

## COLLEGE MATHEMATICS PROJECT 2009

### CMP 2009 Forum Backgrounder

#### **Background**

The College Mathematics Project (CMP) is based on the need for general improvement in first year college mathematics achievement. Past studies have shown that too many students fail or barely pass first semester mathematics in college. And since mathematics is a critical foundation of most programs in business and technology, poor achievement in mathematics can lead to drop-out with negative consequences for students, colleges and the Ontario economy. It is therefore the aim of the CMP to conduct research and deliberations leading to increased student success in mathematics.

In 2009, CMP has expanded to include all 24 colleges and 72 district school boards in the province. Its goals are basically unchanged from previous studies:

- To analyse the mathematics achievement of first-semester college students, particularly in relation to their secondary school mathematics backgrounds;
- To deliberate with members of both college and school communities about ways to increase student success in college mathematics.

The methodology used for the College Mathematics Project is called “Deliberative Inquiry”. It is a cyclical methodology designed for integrating research with deliberations about future courses of action. The questions for research are derived from deliberations about the problems of practice and the deliberations are based on questions emerging from the research and so the cycle of research and deliberation continues. Further information about the methodology and its application to the College Mathematics Project can be found on the CMP web site<sup>1</sup>.

This Forum Backgrounder represents a mid point in the deliberative inquiry cycle, when the data has been collected and enough research has been completed to raise significant questions for deliberation. The research will continue as deliberations suggest additional ways to analyse the data. During the coming months, deliberative forums will take place in all regions of the province bringing together representatives of colleges, schools and government, mathematics specialists, student support and guidance professionals and administrators, to share experiences from their own institutions and to respond to questions raised by the research.

---

<sup>1</sup> <http://collegemathproject.senecac.on.ca>

The document itself is in two parts: this introductory text and a set of data tables and figures. At this point, both parts should be regarded as confidential as the data analyses are preliminary and subject to review and updating.

### **Research Questions**

The following research questions were approved by the CMP Steering Committee at its first meeting in March 2009. These questions form the basis for the study and the CMP interactive data base is organized accordingly. Not all questions have been answered at this stage of the research.

#### **A. PARTICIPATION**

**Note 1: For operational definitions, see the “Key Research Information” section (below)**

- A1. What are the numbers of students in our sample, by college, gender, and program cluster?
- A2. What are the numbers of students under the age of 23 (December 31, 2008) and who are graduates of Ontario secondary schools (ROGs) by college, gender, and program cluster? – also broken down by one-year age groups?
- A3. What are the numbers of students with a Grade 12 mathematics course taken in fall semester 2007 or later, by college, gender and program cluster (VROGs)?
- A4. What are the numbers of students (ROGs, non-ROGS and VROGs) enrolled in all math courses, in college-level math courses, and in preparatory math courses, by college, gender and program cluster?

#### **B. COLLEGE MATH ACHIEVEMENT**

**Note 1: This applies to students taking mathematics courses only (as shown in A4)**

**Note 2: These should be shown separately for all math, college-level math, and preparatory math.**

- B1. What is the mathematics grade distribution for ROGs, non-ROGs and VROGs, by college, gender, and program cluster? (ROGs also broken down by age as in A2).
- B2. What are the % of students achieving a “good passing grade” (A, B, C) and “at risk” (D, F, W) for ROGs, non-ROGs and VROGs by college, gender, and program cluster?
- B3. How do students’ college English (or French) marks compare with their college mathematics marks?

#### **C. SECONDARY SCHOOL MATHEMATICS BACKGROUNDS**

**Note 1: This applies to ROGs and VROGs only (as shown in A3)**

**Note 2: These should be shown separately for all math, college-level math, and preparatory math.**

- C1. What are the numbers of both ROGs and VROGs taking each secondary school mathematics pathway and what % of those taking each pathway achieve good grades or are at risk in college.
- C2. For both ROGs and VROGs following a pathway culminating in MCT4C, MAP4C, or a 12U course, how do students' Grade 12 math marks compare with their college math marks?
- C3. What is the profile (gender, college, program cluster) of students following selected pathways?

**D. COLLEGE ACHIEVEMENTS BY SCHOOL BOARD AND SCHOOL**

**Note 1: This applies to ROGs and VROGs only (as shown in A3)**

**Note 2: These should be shown separately for all math, college-level math, and preparatory math.**

- D1. What are the % of students with a "good passing grade" (A, B, C) and "at risk" (D, F and W) from each district school board? – also broken down by secondary school?
- D2. What are the % of students enrolled in college-level courses and preparatory courses from each district school board?
- D3. Which secondary schools in Ontario offered MCT4C during 2007-08 and were college mathematics achievement levels of graduates of those schools significantly different from graduates of other schools?

### **Key Research Information**

#### *Students*

Students whose data is included in this study are those who, in Fall 2008, were enrolled in the first semester of all full time post secondary college programs *except* applied degree programs, apprenticeship programs, and post-graduate certificate programs.

This CMP student population is extremely diverse and includes students of a range of ages and a wide variety of origins. Since significant aspects of CMP relate to mathematics in Ontario secondary schools, we have found it useful to subdivide the overall CMP student population into "Recent Ontario Graduates" (ROGs) and others (non-ROGs), whose secondary school mathematics was either a long time ago or took place in another jurisdiction. ROGs are defined as being under the age of 23 (as of December 31 2008) and having an Ontario Secondary School Diploma (OSSD).

In Fall 2008, students who had taken the most recently revised Mathematics courses in the Ontario curriculum began to enter the College system. Since CMP desires to analyse the achievement of this group separately, we have created a new sub-group of ROGs called “Very Recent Ontario Graduates” (VROGs). These students are identified by the date of their final school mathematics course shown on their transcript: if this date is after January 1 2008, then we assume that they have followed the revised mathematics curriculum through secondary school<sup>2</sup>.

*Programs*

The full time postsecondary programs included in the College Mathematics Project are designated by each college independently with names and codes for local use. However, they are also based on a common system of MTCU program standards and CMP uses the MTCU codes as the basis for grouping similar programs from different colleges together, regardless of their local names or faculty affiliation. Over the past several years, CMP has developed the following system of major clusters and sub-clusters to organize the programs.

Major Clusters	<p><b>AA</b> Applied Arts</p> <p><b>B</b> Business</p> <p><b>G</b> General</p> <p><b>T</b> Technology</p>								
Sub-Clusters	<table border="0"> <tr> <td style="vertical-align: top;"><b>AA</b></td> <td style="vertical-align: top;"> <p><b>Arts</b> e.g. graphic design, journalism</p> <p><b>Human</b> e.g. recreation, children &amp; youth</p> <p><b>Health</b> e.g. nursing, paramedic</p> <p><b>Hospitality/Tourism</b> e.g. travel, culinary</p> </td> </tr> <tr> <td style="vertical-align: top;"><b>B</b></td> <td style="vertical-align: top;"> <p><b>Finance</b> e.g. accounting</p> <p><b>Admin</b> e.g. marketing, human resources</p> <p><b>Office</b> e.g. office administration</p> </td> </tr> <tr> <td style="vertical-align: top;"><b>G</b></td> <td style="vertical-align: top;"> <p><b>Arts &amp; Science</b> e.g. general arts &amp; science</p> <p><b>Pre-Health</b> e.g. pre-health</p> <p><b>Pre-Technology</b> e.g. pre-technology</p> </td> </tr> <tr> <td style="vertical-align: top;"><b>T</b></td> <td style="vertical-align: top;"> <p><b>Applied Science</b> e.g. chemical, biotechnology</p> <p><b>Computer</b> e.g. programming, systems</p> <p><b>Construction</b> e.g. architectural, civil, HVAC</p> <p><b>Electrical</b> e.g. electronics, electrical</p> <p><b>Mechanical</b> e.g. manufacturing, fire protection</p> </td> </tr> </table>	<b>AA</b>	<p><b>Arts</b> e.g. graphic design, journalism</p> <p><b>Human</b> e.g. recreation, children &amp; youth</p> <p><b>Health</b> e.g. nursing, paramedic</p> <p><b>Hospitality/Tourism</b> e.g. travel, culinary</p>	<b>B</b>	<p><b>Finance</b> e.g. accounting</p> <p><b>Admin</b> e.g. marketing, human resources</p> <p><b>Office</b> e.g. office administration</p>	<b>G</b>	<p><b>Arts &amp; Science</b> e.g. general arts &amp; science</p> <p><b>Pre-Health</b> e.g. pre-health</p> <p><b>Pre-Technology</b> e.g. pre-technology</p>	<b>T</b>	<p><b>Applied Science</b> e.g. chemical, biotechnology</p> <p><b>Computer</b> e.g. programming, systems</p> <p><b>Construction</b> e.g. architectural, civil, HVAC</p> <p><b>Electrical</b> e.g. electronics, electrical</p> <p><b>Mechanical</b> e.g. manufacturing, fire protection</p>
<b>AA</b>	<p><b>Arts</b> e.g. graphic design, journalism</p> <p><b>Human</b> e.g. recreation, children &amp; youth</p> <p><b>Health</b> e.g. nursing, paramedic</p> <p><b>Hospitality/Tourism</b> e.g. travel, culinary</p>								
<b>B</b>	<p><b>Finance</b> e.g. accounting</p> <p><b>Admin</b> e.g. marketing, human resources</p> <p><b>Office</b> e.g. office administration</p>								
<b>G</b>	<p><b>Arts &amp; Science</b> e.g. general arts &amp; science</p> <p><b>Pre-Health</b> e.g. pre-health</p> <p><b>Pre-Technology</b> e.g. pre-technology</p>								
<b>T</b>	<p><b>Applied Science</b> e.g. chemical, biotechnology</p> <p><b>Computer</b> e.g. programming, systems</p> <p><b>Construction</b> e.g. architectural, civil, HVAC</p> <p><b>Electrical</b> e.g. electronics, electrical</p> <p><b>Mechanical</b> e.g. manufacturing, fire protection</p>								

---

<sup>2</sup> We recognize that this is not a completely accurate assumption but, since the revised curriculum uses the same course codes as the former curriculum, it was the best way to operationally identify this sub-group of students from the data available to us.

A complete list of all CMP College programs with their MTCU codes, clusters and sub-clusters is available on the CMP web site. This year with all 24 colleges participating, CMP has data relating to almost 2,300 programs. It is notable that nearly half of these programs include a Mathematics course in the first semester and nearly 85% include an English course<sup>3</sup>.

*Mathematics Courses*

The programs included in the College Mathematics Project all have mathematics scheduled in the first semester of the curriculum<sup>4</sup>. However, some colleges require or encourage students to take a mathematics assessment and on the basis of their results assign them either to the regularly scheduled mathematics course or to a preparatory (or remedial) mathematics course. If students’ achievement in mathematics in first semester is to be compared, then it is important to distinguish these two types of course.

Therefore in the CMP database, there are three parallel sets of data view:

- All math: students’ achievement in all types of mathematics courses
- Preparatory math: students’ achievement in preparatory mathematics courses only
- College math: students’ achievement in college level mathematics courses

Unless otherwise specified in this report, data analyses are based on data from “all math” courses. Later analyses will examine achievement in preparatory and college-level mathematics.

*Grades*

Since all colleges have their own individual grading systems, the College Mathematics project has had to develop its own simplified system to which grades from all college data sets are transformed. A comparison of each college’s grading system with the CMP system is also available on the CMP web site.

Grades are also grouped together for analysis purposes into two groups, as follows.

---

***Good Grades***

A	(includes A+ and A-)	80% - 100%
B	(includes B+ and B-)	70% - 79%
C	(includes C+ and C-)	60% - 69%
P	(used for courses with Pass/Fail grades)	

---

<sup>3</sup> While CMP is only concerned with mathematics, a parallel study on English achievement is being conducted under the direction of the Colleges’ Heads of Language and CMP extracts data for both studies.

<sup>4</sup> Occasionally, the first mathematics course in a college program occurs in the second or a later semester. CMP does not capture data for these courses.

---

<b>At Risk</b>	D	(includes D+ and D-)	50% - 59%
	F		under 50%
	W		withdrawal

---

Many of the tables in the data section of this Forum Backgrounder show students’ achievement in terms of their having “good grades” or being “at risk”.

*Confidential Data*

Much of the data provided by colleges for the College Mathematics Project is confidential. CMP ensures student confidentiality by replacing all personal identifiers in the data set provided by the college with its own student number and then erasing the original student ID.

College and school board confidentiality is ensured by masking the actual names of colleges and school boards in displays of comparative data and by providing the key to each college and school board in relation to its own data.

This confidentiality procedure is based on the CMP Policy on Confidential Data, which was agreed by participating colleges and school boards; it is available on the CMP web site.

***Preliminary Research Results<sup>5</sup>***

CMP 2009 research is organised under the following four headings:

- Participation
- College Mathematics Achievement
- Secondary School Mathematics Pathways
- District School Boards

At this stage the results are simply presented for discussion with highlights noted below. In the final report, more extensive discussion of the research will be provided.

---

<sup>5</sup> At the time of preparation of this Backgrounder, not all college data had been completely validated and the research results reported here is preliminary in nature and should not be cited. Final results will be reported in the CMP 2009 Final Report.

**PARTICIPATION**

Table 1 outlines the overall student enrolment in the 2,296 programs reviewed by CMP 2009.

**Table 1: Programs & Enrolment by Program Cluster**

Cluster	Programs	Enrolment	Males	Females	% Male	% Female
Applied Arts	936	37,594	13,127	24,405	34.9%	64.9%
Business	387	13,483	6,750	6,698	50.1%	49.7%
General	191	9,559	3,896	5,636	40.8%	59.0%
Technology	782	18,113	14,895	3,182	82.2%	17.6%
<b>TOTAL</b>	<b>2,296</b>	<b>78,749</b>	<b>38,668</b>	<b>39,921</b>	<b>49.1%</b>	<b>50.7%</b>

**Table 1a: Programs & Enrolment by Sub-Cluster: Applied Arts**

Cluster	Programs	Enrolment	Males	Females	% Male	% Female
Arts	258	9,931	4,632	5,289	46.6%	53.3%
Health Services	195	6,981	1,385	5,577	19.8%	79.9%
Hospitality & Tourism	122	4,311	1,662	2,644	38.6%	61.3%
Human Services	361	16,371	5,448	10,895	33.3%	66.6%
<b>TOTAL</b>	<b>936</b>	<b>37,594</b>	<b>13,127</b>	<b>24,405</b>	<b>34.9%</b>	<b>64.9%</b>

**Table 1b: Programs & Enrolment by Sub-Cluster: Business**

Cluster	Programs	Enrolment	Males	Females	% Male	% Female
Administration	228	7,442	4,475	2,952	60.1%	39.7%
Finance	85	4,112	2,195	1,902	53.4%	46.3%
Office	74	1,929	80	1,844	4.1%	95.6%
<b>TOTAL</b>	<b>387</b>	<b>13,483</b>	<b>6,750</b>	<b>6,698</b>	<b>50.1%</b>	<b>49.7%</b>

**Table 1c: Programs & Enrolment by Sub-Cluster: General**

Cluster	Programs	Enrolment	Males	Females	% Male	% Female
Arts & Science	142	6,635	2,933	3,676	44.2%	55.4%
Pre-Health	31	2,411	518	1,893	21.5%	78.5%
Pre-Technology	18	513	445	67	86.7%	13.1%
<b>TOTAL</b>	<b>191</b>	<b>9,559</b>	<b>3,896</b>	<b>5,636</b>	<b>40.8%</b>	<b>59.0%</b>

**Table 1d: Programs & Enrolment by Sub-Cluster: Technology**

Cluster	Programs	Enrolment	Males	Females	% Male	% Female
Applied Science	149	3,551	1,458	2,087	41.1%	58.8%
Computer	143	2,830	2,574	249	91.0%	8.8%
Construction	116	4,223	3,765	455	89.2%	10.8%
Electrical	91	2,465	2,373	83	96.3%	3.4%
Mechanical	283	5,044	4,725	308	93.7%	6.1%
<b>TOTAL</b>	<b>782</b>	<b>18,113</b>	<b>14,895</b>	<b>3,182</b>	<b>82.2%</b>	<b>17.6%</b>

Nearly half of all programs contain a mathematics course in first semester. Tables 2-4 describe enrolments in these courses for all students, for Recent Ontario Graduates (ROGs), and for Very Recent Ontario Graduates (VROGs).

**Table 2: Mathematics Enrolment (All Math, All Students)**

Cluster	Programs	Enrolment	Males	Females	% Male	% Female
Applied Arts	65	2,605	890	1,715	34.2%	65.8%
Business	269	9,387	4,877	4,510	52.0%	48.0%
General	92	5,304	2,086	3,218	39.3%	60.7%
Technology	620	14,221	12,160	2,061	85.5%	14.5%
<b>TOTAL</b>	<b>1,046</b>	<b>31,517</b>	<b>20,013</b>	<b>11,504</b>	<b>63.5%</b>	<b>36.5%</b>

**Table 3: Mathematics Enrolment (All Math, Recent Ontario Graduates)**

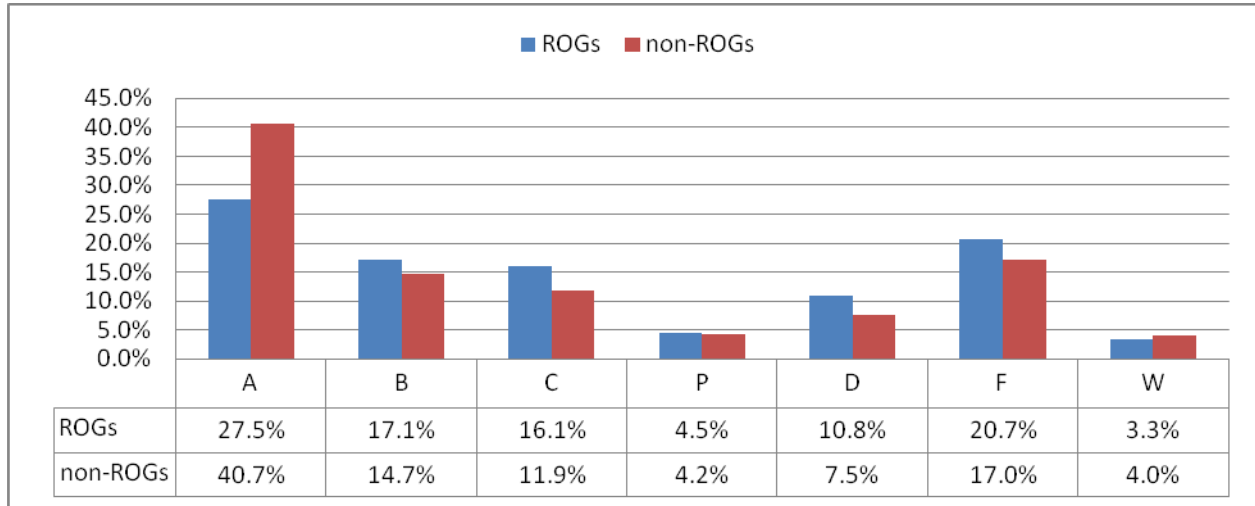
Cluster	Overall	ROGs	Males	Females	% Male	% Female
Applied Arts	2,605	1,786	639	1,146	35.8%	64.2%
Business	9,387	6,574	3,550	3,017	54.0%	45.9%
General	5,304	3,753	1,454	2,297	38.7%	61.2%
Technology	14,221	9,899	8,549	1,342	86.4%	13.6%
<b>TOTAL</b>	<b>31,517</b>	<b>22,012</b>	<b>14,192</b>	<b>7,802</b>	<b>64.5%</b>	<b>35.4%</b>

**Table 4: Mathematics Enrolment (All Math, Very Recent Ontario Graduates)**

Cluster	Overall	VROGs	Males	Females	% Male	% Female
Applied Arts	2,605	538	196	342	36.4%	63.6%
Business	9,387	2,491	1,429	1,062	57.4%	42.6%
General	5,304	1,140	375	765	32.9%	67.1%
Technology	14,221	4,241	3,723	512	87.8%	12.1%
<b>TOTAL</b>	<b>31,517</b>	<b>8,410</b>	<b>5,723</b>	<b>2,681</b>	<b>68.0%</b>	<b>31.9%</b>

**COLLEGE MATHEMATICS ACHIEVEMENT**

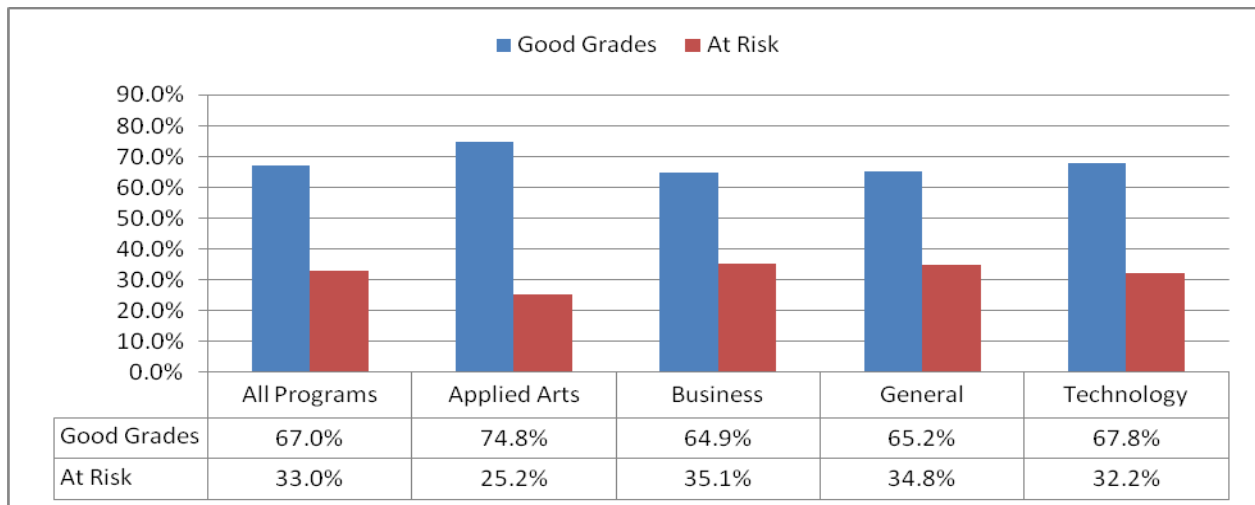
**Figure 1: Grade Distribution, ROGs and non-ROGs, all programs (n = 31,570)**



**Notes:**

- The total number of grades analysed (31,570) exceeds the total number of students enrolled in first-semester mathematics as shown in Table 2 (31,517) because some students take more than one mathematics course.
- In subsequent displays, following past practice in CMP, the A, B, C, & P grades are combined as being “Good Grades,” and the combined D, F, & W grades as “At Risk”.

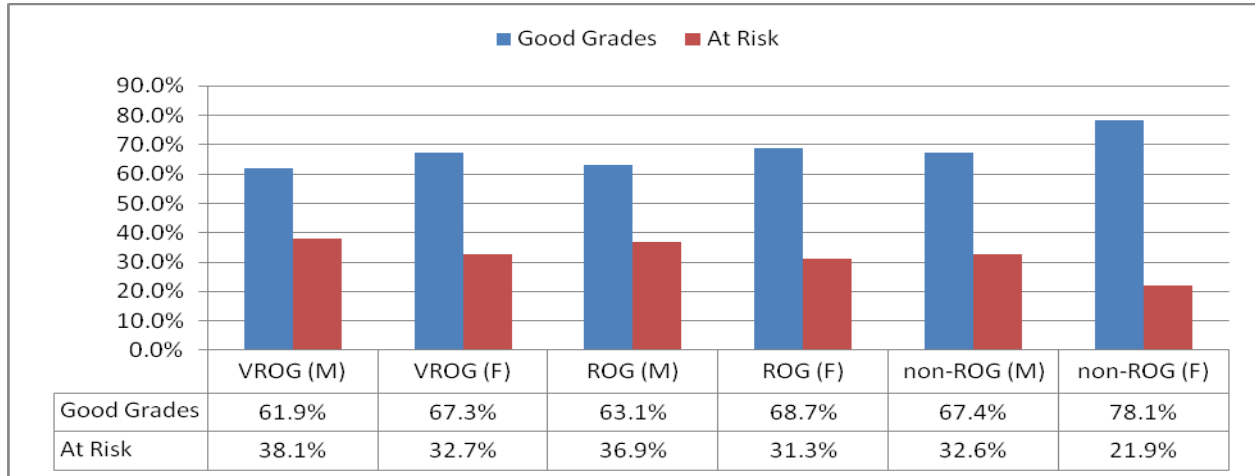
**Figure 2: Achievement by Program Cluster (n=31,570)**



Notes:

- Overall, 67.0% achieved good grades this year, compared with 64.7% last year (with 11 of the 24 colleges participating).
- While a higher proportion of Applied Arts students achieved good grades than in other program clusters, these represent fewer than 7% of all students in Applied Arts.

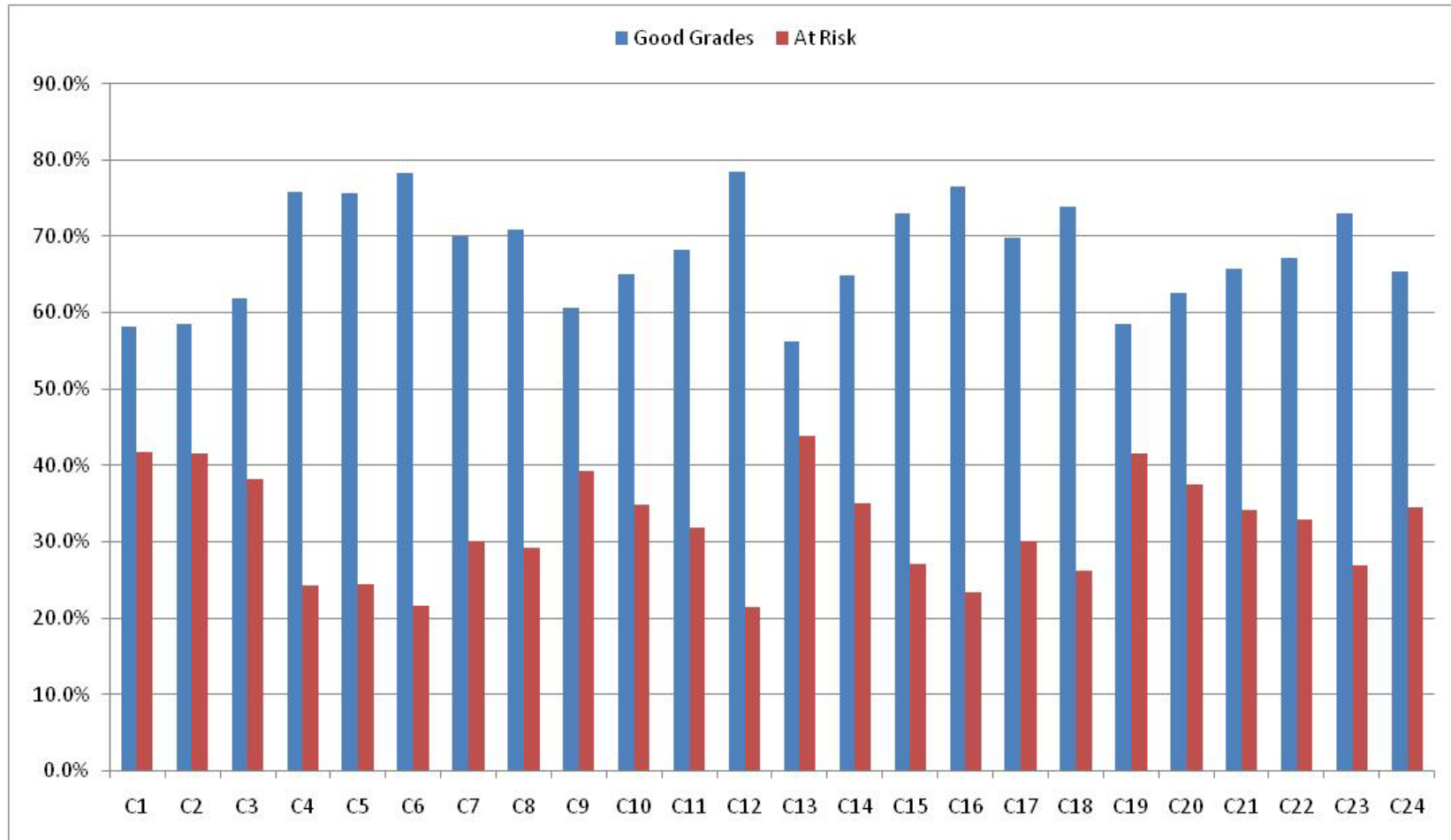
**Figure 3: Achievement by Student Type and Gender (n=31,570)**



Notes:

- As noted in previous years, female students in all categories (VROGs, ROGs, & non-ROGs) outperform male students in college mathematics, though their overall enrolment in mathematics is smaller (see Tables 2-4).

Figure 4: Achievement by College



Notes:

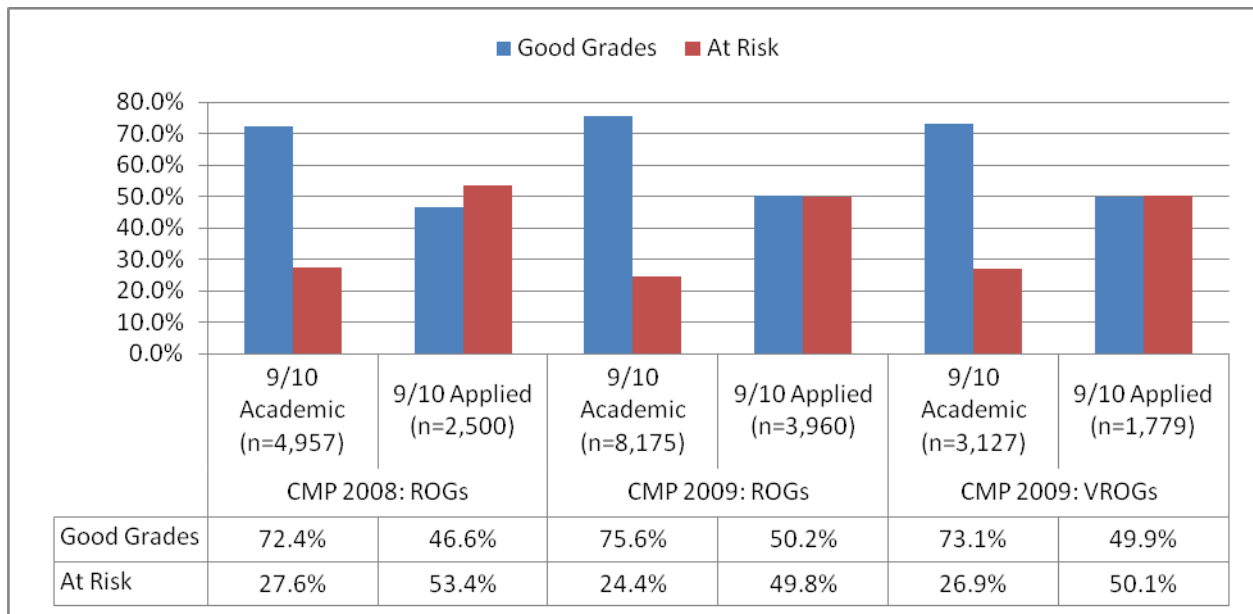
- Individual colleges can examine their data in more detail in the CMP database.

• **SECONDARY SCHOOL MATHEMATICS PATHWAYS**

In the figures that follow, comparisons are made between the college mathematics achievements of CMP 2008 Recent Ontario Graduates (ROGs), CMP 2009 ROGs, and CMP 2009 Very Recent Ontario Graduates (VROGs) who followed selected sequences of mathematics courses (pathways) through secondary school. These comparisons enable readers to estimate the combined impacts of the recently revised Ontario mathematics curriculum, the recommendations of the College Mathematics Project, and the efforts of Ontario school boards to increase student achievement.

Overall, CMP 2009 data from 21,024 ROGs were available for analysis; these students followed a total of 339 distinct pathways. As in the past, pathways followed by fewer than 10 students were discarded, leaving 148 pathways followed by a total of 19,969 students (95% of the total). Of these, 7,671 were VROGs and these students followed 74 pathways.

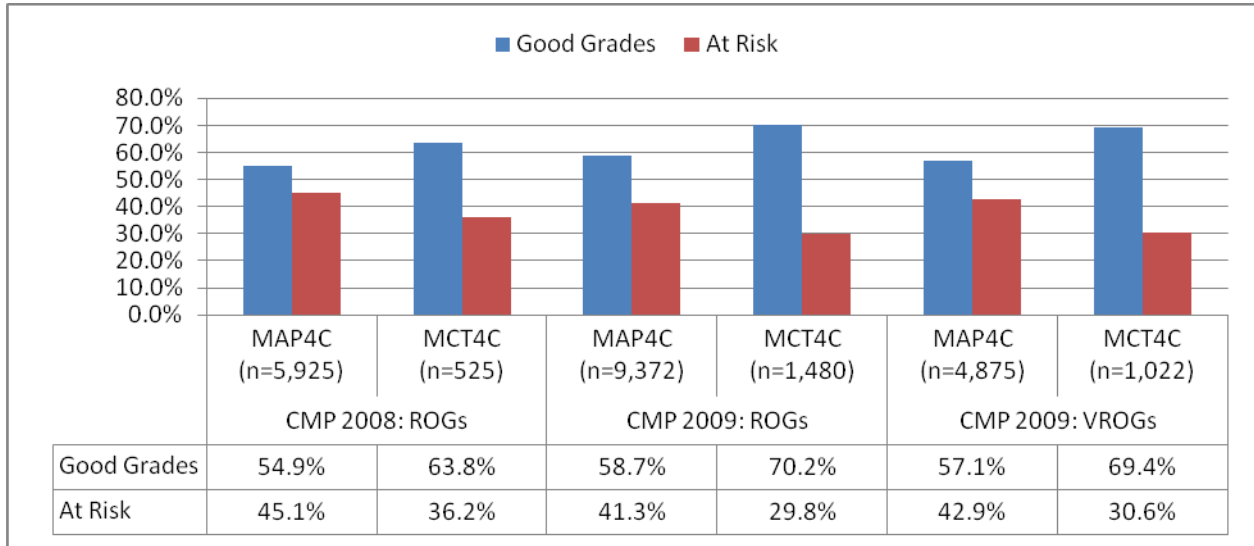
**Figure 5: Grade 9/10 Academic and Applied Courses**



Notes:

- A distinct improvement in college mathematics achievement of students who had taken both Academic and Applied courses in Grades 9 and 10 can be seen from 2008 to 2009.
- The proportion of VROGs enrolling in college mathematics who have taken Applied mathematics courses in Grades 9 and 10 (23.2%) is higher than the proportion of ROGs in both 2009 (19.8%) and 2008 (20.9%). This was one of the goals of the revised mathematics curriculum.

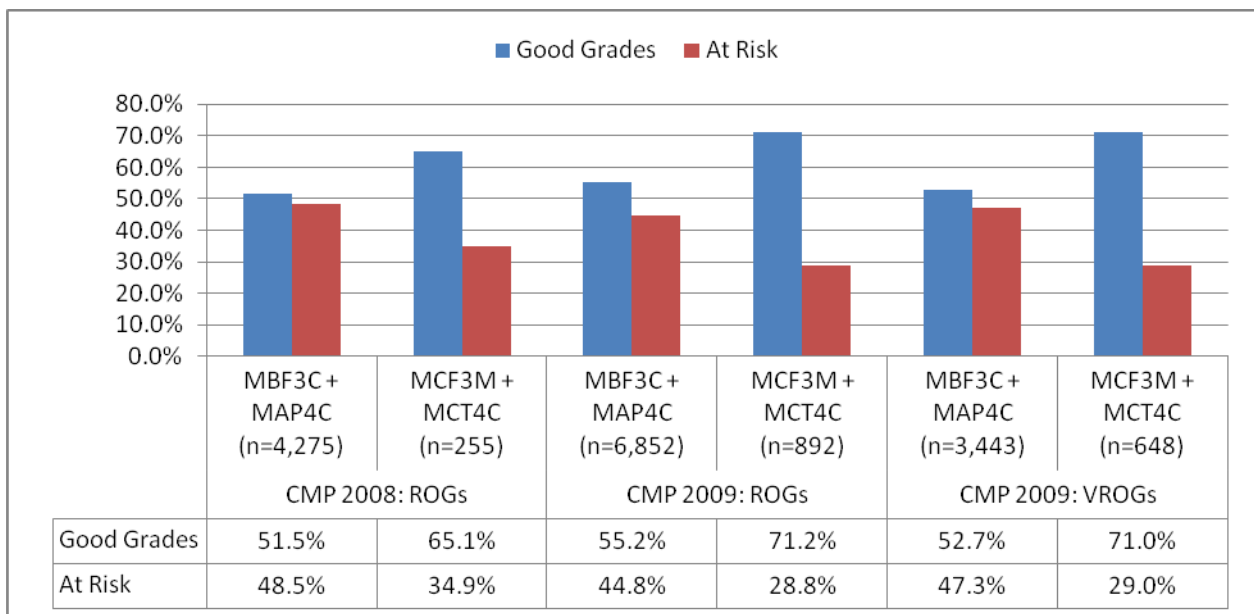
Figure 6: Grade 12 College Preparation Courses



Notes:

- Enrolments in MCT4C appear to be on the increase; in 2008 ROG enrolment in MCT4C was 4.4%, this year it is 7.4% and for VROGs, it is 13.3%.
- College mathematics achievement is also up, among students with both MAP4C and MCT4C.

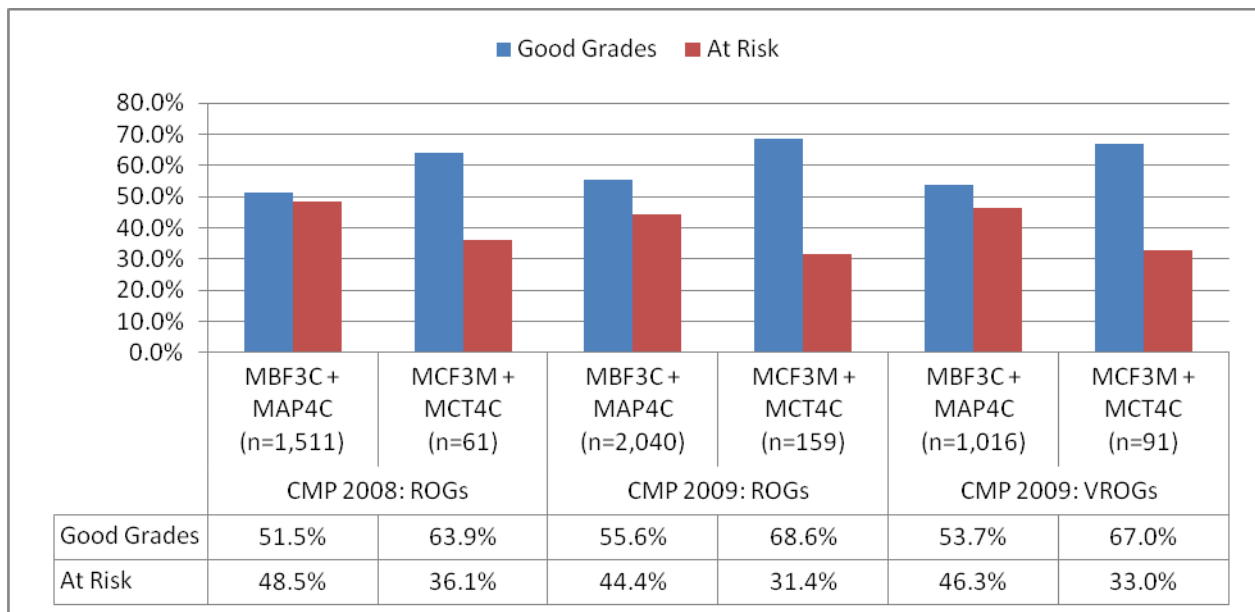
Figure 7: Grades 11 and 12 Course Choices (All Programs)



Notes:

- Of the many possible pathways from Grade 11 through Grade 12, Figures 7-9 show the two intended as college preparation pathways: MBF3C – MAP4C, and MCF3M – MCT4C. Figure 7 shows achievement for all programs, Figure 8 for Business programs, and Figure 9 for Technology programs.
- Enrolment in the MCF3M – MCT4C pathway has traditionally been small (In CMP 2008 it was 2.1% of all students); in 2009, this increased to 4.5% for all ROGs and to 8.4% for VROGs, a very significant increase, likely facilitated by the revisions to the mathematics curriculum.

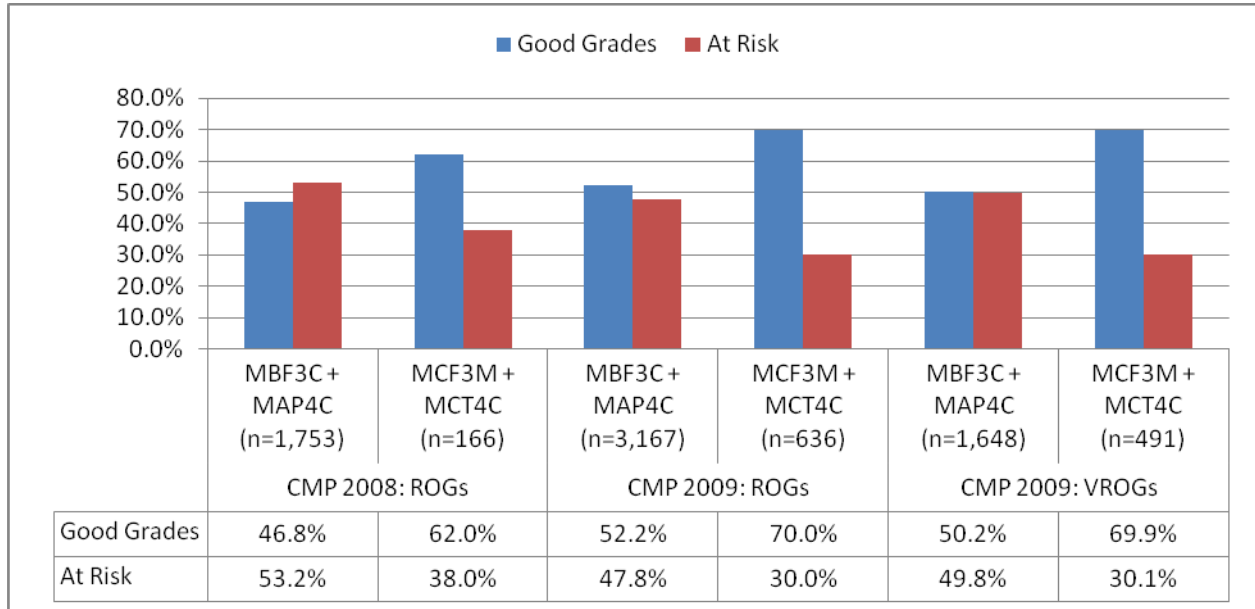
**Figure 8: Grades 11 and 12 Course Choices (Business Programs)**



Notes:

- Mathematics achievement by both ROGs and VROGs in Business programs is improved in CMP 2009

Figure 9: Grades 11 and 12 Course Choices (Technology Programs)



Notes:

- The MCF3M – MCT4C pathway was designed specifically for Technology students; enrolments have grown from 3.3% (2008 ROGs) to 7.1% (2009 ROGs) to 12.8% (2009 VROGs). These are dramatic increases, on top of which achievement levels have also risen, as shown in Figure 9.

***DISTRICT SCHOOL BOARDS***

Table 5 shows the college mathematics achievement for District School Boards throughout Ontario. In accordance with CMP practice, boards are identified by code numbers, which are made known to authorized individuals from each board. More detailed information, including a breakdown by program cluster and by individual secondary school, is available in the CMP database, access to which is also open to authorized representatives of each school board.

<b>Table 5: College Mathematics Achievement by Graduates of District School Boards</b>													
		<b>All Boards</b>	<b>B1</b>	<b>B2</b>	<b>B3</b>	<b>B6</b>	<b>B7</b>	<b>B8</b>	<b>B9</b>	<b>B10</b>	<b>B11</b>	<b>B12</b>	<b>B13</b>
<b>VROGs</b>	<b>%good</b>	<b>66.4%</b>	62.9%	62.8%	78.6%	75.4%	60.9%	76.5%	61.9%	51.2%	78.4%	78.3%	89.3%
	<b>%at risk</b>	<b>33.6%</b>	37.1%	37.2%	21.4%	24.6%	39.1%	23.5%	38.1%	48.8%	21.6%	21.7%	10.7%
<b>ROGs</b>	<b>%good</b>	<b>65.0%</b>	60.7%	60.9%	79.2%	73.3%	61.8%	78.6%	58.0%	54.2%	76.1%	67.7%	89.5%
	<b>%at risk</b>	<b>35.0%</b>	39.3%	39.1%	20.8%	26.7%	38.2%	21.4%	42.0%	45.8%	23.9%	32.3%	10.5%
		<b>All Boards</b>	<b>B14</b>	<b>B15</b>	<b>B16</b>	<b>B17</b>	<b>B18</b>	<b>B19</b>	<b>B20</b>	<b>B21</b>	<b>B22</b>	<b>B23</b>	<b>B24</b>
<b>VROGs</b>	<b>%good</b>	<b>66.4%</b>	60.0%	63.3%	77.5%	100.0%	78.2%	72.6%	69.9%	64.9%	63.6%	77.2%	60.7%
	<b>%at risk</b>	<b>33.6%</b>	40.0%	36.7%	22.5%	0	21.8%	27.4%	30.1%	35.1%	36.4%	22.8%	39.3%
<b>ROGs</b>	<b>%good</b>	<b>65.0%</b>	62.5%	62.3%	77.0%	66.7%	76.6%	71.3%	72.7%	61.9%	62.7%	76.1%	60.2%
	<b>%at risk</b>	<b>35.0%</b>	37.5%	37.7%	23.0%	33.3%	23.4%	28.7%	27.3%	38.1%	37.3%	23.9%	39.8%
		<b>All Boards</b>	<b>B25</b>	<b>B26</b>	<b>B27</b>	<b>B28</b>	<b>B29</b>	<b>B30</b>	<b>B31</b>	<b>B32</b>	<b>B33</b>	<b>B34</b>	<b>B35</b>
<b>VROGs</b>	<b>%good</b>	<b>66.4%</b>	65.9%	64.2%	73.0%	69.4%	59.5%	63.8%	54.7%	64.5%	69.5%	83.7%	71.2%
	<b>%at risk</b>	<b>33.6%</b>	34.1%	35.8%	27.0%	30.6%	40.5%	36.2%	45.3%	35.5%	30.5%	16.3%	28.8%
<b>ROGs</b>	<b>%good</b>	<b>65.0%</b>	66.5%	64.7%	70.3%	69.2%	57.4%	62.4%	53.2%	64.0%	67.1%	85.4%	66.7%
	<b>%at risk</b>	<b>35.0%</b>	33.5%	35.3%	29.7%	30.8%	42.6%	37.6%	46.8%	36.0%	32.9%	14.6%	33.3%
		<b>All Boards</b>	<b>B36</b>	<b>B37</b>	<b>B38</b>	<b>B39</b>	<b>B40</b>	<b>B41</b>	<b>B45</b>	<b>B46</b>	<b>B48</b>	<b>B49</b>	<b>B50</b>
<b>VROGs</b>	<b>%good</b>	<b>66.4%</b>	33.3%	68.0%	75.0%	33.3%	57.1%	62.9%	66.4%	72.6%	70.3%	62.0%	55.2%
	<b>%at risk</b>	<b>33.6%</b>	66.7%	32.0%	25.0%	66.7%	42.9%	37.1%	33.6%	27.4%	29.7%	38.0%	44.8%
<b>ROGs</b>	<b>%good</b>	<b>65.0%</b>	33.3%	62.9%	75.8%	66.7%	55.3%	66.1%	65.3%	70.6%	67.7%	60.4%	54.3%
	<b>%at risk</b>	<b>35.0%</b>	66.7%	37.1%	24.2%	33.3%	44.7%	33.9%	34.7%	29.4%	32.3%	39.6%	45.7%

<b>Table 5: College Mathematics Achievement by Graduates of District School Boards (continued)</b>													
		<b>All Boards</b>	<b>B51</b>	<b>B52</b>	<b>B53</b>	<b>B55</b>	<b>B56</b>	<b>B58</b>	<b>B59</b>	<b>B60</b>	<b>B61</b>	<b>B62</b>	<b>B63</b>
<b>VROGs</b>	<b>%good</b>	66.4%	81.2%	55.6%	56.9%	68.0%	60.7%	65.4%	58.6%	87.5%	68.2%	66.8%	60.5%
	<b>%at risk</b>	33.6%	18.8%	44.4%	43.1%	32.0%	39.3%	34.6%	41.4%	12.5%	31.8%	33.2%	39.5%
<b>ROGs</b>	<b>%good</b>	65.0%	82.4%	56.8%	54.4%	65.5%	59.7%	61.0%	56.8%	71.7%	66.4%	67.0%	61.5%
	<b>%at risk</b>	35.0%	17.6%	43.2%	45.6%	34.5%	40.3%	39.0%	43.2%	28.3%	33.6%	33.0%	38.5%
		<b>All Boards</b>	<b>B64</b>	<b>B65</b>	<b>B66</b>	<b>B69</b>	<b>B70</b>	<b>B73</b>	<b>B74</b>	<b>B75</b>	<b>B76</b>	<b>B77</b>	<b>B78</b>
<b>VROGs</b>	<b>%good</b>	66.4%	65.0%	60.5%	65.8%	80.7%	63.2%	63.7%	67.4%	65.1%	63.1%	73.0%	63.9%
	<b>%at risk</b>	33.6%	35.0%	39.5%	34.2%	19.3%	36.8%	36.3%	32.6%	34.9%	36.9%	27.0%	36.1%
<b>ROGs</b>	<b>%good</b>	65.0%	61.8%	55.6%	63.5%	80.6%	58.4%	60.4%	65.9%	64.6%	61.7%	72.2%	64.9%
	<b>%at risk</b>	35.0%	38.2%	44.4%	36.5%	19.4%	41.6%	39.6%	34.1%	35.4%	38.3%	27.8%	35.1%
		<b>All Boards</b>	<b>B79</b>	<b>B80</b>	<b>B81</b>	<b>B82</b>	<b>B83</b>						
<b>VROGs</b>	<b>%good</b>	66.4%	75.8%	59.2%	65.0%	58.2%	63.4%						
	<b>%at risk</b>	33.6%	24.2%	40.8%	35.0%	41.8%	36.6%						
<b>ROGs</b>	<b>%good</b>	65.0%	74.8%	60.5%	63.4%	56.4%	61.6%						
	<b>%at risk</b>	35.0%	25.2%	39.5%	36.6%	43.6%	38.4%						