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UNIVERSITY OF LIMERICK
OLLSCOIL LUIMNIGH

School of Medicine

Professor Liam Glynn
liam.glynn@ul.ie

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5. NPA Regions Versus Non-NPA Regions (data to 28-02-2021)

5.1 Introduction

Many countries post regular updates about geographical breakdown of COVID-19 cases and deaths in order to inform and engage the public. Analysing these data can give us important information about a country's COVID-19 response. We aimed to examine if rurality and low population density is protective against COVID-19 infection and death by examining rates of COVID-19 infections and deaths in NPA versus Non-NPA regions in the same country.

5.2 The Data

Table 8 lists cases and deaths in each country, and where possible then splits out the data from each country into NPA and non-NPA regional data.

Table 1- Cases and Deaths data to 28th Feb 2021 – data are split out by NPA regions (Blue text headings) and non-NPA regions (Orange text headings), where available

COUNTRY (ordered by Deaths per 100,000)	Total Number of COVID-19 Cases + (per 100,000)	Total Number of COVID-19 Deaths + (per 100,000)	NPA regions Cases	NPA regions Deaths	non-NPA regions Cases	non-NPA regions Deaths
Greenland [57k]	30 (52.6)	0 (0.0)	All (-)	All (-)	- (-)	- (-)
Faroe Islands [49k]	658 (1351.7)	1 (2.1)	All (-)	All (-)	- (-)	- (-)
Iceland [339k]	6,049 (1784.2)	29 (8.6)	All (-)	All (-)	- (-)	- (-)
Norway [5.5m]	70,953 (1286.3)	622 (11.3)	17,811 (779.3)	not available	53,142 (1724.3)	not available
Finland [5.5m]	58,359 (1057.6)	742 (13.4)	8,201 (534.1)	not available	50,158 (1251.3)	not available
Ireland [4.9m]	214,866 (4381.4)	3,882 (79.2)	65,896 (3994.6)	1,061 (64.3)	148,970 (4786.6)	2,821 (90.6)
Northern Ireland [1.8m]	109,121 (5989.1)	2,056 (108.6)	87,965 (5674.8)	1,677 (108.2)	21,156 (6159.0)	379 (110.3)
Sweden [10.2m]	680,130 (6648.4)	12,977 (126.9)	50,849 (5662.6)	887 (98.8)	629,281 (6673.5)	12,090 (128.2)
Scotland [5.4m]	202,084 (3705.2)	9,573 (175.5)	9,228 (1701.1)	409 (75.4)	192,856 (3919.2)	9,164 (186.2)

It may be noted that the data to 28th February 2021 at regional level is different to that used in other sections for Ireland, the UK and Sweden. Typically, statistical bodies in each country reported the detailed regional level data, whereas departments of health publish the open data relating to COVID-19 cases and deaths.

In Ireland, the deaths data at regional level is less complete than that reported in Table 4, as the regional breakdown does not include “probable deaths”. This means the estimate for total deaths in Ireland is 10% less than the figure quoted by the department of health (see Table 4). In the UK, the opposite is true, where deaths data at regional level are more complete than official department of health data.

As intra-country comparisons (i.e. NPA versus non-NPA regions within a given country) is the main focus of this section, differing granularity of reporting is less important. While data are very different between countries, reporting within countries is consistent across regions and so we can test the hypothesis that living in an NPA region translates to lower risk from COVID-19.

5.3 The Data mapped

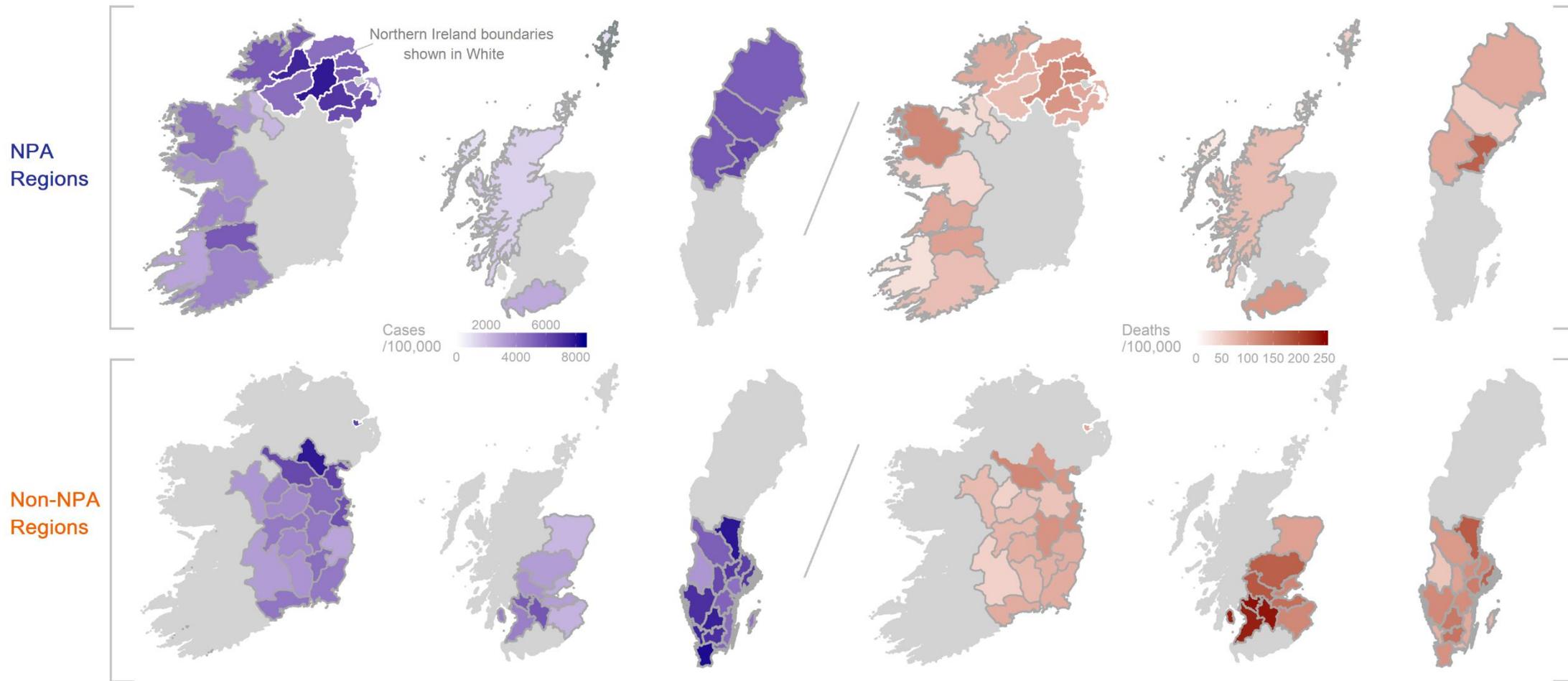


Figure 1- COVID Cases (blue) and Deaths (red) for Ireland, Northern Ireland, Scotland and Sweden- each country is broken into NPA regions (top) and non-NPA regions (bottom)

Looking at the map of Ireland, Northern Ireland, Scotland and Sweden (Figure 12), we can see that where COVID-19 activity is high, COVID-19 mortality is correspondingly high.

However, case levels depend on testing systems, whereas COVID-19 deaths can be a more robust measure of the impact of the pandemic. Interestingly areas of high case density on the island of Ireland, i.e. darker blue areas on the left hand maps, do not generate very high death rates deaths when compared to the Scottish maps.

The Scottish maps show comparatively high death rates in the non-NPA regions of Scotland, whereas these same areas are not associated with high density on the blue/case graph on the left hand side of the image. This again likely reflects under-testing or more unchecked spread in Scotland, possibly in conjunction with more nursing home outbreaks and/or a more vulnerable population.

5.4 Calculating COVID-19 burden for NPA regions vs non-NPA regions

Table 8 shows that for each country with NPA and non-NPA regions, the NPA regions see significantly less COVID-19 cases and less COVID-19 deaths. Using the data from Table 8, and with the number of citizens who live in the designated NPA regions, Table 9 demonstrates the combined case and death data for all NPA regions versus non-NPA regions where data are available.

Table 2- COVID-19 burden in NPA vs non-NPA countries

COUNTRY [population] (ordered by Deaths per 100,000)	NPA population	NPA regions Cases	rate/ 100,000	NPA regions Deaths	rate/ 100,000	non-NPA population	non-NPA regions Cases	rate/ 100,000	non-NPA regions Deaths	rate/ 100,000
Norway [5.5m]	2,285,621	17,811	(779.3)	not available		3,081,966	53142	(1724.3)	not available	
Finland [5.5m]	1,535,445	8,201	(534.1)	not available		4,008,356	50158	(1251.3)	not available	
Ireland [4.9m]	1,649,627	65,896	(3994.6)	1,061	(64.3)	3,112,238	148970	(4786.6)	2,821	(90.6)
Northern Ireland [1.8m]	1,550,100	87,965	(5674.8)	1,677	(108.2)	343,500	21156	(6159.0)	379	(110.3)
Sweden [10.2m]	898,010	50,849	(5662.4)	887	(98.8)	9,429,662	629281	(6673.4)	12,090	(128.2)
Scotland [5.4m]	542,470	9,228	(1701.1)	409	(75.4)	4,920,830	192856	(3919.2)	9,164	(186.2)
Totals	8,461,273	239,950	2,835.9	4,034	47.7	24,896,552	1,095,563	4,400.5	24,454	98.2

While it should be noted that NPA regions in each country account for very different proportions of the population (42% of citizens in Norway live in an NPA region, while the corresponding figure for Sweden is 9%), Table 9 shows us that non-NPA regions have seen 55% more cases and approximately twice as many deaths per 100,000 citizens compared to NPA regions. It would appear that living in a community in an NPA region has conferred a particular advantage in reducing the health impact of the COVID-19 global pandemic in comparison to non-NPA regions.

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