



GIS-based Epidemiological Studies at ITU and Future Perspectives

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Outline

- ❖ Current studies
- ❖ Future perspective (Ph.D proposal)

**☐ Monitoring Vaccination Coverage in Istanbul Using
the Lot Quality Assurance Sampling and Geographic
Information System**

S. ALKOY, N. ULUGTEKIN and A.O. DOGRU

The Journal of International Medical Research, 2007, 35: 242 – 252

The aim of the study

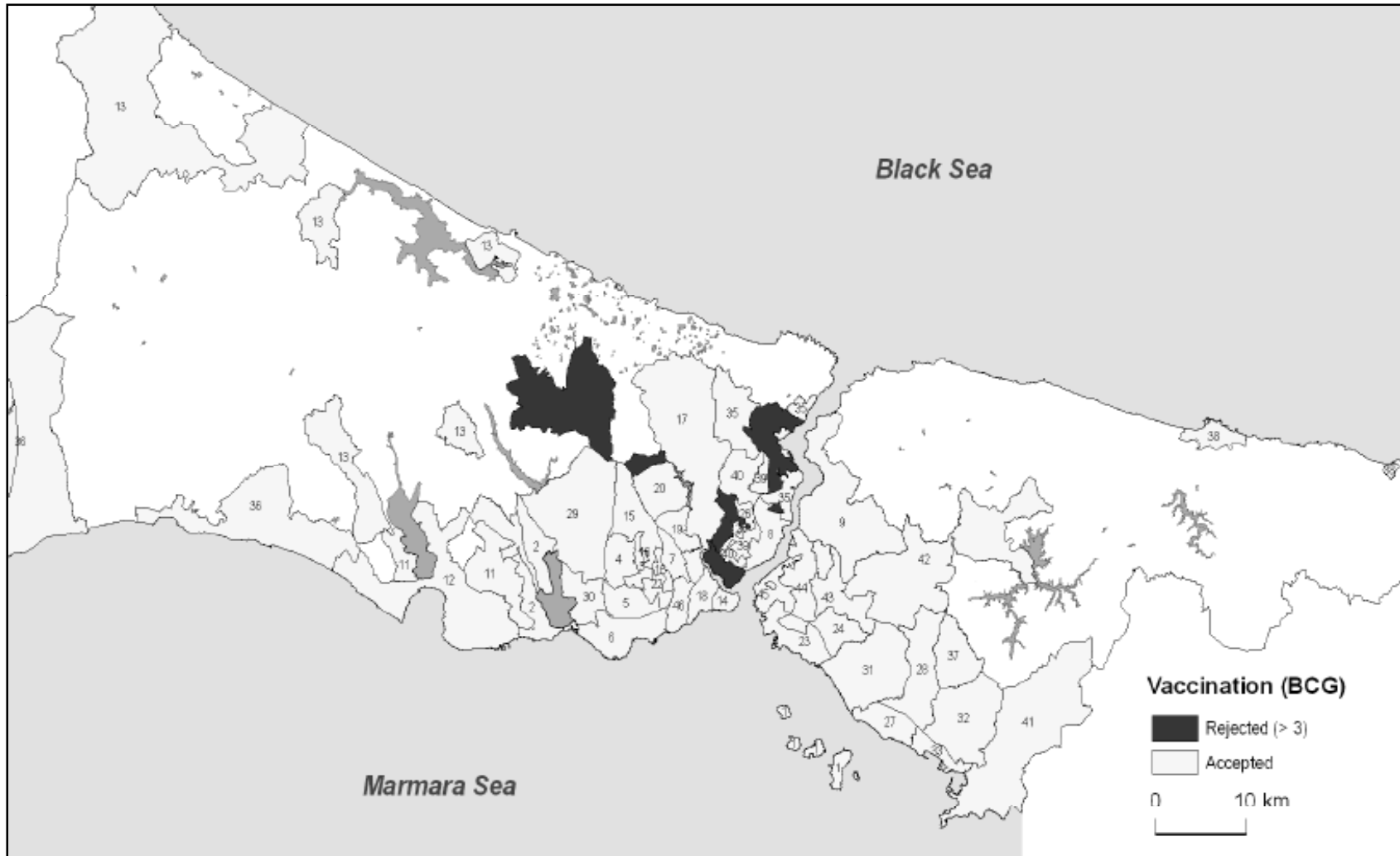
- Monitoring vaccination coverage in Istanbul.
- Lot Quality Assurance Sampling-LQAS or LQ Technique method and GIS.
- The children of 12-23 months old in Istanbul. Total number of children in this epidemiological survey was 1104.
- Istanbul is divided into 46 lots.
- BCG, DPT, Oral Polio, Hepatitis B and Measles.

Classification:

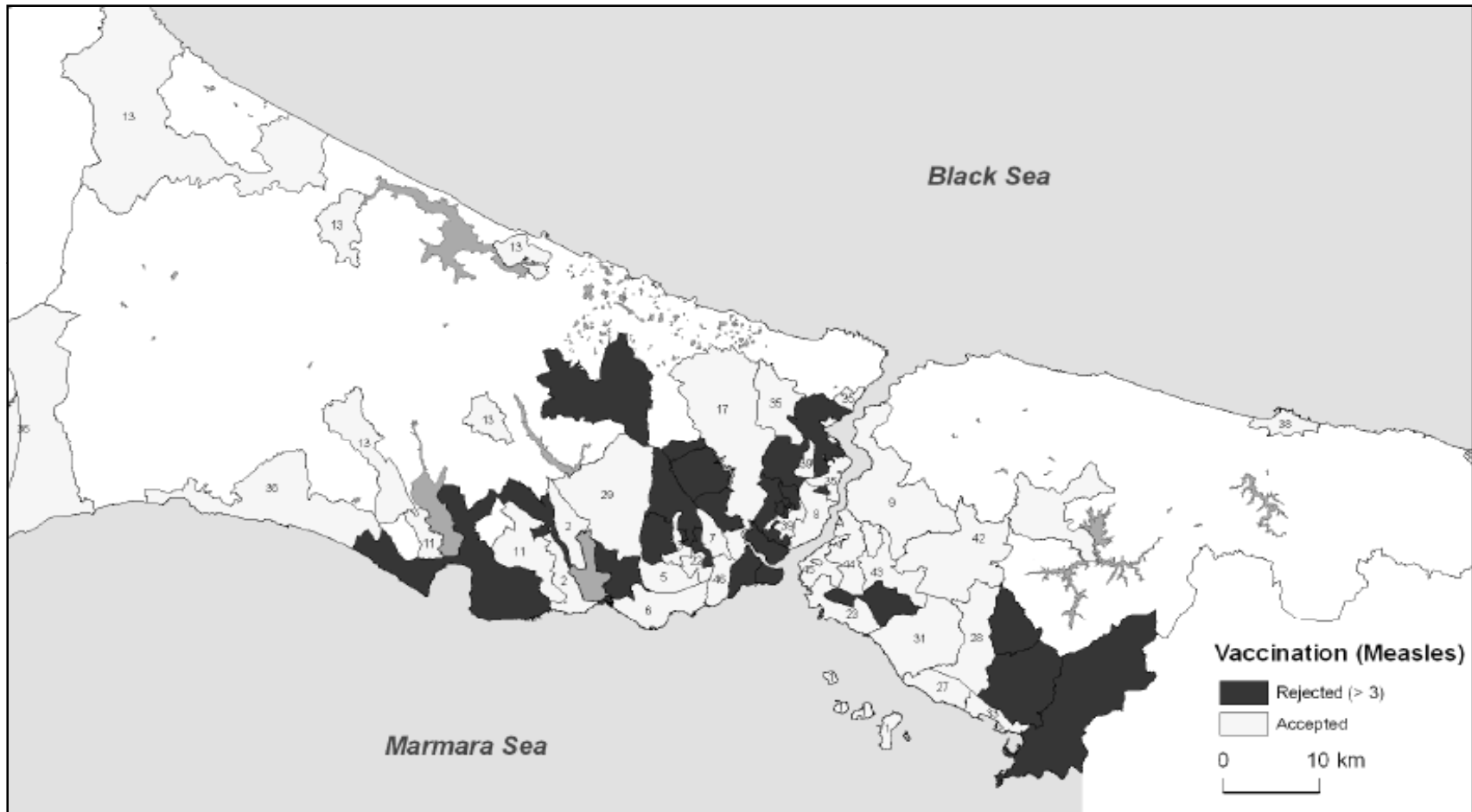
- *“fully vaccinated”*,
- *“not fully vaccinated”*
- *“unvaccinated”*

- Threshold levels were determined as “65%” and “95%”.
- *Decision value regarding to treshold levels was defined as “3”.*
- The lots that had smaller value than the decision value “3” was *“acceptable”* and the lots that had higher decision value “3” defined as *“unacceptable-rejected”*.
- The minimum sample size per lot was estimated as 24.

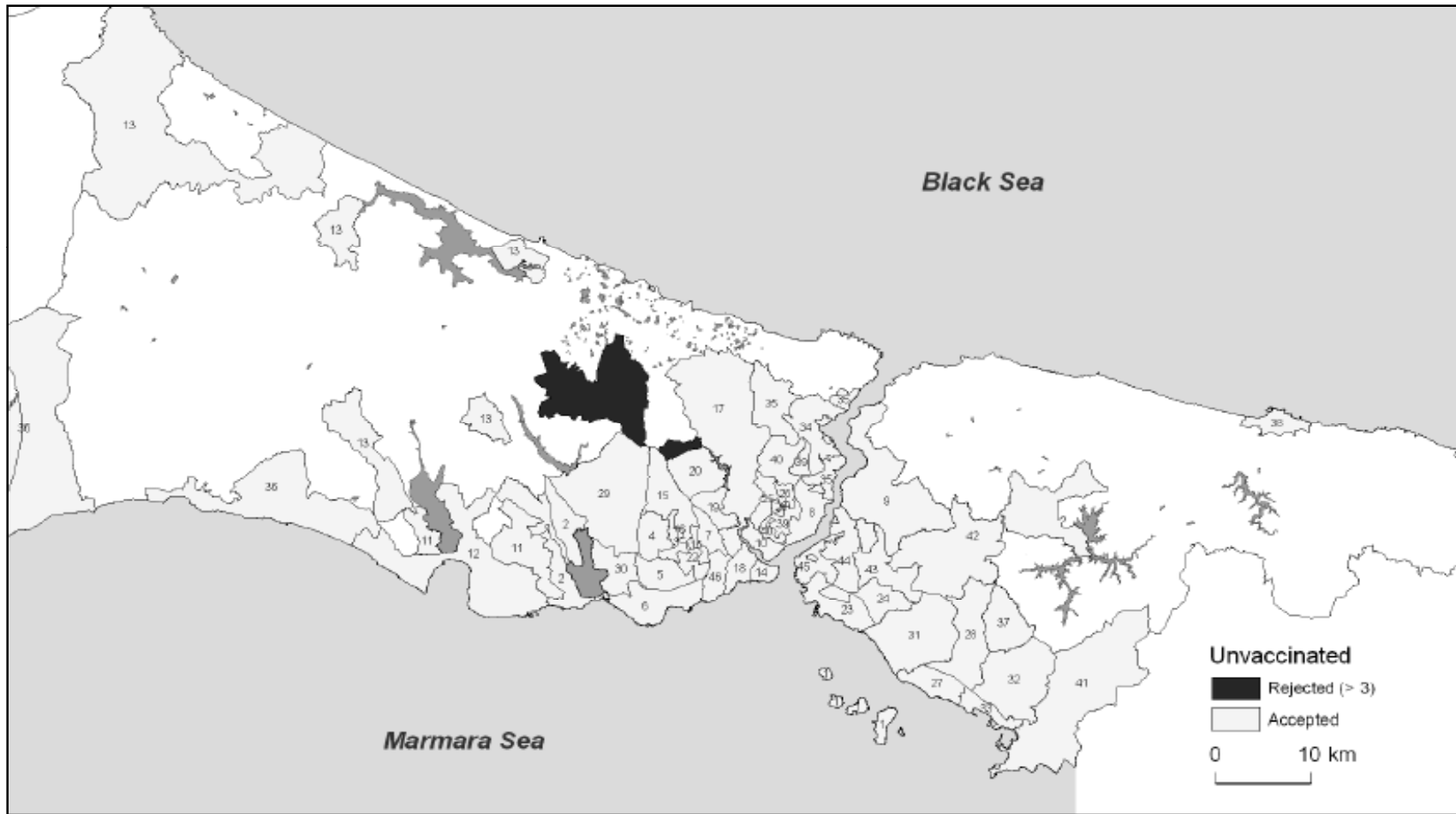
Evaluation of lots for BCG vaccination in Istanbul



Evaluation of lots for the measles vaccination in Istanbul



Evaluation of lots across all vaccines in Istanbul



Results

- Monitoring the data spatially and managing it from a
- database enable the specialists to monitor these data as a
- whole and to make relative evaluations.

- The determination of the vaccination services coverage
- Quality of vaccination services
- The performance achieved at each lot
- All findings were made visually traceable
- Problematic areas in terms of quality of services have been identified at provincial level.

Determination of the Epidemiological Aspects of Air Pollution by using GIS in Istanbul

Alkoy S., Dogru A. O., Basaraner M., Sahin U., Ulugtekin N.,
Seker D.Z.

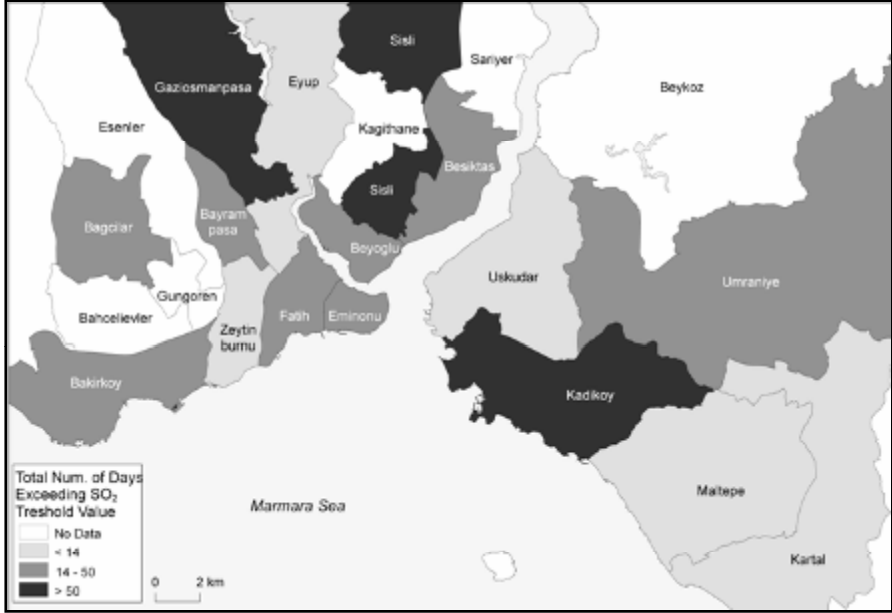
14th International Symposium on Environmental Pollution and Its Life
Impact on in the Mediterranean Region, 10-14 October 2007, Seville
Spain.

The aim of the study

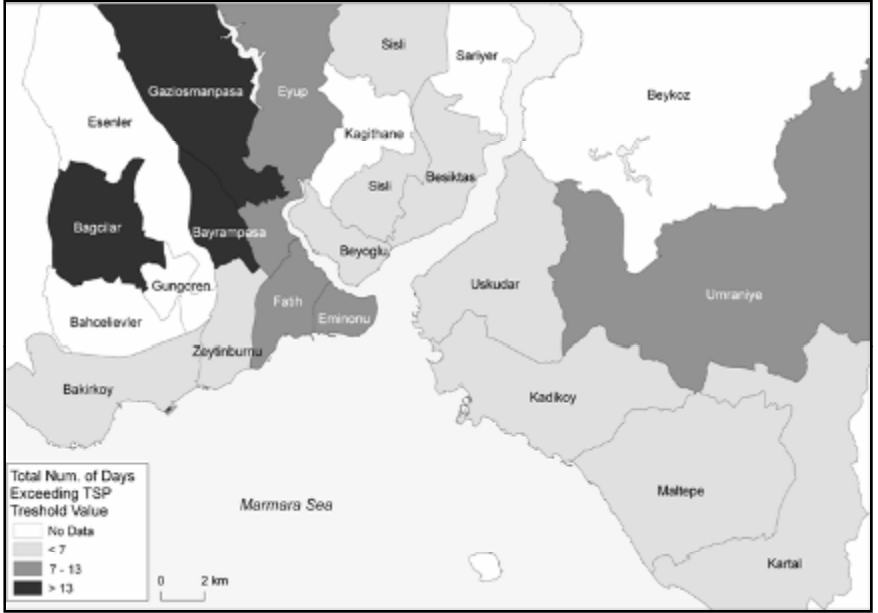
Spatio-temporal distribution of some significant air pollutants and epidemiological aspect of air pollution through the use of Geographical Information Systems (ArcGIS).

- Implemented in 17 region
- 1994-1998, 5 years period

SO₂



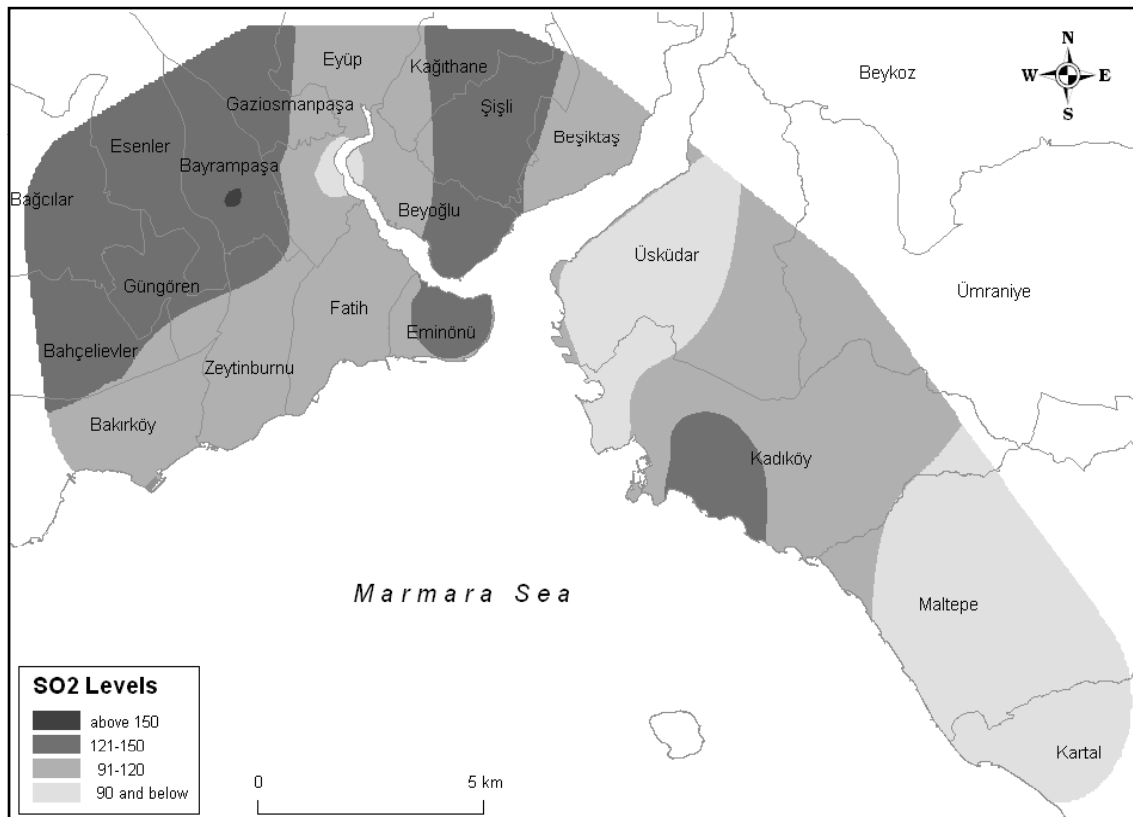
TSP



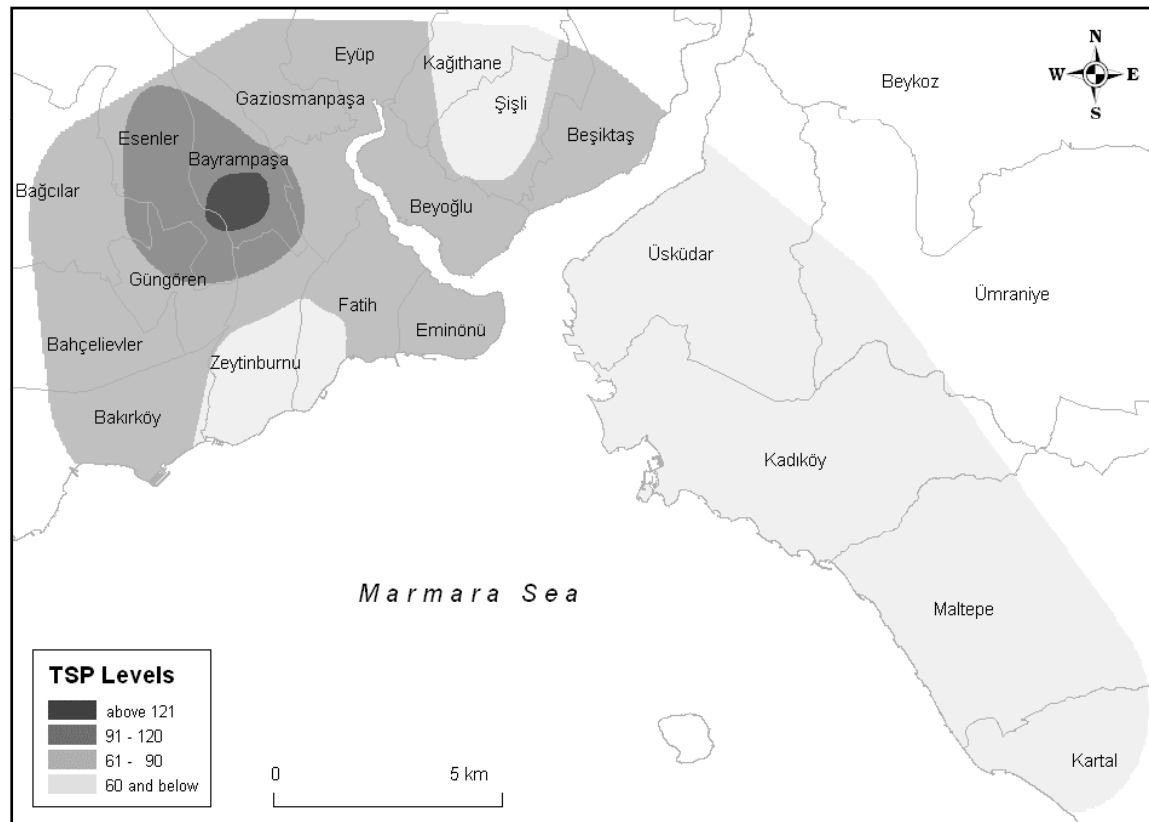
Classification of the districts according their potential to exceed determined threshold values for SO₂ and TSP

Results

Distribution of average SO₂ measurements for 5-years period by using natural neighbourhood method.



Distribution of average TSP measurements for 5-years period by using natural neighbourhood method.



Future Perspective

- PhD study : A system approach for spatial epidemiology.
- As a future perspective, a world- wide system approach on health considering by environmental factors, climate factors, land cover and demographic data is a crucial need. The planned system can be integrated with a global spatial information system.

Some of priorities / problematic issues in GIS are :

- Administration,
- Cooperation (between different disciplines),
- Cartographic visualization.
- The understanding of current national health system!
- Decision making in which part of health system will be assessed with proposed system. Disease? Health? or Both?

If Disease is chosed:

Disease:

1. Communicable or
2. Non-communicable

A system which helps:

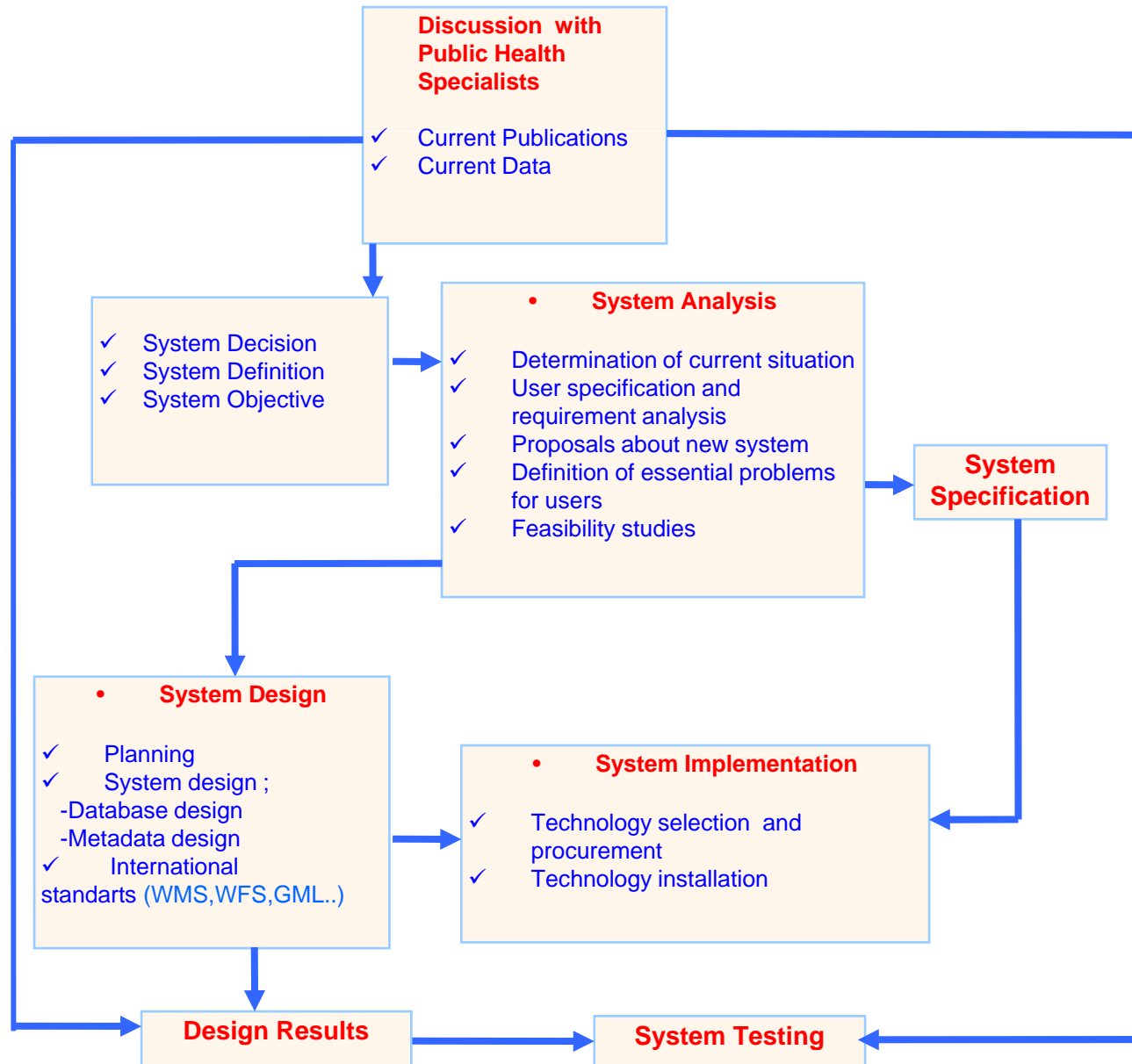
- Assess existing data and
- Decision making on use of cartographic visualization technique.

Advantages of the system (1)

- Determine the populations at risk by creating risk maps by using GIS.
- Determine geographic distribution of disease.
- Surveillance and control the communicable diseases.
- Reducing time loss in decision making for healthcare services.

Advantages of the system (2)

- The use of GIS allows spatial analyses and geostatistical tools that are significant especially in decision making process under urgent conditions.
- Space-time relation will be visualized that will be the key issue in epidemiology daily or long-term planning.
- Epidemiology-GIS integration.



General Implementation Stages of Proposed System

Thanks



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