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Explaining Canada's Falling HDI Ranking Over Time: A True Decline or a Statistical Artifact?



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Explaining Canada’s Falling HDI Ranking Over Time: A True Decline or a Statistical Artifact?

Abstract

Canada’s position in the United Nations Human Development Index (HDI) has slipped from 3rd in 1990 to 16th in 2023, when the latest report was released in 2025. This 13-place decline occurred even though Canada’s absolute HDI score continued to improve. Using the UNDP’s revised HDI series, national Labour Force Survey (LFS) enrolment data and counterfactual growth scenarios, this report decomposes Canada’s deteriorating position. Data issues in UNESCO’s “expected years of schooling” series explain roughly two-fifths of the rank loss and replacing the apparent mismeasured values with LFS-based estimates narrows the 1990-2023 drop from 13 to 8 places because of a lower ranking in 1990 instead of the 3rd. The remaining three-fifths reflects genuine underperformance. Canada’s life-expectancy rank fell from 7th to 18th, while its real GNI-per-capita rank hovered near 25th as both variables lagged the OECD average growth in that period. These findings demonstrate that measurement errors have distorted Canada’s HDI performance over time. However, correcting them is only a partial remedy; regaining Canada’s 1990s HDI ranking will ultimately require faster progress in health outcomes and income growth.

Explaining Canada's Falling HDI Ranking Over Time: A True Decline or a Statistical Artifact?

Executive Summary

Canada's global standing in the United Nations Human Development Index (HDI) fell from 3rd in 1990 based on the revised UNDP estimates to 16th in 2023, a slide that coincided with a rise in its absolute HDI score from 0.865 to 0.939 over the same period. This report dissects the fall by asking: How much of the 13-place decline is “real” and how much is due to statistical mismeasurement? To answer this question, we combine three strands of evidence: 1) the United Nations Development Programme's (UNDP) 2023 vintage, methodologically consistent HDI series; 2) a Labour Force Survey (LFS) derived replacement for Canada's “expected years of schooling” (EYS) data; and 3) counterfactual simulations that impose average OECD growth rates on Canada's life expectancy and income trajectories.

The study begins by revisiting HDI methodologies. The index is calculated as a geometric mean—an average obtained by multiplying the three domains' scores together and then taking their cube root: health (life expectancy at birth); education (average of mean and expected years of schooling); and income (real GNI per capita). Canada's absolute scores rose for the following indicators between 1990 and 2023: life expectancy gained 5.2 years, mean years of schooling climbed from 10.8 to 13.9, and real GNI per capita climbed from \$36,258 to \$54,688 PPP USD while expected years of schooling fell from 16.7 to 15.9 years. As a result, Canada's relative position weakened most dramatically in EYS, where the rank fell from 2nd to 49th, and in life expectancy, which slid from 7th to 18th.

A closer inspection of the education data reveals that data inconsistencies in UNESCO Institute for Statistics (UIS) series between 1996 and 1998 that involves an improbable 1.5-year drop of tertiary level expected years of schooling. National LFS data show no comparable drop. Substituting LFS-based EYS values lowers Canada's starting rank in 1990 (from 3rd to 7th) while lifting its 2023 rank by one place (from 16th to 15th). This correction explains five of Canada's 13 lost places, meaning that roughly two fifths of Canada's apparent decline is due to mismeasurement and that the decline in Canadian HDI rankings was not as dramatic as UNDP data suggest.

Turning to health, the report notes that Canada's life expectancy grew at 0.20 per cent per year between 2000 and 2023, slightly below the OECD average of 0.26 per cent. A counterfactual in which Canada matched the OECD pace would raise the 2023 HDI rank to 12th from 16th, clawing back four places. On the income front, Canada's real GNI per capita expanded 1.25 per cent annually, whereas its OECD peers averaged 1.73 per cent. If Canada had kept up, its 2023 HDI rank would have been 13th, recovering three places. Together, sluggish gains in health and income, therefore, account for almost 54 per cent of Canada's total rank loss over this period.

The following policy implications flow naturally from these findings:

1. **Improve data quality:** the UIS break amplified Canada's perceived downfall, misinforming both domestic audiences and international observers. A review of data could restore confidence in the education series.
2. **Accelerate progress in health and income:** Policies that accelerate longevity gains through preventive care, mental health services, and targeted investments in underserved communities, while also boosting productivity and capital deepening—particularly in intangible assets—to revitalize GNI growth are needed.
3. **Address structural educational challenges:** raising tertiary completion rates and smoothing school to labour market transitions could prevent further erosion in EYS, even under a flawless statistical regime.

Finally, the study positions Canada's HDI trajectory within a broader comparative context. Australia, Norway, and other resource rich economies have sustained top ten HDI ranks over the same period, suggesting that Canada's slide is not inevitable but influenced by policy choices.

Explaining Canada's Falling HDI Ranking Over Time: A True Decline or a Statistical Artifact?¹

I. Introduction

The first Human Development Report (HDR) produced in 1990 defined human development as “a process of enlarging people's choices. In principle, these choices can be infinite and change over time. But at all levels of development, the three essential ones are for people to lead a long and healthy life, to acquire knowledge and to have access to resources needed for a decent standard of living. If these essential choices are not available, many other opportunities remain inaccessible.”

Throughout the report when specifically referring to the year of release of the HDR report we use the following format: “X HDR” where X is the year of release. It is worth noting that there is usually a 2–3-year lag between the year of the release of the HDR and the year that the data refers to. For instance, the data that were used to produce the 2025 HDR (released in May 2025) corresponded to 2023.

HDRs have focused on three key Human Development Domains:

- 1- Longevity as a measure for long and healthy life
- 2- Access to education as a measure for knowledge
- 3- Income as a measure for a decent standard of living

Throughout the years, HDRs have employed different methodologies and variables to estimate these indicators for various countries so that cross country comparisons could be made possible. This meant that the choice of variables to construct the indicators was constrained by data availability from all UN member states. The first HDR utilized the following variables to estimate the human development components:

- 1- Life expectancy at birth to estimate longevity.
- 2- Adult literacy rate to estimate access to education.
- 3- Purchasing power-adjusted real GDP per capita to estimate income²

Figure 1 summarizes the various components that are currently used to estimate the HDI.

The HDI estimates in the most recent HDR are calculated in the following manner. First, the estimates for life expectancy, average educational attainment, expected years of schooling and gross national income (GNI) per capita for each country are scaled into indices using the following equation:

¹ This report was written by CSLS Economist Alisaleh Shariati under the supervision of CSLS Executive Director Emeritus, Andrew Sharpe. It also benefited significantly from insights provided by CSLS CEO and Chief Economist Stephen Tapp as well as comments provided by Statistics Canada's Assistant Chief Statistician, Josée Bégin, Finance Canada's Director General, Nelson Paterson, and others at the 2025 CSLS session “Trends in Well-being in Canada” at the annual meeting of the Canadian Economics Association on May 29-31 in Montreal, Canada. Email: ali.shariati@csls.ca.

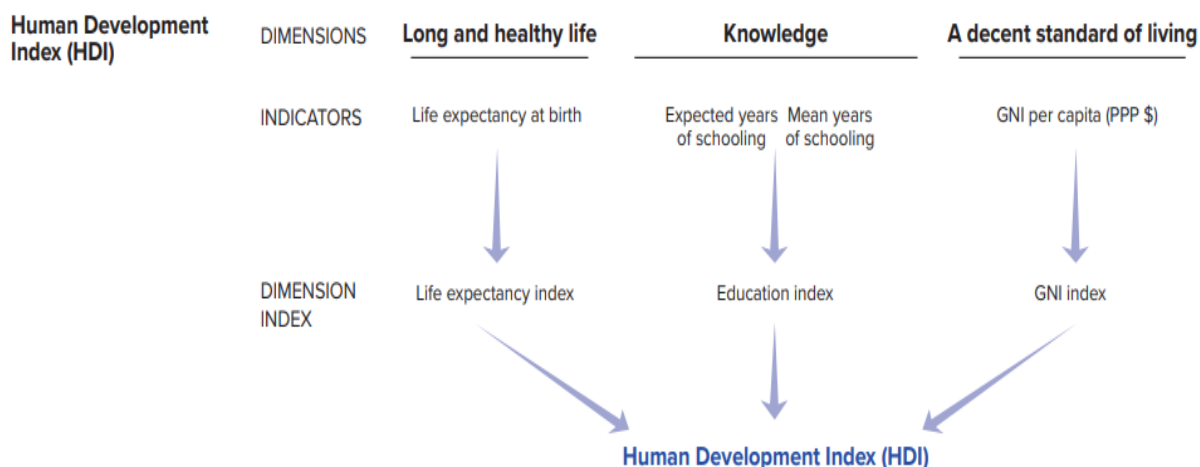
² Since there are diminishing returns in the conversion of income into the fulfilment of human needs, the adjusted GDP per capita figures have been transformed into their logarithms.

$$Index = \frac{\text{actual value} - \text{minimum value}}{\text{maximum value} - \text{minimum value}} \quad (1)$$

The maximum and minimum values for each dimension are taken from the most recent HDR which have been last updated in 2010.³ The minimum values are based on the concept of subsistence, that is, they are set at the lowest value needed in that indicator for a society to function, or, in the case of income, the lowest value in recorded history.⁴ The maximum values are set as “aspirational goals”.⁵

Figure 1: Dimensions and Indicators of the HDI

Calculating the human development indices—graphical presentation



Source: Human Development Report 2023/2024 technical notes available at https://hdr.undp.org/sites/default/files/2023-24_HDR/hdr2023-24_technical_notes.pdf

³ **Life Expectancy:** minimum=20 years based on long-run historical evidence from Maddison (2010) and Riley (2005), maximum=85.

Education: minimum=0 years for both average educational attainment and expected years of schooling since survival is possible without education, maximum=15 years for average educational attainment and maximum=18.0 years for expected years of schooling.

Income (PPP adjusted 2021 US\$): maximum= \$75,000 as Kahneman and Deaton (2010) showed that there is essentially no gain in human development and well-being beyond an annual income of \$75,000, minimum= \$100.

For more information see Technical notes in the most recent HDR at https://hdr.undp.org/sites/default/files/2023-24_HDR/hdr2023-24_technical_notes.pdf

⁴ Before the 2010 HDR the average used to create the HDI was an arithmetic mean. Since then, a geometric mean with equal weights given to each indicator is used to estimate the HDI:

$$HDI = I_{Life\ Expectancy}^{1/3} * I_{Educational\ Attainment}^{1/3} * I_{income}^{1/3}$$

This reduces the substitutability of improvements across measures, so a country cannot linearly trade off performing poorly in one dimension by performing well in another. In other words, a country cannot receive a very high human development score without impressive scores in all dimensions.

⁵ Some countries already exceed these aspirational goals. For example, San Marino had a life expectancy of 85.7 years, Greece had an expected years of schooling of 20.8 years and Norway a GNI per capita of 112,710 USD PPP in 2023.

Table 1: Maximum and Minimum Values of Various HDI Components⁶

Dimension	Indicator	Minimum	Maximum
Health	Life expectancy at birth (years)	20	85
Education	Expected years of schooling (years)	0	18
	Mean years of schooling (years)	0	15
Standard of living	GNI per capita (2021 PPP\$)	100	75,000

Source: HDR Technical Note (2024) available at https://hdr.undp.org/sites/default/files/2023-24_HDR/hdr2023-24_technical_notes.pdf

Before the release of the 1994 HDR the UNDP updated the minimum and maximum values for each indicator annually but then a decision was made to fix the minima and maxima since then. These thresholds were introduced based on the trends of variables and their probable values in the next 25 years. Specifically, as Table 1 demonstrates, in calculating the HDI value in the most recent HDR, life expectancy is capped at 85 years, mean years of schooling is capped at 15 years, expected years of schooling at 18 years and per capita income is capped at 75,000 USD.⁷

In addition, the selection of indicators to estimate the HDI components has also been subject to revisions. In the 1991 HDR, adult literacy rate was augmented by mean years of schooling proxying educational attainment and there were some adjustments to the weights of the income measure.⁸ In the 1995 HDR, mean years of schooling was replaced with combined gross enrolment at the primary, secondary and tertiary levels. The formulation of taking the log of income was reintroduced in the 1999 HDR.⁹

The 2010 HDR was a major turning point for the calculation of HDI as a series of methodological changes were introduced that are still the basis for the calculation of HDI in the most recent HDR report. First, the education index was changed from adult literacy rate and combined gross enrolment to be constructed using average educational attainment (mean years of schooling) and expected years of schooling.

Second, income per capita was changed to be measured by GNI per capita instead of Gross Domestic Product (GDP) per capita. This switch occurred because GDP measures the amount produced in a country without capturing where the income from this production goes. In contrast, GNI reflects the income of the residents of a country regardless of where the income is generated and is therefore a better measure of domestic purchasing power than GDP.

⁶ Some countries already exceed these aspirational goals. For example, San Marino had a life expectancy of 85.7 years, Greece had an expected years of schooling of 20.8 years and Norway a GNI per capita of 112,710 USD PPP in 2023.

⁷ USD measured in 2021 PPP.

⁸ Mean years of schooling was added as a second component to form educational attainment. Adult literacy was given two-thirds weight and mean years of schooling one-third. For more details see the 1991 HDR available at <https://hdr.undp.org/system/files/documents/hdr1991encompletenostats.pdf>

⁹ The formulation of logging income was reintroduced because the adjustment introduced in 1991 was so drastic that middle-income countries were unjustifiably penalized. The treatment of income in the 1999 HDR emphasized that people do not need an infinite amount of income for a decent standard of living. As income increases, its value is adjusted downwards through mathematical treatment before it enters the HDI.

Finally, the geometric mean has replaced the arithmetic mean for calculating the overall index.

There have not been any major methodological revisions to the HDRs since then. However, because of these methodological shifts including the selection of HDI indicators, that were outlined earlier and the fact that national and international agencies continually improve their data series, the data, including the HDI values and ranks, presented in each HDR are not comparable to those published in earlier editions. The UNDP has therefore produced a consistent time series for HDI and its components that employs the latest HDI estimation methodology and the revised data that national statistical agencies have produced.¹⁰ We will refer to the data and rankings published at the time of each HDR release as “historical data and rankings” and the time consistent data and rankings as “revised data and rankings”.

Section 2 presents the HDI performance of Canada from the 1987 until 2023. Due to lack of data availability on the historical values of HDI components before 1998 (2000 HDR), we are only able to document the historical rankings of the HDI components since that report. In Section 3, we demonstrate how the rankings and overall HDI performance of Canada would have changed if we used the revised data (i.e. using a common methodology and fixed variables to create the indicators). Section 4 then analyzes what factors have contributed the most to the fall in Canada’s ranking both in the historical and revised series. Section 5 concludes.

II. Canada’s Historical HDI Performance

Canada has consistently been ranked among the “Very high human development” countries.¹¹ Chart 1, Panel A shows the evolution of Canada’s historical HDI values as they were reported since 1987 until the most recent HDR. There was a steep decline in Canada’s HDI after the 1991 followed by a rebound until the 1996. Since 1997, Canada experienced a steady increase in the absolute value of its HDI until 2010 when there was a sharp decrease in its value from 0.966 to 0.888.¹² Correspondingly, as Chart 1, Panel B shows, Canada was ranked 1st between the 1990 and 1996 with only one exception in 1991 which ranked Canada 2nd.

Since 1998 however, Canada’s historical HDI ranking was on a decline, dropping from 1st in the 1998 to 16th in the 2023. This decline is perhaps somewhat surprising as the absolute value of the HDI for Canada was higher in 2023 (0.939) than in 1998 (0.935).

It is important to note that that the historical HDI rankings and values are not necessarily comparable from one year to another due to the changes in methodology and choice of variables in calculating the HDI. In other words, this fall in HDI ranking partly reflects the substantial changes in the

¹⁰ To access the revised HDI data series see https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_Statistical_Annex_HDI_Table.xlsx.

¹¹ The 2014 Human Development Report introduced a system of fixed cutoff points for the four categories of human development achievements. The cutoff points (COP) are the HDI values calculated using the quartiles (q) from the distributions of the component indicators averaged over 2004–2013. Countries with a HDI value of 0.800 or above are considered “Very high human development”.

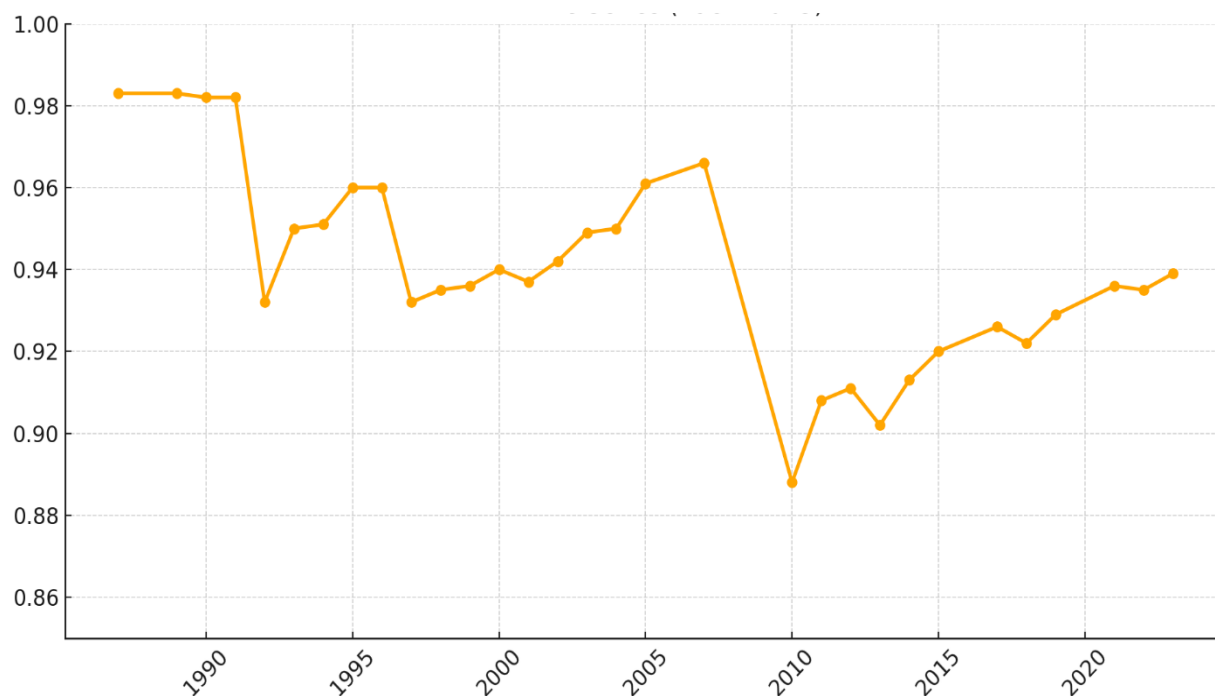
¹² Shariati (2025) finds that the national ranking ignores significant regional variations among the Canadian provinces and territories and estimates provincial and territorial HDI values for Canada.

methodology and selection of indicators used in calculating the HDI in 2010 and does not necessarily reflect a deterioration in Canada's HDI performance.

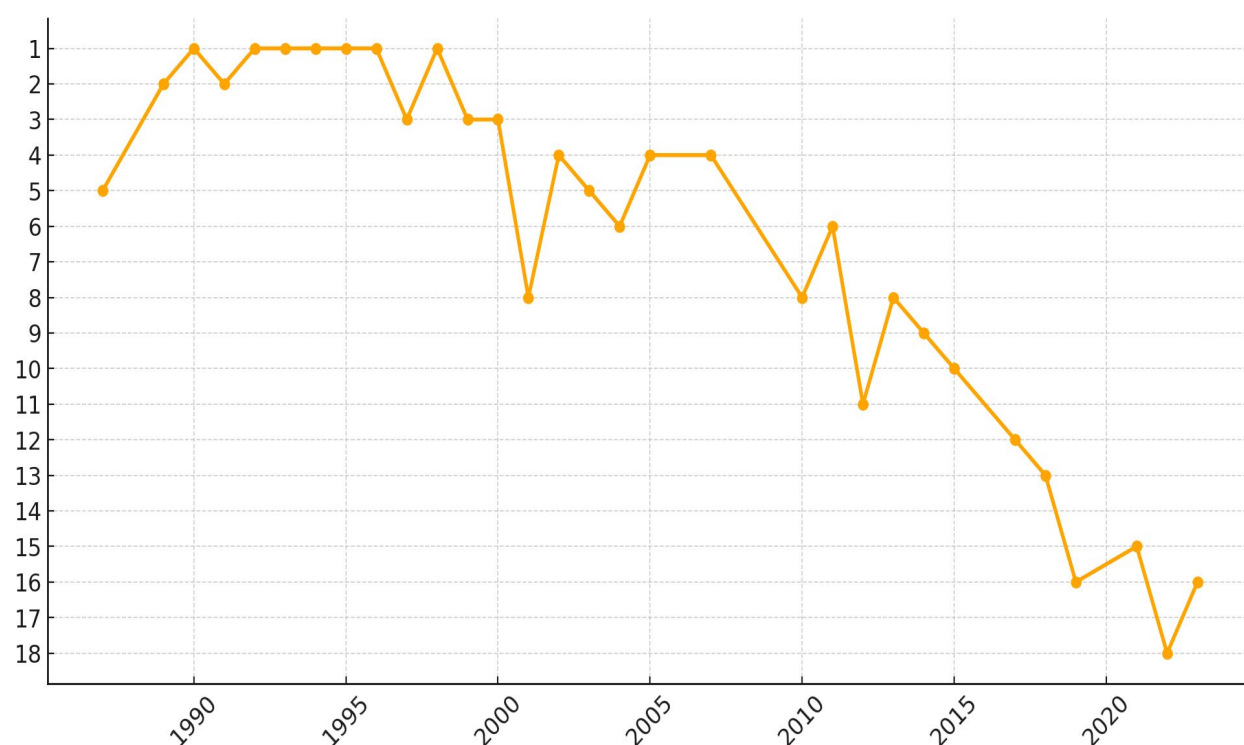
However, it is worth noting that the methodological shifts and indicators selection affected some countries differently. For instance, Norway that ranked 1st in both the 2007 and 2010 saw an increase in its HDI value from 0.925 to 0.938.

Chart 1: Canada's Historical HDI Performance: 1987-2023

Panel A: Historical HDI Index



Panel B: Historical HDI Rankings



Note: There was no report released in 2012. Also, the 2007/2008, 2021/2022 and 2023/2024 were released covering two years of data.

Source: CSLS Compilation from HDR reports 2000-2025.

Most other countries in the very high human development category experienced a decline in their HDI values in the 2010.¹³ From 2010 to 2012, there was a steady increase in Canada's HDI value up from 0.888 to 0.911. It subsequently fell to 0.902 in the 2013 only to rise steadily again until 2023 reaching 0.939. Due to the existence of multiple confounding factors (i.e. changes in methodology, selection of HDI indicators, changes in the performance of countries in each indicator over time etc.) it is not clear what are the underlying reasons driving the relative decline in the overall HDI ranking of Canada compared to other countries.

As a first step, we examine the changes in the rankings for various HDI components for Canada over time. We put special emphasis on the years where Canada's overall HDI ranking dropped compared to the preceding year, namely 2010, 2012 and 2019.

Table 2 shows how Canada's position in each HDI component changed from reference year 1998 (2000 HDR) to the 2023 (most recent HDR published in 2025). Over that period Canada's overall HDI rank slid from 1st to 16th, a loss of 15 places. Pre-2010, the education variables adult literacy rates and combined enrolment ratio showed completely different patterns. Canada's adult literacy

¹³ Examples include Switzerland down from 0.945 to 0.874, United Kingdom down from 0.906 to 0.849 and Finland from 0.908 to 0.871 between 2007 and 2008.

rate was consistently 1st while its enrolment ratio ranking ranged from a low of 15th in 2003 to a high of 6 in 1998.¹⁴

Post-2010, Canada's mean years of schooling improved significantly from 15th in 2010 to a high of 2nd reached in 2019 and 2022. Expected years of schooling however, moved in the other direction and fell from 16th in 2010 to 49th in 2023.

In the overall period of 1998 to 2023, life expectancy moved from 2nd to 18th and income from 9th to 25th, each down 16 positions. The sharpest single-year shift in the overall HDI remains between the 2011 and 2012 reports, when Canada's HDI rank slipped from 6th to 11th. Another interesting development in the historical HDI ranking of Canada is the drop of 4 rankings (from 4th to 8th) between 2007 to 2010.

III. Overview of Canada's HDI Using the Revised Time Series

To attempt to distinguish between a genuine decline in Canada's HDI indicators and data or methodological changes that may have driven the deterioration in Canada's HDI ranking, we employ the revised time series produced by UNDP.¹⁵ This series is based on the methodology used to construct the 2025 HDR indicators and provides a consistent framework to evaluate the evolution of Canada's HDI performance.¹⁶

Table 2: Historical Ranking for HDI Indicators, Canada, Select Years

Reference Year	Life Expectancy Rank	Adult Literacy Rank	Combined Enrolment Ratio Rank	Mean Years of Schooling Rank	Expected Years of Schooling Rank	Income Rank	HDI Rank
1998	2	1	6	-	-	9	1
1999	7	1	8	-	-	6	3
2000	4	1	8	-	-	6	3
2001	5	1	11	-	-	7	8
2002	5	1	12	-	-	6	4
2003	5	1	15	-	-	5	5
2004	6	1	15	-	-	7	6
2005	9	1	6	-	-	10	4
2007	11	1	7	-	-	18	4
2010	10	-	-	15	16	14	8
2011	13	-	-	6	20	16	6
2012	10	-	-	4	38	16	11
2013	9	-	-	8	25	19	8

¹⁴ In fact, Canada shared the 1st ranking with other developing countries as the rate was near 100 per cent for these nations. This made differentiated high-income countries based on education performance difficult and was one of the main reasons that the UNDP decided to switch to expected years of schooling and mean years of schooling variables in the 2010 HDR.

¹⁵ The underlying data used for the analysis in this section can be found at https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_Statistical_Annex_HDI_Table.xlsx

¹⁶ We note that the 2025 HDR uses 2023 data.

2014	12	-	-	3	26	20	9
2015	12	-	-	6	22	21	10
2017	10	-	-	4	22	22	12
2018	12	-	-	4	33	23	13
2019	15	-	-	2	34	21	16
2021	14	-	-	3	29	24	15
2022	13	-	-	2	44	29	18
2023	18	-	-	5	49	25	16

Note: For 2010 and beyond HDRs, education variables switch from adult literacy rates and combined enrolment ratio to mean years of schooling and expected years of schooling. From 2010 onward, GNI per capita replaced GDP per capita as a measure of income.

Source: CSLS calculations from HDR reports 2000-2025. Data Appendix lists the rankings for all HDI components and the overall HDI score of all countries and can be found at https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_Statistical_Annex_HDI_Table.xlsx.

Table 3 provides Canada's rankings in HDI and its components between 1990 and 2023.

Starting with overall HDI, Chart 2, Panel A demonstrates Canada's revised HDI values. The revised data present a significantly different perspective compared to the historical data illustrated in Chart 1. According to the revised measure, Canada's HDI increased steadily from 0.865 in 1990 to 0.939 in 2023, representing a compound average annual growth rate of 0.25 per cent over this period.

Chart 2, Panel B illustrates Canada's HDI ranking between 1990 and 2023 according to this revised series. Canada's HDI rank has been on a downward trend since 1992, when it ranked 2nd. This decline continued steadily until 2010, when Canada's ranking fell to 14th, with most of the decline taking place between 1996 (ranked 4th) and 1999 (ranked 12th), before rebounding slightly to 10th in 2012.

Table 3: HDI Revised Data Rankings for HDI Indicators, Canada, 1990-2023

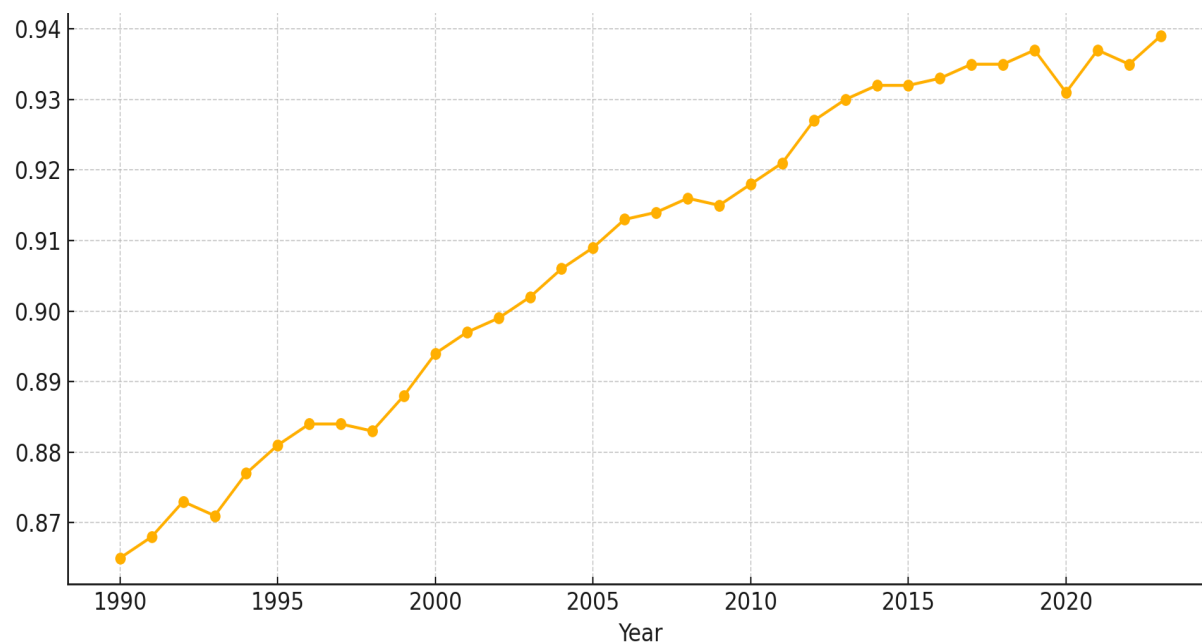
Year	Life Expectancy Rank	Mean Years of Schooling Rank	Expected Years of Schooling Rank	Income Rank	HDI Rank
1990	9	7	2	27	3
1991	9	7	2	28	2
1992	9	7	2	28	2
1993	12	7	2	28	4
1994	11	5	4	28	4
1995	11	5	4	28	5
1996	12	5	5	28	4
1997	12	5	8	29	6
1998	11	4	13	30	11
1999	12	3	14	27	12
2000	11	3	16	26	11
2001	12	4	20	27	11
2002	12	5	26	27	10
2003	13	4	29	27	10

2004	15	3	29	26	10
2005	17	3	32	26	11
2006	16	2	35	26	11
2007	16	2	38	25	12
2008	16	2	41	21	12
2009	16	2	39	23	11
2010	17	2	44	22	14
2011	16	2	46	22	12
2012	16	2	32	22	10
2013	17	2	38	22	13
2014	19	2	39	21	11
2015	19	3	39	23	14
2016	19	2	39	24	16
2017	21	2	37	24	15
2018	21	3	39	24	16
2019	21	3	42	25	16
2020	22	3	43	25	15
2021	19	4	45	24	16
2022	24	5	49	24	16
2023	18	5	49	25	16

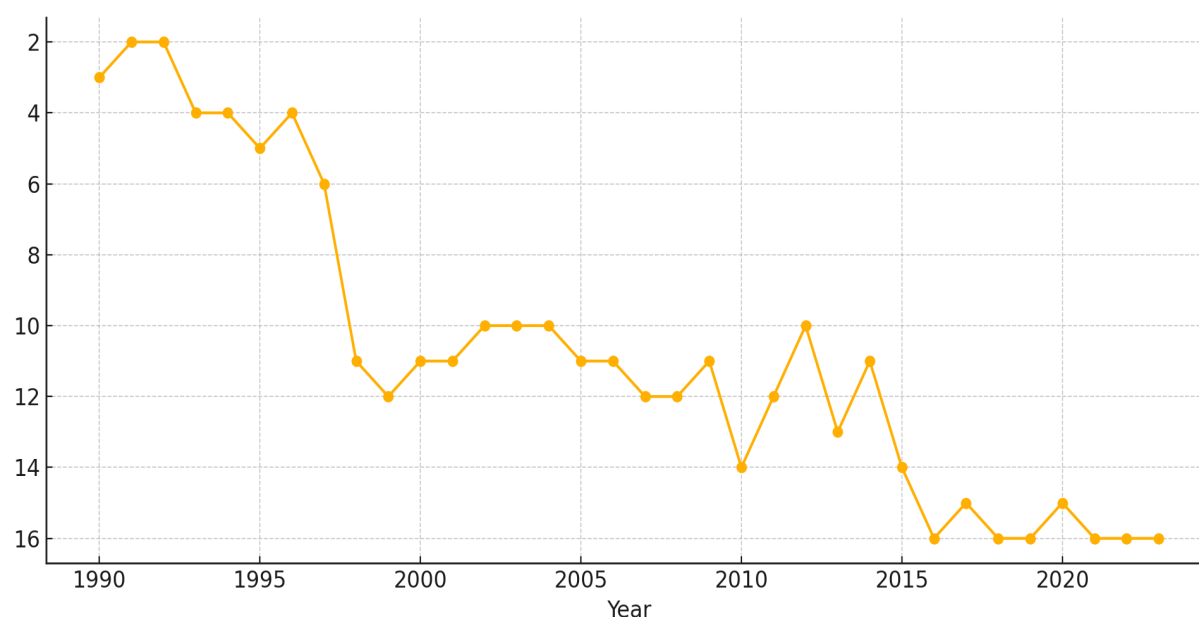
Source: CSLS calculations based on UNDP revised data found at https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_Statistical_Annex_HDI_Table.xlsx

Chart 2: HDI Ranking and Index Values Based on Revised Data, Canada, 1990-2023

Panel A: UNDP HDI Revised Index



Panel B: UNDP HDI Revised Ranking



Source: UNDP revised data found at https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_Statistical_Annex_HDI_Table.xlsx.

From 2012 onward, Canada experienced another period of declining international standing, eventually stabilizing at a rank of 16th between 2021 and 2023.

Life Expectancy

To better understand the evolution of revised HDI values over the 1990-2023 period, we now examine the changes in the HDI components based on the revised data during this period. Chart 3, Panel A illustrates how Canada's life expectancy has experienced an almost consistent increase in recent decades. In 1990, average life expectancy in Canada was 77.4 years. This measure grew by 5.2 years (0.20 per cent annual growth), rising to 82.6 years in 2023. Chart 3, Panel B shows how Canada's international ranking has evolved since 1990.

Canada's life expectancy ranking dropped by 3 places from 9th to 12th between 1990 and 1996. From 1996 to 2003 it remained relatively stable, subsequently declining to 17th in 2005. The ranking continued a gradual decline, reaching its lowest point at 24th in 2022, before improving significantly to 18th in 2023.

Education

As stated earlier, since 2010 the HDR uses two measures of educational attainment: *Mean years of schooling* and *Expected years of schooling*. Mean years of schooling can be thought of as the *stock* of education each year that has been accumulated over time by a population, and the expected years of schooling as the *flow* of educational attainment into the stock of education in future.

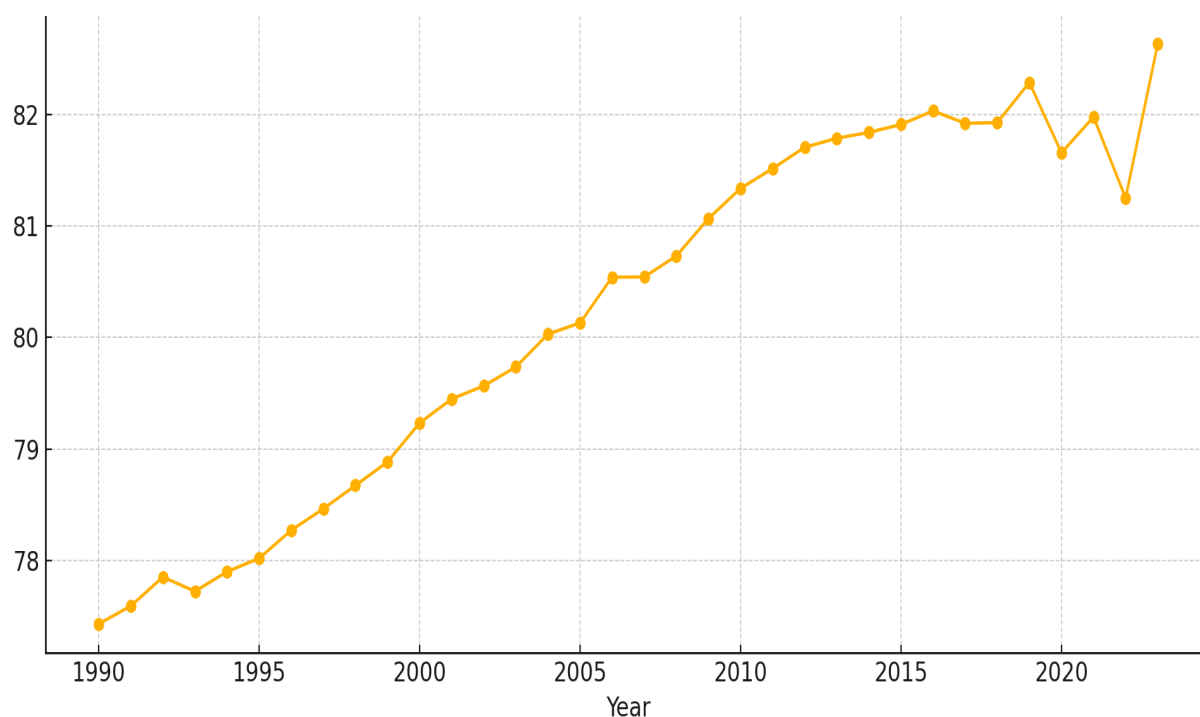
Chart 4, Panel A demonstrates the levels of mean years of schooling for Canada between 1990-2023. Mean years of schooling has been growing considerably in Canada since the early 1990s. It went up from 10.74 years to 13.87 years, growing by 0.81 per cent per year between 1990 and 2023.

On the other hand, as Chart 5, Panel A shows, expected years of schooling experienced a significant decline from its peak of 17.10 years in 1992 to 15.17 years in 2010. Since 2010, this indicator recovered somewhat, reaching 15.89 years in 2023. From 1990 to 2023, expected years of schooling in Canada decreased by about 0.80 years, corresponding to an annual decline of approximately 0.15 per cent.

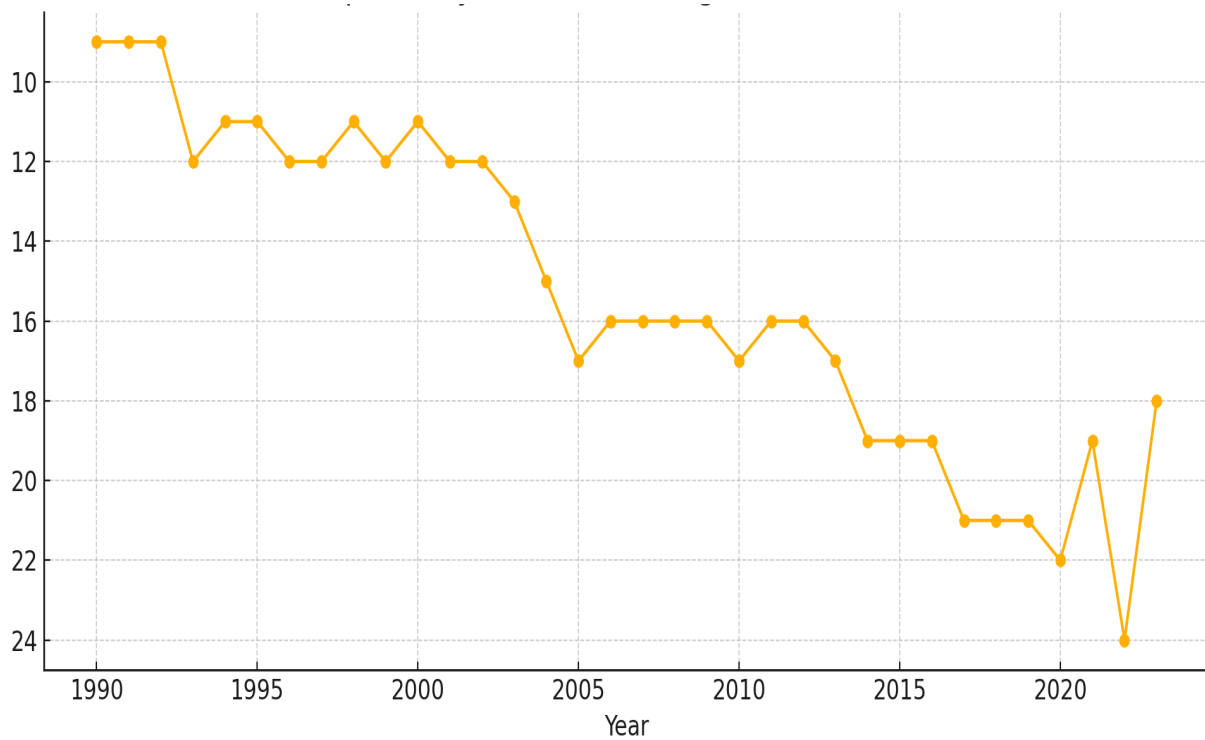
In terms of the relative ranking of Canada in these two educational attainment sub-domains, the increase in the absolute value for mean years of schooling is reflected in the improvement in Canada's ranking in this domain (rising from 7th in 1990 to 5th in 2023) as illustrated in Chart 4, Panel B. Similarly, the decline in the expected years of schooling is captured by the major deterioration of Canada's ranking from 2nd in 1990 to 49th in 2023 (Chart 5, Panel B). This notable decline in expected years of schooling is a major driver of the overall decline in Canada's HDI ranking and will be investigated further in this report.

Chart 3: Life Expectancy, Canada 1990-2023

Panel A: UNDP Life Expectancy Revised Values (years)



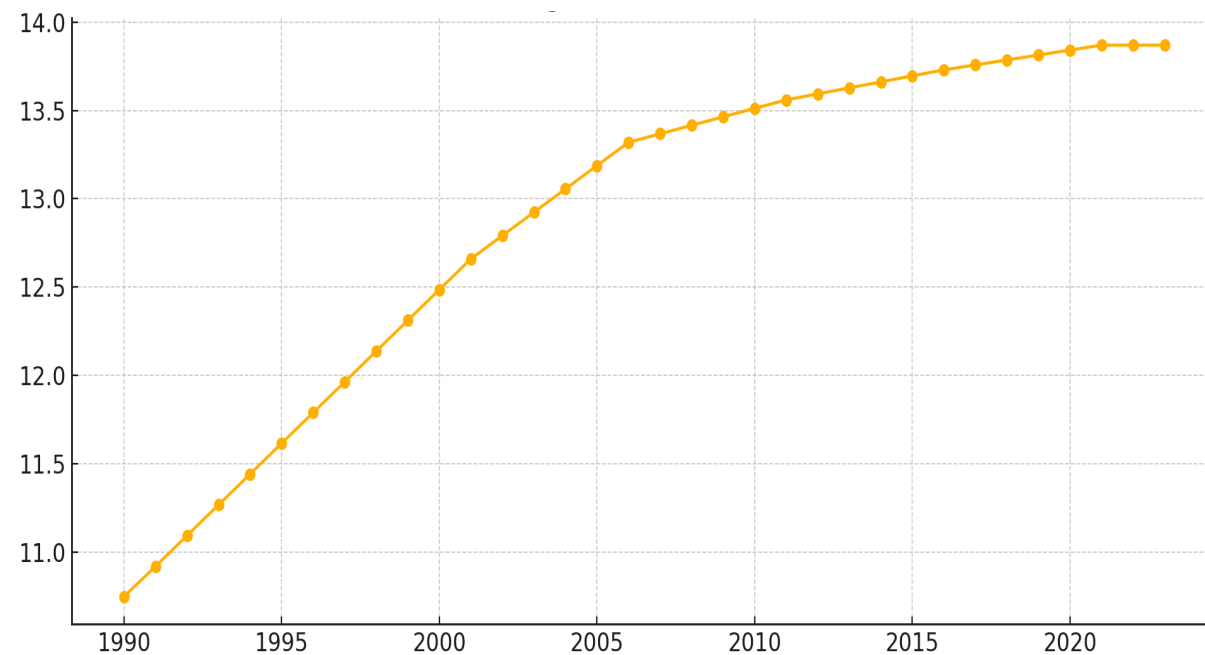
Panel B: UNDP Life Expectancy Revised Rankings



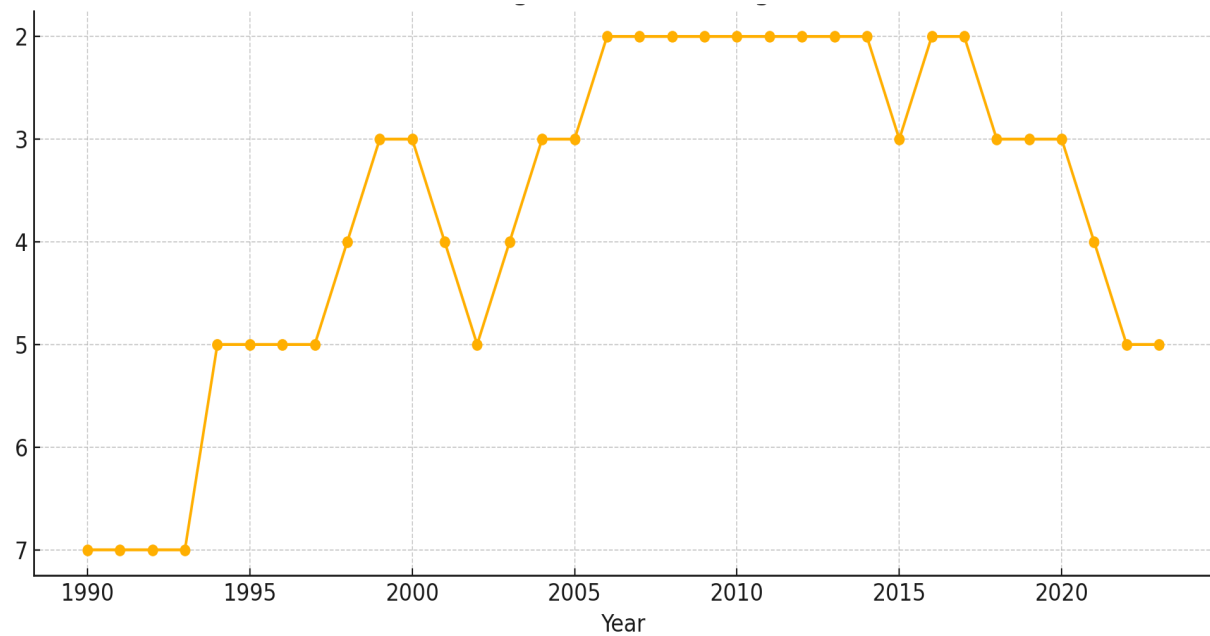
Source: UNDP revised data found at https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_Statistical_Annex_HDI_Table.xlsx.

Chart 4: Mean Years of Schooling, Canada 1990-2023

Panel A: Values



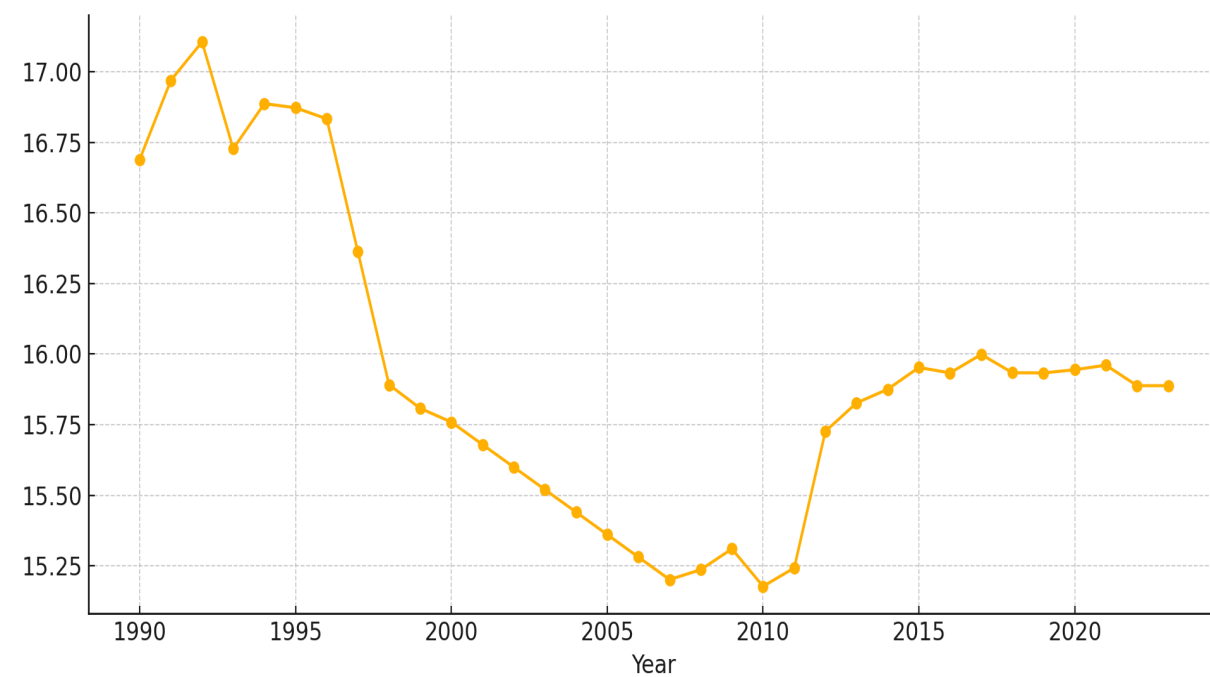
Panel B: Rankings



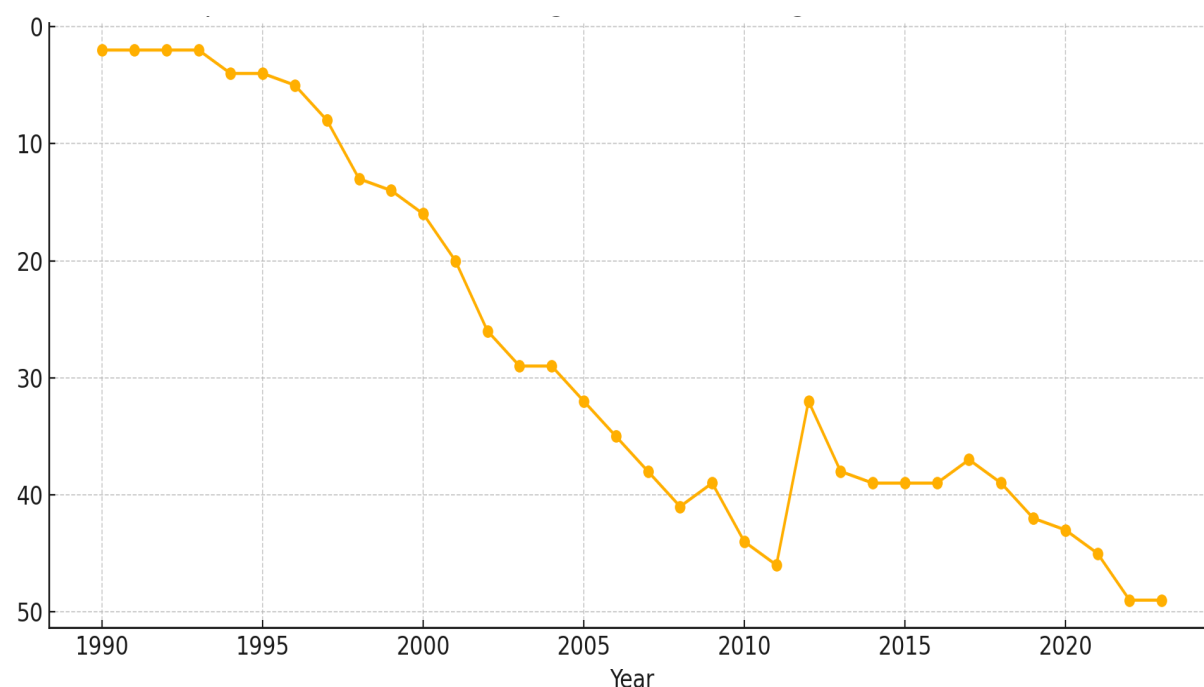
Source: UNDP revised data found at https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_Statistical_Annex_HDI_Table.xlsx.

Chart 5: Expected Years of Schooling, Canada 1990-2023

Panel A: Values



Panel B: Rankings



Source: UNDP revised data found at https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_Statistical_Annex_HDI_Table.xlsx.

Table 4: Growth Rate of Revised HDI Values and Components, Canada, 1990-2023 (Average annual growth rates)

Period	HDI	Life Expectancy	Mean Years of Schooling	Expected Years of Schooling	GNI per capita
1990-2023	0.25	0.20	0.78	-0.15	1.25
1990-2000	0.33	0.23	1.51	-0.57	1.96
2000-2008	0.30	0.23	0.90	-0.42	2.15
2008-2019	0.21	0.17	0.27	0.41	0.39
2019-2023	0.05	0.10	0.10	-0.07	0.09

Source: CSLS Calculations

Income

Since the 2010 HDR, UNDP's income measure in the HDI has been GNI per capita (PPP). Chart 6, Panel A shows that Canada's GNI per capita rose almost continuously from US\$ 36,258 in 1990 to US\$ 54,688 in 2023, an average annual increase of about 1.2 per cent. Two sharp reversals punctuate this upward trend. During the Global Financial Crisis GNI fell by US\$ 3,767 between 2008 and 2009 (from US\$ 52,211 to US\$ 48,444). A second drop followed the Covid-19 shock, with GNI sliding US\$ 3,575 from 2019 to 2020 (US\$ 54,499 to US\$ 50,925) before recovering.

Canada's relative standing has moved within a narrow band over the same period (Chart 6, Panel B). In 1990 the country ranked 27th. The position improved through the 2000s, reaching 21st in 2008,

and then fluctuated between 22nd and 24th for most of the next decade. The pandemic likely pushed the rank to 25th in 2020; a brief rebound to 24th in 2021 and 2022 was followed by a return to 25th in 2023.

HDI Components Growth Rates in 1990-2023 Sub-periods

We now examine how the HDI and its components have grown over selected sub-periods between 1990 and 2023 (Table 4). These periods are chosen based on cyclically neutral periods (peak to peak of business cycles) up to the last year of available data of 2023. Over the full 1990-2023 window Canada's HDI increased by 0.25 per cent per year. GNI per capita was the fastest growing component in this period growing at 1.25 per cent per year, followed by 0.78 per cent per year growth in mean years of schooling and life expectancy at 0.20 per cent per year. Expected years of schooling was the only declining component falling by 0.15 per cent per year which is a surprising result and will be examined in the next section of this report in detail.

During 1990-2000 Canada's HDI increased by 0.33 per cent per year; GNI per capita was the fastest-growing component at 1.96 per cent, while expected years of schooling fell by 0.57 per cent a year and was the only indicator posting a decline.

HDI growth slowed in the following decade. Between 2000 and 2008 it rose by 0.30 per cent per year, mainly because growth in mean years of schooling eased to 0.90 per cent and the GNI-per-capita rate fell to 2.15 per cent. Expected years of schooling continued to weigh on the index, declining by 0.42 per cent a year.

Chart 6: GNI per Capita, Canada, 1990-2023 (2021 USD PPP)

Panel A: UNDP GNI per Capita Revised Levels

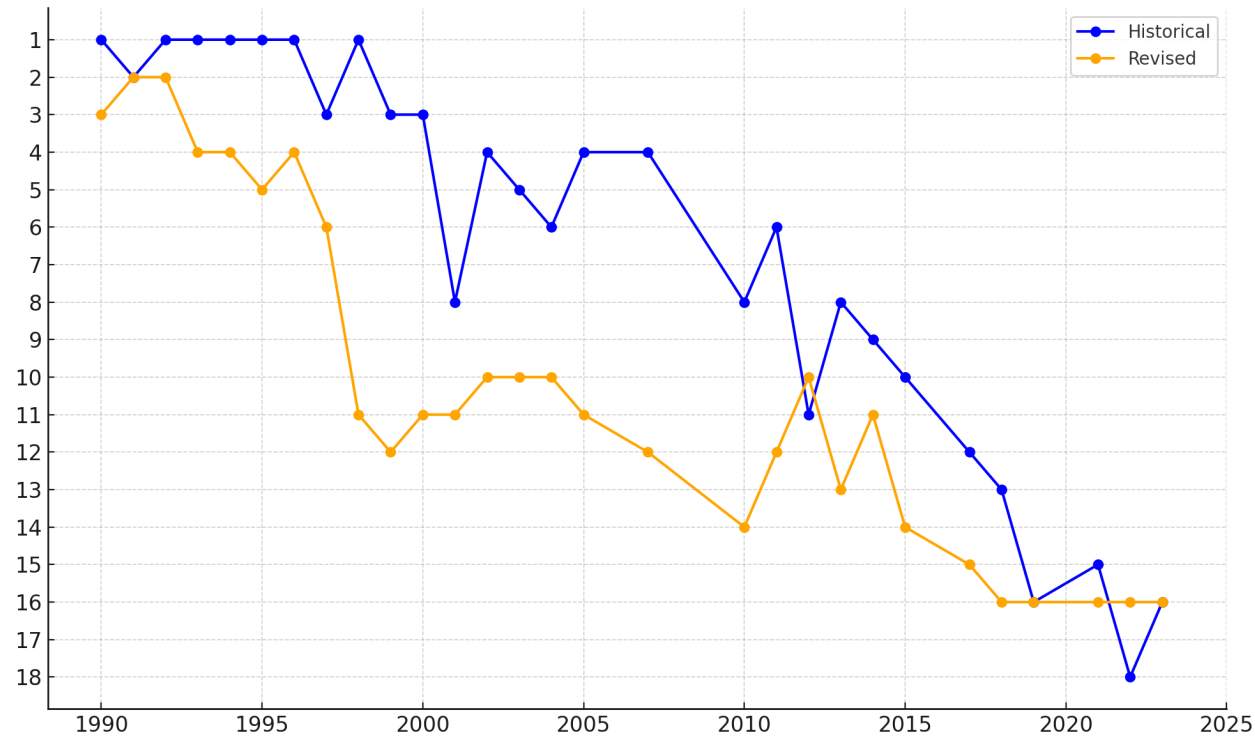


Panel B: UNDP GNI per Capita per Capita Rankings



Source: UNDP revised data found at https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_Statistical_Annex_HDI_Table.xlsx

Chart 7: HDI Rankings, Historical and Revised Data, Canada, 1990-2023



Source: CSLS calculations based on UNDP revised data found at https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_Statistical_Annex_HDI_Table.xlsx. Note: Historical rankings for reference years 2006, 2009, 2011, 2016, 2020 are not available as they were not reference years for any HDR report. HDI ranks for these years were interpolated for the historical series.

From 2008 to 2019 HDI growth moderated further to 0.21 per cent per year. Life expectancy growth fell to 0.17 per cent, mean years of schooling to 0.27 per cent, and GNI per capita to 0.39 per cent. In contrast, expected years of schooling turned positive, contributing 0.41 per cent annual growth to the index.

In the most recent period, 2019-2023, HDI growth almost stalled at 0.05 per cent per year, a slowdown of 0.16 percentage points from 2008-2019. The deceleration was driven by chiefly by expected years of schooling (down 0.48 percentage points), followed by GNI per capita (down 0.30 percentage points) and mean years of schooling (down 0.17 percentage points). Life expectancy growth had the lowest fall off compared to the 2008-2019 period at 0.07 percentage points.

IV. Drivers of Canada's HDI Ranking Decline

In this section, we analyze the drivers of the deterioration of Canada's HDI ranking globally between 1990 and 2023. As was evident in both the historical data analysis and the one based on the revised time series, Canada's ranking has fallen considerably (Chart 7).

However, the revised data suggest that the fall in ranking began much earlier than the historical data shows. According to the historical data Canada was consistently ranked 1st until 2000, whereas the

Table 5: HDI Components Values and Revised Rankings, Canada, 1990 and 2023

HDI Components	1990	2023
Life Expectancy	77.43	82.63
Life Expectancy Ranking	7	18
Expected Years of Schooling	16.69	15.89
Expected Years of Schooling Ranking	2	49
Mean Years of Schooling	10.75	13.87
Mean Years of Schooling Ranking	7	5
GNI per capita	\$36,258	\$54,688
GNI per capita Ranking	27	25
HDI	0.861	0.939
HDI Ranking	3	16

Source: CSLS Calculations based on UNDP revised data found at https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_Statistical_Annex_HDI_Table.xlsx

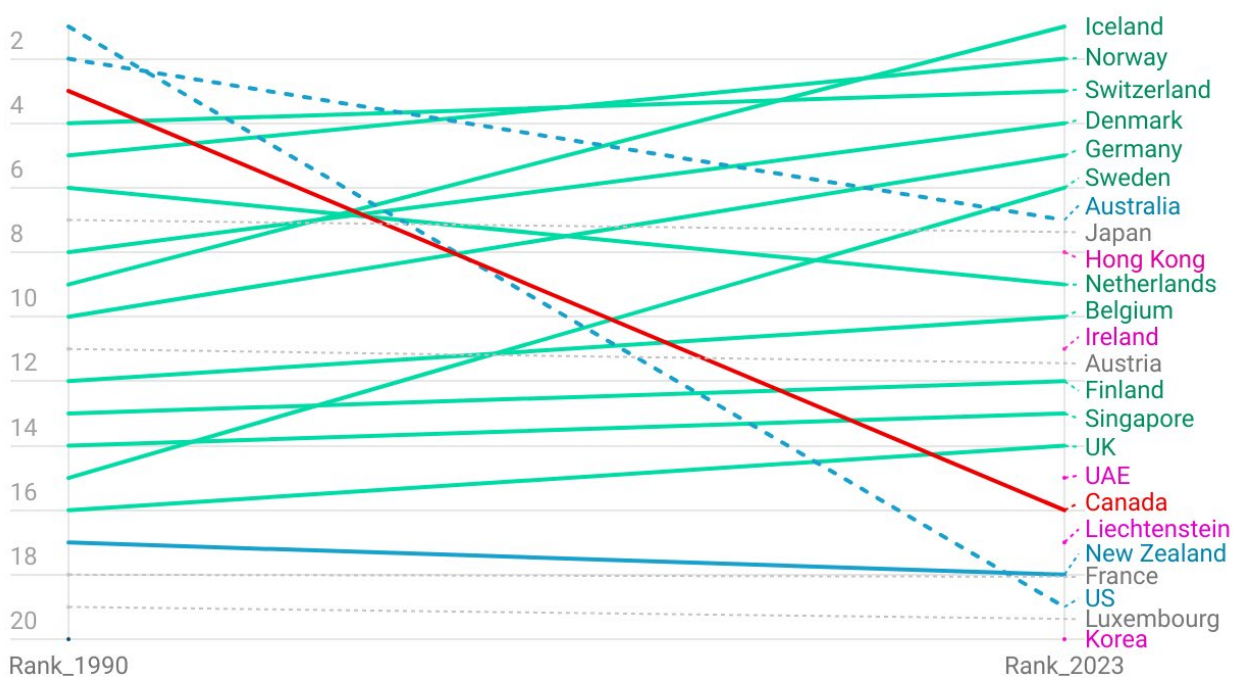
revised data indicates that Canada was only ranked 2nd in 1992 and throughout the 1990s ranked lower than that year and was placed 8th in 2000 (Chart 7).

The HDI value for Canada has been on the rise throughout this period when the revised data are used (Chart 4).¹⁷ This indicates that the fall in Canada's HDI standing was purely due to the relatively better performance of peer countries in the HDI domains. However, it is not clear if this better performance was a result of a genuine increase in the HDI indicators in those countries or was it a consequence of data issues that affected Canada's ranking. The advantage of the revised series is that it uses the same methodology and variables for all countries and therefore removes the impact of methodological changes over time.¹⁸

Through an examination of the HDI components in Canada using the revised data and as Table 5 shows:

- Life expectancy continued to rise, from 77.43 years in 1990 to 82.63 years in 2023, yet Canada's position slipped from 7th in 1990 to 18th in 2023.
- Expected years of schooling was the only indicator that declined in absolute terms, falling from 16.69 years in 1990 to 15.89 years in 2023. This is quite odd as the mean years of schooling has been on the rise both in absolute (10.75 years in 1990 to 13.87 years in 2023) and relative terms (7th in 1990 to 5th in 2023). Canada's international rank in expected years of schooling fell the most dramatically, dropping 47 places from 2nd in 1990 to 49th in 2023.

Chart 8: Change in HDI Rankings, Top 20 Countries, 1990 vs 2023



Note: Green: Top 20 both years (lower than Canada in 1990), Blue: Top 20 both years (higher than Canada in 1990), Purple: Top 20 only in 2023 and Grey: Top 20 only in 1990.

¹⁷ Pandemic year of 2019-2020 was the only year that there was a drop in the absolute value of HDI.

¹⁸ This does not negate the fact that there may be some fundamental issues with the methodologies used in estimating HDI components.

Source: CSLS Calculations based on UNDP revised data found at https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_Statistical_Annex_HDI_Table.xlsx

- GNI per capita rose from US \$36,258 to US \$54,688 (2021 PPP), while Canada's rank edged up slightly from 27th to 25th.

Taken together, the decline in Canada's overall HDI ranking can be attributed mainly to

1. the substantial absolute and relative fall in expected years of schooling,
2. the relative slide in life expectancy.

Table 6 compares Canada's HDI component levels and ranks with those of the other countries that occupied a top 20 HDI position in 1990 and/or 2023. Chart 8 visualizes the HDI rankings for these countries in 1990 and 2023.

In 1990 only the United States and Australia ranked higher than Canada (in that order). By 2023 the United States had slipped to 17th, largely because its life expectancy rank plunged from 25th to 44th, and its expected-schooling rank collapsed from 4th to 46th. Australia fared better, dropping from 2nd to 7th. All its component values rose, and it kept the top expected-schooling position (1st in 1990 and 2nd in 2023) while improving its life expectancy rank from 12th to 7th; the single drag was mean years of schooling, which fell from 5th to 21st.

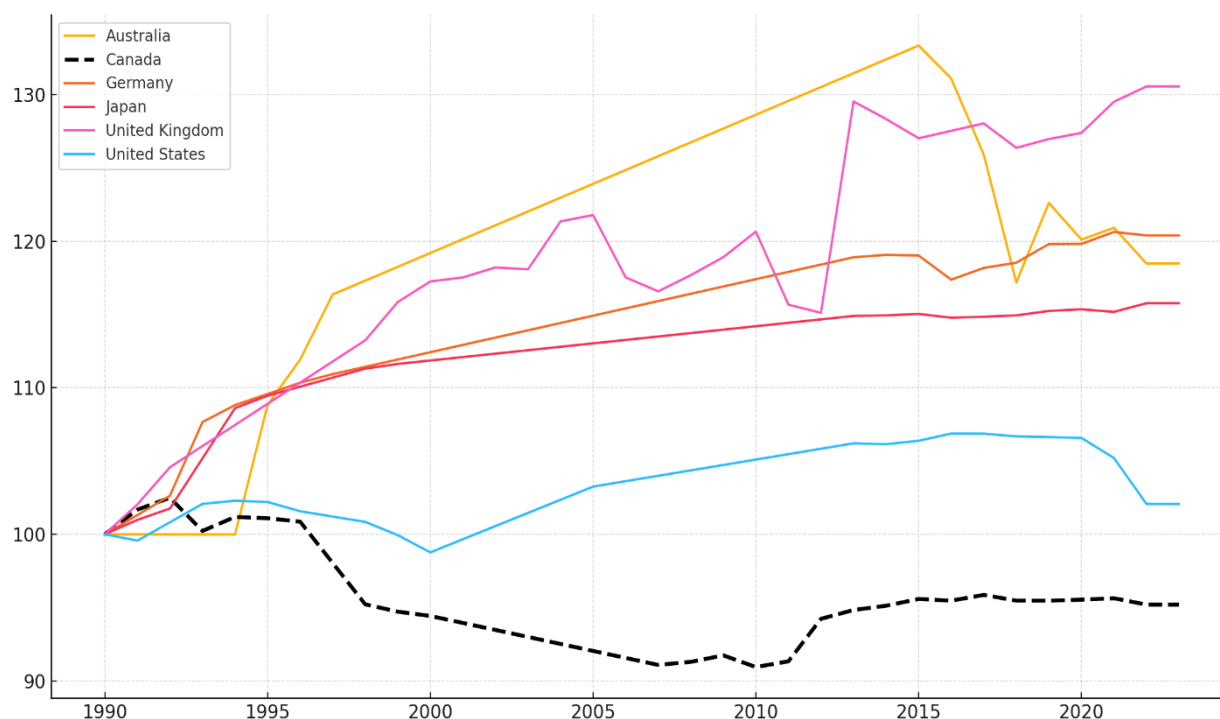
Table 6: HDI Components Values and Rankings, Canada and Peer Countries, 1990 and 2023

Country	Year	HDI	HDI Ranking	LE	LE Ranking	MYS	MYS Ranking	EYS	EYS Ranking	GNIPC	GNIPC Ranking
Australia	1990	0.867	2	77.04	12	11.23	5	17.43	1	30,554	31
Australia	2023	0.958	7	83.92	7	12.87	21	20.65	2	58,277	21
Austria	1990	0.832	11	75.74	22	10.2	12	13.84	18	46,156	10
Belgium	1990	0.824	12	76.06	20	9.4	24	14.1	14	44,656	13
Belgium	2023	0.951	10	82.12	25	12.69	27	19.0	7	63,582	19
Canada	1990	0.865	3	77.43	9	10.75	7	16.69	2	36,258	27
Canada	2023	0.939	16	82.63	18	13.87	5	15.89	49	54,688	25
Denmark	1990	0.844	8	74.86	29	11.48	4	14.31	12	42,093	18
Denmark	2023	0.962	4	81.93	28	13.03	15	18.7	12	76,008	8
Finland	1990	0.823	13	74.99	27	9.18	28	15.05	6	41,408	20
Finland	2023	0.948	12	81.91	29	12.98	17	19.49	4	57,068	22
France	1990	0.798	18	76.83	16	7.55	49	13.98	17	40,765	22
Germany	1990	0.834	10	75.34	26	10.36	10	14.38	10	42,722	17
Germany	2023	0.959	5	81.38	33	14.3	1	17.31	22	64,053	18
Hong Kong	2023	0.955	8	85.51	2	12.35	37	16.9	25	69,436	12
Iceland	1990	0.841	9	77.74	6	10.51	9	14.14	13	38,975	24
Iceland	2023	0.972	1	82.69	17	13.91	4	18.85	9	69,117	13
Ireland	2023	0.949	11	82.41	19	11.72	47	19.18	6	90,885	5
Israel	1990	0.787	19	78.04	4	9.9	16	12.1	49	22,848	43

Italy	1990	0.787	19	76.99	15	7.44	53	12.96	28	42,768	16
Japan	1990	0.853	7	78.99	1	11.64	3	13.4	21	38,205	25
Korea	2023	0.937	20	84.33	4	12.72	25	16.62	33	49,726	31
Liechtenstein	2023	0.938	17	83.63	11	12.41	35	15.41	60	166,812	1
Netherlands	1990	0.855	6	77.01	13	11.1	6	14.77	8	42,020	19
Netherlands	2023	0.955	8	82.16	24	12.67	29	18.58	13	68,344	14
New Zealand	1990	0.811	17	75.42	24	10.14	13	14.59	9	26,496	39
New Zealand	2023	0.938	17	82.09	26	12.88	20	19.3	5	47,260	34
Norway	1990	0.856	5	76.59	17	11.71	2	14.01	16	45,194	12
Norway	2023	0.97	2	83.31	13	13.12	13	18.79	11	112,710	2
Singapore	1990	0.819	14	74.6	31	7.54	50	16.41	3	45,792	11
Singapore	2023	0.946	13	83.74	8	11.99	42	16.74	28	111,239	3
Sweden	1990	0.818	15	77.59	7	9.55	22	12.95	31	41,337	21
Sweden	2023	0.959	5	83.26	15	12.74	24	18.99	8	66,102	15
Switzerland	1990	0.858	4	77.39	10	10.53	8	13.5	20	68,592	5
Switzerland	2023	0.97	2	83.95	6	13.95	2	16.67	31	81,949	7
UAE	2023	0.94	15	82.91	16	12.99	16	15.6	52	71,142	11
UK	1990	0.812	16	75.74	23	9.64	21	13.64	19	36,613	26
UK	2023	0.946	13	81.3	34	13.49	9	17.81	17	54,372	26
US	1990	0.878	1	75.37	25	12.98	1	15.6	4	43,041	14
US	2023	0.938	17	79.3	44	13.91	3	15.92	46	73,650	10

Source: CSLS Calculations based on UNDP revised data. Note: Countries that appear once were not in the top 20 rankings in both years.

Chart 9: Expected Years of Schooling, Select Developed Economies, 1990-2022 (index = 100 in 1990)



Note: Data for Canada is not available for 2023. Therefore, only data up to 2022 is presented for comparison.

Education indicators account for much of the reshuffling among high-HDI countries.¹⁹ Yet, as Chart 9 shows, Canada is the only peer whose expected years of schooling fell in both absolute (from 16.69 to 15.89 years) and relative terms, with its ranking tumbling from 2nd to 49th, the steepest drop in the group. This decline, together with the slippage in life expectancy rank and only modest gains in GNI per capita, explains most of Canada's fall from 3rd to 16th in the overall HDI table.

The main data source used by the HDR in constructing both educational attainment variables is produced by the UNESCO Institute for Statistics (UIS).²⁰ Primary and secondary expected years of schooling have remained stable over time in Canada overall (Table 7).²¹ This shift in data however is much more noticeable at the tertiary level. As Table 7 illustrates, expected years of schooling fell from 4.44 to 2.90 years (a fall of 34.6 per cent) between 1996 and 1998. Such drastic fall cannot be reflective of a genuine decrease in enrolment of students in tertiary education and can only be attributed to statistical/data changes.

It is also worth noting that the UIS does not report any data for expected years of schooling for Canada in 1997 and between 2001 and 2007. Therefore, the data source used to create the time-

Table 7: Expected Years of Schooling, by Level of Education, Canada, 1990-2022

Year	Pre-primary (1)	Primary (2)	Secondary (3)	Post-secondary non-tertiary (4)	Tertiary (5)	Primary to tertiary (6)	UNDP Estimates (7)
1990	1.23	6.18	6.02		4.49	16.69	16.69
1991	1.22	6.18	6.07		4.72	16.97	16.97
1992	1.27	6.16	6.12		4.82	17.11	17.11
1993	1.25	6.13	6.22		4.38	16.73	16.73
1994	1.24	6.11	6.28		4.50	16.89	16.89
1995	1.23	6.10	6.25		4.52	16.87	16.87
1996	1.24	6.13	6.26		4.44	16.83	16.83
1997	..	..	..		..		16.36
1998	1.31	5.90	6.27	0.81	2.90	15.89	15.89
1999	1.29	5.92	6.11	0.79	2.98	15.81	15.81
2000		5.97	6.12	0.75	2.93	15.76	15.76
2001		..					15.68
2002		..	..		2.88		15.60
2003		..					15.52
2004		5.97	..			..	15.44
2005		5.91	6.02				15.36

¹⁹ As noted earlier that since 2010, Education index has not been explicitly reported in HDR reports. Instead, mean years of schooling and expected years of schooling values are reported.

²⁰ Available at https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_Statistical_Annex_HDI_Table.xlsx.

²¹ There was a slight decrease in primary expected years of schooling in 1998 which occurs after a year of missing data, 1997.

2006		5.99	6.03				15.28
2007		5.97	6.08		3.15	15.20	15.20
2008	1.40	5.92	6.14		3.18	15.24	15.24
2009	1.43	5.98	6.18		3.16	15.31	15.31
2010	1.42	5.95	6.15		3.08	15.18	15.18
2011	1.42	5.91	6.17		3.16	15.24	15.24
2012	1.43	5.97	6.58		3.18	15.73	15.73
2013	..	5.96	6.59		3.27	15.83	15.83
2014	1.45	5.97	6.59		3.32	15.88	15.88
2015	..	5.99	6.59		3.37	15.95	15.95
2016	1.44	5.91	6.63		3.39	15.93	15.93
2017	..	5.93	6.64		3.43	16.00	16.00
2018	1.45	5.94	6.61		3.38	15.93	15.93
2019	..	5.87	6.53		3.53	15.93	15.93
2020	1.44	5.86	6.49		3.59	15.94	15.94
2021	1.34	5.78	6.46		3.72	15.96	15.96
2022	1.40	5.76	6.42		3.71	15.89	15.89

Note: Column (6) is the sum of Columns (2)-(5). Data for 2023 for Canada were not available at the time of the writing of this report.

Source: UIS expected years of schooling data found at <https://data.uis.unesco.org/#>

consistent variables for the expected years of schooling in the HDI revised series for those years is not clear and is unfortunately not explained in the HDRs.²²

To investigate the sudden decline in expected years of schooling in Canada between 1996 and 1998, the author contacted both the UNDP and the UNESCO Institute for Statistics (UIS). Following several attempts, representatives from UIS confirmed that the decline in tertiary enrolment data was linked to discrepancies in the data reported to the UIS. As of August 2025, they are reviewing the source of this data more closely and may seek additional clarification from Statistics Canada to better understand the underlying causes of these discrepancies.²³

Clearly, data inconsistencies have influenced the expected years of schooling estimates that were produced for Canada's HDI ranking. Next, we attempt to reproduce this variable using national enrollment estimates and simulate the changes that will bring to Canada's HDI standing.

V. Estimating Canada's HDI Values Using National Enrolment Estimates

To calculate the enrolment rates for various age groups in Canada, we use the Labour Force Survey (LFS) to obtain the population and number of students for age groups 15-19, 20-24 and 25-29. Table 8 shows the populations for each category (students and total) for each age group along with their

²² A linear interpolation was used to estimate the expected years of schooling between 2001 and 2006 in the UNDP series based on the constant rate of decrease of values in the series as shown in column (7) of Table 7 (-0.08 for each year between 2001 and 2006).

²³ In a recent correspondence, a representative from Statistics Canada on behalf of the Centre for Education Statistics provided the following statement:

"The discrepancies noted in the UIS data are not reflected in Statistics Canada's series. Without a clear understanding of how UIS processed or classified this data during the 1996–1998 period, it is challenging to identify the source of the discrepancy. Further insight into UIS's data handling may be necessary to resolve this."

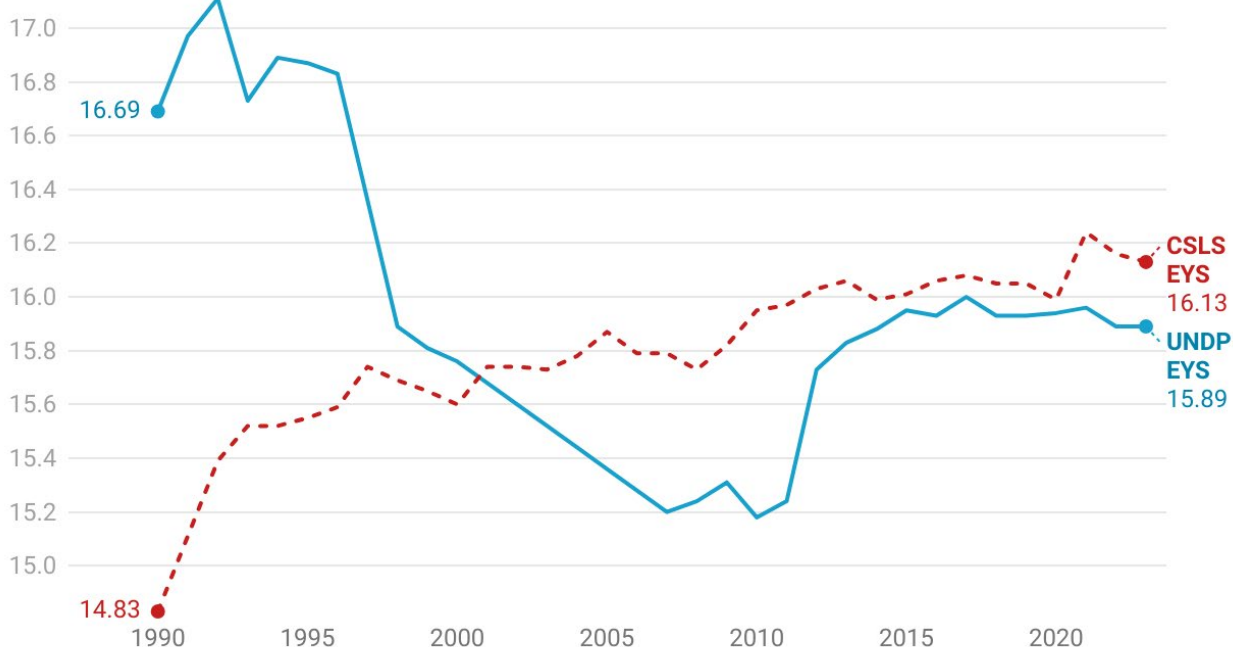
respective enrolment rates. Due to data inconsistency issues explained earlier and very high K-12 education enrolment in Canada, we assume that anyone below the age of 15 is in school. In addition, those above 30 are assumed to have finished schooling due to lack of data availability for these individuals in the LFS time series.²⁴

As Table 8 illustrates, enrolment rates have experienced an increase across the board for all age groups between 1990 and 2023. Enrolment rates for 15–19-year-olds went up from 79.0 per cent to 85.7 per cent, 27.9 percent to 44.0 per cent for 20–24-year-olds and 9.7 to 12.8 for 25–29-year-olds in this period. These findings paint a completely different picture for the expected years of schooling from the data used in the HDI revised series sourced from the UIS database.

We utilize these enrolment rates to calculate the expected years of schooling in Canada. As Chart 10 illustrates, expected years of schooling were significantly over-estimated in the early 1990s in the UNDP revised series (e.g. 16.68 years in UNDP revised vs 14.82 years using LFS data). Importantly, the LFS estimates do not show the sudden drop in expected years of schooling in 1998 and are on an upward trend between 1998-2023.

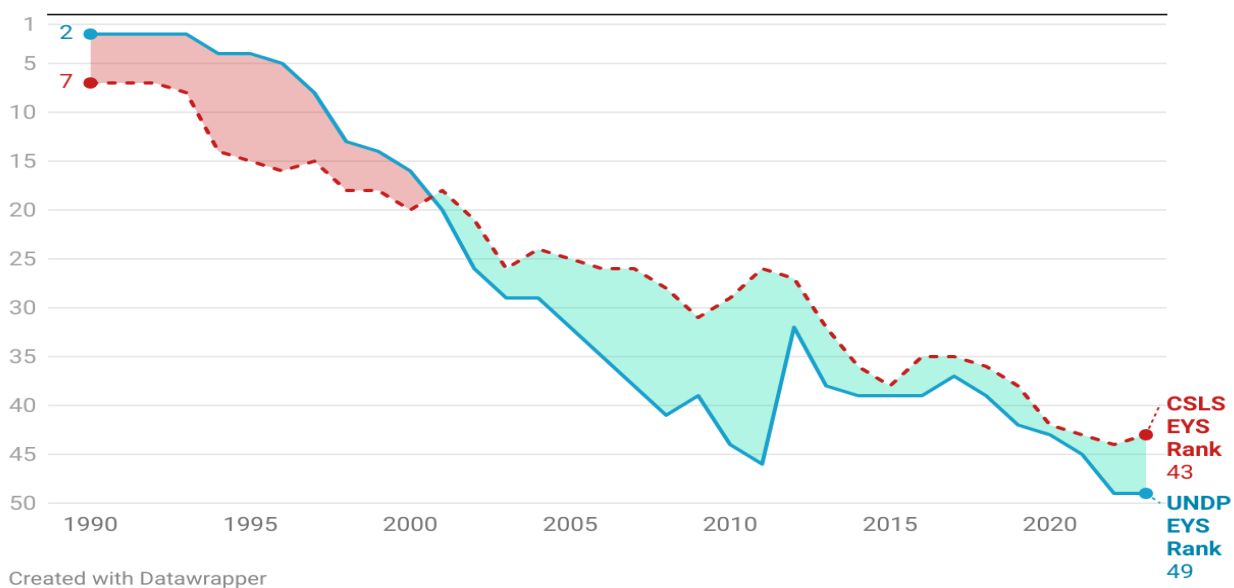
Chart 10: Expected Years of Schooling, UNDP Revised vs. CSLS LFS-Based Estimates, Canada, 1990-2023

Panel A: Values



²⁴ This implies that the LFS-based estimates may slightly underestimate the true magnitude of expected years of schooling.

Panel B: Rankings



Note: Red areas illustrate a deterioration in Canada's ranking using the LFS-based expected years of schooling estimates and green areas show improvements in ranking compared to the UNDP revised rankings.

Source: Statistics Canada Table: 14-10-0081-01 (LFS) and UNDP revised data found at https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_Statistical_Annex_HDI_Table.xlsx.

Table 8: Full-time and Part-time School Attendance by Age Group and Enrolment Rates, Canada, 15- 29-Year-olds, 1990-2023

Year	15 to 19 years			20 to 24 years			25 to 29 years		
	Students	Total	Enrolment Ratio	Students	Total	Enrolment Ratio	Students	Total	Enrolment Ratio
	Persons in thousands		Per cent	Persons in thousands		Per cent	Persons in thousands		Per cent
1990	1,487	1,884	79.0	570	2,042	27.9	239	2,477	9.7
1991	1,529	1,879	81.3	617	2,019	30.6	250	2,422	10.3
1992	1,566	1,880	83.3	666	2,005	33.2	264	2,354	11.2
1993	1,593	1,891	84.2	686	1,993	34.4	267	2,269	11.8
1994	1,604	1,913	83.9	694	1,975	35.1	250	2,187	11.5
1995	1,611	1,937	83.2	710	1,961	36.2	248	2,127	11.7
1996	1,634	1,964	83.2	712	1,953	36.5	253	2,095	12.1
1997	1,672	1,982	84.4	761	1,961	38.8	242	2,073	11.7
1998	1,668	2,005	83.2	757	1,972	38.4	249	2,053	12.1
1999	1,691	2,027	83.4	746	1,992	37.5	245	2,031	12.1
2000	1,686	2,047	82.4	757	2,021	37.5	247	2,024	12.2
2001	1,716	2,064	83.2	788	2,055	38.4	269	2,020	13.3
2002	1,716	2,074	82.7	808	2,086	38.7	272	2,032	13.4
2003	1,707	2,079	82.1	825	2,119	38.9	279	2,045	13.6
2004	1,715	2,093	82.0	856	2,151	39.8	285	2,068	13.8
2005	1,752	2,121	82.6	892	2,177	41.0	288	2,093	13.8
2006	1,776	2,152	82.5	864	2,194	39.4	296	2,126	13.9
2007	1,790	2,173	82.4	871	2,205	39.5	301	2,164	13.9
2008	1,797	2,192	82.0	857	2,211	38.8	309	2,211	14.0
2009	1,824	2,198	83.0	876	2,226	39.3	320	2,259	14.1
2010	1,829	2,191	83.5	924	2,252	41.0	332	2,293	14.5
2011	1,817	2,176	83.5	942	2,289	41.2	340	2,307	14.7
2012	1,780	2,141	83.2	996	2,327	42.8	338	2,319	14.6
2013	1,771	2,100	84.3	988	2,352	42.0	346	2,331	14.9
2014	1,742	2,066	84.3	975	2,356	41.4	333	2,347	14.2
2015	1,723	2,043	84.4	970	2,337	41.5	339	2,367	14.3
2016	1,729	2,033	85.0	982	2,331	42.1	338	2,401	14.1
2017	1,732	2,028	85.4	1,002	2,356	42.5	337	2,454	13.7
2018	1,712	2,029	84.4	1,026	2,391	42.9	346	2,520	13.7
2019	1,717	2,028	84.6	1,033	2,409	42.9	346	2,573	13.5
2020	1,680	2,029	82.8	1,059	2,417	43.8	348	2,617	13.3
2021	1,732	2,023	85.6	1,071	2,369	45.2	365	2,621	13.9
2022	1,766	2,071	85.3	1,050	2,364	44.4	362	2,655	13.6
2023	1,839	2,147	85.7	1,076	2,448	44.0	353	2,760	12.8

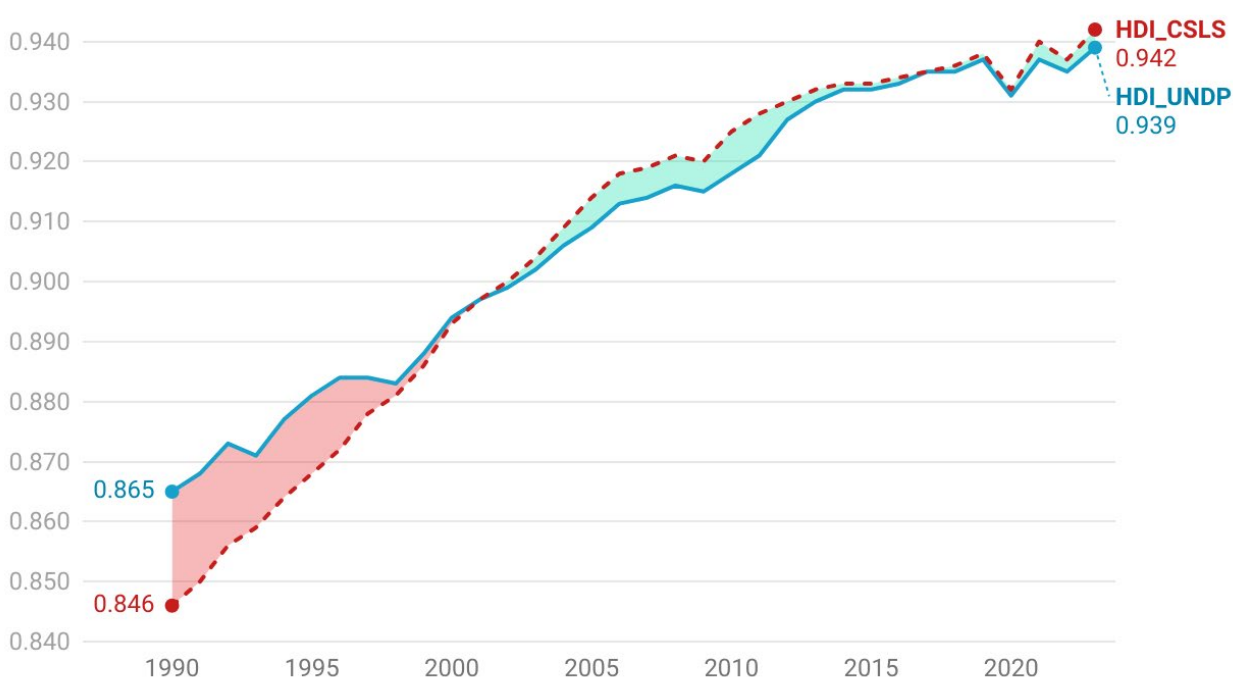
Note: Number of students and population are given in thousands.

Source: Statistics Canada Table: 14-10-0081-01 (LFS)

Table 9 shows the impact of using the LFS-based estimates on Canada's expected years of schooling rankings over time. Canada's ranking in this domain would have been considerably lower before 2000 if the LFS-based estimates were used (from 11 places in 1995-1996 to 4 places in 1999-2000). On the other hand, switching to LFS-based estimates would increase Canada's ranking significantly after 2000. In 2011, Canada's expected years of schooling would have been 20 places higher than what is implied by the UNDP estimates. The improvements in ranking are less in recent years (only 6 places in 2023).

Using the LFS estimates and the *Calculating the Indices* tool²⁵ we simulate the HDI index for Canada between 1990 and 2023. As Chart 11 illustrates, because of the upwardly biased expected years of schooling, the revised HDI series overestimated Canada HDI ranking until 2000 and underestimated it since then. Table 10 shows the difference between the HDI ranking implied by the LFS estimates and UNDP revised HDI.

Chart 11: HDI Index, UNDP Revised vs. LFS-Based Simulated Values for Expected Years of Schooling, Canada, 1990-2023



Note: Red areas illustrate a deterioration in Canada's HDI values using the LFS-based expected years of schooling estimates and green areas show improvements in HDI values compared to the UNDP revised rankings.

Source: Calculating the Indices tool found at https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_calculating_indices.xlsx

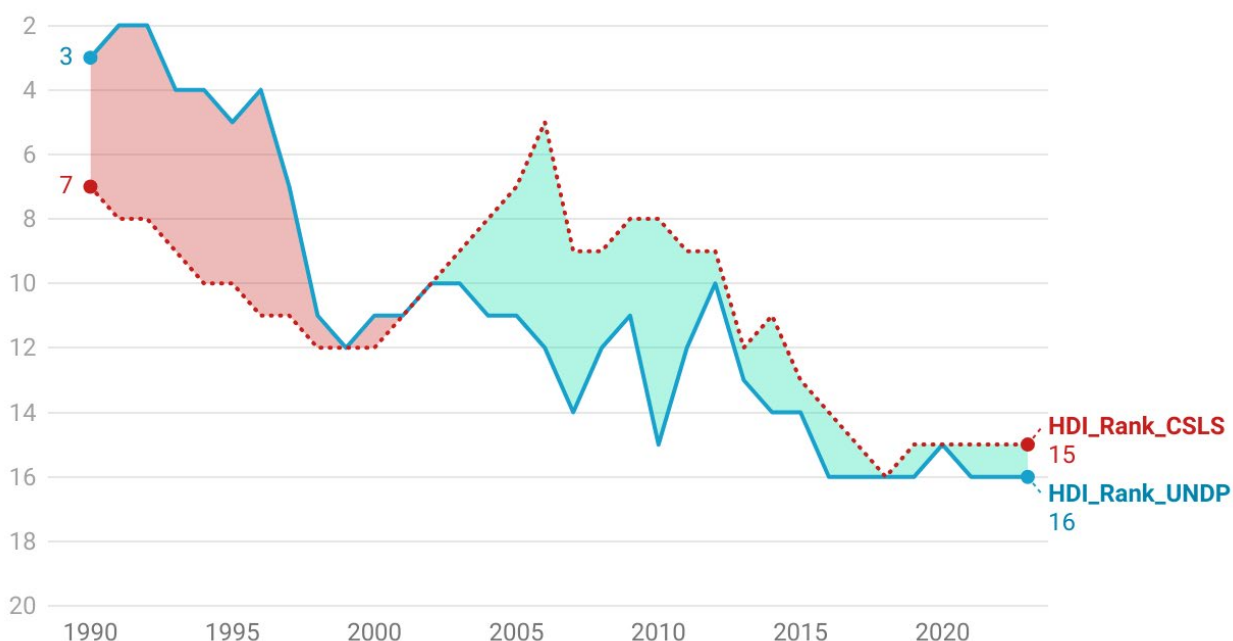
²⁵ Calculating the Indices is a tool that helps one learn how the composite human development indices - the human development index (HDI), the inequality-adjusted HDI (IHDI), the gender inequality index (GII), the gender development index (GDI) and the planetary-pressures adjusted HDI (PHDI) can be calculated, based on the current methodologies described in the technical notes. It can be found here: https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_calculating_indices.xlsx

Table 9: Expected Years of Schooling and HDI Rankings, UNDP Revised vs. CSLS LFS-based Estimates, Canada, 1990-2023

Year	UNDP EYS (1)	UNDP EYS Rank (2)	CSLS EYS (3)	CSLS EYS Rank (4)	Change in EYS Ranking (5) = (4-2)	UNDP HDI Ranking (6)	CSLS HDI Ranking (7)	Change in HDI Ranking (8) = (7-6)
1990	16.69	2	14.83	7	-5	3	7	-4
1991	16.97	2	15.11	7	-5	3	8	-5
1992	17.11	2	15.39	7	-5	2	8	-6
1993	16.73	2	15.52	8	-6	4	9	-5
1994	16.89	4	15.52	14	-10	4	10	-6
1995	16.87	4	15.55	15	-11	5	10	-5
1996	16.83	5	15.59	16	-11	4	11	-7
1997	16.36	8	15.74	15	-7	6	11	-5
1998	15.89	13	15.69	18	-5	12	12	0
1999	15.81	14	15.65	18	-4	12	12	0
2000	15.76	16	15.60	20	-4	12	12	0
2001	15.68	20	15.74	18	2	12	11	1
2002	15.60	26	15.74	21	5	10	10	0
2003	15.52	29	15.73	26	3	10	9	1
2004	15.44	29	15.78	24	5	11	8	3
2005	15.36	32	15.87	25	7	11	8	3
2006	15.28	35	15.79	26	9	12	6	6
2007	15.20	38	15.79	26	12	14	8	6
2008	15.24	41	15.73	28	13	12	9	3
2009	15.31	39	15.82	31	8	12	8	4
2010	15.18	44	15.95	29	15	14	8	6
2011	15.24	46	15.97	26	20	12	9	3
2012	15.73	32	16.03	27	5	10	9	1
2013	15.83	38	16.06	32	6	13	12	1
2014	15.88	39	15.99	36	3	12	11	1
2015	15.95	39	16.01	38	1	14	14	0
2016	15.93	39	16.06	35	4	16	14	2
2017	16.00	37	16.08	35	2	16	15	1
2018	15.93	39	16.05	36	3	16	15	1
2019	15.93	42	16.05	38	4	16	15	1
2020	15.94	43	15.99	42	1	15	15	0
2021	15.96	45	16.24	43	2	16	15	1
2022	15.89	49	16.16	44	5	16	15	1
2023	15.89	49	16.13	43	6	16	15	1

Note: Columns (2) and (5) give Canada's expected years of schooling and HDI rankings as they appear in the UNDP revised data, respectively. Columns (4) and (6) provide the expected years of schooling and HDI rankings implied by using the expected years of schooling values for Canada from the LFS instead of the UIS data underpinning the UNDP estimates. Source: CSLS Calculations.

Chart 12: HDI Rankings Based on UNDP Revised Data vs. LFS-Based Simulations for Expected Years of Schooling, Canada, 1990-2023



Note: Red areas illustrate a deterioration in Canada's ranking using the LFS-based expected years of schooling estimates and green areas show improvements in ranking compared to the UNDP revised rankings.
Source: CSLS Calculations.

As Chart 12 shows, the largest gap between the two ranking series occurs in 1996, when the LFS-based HDI rank is 11th while the revised series places Canada 4th, a difference of 7 places. Before 2000 the LFS series consistently puts Canada lower, by as much as seven positions, whereas from 2001 onward it generally lifts the ranking, with gains of up to six places in 2006, 2007 and 2010.

These results indicate that data inconsistencies in expected years of schooling exaggerate the magnitude of Canada's HDI decline, particularly in the 1990s; however, even after the adjustment a genuine slide remains after 2009. The persistent drop could be linked to the comparatively slow growth of life expectancy, Canada's rank fell from 7th in 1990 to 18th in 2023, and to middling gains in GNI per capita. Even under the LFS scenario Canada's expected-schooling rank in 2023 would be 43th, only a modest improvement on the current 49th, so weaknesses in this indicator continue to weigh on Canada's overall HDI standing.

VI. Simulating Canada's HDI Values Assuming Average OECD Growth Rates for Life Expectancy and Income per Capita

This section simulates Canada's HDI by applying the unweighted OECD-wide average annual growth rate in life expectancy and GNI per capita to Canada's 1990 baseline. The goal is to gauge

how Canada's relatively modest life expectancy and GNI per capita gains have affected its HDI standing.²⁶

To estimate how Canada's life expectancy and GNI per capita might have evolved had they grown at the average pace of other OECD countries, we apply a compound growth model. First, we calculate the compound annual growth rate (CAGR) for life expectancy and GNI per capita across all OECD countries between 1990 and 2023. The resulting average growth rates, are then applied to Canada's 1990 baseline values using the standard compound growth formula

$$\text{Projected Value}_{\text{year } t} = \text{Value}_{1990} \times (1 + \text{Average OECD CAGR})(\text{year} - 1990) (1)$$

This approach allows us to construct a counterfactual series that reflects how these indicators would have evolved in Canada if they had kept pace with typical OECD trends over the same period.

Life Expectancy Simulation

Across the OECD, life expectancy rose by roughly 0.26 per cent per year between 1990 and 2023, while Canada managed about 0.20 per cent. Chart 13, Panel A illustrates the actual and projected life expectancy values for Canada between 1990 and 2023. Except for early 1990s, Canada's actual life expectancy was lower than the projected life expectancy values which likely reflects the faster growth rate of many middle-income OECD countries in this period, which has in turn made the average growth rate of life expectancy across OECD higher than that of Canada. Chart 13, Panel B shows how life expectancy rankings would have been different had Canada grown at the average OECD growth rate in this dimension. A significant improvement in Canada's ranking in life expectancy would have occurred post 2014 with the peak difference in ranking being in 2020 (4th using the simulated series vs 18th the actual ranking using UNDP estimates).

If Canada had matched the OECD pace, its HDI ranking would have also been higher in many years. Table 11 reports the simulated HDI ranks under the higher life expectancy path and the difference from the revised series. For most of the 1990s and early 2000s the simulated ranking is either identical to, or at most one to three places above, the revised figure.

Beginning in the mid-2010s the gap widens. By 2016 the improvement reaches four places, and it peaks at six places in 2022, when Canada would rank 10th rather than 16th. The pattern suggests that Canada's life expectancy gains have lagged the OECD average especially since the late 2010s, and that shortfall now meaningfully drags on Canada's overall HDI position.

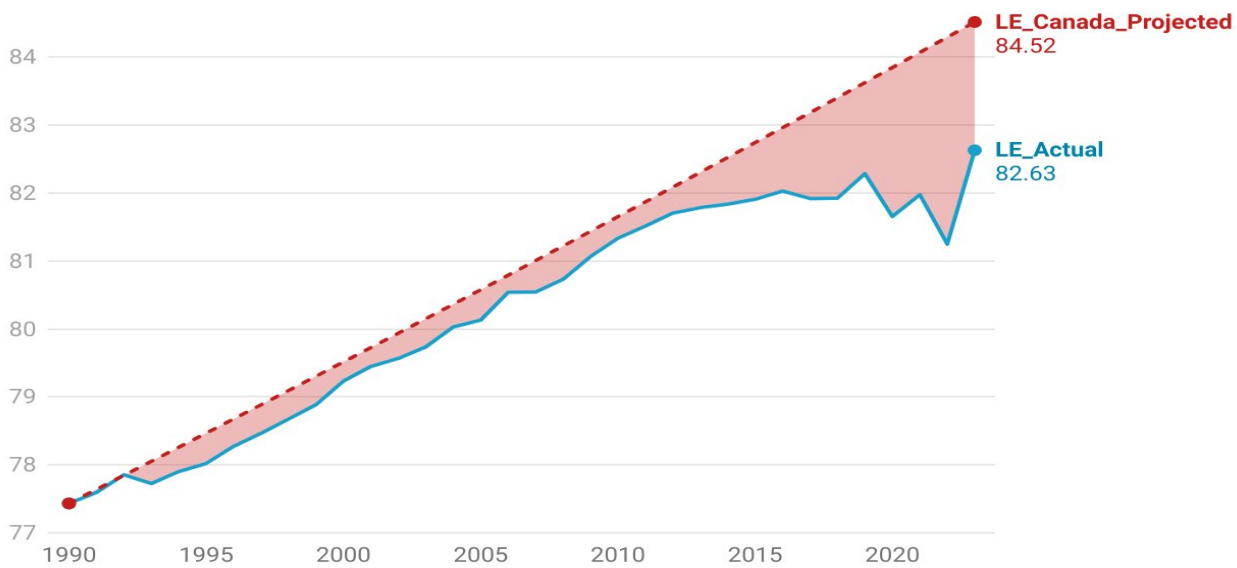
GNI Per Capita Simulation

During the same period, GNI per capita across the OECD expanded at an average rate of about 1.73 per cent a year, fast enough to double in a little over four decades. Canada's growth was slower, at

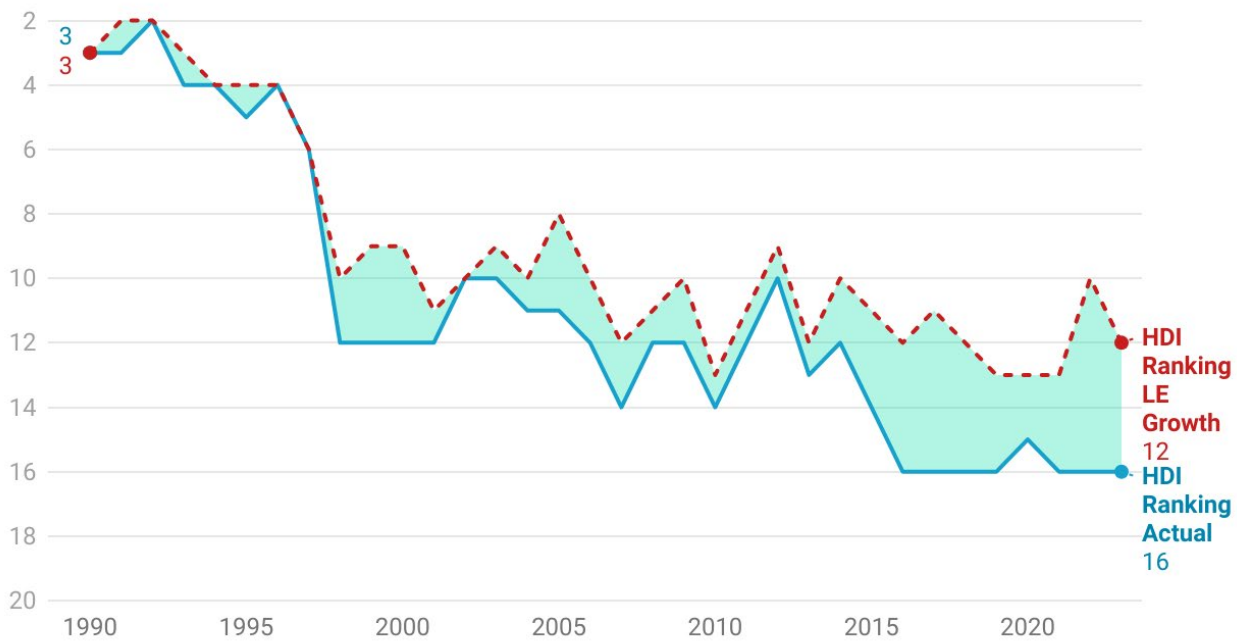
²⁶ 38 OECD member countries include: Australia, Austria, Belgium, Canada, Chile, Colombia, Costa Rica, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea (Republic of), Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye, United Kingdom, United States. The growth rates calculated are unweighted average of the cumulative average annual growth rates between 1990 and 2023 for each OECD country.

**Chart 13: Life Expectancy Simulations Assuming OECD Average Life Expectancy Growth
Canada, 1990-2023**

Panel A: UNDP Revised vs Projected Life Expectancy Values



Panel B: Life Expectancy Rankings Based on UNDP Revised vs Projected Data



Source: CSLS Calculations.

Table 11: HDI Rankings and Change in Rankings, UNDP Revised Estimates and CSLS Estimates Assuming Average OECD Life Expectancy Growth, Canada, 1990-2023

Year	UNDP Revised Ranking (1)	CSLS HDI Ranking- Average OECD LE Growth (2)	Change in Ranking (3) = (2)-(1)
1990	3	3	0
1991	3	2	1
1992	2	2	0
1993	4	3	1
1994	4	4	0
1995	5	4	1
1996	4	4	0
1997	6	6	0
1998	12	10	2
1999	12	9	3
2000	12	9	3
2001	12	11	1
2002	10	10	0
2003	10	9	1
2004	11	10	1
2005	11	8	3
2006	12	10	2
2007	14	12	2
2008	12	11	1
2009	12	10	2
2010	14	13	1
2011	12	11	1
2012	10	9	1
2013	13	12	1
2014	12	10	2
2015	14	11	3
2016	16	12	4
2017	16	11	5
2018	16	12	4
2019	16	13	3
2020	15	13	2
2021	16	13	3
2022	16	10	6
2023	16	12	4

Source: CSLS Calculations.

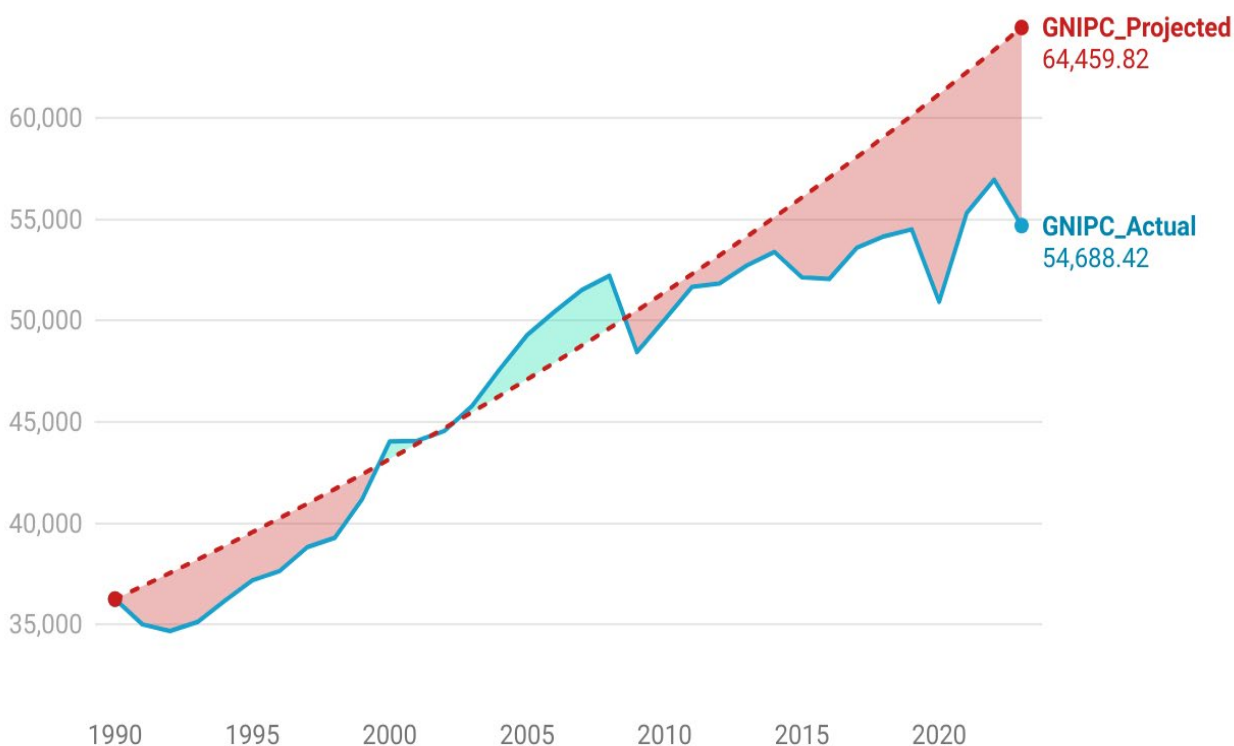
roughly 1.25 per cent. Chart 14, Panel A shows the path of simulated and actual GNI per capita values for Canada between 1990 and 2023. Except for 2000-2008, Canada's simulated GNI per capita was lower than the simulated values based on average OECD growth rates. Chart 14, Panel B illustrates how Canada's rankings in GNI per capita would have been higher between 1990-2000 and post-2010 if it had grown on par with the average of OECD countries. The largest improvement would have occurred in 2023 (18th using the simulated series vs 26th the actual ranking using UNDP estimates).

If Canadian GNI per capita had matched the OECD pace its overall HD would have been higher. Table 12 models this counterfactual and compares the simulated HDI ranks with the revised series.

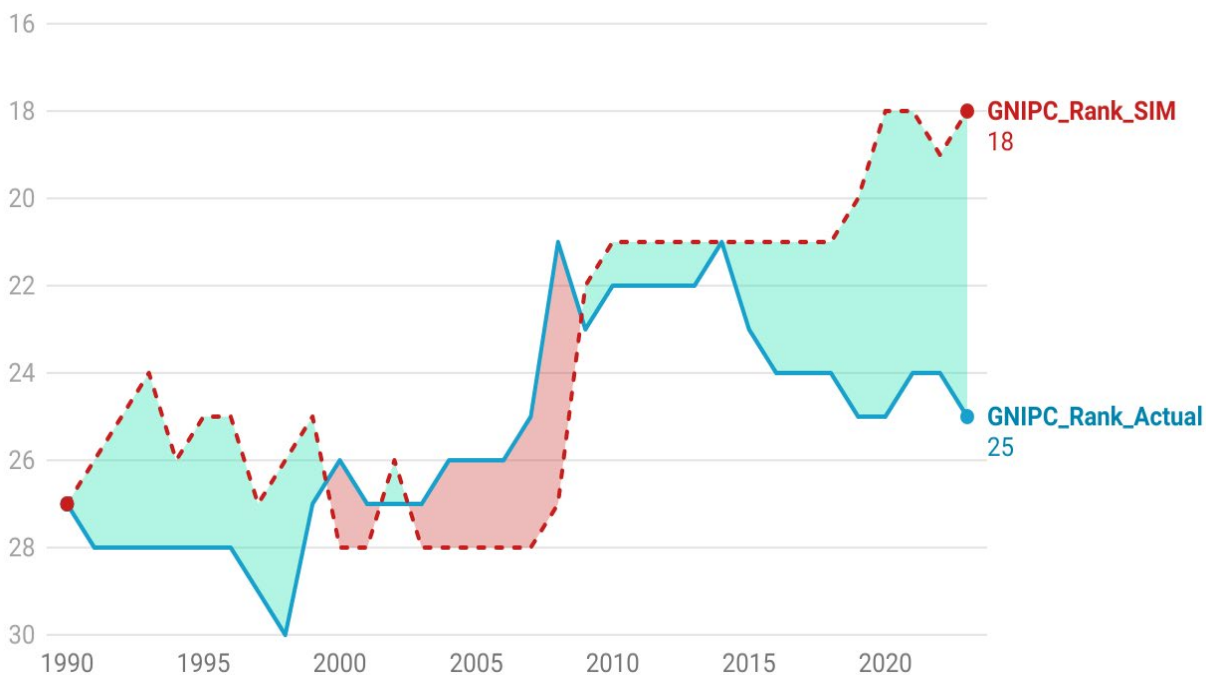
Under faster GNI growth Canada's rank improves in 17 of the 34 years from 1990 to 2023, typically by one to three places. The largest gains occur in 2016 (up four positions to 12th) and 2023, 2017, 2015, 1999 and 1998 (up 3 positions to 8th), while the biggest setbacks are in 2005 (down three positions to 14th) and 2004 and 2006 (down two positions). Matching the OECD income trend would have lifted Canada back into, or very near, the global top ten several times after the late 1990s, but the effect is smaller than the life expectancy simulation.

Chart 14: GNI per Capita Simulations Assuming OECD Average Income per Capita Growth, Canada, 1990-2023

Panel A: UNDP Revised vs Projected GNI per Capita Values (2021 USD PPP)



Panel B: GNI per Capita Based on UNDP Revised vs Projected Data



Source: CSLS Calculations

Overall, below OECD average GNI-per-capita growth since 2019 still drags on Canada's HDI ranking, raising the simulated rank only two or three places (to 13th in 2023), but the income shortfall appears less decisive than the lag in life expectancy or the weakness in expected years of schooling.

Table 12: HDI Rankings and Change in Ranking Due to Simulated Values Based on Average OECD GNI Growth, Canada, 1990-2023

Year	HDI Ranking Revised	HDI Ranking GNI PC Growth	Change in Ranking
1990	3	3	0
1991	3	2	1
1992	2	2	0
1993	4	2	2
1994	4	4	0
1995	5	4	1
1996	4	4	0
1997	6	6	0
1998	12	9	3
1999	12	9	3
2000	12	12	0
2001	12	11	1
2002	10	10	0
2003	10	10	0
2004	11	13	-2
2005	11	14	-3
2006	12	14	-2
2007	14	14	0
2008	12	13	-1
2009	12	10	2
2010	14	13	1
2011	12	12	0
2012	10	10	0
2013	13	12	1
2014	12	11	1
2015	14	11	3
2016	16	12	4
2017	16	13	3
2018	16	14	2
2019	16	14	2
2020	15	13	2
2021	16	14	2
2022	16	15	1
2023	16	13	3

Source: CSLS Calculations

Table 13: Implications of Data Correction and Simulation Exercises on HDI Ranking, Canada, 1990-2023

Scenario	CSLS Estimated 1990 HDI rank (1)	CSLS Estimated 2023 HDI Rank (2)	CSLS estimated drop in HDI ranking 1990-2023 (3) = (1)-(2)	Improvement upon observed HDI rank drop (4) = 13-(3)
LFS-based EYS Estimates	7	15	8	5
Average OECD Growth: LE	3	12	9	4
Average OECD Growth: GNIPC	3	13	10	3

Note: Column (1) shows 1990 HDI Rankings if the data correction/simulation is imposed on the data. Column (2) shows the 2023 HDI Ranking for the same situation. Column (3) is the fall in HDI rankings under each scenario (data correction or simulation). Column (4) is the percentage of total drop in HDI rankings that would be reduced if the data correction/simulation is implemented.

Source: CSLS Calculations

Table 13 shows that Canada's 13-place fall in the HDI rankings—from 3rd in 1990 to 16th in 2023—would have almost completely disappeared had the paper's data-correction and simulation exercises been realized. The largest factor, worth 5 of the 13 places, stems from mismeasurement of the expected years of schooling variable in UIS data: replacing UIS with LFS estimates implies a lower starting rank in 1990 (7th rather than 3rd) and a higher ending rank in 2023 (15th), trimming the overall drop to eight places. Sluggish life-expectancy growth accounts for another 4 places; matching the average OECD improvement would have left Canada 12th in 2023. Relatively slow growth in real GNI per capita reduced the fall in Canada's HDI ranking by a further 3 places.

VII. Conclusion

This report documents the evolution of Canada's HDI value and its global standing, using both the UNDP revised series and simulations that replace the UIS expected-schooling figures with Labour Force Survey (LFS) estimates as well as ones simulating the country's life expectancy and GNI per capita based on average OECD growth rates between 1990 and 2023. Canada's overall HDI rank has slipped over the past three decades, and the revised data point to three main causes: a relative and absolute decline in expected years of schooling, slower gains in life expectancy and GNI per capita.

Expected years of schooling, slipped from 16.69 to 15.89 years between 1990 and 2023, and the ranking for this indicator collapsed from 2nd to 49th. Life expectancy in Canada rose from 77.43 years in 1990 to 82.63 years in 2023, yet its life expectancy rank fell from 7th to 18th. Mean years of schooling increased from 10.75 to 13.87 years, improving Canada's rank from 7th to 5th. GNI per capita more than doubled in real terms US \$36,258 to US \$54,688 (2021 PPP), but Canada's income rank edged down from 27th to 25th. These component shifts help explain the drop in the overall HDI ranking from 3rd in 1990 to 16th in 2023.

Closer inspection shows that the UIS expected-schooling series for Canada diverges from LFS-based estimates, especially before 2015. Using the CSLS EYS estimates based on LFS data, Canada's expected years of schooling is lower than the UIS value through 2000 and higher thereafter. When the LFS series is substituted in the HDI calculation, Canada's rank in the 1990s would have been up to seven places lower (e.g., 11th versus 4th in 1996), but from 2001 onward the LFS version consistently lifts the ranking, by as much as six places in years such as 2006, 2007, 2010, and 2022. The 2023 LFS-based rank is 15th, compared with 16th in the revised series.

These findings imply that part of the apparent deterioration in Canada's HDI record stems from data inconsistencies in expected years of schooling. Even after correcting for those inconsistencies, however, a real decline remains since 2009, driven primarily by Canada's slower life expectancy gains and only middling growth in GNI per capita. The expected year of schooling continues to weigh on Canada's HDI standing despite the adjustment, with the LFS-implied 2023 HDI rank of 15th still well below the 3rd place held in 1990.

In light of these results, a fuller understanding of Canada's human-development trajectory requires answering several outstanding questions that extend beyond the scope of the present analysis:

- 1- How do trends in public expenditure on education, healthcare, and social protection map onto Canada's HDI components?
- 2- Should the HDI incorporate learning-adjusted years of schooling (LAYS) or OECD PIAAC proficiency scores to better capture quality rather than quantity? What role might micro-credentials and work-integrated learning play in future indicators?
- 3- How would Canada fare under the Inequality-adjusted HDI (IHDI), the Gender Development Index (GDI), or the Planetary-pressures adjusted HDI (PHDI)? Do gender gaps and environmental pressures widen or narrow Canada's development deficit?
- 4- Why have countries like Norway and Australia sustained top-tier HDI rankings despite similar resource endowments and demographic pressures? Which policies in health system efficiency, tertiary-education governance, or innovation support might Canada emulate?

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