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Ethnic mortality estimates for the UK – how reliable are they?

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The ethnic composition of the UK is changing and diversity is increasing. By 2011, about 20% of the population in England and Wales considered their ethnic belonging as other than White British (Jivraj and Simpson, 2015). Still, information on mortality for ethnic groups, an important population health indicator, is not routinely collected. This even though numerous UK health studies found varying health outcomes by ethnic group and immigrant mortality also varies significantly between groups.

In the course of developing population projection for UK ethnic groups (Rees et al, 2009, Rees et al, 2011), we estimated ethnic mortality by combining information on the spatial distribution of ethnic groups and overall mortality with our Geographical Distribution Method (GDM).

Geographical Distribution Method

The GDM has minimal data requirements. All that is needed are sub-national mortality rates for the total population by age and sex of the country of interest. In the case of the UK we work with 328 areas for England, 22 for Wales, 32 for Scotland and 26 for Northern Ireland. In addition we need the total population as well as the ethnic population in the same data structure.

Formally, the estimates of the national mortality rates by GDM for each ethnic group are generated thus:

$$m^{c}_{exg} = \sum_{i} \{ m^{i(c)}_{xg} (P^{i(c)}_{exg} / \sum_{i} P^{i(c)}_{exg}) \}$$

where

m	= mortality rate	e	= ethnic group
i	= local area	x	= age
c	= country	g	= gender
		p	= population

To explain this in words: Each ethnic group has a certain proportion of its overall population in a local area. The assumption is that the overall national mortality rate of a group is made up of equivalent proportion of mortality rate of each area. For example if 50% of group Z live in area A and 25% in area B in 25% in area C, then the national mortality rate of group Z would be made up of 50% of the mortality rate of area A and to 25% of that of area B and 25% of that of area C.

Example results from applying GDM

When applied to ethnic populations in England and Wales by nativity we found significant variations in mortality between groups for the part of the population that was born in the UK, shown in the Figure below as life expectancy at birth (LE). Five groups had significantly lower LE compared to the White British majority; these were White and Black African group, the White and Black Caribbean group, the Pakistani and Bangladeshi group and the Other Black group. Two groups, the White Other group and the Black African group, had significantly higher LE.

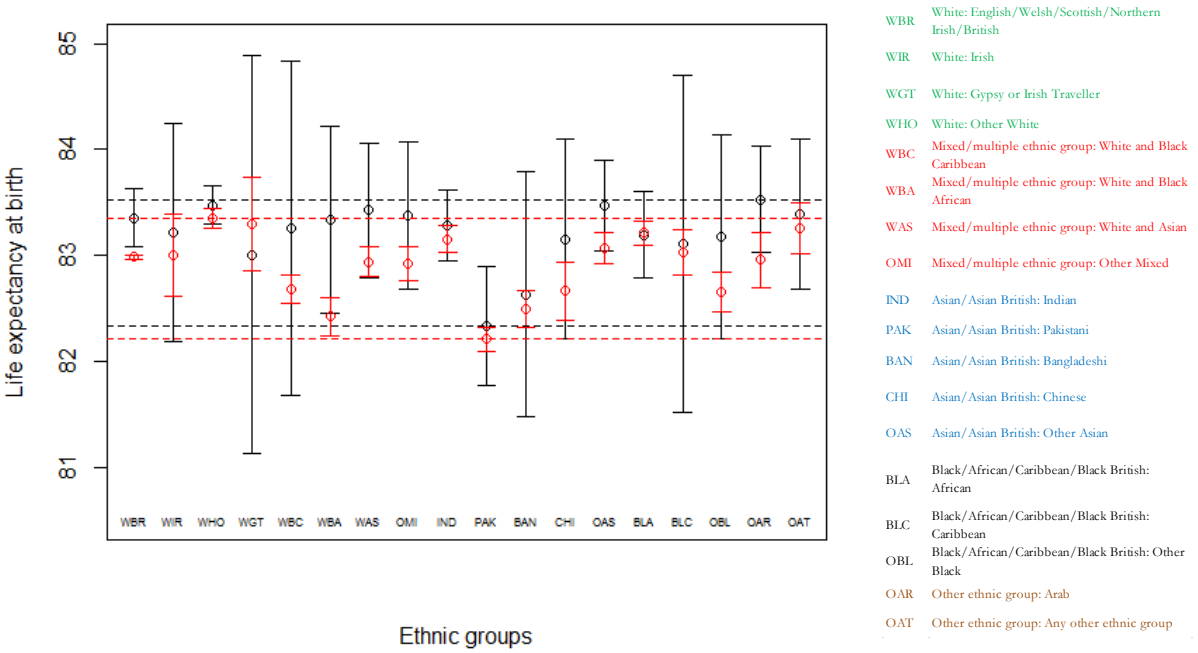

Figure Life expectancy at birth for women and different ethnic groups in England and Wales in 2011, born abroad (black), born in the UK (red), with 95%CI.

Question: How reliable are these GDM estimates?

Even though we unearthed other studies using similar methods (Morris et al, 2014, North West Public Health Observatory, 2005) to estimate ethnic mortality, to our knowledge no validation of the method has ever been undertaken.

The aim of this study is to validate the method, using data from Northern Ireland. Northern Ireland is the only UK home country that has a 100% linkage of census population to the death register, with data held in the Northern Ireland Mortality study (NIMS). Traditionally only a small number of ethnic minorities lived in Northern Ireland compared to England and Wales, but the proportion of ethnic minorities doubled since 2001 and reached about 32400 by 2011. Nationally large ethnic groups in 2011 were Chinese, Indian, Mixed, Other Asian and slightly smaller Irish Travellers, with big enough numbers to robustly estimate mortality in these populations using NIMS data.

This study sets out to compare mortality estimates for ethnic groups using GDM with ethnic mortality estimates derived from actual data. Demonstrating the effectiveness of GDM is not only immensely useful for estimating ethnic mortality, but could encourage applying this method in any setting were demographic intensities are not actually measured.

References

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