In 2003 in this journal, I presented a ‘health check’ on the UK contact lens market and, six years on, it seems appropriate to review the state of the market in light of the changes in lens availability over the intervening period.

Precisely how we measure the health of any contact lens market is open to some debate, but a logical approach which is widely adopted is to estimate the number of contact lens wearers within a country or region as the ultimate indicator of the success of this form of vision correction. Of course, a simple absolute number on a country-by-country basis is of limited value on its own and, typically, this parameter is expressed in percentage terms as the proportion of the adult population who are contact lens wearers. This is the ‘wearer base’.

Estimation of the size of the wearer base is a challenging and potentially expensive exercise. One approach is to adopt conventional market research strategies and approach a large population via the post, web, email or with street surveys. The market research companies that undertake this form of analysis work carefully not to bias their sample with these methods; it is likely, for example, that the demographics of the population who volunteer for verbal questioning on a high street are different to those responding to a web-based poll.

Further to this, with contact lens wearers representing a relatively small minority of the total population, a very high number of people need to be surveyed to provide a good level of detail about the types of lenses worn.

A second approach is to access information about the number of contact lenses sold in the market and derive information about the number of wearers from that dataset. This method is dependent on the distribution of the lenses sold being well controlled and the geographic area being well demarcated. This is the case for the contact lens industry. Because lenses are sold to practitioners who then supply patients, there are no complicating effects due to multiple levels along the supply chain; furthermore, contact lens companies are generally readily able to identify the number of lenses supplied into the UK, even if the company and/or distribution centre is based overseas.

Another factor is the requirement to capture information about all (or almost all) of the lenses supplied. We are well served in this regard by the Association of Contact Lens Manufacturers, which coordinates an assessment of lens sales in the UK each year, with its 15 contributing manufacturers accounting for more than 95 per cent of lenses sold.

Although the lens sales information from this source is likely to be highly accurate, deriving data about the number of lens wearers requires a series of assumptions about lens consumption. For example, lens consumption for a daily disposable wearer is estimated to be 350 lenses per year. This figure, which indicates that the average wearer uses their daily disposable lenses on a half-time basis, is derived from surveys of lens prescribing and usage. A full analysis comparing estimations of wearer numbers from this lens sales analysis compared to standard market research techniques has been previously reported and suggests that the assumptions related to lens consumption are generally robust.

Total number of wearers

Figure 1 shows the estimate of contact lens wearers in the UK since 1992, taking stock of the UK contact lens market

Using data from the Association of Contact Lens Manufacturers, Dr Philip Morgan reports on the state of the UK market.
Sulley and colleagues reported wearer discontinuations. In 2002, the number of former contact lens wearers is perhaps slower than might be expected. This observation is, of course, explained by the number of wearer discontinuations. In 2002, Sulley and colleagues reported that there were about 1.2 million ex-contact lens wearers in the UK, on the basis that this figure will have increased in the intervening period, the number of former contact lens wearers is probably about half the number of current wearers. Young and colleagues have reported that patients who have dropped out of contact lens wear are very successful when re-introduced to the modality, with a majority of wearers who are refitted still using lenses after six months.

**Lens types worn**

In the ACLM dataset, each lens type is categorised into one of five options, and the number of wearers calculated for each. The change in the number of wearers of each option is shown in Figure 2 and the number of wearers in 2000 and 2008 is shown in Table 1.

Daily disposable lenses were first recorded as a separate category in 1996 and the number of wearers has risen approximately linearly to the current number of 1.3 million wearers (38 per cent of all lens wearers). Frequent replacement hydrogel lenses accounted for the largest number of contact lens wearers (46 per cent in 2000) until a decline in recent years (23 per cent in 2008) as the number of silicone hydrogel lens wearers increased (1 per cent of wearers in 2000 and 26 per cent of wearers in 2008). The rise in silicone hydrogel wearers accelerated from 2004 when the lens manufacturers started to promote this material as a daily wear option; previously, silicone hydrogels were typically prescribed for extended wear.

The number of rigid lens wearers has seen a modest decline over the period of the ACLM data collection, from 399,000 in 2000 to 324,000 in 2008.

**Predicting the future**

For the past 14 years, with colleagues from EuroLens Research, I have also collected data relating to contact lens prescribing trends in the UK and it seems reasonable to assume that there must be a relationship between how lenses are prescribed and how many are sold, albeit with a time ‘offset’ between the two sets of data. For example, if a new lens type is launched in any one year and widely fitted, lens sales for this lens (and the number of wearers) will lag behind the prescribing data. The magnitude of this lag is dependent on many factors such as the frequency of lens wear and the likelihood of discontinuation. While these are difficult to quantify, it seems that a one year lag between prescribing popularity and the number of calculated wearers gives good agreement.

Figure 3 shows the change in the proportion of rigid lens wearers in the UK market in terms of both values derived from ACLM sales data and the predicted number of wearers from EuroLens Research prescribing data with the later data set offset by one year. The agreement between 1998 and 2008 appears quite robust, suggesting that the predicted number of wearers for 2009 and 2010 is also likely to be reasonably accurate. This information suggests a small rise in the proportion of wearers who use rigid lenses which in turn could be used to predict the number of rigid lenses that will be sold this year and next.

Perhaps a more dramatic example of these future predictions is that for silicone hydrogel lenses (Figure 4). Again, the number of wearers predicted from prescribing data appears reasonably accurate for 1999-2008. This model suggests a significant rise in silicone hydrogel...
Hospital case

Part 1 - Eye rubbing

In a new series Dr Lynne Speedwell presents interesting and unique contact lens cases from her hospital practice.

No matter how many patients we see, there are always those patients who make our work experience more interesting and keep us on our toes so that we do not become complacent. This series presents six case reports of patients who fit this category and who demonstrate how wide ranging the use of contact lens fitting can be.

In hospital practice, we are used to seeing atypical cases, but I want to start with two who were, in my experience, unique. In both cases, neither I nor the various other specialists who have treated them have seen another like them. I have been lucky enough to be able to follow them both over several years. The last four patients in the series show how dependent our patients are on their contact lenses.

Eye rubbing

IP was a young girl who first attended the hospital at the age of seven years. The referring doctor stated that she had an asymmetrical orbital appearance with hollowing above the right eyelid and a bluish discoloration and queried whether this was from repetitive eyelid rubbing leading to fat atrophy.

Her parents reported that she had rubbed the upper part of the right eye since birth. They were concerned that she had a six month history of darkening of the skin around her right eye.

Figure 1 The eyes showed some reduction of the peri-orbital fat

Figure 2 A dense central scar

References


Dr Philip Morgan is director of Eurolens Research and a senior lecturer in optometry at the University of Manchester. He is an honorary member of the Association of Contact Lens Manufacturers.
eye and an apparent sunken appearance of the eye. The eye wasn’t red or sticky, she had no history of atopy and on questioning said her eye did not itch. She just wanted to rub it. She was well and there was no family history of eye problems.

On examination, she was found to have equal size orbits and no other facial asymmetry. However, her acuity was R 1.04 logMAR and L 0.0. There was no movement on cover test and no proptosis. Corneas were clear and the bulbar conjunctiva showed no sign of allergy.

Refraction
R -3.75/-7.75 x 15 0.94
L Plano

Ks R 7.02 x 9, 6.01 x 99
L 7.92 x 173, 7.71 x 83
(Regular mires in both eyes)

Her full spectacle prescription was ordered and her parents were advised to patch her left eye for five hours a day and to pad the right eye at night to prevent her from rubbing it. Mast cell stabilisers were prescribed three times a day.

The diagnosis was made of orbital fat atrophy, and keratoconus due to repetitive eye rubbing. She was referred for a craniofacial assessment. They excluded Romberg’s disease (also known as progressive hemifacial atrophy) which in its early stages usually involves the skin and subcutaneous tissue and later may involve the facial muscles and skeleton.

She was seen three months later. The mast cell stabilisers had made no difference and she was now rubbing her left eye at night as well as the right. Acuity was R 0.56 and L 0.0.

The right refraction continued to increase to -3.50/-9.50x10 by age seven and three-quarters. With this prescription and continued patching, the right VA improved to 0.24 but by then, the left vision had reduced to 0.14 unaided and both K readings had altered, R6.88 x 10, 5.91 x 100, L 7.95 x 159, 7.44 x 69. Slit-lamp examination remained clear throughout. The appearance of both eyes now showed some reduction of the peri-orbital fat, though the right eye was far worse than the left (Figure 1). Daytime patching was reduced to two hours a day and her parents were advised to pad both eyes at night to prevent rubbing.

By eight years, the left K readings had again steepened. Slit lamp examination showed corneal striae in the right and early epithelial changes in the left. Trial contact lenses were ordered for both eyes which she successfully wore for several months.

One year later, aged nine, she developed right hydrops and became so upset that for a time, she stopped rubbing her eyes. Three months later the hydrops was beginning to resolve and she had stopped all drops. The right VA was 6/38 at 1/3m and there was a dense central scar (Figure 2). This slowly improved and six months after the hydrops occurred, she was able to see 1.0. However, she was complaining that her vision was worse and her left eye was now only able to see 0.24 unaided.

Refraction
R -5.00/-10.00 x 160 (0.9)
L 0.0/ -4.50 x 75

with K readings
R 6.85 x 160, 6.30 x 70
L 7.85 x 164, 6.93 x 75

Pachymetry measurements revealed reduced central corneal thickness (R=L) of CCT R 0.513mm (off centre), L 0.543mm.

New contact lenses were ordered: R Rose K 6.40/9.30/-13.00 (0.7)
L Rose K 7.30/9.30/-2.25 (-0.1)

She was now aged 10 years. The scarring from the hydrops was resolving but she continued to rub her eyes in spite of the bilateral night time patching and the scare she had had with the hydrops. Her right eye again required a steeper contact lens.

With no other suggestions for treatment, she was referred to a psychology department. This she duly attended but they could find no likely cause of the constant eye rubbing.

Nine months later, the scar in the right eye was much resolved (Figure 3). She had superficial punctuate epitheliopathy over scarred area and splits in Descemet’s membrane but the vision had improved to 0.3 with a contact lens.

By the following year, at age 11 years, although she was doing well with her lenses and her vision was good, her parents reported that she still rubbed her eyes a lot even while wearing her rigid lenses. Even her classmates were on her case and told her to stop each time they saw her rubbing the eyes. The left eye needed a steeper lens – Rose K 7.20/9.30/0.00 (-0.1).

She continued thus for another year when it was decided to refer her for a trial of hypnosis. This appeared to help a little. However, it was not until six months later that the eye-rubbing finally started to lessen. Now aged 13, she had had her ears pierced and instead of eye rubbing, she now ‘fiddled’ with her diamante ear studs.

Over the course of the next year, her corneas continued to steepen and the lenses have been refitted. The right acuity is 0.0 and Left 0.06 logMAR. Surprisingly, the right eye sees better than the left.

She is now aged 14 years. She will not leave the house without her makeup and she has completely stopped rubbing her eyes as the makeup would be ruined were she to do so. With hindsight, had makeup been prescribed for her as a seven-year-old, she may have avoided the problems her eye rubbing has incurred.●

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