

# PREDICTIVE HEALTH ANALYTICS

MODELS AND CASE MANAGEMENT  
FOR IMPROVING QUALITY OF LIFE  
AND REDUCING UNNECESSARY  
CONSUMPTION OF RESOURCES

## **Predictive model identifies, a year in advance, patients with a heightened risk of avoidable hospitalizations**

**In developed countries, approximately 60 per cent of healthcare costs are consumed by 5 per cent of patients in whom a large number of chronic diseases are concentrated. With increasing life expectancy and a rapid increase in the prevalence of chronic diseases, health systems are challenged to improve the quality of life of these multi-chronic patients and manage their consumption of limited health resources.**

### **CLIENT BACKGROUND**

The Health Department of La Fe in Valencia provides health services to a population of 300,000. The cornerstone of the department is the University Hospital and Polyclinic La Fe which, with over 40 years of history, provides a core integrated unit consisting of a specialty center, 12 health centers and eight surgeries. With its recent renovation, and Polytechnic University Hospital La Fe has become one of the largest and most technologically advanced in Spain, and has positioned itself as a referral hospital within and outside of Valencia.

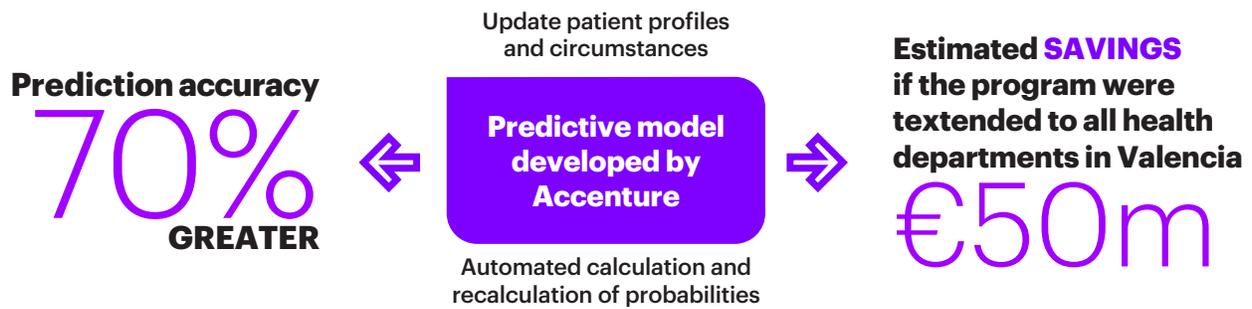
The 7,000 professionals employed by the Department include more than 1,100 doctors, 445 interns and residents, about 3,800 people in the disciplines of nursing (including midwives, nursing college graduates, physiotherapists, occupational therapists and radiographers). The Department is based in Valencia, which is the third largest city in Spain after Madrid and Barcelona.

### **BUSINESS CHALLENGE**

Hospitalizations for decompensation are the main cause of deterioration of the quality of life of patients with multiple chronic conditions. These hospitalizations represent a high cost for health systems.

The challenge for Polytechnic University Hospital La Fe was to identify pre-emptively (12 months in advance), and as accurately as possible, those multi-chronic patients with an increased risk of hospitalization for both predictable and avoidable reasons. Once identified, these patients are included in personalized and proactive care programs, as well as frequent, continued monitoring. This care approach should generate a clear improvement in patient quality of life of patients and consumption of healthcare resources.

However, predictive analytics based on educated guesswork brought low levels of reliability (45%), and often meant the analytics were applied to unsuitable candidates which resulted in less than optimal results.



## HOW ACCENTURE HELPED

Accenture predictive analytics experts worked with La Fe clinicians to design a predictive model and identify, 12 months in advance, those patients with a heightened risk of avoidable hospitalizations. The comprehensive patient information at its disposal allowed the Department to develop an advanced predictive model that assigns a specific risk level to each patient in the reference population.

In collaboration with clinicians from La Fe, Accenture helped design and implement operational support units and monitor patients covered by this program.

Ensuring the selection of appropriate patients (predictive model) and optimizing the way the support and monitoring worked (operational units), significantly increased the chances of producing better results.

## HIGH PERFORMANCE DELIVERED

The predictive model improved prediction accuracy by 70 per cent compared to traditional models, an achievement which, according to estimates by the Department, should enable savings of up to 50 million euros per year.

Furthermore, a year-long clinical trial with 500 multi-chronic patients concluded that in terms of quality of life related to health, an improvement of up to 22 per cent (measured by the EQ5D) can be achieved. In addition to their inclusion in the program, some patients have used the platform for monitoring and telemedicine. Moreover, initial health consumption analysis suggests a drastic reduction of up to 79 per cent of hospitalizations and emergency room visits.

The extension of these services to a group of 800 patients has freed 21 bed days during the clinical trial. The deployment of this program to the 1.5 per cent of the population at greatest risk may release a maximum of approximately 100 bed days.

The indicate that combined use of advanced predictive analytical models, custom delivery models and continuing care services constitute a solution to the sustainability challenge facing health systems in developed countries.

The full results of the trial will be published shortly in major national and international journals.

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