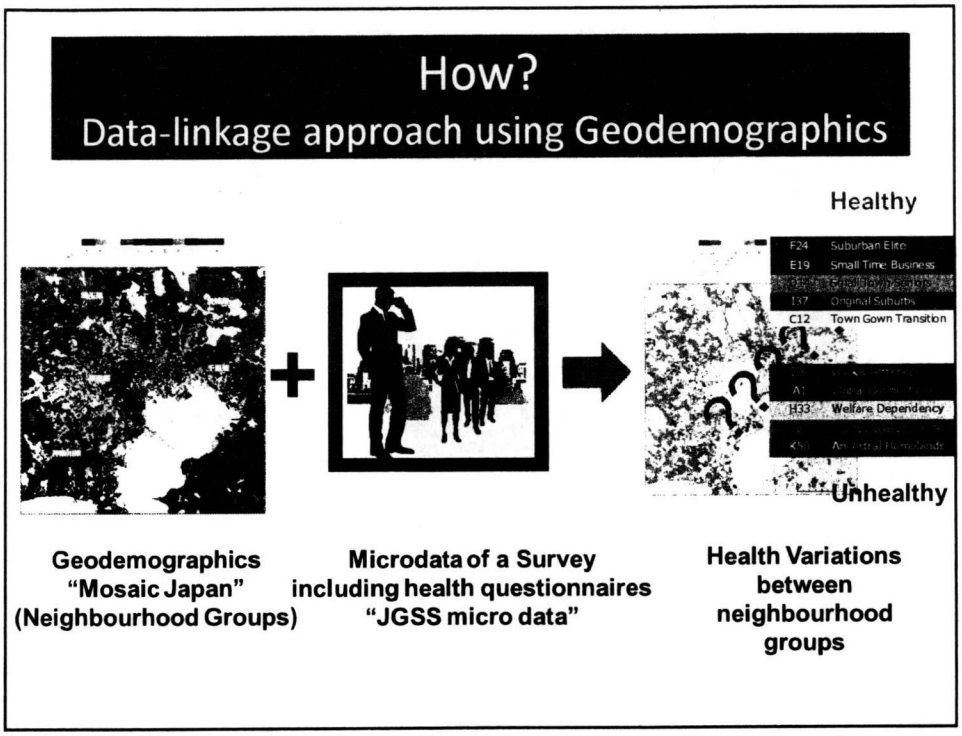
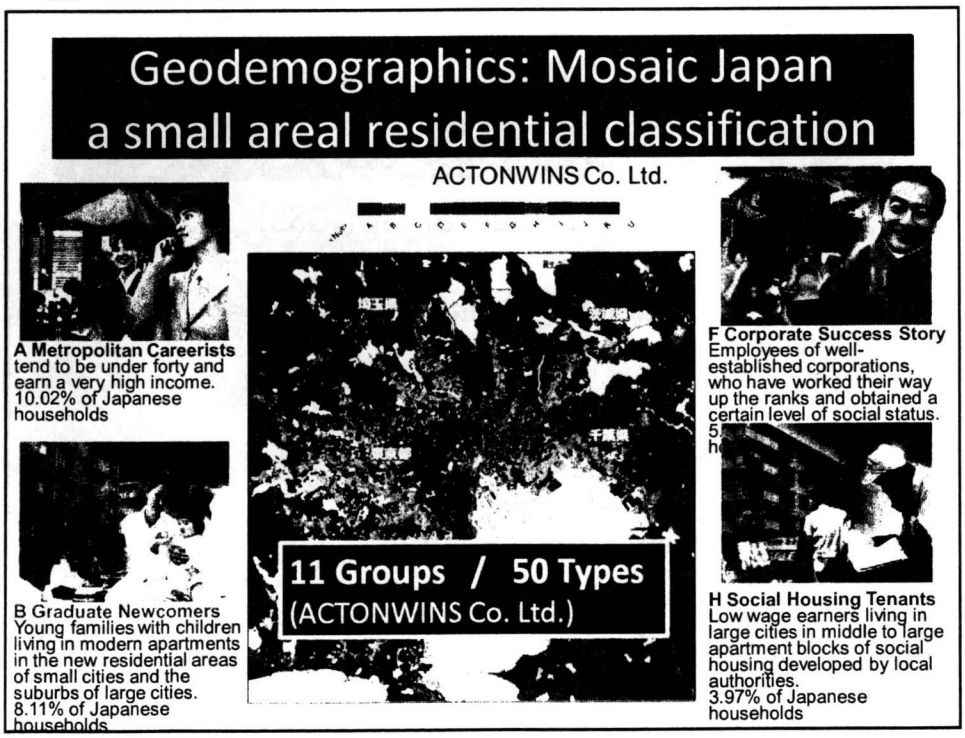
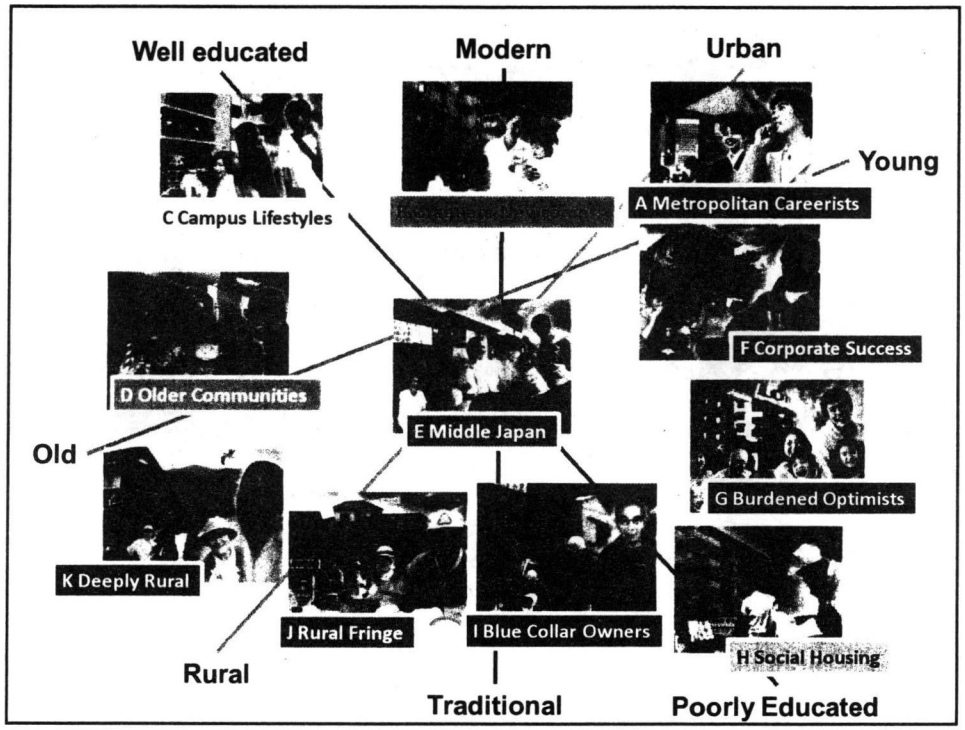

How?
Data-linkage approach using Geodemographics
Healthy
F24 Suburban Elite
E19 Small Time Business
I37 Original Suburbs
C12 Town Gown Transition
H33 Welfare Dependency
Unhealthy
Geodemographics "Mosaic Japan" (Neighbourhood Groups)
Microdata of a Survey including health questionnaires "JGSS micro data"
Health Variations between neighbourhood groups


Geodemographics: Mosaic Japan
a small areal residential classification
ACTONWINS Co. Ltd.
A Metropolitan Careerists
tend to be under forty and earn a very high income.
10.02% of Japanese households
B Graduate Newcomers
Young families with children living in modern apartments in the new residential areas of small cities and the suburbs of large cities.
8.11% of Japanese households
11 Groups / 50 Types
(ACTONWINS Co. Ltd.)
F Corporate Success Story
Employees of well-established corporations, who have worked their way up the ranks and obtained a certain level of social status.
H Social Housing Tenants
Low wage earners living in large cities in middle to large apartment blocks of social housing developed by local authorities.
3.97% of Japanese households



JGSS Micro-dataset

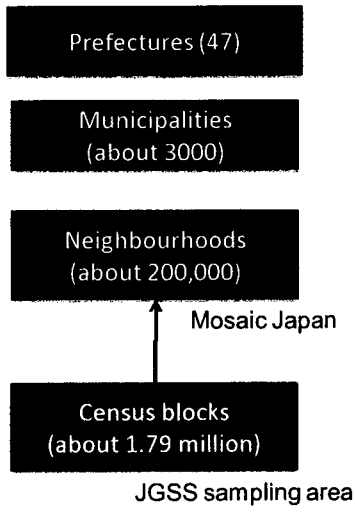
- Japanese General Social Survey (JGSS)
  - Area : Nationwide
  - Population : men and women 20-89 years of age living in Japan
- JGSS Cumulative Data 2000-2003
  - #sample: 12,299
  - #sampling areas: 1,430
  - #samples for each sampling area: about 15
  - Response rate: about 60% (48.0-64.9%)

Address-matching

Address
"21 xx town, Kamigyo-ku,Kyoto-City"

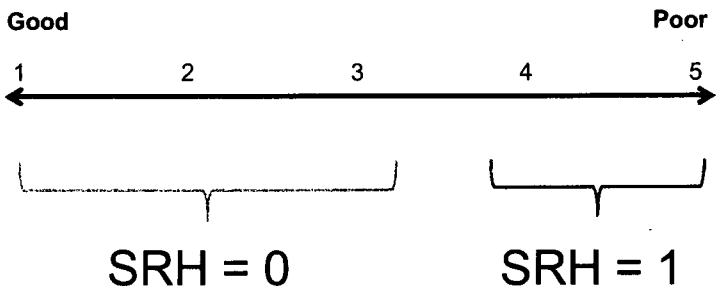
→"Mosaic Group: F"

- Assigning a Mosaic group to each sampling areal unit of JGSS
- "Cleansing Cube"(Actonwins Ltd.)
- Rate of successful matching: about 90%



Outcome: Self-rated Health Measure

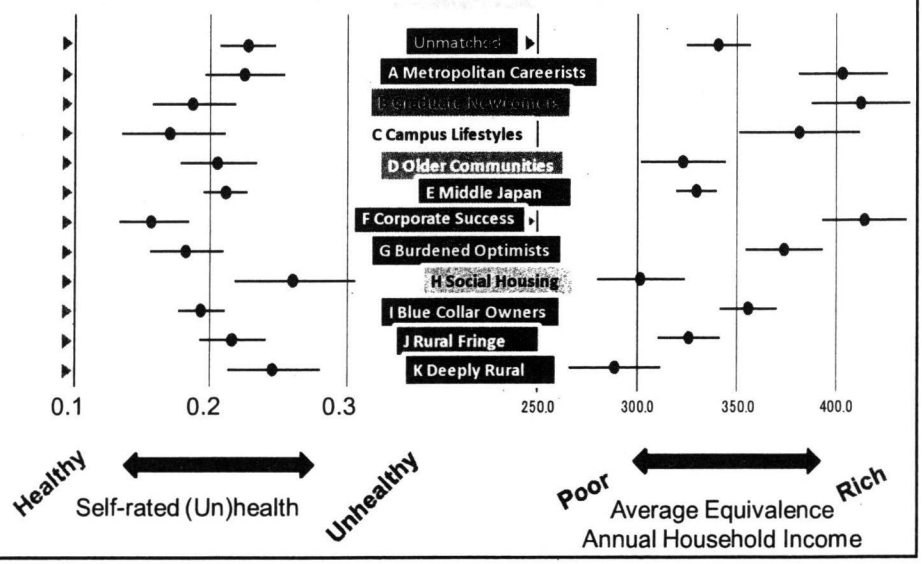
Q How would you rate your health condition?



Small Areal Variations in Self-rated Health among Neighbourhood Categories

Geodemographics and health determinants

Healthy=Rich?
Simple Cross-tabulation by Mosaic Groups

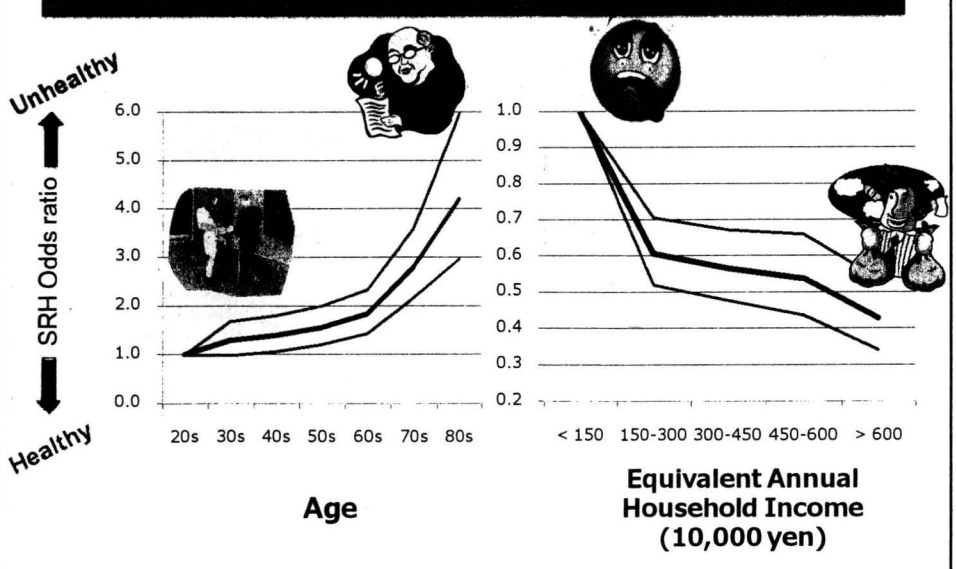


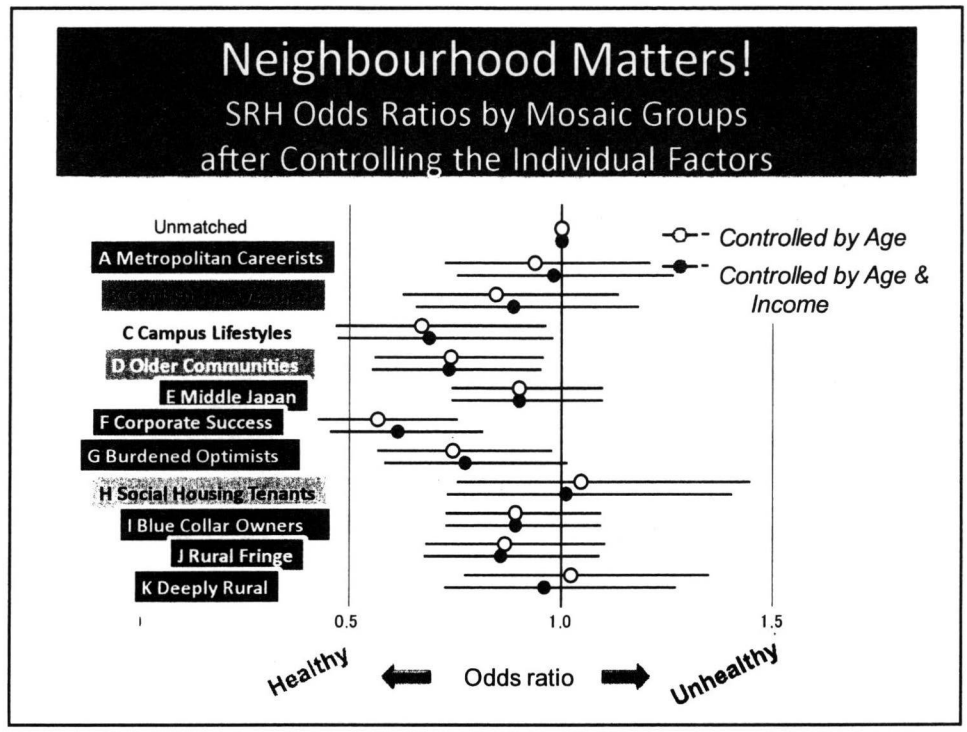
A simple logistic regression

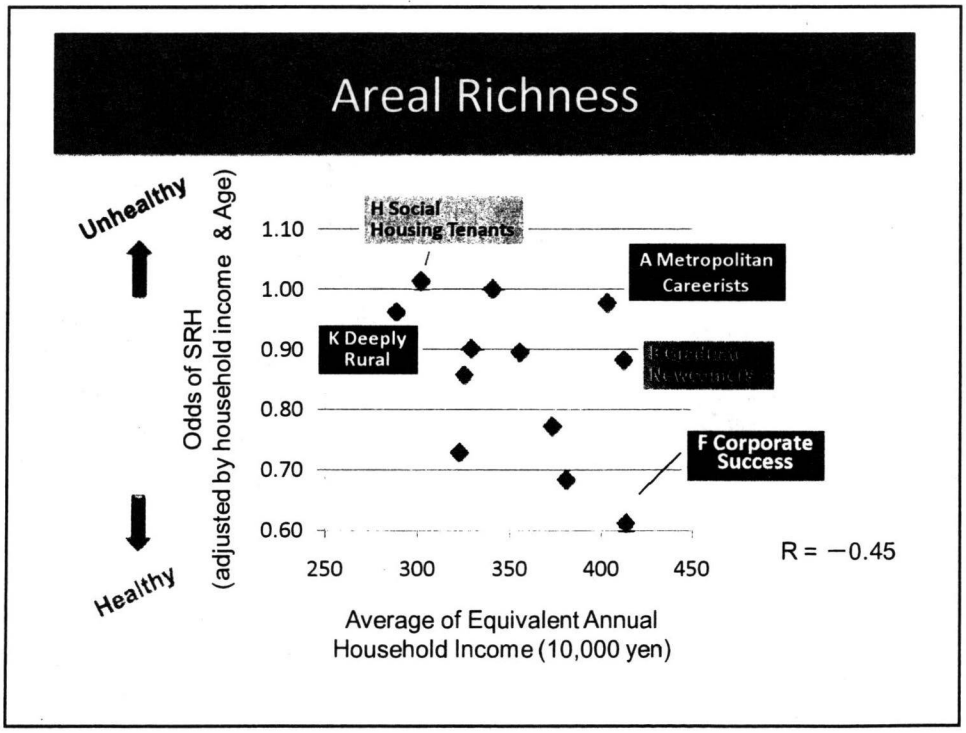
Logit (P(SRH = 1)) = age + income + mosaic

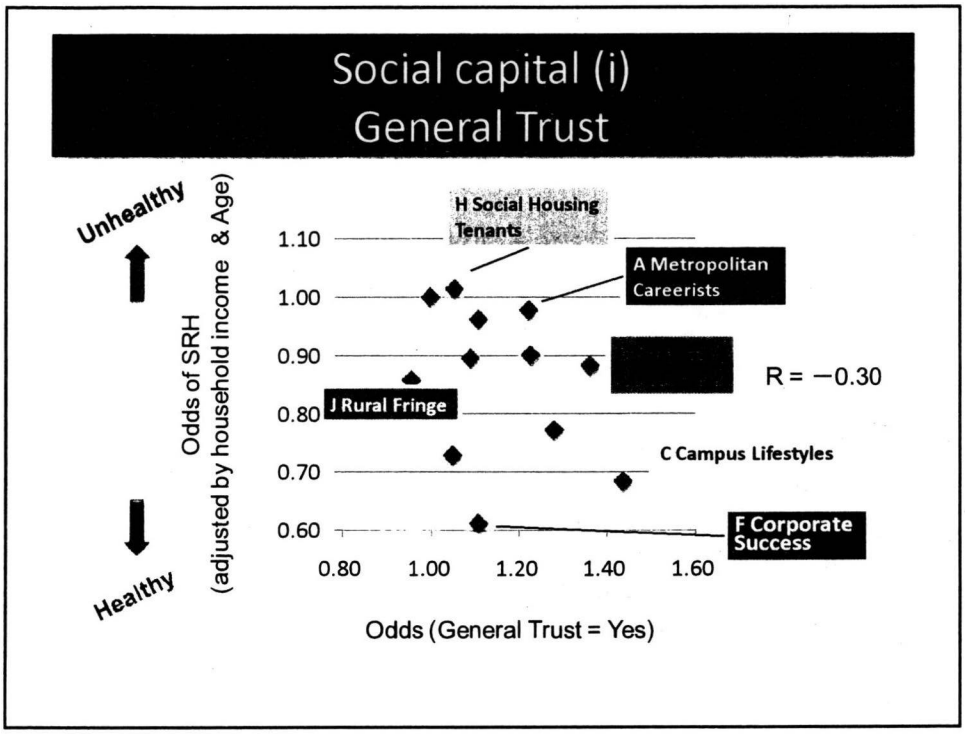
- Explanatory Variables
  - Age group
  - Equivalence Annual Household Income
  - Mosaic Neighbourhood Classification (11 Groups)
- N=8220

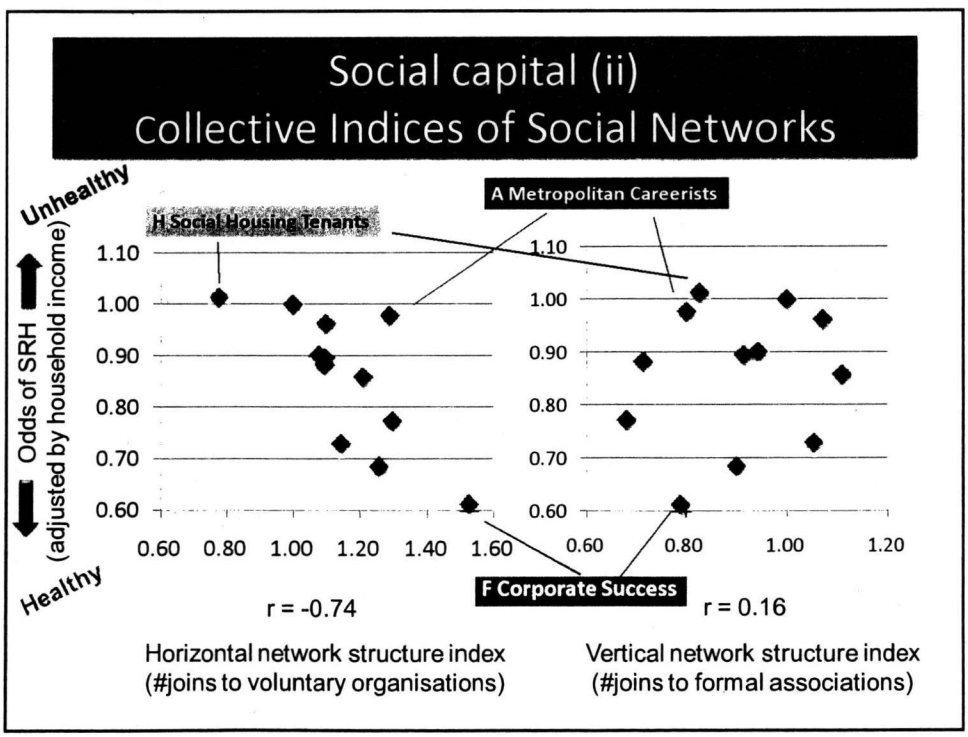
Common Individualistic Factors




Neighbourhood Matters!
SRH Odds Ratios by Mosaic Groups
after Controlling the Individual Factors
Unmatched
A Metropolitan Careerists
C Campus Lifestyles
D Older Communities
E Middle Japan
F Corporate Success
G Burdened Optimists
H Social Housing Tenants
I Blue Collar Owners
J Rural Fringe
K Deeply Rural
Controlled by Age
Controlled by Age & Income
0.5
1.0
1.5
Healthy
Odds ratio
Unhealthy


Areal Richness
Unhealthy
Healthy
Odds of SRH
(adjusted by household income & Age)
1.10
1.00
0.90
0.80
0.70
0.60
H Social Housing Tenants
A Metropolitan Careerists
K Deeply Rural
F Corporate Success
250
300
350
400
450
R = −0.45
Average of Equivalent Annual
Household Income (10,000 yen)


Social capital (i)
General Trust
Unhealthy
Odds of SRH
(adjusted by household income & Age)
Healthy
H Social Housing Tenants
A Metropolitan Careerists
J Rural Fringe
C Campus Lifestyles
F Corporate Success
R = −0.30
1.10
1.00
0.90
0.80
0.70
0.60
0.80
1.00
1.20
1.40
1.60
Odds (General Trust = Yes)

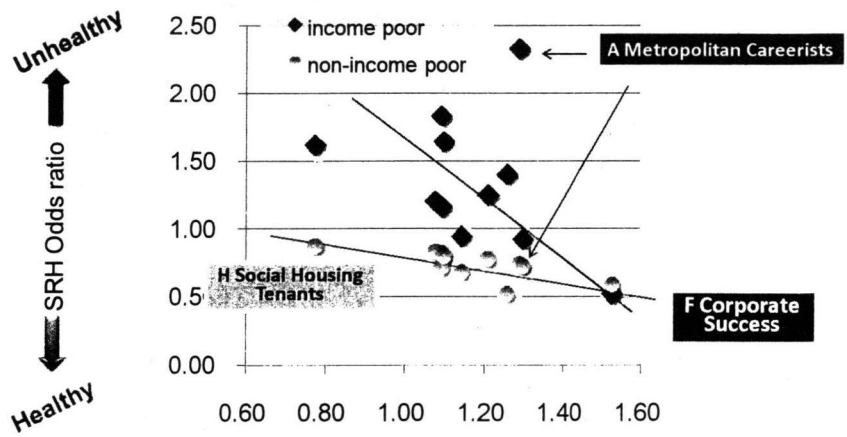

Social capital (ii)
Collective Indices of Social Networks
Unhealthy
Odds of SRH
(adjusted by household income)
Healthy
H Social Housing Tenants
A Metropolitan Careerists
F Corporate Success
1.10
1.00
0.90
0.80
0.70
0.60
0.60
0.80
1.00
1.20
1.40
1.60
r = -0.74
r = 0.16
Horizontal network structure index
(#joins to voluntary organisations)
Vertical network structure index
(#joins to formal associations)

A modified but still simple model

Logit(P(SRH = 1)) = age + horizontal_join
+ **income_poor x mosaic**

- Explanatory Variables
  - Age group
  - Horizontal_join: 1 (if the respondent joins to any horizontal organisation), or 0 (otherwise)
  - Income poor: 1 (if equivalent annual household income is lower than 1.5 million JPY) or 0 (equal to or larger than 1.5 million JPY)
  - Mosaic Neighbourhood Classification (11 Groups)

Collective horizontal relationships reduce health gaps between the poor and the rich?



(Individual age and Joining to horizontal organisations are controlled)

地区類型と健康まとめ

- 近隣空間スケールでの社会地区類型と健康
  - 社会地区類型間で、有意な主観的健康感の格差
  - 個人の所得水準と独立した近隣空間特性の健康感への影響
    - 地域平均所得水準や水平組織参加の度合い(ソーシャル・キャピタル指標の1つ)
  - 貧困世帯(低所得世帯)の構成員が、低い主観的健康感を感じる程度の地理的文脈性
    - 健康の社会的分化が生じる空間(中心と周辺)
- 留意点と課題
  - 地域剥奪指標研究と操作上の統一はなされていない
  - 合意形成アプローチの場合はどうか？
  - 社会地区類型の妥当性(独自の地区類型の利用)

Conclusions

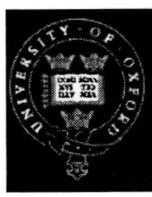
整理

- 地理的剥奪指標 deprivation index と市区町村別SMR
  - 「貧困な地域は不健康な地域なのか？」
    - 大都市圏ではYes → （非）都市型貧困／剥奪の検討が課題
    - 『健康の地理＝社会的傾度は大都市圏で大』
  - 国勢調査の地域指標による合成の妥当性
    - ミクロデータでの関連性と一定の整合性を担保する重み付け
    - 貧困・剥奪の定義、考慮する領域、分析操作上の課題は多く残る
- 近隣の社会地区類型 geodemographics と主観的健康感
  - 「貧困な人はどのような地域で不健康になるのか？」
    - 地域の所得水準、ソーシャルキャピタルの水準と対応した健康水準の地域格差が認められる。一方で
    - 貧困世帯のサンプルと低い健康感は、大都市圏中心部の地区類型で著しく高くなる文脈性 → ライフコース上での健康の分化（エスカレーターに乗る人と乗りそこなう人）が生じる空間
  - 地理的剥奪との関連性は検討課題

Acknowledgement

The Japanese General Social Surveys (JGSS) are designed and carried out at the Institute of Regional Studies at Osaka University of Commerce in collaboration with the Institute of Social Science at the University of Tokyo under the direction of Ichiro TANIOKA, Michio NITTA, Hiroki SATO and Noriko IWAI with Project Manager, Minae OSAWA. The project is financially assisted by Gakujutsu Frontier Grant from the Japanese Ministry of Education, Culture, Sports, Science and Technology for 1999-2003 academic years, and the datasets are compiled and distributed by SSJ Data Archive, Information Center for Social Science Research on Japan, Institute of Social Science, the University of Tokyo.

Special thanks to Dr. Tomoya Hanibuchi, Profs. Danny Dorling and David Gordon for their special helps



Department of Social Policy and Social Work
University of Oxford

Measuring deprivation at the local level using administrative data

Examples from the UK

George Smith

February 2010

Outline

- Objectives
- A Little History
- Designing an Index of Multiple Deprivation
- Constructing an Index of Multiple Deprivation
- Geographies
- Outcomes
  - Mapping deprivation
  - Validity
  - How it is used

Objectives

- To design and construct a measure of multiple deprivation at the local level

"A relative measure of multiple deprivation expressed at small area level and covering an entire country"

- *This must*
  - Measure major forms of deprivation
  - Be consistent from one area to another across the country
  - Be updateable on a regular basis
- Primary purpose: target anti-poverty initiatives or allocating resources for poverty alleviation/re-generation

A Little History

- Policies to target small deprived areas for additional resources
  - Began in the 1960s, influenced by the US Kennedy/Johnson 'War on Poverty' (1965)
  - Policies *came before* any accepted measures to identify such areas in a consistent way
  - In 1967 the Plowden Commission on Primary Education called for the creation of 'Educational Priority Areas'
- Early attempts to develop such measures had to use national 10 year census as the *only* source for such data

Historical developments in the UK

- From 1970s some use of 1971 census
- 1983 Department of the Environment: multidimensional index identifying groups 'at risk' of deprivation across England (8 indicators, of which 7 from 1981 Census).
- 1991 Index of Local Conditions, DoE: retained multidimensional approach but moved away from 'at risk' groups to include more direct measures (7 small-area indicators from Census, 6 non-Census at higher levels).
- 1998 Index of Local Deprivation, DETR: update of 1991 index (no new indicators but some removed).
- Late 1990s possibility of administrative data as alternative source.

Using Administrative Data for Social Research

- Administrative data: data primarily collected for administrative purposes, converted to use as a research tool
- Such data traditionally released in an aggregated format but increasingly available in individual format
- Increasingly linkable laterally (across different datasets) and over time (but still a very long way short of what is possible in Denmark and Sweden).
- Key strengths are the potentially universal coverage of many of these datasets, and their regular updating; also they may be the only way to study some social phenomena
- Nordic countries such as Sweden, Denmark have used administrative (register) data since the 1970s for primary statistics.

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Recent Indices of Deprivation

- Index of Local Conditions, 1991
- Index of Local Deprivation, 1998
- Indices of Deprivation, 2000 (ID2000)
- Welsh Index of Multiple Deprivation, 2000
- Northern Ireland Measures of Multiple Deprivation, 2001 and 2005
- Index of Deprivation for Scotland, 2002/3
- English Indices of Deprivation, 2004 and 2007
- Update in progress for England 2010

Designing the Index of Multiple Deprivation

The Model of Multiple Deprivation

- Deprivation is (like social exclusion) multi-dimensional.
- Multiple Deprivation can be most easily understood as a combination of individual dimensions or 'domains' of deprivation.
- The individual dimensions or domains must be identified and carefully defined.
- Indicators are selected for each domain which are the best possible **direct** measures of that dimension of deprivation.
- The indicators are combined to create an overall relative measure of that dimension of deprivation.
- Single dimensions of deprivation should not cancel each other out when combined. Statistical techniques to give control over cancellation are vital.

Model of multiple deprivation at small area level

1. Domains or Dimensions must be measured as accurately as possible with indicators that pass certain tests of fitness.
2. Problems of unacceptable standard error must be dealt with.
3. Indicators must be combined to form domains in such a way as to best measure the construct in question.
4. Domain scores must be capable of being ranked to generate a relative picture of that form of deprivation.
5. Domain ranks must be standardised and transformed in a way that allows their weighted combination into an overall index.
6. Appropriate domain weights should be selected.

Criteria for Indicators

- **'Domain specific' and appropriate for the purpose (as direct as possible measures of that form of deprivation);**
- **measure major features of that deprivation (not conditions just experienced by a very small number of people or areas);**
- **up-to-date;**
- **capable of being updated on a regular basis;**
- **statistically robust;**
- **available for the whole of England at a small area level in a consistent form.**

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Domains in the ID 2007 for England

- Income Deprivation
- Employment Deprivation
- Health Deprivation and Disability
- Education, Training and Skills Deprivation
  - Children and young people sub-domain
  - Adult skills sub-domain
- Barriers to Housing and Services
  - Geographical barriers sub-domain
  - Wider barriers sub-domain
- The Living Environment
  - Indoors environment sub-domain
  - Outdoors environment sub-domain
- Crime

Index of Multiple Deprivation 2007

Employment Deprivation Domain of ID 2007

Dimension of deprivation:

"Involuntary exclusion from the labour market"

- Recipients of Jobseekers Allowance
- Recipients of Incapacity Benefit
- Recipients of Severe Disablement Allowance
- Participants in the New Deal for the 18-24s who are not in receipt of JSA
- Participants in the New Deal for 25+ who are not in receipt of JSA
- Participants in the New Deal for Lone Parents (after initial interview)
- All numerators relate to people of working age (18-59/64) in 2005.
- Each indicator expressed as a rate, using denominator of working age 18-59/64 population in mid 2005.

Education Deprivation: Children and Young Persons

- Average points score of pupils at age 11 (end of primary) (2002, Source: Pupil Level Annual School Census (PLASC) and the National Pupil Database (NPD) from the DfES)
- Average points score of pupils at age 13/14 (2002, Source: Pupil Level Annual School Census (PLASC) and the National Pupil Database (NPD) from the DfES)
- Average points score of pupils at age 16+ (GCSE/GNVQ – best of eight results) (2002, Source: Pupil Level Annual School Census (PLASC) and the National Pupil Database (NPD) from the DfES)
- Proportion of young people *not* staying on in school or non-advanced further education above 16 (Child Benefit *2001*, Source: DWP)
- Secondary school absence rate (Average of 2001 and 2002, Source: DfES school level survey of authorised and unauthorised absences, allocated to the local area via the PLASC data, DfES)
- Proportion of those aged under 21 not entering Higher Education (1999 -2002, Source: UCAS)

Geographies

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Spatial Scale

- Sub local authority level in UK (and equivalent elsewhere).
- Ideally approximate to 'neighbourhoods'.
- Small areas with similar characteristics and standardised population size.
- Preferably a standard statistical geography for which robust population estimates are readily available.
- Allow identification of 'pockets' of deprivation that might otherwise be missed if looking at higher level aggregates.

2001 Census Geography: England

England
9 Regions
354 Local Authority Districts
7,932 Wards*
32,482 Lower Layer Super Output Areas (LSOAs)
165,665 Output Areas (OAs)

* 2001 Census 'Standard Table' Wards

Small numbers problem

- 'Shrinkage Estimation' (empirical Bayesian estimation):
  - In some small areas, indicators may be 'unreliable', particularly where populations at risk are small.
  - Level of 'unreliability' measured by calculating standard error.
  - Shrinkage adjusts small area indicator scores by 'borrowing strength' from a more robust score.
  - District level average score used as 'more robust' figure.
  - All small area scores move, but only those with a large standard error move substantially.

Constructing the Index of Multiple Deprivation

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Constructing the Index

1. **Combine indicators to form domain scores at SOA level**
2. **Combine domain scores to form overall IMD at SOA level**
3. **Present SOA level information at other levels of spatial aggregation e.g. Local Authorities, Counties, Parliamentary Constituencies.**
4. **Importance of 'measures' as opposed to single index**

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