



# ASA24

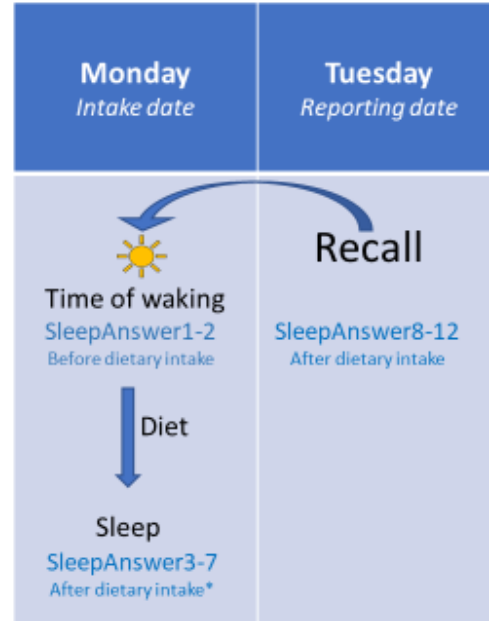
Automated Self-Administered 24-Hour Dietary Assessment Tool

## **ASA24 Dietary Recall Sleep Module Codebook**

*Updated June 2, 2023*

Please note: The calculated variables and flags included below were created to help guide researchers using the ASA24 Sleep module. However, it is strongly recommended that research teams include a researcher with sleep expertise to review the chosen formulas to calculate sleep variables, the interpretation, and at the created flags before proceeding. Alterations to calculated variables and the omission of flagged data should be based on the research objective, outcome(s) of interest, and study design. NCI will not provide further guidance on these decisions.

**Program will create SAS dataset "recallsleep".**



\*Note: Participant could have eaten after getting in bed or sleep onset

Variable label	Variable name	Description and Format	Calculation and Notes
<b>Variables needed to merge datasets</b>			
RecallNo	RecallNo	Recall number	
Username	Username	Study abbreviation plus researcher provided ID	
<b>Existing variables</b>	Used to calculate program-generated variables. These are found in the TNS file, and are not included in the final calculated dataset called "recallsleep".		
Date	ReportingDate	The date that the last data were reported within the reporting period. Reporting period is the time within which respondents are allowed to report their intake.	When respondents complete the Sleep Module within a dietary recall, information is gathered on the sleep periods immediately preceding and immediately following the intake date.

Sleep offset yesterday	SleepAnswer1	What time did you wake up yesterday?  'HH:MM' ('00:00' to '12:59') AM/PM 77777=I prefer not to answer 99999=I don't know	Output in military time with no corresponding date. See variable <i>SleepAnswer1_datetime</i> for date and time format conversion.
Feeling refreshed yesterday	SleepAnswer2	How did you feel when you woke up yesterday?  1=Refreshed 2=Somewhat refreshed 3=Tired 77777=I prefer not to answer 99999=I don't know	
In bed time yesterday	SleepAnswer3	What time did you get into bed? This may not be the time that you began trying to fall asleep.  'HH:MM' ('00:00' to '12:59') AM/PM 77777=I prefer not to answer 99999=I don't know	Output in military time with no corresponding date. See variable <i>SleepAnswer3_datetime</i> for date and time format conversion.
Lights out time yesterday	SleepAnswer4	What time did you begin trying to fall asleep?  'HH:MM' ('00:00' to '12:59') AM/PM 77777=I prefer not to answer 99999=I don't know	Output in military time with no corresponding date. See variable <i>SleepAnswer4_datetime</i> for date and time format conversion.
Sleep latency	SleepAnswer5	About how long did it take you to fall asleep, from when you first began trying?  0-59 (Minutes); 0-24 (Hours)	Output as a character variable, hours and minutes (HH:MM). See variable <i>SleepAnswer5_minutes</i> for minutes conversion.

		77777=I prefer not to answer 99999=I don't know	
Wake episodes	SleepAnswer6	How many times did you wake up, not counting the final time you woke up?  1-No limit 0=None 77777=I prefer not to answer 99999=I don't know	
Wake after sleep onset (WASO)	SleepAnswer7	In total, about how long were you awake? What was the total time you were awake between the time you first fell asleep and the final time you woke up?  0-59 (Minutes) 0-24 (Hours) 55555=skip 77777=I prefer not to answer 99999=I don't know	Output as a character variable, hours and minutes (HH:MM). See variable <i>SleepAnswer7_minutes</i> for minutes conversion.
Sleep offset today	SleepAnswer8	What was the final time you woke up today?  'HH:MM' ('00:00' to '12:59') AM/PM 77777=I prefer not to answer 99999=I don't know	Output in military time with no corresponding date. See variable <i>SleepAnswer8_datetime</i> for date and time format conversion.
Out of bed time today	SleepAnswer9	What time did you get out of bed today? This may be different from the final time you woke up.  'HH:MM' ('00:00' to '12:59') AM/PM 77777=I prefer not to answer 99999=I don't know	Output in military time with no corresponding date. See variable <i>SleepAnswer9_datetime</i> for date and time format conversion.

Sleep quality	SleepAnswer10	How well did you sleep last night?  1=Very good 2=Good 3=Fair 4=Poorly 5=Very poorly 77777=I prefer not to answer 99999=I don't know	
Feeling refreshed today	SleepAnswer11	How did you feel when you woke up today?  1=Refreshed 2=Somewhat refreshed 3=Tired 77777=I prefer not to answer 99999=I don't know	
Usual sleep amount	SleepAnswer12	How does the amount of sleep you reported compare to your usual sleep?  1=Much more than usual 2=Usual 3=Much less than usual 77777=I prefer not to answer 99999=I don't know	
<b>Calculated variables</b>	The below variables are created in this program and are included in the final calculated dataset called " <b>recallsleep</b> ".		
SleepAnswer1: Sleep offset yesterday (date and time)	SleepAnswer1_datetime		<i>SleepAnswer1</i> in SAS date and time format.

SleepAnswer3: In bed time yesterday (date and time)	SleepAnswer3_datetime		<i>SleepAnswer3</i> in SAS date and time format. Since in bed time may occur before or after midnight, the SAS code changes the date for any times midnight onward to the reporting date.  If the reported in bed time yesterday is $\geq 12:00\text{AM}$ (in AM/PM format), the date preceding the reporting date is assigned. If the reported in bed time is $< 12\text{AM}$ , the reporting date is assigned.
SleepAnswer4: Lights out time yesterday (date and time)	SleepAnswer4_datetime		<i>SleepAnswer4</i> in SAS date and time format. Since sleep onset may occur before or after midnight, the SAS code changes the date for any times midnight onward to the reporting date.
SleepAnswer5: Sleep latency (minutes)	SleepAnswer5_minutes		<i>SleepAnswer5</i> in minutes
SleepAnswer7: Wake after sleep onset (WASO, minutes)	SleepAnswer7_minutes		<i>SleepAnswer7</i> in minutes
SleepAnswer8: Sleep offset today (date and time)	SleepAnswer8_datetime		<i>SleepAnswer8</i> in SAS date and time format.
SleepAnswer9: Out of bed time today (date and time)	SleepAnswer9_datetime		<i>SleepAnswer9</i> in SAS date and time format.
Sleep onset (date and time)	Sleep_onset	The date and time that the respondent fell asleep, calculated by <i>adding Sleep latency to Lights out time yesterday</i> .	<i>SleepAnswer4_datetime</i> + <i>SleepAnswer5_minutes</i>  This variable is reported in SAS date and time format.
Time in bed (TIB, minutes)	Time_in_bed	The total amount of time the respondent spent in bed (in minutes), awake and asleep, calculated as the interval between <i>In bed time yesterday</i> and <i>Out of bed time today</i> .	<i>SleepAnswer9_datetime</i> – <i>SleepAnswer3_datetime</i>

Sleep period (minutes)	Sleep_period	The total amount of time (in minutes) between sleep onset and sleep offset, without subtracting any WASO time.	<i>SleepAnswer8_datetime – Sleep_Onset</i>
Total sleep time (TST, minutes)	Total_sleep_time	The amount of time (in minutes) the respondent spent in bed sleeping from sleep onset to offset, minus awakenings after sleep onset (WASO).	<i>Sleep_period – SleepAnswer7_minutes</i>
First eating occasion (date and time)	EO_first	The date and time of the first non-tap water (any food code other than 94000100*) eating occasion of the given recall day.	Output in SAS date and time format.
Last eating occasion (date and time)	EO_last	The date and time of the last non-tap water eating occasion of the given recall day.	Output in SAS date and time format.
<b>Flag labels</b>	<b>Flag name</b>	<b>Flag Description</b>	
<b>Time flags</b>	<i>Based on participant responses, no calculation.</i> The below variables are created in this program and are included in the final calculated dataset called “ <b>recallsleep</b> ”.		
1. Sleep offset yesterday between 5pm–2am	Flag_wokeyest		
2. In bed time yesterday between 5am–7pm	Flag_gotobed	For <i>SleepAnswer3_datetime</i>	
3. Lights out time yesterday between 5am–7pm	Flag_gotosleep	For <i>SleepAnswer4_datetime</i>	
4. Sleep offset today between 5pm–2 am	Flag_woketoday	For <i>SleepAnswer8_datetime</i>	

5. Out of bed time today between 5pm–2am	Flag_outofbed	For <i>SleepAnswer9_datetime</i>	
6. Lights out time yesterday is before In bed time yesterday	Flag_sleepbeforeTIB	<i>SleepAnswer4_datetime</i> occurred before <i>SleepAnswer3_datetime</i>	
7. Number of flags for times reported	Flag_sumtime	Sum of raw flags 1-6	
<b>Calculated flags</b>	<i>Based on calculated variables.</i> The below variables are created in this program and are included in the final calculated dataset called “ <b>recallsleep</b> ”.		
1. Time in bed (TIB) is >16 hours	Flag_TIB		<i>Time_in_bed</i> is > 16 hours (960 minutes)
2. Sleep period is >16 hours or <2 hours	Flag_sleeperiod		<i>Sleep_period</i> is >16 hours (960 minutes) or < 2 hours (120 minutes)
3. Ate during sleep	Flag_EOduringsleeperiod	Reported a non-tap water (any food code other than 94000100*) only eating occasion after sleep onset or before sleep offset (i.e., during the sleep period).	
4. Number of flags for calculated variables	Flag_sumcalc	Sum of calculated flags 1-3.	
5. Total number of flags	Flag_total	Sum of all raw and calculated flags.	

\*The Sleep module was introduced in ASA24-2020 which is based on Food and Nutrient Database for Dietary Studies (FNDDS), version 2015-2016. The food code # 94000100 is described as “Water, tap”, inclusive of filtered tap water; well water; water fountain; Brita water. This food code has not changed between FNDDS 2011-2012 and FNDDS 2019-2020 and is not expected to change; however, users should be aware that changes to the description could impact the definition of water and consequently of calculated variables and flags. It is important to note that there are other food codes representing water, but they include flavored or sparkling water which in some cases may cause the person to no longer be considered in the fasted state.