Derived Variables- Basic Activities of Daily Living (ADL) & Instrumental Activities of Daily Living (IAL)

(Tracking and Comprehensive Assessments)

Activities of daily living are measured in the CLSA using modified questions from the Older Americans' Resources and Services (OARS) Multidimensional Functional Assessment Questionnaire (1). Participants are questioned on seven basic activities of daily living in the Basic Activities of Daily Living module (ADL) and seven instrumental activities of daily living in the Instrumental Activities of Daily Living module (IAL).

There are four derived variables (DVs) in the ADL module, composed of data obtained in both the ADL and IAL modules. The DV indicating some or complete dependence for meal preparation is used with the DV for the Basic and Instrumental Activities of Daily Living Classification excluding meal preparation to create the DV for the overall Basic and Instrumental Activities of Daily Living Classification, as is specified in Table 11 of the OARS manual (2).The overall Basic and Instrumental Activities of Daily Living Classification is a 5-point scale ranging from no impairment to total impairment. The fourth DV is the sum of some and complete dependence for all basic activities of daily living and all instrumental activities of daily living, except for meal preparation. Furthermore, there is also a variable indicating the number of missing items from all basic activities of daily living and all instrumental activities of daily living, except meal preparation.

When there are missing items, the CLSA uses the partial information available to make the Basic and Instrumental Activities of Daily Living Classification, if making that classification is indeed still feasible. To do this, we consider the number of missing items and determine if the current classification could be altered if those missing values were known. If it could not, then a classification is made. If it could alter the classification, the partial information available is deemed inconclusive and the classification is considered missing.

These DVs are created in both the Tracking and Comprehensive assessments. For simplicity, we describe them here for the Tracking assessment; however, the process of creating the DVs for the Comprehensive assessment is identical. Distinguishing the two are the variable name endings; all variable names in the Tracking assessment end in 'TRM' and in the Comprehensive assessment in 'COM'. For example, the DV named ADL_DSUM_**TRM** in the Tracking assessment is named ADL_DSUM_**COM** in the Comprehensive assessment.

References

(1) Fillenbaum GG, Smyer MA. The development, validity, and reliability of the OARS multidimensional functional assessment questionnaire. J Gerontol 1981; 36(4):428-434.

(2) Fillenbaum GG. (2005) Multidimensional functional assessment of older adults: the Duke Older Americans Resources and Services Procedures. Hillsdale, NJ; Lawrence Erlbaum Associates, Inc.

1) OARS Scale: Number of Missing Items (Excluding Meal Preparation)

Variable Name: ADL_NBRMIS_TRM

Description: This variable counts the total number of daily activities, both basic and instrumental, except for meal preparation, for which the respondent did not provide an answer of their ability to perform the task.

Based on:

ADL_ABLDR_TRM	ADL_HPDR_TRM	ADL_UNDR_TRM	ADL_ABLFD_TRM	ADL_HPFD_TRM	ADL_UNFD_TRM
ADL_ABLAP_TRM	ADL_HPAP_TRM	ADL_UNAP_TRM	ADL_ABLWK_TRM	ADL_HPWK_TRM	ADL_UNWK_TRM
ADL_ABLBD_TRM	ADL_HPBD_TRM	ADL_UNBD_TRM	ADL_ABLBT_TRM	ADL_HPBT_TRM	ADL_UNBT_TRM
ADL_BATH_TRM	ADL_INCNT_TRM	IAL_ABLTEL_TRM	IAL_HPTEL_TRM	IAL_UNTEL_TRM	IAL_ABLTRV_TRM
IAL_HPTRV_TRM	IAL_UNTRV_TRM	IAL_ABLGRO_TRM	IAL_HPGRO_TRM	IAL_UNGRO_TRM	IAL_ABLWRK_TRM
IAL_HPWRK_TRM	IAL_UNWRK_TRM	IAL_ABLMED_TRM	IAL_HPMED_TRM	IAL_UNMED_TRM	IAL_ABLMO_TRM
IAL_HPMO_TRM	IAL_UNMO_TRM				

Temporary Indicator Variables: In order to count the number of missing items, we first create 13 temporary indicator variables, ADL_IMDR_TRM, ADL_IMFD_TRM, ADL_IMAP_TRM, ADL_IMWK_TRM, ADL_IMBD_TRM, ADL_IMBT_TRM, ADL_IMBATH_TRM, ADL_IMTEL_TRM, ADL_IMTRV_TRM, ADL_IMGRO_TRM, ADL_IMWRK_TRM, ADL_IMMED_TRM, and ADL_IMMO_TRM, to indicate if any of the 13 activities are missing responses of participants' abilities to perform the task. These indicator variables are not included in the CLSA dataset.

Value	Condition(s)	Description
ADL_IMDR_TRM = 1	ADL_ABLDR_TRM ≠1 and ADL_HPDR_TRM ≠1 and ADL_UNDR_TRM ≠1	Missing value
ADL_IMDR_TRM = 0	ADL_ABLDR_TRM =1 or ADL_HPDR_TRM =1 or ADL_UNDR_TRM =1	Not missing value
ADL_IMFD_TRM = 1	ADL_ABLFD_TRM ≠1 and ADL_HPFD_TRM ≠1 and ADL_UNFD_TRM ≠1	Missing value
ADL_IMFD_TRM = 0	ADL_ABLFD_TRM =1or ADL_HPFD_TRM =1 or ADL_UNFD_TRM =1	Not missing value
ADL_IMAP_TRM = 1	ADL_ABLAP_TRM ≠1and ADL_HPAP_TRM ≠1 and ADL_UNAP_TRM ≠1	Missing value
ADL_IMAP_TRM = 0	ADL_ABLAP_TRM =1or ADL_HPAP_TRM =1 or ADL_UNAP_TRM =1	Not missing value
ADL_IMWK_TRM = 1	ADL_ABLWK_TRM ≠1and ADL_HPWK_TRM ≠1 and ADL_UNWK_TRM ≠1	Missing value
ADL_IMWK_TRM = 0	ADL_ABLWK_TRM =1or	Not missing value

	ADL_HPWK_TRM =1 or ADL_UNWK_TRM =1	
ADL_IMBD_TRM = 1	ADL_ABLBD_TRM ≠1and ADL_HPBD_TRM ≠1 and ADL_UNBD_TRM ≠1	Missing value
ADL_IMBD_TRM = 0	ADL_ABLBD_TRM =1 or ADL_HPBD_TRM =1 or ADL_UNBD_TRM =1	Not missing value
ADL_IMBT_TRM = 1	ADL_ABLBT_TRM ≠1 and ADL_HPBT_TRM ≠1 and ADL_UNBT_TRM ≠1	Missing value
ADL_IMBT_TRM = 0	ADL_ABLBT_TRM =1 or ADL_HPBT_TRM =1 or ADL_UNBT_TRM =1	Not missing value
ADL_IMBATH_TRM = 1	ADL_BATH_TRM ≠ (1, 2) or (ADL_BATH_TRM = 1 and ADL_INCNT_TRM ≠(1, 2, 3))	Missing value
ADL_IMBATH_TRM = 0	(ADL_BATH_TRM = 1 and ADL_INCNT_TRM =(1, 2, 3)) or ADL_BATH_TRM = 2	Not missing value
ADL_IMTEL_TRM = 1	IAL_ABLTEL_TRM ≠1 and IAL_HPTEL_TRM ≠1 and IAL_UNTEL_TRM ≠1	Missing value

ADL_IMTEL_TRM = 0	IAL_ABLTEL_TRM =1 or IAL_HPTEL_TRM =1 or IAL_UNTEL_TRM =1	Not missing value
ADL_IMTRV_TRM = 1	IAL_ABLTRV_TRM ≠1 and IAL_HPTRV_TRM ≠1 and IAL_UNTRV_TRM ≠1	Missing value
ADL_IMTRV_TRM = 0	IAL_ABLTRV_TRM =1 or IAL_HPTRV_TRM =1 or IAL_UNTRV_TRM =1	Not missing value
ADL_IMGRO_TRM = 1	IAL_ABLGRO_TRM ≠1 and IAL_HPGRO_TRM ≠1 and IAL_UNGRO_TRM ≠1	Missing value
ADL_IMGRO_TRM = 0	IAL_ABLGRO_TRM =1 or IAL_HPGRO_TRM =1 or IAL_UNGRO_TRM =1	Not missing value
ADL_IMWRK_TRM = 1	IAL_ABLWRK_TRM ≠1 and IAL_HPWRK_TRM ≠1 and IAL_UNWRK_TRM ≠1	Missing value
ADL_IMWRK_TRM = 0	IAL_ABLWRK_TRM =1 or IAL_HPWRK_TRM =1 or IAL_UNWRK_TRM =1	Not missing value
ADL_IMMED_TRM = 1	IAL_ABLMED_TRM ≠1 and IAL_HPMED_TRM ≠1 and	Missing value

	IAL_UNMED_TRM ≠1	
ADL_IMMED_TRM = 0	IAL_ABLMED_TRM =1 or IAL_HPMED_TRM =1 or IAL_UNMED_TRM =1	Not missing value
ADL_IMMO_TRM = 1	IAL_ABLMO_TRM ≠1 and IAL_HPMO_TRM ≠1 and IAL_UNMO_TRM ≠1	Missing value
ADL_IMMO_TRM = 0	IAL_ABLMO_TRM =1 or IAL_HPMO_TRM =1 or IAL_UNMO_TRM =1	Not missing value

Variable Specifications:

Value	Description	Notes
ADL_IMDR_TRM + ADL_IMFD_TRM + ADL_IMAP_TRM + ADL_IMWK_TRM + ADL_IMBD_TRM + ADL_IMBT_TRM + ADL_IMBATH_TRM + ADL_IMTEL_TRM + ADL_IMTRV_TRM + ADL_IMGRO_TRM + ADL_IMWRK_TRM + ADL_IMMED_TRM + ADL_IMMO_TRM	Number of missing items, excluding meal preparation.	(Min: 0; Max: 13)

2) OARS Scale: Some or Complete Dependence for Meal Preparation - Intermediate Derived Variable

Derived Variable Name: ADL_DMEA_TRM

Description: This variable indicates whether a respondent is able to prepare their own meals. The authors of the OARS instrument determined that the inability to prepare one's own meals without help is more detrimental to independent living than all other activities of daily living and hence, the meal preparation component of the questionnaire should be considered separately when determining functional capacity (2).

This DV is similar to the variable "ADLDMEA" in Statistics Canada's Canadian Community Health Survey (CCHS) – Healthy Aging.

Based on: IAL_ABLML_TRM, IAL_HPML_TRM, IAL_UNML_TRM

Derived Variable Specifications:

Value	Condition(s)	Description
9	IAL_ABLML_TRM ≠ 1 and IAL_HPML_TRM ≠ 1 and IAL_UNML_TRM ≠ 1	Required questions were not answered (don't know, refusal, not stated)
1	IAL_HPML_TRM = 1 or IAL_UNML_TRM = 1	Needs help to prepare meals or completely unable to prepare meals
0	IAL_ABLML_TRM = 1	Able to prepare own meals without help

3) OARS scale: Sum of Some Dependence and Complete Dependence (Excluding Meal Preparation) – Temporary Variable

Derived Variable Name: ADL_TDSUM_TRM

Description: This variable calculates the total number of times the respondent indicated that they need help with an activity or that they are completely unable to do an activity in the ADL and IAL modules, excluding the questions regarding meal preparation ability (IAL_ABLML_TRM, IAL_HPML_TRM, and IAL_UNML_TRM). It ignores missing values and cannot be interpreted without considering the number of missing items, ADL_NBRMIS_TRM. This variable in not provided in the CLSA dataset.

Note: In the Canadian Community Health Survey (CCHS) – Healthy Aging document on Derived Variables, Statistics Canada notes that the authors of the OARS manual mistakenly omitted the questions regarding continence from their calculations of functional capacity. The variables ADL_BATH_TRM (ability to get to bathroom on time) and ADL_INCNT_TRM (frequency of wetting and

soiling self) <u>are</u> included in our calculations. For the purposes of obtaining the sum of some and complete dependence, the answers to these questions are interpreted as follows:

Conditions	Interpretation
ADL_BATH_TRM=2 or (ADL_BATH_TRM=1 and ADL_INCNT_TRM=1)	Can perform activity without help
ADL_BATH_TRM=1 and ADL_INCNT_TRM=2	Needs some help to perform activity
ADL_BATH_TRM=1 and ADL_INCNT_TRM=3	Completely unable to perform activity

Based on:

ADL_ABLDR_TRM	ADL_HPDR_TRM	ADL_UNDR_TRM	ADL_ABLFD_TRM	ADL_HPFD_TRM	ADL_UNFD_TRM
ADL_ABLAP_TRM	ADL_HPAP_TRM	ADL_UNAP_TRM	ADL_ABLWK_TRM	ADL_HPWK_TRM	ADL_UNWK_TRM
ADL_ABLBD_TRM	ADL_HPBD_TRM	ADL_UNBD_TRM	ADL_ABLBT_TRM	ADL_HPBT_TRM	ADL_UNBT_TRM
ADL_BATH_TRM	ADL_INCNT_TRM	IAL_ABLTEL_TRM	IAL_HPTEL_TRM	IAL_UNTEL_TRM	IAL_ABLTRV_TRM
IAL_HPTRV_TRM	IAL_UNTRV_TRM	IAL_ABLGRO_TRM	IAL_HPGRO_TRM	IAL_UNGRO_TRM	IAL_ABLWRK_TRM
IAL_HPWRK_TRM	IAL_UNWRK_TRM	IAL_ABLMED_TRM	IAL_HPMED_TRM	IAL_UNMED_TRM	IAL_ABLMO_TRM
IAL_HPMO_TRM	IAL_UNMO_TRM				

Temporary Reformatting:

To facilitate the counting of the number of times respondents indicated that they need help with an activity or that they are completely unable to do an activity, the following temporary variables were created with binary response formats. These variables are not part of the CLSA dataset.

Temporary Variable Name and Assigned Value	Condition(s)
ADL_THPDR_TRM = 1	ADL_HPDR_TRM = 1
ADL_THPDR_TRM = 0	ADL_HPDR_TRM ≠ 1
ADL_TUNDR_TRM = 1	ADL_UNDR_TRM = 1
ADL_TUNDR_TRM = 0	ADL_UNDR_TRM ≠ 1
ADL_THPFD_TRM = 1	ADL_HPFD_TRM = 1
ADL_THPFD_TRM = 0	ADL_HPFD_TRM ≠ 1
ADL_TUNFD_TRM = 1	ADL_UNFD_TRM = 1
ADL_TUNFD_TRM = 0	ADL_UNFD_TRM ≠ 1
ADL_THPAP_TRM = 1	ADL_HPAP_TRM = 1
ADL_THPAP_TRM = 0	ADL_HPAP_TRM ≠ 1
ADL_TUNAP_TRM = 1	ADL_UNAP_TRM = 1

ADL_TUNAP_TRM = 0	ADL_UNAP_TRM ≠ 1
ADL_THPWK_TRM = 1	ADL_HPWK_TRM = 1
ADL_THPWK_TRM = 0	ADL_HPWK_TRM ≠ 1
ADL_TUNWK_TRM = 1	ADL_UNWK_TRM = 1
ADL_TUNWK_TRM = 0	ADL_UNWK_TRM ≠ 1
ADL_THPBD_TRM = 1	ADL_HPBD_TRM = 1
ADL_THPBD_TRM = 0	ADL_HPBD_TRM ≠ 1
ADL_TUNBD_TRM = 1	ADL_UNBD_TRM = 1
ADL_TUNBD_TRM = 0	ADL_UNBD_TRM ≠ 1
ADL_THPBT_TRM = 1	ADL_HPBT_TRM = 1
ADL_THPBT_TRM = 0	ADL_HPBT_TRM ≠ 1
ADL_TUNBT_TRM = 1	ADL_UNBT_TRM = 1
ADL_TUNBT_TRM = 0	ADL_UNBT_TRM ≠ 1
ADL_TINCNT_TRM = 1	ADL_INCNT_TRM = (2, 3)
ADL_TINCNT_TRM = 0	ADL_INCNT_TRM ≠ (2, 3)
IAL_THPTEL_TRM = 1	IAL_HPTEL_TRM = 1
IAL_THPTEL_TRM = 0	IAL_HPTEL_TRM ≠ 1
IAL_TUNTEL_TRM = 1	IAL_UNTEL_TRM = 1
IAL_TUNTEL_TRM = 0	IAL_UNTEL_TRM ≠ 1
IAL_THPTRV_TRM = 1	IAL_HPTRV_TRM = 1
IAL_THPTRV_TRM = 0	IAL_HPTRV_TRM ≠ 1
IAL_TUNTRV_TRM = 1	IAL_UNTRV_TRM = 1
IAL_TUNTRV_TRM = 0	IAL_UNTRV_TRM ≠ 1
IAL_THPGRO_TRM = 1	IAL_HPGRO_TRM = 1
IAL_THPGRO_TRM = 0	IAL_HPGRO_TRM ≠ 1
IAL_TUNGRO_TRM = 1	IAL_UNGRO_TRM = 1
IAL_TUNGRO_TRM = 0	IAL_UNGRO_TRM ≠ 1
IAL_THPWRK_TRM = 1	IAL_HPWRK_TRM = 1
IAL_THPWRK_TRM = 0	IAL_HPWRK_TRM ≠ 1
IAL_TUNWRK_TRM = 1	IAL_UNWRK_TRM = 1
IAL_TUNWRK_TRM = 0	IAL_UNWRK_TRM ≠ 1
IAL_THPMED_TRM = 1	IAL_HPMED_TRM = 1
IAL_THPMED_TRM = 0	IAL_HPMED_TRM ≠ 1
IAL_TUNMED_TRM = 1	IAL_UNMED_TRM = 1
IAL_TUNMED_TRM = 0	IAL_UNMED_TRM ≠ 1
IAL_THPMO_TRM = 1	IAL_HPMO_TRM = 1
IAL_THPMO_TRM = 0	IAL_HPMO_TRM ≠ 1
IAL_TUNMO_TRM = 1	IAL_UNMO_TRM = 1
IAL_TUNMO_TRM = 0	IAL_UNMO_TRM ≠ 1

Derived Variable Specifications:

Value	Description	Notes
ADL_THPDR_TRM +	Number of times	(min: 0;

ADL_TUNDR_TRM + ADL_THPFD_TRM + ADL_TUNFD_TRM + ADL_THPAP_TRM + ADL_TUNAP_TRM + ADL_THPWK_TRM + ADL_TUNWK_TRM + ADL_THPBD_TRM + ADL_TUNBD_TRM + ADL_THPBT_TRM + ADL_TUNBT_TRM + ADL_TINCNT_TRM + IAL_THPTEL_TRM + IAL_TUNTEL_TRM + IAL_THPTRV_TRM + IAL_TUNTRV_TRM + IAL_THPGRO_TRM + IAL_TUNGRO_TRM + IAL_THPWRK_TRM + IAL_TUNWRK_TRM + IAL_THPMED_TRM + IAL_TUNMED_TRM + IAL_THPMO_TRM + IAL_TUNMO_TRM	respondent answers that they need some help doing an activity or that they are completely unable to do an activity, ignoring missing values.	max: 13)

4) OARS scale: Basic and Instrumental Activities of Daily Living Classification (Excluding Meal Preparation) – Intermediate Derived Variable

Derived Variable Name: ADL_DCLST_TRM

Description: This variable categorizes the respondent's ability to perform activities of daily living based on the number of times they indicated that they need help with an activity or that they are completely unable to do an activity in the ADL and IAL modules, excluding the questions regarding meal preparation ability (IAL_ABLML_TRM, IAL_HPML_TRM, and IAL_UNML_TRM). The classification is done according to the instructions provided in Table 11 of the OARS manual (2). However, the CLSA has augmented the classification conditions to also take account of the number of missing items. If the possible values of those missing items would not change the results of a classification, then the classification can be made. Hence, some participants with missing items who would have otherwise had a missing classification can be classified. The classification values range from 0 (no problems performing activities of daily living) to 4 (complete inability in performing daily activities).

This DV is similar to the variable "ADLDCLST" in Statistics Canada's Canadian Community Health Survey (CCHS) – Healthy Aging. The difference between the two variables is in how they treat missing values. ADLDCLST will always be missing if any of the items, excluding meal preparation, are missing.

Based on: ADL_TDSUM_TRM, ADL_NBRMIS_TRM

Derived Variable Specifications:

Value	Condition(s)	Description
0	(ADL_TDSUM_TRM = 0 and ADL_NBRMIS_TRM = 0)	No activities of daily living problems
1	(ADL_TDSUM_TRM = (1, 2, 3) and ADL_NBRMIS_TRM = 0) or (ADL_TDSUM_TRM = (1, 2) and ADL_NBRMIS_TRM = 1) or (ADL_TDSUM_TRM = 1 and ADL_NBRMIS_TRM = 2)	Mild activities of daily living problems
2	(ADL_TDSUM_TRM = (4, 5) and ADL_NBRMIS_TRM = 0) or (ADL_TDSUM_TRM = 4 and ADL_NBRMIS_TRM = 1)	Moderate activities of daily living problems
3	(ADL_TDSUM_TRM = (6, 7) and ADL_NBRMIS_TRM = 0) or (ADL_TDSUM_TRM = 6 and ADL_NBRMIS_TRM = 1)	Severe activities of daily living problems
4	ADL_TDSUM_TRM = (8, 9, 10, 11, 12, 13)	Total activities of daily living problems
9	All other possible combinations of ADL_TDSUM_TRM and ADL_NBRMIS_TRM	Inconclusive classification due to missing values.

5) OARS scale: Basic and Instrumental Activities of Daily Living Classification

Derived Variable Name: ADL_DCLS_TRM

Description: This variable is an overall classification of a respondent's capacity to perform activities of daily living. It is based on the 5-point scale described in Table 11 of the OARS manual (2), which ranges from 2 (Excellent/Good) to 6 (Total Impairment). The CLSA has modified this scale so that the range is now 1 to 5, and the first category "Excellent/Good" has been renamed "No functional impairment". Higher values indicate greater impairment. This variable combines the functional status classification determined from all activities of daily living excluding meal preparation (ADL_DCLST_TRM) with the

meal preparation indicator (ADL_DMEA_TRM), creating an overall classification of functional capacity that assigns extra weight to the meal preparation component.

This DV is similar to the variable "ADLDCLS" in Statistics Canada's Canadian Community Health Survey (CCHS) – Healthy Aging. The difference between the two variables is in how they treat missing values. ADLDCLS will always be missing if any of the items are missing.

Based on: ADL_DMEA_TRM, ADL_DCLST_TRM

Derived Variable Specifications:

Value	Condition(s)	Description
1	ADL_DMEA_TRM = 0 and ADL_DCLST_TRM = 0	No functional impairment
2	ADL_DMEA_TRM = 0 and ADL_DCLST_TRM = 1	Mild impairment
3	(ADL_DMEA_TRM = 1 and ADL_DCLST_TRM = (0, 1)) or (ADL_DCLST_TRM = 2)	Moderate impairment
4	ADL_DCLST_TRM = 3	Severe impairment
5	ADL_DCLST_TRM = 4	Total impairment
9	All other possible combinations of ADL_DMEA_TRM and ADL_DCLST_TRM.	Inconclusive classification due to missing values

6) OARS scale: Sum of Some Dependence and Complete Dependence (Excluding Meal Preparation)

Derived Variable Name: ADL_DSUM_TRM

Description: This variable calculates the total number of times the respondent indicated that they need help with an activity or that they are completely unable to do an activity in the ADL and IAL modules, excluding the questions regarding meal preparation ability (IAL_ABLML_TRM, IAL_HPML_TRM, and IAL_UNML_TRM).If there are any missing items, it too is missing. However, it distinguishes between participants with missing items who have provided sufficient information for a Basic and Instrumental Activities of Daily Living Classification and those who have not.

This DV is similar to the variable "ADLDSUM" in Statistics Canada's Canadian Community Health Survey (CCHS) – Healthy Aging. The difference between the two variables is in the differentiation between

missing values for participants with and without a Basic and Instrumental Activities of Daily Living Classification.

Based on: ADL_TDSUM_TRM, ADL_NBRMIS_TRM, and ADL_DCLST_TRM

Derived Variable Specifications:

Value	Condition(s)	Description	Notes
ADL_TDSUM_TRM	ADL_NBRMIS_TRM=0	Number of times respondent answers that they need some help doing an activity or that they are completely unable to do an activity.	(min: 0; max: 13)
99	ADL_NBRMIS_TRM> 0 and ADL_DCLST_TRM =9	At least one missing item andBasic and Instrumental Activities of Daily Living Classification not obtained.	
-88	ADL_NBRMIS_TRM> 0 and ADL_DCLST_TRM≠9	At least one missing item but Basic and Instrumental Activities of Daily Living Classification obtained.	