

Temporal GISes of Changing Administrative Boundaries: European Comparisons

**Dr. Ian Gregory,
Department of Geography,
University of Portsmouth**

The need for geography

- Many countries have been publishing census and similar statistics for two centuries or more
- Most of these datasets are geographical
- They are also temporal as they are published at regular intervals
- Traditionally:
 - Spatial detail is only available for individual snapshots
 - Temporal exploration grossly simplifies space

Temporal GIS

- Opens up huge potential for exploring, analysing and visualising data through all three components:
 - Attribute
 - Space
 - Time
- Problem: Temporal GIS only poorly developed

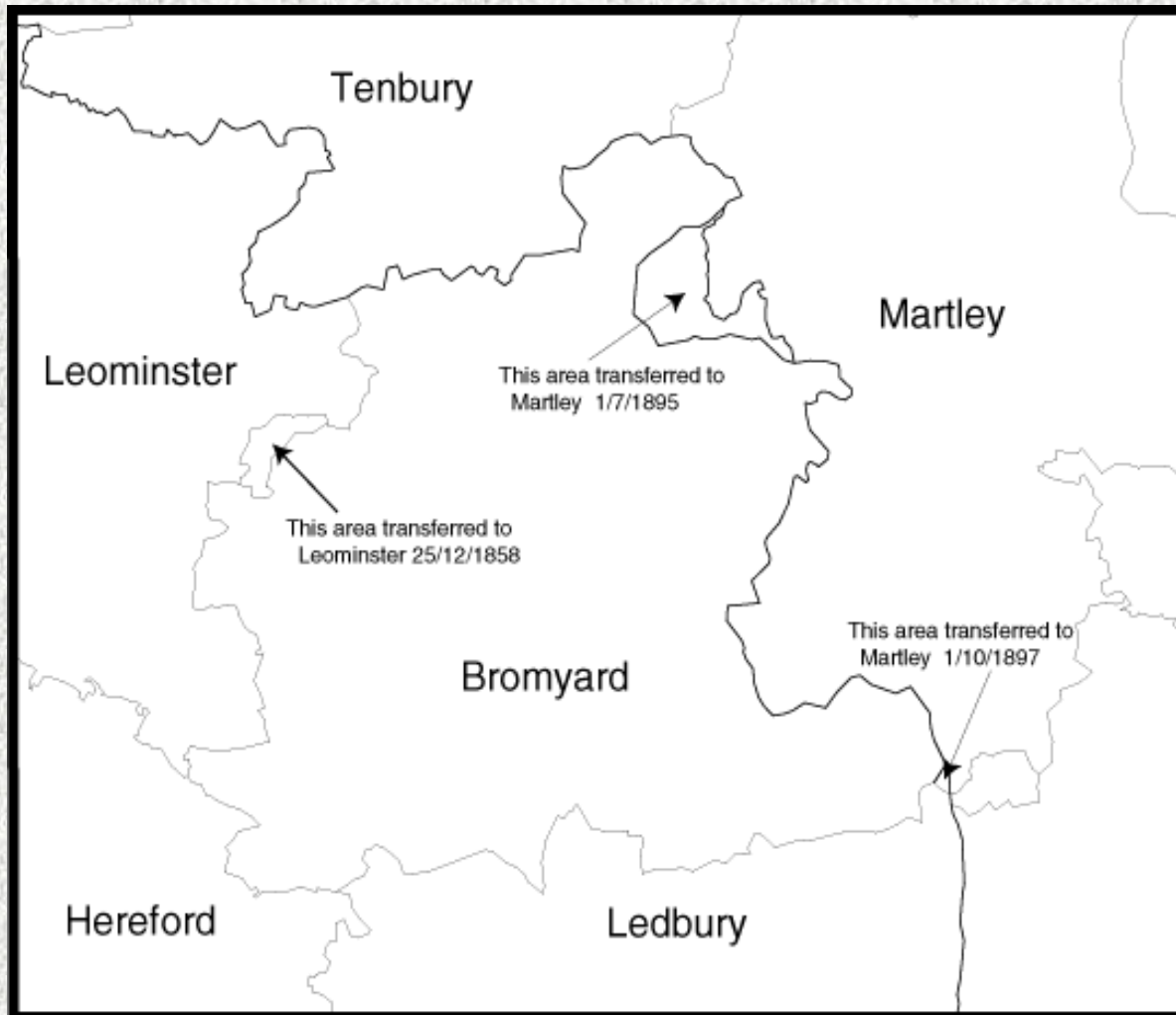
Spatio-temporal architecture

- Three approaches:
 - Key dates (Ireland, Prussia)
 - Date stamping (GBHGIS)
 - Space-time composite (Sweden, Belgium)

Key dates

- Simply digitise boundaries at important dates and link attribute data to them.

Date stamping



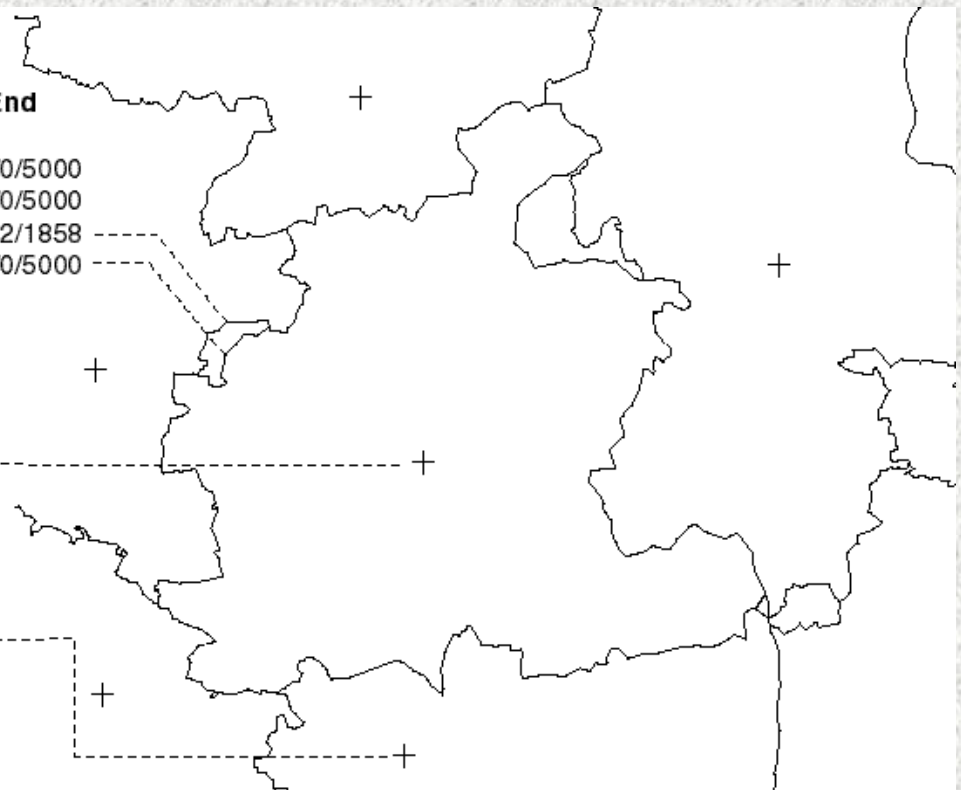
Date stamping (2)

Arc Attribute Table

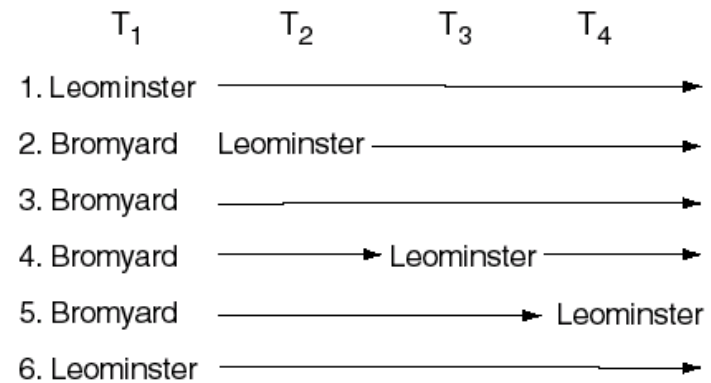
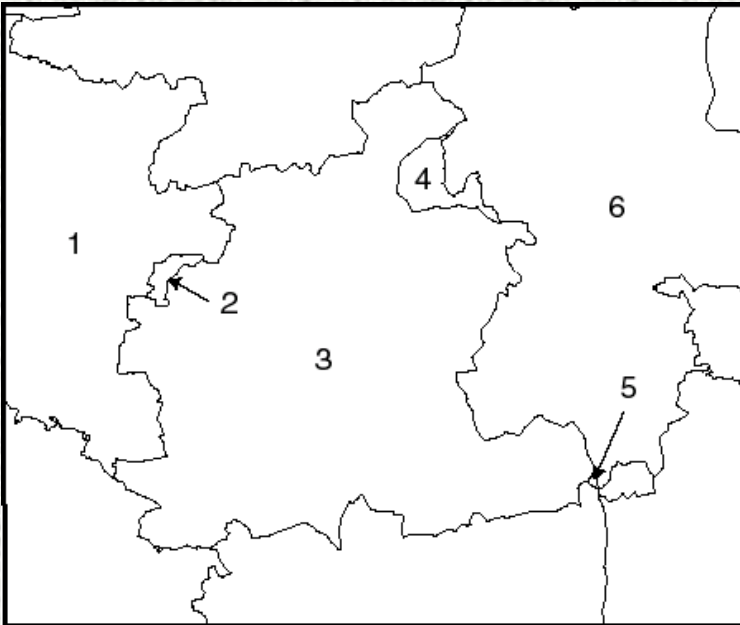
County1	County2	County Boundary	Start	End
Herefordshire		N	0/0/0000	0/0/5000
Worcestershire	Herefordshire	Y	0/0/0000	0/0/5000
Herefordshire		N	0/0/0000	25/12/1858
Herefordshire		N	25/12/1858	0/0/5000

Polygon Attribute Table

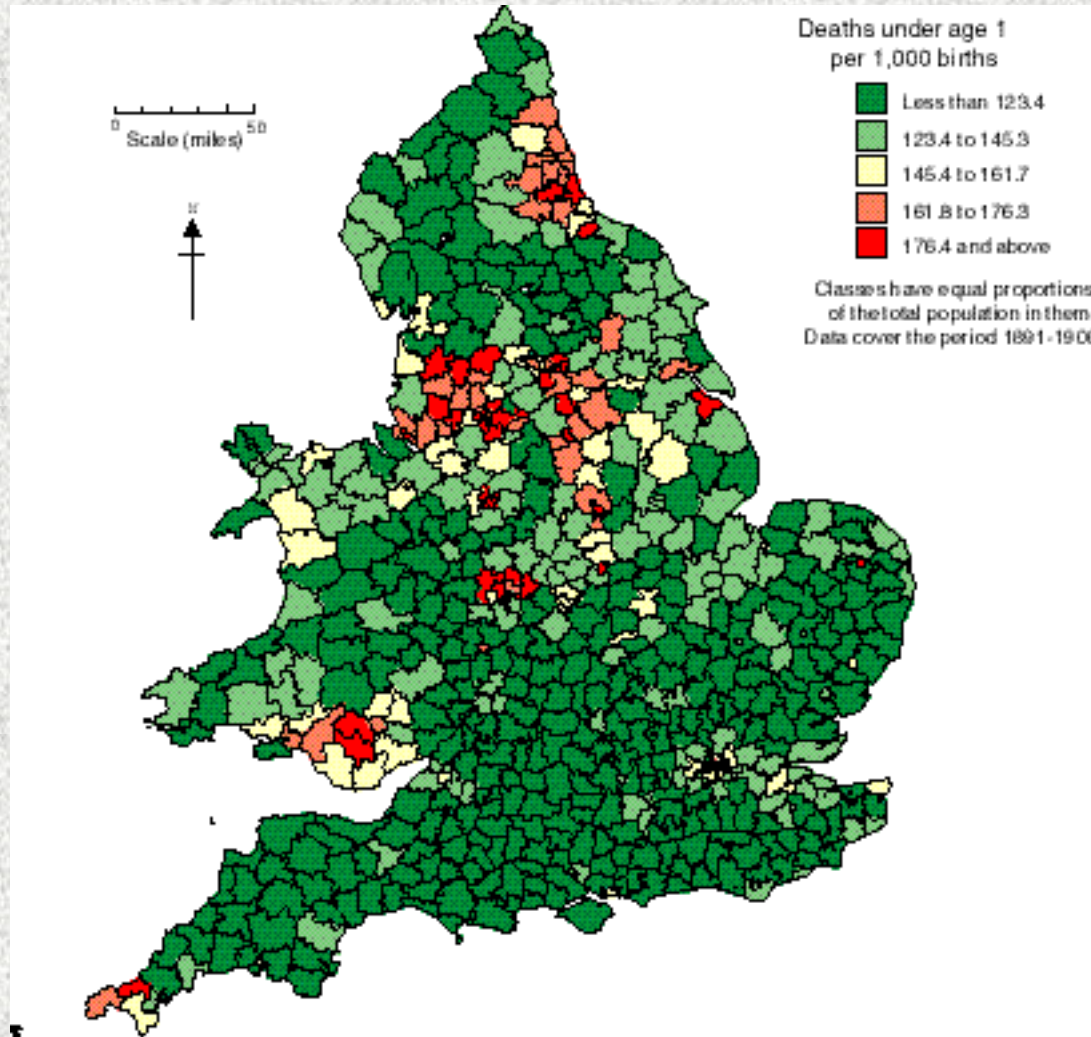
Name	County	Start	End
Bromyard	Herefordshire	0/0/0	0/0/5000
Hereford	Herefordshire	0/0/0	0/0/5000
Ledbury	Herefordshire	0/0/0	0/0/5000
Leominster	Herefordshire	0/0/0	0/0/5000
Martley	Worcestershire	0/0/0	0/0/5000
Tenbury	Worcestershire	0/0/0	0/0/5000



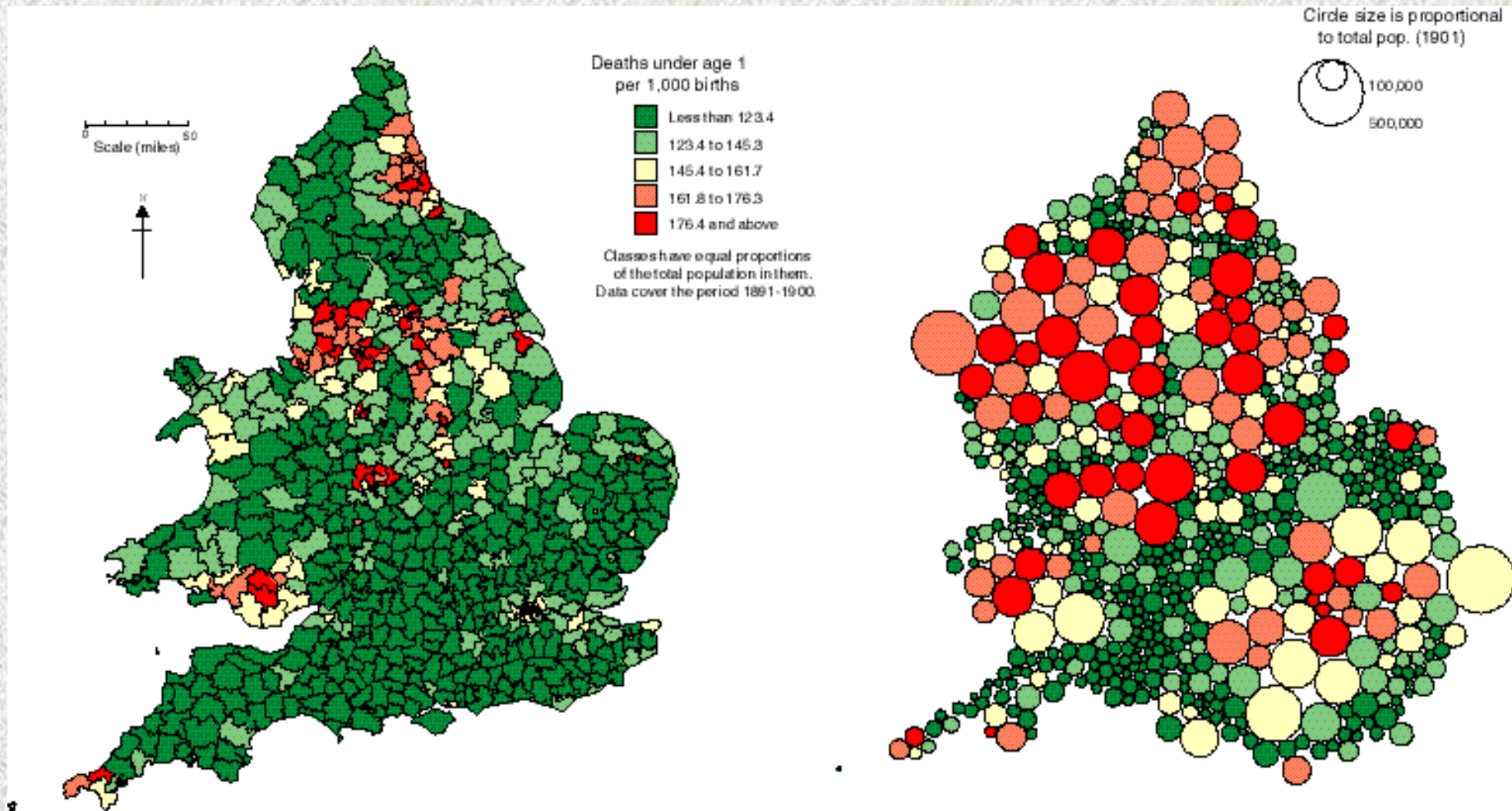
Space-time composite



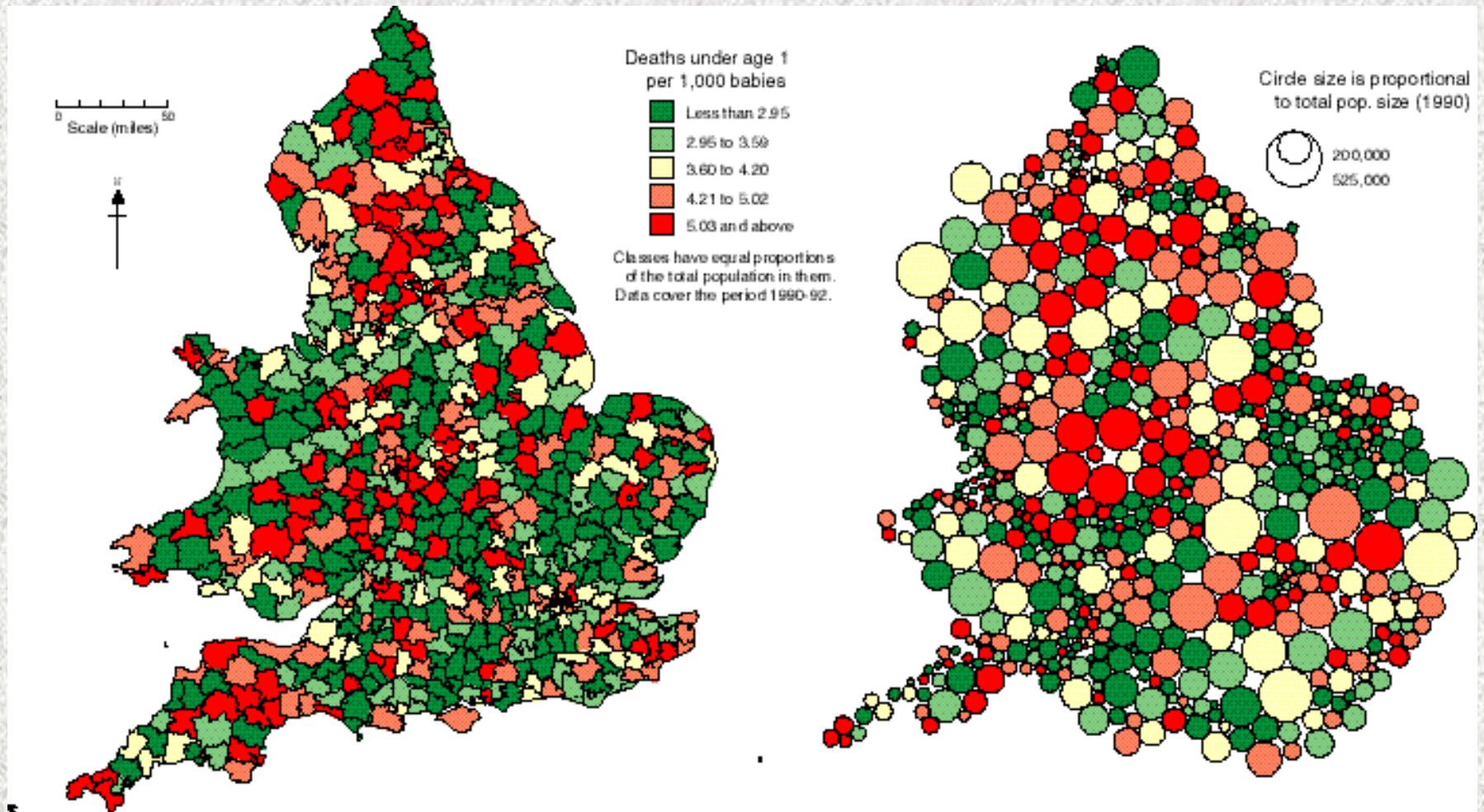
Infant mortality, 1890s



Infant mortality, 1890s (2)



Infant mortality, 1990s



Conclusions

- There are three main approaches to building temporal GISes of changing administrative units
- The key dates approach is the simplest but provides a good starting point for either of the others
- Once built systems such as these open up massive new potential for understanding the past
- A version of this paper is forthcoming in Transactions in GIS