

Evaluating the Adequacy of the Geographic Distribution of Eye Care Professionals in Alberta: Is There a Need for Optician Performed Refractions?

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Abstract

A refraction is one of several diagnostic procedures performed by optometrists and ophthalmologists to formulate a prescription for eyeglasses. In Alberta, optometrists and ophthalmologists are authorized to perform refractions and prescribe eyeglasses based on the results. On the other hand, opticians are authorized to perform refractions, but may not prescribe eyeglasses. This study considers whether there is a public need for opticians to be authorized to independently refract and prescribe eyeglasses given the current geographic distribution of optometrists and ophthalmologists in Alberta. To answer this question, the optometrist- and ophthalmologist-to-population ratios for each of Alberta's five health zones were calculated and compared to international benchmarks. Our results show that all five of Alberta's health zones have optometrist-to-population ratios that either meet or exceed the 1:10,000 international benchmark of public need, and three of the five health zones have ophthalmologist-to-population ratios that meet or exceed the 3:100,000 international benchmark of public need. Based on this data, there is an adequate distribution of optometrists, but an inadequate distribution of ophthalmologists, in the province. With the current availability of optometrists and ophthalmologists in Alberta, there is no public need for opticians to be authorized to independently refract and prescribe eyeglasses.

KEYWORDS:

Refraction, Optometrist, Optician, Ophthalmologist, Benchmarking, Alberta, Public Need

INTRODUCTION

In Alberta, both optometrists and ophthalmologists can perform comprehensive eye examinations and prescribe eyeglasses. A comprehensive eye examination includes an assessment of the patient's health history, ocular and systemic health, and visual function including refraction, acuity, visual field, and binocular vision status. A reliable prescription for eyeglasses can be issued only with a complete understanding of a patient's health and visual functioning. In Alberta, opticians are authorized to perform refractions, and, with the approval of an authorized prescriber (optometrist or ophthalmologist), dispense eyeglasses based on the prescription received from the authorized prescriber.

In this study, we investigate whether there is a public need for opticians to be authorized to independently refract and prescribe eyeglasses. An adequate distribution of optometrists and ophthalmologists is important to ensure that Albertans, wherever they may live, have easy access to a professional who can perform a comprehensive eye examination and issue a prescription for glasses.

This study will not make any conclusions about whether opticians possess the requisite knowledge, skills and competencies to perform a refraction and prescribe eyeglasses based on that refraction. In addition, this study does not make any conclusions about whether the public understands the difference between a refraction (sight test) and a comprehensive eye examination. Although these are both important considerations, this paper focuses solely on whether there is currently an adequate number of health professionals authorized to provide care for refractive error in the province.

METHODS

To determine the geographic distribution of eye care professionals in Alberta, the province was divided into five health zones. The health zones are defined by Alberta Health Services and include the North Zone, Edmonton Zone, Central Zone, Calgary Zone, and South Zone (Figure 1).¹

Figure 1: A map of the province of Alberta showing the five health zones as defined by Alberta Health Services. Figure generated using GeoDiscover Alberta mapping application.



The number and location of practicing optometrists, ophthalmologists, and opticians in Alberta were determined using data from the Alberta College of Optometrists,² the College of Physicians and Surgeons of Alberta,³ and the Alberta College and Association of Opticians.⁴ Based on 2018 population data for each of the five health zones, the optometrist- and ophthalmologist-to-population ratios in each region were calculated and compared to previously defined international benchmarks. The international benchmark for optometrists, as seen in Canada, the United States, and Australia, is 1 per 10,000 people.^{5,6} The international benchmark for ophthalmologists is estimated to be 3 per 100,000 people.⁷ The public need for optician-performed refractions is based on whether the optometrist- and ophthalmologist-to-population ratios in each health zone meet these international benchmarks.

RESULTS

Figure 2 shows the optometrist-to-population ratios in each of Alberta's five health zones (North, Edmonton, Central, Calgary, and South) and compares these ratios to the previously defined international benchmark of 1 per 10,000 people.

With 2.2 optometrists per 10,000 people, the Calgary Zone has the highest optometrist-to-population ratio (Figure 2). The Edmonton Zone follows closely behind with 2.1 optometrists per 10,000 people.

Figure 3 shows the ophthalmologist-to-population ratios in each of Alberta's five health zones and compares these ratios to the previously defined international benchmark of 3 per 100,000 people.

Figure 2: Number of optometrists per 10,000 people in each of Alberta's five health zones compared to the international benchmark of 1 per 10,000 people. Optometrist numbers are current as of 2019. Population data were taken from the Alberta Health Services 2018-2019 Annual Report.

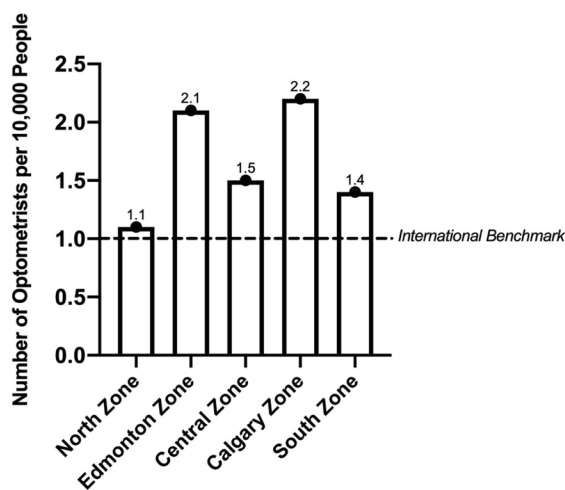
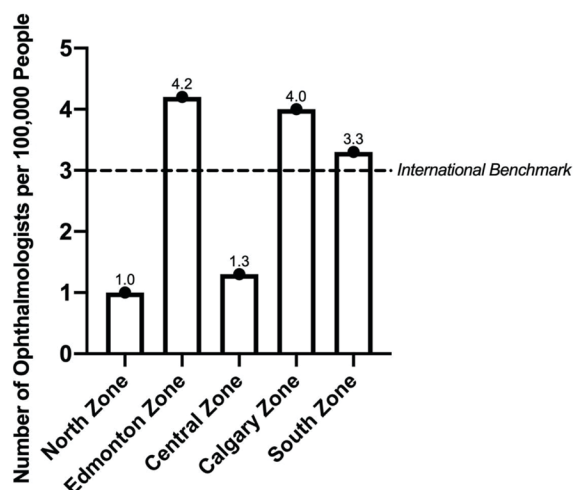


Figure 3: Number of ophthalmologists per 100,000 people in each of Alberta's five health zones compared to the international benchmark of 3 per 100,000 people. Ophthalmologist numbers are current as of 2019. Population data were taken from the Alberta Health Services 2018-2019 Annual Report.



With 4.2 ophthalmologists per 100,000 people, the Edmonton Zone has the highest ophthalmologist-to-population ratio (Figure 3). The Calgary Zone follows closely behind with 4.0 ophthalmologists per 100,000 people. Notably, the North Zone has the lowest optometrist- and ophthalmologist-to-population ratios of all five zones (1.1 and 1.0, respectively) (Figures 2 and 3).

DISCUSSION

When we calculated the optometrist- and ophthalmologist-to-population ratios, 2018 population data were used for each of Alberta's health zones and 2019 data were used to determine the locations of optometrists and ophthalmologists currently practicing in the province. Thus, the optometrist- and ophthalmologist-to-population ratios were calculated using data from different years. This limitation was unavoidable due to the lack of publicly accessible 2019 population data for Alberta's health zones. While this limitation may have caused slight inaccuracies in the calculated optometrist- and ophthalmologist-to-population ratios, it was not considered to significantly affect our general conclusions.

Figure 2 shows that all five of Alberta's health zones have optometrist-to-population ratios that either meet or exceed the 1:10,000 international benchmark. Figure 3 shows that only three of the five health zones have ophthalmologist-to-population ratios that meet or exceed the 3:100,000 international benchmark. Specifically, the North Zone and Central Zone have ophthalmologist-to-population ratios that fall short of the international benchmark (1.0 and 1.3, respectively) (Figure 3). A shortage of ophthalmologists in a specific health zone may severely impact the public's ability to access emergency eye care services, thus placing the public at greater risk for avoidable vision loss. Further, the inadequate distribution of ophthalmologists combined with the adequate distribution of optometrists suggests that there may be some value in expanding optometrists' scope of practice to include the ability to perform certain surgeries or provide treatments currently restricted to ophthalmologists. However, this notion requires considerable research and falls outside the scope of this study. Importantly, the finding that the ophthalmologist-to-population ratio falls short of the international benchmark in two health zones does not necessarily point towards a public need for opticians to be authorized to independently refract and prescribe eyeglasses. The optometrist-to-population ratio of 1:10,000 is, in and of itself, sufficient to meet the public need for access to care for refractive error. This deficiency in the number of ophthalmologists suggests that there may be limited access to secondary and surgical eye care services in certain health zones in Alberta, rather than a deficiency in the supply of care for refractive error. Based on geography alone, the fact that all five health zones have optometrist-to-population ratios that exceed the international benchmark supports the notion that there is not an urgent public need for opticians to be authorized to independently refract and prescribe eyeglasses.

Certainly, there are factors other than geographic distribution that must be considered when determining if there is a public need for opticians to refract and prescribe. In a separate study (currently unpublished), we conducted a jurisdictional review investigating the laws governing optician-performed refractions in 34 jurisdictions. We found that the gold standard surrounding optician-performed refractions is to completely prohibit them. Further, in a different study⁸ we found that refracting opticians in Alberta do not possess adequate training, skills, or knowledge to safely and competently refract and prescribe. Although this is outside the scope of this study, the findings of these two studies seem to support the conclusion that there is no public need for opticians to refract and prescribe in Alberta.

If Alberta's population grows faster than the number of practicing optometrists and ophthalmologists, a public need for opticians to be authorized to independently refract and prescribe eyeglasses may arise. However, as of 2019, optometrists and ophthalmologists are distributed within the province in an adequate manner to ensure that Albertans have easy access to an eye care professional who can perform a comprehensive eye exam and issue a prescription for eyeglasses.

CONCLUSION

The geographic distribution of optometrists and ophthalmologists across Alberta's five health zones is adequate to ensure that all Albertans have appropriate access to an eye care professional who may issue a prescription for glasses. These results suggest that there is no urgent public need for opticians to be authorized to independently refract and prescribe eyeglasses. ●

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Appendix A: 2018 Population Data for Alberta's Health Zones

AHS Health Zone	Population
North	482,635
Edmonton	1,404,498
Central	479,435
Calgary	1,669,272
South	306,577
Total	4,342,417

AHS, Alberta Health Services

Appendix B: 2019 Optometrist, Ophthalmologist, and Optician Location Data

City	Optometrists	Ophthalmologists	Opticians	Health Zone
Airdrie	12	1	14	Calgary
Athabasca	1	0	0	North
Balzac	0	0	1	Calgary
Banff	0	0	1	Calgary
Barrhead	1	0	1	North
Beaumont	1	0	3	Edmonton
Beaverlodge	1	0	0	North
Black Diamond	1	0	0	Calgary
Bonnyville	1	0	1	North
Bragg Creek	3	0	2	Calgary
Brooks	2	0	2	South
Calgary	324	64	333	Calgary
Calmar	1	0	0	Edmonton
Camrose	4	0	0	Central
Canmore	6	0	3	Calgary
Cardston	2	0	0	South
Chestermere	5	0	2	Calgary
Cochrane	4	0	8	Calgary
Cold Lake	3	0	5	North
County of Grande Prairie	3	0	0	North
Devon	1	0	0	Edmonton
DeWinton	1	0	0	Calgary
Drumheller	5	0	4	Central
Duncan	0	1	0	North
Edmonton	223	57	340	Edmonton
Edson	3	0	6	North
Fort MacLeod	1	0	0	South
Fort McMurray	5	0	2	North
Fort Saskatchewan	7	0	9	Edmonton
Gibbons	1	0	1	Edmonton
Grande Prairie	16	3	25	North
High Level	1	0	0	North
High Prairie	0	0	1	North
High River	3	1	3	Calgary
Hinton	4	0	0	North
Jasper	1	0	0	North
Lac La Biche	1	0	0	North
Lacombe	3	0	1	Central

Lamont	0	1	0	Central
Leduc	5	0	7	Edmonton
Lethbridge	22	6	44	South
Lloydminster	10	0	16	Central
Maskwacis	0	0	2	Central
Medicine Hat	11	4	24	South
Morinville	1	0	3	Edmonton
Nanton	0	0	1	Calgary
Okotoks	5	0	19	Calgary
Olds	3	0	5	Central
Oyen	1	0	2	South
Peace River	2	0	0	North
Pincher Creek	1	0	0	South
Ponoka	2	0	1	Central
Red Deer	25	5	41	Central
Red Deer County	4	0	0	Central
Redcliff	1	0	0	South
Rimbey	1	0	0	Central
Rocky Mountain House	0	0	1	Central
Rocky View	2	0	17	Calgary
Sherwood Park	24	1	46	Edmonton
Slave Lake	1	0	0	North
Smoky Lake	1	0	0	North
Spruce Grove	7	0	15	Edmonton
St Paul	4	1	4	North
St. Albert	15	1	28	Edmonton
Stettler	2	0	2	Central
Stony Plain	2	0	2	Edmonton
Strathmore	1	0	1	Calgary
Sturgeon County	1	0	0	Edmonton
Sylvan Lake	0	0	2	Central
Taber	2	0	5	South
Three Hills	1	0	0	Central
Tofield	1	0	2	Central
Vegreville	2	0	2	Central
Vermillion	1	0	0	Central
Wainwright	5	0	3	Central
Westlock	1	0	0	North
Wetaskiwin	5	0	2	Central
Whitecourt	2	0	0	North
TOTAL	825	146	1065	