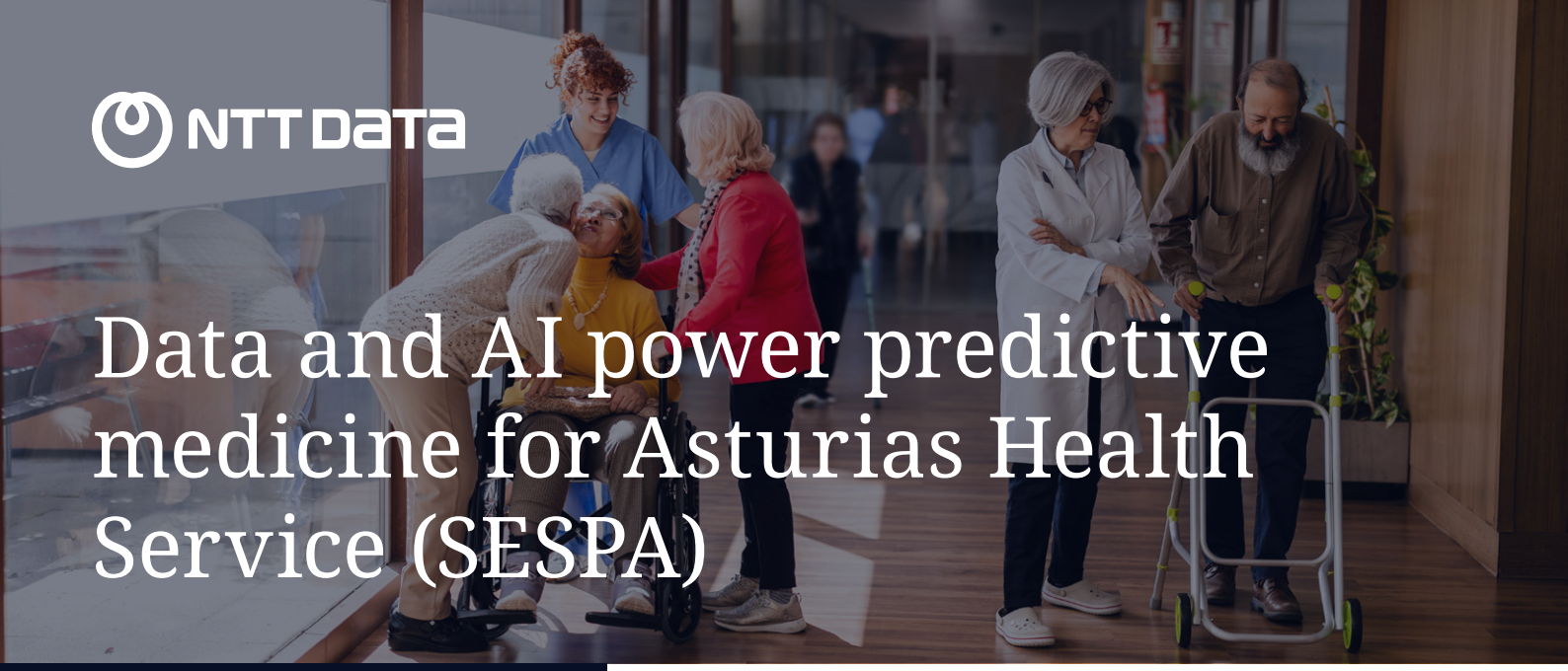


Data and AI power predictive medicine for Asturias Health Service (SESPA)

SERVICIO DE SALUD
DEL PRINCIPADO DE ASTURIAS

Client profile

The Health Service of the Principality of Asturias (SESPA) is a public organization responsible for managing healthcare services in the Asturias.
The organization coordinates primary and specialized care for people in Asturias, and manages the healthcare resources of districts in the principality.

AI has become a key enabler of predictive medicine.
By analyzing clinical data and patterns of care, AI can predict health risks, identify early signs of disease progression and recommend personalized care to meet each patient's needs. This approach supports the transition to a more preventive, efficient healthcare model focused on measurable clinical outcomes.

Against this backdrop, the Health Service of the Principality of Asturias (Servicio de Salud del Principado de Asturias, SESPA) set an ambitious goal: use AI to develop a model that can predict the progression of chronic kidney disease (CKD) in one of Spain's oldest and most heavily medicated populations. Handling the clinical complexities for this demographic required a solution that could apply advanced analytics to a large volume of data.

To meet this need, NTT DATA and SESPA developed TrASgu, a pioneering solution that applies AI to nephrology to identify patients at the greatest risk of kidney deterioration as early as possible, and support timely, personalized intervention.

~1 billion
clinical data points

43,000
patients identified as being at genuine risk of disease progression

6,900
potentially preventable annual episodes of clinical deterioration identified

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Business need

AI as a catalyst for predictive medicine

Chronic kidney disease (CKD) is a progressive condition that, currently has no cure. However, it can be managed through clinical intervention. It's characterized by a gradual and irreversible decline in kidney function. In the advanced stages of the disease, patients require renal replacement therapies such as dialysis or kidney transplants.

Early detection and intervention are critical to slowing the progression of the disease and improving patients' quality of life, reducing the burden on healthcare services as well as the costs associated with treating advanced kidney disease.

Structural kidney damage is irreversible in the advanced stages of CKD. To prevent this, it's a clinical priority to implement screening strategies, conduct longitudinal monitoring and track risk factors such as hypertension, diabetes and proteinuria.

The primary objective of the SESPA project was to develop a machine-based learning predictive model that could predict the progression of CKD in patients taking multiple medicines and/or medicines that may harm the kidneys

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In addition to estimating each patient's individual risk, the project aimed to create a population-screening system to identify at-risk patients who would benefit most from preventive clinical intervention, which would in turn help optimize the use of healthcare resources.

Data quality, traceability and standardization were essential to building a reliable, scalable model, and this presented a significant technical challenge, as clinical records were held in multiple systems. Nearly one billion clinical data points were spread across various structured and unstructured data sources.

> “With TrASgu, we will be able to anticipate CKD progression by identifying the patients most at risk early and providing healthcare professionals with a tool that enhances patient care. This will help optimize clinical follow-ups and improve patients' quality of life.”

Dr Pedro José Espinosa Prados,
Clinical Analysis Specialist and Cuélebre Project Lead, SESPA

Solution

Data platform transforms kidney analytics

To enable early detection and identify patients at greater risk of CKD progression, NTT DATA and SESPA developed TrASgu, predictive model deployed on Cloudera, a leading platform for advanced data management, big data and AI.

The solution combines robust technology components with high-impact clinical capabilities:

Healthcare data platform (OMOP data lake)

- Integration and standardization of nearly 1 billion clinical records
- Observational Medical Outcomes Partnership (OMOP) Common Data Model (CDM) for interoperability, quality and traceability
- Cloudera-based big-data infrastructure designed for large-scale advanced analytics

AI-powered predictive engine

- Machine-learning model to predict progression between CKD stages
- Population segmented into three risk levels: low, medium and high
- Individual predictions of disease progression and stage transitions
- Advanced patient triage capabilities that reduce unnecessary interventions for low-risk patients

Natural language processing (NLP) module

- Extraction of clinically relevant information from unstructured text
- Enrichment of the model with information extracted from medication package leaflets available through the Spanish Agency for Medicines and Health Products (AEMPS) Online Medicines Information Center (CIMA).

Clinical visualization and analytics layer

- Interactive dashboard for healthcare professionals
- Dynamic identification of patients based on their risk level

Key clinical capabilities

- Automated population screening for early-stage CKD
- Proactive identification of patients with a high likelihood of disease progression
- Clinical prioritization based on actual risk
- Improved coordination between primary and specialized care
- Structured support for clinical decision-making and early intervention

Scalable and reusable architecture

- Modular design that supports long-term sustainability
- Easily extended to other chronic diseases or healthcare regions
- Maximizes return on investment in data and AI capabilities

TrASgu is now established as an advanced clinical screening tool that moves beyond traditional static approaches to enable proactive CKD management through predictive analytics and the comprehensive use of healthcare data.

The project received recognition at the Ennova Health Awards in the AI and Data Management category for its contribution to the Cuélebre project and its impact on digital transformation in healthcare.

Outcomes

Earlier intervention improves patient outcomes

The TrASgu solution, developed by NTT DATA and SESPA, delivered the following results:

- Nearly 1 billion clinical records integrated
- Population screening could identify approximately 43,000 patients at genuine risk of disease progression
- Up to 6,900 annual episodes of clinical deterioration could potentially be prevented



> “TrASgu stands out as one of Asturias’ most innovative and pioneering projects because of its AI-powered population screening capabilities. Its design is specifically optimized to anticipate clinical deterioration in patients with chronic kidney disease, enabling earlier medical intervention and supporting a more proactive approach to patient care. It represents a major step toward integrating advanced healthcare solutions and helping build smarter, more efficient health systems focused on prevention.”

Mario Torrego García,
Health Data Scientist — Business Analytics, NTT DATA

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