Epi Communication 1

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Linear Regression Assignment

Assignment

The following analysis uses the Can-Path Dataset available in Canvas.

One of your biostatistician staff has conducted an analysis examining the association between different social and behavioural factors on Body Mass Index using the Can-Path dataset. Your goal as a epidemiologist is to use the analysis provided and develop a one page communication report/document to communicate the beginning of health promotion strategy for your region. You can write text, develop an infographic, and use outside knowledge to support the development of your report.

It is crucial when discussing obesity and weight status that we avoid adding to stigma as researchers and epidemiologists. There are a number of health consequences to weight stigma that we must attempt to avoid. At the same time, we need to work with people to try and improve health. Some resources here:

1. Puhl, R M., Wharton, C M. Weight Bias: A Primer for the Fitness Industry. Health & Fitness Journal. 2007; 11(3), p 7-11. https://doi.org/10.1249/01.FIT.0000269060.03465.ab
2. Phelan SM, Burgess DJ, Yeazel MW, Hellerstedt WL, Griffin JM, van Ryn M. Impact of weight bias and stigma on quality of care and outcomes for patients with obesity. Obes Rev. 2015;16(4):319-326. https://doi.org/10.1111/obr.12266.
3. Puhl RM, Himmelstein MS, Pearl RL. Weight stigma as a psychosocial contributor to obesity. Am Psychol. 2020;75(2):274-289. https://doi.org/10.1037/amp0000538

Outcome

The outcome is BMI. The histogram and summary statistics of the BMI variable is below.
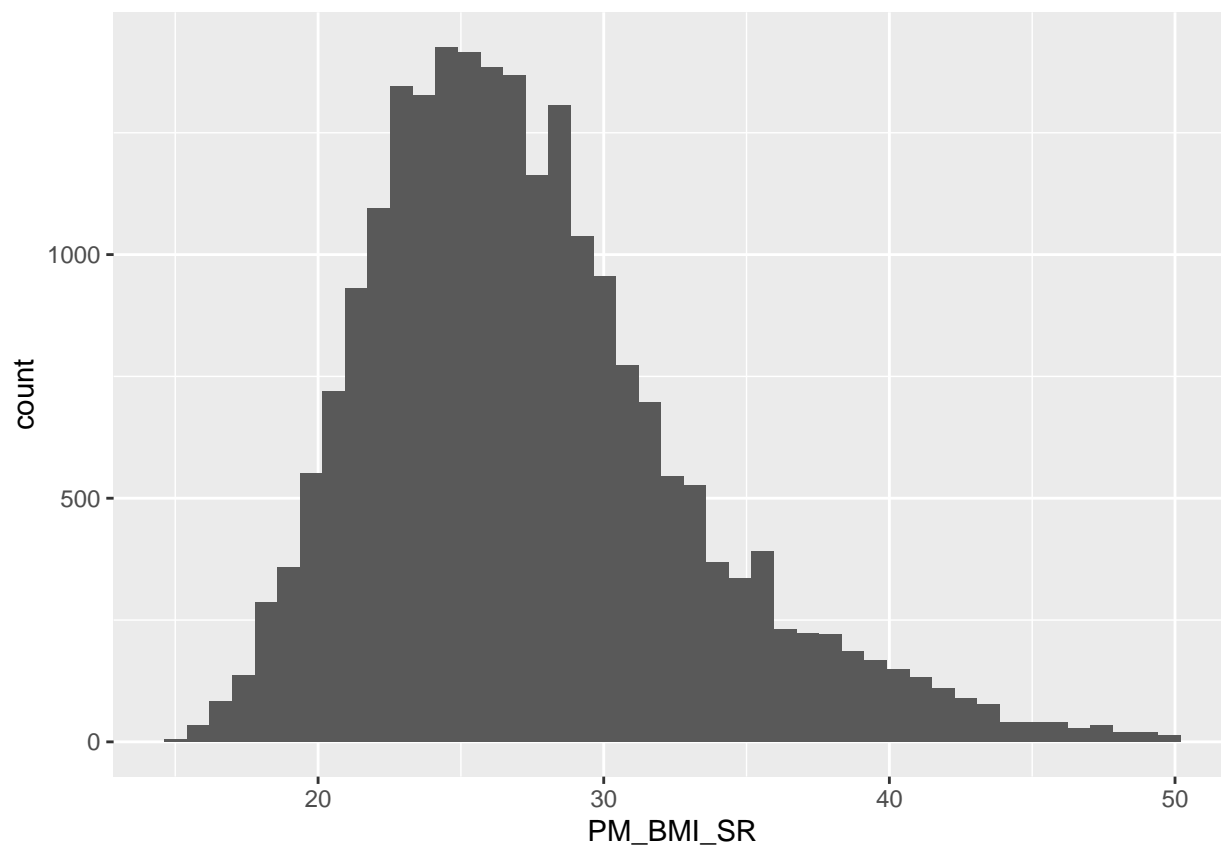
```
##    Min. 1st Qu.  Median   Mean 3rd Qu.    Max.
##   15.16   23.34   26.52   27.35   30.27   49.94
```

Behavioural Factors

The behavioural factors included in the analysis are smoking, physical activity, alcohol consumption, and fruit and vegetable consumption. The descriptive statistics for the

SMK_CIG_CUR_FREQ   Variable outlining the smoking status of participants.

(0) Does not smoke currently

(1) Current occasional smoker

(2) Current daily smoker

(3) Never smoked

```
##            SMK_CIG_CUR_FREQ     n percent
##    0_Does not smoke currently  7552   33.8%
##  1_Current occasional smoker   554    2.5%
##      2_Current daily smoker   1782    8.0%
##             3_Never smoked  12488   55.8%
```

PA_LEVEL_SHORT   Variable outlining the physical activity level of participants.

(1) Low level of physical activity

(2) Moderate level of physical activity

(3) High level of physical activity

```
##            PA_LEVEL_SHORT    n percent
##       1_Low level of PA 6067   27.1%
##  2_Moderate level of PA 7297   32.6%
##      3_High level of PA 9012   40.3%
```

ALC_CUR_FREQ Variable outlining the number (units are a bit all over the place) of alcoholic beverages consumed.

(0) Never

(1) Less than once a month

(2) About once a month

(3) 2 to 3 times a month

(4) Once a week

(5) 2 to 3 times a week

(6) 4 to 5 times a week

(7) 6 to 7 times a week

```
##              ALC_CUR_FREQ    n percent
##                  0_Never 1394    6.5%
##  1_Less than once a month 3848   18.1%
##      2_About once a month 1766    8.3%
##    3_2 to 3 times a month 2758   12.9%
##            4_Once a week 2536   11.9%
##     5_2 to 3 times a week 4173   19.6%
##     6_4 to 5 times a week 2465   11.6%
##     7_6 to 7 times a week 2373   11.1%
```

FRUIT_VEG Count of the number of fruit and vegetables consumed per week.
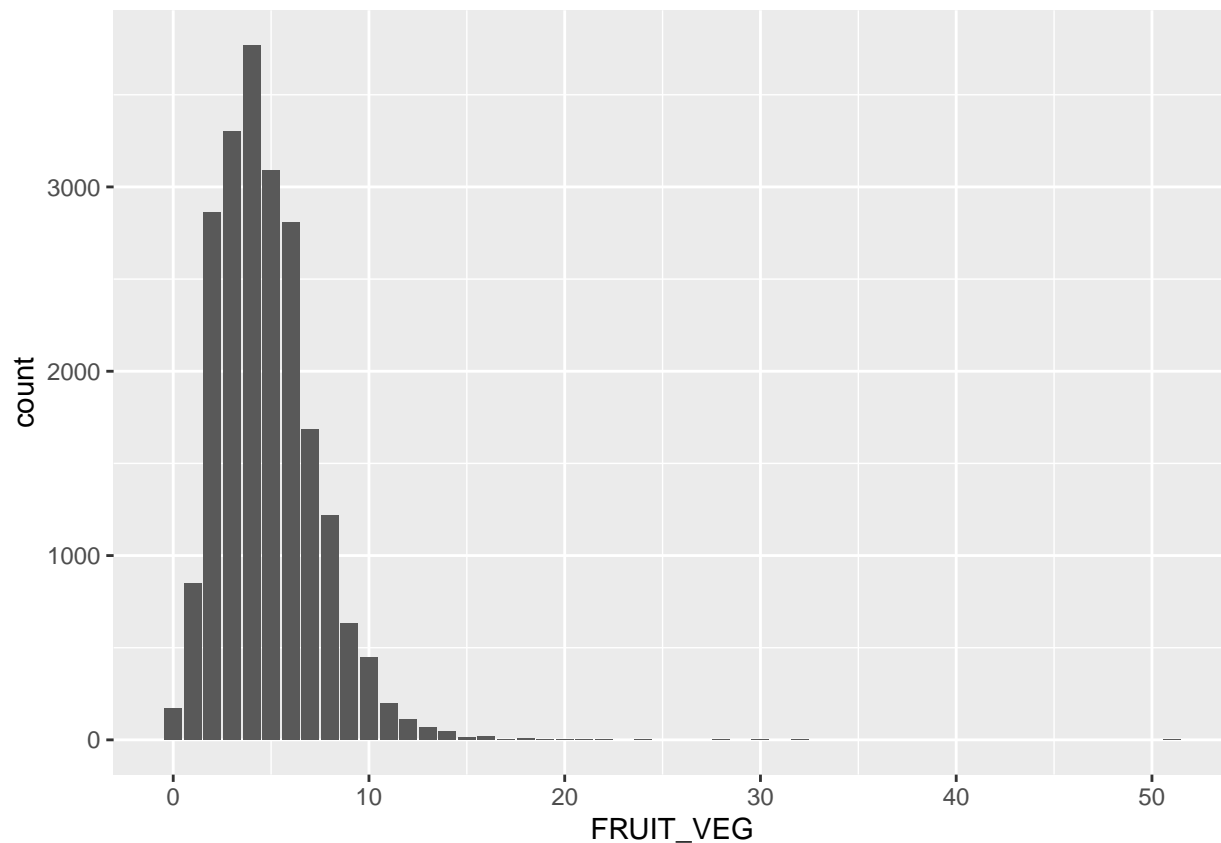
```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.000   3.000   4.000   4.768   6.000  51.000
```

Social and Demographic Factors

The social and demographic factors included in the analysis are age, income category, student status, and education level. The descriptive statistics for these variables is below:

SDC_GENDER   Variable representing the gender of participants.

  (1) Male
  (2) Female

```
##  SDC_GENDER      n percent
##      Female 12058   56.6%
##        Male  9255   43.4%
```

SDC_AGE_CALC   Age of the participant at the time of completing the survey.

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   30.00   43.00   52.00   51.33   60.00   74.00
```

SDC_INCOME   Variable representing the income of participants.

  (1) Less than 10 000 $
  (2) 10 000 $ - 24 999 $
  (3) 25 000 $ - 49 999 $
  (4) 50 000 $ - 74 999 $
  (5) 75 000 $ - 99 999 $

(6) 100 000 $ - 149 999 $
(7) 150 000 $ - 199 999 $
(8) 200 000 $ or more

```
##              SDC_INCOME    n percent
##    1_Less than 24 999$ 1371    6.4%
##    2_25 000$ - 49 999$ 3207   15.0%
##    3_50 000$ - 74 999$ 4051   19.0%
##    4_75 000$ - 99 999$ 4162   19.5%
##  5_100 000$ - 149 999$ 4771   22.4%
##  6_150 000$ - 199 999$ 2204   10.3%
##      7_200 000$ or more 1547    7.3%
```

WRK_STUDENT Variable representing if a participant is a student or not.

(0) Participant is not a student
(1) Participant is a student

```
##  WRK_STUDENT     n percent
##           0 21118  99.1%
##           1   195   0.9%
```

SDC_EDU_LEVEL Variable representing the education level of participants.

(0) None
(1) Elementary school
(2) High school
(3) Trade, technical or vocational school, apprenticeship training or technical CEGEP
(4) Diploma from a community college, pre-university CEGEP or non-university certificate
(5) University certificate below bachelor's level
(6) Bachelor's degree
(7) Graduate degree (MSc, MBA, MD, PhD, etc.)

```
##                                 SDC_EDU_LEVEL    n percent
##                 1_Elementary school or less   267    1.3%
##                                2_High school 3803   17.8%
##       3_Trade, technical or vocational school 1775    8.3%
##             4_Diploma from a community college 5186   24.3%
##  5_University certificate below bachelor's level  878    4.1%
##                            6_Bachelor's degree 5996   28.1%
##                             7_Graduate degree 3408   16.0%
```

Linear Regression

Behavioural Variables

	Dependent: PM_BMI_SR		unit	value	OR (univariable
28	SMK_CIG_CUR_FREQ	0_Does not smoke currently	Mean (sd)	27.6 (5.6)	-
29		1_Current occasional smoker	Mean (sd)	27.7 (5.8)	0.06 (-0.42 to 0
30		2_Current daily smoker	Mean (sd)	27.8 (6.1)	0.17 (-0.13 to 0
31		3_Never smoked	Mean (sd)	27.1 (5.5)	-0.50 (-0.66 to -
10	PA_LEVEL_SHORT	1_Low level of PA	Mean (sd)	28.1 (6.1)	-
11		2_Moderate level of PA	Mean (sd)	27.5 (5.6)	-0.63 (-0.83 to -
12		3_High level of PA	Mean (sd)	26.7 (5.3)	-1.38 (-1.56 to -
1	ALC_CUR_FREQ	0_Never	Mean (sd)	28.4 (6.1)	-

	Dependent: PM_BMI_SR		unit	value	OR (univariable
2		1_Less than once a month	Mean (sd)	27.8 (6.0)	-0.59 (-0.94 to -
3		2_About once a month	Mean (sd)	27.5 (5.7)	-0.87 (-1.26 to -
4		3_2 to 3 times a month	Mean (sd)	27.5 (5.7)	-0.92 (-1.28 to -
5		4_Once a week	Mean (sd)	26.8 (5.2)	-1.58 (-1.95 to -
6		5_2 to 3 times a week	Mean (sd)	27.0 (5.3)	-1.39 (-1.73 to -
7		6_4 to 5 times a week	Mean (sd)	27.0 (5.4)	-1.35 (-1.72 to -
8		7_6 to 7 times a week	Mean (sd)	27.3 (5.4)	-1.07 (-1.44 to -
9	FRUIT_VEG	[0.0,51.0]	Mean (sd)	27.3 (5.6)	-0.15 (-0.18 to -
13	SDC_AGE_CALC	[30.0,74.0]	Mean (sd)	27.3 (5.6)	0.04 (0.03 to 0.
21	SDC_INCOME	1_Less than 24 999$	Mean (sd)	28.0 (6.4)	-
22		2_25 000$ - 49 999$	Mean (sd)	27.7 (5.8)	-0.38 (-0.73 to -
23		3_50 000$ - 74 999$	Mean (sd)	27.5 (5.6)	-0.51 (-0.86 to -
24		4_75 000$ - 99 999$	Mean (sd)	27.4 (5.4)	-0.67 (-1.01 to -
25		5_100 000$ - 149 999$	Mean (sd)	27.1 (5.5)	-0.92 (-1.26 to -
26		6_150 000$ - 199 999$	Mean (sd)	26.9 (5.6)	-1.12 (-1.50 to -
27		7_200 000$ or more	Mean (sd)	26.9 (5.2)	-1.12 (-1.53 to -
32	WRK_STUDENT	0	Mean (sd)	27.4 (5.6)	-
33		1	Mean (sd)	26.3 (5.8)	-1.04 (-1.83 to -
14	SDC_EDU_LEVEL	1_Elementary school or less	Mean (sd)	28.7 (5.5)	-
15		2_High school	Mean (sd)	28.1 (5.7)	-0.67 (-1.36 to 0
16		3_Trade, technical or vocational school	Mean (sd)	28.1 (5.6)	-0.65 (-1.37 to 0
17		4_Diploma from a community college	Mean (sd)	27.4 (5.7)	-1.35 (-2.04 to -
18		5_University certificate below bachelor's level	Mean (sd)	27.2 (5.8)	-1.57 (-2.34 to -
19		6_Bachelor's degree	Mean (sd)	27.0 (5.5)	-1.78 (-2.46 to -
20		7_Graduate degree	Mean (sd)	26.7 (5.4)	-2.02 (-2.72 to -

Below is the same model output but includes the model descriptive statistics

```
## Table printed with `knitr::kable()`, not {gt}. Learn why at
## https://www.danieldsjoberg.com/gtsummary/articles/rmarkdown.html
## To suppress this message, include `message = FALSE` in code chunk header.
```

Characteristic	Beta	95% CI	p-value
SMK_CIG_CUR_FREQ			
0_Does not smoke currently	—	—	
1_Current occasional smoker	0.10	-0.38, 0.59	0.7
2_Current daily smoker	0.02	-0.27, 0.32	0.9
3_Never smoked	-0.51	-0.67, -0.35	<0.001
PA_LEVEL_SHORT			
1_Low level of PA	—	—	
2_Moderate level of PA	-0.54	-0.73, -0.34	<0.001
3_High level of PA	-1.2	-1.4, -1.0	<0.001
ALC_CUR_FREQ			
0_Never	—	—	
1_Less than once a month	-0.60	-0.94, -0.26	<0.001
2_About once a month	-0.80	-1.2, -0.40	<0.001
3_2 to 3 times a month	-0.83	-1.2, -0.48	<0.001
4_Once a week	-1.5	-1.9, -1.2	<0.001
5_2 to 3 times a week	-1.3	-1.6, -0.95	<0.001
6_4 to 5 times a week	-1.3	-1.6, -0.90	<0.001
7_6 to 7 times a week	-1.0	-1.4, -0.63	<0.001

Characteristic	Beta	95% CI	p-value
FRUIT_VEG	-0.11	-0.14, -0.08	<0.001

PM BMI SR
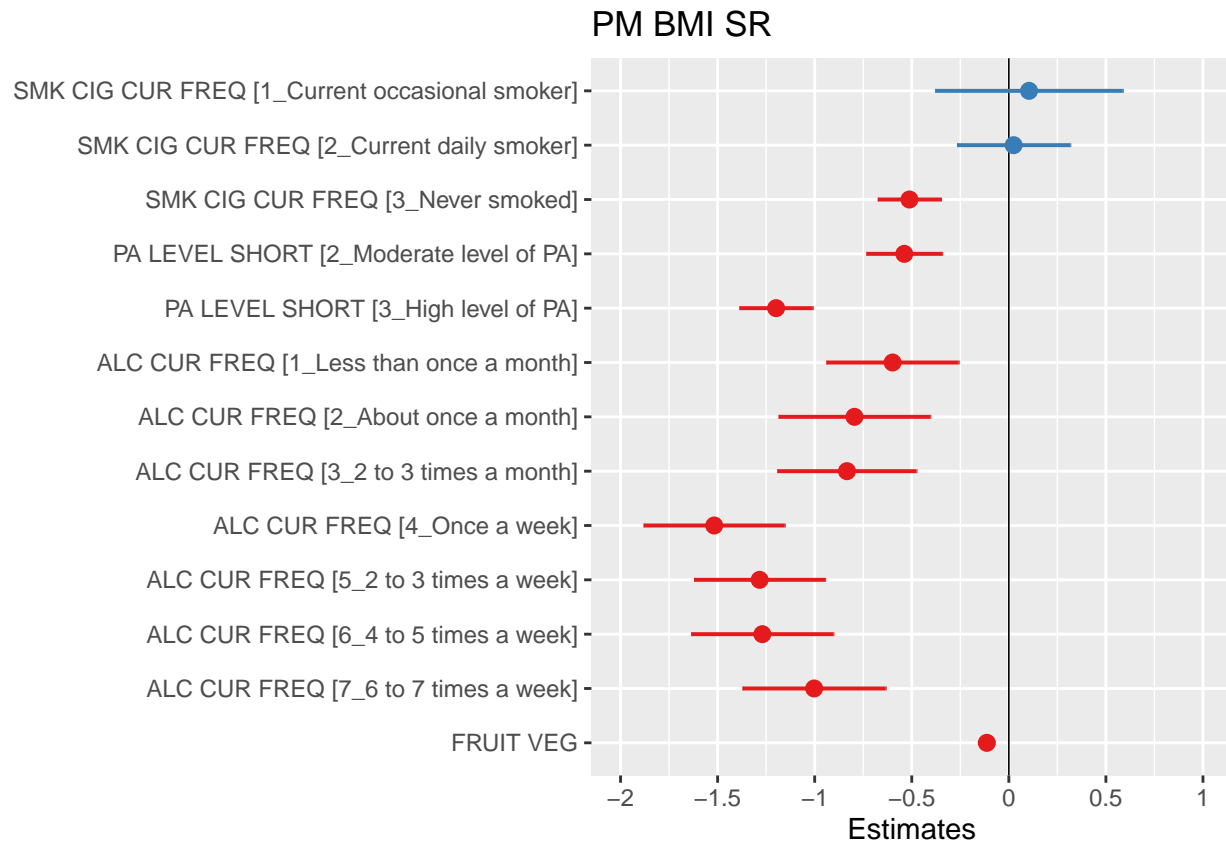
Social and Demographic Variables

```
## Table printed with `knitr::kable()`, not {gt}. Learn why at
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```

Characteristic	Beta	95% CI	p-value
SDC_GENDER			
Female	—	—	
Male	1.3	1.1, 1.4	<0.001
SDC_AGE_CALC	0.02	0.02, 0.03	<0.001
SDC_INCOME			
1_Less than 24 999$	—	—	
2_25 000$ - 49 999$	-0.45	-0.81, -0.10	0.011
3_50 000$ - 74 999$	-0.54	-0.88, -0.20	0.002
4_75 000$ - 99 999$	-0.58	-0.92, -0.23	<0.001
5_100 000$ - 149 999$	-0.77	-1.1, -0.43	<0.001
6_150 000$ - 199 999$	-0.85	-1.2, -0.47	<0.001
7_200 000$ or more	-0.84	-1.3, -0.43	<0.001
WRK_STUDENT			
0	—	—	
1	-0.56	-1.3, 0.23	0.2

Characteristic	Beta	95% CI	p-value
SDC__EDU__LEVEL			
1_Elementary school or less	—	—	
2_High school	-0.22	-0.91, 0.47	0.5
3_Trade, technical or vocational school	-0.41	-1.1, 0.31	0.3
4_Diploma from a community college	-0.67	-1.4, 0.02	0.055
5_University certificate below bachelor's level	-1.0	-1.8, -0.27	0.008
6_Bachelor's degree	-1.2	-1.8, -0.46	0.001
7_Graduate degree	-1.5	-2.2, -0.79	<0.001

PM BMI SR
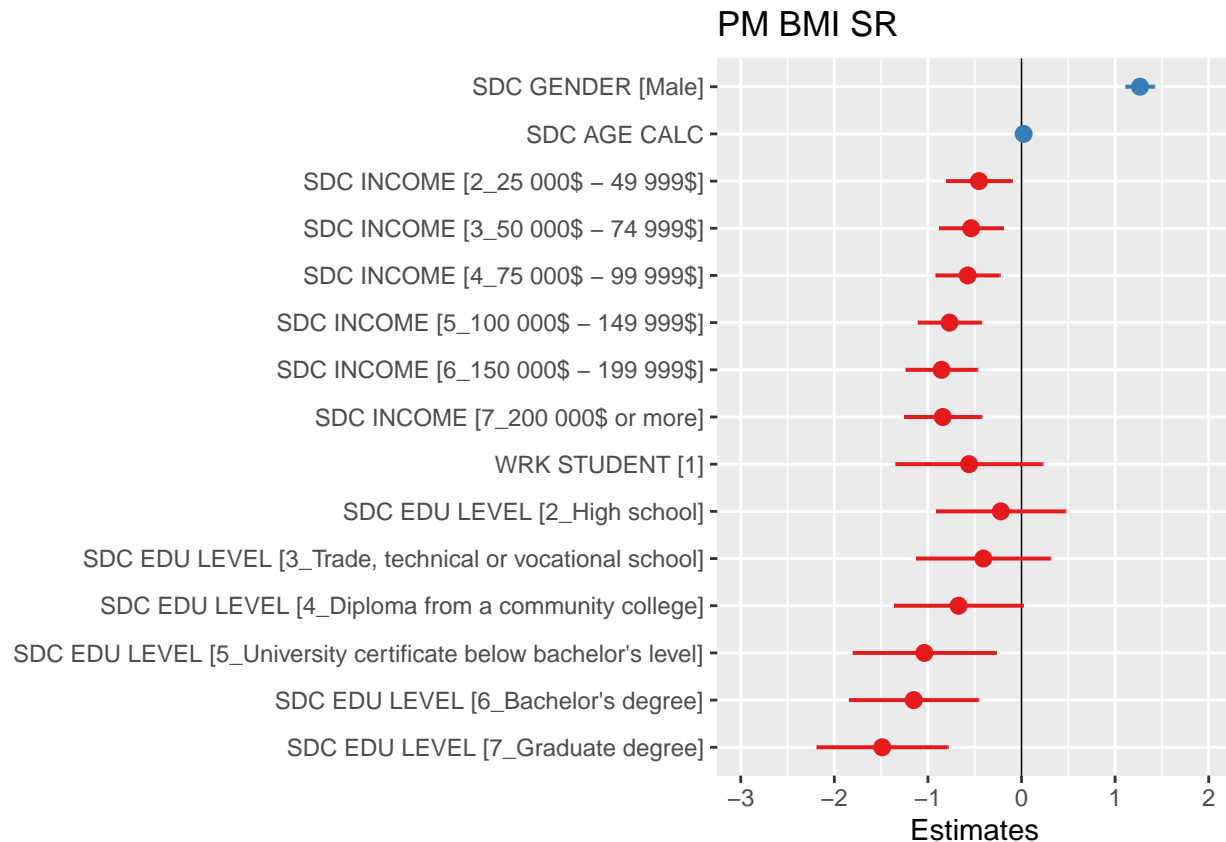
Full model

```
## Table printed with `knitr::kable()`, not {gt}. Learn why at
## https://www.danieldsjoberg.com/gtsummary/articles/rmarkdown.html
## To suppress this message, include `message = FALSE` in code chunk header.
```

Characteristic	Beta	95% CI	p-value
SDC__GENDER			
Female	—	—	
Male	1.3	1.1, 1.5	<0.001
SDC__AGE__CALC	0.03	0.02, 0.04	<0.001
SDC__INCOME			
1_Less than 24 999$	—	—	
2_25 000$ - 49 999$	-0.37	-0.72, -0.02	0.037
3_50 000$ - 74 999$	-0.35	-0.69, -0.01	0.045

Characteristic	Beta	95% CI	p-value
4_75 000$ - 99 999$	-0.33	-0.67, 0.02	0.061
5_100 000$ - 149 999$	-0.48	-0.81, -0.14	0.006
6_150 000$ - 199 999$	-0.50	-0.88, -0.12	0.011
7_200 000$ or more	-0.44	-0.85, -0.02	0.039
WRK_STUDENT			
0	—	—	
1	-0.45	-1.2, 0.32	0.3
SDC_EDU_LEVEL			
1_Elementary school or less	—	—	
2_High school	-0.17	-0.86, 0.51	0.6
3_Trade, technical or vocational school	-0.28	-0.99, 0.44	0.4
4_Diploma from a community college	-0.58	-1.3, 0.10	0.10
5_University certificate below bachelor's level	-0.91	-1.7, -0.15	0.019
6_Bachelor's degree	-0.92	-1.6, -0.24	0.008
7_Graduate degree	-1.2	-1.9, -0.52	<0.001
SMK_CIG_CUR_FREQ			
0_Does not smoke currently	—	—	
1_Current occasional smoker	0.34	-0.14, 0.82	0.2
2_Current daily smoker	0.11	-0.18, 0.40	0.5
3_Never smoked	-0.32	-0.48, -0.15	<0.001
PA_LEVEL_SHORT			
1_Low level of PA	—	—	
2_Moderate level of PA	-0.50	-0.69, -0.30	<0.001
3_High level of PA	-1.2	-1.4, -1.0	<0.001
ALC_CUR_FREQ			
0_Never	—	—	
1_Less than once a month	-0.41	-0.74, -0.07	0.018
2_About once a month	-0.61	-0.99, -0.22	0.002
3_2 to 3 times a month	-0.68	-1.0, -0.32	<0.001
4_Once a week	-1.4	-1.8, -1.1	<0.001
5_2 to 3 times a week	-1.3	-1.6, -0.94	<0.001
6_4 to 5 times a week	-1.3	-1.7, -0.96	<0.001
7_6 to 7 times a week	-1.2	-1.6, -0.83	<0.001
FRUIT_VEG	-0.04	-0.07, -0.01	0.013

PM BMI SR

Estimates

SDC GENDER [Male]
SDC AGE CALC
SDC INCOME [2_25 000$ – 49 999$]
SDC INCOME [3_50 000$ – 74 999$]
SDC INCOME [4_75 000$ – 99 999$]
SDC INCOME [5_100 000$ – 149 999$]
SDC INCOME [6_150 000$ – 199 999$]
SDC INCOME [7_200 000$ or more]
WRK STUDENT [1]
SDC EDU LEVEL [2_High school]
SDC EDU LEVEL [3_Trade, technical or vocational school]
SDC EDU LEVEL [4_Diploma from a community college]
SDC EDU LEVEL [5_University certificate below bachelor's level]
SDC EDU LEVEL [6_Bachelor's degree]
SDC EDU LEVEL [7_Graduate degree]
SMK CIG CUR FREQ [1_Current occasional smoker]
SMK CIG CUR FREQ [2_Current daily smoker]
SMK CIG CUR FREQ [3_Never smoked]
PA LEVEL SHORT [2_Moderate level of PA]
PA LEVEL SHORT [3_High level of PA]
ALC CUR FREQ [1_Less than once a month]
ALC CUR FREQ [2_About once a month]
ALC CUR FREQ [3_2 to 3 times a month]
ALC CUR FREQ [4_Once a week]
ALC CUR FREQ [5_2 to 3 times a week]
ALC CUR FREQ [6_4 to 5 times a week]
ALC CUR FREQ [7_6 to 7 times a week]
FRUIT VEG

−3   −2   −1   0   1   2

Estimates