**Supplemental Digital Content**

Calibration Models for Estimation of Physical Activity and Sedentary Behavior

*This content provides additional details to explain how the final and alternative models in Table 2 can be used to predict objectively measured SB and MVPA*

Calibration Model Equations for SB

Estimates of objectively assessed SB can be obtained for individuals with observed values for PARsed, PARMVPA, Female, Age, Education (not necessary for the alternative model), and BMI. For example, the predicted value of SB for a group of individuals with a mean response with values of PARsedk, PARMVPAk, Femalek, Agek, Educationk, and BMIk using the final prediction model is as follows:

Sed\_Predk = -235.574 + (0.585 × PARsedk) + (-0.296 × PARMVPAk) + (68.166 × Femalek) + (4.556 × Agek) + (70.210 × Educationk) + (17.574 × BMIk) + (-0.011 × PARsedk x BMIk) + (-1.096 × Agek × Educationk).

The 95% confidence interval for the group mean response Sed\_Predk is as follows:

Sed\_Predk ± t1157,0.975\*SE(Sed\_Predk) where t1157,0.975 is the 0.975 quantile of a t-distribution with 1157 degrees of freedom and SE(Sed\_Predk) is the standard error of the mean response, Sed\_Predk.[[1]](#footnote-1)

It is important to note that values for each of these variables must be within bounds used to develop the model. Values of PARsed must be between 70 and 992 minutes/day. Values of PARMVPA must be between 0 and 765 minutes/day. The value for Female must be 1 if the individual is a female and 0 if the individual is a male. The individual’s Age must be between 20 and 71. The individual’s Education must be specified as 1 if the individual has a high school diploma or less, 2 if the individual has some college, or 3 if the individual has a college degree or higher. Values for BMI must be between 16 kg/m2 and 72 kg/m2. Model predictions may not be appropriate outside of these ranges specified due to potential hidden extrapolations. The equations are designed to provide group level estimates of MVPA and may not hold for individual estimation.

Calibration Model Equations for MVPA

Estimates of objectively assessed MVPA can be obtained with observed values for *PARsed*, *PARMVPA*, *Female*, *Age*, *Education*, and *BMI*. A predicted value of MVPA for individuals with a mean response with values of *PARsedk*, *PARMVPAk*, *Femalek*, *Agek*, *Educationk*, and *BMIk* using the final prediction model is as follows:

*MVPA\_Predk* = Exp{*μk*},

where,   
*μk* = 13.614 + [0.207 × log(*PARMVPAk*)] + [-1.150 × log(*PARSedk*)] + [0.595 × *Femalek*] + [-0.028 × *Agek*] + [-0.397 × *Educationk*] + [-0.199 × *BMIk*] + [0.026 × *PARsedk* × *BMIk*] + [0.005 × *Agek* × *Educationk*] + [-0.046 × *Femalek* × *BMIk*]

and where, Exp{ } represents the exponential function and log( ) represents the natural logarithm formula.

The 95% confidence interval for the mean response *MVPA\_Predk* is as follows:

Exp{*μk* ± z0.975\*SE(*MVPA\_Predk*)},

where, z0.975 is the 0.975 quantile of a standard normal distribution and SE(*MVPA\_Predk*) is the standard error of the mean response, *MVPA\_Predk*. [[2]](#footnote-2)

As with the SB models, the values for each of these variables must be within bounds used to develop the model. Values of *PARsed* must be between 70 and 992 minutes. Values of *PARMVPA* must be between 0 and 765 minutes/day. The value for *Female* must be 1 if the individual is a female and 0 if the individual is a male. The individual’s *Age* must be between 20 and 71. The individual’s *Education* must be specified as 1 if the individual has a high school diploma or less, 2 if the individual has some college, or 3 if the individual has a college degree or higher. Values for *BMI* must be between 16 and 72. Model predictions may not be appropriate outside of these ranges specified due to potential hidden extrapolations.

Please note, the equations are designed to provide group level estimates of MVPA and may not hold for individual estimation.

1. A more technical formula for SE(Sed\_Predk), using matrix notation for multiple linear regression models, can be found in most textbooks on linear models. [↑](#footnote-ref-1)
2. A more technical formula for SE(*MVPA\_Predk*), using matrix notation for generalized linear regression models, can be found in most textbooks on linear models. [↑](#footnote-ref-2)