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Alliance for Canadian Health Outcomes Research in Diabetes

# Alberta Provincial Norms for EQ-5D-3L

July 2013

Promoting and improving patient safety and health service quality across Alberta

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# Introduction

Disease specific and generic health measures have been increasingly used to measure the health status of populations.[1, 2, 3, 4] Health related quality of life (HRQL) measures are often used in economic evaluations of healthcare as well as in population health surveys. However, HRQL is often influenced by multiple patient and disease factors and for economic evaluations to be informative; measures need to be representative of the population the health intervention is being developed for.

A common generic measure that is used in population health assessments is the EuroQol groups' EQ-5D™, a standardized instrument for use as a measure of health outcome (www.euroqol.org). 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 three levels indicating: no problems, some or moderate problems, and extreme problems, resulting in 3 to the fifth or 243 possible health states. Studies have shown that the EQ-5D discriminates well between demographic characteristics (age, gender, income, education and various disease-specific variables), but may lack the ability to detect multiple conditions.[5] This document reports the norms[a] for the EQ-5D (profile and index scores) for adult males and females for the Alberta population, established from a recent population-based study in the province of Alberta.

# Research Design and Methods

### Questionnaire

The Health Quality Council of Alberta (HQCA) incorporated the EQ-5D in its 2010 Satisfaction and Experience with Health Care Services Survey.[6] The Population Research Laboratory (PRL) at the University of Alberta reviewed the questionnaire and conducted a pre-test on routing patterns, question wording and flow, adequacy of transitional statements and instruction to interviewers and estimated the length of the interview.[6]

[a] Norms - how the general population values health based on EQ-5D dimensions (mobility, self-care, usual activities, anxiety/depression, pain/discomfort). It should be noted that the set of observations from the EQ-5D descriptive system constitutes a health state. The health state can be converted to an index value using a formula that is based on the valuation of health states from the general population. There are currently no value sets for Canada. Valuation studies are ongoing. The data presented in this report is a contribution to the ongoing valuation effort and can be treated as descriptive population 'norms' for Alberta, as it provides baseline values for monitoring variations in health for specific population groups.

### Sampling design

Sampling quotas were drawn from the Alberta Health Services (AHS) zones.[6] The sampling quotas are representative of the age and gender composition of each AHS zone and were based on estimates of the population in each AHS zone provided by Alberta Health.[6] Random digit dialing (RDD) was used to ensure that each household had an equal chance of being contacted regarding participation in the survey.[6] The sampling frame was based on landlines and excluded businesses, unlisted cell phone exchanges and government exchanges.[6] The target population consisted of people who at the time of the survey were living in any of the AHS zones and could be contacted by direct phone calling.[6]

Rules for participation were a random selection of an individual who was 18 years of age or older (18+) and resided within the household.[6] For households' containing more than one eligible respondent, the person with the next birthday was selected for the survey and if he/she refused, no other individual in the household was screened to participate.[6]

Sampling was adjusted to take into consideration the population size of each AHS zone.[6] Analyses in this report is based on the combined sample from individual AHS zones. Sample weights were applied to correct for over - and under - sampling of the respective health zones in order to represent the total Alberta population.[6]

### Data Collection

The computer-assisted telephone interview (CATI) system was used to allocate telephone numbers to interviewing stations.[6] Data collection was conducted at the PRL at the University of Alberta in centralized CATI facilities from February to May 2010.[7] Survey text, questions, and instructions were presented on the computer screen to the interviewer. Interviews were conducted from 9 a.m. to 2 p.m. and 4 p.m. to 9 p.m. on weekdays, from 10 a.m. to 4 p.m. on Saturdays and from 2 p.m. to 8 p.m. on Sundays.[6] Telephone numbers were dialed at least eight times or until final disposition.[6] For individuals who first refused to participate, a specially trained "refusal interviewer" attempted to convert initial refusals into an agreement to participate or called up to eight times to reach potential respondents before coding as "final refusal".[6]

Reliance and high rates of cell phone usage reduced the likelihood of reaching the age group of 18-24 years of age.[6] To increase the number of completed interviews to the youngest age groups, the HQCA approved a protocol screening procedure starting on May 3 for the final week of data collection to obtain interviews from only 18 to 24 year - olds.[6] This was achieved from a telephone script revision where the interviewers would ask for a household member who was 18 to 24 years old with the next birthday.[6]

### EQ-5D Norms

Responses to the EQ-5D are presented in two formats:

1. Distribution of responses to the individual dimensions are presented as proportions; and

2. As an overall weighted EQ-5D Index Score ranging from 0 to 1; with 0 representing death and 1 representing full health.

The United States scoring algorithm was used to calculate the EQ-5D Index scores.[7]

## Results

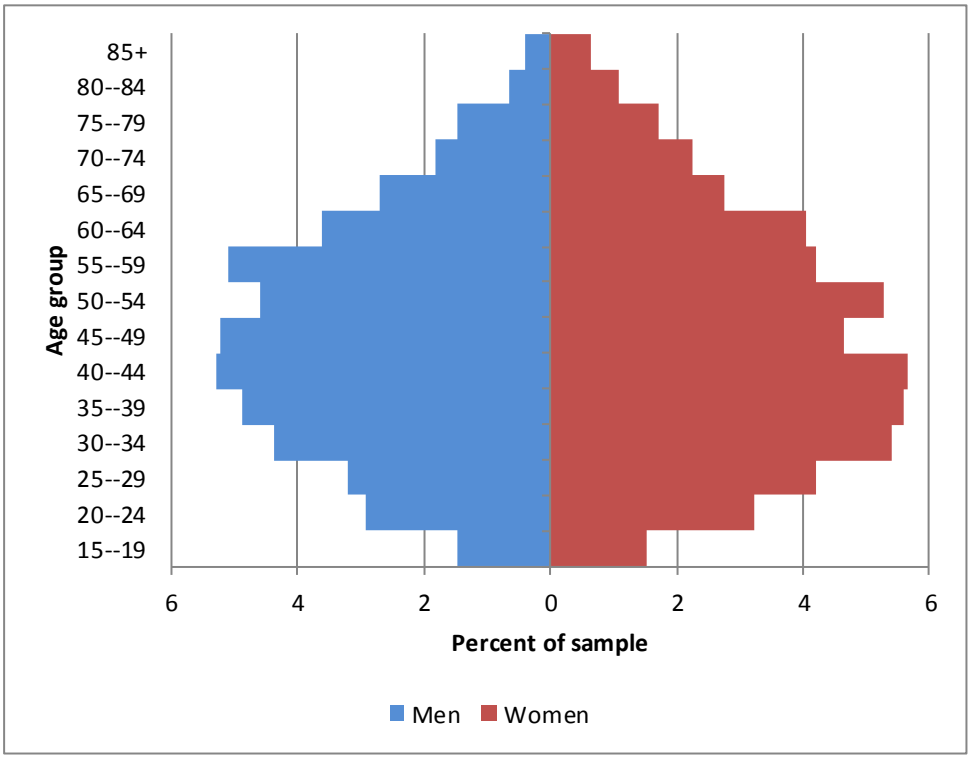
Data was collected between February 24, 2010 and May 11, 2010.[6] Quotas were increased from 4,500 to 5,500 by request of the HQCA, and the duration of data collection extended to May 31, 2010, however due to low response numbers, the HQCA terminated the data collection on May 11, 2010.[6] The PRL made 248,842 call attempts on 53,285 telephone numbers to obtain 5,010 completed interviews.[7] Median survey interview duration for all respondents was 26 minutes. The survey response rate was reported to be 33.1%.[6]

### EQ-5D Index Scores

The mean age of the sample was 46.7 years (standard deviation [SD] 16.5 years)

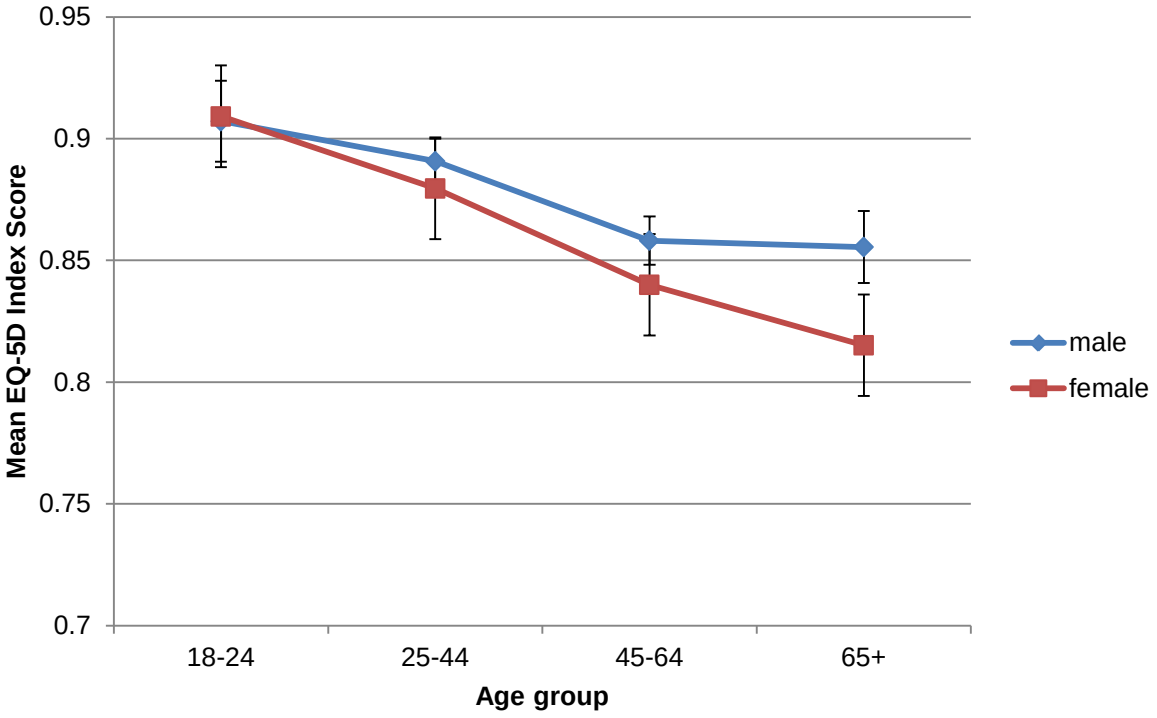
- 47.7% of the sample was male (mean age 46.8 [SD 16.1] range 18-91 years)
- 52.3% of the sample was female (mean age 46.6 [SD 16.8] range 18-91 years)
- The age distribution for females and males was similar (Figure 1)

**Figure 1: Age distribution of sample (2010)**




The mean EQ-5D index score decreased as age increased and females reported a lower mean EQ-5D index score than males (Figure 2).

**Figure 2: Mean EQ-5D index score for Alberta population sample by age/sex**




Strong ceiling effects[b] were observed in females and males with 39.8% and 44.6% reporting perfect health or EQ-5D responses of 11111, respectively (Figures 3 & 4). The median EQ-5D index score for females was 0.83 [0.83, 0.84] (Figure 3), and for males was 0.84 [0.84, 0.84) as illustrated in Figure 4.

[b] The instrument doesn't show variation at the highest level of functional health. This is when respondents select option 1, 'no problems' for each of five dimensions (mobility, self- care, usual-activities, pain/discomfort, anxiety/depression).

**Figure 3: Histogram of EQ-5D index scores for females**

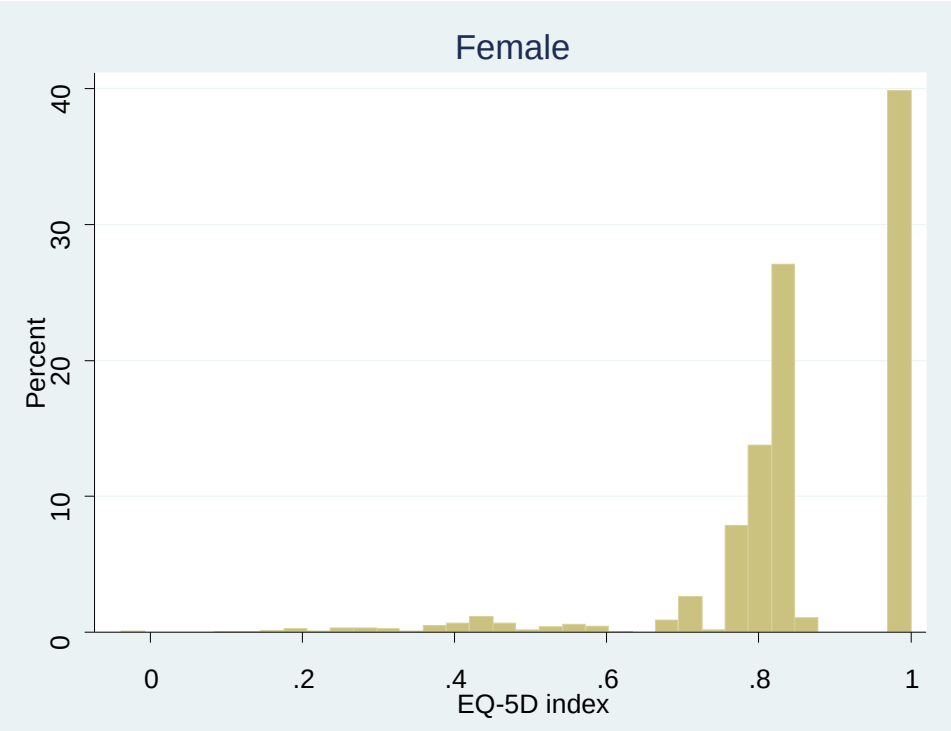
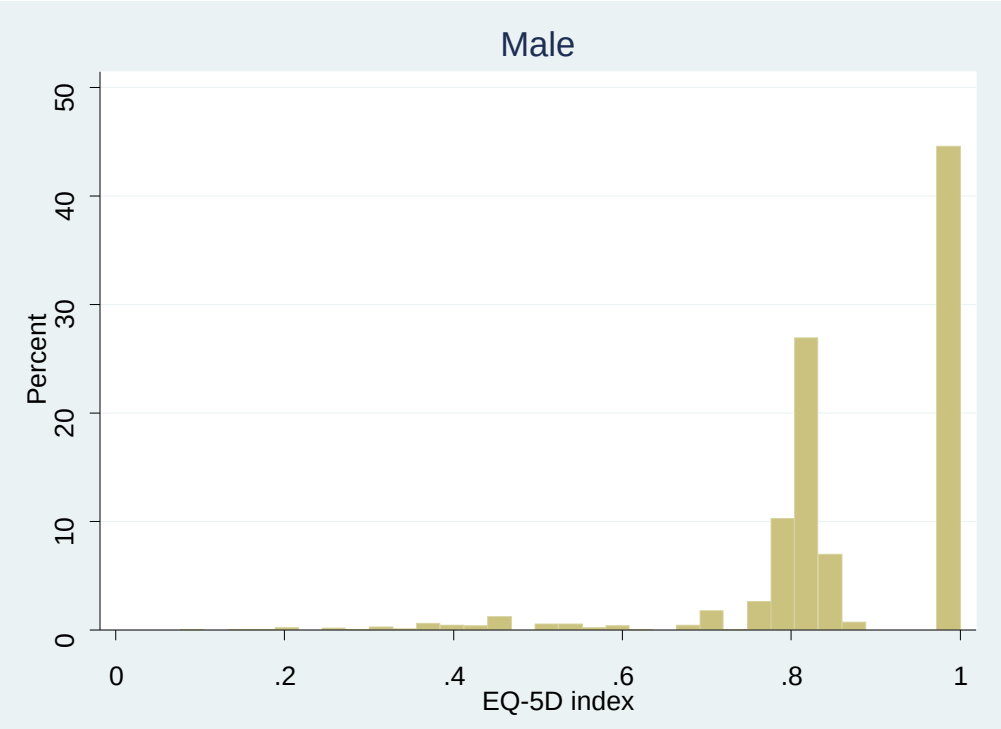



**Figure 4: Histogram of EQ-5D index scores for males**



Compared to males, females showed larger decreases in EQ-5D index with increasing age. There was a statistical difference between mean EQ-5D index scores in the older age groups (45-64; p-value<0.05, 65+; p-value<0.001) (Table 1).

**Table 1: Mean EQ-5D index scores for females and males**

| Age (years) | Female | Male |
|---|---|---|
| **18-24** | 0.91 | 0.91 |
| **25-44** | 0.88 | 0.89 |
| **45-64** | 0.84 | 0.86 |
| **65+** | 0.82 | 0.86 |

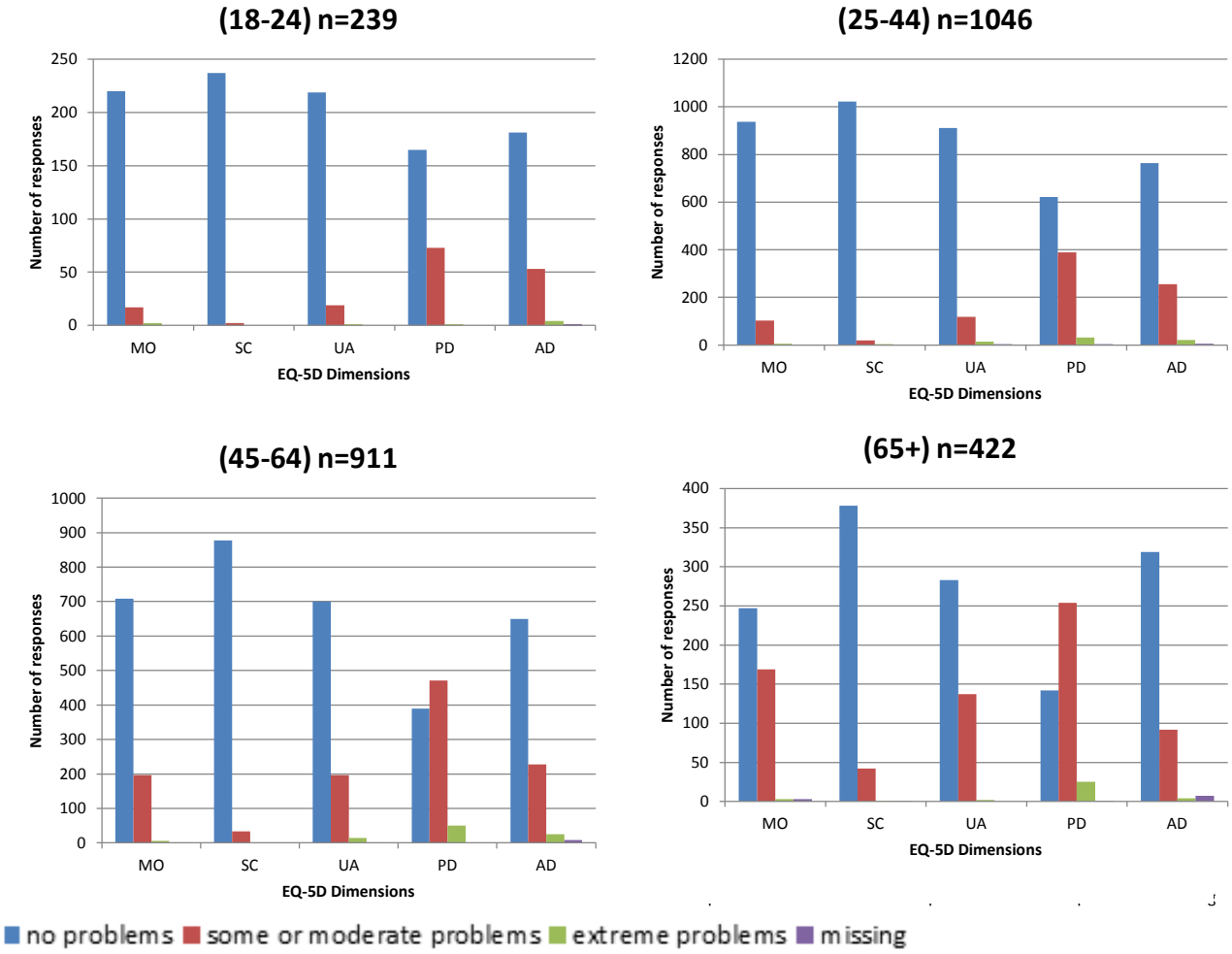
## Female Results

The greatest amount of problems (moderate and extreme) for females, aged 18-24, 25-44, and 45-64, were in usual activities (UA), pain/discomfort (PD), and anxiety/depression (AD). Females aged 65 years and over, reported the greatest amount of problems in mobility (MO), usual activities (US) and pain/discomfort (PD) (Table 2).

**Table 2: EQ-5D Profile for females by age group**

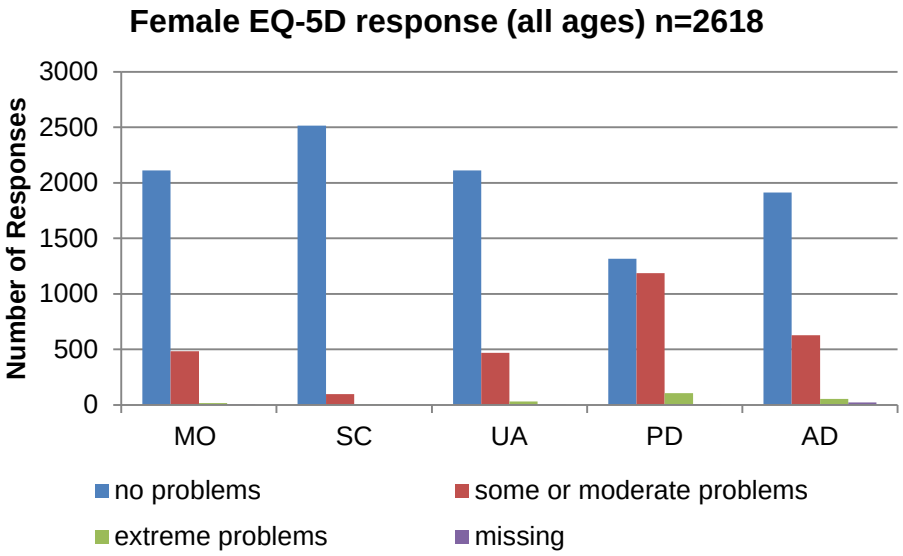
| | EQ-5D Dimensions | | | | |
|---|---|---|---|---|---|
| **18-24 (years)** | **Mobility** | **Self - care** | **Usual activities** | **Pain / discomfort** | **Anxiety / depression** |
| No problems | 92.1% | 99.2% | 91.6% | 69.0% | 75.7% |
| Some or moderate problems | 7.1% | 0.8% | 7.9% | 30.5% | 22.2% |
| Extreme problems | 0.8% | 0.0% | 0.4% | 0.4% | 1.7% |
| Missing | 0.0% | 0.0% | 0.0% | 0.0% | 0.4% |
| **25-44** | | | | | |
| No problems | 89.6% | 97.7% | 87.1% | 59.4% | 73.0% |
| Some or moderate problems | 9.8% | 1.9% | 11.3% | 37.2% | 24.4% |
| Extreme problems | 0.5% | 0.3% | 1.3% | 3.1% | 2.0% |
| Missing | 0.1% | 0.1% | 0.3% | 0.4% | 0.6% |
| **45-64** | | | | | |
| No problems | 77.7% | 96.3% | 76.8% | 42.8% | 71.4% |
| Some or moderate problems | 21.5% | 3.6% | 21.5% | 51.7% | 25.0% |
| Extreme problems | 0.7% | 0.1% | 1.5% | 5.5% | 2.7% |
| Missing | 0.1% | 0.0% | 0.1% | 0.0% | 0.9% |
| **65+** | | | | | |
| No problems | 58.5% | 89.6% | 67.1% | 33.6% | 75.6% |
| Some or moderate problems | 40.0% | 10.0% | 32.5% | 60.2% | 21.8% |
| Extreme problems | 0.7% | 0.2% | 0.5% | 5.9% | 0.9% |
| Missing | 0.7% | 0.2% | 0.0% | 0.2% | 1.7% |
| **All age groups** | | | | | |
| No problems | 80.7% | 96.0% | 80.7% | 50.3% | 73.1% |
| Some or moderate problems | 18.5% | 3.7% | 18.0% | 45.3% | 24.0% |
| Extreme problems | 0.6% | 0.2% | 1.2% | 4.1% | 2.1% |
| Missing | 0.2% | 0.1% | 0.2% | 0.2% | 0.8% |

**Figure 5: EQ-5D profile distribution of problems by age group - female**




MO: Mobility SC: Self-care UA: Usual activities PD: Pain/discomfort AD: Anxiety/depression

**Figure 6: EQ-5D profile distribution of problems - female (all ages)**




MO: Mobility SC: Self-care UA: Usual activities PD: Pain/discomfort AD: Anxiety/depression

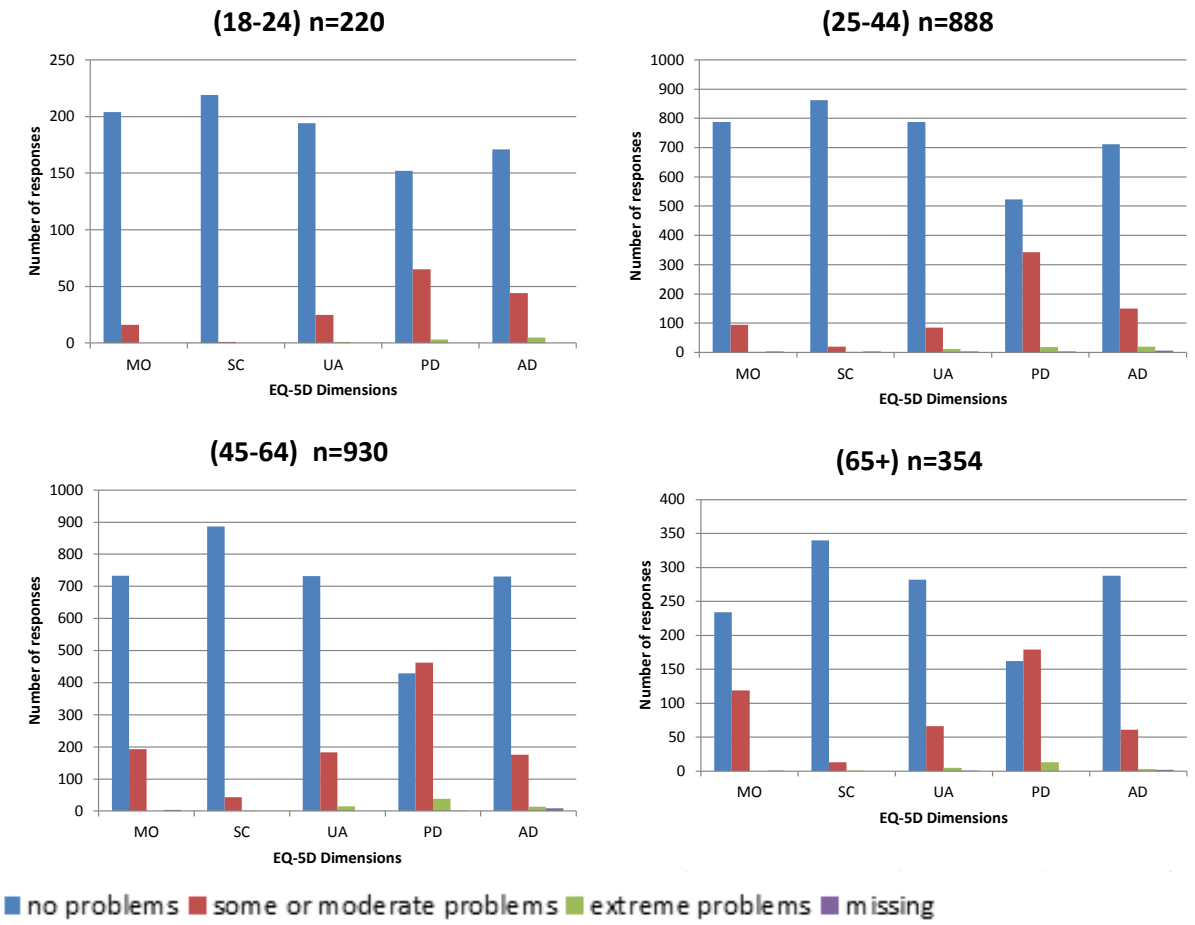
### Male Results

Males, aged 18-24 reported the greatest amount of problems in usual activities (UA), pain/discomfort (PD) and anxiety/depression (AD). Males aged 25-44 reported the greatest amount of problems in mobility (MO), usual activities (UA), pain/discomfort (PD) and anxiety/depression (AD). Meanwhile males aged 45-64 and 65 years and over, reported the greatest amount of problems in mobility (MO), usual activities (UA) and pain/discomfort (PD) (Figure 7).

**Table 3. EQ-5D Profile for males by age group**

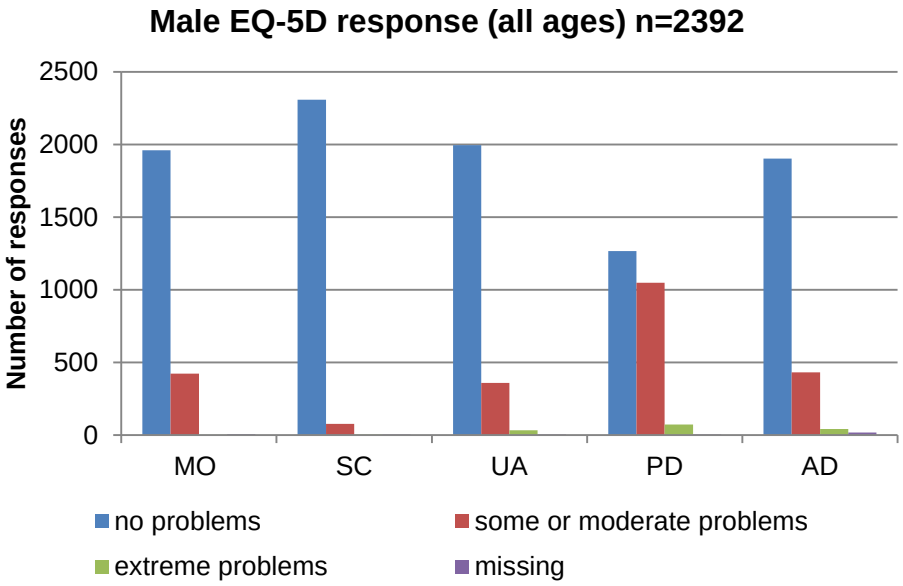
| | EQ-5D Dimensions | | | | |
|---|---|---|---|---|---|
| **18-24 (years)** | **Mobility** | **Self-care** | **Usual activities** | **Pain / discomfort** | **Anxiety / depression** |
| No problems | 92.7% | 99.5% | 88.2% | 69.1% | 77.7% |
| Some or moderate problems | 7.3% | 0.5% | 11.4% | 29.5% | 20.0% |
| Extreme problems | 0.0% | 0.0% | 0.5% | 1.4% | 2.3% |
| Missing | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| **25-44 (years)** | | | | | |
| No problems | 88.7% | 97.1% | 88.7% | 58.9% | 80.2% |
| Some or moderate problems | 10.7% | 2.3% | 9.6% | 38.6% | 16.9% |
| Extreme problems | 0.2% | 0.2% | 1.4% | 2.0% | 2.3% |
| Missing | 0.3% | 0.5% | 0.3% | 0.5% | 0.7% |
| **45-64 (years)** | | | | | |
| No problems | 78.8% | 95.3% | 78.7% | 46.1% | 78.6% |
| Some or moderate problems | 20.8% | 4.6% | 19.7% | 49.7% | 18.9% |
| Extreme problems | 0.0% | 0.1% | 1.6% | 4.1% | 1.5% |
| Missing | 0.4% | 0.0% | 0.0% | 0.1% | 1.0% |
| **65+ (years)** | | | | | |
| No problems | 66.1% | 96.0% | 79.7% | 45.8% | 81.4% |
| Some or moderate problems | 33.6% | 3.7% | 18.6% | 50.6% | 17.2% |
| Extreme problems | 0.0% | 0.3% | 1.4% | 3.7% | 0.8% |
| Missing | 0.3% | 0.0% | 0.3% | 0.0% | 0.6% |
| **All age groups** | | | | | |
| No problems | 81.9% | 96.4% | 83.4% | 52.9% | 79.5% |
| Some or moderate problems | 17.7% | 3.2% | 15.0% | 43.9% | 18.0% |
| Extreme problems | 0.1% | 0.2% | 1.4% | 3.0% | 1.8% |
| Missing | 0.3% | 0.2% | 0.2% | 0.2% | 0.7% |

**Figure 7: EQ-5D profile distribution of problems by age - male**




MO: Mobility SC: Self-care UA: Usual activities PD: Pain/discomfort AD: Anxiety/depression

**Figure 8**: **EQ-5D profile distribution of problems - male (all ages)**




MO: Mobility SC: Self-care UA: Usual activities PD: Pain/discomfort AD: Anxiety/depression

## Going forward

In October of 2012, the Health Quality Council of Alberta, Alberta Health Services and the Institute of Health Economics (IHE) brought together key stakeholders in Alberta's health system to discuss the potential for adopting the EQ-5D as a standardized health outcome measure in Alberta. This meeting, organized under the theme "Patient-reported outcome measurement in Alberta: potential of the EQ-5D" brought together national and international keynote speakers who shared their perspectives on applications of the EQ-5D. The proceedings of the symposium can be downloaded from: http://www.hqca.ca/index.php?id=280. Given the launch of an improved EuroQol five dimensions tool, the EQ-5D-5L, the HQCA has incorporated this tool into its Alberta population-level surveys. For future reporting, the HQCA plans to conduct analyses to describe population norms for Alberta based on the EQ - 5D-5L in its *Satisfaction and Experience with Healthcare Services* survey in comparison with the *Commonwealth Fund International Health Policy Survey*. [8]

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