

Alberta Population Norms for EQ-5D-5L

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INTRODUCTION

A common generic measure used in population health assessments is the EuroQol Group's EQ-5D™, a standardized instrument used as a measure of health outcome.⁷ The EQ-5D describes the health status of individuals using five dimensions [mobility (MO), self-care (SC), usual activities (UA), pain/discomfort (PD), and anxiety/depression (AD)]. Each dimension has five levels of response (no problems, slight problems, moderate problems, severe problems, extreme problems), resulting in 3125 unique health states. The EQ-5D also utilizes a visual analogue scale (EQ VAS). The EQ-VAS records the respondent's self-rated health on a vertical, visual analogue scale, ranging from 0 to 100, where the endpoints are labeled 'worst imaginable health state' and 'best imaginable health state', respectively.

A key aspect of the EQ-5D-5L is the availability of 'value sets' to weight the EQ-5D-5L health states by local patient and population preferences, to calculate EQ-Index scores.⁸ These 'value sets' reflect the preferences of the general public in each country, and the resulting EQ-Index score can be used to estimate quality-adjusted life years (QALYs) in economic evaluations of health interventions or innovations. With the introduction of the EQ-5D-5L, the EuroQol Group has invested considerable effort to generate country-specific values sets. Population norms for the EQ-5D-5L exist for some countries, including Canada.¹ The Canadian value set,² including preferences for Alberta's general population, was used to generate EQ-5D-5L index scores in this report.

This report describes the health profiles and self-reported health status of the Alberta population, stratified by sex, age, and Alberta Health Services (AHS) zones.

DATA SOURCES

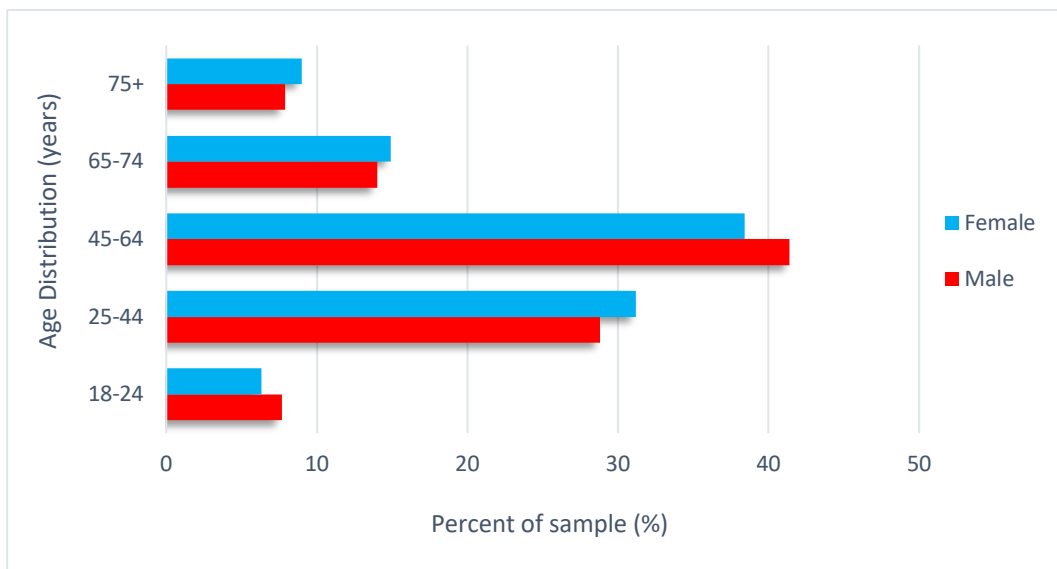
Norms were generated using data from the Health Quality Council of Alberta (HQCA) and Alberta Health (AH). The HQCA data came from the *Satisfaction and Experience with Healthcare Services* survey from 2012, 2014, and 2016. The Alberta Health data came from the *Alberta Community Health Survey* from 2014, 2015, and 2016. These six independent cross-sectional population-based surveys included residents of Alberta, Canada, aged 18 years and older who were living in a household at the time of the survey's administration. Eligible participants completed the survey over the phone via Computer-assisted Telephone Interview (CATI) technology. All six cross-sectional datasets were combined and only individuals with complete EQ-5D-5L data were included in this report (N= 30,334).

RESULTS

Profile of total sample

- 40% of the sample was between 45 and 64 years old.
- 59.1% of the sample was female (n=17,914).
- 40.9% of the sample was male (n=12,409).
- The age distribution between males and females was similar (Figure 1).

Figure 1. Age distribution of total sample by sex



Health profile of total sample

Table 1 shows the proportion of the sample for each of the EQ-5D-5L levels within each dimension, by age. The last column (total) presents the population average for each level within each dimension. Level 1 (no problems) is generally the commonly reported dimension across the age groups, with the exception of the pain/discomfort dimension for respondents aged 45-64 and 75+, where level 2 is the most common.

Table 1. Proportion of respondents (%) by EQ-5D-5L dimension and age

EQ-5D-5L Dimension		AGE GROUP					Total (N=30,576)
		18-24 (N=2,188)	25-44 (N=9,582)	45-64 (N=12,557)	65-74 (N=4,604)	75+ (N=2,698)	
Mobility	Level 1	91.0%	87.2%	69.6%	57.1%	47.3%	72.8%
	Level 2	6.7%	8.7%	17.2%	22.4%	23.4%	15.2%
	Level 3	2.0%	3.1%	9.2%	14.4%	20.1%	8.5%
	Level 4	0.1%	0.7%	3.4%	5.2%	8.1%	3.0%
	Level 5	0.1%	0.3%	0.5%	0.8%	1.0%	0.5%
Self-care	Level 1	98.3%	97.3%	92.8%	92.0%	88.1%	94.1%
	Level 2	1.2%	1.8%	4.5%	4.7%	7.2%	3.7%
	Level 3	0.2%	0.7%	2.2%	2.8%	3.4%	1.8%
	Level 4	0.1%	0.1%	0.3%	0.4%	0.6%	0.3%
	Level 5	0.1%	0.1%	0.1%	0.1%	0.5%	0.2%
Usual activities	Level 1	86.7%	84.4%	71.4%	63.0%	56.1%	74.0%
	Level 2	10.3%	10.2%	16.2%	21.7%	22.9%	15.3%
	Level 3	2.2%	3.9%	8.8%	12.1%	16.5%	8.0%
	Level 4	0.6%	1.0%	2.4%	2.2%	2.6%	1.8%
	Level 5	0.1%	0.6%	1.2%	0.9%	1.7%	0.9%
Pain/ discomfort	Level 1	58.2%	48.4%	29.6%	23.3%	24.1%	36.0%
	Level 2	30.4%	36.4%	41.6%	27.5%	36.6%	38.8%
	Level 3	9.6%	12.2%	21.2%	5.9%	31.7%	19.4%
	Level 4	1.5%	2.2%	5.9%	1.4%	6.4%	4.5%
	Level 5	0.4%	0.7%	1.7%	0.1%	1.0%	1.2%
Anxiety/ depression	Level 1	56.0%	60.9%	62.7%	66.8%	68.8%	62.8%
	Level 2	27.7%	24.6%	23.0%	21.7%	20.7%	23.4%
	Level 3	11.6%	11.3%	11.0%	10.2%	9.1%	10.8%
	Level 4	3.0%	2.2%	2.2%	0.9%	0.5%	1.9%
	Level 5	1.6%	1.0%	0.1%	0.3%	0.4%	0.9%

Note: Level 1 (no problems), Level 2 (slight problem), Level 3 (moderate problem), Level 4 (severe problem), Level 5 (extreme problem).

Table 2 presents the proportion of the sample who reported ‘no problems’ (level 1) compared to those who reported ‘problems’ (levels 2-5) by age group. Of all the dimensions, respondents reported problems with pain/discomfort most frequently. In contrast, the least reported problems were in the self-care dimension.

Table 2. Proportion of respondents reporting no problems versus problems by EQ-5D-5L dimension and age group

EQ-5D-5L Dimension		AGE GROUP					Total (N=30,592)
		18-24 (N=2,188)	25-44 (N=9,582)	45-64 (N=12,557)	65-74 (N=4,604)	75+ (N=2,698)	
Mobility	No Problems	91.0%	87.2%	69.6%	57.1%	47.3%	72.8%
	Problems	8.9%	12.8%	30.3%	42.8%	52.6%	27.1%
Self-care	No Problems	98.3%	97.3%	92.8%	92.0%	88.1%	94.1%
	Problems	1.7%	2.7%	7.1%	8.0%	11.6%	5.9%
Usual activities	No Problems	86.7%	84.4%	71.4%	63.0%	56.1%	74.0%
	Problems	13.3%	15.5%	28.6%	36.9%	43.6%	26.0%
Pain/ discomfort	No Problems	58.2%	48.4%	29.6%	22.9%	24.1%	36.0%
	Problems	41.8%	51.5%	70.3%	76.9%	75.7%	63.9%
Anxiety/ depression	No Problems	56.0%	60.9%	62.7%	66.8%	68.8%	62.8%
	Problems	44.0%	39.0%	37.1%	33.0%	30.7%	37.0%

Figures 2 and 3 show the percentage of respondents who reported problems (levels 2 to 5) for each of the EQ-5D-5L dimensions, by age group and sex, respectively. Except for anxiety/depression, people reported more problems for the other four dimensions as they aged. Additionally, except for self-care, females reported more problems for the other four dimensions than men. Table 3 shows the proportion of males and females within each dimension level. Level 1 (no problems) is generally the commonly reported dimension across the sexes, with the exception of the pain/discomfort dimension where level 2 is most commonly reported for both males and females.

Figure 2. Proportion of sample with “problems present” (levels 2-5) by EQ-5D-5L dimension and age

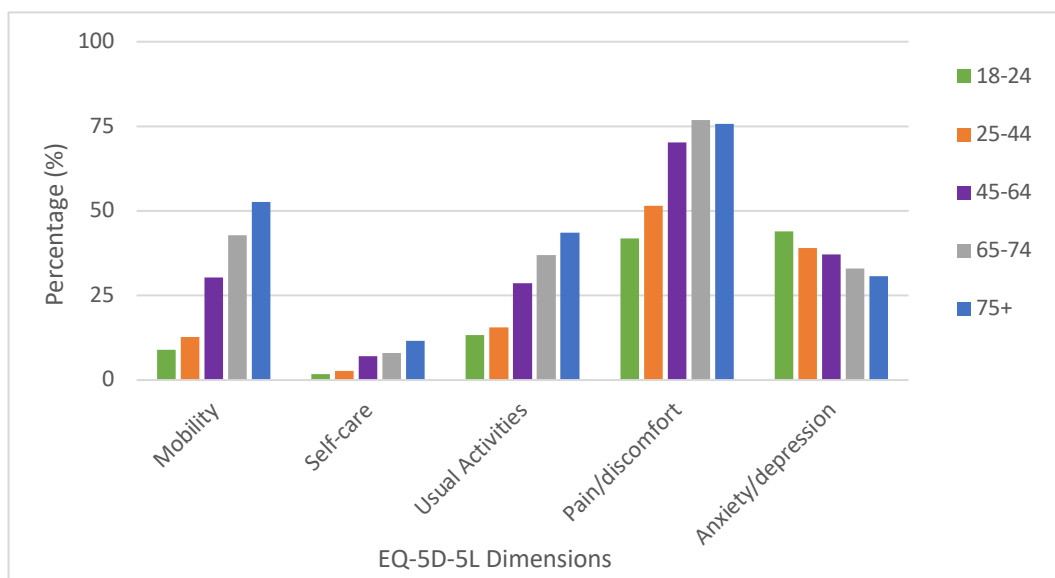


Figure 3. Proportion of sample with “problems present” (levels 2-5) by EQ-5D-5L dimension and sex

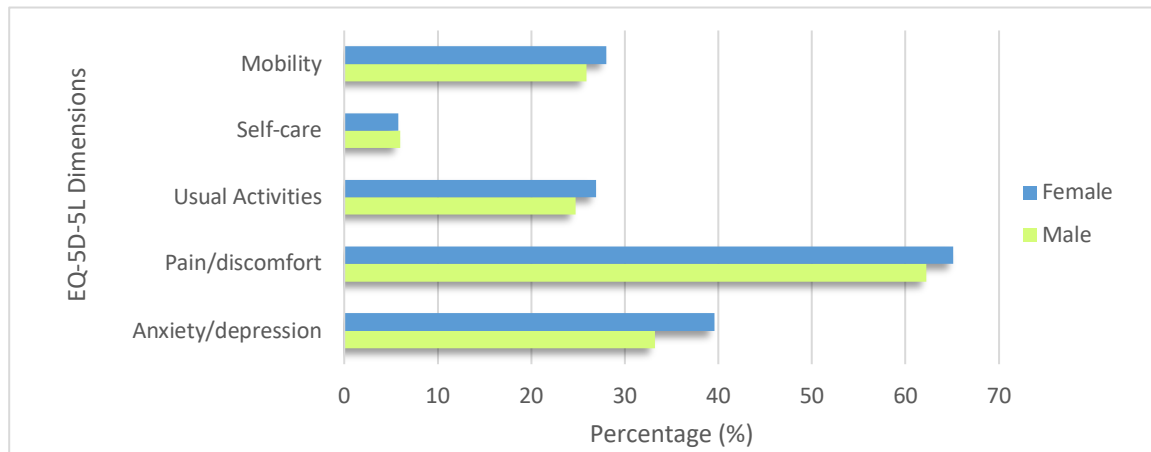


Table 3. Dimension level proportions by sex

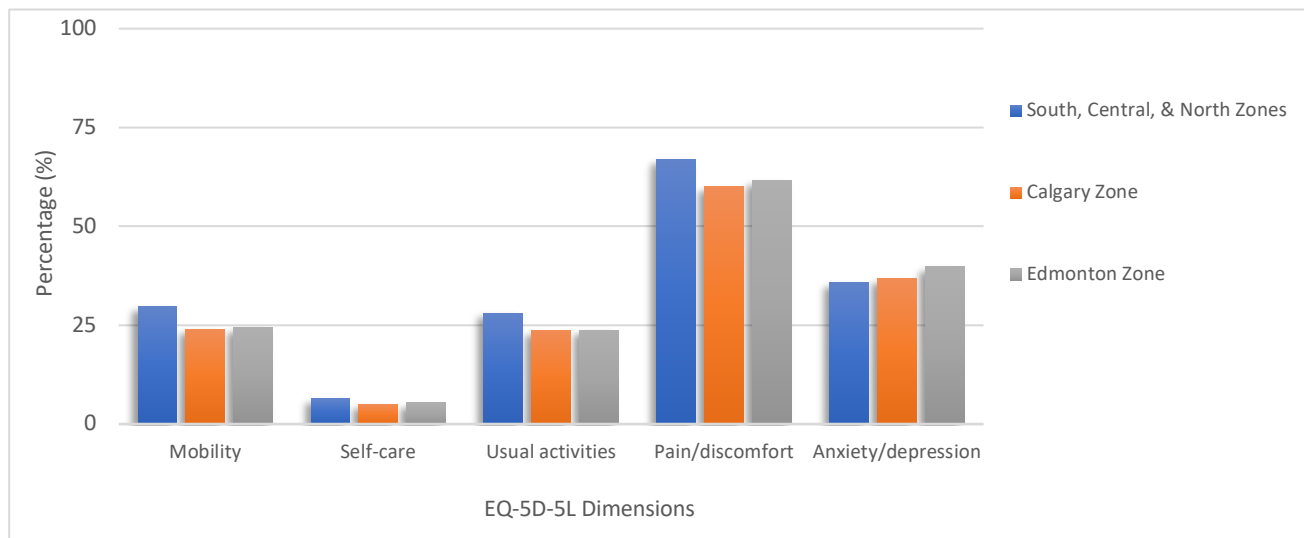
EQ-5D-5L Dimension		Male (N= 12,932)	Female (N= 18,842)	Total (N=30,592)
Mobility	Level 1	74.1%	72.0%	72.8%
	Level 2	14.8%	15.4%	15.2%
	Level 3	7.7%	9.1%	8.5%
	Level 4	2.9%	3.1%	3.0%
	Level 5	0.6%	0.4%	0.5%
Self-care	Level 1	93.9%	94.2%	94.1%
	Level 2	3.7%	3.7%	3.7%
	Level 3	2.0%	1.7%	1.8%
	Level 4	0.3%	0.3%	0.3%
	Level 5	0.1%	0.2%	0.2%
Usual activities	Level 1	75.3%	73.1%	74.0%
	Level 2	14.5%	15.9%	15.3%
	Level 3	7.6%	8.2%	8.0%
	Level 4	1.7%	1.8%	1.8%
	Level 5	0.9%	0.9%	0.9%
Pain/ discomfort	Level 1	37.7%	34.8%	36.0%
	Level 2	38.7%	38.9%	38.8%
	Level 3	18.6%	19.9%	19.4%
	Level 4	3.7%	5.1%	4.5%
	Level 5	1.1%	1.2%	1.2%
Anxiety/ depression	Level 1	66.6%	60.2%	62.8%
	Level 2	21.6%	24.6%	23.4%
	Level 3	9.5%	11.8%	10.8%
	Level 4	1.4%	2.3%	1.9%
	Level 5	0.7%	1.0%	0.9%

Table 4 shows the proportion of the sample for each of the EQ-5D-5L levels within each dimension, by AHS zone. The three rural AHS zones (South, Central and North) were combined into one category whereas the urban zones (Calgary and Edmonton) were kept separate. The last column (total) presents the population average for each level within each dimension. Level 1 (no problems) is generally the commonly reported dimension across the AHS zones, with the exception of the pain/discomfort dimension where levels 1 and 2 are nearly equally reported in each of the zones. Figure 4 shows the percentage of respondents who reported problems (levels 2 to 5) for each of the EQ-5D-5L dimensions by AHS zone. There are little differences between the zones, but the rural AHS zones have a greater proportion of problems present in the mobility, usual activities and pain/discomfort dimensions compared to the urban zones.

Table 4. Dimension level proportions by AHS zone

EQ-5D-5L Dimensions		South, Central & North Zones (N=16,582)	Calgary Zone (N=7,422)	Edmonton Zone (N=7,166)	Total (N=30,592)
Mobility	Level 1	70.2%	75.8%	75.6%	72.8%
	Level 2	16.5%	13.6%	13.9%	15.2%
	Level 3	9.4%	7.6%	7.5%	8.5%
	Level 4	3.4%	2.5%	2.5%	3.0%
	Level 5	0.5%	0.4%	0.6%	0.5%
Self-care	Level 1	93.5%	94.9%	94.6%	94.1%
	Level 2	4.0%	3.2%	3.5%	3.7%
	Level 3	2.1%	1.5%	1.4%	1.8%
	Level 4	0.3%	0.2%	0.2%	0.3%
	Level 5	0.1%	0.1%	0.1%	0.2%
Usual activities	Level 1	71.8%	76.2%	76.1%	74.0%
	Level 2	16.2%	14.3%	14.4%	15.3%
	Level 3	8.7%	7.1%	7.1%	8.0%
	Level 4	2.0%	1.5%	1.6%	1.8%
	Level 5	1.1%	0.8%	0.7%	0.9%
Pain/discomfort	Level 1	33.1%	39.8%	38.4%	36.0%
	Level 2	39.2%	38.3%	38.6%	38.8%
	Level 3	21.3%	17.0%	17.5%	19.4%
	Level 4	5.1%	3.8%	4.1%	4.5%
	Level 5	1.3%	1.0%	1.2%	1.2%
Anxiety/depression	Level 1	64.1%	63.3%	60.1%	62.8%
	Level 2	22.7%	23.5%	24.7%	23.4%
	Level 3	10.4%	10.7%	11.9%	10.8%
	Level 4	1.8%	1.6%	2.3%	1.9%
	Level 5	0.9%	0.8%	0.8%	0.9%

Figure 4. Proportion of sample with “problems present” (levels 2-5) by EQ-5D-5L dimension and AHS Zone



Overall self-rated health status

The EQ-5D-5L dimensions may be converted into a single index value and presented in country-specific value sets. The EQ-5D-5L self-reported VAS data generated information on the overall health-related quality of life of respondents. The mean index and EQ VAS rating decreased with increasing age, demonstrated by table 5. Mean index and VAS scores were only slightly higher in the urban health zones (Calgary and Edmonton) compared to the rural zones (North, Central, and South zones).

Table 5. EQ-5D-5L index and VAS mean and standard deviation by sex, age group and AHS zone

		Index (mean, SD) (N= 30,334)	VAS (mean, SD) (N= 30,442)
Overall		0.84 (0.14)	77.4 (17.1)
Sex	Male	0.86 (0.13)	77.3 (16.1)
	Female	0.85 (0.14)	78.3 (16.1)
Age group	18-24	0.88 (0.10)	81.6 (14.2)
	25-44	0.87 (0.11)	79.8 (15.1)
	45-64	0.83 (0.16)	76.3 (17.9)
	65-74	0.82 (0.15)	75.5 (18.1)
	75+	0.80 (0.15)	73.9 (18.0)
AHS zone	North, Central and South Zones	0.84 (0.15)	76.9 (17.6)
	Calgary	0.85 (0.13)	78.5 (16.0)
	Edmonton	0.85 (0.14)	77.6 (16.7)

Figures 5 and 6 compares the mean EQ VAS and index scores, respectively, in males and females within each age group. Mean EQ-VAS and index scores were very similar between males and females across age groups, although mean index scores were slightly higher in males across all the age groups and mean EQ-VAS scores were slightly higher in females in the 45-64 and 65-74 year old groups.

Figure 5. Mean population EQ-VAS ratings by age and sex

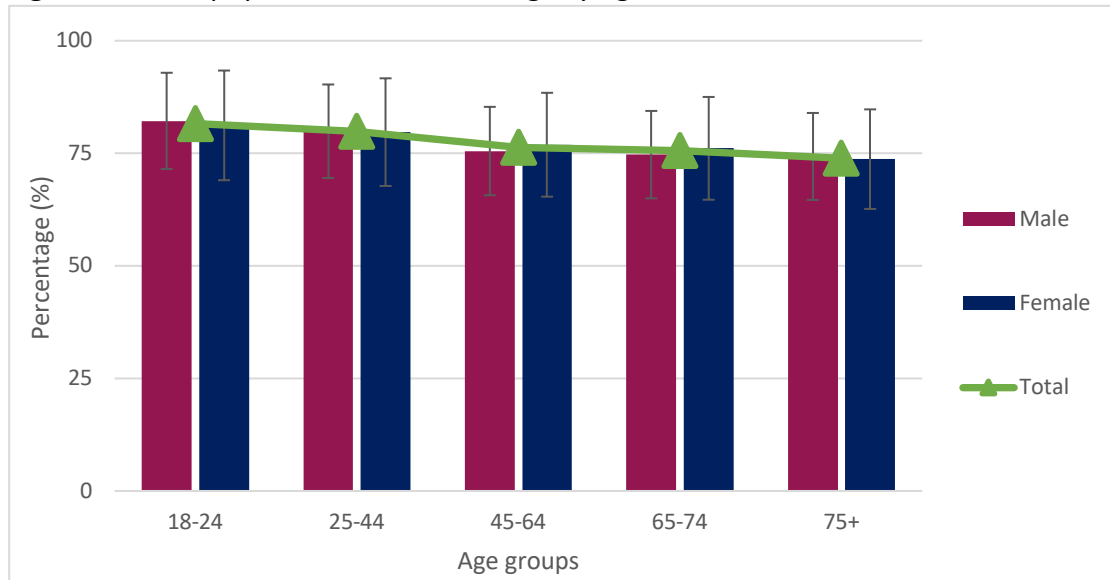


Figure 6. Mean EQ-5D-5L index scores by age and sex

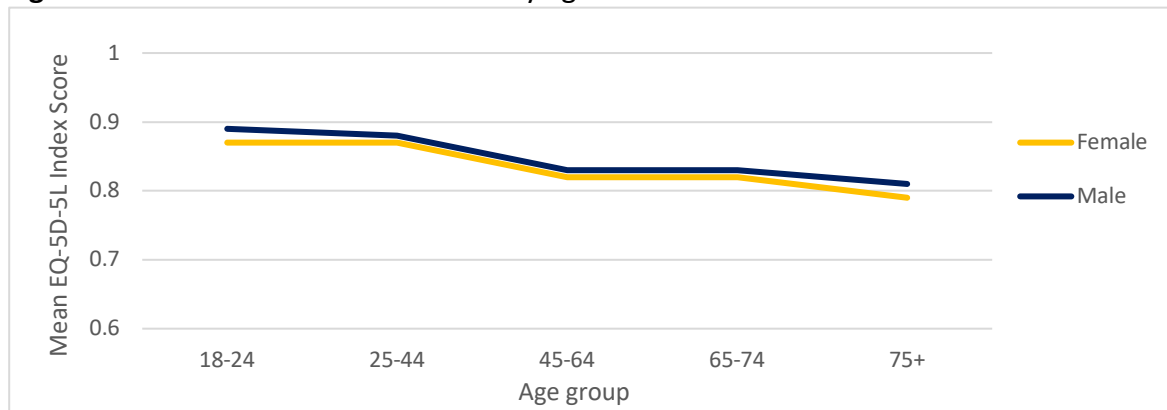


Table 6 shows that there is no difference in EQ-5D-5L index scores by AHS zone.

Table 6. Mean EQ-5D-5L index scores by AHS zone

AHS Zone	EQ-5D-5L Index score	LW CI	UP CI
South, Central, North (N=15,799)	0.84	0.83	0.84
Calgary (N=7,076)	0.85	0.85	0.85
Edmonton (N=6,871)	0.85	0.84	0.85

The distributions of the EQ-5D-5L index score for the overall Alberta population by sex are skewed (Figures 7 & 8). The median [inter-quartile range] EQ-5D-5L index score for females and males were 0.87 [0.81, 0.91] and 0.90 [0.83, 0.95], respectively. The medians and distributions generally followed the same patterns.

Figure 7. Histogram of EQ-5D-5L index scores for females

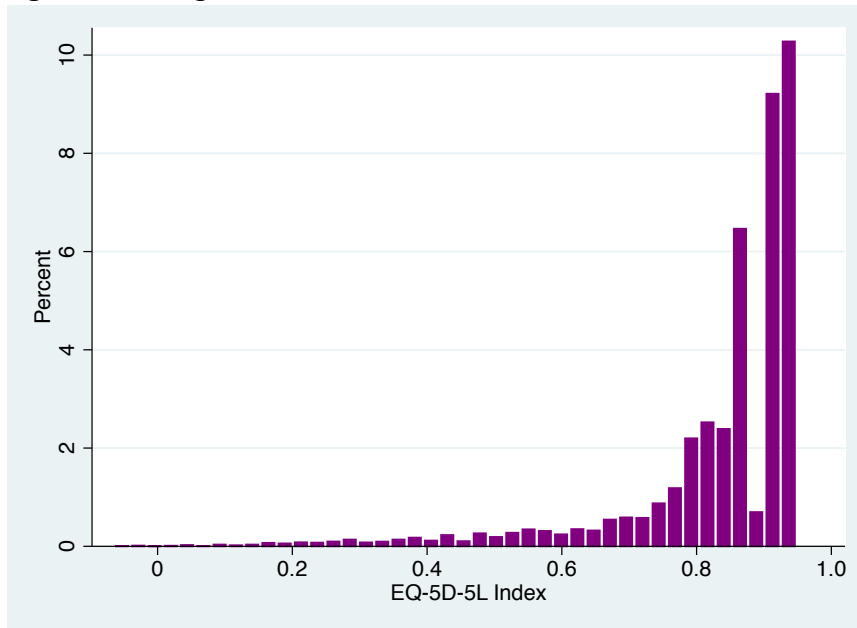
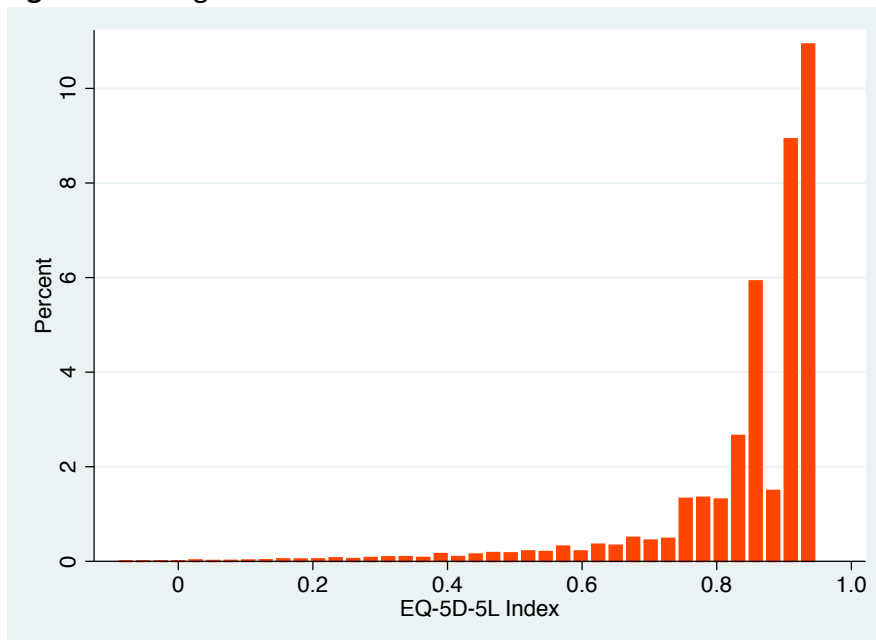


Figure 8. Histogram of EQ-5D-5L index scores for males



The mean EQ-5D-5L index score decreased as age increased and females reported a lower mean EQ-5D-5L index score than males. The decreasing trend in EQ-5D-5L index scores with increasing age groups was statistically significant ($p < 0.01$) (Table 7). Males and females showed different patterns of decreasing index scores with increasing age groups, but the overall decrease from 18-24 to 75+ was the same (-0.08 points).

Table 7. EQ-5D-5L index means and 95% confidence intervals by sex and age group

	Age	Mean	LW CI	UP CI
Female	18-24	0.87	0.87	0.88
	25-44	0.87	0.87	0.87
	45-64	0.82	0.82	0.83
	65-74	0.82	0.82	0.83
	75+	0.79	0.79	0.80
Male	18-24	0.89	0.89	0.90
	25-44	0.88	0.88	0.88
	45-64	0.83	0.83	0.84
	65-74	0.83	0.82	0.84
	75+	0.81	0.81	0.82
Total	18-24	0.88	0.88	0.89
	25-44	0.87	0.87	0.88
	45-64	0.83	0.83	0.83
	65-74	0.82	0.81	0.82
	75+	0.80	0.80	0.81

Appendix 1: Norms by Dataset

Table 8. EQ-5D-5L Index Score (Mean, SD), Alberta Health data only

Alberta Health EQ-5D-5L index norms		2014 (N=6,314)	2015 (N=7,079)	2014 + 2015 (N=13,393)	2016 (N=6,296)	2014 + 2015 + 2016 (N=19,689)
Overall		0.85 (0.14)	0.83 (0.14)	0.84 (0.14)	0.83 (0.14)	0.84 (0.14)
Sex	Male	0.85 (0.14)	0.84 (0.14)	0.85 (0.14)	0.84 (0.14)	0.85 (0.14)
	Female	0.85 (0.14)	0.83 (0.14)	0.84 (0.14)	0.82 (0.15)	0.83 (0.15)
Age group	18-24	0.88 (0.10)	0.87 (0.09)	0.88 (0.10)	0.86 (0.12)	0.87 (0.10)
	25-44	0.88 (0.11)	0.87 (0.11)	0.88 (0.11)	0.86 (0.12)	0.87 (0.11)
	45-64	0.83 (0.16)	0.82 (0.16)	0.83 (0.16)	0.83 (0.15)	0.83 (0.16)
	65-74	0.82 (0.15)	0.81 (0.14)	0.82 (0.14)	0.80 (0.16)	0.81 (0.15)
	75+	0.80 (0.16)	0.80 (0.14)	0.80 (0.15)	0.79 (0.15)	0.80 (0.15)
AHS Zone	North, Central, South Zones	0.84 (0.15)	0.83 (0.15)	0.84 (0.15)	0.82 (0.15)	0.83 (0.15)
	Calgary	0.86 (0.14)	0.84 (0.14)	0.86 (0.14)	0.83 (0.14)	0.85 (0.14)
	Edmonton	0.86 (0.13)	0.84 (0.13)	0.86 (0.13)	0.84 (0.13)	0.85 (0.13)

Table 9. EQ-5D-5L Index Score (Mean, SD), Healthy Quality Council of Alberta data only

HQCA EQ-5D-5L index norms		2012 (N=4,752)	2014 (N=4,390)	2012 + 2014 (N=8,780)	2016 (N=1,504)	2012 + 2014 + 2016 (N=10,646)
Overall		0.85 (0.14)	0.85 (0.14)	0.85 (0.14)	0.86 (0.13)	0.85 (0.14)
Sex	Male	0.86 (0.13)	0.85 (0.14)	0.85 (0.14)	0.87 (0.12)	0.85 (0.14)
	Female	0.85 (0.14)	0.84 (0.14)	0.84 (0.14)	0.85 (0.14)	0.84 (0.14)
Age groups	18-24	0.90 (0.08)	0.88 (0.11)	0.88 (0.11)	0.88 (0.10)	0.88 (0.11)
	25-44	0.88 (0.12)	0.87 (0.12)	0.87 (0.12)	0.88 (0.11)	0.87 (0.12)
	45-64	0.83 (0.16)	0.83 (0.16)	0.83 (0.16)	0.83 (0.16)	0.83 (0.16)
	65-74	0.84 (0.14)	0.82 (0.14)	0.82 (0.14)	0.83 (0.13)	0.82 (0.14)
	75+	0.81 (0.15)	0.82 (0.14)	0.82 (0.14)	0.80 (0.15)	0.82 (0.14)
AHS Zone	North, Central, South Zones	0.85 (0.14)	0.84 (0.15)	0.84 (0.14)	0.85 (0.13)	0.85 (0.14)
	Calgary	0.86 (0.13)	0.86 (0.13)	0.86 (0.13)	0.87 (0.12)	0.86 (0.13)
	Edmonton	0.86 (0.14)	0.85 (0.14)	0.85 (0.14)	0.85 (0.15)	0.85 (0.14)

Table 10. EQ-5D-5L VAS (Mean, SD), Alberta Health data only

Alberta Health EQ-5D-5L VAS norms		2014 (N=6,342)	2015 (N=7,047)	2014 + 2015 (N=13,389)	2016 (N=6,376)	2014 + 2015 + 2016 (N= 19,765)
Overall		79.5 (17.7)	76.4 (17.1)	77.9 (17.5)	75.9 (17.6)	77.2 (17.5)
Sex	Male	79.6 (17.0)	76.1 (16.6)	77.8 (16.9)	75.4 (17.9)	77.0 (17.3)
	Female	79.5 (18.2)	76.6 (17.4)	77.9 (17.8)	76.2 (17.4)	77.4 (17.7)
Age group	18-24	83.3 (14.0)	78.3 (16.3)	81.0 (15.3)	79.4 (14.3)	90.5 (15.0)
	25-44	82.4 (15.2)	78.9 (14.3)	80.7 (14.9)	77.6 (15.9)	79.8 (15.3)
	45-64	78.5 (18.8)	75.7 (18.0)	76.9 (18.4)	75.5 (17.8)	76.5 (18.2)
	65-74	77.0 (19.4)	75.5 (18.0)	76.1 (18.6)	74.4 (19.3)	75.5 (18.9)
	75+	74.6 (18.7)	73.3 (17.9)	73.8 (18.3)	73.1 (19.0)	73.6 (18.5)
AHS Zone	North, Central and South Zones	78.7 (18.2)	75.9 (17.4)	78.7 (18.2)	74.9 (18.5)	78.7 (18.2)
	Calgary	81.2 (16.6)	77.1 (16.8)	81.2 (16.6)	76.3 (16.3)	81.2 (16.6)
	Edmonton	80.3 (17.2)	76.9 (16.1)	80.3 (17.2)	76.8 (16.9)	80.3 (17.2)

Table 11. EQ-5D-5L VAS (Mean, SD), Health Quality Council of Alberta data only

HQCA EQ-5D-5L VAS norms		2012 (N=4785)	2014 (N=4393)	2012 + 2014 (N=8,786)	2016 (N= 1,499)	2012 + 2014 + 2016 (N= 10,677)
Overall		77.9 (16.0)	77.5 (16.3)	77.5 (16.3)	78.5 (15.7)	77.7 (16.2)
Sex	Male	77.6 (15.6)	76.4 (16.9)	76.4 (16.9)	79.0 (15.4)	76.8 (16.7)
	Female	78.2 (16.4)	78.4 (15.9)	78.4 (15.9)	78.1 (16.1)	78.3 (15.9)
Age group	18-24	83.3 (11.9)	82.0 (14.4)	82.0 (14.4)	82.3 (14.0)	82.1 (14.3)
	25-44	79.9 (14.8)	79.3 (15.2)	79.3 (15.2)	81.0 (13.8)	79.6 (15.0)
	45-64	75.8 (17.5)	76.2 (17.2)	76.2 (17.2)	76.2 (17.1)	76.2 (17.2)
	65-74	75.8 (15.9)	75.4 (15.6)	75.4 (15.6)	75.3 (17.1)	75.4 (15.8)
	75+	74.5 (16.0)	75.1 (17.3)	75.1 (17.3)	72.5 (16.5)	74.8 (17.2)
AHS Zone	North, Central and South Zones	77.4 (16.7)	77.1 (16.6)	77.3 (16.7)	78.0 (16.0)	77.3 (16.6)
	Calgary	78.9 (15.0)	79.1 (14.6)	79.0 (14.9)	80.0 (14.1)	79.2 (14.7)
	Edmonton	78.2 (15.3)	76.8 (17.1)	77.5 (16.2)	77.5 (16.9)	77.5 (16.3)

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