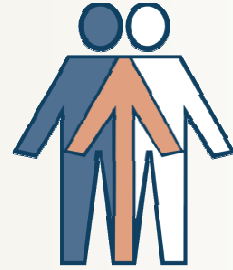


# Equitable access to transplantation

**Axel Rahmel**

**10<sup>th</sup> European Donation and Transplantation Day  
in Slovenia**

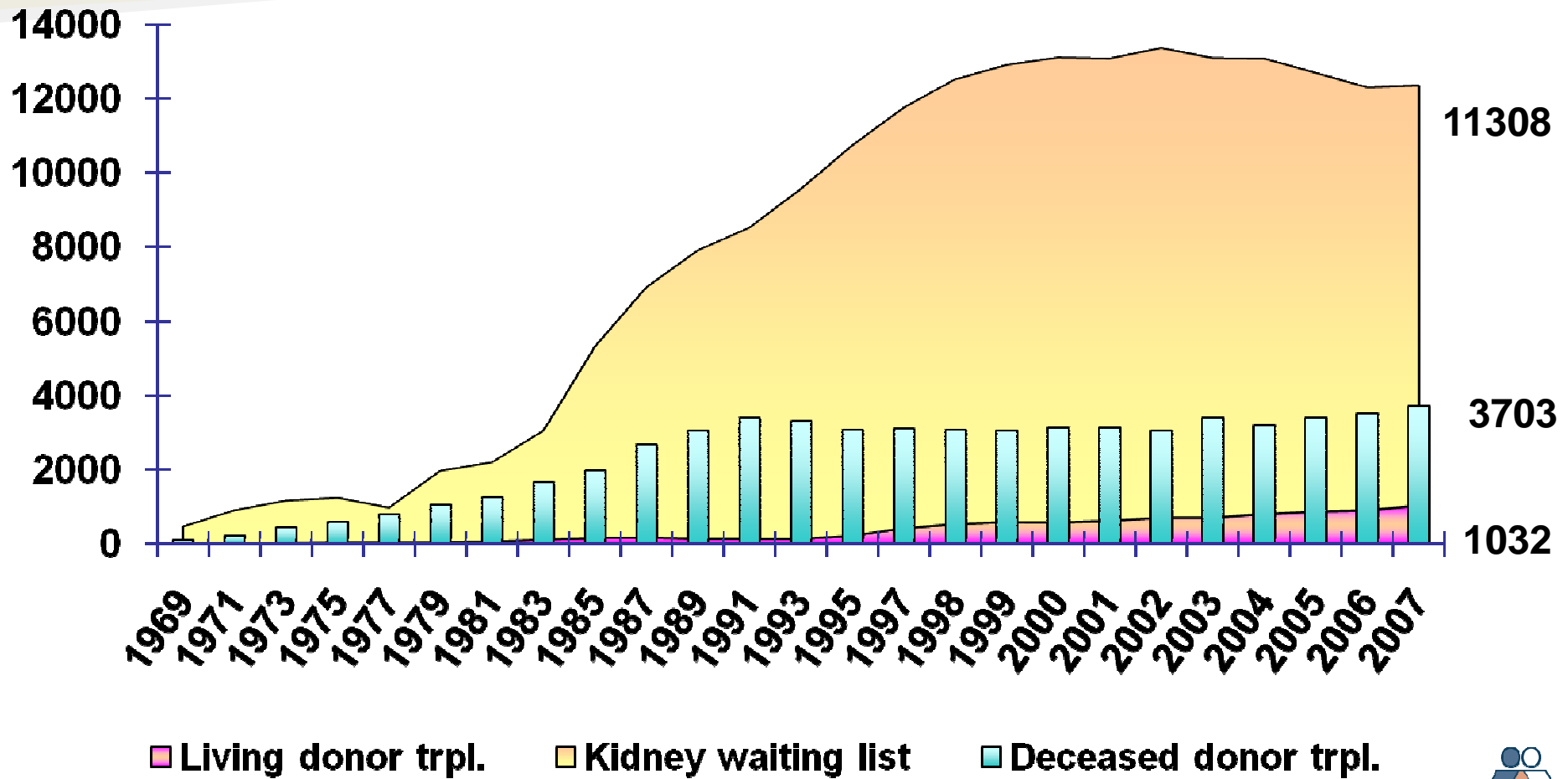
**Ljubljana, October 18<sup>th</sup>, 2008**



# Donation, waiting lists and transplantation

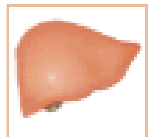
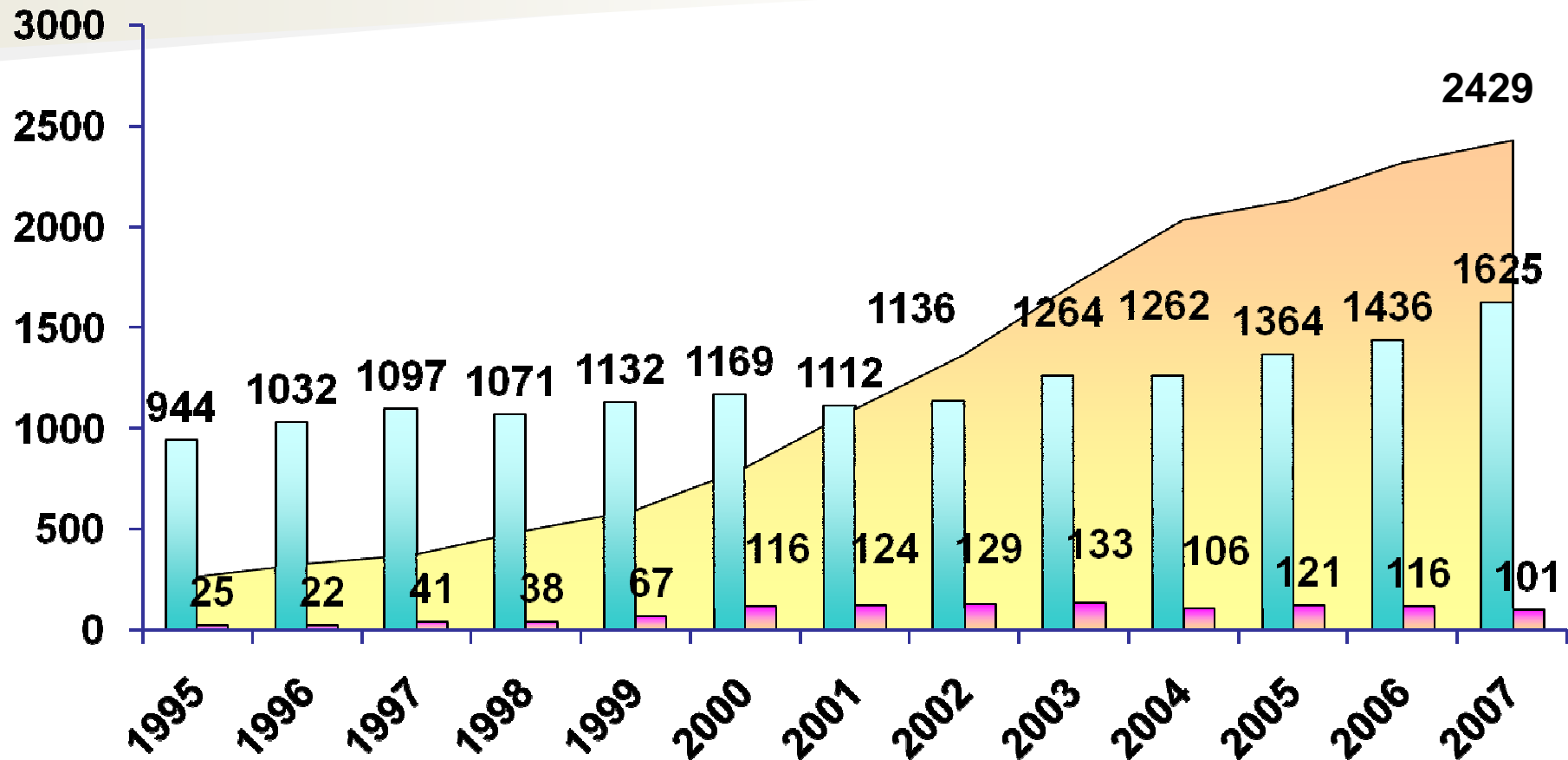
# Kidney waiting list and transplants

## Eurotransplant 1969 - 2007



# Liver waiting list and transplants

## Eurotransplant 1995 - 2007



■ Liver waiting list

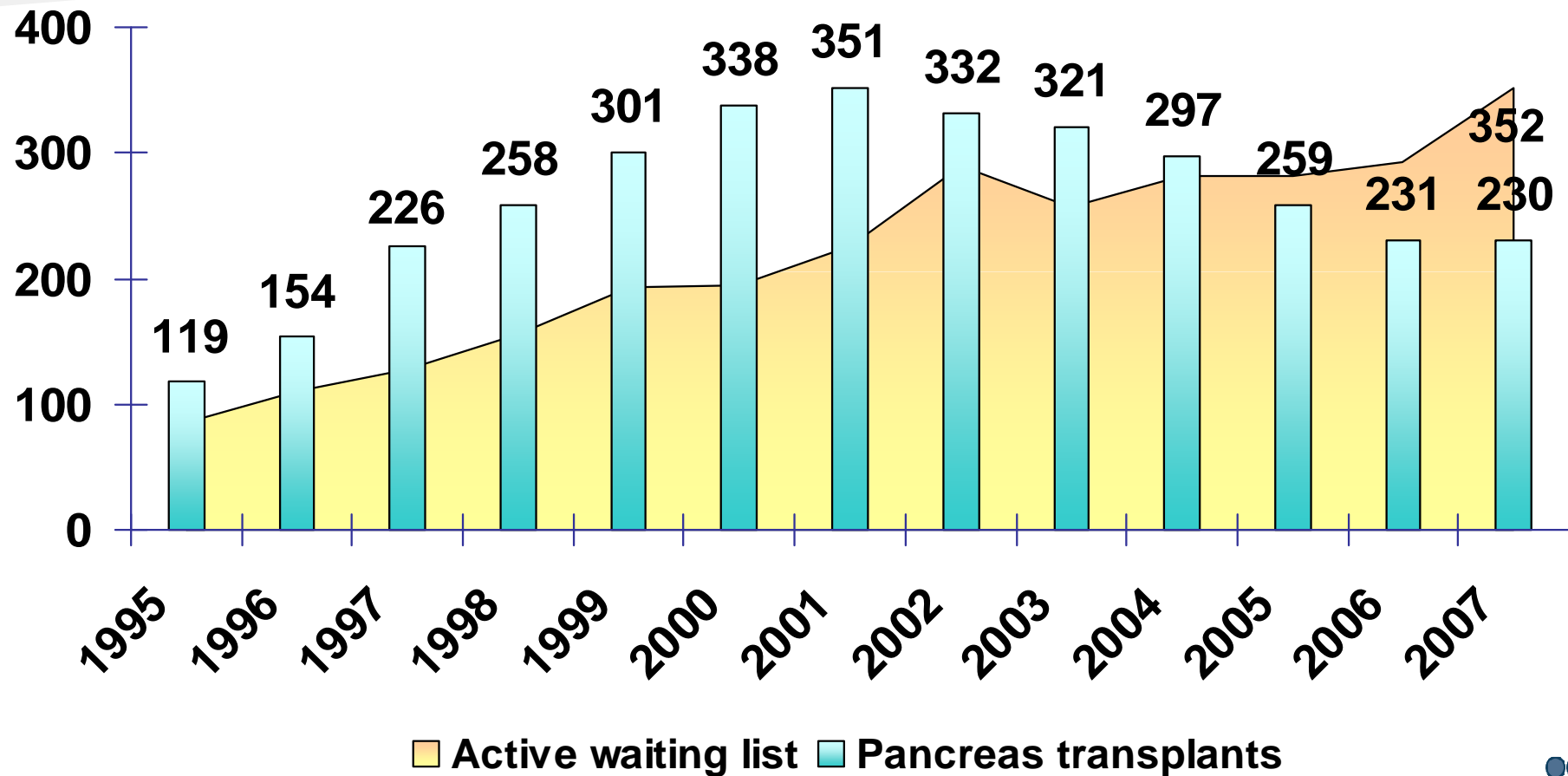
■ Deceased donor transplants

■ Living donor transplants



# Pancreas waiting list and transplants\*

## Eurotransplant 1995 - 2007

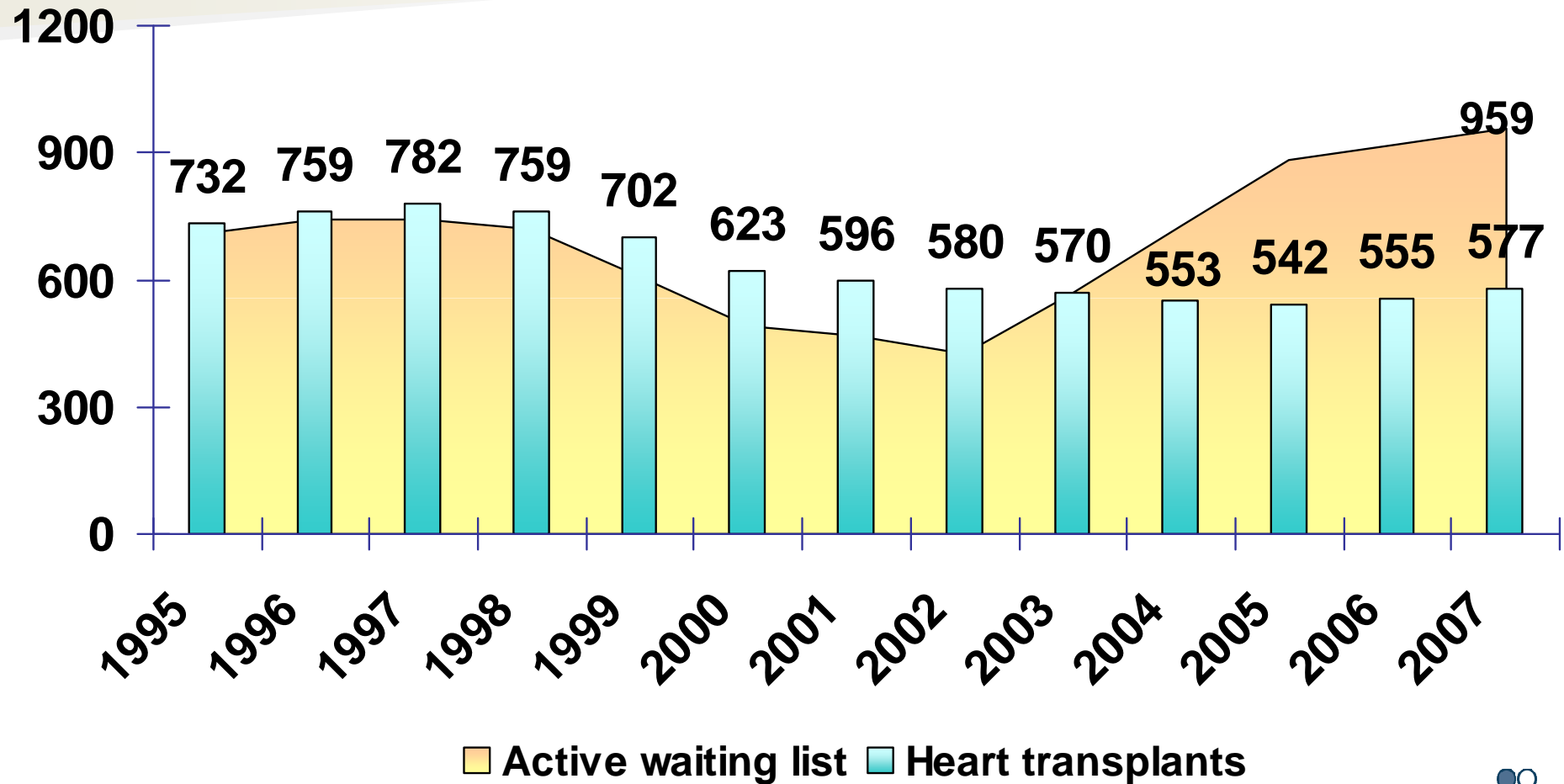


\* including kidney and islet transplants



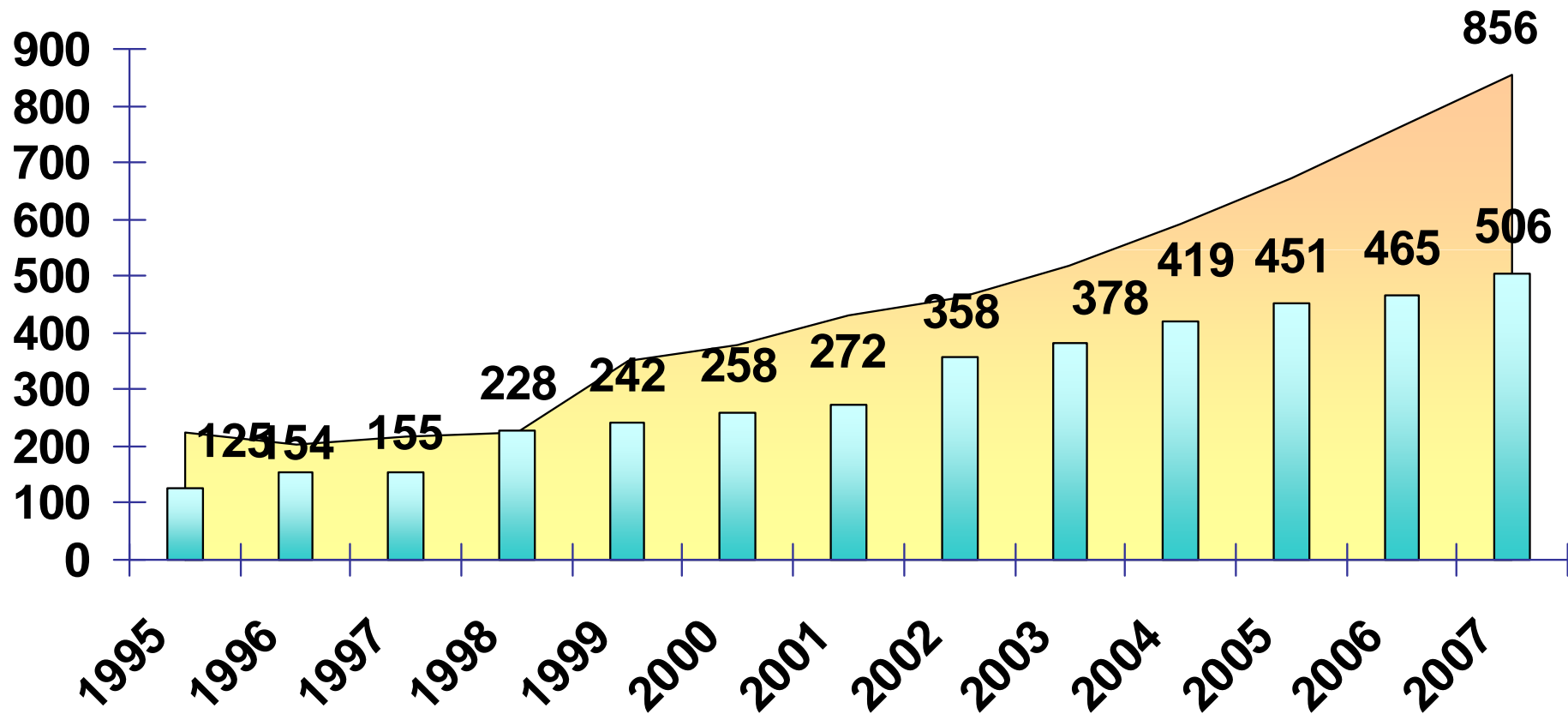
# Heart waiting list and transplants

Eurotransplant 1995 - 2007



# Lung waiting list and transplants

Eurotransplant 1995 - 2007



Active waiting list Lung (s+d) transplants



# Grim facts...



Each day, **9 European citizens** die whilst waiting for a suitable organ transplant\*

*\*3.262 deaths on the waiting list in 2007, Council of Europe data 2008*

Based on: Leo Roels, Donor Action



# WHO GUIDING PRINCIPLES ON HUMAN CELL, TISSUE AND ORGAN TRANSPLANTATION

## Guiding Principle 9

- Where donation rates do not meet clinical demand, allocation criteria should be defined at national or subregional level by a committee that includes experts in the relevant medical specialties, bioethics and public health...





# Allocation principles

# Organ allocation principles

- Equity: every patient the same chance
  - Sense of fairness or impartiality
  - Lack of bias or discrimination
- Queuing: longest waiting first
- **Equal/similar patients have to be treated equal/similar**
- Net benefit: balancing urgency and outcome



# Selection criteria dialysis treatment

Seattle Artificial Kidney Center Admissions Committee  
1962-1971

- Anonymous expert group
  - Priest (chairman), 3 other non medical professionals, 2 medical doctors (no nephrologists!)
- Decided on enrollment in dialysis program
- Criteria used (among others):
  - Age
  - Previous input to society
  - Future potential for society
  - Financial background
  - Residency
- A report on this committee led to an extensive bio-ethical debate in the US



# Important factors in allocation

## Public opinion

### No priority

- Gender (95%)
- Income (97%)
- Employment status (95%)
- Profession (92%)

### High priority

- Waiting time (87%)
- Post-tx outcome (79%)
- Young age (66%)
- Parental status (56%)



# Organ Allocation Principles

- Equity: every patient the same chance

- Queue

- Wait
  - “first come, first served”

- Need

- Utility

- Net

out



do



# Queuing: longest waiting first

## Emergency department



# Consequences of waiting time

- If patients get sick quickly, they die
- Patients well enough to wait the longest get transplanted
- If a patient is well enough to continue to wait safely, wouldn't it be fair to allocate the organ to the sickest who is at most risk of death?



# Waiting time vs need/urgency

- Waiting time may be easy to understand but so is severity of illness
  - What do patients think?
  - Top priority should be given to:
    - Most urgent 54%
    - Longest waiting time 33%
- UNOS Survey 1994



# Organ allocation principles

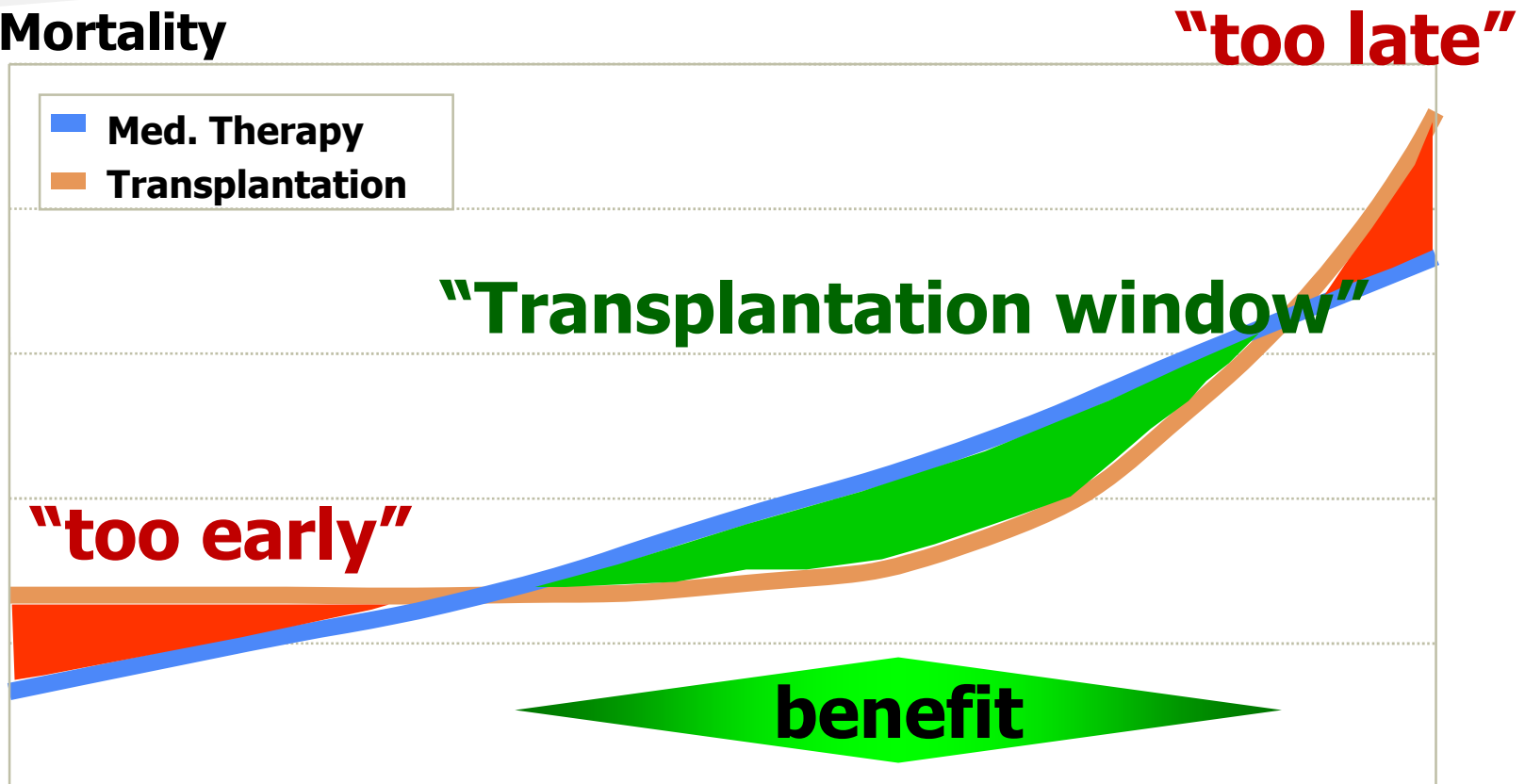
- Equity: every patient the same chance
- Queuing: longest waiting first
- **Need/urgency: sickest patient first**
  - Direct organs to those most in need, i.e. most at risk of death without a transplant (medical urgency)
- Utility: best post-Tx outcome first
- Net benefit: balancing urgency and outcome



# Balancing urgency and outcome

## “Transplant window“-concept

**Mortality**



-> Increasing organ failure ->



# Justice vs Utility

- Transplanting patients who will not survive is a waste of a limited resource
- Decreasing deaths on the waiting list must be balanced by *not* increasing deaths after transplant



# Organ Allocation Principles

- Equity: every patient the same chance
- Queuing: longest waiting first
- Need/urgency: sickest patient first
- Utility: best post-Tx outcome first
- Net benefit: balancing urgency and outcome

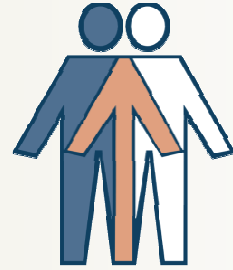


# WHO GUIDING PRINCIPLES ON HUMAN CELL, TISSUE AND ORGAN TRANSPLANTATION

## Guiding Principle 9

- The allocation of organs, cells and tissues should be guided by clinical criteria and ethical norms, not financial or other considerations.
- Allocation rules, defined by appropriately constituted committees, should be equitable, externally justified, and transparent.





# Practical implementation of allocation rules in Eurotransplant

Kidney and liver allocation R1

## Diapositive 23

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**R1**

Rahmel-ET; 18/10/2008

# ET organ allocation - renal

**Highly immunized -  
Acceptable Mismatch (AM) - Program**

**Zero Mismatch (“full house”)**

**Pediatric Donor (< 10 a) to Pediatric Recipient (< 6 a)  
when HLA-DR-identical**

**Eurotransplant Senior Program (ESP)**

**ETKAS**

**Point Score System (including HU)**

**A**

**B/L**

**D**

**HR**

**NL**

**SLO**

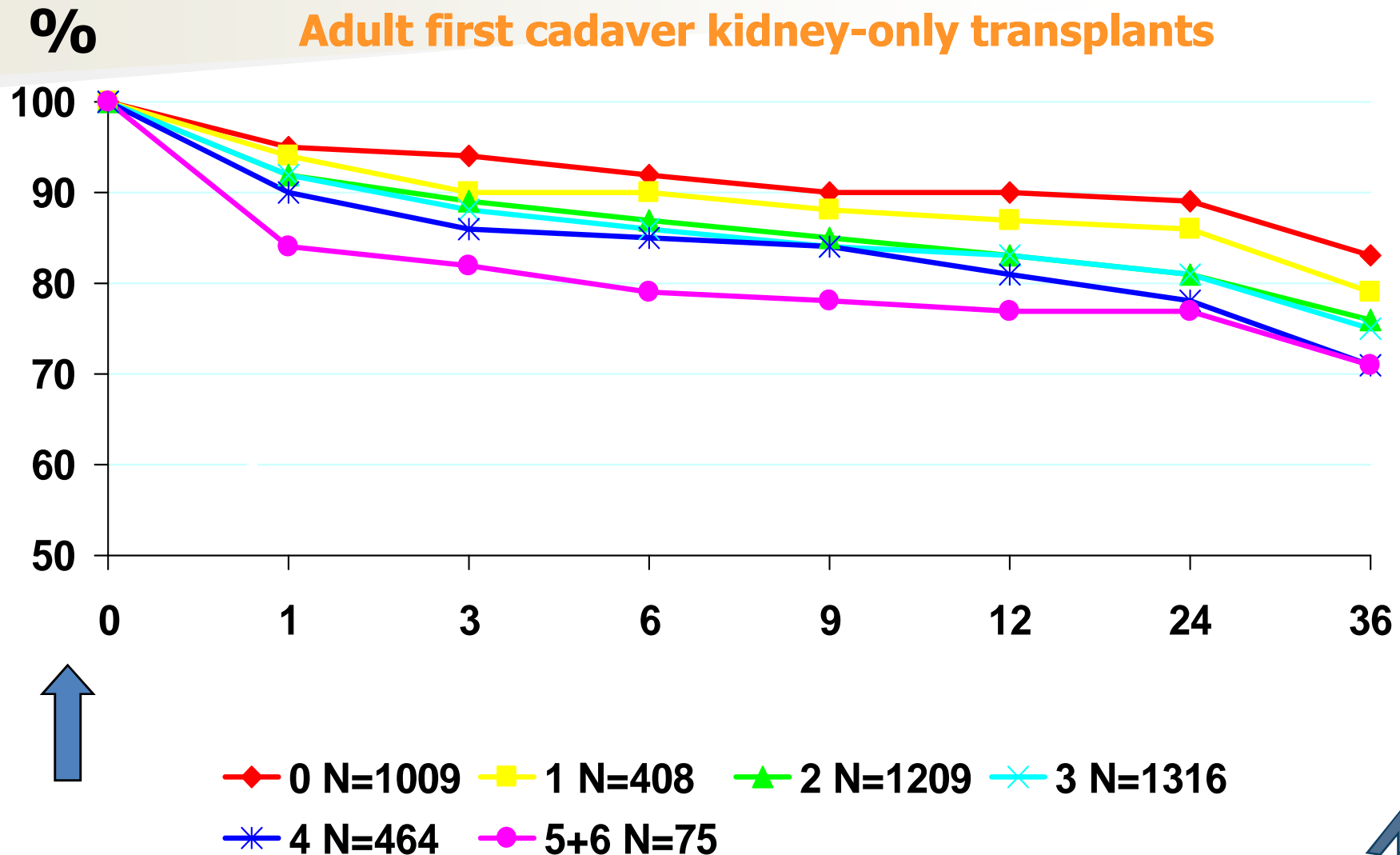


# Eurotransplant kidney allocation factors

	<b>Min</b>	<b>Max</b>
<b>HLA-A, B, DR Mismatch</b>	<b>0</b>	<b>400</b>
<b>Mismatch Probability</b>	<b>0</b>	<b>100</b>
<b>Waiting time</b>	<b>0.09 points per day</b>	
<b>Distance Donor / Transplant Center</b>	<b>0 - 100 - 200 - 300</b>	
<b>National Import / Export Balance</b>	<b>0</b>	<b>balance dependent</b>



# Kidney graft survival and HLA-ABDR mismatches



# HLA-matching in kidney transplantation

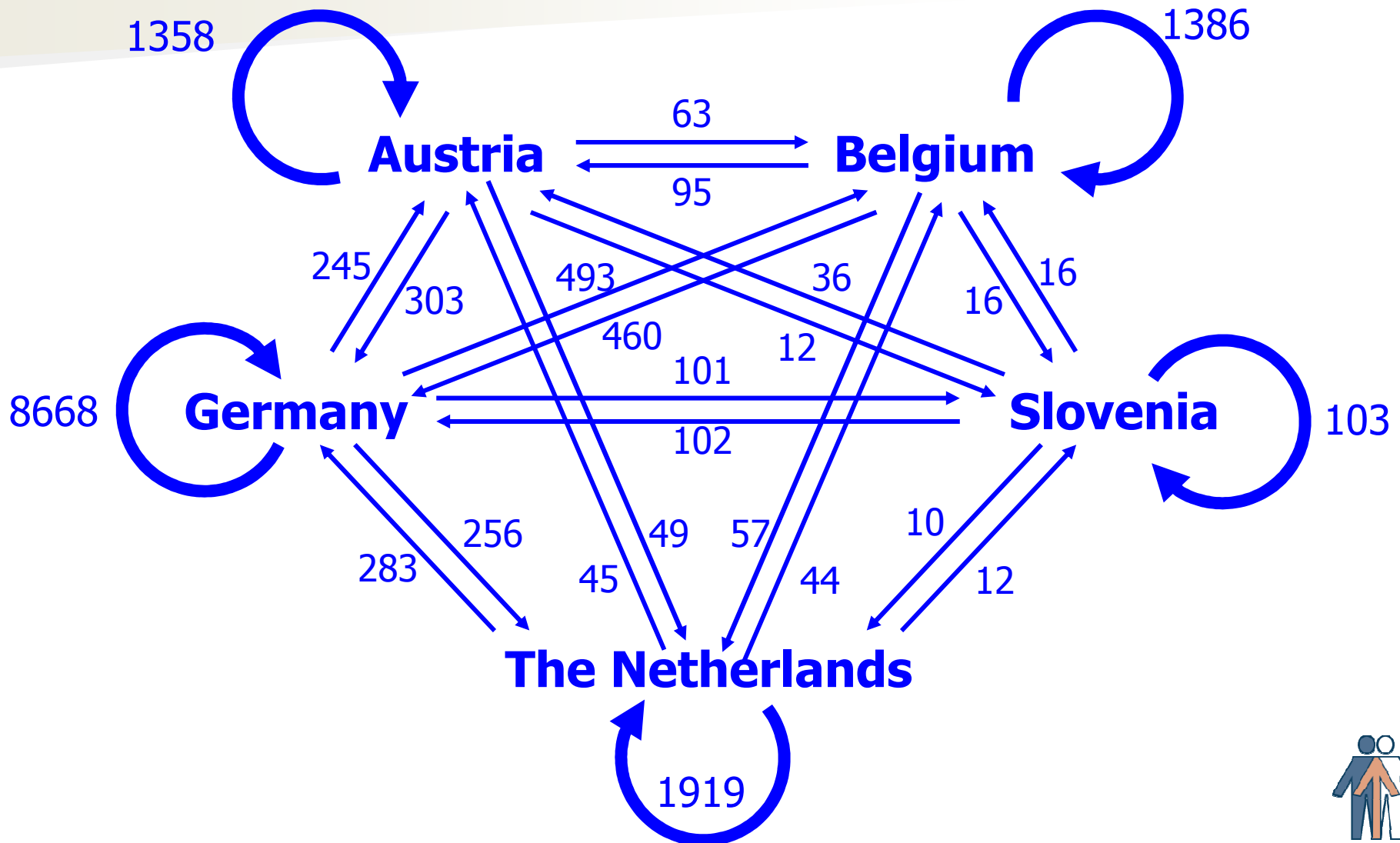
ET 2000-2004, non-ESP patients

No. of Mismatches	No. of transplants	percentage
0	2176	21,6 %
1	832	8,3 %
2	2679	26,6 %
3	3043	30,2%
4	1055	10,5 %
5	244	2,4 %
6	44	0,4%
total	10073	100%



# Organ exchange in the ET area

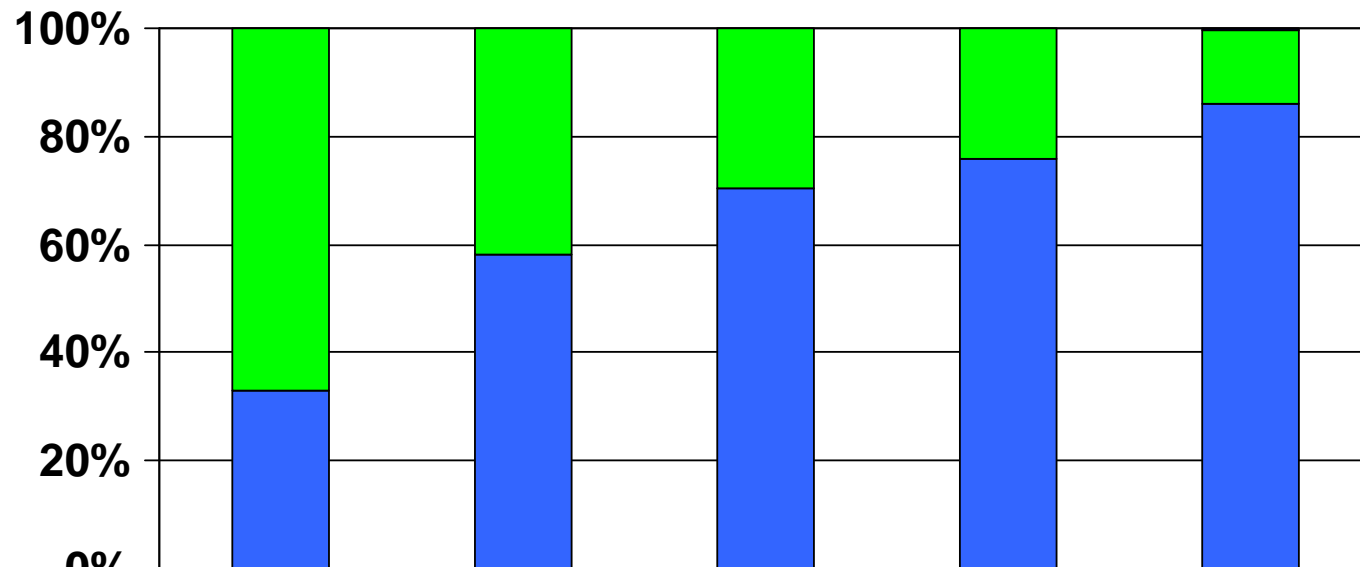
## Kidney transplantation 2000-2004



# International organ exchange in kidney transplantation

## Impact on selected patient groups

Eurotransplant 01.01.2002 -31.12.2006



	Highly immunized	000- HLA MM	Paediatric	High Urgency	Other
■ Outside ET	0	1	0	0	44
■ Other ET country	121	1022	141	87	1422
■ Recipient country	60	1420	336	271	9106



# ET organ allocation – liver

## International HU

### Selected combined organs (ACO)

**Elective**  
MatchMELD  
(labMELD  
SE, NSE)

**Elective**  
MatchMELD  
(labMELD  
SE, (NSE))

**Elective**  
MatchMELD  
(labMELD  
SE, NSE)

### PediatricMELD

### Elective (labMELD)

**A, Cr, SI**

**B**

**G**

**NL**



# Model for End-stage Liver Disease (MELD)

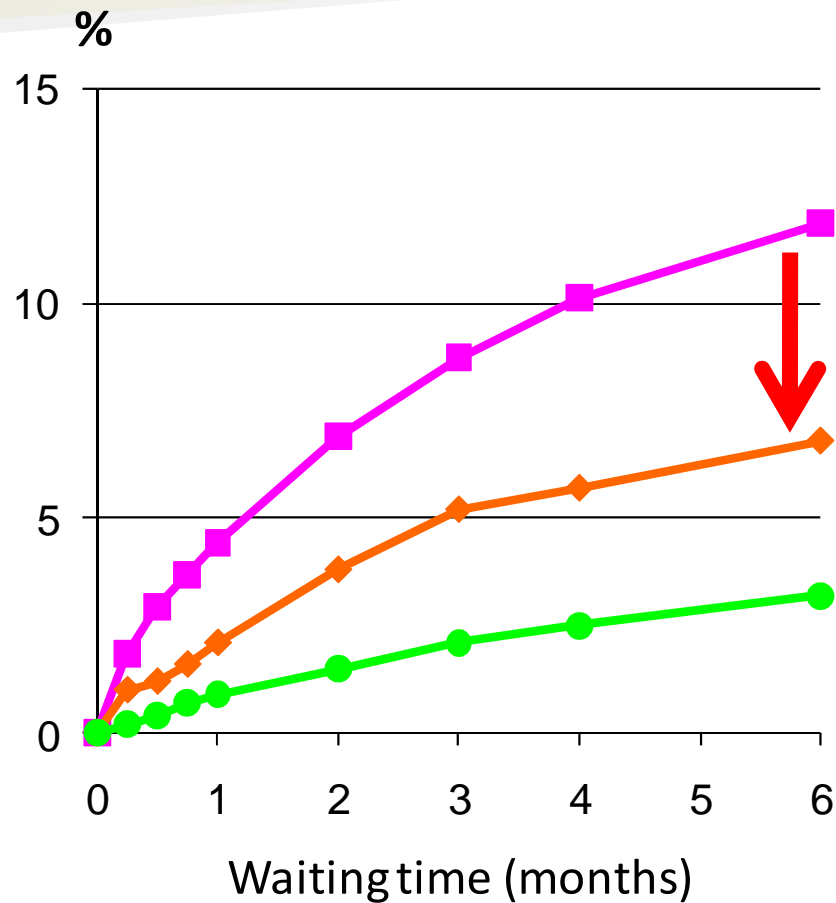
- Reproducible scores based on objective parameter (bili, crea, INR)
- Range of MELD-scores:  $6 \geq \text{MELD} \leq 40$
- Allows **urgency-based** allocation
- Potentially reduces mortality on the waiting list
- Reduces role of waiting time in allocation



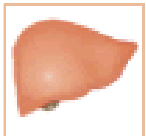
# Probability of death on the liver waiting list

## All elective liver-tx candidates

### Per era, Eurotransplant 2002-2008

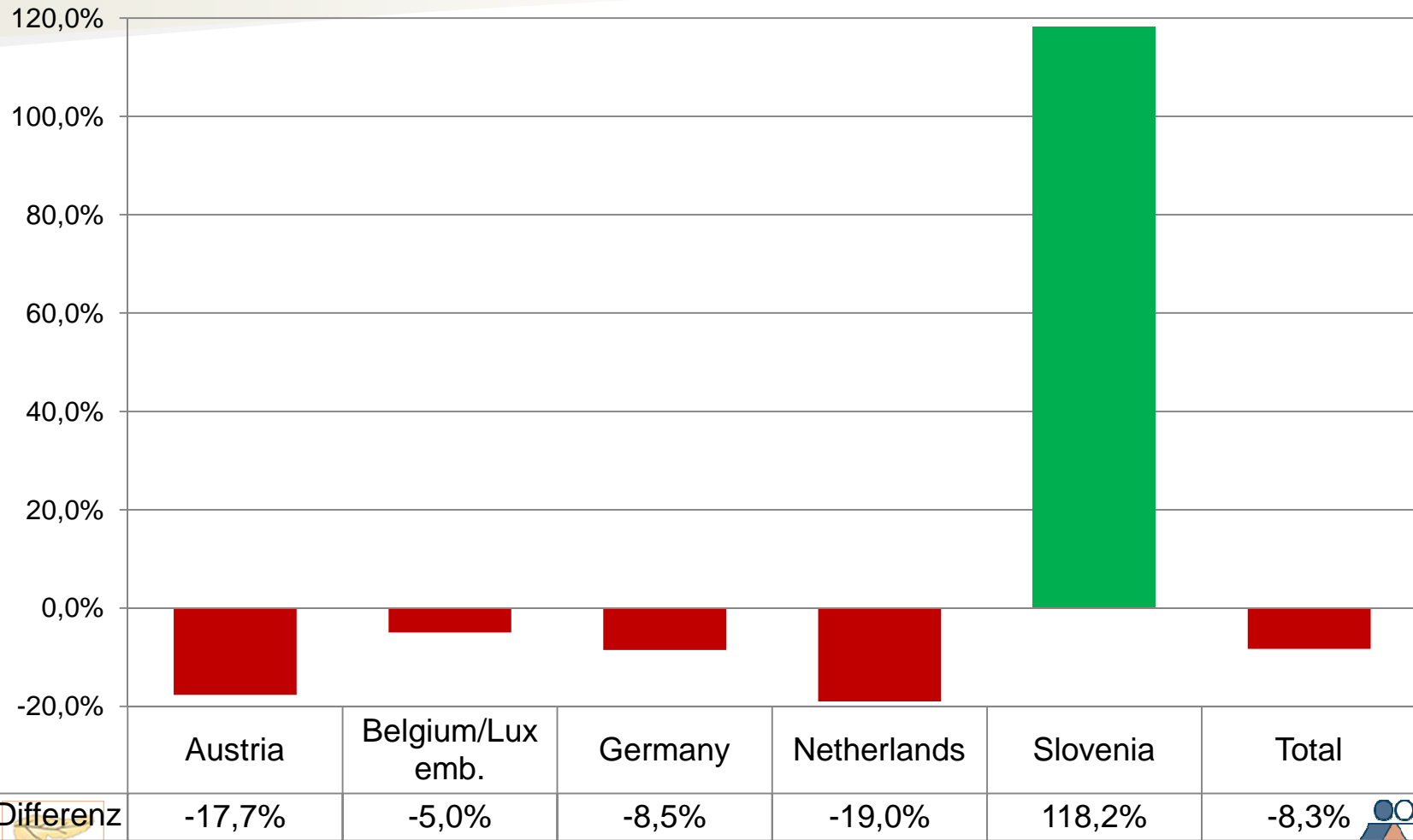


- Pts registered Jan 2002 - June 30, 2005 Pre-MELD [N=6367]
- ◆ Pts registered 16.12.06 - 01.01.08 Post-MELD [N=2174]
- Pts on the waiting list 15.12.06 [N=2145]

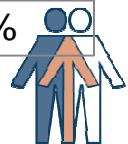


# Organ donation in the ET countries

Number of donors, at least one organ transplanted  
Eurotransplant Jan-Sept 2007 vs. 2008



%-Differenz



# Quality of life after transplantation

