

# Constructing Indices of Multiple Deprivation for Neighbourhood Ranking

A case study on Five Municipalities in Province  
of Overijssel



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## The problem

- Many countries: indicator projects to support area-based initiatives in evidence-based planning
- Index of multiple deprivation
- Neighborhood Ranking based on indicators to point out neighborhoods to be improved
- Different methods and techniques in constructing indicators → different outcomes ?



## The case

- KISS and 5 major municipalities in (G5) in Overijssel together undertook a ranking exercise
- I reviewed this ranking exercise (for the G5)
- I analysed different techniques for index construction (for Deventer)

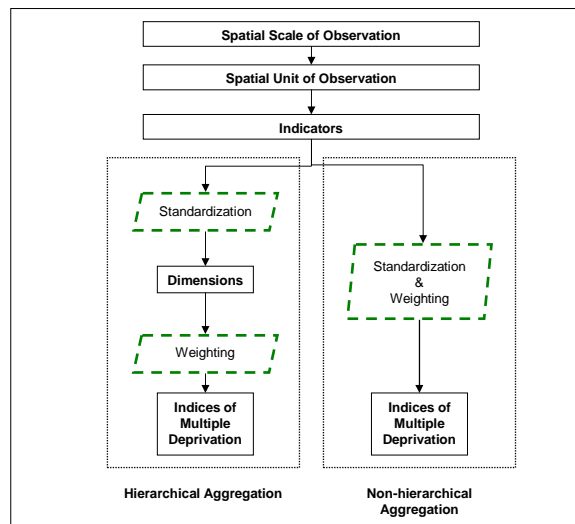


## 6 themes and 10 indicators

1. The population composition
  - The percentage of inhabitants with non-western backgrounds
  - The percentage of single parent family
2. Health
3. Education
  - The number of disablement benefits recipients
  - The percentage of unemployed job seekers with low education
4. Employment
  - The number of disablement benefits recipients
  - The percentage of short term unemployed job seekers
5. Income and house prices
  - The average house prices
  - The average personal disposable income
  - The average household disposable income
  - The number of social benefits recipients
6. Participation



## The procedure of constructing the index of multiple deprivation



## Experiments with Techniques

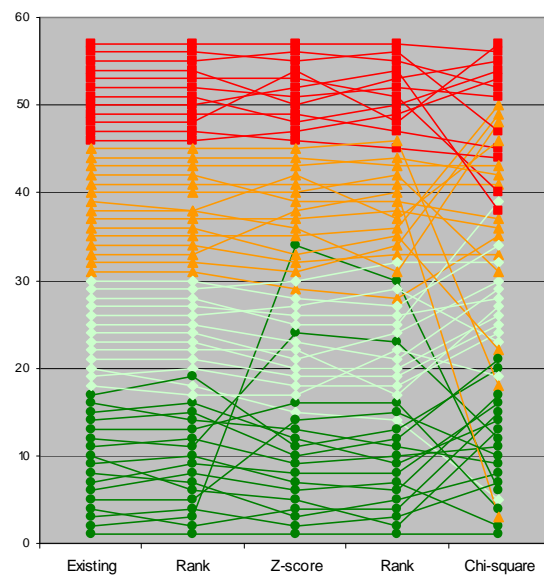
- Aggregation:
  - All indicators one-by-one or grouped per theme
- Standardization:
  - Different measurements → same unit of measurement
- Weighting:
  - All equal or one indicator more important than another

## Experiments with Techniques

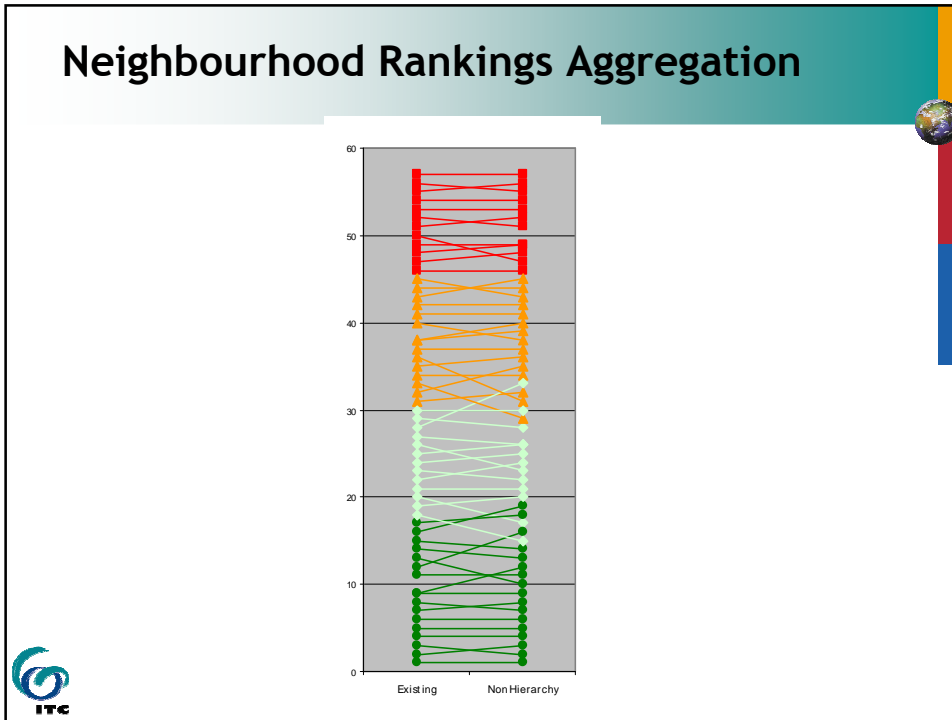
- Aggregation:
  - Hierarchical
  - Non-Hierarchical
- Standardization:
  - Rank
  - z-score
  - Range
  - chi-square
- Weighting:
  - Equal weighting
  - Expert opinion
  - factorial analysis



## Neighbourhood Rankings Standardization

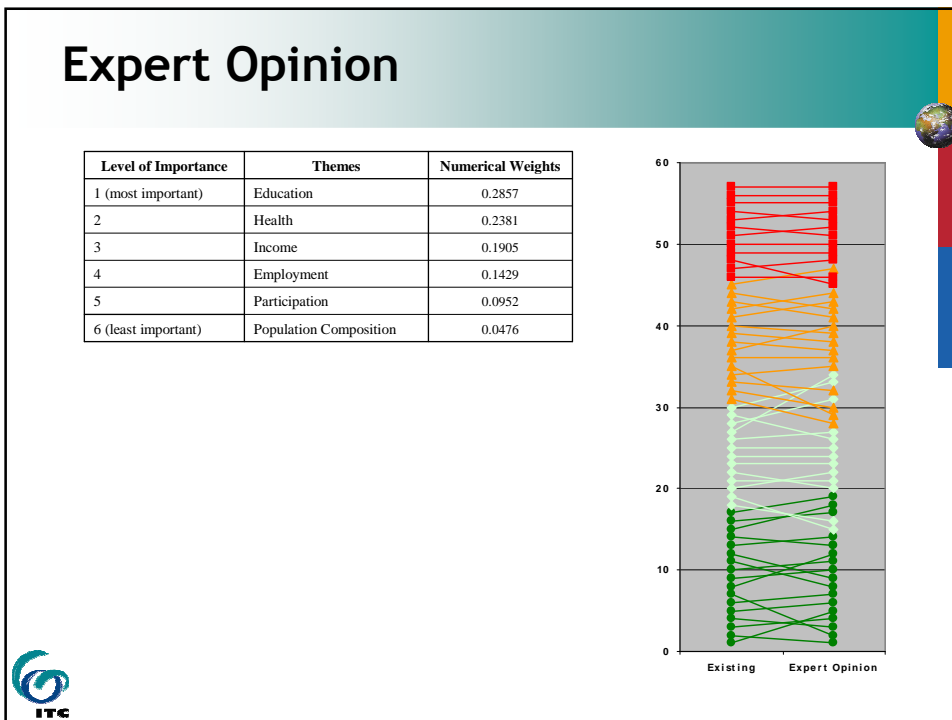


## Neighbourhood Rankings Aggregation

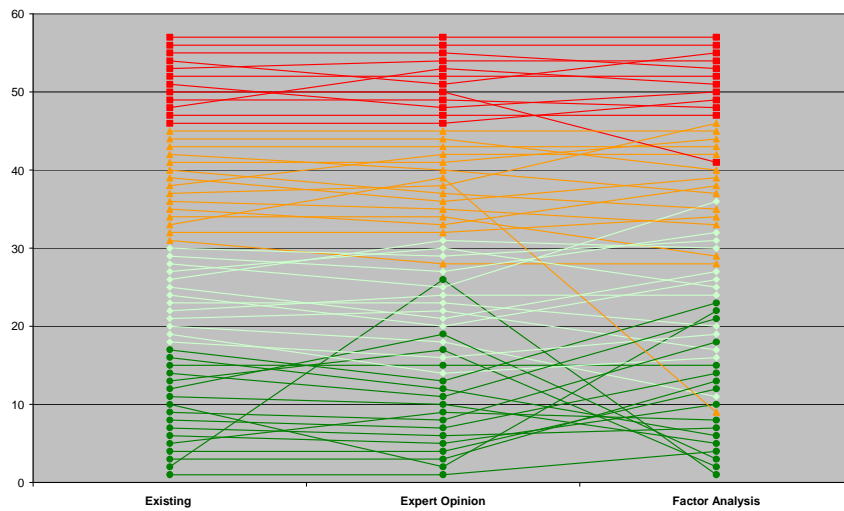


## Expert Opinion

Level of Importance	Themes	Numerical Weights
1 (most important)	Education	0.2857
2	Health	0.2381
3	Income	0.1905
4	Employment	0.1429
5	Participation	0.0952
6 (least important)	Population Composition	0.0476



## Neighbourhoods Rankings Weighting



## Z-score more sensitive to weighting changes (Rankings)

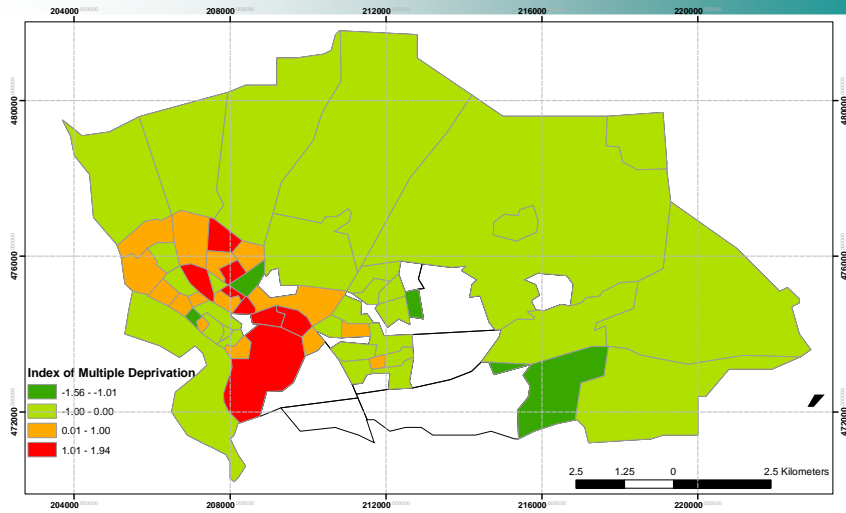
The Rank Spearman Correlation between the final neighbourhood ranking and neighbourhood ranking based on education theme

Expert opinion gives more weight to education theme than the other themes

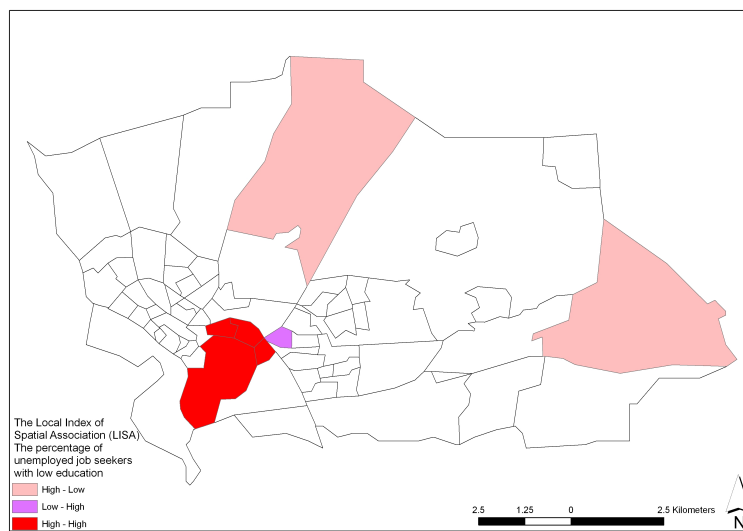
	Rank Without Ties	Rank With Ties	Z-score	Range	Chi-square
Equal Weighting	0.8216	0.8109	0.7664	0.7495	0.5569
Expert Opinion Weighting	0.8224	0.8163	0.8060	0.7579	0.5626



## Deventer (Z-score) Neighbourhood



## Spatial association for the Education theme



## Conclusions

- Development of indicators should relate to the concept being measured and the policy purpose
- Data availability often determines the actual indicators
- Population per area should not differ too much (modifiable area unit)
- 'No' dramatic changes in the neighbourhood ranking by using different techniques
- However, z-score might be preferred because
  - it does not change the distribution of the original scores
  - can cope with the relativity of deprivation
  - sensitive to the changes of weighting

Still ....

- necessary to check and show sensitivity of different techniques to policy and decision makers (transparency)
- Don't consider the neighbourhoods as independent but, verify the spatial correlation between the neighbourhoods

