Public Health, Infections and Transplantation

Dr Kerry Chant

Chief Health Officer

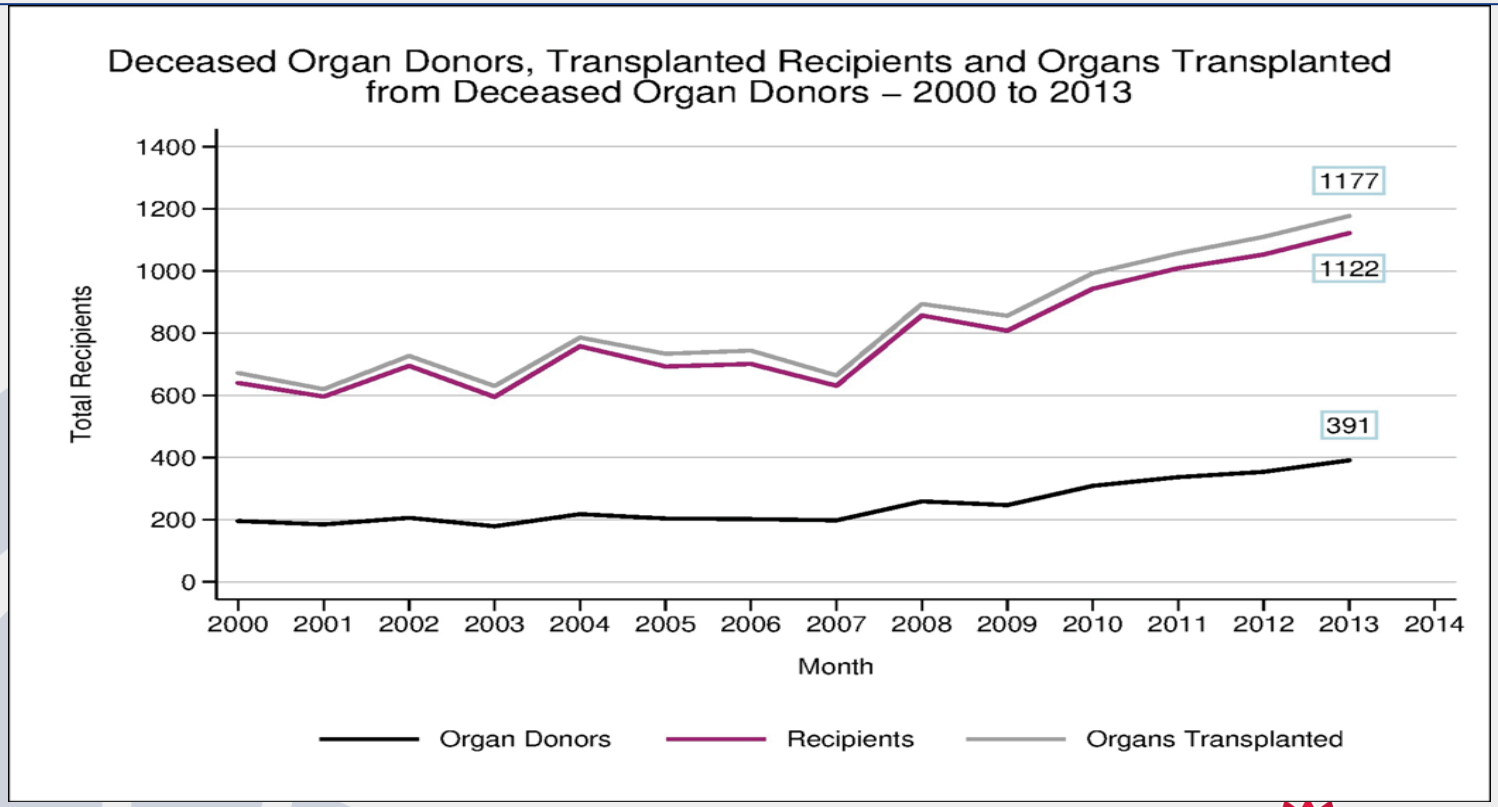
& Deputy Director General Population and Public Health

NSW Ministry of Health

May2014

NSW GOVERNMENT Health

Public Health Infection and **Transplantation**



NSW GOVERNMENT Health

Graft and Patient Survival After Transplantation by Organ

	Graft Survival (%)		Patient Survival (%)	
Type	1 year	3 year	1 year	3 year
Renal-LD	96	90	99	95
Renal-Cad	91	80	96	89
Pancreas	76	60	98	92
Heart	88	81	88	82
Liver	84	74	88	79
Lung	82	64	83	66
Heart-Lung	81	62	81	62

LD = Living donor

Cad = Cadaveric donor

Data from SRTR 2009 Annual Report

NSW GOVERNMENT Health

Figure 8.33

Graft Losses 2007 - 2011

Cause of Loss	Australia			New Zealand		
	Graft Function			Graft Function		
	<1 year	>= 1 year	Any Time	<1 year	>= 1 year	Any Time
Death with functioning Graft						
Cardiac	21 (30%)	191 (24%)	212 (25%)	4 (36%)	47 (28%)	51 (28%)
Vascular	5 (7%)	70 (9%)	75 (9%)	1 (9%)	7 (4%)	8 (4%)
Infection	29 (42%)	130 (17%)	159 (19%)	1 (9%)	27 (16%)	28 (16%)
Social	3 (4%)	53 (7%)	56 (7%)	1 (9%)	8 (5%)	9 (5%)
Malignancy	5 (7%)	262 (33%)	267 (31%)	3 (27%)	60 (36%)	63 (35%)
Miscellaneous	6 (9%)	77 (10%)	83 (10%)	1 (9%)	19 (11%)	20 (11%)
Total	**69 (100%)**	**783 (100%)**	**852 (100%)**	**11 (100%)**	**168 (100%)**	**179 (100%)**
Graft Failure						
Rejection - Acute	30 (23%)	25 (3%)	55 (5%)	-	6 (4%)	6 (4%)
Rejection - Chronic Allograft (CAN)	9 (7%)	734 (78%)	743 (69%)	1 (6%)	100 (67%)	101 (60%)
Rejection - Hyperacute	2 (2%)	-	2 (<1%)	-	-	-
Vascular	41 (31%)	15 (2%)	56 (5%)	8 (44%)	3 (2%)	11 (7%)
Technical Problems	10 (8%)	5 (1%)	15 (1%)	1 (6%)	-	1 (1%)
Glomerulonephritis	9 (7%)	59 (6%)	68 (6%)	3 (17%)	15 (10%)	18 (11%)
Non Compliance	1 (1%)	37 (4%)	38 (4%)	1 (6%)	15 (10%)	16 (10%)
Other	30 (23%)	64 (7%)	94 (9%)	4 (22%)	10 (7%)	14 (8%)
Total	**132 (100%)**	**939 (100%)**	**1071 (100%)**	**18 (100%)**	**149 (100%)**	**167 (100%)**

Risk of acquisition of a BBV through organ transplantation

- The prevalence of the virus in the donor population
- The viral load in the donor
- The specific organ transplanted
- The efficiency of virus transmission after contact with blood and tissues

NSW GOVERNMENT | Health

Estimated Prevalence of BBV in Australia

Virus	Estimated Infected Population	Prevalence rate (%)
HIV	25,700	0.10
HBV	207,000	0. 91
HCV	231,500	1.01

NSW GOVERNMENT | Health

Safety Paradigms for SOT and Blood

Parameter	Organ Donors	Blood Donors
Timeline	Restrictive <12 -18 hrs	24 – 48 hrs
Medical & Social History	2nd & 3rd hand Poorly standardised	Statutory declaration Standardised
Screening paradigm	Serology based	Serology + NAT
NAT practice & capacity	Variable	Standard
Policies & Regulations	Incomplete Immature	GMP based Mature, Prescribed
Biovigilance system	Voluntary, Jurisdictional No standardisation	Jurisdictional Haemovigilance
Public expectation	Risk-benefit tradeoffs	"Zero Risk"
Protections	Risk Management	Legislative

virology division
diagnosis.research.teaching

NSW Viral Screening Markers

[PD2013_029 Organ Donation and Transplantation - Managing Risks of Transmission of HIV, HCV and HBV]

Serology:

- Anti-HIV-1/2
- Anti-HCV
- Anti-HTLV-I/II
- HBsAg
- Anti- HBc
- Anti-HBs
- anti-EBV
- anti-CMV
- Syphilis antibody (TPHA)

NAT:

- HIV-1 RNA
- HCV RNA
- HBV DNA
- Prospective in “increased risk”
- Otherwise performed retrospectively

NSW GOVERNMENT Health

Donors with identified risk factors

- MSM
- People who inject drugs
- Incarceration in previous 12 months
- Sexual partners of above
- Unexplained fever /weight loss/ LAD/cough etc
- Partner with HIV/HBV/HCV
- Sex workers
- STD in past 12 months
- Cosmetic body piercing/tattooing
- (cocaine snorting)
- Physician concern

NSW GOVERNMENT | Health

Risk Stratification: Donors

- Routine assessment of donors: Is there a trade off to be had between screening all donors vs those considered to be at “increased risk”?
- Whose definition of “increased risk” do we use ? Does it matter?
- Australia/USA Definitions – Stratified into either “increased risk” or “without identified risk for transmission”
  - Europe – a more graded system

NSW GOVERNMENT | Health

European system

Unacceptable risk: includes absolute contraindication but some life saving transplantation in the absence of other therapeutic options

Increased but acceptable risk: transmissible disease identified but organ utilisation justified by the health status of recipient or the severity of their condition

Calculated risk: transplantation is allowed for recipients with same disease or with a protective serological status

Not assessable risk: includes where a risk assessment for transmissible disease wasn't able to be performed

Standard risk: includes where the evaluation did not identify a transmissible disease.

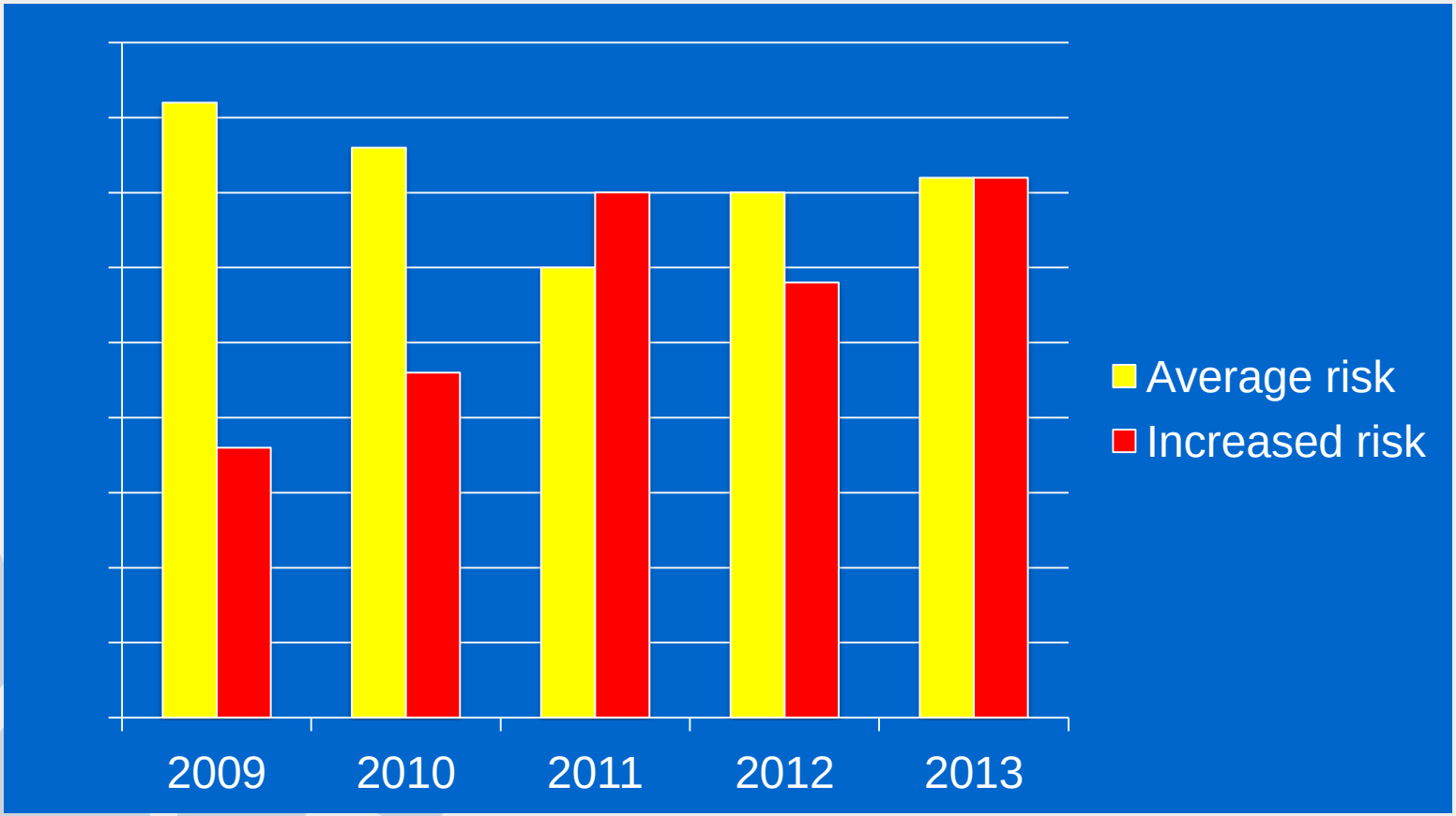
NSW GOVERNMENT | Health

Donor Screening and Risk Stratification

- How are results to be used?
- To rule donors in or out? –What about false positives? Do we risk losing a donor (up to 8 solid organs and 3 tissues) by adhering to a possibly false positive result?
- To risk stratify a donor? (CMV, EBV, HBV, HCV)
- What about screening limitations –the window period between exposure and serologic conversion ? Do we lose donors or do we risk transmissions?
- Transplant community needs to be better educated on how to use these results – e.g. HBV organ utilisation is variable even in HBV seroprotected donors

NSW GOVERNMENT Health

Increased risk vs. Average risk
Organs retrieved in NSW since NAT



NSW GOVERNMENT | Health

Australian Donor Profiles 2012

- **354 donors across Australia**
- CMV positive = 225
- EBV positive = 321
- HCV positive = 5 Organs transplanted included 1 kidney and 5 (whole) livers
- HBV core antibody positive = 15. Organs transplanted included 26 kidneys, 8 Livers, 2 hearts, 6 double lungs.

(data from ANZOD 2013 annual report)

NSW GOVERNMENT | Health

Live Donor Screening

- In the USA a 2011 transmission of HIV from a live donor to his recipient highlighted the need for testing of live donors.
- **Recommendations**:
  - within 28 days but optimally 14 days of procurement.
  - Testing ideally NAT for HIV and HCV and Hep B surface antigen in the donor.
  - Live donors also need to be educated about the ways they can avoid acquiring infections in the time between screening and donation.

NSW GOVERNMENT | Health

Recipient Risk Stratification

- Optimal screening of recipients both pre and post transplant
- Risk of infection is an interplay between:
  - Exposure history (both donor and recipient)
  - Intensity and quality of immunosuppression
  - Use of prophylactic medications
- **Factor in the urgency of the need for transplant**

NSW GOVERNMENT | Health

Recipient Consent – Ethical Issues

- Allowing transplantation of organs from deceased donors with viral syndromes is controversial.
- Requires recipient informed consent. Must be done early in work up and repeated periodically.
- Livers with known Hep B core infection may be used as there are effective treatments for these infections
- NSW policy allows HCV +ve donor organs to be transplanted into HCV +ve recipients who consent to a range of risk management strategies to minimise inadvertent transmission. This is managed through a national registry.

NSW GOVERNMENT | Health

Recipient Consent – Ethical Issues

- The US Congress recently passed the HIV Organ Policy Equality Act (HOPE ACT).
- The Act paves the way for research into HIV +ve to HIV +ve transplants.
- It is estimated that this could provide up to 600 organs per year for HIV infected transplant candidates.
- In the US kidney and liver failure is now a leading cause of death for HIV +ve patients
- **Would we consider this in Australia**?

NSW GOVERNMENT | Health

Biovigilance and Safety
The spectrum of public health surveillance

- Public health surveillance for blood borne viruses
  - is a passive surveillance system
  - laboratories notify positive test results to NSW Health
  - only people who are tested will be notified
  - most infections with a BBV do not have symptoms at the time of infection and an infected recipient may not be tested for some time post transplant.
  - not all notifications are followed up so an infected recent organ recipient may not be detected even if tested and notified

NSW GOVERNMENT | Health

Bio-vigilance and Safety

- Systems usually require recognition that the disease in the recipient is potentially of donor origin.
- There is no dedicated organ donation and transplant surveillance registry in Australia (No TGA regulation for solid organs). This is variable and ad hoc.
- Usually the transplant team report back to donor agency – record linkage will occur through donor agency.

NSW GOVERNMENT | Health