H1N1 2009 influenza vaccine prevention: a comparison between the Italian press and the scientific recommendations

Sara Monti[1], Valentina Zuccaro[1], Federica De Vecchi[1], Rodolfo Benech[1], Elias Allara[2,3], Fabrizio Faggiano[3] and the Avogadro Vaccine Prevention Group*

[1]School of Medicine, Avogadro University, Novara, Italy; [2]School of Public Health, University of Torino, Italy; [3]Department of Clinical and Experimental Medicine, Avogadro University, Novara, Italy

Correspondence to: Elias Allara, School of Public Health, University of Torino, Via Santena 7, 10126 Torino, Italy. E-mail: elias.allara@unito.it

Abstract

Methods: Messages broadcasted by the press were compared with national and international recommendations regarding influenza vaccine. All of the issues of the 5 best selling national newspapers and the 2 best selling general magazines were read from 15 October 2009 to 15 November 2009 in order to select the articles that addressed influenza vaccination. The major messages extracted from these articles were compared with the scientific literature.

Results: 217 articles out of 160 newspaper issues and 7 articles out of 8 magazine issues were selected. Articles mainly focused on the vaccine target population and on health care workers reluctance to be vaccinated. Dosage, side effects, efficacy and safety were other recurrent topics. Press-reported messages were largely consistent with the scientific literature, except for the time interval needed between H1N1 and seasonal influenza vaccine administration.

Discussion: The issue of vaccination against the H1N1 pandemic influenza received broad media attention during the study period. The information reported was usually correct, but sometimes it failed to convey clear messages. In particular, concern regarding potential side effects and the low uptake of vaccination in healthcare workers appears to have been associated with the very low vaccine uptake in the general population.

Key words: H1N1 2009 influenza, vaccine prevention, Italian press, scientific recommendations, guidelines

Introduction

Influenza is an acute respiratory illness caused by infection with influenza viruses. It affects the respiratory tract and is often accompanied by systemic symptoms such as fever, headache, myalgia, and weakness [1].

Influenza affects all age groups [2] with substantial morbidity and mortality [3]; it represents the third cause of death by infectious disease after HIV and TBC [4].

Based on the antigenic characteristics, influenza viruses are classified as A, B, and C and the former are further sub-typed on the basis of the surface hemagglutinin (H) and neuraminidase (N) antigens. The most extensive and severe outbreaks have been caused by influenza A viruses, partly because of the higher antigenic variability of the H and N antigens. Antigenic drift, resulting from point mutations, is responsible for annual influenza outbreaks, whereas antigenic shifts, major antigenic variations, occur less frequently and have the potential to cause a pandemic.

Pandemics follow the introduction of a virus with an HA subtype that is new to human populations [5]. During the 20th century there were three influenza pandemics: the H1N1 Spanish pandemic (1918-19), the H2N2 Asiatic-pandemic (1957-58) and the H3N2 Hong Kong pandemic (1968-69) [6].

During early 2009 a new strain of influenza A virus was recognised with an outbreak that probably originated in Mexico: this new influenza

virus was called "Swine Flu" or H1N1 2009. Since the initial reports of epidemic H1N1 Influenza in the spring of 2009, the virus has spread worldwide. On 11 June 2009 the World Health Organization (WHO) declared that the outbreak had reached pandemic proportion [7].

Clinical characteristics for the H1N1 2009 Influenza virus are similar to those of seasonal influenza, although some peculiar features emerged such as: younger - 5 to 49 years - rather than older - > 65 years - age groups were most affected [8], and mortality rates appeared to be higher in younger age groups [6]. Approximately 1% to 10% of persons with clinical illness required hospitalisation, particularly among children < 5 years, and 10% to 30% of hospitalised patients required intensive care [8]. The fatality rate estimated in Europe ranged from 0.3% to 1.5% [6].

The Italian situation as at the 11 April 2010 reported 5,413,000 cases of H1N1 2009 Influenza with 243 deaths; the epidemic curve reached its peak during the second week of November 2009, with an incidence rate of 12.93 cases per 1000 inhabitants. As at 11 April, 869,576 persons were vaccinated and the 10,047,421 vaccine doses distributed in Italy remained largely unused. The total vaccination coverage was 4.1% [9].

Influenza vaccination is however the most effective method for preventing influenza virus infection and its complications [3]. Inactivated and live attenuated vaccines against influenza are available. The vast majority of currently used vaccines (and the only type available in Italy) are inactivated ("killed") preparations.

Considering the shortage of vaccine at the beginning of the pandemic, a set of vaccination recommendations were established, in order to prioritise vaccination for health care workers and groups at higher risk (i.e. pregnant women or people with chronic medical conditions).

It is clear from the H1N1 2009 Influenza outbreaks that media communication with the general population regarding healthy behaviours is a fundamental component of any public health strategy. Although there are several sources of health-related information (specialised magazines, websites), the general public most often turns to TV, newspapers and magazines, which can play the role of broadcasting and reinforcing messages about medical interventions, while simplifying and framing complex biomedical issues for the lay public.

The aim of this study is to investigate how major Italian newspapers and magazines dealt with vaccination as a mean of prevention for influenza, and in particular what information was addressed by them. In order to do this, all of the messages issued by the press about the influenza H1N1 pandemic during the period of observation (from 15 October 2009 until 5 November 2009, coinciding with the pandemic peak) were compared with the scientific recommendations regarding influenza prevention and vaccine administration.

Methods

This study was carried out by 13 fifth-year medical students as a curricular activity for their "Public Health and Evidence-Based Medicine" course at Avogadro University – Novara. During the month of observation of the study (15 October 2009 - 15 November 2009) the group was divided into two subgroups: 6 members scanned the national and international recommendations regarding influenza vaccine prevention as well as information concerning H1N1 2009 that was available at that time. The remaining 7 members analysed the national press. The scientific evidence collection and the press survey were carried out concurrently, while the Italian epidemiologic trend of H1N1 2009 influenza was followed until April 2010.

Press survey

The official list of the widest circulating Italian press [10] was used in order to select (1) the 5 best selling national newspapers – "Il Corriere della sera" (496,611 average number of copies sold per day in 2009), "La Repubblica" (449,407), "La Stampa" (291,563), "Il Messaggero" (197,341), and "Il Giornale" (181,514) – excluding regional and business newspapers, and (2) the 2 best selling general magazines – "Panorama" (377,210 average number of copies sold per week in 2009) and "L'Espresso" (316,647) – excluding female and custom magazines.

During the period 15 October 2009-15 November 2009 every newspaper and magazine issue was accurately scanned in order to select the articles that addressed vaccine prevention of influenza. During the month of observation, 217 articles from 160 newspaper issues and 7 articles from the 8 issues of the selected magazines were collected.

Each article was analysed by two group members independently. In cases of disagreement, a third reviewer was consulted. The articles were then analysed basing on their structural aspects and content, without a predefined list of possibilities. The main messages were extracted independently by two of the team and then approved by the rest of the group. The selected topics were then tabulated in order to be compared to the scientific evidence. Percentages were calculated in order to illustrate the distribution of different topics using the number of total articles from newspapers or
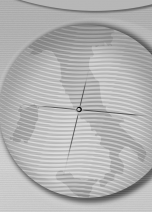
magazines as the denominator; this can result in percentages higher than 100%. The full study process was described in a draft protocol.

Scientific evidence

In order to gather the scientific evidence relating to H1N1 2009 vaccination, a Medline search was carried out with the aim of collecting recent primary or secondary papers, in particular, systematic reviews and guidelines. The search terms used were: "Influenza, Human" [Mesh] AND "prevention and control" [Subheading] AND "Vaccines" [Mesh] [Limits: Free Full Text, Humans, Meta-Analysis, Practice Guideline, English]. 75 titles were selected; 45 were excluded for the following reasons: comments or editorials (n=20), limited to specific categories of risks (HIV, COPD, asthma, cardiovascular disease), to LAIV (live attenuated influenza vaccine) or to economic issues (n=25). 27 further titles were excluded because they were not updated. In the end 3 papers were included [2,11,12].

The search for national and international recommendations for vaccine prevention of influenza was carried out by searching the websites of the following relevant International Health Institutions: WHO [8,13,14]; Centers for Disease Control and Prevention (CDC), USA [3]; Department of Health (DH), UK [15]; Ministero del Lavoro, della Salute e delle Politiche Sociali [4,16,17]; Società Italiana Malattie Infettive e Tropicali (SIMIT) [6]; European Medicines Agency (EMEA) [18]; Epicentro: Istituto Superiore di Sanità [9]. This search resulted in 11 documents being identified, and these represented the evidence base for the comparison. The report by the Italian Ministry of Health is a summary of the scientific evidence adapted specifically to the Italian situation.

The documents were scanned by two of the team members independently. In cases of disagreement, a third reviewer was consulted. The messages conveyed by the scientific literature were put together and in case of disagreement between national and international recommendations the latter were considered.

Comparison between press messages and scientific evidence

The main health messages extracted from the newspapers and magazines were tabulated and compared with the recommendations of the scientific literature in order to describe the scientific base of the press information, to identify messages not supported by scientific evidence, and to identify any relevant evidence-based message missed by the media.

Results

During the month of observation 217 articles were identified from the 160 issues of the selected newspapers and 7 articles from the 8 issues of the selected magazines. 32.3% were published in "Il Messaggero", 27.2% in "La Repubblica", 14.7% in "La Stampa", 13.8% in "Corriere della Sera" and 12% in "Il Giornale" (Figure 1). The majority of articles were issued during the third week of the study period (Table 1).

The newspaper that most often addressed the topic on their front page was "Il Giornale" (15.4%) followed by "Il Messaggero" (14.3%), "La Repubblica" (10.2%), "La Stampa" (9.4%) and "Il Corriere della Sera" (3.3%). "Panorama" published 5 articles while "L'Espresso" published 2 (Table 1).

Overall, 224 articles addressed 267 topics (217 and 246 in newspapers and 7 and 21 in magazines respectively). Table 2 and 3 describe the distribution of topics (and of articles addressing the specific topic) from the selected newspapers and magazines. The most covered topic was the vaccine target population (found 246 times in newspapers and 21 times in magazines), with particular reference to children (20.3% of newspapers' topics, 23.8% of magazines' topics), pregnant women (17.5% and 19.0% respectively), patients with chronic disease (18.3% and 19.0%) and indications for health care workers (19.9% and 19.0%). Articles concerning vaccine dosage were found 33 times in the newspapers and 5 times in the magazines. Other recurrent topics included vaccine effectiveness, vaccine safety, co-vaccination time gap and previous exposure to similar viruses A (H1N1) (51 and 13 times respectively).

Other important vaccine related issues included: health care workers reluctance, complication risk, risks associated with adjuvants, and the clinical testing period (found 74 and 13 times respectively in the articles) (Figure 2).

Analytic results regarding the major topics are summarised below.

Vaccine target population

Risk categories, Scientific Recommendations – The risk categories, based on the scientific recommendations, were very similar for both common flu and H1N1 2009 Influenza (Table 4). For H1N1, because of the initial shortage of vaccine, priority categories were defined. On the other hand, CDC guidelines recommend annual vaccination to any adult who wants to reduce the risk of infection and of transmission to others [3].

Risk categories, Italian Press – Out of 217 newspaper articles found, 59 (27.2%) referred to persons with general risk factors who should
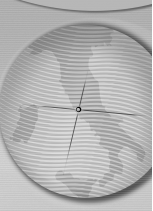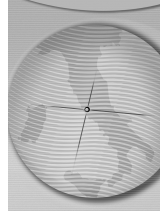
Table 1. Distribution and characteristics of articles focusing on H1N1 epidemic in the 5 major Italian newspapers and 2 magazines during the period 15 October 2009 -15 November 2009.

	Newspaper row	Corriere della sera	La Stampa	Il Giornale	Il Messaggero	La Repubblica	Total	Magazine row	Panorama	L'espresso	Total
Length	Full page (%)	16.7	25.0	15.4	11.4	-	11.5	Several pages (%)	60.0	50.0	57.1
	Middle page (%)	53.3	62.5	57.7	51.4	76.3	60.8	Full page (%)	40.0	50.0	42.9
	Selection (%)	30.0	12.5	26.9	37.1	23.7	27.6				
Section	Chronicle (%)	56.7	53.1	69.3	57.2	38.9	53.0	Chronicle (%)	40.0	-	28.6
	Central section (%)	33.3	34.4	11.5	31.4	49.2	34.6	Top news (%)	60.0	100.0	71.4
	Supplement (%)	10.0	12.5	19.2	11.4	11.9	12.4				
Type of article	Journalistic (%)	63.3	15.6	50.0	40.0	13.6	33.7	Journalistic (%)	20.0	-	14.3
	Specialised (%)	10.0	18.8	11.5	30.0	25.4	22.1	Specialised (%)	60.0	-	42.9
	Mixed journalistic and specialised (%)	26.7	65.6	38.5	30.0	61.0	44.2	Mixed journalistic and specialised (%)	20.0	100.0	42.9
Pages	First page (%)	3.3	9.4	15.4	14.3	10.2	11.1				
	Pages 2-5 (%)	23.3	21.9	19.2	32.8	22.0	25.4				
	Pages 6-10 (%)	16.7	12.5	-	14.3	22.0	14.7				
	After page 10 (%)	56.7	56.2	65.4	38.6	45.8	48.8				
Publication period	15-25 Oct 2009 (%)	10.0	-	15.4	5.7	1.7	5.5				
	26 Oct - 1 Nov (%)	10.0	15.6	11.5	17.1	23.7	17.1				
	2-8 Nov (%)	53.3	56.3	53.8	54.3	52.5	53.9				
	9-15 Nov (%)	26.7	28.1	19.2	22.9	22.0	23.5				
	Total (N)	30	32	26	70	59	217	Total (N)	5	2	7

Figure 1. Number of articles focusing on H1N1 epidemic issued in the 5 major Italian newspapers during the period 15 October 2009 - 15 November 2009.
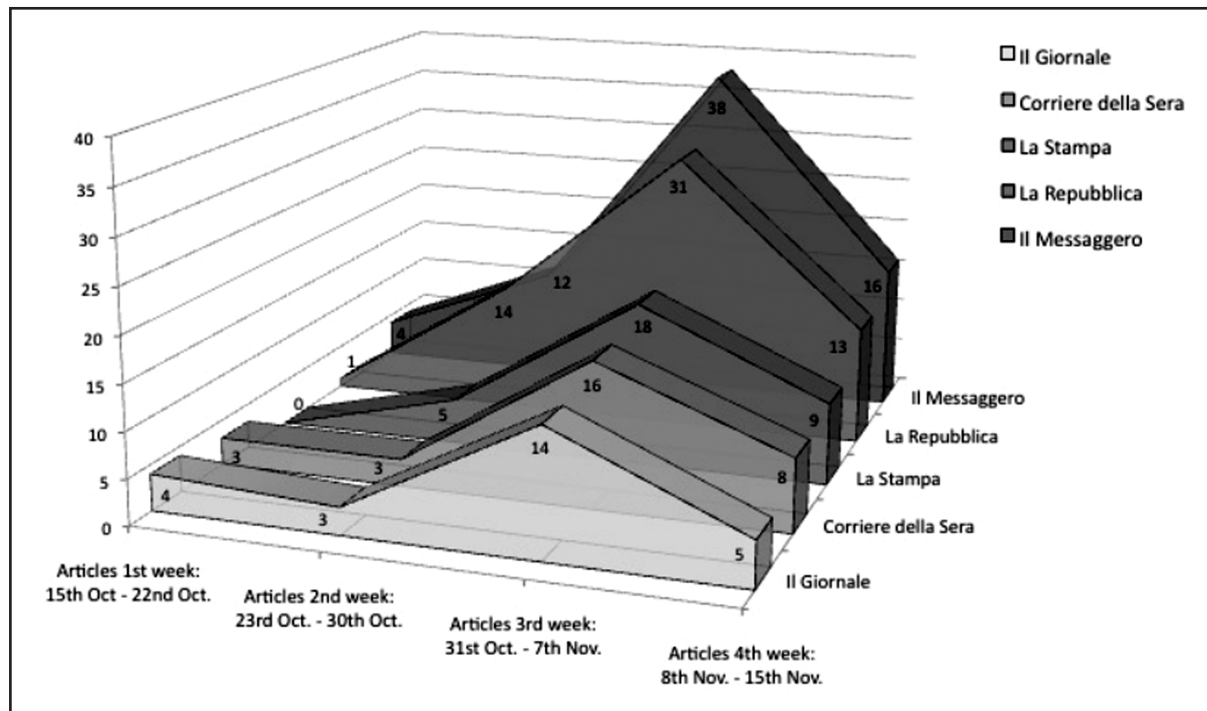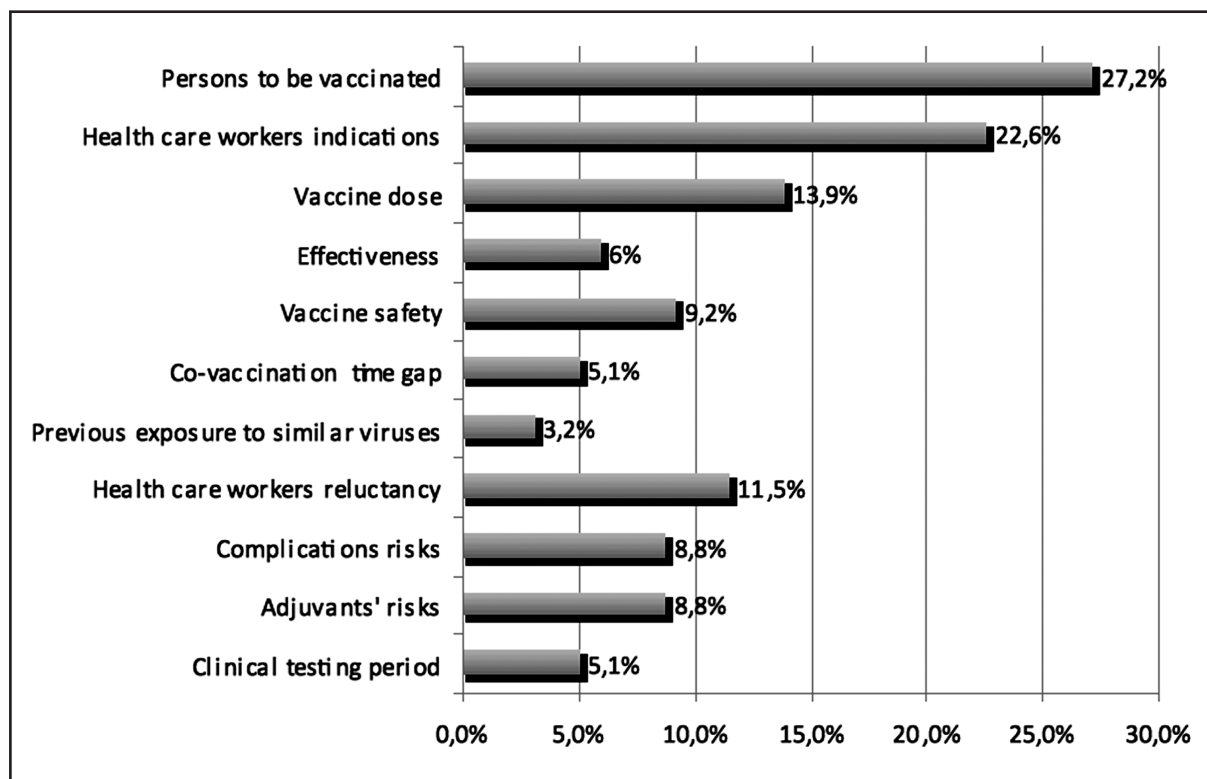

Figure 2. Frequency of the different topics concerning influenza vaccine prevention found in the selected newspapers.

be vaccinated. Out of 7 magazine articles, this topic was found 4 times (57.1%). Some specific target populations were also addressed by the press: (1) children, cited by 50 newspapers articles (23.0%) and 5 magazines articles (71.4%); (2) pregnant women, mentioned 43 times (19.8%) by newspapers and 4 times (57.1%) by magazines; (3) patients with chronic diseases presented in 45 newspapers articles (20.7%) and in 4 magazines articles (57.1%).
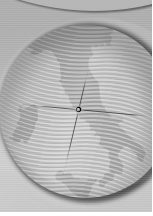
Table 2. Distribution of topics (and of articles addressing the specific topic) focusing on H1N1 epidemic in the 5 major Italian newspapers.

	Corriere della sera			La Stampa			Il Giornale			Il Messaggero			La Repubblica			Total		
	N	%_T	%_A	N	%_T	%_A	N	%_T	%_A	N	%_T	%_A	N	%_T	%_A	N	%_T	%_A
Vaccine target population																		
Generic indication "persons at risk"	12	26.1	40.0	10	22.7	31.3	10	20.0	38.5	16	23.9	22.9	11	28.2	18.6	59	24.0	27.2
Children	11	23.9	36.7	9	20.5	28.1	10	20.0	38.5	13	19.4	18.6	7	17.9	11.9	50	20.3	23.0
Pregnant women	8	17.4	26.7	8	18.2	25.0	9	18.0	34.6	11	16.4	15.7	7	17.9	11.9	43	17.5	19.8
Patients with chronic disease	8	17.4	26.7	7	15.9	21.9	9	18.0	34.6	13	19.4	18.6	8	20.5	13.6	45	18.3	20.7
Indications for Health care workers	7	15.2	23.3	10	22.7	31.3	12	24.0	46.2	14	20.9	20.0	6	15.4	10.2	49	19.9	22.6
Total topics (N, %_T)	46	100.0	-	44	100.0	-	50	100.0	-	67	100.0	-	39	100.0	-	246	100.0	-
Total articles (N, %_A)	30	-	153.3	32	-	137.5	26	-	192.3	70	-	95.7	59	-	66.1	217	-	113.4
Vaccine dose for																		
Non specific indication	2	40.0	6.7	5	100.0	15.6	3	42.9	11.5	3	21.4	4.3	1	50.0	1.7	14	42.4	6.5
Children	2	40.0	6.7	-	-	-	2	28.6	7.7	11	78.6	15.7	1	50.0	1.7	16	48.5	7.4
Pregnant women	1	20.0	3.3	-	-	-	2	28.6	7.7	-	-	-	-	-	-	3	9.1	1.4
People with chronic disease	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total topics (N, %_T)	5	100.0	-	5	100.0	-	7	100.0	-	14	100.0	-	2	100.0	-	33	100.0	-
Total articles (N, %_A)	30	-	16.7	32	-	15.6	26	-	26.9	70	-	20.0	59	-	3.4	217	-	15.2
Vaccine elements																		
Effectiveness	3	60.0	10.0	3	30.0	9.4	7	33.3	26.9	-	-	-	-	-	-	13	25.5	6.0
Vaccine safety	-	-	-	5	50.0	15.6	9	42.9	34.6	4	30.8	5.7	2	100.0	3.4	20	39.2	9.2
Co-vaccination time gap	1	20.0	3.3	1	10.0	3.1	3	14.3	11.5	6	46.2	8.6	-	-	-	11	21.6	5.1
Previous exposure to similar viruses	1	20.0	3.3	1	10.0	3.1	2	9.5	7.7	3	23.1	4.3	-	-	-	7	13.7	3.2
Total topics (N, %_T)	5	100.0	-	10	100.0	-	21	100.0	-	13	100.0	-	2	100.0	-	51	100.0	-
Total articles (N, %_A)	30	-	16.7	32	-	31.3	26	-	80.8	70	-	18.6	59	-	3.4	217	-	23.5
Vaccine issues																		
Health care workers reluctance	4	30.8	13.3	8	42.1	25.0	4	21.1	15.4	5	38.5	7.1	4	40.0	6.8	25	33.8	11.5
Complication risk	3	23.1	10.0	4	21.1	12.5	7	36.8	26.9	1	7.7	1.4	4	40.0	6.8	19	25.7	8.8
Adjuvants risk	4	30.8	13.3	3	15.8	9.4	7	36.8	26.9	3	23.1	4.3	2	20.0	3.4	19	25.7	8.8
Clinical testing period	2	15.4	6.7	4	21.1	12.5	1	5.3	3.8	4	30.8	5.7	-	-	-	11	14.9	5.1
Total topics (N, %_T)	13	100.0	-	19	100.0	-	19	100.0	-	13	100.0	-	10	100.0	-	74	100.0	-
Total articles (N, %_A)	30	-	43.3	32	-	59.4	26	-	73.1	70	-	18.6	59	-	16.9	217	-	34.1

N = absolute numbers; %_T = relative number of topics; %_A = relative number of articles
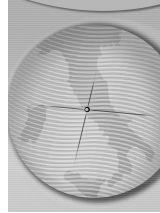
Table 3. Distribution of topics (and of articles addressing the specific topic) focusing on H1N1 epidemic in the 2 major Italian magazines.

		Panorama			L'espresso			Total		
		N	$\%_T$	$\%_A$	N	$\%_T$	$\%_A$	N	$\%_T$	$\%_A$
Vaccine target population	Generic indication "persons at risk"	4	25.0	80.0	-	-	-	4	19.0	57.1
	Children	4	25.0	80.0	1	20.0	50.0	5	23.8	71.4
	Pregnant women	3	18.8	60.0	1	20.0	50.0	4	19.0	57.1
	Patients with chronic disease	3	18.8	60.0	1	20.0	50.0	4	19.0	57.1
	Indications for Health care workers	2	12.5	40.0	2	40.0	100.0	4	19.0	57.1
	Total topics (N, $\%_T$)	16	100.0	-	5	100.0	-	21	100.0	-
	Total articles (N, $\%_A$)	5	-	320.0	2	-	250.0	7	-	300.0
Vaccine dose for	Non specifcic indication	1	50.0	20.0	-	-	-	1	20.0	14.3
	Children	1	50.0	20.0	1	33.3	50.0	2	40.0	28.6
	Pregnant women	-	-	-	1	33.3	50.0	1	20.0	14.3
	People with chronic disease	-	-	-	1	33.3	50.0	1	20.0	14.3
	Total topics (N, $\%_T$)	2	100.0	-	3	100.0	-	5	100.0	-
	Total articles (N, $\%_A$)	5	-	40.0	2	-	150.0	7	-	71.4
Vaccine elements	Effectiveness	2	25.0	40.0	1	20.0	50.0	3	23.1	42.9
	Vaccine safety	2	25.0	40.0	2	40.0	100.0	4	30.8	57.1
	Co-vaccination time gap	1	12.5	20.0	1	20.0	50.0	2	15.4	28.6
	Previous exposure to similar viruses	3	37.5	60.0	1	20.0	50.0	4	30.8	57.1
	Total topics (N, $\%_T$)	8	100.0	-	5	100.0	-	13	100.0	-
	Total articles (N, $\%_A$)	5	-	160.0	2	-	250.0	7	-	185.7
Vaccine issues	Health care workers reluctance	1	16.7	20.0	2	28.6	100.0	3	23.1	42.9
	Complication risk	1	16.7	20.0	2	28.6	100.0	3	23.1	42.9
	Adjuvants risk	2	33.3	40.0	2	28.6	100.0	4	30.8	57.1
	Clinical testing period	2	33.3	40.0	1	14.3	50.0	3	23.1	42.9
	Total topics (N, $\%_T$)	6	100.0	-	7	100.0	-	13	100.0	-
	Total articles (N, $\%_A$)	5	-	120.0	2	-	350.0	7	-	185.7

N = absolute numbers; $\%_T$ = relative number of topics; $\%_A$ = relative number of articles

Chronic diseases were further specified as morbid obesity, diabetes, cardiovascular and pulmonary diseases.

Health and social workers, Scientific Recommendations – Vaccination for health and social workers is recommended because it may reduce the transmission of infection to vulnerable patients, some of whom may have impaired immunity. Vaccination can also reduce staff absenteeism and guarantee healthcare assistance to patients [15]. Finally, vaccination of medical staff has a significant effect in reducing patient deaths [11].

Health and social workers, Italian Press – many newspapers and magazines emphasised the reluctance of health care workers to be vaccinated against H1N1 2009 Influenza, identified in 25 newspaper articles (11.5%) and in 3 (42.9%) magazine articles. The reasons identified for this behaviour were related to the risks connected with vaccine components or adjuvants such as Squalene. Indication for the vaccination of healthcare personnel was found in 49 newspapers articles (22.6%) and in 4 magazine articles (57.1%). Another criticism raised by the press concerned vaccine authorisation procedures and testing, even though this topic was never addressed in "La Repubblica". The press never cited other relevant aspects of the guidelines such as the importance of vaccination for students and trainees or for pharmacists, who can contribute to the spread of infection amongst patients, with the potential to increase infection related
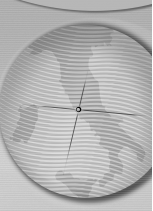
Table 4. Target population for Influenza vaccination recommended by official guidelines presented by ACIP [2], CDC [3] and the Italian Ministry of Health [4]. Generic indications (applicable both to seasonal and to H1N1 2009 influenza viruses) are listed on the left, priorities concerning H1N1 2009 influenza are presented on the right. Health care workers indications indicated by the British Department of Health guidelines [15] are on the bottom.

Target population	
INFLUENZA (common to seasonal and H1N1 2009)	H1N1 2009 INFLUENZA
– Persons aged ≥ 50 – Women who will be pregnant during the influenza season – Persons with immune suppression – Persons who have any condition compromising respiratory function or the handling of respiratory secretions or that can increase the risk for aspiration – Persons residents of nursing homes and other chronic-care facilities – Contacts and caregivers of children aged < 5 years and adults aged ≥ 50 years – Contacts and caregivers of patients with at high risk for severe complications from influenza Health-care personnel [2].	During vaccination shortage [2]: – Pregnant women – People who live with or care for infants < 6 months of age – Health care and emergency medical personnel – Anyone from 6 months through 24 years of age – Persons with chronic medical conditions or immune suppression Once overcome the vaccination shortage [3]: – All other healthy adults Only indicated by "Italian Ministry of Health" [4]: – Public services and civil protection personnel – Police and fire men department – Periodic blood donors
HEALTH CARE WORKERS INDICATIONS	
– Clinicians, midwives and nurses, paramedics and ambulance drivers – Occupational therapists, physiotherapists and radiographers – Primary care providers such as GPs, practice nurses, district nurses and health visitors – Staff in nursing and care homes that look after older people – Pharmacists, both those working in the community and in clinical settings – Students, trainees and volunteers working with patients [15].	

complications and mortality [15]. Furthermore, the press did not address the need for vaccination of other categories such as poultry workers or cattlemen. This practice is believed to reduce the risk of contracting both avian and human influenza simultaneously, and of human influenza virus to re-assort with avian influenza virus, thereby producing a new influenza virus with pandemic potential [15].

Contraindications to vaccination
Scientific Recommendations – These include: persons with a history of anaphylaxis or other allergic reactions to any of the constituents or trace residues of the vaccine; persons who developed any severe reaction to a previous influenza vaccine; children < 6 months of age; persons who have an acute moderate-to-severe illness with fever [14].

Italian Press – During the period of observation, the Italian press never addressed contraindications to vaccination.

Vaccine administration
Doses, Scientific Recommendations – 2 vaccine doses for children 6 months - 9 years (with a 4 weeks interval) and 1 dose for those older than 9 are recommended [6,13].

Doses, Italian Press – The Italian daily press suggested one dose for adults ("no specific indication") in 14 articles (6.5%), whereas the 16 articles (7.4%) referring to children recommended
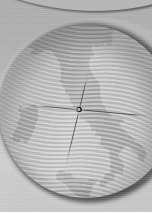
a second dose of vaccine. Indications for pregnant women were only given 3 times (1.4%), while no newspaper gave indications on doses for persons with chronic diseases. The magazines referred to doses only once (14.3%) with reference to adults and twice (28.3%) with reference to children. Pregnant women and patients with chronic diseases were discussed on one occasion each (14.3% each). Newspapers did not specify age ranges but generally indicated: "children and adults".

Other inactivated non-influenza vaccines, Scientific Recommendations – According to the WHO guidelines, H1N1 2009 vaccination can be administrated simultaneously with *other vaccines* at a different injection site. Seasonal influenza and pandemic influenza vaccines can be administered together [13]. In this case, seasonal influenza vaccine should be non adjuvated. When the concurrent administration of both influenza vaccines is not possible, priority should be given to the pandemic vaccine, with a three weeks gap between the two vaccinations [16].

Other inactivated non-influenza vaccines, Italian Press – In the newspapers 11 articles (5.1%) focused on co-vaccination of H1N1 2009 and seasonal influenza recommending a time distance of 21 days between the two injections. This topic was also presented in 2 magazines articles (28.6%).

Effectiveness and safety

Effectiveness, Scientific Recommendations – At the time of the observation period there were still no data regarding the effectiveness of the H1N1 2009 influenza vaccine. Literature only reported the effectiveness of seasonal influenza vaccine (ranging from 23 to 90%) [17].

Effectiveness, Italian Press – Discussion about effectiveness was the main topic in 13 newspapers articles (6%), but this was never mentioned neither by "Il Messaggero" nor by "La Repubblica". Three magazine articles also (42.9%) covered this topic.

Protection against influenza, Scientific Recommendations – According to the Advisory Committee on Immunization Practices (ACIP) [2] dispositions, protection against influenza virus infection is obtained within 2 weeks after vaccination, while latency to reach immunisation is estimated around 8-10 days according to SIMIT [6]. A possible immunologic priming mechanism for people who were born before the Asiatic pandemic of 1976 was also described, acting as partial protection against the H1N1 2009 Influenza virus [6].

Protection against influenza, Italian Press – Latency in effectiveness was never mentioned, whereas 7 references (3.2%) to immunologic

priming mechanism of older people were found in the newspapers, and 4 articles (57.1%) covering this topic were isolated from the magazines.

Safety, Scientific Recommendations – According to the official guidelines, pandemic vaccine is as safe as seasonal influenza vaccine [14].

Safety, Italian Press – The message sent by newspapers concluded that the vaccine was absolutely safe; vaccine safety for pregnant women was confirmed in 20 articles (9.2%), with the exception of "Il Corriere della Sera". The same conclusions were made by magazines in 4 articles (57.1%).

Adverse reactions, Scientific Recommendations – Adverse reactions listed by WHO include: soreness, swelling and redness at the injection site, fever, muscle or joint aches or headache, allergic reactions (hives, swelling, asthma or sever multisystem allergic reaction), oculo-respiratory syndrome (characterised by bilateral conjunctivitis, facial swelling and difficulty in breathing) [12]. During 1976, swine influenza vaccines used in the United States had been associated with an increased risk of Gulliain Barrè Syndrome [15]; however, since then this association has never been observed [2].

Adverse reactions, Italian Press – Even though doubts were raised by the press about the safety of the vaccination, no specific reference to side effects was made. 19 newspapers articles (8.8%) and 3 magazines articles (42.9%) presented a possible association of Guillain-Barrè Syndrome with some vaccine components such as Squalene. The rest of the articles confirmed the safety of this adjuvant and the vaccine.

Adjuvanted vs non adjuvated vaccine, Scientific Recommendations – Literature confirms a higher incidence of local reactions (such as soreness, swelling and redness at the injection site) with adjuvated vaccines compared to those that are non adjuvated. Scientific data also support the safety of adjuvants in pandemic influenza vaccine production, which are the same as those already licensed for use in other vaccines [14]. The 2009 H1N1 Influenza vaccine contains MF59 (containing Squalene as emulsionant) and Thimerosal (an anti-bacterial compound containing mercury), used as a preservative in multi-dose vaccine vials. Initial concerns regarding a possible association of MF59 with the Gulf war syndrome was not supported by scientific evidence. A recent meta analysis on the safety of Thimerosal reported high tolerability except for a higher incidence of local reactions [6]. No scientific evidence indicates that Thimerosal is a cause of adverse events other than local hypersensitivity reactions [2].
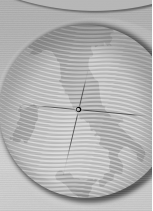
Adjuvanted vs non adjuvated vaccine, Italian Press – Concerns about vaccine components, especially Squalene, were raised in 19 newspapers articles (8.8%) and 4 magazines articles (57.1%).

Authorisation procedures and testing

Scientific Recommendations – The manufacturing process for trivalent influenza virus vaccines takes 6-8 months to complete [2]. In general, authorisation of a new medication requires 18-24 months in Europe [18]. In order to speed up the availability of medications for epidemics, like vaccines for pandemic influenza, the European Medicine Agency established two main procedures: (1) the 'mock up procedure', which allows a vaccine to be developed and authorised prior to the spread of the pandemic, based on information on potentially pandemic virus strain: once the virus strain has been identified, the manufacturer can include this strain in the mock-up vaccine and apply for authorisation; (2) the 'emergency procedure', which allows for fast-track approval of a new vaccine developed after a pandemic has already been declared (around 70 days instead of 210 days) [18]. Although the fast track, studies reported the vaccines are as safe as seasonal influenza vaccines [14].

Italian Press – Concerns on inadequate timing for the manufacturing of the vaccine were raised by 11 newspapers articles (5.1%) and 3 magazine articles (42.9%).

Discussion

The aim of this study was to investigate how the most authoritative Italian press (5 newspapers and 2 magazines) addressed the topic of vaccination during the month of the epidemiological peak of the H1N1 2009 pandemic.

The Italian press extensively covered the influenza pandemic; during the month of observation each newspaper issue contained an average of 1.36 articles addressing influenza vaccine prevention, and 0.88 for each magazines issue. On the other hand, the press only concentrated on the pandemic H1N1 2009 Influenza, and did not consider indications for seasonal influenza.

Despite the large media coverage and the insistent government warnings, only 869,576 of the 10,047,421 vaccine doses distributed in Italy were used at the end of our study. The total coverage was only 4.1%.

The most recurrent topic in the press regarded population groups who should be vaccinated, but the identified categories were generic, as probably expected, whereas the official documents addressed a wider list of persons at risk.

In general, the Italian press messages about the pandemics were on the whole correct from a scientific point of view, and consistent with the reports from the Italian Ministry of Health.

However, there were 3 topics that were communicated in a way that may have contributed to the misinterpretation of the vaccine prevention strategy: first of all Guillain-Barrè Syndrome, presented by 9% of newspaper articles and by 43% of magazine articles as a side effect of vaccines containing Squalene, without any scientific evidence confirming this hypothesis; the second is the suggestion to observe a 3 week time gap between seasonal and pandemic influenza vaccines, addressed by 5.1% of articles in newspapers and 28.6% in magazines; but the major concern regarded the debate about the need for health care workers to be vaccinated. The press often focused their attention on the low willingness of health care personnel to be vaccinated, justified by a suspicion of inefficacy of the vaccine.

These three topics probably explain the failure of the press to impart to the population the strong scientific evidence that supports the importance of this form of prevention, and probably contributed to the general diffidence of the population surrounding the H1N1 2009 vaccination campaign, and the low compliance to vaccination access.

There are also some relevant arguments that were not treated by the press; in particular, contraindications to vaccination for specific categories, indications to be vaccinated for some categories such as poultry workers, medical students, specific and scientifically proved side effects and latency of effectiveness.

These results are not obtained from a comprehensive survey of the National Italian Press, but from the most sold and influential newspapers and magazines. Moreover, even if limited to one month, the coincidence of the pandemic peak with the observation period is a strength of the study. The scientific base of reference was not limited to a single guideline, but recommendations from different official sources were gathered.

The study certainly has some limits: apart from the short observation period, other major sources of information such as TV, radio or Internet, other popular magazines and newspapers were not included. In particular with regards to the magazines, the number of articles was very limited.

One study [19] analysing how the media
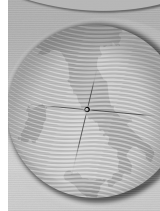
reported the first days of the 2009 H1N1 pandemic reached similar conclusions about the general consistence of press information compared to scientific evidence. This can be explained by the fact that in the surveyed countries press were provided with reliable information by health authorities. Another study [20] compared information given by the media (in this case the results from Google Flu trends) with data from the existing surveillance system and demonstrated a substantial consistency between the two sources of information. Results and conclusions of these studies are similar to ours, indicating the success in establishing a relationship of trust with the media. Still, information needs to be better shared and made more easily available to all levels of the public health response chain (local, regional, national and international) [21].

Conclusions

The press extensively addressed and contributed to raising awareness of influenza prevention strategies and pandemic risk perception. Both magazines and newspapers highlighted the importance of vaccine prevention, while searching for the opinion of health authorities and experts. Nevertheless, the press was not always consistent with the scientific recommendations regarding the target population or the timing and modalities of the vaccine administration. The results of the study suggest the advisability to improve the quality of media communication about health issues. This requires stronger co-operation between medical researchers and journalists, but also the improvement of the ability of journalists to access and critically appraise scientific literature.

References

1) Kasper DL, Branwald E, Fauci AS, Hauser SL, Longo DL, Jameson JL. Harrison's Principles of Internal Medicine. 16th ed. McGraw-Hill, 2005.

2) Fiore AE, Shay DK, Broder K et al. Prevention and control of influenza: recommendation of the Advisory Committee on Immunization practices (ACIP). 2008 Aug 8;57(RR-7):1-60.

3) Centres for Disease Control USA. 2009. Available from: www.cdc.gov/vaccines/pubs/vis/downloads/vis-inact-h1n1.pdf. [Accessed December 2010].

4) Fazio F. Prevenzione e controllo dell'influenza: raccomandazioni per la stagione 2009-2010. Ministero del Lavoro, della Salute e delle Politiche Sociali, 2009. Available from: www.normativasanitaria.it/normsan-pdf/0000/29731_1.pdf. [Accessed December 2010].

5) Neumann G, Takeshi N, Yoshihiro K. Emergence and pandemic potential of swine-origin H1N1 influenza virus. Nature 2009;459:931-9.

6) Società Italiana Malattie Infettive e Tropicali. Influenza pandemica A H1N1. 2009. Available from: www.simit.org/download/position_paper_30_11_09.pdf. [Accessed December 2010].

7) Yasushi Itoh et al. In vitro and in vivo characterization of new swine-origin H1N1 influenza viruses. Nature 2009;460(7258):1021-5.

8) World Health Organization A. Interim planning considerations for mass gatherings in the context of pandemic (H1N1) 2009 influenza. 2009. Available from: www.who.int/csr/resources/publications/swineflu/cp002_2009-0511_planning_considerations_for_mass_gatherings.pdf, [Accessed December 2010].

9) Epicentro: Istituto Superiore di Sanità. 2010. Available from: www.epicentro.iss.it/focus/h1n1/pdf/flunews/FluNews_24.pdf. [Accessed December 2010].

10) Accertamenti Diffusione Stampa. 2009. Available from: www.adsnotizie.it. [Accessed December 2010].

11) Thomas RE, Jefferson T, Demicheli V et al. Influenza vaccination for healthcare workers who work with elderly. Cochrane Database Syst Rev. 2006;3:CD005187.

12) Demicheli V, Di Pietrantonj C, Jefferson T, Rivetti A, Rivetti D. Vaccines for preventing influenza in healthy adults. Cochrane Database Syst Rev. 2007;2:CD001269.

13) World Health Organization B. Use of the pandemic (H1N1) 2009 vaccines. 2009. Available from: www.who.int/csr/disease/swineflu/frequently_asked_questions/vaccine_preparedness/use/en/index.html. [Accessed December 2010].

14) World Health Organization C. Safety of pandemic (H1N1) 2009 vaccines. 2009. Available from: www.who.int/csr/disease/swineflu/frequently_asked_questions/vaccine_preparedness/safety_approval/en/index.html. [Accessed December 2010].

15) Department of Health. Influenza immunisation campaign 2009/10. 2009. Available from: www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_097535.pdf. [Accessed December 2010].

16) Ministero del lavoro, della Salute e delle Politiche Sociali. 2009. Available from: www.nuovainfluenza.salute.gov.it/nuovainfluenza/paginaInternaMenuInfluenza.jsp?id=7&menu=vaccino&id_dettaglio=7&tab=vaccino. [Accessed December 2010].

17) Ministero del lavoro, della Salute e delle Politiche Sociali. 2009. Available from: www.salute.gov.it/influenza/paginaInternaMenuInfluenza.jsp?id=670&lingua=italiano&menu=vaccinazione. [Accessed December 2010].

18) European Medicines Agency. 2009. Available from: www.ema.europa.eu/influenza/vaccines/authorisation_procedures.htm. [Accessed December 2010].

19) Duncan B. How the media reported the first days of the pandemic (H1N1) 2009: results of EU-wide media analysis. Euro Surveill 2009;14(30).

20) Wilson N, Manson K, Tobias M, Huang QS. Interpreting Google flu trends data for pandemic H1N1 influenza: the New Zealand experience. Euro Surveill 2009;14(44).

21) John Paget. The influenza pandemic and Europe: the social impact and public health response. Ital J Public Health 2009;6(3):257-9.