



## Ethnic density and risk of mental ill health – The case of religious sectarianism in Northern Ireland: A population data linkage study



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### ABSTRACT

An ethnic group that lives in a neighbourhood in which it is in the minority, termed 'lower ethnic density,' tends to report a higher incidence of mental ill-health. This population-based study investigated for the first time the existence of an own-group density effect among Catholic and Protestant communities in Northern Ireland. The entire Northern Ireland born Catholic and Protestant working age ( $n = 1,004,060$ ) enumerated population in the 2011 Census of Northern Ireland were included in the study via administrative data-linkage methodology. Catholics had a greater likelihood of reporting mental ill health in neighbourhoods with the largest proportion of Catholics (OR = 1.25, 95%CI 1.07–1.47), whereas mental health among Protestants was not associated with neighbourhood proportion of Protestants, after adjusting for socio-economic status and neighbourhood deprivation. The results indicate that a complex relationship exists between group identity, population composition of ethnic and religious groups and prevalence of community mental health.

### 1. Introduction

Elevated psychiatric morbidity has been found across ethnic minority groups (Shaw et al., 2012; Neeleman et al., 2001). Theories that minority ethnic groups tend to be more vulnerable to social exclusion, unemployment and insecure housing, all of which have been associated with risk for mental ill health (Muntaner et al., 2013), or that such groups have been victim to institutional racism in diagnosis and access to preventative interventions (Morgan and Hutchinson, 2010), have been insufficient in fully explaining the complexity of this increased risk (Brown et al., 2007). Considering neighbourhood effects has provided further insight; ethnic minority individuals have an increased incidence of mental health difficulties, compared to the rest of the population, when living in a neighbourhood in which their own group is a minority and a relative decrease in incidence when their group is in the majority, regardless of individual or neighbourhood deprivation (Schofield et al., 2010; McKenzie et al., 2003). This has been termed the ethnic density effect.

Mechanisms to explain this phenomenon include exposure to racism, which is directly linked to increased mental health difficulties (Williams and Williams-Morris, 2010) and more likely to occur in low ethnic density areas (Bécares et al., 2009); poorer access to appropriate and accessible services (Whitley et al., 2006); and lower social capital, greater social isolation and greater social marginalisation (Kirkbride et al., 2009). If the effect is related to the experience of being a minority then it would be reasonable to conclude that this effect would also be found within other types of minority groups. Indeed, some studies have found an effect for French speaking residents in Canada (Pickett and Wilkinson, 2008) and for single parents (Driessen et al., 1998).

Studying the neighbourhood density effect in Northern Ireland offers a unique opportunity, given that the population of Northern Ireland is made up of a large minority (45.14% Catholic) and small majority (48.36% Protestant (NISRA, 2013)). Religious affiliation is of ongoing social importance since the official end of the civil conflict known as 'The Troubles' with the signing of the Good Friday

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Agreement in 1998. The Troubles led to the violent deaths of over 3500 people, in a population of approximately 1.5 million; with many more injured or psychologically traumatised (Mulholland et al., 2008). Christian religious denomination has become amalgamated with a polarisation of complex cultural, ethnic and political affiliation associated with predominantly Catholic nationalism or Protestant unionism. Sectarian motivated prejudice and discrimination manifests itself through distinctions made using names, accents, or place of birth (Muldoon et al., 2007; Northern Ireland Human Rights Commission, 2011). Although the two groups are clearly not homogenous (O'Reilly and Rosato, 2008), the Catholic and Protestant polarisation has become evident in the religious segregation of neighbourhoods across Northern Ireland (Shuttleworth et al., 2011). Neighbourhoods in Northern Ireland can be highly concentrated by religion with up to 98% of the population belonging to the dominant group, with territories marked through flags, murals and overt political affiliations. The segregation of neighbourhoods has increased over time since the early 1970s, particularly during the Troubles, due to the migration of people to own-group areas in search of safety (Schmid et al., 2008). Today, around 40% of the population live in these highly divided neighbourhoods, which also tend to have relatively high rates of income deprivation. There are over 80 interface barriers separating highly Protestant and highly Catholic neighbourhoods, including walls, barriers and gates. They are located across Northern Ireland, predominantly in the largest urban conurbations of Belfast and Derry, and their continuing existence reflects the ongoing tension between adjacent communities (Byrne et al., 2012). Still, a substantial proportion of neighbourhoods in Northern Ireland are well mixed between the two dominant groups. Northern Ireland therefore provides a comprehensive range of population densities for research purposes.

This study therefore aims to establish if a neighbourhood own-group density effect exists for both Catholic and Protestant affiliated populations on the prevalence of mental health conditions, measured as self-reported mental health from the 2011 Census of Northern Ireland. Given past research on the protective effect of own-group ethnic density for ethnic minorities, this study hypothesises that a) a protective own-group density effect will exist for both Catholics and Protestants respectively, and b) the effect will not be entirely explained by socio-economic disadvantage.

## 2. Method

### 2.1. Data

Data linkage methodology was used as part of the Northern Ireland Mortality Study (NIMS) which holds data on the entire population of Northern Ireland enumerated in the 2011 Census ( $n = 1.811$  million). Data for this study was therefore derived from working age residents of Northern Ireland who responded to the 2011 Census, and linked to publicly available neighbourhood data held by the Northern Ireland Neighbourhood Information Service (NINIS). Census and Neighbourhood datasets were linked using anonymous one-way encryption methods by the data custodians at the Northern Ireland Statistics and Research Agency (NISRA), and the anonymous data was made available to the research team. After analysis, final output was screened by the Northern Ireland Longitudinal Study (NILS) Research Support Officers for non-identifiability and approved final output released for publication. Ethical approval was obtained from both the School of Medicine, Dentistry and Biomedical Sciences, Queen's University Belfast, and NISRA, who conform to the principles embodied in the Declaration of Helsinki.

Prior to analysis, those aged less than 18 years old ( $n = 405, 123$ ), more than 75 years old ( $n = 105,149$ ), living in an institution ( $n = 10,791$ ) or with imputed data for age, sex or mental health ( $n = 44,232$ ) were excluded. Remaining individuals who self-reported as 'no religion' ( $n = 50,539$ ) or 'other religion' ( $n = 11,615$ ) were also excluded, as well

as those remaining who were not born in Northern Ireland ( $n = 123,513$ ). This was predominantly people born in the rest of the United Kingdom or the Republic of Ireland (approximately 67.43%). Any non-response (missing) data was included as a separate category. The number of non-responses varied by Census question, and was only present for home ownership ( $n = 76,291, 7.60\%$ ) and settlement band ( $n = 18,342, 1.83\%$ ).

### 2.2. Variables

#### 2.2.1. Socio-demographic variables

Variables derived from the Census were age, gender, religion, country of birth, marital status, and socio-economic status which included qualifications, housing tenure, housing value, and car ownership. Religion ('Catholic' vs. 'Protestant/Christian other including Christian-related') was an amalgamation of two Census questions, where if an individual did not report their religion 'brought up in' then their response to their religion 'belonging to' was used. Country of birth was grouped into those born in Northern Ireland, those born outside of Northern Ireland and those for whom the question was not required, such as students. Qualifications include GCSEs and A-levels, referring to the United Kingdom examinations at the end of secondary school (age 14–16) and high school (age 16–18) respectively. Housing tenure and value were grouped, where a value was assigned to those who own their property outright, with a mortgage or part-owned. The renting variable included those renting with or without housing benefit, or who are living rent-free. Housing value was derived from capital values not exempt from local taxation in 2005. Exemptions include properties that are second homes, empty or student housing. A variable for movement between neighbourhoods in the last 12 months was created using the Census question on current and past addresses, which included a category for term-time movement of students.

#### 2.2.2. Area-level measures

Data from the Census were linked to publicly available neighbourhood data held by NINIS to determine religious neighbourhood density and area deprivation. For density, data were linked using the 4537 Census Small Area codes which have a mean size of 399 people ( $SD = 202.97$ ) per neighbourhood. Small Areas were sorted and converted into deciles from low to high religious density using religion 'brought up in' and calculated separately for Catholics and for Protestants. For area deprivation, data were linked using the 890 Super Output Area codes which have a mean of 2035 residents ( $SD = 547.28$ ) using an Income Domain Score created in 2010, which was converted into quintiles from high to low area income deprivation (NISRA, 2010). The score is derived by identifying the proportion of individuals on income-related benefits and tax credits in each Small Area. Due to data anonymity rules, Census Small Area codes were not obtainable at the individual level and could not be used in a multi-level analysis. Super Output Area identifiers were therefore used instead in a multi-level model to adjust for any unobserved neighbourhood effects.

#### 2.2.3. Outcome measure

A dichotomous self-reported mental health status was derived from a census question which asks whether the individual has had 'an emotional, psychological or mental health condition (such as depression or schizophrenia)' which has lasted, or is expected to last, at least 12 months'.

#### 2.2.4. Statistical analysis

Three multi-level logistic regression models were run. The first multi-level model was unadjusted and included only individual religion and neighbourhood density based on religion. The second multi-level model was adjusted for individual socio-economic characteristics (sex, age, marital status, highest qualification, housing tenure and car ownership). The final fully adjusted multi-level model adjusted for

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