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Annual Report

Contents

1. What is the purpose of a Registry	3
2. EUREQUO Success and Future	3
3. The EUREQUO Platform	3
4. EUREQUO Benefits and Benchmarking	3
5. Cataract surgery	4
Development of the database	4
Data for 2016	6
Benchmarking diagrams	7
6. Refractive surgery	9
Development of the database	9
Data for 2016	10
Benchmarking diagrams from the refractive surgery output report	11
7. References	13



Annual Report 2016

based on data from the European Registry
of Quality Outcomes for Cataract and Refractive Surgery

This report is dedicated to Peter Barry to commemorate
his immense contribution to the EUREQUO project.

EUREQUO Steering Committee

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www.eurequo.org

1. What is the purpose of a Registry

In health care, most countries have well-developed and functioning systems to monitor economic and human resource activities. Corresponding systems have not been developed for working with patients, although this is the actual core and the ultimate aim of provider organizations. The traditional patient record systems have not facilitated the compilation and analysis of data needed for quality improvement. Although increasingly more records are electronic, they essentially continue to be note pads that individual caregivers use for memory support in treating individual patients.

Quality registries have been developed to fill the gap left by the lack of primary monitoring systems. The quality registries collect information on individual patient's problems, interventions, and outcomes of interventions in a way that allows the data to be compiled for all patients and analysed anonymously at the unit level. The data from registers is invaluable; as the conclusions are evidence based with external validity and is not based on the results from a small clinical trial or a case series. In summary, the quality registries are created and ran by professionals within areas where a need for specific information not covered by textbooks or scientific literature has been identified.

2. EUREQUO Success and Future

The ESCRS believes that a continuing audit of surgical outcomes is necessary to ensure the best care for patients, by making comprehensive data available for comparison of visual outcomes.

EUREQUO is one of the largest international IT projects in ophthalmology, connecting surgeons all over the world and building a network to facilitate the exchange of expertise.

The EUREQUO Steering Committee is constantly working to update the platform with new parameters to reflect the development of new surgical techniques and trends in the field. The committee is also committed to analysing the aggregate data of the database and developing new scientific papers, and has released ten publications to date. This work will continue into the future.

3. The EUREQUO Platform

The European Registry of Quality Outcomes for Cataract and Refractive Surgery (EUREQUO) provides a platform to audit surgical results and encourages surgeons to make adjustments to their techniques and improve their outcomes.

One important use of the database is benchmarking. To date, more than 2.2 million cataract surgeries have been recorded in the system.

EUREQUO is funded by the ESCRS, with initial support from the EU. The platform has been launched globally, and all ESCRS members can access it free of charge.

4. EUREQUO Benefits and Benchmarking

- By collecting data, surgeons will be able to monitor their own results over time, and anonymously compare their results with other colleagues, clinics and countries.
- EUREQUO is a convenient web-based registry. Cataract, refractive and patient-reported outcomes are all in one platform.
- EUREQUO provides a unique opportunity to monitor and compare results.
- Collecting data will support surgeons to make an audit report.
- EUREQUO is linked to patient-reported outcomes.
- EUREQUO allows clinical improvement using patient-reported and clinical data.

Only anonymous data are stored within EUREQUO, and only clinical data without any patient ID data are mandatory within the EUREQUO datasets.

For more information visit the EUREQUO website at: www.eurequo.org

Development of the database

The number of cataract extractions reported to the EUREQUO database is shown in Table 1.

Table 1.

Number of annually reported cataract extractions and the accumulated number of cases in the database.

Year	Number of reported cataract extractions	Accumulated number of cataract extractions in the database
2007	57,552	57,552
2008	165,647	223,199
2009	201,355	424,544
2010	227,283	651,837
2011	249,474	901,311
2012	260,525	1,161,836
2013	280,090	1,441,926
2014	297,564	1,739,490
2015	259,662	1,999,152
2016	203,955	2,203,107

The growth of the database is shown graphically in Figure 1.

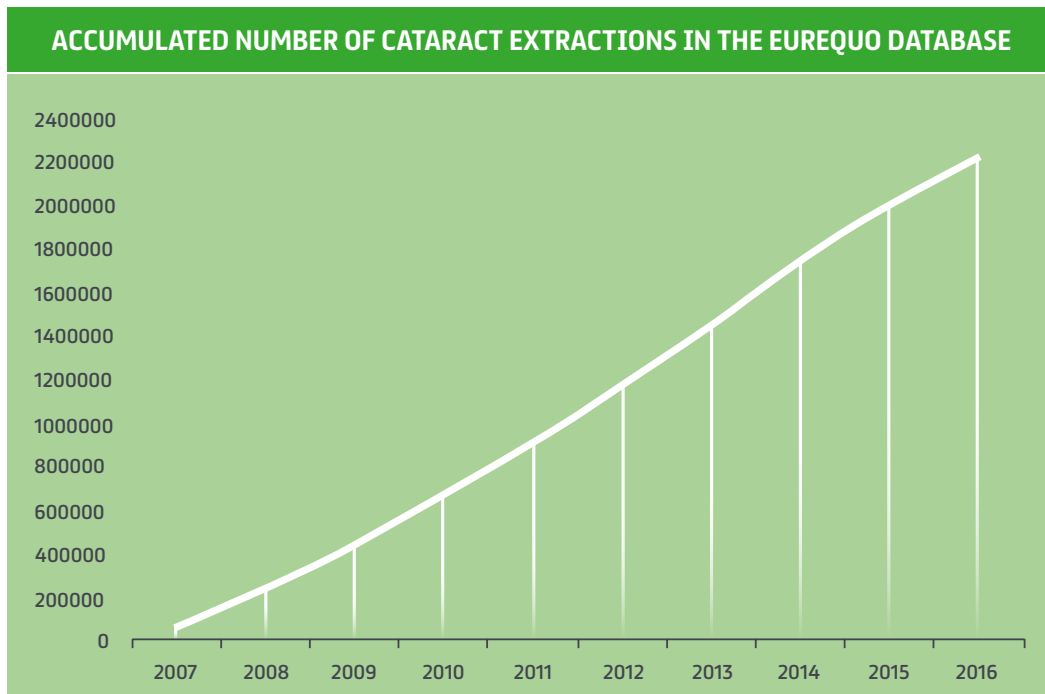


Figure 1.

Number of accumulated cataract extractions in the EUREQUO database over time. One million cases was achieved in 2011 and two million cases in 2016.

Since launch the number of participating countries has varied between 14 and 16 and the number of reporting sites between 185 and 221.

Trends in outcomes over time

Visual outcome, postoperative corrected distance visual acuity, LogMAR. Cases with follow up data.

Year	N	Mean	SD
2008	64,751	0.088	0.23
2009	100,302	0.081	0.23
2010	110,037	0.080	0.23
2011	114,036	0.076	0.23
2012	122,024	0.069	0.22
2013	118,625	0.062	0.20
2014	142,591	0.069	0.24
2015	140,220	0.059	0.23
2016	91,725	0.041	0.16

Refractive outcome, biometry prediction error (spherical equivalent). Cases with follow up data.

Year	N	Absolute mean	SD	within $\pm 0.5D$
2008	63,568	0.478	0.54	67.3%
2009	100,628	0.457	0.52	69.0%
2010	111,091	0.443	0.49	70.2%
2011	114,414	0.433	0.48	71.2%
2012	122,367	0.419	0.52	72.3%
2013	118,889	0.416	0.47	72.4%
2014	142,575	0.435	0.55	72.3%
2015	140,201	0.415	0.48	73.2%
2016	91,934	0.412	0.48	73.5%

Any surgical complication

Year	N	Number	% of all surgeries
2007	85,71	2768	3.2
2008	137,543	3402	2.5
2009	201,287	4593	2.3
2010	226,471	4973	2.2
2011	244,639	6005	2.5
2012	256,855	4908	1.9
2013	261,100	4354	1.7
2014	293,554	7103	2.4
2015	254,838	3323	1.3
2016	197,391	2447	1.2

The trends show an improvement for visual outcome, refractive outcome and a reduced number of surgical complications.



Data for 2016

Preoperative and surgical data

The number of cataract extractions reported into the database for 2016 was 203,959. The mean age of the operated patients was 74.0 years and 58% were females and 42% males.

Preoperative visual acuity

The preoperative corrected distance visual acuity (CDVA) in surgery eye was 0.1 (6/60) or worse in 8.5% of all cases. In 42.6% of the cases the preoperative CDVA was worse than 0.5 (6/12). This means that in 57.4% the visual acuity was 0.5 (6/12) or better.

Ocular co-morbidity

In 28.4% there was an ocular co-morbidity in the surgery eye. Such co-morbidities were Glaucoma (6.9%), Macular Degeneration (11.4%), Diabetic Retinopathy (3%), Amblyopia (0.9%) or another sight-threatening eye disease (8.9%).

Surgical difficulty

In 10.4% the surgeon reported a surgical difficulty. Such a difficulty could be: Previous corneal refractive surgery (0.13%), White/Brown cataract with need of capsular staining (2.49%), Small pupil with need for mechanical dilatation (3.15%), Corneal opacities (0.8%), Previous vitrectomy (0.54%) and other surgical difficulty (4.19%).

Type of operation

A phacoemulsification with implantation of a posterior chamber intraocular lens (IOL) was the absolutely most frequent type of surgery (99.24%). In 40 (0.02%) cases a planned extracapsular cataract extraction was performed, in 27 (0.01%) cases an anterior chamber IOL was implanted and in 31 (0.02%) cases a cataract extraction was combined with a filtering procedure. In 1446 (0.71%) cases another type of operation was performed.

Type of IOL material

The dominating type of IOL material was an acrylic hydrophobic IOL, 92% received such an IOL. An acrylic hydrophilic IOL was implanted in 7.4%. In 193 cases (0.09%) no IOL was implanted and the eye left aphakic.

Additional refractive quality IOL

In 1372 (0.7%) cases a multifocal IOL was implanted and in 296 (0.14%) a toric IOL was implanted.

Surgical complications

In 1523 (0.75%) cases a posterior capsule rupture with or without vitreous loss occurred. Other surgical complications were: Dropped nucleus in 30 (0.01%) cases, Iris damage in 246 (0.12%) cases, and "Other sight-threatening complication" in 696 (0.34%) cases.

Follow up data (data from clinics committed to report outcome data)

Complete follow up data was reported for 91,934 cataract extractions. The average time from date of surgery to date of follow up was 30 days.

Visual outcome

A final CDVA of 1.0 (6/6) or better was achieved by 73.5% (95% Confidence Interval [CI]: 73.2-73.8) of all reported cases. A CDVA of 0.5 (6/12) or better was achieved by 95.9% (95%CI: 95.8-96.0) of all cases.

Refractive outcome

The average spherical equivalent error was -0.04D (SD 0.63). Within ± 0.5 D biometry prediction error (spherical equivalent) was 73.5% (95% CI: 73.2-73.8), and within ± 1.0 D 93.6% (95% CI: 93.4-93.8).

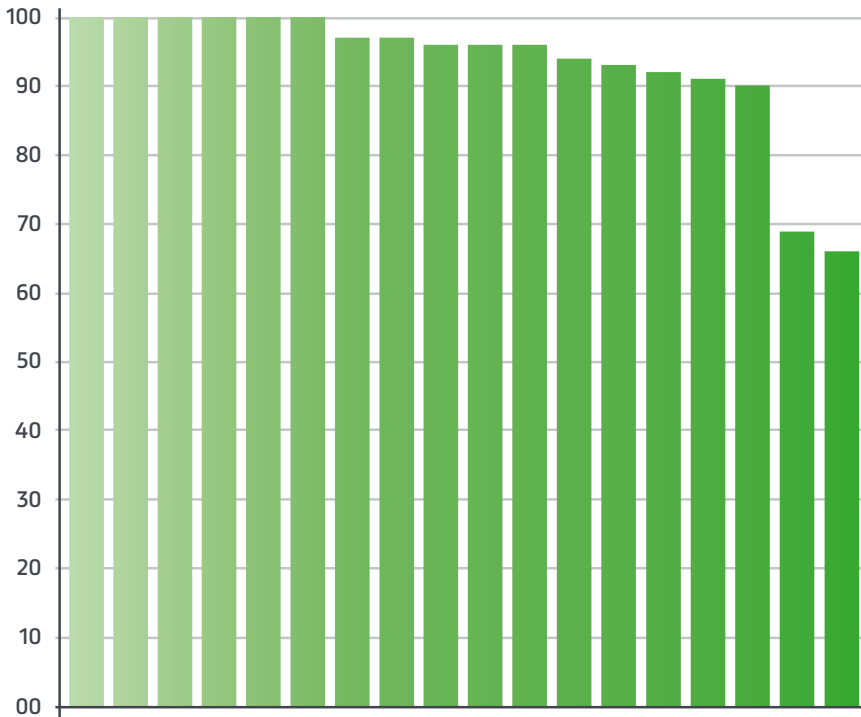
Postoperative complications

In 98.7% of the cases no postoperative complication was reported during the follow up time. In 86 (0.09%) cases there was a persistent corneal edema and in 30 (0.03%) cases uncontrolled elevated intraocular pressure. Two cases of endophthalmitis were reported.

Benchmarking diagrams

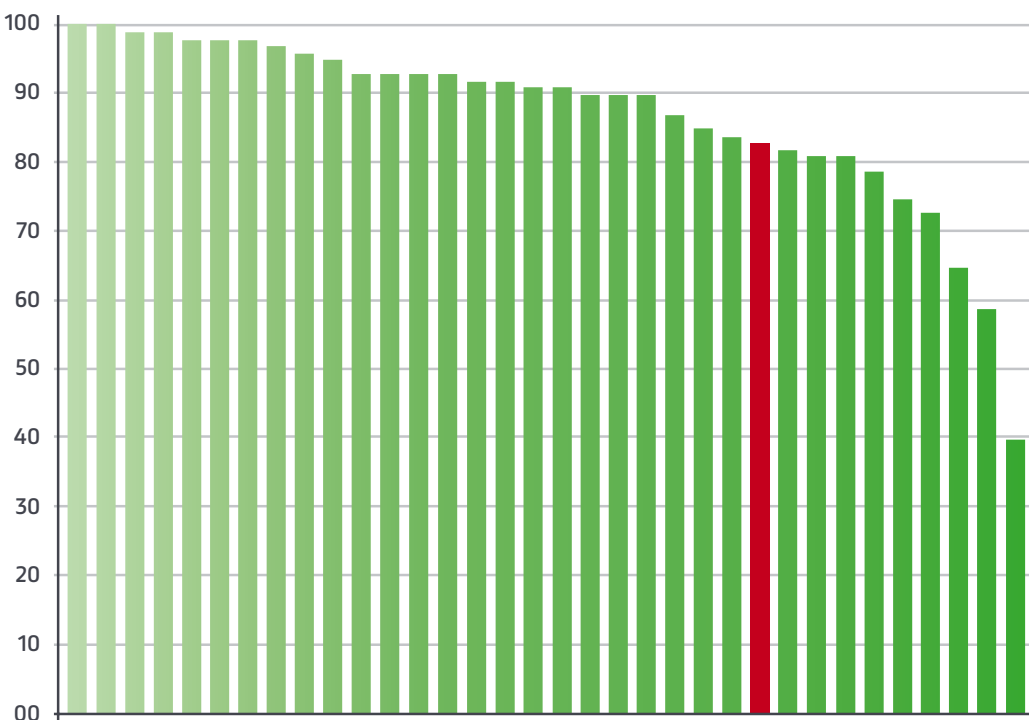
1. Visual outcome, percentage of cases with CDVA 0.5 (6/12) or better. Each bar represents one clinic. Only a part of the clinics is shown.

BCVA surgery eye ≥ 0.5 | (6/12) at final follow-up percent



2. Biometry prediction error. Percentage of cases within ± 1.0 D of deviation from intended refractive outcome. Every bar represents a unit. Red bar = requesting unit. Only a part of the clinics is shown.

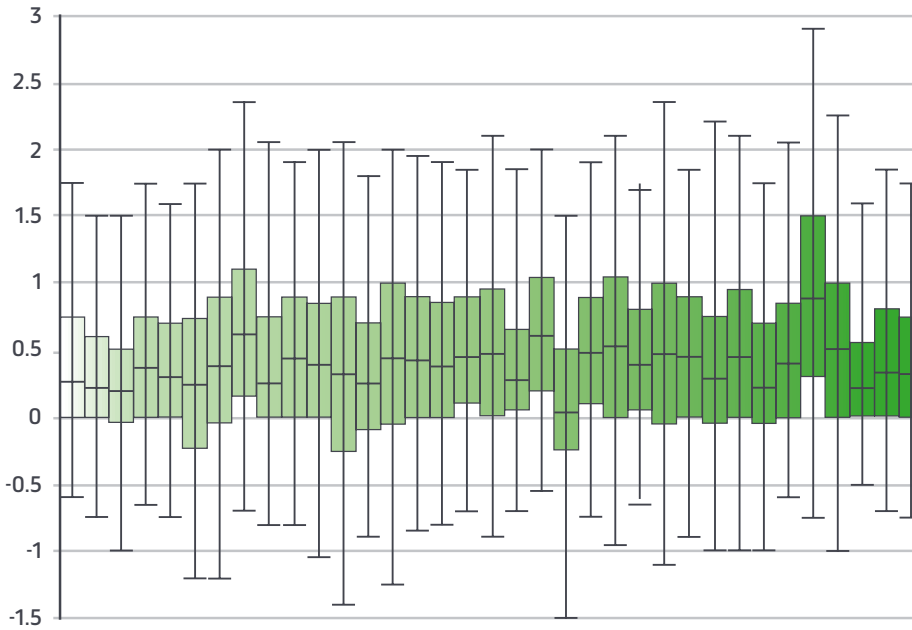
Biometry prediction error, % within 1D deviation from intended





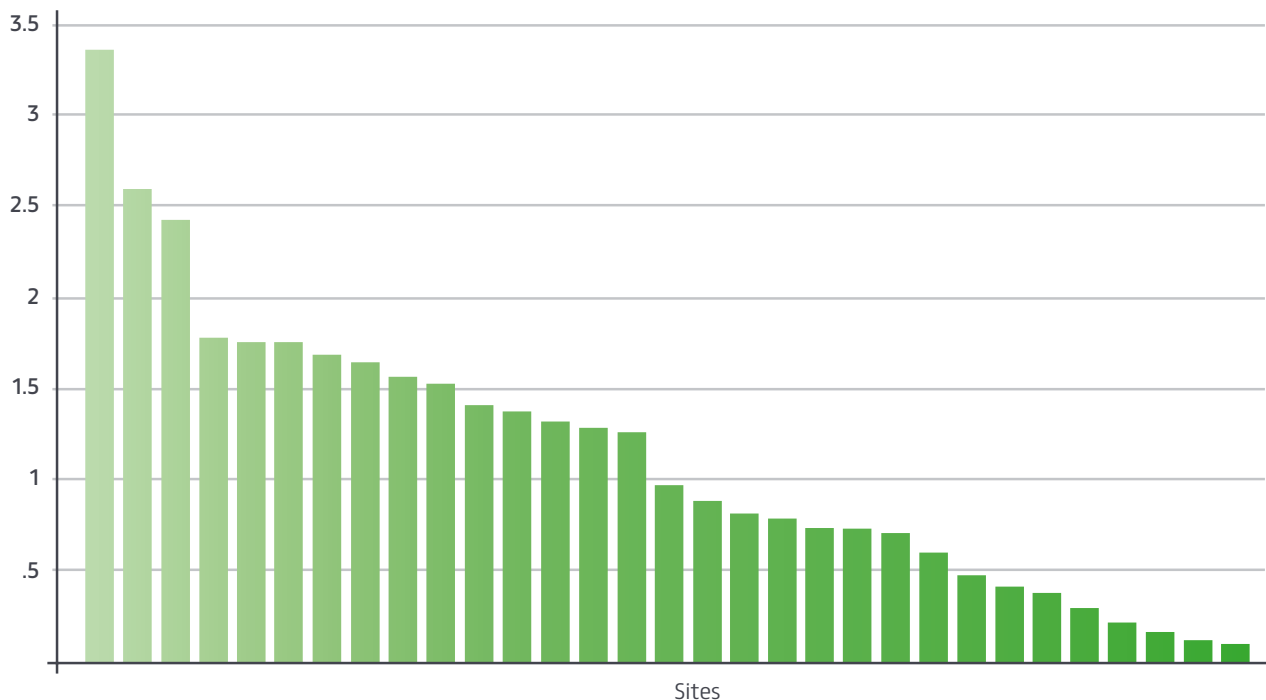
3. Boxplot diagram with biometry prediction error, correct sign. Every box represents a unit. Only a part of the clinics is shown.

Biometry prediction error, boxchart with correct signs



4. Reported capsule complications in per cent (posterior capsular break with or without vitreous loss) during surgery. Every bar represents a unit. Only a part of the clinics is shown.

Capsule complication in per cent



6. Refractive Surgery

Development of the database

The number of refractive surgeries reported to the EUREQUO database is shown in Table 2.

Table 1.

Number of annually reported refractive surgeries and the accumulated number of cases in the database. The database inherited historical cases from the Refractive Outcomes Information System collected until the end of 2007.

Year	Number of reported refractive surgeries	Accumulated number of refractive surgeries in the database
Inherited cases until the end of 2007	5773	5773
2008	492	6265
2009	1081	7346
2010	3100	10,446
2011	7766	18,212
2012	6837	25,049
2013	10,926	35,975
2014	19,711	55,686
2015	20,279	75,965
2016	15,470	91,435

The growth of the database is shown graphically in Figure 2.

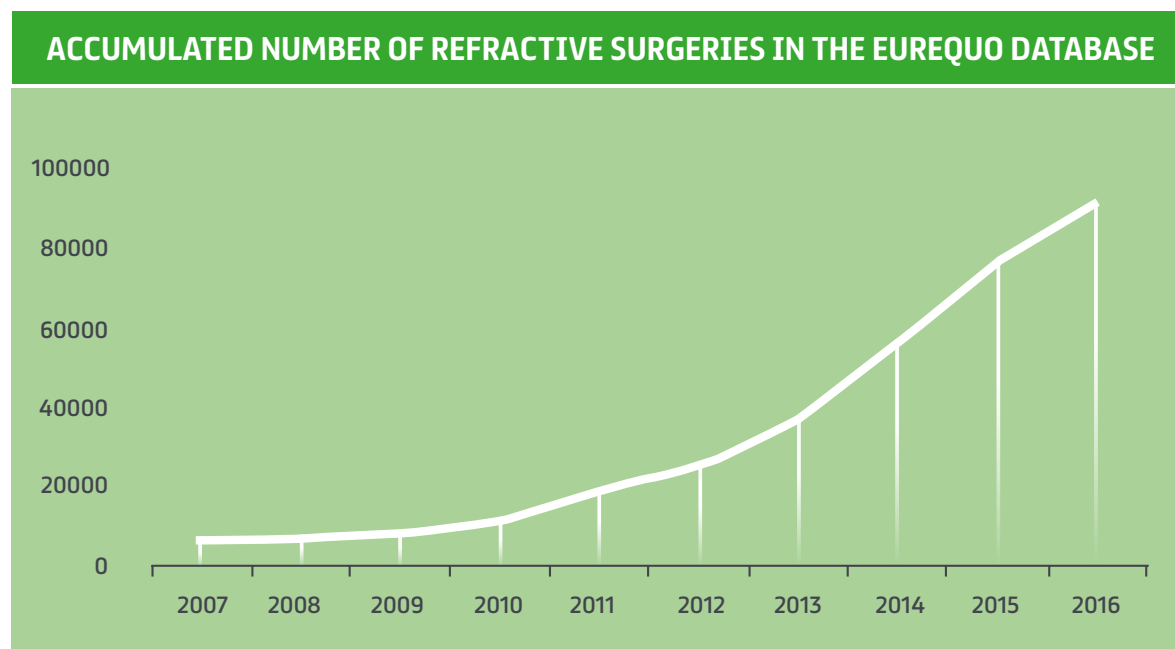


Figure 2.

Number of accumulated refractive surgeries in the EUREQUO database over time. 50,000 cases was reached in 2014.

Data from 14 countries has been entered into the database by altogether 47 units.



Data for 2016

The number of refractive surgeries entered into the database for 2016 was 15,313.

Preoperative data

The mean age of the patients was 43.4 (SD 19.8) years and 47.5% were females and 52.5% were males.

The mean preoperative corrected distance visual acuity (CDVA) in the eye to be operated on was -0.13 (SD 0.06) LogMAR and the median value 0.0 LogMAR. The mean preoperative spherical refraction was -1.25 (SD 3.08) and the mean spherical equivalent was -1.64 (SD 3.11). A preoperative myopia of -3.0D or more existed in 28.1% of the eyes and a hyperopia of 2.0D or more in 12.6% of the eyes. A myopic spherical equivalent existed in 65.3% of the eyes, 0.9% were emmetropic and 33.8% had a hyperopic spherical equivalent before surgery.

Type of surgery

The majority of surgeries were primary (99.5%). Only a small fraction were enhancements (0.3%) or additional (0.2%) surgery.

Surgery method

LASIK was performed in 5764 eyes, 912 by blade and 4852 by femtosecond laser. LASEK was performed in 1139 eyes and PRK in 833 eyes.

Refractive lens exchange (RLE) dominated the type of refractive surgeries during 2016, 8714 eyes were reported. Most of the operated eyes (6268) were given a trifocal intraocular lens (IOL), and in 1954 eyes a toric IOL was implanted.

A phakic IOL in posterior chamber was implanted in 577 eyes and a phakic IOL in the anterior chamber was implanted in 45 eyes.

Surgical complications

Very few surgical complications were reported. A corneal flap complication occurred in 18 eyes out of 4852 femtosecond LASIK procedures. In single eyes of RLE a posterior capsular tear occurred (5 eyes).

Visual and refractive outcomes

Follow up visit and examination occurred on average 101 (SD 37.7) days after surgery.

In 64.8% of the eyes a final uncorrected distance visual acuity of 1.0 (6/6) was achieved and in 89.2% the same final distance visual acuity was achieved with best correction.

A final refraction within $\pm 0.5D$ was achieved in 87.2% of the eyes.

Postoperative complications

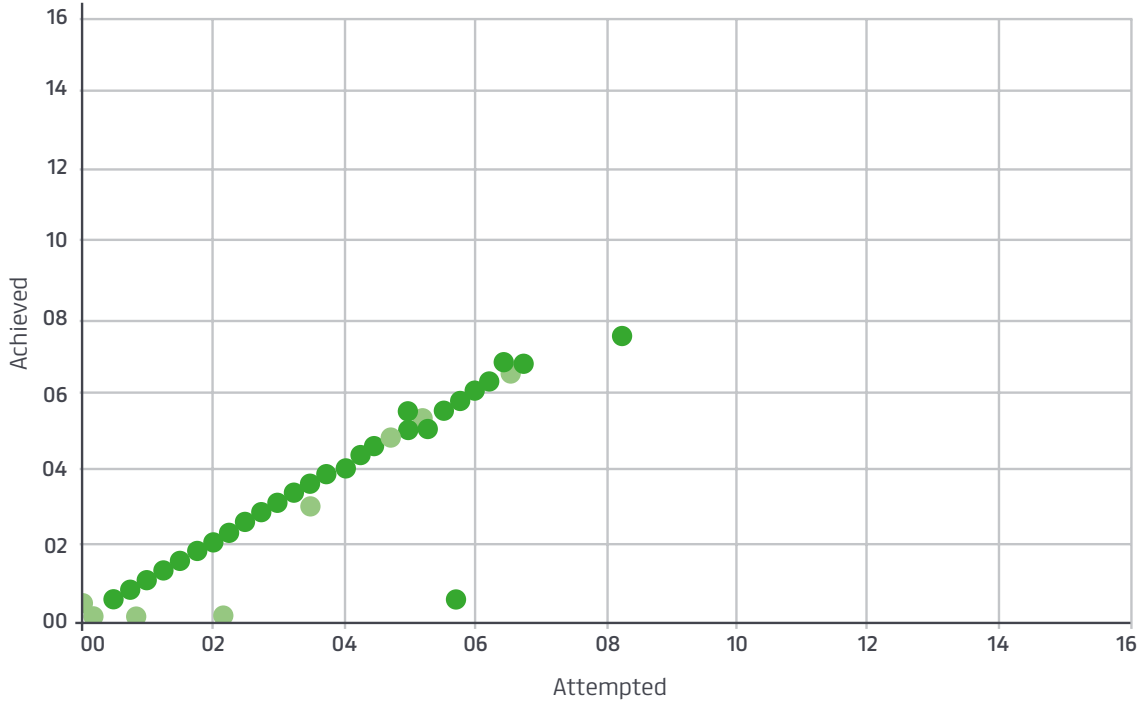
In altogether 29 eyes a postoperative complication was reported. Three eyes with significant haze, single eyes with persistent corneal edema and optical error ($>2.D$ of error) were reported.

Benchmarking diagrams from the refractive surgery output report

The graphs are from one reporting unit

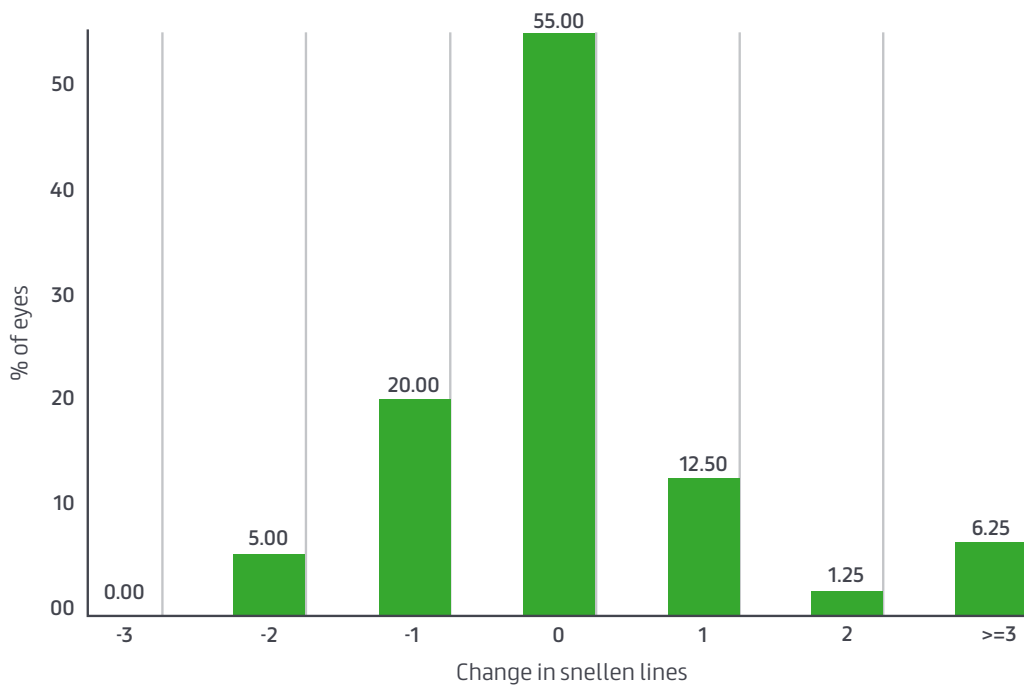
Graph 1.

Attempted versus achieved refraction



Graph 1.

Attempted versus achieved refraction





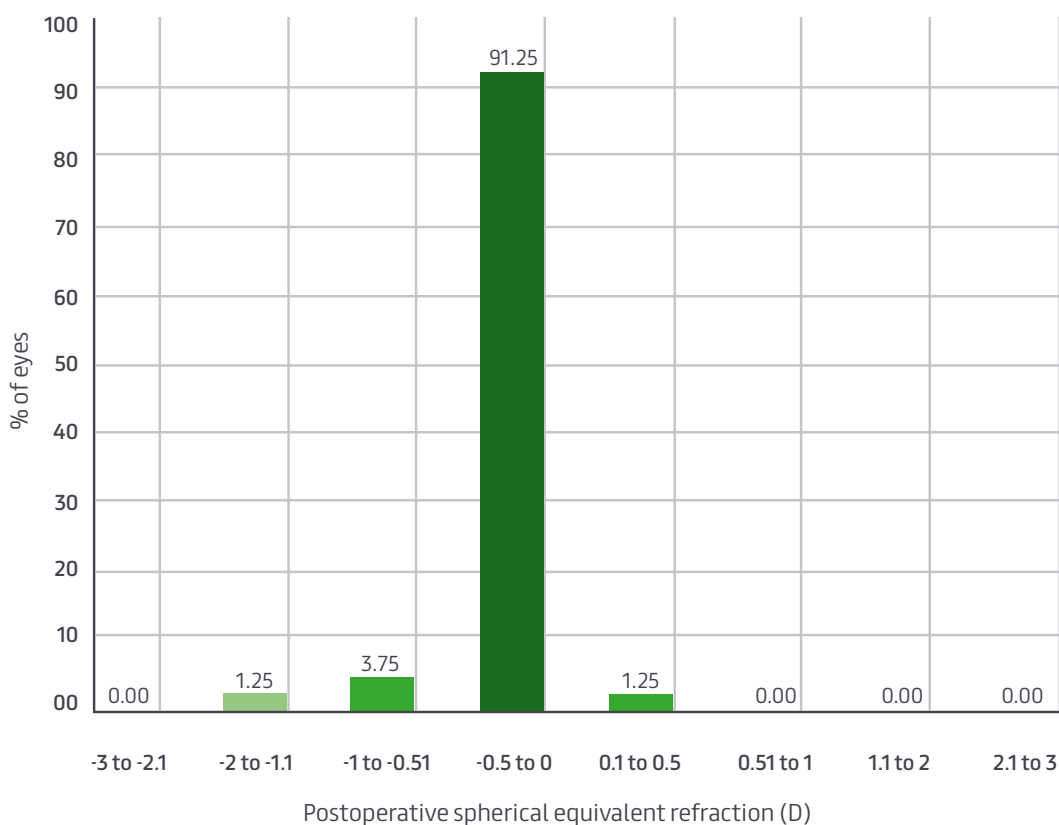
Graph 3.

Preoperative spectacle corrected VA and postoperative uncorrected VA



Graph 4.

Postoperative spherical equivalent



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