

# Thimerosal exposure in infants and neurodevelopmental disorders: An assessment of computerized medical records in the Vaccine Safety Datalink

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Received 20 December 2007; received in revised form 27 March 2008; accepted 1 April 2008

Available online 15 May 2008

## Abstract

The study evaluated possible associations between neurodevelopmental disorders (NDs) and exposure to mercury (Hg) from Thimerosal-containing vaccines (TCVs) by examining the automated Vaccine Safety Datalink (VSD). A total of 278,624 subjects were identified in birth cohorts from 1990–1996 that had received their first oral polio vaccination by 3 months of age in the VSD. The birth cohort prevalence rate of medically diagnosed International Classification of Disease, 9th revision (ICD-9) specific NDs and control outcomes were calculated. Exposures to Hg from TCVs were calculated by birth cohort for specific exposure windows from birth–7 months and birth–13 months of age. Poisson regression analysis was used to model the association between the prevalence of outcomes and Hg doses from TCVs. Consistent significantly increased rate ratios were observed for autism, autism spectrum disorders, tics, attention deficit disorder, and emotional disturbances with Hg exposure from TCVs. By contrast, none of the control outcomes had significantly increased rate ratios with Hg exposure from TCVs. Routine childhood vaccination should be continued to help reduce the morbidity and mortality associated with infectious diseases, but efforts should be undertaken to remove Hg from vaccines. Additional studies should be conducted to further evaluate the relationship between Hg exposure and NDs.

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*Keywords:* ADD; ADHD autistic disorder; ASD; Ethylmercury; Merthiolate; Thiomersal

## 1. Introduction

In the last few decades, vaccines—one of the greatest breakthroughs in health sciences—have helped to accom-

plish striking reductions of infection and disease worldwide [1]. From the 1930s through the early 2000s, many routinely administered childhood vaccines in the United States contained Thimerosal [2]. Thimerosal is an organic mercury-containing compound that is 49.55% mercury (Hg) by weight, and initially metabolized to ethylmercury compounds and thiosalicylate [3].

The American Academy of Pediatrics and the US Public Health Service in 1999 [4] published a joint statement that urged “all government agencies to work rapidly toward reducing children’s exposure to mercury from all sources.” The statement recommended that Thimerosal be removed from vaccines as soon as possible as part of this overall process. Between 1999 and 2001, many vaccines recommended for children ≤ 6 years of age were made available in

*Abbreviations:* ADD, Attention Deficit Disorder; ADHD, Attention Deficit Hyperactivity Disorder; ASD, Autism Spectrum Disorder; IRB, Institutional Review Board; ICD-9, International Classification of Disease, 9th revision; Hg, Mercury; µg, micrograms; NDs, neurodevelopmental disorders; TCVs, Thimerosal-containing vaccines; US Agency for Toxic Substances and Disease Registry; CDC, US Centers for Disease Control and Prevention; EPA, US Environmental Protection Agency; FDA, US Food and Drug Administration; VAERS, Vaccine Adverse Event Reporting System; VSD, Vaccine Safety Datalink.

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