Final Report

OPTN Data Advisory Committee

Descriptive Data Request

Update to Refusal Codes
Twelve-Month Post-Implementation Monitoring Report

DHHS Contract No. 250-2019-00001C
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Data Advisory Committee
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By:
Anne M. Zehner, MPH
Rae Shean, MS
UNOS Research Department

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ORGAN PROCUREMENT AND
TRANSPLANTATION NETWORK

Background/Purpose

In response to feedback received from the transplant community and at the recommendation of the OPTN Ad Hoc Systems Performance Committee, the OPTN Data Advisory Committee updated the list of options under the primary refusal and secondary refusal reason code drop downs in the offer details form section of DonorNet. Last revised in 2004, the new proposed list of refusal codes has incorporated multiple rounds of feedback received from various stakeholder groups, OPTN committees, and the larger transplant community between 2019-2021. The updated list intends to further the strategic priority of increasing donor and recipient matching by improving the refusal reason data used for quality improvement, retrospective reviews, and real-time decision making. By providing more relevant and granular options, the insights gathered will be more actionable and improve upon the current list by reducing the overutilization of the refusal code "donor age or quality" which accounted for 66% of the primary refusal reasons entered between July 2019 and June 2020. These revisions did not change or add data collection, but provide a revised list of options that are more relevant, discrete, and mutually exclusive, to promote the collection of more actionable data. A crosswalk between previously used and new refusal codes is provided in Figure 1.

Strategic Plan Goal or Committee Project Addressed

Increase the number of transplants by efficient donor/recipient matching.

Committee Request

The OPTN will analyze data beginning at three months after implementation of the new refusal codes, allowing for two months of data with the first review. In order to facilitate monthly updates, the results will be provided to the committee via a standard report or dashboard for two years, with a presentation of updated results to the committee quarterly for the first year and a final report presentation at the end of year two.

The first two items below will be provided overall, by match organ type, size of program (small, medium, large) as defined by transplant volume in calendar year 2020, and relative location on match run. Stratifications of location on match run will be done by match organ type, and before or after the 90th percentile for rank of acceptances in calendar year 2020 for that organ type. The analysis will include:

- The percentage of patient-specific refusals by reason, to identify any code not being used or making up an unexpectedly high proportion of the total (suggesting that it has become a new, nonspecific catch-all code).

- Limited to range refusals (center refusing for multiple patients at same time), the percentage by reason to identify any code making up an unexpectedly high proportion of the total (suggesting that it has become a new, nonspecific catch-all code).

- A review of the cases (stratified only by match organ) where the "other/specify" text field was used, to identify any manually-entered reasons not currently in the list and making up a significant proportion of the total "others". This will identify any additional codes needing to be added to the updated list. Due to the manual effort required, this portion of the analysis will be updated quarterly during the first year, and once in year two of implementation.

Additionally, UNOS staff will provide feedback on questions received from members related to the new refusal codes.

Figure 1: Crosswalk overview of changes between previously used and new refusal codes available to transplant hospitals following December 2021 implementation

PREVIOUS REFUSAL CODE	NEW REFUSAL CODE
800 - Patient's condition improved, transplant not needed	722 - Candidate's condition improved, transplant not needed
801 - Patient ill, unavailable, refused, or temporarily unsuitable	720 - Candidate temporarily medically unsuitable 727 - Candidate unavailable 728 - Candidate refused
802 - Multiple organ transplant or different laterality is required	723 - Candidate requires different laterality 724 - Candidate requires multiple organ transplant
803 - Patient txed, tx in progress, or other offer being considered	721 - Candidate transplanted or pending transplant
810 - Positive crossmatch 813 - Unacceptable Antigens	732 - Positive physical crossmatch 733 - Positive virtual crossmatch/unacceptable antigens
811 - Number of HLA mismatches unacceptable	734 - Number of HLA mismatches unacceptable
812 - No serum for crossmatching	730 - No candidate serum for crossmatching 731 - No donor cells/specimen for crossmatching, or no time for crossmatch
814 - High PRA 815 - High CPRA	Removed
820 - Heavy workload 823 - Surgeon unavailable 825 - Operational – transplant center	760 - Resource time constraint (OPO, TXC, donor hospital, etc.) 762 - Recovery team availability 763 - Transplant team or transplant facility availability
822 - Exceeded one hour response time 826 - Exceeded 30 minute evaluation time	765 - Exceeded policy defined response time
824 - Distance to travel or ship	712 - Actual or projected cold ischemic time too long
830 - Donor age or quality	700 - Donor age 713 - Warm ischemic time too long 750 - Donor medical history, specify* 751 - Donor instability/high vasopressor usage 752 - Prolonged downtime/CPR 754 - VCA graft appearance or quality, specify**

831 - Donor size/weight	701 - Organ size, specify**
832 - Donor ABO	Removed
833 - Donor social history	740 - PHS risk criteria or social history
834 - Positive serological tests	742 - Donor infection or positive culture 741 - Positive infectious disease screening test: CMV, HBV, HCV, etc.
835 - Organ Preservation	710 - Organ preservation: Unacceptable method or findings
836 - Organ anatomical damage or defect	711 - Organ anatomical damage or defect 715 - Biopsy results unacceptable
837 - Organ-specific donor issue	714 - Biopsy not available 716 - Organ specific test results not available, specify** 717 - Unacceptable organ specific test results, specify* 743 - Malignancy or suspected malignancy
840 - COVID-19: candidate-related reason	725 - Epidemic/Pandemic - Candidate
841 - COVID-19: donor-related reason	744 - Epidemic/Pandemic - Donor
842 - COVID-19: OPO or transplant hospital operational issue	763 - Transplant team or transplant facility availability
860 - Medical urgency of another potential recipient	Removed
880 - Kidney placed with extra-renal	Removed
898 - Other Specify	798 - Other Specify* Note: 799 - Other Specify* is the replacement Other Specify for bypasses. 898 previously served as both the refusal and bypass code.
New Codes	726 - Candidate temporarily ineligible due to insurance or financial issue 753 - DCD donor neurological function/not expected to arrest 761 - Donor family time constraint 764 - Transportation availability 790 - Disaster Emergency Management

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Data and Methods

These analyses use OPTN potential transplant recipient (PTR) match run data and include roughly 364 days before and after implementation on December 2, 2021, at 7:59:53 AM. Transplant candidate organ offers between December 03, 2020 and December 02, 2021 (pre) or between December 02, 2021 and December 01, 2022 (post) on matches with at least one final acceptance were used.

Only offers prior to the final acceptor with a refusal were included, organ offers that were bypassed or provisional yes at the close of the match were excluded. Note that offers for candidates on heart-alone organ matches and heart-lung organ matches were combined to heart-lung match organ type, since heart-alone matches are only run if no viable lungs available from the donor.

Figures present top reasons for refusal of organ offers, and associated tables are given either in the Results section or at the end of the report in the Appendix. Figure colors represent the broader category that can describe each type of refusal reason.

Analyses are based on OPTN data as of April 14, 2023 and are subject to change based on any future data submission or correction.

Results

Pre-implementation Review

Prior to the updates to the refusal reasons, the most frequently used reason for refusal of an organ offer across all organs, excluding intestine, was **'Donor age or quality'**. This refusal reason accounted for over 60% of refused offers for kidney and liver match runs, over 55% of refused offers for lung and kidney-pancreas, almost 50% of heart-lung, and 15% of intestine match runs, pre-implementation. Effective March 25, 2020, three new refusal codes were established to document refusal of an organ offer for a transplant candidate for COVID-19-related reasons:

- 840: COVID-19 candidate-related reason
- 841: COVID-19 donor-related reason
- 842: COVID-19 OPO or transplant hospital operational issue

The second of these became one of the top five given reasons for refusal for **kidney** match offers pre-implementation. In prior monitoring reports, the pre-implementation period was of shorter duration, and this **841: COVID-19 donor-related reason** code appeared more frequently in the list of top five reasons for other organs besides kidney. However, shifts in pandemic burden and the public health response over time seem to have shifted the degree to which this code was used when additional pre-implementation months were considered in this report. Organ preservation, distance to ship, donor size/weight, and other organ-specific donor issues were among top reasons across organs.

Table 1: Top five reasons for refusal of organ offers for transplant candidates prior to implementation by match organ type, December, 03, 2020 - December, 02, 2021

Refusal Reason	N Offers	% Offers per Organ
Kidney match organ		
Donor age or quality	1,663,928	67.4%
Organ Preservation	208,889	8.5%
Organ-specific donor issue	161,598	6.5%
COVID-19: donor-related reason	117,637	4.8%
Organ anatomical damage or defect	97,207	3.9%
Liver match organ		
Donor age or quality	226,851	66.7%
Donor size/weight	26,660	7.8%
Distance to travel or ship	13,988	4.1%
Patient ill, unavailable, refused, or temporarily unsuitable	12,354	3.6%
Other Specify	12,055	3.5%
Heart-Lung match organ		
Donor age or quality	31,228	45.8%
Donor size/weight	18,534	27.2%
Distance to travel or ship	3,586	5.3%
Patient txed, tx in progress, or other offer being considered	2,731	4.0%
Organ-specific donor issue	2,407	3.5%
Lung match organ		
Donor age or quality	28,415	59.2%
Donor size/weight	8,635	18.0%
Multiple organ transplant or different laterality is required	3,539	7.4%
Organ-specific donor issue	2,189	4.6%
Other Specify	1,606	3.3%
Kidney-Pancreas match organ		
Donor age or quality	6,324	55.6%
Multiple organ transplant or different laterality is required	1,580	13.9%
Distance to travel or ship	900	7.9%
Patient ill, unavailable, refused, or temporarily unsuitable	658	5.8%
Donor size/weight	318	2.8%
Intestine match organ		
Multiple organ transplant or different laterality is required	565	64.3%
Donor age or quality	179	20.4%
Donor size/weight	43	4.9%
Number of HLA mismatches unacceptable	40	4.6%
Patient ill, unavailable, refused, or temporarily unsuitable	20	2.3%

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Patient-specific Refusals by Reason

Overall

Since the implementation of the new codes, the most frequently used reason for refusal of an organ offer for a transplant candidate has been ' 'Actual or projected cold ischemic time too long' (18.7%) followed by 'Unacceptable organ specific test results, specify' (14.6%). Interestingly, the other updated COVID-19 related refusal reasons, 'Epidemic/Pandemic - Candidate' and 'Disaster Emergency Management Consideration' have only been used for refusal of 3504 (0.1%) and 1023 (0.03%) organ offers for a transplant candidate overall.

Figure 2: Reasons for refusal of an organ offer for a transplant candidate post-implementation, all match organs, December 02, 2021 - December 01, 2022

* Reasons making up < 0.5% are not included in figure.
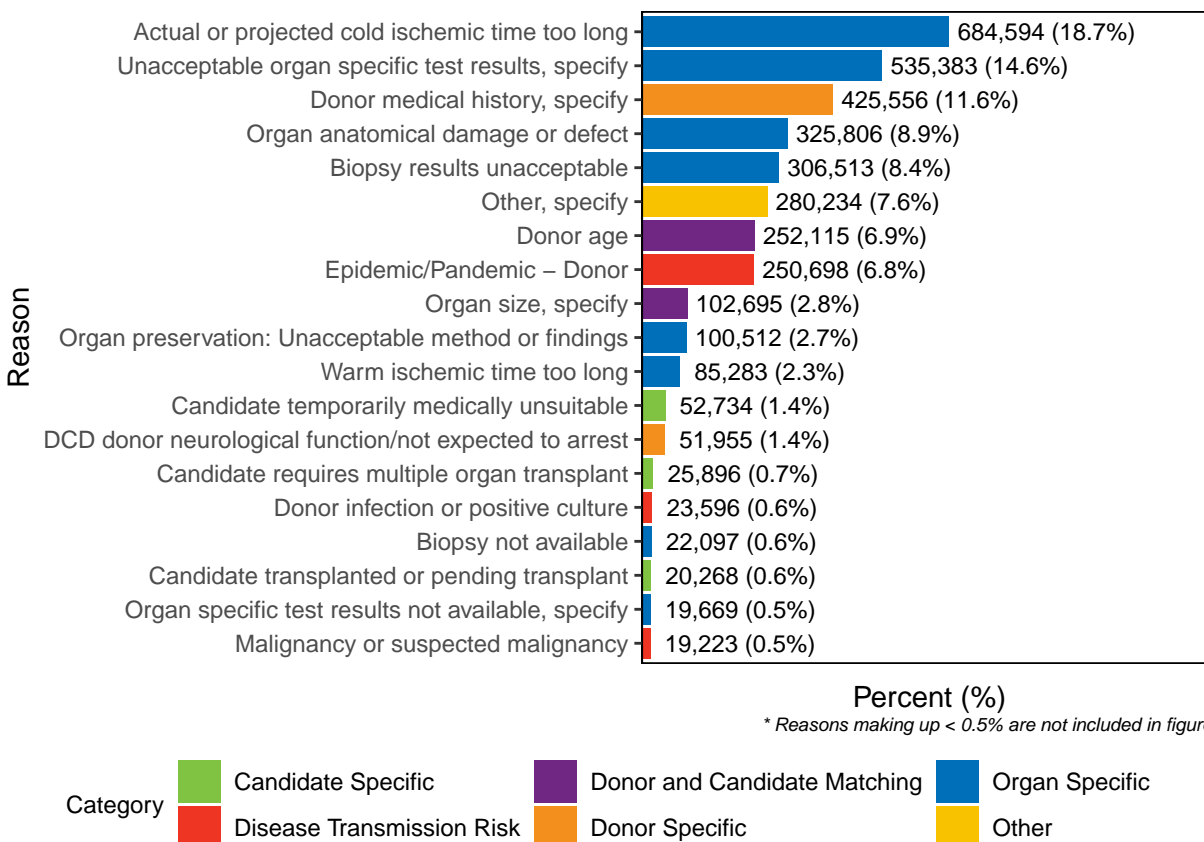
By Organ

Figure 3: Percentage of Covid-19 refusal codes among all codes December 02, 2021 - December 01, 2022, by organ.
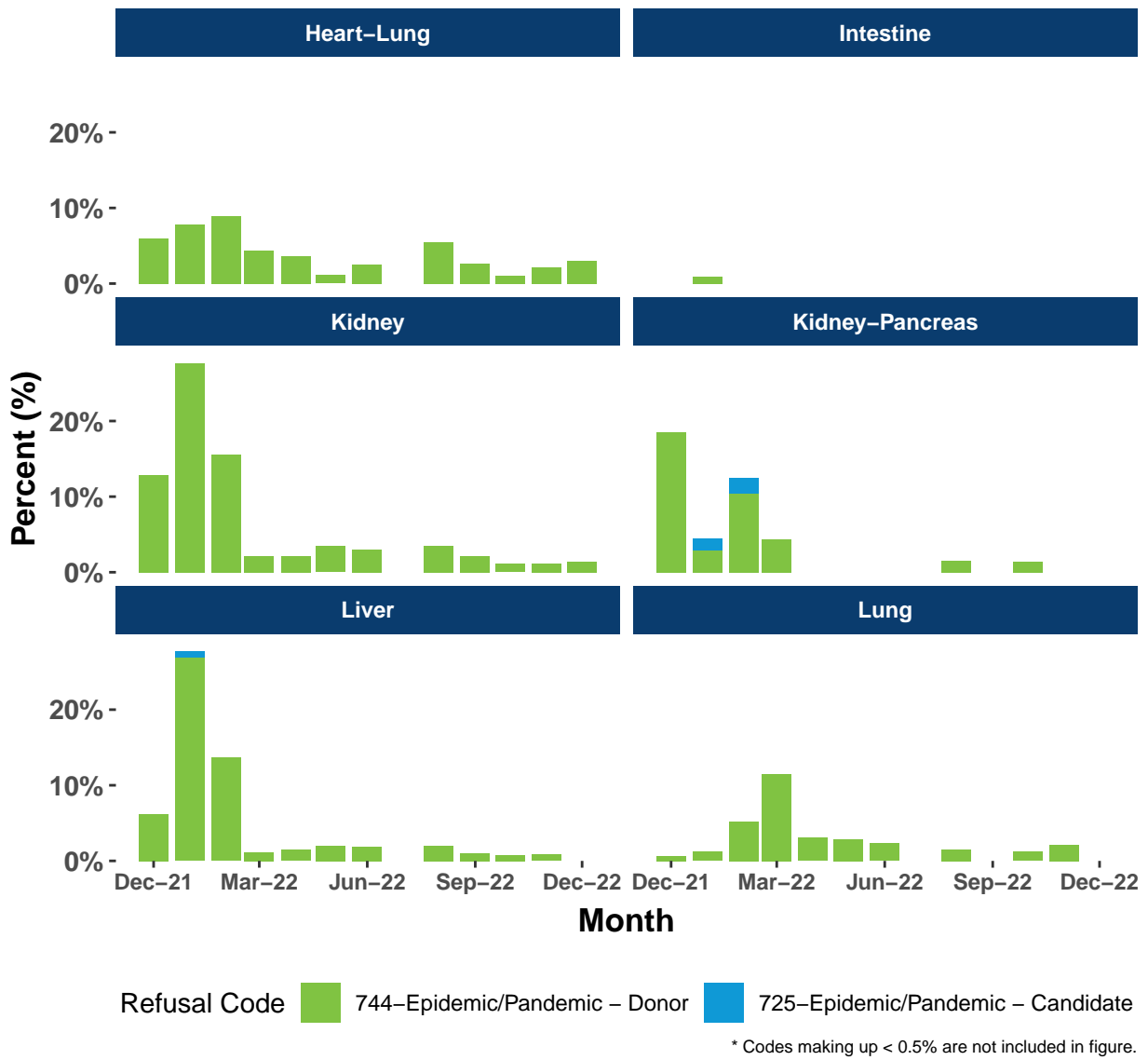
Figure 4: Top ten reasons for refusal of kidney match organ offers for transplant candidates post implementation, for kidney matches submitted December 02, 2021 - December 01, 2022.

Match Organ Type = KI	
Actual or projected cold ischemic time too long	637,555 (20.4%)
Unacceptable organ specific test results, specify	446,700 (14.3%)
Donor medical history, specify	383,901 (12.3%)
Organ anatomical damage or defect	317,160 (10.1%)
Biopsy results unacceptable	291,204 (9.3%)
Other, specify	230,883 (7.4%)
Epidemic/Pandemic – Donor	226,232 (7.2%)
Donor age	173,191 (5.5%)
Organ preservation: Unacceptable method or findings	97,914 (3.1%)
Warm ischemic time too long	84,535 (2.7%)

Percent (%)

Category
Disease Transmission Risk   Donor Specific   Other
Donor and Candidate Matching   Organ Specific

Table 2: Count and percent of reasons for refusal of kidney match organ offers post implementation, for kidney matches submitted December 02, 2021 - December 01, 2022

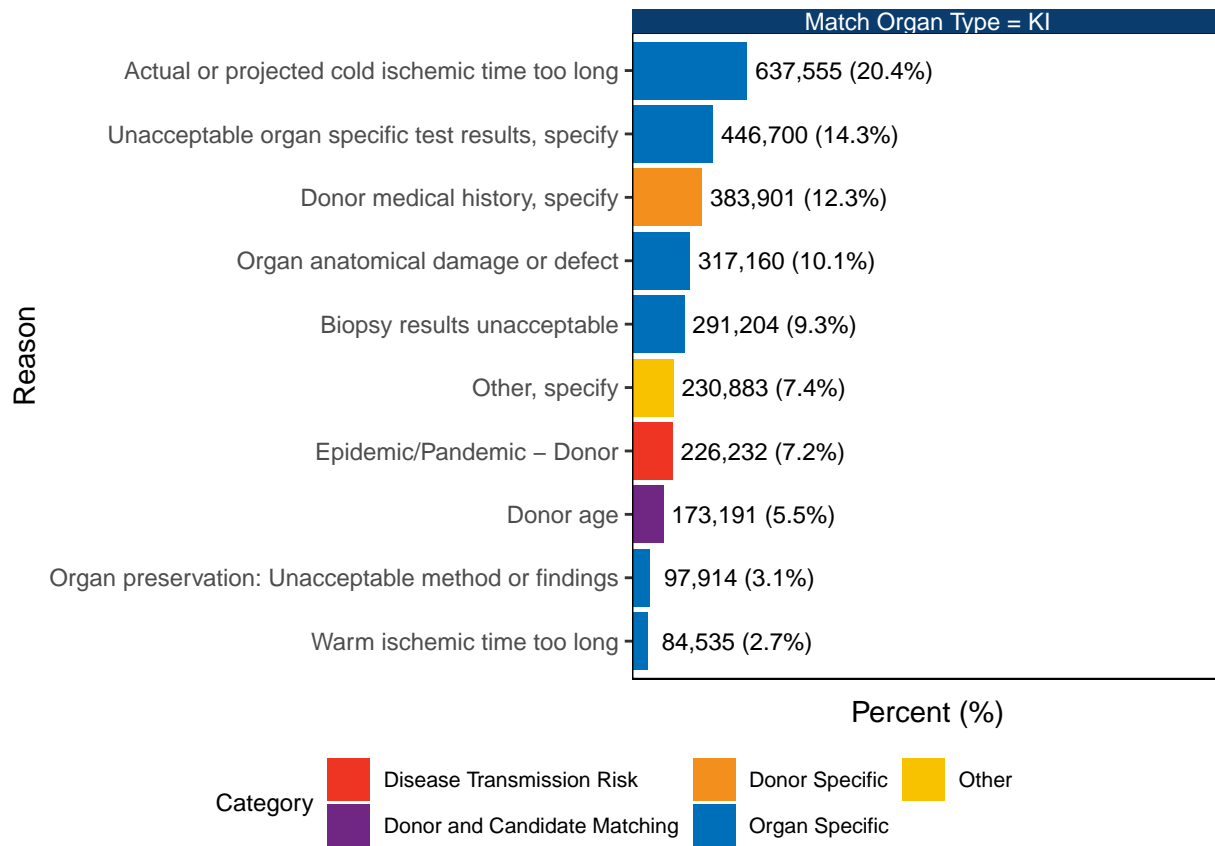| Category	Description	N	%
Kidney match organ			
Organ Specific	Actual or projected cold ischemic time too long	637,555	20.37%
Organ Specific	Unacceptable organ specific test results, specify	446,700	14.27%
Donor Specific	Donor medical history, specify	383,901	12.27%
Organ Specific	Organ anatomical damage or defect	317,160	10.13%
Organ Specific	Biopsy results unacceptable	291,204	9.30%
Other	Other, specify	230,883	7.38%
Disease Transmission Risk	Epidemic/Pandemic - Donor	226,232	7.23%
Donor and Candidate Matching	Donor age	173,191	5.53%
Organ Specific	Organ preservation: Unacceptable method or findings	97,914	3.13%
Organ Specific	Warm ischemic time too long	84,535	2.70%
Candidate Specific	Candidate temporarily medically unsuitable	37,351	1.19%
Donor and Candidate Matching	Organ size, specify	37,201	1.19%
Disease Transmission Risk	Donor infection or positive culture	21,330	0.68%
Organ Specific	Biopsy not available	21,044	0.67%
Donor Specific	DCD donor neurological function/not expected to arrest	17,390	0.56%
Organ Specific	Organ specific test results not available, specify	16,592	0.53%
Disease Transmission Risk	Malignancy or suspected malignancy	16,490	0.53%
Candidate Specific	Candidate requires multiple organ transplant	16,230	0.52%
Disease Transmission Risk	Positive infectious disease screening test: CMV, HBV, HCV, etc.	10,060	0.32%
Disease Transmission Risk	PHS risk criteria or social history	7,337	0.23%
Histocompatibility Related	No candidate serum for crossmatching	5,506	0.18%
Histocompatibility Related	Positive virtual crossmatch/unacceptable antigens	5,303	0.17%
Candidate Specific	Candidate transplanted or pending transplant	5,251	0.17%
Candidate Specific	Candidate refused	3,775	0.12%
Candidate Specific	Epidemic/Pandemic - Candidate	2,646	0.08%
Donor Specific	Donor instability/high vasopressor usage	2,603	0.08%
Candidate Specific	Candidate unavailable	2,502	0.08%
Donor Specific	Prolonged downtime/CPR	2,374	0.08%
Logistics	Transplant team or transplant facility availability	2,025	0.06%
Histocompatibility Related	Positive physical crossmatch	1,851	0.06%
Candidate Specific	Candidate temporarily ineligible due to insurance or financial issue	1,203	0.04%
Logistics	Resource time constraint (OPO, TXC, donor hospital, etc.)	1,018	0.03%
Histocompatibility Related	Number of HLA mismatches unacceptable	1,001	0.03%
Other	Disaster Emergency Management Consideration	911	0.03%
Histocompatibility Related	No donor cells/specimen for crossmatching, or no time for crossmatch	450	0.01%
Logistics	Exceeded policy defined response time	446	0.01%
Candidate Specific	Candidate requires different laterality	222	0.01%
Logistics	Transportation availability	209	0.01%
Logistics	Recovery team availability	74	0.00%
Candidate Specific	Candidate's condition improved, transplant not needed	68	0.00%
Logistics	Donor family time constraint	2	0.00%

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Figure 5: Top ten reasons for refusal of liver match organ offers for transplant candidates post implementation, for liver matches submitted December 02, 2021 - December 01, 2022.

Match Organ Type = LI

Reason	Value
Donor age	71,485 (18.3%)
Unacceptable organ specific test results, specify	44,849 (11.5%)
Other, specify	42,718 (10.9%)
Actual or projected cold ischemic time too long	41,240 (10.6%)
Organ size, specify	33,925 (8.7%)
Donor medical history, specify	33,333 (8.5%)
DCD donor neurological function/not expected to arrest	30,104 (7.7%)
Epidemic/Pandemic – Donor	19,668 (5.0%)
Biopsy results unacceptable	15,286 (3.9%)
Candidate temporarily medically unsuitable	11,815 (3.0%)

Percent (%)

Category:
- Candidate Specific
- Donor and Candidate Matching
- Organ Specific
- Disease Transmission Risk
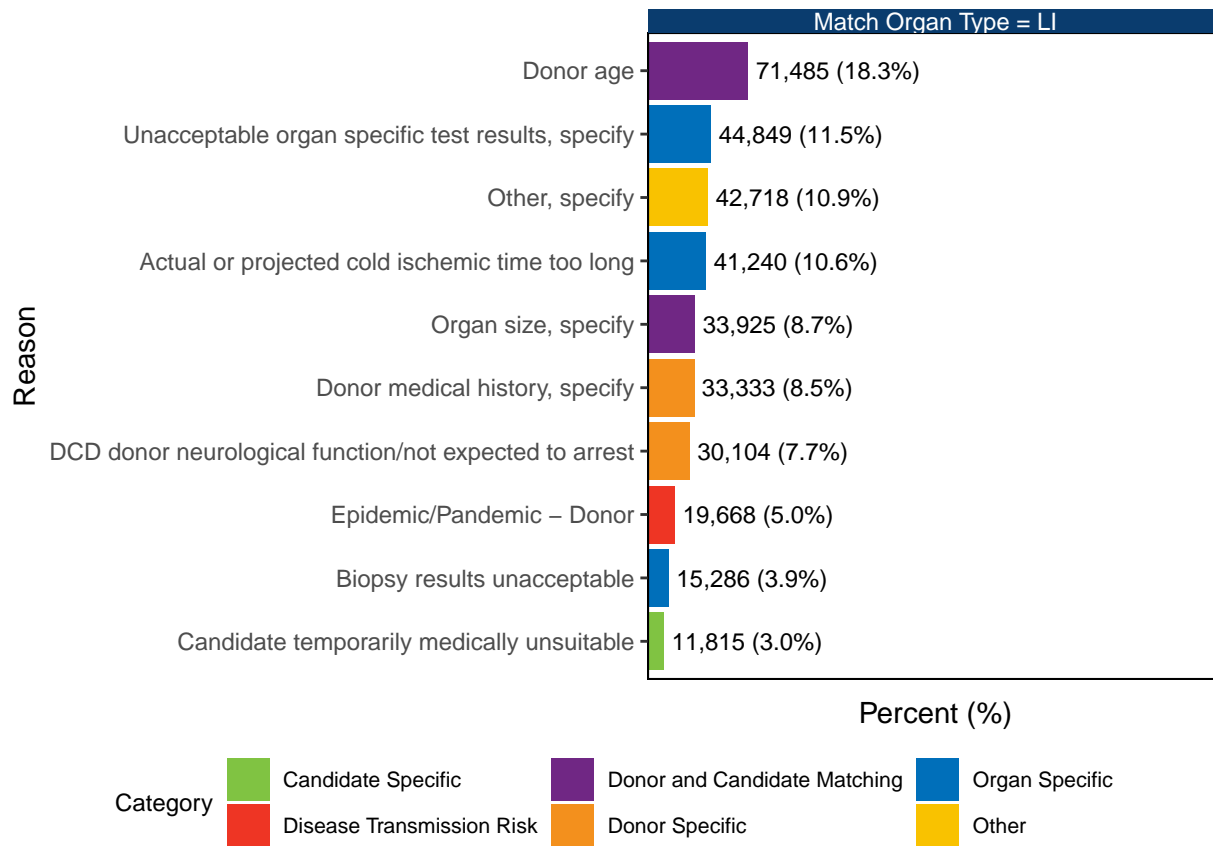- Donor Specific
- Other

Table 3: Count and percent of reasons for refusal of liver match organ offers post implementation, for liver matches submitted December 02, 2021 - December 01, 2022

Category	Description	N	%
Liver			
Donor and Candidate Matching	Donor age	71,485	18.29%
Organ Specific	Unacceptable organ specific test results, specify	44,849	11.48%
Other	Other, specify	42,718	10.93%
Organ Specific	Actual or projected cold ischemic time too long	41,240	10.55%
Donor and Candidate Matching	Organ size, specify	33,925	8.68%
Donor Specific	Donor medical history, specify	33,333	8.53%
Donor Specific	DCD donor neurological function/not expected to arrest	30,104	7.70%
Disease Transmission Risk	Epidemic/Pandemic - Donor	19,668	5.03%
Organ Specific	Biopsy results unacceptable	15,286	3.91%
Candidate Specific	Candidate temporarily medically unsuitable	11,815	3.02%
Candidate Specific	Candidate transplanted or pending transplant	10,822	2.77%
Organ Specific	Organ anatomical damage or defect	5,642	1.44%
Candidate Specific	Candidate requires multiple organ transplant	4,837	1.24%
Disease Transmission Risk	Positive infectious disease screening test: CMV, HBV, HCV, etc.	2,885	0.74%
Logistics	Resource time constraint (OPO, TXC, donor hospital, etc.)	2,608	0.67%
Disease Transmission Risk	Malignancy or suspected malignancy	2,545	0.65%
Organ Specific	Organ preservation: Unacceptable method or findings	2,140	0.55%
Organ Specific	Organ specific test results not available, specify	1,912	0.49%
Donor Specific	Donor instability/high vasopressor usage	1,671	0.43%
Disease Transmission Risk	Donor infection or positive culture	1,596	0.41%
Candidate Specific	Candidate unavailable	1,423	0.36%
Disease Transmission Risk	PHS risk criteria or social history	1,389	0.36%
Donor Specific	Prolonged downtime/CPR	1,081	0.28%
Organ Specific	Biopsy not available	1,046	0.27%
Logistics	Donor family time constraint	764	0.20%
Candidate Specific	Candidate's condition improved, transplant not needed	648	0.17%
Candidate Specific	Epidemic/Pandemic - Candidate	639	0.16%
Organ Specific	Warm ischemic time too long	601	0.15%
Logistics	Transplant team or transplant facility availability	526	0.13%
Candidate Specific	Candidate refused	480	0.12%
Logistics	Exceeded policy defined response time	394	0.10%
Candidate Specific	Candidate temporarily ineligible due to insurance or financial issue	162	0.04%
Histocompatibility Related	Positive virtual crossmatch/unacceptable antigens	155	0.04%
Logistics	Recovery team availability	140	0.04%
Logistics	Transportation availability	116	0.03%
Histocompatibility Related	Number of HLA mismatches unacceptable	92	0.02%
Other	Disaster Emergency Management Consideration	42	0.01%
Histocompatibility Related	No donor cells/specimen for crossmatching, or no time for crossmatch	12	0.00%
Histocompatibility Related	Positive physical crossmatch	10	0.00%
Histocompatibility Related	No candidate serum for crossmatching	1	0.00%

Figure 6: Top ten reasons for refusal of heart and heart-lung match organ offers for transplant candidates post implementation, for heart and heart-lung matches submitted December 02, 2021 - December 01, 2022.
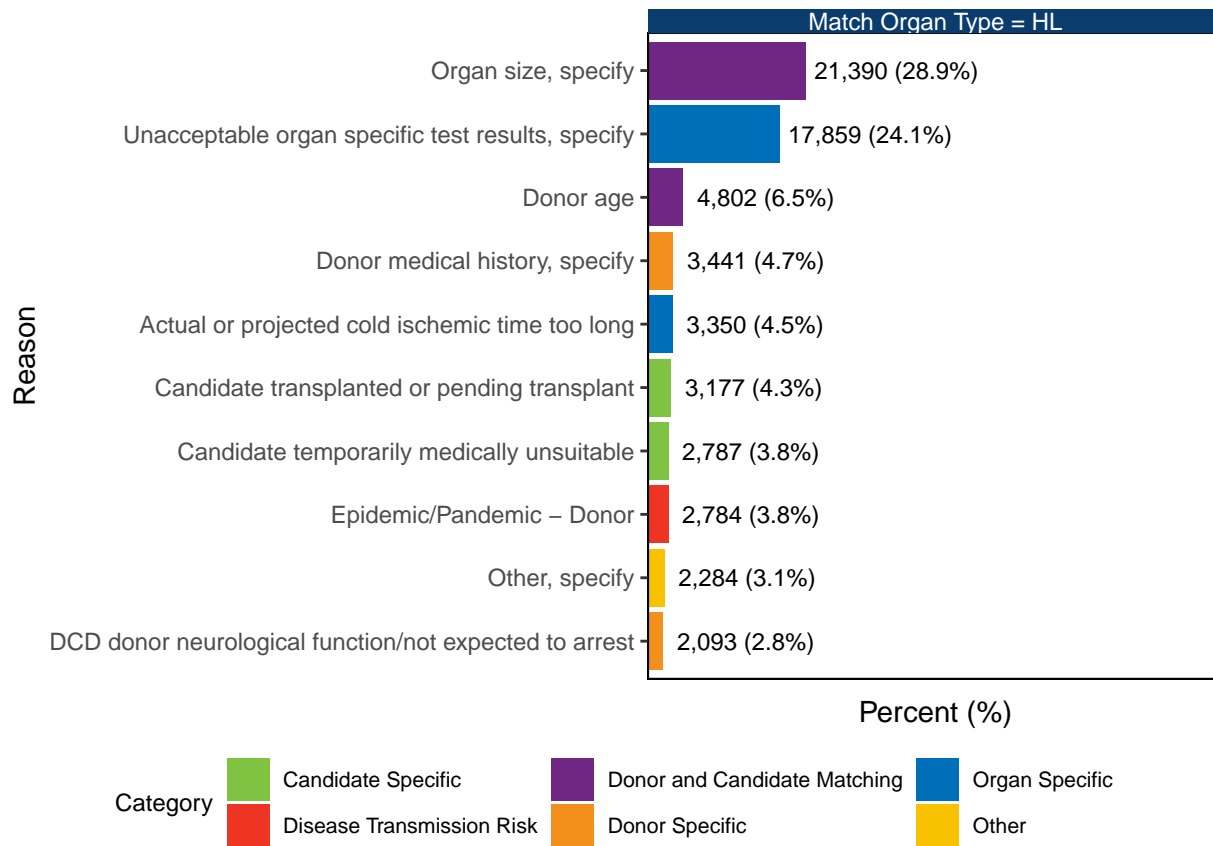
Table 4: Count and percent of reasons for refusal of heart and heart-lung match organ offers post implementation, for heart and heart-lung matches submitted December 02, 2021 - December 01, 2022

Category	Description	N	%
Heart-Lung			
Donor and Candidate Matching	Organ size, specify	21,390	28.91%
Organ Specific	Unacceptable organ specific test results, specify	17,859	24.13%
Donor and Candidate Matching	Donor age	4,802	6.49%
Donor Specific	Donor medical history, specify	3,441	4.65%
Organ Specific	Actual or projected cold ischemic time too long	3,350	4.53%
Candidate Specific	Candidate transplanted or pending transplant	3,177	4.29%
Candidate Specific	Candidate temporarily medically unsuitable	2,787	3.77%
Disease Transmission Risk	Epidemic/Pandemic - Donor	2,784	3.76%
Other	Other, specify	2,284	3.09%
Donor Specific	DCD donor neurological function/not expected to arrest	2,093	2.83%
Candidate Specific	Candidate requires multiple organ transplant	1,639	2.21%
Donor Specific	Prolonged downtime/CPR	1,579	2.13%
Organ Specific	Organ anatomical damage or defect	1,424	1.92%
Histocompatibility Related	Positive virtual crossmatch/unacceptable antigens	1,057	1.43%
Organ Specific	Organ specific test results not available, specify	660	0.89%
Disease Transmission Risk	PHS risk criteria or social history	650	0.88%
Logistics	Resource time constraint (OPO, TXC, donor hospital, etc.)	370	0.50%
Disease Transmission Risk	Donor infection or positive culture	352	0.48%
Disease Transmission Risk	Positive infectious disease screening test: CMV, HBV, HCV, etc.	336	0.45%
Organ Specific	Organ preservation: Unacceptable method or findings	258	0.35%
Donor Specific	Donor instability/high vasopressor usage	243	0.33%
Histocompatibility Related	Number of HLA mismatches unacceptable	180	0.24%
Disease Transmission Risk	Malignancy or suspected malignancy	160	0.22%
Histocompatibility Related	No candidate serum for crossmatching	152	0.21%
Histocompatibility Related	No donor cells/specimen for crossmatching, or no time for crossmatch	141	0.19%
Candidate Specific	Candidate temporarily ineligible due to insurance or financial issue	135	0.18%
Organ Specific	Warm ischemic time too long	107	0.14%
Candidate Specific	Epidemic/Pandemic - Candidate	99	0.13%
Histocompatibility Related	Positive physical crossmatch	95	0.13%
Logistics	Transplant team or transplant facility availability	91	0.12%
Logistics	Donor family time constraint	87	0.12%
Candidate Specific	Candidate's condition improved, transplant not needed	77	0.10%
Candidate Specific	Candidate unavailable	34	0.05%
Candidate Specific	Candidate refused	32	0.04%
Logistics	Exceeded policy defined response time	24	0.03%
Logistics	Recovery team availability	23	0.03%
Other	Disaster Emergency Management Consideration	12	0.02%
Logistics	Transportation availability	7	0.01%
Organ Specific	Biopsy results unacceptable	6	0.01%
Organ Specific	Biopsy not available	3	0.00%

Figure 7: Top ten reasons for refusal of lung match organ offers for transplant candidates post implementation, for lung matches submitted December 02, 2021 - December 01, 2022.
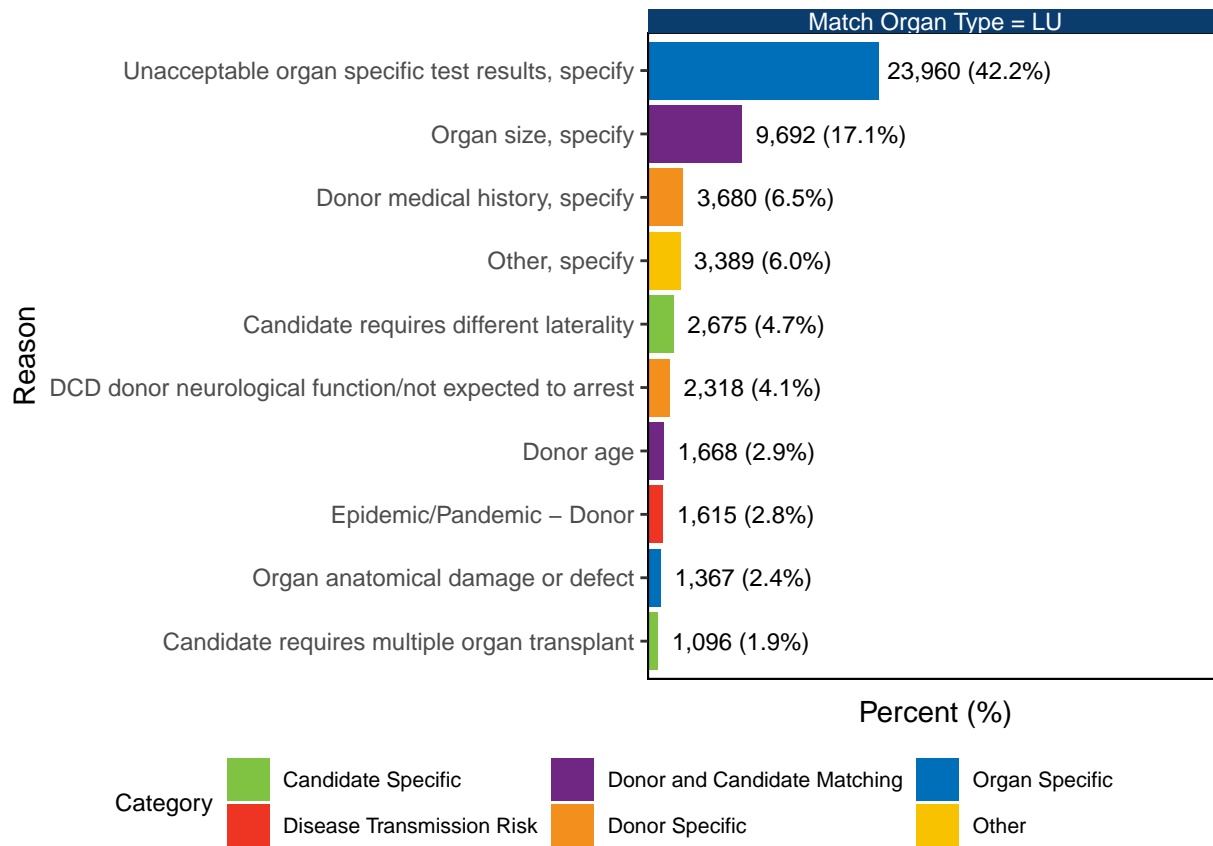
Table 5: Count and percent of reasons for refusal of lung match organ offers post implementation, for lung matches submitted December 02, 2021 - December 01, 2022

Category	Description	N	%
Lung			
Organ Specific	Unacceptable organ specific test results, specify	23,960	42.23%
Donor and Candidate Matching	Organ size, specify	9,692	17.08%
Donor Specific	Donor medical history, specify	3,680	6.49%
Other	Other, specify	3,389	5.97%
Candidate Specific	Candidate requires different laterality	2,675	4.72%
Donor Specific	DCD donor neurological function/not expected to arrest	2,318	4.09%
Donor and Candidate Matching	Donor age	1,668	2.94%
Disease Transmission Risk	Epidemic/Pandemic - Donor	1,615	2.85%
Organ Specific	Organ anatomical damage or defect	1,367	2.41%
Candidate Specific	Candidate requires multiple organ transplant	1,096	1.93%
Candidate Specific	Candidate transplanted or pending transplant	928	1.64%
Organ Specific	Actual or projected cold ischemic time too long	870	1.53%
Histocompatibility Related	Positive virtual crossmatch/unacceptable antigens	472	0.83%
Organ Specific	Organ specific test results not available, specify	439	0.77%
Logistics	Resource time constraint (OPO, TXC, donor hospital, etc.)	435	0.77%
Disease Transmission Risk	PHS risk criteria or social history	420	0.74%
Candidate Specific	Candidate temporarily medically unsuitable	371	0.65%
Disease Transmission Risk	Donor infection or positive culture	293	0.52%
Disease Transmission Risk	Positive infectious disease screening test: CMV, HBV, HCV, etc.	232	0.41%
Logistics	Donor family time constraint	137	0.24%
Logistics	Transplant team or transplant facility availability	112	0.20%
Organ Specific	Organ preservation: Unacceptable method or findings	92	0.16%
Candidate Specific	Epidemic/Pandemic - Candidate	62	0.11%
Histocompatibility Related	Number of HLA mismatches unacceptable	62	0.11%
Other	Disaster Emergency Management Consideration	58	0.10%
Histocompatibility Related	Positive physical crossmatch	51	0.09%
Candidate Specific	Candidate unavailable	36	0.06%
Donor Specific	Prolonged downtime/CPR	31	0.05%
Candidate Specific	Candidate refused	29	0.05%
Organ Specific	Warm ischemic time too long	24	0.04%
Histocompatibility Related	No candidate serum for crossmatching	22	0.04%
Logistics	Exceeded policy defined response time	21	0.04%
Disease Transmission Risk	Malignancy or suspected malignancy	16	0.03%
Organ Specific	Biopsy results unacceptable	16	0.03%
Logistics	Transportation availability	10	0.02%
Logistics	Recovery team availability	8	0.01%
Candidate Specific	Candidate's condition improved, transplant not needed	6	0.01%
Donor Specific	Donor instability/high vasopressor usage	6	0.01%
Histocompatibility Related	No donor cells/specimen for crossmatching, or no time for crossmatch	5	0.01%
Organ Specific	Biopsy not available	4	0.01%
Candidate Specific	Candidate temporarily ineligible due to insurance or financial issue	3	0.01%

Figure 8: Top ten reasons for refusal of kidney-pancreas match organ offers for transplant candidates post implementation, for kidney-pancreas matches submitted December 02, 2021 - December 01, 2022.
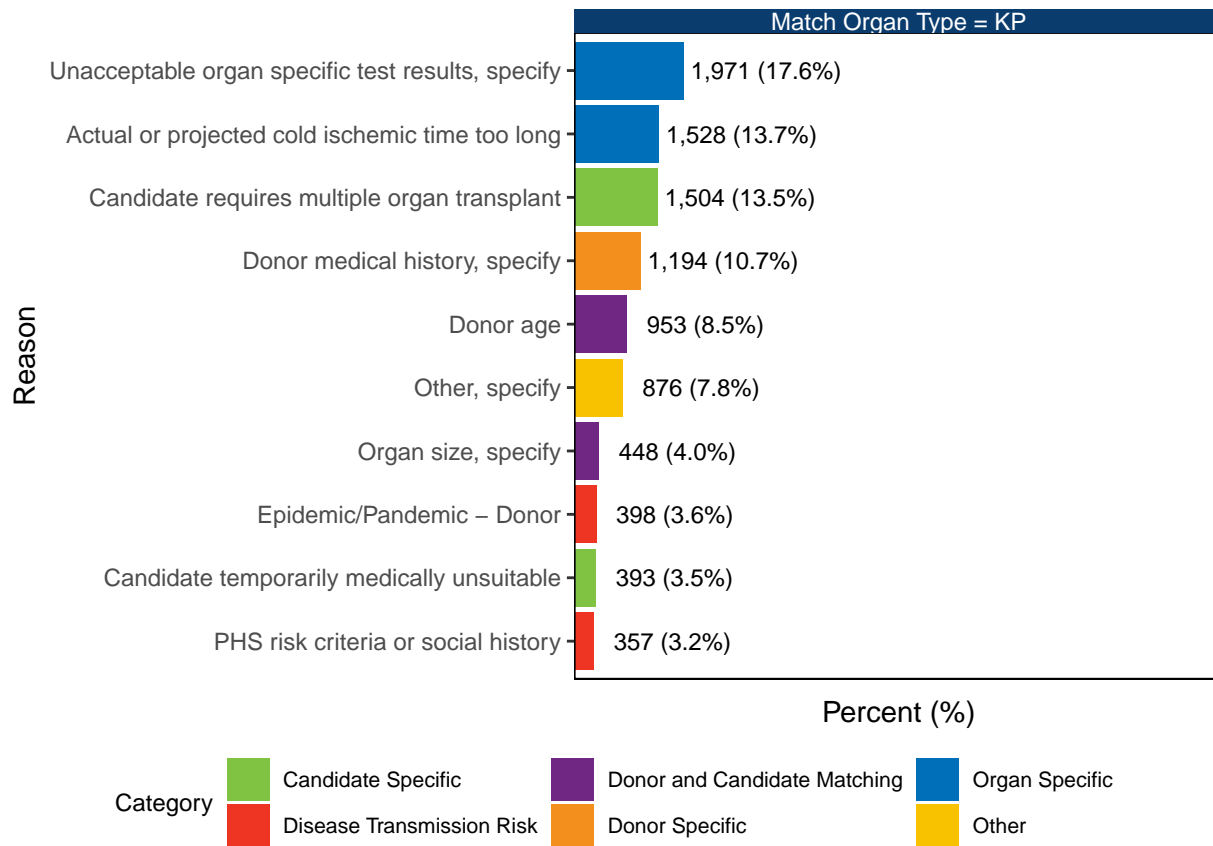
Table 6: Count and percent of reasons for refusal of kidney-pancreas match organ offers post implementation, for kidney-pancreas matches submitted December 02, 2021 - December 01, 2022

Category	Description	N	%
Kidney-Pancreas			
Organ Specific	Unacceptable organ specific test results, specify	1,971	17.63%
Organ Specific	Actual or projected cold ischemic time too long	1,528	13.67%
Candidate Specific	Candidate requires multiple organ transplant	1,504	13.46%
Donor Specific	Donor medical history, specify	1,194	10.68%
Donor and Candidate Matching	Donor age	953	8.53%
Other	Other, specify	876	7.84%
Donor and Candidate Matching	Organ size, specify	448	4.01%
Disease Transmission Risk	Epidemic/Pandemic - Donor	398	3.56%
Candidate Specific	Candidate temporarily medically unsuitable	393	3.52%
Disease Transmission Risk	PHS risk criteria or social history	357	3.19%
Organ Specific	Organ anatomical damage or defect	207	1.85%
Donor Specific	Prolonged downtime/CPR	160	1.43%
Logistics	Transplant team or transplant facility availability	127	1.14%
Logistics	Resource time constraint (OPO, TXC, donor hospital, etc.)	112	1.00%
Organ Specific	Organ preservation: Unacceptable method or findings	108	0.97%
Donor Specific	Donor instability/high vasopressor usage	90	0.81%
Candidate Specific	Candidate transplanted or pending transplant	89	0.80%
Histocompatibility Related	Positive virtual crossmatch/unacceptable antigens	85	0.76%
Histocompatibility Related	Number of HLA mismatches unacceptable	70	0.63%
Organ Specific	Organ specific test results not available, specify	66	0.59%
Candidate Specific	Epidemic/Pandemic - Candidate	58	0.52%
Logistics	Recovery team availability	57	0.51%
Disease Transmission Risk	Positive infectious disease screening test: CMV, HBV, HCV, etc.	54	0.48%
Donor Specific	DCD donor neurological function/not expected to arrest	50	0.45%
Candidate Specific	Candidate refused	44	0.39%
Candidate Specific	Candidate unavailable	34	0.30%
Candidate Specific	Candidate temporarily ineligible due to insurance or financial issue	29	0.26%
Histocompatibility Related	Positive physical crossmatch	25	0.22%
Disease Transmission Risk	Donor infection or positive culture	22	0.20%
Disease Transmission Risk	Malignancy or suspected malignancy	12	0.11%
Histocompatibility Related	No donor cells/specimen for crossmatching, or no time for crossmatch	12	0.11%
Logistics	Transportation availability	10	0.09%
Histocompatibility Related	No candidate serum for crossmatching	9	0.08%
Organ Specific	Warm ischemic time too long	8	0.07%
Candidate Specific	Candidate's condition improved, transplant not needed	6	0.05%
Logistics	Donor family time constraint	6	0.05%
Logistics	Exceeded policy defined response time	4	0.04%
Organ Specific	Biopsy results unacceptable	1	0.01%

Figure 9: Top ten reasons for refusal of intestine match organ offers for transplant candidates post implementation, for intestine matches submitted December 02, 2021 - December 01, 2022.
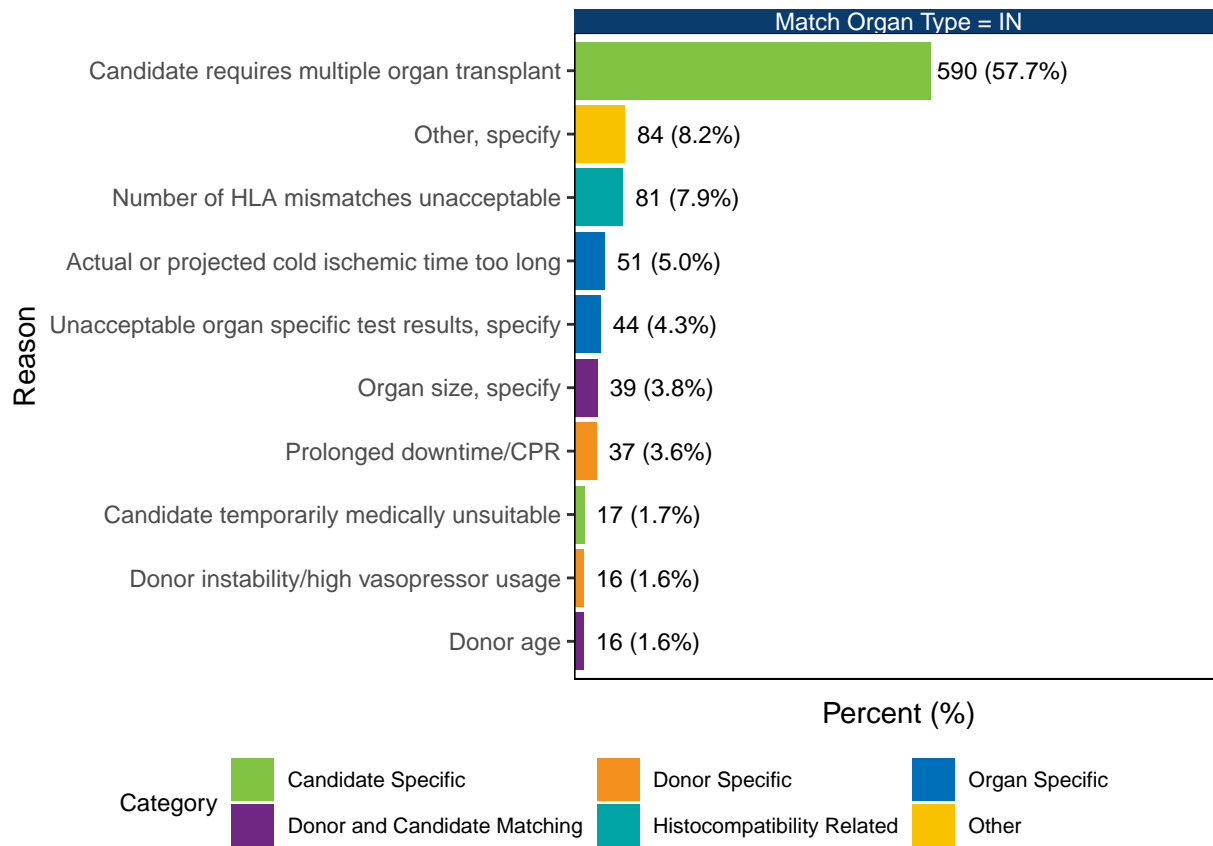
Table 7: Count and percent of reasons for refusal of intestine match organ offers post implementation, for intestine matches submitted December 02, 2021 - December 01, 2022

Category	Description	N	%
Intestine			
Candidate Specific	Candidate requires multiple organ transplant	590	57.67%
Other	Other, specify	84	8.21%
Histocompatibility Related	Number of HLA mismatches unacceptable	81	7.92%
Organ Specific	Actual or projected cold ischemic time too long	51	4.99%
Organ Specific	Unacceptable organ specific test results, specify	44	4.30%
Donor and Candidate Matching	Organ size, specify	39	3.81%
Donor Specific	Prolonged downtime/CPR	37	3.62%
Candidate Specific	Candidate temporarily medically unsuitable	17	1.66%
Donor and Candidate Matching	Donor age	16	1.56%
Donor Specific	Donor instability/high vasopressor usage	16	1.56%
Disease Transmission Risk	Positive infectious disease screening test: CMV, HBV, HCV, etc.	12	1.17%
Disease Transmission Risk	PHS risk criteria or social history	8	0.78%
Organ Specific	Warm ischemic time too long	8	0.78%
Donor Specific	Donor medical history, specify	7	0.68%
Organ Specific	Organ anatomical damage or defect	6	0.59%
Disease Transmission Risk	Donor infection or positive culture	3	0.29%
Candidate Specific	Candidate transplanted or pending transplant	1	0.10%
Disease Transmission Risk	Epidemic/Pandemic - Donor	1	0.10%
Histocompatibility Related	Positive virtual crossmatch/unacceptable antigens	1	0.10%
Logistics	Resource time constraint (OPO, TXC, donor hospital, etc.)	1	0.10%

We also sought to review reasons that have not yet been used, or have only been used a handful of times since the chang. Table 8 lists the refusal reasons by category that have been used for less than 10 organ offers, or not at all, by match organ type.

Table 8: Refusal reasons given for less than 10 organ offers for transplant candidates post implmentation by match organ type, matches submitted December 02, 2021 - December 01, 2022

Category	Description	Match Organ Type						
		KI	LI	HL	LU	HR	KP	IN
Candidate Specific	Candidate refused					X		X
	Candidate requires different laterality		X	X		X	X	X
	Candidate temporarily ineligible due to insurance or financial issue				X			X
	Candidate transplanted or pending transplant							X
	Candidate unavailable							X
	Candidate's condition improved, transplant not needed				X		X	X
	Epidemic/Pandemic - Candidate							X
Disease Transmission Risk	Donor infection or positive culture							X
	Epidemic/Pandemic - Donor							X
	Malignancy or suspected malignancy					X		X
	PHS risk criteria or social history							X
Donor Specific	DCD donor neurological function/not expected to arrest							X
	Donor instability/high vasopressor usage				X			
	Donor medical history, specify							X
	VCA graft appearance or quality, specify	X	X	X	X	X	X	X
Histocompatibility Related	No candidate serum for crossmatching		X				X	X
	No donor cells/specimen for crossmatching, or no time for crossmatch				X			X
	Positive physical crossmatch							X
	Positive virtual crossmatch/unacceptable antigens							X
	Donor family time constraint	X					X	X

Table 8: Refusal reasons given for less than 10 organ offers for transplant candidates post implmentation by match organ type, matches submitted December 02, 2021 - December 01, 2022 *(continued)*

Category	Description	KI	LI	HL	LU	HR	KP	IN
Logistics	Exceeded policy defined response time					X	X	X
	Recovery team availability				X			X
	Resource time constraint (OPO, TXC, donor hospital, etc.)							X
	Transplant team or transplant facility availability							X
	Transportation availability			X		X		X
Organ Specific	Biopsy not available			X	X	X	X	X
	Biopsy results unacceptable			X		X	X	X
	Organ anatomical damage or defect							X
	Organ preservation: Unacceptable method or findings							X
	Organ specific test results not available, specify							X
	Warm ischemic time too long						X	X
Other	Disaster Emergency Management Consideration					X	X	X

r Emergency Management Consideration & & & & & X & X & X* \end{longtable}

By Program Size

Program size groups were defined based on the following volumes of deceased donor transplants during 2020:

Match Organ Type	Volume Range Definitions			Number of Programs		
	Small	Medium	Large	Small	Medium	Large
KI	[2, 26]	(26, 89]	(89, 455]	79	76	78
LI	[1, 26]	(26, 76]	(76, 181]	48	47	46
HL	[1, 11]	(11, 29]	(29, 148]	49	46	48
LU	[1, 20]	(20, 41]	(41, 142]	23	22	22
KP	[1, 3]	(3, 8]	(8, 30]	38	35	34
IN	[1, 2]	(2, 6]	(6, 18]	6	5	5

OPTN ORGAN PROCUREMENT AND
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Figure 10: Top five reasons for refusal of kidney match organ offers for transplant candidates post implementation stratified by program size, for kidney matches submitted December 02, 2021 - December 01, 2022. Program size defined by volume of deceased donor kidney transplants during 2020.
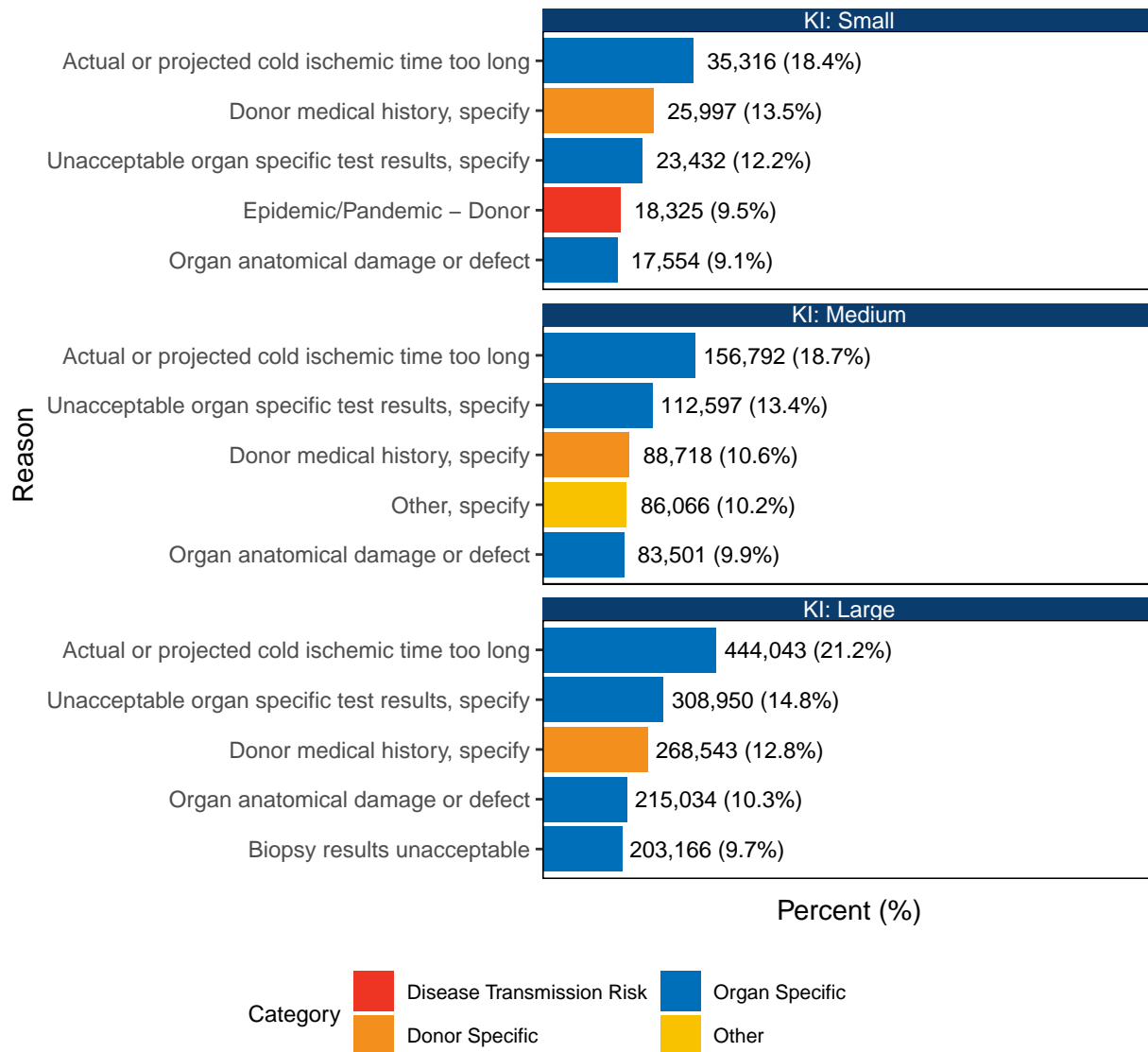
Figure 11: Top five reasons for refusal of liver match organ offers for transplant candidates post implementation stratified by program size, for liver matches submitted December 02, 2021 - December 01, 2022. Program size defined by volume of deceased donor liver transplants during 2020.
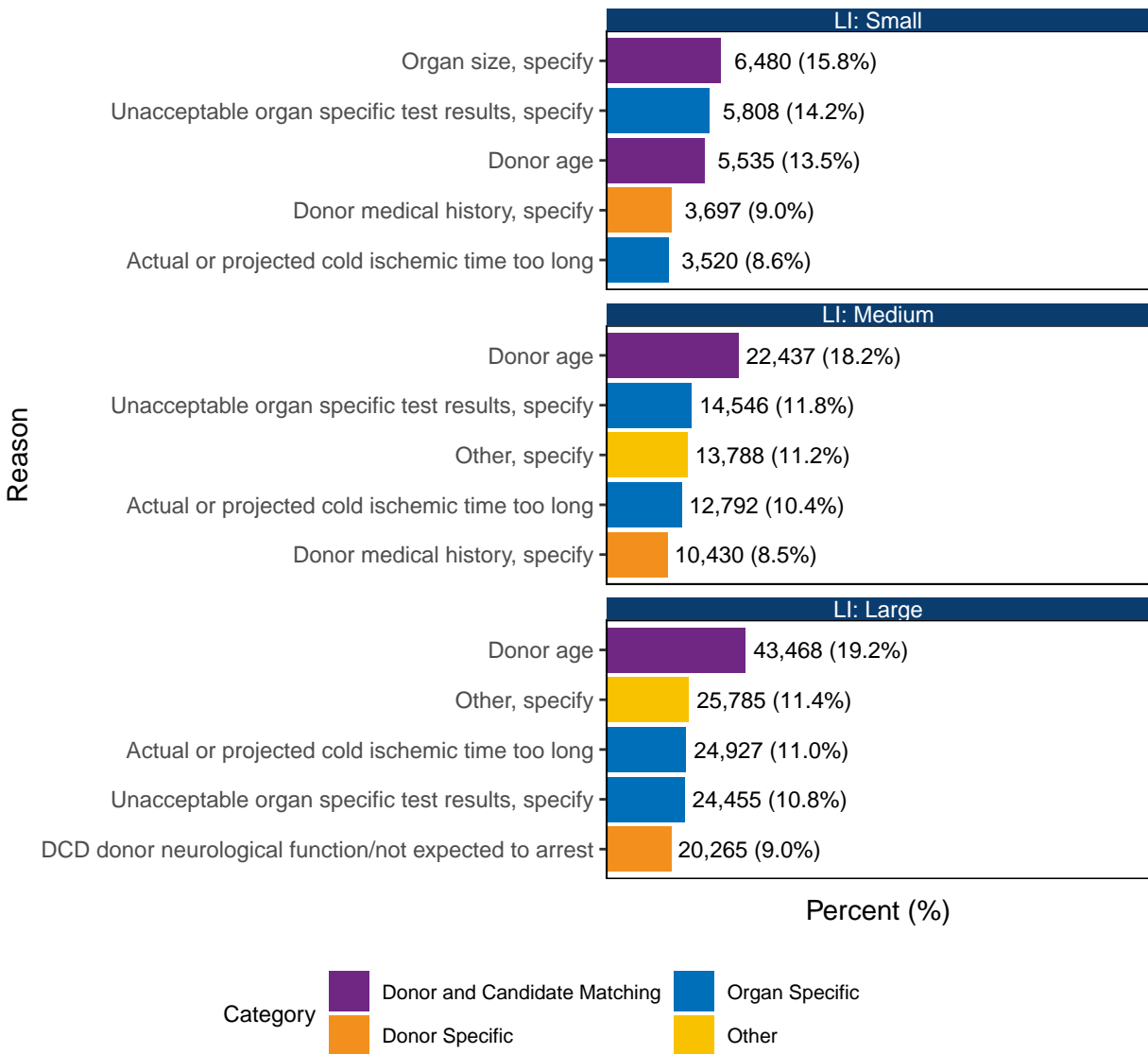
Figure 12: Top five reasons for refusal of heart and heart-lung match organ offers for transplant candidates post implementation stratified by program size, for heart and heart-lung matches submitted December 02, 2021 - December 01, 2022. Program size defined by volume of deceased donor heart and heart-lung transplants during 2020.
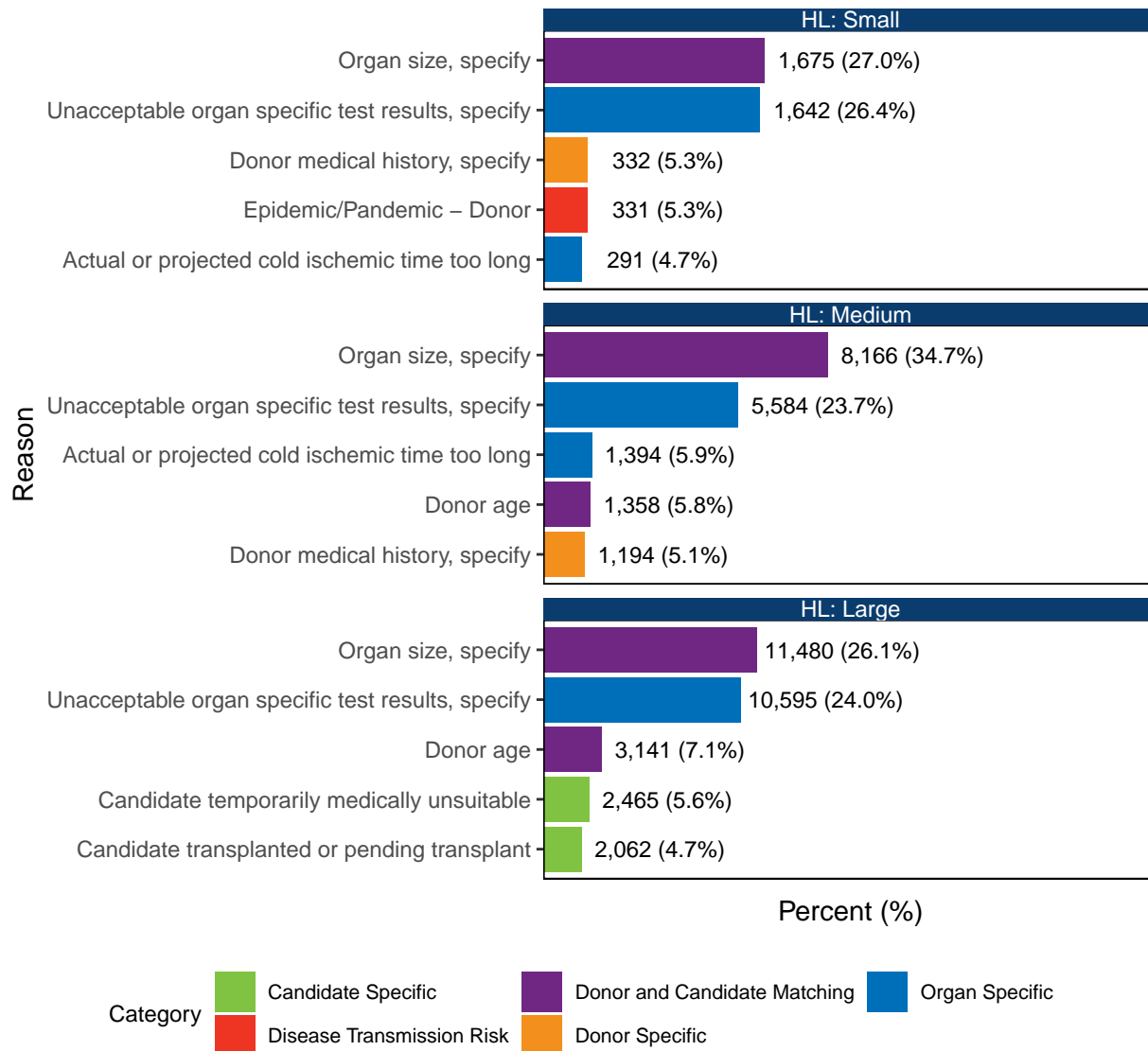
Figure 13: Top five reasons for refusal of lung match organ offers for transplant candidates post implementation stratified by program size, for lung matches submitted December 02, 2021 - December 01, 2022. Program size defined by volume of deceased donor lung transplants during 2020.

Figure 14: Top five reasons for refusal of kidney-pancreas match organ offers for transplant candidates post implementation stratified by program size, for kidney-pancreas matches submitted December 02, 2021 - December 01, 2022. Program size defined by volume of deceased donor kidney-pancreas transplants during 2020.
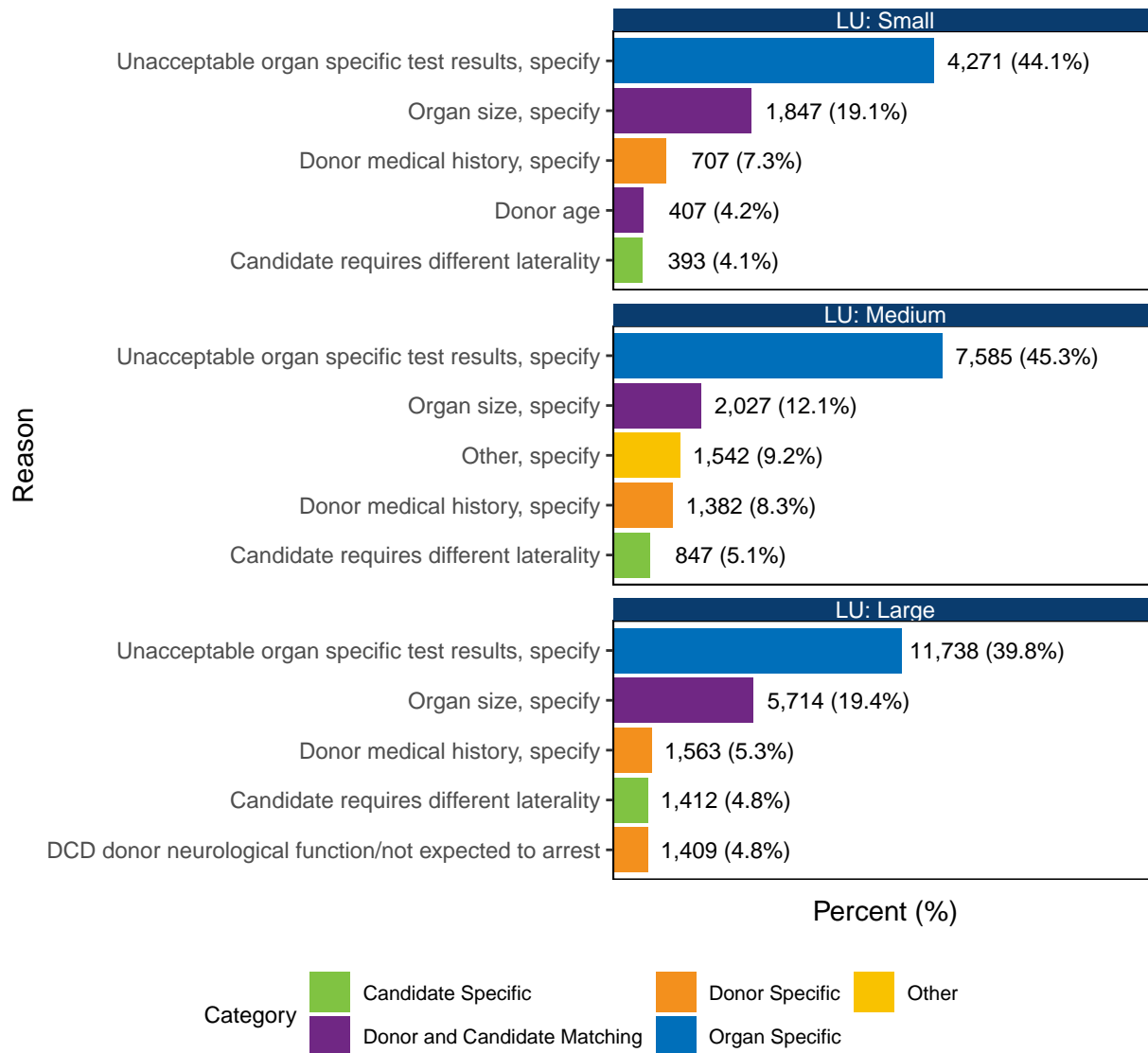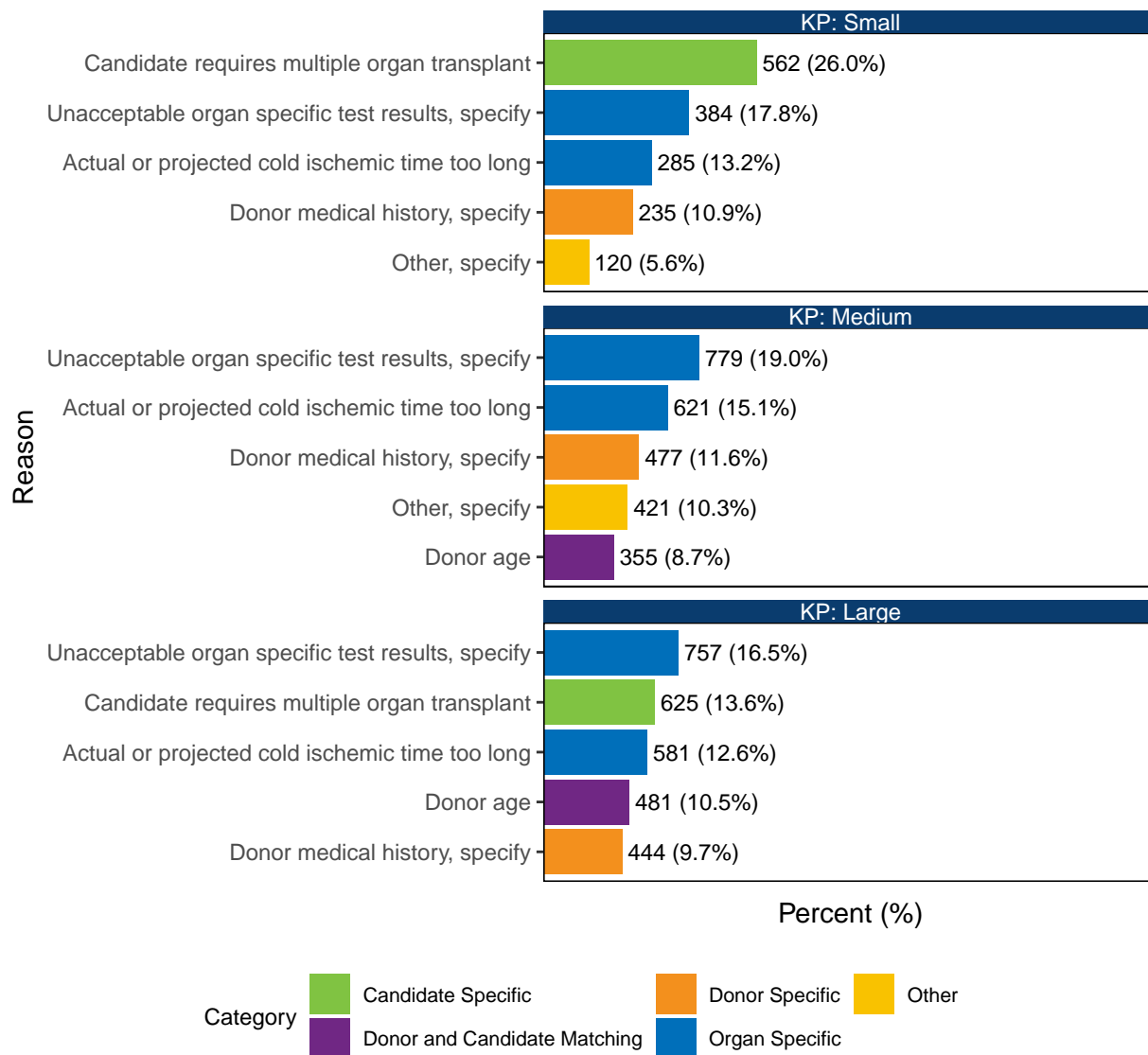
By Sequence Number

The following figures group all offers on a match into one category based on the last sequence number of the acceptor on the match. We specify 'last' here as some organs may have more than one final acceptor, e.g. left and right kidney. Sequence number groups were defined by the 90th percentile of sequence numbers for organ acceptors in 2020 as the following:

Match Organ Type	Match Acceptor Sequence Number < 90th Percentile	Match Acceptor Sequence Number ≥ 90th Percentile
HL	[1, 41)	[41, 1396]
IN	[1, 34)	[34, 59]
KI	[1, 667)	[667, 31425]
KP	[1, 29)	[29, 286]
LI	[1, 78)	[78, 7555]
LU	[1, 53)	[53, 514]

Figure 15: Top five reasons for refusal of kidney match organ offers for transplant candidates post implementation stratified by match acceptance number, for kidney matches submitted December 02, 2021 - December 01, 2022. Group was defined by the 90th percentile of sequence numbers for acceptances on kidney matches during 2020.
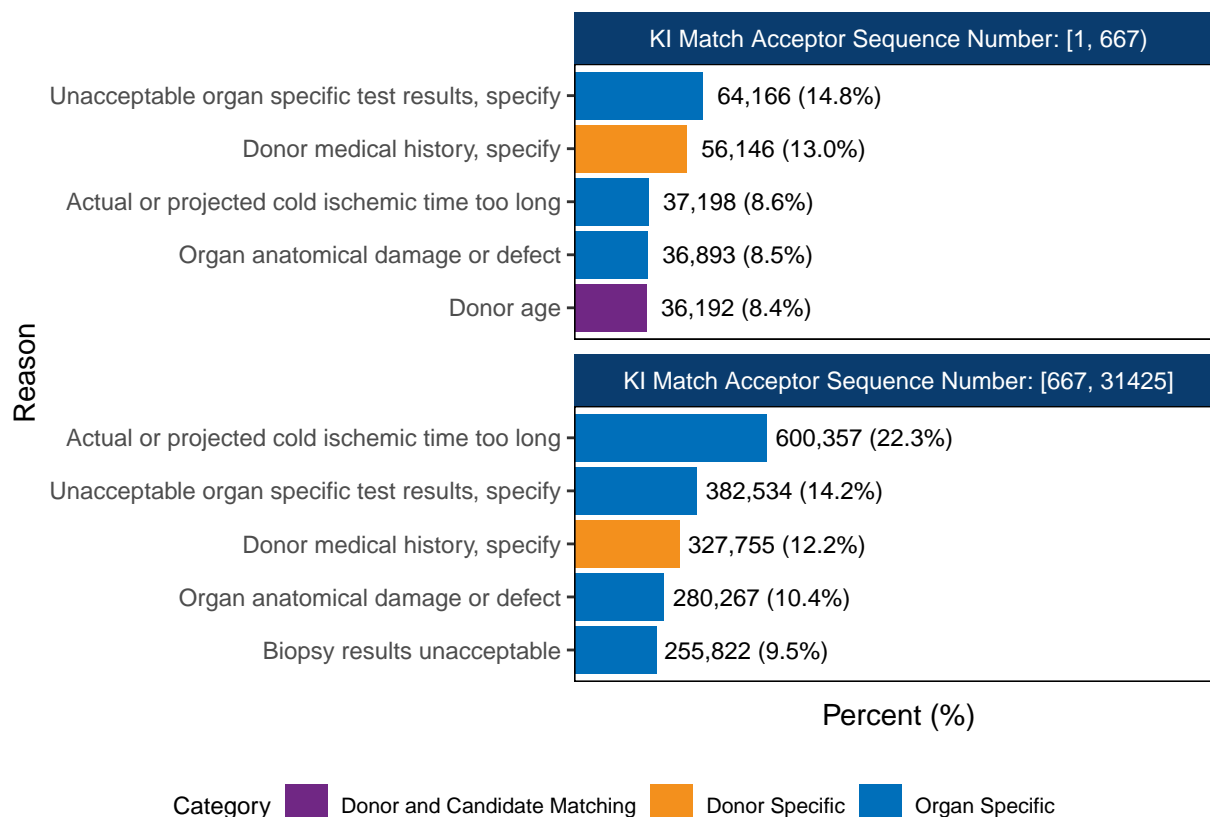
Figure 16: Top five reasons for refusal of liver match organ offers for transplant candidates post implementation stratified by match acceptance number, for liver matches submitted December 02, 2021 - December 01, 2022. Group was defined by the 90th percentile of sequence numbers for acceptances on liver matches during 2020.
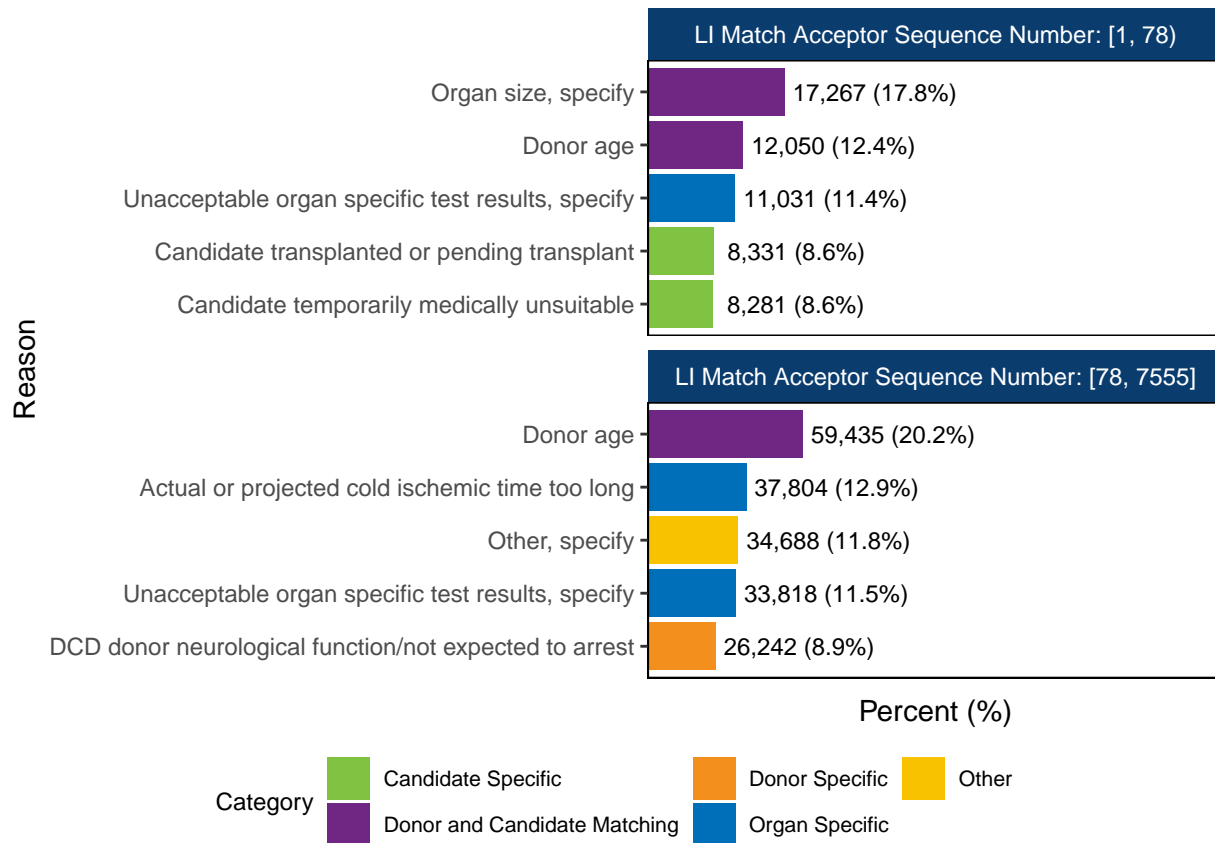
Figure 17: Top five reasons for refusal of heart and heart-lung match organ offers for transplant candidates post implementation stratified by match acceptance number, for heart and heart-lung matches submitted December 02, 2021 - December 01, 2022. Group was defined by the 90th percentile of sequence numbers for acceptances on heart and heart-lung matches during 2020.
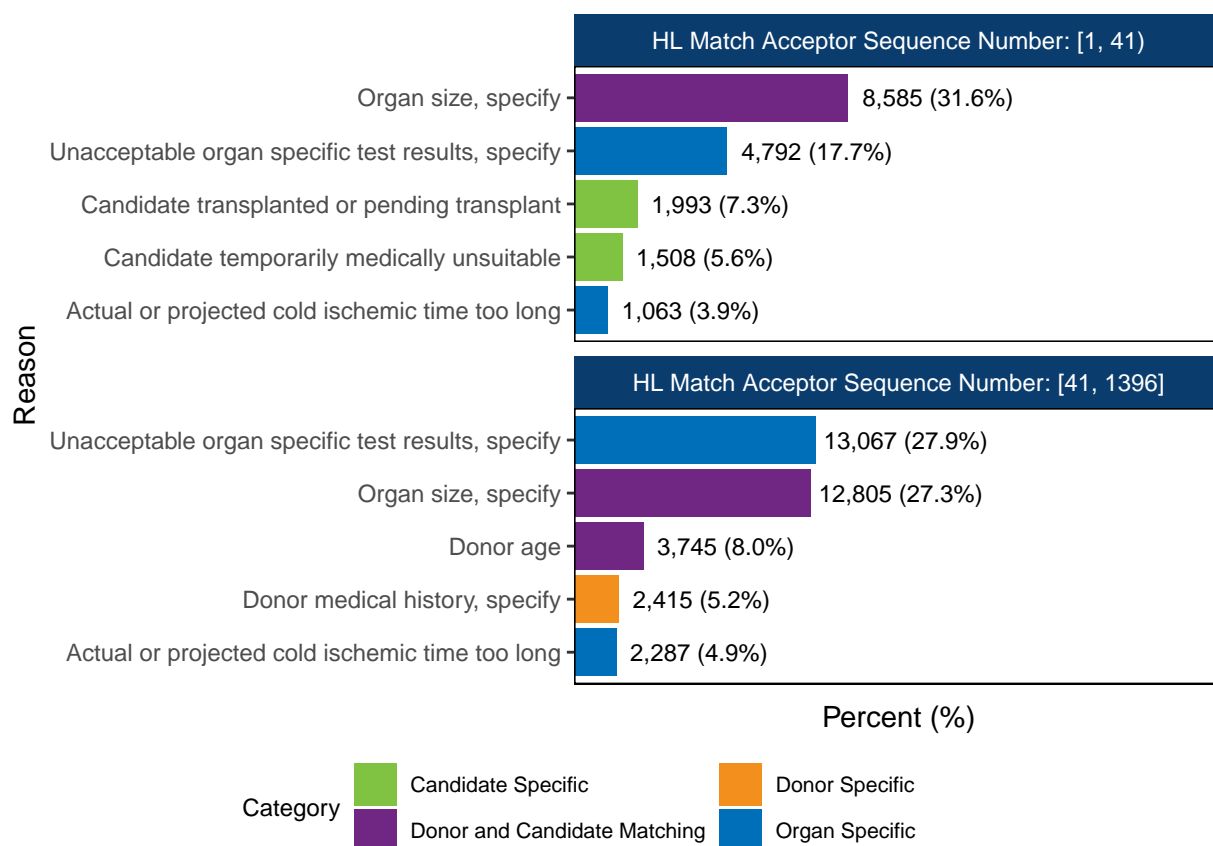
Figure 18: Top five reasons for refusal of lung match organ offers for transplant candidates post implementation stratified by match acceptance number, for lung matches submitted December 02, 2021 - December 01, 2022. Group was defined by the 90th percentile of sequence numbers for acceptances on lung matches during 2020.
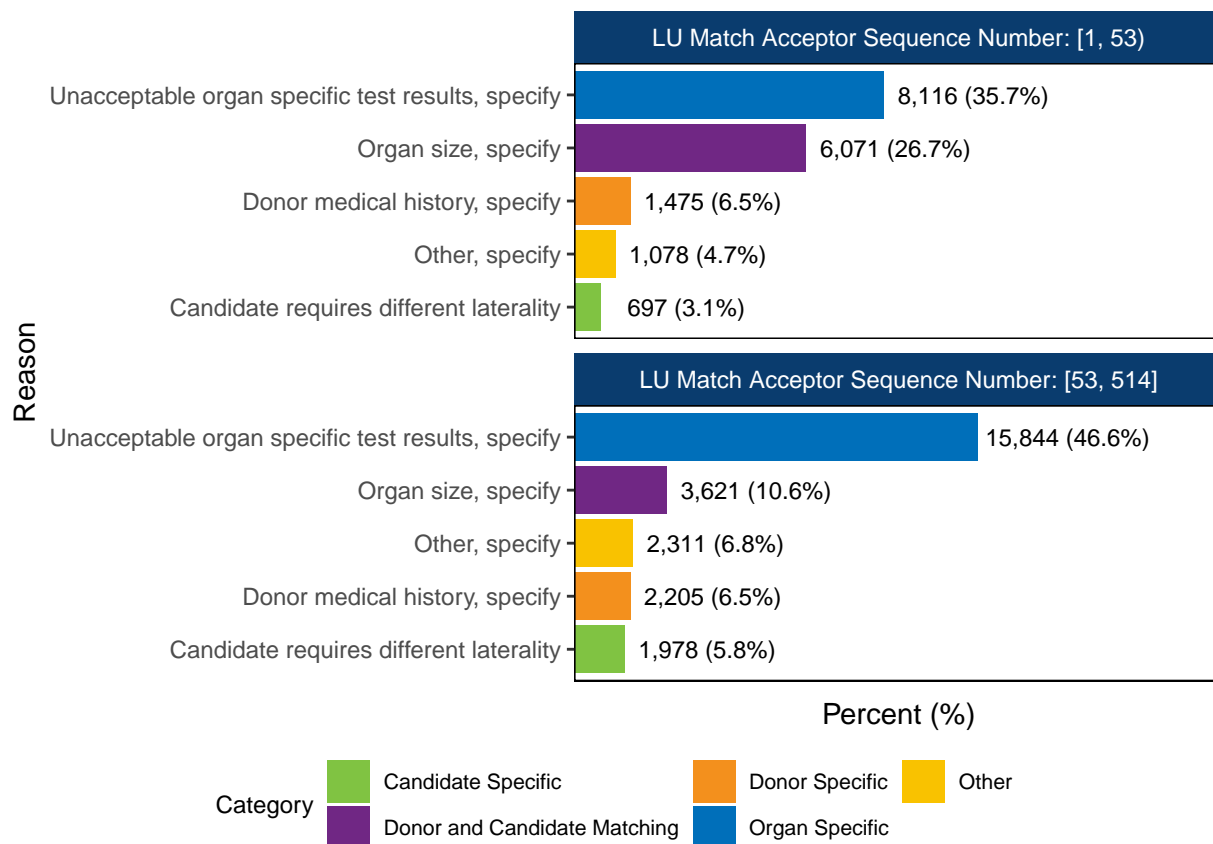
Figure 19: Top five reasons for refusal of kidney-pancreas match organ offers for transplant candidates post implementation stratified by match acceptance number, for kidney-pancreas matches submitted December 02, 2021 - December 01, 2022. Group was defined by the 90th percentile of sequence numbers for acceptances on kidney-pancreas matches during 2020.
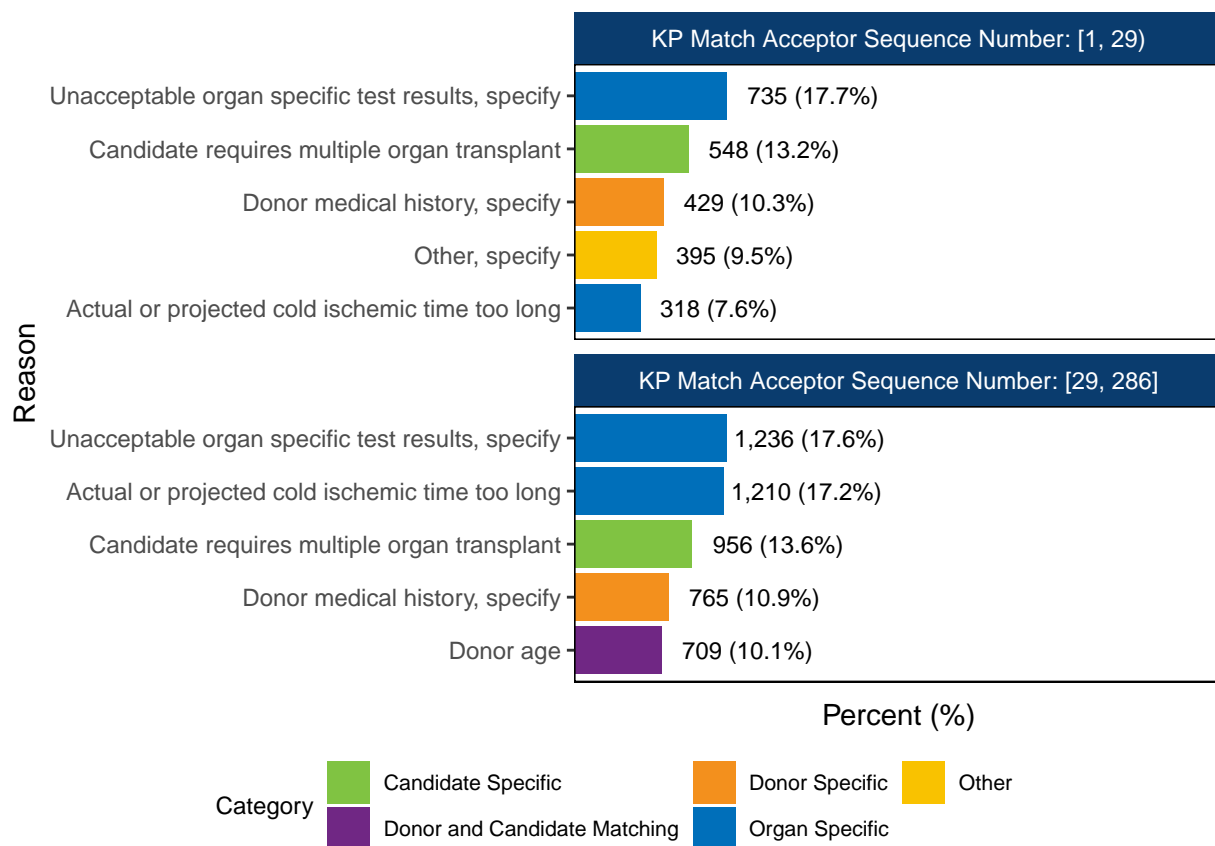
Range Refusals

Transplant centers are not only able to accept or refuse organ offers for an individual transplant candidate, they may also refuse multiple organ offers on a match run for transplant candidates at their center. When this is done, the same reason for refusal is applied for that chunk of organ offers for the transplant candidates. Because the same reason for refusal is used for varying numbers of organ offers in a batch, the following are de-duplicated such that an instance of refusing 15 organ offers for transplant candidates at a center only presents this reason once rather than 15 times. This ensures that the results are not unnecessarily skewed by the number of offers in a range refusal.

Figure 20 indicates how many offers were typically included in a range refusal instance, by match organ type. For kidney and liver matches, there were most often 11-50 offers in a range refusal, though it was possible for there to be upwards of 1,000 offers in a range refusal instance. Heart-lung matches most often included 11-20 offers in a range refusal, though there could be upwards of 50 offers in some. There were most often 2-10 offers in a range refusal for lung matches, 2-5 offers for kidney-pancreas matches, and 6-10 offers for intestine matches.

Figure 20: Number of organ offers in range refusal post implementation by match organ type, December 02, 2021 - December 01, 2022
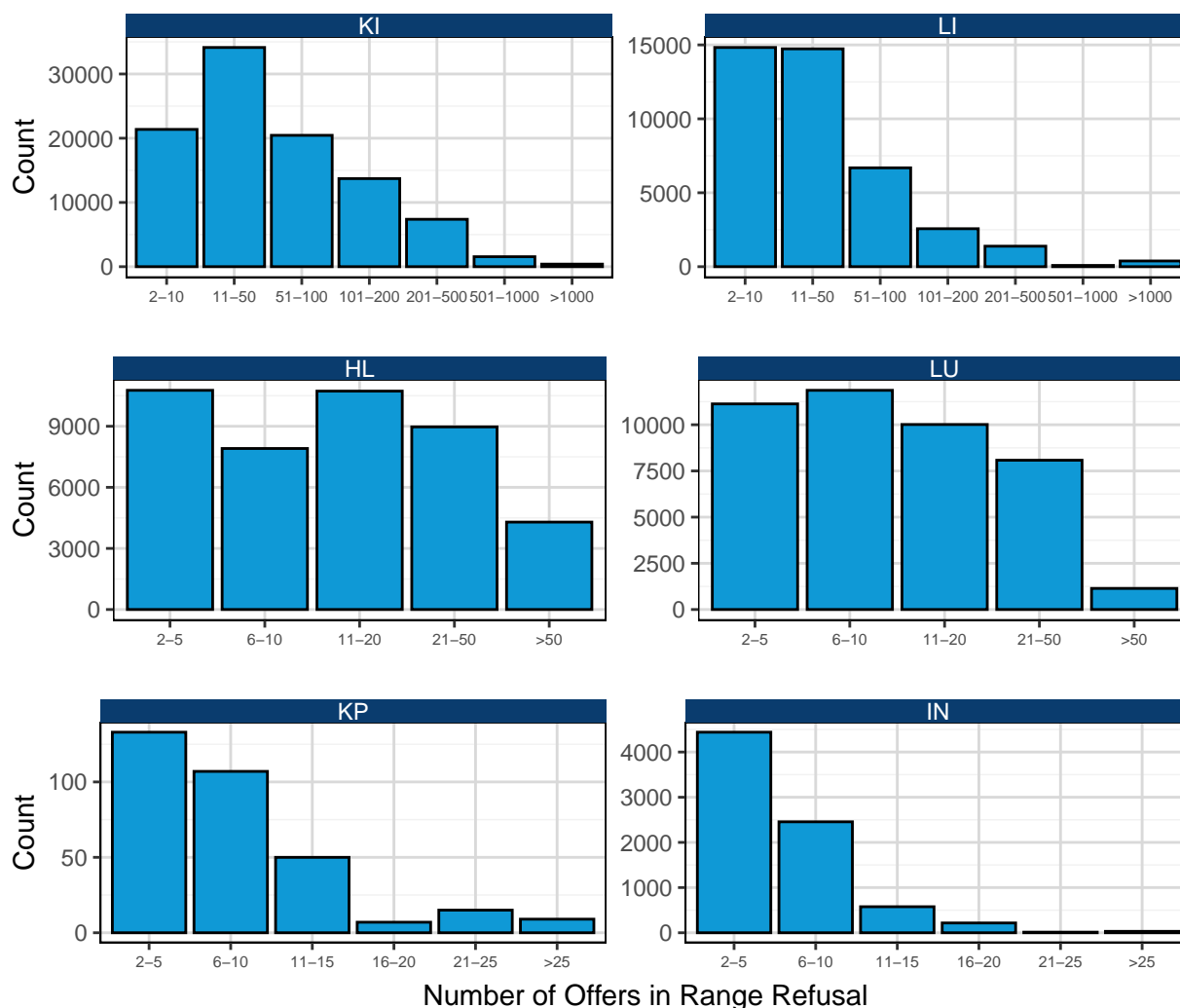
By Organ

Figure 21: Percentage of Covid-19 range refusal codes among all codes December 02, 2021 - December 01, 2022, by organ.

Figure 22: Top ten reasons for refusal of range refused kidney match organ offers for transplant candidates post implementation, for kidney matches submitted December 02, 2021 - December 01, 2022.

Figure 23: Top ten reasons for refusal of range refused liver match organ offers for transplant candidates post implementation, for liver matches submitted December 02, 2021 - December 01, 2022.

Figure 24: Top ten reasons for refusal of range refused heart and heart-lung match organ offers for transplant candidates post implementation, for heart and heart-lung matches submitted December 02, 2021 - December 01, 2022.

Figure 25: Top ten reasons for refusal of range refused lung match organ offers for transplant candidates post implementation, for lung matches submitted December 02, 2021 - December 01, 2022.

Figure 26: Top ten reasons for refusal of range refused kidney-pancreas match organ offers for transplant candidates post implementation, for kidney-pancreas matches submitted December 02, 2021 - December 01, 2022.

Figure 27: Top ten reasons for refusal of range refused intestine match organ offers for transplant candidates post implementation, for intestine matches submitted December 02, 2021 - December 01, 2022.

By Program Size

Figure 28: Top five reasons for refusal of range refused kidney match organ offers for transplant candidates post implementation stratified by program size, for kidney matches submitted December 02, 2021 - December 01, 2022. Program size defined by volume of deceased donor kidney transplants during 2020.
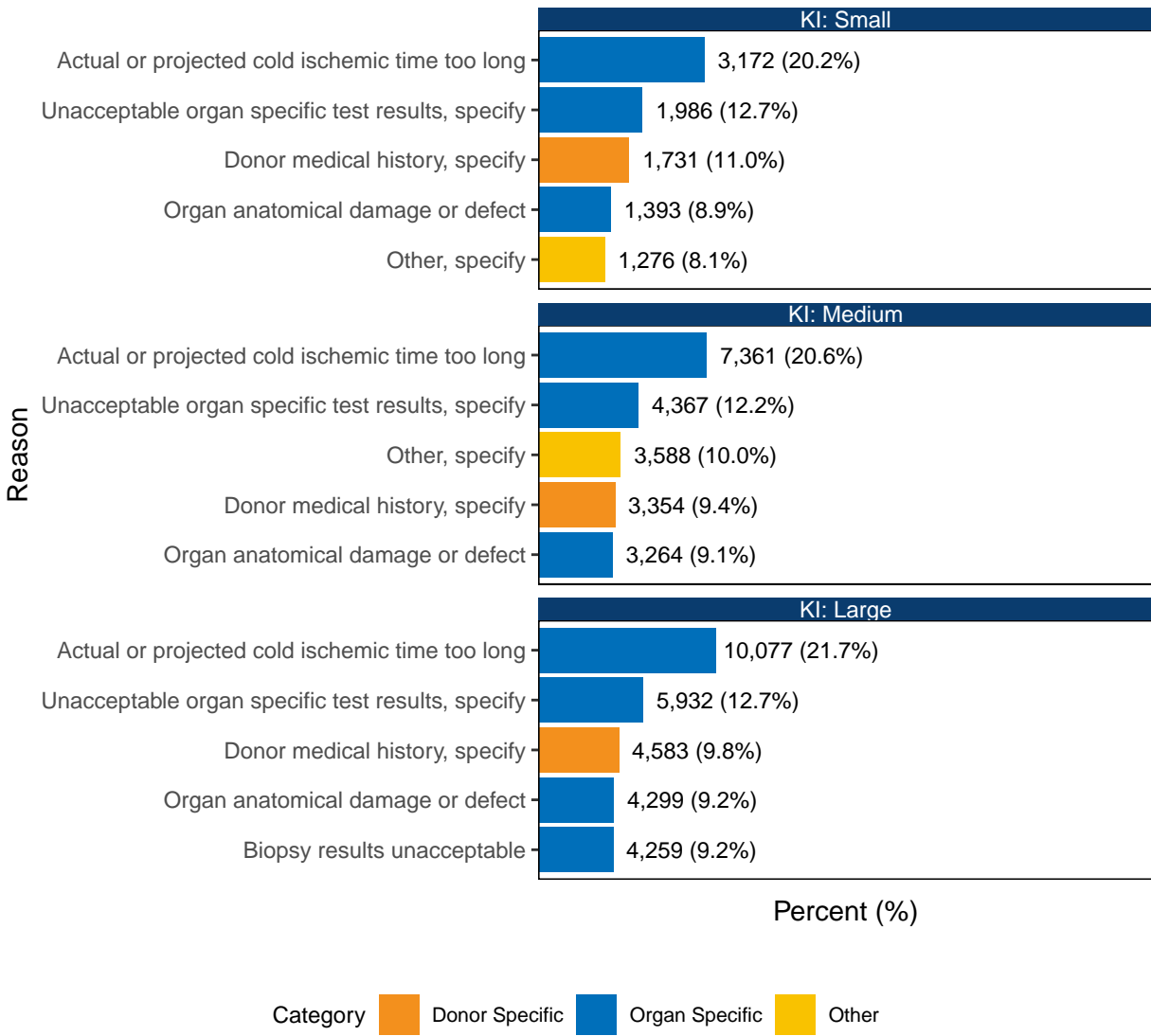
Figure 29: Top five reasons for refusal of range refused liver match organ offers for transplant candidates post implementation stratified by program size, for liver matches submitted December 02, 2021 - December 01, 2022. Program size defined by volume of deceased donor liver transplants during 2020.
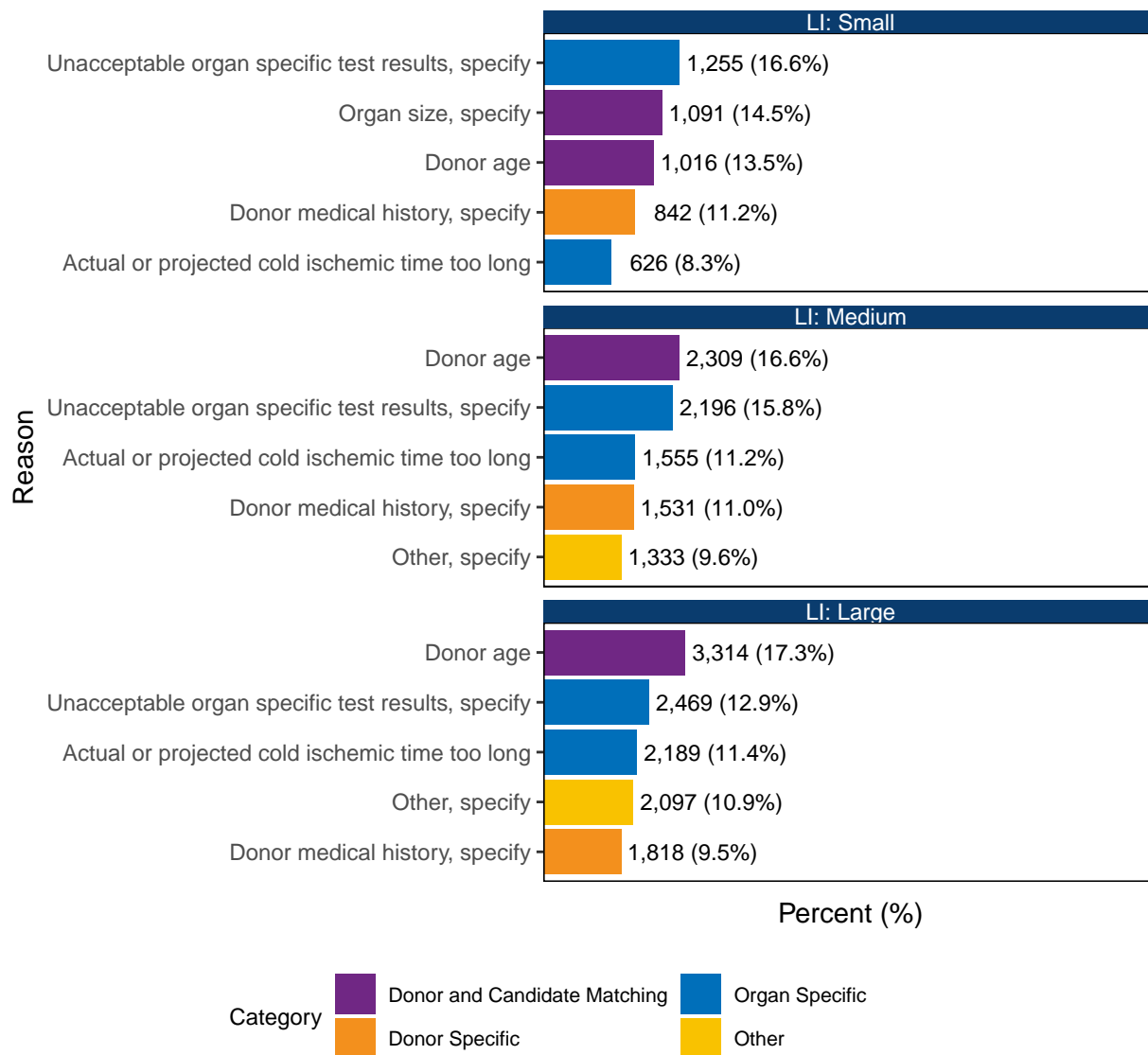
Figure 30: Top five reasons for refusal of range refused heart and heart-lung match organ offers for transplant candidates post implementation stratified by program size, for heart and heart-lung matches submitted December 02, 2021 - December 01, 2022. Program size defined by volume of deceased donor heart and heart-lung transplants during 2020.
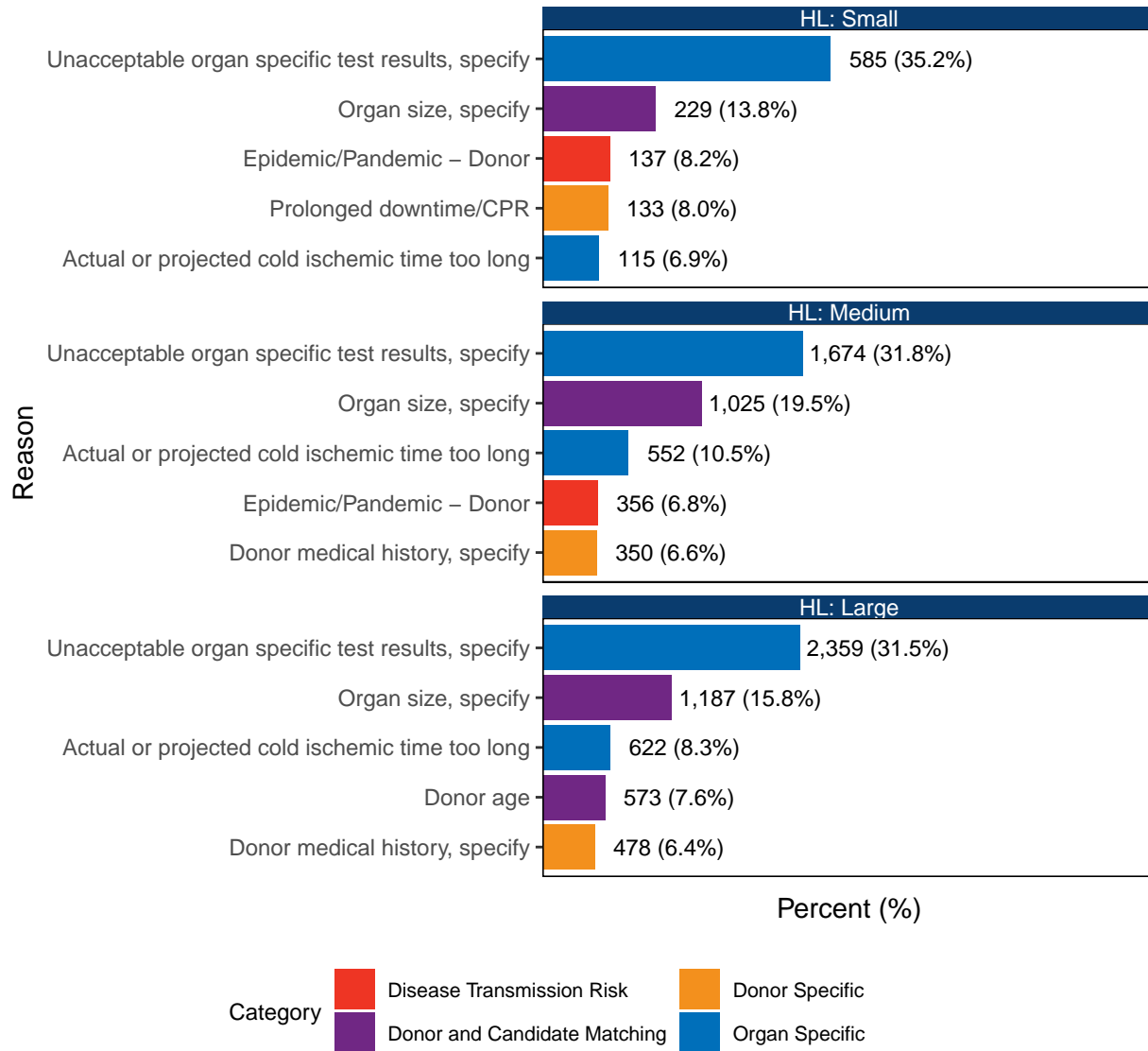
Figure 31: Top five reasons for refusal of range refused lung match organ offers for transplant candidates post implementation stratified by program size, for lung matches submitted December 02, 2021 - December 01, 2022. Program size defined by volume of deceased donor lung transplants during 2020.
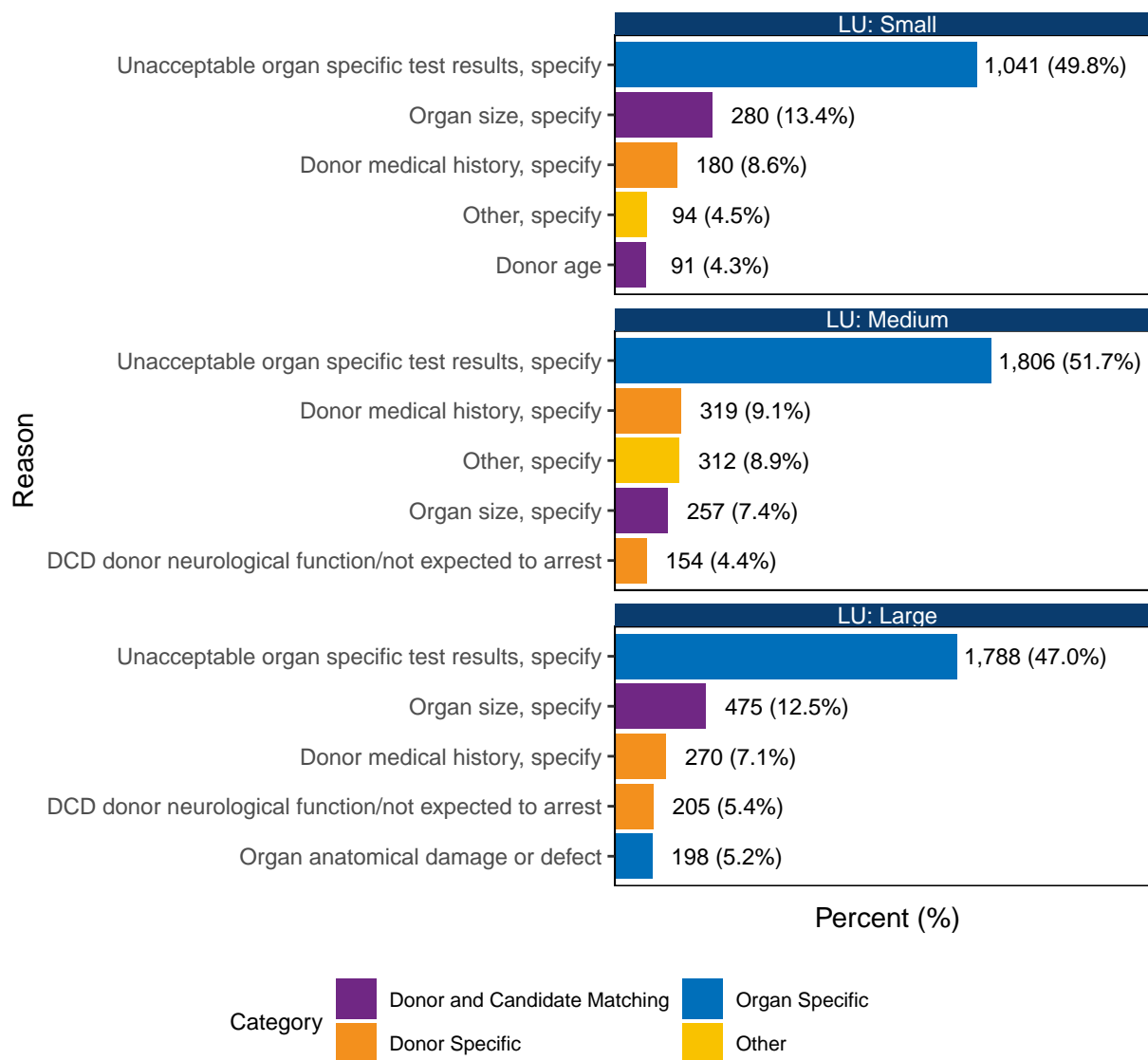
By Sequence Number

Figure 32: Top five reasons for refusal of range refused kidney match organ offers for transplant candidates post implementation stratified by match acceptance number, for kidney matches submitted December 02, 2021 - December 01, 2022. Group was defined by the 90th percentile of sequence numbers for acceptances on kidney matches during 2020.
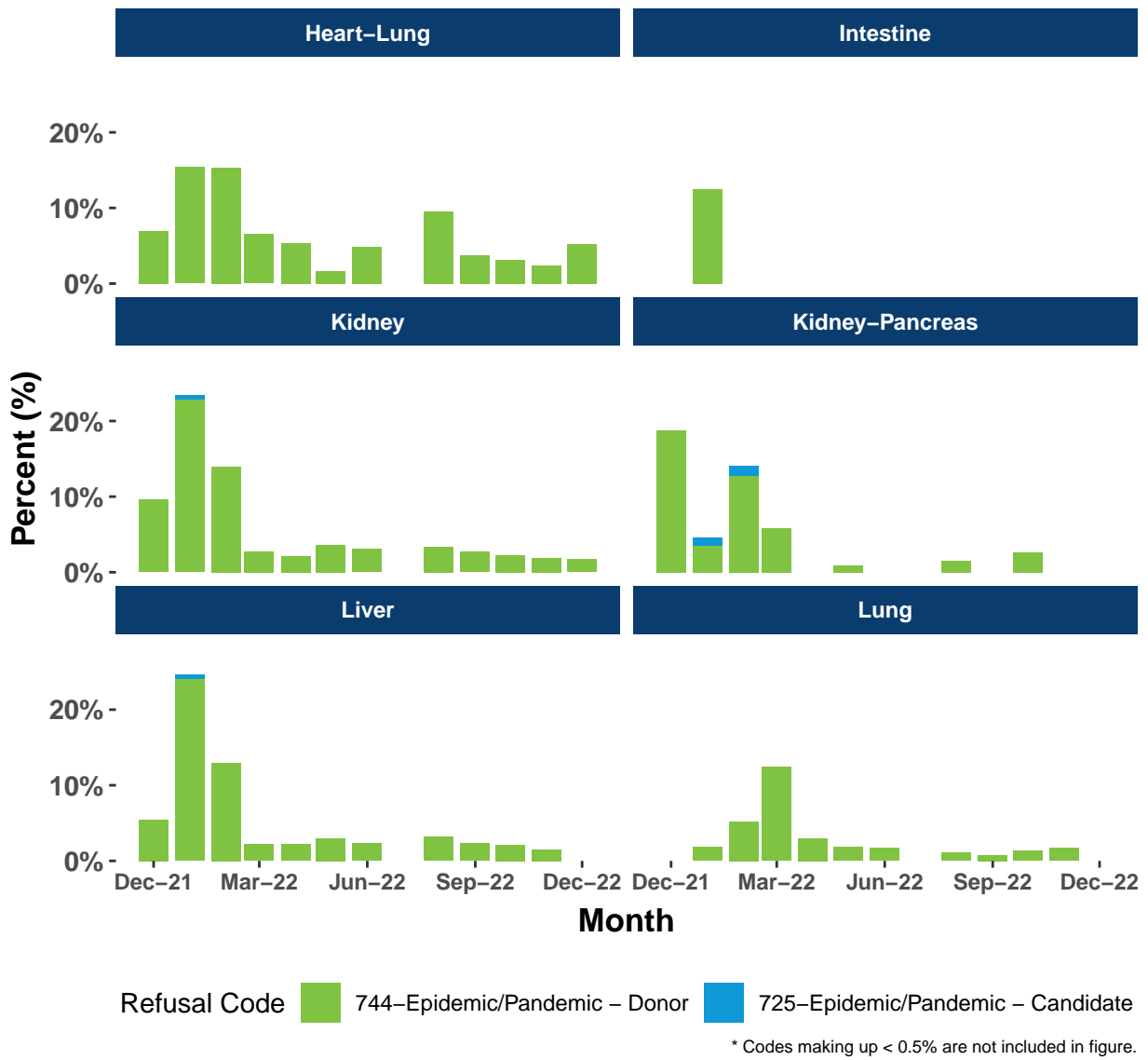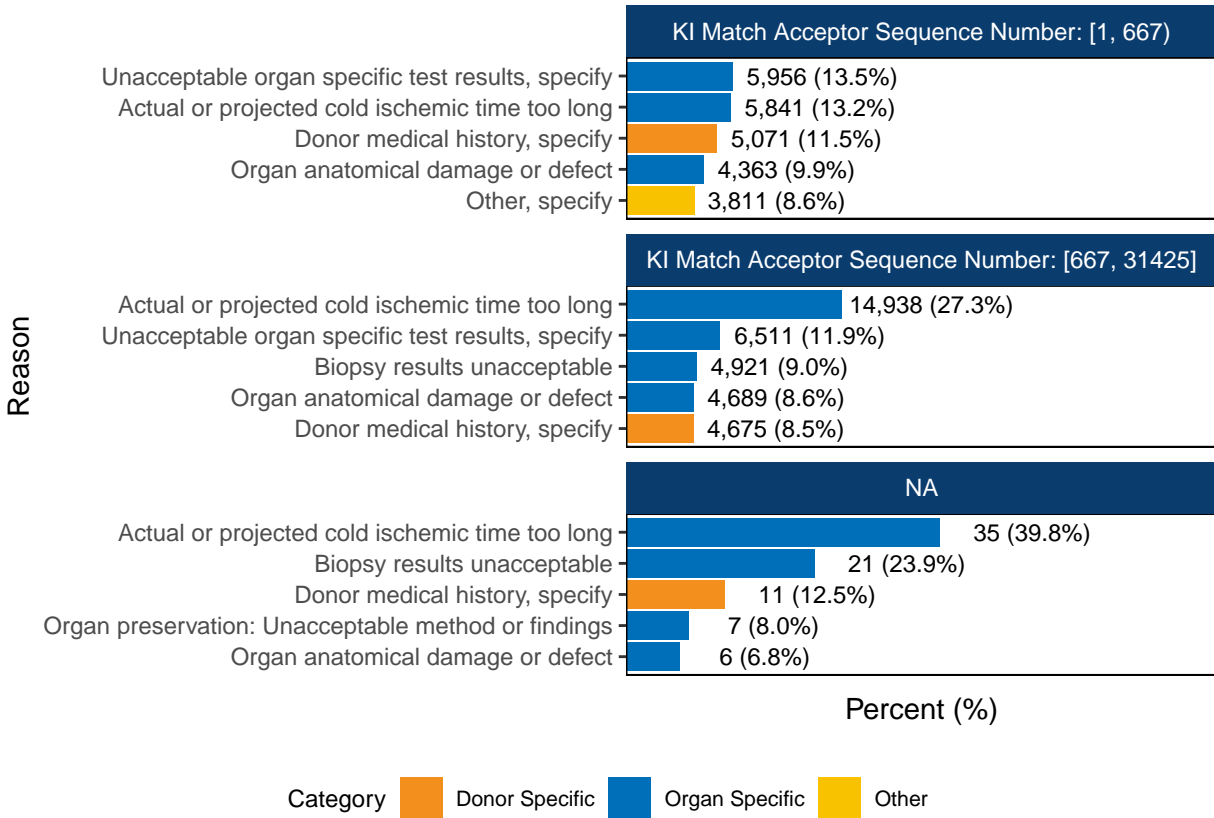
Figure 33: Top five reasons for refusal of range refused liver match organ offers for transplant candidates post implementation stratified by match acceptance number, for liver matches submitted December 02, 2021 - December 01, 2022. Group was defined by the 90th percentile of sequence numbers for acceptances on liver matches during 2020.
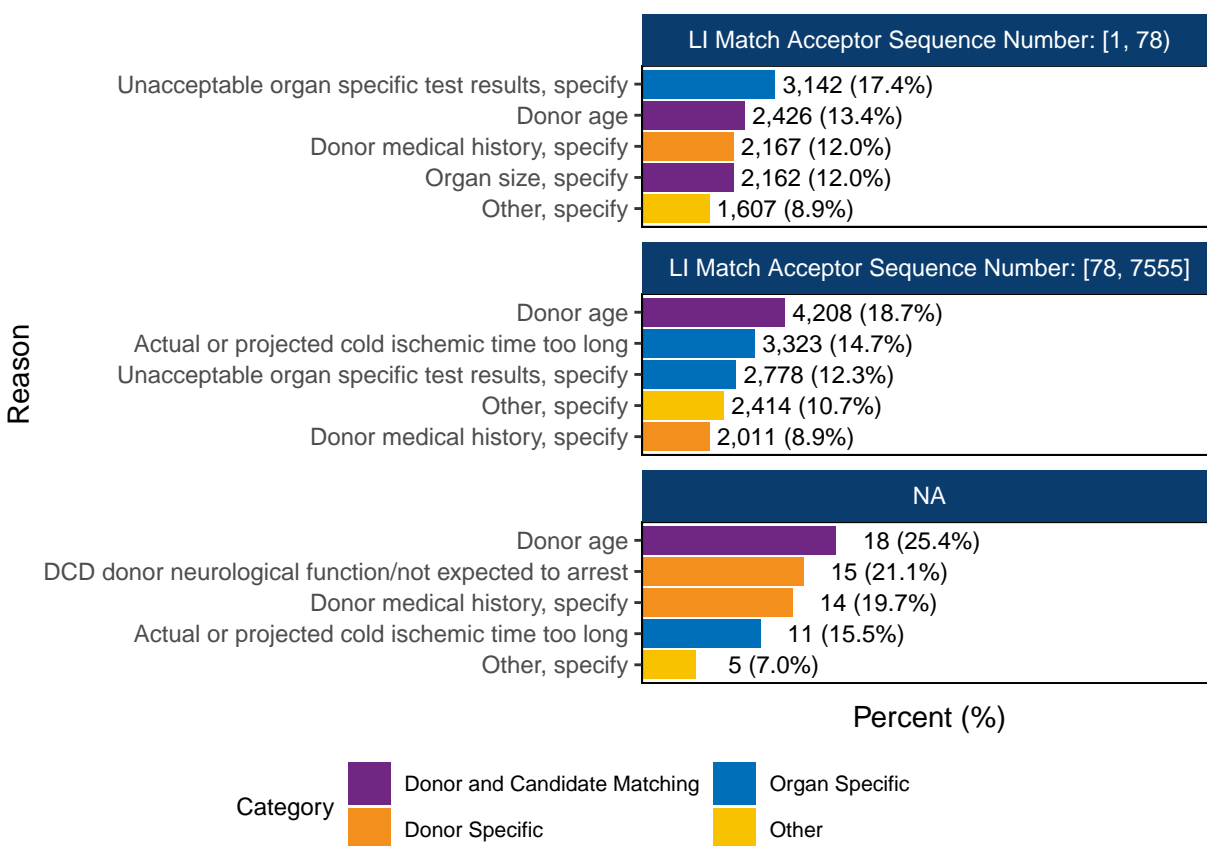
Figure 34: Top five reasons for refusal of range refused heart and heart-lung match organ offers for transplant candidates post implementation stratified by match acceptance number, for heart and heart-lung matches submitted December 02, 2021 - December 01, 2022. Group was defined by the 90th percentile of sequence numbers for acceptances on heart and heart-lung matches during 2020.
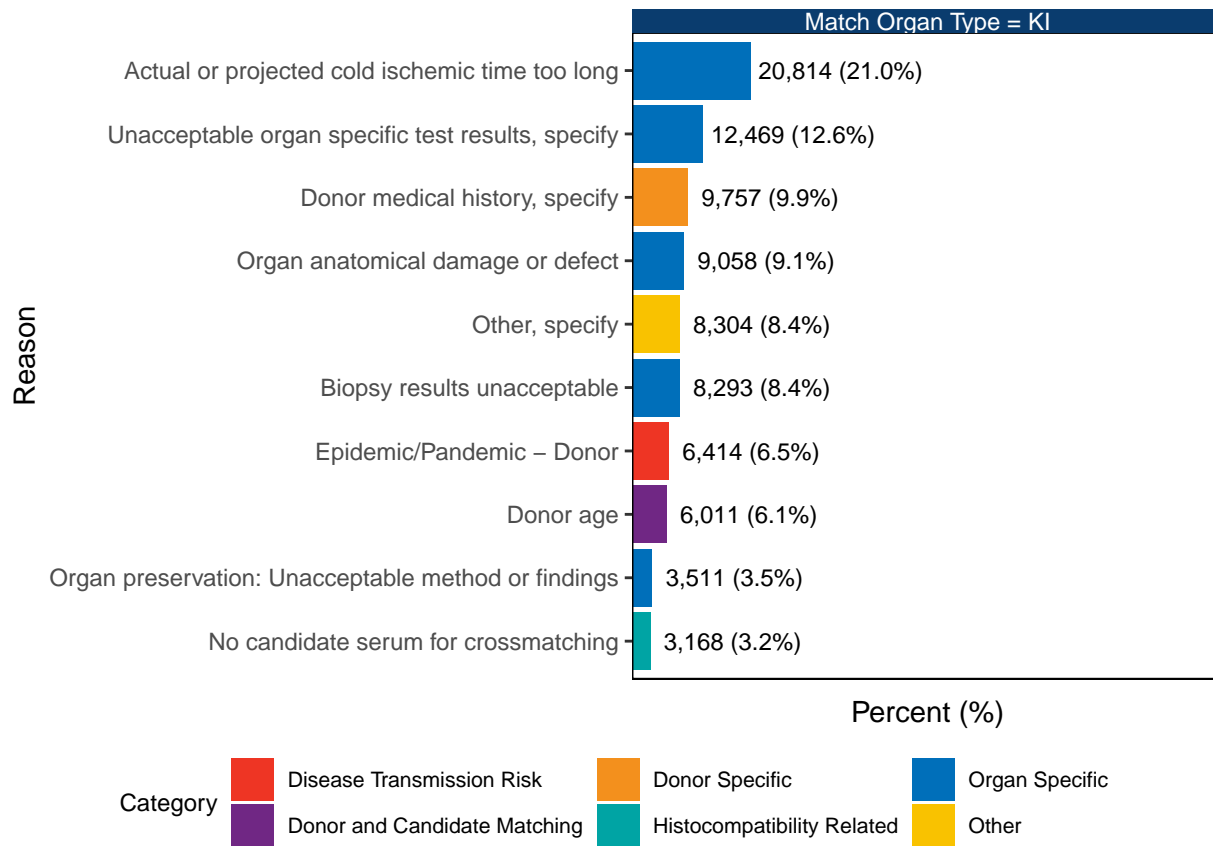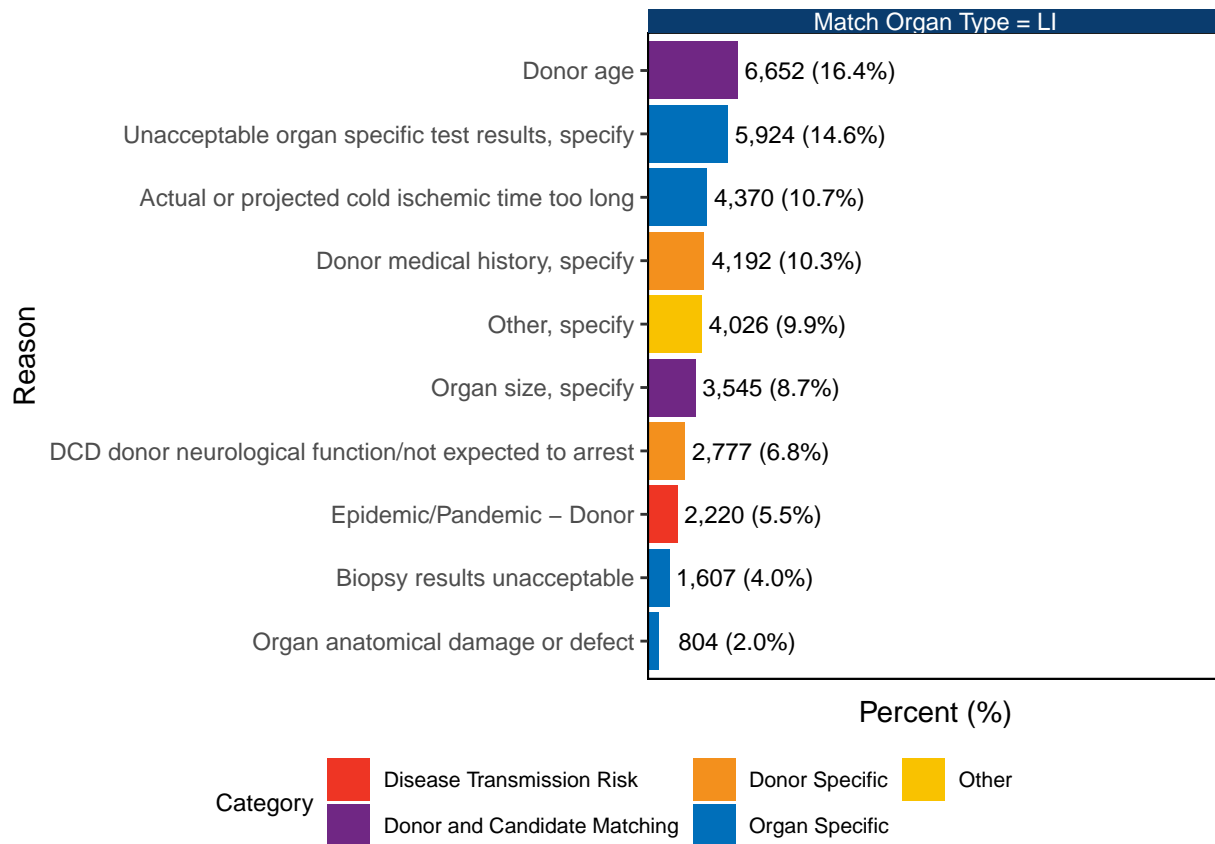
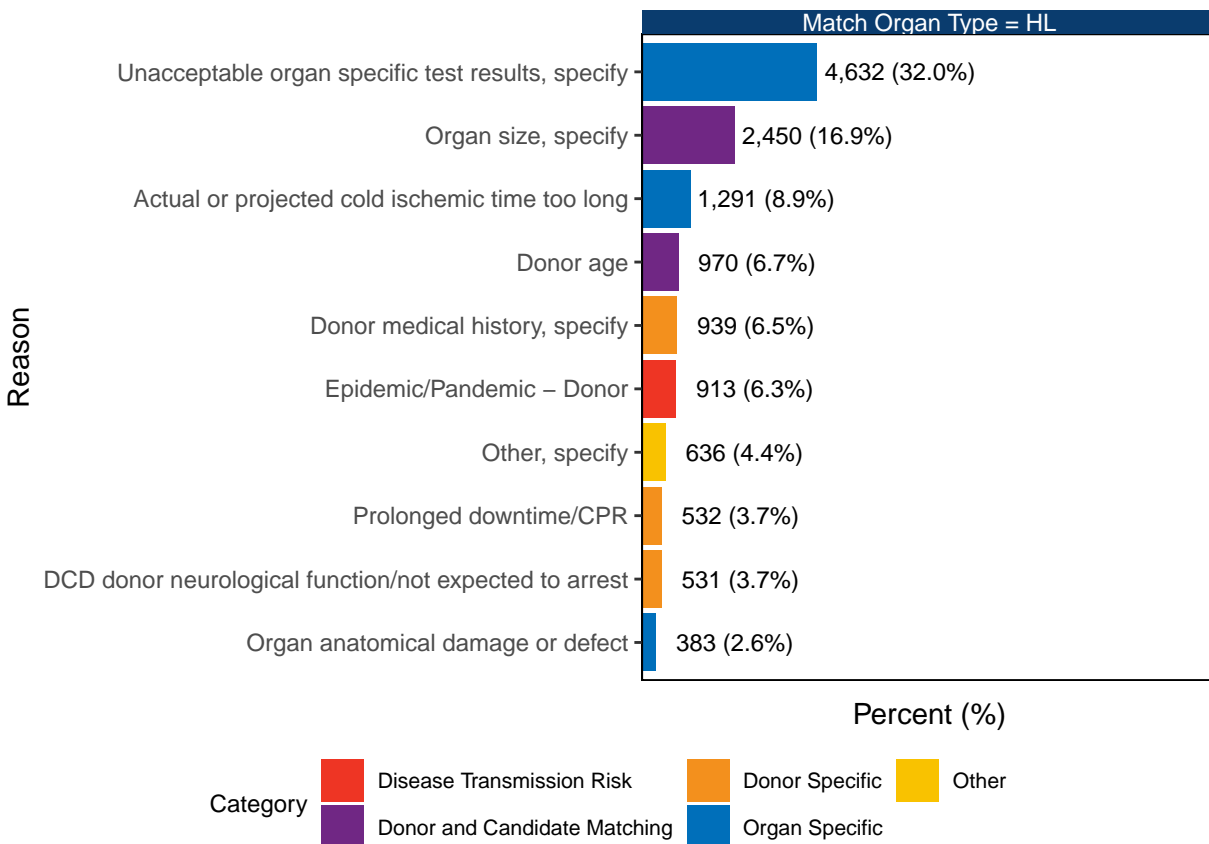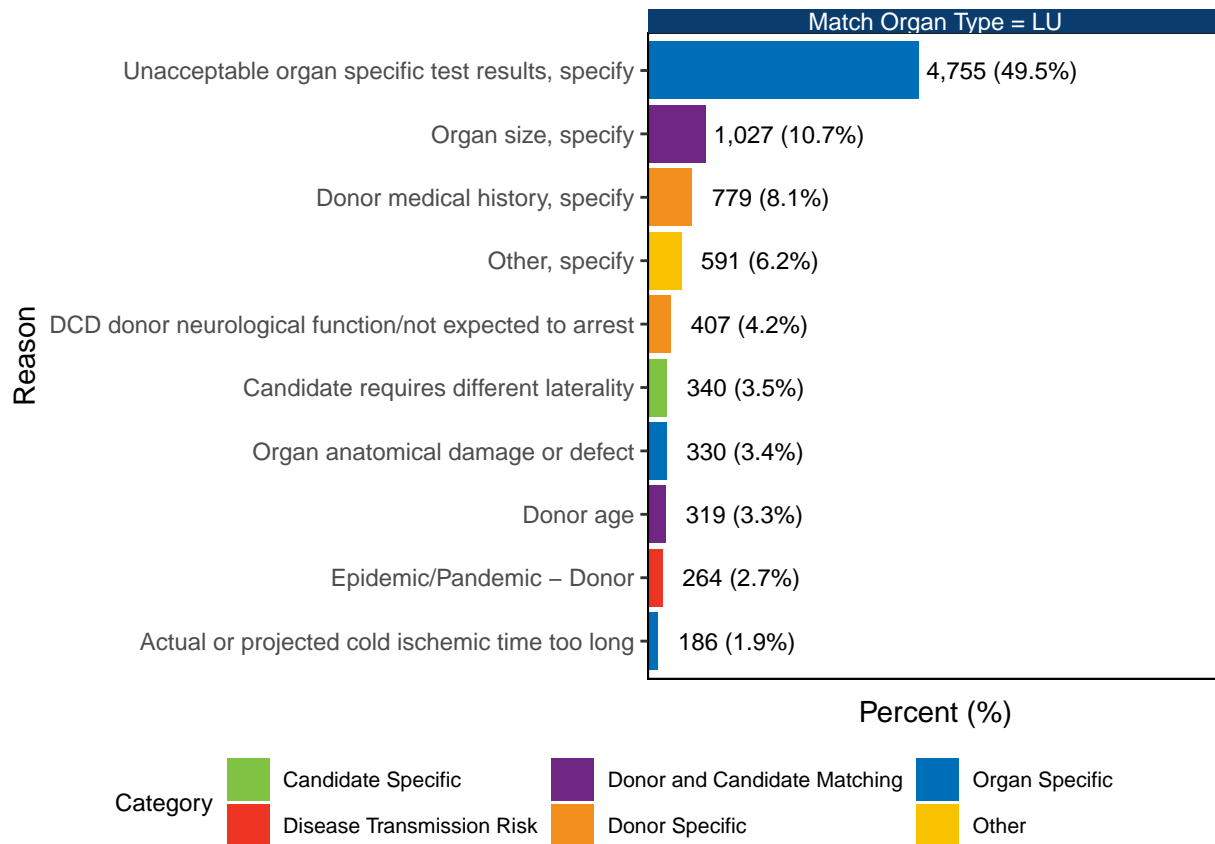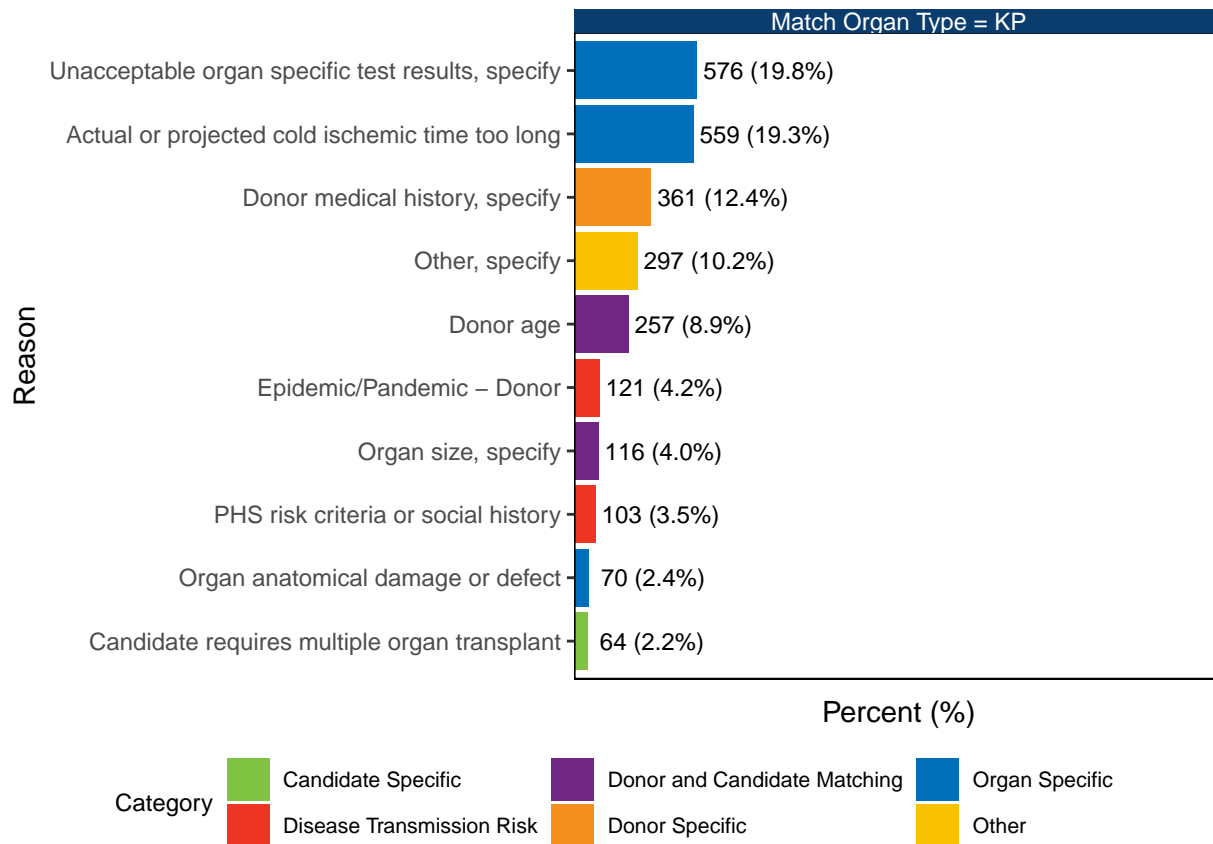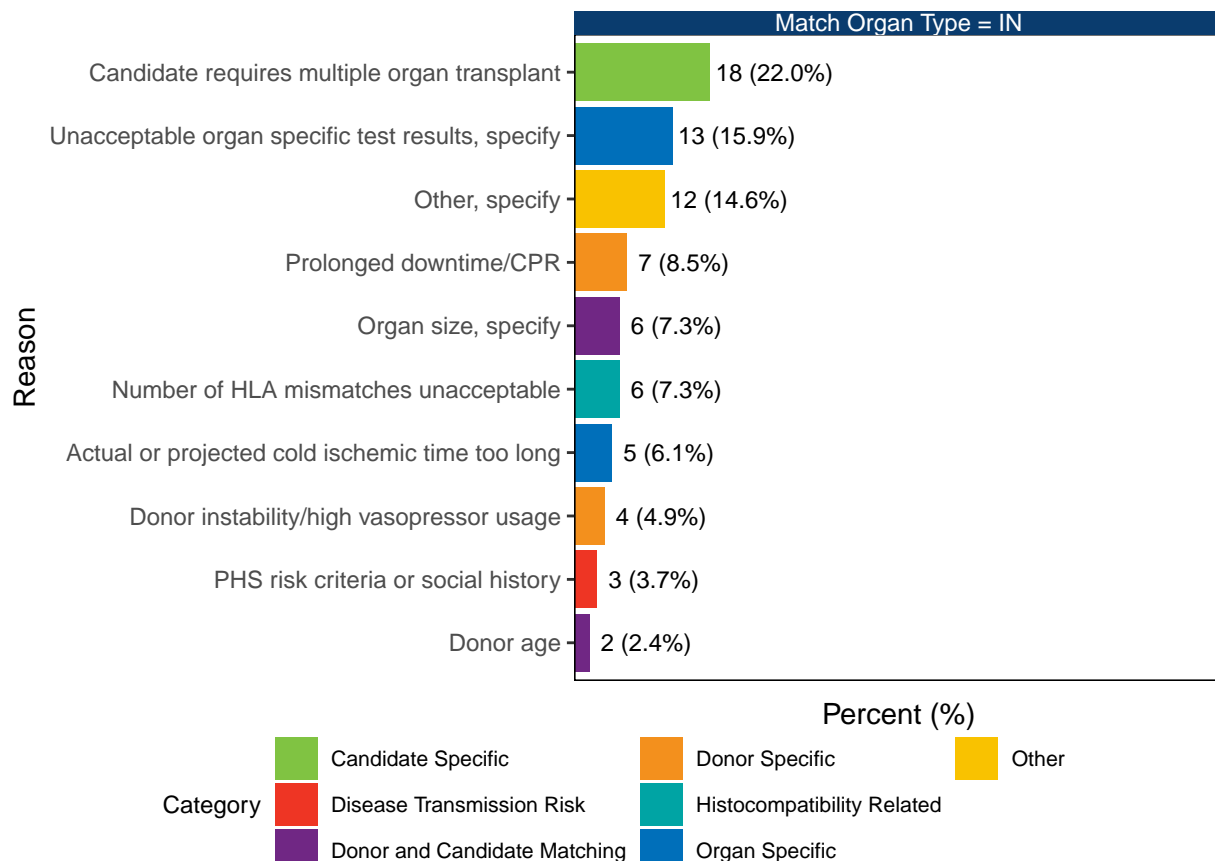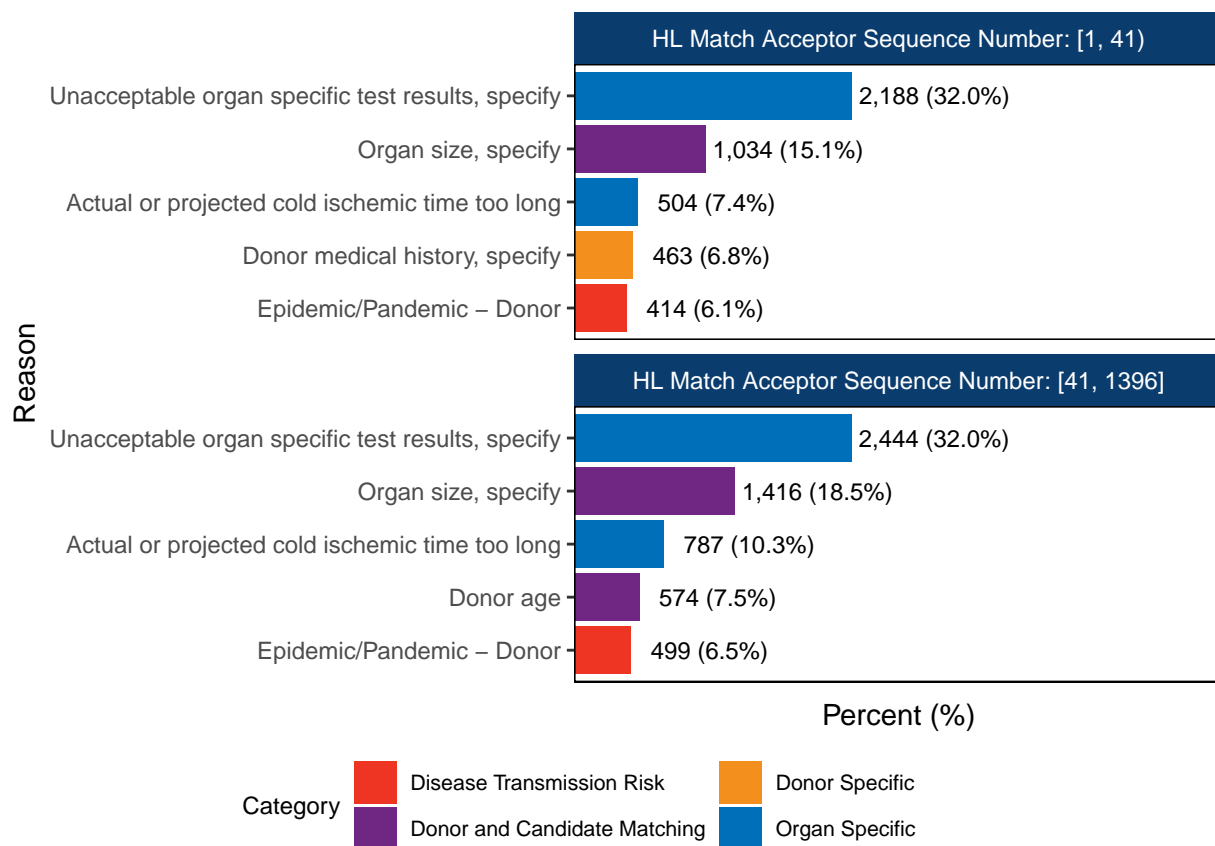Figure 35: Top five reasons for refusal of range refused lung match organ offers for transplant candidates post implementation stratified by match acceptance number, for lung matches submitted December 02, 2021 - December 01, 2022. Group was defined by the 90th percentile of sequence numbers for acceptances on lung matches during 2020.
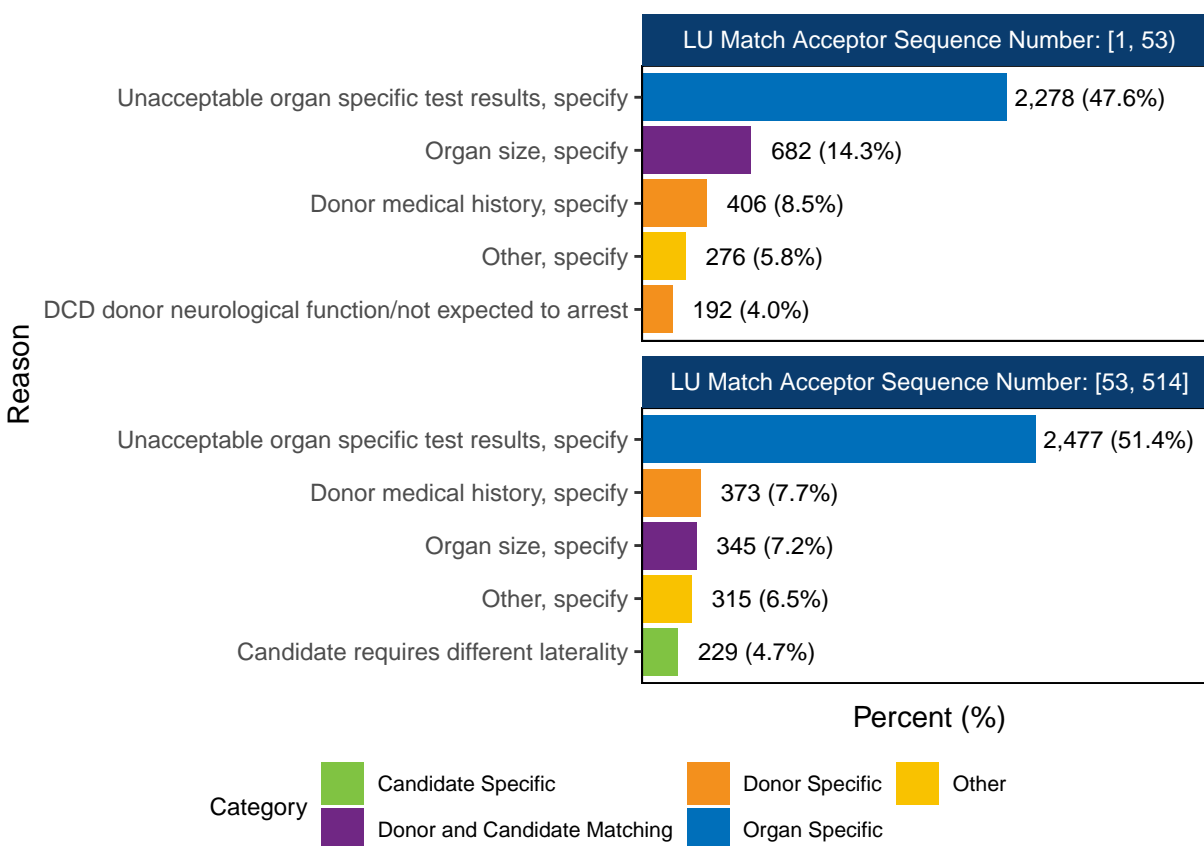
"Other, Specify" Free Text Fields

At the request of the DAC, this report also includes an analysis of the use of "Other, specify" organ refusal reasons. We carried out this analysis by analyzing the most frequent word use of any free text entered by the user for a primary or secondary "Other, specify" refusal code for all match types. These codes included:

- 701 - Organ size, specify
- 750 - Donor medical history, specify
- 717 - Unacceptable organ specific test results, specify
- 798 - Other, specify

Note that this analysis was restricted to the post-policy era. Range refusal text was limited to one observation per unique donor and listing center. Standard natural language processing (NLP) pre-processing techniques were used to standardize the free text, accounting for capitalization variation, removing common English words, and removing punctuation, numerals, and additional spacing.

For each included refusal code and match type, an aggregated table of the top 10 words entered, along with a wordcloud displaying the top 20 words entered, is presented below. Note that due to very small numbers, analysis of words reported commonly for IN matches has not been reported here.

701: Organ size, specify

The following graphs and tables report free text words most commonly found in the **701: Organ size, specify** field by organ. Words commonly used in these free text blocks did, in fact, tend to cluster around physical descriptions of size, including "small", "large", "undersized", "bmi", "big", "height", etc., suggesting that the more common responses in this field are providing more detail about the nature of the organ size issue that led to the refusal.

Table 9: Top ten words in free text for refusal code 701 and match type KI

Word	Frequency
small	384
donor	250
size	135
weight	66
kidney	45
kidneys	42
bmi	38
recipient	35
pediatric	30
dcd	29

Figure 36: Top twenty words in free text for refusal code 701 and match type KI

Table 10: Top ten words in free text for refusal code 701 and match type KP

Word	Frequency
bmi	35
donor	20
small	19
size	13
high	3
weight	1
recips	1
match	1
mis	1
mismatch	1

Figure 37: Top twenty words in free text for refusal code 701 and match type KP

Table 11: Top ten words in free text for refusal code 701 and match type LI

Word	Frequency
bmi	579
donor	396
big	254
large	234
size	176
small	129
liver	123
recipient	100
dcd	79
organ	66

Figure 38: Top twenty words in free text for refusal code 701 and match type LI
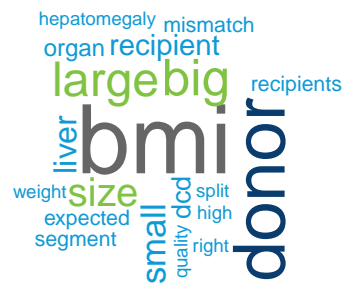
Table 12: Top ten words in free text for refusal code 701 and match type HR

Word	Frequency
small	158
donor	108
female	47
size	47
male	33
recipient	23
mismatch	19
recipients	17
mass	17
cardiac	16

Figure 39: Top twenty words in free text for refusal code 701 and match type HR
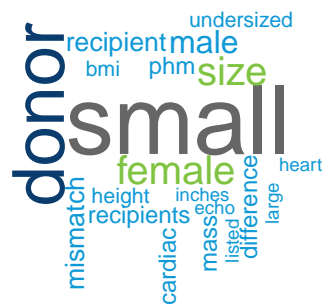
Table 13: Top ten words in free text for refusal code 701 and match type LU

Word	Frequency
big	75
size	72
donor	65
large	65
small	58
lung	52
recipient	36
measurements	34
lungs	25
mismatch	24

Figure 40: Top twenty words in free text for refusal code 701 and match type LU

Table 14: Top ten words in free text for refusal code 701 and match type HL

Word	Frequency
small	377
donor	271
size	154
female	150
male	94
mismatch	76
recipient	74
mass	56
phm	54
cardiac	47

Figure 41: Top twenty words in free text for refusal code 701 and match type HL
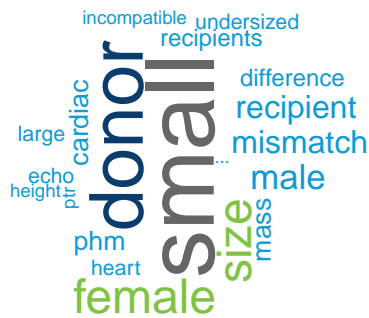
750: Donor medical history, specify

The following graphs and tables report free text words most commonly found in the **750: Donor medical history, specify** field by organ. Words commonly used in this field varied considerably by organ type, but largely included clinical terms that appear to describe things like smoking, drug or alcohol history, circumstances that led to the death (i.e. "trauma", "cardiac arrest", "dcd"), or risk of co-occurring infection or comorbidity (e.g. "htn", "asthma", "insulin", "lvh", etc.).

Table 15: Top ten words in free text for refusal code 750 and match type KI

Word	Frequency
htn	1753
kdpi	1102
dcd	818
creatinine	715
age	437
elevated	419
quality	418
history	393
crrt	383
kidney	328

Figure 42: Top twenty words in free text for refusal code 750 and match type KI
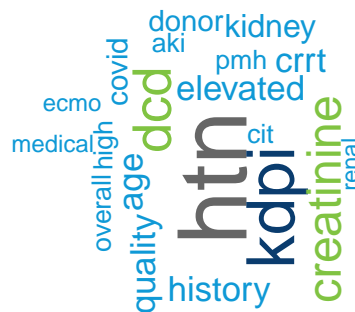
Table 16: Top ten words in free text for refusal code 750 and match type KP

Word	Frequency
etoh	39
use	27
history	24
bmi	23
drug	19
elevated	19
htn	16
heavy	16
insulin	15
abuse	14

Figure 43: Top twenty words in free text for refusal code 750 and match type KP
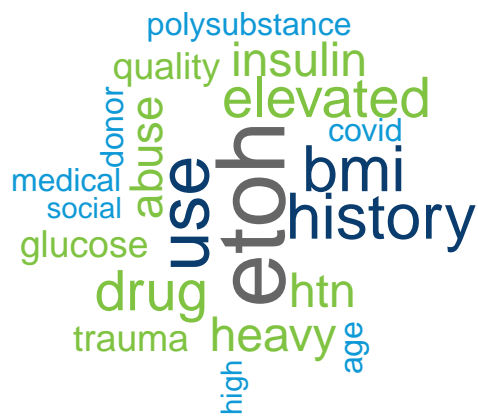
Table 17: Top ten words in free text for refusal code 750 and match type LI

Word	Frequency
etoh	379
quality	365
htn	333
bmi	312
dcd	253
overall	210
history	210
age	181
liver	179
donor	166

Figure 44: Top twenty words in free text for refusal code 750 and match type LI

Table 18: Top ten words in free text for refusal code 750 and match type HR

Word	Frequency
quality	38
use	27
history	21
cath	20
echo	20
cardiac	18
htn	18
drug	17
unknown	15
arrest	14

Figure 45: Top twenty words in free text for refusal code 750 and match type HR

Table 19: Top ten words in free text for refusal code 750 and match type LU

Word	Frequency
smoking	154
history	77
quality	65
asthma	64
pack	27
smoker	24
covid	24
overall	23
sternotomy	23
lung	22

Figure 46: Top twenty words in free text for refusal code 750 and match type LU

Table 20: Top ten words in free text for refusal code 750 and match type HL

Word	Frequency
quality	66
history	60
use	52
drug	43
echo	42
htn	42
unknown	38
endocarditis	35
abuse	33
cath	32

Figure 47: Top twenty words in free text for refusal code 750 and match type HL

717: Unacceptable organ specific test results, specify

The following graphs and tables report free text words most commonly found in the **717: Unacceptable organ specific test results, specify** field by organ. Words used in these fields generally indicated varied clinical test results indicating a potential issue with the organ (e.g. "glucose", "lipase", "sternotomy", "troponin", "amylaes", "labs", etc.).

Table 21: Top ten words in free text for refusal code 717 and match type KI

Word	Frequency
creatinine	3540
elevated	1369
pump	1152
kdpi	749
numbers	740
high	540
crrt	391
poor	301
terminal	284
dcd	268

Figure 48: Top twenty words in free text for refusal code 717 and match type KI

Table 22: Top ten words in free text for refusal code 717 and match type KP

Word	Frequency
elevated	106
creatinine	71
lipase	50
amylase	40
labs	29
insulin	17
high	17
glucose	16
blood	14
sugars	13

Figure 49: Top twenty words in free text for refusal code 717 and match type KP
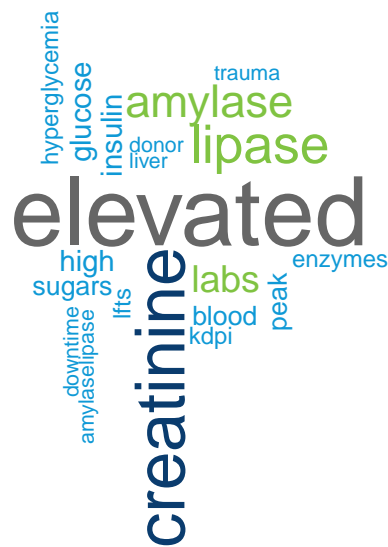
Table 23: Top ten words in free text for refusal code 717 and match type LI

Word	Frequency
lfts	721
elevated	679
liver	659
steatosis	448
fatty	344
hepatic	298
enzymes	196
labs	186
imaging	185
results	154

Figure 50: Top twenty words in free text for refusal code 717 and match type LI
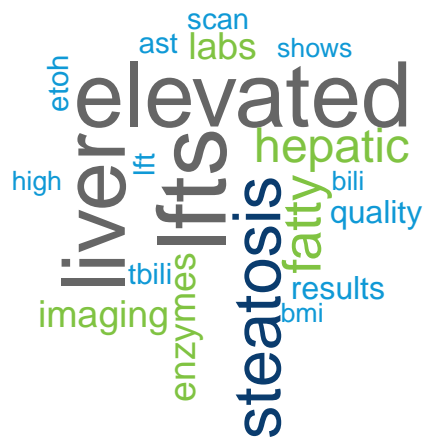
Table 24: Top ten words in free text for refusal code 717 and match type HR

Word	Frequency
echo	295
cath	176
lvh	93
quality	66
results	57
cad	57
elevated	57
troponin	49
mild	42
poor	39

Figure 51: Top twenty words in free text for refusal code 717 and match type HR

Table 25: Top ten words in free text for refusal code 717 and match type LU

Word	Frequency
chest	352
imaging	289
bronch	236
cxr	218
poor	196
pneumonia	187
quality	170
aspiration	149
results	147
bilateral	143

Figure 52: Top twenty words in free text for refusal code 717 and match type LU

Table 26: Top ten words in free text for refusal code 717 and match type HL

Word	Frequency
echo	917
cath	392
lvh	239
elevated	158
results	144
quality	132
troponin	124
low	117
poor	111
cad	110

Figure 53: Top twenty words in free text for refusal code 717 and match type HL
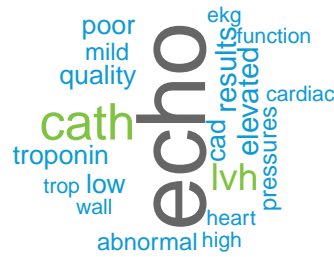
798: Other, specify

The following graphs and tables report free text words most commonly found in the **717: Other, specify** field by organ. Words captured in this field did seem to vary by theme, with some suggestion that perhaps another listed refusal code would have been more appropriate (e.g. "cit", "dcd", "quality", "anatomy", "kdpi", "distance", "import", "age", "bmi", "covid", "echo", "time", "smoking", "downtime"). Use of this field in particular should be monitored to determine if there are opportunities for further revision of this option as a refusal code.

Table 27: Top ten words in free text for refusal code 798 and match type KI

Word	Frequency
criteria	1563
kdpi	1481
dcd	1424
cit	1333
meet	1057
center	1013
pump	868
quality	804
donor	554
anatomy	519

Figure 54: Top twenty words in free text for refusal code 798 and match type KI

Table 28: Top ten words in free text for refusal code 798 and match type KP

| Word	Frequency
import	53
quality	45
non	43
distance	28
donor	20
elevated	19
insulin	15
offer	13
criteria	12
dcd	11

Figure 55: Top twenty words in free text for refusal code 798 and match type KP
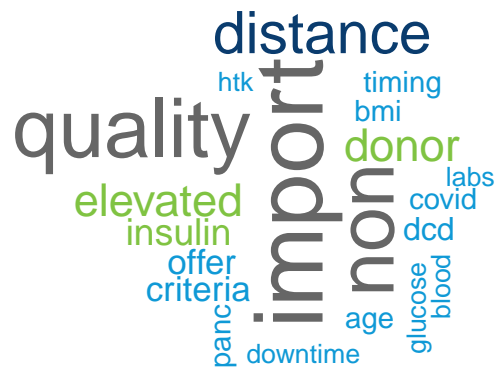
Table 29: Top ten words in free text for refusal code 798 and match type LI

Word	Frequency
dcd	1020
quality	839
donor	319
age	314
distance	294
criteria	271
liver	227
overall	196
bmi	171
covid	145

Figure 56: Top twenty words in free text for refusal code 798 and match type LI
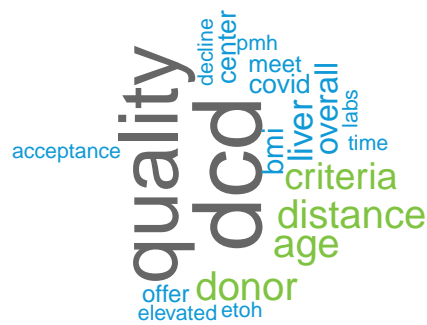
Table 30: Top ten words in free text for refusal code 798 and match type HR

Word	Frequency
quality	79
dcd	46
donor	36
distance	35
time	31
covid	28
heart	22
overall	20
elevated	11
echo	11

Figure 57: Top twenty words in free text for refusal code 798 and match type HR

Table 31: Top ten words in free text for refusal code 798 and match type LU

Word	Frequency
quality	197
dcd	47
lung	46
donor	35
chest	25
bilateral	23
overall	22
covid	21
offer	18
smoking	17

Figure 58: Top twenty words in free text for refusal code 798 and match type LU
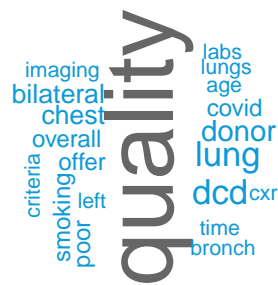
Table 32: Top ten words in free text for refusal code 798 and match type HL

Word	Frequency
quality	109
dcd	76
donor	61
distance	39
time	38
echo	35
overall	33
unknown	32
downtime	32
heart	27

Figure 59: Top twenty words in free text for refusal code 798 and match type HL

Summary

Thus far, it does not appear that any one code has replaced the previously popular "860: Donor age and quality" code across all organs, as no code now comprises the majority of the refusal reasons that code did pre-implementation. There are some differences in the most frequently used reasons for refusal by organ, program size, and whether the last acceptor on a match is within the 90th percentile or not. This also holds true for range refusals.

Furthermore, while common terms used in the more specific "other, specify" codes (i.e. "701: Organ size, specify", "750: Donor medical history, specify", and "717: Unacceptable organ specific test results, specify") largely seemed to reflect those specific themes, suggesting that free text responses are being provided appropriately, the responses in "798: Other, specify" often contained words that at least suggest that other, more specific and informative codes could have been selected. The utility of this more vaguely-defined free text field should be further considered over time.

The implementation of these new refusal reasons appears to have accomplished its goals of providing more relevant, discrete, and mutually exclusive information and promoting the collection of more actionable data. One refusal code no longer dominates refusals across multiple organ types, and the top listed refusal reasons offer more nuanced information than the old **Donor age and quality** code that previously predominated.

Appendix

Table 33: Count and percent of reasons for refusal of kidney match organ offers post implementation stratified by program size, for kidney matches submitted December 02, 2021 - December 01, 2022. Program size is defined by volume of deceased donor kidney transplants during 2020.

Description	Large N	Large %	Medium N	Medium %	Small N	Small %	No Transplants in 2020 N	No Transplants in 2020 %
Actual or projected cold ischemic time too long	444,043	21.2%	156,792	18.7%	35,316	18.4%	1,404	18.0%
Unacceptable organ specific test results, specify	308,950	14.8%	112,597	13.4%	23,432	12.2%	1,721	22.1%
Donor medical history, specify	268,543	12.8%	88,718	10.6%	25,997	13.5%	643	8.2%
Organ anatomical damage or defect	215,034	10.3%	83,501	9.9%	17,554	9.1%	1,071	13.7%
Biopsy results unacceptable	203,166	9.7%	72,120	8.6%	15,360	8.0%	558	7.2%
Other, specify	133,051	6.4%	86,066	10.2%	11,542	6.0%	224	2.9%
Epidemic/Pandemic - Donor	132,508	6.3%	74,757	8.9%	18,325	9.5%	642	8.2%
Donor age	113,457	5.4%	44,626	5.3%	14,896	7.8%	212	2.7%
Organ preservation: Unacceptable method or findings	61,882	3.0%	29,889	3.6%	5,637	2.9%	506	6.5%
Warm ischemic time too long	54,697	2.6%	24,395	2.9%	5,379	2.8%	64	0.8%
Organ size, specify	27,875	1.3%	6,768	0.8%	2,472	1.3%	86	1.1%
Candidate temporarily medically unsuitable	19,696	0.9%	14,206	1.7%	3,373	1.8%	76	1.0%
Biopsy not available	15,965	0.8%	3,941	0.5%	948	0.5%	190	2.4%
Donor infection or positive culture	13,358	0.6%	6,164	0.7%	1,765	0.9%	43	0.6%
Candidate requires multiple organ transplant	12,119	0.6%	3,387	0.4%	724	0.4%	0	0.0%
DCD donor neurological function/not expected to arrest	11,358	0.5%	4,804	0.6%	1,171	0.6%	57	0.7%
Organ specific test results not available, specify	11,119	0.5%	4,420	0.5%	1,032	0.5%	21	0.3%
Malignancy or suspected malignancy	9,656	0.5%	5,763	0.7%	1,064	0.6%	7	0.1%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	6,906	0.3%	2,462	0.3%	615	0.3%	77	1.0%
PHS risk criteria or social history	4,799	0.2%	945	0.1%	1,524	0.8%	69	0.9%
Candidate transplanted or pending transplant	3,425	0.2%	1,367	0.2%	425	0.2%	34	0.4%
Positive virtual crossmatch/unacceptable antigens	3,279	0.2%	1,593	0.2%	410	0.2%	21	0.3%
No candidate serum for crossmatching	2,490	0.1%	2,686	0.3%	325	0.2%	5	0.1%
Candidate refused	2,381	0.1%	917	0.1%	451	0.2%	26	0.3%
Donor instability/high vasopressor usage	1,513	0.1%	886	0.1%	204	0.1%	0	0.0%
Candidate unavailable	1,412	0.1%	792	0.1%	293	0.2%	5	0.1%
Transplant team or transplant facility availability	1,280	0.1%	424	0.1%	311	0.2%	10	0.1%
Epidemic/Pandemic - Candidate	1,076	0.1%	1,273	0.2%	293	0.2%	4	0.1%
Positive physical crossmatch	1,041	0.0%	643	0.1%	162	0.1%	5	0.1%
Candidate temporarily ineligible due to insurance or financial issue	742	0.0%	357	0.0%	102	0.1%	2	0.0%
Number of HLA mismatches unacceptable	634	0.0%	156	0.0%	208	0.1%	3	0.0%
Disaster Emergency Management Consideration	576	0.0%	334	0.0%	1	0.0%	0	0.0%
Prolonged downtime/CPR	576	0.0%	1,323	0.2%	468	0.2%	7	0.1%
Resource time constraint (OPO, TXC, donor hospital, etc.)	558	0.0%	357	0.0%	103	0.1%	0	0.0%
Exceeded policy defined response time	238	0.0%	154	0.0%	52	0.0%	2	0.0%
No donor cells/specimen for crossmatching, or no time for crossmatch	185	0.0%	123	0.0%	142	0.1%	0	0.0%
Transportation availability	176	0.0%	16	0.0%	17	0.0%	0	0.0%
Candidate requires different laterality	121	0.0%	89	0.0%	12	0.0%	0	0.0%
Candidate's condition improved, transplant not needed	36	0.0%	25	0.0%	7	0.0%	0	0.0%
Recovery team availability	31	0.0%	43	0.0%	0	0.0%	0	0.0%
Donor family time constraint	1	0.0%	0	0.0%	1	0.0%	0	0.0%

Table 34: Count and percent of reasons for refusal of liver match organ offers post implementation stratified by program size, for liver matches submitted December 02, 2021 - December 01, 2022. Program size is defined by volume of deceased donor liver transplants during 2020.

Description	Large		Medium		Small		No Transplants in 2020	
	N	%	N	%	N	%	N	%
Donor age	43,468	19.2%	22,437	18.2%	5,535	13.5%	45	12.0%
Other, specify	25,785	11.4%	13,788	11.2%	3,132	7.6%	13	3.5%
Actual or projected cold ischemic time too long	24,927	11.0%	12,792	10.4%	3,520	8.6%	1	0.3%
Unacceptable organ specific test results, specify	24,455	10.8%	14,546	11.8%	5,808	14.2%	40	10.7%
DCD donor neurological function/not expected to arrest	20,265	9.0%	8,548	6.9%	1,290	3.1%	1	0.3%
Donor medical history, specify	19,192	8.5%	10,430	8.5%	3,697	9.0%	14	3.7%
Organ size, specify	17,630	7.8%	9,757	7.9%	6,480	15.8%	58	15.5%
Epidemic/Pandemic - Donor	8,565	3.8%	8,547	6.9%	2,550	6.2%	6	1.6%
Biopsy results unacceptable	8,379	3.7%	5,294	4.3%	1,605	3.9%	8	2.1%
Candidate transplanted or pending transplant	6,869	3.0%	3,024	2.5%	846	2.1%	83	22.1%
Candidate temporarily medically unsuitable	6,226	2.8%	4,474	3.6%	1,066	2.6%	49	13.1%
Organ anatomical damage or defect	3,381	1.5%	1,415	1.1%	839	2.0%	7	1.9%
Candidate requires multiple organ transplant	3,283	1.5%	929	0.8%	615	1.5%	10	2.7%
Resource time constraint (OPO, TXC, donor hospital, etc.)	1,575	0.7%	770	0.6%	263	0.6%	0	0.0%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	1,496	0.7%	1,085	0.9%	295	0.7%	9	2.4%
Malignancy or suspected malignancy	1,468	0.6%	812	0.7%	264	0.6%	1	0.3%
Organ preservation: Unacceptable method or findings	1,175	0.5%	284	0.2%	680	1.7%	1	0.3%
Organ specific test results not available, specify	1,124	0.5%	548	0.4%	239	0.6%	1	0.3%
Candidate unavailable	1,062	0.5%	253	0.2%	104	0.3%	4	1.1%
Donor infection or positive culture	946	0.4%	436	0.4%	213	0.5%	1	0.3%
Donor instability/high vasopressor usage	823	0.4%	594	0.5%	254	0.6%	0	0.0%
Biopsy not available	673	0.3%	318	0.3%	49	0.1%	6	1.6%
PHS risk criteria or social history	553	0.2%	535	0.4%	300	0.7%	1	0.3%
Donor family time constraint	491	0.2%	207	0.2%	66	0.2%	0	0.0%
Candidate's condition improved, transplant not needed	395	0.2%	167	0.1%	81	0.2%	5	1.3%
Transplant team or transplant facility availability	390	0.2%	125	0.1%	11	0.0%	0	0.0%
Epidemic/Pandemic - Candidate	381	0.2%	145	0.1%	113	0.3%	0	0.0%
Candidate refused	310	0.1%	112	0.1%	56	0.1%	2	0.5%
Prolonged downtime/CPR	270	0.1%	267	0.2%	542	1.3%	2	0.5%
Exceeded policy defined response time	230	0.1%	132	0.1%	32	0.1%	0	0.0%
Warm ischemic time too long	197	0.1%	290	0.2%	113	0.3%	1	0.3%
Recovery team availability	86	0.0%	42	0.0%	12	0.0%	0	0.0%
Candidate temporarily ineligible due to insurance or financial issue	81	0.0%	42	0.0%	33	0.1%	6	1.6%
Transportation availability	57	0.0%	19	0.0%	40	0.1%	0	0.0%
Positive virtual crossmatch/unacceptable antigens	26	0.0%	39	0.0%	90	0.2%	0	0.0%
Disaster Emergency Management Consideration	10	0.0%	0	0.0%	32	0.1%	0	0.0%
No donor cells/specimen for crossmatching, or no time for crossmatch	7	0.0%	3	0.0%	2	0.0%	0	0.0%
Positive physical crossmatch	4	0.0%	1	0.0%	5	0.0%	0	0.0%
Number of HLA mismatches unacceptable	2	0.0%	0	0.0%	90	0.2%	0	0.0%
No candidate serum for crossmatching	0	0.0%	1	0.0%	0	0.0%	0	0.0%

Table 35: Count and percent of reasons for refusal of heart and heart-lung match organ offers post implementation stratified by program size, for heart and heart-lung matches submitted December 02, 2021 - December 01, 2022. Program size is defined by volume of deceased donor heart and heart-lung transplants during 2020.

Description	Large		Medium		Small		No Transplants in 2020	
	N	%	N	%	N	%	N	%
Organ size, specify	11,480	26.1%	8,166	34.7%	1,675	27.0%	69	39.7%
Unacceptable organ specific test results, specify	10,595	24.0%	5,584	23.7%	1,642	26.4%	38	21.8%
Donor age	3,141	7.1%	1,358	5.8%	291	4.7%	12	6.9%
Candidate temporarily medically unsuitable	2,465	5.6%	208	0.9%	100	1.6%	14	8.0%
Candidate transplanted or pending transplant	2,062	4.7%	875	3.7%	230	3.7%	10	5.7%
Donor medical history, specify	1,910	4.3%	1,194	5.1%	332	5.3%	5	2.9%
DCD donor neurological function/not expected to arrest	1,827	4.1%	262	1.1%	4	0.1%	0	0.0%
Actual or projected cold ischemic time too long	1,661	3.8%	1,394	5.9%	291	4.7%	4	2.3%
Other, specify	1,446	3.3%	610	2.6%	228	3.7%	0	0.0%
Epidemic/Pandemic - Donor	1,363	3.1%	1,080	4.6%	331	5.3%	10	5.7%
Candidate requires multiple organ transplant	1,222	2.8%	394	1.7%	23	0.4%	0	0.0%
Prolonged downtime/CPR	836	1.9%	450	1.9%	289	4.7%	4	2.3%
Positive virtual crossmatch/unacceptable antigens	708	1.6%	256	1.1%	91	1.5%	2	1.1%
Organ anatomical damage or defect	593	1.3%	712	3.0%	118	1.9%	1	0.6%
Organ specific test results not available, specify	486	1.1%	128	0.5%	44	0.7%	2	1.1%
Resource time constraint (OPO, TXC, donor hospital, etc.)	276	0.6%	62	0.3%	32	0.5%	0	0.0%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	261	0.6%	52	0.2%	23	0.4%	0	0.0%
PHS risk criteria or social history	244	0.6%	204	0.9%	201	3.2%	1	0.6%
Donor infection or positive culture	185	0.4%	99	0.4%	67	1.1%	1	0.6%
Organ preservation: Unacceptable method or findings	158	0.4%	96	0.4%	4	0.1%	0	0.0%
Candidate temporarily ineligible due to insurance or financial issue	134	0.3%	1	0.0%	0	0.0%	0	0.0%
Number of HLA mismatches unacceptable	132	0.3%	28	0.1%	20	0.3%	0	0.0%
No donor cells/specimen for crossmatching, or no time for crossmatch	124	0.3%	13	0.1%	4	0.1%	0	0.0%
No candidate serum for crossmatching	113	0.3%	8	0.0%	31	0.5%	0	0.0%
Malignancy or suspected malignancy	90	0.2%	55	0.2%	15	0.2%	0	0.0%
Warm ischemic time too long	90	0.2%	14	0.1%	3	0.0%	0	0.0%
Donor instability/high vasopressor usage	78	0.2%	113	0.5%	52	0.8%	0	0.0%
Positive physical crossmatch	68	0.2%	18	0.1%	9	0.1%	0	0.0%
Candidate's condition improved, transplant not needed	67	0.2%	5	0.0%	5	0.1%	0	0.0%
Transplant team or transplant facility availability	57	0.1%	15	0.1%	19	0.3%	0	0.0%
Epidemic/Pandemic - Candidate	56	0.1%	25	0.1%	17	0.3%	1	0.6%
Donor family time constraint	49	0.1%	27	0.1%	11	0.2%	0	0.0%
Candidate unavailable	25	0.1%	7	0.0%	2	0.0%	0	0.0%
Candidate refused	20	0.0%	8	0.0%	4	0.1%	0	0.0%
Exceeded policy defined response time	15	0.0%	8	0.0%	1	0.0%	0	0.0%
Recovery team availability	12	0.0%	11	0.0%	0	0.0%	0	0.0%
Disaster Emergency Management Consideration	11	0.0%	1	0.0%	0	0.0%	0	0.0%
Transportation availability	4	0.0%	2	0.0%	1	0.0%	0	0.0%
Biopsy not available	2	0.0%	1	0.0%	0	0.0%	0	0.0%
Biopsy results unacceptable	2	0.0%	2	0.0%	2	0.0%	0	0.0%

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Table 36: Count and percent of reasons for refusal of lung match organ offers post implementation stratified by program size, for lung matches submitted December 02, 2021 - December 01, 2022. Program size is defined by volume of deceased donor lung transplants during 2020.

Description	Large		Medium		Small		No Transplants in 2020	
	N	%	N	%	N	%	N	%
Unacceptable organ specific test results, specify	11,738	39.8%	7,585	45.3%	4,271	44.1%	366	46.1%
Organ size, specify	5,714	19.4%	2,027	12.1%	1,847	19.1%	104	13.1%
Donor medical history, specify	1,563	5.3%	1,382	8.3%	707	7.3%	28	3.5%
Candidate requires different laterality	1,412	4.8%	847	5.1%	393	4.1%	23	2.9%
DCD donor neurological function/not expected to arrest	1,409	4.8%	735	4.4%	169	1.7%	5	0.6%
Other, specify	1,375	4.7%	1,542	9.2%	342	3.5%	130	16.4%
Epidemic/Pandemic - Donor	937	3.2%	477	2.8%	192	2.0%	9	1.1%
Organ anatomical damage or defect	904	3.1%	243	1.5%	214	2.2%	6	0.8%
Donor age	806	2.7%	426	2.5%	407	4.2%	29	3.7%
Candidate requires multiple organ transplant	642	2.2%	135	0.8%	297	3.1%	22	2.8%
Candidate transplanted or pending transplant	494	1.7%	293	1.7%	124	1.3%	17	2.1%
Actual or projected cold ischemic time too long	350	1.2%	197	1.2%	288	3.0%	35	4.4%
Positive virtual crossmatch/unacceptable antigens	332	1.1%	97	0.6%	42	0.4%	1	0.1%
PHS risk criteria or social history	284	1.0%	97	0.6%	37	0.4%	2	0.3%
Organ specific test results not available, specify	282	1.0%	93	0.6%	59	0.6%	5	0.6%
Resource time constraint (OPO, TXC, donor hospital, etc.)	238	0.8%	141	0.8%	56	0.6%	0	0.0%
Candidate temporarily medically unsuitable	211	0.7%	79	0.5%	77	0.8%	4	0.5%
Donor infection or positive culture	199	0.7%	73	0.4%	20	0.2%	1	0.1%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	189	0.6%	17	0.1%	21	0.2%	5	0.6%
Donor family time constraint	103	0.3%	27	0.2%	7	0.1%	0	0.0%
Disaster Emergency Management Consideration	49	0.2%	9	0.1%	0	0.0%	0	0.0%
Organ preservation: Unacceptable method or findings	45	0.2%	9	0.1%	37	0.4%	1	0.1%
Number of HLA mismatches unacceptable	43	0.1%	15	0.1%	4	0.0%	0	0.0%
Epidemic/Pandemic - Candidate	41	0.1%	8	0.0%	13	0.1%	0	0.0%
Candidate unavailable	26	0.1%	9	0.1%	1	0.0%	0	0.0%
Prolonged downtime/CPR	26	0.1%	3	0.0%	2	0.0%	0	0.0%
Positive physical crossmatch	24	0.1%	22	0.1%	5	0.1%	0	0.0%
Warm ischemic time too long	23	0.1%	1	0.0%	0	0.0%	0	0.0%
Candidate refused	19	0.1%	4	0.0%	6	0.1%	0	0.0%
Exceeded policy defined response time	10	0.0%	7	0.0%	4	0.0%	0	0.0%
Transplant team or transplant facility availability	10	0.0%	81	0.5%	21	0.2%	0	0.0%
Transportation availability	5	0.0%	3	0.0%	2	0.0%	0	0.0%
Malignancy or suspected malignancy	3	0.0%	12	0.1%	1	0.0%	0	0.0%
Recovery team availability	3	0.0%	4	0.0%	1	0.0%	0	0.0%
Candidate temporarily ineligible due to insurance or financial issue	2	0.0%	1	0.0%	0	0.0%	0	0.0%
Candidate's condition improved, transplant not needed	2	0.0%	2	0.0%	1	0.0%	1	0.1%
Donor instability/high vasopressor usage	2	0.0%	2	0.0%	2	0.0%	0	0.0%
No candidate serum for crossmatching	2	0.0%	17	0.1%	3	0.0%	0	0.0%
Biopsy results unacceptable	1	0.0%	14	0.1%	1	0.0%	0	0.0%
No donor cells/specimen for crossmatching, or no time for crossmatch	1	0.0%	3	0.0%	1	0.0%	0	0.0%
Biopsy not available	0	0.0%	4	0.0%	0	0.0%	0	0.0%

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Table 37: Count and percent of reasons for refusal of kidney-pancreas match organ offers post implementation stratified by program size, for kidney-pancreas matches submitted December 02, 2021 - December 01, 2022. Program size is defined by volume of deceased donor kidney-pancreas transplants during 2020.

Description	Large		Medium		Small		No Transplants in 2020	
	N	%	N	%	N	%	N	%
Unacceptable organ specific test results, specify	757	16.5%	779	19.0%	384	17.8%	51	16.2%
Candidate requires multiple organ transplant	625	13.6%	306	7.5%	562	26.0%	11	3.5%
Actual or projected cold ischemic time too long	581	12.6%	621	15.1%	285	13.2%	41	13.0%
Donor age	481	10.5%	355	8.7%	98	4.5%	19	6.0%
Donor medical history, specify	444	9.7%	477	11.6%	235	10.9%	38	12.1%
Other, specify	298	6.5%	421	10.3%	120	5.6%	37	11.7%
Organ size, specify	249	5.4%	149	3.6%	48	2.2%	2	0.6%
Candidate temporarily medically unsuitable	162	3.5%	187	4.6%	38	1.8%	6	1.9%
Epidemic/Pandemic - Donor	155	3.4%	139	3.4%	87	4.0%	17	5.4%
PHS risk criteria or social history	101	2.2%	188	4.6%	49	2.3%	19	6.0%
Transplant team or transplant facility availability	94	2.0%	4	0.1%	25	1.2%	4	1.3%
Resource time constraint (OPO, TXC, donor hospital, etc.)	89	1.9%	20	0.5%	2	0.1%	1	0.3%
Organ anatomical damage or defect	78	1.7%	78	1.9%	45	2.1%	6	1.9%
Organ preservation: Unacceptable method or findings	64	1.4%	34	0.8%	7	0.3%	3	1.0%
Candidate transplanted or pending transplant	57	1.2%	22	0.5%	9	0.4%	1	0.3%
Positive virtual crossmatch/unacceptable antigens	44	1.0%	29	0.7%	11	0.5%	1	0.3%
Prolonged downtime/CPR	44	1.0%	54	1.3%	36	1.7%	26	8.3%
Epidemic/Pandemic - Candidate	33	0.7%	17	0.4%	8	0.4%	0	0.0%
Number of HLA mismatches unacceptable	31	0.7%	37	0.9%	2	0.1%	0	0.0%
Donor instability/high vasopressor usage	30	0.7%	30	0.7%	17	0.8%	13	4.1%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	30	0.7%	12	0.3%	12	0.6%	0	0.0%
Recovery team availability	28	0.6%	4	0.1%	22	1.0%	3	1.0%
Candidate refused	21	0.5%	21	0.5%	2	0.1%	0	0.0%
DCD donor neurological function/not expected to arrest	18	0.4%	27	0.7%	5	0.2%	0	0.0%
Candidate temporarily ineligible due to insurance or financial issue	13	0.3%	15	0.4%	1	0.0%	0	0.0%
Candidate unavailable	13	0.3%	12	0.3%	7	0.3%	2	0.6%
Donor infection or positive culture	12	0.3%	4	0.1%	6	0.3%	0	0.0%
Organ specific test results not available, specify	10	0.2%	31	0.8%	24	1.1%	1	0.3%
Transportation availability	9	0.2%	0	0.0%	1	0.0%	0	0.0%
Positive physical crossmatch	8	0.2%	9	0.2%	4	0.2%	4	1.3%
No candidate serum for crossmatching	7	0.2%	2	0.0%	0	0.0%	0	0.0%
Donor family time constraint	5	0.1%	0	0.0%	1	0.0%	0	0.0%
Malignancy or suspected malignancy	4	0.1%	4	0.1%	3	0.1%	1	0.3%
Warm ischemic time too long	3	0.1%	2	0.0%	3	0.1%	0	0.0%
Candidate's condition improved, transplant not needed	1	0.0%	5	0.1%	0	0.0%	0	0.0%
Exceeded policy defined response time	1	0.0%	3	0.1%	0	0.0%	0	0.0%
No donor cells/specimen for crossmatching, or no time for crossmatch	0	0.0%	3	0.1%	1	0.0%	8	2.5%
Biopsy results unacceptable	0	0.0%	0	0.0%	1	0.0%	0	0.0%

Table 38: Count and percent of reasons for refusal of intestine match organ offers post implementation stratified by program size, for intestine matches submitted December 02, 2021 - December 01, 2022. Program size is defined by volume of deceased donor intestine transplants during 2020.

Description	Large		Medium		Small		No Transplants in 2020	
	N	%	N	%	N	%	N	%
Candidate requires multiple organ transplant	326	68.1%	238	54.2%	24	25.5%	2	18.2%
Number of HLA mismatches unacceptable	80	16.7%	1	0.2%	0	0.0%	0	0.0%
Organ size, specify	14	2.9%	15	3.4%	4	4.3%	6	54.5%
Actual or projected cold ischemic time too long	13	2.7%	27	6.2%	11	11.7%	0	0.0%
Donor age	9	1.9%	5	1.1%	1	1.1%	1	9.1%
Warm ischemic time too long	8	1.7%	0	0.0%	0	0.0%	0	0.0%
Candidate temporarily medically unsuitable	6	1.3%	4	0.9%	7	7.4%	0	0.0%
Donor medical history, specify	6	1.3%	1	0.2%	0	0.0%	0	0.0%
Prolonged downtime/CPR	4	0.8%	24	5.5%	9	9.6%	0	0.0%
Unacceptable organ specific test results, specify	4	0.8%	22	5.0%	16	17.0%	2	18.2%
Other, specify	3	0.6%	71	16.2%	10	10.6%	0	0.0%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	3	0.6%	2	0.5%	7	7.4%	0	0.0%
Organ anatomical damage or defect	2	0.4%	3	0.7%	1	1.1%	0	0.0%
Donor infection or positive culture	1	0.2%	2	0.5%	0	0.0%	0	0.0%
Donor instability/high vasopressor usage	0	0.0%	13	3.0%	3	3.2%	0	0.0%
PHS risk criteria or social history	0	0.0%	8	1.8%	0	0.0%	0	0.0%
Candidate transplanted or pending transplant	0	0.0%	1	0.2%	0	0.0%	0	0.0%
Epidemic/Pandemic - Donor	0	0.0%	1	0.2%	0	0.0%	0	0.0%
Resource time constraint (OPO, TXC, donor hospital, etc.)	0	0.0%	1	0.2%	0	0.0%	0	0.0%
Positive virtual crossmatch/unacceptable antigens	0	0.0%	0	0.0%	1	1.1%	0	0.0%

Table 39: Count and percent of reasons for refusal of kidney match organ offers post implementation stratified by match acceptance number, for kidney matches submitted December 02, 2021 - December 01, 2022. Group is defined by the 90th percentile of sequence numbers for acceptances on kidney matches during 2020.

Description	Acceptor Sequence Number: [1, 667)		Acceptor Sequence Number: [667, 31425]	
	N	%	N	%
Unacceptable organ specific test results, specify	64,166	14.8%	382,534	14.2%
Donor medical history, specify	56,146	13.0%	327,755	12.2%
Actual or projected cold ischemic time too long	37,198	8.6%	600,357	22.3%
Organ anatomical damage or defect	36,893	8.5%	280,267	10.4%
Donor age	36,192	8.4%	136,999	5.1%
Biopsy results unacceptable	35,382	8.2%	255,822	9.5%
Other, specify	34,382	7.9%	196,501	7.3%
Candidate temporarily medically unsuitable	23,755	5.5%	13,596	0.5%
Epidemic/Pandemic - Donor	22,218	5.1%	204,014	7.6%
Organ preservation: Unacceptable method or findings	12,006	2.8%	85,908	3.2%
Warm ischemic time too long	10,719	2.5%	73,816	2.7%
Organ size, specify	10,673	2.5%	26,528	1.0%
Candidate requires multiple organ transplant	9,624	2.2%	6,606	0.2%
DCD donor neurological function/not expected to arrest	4,309	1.0%	13,081	0.5%
Biopsy not available	4,290	1.0%	16,754	0.6%
Positive virtual crossmatch/unacceptable antigens	4,081	0.9%	1,222	0.0%
Donor infection or positive culture	3,647	0.8%	17,683	0.7%
Candidate transplanted or pending transplant	3,539	0.8%	1,712	0.1%
Candidate refused	2,781	0.6%	994	0.0%
PHS risk criteria or social history	2,754	0.6%	4,583	0.2%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	2,710	0.6%	7,350	0.3%
No candidate serum for crossmatching	2,605	0.6%	2,901	0.1%
Organ specific test results not available, specify	2,191	0.5%	14,401	0.5%
Malignancy or suspected malignancy	1,884	0.4%	14,606	0.5%
Candidate unavailable	1,708	0.4%	794	0.0%
Positive physical crossmatch	1,483	0.3%	368	0.0%
Epidemic/Pandemic - Candidate	1,124	0.3%	1,522	0.1%
Number of HLA mismatches unacceptable	827	0.2%	174	0.0%
Candidate temporarily ineligible due to insurance or financial issue	764	0.2%	439	0.0%
Donor instability/high vasopressor usage	763	0.2%	1,840	0.1%
Transplant team or transplant facility availability	661	0.2%	1,364	0.1%
Prolonged downtime/CPR	635	0.1%	1,739	0.1%
Resource time constraint (OPO, TXC, donor hospital, etc.)	309	0.1%	709	0.0%
No donor cells/specimen for crossmatching, or no time for crossmatch	183	0.0%	267	0.0%
Candidate requires different laterality	158	0.0%	64	0.0%
Exceeded policy defined response time	127	0.0%	319	0.0%
Disaster Emergency Management Consideration	91	0.0%	820	0.0%
Candidate's condition improved, transplant not needed	46	0.0%	22	0.0%
Recovery team availability	37	0.0%	37	0.0%
Transportation availability	22	0.0%	187	0.0%
Donor family time constraint	1	0.0%	1	0.0%

Table 40: Count and percent of reasons for refusal of liver match organ offers post implementation stratified by match acceptance number, for liver matches submitted December 02, 2021 - December 01, 2022. Group is defined by the 90th percentile of sequence numbers for acceptances on liver matches during 2020.

Description	Acceptor Sequence Number: [1, 78)		Acceptor Sequence Number: [78, 7555]	
	N	%	N	%
Organ size, specify	17,267	17.8%	16,658	5.7%
Donor age	12,050	12.4%	59,435	20.2%
Unacceptable organ specific test results, specify	11,031	11.4%	33,818	11.5%
Candidate transplanted or pending transplant	8,331	8.6%	2,491	0.8%
Candidate temporarily medically unsuitable	8,281	8.6%	3,534	1.2%
Donor medical history, specify	8,085	8.3%	25,248	8.6%
Other, specify	8,030	8.3%	34,688	11.8%
DCD donor neurological function/not expected to arrest	3,862	4.0%	26,242	8.9%
Actual or projected cold ischemic time too long	3,436	3.5%	37,804	12.9%
Candidate requires multiple organ transplant	3,159	3.3%	1,678	0.6%
Epidemic/Pandemic - Donor	2,601	2.7%	17,067	5.8%
Biopsy results unacceptable	1,666	1.7%	13,620	4.6%
Organ anatomical damage or defect	1,218	1.3%	4,424	1.5%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	992	1.0%	1,893	0.6%
Candidate unavailable	722	0.7%	701	0.2%
Resource time constraint (OPO, TXC, donor hospital, etc.)	604	0.6%	2,004	0.7%
PHS risk criteria or social history	593	0.6%	796	0.3%
Prolonged downtime/CPR	561	0.6%	520	0.2%
Candidate's condition improved, transplant not needed	493	0.5%	155	0.1%
Organ specific test results not available, specify	452	0.5%	1,460	0.5%
Donor infection or positive culture	399	0.4%	1,197	0.4%
Organ preservation: Unacceptable method or findings	381	0.4%	1,759	0.6%
Donor instability/high vasopressor usage	341	0.4%	1,330	0.5%
Candidate refused	330	0.3%	150	0.1%
Epidemic/Pandemic - Candidate	321	0.3%	318	0.1%
Donor family time constraint	292	0.3%	472	0.2%
Biopsy not available	289	0.3%	757	0.3%
Malignancy or suspected malignancy	196	0.2%	2,349	0.8%
Warm ischemic time too long	193	0.2%	408	0.1%
Transplant team or transplant facility availability	156	0.2%	370	0.1%
Positive virtual crossmatch/unacceptable antigens	131	0.1%	24	0.0%
Candidate temporarily ineligible due to insurance or financial issue	120	0.1%	42	0.0%
Number of HLA mismatches unacceptable	78	0.1%	14	0.0%
Exceeded policy defined response time	75	0.1%	319	0.1%
Recovery team availability	39	0.0%	101	0.0%
Disaster Emergency Management Consideration	29	0.0%	13	0.0%
Transportation availability	28	0.0%	88	0.0%
Positive physical crossmatch	10	0.0%	0	0.0%
No donor cells/specimen for crossmatching, or no time for crossmatch	2	0.0%	10	0.0%
No candidate serum for crossmatching	1	0.0%	0	0.0%

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Table 41: Count and percent of reasons for refusal of heart and heart-lung match organ offers post implementation stratified by match acceptance number, for heart and heart-lung matches submitted December 02, 2021 - December 01, 2022. Group is defined by the 90th percentile of sequence numbers for acceptances on heart and heart-lung matches during 2020.

Description	Acceptor Sequence Number: [1, 41)		Acceptor Sequence Number: [41, 1396]	
	N	%	N	%
Organ size, specify	8,585	31.6%	12,805	27.3%
Unacceptable organ specific test results, specify	4,792	17.7%	13,067	27.9%
Candidate transplanted or pending transplant	1,993	7.3%	1,184	2.5%
Candidate temporarily medically unsuitable	1,508	5.6%	1,279	2.7%
Actual or projected cold ischemic time too long	1,063	3.9%	2,287	4.9%
Donor age	1,057	3.9%	3,745	8.0%
Donor medical history, specify	1,026	3.8%	2,415	5.2%
Other, specify	915	3.4%	1,369	2.9%
DCD donor neurological function/not expected to arrest	890	3.3%	1,203	2.6%
Candidate requires multiple organ transplant	886	3.3%	753	1.6%
Epidemic/Pandemic - Donor	842	3.1%	1,942	4.1%
Positive virtual crossmatch/unacceptable antigens	648	2.4%	409	0.9%
Prolonged downtime/CPR	614	2.3%	965	2.1%
Organ anatomical damage or defect	416	1.5%	1,008	2.2%
PHS risk criteria or social history	289	1.1%	361	0.8%
Organ specific test results not available, specify	254	0.9%	406	0.9%
Resource time constraint (OPO, TXC, donor hospital, etc.)	134	0.5%	236	0.5%
Donor infection or positive culture	133	0.5%	219	0.5%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	120	0.4%	216	0.5%
Donor instability/high vasopressor usage	110	0.4%	133	0.3%
Number of HLA mismatches unacceptable	89	0.3%	91	0.2%
Organ preservation: Unacceptable method or findings	86	0.3%	172	0.4%
Positive physical crossmatch	82	0.3%	13	0.0%
No candidate serum for crossmatching	79	0.3%	73	0.2%
No donor cells/specimen for crossmatching, or no time for crossmatch	77	0.3%	64	0.1%
Donor family time constraint	60	0.2%	27	0.1%
Transplant team or transplant facility availability	58	0.2%	33	0.1%
Warm ischemic time too long	58	0.2%	49	0.1%
Malignancy or suspected malignancy	54	0.2%	106	0.2%
Candidate temporarily ineligible due to insurance or financial issue	51	0.2%	84	0.2%
Epidemic/Pandemic - Candidate	48	0.2%	51	0.1%
Candidate's condition improved, transplant not needed	24	0.1%	53	0.1%
Candidate unavailable	22	0.1%	12	0.0%
Candidate refused	17	0.1%	15	0.0%
Recovery team availability	17	0.1%	6	0.0%
Exceeded policy defined response time	16	0.1%	8	0.0%
Disaster Emergency Management Consideration	10	0.0%	2	0.0%
Transportation availability	3	0.0%	4	0.0%
Biopsy not available	2	0.0%	1	0.0%
Biopsy results unacceptable	2	0.0%	4	0.0%

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Table 42: Count and percent of reasons for refusal of lung match organ offers post implementation stratified by match acceptance number, for lung matches submitted December 02, 2021 - December 01, 2022. Group is defined by the 90th percentile of sequence numbers for acceptances on lung matches during 2020.

Description	Acceptor Sequence Number: [1, 53)		Acceptor Sequence Number: [53, 514]	
	N	%	N	%
Unacceptable organ specific test results, specify	8,116	35.7%	15,844	46.6%
Organ size, specify	6,071	26.7%	3,621	10.6%
Donor medical history, specify	1,475	6.5%	2,205	6.5%
Other, specify	1,078	4.7%	2,311	6.8%
Candidate requires different laterality	697	3.1%	1,978	5.8%
DCD donor neurological function/not expected to arrest	693	3.1%	1,625	4.8%
Donor age	646	2.8%	1,022	3.0%
Organ anatomical damage or defect	578	2.5%	789	2.3%
Candidate requires multiple organ transplant	577	2.5%	519	1.5%
Candidate transplanted or pending transplant	570	2.5%	358	1.1%
Positive virtual crossmatch/unacceptable antigens	332	1.5%	140	0.4%
Epidemic/Pandemic - Donor	322	1.4%	1,293	3.8%
Candidate temporarily medically unsuitable	241	1.1%	130	0.4%
Actual or projected cold ischemic time too long	207	0.9%	663	1.9%
Organ specific test results not available, specify	204	0.9%	235	0.7%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	182	0.8%	50	0.1%
PHS risk criteria or social history	140	0.6%	280	0.8%
Resource time constraint (OPO, TXC, donor hospital, etc.)	114	0.5%	321	0.9%
Donor infection or positive culture	92	0.4%	201	0.6%
Transplant team or transplant facility availability	58	0.3%	54	0.2%
Number of HLA mismatches unacceptable	48	0.2%	14	0.0%
Positive physical crossmatch	46	0.2%	5	0.0%
Donor family time constraint	35	0.2%	102	0.3%
Organ preservation: Unacceptable method or findings	32	0.1%	60	0.2%
Epidemic/Pandemic - Candidate	28	0.1%	34	0.1%
Warm ischemic time too long	24	0.1%	0	0.0%
Candidate refused	20	0.1%	9	0.0%
Disaster Emergency Management Consideration	20	0.1%	38	0.1%
Candidate unavailable	16	0.1%	20	0.1%
Exceeded policy defined response time	13	0.1%	8	0.0%
No candidate serum for crossmatching	9	0.0%	13	0.0%
Recovery team availability	6	0.0%	2	0.0%
Candidate's condition improved, transplant not needed	5	0.0%	1	0.0%
Transportation availability	5	0.0%	5	0.0%
Biopsy not available	4	0.0%	0	0.0%
Malignancy or suspected malignancy	4	0.0%	12	0.0%
No donor cells/specimen for crossmatching, or no time for crossmatch	4	0.0%	1	0.0%
Candidate temporarily ineligible due to insurance or financial issue	3	0.0%	0	0.0%
Donor instability/high vasopressor usage	3	0.0%	3	0.0%
Prolonged downtime/CPR	2	0.0%	29	0.1%
Biopsy results unacceptable	0	0.0%	16	0.0%

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Table 43: Count and percent of reasons for refusal of kidney-pancreas match organ offers post implementation stratified by match acceptance number, for kidney-pancreas matches submitted December 02, 2021 - December 01, 2022. Group is defined by the 90th percentile of sequence numbers for acceptances on kidney-pancreas matches during 2020.

Description	Acceptor Sequence Number: [1, 29)		Acceptor Sequence Number: [29, 286]	
	N	%	N	%
Unacceptable organ specific test results, specify	735	17.7%	1,236	17.6%
Candidate requires multiple organ transplant	548	13.2%	956	13.6%
Donor medical history, specify	429	10.3%	765	10.9%
Other, specify	395	9.5%	481	6.9%
Actual or projected cold ischemic time too long	318	7.6%	1,210	17.2%
Candidate temporarily medically unsuitable	266	6.4%	127	1.8%
Organ size, specify	258	6.2%	190	2.7%
Donor age	244	5.9%	709	10.1%
PHS risk criteria or social history	147	3.5%	210	3.0%
Epidemic/Pandemic - Donor	91	2.2%	307	4.4%
Prolonged downtime/CPR	82	2.0%	78	1.1%
Organ anatomical damage or defect	71	1.7%	136	1.9%
Transplant team or transplant facility availability	62	1.5%	65	0.9%
Positive virtual crossmatch/unacceptable antigens	57	1.4%	28	0.4%
Candidate transplanted or pending transplant	52	1.2%	37	0.5%
DCD donor neurological function/not expected to arrest	49	1.2%	1	0.0%
Organ preservation: Unacceptable method or findings	43	1.0%	65	0.9%
Number of HLA mismatches unacceptable	37	0.9%	33	0.5%
Epidemic/Pandemic - Candidate	33	0.8%	25	0.4%
Candidate refused	29	0.7%	15	0.2%
Donor instability/high vasopressor usage	27	0.6%	63	0.9%
Recovery team availability	27	0.6%	30	0.4%
Resource time constraint (OPO, TXC, donor hospital, etc.)	27	0.6%	85	1.2%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	25	0.6%	29	0.4%
Candidate unavailable	19	0.5%	15	0.2%
Candidate temporarily ineligible due to insurance or financial issue	17	0.4%	12	0.2%
Positive physical crossmatch	17	0.4%	8	0.1%
Organ specific test results not available, specify	13	0.3%	53	0.8%
Malignancy or suspected malignancy	9	0.2%	3	0.0%
Warm ischemic time too long	8	0.2%	0	0.0%
Donor infection or positive culture	5	0.1%	17	0.2%
Transportation availability	5	0.1%	5	0.1%
Exceeded policy defined response time	4	0.1%	0	0.0%
No candidate serum for crossmatching	4	0.1%	5	0.1%
No donor cells/specimen for crossmatching, or no time for crossmatch	4	0.1%	8	0.1%
Candidate's condition improved, transplant not needed	3	0.1%	3	0.0%
Biopsy results unacceptable	1	0.0%	0	0.0%
Donor family time constraint	0	0.0%	6	0.1%

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Table 44: Count and percent of reasons for refusal of intestine match organ offers post implementation stratified by match acceptance number, for intestine matches submitted December 02, 2021 - December 01, 2022. Group is defined by the 90th percentile of sequence numbers for acceptances on intestine matches during 2020.

Description	Acceptor Sequence Number: [1, 34)		Acceptor Sequence Number: [34, 59]	
	N	%	N	%
Candidate requires multiple organ transplant	368	63.6%	222	50.0%
Number of HLA mismatches unacceptable	56	9.7%	25	5.6%
Organ size, specify	29	5.0%	10	2.3%
Other, specify	27	4.7%	57	12.8%
Prolonged downtime/CPR	26	4.5%	11	2.5%
Unacceptable organ specific test results, specify	23	4.0%	21	4.7%
Actual or projected cold ischemic time too long	14	2.4%	37	8.3%
Donor instability/high vasopressor usage	10	1.7%	6	1.4%
Candidate temporarily medically unsuitable	9	1.6%	8	1.8%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	7	1.2%	5	1.1%
Organ anatomical damage or defect	4	0.7%	2	0.5%
Donor infection or positive culture	3	0.5%	0	0.0%
Donor age	1	0.2%	15	3.4%
Donor medical history, specify	1	0.2%	6	1.4%
Epidemic/Pandemic - Donor	1	0.2%	0	0.0%
PHS risk criteria or social history	0	0.0%	8	1.8%
Warm ischemic time too long	0	0.0%	8	1.8%
Candidate transplanted or pending transplant	0	0.0%	1	0.2%
Positive virtual crossmatch/unacceptable antigens	0	0.0%	1	0.2%
Resource time constraint (OPO, TXC, donor hospital, etc.)	0	0.0%	1	0.2%

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Table 45: Count and percent of reasons for refusal of range refused kidney match organ offers post implementation stratified by program size, for kidney matches submitted December 02, 2021 - December 01, 2022. Program size is defined by volume of deceased donor kidney transplants during 2020.

Description	Large		Medium		Small		No Transplants in 2020	
	N	%	N	%	N	%	N	%
Actual or projected cold ischemic time too long	302,758	20.8%	109,963	18.4%	25,629	19.1%	668	17.9%
Unacceptable organ specific test results, specify	207,949	14.3%	76,532	12.8%	16,095	12.0%	722	19.3%
Donor medical history, specify	194,553	13.4%	63,873	10.7%	18,925	14.1%	277	7.4%
Organ anatomical damage or defect	150,909	10.4%	60,517	10.1%	12,075	9.0%	521	14.0%
Biopsy results unacceptable	145,135	10.0%	52,437	8.8%	11,001	8.2%	254	6.8%
Epidemic/Pandemic - Donor	126,530	8.7%	69,588	11.7%	16,090	12.0%	520	13.9%
Other, specify	88,500	6.1%	59,950	10.1%	8,717	6.5%	83	2.2%
Donor age	73,037	5.0%	34,201	5.7%	9,999	7.5%	123	3.3%
Organ preservation: Unacceptable method or findings	43,847	3.0%	21,092	3.5%	3,607	2.7%	253	6.8%
Warm ischemic time too long	38,696	2.7%	16,608	2.8%	3,461	2.6%	28	0.7%
Organ size, specify	22,490	1.5%	5,017	0.8%	1,542	1.2%	34	0.9%
Biopsy not available	12,328	0.8%	2,697	0.5%	617	0.5%	102	2.7%
Donor infection or positive culture	10,394	0.7%	5,123	0.9%	1,186	0.9%	42	1.1%
Malignancy or suspected malignancy	9,178	0.6%	5,011	0.8%	935	0.7%	0	0.0%
DCD donor neurological function/not expected to arrest	7,878	0.5%	2,512	0.4%	653	0.5%	7	0.2%
Organ specific test results not available, specify	7,189	0.5%	3,374	0.6%	802	0.6%	17	0.5%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	4,141	0.3%	1,905	0.3%	401	0.3%	35	0.9%
PHS risk criteria or social history	3,027	0.2%	584	0.1%	838	0.6%	42	1.1%
Donor instability/high vasopressor usage	1,376	0.1%	669	0.1%	77	0.1%	0	0.0%
No candidate serum for crossmatching	1,252	0.1%	1,182	0.2%	168	0.1%	0	0.0%
Candidate temporarily medically unsuitable	1,124	0.1%	207	0.0%	80	0.1%	1	0.0%
Transplant team or transplant facility availability	938	0.1%	312	0.1%	299	0.2%	0	0.0%
Candidate requires multiple organ transplant	840	0.1%	63	0.0%	51	0.0%	0	0.0%
Epidemic/Pandemic - Candidate	401	0.0%	938	0.2%	110	0.1%	0	0.0%
Prolonged downtime/CPR	351	0.0%	1,068	0.2%	210	0.2%	3	0.1%
Resource time constraint (OPO, TXC, donor hospital, etc.)	313	0.0%	264	0.0%	100	0.1%	0	0.0%
Positive virtual crossmatch/unacceptable antigens	281	0.0%	25	0.0%	24	0.0%	0	0.0%
Exceeded policy defined response time	200	0.0%	68	0.0%	24	0.0%	0	0.0%
Transportation availability	124	0.0%	9	0.0%	1	0.0%	0	0.0%
Positive physical crossmatch	122	0.0%	122	0.0%	23	0.0%	0	0.0%
Candidate refused	106	0.0%	39	0.0%	24	0.0%	0	0.0%
Candidate unavailable	104	0.0%	81	0.0%	7	0.0%	1	0.0%
Candidate transplanted or pending transplant	75	0.0%	45	0.0%	5	0.0%	0	0.0%
Disaster Emergency Management Consideration	31	0.0%	207	0.0%	0	0.0%	0	0.0%
Candidate requires different laterality	13	0.0%	4	0.0%	0	0.0%	0	0.0%
Candidate temporarily ineligible due to insurance or financial issue	11	0.0%	6	0.0%	0	0.0%	1	0.0%
No donor cells/specimen for crossmatching, or no time for crossmatch	11	0.0%	42	0.0%	90	0.1%	0	0.0%
Number of HLA mismatches unacceptable	8	0.0%	2	0.0%	9	0.0%	0	0.0%
Candidate's condition improved, transplant not needed	1	0.0%	0	0.0%	1	0.0%	0	0.0%
Donor family time constraint	1	0.0%	0	0.0%	0	0.0%	0	0.0%
Recovery team availability	0	0.0%	41	0.0%	0	0.0%	0	0.0%

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Table 46: Count and percent of reasons for refusal of range refused liver match organ offers post implementation stratified by program size, for liver matches submitted December 02, 2021 - December 01, 2022. Program size is defined by volume of deceased donor liver transplants during 2020.

Description	Large		Medium		Small	
	N	%	N	%	N	%
Donor age	25,896	20.0%	14,981	19.6%	3,854	16.1%
Other, specify	15,935	12.3%	8,550	11.2%	2,018	8.4%
Actual or projected cold ischemic time too long	15,866	12.2%	8,489	11.1%	2,355	9.8%
Unacceptable organ specific test results, specify	15,051	11.6%	9,514	12.5%	3,764	15.7%
DCD donor neurological function/not expected to arrest	13,084	10.1%	5,626	7.4%	855	3.6%
Donor medical history, specify	11,914	9.2%	6,738	8.8%	2,577	10.7%
Epidemic/Pandemic - Donor	8,021	6.2%	8,008	10.5%	2,130	8.9%
Organ size, specify	6,148	4.7%	4,270	5.6%	2,270	9.5%
Biopsy results unacceptable	5,637	4.3%	3,874	5.1%	1,126	4.7%
Organ anatomical damage or defect	2,067	1.6%	1,075	1.4%	619	2.6%
Malignancy or suspected malignancy	1,334	1.0%	729	1.0%	213	0.9%
Resource time constraint (OPO, TXC, donor hospital, etc.)	1,168	0.9%	529	0.7%	187	0.8%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	1,064	0.8%	675	0.9%	211	0.9%
Organ specific test results not available, specify	836	0.6%	384	0.5%	133	0.6%
Donor infection or positive culture	783	0.6%	314	0.4%	149	0.6%
Organ preservation: Unacceptable method or findings	726	0.6%	229	0.3%	536	2.2%
Donor instability/high vasopressor usage	670	0.5%	488	0.6%	160	0.7%
Biopsy not available	496	0.4%	238	0.3%	25	0.1%
Candidate unavailable	402	0.3%	21	0.0%	42	0.2%
Candidate temporarily medically unsuitable	341	0.3%	149	0.2%	50	0.2%
PHS risk criteria or social history	337	0.3%	390	0.5%	154	0.6%
Transplant team or transplant facility availability	303	0.2%	65	0.1%	7	0.0%
Donor family time constraint	302	0.2%	112	0.1%	60	0.2%
Candidate transplanted or pending transplant	260	0.2%	115	0.2%	30	0.1%
Candidate requires multiple organ transplant	244	0.2%	32	0.0%	13	0.1%
Exceeded policy defined response time	214	0.2%	97	0.1%	28	0.1%
Epidemic/Pandemic - Candidate	158	0.1%	39	0.1%	22	0.1%
Warm ischemic time too long	136	0.1%	261	0.3%	45	0.2%
Prolonged downtime/CPR	111	0.1%	201	0.3%	277	1.2%
Transportation availability	40	0.0%	16	0.0%	40	0.2%
Candidate refused	39	0.0%	20	0.0%	4	0.0%
Recovery team availability	7	0.0%	37	0.0%	10	0.0%
No donor cells/specimen for crossmatching, or no time for crossmatch	6	0.0%	0	0.0%	0	0.0%
Candidate temporarily ineligible due to insurance or financial issue	4	0.0%	0	0.0%	0	0.0%
Candidate's condition improved, transplant not needed	3	0.0%	4	0.0%	12	0.0%
Number of HLA mismatches unacceptable	2	0.0%	0	0.0%	0	0.0%
Positive virtual crossmatch/unacceptable antigens	1	0.0%	2	0.0%	1	0.0%
Positive physical crossmatch	0	0.0%	1	0.0%	2	0.0%
Disaster Emergency Management Consideration	0	0.0%	0	0.0%	32	0.1%

Table 47: Count and percent of reasons for refusal of range refused heart and heart-lung match organ offers post implementation stratified by program size, for heart and heart-lung matches submitted December 02, 2021 - December 01, 2022. Program size is defined by volume of deceased donor heart and heart-lung transplants during 2020.

Description	Large		Medium		Small	
	N	%	N	%	N	%
Unacceptable organ specific test results, specify	4,555	37.5%	2,176	30.6%	620	41.4%
Organ size, specify	1,545	12.7%	1,638	23.1%	165	11.0%
Donor age	1,196	9.8%	640	9.0%	52	3.5%
Donor medical history, specify	938	7.7%	632	8.9%	104	7.0%
DCD donor neurological function/not expected to arrest	586	4.8%	53	0.7%	0	0.0%
Other, specify	584	4.8%	250	3.5%	88	5.9%
Prolonged downtime/CPR	476	3.9%	257	3.6%	126	8.4%
Epidemic/Pandemic - Donor	475	3.9%	291	4.1%	64	4.3%
Actual or projected cold ischemic time too long	413	3.4%	437	6.2%	78	5.2%
Organ anatomical damage or defect	381	3.1%	339	4.8%	27	1.8%
Organ specific test results not available, specify	172	1.4%	46	0.6%	15	1.0%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	161	1.3%	13	0.2%	3	0.2%
PHS risk criteria or social history	137	1.1%	87	1.2%	64	4.3%
Resource time constraint (OPO, TXC, donor hospital, etc.)	105	0.9%	21	0.3%	14	0.9%
Organ preservation: Unacceptable method or findings	91	0.7%	18	0.3%	0	0.0%
Donor infection or positive culture	80	0.7%	43	0.6%	24	1.6%
Malignancy or suspected malignancy	49	0.4%	40	0.6%	4	0.3%
Warm ischemic time too long	41	0.3%	12	0.2%	1	0.1%
Candidate requires multiple organ transplant	25	0.2%	19	0.3%	1	0.1%
Candidate temporarily medically unsuitable	23	0.2%	8	0.1%	2	0.1%
Donor instability/high vasopressor usage	21	0.2%	43	0.6%	21	1.4%
Transplant team or transplant facility availability	19	0.2%	2	0.0%	5	0.3%
Epidemic/Pandemic - Candidate	15	0.1%	4	0.1%	8	0.5%
Candidate transplanted or pending transplant	14	0.1%	12	0.2%	3	0.2%
Exceeded policy defined response time	12	0.1%	4	0.1%	1	0.1%
Positive virtual crossmatch/unacceptable antigens	12	0.1%	4	0.1%	1	0.1%
Donor family time constraint	8	0.1%	4	0.1%	2	0.1%
No donor cells/specimen for crossmatching, or no time for crossmatch	4	0.0%	0	0.0%	0	0.0%
Number of HLA mismatches unacceptable	4	0.0%	0	0.0%	0	0.0%
Positive physical crossmatch	3	0.0%	0	0.0%	0	0.0%
Candidate refused	2	0.0%	0	0.0%	0	0.0%
Transportation availability	2	0.0%	1	0.0%	0	0.0%
Recovery team availability	0	0.0%	6	0.1%	0	0.0%
Candidate's condition improved, transplant not needed	0	0.0%	2	0.0%	0	0.0%
Biopsy results unacceptable	0	0.0%	1	0.0%	2	0.1%
Candidate unavailable	0	0.0%	1	0.0%	0	0.0%
No candidate serum for crossmatching	0	0.0%	1	0.0%	1	0.1%

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Table 48: Count and percent of reasons for refusal of range refused lung match organ offers post implementation stratified by program size, for lung matches submitted December 02, 2021 - December 01, 2022. Program size is defined by volume of deceased donor lung transplants during 2020.

Description	Large		Medium		Small		No Transplants in 2020	
	N	%	N	%	N	%	N	%
Unacceptable organ specific test results, specify	7,542	49.7%	4,669	49.8%	2,281	51.3%	112	47.3%
Organ size, specify	1,171	7.7%	461	4.9%	513	11.5%	19	8.0%
Donor medical history, specify	1,028	6.8%	916	9.8%	381	8.6%	16	6.8%
Other, specify	991	6.5%	1,184	12.6%	195	4.4%	46	19.4%
Epidemic/Pandemic - Donor	804	5.3%	384	4.1%	119	2.7%	7	3.0%
DCD donor neurological function/not expected to arrest	728	4.8%	370	3.9%	80	1.8%	0	0.0%
Organ anatomical damage or defect	669	4.4%	190	2.0%	132	3.0%	3	1.3%
Donor age	518	3.4%	290	3.1%	226	5.1%	7	3.0%
Candidate requires different laterality	387	2.5%	325	3.5%	101	2.3%	9	3.8%
Organ specific test results not available, specify	236	1.6%	65	0.7%	53	1.2%	1	0.4%
Actual or projected cold ischemic time too long	225	1.5%	121	1.3%	194	4.4%	14	5.9%
Resource time constraint (OPO, TXC, donor hospital, etc.)	197	1.3%	121	1.3%	26	0.6%	0	0.0%
PHS risk criteria or social history	153	1.0%	47	0.5%	3	0.1%	0	0.0%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	144	0.9%	10	0.1%	2	0.0%	1	0.4%
Donor infection or positive culture	124	0.8%	58	0.6%	10	0.2%	1	0.4%
Organ preservation: Unacceptable method or findings	40	0.3%	3	0.0%	31	0.7%	0	0.0%
Donor family time constraint	39	0.3%	8	0.1%	3	0.1%	0	0.0%
Candidate requires multiple organ transplant	34	0.2%	51	0.5%	74	1.7%	1	0.4%
Prolonged downtime/CPR	26	0.2%	2	0.0%	2	0.0%	0	0.0%
Epidemic/Pandemic - Candidate	23	0.2%	1	0.0%	0	0.0%	0	0.0%
Warm ischemic time too long	22	0.1%	1	0.0%	0	0.0%	0	0.0%
Candidate unavailable	18	0.1%	6	0.1%	0	0.0%	0	0.0%
Candidate temporarily medically unsuitable	14	0.1%	5	0.1%	2	0.0%	0	0.0%
Candidate transplanted or pending transplant	11	0.1%	10	0.1%	1	0.0%	0	0.0%
Positive virtual crossmatch/unacceptable antigens	10	0.1%	7	0.1%	3	0.1%	0	0.0%
Exceeded policy defined response time	9	0.1%	4	0.0%	3	0.1%	0	0.0%
Positive physical crossmatch	5	0.0%	4	0.0%	1	0.0%	0	0.0%
Disaster Emergency Management Consideration	3	0.0%	0	0.0%	0	0.0%	0	0.0%
Number of HLA mismatches unacceptable	3	0.0%	0	0.0%	0	0.0%	0	0.0%
Donor instability/high vasopressor usage	2	0.0%	0	0.0%	0	0.0%	0	0.0%
Malignancy or suspected malignancy	2	0.0%	2	0.0%	0	0.0%	0	0.0%
Candidate refused	1	0.0%	0	0.0%	1	0.0%	0	0.0%
No candidate serum for crossmatching	1	0.0%	0	0.0%	2	0.0%	0	0.0%
Transplant team or transplant facility availability	0	0.0%	60	0.6%	3	0.1%	0	0.0%
Biopsy not available	0	0.0%	4	0.0%	0	0.0%	0	0.0%
Recovery team availability	0	0.0%	3	0.0%	1	0.0%	0	0.0%
Transportation availability	0	0.0%	1	0.0%	0	0.0%	0	0.0%

Table 49: Count and percent of reasons for refusal of range refused kidney-pancreas match organ offers post implementation stratified by program size, for kidney-pancreas matches submitted December 02, 2021 - December 01, 2022. Program size is defined by volume of deceased donor kidney-pancreas transplants during 2020.

Description	Large		Medium		Small		No Transplants in 2020	
	N	%	N	%	N	%	N	%
Unacceptable organ specific test results, specify	471	19.2%	455	21.0%	247	24.7%	38	22.2%
Actual or projected cold ischemic time too long	398	16.2%	415	19.1%	205	20.5%	27	15.8%
Donor age	355	14.5%	226	10.4%	63	6.3%	8	4.7%
Donor medical history, specify	253	10.3%	272	12.5%	144	14.4%	15	8.8%
Other, specify	169	6.9%	282	13.0%	59	5.9%	17	9.9%
Organ size, specify	156	6.4%	67	3.1%	21	2.1%	2	1.2%
Epidemic/Pandemic - Donor	123	5.0%	125	5.8%	71	7.1%	9	5.3%
Transplant team or transplant facility availability	68	2.8%	3	0.1%	18	1.8%	4	2.3%
Candidate requires multiple organ transplant	65	2.6%	3	0.1%	9	0.9%	3	1.8%
PHS risk criteria or social history	62	2.5%	93	4.3%	31	3.1%	15	8.8%
Organ anatomical damage or defect	61	2.5%	41	1.9%	28	2.8%	3	1.8%
Organ preservation: Unacceptable method or findings	48	2.0%	29	1.3%	1	0.1%	3	1.8%
Resource time constraint (OPO, TXC, donor hospital, etc.)	48	2.0%	17	0.8%	0	0.0%	0	0.0%
Donor instability/high vasopressor usage	28	1.1%	22	1.0%	13	1.3%	11	6.4%
Candidate temporarily medically unsuitable	27	1.1%	14	0.6%	5	0.5%	0	0.0%
Prolonged downtime/CPR	27	1.1%	42	1.9%	32	3.2%	13	7.6%
Recovery team availability	13	0.5%	4	0.2%	15	1.5%	3	1.8%
Donor infection or positive culture	12	0.5%	0	0.0%	5	0.5%	0	0.0%
DCD donor neurological function/not expected to arrest	10	0.4%	10	0.5%	5	0.5%	0	0.0%
Organ specific test results not available, specify	9	0.4%	24	1.1%	16	1.6%	0	0.0%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	9	0.4%	7	0.3%	3	0.3%	0	0.0%
Candidate transplanted or pending transplant	8	0.3%	1	0.0%	1	0.1%	0	0.0%
Epidemic/Pandemic - Candidate	8	0.3%	4	0.2%	4	0.4%	0	0.0%
Transportation availability	7	0.3%	0	0.0%	0	0.0%	0	0.0%
Donor family time constraint	5	0.2%	0	0.0%	0	0.0%	0	0.0%
Candidate refused	3	0.1%	1	0.0%	0	0.0%	0	0.0%
Malignancy or suspected malignancy	3	0.1%	4	0.2%	0	0.0%	0	0.0%
Candidate unavailable	2	0.1%	1	0.0%	2	0.2%	0	0.0%
Warm ischemic time too long	2	0.1%	2	0.1%	3	0.3%	0	0.0%
Exceeded policy defined response time	1	0.0%	2	0.1%	0	0.0%	0	0.0%
Number of HLA mismatches unacceptable	1	0.0%	2	0.1%	0	0.0%	0	0.0%
Positive physical crossmatch	1	0.0%	1	0.0%	0	0.0%	0	0.0%
Positive virtual crossmatch/unacceptable antigens	1	0.0%	2	0.1%	1	0.1%	0	0.0%

Table 50: Count and percent of reasons for refusal of range refused intestine match organ offers post implementation stratified by program size, for intestine matches submitted December 02, 2021 - December 01, 2022. Program size is defined by volume of deceased donor intestine transplants during 2020.

Description	Large		Medium		Small		No Transplants in 2020	
	N	%	N	%	N	%	N	%
Candidate requires multiple organ transplant	36	48.0%	23	25.3%	1	3.4%	0	0.0%
Number of HLA mismatches unacceptable	12	16.0%	0	0.0%	0	0.0%	0	0.0%
Donor age	9	12.0%	5	5.5%	0	0.0%	0	0.0%
Warm ischemic time too long	8	10.7%	0	0.0%	0	0.0%	0	0.0%
Unacceptable organ specific test results, specify	4	5.3%	13	14.3%	7	24.1%	2	50.0%
Actual or projected cold ischemic time too long	2	2.7%	0	0.0%	5	17.2%	0	0.0%
Organ size, specify	2	2.7%	9	9.9%	0	0.0%	2	50.0%
Donor infection or positive culture	1	1.3%	0	0.0%	0	0.0%	0	0.0%
Other, specify	1	1.3%	23	25.3%	6	20.7%	0	0.0%
PHS risk criteria or social history	0	0.0%	8	8.8%	0	0.0%	0	0.0%
Prolonged downtime/CPR	0	0.0%	7	7.7%	6	20.7%	0	0.0%
Organ anatomical damage or defect	0	0.0%	2	2.2%	0	0.0%	0	0.0%
Epidemic/Pandemic - Donor	0	0.0%	1	1.1%	0	0.0%	0	0.0%
Donor instability/high vasopressor usage	0	0.0%	0	0.0%	3	10.3%	0	0.0%
Positive virtual crossmatch/unacceptable antigens	0	0.0%	0	0.0%	1	3.4%	0	0.0%

Table 51: Count and percent of reasons for refusal of range refused kidney match organ offers post implementation stratified by match acceptance number, for kidney matches submitted December 02, 2021 - December 01, 2022. Group is defined by the 90th percentile of sequence numbers for acceptances on kidney matches during 2020.

Description	Acceptor Sequence Number: [1, 667]		Acceptor Sequence Number: [667, 31425]	
	N	%	N	%
Unacceptable organ specific test results, specify	45,074	16.6%	256,224	13.3%
Donor medical history, specify	39,017	14.4%	238,611	12.4%
Organ anatomical damage or defect	27,160	10.0%	196,856	10.3%
Actual or projected cold ischemic time too long	26,900	9.9%	412,118	21.5%
Biopsy results unacceptable	25,930	9.6%	182,897	9.5%
Other, specify	22,567	8.3%	134,683	7.0%
Donor age	22,508	8.3%	94,852	4.9%
Epidemic/Pandemic - Donor	20,169	7.4%	192,559	10.0%
Organ preservation: Unacceptable method or findings	8,729	3.2%	60,070	3.1%
Warm ischemic time too long	7,733	2.9%	51,060	2.7%
Organ size, specify	5,170	1.9%	23,913	1.2%
Donor infection or positive culture	2,923	1.1%	13,822	0.7%
Biopsy not available	2,886	1.1%	12,858	0.7%
DCD donor neurological function/not expected to arrest	2,536	0.9%	8,514	0.4%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	1,728	0.6%	4,754	0.2%
Organ specific test results not available, specify	1,626	0.6%	9,756	0.5%
PHS risk criteria or social history	1,552	0.6%	2,939	0.2%
Malignancy or suspected malignancy	1,546	0.6%	13,578	0.7%
No candidate serum for crossmatching	985	0.4%	1,617	0.1%
Candidate temporarily medically unsuitable	723	0.3%	689	0.0%
Donor instability/high vasopressor usage	602	0.2%	1,520	0.1%
Transplant team or transplant facility availability	575	0.2%	974	0.1%
Candidate requires multiple organ transplant	388	0.1%	566	0.0%
Prolonged downtime/CPR	358	0.1%	1,274	0.1%
Epidemic/Pandemic - Candidate	269	0.1%	1,180	0.1%
Positive physical crossmatch	187	0.1%	80	0.0%
Resource time constraint (OPO, TXC, donor hospital, etc.)	160	0.1%	517	0.0%
Candidate refused	123	0.0%	46	0.0%
Candidate unavailable	119	0.0%	74	0.0%
Positive virtual crossmatch/unacceptable antigens	115	0.0%	215	0.0%
Candidate transplanted or pending transplant	98	0.0%	27	0.0%
Exceeded policy defined response time	88	0.0%	204	0.0%
Disaster Emergency Management Consideration	63	0.0%	175	0.0%
No donor cells/specimen for crossmatching, or no time for crossmatch	48	0.0%	95	0.0%
Recovery team availability	32	0.0%	9	0.0%
Number of HLA mismatches unacceptable	16	0.0%	3	0.0%
Candidate requires different laterality	15	0.0%	2	0.0%
Candidate temporarily ineligible due to insurance or financial issue	14	0.0%	4	0.0%
Transportation availability	8	0.0%	126	0.0%
Candidate's condition improved, transplant not needed	2	0.0%	0	0.0%
Donor family time constraint	0	0.0%	1	0.0%

Table 52: Count and percent of reasons for refusal of range refused liver match organ offers post implementation stratified by match acceptance number, for liver matches submitted December 02, 2021 - December 01, 2022. Group is defined by the 90th percentile of sequence numbers for acceptances on liver matches during 2020.

Description	Acceptor Sequence Number: [1, 78)		Acceptor Sequence Number: [78, 7555]	
	N	%	N	%
Donor age	5,700	16.6%	39,038	20.0%
Unacceptable organ specific test results, specify	5,308	15.4%	23,022	11.8%
Donor medical history, specify	4,008	11.6%	17,221	8.8%
Organ size, specify	3,621	10.5%	9,070	4.6%
Other, specify	3,467	10.1%	23,043	11.8%
DCD donor neurological function/not expected to arrest	2,502	7.3%	17,063	8.7%
Actual or projected cold ischemic time too long	2,104	6.1%	24,606	12.6%
Epidemic/Pandemic - Donor	1,927	5.6%	16,232	8.3%
Biopsy results unacceptable	960	2.8%	9,681	5.0%
Organ anatomical damage or defect	721	2.1%	3,042	1.6%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	510	1.5%	1,440	0.7%
Candidate temporarily medically unsuitable	400	1.2%	144	0.1%
Candidate transplanted or pending transplant	344	1.0%	63	0.0%
Resource time constraint (OPO, TXC, donor hospital, etc.)	277	0.8%	1,607	0.8%
PHS risk criteria or social history	258	0.7%	623	0.3%
Donor infection or positive culture	244	0.7%	1,002	0.5%
Prolonged downtime/CPR	244	0.7%	345	0.2%
Organ specific test results not available, specify	229	0.7%	1,125	0.6%
Organ preservation: Unacceptable method or findings	215	0.6%	1,277	0.7%
Donor instability/high vasopressor usage	189	0.5%	1,129	0.6%
Candidate requires multiple organ transplant	187	0.5%	102	0.1%
Malignancy or suspected malignancy	173	0.5%	2,103	1.1%
Biopsy not available	161	0.5%	598	0.3%
Donor family time constraint	120	0.3%	354	0.2%
Warm ischemic time too long	120	0.3%	323	0.2%
Transplant team or transplant facility availability	116	0.3%	259	0.1%
Candidate unavailable	109	0.3%	356	0.2%
Exceeded policy defined response time	49	0.1%	290	0.1%
Epidemic/Pandemic - Candidate	45	0.1%	174	0.1%
Candidate refused	34	0.1%	29	0.0%
Recovery team availability	22	0.1%	32	0.0%
Disaster Emergency Management Consideration	19	0.1%	13	0.0%
Transportation availability	17	0.0%	79	0.0%
Candidate's condition improved, transplant not needed	13	0.0%	7	0.0%
Candidate temporarily ineligible due to insurance or financial issue	4	0.0%	0	0.0%
Positive physical crossmatch	3	0.0%	0	0.0%
Positive virtual crossmatch/unacceptable antigens	2	0.0%	2	0.0%
No donor cells/specimen for crossmatching, or no time for crossmatch	0	0.0%	6	0.0%
Number of HLA mismatches unacceptable	0	0.0%	2	0.0%

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Table 53: Count and percent of reasons for refusal of range refused heart and heart-lung match organ offers post implementation stratified by match acceptance number, for heart and heart-lung matches submitted December 02, 2021 - December 01, 2022. Group is defined by the 90th percentile of sequence numbers for acceptances on heart and heart-lung matches during 2020.

Description	Acceptor Sequence Number: [1, 41)		Acceptor Sequence Number: [41, 1396]	
	N	%	N	%
Unacceptable organ specific test results, specify	1,731	32.0%	5,621	36.6%
Organ size, specify	913	16.9%	2,439	15.9%
Donor medical history, specify	377	7.0%	1,297	8.5%
Actual or projected cold ischemic time too long	323	6.0%	607	4.0%
Donor age	321	5.9%	1,567	10.2%
DCD donor neurological function/not expected to arrest	303	5.6%	336	2.2%
Prolonged downtime/CPR	298	5.5%	562	3.7%
Other, specify	280	5.2%	642	4.2%
Epidemic/Pandemic - Donor	172	3.2%	658	4.3%
Organ anatomical damage or defect	133	2.5%	614	4.0%
Organ specific test results not available, specify	115	2.1%	118	0.8%
PHS risk criteria or social history	76	1.4%	212	1.4%
Donor infection or positive culture	41	0.8%	106	0.7%
Resource time constraint (OPO, TXC, donor hospital, etc.)	40	0.7%	100	0.7%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	39	0.7%	138	0.9%
Donor instability/high vasopressor usage	33	0.6%	52	0.3%
Malignancy or suspected malignancy	28	0.5%	65	0.4%
Warm ischemic time too long	25	0.5%	29	0.2%
Candidate temporarily medically unsuitable	24	0.4%	9	0.1%
Candidate requires multiple organ transplant	23	0.4%	22	0.1%
Candidate transplanted or pending transplant	22	0.4%	7	0.0%
Organ preservation: Unacceptable method or findings	22	0.4%	87	0.6%
Transplant team or transplant facility availability	19	0.4%	7	0.0%
Exceeded policy defined response time	15	0.3%	2	0.0%
Positive virtual crossmatch/unacceptable antigens	11	0.2%	6	0.0%
Donor family time constraint	10	0.2%	4	0.0%
Epidemic/Pandemic - Candidate	10	0.2%	17	0.1%
No donor cells/specimen for crossmatching, or no time for crossmatch	2	0.0%	2	0.0%
Positive physical crossmatch	2	0.0%	1	0.0%
Recovery team availability	2	0.0%	4	0.0%
Candidate refused	1	0.0%	1	0.0%
Candidate unavailable	1	0.0%	0	0.0%
No candidate serum for crossmatching	1	0.0%	1	0.0%
Transportation availability	1	0.0%	2	0.0%
Number of HLA mismatches unacceptable	0	0.0%	4	0.0%
Biopsy results unacceptable	0	0.0%	3	0.0%
Candidate's condition improved, transplant not needed	0	0.0%	2	0.0%

Table 54: Count and percent of reasons for refusal of range refused lung match organ offers post implementation stratified by match acceptance number, for lung matches submitted December 02, 2021 - December 01, 2022. Group is defined by the 90th percentile of sequence numbers for acceptances on lung matches during 2020.

Description	Acceptor Sequence Number: [1, 53)		Acceptor Sequence Number: [53, 514]	
	N	%	N	%
Unacceptable organ specific test results, specify	4,927	47.5%	9,677	51.3%
Organ size, specify	1,256	12.1%	908	4.8%
Donor medical history, specify	977	9.4%	1,364	7.2%
Other, specify	717	6.9%	1,699	9.0%
Donor age	423	4.1%	618	3.3%
DCD donor neurological function/not expected to arrest	413	4.0%	765	4.1%
Organ anatomical damage or defect	403	3.9%	591	3.1%
Epidemic/Pandemic - Donor	232	2.2%	1,082	5.7%
Candidate requires different laterality	191	1.8%	631	3.3%
Organ specific test results not available, specify	174	1.7%	181	1.0%
Actual or projected cold ischemic time too long	118	1.1%	436	2.3%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	115	1.1%	42	0.2%
PHS risk criteria or social history	75	0.7%	128	0.7%
Resource time constraint (OPO, TXC, donor hospital, etc.)	73	0.7%	271	1.4%
Donor infection or positive culture	49	0.5%	144	0.8%
Candidate requires multiple organ transplant	45	0.4%	115	0.6%
Transplant team or transplant facility availability	32	0.3%	31	0.2%
Organ preservation: Unacceptable method or findings	24	0.2%	50	0.3%
Warm ischemic time too long	23	0.2%	0	0.0%
Candidate transplanted or pending transplant	19	0.2%	3	0.0%
Candidate temporarily medically unsuitable	12	0.1%	9	0.0%
Exceeded policy defined response time	12	0.1%	4	0.0%
Positive virtual crossmatch/unacceptable antigens	12	0.1%	8	0.0%
Positive physical crossmatch	10	0.1%	0	0.0%
Donor family time constraint	8	0.1%	42	0.2%
Candidate unavailable	6	0.1%	18	0.1%
Biopsy not available	4	0.0%	0	0.0%
Recovery team availability	4	0.0%	0	0.0%
Epidemic/Pandemic - Candidate	3	0.0%	21	0.1%
Number of HLA mismatches unacceptable	3	0.0%	0	0.0%
Donor instability/high vasopressor usage	2	0.0%	0	0.0%
Malignancy or suspected malignancy	2	0.0%	2	0.0%
No candidate serum for crossmatching	2	0.0%	1	0.0%
Prolonged downtime/CPR	2	0.0%	28	0.1%
Candidate refused	1	0.0%	1	0.0%
Transportation availability	1	0.0%	0	0.0%
Disaster Emergency Management Consideration	0	0.0%	3	0.0%

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Table 55: Count and percent of reasons for refusal of range refused kidney-pancreas match organ offers post implementation stratified by match acceptance number, for kidney-pancreas matches submitted December 02, 2021 - December 01, 2022. Group is defined by the 90th percentile of sequence numbers for acceptances on kidney-pancreas matches during 2020.

Description	Acceptor Sequence Number: [1, 29)		Acceptor Sequence Number: [29, 286]	
	N	%	N	%
Unacceptable organ specific test results, specify	459	23.4%	752	19.6%
Donor medical history, specify	245	12.5%	439	11.5%
Other, specify	243	12.4%	284	7.4%
Actual or projected cold ischemic time too long	191	9.7%	854	22.3%
Donor age	150	7.6%	502	13.1%
Organ size, specify	118	6.0%	128	3.3%
PHS risk criteria or social history	90	4.6%	111	2.9%
Epidemic/Pandemic - Donor	64	3.3%	264	6.9%
Prolonged downtime/CPR	59	3.0%	55	1.4%
Organ anatomical damage or defect	48	2.4%	85	2.2%
Transplant team or transplant facility availability	43	2.2%	50	1.3%
Candidate temporarily medically unsuitable	42	2.1%	4	0.1%
Candidate requires multiple organ transplant	33	1.7%	47	1.2%
Organ preservation: Unacceptable method or findings	30	1.5%	51	1.3%
DCD donor neurological function/not expected to arrest	25	1.3%	0	0.0%
Donor instability/high vasopressor usage	23	1.2%	51	1.3%
Recovery team availability	22	1.1%	13	0.3%
Resource time constraint (OPO, TXC, donor hospital, etc.)	18	0.9%	47	1.2%
Organ specific test results not available, specify	8	0.4%	41	1.1%
Candidate transplanted or pending transplant	7	0.4%	3	0.1%
Malignancy or suspected malignancy	7	0.4%	0	0.0%
Positive infectious disease screening test: CMV, HBV, HCV, etc.	7	0.4%	12	0.3%
Warm ischemic time too long	7	0.4%	0	0.0%
Candidate unavailable	5	0.3%	0	0.0%
Epidemic/Pandemic - Candidate	4	0.2%	12	0.3%
Exceeded policy defined response time	3	0.2%	0	0.0%
Number of HLA mismatches unacceptable	3	0.2%	0	0.0%
Transportation availability	3	0.2%	4	0.1%
Candidate refused	2	0.1%	2	0.1%
Donor infection or positive culture	2	0.1%	15	0.4%
Positive virtual crossmatch/unacceptable antigens	2	0.1%	2	0.1%
Positive physical crossmatch	1	0.1%	1	0.0%
Donor family time constraint	0	0.0%	5	0.1%

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Table 56: Count and percent of reasons for refusal of range refused intestine match organ offers post implementation stratified by match acceptance number, for intestine matches submitted December 02, 2021 - December 01, 2022. Group is defined by the 90th percentile of sequence numbers for acceptances on intestine matches during 2020.

Description	Acceptor Sequence Number: [1, 34)		Acceptor Sequence Number: [34, 59]	
	N	%	N	%
Candidate requires multiple organ transplant	18	24.7%	42	33.3%
Organ size, specify	13	17.8%	0	0.0%
Unacceptable organ specific test results, specify	12	16.4%	14	11.1%
Number of HLA mismatches unacceptable	9	12.3%	3	2.4%
Prolonged downtime/CPR	9	12.3%	4	3.2%
Other, specify	5	6.8%	25	19.8%
Donor instability/high vasopressor usage	3	4.1%	0	0.0%
Organ anatomical damage or defect	2	2.7%	0	0.0%
Donor infection or positive culture	1	1.4%	0	0.0%
Epidemic/Pandemic - Donor	1	1.4%	0	0.0%
Donor age	0	0.0%	14	11.1%
PHS risk criteria or social history	0	0.0%	8	6.3%
Warm ischemic time too long	0	0.0%	8	6.3%
Actual or projected cold ischemic time too long	0	0.0%	7	5.6%
Positive virtual crossmatch/unacceptable antigens	0	0.0%	1	0.8%