Dementia Data Analytics

A spatial analysis of dementia, mild cognitive impairment and ageing for the understanding of future care provision within rural areas of Northern Ireland

ER/DARUG/01/18/19F

Dr Gemma Catney, School of Natural and Built Environment, Queen's University Belfast

Dr Nigel Hart, Prof Chris Lloyd, Dr Lucy Hodkinson

Timescale

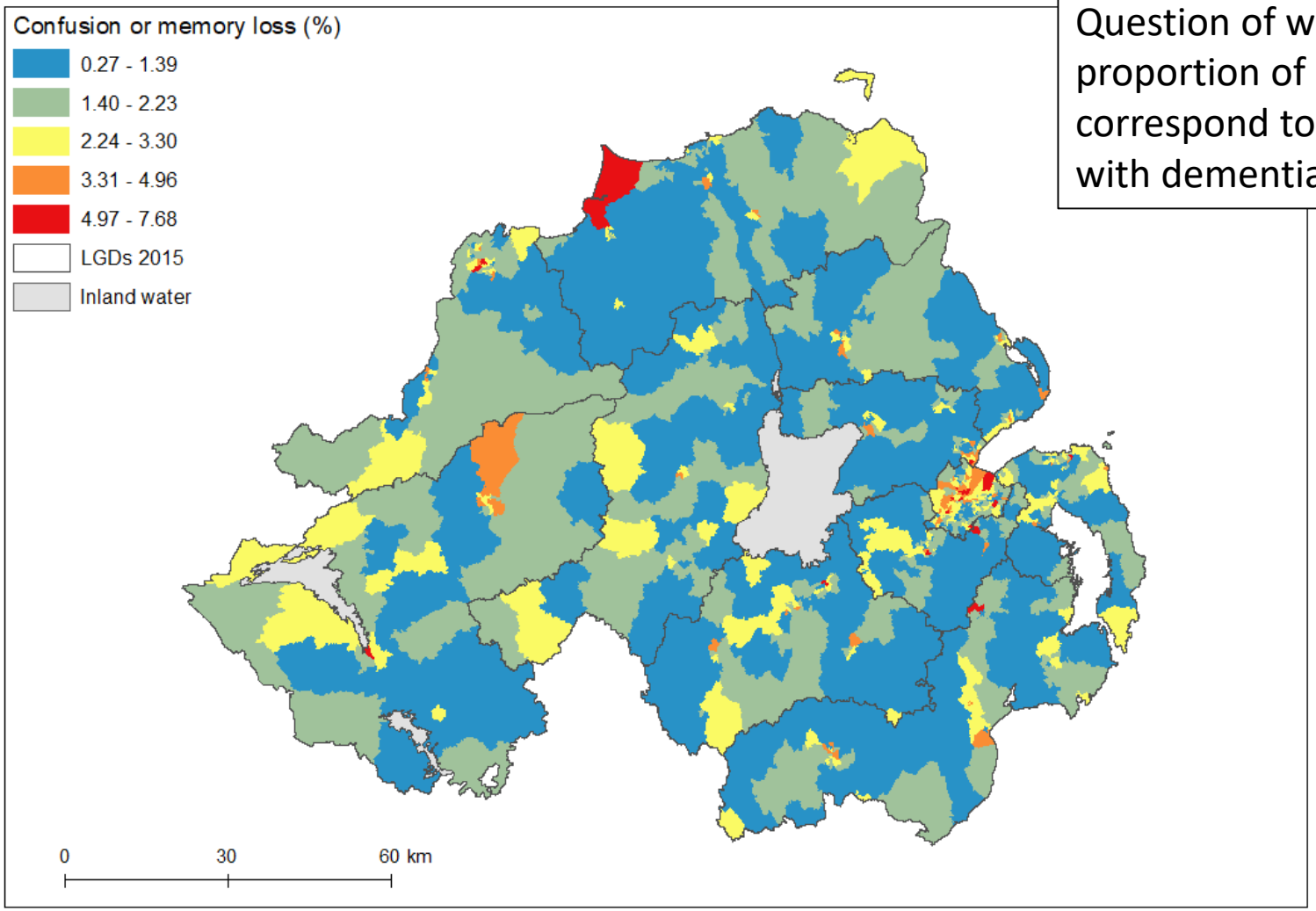
- Project Start: 1st April 2019
- Project End: 1st October 2019
- The proposed research comprises four sprints:
  - (i) analyses of the trajectories of ageing (months 1-2)
  - (ii) mapping of current dementia rates combined with projections (months 3-4)
  - (iii) spatial analyses of the associations between dementia and age, and multiple demographic and socio-economic variables (month 5)
  - (iv) spatial analyses of dementia, ageing, and access to resources (month 6)

Progress

- Dementia estimates made for super output areas (SOAs) using BSO data
- Exploration of Census data on confusion or memory loss (2011), age (2011), ageing (1971-2011) – key focus on 1km grid square data
- Analysis of relationships between variables (including access to resources)

- Provisional work on incorporating projections to assess future demands

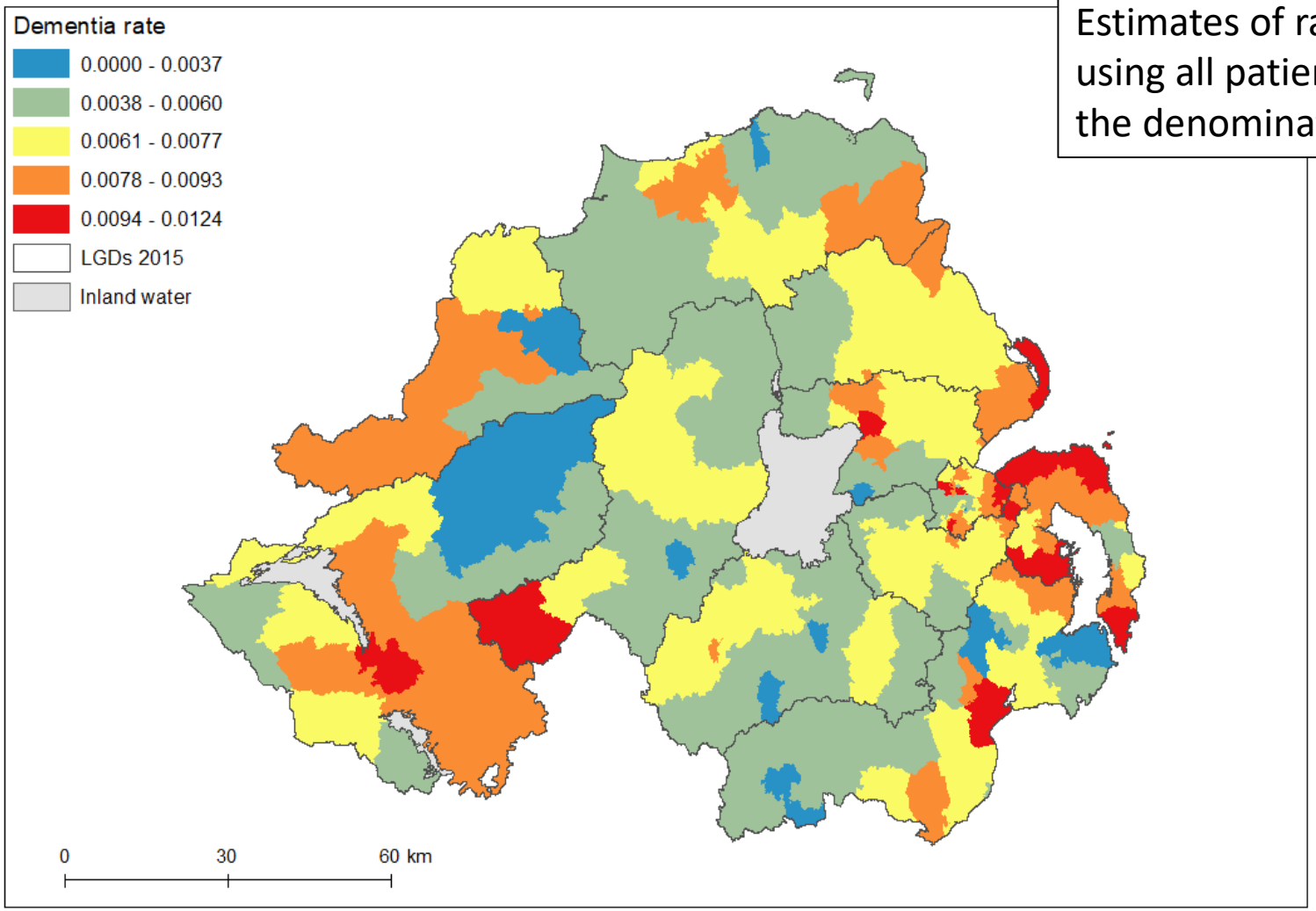
Confusion or memory loss



Question of what proportion of cases correspond to people with dementia…?

Frequent periods of confusion or memory loss (%) by Super Output Area; source: 2011 Census

Dementia rates

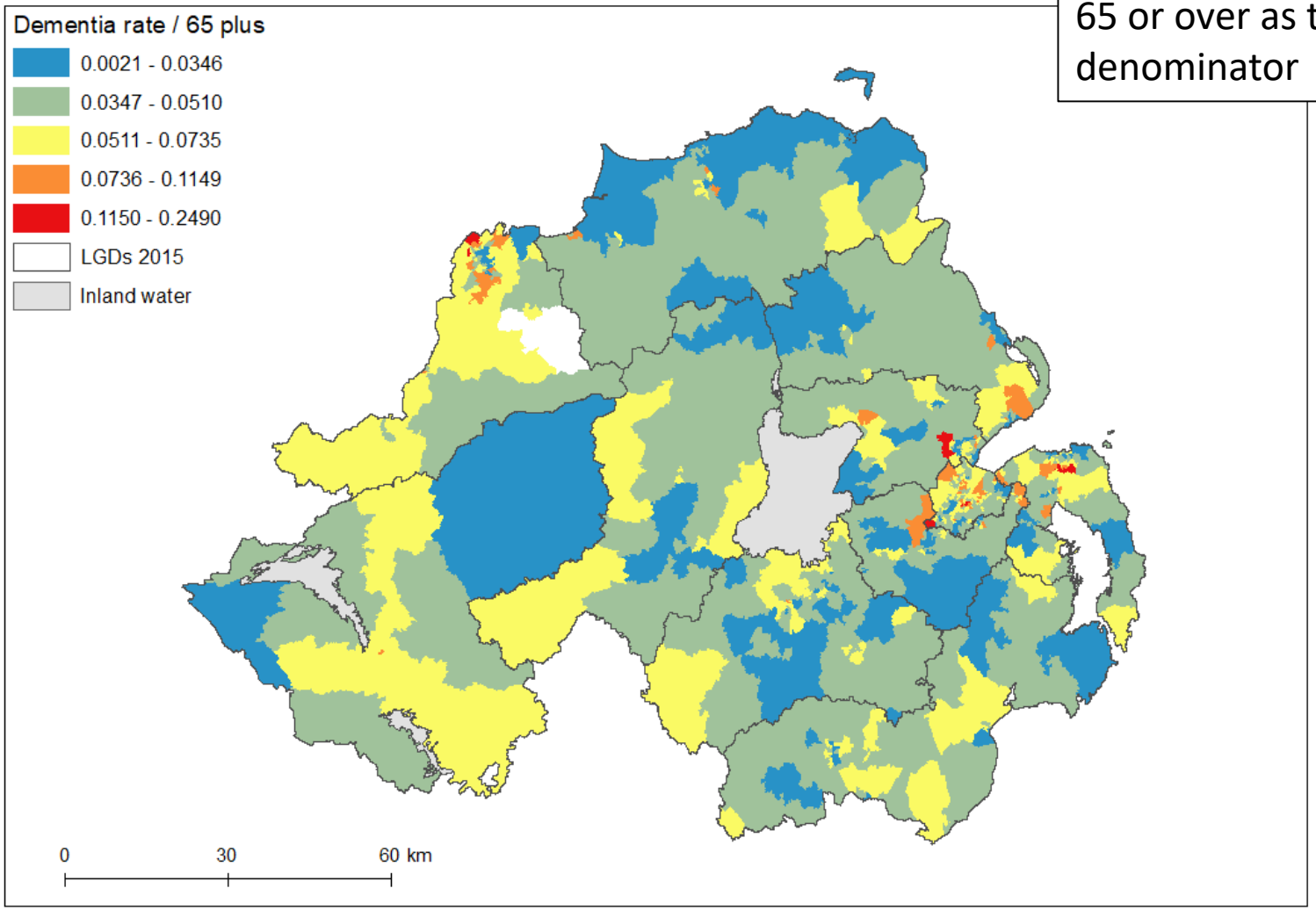


Estimates of rates using all patients as the denominator

Dementia rate (all patients as denominator) estimates by Super Output Area

Dementia rates

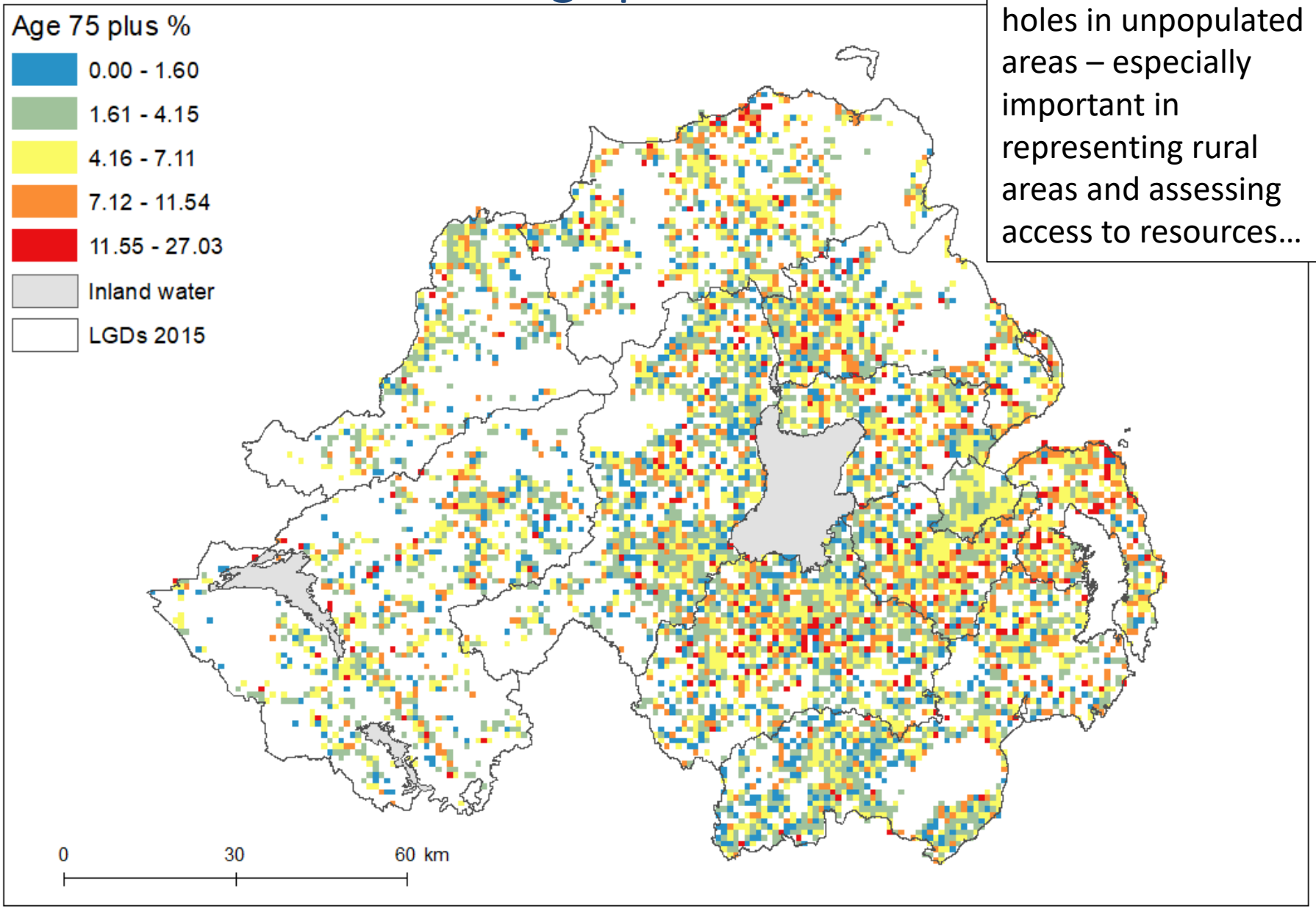
Estimates of rates using all people aged 65 or over as the denominator



Dementia rate (all patients as denominator) estimates by Super Output Area

Age profiles

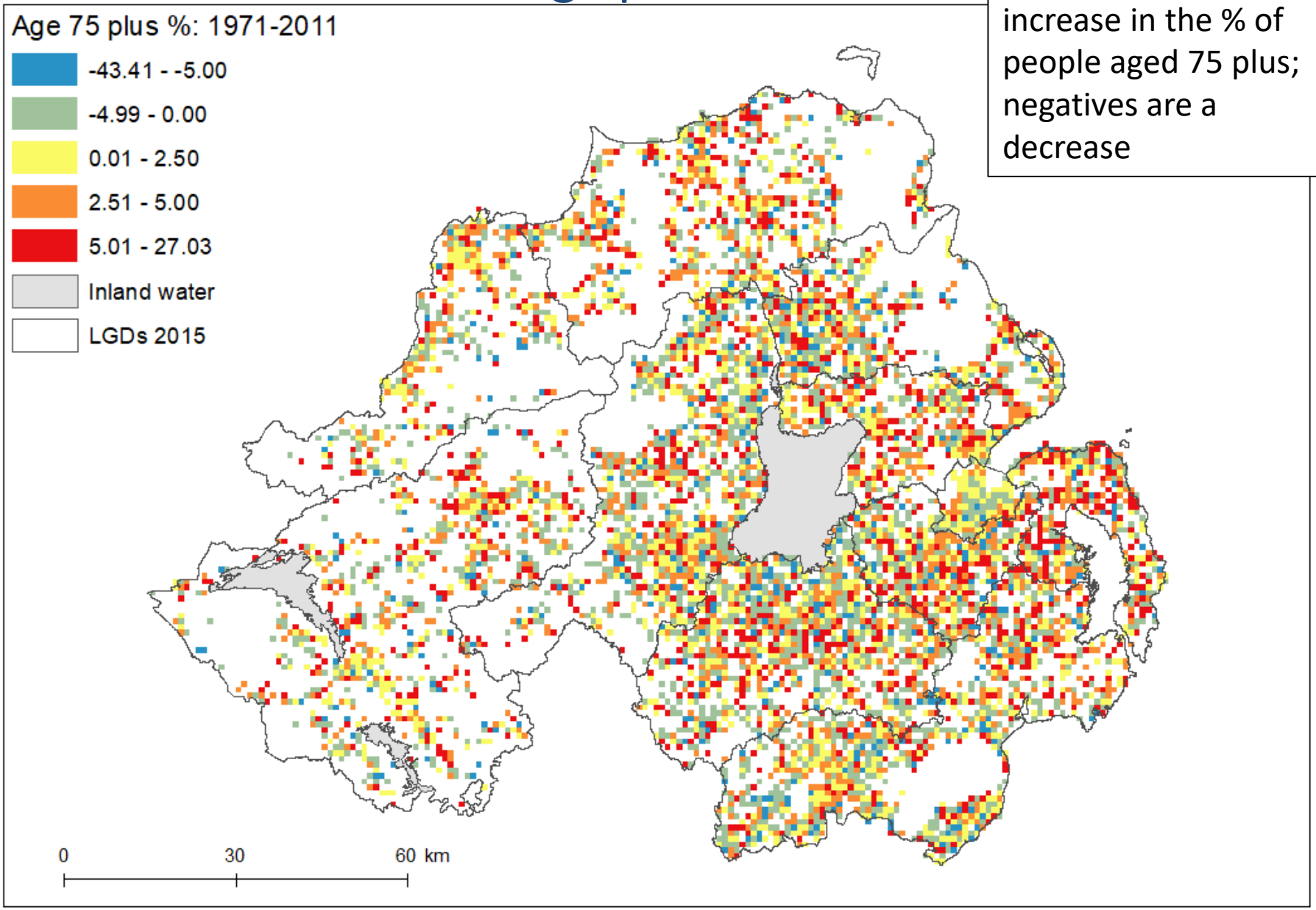
Grid square data have holes in unpopulated areas – especially important in representing rural areas and assessing access to resources…



Percentage of the population aged 75 plus; 2011 Census for 1km grid cells

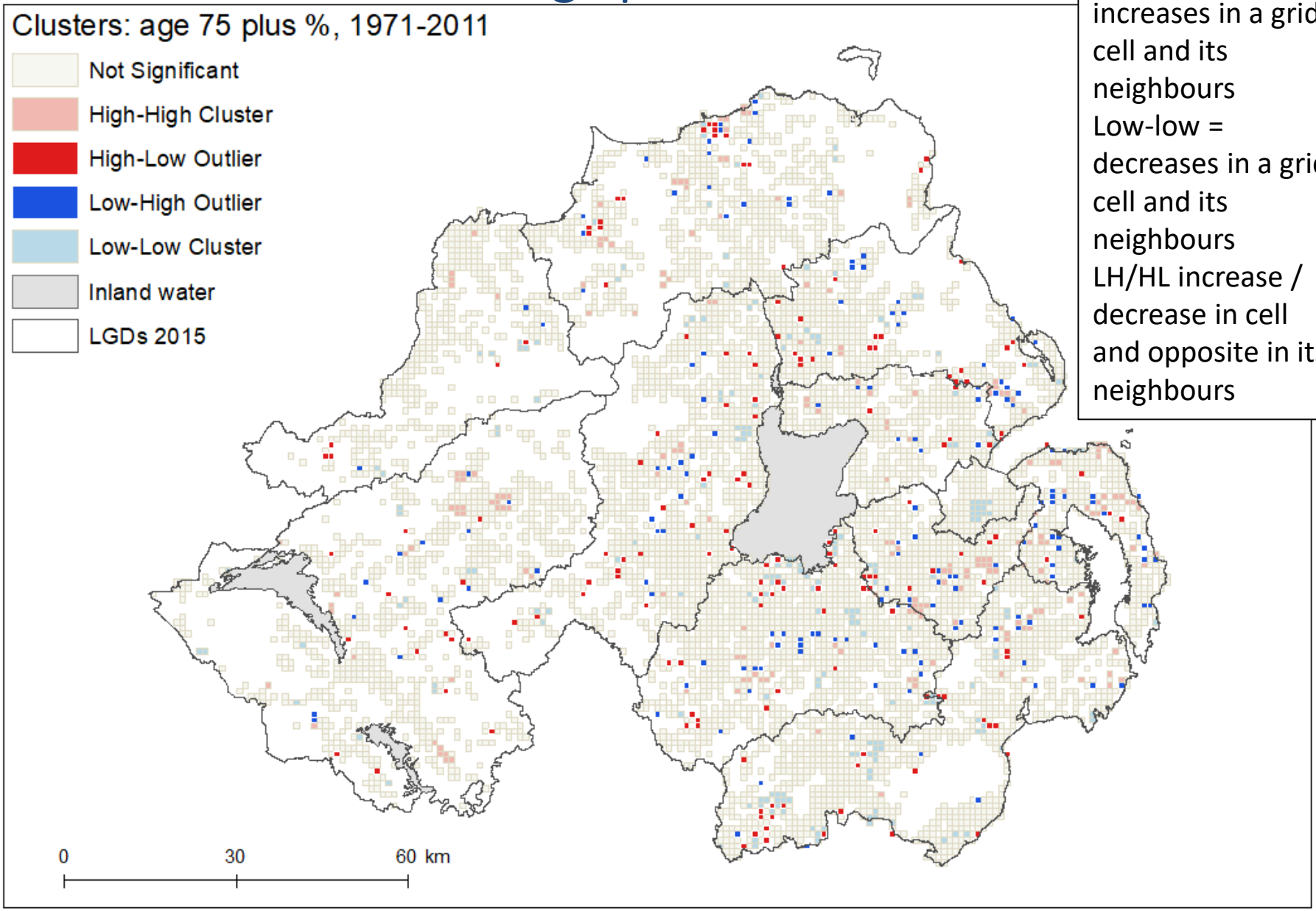
Age profiles

Positives are an increase in the % of people aged 75 plus; negatives are a decrease



Percentage of the population aged 75 plus; 1971-2011 Census for 1km grid cells

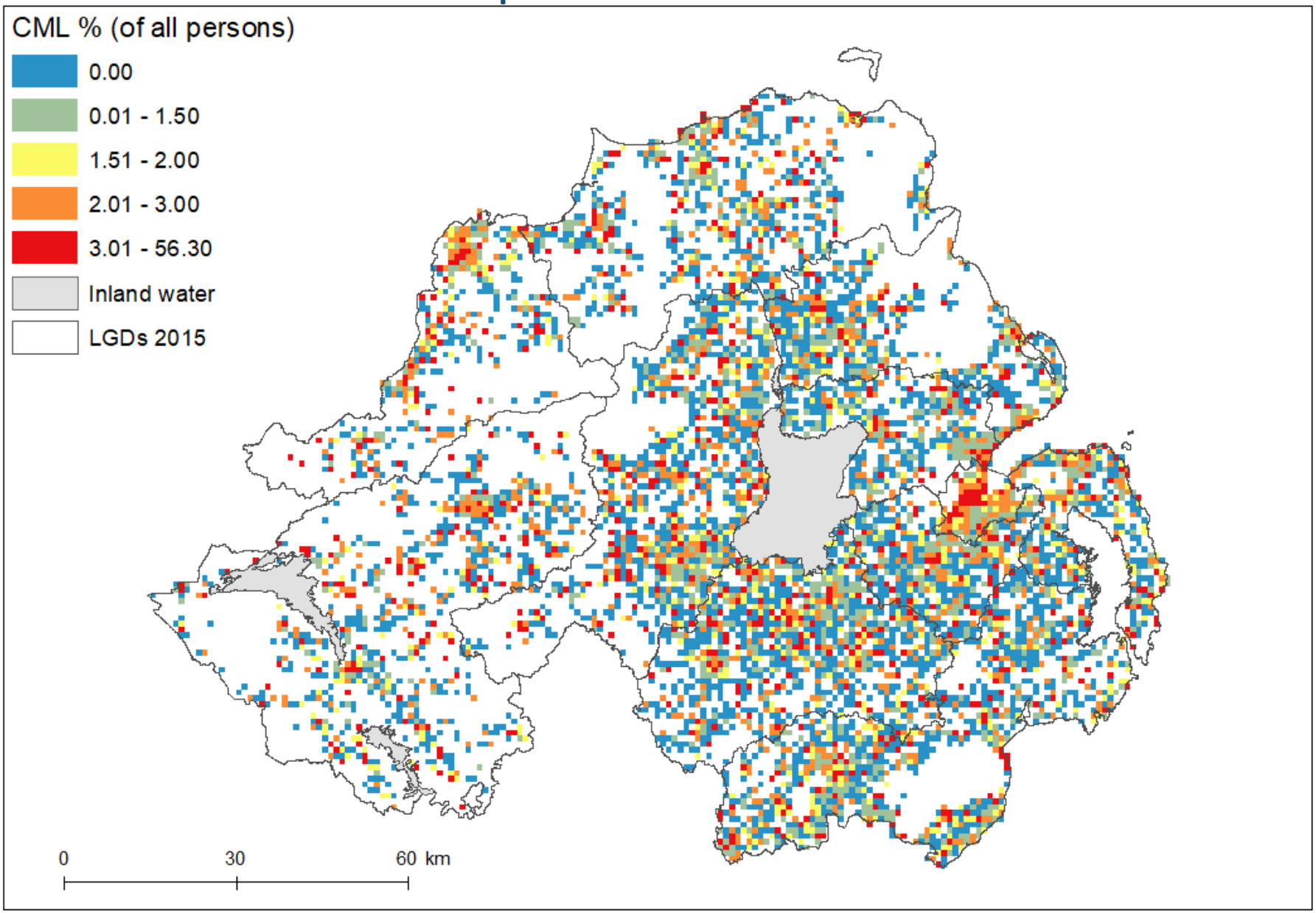
Age profiles



High-high = increases in a grid cell and its neighbours
Low-low = decreases in a grid cell and its neighbours
LH/HL increase / decrease in cell and opposite in its neighbours

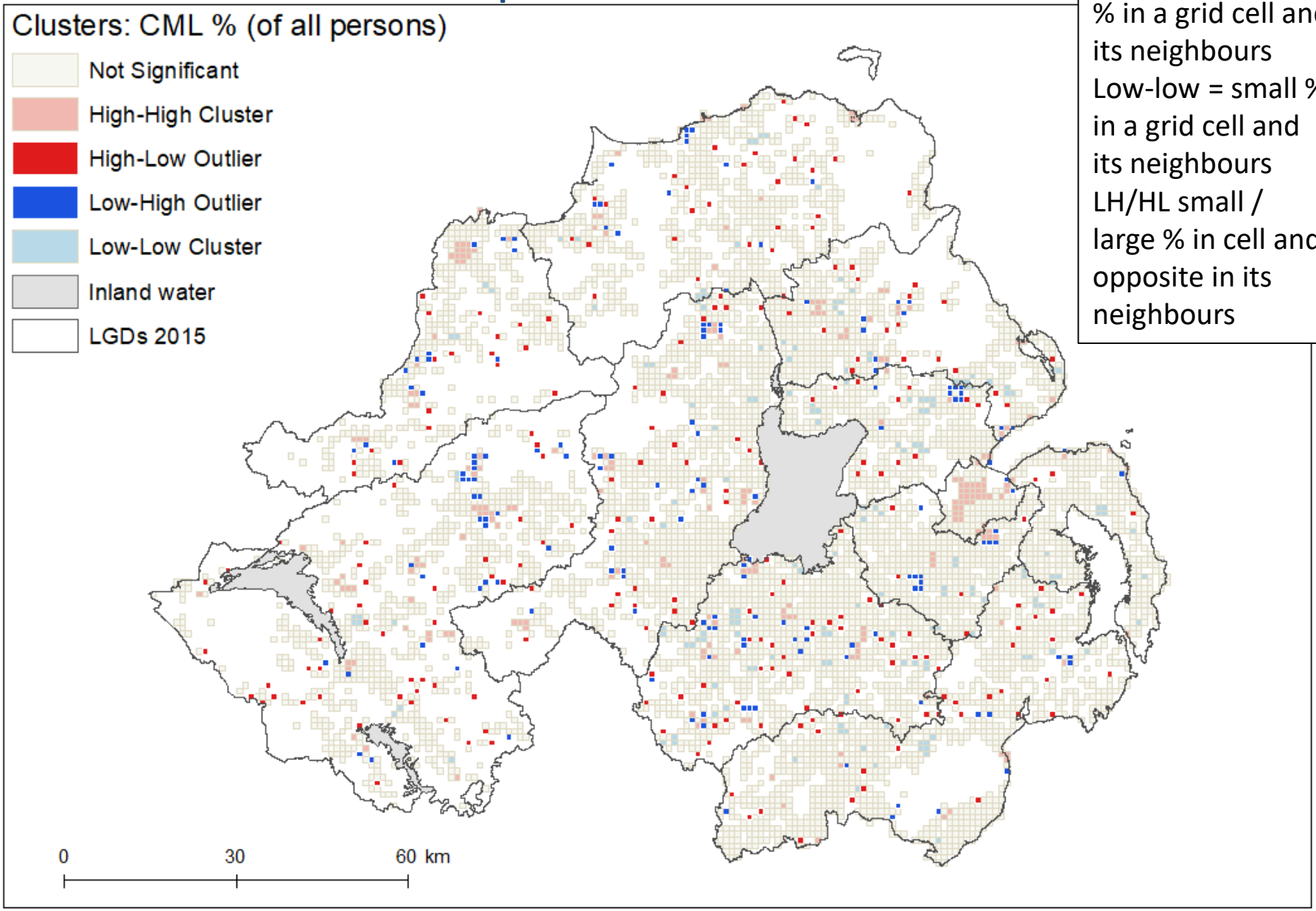
Clusters: Percentage of the population aged 75 plus; 1971-2011 Census for 1km grid cells

Self-reported health status



Frequent periods of confusion or memory loss (%); 2011 Census for 1km grid cells

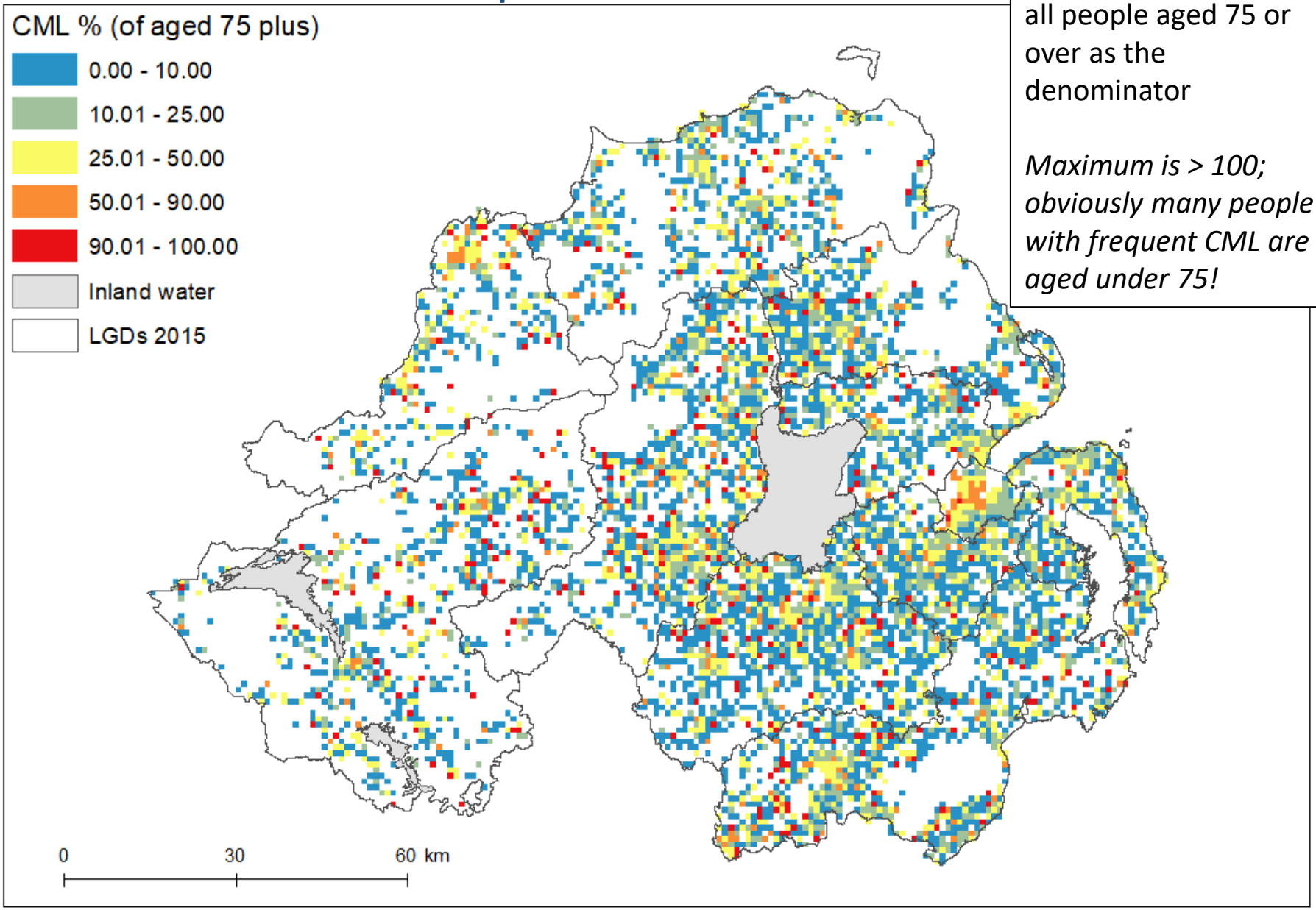
Self-reported health status



High-high = large % in a grid cell and its neighbours
Low-low = small % in a grid cell and its neighbours
LH/HL small / large % in cell and opposite in its neighbours

Frequent periods of confusion or memory loss (%); 2011 Census for 1km grid cells

Self-reported health status



Estimates of rates using all people aged 75 or over as the denominator

Maximum is > 100; obviously many people with frequent CML are aged under 75!

Frequent periods of confusion or memory loss (%); 2011 Census for 1km grid cells

Confusion and memory loss

1. Moderately strongly related to the percentage of persons aged 75 plus (*r* squared = 0.202)
2. Weakly related to socio-economic classification (*r* squared vs. NSSEC 8 = 0.0344)

Assessment of spatial relationships with other demographic, social and economic variables > what are the characteristics of areas with the greatest challenges?

Also, access to services…

Ongoing…

1. Linking dementia estimate with data on confusion or memory loss
2. Expanded analysis of associations between rates and access to resources (e.g., deprivation and dementia)
3. Incorporating projections by age to estimate future changes in dementia rates

Future aim of seeking dementia patient counts for Super Output Areas via CLIP…

Web-based mapping resource

The resource will enable users to view data for small areas (super output areas and 1km grid squares):

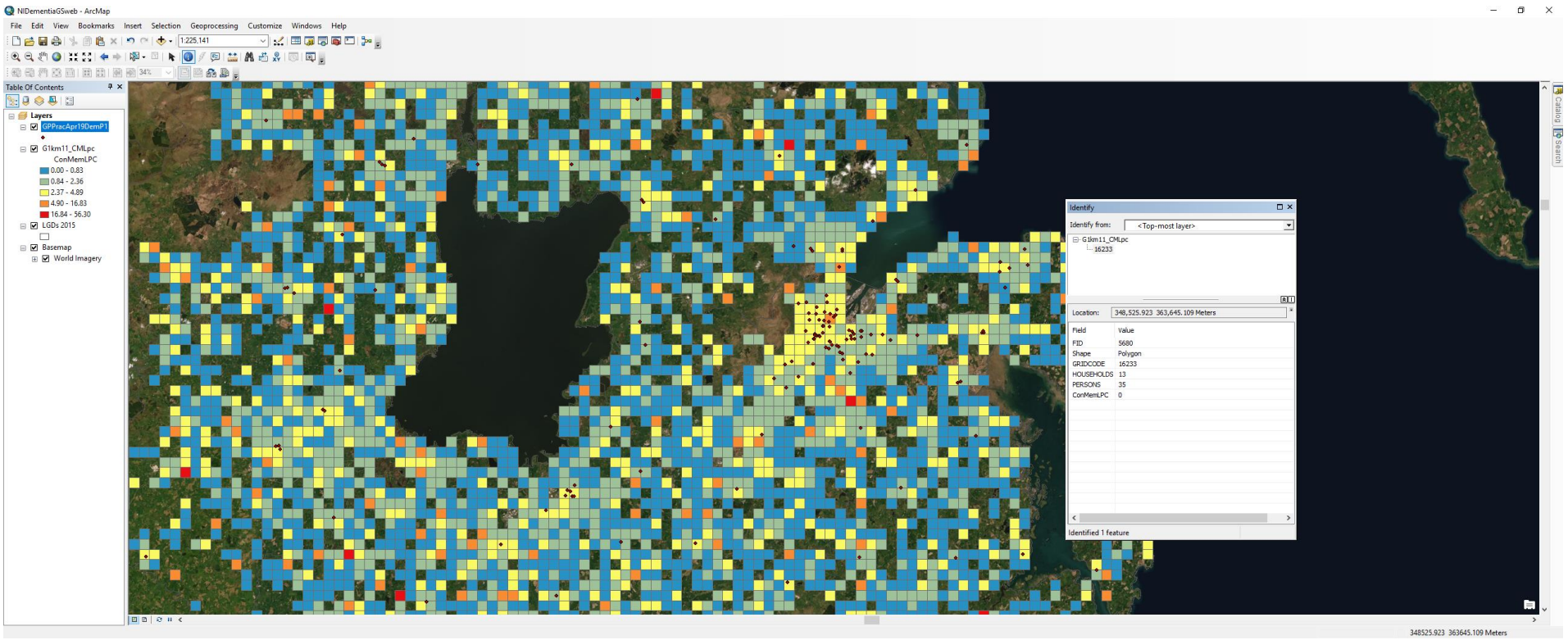
1. Dementia rates, and rates of people with frequent confusion or memory loss
2. Age profiles, deprivation scores, and other characteristics
3. An index of access to health care resources
4. Projected age profiles (20 years +)

Plus, data on individual health care facilities and background maps will be included

Web-based mapping resource

The resource will enable users to:

1. Select areas with specific characteristics
2. Zoom in and pan around NI
3. Extract characteristics of individual areas



Example: Map of rates of frequent confusion or memory loss with GP locations superimposed and image base map – zoomed into mid/east NI

Questions could include:

- Where are dementia rates highest?
- Where are older age groups projected to grow fastest?
- Where is access to core health resources poorest and where is demand likely to grow fastest?
- What facilities are available in my area?

Any Questions?