Abt

Abt Associates Inc.

The Study of Thimerosal and Autism

Documentation and Codebook for the Main Analysis File:

Cambridge, MA
Lexington, MA
Hadley, MA
Bethesda, MD
Chicago, IL

September 3, 2010

Prepared for
Frank DeStefano
National Immunization Program
Centers for Disease Control and Prevention
Atlanta, GA 30329

Prepared by
Cristofer Price
Yeqin He

Abt Associates Inc.
Suite 800 North
4550 Montgomery Avenue
Bethesda, MD 20814-3343

This documentation was prepared by Cristofer Price and Yeqin He of Abt Associates Inc. for the Immunization Safety Office (ISO) of the Centers for Disease Control and Prevention (CDC) Atlanta, GA 30333. Questions about the documentation, substantive questions, or technical issues regarding the data file should be directed to the CDC ISO, MS D26, 1600 Clifton Road, Atlanta, Georgia 30333 (404-639-8256).

Suggested Citation for Study of Thimerosal and Autism Public Use Data Set:

Price, C.S., He, Y. (2010) The Study of Thimerosal and Autism: Data Set Documentation. Bethesda MD: Abt Associates, Inc; Prepared for the National Immunization Program Centers for Disease Control and Prevention Atlanta, GA

Documentation and Codebook
for the
Main Analysis File

1. Introduction to the Main Analysis File

The Thimerosal and Autism Main Analysis File (hereafter called *the Main Analysis File*) is analytical file that was used for the primary analyses[1] of the Study of Thimerosal and Autism. The study design, data sources, analyses and results are explained in detail in the *Thimerosal and Autism Technical Reports, Volumes I* and *II* (hereafter called *the Technical Report*), which is also included on the public use CD.

The Main Analysis File is one of four data files included in the data set. The Main Analysis File contains n=1,095 records, corresponding to one record per participant child. The remaining three data files contained within the set are provided to give researchers a rich source of data on the timing, sources, and amount of prenatal and postnatal exposure to ethylmercury from thimerosal-containing vaccines and immune globulin preparations.

---

[1] All results reported in "Price, C.S., Thompson, W.W., Goodson, Ph.D., B., Weintraub, E.S., Croen, L.A., Hinrichsen, V.L., Marcy, M., Robertson, A., Eriksen, E., Lewis, E., Bernal, P., Shay, D., Davis, R.L., DeStefano, F. Prenatal and Infant Exposure to Thimerosal from Vaccines and Immunoglobulins and Risk of Autism Pediatrics published online: September 13, 2010 (doi: 10.1542/peds.year.2010-0309) can be reproduced using the Main Analysis File. Additionally, analyses reported in the Technical Report Chapters 9, 11, 12, 15, 19, 20, and Sections 21.2 and 21.3 also used this data set. Due to the sensitive nature of the information, the indicator variable for use of cocaine or narcotics during pregnancy (the variable "*PreNatIllDrug*") has been omitted from the Main Analysis File. That variable was used a covariate for models of outcomes "*ASD-not-AD*" and "*AD with screened controls*". Therefore results from models fit to the data from the Main Analysis file will differ slightly from those reported in the Technical Report for these two outcomes. Analyses based both study participants and non-participants, e.g. Chapters 13, 14, 22 and part of Chapter 5, used sampling frame data which are not included in the public use data set. Replication of results in Chapter 16 will require the use of both the Main Analysis File, and the Child Vaccination Histories File. Some of the analyses reported in Chapter 17 used data from medical charts or parent interviews that are not needed for replication of any of the main analyses, and are not included in the public use data set. Analyses results shown Technical Report Chapter 18 were based on the Child Body Weights File.

Those data sets are explained in the documents titled "*Documentation and Codebook for the Prenatal Ethlymercury Exposures File*", "*Documentation and Codebook for the Child Vaccination Histories File*", and "*Documentation and Codebook for the Child Body Weights File*"

The remainder of the current document is organized as follows. Section 2 is a listing showing the names, labels, minimum, maximum, and number of missing values for each of the numeric variables included in the Analysis File. The listing of variables in Section 2 is intended to give the user a quick overview of the variables included in the file. Section 3 provides detail on the data sources, valid values, and construction of the variables included in the file. Section 4 provides information that will help data users to reproduce results presented in the Technical Report. This section includes example SAS code that can be used to reproduce the results shown Section 19, "Detail of Model Results" of Volume II of the Technical Report

2. List of the Variables Included on the Data Set

Exhibit 2.1. List of Variables Included in the Analysis File

Variable	Label	n	n Miss	Min	Max
Data Management Variables					
ChildID	ID for merging files	1095	0	1	1095
DS_ASD_Main	=1 if ASD Main Data Set	1095	0	1	99
DS_AD_Main	=1 if AD Main Data Set	1095	0	1	99
DS_ASD_Only	=1 if ASD Only Data Set	1095	0	1	99
DS_ASD_Regr	=1 if ASD w/Regression data set	1095	0	1	99
DS_AD_ExLoIQ	=1 if AD w/Lo IQ Excluded data set	1095	0	1	99
DS_ASD_TCln	=1 if ASD T Clean Data Set	1095	0	1	99
DS_AD_TCln	=1 if AD T Clean Data Set	1095	0	1	99
StatusCode	1=full participant control, 2=full participant ASD case, 3=Full participant below criteria case	1095	0	1	3
InElig_Cntrl	=1 if control ineligible	1095	0	0	1
MatchStrat	Matching Stratum	1095	0	2	48
weight1	weight1 DS_ASD_main=1	1008	87	0.333	1.8
weight2	weight2 DS_AD_main=1	911	184	0.273	1.5
weight3	weight3 DS_ASD_only=1	773	322	0.136	1.5
weight4	weight4 DS_ASD_Regr=1	701	394	0.115	1
weight5	weight5 DS_AD_ExLoIQ=1	884	211	0.273	1.5
weight6	weight6 DS_ASD_TCln=1	821	274	0.5	3
weight7	weight7 DS_AD_TCln=1	728	367	0.3	3
Outcome Indicators					
ASD_Outc	=1 if ASD/AD, =0 Cntr, .=exclude	1018	77	0	1
ASD_time	=1 if ASD/AD, =2 Cntr, .=exclude	1018	77	1	2
AD_Outc	=1 if AD, =0 Cntr, .=exclude	949	146	0	1
AD_time	=1 if AD, =2 Cntr, .=exclude	949	146	1	2
ASD_Only	=1 if ASD only, =0 Cntr, .=exclude	831	264	0	1
ASD_Only_time	=1 if ASD only, =2 Cntr, .=exclude	831	264	1	2
ASD_Regr	=1 if ASD w/Regress,=0 Cntr	701	394	0	1
ASD_Regr_Time	=1 if ASD w/Reg, =2 if Cntr,=. exclude	701	394	1	2
AD_ExLoIQ	=1 if AD w/Lo IQ Excluded,=0 Cntr	884	211	0	1

Exhibit 2.1. List of Variables Included in the Analysis File

Variable	Label	n	n Miss	Min	Max
AD_ExLoIQ_Time	=1 if AD w/IQ excluded, =2 if Cntr,=. exclude	884	211	1	2
ASD_TCln	=1 if ASD/AD, =0 Tot Cln Cntr, .=exclude	828	267	0	1
ASD_TCln_time	=1 if ASD/AD, =2 Tot Cln Cntr, .=exclude	828	267	1	2
AD_TCln	=1 if AD/AD, =0 Tot Cln Cntr, .=exclude	759	336	0	1
AD_TCln_time	=1 if AD/AD, =2 Tot Cln Cntr, .=exclude	759	336	1	2
<mark>Exposure Variables</mark>					
PreNatThimer	PreNat Exp Amt	1095	0	0	100
PreNatThimer_Alt	PreNat Exp Amt (Alt)	1095	0	0	111
Exp01mos	Amt/Wt(KGs) birth-28 days	1095	0	0	21
Exp17mos	Amt/Wt(KGs) 29-214 days	1095	0	0	66.9
Exp07mos	Amt/Wt(KGs) birth-214 days	1095	0	0	66.9
Exp020mos	Amt/Wt(KGs) birth-609 days	1095	0	0	76.7
Amt01mos	Amt Merc birth-28 days	1095	0	0	50
Amt17mos	Amt Merc 29-214 days	1095	0	0	188
Amt07mos	Amt Merc birth-214 days	1095	0	0	191
Amt020mos	Amt Merc birth-609 days	1095	0	0	300
AbExp01mos	Concur Amt/Wt(KGs) birth-28 days	1095	0	0	6.77
AbExp07mos	Concur Amt/Wt(KGs) birth-214 days	1095	0	0	54.9
AbExp17mos	Concur Amt/Wt(KGs) 29-214 days	1095	0	0	54.9
AbExp020mos	Concur Amt/Wt(KGs) birth-609 days	1095	0	0	54.9
AbAmt01mos	Concur Amt Merc birth-28 days	1095	0	0	12.5
AbAmt07mos	Concur Amt Merc birth-214 days	1095	0	0	188
AbAmt17mos	Concur Amt Merc 29-214 days	1095	0	0	188
AbAmt020mos	Concur Amt Merc birth-609 days	1095	0	0	188
ncAbExp01mos	NonConcur Amt/Wt(KGs) birth-28 days	1095	0	0	21
ncAbExp07mos	NonConcur Amt/Wt(KGs) birth-214 days	1095	0	0	65.2
ncAbExp17mos	NonConcur Amt/Wt(KGs) 29-214 days	1095	0	0	65.2
ncAbExp020mos	NonConcur Amt/Wt(KGs) birth-609 days	1095	0	0	70.3
ncAbAmt01mos	NonConcur Amt Merc birth-28 days	1095	0	0	50
ncAbAmt07mos	NonConcur Amt Merc birth-214 days	1095	0	0	191
ncAbAmt17mos	NonConcur Amt Merc 29-214 days	1095	0	0	188
ncAbAmt020mos	NonConcur Amt Merc birth-609 days	1095	0	0	300
AbDays01mos	# days on Abiots birth-28 days	1095	0	0	28

Exhibit 2.1. List of Variables Included in the Analysis File

Variable	Label	n	n Miss	Min	Max
AbDays07mos	# days on Abiots 1-214 days	1095	0	0	69
AbDays17mos	# days on Abiots 29-214 days	1095	0	0	69
AbDays020mos	# days on Abiots birth-609 days	1095	0	0	216
AnyAb01mos	=1 if any Abiots 01 mos	1095	0	0	1
AnyAb07mos	=1 if any Abiots 07 mos	1095	0	0	1
AnyAb17mos	=1 if any Abiots 17 mos	1095	0	0	1
AnyAb020mos	=1 if any Abiots 020 mos	1095	0	0	1
PreNatAllMerc	Prenatal exposure from multiple sources	1095	0	0	5
General Information about Child					
SexMale	=1 if Sex=Male	1095	0	0	1
AgeAtPIYrs	Age in Years at Par Interview, from IQ_Status.sas	1095	0	5.903	13.2
Ravens_Score_n	Cases only-Score if given Raven, from IQ_Status.sas	298	797	6	140
Mullen_Age	Cases only-IQ Age equiv if given Mullen, from IQ_Status.sas	21	1074	0.917	5.5
RatioIQ	(Mullen_age/AgeAtPIYrs)*100, from IQ_Status.sas	21	1074	8.806	69.6
LowIQ	=1 if Ravens_Score<35 or Mullen RatioIQ<35, from IQ_Status.sas	321	774	0	1
ScreenOut	=1 if should be excluded from screened control group analyses	1095	0	0	1
Q11	ADIR Loss of Lang Skills, see Regression_Status.sas	321	774	0	8
Q12b_SkillsLost	# skills lost in ADIR Q12b, see Regression_Status.sas	317	778	0	7
Q12b_skillsprior	# skills before 24 mos in ADIR Q12b	13	1082	3	7
Q12b_PctLost	% skills lost in ADIR Q12b	13	1082	14	100
Regression	=1 if Regression (loss of lang/skills), created in Regression_Status.sas	321	774	0	1
Older_aut_sib	=1 if child has older autistic sibling	1095	0	0	1
MC_epilepsy_230	230: Epilepsy/seizures/convulsions (specify)	1095	0	0	1
MC_CerePal_212	212: Cerebral Palsy	1095	0	0	1
MC_HearingDis_233	233: Hearing disorder (specify)	1095	0	0	1
MC_VisImp_261	261: Visual Impairment	1095	0	0	1
DownsSyndrome	1 if down syndrome dx in med chart	1095	0	0	1
MC_Neuro_243	243: Neurofibromatosis	1095	0	0	1
MC_PKU_250	250: PKU	1095	0	0	0
MC_CMV_225	225: CMV	1095	0	0	0
MC_DevDelay_227	227: Developmental delay, other (specify)	1095	0	0	1
PI_DevDelay	Any other developmental delay, such as mental retardation	1095	0	0	1
MC_AbPain_214	214: Chronic abdominal pain/cramps before age 3	1095	0	0	0

Exhibit 2.1. List of Variables Included in the Analysis File

Variable	Label	n	n Miss	Min	Max
MC_bloating_215	215: Chronic bloating before age 3	1095	0	0	0
MC_celiac_216	216: Chronic celiac disease before age 3	1095	0	0	0
MC_const_217	217: Chronic constipation before age 3	1095	0	0	1
MC_FoodInt_218	218: Chronic food intolerance before age 3 (specify)	1095	0	0	1
MC_gastroenteritis_219	219: Chronic gastroenteritis before age 3	1095	0	0	1
MC_MalAbs_220	220: Chronic malabsorption before age 3	1095	0	0	0
MC_diarrhea_221	221: Chronic/recurrent diarrhea before age 3	1095	0	0	1
MC_enteritis_222	222: Chronic regional enteritis before age 3	1095	0	0	0
MC_VomitColic_224	224: Chronic vomiting/colic before age 3	1095	0	0	1
<mark>Covariates: Child and Family Characteristics</mark>					
BWLt1k	=1 if Birth wgt < 1 Kg	1095	0	0	1
BW1_1p5k	=1 if Birth wgt 1.0 Kg to 1.499 Kg	1095	0	0	1
BW1p5_2p5k	=1 if Birth wgt 1.5 Kg to 2.499 Kg	1095	0	0	1
BW2p5_4k	=1 if Birth wgt 2.5 Kg to 3.999 Kg	1095	0	0	1
BW4kup	=1 if Birth wgt 4.0 Kg and up	1095	0	0	1
BwgtCat	1=<1kg;2=1-1.4999;3=1.5-2.4999;4=2.5-3.999;5=ge4kg	1095	0	1	5
PovertyRatio_imp	=1 if missing value imputed	1095	0	0	1
PovertyRatio1	Ratio of household income to poverty line.	1095	0	0.185	20
MomEduc	0=NoHSDip;1=HS_GED;2=SomeCollege;3= CollDegree(BA, Associate's or above)	1095	0	0	3
momeduc_imp	=1 if momeduc imputed	1	1094	1	1
MomEduc_NoHS	=1 if Mom has no HS diploma	1095	0	0	1
MomEduc_HS	=1 if Mom HS Grad	1095	0	0	1
MomEduc_Some	=1 if Mom Some Coll	1095	0	0	1
MomEduc_Coll	=1 if Mom Coll Grad	1095	0	0	1
SingleParent	Child lives in a single parent household(0/1)	1095	0	0	1
MomAgeCat	1=lt20;2=20-24;3=25-29;4=30-34;5=ge35	1095	0	1	5
MomLt20	Mom Age at child birth lt 20	1095	0	0	1
Mom20_24	Mom Age at child birth 20 - 24	1095	0	0	1
Mom25_29	Mom Age at child birth 25 - 29	1095	0	0	1
Mom30_34	Mom Age at child birth 30 - 34	1095	0	0	1
MomGE35	Mom Age at child birth ge 35	1095	0	0	1
BioDadAge_Imp	=1 if missing value imputed	1095	0	0	1
BioDadAgeCat_1	1=0-19, 2=20-29, 3=30-39, 4=40-49, 5=49+	1095	0	1	5

Exhibit 2.1. List of Variables Included in the Analysis File

Variable	Label	n	n Miss	Min	Max
Dadlt20_i1	Dad <20 years old	1095	0	0	1
Dad20_29_i1	Dad 20-29 years old	1095	0	0	1
Dad30_39_i1	Dad 30-39 years old	1095	0	0	1
Dad40_49_i1	Dad 40-49 years old	1095	0	0	1
DadGE49_i1	Dad >49 years old	1095	0	0	1
BirthOrder_Imp	Imputation indicator for birth order	1095	0	0	1
BirthOrderCat_1	1=1st,2=2nd,3=3rd or higher	1095	0	1	3
BirthOrder1_1	=1 if 1st born	1095	0	0	1
BirthOrder2_1	=1 if 2nd born	1095	0	0	1
BirthOrderGE3_1	=1 if 3rd born or higher	1095	0	0	1
~~Multiple~~	~~=1 if twin or triplet~~ (this variable omitted from file)	1095	0	0	1
BFNone	=1 if Breastfed 0 months	1095	0	0	1
BF1_6mos	=1 if Breastfed 1-5.99 months	1095	0	0	1
BFgt6mos	=1 if Breastfed 6+ months	1095	0	0	1
BFMthsCat	Breastfed: 1=lt 1mo;2=1-5.99;3=6+mos	1095	0	0	2
Covariates: Child Birth Conditions					
C5APGAR	5-minute APGAR score	1095	0	5	10
BirthAsphyxia	=1 if Birth asphyxia	1095	0	0	1
RespDistress	=1 if Resp Distress Syndrome (hyaline)	1095	0	0	1
Bilirubin	=1 if hyperbilirubinemia	1095	0	0	1
Covariates: Prenatal non-vaccine exposures					
PreNatNicotine_Imp	=1 if missing value imputed	1095	0	0	1
PreNatNicotine_1	=1 if any tobacco use: pregnancy	1095	0	0	1
PreNatAlcohol_Imp	=1 if missing value imputed	3	1092	1	1
PreNatAlcohol_1	0=Never,1=Occasional,2=light,3=moderate	1095	0	0	3
PreNatTuna	Prenatal Tuna (0=none, 1=moderate, 2=high)	1095	0	0	2
PreNatTuna_Imp	=1 if missing value imputed	1095	0	0	1
PreNatOceanFresh	Hi Prenatal OceanFresh (1= ate other OceanFresh often or very often)	1095	0	0	1
PreNatOceanFresh_Imp	=1 if missing value imputed	1095	0	0	1
PreNatFish	=1 if PreNatTuna=Hi or PreNatOceanFresh in(Often,VeryOften)	1095	0	0	1
PreNatFish_Imp	=1 if missing value imputed	1095	0	0	1
PreNatOthMerc_Any	=1 if any prenat non-vac merc exposures	1095	0	0	1
PreNatFillings_Imp	=1 if missing value imputed	1095	0	0	1

Exhibit 2.1. List of Variables Included in the Analysis File

Variable	Label	n	n Miss	Min	Max
PreNatFillings_1	0=None,1=Have(noWrk,Grnd,gum)2=Have(YesWrk,Grnd or Gum)	1095	0	0	2
PreNatLead_Imp	=1 if PreNatResiLead_imp or PreNatOccupLead_imp = 1	1095	0	0	1
PreNatLead_1	=1 if PreNatResiLead or PreNatOccupLead=1	1095	0	0	1
~~PreNatIllDrug~~	~~=1 if Cocaine or Narcotic use during pregnancy~~ (This variable omitted from file)	1095	0	0	1
PreNatValproic	Used Prenatal Valproic acid	1095	0	0	1
Folic_PNVit_Multi	=1 if Folic,PreNatVit or Multivit prenatally	1095	0	0	1
PreNatViralInf	=1 if any viral infections during pregnancy	1095	0	0	1
<mark>Covariates: Child Medical Condition</mark>					
Anemia	=1 if anemia 6-30 mos	1095	0	0	1
Enceph	=1 if Encephalitis or any CNS infection <36mos	1095	0	0	1
ChildLead	=1 if child exposure to lead	1095	0	0	1
ChildPica	=1 if child had pica	1095	0	0	1
<mark>Covariates: Health care seeking</mark>					
HC_Cholest	Cholesteral Test 0=never,1=>3yrs,2=w/in3yrs	1095	0	0	2
HC_Cholest_0	0=never	1095	0	0	1
HC_Cholest_1	1=>3yrs	1095	0	0	1
HC_Cholest_2	2=w/in3yrs	1095	0	0	1
HC_pap	Pap Smear 0=never,1=>3yrs,2=w/in3yrs	1095	0	0	2
HC_PAP_0	0=never	1095	0	0	1
HC_PAP_1	1=>3yrs	1095	0	0	1
HC_PAP_2	2=w/in3yrs	1095	0	0	1
HC_InitInad_1	=1 if Kotel = Inadeq PreNat Care	1095	0	0	1
HC_InitInad_Imp	=1 if imputed	7	1088	1	1

3. Variable Descriptions

Exhibit 3.1 Data Sources and Construction of Variables Used in Analytical Models

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
Data Management Variables						
ChildID	ChildID for merging data sets					Numeric variable, ranging from 1 to1093.
DS_ASD_Main	=1 if ASD Main Data Set =98 if control omitted because no cases within matching stratum. =99 ineligible control or below criteria case	X	X		X	Use this variable to create the ASD with matched controls data set (n=256 ASD, n=752 Controls) See Vol I[a], Section 5.5, Exhibit 5.5.1 for details. See this variable used in "Example Analysis", below.
DS_AD_Main	=1 if AD Main Data Set =98 if control omitted because no cases within matching stratum. =99 ineligible control or below criteria case	X	X		X	Use this variable to create the AD with matched controls data set (n=187 AD, n=724 Controls) See Vol I, Section 5.5, Exhibit 5.5.1 for details.
DS_ASD_Only	=1 if ASD only Data Set =98 if control omitted because no cases within matching stratum. =99 ineligible control or below criteria case	X	X		X	Use this variable to create the ASD-no-AD with matched controls data set (n=69 Cases, n=704 Controls) See Vol I, Section 5.5, Exhibit 5.5.1 for details.
DS_ASD_Regr	=1 if ASD with regression Data Set =98 if control omitted because no cases within matching stratum. =99 ineligible control or below criteria case	X	X		X	Use this variable to create the ASD w/regression with matched controls data set (n=49 Cases, n=652 Controls) See Vol I, Section 5.5, Exhibit 5.5.1 for details.
DS_AD_ExLoIQ	=1 if AD with low cognitive function excluded data set =98 if control omitted because no cases within matching stratum. =99 ineligible control or below criteria case	X	X		X	Use this variable to create the AD with low cognitive function excluded with matched controls data set (n=165 Cases, n=719 Controls) See Vol I, Section 5.5, Exhibit 5.5.1 for details.
DS_ASD_TCln	=1 if ASD and screened controls data set =98 if control omitted because no cases within matching stratum. =99 ineligible control or below criteria case	X	X		X	Use this variable to create the ASD with matched screened controls data set (n=255 Cases, n=566 Controls) See Vol I, Section 5.5, Exhibit 5.5.1 for details.

Exhibit 3.1 Data Sources and Construction of Variables Used in Analytical Models

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
DS_AD_TCln	=1 if AD and screened controls data set =98 if control omitted because no cases within matching stratum. =99 ineligible control or below criteria case	X	X		X	Use this variable to create the AD with matched screened controls data set (n=186 Cases, n=542 Controls) See Vol I, Section 5.5, Exhibit 5.5.1 for details.
StatusCode	Status code of each subject	X	X		X	=1 if control; =2 if case confirmed; =3 if case below criteria.
InElig_Cntrl	=1 if control ineligible	X	X			=1 if control ineligible because of diagnosis of Asperger's syndrome, tuberous sclerosis, or pervasive developmental disorder. See Vol I, Section 5.5.
MatchStrat	Matching Stratum HMO, Birth year, Sex	X	X	X		Matching strata are numbered 1-48. See this variable used in "Example Analysis", below.
weight1	Weight for DS_ASD_main=1					Used in Vol II , Section 16. See Section 16.3. Weights were created for DS_ASD_main=1 so that for each matching stratum, the sum of weights of controls is 3 times of the number of cases.
weight2	Weight for DS_AD_main=1					Used in Vol II , Section 16. See Section 16.3. Weights were created for DS_AD_main=1 so that for each matching stratum, the sum of weights of controls is 3 times of the number of cases.
weight3	Weight for DS_ASD_only=1					Used in Vol II , Section 16. See Section 16.3. Weights were created for DS_ASD_only=1 so that for each matching stratum, the sum of weights of controls is 3 times of the number of cases.
weight4	Weight for DS_ASD_regr=1					Used in Vol II , Section 16. See Section 16.3. Weights were created for DS_ASD_regr=1 so that for each matching stratum, the sum of weights of controls is 3 times of the number of cases.

Exhibit 3.1 Data Sources and Construction of Variables Used in Analytical Models

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
weight5	Weight for DS_AD_ExLoIQ=1					Used in Vol II , Section 16. See Section 16.3. Weights were created for DS_AD_ExLoIQ=1 so that for each matching stratum, the sum of weights of controls is 3 times of the number of cases.
weight6	Weight for DS_ASD_TCln=1					Used in Vol II , Section 16. See Section 16.3. Weights were created for DS_ASD_TCln=1 so that for each matching stratum, the sum of weights of controls is 3 times of the number of cases.
weight7	Weight for DS_AD_TCln=1					Used in Vol II , Section 16. See Section 16.3. Weights were created for DS_AD_TCln=1 so that for each matching stratum, the sum of weights of controls is 3 times of the number of cases
Outcome Indicators						
ASD_Outc	=1 if ASD/AD, =0 Cntr, .=exclude				X	See this variable used in "Example Analysis", below.
ASD_time	=1 if ASD/AD, =2 Cntr, .=exclude				X	See this variable used in "Example Analysis", below.
AD_Outc	=1 if AD, =0 Cntr, .=exclude				X	
AD_time	=1 if AD, =2 Cntr, .=exclude				X	
ASD_Only	=1 if ASD only, =0 Cntr, .=exclude				X	
ASD_Only_time	=1 if ASD only, =2 Cntr, .=exclude				X	
ASD_Regr	=1 if ASD w/Regress,=0 Cntr				X	
ASD_Regr_Time	=1 if ASD w/Reg, =2 if Cntr,=. exclude				X	
AD_ExLoIQ	=1 if AD w/Lo IQ Excluded,=0 Cntr				X	
AD_ExLoIQ_Time	=1 if AD w/IQ excluded, =2 if Cntr,=. exclude				X	
ASD_TCln	=1 if ASD/AD, =0 Tot Cln Cntr, .=exclude				X	
ASD_TCln_time	=1 if ASD/AD, =2 Tot Cln Cntr, .=exclude				X	
AD_TCln	=1 if AD/AD, =0 Tot Cln Cntr, .=exclude				X	
AD_TCln_time	=1 if AD/AD, =2 Tot Cln Cntr, .=exclude				X	
Exposure Variables						
PreNatThimer	PreNat Exp Amt	X	X			*PreNatThimer* measures the sum total amount

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
						of mother's ethyl mercury exposure to Thimerosal in influenza vaccine or Rhogam or any other immune globulin products, during pregnancy, expressed in □g units See Vol I, Section 7.4 for variable creation. See Vol I, Section 9.4.1 for use in analysis models See this variable used in "Example Analysis", below.
PreNatThimer_Alt	PreNat Exp Amt (Alt)	X	X			*PreNatThimer_Alt* is an alternate amount of prenatal ethyl mercury exposure from thimerosal in vaccines and immune globulins received by the mother during her pregnancy with focus child. Calculated using alternative prenatal immune globulin amount variables (PN_IG1_Amt_Alt, PN_IG2_Amt_Alt). See Vol I, Section 7.4 for variable creation. See Vol II, Section 11.1 for use in analysis models
Exp01mos	Amt/Wt(KGs) birth-28 days		X	X		Exp01mos measures the □g of ethyl mercury received from Thimerosal in vaccines in the first 28 days of life divided by child's weight in grams at the time of receipt of the vaccine. See Vol I, Section 7.3 for variable creation. See Vol I, Section 9.4.1 for use in analysis models See this variable used in "Example Analysis", below.
Exp17mos	Amt/Wt(KGs) 29-214 days		X	X		*Exp17mos* is a cumulative measure of ethyl mercury exposure to Thimerosal during the age range of one to seven months (29 to 214 days), expressed in □g units per kg of body weight. Prenatal exposures and exposure to Thimerosal from a hepatitis B vaccination received at birth (i.e., in the first month of life) are not included in this measure.

Exhibit 3.1 Data Sources and Construction of Variables Used in Analytical Models

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
						See Vol I, Section 7.3 for variable creation. See Vol I, Section 9.4.1 for use in analysis models. See this variable used in "Example Analysis", below.
Exp07mos	Amt/Wt(KGs) birth-214 days		X	X		*Exp07mos* is a cumulative measure of ethyl mercury exposure to Thimerosal during the age range of birth through seven months (1 to 214 days), expressed in □g units per kg of body weight. Prenatal exposures are not included in this measure.
Exp020mos	Amt/Wt(KGs) birth-609 days		X	X		*Exp07mos* is a cumulative measure of ethyl mercury exposure to Thimerosal during the age range of birth through twenty months (1 to 609 days), expressed in □g units per kg of body weight. Prenatal exposures are not included in this measure. See Vol I, Section 7.3 for variable creation. See Vol I, Section 9.4.1 for use in analysis models. See this variable used in "Example Analysis", below.
Amt01mos	Amt Merc birth-28 days		X	X		*Amt01mos* measures the □g of ethyl mercury received from Thimerosal in vaccines in the first 28 days of life. See Vol I, Section 7.3 for variable creation. See Vol II, Section 11.1 for use in analysis models
Amt17mos	Amt Merc 29-214 days		X	X		*Amt17mos* measures the □g of ethyl mercury received from Thimerosal in vaccines in days 29 to 214 of life. Prenatal exposures and exposure to Thimerosal from a hepatitis B vaccination received at birth (i.e., in the first month of life) are not included in this measure. See Vol I, Section 7.3 for variable creation. See Vol II, Section 11.1 for use in analysis

		Data Sources				
Variable	**Description**	**Par Int**	**Med Abstr**	**Comp Aut**	**Case Asmt**	**Additional Details**[a]
						models
Amt07mos	Amt Merc birth-214 days		X	X		*Amt07mos* measures the □g of ethyl mercury received from Thimerosal in vaccines in the first 214 days of life. Prenatal exposures are not included in this measure. See Vol I, Section 7.3 for variable creation. See Vol I, Exhibit 8.3 for use.
Amt020mos	Amt Merc birth-609 days		X	X		*Amt020mos* measures the □g of ethyl mercury received from Thimerosal in vaccines in the first 609 days of life. Prenatal exposures are not included in this measure. See Vol I, Section 7.3 for variable creation. See Vol I, Exhibit 8.3 for use.
AbExp01mos	Concur Amt/Wt(KGs) birth-28 days		X	X		*AbExp01mos* is a cumulative measure of ethylmercury exposure from thimerosal in vaccines received ***concurrent with antibiotics*** during the age ranges from birth through one month1 (1 – 28 days), expressed in microgram units per kilograms of body weight at the time of vaccine receipt. See Vol I, Section 9.4.5 for details and use.
AbExp07mos	Concur Amt/Wt(KGs) birth-214 days		X	X		*AbExp07mos* is a cumulative measure of ethylmercury exposure from thimerosal in vaccines received ***concurrent with antibiotics*** during the age range from birth through seven months (1 – 214 days), expressed in microgram units per kilograms of body weight at the time of vaccine receipt. See Vol I, Section 9.4.5 for details and use.
AbExp17mos	Concur Amt/Wt(KGs) 29-214 days		X	X		*AbExp17mos* is a cumulative measure of ethylmercury exposure from thimerosal in vaccines received ***concurrent with antibiotics*** during the age ranges from one through seven months (29 – 214 days), expressed in microgram units per kilograms of

Exhibit 3.1 Data Sources and Construction of Variables Used in Analytical Models

Exhibit 3.1 Data Sources and Construction of Variables Used in Analytical Models

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
						body weight at the time of vaccine receipt. See Vol I, Section 9.4.5 for details and use.
AbExp020mos	Concur Amt/Wt(KGs) birth-609 days		X	X		*AbExp020mos* is a cumulative measure of ethylmercury exposure from thimerosal in vaccines received ***concurrent with antibiotics*** during the age range from birth through twenty months (1 – 609 days), expressed in microgram units per kilograms of body weight at the time of vaccine receipt. See Vol I, Section 9.4.5 for details and use.
ncAbExp01mos	NonConcur Amt/Wt(KGs) birth-28 days		X	X		*ncAbExp01mos* is a cumulative measure of ethylmercury exposure from thimerosal in vaccines received ***without concurrent antibiotics use*** during the age ranges from birth through one month1 (1 – 28 days), expressed in microgram units per kilograms of body weight at the time of vaccine receipt. See Vol I, Section 9.4.5 for details and use.
ncAbExp07mos	NonConcur Amt/Wt(KGs) birth-214 days		X	X		*ncAbExp07mos* is a cumulative measure of ethylmercury exposure from thimerosal in vaccines received ***without concurrent antibiotics use*** during the age range from birth through seven months (1 – 214 days), expressed in microgram units per kilograms of body weight at the time of vaccine receipt. See Vol I, Section 9.4.5 for details and use.
ncAbExp17mos	NonConcur Amt/Wt(KGs) 29-214 days		X	X		*ncAbExp17mos* is a cumulative measure of ethylmercury exposure from thimerosal in vaccines received ***without concurrent antibiotics use*** during the age ranges from one through seven months (29 – 214 days), expressed in microgram units per kilograms of body weight at the time of vaccine receipt. See Vol I, Section 9.4.5 for details and use.
ncAbExp020mos	NonConcur Amt/Wt(KGs) birth-609 days		X	X		*ncAbExp020mos* is a cumulative measure of

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
		Data Sources				
						ethylmercury exposure from thimerosal in vaccines received ***without concurrent antibiotics use*** during the age range from birth through twenty months (1 – 609 days), expressed in microgram units per kilograms of body weight at the time of vaccine receipt. See Vol I, Section 9.4.5 for details and use.
AbDays01mos	# days on Abiots birth-28 days		X	X		*AbDays01mos* is the number of days a child was on antibiotics in the period 1- 28 days old. See Vol I, Section 9.4.5 for details and use.
AbDays07mos	# days on Abiots 1-214 days		X	X		*AbDays07mos* is the number of days a child was on antibiotics in the period 1- 214 days old. See Vol I, Section 9.4.5 for details and use.
AbDays17mos	# days on Abiots 29-214 days		X	X		*AbDays17mos* is the number of days a child was on antibiotics in the period 29-214 days old. See Vol I, Section 9.4.5 for details and use.
AbDays020mos	# days on Abiots birth-609 days		X	X		*AbDays020mos* is the number of days a child was on antibiotics in the period 1- 609 days old. See Vol I, Section 9.4.5 for details and use.
AnyAb01mos	=1 if any Abiots 01 mos		X	X		=1 if a child was on antibiotics in the period 1- 28 days old. =0 if not. See Vol I, Section 9.4.6 for details and use.
AnyAb07mos	=1 if any Abiots 07 mos		X	X		=1 if a child was on antibiotics in the period 1- 214 days old. =0 if not. See Vol I, Section 9.4.6 for details and use.
AnyAb17mos	=1 if any Abiots 17 mos		X	X		=1 if a child was on antibiotics in the period 28-214 days old. =0 if not. See Vol I, Section 9.4.6 for details and use.
AnyAb020mos	=1 if any Abiots 020 mos		X	X		=1 if a child was on antibiotics in the period 1- 609 days old. =0 if not. See Vol I, Section 9.4.6 for details and use.
PreNatAllMerc		X	X	X		A broader measures of prenatal exposure

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
						including mercury exposures from thimerosal in vaccines and immune globulins, maternal fish consumption, maternal use of mercury containing health care produces (contact lens, nasal, ear, eye drops), maternal exposure from home products, and from amalgam fillings. See Vol I, Section 9.4.4 for details and use.
General Information about Child						
SexMale	=1 if Sex=Male	X	X	X		Used in Vol I, Section 9.1 "Descriptive Statistics"
AgeAtPIYrs	Age in Years at Par Interview, from IQ_Status.sas	X	X	X		Used in Vol I, Section 9.1 "Descriptive Statistics"
Ravens_Score_n	Cases only-Score if given Raven, from IQ_Status.sas				X	See Vol I, Section 7.1.3 for details and use.
Mullen_Age	Cases only-IQ Age equiv if given Mullen, from IQ_Status.sas				X	See Vol I, Section 7.1.3 for details and use.
RatioIQ	(Mullen_age/AgeAtPIYrs)*100, from IQ_Status.sas				X	See Vol I, Section 7.1.3 for details and use.
LowIQ	=1 if Ravens_Score<35 or Mullen RatioIQ<35, from IQ_Status.sas				X	See Vol I, Section 7.1.3 for details and use.
SCQ_Administered	=1 if SCQ was administered	X				See Vol I, Section 7.2 for details and use.
ScreenOut	=1 if should be excluded from screened control group analyses	X	X	X		See Vol I, Section 7.2 for details and use.
Q11	ADIR Loss of Lang Skills, see Regression_Status.sas				X	See Vol I, Section 7.1.2 for details and use.
Q12b_SkillsLost	# skills lost in ADIR Q12b, see Regression_Status.sas				X	See Vol I, Section 7.1.2 for details and use.
Q12b_skillsprior	# skills before 24 mos in ADIR Q12b				X	See Vol I, Section 7.1.2 for details and use.
Q12b_PctLost	% skills lost in ADIR Q12b				X	See Vol I, Section 7.1.2 for details and use.

Exhibit 3.1 Data Sources and Construction of Variables Used in Analytical Models

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
Regression	=1 if Regression (loss of lang/skills), created in Regression_Status.sas				X	See Vol I, Section 7.1.2 for details and use.
Older_aut_sib	=1 if child has older autistic sibling	X				See Vol II, Section15 for details and use.
MC_epilepsy_230	230: Epilepsy/seizures/convulsions (specify)		X			See Vol II, Section21.3 for details and use.
MC_CerePal_212	212: Cerebral Palsy		X			See Vol II, Section21.3 for details and use.
MC_HearingDis_233	233: Hearing disorder (specify)		X			See Vol II, Section21.3 for details and use.
MC_VisImp_261	261: Visual Impairment		X			See Vol II, Section21.3 for details and use.
DownsSyndrome	1 if down syndrome dx in med chart		X			See Vol II, Section21.3 for details and use.
MC_Neuro_243	243: Neurofibromatosis		X			See Vol II, Section21.3 for details and use.
MC_PKU_250	250: PKU		X			See Vol II, Section21.3 for details and use.
MC_CMV_225	225: CMV		X			See Vol II, Section21.3 for details and use.
MC_DevDelay_227	227: Developmental delay, other (specify)		X			See Vol II, Section21.3 for details and use.
PI_DevDelay	Any other developmental delay, such as mental retardation	X				See Vol II, Section21.3 for details and use.
MC_AbPain_214	214: Chronic abdominal pain/cramps before age 3		X			See Vol II, Section21.3 for details and use.
MC_bloating_215	215: Chronic bloating before age 3		X			See Vol II, Section21.3 for details and use.
MC_celiac_216	216: Chronic celiac disease before age 3		X			See Vol II, Section21.3 for details and use.
MC_const_217	217: Chronic constipation before age 3		X			See Vol II, Section21.3 for details and use.
MC_FoodInt_218	218: Chronic food intolerance before age 3		X			See Vol II, Section21.3 for details and use.
MC_gastroenteritis_219	219: Chronic gastroenteritis before age 3		X			See Vol II, Section21.3 for details and use.
MC_MalAbs_220	220: Chronic malabsorption before age 3		X			See Vol II, Section21.3 for details and use.
MC_diarrhea_221	221: Chronic/recurrent diarrhea before age 3		X			See Vol II, Section21.3 for details and use.
MC_enteritis_222	222: Chronic regional enteritis before age 3		X			See Vol II, Section21.3 for details and use.
MC_VomitColic_224	224: Chronic vomiting/colic before age 3		X			See Vol II, Section21.3 for details and use.
Covariates						
Child and Family Characteristics						
BwgtCat	1 = <1.0 kilograms (KG) 2 = 1.0 to 1.4999 KGs 3 = 1.5 to 2.4999 KGs		X	X		The five category variable was made into four dummy variables for use in analytical models. Category 1 (<1.0 KGs) is omitted category in

Exhibit 3.1 Data Sources and Construction of Variables Used in Analytical Models

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
	4 = 2.5 to 3.4999 KGs 5 = 4.0 + KGs					models.
BWLt1k	=1 if Birth wgt < 1 Kg		X	X		See Vol I, Sec. 8.2, Exhibit 8.2
BW1_1p5k	=1 if Birth wgt 1.0 Kg to 1.499 Kg		X	X		See Vol I, Sec. 8.2, Exhibit 8.2
BW1p5_2p5k	=1 if Birth wgt 1.5 Kg to 2.499 Kg		X	X		See Vol I, Sec. 8.2, Exhibit 8.2
BW2p5_4k	=1 if Birth wgt 2.5 Kg to 3.999 Kg		X	X		See Vol I, Sec. 8.2, Exhibit 8.2
BW4kup	=1 if Birth wgt 4.0 Kg and up		X	X		See Vol I, Sec. 8.2, Exhibit 8.2

PovertyRatio1	Ratio of household income to poverty line. Values below 1 corresond to families living below the poverty line. Values above 1 correspond to families living above the poverty line.	X				Percent of poverty line calculated from household (HH) size, household income, and the 2004 poverty guidelines for the 48 contiguous states and the District of Columbia shown in Department of Health and Human Services Annual Update of the HHS Poverty Guidelines; Federal Register, Vol. 69, No. 30, February 13, 2004 / Notices according to the following algorithm:
						if HH size=2 then PovertyRatio=HH Income/12490;
						if HH size=3 then PovertyRatio =HH Income/15670;
						if HH size=4 then PovertyRatio=HH Income/18850;
						if HH size=5 then PovertyRatio=HH Income/22030;
						if HH size=6 then PovertyRatio=HH Income/25210;
						if HH size=7 then PovertyRatio=HH Income/28390;
						if HH size=8 then PovertyRatio=HH Income/31570;
						if HH size=9 then PovertyRatio=HH Inc./(31570+3180);
						if HH size=10 then PovertyRatio=HH nc./(31570+6360)
						See Vol I, Sec. 8.2, Exhibit 8.2

PovertyRatio_imp	=1 if missing value imputed	X				See Vol I, Section 7.5.2.
MomEduc	0= No high school degree 1=High school diploma or GED 2=attended some college, but no degree 3=Associate's degree or higher	X				Maternal education level The four category variable was made into three dummy variables for use in analytical models. Category 1 (No high school degree) is omitted category in models.
momeduc_imp	=1 if momeduc imputed	X				See Vol I, Section 7.5.2.
MomEduc_NoHS	=1 if Mom has no HS diploma	X				See Vol I, Sec. 8.2, Exhibit 8.2

Exhibit 3.1 Data Sources and Construction of Variables Used in Analytical Models

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
MomEduc_HS	=1 if Mom HS Grad	X				See Vol I, Sec. 8.2, Exhibit 8.2
MomEduc_Some	=1 if Mom Some Coll	X				See Vol I, Sec. 8.2, Exhibit 8.2
MomEduc_Coll	=1 if Mom Coll Grad	X				See Vol I, Sec. 8.2, Exhibit 8.2
SingleParent	Child lives in a single parent household (0=no, 1=yes)	X				See Vol I, Sec. 8.2, Exhibit 8.2
Child and Family Characteristics						
MomAgeCat	Age at birth of child 1 = <20 years old 2 = 20 – 24 years 3 = 25 – 29 years 4 = 30 – 34 years 5 = 35 years or older	X	X	X		The five category variable was made into four dummy variables for use in analytical models. Category 1 (<20 years old) is omitted category in models.
MomLt20	Mom Age at child birth lt 20	X	X	X		See Vol I, Sec. 8.2, Exhibit 8.2
Mom20_24	Mom Age at child birth 20 - 24	X	X	X		See Vol I, Sec. 8.2, Exhibit 8.2
Mom25_29	Mom Age at child birth 25 - 29	X	X	X		See Vol I, Sec. 8.2, Exhibit 8.2
Mom30_34	Mom Age at child birth 30 - 34	X	X	X		See Vol I, Sec. 8.2, Exhibit 8.2
MomGE35	Mom Age at child birth ge 35	X	X	X		See Vol I, Sec. 8.2, Exhibit 8.2
BioDadAgeCat_1	Paternal Age at birth of child 1 = <20 years old 2 = 20 – 29 years 3 = 30 – 39 years 4 = 40 – 49 years 5 = 50 years or older	X	X			The five category variable was made into four dummy variables for use in analytical models. Category 1 (<20 years old) is omitted category in models.
BioDadAge_Imp	=1 if missing value imputed	X	X			See Vol I, Section 7.5.2.
Dadlt20_i1	=1 if Dad <20 years old	X	X			See Vol I, Sec. 8.2, Exhibit 8.2
Dad20_29_i1	=1 if Dad 20-29 years old	X	X			See Vol I, Sec. 8.2, Exhibit 8.2
Dad30_39_i1	=1 if Dad 30-39 years old	X	X			See Vol I, Sec. 8.2, Exhibit 8.2
Dad40_49_i1	=1 if Dad 40-49 years old	X	X			See Vol I, Sec. 8.2, Exhibit 8.2
DadGE49_i1	=1 if Dad >49 years old	X	X			See Vol I, Sec. 8.2, Exhibit 8.2
BirthOrderCat_1	1=Child is first born 2=Child is Second born 3=Child is third born or later	X				The three category variable was made into two dummy variables for use in analytical models. Category 1 (first born) is omitted category in models.
BirthOrder1_1	=1 if 1st born	X				See Vol I, Sec. 8.2, Exhibit 8.2
BirthOrder2_1	=1 if 2nd born	X				See Vol I, Sec. 8.2, Exhibit 8.2

Exhibit 3.1 Data Sources and Construction of Variables Used in Analytical Models

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
BirthOrderGE3_1	=1 if 3rd born or higher	X				See Vol I, Sec. 8.2, Exhibit 8.2
birthOrder_imp	=1 if missing value imputed	X				See Vol I, Section 7.5.2.
~~*Multiple*~~	~~Plurality~~ ~~=1 if child was a multiple (twin, triplet)~~ ~~=0 if child was a singleton~~ (This variable omitted from file)	X	X			See Vol I, Sec. 8.2, Exhibit 8.2
BFMthsCat	*Breast Feeding (Duration)* 0 = Breast Fed: <1 month 1 =Breast Fed: 1-6 months 2 = Breast Fed: 6+ months	X	X			The three category variable was made into two dummy variables for use in analytical models. Category 0 (<1 month) is omitted category in models.
BFNone	=1 if Breastfed 0 months	X	X			See Vol I, Sec. 8.2, Exhibit 8.2
BF1_6mos	=1 if Breastfed 1-5.99 months	X	X			See Vol I, Sec. 8.2, Exhibit 8.2
BFgt6mos	=1 if Breastfed 6+ months	X	X			See Vol I, Sec. 8.2, Exhibit 8.2
Child Birth Conditions						
C5APGAR	5-minute APGAR score		X			Child's score on the 5 minute APGAR, which is a test given to newborns five minutes after birth to measure activity, pulse, grimace, appearance, and respiration. See Vol I, Sec. 8.2, Exhibit 8.2
BirthAsphyxia	=1 if medical record indicates birth asphyxia =0 else		X			See Vol I, Sec. 8.2, Exhibit 8.2
RespDistress	=1 if medical record indicates respiratory distress =0 else		X			See Vol I, Sec. 8.2, Exhibit 8.2
Bilirubin	=1 if neonatal hyperbilirubinemia =0 else		X			=1 if total bilirubin >10 on day 1; or If total bilirubin > 12 on day 2; or If total bilirubin >15 on day 3; or If any of the following treatments: phototherapy, bililites, bilirubin lights, exchange transfusion, or type and cross match blood. See Vol I, Sec. 8.2, Exhibit 8.2
Prenatal Exposures (non-vaccine related)						
PreNatNicotine_1	Used tobacco during pregnancy	X	X			= 1 if mother used any tobacco products during pregnancy.

Exhibit 3.1 Data Sources and Construction of Variables Used in Analytical Models

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
						See Vol I, Sec. 8.2, Exhibit 8.2
PreNatNicotine_Imp	=1 if missing value imputed	X	X			See Vol I, Section 7.5.2.
PreNatAlcohol_1	Alcohol use during pregnancy:	X	X			0= none 1= occasional (1-4 drinks per month) 2= light (20-24 drinks/month or 5-6 per week) 3=moderate(10-15 drinks per week) 4=heavy (more than 15 drinks per week) Entered in models as linear term. See Vol I, Sec. 8.2, Exhibit 8.2
PreNatAlcohol_Imp	=1 if missing value imputed	X	X			See Vol I, Section 7.5.2.
PreNatTuna	Maternal tuna consumption during pregnancy	X				0= no consumption of tuna during pregnancy. 1 = moderate consumption (less than one serving per week) 2 = high consumption (more than one serving per week) Entered in models as linear term. See Vol I, Sec. 8.2, Exhibit 8.2
PreNatTuna_Imp	=1 if missing value imputed	X				See Vol I, Section 7.5.2.
PreNatFish_1	High consumption of fish during pregnancy.	X				1= if mother reported eating tuna, and ocean fish, and home-caught fish during pregnancy. 0 = else.
PreNatFish_Imp	=1 if missing value imputed	X				See Vol I, Section 7.5.2. PreNatFish_Imp = 1 if PreNatTuna_Imp = 1 or if PreNatOceanFresh =1.
PreNatOthMerc_Any	=1 if any prenat non-vac merc exposures	X				PreNat non-vac mercury exposures: PreNatChin= 1=used chinese herbal ball prep PreNatMex= 1=used native Am or Mex folk meds PreNatFolk= 1= used folk to treat empacho PreNatRelig= 1=materials Santeria,espiritismo,oth relig PreNatContacts= 1=used thim-containing contact soln PreNatNasal= 1=used thim-containing nasal soln PreNatEyeDrops= 1=used thim-containing eye drops PreNatEar = 1=used thim-containing ear wax soln PreNatSkin= 1=used skin lightening cream PreNatTherm= 1=exposed to broken merc-contain thermometer PreNatBulb= 1=exposed to broken florescent bulb PreNatShoes= 1=exposed to broken pre-97 shoe lights

Exhibit 3.1 Data Sources and Construction of Variables Used in Analytical Models

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
						PreNatGauge= 1=exposed to broken electronic switches,relays,gauges See Vol I, Sec. 8.2, Exhibit 8.2
PreNatFillings_1	Mercury-containing dental amalgams	X				Amalgam fillings during pregnancy: 0 = mother had no amalgam fillings 1 = had amalgam filling, but no dental work and did not chew gum during pregnancy 2= had amalgam fillings and had dental work or chewed gum during pregnancy.
PreNatFillings_Imp	=1 if missing value imputed	X				See Vol I, Section 7.5.2.
PreNatlead_1	Prenatal exposure to lead from occupational or residential sources	X				=1 if during pregnancy mother worked in: Worked in smelting, soldering, construction, or demolition or if during pregnancy mother lived in : a pre-1950 home, or a pre-1978 home that underwent painting or renovation during her pregnancy. See Vol I, Sec. 8.2, Exhibit 8.2
PreNatLead_Imp	=1 if PreNatResiLead_imp or PreNatOccupLead_imp = 1	X				See Vol I, Section 7.5.2.
~~*PreNatIllDrug*~~	~~1=Cocaine or Narcotic~~ (this variable omitted from file)	X	X			1= if mother reported any use of cocaine, crack, heroin, methamphetamines, or speed during pregnancy, or maternal medical chart indicated suspected use or suspected use of cocaine or narcotics during pregnancy. 0 = else. See Vol I, Sec. 8.2, Exhibit 8.2
PreNatValproic	= 1 if mother took valproic acid during pregnancy =0 else.	X	X			If chart or parent interview indicated that mother took valproic acid during pregnancy, or phenobarbitol, depakote, monistat, macrodantin during pregnancy. See Vol I, Sec. 8.2, Exhibit 8.2
Folic_PNVit_Multi	= 1 if mother took folic acid or prenatal vitamins or multivitamins during pregnancy	X	X			See Vol I, Sec. 8.2, Exhibit 8.2

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
	=0 else.					
PreNatViralInf	= 1 if medical chart indicated that mother had any viral infection (e.g., herpes simplex virus outbreak, chlamydia,strep infection, upper respiratory viral infection, viral enteritis) at anytime during pregnancy = 0 otherwise.		X			See Vol I, Sec. 8.2, Exhibit 8.2

Child Medical Conditions

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
Anemia	Anemia or iron deficiency		X			=1 if any records of anemia and iron deficiency in child's chart. =0 else. See Vol I, Sec. 8.2, Exhibit 8.2
Enceph	=1 if child had encephalitis or any CNS infection prior to 36 months of age =0 else		X			See Vol I, Sec. 8.2, Exhibit 8.2
ChildLead	=1 if child had lead test levels over 10 or child was exposed to lead from home before age 3 =0 else	X	X			=1 if lead poisoning before age three indicated in chart; or Parent said child had an elevated lead test level before age 3; or before age 3, Child lived in home where water was tested and found to have high lead content; or Child had pica and child lived in a pre-1950 home; or Child had pica and child lived in a a pre-1978 home that underwent painting or renovation; or Child had pica and parent said paint or floor varnish was tested and had high lead content. See Vol I, Sec. 8.2, Exhibit 8.2
ChildPica	=1 if child exhibited pica before his/her third birthday.	X	X			Pica is characterized by persistent and compulsive cravings (lasting one month or longer) to eat nonfood items. See Vol I, Sec. 8.2, Exhibit 8.2

Maternal Health Care Seeking Behavior

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
HC_InitInad	=1 if Kotelchuck initiation of prenatal care index in "inadequate" range	X	X			If date of initiation of prenatal care is missing from chart, then used information from parent

Exhibit 3.1 Data Sources and Construction of Variables Used in Analytical Models

Variable	Description	Par Int	Med Abstr	Comp Aut	Case Asmt	Additional Details[a]
	=0 else					interview See Vol I, Sec. 8.2, Exhibit 8.2
HC_InitInad_Imp	=1 if missing value imputed					See Vol I, Section 7.5.2.
HC_Pap	= 0 if mother has never had a pap smear. = 1 if mother has ever had a pap smear, but not within the three years prior to interview = 2 if mother had a pap smear within three years.		X			The three category variable was made into two dummy variables for use in analytical models. Category 0 (Never) is omitted category in models. This variable was considered to be a proxy measure for health care seeking behavior.
HC_PAP_0	0=never		X			See Vol I, Sec. 8.2, Exhibit 8.2
HC_PAP_1	1=>3yrs		X			See Vol I, Sec. 8.2, Exhibit 8.2
HC_PAP_2	2=w/in3yrs		X			See Vol I, Sec. 8.2, Exhibit 8.2
HC_Cholest	= 0 if mother has never had a cholesterol test. = 1 if mother has ever had a cholesterol test, but not within the three years prior to interview = 2 if mother had a cholesterol test within the three years.		X			The three category variable was made into two dummy variables for use in analytical models. Category 0 (Never) is omitted category in models. This variable was considered to be a proxy measure for health care seeking behavior.
HC_Cholest_0	0=never		X			See Vol I, Sec. 8.2, Exhibit 8.2
HC_Cholest_1	1=>3yrs		X			See Vol I, Sec. 8.2, Exhibit 8.2
HC_Cholest_2	2=w/in3yrs		X			See Vol I, Sec. 8.2, Exhibit 8.2

[a] Vol I and Vol II are references to *Thimerosal and Autism, Technical Report, Volumes I and II.*

4. Reproducing Results from the Technical Report

In order to reproduce a model result presented in the Technical Report, the data user will need to find the corresponding model specification presented in Section 9 of the Technical Report, and fit the model using the covariates specified in Exhibit 8.2.of the Technical Report. Exhibit 4.1 shows example SAS code that can be used to reproduce results.

Exhibt 4.1 Example Analysis

```
/* ***************************************************************************
  Get data set
 * *********************************************************************** */
data main; set pub.pubuse_mainanalysisfile;

/* ***************************************************************************
  Subset data to the ASD & Control data set (ASD n=256, Control n=762)
 * *********************************************************************** */

data ASD; set main;
if DS_ASD_Main=1;
run;

Proc freq; tables ASD_Outc;
run;

/* ***************************************************************************
   Fit model shown in Tech Report Volume II, Section 19 (Detail of Model Results)
Exhibit 19.1
 * *********************************************************************** */

proc phreg data=ASD;
 model ASD_Time *  ASD_Outc(0) =
    PreNatThimer
    Exp01mos
    Exp17mos
/* BWLt1k  omitted group */
BW1_1p5k
BW1p5_2p5k
BW2p5_4k
BW4kup
/* MomLt20   omitted group  */
Mom20_24
Mom25_29
Mom30_34
MomGE35
/* BirthOrder1_1  omitted group */
BirthOrder2_1
BirthOrderGE3_1

/* BFNone   omitted group */
BF1_6mos
BFgt6mos

PovertyRatio1

PreNatAlcohol_1
```

```
Folic_PNVit_Multi
Anemia
ChildPica

HC_InitInad_1

/* HC_Cholest_0 is omitted group */
HC_Cholest_1
HC_Cholest_2

/* HC_PAP_0 is omitted group */
HC_PAP_1
HC_PAP_2
PreNatLead_1
PreNatViralInf
        / ties = discrete;
 strata MatchStrat;

run;
```