

A Timeline of Thimerosal in the United States (Selected Dates and Years)

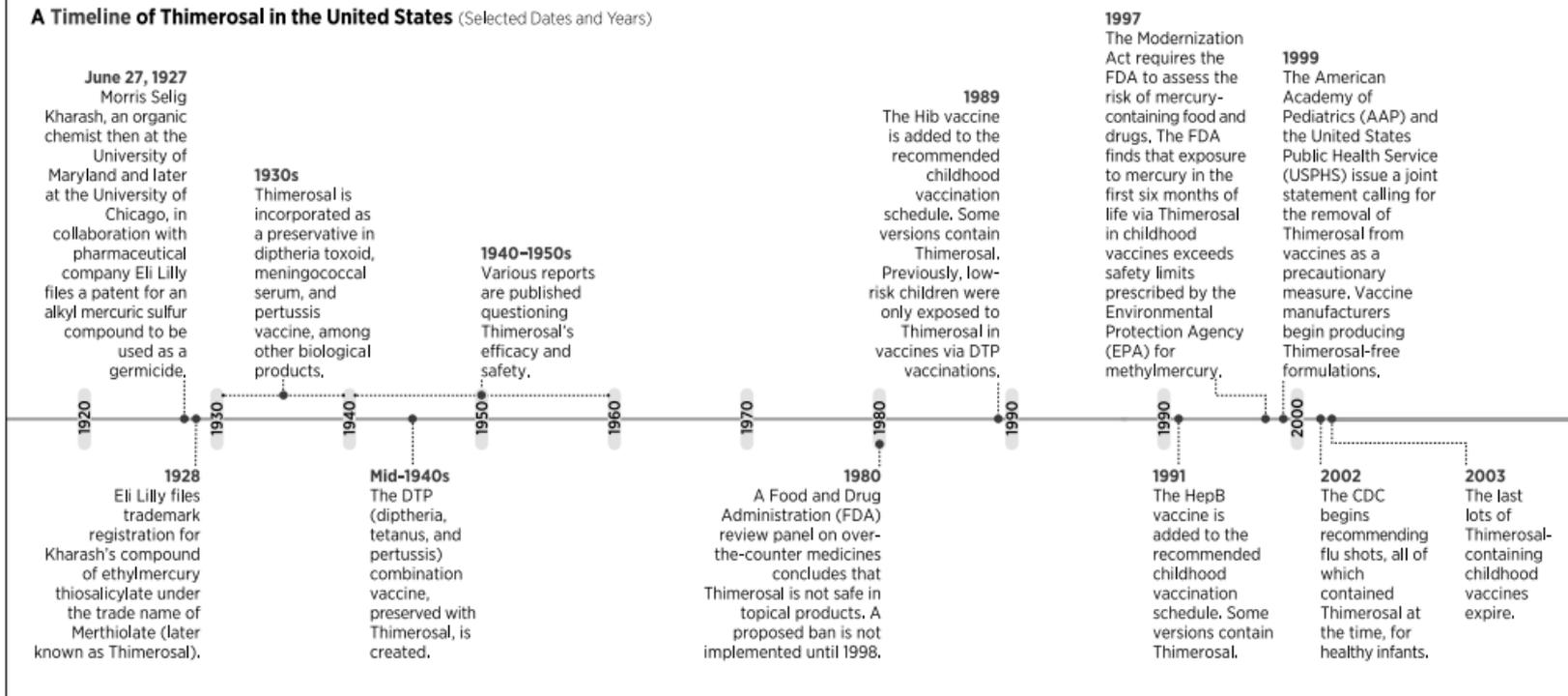


FIGURE 1

Different Forms of Mercury

	Organic	Inorganic	Metallic/Elemental
Chemical description	Bound to carbon	Bound to elements such as chlorine, sulfur or oxygen; known as “mercury salts”	Not bound to other elements
Appearance	As Thimerosal, a white or slightly yellow powder	White powders or crystals, though mercuric sulfide (cinnabar) is red and turns black when exposed to light	Shiny silver metal that is liquid at room temperature
Common human exposure routes	Methylmercury in seafood; ethylmercury in Thimerosal	Exposures at levels of concern not common, but found in some batteries, homeopathic remedies, and skin-bleaching creams	Dental amalgams; air pollution from mining, manufacturing, coal, and waste burning

FIGURE 2

What Is a Microgram?

A microgram is a very small unit of mass measurement: **one millionth of a gram.**

A vaccine containing 0.01 percent Thimerosal as a preservative contains 50 micrograms of Thimerosal per 0.5 milliliter dose, or approximately 25 micrograms of mercury per 0.5 milliliter dose.

An average paperclip weighs one gram.



Trying to imagine something that weighs one millionth of a paperclip is difficult, so here's a way to visualize the comparison.

Picture a single Toyota Camry. Now line up Camry after Camry, bumper-to-bumper, from the first Camry. One million Camrys in a row would stretch approximately across the continental United States from New York City to San Francisco.



FIGURE 3

Recommended **Childhood Immunization Schedules** in the United States

DTP Diphtheria, Tetanus, Pertussis
OPV Oral Polio Vaccine
IPV Inactivated Polio Vaccine

MMR Measles, Mumps, Rubella
Td Adult Tetanus and Diphtheria
Hib *Haemophilus influenzae* type b

Hep B, Hep A Hepatitis B, A
RV Rotavirus
PCV Pneumococcal

vaccines in **black** could have contained Thimerosal

 = range of recommended ages

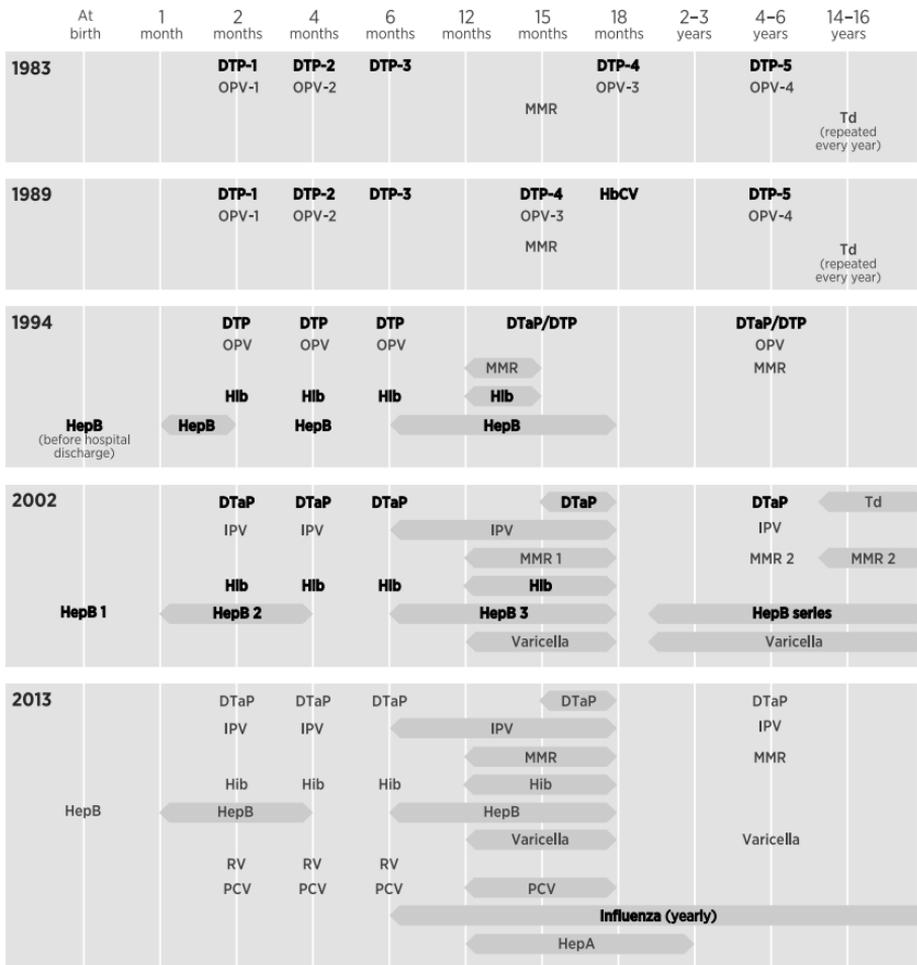
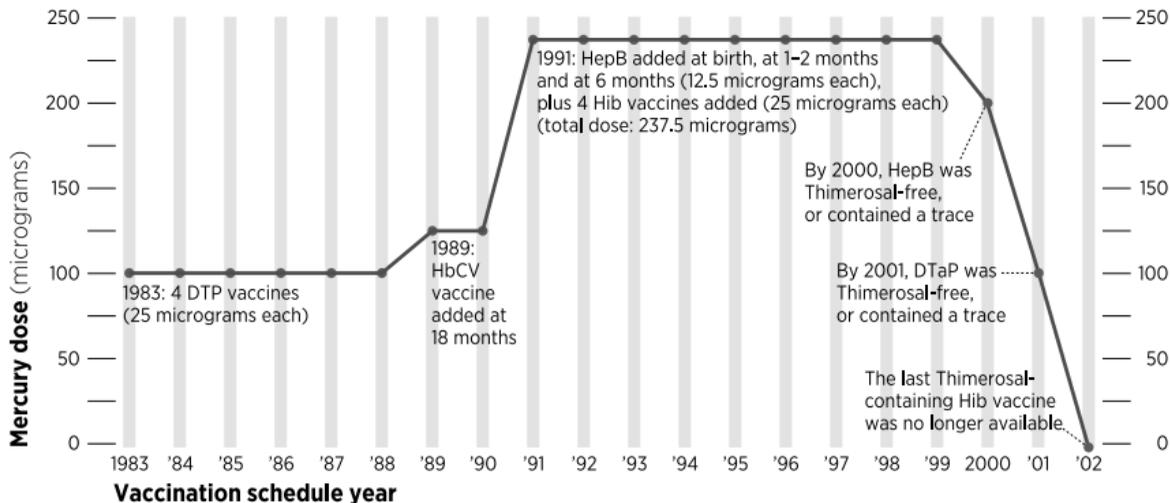


FIGURE 4

Potential Mercury Exposure by the Age of Two from Thimerosal-Containing Vaccines on Recommended Childhood Vaccination Schedule, 1983–2002 (Excluding Flu Vaccines)



“We must keep in mind that the dose of ethylmercury was not generated by ‘rocket science’: conversion of the percentage thimerosal to actual micrograms of mercury involves ninth grade algebra. What took the FDA so long to do the calculations? Why didn’t CDC and the advisory bodies do these calculations when they rapidly expanded the childhood immunization schedule?”

—Peter Patriarca,
 director of the FDA Division of Viral Products
 and FDA liaison to the AAP Committee on Infectious Diseases,
 July 2, 1999

FIGURE 5

Prevalence Estimates of Autism Spectrum Disorders (ASDs) in the United States

Selected years, with study names

“It’s time to start looking for the environmental culprits responsible for the remarkable increase in the rate of autism in California.”

—Irva Hertz-Picciotto, professor of epidemiology, UC Davis MIND Institute

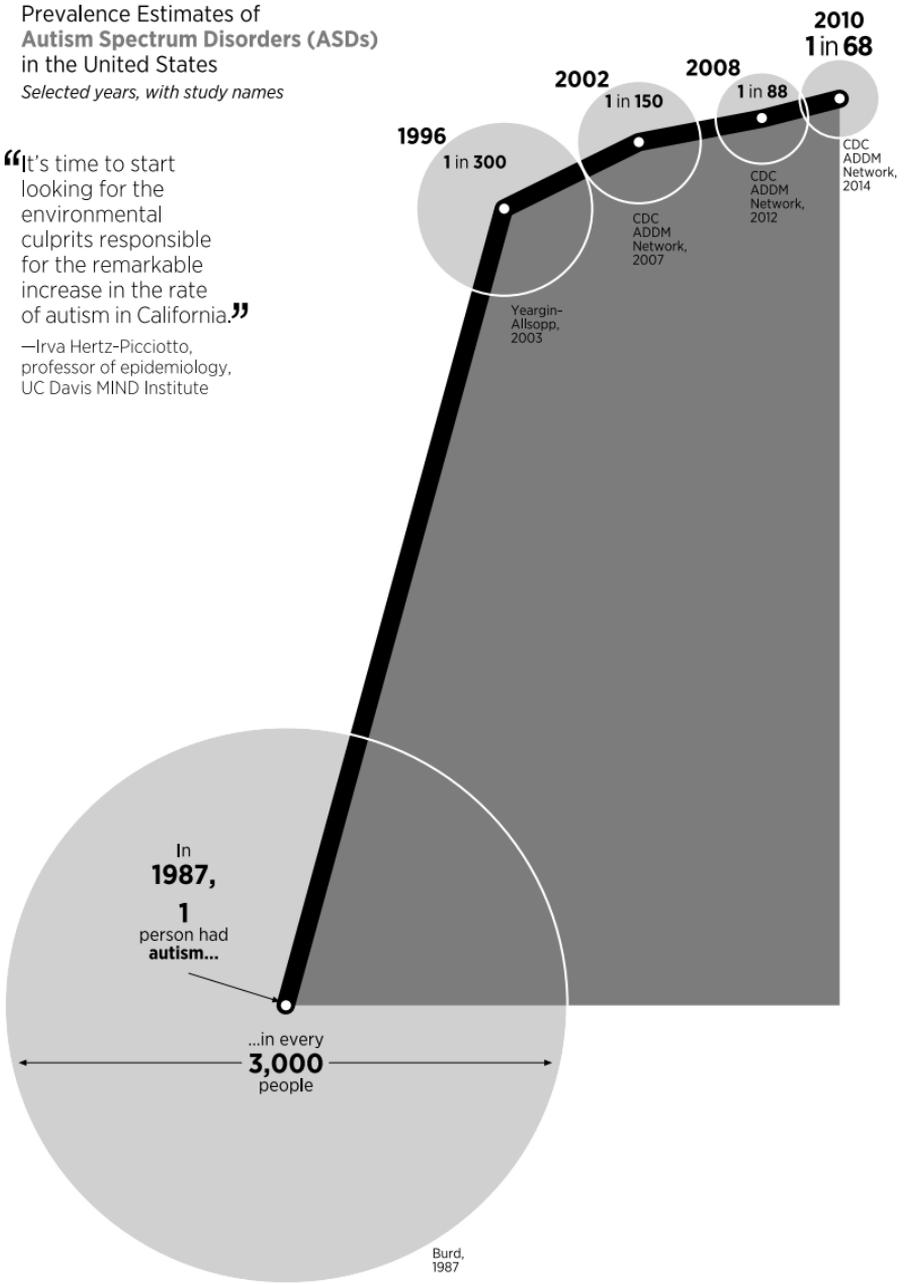


FIGURE 6

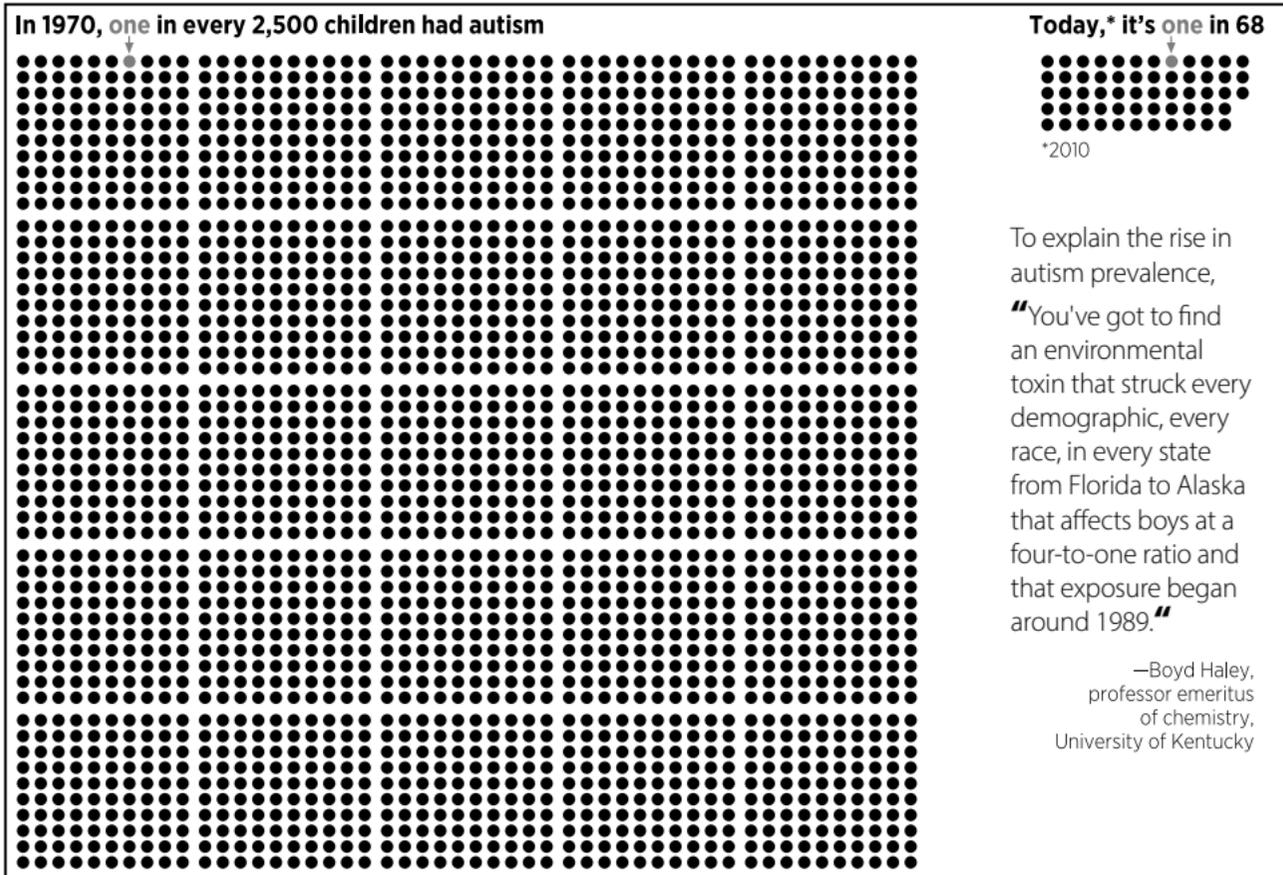


FIGURE 7

Adji A. F. Mahmoud, M.D., Ph.D.
President
Merck Vaccines

Merck & Co., Inc.
One Merck Drive
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Tel: 908-423-4316
Fax: 908-735-1232

July 7, 1999 - via facsimile 404-639-7111



Jeffrey P. Koplan, M.D., M.P.H.
Director
Centers for Disease Control and Prevention
1500 Clifton Road
Atlanta, Georgia 30333

Dear Dr. Koplan:

I am pleased to share with you the following statement:

Merck recognizes that public trust in the safety of vaccines used in the National Immunization Program is critical to that program's success. Therefore, Merck has assessed its capability to accelerate the manufacture of thimerosal-free vaccines. Beginning in early September 1999 and contingent upon FDA approval of a manufacturing supplement for Merck's hepatitis B vaccine, RECOMBIVAX HB®, the Company believes it could provide sufficient thimerosal-free vaccine (although supplies will be tight) to accomplish the following public health objectives:

- *Vaccinate all high-risk infants (those born to Hepatitis B Surface Antigen positive mothers) with thimerosal-free hepatitis B vaccine at birth, one and six months of age;*
- *Vaccinate all low-risk infants (those born to Hepatitis B Surface Antigen negative mothers) at birth with thimerosal-free hepatitis B vaccine, followed by a thimerosal-free combination vaccine for hepatitis B and Hib (COMVAX®), at 2, 4, and 12-15 months of age.*

Please let me know if additional information is needed.

Best regards,

Adel Mahmoud

SB
SmithKline Beecham
Pharmaceuticals

July 31, 1999

Dr. Jeffrey Koplan, Director
Centers for Disease Control and Prevention
1600 Clifton Rd., NE
Atlanta, GA 30333
(404) 639-7111 (fax)

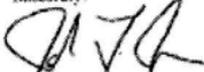
Dear Dr. Koplan,

SmithKline Beecham Pharmaceuticals (SB) as a manufacturer of vaccines has been involved in discussions recently surrounding thimerosal in vaccines, and is aware of and sensitive to the related statements issued by the American Academy of Pediatrics (AAP), U.S. Surgeon General, the Department of Health and Human Services, and the Centers for Disease Control and Prevention (CDC). As a manufacturer, we agree that, despite the absence of any scientific data that thimerosal causes adverse effects, whenever possible "thimerosal-containing vaccines should be removed as soon as possible", as is recommended in the July 7 Joint Statement of the AAP and the U.S. Public Health Service (PHS). For this reason we wish to inform you that SB is in a position to supply Infanrix (Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine Adsorbed), the only U.S. licensed DTPa vaccine that does not use thimerosal as a preservative, in enough quantities to supply the estimated U.S. market needs for at least the remainder of 1999 and the first half of 2000. By that time, other thimerosal free DTPa products, including SB's post-licensure DTPa/HB/TPV, will likely be available, pending FDA approval.

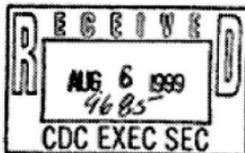
We have significantly increased our inventories of Infanrix in light of the fact that DTPa vaccines are currently a major contributor to the amount of thimerosal which may be given in the pediatric recommended vaccination schedule. Not only are there cumulatively five doses of DTPa vaccine administered to children under 7 years of age, but also three of those doses are recommended in the first 6 months of life. Furthermore, thimerosal-containing DTPa vaccines have the highest concentration of thimerosal among currently recommended vaccines with 25mcg of mercury per dose, more than twice the amount of hepatitis B vaccine. Consequently, infants who receive the first three doses of DTPa vaccine during the first six months of life are exposed cumulatively to 75mcg of mercury, nearing the threshold established by the U.S. Environmental Protection Agency (EPA) of 80mcg of mercury. By contrast, infants receiving Infanrix for the primary series (and a non-thimerosal containing Hib vaccine), can receive all other recommended vaccines, irrespective of manufacturer, and still not exceed the cumulative levels of mercury under the EPA reference guidelines.

Several weeks ago, SmithKline Beecham was approached by the vaccine contracting department at the CDC inquiring about our ability to supply the entire U.S. DTPa market with Infanrix and the potential for an exclusive DTPa contract, until other non-thimerosal DTPa vaccines were licensed. In reviewing our inventory levels, SmithKline Beecham is now in the position to move forward with such a contract. We believe the exclusive availability of Infanrix DTPa moves the AAP, CDC and PHS much closer to their stated objectives of thimerosal free vaccines in the U.S. We look forward to discussing this possibility with you further in the days to come.

Sincerely,



John Jabara, Vice President and Director
Vaccines Business Unit, U.S.



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• Update Sp.
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Centers for Disease Control
and Prevention (CDC)
Atlanta GA 30333

NOV 26 1989

Mr. John Jabara
Vice President and Director
Vaccines Business Unit, U.S.
SmithKline Beecham Pharmaceuticals
One Franklin Plaza
P.O. Box 7929
Philadelphia, Pennsylvania 19101

Dear Mr. Jabara:

I am responding to your letters to Mr. Kevin Thurm, Deputy Secretary to the Department of Health and Human Services (HHS), Dr. David Satcher, Assistant Secretary for Health and Surgeon General (HHS), and to me concerning SmithKline Beecham (SKB) Pharmaceuticals' increased inventories of a thimerosal-free Diphtheria and Tetanus Toxoid and Acellular Pertussis Vaccine (DTaP), which are capable of meeting domestic market needs through the first half of calendar year 2000.

The Centers for Disease Control and Prevention's (CDC) National Immunization Program staff has communicated this updated information regarding your supply to the 64 immunization projects. CDC also plans to monitor DTaP ordering patterns and continue to provide the States with a choice among currently licensed brands of DTaP vaccine.

CDC appreciates the contributions of SKB Pharmaceuticals and other vaccine manufacturers in our Nation's ongoing efforts to effectively and safely reach the immunization goals for our children and youth.

Sincerely,

Jeffrey P. Koplan, M.D., M.P.H.
Director

Potential **Mercury Exposure by the Age of Six** from **Thimerosal-Containing Vaccines** on Recommended Childhood Vaccination Schedule (lighter), and from Recommended Maternal and Pediatric Flu Vaccines (darker)

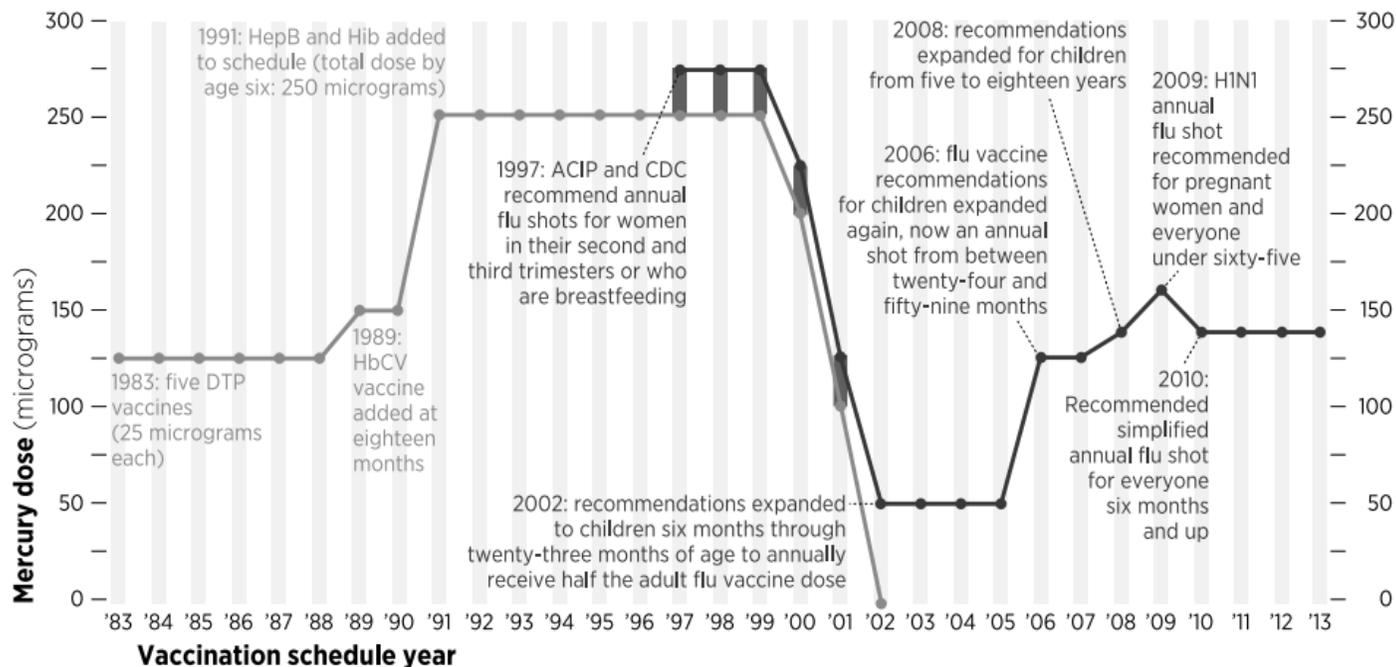


FIGURE 8

Yearly Thimerosal Exposure for Children Receiving Multidose Flu Vaccines, 2003 through 2013

Each block
= 25 micrograms
of Thimerosal

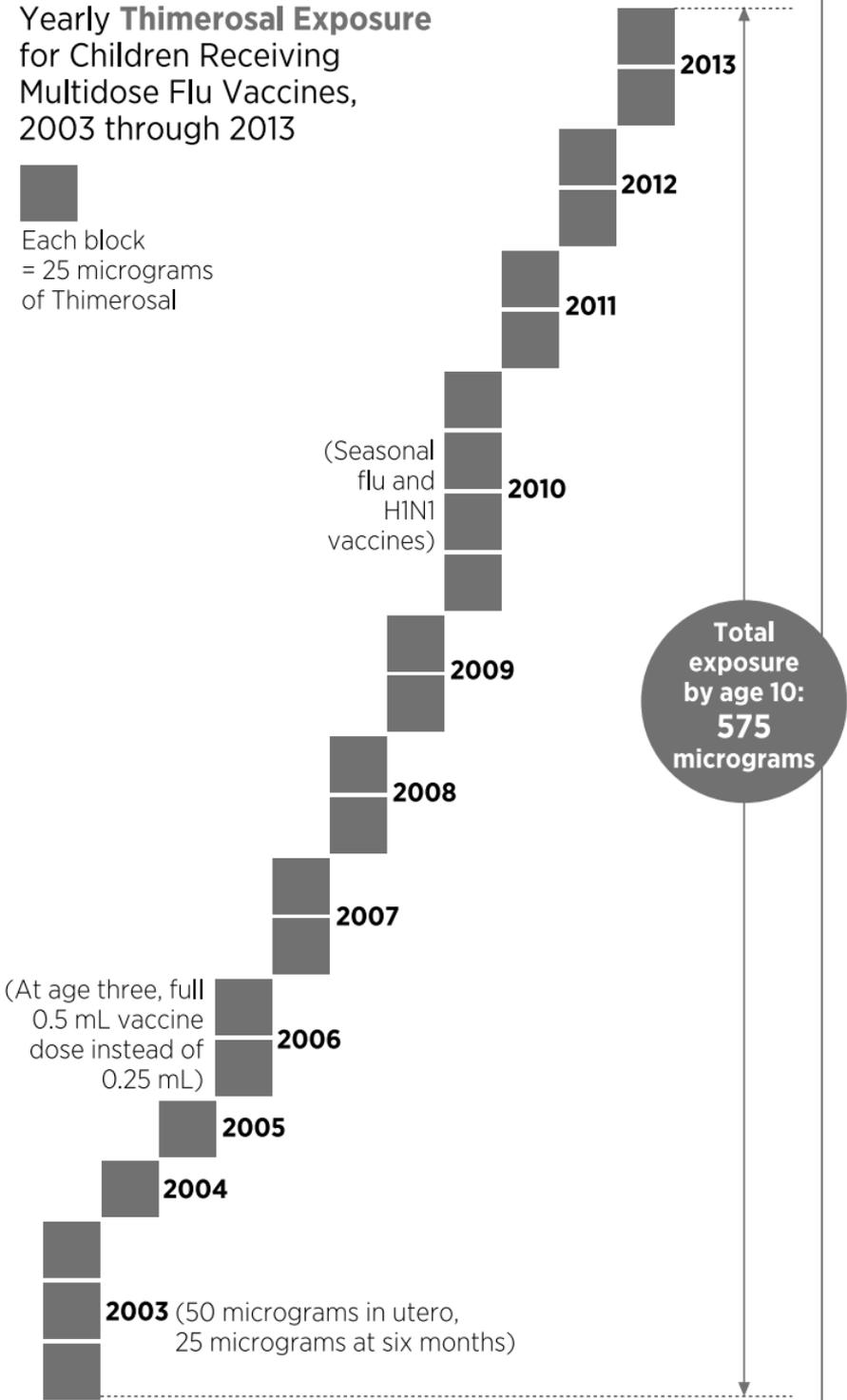


FIGURE 9

THIMEROSAL'S DANGERS TO HUMAN HEALTH AND THE BRAIN

Agencies and governments that have called for or **banned Thimerosal**



FIGURE 10

Relative risk associated with exposure at 3 months of age: Autism

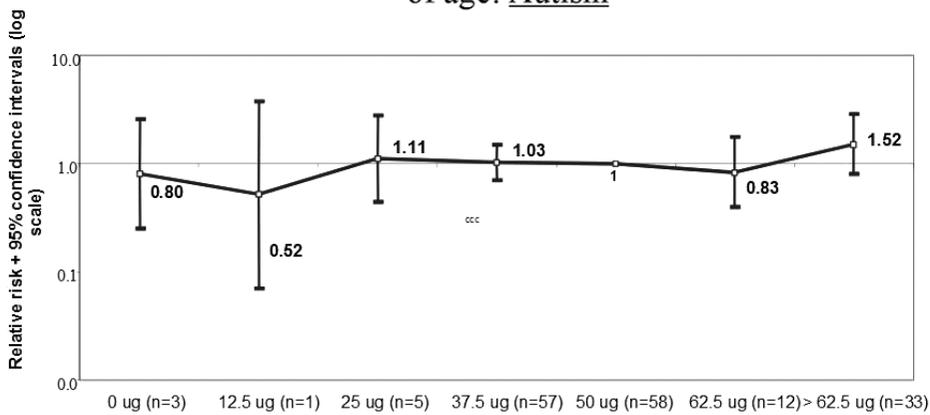


FIGURE 11

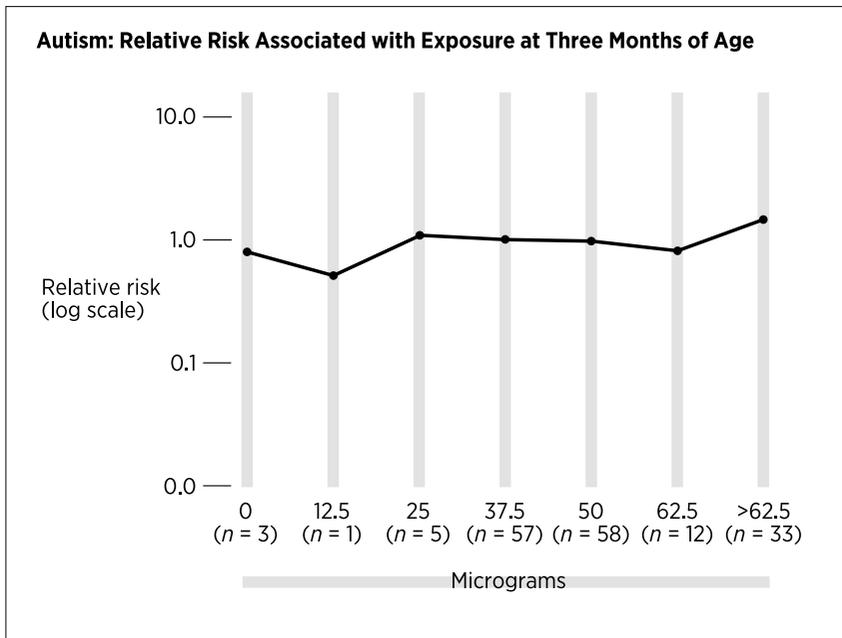


FIGURE 12

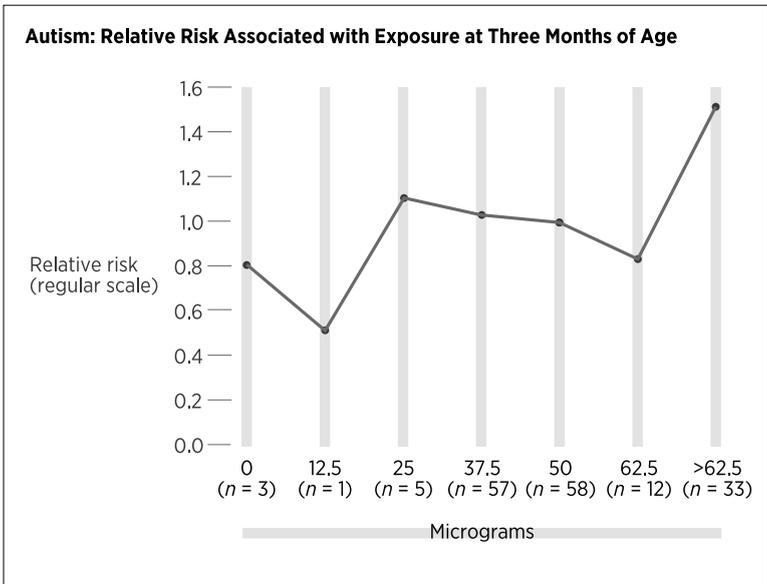


FIGURE 13

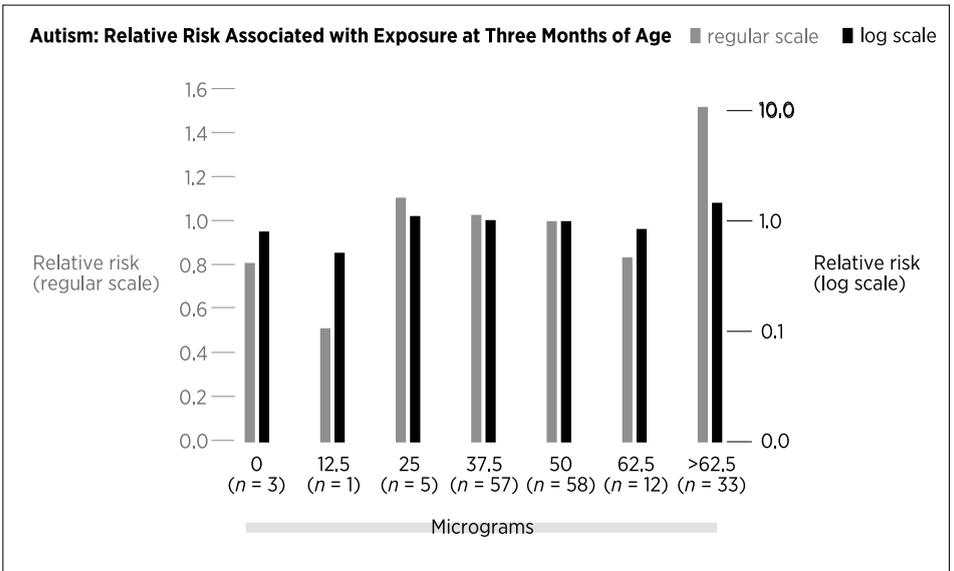


FIGURE 14