

# Sound Choice Pharmaceutical Institute

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## July 2010 Newsletter

### Editorial Contents:

- 1) SCPI relocated its office and laboratory space to our very own space in Eklind Hall in Seattle, WA.
- 2) The Puget Sound Business Journal highlighted Sound Choice Pharmaceutical Institute in May 2010 and in that article the University of Washington revealed that in 2009 they filled 4,400 requests for fresh aborted fetal tissue or cell lines for biomedical research.
- 3) SCPI presented 2 papers at the May 2010 International Meeting for Autism Research on the relationship between the use of aborted fetal cells for vaccine production and increased autism prevalence. How can a scientist such as myself dramatically increase donations and gifts to support the critical work of SCPI? I must appeal to our readers and ask each of you to sacrifice with us with your financial contributions to insure that this work goes forward.

### Introduction:

SCPI now has its own lab and office space in the original Fred Hutchison Cancer Research building, Eklind Hall. This necessary but unbudgeted move has strained an already lean program. SCPI is unique among pro-life organizations in that we directly challenge the commoditization of aborted fetuses by the biomedical community not merely with education and outreach, but with demanding scientific research to demonstrate the dangers and futility of what is being done and to identify solid alternatives for these gruesome practices so pervasive today. If every reader of this newsletter donated \$100.00 we would meet our current budget shortfall. Some readers cannot, and so we ask those who can to donate \$500, or \$1,000 or more to support this critical work. Each and every person working at SCPI has sacrificed financially and professionally to do this work. As a scientific mentor I try never to ask trainees to do anything I have not or would not do, and likewise, as President of SCPI, I am asking that you join us in making financial sacrifices to advance this work.

*Dr. Theresa Deisher, President, Sound Choice Pharmaceutical Institute*

### SCPI lab and office space has been relocated to 1102 Columbia Street Suites 316, 321 and 322, Eklind Hall, Seattle, WA.

We are thrilled about the successful IPO of our prior landlord, and we are grateful for the two and a half years of leased space that we received from them. Their success has required that we relocate to our own space. The relocation will be a net positive for us since our previous office space was a 15 minute walk from the research lab. That was good for my health, but hard on my schedule. Now the office is across the hall from the lab. You can't beat that for convenience.

Our new landlord donated office furniture to us, which we collected using a borrowed pick-up truck and the muscle of all of us who work or volunteer at SCPI. The new office is crowded, but we don't mind the conditions because we are so excited to be together on the same floor. The change has also meant that SCPI needed to purchase laboratory equipment, an expense we had not budgeted for. We now have a biologic safety hood, incubators, centrifuges, pH meters, and other essential equipment. And, as required, we also have an expensive insurance policy. I'll save the rest of my fund raising appeal for the end of this newsletter.

We invite anyone who visits Seattle to come see our new lab and office space and learn first hand about the research and work that we are doing. We are proud of our science, and are thrilled to share it with our supporters who do come to visit.

### The University of Washington filled 4,400 requests from biomedical scientists for aborted fetal tissues and cell lines in 2009. Aborted fetuses are now a biomedical commodity.

Scientists have been grappling with how to obtain experimental material since before Hypocrates. Today, an alarming amount of scientific research occurs using freshly aborted human fetuses. The Puget Sound Business Journal (article attached at end of newsletter) recently featured Sound Choice and our efforts to find alternatives to this material. John Slattery, Vice Dean of Research and Graduate Education, told the Puget Sound Business Journal that in 2009, the University of Washington School of Medicine filled 4,400 requests for fresh aborted fetal tissues and cell lines. There are 426 medical schools and branch campuses in the US ([http://en.wikipedia.org/wiki/Talk:List\\_of\\_medical\\_schools\\_in\\_the\\_United\\_States](http://en.wikipedia.org/wiki/Talk:List_of_medical_schools_in_the_United_States)).

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If we consider only medical schools and branch campuses, ignoring the commercial companies that harvest and sell aborted fetal materials for research, we can estimate that as many as 1.9 million requests for aborted fetal tissue may be filled in the US each year.

Two weeks ago I happened upon recent scientific publications documenting the use of executed NAZI prisoners for anatomical and biomedical research. While we all know about Nazi scientists like Mengele, most of us do not know about the academic/university complicity that occurred. The similarities in what has been documented during the NAZI regime and the biomedical use of fresh aborted fetal tissue are disturbing, to say the least.

A NEWS FOCUS piece was published in the July 16, 2010 issue of the renowned journal SCIENCE, titled "Confronting Anatomy's Nazi Past" by Heather Pringle. Pringle summarizes the symbiosis between university anatomists and researchers who coordinated with Nazi prisons on the timing of execution and the donation of bodies from the prisons to university anatomy departments and other research scientists. For instance, Dr. Hermann Stieve, not satisfied with experiments using chickens to study the effects of stress on ovulation, coordinated with Nazi prison officials to study condemned female prisoners. They told prisoners about their sentence and also planned the actual execution so that he could obtain samples, and ultimately the corpses, for his studies on stress and ovulation, replacing the chickens. Other publications over the past few years document similar biomedical collusion with Nazi executioners ( Pringle H: "Confronting Anatomy's Nazi Past," Science v329, 2010; Hildebrandt S: "Anatomy in the Third Reich: Outline, Part 1" Clinical Anatomy v22, 2009; Cohen MM: "Overview of German, Nazi, and Holocaust Medicine," Am J of Medical Genetics, v152A, 2010.)

The prisoners were executed early in the morning, between 4:30 and 5:00 am (Aumuller G: "Anatomy During the Third Reich" Ann Anat v184 2002). As a sidewalk counselor I used to wonder why abortions were done so early in the morning. If the abortuary wanted to avoid attention and sidewalk counselors, one would think they would schedule the abortions during the day when we were at work, rather than for 6:30 to 7:00 am. Perhaps, like the NAZI executions, the timing is set for the convenience of biomedical scientists who need to receive fresh tissue early in the morning in order to process it and finish their experiments by a reasonable time in the afternoon or evening.

Biomedical experimentation on NAZI victims led to the accumulation of horrendous numbers of body part specimens, histology slides, textbooks, scientific articles and other scientific knowledge. Some of the more junior scientists participating in these studies may well not even have known the source of the material they were

were forced to work with. They were essentially forced to unknowingly participate in murder because of the collaboration of their superiors with the NAZI system of justice. Sixty-five years after these atrocities occurred, scientists and watchdog groups are calling for all materials derived from the murder victims of the NAZIS to be removed from archives, from textbooks, perhaps even from the minds of scientists who have read the experimental information derived from these victims. Will we wait for sixty-five years to demand that the biomedical advances being made through the use of fresh aborted fetal tissue be removed from archives, from scientific journals, from our drugs and medicines and cosmetics? NO, we have to demand it now!

### SCPI presented 2 papers at the May 2010 International Meeting for Autism Research.

The support of all of you made this research and these presentations possible. I have attached the posters as pdf documents at the end of the newsletter. To view the posters you will need to enlarge them on your computer screen.

Our first paper describes specific years in which autism takes steep upward turns. A March 2010 paper from the Environmental Protection Agency (EPA) has also identified distinct years at which autism rose worldwide, called changepoints. While many want to dismiss the epidemic levels of autism as artificial, scientific analysis of these changepoint years demonstrates that neither increased general awareness about autism nor financial incentives to diagnose autism are associated with these changepoints. Therefore, other environmental or sociologic factors must be sought that are linked to these changepoint years.

Our second paper identifies an environmental factor linked to these changepoint years and introduces our research into the biology behind this association. Over decades, and across continents, the switch from using animal cells to produce vaccines to using aborted fetal cells to produce vaccines is linked to autism changepoint years. What is the biological basis for how aborted fetal cell produced vaccines may contribute to autism or other human diseases? The aborted fetal cell produced vaccines contain residual human DNA that we inject in to our children when we vaccinate them with aborted fetal cell produced vaccines.

Our grant from the Murdock Charitable Trust **partially** funds this research, however, we are left with a funding gap that became larger when we had to lease and equip our own research space. Our own lab space is a net positive, however, it is also a short term unbudgeted expense.

**2010 Major Fundraising Appeal**

SCPI has produced essential information, critical educational materials and solid scientific data about the pervasive biomedical use of fresh aborted fetal material. We need YOUR support to maintain this level of scientific progress and output! Our donation goal for 2010 is \$230,000. Our only fund raising is through our newsletter appeals.

What will we do with this money?

- Pay for the equipment we have had to purchase for the new laboratory.
- Raise current employee wages above minimum wage so that we can retain our outstanding scientific talent. We have 7 employees, and a grant of only \$250,250 each year for 2 years. After lease and lab ingredient purchases we have \$25,000 for our employees, before mandatory taxes. We can't retain our scientific talent with these wages, and that won't be because they aren't willing to sacrifice but because they cannot care for their families.
- Hire a new employee to develop and market our certification stamp that will inform consumers about the contents of their medicines.
- Offer basic health care and other basic benefits.
- Purchase needed reagents to prove the biological dangers of using aborted fetal cell lines for vaccine and drug production.

Donate now and partner with SCPI to let people know what is being done with the corpses of aborted babies. Donate now and partner with SCPI to develop a certification stamp so that you can know which medicines, which vaccines and which cosmetics are morally produced. Donate now and partner with SCPI to develop moral alternatives so that we can vaccinate our children in good conscience.

Scientific research and development is expensive, but the pay-off is well worth it. We cannot afford to wait sixty-five years to expose the harvesting and biomedical exploitation of aborted fetuses. We cannot wait sixty-five years to demand that medicines produced based on this atrocity be removed from our shelves.

**Donate on-line at**  
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**Seattle, WA 98111**

# Grant aims for alternatives to abortion-linked research

By CLAY HOLTZMAN  
STAFF WRITER

A grant from one of Washington's largest foundations to a fledgling research organization could expand a debate in biomedical ethics reminiscent of clashes over the use of stem cells.

With a \$500,000 grant awarded in February from the M.J. Murdock Charitable Trust in Vancouver, Wash., the Sound Choice Pharmaceutical Institute says it will look for alternatives to the use of fetal tissue obtained through abortions in medical research and drug development.

The Seattle institute's goal is to find a new way to develop vaccines without the use of fetal cell lines, which the organization's founder, Theresa Deisher, opposes on moral grounds. She also contends that treatments derived from such sources could endanger patient safety.

"This is a fledgling but rapidly growing movement," said Deisher, who earned her doctorate in physiology from Stanford University. "It is not going to go away, and these are important safety issues for everyone that need to be resolved, not just debated."

Deisher also has founded a for-profit company, backed by investors, to com-

mercialize "morally produced" vaccines and stem cells.

Deisher, who founded her nonprofit institute in 2008, says alternatives such as animal cell lines should be used, which would give patients who refuse medicines derived from aborted fetuses a choice in their treatment.

However, most researchers say there is no adequate substitute for fetal cell lines and tissues.

"There is definitely value in using fetal tissue in research," said Jerome Strauss, dean of the School of Medicine at Virginia Commonwealth University.

Such tissues are particularly im-



BUSINESS JOURNAL PHOTO | Stephen Brashear

**SEARCHING:** Theresa Deisher is studying potential side effects of medical treatments derived from fetal tissue.

portant for studying miscarriages and stillbirths, he said. Strauss said fetal research has led to major discoveries, and institutions have strict protocols governing their use.

The Murdock Charitable Trust is one of Washington's largest philanthropies, with more than \$665 million in assets, according to its 2008 tax filing. The trust funds a variety of activities, including faith-based initiatives.

Under the two-year grant, Deisher will perform study the relationship between autism and vaccines that contain residual human DNA, using software to model the prevalence of autism and identify sites where residual DNA could combine with a patient's DNA.

She also will conduct lab experiments to examine, among other things, how much residual DNA existing vaccines contain. Results from the studies will be submitted for peer review and publication in scholarly journals, Deisher said.

Deisher is also managing member of a startup biotech company she founded in Seattle called AVM Biotechnology. The company has raised \$425,000 from angel investors and another \$700,000 in donated professional services, she said. The startup is focused on commercializing vaccines that do not use fetal materials and developing biologics that will improve the research effectiveness of adult stem cells, which can be an alternative to embryonic stem cells.

At the University of Washington, which in 2009 filled more than 4,400 requests for fetal tissues and cell lines, an institutional review board must approve all requests, said John Slattery, vice dean of research and graduate education at the UW School of Medicine.

The UW primarily obtains material from its network of hospitals and clinics.

Deisher estimates that there is a strong market among members of the anti-abortion movement, for what she calls "morally produced" vaccines. She estimates that 10 percent of the population refuses vaccines, and one-third of those cite religious or moral reasons.

But researchers say fetal cell lines and tissues cannot be replicated.

"It is hard for me to imagine an alternative tissue for something like that," Slattery said.

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# Computational Detection of Homologous Recombination Hotspots in X-Chromosome Autism-Associated Genes

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## Introduction

Recently, changepoint analyses by Environmental Protection Agency (EPA) scientists (McDonald & Paul 2010) identified changepoint birth years in autistic disorder data from US and Denmark. We have carried out further analyses and found additional changepoints, shown in Figure 1 for the US, summarized in Table 1. In the countries studied, the only universal environmental cause correlated with the changepoint years that we have identified is the introduction of vaccines containing human DNA residuals.

The safety of human DNA residuals has been debated for 50 years (Sheng et al. 2009). Potential dangers of the residuals include auto-immune reactions to the non-host human DNA or improper integration of DNA fragments into the host genome or host mitochondrial genome during base lesion repair by homologous recombination.

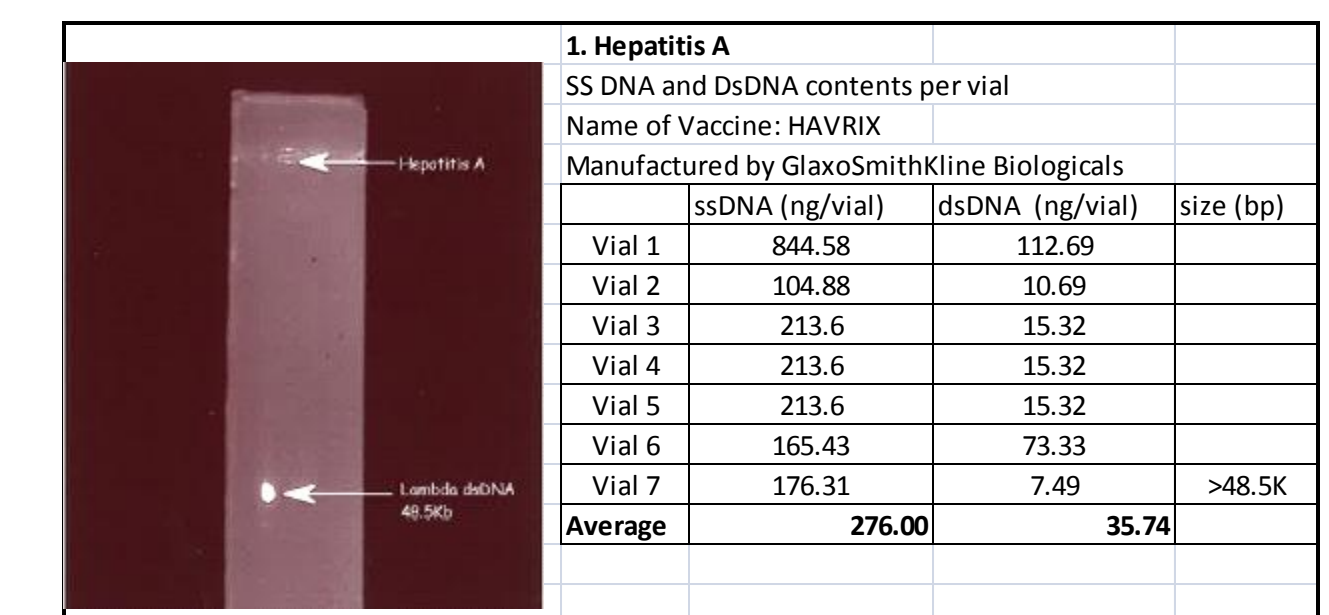
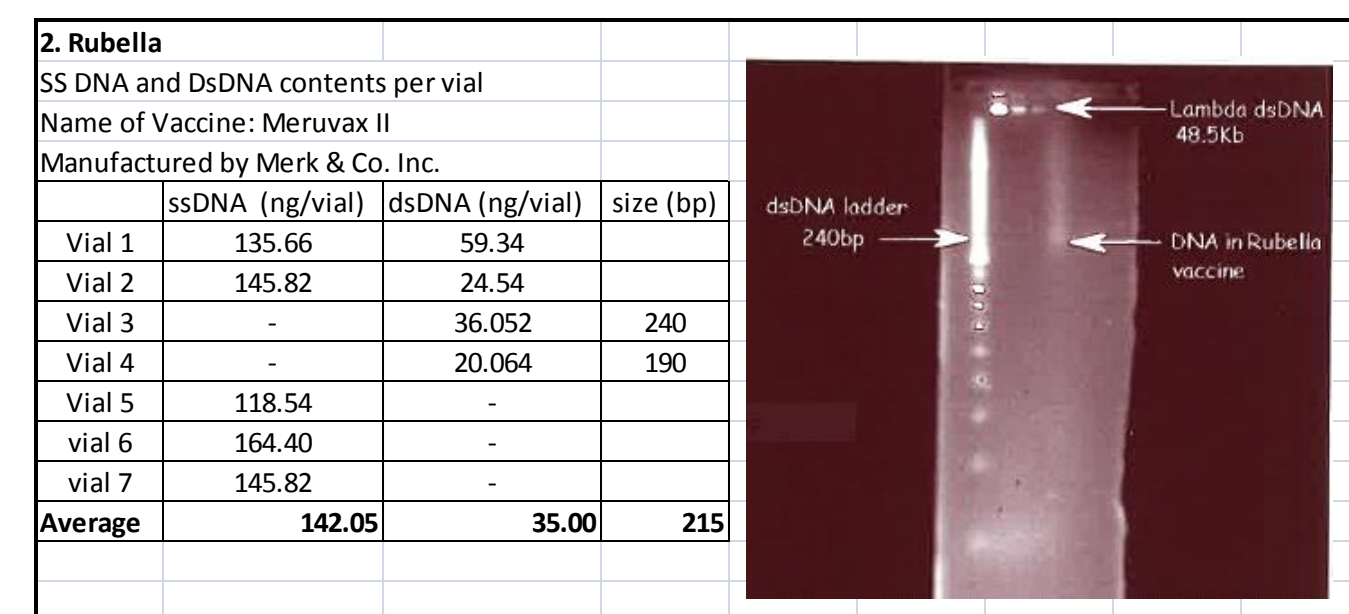
This study focuses on improper integration of the residual DNA as a possible contributor to autism, particularly in genetically susceptible infants. It is known from gene therapy studies that injected naked DNA can be transported to the brain (Wang et al. 2001); that improperly integrated therapeutic DNA has caused cancer in young children (Hacein-Bey-Abina et al. 2008); and that shorter DNA fragments have a higher probability of entering the nucleus (Lechardeur et al. 2002). To investigate whether improper DNA integration can contribute to autism, we are undertaking the following: (1) measure the amount and length distribution of residual human DNA in vaccines; (2) predict sites of DNA insertion via homologous recombination (HR) and measure insertion rates; (3) model how brain cell function might be affected, either via loss of the ability to make proper connections or via selective growth of cells with improperly integrated DNA at the expense of healthy cells; (4) conduct epidemiology studies comparing autism rates in children injected with vaccines containing human DNA residuals.

## Methods and Results

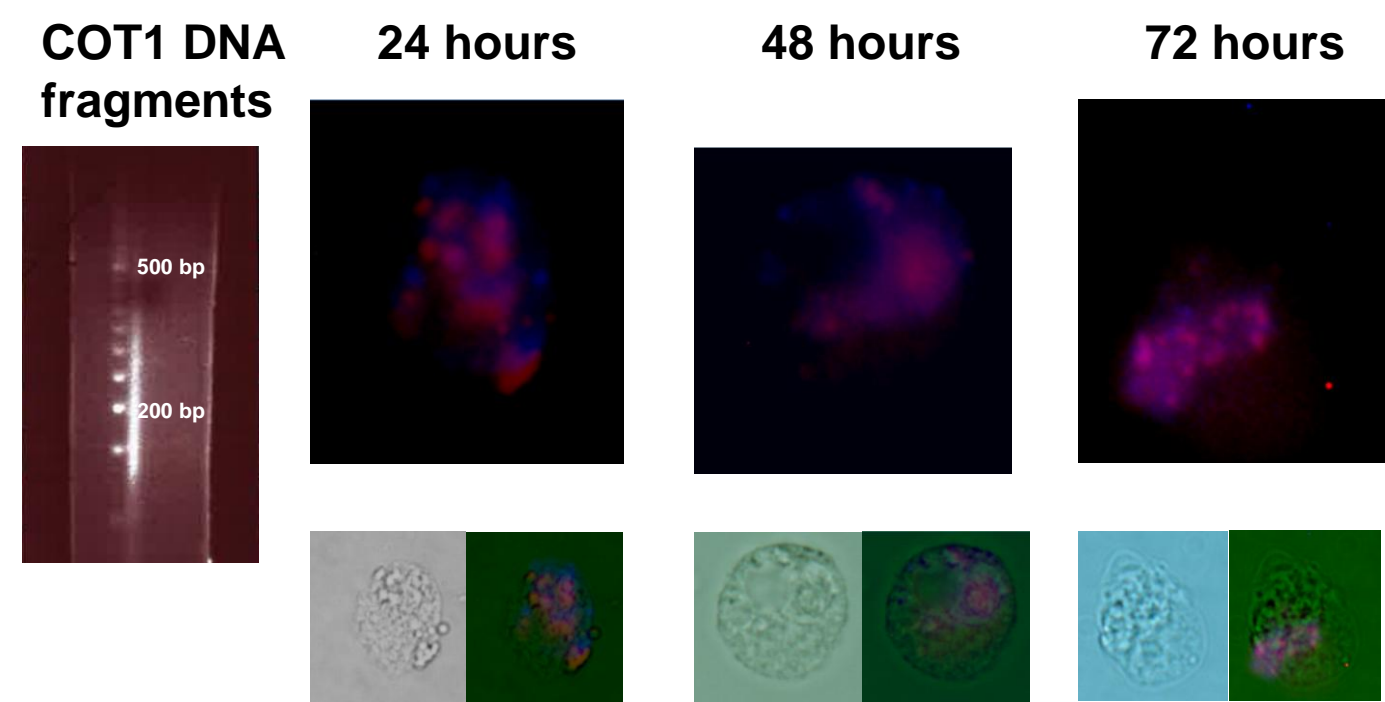
### DNA levels and lengths

Vials of Meruvax II (rubella, Merck&Co. Inc) and Havrix (hepatitis A, Glaxo Smith Kline Biologicals) were heat inactivated by placement in a 60degC water bath for 2 hours. Meruvax contents were reconstituted in Tris-EDTA (TE), pH8, then loaded onto 4% agarose gel. Havrix came as a suspension. Human DNA was isolated using ethanol precipitation, then resuspended in TE. DNA was loaded onto 4% agarose gel. After electrophoresis, gels were stained with SYBR Gold dye (Invitrogen). Human DNA was quantified by labeling double stranded DNA (dsDNA) with picogreen (Invitrogen) and single-stranded (ssDNA) with oligreen (Invitrogen), then reading with a spectrofluorometer.

**Fig. 2: Levels and residual size (SYBR gold) of human dsDNA (picogreen assay) and ssDNA (oligreen assay) in Havrix (HepA) and Meruvax II (Rubella)**



**Fig. 3: Human DNA accumulation in nucleus of human U937 cells**



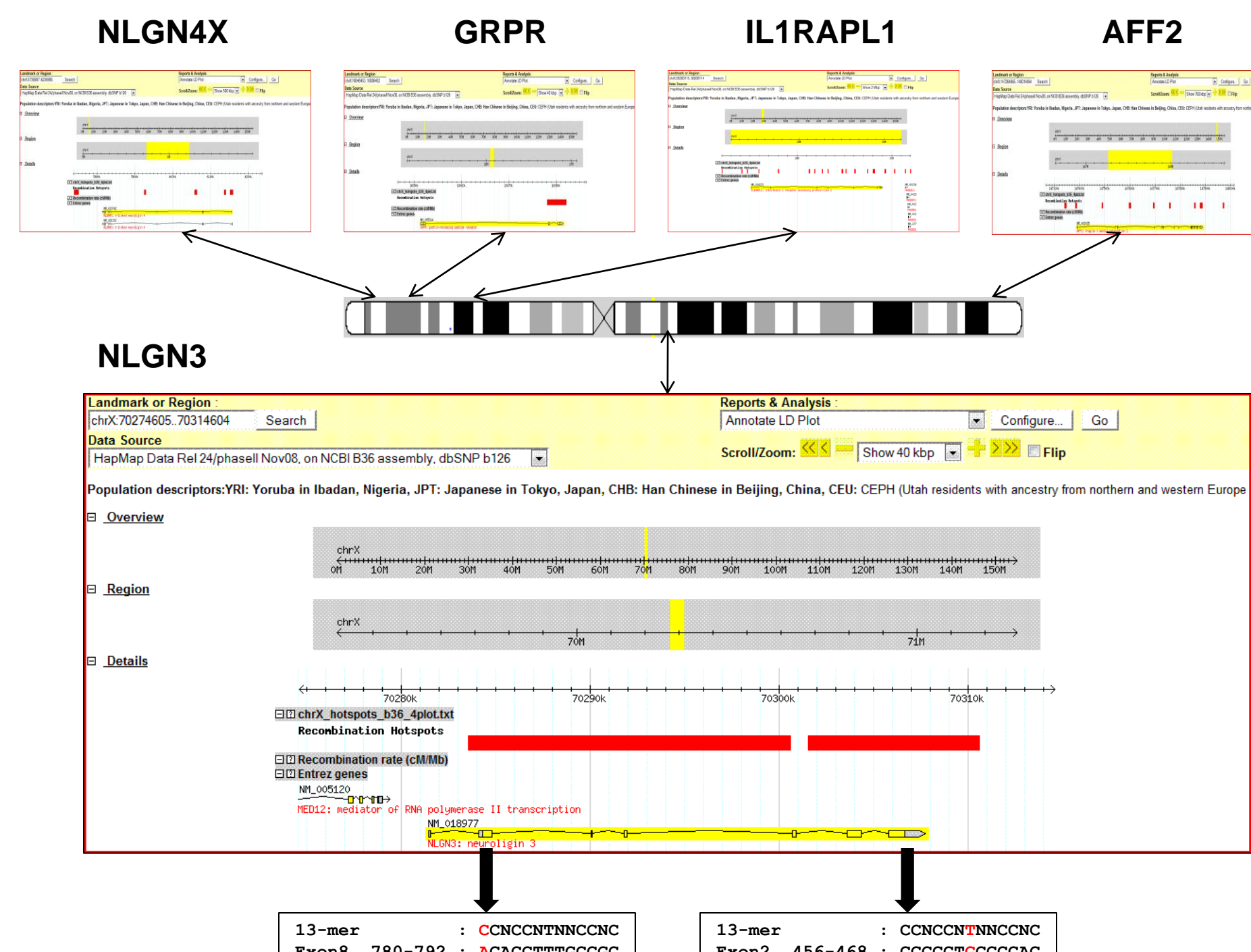
On day (-1), U937 cells were permeabilized with 0.2% saponin and then treated with DAPI to inhibit cell proliferation and to label endogenous cellular DNA blue. On day 0, 2 ugs Cy3-labeled red COT1 DNA fragments were added to the culture. Nuclear COT1 DNA accumulation (red) is evident after 24 hours and persists out to 72 hours.

### Recombination Hotspots

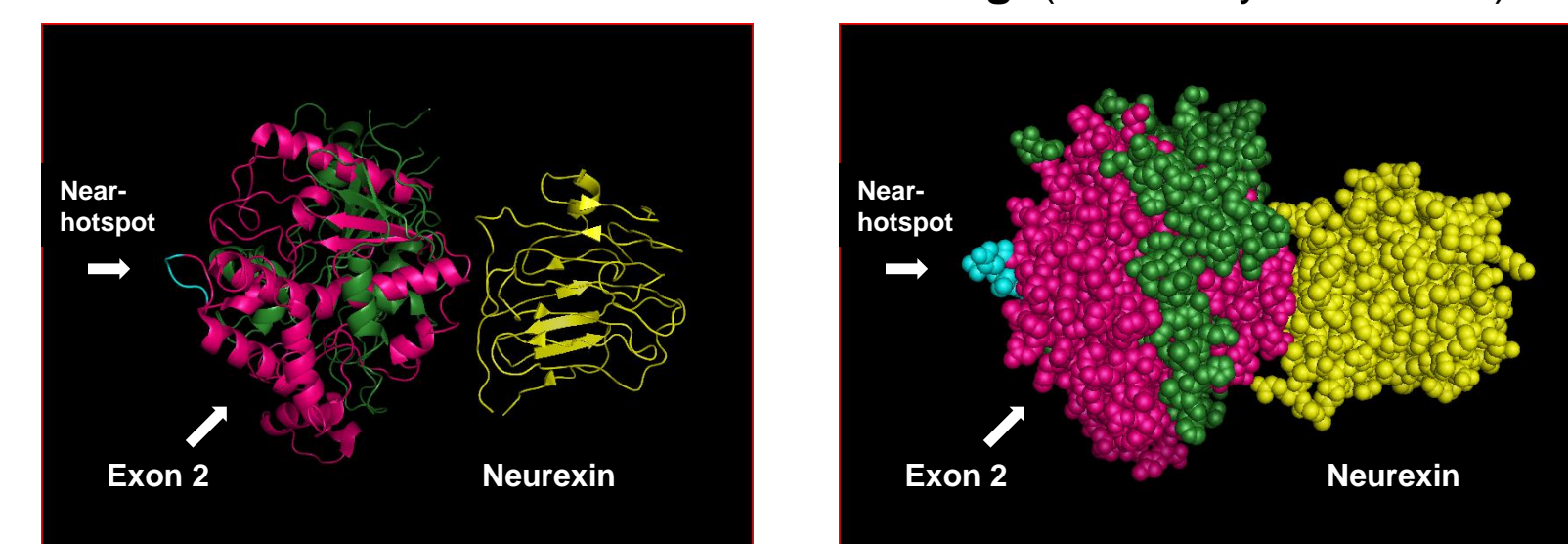
Chromosomal coordinates of hotspots (Myers et al. 2004) were overlaid with coordinates (transcription starts and ends) of autism-associated genes downloaded from the ACGMAP website. This procedure finds kb-length hotspot regions in the genes. More localized searches for hotspot motifs were done using BLAST. Gene coordinates are from build 36. Initial focus is on X-chromosome genes due to the >3:1 male:female ASD ratio.

**Fig. 4: X-chromosome autism-associated genes with recombination hotspots.**

Gene	Function or Involvement with Disease	Tissue Specificity
GRPR: Gastrin-releasing peptide receptor	Receptor for gastrin releasing peptide (GRP). This receptor mediates its action by association with G proteins that activate a phosphatidylinositol-calcium second messenger system.	Highly expressed in pancreas. Also expressed in stomach, adrenal cortex and brain.
NLGN3: neuroligin-3	Neuronal cell surface protein thought to be involved in cell-cell interactions by forming intercellular junctions through binding to beta-neurexins. May play a role in formation or maintenance of synaptic junctions. May also play a role in glia-glia or glia-neuron interactions in the developing peripheral nervous system.	Brain
NLGN4X: neuroligin-4, X-linked	Putative neuronal cell surface protein involved in cell-cell interactions.	Expressed at highest levels in heart. Expressed at lower levels in liver, skeletal muscle and pancreas and at very low levels in brain.
IL1RAPL1: X-linked interleukin-1 receptor accessory protein-like 1	Defects in IL1RAPL1 are the cause of mental retardation X-linked type 21 (MRX21) [MIM:300143]. Mental retardation is a mental disorder characterized by significantly sub-average general intellectual functioning associated with impairments in adaptive behavior and manifested during the developmental period. Non-syndromic mental retardation patients do not manifest other clinical signs.	Detected at low levels in heart, skeletal muscle, ovary, skin, and in amygdala, caudate nucleus, corpus callosum, hippocampus, substantia nigra and thalamus. Detected at very low levels in tonsil, prostate, testis, small intestine, placenta, colon and fetal liver.
AFF2	Defects in AFF2 are the cause of FRAXE [MIM:309548]. FRAXE is an X-linked form of mental retardation. Loss of FMR2 expression is correlated with FRAXE CCG <sub>n</sub> expansion. Normal individuals have 6-35 copies of the repeat, whereas cytogenetically positive, developmentally delayed males have more than 200 copies and show methylation of the associated CPG island.	Brain (most abundant in hippocampus and amygdala), placenta and lung.



**Fig. 5: 3-dimensional models for NLGN 4X and NRXN1 (neurexin) that exon2 of NLGN4X is involved in binding. (Fabrichny et al. 2007)**



## Discussion

Changepoint analysis of autism disorder demonstrates a temporal correlation with events associated with human DNA residuals in vaccines. The levels of residual DNA are well over FDA-recommended limits. To reduce the dangers of residual DNA, recommendations were made to fragment the DNA. Unfortunately, in vitro studies in model organisms have shown that shorter fragments have a higher chance of entering the nucleus. Cell culture experiments are in progress to determine the rate and sites at which these residual DNA fragments integrate into the genome.

Our preliminary bioinformatic analysis has identified sites at which these DNA residuals might integrate into the genome and predicted that disruption of exon 2 of NLGN4X could alter binding to neurexin. Neuroligin binding to neurexin is critical for synapse maturation and function in the brain. Across the entire genome, the vast majority of recombination hotspots are located outside the transcribed regions of a gene (Myers et al. 2004). In contrast, we find 5 of 15 autism-associated X-chromosome genes contain hotspots within the transcribed regions. Among all 238 published autism-associated genes, 119 genes have a combined total of 536 hotspots within transcribed regions. Moreover, we find almost-perfect-matches to the most common hotspot motif (Myers et al. 2008) inside exons of two X-chromosome neuroligin genes. Mouse models have demonstrated that loss of binding of NLGN4X to neurexin leads to deficits in social interactions and communication that are similar to autism spectrum disorder (Jamain et al. 2008).

## Summary

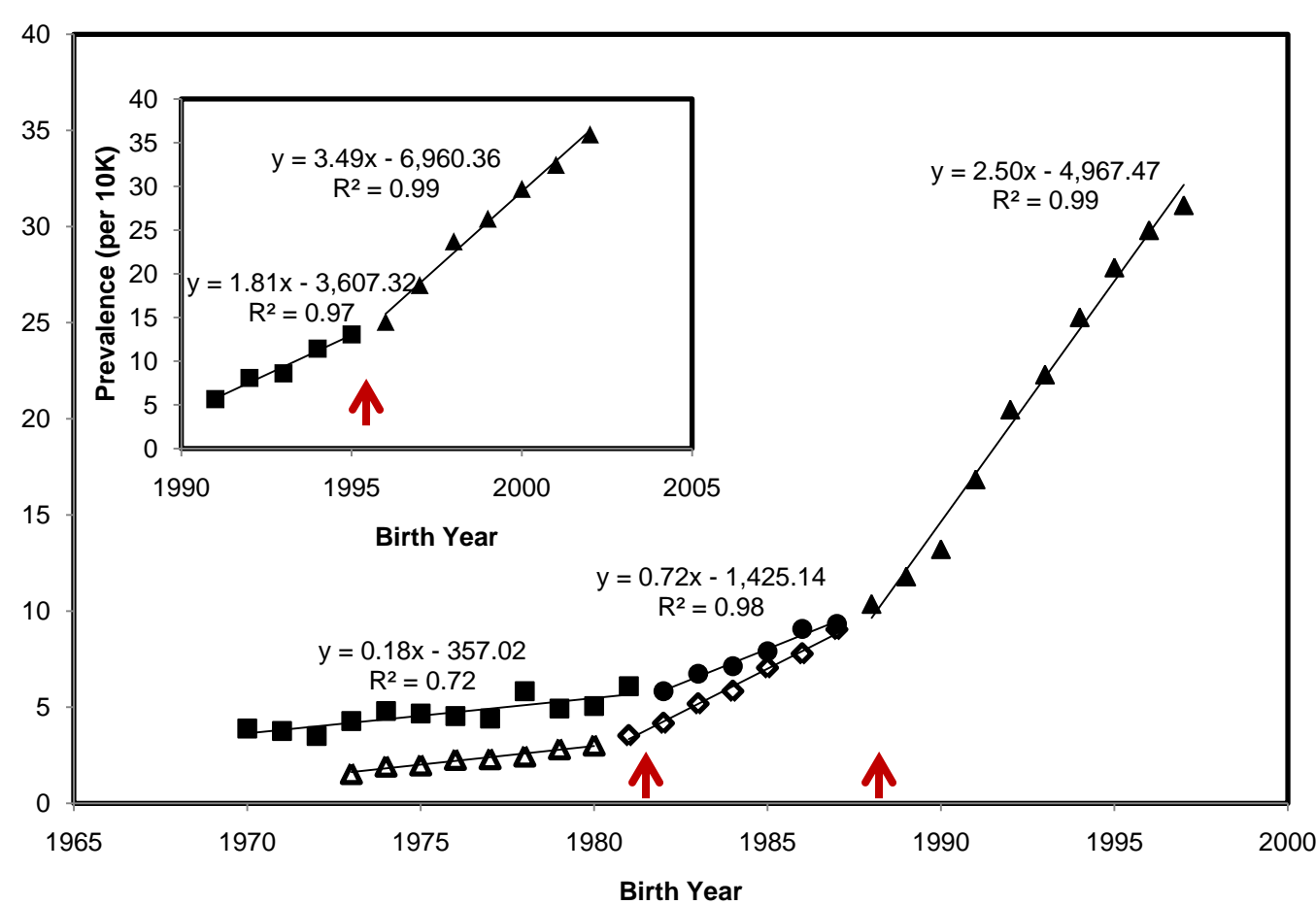
1. Meruvax-II contains >140ng/vial ssDNA and >30ng/vial dsDNA, with average lengths of 215bp. Havrix contains >270ng/vial ssDNA and >30ng/vial dsDNA. The FDA-recommended amounts are 10ng/dose.
2. There are 5/15 autism-associated genes in the X-chromosome with recombination hotspots inside the transcribed regions.
3. NLGN3 (exons 2,8) and NLGN4X (exons 2,3) contain near-matches to the most common recombination hotspot motif in humans. Structural modeling shows that exon 2 is involved in the binding to neurexin (NRXN1), which is important for synapse formation.

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Conflict of Interest: None

**Fig. 1: Changepoint analysis for US(DOE) and CA(DDS) Autistic Disorder**



Arrows point to changepoint years obtained using hockey-stick analysis. Filled points are from California (CA) Department of Developmental Services (DDS), open points are from Department of Education (DOE), 19 year olds. Inset is adapted from CA DDS data in Schechter & Grether (2008).

**Table 1: Events related to vaccines with human DNA residuals**

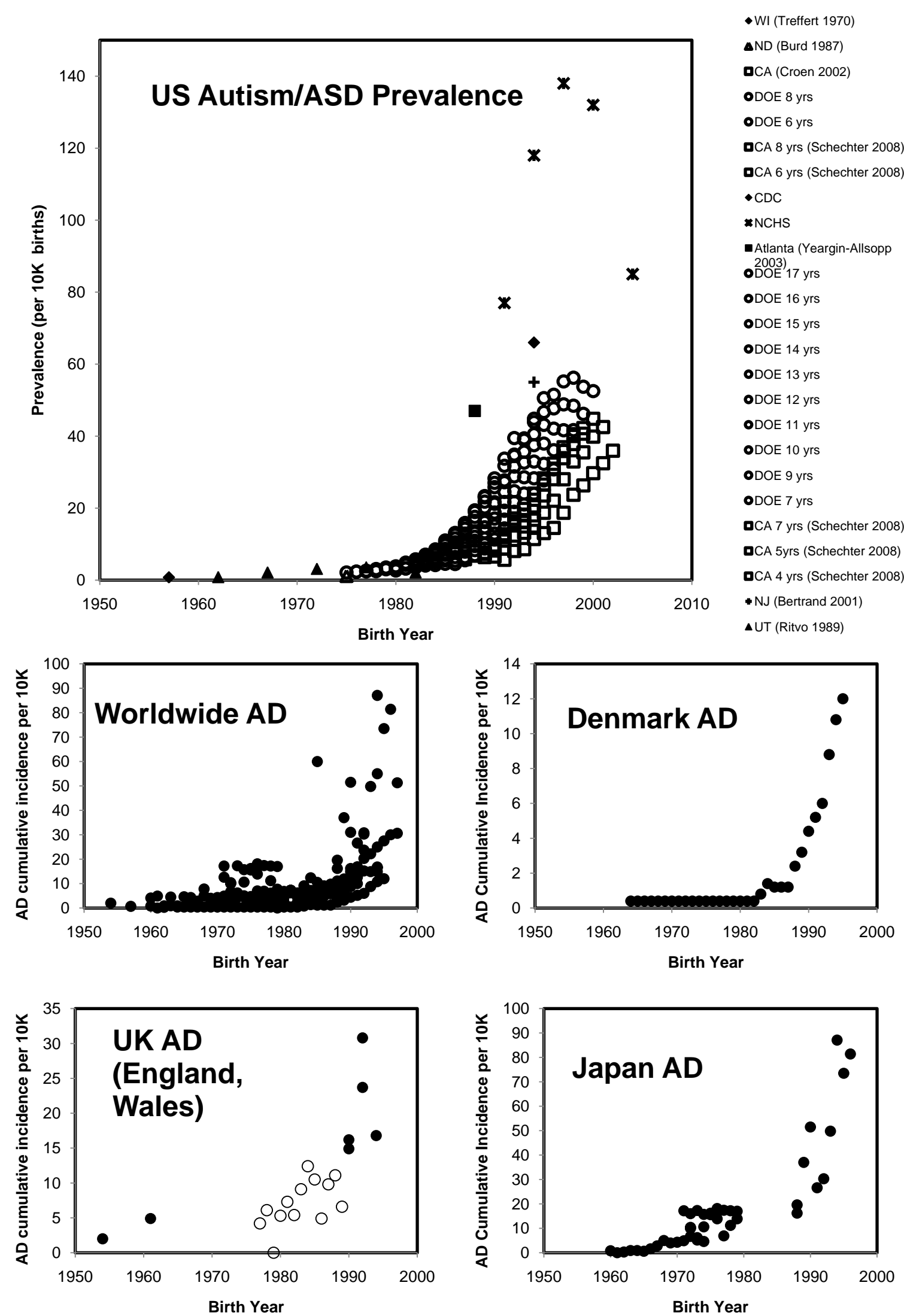
Country	Changepoint (Birth Year)	Vaccine-related event
Denmark	1988	2 dose MMR introduced 1987
USA (CA DDS)	1988	MMR-II booster recommendation (1989); increased MCV compliance
USA (CA DDS)	1995	Varivax (chicken pox vaccine) licensed in 1995
USA (DOE, CA DDS)	1981, 1982	Meruvax-II, MMR-II licensed in 1979; market exclusivity by early 1980s
Japan	1988*	Introduction of chicken pox vaccine in 1988

\*Changepoint algorithm could not detect Japan changepoint due to scatter. However, the data (McDonald & Paul 2010; Honda et al. 2005; Ohtaki et al. 1992; Tanoue et al. 1988; Matsuishi et al. 1987; Ishii et al. 1988; Hoshino et al. 1982) are suggestive of a slope change starting near 1988.

# Quantitative Evaluation of Sociologic Factors That Can Lead to Apparent Increases in Autism Prevalence

M. A. LaMadrid, C. Brown, T. A. Deisher  
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## Introduction



In the US and other first world countries, autism has risen dramatically over the last 2-3 decades (see references 3, 4). Recent information suggest an autism increase within the last decade in Asian and African countries (e.g., Perera et al. 2009; Malhotra et al. 2005; Khan et al. 1996), although sample sizes are small. Scientific articles (e.g., Baron-Cohen 2009), popularly cited by the press, have characterized the measured rise in first world countries as being primarily artifactual, due to broadened diagnosis and improved ascertainment (increased awareness by professionals, increased awareness by parents, and increased special education funding).

Recent studies have shown that broadened diagnosis (MIND Institute 2002) and diagnostic substitution (e.g., Newschaffer et al. 2005, King & Bearman 2009) do not explain the measured increase in autism. A brief analysis of diagnostic coding changes and their relationship to autism disorder is shown in figure 3. Autism rates are commonly graphed by birth year, with diagnosis made between age 3 and 8. Therefore, diagnostic coding changes should first impact birth years 3-8 years prior to the year of diagnostic change (see Fig 3). Change point analysis of California DDS data for AD identifies 1995 as an autism disorder change point and no diagnostic relaxation event can be associated with this change point (see poster 118.043).

The other factors (increased awareness by professionals and parents, increased funding), which are part of 'improved ascertainment' have not been objectively measured. In this study, we report the contributions of increased professional awareness, parental awareness, and federal special education funding to autism disorder prevalence using objective measures representative of these sociologic phenomena from publicly available data.

## Methods

### Autism Prevalence

State level data were obtained from various publications as listed in the references. US national prevalence data were downloaded from <http://www.fightingautism.org/idea/> and Department of Education. Some pre-computed prevalence data were verified with direct downloads from the Department of Education IDEA program (<http://www.ideadata.org>) and prevalence was obtained by normalizing to birth year data as obtained from <http://www.cdc.gov/nchs>. Non-weighted averages are calculated if multiple prevalence measurements are shown for a given year.

### Professional Awareness

The number of professionals who can diagnose autism and the number of professional publications on autism are used as objective measures of 'professional awareness'. Professional awareness can be quantitatively considered to be dependent both on the number of practicing professionals and on their interaction with other professionals, which can be measured using publication counts. It is assumed that all professionals read the literature, and the contents of their textbooks are ultimately derived from published scientific articles. Professionals who can diagnose ASD include pediatricians, psychiatrists, neurologists and clinical psychologists. The numbers of pediatricians, psychiatrists, and neurologists were obtained from the US Statistical Abstracts, ([http://www.census.gov/compendia/statab/past\\_years.html](http://www.census.gov/compendia/statab/past_years.html)) published by the US Census Bureau. The numbers of clinical psychologists were obtained from the Department of Labor (<http://www.dol.gov>); missing counts for some years were linearly extrapolated. Background population counts were also obtained from the US Statistical Abstracts. The number of professional publications on autism were obtained by searching PubMed (<http://www.ncbi.nlm.nih.gov/PubMed>) using search term "autism OR autistic" in the Title/Abstract. Only articles in English were used for comparisons with US data.

### Parental Awareness

The number of messages on Yahoo groups related to autism is used to objectively measure parental awareness. Yahoo group websites (<http://groups.yahoo.com>) display the number of messages each month. These webpages were downloaded and parsed to obtain the numbers of messages per year. Only groups with 2 or more members were included. For comparison, the numbers of messages from Yahoo sites on 'Health and Wellness' and 'Children', but not on 'autism' or 'Asperger', were also obtained.

### Federal Special Education Funding

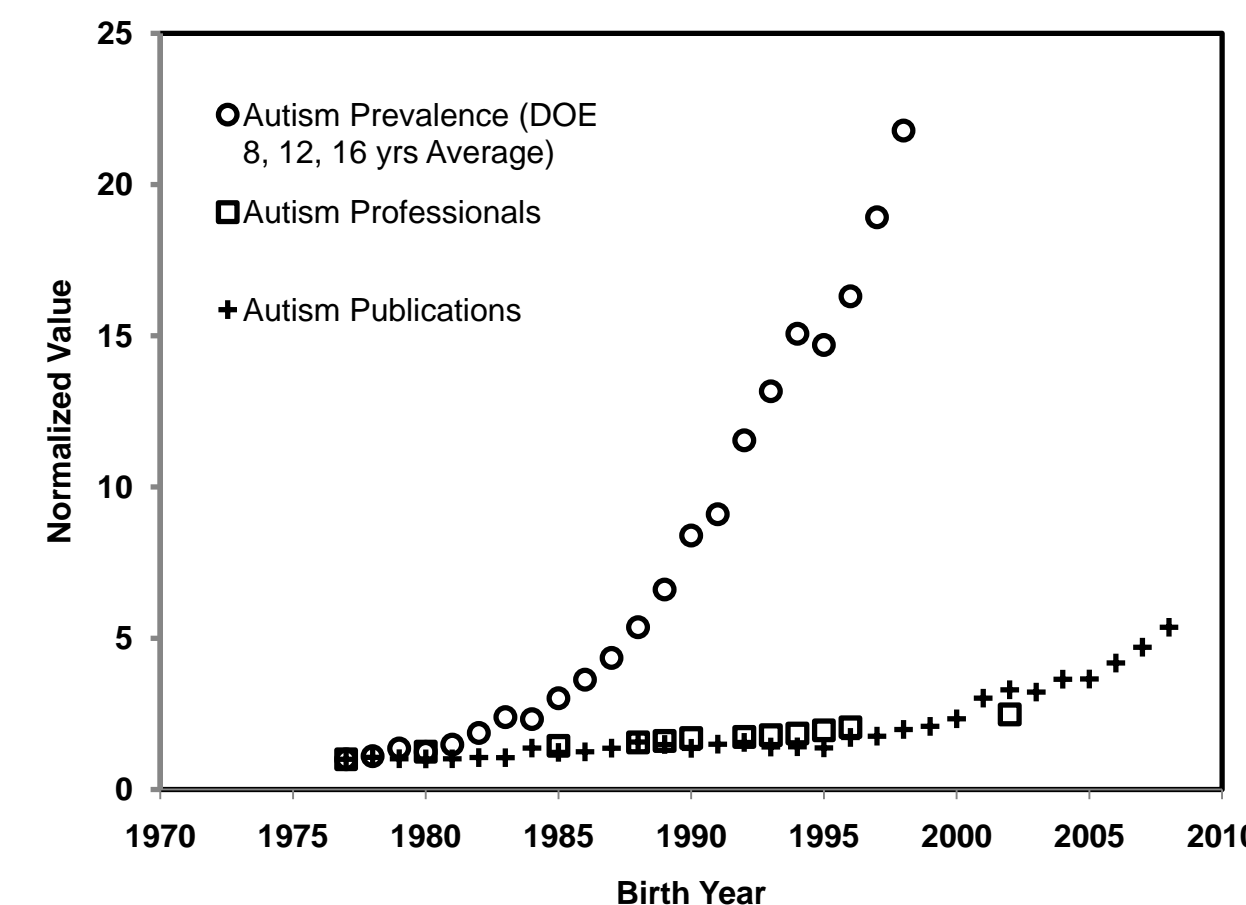
Funding tables were obtained from the CRS Report to Congress(2006) and the National Center for Education Statistics.

## Input Data Statistics

Data Source	Statistics
US Census, Dept. of Labor (1970-2002)	128,000 average total of psychologists, psychiatrists, pediatricians, neurologists
Pubmed	10,132 "autism OR autistic" articles (1977-2008); 10,689 for 1923-2008 14,288,181 total Pubmed articles for 1977-2008
Yahoo (1990-2008)	3,298 autism sites; 7,160,441 total messages 3,025 non-autism children's health sites; 3,126,315 total messages

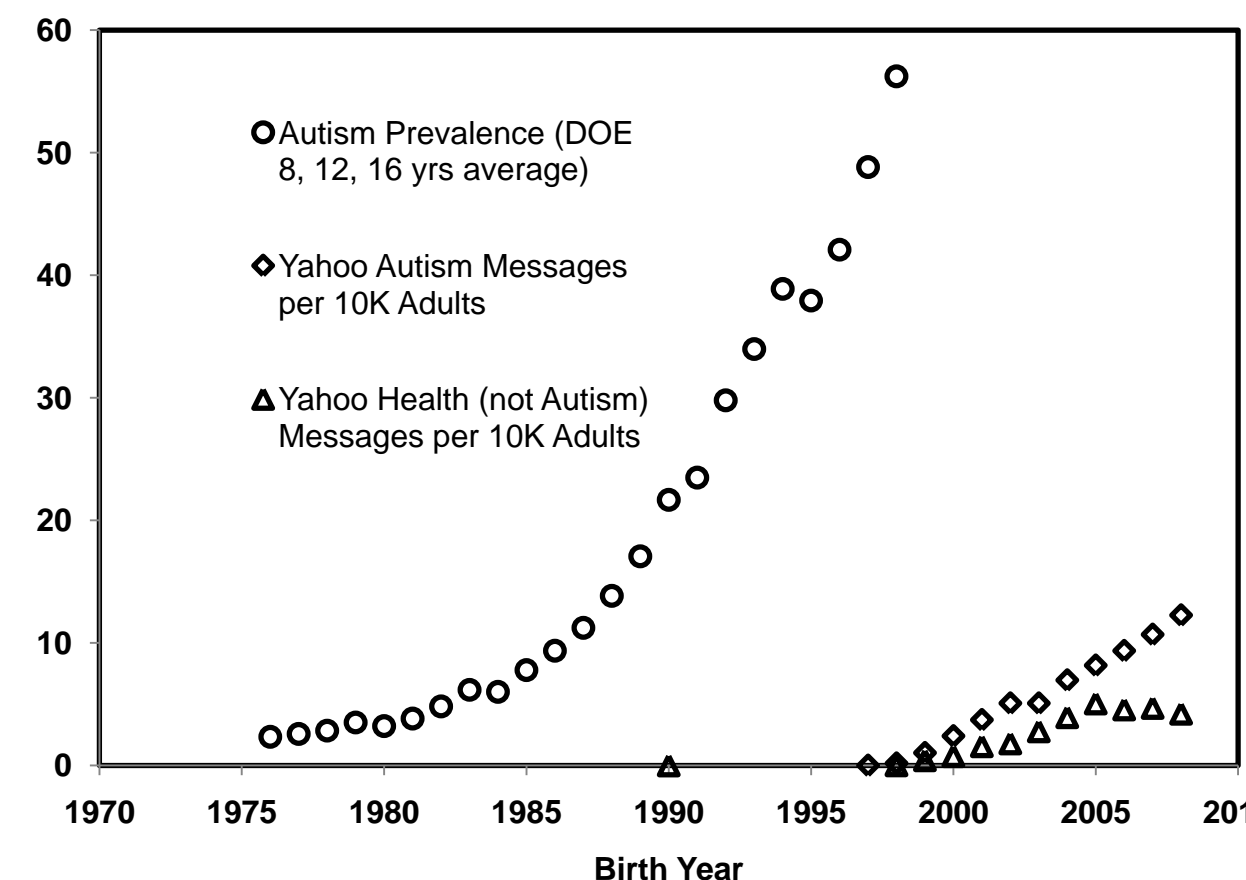
## Results

Fig. 1 Comparison of Autism Prevalence, Number of Autism Professionals and Number of Autism Publications



Awareness of professionals increases much more slowly that the autism rate. Awareness increase also lags behind the autism increase. (Data normalized to 1977 values.)

Fig. 2 Comparison of Autism Prevalence Trends and Parent Interaction Trends



Increased awareness of parents, as measured by numbers of Yahoo chat group messages, do not play a significant role until the late 1990s.

Table 1

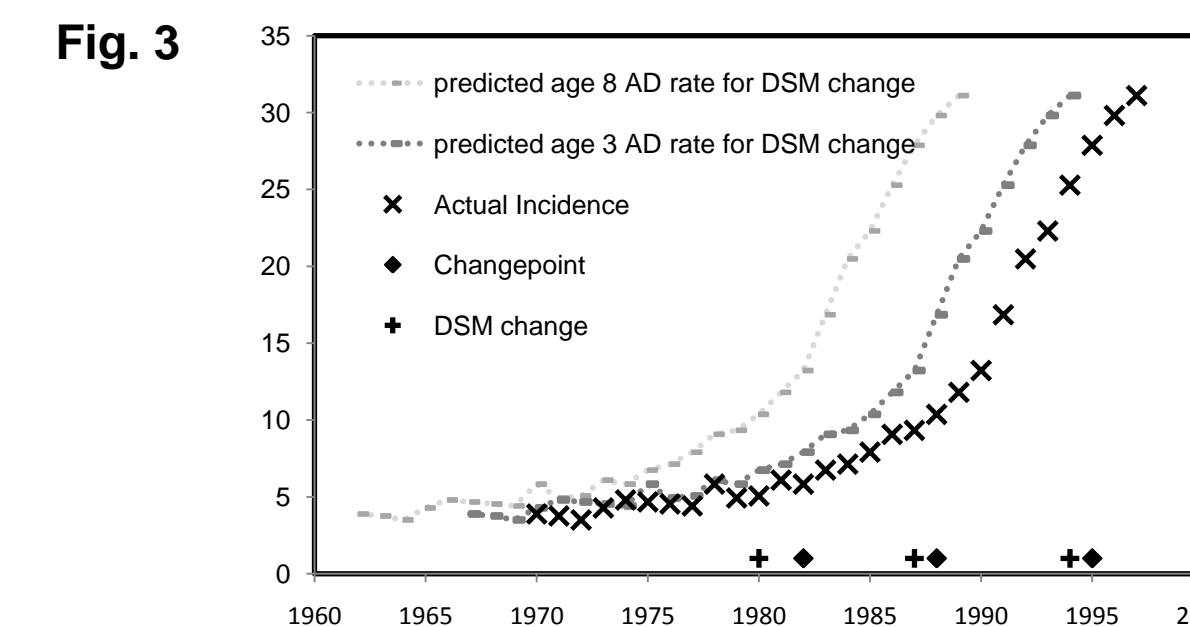
Disability	1976-77	1980-81	1990-91	1994-95	1995-96	1996-97	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
All disabilities	8.3	10.1	11.4	12.2	12.4	12.6	12.8	13.0	13.2	13.3	13.4	13.5	13.7	13.8	13.7
Specific learning disabilities <sup>1</sup>	1.8	3.6	5.2	5.6	5.8	5.8	5.9	6.0	6.0	6.1	6.0	5.9	5.8	5.7	5.6
Speech or language impairments	2.9	2.9	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.0	2.9	3.0	3.0	3.0	3.0
Mental retardation	2.2	2.0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.1	1.1
Emotional disturbance	0.6	0.8	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9
Hearing impairments	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Orthopedic impairments	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1
Other health impairments	0.3	0.2	0.1	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.8	1.0	1.1	1.2
Visual impairments	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Multiple disabilities	—	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Deaf/blindness	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Autism	—	—	—	—	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5
Traumatic brain injury	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0
Developmental delay	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.7
Preschool-age with disability <sup>2</sup>	↑	↑	0.9	1.2	1.2	1.2	1.2	1.2	1.2	↑	↑	↑	↑	↑	↑

Data from National Center for Health Statistics shows that disbursement of federal funding for autism (to be part of Special Education) did not start until 1995, even though legislation was signed in 1992.

## Discussion

Autism prevalence is rising in the US and many other countries worldwide. The phrase 'improved ascertainment' has been used to explain and partially dismiss the significance of this rise. We quantified 'improved ascertainment' by using objective measures for the most important components of this term – professionals, parents, and funding.

Our results demonstrate that when objectively measured and analyzed, 'improved ascertainment' could not significantly contribute to the documented rise in AD or ASD prior to 1995. After 1995, both a linear increase in federal spending and an exponential increase in Internet use may have contributed to 'improved ascertainment'; however, the data also show that the rise in these measures occurs well after autism had already risen significantly. Therefore the increase in funding and internet awareness are more likely to be a result of, rather than the cause of, the rise in autism.



## Summary

1. Autism prevalence increased much faster than increases in professionals or publications. In fact, the data suggest that increased awareness is caused by the increase in autism.
2. It was only after 1998 that parental awareness of autism increased significantly; however, much of this rise may be due to an expected increase due to Internet usage.
3. Although federal mandates for Special Education funding for autism were signed in 1992, funding did not get disbursed until 1995.
4. Although recent autism prevalence increases may be partly due to sociological reasons, there already existed a non-sociological rise before 1995.

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