

Moses: Modelling and Simulation for e-Social Science

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Background & Objectives

- To develop a complete **representation** of the UK population at a very fine spatial scale
- To produce rich, detailed and robust **forecasts** of the future population of the UK
- To investigate **scenarios** which relate demographics to service provision
 - with particular emphasis on policy applications - health, transport, housing

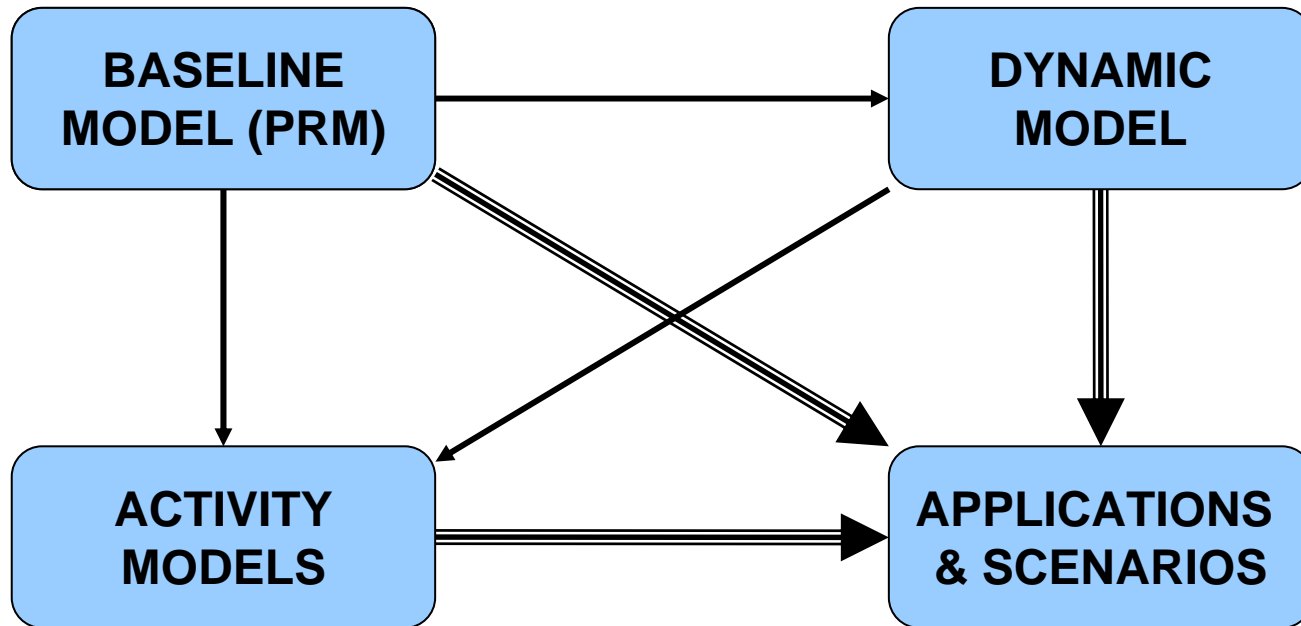
Background and Objectives

- How do we use massive data resources and computational power of e-Science to address important intellectual and applied problems?
 - Problem of planning service delivery in cities and regions
 - Transport, housing, hospitals...
- Social simulation as a 'Grand Challenge'

Methodology

- Population Reconstruction Model
- Dynamic Model
- Activity Modelling
- Application Scenarios

Moses: Project Components

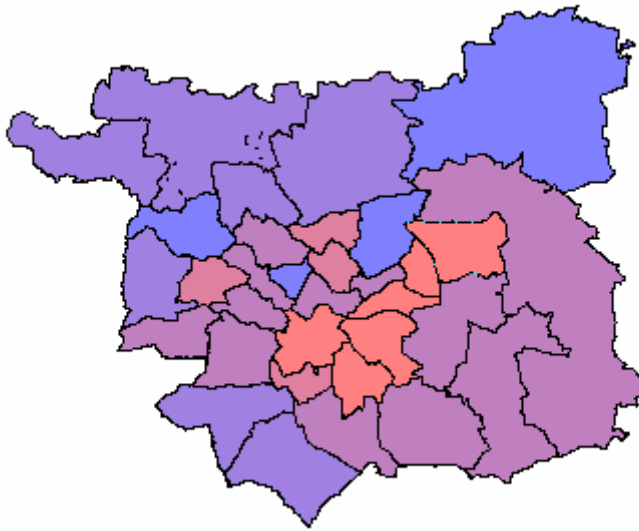


Progress to Date

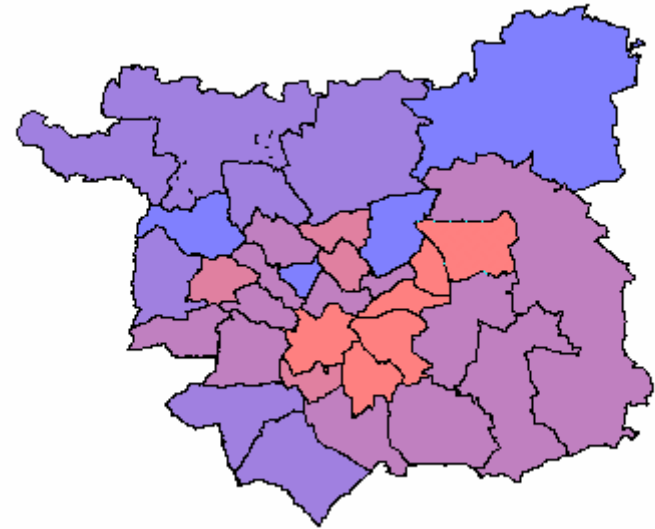
- Prototype baseline and dynamic model
- Demonstration Moses portal
- Health application scenarios

Health Status (Optimised)

Actual



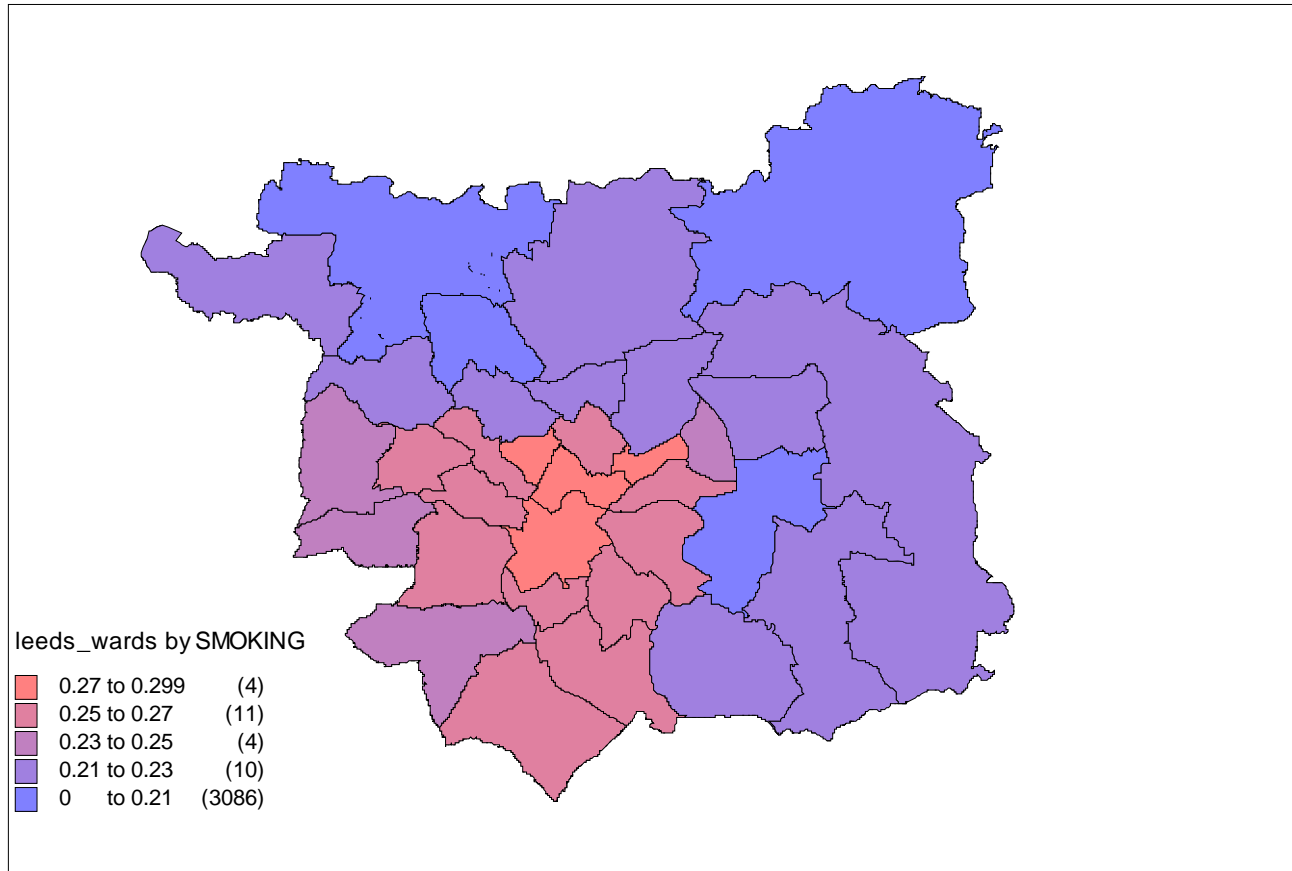
Model



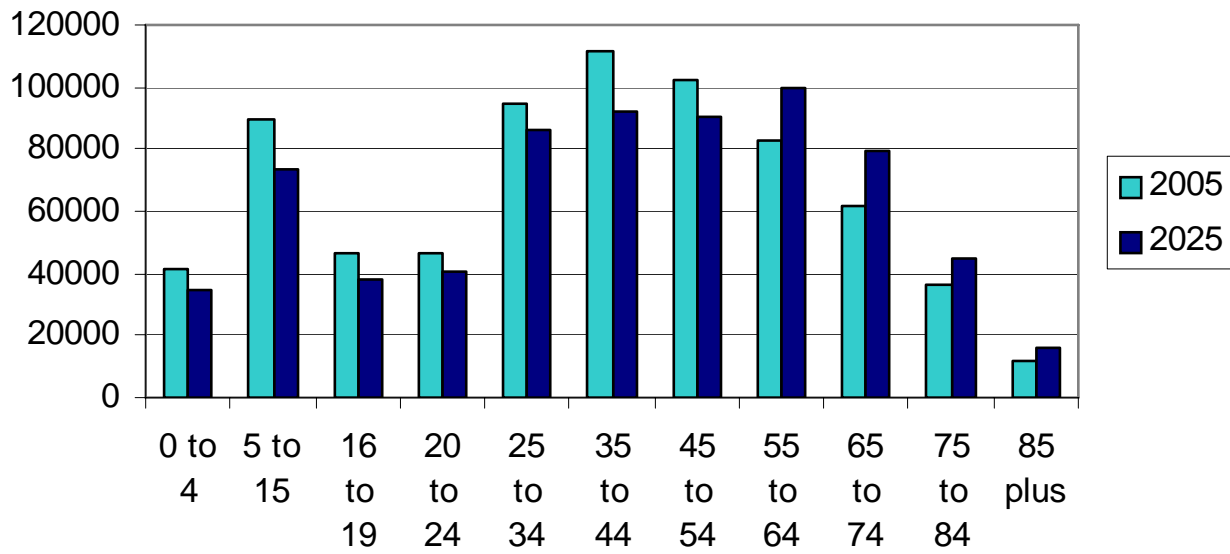
leeds_wards by health

0.5 to 0.6	(6)
0.45 to 0.5	(4)
0.4 to 0.45	(12)
0.35 to 0.4	(7)
0 to 0.35	(3086)

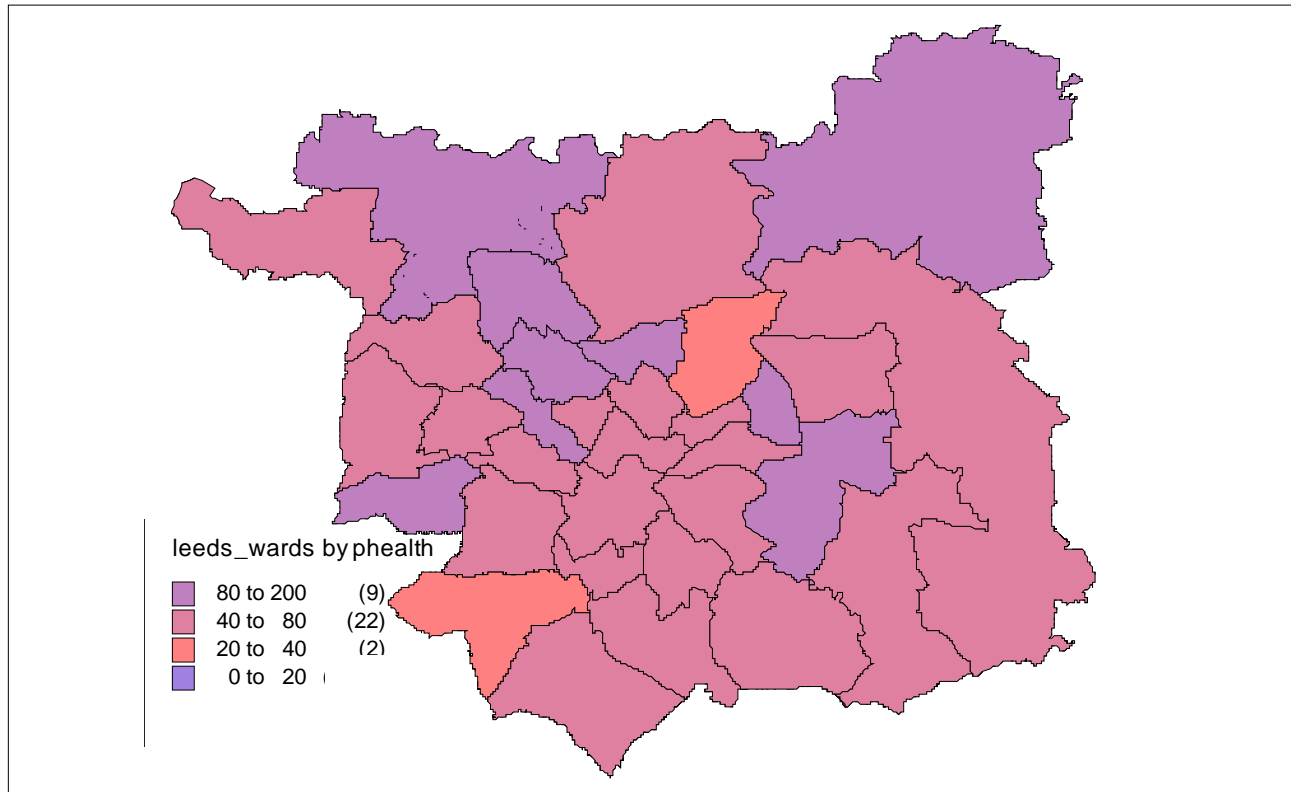
Smoking



Dynamic Model: Leeds



Diabetes 2030



Data Sources

- Census Small Area Statistics
- Sample of Anonymised Records
- British Household Panel Survey
- General Household Survey
- Hospital Episode Statistics
- Local house prices
- Journey-to-work & migration patterns

Modelling and Simulation of e-Social Science

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Welcome, Mark Birkin

- Welcome**
- MOSES Selection Portlet
- MOSES Analysis Portlet
- MOSES Charting Portlet
- MOSES Mapping Portlet
- MOSES Scenario Portlet

Settings Layout

Profile Manager

profile settings

Last Login Time: **23 November 2006 13:12:24 o'clock GMT**

Username: mark Email: Locale: English

Full Name: Timezone:

Organization:

Roles: USER

Save

Update password

Enter original password:
 Password:
 Confirm password:

Save

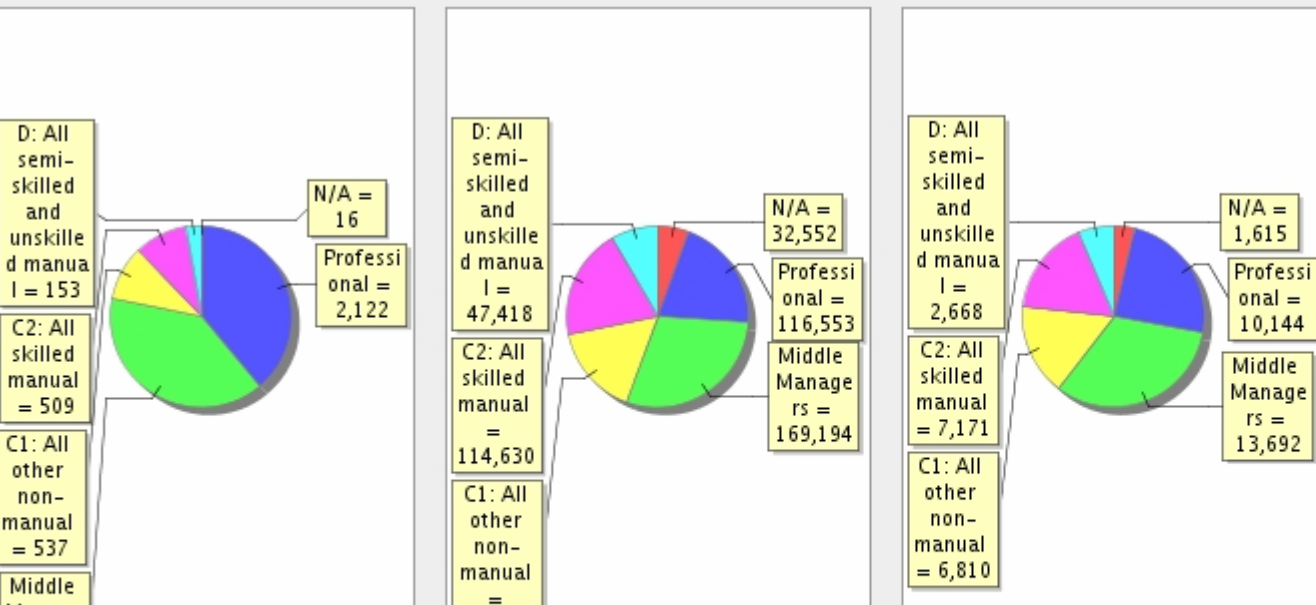
Configure group membership

Groups:	Group Description:
<input checked="" type="checkbox"/> moses demonstrator	The MOSES demonstrator group

Save

Social Grade	N/A	No care	1-19 hours	20-49 hours	50+ hours
A	16.0	32552.0	1615.0	671.0	2388.0
Professional	2122.0	116553.0	10144.0	1005.0	1401.0
Middle Managers	2155.0	169194.0	13692.0	1658.0	2429.0
C1: All other non-manual	537.0	92425.0	6810.0	1186.0	1834.0
C2: All skilled manual	509.0	114630.0	7171.0	1806.0	2702.0
D: All semi-skilled and unskilled manual	153.0	47418.0	2668.0	860.0	2281.0

MOSES Provision of care vs Social grade for the year 2001



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[http://geo-s12.leeds.ac.uk:8080/gridsphere/gridsphere?cid=mosesScenarioDemonstrator&gs_action=](#) [Go](#)

Proportions of people with diabetes:

The following is a breakdown of the health scenario results, based on the selected wards:

Total aggregation for all selected areas:

Age	2001	2015	2025
0-15	0.24	0.23	0.2
Total affected	327.0	267.0	221.0
Total population	135660.0	117491.0	112344.0
16-44	1.51	1.5	1.47
Total affected	4211.0	3624.0	3429.0
Total population	278593.0	241560.0	232915.0
45-64	4.1	3.53	3.4
Total affected	5710.0	6036.0	5968.0
Total population	139270.0	171178.0	175710.0
65+	10.35	10.36	9.62
Total affected	9013.0	11949.0	12817.0
Total population	87062.0	115305.0	133292.0
All ages	3.01	3.39	3.43
Total affected	19261.0	21876.0	22435.0
Total population	640585.0	645534.0	654261.0

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MOSES Mapping Demonstrator

The MOSES mapping demonstrator

Welcome to the MOSES mapping demonstrator.

This portlet generates shaded maps based on various analyses performed by the MOSES Analysis portlet. If you haven't run an analysis yet, then please do so. Else, choose an analysis from the drop-down menu below.

Ward	Car Ownership per household
Barwick and Kippax	1.06
Pudsey North	1.14
Kirkstall	1.03
Weetwood	1.0
Horsforth	1.11
Cookridge	0.97
Middleton	1.0
Rothwell	1.07
Hunslet	0.88
City and Holbeck	0.89
University	0.87
Morley North	1.0
Richmond Hill	0.9
Burmantofts	0.94
Halton	1.02
Roundhay	1.14
Whinmoor	0.92
Moortown	1.09
North	1.08

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Unknown Zone (Mixed)

Applications

- Example: Changing pattern of hospital admissions and social care, 2007-2025
 - Service reorganisation
 - Ageing, changing lifestyles and morbidity
 - New delivery mechanisms
- Difficulty:
 - Restricted access to patient data

Future Plans

- Extend the modelling to a full national basis
- Develop fully dynamic methods for demographic forecasting and projection
- Build demonstrator applications for a variety of scenarios
- Provide a portal which provides a powerful, flexible and friendly environment in which users can explore a variety of policy-relevant scenarios