Federal University of Bahia
Instituto de Saúde Coletiva

25 years of Dengue in Brazil: Epidemiological differences and similarities between Brazil and Southeast Asia

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Porto Alegre
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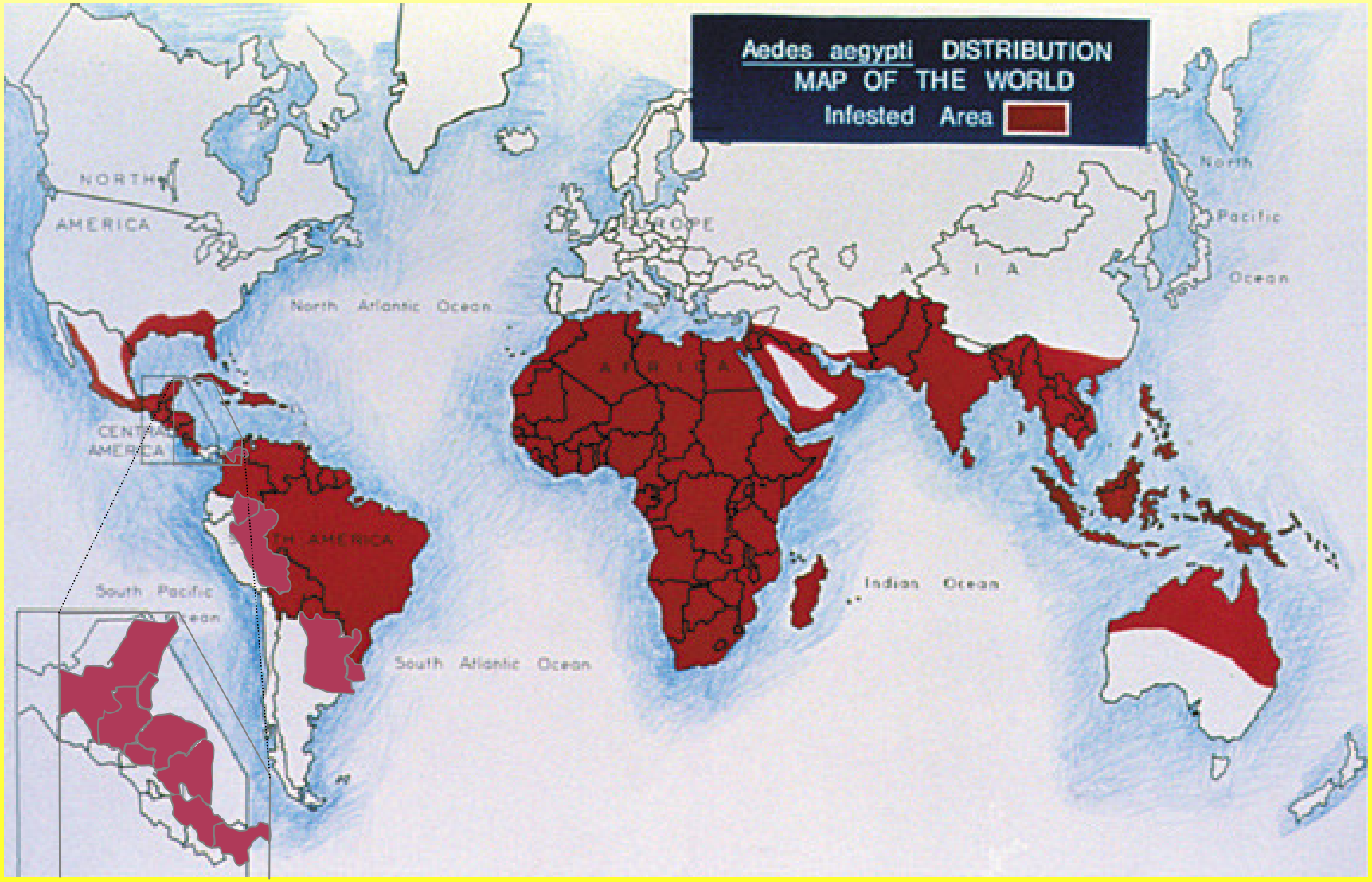
The Current Situation

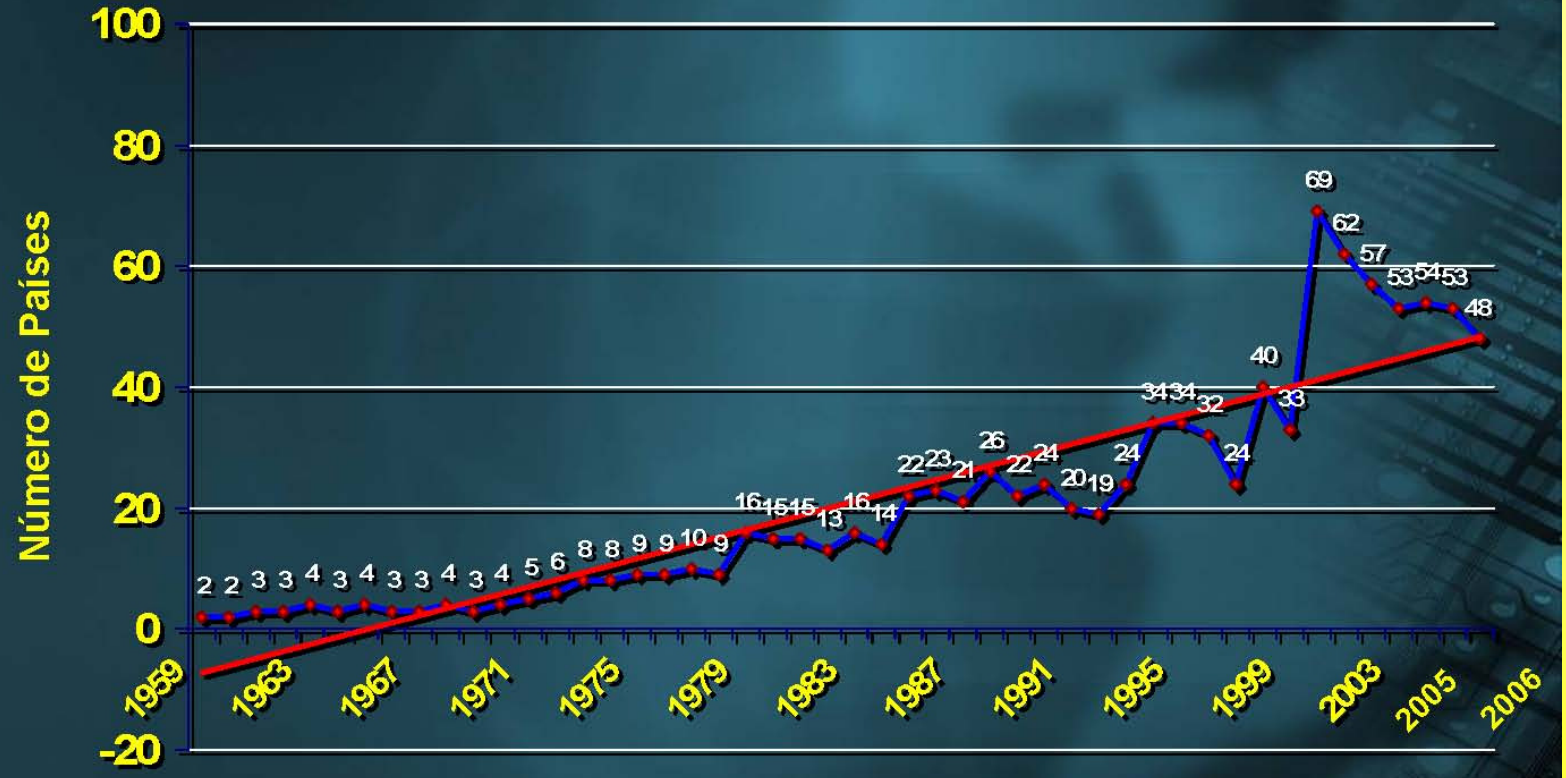
Strength of Reemergence

- Speed of viral circulation and replication;
- Ability of *Aedes aegypti* to constantly adapt*;*
- Inability of man to protect himself against these infections.



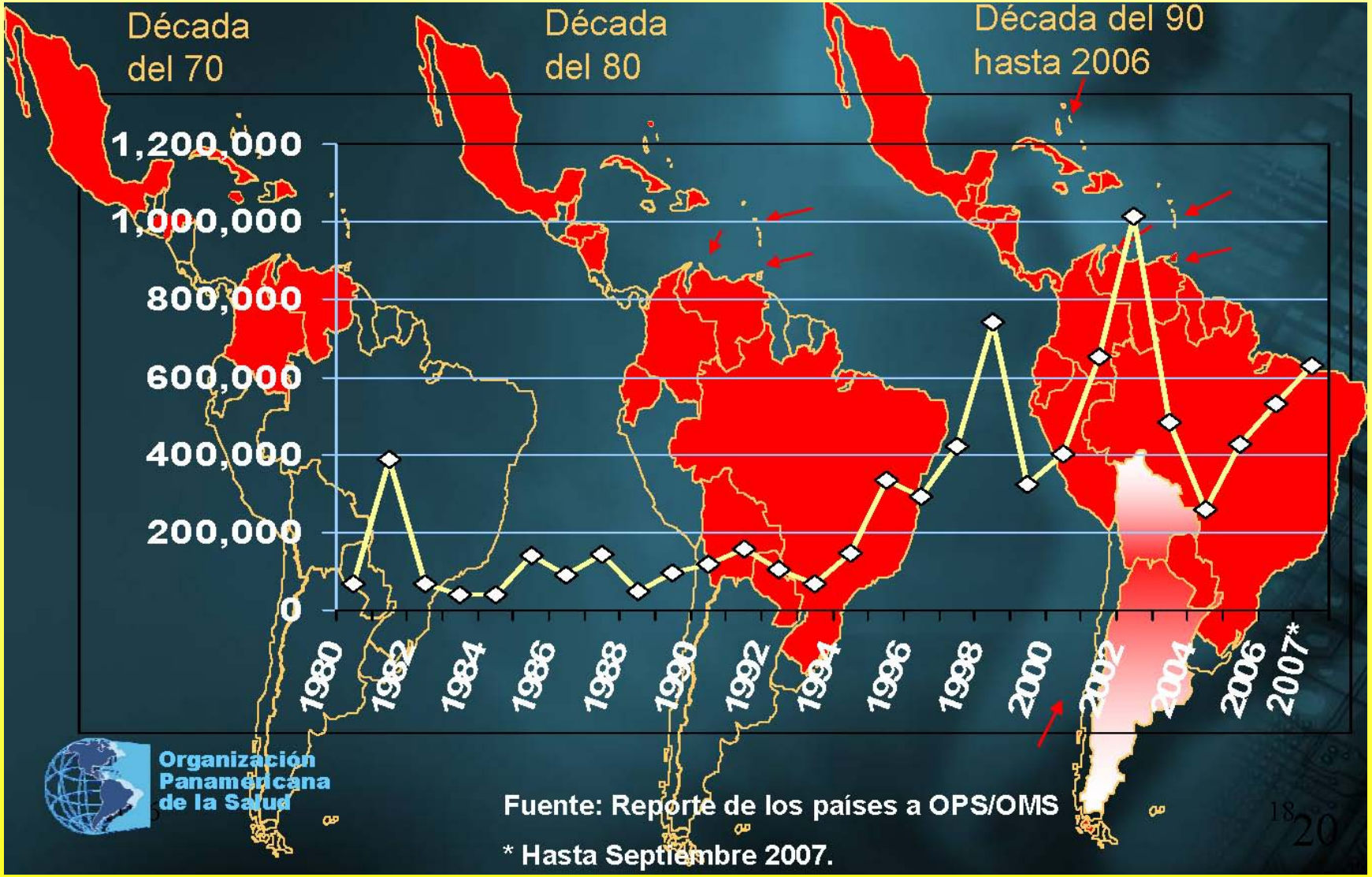
Areas or countries at highest risk of dengue fever transmission:
those located between the 40th parallel north and the 40th parallel south.

Número anual de países que reportan casos de D/FHD a la OMS, 1959-2006

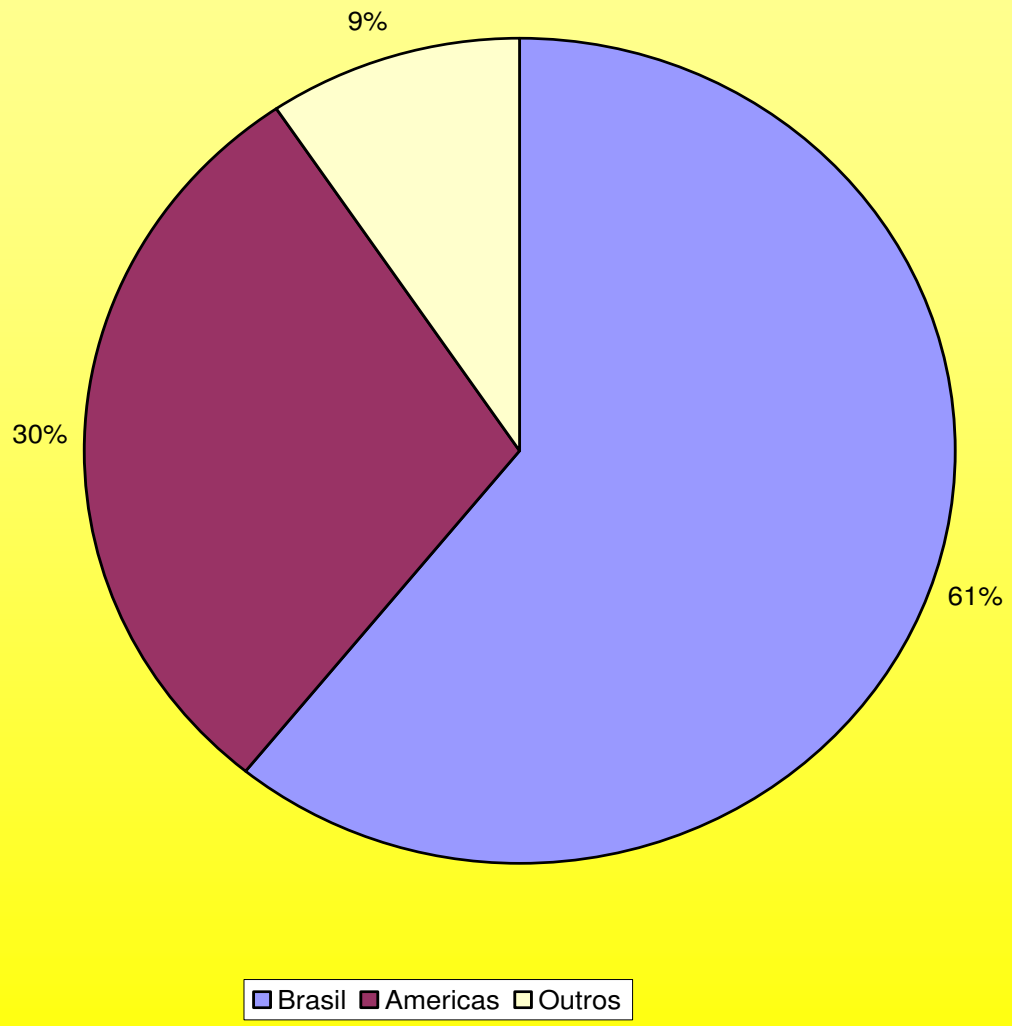


Fuente: Reporte de países OMS.

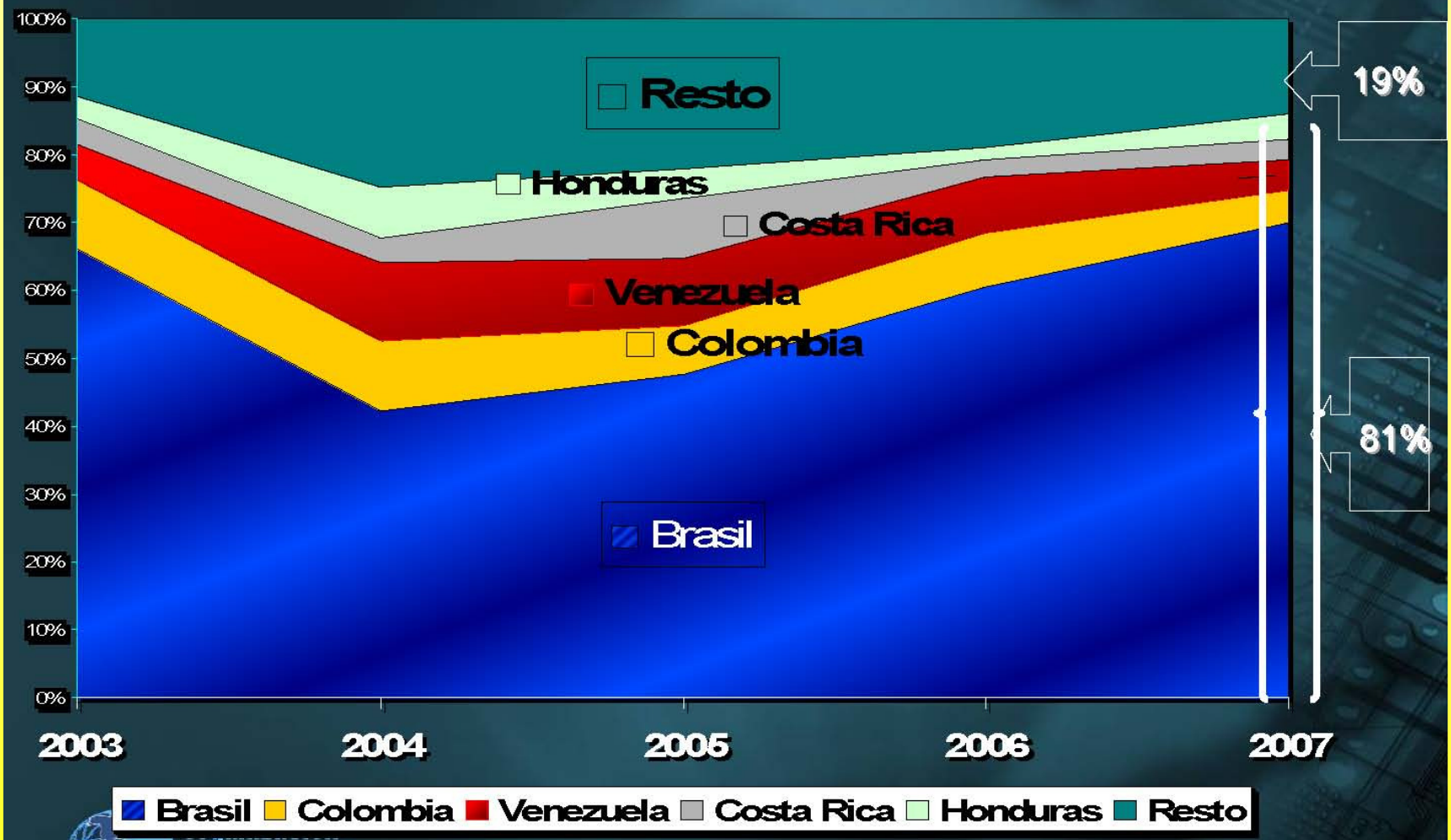
Organización Panamericana de la Salud


Década del 70
Década del 80
Década del 90 hasta 2006
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2007*
Organización Panamericana de la Salud
Fuente: Reporte de los países a OPS/OMS
* Hasta Septiembre 2007.

Dengue: Notified Cases (%) to WHO 2000 a 2005.

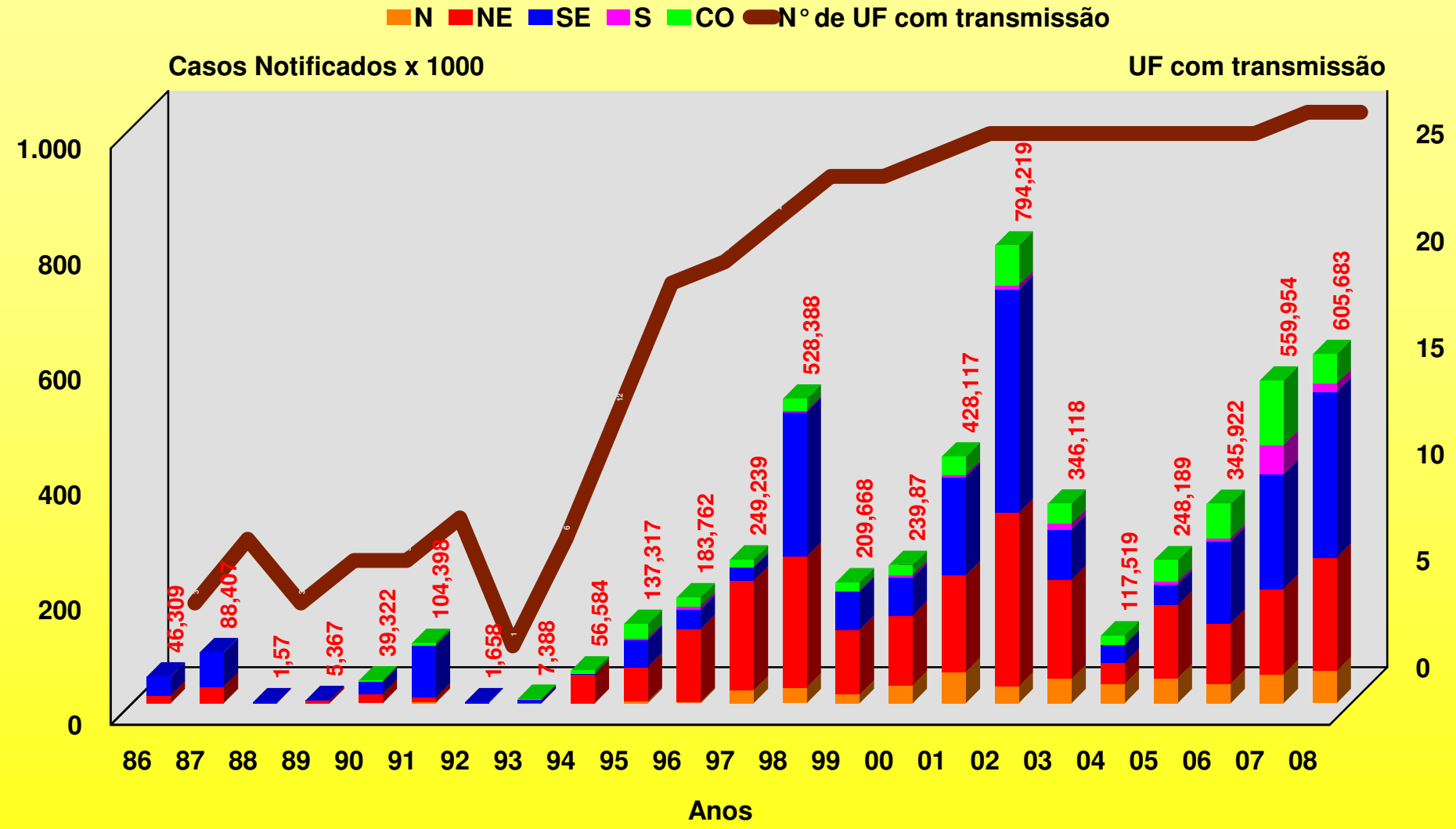


Morbilidad por países de mayor notificación 2003-2006



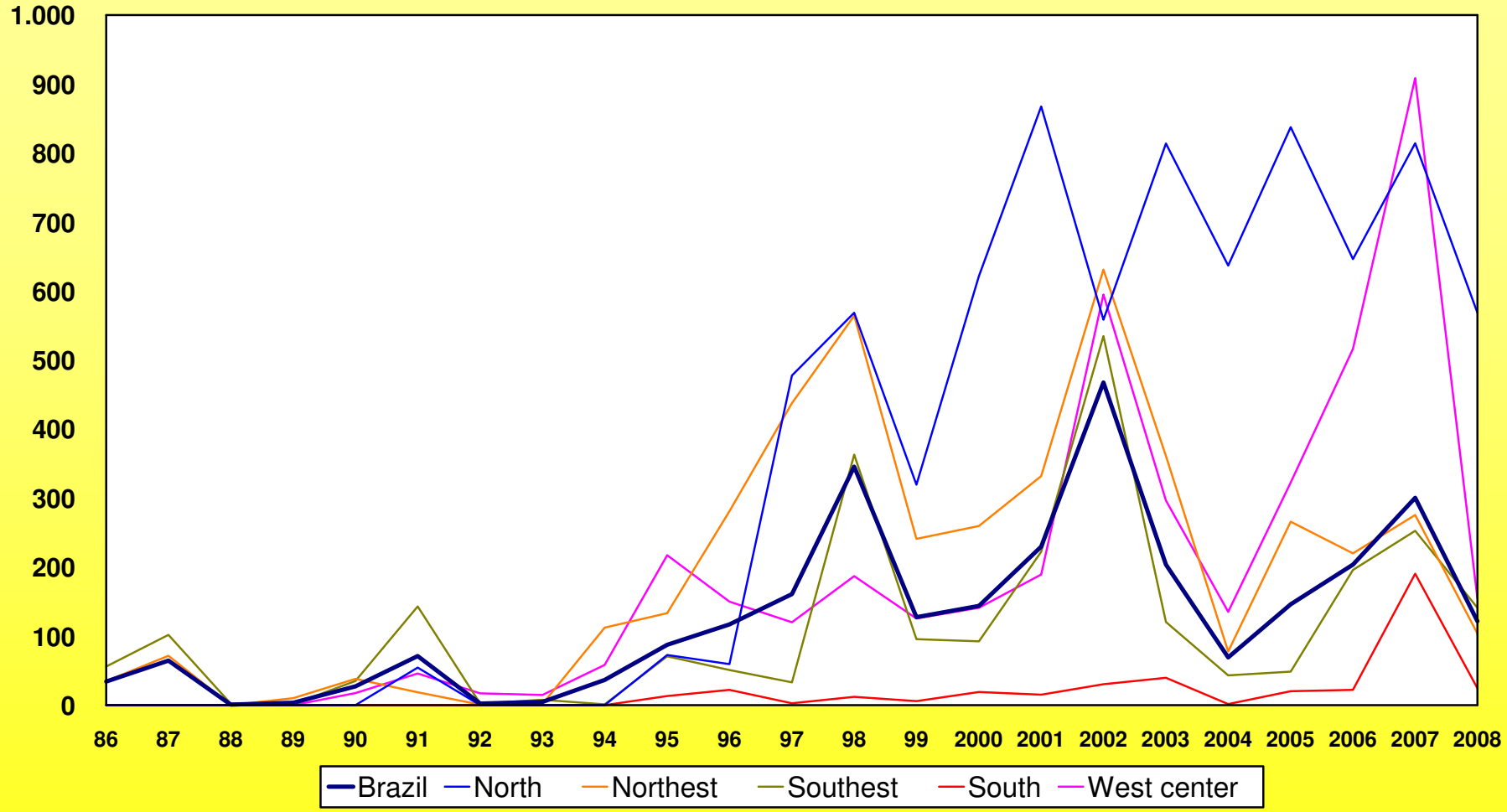
Panamericana
de la Salud

Dengue: Notified and Hospitalized Cases. Brazil, 1986-2008*



*Dados até a s.e 26, sujeitos à alteração

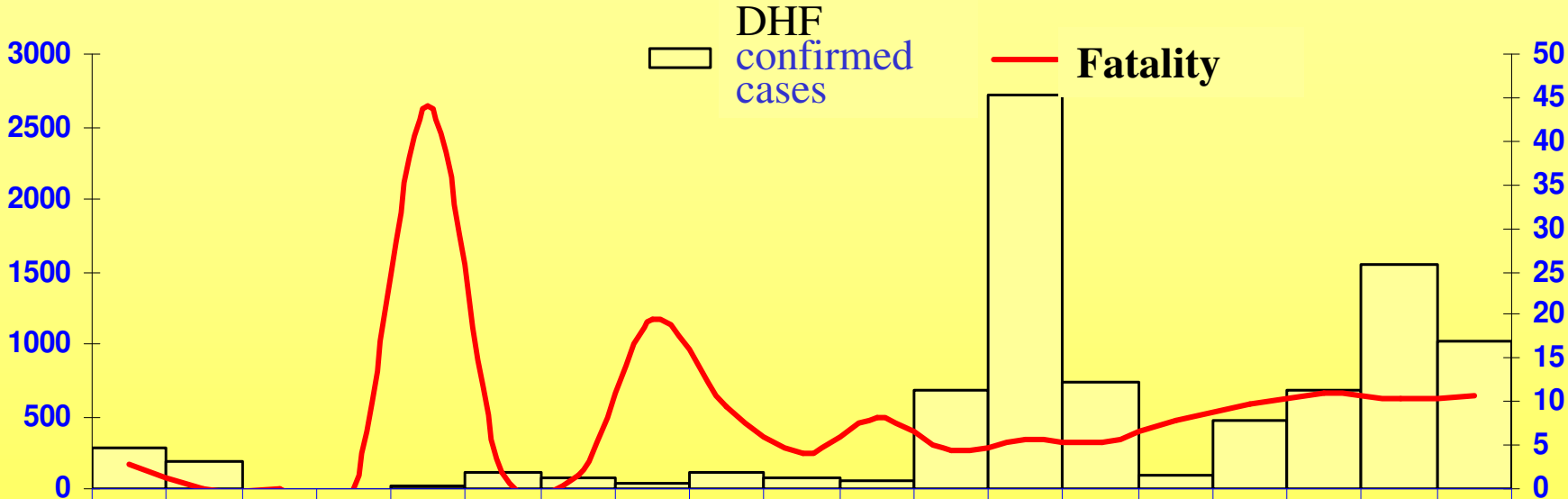
Distribution of Dengue incidence rates per 100.000 inhabitants per year, by Regions, Brazil, 1986 2008*



Source: Ministry of Health, Brazil
*** until april 30**

Confirmed cases and fatality rate of DHF, Brazil 1990-2008*

N^{0} 20



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
DHF	274	188	0	0	25	114	69	46	105	72	62	682	2714	727	103	463	682	1541	1014
Deaths	8	0	0	0	11	2	1	9	10	3	5	29	150	38	8	45	76	158	108
Fatality	2,92	0,00	0,00	0,00	44,00	1,75	1,45	19,57	9,52	4,17	8,06	4,25	5,53	5,23	7,77	9,72	11,14	10,25	10,65

* Data until the 13th e.w

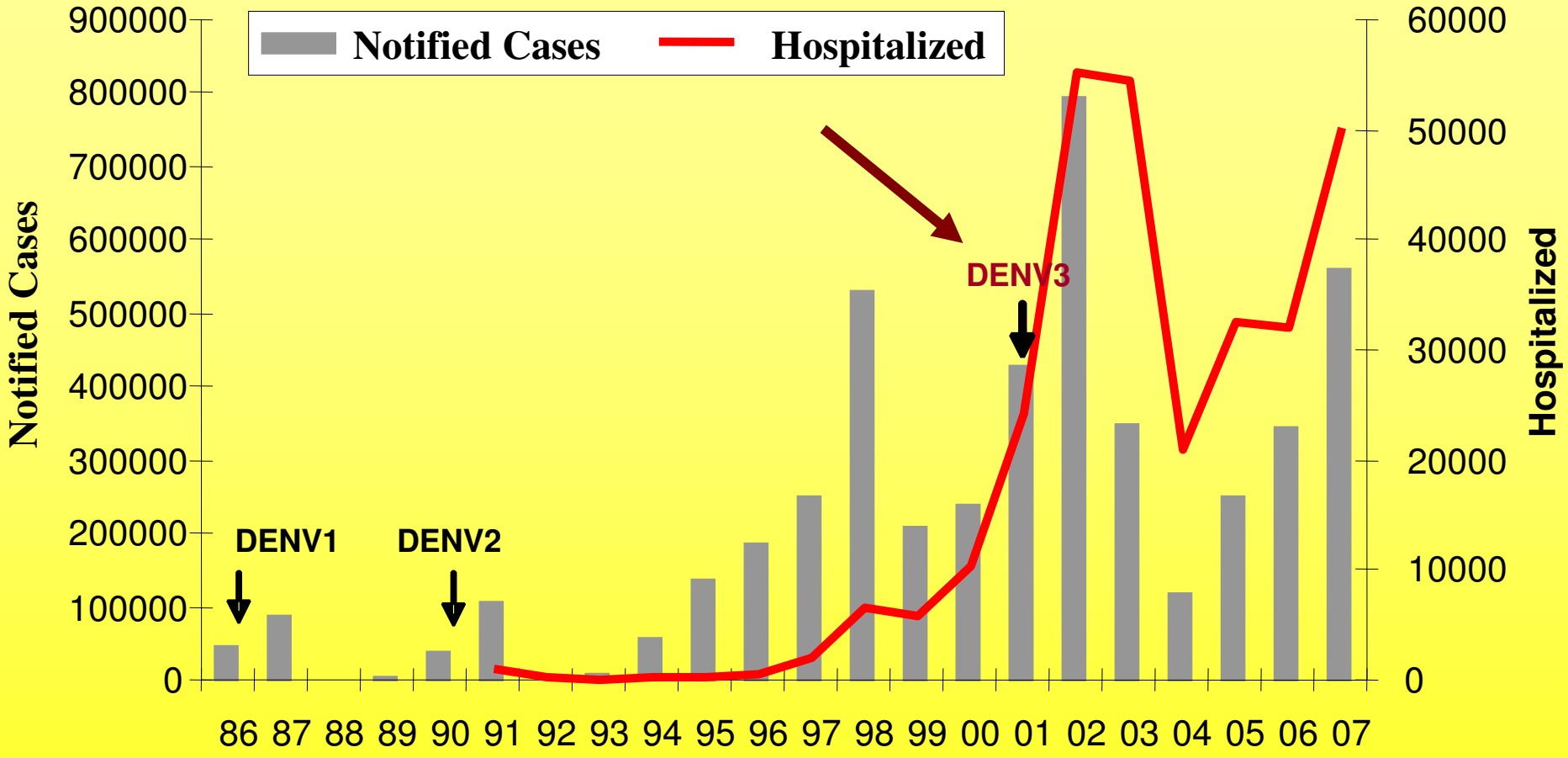
Total number of DHF cases : 8.854

Epidemiological differences and similarities between Brazil and Southeast Asia

Similarities between Brazil and Southeast Asia

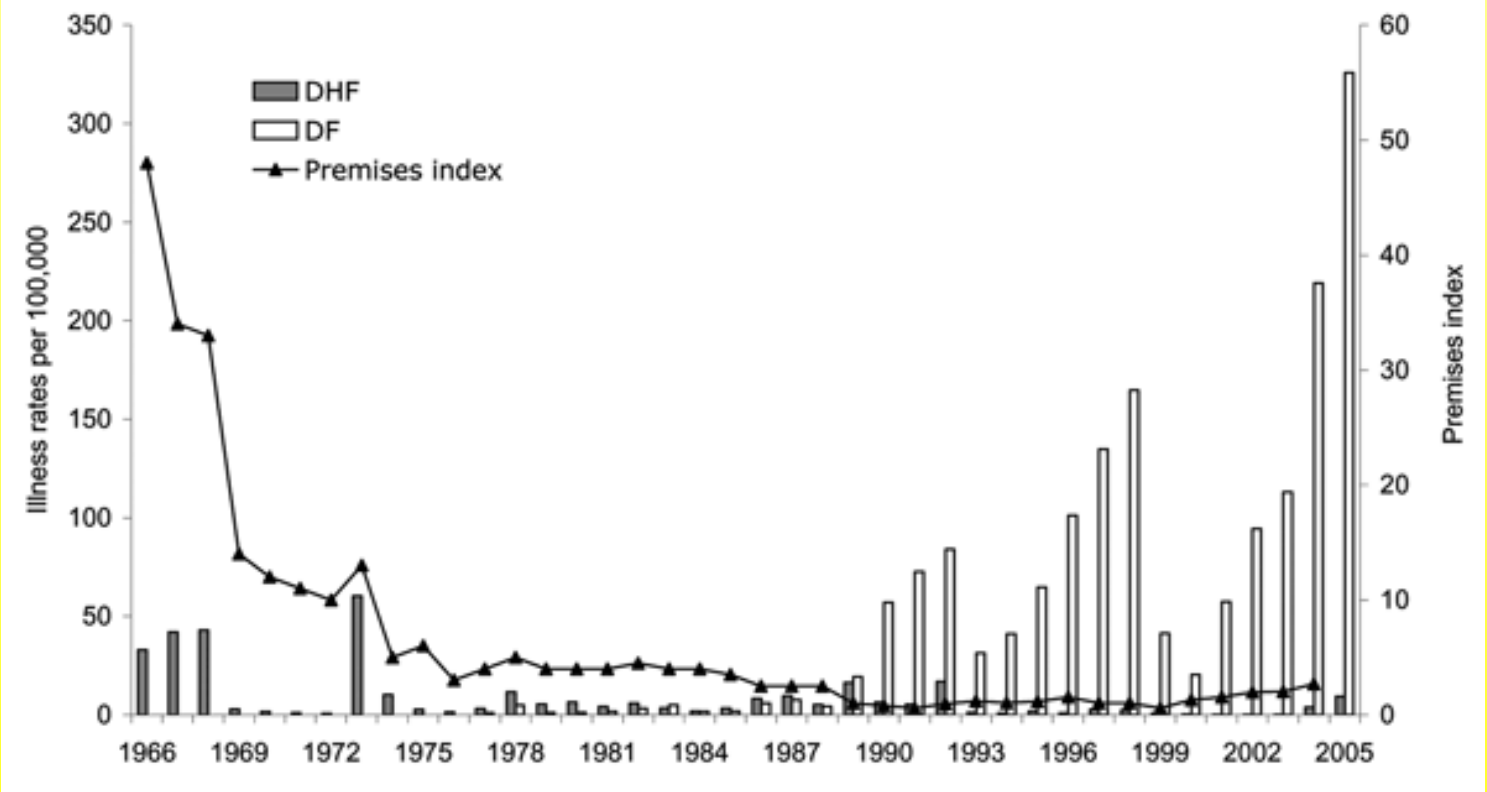
- **Explosive Epidemics/each two years**
- **Sazonality**

Dengue: Notified and Hospitalized Cases. Brazil, 1986-2007*



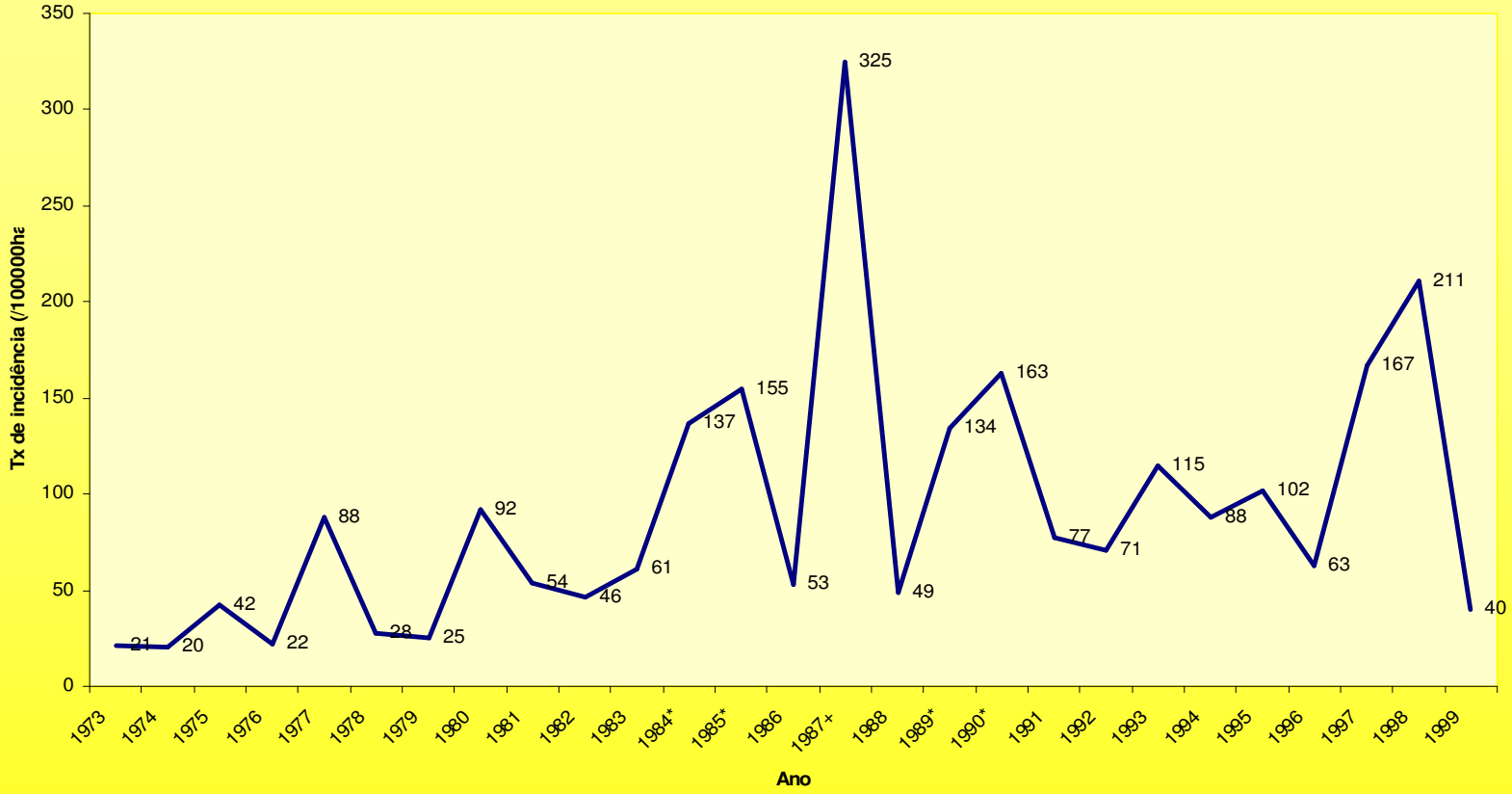
*Until nov 2007

Annual incidence dengue fever (DF) and dengue hemorrhagic fever (DHF) and the premises index, Singapore,1966–2005.



Ooi et al, 2006

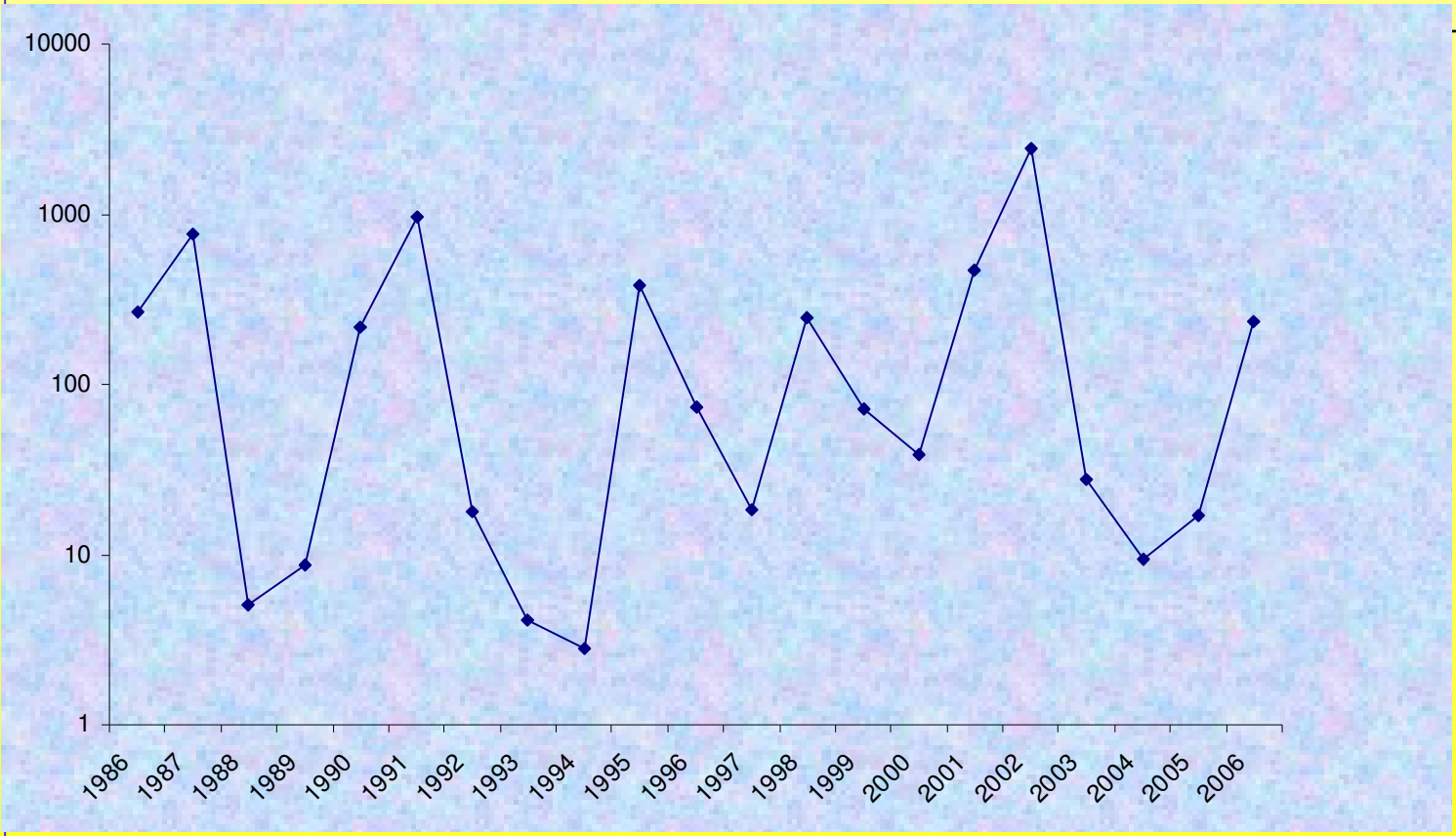
Dengue incidence, Bangkok-Tailândia, 1973-1999



Nisalak et al, 2003

Dengue Incidence, Rio de Janeiro, 1986-2006

Nº 24



Ano	Incidência
1986	263,46
1987	771,61
1988	5,03
1989	8,72
1990	217,42
1991	956,65
1992	18,03
1993	4,14
1994	2,78
1995	377,24
1996	74,21
1997	18,5
1998	243,08
1999	72,26
2000	38,91
2001	472,75
2002	2399,35
2003	27,4
2004	9,3
2005	16,8
2006	234,6

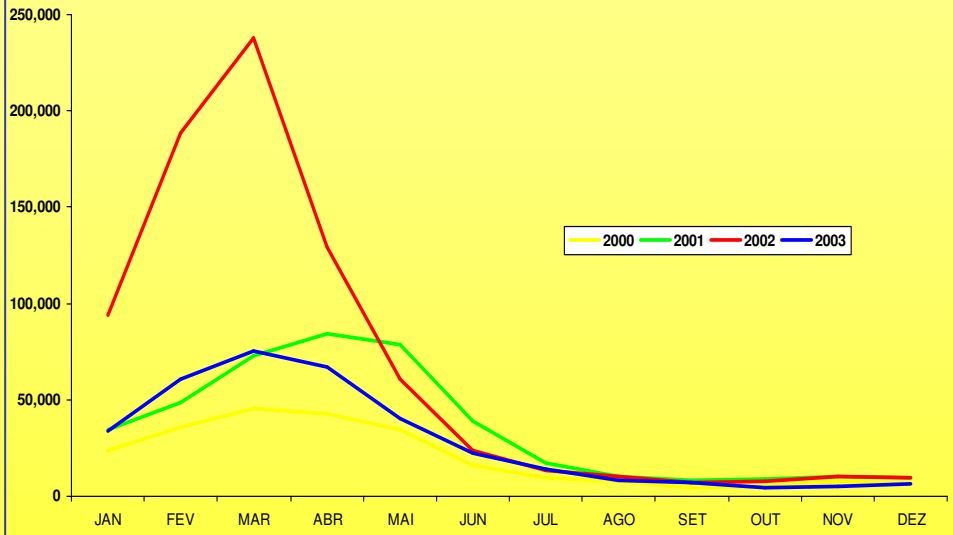
Source: SMS-RJ, 2006

Similarities between Brazil and Southeast Asia

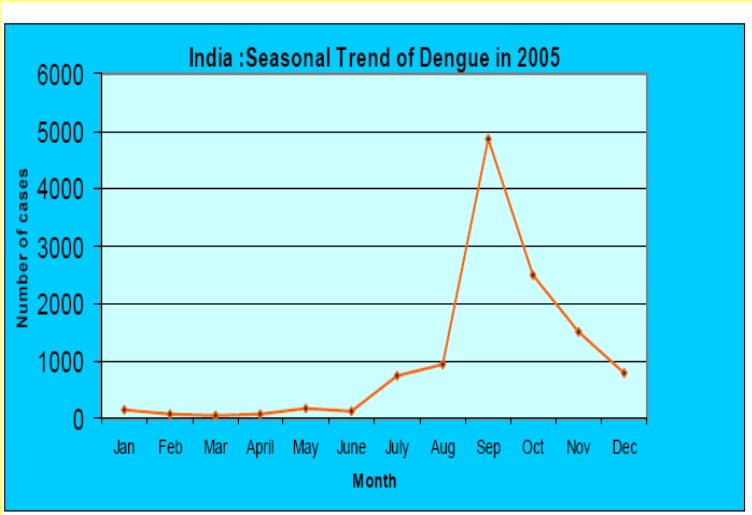
- **Explosive Epidemics/each two years**
- **Sazonality**

Seasonal Trend

Brazil



India



Epidemiological differences between Brazil and Southeast Asia

FHD X FD ratio

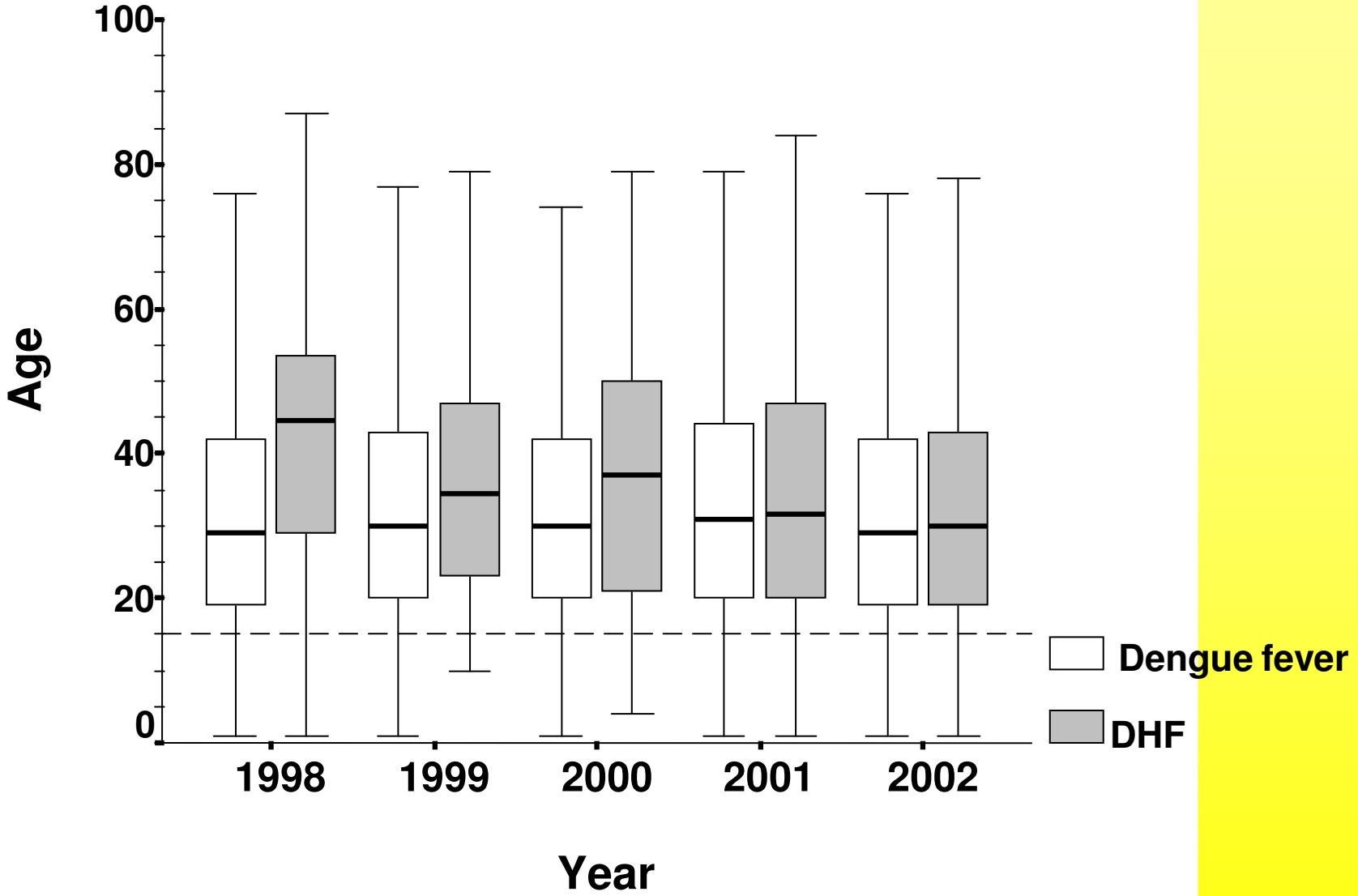
- **Until 2000 – 0,06% (DENV1 and DENV2)**
- **2005 – 0,34% (DENV3)**

Age Group

Predominantly an adult disease (DF and DHF)

Until 2006

Age distribution of dengue and DHF, Brazil, 1998-2002



Changes in Dengue Epidemiology in Brazil 2007-2008

AGE GROUP

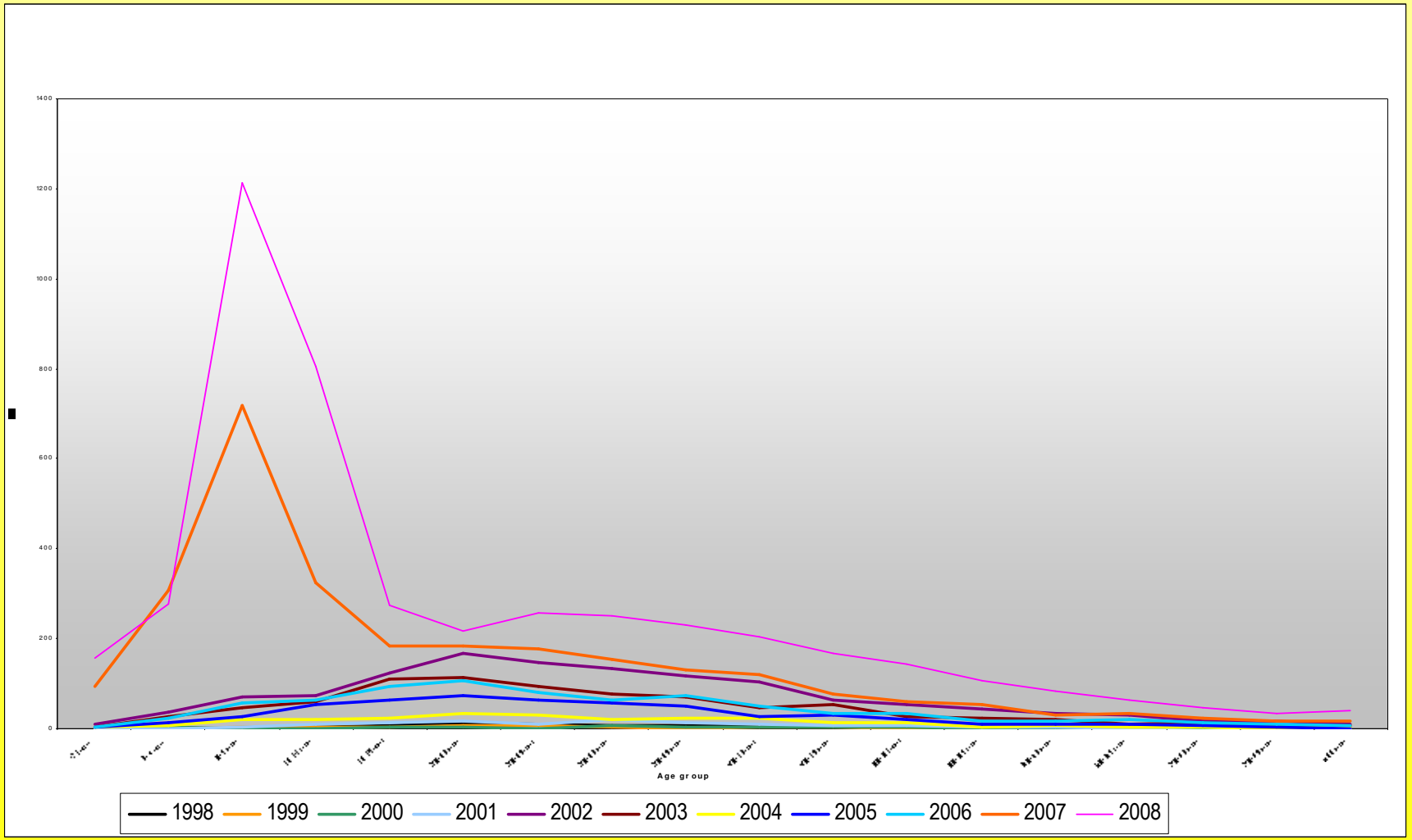
Until 2006: Predominantly an adult disease (DF and DHF)

2007 - Shift in age group

2008 – near 50% of DF cases in < 15 years and

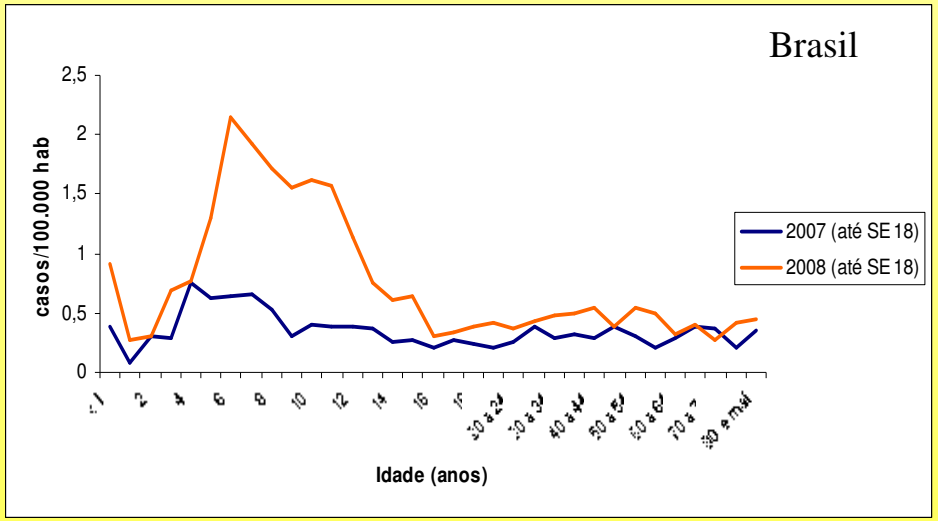
86% of fatality in <15 years

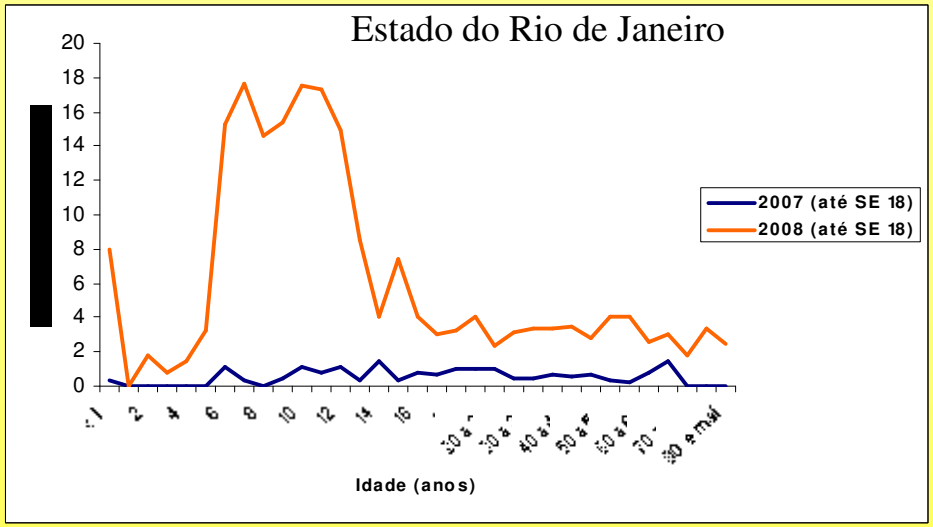
Hospitalized Cases of Haemorragic Fever Dengue According Age Group.Brazil, 1998 – 2007.

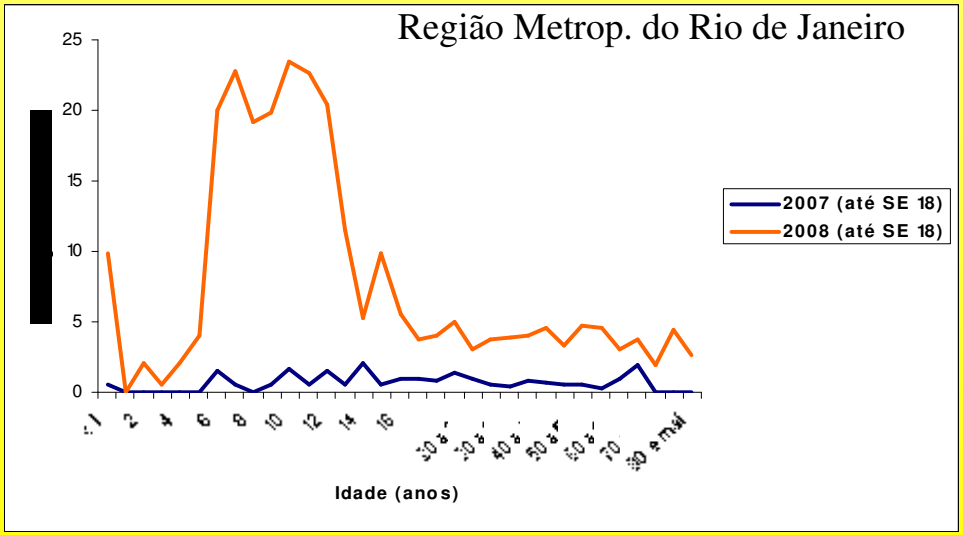


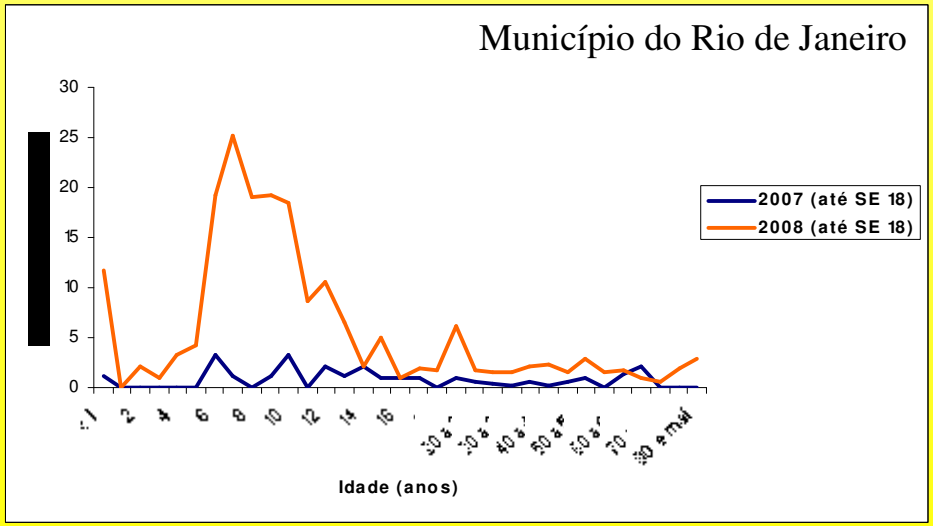
Teixeira et al, 2008. EID

Notified FHD Cases Incidence According Age January - May 2007 and 2008.









Notified Dengue Fever Cases Incidence According Age
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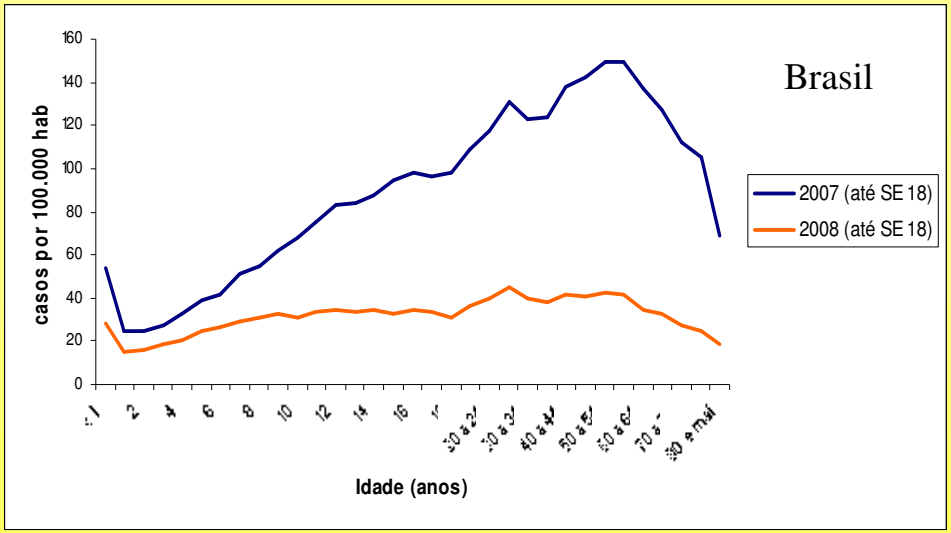

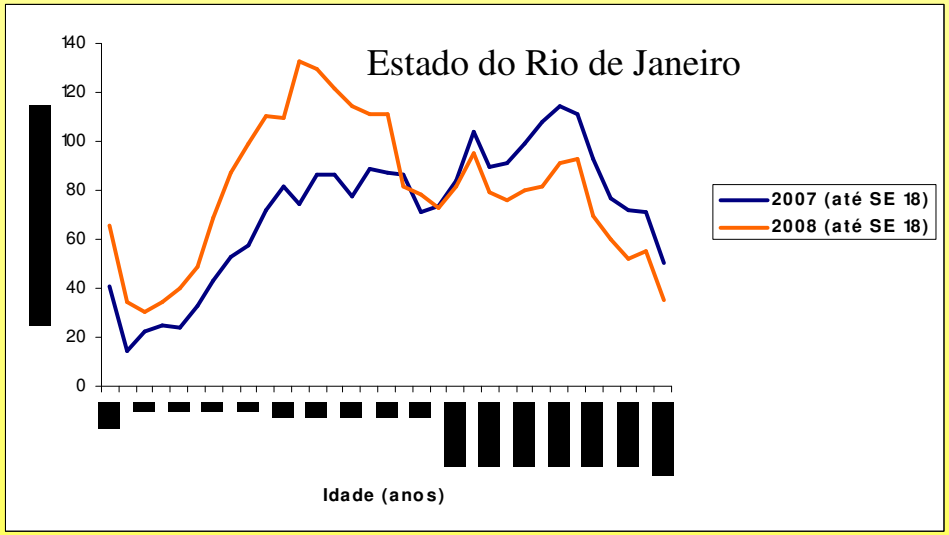

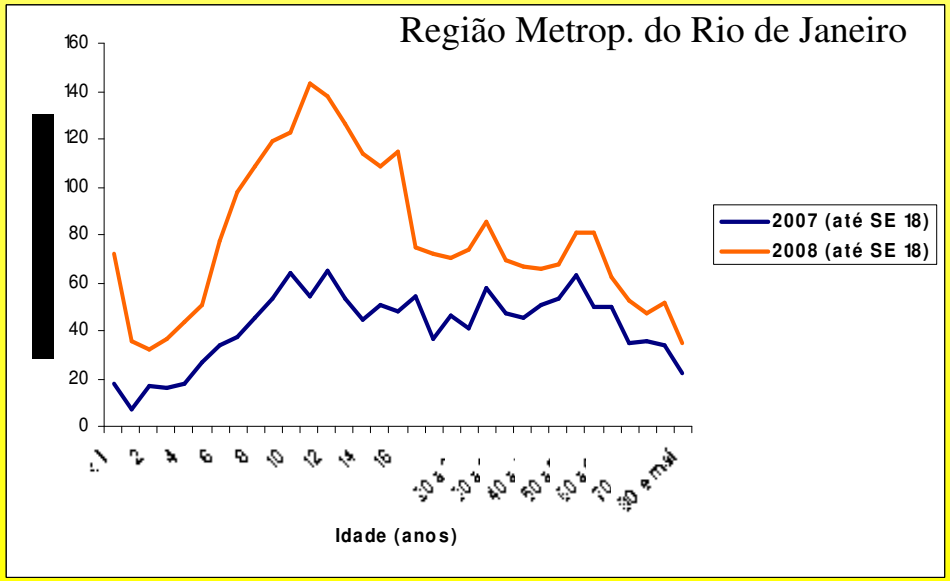

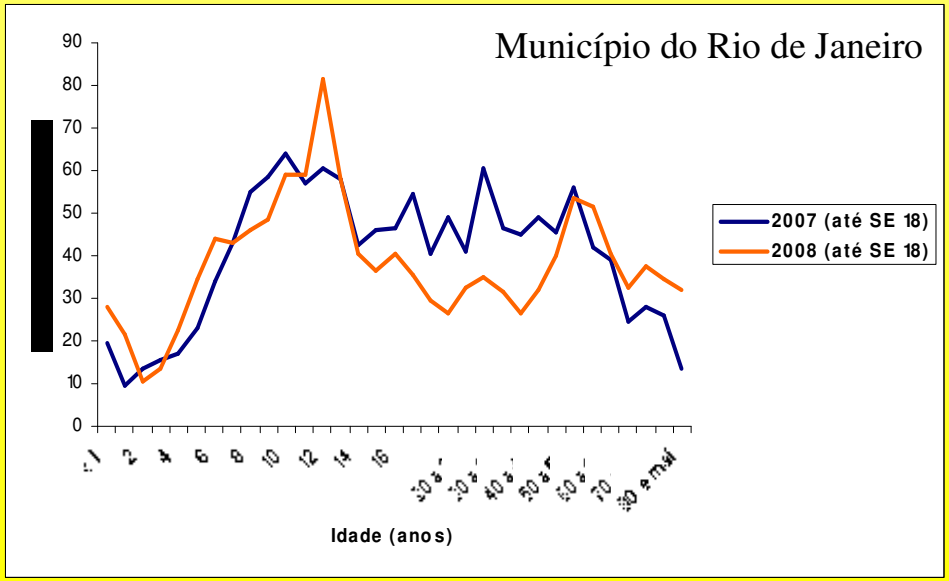

Differences in Dengue Fever between Southeast Asia and Brazil 2007/2008

Southeast Asia

- Predominantly a childhood disease in most areas (except for Singapore)
- High prevalence of dengue hemorrhagic fever (DHF)
- Affects mostly women

Brazil

- Predominantly an adult disease - Trend Increase in child?
- Predominance of mild infections - Increase FHD x FD ratio
- Affecting similar proportions of women and men

Fatality rate ?

25 Years of Dengue in Brazil

- 61% of the cases reported to WHO between 1998 and 2005
- 78% of all reported cases in the Americas between 1998 and 2005
- Explosive and successive epidemics/ Hyperendemicity
- Simultaneous circulation of three serotypes
- Risk of introduction of DENV4
- Increase in the magnitude and severity of epidemics

25 Years of Dengue in Brazil

- Changes in the epidemiological patterns of the disease.
- Annual expenditure of more than 1 billion dollars in vectorial combat programs and healthcare.
- Despite the high investment of resources, results have indicated poor efficacy of control actions.
- High lethality ? (above 10%).

Limitations to Prevention

- ✓ No vaccine available;
- ✓ No specific treatment available;
- ✓ No reliable laboratory tests for the diagnosis of sequential infections;
- ✓ Disease control based on vector combat has proven ineffective;
- ✓ Reducing lethality of the severe forms of the disease depends on timely diagnosis and the quality of healthcare.

An International Call for action on Dengue

1- Development of new approaches for vector control; the existing one are ineffective, and environmentally aggressive and expensive;

2- Development of an efficacious tetravalent vaccine, affordable for the population under dengue risk;

3- A least aspect are actions on the urban environment: dengue in the tropics has its roots in the way the urban environment has been explosively developed, with great part of the urban population lacking the basic environmental infrastructure.

Barreto, ML & Teixeira, MG. Lancet, 2008.