

# Spatial variations in Renal Replacement Treatment. Catalonia (2002-2012).

Martínez-Castelao A<sup>1</sup>, Tebé C<sup>2</sup>, Arcos E<sup>3</sup>, Comas J<sup>3</sup>, Espallargues M<sup>2</sup>, Pons JMV<sup>2</sup>, Díaz JM<sup>4</sup> and Tort J  
and Registry Committee Members of the RMRC

<sup>1</sup>Hospital Universitari de Bellvitge, Hospitalet, IDIBELL, REDinREN, <sup>2</sup>Agència de Qualitat i Avaluació Sanitàries de Catalunya (AQuAS), <sup>3</sup>Organització Catalana de Trasplantaments (OCATT), <sup>4</sup>Fundació Puigvert. Barcelona. Spain.

## Introduction

Variations in the utilization of health care services can be defined as systematic variations of adjusted rates for a certain level of aggregation of the population. From 2002 to 2012 the prevalence of chronic kidney disease stage 5 (CKD-5) has increased in Catalonia up to 1,202 patients per million population. CKD-5 is a well known cardiovascular risk factor and has a high mortality rate. Moreover, it is responsible for 2.5 % of the Spanish global National Health Service budget.

## Objectives

The aim of the study is to evaluate possible changes in the choice of the type of RRT - haemodialysis (HD), peritoneal dialysis (PD), or renal transplant (RT) - within the different health areas of Catalonia.

## Methods

This is an ecological study by health areas. The data source used for this study is the Catalan Renal Registry (RMRC). We present the results by means of incident rates, standard incident and prevalent ratios, and variability statistics were calculated through direct and indirect standard method, taking into account the age, period of time, and gender. Figure 1 represents the centers in Catalonia where HD, PD and/or RT are provided.

## Results

Figure 1. Haemodialysis, Peritoneal Dialysis and Renal Transplant centers in Catalonia.

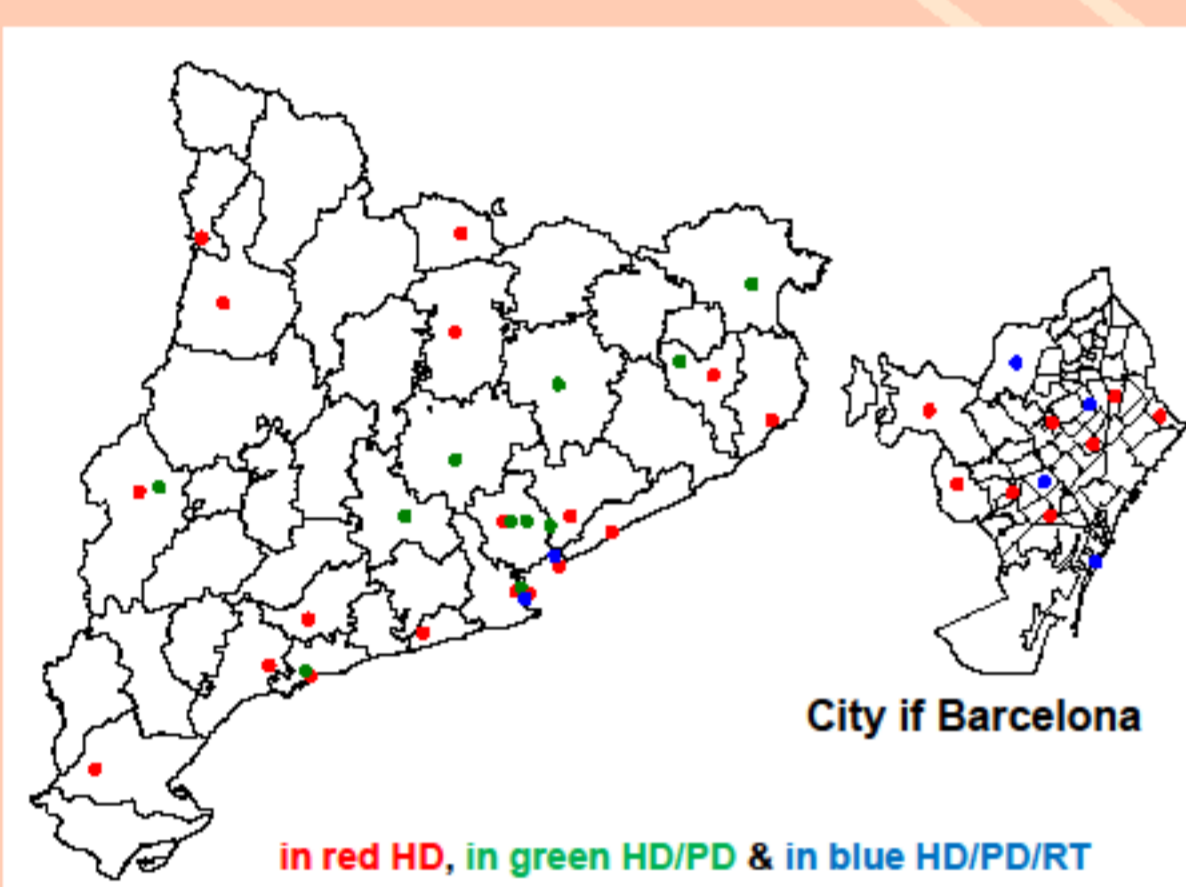


Figure 2. HD cumulative incident rates for age and gender. Period 2002/2012.

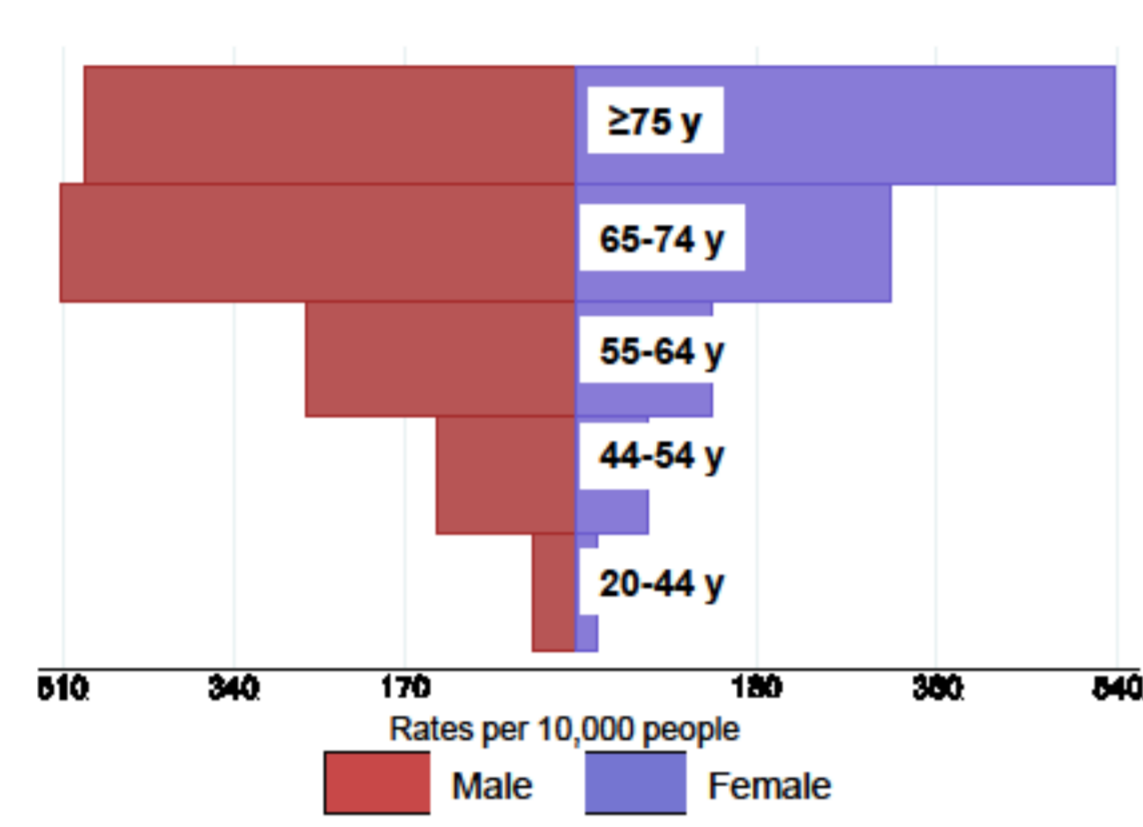


Figure 3. PD cumulative incident rates for age and gender. Period 2002/2012.

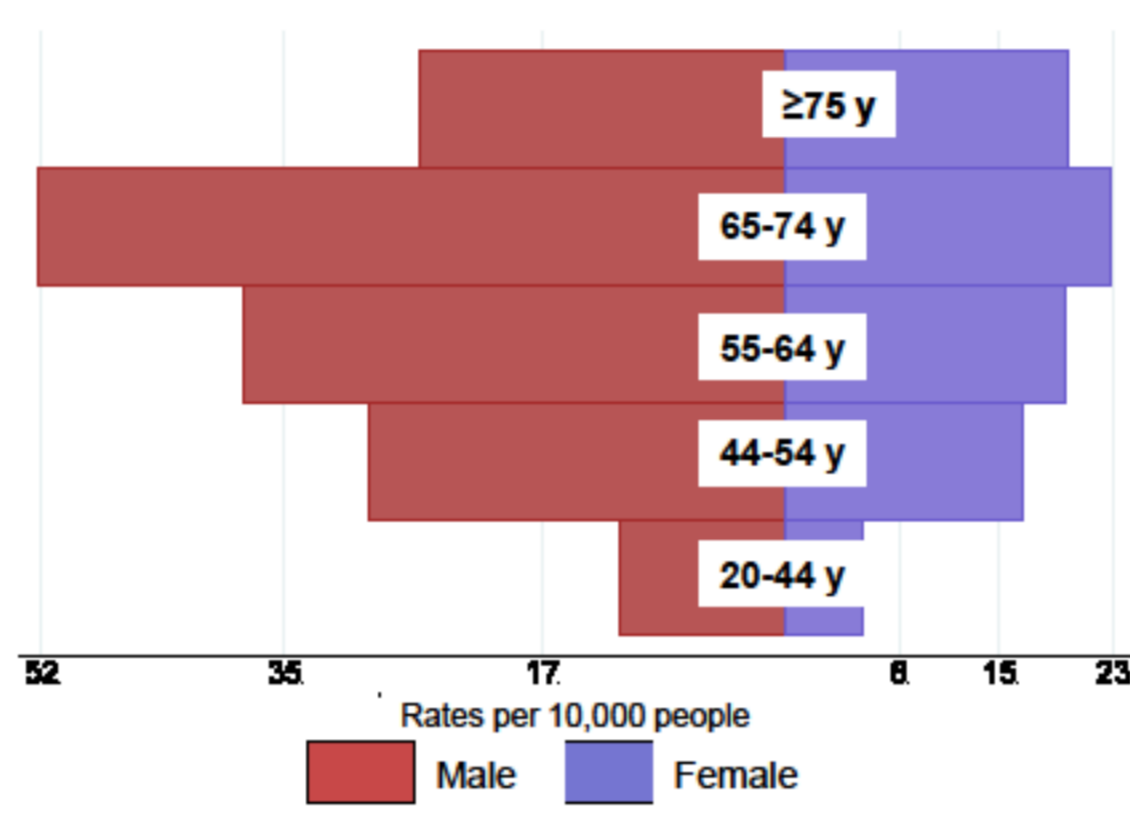


Figure 4. PD incident standardized ratio for age group. Period 2002/2012.

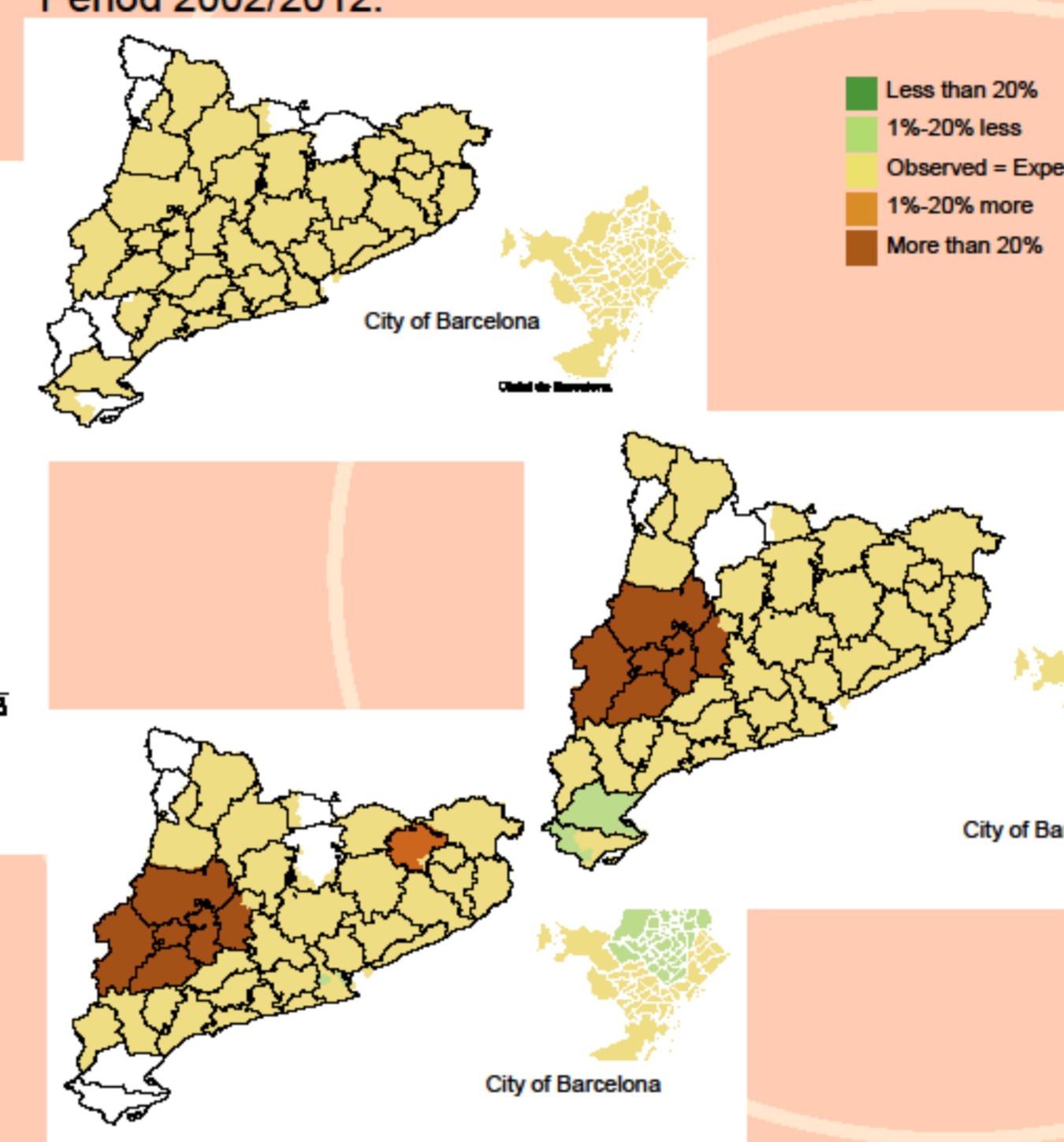
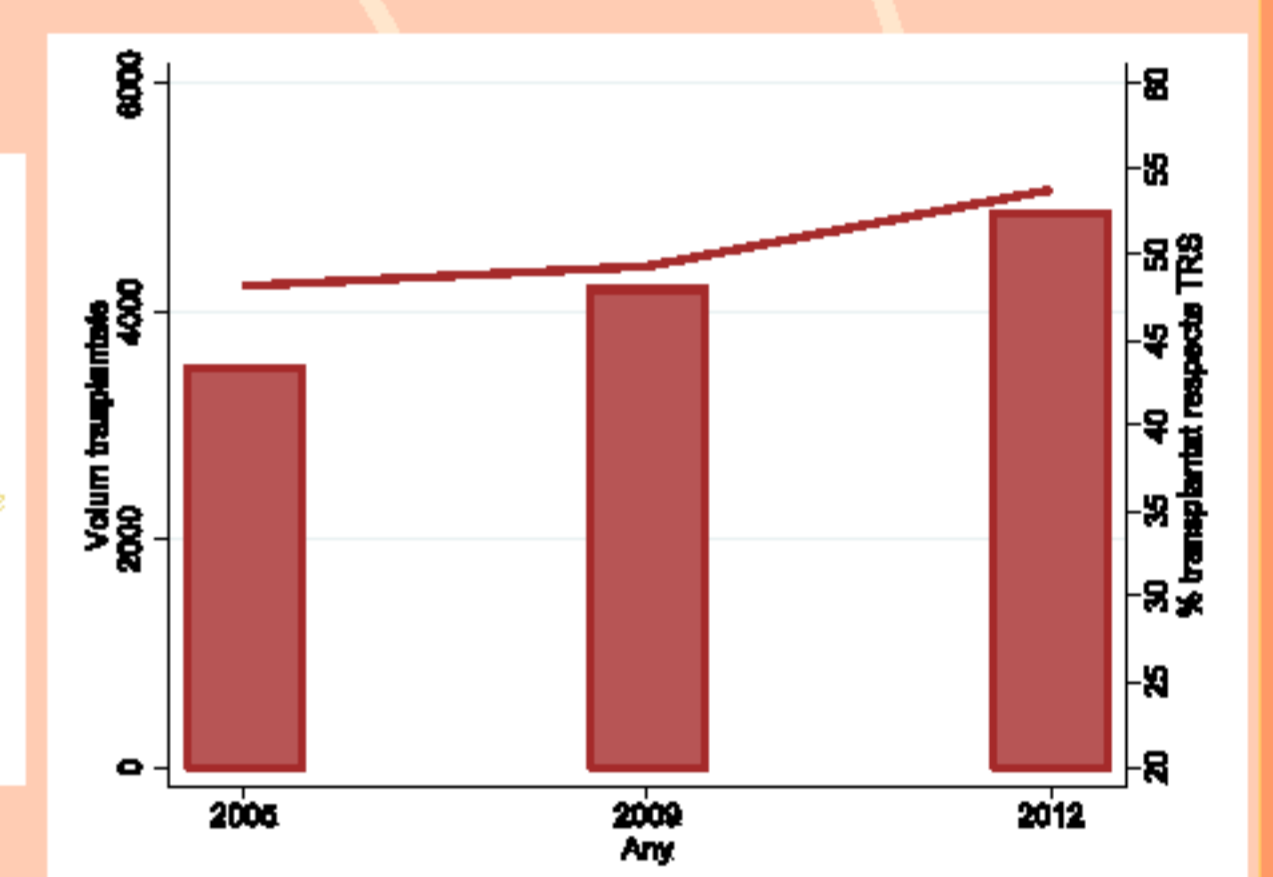


Figure 5. Number and percentage of renal transplants out of the total RRT patients in 2005, 2009 and 2012.



**Haemodialysis:** From January 2002 to 31 December 2012, 9,238 patients were included in RRT, 64% male and 62% older than 65 years. The cumulative incidence rate for HD decreased from 61 p/100,000 inhabitants/year in the period 2002-2005 to 50 p/100,000 inhabitants/year in the period 2010-2012 (from 90 to 80% of the first time patients) (Fig.2). The variation rate (95 percentil standard rate /5 percentil, VR 5-95) was 1.3 for female and 1.2 for male. The empiric Bayes value at long-term was ~ 0) No variations among the different areas were observed.

**Peritoneal Dialysis:** Between 2002 and 2012 PD was started in 1,076 patients, 68% were male and 42% were aged between 45 and 65 years (Fig.3 ). Cumulative incidence rate increased from 5.1 p/100,000 inhabitants/year in the 2002-2005 period to 8.2 p/100,000 inhabitants/year in the 2010-2012 period (from 8% to 13% of first time patients)(Fig.4). The statistical value to quantify the variation showed a moderate increment (empiric Bayes = 0.08). In figure 4 we represent the geographic distribution of the standardized ratios for PD per age and gender groups. There were no variations for patients <45 years old. In the number of cases over 45 years old, in the areas of Segrià, Garrigues, Pla d'Urgell, Segarra and Noguera, we observed an increase higher than 20% compared with the Catalonia median average.

**Renal Transplant:** From 2002 to 2012, 4,750 patients received a kidney transplant, 62 % were male and 49% were aged between 45 and 65 years. The percentage of preemptive RT increased from 6.0% in 2002 to 13.8% in 2012. In the same period, the percentage for living related donor RT increased from 2.1% to 16.7%. The percentage of patients with a functioning RT, out of the total RRT patients, increased from 48% in 2005 to 54% in 2012 (Fig.5). The RT standard prevalence ratio for the different areas was 40% (VR5-95=1.4). We did not observe differences between geographical areas.

## Summary and Conclusions

From January 2002 to December 2012, 10,784 patients started RRT: 9,238 initiated HD, 1,076 PD and 470 received a preemptive RT. In this period, the incidence of HD has decreased by 7% and PD has increased by 63%. The incidence rate of the preemptive RT has increased by 177%. Nevertheless, the PD rates are lower than the rates recommended by international scientific societies.

PD and preemptive RT have been more used in patients <45 years old. PD was started three-fold in younger patients than in patients older than 65 years, and twice as often as in patients aged 45 to 65.

We have maintained the equitable access to HD or RT, but have observed some variations regarding PD as first RRT in some geographical areas of Lleida and Girona provinces. These variations are quite similar to those observed in other countries and probably are in relation to the development of specific PD programmes.

Taking into account these results, we propose three actions:

- 1) The development of **shared decision-making programmes** with patients, families and nephrologists.
- 2) To design **specific programs in PD Continuous Medical Training** for nurses, doctors and professionals involved in the care of CKD patients.
- 3) To add to the current **PD reimbursement some additional incentives**, in order to increase its indication as first RRT choice.