



CSAO

CANADIAN STANDARD ASSESSMENT IN OPTOMETRY

Summary Report

2010 Administrations



Prepared for
Canadian Examiners in Optometry
By
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The purpose of this report is to provide Canadian Examiners in Optometry with annual statistical insight and a psychometric analysis and summary related to the Canadian Standard Assessment in Optometry (CSAO) as a source of reference for ongoing assessment maintenance and development and for communication to stakeholders. Please note that this report focuses solely on data related to CSAO candidates that have initiated the CSAO process during the 2010 calendar year (new candidate = .1). The results analysis contained herein does not include the complete results data related to those candidates that participated during this calendar year, but initiated the CSAO process during the prior calendar year. Nor does it project overall data or “pass rates” for those candidates that initiated the CSAO process during the current calendar year but are eligible to complete that process during the subsequent year.

OVERVIEW

During 2010, a total of 213 candidates participated in the 3 CSAO administrations. Of this number, 173 (81.2%) were new candidates who undertook all 7 components of the CSAO, 22 (10.3%) represented reassessment candidates who initially sat the CSAO prior to 2010 and 18 (8.5%) were new candidates who sat the written components only. The option to take only the written components of the CSAO is a newly offered option for students enrolled in the last year of their program. These candidates may sit the Clinical Skills components when they are 60 days from graduation. This first time, the students taking this option were from the University of Montreal and all 18 candidates were successful in each of the written components. For the purposes of this report, the focus will be on candidates completing all 7 components of the CSAO and reassessment candidates who first undertook the CSAO prior to 2010.

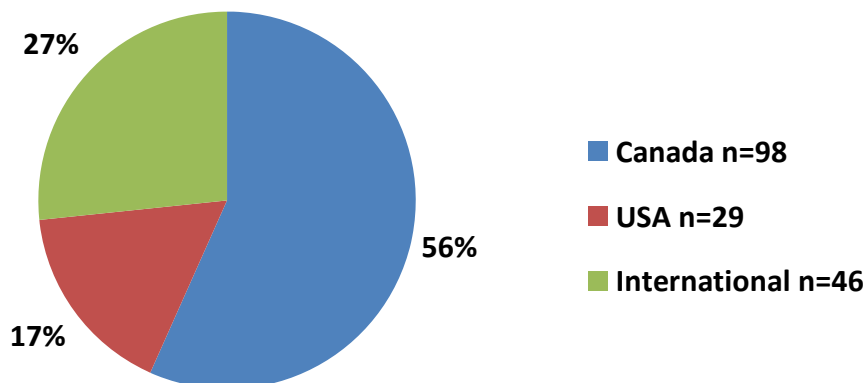
For the April administration, 54 new candidates attended. The May session was made up of 95 new candidates and 14 reassessment candidates while the October administration involved 24 new candidates and 8 reassessments. All of the reassessment candidates had initially sat the CSAO prior to 2010.

Overall, the 173 new candidates for 2010 reflect a lower participation rate than the 238 new candidates who sat the 2009 CSAO.

As Figure 1 indicates, a total of 98 (56.7%) Canadian educated, 29 (16.7%) American educated and 46 (26.6%) Internationally educated candidates participated in the 2010 administrations. In 2009, the American educated candidates represented 43.7% (n=104) of the pool, however, in 2010 this group accounted for only 16.7% (n=29) of all new 2010 candidates. Both Canadian and International participation rates increased with the Canadian pool increasing from 91 candidates in 2009 to 98 candidates in 2010 and the International pool increasing from 43 candidates in 2009 to 46 candidates in 2010.

Figure 1: Distribution of Candidates' Participation Rates by Group

Candidates by Group - 2010 (New Candidates n=173)



Consistent with previous years, a significant number of institutions from around the world were represented at the 2010 examinations.

Table 1 highlights both the institutions and the number of new candidates from each school undertaking the 2010 CSAO.

<u>INSTITUTION</u>	<u>#</u>	<u>%</u>	<u>INSTITUTION</u>	<u>#</u>	<u>%</u>
University of Waterloo	81	46.7	Unisalle, Colombia	3	1.7
University of Montreal	17	9.7	Shahid Beheshti, Iran	3	1.7
Pennsylvania College	5	2.8	Shiraz University, Iran	1	.6
SUNY	4	2.3	Tehran University, Iran	1	.6
Illinois College	13	7.4	Zahedan University of Medical Science, Iran	1	.6
New England College	5	2.8	University of Karachi, Pakistan	1	.6
University of Houston	1	.6	Centro Escolar University, Philippines	3	1.7
Michigan College	1	.6	Pines City Educational Center, Philippines	1	.6
Bradford, England	2	1.2	Benha Faculty of Medicine, Egypt	1	.6
University of Aston, England	2	1.2	Henan Medical, China	1	.6
City University, London	2	1.2	Wenzhou Medical College, China	1	.6
Glasgow Caledonian University	1	.6	Abia State University, Nigeria	2	1.2
Univerity of Melbourne	4	2.2	Cairo University	1	.6
University of Auckland	1	.6	Beijing Medical University	1	.6
Royal College London	1	.6	Central University of Venezuela	2	1.2
Anglina Ruskin UK	1	.6	De Ocampo Memorial College Philippines	1	.6
Elite School of Optometry, India	1	.6	Hospital Churruca Buenos Aires	1	.6
Punjab University, India	1	.6	University of Medical Sciences Iran	1	.6
Dayanand Medical College, India	1	.6	Iran Medical University	1	.6
Bogota,Columbia	1	.6	University of Johannesburg, South Africa	1	.6
			TOTAL	173	100.0

STRUCTURE OF THE CSAO COMPONENTS

The CSAO is comprised of 7 components: 3 written components including Optometric Knowledge (380 items), Ocular Therapeutics (120 items), Clinical Judgment (100 items) and 4 Clinical Stations.

The content of Optometric Knowledge reflects areas from the Biological Sciences and Visual Sciences specifically addressing the following topics: Human Biology, Systemic conditions, Human and Visual Development & Aging, Ocular Visual Biology, Ocular Disease/Trauma, Radiation, Light & Optics, Vision and Public Health and Safety.

The Ocular Therapeutics exam includes the following areas: general microbiology, general immunology, general pharmacology, ocular pharmacology, ocular disease/trauma: treatment, management and progress.

The Clinical Judgment Examination consists of 25 clinical cases reflecting the following areas: Oculomotor, (4 cases,) Sensory-integrative, (3 cases) Systemic disease (4 cases), Refractive Error, (6 cases) Ocular Disease (6 cases) and Accommodation (2 cases).

The four, 45 minute, skills stations require the candidates to perform a number of clinical skills in the following four sessions:

1. Skills and Techniques in Interviewing and Assessing Refractive and Accommodative Conditions
2. Skills and Techniques in Assessing Oculomotor and Sensory-Integrative Functions

3. Skills and Techniques in Assessing Oculomotor and Systemic Disease
4. Skills and Techniques in Assessing Ophthalmic Appliances

SUMMARY OF CANDIDATE PERFORMANCE

For the 2010 administrations, the results are presented at two points in time. The first point reflects the results for first attempt candidates. The second point in time is for the results at Year End, again for new candidates in 2010. Any candidate who is unsuccessful in the Spring administration may choose to retake any failing component in the Fall administration. For those candidates, the Year End result reflects their final status. For example, a candidate who failed in the Spring administration but passed in the October administration would be classified as a failing candidate for the Spring administration but a passing candidate at year-end.

New 2010 Candidates Overall Success Rate - First Attempt

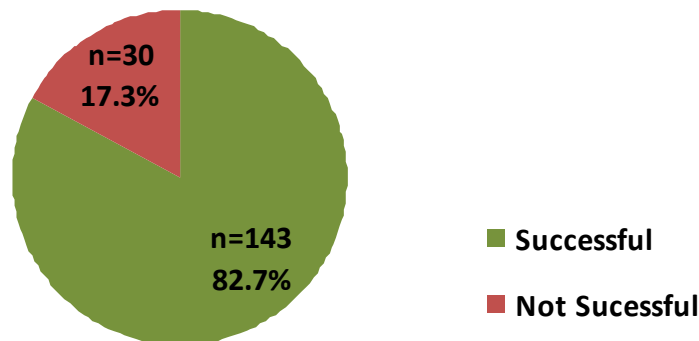
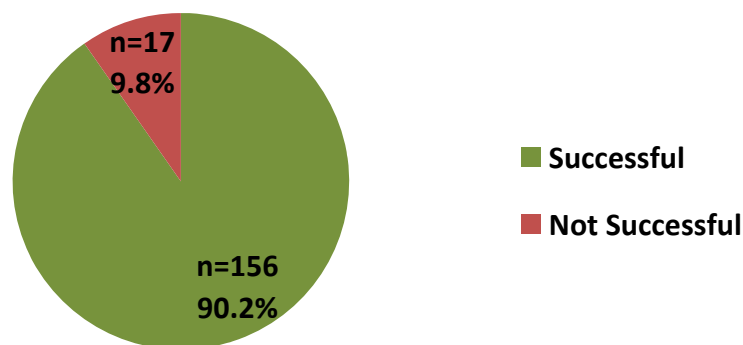


Figure 2, left, represents the overall pass rate for all 173 new 2010 candidates on their first attempt. In order for a performance to be deemed as a “Pass” the candidate is required to be successful in all 7 CSAO components. The overall 2010 first attempt” pass rate was 82.7% and is comparable to the “first attempt” pass rate of 79% in 2009.

Figure 3, below, represents the year-end pass rate for all 173 new 2010 candidates. The 2010 year-end pass rate of 90.2% is comparable to the 2009 year-end result of 89.5%.

New 2010 Candidates Overall Success Rate - Year End



PERFORMANCE BY GROUP

Figure 4 indicates the overall pass rate on first attempt across the three administrations for the 173 new candidates by the following groupings: Canada, USA and International educated. The pattern of results for the three groups was consistent with previous administrations with Canadian candidates having the strongest performance and International candidates reflecting the weakest performance.

Of particular note is the performance of the International candidates. The first attempt data presented below includes both the Spring and Fall administrations. The pass rate for the 26 International candidates in the Spring administration was 38.5% however the pass rate for the 20 International candidates in the Fall, was 70%. When both Spring and Fall sessions are combined, the passing rate on first attempt is 52.2% as reported below.

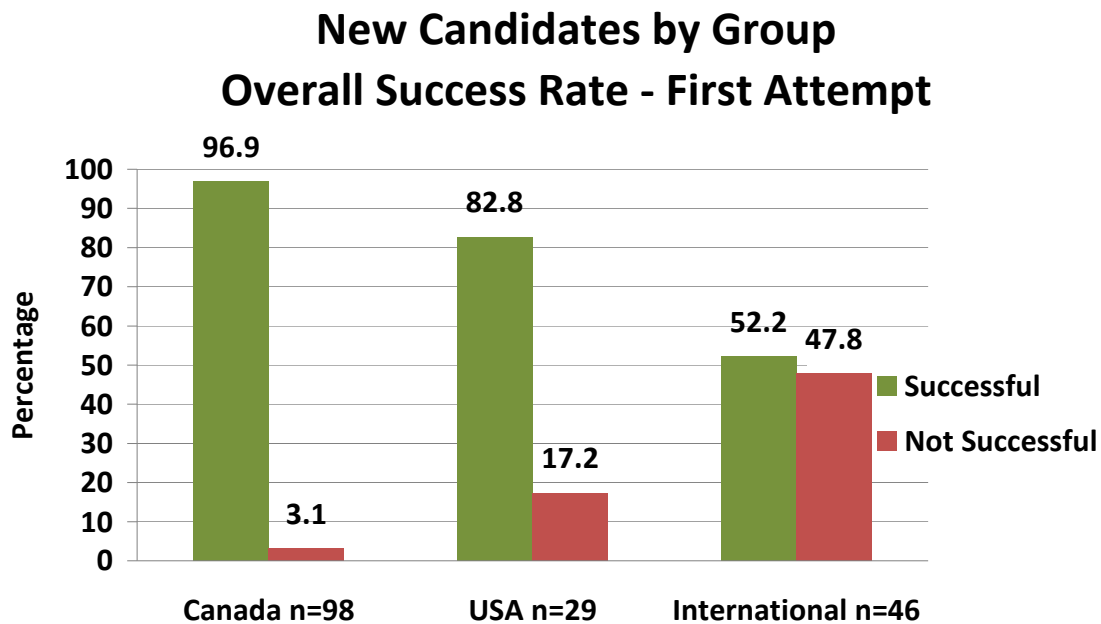
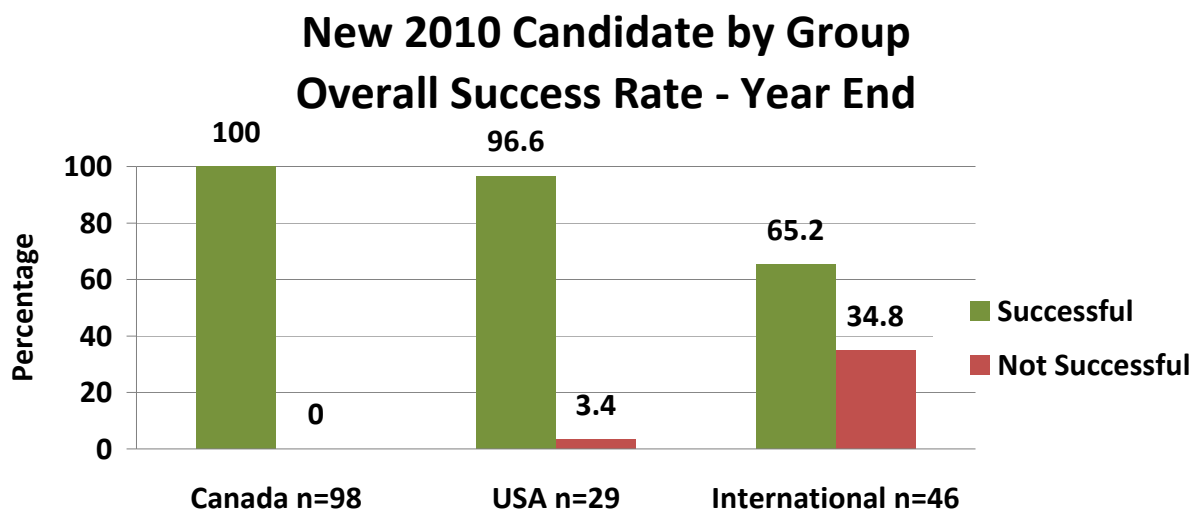


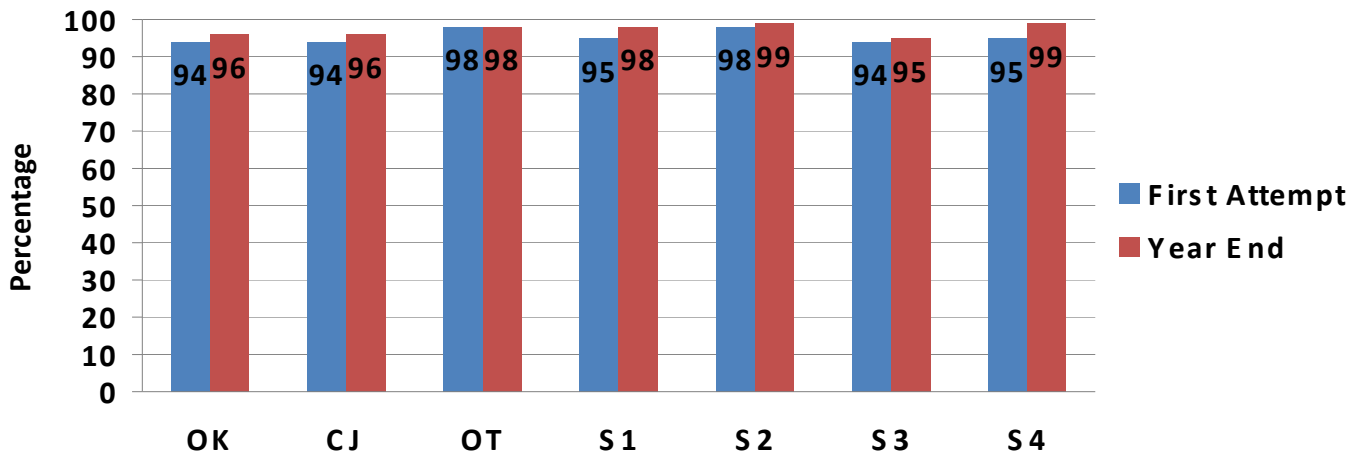
Figure 5 again provides the overall results for each group at year-end. As the results indicate, all three groups (Canadian and US and Internationally educated) benefited from the opportunity to undertake a reassessment session.



PERFORMANCE BY COMPONENT

Figure 6, represents the overall pass rate for each of the 7 CSAO assessment components for all candidates on first attempt and year-end.

**2010 Pass Rate by Component
For All 173 Candidates**



KNOWLEDGE COMPONENTS

OK: Optometric Knowledge

OT: Ocular Therapeutics

CJ: Clinical Judgement

CLINICAL SKILLS COMPONENTS

S1: Interviewing/Assessing Refractive & Accommodative Conditions

S2: Assessing Oculomotor & Sensory-Integrative Functions

S3: Assessing Oculomotor & Systemic Disease

S4: Assessing Ophthalmic Appliances

GROUP PASS RATE BY COMPONENT

Figure 7 compares the first attempt performance of all 3 groups on each of the 7 CSAO exam components. **Figure 8** provides the results for year-end status across each of the 7 components. While the performance of North American candidates was comparable, International candidates encountered greater challenges across all components of the CSAO.

Figure 7: Pass Rates by Component – First Attempt

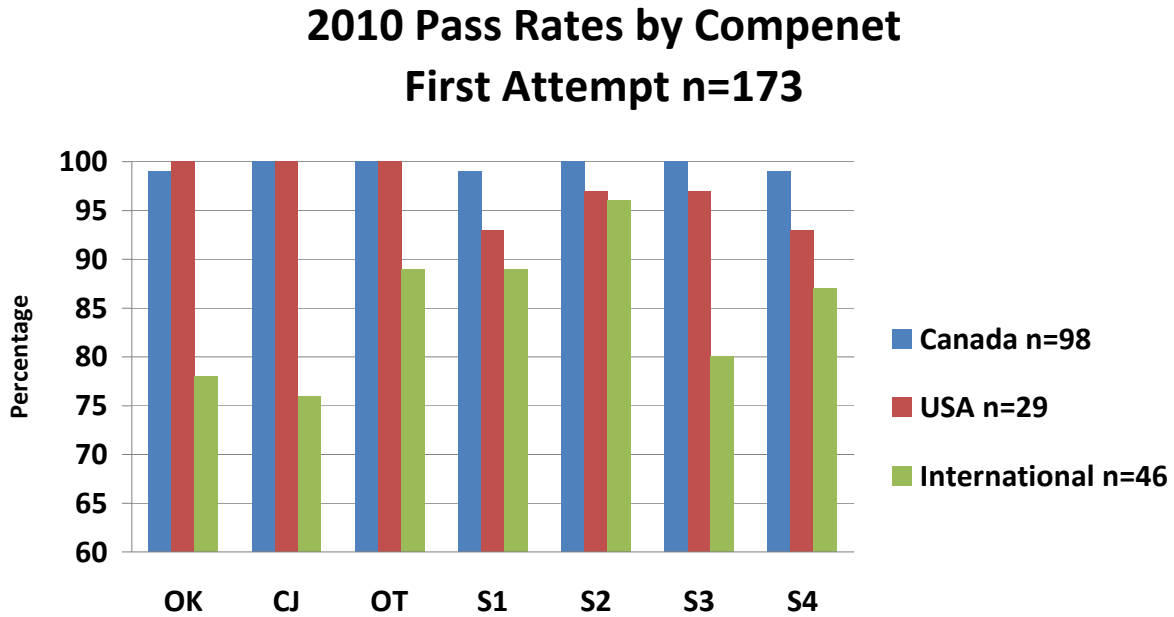
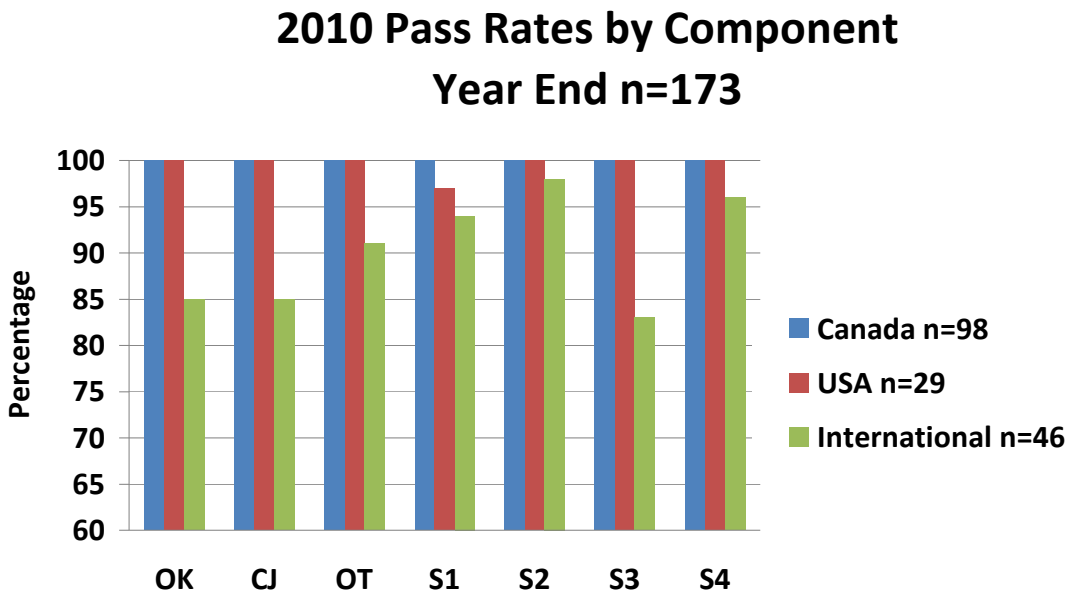


Figure 8: Pass Rates by Component – Year End



ITEM ANALYSIS AND PSYCHOMETRIC PROPERTIES OF THE EXAMINATION COMPONENTS

A complete item analysis was undertaken for all three, 2010 administrations. For the April examinations, 10 items in Optometric Knowledge, 3 items in Ocular Therapeutics and 4 items in Clinical Judgment were deleted from scoring. In May, 16 items in Optometric Knowledge, 7 items in Ocular therapeutics and 6 items in Clinical Judgment were deleted from scoring. In the October exam, 16 items in Optometric Knowledge, 2 items in Ocular Therapeutics and 1 item in Clinical Judgment were deleted from scoring.

No items were deleted for all candidates for any of the 4 Clinical Skills examinations.

Table 2 reports reliability coefficients for each CSAO component for all three 2010 administrations. The traditional Cronbach's alpha is reported but given that the CSAO examinations are better characterized as criterion-referenced tests, the Livingston's reliability coefficient is also provided. A closer examination of the Livingston's coefficient across all components for all administrations indicates that they are strong and contribute to establishing the validity of these measures.

Table 2: Reliability coefficients for the components of all three 2010 CSAO administrations.

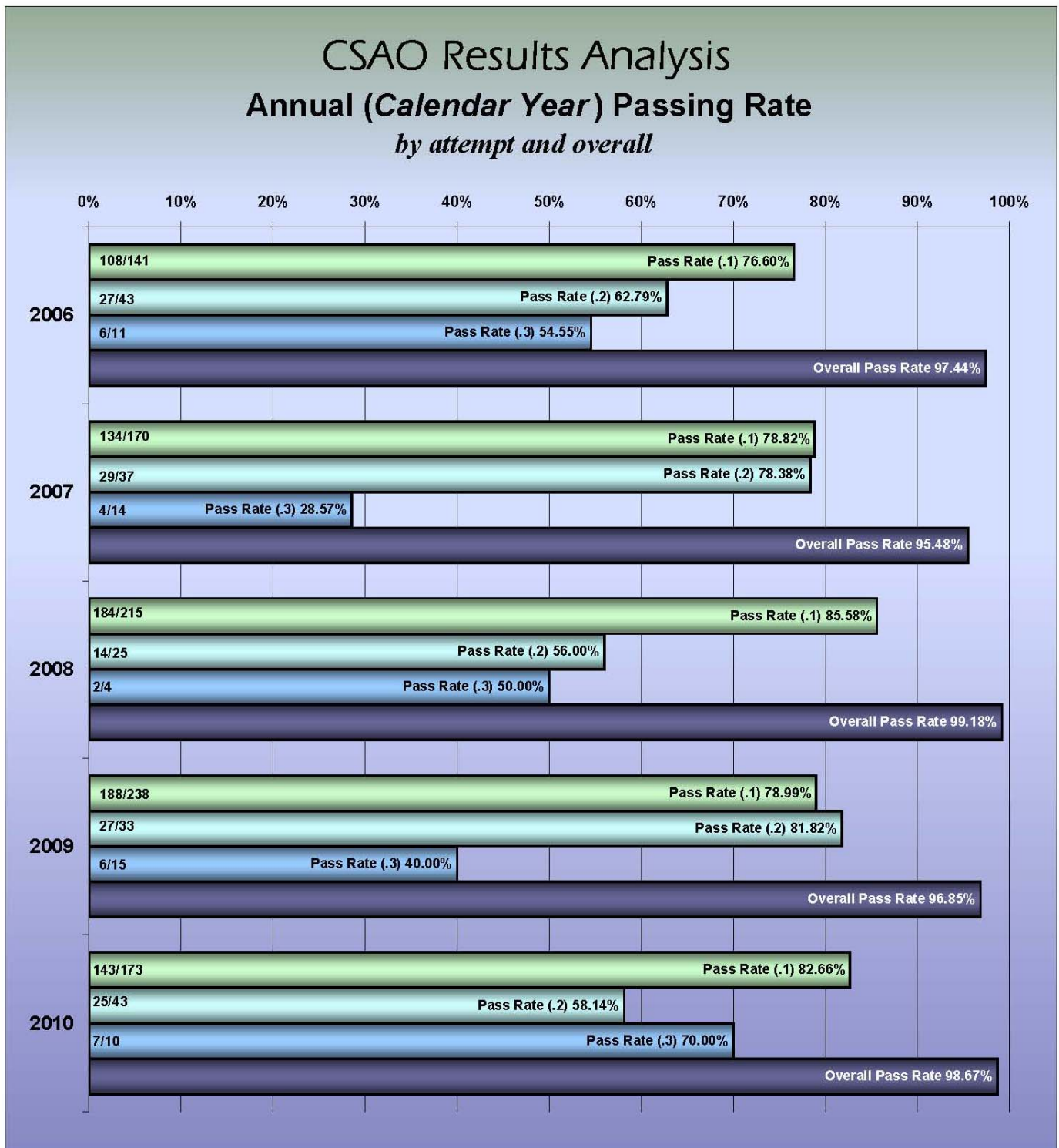
CSAO Component	APRIL 2010		MAY 2010		OCTOBER 2010	
	Alpha	K^2	Alpha	K^2	Alpha	K^2
Optometric Knowledge	.91	.99	.95	.98	.85	.93
Ocular Therapeutics	.74	.98	.86	.97	.90	.97
Clinical Judgment	.70	.97	.86	.95	.81	.92
Clinical Skills 1	.46	.86	.78	.83	.70	.76
Clinical Skills 2	.79	.95	.86	.96	.69	.89
Clinical Skills 3	.72	.96	.84	.95	.83	.88
Clinical Skills 4	.70	.96	.77	.92	.71	.91

k^2 (Livingston's Coefficient Kappa)

PERFORMANCE OF REASSESSMENT CANDIDATES

In total, 22 candidates who had first attempted the CSAO exam prior to 2009 returned for reassessment. Of these, 19 of 22 (86.4%) were successful. The three unsuccessful candidates were all sitting the CSAO for the third time.

The following statistical charts were prepared by CEO-ECO to provide a comprehensive report of CSAO cumulative and overall performance by annual calendar year.



Note: Annual "Overall Pass Rate" is based on those candidates that were unsuccessful on their third attempt within a given year. This figure does not reflect those failing candidates that chose not to complete the entitled two reassessment opportunities.



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CSAO Results Analysis

Annual (Calendar Year) Overall Passing Rate by source of training; by attempt

