

Influenza sentinel surveillance network

A public health-primary care collaborative action to assess influenza A(H1N1)pmd09 in Catalonia, Spain

Nuria Torner,^{1,2,3,*} Maretva Baricot,² Ana Martínez,¹ Diana Toledo,² Pere Godoy,¹ Ángela Domínguez^{2,3} and the Influenza Sentinel Surveillance Primary care physicians' Network of Catalonia (PIDIRAC)

¹Public Health Agency of Catalonia; Barcelona, Spain; ²CIBER Epidemiología y Salud Pública (CIBERESP); Carlos III Institute; Madrid, Spain; ³Department of Public Health; University of Barcelona; Barcelona, Spain

Keywords: public health, influenza sentinel surveillance, primary care, pandemic influenza, collaborative research

Abbreviations: GP, General Practitioner; ILI, Influenza like Illness; A(H1N1)pmd09, Pandemic influenza A (H1N1)2009; P, pediatrician; PIDIRAC, Pla Informació Diària Infeccions Respiratòries Agudes de Catalunya (Acute Respiratory Illness Daily Information Plan of Catalonia)

The aim of this study was to evaluate the outcome of a collaborative action between Public Health services and Primary Care in the context of a case-control study on effectiveness of pharmaceutical and non-pharmaceutical measures to prevent hospitalization in a pandemic situation. To carry out this research the collaborative action of the primary care physicians members of the Influenza surveillance network was needed, they had to recall clinical information from influenza A(H1N1)pmd09 confirmed outpatient cases and negative outpatient controls matching their corresponding hospitalized confirmed case.

A survey questionnaire to assess involvement of Influenza Sentinel Surveillance Primary care physicians' Network of Catalonia (PIDIRAC) regarding the outpatient case and control outreach during the pandemic influenza season was performed. A total of 71.1% of completed surveys were received. Perception of pandemic activity was considered to be similar to seasonal influenza activity in 43.8% or higher but not unbearable in 37.5% of the replies. There was no nuisance reported from patients regarding neither the questions nor the surveyor.

Collaborative research between Public Health services and Primary Care physicians enhances Public Health actions and research.

Introduction

Integration of primary care medicine and public health can have a positive impact on the health of people, and it is shown to be feasible because of common population concerns, shared health information system, organizational approach to integrated interventions and partnership.

According to Last,¹ Public Health is the science and art of preventing disease, prolonging life and promoting health through organized efforts of society, whereas Primary Health Care represents the first point of contact for individuals with the health care system. It is the key to efficient, timely and quality family and community care based on continuity and coordination, early detection and action and better information on needs and outcomes.² Nevertheless, community perception about the professional role in personal care, to prescribe and to answer to the individual's demand ("medical role") prevailing over public health counseling ("promotion role"), may influence their perspectives toward integration. The very close relationship between

the individual and his personal medical doctor creates links and opinions that are quite different from the connection with anonymous professionals in the "distant" public health services.³⁻⁵

European sentinel practitioner influenza surveillance networks represent a simple and feasible framework to conduct observational studies providing rapid and repeated influenza virus estimates. Results from practitioner-based studies complement other pieces of evidence (e.g., immunogenicity or vaccine efficacy) to assess the effect of influenza morbidity.⁶

Pandemic Influenza as well as seasonal influenza surveillance data collection relies on morbidity and virological indicators from primary care reporting of ILI cases by the physicians of sentinel surveillance network. In Catalonia, a region at the northeast of Spain with 7.5 million inhabitants, the daily information reporting of acute respiratory infections network (PIDIRAC) is made up of 56 primary care sentinel physicians, a virological reference laboratory for confirmation of respiratory samples and a coordinating team at the Public Health Agency of Catalonia (formerly Directorate of Public Health).

*Correspondence to: Nuria Torner; Email: nuria.torner@gencat.cat

Submitted: 10/19/12; Accepted: 11/05/12

<http://dx.doi.org/10.4161/hv.23264>

The report on April 2009 by the Center for Diseases Control and Prevention of the existence of a pandemic influenza virus affecting children in California⁷ which later on spread to other countries and continents resulted in the declaration by the World Health Organization of a phase 6 pandemic by mid June. This event triggered a worldwide research activity to assess as best as possible the A(H1N1)pmd09 influenza virus. Due to the lack of knowledge of the effectiveness of pharmaceutical and non-pharmaceutical preventive measures in a pandemic situation, the Research Program on Influenza A(H1N1)pmd09 in Spain of the Ministry of Science and Innovation issued a call for research projects. In reply to this call, on September 2009, researchers from the CIBER Epidemiología y Salud Pública (CIBERESP) network presented a multicenter case-control study, with controls matched for age, hospital and date of hospitalization, to investigate these aspects in 37 hospitals in 7 Spanish autonomous communities, 9 of which were in Catalonia. For each confirmed hospitalized case of pandemic influenza, 1 confirmed outpatient case (positive control) and 1 outpatient tested negative for influenza (negative control) were recruited from sentinel network. Demographic variables, underlying medical conditions, use of antiviral agents, vaccines received and hygiene habits were collected for all cases and controls. A total of 248 hospitalized patients were recruited by February 2010 in Catalonia, with their matched outpatient confirmed sentinel surveillance cases and negative outpatient controls. The aim of this work is to focus on how this partnership can aid at the fulfillment of a case control study on effectiveness of pharmaceutical and non-pharmaceutical measures to prevent pandemic influenza transmission.

Results

By the end of September 2010, 32 completed surveys were received (71.1%), of these 47% were from GP and 53% from P. The mean number of controls contacted by each physician was 9 (SD 9.55; range from 1 to 40). There were 46.9% of physicians who contacted up to 5 patients, 28% from 6 to 10 controls and 25% > 10 controls; no statistical differences between urban and rural setting ($p = 0.102$) nor between GP or P ($p = 0.876$) were observed. Sixty-nine % of participants was aware of the project although only 47% of them had attended the informative session held at the former Directorate of Public Health (now Public Health Agency of Catalonia) in October 2009. Perception of pandemic activity was considered to be similar to seasonal influenza activity in 43.8% of the replies or higher but not unbearable in 37.5% of the replies. To the question whether the collaborative action during pandemic activity presented any disturbance to their daily practice, 88% replied there was no problem, even though 78% of physicians handed out information on medical records of their patients personally to the surveyor. Ninety-four % of sentinel physicians contacted their patients by phone to inform them about the study that was taking place and to coordinate their interview with the person designated to perform the survey. If a patient was not willing to be addressed, another control was searched. There was no nuisance reported from patients

Box 1: Results of the survey addressed to collaborating sentinel physicians of the case-control Project for the study of Effectiveness of pharmaceutical and non-pharmaceutical measures for the prevention of influenza A(H1N1)2009 infection.

regarding neither the questions nor the surveyor. All results are listed on **Box 1**.

There were no statistically significant differences in replies to any of the questions in the survey between rural or urban primary care facilities neither between GP and P.

Discussion

The results of this survey suggest that primary care professionals who are already engaged in public health collaborative actions are prone to also engage in public health research projects acting as a translational framework for research. Understanding translational research as a more comprehensive applied research that strives to translate available knowledge and make it useful for clinical and public health practices.⁸ The relevance of translation of public health research in order to upgrade population health benefits is widely recognized, especially with contemporary health challenges which require a broader range of responses than those that are delivered by already established health care systems.^{9,10}

Social, political and economic disruptions caused by natural and human-caused public health emergencies have catalyzed public health efforts to expand the scope of bio-surveillance and increase the timeliness, quality and comprehensiveness of disease detection, alerting, response and prediction. The notion of information “fusion” may provide opportunities to expand data access, analysis and information exchange to better inform public health action.¹¹

Surveillance for influenza is essential for the selection of influenza vaccine components and detection of human infections with novel influenza A viruses that may signal the start of a pandemic. Viral surveillance provides the milestone from which this information can be obtained. However, morbidity and mortality data are needed to better understand the burden of disease, which, in turn, can provide useful information for policy makers relevant to the allocation of resources for prevention and control efforts. Data on the impact of influenza can be used to identify groups at increased risk for severe influenza-related complications, develop prevention and control policies and monitor the effect of these policies. Influenza surveillance systems frequently monitor outpatient illness, hospitalizations and deaths, but selection of influenza surveillance components should be based on the surveillance goals and objectives of the jurisdiction.¹²

There is some literature documenting collaborative interventions where benefits have been claimed in the context of rigorously designed and conducted studies on this topic, yet it is not clear that collaborative arrangements are more beneficial to the health of the participants than standard care. Even if collaboration could improve health outcomes, there is insufficient data on which models are most likely to be successful.

Lautenbach et al.¹³ in a cross-sectional survey on beliefs among the memberships of the Society of Healthcare Epidemiology of

America found that a majority of respondents believed that US healthcare institutions were heading in the right direction during the first pandemic wave. Paño-Pardo et al.¹⁴ in a survey among the members of the Spanish Society of Infectious Diseases and Clinical Microbiology found that the majority of membership did not believe that A(H1N1)pmd09 influenza had a more severe presentation than influenza in other seasons. The literature identified presents many subjective measures, including attitudes, but albeit there is little evidence of meaningful benefits resulting from changes in lifestyle and the overall outcomes do not indicate that collaboration confers health benefits at either patient or population level.¹⁴ Quality improvement methods and techniques can be implemented using collaborative models through training and expert facilitation.¹⁵ Moreover, public health procedures can be enhanced especially if recruitment of primary care physicians is provided by preexisting networks for sentinel surveillance.¹¹

In conclusion, there is considerable overlap in roles, responsibilities and functions between public health and primary care, especially related to disease and injury prevention and health promotion.² There are great challenges in working together to achieve better understanding of disease and needs for quality health care and prevention. Future public health should be based on the proposition that cultural change and re-integration are necessary components of a more sustainable and equitable society.¹⁶

The current paper addresses an example of a collaborative initiative in the context of a pandemic scenario and intends to recognize the staff efforts that have contributed to public health research and improvement of the understanding of this novel virus. Although organizational structures will remain partially independent of each other, different sectors of health care should continue to work together in order to gather lessons learned and move forward on enhanced collaborations.

Materials and Methods

A survey questionnaire to assess involvement, compliance and perception of work load of the PIDIRAC network regarding the outpatient control outreach during the pandemic influenza season was performed. The survey was conducted on July 2010, following the first pandemic wave. In order to enhance communication between sentinel physicians and survey personnel, the network was coordinated by the epidemiologists in charge of the network at the Public Health Agency of Catalonia.

The survey forwarded by e-mail, was made up of 13 questions related to whether information rendered by researchers on the study had been satisfactory, on workload and on possible inconveniences encountered during the study (See Annex 1). Final collection of replies was scheduled for September 15th 2009. Answers were registered and analyzed on SPSS® 18 (IBM Statistical

Questions Results

1. Number of patients from whom information has been granted: Mean 9 (SD 9.55; 1 to 40)
2. Was healthcare seeking activity during pandemic wave (week 41 to 48, 2009) % (n)

- a. Overwhelming 6.3 (2)
- b. Higher than seasonal influenza epidemic, yet acceptable 37.5 (12)
- c. Similar to seasonal influenza epidemic activity 43.8 (14)
- d. Less than seasonal influenza epidemic activity 12.5 (4)
3. Patients who were sampled for virological testing and rendered positive to A (H1N1)2009 were informed of the results. % (n)
 - a. Always 81.3 (26)
 - b. Never 3.1 (1)
 - c. Sometimes 15.6 (5)
4. Were you aware of the study to which this survey is addressed? % (n)
 - a. Yes 68.8 (22)
 - b. No 6.3 (2)
 - c. Partially 25.0 (8)
5. Have you attended at meetings scheduled by the study researchers. % (n)
 - a. Yes 43.9 (15)
 - b. No 53.1 (17)
6. Did you inform your patients chosen as controls (positive or negative) that a survey agent would contact them to gather information for the study? % (n)
 - a. Always 71.9 (23)
 - b. Never 6.3 (2)
 - c. Sometimes 21.9 (7)
7. Did you forward requested medical information to the survey agent from the patients medical records? % (n)
 - a. Always 78.1 (25)
 - b. Never 3.1 (1)
 - c. Sometimes 18.8 (6)
8. If the answer to question 7 is Yes, please specify the means usually used. % (n)
 - a. Telephone 40.6 (13)
 - b. Fax 0 (0)
 - d. E-mail 15.6 (5)
 - d. Personal interview with the survey agent 12.5 (4)
 - e. Combined: Telephone and interview 12.5 (4)
 - f. Combined: Telephone and e-mail 9.4 (3)
 - g. Combined: Telephone, e-mail and interview 3.1 (1)
 - h. No reply 6.3 (2)
9. Did you provide the survey agent accessibility to medical records so he/she could obtain medical and vaccination information required for the study? % (n)
 - a. Always 28.1 (9)
 - b. Never 62.5 (20)
 - c. Sometimes 6.3 (2)
 - d. No reply 3.1 (1)
10. Collaborating with the study during the pandemic reported any inconvenience for your medical practice? % (n)
 - a. Yes 12.5 (4)
 If the reply is Yes, please specify the reasons: Telephone reach-out was time consuming
 - b. No 87.5 (28)
11. Were any of your patients annoyed by the study survey? % (n)
 - a. Yes 3.1 (1)
 - b. No 96.9 (31)
12. Were any of your patients annoyed at or by being contacted by the survey agent? % (n)
 - a. Yes 12.5 (4)
 If the reply is Yes, please specify the reasons: Too many questions; Not willing to collaborate; Misunderstanding the survey; Unpleased with contacting method
 - b. No 87.5 (28)
13. Did you have any trouble in obtaining informed consent from patients? % (n)
 - a. Yes 0 (0)
 If the reply is Yes, please specify the reasons.....
 - b. No 90.6 (29)
 - c. No reply 9.4 (3)

Package Inc. Chicago, USA). The analysis of data was performed by the ANOVA test to determine differences between rural (locations with < 10,000 inhabitants) or urban (> 10,000 inhabitants) setting physicians, or whether they were GP or P. Statistical significance was established assuming an α error of 0.05.

Disclosure of Potential Conflicts of Interest

No potential conflicts of interest were disclosed.

Acknowledgments

We thank the collaborating PIDIRAC Sentinel Surveillance Network physicians (Aizpurua P, Alonso J, Arigon P, Azemar J,

Basas D, Besora R, Callado M, Casanovas JM, Cid A, Ciurana E, Cots JM, De la Rica D, Estabanell A, Fau E, Fernandez O, Forcada A, Fos E, Gadea G, Garcia J, Garrido P, Gatius C, Grivé M, Juscafresa D, Leon I, Macia E, Mainou A, Marco E, Martinez M, Martinez E, Molinero C, Lopez-Mompó C, Navarro D, Ortola ME, Perez MC, Perez MMar, Prat M, Pujol R, Pujol J, Ribatallada A, Sanchez R, Valen E, Valencia I, VanEsso D, Vila C, Zabala E, Zurilla E).

This work was partially supported by the Carlos III Institute of Health, (GR09/0030) and Agency for the Management of Grants for University Research [(AGAUR)2009 SGR 42].

References

1. Last J. Human rights, doctors' rights, and patients' rights/Droits humains, droits des médecins et des malades. *Ann R Coll Physicians Surg Can* 1995; 28:262-3; PMID:12199231.
2. Ciliska D, Ehrlich A, DeGuzman A. Public Health and Primary Care. Challenges and Strategies for Collaboration. 2005.
3. Starfield B. Public health and primary care: a framework for proposed linkages. *Am J Public Health* 1996; 86:1365-9; PMID:8876503; <http://dx.doi.org/10.2105/AJPH.86.10.1365>.
4. Starfield B. A framework for primary care research. *J Fam Pract* 1996; 42:181-5; PMID:8606309.
5. Gofin J, Gofin R. Community-oriented primary care and primary health care. *Am J Public Health* 2005; 95:757; PMID:15855446; <http://dx.doi.org/10.2105/AJPH.2004.060822>.
6. Valenciano M, Kissling E, Ciancio BC, Moren A. Study designs for timely estimation of influenza vaccine effectiveness using European sentinel practitioner networks. *Vaccine* 2010; 28:7381-8; PMID:20851086; <http://dx.doi.org/10.1016/j.vaccine.2010.09.010>.
7. Centers for Disease Control and Prevention (CDC). Swine influenza A (H1N1) infection in two children--Southern California, March-April 2009. *MMWR Morb Mortal Wkly Rep* 2009; 58:400-2; PMID:19390508.
8. Narayan KM, Gregg EW, Engelgau MM, Moore B, Thompson TJ, Williamson DF, et al. Translation research for chronic disease: the case of diabetes. *Diabetes Care* 2000; 23:1794-8; PMID:11128355; <http://dx.doi.org/10.2337/diacare.23.12.1794>.
9. Woolf SH. The meaning of translational research and why it matters. *JAMA* 2008; 299:211-3; PMID:18182604; <http://dx.doi.org/10.1001/jama.2007.26>.
10. Ogilvie D, Craig P, Griffin S, Macintyre S, Wareham NJ. A translational framework for public health research. *BMC Public Health* 2009; 9:116; PMID:19400941; <http://dx.doi.org/10.1186/1471-2458-9-116>.
11. Temte JL, Grasmick ME. Recruiting primary care clinicians for public health and bioterrorism surveillance. *WMJ* 2009; 108:104-8; PMID:19437937.
12. Brammer L, Budd A, Cox N. Seasonal and pandemic influenza surveillance considerations for constructing multicomponent systems. *Influenza Other Respi Viruses* 2009; 3:51-8; PMID:19496841; <http://dx.doi.org/10.1111/j.1750-2659.2009.00077.x>.
13. Lautenbach E, Saint S, Henderson DK, Harris AD. Initial response of health care institutions to emergence of H1N1 influenza: experiences, obstacles, and perceived future needs. *Clin Infect Dis* 2010; 50:523-7; PMID:20064038; <http://dx.doi.org/10.1086/650169>.
14. Paño-Pardo JR, Martín-Quirós A, Romero-Gómez M, Maldonado J, Martín-Véga A, Rico-Nieto A, et al. Perspectives from Spanish infectious diseases professionals on 2009 A (H1N1) influenza: the third half. *Clin Microbiol Infect* 2011; 17:845-50; PMID:20673267; <http://dx.doi.org/10.1111/j.1469-0691.2010.03322.x>.
15. Riley W, Parsons H, McCoy K, Burns D, Anderson D, Lee S, et al. Introducing quality improvement methods into local public health departments: structured evaluation of a statewide pilot project. *Health Serv Res* 2009; 44:1863-79; PMID:19686251; <http://dx.doi.org/10.1111/j.1475-6773.2009.01012.x>.
16. Hanlon P, Carlisle S, Hannah M, Lyon A, Reilly D. Learning our way into the future public health: a proposition. *J Public Health (Oxf)* 2011; 33:335-42; PMID:21859877; <http://dx.doi.org/10.1093/pubmed/ldr061>.