

2021
EYE BANKING
STATISTICAL
REPORT



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2021 ANALYSIS OF
SURGICAL USE AND
INDICATIONS FOR
CORNEAL
TRANSPLANT

2021 Analysis of Surgical Use and Indications for Corneal Transplant

Introduction:

The 2021 Eye Banking Statistical Report of the Eye Bank Association of America (EBAA) includes information on all EBAA member eye banks (56) and EBAA accredited entities (1) reporting data for the 2021 calendar year and represents an essentially complete picture of eye banking activity in the United States. Data on utilization of tissue are provided for all tissue recovered by EBAA eye banks, with analysis of the indications for surgery of every tissue utilized for transplant.

Details of This Year's Analysis:

Starting in 2017, the summarized data for Indications for Transplant were segregated by where the tissue from domestic eye banks was used - domestically or internationally. Previously, the analysis of indications for transplant came from both internationally and domestically used corneas supplied by U.S. eye banks. However, the large number of unknowns in tissue utilization, mostly from internationally used corneas, diminished the validity of the conclusions about tissue utilization in general and indications for transplant. As one can see in **Table 7**, the large percentage of unknown indications (61.7%) in U.S. tissue shipped internationally for transplant (28.7% exported in 2021) invalidates any conclusions drawn about utilization or surgical indications in the international pool and obfuscates conclusions in the combined pool. For this reason, the indications for transplant data (**Table 8**) are presented only for domestic utilization of corneas supplied by U.S. eye banks, where the unknown was 14.6%.

Donations and Tissue Supply:

The COVID-19 crisis in 2020 made for an unusual year in eye banking. Most eye banks drastically reduced activity for two months in April and May because of the moratorium on elective surgery. Overall activity returned to 96% of the usual business practice in the last 6 months of 2020 (see **Figures 1 and 2** below), but in 2021 is still lagging behind pre-COVID levels.

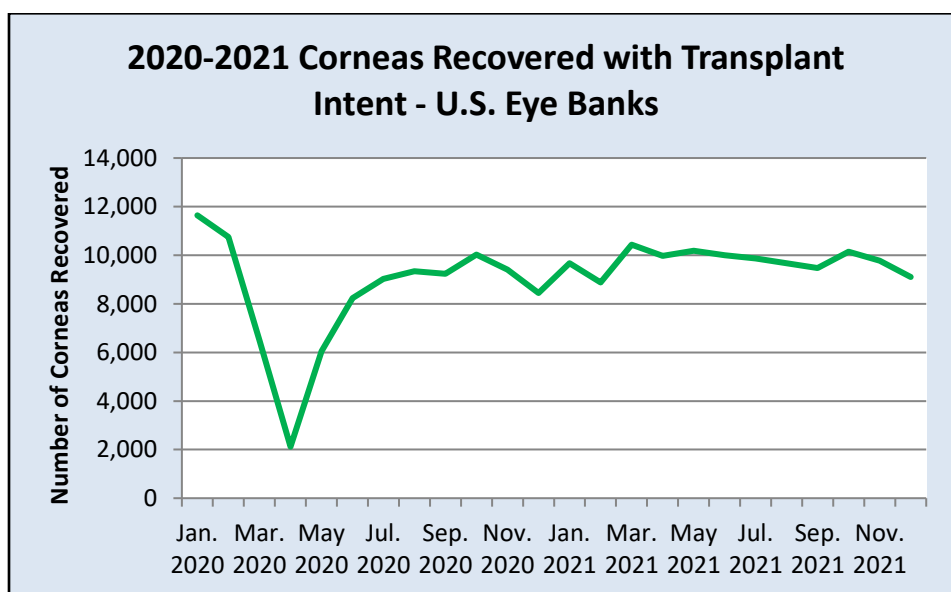


Figure 1. Corneas recovered with intent to transplant

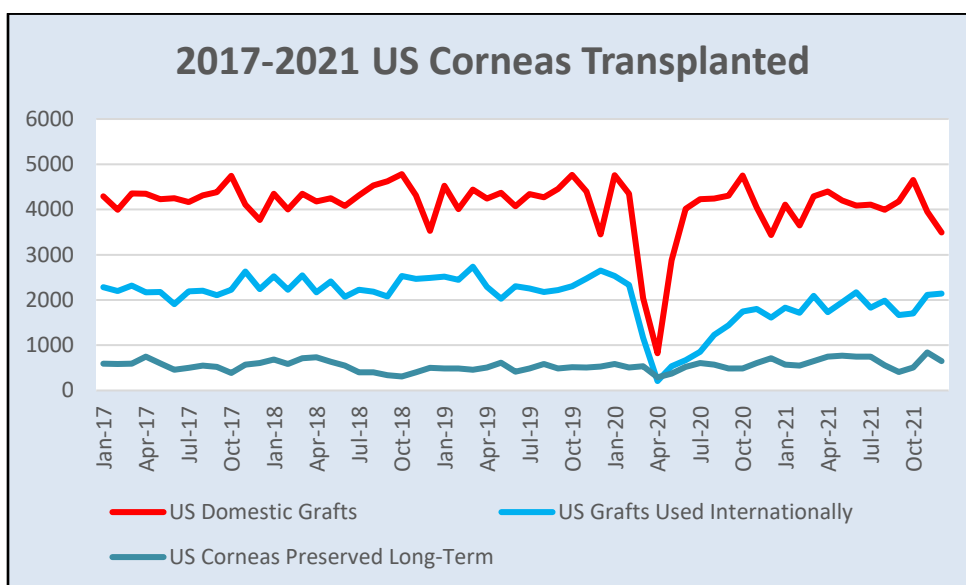


Figure 2. Corneas that were transplanted in 2021 reached 93.0% of pre-COVID levels.

In 2021, total donors were up 14.5% and total corneas donated were up 16.8% compared to 2020, but neither were back to 2019 pre-COVID levels. Please see **Table 1** below for details on donations and distribution of tissue comparing 2019, 2020 and 2021. Total corneal grafts were up 20.2% in 2021 but still 7.0% behind the 2019 total. Intermediate term preserved corneas, which included all refrigerated tissue stored in Optisol GS™, Life4°C™, or Cornea Cold™ used for full thickness and lamellar procedures, increased 20.1% from 59,996 in 2020 to 72,038 in 2021, but were still 9.4% less than 79,534 in 2019. Domestic transplants were up 11.9%. Total international transplants (using tissue from the U.S.) were up 42.2% in 2021 after a 43.2% downturn in 2020. Neither domestic nor international transplants returned to 2019 numbers in 2021. Corneas distributed in long term preservation medium continued to increase this year (12,626 in 2021, 9,093 in 2020, and 8,614 in 2019) but were still less than 13,521 in 2018.

Table 1: Total Donations and Distribution of Tissue in 2021

Donations	2019	2020	2021	% Change
Eye Banks Reported	57	59	57	(3.4%)
Total Whole Globes and Corneas Donated	136,130	108,382	126,623	16.8%
Total Number of Donors	68,759	54,740	64,048	14.5%
Use of Donated Tissue	2019	2020	2021	% Change
Total Corneal Grafts	85,601	66,278	79,641	20.2%
Intermediate-Term Preserved Corneas	79,534	59,996	72,038	20.1%
Total Domestic Transplants	51,336	43,873	49,110	11.9%
Total International Transplants	28,402	16,123	22,928	42.2%
Sclera	5,999	3,151	5,614	78.2%
Long-Term Preserved Corneas	8,614	9,093	12,626	38.9%
Research	13,743	11,336	14,222	25.5%
Training	9,487	6,504	7,425	14.2%

The total numbers for domestic and international transplants provided by US eye banks for the past 20 years can also be seen in **Figure 3** and **Table 2** below. In 2021, U.S. eye banks collectively exported approximately 28.8% of tissue recovered in the U.S. to international surgeons. This trend, averaging approximately 30% over the last 12 years, demonstrates the continuing commitment of U.S. eye banks to help meet international eye banks needs to help reduce global blindness from to corneal disease.

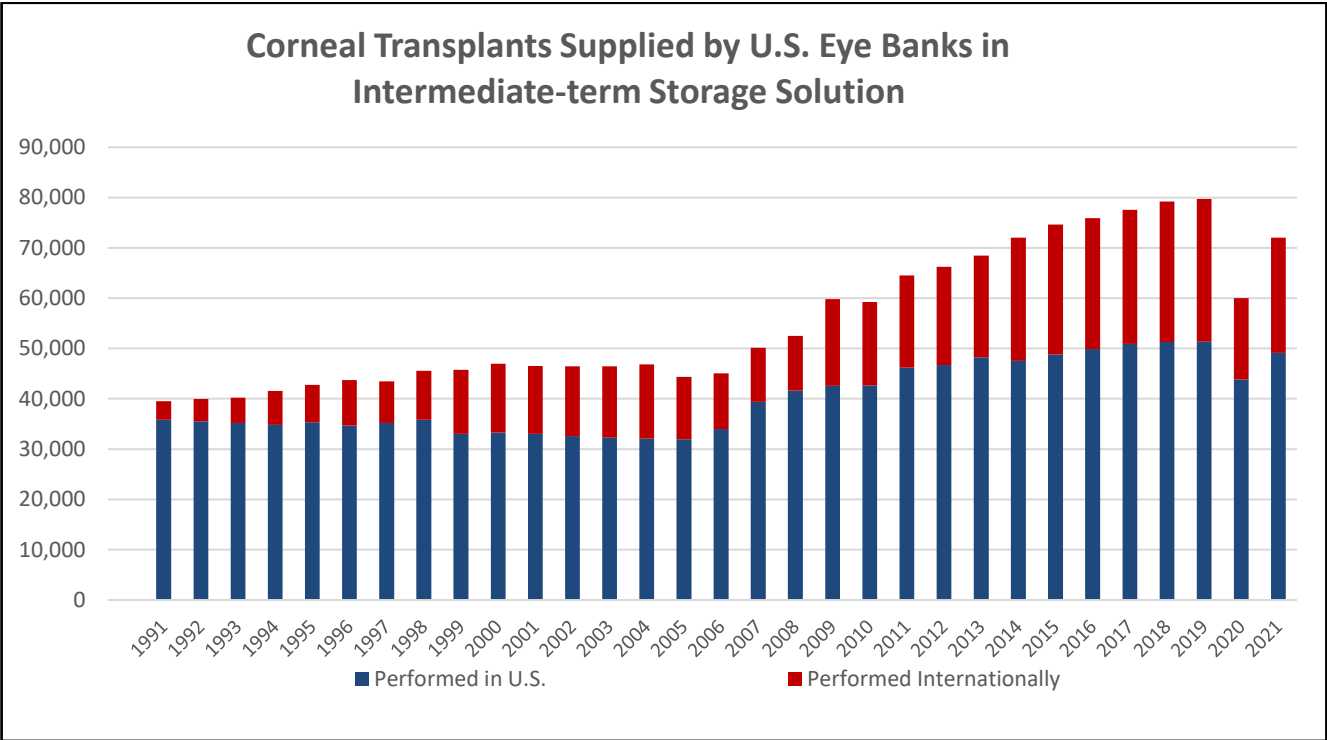


Figure 3: Total Corneal Transplants Supplied by U.S. Banks in Intermediate-Term Storage, stratified by domestic and international use.

Table 2 (below) shows the data in plotted in **Figure 2** (above). Keratoplasty tissue usage in the U.S. in 2021 improved after an 22.6% drop in 2020 from COVID-19. Tissue exported abroad last year also increased from 2020, but neither reached 2019 pre-COVID levels.

Table 2: Corneal Transplants Supplied by U.S. Eye Banks

Year	Total Provided by U.S.	Performed in U.S.	Performed Internationally
1991	39,515	35,831	3,684
1992	39,973	35,525	4,448
1993	40,215	35,173	5,042
1994	41,539	34,842	6,697
1995	42,740	35,300	7,440
1996	43,711	34,668	9,043
1997	43,492	35,209	8,283
1998	45,579	35,861	9,718
1999	45,765	33,020	12,745
2000	46,949	33,260	13,689
2001	46,532	33,035	13,497
2002	46,440	32,559	13,881
2003	46,436	32,240	14,196
2004	46,841	32,106	14,735
2005	44,329	31,952	12,377
2006	45,035	33,962	11,073
2007	50,122	39,391	10,731
2008	52,487	41,652	10,835
2009	59,784	42,606	17,178
2010	59,271	42,642	16,629
2011	67,590	46,196	18,307
2012	68,681	46,684	19,546
2013	72,736	48,229	20,213
2014	76,431	47,530	24,483
2015	79,304	48,792	25,832
2016	82,994	49,869	26,057
2017	84,297	50,934	26,645
2018	85,441	51,294	27,913
2019	85,601	51,336	28,402
2020	66,287	43,873	16,123
2021	79,641	49,110	22,928

Tissue Utilization:

Utilization of tissue supplied by U.S. eye banks in 2021 is shown below in **Table 3** below and includes all tissue used both domestically and internationally. Total grafts in 2021 increased 20.2% from 66,278 to 79,641 after a 22.6% decrease in 2020. Penetrating keratoplasty (PK) numbers, which had decreased 30.3% from 35,919 in 2019 to 25,023 in 2020, increased 21.5% to 30,412 in 2021. Table 3, excluding the 2020 COVID decrease, shows a continuation of the decline in PK procedures observed since 2005. Tissue used for endothelial keratoplasty (EK), down 15.8% in 2020, increased 18.6% to 35,532, nearly back to the pre-COVID level. Anterior lamellar keratoplasty (ALK) increased 21.9% in 2021 to 1,307 but is still a long way behind pre-COVID levels following a nearly 50.0% decrease from 2019 to 2020. The number of corneas used for keratolimbal allograft (KLA) increased slightly 12.6% from 119 in 2020 to 134 in 2021. Corneas used for keratoprosthesis (175 in 2021) were essentially the same as in 2020 (174) but nearly half the 344 KP procedures in 2017. The number of corneas used for ALK, KLA and K-Pro procedures remain relatively small: these three procedures combined made up just 2.5% of the combined number of PK and EK grafts supplied by US eye banks for domestic and international use in 2021 (see **Table 3** below). U.S. eye banks also provided 21,647 ocular tissues for research and training, continuing their support of education and training in cornea surgery.

Table 3 includes use of tissue recovered by U.S. eye banks in 2021, combining both domestic and international distribution. Endothelial keratoplasty procedures recovered to pre-COVID levels in 2021, but although the number of penetrating keratoplasty procedures increased 21.5% over 2020, they still lagged pre-COVID levels by nearly 20%. Recovered corneas not used for transplant (27%) were used for research and surgical training.

Table 3. Use of tissue supplied by US eye banks for domestic and international use over the past 5 years.

Use of Donated Tissue	2017	2018	2019	2020	2021
Corneal Grafts Total	84,297	85,441	85,601	66,278	79,641
Penetrating Keratoplasty	38,025	36,028	35,919	25,023	30,412
Anterior Lamellar Keratoplasty	2,541	2,355	2,146	1,072	1,307
Endothelial Keratoplasty	33,397	35,071	35,555	29,947	35,532
Keratolimbal Allograft	104	87	110	119	134
Keratoprosthesis (K-Pro)	344	243	267	174	175
Glaucoma Shunt Patch or other non-keratoplasty use	1,368	1,058	1,018	873	839
Other keratoplasty (experimental surgery)	232	64	44	11	25
Unknown or Unspecified	1,568	4,301	4,679	2,777	3,614
Sclera	3,253	2,959	5,999	3,151	5,614
Long-Term Preserved Corneas	12,543	13,521	8,614	9,093	12,626
Keratoplasty	197	298	126	125	82
Glaucoma Shunt Patching	12,345	13,066	8,420	7,037	10,283
Other Surgical Uses	1	157	68	1,931	2,261
Research	13,859	12,495	13,743	11,336	14,222
Training	10,539	10,666	9,487	6,504	7,425

Domestic Use of Keratoplasty Tissue from US Eye Banks:

Trends in the domestic use of tissue (tissue supplied by domestic eye banks used in the US) are shown in **Table 4** below. The number of penetrating grafts performed in the U.S. using intermediate-term preservation increased 5.6% this year from 15,402 to 16,269; not back to pre-COVID levels, and likely still part of the trend of decreasing PK numbers seen in each of the previous 15 years from a high of 42,063 in 2005. EK procedures in 2021 increased 15.3% from 26,095 in 2020 to 30,098 in 2021, essentially back to pre-COVID levels. DSAEK and DMEK numbers are discussed separately below in **Table 5**. The number of corneas used domestically for EK has increased every year since tracking started in 2005, surpassing PK in 2012, as noted in the graph in **Figure 4** below. ALK procedures in the US, which had decreased 32.2% in 2020 from 745 in 2019, increased in 2021 from 505 to 544 (7.7%), still well below pre-COVID levels. KLA and K-Pro procedures have been essentially flat in the U.S. over the past 10 years. Combined, ALK, KLAL and K-Pro made up 1.8% of intermediate-term preserved tissue use in the U.S. in 2021.

Table 4: Domestic Use of Intermediate-Term Preserved Tissue from U.S. Eye Banks Annual Comparison 2012 – 2021

Domestic Surgery Use	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Penetrating Keratoplasty	21,422	20,954	19,294	19,160	18,579	18,346	17,347	17,409	15,402	16,269
Endothelial Keratoplasty	23,049	24,987	25,965	27,208	28,327	28,993	30,336	30,650	26,095	30,098
Anterior Lamellar Keratoplasty	883	951	914	1,115	1,232	1,027	884	745	505	544
Keratolimbal Allograft	80	91	80	97	82	93	68	95	109	124
K-Pro	236	223	260	323	279	304	225	251	161	167

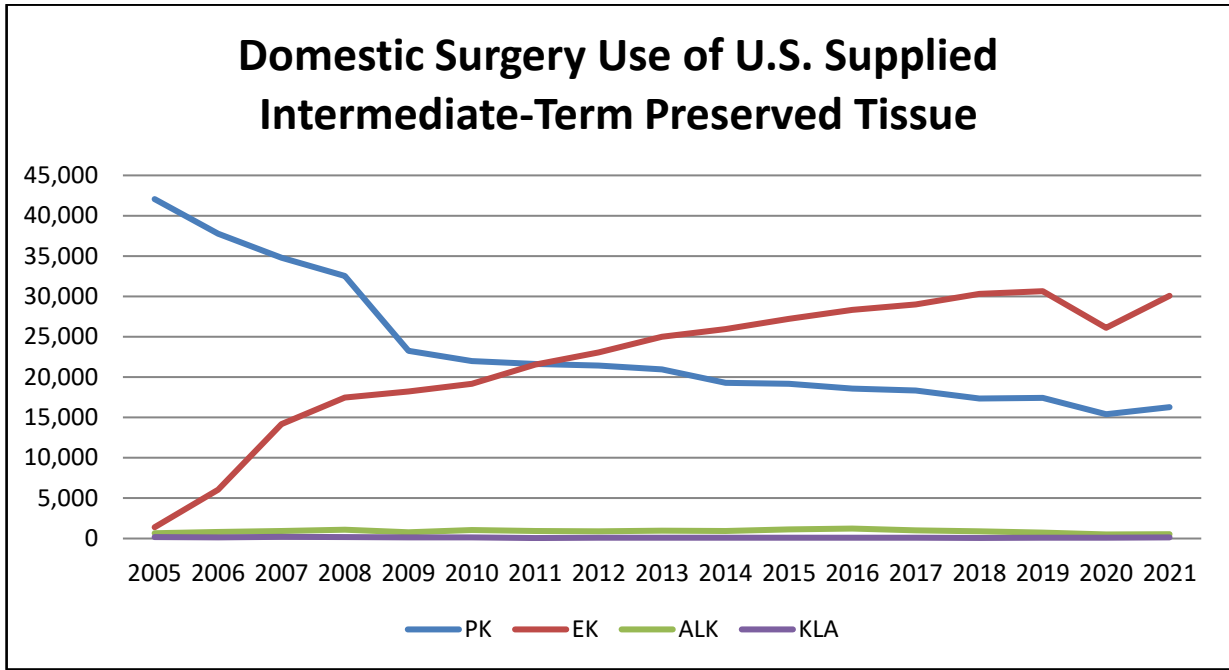


Figure 4: Domestic PK vs. EK vs. ALK Surgery Trends. The relative frequency of PK, EK, and ALK procedures performed in the U.S. over the last 17 years can be seen above. In 2012, the EK procedures exceeded PK. While all procedures increased in 2021 compared to 2020, only EK returned close to pre-COVID numbers.

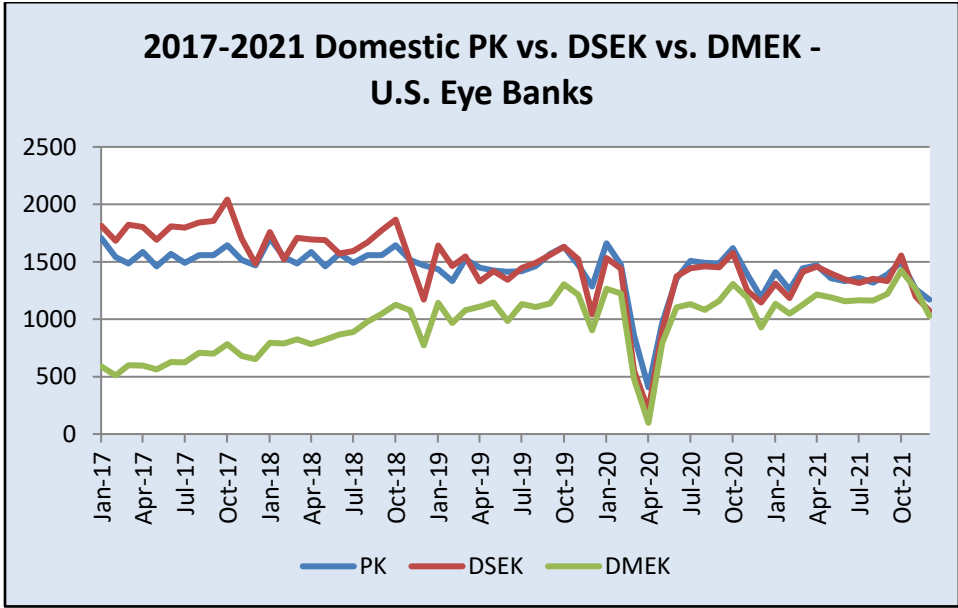


Figure 5: The number of domestic PK, DSAEK, and DMEK procedures using tissue from U.S. Eye Banks are shown monthly for the last five years. In this graph, PK appears relatively constant, DSAEK is decreasing slightly, and DMEK is increasing. The effect of COVID-19 can be seen in April 2020. The increase in DMEK accounts for the increase in EK numbers even though DSAEK is slowly decreasing. Note in the last quarter of 2021, numbers for PK, DSAEK and DMEK are essentially equal.

Table 5: Annual Domestic Endothelial Keratoplasty Numbers (2015 – 2021)

Domestic Surgery Use	2015	2016	2017	2018	2019	2020	2021
Total Endothelial Keratoplasty Procedures	27,208	28,327	28,991	30,336	30,650	26,095	30,098
DSEK, DSAEK, DLEK Procedures	22,514	21,868	21,337	19,526	17,428	14,391	15,935
DMEK or DMAEK Procedures	4,694	6,459	7,628	10,773	13,215	11,749	14,128
PDEK			21	26	6	4	0
Other EK			7	11	1	11	35

Table 5 (above) shows that by the end of 2021, DSAEK and DMEK numbers were comparable. The increased use of DMEK tissue in the past has accounted for the yearly increase in endothelial keratoplasty numbers since 2014. DSAEK numbers were up slightly this year but had declined over the past 5 years as more DMEK procedures were performed for endothelial disease.

DMEK procedures increased from 11,749 in 2020 to 14,128 in 2021 (20.2%). DSAEK procedures increased only 10.7% from 14,391 in 2020 to 15,935 in 2021, but still exceeded the number of DMEK procedures performed in 2021.

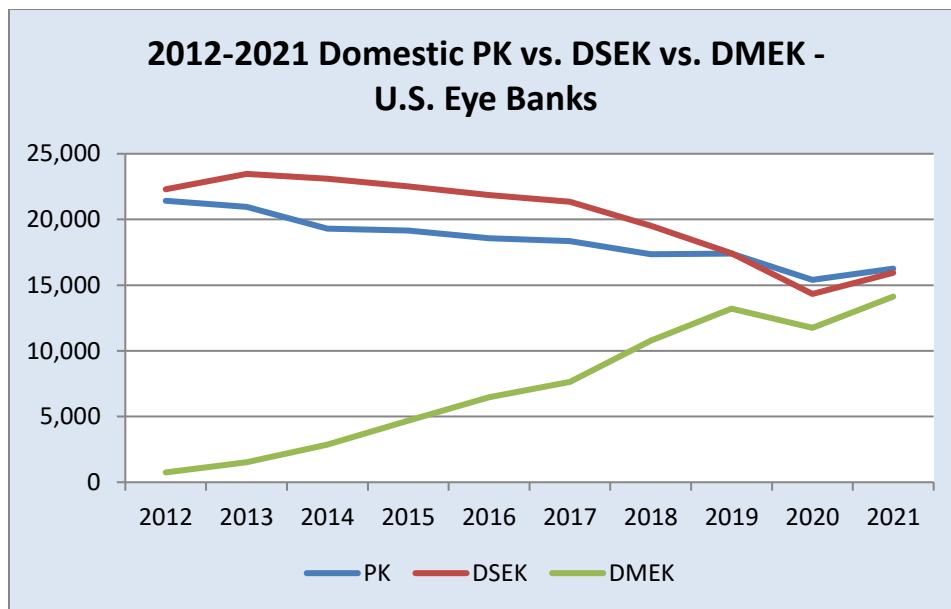


Figure 6 shows that the annual numbers for PK, EK (both decreasing) and DMEK (increasing) are all three approaching 16,000 by the end of 2021.

Tissue for Glaucoma Shunts:

Use of eye bank tissue to cover glaucoma shunt procedures is shown below in **Table 6**. In 2011, sclera was the most common tissue used for glaucoma shunt patching. Corneal tissue is now the most popular tissue with glaucoma surgeons to cover shunt hardware. In 2021, corneas in long term storage made up 65.5% of all ocular tissue used for shunt patching. Of 12,626 long-term preserved corneas used in 2021, 10,283 (81.4%) went for glaucoma shunt patching, 82 (0.6%) were used for keratoplasty, and 2,261 (17.9%) were used for other surgical indications (like eyelid retraction).

Table 6: Ocular Tissue Used for Glaucoma Shunt Patching (2012–2021) includes data from both domestic and international corneas from U.S. eye banks

Ocular Tissue Used for Glaucoma Shunt Patching - U.S. Eye Banks											
Ocular Tissue Used for Glaucoma Shunt Patching	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Long-Term Cornea	4,435	4,040	6,212	10,843	16,683	12,345	13,066	8,420	7,037	10,283	
Intermediate-Term Cornea	676	687	755	527	917	1,368	1,058	1,018	873	839	
Sclera	2,260	2,293	2,199	2,175	1,944	2,266	1,900	1,989	1,804	4,583	

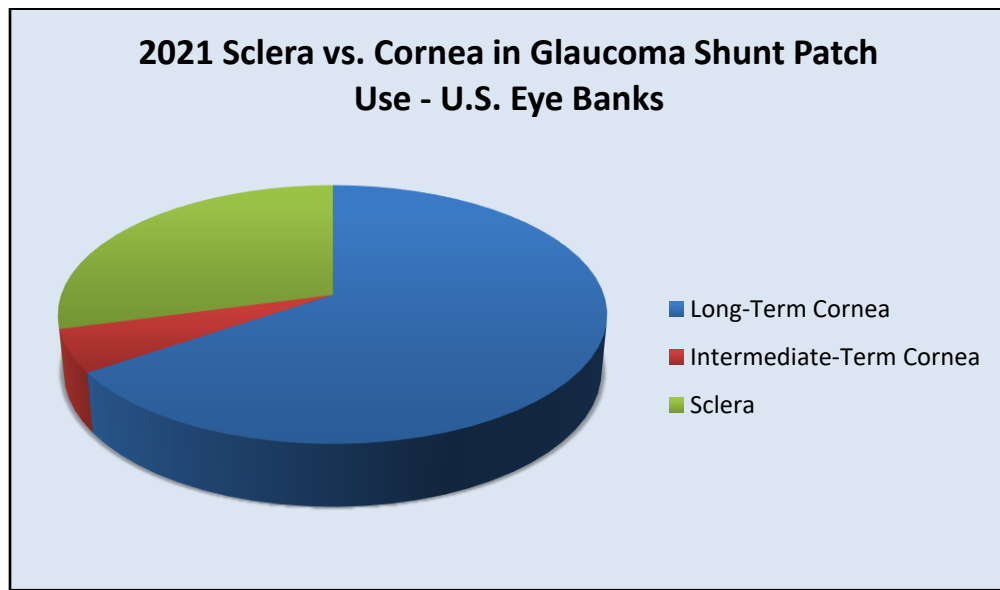


Figure 7: Tissue used for glaucoma shunt patching 2021. Corneas in long-term storage medium comprise 65.5% of all ocular tissue used to cover glaucoma shunts.

Table 7: Indications for 3 Keratoplasty Procedures Reported by US Banks, 2021

Indications for Penetrating Keratoplasty 2020	Domestic Use		International Use		TOTAL
A. Post-cataract surgery edema	877	5.4%	472	3.3%	
B. Ectasias/Thinning	2,243	13.8%	1,163	8.2%	
C. Endothelial Dystrophies	923	5.7%	527	3.7%	
D. Repeat Corneal Transplant	3,124	19.2%	611	4.3%	
E. Other degenerations or dystrophies	784	4.8%	323	2.3%	
F. Refractive	71	0.4%	16	0.1%	
G. Microbial keratitis	370	2.3%	133	0.9%	
H. Mechanical or chemical trauma	399	2.5%	113	0.8%	
I. Congenital opacities	254	1.6%	267	1.9%	
J. Pterygium	8	0.0%	5	0.0%	
K. Non-infectious ulcerative keratitis or perforation	1,135	7.0%	195	1.4%	
L. Other causes of corneal dysfunction or distortion	1,584	9.7%	492	3.5%	
M. Other causes of endothelial dysfunction	1,094	6.7%	372	2.6%	
Z. Unknown, unreported, or unspecified	3,403	20.9%	9,454	66.8%	
Total Indications for Penetrating Keratoplasty	16,269		14,143		30,412
Indications for Anterior Lamellar Keratoplasty	Domestic use		International Use		TOTAL
B. Ectasias/Thinning	199	36.6%	104	13.6%	
D. Repeat Corneal Transplant	25	4.6%	5	0.7%	
E. Other degenerations or dystrophies	51	9.4%	39	5.1%	
F. Refractive	2	0.4%	0	0.0%	
G. Microbial keratitis	23	4.2%	9	1.2%	
H. Mechanical or chemical trauma	9	1.7%	3	0.4%	
I. Congenital opacities	14	2.6%	11	1.4%	
J. Pterygium	1	0.2%	0	0.0%	
K. Non-infectious ulcerative keratitis or perforation	33	6.1%	8	1.0%	
L. Other causes of corneal dysfunction or distortion	94	17.3%	27	3.5%	
Z. Unknown, unreported, or unspecified	93	17.1%	557	73.0%	
Total for Anterior Keratoplasty	544		763		1,307
Indications for Endothelial Keratoplasty	Domestic Use		International Use		TOTAL
A. Post-Cataract Surgery Edema	3,200	10.6%	815	15.0%	
C. Endothelial Dystrophy	15,857	52.7%	707	13.0%	
D. Repeat Corneal Transplant	3,176	10.6%	326	6.0%	
M. Other Causes of Endothelial Dysfunction	4,504	15.0%	1,042	19.2%	
Z. Unknown, unreported, or unspecified	3,361	11.2%	2,544	46.8%	
Total for Endothelial Keratoplasty	30,098		5,434		35,532
Total Number of PK, ALK, and EK Procedures	46,911		20,340		67,251

Indications for Keratoplasty:

The indications for the three main keratoplasty procedures performed utilizing corneas provided by U.S. eye banks were segregated by domestic and international use in **Table 7**, above: Indications for Corneal Transplant Reported by U.S. Banks, 2021. The large number of “unknowns” has been a persistent problem and compromises conclusions drawn from that data. For example, 66.8% of tissue shipped internationally for penetrating keratoplasty has no diagnosis provided (69.5% in 2020 and 71.9% in 2019). The rate of “unknown” diagnosis for which the tissue was used was 14.6% with domestic tissue. Since 2017, the information on indications and utilization in (**Table 7**) has been split into domestic and international use to improve validity for conclusions, and so only domestic data is used for statistical analysis of indications in **Table 8**. For this reason, the data on indications for use in **Table 8**, below, may not be suitable for comparison with data prior to 2017 when domestic and international figures were combined. A side-by-side comparison of the information in **Table 7** is shown in **Figure 8** below. Note the “unknowns” (61.7%) in international use.

Figure 8: 2021 Keratoplasty Indications, US Eye Banks: Domestic vs. International Distribution

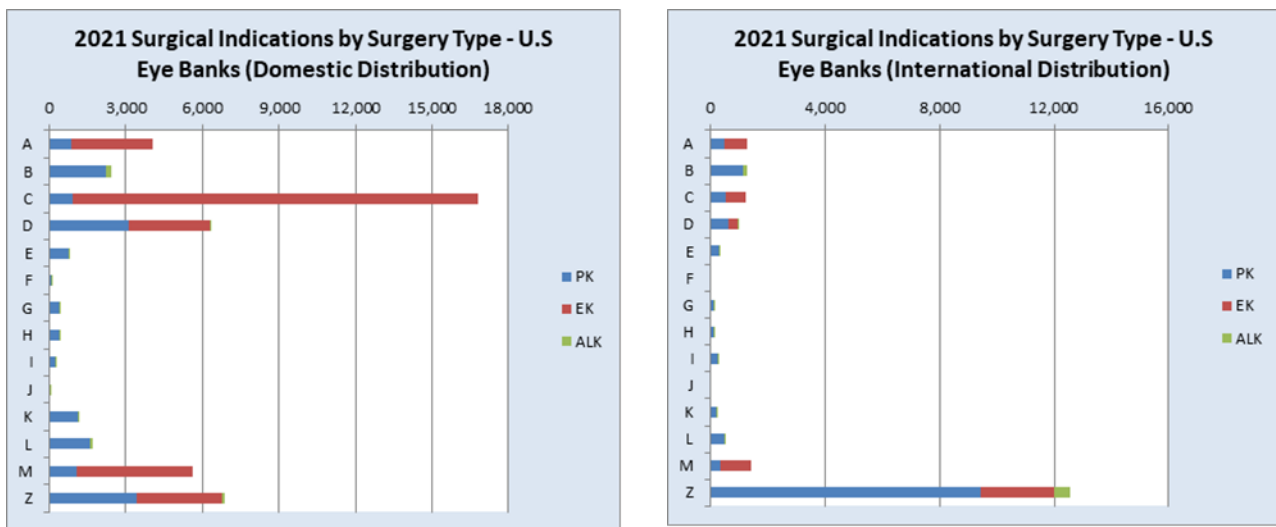


Figure 8. Surgical indication for 2021 domestic (right panel) and international (left panel) tissue distribution for keratoplasty. Note the high number of unknowns by Z.

A – Post-Cataract Surgery Edema. **B** – Ectasias/Thinning. **C** – Endothelial Dystrophies. **D** - Repeat Corneal Transplant. **E** – Other Degenerations/Dystrophies. **F** – Refractive. **G** – Microbial Keratitis. **H** – Mechanical (Non-Surgical) or Chemical Trauma. **I** – Congenital Opacities. **J** – Pterygium. **K** – Non-Infectious Ulcerative Keratitis, Thinning or Perforation. **L** - Other unknown Causes of Corneal Opacification or Distortion. **M** – Other causes of Endothelial Dysfunction. **Z** – Unknown or unreported.

Table 8, Indications for Transplant, Domestic Utilization of Tissue from US Eye Banks, on the following page, is arranged into four basic categories for which keratoplasty is performed: 1) endothelial cell failure, 2) stromal or full thickness (non-endothelial) disease, 3) re-grafts and 4) unknown. The specific diagnosis, or indication for transplant, is listed in each general category.

Endothelial cell failure is the leading domestic indication for keratoplasty. 56.4% of all keratoplasty procedures in the US in 2021 were performed for endothelial failure (Fuchs' endothelial dystrophy, post cataract surgery edema and other causes of endothelial cell failure). For the treatment of endothelial disease, 89.1% of grafts were EK and 10.9% were PK, exactly the same as 2020. 15.5% percent of all keratoplasty procedures were performed for stromal or full thickness disease: 94.1% were PK and 5.9% were ALK. The number of "Unknowns" in that category dropped from second to third most common indication listed (14.6%), down from 18.4% last year. Repeat transplants (6,325 in 2021, 13.5% of all grafts) were the fourth category. Specific re-graft rates were PK 19.2%, EK 10.6% and ALK 4.6%, all nearly identical to last year.

Overall, endothelial disease (26,455 of 46,911 total grafts, 56.4%) was the leading indication for keratoplasty in the US in 2021. Endothelial disease includes the three diagnoses of Fuchs dystrophy, other causes of endothelial dysfunction, and post-cataract surgery corneal edema. Stromal disease (7,274, 15.5%) was second, and includes keratoconus and ectatic disorders, dystrophies and degenerations, corneal opacities, iatrogenic refractive errors, opacity from microbial keratitis and other causes of corneal distortion. Unknowns (6,857, 14.6%) were the third most common indication for transplant. Re-grafts (6,325, 13.5%) were the fourth most common indication, dropping from third last year.

Fuchs' dystrophy was the leading diagnosis for keratoplasty in the US in 2021 (16,780, 35.8%), as has been the case for the last 8 years. 94.5% of patients with Fuchs' dystrophy were treated with EK and 5.5% had PK. As mentioned above, "Unknown" was the second most frequent diagnosis provided (6,857), and "Re-grafts" were third (6,325). "Other causes of endothelial dysfunction" was fourth on the list (5,598, 11.9%) and "post-cataract surgery corneal edema" was fifth (4,077, 8.7%).

As in past years, keratoconus and other ectasias were the sixth most frequent indication for transplant in 2021. There were 2,442 keratoplasty procedures for keratoconus in 2021, a 23.9% increase over 1,971 procedures in 2020, reversing a ten-year trend of declining keratoplasty procedures for keratoconus over the past 10 years but well short of 2,737 procedures in 2019 pre-pandemic. Penetrating keratoplasty continues to be the preferred surgical procedure for treatment of corneal ectasia by almost 11 to 1. There were 2,243 (91.9%) PK and 199 (8.1%) ALK procedures for keratoconus in 2021. The technical difficulty of ALK and uncertainty over reimbursement continue to hold this ratio essentially unchanged for the past six years. Treatment of keratoconus by cross-linking and improved technology in RGP contact lens fitting are likely responsible for the decreasing number of keratoplasty procedures for corneal ectasia.

Table 8: Domestic Indications for Keratoplasty Reported by US Banks, 2021

Endothelial Cell Failure								
Surgical Diagnosis		PK		ALK		EK		TOTAL
A	Post-cataract surgery edema	877	21.5%	--	--	3,200	78.5%	4,077
C	Endothelial Dystrophies	923	5.5%	--	--	15,857	94.5%	16,780
M	Other causes of endothelial dysfunction	1,094	19.5%	--	--	4,504	80.5%	5,598
	Subtotal	2,894	10.9%	0	0.0%	23,561	89.1%	26,455
		17.8% of PK				78.3% EK		56.4% of grafts
Stromal or Full Thickness (non-endothelial) Disease								
Surgical Diagnosis		PK		ALK		EK		TOTAL
B	Ectasias /Thinnings	2,243	91.9%	199	8.1%	--	--	2,442
E	Other Degenerations of Dystrophies	784	93.9%	51	6.1%	--	--	835
F	Refractive	71	97.3%	2	2.7%	--	--	73
G	Microbial Keratitis	370	94.1%	23	5.9%	--	--	393
H	Mechanical or Chemical Trauma	399	97.8%	9	2.2%	--	--	408
I	Congenital Opacities	254	94.8%	14	5.2%	--	--	268
J	Pterygium	8	88.9%	1	11.1%	--	--	9
K	Non-infectious ulcerative keratitis or perforations	1,135	97.2%	33	2.8%	--	--	1,168
L	Other causes of corneal dysfunction or distortion	1,584	94.4%	94	5.6%	--	--	1,678
	Subtotal	6,848	94.1%	426	5.9%	0	0%	7,274
		42.1% of PK		78.3% of ALK				15.5% of grafts
Regraft								
Surgical Diagnosis		PK		ALK		EK		TOTAL
D	Repeat Corneal Transplant	3,124	49.4%	25	0.4%	3,176	50.2%	6,325
		19.2% of PK		4.6% of ALK		10.6% of EK		13.5% of grafts
Unknown / Unspecified								
Surgical Diagnosis		PK		ALK		EK		TOTAL
Z.	Unknown, unreported, or unspecified	3,403	49.6%	93	1.4%	3,361	49.0%	6,857
		20.9% of PK		17.1% of ALK		11.2% of EK		14.6% of grafts
		PK		ALK		EK		TOTAL
	Total for Each Procedure	16,269	34.7%	544	1.2%	30,098	64.2%	46,911

In 2020, the number of primary penetrating keratoplasty for keratoconus dipped for the first time below the number of PKs for regrant (See **Figure 9**, below). This year, there were 3,124 PK re-grafts and 2,243 grafts for keratoconus. PK for both keratoconus (red) and for post-cataract surgery corneal edema (dark blue) has been decreasing over the past 10 years, and the significance of the uptick in 2021 following the 2020 year of COVID-19 is not known. PK for keratoconus is decreasing because of cross-linking and because of newer RGP CL, a trend present for the past 8 years. PK for post-cataract surgery corneal edema also dropped as more surgeons become comfortable with endothelial keratoplasty. Another possibility exists that fewer surgeons in training are being taught penetrating keratoplasty technique.

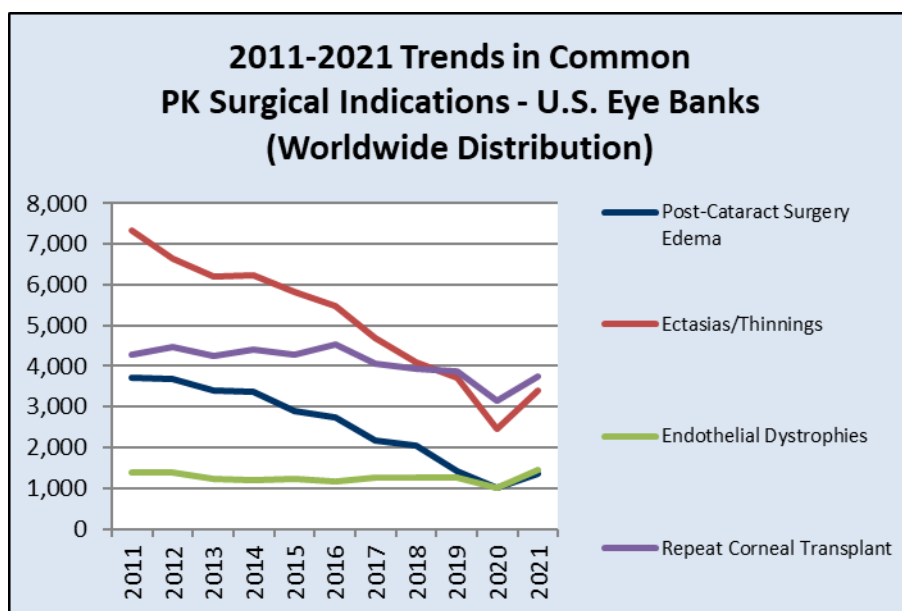


Figure 9. Line graph of common keratoplasty indications over the past ten years shows a rebound in the number of procedures for all keratoplasty indications in 2021 post COVID-19, although the declining trend of procedures for keratoconus (red) and post-cataract surgery corneal edema (dark blue) can be seen.

Conclusions:

1. In 2021 there a 16.8% increase in corneas donated and a 20.2% increase in total corneas transplanted (domestic and international). Domestic keratoplasty procedures increased from 43,873 in 2020 to 49,110 in 2021 (11.9%). Neither total transplants nor domestic transplant numbers reached pre-COVID levels (2019).
2. Endothelial keratoplasty continues to be the most common domestic keratoplasty procedure in 2021 for the 10th year in a row (since 2012, see **Figure 4**).
3. The leading indication for keratoplasty in 2021 was endothelial disease (56.4% of grafts, see **Table 8**).
4. The number of PK (16,269), DSAEK (15,935) and DMEK (14,128) procedures were comparable in 2021.
5. PK procedures in the U.S. have declined from a high of 42,063 in 2005.
6. The number of anterior lamellar keratoplasty, keratolimbal allografts and keratoprosthesis procedures have been essentially flat over the last 8 years. These three procedures combined make up 2.5% of all keratoplasty procedures performed in the U.S. (See **Table 4**).
7. Corneas in long-term storage solution are the most common ocular tissue (65.5%) used by glaucoma surgeons to cover glaucoma drainage devices. (See **Table 6**).
8. The number of keratoplasty procedures for keratoconus increased 23.9% in 2021, more likely due to a pandemic rebound than a change in prevalence. PK for keratoconus had decreased for the past 8 years due to cross-linking and newer RGP/scleral contact lenses (see **Figure 7** and **Table 7**).
9. There was no recipient diagnosis for 61.7% of U.S. eye bank tissue shipped internationally (**Table 7**), an improvement over 69.7% in 2020. The unknown rate for domestic tissue improved to 14.6% in 2021 from 18.4% in 2020 (see **Table 7**). Eye banks still need to diligently try to collect recipient information on tissue used domestically and internationally, as well as when exporting tissue to other eye banks.

Respectfully submitted,

Woodford S. Van Meter, MD
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Medical Director, Kentucky Eye Bank
EBAA Statistical Report Committee

STATISTICS FROM
UNITED STATES
EYE BANKS

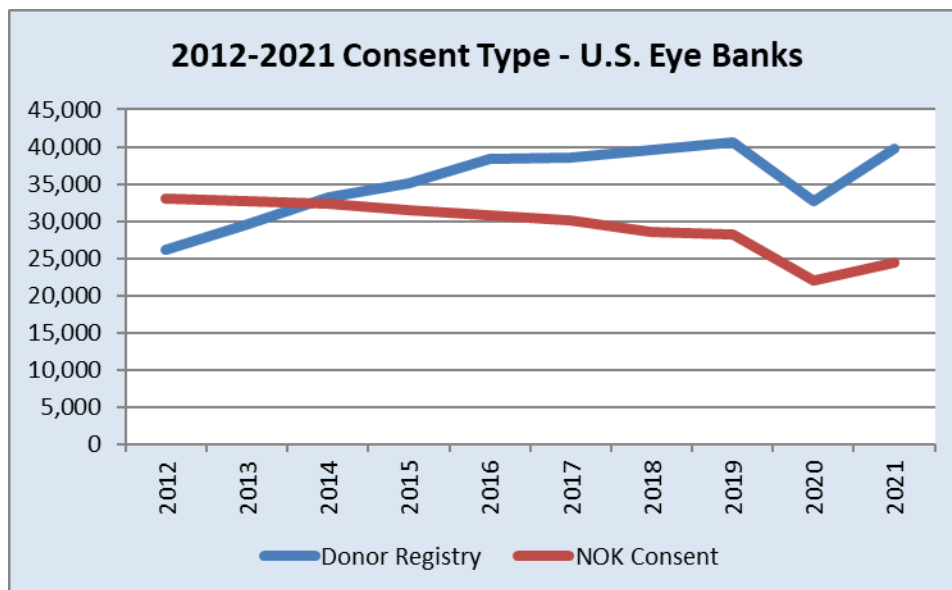


2021 Eye Banking Statistics Reported by U.S. Banks *Death Referrals and Tissue Recoveries*

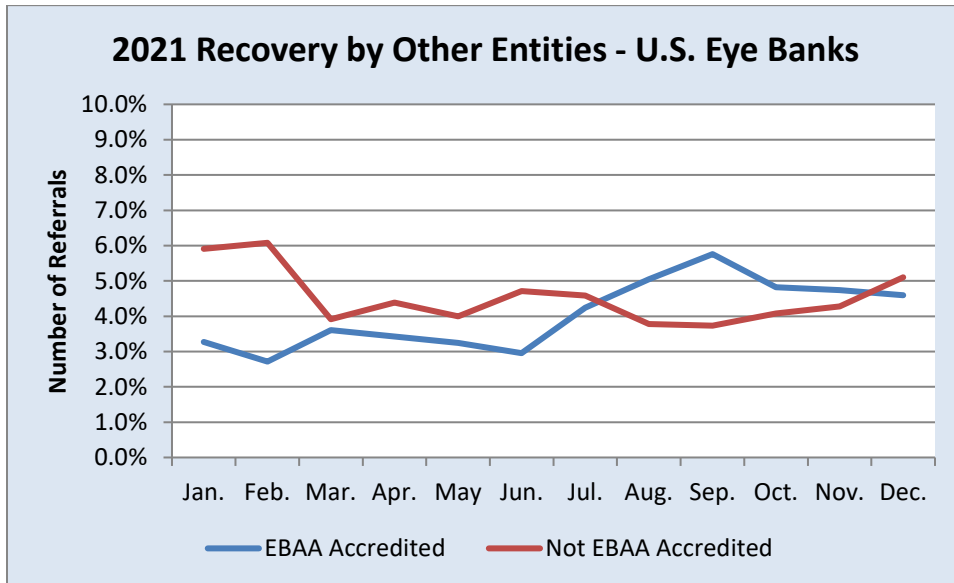
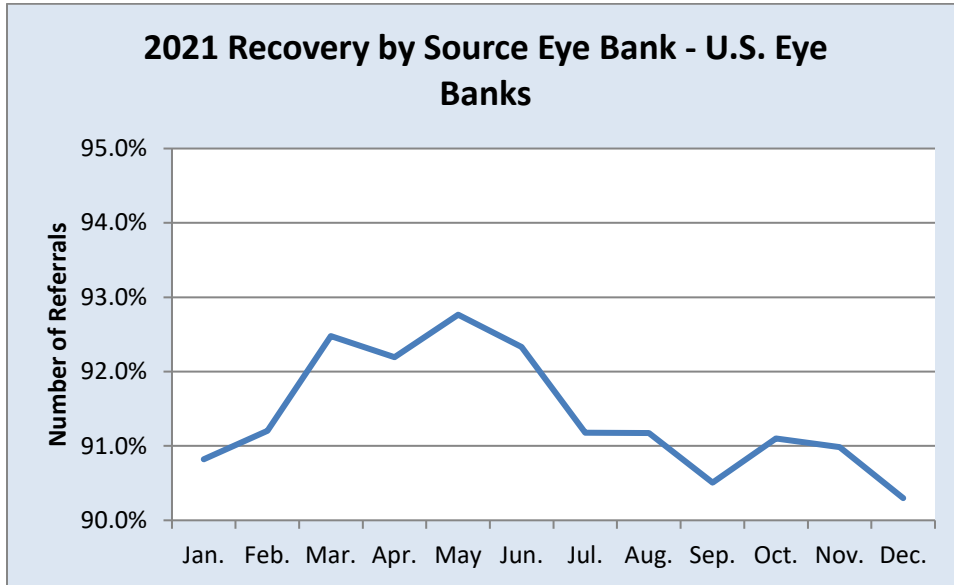
Donations	2019	2020	2021
Number of Eye Bank Reporting Entities*	57	59	57
Total Whole Eyes and Corneas Donated	136,130	108,382	126,623
Total Number of Donors	68,759	54,740	64,048

* Reporting entities may not reflect number of physical eye banks

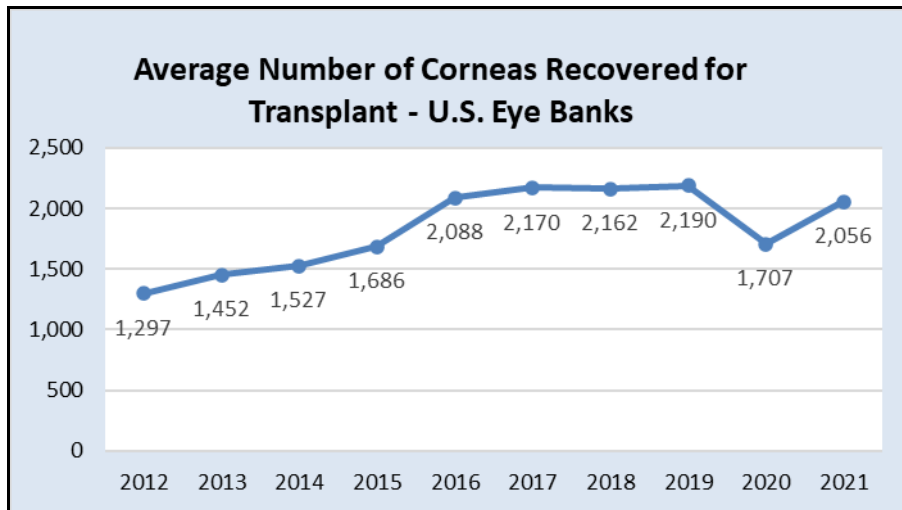
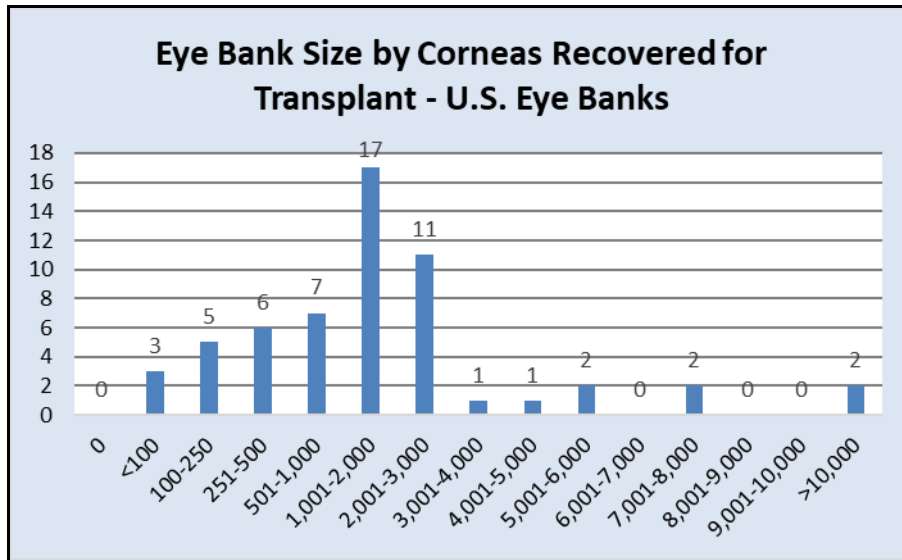
Death Referrals	2019	2020	2021
Total Death Referrals	717,316	828,391	941,499
Death referrals determined eligible	176,262	163,074	187,980
Tissue Recoveries			
Total Donors	68,759	54,740	64,048
Donors recovered not found on donor registry or known to have first person consent	28,217	21,978	24,344
Donors recovered found on donor registry or known to have first person consent	40,542	32,762	39,704
Eyes or Corneas Recovered with Intent for Surgical Use	124,843	100,732	117,177
Eyes or Corneas Recovered for Other Uses	11,287	7,650	9,466



2021 U.S. Eye Banking Statistics Reported by U.S. Banks *Recovery Entities*



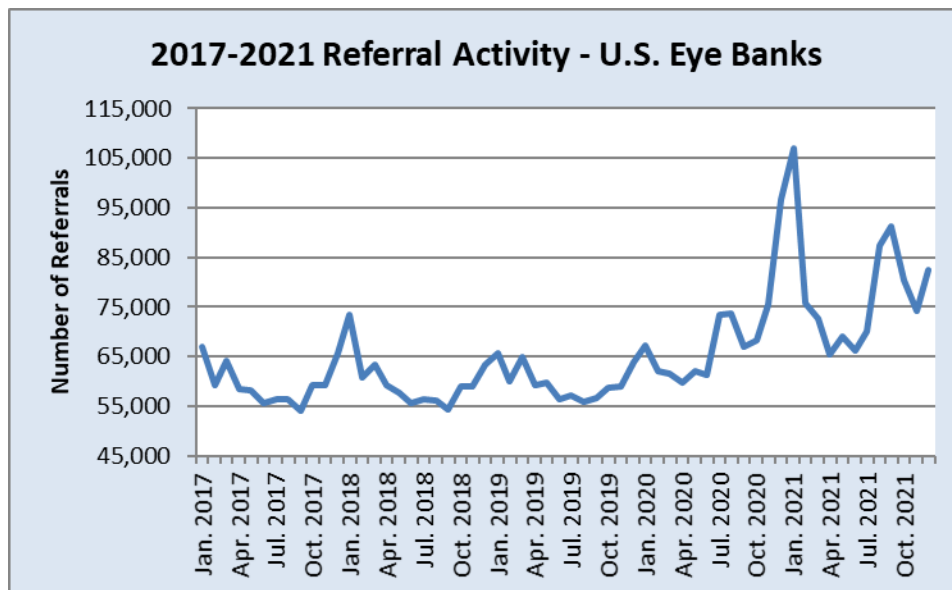
2021 U.S. Eye Banking Statistics Reported by U.S. Banks
Comparison of Eye Bank Cornea Recovery Rates



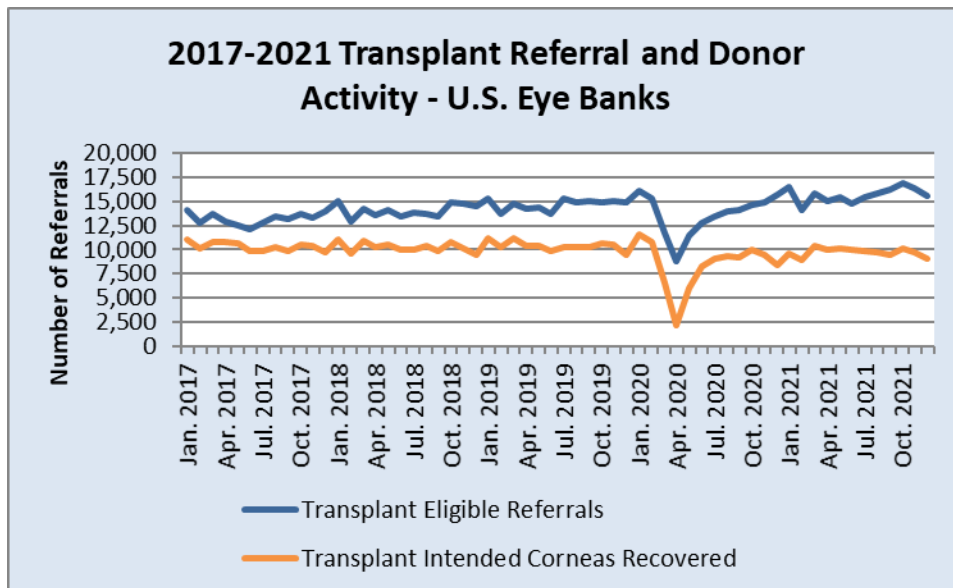
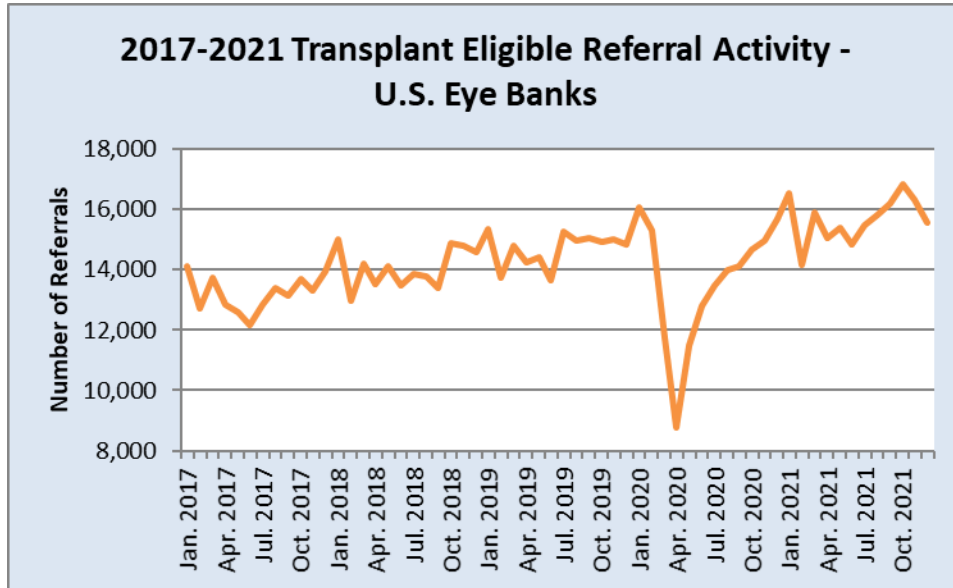
2021 Eye Banking Statistics Reported by U.S. Banks *Referral Trends, Transplant and Conversion Rates*

Transplant & Conversion Rates - U.S. Eye Banks					
Month	Transplant Rate	Conversion Rate	Death Referrals	Transplant Eligible Referrals	Transplant Intended Corneas Recovered
Jan. 2021	67.4%	29.6%	106,949	16,522	9,664
Feb. 2021	66.6%	31.8%	75,839	14,141	8,884
Mar. 2021	67.4%	33.1%	72,661	15,881	10,438
Apr. 2021	68.9%	33.4%	65,348	15,049	9,978
May 2021	67.9%	33.5%	68,980	15,374	10,187
Jun. 2021	70.0%	34.1%	66,189	14,832	10,005
Jul. 2021	67.8%	32.4%	70,137	15,464	9,870
Aug. 2021	67.6%	31.2%	87,247	15,809	9,673
Sep. 2021	66.1%	29.5%	91,302	16,200	9,466
Oct. 2021	67.7%	30.4%	80,345	16,833	10,143
Nov. 2021	70.7%	30.2%	74,156	16,330	9,769
Dec. 2021	69.0%	29.6%	82,346	15,545	9,100
2019 Total	68.7%	35.8%	717,316	176,262	124,843
2020 Total	65.8%	31.2%	828,391	163,074	100,732
2021 Total	68.1%	31.5%	941,499	187,980	117,177
2021 Avg.	N/A	N/A	78,458	15,665	9,765
Std. Dev.	1.3%	1.7%	12,110	765	449

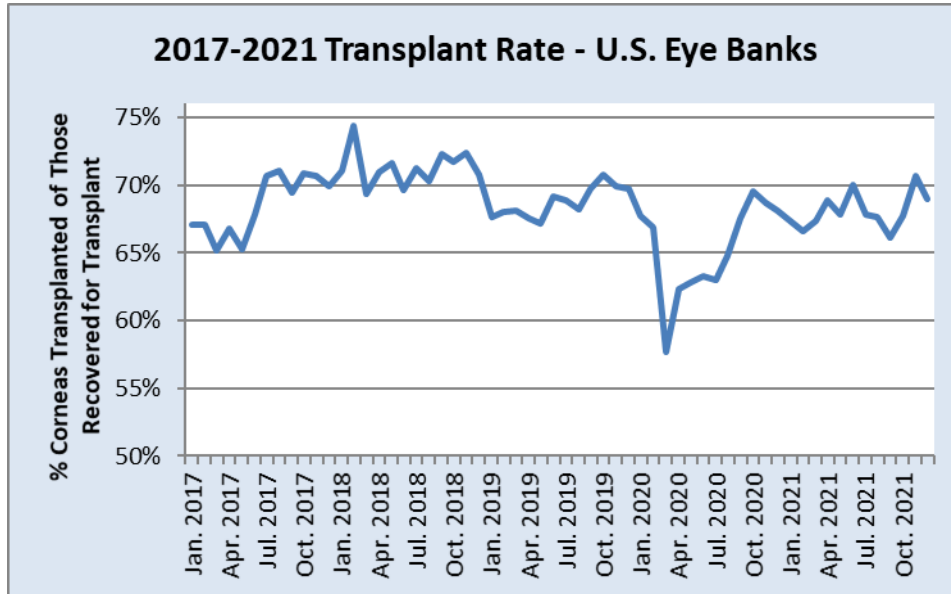
***Transplant rate** is the number of corneas used for transplant divided by the number recovered for transplant.
Conversion rate is the number of transplant donors divided by the number of transplant eligible referrals.



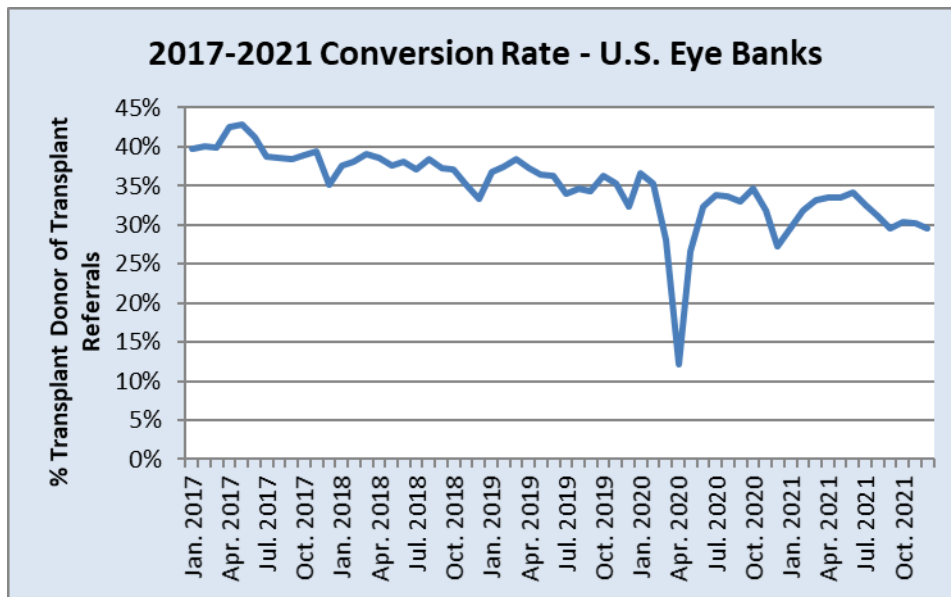
2021 Eye Banking Statistics Reported by U.S. Banks *Referral Trends, Transplant and Conversion Rates*



2021 Eye Banking Statistics Reported by U.S. Banks *Transplant and Conversion Rates*



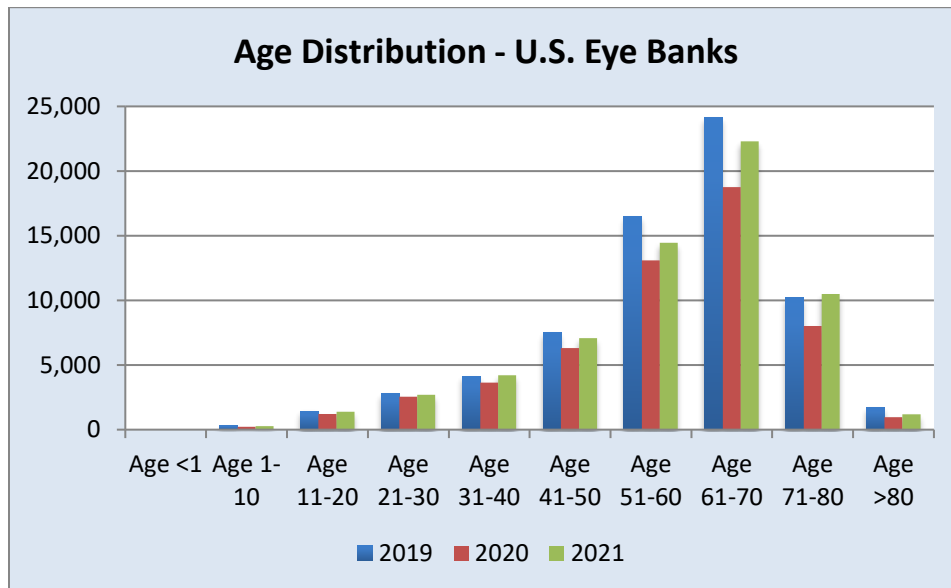
Transplant rate is the number of corneas used for transplant divided by the number recovered for transplant.



Conversion rate is the number of transplant donors divided by the number of transplant eligible referrals.

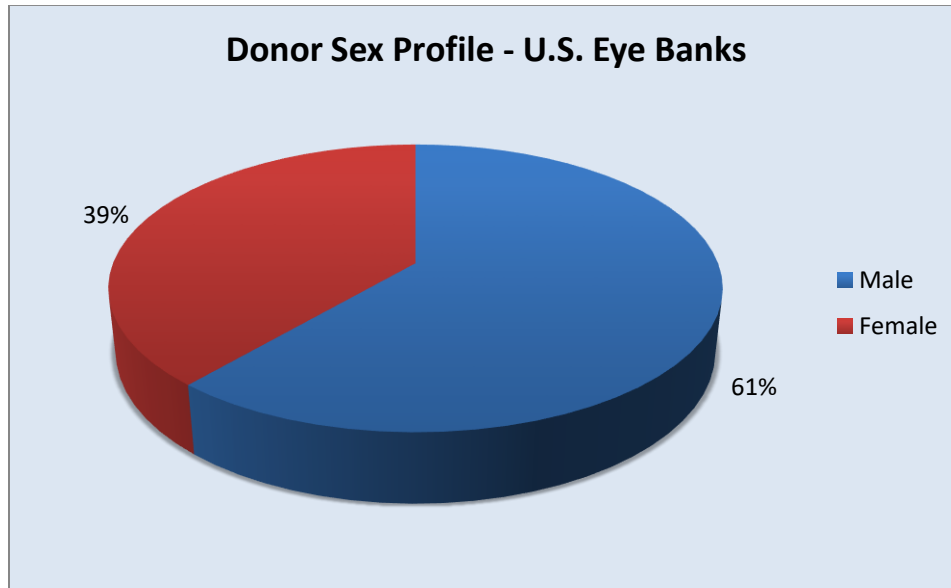
2021 U.S. Eye Banking Statistics Reported by U.S. Banks *Donors by Age Reported by U.S. Banks*

Age Demographics - U.S. Eye Banks										
Year	Age <1	Age 1-10	Age 11-20	Age 21-30	Age 31-40	Age 41-50	Age 51-60	Age 61-70	Age 71-80	Age >80
2019	6	310	1,435	2,778	4,145	7,535	16,490	24,151	10,209	1,700
2020	2	221	1,200	2,553	3,643	6,316	13,087	18,757	8,008	953
2021	1	262	1,377	2,684	4,213	7,085	14,445	22,294	10,491	1,196
2021 Percent										
2021 Percent	0.0%	0.4%	2.1%	4.2%	6.6%	11.1%	22.6%	34.8%	16.4%	1.9%
Monthly Avg	0	22	115	224	351	590	1,204	1,858	874	100
Std. Dev.	0.3	5.0	16.3	28.6	33.5	33.8	46.7	77.5	61.7	15.2



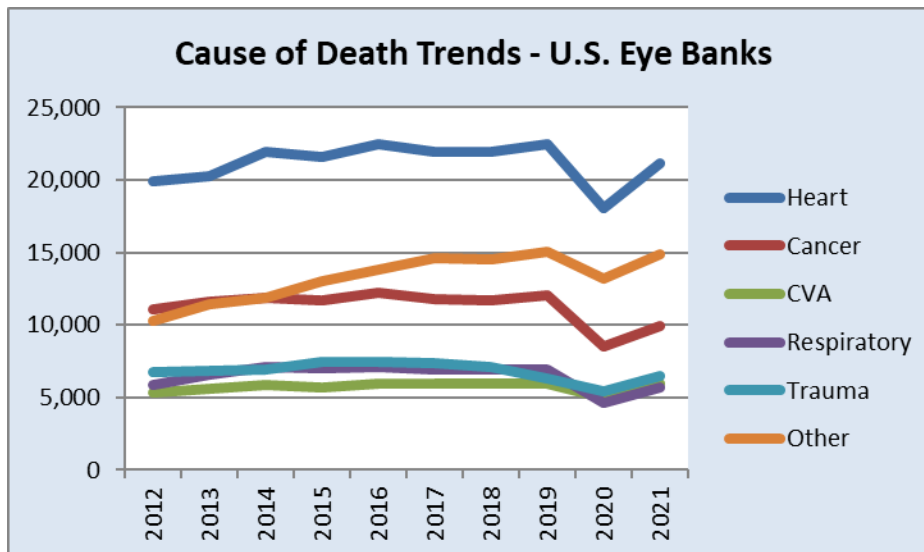
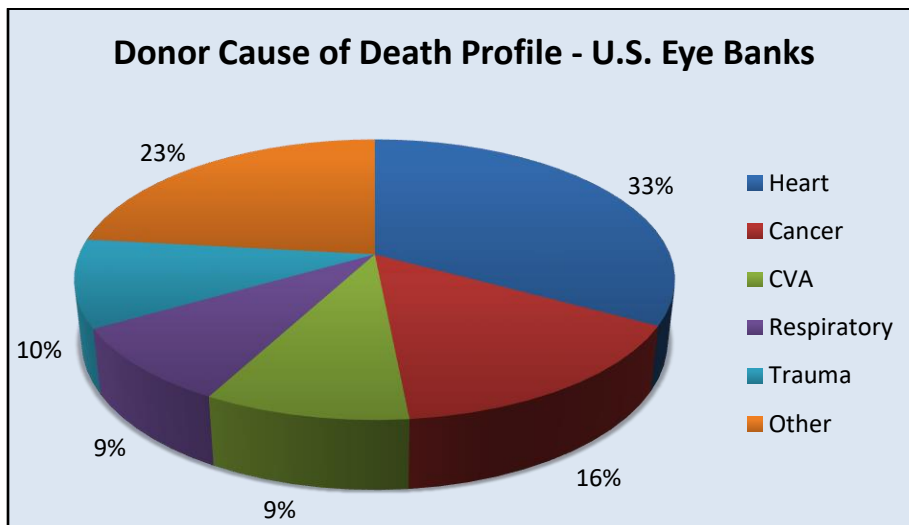
2020 Eye Banking Statistics Reported by U.S. Banks
Donors by Gender Reported by U.S. Banks

Donor Sex Demographics U.S. Eye Banks		
Year	Male	Female
2019 Total	41,261	27,498
2020 Total	33,010	21,730
2021 Total	39,268	24,780
2021 Percent		
	61.3%	38.7%
Monthly Avg.	3,272	2,065
Std. Dev.	155.0	103.3



2021 U.S. Eye Banking Statistics Reported by U.S. Banks *Cause of Death Reported by U.S. Banks*

Cause of Death Demographics - U.S. Eye Banks						
Year	Heart	Cancer	CVA	Respiratory	Trauma	Other
2019	22,457	12,033	5,980	6,912	6,310	15,067
2020	18,040	8,499	4,947	4,631	5,440	13,183
2021	21,136	9,904	5,992	5,669	6,476	14,871
2021 Percent	33.0%	15.5%	9.4%	8.9%	10.1%	23.2%
Monthly Avg.	1,761	825	499	472	540	1,239
Std. Dev.	81.4	61.2	34.5	38.2	68.4	73.9



2021 Eye Banking Statistics Reported by U.S. Banks ***Reasons Tissue Intended for Surgery Was Not Released***

There are several reasons why tissue intended for surgery may not ultimately be used for surgery. These include positive serology results, defects noted at the time of evaluation (scars, infiltrates, low cell counts, etc.) and/or medical or social history information, all of which occur subsequent to initial screening and procurement.

Contraindications for Transplant¹	2019		2020		2021	
Positive or Reactive Test for Communicable Disease Agent or Disease	11,183	33.6%	9,308	34.1%	11,219	36.3%
HIV Antibody (HIV I/II Ab)	265	0.8%	177	0.6%	309	1.0%
HIV Nucleic Acid Test (HIV NAT)	167	0.5%	148	0.5%	90	0.3%
Hepatitis B Surface Antigen (HBsAg)	1,344	4.0%	1,267	4.6%	2,314	7.5%
Hepatitis B Core Antibody (HBcAb)	5,115	15.4%	3,940	14.4%	4,176	13.5%
Hepatitis B Nucleic Acid Test (HBV NAT)	588	1.8%	565	2.1%	540	1.7%
Hepatitis C Antibody (HCV Ab)	1,986	6.0%	1,512	5.5%	1,687	5.5%
Hepatitis C Nucleic Acid Test (HCV NAT)	826	2.5%	728	2.7%	691	2.2%
Syphilis	331	1.0%	206	0.8%	286	0.9%
HTLV Antibody (HTLV I/II Ab)	103	0.3%	139	0.5%	80	0.3%
West Nile Virus Nucleic Acid Test (WNV NAT)	20	0.1%	0	0.0%	11	0.0%
Other Positive or Reactive Test	438	1.3%	626	2.3%	1,035	3.3%
Other Communicable Disease Testing Issue	323	1.0%	380	1.4%	577	1.9%
Medical Record or Autopsy Findings	6,650	20.0%	6,164	22.6%	7,173	23.2%
Dementia / Neurological Issues	791	2.4%	566	2.1%	698	2.3%
Sepsis	3,114	9.4%	2,340	8.6%	3,166	10.2%
Sepsis - (determined by positive blood cultures)	1,352	4.1%	1,063	3.9%	1,416	4.6%
Sepsis - (determined by other indicators)	1,762	5.3%	1,277	4.7%	1,750	5.7%
Plasma Dilution	261	0.8%	160	0.6%	242	0.8%
Unknown Cause of Death	165	0.5%	98	0.4%	131	0.4%
Other	2,319	7.0%	3,000	11.0%	2,936	9.5%
Medical/Social Interview	2,992	9.0%	2,062	7.6%	2,071	6.7%
Travel	383	1.2%	327	1.2%	369	1.2%
Dementia / Neurological Issues	171	0.5%	162	0.6%	182	0.6%
Other	2,438	7.3%	1,573	5.8%	1,520	4.9%
Body Exam	374	1.1%	226	0.8%	252	0.8%
Total eyes/corneas intended for transplant but not released for transplant	33,258		27,304		30,902	

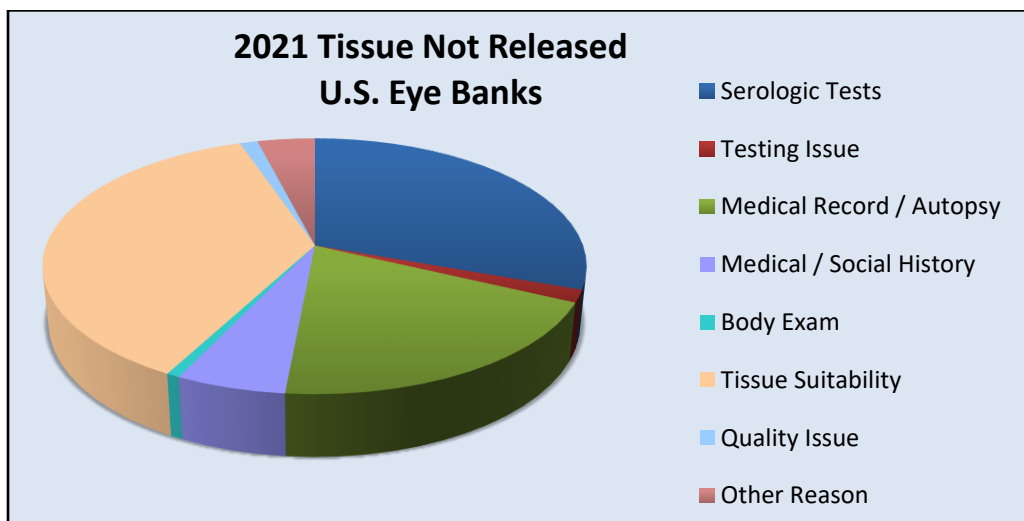
*Percentages read from this table should be read as "of the tissue not released for transplant"

¹ Some tissues had multiple contraindications.

2021 Eye Banking Statistics Reported by U.S. Banks *Reasons Tissue Intended for Surgery Was Not Released*

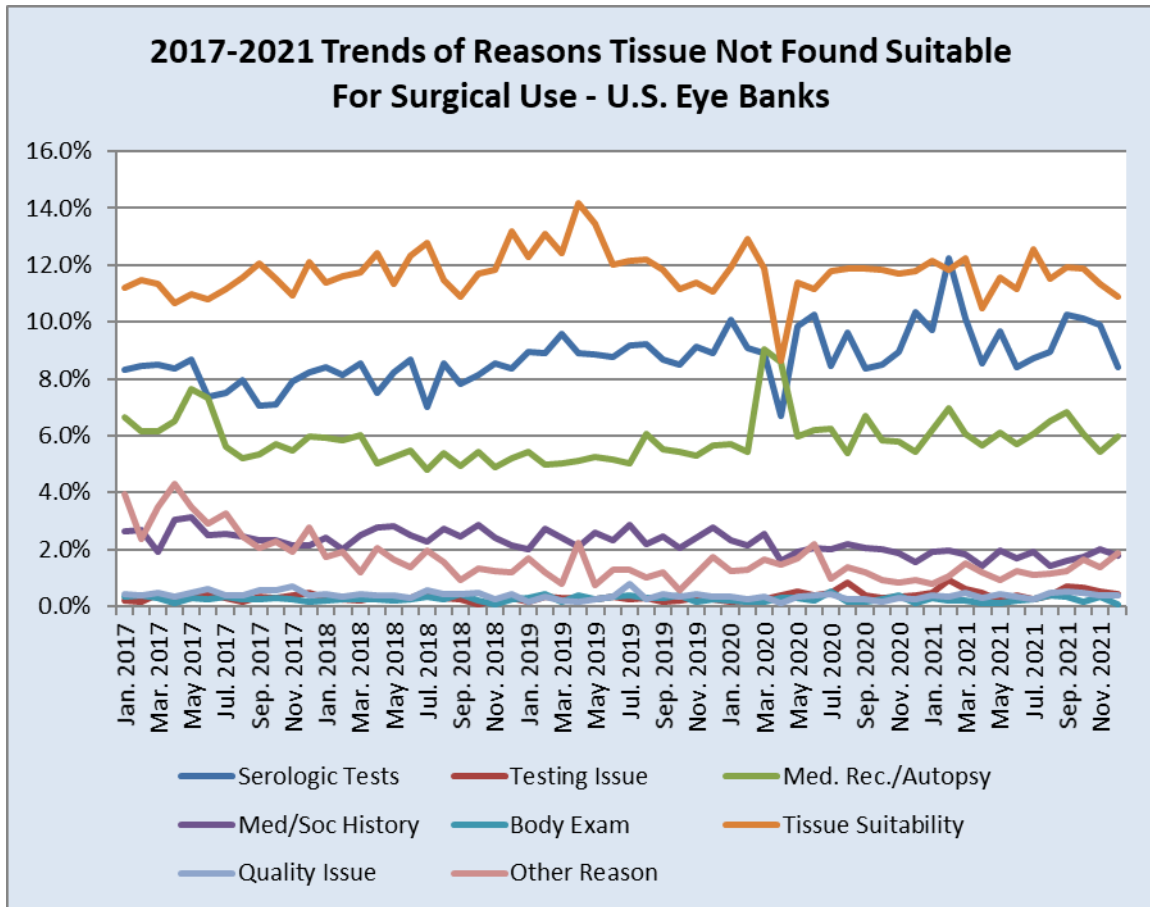
Contraindications for Transplant ²	2019		2020		2021	
Tissue Suitability (e.g. slit lamp/spec eval)	15,319	46.1%	11,887	43.5%	13,625	44.1%
Epithelium	133	0.4%	105	0.4%	230	0.7%
Stroma	8,265	24.9%	6,334	23.2%	7,699	24.9%
Prior reactive surgery	609	1.8%	458	1.7%	474	1.5%
Scar	1,069	3.2%	838	3.1%	1,094	3.5%
Infiltrate	3,906	11.7%	3,167	11.6%	3,773	12.2%
Foreign Body	178	0.5%	91	0.3%	139	0.4%
Other	2,503	7.5%	1,780	6.5%	2,219	7.2%
Descemet's membrane	321	1.0%	269	1.0%	232	0.8%
Endothelium	6,600	19.8%	5,179	19.0%	5,464	17.7%
Quality Issue	405	1.2%	286	1.0%	455	1.5%
Storage	128	0.4%	103	0.4%	172	0.6%
Labeling	3	0.0%	7	0.0%	15	0.0%
Processing	157	0.5%	107	0.4%	142	0.5%
Supply or Reagent	86	0.3%	43	0.2%	51	0.2%
Environmental Control	31	0.1%	26	0.1%	75	0.2%
Other Reason prior to Tissue Release	1,542	4.6%	1,279	4.7%	1,468	4.8%
Total eyes/corneas intended for transplant but not released for transplant	33,258		27,304		30,902	

*Percentages read from this table should be read as "of the tissue not released for transplant."



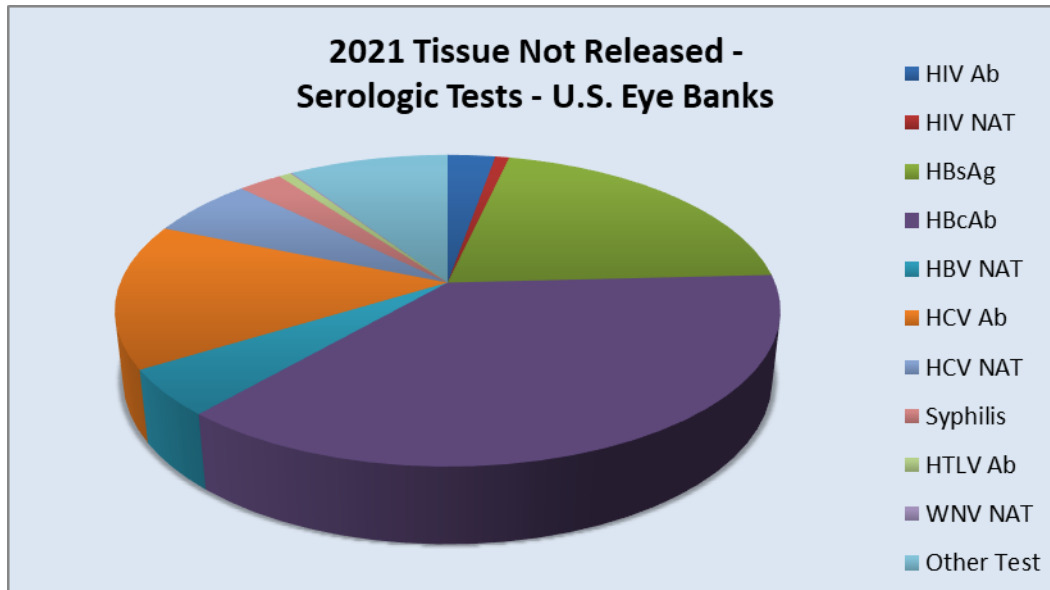
² Some tissues had multiple contraindications.

2021 Eye Banking Statistics Reported by U.S. Banks *Reasons Tissue Intended for Surgery Was Not Released*



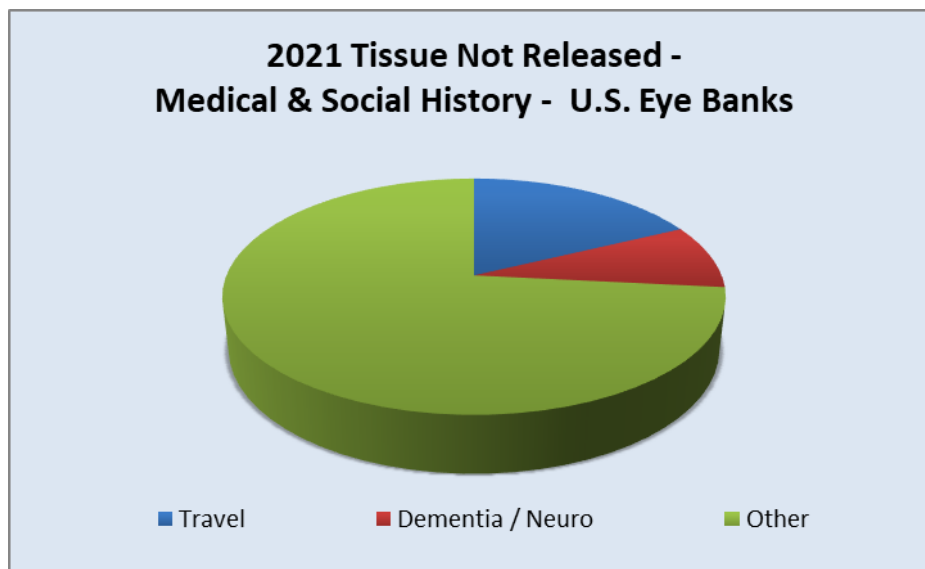
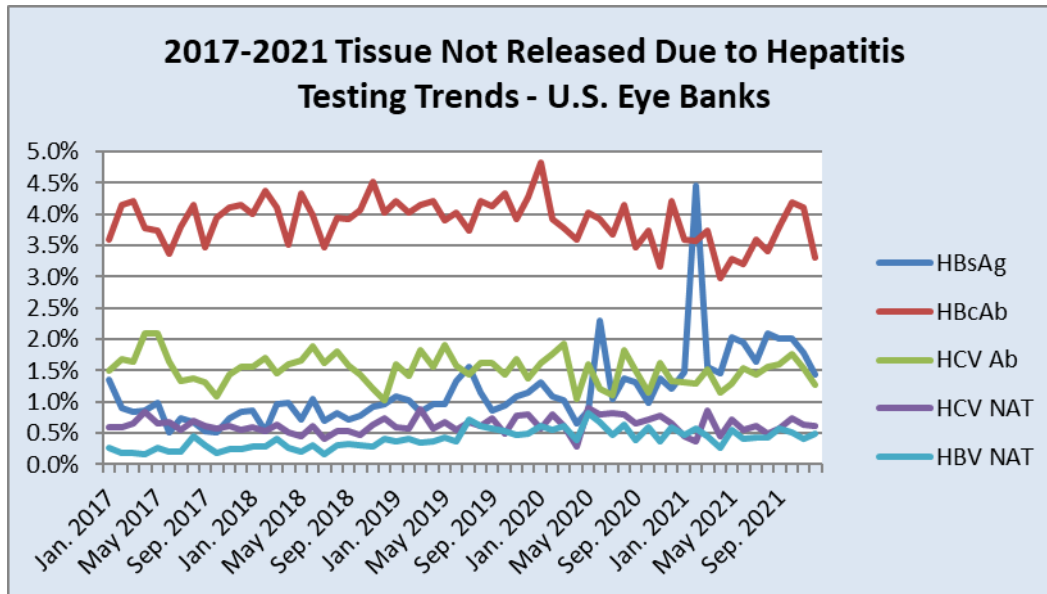
Reasons Corneas Recovered for Transplant Were Not Released - U.S. Eye Banks											
Reasons Not Released	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Serology Tests	9,250	9,656	10,161	9,903	10,523	9,845	10,067	11,183	9,308	11,219	
Testing Issue	307	375	423	368	632	385	319	323	380	577	
Med. Rec./Autopsy Finding	6,701	7,138	7,313	7,754	7,578	7,614	6,599	6,650	6,164	7,173	
Med Soc Hx Finding	2,158	2,200	2,331	2,745	2,803	3,067	3,083	2,992	2,062	2,071	
Body Exam	273	189	235	266	280	325	292	374	226	252	
Tissue Suitability	12,360	12,384	14,463	15,341	14,511	13,994	14,631	15,319	11,887	13,625	
Quality Issue	378	416	434	486	477	575	493	405	286	455	
Other Reason	2,296	2,294	2,065	1,708	2,194	3,656	1,857	1,542	1,279	1,468	

2021 Eye Banking Statistics Reported by U.S. Banks *Reasons Tissue Intended for Surgery Was Not Released*



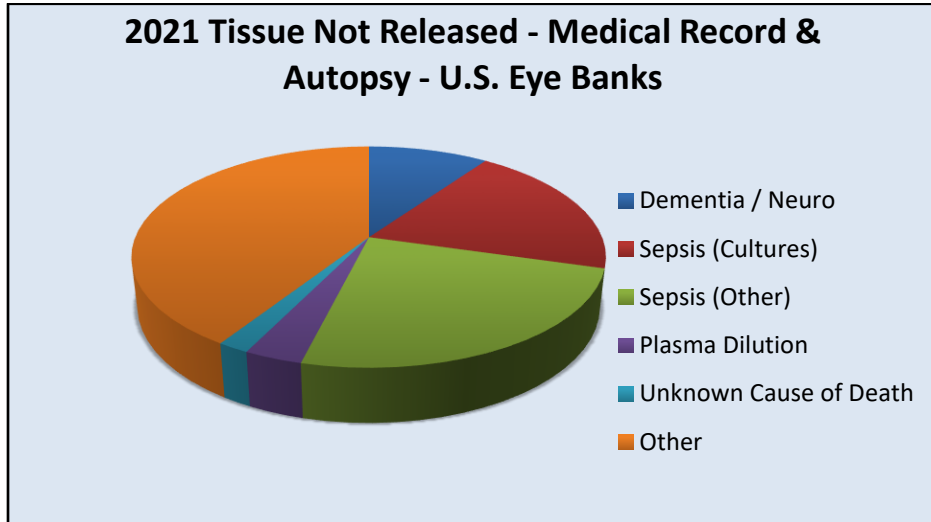
Corneas Not Released for Transplant (Serologic Testing) - U.S. Eye Banks											
Not Released - Serology	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trend
HIV	258	253	255	300	283	310	370	432	325	399	
HIV I/II Ab	173	169	185	220	185	216	274	265	177	309	
HIV NAT	85	84	70	80	98	94	96	167	148	90	
HBV	5,268	5,425	6,366	5,810	6,565	6,075	6,346	7,047	5,772	7,030	
HBsAg	876	786	1,130	1,070	1,457	986	1,028	1,344	1,267	2,314	
HBcAb	4,392	4,639	4,889	4,453	4,755	4,789	4,956	5,115	3,940	4,176	
HBV NAT	0	0	347	287	353	300	362	588	565	540	
HCV	2,623	2,791	2,598	2,725	2,762	2,719	2,596	2,812	2,240	2,378	
HCV Ab	1,957	2,029	1,889	2,025	1,996	1,936	1,911	1,986	1,512	1,687	
HCV NAT	666	762	709	700	766	783	685	826	728	691	
Syphilis	348	397	390	358	468	357	383	331	206	286	
HTLV	215	237	206	234	143	80	109	103	139	80	
WNV	0	0	4	10	3	22	8	20	0	11	
Other	538	553	342	466	299	282	255	438	626	1,035	

2021 Eye Banking Statistics Reported by U.S. Banks *Reasons Tissue Intended for Surgery Was Not Released*



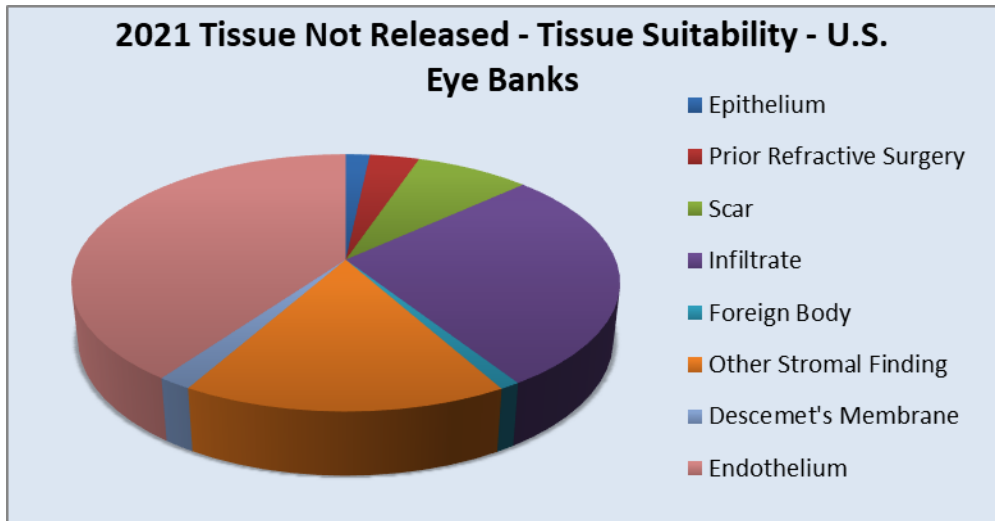
Corneas Not Released for Transplant (Med Soc Hx) - U.S. Eye Banks											
Not Released - Med Soc	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Travel	285	338	379	467	418	435	507	383	327	369	
Dementia/Neuro	174	198	139	180	216	256	312	171	162	182	
Other	1,699	1,664	1,813	2,098	2,169	2,376	2,264	2,438	1,573	1,520	

2021 Eye Banking Statistics Reported by U.S. Banks
Reasons Tissues Were Not Released

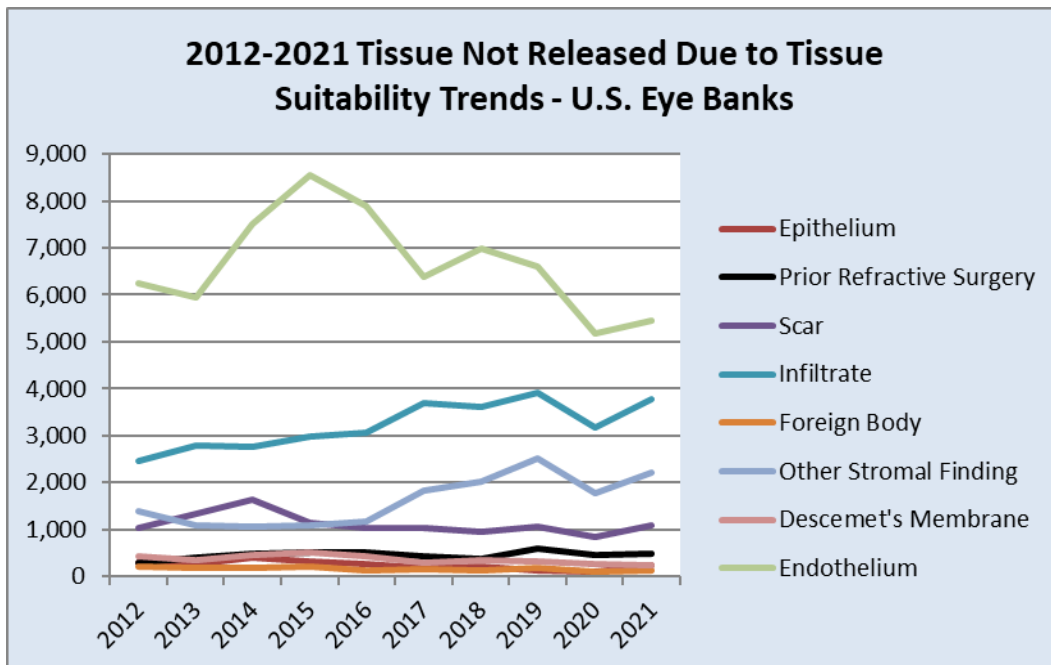


Corneas Not Released for Transplant (Medical Records) - U.S. Eye Banks											
Not Released - Med Rec / Autopsy	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Dementia/Neuro	542	660	733	827	778	723	732	791	566	698	
Sepsis (Cultures)	880	958	1,067	1,078	1,249	1,355	1,337	1,352	1,063	1,416	
Sepsis (Other)	2,511	2,628	2,443	2,443	2,262	1,949	1,853	1,762	1,277	1,750	
Plasma Dilution	353	447	445	381	346	407	315	261	160	242	
Unknown COD	416	485	388	326	192	179	132	165	98	131	
Other	1,999	1,960	2,237	2,699	2,751	3,001	2,230	2,319	3,000	2,936	

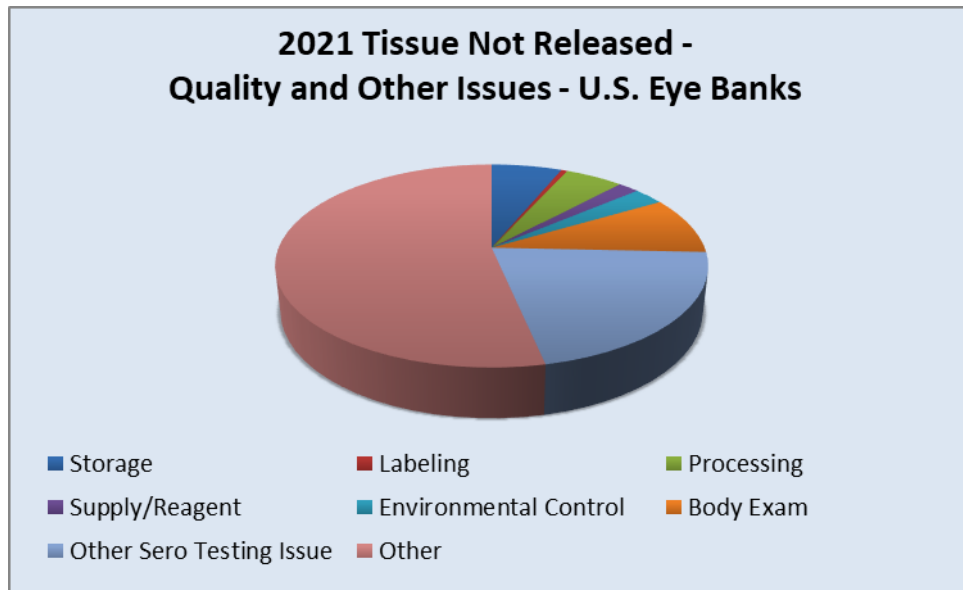
2021 Eye Banking Statistics Reported by U.S. Banks *Tissue Suitability Reasons Tissues Were Not Released*



Corneas Not Released for Transplant (Tissue Suitability) - U.S. Eye Banks											
Not Released - Tissue Suitability	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Epithelium	288	279	403	313	272	192	218	133	105	230	
Prior Refractive Surgery	298	390	473	512	508	424	383	609	458	474	
Scar	1,036	1,329	1,628	1,151	1,040	1,030	943	1,069	838	1,094	
Infiltrate	2,455	2,800	2,755	2,983	3,076	3,686	3,600	3,906	3,167	3,773	
Foreign Body	200	188	187	210	135	170	133	178	91	139	
Other Stromal Finding	1,404	1,095	1,068	1,098	1,162	1,825	2,033	2,503	1,780	2,219	
Descemet's Membrane	438	346	455	520	425	293	338	321	269	232	
Endothelium	6,241	5,957	7,494	8,554	7,893	6,374	6,983	6,600	5,179	5,464	



2021 Eye Banking Statistics Reported by U.S. Banks *Quality Issues for Tissue Not Released*

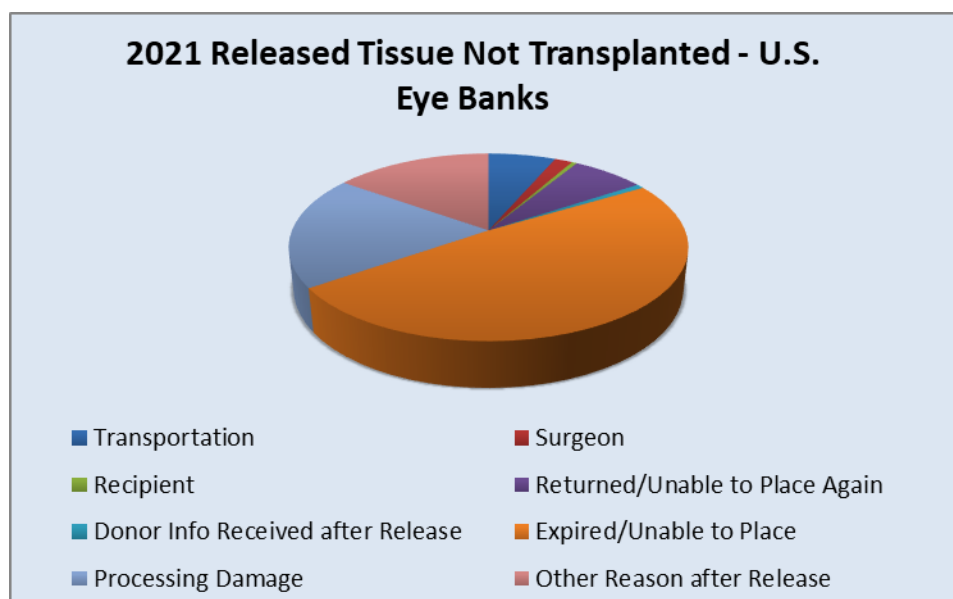


Corneas Not Released for Transplant (Quality) - U.S. Eye Banks											
Not Released - Quality Issues	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Storage Issue	123	101	136	135	131	93	108	128	103	172	
Labeling Issue	14	14	11	9	16	9	21	3	7	15	
Processing Issue (not released)	181	225	232	252	251	403	303	157	107	142	
Supply / Reagent Issue	40	47	24	58	57	51	37	86	43	51	
Environmental Control Issue	20	29	31	32	22	19	24	31	26	75	
Body Exam	273	189	235	266	280	325	292	374	226	252	
Other Sero Testing Issue	307	375	423	368	632	385	319	323	380	577	
Other Issue	2,296	2,294	2,065	1,708	2,194	3,656	1,857	1,542	1,279	1,468	

2021 Eye Banking Statistics Reported by U.S. Banks *Reasons Released Tissues Were Not Transplanted*

Reasons Released Tissues Were Not Transplanted	2019		2020		2021	
	Count	Percentage	Count	Percentage	Count	Percentage
Transportation Issue	192	3.2%	132	1.8%	469	7.1%
Surgeon Issue	116	1.9%	83	1.1%	124	1.9%
Recipient Issue	39	0.7%	32	0.4%	36	0.5%
Returned and Unable to Place Again	516	8.6%	524	7.2%	507	7.6%
Donor Information Not Available at the Time of Tissue Release	17	0.3%	17	0.2%	54	0.8%
Expired or Unable to Place Tissue	3,176	53.1%	4,615	63.2%	3,539	53.3%
Tissue Damaged During Processing	1,414	23.6%	1,226	16.8%	1,416	21.3%
Other Reason After Release of Tissue	686	11.5%	808	11.1%	1,096	16.5%
Total eyes/corneas released for transplant but not used for transplant	5,984		7,297		6,634	

*Percentages read from this table should be read as "of the tissue not released for transplant"



Corneas Released but Not Transplanted - U.S. Eye Banks											
Released but Not Transplanted	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Transport Issue	116	109	169	226	139	147	175	192	132	469	
Surgeon Issue	146	162	150	140	103	108	115	116	83	124	
Recipient Issue	37	38	51	35	41	52	36	39	32	36	
Returned, Unable to Place Again	301	267	414	511	475	453	467	516	524	507	
Donor Info Received After Release	12	54	26	50	28	21	14	17	17	54	
Expired, Unable to Place	3,798	3,428	4,265	3,958	4,176	2,679	2,473	3,176	4,615	3,539	
Processing Damage After Release	440	501	596	764	1,030	1,113	1,454	1,414	1,226	1,416	
Other Reason After Release	270	714	1,063	1,359	1,511	2,007	977	686	808	1,096	

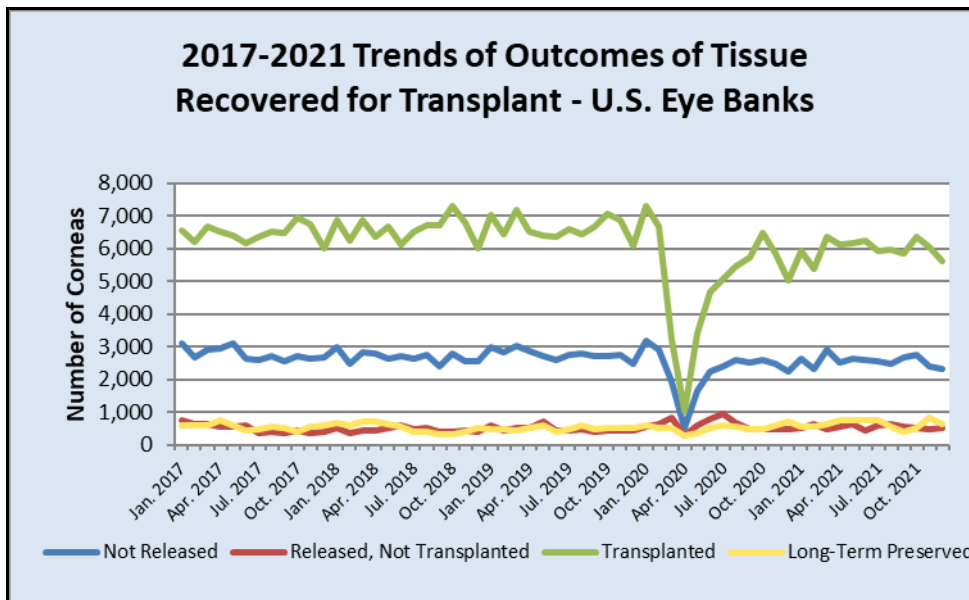
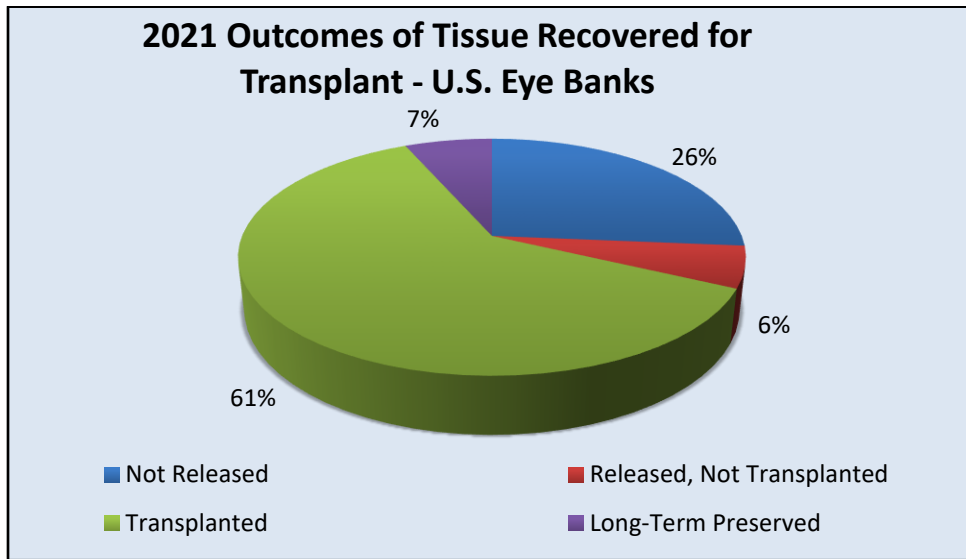
2021 Eye Banking Statistics Reported by U.S. Banks *Outcomes of Tissue Recovered for Transplant*

Donations	2019	2020	2021	% Change
Eye Banks Reported	57	59	57	(3.4%)
Total Whole Globes and Corneas Donated	136,130	108,382	126,623	16.8%
Total Number of Donors	68,759	54,740	64,048	14.5%
Distribution	2019	2020	2021	% Change
Intermediate-Term Preserved Corneas	79,534	59,996	72,038	20.1%
Sclera	5,999	3,151	5,614	78.2%
Long-Term Preserved Corneas	8,614	9,093	12,626	38.9%
Research	13,743	11,336	14,222	25.5%
Training	9,487	6,504	7,425	14.2%

Outcomes of Corneas Recovered for Transplant Use - U.S. Eye Banks											
Month	Corneas Recovered for Transplant	Corneas Segmented	Corneal Segments Produced	Not Released		Released but Not Transplanted		Whole Corneas and Segments Transplanted		Preserved Long-Term	
Jan. 2021	9,664	9	18	2,652	27.4%	512	5.3%	5,940	61.4%	569	5.9%
Feb. 2021	8,884	13	22	2,343	26.4%	632	7.1%	5,366	60.3%	552	6.2%
Mar. 2021	10,438	20	39	2,925	28.0%	501	4.8%	6,383	61.0%	648	6.2%
Apr. 2021	9,978	7	14	2,533	25.4%	580	5.8%	6,124	61.3%	748	7.5%
May 2021	10,187	9	18	2,655	26.1%	626	6.1%	6,149	60.3%	766	7.5%
Jun. 2021	10,005	31	62	2,584	25.8%	448	4.5%	6,253	62.3%	751	7.5%
Jul. 2021	9,870	10	16	2,572	26.1%	612	6.2%	5,942	60.2%	750	7.6%
Aug. 2021	9,673	16	22	2,497	25.8%	643	6.6%	5,981	61.8%	558	5.8%
Sep. 2021	9,466	8	16	2,671	28.2%	543	5.7%	5,848	61.7%	412	4.3%
Oct. 2021	10,143	9	18	2,745	27.1%	540	5.3%	6,358	62.6%	509	5.0%
Nov. 2021	9,769	20	40	2,404	24.6%	478	4.9%	6,066	62.0%	841	8.6%
Dec. 2021	9,100	16	32	2,321	25.5%	519	5.7%	5,628	61.7%	648	7.1%
2019 Total	124,843	269	473	33,258	26.6%	5,984	4.8%	79,738	63.8%	6,067	4.9%
2020 Total	100,732	165	312	27,304	27.1%	7,297	7.2%	59,996	59.5%	6,282	6.2%
2021 Total	117,177	168	317	30,902	26.4%	6,634	5.7%	72,038	61.4%	7,752	6.6%
2021 Avg.	9,765	14	26	2,575	N/A	553	N/A	6,003	N/A	646	N/A
Std. Dev.	449	7.05	14.3	173	1.1%	65	0.8%	294	0.8%	128	1.2%

*Percentages read from this table should be read as "of the tissue recovered with transplant intent"

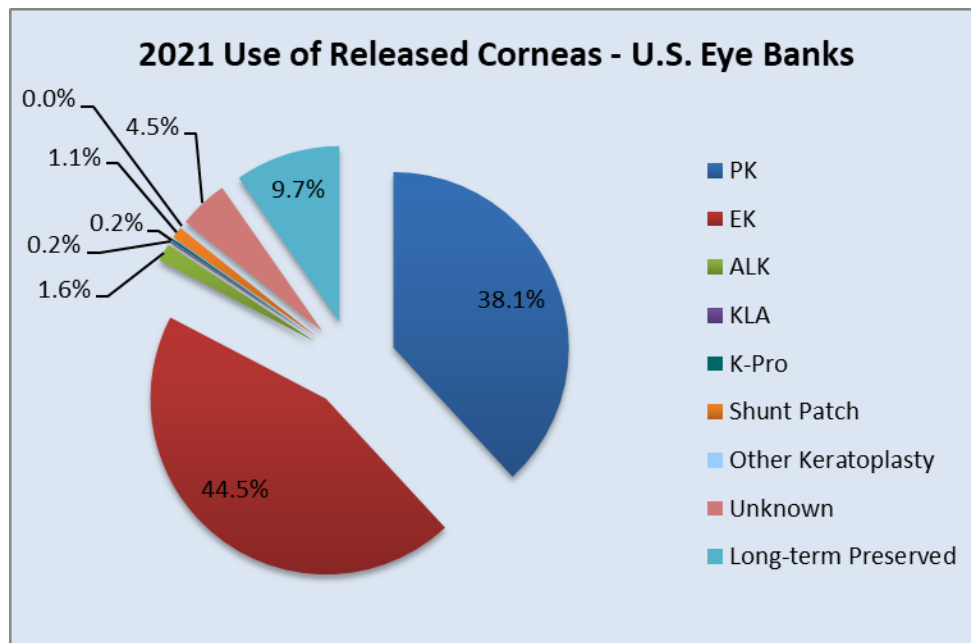
2021 Eye Banking Statistics Reported by U.S. Banks *Outcomes of Tissue Recovered for Transplant*



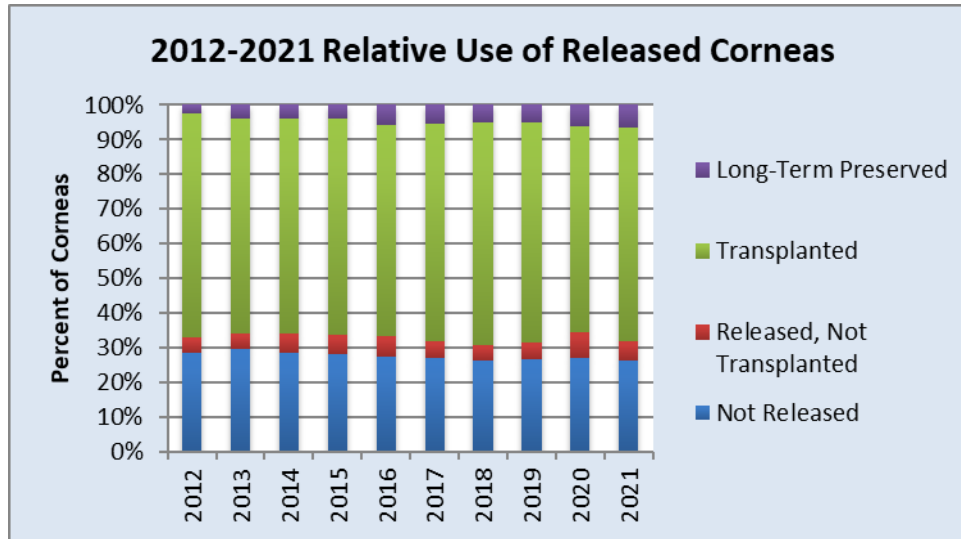
General Outcomes of Corneas Recovered for Transplant Use - U.S. Eye Banks											
Outcome	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trend
Not Released	30,185	32,456	32,958	33,577	34,126	33,310	32,225	33,258	27,304	30,902	
Released, Not Transplanted	4,908	5,182	6,681	6,806	7,529	6,109	5,556	5,984	7,297	6,634	
Transplanted	68,684	68,442	72,013	74,624	75,926	77,579	79,207	79,738	59,996	72,038	
Long-Term Preserved	2,454	4,294	4,420	4,681	7,068	6,718	6,263	6,067	6,282	7,752	

2021 Eye Banking Statistics Reported by U.S. Banks *Use of Donated Tissues*

Use of Donated Tissue	2017	2018	2019	2020	2021
Corneal Grafts Total	84,297	85,441	85,601	66,278	79,641
Penetrating Keratoplasty	38,025	36,028	35,919	25,023	30,412
Anterior Lamellar Keratoplasty	2,541	2,355	2,146	1,072	1,307
Endothelial Keratoplasty	33,397	35,071	35,555	29,947	35,532
Keratolimbal Allograft	104	87	110	119	134
Keratoprosthesis (K-Pro)	344	243	267	174	175
Glaucoma Shunt Patch or other non-keratoplasty use	1,368	1,058	1,018	873	839
Other keratoplasty (experimental surgery)	232	64	44	11	25
Unknown or Unspecified	1,568	4,301	4,679	2,777	3,614
Sclera	3,253	2,959	5,999	3,151	5,614
Long-Term Preserved Corneas	12,543	13,521	8,614	9,093	12,626
Keratoplasty	197	298	126	125	82
Glaucoma Shunt Patching	12,345	13,066	8,420	7,037	10,283
Other Surgical Uses	1	157	68	1,931	2,261
Research	13,859	12,495	13,743	11,336	14,222
Training	10,539	10,666	9,487	6,504	7,425

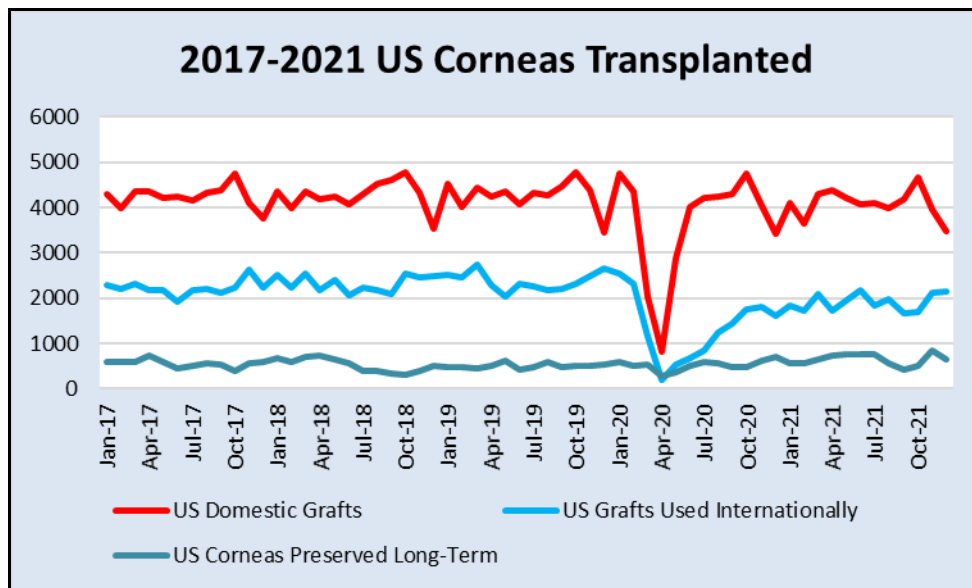
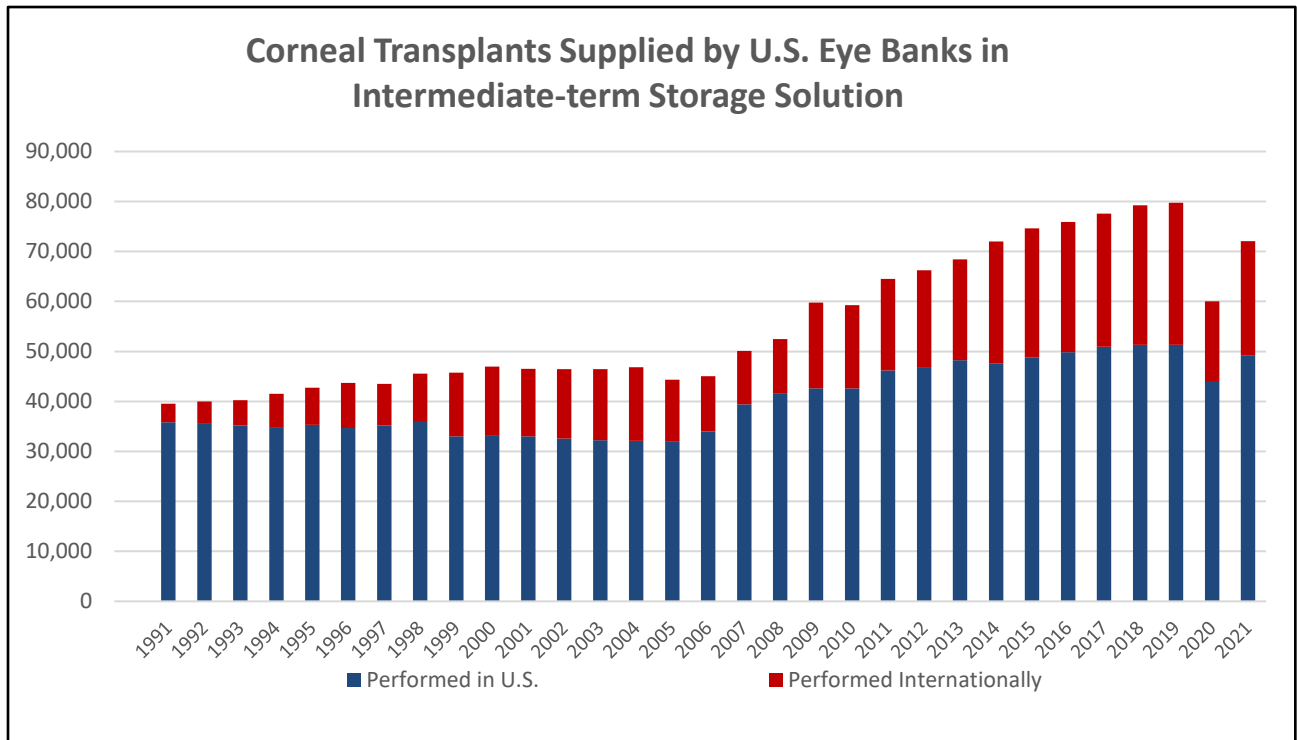


2021 Eye Banking Statistics Reported by U.S. Banks *Use of Donated Tissues*

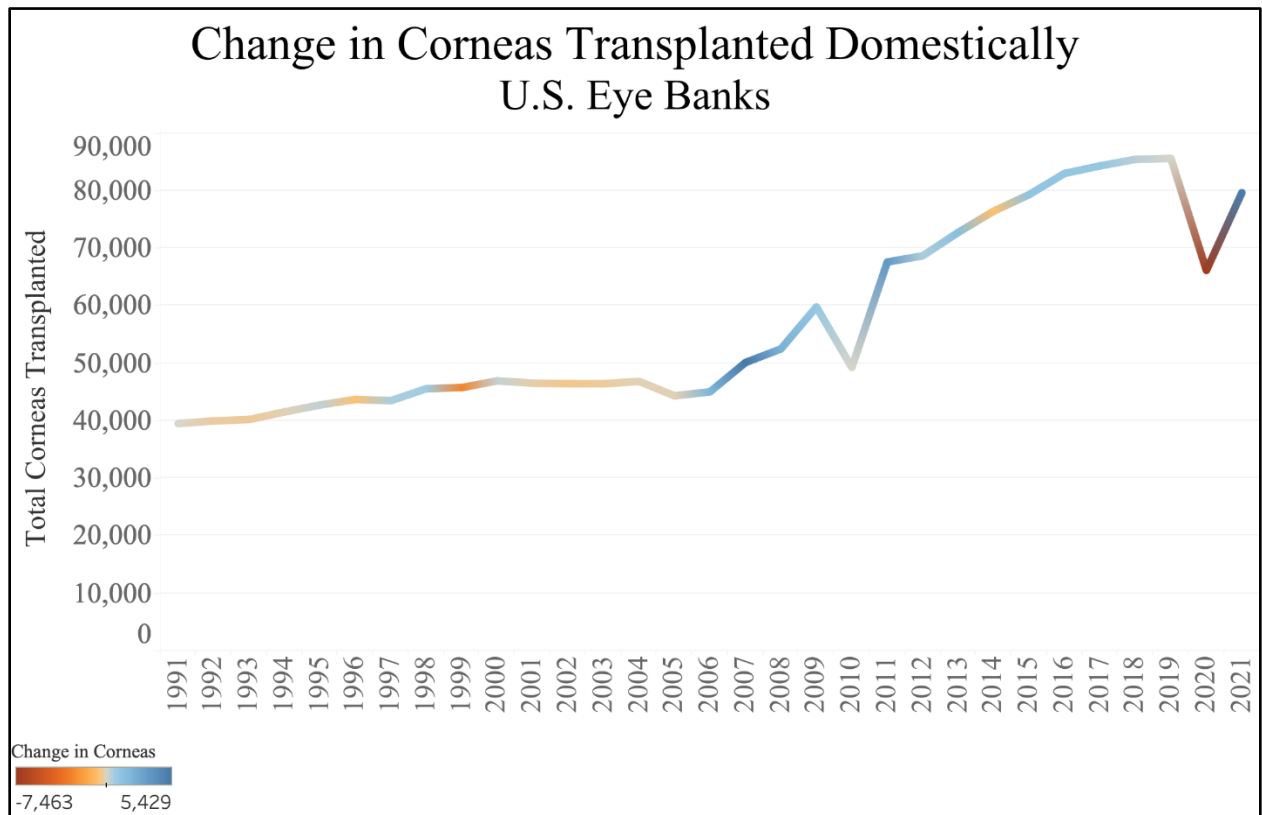
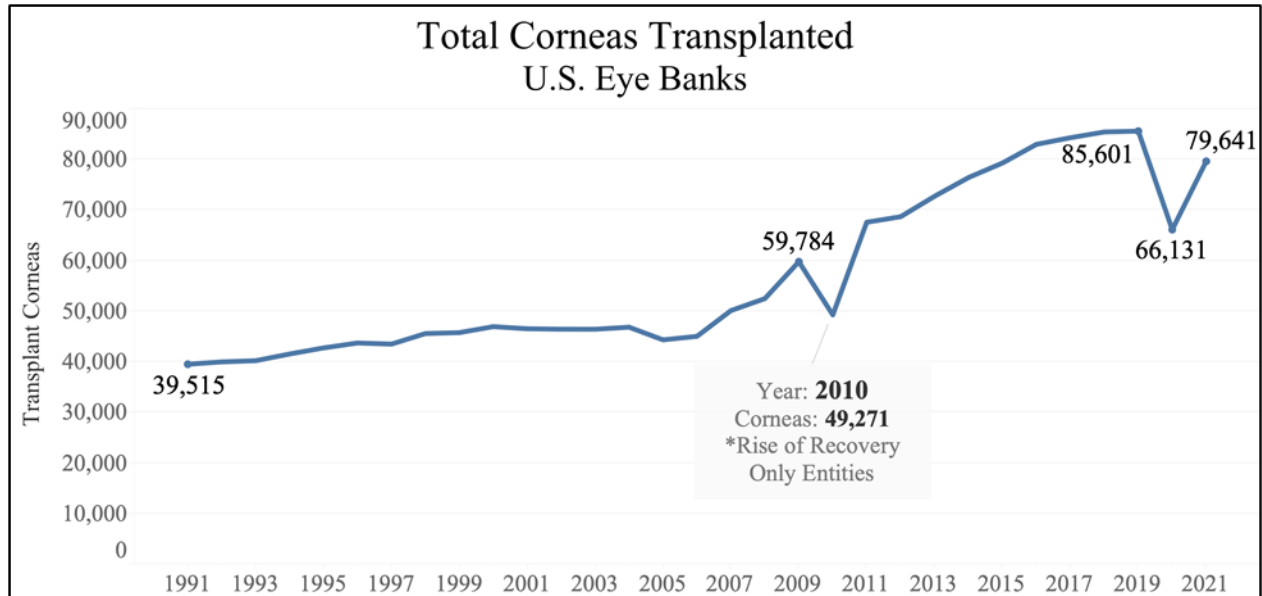


Surgical Outcomes of Corneas Recovered for Transplant Use - U.S. Eye Banks											
Surgery Type	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trend
PK	36,716	36,998	38,919	39,554	38,413	38,025	36,028	35,919	25,023	30,412	
EK	25,025	27,298	28,961	30,710	32,221	33,397	35,071	35,555	29,947	35,532	
ALK	1,855	2,009	1,953	2,201	2,386	2,541	2,355	2,146	1,072	1,307	
KLA	97	110	88	107	97	104	87	110	119	134	
K-Pro	263	255	294	364	313	344	243	267	174	175	
Shunt Patch	676	687	755	527	917	1,368	1,058	1,018	873	839	
Other Keratoplasty	44	17	17	19	65	232	64	44	11	25	
Unknown	1,554	1,068	1,026	1,142	1,514	1,568	4,301	4,679	2,777	3,614	
Long-term Preserved	2,454	4,294	4,420	4,681	7,068	6,718	6,263	6,067	6,282	7,752	

2021 Eye Banking Statistics Reported by U.S. Banks *Annual Number of Corneal Transplants Supplied by U.S. Banks*

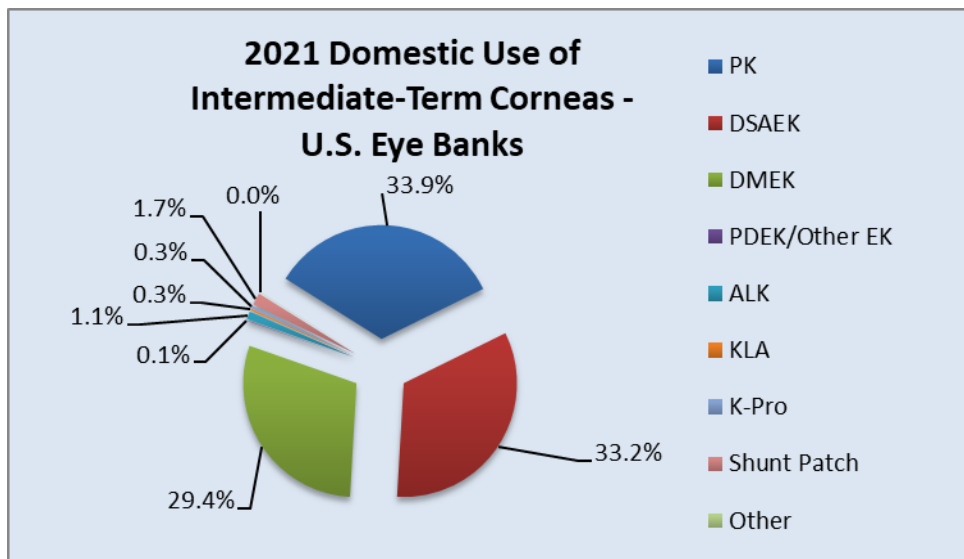


2021 Eye Banking Statistics Reported by U.S. Banks *Transplant Activity*

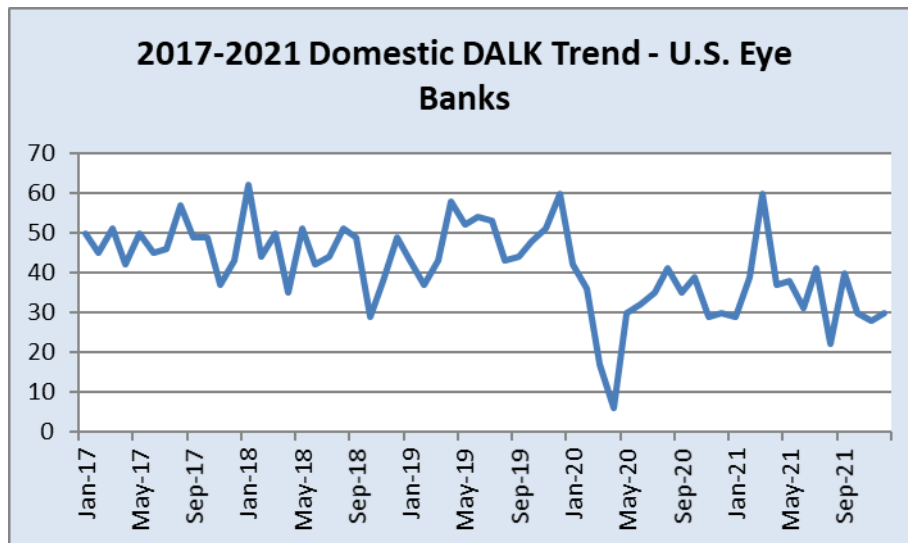
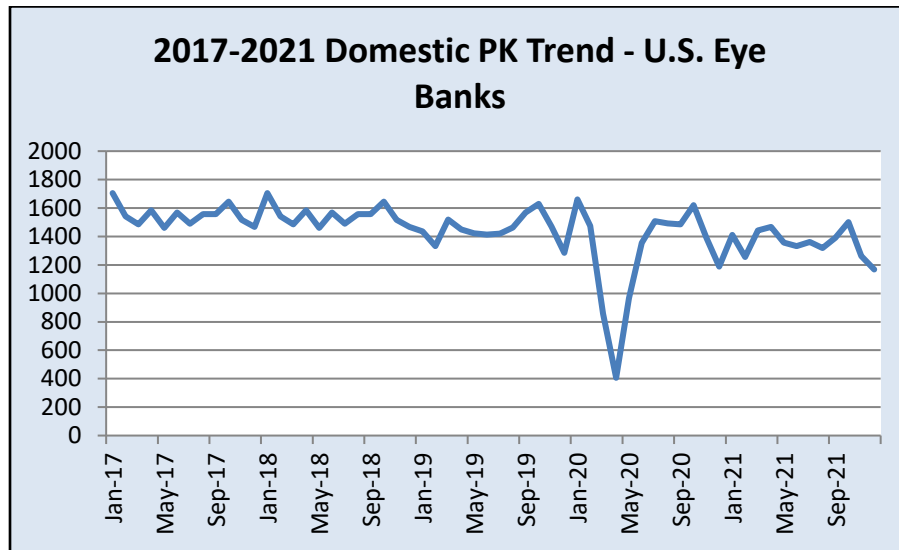


2021 Eye Banking Statistics Reported by U.S. Banks *Domestic Surgery Use of Intermediate-Term Preserved Tissue*

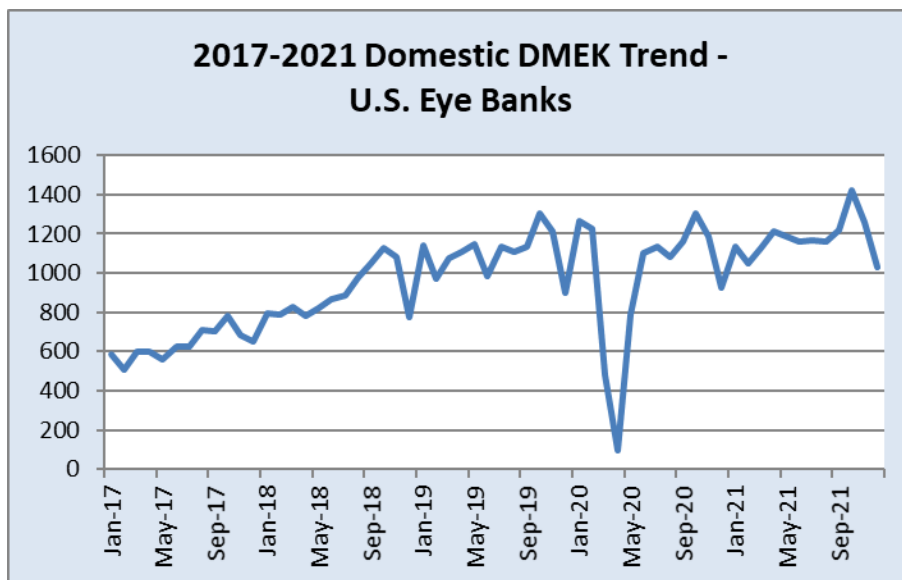
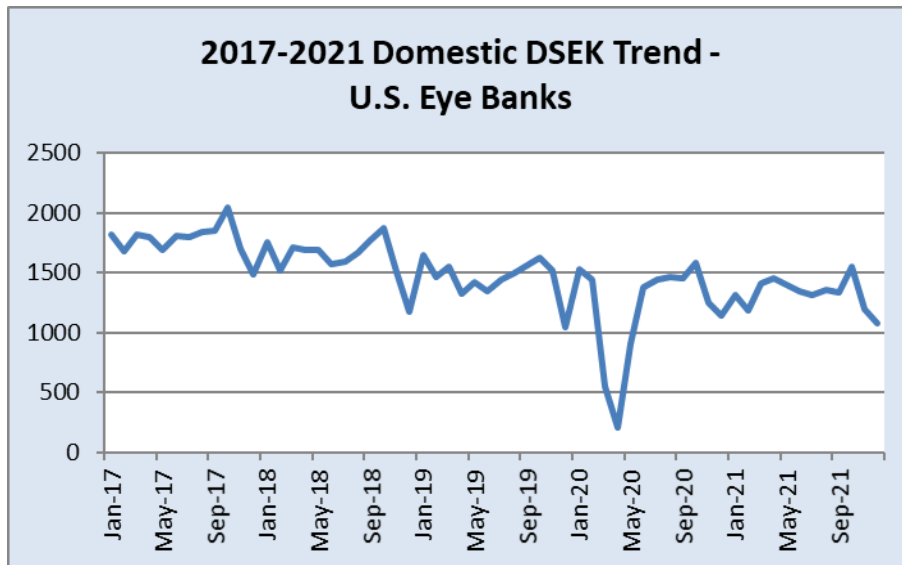
	2019	2020	2021
Intermediate-term preserved corneas processed into corneal segments	269	165	168
Number of intermediate-term preserved corneas segments produced	473	312	317
Intermediate-term preserved corneas, corneal segments or whole eyes transplanted in the U.S for:	51,336	43,873	49,110
PK	17,409	15,402	16,269
EK	30,650	26,095	30,098
DSEK, DSAEK, DLEK	17,428	14,331	15,935
DMEK or DMAEK	13,215	11,749	14,128
PDEK	6	4	0
Other EK	1	11	15
ALK	745	505	544
DALK (Deep Anterior Lamellar Keratoplasty)	586	372	425
SALK (Superficial Anterior Lamellar Keratoplasty)	10	29	17
Other ALK (e.g., peripheral, eccentric, etc.)	149	104	102
KLA	95	109	124
Keratoprosthesis (K-Pro)	251	161	167
Glaucoma shunt patch or other non-keratoplasty use	971	854	817
Other Keratoplasty (e.g., experimental surgery type)	62	7	20
Unknown or Unspecified	1,393	740	1,071



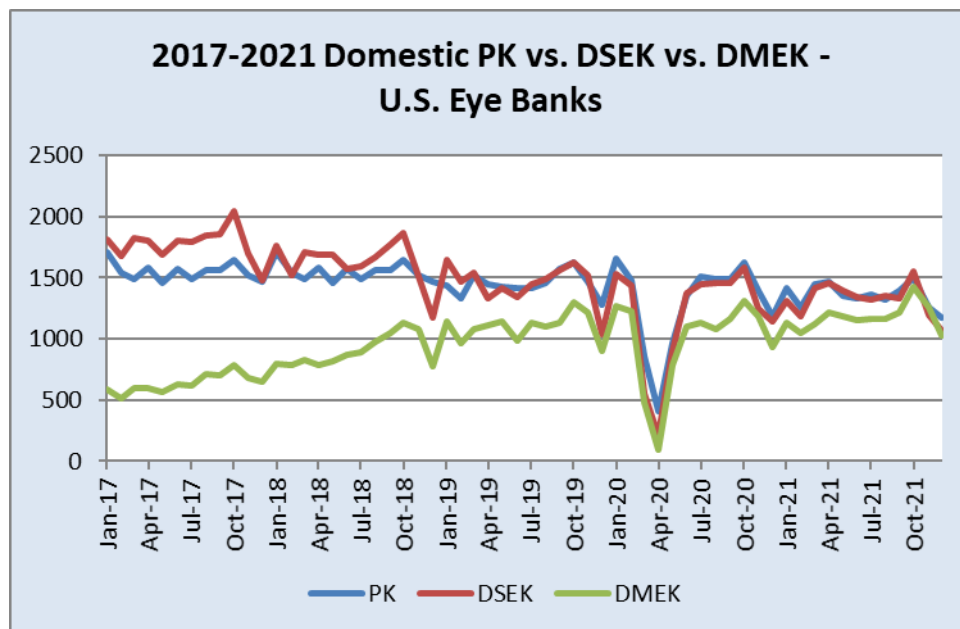
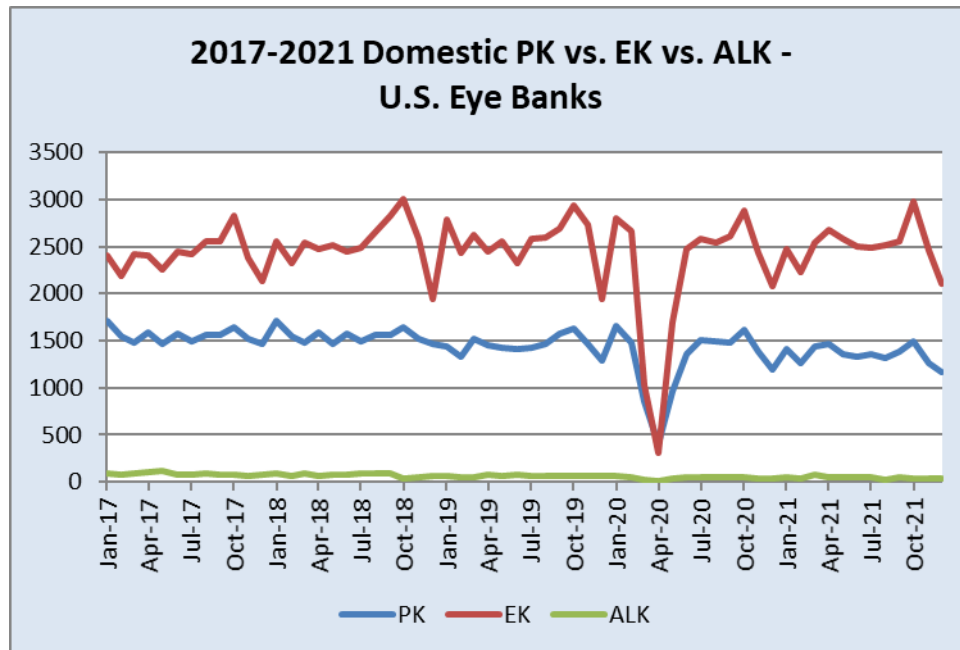
2021 Eye Banking Statistics Reported by U.S. Banks *Domestic Surgery Use of Intermediate-Term Preserved Tissue*



2021 Eye Banking Statistics Reported by U.S. Banks
Domestic Surgery Use of Intermediate-Term Preserved Tissue

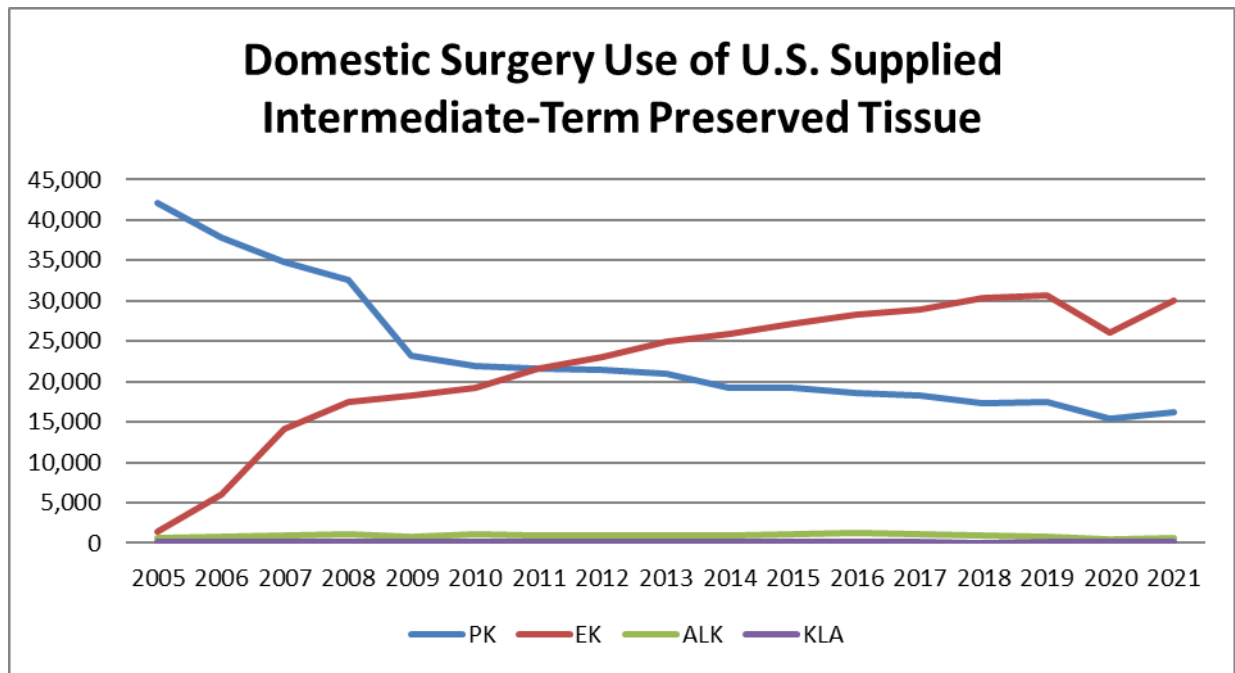


2021 Eye Banking Statistics Reported by U.S. Banks
Domestic Surgery Use of Intermediate-Term Preserved Tissue



Eye Banking Statistics Reported by U.S. Banks
Domestic Use of Intermediate-Term Preserved Tissues
Annual Comparison 2012 - 2020

Domestic Surgery Use	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Penetrating Keratoplasty	21,422	20,954	19,294	19,160	18,579	18,346	17,347	17,409	15,402	16,269
Endothelial Keratoplasty	23,049	24,987	25,965	27,208	28,327	28,993	30,336	30,650	26,095	30,098
Anterior Lamellar Keratoplasty	883	951	914	1,115	1,232	1,027	884	745	505	544
Keratolimbal Allograft	80	91	80	97	82	93	68	95	109	124
K-Pro	236	223	260	323	279	304	225	251	161	167



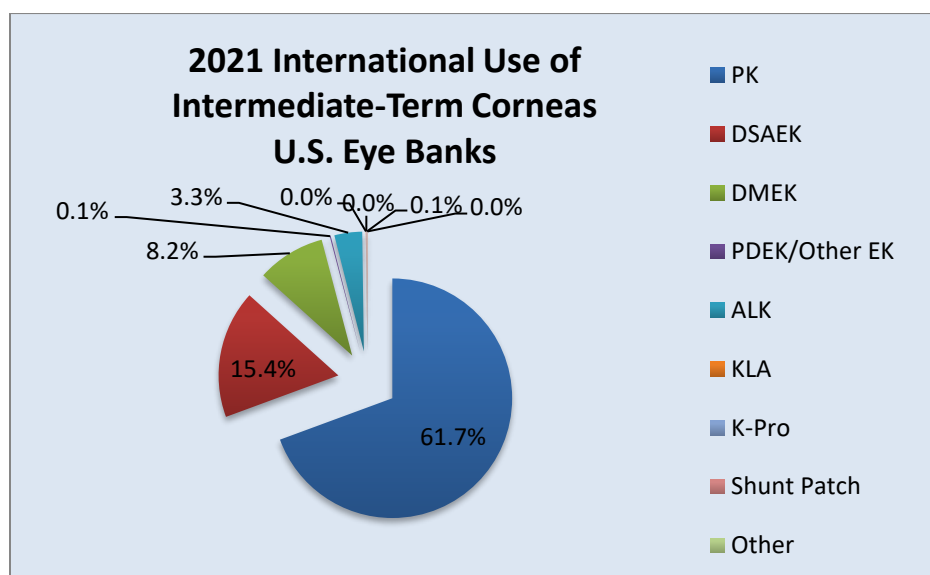
2021 Eye Banking Statistics Reported by U.S. Banks Domestic Surgery Use of Intermediate-Term Preserved Tissue

Surgery Type (Domestically Distributed Corneas) - U.S. Eye Banks												
Month	PK	EK (DSEK)	EK (DMEK)	EK (Other)	ALK (DALK)	ALK (SALK)	ALK (Other)	KLA	K-Pro	Shunt Patch	Other	Unknown
Jan. 2021	34.3%	31.9%	27.6%	0.6%	0.7%	0.1%	0.5%	0.2%	0.4%	2.2%	0.0%	1.6%
Feb. 2021	34.4%	32.5%	28.7%	0.0%	1.1%	0.0%	0.1%	0.1%	0.3%	1.2%	0.0%	1.7%
Mar. 2021	33.6%	32.9%	26.2%	0.0%	1.4%	0.1%	0.3%	0.1%	0.4%	2.1%	0.0%	2.8%
Apr. 2021	33.4%	33.1%	27.6%	0.0%	0.8%	0.0%	0.2%	0.5%	0.3%	1.9%	0.0%	2.1%
May 2021	32.3%	33.3%	28.3%	0.0%	0.9%	0.0%	0.3%	0.2%	0.3%	1.5%	0.0%	2.9%
Jun. 2021	32.6%	32.9%	28.3%	0.0%	0.8%	0.0%	0.3%	0.5%	0.4%	1.4%	0.0%	2.6%
Jul. 2021	33.1%	32.0%	28.3%	0.1%	1.0%	0.0%	0.0%	0.3%	0.4%	1.9%	0.1%	2.6%
Aug. 2021	33.0%	33.9%	29.1%	0.1%	0.6%	0.0%	0.2%	0.3%	0.3%	1.3%	0.0%	1.3%
Sep. 2021	33.3%	31.9%	29.2%	0.0%	1.0%	0.0%	0.1%	0.2%	0.4%	1.6%	0.0%	2.2%
Oct. 2021	32.2%	33.4%	30.6%	0.0%	0.6%	0.0%	0.1%	0.2%	0.3%	1.3%	0.0%	1.2%
Nov. 2021	32.0%	30.3%	31.9%	0.0%	0.7%	0.0%	0.2%	0.3%	0.3%	1.9%	0.1%	2.3%
Dec. 2021	33.5%	30.8%	29.5%	0.0%	0.9%	0.1%	0.2%	0.1%	0.4%	1.5%	0.1%	3.0%
2019 Avg.	36.2%	33.9%	25.7%	0.0%	1.1%	0.0%	0.3%	0.2%	0.5%	1.9%	0.1%	2.3%
2020 Avg.	35.1%	32.7%	26.8%	0.0%	0.8%	0.1%	0.2%	0.2%	0.4%	1.9%	0.0%	1.7%
2021 Avg.	33.1%	32.4%	28.8%	0.1%	0.9%	0.0%	0.2%	0.3%	0.3%	1.7%	0.0%	2.2%
Std. Dev.	0.8%	1.1%	1.5%	0.2%	0.2%	0.0%	0.1%	0.1%	0.1%	0.3%	0.1%	0.6%
2021 Totals	16,269	15,935	14,128	35	425	17	102	124	167	817	20	1,071

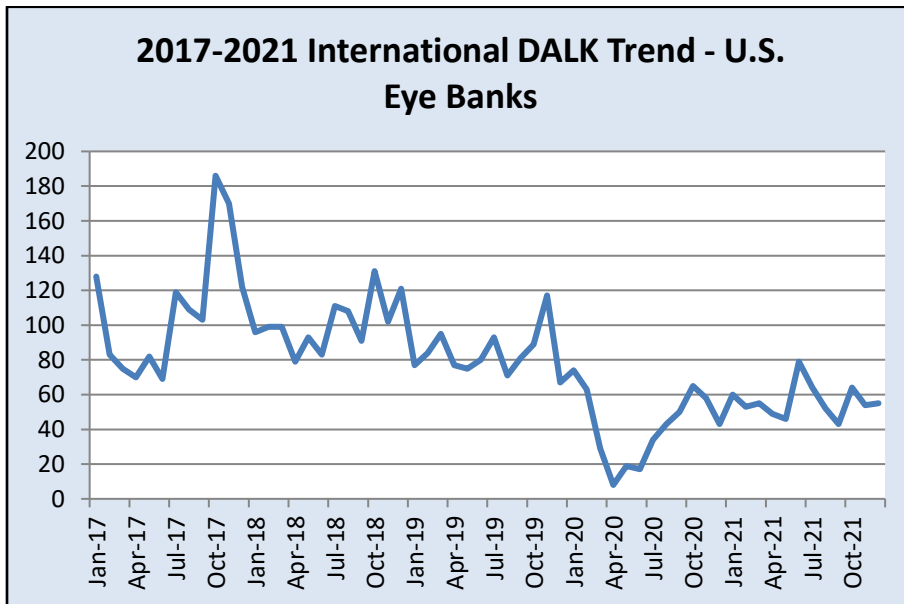
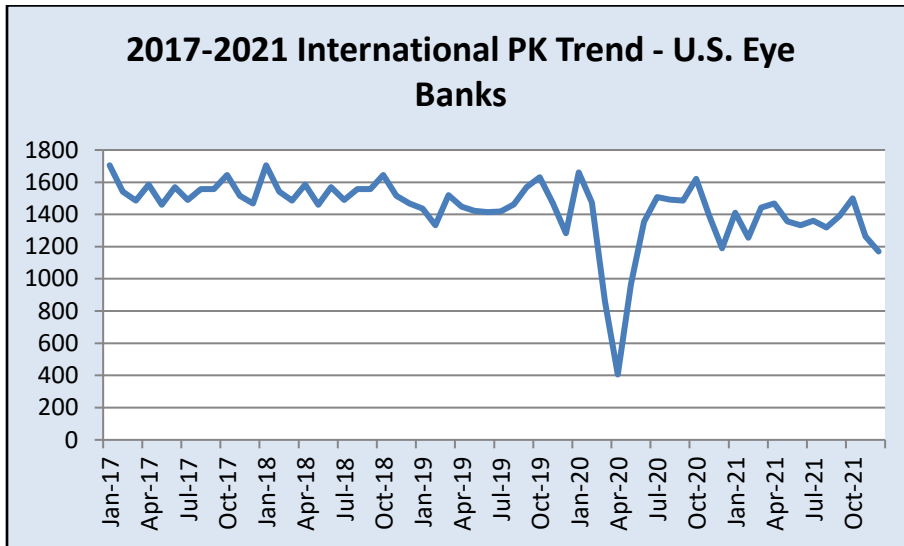
*Percentages read from this table should be read as "of the tissue distributed for transplant use domestically"

2021 Eye Banking Statistics Reported by U.S. Banks *International Surgery Use of Intermediate-Term Preserved Tissue*

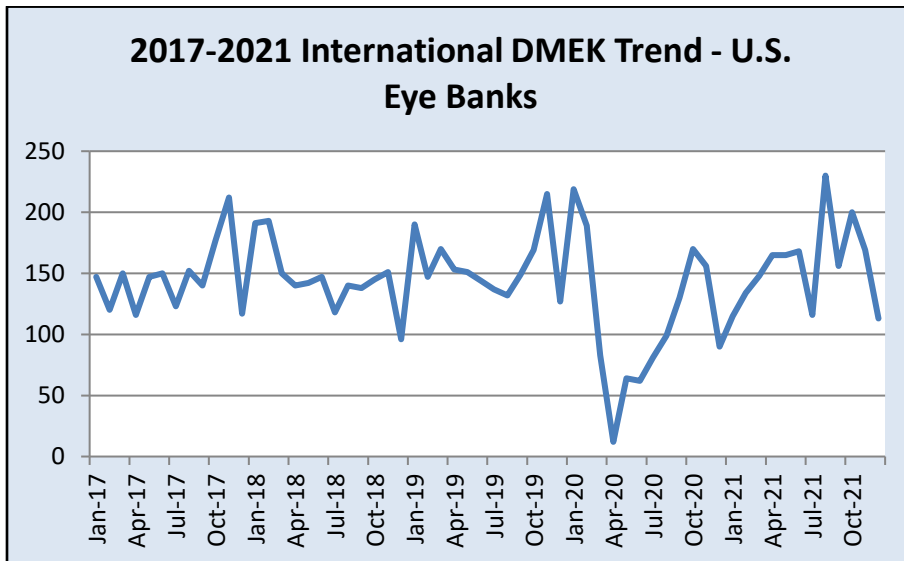
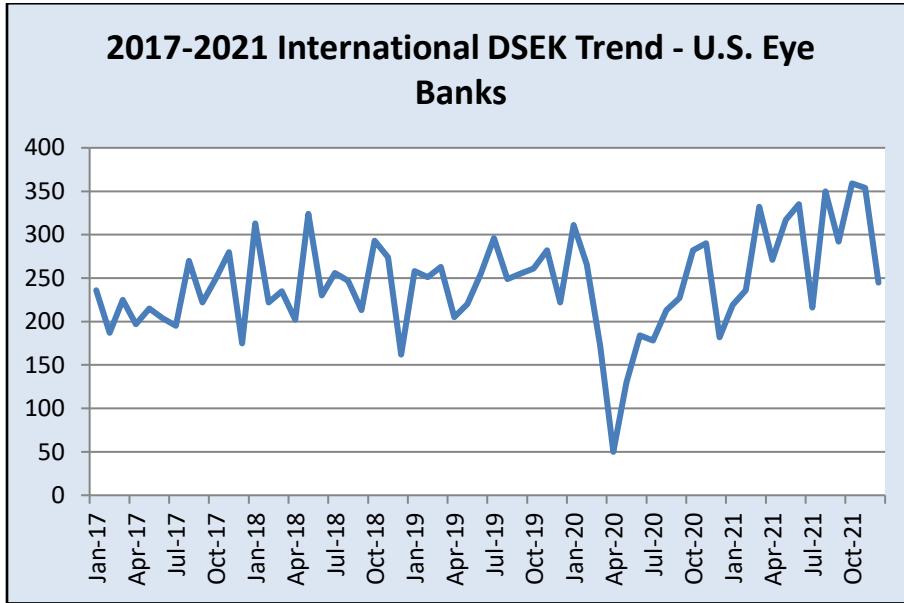
International Use of Intermediate-Term Corneas – U.S. Eye Banks	2019	2020	2021
Intermediate-term preserved corneas, corneal segments or whole eyes transplanted internationally for:	28,402	16,123	22,928
PK	18,510	9,621	14,143
EK	4,905	3,852	5,434
DSEK, DSAEK, DLEK	3,017	2,485	3,526
DMEK or DMAEK	1,884	1,355	1,879
PDEK	0	0	3
Other EK	4	12	26
ALK	1,401	567	763
DALK (Deep Anterior Lamellar Keratoplasty)	1,006	503	674
SALK (Superficial Anterior Lamellar Keratoplasty)	53	25	20
Other ALK (e.g., peripheral, eccentric, etc.)	342	39	69
KLA	15	10	10
Keratoprosthesis (K-Pro)	16	13	8
Glaucoma shunt patch or other non-keratoplasty use	47	19	22
Other Keratoplasty (e.g. experimental surgery type)	4	4	5
Unknown or Unspecified	3,504	2,037	2,543
Total intermediate-term preserved corneas, corneal segments, and whole eyes used for KERATOPLASY	78,720	59,123	71,199
Total intermediate term preserved corneas, corneal segments, and whole eyes used for TRANSPLANT	79,534	59,849	71,889



2021 Eye Banking Statistics Reported by U.S. Banks
International Surgery Use of Intermediate-Term Preserved Tissue



2021 Eye Banking Statistics Reported by U.S. Banks
International Surgery Use of Intermediate-Term Preserved Tissue



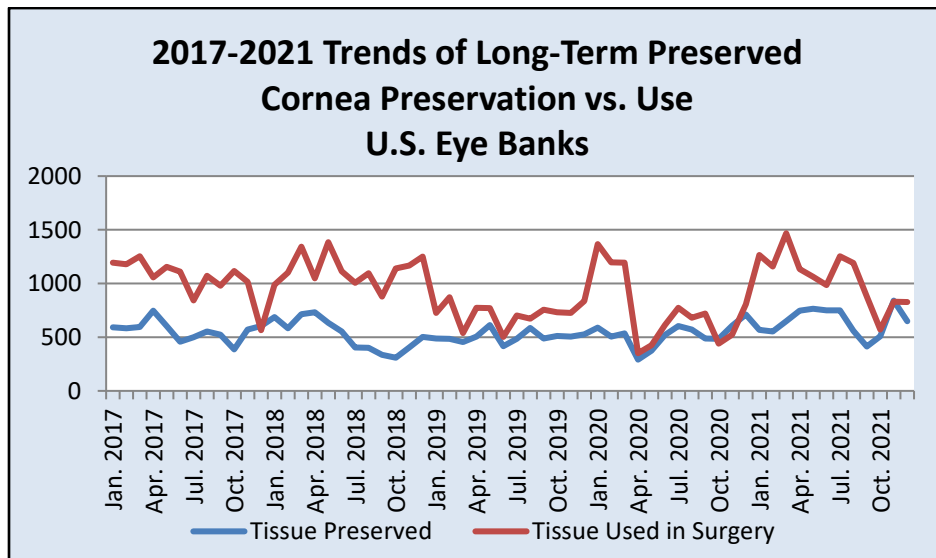
2021 Eye Banking Statistics Reported by U.S. Banks
International Surgery Use of Intermediate-Term Preserved Tissue

Surgery Type (Internationally Distributed Corneas) - U.S. Eye Banks												
Month	PK	EK (DSEK)	EK (DMEK)	EK (Other)	ALK (DALK)	ALK (SALK)	ALK (Other)	KLA	K-Pro	Shunt Patch	Other	Unknown
Jan. 2021	64.3%	12.0%	6.3%	0.3%	3.3%	0.3%	0.2%	0.0%	0.2%	0.3%	0.0%	12.8%
Feb. 2021	63.6%	13.8%	7.8%	0.4%	3.1%	0.2%	0.1%	0.1%	0.0%	0.1%	0.0%	10.8%
Mar. 2021	60.1%	15.9%	7.1%	0.1%	2.6%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	13.7%
Apr. 2021	56.5%	15.7%	9.5%	0.0%	2.8%	0.1%	0.2%	0.0%	0.0%	0.1%	0.0%	15.2%
May 2021	56.7%	16.3%	8.5%	0.1%	2.4%	0.0%	0.4%	0.0%	0.0%	0.2%	0.0%	15.6%
Jun. 2021	60.1%	15.4%	7.7%	0.0%	3.6%	0.2%	0.2%	0.1%	0.0%	0.0%	0.0%	12.4%
Jul. 2021	66.8%	11.8%	6.3%	0.2%	3.5%	0.0%	0.2%	0.1%	0.1%	0.1%	0.0%	11.0%
Aug. 2021	62.9%	17.6%	11.6%	0.2%	2.6%	0.1%	0.3%	0.0%	0.0%	0.0%	0.0%	4.8%
Sep. 2021	58.4%	17.5%	9.3%	0.1%	2.6%	0.0%	0.3%	0.0%	0.1%	0.1%	0.0%	11.7%
Oct. 2021	56.2%	21.1%	11.7%	0.0%	3.8%	0.0%	1.0%	0.1%	0.0%	0.1%	0.2%	5.9%
Nov. 2021	63.0%	16.7%	8.0%	0.1%	2.6%	0.0%	0.2%	0.0%	0.0%	0.1%	0.0%	9.2%
Dec. 2021	69.9%	11.5%	5.3%	0.0%	2.6%	0.1%	0.5%	0.0%	0.0%	0.0%	0.0%	10.1%
2019 Avg.	65.2%	10.6%	6.6%	0.0%	3.5%	0.2%	1.2%	0.1%	0.1%	0.2%	0.0%	12.3%
2020 Avg.	59.7%	15.4%	8.4%	0.1%	3.1%	0.2%	0.2%	0.1%	0.1%	0.1%	0.0%	12.6%
2021 Avg.	61.7%	15.4%	8.2%	0.1%	2.9%	0.1%	0.3%	0.0%	0.0%	0.1%	0.0%	11.1%
Std. Dev.	4.3%	2.8%	2.0%	0.1%	0.5%	0.1%	0.3%	0.1%	0.1%	0.1%	0.1%	3.3%
2021 Totals	14,143	3,526	1,879	29	674	20	69	10	8	22	5	2,543

*Percentages read from this table should be read as "of the tissue distributed for transplant use internationally"

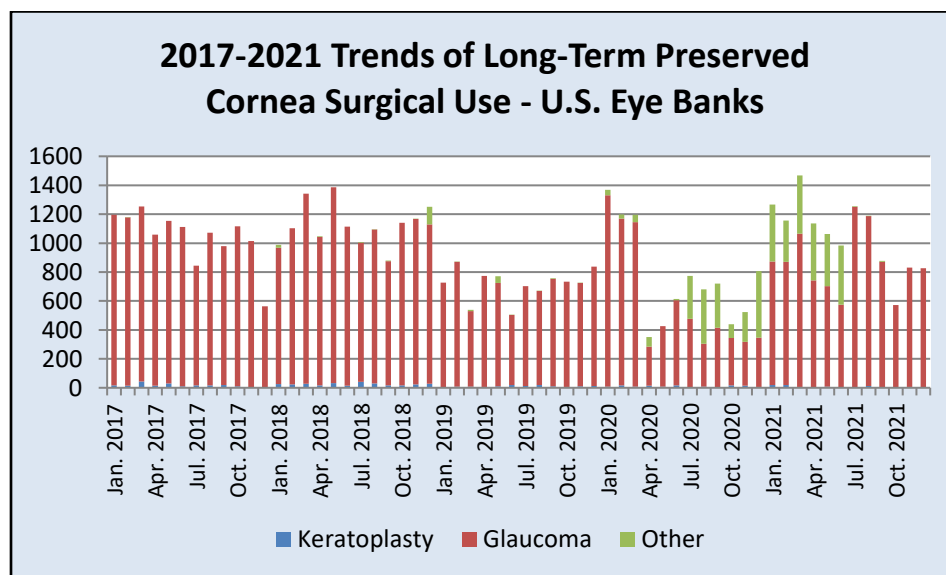
2021 Eye Banking Statistics Reported by U.S. Banks *Long-Term Preserved Tissue Distribution*

Long-Term Preserved Tissue Preservation and Distribution	2019	2020	2021
Long-term preserved corneas or whole globes PRESERVED for transplant	6,067	6,282	7,752
Long-term preserved corneas, corneal segments, or whole globes DISTRIBUTED for:	8,614	9,093	12,626
Keratoplasty	126	125	82
Glaucoma Shunt patching	8,420	7,037	10,283
Other Surgical Uses	68	1,931	2,261
Long-term preserved corneas, corneal segments, or whole globes FORWARDED to another entity for final distribution	577	762	309
Sclera or sclera segments PRESERVED for transplantation	3,148	4,183	6,928
Sclera or sclera segments DISTRIBUTED for:	5,999	3,151	5,614
Prosthesis following enucleation	495	444	318
Glaucoma shunt patching	1,989	1,804	4,583
Other surgical uses	3,515	903	713
Sclera or sclera segments FORWARDED to another entity for final distribution	268	308	280

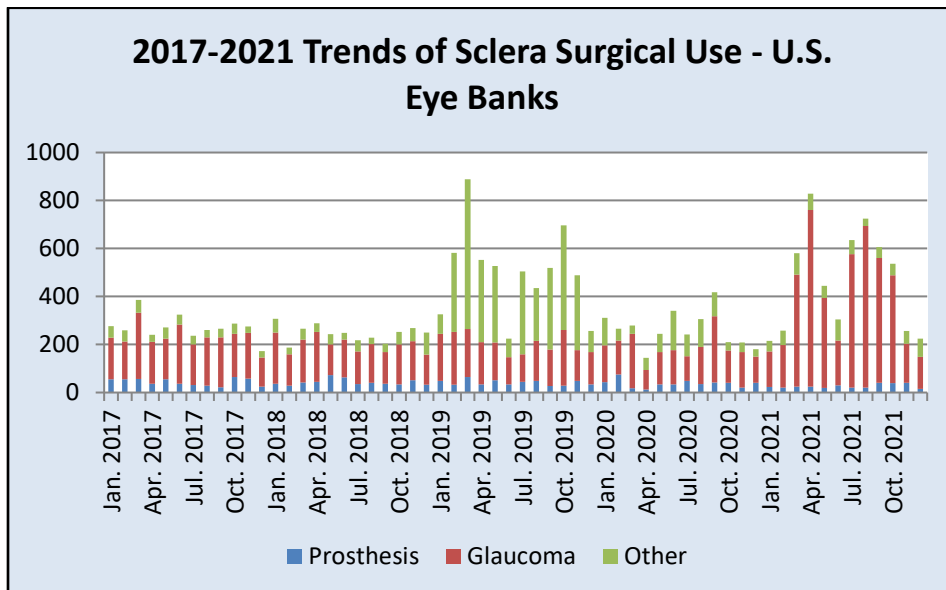
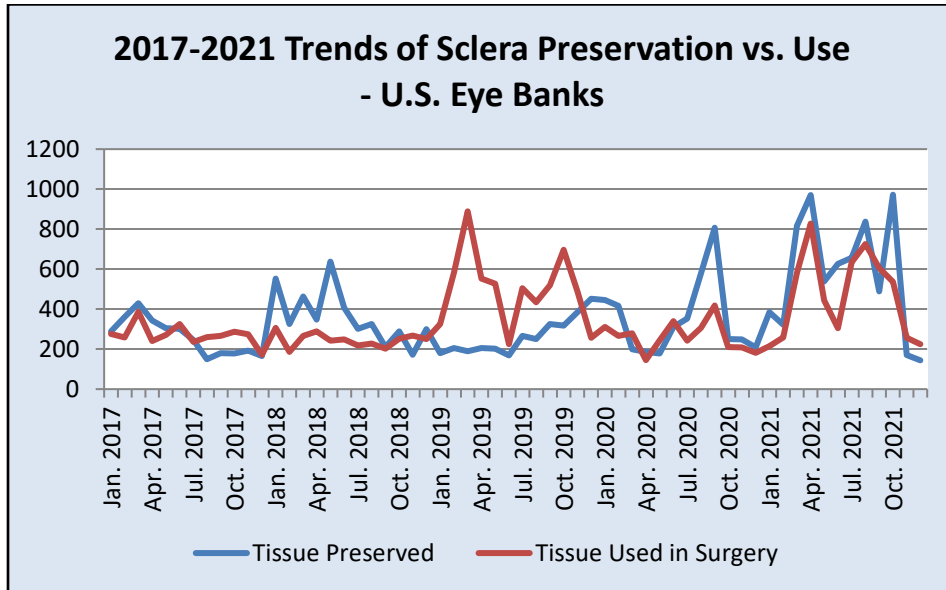


2021 Eye Banking Statistics Reported by U.S. Banks *Long-Term Preserved Tissue Distribution*

Long-Term Tissue Trends - U.S. Eye Banks								
Month	Long-Term Preserved Corneas	Long-Term Cornea Use - Keratoplasty	Long-Term Cornea Use - Glaucoma	Long-Term Cornea Use - Other	Scleral Segments Preserved	Sclera Use - Prosthesis	Sclera Use - Glaucoma	Sclera Use - Other
Jan. 2021	569	19	854	394	385	23	148	44
Feb. 2021	552	20	851	286	322	20	178	60
Mar. 2021	648	5	1,060	403	816	25	466	90
Apr. 2021	748	2	741	392	970	24	736	68
May 2021	766	7	695	361	539	19	375	50
Jun. 2021	751	2	573	409	627	30	186	89
Jul. 2021	750	3	1,247	5	657	21	555	59
Aug. 2021	558	13	1,174	3	837	20	674	31
Sep. 2021	412	1	869	8	489	41	520	45
Oct. 2021	509	1	571	0	972	39	450	47
Nov. 2021	841	6	824	0	170	41	162	54
Dec. 2021	648	3	824	0	144	15	133	76
2019 Total	6,067	126	8,420	68	3,148	495	1,989	3,515
2020 Total	6,282	125	7,037	1,931	4,183	444	1,804	903
2021 Total	7,752	82	10,283	2,261	6,928	318	4,583	713
2020 Avg.	646	7	857	188	577	27	382	59
Std. Dev.	128	7	213	197	287	9	217	18

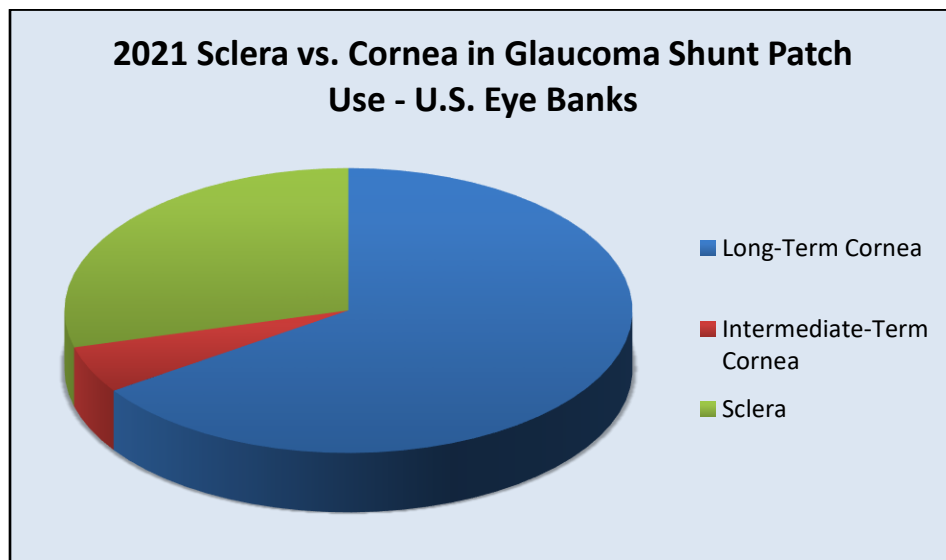
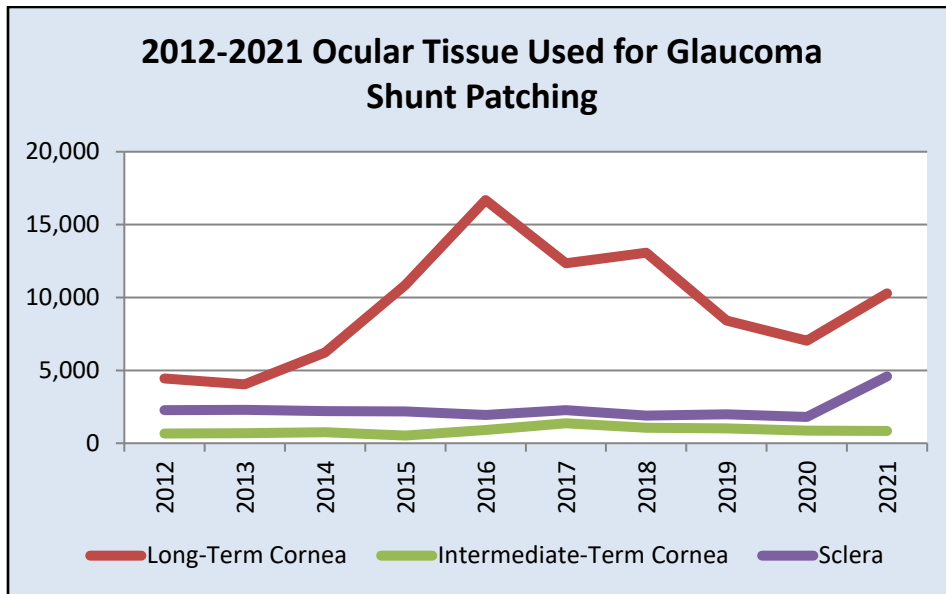


2021 Eye Banking Statistics Reported by U.S. Banks *Long-Term Preserved Tissue Distribution*



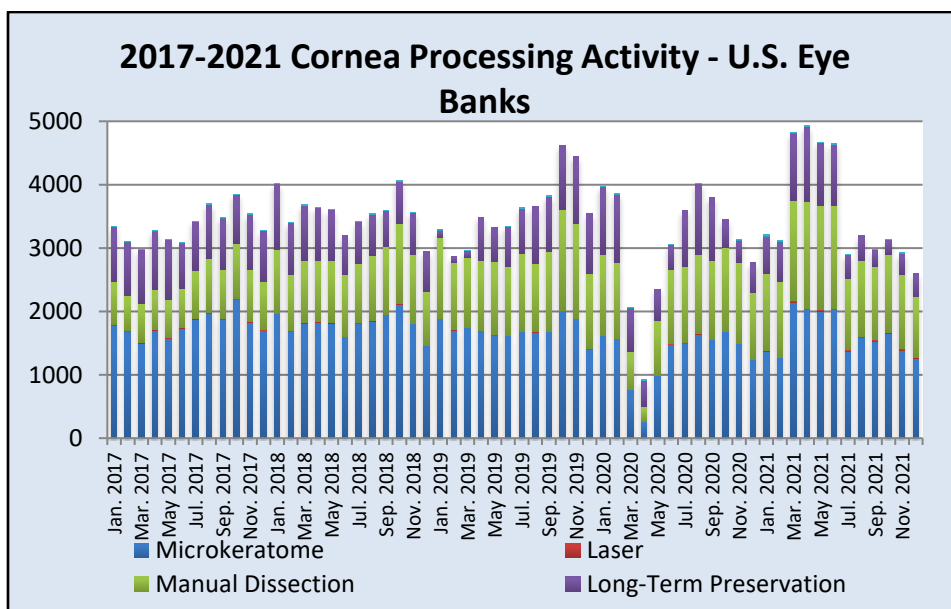
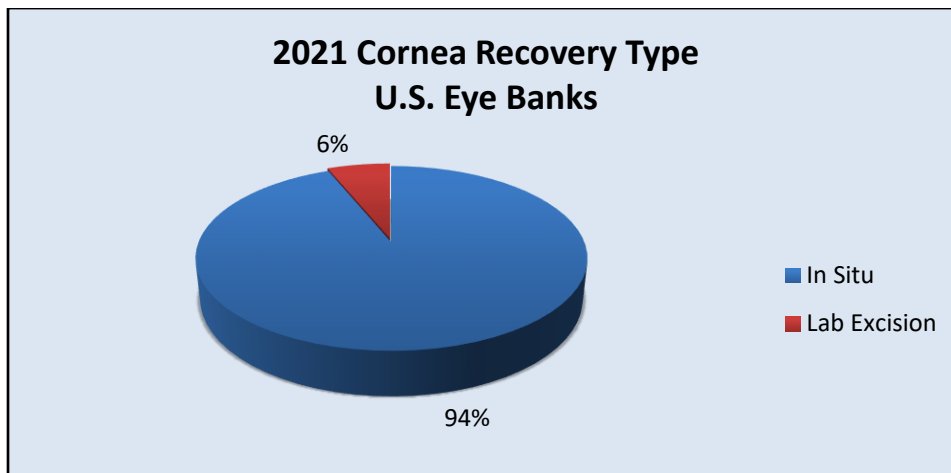
2021 Eye Banking Statistics Reported by U.S. Banks *Long-Term Preserved Tissue Distribution*

Ocular Tissue Used for Glaucoma Shunt Patching - U.S. Eye Banks											
Ocular Tissue Used for Glaucoma Shunt Patching	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Long-Term Cornea	4,435	4,040	6,212	10,843	16,683	12,345	13,066	8,420	7,037	10,283	
Intermediate-Term Cornea	676	687	755	527	917	1,368	1,058	1,018	873	839	
Sclera	2,260	2,293	2,199	2,175	1,944	2,266	1,900	1,989	1,804	4,583	



2021 Eye Banking Statistics Reported by U.S. Banks *Tissue Processing for Transplant*

Tissue Processing for Transplant	2019	2020	2021
Eye Processing (does not include in situ excision)	2,842	2,164	7,238
Processed for corneal preservation only	1,115	170	2,272
Processed for sclera preservation	1,697	1,955	1,987
Processed for other ocular materials	30	39	2,979
Cornea Processing	42,968	36,962	43,112
Processed by microkeratome	20,594	15,797	19,635
Preloaded into a device following microkeratome processing			680
Processed by laser	79	61	215
Processed by hand dissection	14,635	12,670	15,813
Preloaded into a device following manual dissection processing			9,747
Processed by transfer into long-term preservation	7,634	8,393	7,356
Processed by other methods	26	41	93

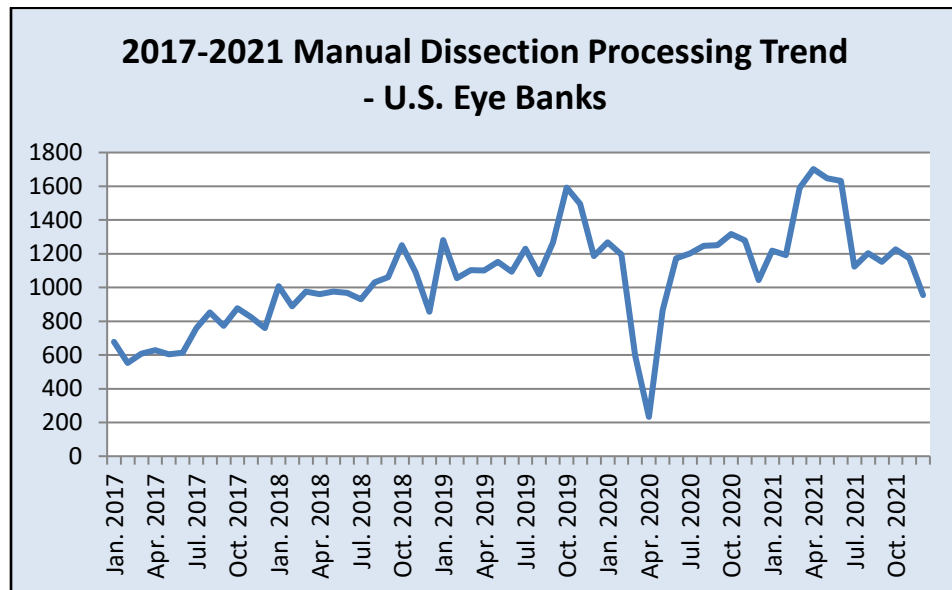
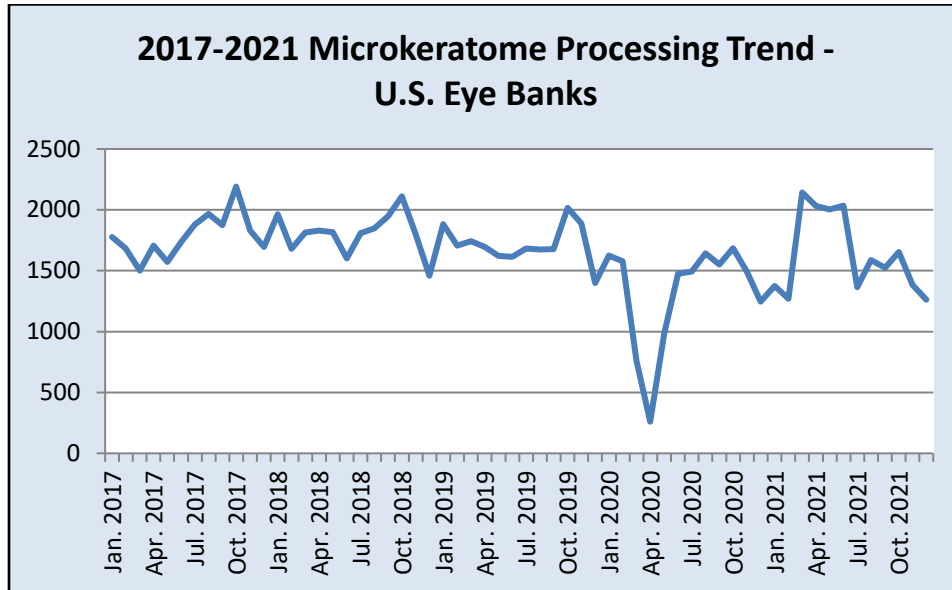


2021 Eye Banking Statistics Reported by U.S. Banks *Tissue Processing for Transplant*

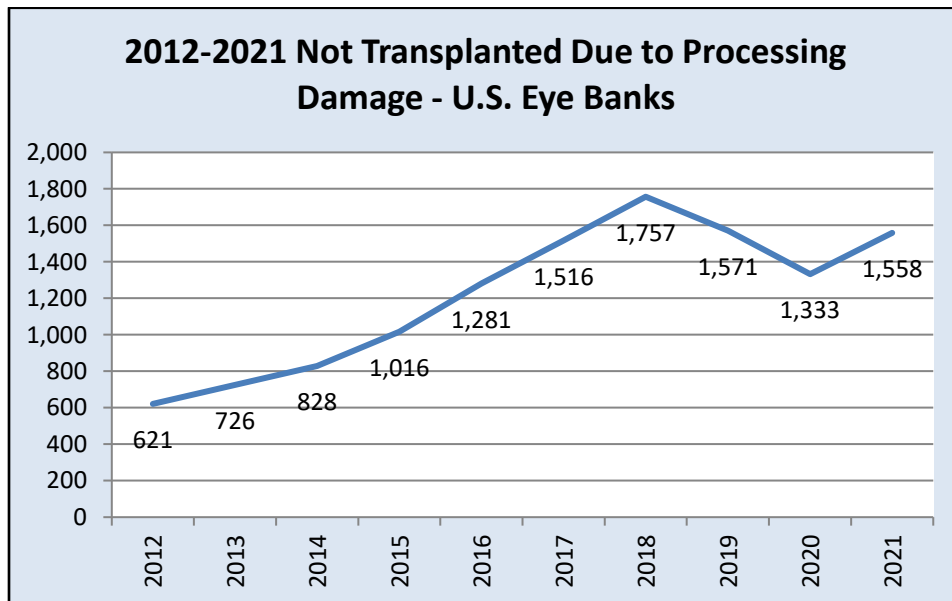
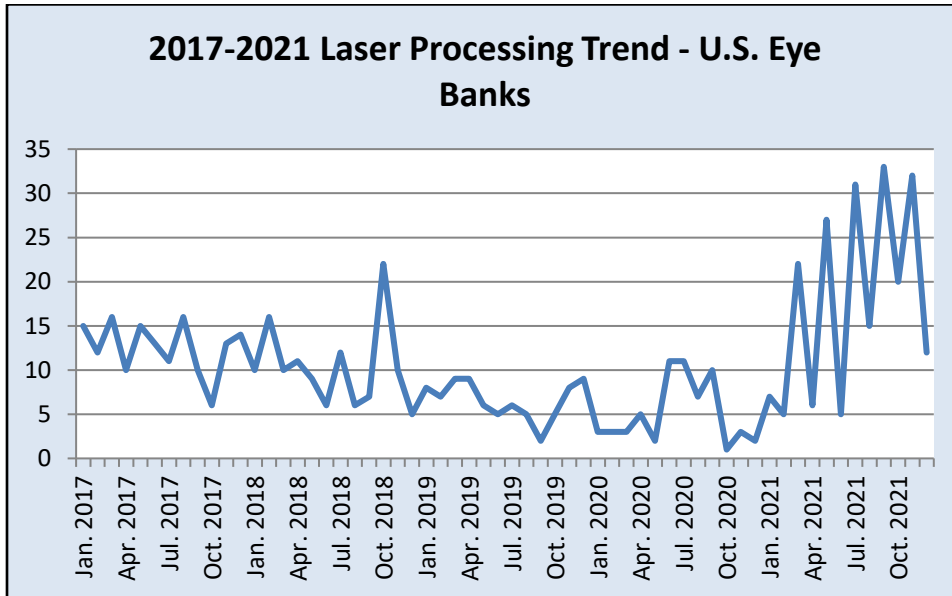
Cornea Processing - U.S. Eye Banks									
Month	Microkeratome Processing	Pre-loaded after Microkeratome Processing	Percent DSAEK Pre-load	Laser Processing	Manual Processing (e.g. DMEK)	Pre-loaded after Manual Processing	Percent DMEK Pre-load	Long-term Preservation	Other Cornea Processing
Jan. 2021	1,374	28	2.0%	7	1,219	800	65.6%	572	41
Feb. 2021	1,269	21	1.7%	5	1,191	748	62.8%	630	29
Mar. 2021	2,143	56	2.6%	22	1,590	801	50.4%	1,059	3
Apr. 2021	2,033	35	1.7%	6	1,702	853	50.1%	1,181	1
May 2021	2,004	50	2.5%	27	1,647	916	55.6%	989	1
Jun. 2021	2,034	61	3.0%	5	1,632	940	57.6%	967	3
Jul. 2021	1,364	65	4.8%	31	1,123	693	61.7%	373	2
Aug. 2021	1,588	67	4.2%	15	1,203	743	61.8%	392	0
Sep. 2021	1,525	93	6.1%	33	1,153	717	62.2%	263	2
Oct. 2021	1,654	71	4.3%	20	1,226	978	79.8%	229	5
Nov. 2021	1,384	70	5.1%	32	1,173	910	77.6%	329	6
Dec. 2021	1,263	63	5.0%	12	954	648	67.9%	372	0
2019 Total	20,594	N/A	N/A	79	14,635	N/A	N/A	7,634	26
2020 Total	15,797	N/A	N/A	61	12,670	N/A	N/A	8,393	41
2021 Total	19,635	680	3.5%	215	15,813	9,747	61.6%	7,356	93
2021 Avg.	1,636	57	3.6%	18	1,318	812	62.8%	613	8
Std. Dev.	331	20	1.5%	11	251	107	9.2%	344	13

Cornea Processing Success Rates - U.S. Eye Banks											
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Processing Events	22,599	24,168	24,347	28,660	38,180	40,167	42,650	42,968	36,962	53,540	
Failed Processing	621	726	828	1,016	1,281	1,516	1,757	1,571	1,333	1,558	
Success Rate	97.3%	97.0%	96.6%	96.5%	96.6%	96.2%	95.9%	96.3%	96.4%	97.1%	
Cornea Recovery Methods - U.S. Eye Banks											
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
In Situ	98,512	106,710	113,163	117,250	121,971	120,861	121,001	122,001	98,568	109,939	
Lab Excision	5,262	3,655	2,908	2,437	2,678	2,855	2,221	2,842	2,164	7,238	
Percent In Situ	94.9%	96.7%	97.5%	98.0%	97.9%	97.7%	98.2%	97.7%	97.9%	93.8%	

2021 Eye Banking Statistics Reported by U.S. Banks *Tissue Processing for Transplant*



2021 Eye Banking Statistics Reported by U.S. Banks *Tissue Processing for Transplant*



2021 Eye Banking Statistics Reported by EBAA Members *Countries of Destination*

NORTH AMERICA				
Country	US Eye Banks - Transplanted Corneas	Non-US Member Eye Banks - Transplanted Corneas	All EBAA Member Eye Banks - Transplanted Corneas	Change (2021 – 2020)
Antigua and Barbuda	1	0	1	(3)
Barbados	13	0	13	2
Canada	399	3,216	3,615	642
Costa Rica	69	0	69	28
Cuba	2	0	2	2
Dominican Republic	450	0	450	229
El Salvador	114	0	114	73
Guatemala	29	0	29	(1)
Honduras	71	0	71	2
Jamaica	11	0	11	8
Mexico	1,016	0	1,016	526
Nicaragua	4	0	4	(1)
Panama	7	0	7	7
Trinidad and Tobago	41	0	41	17
United States	49,110	0	49,110	5,237
TOTAL	51,337	3,216	54,553	6,758 (+13.9%)

AUSTRALIA and OCEANIA				
Country	US Eye Banks - Transplanted Corneas	Non-US Member Eye Banks - Transplanted Corneas	All EBAA Member Eye Banks - Transplanted Corneas	Change (2021 – 2020)
New Zealand	20	0	20	8
Vanuatu	3	0	3	3
TOTAL	23	0	23	10 (+55%)

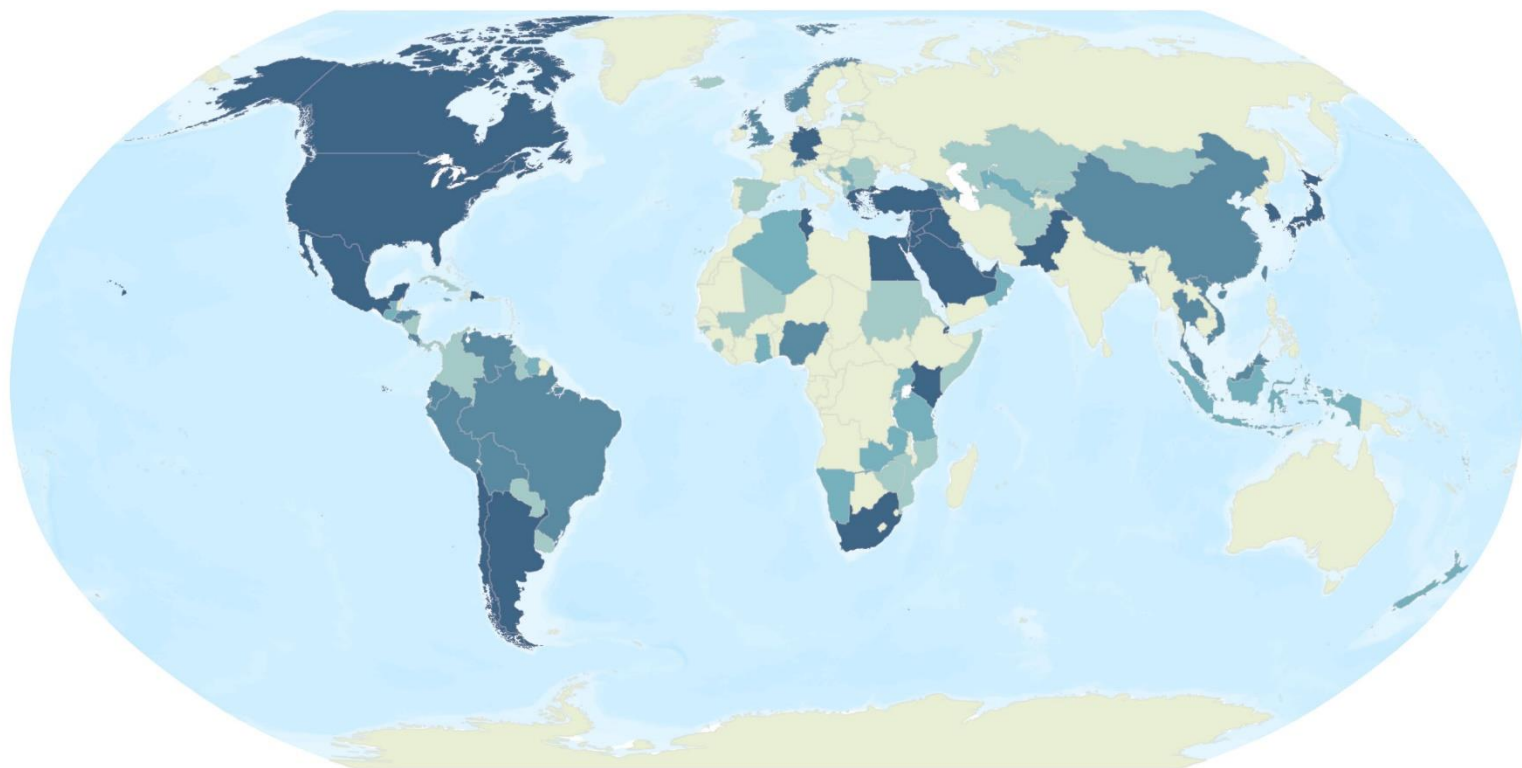
SOUTH AMERICA				
Country	US Eye Banks - Transplanted Corneas	Non-US Member Eye Banks - Transplanted Corneas	All EBAA Member Eye Banks - Transplanted Corneas	Change (2021 – 2020)
Argentina	372	0	372	239
Bolivia	60	0	60	36
Brazil	69	0	69	(8)
Chile	486	0	486	230
Colombia	2	0	2	(1)
Ecuador	192	0	192	136
Guyana	3	0	3	3
Paraguay	1	0	1	1
Peru	156	0	156	83
Suriname	13	0	13	8
Uruguay	10	0	10	4
Venezuela	97	0	97	50
TOTAL	1,461	0	1,461	781 (+114.7%)

EUROPE				
Country	US Eye Banks - Transplanted Corneas	Non-US Member Eye Banks - Transplanted Corneas	All EBAA Member Eye Banks - Transplanted Corneas	Change (2021 – 2020)
Albania	5	0	5	(4)
Bulgaria	6	0	6	2
Croatia	2	0	2	2
Cyprus	57	0	57	55
Germany	1,010	41	1,051	75
Greece	246	0	246	80
Iceland	7	0	7	6
Italy	4	0	4	(1)
Latvia	8	0	8	(6)
Macedonia	16	0	16	(2)
Norway	65	0	65	22
Romania	1	0	1	1
Serbia	12	0	12	(6)
Spain	1	0	1	1
Switzerland	52	0	52	15
United Kingdom	54	0	54	29
TOTAL	1,546	41	1,587	261 (+19.1%)

AFRICA				
Country	US Eye Banks - Transplanted Corneas	Non-US Member Eye Banks- Transplanted Corneas	All EBAA Member Eye Banks - Transplanted Corneas	Change (2021 – 2020)
Algeria	24	0	24	19
Djibouti	1,278	0	1,278	408
Egypt	4,942	0	4,942	1,962
Eritrea	1	0	1	1
Ghana	42	0	42	(14)
Guinea-Bissau	1	0	1	1
Kenya	234	0	234	77
Mali	3	0	3	0
Morocco	285	0	285	72
Mozambique	5	0	5	5
Namibia	13	0	13	4
Nigeria	68	0	68	31
Rwanda	50	0	50	18
Seychelles	1	0	1	1
Sierra Leone	3	0	3	3
Somalia	1	0	1	1
South Africa	707	0	707	95
Sudan	1	0	1	(20)
Tanzania	47	0	47	40
Tunisia	337	0	337	80
Uganda	17	0	17	15
Zambia	20	0	20	12
Zimbabwe	2	0	2	1
TOTAL	8,082	0	8,082	2,782 (+52.5%)

ASIA				
Country	US Eye Banks - Transplanted Corneas	Non-US Member Eye Banks- Transplanted Corneas	All EBAA Member Eye Banks - Transplanted Corneas	Change (2021 – 2020)
Afghanistan	2	0	2	(6)
Armenia	60	0	60	37
Azerbaijan	64	0	64	19
Bahrain	32	0	32	8
Bangladesh	212	0	212	(17)
China	151	16	167	(44)
Georgia	51	0	51	2
Hong Kong	39	186	225	(6)
Indonesia	49	0	49	(8)
Iraq	455	0	455	255
Israel	422	53	475	145
Japan	2,219	30	2,239	646
Jordan	222	0	222	101
Kazakhstan	9	0	9	(13)
Korea, Republic of	895	0	895	128
Kuwait	115	0	115	97
Kyrgyzstan	10	0	10	10
Lebanon	268	0	268	127
Malaysia	126	0	126	1
Mongolia	3	0	3	3
Oman	14	0	14	(2)
Pakistan	1,202	0	1,202	358
Palestine	32	0	32	6
Qatar	23	0	23	11
Saudi Arabia	1,228	0	1,228	79
Singapore	357	0	357	158
Syrian Arab Republic	246	0	246	12
Taiwan	138	0	138	1
Thailand	78	0	78	(38)
Turkey	423	0	423	168
Turkmenistan	1	0	1	1
United Arab Emirates	329	0	329	109
Uzbekistan	43	0	43	12
Vietnam	71	0	71	(118)
TOTAL	9,589	285	9,874	2,138 (+27.6%)

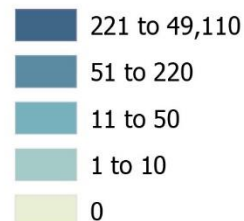
Corneas Distributed for Transplant by All EBAA Members in 2021



For 2021, the top ten recipient countries for EBAA member corneas were the United States, Egypt, Canada, Japan, Djibouti, Saudi Arabia, Pakistan, Germany, Mexico, and Republic of Korea.

Several countries received EBAA corneas this year who did not in 2020: Kyrgyzstan (10), Panama (7), Mozambique (5), Guyana (3), Mongolia (3), Sierra Leone (3), Vanuatu (3), Croatia (2), Cuba (2), and Eritrea (1), among others.

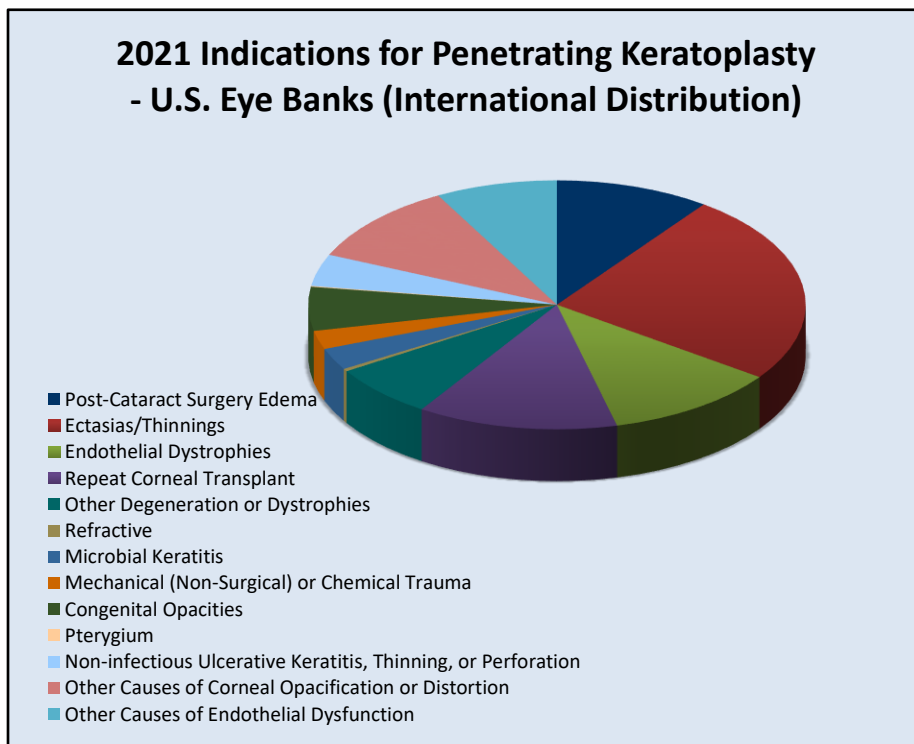
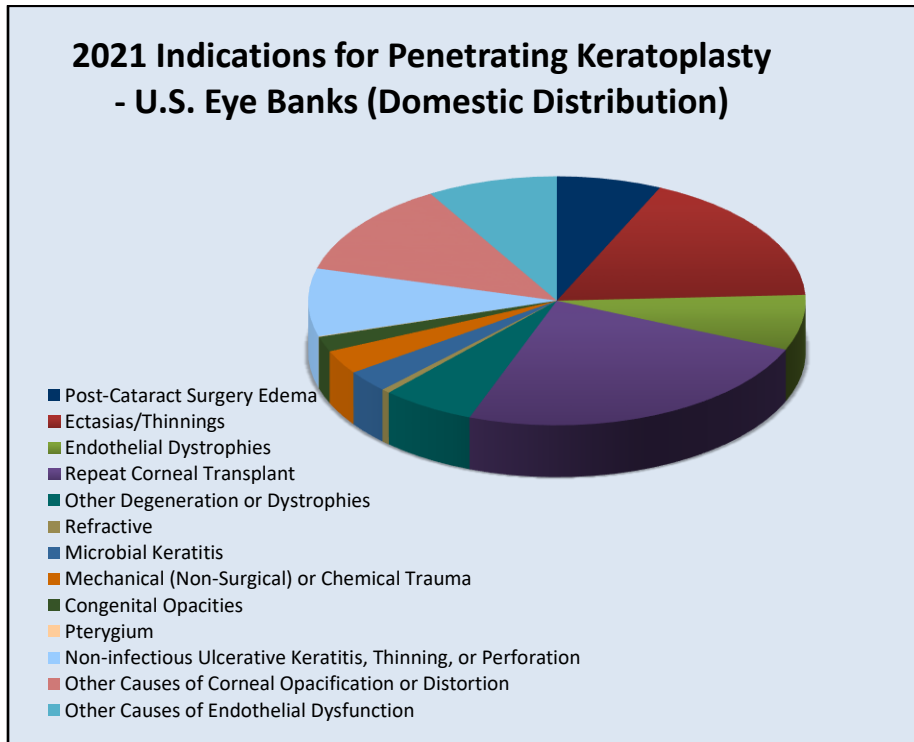
Corneas Distributed



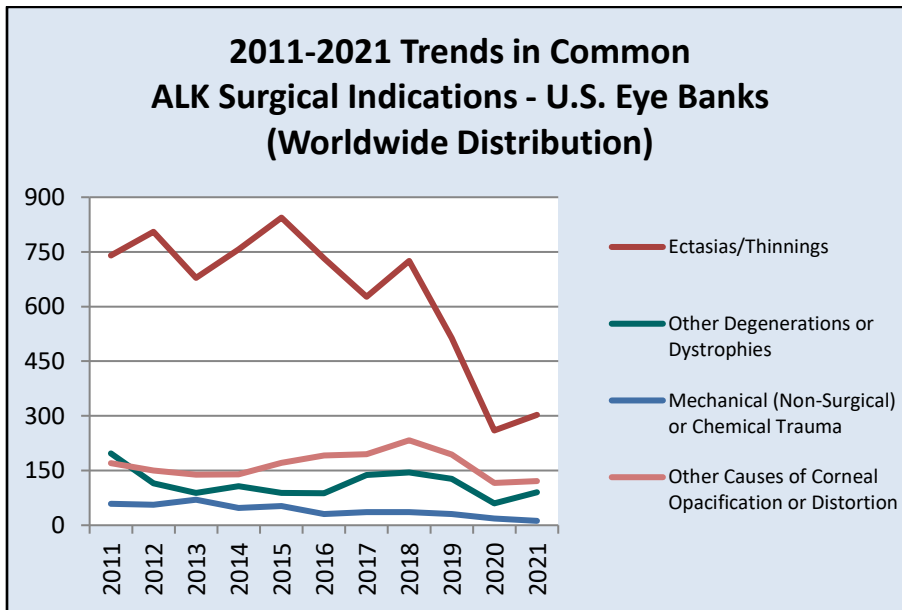
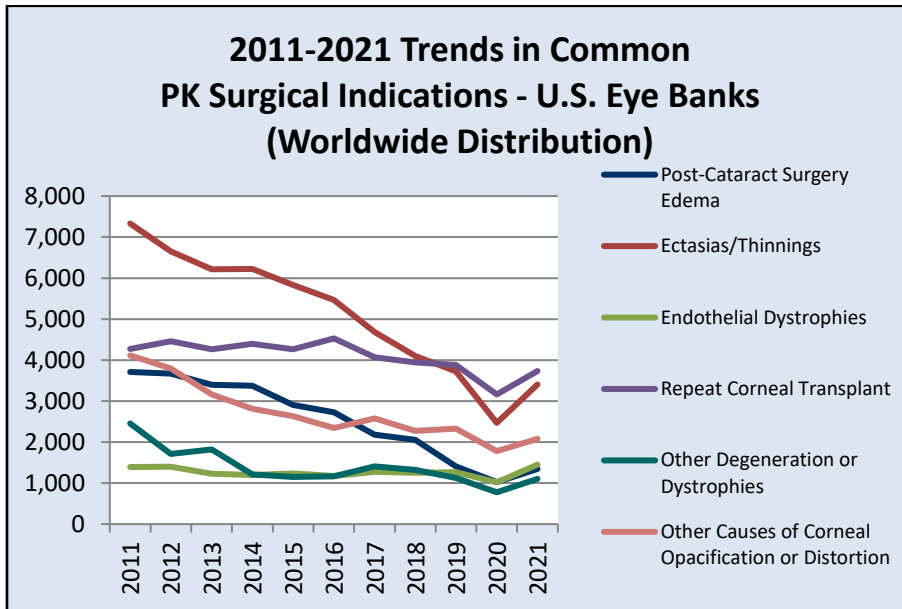
2021 Eye Banking Statistics Reported by U.S. Banks
Indications for Corneal Transplant Reported by U.S. Banks

Indications for Penetrating Keratoplasty 2020	Domestic Use		International Use		TOTAL
A. Post-cataract surgery edema	877	5.4%	472	3.3%	
B. Ectasias/Thinning	2,243	13.8%	1,163	8.2%	
C. Endothelial Dystrophies	923	5.7%	527	3.7%	
D. Repeat Corneal Transplant	3,124	19.2%	611	4.3%	
E. Other degenerations or dystrophies	784	4.8%	323	2.3%	
F. Refractive	71	0.4%	16	0.1%	
G. Microbial keratitis	370	2.3%	133	0.9%	
H. Mechanical or chemical trauma	399	2.5%	113	0.8%	
I. Congenital opacities	254	1.6%	267	1.9%	
J. Pterygium	8	0.0%	5	0.0%	
K. Non-infectious ulcerative keratitis or perforation	1,135	7.0%	195	1.4%	
L. Other causes of corneal dysfunction or distortion	1,584	9.7%	492	3.5%	
M. Other causes of endothelial dysfunction	1,094	6.7%	372	2.6%	
Z. Unknown, unreported, or unspecified	3,403	20.9%	9,454	66.8%	
Total Indications for Penetrating Keratoplasty	16,269		14,143		30,412
Indications for Anterior Lamellar Keratoplasty	Domestic use		International Use		TOTAL
B. Ectasias/Thinning	199	36.6%	104	13.6%	
D. Repeat Corneal Transplant	25	4.6%	5	0.7%	
E. Other degenerations or dystrophies	51	9.4%	39	5.1%	
F. Refractive	2	0.4%	0	0.0%	
G. Microbial keratitis	23	4.2%	9	1.2%	
H. Mechanical or chemical trauma	9	1.7%	3	0.4%	
I. Congenital opacities	14	2.6%	11	1.4%	
J. Pterygium	1	0.2%	0	0.0%	
K. Non-infectious ulcerative keratitis or perforation	33	6.1%	8	1.0%	
L. Other causes of corneal dysfunction or distortion	94	17.3%	27	3.5%	
Z. Unknown, unreported, or unspecified	93	17.1%	557	73.0%	
Total for Anterior Keratoplasty	544		763		1,307
Indications for Endothelial Keratoplasty	Domestic Use		International Use		TOTAL
A. Post-Cataract Surgery Edema	3,200	10.6%	815	15.0%	
C. Endothelial Dystrophy	15,857	52.7%	707	13.0%	
D. Repeat Corneal Transplant	3,176	10.6%	326	6.0%	
M. Other Causes of Endothelial Dysfunction	4,504	15.0%	1,042	19.2%	
Z. Unknown, unreported, or unspecified	3,361	11.2%	2,544	46.8%	
Total for Endothelial Keratoplasty	30,098		5,434		35,532
Total Number of PK, ALK, and EK Procedures	46,911		20,340		67,251

2021 Eye Banking Statistics Reported by U.S. Banks
Indications for Corneal Transplant Reported by U.S. Banks

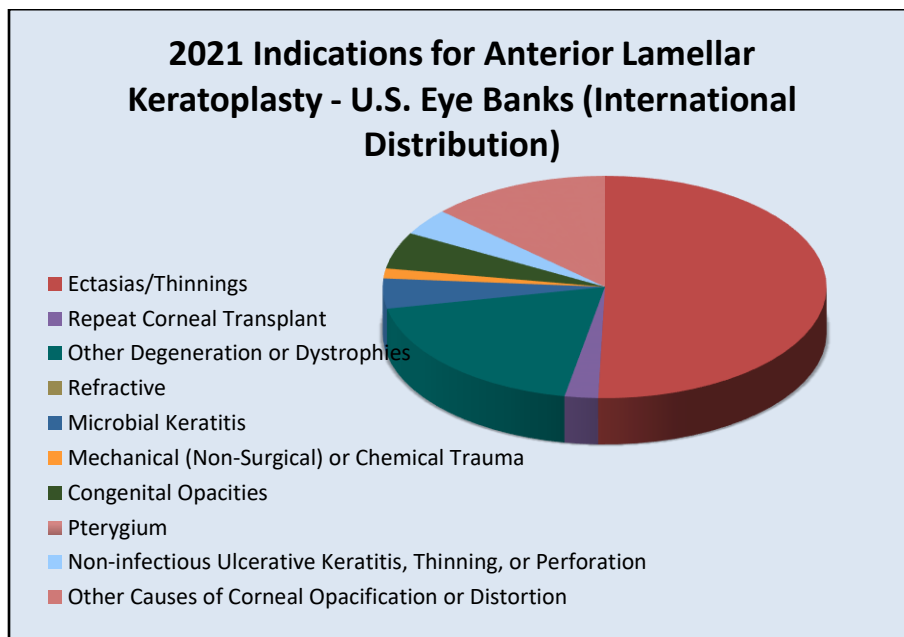
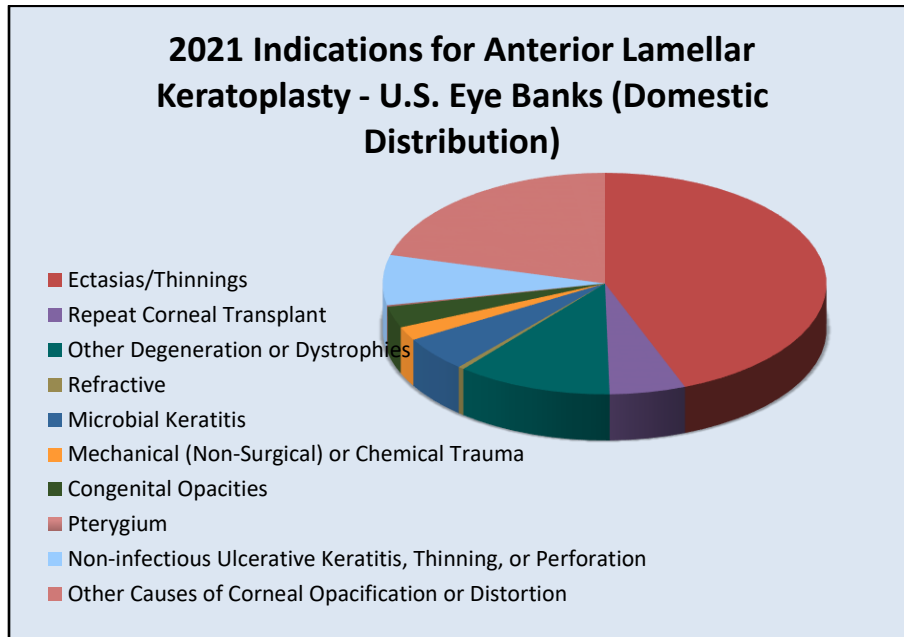


2021 Eye Banking Statistics Reported by U.S. Banks *Indications for Corneal Transplant Reported by U.S. Banks*



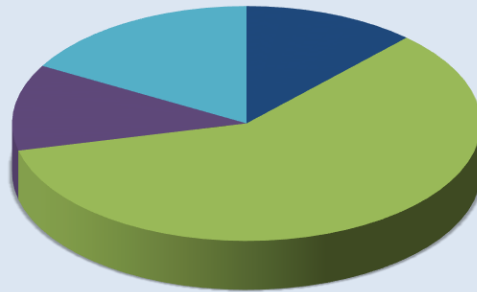
*Worldwide Distribution = Combined Domestic and International Distribution

2021 Eye Banking Statistics Reported by U.S. Banks
Indications for Corneal Transplant Reported by U.S. Banks



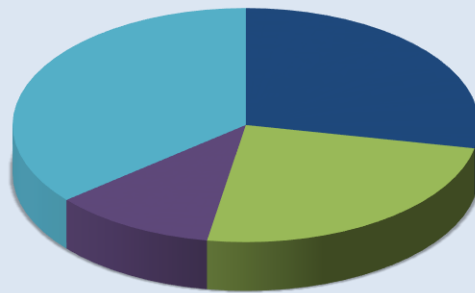
2021 Eye Banking Statistics Reported by U.S. Banks
Indications for Corneal Transplant Reported by U.S. Banks

**2021 Indications for Endothelial Keratoplasty -
U.S. Eye Banks (Domestic Distribution)**



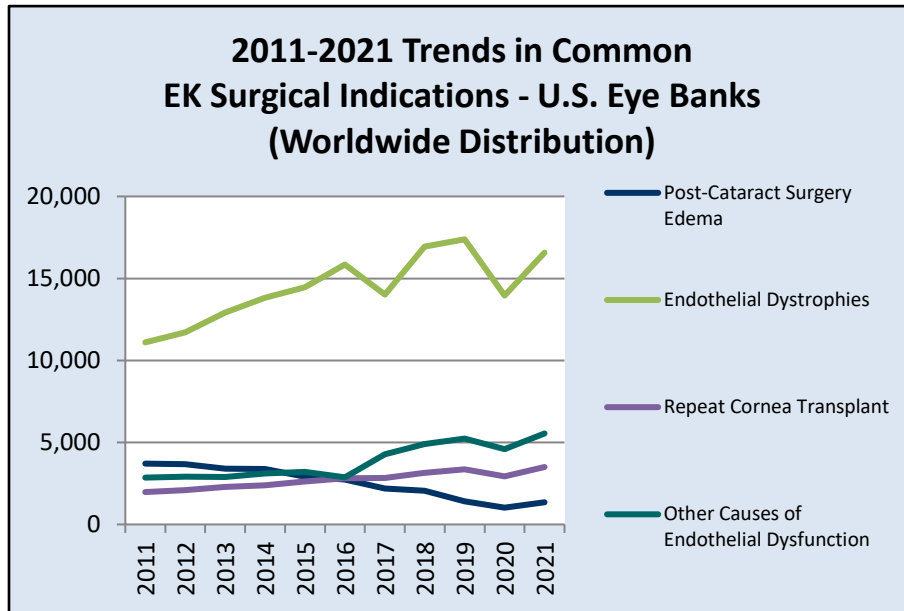
- Post-Cataract Surgery Edema
- Endothelial Dystrophies
- Repeat Corneal Transplant
- Other Causes of Endothelial Dysfunction

**2021 Indications for Endothelial Keratoplasty -
U.S. Eye Banks (International Distribution)**



- Post-Cataract Surgery Edema
- Endothelial Dystrophies
- Repeat Corneal Transplant
- Other Causes of Endothelial Dysfunction

2021 Eye Banking Statistics Reported by U.S. Banks
Indications for Corneal Transplant Reported by U.S. Banks



***Worldwide Distribution = Combined Domestic and International Distribution**

2021 Eye Banking Statistics Reported by U.S. Banks *Indications for Corneal Transplant Reported by U.S. Banks*

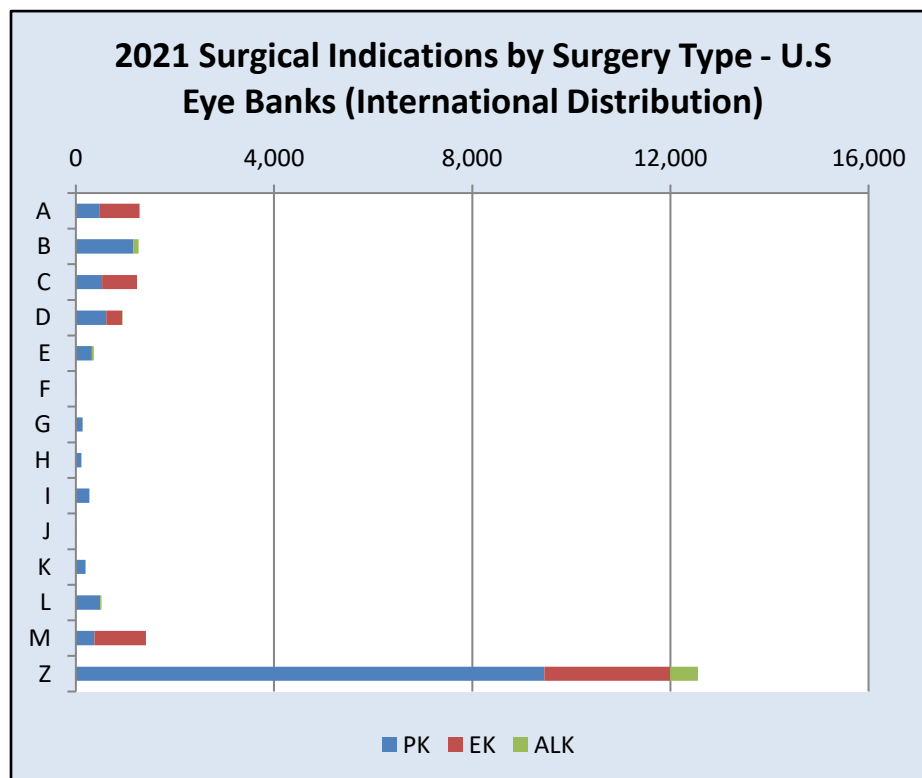
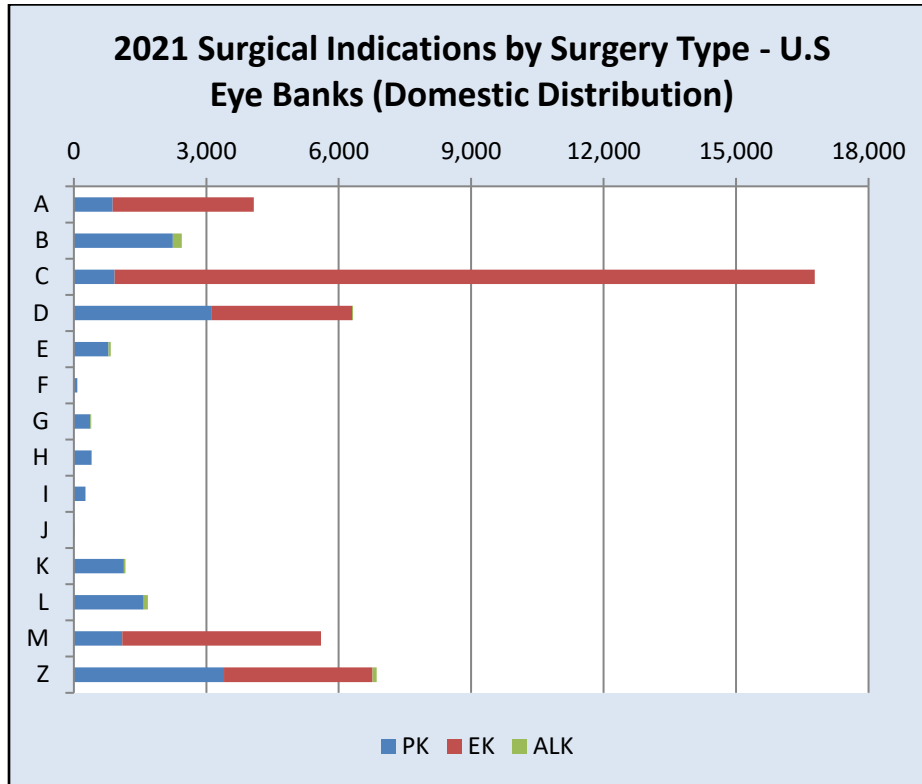
2021 (Domestically Distributed Corneas Only) - U.S. Eye Banks														
	A	B	C	D	E	F	G	H	I	J	K	L	M	Z
PK	877	2,243	923	3,124	784	71	370	399	254	8	1,135	1,584	1,094	3,403
EK	3,200		15,857	3,176									4,504	3,361
ALK		199		25	51	2	23	9	14	1	33	94		93

2021 (Internationally Distributed Corneas Only) - U.S. Eye Banks														
	A	B	C	D	E	F	G	H	I	J	K	L	M	Z
PK	472	1,163	527	611	323	16	133	113	267	5	195	492	372	9,454
EK	815		707	326									1,042	2,544
ALK		104		5	39	0	9	3	11	0	8	27		557

2021 (Combined Domestic & International Distributed Corneas) - U.S. Eye Banks														
	A	B	C	D	E	F	G	H	I	J	K	L	M	Z
PK	1,349	3,406	1,450	3,735	1,107	87	503	512	521	13	1,330	2,076	1,466	12,857
EK	4,015		16,564	3,502									5,546	5,905
ALK		303		30	90	2	32	12	25	1	41	121		650

- A - Post-Cataract Surgery Edema
- B - Ectasias/Thinnings
- C - Endothelial Dystrophies
- D - Repeat Corneal Transplant
- E - Other Degeneration or Dystrophies
- F - Refractive
- G - Microbial Keratitis
- H - Mechanical (Non-Surgical) or Chemical Trauma
- I - Congenital Opacities
- J - Pterygium
- K - Non-infectious Ulcerative Keratitis, Thinning, or Perforation
- L - Other Causes of Corneal Opacification or Distortion
- M - Other Causes of Endothelial Dysfunction
- Z - Unknown or Unreported

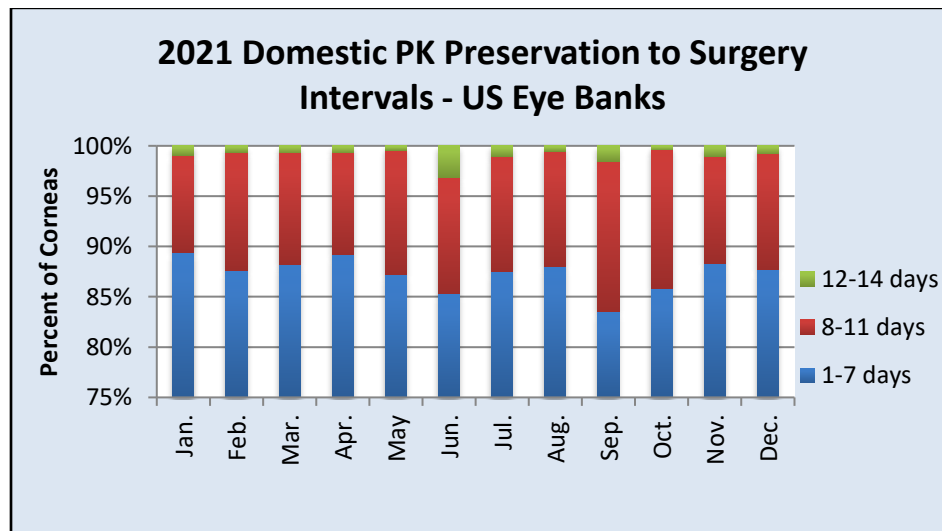
2021 Eye Banking Statistics Reported by U.S. Banks
Indications for Corneal Transplant Reported by U.S. Banks



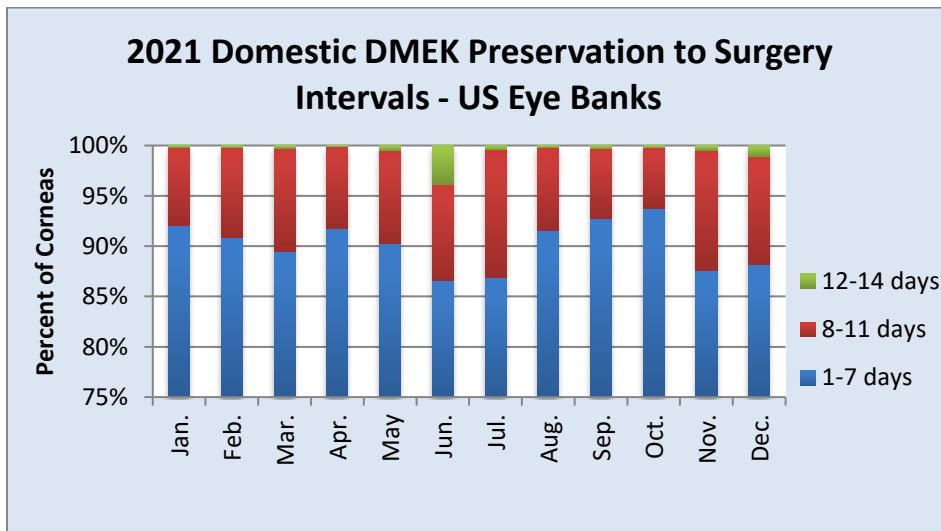
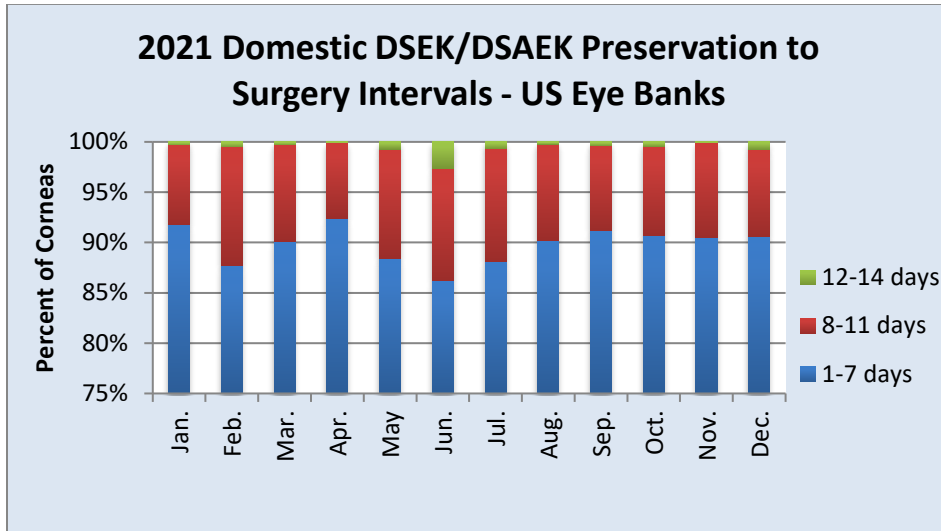
2021 Eye Banking Statistics Reported by U.S. Banks *Preservation Time Reported by U.S. Banks*

Preservation to Surgery - U.S. Eye Banks (Tissue used domestically only)									
Month	PK: 1-7 days	PK: 8-11 days	PK: 12-14 days	DSEK/DSAEK: 1-7 days	DSEK/DSAEK: 8-11 days	DSEK/DSAEK: 12-14 days	DMEK: 1-7 days	DMEK: 8-11 days	DMEK: 12-14 days
Jan. 2021	89.4%	9.6%	0.9%	91.8%	7.9%	0.3%	92.1%	7.8%	0.2%
Feb. 2021	87.7%	11.7%	0.6%	87.7%	11.8%	0.5%	90.8%	9.0%	0.2%
Mar. 2021	88.2%	11.1%	0.7%	90.1%	9.6%	0.3%	89.5%	10.2%	0.3%
Apr. 2021	89.2%	10.1%	0.7%	92.4%	7.6%	0.1%	91.8%	8.1%	0.1%
May 2021	87.2%	12.4%	0.4%	88.4%	10.9%	0.7%	90.2%	9.3%	0.5%
Jun. 2021	85.4%	11.5%	3.2%	86.2%	11.1%	2.7%	86.6%	9.5%	3.9%
Jul. 2021	87.5%	11.5%	1.0%	88.1%	11.2%	0.7%	86.9%	12.7%	0.4%
Aug. 2021	88.0%	11.4%	0.5%	90.2%	9.5%	0.2%	91.6%	8.3%	0.2%
Sep. 2021	83.5%	15.0%	1.5%	91.2%	8.4%	0.4%	92.7%	7.0%	0.3%
Oct. 2021	85.8%	13.8%	0.4%	90.7%	8.9%	0.5%	93.8%	6.0%	0.2%
Nov. 2021	88.3%	10.7%	1.0%	90.5%	9.4%	0.1%	87.6%	11.9%	0.5%
Dec. 2021	87.7%	11.5%	0.8%	90.6%	8.7%	0.7%	88.1%	10.8%	1.1%
2021 Avg.	87.3%	11.7%	1.0%	89.9%	9.6%	0.6%	90.2%	9.1%	0.6%
Std. Dev.	1.7%	1.5%	0.7%	1.8%	1.4%	0.7%	2.4%	2.0%	1.1%

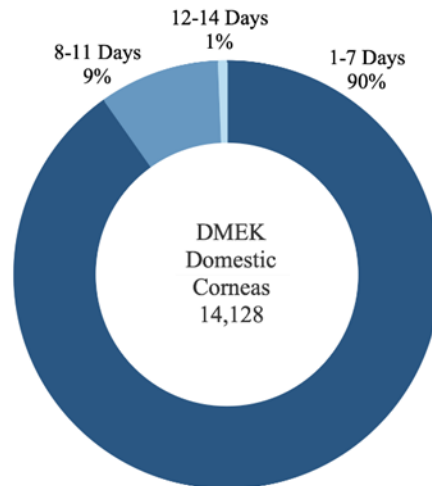
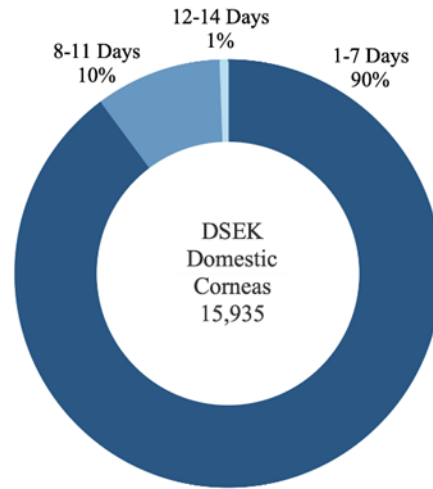
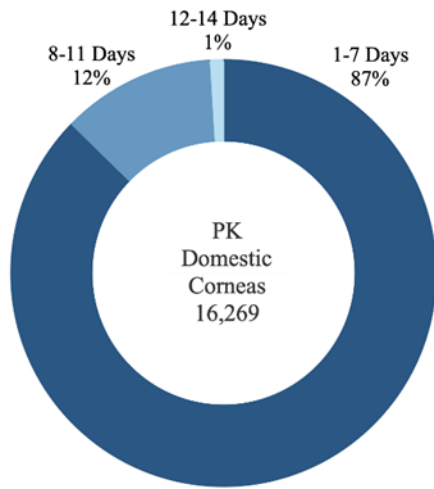
*Percentages read from this table should be read as "of the domestically distributed tissue used (for PK, DSEK, or DMEK, respectively)"



2021 Eye Banking Statistics Reported by U.S. Banks
Preservation Time Reported by U.S. Banks



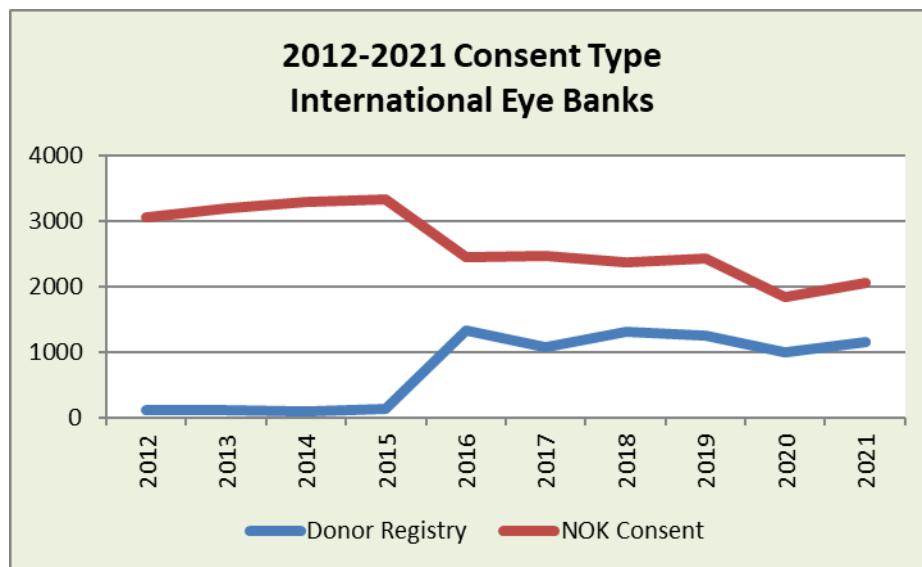
2021 Eye Banking Statistics Reported by U.S. Banks *Preservation Time Reported by U.S. Banks*



STATISTICS FROM
INTERNATIONAL
EYE BANKS

2021 International Eye Banking Statistics *Donations and Tissue Recoveries*

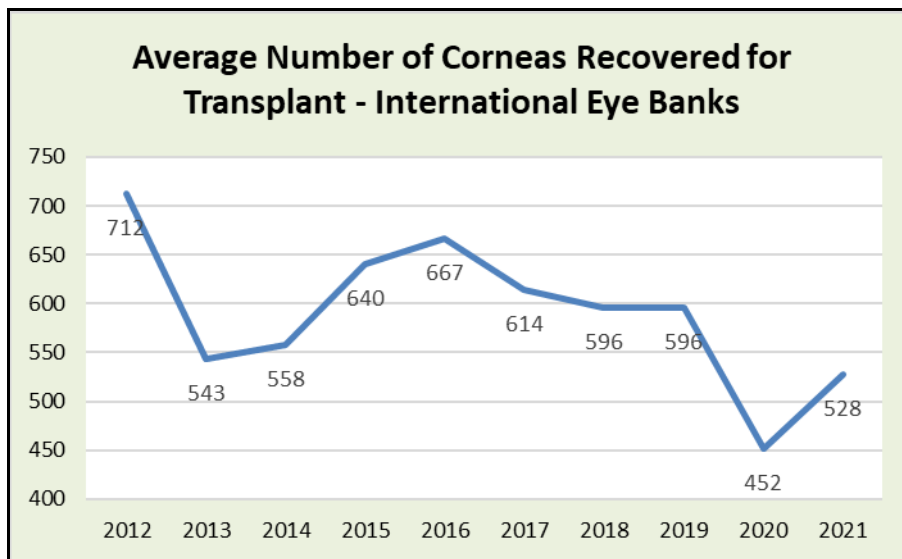
Donations	2019	2020	2021
Number of Eye Banks Reporting	11	11	11
Total Whole Eyes and Corneas Donated	7,271	5,622	6,416
Total Number of Donors	3,669	2,827	3,218
Death Referrals	2019	2020	2021
Total Death Referrals	63,512	56,200	71,205
Death referrals Determined Eligible	11,728	9,967	12,106
Tissue Recoveries	2019	2020	2021
Total Donors	3,669	2,827	3,218
Donors recovered not found on donor registry or known to have first person consent	2,421	1,836	2,065
Donors recovered found on donor registry or known to have first person consent	1,248	991	1,153
Eyes or Corneas Recovered with Intent for Surgical Use	6,551	4,972	5,808
Eyes or Corneas Recovered for Other Uses	720	650	608



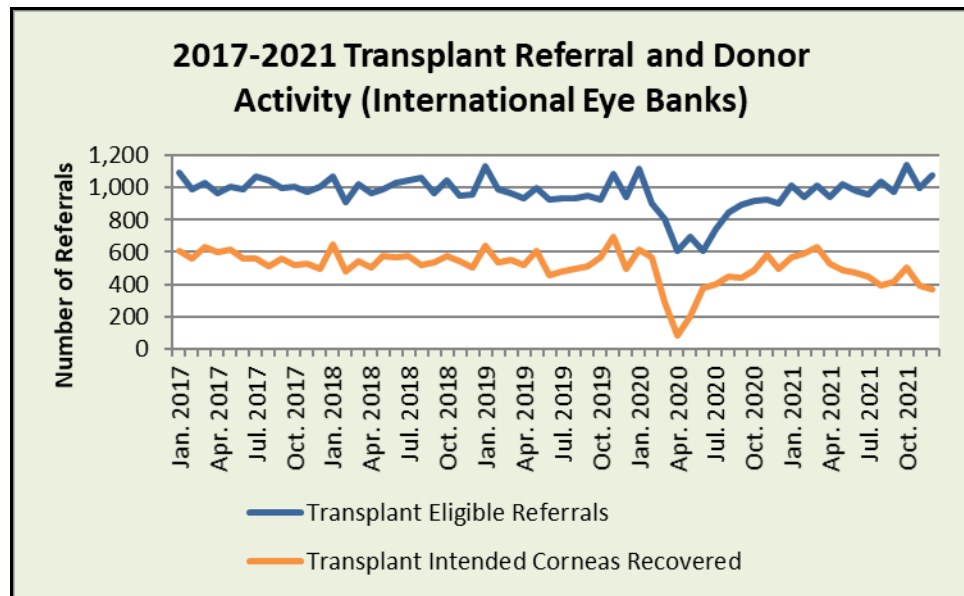
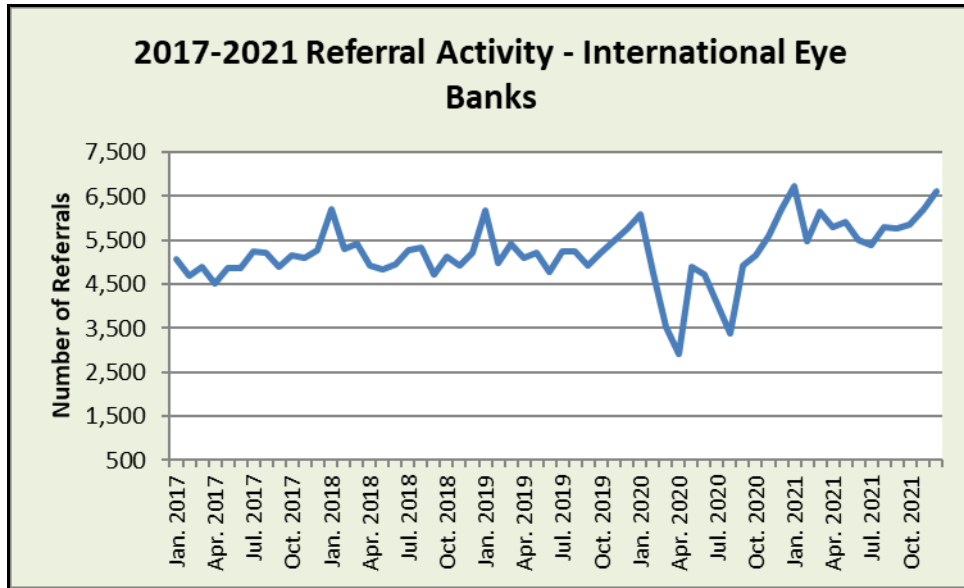
2021 International Eye Banking Statistics *Referral Trends, Transplant and Conversion Rates*

Transplant & Conversion Rates - International Eye Banks					
Month	Transplant Rate	Conversion Rate	Death Referrals	Transplant Eligible Referrals	Transplant Intended Corneas Recovered
Jan. 2021	65.7%	28.0%	6,735	1,015	566
Feb. 2021	57.6%	31.4%	5,468	940	589
Mar. 2021	68.5%	31.0%	6,146	1,012	628
Apr. 2021	59.5%	28.2%	5,801	945	531
May 2021	68.0%	24.0%	5,922	1,023	491
Jun. 2021	68.8%	24.2%	5,521	982	475
Jul. 2021	63.4%	23.4%	5,397	958	448
Aug. 2021	69.0%	19.1%	5,787	1,036	394
Sep. 2021	70.3%	21.7%	5,761	972	418
Oct. 2021	71.4%	22.3%	5,856	1,142	507
Nov. 2021	70.6%	19.9%	6,209	1,001	395
Dec. 2021	68.6%	16.9%	6,602	1,080	366
2019 Total					
	59.3%	28.2%	63,512	11,728	6,551
2020 Total					
	63.2%	25.1%	56,200	9,967	4,972
2021 Total					
	66.5%	24.1%	71,205	12,106	5,808
2021 Avg.					
	N/A	N/A	5,934	1,009	484
Std. Dev.					
	4.4%	4.6%	422	58	84

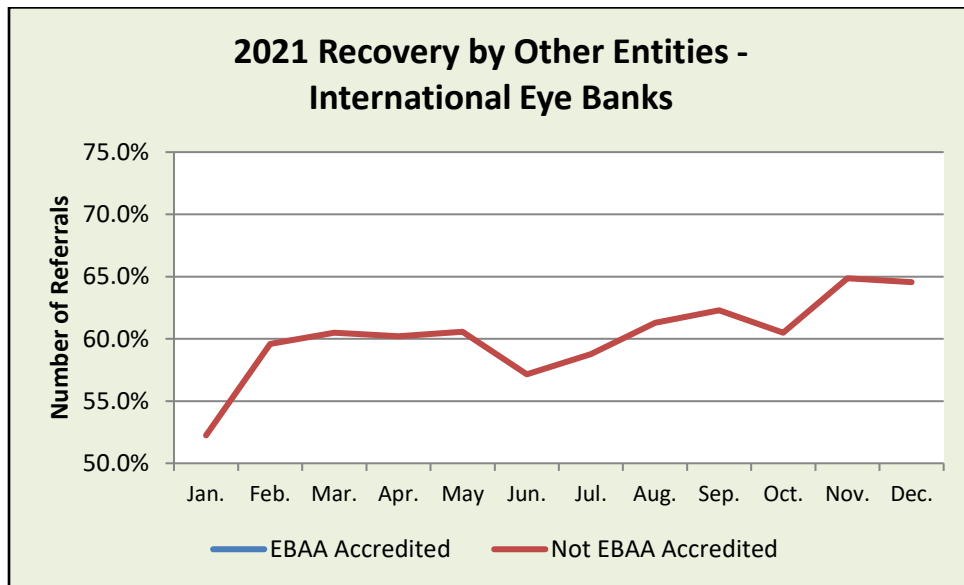
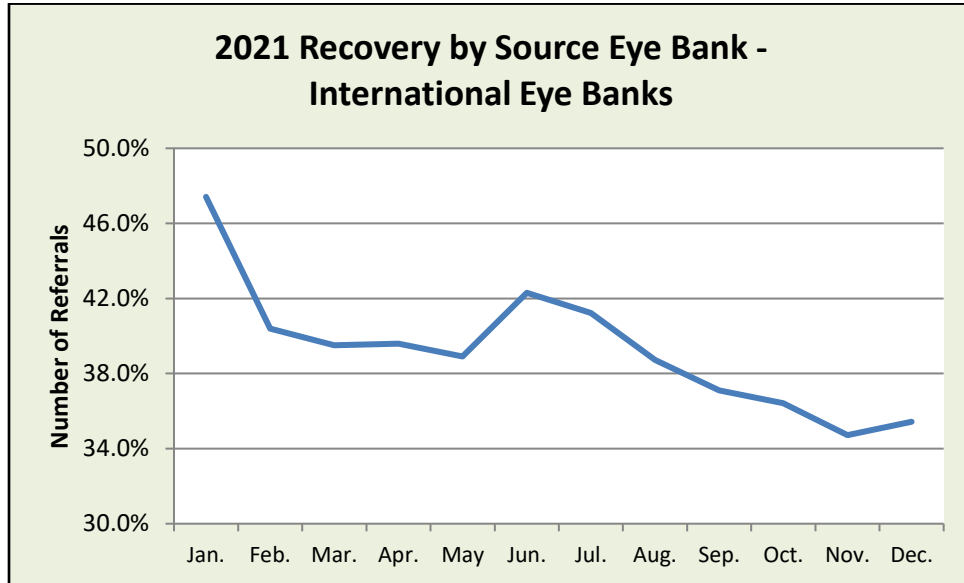
*Transplant rate is the number of corneas used for transplant divided by the number recovered for transplant.
Conversion rate is the number of transplant donors divided by the number of transplant eligible referrals.



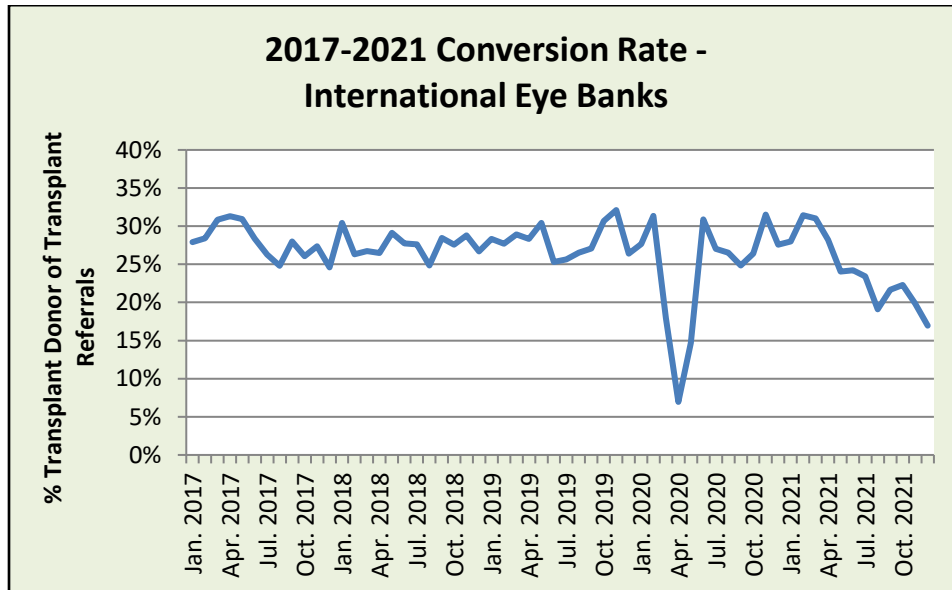
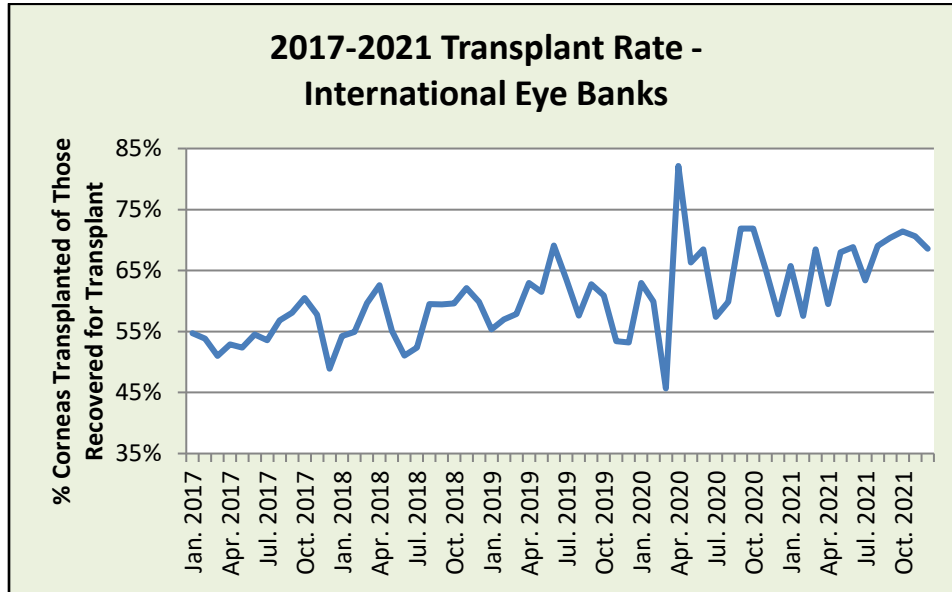
2021 International Eye Banking Statistics *Referral Trends, Transplant and Conversion Rates*



2021 International Eye Banking Statistics *Recovery Entities*



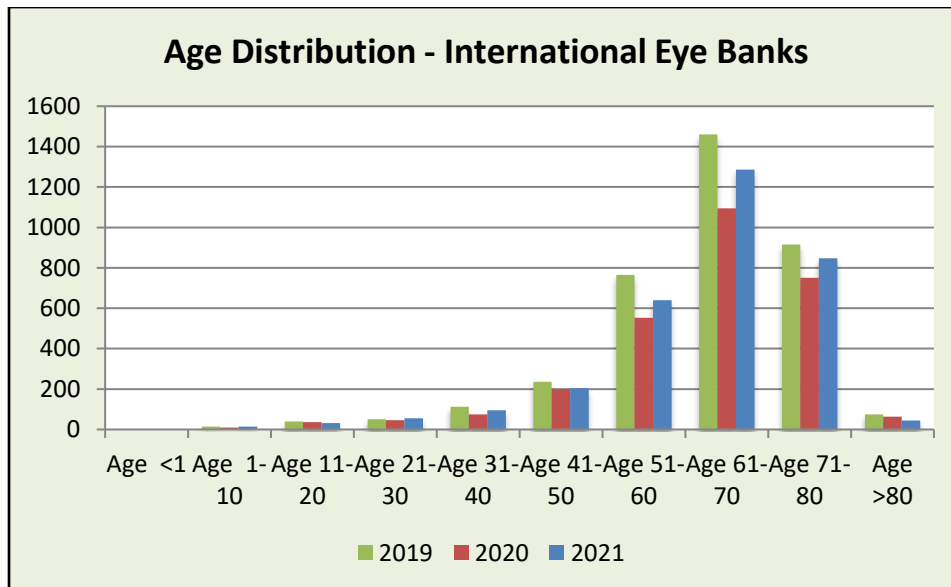
2021 International Eye Banking Statistics *Transplant and Conversion Rates*



Transplant rate is the number of corneas used for transplant divided by the number recovered for transplant.
Conversion rate is the number of transplant donors divided by the number of transplant eligible referrals.

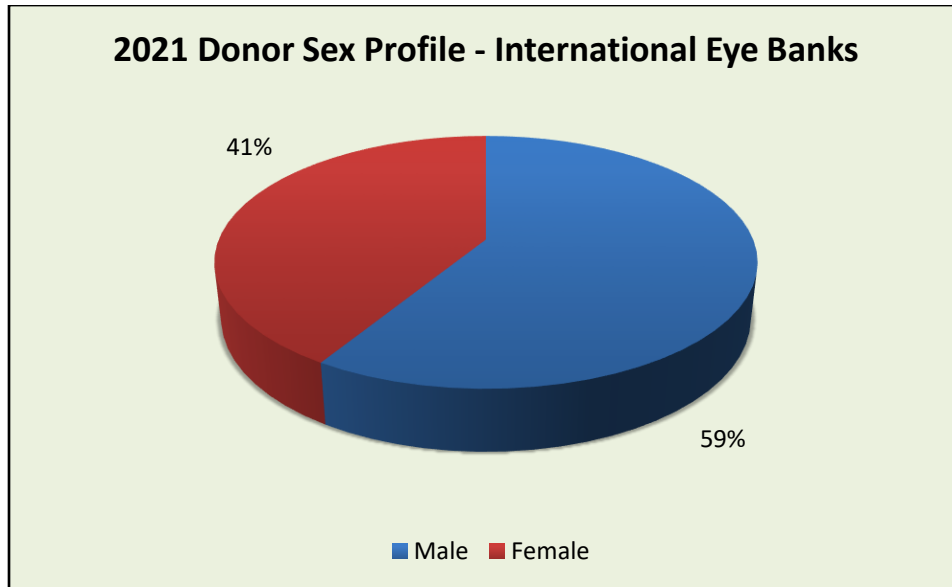
2021 International Eye Banking Statistics *Donor Profiles: Age*

Age Demographics - International Eye Banks										
Year	Age <1	Age 1-10	Age 11-20	Age 21-30	Age 31-40	Age 41-50	Age 51-60	Age 61-70	Age 71-80	Age >80
2017	0	8	35	58	101	222	731	1,403	873	116
2018	0	9	40	64	93	240	722	1,439	995	73
2019	0	15	40	51	112	236	765	1,460	916	74
2020	0	10	36	46	75	200	552	1,094	750	64
2021	0	14	31	56	95	204	640	1,286	848	44
2021 Percent	0.0%	0.4%	1.0%	1.7%	3.0%	6.3%	19.9%	40.0%	26.4%	1.4%
Monthly Avg.	0	1	3	5	8	17	53	107	71	4
Std. Dev.	0.0	1.0	1.3	1.7	2.4	4.3	6.3	17.6	11.1	2.7



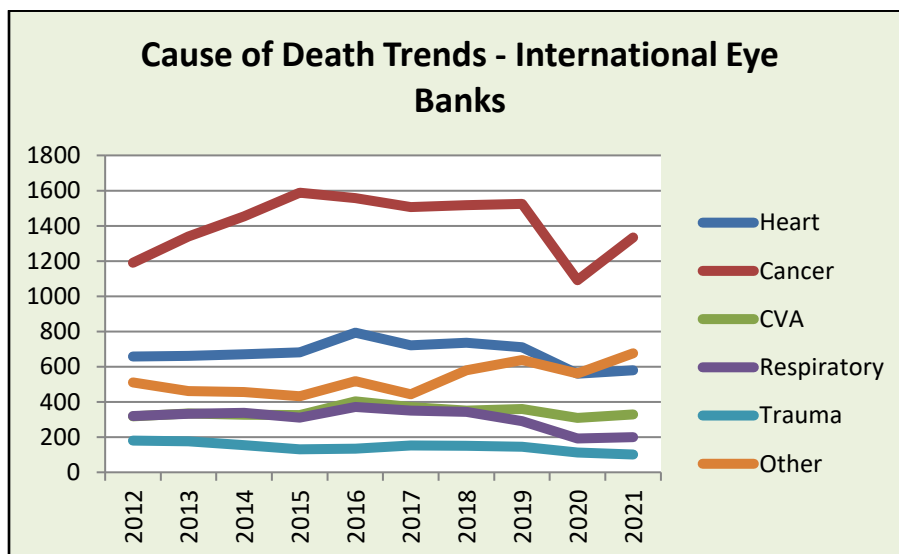
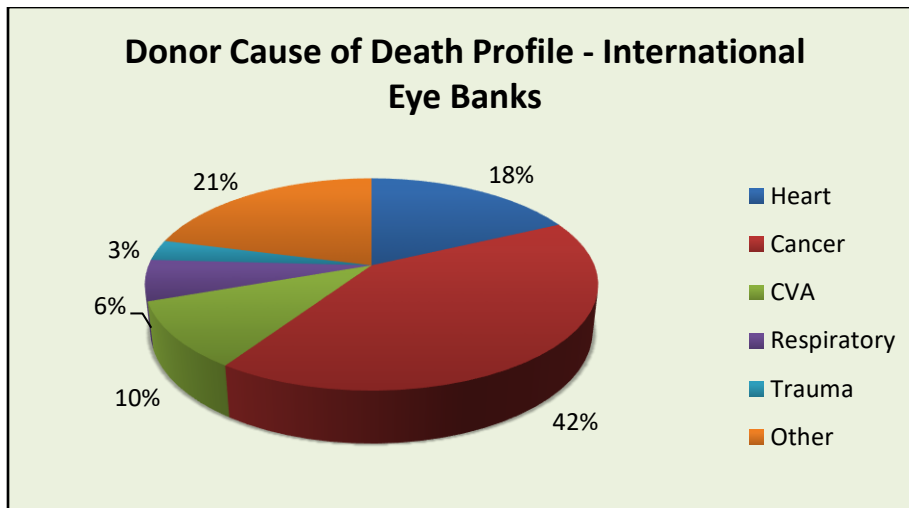
2021 International Eye Banking Statistics
Donor Profiles: Gender and Cause of Death

Sex Demographics – International Eye Banks		
Year	Male	Female
2017	2,077	1,470
2018	2,182	1,495
2019	2,151	1,518
2020	1,688	1,139
2021	1,891	1,327
2021 Percent		
	58.8%	41.2%
Monthly Avg.	158	111
Std. Dev.	17.2	16.5



2021 International Eye Banking Statistics *Donor Profiles: Cause of Death*









Cause of Death Demographics - International Eye Banks						
Month	Heart	Cancer	CVA	Respiratory	Trauma	Other
2017 Total	722	1,507	370	351	153	444
2018 Total	735	1,518	350	343	151	580
2019 Total	711	1,525	360	291	145	637
2020 Total	560	1,091	309	192	113	562
2021 Total	579	1,333	329	200	101	676
2021 Percent	18.0%	41.4%	10.2%	6.2%	3.1%	21.0%
Monthly Avg.	48	111	27	17	8	56
Std. Dev.	6.7	17.2	4.3	5.9	3.4	8.1



2021 International Eye Banking Statistics
***Reasons Tissue Intended for Surgery Was Not Suitable
For Transplant***

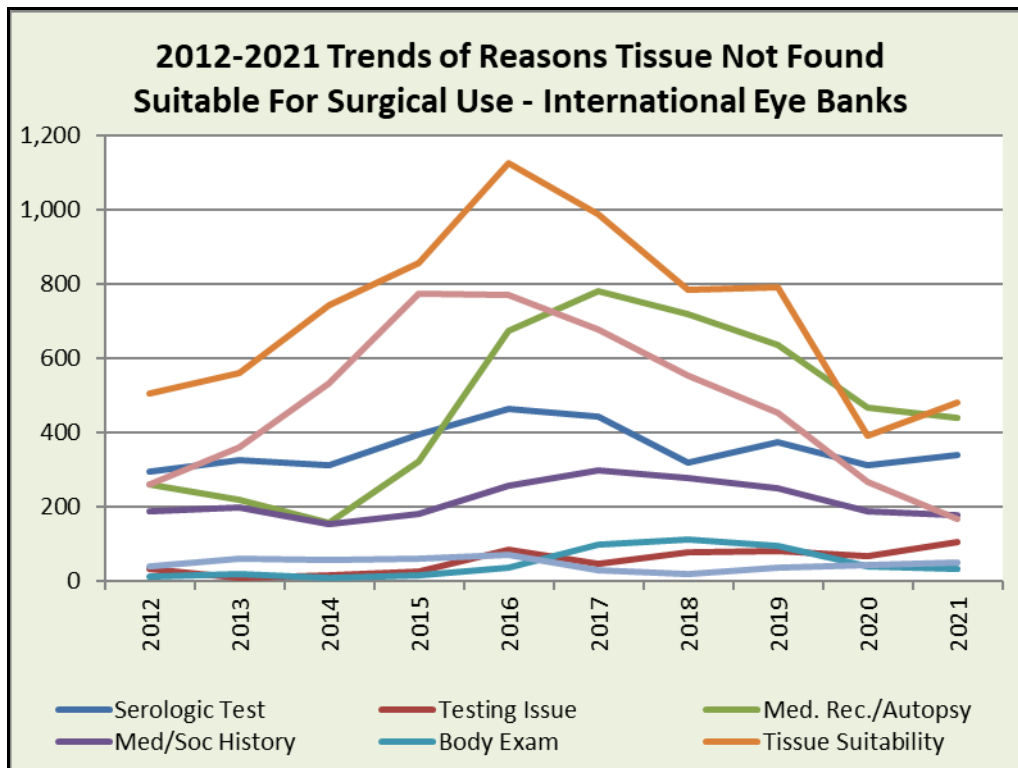
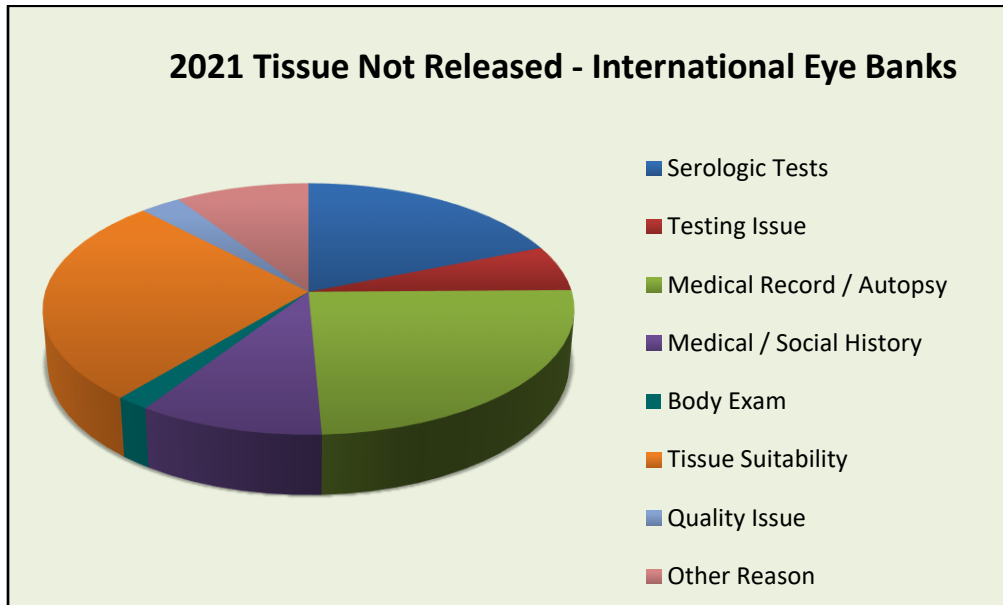
Contraindications for Transplant ¹	2019		2020		2021	
Donor Eligibility	1,434	59.9%	1,073	68.2%	1,092	68.7%
Positive or reactive test for communicable disease agent or disease	374	15.6%	312	19.8%	338	21.3%
Other communicable disease testing issue	80	3.3%	67	4.3%	105	6.6%
Medical record or autopsy findings	635	26.5%	467	29.7%	439	27.6%
Medical/social history interview	251	10.5%	187	11.9%	178	11.2%
Body Exam	94	3.9%	40	2.5%	32	2.0%
Tissue Suitability	790	33.0%	392	24.9%	480	30.2%
Quality Issue	36	1.5%	41	2.6%	51	3.2%
Other reason prior to tissue release	454	19.0%	267	17.0%	166	10.4%
Total eyes/corneas intended for transplant but not released for transplant	2,392		1,573		1,590	

*Percentages read from this table should be read as "of the tissue not released for transplant."

Reasons Corneas Recovered for Transplant Were Not Released - International Eye Banks											
Reasons Not Released	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Serology Tests	296	326	310	394	464	442	318	374	312	338	
Testing Issue	31	8	16	24	83	47	77	80	67	105	
Med. Rec./Autopsy Finding	260	219	155	323	675	780	718	635	467	439	
Med Soc Hx Finding	186	197	154	182	258	297	278	251	187	178	
Body Exam	12	18	8	16	37	98	110	94	40	32	
Tissue Suitability	506	561	743	856	1,125	987	783	790	392	480	
Quality Issue	38	61	55	60	70	29	18	36	41	51	
Other Reason	260	360	531	775	770	678	554	454	267	166	

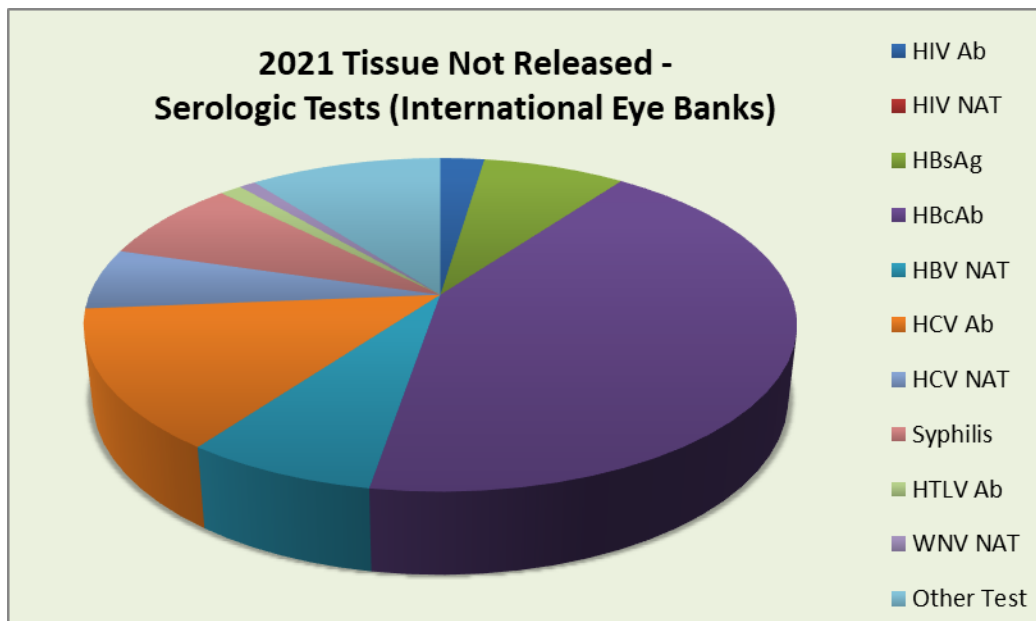
¹ Some tissues had multiple contraindications.

2021 International Eye Banking Statistics *Reasons Tissue Intended for Surgery Was Not Released*

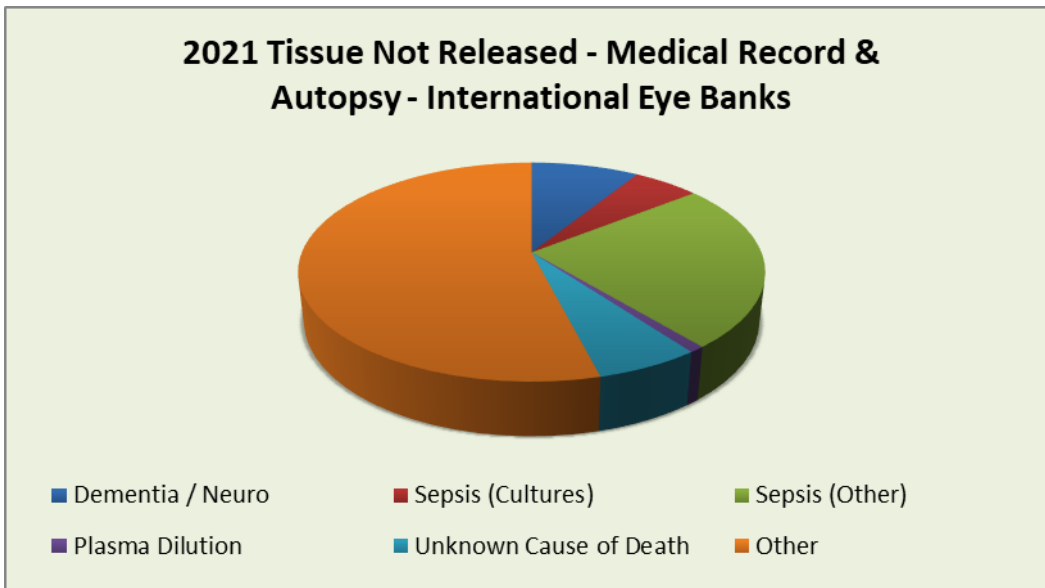
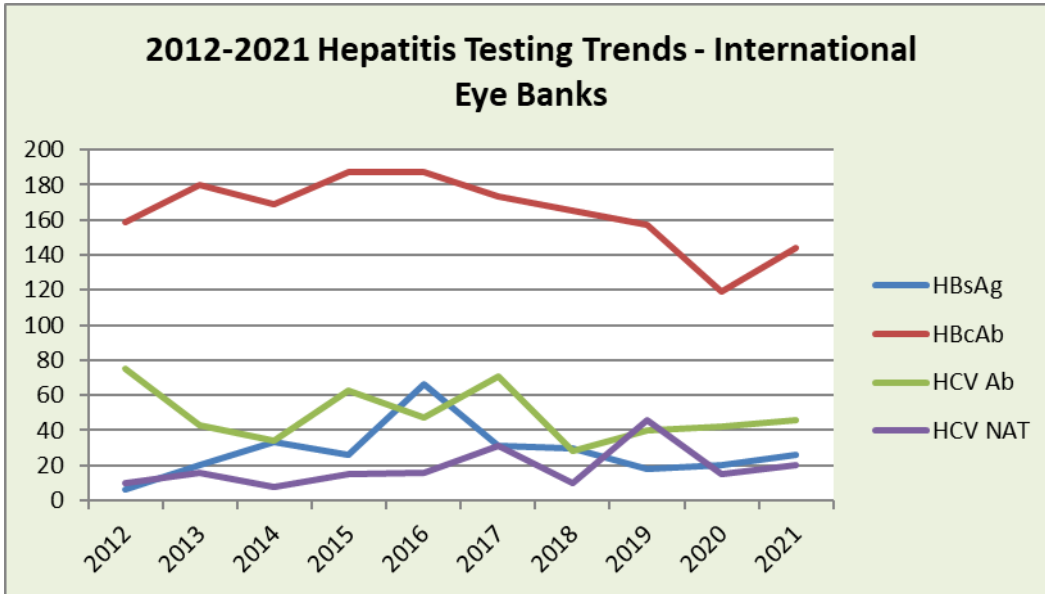


2021 International Eye Banking Statistics *Reasons Tissue Intended for Surgery Was Not Released*

Corneas Not Released for Transplant (Serologic Testing) - International Eye Banks											
Not Released - Serology	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trend
HIV	10	18	22	37	30	34	22	27	44	8	
HIV I/II Ab	8	6	20	37	30	32	22	25	42	8	
HIV NAT	2	12	2	0	0	2	0	2	2	0	
HBV	165	200	203	213	263	209	219	203	162	195	
HBsAg	6	20	33	26	66	31	30	18	20	26	
HBcAb	159	180	169	187	187	173	165	157	119	144	
HBV NAT	0	0	1	0	10	5	24	28	23	25	
HCV	85	59	42	78	63	102	38	86	57	66	
HCV Ab	75	43	34	63	47	71	28	40	42	46	
HCV NAT	10	16	8	15	16	31	10	46	15	20	
Syphilis	6	16	22	41	64	59	15	37	21	27	
HTLV	12	11	14	5	20	12	6	4	4	4	
WNV	0	0	4	0	0	2	0	0	0	3	
Other	18	22	3	20	24	24	18	17	24	35	

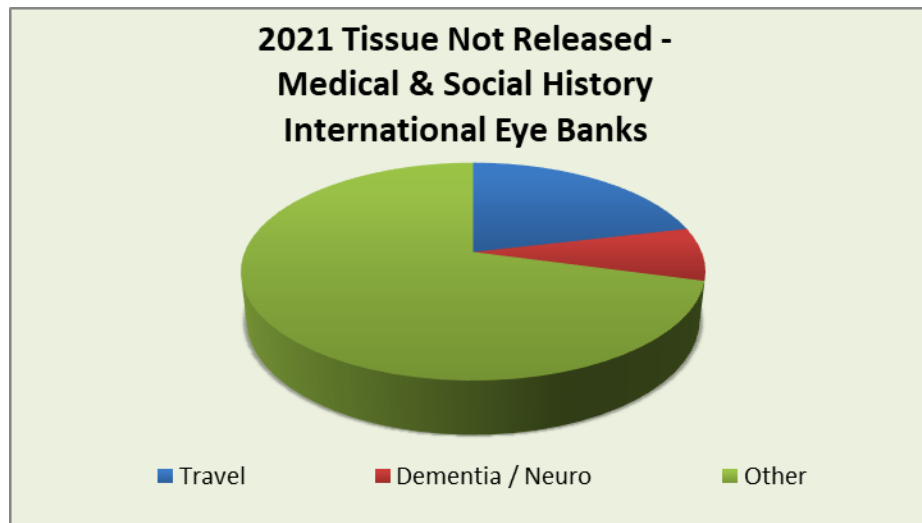


2021 International Eye Banking Statistics *Reasons Tissue Intended for Surgery Was Not Released*



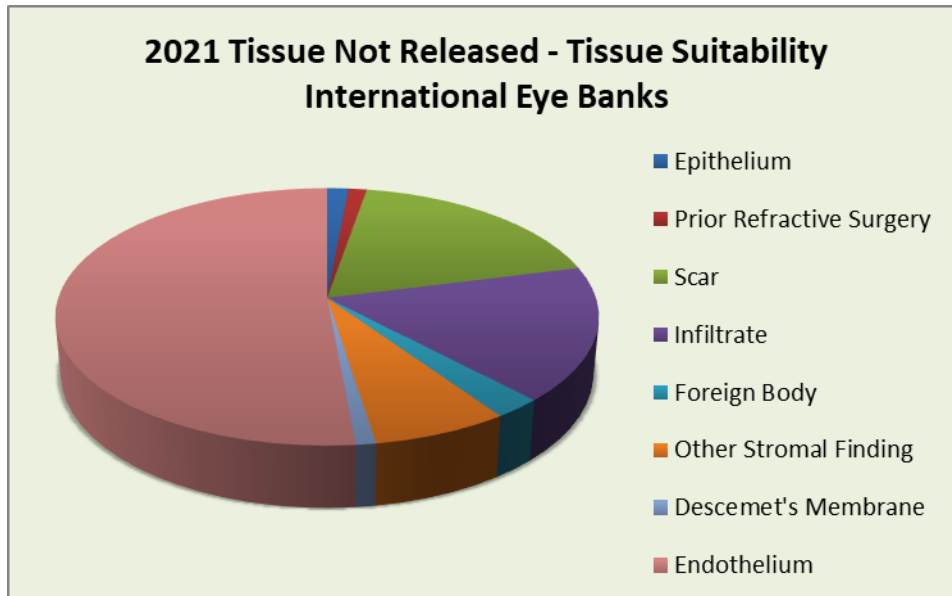
2021 International Eye Banking Statistics *Reasons Tissue Intended for Surgery Was Not Suitable*

Corneas Not Released for Transplant (Medical Records) - International Eye Banks											
Not Released - Med Rec / Autopsy	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Dementia/Neuro	16	20	20	48	171	161	191	101	64	39	
Sepsis (Cultures)	68	39	23	26	50	46	80	40	39	24	
Sepsis (Other)	79	80	50	111	140	145	114	146	129	108	
Plasma Dilution	10	6	6	4	10	10	6	9	2	4	
Unknown COD	35	26	22	28	24	12	10	30	20	27	
Other	52	48	34	106	280	406	317	309	213	237	



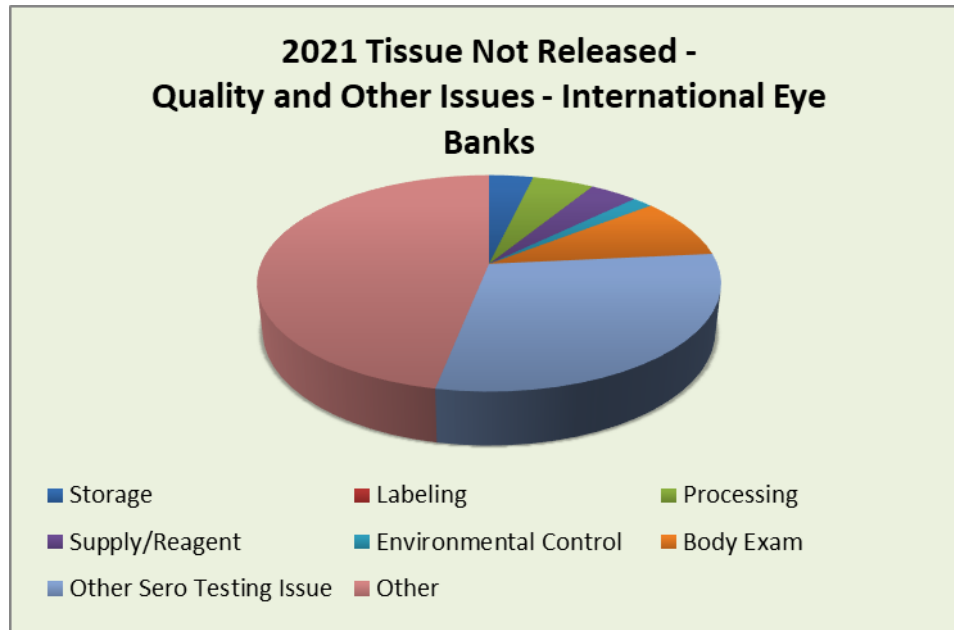
Corneas Not Released for Transplant (Med Soc Hx) - International Eye Banks											
Not Released - Med Soc	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Travel	36	36	30	16	24	38	24	40	38	38	
Dementia/Neuro	2	24	30	40	19	24	43	20	6	14	
Other	136	137	94	126	215	235	211	191	143	126	

2021 International Eye Banking Statistics
Tissue Suitability Reasons Tissue Was Not Released



Corneas Not Released for Transplant (Tissue Suitability) - International Eye Banks											
Not Released - Tissue Suitability	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Epithelium	31	55	65	45	54	37	10	18	13	7	
Prior Refractive Surgery	4	9	33	33	40	21	9	12	2	6	
Scar	68	93	142	238	282	328	156	124	44	88	
Infiltrate	76	81	107	106	164	85	106	96	89	81	
Foreign Body	7	3	28	21	25	23	6	2	0	12	
Other Stromal Finding	59	40	34	77	77	119	48	43	35	34	
Descemet's Membrane	4	3	34	16	35	10	23	19	12	5	
Endothelium	257	277	300	320	448	364	425	476	197	247	

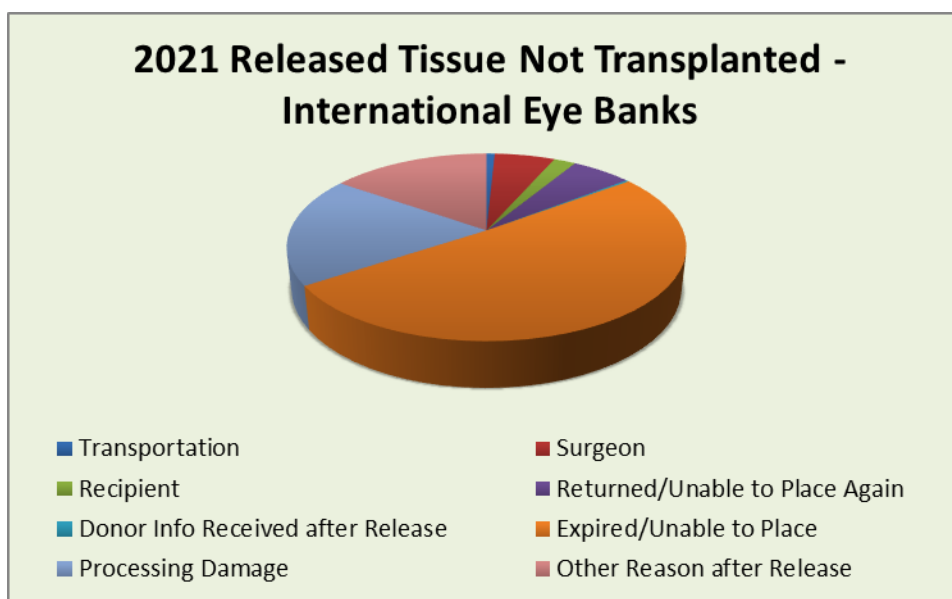
2021 International Eye Banking Statistics *Quality Reasons Tissue Intended for Surgery Was Not Released*



Corneas Not Released for Transplant (Quality) - International Eye Banks											
Not Released - Quality Issues / Other	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Storage Issue	13	22	16	23	13	4	3	10	6	13	
Labeling Issue	0	5	11	9	10	0	0	0	5	0	
Processing Issue (not released)	21	14	10	8	11	8	8	19	18	18	
Supply / Reagent Issue	2	14	8	5	5	6	3	7	6	14	
Environmental Control Issue	2	6	10	15	31	11	4	0	6	6	
Body Exam	12	18	8	16	37	98	110	94	40	32	
Other Sero Testing Issue	31	8	16	24	83	47	77	80	67	105	
Other Issue	260	360	531	775	770	678	554	454	267	166	

2021 International Eye Banking Statistics *Reasons Released Tissues Were Not Transplanted*

Reasons Released Tissues Were Not Transplanted	2019		2020		2021	
	Count	Percentage	Count	Percentage	Count	Percentage
Transportation Issue	2	0.7%	3	1.2%	3	0.8%
Surgeon Issue	52	18.6%	17	6.5%	22	6.1%
Recipient Issue	9	3.2%	4	1.5%	8	2.2%
Returned and Unable to Place Again	41	14.7%	11	4.2%	22	6.1%
Donor Information Not Available at the Time of Tissue Release	0	0.0%	0	0.0%	1	0.3%
Expired or Unable to Place Tissue	112	40.1%	167	64.2%	193	53.8%
Tissue Damaged During Processing	46	16.5%	40	15.4%	72	20.1%
Other Reason After Release of Tissue	42	15.1%	23	8.8%	58	16.2%
Total eyes/corneas released for transplant, but not used for transplant	279		260		359	



Corneas Released but Not Transplanted - International Eye Banks											
Released But Not Transplanted	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Transport Issue	10	0	26	2	8	1	2	2	3	3	
Surgeon Issue	23	11	20	53	24	46	38	52	17	22	
Recipient Issue	5	3	5	6	6	6	5	9	4	8	
Returned, Unable to Place Again	55	53	56	24	32	35	26	41	11	22	
Donor Info Received After Release	0	0	0	2	7	2	0	0	0	1	
Expired, Unable to Place	246	198	316	234	215	219	156	112	167	193	
Processing Damage After Release	32	41	54	41	55	47	52	46	40	72	
Other Reason After Release	12	9	10	24	42	44	48	42	23	58	

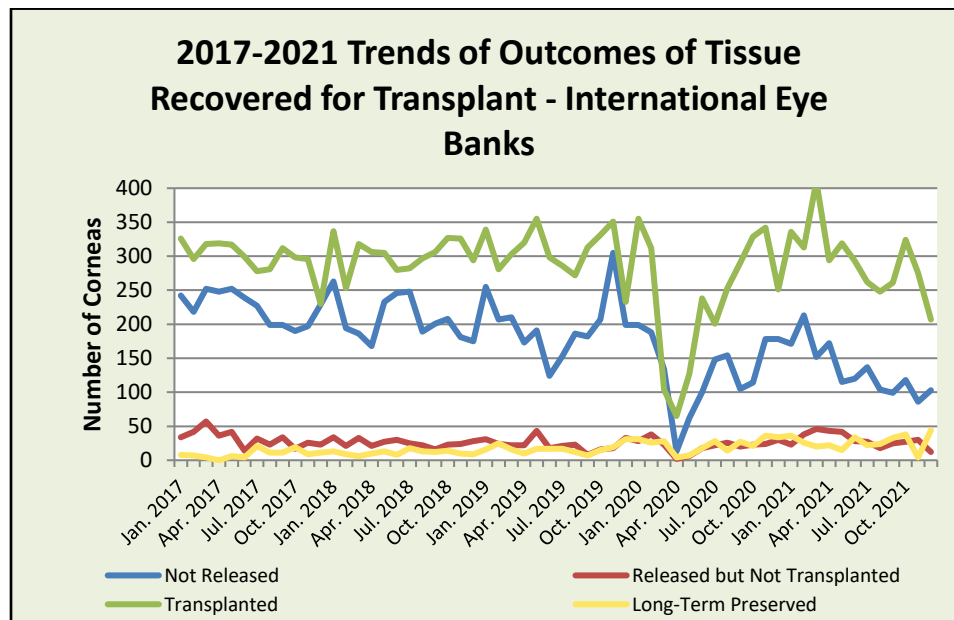
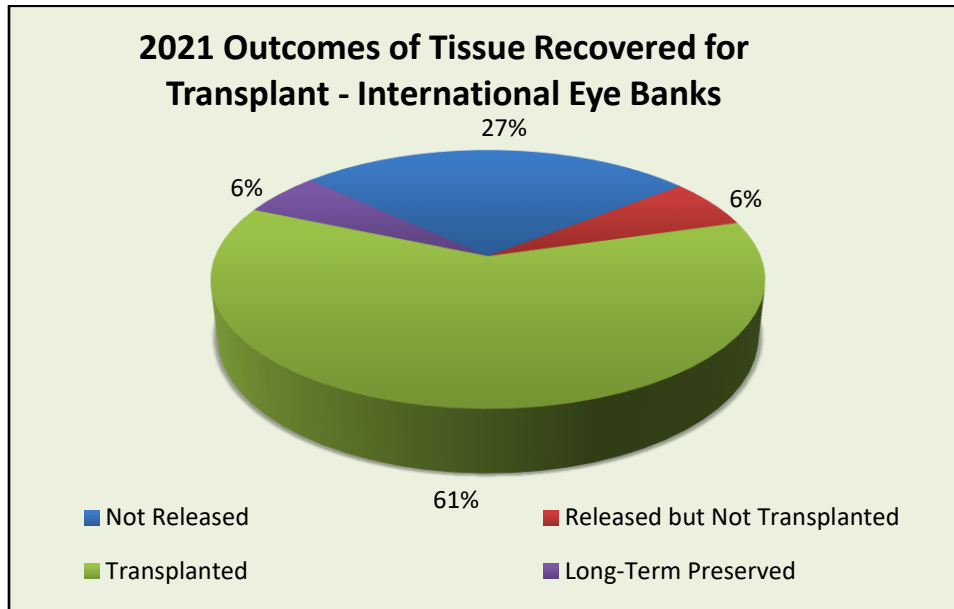
2021 International Eye Banking Statistics *Outcomes of Tissue Recovered for Transplant*

Donations	2019	2020	2021	% Change
Eye Banks Reported	11	11	11	0.0%
Total Whole Eyes and Corneas Donated	7,271	5,622	6,416	14.1%
Total Number of Donors	3,669	2,827	3,218	13.8%
Distribution	2019	2020	2021	2021
Intermediate-Term Preserved Corneas	3,682	2,867	3,542	23.5%
Sclera	1,420	1,332	1,315	(1.3%)
Long-Term Preserved Corneas	191	235	381	62.1%
Research	124	86	199	131.4%
Training	1,958	1,431	1,239	(13.4%)

Outcomes of Corneas Recovered for Transplant Use - International Eye Banks											
Month	Corneas Recovered for Transplant	Corneas Segmented	Corneal Segments Produced	Not Released		Released but Not Transplanted		Whole Corneas and Segments Transplanted		Preserved Long-Term	
Jan. 2021	566	0	0	171	30.2%	23	4.1%	336	59.4%	36	6.4%
Feb. 2021	589	1	2	213	36.2%	38	6.5%	313	53.1%	26	4.4%
Mar. 2021	628	0	0	152	24.2%	46	7.3%	410	65.3%	20	3.2%
Apr. 2021	531	0	0	172	32.4%	43	8.1%	294	55.4%	22	4.1%
May 2021	491	0	0	115	23.4%	42	8.6%	319	65.0%	15	3.1%
Jun. 2021	475	0	0	120	25.3%	28	5.9%	293	61.7%	34	7.2%
Jul. 2021	448	0	0	137	30.6%	27	6.0%	262	58.5%	22	4.9%
Aug. 2021	394	0	0	104	26.4%	18	4.6%	248	62.9%	24	6.1%
Sep. 2021	418	0	0	99	23.7%	25	6.0%	261	62.4%	33	7.9%
Oct. 2021	507	0	0	118	23.3%	27	5.3%	324	63.9%	38	7.5%
Nov. 2021	395	0	0	86	21.8%	30	7.6%	275	69.6%	4	1.0%
Dec. 2021	366	0	0	103	28.1%	12	3.3%	207	56.6%	44	12.0%
2019 Total	6,551	4	8	2,392	36.5%	279	4.3%	3,682	56.2%	202	3.1%
2020 Total	4,972	4	6	1,573	31.6%	260	5.2%	2,867	57.6%	274	5.5%
2021 Total	5,808	1	2	1,590	27.4%	359	6.2%	3,542	61.0%	318	5.5%
2021 Avg.	484	0	0	133	N/A	30	N/A	295	N/A	27	N/A
Std. Dev.	84	0.29	0.6	38	4.4%	10	1.6%	52	4.7%	11	2.9%

*Percentages read from this table should be read as "of the tissue recovered with transplant intent"

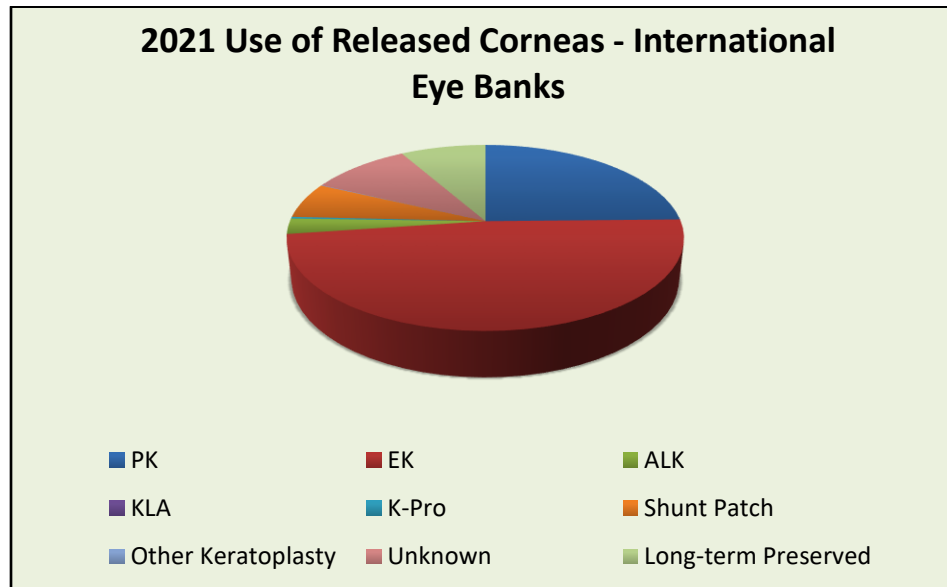
2021 International Eye Banking Statistics *Outcomes of Tissues Recovered for Transplant*



General Outcomes of Corneas Recovered for Transplant Use - International Eye Banks											
Outcome	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trend
Not Released	1,394	1,588	1,443	2,217	2,838	2,692	2,492	2,392	1,573	1,590	
Released but Not Transplanted	394	324	459	380	379	380	304	279	260	359	
Transplanted	3,270	3,415	3,718	3,500	4,035	3,570	3,631	3,682	2,867	3,542	
Long-Term Preserved	137	100	110	307	81	111	135	202	274	318	

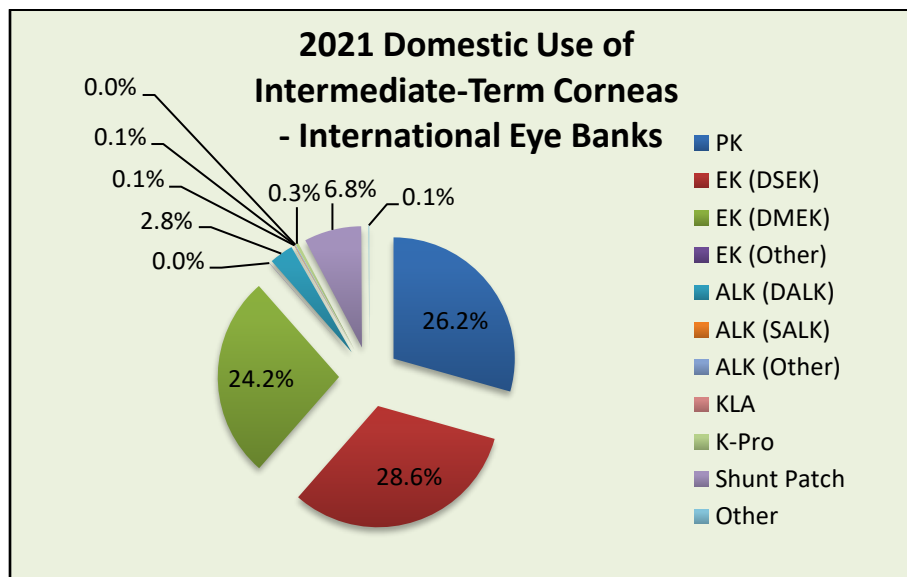
2021 International Eye Banking Statistics *Use of Donated Tissues*

Use of Donated Tissue	2017	2018	2019	2020	2021
Corneal Grafts Total	3,681	3,628	3,880	3,141	3,860
Penetrating Keratoplasty	1,248	1,055	1,001	763	953
Anterior Lamellar Keratoplasty	174	182	181	105	104
Endothelial Keratoplasty	1,736	1,865	1,991	1,693	1,856
Keratolimbal Allograft	6	3	3	0	0
Keratoprosthesis (K-Pro)	10	11	18	12	12
Glaucoma Shunt Patch or other non-keratoplasty use	229	245	239	167	238
Other keratoplasty (experimental surgery)	3	8	1	3	3
Unknown or Unspecified	164	262	248	124	374
Sclera	995	1,193	1,420	1,332	1,315
Long-Term Preserved Corneas	93	88	191	235	381
Keratoplasty	6	3	13	4	2
Glaucoma Shunt Patching	62	62	126	166	355
Other Surgical Uses	25	23	52	65	24
Research	200	310	124	86	199
Training	1,992	1,997	1,958	1,431	1,239



2021 International Eye Banking Statistics *Intermediate-Term Tissue Distribution*

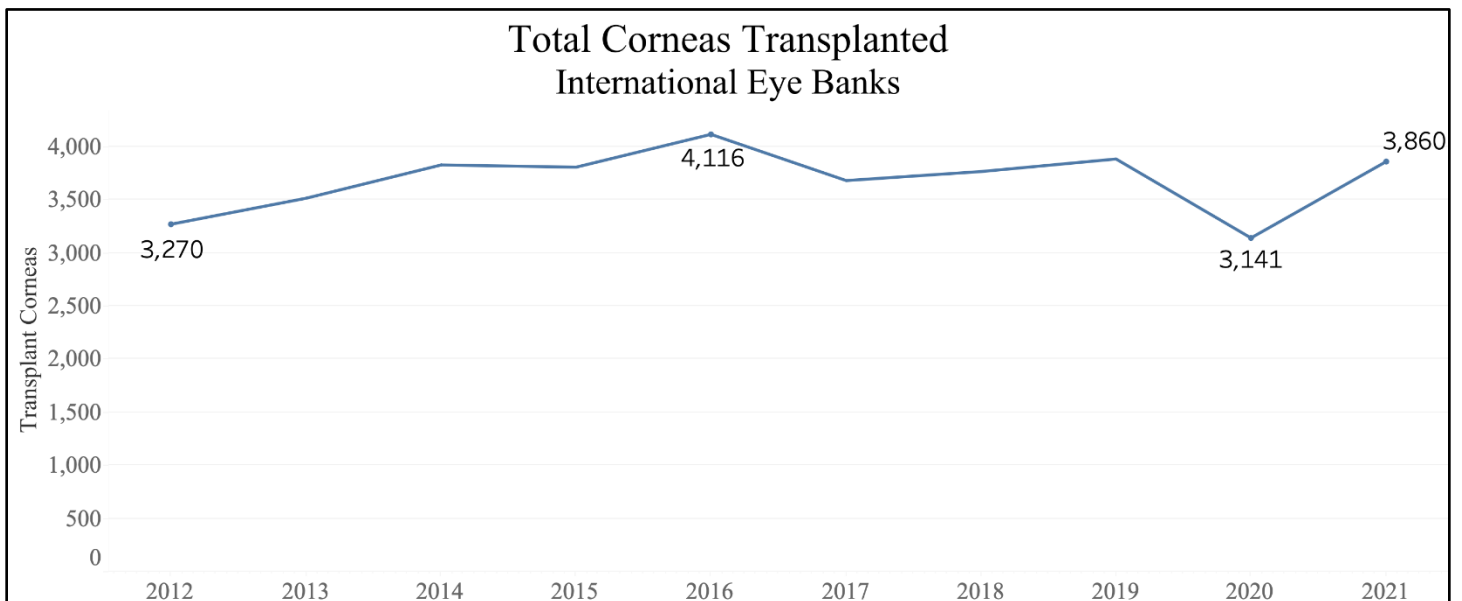
Intermediate-Term Tissue Distribution of Source Eye Bank Corneas for Domestic Use			
	2019	2020	2021
Intermediate-term preserved corneas, corneal segments or whole eyes transplanted domestically for:	3,546	2,832	3,489
PK	912	745	915
EK	1,948	1,676	1,843
DSEK, DSAEK, DLEK	1,117	1,004	999
DMEK or DMAEK	831	671	843
PDEK	0	0	0
Other EK	0	1	1
ALK	177	105	104
DALK (Deep Anterior Lamellar Keratoplasty)	152	99	99
SALK (Superficial Anterior Lamellar Keratoplasty)	15	2	2
Other ALK (e.g., peripheral, eccentric, etc.)	10	4	3
KLA	3	0	0
Keratoprosthesis (K-Pro)	18	12	12
Glaucoma shunt patch or other non-keratoplasty use	239	167	238
Other Keratoplasty (e.g., experimental surgery type)	1	3	3
Unknown or Unspecified	248	124	374
Total intermediate-term preserved corneas, corneal segments, and whole eyes used for KERATOPLASTY	3,439	2,700	3,302
Total intermediate-term preserved corneas, corneal segments, and whole eyes used for TRANSPLANT	3,678	2,865	3,542



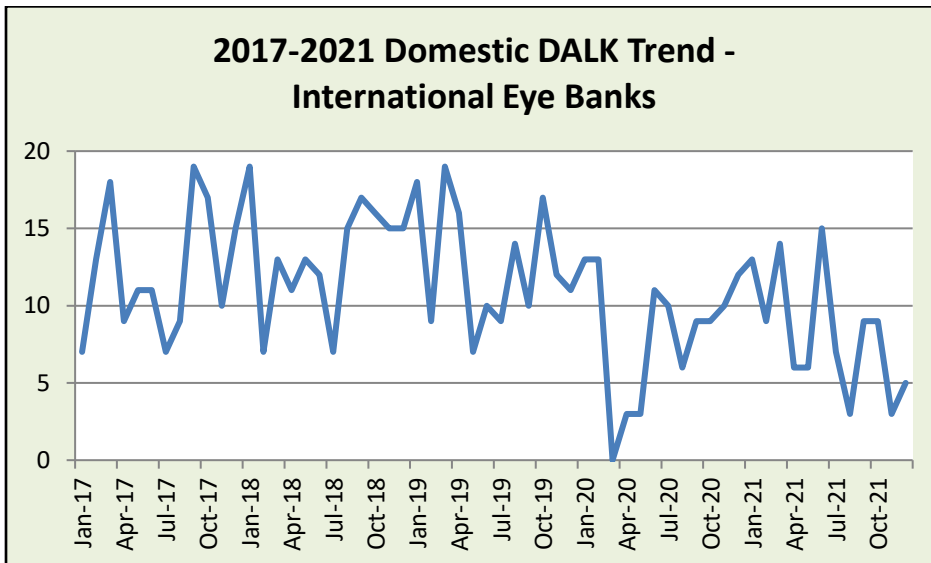
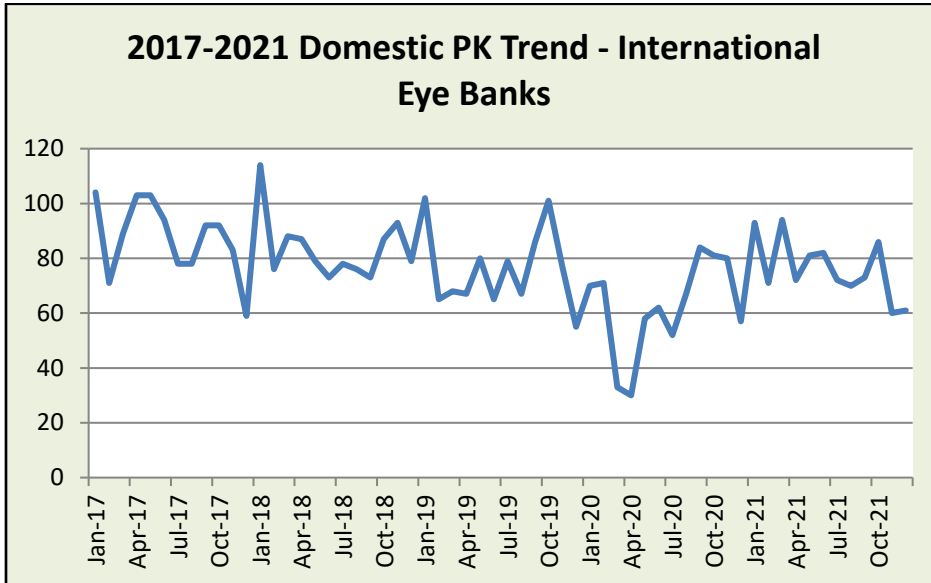
2021 International Eye Banking Statistics *Domestic Surgery Use of Intermediate-Term Preserved Tissue*

Surgery Type (Domestically Distributed Corneas) - International Eye Banks												
Month	PK	EK (DSEK)	EK (DMEK)	EK (Other)	ALK (DALK)	ALK (SALK)	ALK (Other)	KLA	K-Pro	Shunt Patch	Other	Unknown
Jan. 2021	27.7%	35.4%	22.0%	0.3%	3.9%	0.0%	0.0%	0.0%	0.3%	7.1%	0.0%	3.3%
Feb. 2021	22.7%	30.4%	21.4%	0.0%	2.9%	0.3%	0.3%	0.0%	0.0%	6.1%	0.3%	15.7%
Mar. 2021	22.9%	26.6%	19.5%	0.0%	3.4%	0.0%	0.2%	0.0%	0.0%	5.9%	0.0%	21.5%
Apr. 2021	25.2%	24.1%	22.4%	0.0%	2.1%	0.0%	0.0%	0.0%	0.3%	8.0%	0.0%	17.8%
May 2021	25.9%	27.2%	29.4%	0.0%	1.9%	0.0%	0.0%	0.0%	0.3%	8.9%	0.0%	6.4%
Jun. 2021	28.4%	28.4%	21.5%	0.0%	5.2%	0.3%	0.0%	0.0%	0.7%	7.3%	0.0%	8.3%
Jul. 2021	30.6%	31.5%	26.0%	0.0%	3.0%	0.0%	0.0%	0.0%	0.0%	6.4%	0.0%	2.6%
Aug. 2021	28.7%	32.8%	27.9%	0.0%	1.2%	0.0%	0.0%	0.0%	2.0%	4.1%	0.0%	3.3%
Sep. 2021	28.0%	27.6%	31.4%	0.0%	3.4%	0.0%	0.0%	0.0%	0.0%	6.5%	0.4%	2.7%
Oct. 2021	26.5%	27.8%	24.7%	0.0%	2.8%	0.0%	0.0%	0.0%	0.3%	8.3%	0.3%	9.3%
Nov. 2021	21.8%	29.8%	26.5%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	8.7%	0.0%	12.0%
Dec. 2021	30.0%	20.7%	19.7%	0.0%	2.5%	0.0%	0.5%	0.0%	0.5%	3.0%	0.0%	23.2%
2019 Avg.	25.7%	31.5%	23.4%	0.0%	4.3%	0.4%	0.3%	0.1%	0.5%	6.7%	0.0%	7.0%
2020 Avg.	26.3%	35.5%	23.7%	0.0%	3.5%	0.1%	0.1%	0.0%	0.4%	5.9%	0.1%	4.4%
2021 Avg.	26.2%	28.6%	24.2%	0.0%	2.8%	0.1%	0.1%	0.0%	0.3%	6.8%	0.1%	10.7%
Std. Dev.	2.9%	3.9%	3.9%	0.1%	1.1%	0.1%	0.2%	0.0%	0.6%	1.8%	0.2%	7.5%
2021 Totals	915	999	843	1	99	2	3	0	12	238	3	374

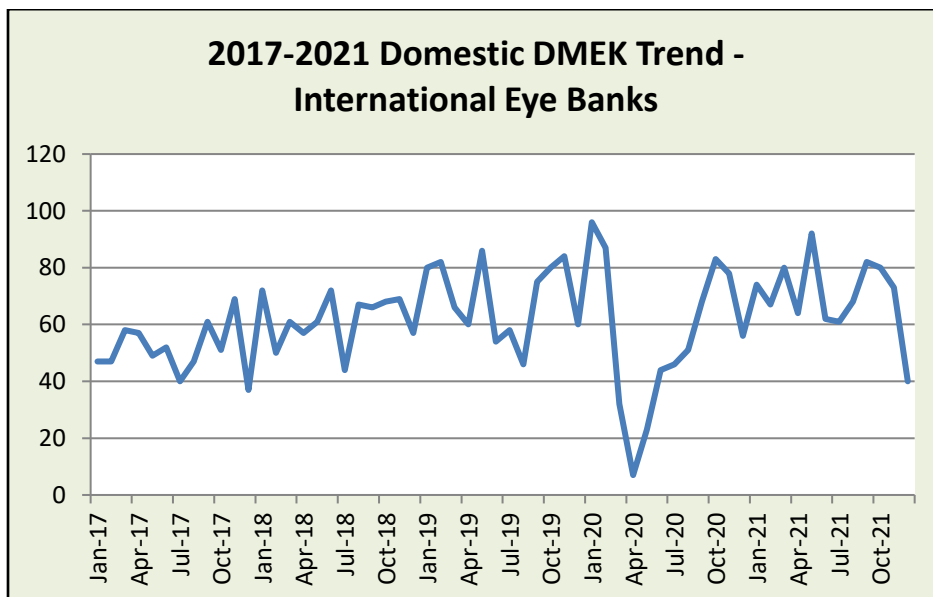
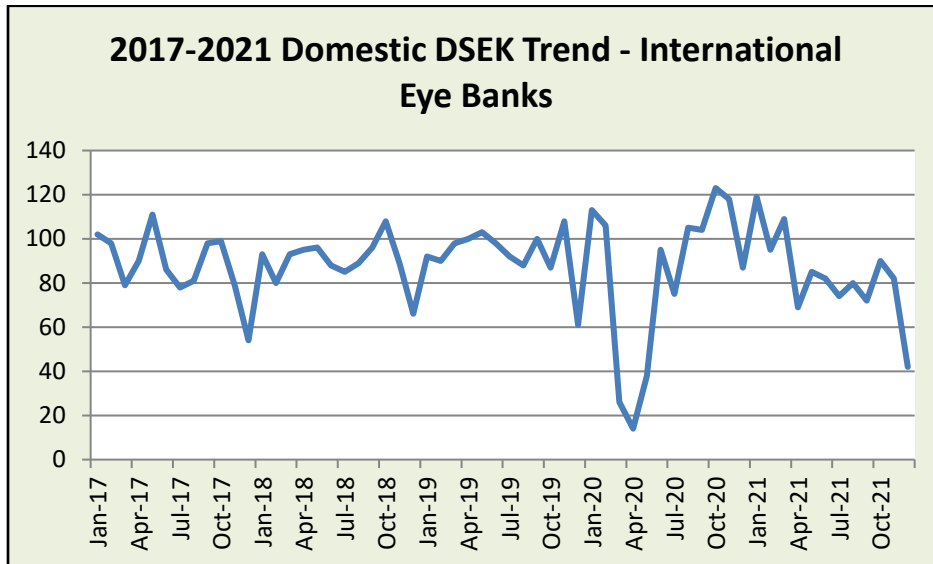
*Percentages read from this table should be read as "of the tissue distributed for transplant use domestically"



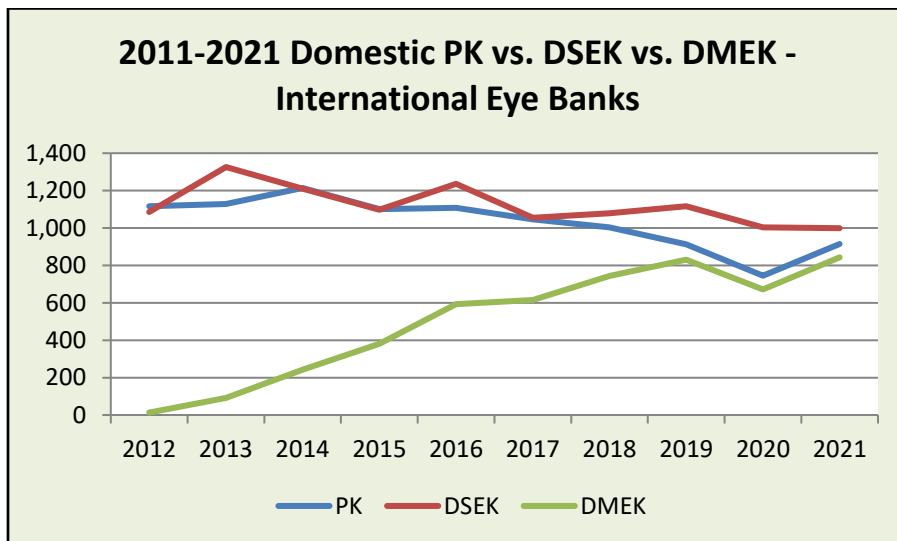
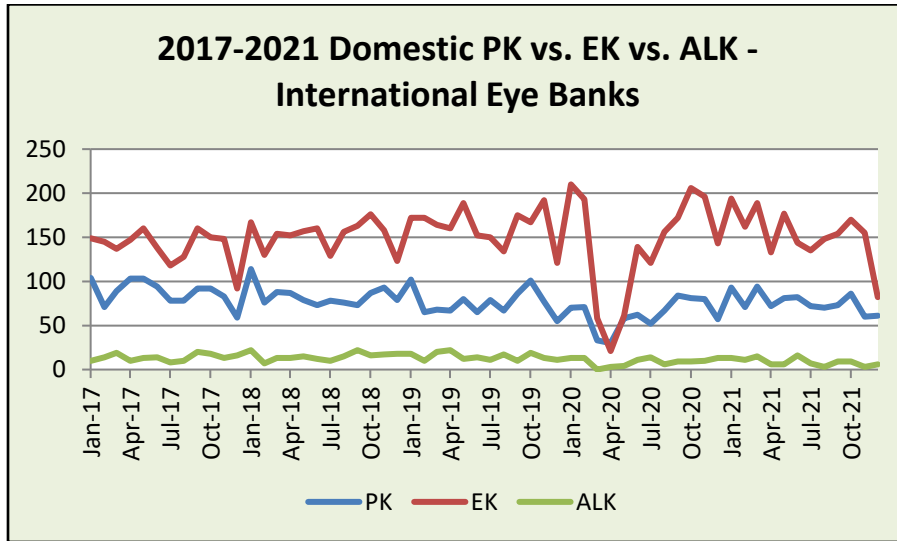
2021 International Eye Banking Statistics
Trends of Domestic Use



2021 International Eye Banking Statistics
Trends of Domestic Use



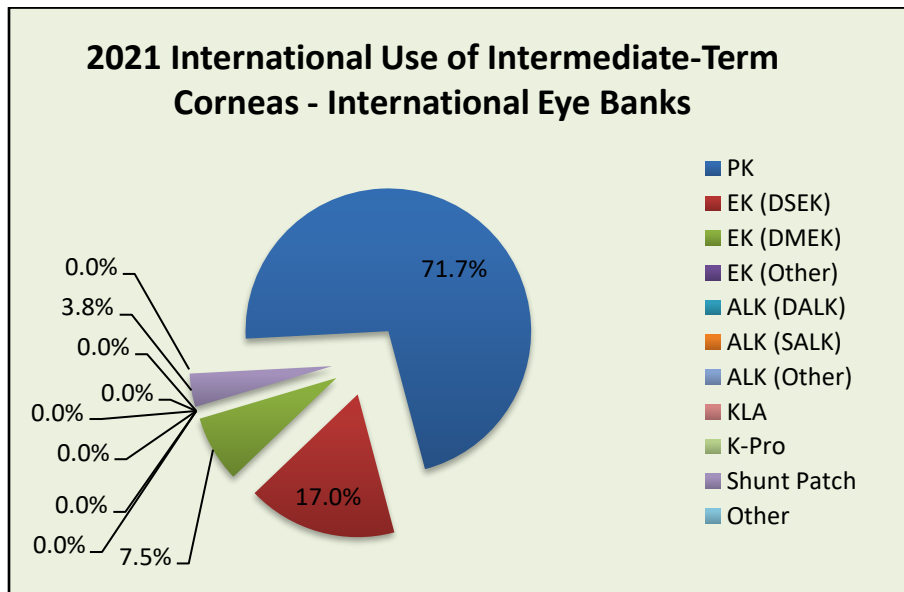
2021 International Eye Banking Statistics *Domestic Surgery Use of Intermediate-Term Preserved Tissue*



Domestic PK vs. DSAEK vs. DMEK - International Eye Banks											
Surgery Type	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trend
PK	1,117	1,129	1,214	1,101	1,107	1,046	1,003	912	745	915	
DSEK	1,085	1,326	1,211	1,097	1,237	1,055	1,078	1,117	1,004	999	
DMEK	13	92	242	381	592	615	744	831	671	843	
Other EK	N/A	N/A	N/A	N/A	N/A	2	3	0	1	1	
DALK	95	144	136	183	128	146	160	152	99	99	
SALK	17	3	0	0	1	10	11	15	2	2	
Other ALK	3	3	6	2	6	9	9	10	4	3	
KLA	0	0	0	8	4	6	3	3	0	0	
K-Pro	16	11	19	15	24	10	11	18	12	12	
Shunt Patch	168	227	303	239	311	228	243	239	167	238	
Other	0	0	0	1	2	3	8	1	3	3	
Unknown	306	144	36	57	260	164	262	248	124	374	

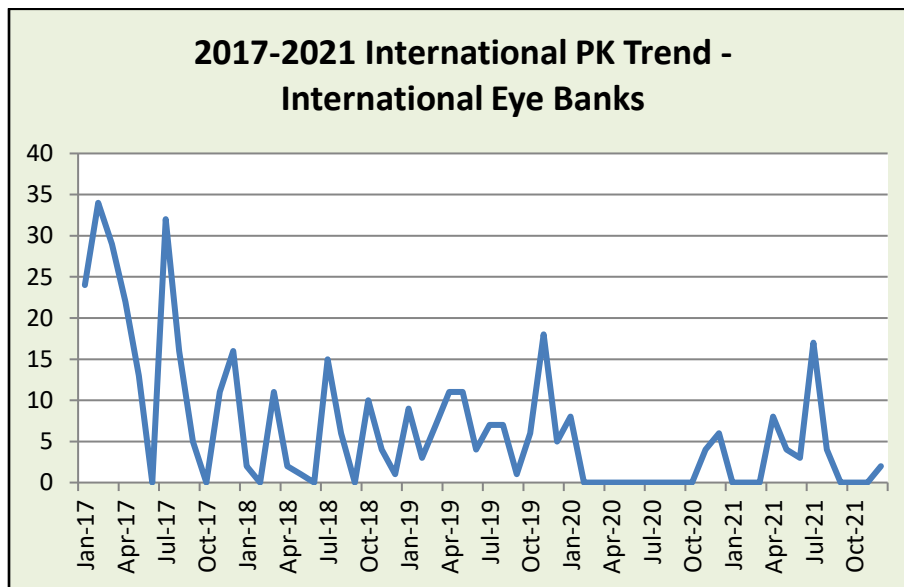
2021 International Eye Banking Statistics *International Surgery Use of Intermediate-Term Preserved Tissue*

International Use of Intermediate-Term Corneas – International Eye Banks			
	2019	2020	2021
Intermediate-term preserved corneas, corneal segments or whole eyes transplanted for:	136	35	53
PK	89	18	38
EK	43	17	13
DSEK, DSAEK, DLEK	16	7	9
DMEK or DMAEK	27	10	4
PDEK	0	0	0
Other EK	0	0	0
ALK	4	0	0
DALK (Deep Anterior Lamellar Keratoplasty)	4	0	0
SALK (Superficial Anterior Lamellar Keratoplasty)	0	0	0
Other ALK (e.g., peripheral, eccentric, etc.)	0	0	0
KLA	0	0	0
Keratoprosthesis (K-Pro)	0	0	0
Glaucoma shunt patch or other non-keratoplasty use	0	0	2
Other Keratoplasty (e.g., experimental surgery type)	0	0	0
Unknown or Unspecified	0	0	0
Total intermediate-term preserved corneas, corneal segments, and whole eyes used for KERATOPLASTY	3,439	2,700	3,302
Total intermediate-term preserved corneas, corneal segments, and whole eyes used for TRANSPLANT	3,678	2,865	3,542

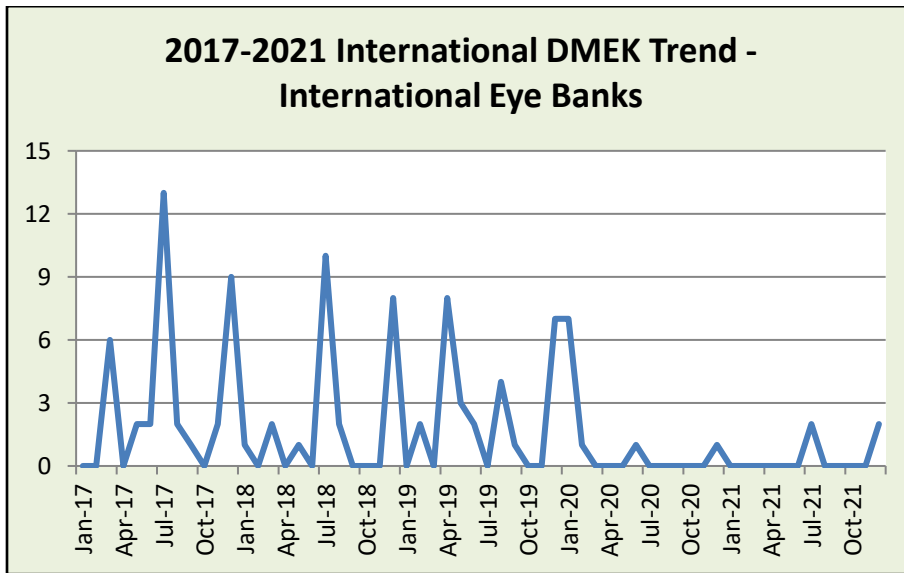
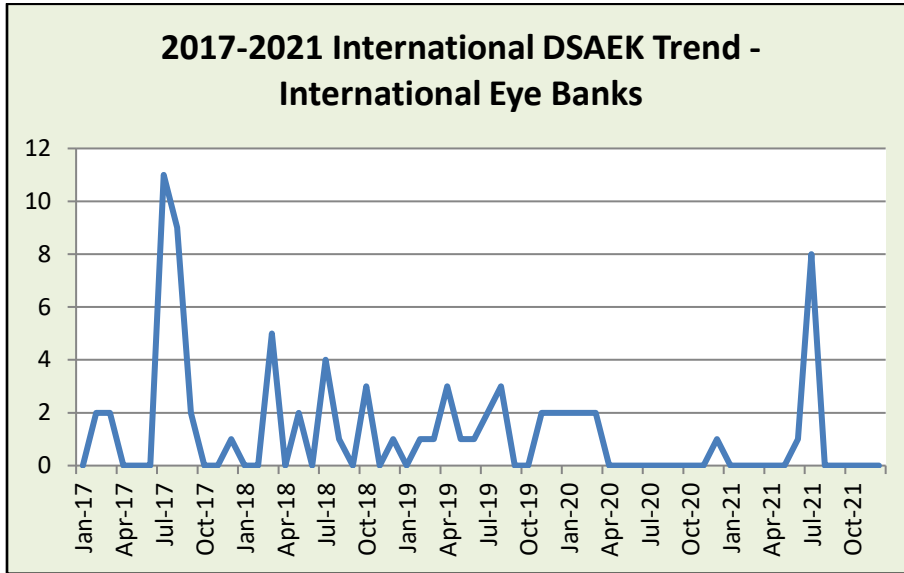


2021 International Eye Banking Statistics *International Surgery Use of Intermediate-Term Preserved Tissue*

Surgery Type (Internationally Distributed Corneas) - International Eye Banks												
Year	PK	EK (DSEK)	EK (DMEK)	EK (Other)	ALK (DALK)	ALK (SALK)	ALK (Other)	KLA	K-Pro	Shunt Patch	Other	Unknown
2017	202	27	37	0	9	0	0	0	0	1	0	0
2018	52	16	24	0	2	0	0	0	0	2	0	0
2019	89	16	27	0	4	0	0	0	0	0	0	0
2020	18	7	10	0	0	0	0	0	0	0	0	0
2021	38	9	4	0	0	0	0	0	0	2	0	0

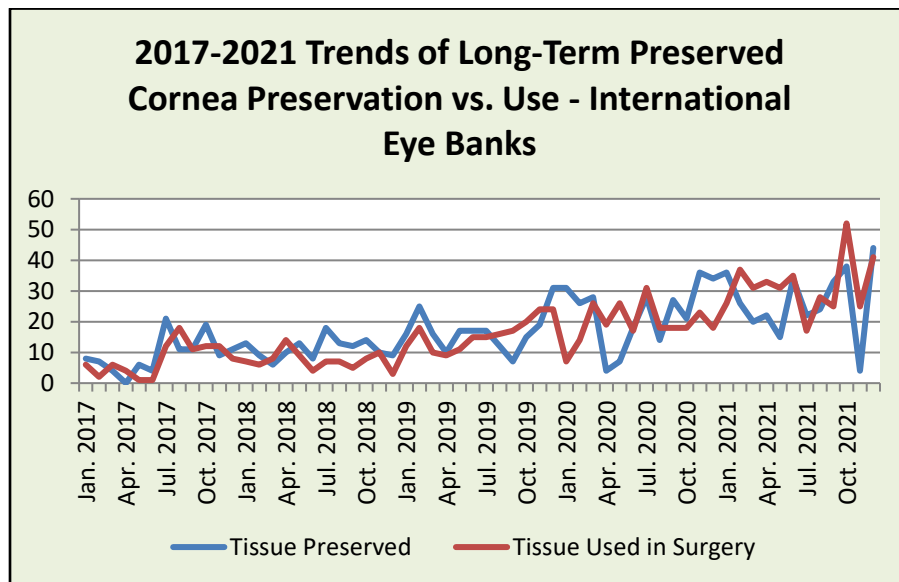


2021 International Eye Banking Statistics
Trends of International Use






2021 International Eye Banking Statistics *Long-Term Tissue Distribution*

Long-Term Preserved Tissue Preservation and Distribution			
	2019	2020	2021
Long-term preserved corneas or whole globes PRESERVED for transplant	202	274	318
Long-term preserved corneas, corneal segments, or whole globes DISTRIBUTED for:	191	235	381
Keratoplasty	13	4	2
Glaucoma Shunt patching	126	166	355
Other Surgical Uses	52	65	24
Long-term preserved corneas, corneal segments, or whole globes FORWARDED to another entity for final distribution	62	62	10
Sclera or sclera segments PRESERVED for transplantation	1,879	1,616	1,638
Sclera or sclera segments DISTRIBUTED for:	1,420	1,332	1,315
Prosthesis following enucleation	33	43	45
Glaucoma shunt patching	1,246	1,171	1,170
Other surgical uses	141	118	100
Sclera or sclera segments FORWARDED to another entity for final distribution	2	17	0

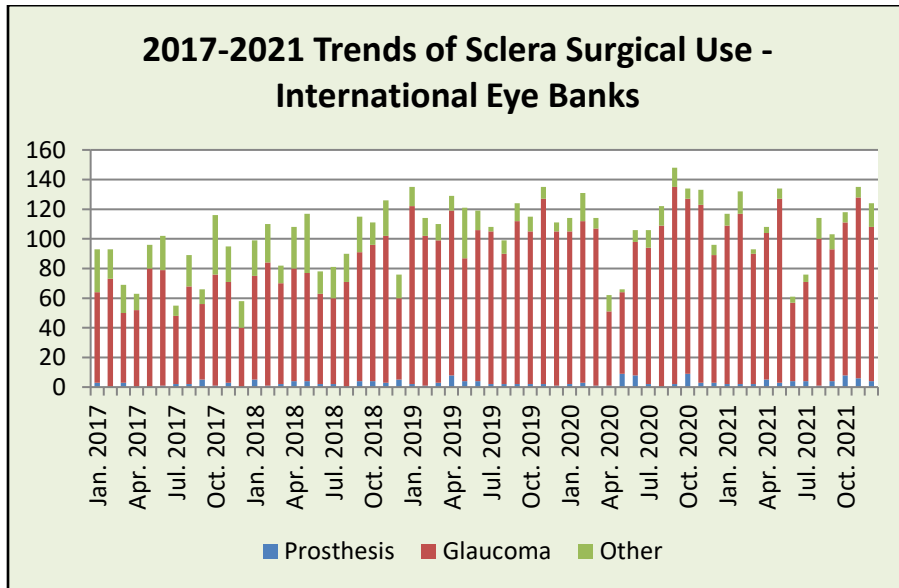
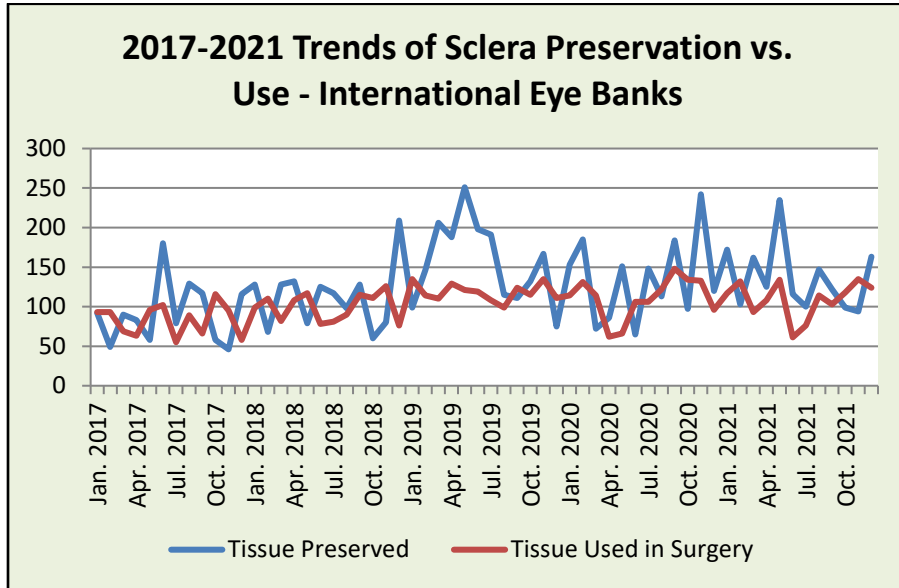


2021 International Eye Banking Statistics *Long-Term Tissue Trends*

Ocular Tissue Used for Glaucoma Shunt Patching - International Eye Banks											
Ocular Tissue Used for Glaucoma Shunt Patching	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Long-Term Cornea	119	110	101	102	89	62	62	126	166	355	
Intermediate-Term Cornea	169	227	304	240	313	229	245	239	167	240	
Sclera	609	597	679	611	773	737	893	1246	1171	1170	

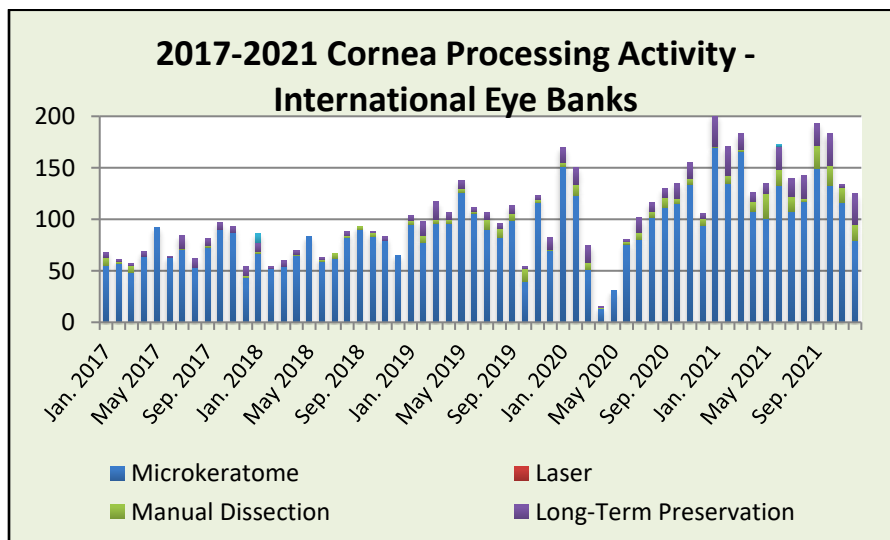
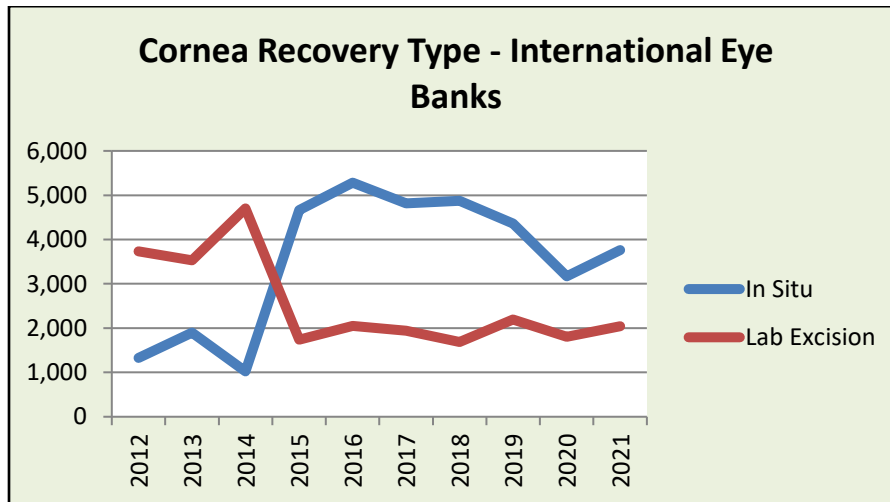
Long-Term Tissue Trends - International Eye Banks								
Month	Long-Term Preserved Corneas	Long-Term Cornea Use - Keratoplasty	Long-Term Cornea Use - Glaucoma	Long-Term Cornea Use - Other	Scleral Segments Preserved	Sclera Use - Prosthesis	Sclera Use - Glaucoma	Sclera Use - Other
Jan. 2021	36	0	23	3	172	2	107	8
Feb. 2021	26	1	34	2	103	2	115	15
Mar. 2021	20	0	27	4	162	2	88	3
Apr. 2021	22	0	31	2	125	5	99	4
May 2021	15	0	30	1	235	3	124	7
Jun. 2021	34	1	33	1	116	4	53	4
Jul. 2021	22	0	16	1	100	4	67	5
Aug. 2021	24	0	25	3	147	1	99	14
Sep. 2021	33	0	24	1	122	4	89	10
Oct. 2021	38	0	51	1	99	8	103	7
Nov. 2021	4	0	25	0	94	6	122	7
Dec. 2021	44	0	36	5	163	4	104	16
2019 Total	202	13	126	52	1,879	33	1246	141
2020 Total	274	4	166	65	1,616	43	1171	118
2021 Total	318	2	355	24	1,638	45	1170	100
2021 Avg.	27	0	30	2	137	4	98	8
Std. Dev.	11	0	9	1	41	2	21	4

2021 International Eye Banking Statistics *Long-Term Tissue Trends*



2021 International Eye Banking Statistics *Tissue Processing*

Tissue Processing for Transplant – International Eye Banks			
	2019	2020	2021
Eye Processing (does not include in situ excision)	2,191	1,806	2,045
Processed for corneal preservation only	1,422	1,179	1,513
Processed for sclera preservation	727	578	518
Processed for other ocular materials	42	49	14
Cornea Processing	1,250	1,265	1,908
Processed by microkeratome	1,093	1,081	1,515
Preloaded into a device following microkeratome processing			0
Processed by laser	0	0	0
Processed by hand dissection	67	66	149
Preloaded into a device following hand dissection			9
Processed by transfer into long-term preservation	90	118	242
Processed by other methods	0	0	2

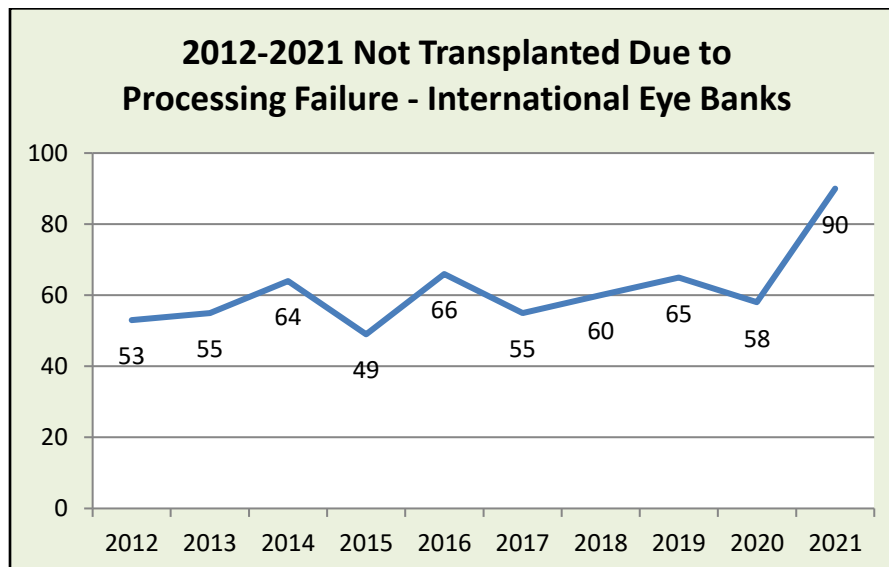


2021 International Eye Banking Statistics *Tissue Processing*

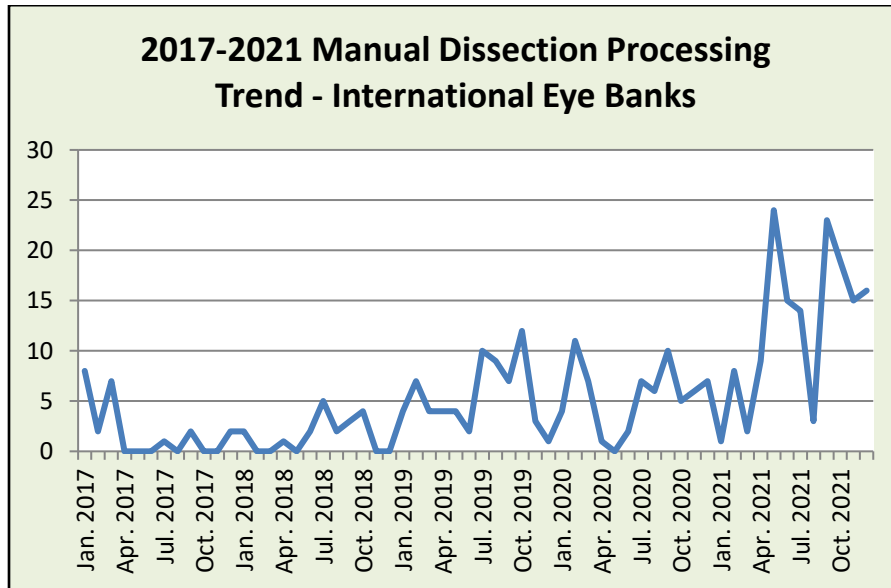
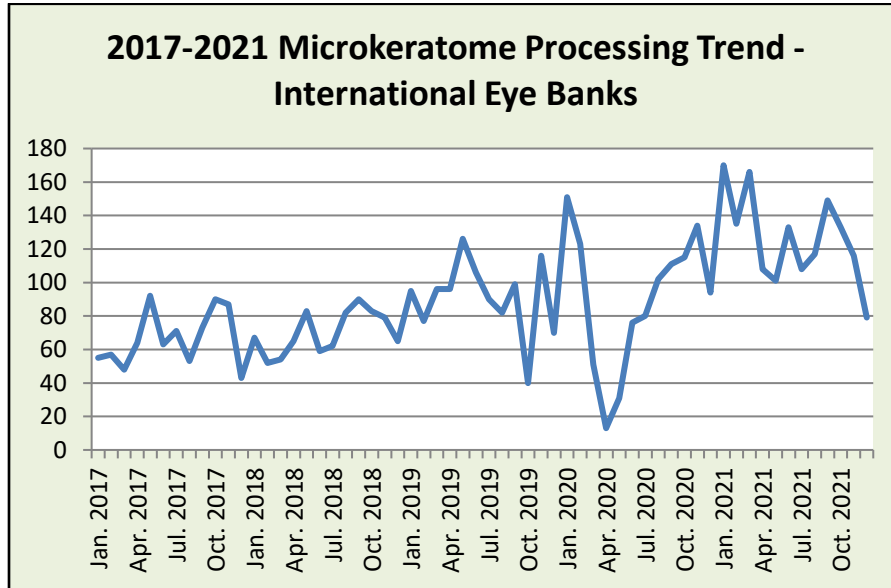
Cornea Processing - International Eye Banks									
Month	Microkeratome Processing	Pre-loaded after Microkeratome Processing	Percent DSAEK Pre-load	Laser Processing	Manual Processing (e.g. DMEK)	Pre-loaded after Manual Processing	Percent DMEK Pre-load	Long-term Preservation	Other Cornea Processing
Jan. 2021	170	0	0.0%	0	1	0	0.0%	31	0
Feb. 2021	135	0	0.0%	0	8	0	0.0%	28	0
Mar. 2021	166	0	0.0%	0	2	0	0.0%	15	0
Apr. 2021	108	0	0.0%	0	9	0	0.0%	9	0
May 2021	101	0	0.0%	0	24	0	0.0%	10	0
Jun. 2021	133	0	0.0%	0	15	9	60.0%	23	2
Jul. 2021	108	0	0.0%	0	14	0	0.0%	18	0
Aug. 2021	117	0	0.0%	0	3	0	0.0%	23	0
Sep. 2021	149	0	0.0%	0	23	0	0.0%	21	0
Oct. 2021	133	0	0.0%	0	19	0	0.0%	31	0
Nov. 2021	116	0	0.0%	0	15	0	0.0%	3	0
Dec. 2021	79	0	0.0%	0	16	0	0.0%	30	0
2019 Total	1093			0	67			90	0
2020 Total	1081			0	66			118	0
2021 Total	1515	0	0.0%	0	149	9	6.0%	242	2
2021 Avg.	126	0	0.0%	0	12	1	5.0%	20	0
Std. Dev.	27	0	0.0%	0	8	3	17.3%	9	1

Cornea Processing Success Rates - International Eye Banks											
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
Processing Events	556	451	664	719	929	882	900	1,250	1,265	1,917	
Failed Processing	53	55	64	49	66	55	60	65	58	90	
Failure Rate	90.5%	87.8%	90.4%	93.2%	92.9%	93.8%	93.3%	94.8%	95.4%	95.3%	

Cornea Recovery Methods - International Eye Banks											
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Trends
In Situ	1,327	1,897	1,024	4,667	5,283	4,813	4,872	4,360	3,166	3,763	
Lab Excision	3,731	3,530	4,702	1,736	2,050	1,940	1,687	2,191	1,806	2,045	
Percent In Situ	26.2%	35.0%	17.9%	72.9%	72.0%	71.3%	74.3%	66.6%	63.7%	64.8%	



2021 International Eye Banking Statistics *Tissue Processing*



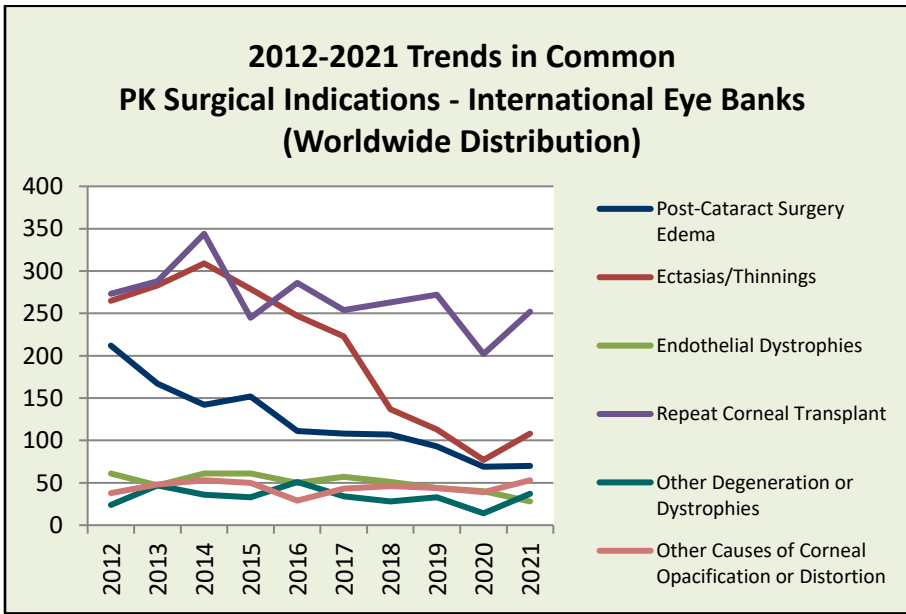
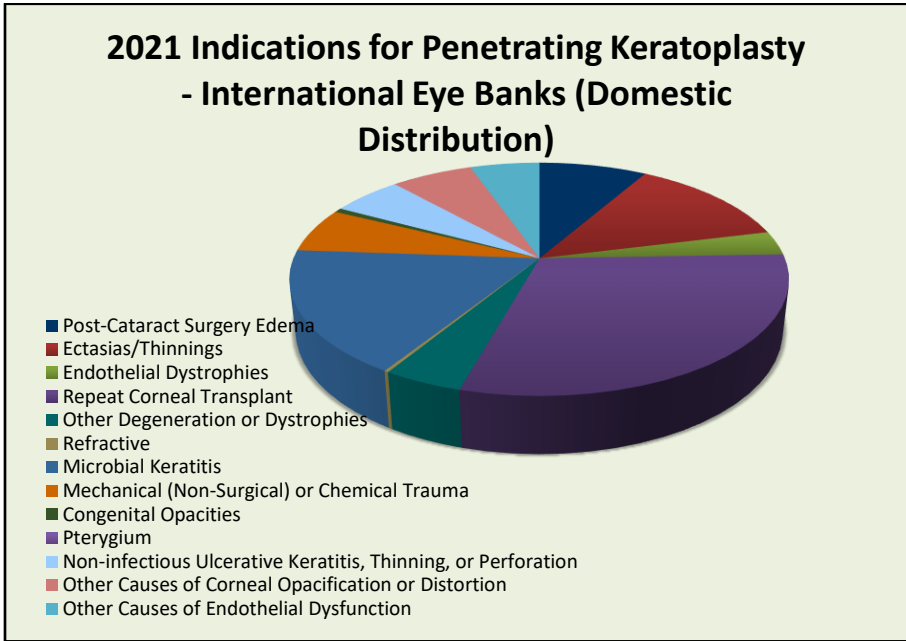
2021 International Eye Banking Statistics *Indications for Corneal Transplant*

Indications for Penetrating Keratoplasty 2020	Domestic Use		International Use	
A. Post-cataract surgery edema	70	7.7%	0	0.0%
B. Ectasias/Thinnings	108	11.8%	0	0.0%
C. Endothelial Dystrophies	28	3.1%	0	0.0%
D. Repeat Corneal Transplant	252	27.5%	0	0.0%
E. Other degenerations or dystrophies	37	4.0%	0	0.0%
F. Refractive	2	0.2%	0	0.0%
G. Microbial keratitis	145	15.8%	0	0.0%
H. Mechanical or chemical trauma	52	5.7%	0	0.0%
I. Congenital opacities	5	0.5%	0	0.0%
J. Pterygium	0	0.0%	0	0.0%
K. Non-infectious ulcerative keratitis or perforation	46	5.0%	0	0.0%
L. Other causes of corneal dysfunction or distortion (non-endothelial)	53	5.8%	0	0.0%
M. Other causes of endothelial dysfunction	45	4.9%	0	0.0%
Z. Unknown, unreported, or unspecified	72	7.9%	38	100.0%
Total Indications for Penetrating Keratoplasty	915		38	

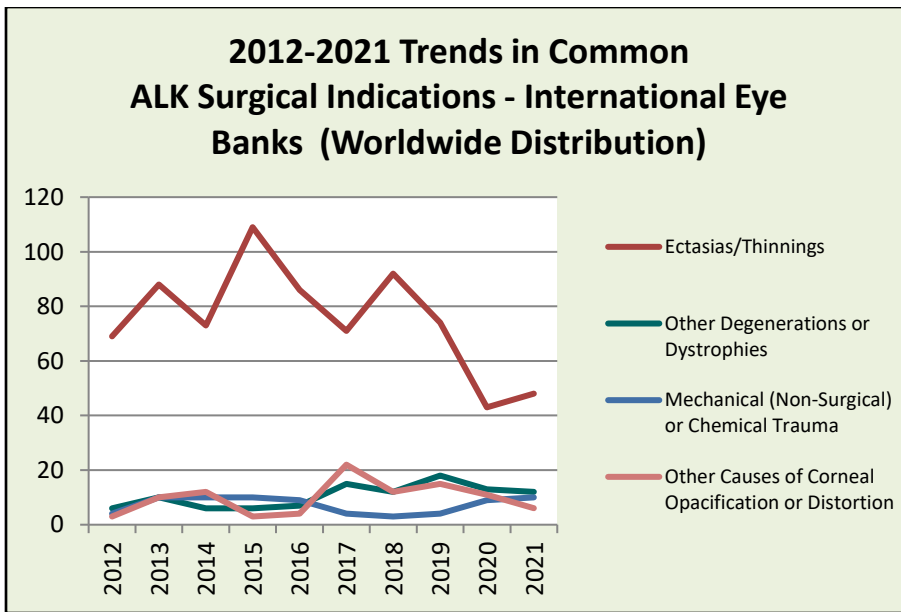
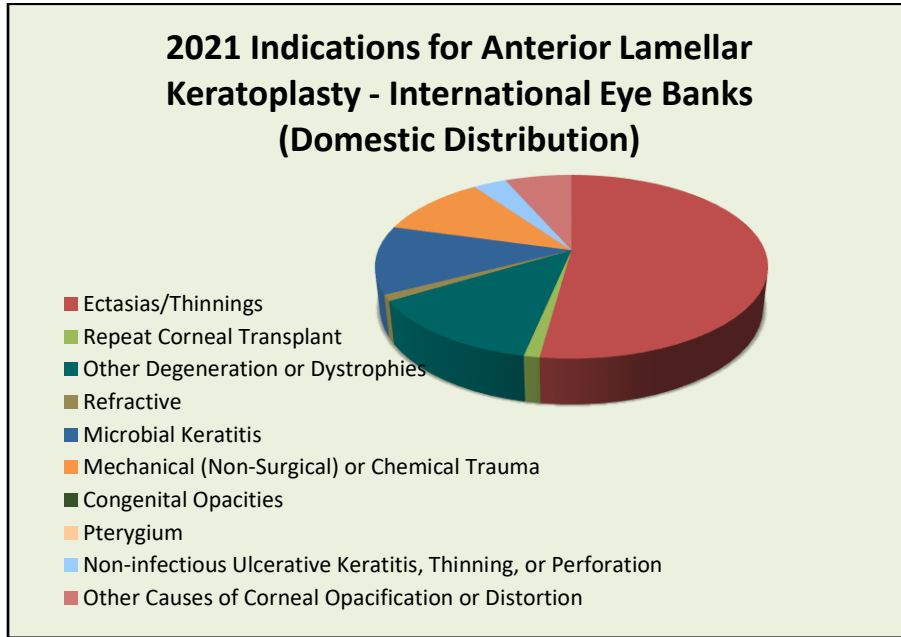
Indications for Anterior Lamellar Keratoplasty	Domestic Use		International Use	
B. Ectasias/Thinnings	48	46.2%	0	0.0%
D. Repeat Corneal Transplant	1	1.0%	0	0.0%
E. Other degenerations or dystrophies	12	11.5%	0	0.0%
F. Refractive	1	1.0%	0	0.0%
G. Microbial keratitis	11	10.6%	0	0.0%
H. Mechanical or chemical trauma	10	9.6%	0	0.0%
I. Congenital opacities	0	0.0%	0	0.0%
J. Pterygium	0	0.0%	0	0.0%
K. Non-infectious ulcerative keratitis or perforation	3	2.9%	0	0.0%
L. Other causes of corneal dysfunction or distortion	6	5.8%	0	0.0%
Z. Unknown, unreported, or unspecified	12	11.5%	0	0.0%
Total for Anterior Keratoplasty	104		0	

Indications for Endothelial Keratoplasty	Domestic Use		International Use	
A. Post-Cataract Surgery Edema	284	15.4%	0	0.0%
C. Endothelial Dystrophies	688	37.3%	0	0.0%
D. Repeat Corneal Transplant	241	13.1%	0	0.0%
M. Other Causes of Endothelial Dysfunction	72	3.9%	0	0.0%
Z. Unknown, unreported, or unspecified	558	30.3%	13	100%
Total for Endothelial Keratoplasty	1,843		13	

2021 International Eye Banking Statistics *Indications for Corneal Transplant*

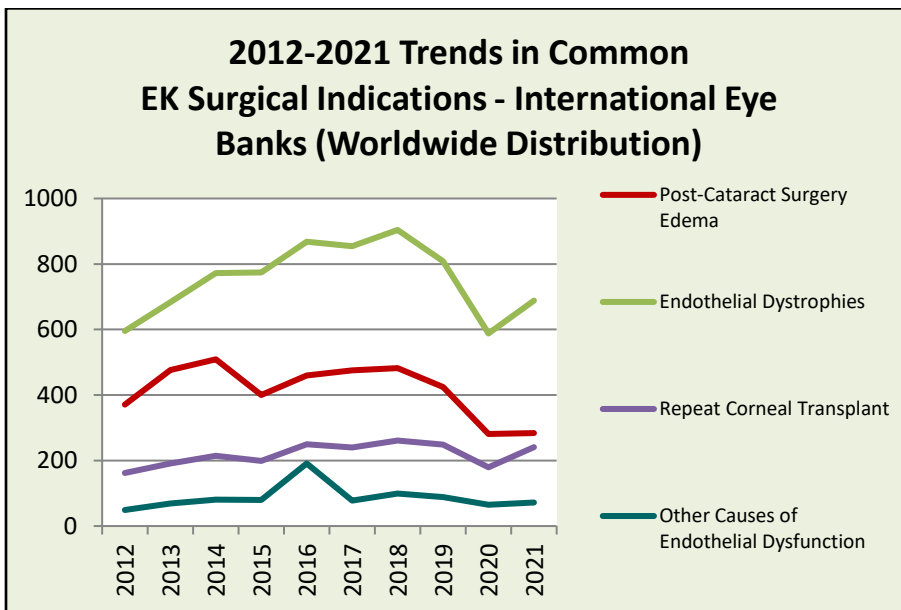
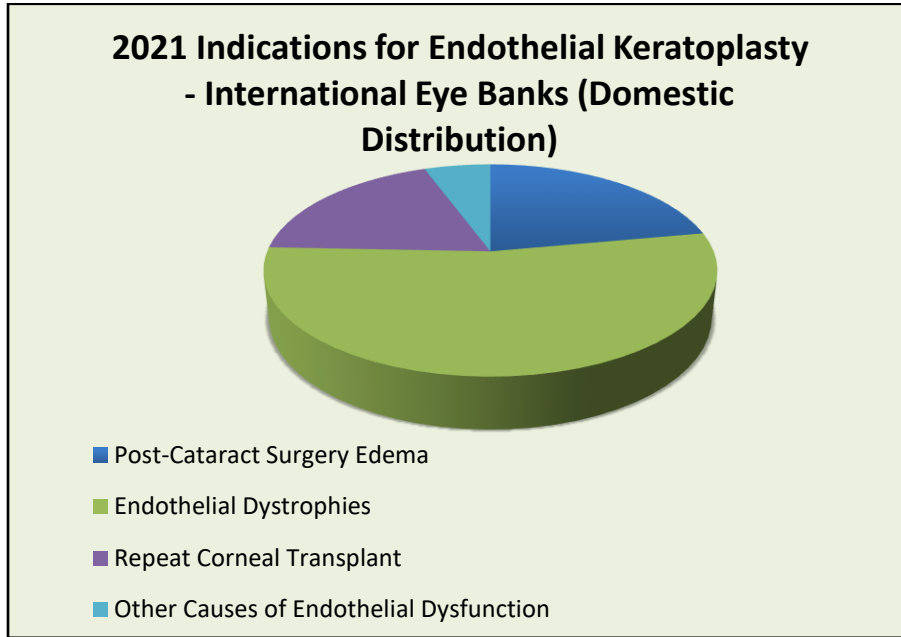


2021 International Eye Banking Statistics *Indications for Corneal Transplant*



*Worldwide Distribution = Combined Domestic and International Distribution

2021 International Eye Banking Statistics *Indications for Corneal Transplant*



*Worldwide Distribution = Combined Domestic and International Distribution

2021 International Eye Banking Statistics *Indications for Corneal Transplant*

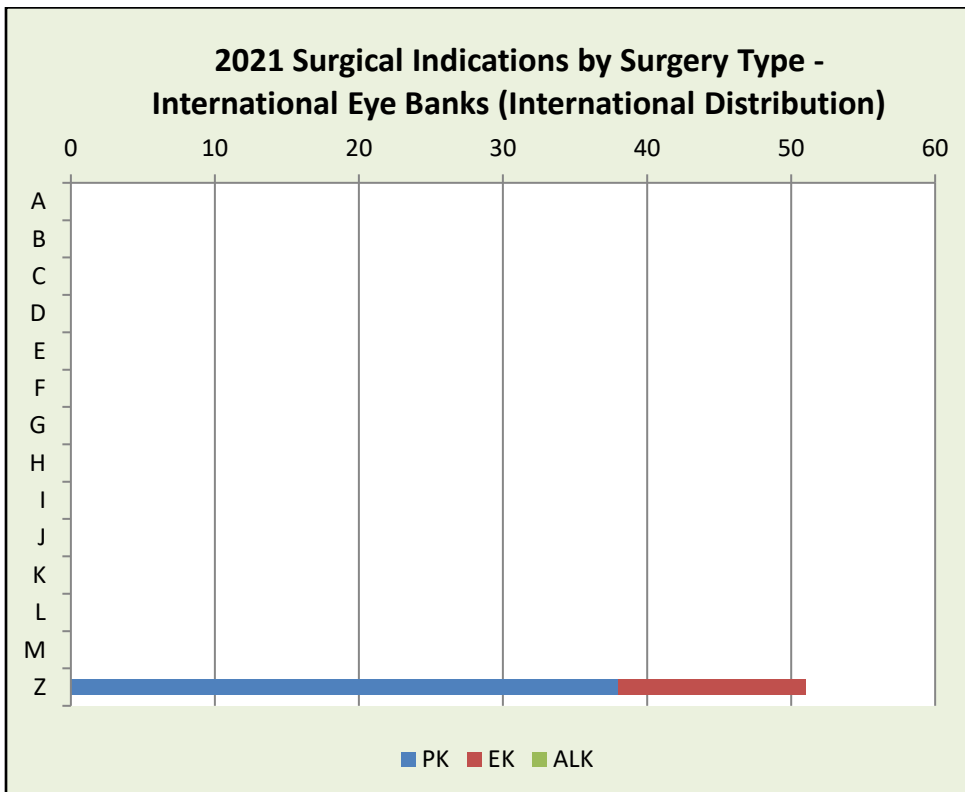
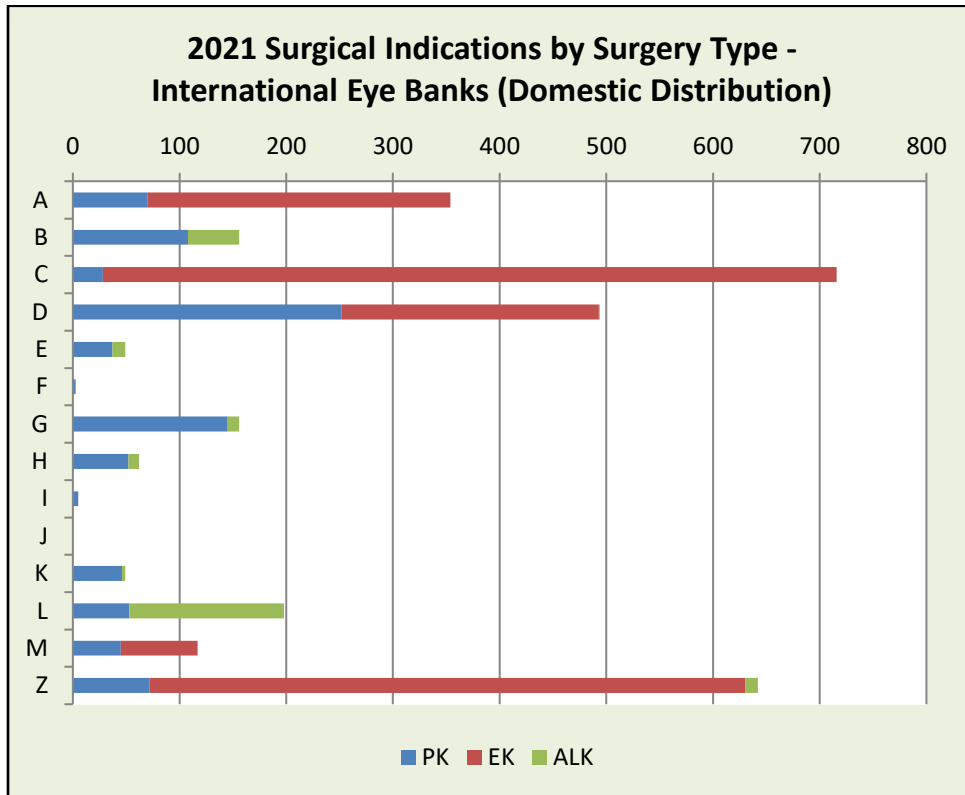
2021 (Domestically Distributed Corneas Only) - International Eye Banks														
	A	B	C	D	E	F	G	H	I	J	K	L	M	Z
PK	70	108	28	252	37	2	145	52	5	0	46	53	45	72
EK	284		688	241									72	558
ALK		48		1	12	1	11	10	0	0	3	145		12

2021 (Internationally Distributed Corneas Only) - International Eye Banks														
	A	B	C	D	E	F	G	H	I	J	K	L	M	Z
PK	0	0	0	0	0	0	0	0	0	0	0	0	0	38
EK	0		0	0									0	13
ALK		0		0	0	0	0	0	0	0	0	0		0

2021 (Combined Domestic & International Distributed Corneas) - International Eye Banks														
	A	B	C	D	E	F	G	H	I	J	K	L	M	Z
PK	70	108	28	252	37	2	145	52	5	0	46	53	45	110
EK	284		688	241									72	571
ALK		48		1	12	1	11	10	0	0	3	6		12

- A - Post-Cataract Surgery Edema
- B - Ectasias/Thinning
- C - Endothelial Dystrophies
- D - Repeat Corneal Transplant
- E - Other Degeneration or Dystrophies
- F - Refractive
- G - Microbial Keratitis
- H - Mechanical (Non-Surgical) or Chemical Trauma
- I - Congenital Opacities
- J - Pterygium
- K - Non-infectious Ulcerative Keratitis, Thinning, or Perforation
- L - Other Causes of Corneal Opacification or Distortion
- M - Other Causes of Endothelial Dysfunction
- Z - Unknown or Unreported

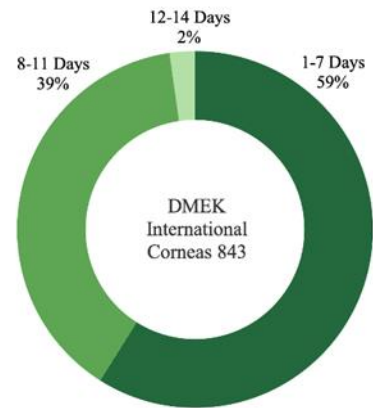
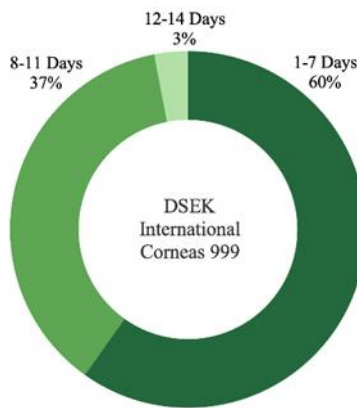
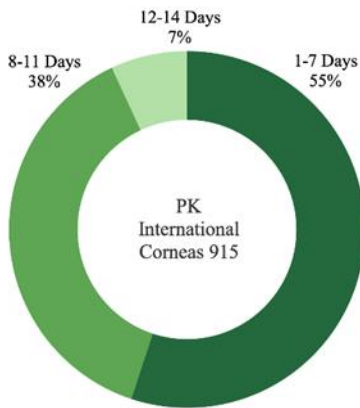
2021 International Eye Banking Statistics *Indications for Corneal Transplant*



2021 International Eye Banking Statistics *Preservation Time*

Preservation to Surgery - International Eye Banks (Tissue used domestically with respect to source nation only)									
Month	PK: 1-7 days	PK: 8-11 days	PK: 12-14 days	DSEK/DSA EK: 1-7 days	DSEK/DSA EK: 8-11 days	DSEK/DSA EK: 12-14 days	DMEK: 1-7 days	DMEK: 8-11 days	DMEK: 12-14 days
Jan. 2021	54.8%	33.3%	11.8%	59.7%	36.1%	4.2%	50.0%	50.0%	0.0%
Feb. 2021	54.9%	39.4%	5.6%	60.0%	40.0%	0.0%	61.2%	32.8%	6.0%
Mar. 2021	55.3%	34.0%	10.6%	62.4%	33.9%	3.7%	70.0%	27.5%	2.5%
Apr. 2021	61.1%	36.1%	2.8%	59.4%	36.2%	4.3%	62.5%	37.5%	0.0%
May 2021	50.6%	45.7%	3.7%	50.6%	49.4%	0.0%	56.5%	42.4%	1.1%
Jun. 2021	39.0%	47.6%	13.4%	47.6%	45.1%	7.3%	45.2%	54.8%	0.0%
Jul. 2021	68.1%	26.4%	5.6%	56.8%	36.5%	6.8%	39.3%	55.7%	4.9%
Aug. 2021	51.4%	42.9%	5.7%	61.3%	37.5%	1.3%	67.6%	30.9%	1.5%
Sep. 2021	57.5%	39.7%	2.7%	66.7%	33.3%	0.0%	68.3%	31.7%	0.0%
Oct. 2021	53.5%	41.9%	4.7%	62.2%	33.3%	4.4%	62.5%	32.5%	5.0%
Nov. 2021	56.7%	38.3%	5.0%	62.2%	35.4%	2.4%	61.6%	32.9%	5.5%
Dec. 2021	62.3%	29.5%	8.2%	78.6%	21.4%	0.0%	55.0%	45.0%	0.0%
2021 Avg.	55.1%	38.0%	6.9%	59.9%	37.1%	3.0%	59.0%	38.8%	2.3%
Std. Dev.	7.1%	6.3%	3.6%	7.7%	6.8%	2.7%	9.5%	9.9%	2.5%

*Percentages read from this table should be read as "of the domestically distributed tissue used (for PK, DSEK, or DMEK, respectively)"



EYE BANKS SUBMITTING
DATA FOR THE 2021
STATISTICAL REPORT



Eye Banks Submitting Data for the 2021 Eye Banking Statistical Report

STATE	EYE BANK NAME	CITY
AL	Advancing Sight Network	Birmingham
AR	Arkansas Lions Eye Bank & Laboratory	Little Rock
AZ	Donor Network of Arizona	Tempe
CA	One Legacy	Los Angeles
	San Diego Eye Bank	San Diego
	Sierra Donor Services Eye Bank	West Sacramento
CO	Rocky Mountain Lions Eye Bank	Aurora
FL	Florida Lions Eye Bank	Miami
	Lions Eye Institute for Transplantation and Research	Tampa
GA	Georgia Eye Bank	Atlanta
HI	Lions Eye Bank of Hawaii	Honolulu
IA	Iowa Lions Eye Bank	Coralville
ID	Envision	Boise
IN	VisionFirst	Carmel
KS	Kansas Eye Bank & Cornea Research Center	Wichita
KY	Kentucky Lions Eye Bank	Louisville
LA	Baton Rouge Regional Eye Bank	Baton Rouge
	Southern Eye Bank	Metairie
MI	Eversight	Ann Arbor
MN	Lions Gift of Sight	Minneapolis
MO	Mid-America Transplant	St. Louis
	Saving Sight	Kansas City
MS	Mississippi Lions Eye Bank	Flowood
NC	LifeShare Carolinas	Charlotte
	Miracles in Sight.	Winston-Salem
NE	Lions Eye Bank of Nebraska	Omaha
NM	New Mexico Lions Eye Bank	Albuquerque
NV	Nevada Donor Network	Las Vegas
NY	Sight Society of Northeastern New York	Albany
	The Lions Eye Bank for Long Island	Valley Stream
	The Eye-Bank for Sight Restoration	New York
	ConnectLife	Williamsville
OH	Central Ohio Lions Eye Bank	Columbus
	Cincinnati Eye Bank	Cincinnati
	Lions Eye Bank of West Central Ohio	Dayton
OK	Oklahoma Lions Eye Bank	Oklahoma City
OR	Lions VisionGift	Portland

STATE	EYE BANK NAME	CITY
PA	Center for Organ Recovery & Education (CORE)	Pittsburgh
	Gift of Life Donor Program Eye Bank	Hershey
	Lions Eye Bank of Delaware Valley	Philadelphia
	Lions Eye Bank of NW PA	Erie
PR	Lions Eye Bank of Puerto Rico	San Juan
SD	Dakota Lions Sight and Health	Sioux Falls
TN	East Tennessee Lions Eye Bank	Knoxville
	Mid-South Eye Bank	Memphis
TX	Great Plains Lions Eye Bank	Lubbock
	Lions Eye Bank of Texas at Baylor College of Medicine	Houston
	Transplant Services Center, UT Southwestern Medical Center	Dallas
	Western Texas Lions Eye Bank Alliance	San Angelo
	San Antonio Eye Bank	San Antonio
UT	Utah Lions Eye Bank	Murray
VA	Lions Medical Eye Bank & Research Center of Eastern VA	Norfolk
	Old Dominion Eye Foundation	Richmond
WA	SightLife	Seattle
	CorneaGen	Seattle
WI	Lions Eye Bank of Wisconsin	Madison
WV	Medical Eye Bank of West Virginia	Charleston

COUNTRY	EYE BANK NAME	CITY
Canada	Lions Eye Bank	Calgary, AB
	Eye Bank of British Columbia	Vancouver, BC
	Tissue Bank Manitoba Shared Health	Winnipeg, MB
	New Brunswick Organ and Tissue Program- Ocular Division	Saint John, NB
	Regional Tissue Bank	Halifax, NS
	Eye Bank of Canada, Ontario Division	Toronto, ON
	Eye Bank of Saskatchewan	Saskatoon, SK
China	Daqing Eye Bank	Daqing
Germany	Hornhautbank Muenchen gGmbH	Munich
Hong Kong	Hospital Authority Eye Bank	Kowloon
Japan	Cornea Center & Eye Bank	Ichikawa City



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