

## WORLD VIEW

# Eye healthcare services in eastern Europe: Part 1 Cataract surgery

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**Aim:** To describe cataract surgical services in 1998 in 12 eastern European countries and to identify their needs to reduce cataract blindness.

**Methods:** All inpatient eye departments in the 12 countries received a standardised questionnaire; the data obtained were further processed at the coordinating centre in Prague.

**Results:** All 458 eye departments in the region were involved. The response rate was 100%, except for Bulgaria (93%) and Romania (93%). The total number of cataract surgeries per one million inhabitants in 1998 was calculated: Belarus (800), Federation of Bosnia and Herzegovina (1275), Bulgaria (1730), the Czech Republic (4210), Estonia (2530), Hungary (3530), Latvia (1860), Lithuania (1550), Trans-Dniester Moldova (1300), Poland (1475), Romania (1260), and Slovakia (2430). Cataracts were mostly operated on by the extracapsular technique. Intracapsular extractions were frequently performed in Federation of Bosnia and Herzegovina (47%), Belarus (46%), Bulgaria (18%), and Romania (14.3%). Phacoemulsification was uncommonly used in 1998, except for the Czech Republic (86%), Estonia (50%), Slovakia (38%), and Hungary (16%). An IOL was implanted in more than 90% of patients in the Czech Republic, Estonia, Hungary, Latvia, Lithuania, and Slovakia.

**Conclusions:** Conditions for cataract surgery in the eastern European region differ. The main barriers to cataract surgery were state budget limitations, insufficient supply of consumables, underutilisation of operating theatres, and poor detection of patients requiring surgery.

Health care in eastern Europe is going through a comprehensive process of transformation. The affordability and availability of eye healthcare services are affected by various changes in the economic infrastructure in the region. Under the socialist governments, the healthcare systems were financed from the state budget. Since the beginning of the 1990s, the economy has become more liberal and new aspects of health care have been introduced (for example, healthcare insurance, private practices). The transition of eastern European economies affects state healthcare budgets, temporarily placing many healthcare establishments under severe economic restrictions. Over the past decade, eastern European economies have adopted various models of transition, and the economic indicators already show remarkable differences.<sup>1</sup>

There is a lack of information describing eye healthcare services in the eastern European region by measurable parameters. The aim of this project was to describe the current status of eye healthcare services and evaluate the needs of eastern European countries in order to promote activities across the region in the fight against preventable or treatable diseases which cause blindness. This project has already been extended to cover all countries in eastern Europe willing to participate, to have information on eye healthcare services available within the next 2–3 years. The outcome of this study became a starting point for the development of national prevention of blindness strategies in the framework of the global initiative "Vision 2020—the right to sight."<sup>2</sup>

## SUBJECTS AND METHODS

The study was managed by the international study coordinating centre in Prague. An international study group was created consisting of representatives of national societies of ophthalmology from 12 eastern European countries: Belarus, Federation of Bosnia and Herzegovina, Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Trans-Dniester Region of Moldova, Poland, Romania, and Slovakia (Fig 1). A

standardised questionnaire was distributed among all inpatient eye departments to collect the necessary information about their eye healthcare services in 1998. Information on the number of eye doctors working at inpatient eye departments, their surgical activity, and the equipment of inpatient eye departments was collected. Data obtained this way were complemented by information gathered during personal visits to some eye departments. Particular attention was paid to learning about the current needs in the region, especially with respect to diagnostics and treatment of potentially preventable and/or treatable diseases which cause blindness (for example, cataract, diabetic retinopathy, retinopathy of prematurity). The data were further processed by the international study coordinating centre in Prague. The results are presented in two parts, the first deals with cataract surgery, and the second describes services for posterior segment eye diseases (diabetic retinopathy, retinopathy of prematurity).

## RESULTS

All 458 eye departments (70 university and 388 non-university inpatient departments) located in 12 participating countries were involved in the study (Table 1). The response rate was 100% except for Bulgaria (93%) and Romania (93%). The non-participating eye departments in these two countries were surgically inactive.

## Cataract surgeons

Data on the number of ophthalmologists working at inpatient eye departments were collected (Table 2). The number of trained cataract surgeons per one million inhabitants was calculated: Belarus (15), Federation of Bosnia and Herzegovina (11), Bulgaria (26), the Czech Republic (14), Estonia (12), Hungary (34), Latvia (12), Lithuania (10), Trans-Dniester Region of Moldova (14), Poland (20), Romania (11), and Slovakia (20).



**Figure 1** Map of countries involved in the study (from Bosnia and Herzegovina, only the Federation of Bosnia and Herzegovina was represented; in Moldova only the Trans-Dniester Region was involved.)

The average number of cataract surgeries performed by one cataract surgeon in 1998 was as follows: Belarus (55), Federation of Bosnia and Herzegovina (118), Bulgaria (67), Czech Republic (295), Estonia (216), Hungary (104), Latvia (152), Lithuania (159), Trans-Dniester Region of Moldova (94), Poland (71), Romania (113), and Slovakia (121) (Fig 2).

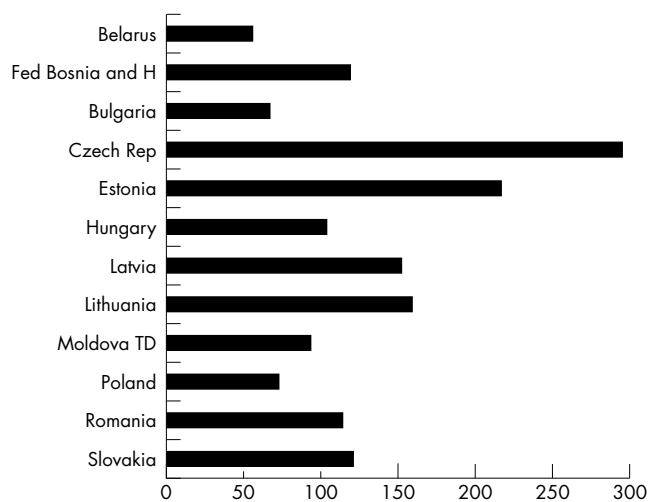
Ophthalmologists trained in cataract surgery represented 57% (2202) of all inpatient ophthalmologists in the 12 countries involved in this study (3851).

**Cataract surgery**

The cataract surgical rate (total number of cataract operations performed within a year per one million inhabitants) in 1998 was as follows: Belarus (800), Federation of Bosnia and Herzegovina (1275), Bulgaria (1730), Czech Republic (4210),

**Table 2** Number of ophthalmologists at inpatient eye departments in eastern Europe in 1998

Country	Population (in millions)	Ophthalmologists at inpatient eye departments
Belarus	10.052	194
Fed Bosnia and Herzegovina	2.226	44
Bulgaria	8.230	577
Czech Republic	10.290	469
Estonia	1.454	37
Hungary	10.092	485
Latvia	2.458	69
Lithuania	3.701	111
Trans-Dniester Moldova	0.666	15
Poland	38.667	1346
Romania	22.503	250
Slovakia	5.391	254
Total	117.881	3851

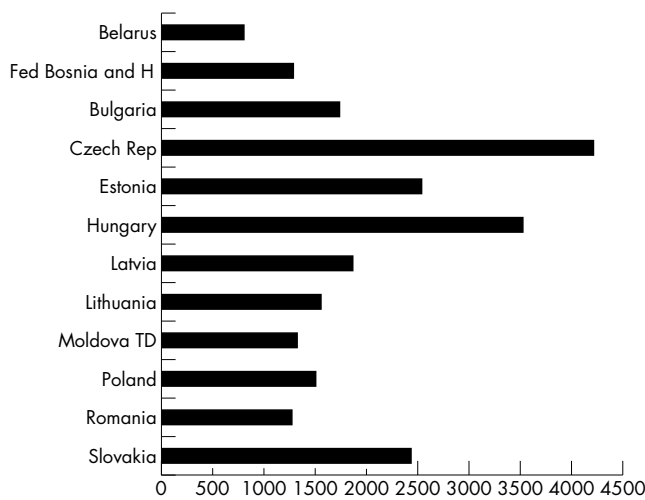


**Figure 2** Average number of cataract surgeries performed by one cataract surgeon in 1998.

Estonia (2530), Hungary (3530), Latvia (1860), Lithuania (1550), Trans-Dniester Region of Moldova (1300), Poland (1475), Romania (1260), and Slovakia (2430) (Fig 3). Extracapsular extraction was the leading technique in cataract surgery; however, in some countries the intracapsular cataract extraction technique was still rather frequent (Federation of Bosnia and Herzegovina, Belarus, Bulgaria, Romania). Phacoemulsification cataract surgery was rarely used except

**Table 1** Departments of ophthalmology in eastern Europe in 1998

Country	University departments of ophthalmology	Non-university departments of ophthalmology	Total
Belarus	4	14	18
Fed Bosnia and Herzegovina	2	3	5
Bulgaria	7	47	54
Czech Republic	10	49	59
Estonia	1	5	6
Hungary	6	55	61
Latvia	1	7	8
Lithuania	2	4	6
Trans-Dniester Moldova	1	5	6
Poland	19	126	145
Romania	10	46	56
Slovakia	7	27	34
Total	70	388	458



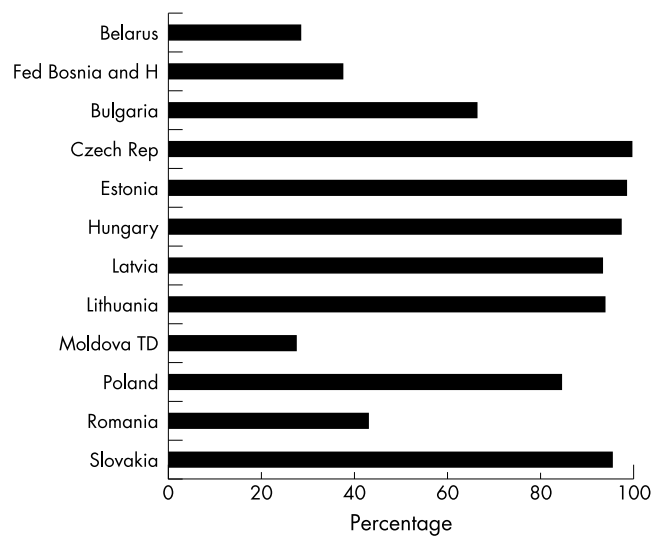
**Figure 3** Cataract surgery rates in 1998 (total number of cataract surgeries performed per one million inhabitants in 1998).

for the Czech Republic (85.7%), Estonia (50%), Slovakia (38%), Hungary (15.9%), Poland (9%), and Latvia (4%). There were no phacoemulsification cataract surgeries reported in 1998 from Moldova-Trans-Dniester Region, and Belarus (Table 3). The number of operated eyes where an intraocular lens (IOL) was implanted was recorded. The percentage of IOL implantations exceeding 90% of cases was in the Czech Republic (99), Estonia (98), Hungary (97), Slovakia (95), Lithuania (94), and Latvia (93). In the other countries, the IOL implantation rate was lower: Poland (84), Bulgaria (66), Romania (43), Federation of Bosnia and Herzegovina (37), Belarus (28), and Trans-Dniester Region of Moldova (27) (Fig 4).

**Availability of cataract surgery**

In 1998, the majority of inpatient eye departments in eastern Europe were operated by the state; private eye hospitals providing surgical services were extremely rare. An estimate of the length of time on a waiting list for cataract surgery in the participating countries was obtained. Waiting lists were reported in Estonia (3–6 months), Lithuania (2 months), Poland (8–12 months), the Czech Republic (2–5 months), Slovakia (6 months to 2 years), Hungary (2–6 months), and Belarus (several weeks up to 3 months). A shorter waiting time was recorded in Latvia (approximately 2 weeks). In Romania, Bulgaria, Federation of Bosnia and Herzegovina, and Trans-Dniester Region of Moldova, there was not enough information on waiting lists for cataract surgery available.

It was revealed that the availability of equipment and consumables for cataract surgery differs greatly. The number of



**Figure 4** Intraocular lens implantation in cataract surgeries in 1998.

phacoemulsification machines was calculated; however, it remained below one phacoemulsification machine per one million inhabitants, except for the Czech Republic (7), Slovakia (6), Hungary (5), Estonia (4), and Poland (1.6). There is a minimal supply of IOLs produced domestically. Hospitals are mostly dependent on rather expensive imported materials. In several countries, the cost of an IOL is covered by health insurance or borne by the state eye care provider (Czech Republic, Hungary, Estonia, Latvia, Lithuania, Poland, Slovakia). However, in other countries, the patients share the cost of their surgery and consumables (Federation of Bosnia and Herzegovina, Bulgaria, Trans-Dniester Region of Moldova, Romania). The ability of patients to bear these costs directly influences the rate of IOL implantation.

**DISCUSSION**

The data collected revealed remarkable differences among the countries in the region. Their healthcare systems are determined by the political situation, status of their economic transition, and historical background. The findings suggest the growing variety in healthcare services of eastern European countries.

All possible efforts have been made to obtain reliable data from the eye departments which participated in the study. The standardised questionnaires allowed easier processing of the data collected. Members of the international study group supervised the data collection in their countries, reviewing reports from all eye departments, and complementing the

**Table 3** Cataract surgery in eastern Europe in 1998

Country	Intracapsular cataract extraction (%)	Extracapsular cataract extraction (%)	Phacoemulsification (%)
Belarus	46	54	–
Fed Bosnia and Herzegovina	47	52.7	0.3
Bulgaria	18	81	1
Czech Republic	0.2	14.1	85.7
Estonia	–	50	50
Hungary	2.6	81.5	15.9
Latvia	–	96	4
Lithuania	2.6	94.6	2.8
Trans-Dniester Moldova	7	93	–
Poland	3	88	9
Romania	14.3	85.3	0.4
Slovakia	1	61	38

information obtained by questionnaires with telephone inquiries and personal visits.

Cataract surgery is among the most frequent intraocular surgical procedure. The cataract surgical rate is considered one of the main indicators of eye care services.<sup>3</sup>

An analysis of cataract surgical services in eastern Europe indicates that the utilisation of cataract surgeons highly varied. The highest number of cataract surgeons per one million inhabitants was recorded in Hungary (34) followed by Bulgaria (26), Slovakia, and Poland (20). However, when compared with the number of cataract surgeries performed by one cataract surgeon in 1998, their productivity was below the regional average, which was 130 cataract surgeries per one cataract surgeon. The most active cataract surgeons in 1998 were in the Czech Republic; there were 14 cataract surgeons per one million inhabitants performing on average 295 surgeries per one surgeon. The reasons for these differences may be at least threefold. Firstly, in some countries there were serious budget limitations for health care, restricting the number of surgeries which might have been otherwise performed. Secondly, the average financial remuneration for healthcare personnel at state hospitals was rather low. It might indirectly discourage employees from increasing their surgical performance, and might also limit the number of surgeries scheduled, therefore leaving the operating theatres underutilised. Thirdly, the poor detection of patients, particularly in rural areas, along with the public's low awareness of cataract surgery might be considered. It particularly applies to countries with a rather low cataract surgical rate and a short or non-existent waiting list for cataract surgery.

Extracapsular cataract extraction remained the main technique for performing cataract surgery in the region, except for the Czech Republic and Estonia, where an equal or higher percentage of phacoemulsifications were performed. Intracapsular extractions were recorded only rarely (Federation of Bosnia and Herzegovina, Belarus). In some countries a rather low rate of IOL implantation was found. This may negatively affect the overall benefit of cataract surgery for the patient. If an appropriate aphakic correction is not readily available, the actual impact of the cataract operation on visual function and comfort of the patient remains low. There was a striking difference in the IOL implantation rate between the countries where an IOL was provided free of charge for patients (Estonia, Latvia, Lithuania, Poland, Czech Republic, Slovakia, and Hungary) and countries where patients shared or fully paid the cost of the IOL (Romania, Bulgaria, Federation of Bosnia and Herzegovina, Trans-Dniester Region of Moldova, and Belarus).

## CONCLUSIONS AND RECOMMENDATIONS

The availability and affordability of cataract surgical services was analysed in 12 eastern European countries. Cataract remains one of the leading causes of blindness worldwide.<sup>4,5</sup>

An improvement in eye care services for patients with cataract in eastern Europe should reduce the number of inhabitants suffering from visual impairment caused by this condition. The following observations may be suggested for further consideration.

(1) There were enough cataract surgeons in the eastern European region; however, in many countries their staff was not fully utilised. The average number of cataract surgeries performed per one cataract surgeon should be increased.

(2) A further analysis of healthcare systems is necessary to identify possible ways to increase the cataract surgical rate. From the economic point of view, this might be achieved through purchases of cheaper consumables (for example, viscoelastic material, IOL). In countries with a long waiting list for cataract surgery, it might be beneficial to allow patients to be operated on earlier if they would share the cost of surgery. This would provide certain income, which would cover running costs along with increasing the number of surgeries performed.

(3) Public awareness of the surgical treatment for cataract should be increased, particularly in countries with a rather low cataract surgical rate and short or non-existent waiting lists for cataract surgery.

(4) A long term quality analysis of cataract surgeries in the region is advisable.

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