INTERNATIONAL CONTACT LENS PRESCRIBING IN 2022

Key trends in prescribing highlighted by our 22nd global survey.

PHILIP B. MORGAN, PHD, MCOPTOM; **CRAIG A. WOODS,** PHD, MCOPTOM; **IOANNIS G. TRANOUDIS,** DO, MSC, PHD; **NATHAN EFRON,** AC, DSC, PHD; **LYNDON JONES,** PHD, DSC, FCOPTOM; **PAULA FACCIA,** PHD; **DORIS RIVADENEIRA,** OD, IACLE; **MARIO TEUFL,** BSC, MSC; **CHRISTINA N. GRUPCHEVA,** MD, PHD; **DEBORAH JONES,** BSC, FCOPTOM; **LINA MARÍA RODRÍGUEZ CELY,** OD, MS; **AMOND ADSERSEN,** MSC, OPTOM; **JACINTO SANTODOMINGO-RUBIDO,** OD(EC), MSC, PHD, MCOPTOM; **LOUISETTE BLOISE,** MD; **NIR ERDINEST,** BOPTOM, PHD; **GIANCARLO MONTANI,** DIPOPTOM; **MOTOZUMI ITOI,** MD, PHD; **JOLANTA BENDORIENE,** MD, PHD; **JEROEN MULDER,** MSC, BOPTOM; **EEF VAN DER WORP,** BSC, PHD; **TIJL VAN MIERLO; JEANETTE ROMUALDEZ-OO,** OD; **CARMEN ABESAMIS-DICHOSO,** OD; **JOSÉ MANUEL GONZÁLEZ-MÉIJOME,** OD, PHD; **RUTE J. MACEDO-DE-ARAÚJO,** PHD; **OSKAR JOHANSSON,** BSC; **JOHN HSIAO,** BA, OD; **& JASON J. NICHOLS,** OD, MPH, PHD

Each year since 2001, *Contact Lens Spectrum* has presented an overview of international contact lens prescribing. The work is conducted by an ad hoc group of national coordinators—colleagues from the contact lens industry, universities, and optometric practices—who organize for contact lens prescribing practitioners (optometrists, ophthalmologists, or opticians, as appropriate) in their countries to provide information on paper or online about the contact lens fits they perform.

Many countries have consistently provided data to this work for long periods and indeed, five markets have contributed data every year since the first *Contact Lens Spectrum* publication: Australia, Canada, the Netherlands, Norway, and the United Kingdom. The United States has been included since 2002, and, in total, 71 countries have provided data since the start of the century.

The purpose of the work is to provide information for different sectors of the contact lens industry; to allow optometrists and other eyecare professionals to compare the prescribing habits of their peers to their own; for researchers to have a sense of the market relevance of their work; and for the industry to see ongoing prescribing trends around the world.

stock.adobe.com

INTERNATIONAL PRESCRIBING 2022

Information about contact lens prescribing is collected proactively, with respondents providing data about 10 contact lens fits conducted after the start of the survey period. In addition to the age and gender of the patients fitted, information is collected about lens material, design, replacement frequency, wearing modality, anticipated weekly usage, and care system prescribed. By examining the dates of the reported lens fits, a weighting system is employed to reflect the volume of fits undertaken by each respondent.

"The purpose of the work is to provide information for the industry to see prescribing trends around the world."

KEY WEARER INFORMATION

For 2022, information for at least 100 fits was collected for 22 markets and is included in this report (Table 1). Six other countries supplied fitting data, but the lower response rates prevented inclusion here. In total, 13,136 fits were reported. The mean age of patients at fitting was 33.7 ± 15.9 (mean ± standard deviation) years with the average age ranging from lower than 30 years in Israel to over 40 years in Denmark and Sweden.

In line with previous years, around two thirds (65%) of fits were to female patients and 39% were defined as "new fits" (i.e., the prescribing of contact lenses to people with no recent wearing experience). Most patients (87%) were prescribed contact lenses on a full-time basis (defined as four days per week or more in this analysis).

Table 2 provides a breakdown of lens fits into seven lens categories for the 22 reported markets. Soft lenses accounted for 86% of fits worldwide with similar numbers of daily wear fits for daily disposables (39%) and reusables (42%). Soft lens extended wear was reported for 6% of fits. High levels of rigid lens prescribing were once again noted for the Netherlands in particular.

Figure 1 shows the trends for these seven categories of contact lenses since the start of these annual surveys. The number of rigid lenses decreased in the first decade of this work but have remained constant

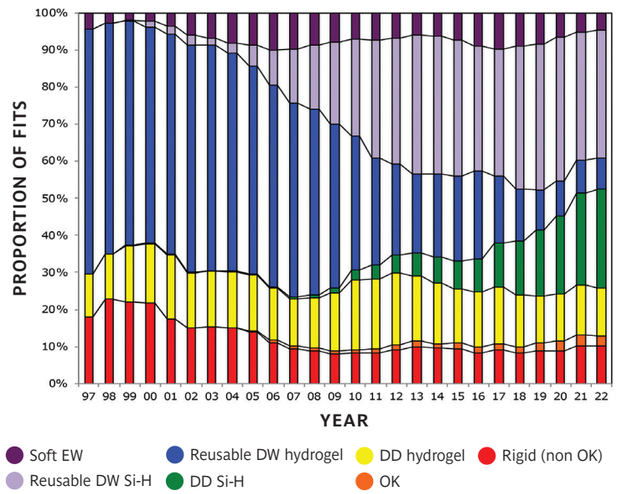


FIGURE 1. Lens prescribing for seven major categories of contact lenses using data from all reported markets 1997 to 2022. Data are three-year moving averages.

for the past 12 years. Orthokeratology has accounted for 2% to 3% of fits in recent years.

Daily disposable hydrogel lenses have also remained relatively stable at between 12% and 20% of fits over this study period, whereas daily disposable silicone hydrogels have increased to 28% of fits worldwide (in 2022) since their introduction in 2006. Similarly, silicone hydrogels now dominate the market for reusable soft lenses, accounting for 1 in 3 of all contact lens fits, with reusable hydrogels making up 8% of fits.

RIGID CORNEAL AND SCLERAL LENSES

Details for rigid lenses are shown for the 12 markets reporting at least 35 rigid lens fits in Table 3. Scleral lenses are growing in popularity within the overall rigid lens segment, accounting for about a quarter of reported fits. Of rigid corneal lenses, spherical design lenses account for 38% of fits with more specialized lenses such as torics, multifocals, and orthokeratology lenses making up more than half of fits.

SOFT LENSES

As in 2021, soft lenses accounted for 86% of all lens fits in 2022 (Table 4). Silicone hydrogels were prescribed to 76% of patients receiving soft lenses. There was some variation here, with some markets reporting more than 90% of soft lens fits with this material type (Australia, Colombia, France,

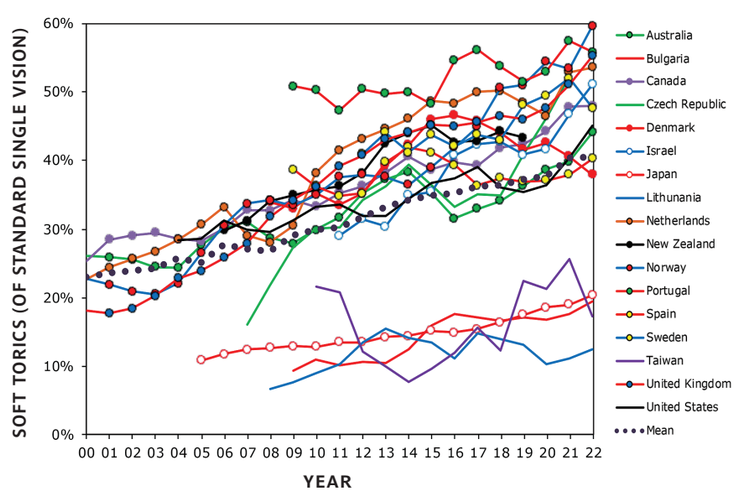


FIGURE 2. Toric lens prescribing (of standard single-vision soft lenses) 2000 to 2022 for 17 markets. Data are three-year moving averages.

PAUL: LITHUA
THAT? THANK

TABLE 1. Demographic information for all surveyed markets reporting at least 100 fits.

COUNTRY	TOTAL FITS	MEAN (±SD) AGE	% FEMALE	% NEW FITS	% PART TIME (≤3DAYS)
Argentina (AR)	282	33.9 ± 15.5	70%	42%	6%
Austria (AT)	121	39.0 ± 15.9	57%	46%	6%
Australia (AU)	509	37.2 ± 18.1	66%	49%	24%
Bulgaria (BG)	323	31.5 ± 11.9	63%	43%	8%
Canada (CA)	1,897	35.6 ± 17.5	66%	35%	24%
Colombia (CO)	349	30.0 ± 13.1	62%	53%	5%
Denmark (DK)	248	40.5 ± 16.1	68%	28%	1%
Spain (ES)	682	33.2 ± 16.2	59%	52%	11%
France (FR)	380	39.3 ± 17.8	69%	37%	4%
Greece (GR)	762	30.2 ± 9.9	62%	30%	2%
Israel (IL)	320	29.4 ± 12.0	56%	30%	3%
Italy (IT)	570	33.3 ± 17.1	59%	60%	16%
Japan (JP)	3,037	32.1 ± 16.4	65%	43%	13%
Lithuania (LT)	519	30.8 ± 10.9	66%	16%	18%
Netherlands (NL)	288	39.1 ± 18.2	62%	37%	4%
Philippines (PH)	957	30.4 ± 12.1	71%	31%	8%
Portugal (PT)	294	35.6 ± 16.1	63%	50%	10%
Sweden (SE)	155	43.2 ± 16.3	64%	14%	11%
Taiwan (TW)	449	30.8 ± 10.2	84%	48%	0%
United Kingdom (UK)	687	37.4 ± 18.0	65%	56%	29%
United States (US)	207	37.8 ± 17.2	71%	32%	3%
Uruguay (UY)	100	31.2 ± 14.5	59%	57%	12%
OVERALL	**13,136**	**33.7 ± 15.9**	**65%**	**39%**	**13%**

*Data for retail outlets only are shown.

TABLE 2. Breakdown of all lens fits into seven key categories of lenses.

COUNTRY	RIGID (NON OK)	OK	DD HYDROGEL	DD SI-H	REUSABLE HYDROGEL	REUSABLE SI-H	SOFT EW
AR	4%	0%	1%	1%	33%	61%	2%
AT	20%	4%	3%	17%	14%	41%	2%
AU	18%	5%	2%	39%	3%	30%	4%
BG	19%	0%	3%	10%	8%	50%	10%
CA	10%	1%	7%	40%	5%	35%	3%
CO	29%	1%	0%	3%	2%	61%	4%
DK	13%	0%	32%	14%	2%	34%	4%
ES	12%	14%	6%	17%	10%	39%	1%
FR	32%	11%	2%	16%	1%	38%	0%
GR	0%	0%	2%	9%	29%	58%	1%
IL	3%	1%	25%	29%	9%	32%	0%
IT	14%	2%	17%	29%	10%	28%	1%
JP	12%	0%	24%	29%	10%	26%	0%
LT	0%	0%	3%	32%	1%	33%	31%
NL	31%	5%	10%	9%	6%	38%	1%
PH	3%	0%	11%	10%	6%	44%	27%
PT	24%	0%	6%	25%	6%	38%	1%
SE	4%	1%	14%	21%	4%	45%	10%
TW	8%	0%	43%	12%	27%	11%	0%
UK	6%	0%	15%	54%	3%	21%	1%
US	11%	1%	4%	33%	6%	38%	8%
UY	25%	0%	8%	3%	26%	38%	0%
OVERALL	**12%**	**2%**	**12%**	**27%**	**8%**	**34%**	**6%**

See Table 1 for country abbreviations. **OK** = orthokeratology **DD** = daily disposable **EW** = extended wear

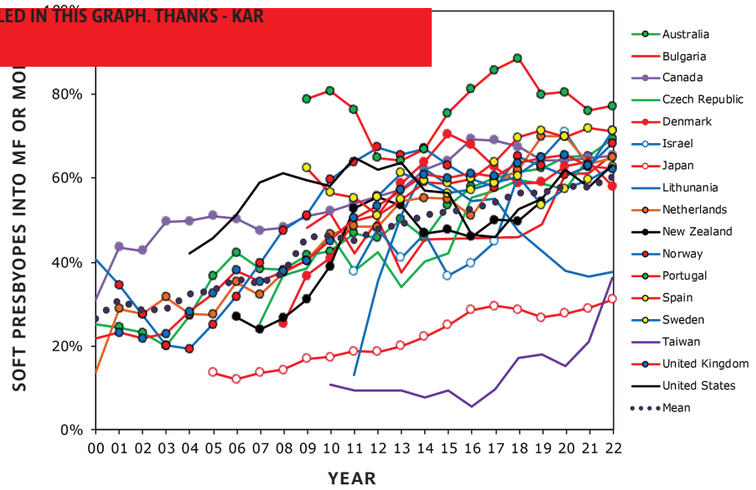


FIGURE 3. Combined multifocal and monovision fits to patients at least 45 years old, prescribed soft contact lenses 2000 to 2022 for 17 markets. Data are three-year moving averages.

and Lithuania) and others noting a significantly lower use (e.g., Taiwan with 25% of soft lens fits).

Of all soft lenses, toric designs account for 28% of fits. This number rises to 37% when only standard single-vision fits are considered (i.e., ignoring multifocal, monovision, cosmetic tint, and myopia control fits). This value has almost doubled since the start of the century, presumably due to greater availability of toric lens parameters, improved lens quality and reproducibility, and increased practitioner confidence (Figure 2).

It is also of note that there

TABLE 3. Detailed information for all prescribed rigid lenses only.

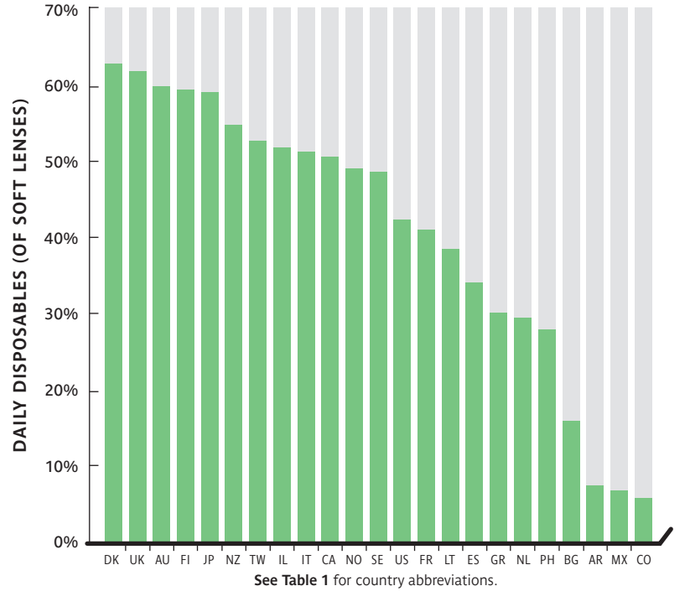
		AU	BG	CA	CO	ES	FR	IT	JP	NL	PT	TW	UK	OVERALL
	Rigid lenses for new fits	19%	22%	14%	32%	31%	53%	13%	5%	17%	29%	7%	3%	14%
	Rigid lenses for refits	28%	20%	9%	29%	22%	38%	20%	17%	47%	18%	9%	11%	14%
TYPES/MATERIALS	Scleral	41%	0%	52%	23%	19%	23%	17%	0%	34%	82%	0%	19%	23%
TYPES/MATERIALS	PMMA	0%	3%	7%	2%	2%	3%	0%	0%	1%	0%	0%	2%	2%
TYPES/MATERIALS	Low Dk (<40)	0%	14%	1%	0%	4%	0%	1%	9%	2%	0%	0%	1%	3%
TYPES/MATERIALS	Mid Dk (40-90)	7%	12%	8%	9%	52%	5%	33%	24%	38%	6%	20%	22%	19%
TYPES/MATERIALS	High Dk (>90)	52%	71%	32%	66%	24%	70%	49%	67%	24%	12%	80%	55%	54%
DESIGN	Sphere	23%	67%	25%	70%	15%	27%	29%	75%	23%	52%	77%	68%	38%
DESIGN	Toric	41%	22%	27%	20%	15%	14%	27%	1%	43%	40%	23%	13%	20%
DESIGN	Multifocal	6%	9%	16%	5%	8%	12%	15%	16%	7%	3%	0%	1%	11%
DESIGN	Monovision	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	0%	0%	2%
DESIGN	Ortho-K	21%	0%	10%	4%	54%	39%	10%	0%	21%	0%	0%	0%	20%
DESIGN	Myopia control	8%	0%	13%	0%	5%	0%	9%	1%	4%	3%	0%	16%	5%
DESIGN	Other	2%	0%	9%	1%	2%	8%	9%	6%	1%	3%	0%	1%	5%
	Planned replacement	12%	100%	35%	98%	81%	90%	74%	24%	38%	92%	91%	47%	64%
	Extended wear	21%	10%	16%	5%	36%	1%	15%	0%	12%	3%	0%	1%	8%

See Table 1 for country abbreviations. Data presented for countries reporting > 35 rigid lens fits. **PMMA** = polymethyl methacrylate.

is a clear disparity between many markets here; soft torics represent at least 30% of all soft lens fits in most markets but there is a smaller group of countries, including Bulgaria, Lithuania, and Japan, where this value is less than 20%. This latter group generally features markets where ophthalmologists prescribe contact lenses, whereas the former set of countries is generally optometry-led.

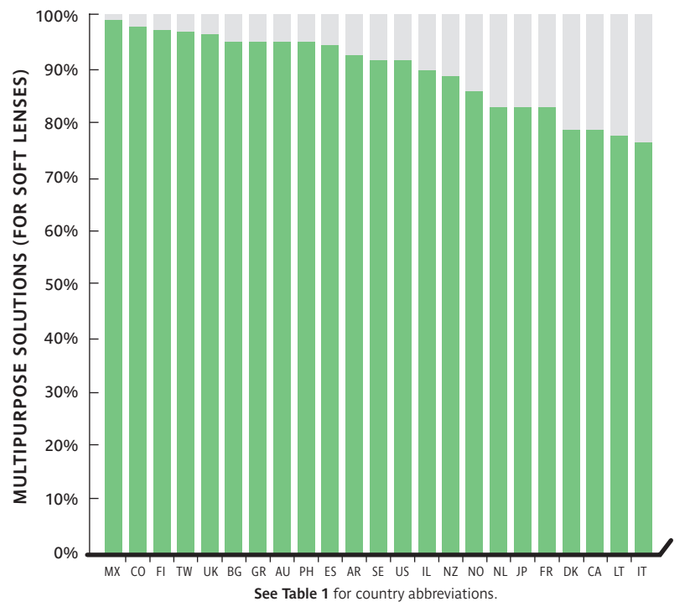
Multifocal and monovision lens designs account for 18% and 3% of soft lens fits, respectively. When only presumed presbyopes are considered (patients aged 45 years and over) these proportions rise to 53% and 7%. In other words, 60% of presbyopes fitted with soft lenses receive a form of presbyopic correction, with the remaining patients presumably mainly fitted with distance single-vision lenses. This rate of "correct" prescribing for presbyopes has more than doubled in the past 20 years (Figure 3), probably due to the same factors which have caused soft toric usage to increase—better products resulting in greater practitioner confidence and patient satisfaction.

For soft lens replacement frequency, daily disposable lenses account for half of all soft lens fits (49%), with monthly and weekly and biweekly lenses the next most prescribed (34% and 15% of lens fits, respectively). The use of daily disposables varies worldwide. Figure 4 shows the prescribing rates of this lens type for all markets for which we have collected information for more than 1,000 fits between 2018 and 2022. Over this period, more than 60% of soft lens wearers in Denmark, the United Kingdom, and Australia were prescribed daily disposables (a value which increases to around 70% if only spherical lenses are considered). On the other hand, daily disposables represented fewer than 10% of fits in the Latin American markets of Argentina, Mexico,



See Table 1 for country abbreviations.

FIGURE 4. Daily disposables as a proportion of soft lens fits 2018 to 2022 for markets reporting at least 1,000 fits.



See Table 1 for country abbreviations.

FIGURE 5. Multipurpose solutions prescribed to soft lens wearers requiring a care regimen 2018 to 2022 for markets reporting at least 1,000 fits.

and Colombia during 2018 to 2022.

Extended wear was reported in 7% of soft lens fits in 2022, with silicone hydrogel materials prescribed in over 90% of extended wear cases. Multipurpose solutions were prescribed to 91% of patients where a care regimen was required. Such solutions dominated in most markets (Figure 5), although multipurpose solution usage was somewhat lower than average in Italy, Lithuania, Canada, and Denmark.

Funding and/or assistance was provided for the following markets: Australia—Optometry Australia; Bulgaria—Vision Protect Ltd; Greece and Israel—Johnson & Johnson Vision; Netherlands—Dutch Association of Contact Lens Suppliers; Spain—Spanish General Council of the Colleges of Opticians-Optometrists.

The authors acknowledge the administrative support of Eurolens Research, University of Manchester, and the Centre for Ocular Research & Education (CORE) at the University of Waterloo. CLS

Dr. Morgan is director of Eurolens Research at the University of Manchester.
Dr. Woods is a conjoint professor at the School of Optometry and Vision Science, University of New South Wales in Sydney, Australia.
Dr. Tranoudis is senior director, Professional Education Solutions, Europe, Middle East, & Africa at Johnson & Johnson Vision.
Dr. Efron is an emeritus professor from the School of Optometry and Vision Science at Queensland University of Technology in Brisbane, Australia.
Dr. Jones is the director of the Centre for Ocular Research & Education at the University of Waterloo, Canada.
Dr. Faccia is an assistant researcher at the National Council of Scientific and Technical Research and professor of optometry and contactology at Universidad Nacional de La Plata in Buenos Aires, Argentina.
Dr. Rivadeneira is a professor of contactology at the Department of Physics at Universidad Nacional del Sur, Argentina.
Ing. Teufl is an optometrist in Kärnten, Austria.
Dr. Grupcheva is head of the Department of Ophthalmology and Visual Science and vice rector for Innovations and Translational Research at the Medical University-Varna, Bulgaria.
Dr. Jones is a clinical professor at the School of Optometry and Vision Science at the University of Waterloo, Canada.

TABLE 4. Detailed information for all prescribed soft lenses for markets reporting >100 soft lens fits. The final row indicates the proportion of multifocal and monovision lenses prescribed for patients over 45 years of age.

		AR	AU	BG	CA	CO	DK	ES	FR	GR
	Soft lenses for new fits	97%	81%	78%	86%	68%	94%	69%	47%	100%
	Soft lenses for refits	96%	72%	80%	91%	71%	87%	78%	62%	100%
MATERIALS	Low water content (<40%)	3%	1%	0%	2%	0%	0%	5%	1%	3%
MATERIALS	Mid water content (40-60%)	32%	4%	3%	6%	2%	15%	10%	0%	23%
MATERIALS	High water content (>60%)	0%	2%	13%	5%	1%	26%	7%	3%	6%
MATERIALS	Silicone hydrogel	65%	94%	84%	87%	97%	58%	78%	95%	68%
DESIGN	Sphere	73%	27%	53%	41%	42%	48%	38%	24%	56%
DESIGN	Toric	20%	25%	17%	34%	35%	26%	32%	24%	34%
DESIGN	Cosmetic tint	0%	3%	2%	1%	3%	0%	1%	0%	1%
DESIGN	Multifocal	5%	35%	25%	19%	18%	25%	22%	48%	8%
DESIGN	Monovisoin	0%	8%	1%	4%	1%	0%	1%	0%	0%
DESIGN	Myopia control	0%	2%	2%	2%	1%	1%	6%	3%	0%
DESIGN	Other	1%	0%	0%	0%	0%	0%	0%	0%	0%
REPLACEMENT	Daily	1%	56%	18%	54%	4%	57%	32%	32%	11%
REPLACEMENT	1-2 weekly	14%	8%	11%	5%	1%	8%	1%	14%	41%
REPLACEMENT	Monthly	79%	34%	67%	40%	65%	34%	62%	50%	46%
REPLACEMENT	3-6 monthly	0%	0%	0%	0%	0%	0%	0%	0%	0%
REPLACEMENT	Annually	2%	0%	3%	0%	25%	1%	4%	3%	1%
REPLACEMENT	Unplanned	4%	2%	0%	0%	4%	0%	1%	1%	0%
	Extended wear	2%	5%	12%	3%	6%	5%	2%	0%	1%
	EW with silicone hydrogels	100%	100%	45%	98%	97%	95%	100%	•	83%
	MPS solutions	96%	97%	98%	82%	99%	95%	93%	81%	98%
	Presbyopes multi/mono	18%/0%	61%/17%	61%/6%	52%/12%	46%/8%	45%/3%	70%/2%	73%/0%	80%/0%

See Table 1 for country abbreviations.

Dr. Rodríguez Cely is a is a member of the academic board of Fedopto Professional College of Optometry in Colombia.
Mr. Adsersen is a senior lecturer at the Danish College of Optometry and Visual Science, Erhvervsakademi Dania, Randers, Denmark.
Dr. Santodomingo-Rubido is clinical affairs manager & senior research scientist at Menicon Co., Ltd.
Dr. Bloise is an ophthalmologist at Point Vision in Nice, France, and president of the Société Française des Ophtalmologistes Adaptateurs de Lentilles de Contact.
Dr. Erdinest is a lecturer at the Hadassah Hebrew University Medical Center in Jerusalem, Israel, and chairman of the Israeli Contact Lens Society.
Professor Montani is a professor at the Department of Mathematics and Physics at the University of Salento in Lecce, Italy.
Dr. Itoi is an associate professor at the Department of Ophthalmology at Juntendo University in Tokyo, Japan.
Dr. Bendoriene works at Vilnius University in Vilnius, Lithuania.
Dr. Mulder is an optometrist at Visser Contactlenzen, Nijmegen, the Netherlands.
Dr. van der Worp runs Eye-Contact-Lens Research & Education consultancy in Amsterdam, the Netherlands.
Mr. Van Mierlo is professional relations manager for Bausch + Lomb Vision Care Benelux, based in the Netherlands.
Dr. Romualdez-Oo is based in Manila, Philippines.
Dr. Abesamis-Dichoso is based in Manila, Philippines, is part of the editorial board for *Cookie* magazine, and is clinical director of the Special Olympics Healthy Athletes Program, Asia Pacific Region.
Dr. González-Méijome is professor of Optometry and Vision Science with the Clinical and Experimental Optometry Research Laboratory at the University of Minho, Portugal.
Dr. Macedo-de-Araújo is with the Clinical and Experimental Optometry Research Laboratory at the University of Minho in Portugal.
Mr. Johansson is a lecturer in the Department of Medicine and Optometry, Section of Optometry and Vision Science at Linnaeus University in Kalmar, Sweden.
Dr. Hsiao is an associate professor at the Department of Optometry at Chung Shan Medical University in Taichung, Taiwan.
Dr. Nichols is senior associate vice president for research and a professor at the University of Alabama at Birmingham; editor-in-chief of *Contact Lens Spectrum*; and editor of *Contact Lenses Today.*

IL	IT	JP	LT	NL	PH	PT	SE	TW	UK	US	OVERALL
96%	87%	95%	100%	78%	95%	71%	96%	93%	97%	84%	86%
95%	80%	83%	100%	53%	98%	82%	94%	91%	89%	91%	86%
1%	4%	7%	0%	4%	15%	0%	0%	54%	1%	1%	5%
29%	17%	25%	4%	15%	2%	3%	6%	21%	13%	8%	13%
6%	11%	7%	2%	8%	8%	13%	15%	0%	5%	3%	6%
64%	68%	61%	94%	74%	76%	84%	79%	25%	81%	88%	76%
39%	24%	70%	78%	35%	47%	33%	32%	75%	31%	36%	48%
41%	37%	20%	14%	26%	29%	36%	29%	16%	39%	35%	28%
2%	2%	2%	1%	1%	1%	1%	2%	0%	2%	0%	1%
11%	25%	8%	6%	33%	19%	21%	30%	8%	23%	13%	18%
5%	0%	0%	0%	3%	4%	1%	6%	0%	4%	14%	3%
2%	12%	0%	1%	1%	0%	9%	0%	0%	1%	0%	2%
0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%
57%	55%	60%	50%	31%	30%	41%	42%	59%	74%	45%	48%
17%	6%	39%	8%	6%	1%	2%	4%	3%	3%	12%	15%
25%	31%	1%	42%	60%	63%	56%	52%	35%	23%	38%	34%
0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
0%	7%	0%	0%	3%	7%	0%	0%	0%	0%	3%	2%
0%	1%	0%	0%	0%	0%	1%	2%	2%	0%	2%	1%
0%	1%	0%	31%	1%	27%	1%	11%	0%	1%	9%	7%
•	100%	50%	98%	45%	79%	100%	0%	•	97%	87%	0%
60%	81%	80%	86%	91%	95%	87%	89%	86%	97%	89%	91%
62%/18%	69%/1%	32%/1%	31%/0%	68%/8%	77%/1%	64%/0%	52%/9%	55%/0%	55%/9%	30%/31%	53%/7%

See Table 1 for country abbreviations.