Effectiveness of seasonal 2008-2009, 2009-2010 and pandemic vaccines, to prevent laboratory confirmed influenza associated hospitalizations during the autumn 2009 influenza pandemic wave in Castellón, Spain. A test-negative, hospital-based, case-control study.

Joan Puig-Barberà [a,b,*] Alberto Arnedo-Pena[c], Francisco Pardo-Serrano[d], María Dolores Tirado-Balaguer [d], Silvia Pérez-Vilar[b], Ester Silvestre-Silvestre[c], Consuelo Calvo-Mas[a], Lourdes Safont-Adsuara[c], Montserrat Ruiz-García [a] and The members of the Surveillance and Vaccine Evaluation Group during the autumn 2009 H1N1 pandemic wave in Castellón, Spain.

[a] Health Promotion Unit. Centre of Public Health, Castellón, Spain. [b] Vaccines Research Centre for Public Health Research, Valencia, Spain. [c] Epidemiology Division Centre for Public Health, Castellón, Spain. [d] Laboratory of Microbiology. Hospital General de Castellón, Castellón, Spain.
* Corresponding author at: Health Promotion Unit. Centre of Public Health, Avda del Mar, 12 12003, Castellón, Spain.
Tel: +34 964 358 303. Fax: +34 964 239 491.
Email address: puig_joa@gva.es

Background

- In April 2009 a new influenza A virus emerged that expressed pandemic potential characteristics. By June 2009, World Health Organization declared a Phase 6 pandemic.

- Seasonal 2009-10 influenza vaccine was offered in Spain, free of charge, to the usual risk groups, beginning 28 September 2009.

- Beginning 16 November 2010, adjuvanted, low antigen pandemic vaccines, were offered to the same risk groups; although age in itself was not considered a risk factor and obese persons were included as a group at risk.

- The public reaction and acceptance of the vaccination campaign was tainted with concerns relative to safety, effectiveness of the vaccine, the seriousness of the threat posed by the new virus and the transparency of the decision-making process.

Aim

To assess influenza seasonal and A(H1N1) 2009 pandemic vaccines effectiveness in preventing A (H1N1) 2009 associated hospitalizations.

Methods

- Test-negative, hospital-based, case-control study.

- Patients residing in Castellón (482,329 inhabitants), Spain), hospitalized from 18 October 2009 to16 January 2010, for a suspected pandemic influenza illness, in any of five hospitals (four public and one private) and in whom a real-time reverse transcriptase polymerase chain reaction (RT-PCR) determination was performed.

- Those with a positive A (H1N1) 2009 RT-PCR result test were considered cases, those negative were considered controls.

- Vaccination was blindly ascertained from a population vaccination register.

- Vaccine effectiveness was estimated as 100 x (1-adjusted odds ratio [OR]) for influenza 2008-2009, 2009-2010 seasonal vaccines and for the pandemic A (H1N1) 2009 vaccines.

- Results were adjusted for age, risk factors, days from the onset of symptoms and epidemiological week by logistic regression.

Results

Number of RT-PCR A (H1N1) 2009 positive and negative hospitalized patients during the study period (arrow: beginning of pandemic vaccination campaign) by epidemiological week.
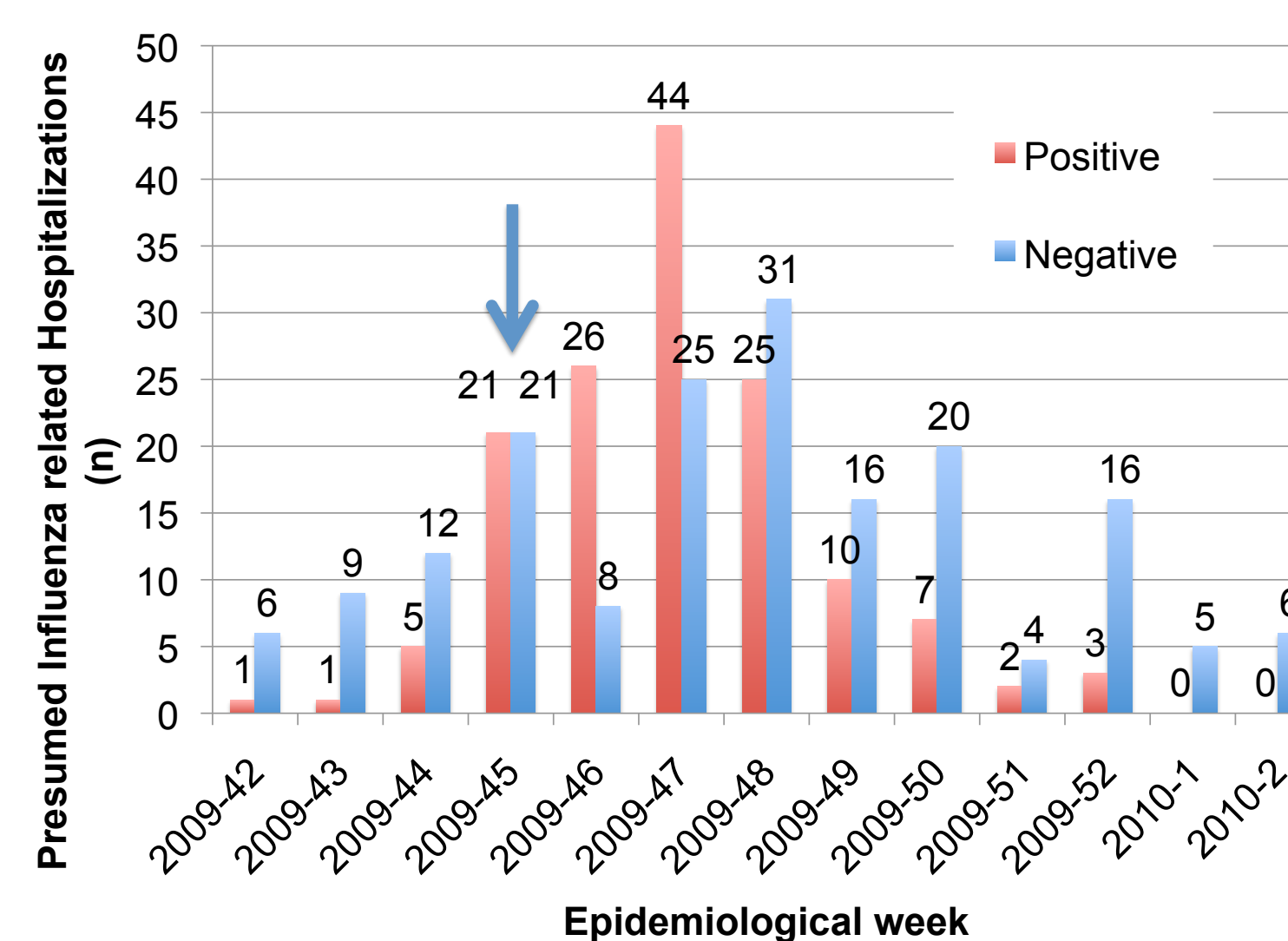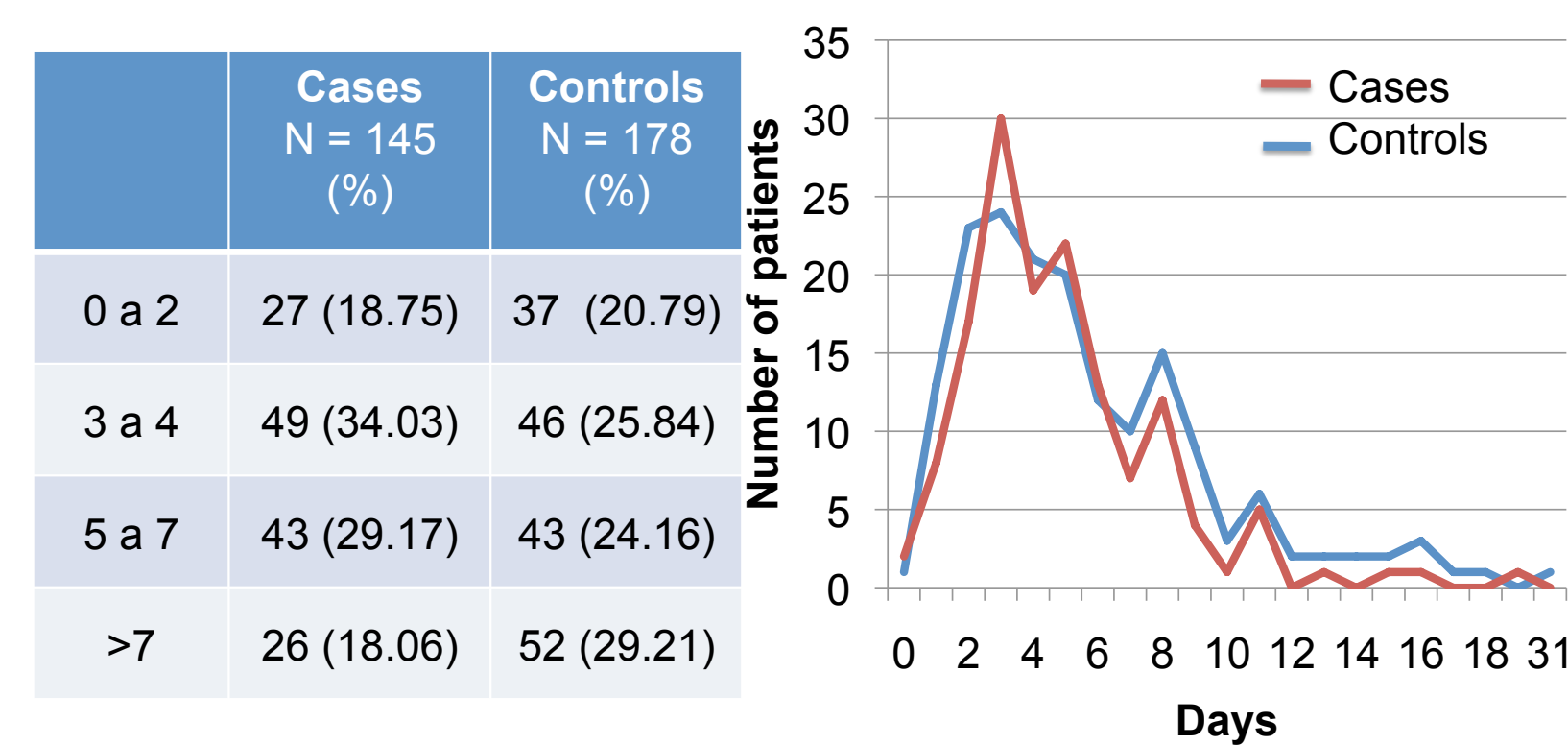

Percent patients vaccinated according to type of vaccine and days elapsed from vaccine administered to symptoms onset.
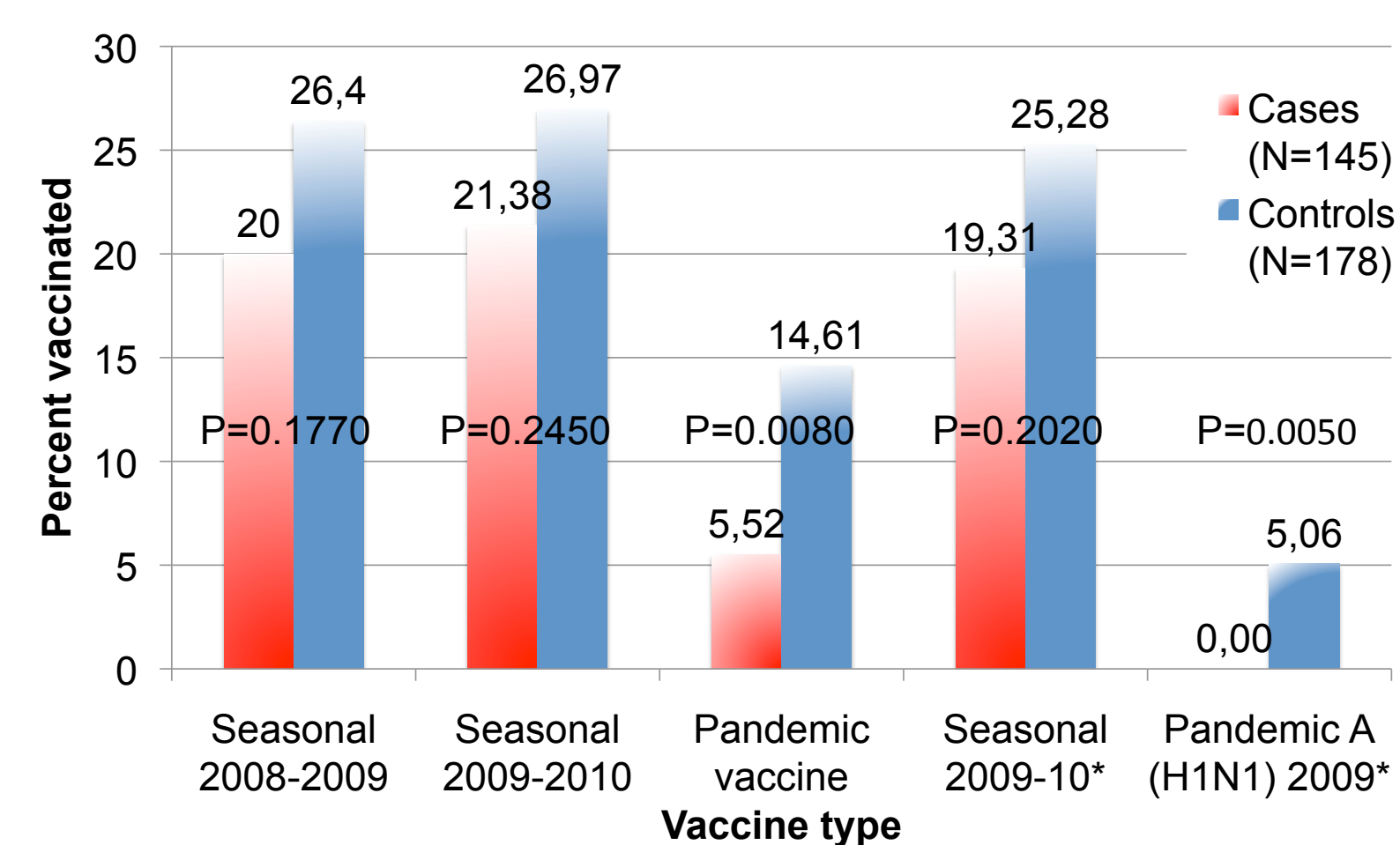

* Seasonal 2009-2010, vaccine administered 15 or more days before onset of symptoms. Pandemic vaccine administered 7 or more days before onset of symptoms.

Days from illness onset to sawb reached lab

	Cases N = 145 (%)	Controls N = 178 (%)
0 a 2	27 (18.75)	37 (20.79)
3 a 4	49 (34.03)	46 (25.84)
5 a 7	43 (29.17)	43 (24.16)
>7	26 (18.06)	52 (29.21)

Adjusted vaccine effectiveness to prevent hospitalizations related to A (H1N1) 2009, according to vaccine.
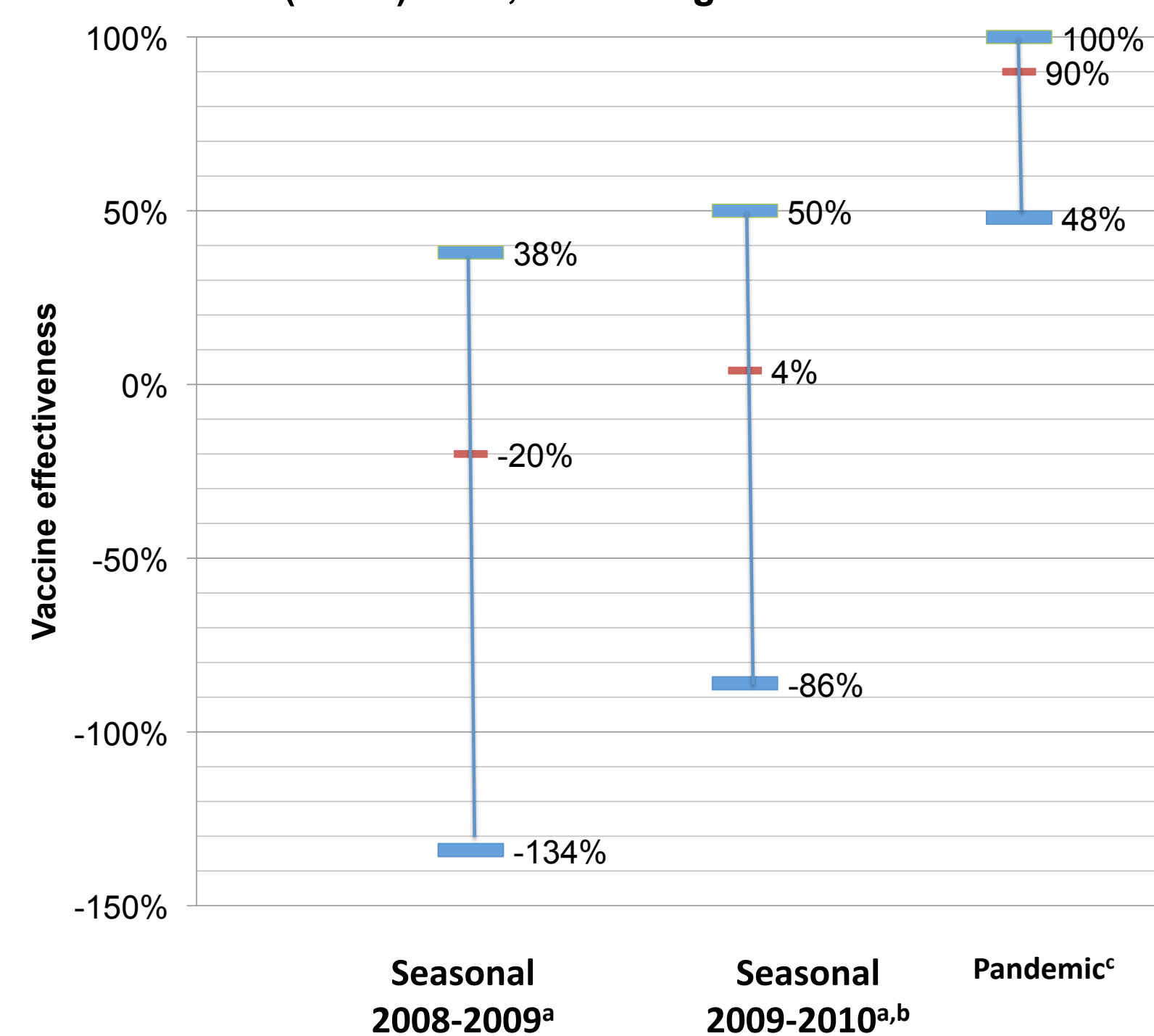
[a] Adjusted by age group, risk factors, epidemiological week and elapsed days since symptoms onset and sample arrival at the laboratory.
[b] Vaccine administered fifteen or more days previous to symptoms onset.
[c] Vaccine administered seven or more days previous to symptoms onset. Exact logistic regression, adjusted by elapsed days since symptoms onset and sample arrival at the laboratory and restricted to hospitalizations seven or more days after the beginning of pandemic vaccination campaign (54 cases and 99 controls, hospitalized from the 23 November 2009 till 16 January 2010).

Conclusions

- Influenza pandemic vaccines, adjuvanted and of low antigen content, were associated with a lower risk of being hospitalized by an episode of lab confirmed A(H1N1) 2009 disease, in a situation of nearly perfect match between vaccine and circulating strain.

- This protection was detected earlier than formerly presumed.