Add Health Wave III
Length of Day Dataset

Filename: w3loday

Description

This Add Health data set contains the number of hours of daylight at each Wave III respondent location on that respondent's survey date. Length of day is derived from the solar declination on a given date and the terrestrial latitude of a given location. All the points at the same latitude on the same calendar date are generally considered to have the same day length.

For reasons of privacy protection and potential deductive disclosure of respondent locations, only geographic latitudes between 28° north and 47° north were allowed. Any respondent locations south of 28° were assigned 28° and any respondent locations north of 47° were assigned 47°. These limits were applied to 764 respondents and ensure that the finest degree to which a respondent location may be reverse calculated is no less than three states (e.g., "this respondent location might be in Florida, Hawai'i, Puerto Rico, or Texas"). For these 764 respondents, the maximum difference between true length of day and the length of day resulting from obfuscated latitude is 37.939039655 minutes.

Solar declination is the angle between the rays of the Sun and the plane of Earth's equator—a measure of where the sun's rays are perpendicular to Earth's surface—in degrees north or south of the equator. This varies from approximately 23.45° north in June to 23.45° south in December.

The algorithms used to calculate solar declination for this data set were obtained from the National Oceanic and Atmospheric Administration at the following Web address: http://www.srrb.noaa.gov/highlights/sunrise/program.txt. These formulae were originally published in *Astronomical Algorithms* by Jean Meeus (Willmann-Bell, Inc., Richmond, VA, 1999). The full equation for deriving day length from geographic latitude and solar declination, which was used for the creation of the length of day dataset, may be expressed as:

$$\text{Length of day} = \arccos([\sin(a) - \sin(\varphi) \times \sin(\delta)] \div [\cos(\varphi) \times \cos(\delta)]) \div 15 \times 2$$

Variable Listing

Variable Name	Variable Label and Description
W3LD1	DAYLIGHT HOURS ON SURVEY DATE • Range: 8.5 to 14.7 hours • Tenths of an hour

Wave III - Length of Day Data

Number of observations: 15,197

AID		Char	Respondent identifier NOTE: Smallest 5 and largest 5 values are displayed.
Frequency	Percent	Value	Label
1	0%	10316654	
1	0%	10316952	
1	0%	10506342	
1	0%	10570810	
1	0%	10606128	
15187	100%	Values omitted	Values omitted
1	0%	99886993	
1	0%	99886994	
1	0%	99886995	
1	0%	99886996	
1	0%	99886999	

W3LD1		Num	Daylight hours on survey date NOTE: Smallest 5 and largest 5 values are displayed.
Frequency	Percent	Value	Label
2	0%	8.50	
13	0%	8.60	
14	0%	8.70	
27	0%	8.80	
20	0%	8.90	
14766	97%	9-14.3	NOTE: Range of values omitted from display
23	0%	14.40	

19	0%	14.50	
4	0%	14.60	
1	0%	14.70	
308	2%	98	Geocode Missing