Lifestyle Factors Toolkit Guideline v2.0

Instruments

Toolkit Purpose

A collection of measures to capture essential phenotypes associated with Lifestyle Factors in biomedical research.

Guideline Description

The Lifestyle Factors toolkit can be used to collect essential phenotypes associated with Lifestyle Factors in biomedical research, including: Physical Activity, Diet, Sleep Habits and more. The following document establishes guidelines (particularly applicable in Africa) on how to use the toolkit and collect detailed, relevant and harmonized phenotype and exposure data for research.

As listed below, the Lifestyle Factors toolkit consists of 5 Instruments, labelled Instruments 1 to 5:

Instrument	**Phenotypes**	**Instrument**	**Phenotypes**
1	Physical Activity	4	Caffeine Intake
2	Diet	5	Sleep Habits
3	Dietary Supplements		

Important Notes

1. The toolkit employs branching logic, therefore, we recommend that it is completed in order, as some variables may or may not appear OR accept input based on the input of previously listed variables.

2. Some branching logic (specifically related to date of birth/age and current pregnancy) affects the display of items relevant to adult or paediatric participants across multiple instruments.

3. Any addition or removal of variables may also affect branching logic so editing of variables should be carefully positioned so as not to interrupt branching logic conditions with related variables.

4. The toolkit is recommended to be used in conjunction with the Core Phenotypes toolkit (https://github.com/h3abionet/h3aphenstds).

5. Although not highlighted below, each instrument requires a collection date, which can be collected either manually or automatically.

6. Consistent codes are recommended for the identification of missing data, and these are incorporated into all Instruments discussed below.

7. Codes for Missing Data are specified below:

Code	Value Label
-991	No information
-992	Asked but unknown
-993	Temporarily unavailable
-994	Not asked
-995	Refused
-998	Not applicable

8. We recommend that when a participant responds with an "I don't know" to a question that the interviewer firstly ensures that the participant understands the question clearly and secondly is gently encouraged to reconsider their response if possible. If "I don't know" is still the response we make use of the 'Asked but unknown' missing code. Questions where "I don't know" is a highly anticipated and valid response will have a checkbox for Unknown included - it should be noted that this will not be recognised as missing data in statistical software.

Recommendations

Instrument 1: Physical Activity

The instrument enables the self-report collection of information related to a research participant's physical activity at home and at work.

Questions	**Physical Activity at Work** Does the participant's work involve vigorous-intensity activity that causes large increases in breathing or heart rate like for at least 10 minutes continuously? **Response Options**: Yes; No (If YES) In a typical week, on how many days does the participant do vigorous-intensity activities at work? How much time does the participant spend doing vigorous-intensity activities at work on a typical day? Does the participant's work involve moderate-intensity activity that causes small increases in breathing or heart rate for at least 10 minutes continuously?

	Response Options: Yes; No In a typical week, on how many days does the participant do moderate-intensity activities at work? How much time does the participant spend doing moderate-intensity activities at work on a typical day?
Notes	- **Examples** of vigorous-intensity activity: carrying or lifting heavy loads, digging or construction work - **Examples** of moderate-intensity activity: brisk walking, carrying light loads
Questions	**Physical Activity During Travel** Does the participant walk or use a bicycle (pedal cycle) for at least 10 minutes continuously to get to and from places? **Response Options**: Yes; No In a typical week, on how many days does the participant walk or bicycle for at least 10 minutes continuously to get to and from places? How much time does the participant spend walking or bicycling for travel on a typical day?
Questions	**Recreational Physical Activity** Does the participant do any vigorous-intensity sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate for at least 10 minutes continuously? **Response Options**: Yes; No In a typical week, on how many days does the participant do vigorous-intensity sports, fitness or recreational (leisure) activities? How much time does the participant spend doing vigorous-intensity sports, fitness or recreational activities on a typical day? Does the participant do any moderate-intensity sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate for at least 10 minutes continuously? **Response Options**: Yes; No In a typical week, on how many days does the participant do moderate-intensity sports, fitness or recreational (leisure) activities? How much time does the participant spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day?
Notes	- **Examples** of vigorous-intensity sports: running or football - **Examples** of moderate-intensity activity: brisk walking, cycling, swimming, volleyball
Questions	**Sedentary Lifestyle** How much time (in hours) does the participant usually spend sitting or reclining on a typical day?

Instrument 2: Diet

The instrument enables the self-report collection of information related to a research participant's dietary intake.

Questions	During the past month, how often did the participant... - eat hot or cold cereals? - have milk (to drink or in cereal)? - drink 100% pure fruit juice? - drink sweetened fruit drinks, sports or energy drinks? - eat fruit? Include fresh, frozen, dried or canned fruit. - eat a green leafy or lettuce salad, with or without other vegetables? - eat any kind of fried potatoes? - eat any other kind of potatoes? - eat refried beans, baked beans, beans in soup, pork and beans or any other type of cooked dried beans? - eat other vegetables not previously mentioned (e.g., carrots, corn, beetroot)? - eat any kind of cheese? - eat whole grain bread? - eat white bread? - eat brown rice or other cooked whole grains, such as bulgur, cracked wheat, or millet? - eat white rice? - eat pasta dishes, such as spaghetti, macaroni or noodles? - eat red meat, such as beef, pork, ham, or sausage? - eat processed meat, such as bacon, and deli meat, or hot dogs? - eat chicken or other poultry? - eat seafood? - eat spicy food, containing peppers or spicy seasoning, such as Mexican and Indian cuisine? - eat food high in sodium such as canned food, ketchup, dressings, table salt addition, pickles, restaurant-type food? - buy from a *vendor or take-away or restaurant? **Response Options**: Usually; Sometimes: Occasionally; Never

Notes	- **Frequency Descriptions:**
	  - Usually (>4 days a week)
	  - Sometimes (1-4 days a week)
	  - Rarely (< 3 days a month)
	  - Never

Questions	What type of oil or fat is most often used for food preparation in the participant's household? **Response Options**: Vegetable oil; Animal fat; Butter or ghee; Margarine; None in particular;

	None used; Other Has a doctor, nurse, or other healthcare worker ever told you to change your diet? **Response Options**: Yes; No Has a doctor, nurse, or other healthcare worker ever advised you to lose weight? **Response Options**: Yes; No

Instrument 3: Dietary Supplements

The instrument enables the self-report collection of information related to a research participant's use of dietary supplements.

<table>
<tr><td>Questions</td><td>Did the participant take any dietary supplements during the past year, at least once a week?
Response Options: Yes; No
How often did the participant take each of the listed dietary supplements?
Response Options:
Daily; 4-6 times a week; 1-3 times a week; Never
For how many years have you taken this supplement(s)
Response Options:
1 year or less; 2 to 4 years; 5 to 9 years; 10 years or more</td></tr>
<tr><td>Notes</td><td>- Listed Supplements and Descriptions:
<table>
<tr><td>Supplement</td><td>Descriptions</td></tr>
<tr><td>**Multivitamin**</td><td>A multivitamin is a preparation intended to serve as a dietary supplement with vitamins, dietary minerals, and other nutritional elements.</td></tr>
<tr><td>**Vitamin B6**</td><td>Vitamin B6, also known as pyridoxine, is a water-soluble vitamin that your body needs for several functions.It's significant to protein, fat and carbohydrate metabolism and the creation of red blood cells and neurotransmitters</td></tr>
<tr><td>**Vitamin B12**</td><td>Vitamin B12 is an essential vitamin which plays a role in the production of the DNA needed to make red blood cells.</td></tr>
<tr><td>**Vitamin C**</td><td>Also known as ascorbic acid, is necessary for the growth, development and repair of all body tissues</td></tr>
<tr><td>**Vitamin D**</td><td>A fat-soluble vitamin called the "sunshine vitamin" because it's produced in your skin in response to sunlight.</td></tr>
<tr><td>**Vitamin E**</td><td>Vitamin E is a fat-soluble antioxidant that stops the production of ROS formed when fat undergoes oxidation.</td></tr>
<tr><td>**Folic Acid**</td><td>A man-made form of folate. Folate is a B-vitamin naturally found in some foods. It is needed to form healthy cells.</td></tr>
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Calcium	Calcium is a mineral that is an essential part of bones and teeth.
Iron	Iron is a mineral that is naturally present in many foods, and is an essential component of hemoglobin.
Magnesium	Magnesium is a cofactor in more than 300 enzyme systems that regulate diverse biochemical reactions in the body, including protein synthesis, muscle and nerve function, blood glucose control, and blood pressure regulation.
Protein Supplement	A popular nutritional supplement. Protein is an essential macronutrient that helps build muscle, repair tissue, and make enzymes and hormones.
Selenium	Selenium is an essential mineral that supports the immune system, fertility, and cognitive function.
Zinc	Zinc is a mineral. It is called an "essential trace element" because very small amounts of zinc are necessary for human health.
Coenzyme Q-10	Coenzyme Q10 is a vitamin-like substance found throughout the body, most commonly used for conditions that affect the heart such as heart failure and fluid build up in the body (congestive heart failure or CHF), chest pain (angina), and high blood pressure. It is also used for preventing migraine headaches, Parkinson disease, and many other conditions.
Flaxseed	Flaxseed is a plant-based food that provides healthful fat, antioxidants, and fiber.
Garlic	Garlic is a plant containing vitamins and minerals like manganese, selenium, vitamin C, vitamin B6, and other antioxidants, including allicin.
Glucosamine	Glucosamine has been used in alternative medicine as an aid to relieving joint pain, swelling, and stiffness caused by arthritis
Probiotics	Probiotics are live microorganisms that are intended to have health benefits when consumed or applied to the body. They can be found in yogurt and other fermented foods, dietary supplements, and beauty products.
Saw Palmetto	Saw palmetto is an extract from the berries of a type of palm tree. The berries have traditionally been used to ease urinary and reproductive health.

Instrument 4: Caffeine Intake

The instrument enables the self-report collection of information related to a research participant's caffeine intake.

Questions	For each of the listed caffeine items… How often does the participant consume the beverage type?

	Response Options: Usually; Sometimes; Rarely; Never Specify cup size for each beverage type **Response Options**: S; M; L; XL

Notes	- Listed Caffeine Items:
	  - Caffeinated sodas; Decaffeinated coffee; Instant coffee; Brewed coffee; Decaffeinated espresso and espresso drinks; Espresso and espresso drinks; Herbal tea; Green tea; Black tea; English tea; Rooibos tea
	- **Frequency Descriptions:**
	  - Usually (>4 days a week)
	  - Sometimes (1-4 days a week)
	  - Rarely (< 3 days a month)
	- **Size Descriptions:**
	  - S (120-270ml)
	  - M (270-290ml)
	  - L (350-450ml)
	  - XL (>500ml)

Instrument 5: Sleep Habits

The instrument enables the self-report collection of information related to a research participant's sleeping habits.

Questions	During the past month, what time did the participant usually go to bed at night? During the past month, how long (in minutes) has it usually taken the participant to fall asleep each night? During the past month, what time has the participant usually gotten up in the morning? During the past month, how many hours of actual sleep did the participant get at night? Has a doctor ever told the participant that they have a sleep disorder known as sleep apnoea? **Response Options**: Yes; No Does the participant use any medication to facilitate sleeping more than twice a week? **Response Options**: Yes; No
Notes	- **Sleep apnoea**: A sleep disorder in which pauses in breathing or periods of shallow breathing during sleep occur more often than normal. Each pause can last for a few seconds to a few minutes and they happen many times a night. In the most common form, this follows loud snoring.

Abbreviations

DNA: Deoxyribonucleic acid
L: Large

M: Medium
S: Small
ROS: Reactive Oxygen Species
XL: Extra Large

Administration

Mode of Administration

	Instruments				
	1	2	3	4	5
Interview OR Self-administered questionnaire	X	X	X	X	X
Clinical assessment					
Bioassay/Lab- based assessment					

Life Stage

	Instruments				
	1	2	3	4	5
Infancy (0 - 12 months)					
Toddler (13 - 24 months)					
Childhood (2-11 years)	X	X	X	X	X
Adolescence (12 - 18 years)	X	X	X	X	X
Adult (18 and older)	X	X	X	X	X

Personnel and Training Required

Instruments 1 to 5 may be implemented as either self-reported questionnaires or interviewer-administered questionnaires. If interviewer-administered, interviews should be conducted by trained or study coordinators or data collectors who speak the native/local language of the target population.

References

The Lifestyle Factors toolkit is based on and aligned with several existing standards, to facilitate data harmonisation. These resources are listed below:

1. WHO Global Physical Activity Questionnaire (https://www.who.int/ncds/surveillance/steps/GPAQ/en/)
2. Instrument - Dietary Intake (https://www.phenxtoolkit.org/protocols/view/231201)
3. Instrument - Dietary Supplements Use (https://www.phenxtoolkit.org/protocols/view/50501)
4. Instrument - Caffeine Intake (https://www.phenxtoolkit.org/protocols/view/50301)
5. Pittsburgh Sleep Quality Index (https://www.sleep.pitt.edu/instruments/)
6. Instrument - Sexual Risk Behavior - Male (https://www.phenxtoolkit.org/protocols/view/101701)
7. Instrument - Sexual Risk Behavior - Female (https://www.phenxtoolkit.org/protocols/view/101702)

Contributors

Phenotype Harmonisation WG - H3Africa
Joint Phenotype Harmonisation Project - H3ABioNet
Phenotype Standardisation Project - H3ABioNet
Judit Kumuthini
Melek Chaouch
Lyndon Zass

Contact Us

For queries related to this standard and guideline, users can log a ticket to the Phenotypes Standards queue in the H3ABioNet Helpdesk. User feedback and improvements on the current toolkit are welcome and encouraged. These can also be submitted through the Helpdesk, or on our GitHub Issues page.