

CEO

Canadian Examiners in Optometry



ECO

Examineurs Canadiens en Optométrie

Summary Report

Canadian Assessment of Competence in Optometry (CACO)

Fall 2012 - Spring 2013 Administrations

Prepared by

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Purpose

This report provides aggregate candidate performance and psychometric analysis of the assessment tools related to the Canadian Assessment of Competence in Optometry (CACO). The report includes data for the October 2012, April 2013 and May 2013 administrations.

Structure of the CACO Components

The CACO examination is comprised of 6 components. The 2 written components include Synthesis made up of 62 cases with 4 multiple-choice questions each, Ocular Therapeutics (120 items) and 4 Clinical Skills Stations.

Cases for the Synthesis component focus on:

- Refractive conditions of the eye and their management
- Accommodative conditions of the eye and vision system, treatment and management
- Oculomotor conditions of the eye and vision system, treatment and management
- Sensory-integrative conditions of the eye and vision system, treatment and management
- Ocular disease and trauma, treatment and management
- Systemic disease and its treatment

The Ocular Therapeutics exam includes the following areas:

- General microbiology
- General immunology
- General pharmacology
- Ocular pharmacology
- Ocular disease/trauma: treatment, management and progress

Skills and Techniques Stations (45 minutes each) assess the following 4 areas:

- Interviewing and Assessing Refractive and Accommodative Conditions
- Assessing Oculomotor and Sensory-Integrative Functions
- Assessing Oculomotor and Systemic Disease
- Assessing Ophthalmic Appliances


Overview

For the three 2012-2013 CACO administrations, a total of 328 candidates participated. Of this number, 240 (73.2%) were new candidates, 18 (5.5%) represented reassessment candidates and 70 (21.3%) were candidates who selected the option to write the written exams only, returning to sit the four clinical sessions at a later administration.

Table 1 reports the new candidate pool (n=240) by Professional School for the 2012-13 administrations. A breakdown of candidates across the categories Canadian, USA and International schools results in a total of 131 (54.6%) Canadian educated, 75 (31.2%) American educated and 34 (14.2%) International educated candidates. In comparison to the last reporting period, the participation rate of both the USA and International candidates was virtually identical. In contrast, the participation rate from both Canadian programs increased, with Waterloo sending 11 more candidates and Université de Montréal sending 12 more candidates. In total, 40 institutions were represented across the 3 administrations.

Table 1: Distribution of New Candidates Across Schools

SCHOOL	# CANDIDATES	PERCENT
U. of Waterloo	93	38.8
U. of Montreal/ Université de Montréal	38	15.8
New England College	15	6.3
Pacific University	12	5.0
Illinois College	12	5.0
University of Aston-England	10	4.2
Nova Southeastern University	8	3.3
SUNY	7	2.9
Pennsylvania College	5	2.1
Indiana University	3	1.3
Michigan College	3	1.3
Southern California	3	1.3
Southern College	2	.8
La Salle University	2	.8
City University (London)	2	.8
Bradford, England	1	.4



University of Melbourne	1	.4
U. of Benin-Nigeria	1	.4
Queensland University	1	.4
U. of Manchester	1	.4
Int. American Puerto Rico	1	.4
University of Houston	1	.4
University of Missouri	1	.4
Royal College, London England	1	.4
University of Baghdad	1	.4
Pines City Educational Center (Philippines)	1	.4
Central University of Venezuela	1	.4
Iran University of Medical Sciences	1	.4
Cuban Institute of Ophthalmology	1	.4
Damascus University, Syria	1	.4
Francisco Marroquin University, Guatemala	1	.4
Fudan University, China	1	.4
Medical University Egypt	1	.4
Salus University	1	.4
San Carlos University, Guatemala	1	.4
University of Kwa-Zulunatal, South Africa	1	.4
University of Rio de Janeiro	1	.4
University of Sao Paulo, Brazil	1	.4
University of St. Louis	1	.4
China Medical College	1	.4
Total	240	100

Summary of Candidate Performance

Figure 1A represents the first attempt performance of the Fall 2012 – Spring 2013 new candidates (n=240). As the results indicate, 205 (85.4%) of the 240 new candidates successfully completed all 6 components of the CACO on their first attempt.

Figure 1A

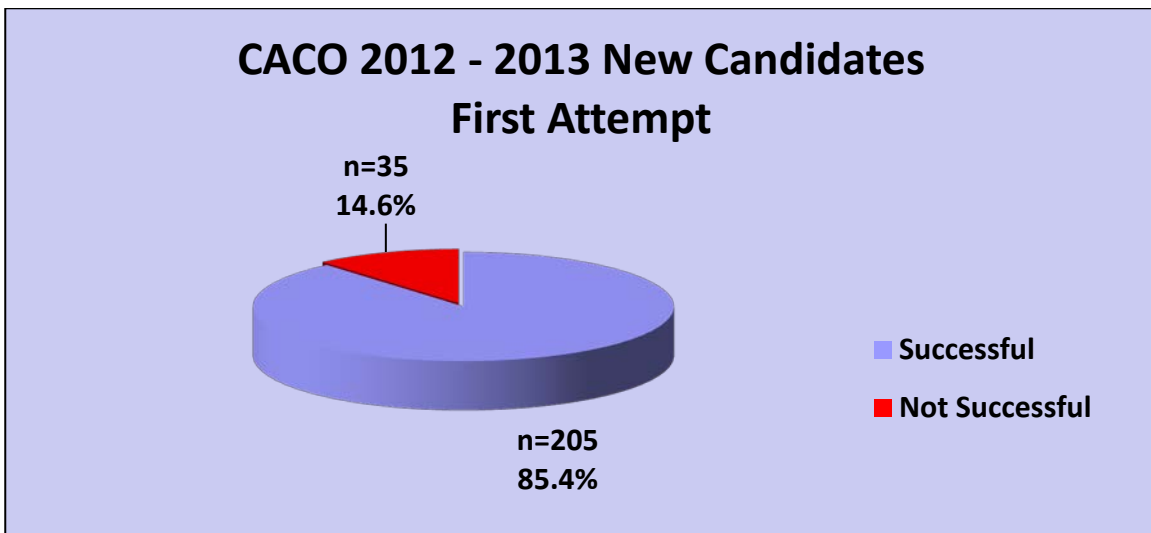
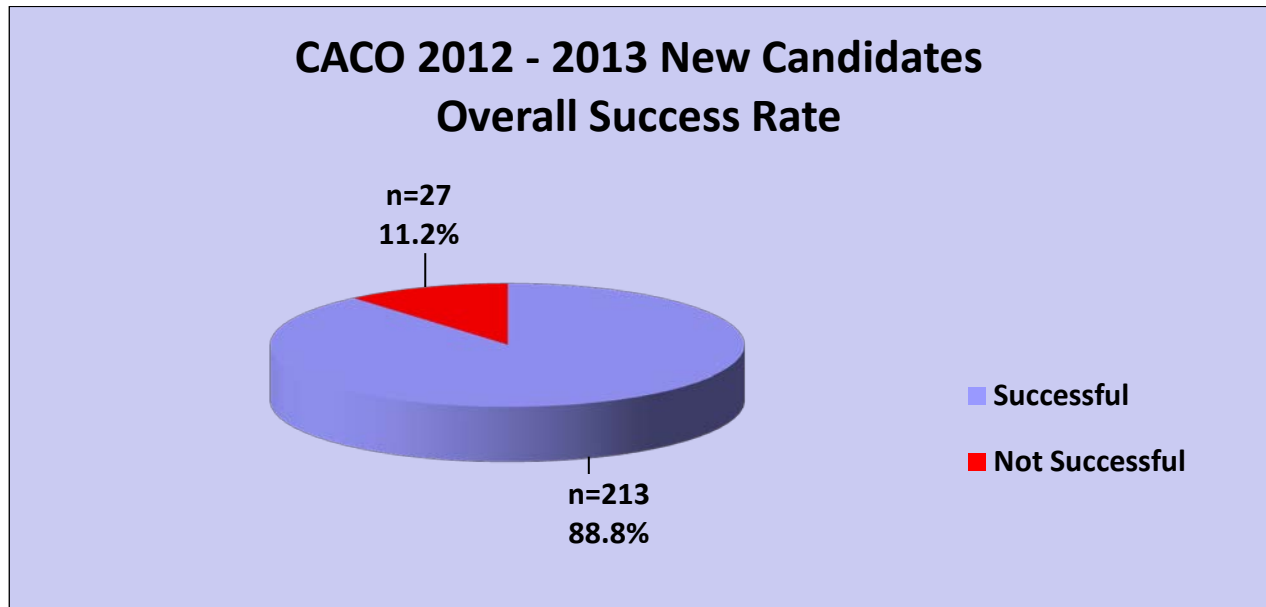


Figure 1B represents the final overall pass rate for all new 240, Fall 2012 - Spring 2013 candidates. The final overall pass rate reflects the performance of the candidates at the end of all three administrations of the examination cycle. In order for a performance to be deemed a “Pass” the candidate is required to be successful in all assessment components. The Fall 2012 – Spring 2013 pass rate of 88.8% is comparable to previous pass rates including last year’s overall pass rate of 91.1%.

Figure 1B





Performance by Group

Figure 2A represents first attempt performance data by group for all 240 new candidates. Consistent with previous administration the overall performance of Canadian candidates is the strongest (95% Pass Rate) while International candidates continue to encounter the greatest difficulty (41% Pass Rate).

Figure 2A

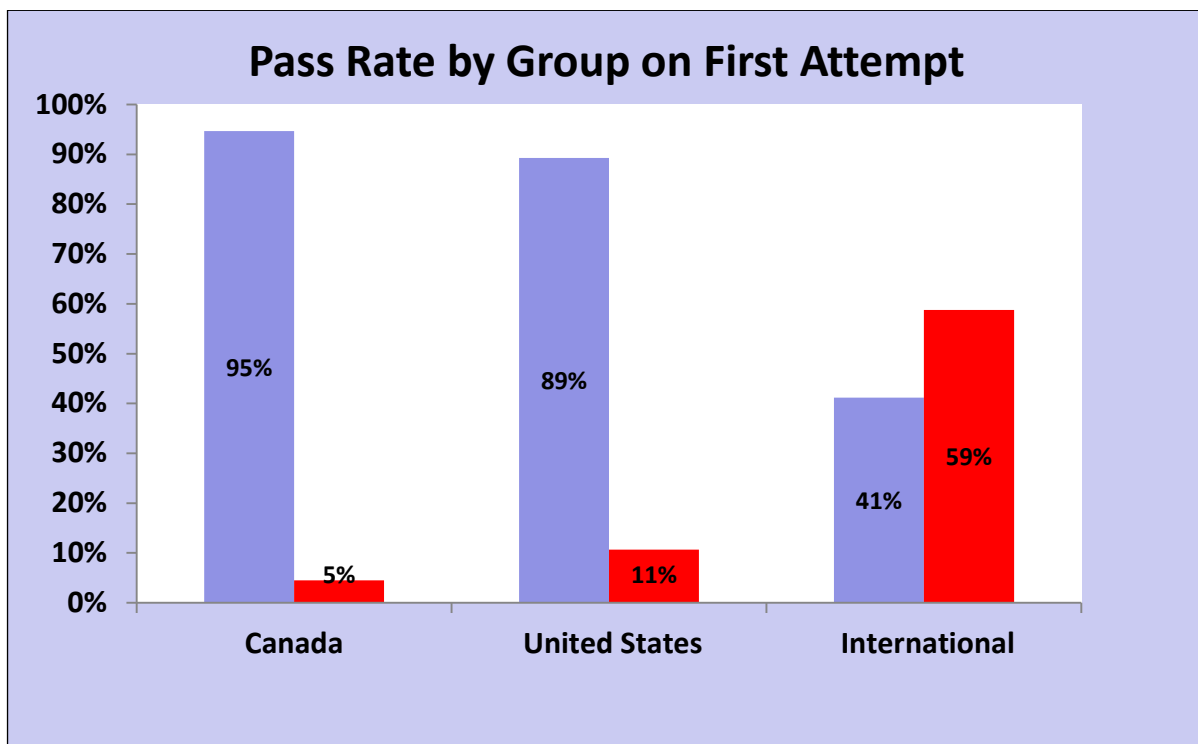
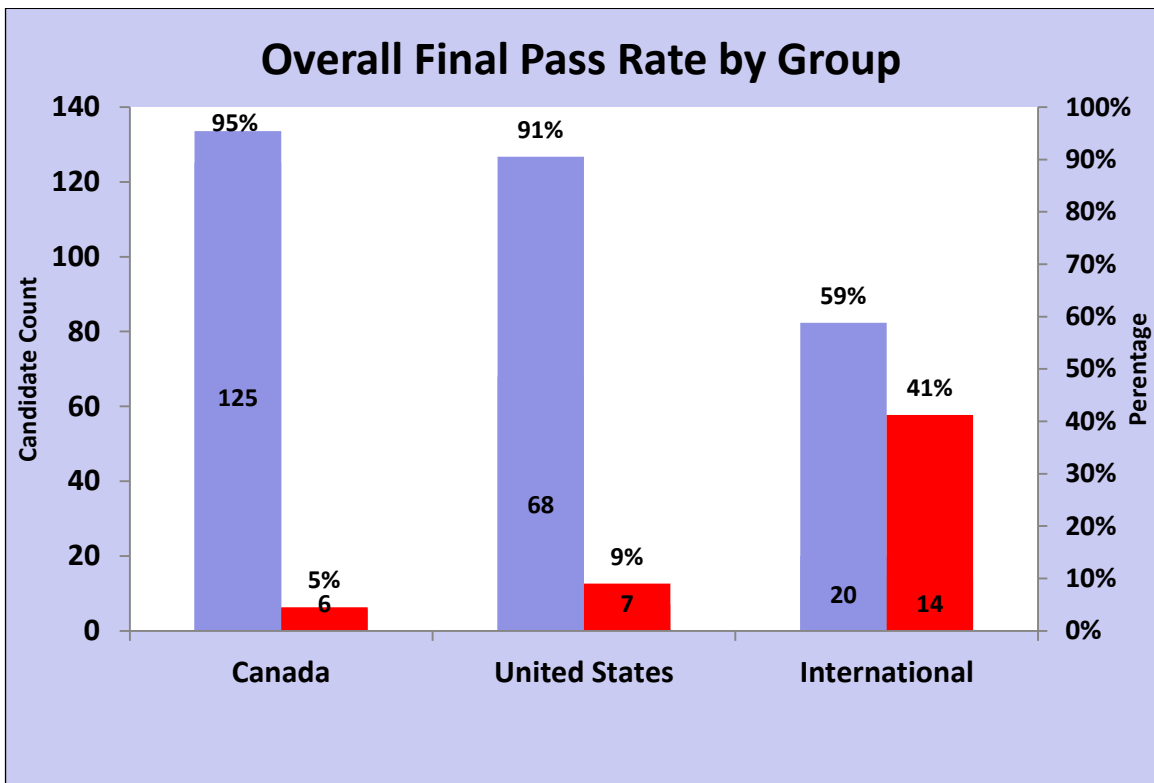




Figure 2B below reports the final overall pass rate for 240 new candidates by the following groupings: Canada (n=131), USA (n=75), and International (n=34) educated. Results for the three groups were consistent with previous administrations with Canadian candidates having overall the strongest performance.

Figure 2B

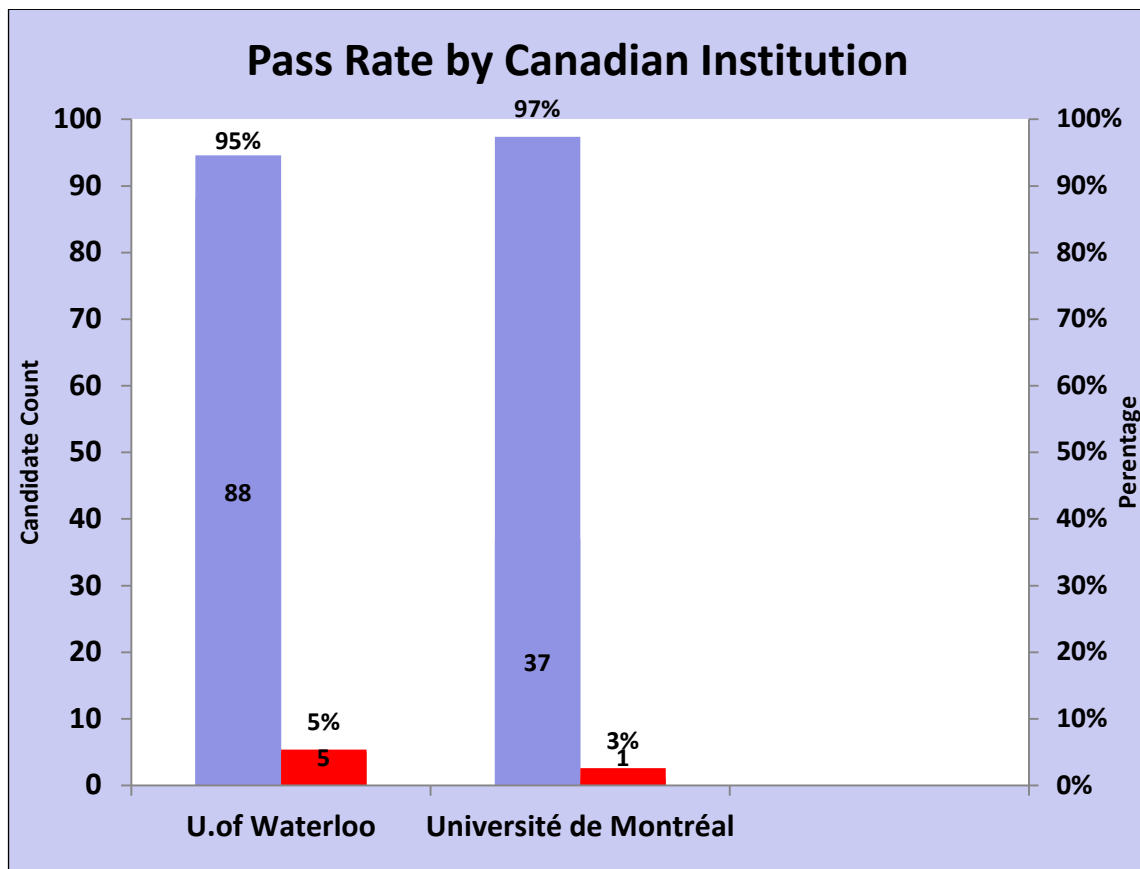




Pass Rate by Canadian Institution

Figure 3, reports the Overall Pass Rate of the two Canadian schools. As the Figure 3, indicates performance of the two schools is very strong and comparable with University of Waterloo obtaining an overall pass rate of 95%, while candidates from the Université de Montréal achieved a pass rate of 97%.

Figure 3

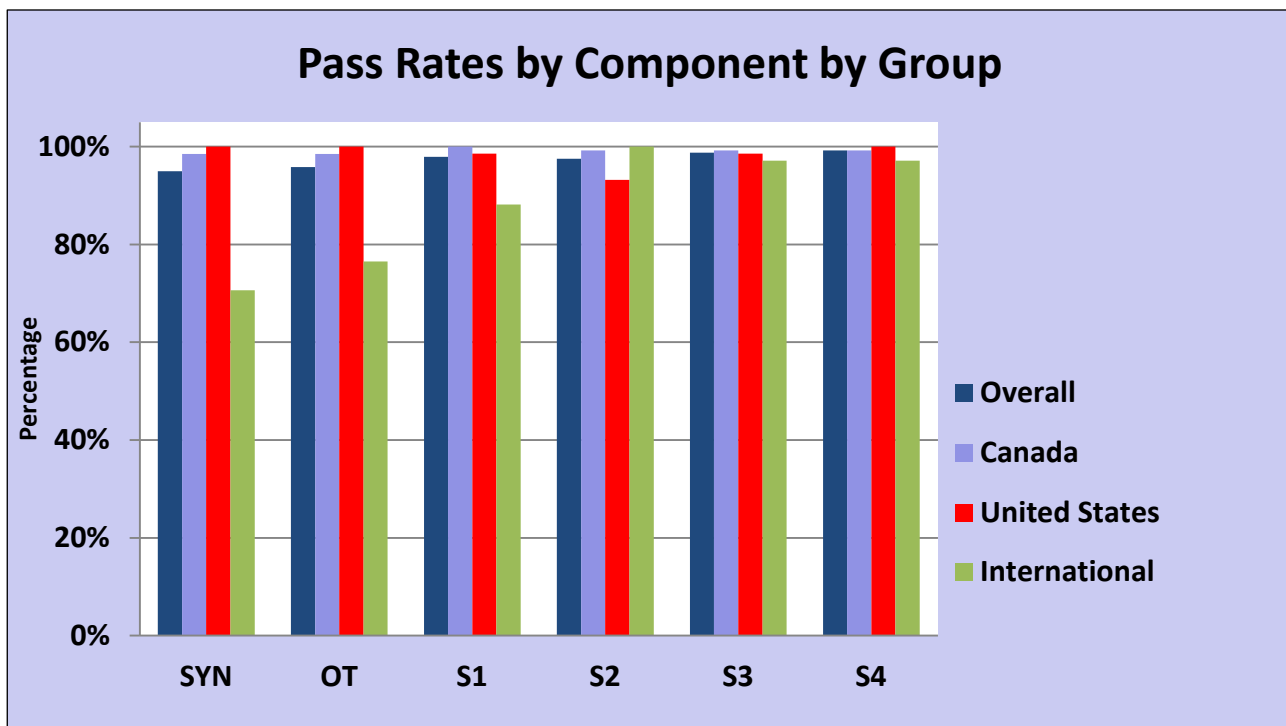




Group Pass Rate by Component

Figure 4, compares the performance of the Canadian, American and International candidates for each of the CACO components across the three 2012 – 2013 administrations. As the data indicates, the overall performance of the Canadian and American educated candidates across all components is comparable. International candidates encountered relative difficulties in both written components (that is Synthesis and Ocular Therapeutics) and in Skills One: Interviewing and Assessing Refractive and Accommodative Conditions.

Figure 4





Item Analysis and Psychometric Properties of the Examination Components

A complete item analysis was undertaken for the Fall 2012 administration. For the Synthesis exam, a total of 7 of the 248 items were deleted from scoring and for Ocular Therapeutics, a total of 5 of the 120 items were deleted from scoring. Overall, the percentage of the items deleted from scoring across the two written components was modest (2.8% and 3.3% respectively).

Similarly, a complete item analysis was undertaken for the Spring 2013 administration. For the Synthesis exam, 5 of the 248 items were deleted from scoring and for Ocular Therapeutics, 2 of the 120 items were deleted from scoring.

No items were deleted for all candidates for any of the 4 Clinical Sessions across any of the 3 administrations.

Table 2 reports reliability coefficients for each CACO component for the three 2012 - 2013 administrations. The traditional Cronbach's alpha is reported but given that the CACO examinations are better characterized as criterion-referenced tests, the Livingston's reliability coefficient is also provided. A closer examination of the Livingston's coefficients across all components for the three administrations indicates that they are strong and contribute to establishing the validity of these measures.

Table 2: Reliability coefficients for each component for all three 2012 - 2013 CACO administrations.

October 2012	Alpha	k² (Livingston's Coefficient Kappa)
Ocular Therapeutics	.77	.95
Synthesis	.84	.99
Skills 1	.76	.82
Skills 2	.69	.94
Skills 3	.90	.93
Skills 4	.75	.88



April 2013	Alpha	k² (Livingston's Coefficient Kappa)
Ocular Therapeutics	n.a.	n.a.
Synthesis	n.a.	n.a.
Skills 1	.48	.86
Skills 2	.80	.93
Skills 3	.69	.92
Skills 4	.67	.96

May 2013	Alpha	k² (Livingston's Coefficient Kappa)
Ocular Therapeutics	.80	.92
Synthesis	.89	.96
Skills 1	.57	.89
Skills 2	.72	.94
Skills 3	.74	.95
Skills 4	.70	.95

Skills and Techniques Stations:

Skills 1: Interviewing and Assessing Refractive and Accommodative Conditions

Skills 2: Assessing Oculomotor and Sensory-Integrative Functions

Skills 3: Assessing Oculomotor and Systemic Disease

Skills 4: Assessing Ophthalmic Appliances



Performance of Reassessment Candidates

In total, 18 candidates returned for reassessment in Fall 2012 – Spring 2013 administrations. Eight candidates were returning for a second attempt, and 10 candidates for a third attempt. Of the 8 second attempters, 3 were Canadian, 3 were USA, and 2 were International candidates. The 10 third attempters were made up of 4 USA and 6 International candidates.

In terms of performance, all 8 second attempters were successful while only 4 of the 10 third attempters successfully completed the CACO (2 USA candidates and 2 International candidates).