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Persistence and graduation indicators of postsecondary students by parental income, 2012/2013 entry cohort

by **Melissa Van Bussel** and **Eric Fecteau**

Abstract

This fact sheet explores the association between parental income and the pathways of young adults in postsecondary education for students who began their studies in the 2012/2013 academic year. Students from low-income families have previously been shown to have lower rates of educational access¹ and attainment^{2, 3, 4}. This fact sheet focuses on persistence and graduation indicators, which [are now released annually](#), and furthers the analysis of these indicators by adding a parental income quartile dimension⁵. Overall, the findings provide the following insights:

- Students in the highest parental income quartile remained enrolled (persisted) and graduated at higher rates than students from the lowest parental income quartile for all selected educational qualifications and groupings. The differences in indicators by the level of parental income were more notable for the graduation rates than for the persistence rates.
- For students who graduated, those in the highest parental income quartile graduated as fast or faster than students in the lowest parental income quartile for all selected educational qualifications and groupings, though these differences were generally small.

These findings are consistent with similar studies regarding postsecondary experiences of students by socioeconomic status.

Introduction

Postsecondary educational attainment is associated with many benefits. These include increased employment rates⁶, higher annual employment earnings^{2, 7, 8}, more substantial life savings⁹ and various health and social benefits¹⁰. Therefore, it is important to understand factors that contribute to the successful completion of postsecondary programs. This fact sheet uses postsecondary administrative data and income tax information to determine the association between postsecondary student pathways and the level of parental after-tax income. Although Statistics Canada [produces annual education indicators on the pathways that students take during their postsecondary studies](#), this is the first time that parental income quartile groups have been used to produce such indicators, addressing an important knowledge gap.

1. L. N. Christofides, J. Cirello, and M. Hoy, "Family Income and Postsecondary Education in Canada," *The Canadian Journal of Higher Education*, vol. 31, no. 1, pp. 177–208, 2001.
2. National Center for Education Statistics, "Postsecondary persistence and attainment," U. S. Department of Education, Washington, 1997.
3. L. Horn and R. Berger, *College persistence on the rise?* National Center for Education Statistics, U.S. Department of Education, 2005.
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5. See the Methodology box for more information on the study population, the definition of the persistence and graduation indicators and how parental income quartiles were derived.
6. Statistics Canada, "Unemployment rate, participation rate and employment rate by educational attainment, annual," 2021.
7. Y. Ostrovsky and M. Frenette, "The Cumulative Earnings of Postsecondary Graduates Over 20 Years: Results by Field of Study," Statistics Canada, 2015.
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Methodology

Study population

The study population for this fact sheet consists of all new students who began postsecondary studies in the 2012/2013 academic year in one of the following five educational qualifications¹¹: college-level certificates, college-level diplomas, undergraduate degrees, master's degrees, and doctoral degrees¹². Students were considered “new” if they had not been previously enrolled in the same educational qualification within the last two academic years. Students above the age of 36 at the end of 2012 (under the age of 16 years at the end of 1992, the first year of available tax information) are excluded from the analysis. Only Canadian citizens and permanent residents, at the time of enrolment, are included in this analysis. As a result of limited data availability, the Ontario college data could not be used and was excluded from the analysis. The complete methodology for the indicators is outlined in the [Persistence and graduation indicators of postsecondary students, technical reference guide](#).

Parental income

This fact sheet organizes persistence and graduation indicators by parental income quartiles¹³. The following steps were taken to compute the parental income quartile for each student in the study population:

1. Using the T1 Family File (T1FF) from the Education and Labour Market Longitudinal Platform (ELMLP), the after-tax income¹⁴ of the student's parents was selected for each year between the student's ages of 16 and 25¹⁵. For example, if the student was 16 years old in 2005, the after-tax income of their parents would be selected for the years 2005 to 2014.
2. The average of the student's after-tax parental income¹⁶ between the ages of 16 to 25 was then computed. This value is referred to as the “average after-tax parental income”.

Parental income quartiles were computed at the total study population level (all ages, all genders)¹⁷.

As shown in Table 1, between 78.4% (doctoral degree) and 85.9% (undergraduate degree) of new students had available parental income information.

Table 1
Count of 2012/2013 new students, by selected educational qualification and availability of parental income information

Educational Qualification	All students	Parental income available	No available parental income	Proportion with parental income available
		count		percent
College-level certificate	19,160	15,530	3,630	81.1
College-level diploma	56,420	47,140	9,280	83.6
Undergraduate degree	174,800	150,200	24,600	85.9
Master's degree	24,610	20,400	4,200	82.9
Doctoral degree	4,250	3,330	920	78.4

Source: Statistics Canada. Postsecondary Student Information System (PSIS), 2012/2013 to 2018/2019 and T1 Family File (T1FF), 1992 to 2019 (subset compiled from integrated microdata files, extracted February 2021).

11. New students were grouped by educational qualification using the ‘[Classification of programs and credentials](#)’ (a combination of the PSIS program type and credential type variables) and the five most common educational qualifications were kept for the analysis.
12. Due to the typical age at which students start doctoral degrees, the data for doctoral degree students in this article is not disaggregated by age group.
13. Although the indicators are also disaggregated by gender and age, the primary focus of this fact sheet is on the differences in indicators by level of parental income. Statistics Canada has previously published [studies](#) on the differences of student pathways through postsecondary education by student characteristics such as gender and age.
14. In some cases, due to self-employment and other types of losses, parental income may be negative.
15. It is important to note that the goal of this fact sheet is to capture the “economic background” of the family; therefore, the parental income is selected between 16 and 25 years of age, regardless of the student's enrolment status. This may capture the parental income any point before, during or after, their postsecondary education; during or after their parents' core working age; during a period of economic downturn or part-time work; or prior, during or after family dissolution (e.g., the parental income may be of only one or both parents, depending on family situation). The income may be from different parents over the period, but will never include the student's own income. This standardizes the parental income, regardless of the age that a student started school.
16. The student's after-tax parental income was adjusted to 2019 constant dollars prior to creating an average.
17. While the cost of living differs by region in Canada over time, due to the possibility of movements of the parents between regions and the mismatch between the region of the parents and that of the educational institution, the parental income quartiles were computed at the national level.

There are several reasons why a student may not have had available after-tax parental income information in a specific taxation year. Most notably, the after-tax parental income information can only be determined for students identified as children¹⁸ on the T1FF of the ELMLP for the specified taxation year in which they filed their taxes. In any given taxation year, a student will be identified as a child if either a) their parents received federal child benefits¹⁹ in that taxation year or b) the student filed their taxes at their parents' address during that taxation year. In addition, to have sufficient information to be integrated into the analysis, a student must have filed their taxes during the specific taxation year. It was determined that postsecondary students are most likely to file their taxes from the same address as their parents (and therefore be identified as a child) between the ages of 16 and their mid-twenties. This is when they are most likely to have sufficient income to file their taxes, without moving away from home.

Any student who does not have available after-tax parental income information for at least one year out of the ten years that they are between the ages of 16 and 25 receives a value of “no available parental income” for their parental income quartile²⁰. “At least 1 year” was selected to limit the number of students in the study population who would receive a value of “no available parental income” for their parental income quartile. However, the general conclusions were consistent if “at least 3 years” was instead used as the exclusion criterion.

Data source

Statistics Canada, in collaboration with the provincial and territorial ministries of education, Employment and Social Development Canada (ESDC), and other stakeholders, has developed the Education and Labour Market Longitudinal Platform (ELMLP). The ELMLP allows longitudinal integration of administrative data related to education with other data sources to create anonymized, customized datasets for analytical purposes. The ELMLP includes anonymized information from the Postsecondary Student Information System (PSIS), the Registered Apprenticeship Information System (RAIS) and tax data from the T1 Family File (T1FF) that can be integrated to study the pathways of students and apprentices, their transitions to the labour market and outcomes over time.

PSIS provides detailed annual information on enrolments and graduations from Canadian public postsecondary institutions (universities and colleges) by the field of study and certain demographic variables. PSIS data do not provide information on students' income or their parents. However, some information is available in administrative data sets such as tax data files.

The current study uses PSIS and tax data to determine the association between parental income and persistence and graduation for young adults in the 2012/2013 entry cohort of selected educational qualifications. The 2012/2013 entry cohort was selected because it allows for a sufficient number of observational years required to produce the graduation indicators.

18. Children are tax filers or imputed persons in couple and lone-parent families. Tax filing children do not live with their spouse, have no children of their own and live with their parent or parents. Previous to the 1998 data, tax filing children had to report “single” as their marital status. Most children are identified from a file pertaining to federal child benefits, a provincial births file or a previous T1 family file.

19. Depending on the year, this refers either to the Canada Child Benefit, the Canada Child Tax Benefit or the Universal Child Care Benefit.

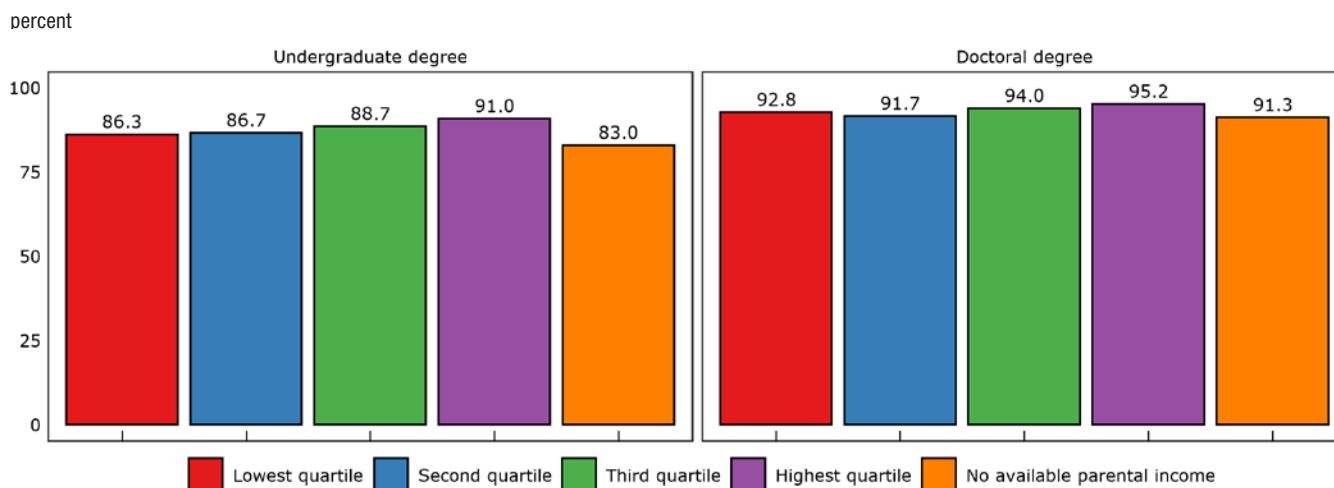
20. These students were retained in the analysis (in the “no available parental income” group), as long as they were otherwise included in the study population.

Persistence rates

The persistence rate is defined as the percentage of the new student cohort that was still enrolled²¹ (full-time or part-time) in the educational qualification in which they initially enrolled, in subsequent years after first entry. Chart 1 shows the persistence rate one year after entry for undergraduate and doctoral degree students (all ages and all genders), the two educational qualifications with a long enough duration to measure persistence. The persistence rates in Chart 1 are grouped by educational qualification and parental income quartile.

Chart 1

Persistence rate one year after entry, by selected educational qualification and parental income quartile, all ages and all genders, 2012/2013 entry cohort



Source: Statistics Canada. Postsecondary Student Information System (PSIS), 2012/2013 to 2018/2019 and T1 Family File (T1FF), 1992 to 2019 (subset compiled from integrated microdata files, extracted February 2021).

The highest persistence rates were observed for students in the highest parental income quartile for both educational qualifications. Tables 2a to 2b show the persistence rates disaggregated by gender and age.

Table 2a

Persistence rate one year after entry for undergraduate degree students, by gender, age groups and parental income quartile, 2012/2013 entry cohort

	All students	Lowest quartile	Second quartile	Third quartile	Highest quartile	No available parental income
Age and gender	percent					
All ages, all genders	87.4	86.3	86.7	88.7	91.0	83.0
Men	86.4	85.3	85.9	87.3	89.5	82.4
Women	88.2	86.9	87.3	89.7	92.2	83.5
15 to 24 years old	88.0	86.8	87.1	89.0	91.2	84.1
25 to 36 years old	81.2	80.8	82.7	83.5	84.8	77.6

Source: Statistics Canada. Postsecondary Student Information System (PSIS), 2012/2013 to 2018/2019 and T1 Family File (T1FF), 1992 to 2019 (subset compiled from integrated microdata files, extracted February 2021).

Table 2b

Persistence rate one year after entry for doctoral degree students, by gender and parental income quartile, 2012/2013 entry cohort

	All students	Lowest quartile	Second quartile	Third quartile	Highest quartile	No available parental income
Gender	percent					
All genders	92.9	92.8	91.7	94.0	95.2	91.3
Men	92.0	92.3	95.0	92.1	94.6	88.9
Women	93.8	93.2	93.0	95.6	93.6	91.7

Source: Statistics Canada. Postsecondary Student Information System (PSIS), 2012/2013 to 2018/2019 and T1 Family File (T1FF), 1992 to 2019 (subset compiled from integrated microdata files, extracted February 2021).

21. The persistence rate also includes a very small proportion of students who had already graduated by the year of measurement.

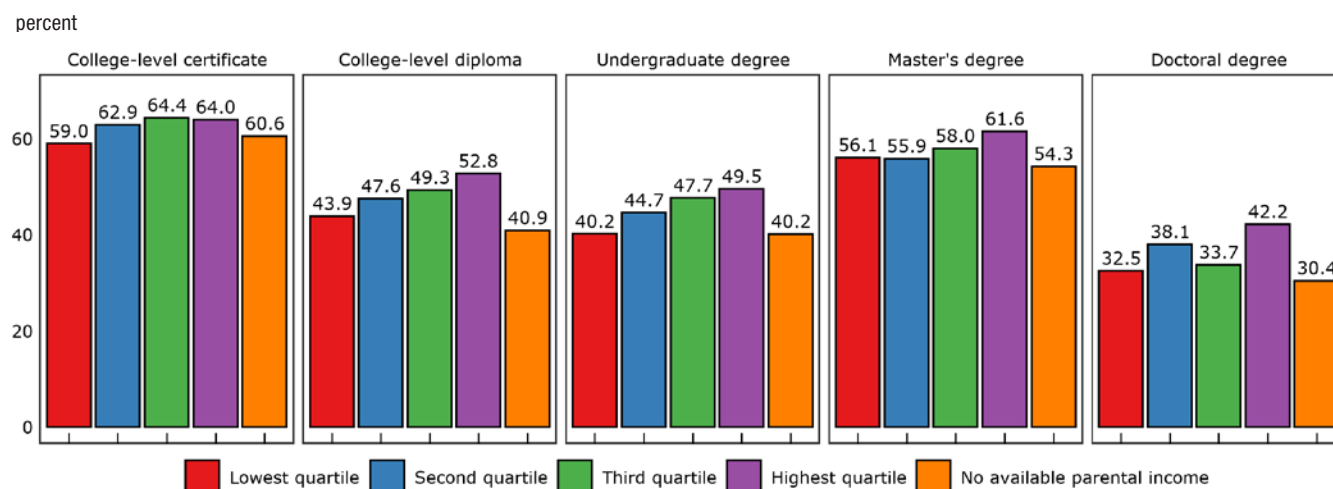
Tables 2a and 2b²² show that students in the highest parental income quartile persisted at higher rates than students in the lowest parental income quartile, for both educational qualifications and for all groupings. For undergraduate degree students, the difference in persistence rate between the highest and lowest quartiles is largest among women (5.3 percentage points). The difference in persistence rates between students in the highest parental income quartile and students in the lowest parental income quartile is less notable for doctoral degree students.

Graduation rates

The graduation rate, measured at a given number of years after the fall of first enrolment, is defined as the percentage of an entry cohort that had completed their specified educational qualification within that time. The measurement years for the graduation rates differ by educational qualification and are specified in Tables 3a to 3e. These measurement years are consistent with previous [Statistics Canada releases](#) and are the typical program duration of the educational qualification. Chart 2 shows the graduation rate for students (all ages and all genders). The graduation rates in Chart 2 are grouped by educational qualification and parental income quartile.

Chart 2

Graduation rate by selected educational qualification and parental income quartile, all ages and all genders, 2012/2013 entry cohort



Note: The measurement years are: one year after entry for college-level certificate; three years after entry for college-level diploma; four years after entry for undergraduate degree; two years after entry for master's degree; and five years after entry for doctoral degree students.

Source: Statistics Canada. Postsecondary Student Information System (PSIS), 2012/2013 to 2018/2019 and T1 Family File (T1FF), 1992 to 2019 (subset compiled from integrated microdata files, extracted February 2021).

For all educational qualifications, the graduation rate (as measured at the time of typical program duration) for the students in the highest parental income quartile is higher than the graduation rate for the students in the lowest parental income quartile. This difference is largest for students in a doctoral degree program, where the graduation rate for the students in the highest parental income quartile is 9.7 percentage points higher than for those in the lowest parental income quartile. A similar magnitude of the difference is observed for students in an undergraduate degree program (where the difference is 9.3 percentage points) and students in a college-level diploma program (where the difference is 8.9 percentage points). These differences in graduation rates between students in the highest and lowest parental income quartiles are larger than those exhibited for the persistence rates.

22. Age group is based on the age of students on December 31st of the first academic year in which they started the program leading to an educational qualification.

Tables 3a to 3e show the graduation rates disaggregated by gender and age.

Table 3a
Graduation rate one year after entry, for college-level certificate students, by gender, age group and parental income quartile, 2012/2013 entry cohort

	All students	Lowest quartile	Second quartile	Third quartile	Highest quartile	No available parental income
Age and gender	percent					
All ages, all genders	62.2	59.0	62.9	64.4	64.0	60.6
Men	62.3	58.5	63.2	64.2	64.1	59.3
Women	62.2	59.6	62.5	64.7	63.9	61.5
15 to 24 years old	61.5	57.7	62.3	63.9	64.5	57.3
25 to 36 years old	64.2	61.7	65.0	66.3	63.9	64.7

Source: Statistics Canada. Postsecondary Student Information System (PSIS), 2012/2013 to 2018/2019 and T1 Family File (T1FF), 1992 to 2019 (subset compiled from integrated microdata files, extracted February 2021).

Table 3b
Graduation rate three years after entry, for college-level diploma students, by gender, age group and parental income quartile, 2012/2013 entry cohort

	All students	Lowest quartile	Second quartile	Third quartile	Highest quartile	No available parental income
Age and gender	percent					
All ages, all genders	47.2	43.9	47.6	49.3	52.8	40.9
Men	44.9	40.8	45.2	46.3	50.0	39.4
Women	49.0	46.1	49.4	51.9	55.8	41.9
15 to 24 years old	45.5	41.1	45.5	47.6	51.8	38.2
25 to 36 years old	55.9	54.6	60.6	62.8	61.5	48.3

Source: Statistics Canada. Postsecondary Student Information System (PSIS), 2012/2013 to 2018/2019 and T1 Family File (T1FF), 1992 to 2019 (subset compiled from integrated microdata files, extracted February 2021).

Table 3c
Graduation rate four years after entry, for undergraduate degree students, by gender, age group and parental income quartile, 2012/2013 entry cohort

	All students	Lowest quartile	Second quartile	Third quartile	Highest quartile	No available parental income
Age and gender	percent					
All ages, all genders	44.8	40.2	44.7	47.7	49.5	40.2
Men	37.3	33.0	37.1	39.2	41.8	33.5
Women	50.4	45.6	50.0	54.1	56.0	44.8
15 to 24 years old	43.5	38.6	43.2	46.6	48.6	38.0
25 to 36 years old	59.6	56.9	61.7	67.0	72.4	51.9

Source: Statistics Canada. Postsecondary Student Information System (PSIS), 2012/2013 to 2018/2019 and T1 Family File (T1FF), 1992 to 2019 (subset compiled from integrated microdata files, extracted February 2021).

Table 3d
Graduation rate two years after entry, for master's degree students, by gender, age group and parental income quartile, 2012/2013 entry cohort

	All students	Lowest quartile	Second quartile	Third quartile	Highest quartile	No available parental income
Age and gender	percent					
All ages, all genders	57.3	56.1	55.9	58.0	61.6	54.3
Men	53.2	52.4	52.2	52.0	56.3	53.6
Women	60.0	58.6	58.4	62.1	65.2	54.8
15 to 24 years old	58.5	57.6	56.5	59.3	60.9	57.0
25 to 36 years old	55.8	54.1	55.5	56.2	62.3	52.9

Source: Statistics Canada. Postsecondary Student Information System (PSIS), 2012/2013 to 2018/2019 and T1 Family File (T1FF), 1992 to 2019 (subset compiled from integrated microdata files, extracted February 2021).

Table 3e
Graduation rate five years after entry, for doctoral degree students, by gender and parental income quartile, 2012/2013 entry cohort

Gender	All students	Lowest quartile	Second quartile	Third quartile	Highest quartile	No available parental income
	percent					
All ages, all genders	35.1	32.5	38.1	33.7	42.2	30.4
Men	36.7	33.3	40.0	36.8	45.9	28.9
Women	33.6	31.8	34.9	33.3	36.2	31.3

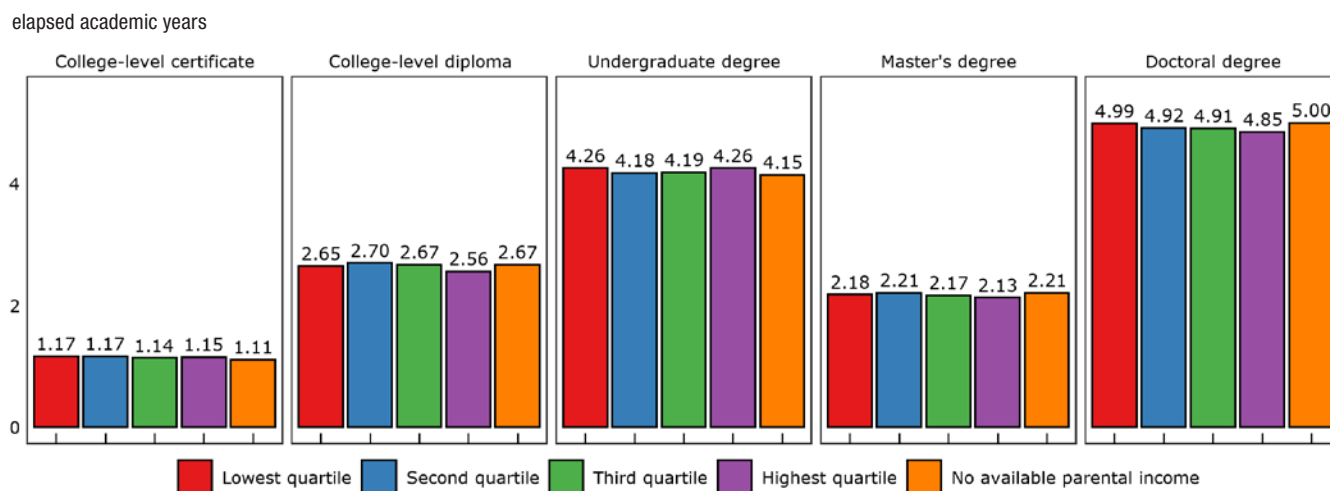
Source: Statistics Canada. Postsecondary Student Information System (PSIS), 2012/2013 to 2018/2019 and T1 Family File (T1FF), 1992 to 2019 (subset compiled from integrated microdata files, extracted February 2021).

Tables 3a to 3e show that the graduation rate for students in the highest parental income quartile is higher than the graduation rate for their counterparts in the lowest parental income quartile, for all educational qualifications and all groupings. The differences in graduation rate between the highest and lowest quartiles are largest among the older age group for undergraduate degrees (15.5 percentage points), men in a doctoral degree program (12.6 percentage points), the younger age group for the college-level diplomas (10.7 percentage points), and women in an undergraduate degree program (10.4 percentage points).

Average times to graduation

The average time to graduation²³ is defined as the average number of elapsed academic years new students took to complete the credential in a given educational qualification. Only students who graduated within the observation period are included in the calculation of average time to graduation. Chart 3 shows the average time to graduation for students (all ages and all genders). The average times to graduation in Chart 3 are grouped by educational qualification and parental income quartile.

Chart 3
Average time to graduation (elapsed academic years), by selected educational qualification and parental income quartile, all ages and all genders, 2012/2013 entry cohort.



Note: Only students who graduated within the observation period are included in the calculation of average time to graduation. The periods of observation are: three years after entry for college-level certificate; four years after entry for college-level diploma; six years after entry for undergraduate degree; four years after entry for master's degree; and six years after entry for doctoral degree students.

Source: Statistics Canada. Postsecondary Student Information System (PSIS), 2012/2013 to 2018/2019 and T1 Family File (T1FF), 1992 to 2019 (subset compiled from integrated microdata files, extracted February 2021).

23. Please see the [Technical Reference Guide](#) for more details on this definition and its implications.

Chart 3 shows that students in the highest parental income quartile graduated as fast or faster than their counterparts in the lowest parental income quartile, for all educational qualifications. The differences in average times to graduation between the highest and lowest parental income quartile groups are less notable than they are for the persistence and graduation rates. The largest differences in average times to graduation between the highest and lowest parental income quartile are observed for the doctoral degree (0.14 years faster, on average) and college-level diploma (0.09 years faster, on average) educational qualifications.

Tables 4a to 4e show the average times to graduation disaggregated by gender and age.

Table 4a

Average time to graduation (elapsed academic years), measured over the three years after the year of first entry, for college-level certificate graduates, by gender, age group and parental income quartile, 2012/2013 entry cohort

	All students	Lowest quartile	Second quartile	Third quartile	Highest quartile	No available parental income
Age and gender	elapsed academic years					
All ages, all genders	1.15	1.17	1.17	1.14	1.15	1.11
Men	1.15	1.17	1.17	1.14	1.16	1.10
Women	1.15	1.16	1.16	1.15	1.14	1.12
15 to 24 years old	1.16	1.17	1.17	1.16	1.15	1.12
25 to 36 years old	1.13	1.16	1.15	1.10	1.14	1.11

Source: Statistics Canada. Postsecondary Student Information System (PSIS), 2012/2013 to 2018/2019 and T1 Family File (T1FF), 1992 to 2019 (subset compiled from integrated microdata files, extracted February 2021).

Table 4b

Average time to graduation (elapsed academic years), measured over the four years after the year of first entry, for college-level diploma graduates, by gender, age group and parental income quartile, 2012/2013 entry cohort

	All students	Lowest quartile	Second quartile	Third quartile	Highest quartile	No available parental income
Age and gender	elapsed academic years					
All ages, all genders	2.65	2.65	2.70	2.67	2.56	2.67
Men	2.60	2.57	2.65	2.63	2.55	2.62
Women	2.68	2.70	2.73	2.71	2.57	2.70
15 to 24 years old	2.71	2.73	2.76	2.73	2.60	2.77
25 to 36 years old	2.36	2.39	2.37	2.31	2.21	2.45

Source: Statistics Canada. Postsecondary Student Information System (PSIS), 2012/2013 to 2018/2019 and T1 Family File (T1FF), 1992 to 2019 (subset compiled from integrated microdata files, extracted February 2021).

Table 4c

Average time to graduation (elapsed academic years), measured over the six years after the year of first entry, for undergraduate degree graduates, by gender, age group and parental income quartile, 2012/2013 entry cohort

	All students	Lowest quartile	Second quartile	Third quartile	Highest quartile	No available parental income
Age and gender	elapsed academic years					
All ages, all genders	4.21	4.26	4.18	4.19	4.26	4.15
Men	4.34	4.38	4.32	4.32	4.37	4.28
Women	4.13	4.18	4.10	4.10	4.18	4.06
15 to 24 years old	4.31	4.37	4.28	4.26	4.32	4.32
25 to 36 years old	3.05	3.12	3.01	2.89	2.85	3.20

Source: Statistics Canada. Postsecondary Student Information System (PSIS), 2012/2013 to 2018/2019 and T1 Family File (T1FF), 1992 to 2019 (subset compiled from integrated microdata files, extracted February 2021).

Table 4d

Average time to graduation (elapsed academic years), measured over the four years after the year of first entry, for master's degree graduates, by gender, age group and parental income quartile, 2012/2013 entry cohort

	All students	Lowest quartile	Second quartile	Third quartile	Highest quartile	No available parental income
Age and gender	elapsed academic years					
All ages, all genders	2.18	2.18	2.21	2.17	2.13	2.21
Men	2.20	2.20	2.24	2.21	2.16	2.19
Women	2.16	2.16	2.19	2.15	2.11	2.22
15 to 24 years old	2.17	2.16	2.23	2.16	2.14	2.20
25 to 36 years old	2.19	2.20	2.19	2.19	2.12	2.21

Source: Statistics Canada. Postsecondary Student Information System (PSIS), 2012/2013 to 2018/2019 and T1 Family File (T1FF), 1992 to 2019 (subset compiled from integrated microdata files, extracted February 2021).

Table 4e

Average time to graduation (elapsed academic years), measured over the six years after the year of first entry, for doctoral degree graduates, by gender and parental income quartile, 2012/2013 entry cohort

	All students	Lowest quartile	Second quartile	Third quartile	Highest quartile	No available parental income
Gender	elapsed academic years					
All genders	4.93	4.99	4.92	4.91	4.85	5.00
Men	4.88	4.97	4.87	4.89	4.70	5.00
Women	4.98	5.01	4.97	4.93	4.98	4.99

Source: Statistics Canada. Postsecondary Student Information System (PSIS), 2012/2013 to 2018/2019 and T1 Family File (T1FF), 1992 to 2019 (subset compiled from integrated microdata files, extracted February 2021).

Tables 4a to 4e show that students in the highest parental income quartile graduated as fast or faster, on average, than their counterparts in the lowest parental income quartile, for all educational qualifications and groupings. This was most notable for men in a doctoral degree program, where students in the highest parental income quartile graduated, on average, 0.27 academic years more quickly than those in the lowest parental income quartile.

Conclusion

The study population's persistence and graduation indicators differed, in general, based on the student's parental income. Students in the highest parental income quartile group exhibited higher persistence and graduation rates (for all selected educational qualifications) than students in the lowest parental income quartile group. This finding held when disaggregating by gender and age group. For students who graduated, those in the highest parental income quartile graduated as fast, or faster, than their counterparts in the lowest parental income quartile, for all selected educational qualifications. This, too, held when disaggregating by gender and age group.

The differences in indicators between students in the highest and lowest parental income quartiles were most notable for the graduation rates, followed by the persistence rates. The differences in average times to graduation across parental income quartiles were generally small.

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