



International Examples of Organ Procurement Allocation & Distribution

Lessons from Eurotransplant

The National Academies of Science · Engineering · Medicine

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Koordinierungsstelle Organspende



I have nothing to disclose



Eurotransplant International Foundation



- Oldest international organ exchange organization
- Founded by Prof. Dr. J.J. van Rood in 1967
- Eight member countries
 - Austria
 - Belgium
 - Croatia
 - Germany
 - Hungary
 - Luxembourg
 - Slovenia
 - The Netherlands

European diversity – Organ Exchange Organizations



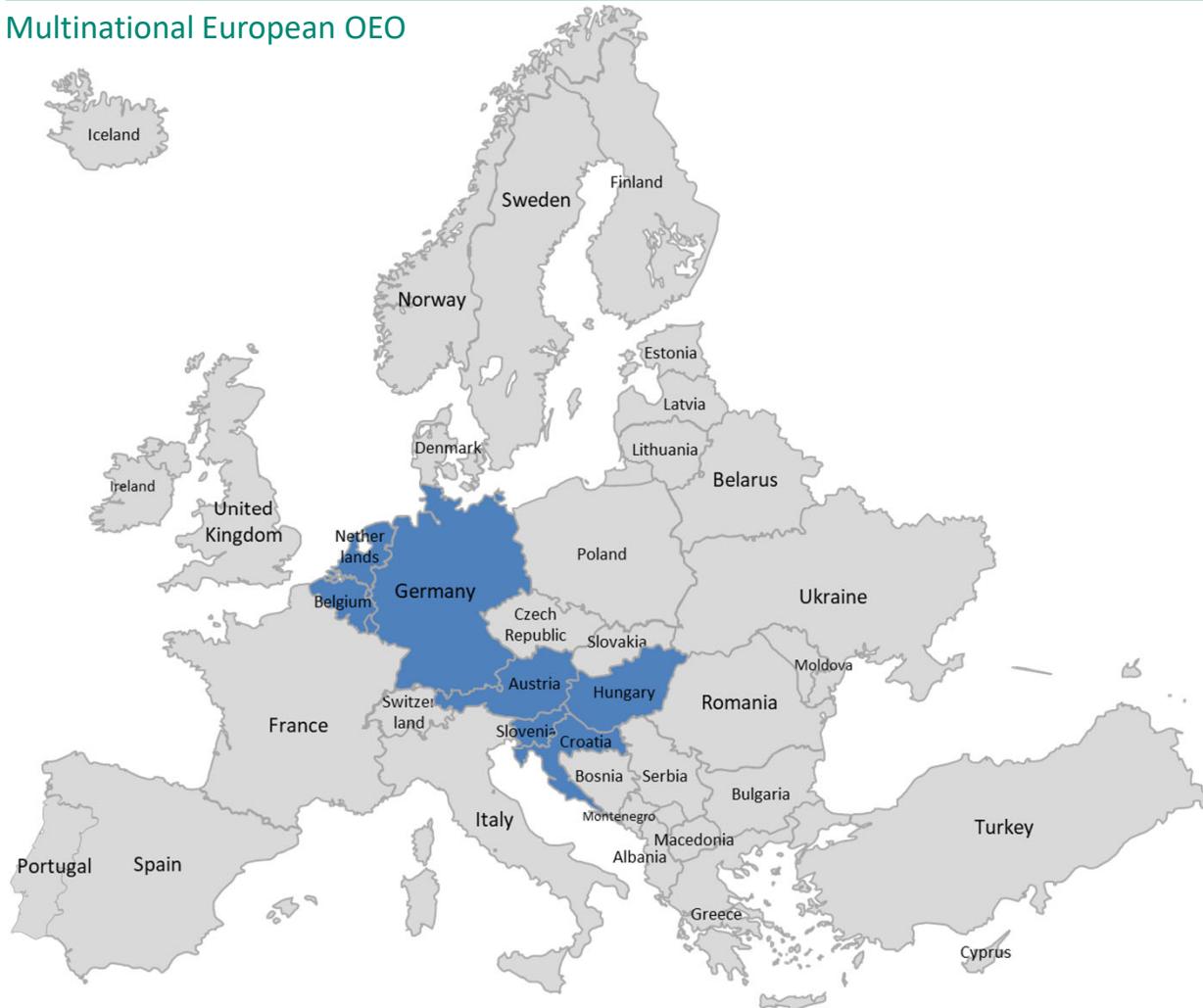
Multinational European OEO



European diversity – Organ Exchange Organizations

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Multinational European OEO

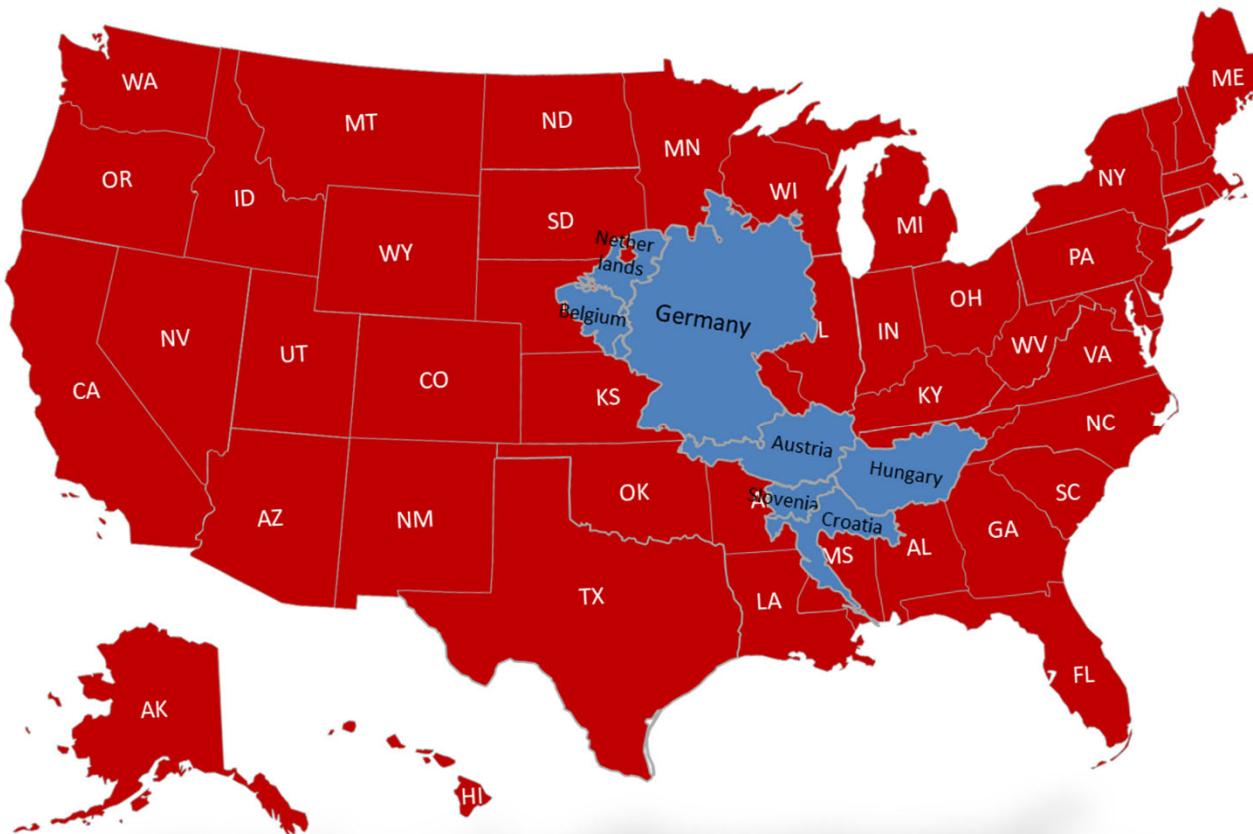


Eurotransplant

Eurotransplant vs. US

Transport - logistical challenges

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Aims of international cooperation in organ allocation

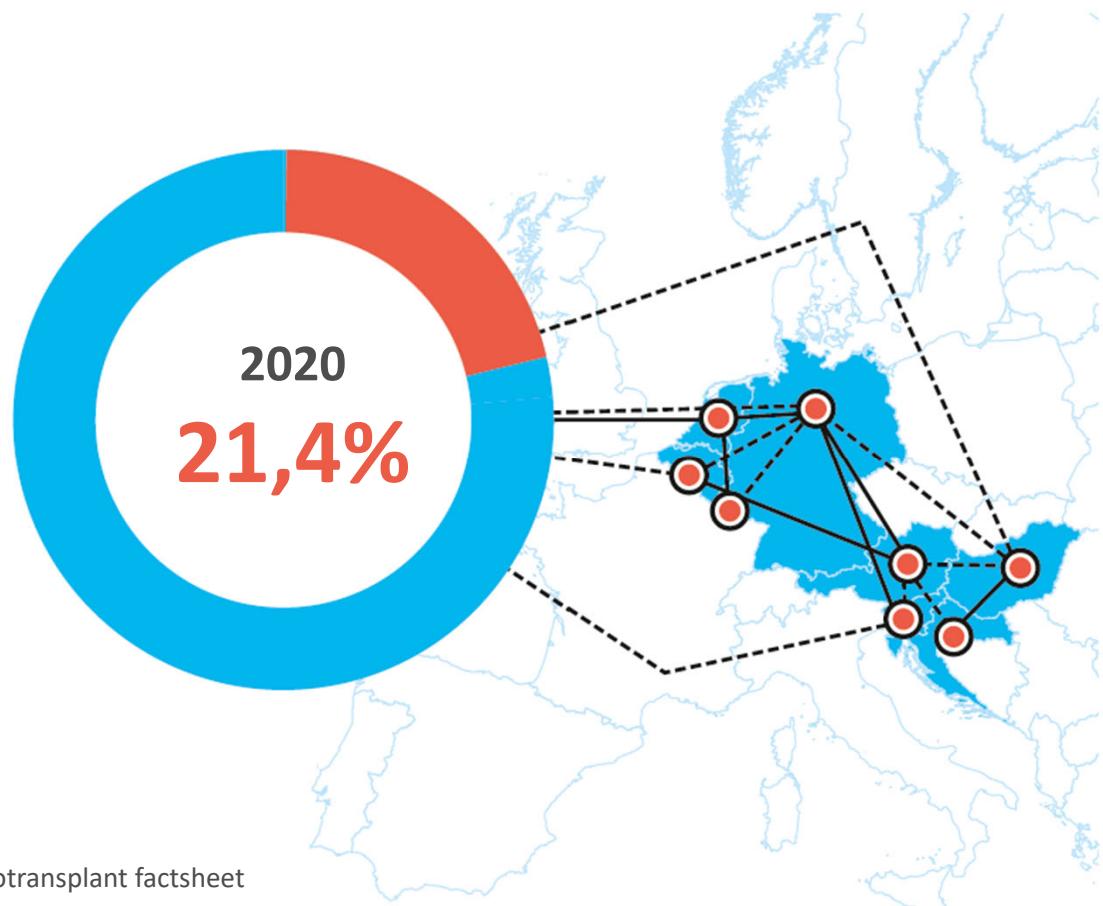


- Finding a suitable donor organ for all patients on the waiting list (including special patient groups) in time
- Optimizing the match between donor and recipient to improve long term outcome of transplantation
- Preventing organ loss

Eurotransplant – cross-border organ exchange

Percentage of organs exchanged cross-border - 2020

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Eurotransplant factsheet
NASEM Webinar - April 16, 2021

NUMBER OF DECEASED DONOR ORGANS TRANSPLANTED IN 2020



Kidney
2,851



Liver
1,470



Heart
587



Lung
1,279



Pancreas
169

6,356 organs donated
≈ 1400 exchanged cross-border

 **Eurotransplant**

Policy making – Organ allocation

Development of allocation rules – General aspects



Stepwise approach

- Agreement on allocation principles
 - Examples:
 - Urgency, outcome ...
- Definition of surrogate parameters for the allocation principles
 - Examples:
 - Urgency:
 - Mortality on the waiting list, deterioration of function of other organs...
 - Outcome:
 - Patient survival after transplantation (1, 3 and/or 5 year survival), graft survival, quality of life...
- Models to (adequately) predict the surrogate parameters
 - Examples:
 - Scores like MELD or LAS...

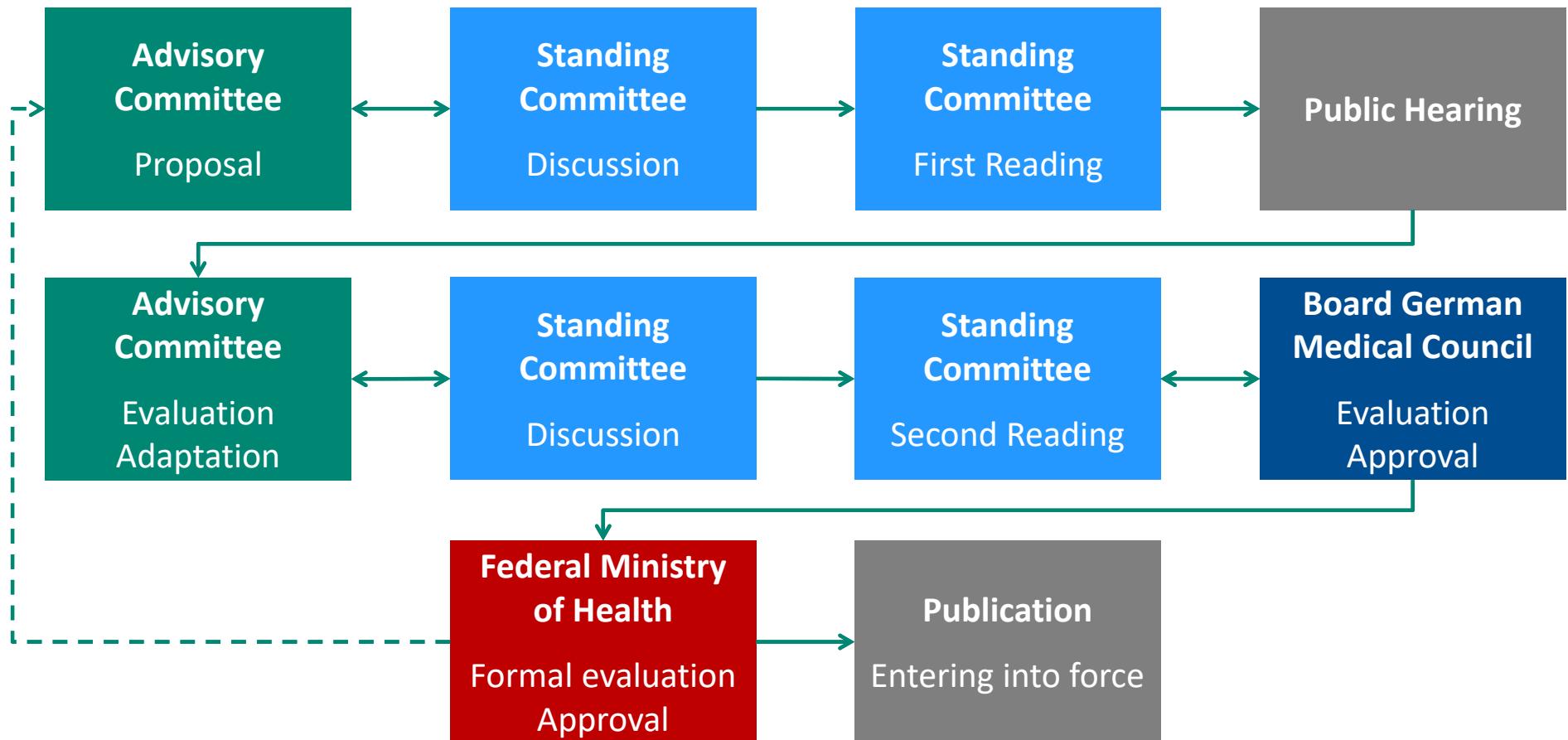
Broad discussion/
„Society“

Respective
expert groups

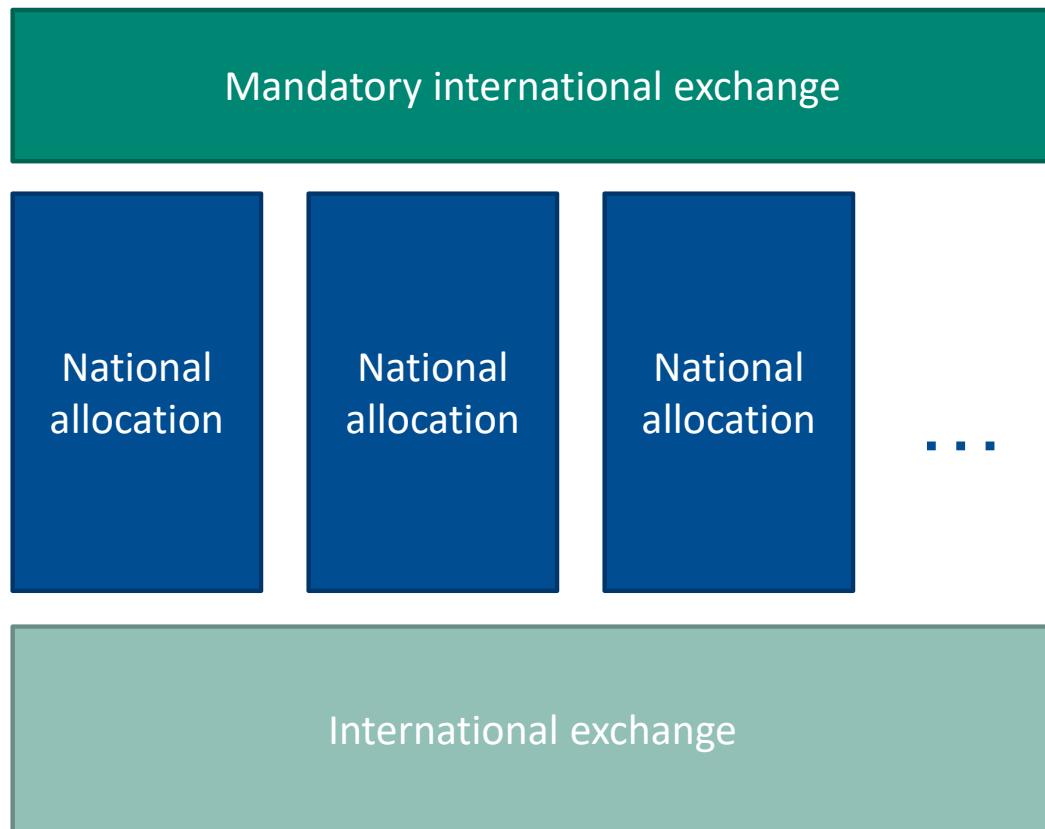
Registries
(Bio-)Statisticians

- Allocation rules vary from country to country
- German Transplant Law
 - Allocation rules have to correspond to the **current state of the art in medical science**
 - Allocation rules shall especially take into consideration **urgency and outcome** of transplantation
 - Waiting lists of all transplant centers have to be treated as a **unified waiting list**
- Development of the allocation rules by the German Medical Council
 - “Standing Committee on Organ Transplantation” with several Organ Advisory Committees
 - Members of the Standing Committee are representatives of:
 - German Transplant Society, Intensive Care Society, Ministries of Health, German Medical Council, German Hospital Federation, National Association of Statutory Health Insurance Funds, ethicists, legal experts, patient representatives, donor family representatives

Development of new allocation rules – Example Germany



Allocation sequence



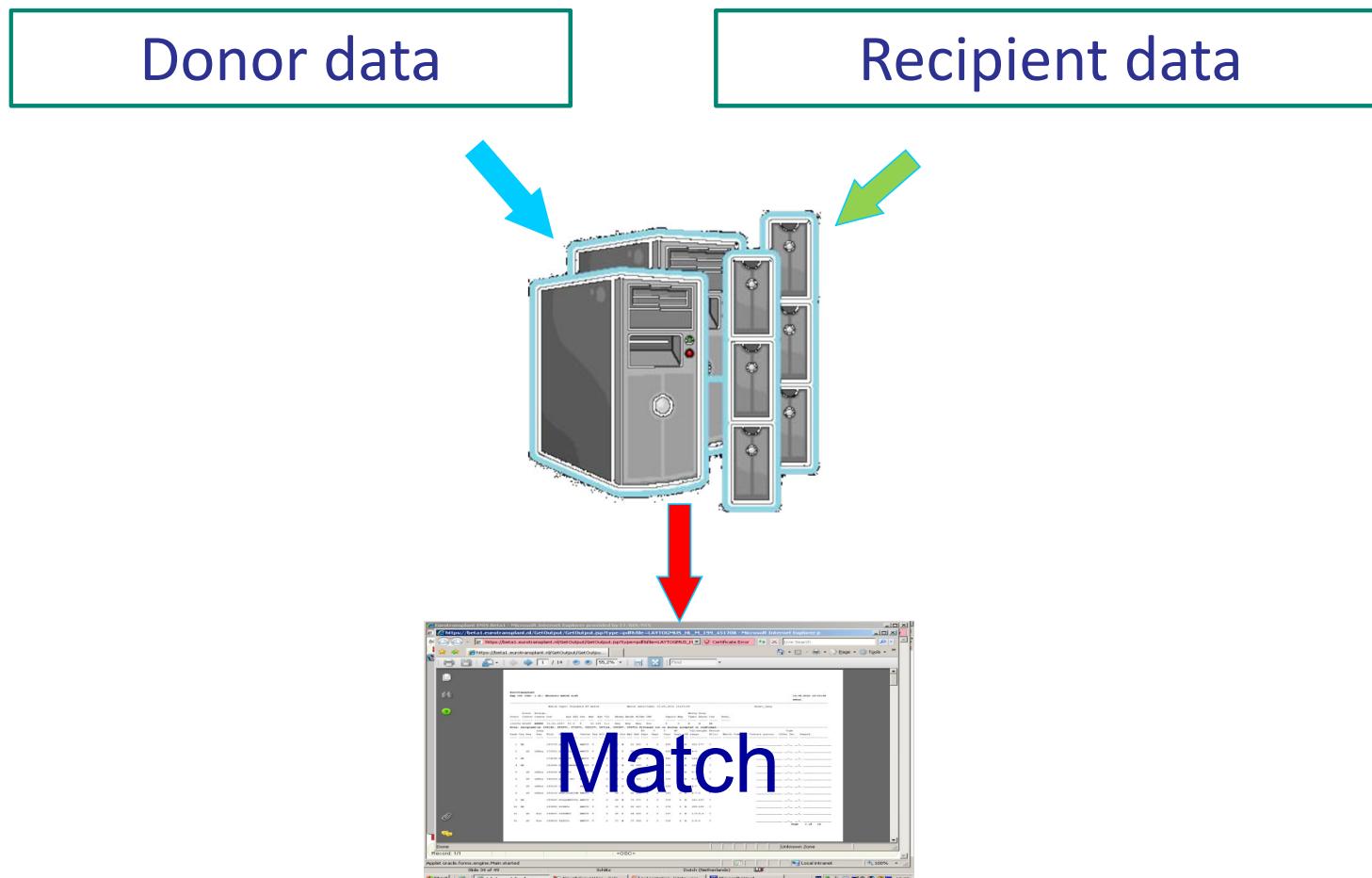
High urgency- / Highly immunized- /
Multi-organ-transplant- recipients
Kidney: zero-mismatch transplantation
International balancing

Addressing specific national
needs/preferences

Preventing organ loss

Standard allocation

Matching process – Standard allocation



Matchlist → Allocation

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120087 V G ULJUOW G IEFUNNUR BETA1				B Pos		NLBTP 29.05.1966					
Save		Modify List		Jump/Add		Reports		Close		Sort by	
RECIPIENT				COMPLETE LIVER LIST						<input checked="" type="radio"/> Rank <input type="radio"/> Decision	
Rank	Crit.	ETnr	Name	Cent.		Req.	Decn.	Org.	Decn.-date	Comment	
1	NAT	246891	TEURUJOWM	NRDTP	LIV	OF					
2	NAT	267734	SOILSAOH	NGRTP	LIV	OF					
3	NAT	257630	OLEPOTLENE	NRDTP	LIV						
4	LOC	249293	FOIM	NLBTP	LIV						
5	NAT	268078	KAOKK	NRDTP	LIV						
6	NAT	256336	EHNIMO	NRDTP	LIV						
7	NAT	246558	FOWRHNI	NGRTP	LIV						
8	LOC	258017	HIUH	NLBTP	LIV						
9	NAT	158145	WAMV	NGRTP	LIV						
10	NAT	268816	MANUAL	NGRTP	LIV						
11	INT	268652	XOUHRIADOEKLEJDO	GESTP	LIV						
12	INT	260344	NILESM	GJETP	LIV						
13	INT	268468	IOPRUOKMUL	AWGTP	LIV						
14	INT	199824	SEUVUR	GLPTP	LIV						
15	INT	221566	FAPUHSUON	GMZTP	LIV						

Modified allocation

Modified allocation

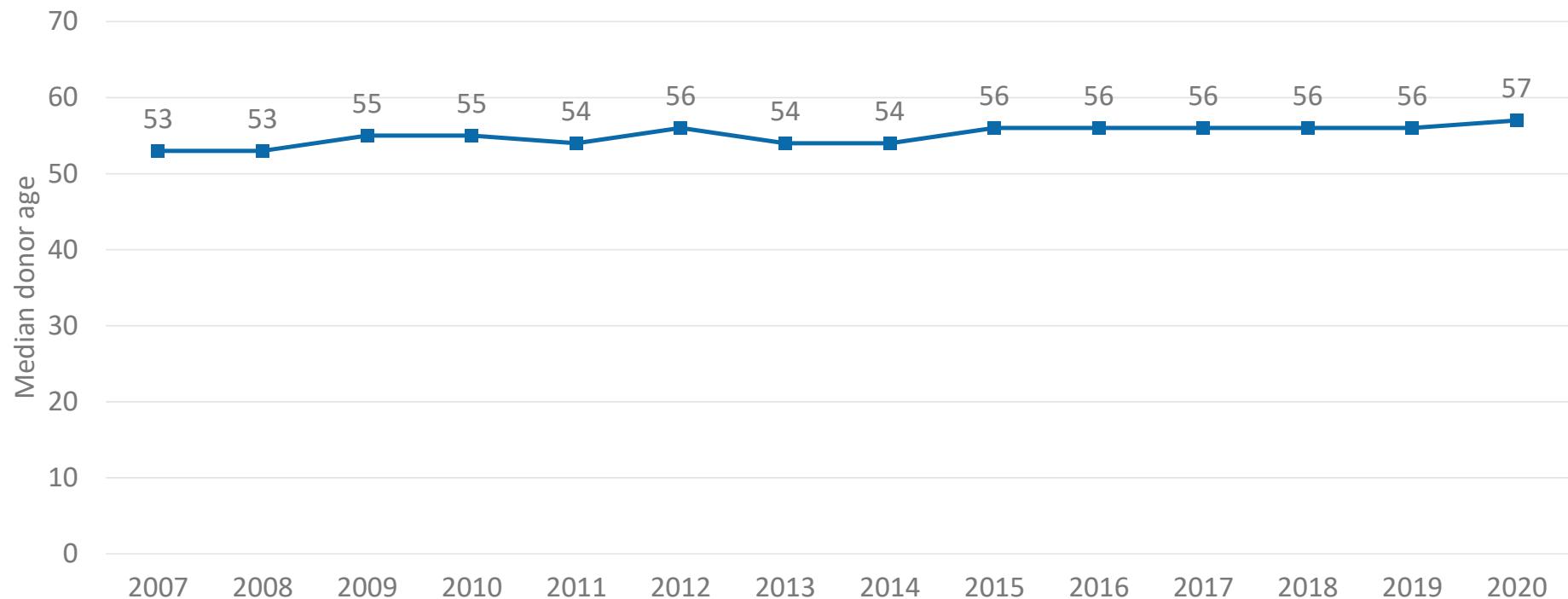
Eurotransplant Senior Program – Kidney allocation

„Old-for-old“-program

Median donor age

Germany, 2007-2020

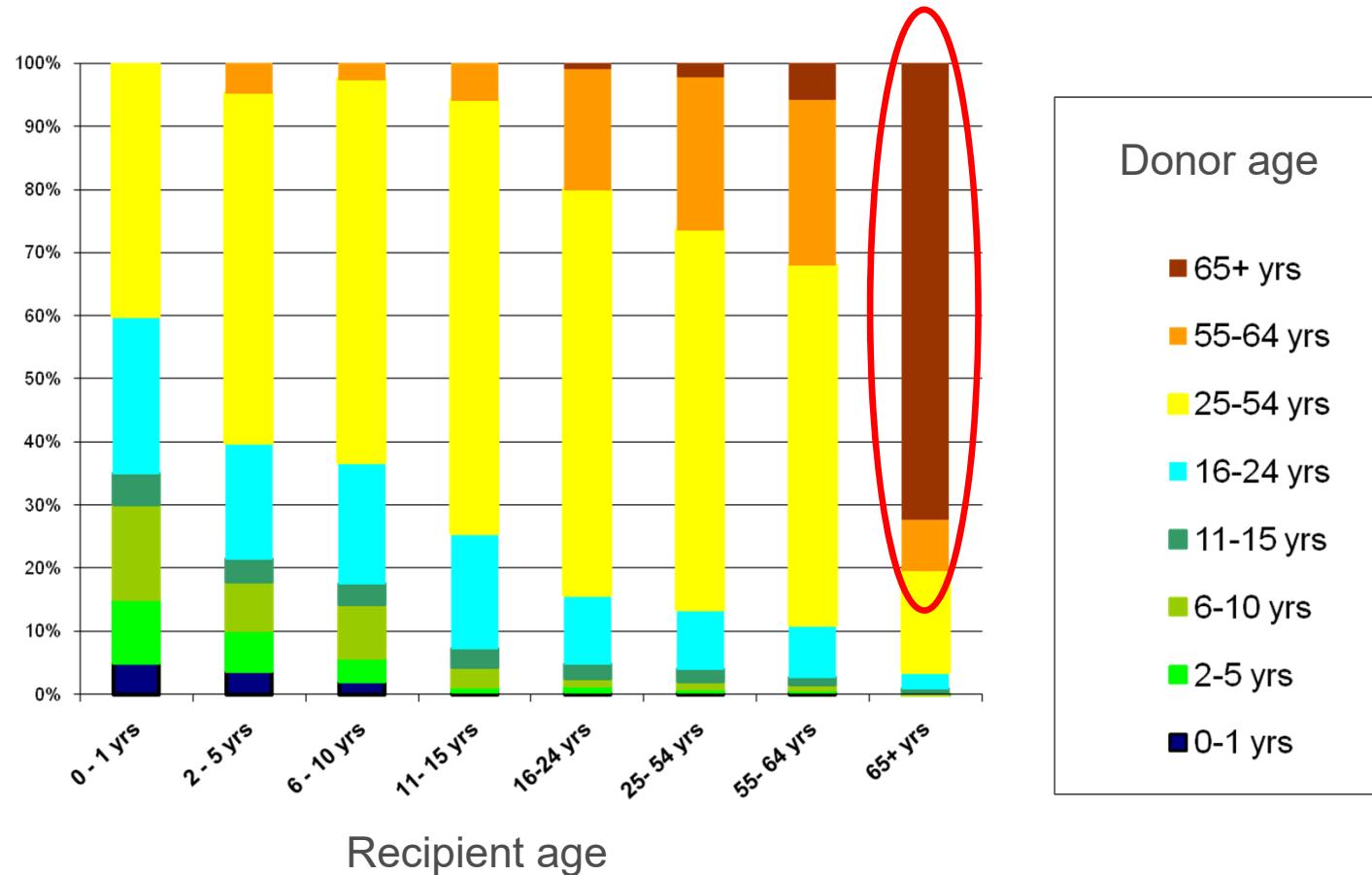
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Eurotransplant Senior Program (ESP) – „Old for old“-program

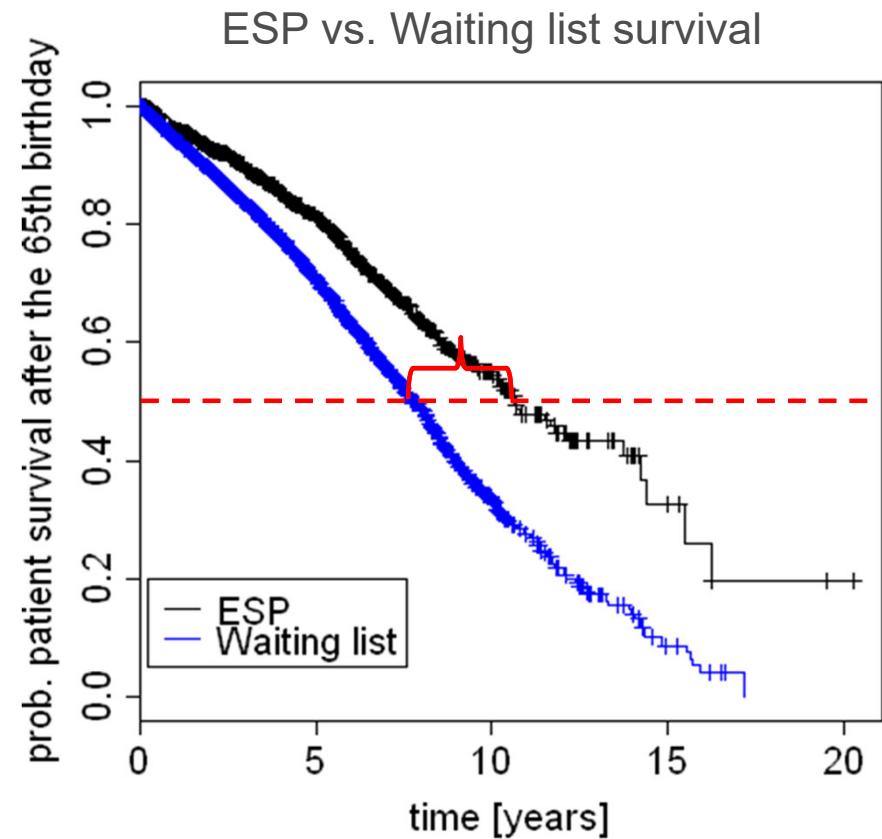
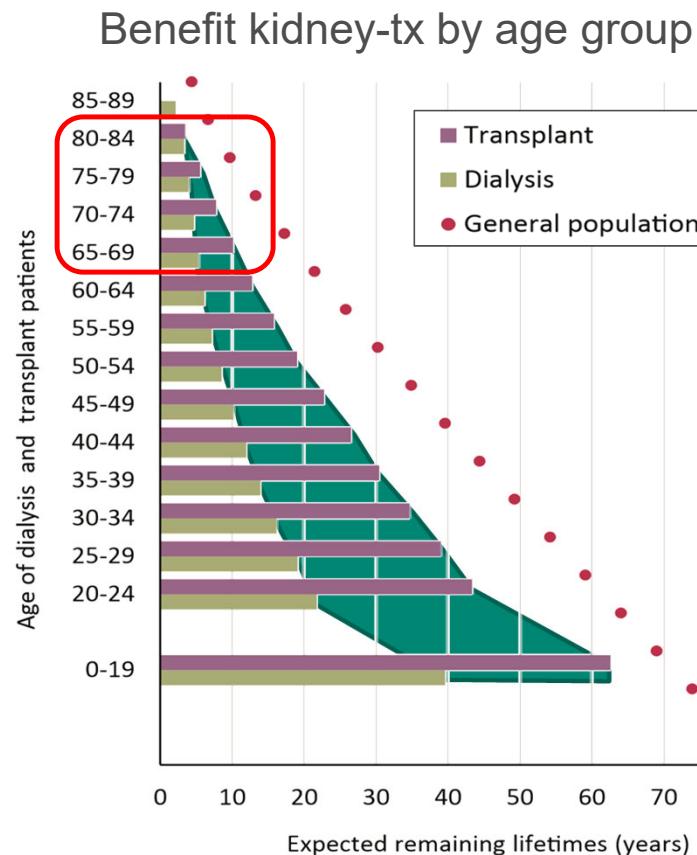
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Deceased donor kidney transplants - donor vs. recipient age



Kidney allocation – Eurotransplant Senior Program (ESP) – Outcome

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Frei et al., AJT 2007

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Modified allocation

Expedited allocation - “Rescue” allocation

Shift from „standard“ to „expedited“ allocation takes place; when

- No suitable recipient can be found using standard allocation prior to the start of explantation (for thoracic organs: plus travel time for the thoracic explant team)
- (Abdominal) organ has been explanted and shipped but is turned down for the selected recipient and ischemic time does not allow restart of standard allocation
- -> Often extended criteria donors (ECD)

Goal

- Preventing organ loss („rescue“ of a precious organ)

Recipient-Oriented Expedited Allocation (REAL)



- All transplant centers that can be reached with the donor organ in time (taking acceptable ischemic time into account) are contacted
- Each center can identify up to two patients from its waiting list that could be transplanted with this donor organ
 - Taking donor and recipient characteristics and consent of the recipient into account
- These suitable recipients are reported back to Eurotransplant within 30 min after the offer
- Eurotransplant creates a match list of these suitable recipients based on the organ-specific allocation criteria and offers the donor organ in the sequence of this “Mini-Match”

Recipient-oriented expedited allocation (REAL)

Rank	ET-number	Name
1	911866 XXXXX XXXXXXXX	
2	481844 XXXXX XXXXXXXX	
3	95383 XXXXX XXXXXXXX	
4	713120 XXXXX XXXXXXXX	
5	315402 XXXXX XXXXXXXX	
6	365392 XXXXX XXXXXXXX	
7	154275 XXXXX XXXXXXXX	
8	211370 XXXXX XXXXXXXX	
9	224889 XXXXX XXXXXXXX	
10	944251 XXXXX XXXXXXXX	
11	236459 XXXXX XXXXXXXX	
12	734391 XXXXX XXXXXXXX	
13	741706 XXXXX XXXXXXXX	
14	17870 XXXXX XXXXXXXX	
15	948339 XXXXX XXXXXXXX	
16	63200 XXXXX XXXXXXXX	
17	565684 XXXXX XXXXXXXX	
18	805966 XXXXX XXXXXXXX	
19	459106 XXXXX XXXXXXXX	
20	422810 XXXXX XXXXXXXX	
21	2726 XXXXX XXXXXXXX	
22	816131 XXXXX XXXXXXXX	
23	984541 XXXXX XXXXXXXX	
24	957569 XXXXX XXXXXXXX	
25	658807 XXXXX XXXXXXXX	
26	899606 XXXXX XXXXXXXX	
27	959612 XXXXX XXXXXXXX	
28	721421 XXXXX XXXXXXXX	
29	591297 XXXXX XXXXXXXX	
30	431398 XXXXX XXXXXXXX	
31	388916 XXXXX XXXXXXXX	
32	448791 XXXXX XXXXXXXX	
33	374639 XXXXX XXXXXXXX	
34	811682 XXXXX XXXXXXXX	
35	275724 XXXXX XXXXXXXX	
36	537873 XXXXX XXXXXXXX	
37	42698 XXXXX XXXXXXXX	
38	937302 XXXXX XXXXXXXX	
39	865791 XXXXX XXXXXXXX	
40	665731 XXXXX XXXXXXXX	
41	633264 XXXXX XXXXXXXX	
42	409280 XXXXX XXXXXXXX	
43	680280 XXXXX XXXXXXXX	
44	291446 XXXXX XXXXXXXX	
45	717307 XXXXX XXXXXXXX	
46	147734 XXXXX XXXXXXXX	
47	572102 XXXXX XXXXXXXX	
48	619994 XXXXX XXXXXXXX	
49	163741 XXXXX XXXXXXXX	
50	336247 XXXXX XXXXXXXX	
...		

Center response:

Center A:

ET-number: 224889 – rank 9
ET-number: 721421 – rank 28

Center B:

ET-number: 154275 – rank 7
ET-number: 336247 – rank 50

Center C:

ET-number: 734391 – rank 12
ET-number: 948339 – rank 15

Mini-Match:

1. ET-number: 154275 – rank 7

2. ET-number: 224889 – rank 9

3. ET-number: 734391 – rank 12

4. ET-number: 948339 – rank 15

5. ET-number: 721421 – rank 28

6. ET-number: 336247 – rank 50

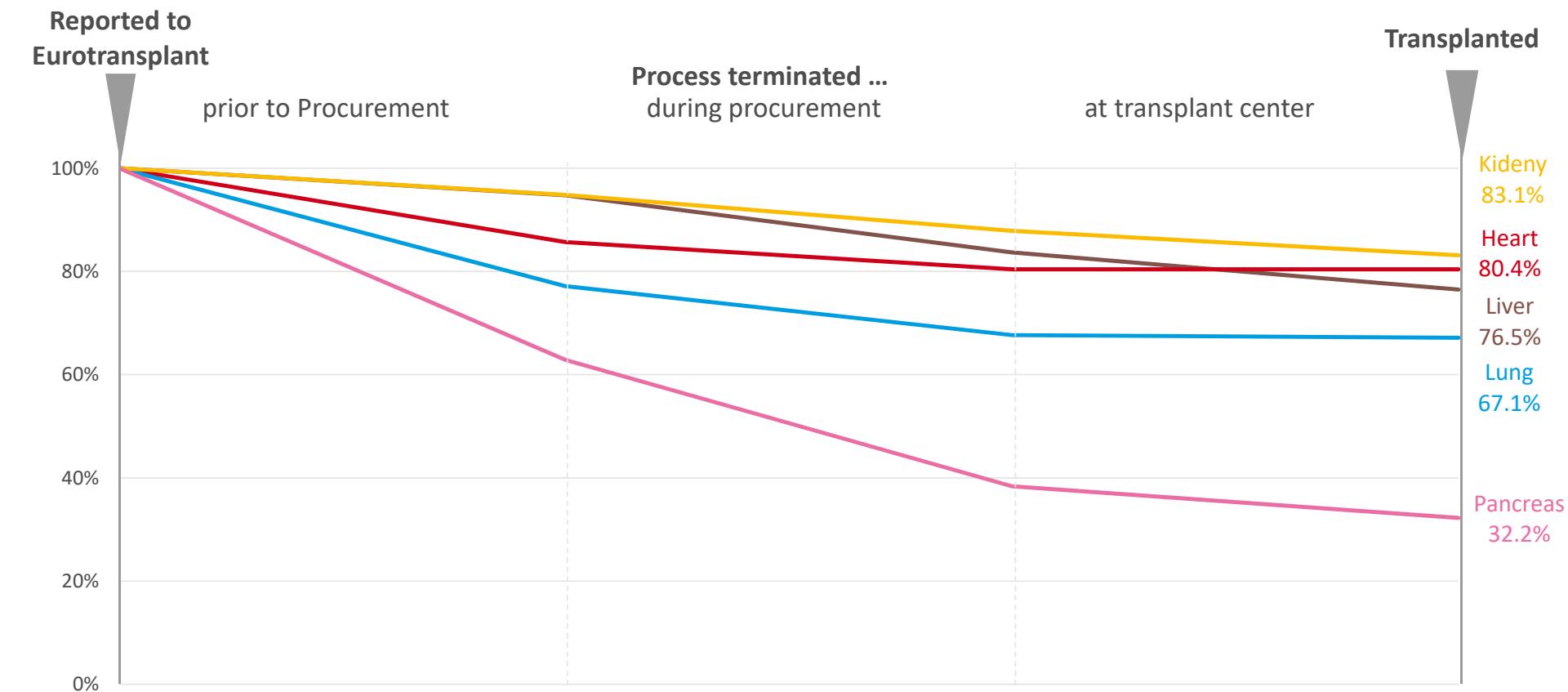
International cooperation and modified allocation Benefits and challenges

Utilization

Organ utilization – from organ reporting to transplantation

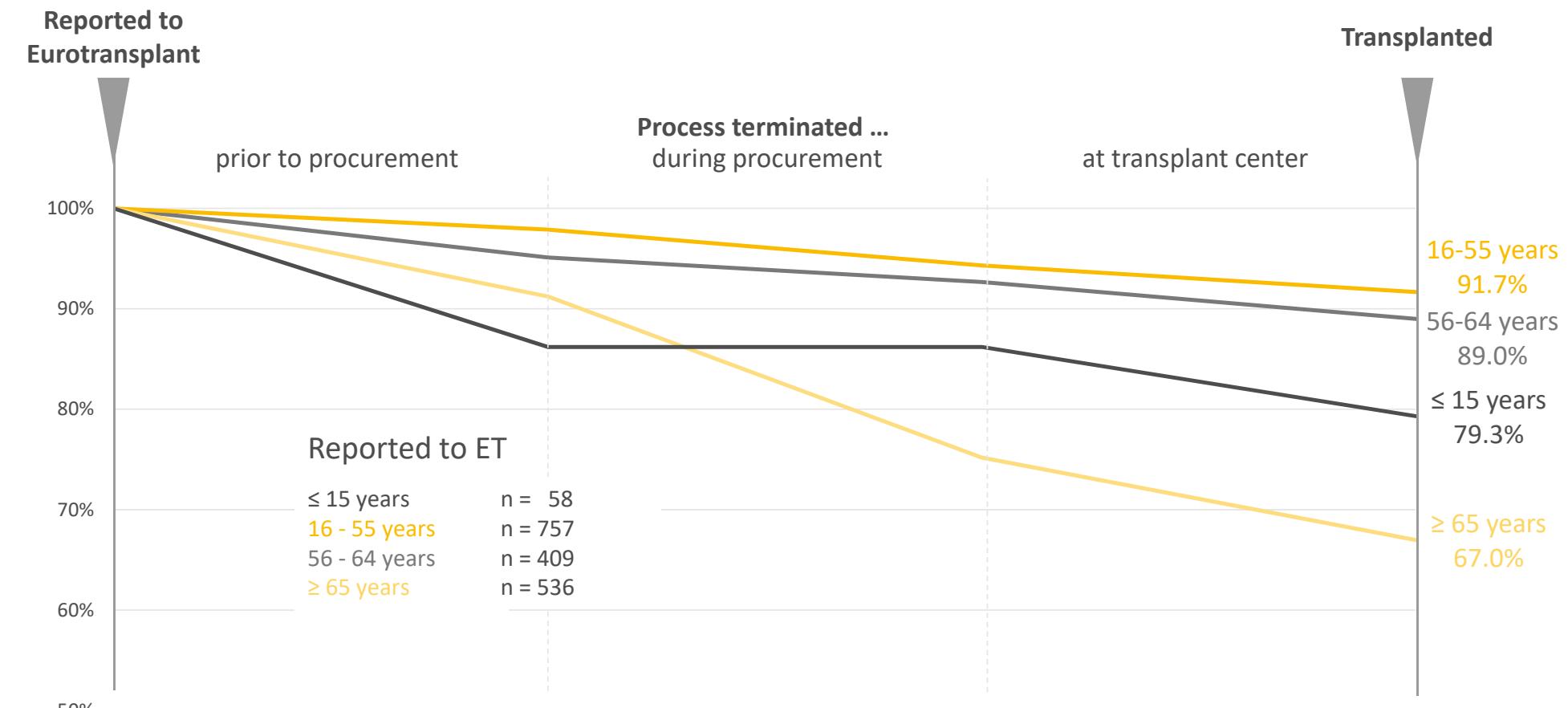
Germany 2020

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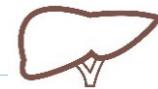
Kidney utilization – from organ reporting to transplantation

By donor age – Germany 2020

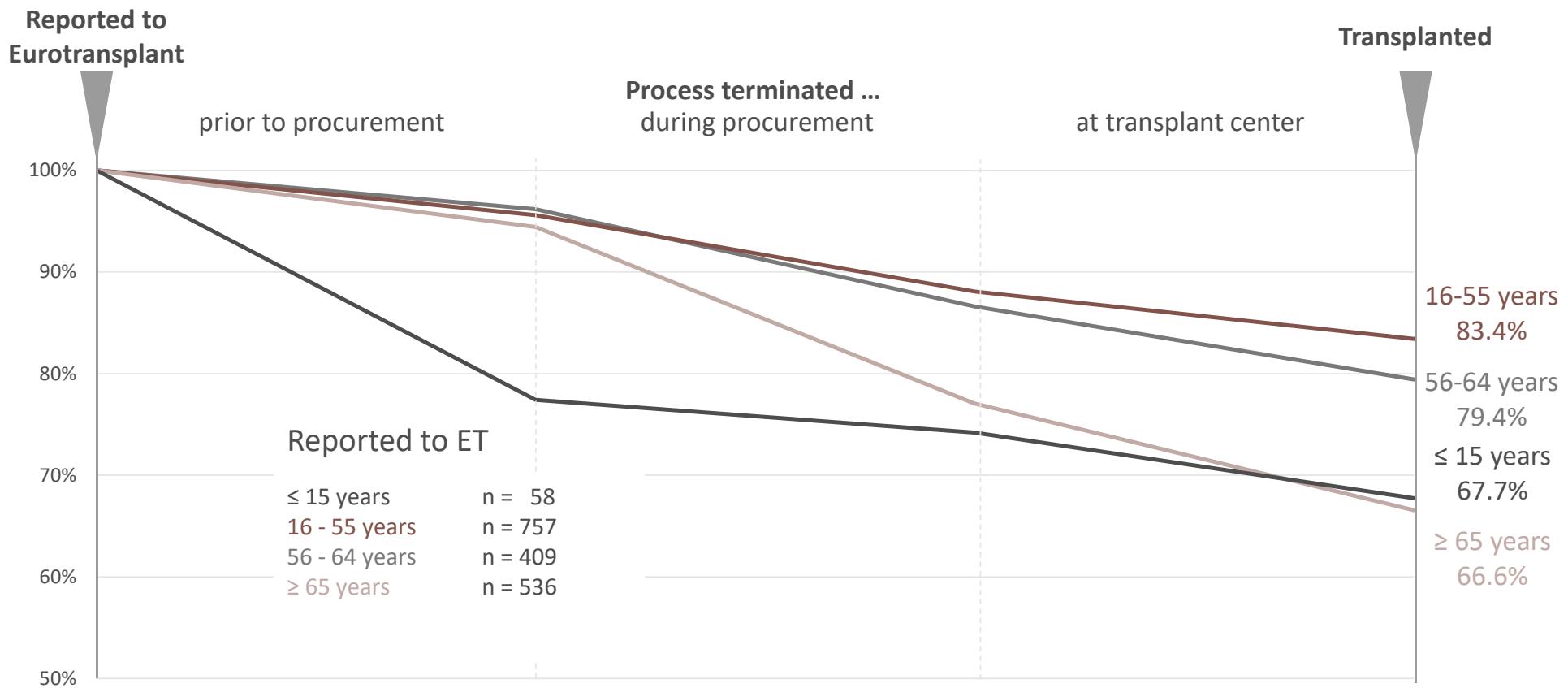


Liver utilization – from organ reporting to transplantation

By donor age – Germany 2020



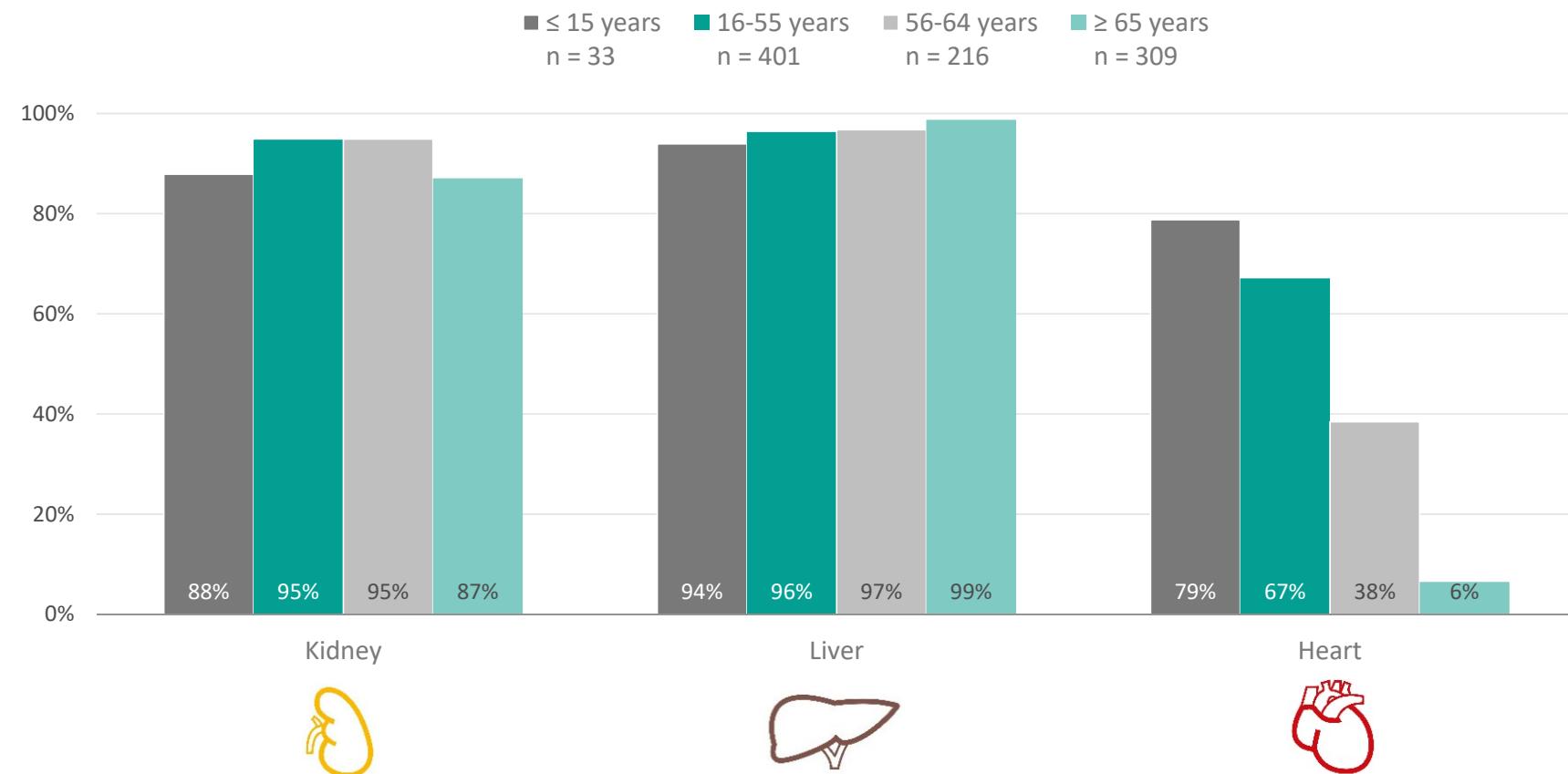
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Organs offered per age group (of all donors reported to Eurotransplant)

Germany 2020

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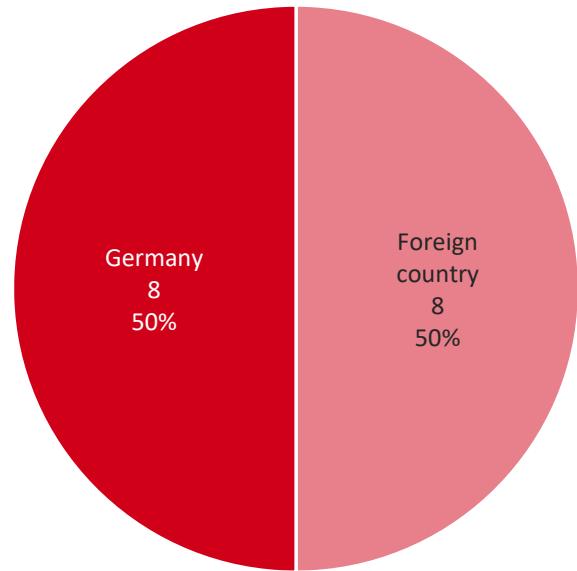
Recipient benefits

Origin of donor organs | Pediatric heart-transplants

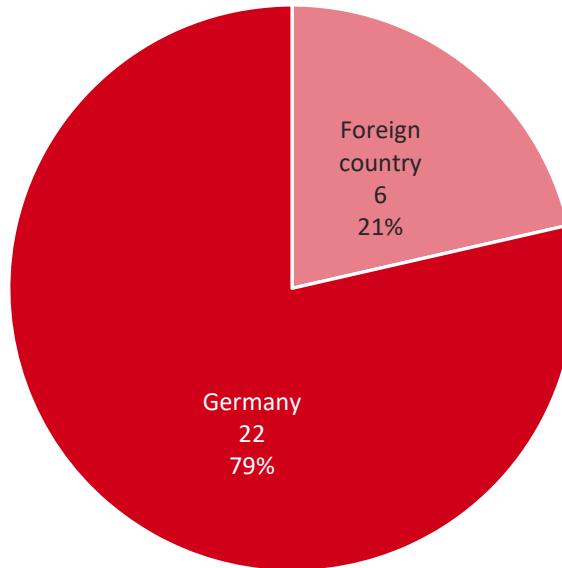
By recipient age | Germany 2019

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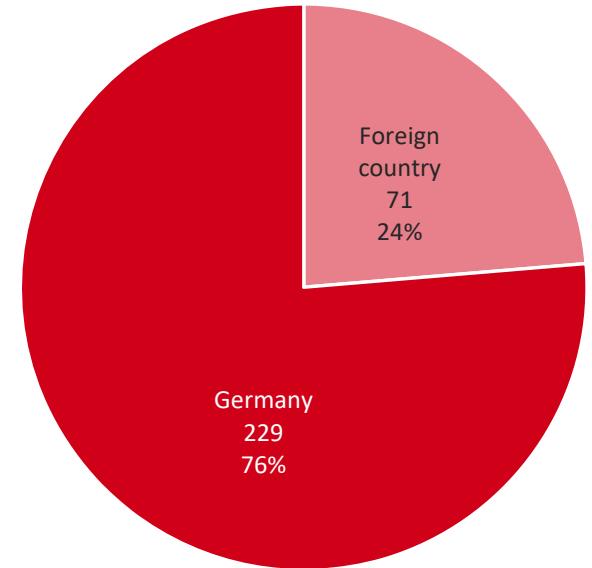
0 - 3 years



4 - 15 years



≥ 16 Jahre

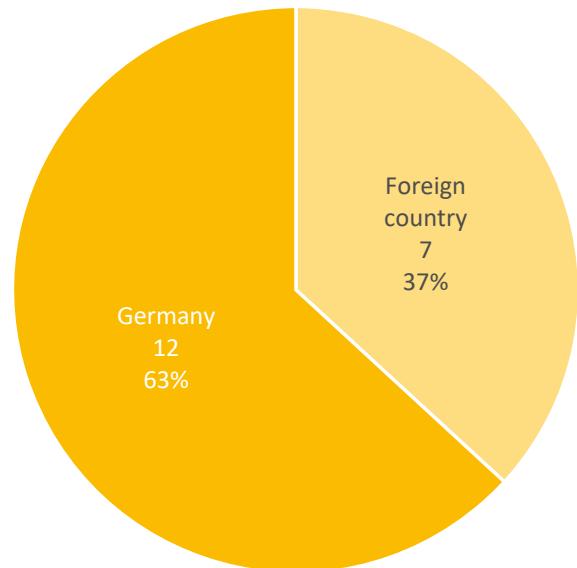


Origin of donor organs | Pediatric kidney-transplants

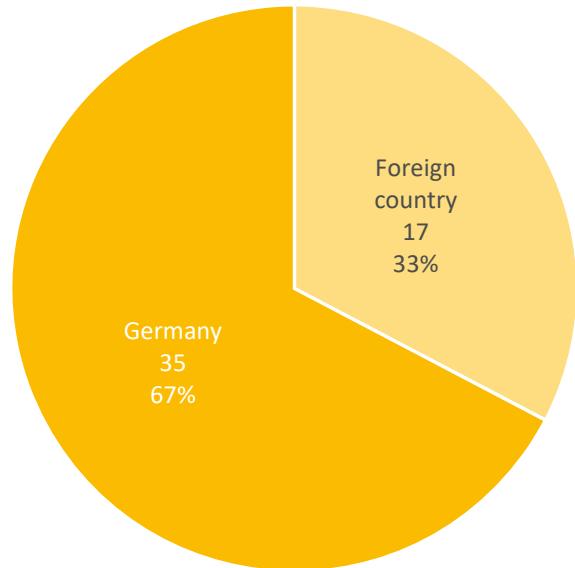
By recipient age | Germany 2019

DSQ.

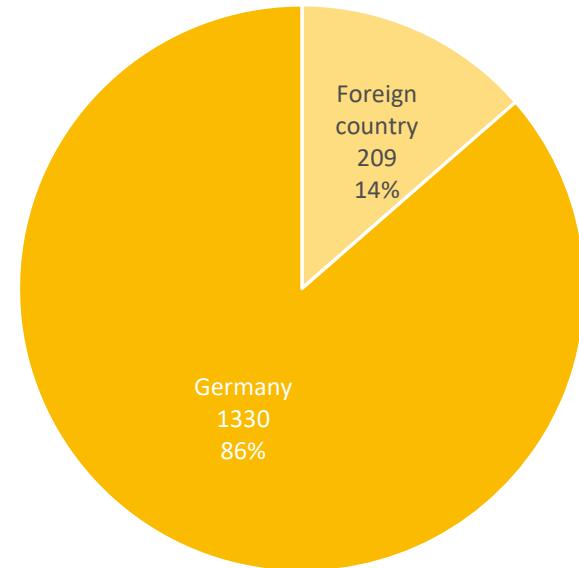
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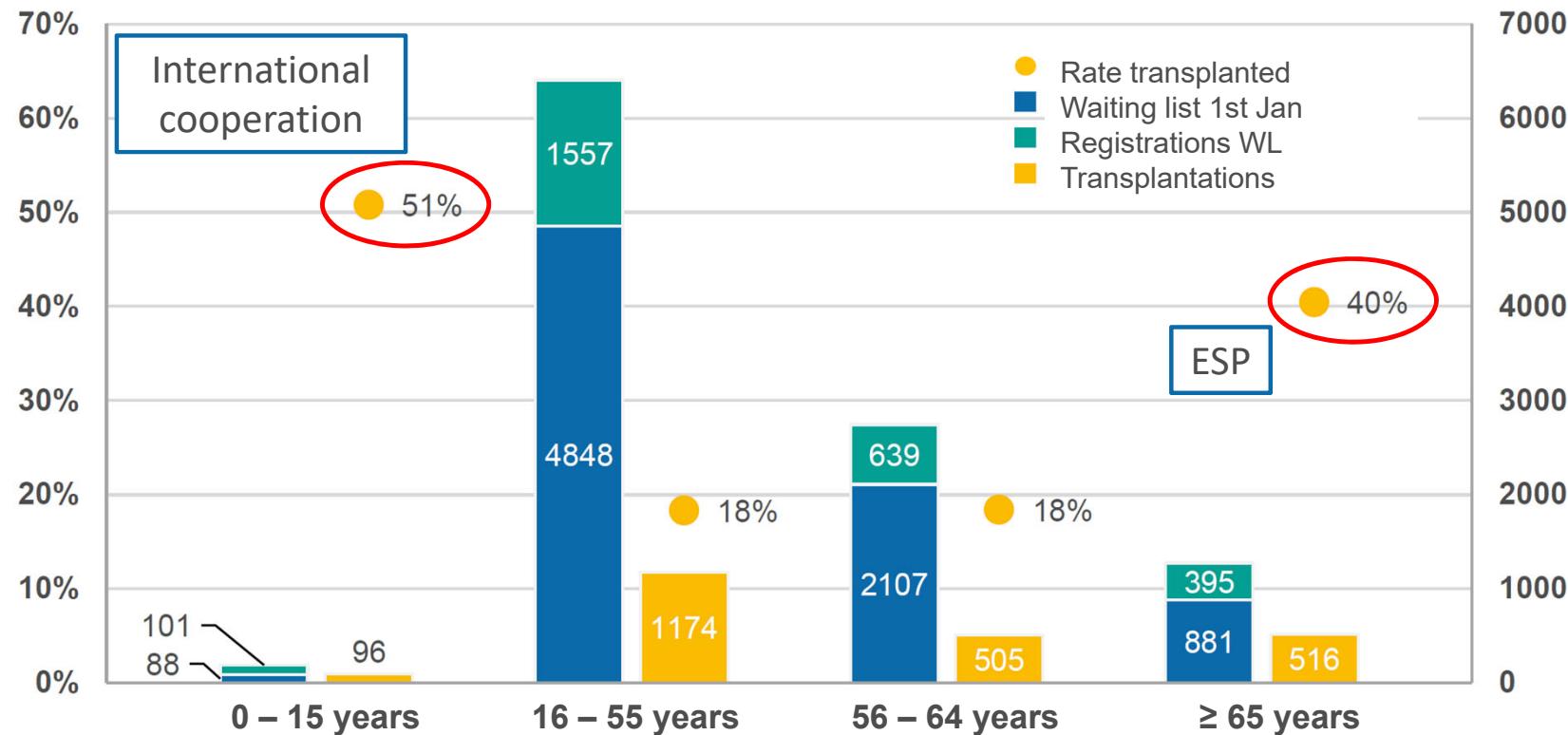
≥ 16 years



Waiting list (WL) + WL registrations, transplants and WL dynamics

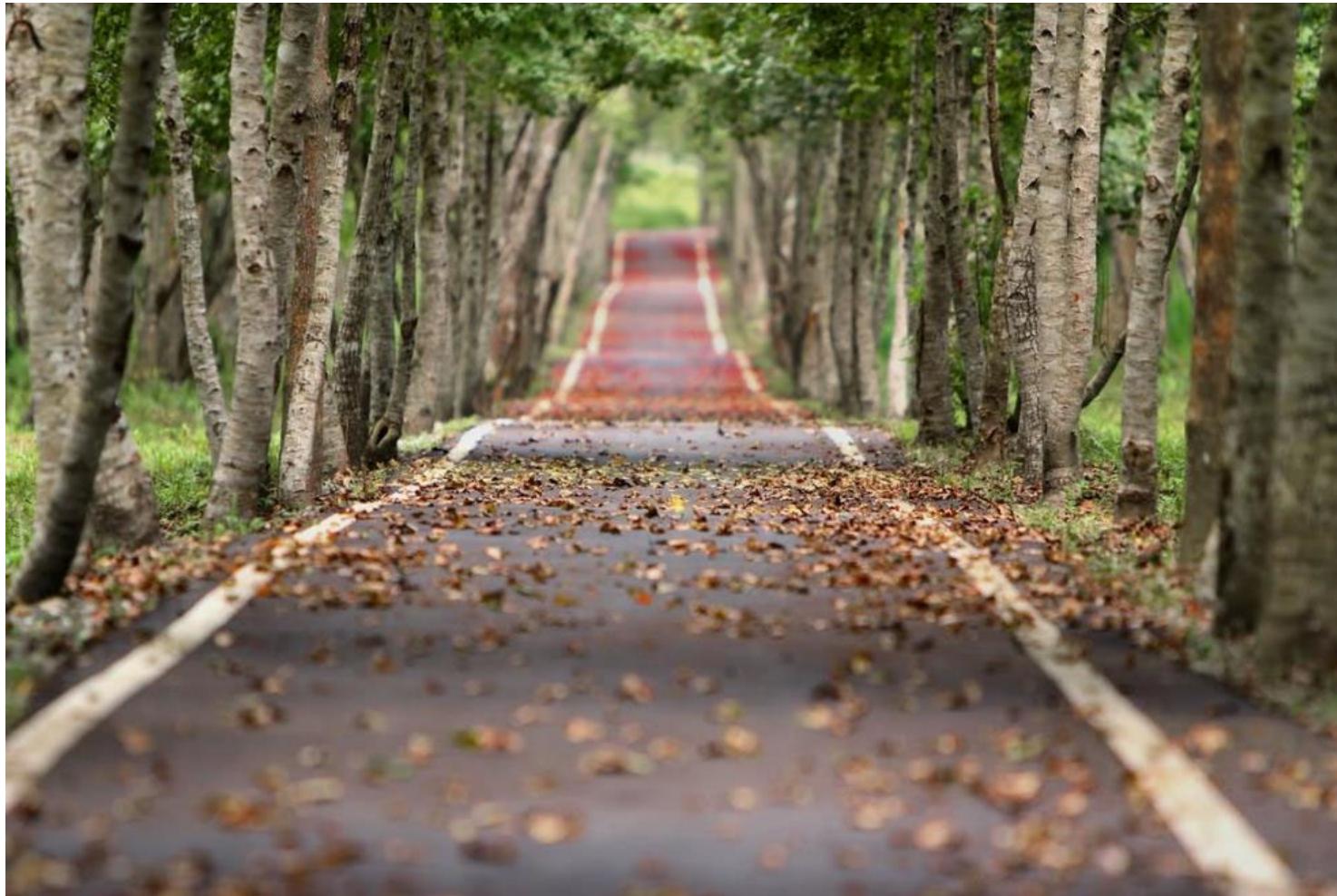
Germany 2018

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- Development of allocation rules has to follow a transparent, stepwise approach
 - Clear definition / prioritization of goals / allocation principles well knowing that they are not always corresponding / can be contradicting
 - External monitoring / evaluation / formal approval of new allocation rules can help structuring the process of developing new allocation rules
- All suitable donors organs should be used to increase the benefit for the transplant population and to respect the precious gift of the donor
 - Allocation rules should take this into account
- Broad organ sharing has substantial benefits, in particular for special patient groups and helps to prevent organ loss

Development of a roadmap needed



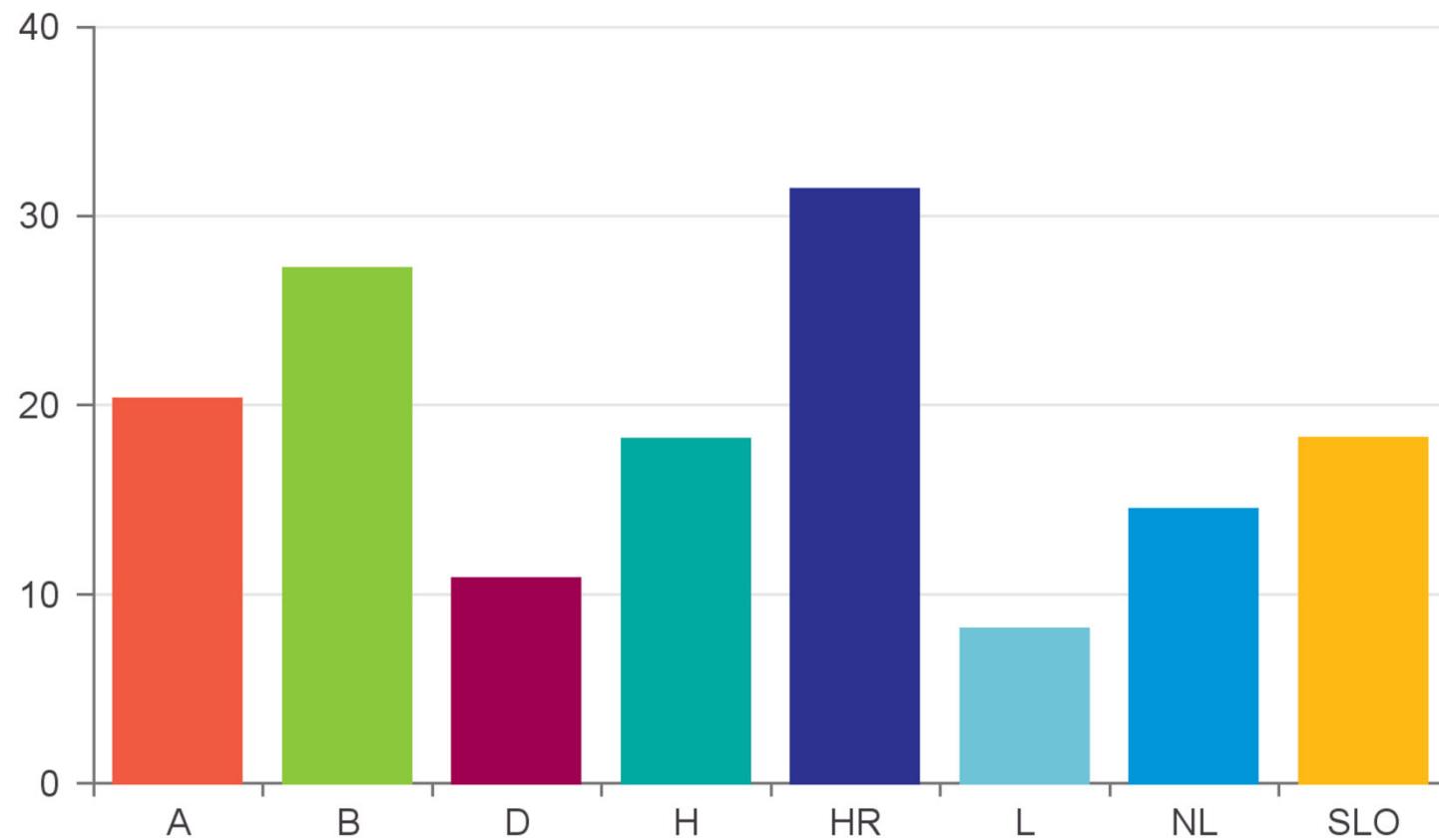


Reserve

Deceased donors – Eurotransplant countries

Per million population – Eurotransplant 2019

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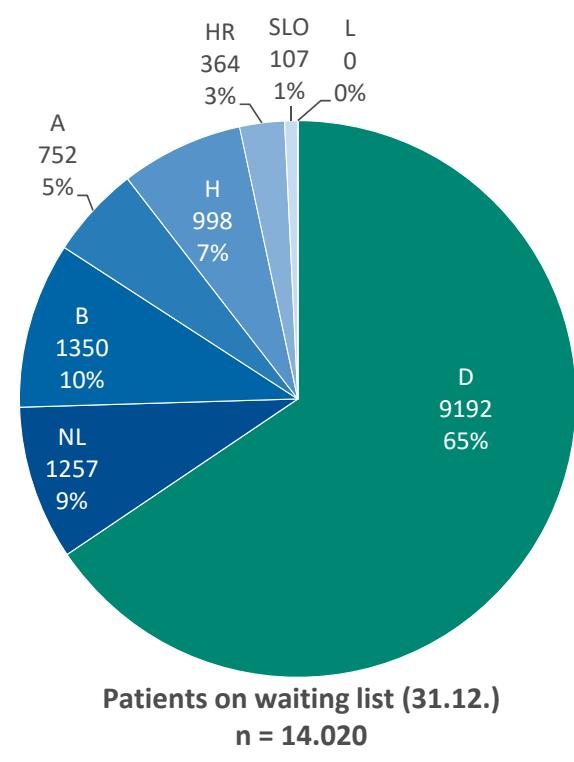
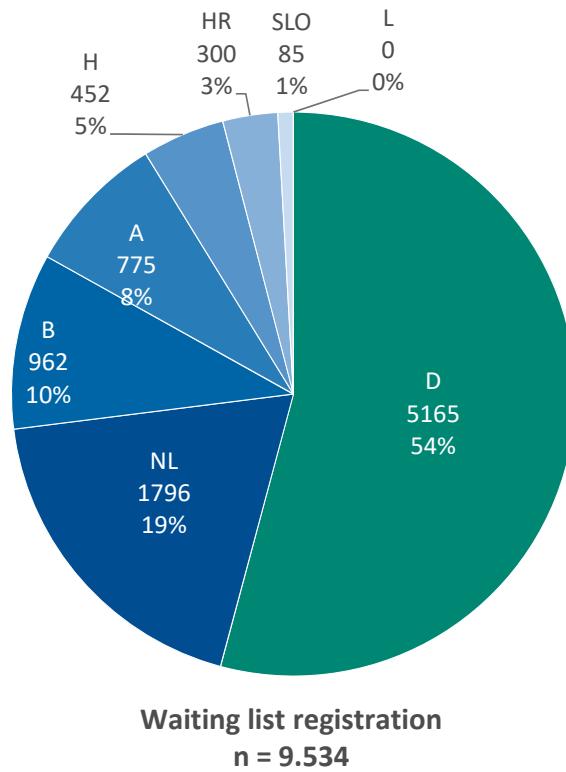
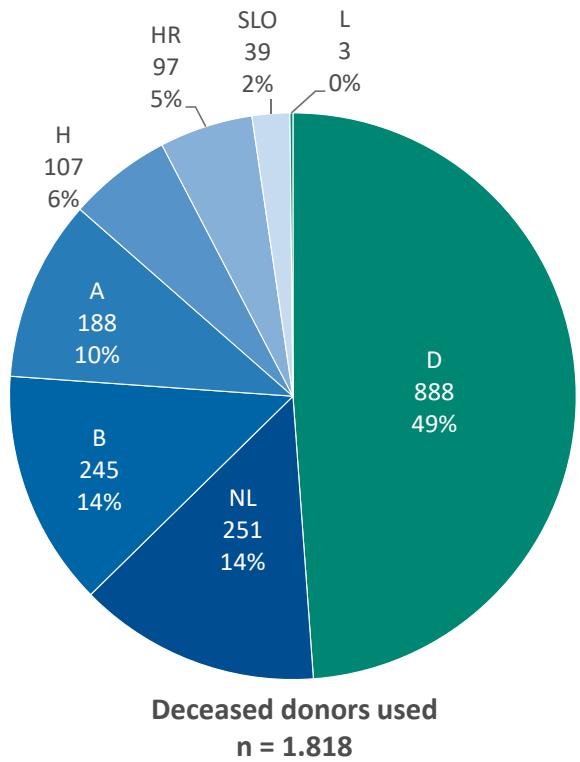
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Comparison Eurotransplant-countries 2020

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Deceased donor used | Waiting list registration | Waiting list by year end



Organ exchange via Eurotransplant – Allocation categories

Import/Export German perspective 2020

