



Vaccines and Autism: A Case Study

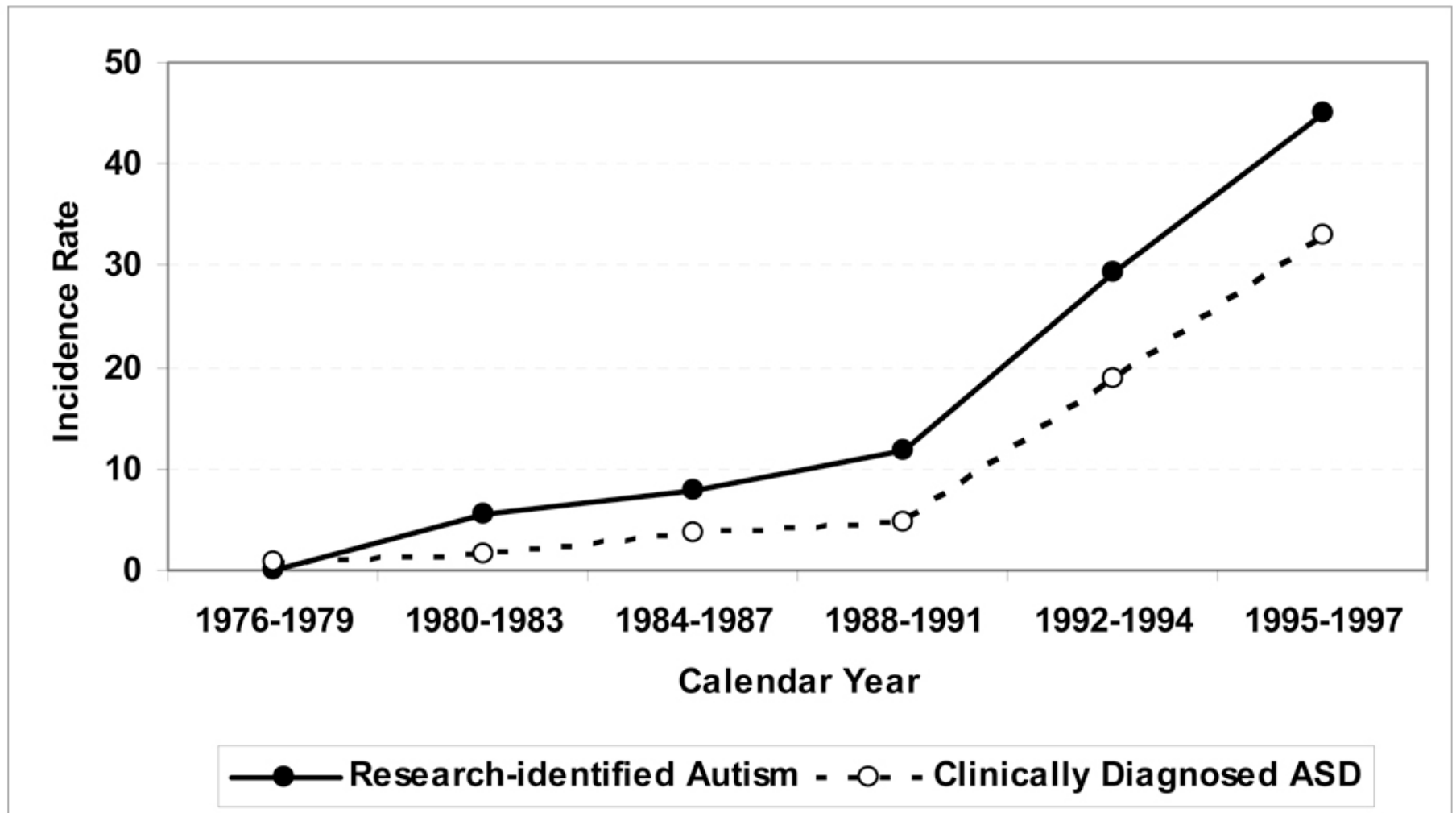
Alison Taylor

Autism

- Neurological and Developmental Disorder
- Autism Spectrum Disorders
- Symptoms
 - Language
 - Social Behaviors
 - Repetitive-Restrictive Behavior

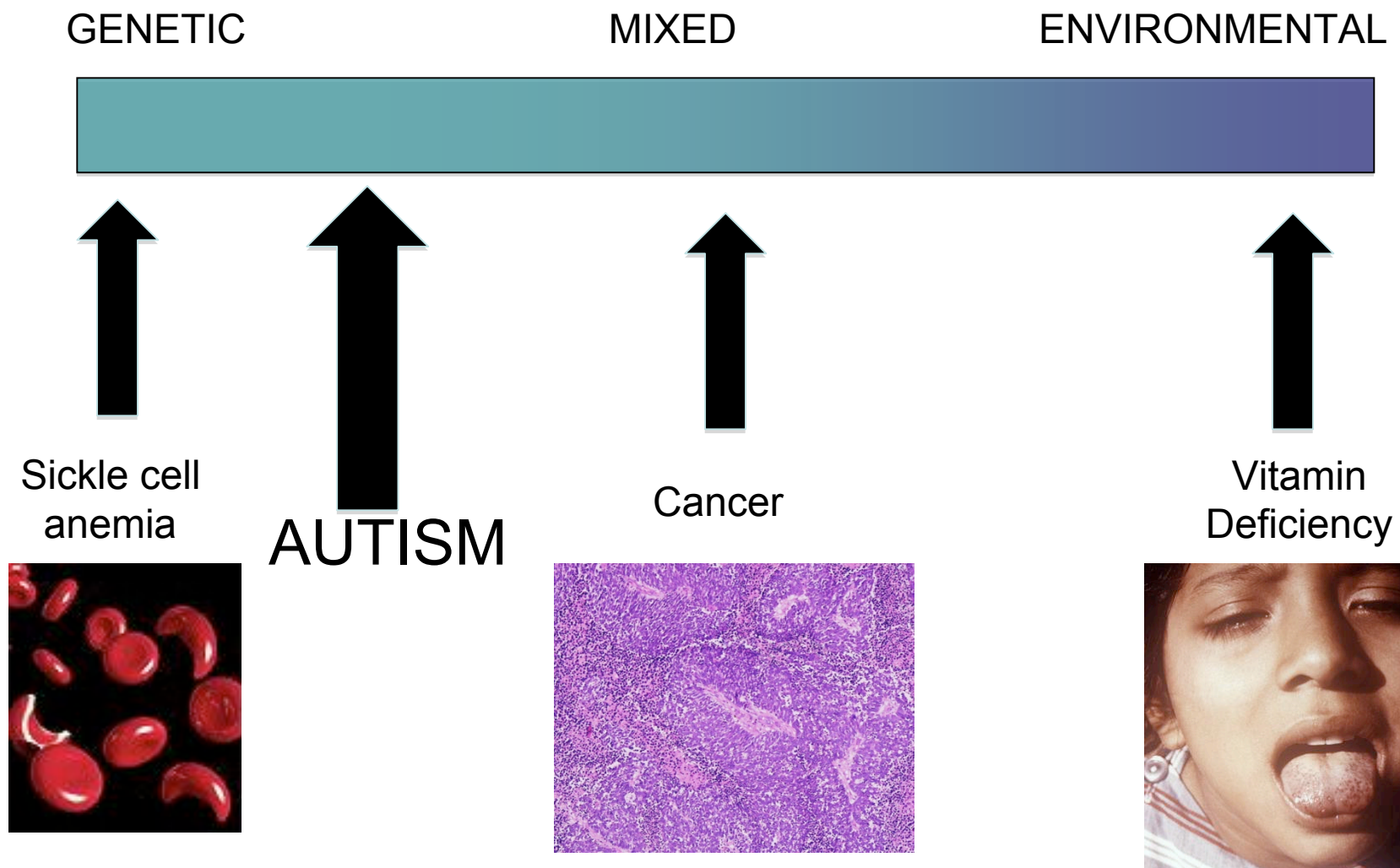


Incidence Rates of Autism



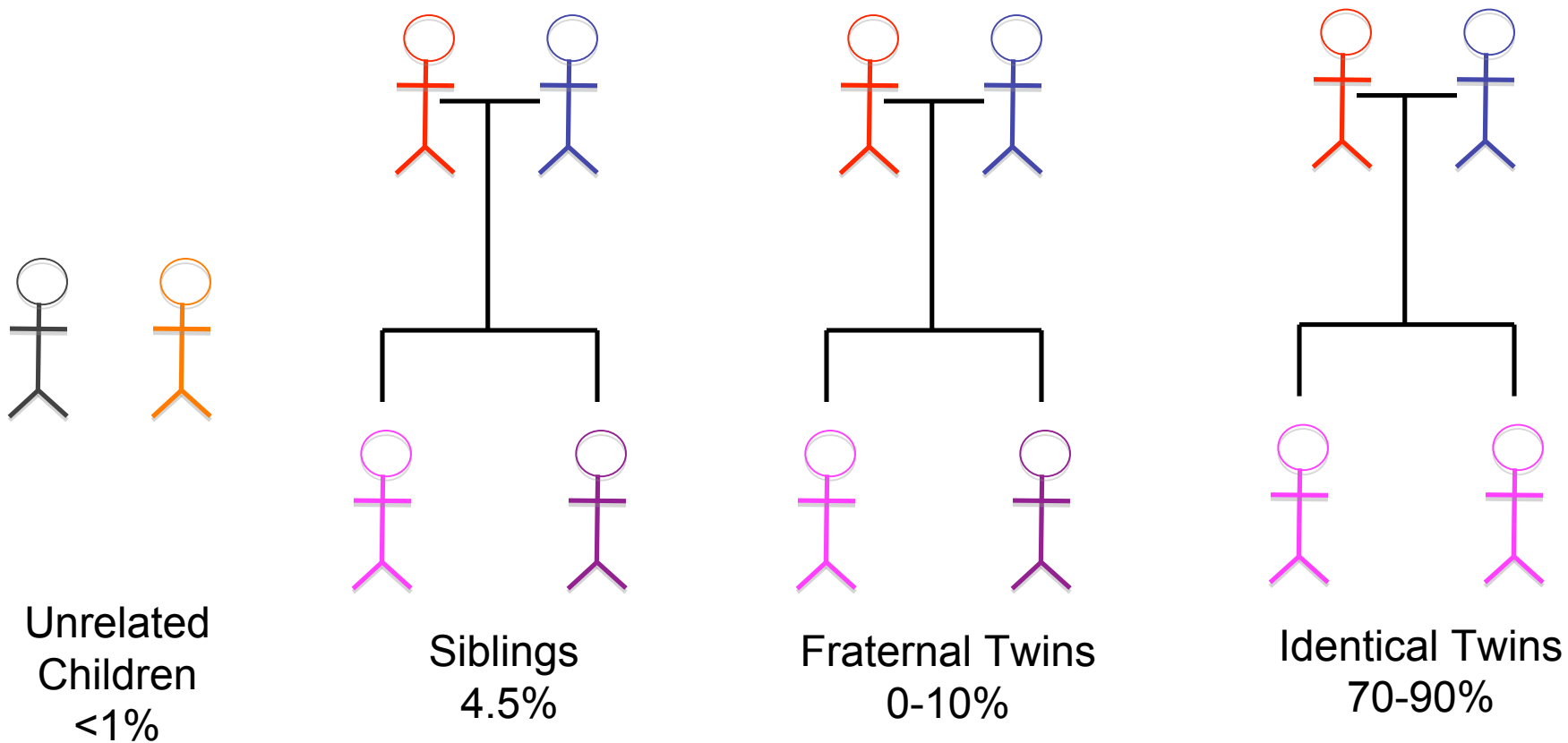
Olmsted County, Minnesota

Genetics and Environment: Human Disorders



<http://commons.wikimedia.org/wiki/File:Sicklecells4.jpg> http://commons.wikimedia.org/wiki/File:Scorbutic_tongue.jpg
http://commons.wikimedia.org/wiki/File:Carcinoma_microcellulare_oatcell_carcinoma_or_anaplastic_carcinoma_%28lung%29H%26E_magn_200x.jpg

Genetics of Autism



The Beginning of the Vaccines & Autism Debate

(1998) Wakefield study suggesting a correlation between receiving the **MMR vaccine** and displaying behavioral symptoms of autism

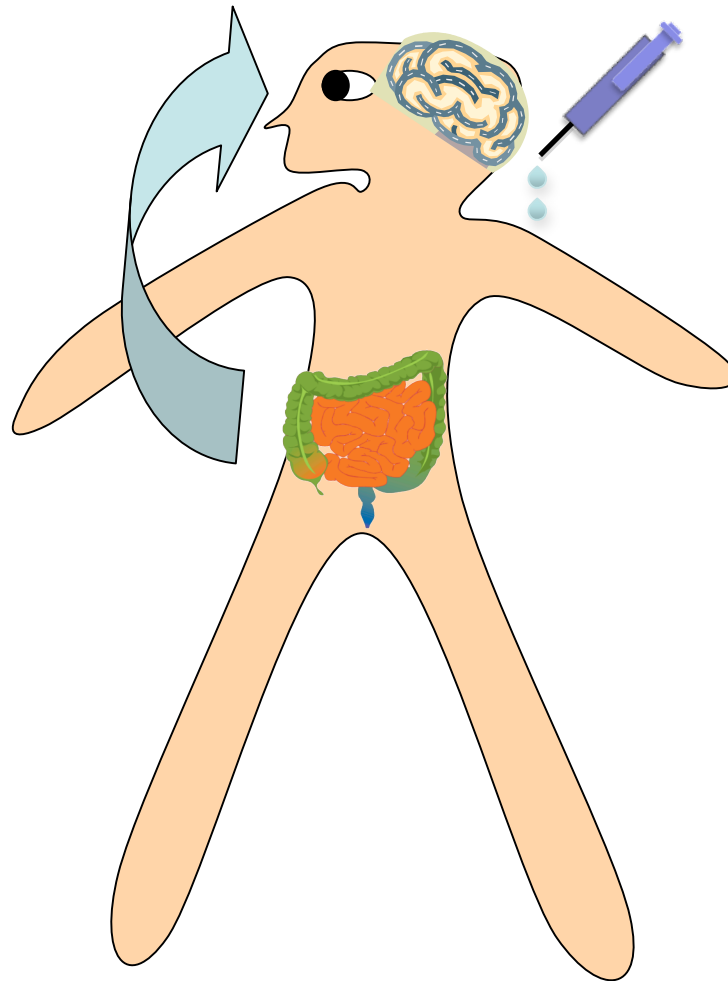
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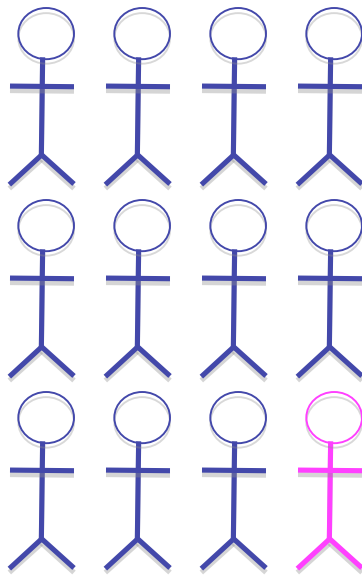
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MMR Vaccine - Autism Hypothesis



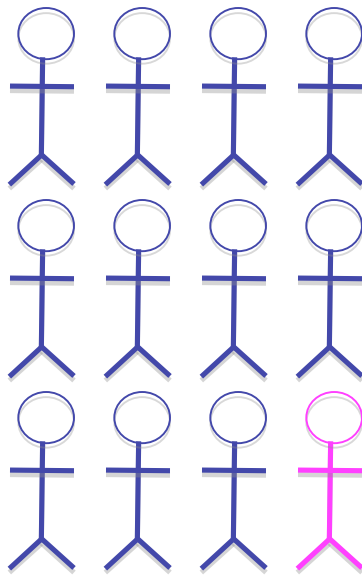
<http://commons.wikimedia.org/wiki/File:Intestine.gif>

Wakefield Study: Study Design



- 12 children
- Parents or doctors reported GI symptoms and autism near administration of MMR vaccine
- Samples were taken to confirm GI symptoms

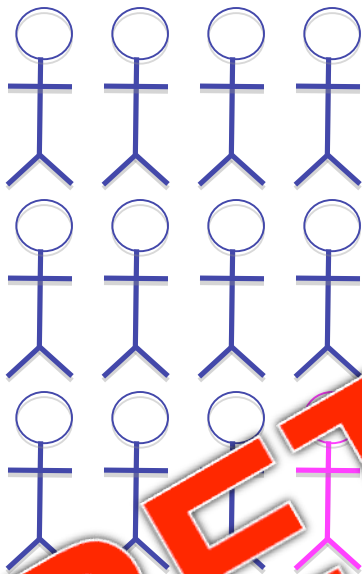
Wakefield Study: Study Flaws



- Small Number
- Case Report
- Patient Testimonial
- Selection Bias
- Confounding factors
- Ethical Concerns
- Does not prove hypothesis

“We did not prove an association between measles, mumps, and rubella vaccine and the syndrome described.”

Wakefield Study: Study Flaws



- Small number
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Denmark Study: Study Design

	Number of Children in Study	Number of Autism Cases	Number per 10,000
Total	537,303	316	5-6/10,000
Vaccinated	440,655	263	5-6/10,000
Not vaccinated	96,648	53	5-6/10,000

- Age at vaccination - No effect
- Interval since vaccination - No effect
- Date of vaccination - No effect
- Confounders: Sex, Birth weight, Gestational age, Socioeconomic status, Age at diagnosis

More Recent Studies

- Larger Numbers
- Retrospective Studies
- No Selection Bias
- No Ethical Concerns

According to the Institute of Medicine:

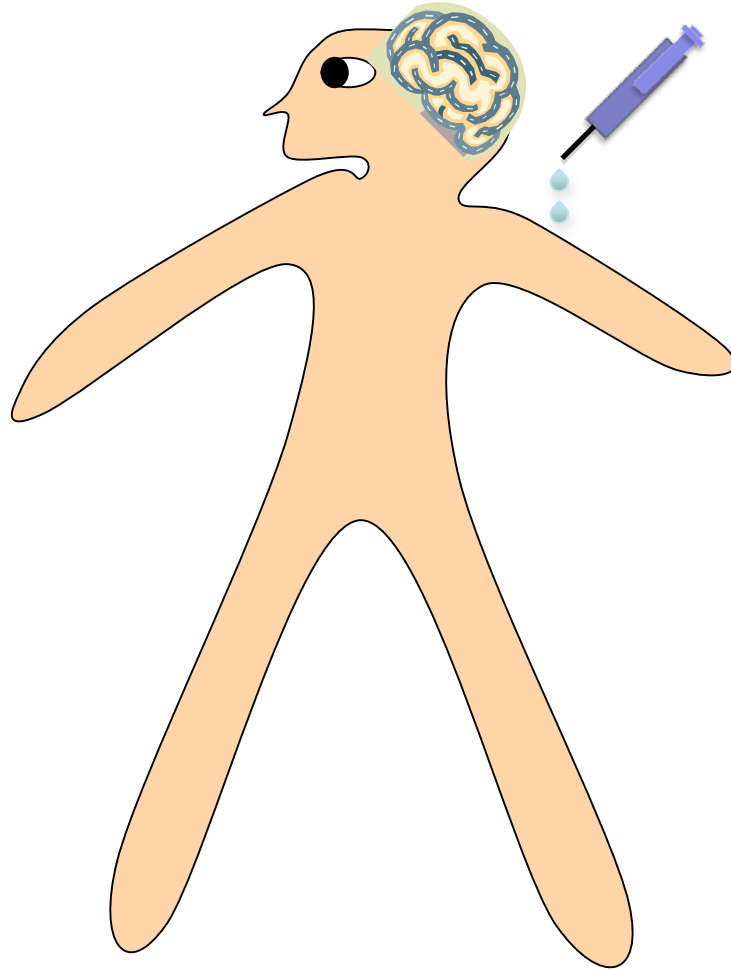
-Evidence rejects the connection between the MMR vaccine and autism

The Beginning of the Vaccines & Autism Debate

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Thimerosal - Vaccine Hypothesis



Mercury Level

TCVs and Autism: Conclusions

Points about TCVs and Autism:

- Methylmercury is known to be toxic, but thimerosal contains ethylmercury
- Source of methylmercury: certain fish
- Thimerosal has been safely used in vaccines since the 1930s

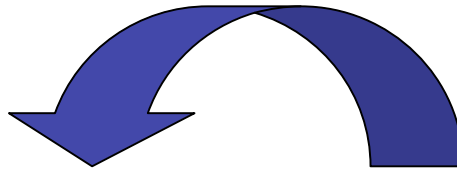
According to the Institute of Medicine:

- Evidence rejects the connection between the thimerosal containing vaccines and autism

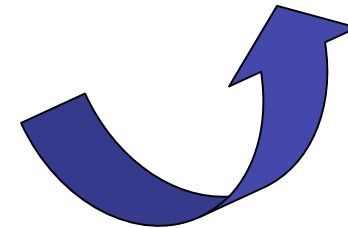
Why is there still a debate?



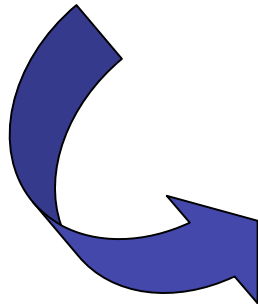
Media



Advocacy
Groups



Public Figures



Summary: Vaccines and Autism

- Explained genetic component of autism
- Discussed one informative study and one uninformative study in terms of evidence based medicine
- Demonstrated that there is no evidence connecting vaccines and autism
- Introduced what started the vaccines and autism debate, and why it continues

Summary

- Evidence-based Medicine (Leah)
- Vaccines (Johnny)
- Vaccines and autism, a case study (Alison)

QUESTIONS?

THANK YOU!