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Add Health Waves III-V Documentation



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# Waves III-V Multi-year Air Pollution Exposure Estimates



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Add Health is supported by grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations.

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## Introduction

There is a growing body of evidence indicating that cumulative, long-term exposure to air pollution affects health and development. This air pollution data described here provides longer-term estimates of air pollution exposure that can be used to address a broad range of research questions related to how air pollution exposure over time may relate to a variety of health outcomes.

## Data Structure and Form

Annual average census-tract level PM<sub>2.5</sub> concentration estimates were constructed from publicly available daily census-tract level PM<sub>2.5</sub> concentration estimates obtained from the US Environmental Protection Agency's Fused Air Quality Surface using Downscaling (FAQSD) files. Estimated PM<sub>2.5</sub> concentrations from all days in each calendar year (January 1-December 31) were averaged to create an annual average PM<sub>2.5</sub> concentration for each year from 2002-2017. The same procedure was used to create annual average census-tract level ozone (O<sub>3</sub>) concentration estimates.

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## Data Dictionary

Annual census tract level averages were assigned to each participant based on census tract of residence as detailed in the table below.

Variable Name	Description	Assigned based on	Other information
AID	Temporary AH participant ID		
APPM02W3	Estimated PM <sub>2.5</sub> concentration in participant's census tract of residence using 2002 air pollution data	Participant's census tract of residence reported at Wave III	Units are micrograms PM <sub>2.5</sub> per cubic meter of air (µg/m <sup>3</sup> )
APPM03W3	Estimated PM <sub>2.5</sub> concentration in participant's census tract of residence in 2003 air pollution data		
APPM04W3	Estimated PM <sub>2.5</sub> concentration in participant's census tract of residence in 2004 air pollution data		
APPM05W3	Estimated PM <sub>2.5</sub> concentration in participant's census tract of residence in 2005 air pollution data		
APPM06W4	Estimated PM <sub>2.5</sub> concentration in participant's census tract of residence in 2006 air pollution data	Participant's census tract of residence reported at Wave IV	
APPM07W4	Estimated PM <sub>2.5</sub> concentration in participant's census tract of residence in 2007 air pollution data		
APPM08W4	Estimated PM <sub>2.5</sub> concentration in participant's census tract of residence in 2008 air pollution data		
APPM09W4	Estimated PM <sub>2.5</sub> concentration in participant's census tract of residence in 2009 air pollution data		
APPM10W4	Estimated PM <sub>2.5</sub> concentration in participant's census tract of residence in 2010 air pollution data		
APPM11W4	Estimated PM <sub>2.5</sub> concentration in participant's census tract of residence in 2011 air pollution data		

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APPM12W5	Estimated PM <sub>2.5</sub> concentration in participant's census tract of residence in 2012 air pollution data	Participant's census tract of residence reported at Wave V	
APPM13W5	Estimated PM <sub>2.5</sub> concentration in participant's census tract of residence in 2013 air pollution data		
APPM14W5	Estimated PM <sub>2.5</sub> concentration in participant's census tract of residence in 2014 air pollution data		
APPM15W5	Estimated PM <sub>2.5</sub> concentration in participant's census tract of residence in 2015 air pollution data		
APPM16W5	Estimated PM <sub>2.5</sub> concentration in participant's census tract of residence in 2016 air pollution data		
APPM17W5	Estimated PM <sub>2.5</sub> concentration in participant's census tract of residence in 2017 air pollution data		
APO302W3	Estimated O <sub>3</sub> concentration in participant's census tract of residence using 2002 air pollution data	Participant's census tract of residence reported at Wave III	Units are parts per billion (ppb) of ozone
APO303W3	Estimated O <sub>3</sub> concentration in participant's census tract of residence using 2003 air pollution data		
APO304W3	Estimated O <sub>3</sub> concentration in participant's census tract of residence using 2004 air pollution data		
APO305W3	Estimated O <sub>3</sub> concentration in participant's census tract of residence using 2005 air pollution data		
APO306W4	Estimated O <sub>3</sub> concentration in participant's census tract of residence using 2006 air pollution data	Participant's census tract of residence reported at Wave IV	
APO307W4	Estimated O <sub>3</sub> concentration in participant's census tract of residence using 2007 air pollution data		

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APO308W4	Estimated O <sub>3</sub> concentration in participant's census tract of residence using 2009 air pollution data		
APO309W4	Estimated O <sub>3</sub> concentration in participant's census tract of residence using 2009 air pollution data		
APO310W4	Estimated O <sub>3</sub> concentration in participant's census tract of residence using 2010 air pollution data		
APO311W4	Estimated O <sub>3</sub> concentration in participant's census tract of residence using 2011 air pollution data		
APO312W5	Estimated O <sub>3</sub> concentration in participant's census tract of residence using 2012 air pollution data	Participant's census tract of residence reported at Wave V	
APO313W5	Estimated O <sub>3</sub> concentration in participant's census tract of residence using 2013 air pollution data		
APO314W5	Estimated O <sub>3</sub> concentration in participant's census tract of residence using 2014 air pollution data		
APO315W5	Estimated O <sub>3</sub> concentration in participant's census tract of residence using 2015 air pollution data		
APO316W5	Estimated O <sub>3</sub> concentration in participant's census tract of residence using 2016 air pollution data		
APO317W5	Estimated O <sub>3</sub> concentration in participant's census tract of residence using 2017 air pollution data		

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## Missing Codes

992=Sample member not in wave

996=Missing source data

998=Geocode missing for wave

## Notes

Publicly available Fused Air Quality Surface Using Downscaling (FAQSD) output files provide air pollution concentration estimates at census tracts in the continental US. Participants residing outside of the continental US (at a given wave) were not assigned FAQSD-estimated air pollution concentrations and are coded as “missing source data.”

## Source Description

Fused Air Quality Surface Using Downscaling (FAQSD) output files from 2002-2017 that are publicly available: <https://www.epa.gov/hesc/rsig-related-downloadable-data-files>. The FAQSD files are produced by a Bayesian space-time downscaler model that is based on statistical modeling research in the development of fused space-time predictive surfaces for air quality. A Bayesian space-time downscaler model is used to "fuse" daily ozone (8-hr max) and fine particulate air (24-hr average) monitoring data from the National Air Monitoring Stations/State and Local Air Monitoring Stations (NAMS/SLAMS) with 12 km gridded output from the Models-3/Community Multiscale Air Quality (CMAQ) model.