Spatial measures of socio-economic inequality in South Africa

Spatial exposure to inequality: Results

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Exposure of ‘poor’ to ‘non-poor’

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Exposure of poor to non-poor national datazone deciles

$ExposInc_{xy}$

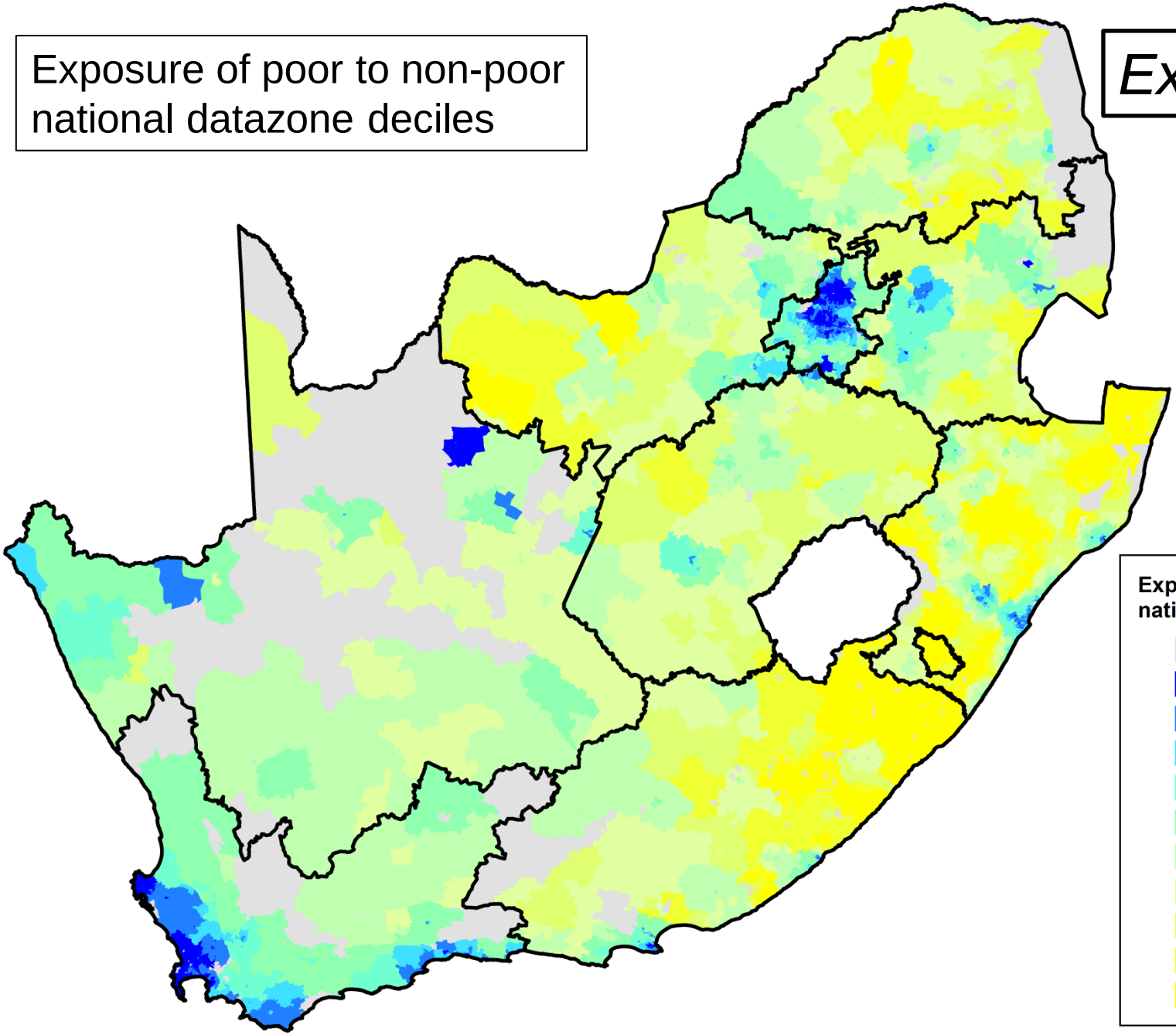

Chart 23: National distribution of datazone Exposure scores
- Income -

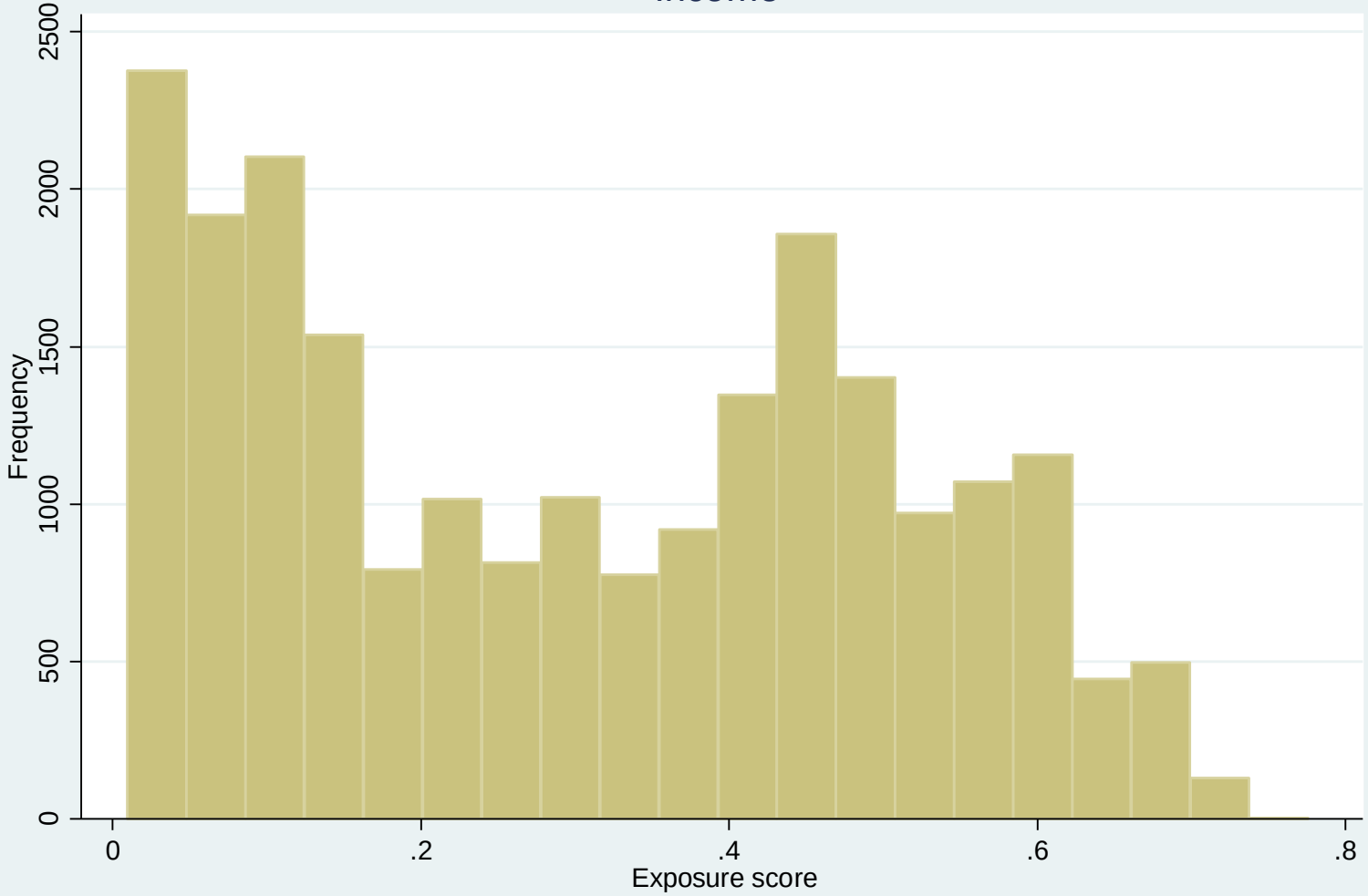

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Chart 24: National distribution of datazone Exposure scores
- Income -
By metro/non-metro status

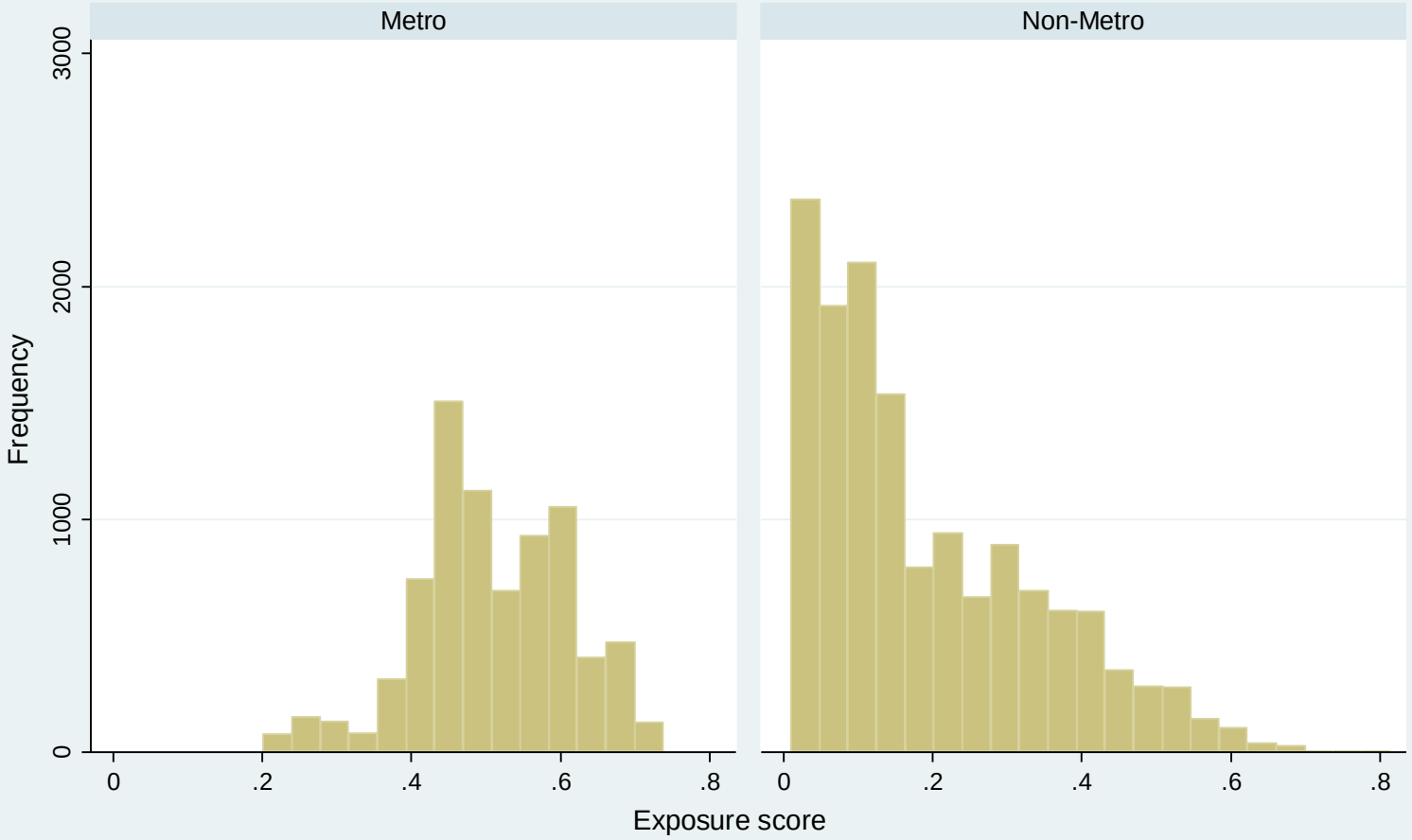

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Table 1: Exposure of poor to non-poor: location of datazones in the 10% highest *ExposInc*$_{xy}$ decile nationally

Municipality	Number	Percentage
City of Cape Town	986	44.5
City of Tshwane Metro	502	22.7
City of Johannesburg Metro	290	13.1
Ekurhuleni Metro	206	9.3
Others (23 municipalities)	232	10.5
Total in the 10% highest exposure decile nationally	**2,216**	**100.0**

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Table 2: Exposure of poor to non-poor: location of the ten municipalities with the largest proportions of datazones in the highest *ExposInc*$_{xy}$ decile nationally

Municipality	Number of datazones in the municipality	Number of datazones in the 10% highest *ExposInc*$_{xy}$ decile nationally	Percentage of municipality datazones in the 10% highest *ExposInc*$_{xy}$ decile nationally
Gamagara	9	7	77.8%
Stellenbosch	60	44	73.3%
City of Cape Town	1388	986	71.0%
Saldanha Bay	34	23	67.6%
City of Tshwane Metro	951	502	52.8%
Mossel Bay	37	10	27.0%
City of Johannesburg Metro	1599	290	18.1%
George	67	12	17.9%
Ekurhuleni Metro	1188	206	17.3%
Nokeng tsa Taemane	21	3	14.3%

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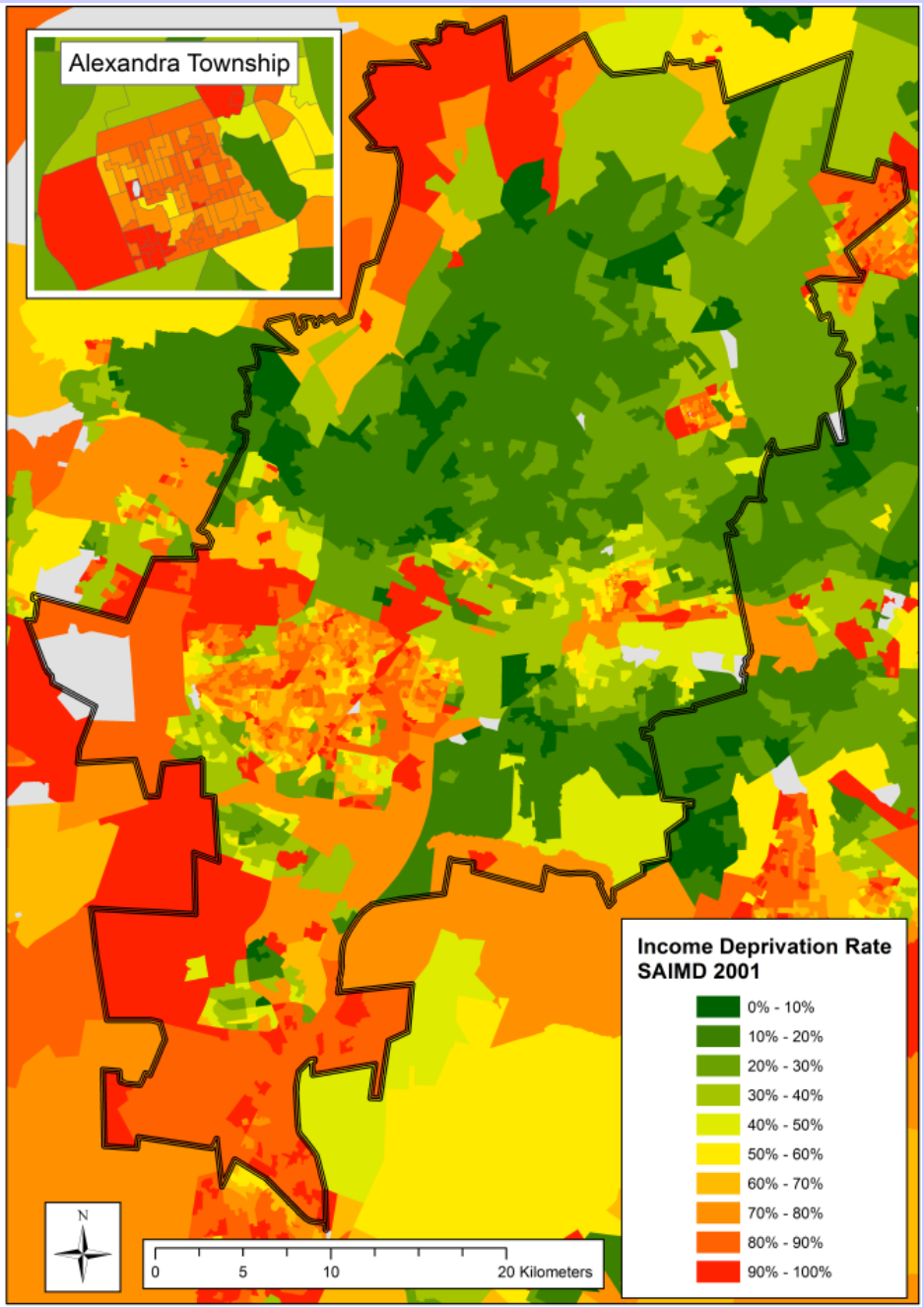
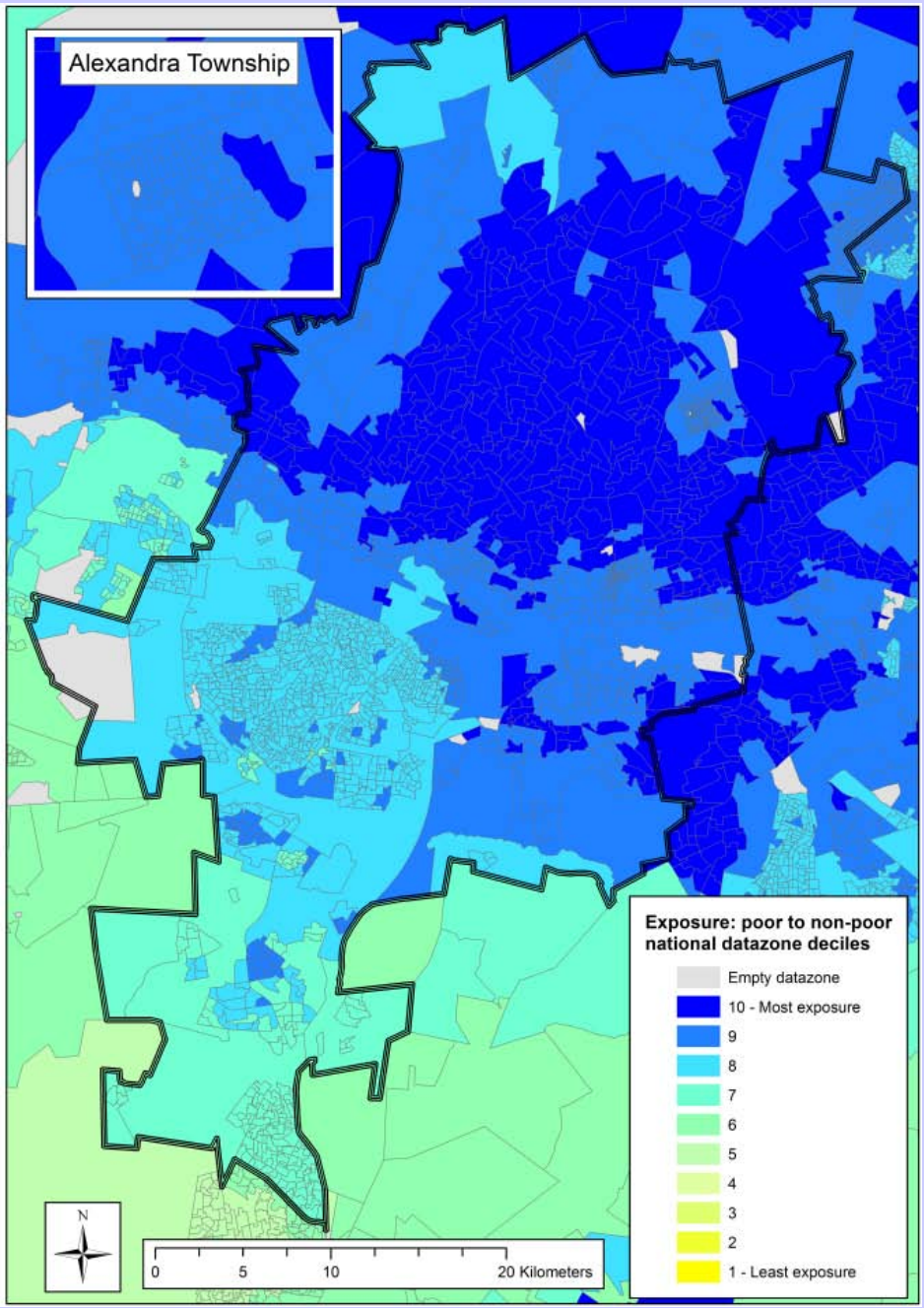
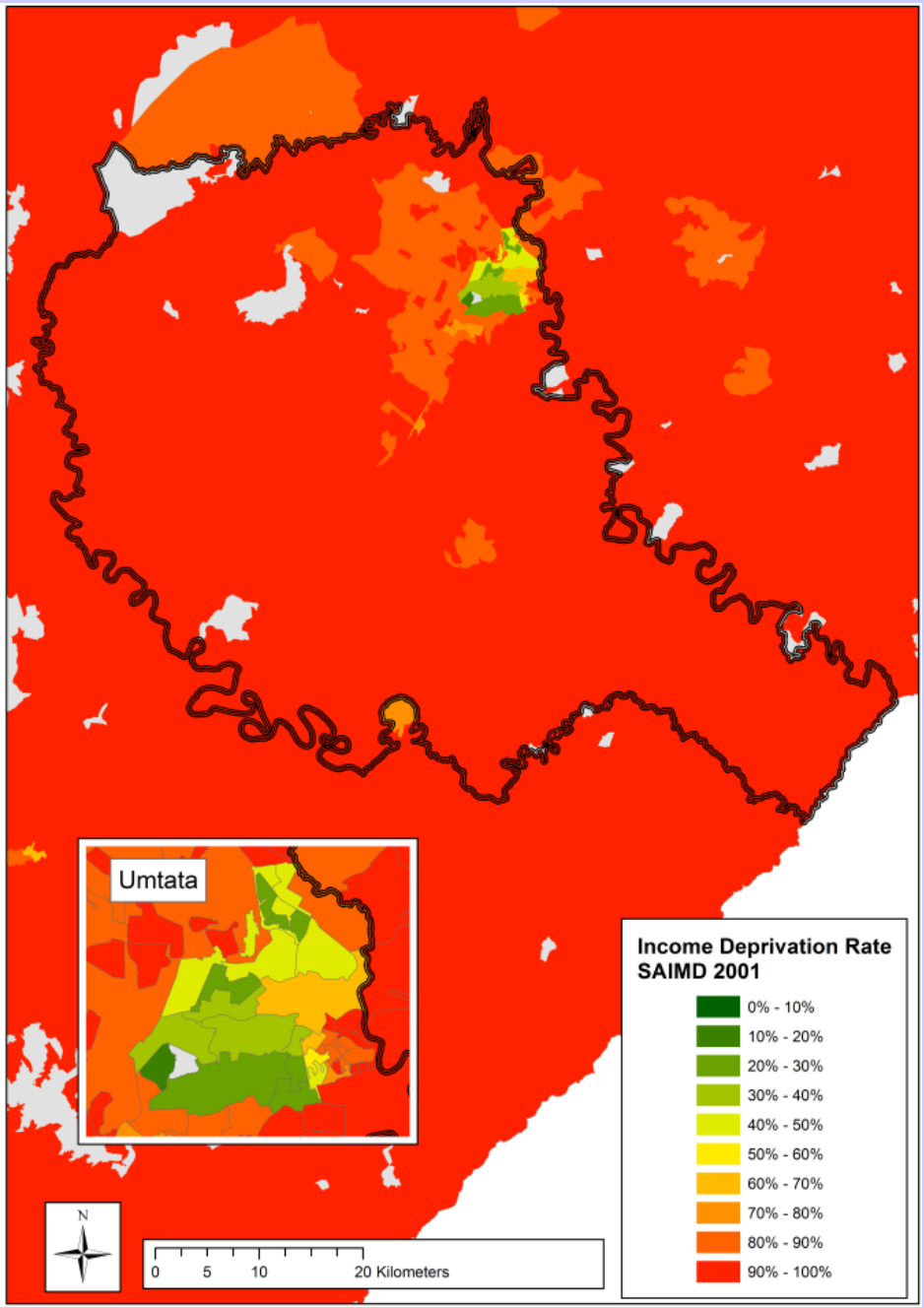
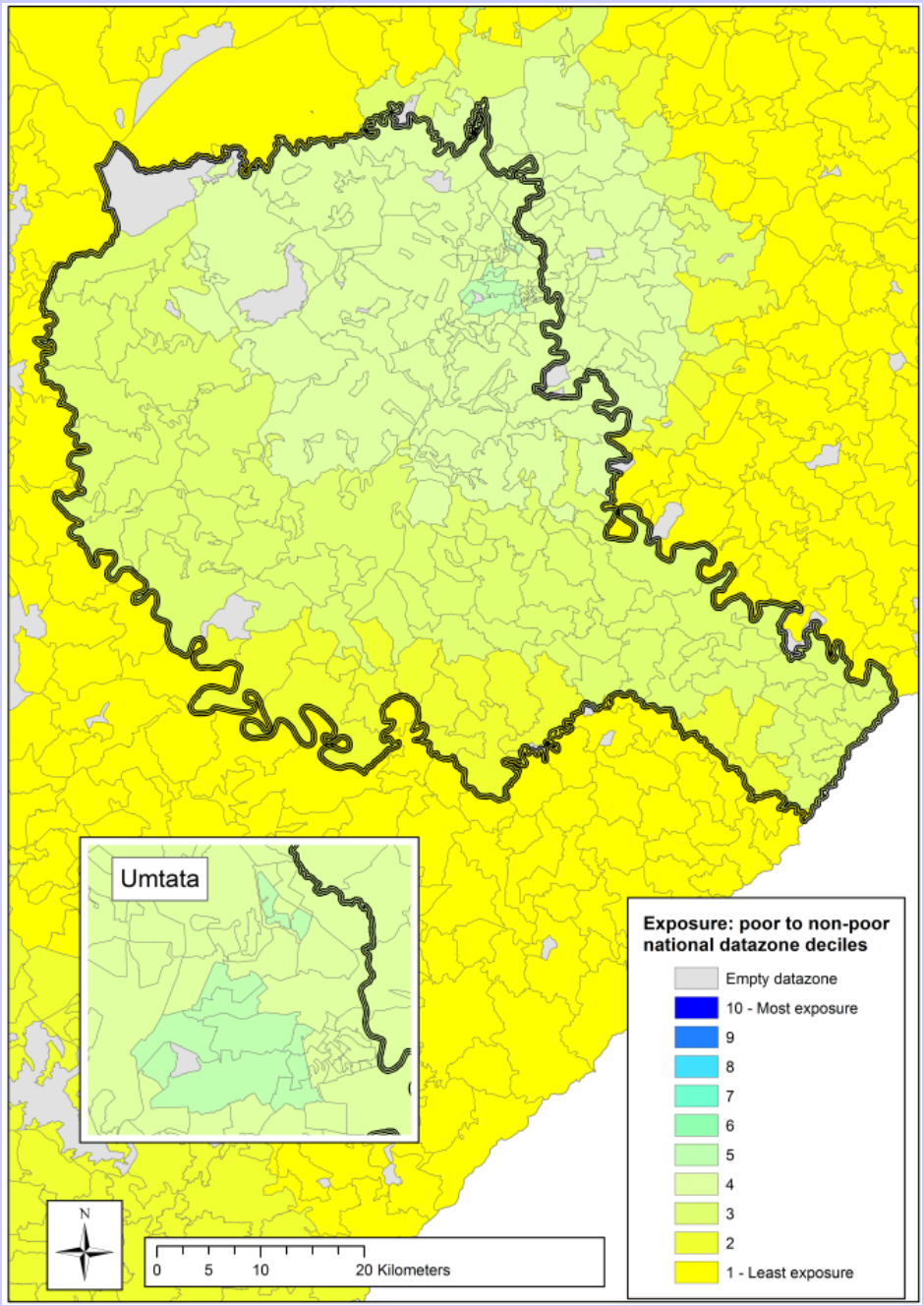

Alexandra Township
Income Deprivation Rate
SAIMD 2001
0% - 10%
10% - 20%
20% - 30%
30% - 40%
40% - 50%
50% - 60%
60% - 70%
70% - 80%
80% - 90%
90% - 100%
N
0
5
10
20 Kilometers


Alexandra Township
Exposure: poor to non-poor
national datazone deciles
Empty datazone
10 - Most exposure
9
8
7
6
5
4
3
2
1 - Least exposure
N
0
5
10
20 Kilometers


Umtata
Income Deprivation Rate
SAIMD 2001
0% - 10%
10% - 20%
20% - 30%
30% - 40%
40% - 50%
50% - 60%
60% - 70%
70% - 80%
80% - 90%
90% - 100%
N
0 5 10 20 Kilometers


Umtata
Exposure: poor to non-poor
national datazone deciles
Empty datazone
10 - Most exposure
9
8
7
6
5
4
3
2
1 - Least exposure
N
0 5 10 20 Kilometers

Focus on the metropolitan municipalities
(Exposure of ‘poor’ to ‘non-poor’)

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Chart 25: Datazone deprivation rate against exposure score - Income -

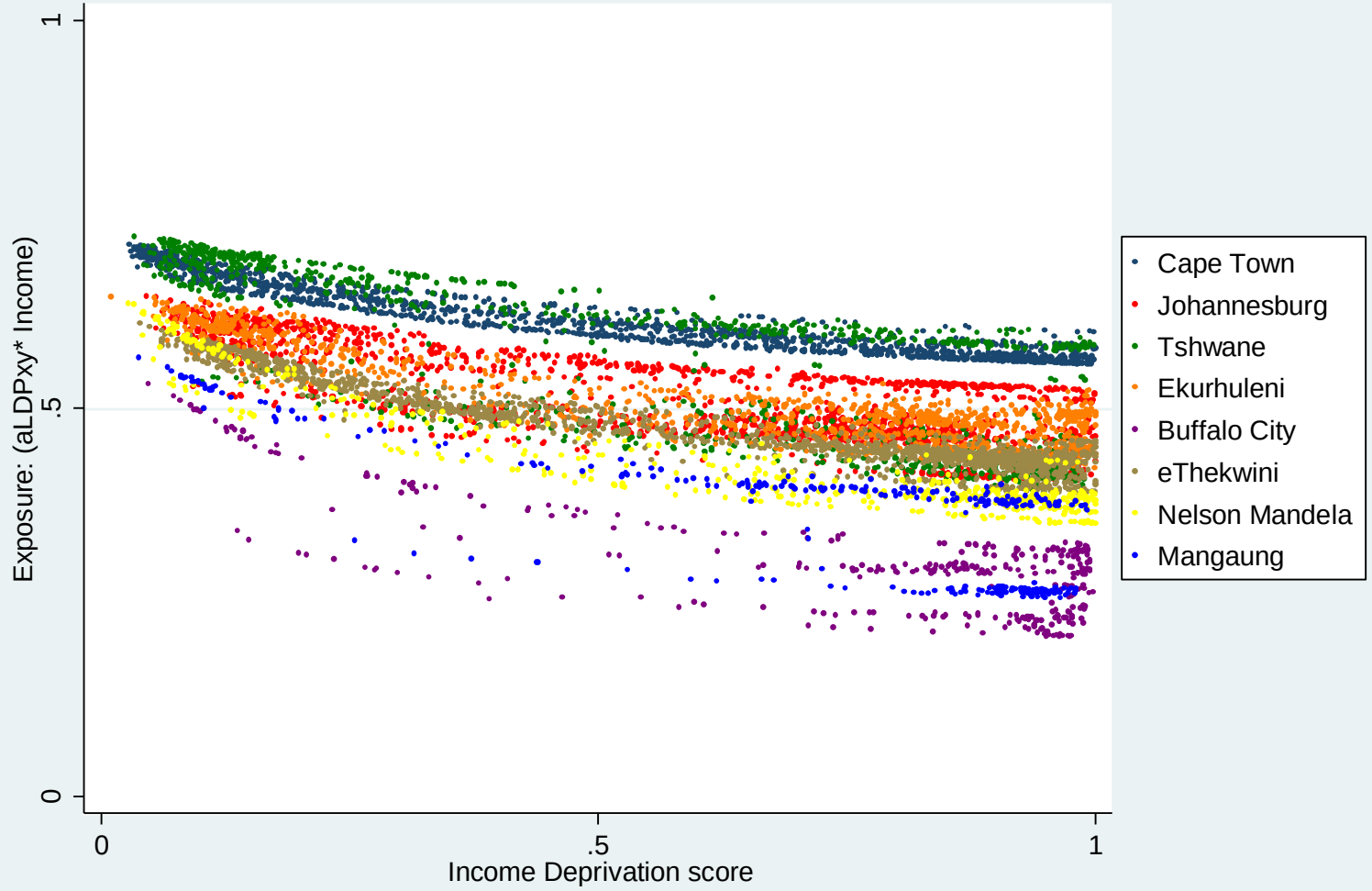

Chart 26: Datazone deprivation rate against exposure score - Employment -

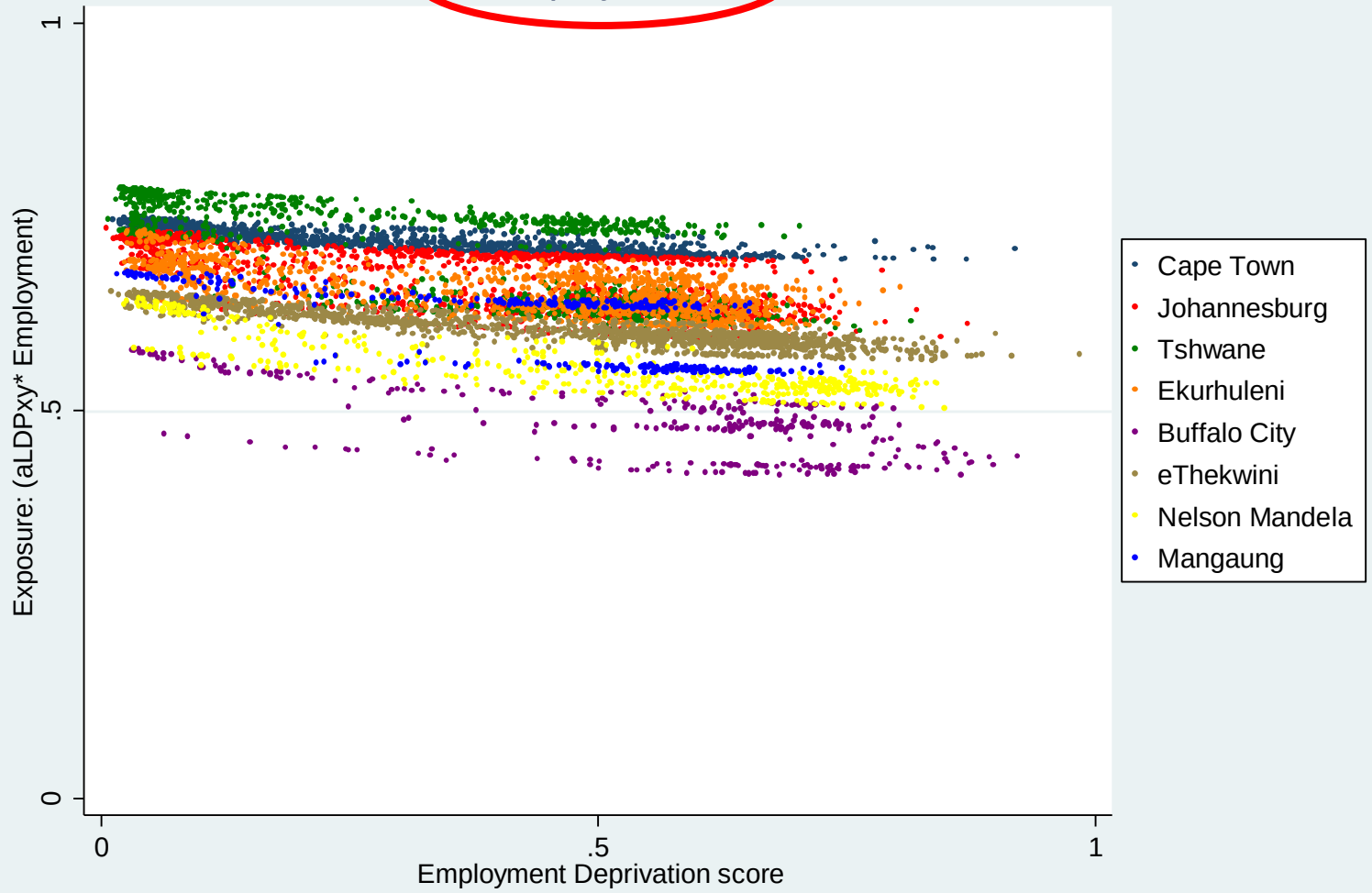

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Chart 27: Datazone deprivation rate against exposure score - Education -

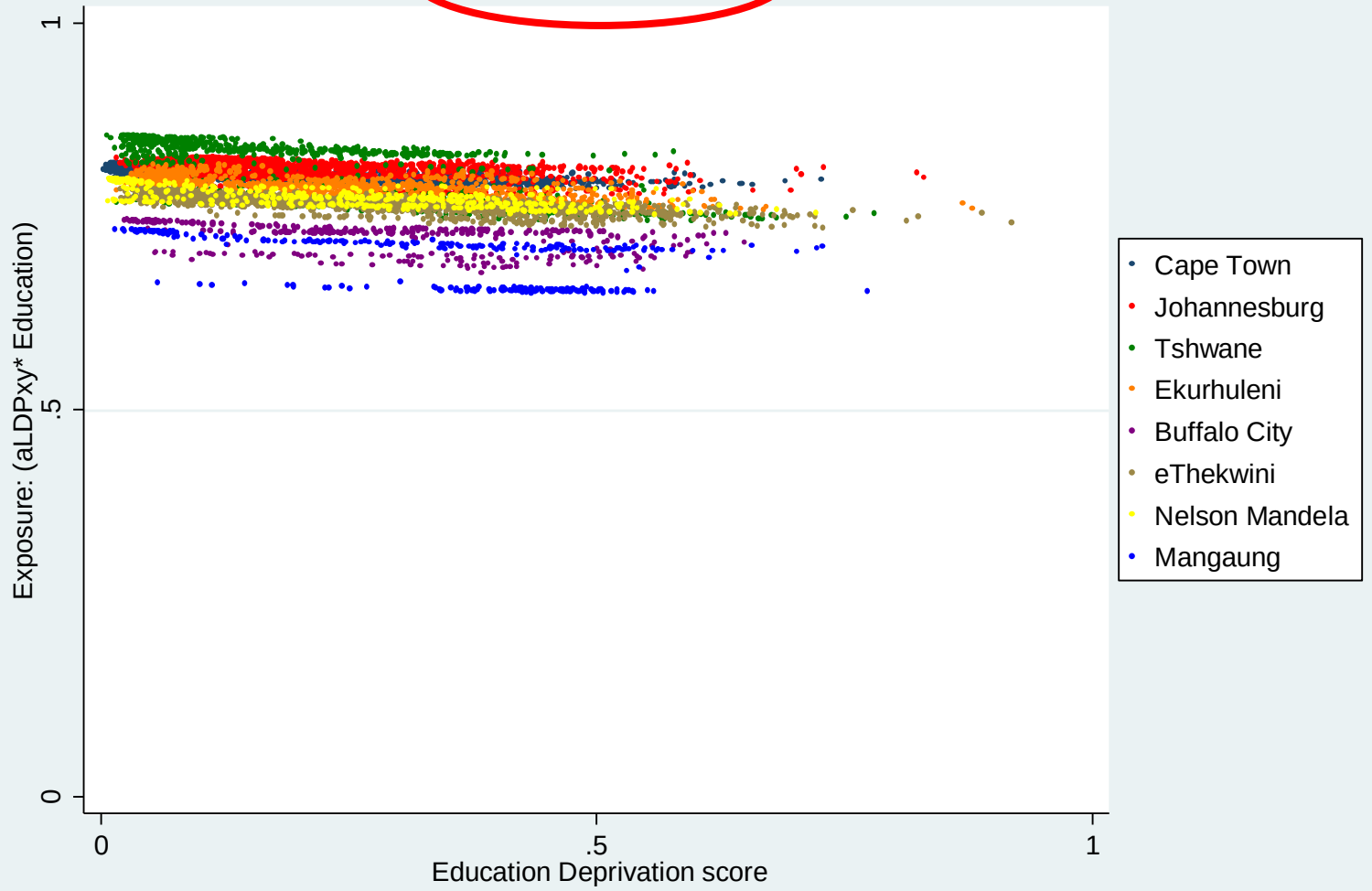

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Chart 28: Datazone deprivation rate against exposure score - Living Environment -

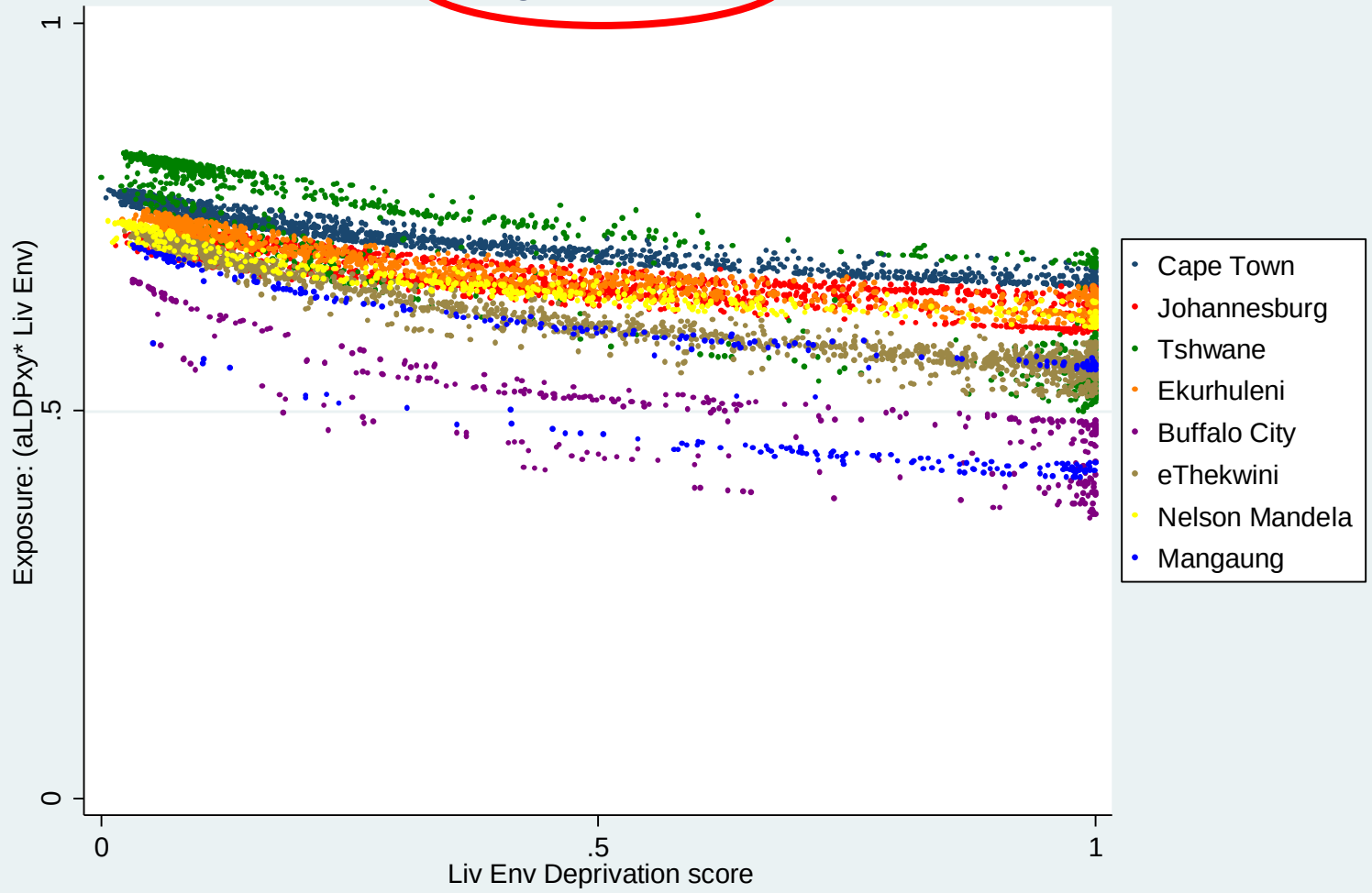

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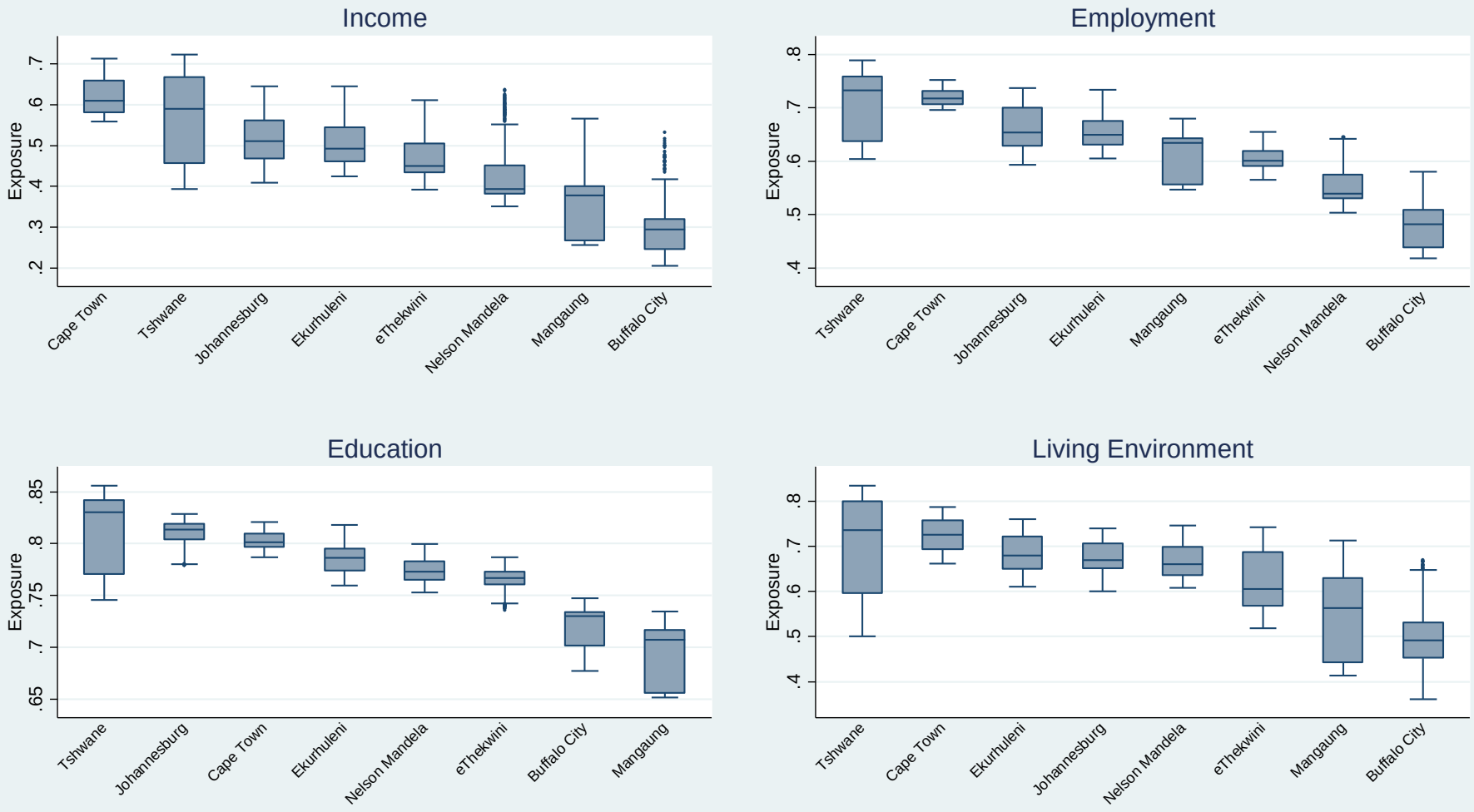
Chart 29: Exposure Scores - Metropolitan municipalities



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Tables 3 & 4: Spearman rank correlation coefficients between the four dimension-specific exposure measures

Table 3: All metropolitan datazones (n=7,800)				
	Expos_Inc	Expos_Emp	Expos_Edu	Expos_Liv
Expos_Inc	1			
Expos_Emp	0.9171	1		
Expos_Edu	0.8104	0.8281	1	
Expos_Liv	0.8947	0.7821	0.7225	1

Table 4: City of Cape Town datazones only (n=1,388)				
	Expos_Inc	Expos_Emp	Expos_Edu	Expos_Liv
Expos_Inc	1			
Expos_Emp	0.9344	1		
Expos_Edu	0.8752	0.8861	1	
Expos_Liv	0.9339	0.8592	0.8116	1

Creating *ExposFac*$_{xy}$

1. Each of the four separate dimension-specific exposure scores at Datazone level was ranked and transformed to a normal distribution.

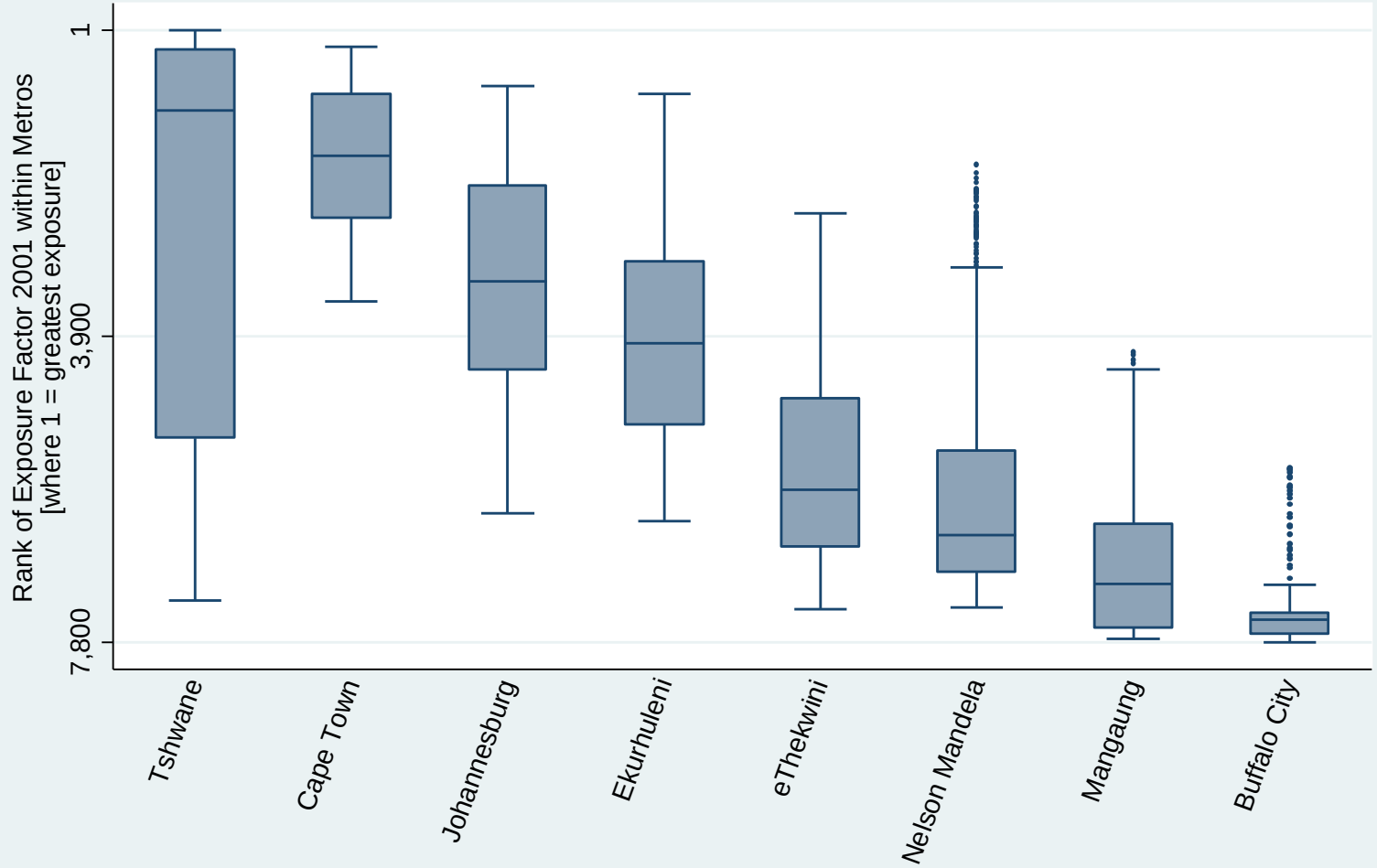
2. The four normalised rank variables were entered into a maximum likelihood factor analysis.

3. Weights derived from the factor analysis were used to combine the four normalised rank variables to form a single composite measure at Datazone level: '*ExposFac*$_{xy}$'.

4. The 7,800 metropolitan Datazones were re-ranked on the *ExposFac*$_{xy}$ measure.

Chart 30: Datazone Exposure Factor Ranks by Municipality

Interquartile Range ranked WITHIN Metropolitan Municipalities



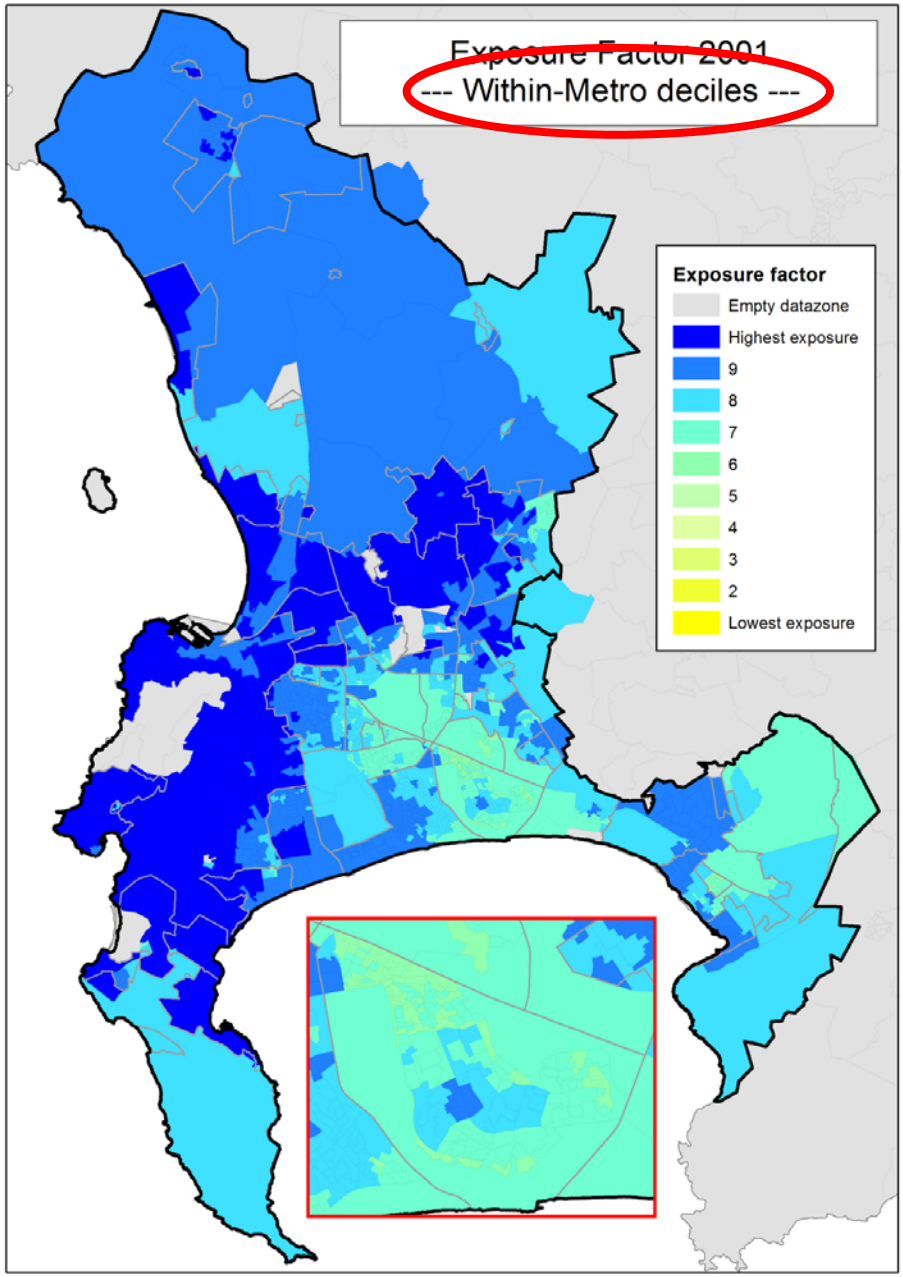

Exposure Factor 2001
--- Within-Metro deciles ---
Exposure factor
Empty datazone
Highest exposure
9
8
7
6
5
4
3
2
Lowest exposure

Chart 31: Datazone Exposure Factor ranks by Cape Town MainPlace Interquartile Range ranked WITHIN Metropolitan Municipalities

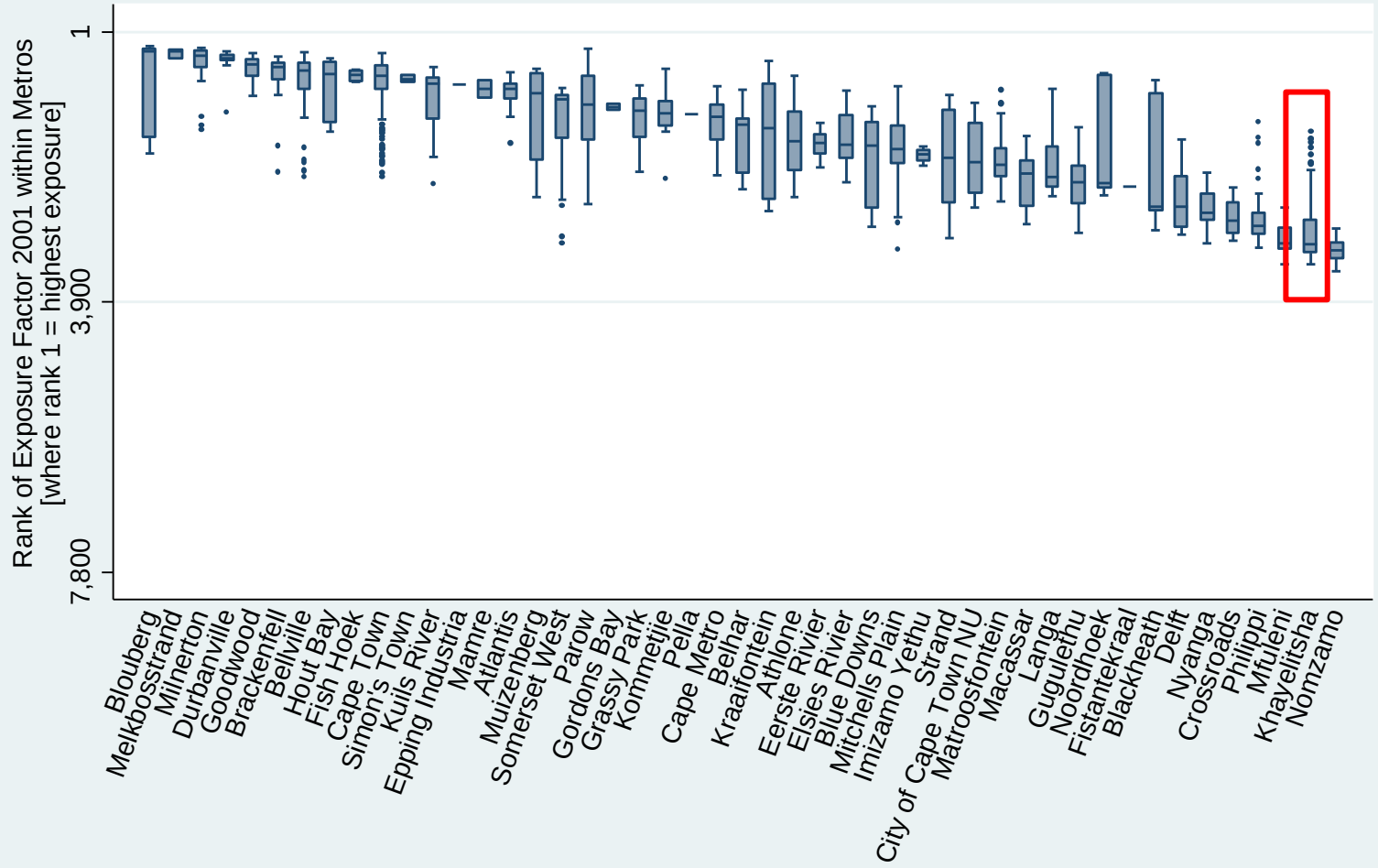


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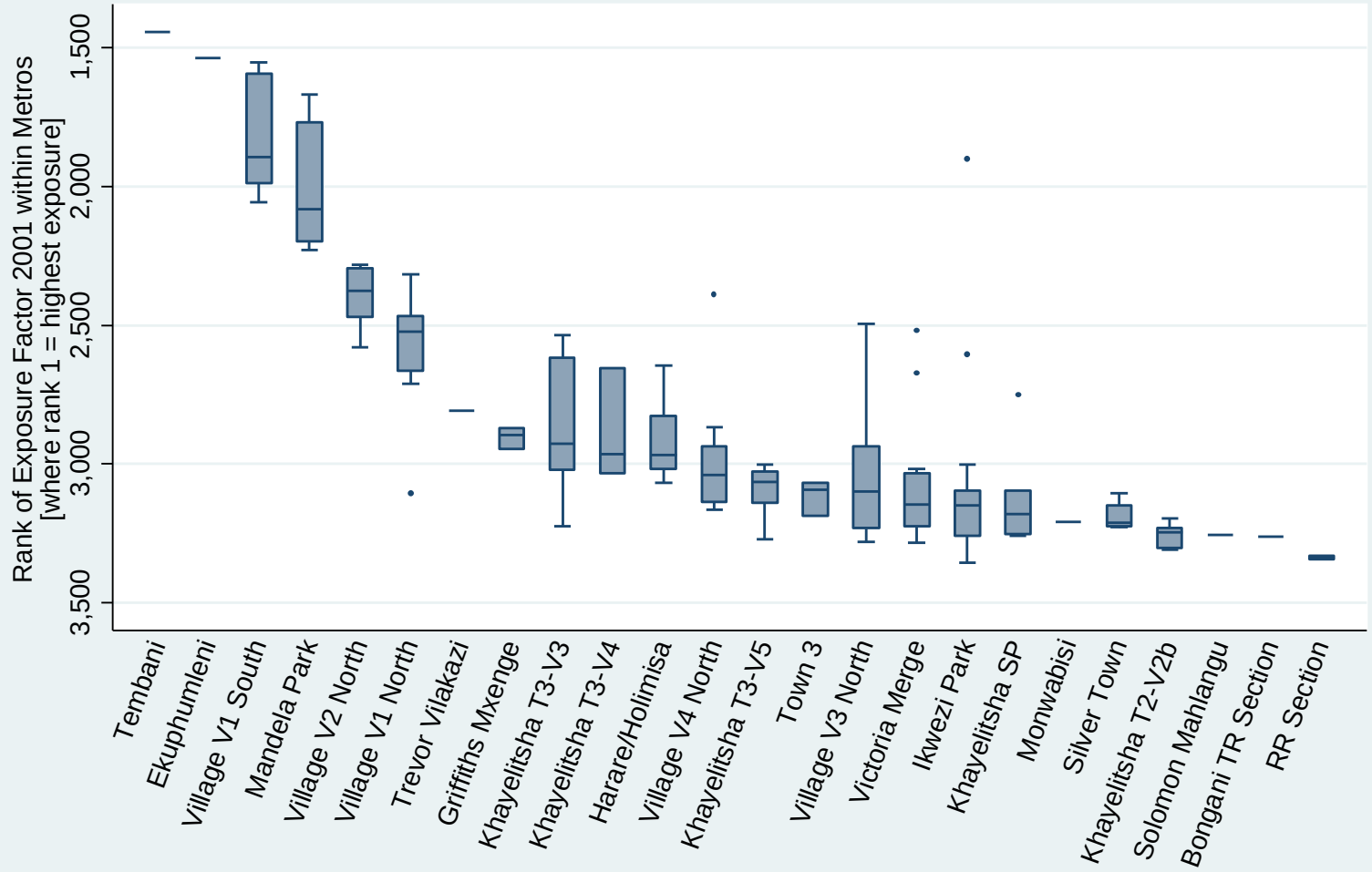
Chart 32: Datazone Exposure Factor ranks by Khayelitsha SubPlace Interquartile Range ranked WITHIN Metropolitan Municipalities



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Summary of Exposure results

- Exposure to socio-economic inequality is typically highest in the urban areas, particularly the metropolitan municipalities.
- There are strong correlations at datazone level between the four separate dimension-specific measures of exposure (income, employment, education, living environment)
- The composite $ExposFac_{xy}$ measure constructed across the 7,800 metropolitan datazones shows that exposure is typically highest in Tshwane and Cape Town, but that there is far more variation within Tshwane than within Cape Town.
- The exposure results can be analysed at a detailed geographical level to explore variations *within* municipalities.

Community ‘Intensity’ of exposure (‘poor’ to ‘non-poor’):
National analyses

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Neighbourhood 'Intensity' of exposure to socio-economic inequality

- The exposure measures represent the likelihood of a given individual living in a given neighbourhood of being exposed to socio-economic inequality.
- Typically, a geographical area with low poverty rates (e.g. Sandton) will be characterised by relatively high levels of exposure amongst the poor population.
- But some neighbourhoods (e.g. Alexandra) have high poverty **and** high exposure to inequality.
- In these areas, it may be argued there is a high community-level 'intensity' of exposure to inequality.

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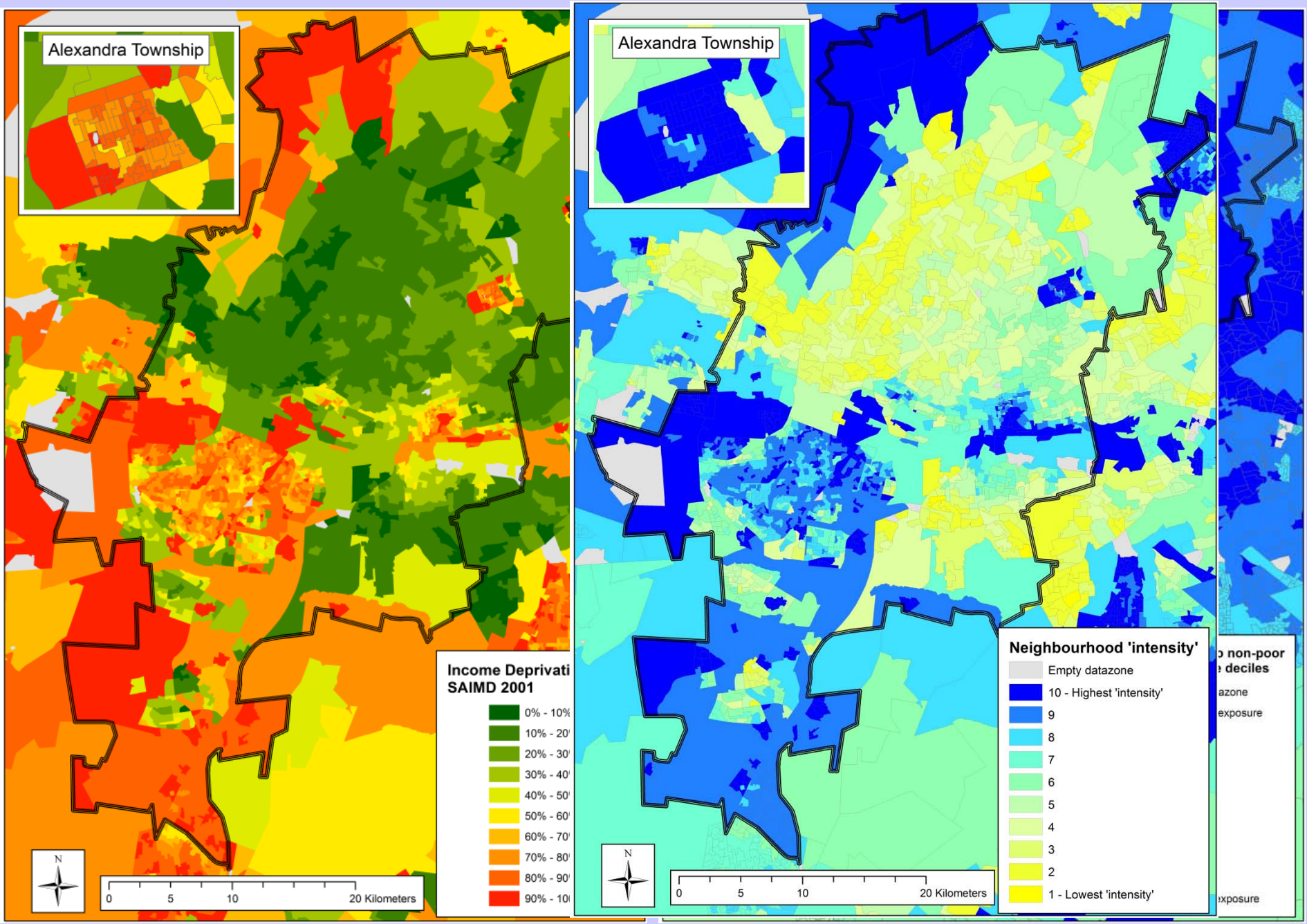
Alexandra Township
Income Deprivati
SAIMD 2001
0% - 10%
10% - 20
20% - 30
30% - 40
40% - 50
50% - 60
60% - 70
70% - 80
80% - 90
90% - 10
N
0
5
10
20 Kilometers
Alexandra Township
Neighbourhood 'intensity'
Empty datazone
10 - Highest 'intensity'
9
8
7
6
5
4
3
2
1 - Lowest 'intensity'
N
0
5
10
20 Kilometers
non-poor
deciles
azone
exposure
xposure

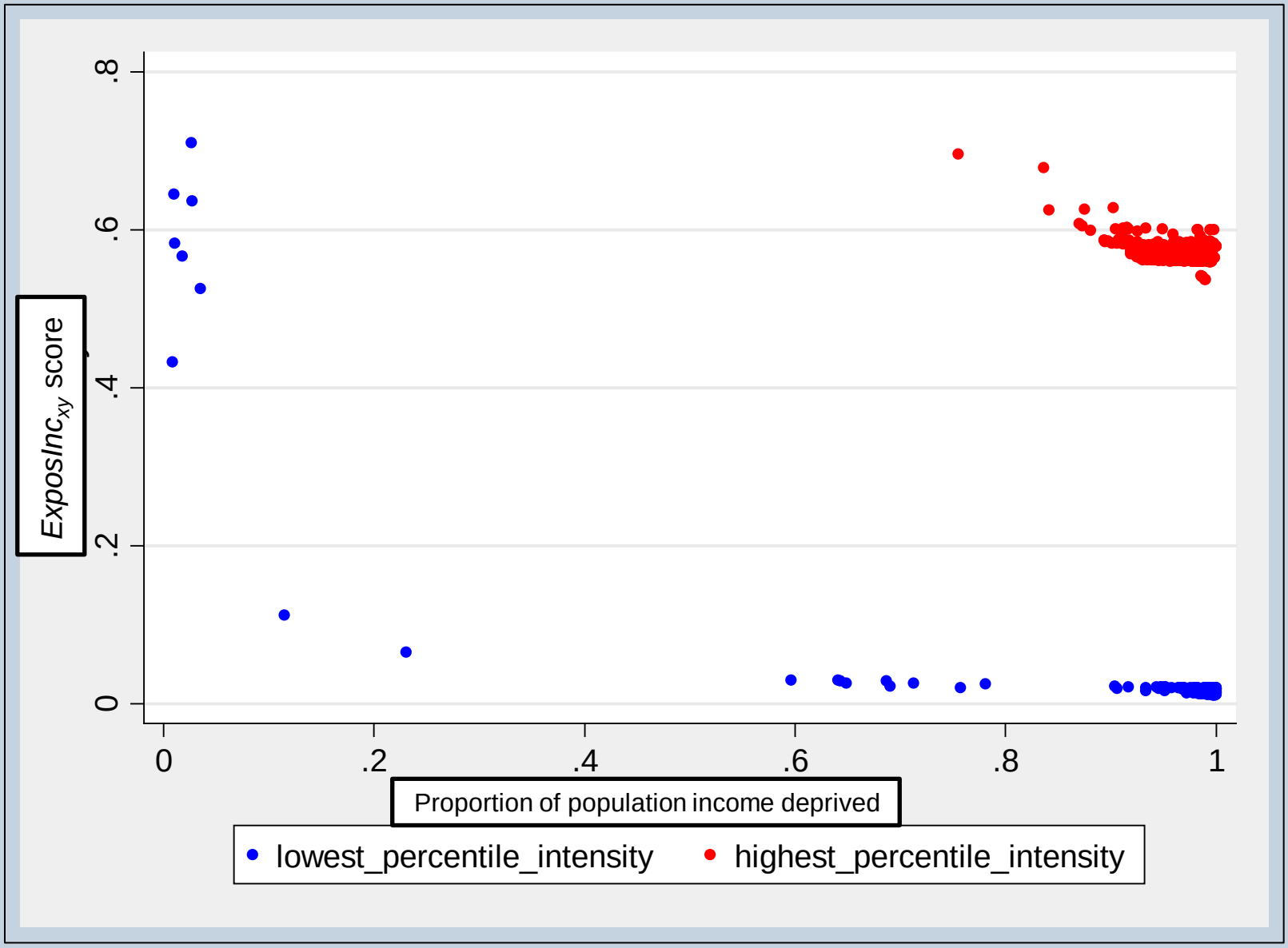

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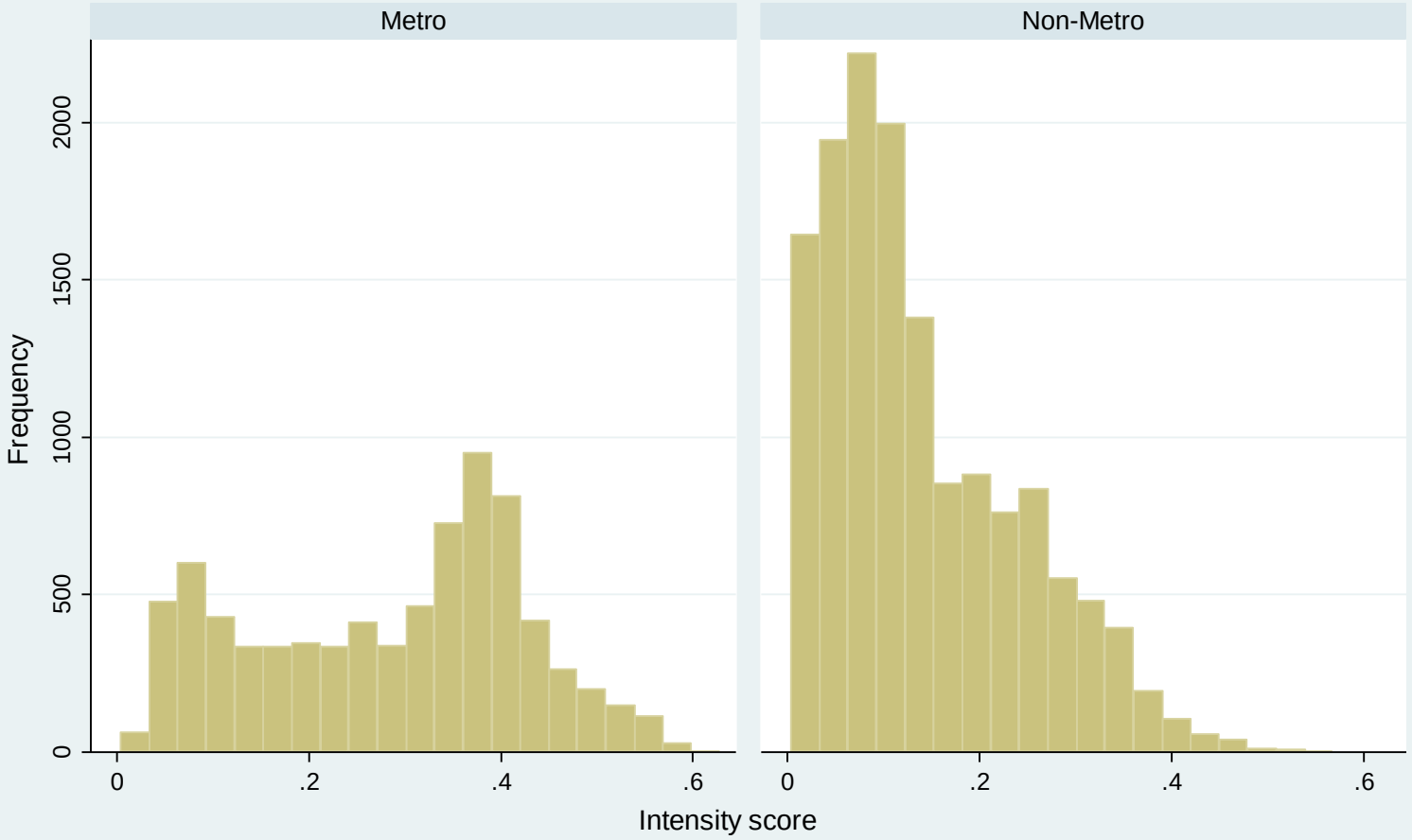
Chart 33: National distribution of datazone Intensity scores
- Income -
By metro/non-metro status



Intensity of exposure ('poor' to 'non-poor'):
Focus on the metropolitan municipalities

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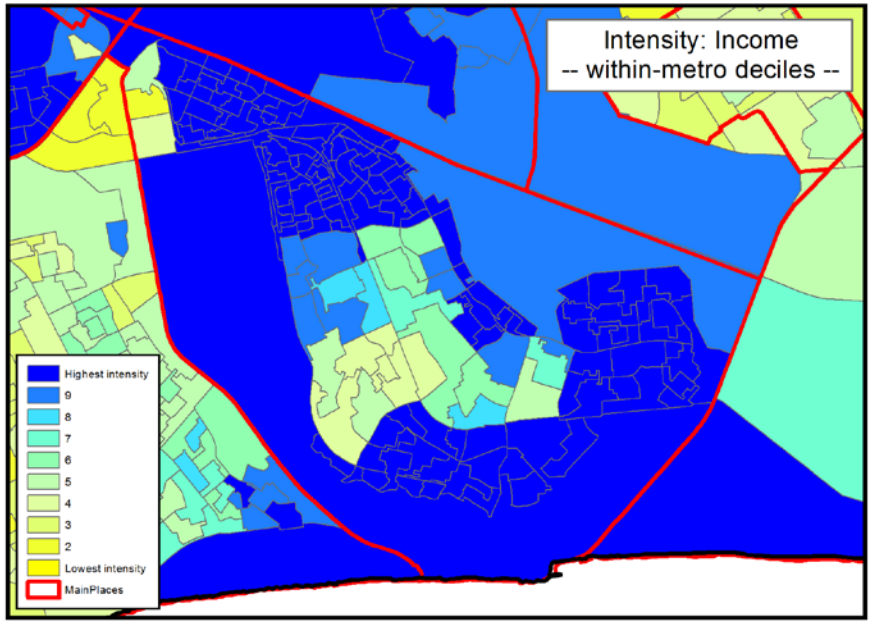
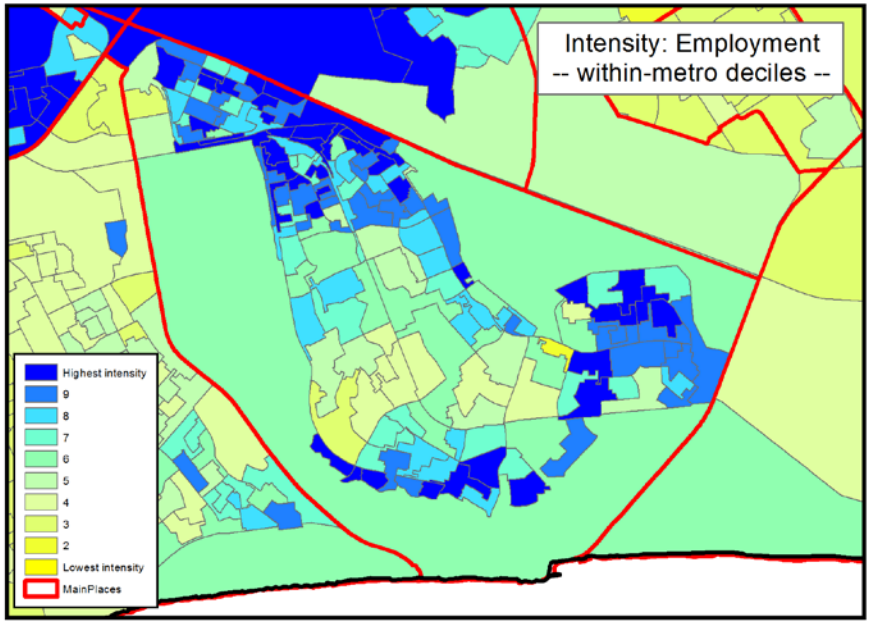
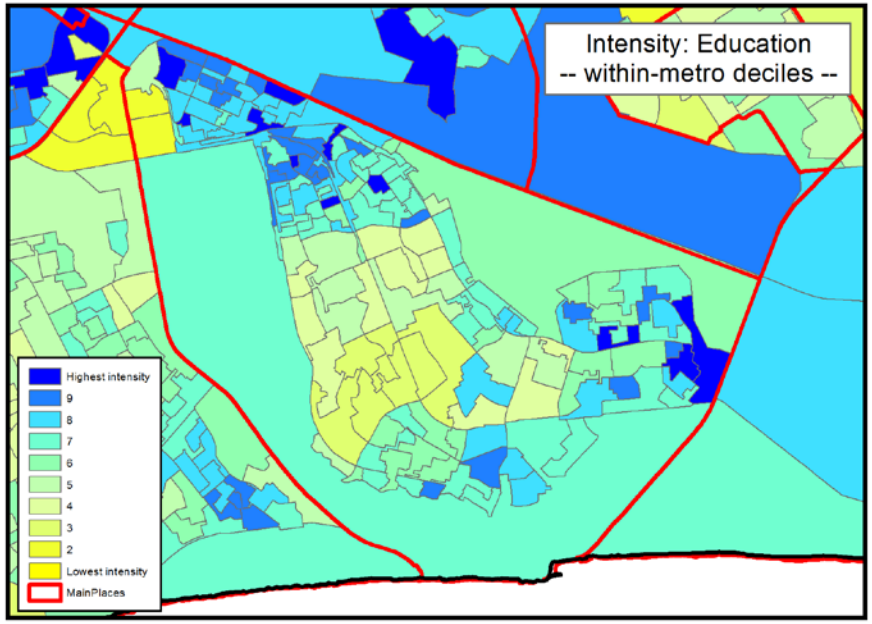
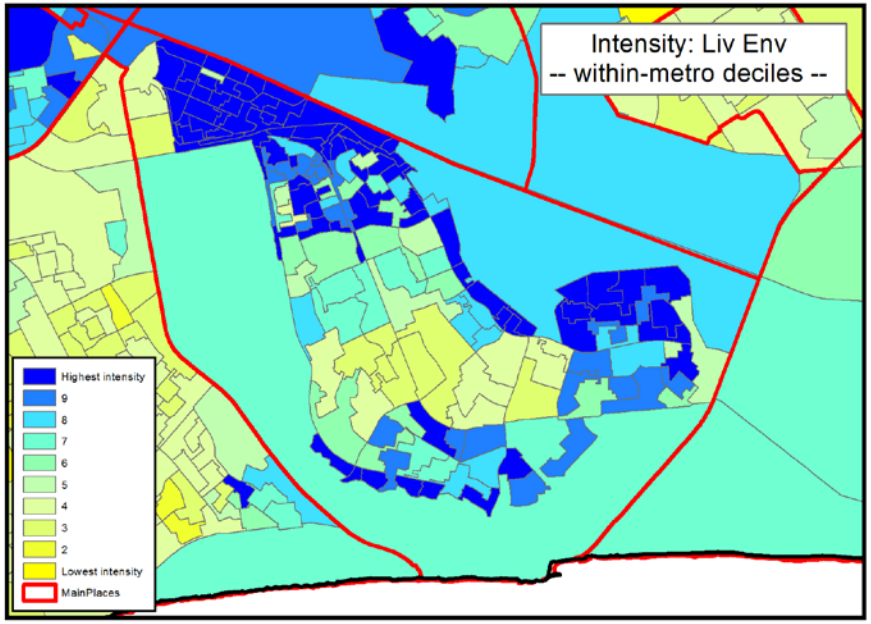

Intensity: Income
-- within-metro deciles --
Highest intensity
9
8
7
6
5
4
3
2
Lowest intensity
MainPlaces


Intensity: Employment
-- within-metro deciles --
Highest intensity
9
8
7
6
5
4
3
2
Lowest intensity
MainPlaces


Intensity: Education
-- within-metro deciles --
Highest intensity
9
8
7
6
5
4
3
2
Lowest intensity
MainPlaces


Intensity: Liv Env
-- within-metro deciles --
Highest intensity
9
8
7
6
5
4
3
2
Lowest intensity
MainPlaces

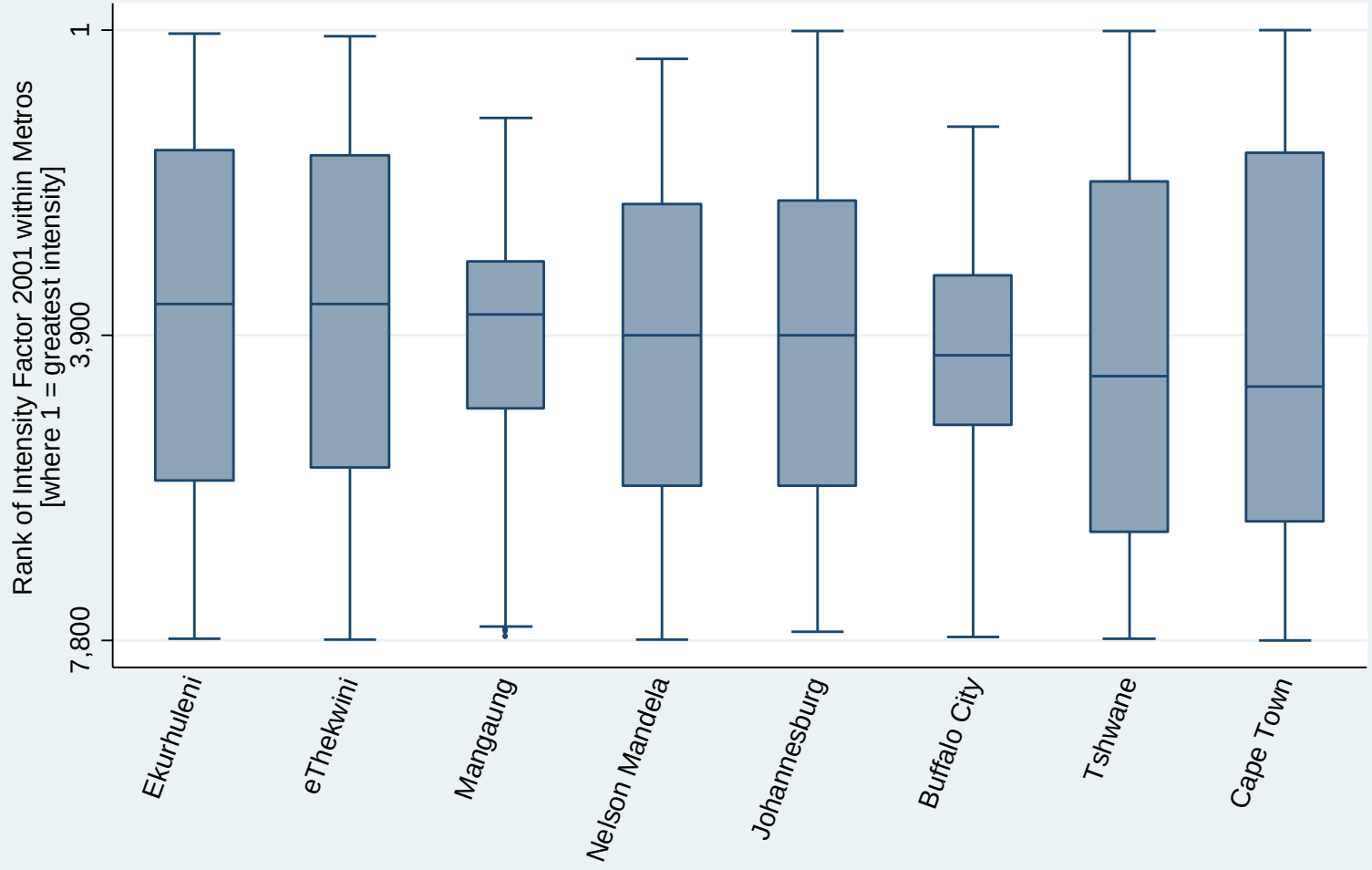
Tables 5 & 6: Spearman rank correlation coefficients between the four dimension-specific ‘intensity’ measures

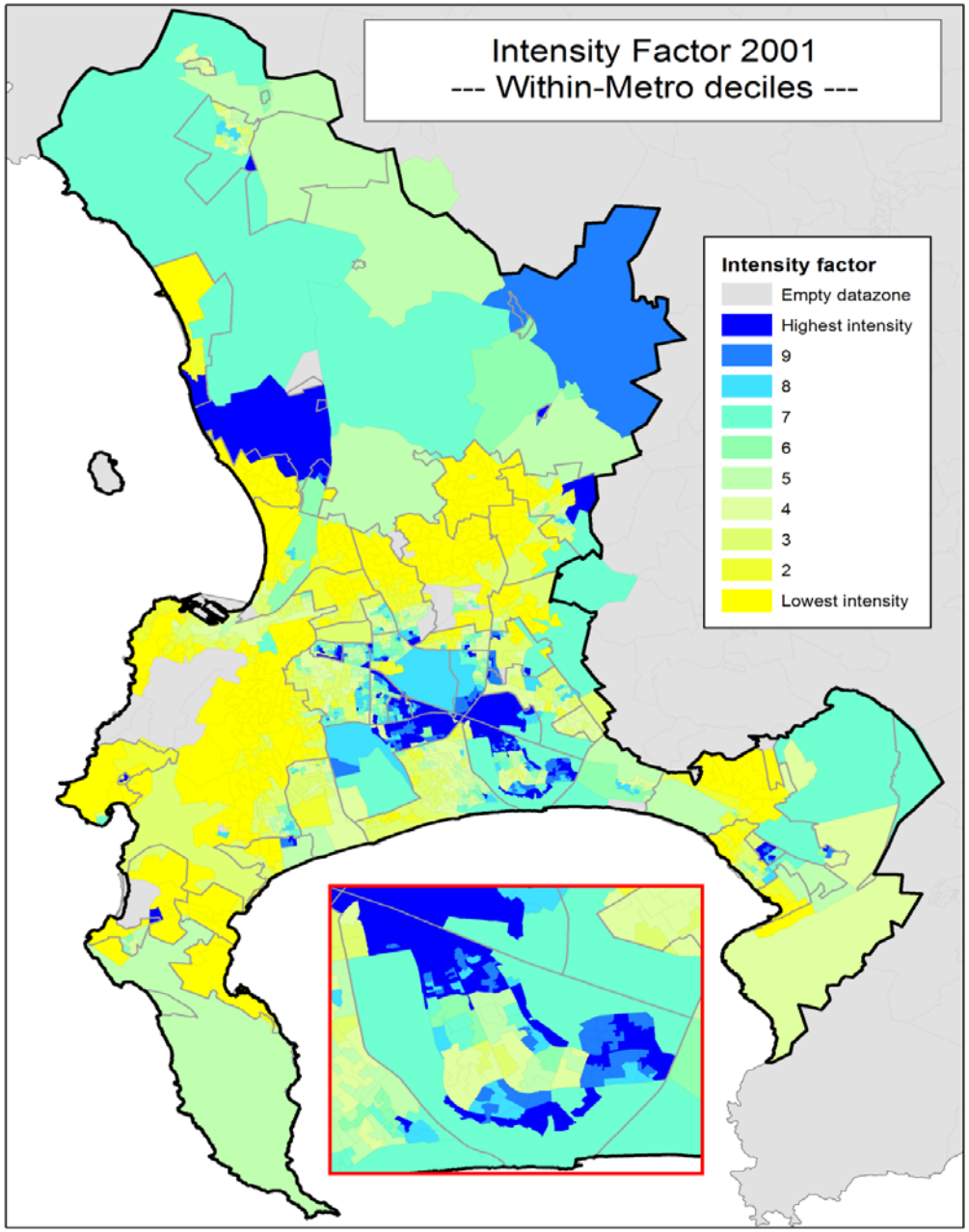
Table 5: All metropolitan datazones				
All Metros	**intensity_inc**	**intensity_emp**	**intensity_edu**	**intensity_liv**
intensity_inc	1			
intensity_emp	0.8245	1		
intensity_edu	0.7960	0.7068	1	
intensity_liv	0.8810	0.7529	0.8399	1

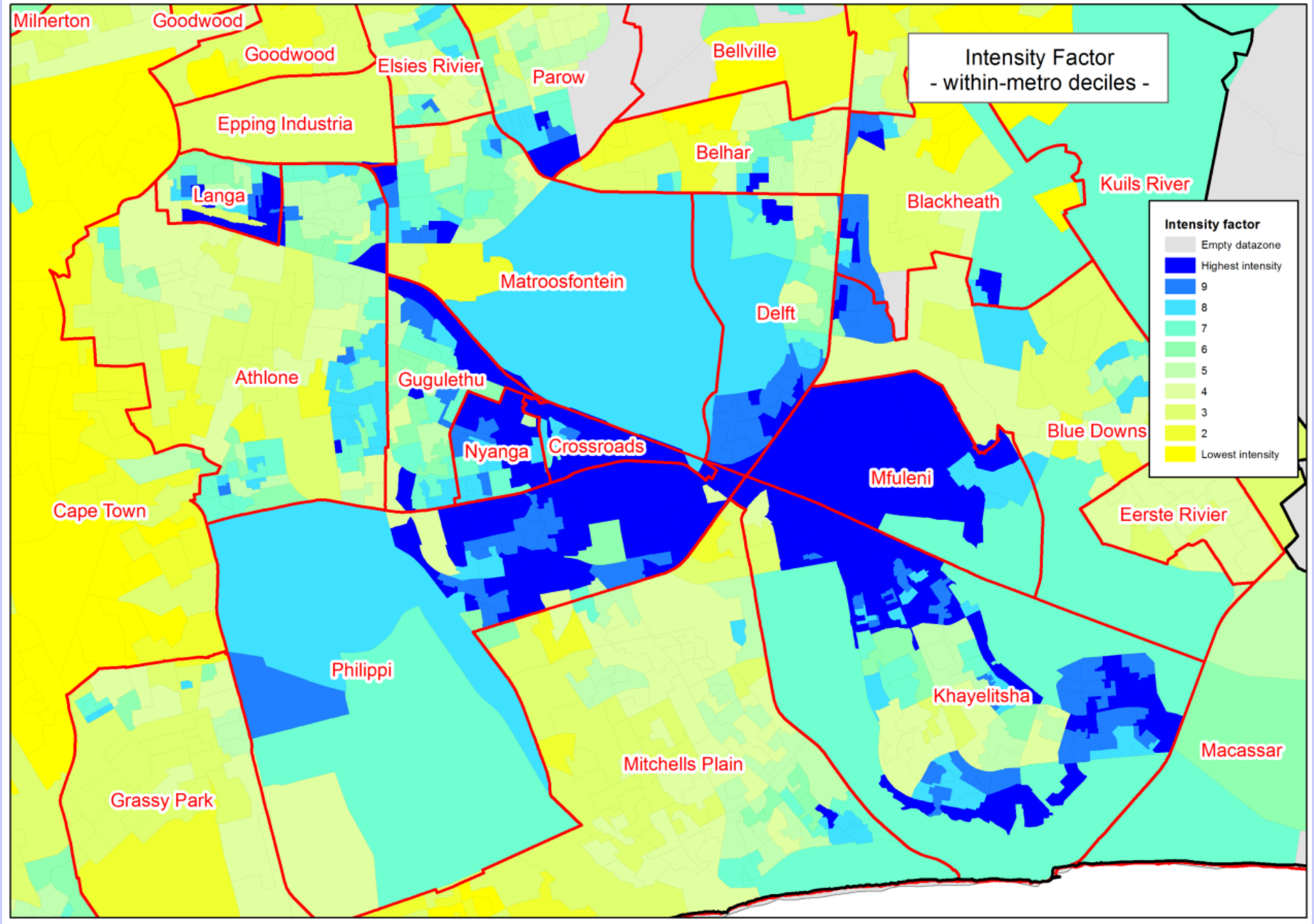
Table 6: City of Cape Town datazones only				
Just Cape Town	**intensity_inc**	**intensity_emp**	**intensity_edu**	**intensity_liv**
intensity_inc	1			
intensity_emp	0.9329	1		
intensity_edu	0.8666	0.8122	1	
intensity_liv	0.9320	0.8780	0.8402	1

Chart 34: Datazone Intensity Factor Ranks by Municipality

Interquartile Range ranked WITHIN Metropolitan Municipalities




Intensity Factor 2001
--- Within-Metro deciles ---
Intensity factor
Empty datazone
Highest intensity
9
8
7
6
5
4
3
2
Lowest intensity


Intensity Factor
- within-metro deciles -
Intensity factor
Empty datazone
Highest intensity
9
8
7
6
5
4
3
2
Lowest intensity
Milnerton
Goodwood
Goodwood
Elsies Rivier
Parow
Bellville
Epping Industria
Belhar
Kuils River
Blackheath
Langa
Matroosfontein
Delft
Athlone
Gugulethu
Nyanga
Crossroads
Blue Downs
Mfuleni
Cape Town
Eerste Rivier
Philippi
Khayelitsha
Macassar
Mitchells Plain
Grassy Park

Summary of ‘Intensity’ results

- ‘Intensity’ can be regarded as a measure of the degree to which neighbourhoods are characterised by the twin stressors of high poverty and high exposure to socio-economic inequality.
- High correlations exist between the four dimension-specific intensity measure, justifying the construction of an ‘$IntensityFac_{xy}$’ composite measure.
- Datazone neighbourhoods with very high levels of ‘intensity’ are found in all metropolitan municipalities.
- All eight metro municipalities exhibit a wide range of datazone level intensity scores, i.e. heterogeneity.

Conclusions

- Spatial inequality measures – particularly the *P** Exposure indices – offer a valuable contribution to the evidence base concerning inequality in South Africa.
- They provide a means to examine geographical patterns in people's lived experience of inequality.
- They can be used as explanatory factors when analysing attitudinal data (as is the focus of the ESRC/NRF-funded project).
- They can also be used to identify geographical areas characterised by both high levels of poverty and high levels of exposure to inequality, which may be most at risk of social unrest or high levels of crime (our 'Safe and Inclusive Cities' project).

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