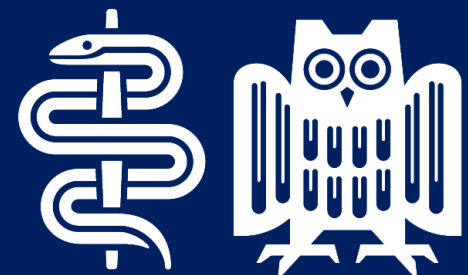


# Deutsches Keratoplastikregister 2022

## Sektion DOG-Kornea

Berthold Seitz

Klinik für Augenheilkunde, Universitätsklinikum des Saarlandes UKS, Homburg/Saar

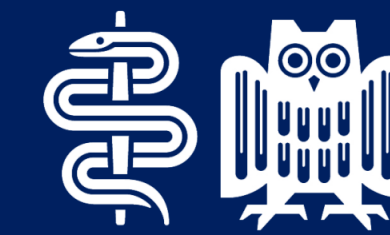


**UKS**  
Universitätsklinikum  
des Saarlandes

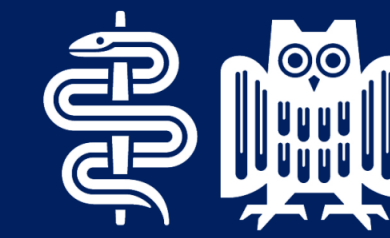
Klinik für Augenheilkunde



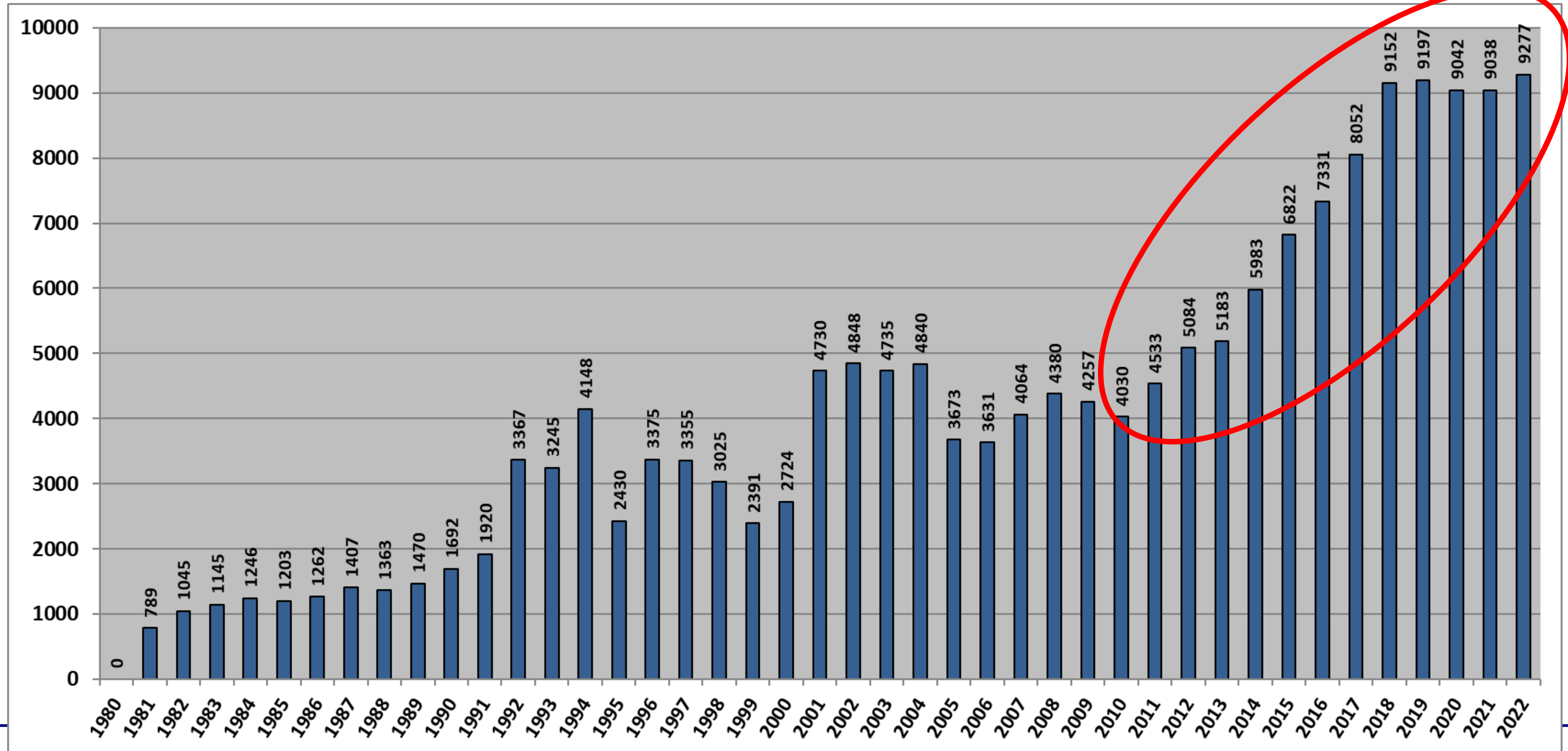
Klaus  
Faber  
Zentrum

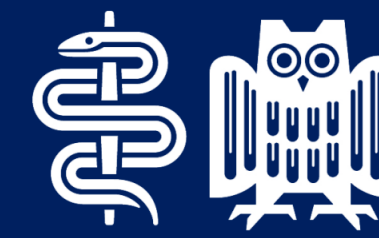


- Von **105** Kliniken (durch die *Sektion DOG-Kornea* angeschrieben) haben 89 geantwortet  
= 85% (VOL: 92 %; DOCH: 80 %)  
(2021: 79 Rückmeldungen)

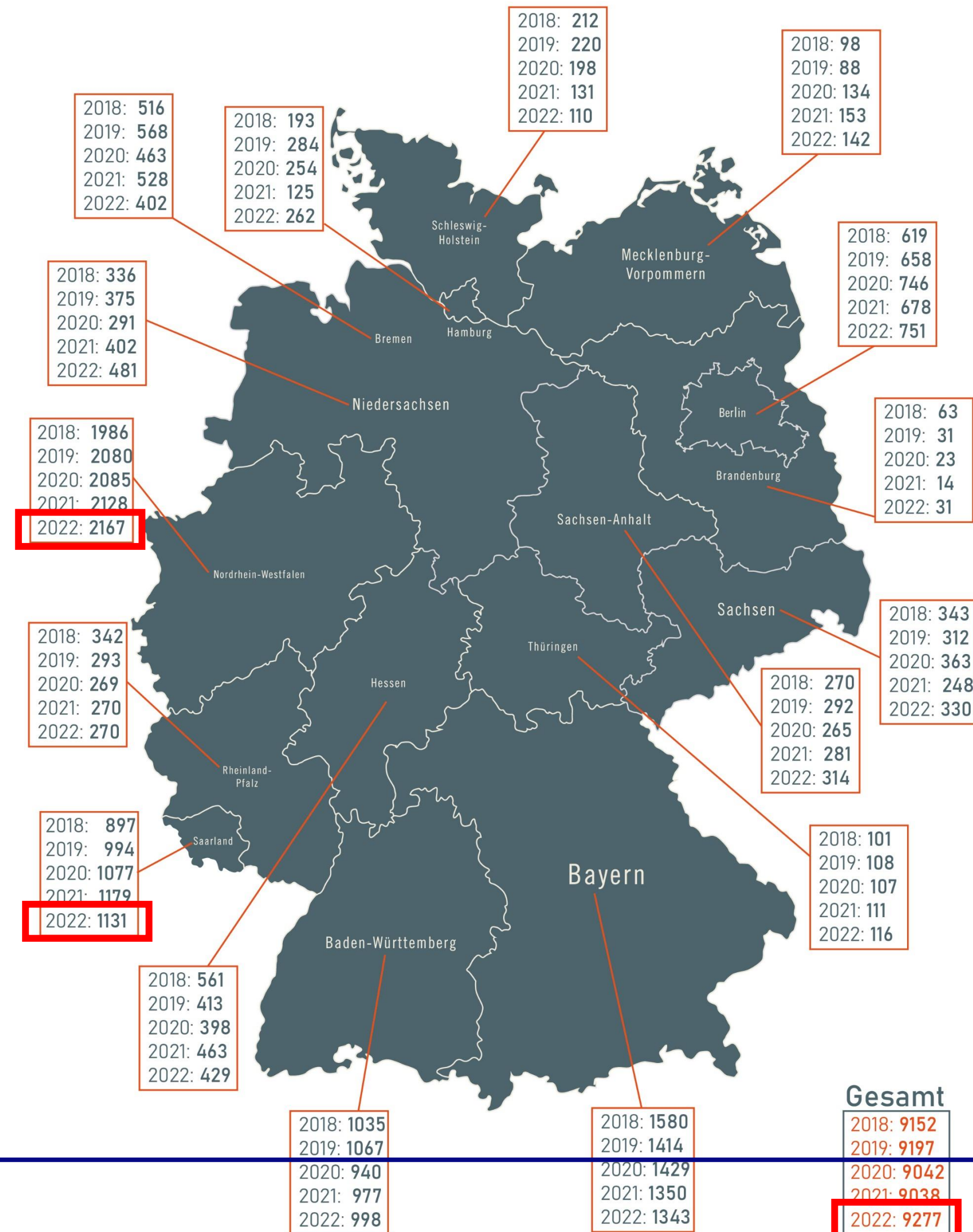


# Gemeldete Hornhauttransplantationen 1980-2022





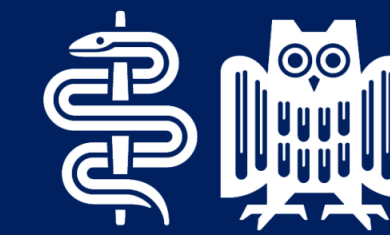
## Keratoplastiken nach Bundesländern 2018-2022



# Keratoplastiken 2016-2022

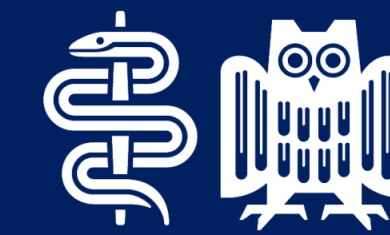


	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
Gesamtsumme	<b>7331</b>	<b>8052</b>	<b>9152</b>	<b>9197</b>	<b>9042</b>	<b>9038</b>	<b>9277</b>
Mittelwert	<b>68</b>	<b>86</b>	<b>86</b>	<b>102</b>	<b>97</b>	<b>102</b>	<b>96</b>
Median	<b>21</b>	<b>24</b>	<b>28</b>	<b>40</b>	<b>35</b>	<b>42</b>	<b>34</b>
Minimum	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Maximum	<b>880</b>	<b>868</b>	<b>819</b>	<b>879</b>	<b>834</b>	<b>805</b>	<b>828</b>

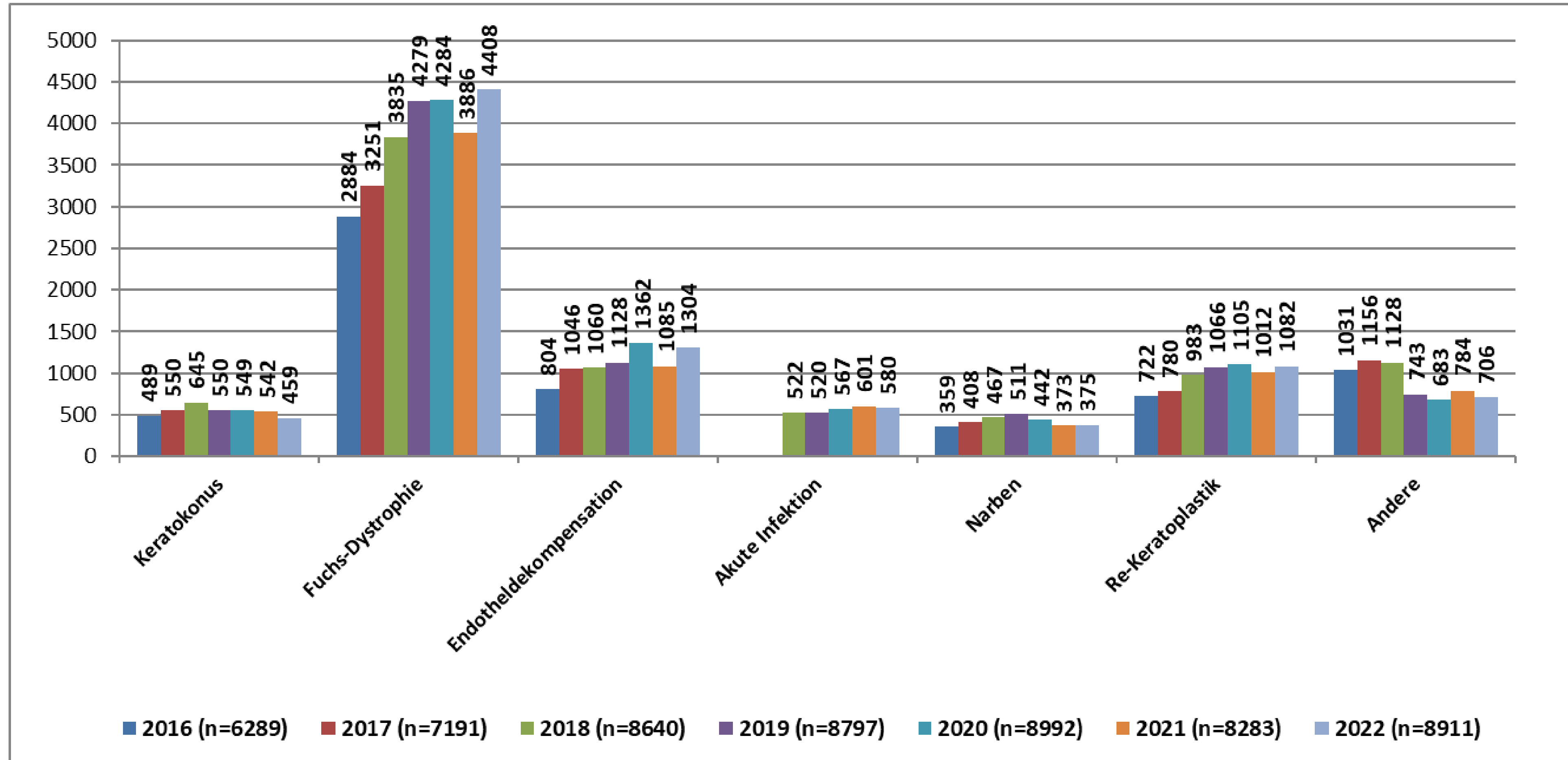


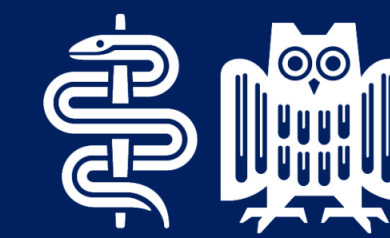
## Auflistung aller gemeldeten Diagnosen von VOL, DOCH und BDOC

	2022		2021		2020	
Gemeldete Diagnosen:	8914		8322		8992	
• <b>Fuchs Dystrophie</b>	<b>4408</b>	<b>49,5%</b>	<b>3895</b>	<b>46,8%</b>	<b>4284</b>	<b>47,7%</b>
• Re-Keratoplastik	1082	12,1%	1016	12,2%	1105	12,3%
• Endotheldekompensation	1304	14,6%	1107	13,3%	1362	15,1%
• <b>Keratokonius</b>	459	5,1%	542	6,5%	549	6,1%
• Narben	375	4,2%	373	4,5%	442	4,9%
• Akute Infektion	580	6,5%	601	7,2%	567	6,3%
• Andere	706	8,0%	788	9,5%	683	7,6%

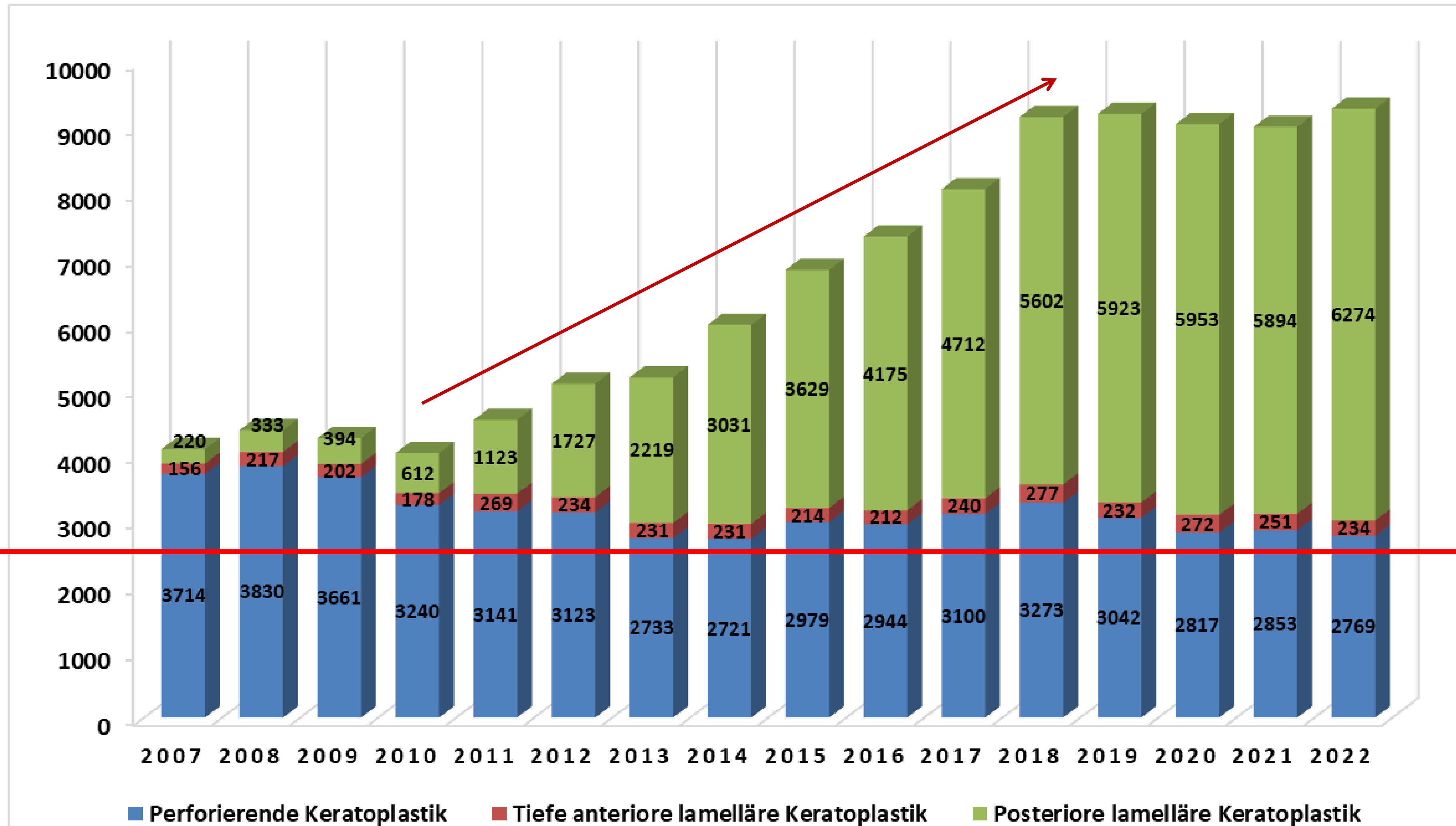


## Auflistung aller gemeldeten Diagnosen von VOL, DOCH und BDOC

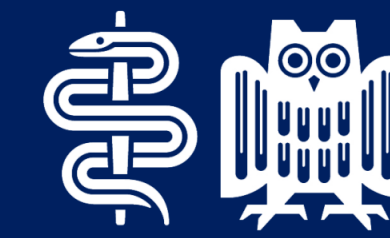




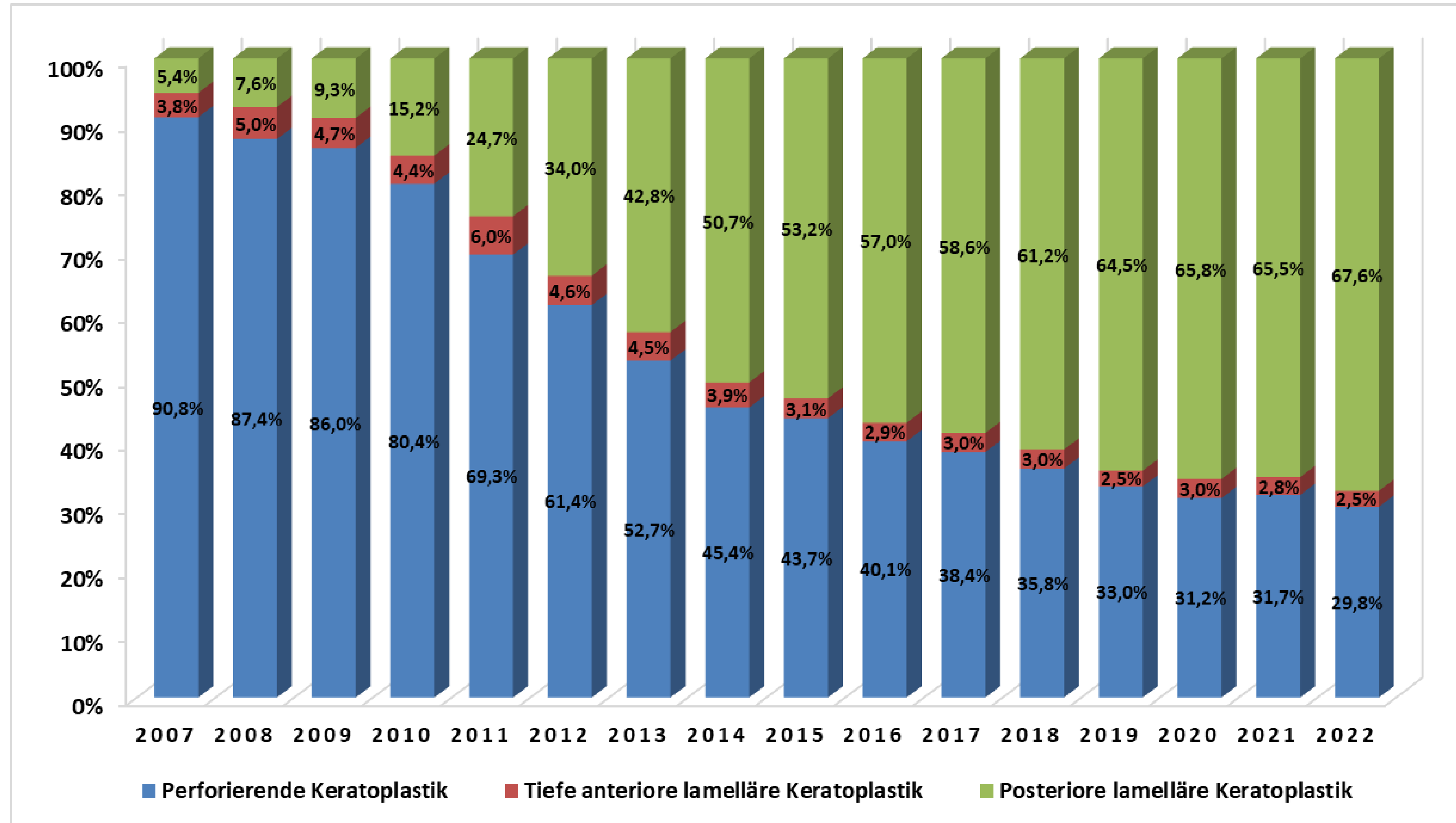
# Verteilung der Keratoplastiken 2007-2022



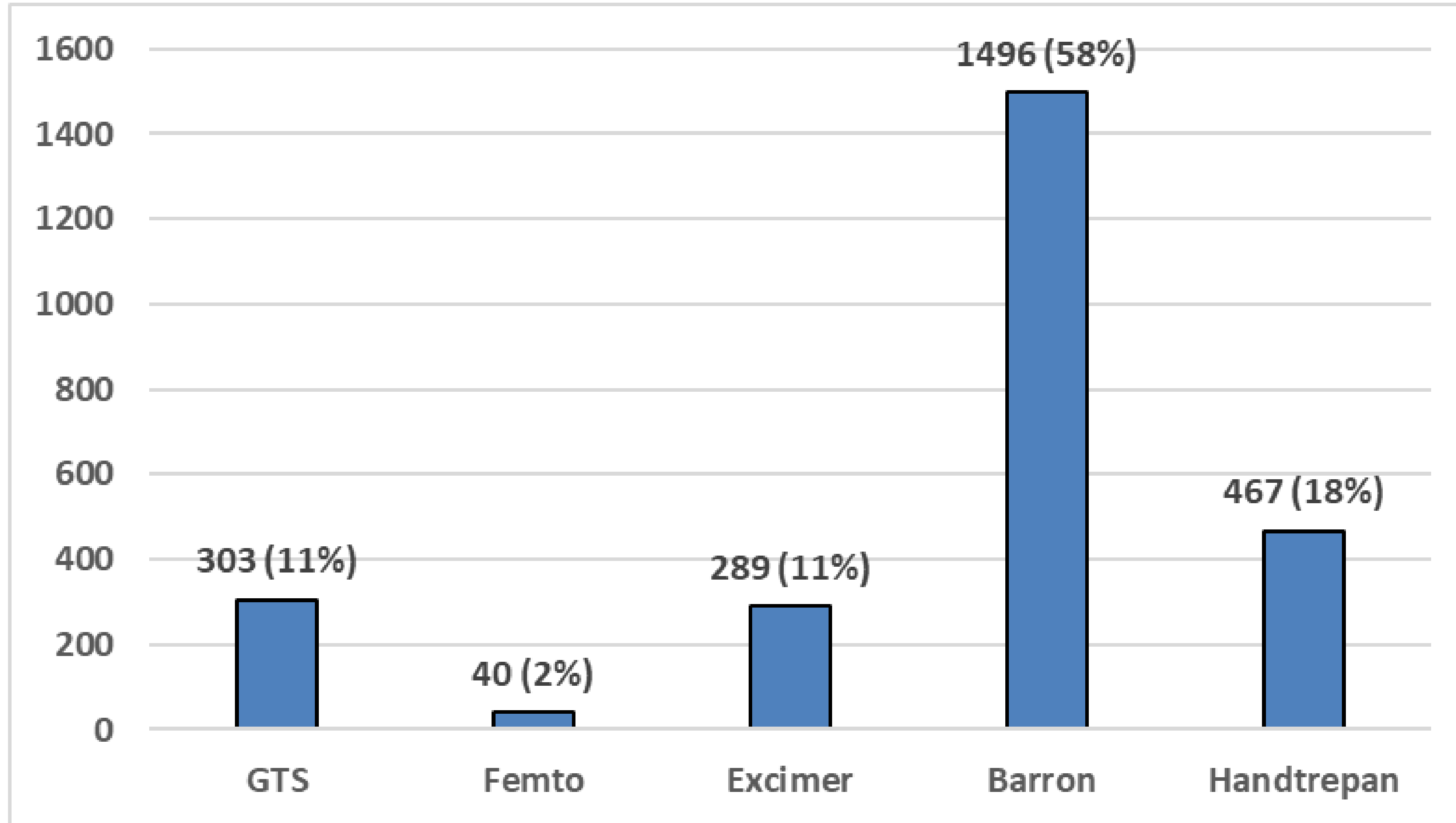
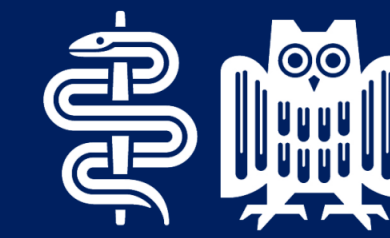




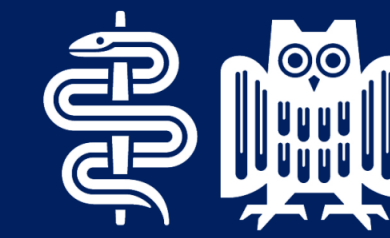
# Prozentuale Anteile der Keratoplastikmethoden



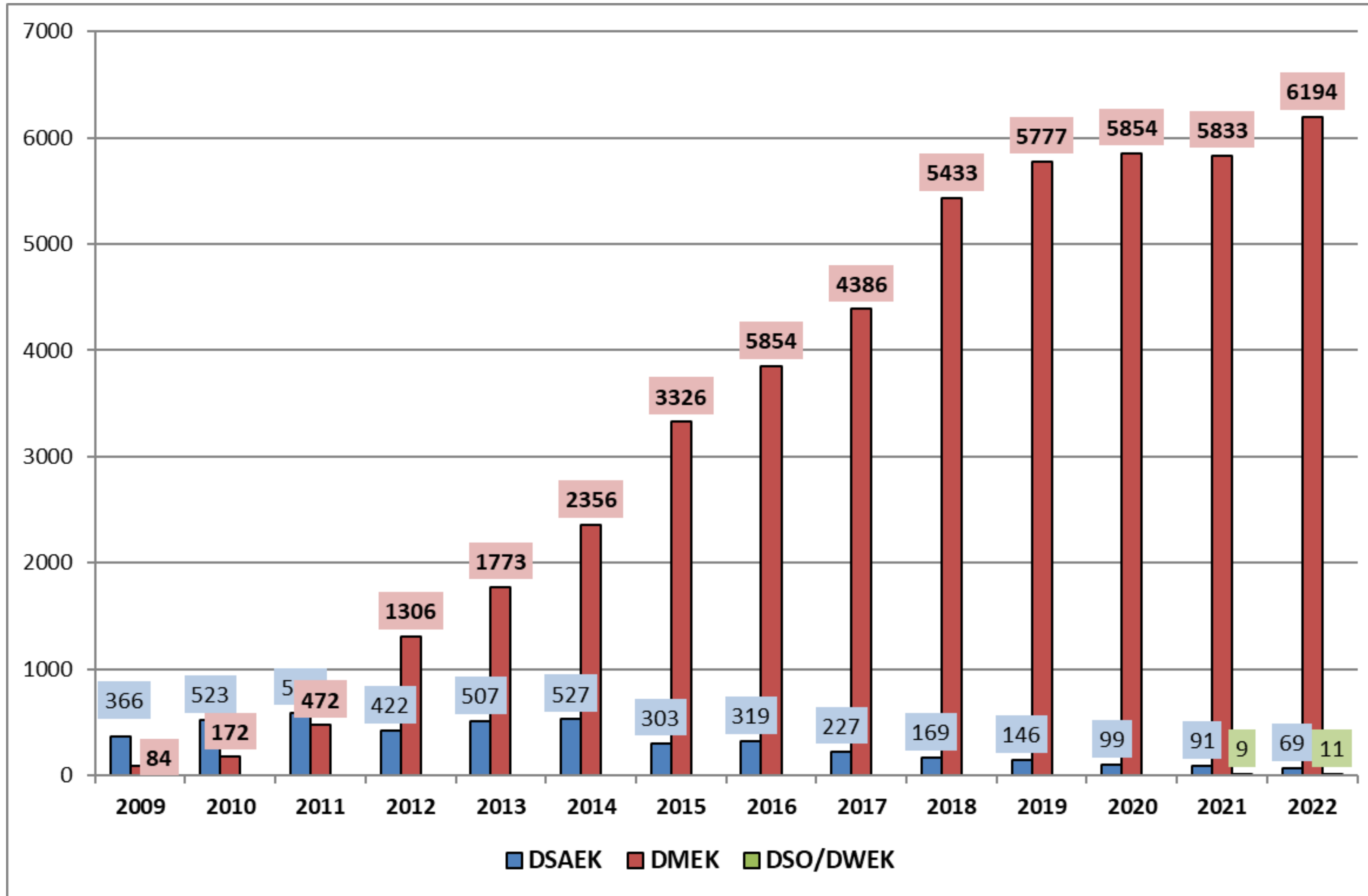
# Trepanationssysteme 2022



n = 2595 (aus  
Gesamtsumme  
PKP = 2769)



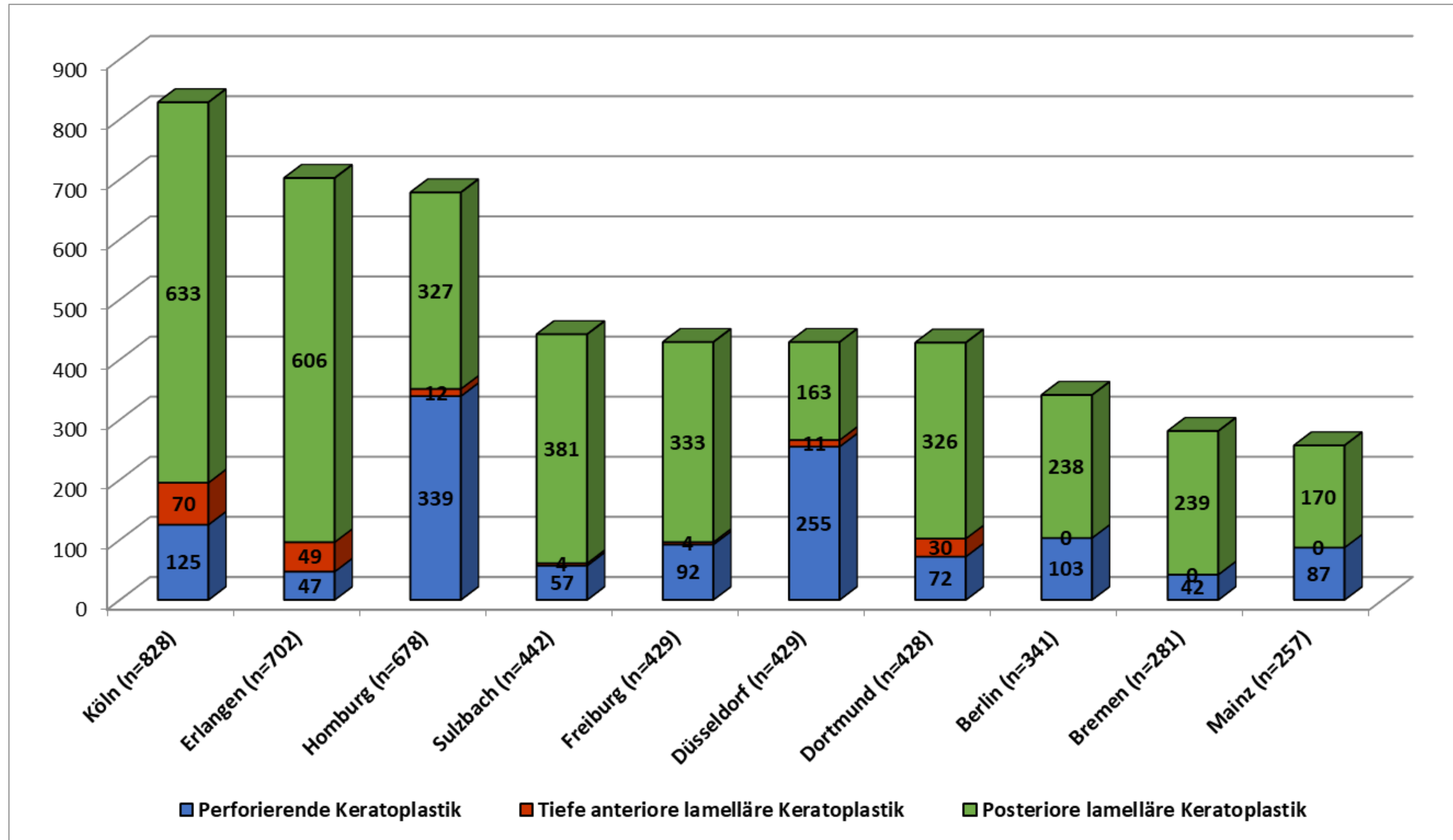
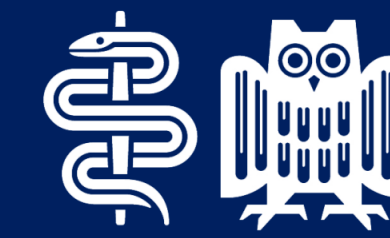
# DMEK vs. DSAEK (plus DSO/DWEK)

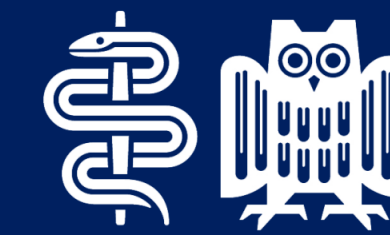


**98,7 %  
DMEK**

Flockerzi E, Turner C, Seitz B, Collaborators GSG; GeKeR Study Group. Descemet's membrane endothelial keratoplasty is the predominant keratoplasty procedure in Germany since 2016: a report of the DOG-section cornea and its keratoplasty registry. Br J Ophthalmol. 2023 Aug 16 Epub ahead of print.

# TOP 10 Keratoplastik-Zentren in Deutschland 2022



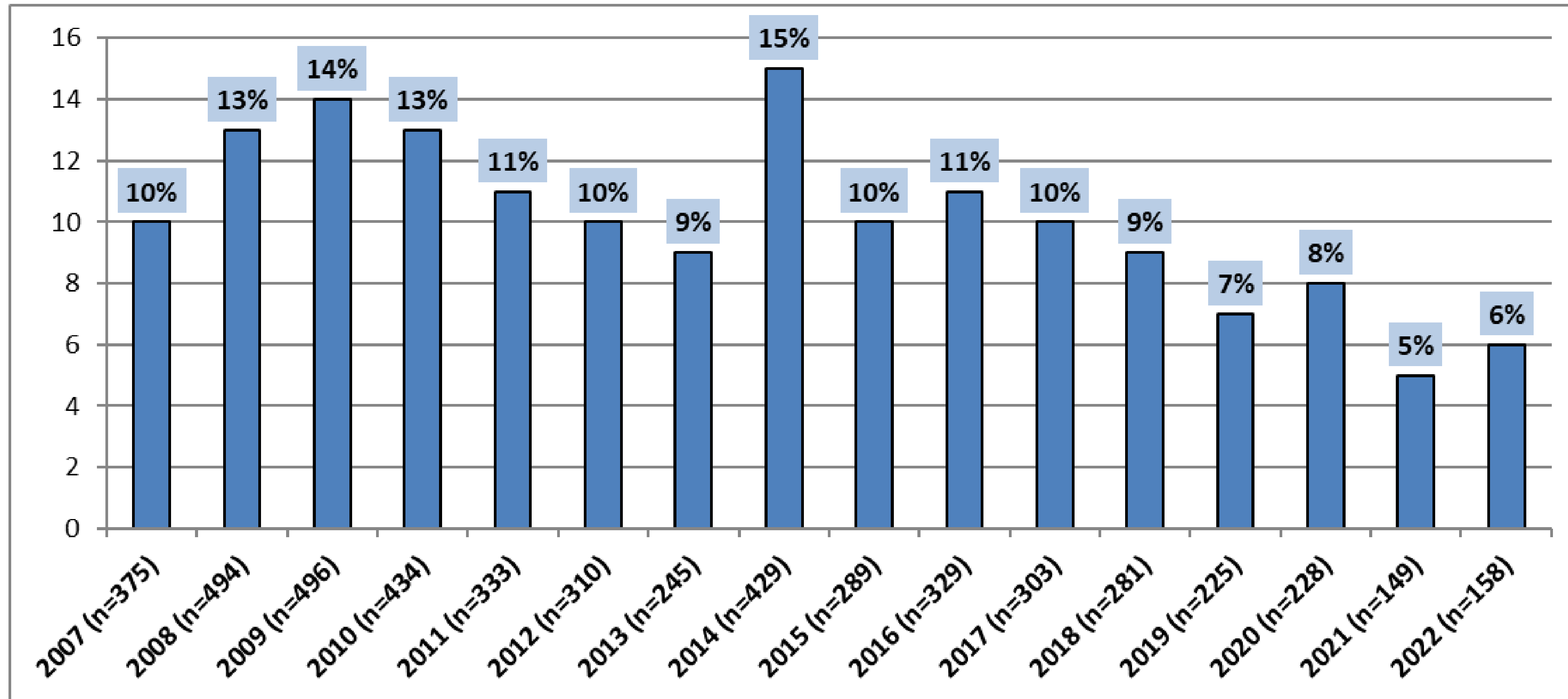


Insgesamt gemeldet durch VOL, DOCH  
und BDOC:

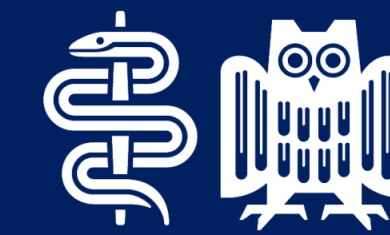
• Davon DSAEK:	69	1,1%
• <b>Davon DMEK:</b>	<b>6194</b>	<b>98,7%</b>
• Davon DSO/DWEK	11	0,2%
• Davon Endo-Art	2	0,03%
• Davon Pre-Cut-Tissue verwendet:	426	6,8%
• <b>Kombiniert mit Linsenoperation:</b>	<b>2141</b>	<b>34,1%</b>
• <b>Davon pseudophak präop</b>	<b>2432</b>	<b>38,8%</b>

# Prozentualer Anteil („Triple-Prozedur“)

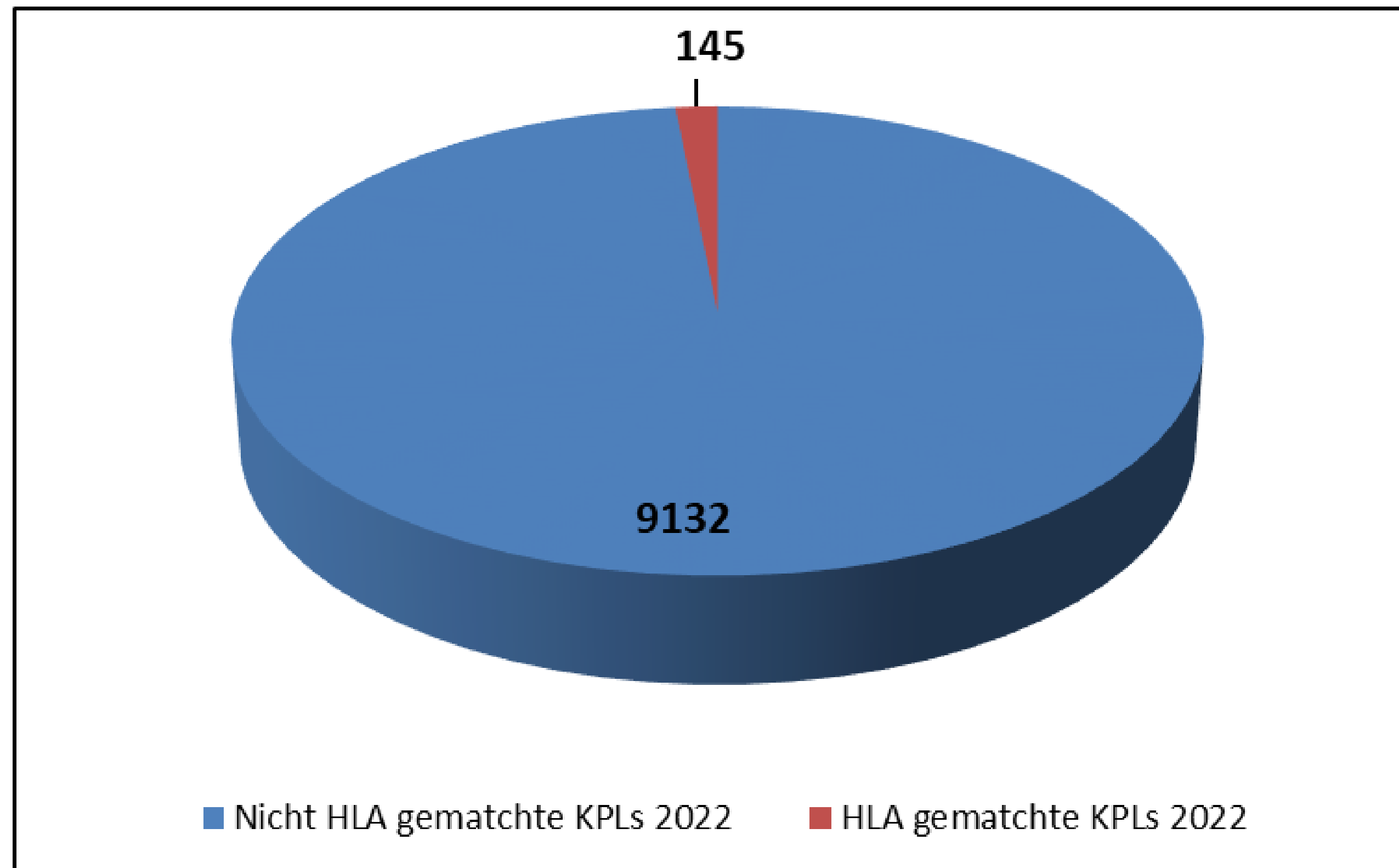
## Prozentualer Anteil der PKP kombiniert mit Linsenoperationen



# Anzahl der HLA-gematchten KPLs in 2022



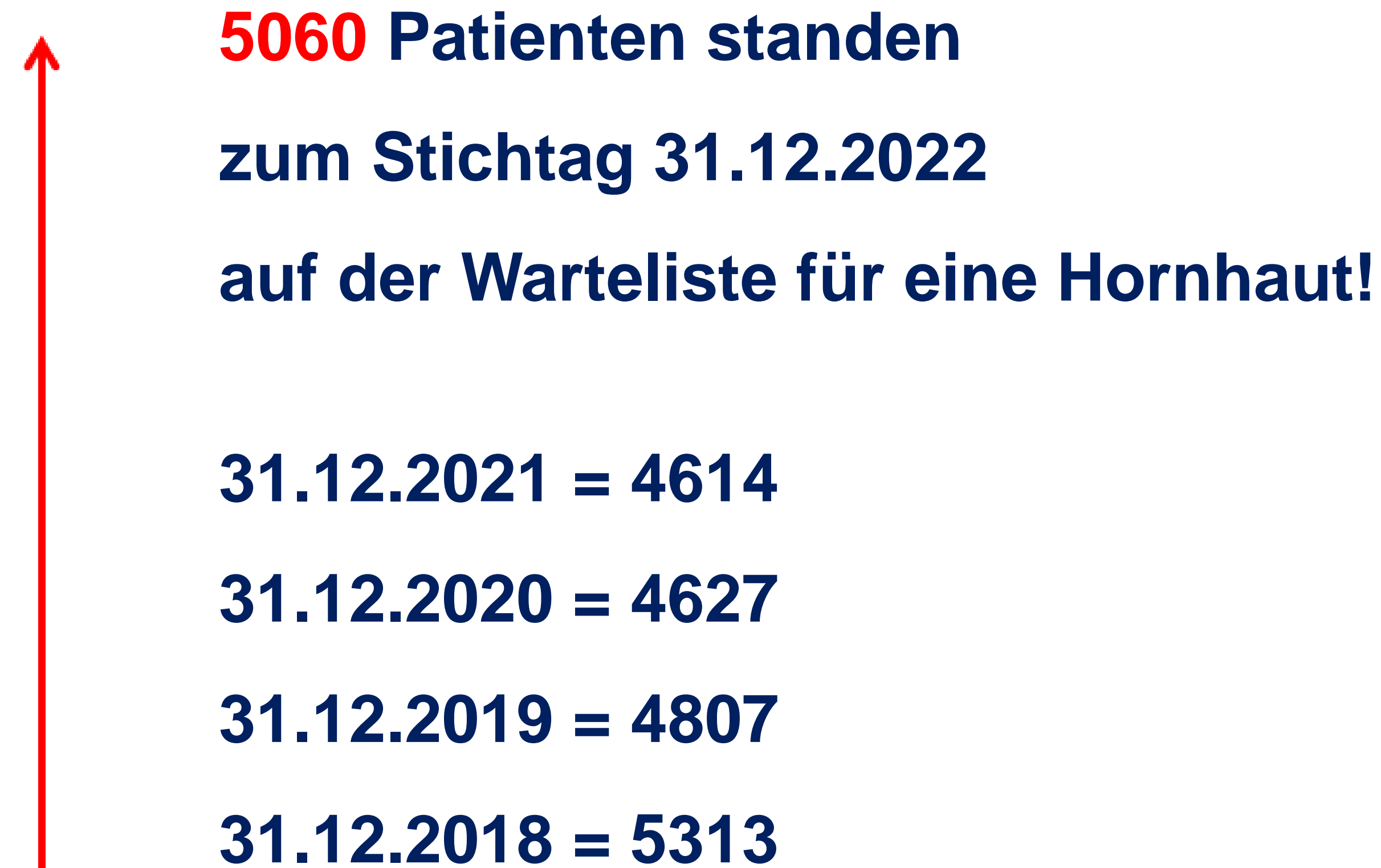
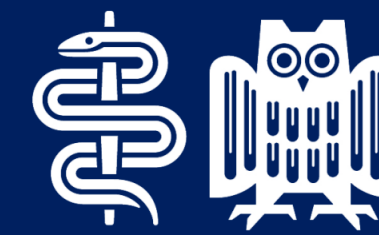
145 HLA-gematchte KPL's von 9277 = 1,5%



**2021: 99 HLA-gematchte KPL's von 9038 = 1,1 %**

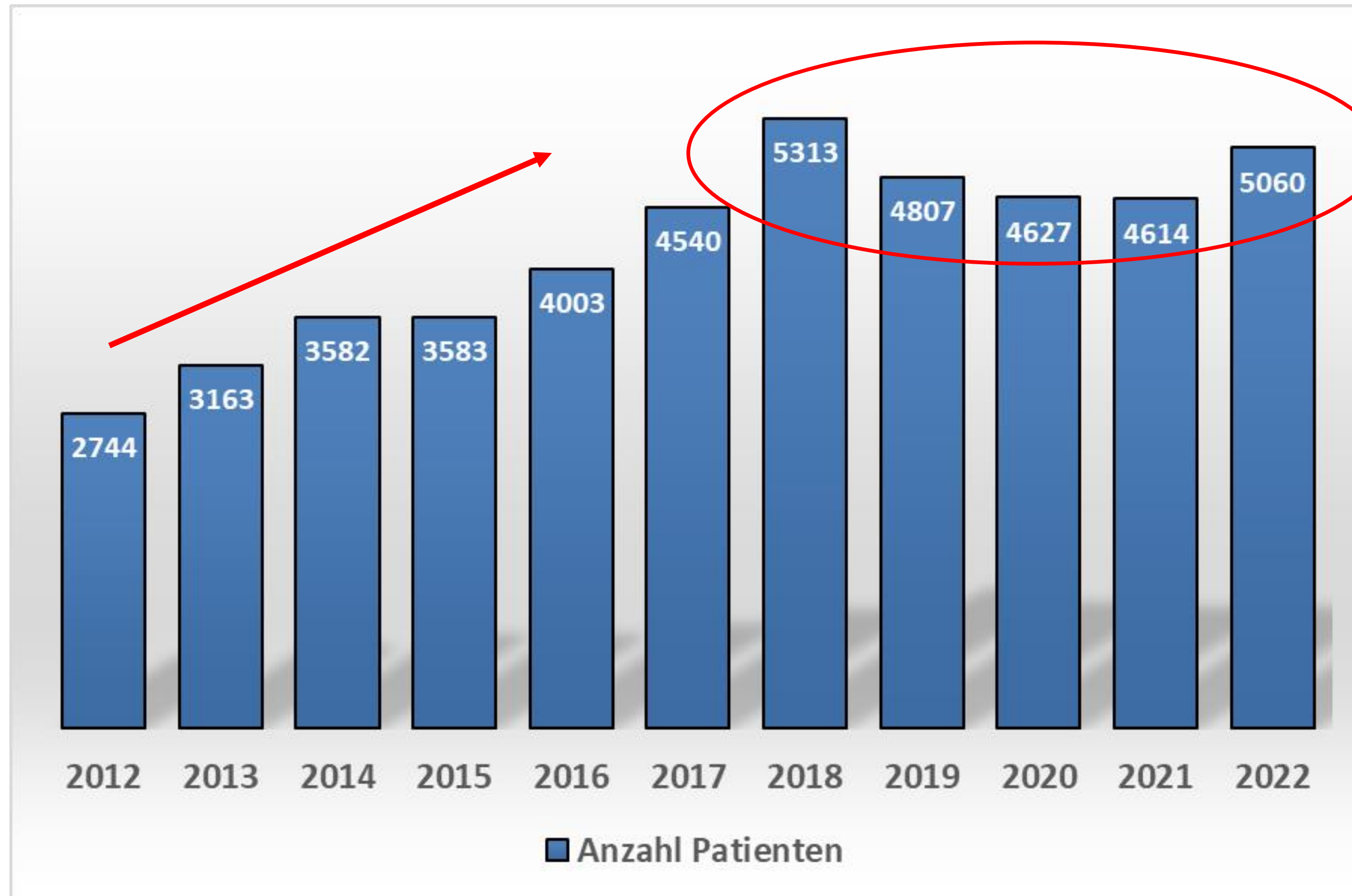
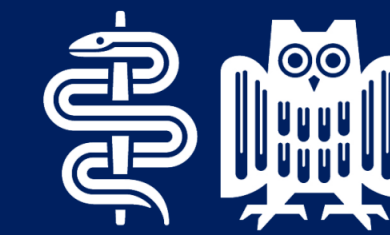
**2020: 108 HLA-gematchte KPL's von 9042 = 1,0%**

**2019: 195 HLA-gematchte KPL's von 8912 = 2,1%**



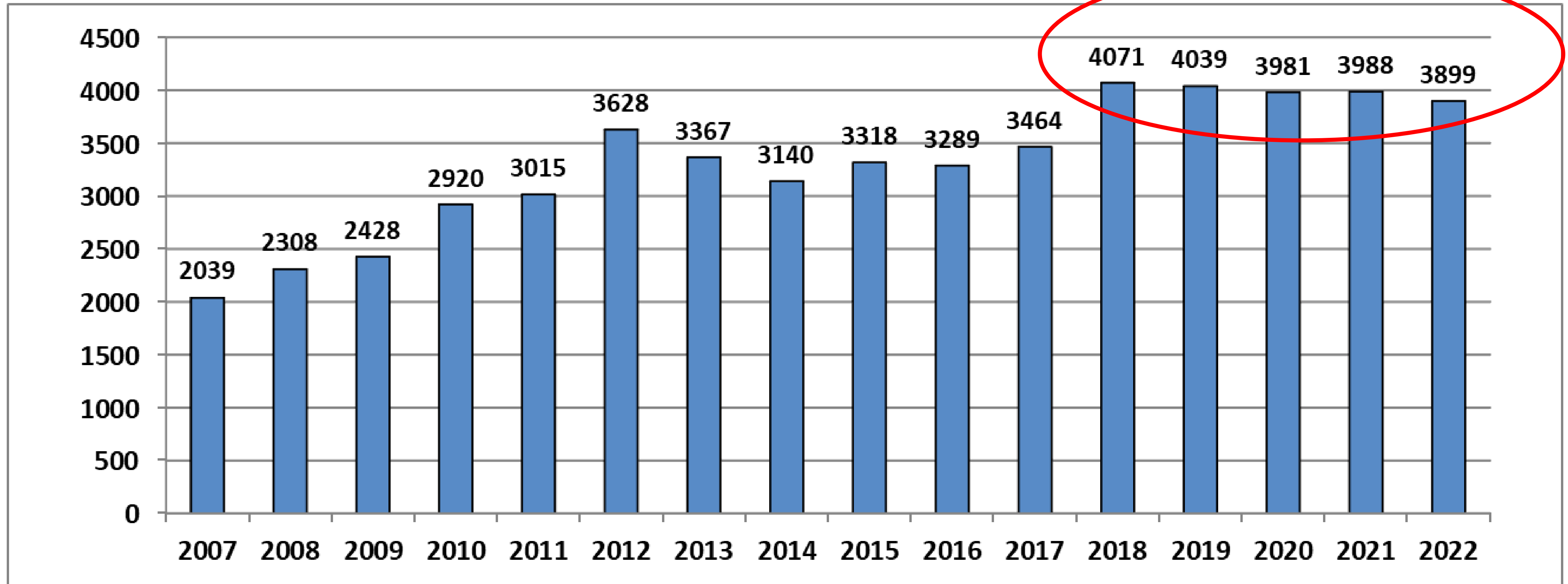
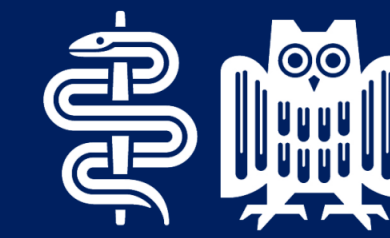


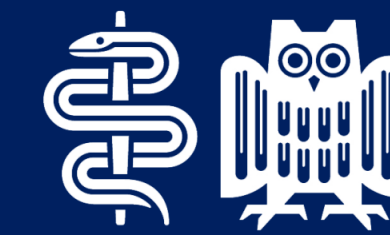
# Patienten-Warteliste 2012-2022



Ø Wartezeit bei:  
PKP: 8 Wochen  
DMEK: 9 Wochen  
DALK: 4 Wochen

# Amnionmembrantransplantationen

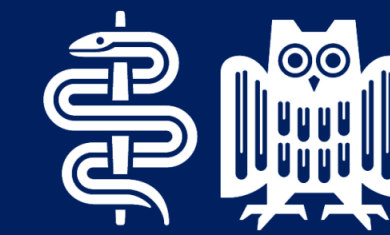




	KPL	Triple
<b>2014</b>	<b>1,902</b>	<b>2,129</b>
<b>2015</b>	<b>1,832</b>	<b>2,044</b>
<b>2016</b>	<b>1,772</b>	<b>1,934</b>
<b>2017</b>	<b>1,705</b>	<b>1,861</b>
<b>2018</b>	<b>1,671</b>	<b>1,788</b>
<b>2019</b>	<b>1,653</b>	<b>1,740</b>
<b>2020</b>	1,478 (+Pflegegelderlös/Tag Bewertungsrelation: 0,6952)	1,542 (+Pflegegelderlös/Tag Bewertungsrelation 0,6465)
<b>2021</b>	1,438 (+ Pflegegelderlös/Tag Bewertungsrelation: 0,7062)	1,551 (+ Pflegegelderlös/Tag Bewertungsrelation: 0,7049)
<b>2022</b>	1,431 (+ Pflegegelderlös/Tag Bewertungsrelation: 0,6892)	1,542 (+ Pflegegelderlös/Tag Bewertungsrelation: 0,6880)
<b>2023</b>	1,357 (+ Pflegegelderlös/Tag Bewertungsrelation: 0,6661)	1,425 (+ Pflegegelderlös/Tag Bewertungsrelation: 0,6785)

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

**Basisfallwert Saarland 2021: 3.773,00 €**  
**Basisfallwert Saarland 2022: 3.859,95 €**  
**Basisfallwert Saarland 2023: 4.030,64 €**



## Clinical science



## Descemet's membrane endothelial keratoplasty is the predominant keratoplasty procedure in Germany since 2016: a report of the DOG-section cornea and its keratoplasty registry

Elias Flockerzi , Christina Turner, Berthold Seitz ,  
GeKeR Study Group Collaborators, GeKeR Study Group

Department of Ophthalmology,  
Saarland University Hospital and  
Saarland University Faculty of  
Medicine, Homburg, Saarland,  
Germany

**Correspondence to**  
Dr Elias Flockerzi, Department  
of Ophthalmology, Saarland  
University Hospital and Saarland  
University Faculty of Medicine,  
Homburg 66421, Saarland,  
Germany; elias.flockerzi@uks.eu

Received 30 December 2022  
Accepted 12 April 2023

**ABSTRACT**

**Background/aims** This retrospective multicentric panel study provides absolute numbers, types of and indications for corneal transplantation in Germany from 2011 to 2021 and sets them into the international context.

**Methods** A questionnaire was sent to the 104 German ophthalmologic surgery departments and 93 (89%) provided their data.

**Results** The number of reported keratoplasties more than doubled from 2011 (n=4474) to 2021 (n=8998). Lamellar keratoplasties (49% posterior (n=2883), 4% anterior (n=231)) surpassed penetrating keratoplasty (PKP; 47%, n=2721) for the first time in 2014. Since 2016, Descemet's membrane endothelial keratoplasty (DMEK) has become the predominant keratoplasty procedure in Germany. Its number increased by 1.5-fold from 3850 (2016) to 5812 (2021). Main indications in 2021 were Fuchs' endothelial corneal dystrophy (FECD, 43%), pseudophakic corneal decompensation (12%), repeated keratoplasty (11%), infections (7%), keratoconus (6%) and corneal scarring (4%, others: 9%). The PKP percentage decreased from 70.2% in 2011 (n=3141) to 31.7% in 2021 (n=2853). Descemet's stripping (automated) endothelial keratoplasties (DSAEKs) decreased to 1% in 2021 (n=74). 98.6% of all posterior lamellar keratoplasties were DMEKs in Germany in 2021. The number of deep anterior lamellar keratoplasties (DALKs) remained comparable from 2011 (n=269) to 2021 (n=251, 2.8%).

**Conclusion** Main indications for corneal transplantation in Germany (2021) were FECD and pseudophakic corneal decompensation. DMEK is by far the predominant corneal transplantation procedure since 2016 followed by PKP, whose absolute number decreased only slightly during the decade from 2011 to 2021. DALK proportions remain low, but stable, whereas DSAEK decreased annually and plays a minor role in Germany.

**Trial registration number** NCT03381794.

**INTRODUCTION**

The beginnings of penetrating keratoplasty (PKP) date back to 1905 when Eduard Zirm performed the first successful full-thickness corneal transplantation<sup>1</sup> and PKP became the gold standard of corneal transplantation during the twentieth

**WHAT IS ALREADY KNOWN ON THIS TOPIC**

⇒ Lamellar keratoplasty procedures are on the rise. However, there exist different trends in the application of lamellar keratoplasty techniques worldwide.

**WHAT THIS STUDY ADDS**

⇒ This report summarises developments in Germany from 2011 to 2021 and sets them into the international context.

**HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY**

⇒ This report underlines the importance of Descemet's membrane endothelial keratoplasty as a relatively novel surgical technique which is likely to become more widely adopted internationally.

century. However, refined lamellar grafting techniques adapted to the wide range of indications for corneal transplantation that are precisely tailored to the individual corneal disease patterns have been introduced and set new standards in the last two decades.<sup>2</sup>

Deep anterior lamellar keratoplasty (DALK) consists of a corneal donor transplantation without endothelium after complete removal of the pathological stroma down to Descemet's membrane.<sup>3-4</sup> Descemet's stripping (automated) endothelial keratoplasty (DSAEK) is a posterior lamellar corneal transplantation applied in endothelial corneal diseases, and comprises the preparation and transplantation of an endothelial donor tissue that was prepared using a microkeratome and includes a stromal layer, Descemet's membrane and the endothelium.<sup>5-7</sup> Descemet's membrane endothelial keratoplasty (DMEK) is defined by the isolated preparation and transplantation of Descemet's membrane and corneal endothelium.<sup>8</sup> Recent approaches that are designated as 'Descemet's stripping only' (DSO) or 'Descemetorhexis without endothelial keratoplasty' (DWEK) aim to remove only the central Descemet's membrane and endothelium without any transplantation.

This study aimed to assess and analyse the absolute numbers, percentages, surgical techniques

## Neue Publikation 2023:

# Descemet's Membrane Endothelial Keratoplasty is the predominant procedure in Germany since 2016: A report of the Section DOG-Cornea and its keratoplasty registry

Elias Flockerzi<sup>1</sup>, Christina Turner<sup>1</sup> and Berthold Seitz<sup>1</sup> for the GeKeR Study Group\*

<sup>1</sup>Department of Ophthalmology, Saarland University Medical Center, 66421 Homburg, Germany

\* German Keratoplasty Registry (GeKeR) Study Members

Br J Ophthalmol 2023 Aug 16;bjo-2022-323162.  
doi: 10.1136/bjo-2022-323162.  
Online ahead of print.

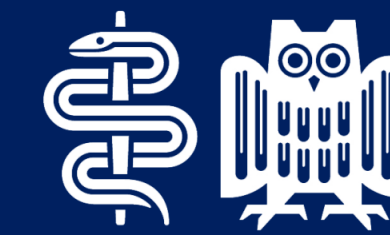


© Author(s) (or their employer(s)) 2023. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

**To cite:** Flockerzi E, Turner C, Seitz B, et al. *Br J Ophthalmol* Epub ahead of print: [please include Day Month Year]. doi:10.1136/bjo-2022-323162

# Publikation - German Keratoplasty Registry (GeKeR)

## Study Members



Julita Adamiak-Kalinowska,  
Sabine Aisenbrey,  
Nasser Al Ashi,  
Gerd Auffarth,  
Holger Baatz,  
Claudia Baier,  
Dirk Bahlmann,  
Karl U Bartz-Schmidt,  
Nikolaos E Bechrakis,  
Marcus Blum,  
Andreas G Böhm,  
Thorsten Böker,  
Simone Brandtner,  
Christian K Brinkmann,  
Reinhard Burk,  
Erik Chankiewitz,  
Claus Cursiefen,  
Burkhard Dick,  
Dirk Ehrich,  
Karl-Heinz Emmerich,  
Katrin Engelmann,  
Nicole Eter,  
Carsten Framme,  
Ulrich Fries,

Thomas A Fuchsluger,  
Matthias Fuest,  
Gerd Geerling,  
Florian Gekeler,  
Christos Haritoglou,  
Lars-Olof Hattenbach,  
Horst Helbig,  
Fritz Hengerer,  
Lutz Hesse,  
Konrad Hille,  
Jost Hillenkamp,  
Fabian Höhn,  
Frank G Holz,  
Antonia M Jousen,  
Bernd Junker,  
Susanne Kaskel-Paul,  
Marcus Knorr,  
Leon Kohen,  
Markus Kohlhaas,  
Thomas Kohnen,  
Lothar Krause,  
Friedrich E Kruse,  
Markus S Ladewig,  
Catharina Latz,

Wolfgang E Lieb,  
Anja Liekfeld,  
Mathias Maier,  
Joachim Magner,  
Daniel Meller,  
Andreas Mohr,  
Markus Motschmann,  
Arthur Mueller,  
Thomas Neuhann,  
Tobias Neuhann,  
Thomas Pahlitzsch,  
Lutz E Pillunat,  
Uwe P Press,  
Siegfried G Priglinger,  
Igor Prusiecki,  
Mahdy Ranjbar,  
Matus Rehak,  
Thomas Reinhard,  
Peter Rieck,  
Johann B Roider,  
Helmut Sachs,  
Gangolf Sauder,  
Hubert Scharf,  
Marc Schargus,

Armin Scharrer,  
Ulrich Schaudig,  
Christian Scheib,  
Andreas Scheider,  
Josef Schmidbauer,  
Stefan Schrader,  
Norbert Schrage,  
Jens Schrecker,  
Frank Schröder,  
Jörg Seewald,  
Martin Spitzer,  
Andreas Stahl,  
Annette Sturm,  
Peter Szurman,  
Hagen Thieme,  
Felix Treumer,  
Arne Viestenz,  
Burkhard von Jagow,  
Joachim Wachtlin,  
Joanna Wasielica-Poslednik,  
Christopher Wirbelauer,  
Armin Wolf,  
Focke Ziemssen

# AUGENÄRZTE SIND ORGANSPENDER!



BESTEN DANK FÜR IHRE AUFMERKSAMKEIT

[www.augenklinik-saarland.de](http://www.augenklinik-saarland.de)  
[berthold.seitz@uks.eu](mailto:berthold.seitz@uks.eu)



**UKS**  
Universitätsklinikum  
des Saarlandes

Klinik für Augenheilkunde

