
Geographical Info Systems

Assignment 2 – Report

Census Data 2011-2016: Geographical Analysis

Module code : CMPU4032: 2022-23

Ciaran Finnegan

Student No : d21124026

TU060 Yr. 2

Data Science MSc

29/11/2022

Table of Contents

| | | |
|----------|--|----------|
| 1 | Assignment Overview..... | 3 |
| 1.1 | High Level Description – Census Data Analysis (2011-2016)..... | 3 |
| 2 | Data and Maps | 4 |
| 2.1 | Changes in Unemployment Rates Between 2011 and 2016 | 4 |
| 2.2 | Correlation of Education Levels to Unemployment | 6 |
| 2.3 | Correlation of Education Level to Socio-Economic Group..... | 6 |
| 2.4 | Correlation of Education Level to Occupation Status..... | 7 |
| 3 | Insights and Conclusions..... | 8 |
| 3.1 | Changing Patterns in Rates in Employment | 8 |
| 3.2 | Relation of Education to Unemployment..... | 8 |
| 3.3 | Socio-Economic Groups and Education | 8 |
| 3.4 | Occupation Status and Education | 8 |



1 Assignment Overview

1.1 High Level Description – Census Data Analysis (2011-2016)

This document covers the design, implementation, and observations on all parts of the November 2022 CA(2) for the GIS module (TU060 – DS – Year 2).

The geographical focus of this report is on the central and northern Electoral Divisions in Dublin County. The *central* areas also cover the Electoral Divisions in the Dublin South-Central and South-East constituencies.

The purpose in limiting the scope to these areas is to concentrate more on the perceived 'east-west' socio-economic divide in north and central Dublin, as opposed to the more traditional 'north v south' narrative.

Section 2 displays a series of maps highlighting the following data points from the 2011 and 2016 Irish census data;

- How employment rates have changed in the EDs from 2011 to 2016.
- Distribution of education Levels across EDs, and how this relates to levels of unemployment.
- The impact of education Levels on socio-economic groups in central and north Dublin EDs.
- The relationship of occupation types to education within the selected EDs.

The Electoral Division data is taken from the 2011 and 2016 **.csv** data files. For simplicity, the Constituency names/borders from 2011 have been preserved but the Electoral Divisions, which is the key geographical unit for this report, are unchanged across the census periods.

2 Data and Maps

2.1 Changes in Unemployment Rates Between 2011 and 2016

The maps below compare the change in unemployment rates in the workforce population across the central and north Dublin Electoral Divisions between the 2011 and 2016 Census readings.

Figure – 2011 Unemployment Rates

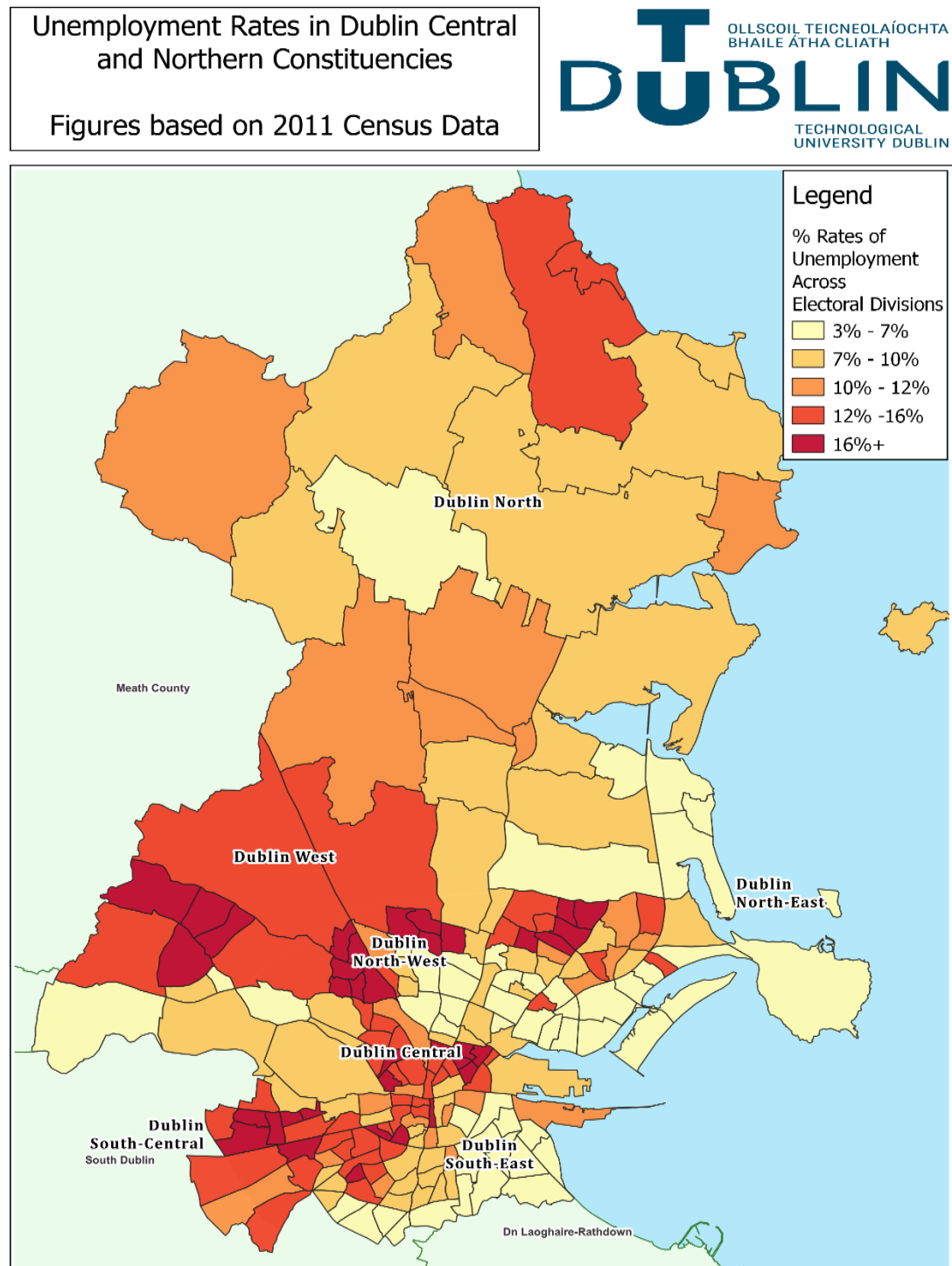
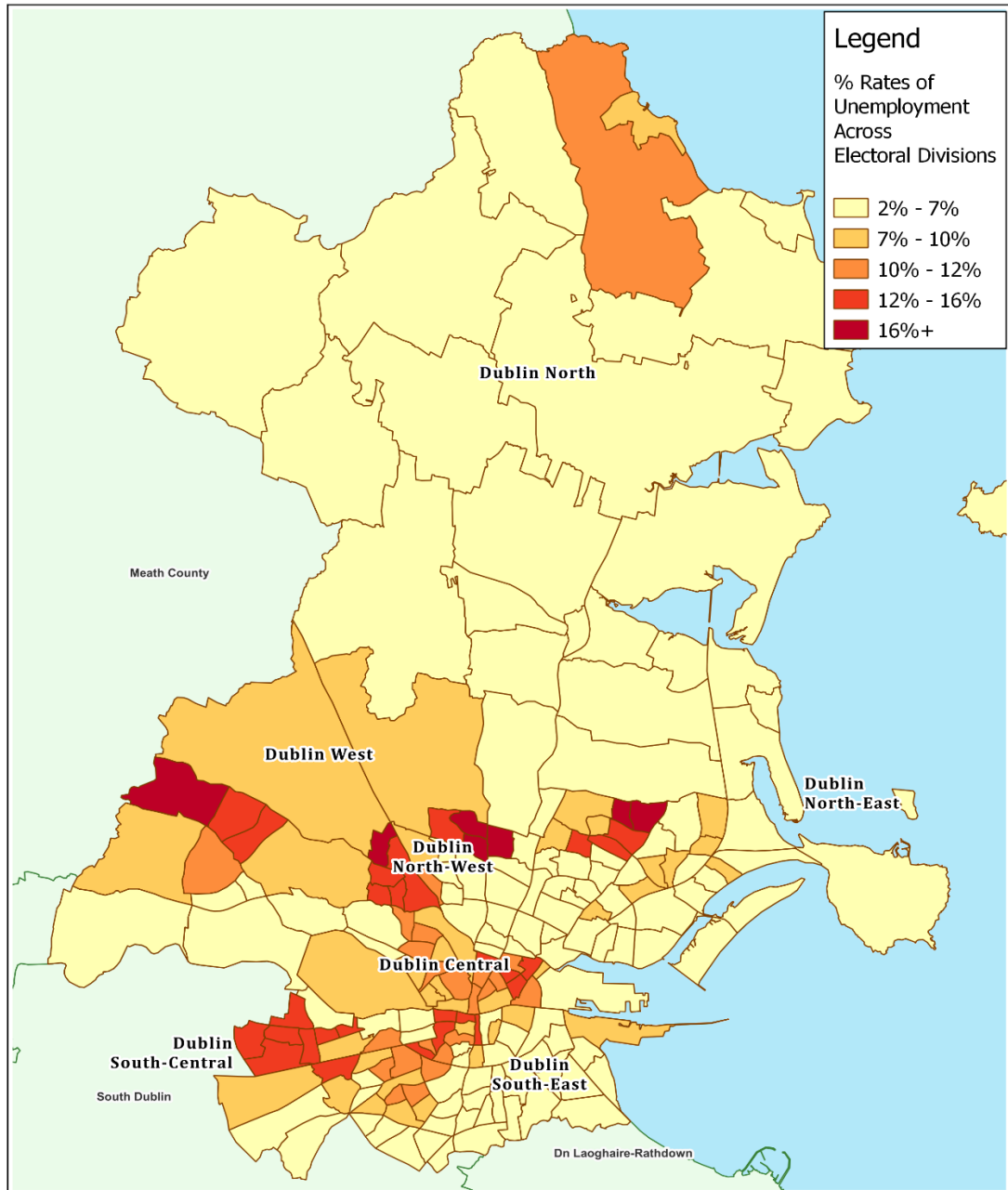
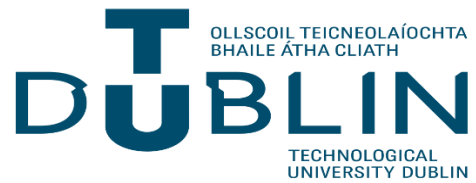


Figure – 2016 Unemployment Rates

Unemployment Rates in Dublin Central and Northern Constituencies

Figures based on 2016 Census Data



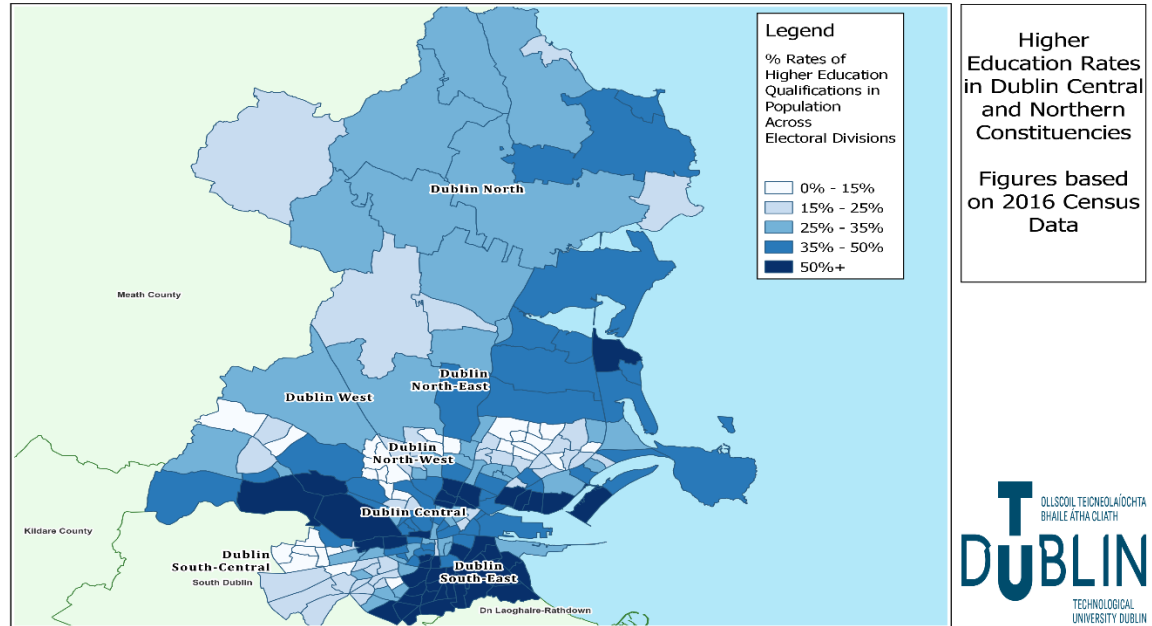
The unemployment rates are noticeably lower in the 2016 data. It will be interesting to determine if this trend continues to improve when the 2022 census data becomes available.

This 2016 visualisation of unemployment rates in the region will be a touchpoint reference for the analysis of other 2016 data points in the following sub-sections.

2.2 Correlation of Education Levels to Unemployment

The distribution of education levels in the 2016 Irish Census data for the chosen Electoral Divisions generates the visualisation below.

Figure – 2016 Rates of Higher Education

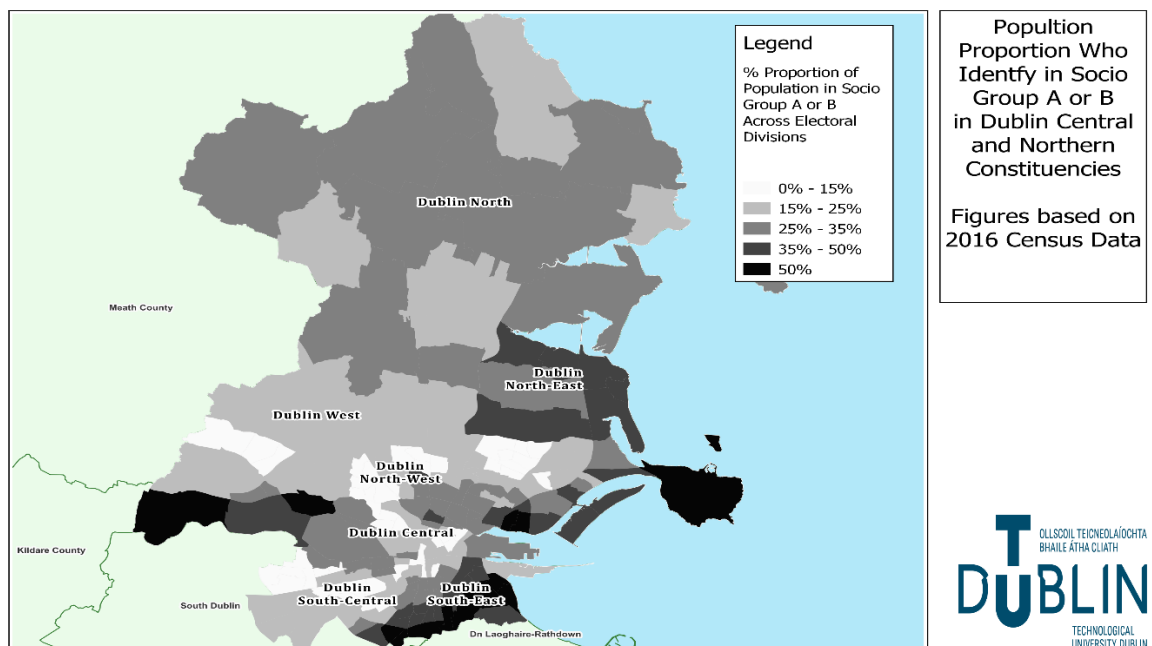


The census data has been collated to group together all individuals who have qualified with an ordinary bachelor degree/national diploma or higher.

2.3 Correlation of Education Level to Socio-Economic Group

With reference to the map visualisation in Section 2.2, the figure below shows the distribution of socio-economic groups in the Electoral Divisions in our study.

Figure – 2016 Population Rate in the A or B Socio-Economic Group



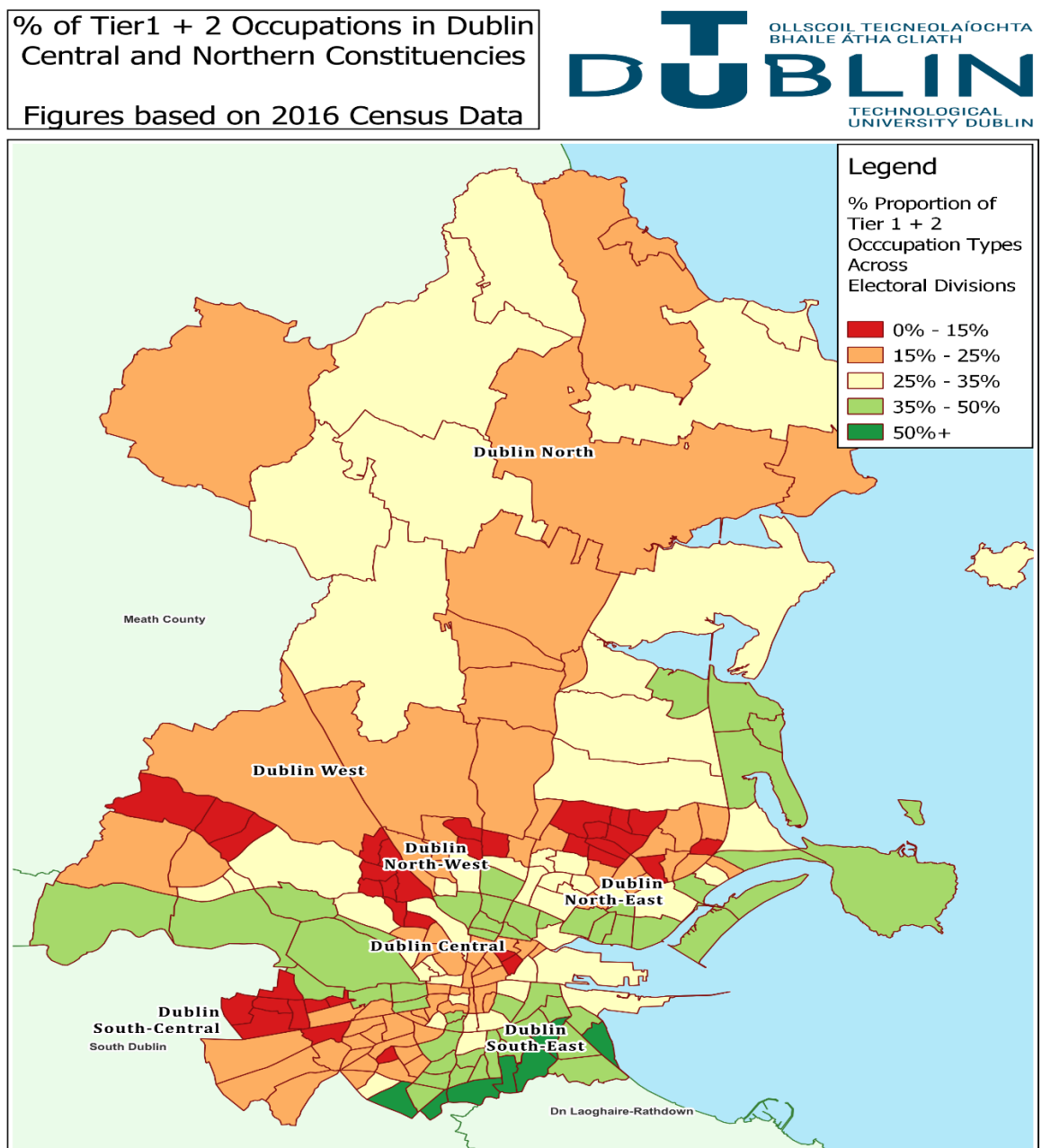
The % of the population of each Electoral Division who classify themselves as belonging to socio-economic groups A (*Employers and Managers*) and B (*Higher Professional*) are collated into a single band. This size of this A+B group is compared against all other Socio-Economic groups in each Electoral Division.

2.4 Correlation of Education Level to Occupation Status

This figure is closely related to the map visualisation in Section 2.3 as it looks at occupation types from the 2016 Census.

Again, the population in each Electoral Division who identify in the top two tiers of occupation type (Managers, Directors, Professionals) are grouped together and compared against numbers in the ED recorded against other occupations.

Figure – 2016 Population Rate in the A or B Socio-Economic Group





3 Insights and Conclusions

3.1 Changing Patterns in Rates in Employment

It is clear that employment rates have significantly improved in the period since the 2011 economic collapse, particularly in EDs in the Dublin North constituency.

However, stubborn pockets of higher unemployment remain in areas such as Mulhuddart, Finglas, and Ballymun, highlighting the challenges which persist in these areas.

3.2 Relation of Education to Unemployment

A comparison of the distribution of education levels in our Electoral Divisions against the 2016 unemployment map in Section 2.1 shows a clear correlation.

Areas of persistent unemployment in the 2011 and 2016 Census data, such as Ballymun and Finglas, have the lowest figures in terms of population with a third level qualification. There will obviously be a multitude of factors effecting unemployment rates, but lack of access to higher education is clearly an issue in certain sections of northern Dublin.

The hypothesis that populations with higher academic qualifications are inordinately concentrated in certain areas appears to be validated by the map in Section 2.2. As an example, there is a clear cluster of Electoral Divisions in the Clontarf area with strong rates of higher education (dark blue), in contrast to the lighter 'less affluent' neighbouring Divisions.

3.3 Socio-Economic Groups and Education

The positive correlation between those who identify as members of the A or B socio-economic groups and their rates of third level education is present, but it is not as striking as the observations discussed in Section 3.2 above.

One notable observation is the clear preference for Dublin's 'elite' to live in the fashionable Electoral Divisions in Howth.

3.4 Occupation Status and Education

Unsurprisingly, those with prominent levels of education tend to correlate to the higher occupation bands in the 2016 Census.

It is noticeable that the spread of higher occupation types is not as marked as the A and B socio-economic groups. In fact, there is a definite cluster of type 1 and 2 occupation types, as defined in the 2016 Census, in the southernmost Electoral Divisions in the Dublin South-East constituency. This probably reflects the fact that these Electoral Divisions border on the more affluent areas of Dun Laoghaire-Rathdown (not included in this analysis).

Again, the Electoral Divisions with the lowest rates of third level education largely correlate to those areas with the lowest population of Type 1 and 2 occupations.