Mercury & Vaccines

By Shanon D. Huston-Willis
Andrew Wakefield published a report in 1998 that proposed a hypothesis linking autism to the measles-mumps-rubella immunization due to the mercury preservative thimerosal (Baker, 2008; Taylor, 2006).

On July 7, 1999, the American Academy of Pediatrics and the US Public Health Service called for the replacement of thimerosal-containing vaccines as soon as possible.

The Debate Begins!!
HISTORY OF THIMEROSAL

- In early 20th century immunizations, there was the threat of a bacterial contamination from multidose vials under poor hygienic conditions (Baker, 2008; Freed, Andreae, Cowan, & Katz, 2002).

- Many children died from the resulting bacterial infections.

- Thimerosal was found to be a suitable preservative that combated bacterial growth in vaccines and became widely used by 1940 (Baker, 2008; Eldich et al., 2007; Freed et al., 2002).
WHAT IS THIMEROSAL?

- Mercury exits in many forms.
- Methylmercury is the form of mercury most closely linked to the public’s mind, which has an infamous history (Baker, 2008).
- The debate of thimerosal rests on its similarities and dissimilarities to methylmercury.
- Thimerosal is ethylmercury which differs only by one methylated side chain in structure (Baker, 2008).
- The distinction between the two is compared with ethanol (alcohol in wine) and methanol which is highly lethal.
- Thimerosal can also be found in eyedrops and contact lens solutions (Freed et al., 2002).
- The level of mercury in thimerosal is 49.9%.
HEALTH RISKS OF THIMEROSAL

- Little information is actually known about the potential health risks from exposure to ethylmercury.
- Early data from the World Health Organization (WHO) noted that limited data is available but concludes that ethylmercury is less hazardous than methylmercury because it is metabolized faster in the body (Freed et al., 2002).
- The WHO, the FDA, the Environmental Protection Agency (EPA), and the Agency for Toxic Substances and Disease Registry each developed differing guidelines for safe exposure to methylmercury which have been used as a guide for the level of ethylmercury to be used in vaccines (Baker, 2008; Freed et al., 2002).
The four different guidelines cause confusion about the array of advisory recommendations on methylmercury and ethylmercury. The EPA was the most conservative.

Some agencies recommended different guidelines for pregnant women, women, and children (Baker, 2008; Freed et al., 2002).

Illinois, Missouri, New York, and Washington had bans against the use of thimerosal in vaccines for pregnant women and children younger than two (Edlich et al., 2007).
SAFE MINDS

- Safe Minds is a key actor in the debate for the autism-mercury link.

- They published several articles in attempts to establish a causal link between autism rates and the use of vaccines with thimerosal.

- They attracted media attention by successfully opposing a rider to the homeland security bill in 2003 that would have protected thimerosal’s manufacturer from legal action.

- [http://www.safeminds.org/index.html](http://www.safeminds.org/index.html)
SAFE MINDS

Bernard, Redwood, and Roger have published articles together in *Molecular Psychiatry* and *Medical Hypotheses*.

Theresa Wrangham - President

Sallie Bernard - Executive Director

Lyn Redwood, RN, MSN - Vice President

Heidi Roger – Treasurer
# List of Claims Against Vaccines

<table>
<thead>
<tr>
<th>Vaccine(s)</th>
<th>Injury</th>
<th>Death</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTP (diphtheria-tetanus-whole cell pertussis)</td>
<td>3282</td>
<td>693</td>
<td>3975</td>
</tr>
<tr>
<td>DTaP (diphtheria-tetanus-acellular pertussis)</td>
<td>184</td>
<td>50</td>
<td>234</td>
</tr>
<tr>
<td>Td (tetanus-diphtheria)</td>
<td>99</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>Tetanus</td>
<td>50</td>
<td>2</td>
<td>52</td>
</tr>
<tr>
<td>Hepatitis B (Hep B)</td>
<td>503</td>
<td>41</td>
<td>544</td>
</tr>
<tr>
<td>Influenza (Trivalent)</td>
<td>32</td>
<td>5</td>
<td>37</td>
</tr>
<tr>
<td>HIB (Haemophilus influenzae type b)</td>
<td>15</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>IPV (inactivated polio)</td>
<td>258</td>
<td>12</td>
<td>270</td>
</tr>
<tr>
<td>OPV (oral polio)</td>
<td>278</td>
<td>26</td>
<td>304</td>
</tr>
<tr>
<td>Measles</td>
<td>142</td>
<td>19</td>
<td>161</td>
</tr>
<tr>
<td>MMR (measles-mumps-rubella)</td>
<td>699</td>
<td>50</td>
<td>749</td>
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<tr>
<td>Rubella</td>
<td>188</td>
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<tr>
<td>Varicella</td>
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</tr>
<tr>
<td>Unspecified</td>
<td>4898</td>
<td>5</td>
<td>4,903</td>
</tr>
</tbody>
</table>

(Edlich & et al., 2007)
Articles have supported a correlational rise in autism prevalence shortly after receiving immunizations containing thimerosal (Bernard et al., 2001; Bernard et al., 2002; Eldich et al., 2007).

Yet, other articles and studies have failed to replicate Andrew Wakefield’s initial study (Baker, 2008; Baker & Stokes, 2007; Nature, 2005; Taylor, 2006).

The same results have not been confirmed by anyone, anywhere in the world.
THE AUTISM LINK

AUTISM

- Autism is a pervasive developmental disorder characterized by impaired language, non-verbal communication and social interaction, and repetitive or stereotypically restricted behaviors (A Mercurial Debate, 2005).

- Studies support a genetic link that can be influenced by environmental factors.
THE AUTISM LINK

MERCURY

Mercury poisoning has commonly occurring symptoms that include extreme shyness, indifference to others, active avoidance of others, depression, lack of interest, and mental confusion, irritability, aggression, and tantrums in children and adults, as well as anxiety and fearfulness, and emotionallability (Bernard et al., 2001).
WHAT ARE THE RATES OF AUTISM?

- The increased prevalence of autism has been highly publicized and several figures exist to record the rise:
  - 1 in 2000 before 1930 to 1 in 1000 from 1920 to 1990 (Bernard, Enayati, Roger, & Binstock, 2001)
  - 7.5 in 10,000 in mid-80’s to 31.2 in 10,000 in late 1990’s (Edlich et al., 2007)
  - 1 in 10,000 children to 1 in 500 over the last generation (Baker & Stokes, 2007)
WHY INCREASED RATES?

- Bernard et al. (2001) argue that the increase of reported autism in the period between 1920 to 1990 was also the period of increased immunizations.

- Baker and Stokes (2007) point to the theory of rising autism rates as a result of the use of thimerosal in vaccines given to children under the age of two.

- But, Taylor (2006) believes that autism incidences have increased due to the under diagnosis of the disorder in the past. Today, there is clear guideline for diagnosis as well as better funding and services that encourage diagnosis.
The FDA and IOM

- The FDA has completed a comprehensive review of the use of thimerosal in childhood vaccines and has found no evidence of harm from the use of thimerosal as a vaccine preservative other than local hypersensitivity reactions (FDA, 2003).

- The U.S. Institute of Medicine (IOM) also had null findings which is not definitive proof of the safety of thimerosal (Baker & Stokes, 2007).
THIMEROSAL AND NOW

- As a precautionary measure, manufacturers were urged to reduce or eliminate thimerosal in vaccines.

- At present, all routinely recommended vaccines for U.S. infants are available only as thimerosal-free or contain only trace amounts of thimerosal (<1 micrograms mercury per dose) with the exception of inactivated influenza vaccine (FDA, 2003).
REFERENCES