DECIDE: NEW TOOL POTENTIALLY OFFERS FASTER ACCESS FOR EARLIER DIAGNOSIS OF ALZHEIMER'S DISEASE

Fulvio Galeazzi,
"DECIDE" project coordinator

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Fulvio Galeazzi, "DECIDE" project coordinator, speaks with Alzheimer Europe about the European project "DECIDE" and how it can help people with dementia and their carers.

Alzheimer Europe (AE): Mr Galeazzi, can you explain what the DECIDE project is and what its aims are?

Fulvio Galeazzi (FG): DECIDE (Diagnostic Enhancement of Confidence by an International Distributed Environment) is a European project within the Seventh Framework Programme (FP7). It began in September 2010 and is based on the pioneering neuGRID e-Infrastructure, which is also an FP7 project. DECIDE aims to develop a European e-service dedicated to researchers and clinicians for the study and the early diagnosis of Alzheimer's and other neurodegenerative diseases. It includes among its partners internationally renowned researchers on Alzheimer's disease.

The service will be based on a secure and unique infrastructure of powerful computing resources, high-speed networks and international databases that allows clinicians to quickly upload, analyse and compare medical imaging data and enabling informed diagnoses.

By making advanced, simple to use diagnostic tools available to clinicians across Europe, DECIDE enables support for the early diagnosis of Alzheimer's disease, improving patient care and family planning.

AE: How will this e-service help clinicians in the early diagnosis of Alzheimer's disease?

FG: Applications integrated in the DECIDE environment allow clinicians and researchers to perform the computer-aided extraction of diagnostic markers from patients' data and medical images such as Positron Emission Tomography (PET), Magnetic Resonance Imaging (MRI), and Electroencephalography (EEG) scans, and explore a multimodal distributed reference database including 850 datasets from control subjects and 2,200 from neurological subjects. It is a huge amount of data to analyse and its elaboration will be possible because DECIDE brings together the power of research networks, distributed databases, powerful diagnostic algorithms and grid computing.

The diagnostic markers extracted will provide clinicians and researchers with quantitative measures of the statistical deviation with respect to the control database, allowing a more sensible and specific early detection of the disease.

AE: Can you explain how clinicians will be able to access the DECIDE service?

FG: It will be available by using a simple web browser. The clinicians, irrespective of location, will access the DECIDE portal through their web browser, upload the biomedical images of the patient and, by a simple click, let DECIDE securely handle the processing, protecting data confidentiality. Markers that have been associated with the onset of Alzheimer's disease will be extracted.

AE: Which are the main benefits that DECIDE may potentially offer people with Alzheimer's disease?

FG: The potential impact for clinical use and research of the proposed e-Infrastructure will be on a large scale by enabling clinicians from hospitals with no access to sophisticated computational algorithms, resources, and large sets of reference databases (images, EEG recordings) to carry out analyses remotely and efficiently. This means that people with Alzheimer's disease will benefit from a more appropriate inclusion in clinical trials, or advanced research therapies, given the better accuracy in early diagnosis.

AE: What have been the key achievements of the project to date?

FG: The distributed e-infrastructure is up and running, providing a testing environment for the new applications that offer very high service levels. We have also implemented a secure but very user-friendly Authentication and Authorisation Infrastructure (AAI), which allows users to be securely and easily authenticated in the grid environment.

A working pilot of the service, implementing the Statistical Parametric Modelling (SPM) and Electroencephalography (EEG) applications was deployed and was successful during initial tests. These applications will soon be available for real users' validation. As of now, we have received expressions of interest from neurologists, imaging experts and other professionals working with people with Alzheimer's disease in 13 European countries: All these people are interested in becoming part of the user panels that will test each application with real patient cases. Once their feedback is collected, we'll be able to launch the service at a wider level and define protocols and rules for the training and qualification of experts enabled to use the service for clinical diagnostic purposes.

AE: Patient information is generally held under legal and ethical obligations of confidentiality. How is the issue of patient privacy in relation to data handling addressed in this project?

FG: Only referent trained medical personnel responsible for a given patient will manage medical data. All patient data will be anonymised from the beginning, so that the patient's personal information can never be associated with his or her diagnostic exams. The physician will be solely responsible to keep the connection between the two, thus protecting the patient's privacy. Furthermore, all data movement, as well as temporary data storage, will be protected by using strong cryptographic techniques.

AE: The DECIDE project is due to end in 2012. Do you envisage the work being carried forward?

FG: The project will strive to ensure the actual usability and exploitability of the service in real-life clinical settings.

The implementation of the DECIDE infrastructure and service should be regarded not only as a step towards streamlining and enhancing confidence in early diagnosis of neurodegenerative pathologies, but as a concept that can be successfully extended to other pathologies and communities, not only in the field of neurology. For instance, it could be extended to disciplines like cardiology and traumatology, where imaging techniques are heavily used, bringing the relevant communities the benefit of automated quantitative image analysis using complex algorithms.

Moreover, DECIDE is keen and open to extending its infrastructure and to enriching its application portfolio by involving other research communities. This will help to build a wider network of scientists and potentially boost the pace of each research programme by allowing scientific cooperation as well as data and information exchange, with the eventual goal of shortening the time needed to enter the daily clinical practice.

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University of Foggia - Italy
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