

**Argentine Registry of Chronic Dialysis 2009-2010  
Annual Report 2011  
Sociedad Argentina de Nefrología (SAN) - Instituto Nacional Central Único Coordinador de  
Ablación e Implante (INCUCAI)**

Director: Sergio Marinovich\*\*

Members: Liliana Bisigniano\*, Carlos Lavorato\*\*, Mariano Soratti\*, Víctor Fernández\*, Guillermo Rosa Diez\*\*, Eduardo Celia\*\*, Daniela Hansen-Krogh\*, Viviana Tagliafichi\*, Claudio Moriño\*\*, Arturo López\* and Alicia Fayad\*\*.

\* Instituto Nacional Central Único Coordinador de Ablación e Implante (INCUCAI)

\*\* Sociedad Argentina de Nefrología (SAN)

➤ This material displays only relevant data; the whole Report will be edited and published in coming months.  
Buenos Aires, November 2011.

## Introduction

This is the fifth report delivered by the Registro Argentino de Diálisis Crónica (Argentine Registry of Chronic Dialysis) Previous reports collecting data from different periods of observation were issued 2004-2005; followed by the 2006'; then the 2007'; lately the 2008' and finally the 2009-2010 report Data are the result of a rigorous strategy that confer credibility, but especially, are the consequence of a collaborative effort carried-out by almost 99% of the dialysis facilities based in Argentina reporting to the data capture system (SINTRA) dependent on the INCUCAI. Without such massive body of information this Registry wouldn't exist.

## Prevalence

**Number of patients undergoing chronic dialysis. Data as at December 31<sup>st</sup>, each year**

2004: 21.034  
2005: 22.333. Increase 2004-2005: 6.18%  
2006: 23.306. Increase 2005-2006: 4.36%  
2007: 24.218. Increase 2006-2007: 3.91%  
2008: 24.778. Increase 2007-2008: 2.31%  
**2009: 25.448. Increase 2008-2009: 2.70%**  
**2010: 25.979. Increase 2009-2010: 2.09%**

**Patients undergoing chronic dialysis (rate: number/million population)**

2004: 550.3  
2005: 578.7. Increase 2004-2005: 5.17%  
2006: 598.0. Increase 2005-2006: 3.34%  
2007: 615.4. Increase 2006-2007: 2.89%  
2008: 623.4. Increase 2007-2008: 1.31%  
**2009: 634.1. Increase 2008-2009: 1.71%**  
**2010: 647.6. Increase 2009-2010: 2.13%**

**Provinces with a prevalence rate lower than 500 ppm in 2010.** Taking into account individual's residence and arranged in ascendant order. *Santa Cruz, Misiones, Formosa, Entre Ríos, Corrientes y Chaco*

**Provinces with a prevalence rate larger than 800 ppm in 2010.** Taking into account individual's residence and arranged in descendent order. *Neuquén, Tucumán, Mendoza, Río Negro, San Luis y San Juan.*

## Incidence

### Number of new patients admitted each year to CD

2004: 5.254

2005: 5.416

2006: 5.493

2007: 5.917

2008: 5.867

**2009: 6.063**

**2010: 6.155**

### New patients entering chronic dialysis (CD) per million population/year (ppm)

2004: 137.5

2005: 140.3. Increase 2004-2005: 2.11%

2006: 141.0. Increase 2005-2006: 0.44%

2007: 150.3. Increase 2006-2007: 6.66%

2008: 143.1. Increase 2007-2008: -4.83%

**2009: 151.1. Increase 2008-2009: 5.58%**

**2010: 153.4. Increase 2009-2010: 1.56%**

**Provinces with an incident rate lower than 130 ppm in 2010.** Taking into account individual's residence and arranged in ascendant order. *Santa Cruz, Formosa, Misiones, Chubut, Santiago del Estero y Chaco*

**Provinces with an incident rate larger than 190 ppm in 2010.** Taking into account individual's residence and arranged in descendent order: *La Rioja, San Juan, Tucumán, San Luis and Mendoza.*

## Characteristic of the Incident Population

**Patient age:** The age of incident patients did not change significantly over the last 3 years: Although in 2010 the mean age was 59.9 years (95%CI 59.5 - 60.4), which is significantly higher than that observed in 2004 (58.1 years, 95%CI: 57.6 - 58.6), the cohort of individuals older than 79 years increased from 6.5% in 2004 to 9.1% by 2010.

Patients living in Buenos Aires City have the highest "incident" age of the country since 2004. The average age by 2010 is 64 and 19% of the admitted patients residing in this district are 80 years or even older.

**Gender:** Men are still the majority in 2010 (57.8%), especially in older age groups where they double, or even triple, the incidence in women.

In the cohort of individuals 65-74 years, men represent 862 ppm while women 526 ppm, similarly, in those 75 or older the rate of males is 1085 ppm and of females is 385 ppm.

**The causes of ESRD** most frequently displayed in 2010 are:

1. Diabetic Nephropathy: 35.5%. (4.1% increase compared to 2004)
2. Hypertensive Nephropathy: 23.5%. (2.8% increase compared to 2004)
3. Unknown cause: 15.9%. (4.1% decrease from 2004)
4. Glomerulonephritis: 7.2%. (0.6% decrease from 2004)

**Diabetics (being diabetes the cause or not of ESRD)** accounted for 36.5% of the population admitted to CD in 2007, 39.3% in 2008, 38.5% in 2009 and 39.6% in 2010. From 2008, virtually 4 in every 10 incident individuals have diabetes.

**Modality of renal replacement therapy at entry:** The most common initial modality of CD remains hemodialysis (HD) (96.1% in 2010) though peritoneal dialysis (PD) increased its relative frequency from 2.7% in 2007 to 3.9% in 2010. Only in groups with individuals younger than 10 years PD surpasses HD: 0-4 years old 81% and 5-9 years old 53% (2010).

#### **Clinical and biochemical parameters**

**Anemia:** Even though a significant improvement in the PCV with which individuals enter RRT (50% compared to 2004), forty four % of incidental patients enter RRT with PCV <27%

**Estimated-glomerular filtration rate (eGFR) at admission.** In 2010, the averaged eGFR at the time of starting CD was 9.6 ml/min/1.73m<sup>2</sup> and 8.7 ml/min/1.73m<sup>2</sup> according to MDRD4 or CKD-EPI equations, respectively. With both, there was a significant increase over the last years ( $p=0.0001$  for the comparisons with 2004). This means that as the time passed, patients are being admitted to CD with larger eGFRs.

**Serum albumin Concentration:** Mean serum albumin concentration at admission to CD was 3.35 g/dL; the lowest since 2004. Moreover, by 2010, 55% of incident individuals admitted to CD displayed serum albumin concentration lower than 3.35 g/dL, higher when compared with 48% in 2004. These changes were not only, extremely significant ( $p=0.0000$ ) but also distressing in both cases.

**Cardiovascular disease.** The percentage of hypertensive patients entering RRT increased significantly from 80.7% in 2004 to 84.4% in 2010.

The percentage of individuals displaying not only heart failure (22%) but also a past medical history of unstable angina or previous myocardial infarction (10%) decreased significantly when current data are compared with those from 2004.

Contrarily, the percentage of individuals suffering from arrhythmia (10%) remained unchanged from 2004 until now.

The finding of pericardial rub and/or the demonstration of pericardial effusion at the start of dialysis is becoming progressively less common; the relative frequency fell down very significantly from 5.0% in 2004 to 3.4% in 2010.

The percentage of patients with peripheral vascular insufficiency (pulse deficit with or without amputation) increased significantly from 19.9% in 2004 to 21.8% by 2010.

The number of individuals entering CD reporting previous stroke or transient ischemic attack decreased significantly from 8.2% to 6.9% (2004 vs. 2010).

**Other co morbid condition:** patients suffering from chronic obstructive pulmonary disease accounted for 7.7% of incident individuals in 2010; this rate remained unchanged over the last 7 years. Tobacco consumption also remained unchanged along this entire period of analysis; almost 17% of the new RRT individuals reported having smoked over the 10 years prior to admission to CD.

Neoplasms, as a cause or not of ESRD, were present in 6% of the patients entering CD. The positive test for Chagas-Mazza disease occurs in 7.4% of the population in 2010, again, with no significant differences compared to the previous years.

**Hepatitis B and C. HIV antibodies:** 1 out of 200 patients (0.5%) entering CD display positive HBsAg; this figure remained unchanged. The complete or incomplete immunization against HBV is a potent indicator of preemptive patient care. This fact occurs in less than a half of those individuals entering CD, and this is highly significant in 2010. By this time, only 40% of incident patients received a partial or a complete immunization schedule. More than 50% of incident individuals start CD without previous immunization. It is to bear in mind that in 2010 nearly 1.3% of new patients have antibodies against hepatitis C virus before entering CD, a percentage significantly lower than that of 2004, and of 2007, when 2.0% of incidents showed the antibody. Positive HIV antibody displays increasing rates in recent years, entering 5 positive patients per thousand inhabitants in 2010 (0.50%), compared to 2.5 per thousand inhabitants (0.25%) in 2004.

**First vascular access for HD:** 68.4% of patients starting HD in 2010 did so with a temporary, non-tunneled vascular access; this rate was rising significantly from 2004 (58.6%). Patients with native fistula represented 26.4% of the new CD

individuals in 2010, compared to 35.0% in 2004. This trend towards an increased use of temporary catheters instead of a permanent vascular access is of concern and closely associates with late or even absent nephrologist intervention at earlier stages of renal failure.

## Characteristics of the Prevalent Population

**Patient age:** The age of prevalent patients increased significantly over the last 7 years. The mean age was 57.2 years (95%CI 57.0 - 57.4 years) in 2010; compared to 55.7 years (95%CI 55.5 - 55.9) in 2004. ( $p= 0.000$ ). During the same period the population of individuals older than 79 years increased from 5.1% (2004) to 7.0% (2010).

Residents from Buenos Aires City displayed the highest age of the country (62.4 years) while 16.3% of those living in this district were 79 years or even older.

**Gender:** Males are still the majority in CD in 2010 (56.2%), especially in older age groups where the incidence of ESRD doubled that for women. In the group aged 65-74 years old: men represented 3163 ppm and women 1856 ppm. In the group aged 75 or older men summed 3393 ppm while women 1402 ppm. In fact, more than 3/1000 males older than 64 received CD in Argentina.

**Prevalent modality:** The most common and prevalent modality for CD remains HD but this account for lower rates of preference when Incident individuals are being considered: 95.8% in 2010. PD increased from 4.00% in 2006 to 4.23% in 2010 and only in groups of patients younger than 10 years, PD patients outnumbered those on HD: 77% for those 0-4 years old and 64% for those 5-9 years old.

**Time on renal replacement therapy:** The proportion of individuals on RRT for 10 or more years is increasing: They represented 8.9% in 2004 and rose to 11.2% in 2010.

## Mortality and Survival

### Mortality

Mortality is assessed in the total population undergoing CD in the respective years, so the prevalence of previous year are added to the number of incident individuals of the year under analysis. It is expressed as deaths per 100 patient exposed at risk-year (P /AER).

#### Crude mortality (p/100 P/AER)

2005: 15.65

2006: 15.70

2007: 17.55

2008: 16.36

**2009: 18.20**

**2010: 17.46**

#### Age, gender and cause-adjusted mortality (p/100 P/AER). Reference 2005

2005: 15.65

2006: 15.44

2007: 16.98

2008: 15.72

**2009: 17.17**

**2010: 16.26**

A significant increase of 4% in the adjusted mortality between 2005 and 2010 did occurred ( $p < 0.01$ ); the higher mortality rate came along in 2009 being 10% higher than in the reference year 2005 ( $p < 0.001$ ).

## Survival

We report the Kaplan-Meier survival estimates (KM) of incident patients starting CD from April 1, 2004 through December 31, 2010. Only those individuals initiating CD for the first time in their lives after March 31<sup>st</sup>, 2004 are considered. Data from the 1<sup>st</sup> day of therapy are included for these “new patients” while those data from individuals readmitted after transplant failure, changing dialysis facility or modality as well as from those recovering renal function were excluded. Data from a total of 39 570 patients with a maximal follow-up of 81 years were analyzed.

### Kaplan-Meier product-limit estimated survival (%)

6 months:	85.8
1 <sup>o</sup> year:	78.0
2 <sup>o</sup> year:	66.2
3 <sup>o</sup> year:	56.4
4 <sup>o</sup> year:	48.2
5 <sup>o</sup> year:	40.5
6 <sup>o</sup> year:	34.0

Median survival was 45.27 months

### Significant influencing factors that lead to poor survival (Multivariate Cox proportional hazard estimate)

Such factors are cited below:

Older age at admission; presence of neoplasia in the last 5 years (except skin cancer), serum albumin levels lower than 3.5 grs/dL, diabetic nephropathy as a cause or not of ESRD; past medical history or current occurrence of cerebrovascular disease, heart failure, cardiac arrhythmias, persistent angina or previous myocardial infarction, presence of peripheral vascular insufficiency, chronic pulmonary disease, smoking in the previous 10 years, presence of hepatitis C antibodies, presence HIV antibodies, poor income (patient and/or relatives), no immunization against hepatitis B virus, higher eGFR at the time of entering CD, residence outside Buenos Aires city and initiate CD with temporary vascular access (only for hemodialysis patients).

## Renal transplant

### Renal transplants in the General Population

The rates of kidney transplants (isolated or combined) in the general population; expressed as transplants per million inhabitants (ppm), performed in patients on CD or not and including both categories (living or diseased donors) as well as those pre-emptive, are displayed.

Organs from diseased donors represent 80% of the transplants carried-out in Argentina.

### Kidney transplant rates in the general population (ppm)

2005:	19.20
2006:	21.86
2007:	23.53
2008:	25.11
<b>2009:</b>	<b>26.36</b>
<b>2010:</b>	<b>28.41</b>

A significant 48% increase in 5 years of renal transplant activity occurred in Argentina ( $p = 0.000$ ).

## Renal transplants in the general CD Population

They are carried-out in the CD population and expressed as transplants for 100 P / AER. The rates from 2005 are as follows:

### Kidney transplant rates among the CD population (100 P/AER)

2005: 3.41

2006: 3.71

2007: 3.83

2008: 3.86

**2009: 3.76**

**2010: 4.02**

The number of 4 transplants per 100 patient-years (of individuals exposed to risk) was reached in 2010. Almost 4 out of 100 patient-years withdraw CD because they received a renal allograft.

When adjusting for age, gender and etiology of ESRD, and comparing with the reference year 2005, the 2010 rate rises to 4.24 transplants per 100 P/AER, with the. The 2010-adjusted rate is 25% higher than in 2005 ( $p = 0.000$ ) and 9% higher than the year 2009 ( $p = 0.007$ ).

### **Provinces with renal transplantation adjusted rates lower than 3 per 100 P / AER in the 2008-2010 period:**

Considering patient's residence and ordered from the lowest to the highest rate: *Santiago del Estero, Neuquén, Tucumán, Rio Negro, Jujuy, Salta and San Juan.*

### **Provinces with renal transplantation adjusted rates larger than 6 per 100 P/AER in the 2008-2010 period:**

Considering patient's residence and given in descendent order of rates: *Corrientes, Capital Federal, Formosa, Entre Rios and Cordoba.*

### **Correspondence:**

**Sergio Miguel Marinovich (MD), Superi 370, Rosario (CP 2000), Republica Argentina.  
Phone: 54-341-4551363. 54-341-6412358, E-mail: smarinovich@fibertel.com.ar**