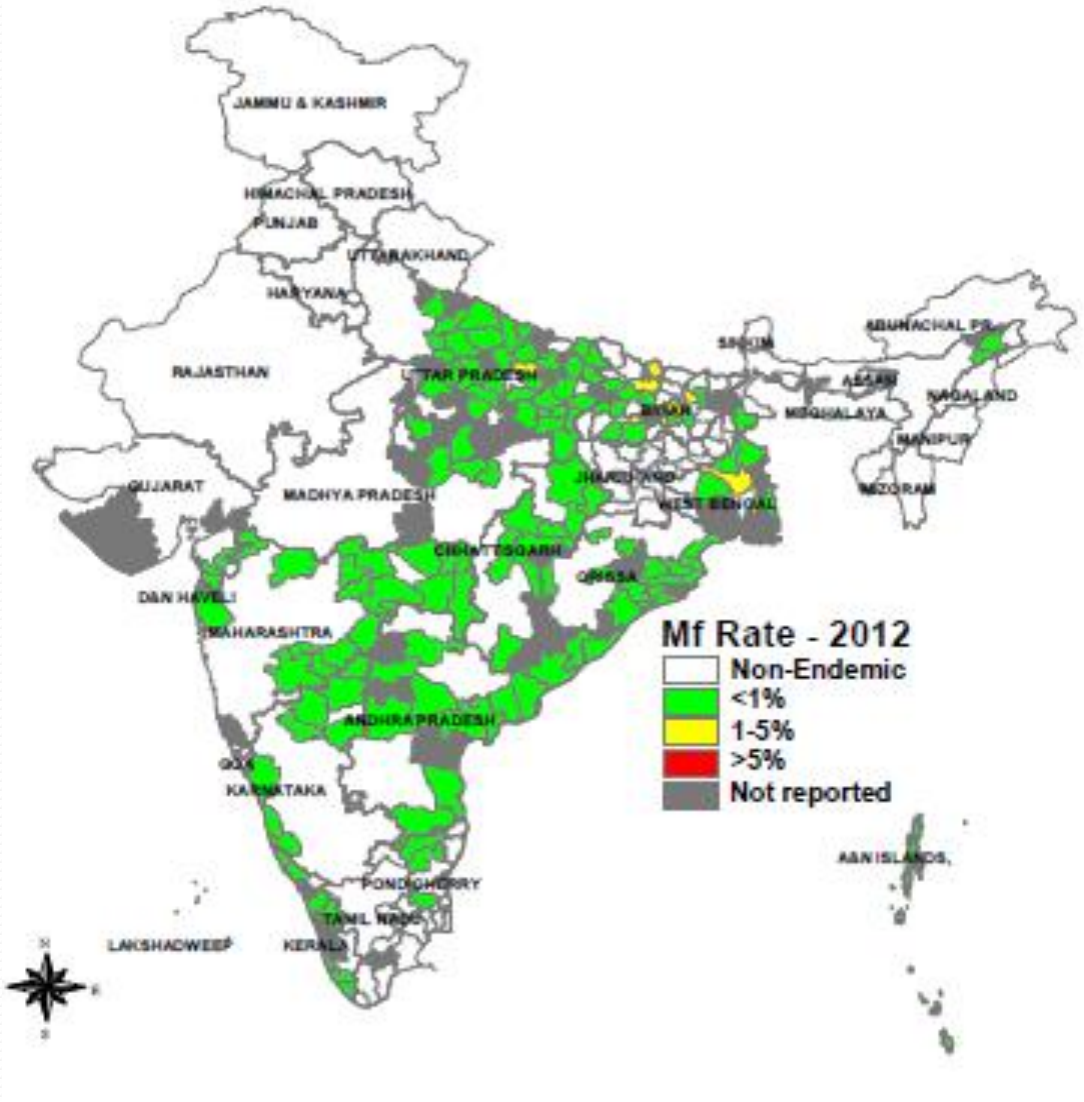
Distribution of LF in the world



Where?

- 99.4% of infections are caused by Wuchereria bancrofti and rest by Brugia malayi.
- Vector: Culex quinquefasciatus.
- Endemic in 255 districts in 21 states and UTs

Filaria Map 2012



LF endemic Districts in Karnataka

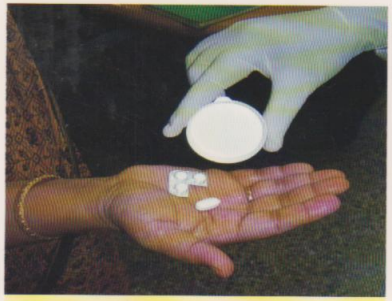
- Bidar
- Bijapura
- Bagalkot
- Gulbarga
- Yadgir
- Raichur
- D Kannada
- Udupi
- U Kannada



Strategy..

Guidelines on

ELIMINATION OF LYMPHATIC FILARIASIS India



Interruption of Transmission through Mass Drug Administration with DEC and albendazole



Disability alleviation through home based management of lymphoedema and hospital based hydrocelectomy

Directorate of National Vector Borne Disease Control Programme
(Directorate G.H.S., MOH & FW, Government of India)
22, Shamnath Marg, Delhi-110 054

2009

ELIMINATION OF LYMPHATIC FILARIASIS

GUIDELINES FOR DRUG DISTRIBUTORS



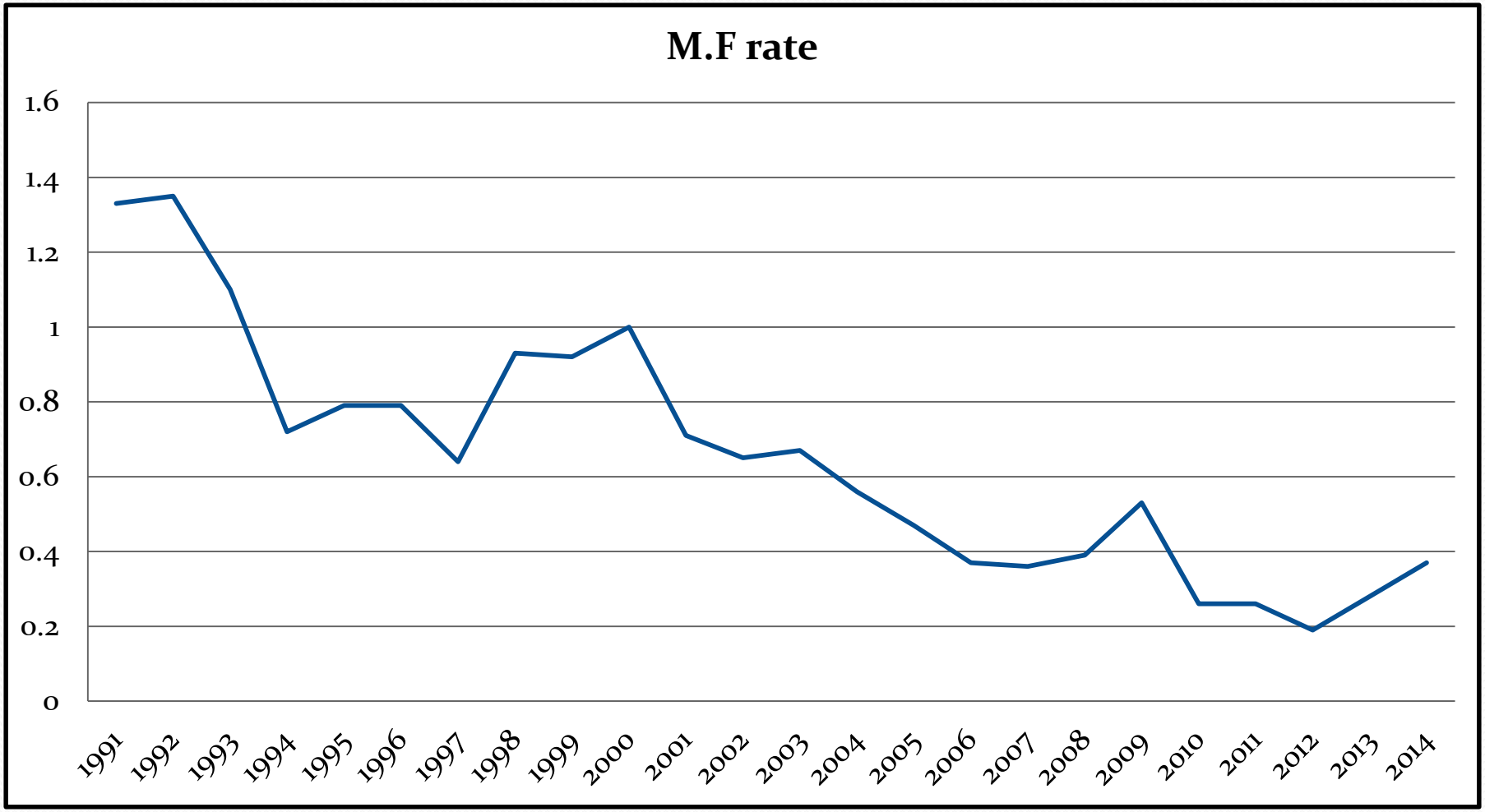
Directorate of National Vector Borne
Disease Control Programme,
Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India
Vector Control Research Centre,
(Indian Council of Medical Research)
Pondicherry

OUR RESOLVE:
FREEDOM FROM
FILARIASIS

Progress..

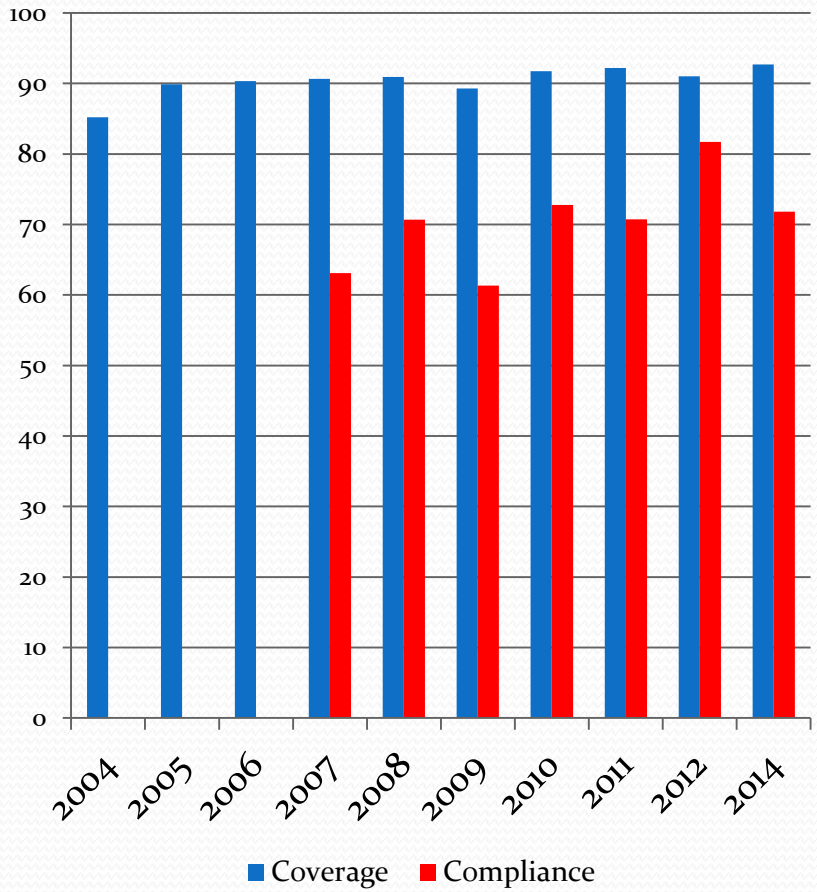
- 10 rounds of Mass Drug administration completed
- M.f. rate has shown satisfactory decline in Dakshina Kannada, Uttara Kannada and Udupi districts. Validation studies showing lack of antigenaemia in these three districts.
- MDA stopped in these three districts
- Lymhoedema management progressing

Trend of M.f rate in Karnataka



Issues..

- Reduction of M.f rate is not up to the desired level in Bijapur, Bagalkot, Gulbarga, Raichur, Bidar and Yadgir districts.
- Post MDA surveillance in Dakshina Kannada, Udupi and Uttara Kannada districts.



Thanks