Australian Government
Organ and Tissue Authority

Australian
PAIRED KIDNEY
EXCHANGE PROGRAMME AKX

# Australian Paired Kidney Exchange (AKX) programme

# Biannual Report #5

As of 30 June 2015

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**Foreword**

Welcome to the 5th Biannual Report of the Australian Paired Kidney Exchange (AKX) programme. The programme is approaching its 5th anniversary and in this short period of time has undergone considerable refinement since the concept of national live donor kidney exchange between incompatible pairs was first proposed in Australia and the first kidney paired donation (KPD) transplants with interstate organ transport were performed in November 2010.

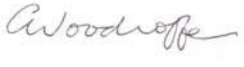
There have been 36 new pairs referred to the registry in the first half of 2015, compared to 56 in the period January-December 2014. As of 30th June 2015, 267 individual pairs were included in the 19 match cycles since commencement of the programme in 2010. To date the AKX programme has facilitated 121 live donor kidney transplants, with a further 18 pairs scheduled for surgery before the next match cycle in late August.

The first 2 match cycles in 2015 identified 43 possible matches in 14 chains. Two chains from the February match cycle were abandoned; one 2-way chain because of acute recipient illness and one 4-way chain due to donor unsuitability. An equal share of unexpected recipient unsuitability (57%) or donor unsuitability (43%) accounts for post-crossmatch non-proceeding transplants, which have so far impacted 49 transplants of 207 match offers (23% non-proceeding transplant rate).

Several innovations have been introduced or are under way this year. The NOMS-PKE platform has undergone significant system revision and improvement, increasing its stability and performance; a clearly defined process for enrolment of altruistic donors was made available to interested participating units and a pathway for hepatitis B core antibody positive donors as well as the corresponding matching option in NOMS have been developed and will be available from the next match cycle in August 2015. A working party of Australian and New Zealand delegates is exploring process and policies that may enable collaboration between the two countries with the AKX programme. This is a very exciting prospect that will benefit both Australian and New Zealand incompatible pairs.

The contribution and efforts of participating transplant units is one of the key drivers for the success of this programme and we wish to acknowledge and thank these units for their continued collaboration and trust in the AKX programme.

With kind regards

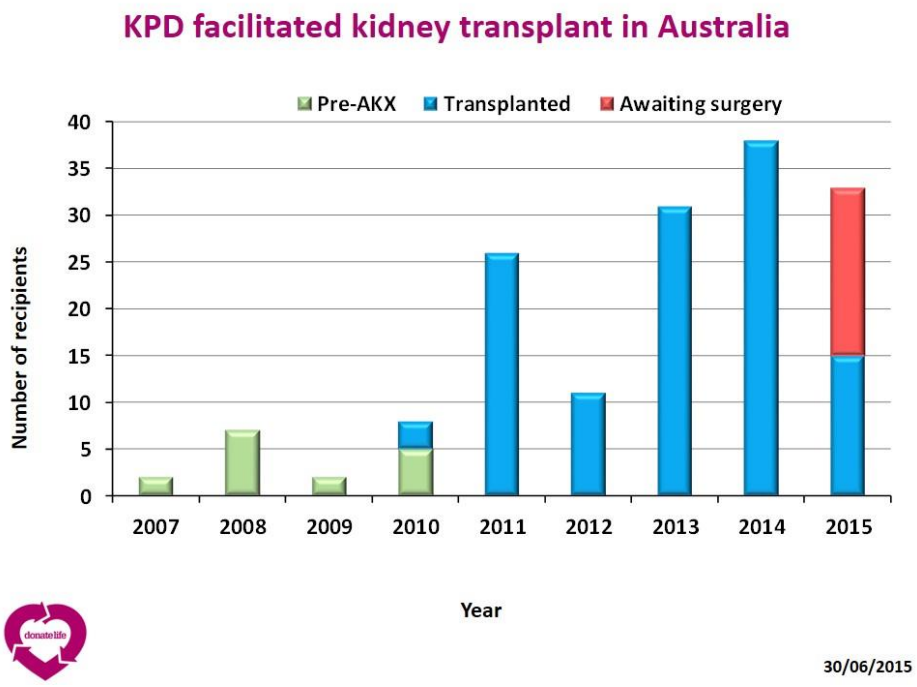


***Paolo Ferrari*** ***Claudia Woodroffe***
***National Coordinating Centre***
***Australian Paired Kidney Exchange programme***

## 1. Transplants facilitated by year

In Australia, 121 kidney paired donation (KPD) transplants facilitated through the AKX Programme have been completed as of 30th June 2015 and 18 AKX-facilitated transplants will undergo transplant surgery in the coming months.

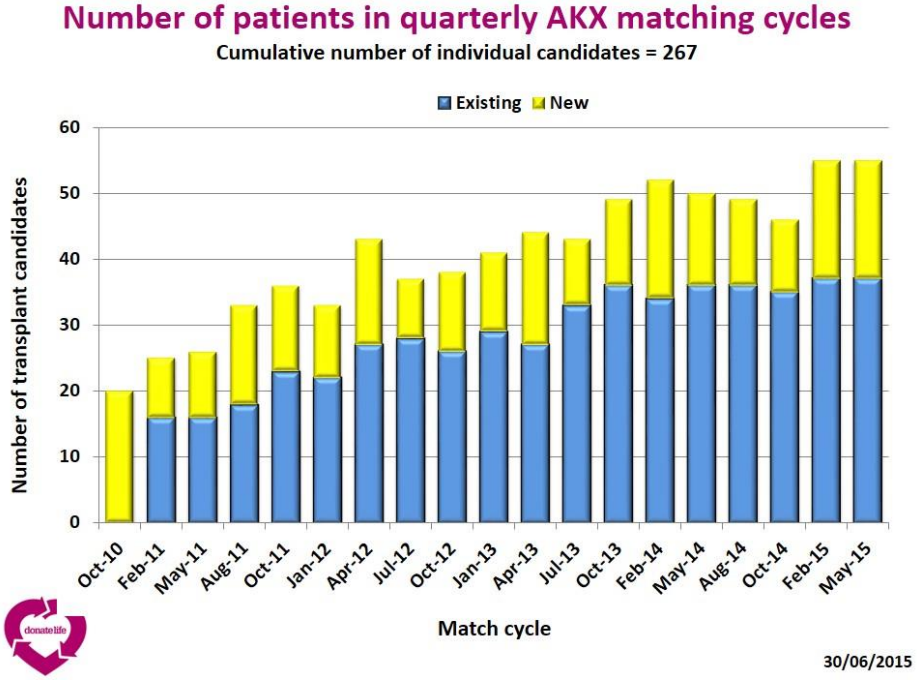
**Figure 1. Kidney paired donation transplants in Australia**




## 2. Number of pairs in quarterly match runs

In 2015, on average 55 pairs were included in each of 3 monthly match runs. In each allocation round the proportion of newly registered patients was 33%.

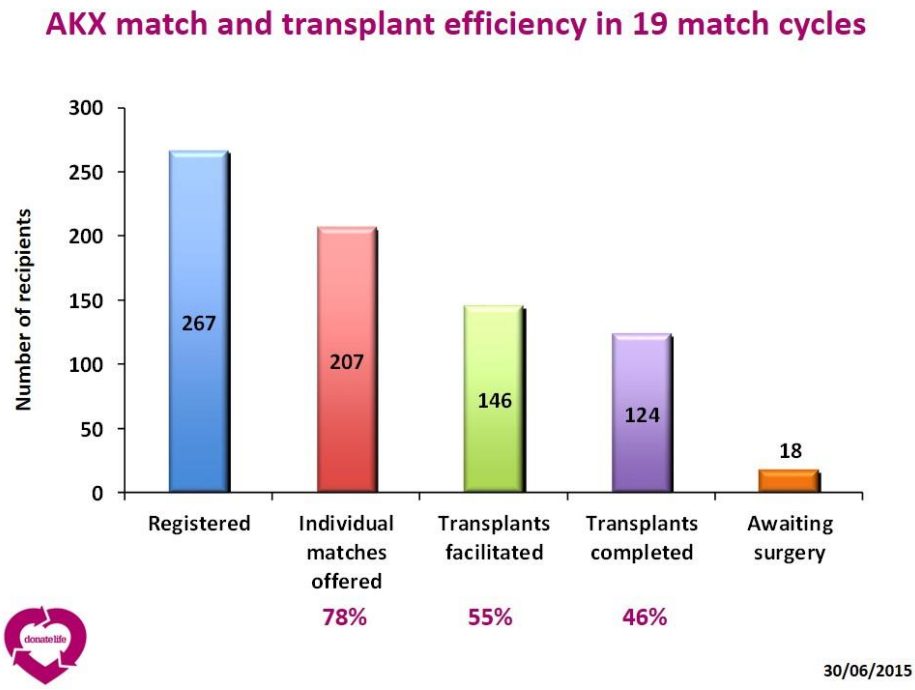
**Figure 2. Number of patients in quarterly match runs**



## 3. Matching efficiency

The match efficiency of the AKX programme remains high, with 78% of registered pairs finding a match. Non-proceeding transplants account for 23% of matched individuals not progressing to live donor kidney transplantation. Nevertheless, to date 51% of registered patients have been accepted for KPD transplantation and 49% were successfully transplanted.

**Figure 3. AKX match and transplant efficiency**




## 4. Donor and recipient characteristics

The proportion of transplant candidates joining the AKX programme because of ABO blood group mismatch with their intended donor remains low (15%) and the main reason for participating in a live donor kidney exchange program remains HLA incompatibility. The ratio of blood group O recipients to donors has been stable at 1.5:1 for the past 24 months now. More than half of the recipients have a cPRA ≥75%. A previous transplant has been the source of sensitisation in almost 2 in 3 transplant candidates.

**Figure 4. AKX donor and recipient characteristics**

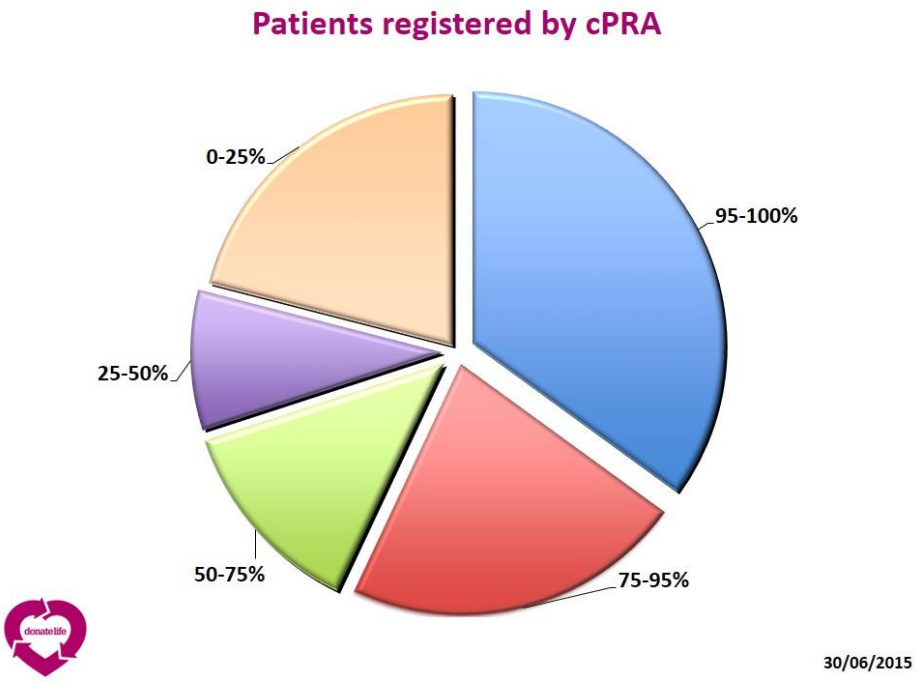
| Characteristic | Candidates | Donors |
|---|---|---|
| Total | 267 | 278 (6 NDAD) |
| Blood Type O | 58% | 38% |
| Accepting ABOi donor<br>O recipients<br>non-O recipients | <br>40%<br>66% | |
| cPRA (median – IQR) | 81% (39-99%) | |
| cPRA<br>≥ 75%<br>≥ 95% | <br>57%<br>35% | |
| Repeat transplants<br>≥ 2 transplants | 59%<br>19% | |

30/06/2015

## 5. Patients registered by cPRA

Nearly 60% of patients who have been referred to the AKX programme have a cPRA >75% and of these one third have cPRA >95%.

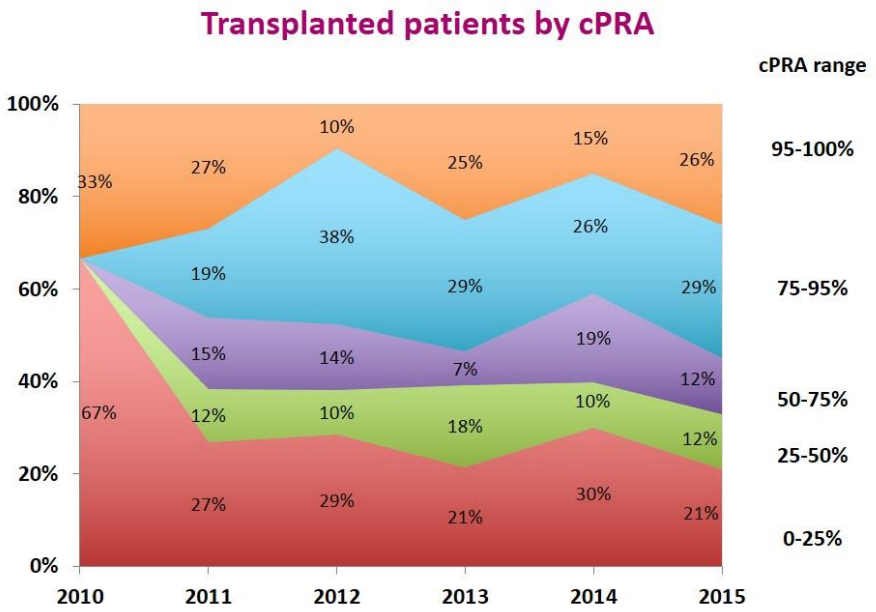
**Figure 5. Level of sensitisation of registered transplant candidates**




## 6. Transplanted patients by cPRA

On average the proportion of registered patients with a cPRA >75% and who receive a kidney transplant through the AKX programme is about 50% of the registrants. Within each cPRA group patients are transplanted at a proportion equivalent to their proportion in the programme, comparable to any other cPRA cohort, with the exception of patients with cPRA >95%. In the latter it is the group of patients with ≥97% cPRA which accumulates over time in the programme and represents the highly sensitised, difficult to transplant patients.

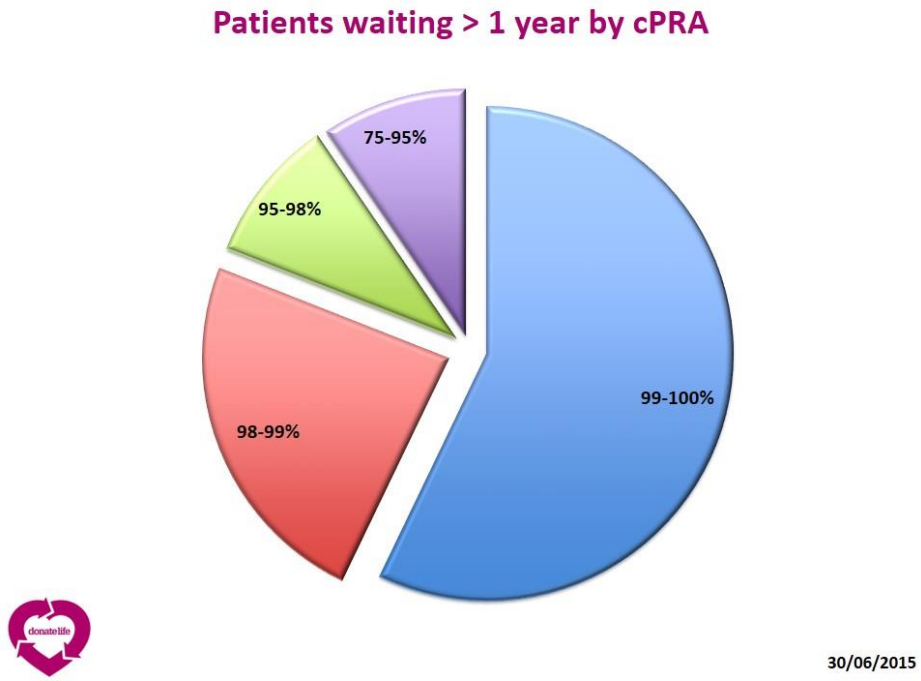
**Figure 6. Proportion of transplanted patients by period and cPRA**



## 7. Patients waiting by cPRA

In the current cohort of active transplant candidates there are 21 patients who have been waiting for 4 or more match cycles in the programme. None of these patients has a cPRA <75% and 90% of them have a cPRA >95%. Half of the patients waiting ≥4 match cycles are so broadly sensitised to HLA antigens (cPRA 99-100%) that they could only receive a kidney from an HLA identical donor.

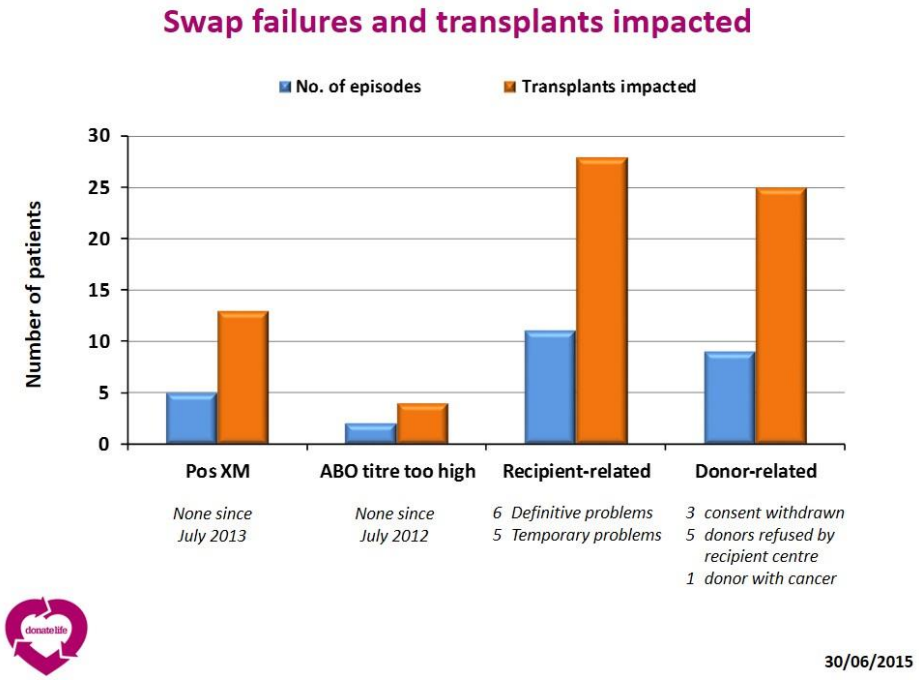
**Figure 7. Level of sensitisation of patients waiting > 1 year in the AKX programme**




## 8. Non-proceeding transplants and transplants impacted

The two leading causes of chain breakdown are (acute) medical unsuitability of a recipient in a chain or declines of matched donors by the recipient unit. Since July 2013 there has been no non-proceeding transplants because of unpredicted positive crossmatch. However, some patients do not proceed to transplantation after offer of a match and cross-matching because of residual concerns regarding pre-existing low level DSA despite negative CDC and flow crossmatches.

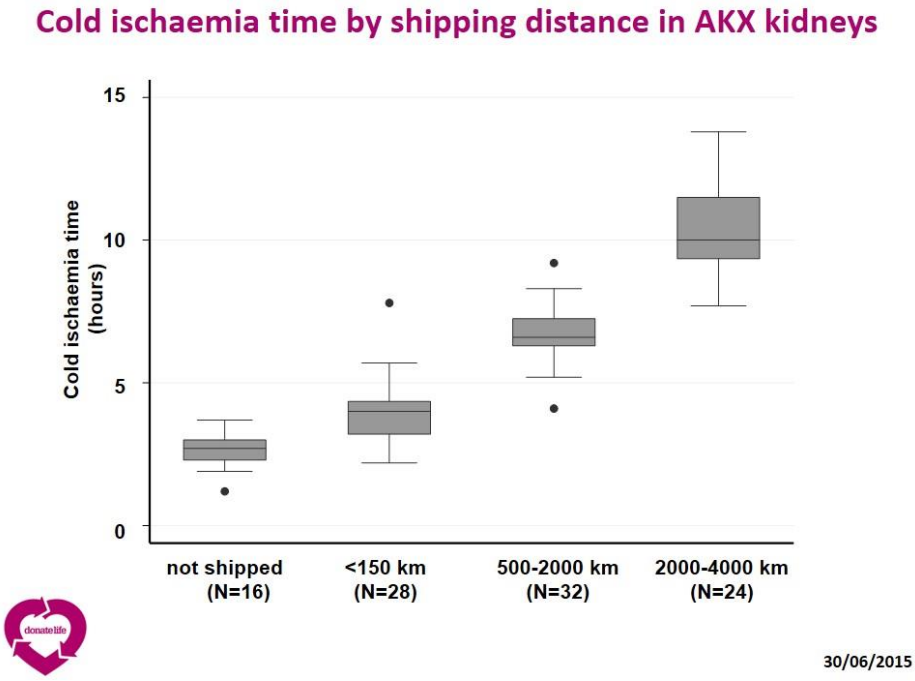
**Figure 8. AKX non-proceeding transplants**



## 9. Outcomes of shipped vs. non-shipped kidneys

Some clinicians remain hesitant about shipping live donor kidneys, as there is a perceived benefit of avoiding the extended cold ischaemia times (CIT) that arise from deceased donor transplantation. The AKX programme has been collecting data on organ transport and outcomes as part of its quality and control obligations and we have analysed outcomes of shipped vs. non-shipped kidneys after the first 100 AKX exchanges. Sixteen kidneys were transplanted at the same hospital (CIT 2.6±0.6h) and 84 required transport to the recipient hospital (CIT 6.8±2.8h). Air transport was required for 48 kidneys, with east-east coast CIT 6.8±1.1h (n=32) and east-west CIT 10.5±1.7h (n=24).

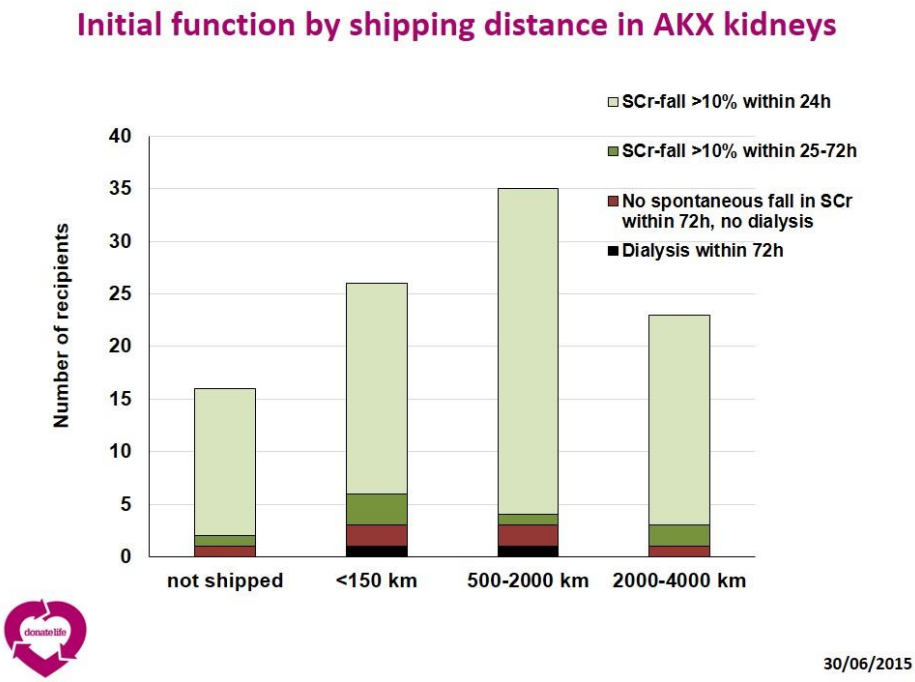
**Figure 9. Cold ischaemia time by shipping distance in 100 AKX kidneys**




## 10. Initial function by shipping distance

A spontaneous fall in serum creatinine by at least 10% within 24 hours was observed in 85% of recipients, with no difference between shipped and non-shipped kidneys. There were 2 cases of transient delayed graft function requiring dialysis (CIT 4.4h and 6.7h and creatinine at 1 month 133 and 171µmol/l, respectively). Both cases were not related to exceedingly long CIT.

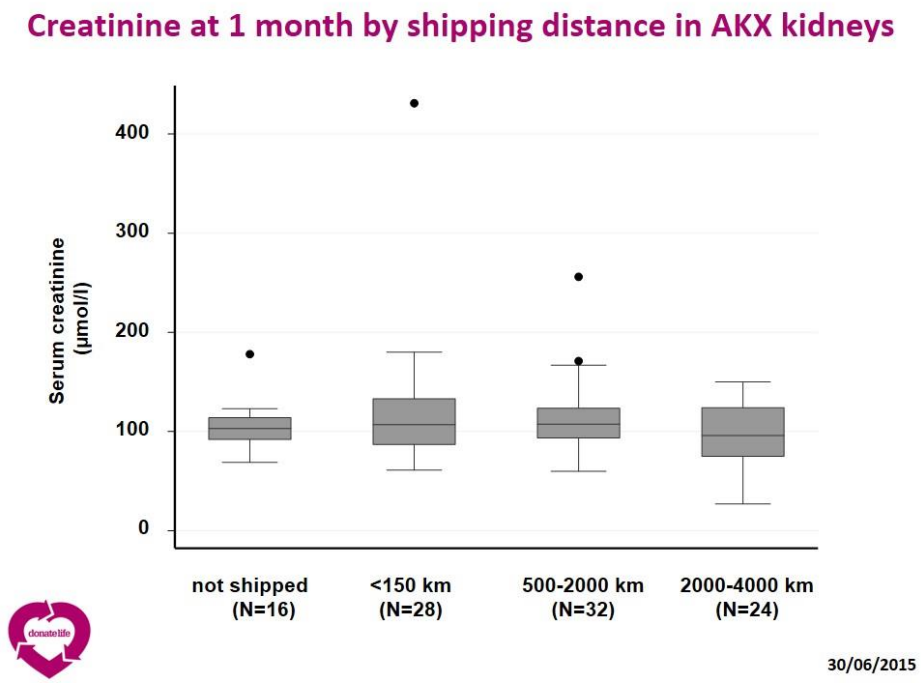
**Figure 10. Initial function by shipping distance in 100 AKX kidneys**



## 11. Early graft function and survival

Serum creatinine at 1 month did not differ in recipients of non-shipped compared to shipped kidneys (105±7µmol/l vs. 112±6µmol/l respectively, P=0.7). The 1-year patient and graft survival in AKX recipients were 98% and 97%, respectively; in comparison, during the period 2010-2013 the 1-year patient and graft survival of 1270 living donor grafts in Australia and New Zealand were 99% and 97%, respectively. In this cohort delayed graft function (DGF) was reported to be 3.7%, compared to 2.4% in the shipped kidneys AKX group. Therefore, despite prolonged CIT for interstate exchanges, the programme's decision to ship donor kidneys rather than the donor appears to be safe.

**Figure 11. Initial function by shipping distance in 100 AKX kidneys**



## 12. Participating transplant centres

| | | |
|---|---|---|
| Alfred Hospital | Melbourne | VIC |
| Austin Hospital | Melbourne | VIC |
| John Hunter Hospital | Newcastle | NSW |
| Mater Children's Hospital | Brisbane | QLD |
| Monash Medical Centre | Melbourne | VIC |
| Monash Medical Centre paediatric | Melbourne | VIC |
| Royal Adelaide Hospital | Adelaide | SA |
| Royal Children's Hospital | Melbourne | VIC |
| Royal Melbourne Hospital | Melbourne | VIC |
| Royal North Shore Hospital | Sydney | NSW |
| Royal Perth Hospital | Perth | WA |
| Royal Prince Alfred Hospital | Sydney | NSW |
| Prince of Wales Hospital | Sydney | NSW |
| Princess Alexandra Hospital | Brisbane | QLD |
| Princess Margaret Hospital | Perth | WA |
| Sir Charles Gairdner Hospital | Perth | WA |
| St. Vincent's Hospital | Melbourne | VIC |
| Sydney Children's Hospital | Sydney | NSW |
| The Children's Hospital at Westmead | Sydney | NSW |
| The Women's and Children's Hospital | Adelaide | SA |
| Westmead Hospital | Sydney | NSW |