

ICPSR 21600

**National Longitudinal Study of  
Adolescent to Adult Health (Add  
Health), 1994-2008 [Public Use]**

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Wave I, III, & IV Longitudinal Weight for  
Public-Use Sample User Guide

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# **National Longitudinal Study of Adolescent Health**

## **Wave I, III, & IV Longitudinal Weight for Public-Use Sample**

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## **Add Health Wave I, III, and IV Longitudinal Weights**

### *Weights for the Public-Use Sample*

The Wave I, III and IV longitudinal weights for the public-use sample were calculated by using the Wave III public-use sample trimmed cross-sectional weights (see Appendix A). For reasons of confidentiality, the Wave III public-use sample cross-sectional weights were adjusted for additional Wave IV nonresponse using weighted nonresponse adjustments to the Wave III public-use sample cross-sectional weights calculated separately for each grade-sex cell. For this analysis, a nonrespondent was defined as a unit that did not respond at either Waves I, III or IV. Sample members who were respondents in Wave III and Wave IV were assigned positive weights. Nonrespondents were assigned zero weights. Weights were missing, otherwise. Of the 5,114 respondents in Wave IV, only 4,208 cases were also respondents in Wave III, and had nonmissing weights in Wave I.

Estimates of the grade-sex-race subpopulations derived from the Wave III public-use sample cross-sectional weights, excluding the deceased, were used to poststratify the nonresponse-adjusted longitudinal weights. The estimates were calculated by summing the Wave III public-use sample cross-sectional weights for all the sample members of each grade-sex-race domain that were still alive at Wave IV. Table A-1 in Appendix A shows subpopulation estimates used to poststratify the cross-sectional weights for all the public-use sample cases still alive at Wave IV.

The basic formulas shown in Appendix A were used to construct the public-use sample Wave I, III, and IV longitudinal weights.

For consistency with the released Wave IV cross-sectional and longitudinal weights, the final calculated weights for a Wave I, III, and IV analysis are untrimmed.

# **Appendix A**

## **Basic Weighting Formulas**

## Basic Weighting Formulas for Wave IV

Define the following symbols:

- D the domain of interest; for example, a particular grade-sex-race cell
- $R_{Dw}$  the set of respondents at Wave  $w$ , for  $w = 1, 3, 4$
- $E_{Dw}$  the set of eligible persons at Wave  $w$ , for  $w = 1, 3, 4$
- $I_{Dw}$  the set of ineligible persons at Wave  $w$ , for  $w = 1, 3, 4$
- $\omega_{3i}$  Wave IV final weight defined for all  $i \in R_{D3}$

## Grand Sample Wave I, III, & IV Longitudinal Weights

For each grade-sex cell, define the cell-specific weighted response rate for Wave IV given Wave III response as

$$r_{D4|3} = \frac{\sum_{i \in R_{D4} \cap R_{D3}} \omega_{3i}}{\sum_{i \in R_{D3} \cap E_{D4}} \omega_{3i}} \quad (\text{A1})$$

Then the Wave I, III, & IV grand sample longitudinal weight, before post-stratification adjustment, is

$$\omega_{D4i}^L = \frac{\omega_{3i}}{r_{D4|3}} \quad (\text{A2})$$

which is defined for all  $i \in R_{D3} \cap R_{D4}$ .

For the post-stratification adjustment, we divide an estimate of the total 1995 population in domain  $D$  who would be eligible for Waves III and IV by an estimate of the same population from Wave IV data as follows:

$$F_{D4}^L = \frac{\hat{X}_{E_{D3} \cap E_{D4}}}{\sum_{i \in R_{D3} \cap R_{D4}} \omega_{D4i}^L} \quad (\text{A3})$$

where

$$\hat{X}_{E_{D3} \cap E_{D4}} = \sum_{i \in E_{D3} \cap E_{D4}} \omega_{3i} \quad (\text{A4})$$

is the sum of the Wave III sample weights for the sample members who were eligible in Waves III and IV (*i.e.*, Waves I and III respondents who were alive at Wave IV). Table A-1 shows the subpopulation estimates (A4) for the grade-sex-race poststratification domains.

Then the final Wave I, III, and IV public-use sample longitudinal weight, which is defined for all  $i \in R_{D3} \cap R_{D4}$  is

$$\omega_{F,D4i}^L = F_{D4}^L \omega_{D4i}^L \quad (\text{A5})$$

The untrimmed Wave I, III, and IV longitudinal weights were computed using Equations A1 to A5.

Tables A-1 shows the subpopulation estimates (A4) for the grade-sex-race poststratification domains, derived using the Wave III public-use sample cross-sectional weights, for all public-use sample cases that were alive at Wave IV.

Table A-2 summarizes the total population estimates derived from both the nonresponse-adjusted and poststratified Wave I, III, and IV longitudinal weights.

**Table A-1. Wave III Subpopulation Estimates for Wave IV Poststratification Domains**  
*(Based on Wave III public-use sample cross-sectional weights for all cases alive at Wave IV)*

<b>Gender</b>	<b>Grade</b>	<b>All Races</b>	<b>Black</b>	<b>Non-Black</b>
Male	7	1,888,567	254,423	1,634,144
	8	1,814,274	300,576	1,513,698
	9	1,965,328	324,384	1,640,944
	10	1,746,728	332,177	1,414,551
	11	1,713,672	251,776	1,461,896
	12	1,911,556	327,167	1,584,389
	Total	11,040,125	1,790,503	9,249,622
Female	7	1,897,676	302,111	1,595,565
	8	1,733,072	282,166	1,450,906
	9	1,854,248	289,635	1,564,613
	10	1,865,623	319,861	1,545,762
	11	1,660,018	302,717	1,357,301
	12	1,855,044	320,716	1,534,328
	Total	10,865,681	1,817,206	9,048,475
	Total	21,905,806	3,607,709	18,298,097



**Table A-2. Weight Totals**

Weights	Sample Members with Sample Weights		Sample Members Eligible (Alive) at Wave IV	
	n	Sum of Weights	n	Sum of Weights
Wave I, III, & IV Public-Use Sample Nonresponse-Adjusted Longitudinal Weight	4,208*	21,905,806	4,208	21,905,806
Wave I, III, & IV Public-Use Sample Poststratified Longitudinal Weight	4,208*	21,905,806	4,208	21,905,806

\* In order to have a positive longitudinal weight, a case would have to be a respondent in all three waves considered for the Wave I, III, and IV longitudinal weights. There were 4,208 cases that responded in all Wave I, III, & IV waves.

## **Appendix B**

### **Documentation for the Add Health Wave I, III, & IV Longitudinal Weights Files**

**Table B-1. Correspondence between Equations in Appendix A and Variable Names**

<b>Equation</b>		<b>Pulic-Use Sample</b>
<b>Wave I, III, &amp; IV Longitudinal Weights</b>		
A1 Nonresponse adjustment	Numerator	PS134A1NU
	Denominator	PS134A1DE
	Result	PGS134NRLO
A2 NR-adjusted weights		PGSW134LO1
A3 Poststratification adjustment	Denominator	PSLOA3DE
	Result	PGS134PSLO
A4		PS134LOA4
A5 Final weight		PGSW134LO2*

\* Add Health variable name for the Wave I, III, and IV weight is GSWG134.