



Synopsis of the method used to estimate the number of pandemic influenza (H1N1) 2009 cases in England in the week 21 to 27 July 2009

31 July 2009

The method currently used to obtain an estimate of the number of pandemic influenza (H1N1) 2009 cases relies on data from two surveillance systems: the QSurveillance® scheme, that provides an estimate of numbers consulting a GP with influenza-like illness (ILI); and the Royal College of General Practitioners (RCGP) and HPA Regional Microbiology Network scheme for swabbing clinically diagnosed cases.

The QSurveillance®-derived estimates of the daily number of people consulting their GP with a diagnosis of ILI are aggregated by age group (less than 1 year, 1-4 years, 5-14 years, 15-24 years, 25-44 years, 45-64 years, 65 years and older), by Strategic Health Authority (SHA) and by week (Tuesday to Monday). The sum of the average size of the GP lists for these categories is also obtained from QSurveillance®.

In data from the RCGP/HPA scheme, swabs are classified as positive or negative for pandemic (H1N1) 2009 virus: these results are used as the dependent variable in a 'mixed-effects' logistic regression model. Due to the small number of swabs taken in certain SHAs, the SHAs have been grouped into 4 regions: London, West Midlands, North (North East, North West, Yorkshire & Humberside, and East Midlands), and South (East of England, South Central, South East Coast, and South West). From this model, the estimated positivity rates for swabs is obtained by region for the same weeks and age groups as used for ILI consultations from QSurveillance®.

The observed number of ILI consultations from QSurveillance® was then multiplied by the estimated positivity rate in each of the SHAs, by age group categories for each week. These results were then scaled by the ratio of the 2007 ONS population estimates to the QSurveillance® population in each category. The resultant figures provide estimates of the numbers of pandemic (H1N1) 2009 cases in each week by SHA and age group that visit their GP.

There is currently no reliable information about the proportion of pandemic (H1N1) 2009 cases who consult their GP. It is thought, however, that this proportion is likely to lie within the range 0.2 (20%) to 0.5 (50%). This proportion is based on research demonstrating that approximately 10% of those with symptoms visit their GPs during normal flu seasons; and an assumption that this percentage is likely to be higher at present due to heightened awareness (and anxiety) about pandemic H1N1. Preliminary estimates from *flusurvey*, a system to monitor the activity of ILI in the population through the internet (www.flusurvey.co.uk), are within this range. These two extremes have been applied as scaling factors to the estimated numbers of pandemic (H1N1) 2009 cases who consult their GP to give a range within which the actual number of pandemic (H1N1) 2009 cases occurring in England that week is likely to fall.

The National Pandemic Flu Service (NPFS) became operational on 23 July and will undoubtedly have reduced the proportion of pandemic (H1N1) 2009 cases who consulted their GP within the week 21 July to 27 July. Again, there is no reliable information on how much the NPFS will reduce the proportion consulting their GP. However, under 1 year olds are not to be managed by NPFS and will continue to be referred to their GP. Therefore, for week 21 July to 27 July, an estimate of the reduction in the proportion consulted has been obtained from the relative increase in the estimated cases of pandemic (H1N1) 2009 in children under 1 compared to other age groups, excluding the 5 to 14 year olds and the over 65 year olds. These were not considered, as changes in cases could result from altered

mixing patterns due to the close of schools for the summer holidays (5 to 14 year olds), and the higher incidence of risk factors likely to result in GP referral (over 65 year olds). There was a relative reduction of around 10% in these age groups compared to the under 1 year olds and this has been assumed to be attributable to the NPFS. Thus, the scaling factors of 2 (50% of cases visit their GP) and 5 (20% of cases visit their GP) were increased to 2.22 and 5.56, respectively, for those aged 1 or older and under 65 in the week 21 July to the 27 July.

The figure provided in the HPA weekly pandemic flu update (110,000) represents a mid-point around the two likely extremes of pandemic (H1N1) 2009 cases.

In summary, the methodology attempts to adjust for the proportion of patients contacting the NPFS, but has continued to use Primary Care attendance (QSurveillance) and positivity rates from 'swabbing' practices within sentinel GP schemes (RCGP and RMN). These have been estimated from a 'mixed effects logistic regression model' using data by age group and Strategic Health Authority (some SHAs are grouped). The effects of NPFS on these other surveillance sources are uncertain and although adjusted for in the analysis, may be greater (or less) than that allowed. The introduction of these changes at the same time as school closures, which may well impact on transmission, mean that there are still uncertainties in the estimated figure.