Impact of 2014/2015 influenza season in Alentejo Region of Portugal

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BACKGROUND

Influenza activity in Europe started week 50/2014 with subtype A(H3N2) viruses as dominant (Broberg *et al.*, 2015). In Portugal was reported medium intensity of influenza activity in week 1/2015 to European Centre for Disease Prevention and Control, with B as dominant subtype.

Influenza causes respiratory infections in humans, leads to increased consultations in general practice and is an important global cause of hospital admissions and mortality.

OBJECTIVE

The main purpose of study is the estimation of impact of the 2014/2015 influenza season in excess mortality, consultations in primary healthcare, hospital admissions and emergency episodes in Alentejo, Portugal.

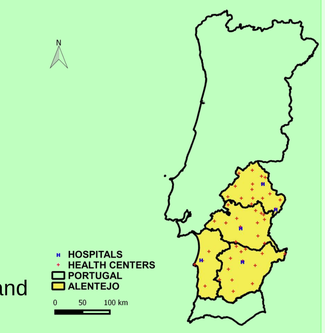

Figure 1. Portugal and Alentejo Region

MATERIAL AND METHODS

Mortality data were obtained from daily mortality surveillance system (VDM) provided by National Institute of Health. The number of consultations by flu syndrome (code R80 in International Classification of Primary Care, ICPC-2) and vaccines administered was obtained from SIARS - Informatic System of Regionals Administrations of Health. The number of hospital admissions and emergency episodes were obtained from all five local hospitals in ALERT ADW and SONHO informatics systems.

The period studied, observed period (O), was week 40 to 20 (Monday to Sunday) 2014/2015 season. Expected number (E) was obtained by taking the sum of variables from an equivalent set of reference with same days of week and month from 2013/2014 season. Only one season was considered for reference period, because for some variables other seasons data wasn't available. Excess was calculated for each variable as O-E.

Rate ratios (RR), RR=O/E, comparing observed versus reference period, were calculated per variable and week. Confidence intervals (CI) at 95% level used methodology described by Hoshinko et al. (2009) and founded by Rothman and Greenland (1998):

$$e^{\left(ln(RR)\pm 1{,}96\sqrt{\left(\frac{1}{O}+\frac{1}{E}\right)}\right)}$$

where 1,96, is the quantil of normal distribution.

RESULTS

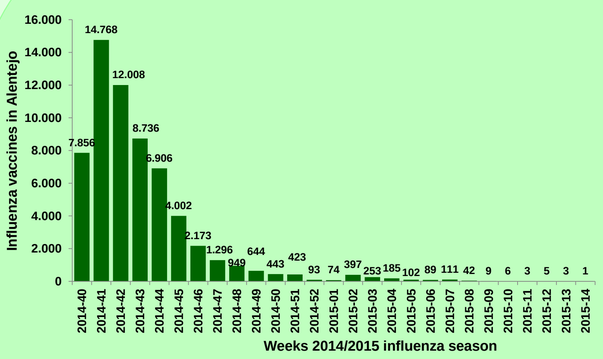

Figure 2. Influenza vaccines administrated in Alentejo per week in 2014/2015 season

Vaccines are free of charge in National Health Service for individuals with 65 years and older. During these season, 82% of total (61.577) influenza vaccines was administered during the first month, October, of accessible (figure 2).

The peak of incidence rate registered in week 5/2015 was the value 255,5/10^5 inhab. and exceeded the maximum values in Alentejo 2009 and in Portugal 2012 (figure 3).

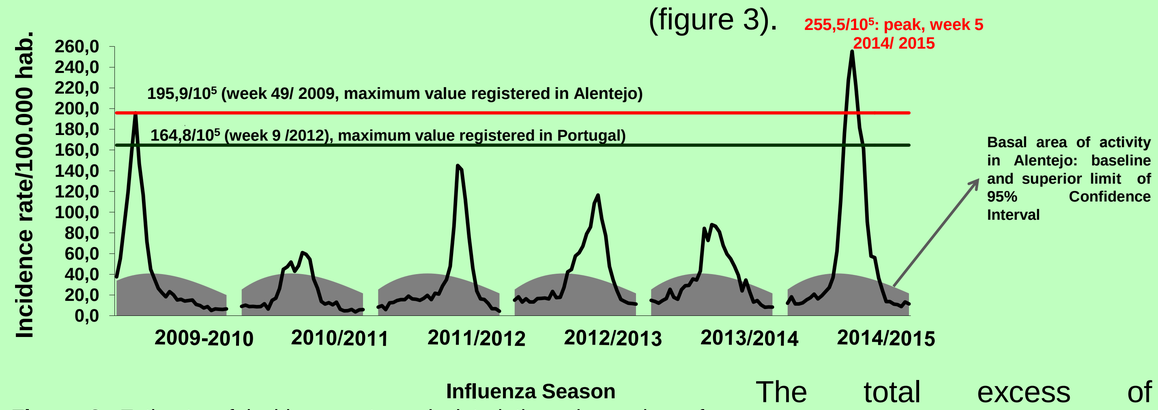

Figure 3. Estimate of incidence rate, calculated through number of consultations by flu (R80) in primary health care, from 2009/2010 to 2014/2015 season in Alentejo.

The total excess of consultations by R80, in season 2014/2015, was 4.530 and statistical significant (RR=1,72; 95%CI: 1,67-1,78). RR was statistical significant from week 1 to week 12 (figure 4). Particularly, week 5/2015 was an excess of 840 consultations, almost triple than the reference period (RR=2,95; 95%CI:2,65-3,30).

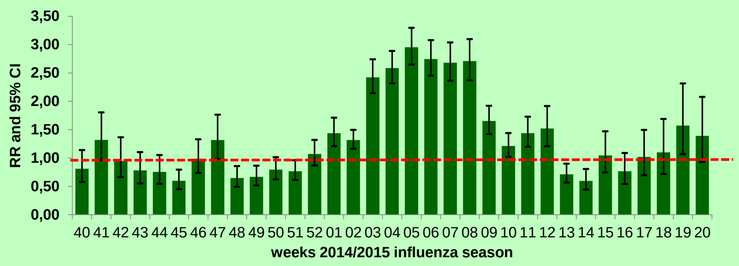

Figure 4. RR and 95% CI of consultations by flu (R80) in primary health care from week 40 to 20, 2014/2015 season in Alentejo.

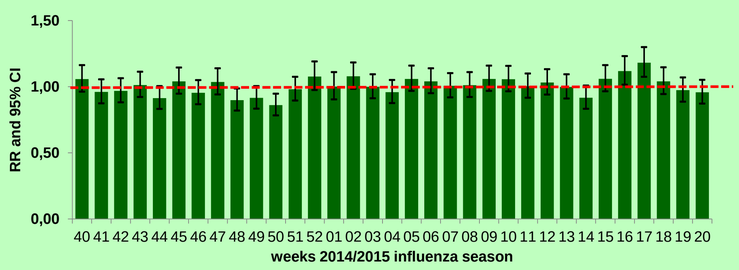

Figure 5. RR and 95% CI of hospital admissions from week 40 to 20, 2014/2015 season in Alentejo.

Hospital admissions didn't show a significant excess during the epidemic weeks (figure 5). Total excess was 808 (RR=1,00; 95%CI:0,99-1,02).

Week 3 to 5/2015, showed a significant excess of emergency episodes (general and pediatric) in priority colors of Manchester Triage System (figure 6 and 7). Total excess in general emergency was 3.158 episodes, with no statistical significant (RR=1,01; 95%CI:1,00-1,02).

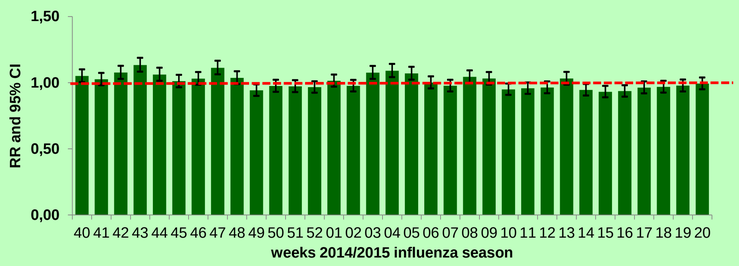

Figure 6. RR and 95% CI of emergency episodes from week 40 to 20, 2014/2015 season in Alentejo.

Pediatric emergency showed an excess of 2.916 episodes comparing with reference period, and it was borderline statistical significant with a RR=1,01 (95%CI:1,04-1,07). The excess in week 3/2015 was 358, RR=1,29 (95%CI:1,19-1,38), and it was significant.

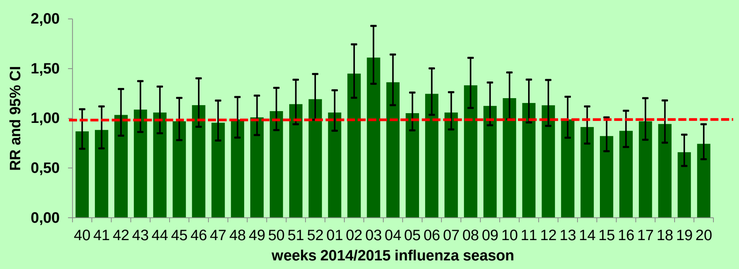

Figure 7. RR and 95% CI of emergency pediatric episodes from week 40 to 20, 2014/2015 season in Alentejo.

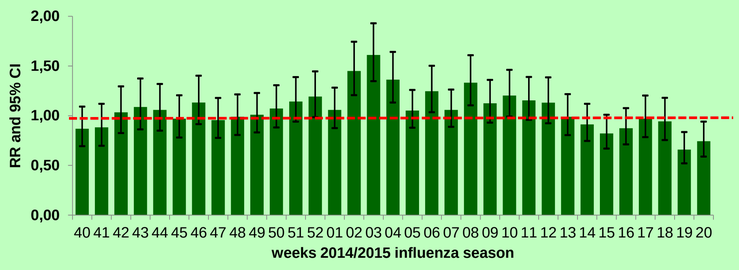

Figure 8. RR and 95% CI of mortality from week 40 to 20, 2014/2015 season in Alentejo.

Total excess of mortality was 669, RR=1,07 (95%CI:1,03-1,11). The peak, also in week 3/2015, had 118 excess deaths, comparing with previous season RR=1,61 (95%CI:1,35-1,93), statistical significant.

CONCLUSIONS

The peak of influenza activity, in Alentejo, was reached in week 5/2015, with an incidence rate, estimated by number of consultations (R80, ICPC-2) in primary health care of 255,5/100.000 inhabitants.

These results are obtained after the end of influenza season, however it hasn't been possible yet, to use mortality, hospital admissions, and emergency episodes data from specific causes of flu and other respiratory infections. Codification of causes is being done.

The excess mortality can be overestimated, because the VDM have included municipalities in Alentejo that aren't in influence area of Alentejo Regional Administration of Health.

Consultations by flu in primary health care, can be underestimated, because depends of registries made by general practitioners.

It's important early detection of influenza epidemics, which will allow better planning of resources. So in the future we pretend to establish epidemic thresholds by Moving Epidemic Method (Vega et al., 2012) since this method provides a robust and specific signal to detect influenza epidemics. On the other hand, to estimate disease burden attributable to influenza, other statistical methods, like Poisson regression models, can be used also in future (Schanzer et al., 2013).

Surveillance in primary and secondary healthcare services should continue, be enhanced or implemented to facilitate early public health risk assessment, prepare health services as well management and treatment of severe cases.

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