

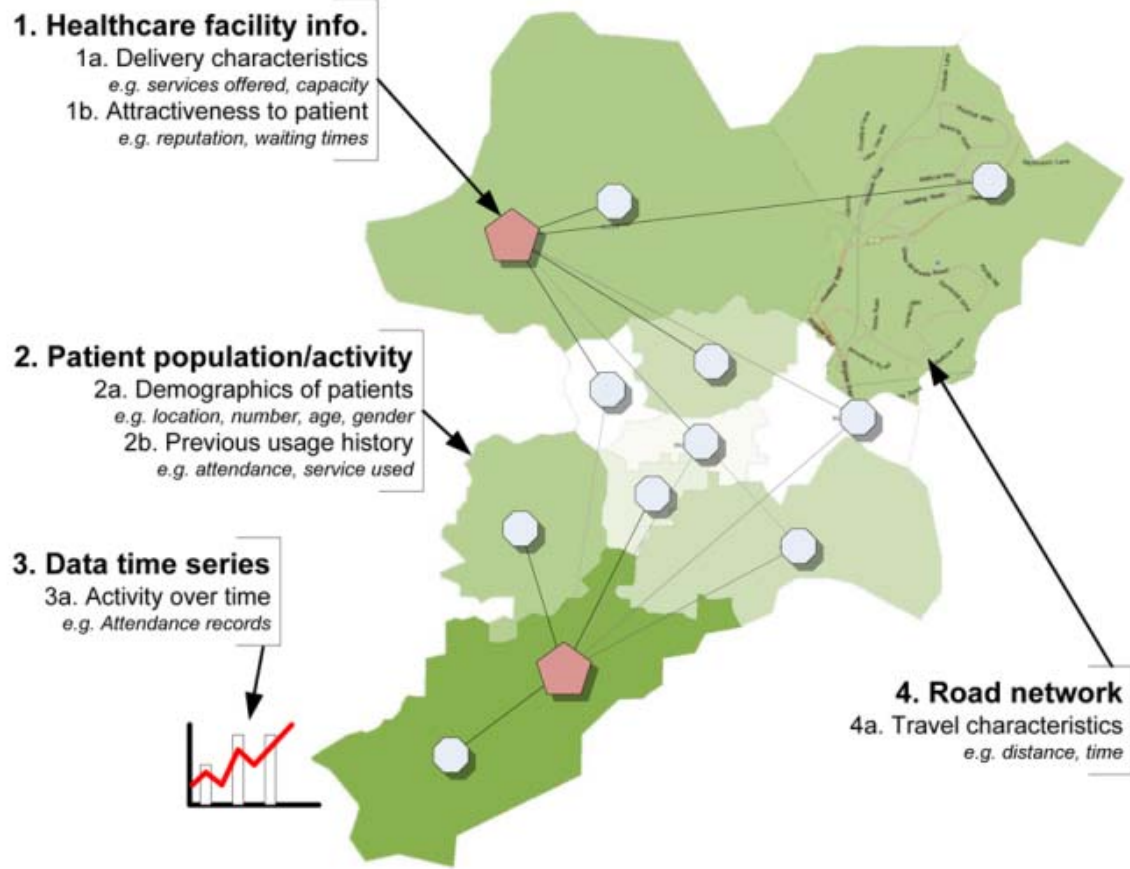
# The use of geographic modelling in healthcare planning

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# Geographic modelling

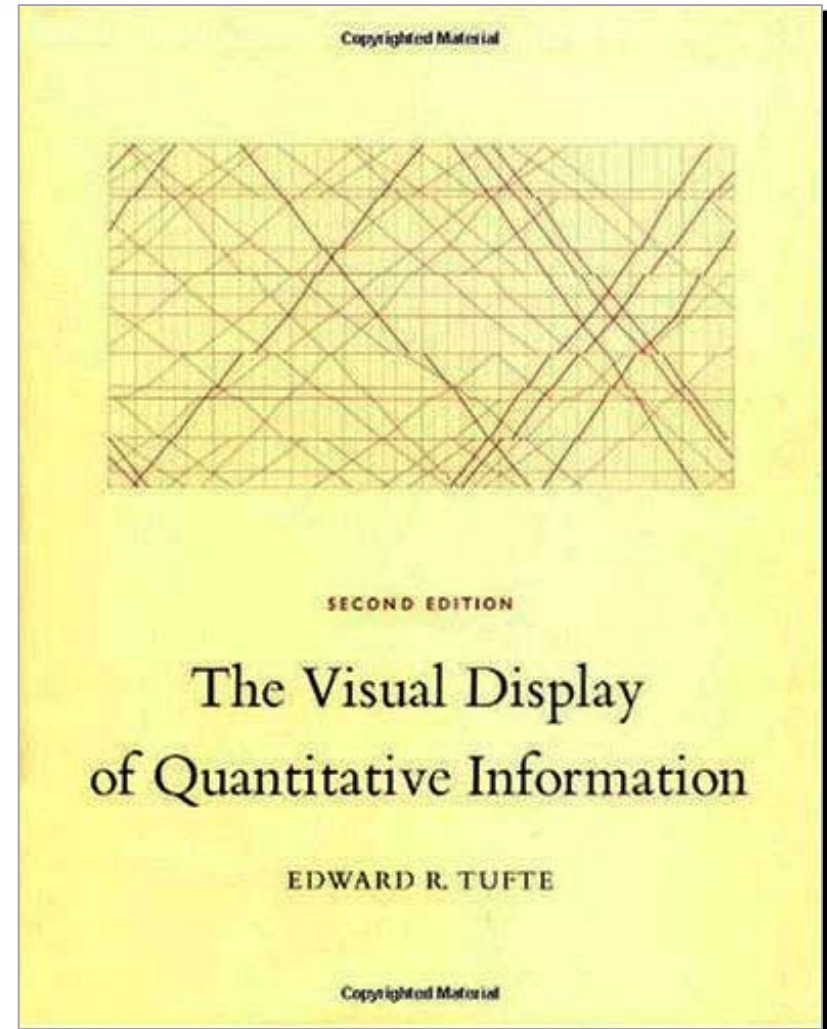


# Uses of geographic modelling

- **Planning healthcare delivery**
  - Location planning by... patient access, disease groups, demographics etc.
- **Logistics**
  - Ambulance: response times etc
  - Efficient visits: “Travelling salesman”
- **Disease modelling**
  - Disease spread/mapping clusters

# Geographic data

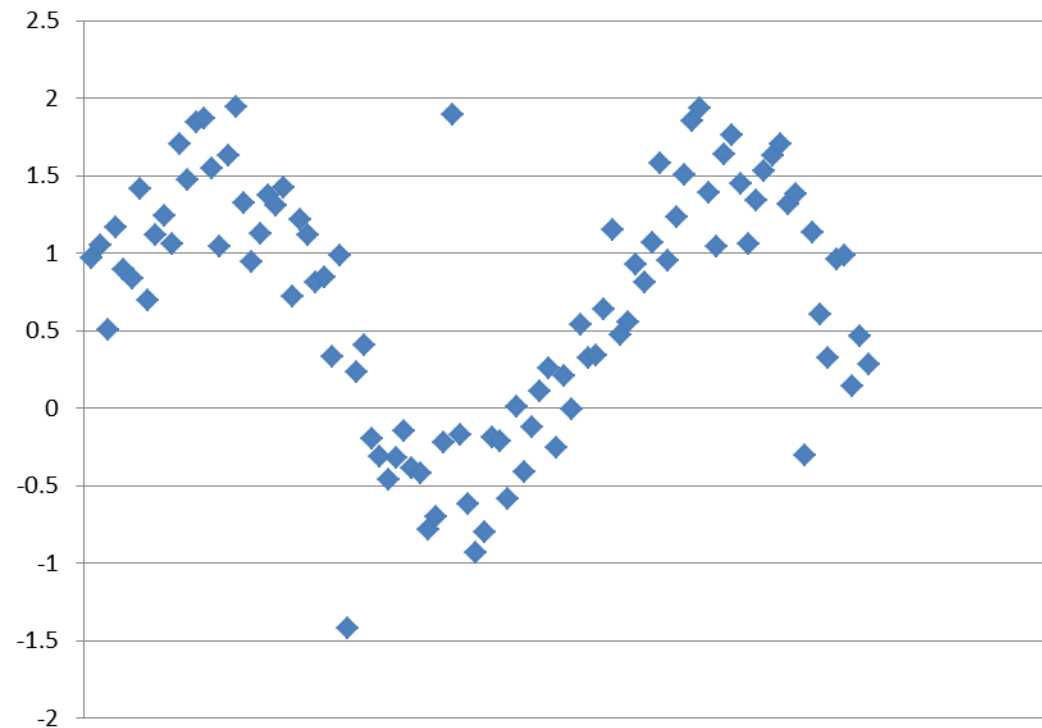
## 1. Data Visualisation



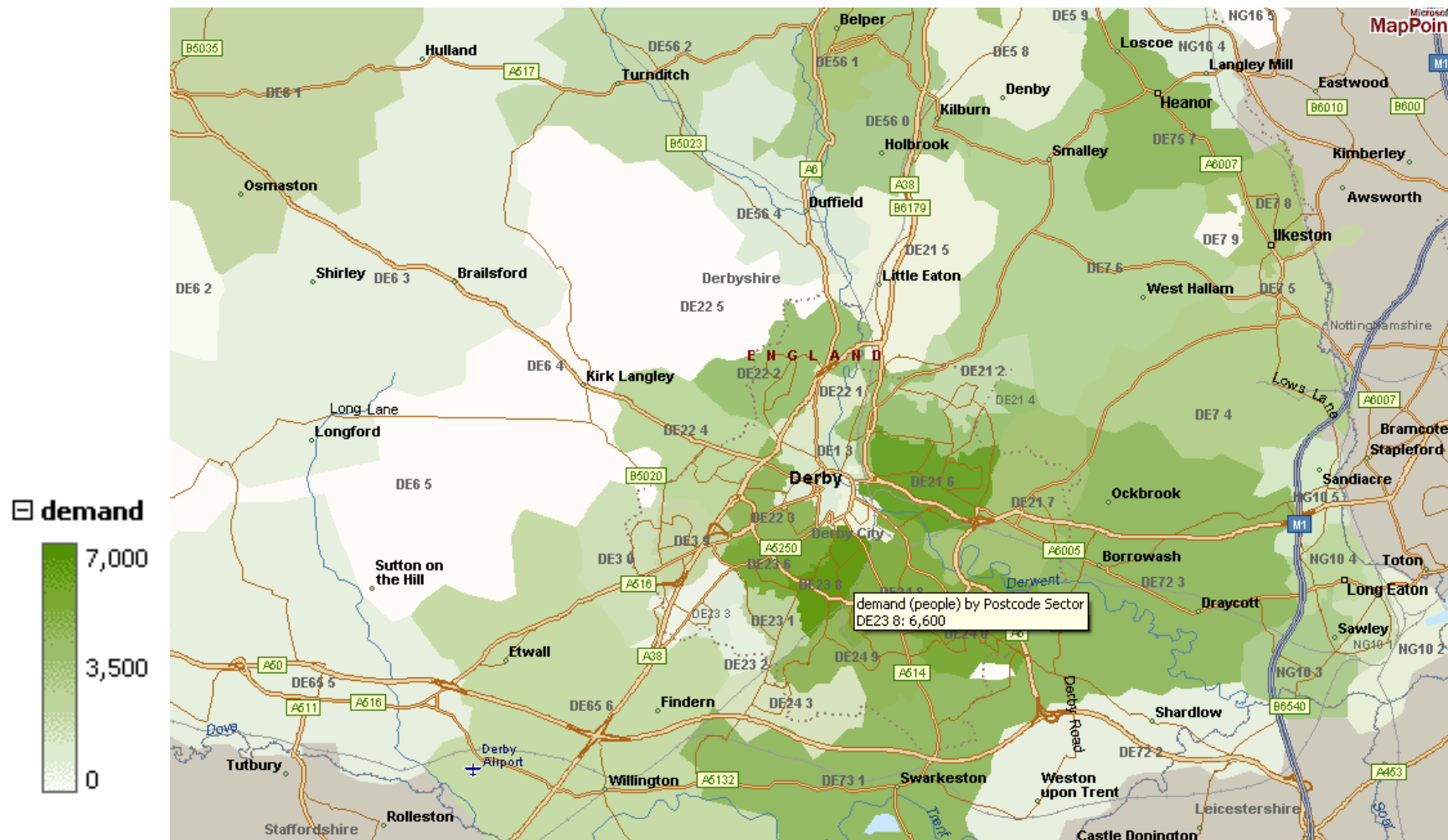
# Geographic data

## 1. Data Visualisation

0.345188  
0.736609  
0.228862  
1.205993  
1.354395  
0.935244  
1.242914  
1.080396  
1.514853  
1.201384  
1.518561  
Etc...

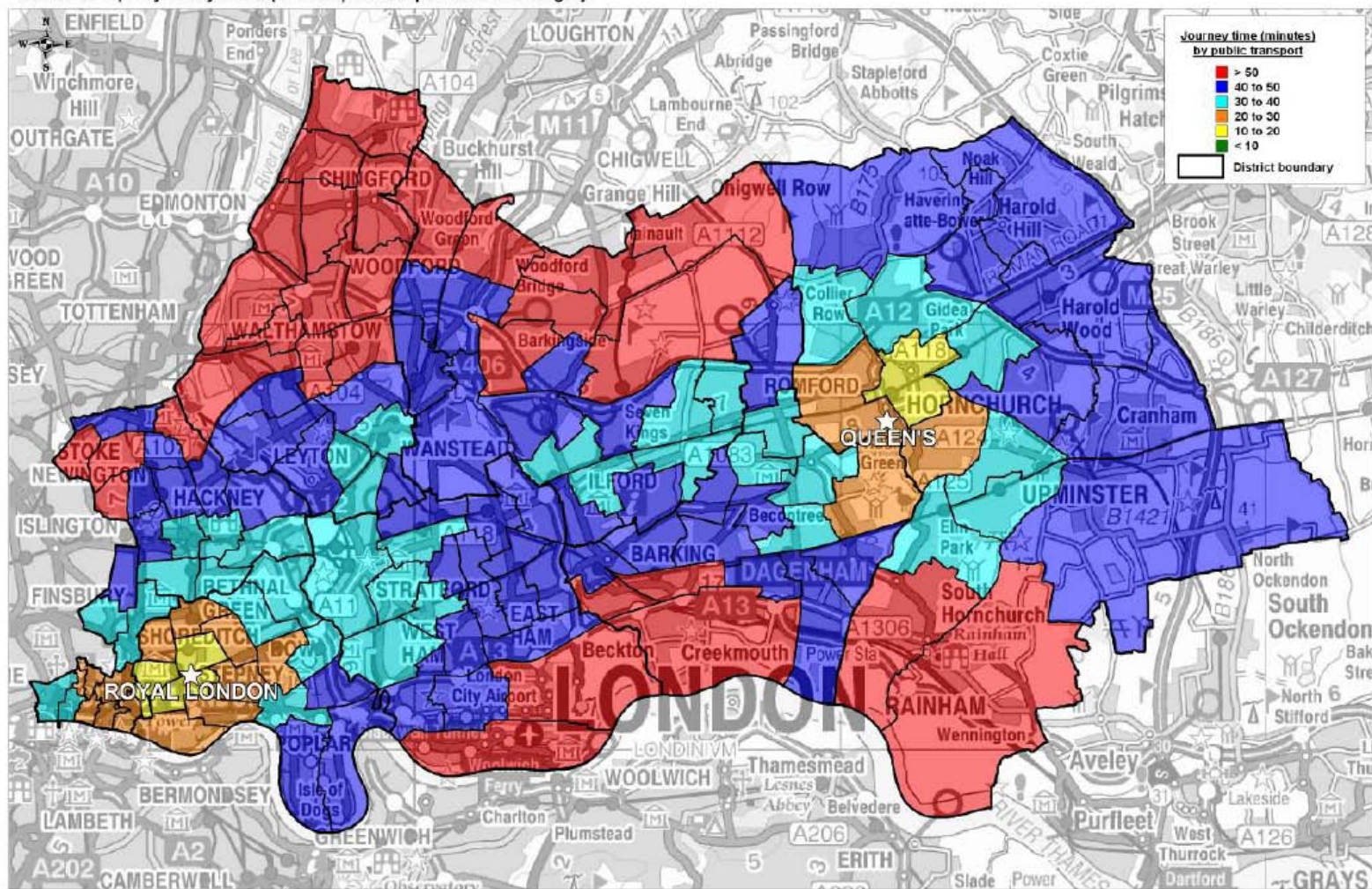


# Geographic data: Patient activity

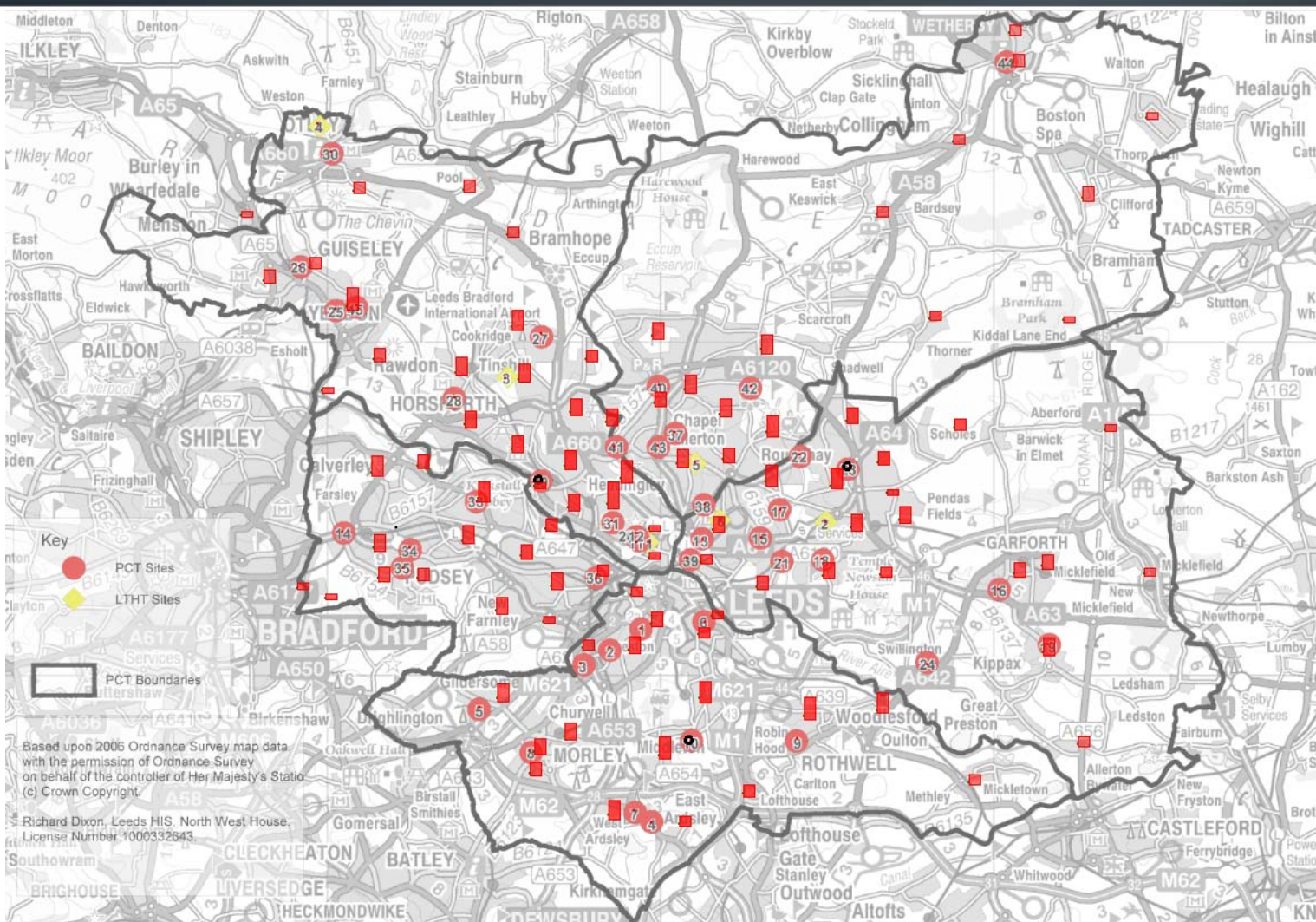


# Geographic data: Patient access

Public transport journey times (minutes) for complex vascular surgery

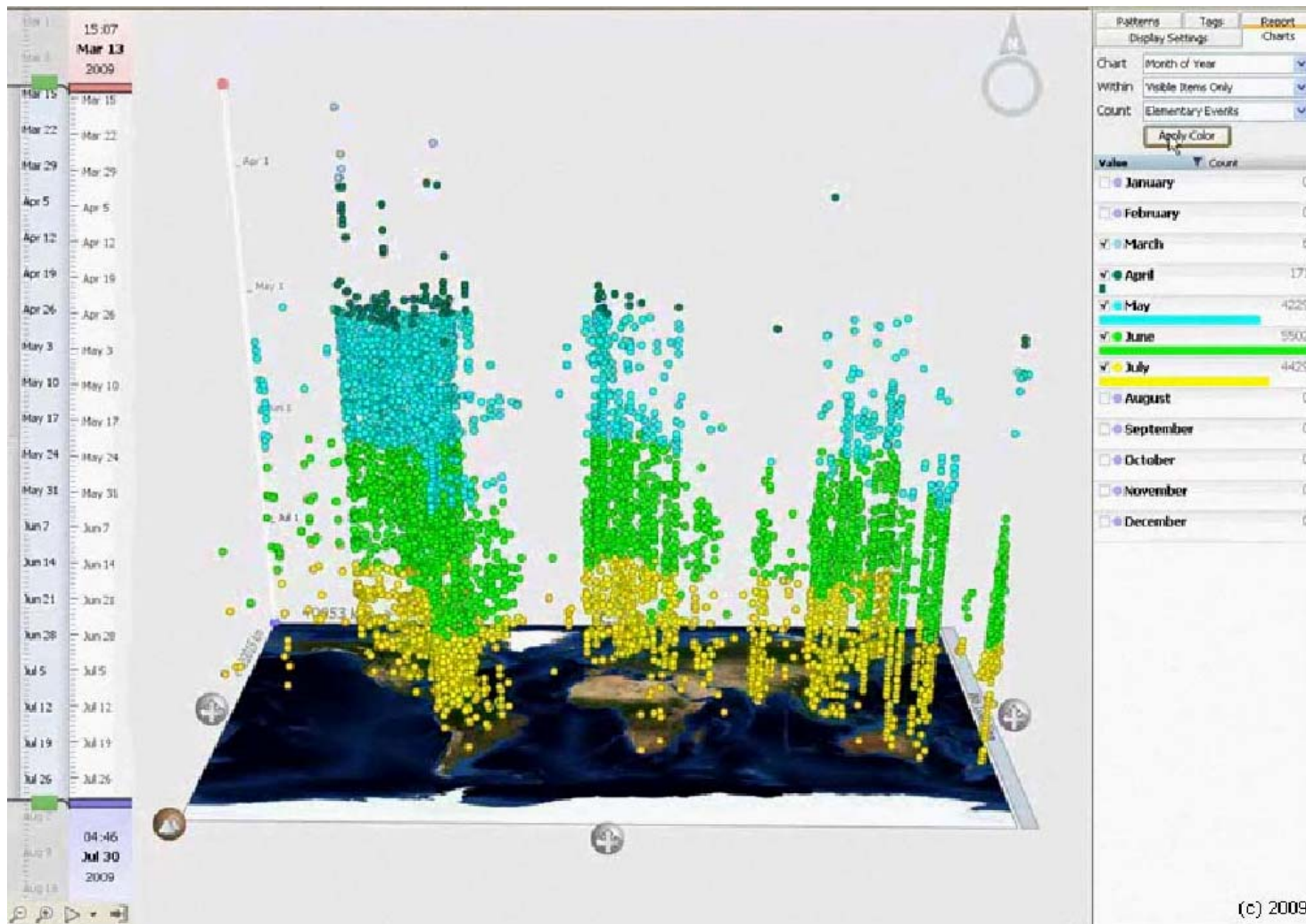


# Geographic data: Polyclinics





# Geographic data: Disease mapping



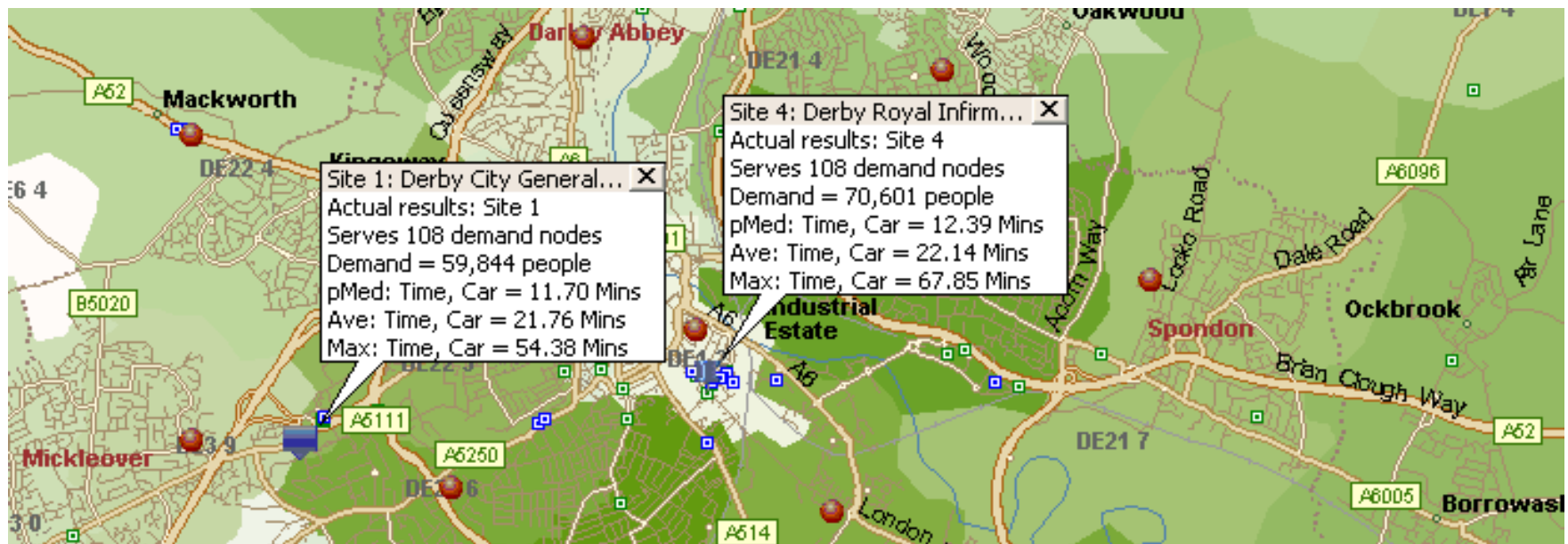
(c) 2009

# Case Study: Derbyshire PCT



# Case Study: Derbyshire PCT

- Context: closing a hospital in Derby City
  - What effect would it have on patient attendance in Derby and Nottingham?

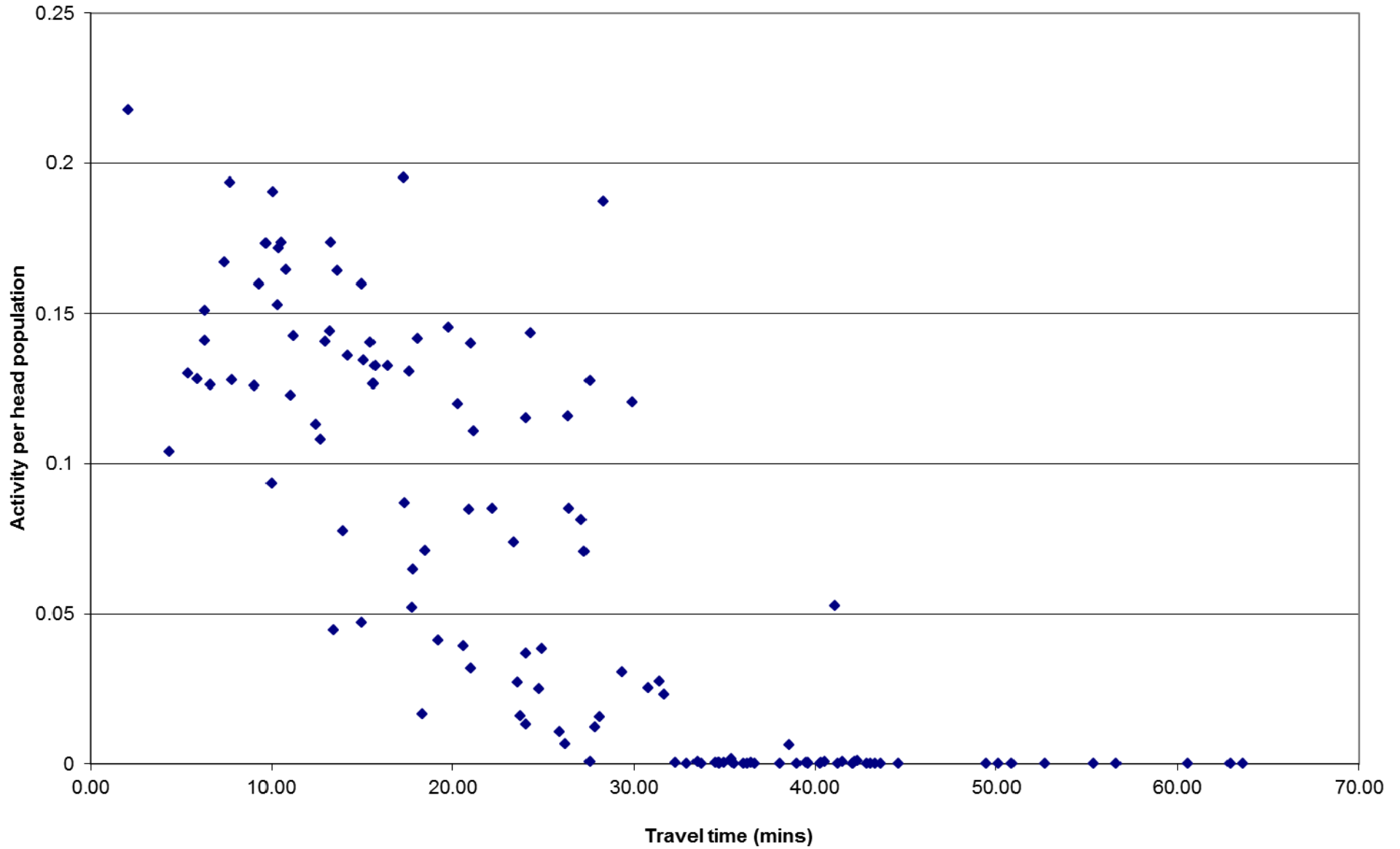




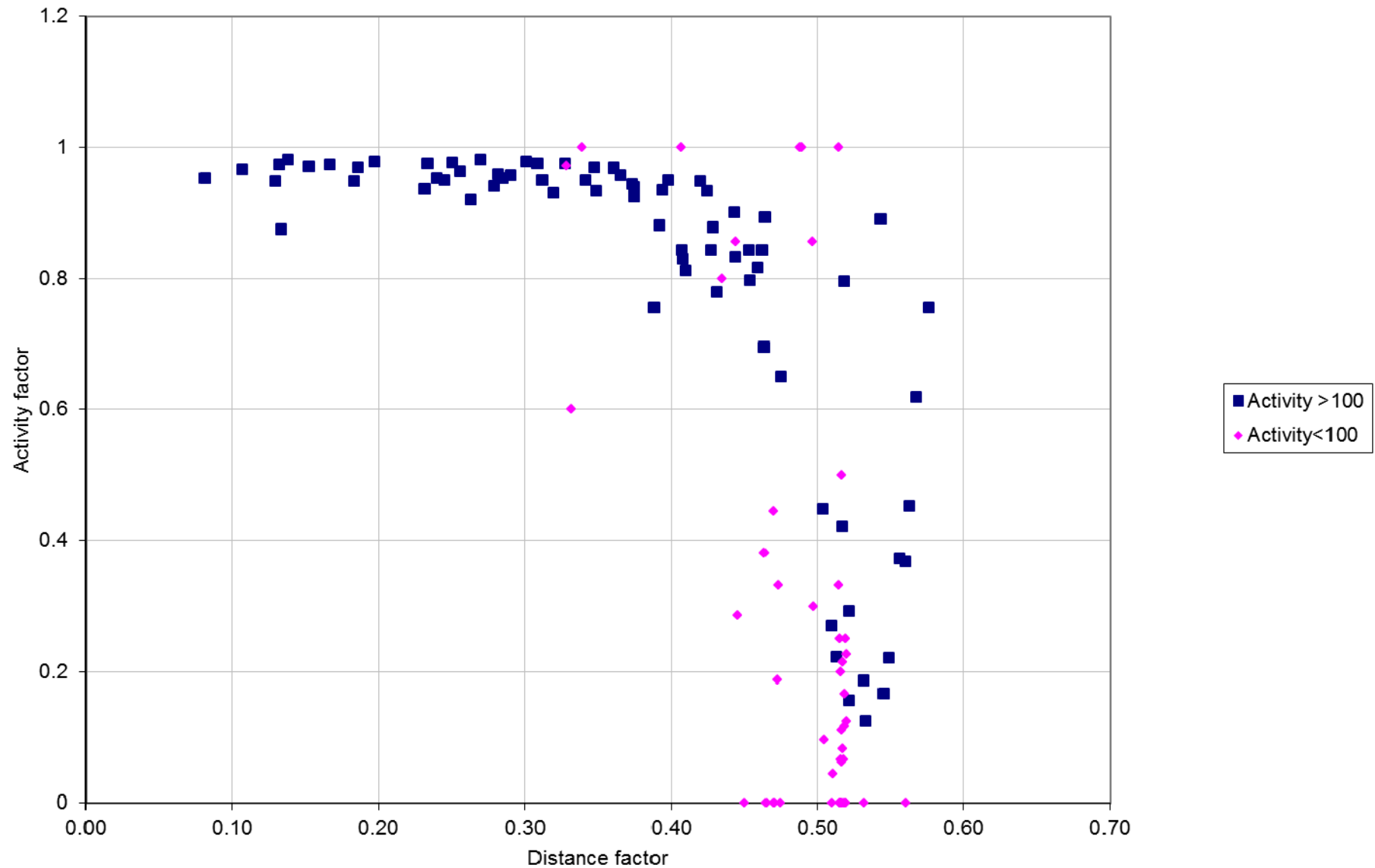
# Case Study: Derbyshire PCT

- Came up with two primary models:
  1. Model on 'go to nearest' (journey time)
  2. Model the prefs for services already at the new hospital: 'same as new'
- Various sub-models looking at:
  - Inpatients: elective/non-elective
  - ED/A&E: Ambulance & self-present
  - Outpatients... Etc.

## Inpatients, Derby Royal Infirmary - activity by travel time



## DCGH inpatients, all specialities, activity against relative distance (>100 covers 99.41% of all activity)







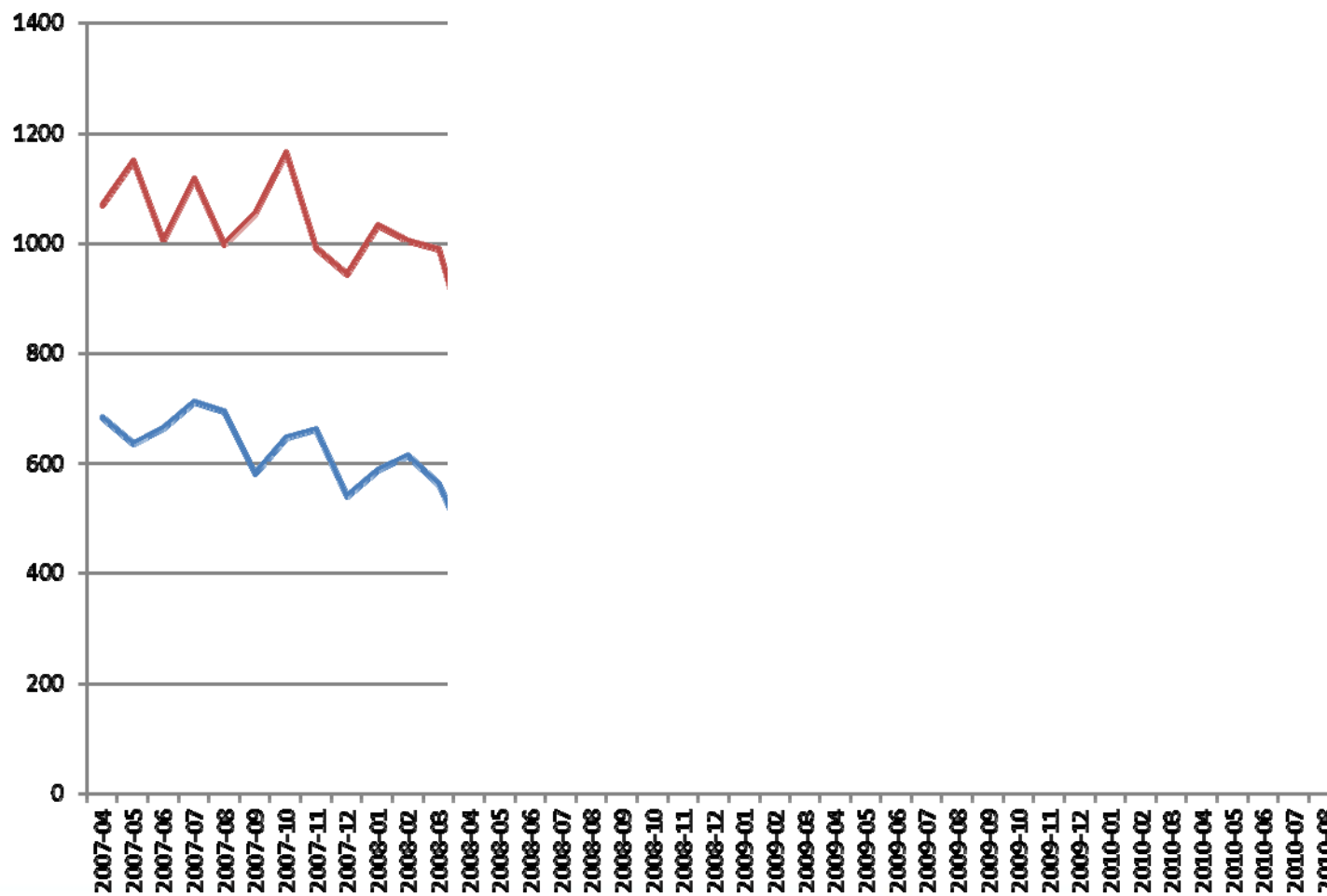
# Case Study: Inpatients

## Predictions of Inpatient attendance:

- ‘Go to nearest’ higher than ‘same as new’.
- The client felt that ‘same as new’ was the closer option, with ‘go to nearest’ at limit.
- Predictions of ‘same as new’ model:
  - **1,500** people/year increase in Notts. e.g. **-1.2%** at Derby, **+7%** at Notts.

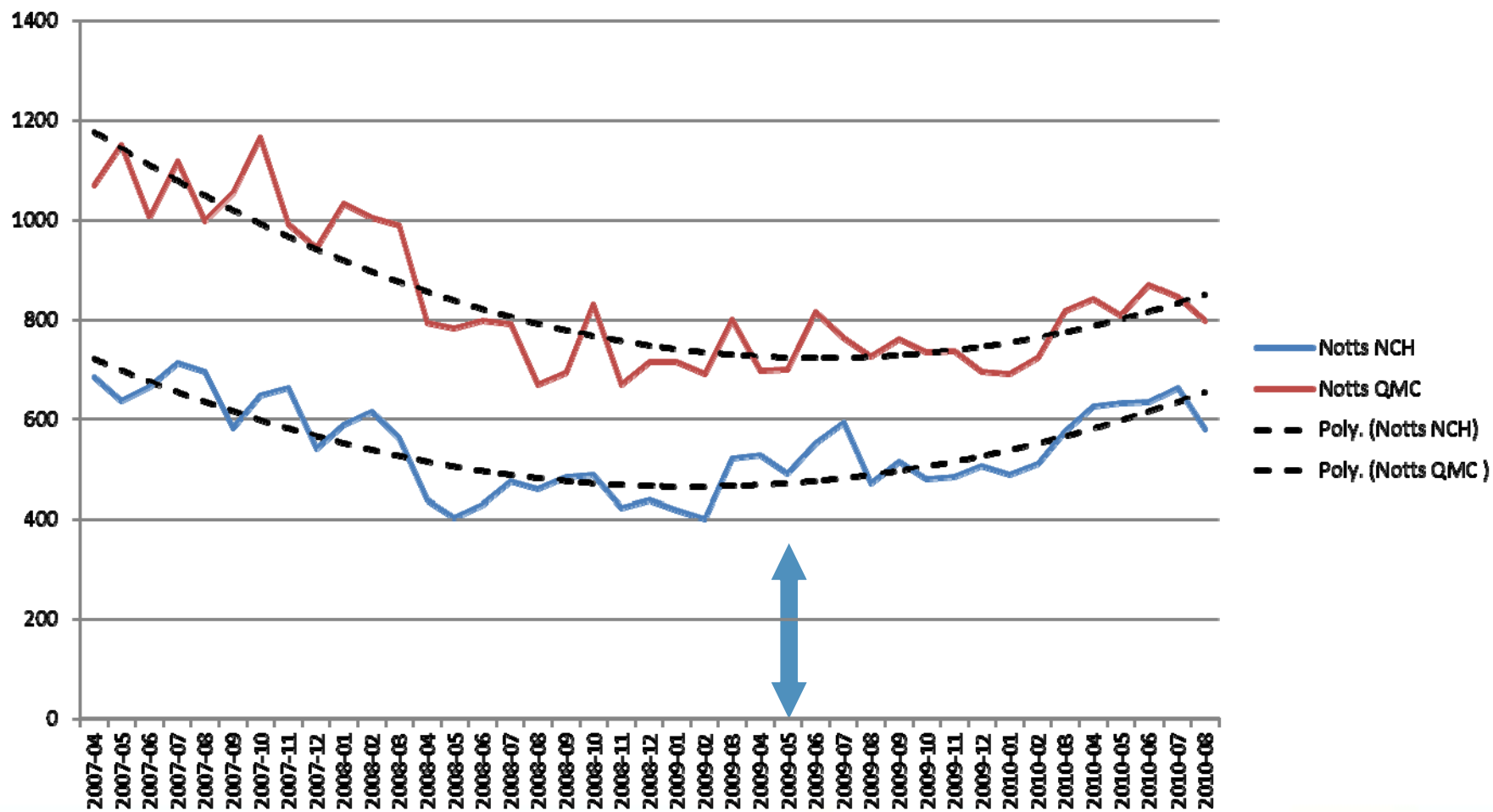
# Case Study: Inpatients

All Nottingham inpatient attendance



# Case Study: Inpatients

## All Nottingham inpatient attendance



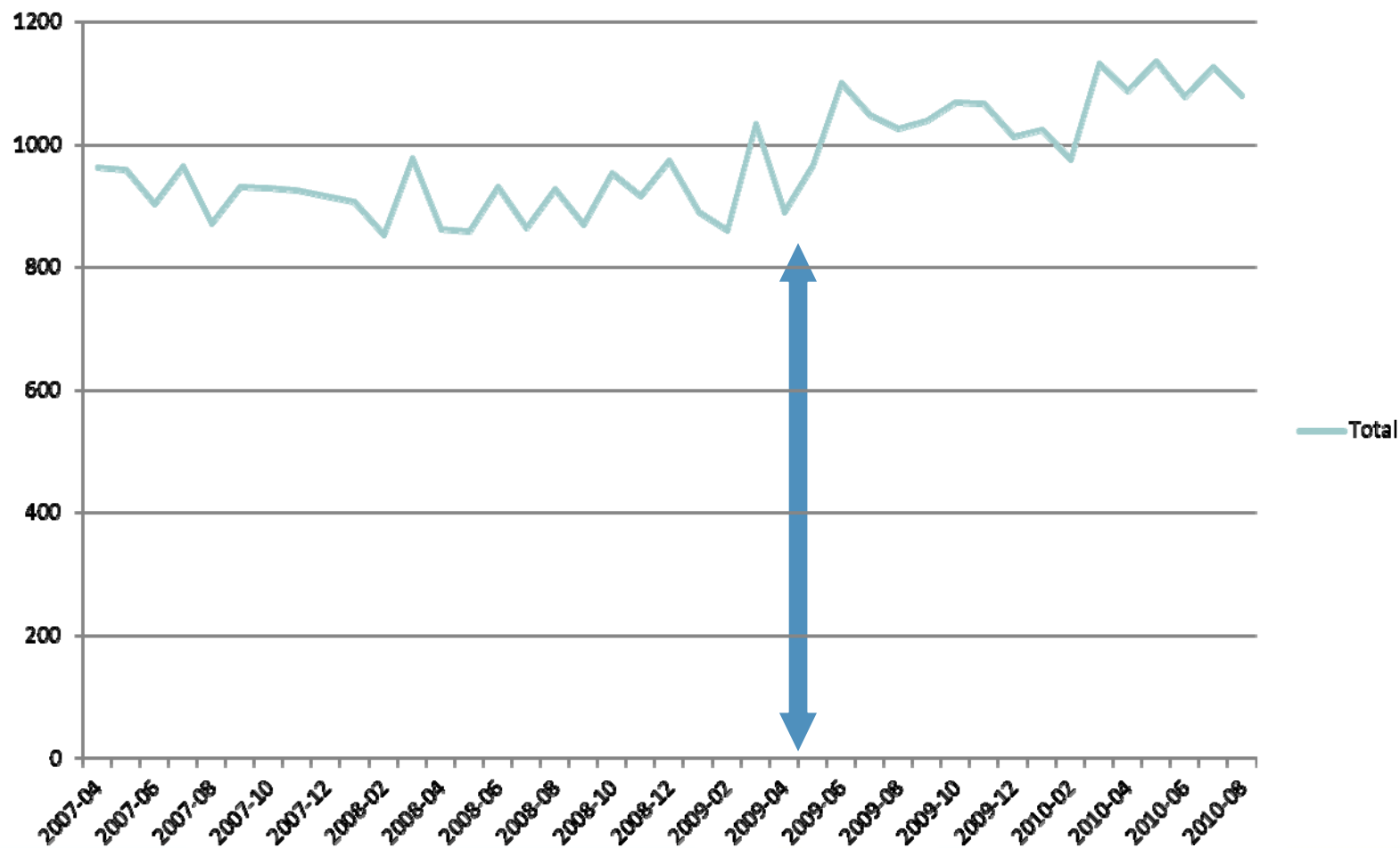
# Case Study: Emergency Dept

## Predictions of **ED/A&E attendance:**

- Only had 'go to nearest' model
- Predictions were
  - **2,700** people/year increase in Notts. e.g. **-3.2%** at Derby, **+31%** at Notts.

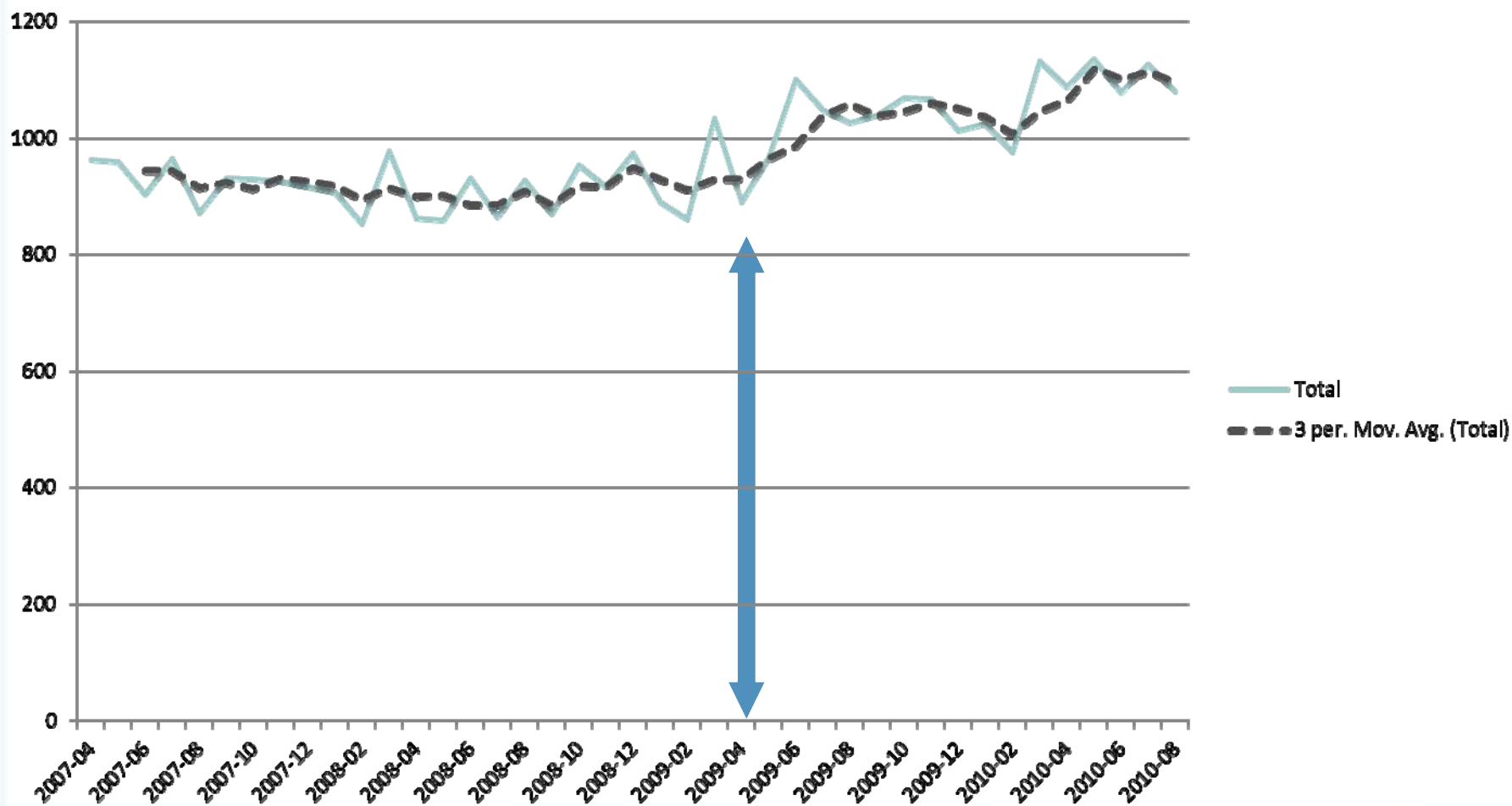
# Case Study: Emergency

## All Nottingham ED attendance



# Case Study: Emergency

## All Nottingham ED attendance



# The End

Questions?

