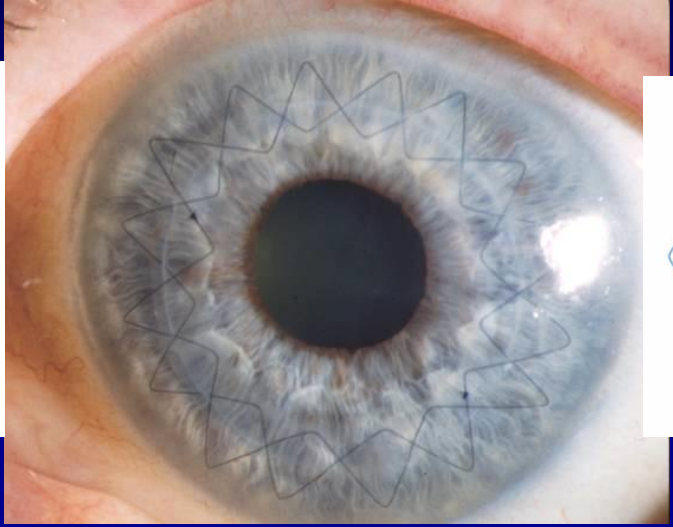


# Deutsches Keratoplastikregister 2019

DOG-Sektion Kornea



**Universitätsklinikum des Saarlandes UKS**  
**Klinik für Augenheilkunde, Homburg/Saar**  
Direktor: Prof. Dr. Berthold Seitz ML, FEBO

# Rücklauf der Umfrage zum Deutschen Keratoplastikregister 2019

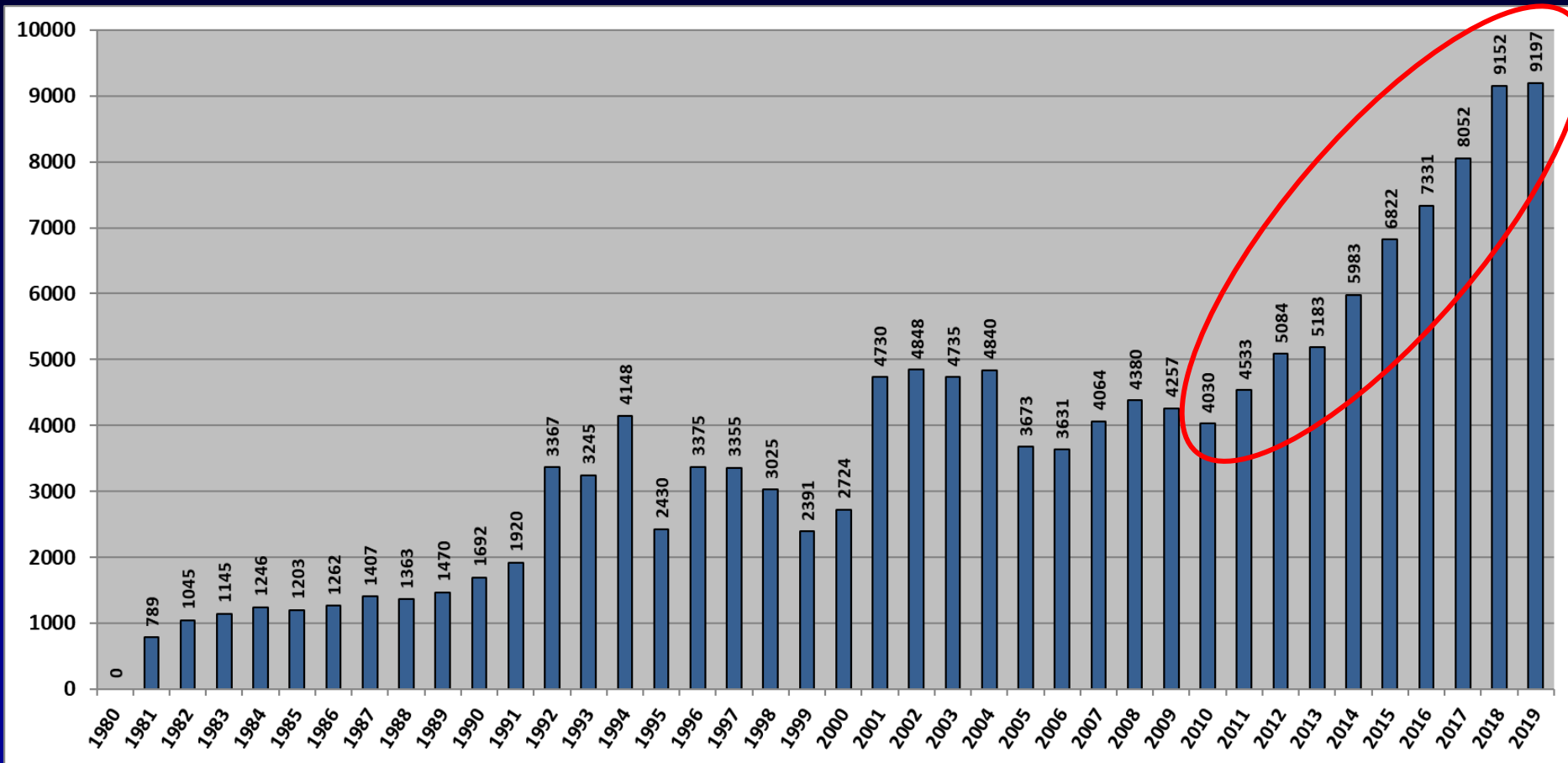
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- Von 103 Kliniken (durch die *DOG-Sektion Kornea* angeschrieben) haben 88 geantwortet  
= 85,4 % (**VOL: 100%**; DOCH: 76,6 %)  
(2018: 99 Rückmeldungen)

# Deutsches Keratoplastikregister

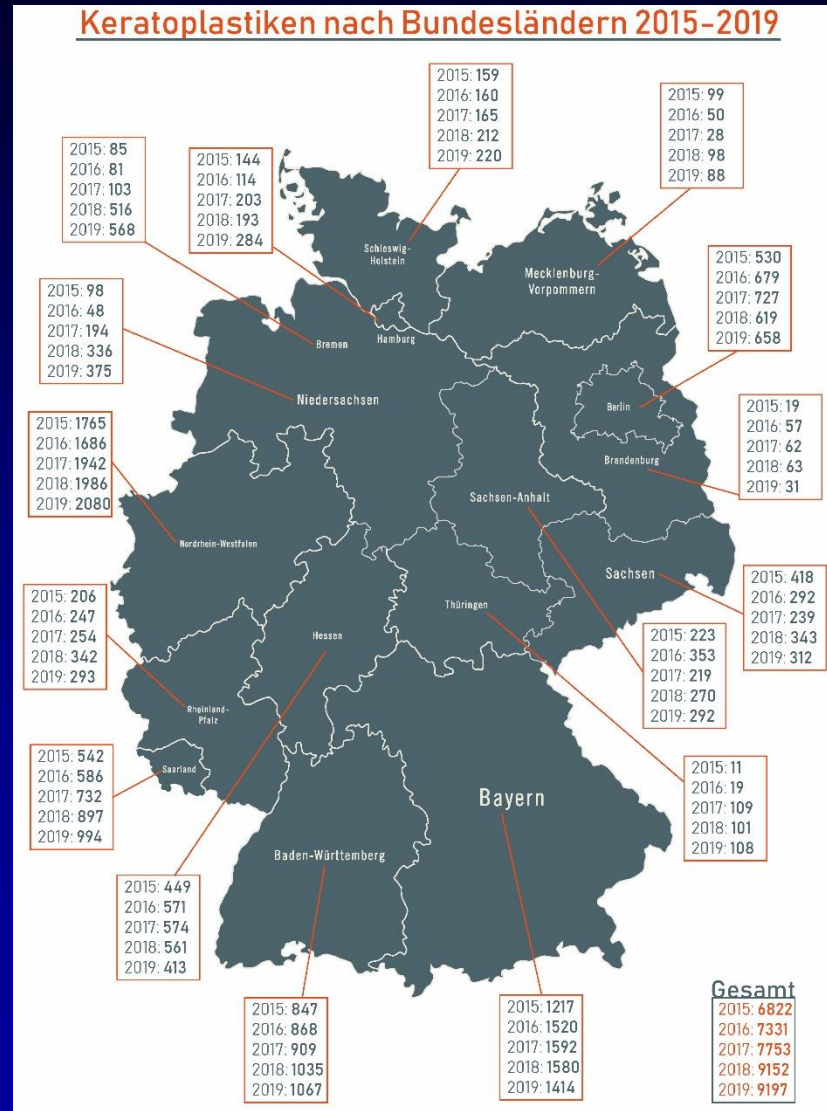
## Gemeldete Hornhauttransplantationen pro Jahr

### 1980 - 2019



# Deutsches Keratoplastikregister

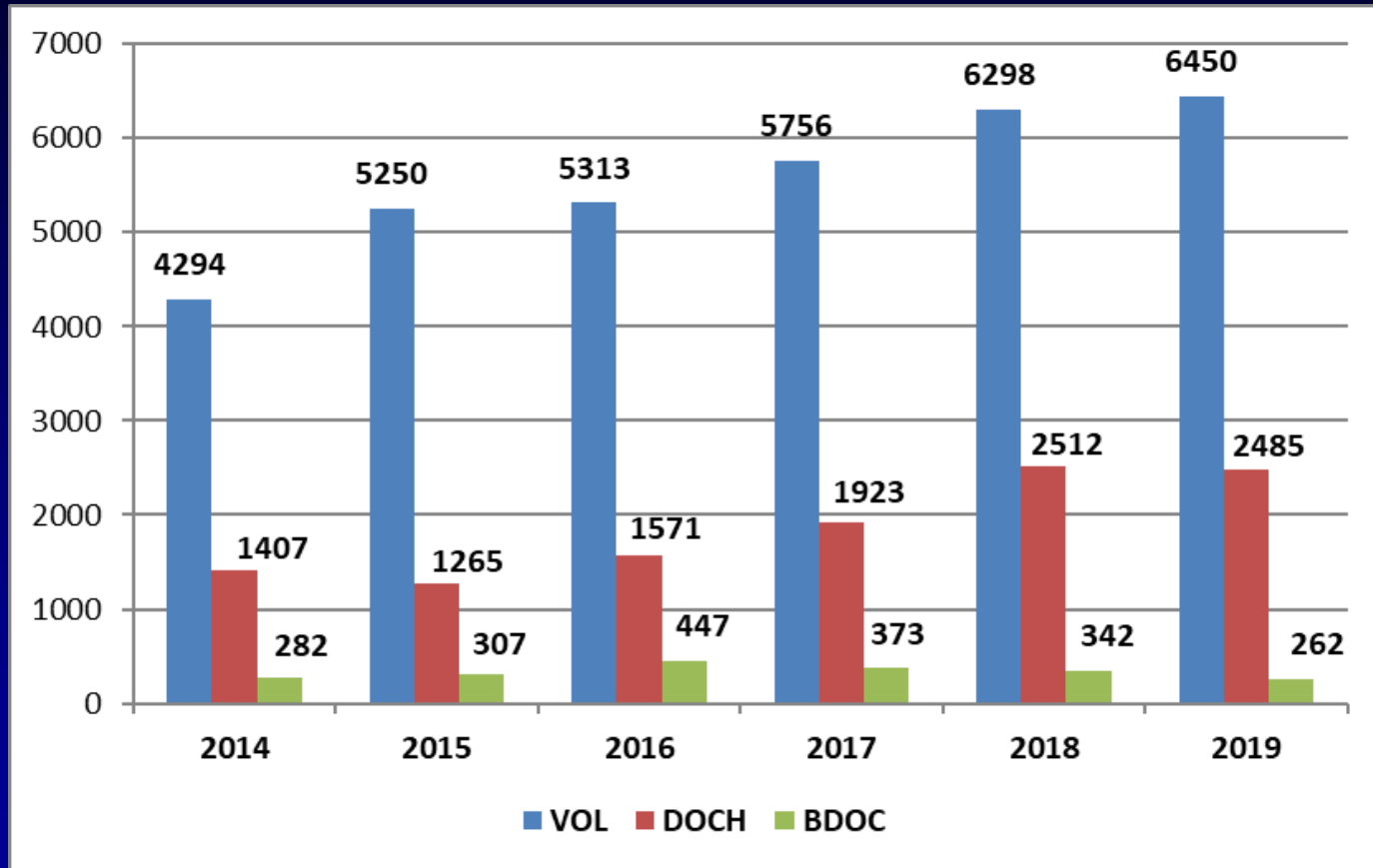
## Gemeldete Hornhauttransplantationen



# Keratoplastiken 2015 - 2019

	2015	2016	2017	2018	2019
Gesamtsumme	6822	7331	8052	9152	9197
Mittelwert	92	68	86	86	102
Median	36	21	24	28	40
Minimum	1	0	0	0	0
Maximum	708	880	868	819	879

# Verteilung aller Keratoplastiken 2014 - 2019



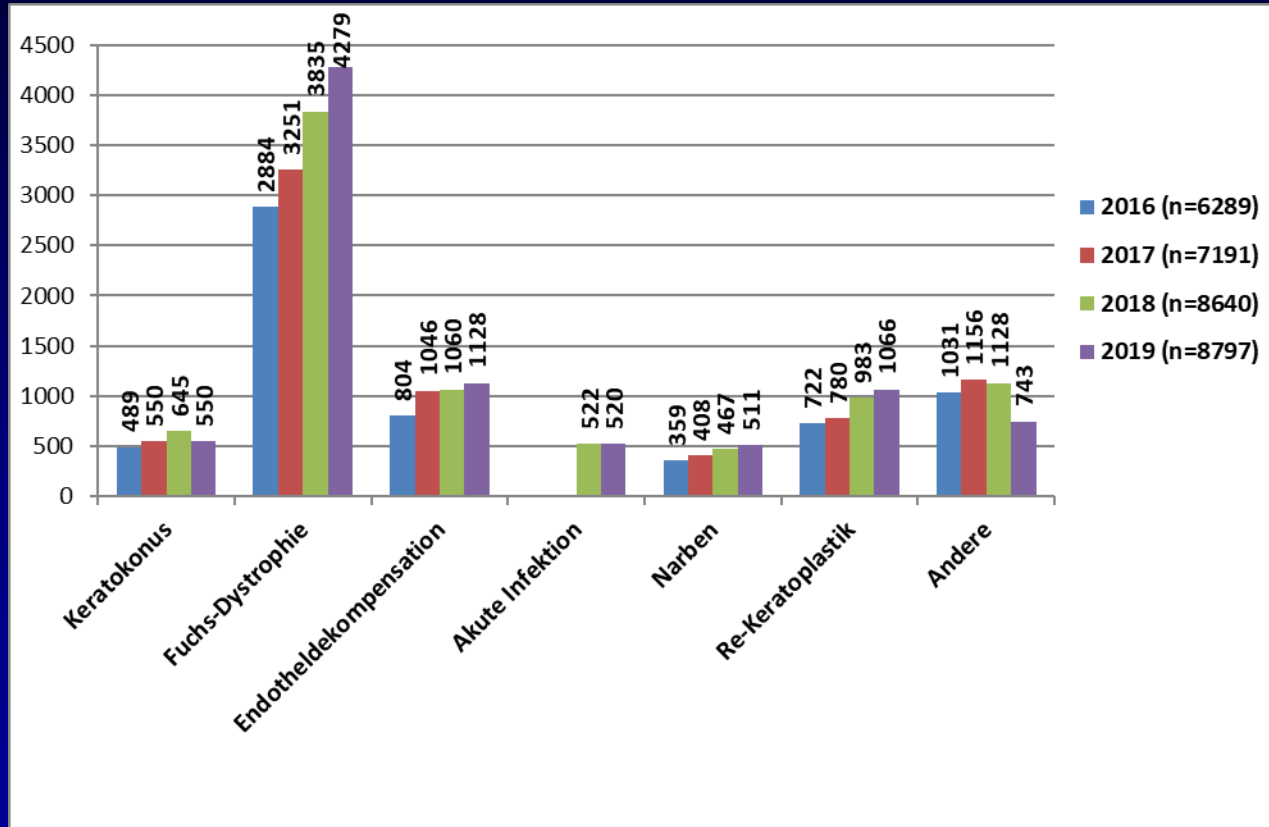
# Diagnosen 2019

## Auflistung aller gemeldeten Diagnosen von VOL, DOCH und BDOC

Gemeldete Diagnosen:	2019	8797	2018	8640
• Fuchs Dystrophie	4279	48,6 %	3835	44,4 %
• Re-Keratoplastik	1066	12,1 %	983	11,4 %
• Endotheldekompensation	1128	12,8 %	1060	12,3 %
• Keratokonus	550	6,3 %	645	7,5 %
• Narben	511	5,8 %	467	5,4 %
• Akute Infektion	520	5,9 %	522	6,0 %
• Andere	743	8,5 %	1128	13,0 %

# Diagnosen 2016 - 2019 im Vergleich

## Auflistung aller gemeldeten Diagnosen von VOL, DOCH und BDOC



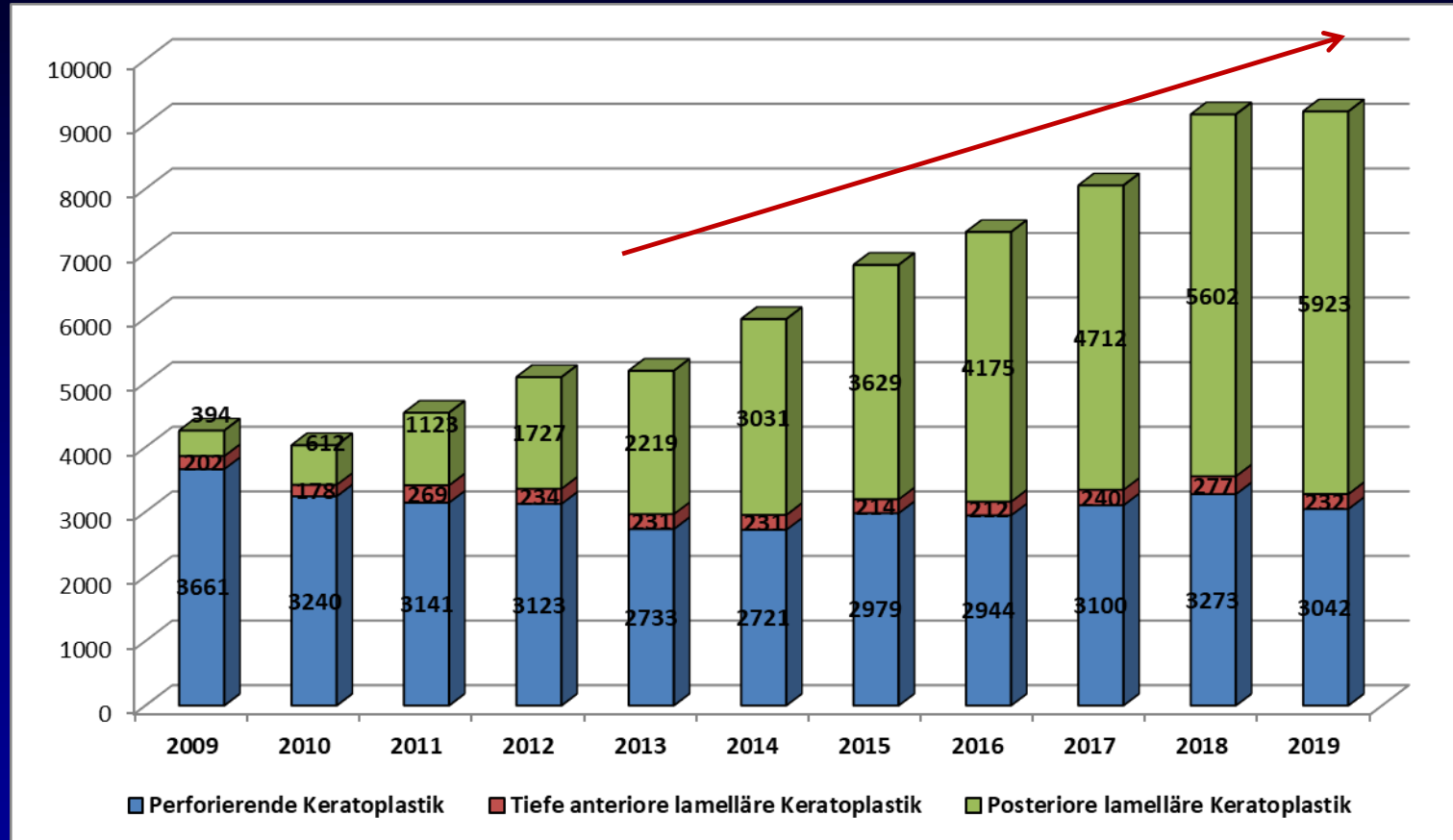


# Prozentuale Verteilung aller Keratoplastiken 2015 - 2019

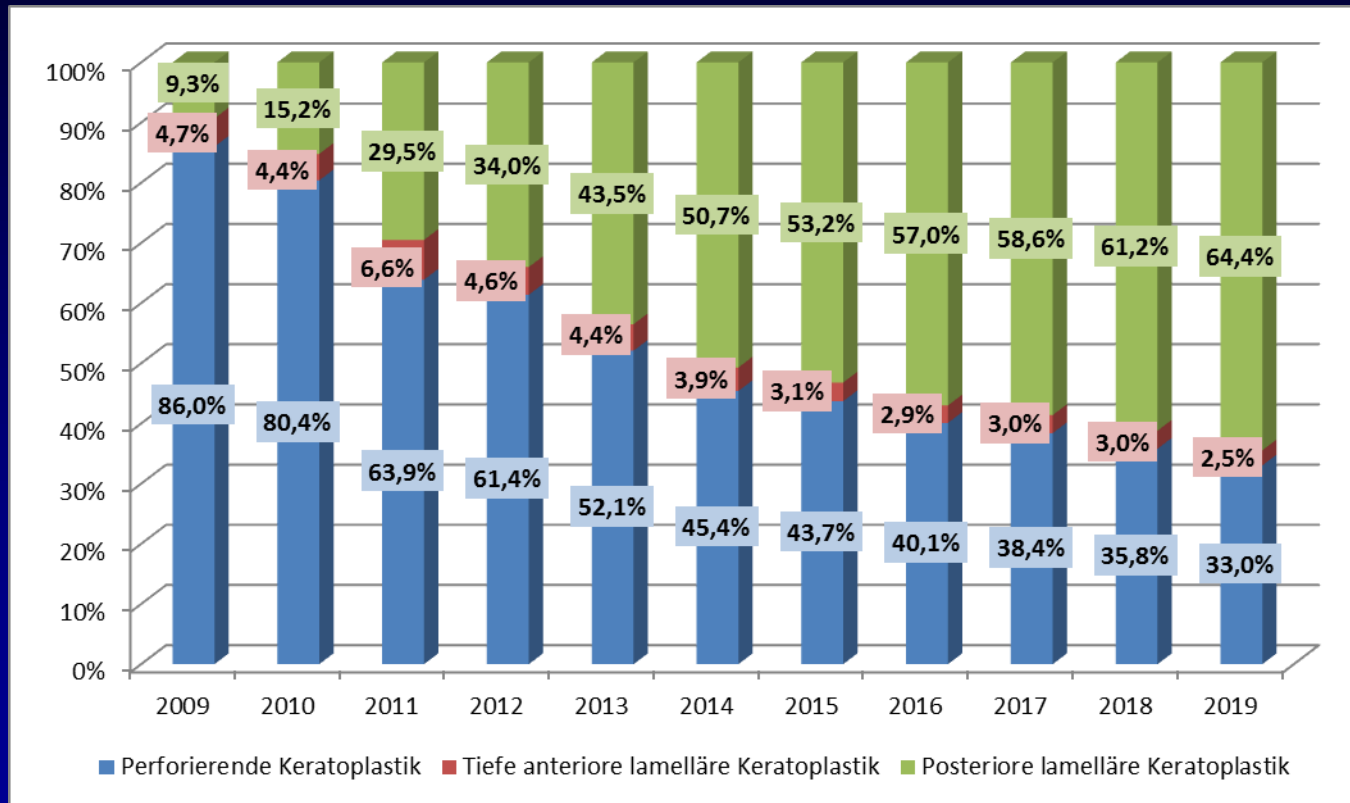
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	2015	2016	2017	2018	2019
<b>VOL</b>	77,0 %	72,5 %	71,5 %	68,8 %	70,1 %
<b>DOCH</b>	18,5 %	21,4 %	23,9 %	27,5 %	27,0 %
<b>BDOC</b>	4,5 %	6,1 %	4,6 %	3,7 %	2,9 %

# Verteilung der perforierenden und lamellären Keratoplastiken 2009 - 2019

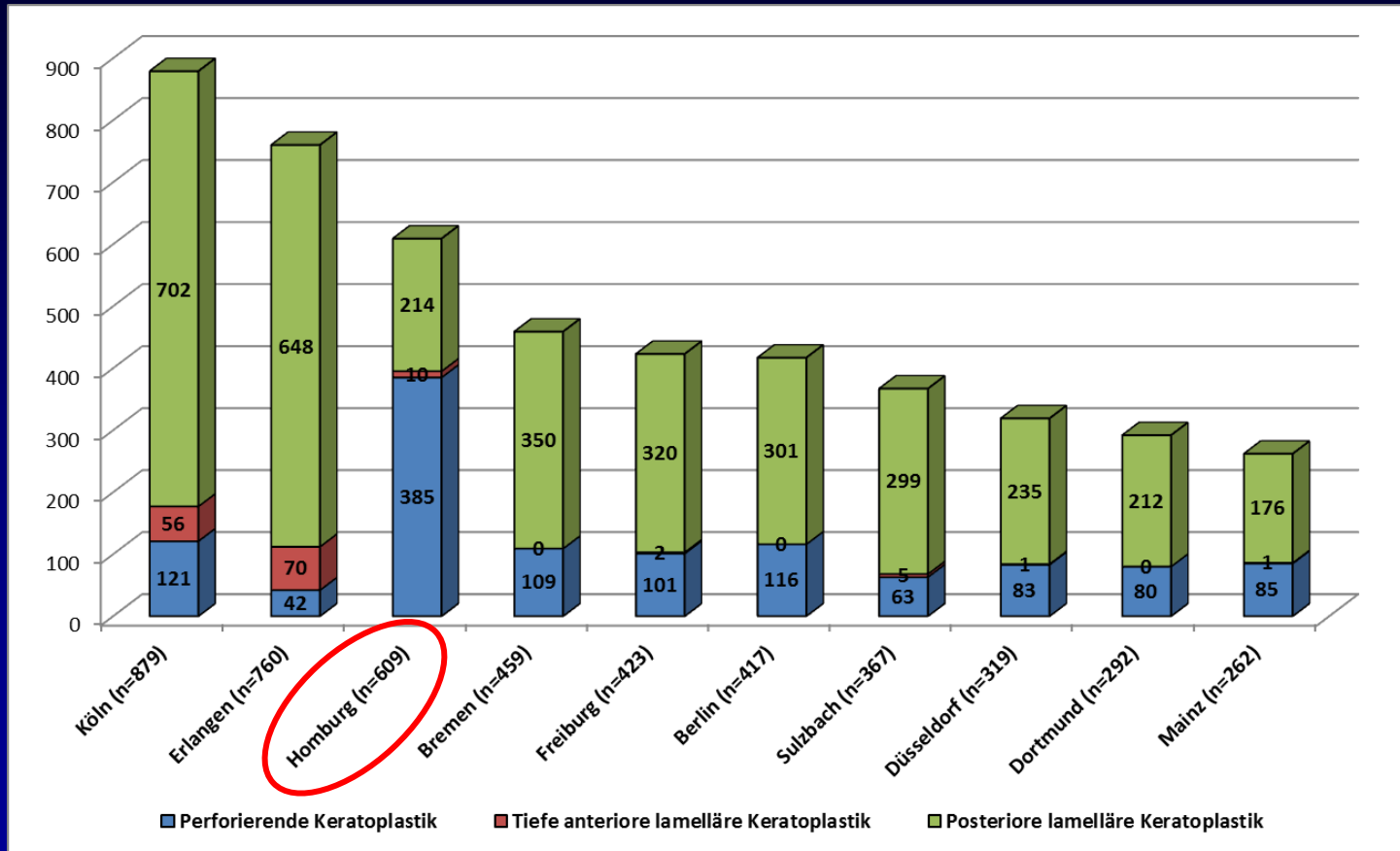


# Prozentuale Anteile der Keratoplastikmethoden 2009 - 2019

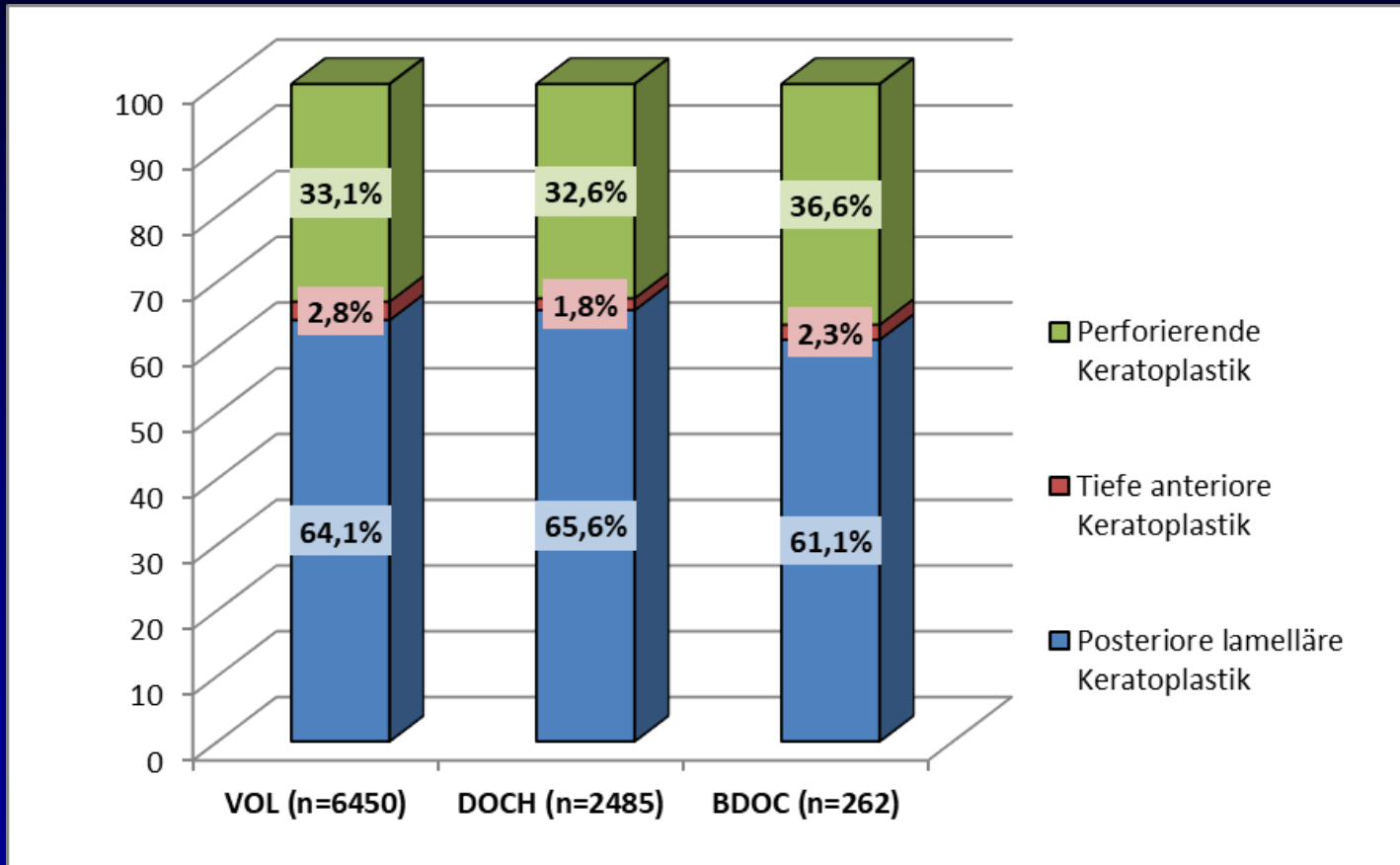


**97,5 %  
DMEK**

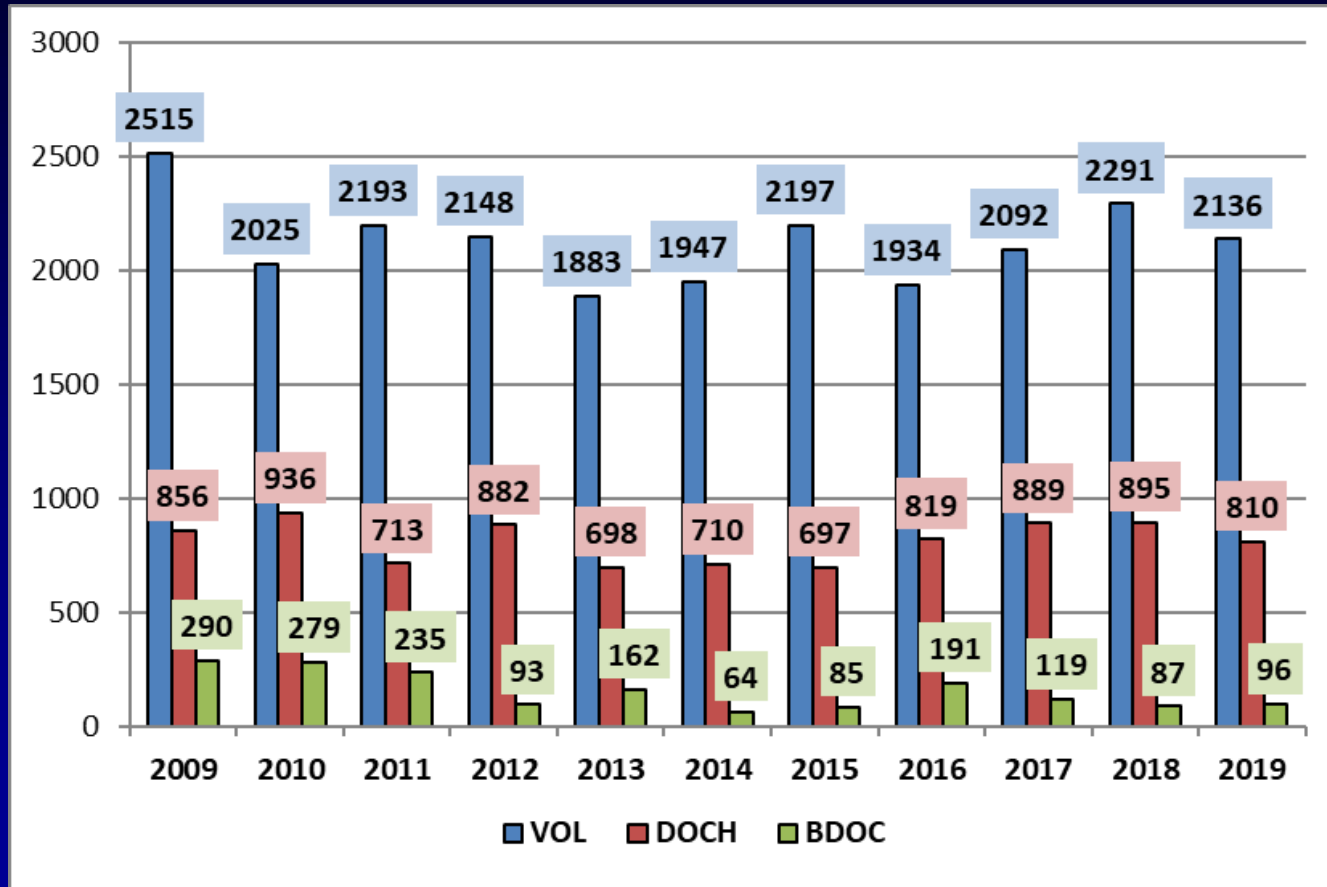
# TOP 10 Keratoplastik-Zentren in Deutschland in 2019



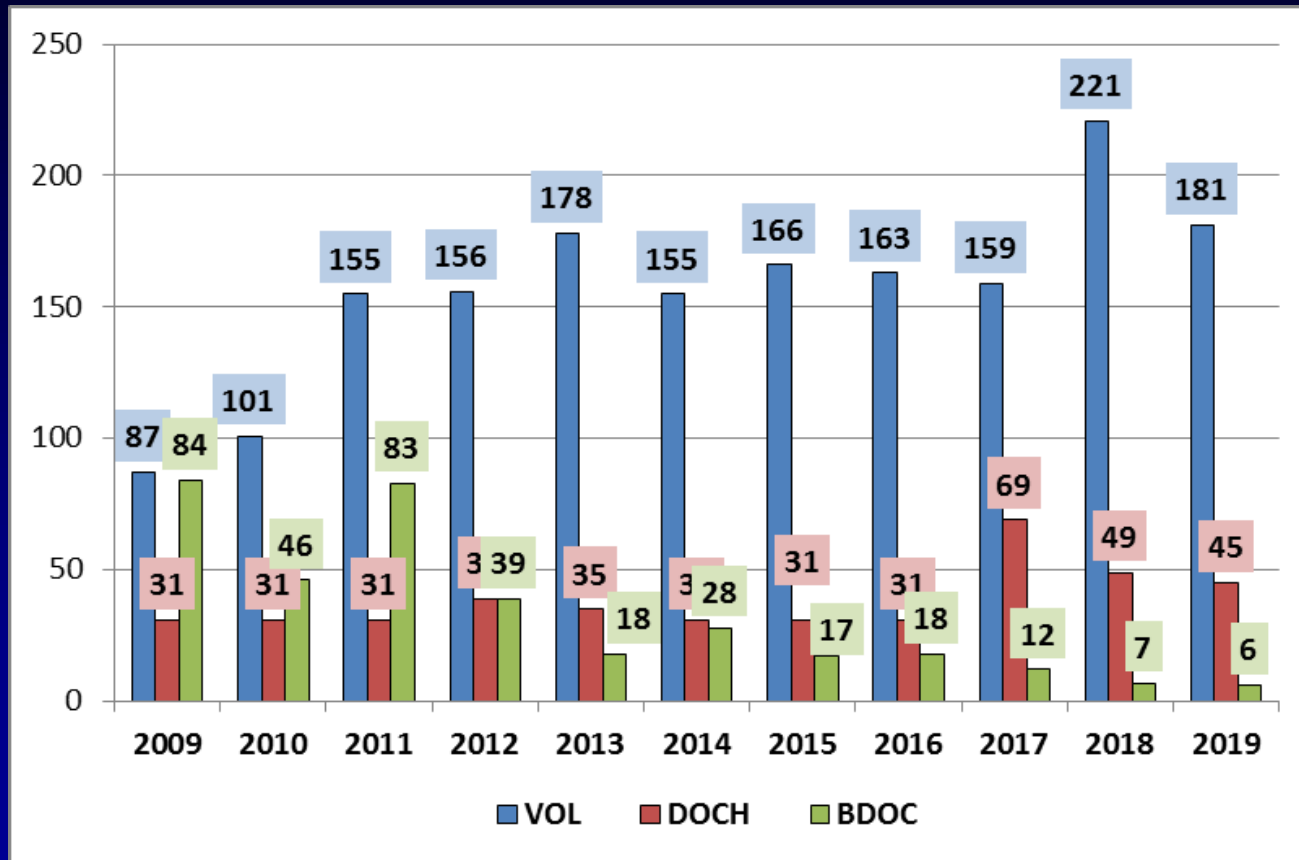
# Prozentuale Verteilung der Keratoplastiken 2019



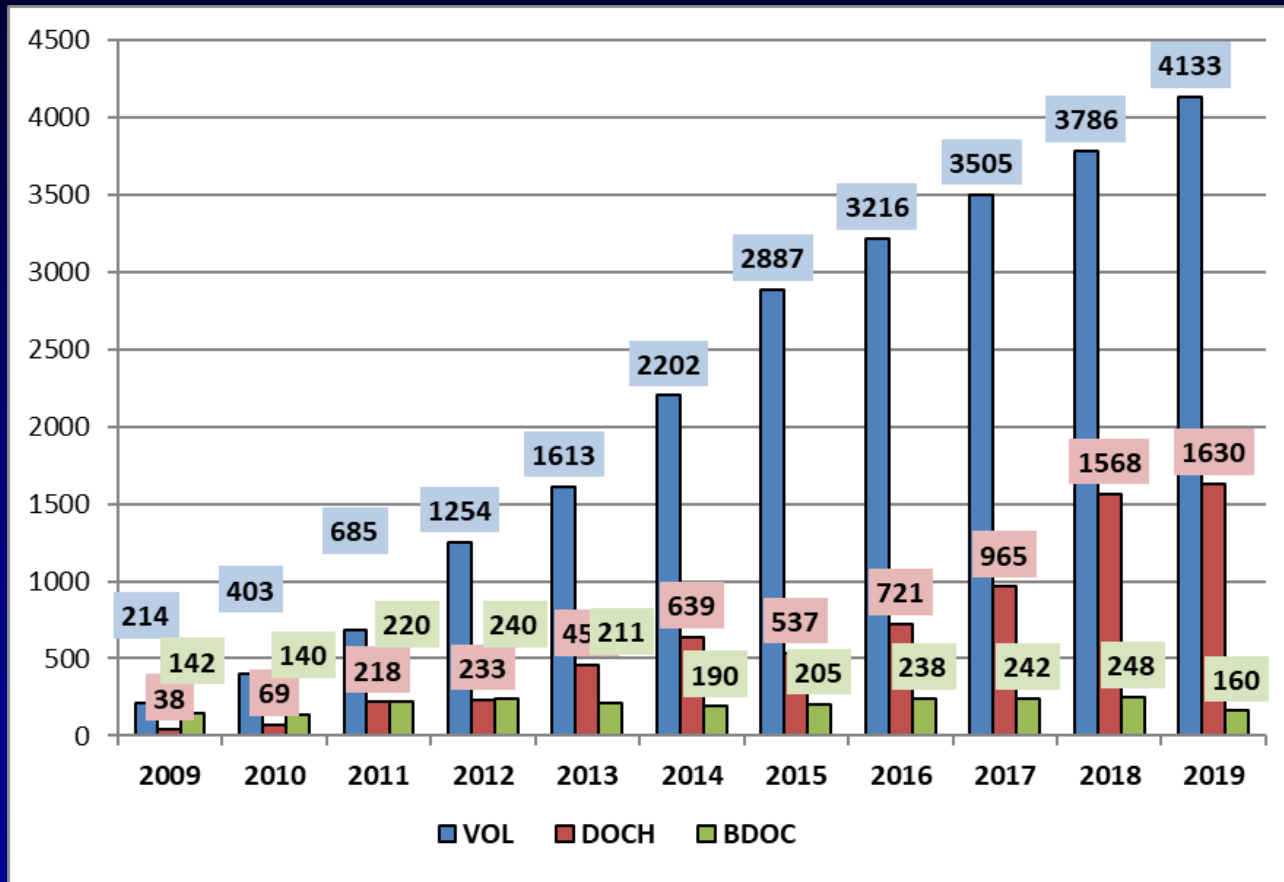
# Verteilung der perforierenden Keratoplastiken 2009 - 2019



# Verteilung der tiefen anterioren lamellären Keratoplastiken 2009 - 2019



# Verteilung der posterioren lamellären Keratoplastiken 2009 - 2019





# Posteriore lamelläre Keratoplastiken 2019

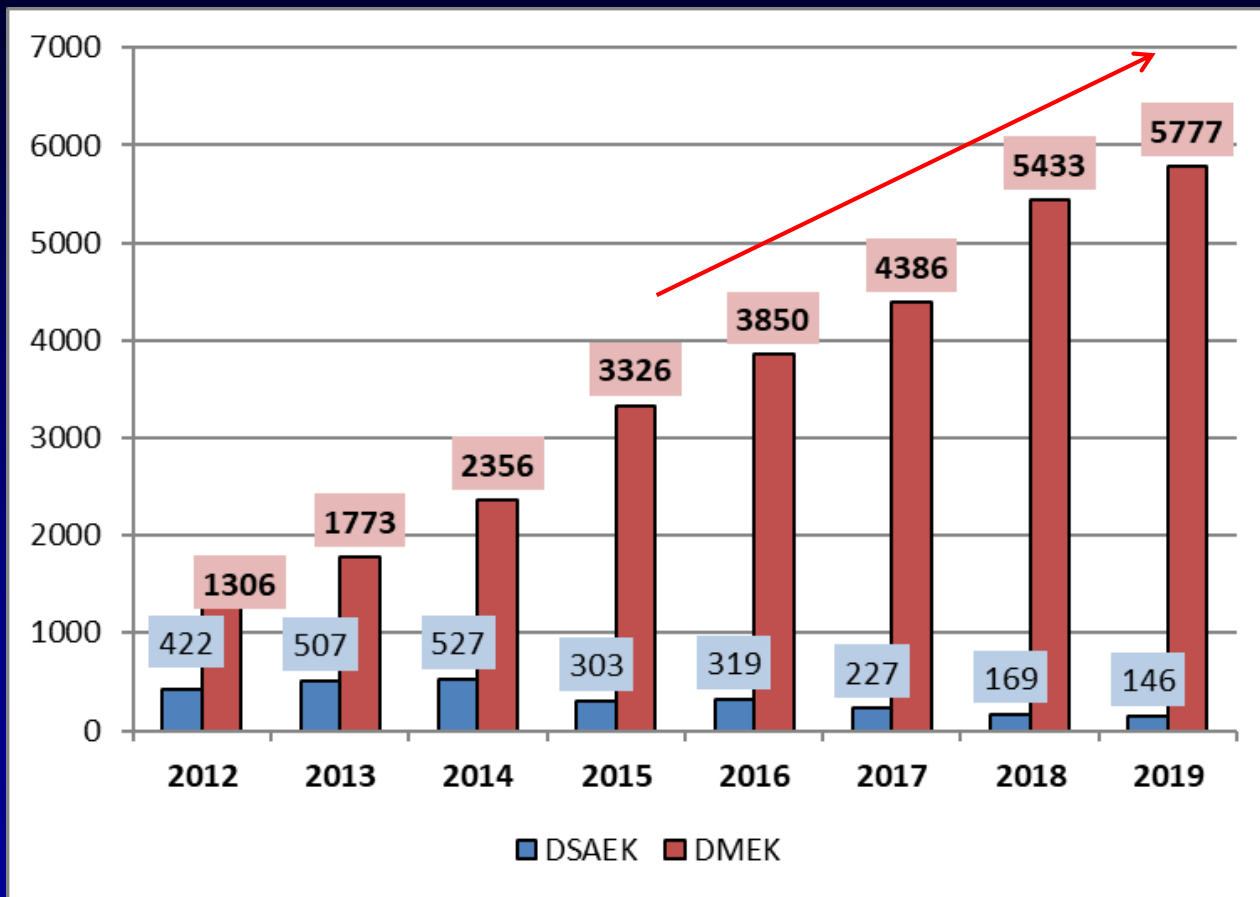
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Insgesamt gemeldet durch VOL, DOCH  
und BDOC:

**5923**

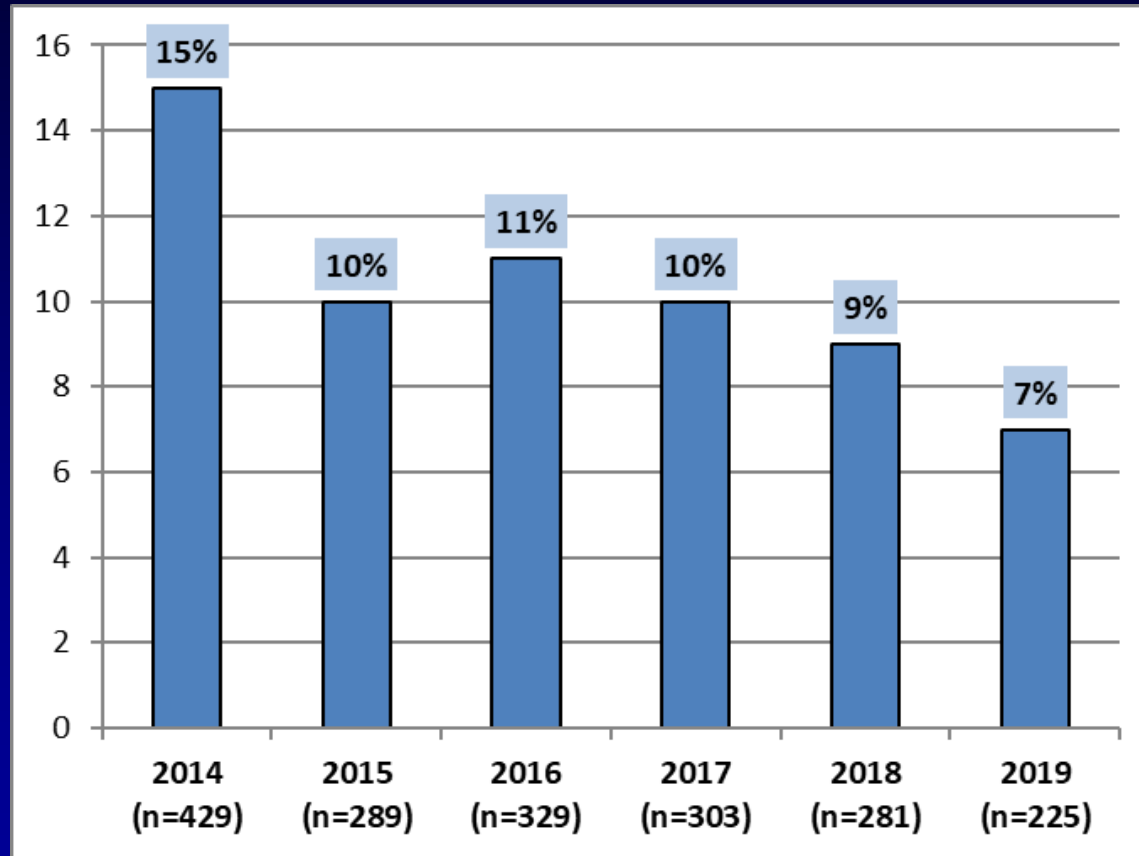
- davon DSAEK: 146 2,5 %
- **davon DMEK:** **5777 97,5 %**
- davon Pre-Cut-Tissue verwendet: 449 7,6 %
- **kombiniert mit Linsenoperation:** **2041 34,5 %**
- **davon pseudophak präop:** **2455 41,4 %**

# DMEK vs. DSAEK



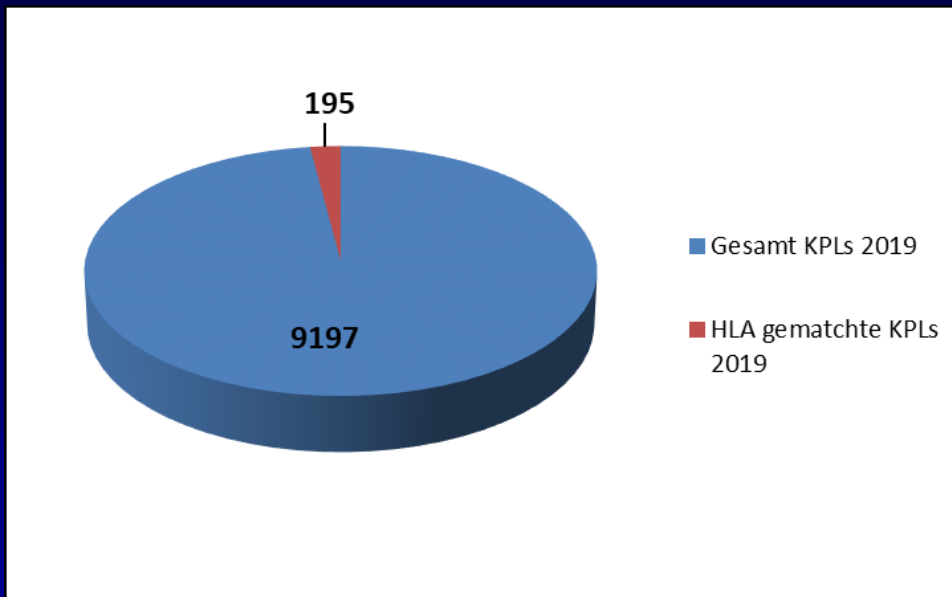
**97,5 %  
DMEK**

# Prozentualer Anteil der perforierenden Keratoplastiken kombiniert mit Linsenoperationen („Triple-Prozedur“) 2014 - 2019



# Anzahl der HLA-gematchten KPLs 2019

**195** HLA-gematchte KPL's = 2,1 %



2018: 268 HLA-gematchte KPL's von 9152 = 2,9 %

2017: 170 HLA-gematchte KPL's von 8052 = 2 %

# Patienten-Warteliste für Keratoplastik

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**4807** Patienten standen  
zum Stichtag 31.12.2019  
auf der Warteliste für eine Hornhaut!

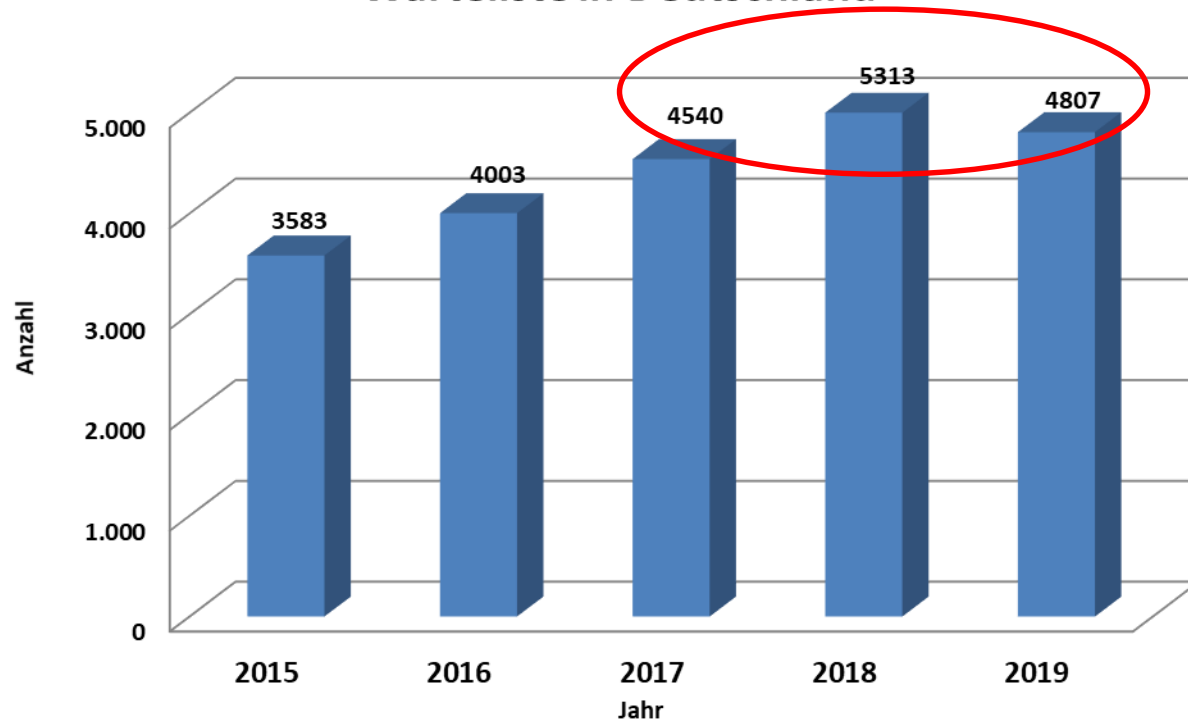
31.12.2018 = 5313

31.12.2017 = 4540

31.12.2016 = 4003

# Patienten-Warteliste 2015 - 2019

Warteliste in Deutschland



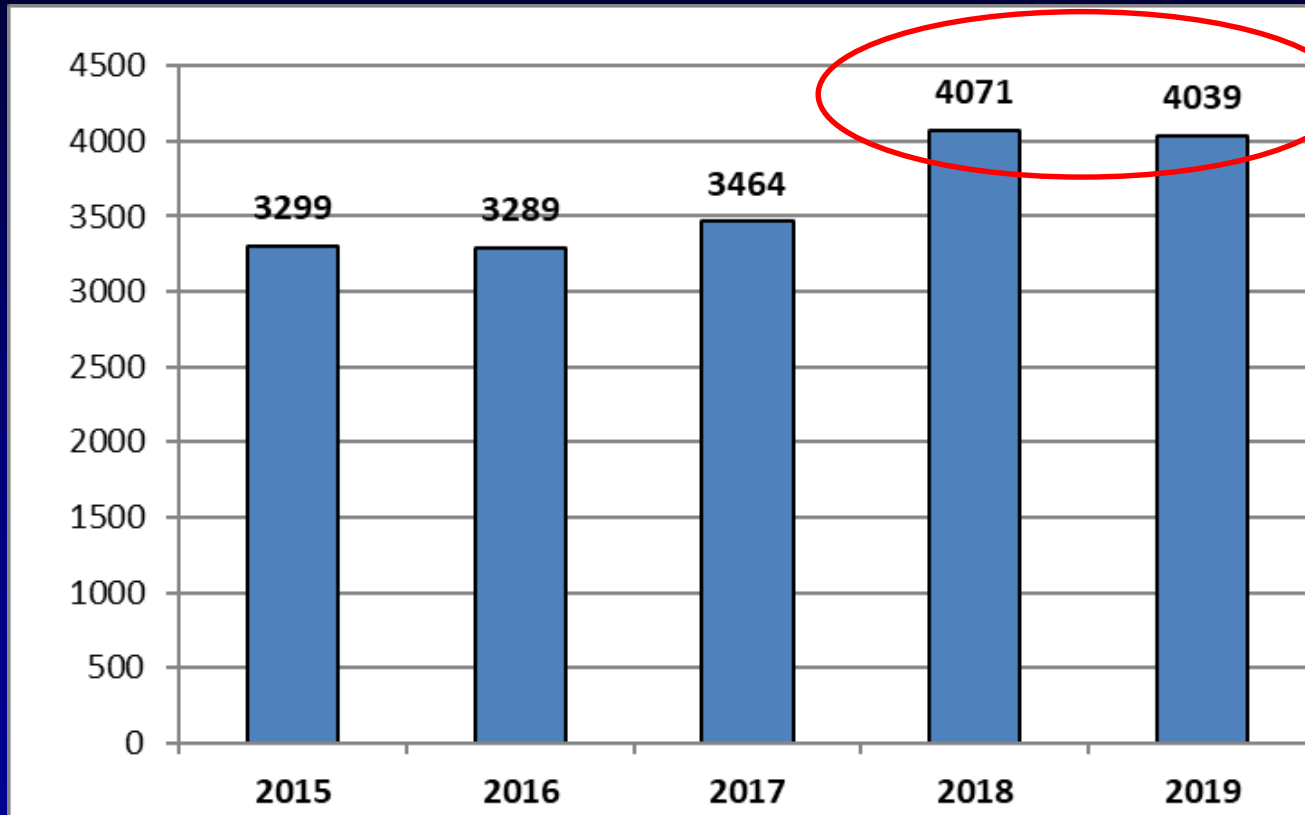
Ø Wartezeit bei:

PKP: 8 Wochen

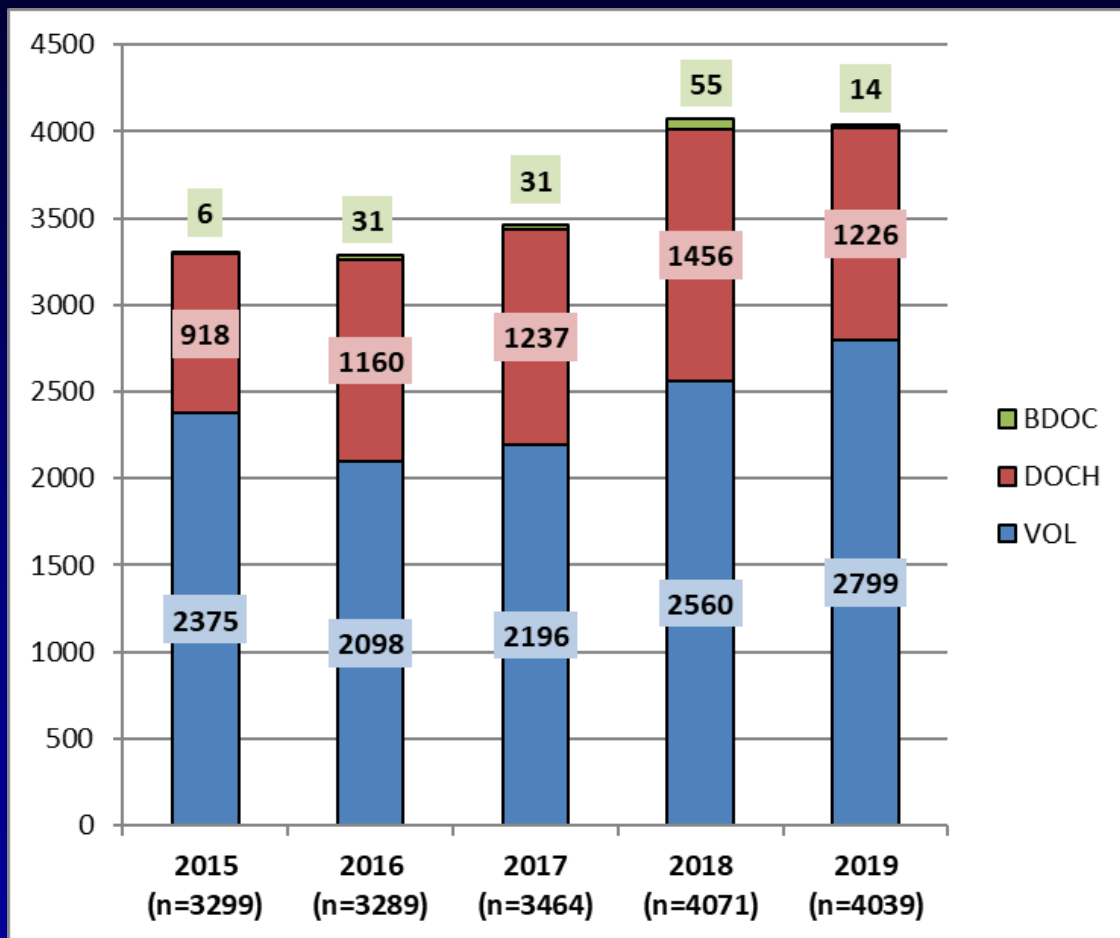
DMEK: 9 Wochen

DALK: 4 Wochen

# Amnionmembrantransplantationen 2015 - 2019



# Amnionmembrantransplantationen 2015 – 2019 (VOL, DOCH & BDOC)





# Keratoplastik DRG

	KPL	Triple
2010	1,762	1,995
2011	2,001	2,240
2012	1,980	2,338
2013	1,909	2,204
2014	1,902	2,129
2015	1,832	2,044
2016	1,772	1,934
2017	1,705	1,861
2018	1,671	1,788
2019	1,653	1,740
2020	1,478	1,542

(+Pflegegelderlös/Tag  
Bewertungsrelation: 0,6952)

(+Pflegegelderlös/Tag  
Bewertungsrelation 0,6465)

**Berechnung  
Pflegegelderlös:**  
Pflegeentgelt €185 x  
Bewertungsrelation =  
Pflegegelderlös/Tag

(Entlassungstag zählt  
nicht mit)

**Basisfallwert Saarland 2019: 3.568,50 €**  
**Basisfallwert Saarland 2020: 3.695,00 €**



# Publikation

## Trends in Corneal Transplantation from 2001 to 2016 in Germany: A Report of the DOG-Section Cornea and its Keratoplasty Registry




ELIAS FLOCKBRZI, PHILIP MAIER, DANIEL BÖHRINGER, HELGA REINSHAGEN, FRIEDRICH KRUSE, CLAUS CURSIEFEN, THOMAS REINHARD, GERD GEERLING, NECIP TORUN, AND BERTHOLD SEITZ, ON BEHALF OF ALL GERMAN KERATOPLASTY REGISTRY CONTRIBUTORS

- **PURPOSE:** The purpose of this retrospective panel study was to provide an overview of absolute numbers and of trends in the types of and indications for corneal transplantation in Germany from 2001 to 2016.
- **METHODS:** A questionnaire about absolute numbers, types of transplantation, and indications was sent to 111 ophthalmologic departments in Germany, out of which 94 (85%) provided their data.
- **RESULTS:** Since the year 2001, the number of corneal transplantations has increased by 1.5-fold, from 4730 penetrating keratoplasties (PKPs) in 2001 to 7325 penetrating and lamellar keratoplasties in 2016. The shift from penetrating to lamellar procedures began in 2006. In 2014, lamellar procedures (231 [4%] anterior and 2883 [49%] posterior lamellar keratoplasties) surpassed PKPs (2721, 47%) for the first time. Main indications for keratoplasty in Germany (2016) are Fuchs endothelial corneal dystrophy (46%), pseudophakic corneal decompensation (bullous keratopathy, 13%), repeated keratoplasty after graft failure (11%), keratoconus (8%), and corneal scarring (6%); others: 16%. The number of Descemet membrane endothelial keratoplasties (DMEKs) was 12 times higher (3850, 53%) than Descemet stripping automated endothelial keratoplasties (DSAEKs, 319, 4.4%) in 2016. The proportion of deep anterior lamellar keratoplasties (DALKs) never exceeded 6% (269 in 2011).
- **CONCLUSIONS:** The number of keratoplasties in Germany has increased from 2001 to 2016. Since

2014, posterior lamellar keratoplasties have surpassed PKPs. There was a constant increase of DMEKs, with a 12-fold higher number compared to DSAEKs in 2016. The shorter recovery time after DMEK seems to contribute to the trend toward earlier operative intervention in corneal endothelial diseases. (Am J Ophthalmol 2018;188:91-98. © 2018 The Author(s). Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

**P**ENETRATING KERATOPLASTY (PKP) IS ONE OF THE oldest, the most commonly performed, and the most successful transplantation in humans.<sup>1</sup> The first successful corneal transplantation was performed by Eduard Zirm in Olmütz (today Olomouc, Czech Republic) in 1905.<sup>2</sup> The penetrating procedure remained the gold standard in the cure of corneal diseases for much of the 20th century. The process of developing further corneal transplantation techniques already began in the middle of the 20th century, when Tillett described the concept of a posterior lamellar keratoplasty in 1956.<sup>3</sup> This pioneering concept was not adopted at that time because it was associated with poor vision<sup>4</sup> in comparison with the penetrating procedure. At the end of the 20th century, in 1998, Melles and associates revitalized not only the concept of a posterior lamellar keratoplasty by presenting the successful attachment of a posterior lamellar graft consisting of stroma, Descemet membrane, and endothelium to recipient stroma without suturing<sup>4,5</sup> but also the concept of deep anterior lamellar keratoplasty (DALK), which initiated the new era of increasingly implementing lamellar techniques in day-to-day practice. The concept of Descemet membrane endothelial keratoplasty (DMEK) was also published by Melles and associates in 2006.<sup>5</sup>

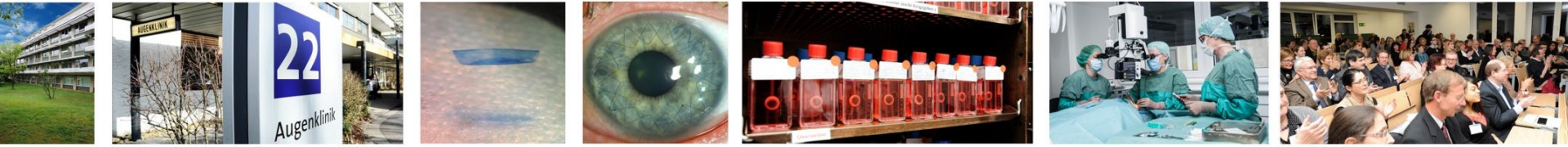
The aim of this manuscript is to reflect on the changing trends in absolute numbers, surgical techniques, and indications of corneal transplantations having been performed over a period of 16 years in Germany between 2001 and 2016, as evidenced by data from the German Keratoplasty Registry from the Cornea Section of the German Ophthalmological Society (DOG).

 Supplemental Material available at [AJCO.com](http://ajco.com).

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# Augenärzte sind Organspender!



**Besten Dank für Ihre Aufmerksamkeit!**

[berthold.seitz@uks.eu](mailto:berthold.seitz@uks.eu)

