Regional Variation in Health

ABSTRACT

This research project focused on whether subjective and objective markers of health provide the same information. Three main research questions were established:

1. How does self-rated health vary by region?
2. How does obesity vary by region?
3. Is regional variation in self-rated health caused by regional variation in obesity?

METHODOLOGY

The data used within this research project was from the Understanding Society dataset, Waves 2 and 3. Multinomial logistic regression was the main method carried out. This is used to predict 'the probability of category membership on a dependent variable based on multiple independent variables' (Starkweather and Moske, 2011: 1).

Self-rated health was researched into first in order to see if any regional patterns appeared to exist. The biomarker Body Mass Index (BMI) was then researched into to see if similar patterns existed. Both self-rated health and BMI were recoded into binary variables for comparative purposes.

Lastly, the relation between BMI and self-rated health was investigated into, in order to understand the relation between subjective and objective markers of health.

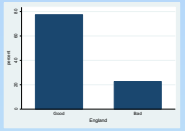
REFERENCES

- Bomback, A. E (2013), 'Self-Rated Health and Public Health: A Critical Perspective', *Front Public Health*, 1 (15)
- Sridharan, S., Tunstall, H., Lawder, R and Mitchell, R (2007), 'An exploratory spatial data analysis approach to understanding the relationship between deprivation and mortality in Scotland', *Social Science & Medicine*, 65, pp 1942-1952.
- Starkweather, J and Moske, A. K (2011), 'Multinomial logistic regression'. Accessed from: : http://www.unt.edu/rss/class/Jon/Benchmarks/MLR JDS Aug2011 (Accessed on 25th July 2016)

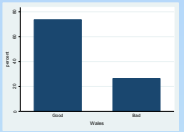
REGIONAL VARIATION IN SELF-RATED HEALTH

Secondary research was carried out looking into the Scottish Effect, with a great amount of evidence present suggesting that Scotland has higher morbidity rates than the rest of the United Kingdom. For example, Sridharan et al highlighted how the factor that makes Scotland prone to higher mortality and morbidity rates is unknown; 'it is not clear whether this missing factor is literally an unknown risk factor for disease, an unusual vulnerability among the Scottish population, or some wider social or physical environmental factor' (2007: 1943).

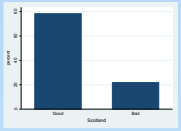
However, the Understanding Society dataset presented Wales to have worse self-rated health. This is a 'a simple, easy to administer measure of general health' (Bomback, 2013), as shown in the graphs 1-3 below. This occurs for the region as a whole, when stratifying for sex and controlling for other factors such as ethnicity. The implications this has suggests that there is something specific about living in Wales causing lower levels of satisfaction in self rated health. Alternatively, it could suggest that different expectations of health exist amongst the different regions.



Graph 1: Self rated health in England



Graph 2: Self rated health in Wales



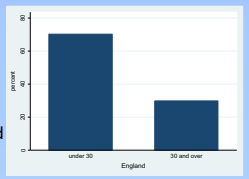
Graph 3: Self rated health in Scotland

REGIONAL VARIATION IN OBESITY

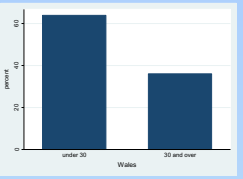
Regional variation relating to Body Mass Index (BMI) was studied. This was used as a binary variable, with a BMI of 30 and above indicating the presence of obesity. Multinomial logistic regression was carried out, and the findings relating to regional variation in obesity correlated to the findings regarding regional variation in self-rated health. These found Wales to be more likely to have a BMI of 30 and above, after adjusting for a multitude of factors such as alcohol intake and National Statistics Socio-economic classification (NS-SEC). This suggests Wales' self-rated health correlates with the evidence produced by the biomarkers of health.

Subsequent to noticing this pattern, differences in localities were studied amongst the three regions. Using Urban England as the base category, the odds ratios are shown in Graph 7. The data presents how the odds of being obese were greater in urban areas respective to each country. For example, Urban Wales has an odds ratio of 1.4, whereas Rural Wales has a smaller value at 1.25.

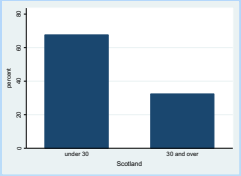
Graph 7: Multinomial logistic regression; obesity relating to BMI of 30 and above



Graph 4: BMI in England



Graph 5: BMI in Wales



Graph 6: BMI in Scotland

RELATIONSHIP BETWEEN REGIONAL VARIATION IN SELF-RATED HEALTH AND REGIONAL VARIATION IN OBESITY.

The below multinomial logistic regression demonstrates the relationship between regional variation in self-rated health and regional variation in obesity, with the different models progressively adding more factors. Variables such as the General Health Questionnaire (GHQ) and Alcohol Intake have been removed from the model due to the presence of missing values reducing the sample size. Taking England as the base category, the greatest explanation for regional variation in obesity within Wales appears evident in Model 5, where the odds ratio reduced from 1.15 in Model 1 to 1.05 in Model 5. However, Model 5 contains a p value of 0.628, and confidence intervals at the 95% level at 0.86 and 1.27. Subsequently, it is difficult to make a conclusion regarding the explanation for regional variation in self-rated health and obesity, due to the likelihood of this explanation being due to chance.

Region	MODEL 1 Region, Sex, Age			MODEL 2 Region, Sex, Age and Demographic Factors (Ethnicity, Employment Status and Income)			MODEL 3 Region, Sex, Age, Demographic Factors, LSI* and Recent Illness			MODEL 4 Region, Sex, Age, Demographic Factors, LSI*, Recent Illness and Behavioural Factors (Smoking Status)			MODEL 5 Region, Sex, Age, Demographic Factors, LSI*, Recent Illness, Behavioural Factors and BMI			MODEL 6 Region, Sex, Age, Demographic Factors, LSI*, Recent Illness, Behavioural Factors, BMI and Medication (Taken, Number Taken)		
	OR	P Value	CI (95%)	OR	P Value	CI (95%)	OR	P Value	CI (95%)	OR	P Value	CI (95%)	OR	P Value	CI (95%)	OR	P Value	CI (95%)
Wales	1.15	0.084	0.98, 1.35	1.07	0.410	0.91 1.28	1.1	0.324	0.91, 1.33	1.09	0.378	0.9, 1.32	1.05	0.628	0.86, 1.27	1.08	0.454	0.88, 1.32
Scotland	0.97	0.673	0.82, 1.14	0.96	0.661	0.8, 1.15	1	0.996	0.82, 1.22	0.97	0.779	0.79, 1.19	0.95	0.652	0.78, 1.17	0.88	0.237	0.71, 1.09

*LSI=Long Standing Illness OR=Odds Ratio CI=Confidence Interval

CONCLUSIONS

The findings regarding regional variation in self-rated health and regional variation in obesity have provided some evidence to show that Wales has significantly worse self-rated health and greater odds of having obesity in comparison to England and Scotland. This is after adjusting for factors such as NS-SEC job classification, alcohol intake, smoking status and ethnicity, and also stratifying for variables such as sex. Limitations persist in the extent to which the relationship between this regional variation in self-rated health and the regional variation in obesity can be explained for due to the existence of extremely large p values. Subsequently, the use of multinomial logistic regression regarding the Understanding Society dataset has minimal influence based on the limited understandings that can be derived.