METROPOLITAN HEALTH AND WEALTH PERFORMANCE

METHODOLOGY AND INITIAL RESULTS

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LSE Cities
AN INTERNATIONAL CENTRE SUPPORTED BY DEUTSCHE BANK
SUMMARY

Estimates of health and wealth performance for 126 metropolitan regions: spatial and data comparability

Extended Metropolitan Region (EMR): sub-national units that proxy the city’s maximum spatial extent

Standardised ratio of EMR to national performance with available data in each national context

Apply ratio to internationally comparable national-level indices

Initial analysis of the (de)coupling of the health and wealth performance of EMRs in relation to their national contexts
A NEW SPATIAL UNIT

It is not possible to rely on existing spatial units if we want to compare the same type of urban entity in all places.

A new spatial unit to compare the maximum spatial extent of metropolitan regions globally.

Focus is on establishing a consistent relationship between city and administrative boundary in different national contexts.

EMR: administrative unit(s) which contain(s) the largest spatial extent of the city.
A NEW SPATIAL UNIT

Dhaka District: 11.8m (2010)
Narayanganj District: 3 m (2010)
Gazipur District: 2.8m (2010)
Dhaka EMR: 17.6m (2010)
Dhaka UNWUP UA: 14.9m (2010)
12.2% of Bangladesh, 1.43 UNWUP UA
A NEW SPATIAL UNIT

EMR must stay within reasonable bounds of the population of the urban agglomeration as defined by the UN (and national statistical institutes where necessary)

The percentage of the national population living in an EMR must not vary too greatly

China, India, U.S., Brazil: second tier administrative divisions and third level divisions to construct the EMRs
126 EXTENDED METROPOLITAN REGIONS

SOUTH ASIA 21
SUB-SAHARAN AFRICA 15
SOUTH EAST ASIA 12
WESTERN EUROPE 9

CENTRAL AND SOUTH AMERICA 21
NORTH AMERICA AND AUSTRALIA 14
MIDDLE EAST AND NORTH AFRICA 11
EASTERN EUROPE 8
EAST ASIA 15
No single indicator in health or wealth available internationally for sub-national administrative units

Estimation procedure to ensure comparability:

1. Identify two priority indicators and a set second-order indicators, and;
2. If both priority indicators available, 50% weight each
3. If only one priority indicator available, 50% weight and all secondary indicators 50% weight
4. If no priority indicator, use all secondary indicators (equally weighted)
METROPOLITAN LEVEL INDICATORS

Health:
1. Life expectancy and infant mortality
2. Immunisation, skilled assistance at delivery, doctors and hospital beds, mothers protected against tetanus

Wealth:
1. GPD and income per capita
2. Poverty, household characteristics (access to safe water, sanitation or electricity), malnourishment.
METROPOLITAN LEVEL INDICATORS

Standardisations used to make ratios between indicators at the EMR and national levels comparable across indicators:

1. Life expectancy: \[ z_1 = \frac{x_{EMR}}{x_{Nat}} \]
2. Expressed as %: \[ z_2 = \frac{x_{EMR}^{1/2}}{x_{Nat}^{1/2}} \]
3. IMR, GDP: \[ z_3 = \frac{\log(x_{EMR})}{\log(x_{Nat})} \]

Health and wealth factors are the standardised ratios between EMR and national context arrived on the indicators selected systematically in each national context.
NATIONAL LEVEL INDICATORS

180 National contexts

**Health**: Life expectancy and infant mortality rate (equal weight)

**Wealth**: GNI PPP $2008 per capita

Standardisation: $z_N = \frac{x - x_{\text{min}}}{x_{\text{max}} - x_{\text{min}}}$

IMR and GNI per capita: logarithmic transformation
A METROPOLITAN HEALTH ADVANTAGE?

15 EMRs Underperform nation in health, 12 in wealth

Health advantage due to wealth?

Health and wealth performance: difference in points between national index and EMR level index

For 126 EMRs, wealth performance (WP) explains over 40% of variation in health performance (HP)

Cannot discuss EMR health advantages in isolation: they need to be juxtaposed to the EMR wealth advantages.
A METROPOLITAN HEALTH ADVANTAGE?

### Regression Statistics

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Multiple R</td>
<td>0.6736</td>
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<tr>
<td>R Square</td>
<td>0.4538</td>
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<tr>
<td>Adjusted R Square</td>
<td>0.4264</td>
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<tr>
<td>Standard Error</td>
<td>19.7297</td>
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<td>Observations</td>
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### ANOVA

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<td>Regression</td>
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<td>38801.9295</td>
<td>6466.9882</td>
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<td>Residual</td>
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<td>46711.1861</td>
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<td>Total</td>
<td>126</td>
<td>85513.1156</td>
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### Coefficients

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<tr>
<th></th>
<th>Coefficients</th>
<th>Standard Error</th>
<th>t Stat</th>
<th>P-value</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
<th>Lower 95.0%</th>
<th>Upper 95.0%</th>
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<td>Intercept</td>
<td>4.0777</td>
<td>9.4969</td>
<td>0.4294</td>
<td>0.6684</td>
<td>-14.7256</td>
<td>22.8810</td>
<td>-14.7256</td>
<td>22.8810</td>
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<tr>
<td>EMR to Urban Agglomeration population ratio (2010)</td>
<td>-5.6686</td>
<td>5.2798</td>
<td>-1.0736</td>
<td>0.2851</td>
<td>-16.1222</td>
<td>4.7851</td>
<td>-16.1222</td>
<td>4.7851</td>
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<tr>
<td>Urban Agglomeration population growth rate (1950-2010)</td>
<td>-0.0564</td>
<td>1.1828</td>
<td>-0.0477</td>
<td>0.9620</td>
<td>-2.3982</td>
<td>2.2853</td>
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<tr>
<td>EMR Population (2010)</td>
<td>0.0000</td>
<td>0.0000</td>
<td>1.8603</td>
<td>0.0653</td>
<td>0.0000</td>
<td>0.0000</td>
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<tr>
<td>% of national population in EMR (2010)</td>
<td>-0.2346</td>
<td>0.2012</td>
<td>-1.1661</td>
<td>0.2459</td>
<td>-0.6330</td>
<td>0.1637</td>
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<td>Net density estimate (2011)</td>
<td>0.0005</td>
<td>0.0003</td>
<td>1.4310</td>
<td>0.1550</td>
<td>-0.0002</td>
<td>0.0011</td>
<td>-0.0002</td>
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<td>Wealth Performance (2000-2011)</td>
<td>0.5412</td>
<td>0.0599</td>
<td>9.0349</td>
<td>0.0000</td>
<td>0.4226</td>
<td>0.6597</td>
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THE (DE)COUPLING OF HP AND WP

2 types of EMRs:

1. HP and WP are similar: $0.5 < \frac{HP}{WP} < 2$
   - Health and wealth performance are **coupled**
     52 EMRs

2. HP and WP either go in **different directions** or are very different: $0.5 > \frac{HP}{WP} > 2$
   - Health and wealth performance are **decoupled**
     74 EMRs
THE (DE)COUPLING OF HP AND WP

2 types of EMRs:

1. HP and WP are similar: $0.5 < \text{HP/WP} < 1.5$
   - Health and wealth performance are coupled
   - 52 EMRs; 71% SA, 53% EA, 50% SEA

2. HP and WP either go in different directions or are very different: $0.5 > \text{HP/WP} > 1.5$
   - Health and wealth performance are decoupled
   - 74 EMRs; 89% WE, 75% EE, 73% MENA, 71% CSA, 67% SSA, 57% NA
THE (DE)COUPLING OF HP AND WP

Assumption: national level sets overall frame which conditions possibilities at lower levels

Comparing national data is valid for all EMRs

Initial results:
HP, WP: coupled (37.2, 44.7); decoupled (6.7, 28.6)

Private expenditure on health as % of total exp on health: 57% for coupled, 48% for decoupled

Gini Index: 39.3 for coupled, 42.2 for decoupled
THE (DE)COUPLING OF HP AND WP

Hypothesis: EMRs with high private expenditure in health have similar health and wealth performances if national inequality is low

- Little scope for public authorities to allocate resources equally among territory
- Private expenditure drives allocation of resources, depending on the financial resources in each place
- Concentration of high health outcomes where wealth outcomes are high
- Inequality affects access to health and blocks the EMR translation of wealth outcomes into health outcomes.