Information and Communication Technologies

EPIWORK

Developing the Framework for an Epidemic Forecast Infrastructure

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D 5.3 Tests run in 2009

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Work package participants

The following partners have taken active part in the work leading to the elaboration of this document, even if they might not have directly contributed writing parts of this document:

- AIBV
- ISI
- FGC-IGC
- CREATE-NET
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Change log

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1	**30-09-10**		

Test run in 2009

The first objective of WP5 is to enhance the portability of the interactive Internet Monitoring Systems for diseases surveillance in Europe and to extend its implementation into five new countries: UK, Sweden, France, Spain and Germany. At the beginning of the project, the system was active in four countries: The Netherlands, Belgium, Portugal and Italy.
The first year of WP5 was designed to be a pilot year including determination of a 'golden standard' set of ILI symptoms, database infrastructure preparation for , internet database design, translation of documents and testing.
The surveillance activities of the already existing platforms have been intensified in the Spring 2009 because of the H1N1pdm. All groups in the several countries where the IMS were not yet active, have accelerated the work and pushed forward the implementation of the surveillance system to start collecting data in real time during the newly announced pandemic. In particular, in the UK the IMS has been deployed in the early Summer of 2009 (http://flusurvey.org.uk), well ahead of schedule. The platform has been collecting data on Influenza since July 2009.

Despite the work on the IMS platform consider n a common template web platform and database structure, the implementation of the IMS in each country represents a separate scientific challenges and research problems. Each country has different population stratification and geographical distribution. The IMS has to take into account these differences and design specific mapping/representation solutions as well as finding the optimal granularity for the data acquisition and statistical sampling.
The prompt implementation of the system in the UK at the beginning of the first pandemic wave in June 2009 has been successful thanks to the possibility of leveraging on the experience gained in the 'old' IMS countries, where the IMS was already active.
In parallel, partners in WP5 have brought on the discussion on the development of a . golden standard of case definitions and survey schemes (see Task 1), stimulated by the need of having an appropriate survey best describing the different countries requirements in the data collection method during a public health emergency period. The first draft has been developed in July, the second draft has been tuned in August 2009, before the striking of the Autumn wave of H1N1 pandemic.

General outline and implementation of *European IMS database infrastructure* and website (single centralized database, design of templates for the website in five new local versions) have proceed further during 2009 (see Task 2). Already during the early phases of the H1N1 pandemic, database contents of the already existing local IMS platform have been collected in a centralized repository that provided an extensive source of epidemiological data. During the first WP5 meeting (25-26 May 2009) in Amsterdam and Epiwork project meeting (15-18 November 2009) the discussion among the partners has led to the preparation in December 2009 of a draft for the design of the European centralized database, again brought forward by the occurrence of the H1N1 pandemic. The presentation has been in March 2010, well ahead of schedule. The database will provide easy-to-access, reliable, uniform and

standardized epidemiological data. Database contents of the local IMS will be consistent and have standard cross-country information.

The development of a common Gold Standard Questionnaire, the implementation of a unique database infrastructure where to collect all data coming from the different countries, and the availability of related documentation and information pages in different languages (obtained through Task 3), have allowed researchers in WP5 to build a concretely portable system for surveillance that can be more easily exported and implemented in different countries. However, many issues still need to be considered in the unique standard approach.
Each system needs to be based on local country data, as e.g. demographic data, age stratification data, and geographic data at different resolution scales. Data needs to be collected, analyzed, and synchronized. Each system needs to deal with the local privacy regulations to ensure privacy protection of the personal data submitted by each user. Problems of data handling and visualization of results at different scale resolution needs to be addressed and to conform to the local scenario: e.g. the choice between administrative regions and postal codes, conformity of the choice made with the national privacy regulations, analysis of the hierarchical systems used by each country for administrative regions and/or postal codes, and others.
The IMS platform needs to be tested to allow the assessment of software stability, database reliability and tune the advertisement campaign according to the various national habits and Internet penetration. This test run are usually made with a limited number of users and are done before the launch of massive data gathering campaigns.
During 2009, these tests have necessarily been accelerated due to the H1N1 pandemic. The pilot phase of IMS in the new countries, foreseen for the winter season 2010/2011, was forcedly anticipated. As mentioned above, the IMS was deployed in UK in the early summer of 2009, thanks in particular to the joint effort of the UK, Portuguese and Italian teams. Sweden has followed in 2010-11 and Germany, France and Spain from 2011 – 2012.
Thus, UK has been the first "new" country where the IMS has been extensively tested in 2009. The UK IMS (http://flusurvey.lshtm.ac.uk/) has been collecting data on influenza on a national scale since July 2009. Information was collected in 2009 from over 5500 participants across the UK (making the UK survey the third largest survey within the network).
UK has also been the only country in Europe to experience a double wave of contagions during the pandemic: the summer wave between June and July 2009, and the Autumn wave that has involved also the rest of Europe. The prompt deployment of the IMS platform has allowed the detection of changes in the way individuals accessed treatment over the course of the H1N1v epidemic. Importantly, there were major changes in access to health care during the epidemic, with individuals being far more likely to contact health services during the early part of the epidemic than later on. This was partly because in the National Pandemic Flu Service (NPFS) was introduced (a service that allowed individuals to collect antivirals without visiting a general practitioner). This highlights the utility of this internet-based collection methods, as all traditional forms of data collection require individuals to contact the health service in some way. If individuals change the way they access health services (which is evident from the data collected by flusurvey – Figure 1), then the traditional surveillance data will be biased. The ICT allowed the UK to monitor and correct for this bias in the epidemic in real-time.

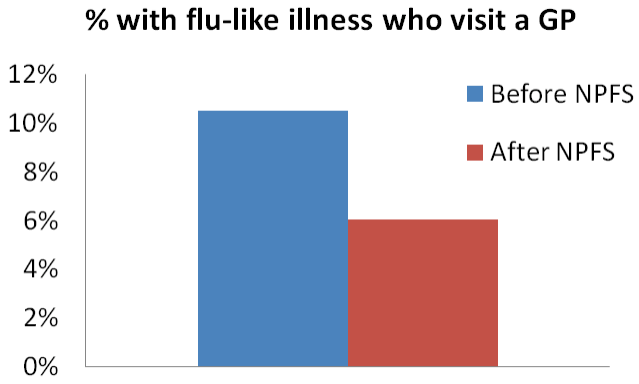

Figure 1. Changes in the fraction of individuals contacting their GP after the implementation of NPFS.

Moreover, data from the ICT monitoring system were used to inform pandemic-related decision-making in the UK on a range of topics from the period of absenteeism to the physician consultation and hospitalisation rates. John Edmunds is a member of UK Government's pandemic scientific advisory committee, and the results from flusurvey were used to inform the modelling committee on epidemic progress and changes to access care patterns etc, during the epidemic. The data were also used to inform a real-time model of pandemic influenza in the UK and an associated economic evaluation of alternative vaccination policies.

In summary, the unique circumstances under which the first deployment of the IMS in one of the new countries have shown how each local IMS will become a rich source of general information about influenza – scientific, medical, historical as well as social – constantly updated according to the latest information available.
In 2010, tests for the new platform have involved all the old countries (The Netherlands/Belgium, Portugal, Italy and UK) with the new entry of Sweden.