INDRA LEADS AN R&D&I PROJECT TO PREVENT STROKE IN PATIENTS AT RISK THROUGH BIG DATA TECHNOLOGY

- **The ultimate aim of P-Ictus is to develop a solution based on the intelligent processing of data stored in digital health records, allowing professionals to anticipate the appearance of stroke, pinpoint its causes and improve the treatment of patients**

- **Reduction of mortality and the disabilities caused by stroke, access to personalized treatments, and the contribution of new knowledge based on scientific evidence are some of the benefits expected within the framework of this initiative**

Madrid, July 11, 2018 Indra, one of the world's foremost technology and consulting companies, is leading P-Ictus, an R&D&i project aimed at creating a solution to prevent stroke in patients at risk based on the use of big data technology to extract knowledge from digital health records and other non-clinical data sources. The tool will enable healthcare professionals to anticipate the appearance of stroke, pinpoint its causes, and treat patients earlier and more effectively.

The main source of information for this project is FUNDESALUD (Foundation for the Training and Research of Healthcare Professionals of Extremadura), and in particular the data provided by the Stroke Unit of the Hospital San Pedro de Alcántara in Cáceres. Data will be extracted from the records, previously anonymized, of patients who have suffered a stroke and will take into account other aspects of their clinical history, such as hospital treatment, relapses, medication and any diagnostic tests performed. These data will then be enriched with socio-demographic, economic, climate, pollution and social data to refine the individual layering process carried out.

All of this information will be processed using techniques like big data statistical analysis to create new prediction algorithms based on physical and mathematical models that will generate knowledge about the prevention and diagnosis of the different types of stroke. The results obtained will facilitate the development of rules and models based on scientific evidence, which will then be integrated into an assisted decision-making tool for professionals.

The solution developed within the framework of the project will become the first information system based on scientific evidence generated from data stored in health records, focused on the prevention of stroke in the population at risk.

"Everyone is talking about the potential of big data techniques for health, but until now no one has been able to apply them to clinical data, validated by healthcare professionals, related to diagnoses, medical history or allergies," explained Carlos González, healthcare manager at Indra and the project coordinator.

With a budget of nearly two million euros, P-Ictus is financed by the European Regional Development Fund (ERDF) and the Center for Industrial Technological Development (CDTI). Completion is expected in the first quarter of 2019. In addition to Indra, the other project participants are the Casaverde Group, an organization specializing in the rehabilitation of patients with stroke; DRIMAY, an Andalusian SME specializing in the statistical analysis of data, with ample experience in the health field; and Xtrem, an Extremadura-based SME specializing in the development of IT tools for the clinical stations of healthcare professionals.

Impact

The development of a solution of this kind would have a very positive impact. According to several clinical experts consulted, there are currently no expert tools for classifying the occurrence of stroke etiologically

(according to its causes), for assisting secondary prevention (post-occurrence), or for predicting when a patient is nearing the critical point that precedes the onset of an attack.

People will therefore be able to anticipate the appearance of stroke, receive personalized attention and care, and access the appropriate treatment based on the cause of the attack. Their life quality will also be improved because it will be possible to prevent the disability that often stems from this type of cardiovascular accident.

For their part, healthcare professionals will benefit from the use of tools to classify attacks, as well as tools to predict and prevent them. Furthermore, the recorded knowledge will enable them to identify the population at the greatest risk, practice personalized medicine, and improve the early diagnosis of certain diseases.

The *causes of death statistics* published at the beginning of 2017 by the National Institute of Statistics (INE) indicate circulatory diseases as the leading causes of death in Spain in 2015. Within this group, ischemic heart diseases (infarction, angina) and cerebrovascular diseases (such as stroke) once again occupied first and second place in number of deaths. Meanwhile, the latest reports from the American Heart Association (AHA) and the American Stroke Association (ASA) both indicate that the causes are unknown in 35% of cases.

Leader in healthcare transformation projects

Indra has been actively involved in developing regional healthcare systems in most of Spain's autonomous communities. The company has supported the implementation of electronic medical records in Andalusia (Diraya), Valencia (Abucasis) and Galicia (IANUS).

Indra is also Spain's bellwether in the implementation of electronic prescriptions (e-prescriptions), with successful projects in Aragon, Andalusia, Asturias, Cantabria, Madrid, La Rioja, Murcia, Valencia, Galicia and the autonomous cities of Ceuta and Melilla, and it is currently working on e-prescription interoperability in several autonomous communities. The company has also undertaken emblematic projects in countries like Bahrein, Chile, Colombia and the Philippines.

In the field of private healthcare, Indra has become the benchmark provider of solutions for electronic medical records and hospital management in Spain, servicing more than 40 healthcare centers (48% of the centers belonging to the large private healthcare franchises operating in the country).

In collaboration with Minsait, Indra's digital transformation unit, the company is also developing innovative solutions to facilitate and improve access and the points of contact with the health system and home telecare services by assessing biometric signals and providing online care, and it is engaged in projects that include connecting sensors that send real-time alerts and developing systems to integrate data from multiple sources to improve health-related decision-making.

About Indra

Indra is one of the world's top technology and consulting companies and a technology partner for the key operations of its customers' businesses worldwide. It is a leading worldwide provider of proprietary solutions in niche areas in transport and defense markets and the absolute leader in IT in Spain and Latin America. It offers a comprehensive range of proprietary solutions and cutting-edge services with a high added value in technology based on a unique culture of reliability, flexibility and adaptability to its customers' needs. Indra is a world leader in developing end-to-end technology solutions in fields such as Defense and Security, Transport and Traffic, Energy and Industry, Telecommunications and Media, Financial Services, Electoral Processes, and Public Administrations and Healthcare. Minsait is Indra's digital transformation business unit. In 2017, Indra posted a revenue of €3,011 billion, employed 40,000 professionals, and had a local presence in 46 countries plus sales operations in more than 140 countries.