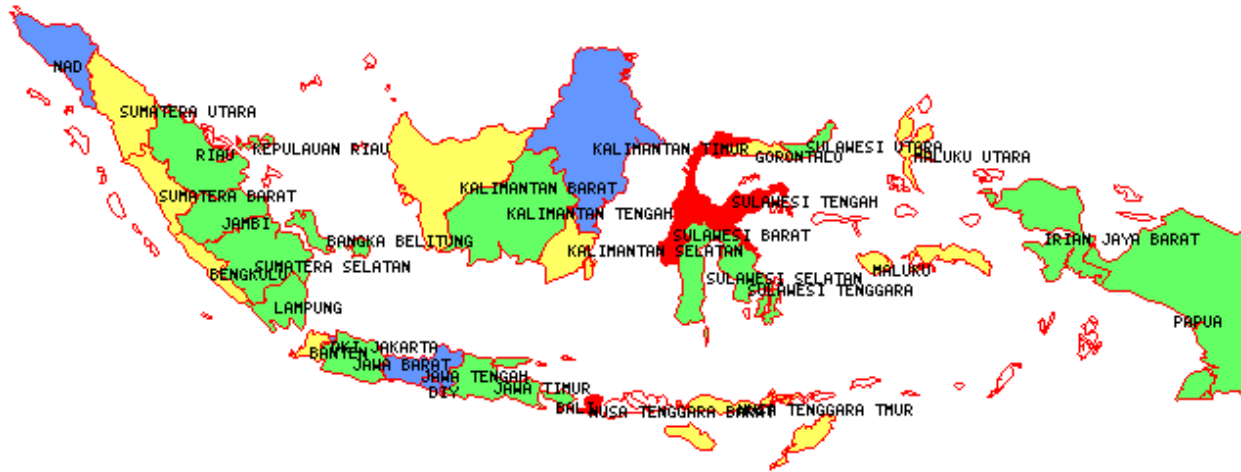


Winter School 2013: Social Determinants of Health



Geo-spatial differences: the role of social and environmental variables

Lutfan Lazuardi

Social determinant of health factors

- Socioeconomic status
- Transportation
- Housing
- Access to health care services
- Social grouping (e.g., ethnic, race, gender)
- Social or environmental stressors

Geospatial analysis & social determinant maps

Socioenvironmental

- Poverty
- Urban-rural
- Unemployment

Sociodemographic

- Children-Elderly
- Race and ethnic group

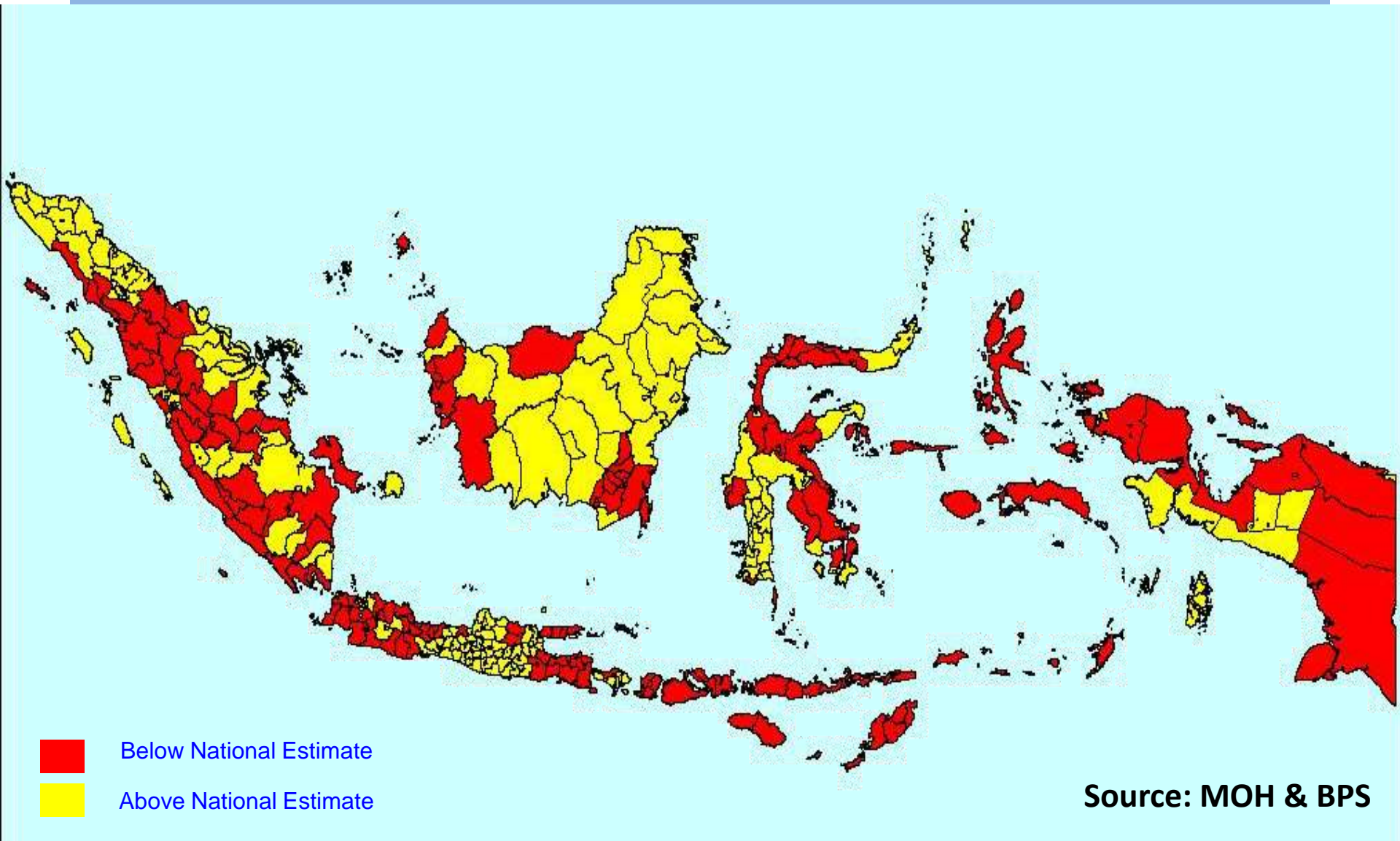
Health Care Accessibility

- Physical accessibility
- Financial accessibility
- Doctors/health professionals availability

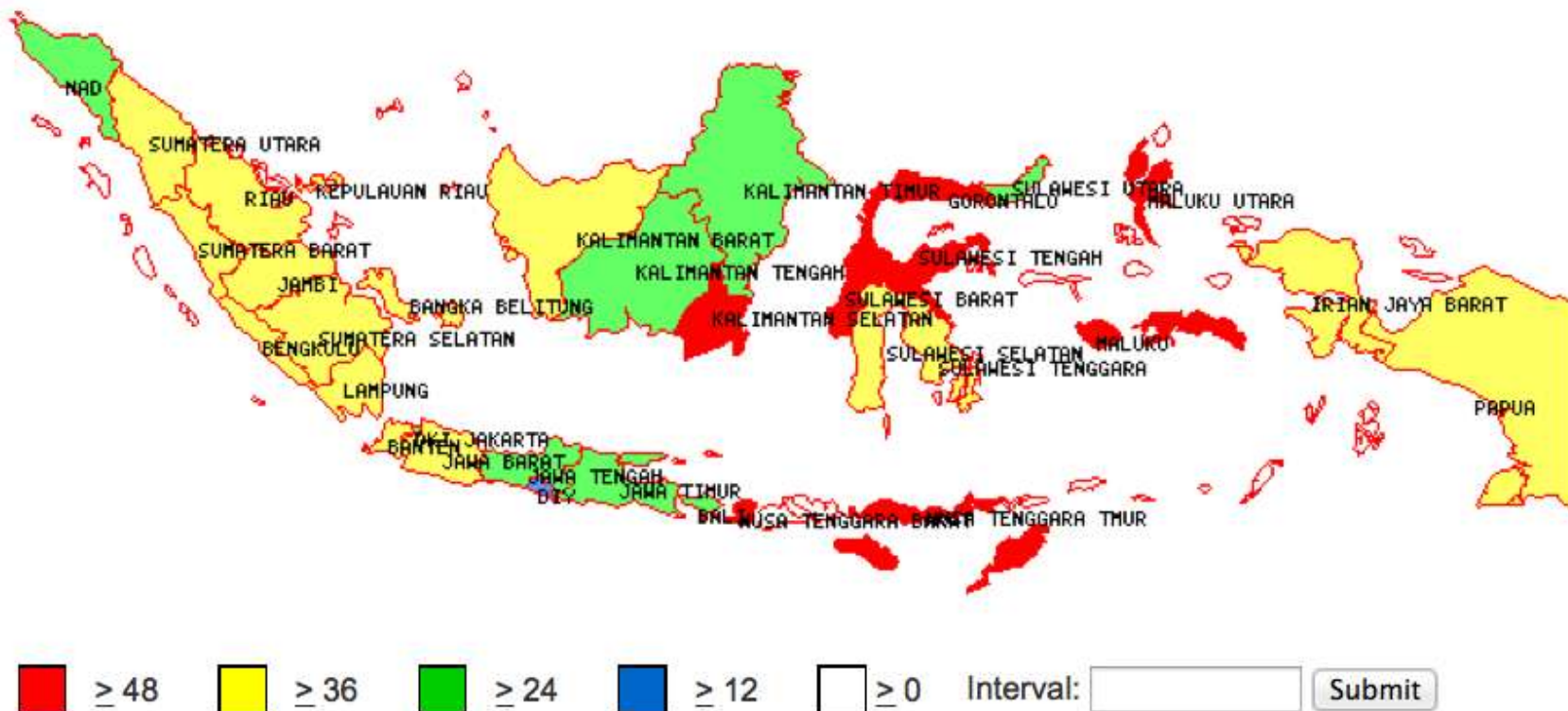
Example of geospatial application in health sector

- Health mapping
 - Service availability mapping
 - disease mapping
- Geographical correlation analysis
- Cluster analysis

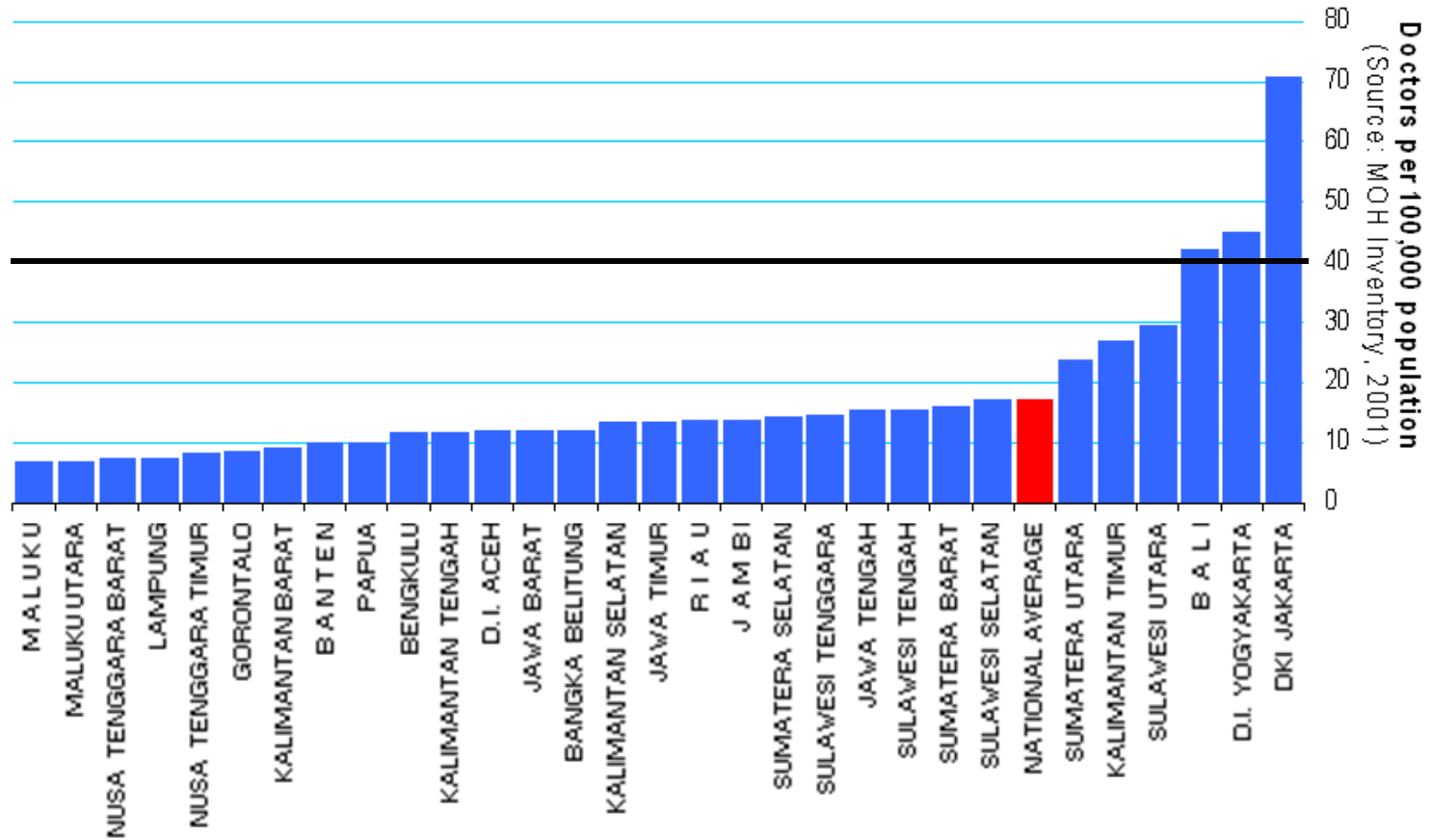
Disparity in life expectancy at birth



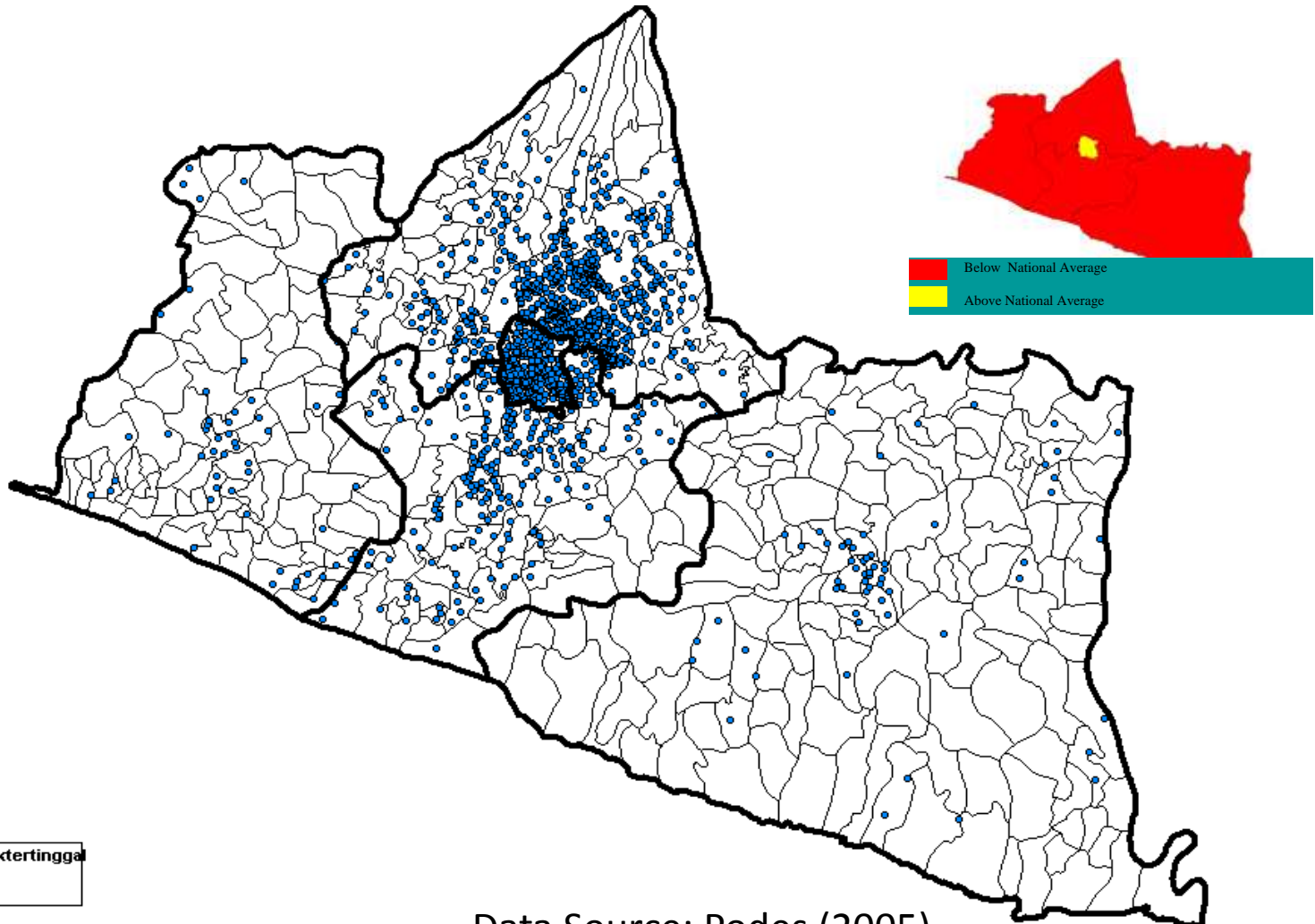
Disparity in Infant Mortality Rate (2007)

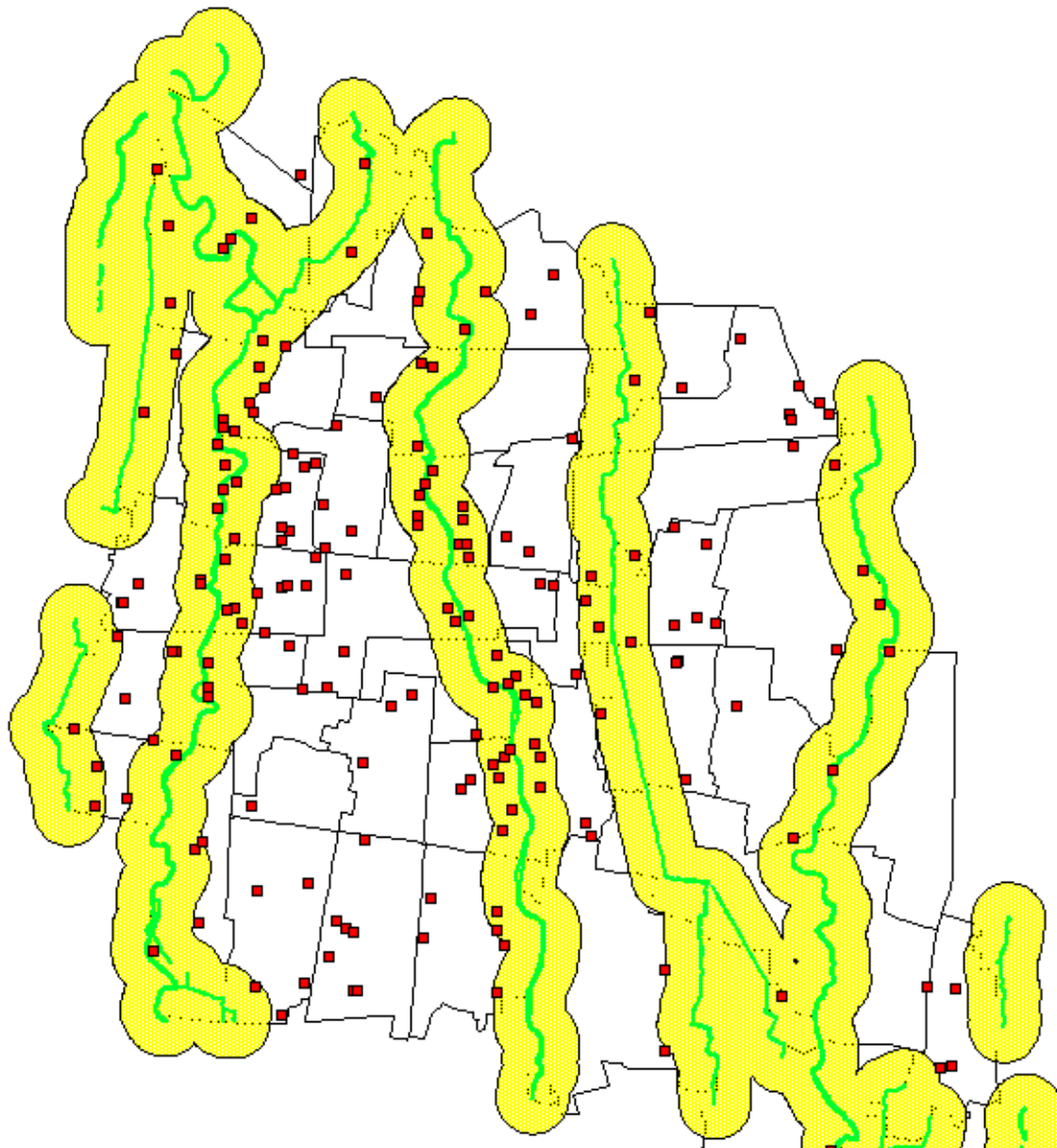


Doctors variation by province (per 100.000 population)



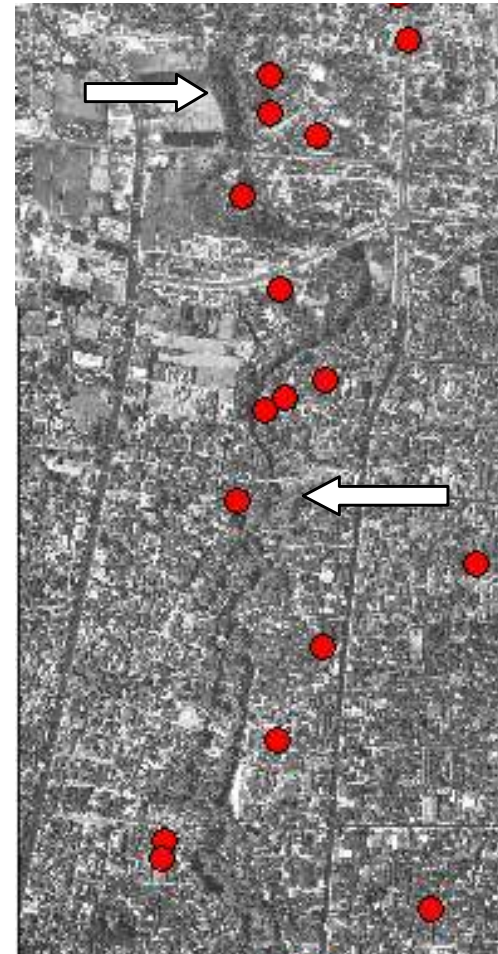
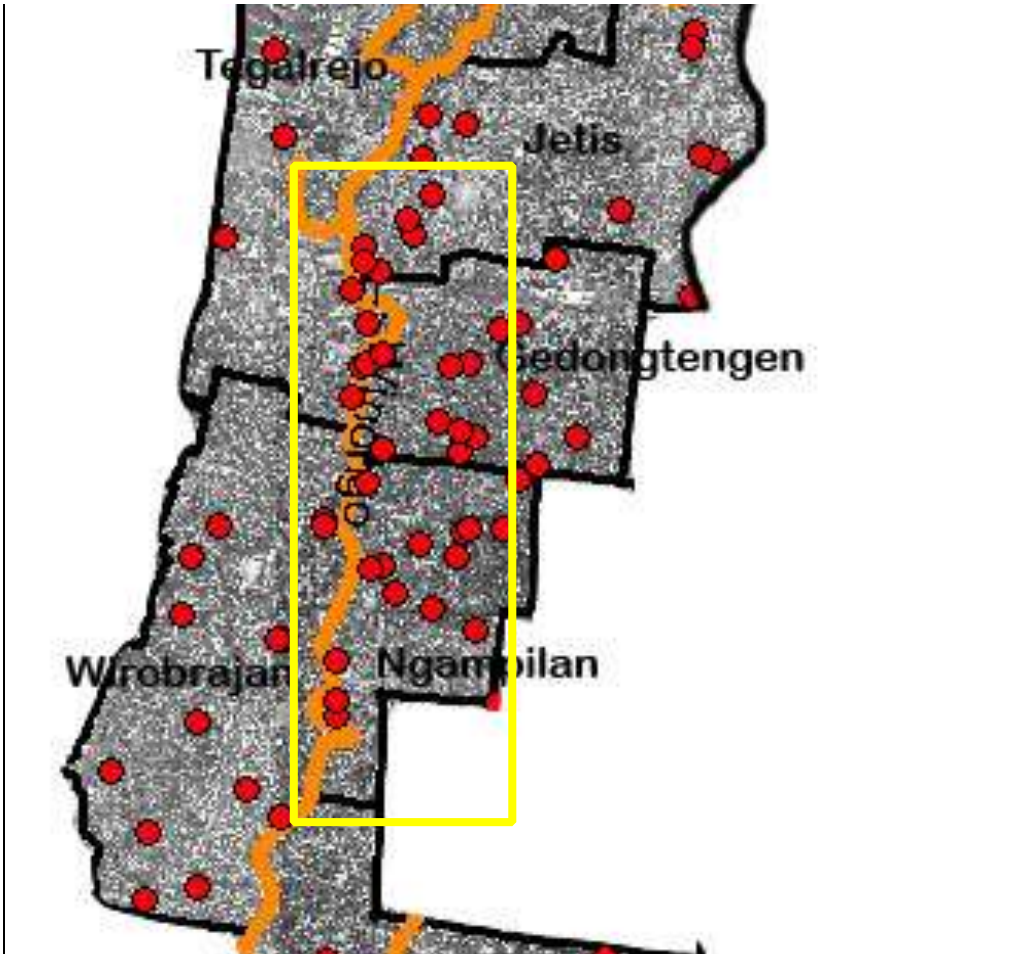
Doctors distribution at Yogyakarta





~ 56% cases
living 200
meters from
the river

Chrysantina et al. (2004)



Chrysantina et al. (2004)

Research article

Open Access

Delayed treatment of tuberculosis patients in rural areas of Yogyakarta province, Indonesia

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From data to policy

DI KOTA SEKITAR 400 PENDERITA
Warga Bantaran Sungai Rentan Terkena TBC

YOGYA (KR) - Warga yang berada di sepanjang bantaran sungai dan padat penduduk di Kota Yogya rentan terhadap penularan penyakit TBC. Penyakit ini biasanya juga menyerang mereka yang rumahnya kurang pencahayaannya dan memiliki perilaku hidup yang kurang sehat. Untuk Kota Yogya, kasus yang ditemui dari tahun ke tahun angkanya masih stagnan, yaitu sekitar 400 penderita. Dengan penderita usia anak sekitar 10 persen. Meski demikian, angka penderita sebenarnya kemungkinan lebih besar, karena banyak yang malu untuk berobat.

Demikian dikatakan Kepala Dinas Kesehatan Kota Yogyakarta dr Choirul Anwar MKes menjawab pertanyaan KR, Selasa (15/4), di sela-sela penilaian tim Perilaku Hidup Bersih dan Sehat (PHBS) tingkat Nasional di RW 09 Demangan.

"TBC ini biasanya menyerang mereka yang kurang sehat perilakunya. Juga masyarakat yang tinggal di wilayah padat, kurang pencahayaannya, khususnya di daerah bantaran sungai, rentan terhadap penyakit ini," ungkap Choirul.

Dipaparkan, hal seperti seperti meludah sembarangan di jalan, juga merupakan potensi terjadinya penularan TBC. Sehingga perilaku hidup bersih harus terus dikedepankan.

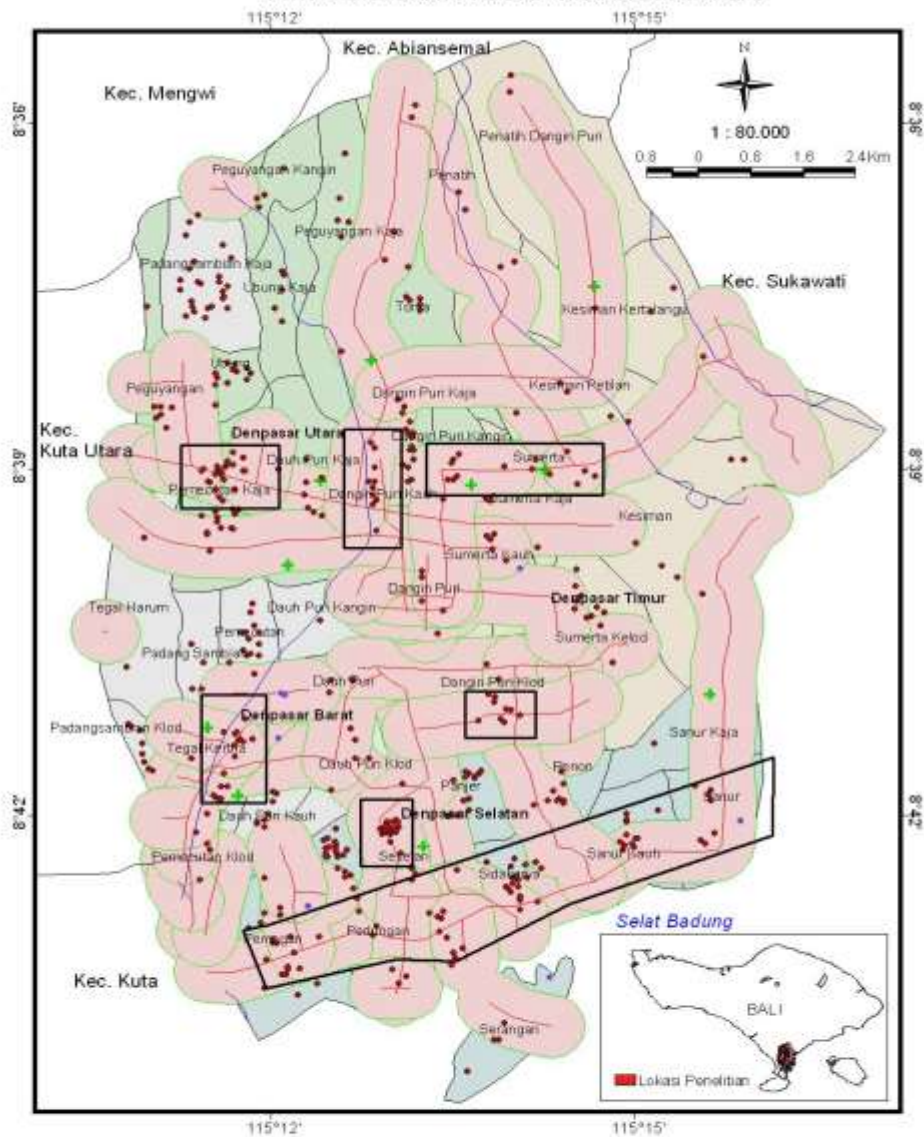
"Kami juga terus mengupayakan agar jumlah penderita di kota semakin berkurang. Mencari terus, jangan sampai ada yang malu berobat. Waspada! saja jika batuk lebih dari 3 minggu, badan terasa tidak fit serta berat tubuh terus menurun, juga berkeringat pada malam hari," ujarnya.

Choirul mengatakkan, meski TBC bukan penyakit turunan, namun yang agak menyulitkan bahwa pengobatan ini membutuhkan ketelatenan karena perlu waktu 6 bulan untuk sembuh benar dan harus minum obat setiap hari. Menggunakan program DOTS Directly Observed Treatment Short-course (Pengobatan secara langsung dalam jangka pendek dengan pengawasan). "Ini yang kadang menyulitkan, karena penderita biasanya bosan harus minum obat setiap hari selama 6 bulan. Banyak yang baru beberapa hari saja, sudah malas minum lagi. Makanya perlu ada Pendamping Minum Obat (PMO), yang selalu mengingatkan agar pasien rajin minum obat," ucapnya.

(Ret/R-3)-f

- Intersectoral collaboration
- Active case finding

PETA PENDERITA TB DAN JARAK DARI JALAN



TB in Denpasar

- 67,33% cases located $<500\text{m}$ from the road; while 32,66% $> 500\text{m}$
- Urban population living in poverty
- **Kristina (2008)**

Legenda :

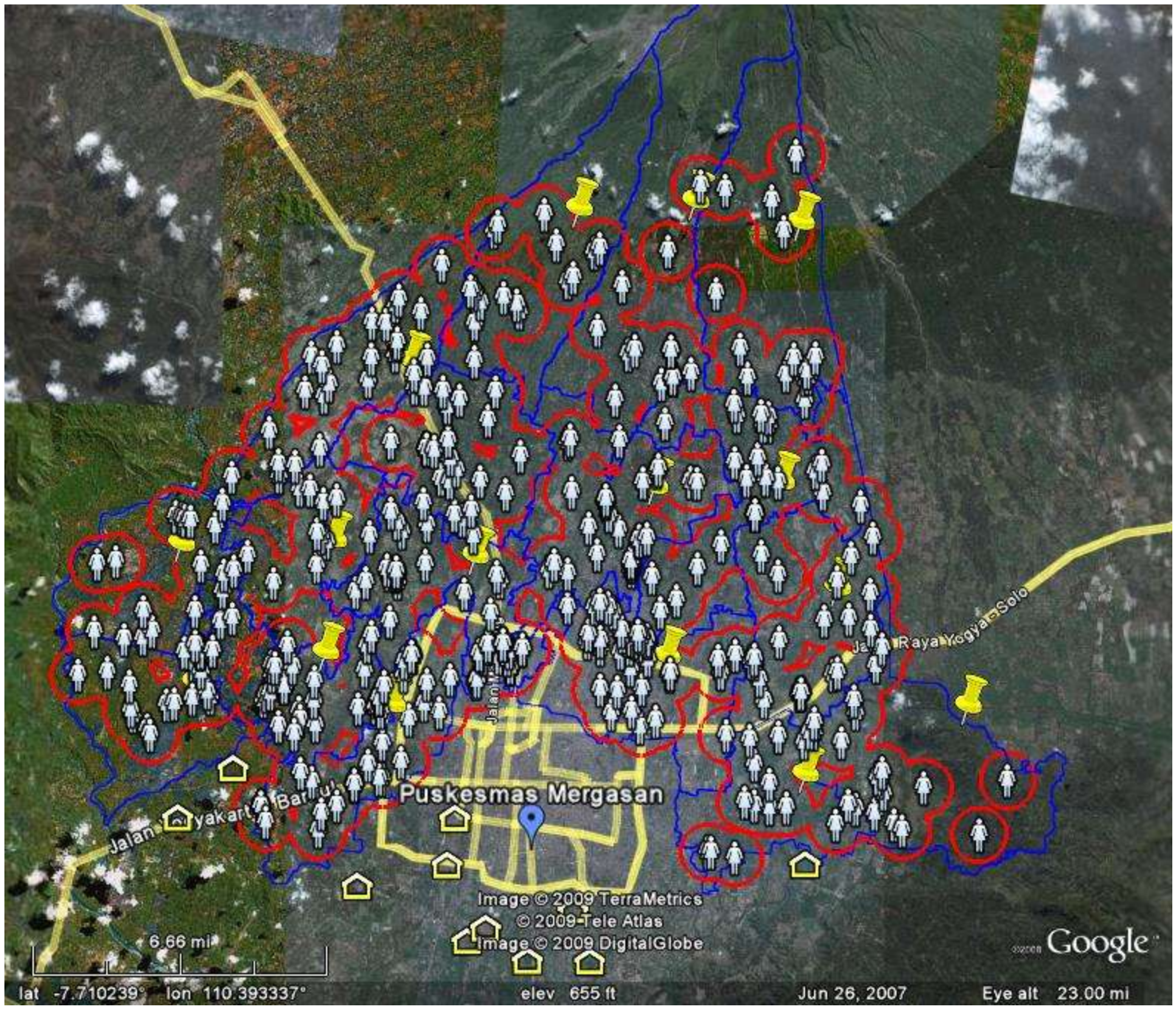
- Penderita TB
- Lokasi Kumuh
- Sungai
- Jalan
- Puskesmas
- Buffer Jalan 500 m

- ### Administrasi Kecamatan
- Denpasar Barat
 - Denpasar Selatan
 - Denpasar Timur
 - Denpasar Utara

Dibuat Oleh : Ni Niyoman Kristina
19.142/PS/KM/06

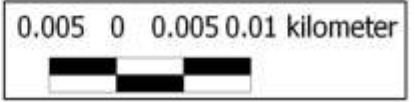
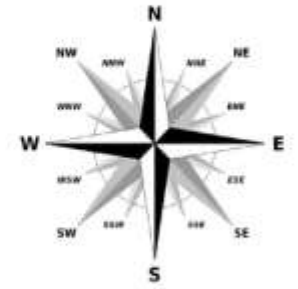


Sekolah Pascasarjana
Sistem Informasi Manajemen Kesehatan
Program Studi Ilmu Kesehatan Masyarakat
Universitas Gadjah Mada



110.400

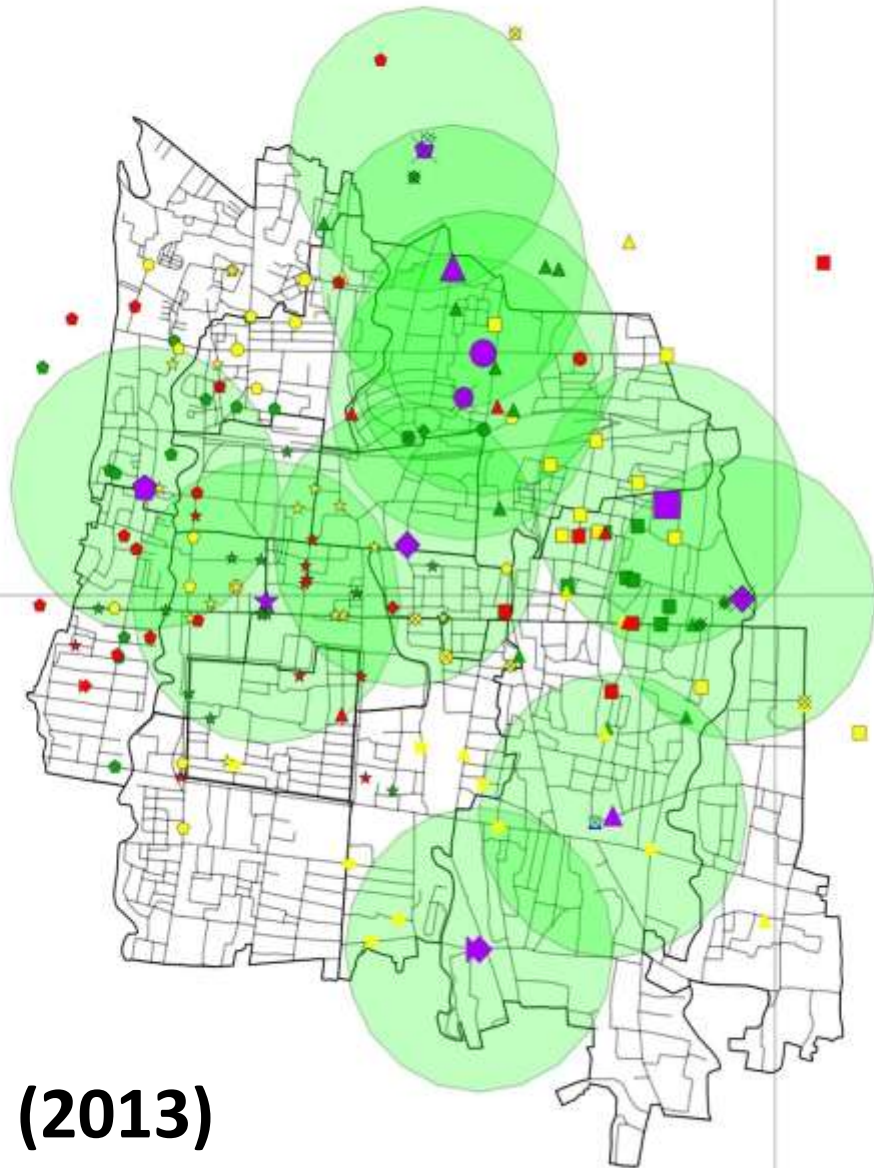
Response Time Kasus yang Diambil Alih Rumah Sakit



Skala 1:49000

LEGENDA
 Rumah Sakit

- 0-4 menit
- 5-9 menit
- 10-14 menit
- >15 menit

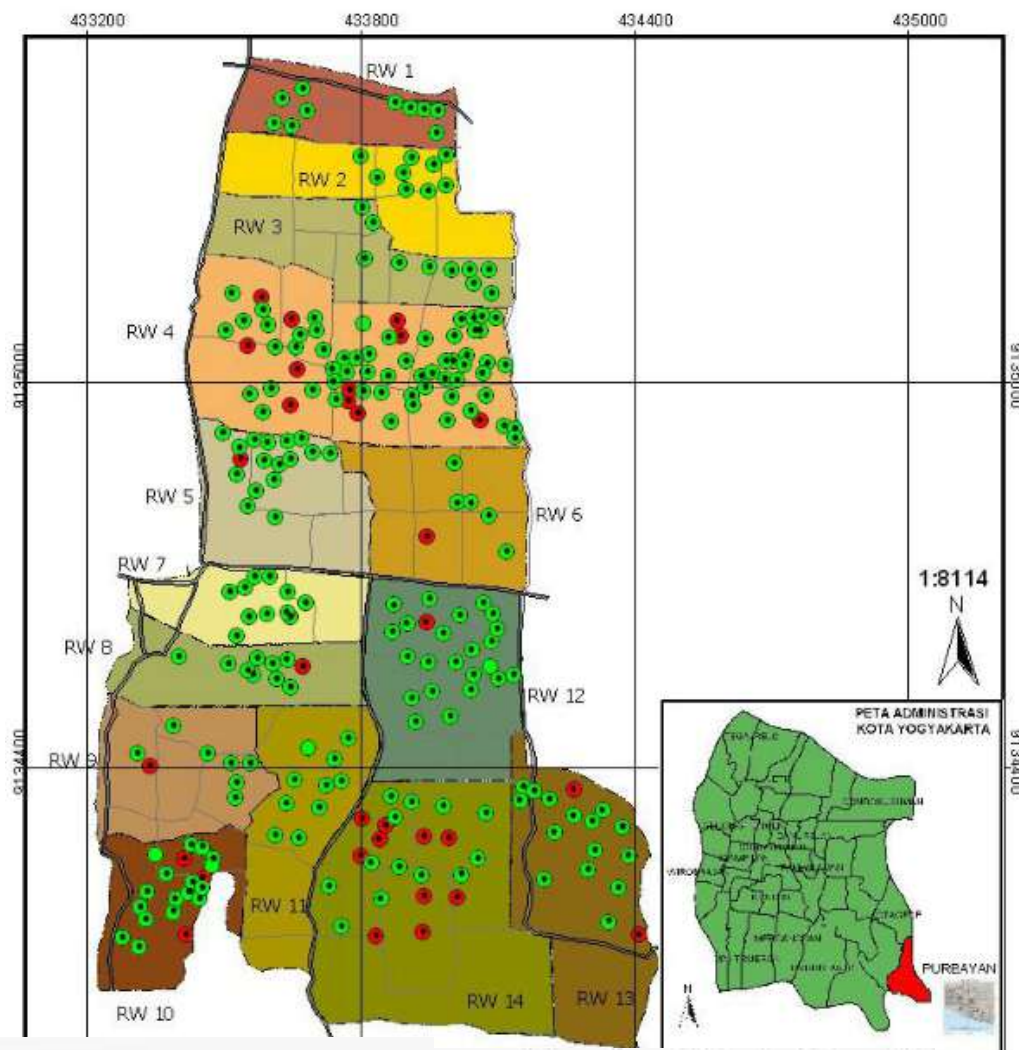


Oktaviani (2013)

110.400

-7.800

-7.800



LEGENDA

- Gang
- Jalan Aspal
- Jalan Kampung
- Batas Wilayah
- tidak padat penghuni
- padat penghuni
- Nitrat > BM

Digambar oleh : Nur Basuki
15 Mei 2011

MINAT SIMKES
PROGRAM PASCA SARJANA
ILMU KESEHATAN MASYARAKAT
UGM YOGYAKARTA



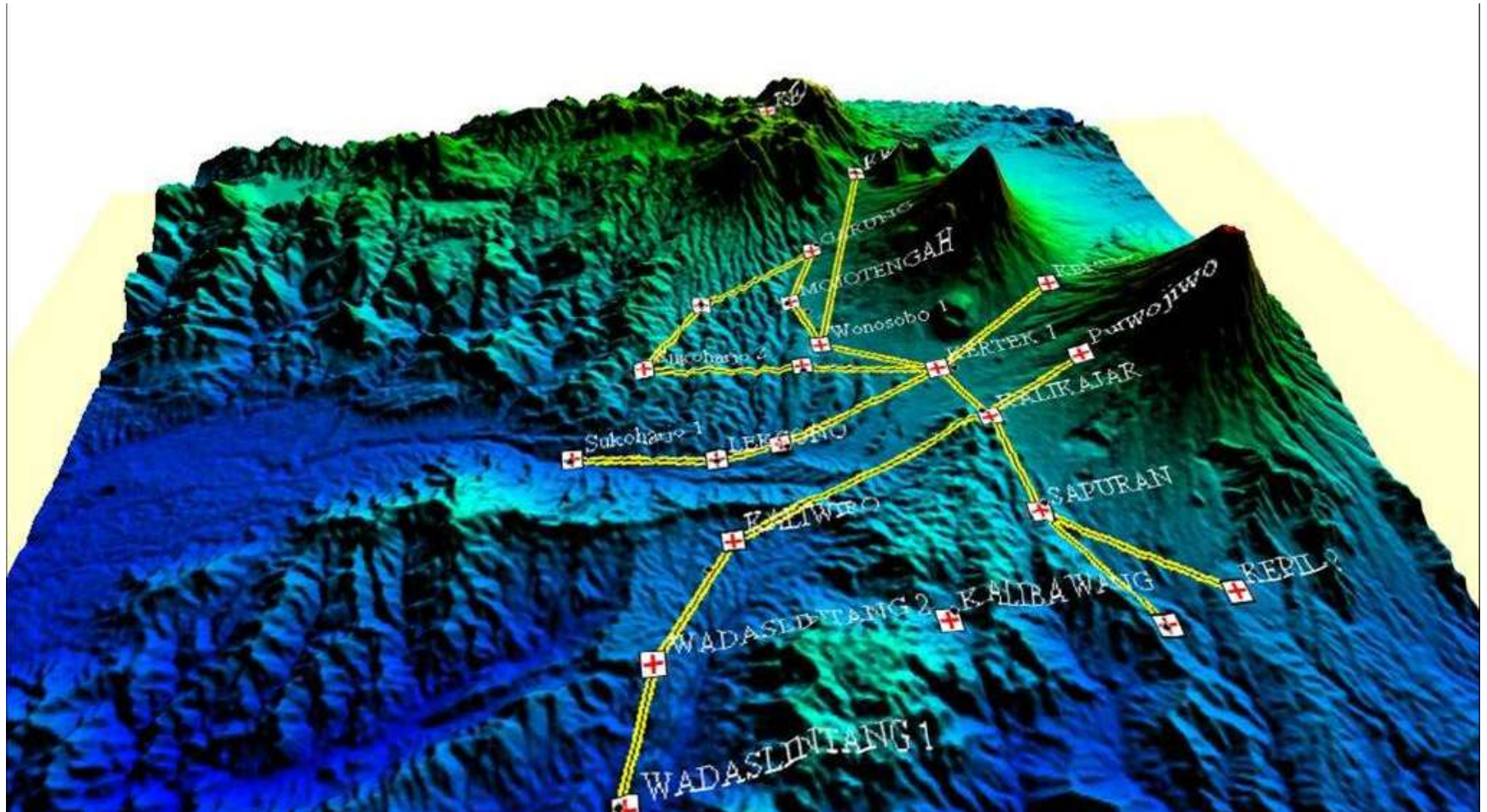
- 242 (98%) domestic water wells have nitrate concentration exceed the normal value

- **Basuki (2011)**

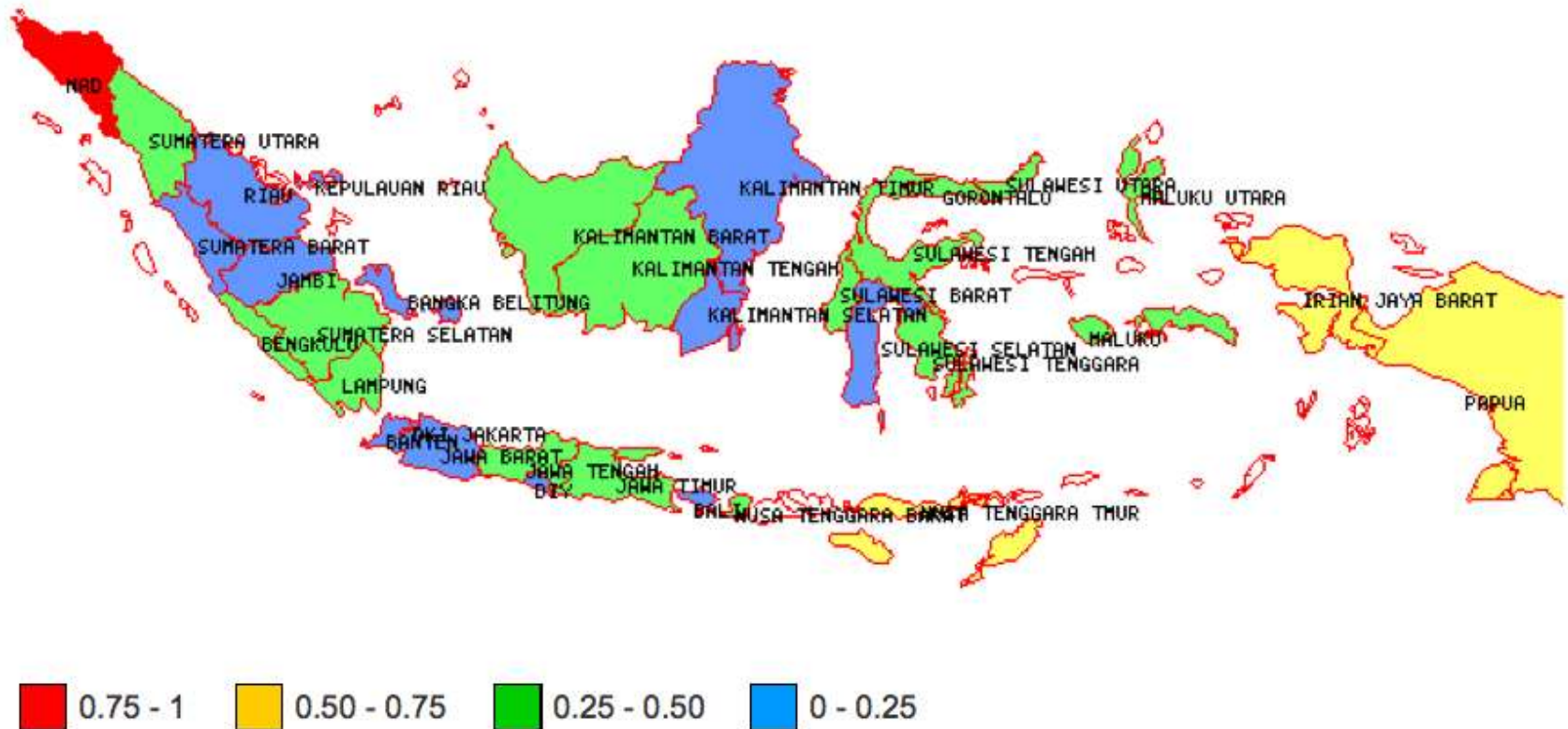
Challenges in providing healthcare



22 primary health centers at Wonosobo district



Construction expensiveness index



Koschinsky (2013): The case for spatial analysis in evaluation to reduce health inequities

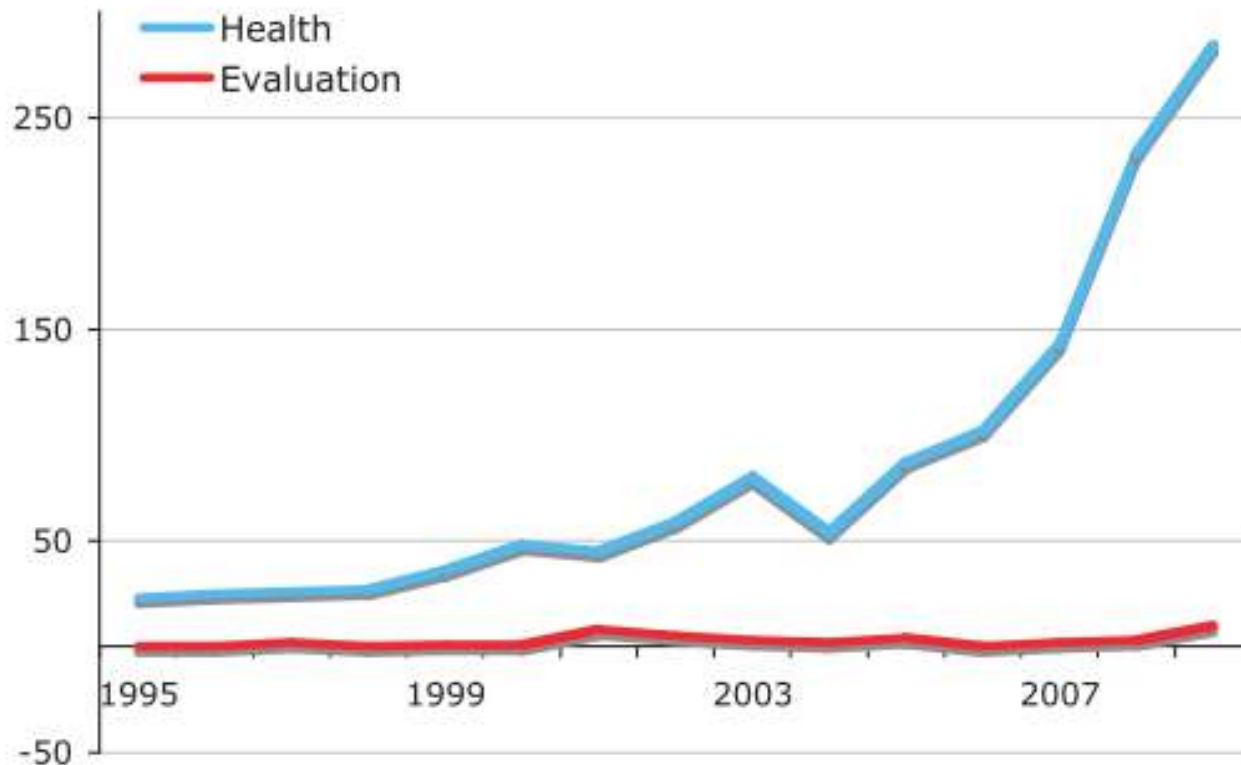


Fig. 1. Spatial articles in health and evaluation journals, 1995–2009.

Data input for geospatial analysis

- Spatial data
 - Information about the locations and shapes of geographic features and the relationships between them, usually stored as coordinates and topology
- Attribute data
 - Data describing the geographic characteristics of features (e.g. population information, incidence, prevalence)

Freeware and open source tools

- HealthMapper
- Geoda
- SatScan
- Google Earth/Map
- OpenJump

What are the benefits of using geospatial application?



Thank you



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