Depression and daily mobility in the Paris metropolitan area

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The 15th Emerging New Researchers in the Geography of Health and Impairment Conference
10-11 June 2010 - Paris - France
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Mental Health Geography

- Health geography literature studying mental health...
  - often accounts for neighbourhoods of residence
    Studies have revealed the effect of:
    - neighbourhood structural features (such as socioeconomic composition or built and services environment)
    - and neighbourhood social processes (such as disorders, social cohesion or perceived violence)
    on depression of inhabitants

- ... but rarely accounts for daily mobility
  Interesting to consider spatial extent of daily travels when studying spatial determinants of depression?
Link between daily mobility and depression?

- 2 opposite assumptions:
  A spatially-limited mobility may...
  - (1) ... reflect spatial and social confinement and then be associated with a *higher* risk to be depressed
  or conversely
  - (2) ... reflect a deep attachment to neighbourhood and then be associated with a *lower* risk to be depressed

- My alternative assumption
  - In *deprived* neighbourhoods, a spatially-limited mobility may be linked with a *higher* risk to be depressed because it reveals a constrained exposure to unpleasant neighbourhoods.
  - In *favoured* neighbourhoods, a spatially-limited mobility may be linked with a *lower* risk to be depressed because it reveals a deep attachment to pleasant neighbourhoods.
Objectives

Study the combined effect of daily mobility and neighbourhood socioeconomic composition on depression

- Check
  - if there is an association between neighbourhood socioeconomic composition and depression

- Determine
  - if there is an relationship between daily mobility and depression
  - if the relationship between daily mobility and depression varies in an opposite way according to neighbourhood socioeconomic composition
SIRS Survey
- SIRS: Acronym for Health, Inequalities and Social Ruptures
- carried out in 2005 & 2009
- among a representative sample of 3000 adults
- living in 50 neighbourhoods of the Paris metropolitan area
Measure of Daily Mobility (1)

- Concept of “Activity Space” → The space within which people move about or travel in the course of their daily activities

- In SIRS survey, people reported where they usually:
  a) go food shopping
  b) use services (bank, post office)
  c) go for a walk
  d) meet friends
  e) go for a restaurant or café

- mainly within neighbourhood (value 1)
- mainly outside neighbourhood (value 0)
- both within and outside (value 0.5)

!!! Neighbourhood was not delimited - individual’s own perception.
Create a score to measure the concentration of daily activities in perceived neighbourhood
- Adding values & dividing by the number of reported activities (=5)
- A score from 0 to 1
- Then, categorized in two classes
Others variables

- **Mental Health**
  Depression was evaluated by a 10-item questionnaire for measuring the occurrence of depressive symptoms during the last 2 weeks

- **Individual characteristics**
  - sex
  - age
  - nationality
  - level of education
  - occupational status
  - employment status
  - couple relationship

- **Neighbourhood socioeconomic composition**
  - From the 1999 census socio-professional data
  - Aggregated by census-block
Statistical Models

- Bivariate Analysis

- Multilevel logistic regression
  - Adjustment on individual socio-demographic characteristics to control for residual confounding
  - To study
    1) association between neighbourhood socioeconomic composition & depression.
    2) association between activity space & depression.
    3) cross-level interaction between activity space & neighbourhood socioeconomic composition.
Spatial determinants of depression

<table>
<thead>
<tr>
<th>Bivariate</th>
<th>Multivariate After adjustment on individual data</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of depressed people</td>
<td>$p$</td>
</tr>
<tr>
<td><strong>In the whole population (=3,023 adults)</strong></td>
<td>12 %</td>
</tr>
<tr>
<td><strong>According to neighb. socioeconomic composition</strong></td>
<td></td>
</tr>
<tr>
<td>Upper or middle class neighbourhood</td>
<td>10 %</td>
</tr>
<tr>
<td>Working-class neighbourhood</td>
<td>17 %</td>
</tr>
<tr>
<td><strong>According to activity space</strong></td>
<td></td>
</tr>
<tr>
<td>Larger than neighbourhood of residence</td>
<td>11 %</td>
</tr>
<tr>
<td>Limited to neighbourhood of residence</td>
<td>13 %</td>
</tr>
</tbody>
</table>

- Significant association between neighbourhood socioeconomic composition & depression
  - Living in deprived neighb. multiply by 1.6 the risk to be depressed

- No apparent association between activity space & depression (OR≈1)
## Interaction between activity space & neighbourhood

<table>
<thead>
<tr>
<th>Activity space</th>
<th>Whole population</th>
<th>Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larger than neighbourhood of residence</td>
<td>1 (Ref.)</td>
<td>1 (Ref.)</td>
</tr>
<tr>
<td>Limited to neighbourhood of residence</td>
<td>0.7 (0.4-0.9)*</td>
<td>1.6 (1.1-2.5)*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DEPRESSION After adjustment on individual data</th>
<th>People living in ....</th>
<th>Whole population</th>
<th>Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>limited activity space</em></td>
<td>... upper or middle class neighbourhood</td>
<td>... working-class neighbourhood</td>
<td>Activity space x Neighbourhood socioeconomic composition</td>
</tr>
</tbody>
</table>

Results (2)

Significant cross-level interaction
i.e. people with a **limited activity space** had:
- a significant *lower* risk to be depressed when they lived in upper or middle class neighbourhoods (OR<1)
- a significant *higher* risk to be depressed when they lived in working class neighbourhoods (OR>1)
The combined effect of activity space & neighbourhood on depression

A limited activity space appeared to be:

- a *protective* factor towards depression for people living in favoured neighbourhoods
  
*Because spatial confinement within favoured neighbourhoods may result from well-being in these neighbourhoods → a *choice*?*

- a *damageable* factor toward depression for people living in deprived neighbourhoods
  
*Because spatial confinement within deprived neighbourhoods may be due to the symbolic, material and physical difficulties to move outside such neighbourhoods → a *constraint*?*
A study based on transversal data (2005)

- Analyses can not be discussed in term of causality.
  It remains unknown if:
  - activity space has an influence on depression
  - or depression has an influence on activity space

- Reverse causation may occur if depressed people were particularly inclined to stay in deprived neighbourhood
  → exposure to neighbourhood characteristic would be a consequence and not a cause of depression

- Next step : Longitudinal analysis from data collected in 2005 and 2009 among the same population
About measure of activity space

- A simplified measure of activity space
  - easy to collect in large sample
  - but linked with perceived neighbourhood delimitation
  → Impossible to isolate the real spatial extent of daily mobility from the perceived neighbourhood delimitation

- Unfortunately, in 2005, no information about perceived neighbourhood delimitation:
  → The main limitation of this measure of activity space in 2005

- In 2009 survey, there is information about perceived neighbourhood delimitation. The next step will be to:
  - analyse perceived neighbourhood delimitation for every surveyed inhabitant
  - & compare with activity space
To conclude...

Take into consideration activity space may help:

- to better understand mechanisms relying neighbourhood of residence and mental health
- to consider how individual's experience of place and degree of mobility may influence well-being
- to improve knowledge about geographic factors involved in mental health
Thanks for your attention!

Additional Information


- Research Team on the Social Determinants of Health and Healthcare, U707 (University Paris 6 - Inserm) - http://www.b3e.jussieu.fr/ds3/