

# Estimating the impact of the 2009 influenza A(H1N1) pandemic on mortality in the elderly in Navarre, Spain

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**To the editor:** We read with particular attention the article “Estimating the impact of the 2009 influenza A(H1N1) pandemic on mortality in the elderly in Navarre, Spain” by Castilla and colleagues [1].

We were surprised by the results and conclusion of the authors. They refer to a significant excess of deaths (Table 1: +4.9%,  $p=0.0268$ ) among adults aged 65 years or older during the pandemic period (weeks 24 to 52, 2009). When considering the average annual mortality rate for 2006–2008 compared to the same rate in 2009, the excess of deaths is non-significant (Table 1: +2%,  $p=0.47$ ). Because of the marked growth of the elderly population (the authors mention an increase of 10% in people aged 85 and more from 2006 to 2009), it would be preferable to use mortality rates rather than the numbers of deaths to compare the observed with the estimated deaths.

In Table 2, the authors estimate a significant excess of mortality of 9.9% in the population aged 65 years or older during the 12-week first pandemic wave (weeks 24 to 35) and a new non-significant excess of mortality during the second 10-week pandemic wave (weeks 40 to 49). If we compare those two periods on a weekly basis we observe 56 deaths per week (weeks 24 to 35) and 60 deaths per week (weeks 40 to 49). The authors report 208 cases of pandemic influenza A(H1N1) per week and 1,757 cases of pandemic influenza A(H1N1) per week, respectively, for these periods (Table 2). It would appear strange to have 1.07 times more deaths per week while at the same time 8.5 times more cases of influenza were observed per week. Furthermore, the numbers for laboratory-confirmed cases of influenza presented in Table 2 are higher in week 40 to 49 than for all other periods, which is not consistent with the conclusions. In the same table, the authors show a decrease of 4% in the number of deaths between week 36 and 39 during which 52 deaths per week and 346 cases of influenza per week were observed (see Table 2) but do not elaborate on those results.

The authors do not provide information about the percentage of the population aged 65 years or older in the number of cases during the two pandemic waves, while it is known that the elderly seem to have suffered less from the 2009 influenza pandemic than the younger adults [2-3].

In the Figure, the weekly observed number of deaths is higher than the expected number of deaths from week 24 to week 35 (summer period). The authors mention that the heat-alert threshold in their region was not reached during the summer, while it is known that a slight increase in mortality is possible even if temperatures remain below the heat-alert threshold. In the summer period, temperatures and mortality fluctuations are closely related and temperatures just below the heat-alert threshold can have already a marked effect on mortality among the elderly [4]. We wonder whether the observed temperatures during the summer 2009 were more elevated than those recorded during the three previous summers, which would partly explain the inconsistency of the observed mortality results during the two pandemic waves?

The Poisson fluctuation interval around the observed weekly numbers of deaths would have facilitated the identification of the weeks in which there was a statistically significant excess of deaths.

As the study was done on the basis of all-cause mortality data, it is difficult to deduce a causal relationship between pandemic influenza and mortality in our opinion. A temporal relationship should have been discussed more in-depth. The monitoring of mortality is a part of measuring the burden of disease in a population and needs to be done cautiously.

## References

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