



OBSERVATÓRIO DE SAÚDE URBANA
DE BELO HORIZONTE

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Universidade Federal de Minas Gerais



Dengue in Urban Settings The Belo Horizonte Experience

José Eduardo Marques Pessanha

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Belo Horizonte Urban Health Observatory/ Federal University of Minas Gerais



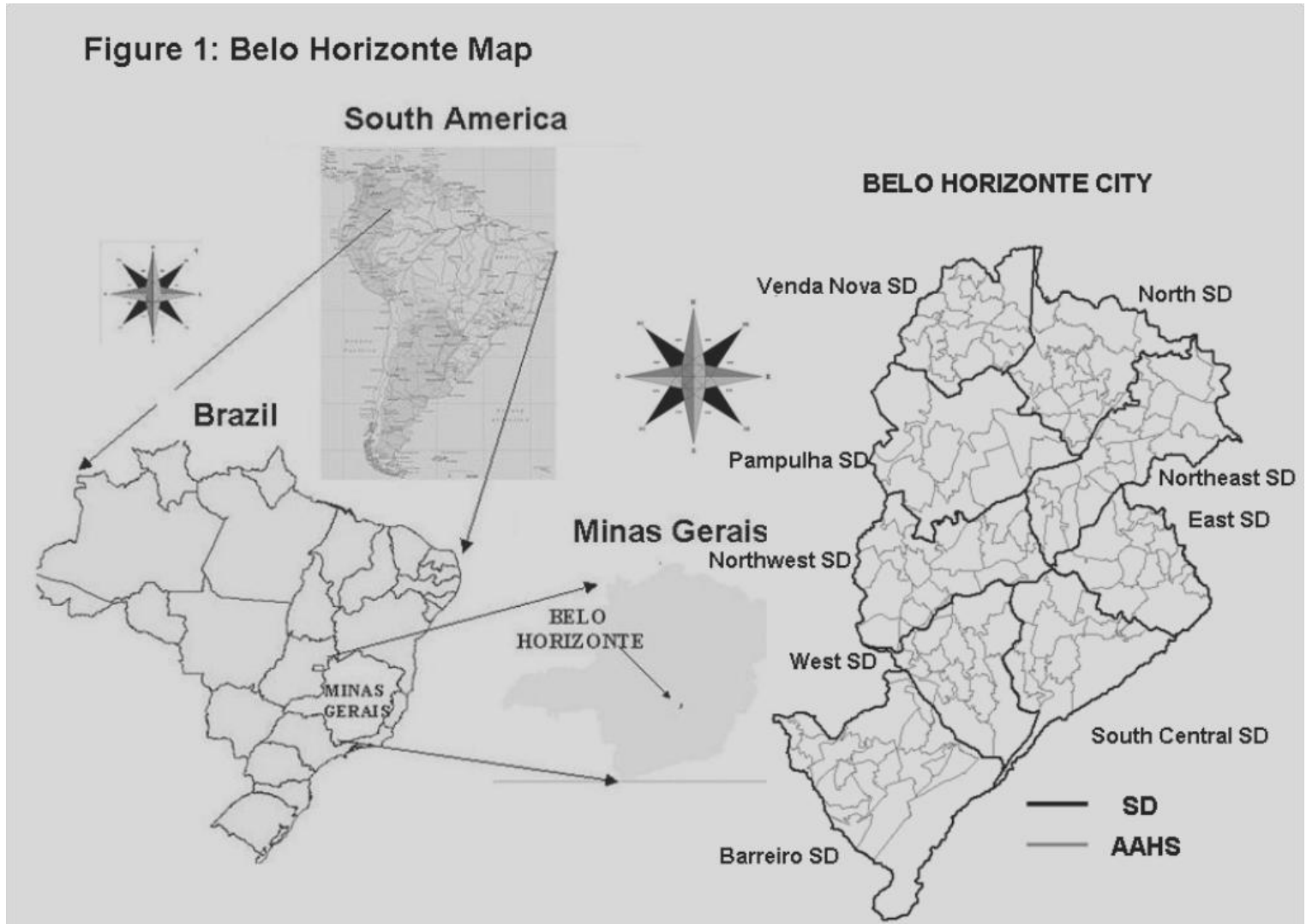
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Belo Horizonte Location



Figure 1: Belo Horizonte Map



Belo Horizonte Metropolitan Region



34 counties

**Population: 4.9 million
de inhabitants**



Belo Horizonte Administrative Regions



Population: 2,375,151

Basic Sanitation:

Water supply – 99.7%

Garbage collection – 100.0%

Sewerage system – 93.0%

Geographic area:

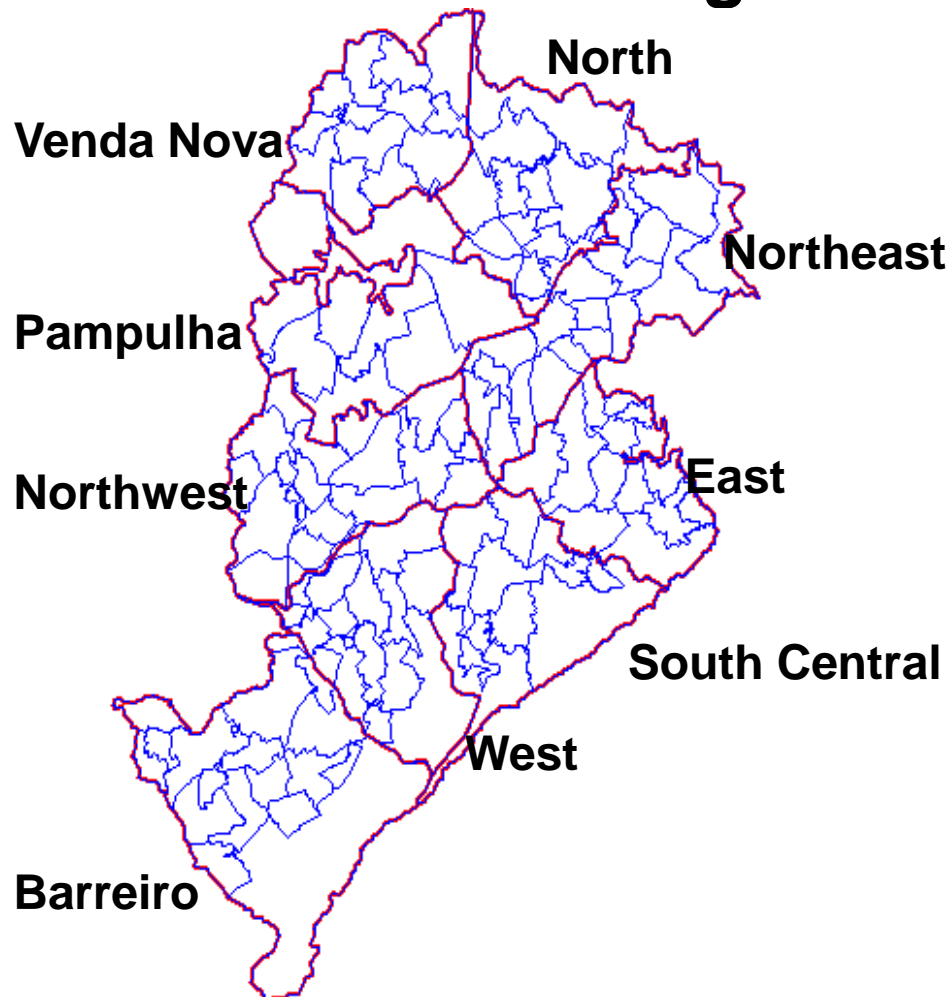
331 KM²

(IBGE 2010)

Health Territory Organization:

9 Sanitary Districts

146 Basic Health Unities



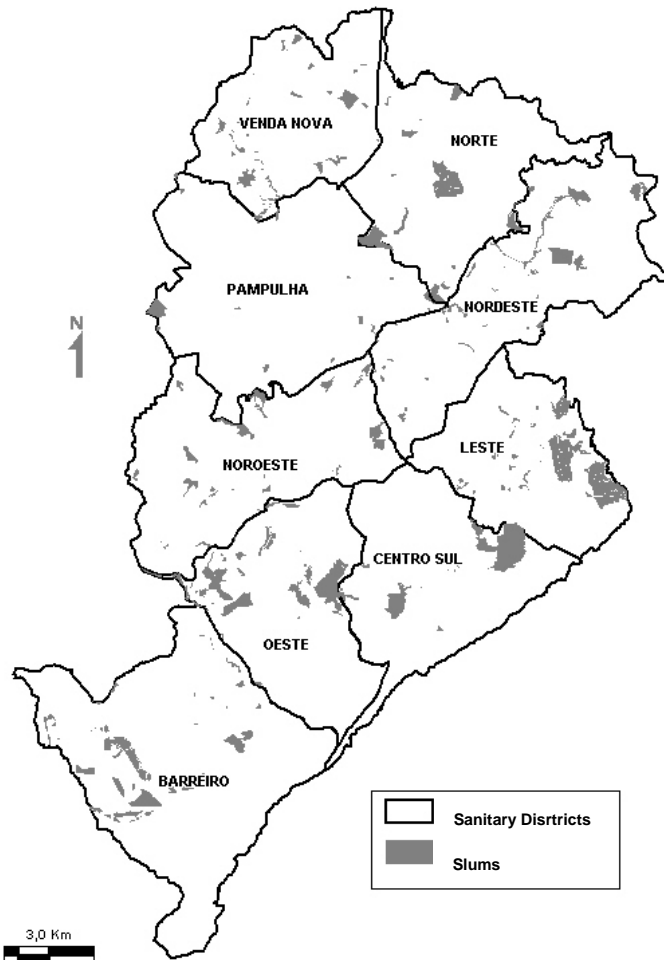
City characterization

Slums

Fotos Ierê Ferreira



Formal urbanization



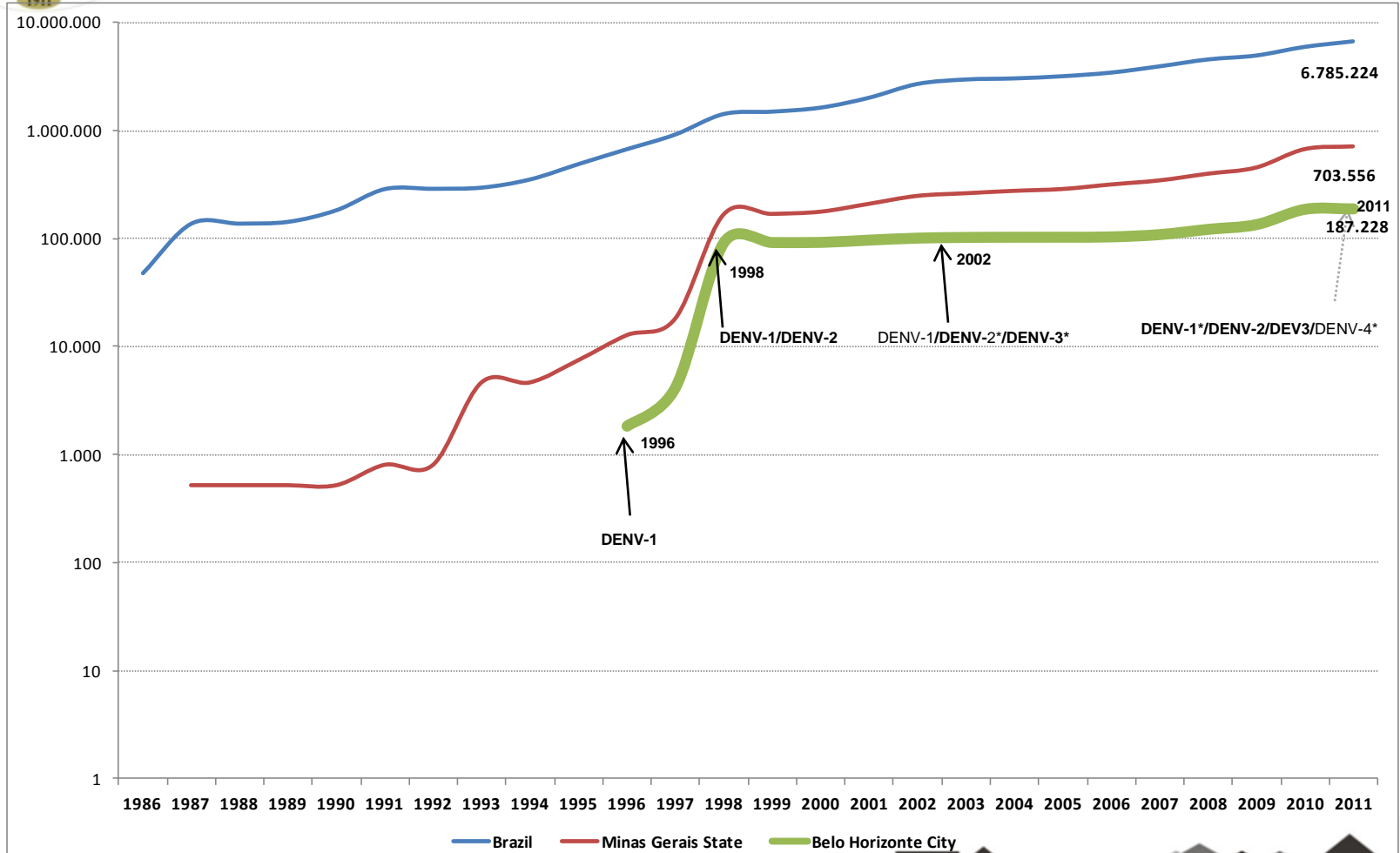
Slums Census Sectors :
12.2%

Stimted Population:
292,157



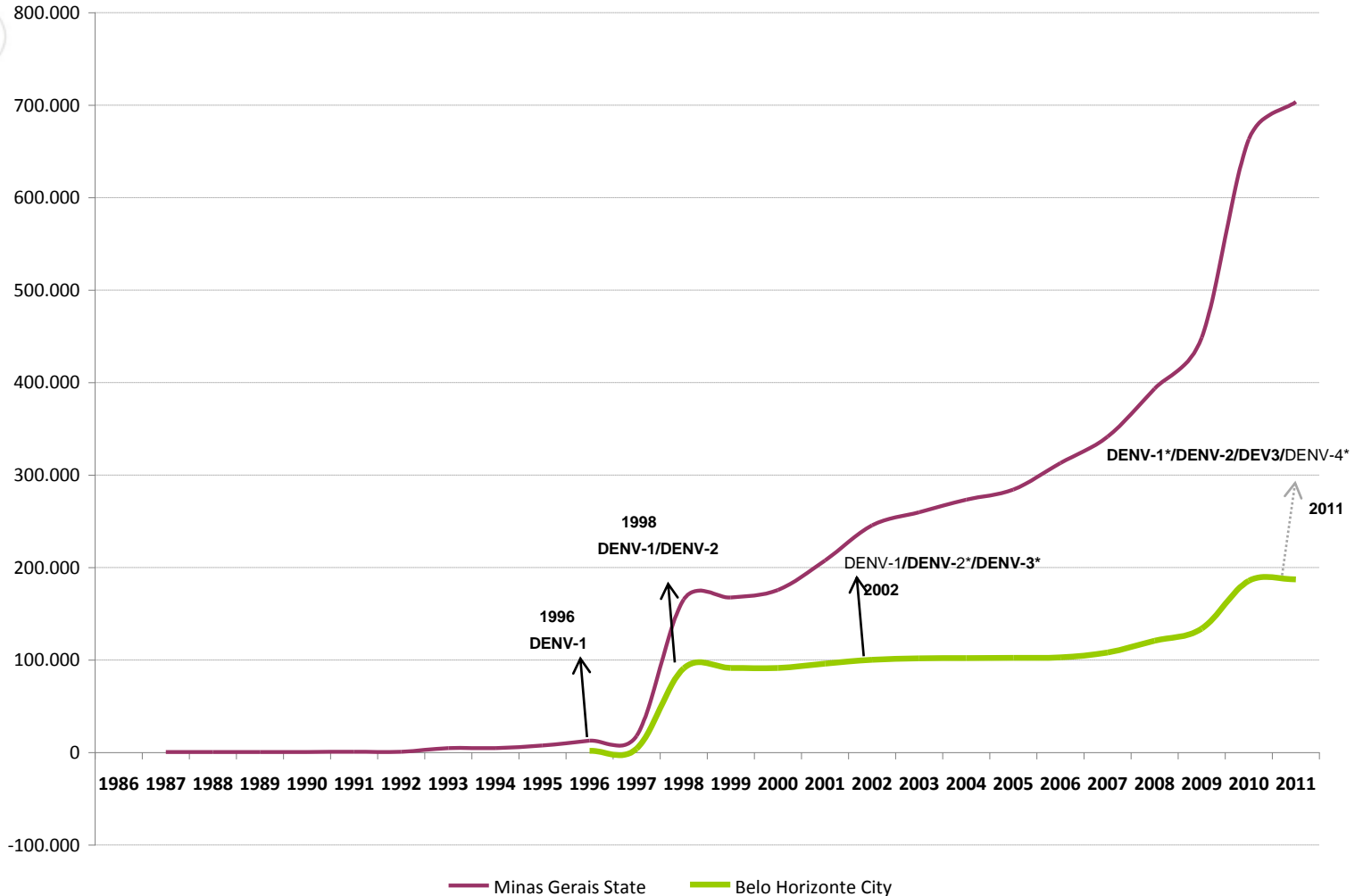
Background

- Yearly Dengue, 1986-2011, Belo Horizonte-MG, Brazil
- First Dengue epidemic in Belo Horizonte (BH) --> 1996.
- Dengue serotype 1, 2,3 and 4 involved.



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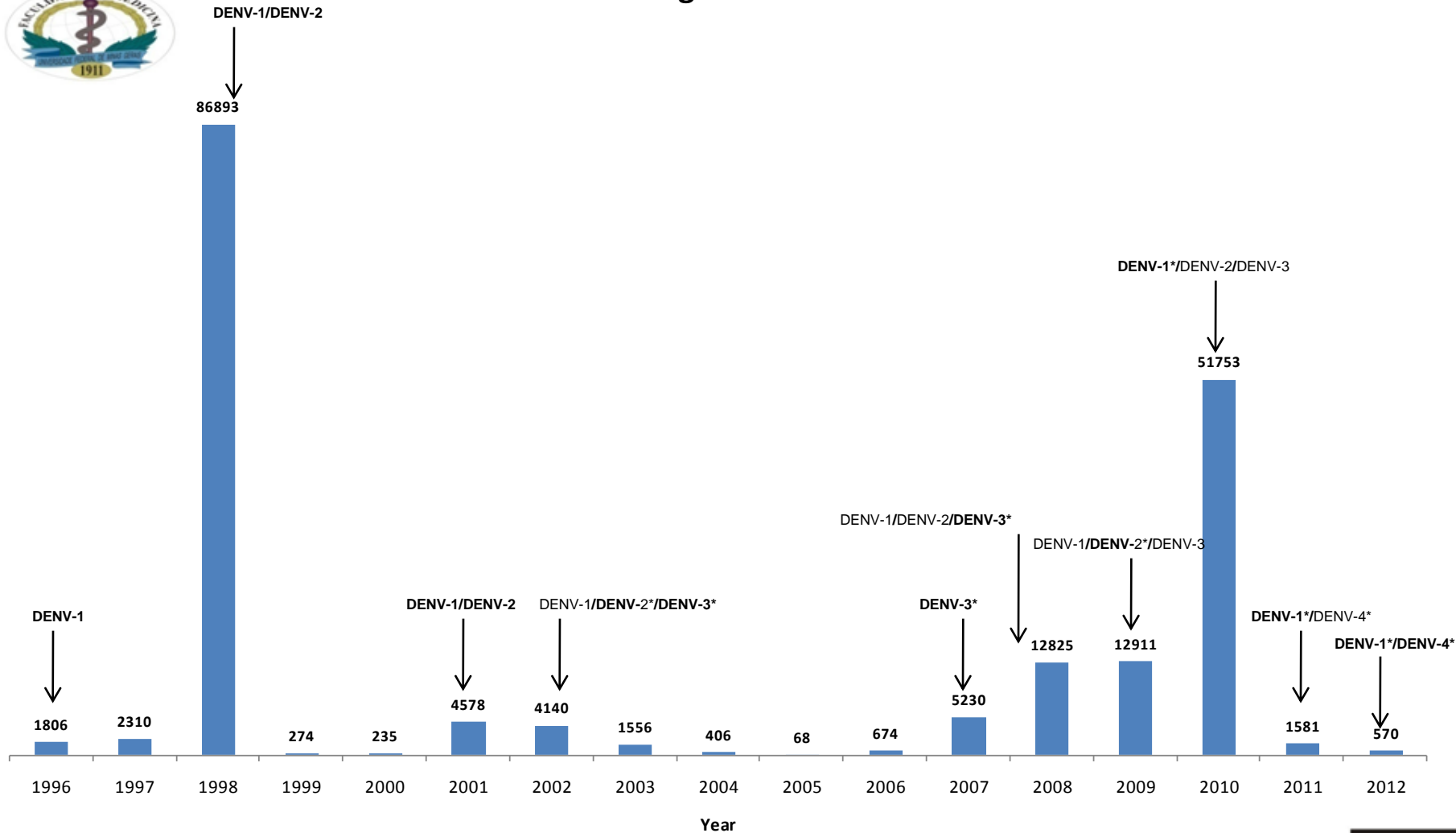


Background

- Yearly Dengue, 1996-2012, Belo horizonte-MG, Brazil
- First Dengue epidemic in Belo Horizonte (BH) --> 1996.
- Dengue serotype 1, 2,3 and 4 involved.



Dengue cases



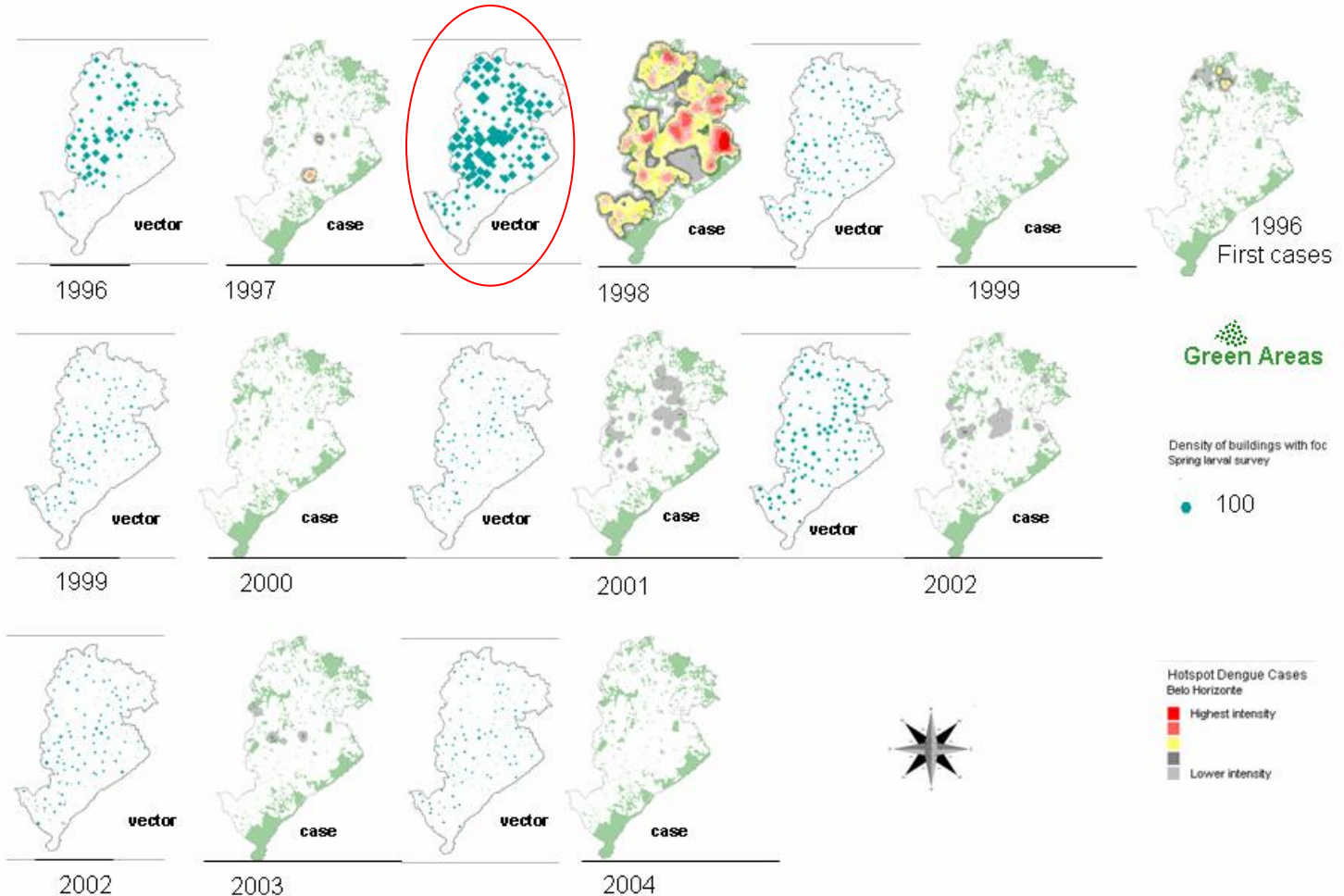


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Background

Temporal dynamics in space, foci of *Aedes aegypti* larvae in October survey and dengue outbreaks, between 1996-2004, Belo Horizonte/MG, Brazil.



José Eduardo Marques Pessanha Pessanha, Waleska Teixeira Caiaffa, Maria Cristina de Mattos Almeida, Silvana Tecles Brandão, and Fernando Augusto Proietti, "Diffusion Pattern and Hotspot Detection of Dengue in Belo Horizonte, Minas Gerais, Brazil," *Journal of Tropical Medicine*, vol. 2012, Article ID 760951, 11 pages, 2012. doi:10.1155/2012/760951



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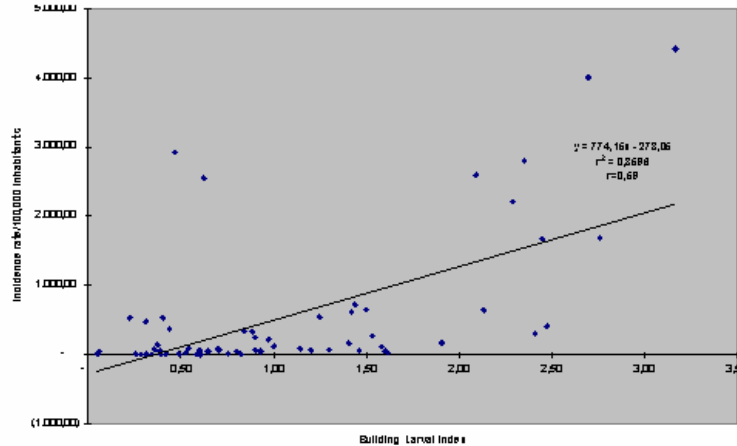
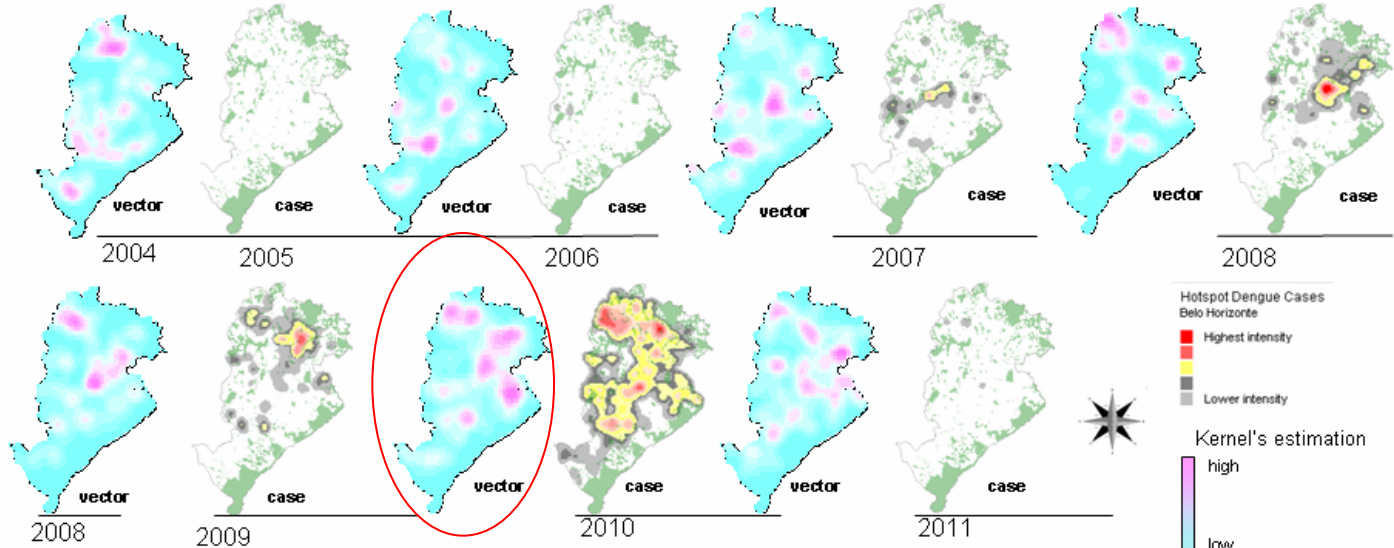




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Background

Temporal dynamics in space, foci of *Aedes aegypti* larvae Kernel's estimation in October survey and Hotspot dengue outbreaks, Regression Linear Graphic, between 2004-2011, Belo Horizonte/MG, Brazil.



José Eduardo Marques Pessanha Pessanha, Waleska Teixeira Caialfa, Maria Cristina de Mattos Almeida, Silvana Tecles Brandão, and Fernando Augusto Proietti, "Diffusion Pattern and Hotspot Detection of Dengue in Belo Horizonte, Minas Gerais, Brazil," *Journal of Tropical Medicine*, vol. 2012, Article ID 760951, 11 pages, 2012. doi:10.1155/2012/760951

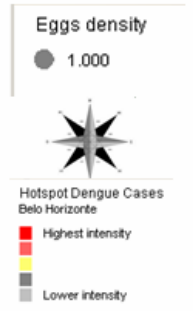
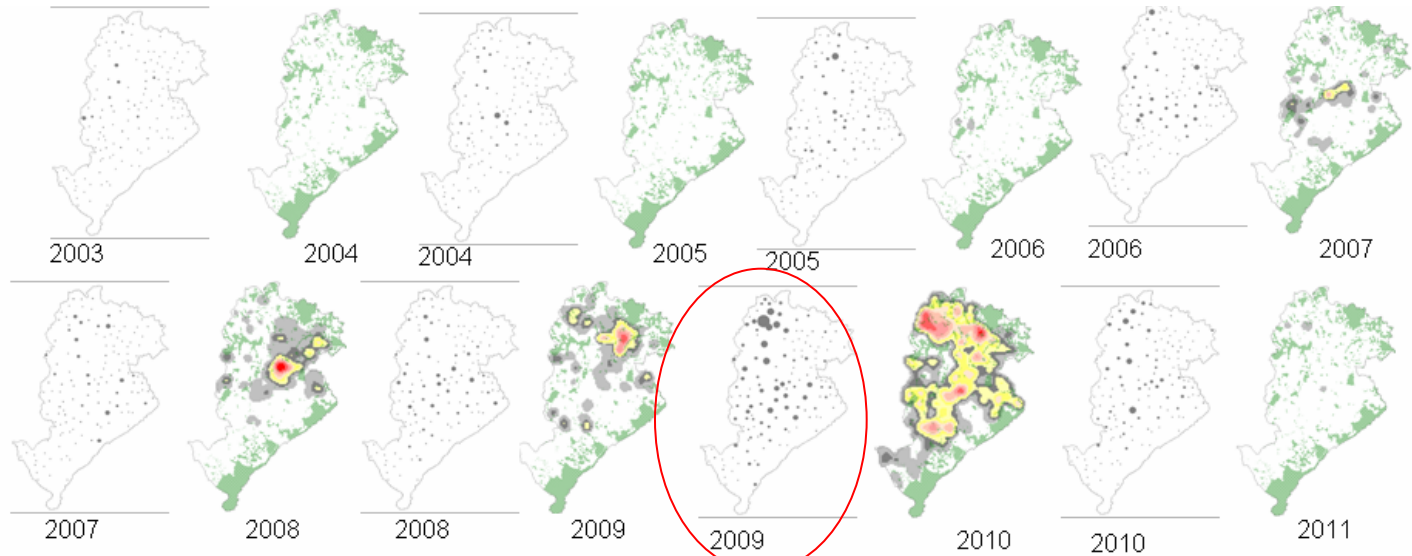


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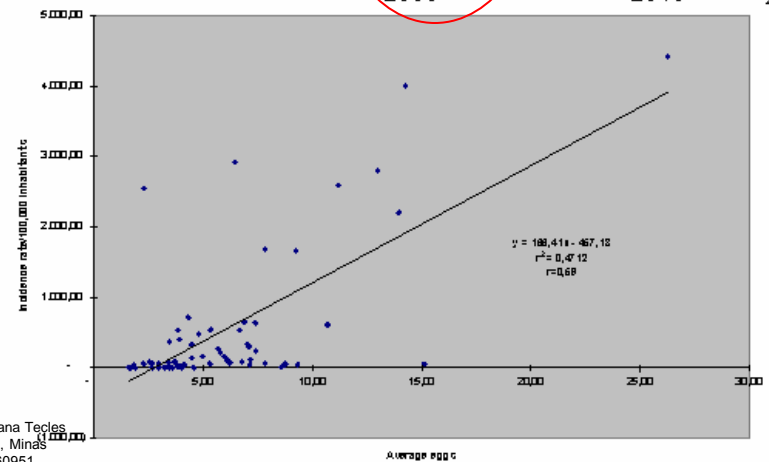


Background

Aedes aegypti eggs in ovitraps September-October, and dengue outbreaks, temporal dynamics in space, Regression Linear Graphic, 2003-2011, Belo Horizonte/MG, Brazil.



Green Areas



José Eduardo Marques Pessanha Pessanha, Waleska Teixeira Caiáffa, Maria Cristina de Mattos Almeida, Silvana Teófilo Brandão, and Fernando Augusto Proietti, "Diffusion Pattern and Hotspot Detection of Dengue in Belo Horizonte, Minas Gerais, Brazil," Journal of Tropical Medicine, vol. 2012, Article ID 760951, 11 pages, 2012. doi:10.1155/2012/760951



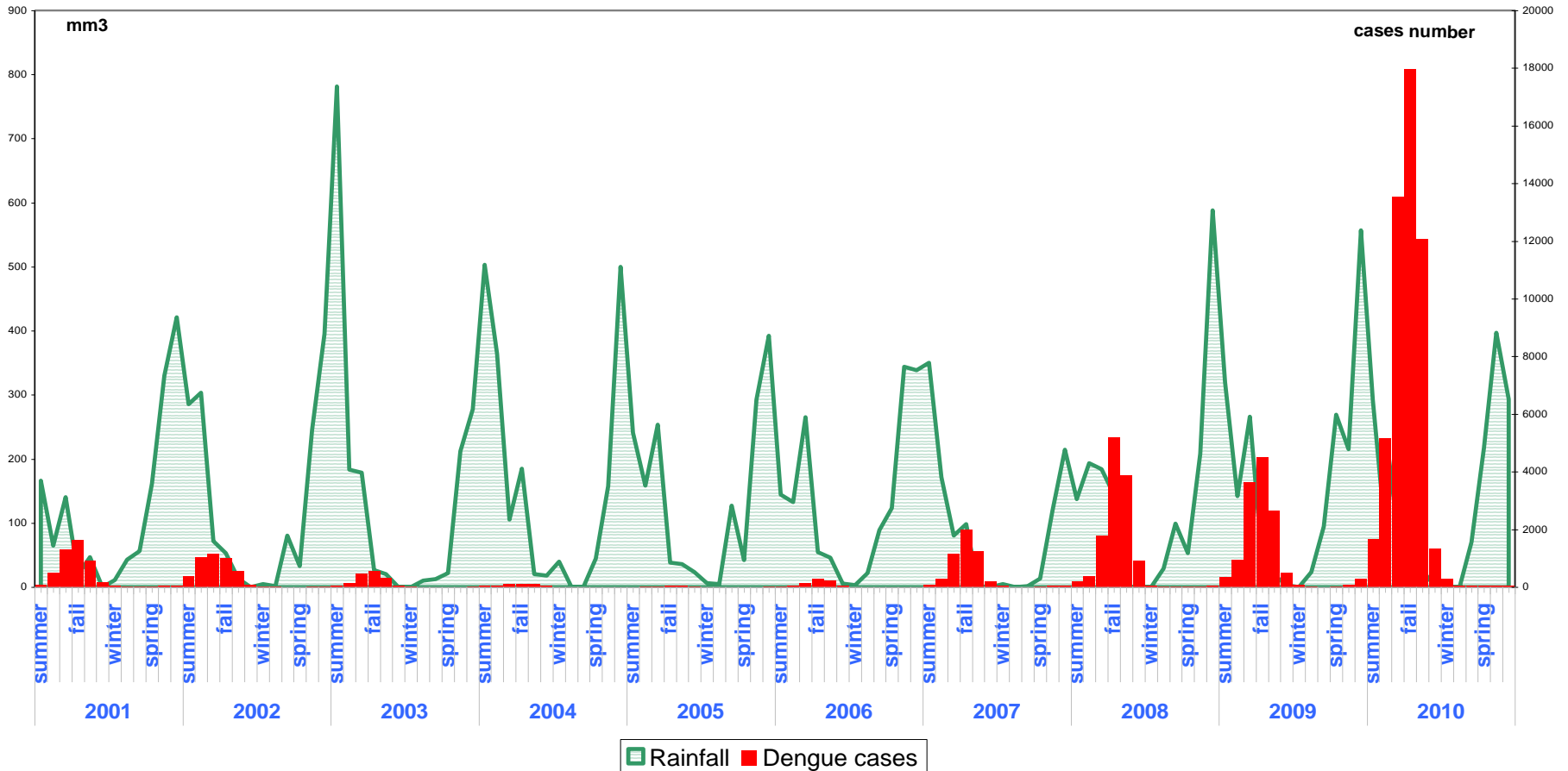


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Background

Dengue cases and Rainfall by months, seasons and years, Belo Horizonte, Minas Gerais State, Brazil, 2001 to 2010



José Eduardo Marques Pessanha Pessanha, Waleska Teixeira Caialfa, Maria Cristina de Mattos Almeida, Silvana Teces Brandão, and Fernando Augusto Proietti, "Diffusion Pattern and Hotspot Detection of Dengue in Belo Horizonte, Minas Gerais, Brazil," Journal of Tropical Medicine, vol. 2012, Article ID 760951, 11 pages, 2012. doi:10.1155/2012/760951

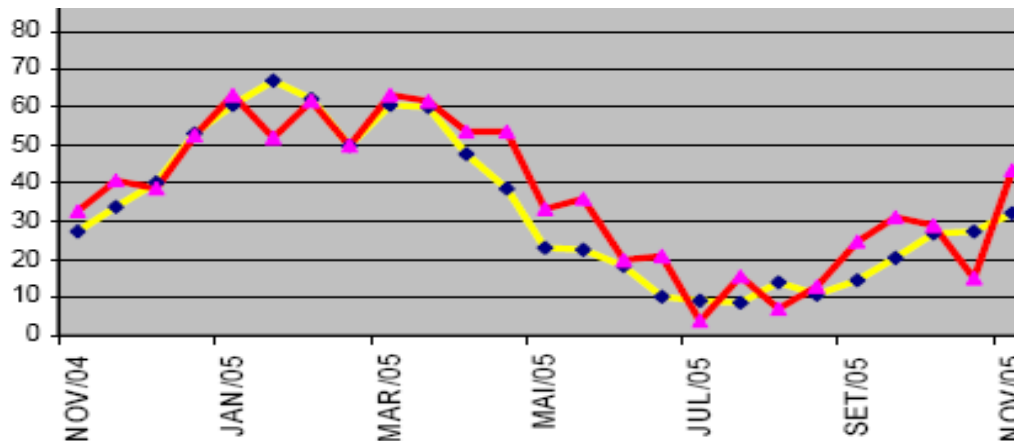
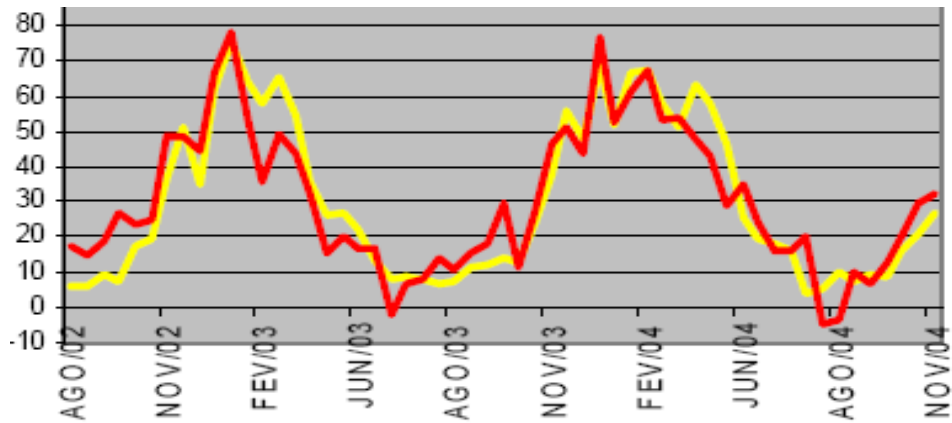




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Multiple linear regression between positive ovitrap data and delayed average temperature, relative humidity and rainfall data (all retroactive) in Belo Horizonte, 04 Nov. 2002 – 24 Out. 2004. Estimated Model and observed data, 07 Nov 2004 - 06 NOV. 2005. [The left scale is for positive ovitrap, the yellow line represents observed values, and the red line represents predicted values.]

VIANELLO, R. L., PESSANHA, J. E. M., SEDIYAMA, G. C. Previsão de ocorrência dos mosquitos da dengue em Belo Horizonte, com base em dados meteorológicos. XIV Congresso Brasileiro de Meteorologia, Florianópolis, 2006



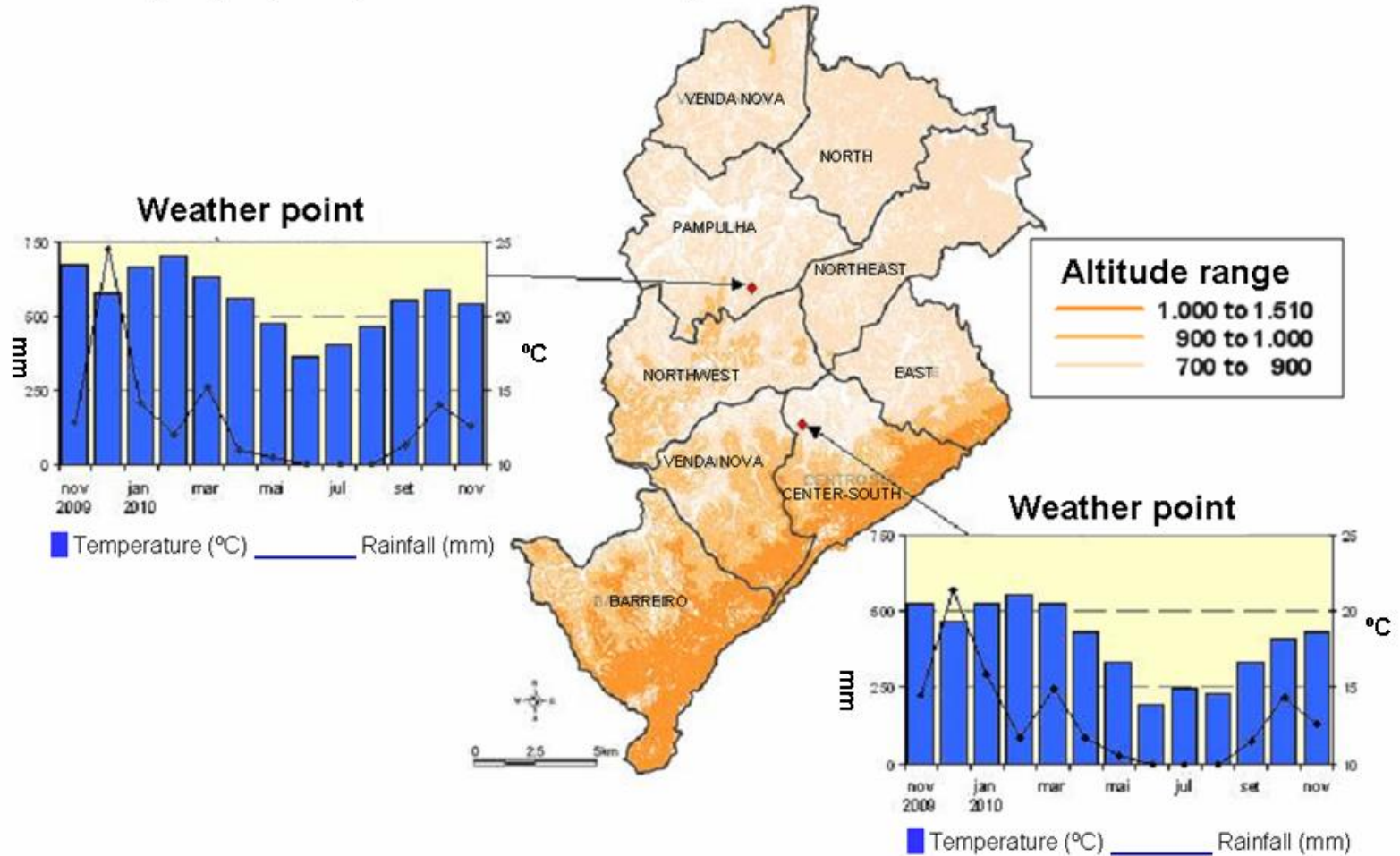


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Background

Monthly minimum temperature and rainfall, from Nov/2009 to Nov/2010, weathers geographic points, altitude range, Belo Horizonte/MG, Brazil.



José Eduardo Marques Pessanha Pessanha, Waleska Teixeira Caiaffa, Maria Cristina de Mattos Almeida, Silvana Tecles Brandão, and Fernando Augusto Proietti, "Diffusion Pattern and Hotspot Detection of Dengue in Belo Horizonte, Minas Gerais, Brazil," Journal of Tropical Medicine, vol. 2012, Article ID 760951, 11 pages, 2012. doi:10.1155/2012/760951



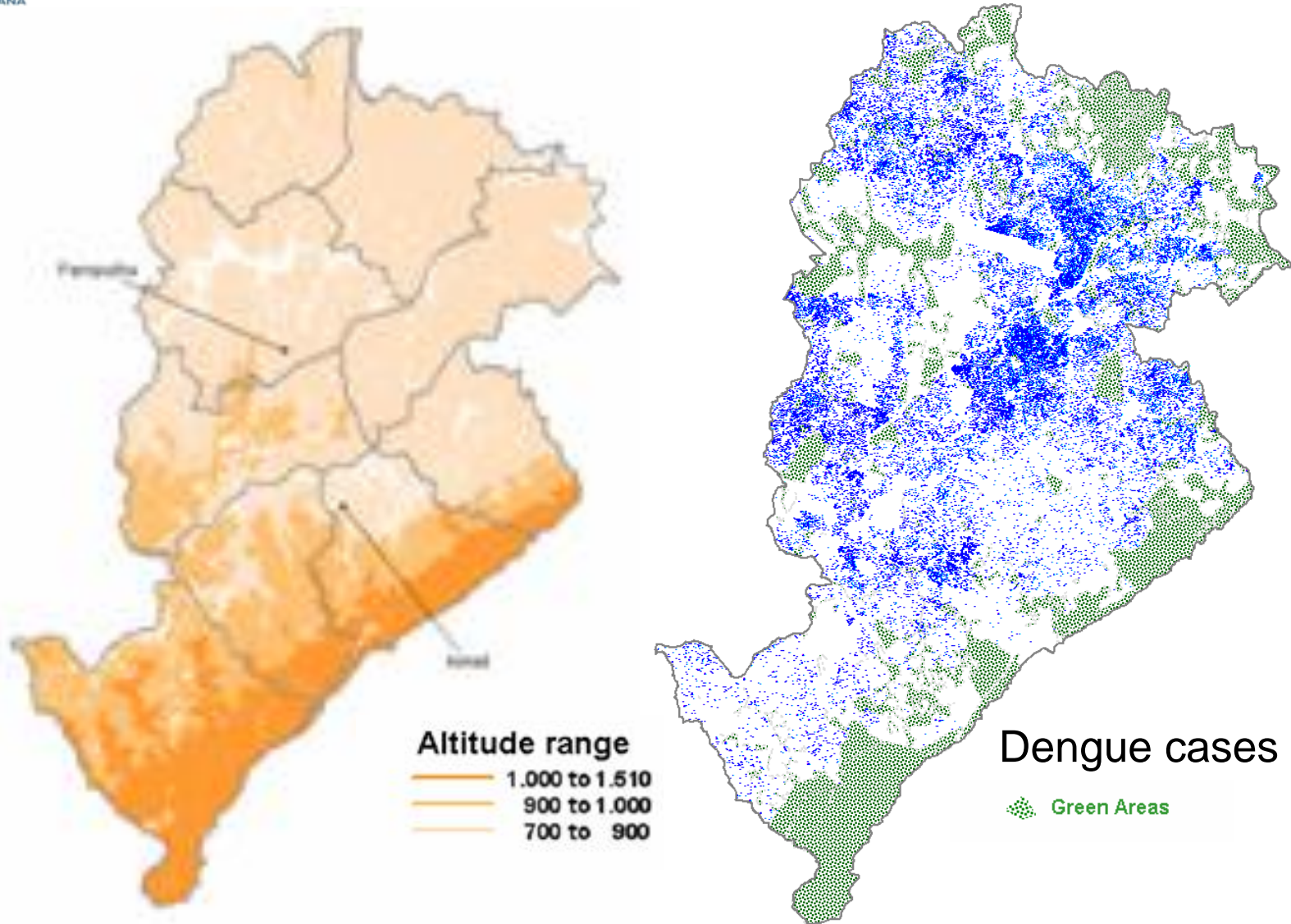


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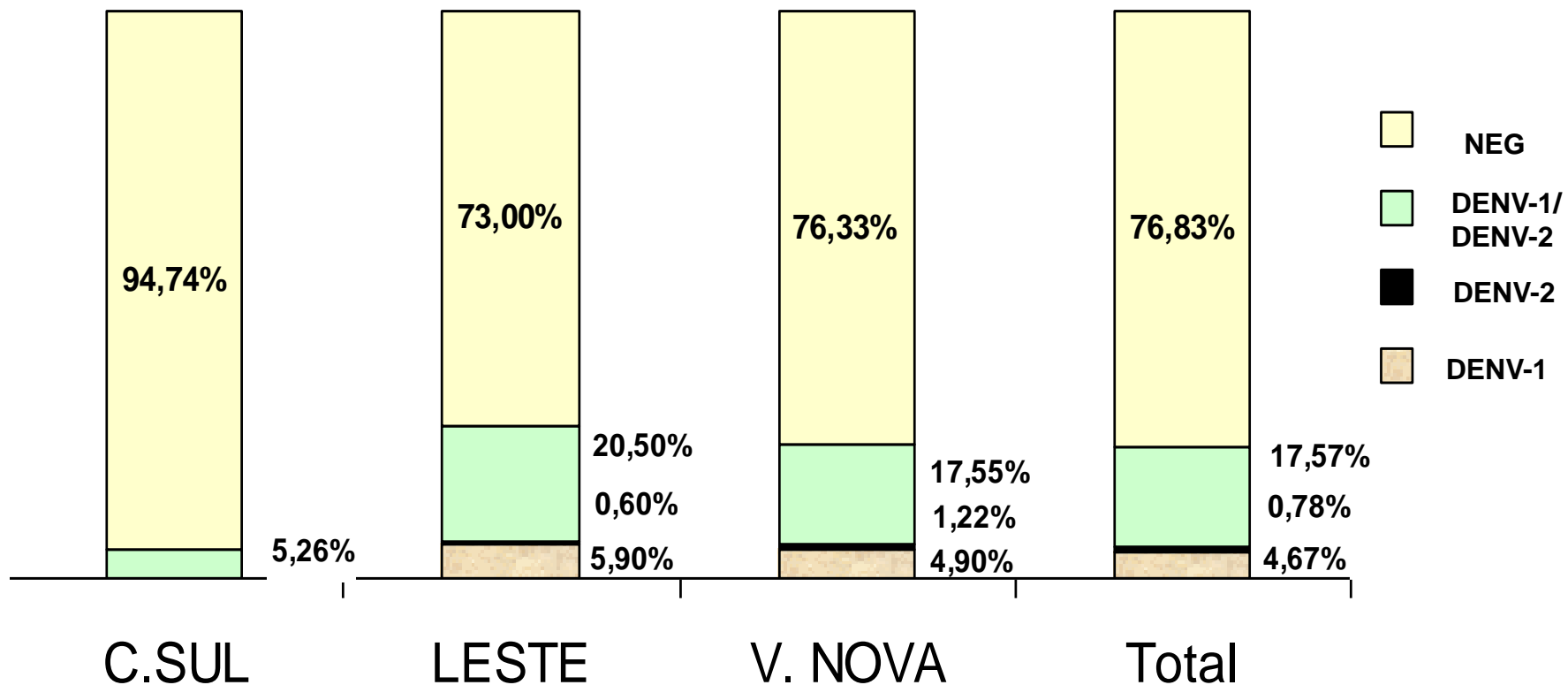
Dengue Cases Residence, 1996-2011, Altitude Range, Belo Horizonte/MG, Brazil.



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Results of seroepidemiological survey for dengue, 1999-2000, Belo Horizonte / MG.



M. C. M. Cunha, W. T. Caiffa, C. L. Oliveira, et al., "Fatores associados à infecção pelo vírus do dengue no Município de Belo Horizonte, Estado de Minas Gerais, Brasil: características individuais e diferenças intra-urbanas," Epidemiol Serv Saude, vol. 17, no. 3, pp. 217-230, 2008.



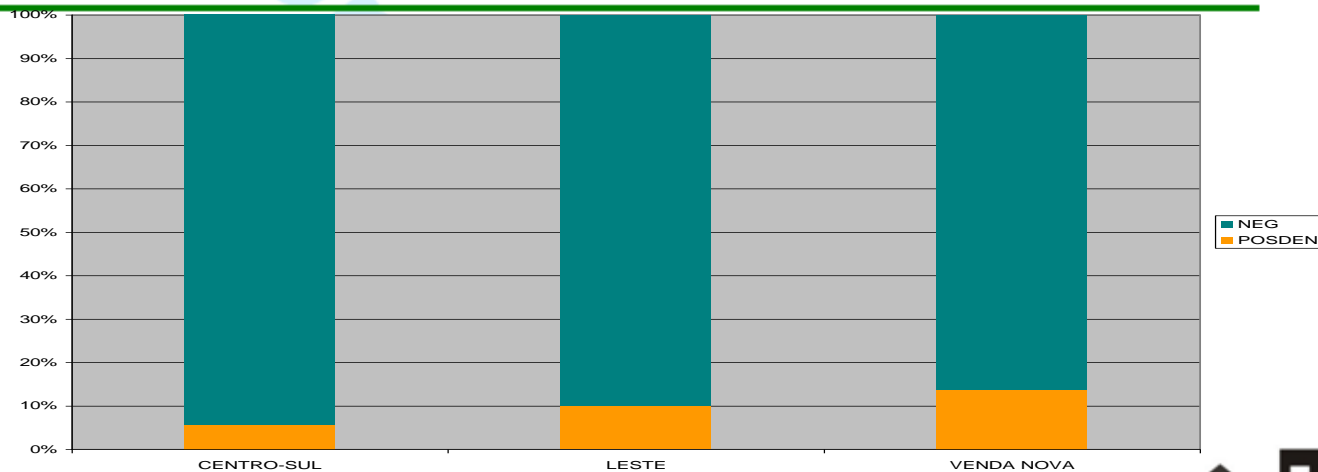


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Results of seroepidemiological survey for dengue, 2006-2007, Belo Horizonte / MG.

SOROLOGIA	CENTRO-SUL	LESTE	VENDA NOVA	TOTAL
NEGATIVA	84(94,38%)	311(89,88%)	230(83,94%)	625(88,15%)
POSITIVA	5(5,62%)	35(10,12%)	44(16,06%)	84(11,85%)
DENV-1	1(1,12%)	5(1,45%)	9(3,28%)	15(2,12%)
DENV-1-2		1(0,3%)	7(1,82%)	8(1,13%)
DENV-1-2-3	4(4,49%)	9(2,6%)	15(5,47%)	28(3,95%)
DENV-1-3		7(2,02%)	1(0,36%)	8(1,13%)
DENV-2		3(0,87%)	6(2,19%)	9(1,27%)
DENV-2-3		3(0,87%)	3(1,09%)	6(0,85%)
DENV-3		7(2,02%)	3(1,09%)	10(1,41%)
TOTAL	89(100,00%)	346(100,00%)	274(100,00%)	709(100,00%)



J. E. M. Pessanha, W. T. Caiiffa, E. G. Kroon, and F. A. Proietti, "Dengue fever in three sanitary districts in the city of Belo Horizonte, Brazil: a population-based seroepidemiological survey, 2006 to 2007," Revista Panamericana de Salud Publica, vol. 27, no. 4, pp. 252-258, 2010.





Results of seroepidemiological survey for dengue, 1999/2000 and 2006-2007, Belo Horizonte / MG.



- **Dengue Seroprevalence was not associated with sex, age, family income, and changed town in the past 10 years.**
- **Dengue Seroprevalence was associated with the home type (apartment or house/shanty, with apartment being a protection factor) and with an elevated Health Vulnerability Index (HVI*) where the sector census where the residence was located.**

**Measure that associates different socioeconomic and environmental variables in a synthetic indicator to analyze the characteristics of population groups living in certain geographic areas*

- **<http://www.pbh.gov.br/smsa/biblioteca/gabinete/risco2003.pdf>**

FONTE-GECOZ/SMSA





Intervention: Insecticide Vector control

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Larval Focus Control

In all buildings,
intervention 5 times by
year

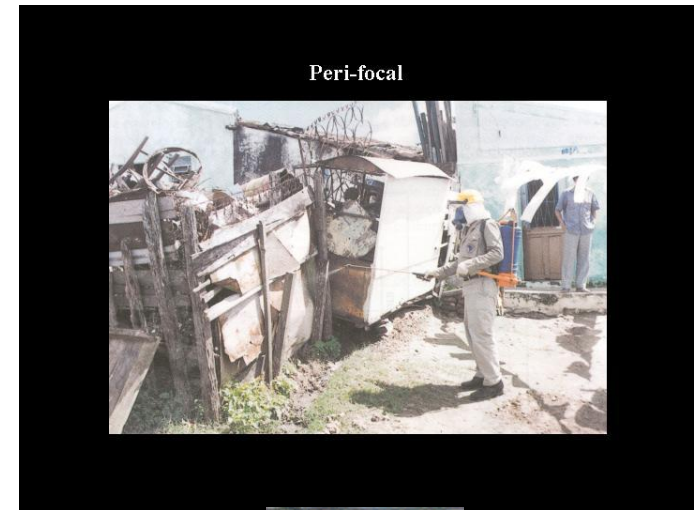
ULV

Insecticide
applications on
dengue epidemics



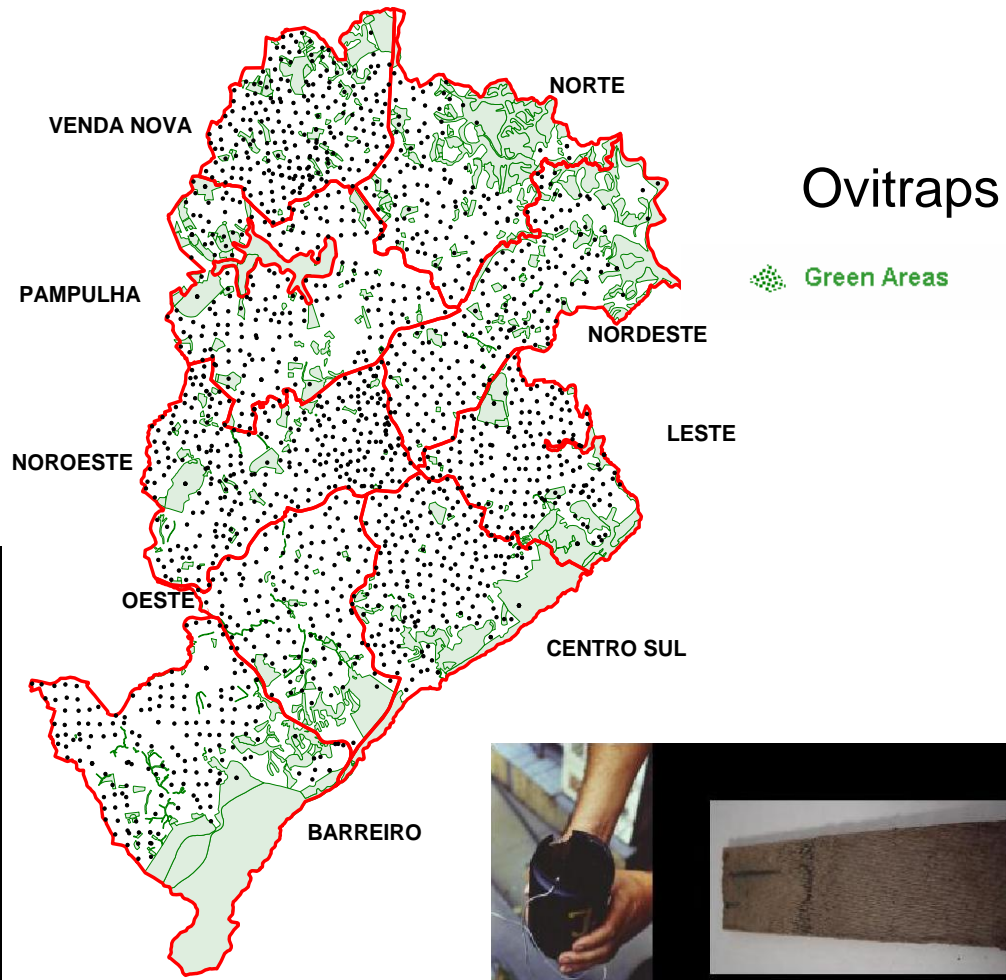
Perifocal

Two weeks survey and vector
control in strategic buildings





Larval Foci Surveys





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Composite indicator for identifying areas of greatest vulnerability for the occurrence of dengue



- Larval Building Index, last October survey
- Population Density
- Last Years dengue Cases
- Historical Series of Larval Building Index
- Vertical Buildings Percents .
- Ovitrap Eggs Average, September-October last year.



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GECD: Executive Group for Dengue Control



4 Intersectoral management in dengue control:

- civil society mobilization;
- surveillance activities intensification;
- cleaning efforts;
- activities in schools;
- conjunction with private companies, state and federal bureaus;
- health care;
- and media.





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Intervention: community participation and educational campaigns



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Intervention: Hurdle to *Aedes sp* control



vo Editar Exibir Histórico Favoritos Ferramentas Ajuda

http://www.lagoinha.com/engine.php?pag=art&sec=16&cat=59&art=9875

fotos ermelinda belo horizonte

NOTÍCIAS

Home > Notícias > Brasil

Brasil

Faxina para combater Aedes

Publicado em 01/04/2008

Na Região Noroeste de Belo Horizonte, moradores participam de mutirão para recolher todo tipo de material que serve de criadouro para o mosquito transmissor da dengue

Por: Junia Oliveira

Moradores da Região Noroeste de Belo Horizonte se uniram, ontem, no combate à dengue, participando do mutirão de equipes da Secretaria Municipal de Saúde e da Superintendência de Limpeza Urbana (SLU). O recolhimento de materiais que servem de criadouros para o mosquito *Aedes aegypti* ocorreu na área do Centro de Saúde Ermelinda e atendeu 22 mil pessoas dos bairros Ermelinda, Nova Cachoeirinha e Aparecida e das vilas Sumaré e Cachoeirinha.

No Centro de Saúde Glória, também na Região Noroeste, a campanha contra a dengue já resultou na retirada de 23 toneladas de lixo. O mutirão, no mês passado, foi feito nos bairros Coqueiros, Glória e São Salvador. As atividades educativas e de coleta dos materiais são organizadas pelo Comitê da Dengue, integrado por representantes das gerências da área social e urbana das regionais. Os locais do mutirão são escolhidos com base nos registros de ocorrências de casos de dengue.

A dona-de-casa Renata Soares Moreira, de 32 anos, e a sobrinha Ana Flávia, de 11,

- > Bíblia Falada
- > Cidades
- > Esportes
- > Igreja Online
- > Multimídia
- > Notícias
- > Acontece BH
- > Brasil
- > Economia
- > Mundo
- > Mundo Evangélico
- > Variedades
- > Vida Cristã

SHOPPING

DVD: Desafiando os Gigantes
Autor não informado
R\$ 41,00

Livro: Entendendo o Propósito e o Poder das Mulheres
Myles Munroe
R\$ 29,00

Livro: O Espírito de Jezabel
Garland e Beverly Bilbo
R\$ 23,00

Livro: Apaixonando-se Por Seu Marido
Debra White Smith
R\$ 28,00

Livro: O Ato Conjugal
Tim e Beverly LaHaye
R\$ 29,00

Web
Divulgation



Conclusion



Control measures

- community participation
- educational campaigns
- intensive collection of garbage
- surveillance for vector and cases
- households spraying
- integrality of the interventions

**Essential to respond quickly to dengue outbreaks
and maintenance of the vector control.**



Conclusion



**Although the really solution to these problems
requires:**

- better environmental conditions
- decrease social-economical disadvantages





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Thank for your attention!



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www.medicina.ufmg.br/osubh
www.pbh.gov.br/saude

