



FreeStyle Libre

89  
mg/dL



12:46  
Fin en 10 días

# COLOMBIA WILL ATTAIN A PRECISE KNOWLEDGE OF THE COSTS OF DIABETES

Financial planning and the effective projection of costs will allow for a sounder management of the resources of hospitals and an optimum service for patients with chronic diseases like diabetes. Javier Leonardo González Rodríguez and Olga Lucía Pinzón, researchers at the Universidad del Rosario, focused on assessing the expenses related to this disease in the country and how to improve the quality of life of patients.

By: Marisol Ortega Guerrero  
Photos: Alberto Sierra

**T**he projections of the World Health Organization (WHO) indicated that, by the year 2030, diabetes would be the seventh biggest cause of mortality in the world, since it will affect more than 430 million people. Today, 11 years before that date, it already is. One of its most worrying aspects is that it does not occur on its own but with several associated comorbidities: It causes blindness, renal insufficiency, myocardial infarction and strokes and may necessitate the amputation of the lower limbs, among other after-effects.

To that is added the economic impact not only on the patients, but also their families and the health systems and the economies of countries, due to direct medical expenses and indirect costs, like lost work days, ambulatory care and hospitalizations. According to the WHO, the latter two account for most of the costs.

This harsh situation has led researchers at the Universidad del Rosario to study the problem in depth, not only from the point of view of health but of economics as well. The idea is to make people aware of the costs of the disease and the very need to keep it controlled, says Javier Leonardo González Rodríguez, professor at the School of Management and Business of the Universidad del Rosario and director of the Health Administration line of research.

That is why González and the nutritionist, Olga Lucía Pinzón, director of the Nutrition Department at the Hospital Universitario Mayor - Méderi (Méderi University Hospital), set out to investigate the problem. They have now done a study

# AN ALARMING REALITY

# 422

Million adults have diabetes

That means one in 11 persons

Nowadays, diabetes is the seventh highest cause of death in the world, after ischemic heart disease, heart attacks, chronic obstructive pulmonary disease, respiratory infections and Alzheimer disease, among others.

entitled *Stratification and analysis: The pharmaceutical cost of diabetes patients. A problem for Colombia*, which focused on finding out the costs related to diabetes in the country and how they may be reduced in order to improve the quality of life of patients.

Catalina Latorre, researcher of the School of Medicine and Health Sciences, and Carlos Franco, of the School of Management and Business of the Universidad del Rosario, also participated in the study. Their contacts and cooperative alliances with colleagues in other centers have also been important. They include the Center of Investigation of the Economy and Management of Health (CIEGS) of the Universidad Politécnica de Valencia, Spain; the *Research Group on Public Health, Chronic Diseases and the Quality of Life* of the University of Maastricht (The Netherlands); and the *Group of Applied Engineering for the Management of Health Services*, at the Institut Mines, Saint Étienne (Saint-Étienne School of Mines) France, all of whom have undertaken interesting studies of the subject of diabetes.

“Our aim has been none other than to show how many costs are associated with diabetes; first, to learn how to determine them, so that the institutions are clear about it, and second, to create models which predict the costs that will enable us to improve the models of care and in the end, the health of the patients,” González remarks.

He adds that the costs of pharmaceuticals account for more or less 70% of the total spend-



## MAIN TYPES OF DIABETES



### Type 1 Diabetes

The body does not produce enough insulin.



### Type 2 Diabetes

The body produces insulin but not use it adequately.



### Gestational Diabetes

It is a temporary condition during pregnancy.

If a person's blood sugar is not controlled, with the passage of time it gravely harms many organs and systems, especially the nerves and blood vessels.

## CONSEQUENCES

Diabetes may lead to complications in many parts of the body and heighten the risk of premature death.

STROKES

BLINDNESS

HEART ATTACKS

KIDNEY FAILUTRE

AMPUTATION

ing. Thus, their proposal is that financial planning should be done, along with the creation of predictive models which would reduce costs and make the systems more bearable. It has been found that the total average spending on patients with diabetes in a high complexity hospital amounts to nearly two and a half million dollars per year and that it can be reduced.

With such predictive models, it is possible to make a categorization of the risks of someone who enters a hospital and an optimum strategic planning, with packages of precise services with health provider companies, so that “you do not begin to delay the services or the care which is needed, because a patient with diabetes who stays in a hospital longer than is necessary represents higher costs for the system and increased risks to his or her health, given the patient's vulnerability to associated diseases, like infections,” Professor Javier González points out.

## Step by step

To undertake the study, the researchers engaged in a prior phase with the aim of obtaining authorizations from the Research Committees at the Méderi Hospital and the Rosario, along with the University's Ethics Committee, among other aspects related to the protocols of their research.

Then, with the data bases of the Hospital, they began a detailed analysis of the subject. Professor González presented the results to the Universidad Politécnica de Valencia, Spain as “a sabbatical research project”, taking advantage of the fact that the University has modern technologies of analysis like “machine

According to the World Health Organization, diabetes "is a chronic illness which emerges when the pancreas does not produce enough insulin or when the body does not efficiently use the insulin which it produces. Insulin is a hormone which regulates blood sugar."

According to the Pan American Health Association/ World Health Organization's report, Health Situation in the Americas: Core Indicators, 33 out of each 100,000 inhabitants have diabetes (36.4 men and 30.9 women). In Latin America, the figure is 45.4 out of each 100,000 inhabitants (48.1 men and 43.1 women) and in Colombia, it is 21.8 out of each 100,000 inhabitants (22.3 men and 20.9 women).



"Our aim has been none other than to show how many costs are associated with diabetes; first, to learn how to determine them, so that the institutions are clear about it, and second, to create models which predict the costs that will enable us to improve the models of care and in the end, the health of the patients," Javier González remarks.

learning" and advanced techniques of artificial intelligence, both of which allow for a wider and better analysis of the data he was using.

In his own words, "we started with very large, very important data bases on 15,000 patients with diabetes, but it was still raw. We had to begin by refining the data and then go on to a multivariate statistics correlation analysis. We are now working on one of the most important aspects of the study, which is to build a risk index, because a person who only has diabetes is not the same as one who also has a cardiovascular disease, or one who is a smoker and suffers from a chronic obstructive pulmonary disease or one whose sight has also been affected or whose kidney is already affected and may be prone to chronic renal failure or who has arthritis. There are several categories of risk and we have to analyze all of them."

In the same comorbidity, you may even come across, for example, the case of a cardiovascular disease which may be slight, moderate or severe, so that you have to do a multivariate and factorial exercise, which is purely mathematical. This year, Professor González will be doing another internship at the Universities of Maastricht in the Netherlands and Saint-Étienne in France, which will facilitate the building of predictive models, the final stage of the study. □

## A warning to all

- With its research project entitled *Stratification and analysis: The pharmaceutical cost of diabetes patients, a problem for Colombia*, the Business and Management Research Group of the School of Management and Business of the Universidad del Rosario, which links the medical aspects with the administrative and economic ones, not only hopes to create a leading-edge predictive model for Colombia, but also make the country more aware of the impact of diabetes and the commitment to dealing with it which those who suffer from the disease, their families, companies which provide health care and health insurance and government agencies should have.
- The study shows the importance of the active participation of the patients and it makes them aware that while diabetes is a grave illness, it can be kept under control and that that is not only the responsibility of the doctor: "The patient is an active subject of his or her therapeutic process. The patient can collaborate by improving his or her diet, exercising, taking care of himself or herself, undergoing periodical health checks, following the instructions of the doctor about medication and undergoing examinations to detect and deal with the complications on a regular basis. These precautions, in turn, reduce the economic burden of the disease," explains the researcher Javier González.
- The researchers recommend that health providers "make very well structured modellings of costs, so that they do not remain underfinanced or without liquidity, and, as a result, begin to delay their services for the patients, delays which turn into an endless problem, due to the adverse consequences which arise. By contrast, with predictive models and a sound financial management, everything works for the benefit of the quality of life of the patient. The same message applies to health insurers and not only for cases of diabetes, but all chronic diseases."
- Those who are already implementing predictive models are seeing the changes and what financial planning in health really signifies, as in the case of the *Coomeva* and *Sanitas* health provider companies, but it still has not been expanded in a massive way.

