Influenza and immunization: a quantitative study of media coverage in the season of the «Fluad case»

Informazione: risultati di un’indagine di monitoraggio nella stagione del «caso Fluad»

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Abstract

Background. Seasonal influenza generates serious health and economic losses. In the last influenza season, the report of three deaths originally blamed on the Fluad vaccine drew widespread attention from the media and is likely to have had a major negative impact on vaccine uptake.

Objective. We quantitatively analyzed media coverage on influenza and immunization-related topics on all published issues of the Italian newspaper ranking first in circulation, over one year.

Design. We retrieved relevant keywords and articles, reporting on article topic, length, position, and approach to immunization, and on other selected indicators’ summary statistics, trends, and correspondence with key events.

Results. Selected key words were retrieved 798 times over the study period, 34% specifically focusing on influenza. The average number of influenza-related keywords per issue was 96% higher in the four-day «uncertainty» period from when the deaths were first reported to the release of the test results disproving any causal association between the deaths and the vaccine (time frame #1), as compared to the whole study period. Ninety relevant articles were included in the analysis, 51% focusing on influenza, the average number/issue being 97% higher during time frame #1. During time frame #1, articles were also longer and located in the main sections of the newspapers. No articles were published at the launch of the seasonal influenza immunization campaign.

Conclusion. We propose an analytic model of media monitoring that could be effectively applied to support health authorities and representatives of the scientific community in conveying health education messages through the media.

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Keywords: seasonal influenza, vaccine, Fluad, immunization, media coverage and communication, media monitoring

Riassunto

Obiettivo. L’influenza ha rilevan te impatto sanitario, economico e sociale. Nonostante l’offerta vaccinale, le coperture rimangono basse. I mezzi di informazione di massa sono potenti strumenti per convogliare messaggi di educazione sanitaria. Abbiamo condotto un’analisi quantitativa dell’impatto mediatico del «caso Fluad».

Disegno. L’analisi è stata effettuata su 366 numeri del Corriere della Sera, valutati per la presenza di parole chiave e di articoli inerenti le tematiche della patologia influenzale e delle vaccinazioni. Per ciascun articolo sono stati analizzati rilevanza (numero di parole e posizione) e approccio nei confronti delle vaccinazioni. Per le parole chiave è stato valutato il trend di frequenza nel tempo in relazione all’inizio della campagna vaccinale e al caso Fluad.

Risultati. Le parole chiave sono apparse sul quotidiano 798 volte, con una media di 16,2/giorno nei 4 giorni immediatamente successivi alla notizia delle morti sospette e prima della smenza definitiva dell’Agenzia italiana del farmaco e dell’Istituto superiore di sanità (ISS) sulla responsabilità vaccinale dei decessi (contro 0,7/giorno nell’intero periodo analizzato). Novanta gli articoli rilevanti pubblicati, di cui 51% specifici sull’influenza, con una media di 4 articoli/giorno durante il caso Fluad, di cui 3 in prima pagina e con una lunghezza mediana del 25% maggiore rispetto ai restanti. Nessun articolo è stato pubblicato durante il lancio della campagna di immunizzazione.

Conclusioni. Proponiamo un modello analitico di monitoraggio dei media quale strumento utile per studiare l’impatto sui comportamenti della popolazione in tema di salute e prevenzione. L’ISS ha stimato che le coperture della vaccinazione antiinfluenzale siano calate drasticamente in seguito al caso Fluad. I risultati preliminari del nostro studio dimostrano come i mezzi di informazione siano stati principali mediatori di quest’associazione.

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Parole chiave: influenza stagionale, Fluad, vaccini, mezzi di informazione, copertura mediatica, comunicazione, monitoraggio mediatico
BACKGROUND
Seasonal influenza generates serious health and economic losses for individuals and society as a whole. In Italy it is estimated that, in the last season, around 11% of the general population (over 6.3 million cases) got influenza. Influenza-related outcomes, including complications, hospitalizations, and deaths, have a relevant clinical, social, and economic burden. Despite the availability and active free-of-charge offer of influenza vaccines to subjects aged ≥65 and at-risk subgroups, flu vaccine coverage rates remain low and still far from the 75% target established by the Ministry of Health. More in general, despite immunization being among the most effective primary prevention tools ever invented, vaccines are “victims of their own success” and have recently lost public confidence. False myths related to adverse reaction risks and commercial interests are fuelling the growing phenomenon of vaccine hesitancy.

Media play a crucial role in channelling health-related information. They are powerful tools for delivering health education and promoting disease prevention, including immunization. However, if misused or exploited, they can negatively influence the general population’s health attitudes and behaviour towards prevention. In the last influenza season, the report of three deaths originally thought to be associated with administration of the Fluad influenza vaccine – the «Fluad case» (detailed in box 1) – drew widespread attention from the media and is likely to have had a major negative impact on influenza vaccine uptake.

OBJECTIVES
General aim of the current study was to retrospectively monitor reporting on influenza and immunization-related topics (immunization in general; vaccines other than influenza; public health issues with mention of vaccines), on all published issues of the most-read Italian newspaper, Corriere della Sera, over a one-year study period. In particular, specific objectives were:

- to quantitatively analyze media coverage of the Fluad case in its temporal development;
- to quantitatively analyze media coverage of the Fluad case in comparison to media coverage of influenza and influenza-related topics during the whole influenza season;
- to quantitatively analyze media coverage of immunization-related topics;
- to explore the type of message (positive/negative/neutral) delivered by the media with regard to influenza immunization and immunization in general;
- to propose a preliminary media monitoring model and build and apply media monitoring indicators that can be used to analyze media coverage of health-related topics in the press;
- to describe the health education and communication role played by the media and reflect about its impact on the general population’s health behaviours and approaches to prevention and immunization.

METHODS
We considered a one-year (366 days) study period, from 15 May 2014 to 15 May 2015, for which we retrospectively retrieved all published issues of the Italian daily newspaper ranking first in readership, Corriere della Sera (full digital version in portable document format, PDF).

Data extraction
Each newspaper issue was manually screened to retrieve all published articles focusing on influenza and immunization-related topics. The screening was independently conducted by two authors, using key words related to the concepts of influenza and vaccination. Disagreements by authors were resolved by consensus. Relevant data were extracted by two authors, supervised by a third author, using a pre-defined data extraction spread-box.

THE «FLUAD CASE»
On 27 November 2014, the Italian Medicines Agency (AIFA) suspended the use of two batches of Fluad influenza vaccine after three deaths were reported through the National Network of Pharmacovigilance as having occurred within 48 hours from vaccine administration and deemed to be associated with it by general practitioners (GPs). The decision was taken as a precautionary measure, following the EU legislation on pharmacovigilance. The three deaths in question were reported by general practitioners and occurred in a 68-year-old who died of myocardial infarction within an hour of vaccination and in two subjects, aged 79 and 87 respectively, who died of meningoencephalitis within 48 hours of vaccination. The three administered vaccines belonged to two Fluad batches whose use was consequently suspended. After this precautionary decision, testing and analysis were initiated by the Italian Institute of Health (ISS) and AIFA, in agreement with the European Medicines Agency (EMA), both on the identified vaccine batches – to assess their safety – as well as on the case reports – to assess the nature of the association between the adverse events and the vaccine. On 1 December, the ISS announced the first tests results; there was no presence of endotoxins and the content and characteristics of the vaccine virus antigen were compliant with quality standards. On 3 December, EMA’s Pharmacovigilance Risk Assessment Committee (PRAC) concluded that there was no evidence of a causal relationship between the reported fatal events and the administration of Fluad and reassured other European countries about the safety of the flu vaccine. On 23 December, ISS released the final test results (abnormal toxicity test, or ATT, and sterility test) confirming the vaccine was safe, and removed the ban on the Fluad batches.

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sheet. The data extraction spreadsheet was piloted on 10 randomly selected articles and modified accordingly.

**Indicators and time frames taken into account and analysis**

We defined and selected five key events that occurred during the study period (Figure 1):

- **3rd September 2014** (Key event #1): the Ministry of Health released its 2014-2015 Circular containing recommendations for influenza prevention and control;
- **27th November 2014** (Key event #2): three deaths surmised to be associated with Fluad vaccine administration were reported and the Fluad batches in question were suspended;
- **1st December 2014** (Key event #3): the Italian Institute of Health released the first safety results;
- **3rd December 2014** (Key event #4): EMA released the Pharmacovigilance Risk Assessment Committee conclusion;
- **23rd December 2014** (Key event #5): the Italian Institute of Health released the final safety results.

For the sake of our analysis, we split the Fluad case into two timeframes within the study period:

- a 4-day timeframe (28th Nov-1st Dec): from reporting on the deaths to the release of the first safety results by the ISS – namely, when there was uncertainty about the vaccine’s safety (time frame #1 – Fluad case - uncertainty);
- a 27-days timeframe (28th Nov-24th Dec): from reported deaths to the final safety results release (time frame #2 – whole Fluad case).

We considered two units of analysis:

- **Event-related indicators**:
  - number of key words per day (per newspaper issue);
  - average number of key words per time frame.
- **Article-related indicators**:
  - average number of articles per month and time frame;
  - absolute number of articles per key event (media coverage was assessed the day after each event (4th Sept, 28th Nov, 2nd Dec, 4th Dec, and 24th Dec, respectively), as printed newspapers publish news the day after its occurrence);
  - topic of the article, using four different categories:
    - articles specifically focusing on influenza and influenza immunization;
    - articles focusing on vaccines in general;
    - articles focusing on vaccines other than influenza;
    - articles focusing on public health issues with mention of vaccines and immunization.
  - position of the article (i.e., front page, specific section of the newspaper);
  - length of the article (expressed in number of words);
  - overall approach of the article, using three different categories:
    - positive approach towards vaccines;
    - negative/critical approach towards vaccines;
    - descriptive/neutral approach.

**Figure 1.** 2014-2015 influenza season: key dates. / **Figura 1.** Stagione influenzale 2014-2015: eventi chiave.
Analysis
We carried out descriptive analysis reporting selected indicators summary statistics, trends and correspondence with key events occurred during the influenza season. For both units of analysis (key word and articles) data were explored first on whole retrieved elements (all immunization-related topics) and then on elements specifically focusing on influenza.

RESULTS
Three hundred and fifty eight newspaper issues were published in the study period and were included in the study. *Corriere della Sera* was not published on 8 days during the study period due to strikes or national holidays (on 23–25 May 2014, 16 August 2014, 25–26 December 2014, 6 April 2015, 2 May 2015).

Key word analysis
During the study period, Italian words for «influenza» and «vaccine/s» were retrieved 798 times: «influenza» 273 times (34%) and «vaccine/s» 525 times (66%). Their distribution over time is presented in figure 2.

The average number of key words per day was 45.5/day during time frame #1 and 10/day during time frame #2, as compared to 2.2/day during the whole study period.

When only considering «influenza»-related key words, figures were: 16.2/day during time frame #1 and 10/day during time frame #2, as compared to 2.2/day during the whole study period.

Looking at «influenza» key words (n=273), the distribution among the 5 identified key events (figure 3), showed the greatest share (62%, n=23) on key day #2; key day # 3 accounted for 38%, while no key words were retrieved on key days #1, #4, and #5. Similar distribution was reported for total key words (figure 3).

Analysis of relevant articles
Ninety relevant articles were retrieved during the study period. Among them: 51% (n=46) specifically focused on seasonal influenza and seasonal influenza immunization, 13.5% (n=12) focused on vaccines in general, 14.5% (n=13) specifically focused on vaccines other than influenza and 21% (n=19) focused on public health issues and mentioned vaccines and immunization. The distribution over time of relevant articles by article type is reported in figure 4.

When including all four categories of articles (total n=90), there were: 7.5 per month on average during the study period, 3.5/month when only considering those focusing on seasonal influenza and seasonal influenza immunization.

The average number of total relevant articles published per day over the study period was 0.2, increasing to 4/day during time frame #1 and 1.2/day during time frame #2. In particular, 16 articles were published during time frame #1 (four days).

A similar distribution was reported when only considering articles specifically focusing on influenza and influenza vaccine: 0.1/day for the whole study period, 1/day during time frame #2 and 4/day during time frame #1 (it must be noted that all articles published during time frame #1 were on influenza and influenza immunization).

Figure 3 reports the articles’ distribution over the 5 key dates: no articles focusing on influenza and influenza immunization were published on key date #1. Two articles were published around the start of the seasonal influenza immunization campaign (on 4 and 12 October). They were placed on page 31 and 53 of the newspaper; one was a 23-word long article placed at the bottom of the page, the other focused on influenza without mentioning the approaching influenza immunization campaign.
Influenza-related articles were published from April to September 2014 (5 months), neither were articles published on key date #4 and #5 (figure 3), while 6 articles were published on key date #2 and 5 on key date #3. A similar distribution among the 5 key events was reported when considering total relevant articles (all topics, figure 3).

With regard to the articles’ approach towards immunization, among the articles focusing on seasonal influenza and seasonal influenza immunization, 37% (n=17) had a positive approach, while 6.5% (n=3) had a critical/negative approach, 26.1% (n=12) had a neutral/descriptive approach, and the remaining 30.4% (n=14) focused on influenza symptoms or management without mentioning the vaccine. A similar distribution was reported when considering all retrieved articles and no differences were observed by time frame. The median length of articles focusing on influenza and in-
fluenza immunization during time frame #1 and time frame #2 was 25% and 15%, respectively, higher than the length observed during the whole study period (317 words). Considering all retrieved articles, the median length during time frame #1 and time frame #2 was 20% higher than the length observed during the whole study period.

The share of retrieved articles placed in the main section of the newspaper increased from 13% when considering the whole study period to 38% during time frame #2 (43% if only considering articles on influenza), reaching 50% during time frame #1. Overall, 5 articles made the front page, of which 3 during time frame #1.

**DISCUSSION**

We assessed media coverage of influenza and immunization-related topics on all published issues of the Italian newspaper ranking highest in circulation over one year. We report that 7.5 articles per month were published on immunization-related issues, 3.5 specifically focusing on influenza. The largest share of them were concentrated around the period of the Fluad case and – this is particularly relevant – were published in the «uncertainty» period between the first reporting of the deaths suspected to be associated with Fluad vaccine administration and before the Italian Institute of Health’s announcement that there was no evidence of causal association. Not only were more articles published during that period, but they were also longer and located in the main sections of the newspapers, including the front page. In addition, poor media coverage was given to the release of official safety results by national and international health authorities. Not a single article was published reporting EMA’s Pharmacovigilance Risk Assessment Committee statement that there was no evidence of a causal relationship between the fatal events and the administration of Fluad, nor was a single article published reporting the final test results conducted by the National Institute of Health, proving Fluad vaccine safety. On the contrary: before health authorities announced that the Fluad vaccine was safe and encouraged the population to get vaccinated against the flu to prevent serious complications, article titles kept reporting on increasing numbers of deaths suspected to be associated with Fluad, using alarming title words such as «deadly vaccine» and «killer vaccine».

We would also like to underline that, apart from the Fluad case, very little attention was paid by the media to influenza prevention and immunization in general; no articles were published when the Ministry of Health released the annual Circular with the recommendations for influenza prevention and control, nor were any articles published around the launch of the seasonal immunization campaign promoting influenza vaccination among the elderly and at-risk populations.

The 2014–2015 seasonal influenza immunization coverage data have been recently made available by the Ministry of Health: in subjects aged ≥65 years vaccine coverage this year decreased by 11% as compared to the previous season, a step back to 2000-2001 coverage rates.12 Luckily enough, the Fluad case occurred halfway through the immunization campaign: (more than one month after its start), and this limited its negative impact, as many people had already been vaccinated. Still, a survey conducted by the Union of Italian Physicians (SMI) reported that, right after the Fluad case, influenza vaccine uptake rates decreased by 80% at the national level, ranging from -15% to -100% in different regions.7 In addition, the clinical burden of influenza was larger this year than in previous seasons, with the national epidemiologic surveillance system reporting 648 serious flu cases and 163 influenza-related deaths, corresponding, respectively, to an 85% and 90% increase as compared to the 2013-2014 season.2 It must be noted that, of all reported serious flu cases, only 7.6% of patients were vaccinated against influenza. All available indicators point to the fact that the last influenza season was the second most severe after the 2009/2010 pandemic.12

Our findings suggest that the Fluad case media coverage might have had a negative impact on influenza vaccine uptake, therefore worsening influenza-related clinical outcomes and direct and indirect healthcare costs. When health-related events make the headlines, they greatly influence the risk perceptions of the general population. In this context, institutions and health authorities should invest more in communication and their role in the press needs to be more prominent.13 If the Ministry of Health, the National Institute of Health, and the Italian Medicines Agency’s statements and positions on the Fluad case had had greater visibility, this could have limited the circulation of alarming and misleading messages, and ultimately the decrease in vaccine uptake.13

Trust in vaccines and immunization is being increasingly undermined.14 As anti-vaccination arguments are widely available online and anti-vaccination movements capitalize on the potential offered by the new means of communication, public institutions and scientific societies are called to handle this growing public health concern. Along these lines, in 2013 the Italian Society of Hygiene and Preventive Medicine launched the VaccinariSi project, with the aim of exploiting the great potential offered by media to communicate and educate the general population, as well as the healthcare community at large, about vaccines.15

Our study presents both strengths and limitations. To our knowledge, this is the first study to have performed a comprehensive media monitoring on all issues of a national newspaper (ranking first in circulation) over a one-year follow up. Another major strength of our work is that we carried out a quantitative analysis of the media coverage of influenza and immunization-related topics: we built and applied a number of indicators that enabled us to quantitatively assess the number, content, and relevance of retrieved articles, as well as analyze trends and perform comparisons. Similar studies published in the literature considered shorter study periods, did not scan printed newspapers, and carried out only qualitative analyses.16

Limitations include only having considered one newspaper. However, Corriere della Sera is the newspaper that ranks first in readership in Italy (with a print run of 400,697 copies per day) and reaches a large and representative sample of the Italian population.17 Another limitation is that we did not include
other types of media, such as new and social media, in our analysis; nevertheless, as the target population of the influenza vaccine is the elderly, we believe they are likely to read printed newspapers rather than seek for information on the Internet. Last but not least, it would have been interesting to analyze influenza and influenza immunization media coverage trends over a longer period comprising several influenza seasons, as well as compare it with media coverage of other relevant health issues.

We carried out a retrospective analysis. We suggest that media monitoring models like ours could be applied prospectively. In case of relevant public health issues, this could be a helpful tool to plan, implement, and evaluate effective communication strategies promoting healthy behaviours.

CONCLUSION

Seasonal influenza vaccines can prevent millions of cases, thousands of hospitalizations, and hundreds of deaths, which also produce direct and indirect-related costs and societal burden. However, influenza immunization coverage in Italy remains low and far from the targets established by the Ministry of Health. During the last influenza season, the Fluid case is likely to have negatively influenced not only influenza vaccine uptake and confidence, but immunization in general: our findings suggest that media coverage of the event might be mainly responsible for this.

Media – if misused – can have a detrimental effect on population health and prevention behaviours. Public institutions, health authorities and representatives of the scientific community should increase their efforts in conveying health education messages through the media.18

We proposed an analytic model of public health-related topic media monitoring that can be effectively applied to support this.

Conflicts of interest: none declared

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