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## Fish Consumption Advisories and the Surprising Relationship to Prevalence Rate of Developmental Disability as Reported by Public Schools

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### ABSTRACT

According to the Environmental Protection Agency (EPA), fish consumption is the most significant route of mercury exposure, and the concern is greatest for women of childbearing age due to the potential for neurodevelopmental effects on a developing fetus. Rates of developmental disorders vary. But in 2008 it was demonstrated that the rate of autism is higher near industries that emit heavy metals. Furthermore past research findings can be taken to show that where a pregnancy occurred may predict later autism likelihood in the offspring more than where diagnosis occurs. If mercury plays any role in developmental disabilities, the rate of disability should relate to any reliable direct measure of contamination. The current research focuses on one index of environmental mercury contamination. Specifically, mercury-related fish advisories are found to be a surprisingly strong predictor of a state's autism rate,  $r = 0.48$ ,  $p < 0.001$ . The relationship remains strong after controlling for student to teacher ratio and per pupil spending. It is argued that a secular increase in autism has been occurring and that prenatal exposure to heavy metal toxins may play a significant role. Because we suspect this finding may be of some interest, the full data set is provided in the appendix so that researchers can independently analyze the key findings which rely on CDC, EPA and IDEA data sets.

### KEYWORDS

Mercury; Prenatal; Autism; ASD; Seafood; Diet; Environmental Health Environmental Mercury Exposure and Prevalence Rate of Autism as Reported by Public Schools

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### References

- [1] D. C. Rimm and J. W. Somerville, "Abnormal Psychology," Academic Press, Waltham, 1977, pp. 315-318.
- [2] J. Merrick, I. Kandel and M. Morad, "Trends in Autism," *International Journal of Adolescent Medicine and Health*, Vol. 16, No. 1, 2004, pp. 75-78. doi: 10.1515/IJAMH.2004.16.1.75
- [3] C. Gillberg, M. Cederland, K. Lamberg and L. Zeijlon, "The Autism Epidemic: The Registered Prevalence of Autism in a Swedish Urban Area," *Journal of Autism and Developmental Disorders*, Vol. 36, No. 3, 2006, pp. 429-435. doi: 10.1007/s10803-006-0081-6
- [4] H. O. Atladottir, D. Schendel, S. Dalsgaard, P. H. Thomsen and P. Thorsen, "Time Trends in Reported Diagnoses of Childhood Neuropsychiatric Disorders: A Danish Cohort Study," *Archives of Pediatrics and Adolescent Medicine*, Vol. 161, No. 2, 2007, pp. 193-199. doi: 10.1001/archpedi.161.2.193
- [5] A. Kamer, R. Diamond, Y. Inbar, G. W. Zohar, D. Youngmann and A. H. Senecky, "A Prevalence Estimate of Pervasive Developmental Disorder among Immigrants to Israel and Israel Natives—A File Review Study," *Social Psychiatry and Psychiatric Epidemiology*, Vol. 39, No. 2, 2004, pp. 141-145.

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- [6] Y. Hoshino, Y. Tachibana, H. Watanabe, R. Kumashiro and M. Yashima, " The Epidemiological Study of Autism Fukushima-Ken," *Folia Psychiatric Neurology Japan*, Vol. 36, 1982, pp. 115-124.
- [7] J. G. Gurney, M. S. Fritz, K. L. Ness, P. Sievers, C. J. Newschaffer and E. G. Shapiro, " Analysis of Prevalence Trends of Autism Spectrum Disorder in Minnesota," *Archives of Pediatrics and Adolescent Medicine*, Vol. 157, No. 7, 2003, pp. 622-627. doi:10.1001/archpedi.157.7.622
- [8] M. Yeargin-Allsopp, C. Rice, T. Karapurkar, N. Doernberg, C. Boyle and C. Murphy, " Prevalence of Autism in a US Metropolitan Area," *Journal of the American Medical Association*, Vol. 289, No. 1, 2003, pp. 49-55. doi:10.1001/jama.289.1.49
- [9] C. Rice, " Prevalence of Autism Spectrum Disorders— Autism and Developmental Disabilities Monitoring Network, Six Sites, United States, 2000," *Surveillance Summaries*, Vol. 56, 2007, pp. 1-11.
- [10] C. Rice, " Prevalence of Autism Spectrum Disorders— Autism and Developmental Disabilities Monitoring Network, 14 Sites, United States, 2002," *Surveillance Summaries*, Vol. 56, 2007, pp. 12-28.
- [11] E. Fombonne, " The Prevalence of Autism," *Journal of the American Medical Association*, Vol. 289, No. 1, 2003, pp. 87-89. doi:10.1001/jama.289.1.87
- [12] Thoughtful House Center for Children, " Graphing IDEA Professional 2008, Fighting Autism, Austin, TX," 2008. <http://www.fightingautism.org/idea/>
- [13] Centers for Disease Control and Prevention, " Prevalence of Selected Developmental Disabilities in Children 3-10 Years of Age: The Metropolitan Atlanta Developmental Disabilities Surveillance Program," *MMWR Surveillance Summaries*, Vol. 45, 1996, pp. 1-14.
- [14] Environmental Protection Agency, " Fact Sheet on Utility Air Toxics Report to Congress," 1998. <http://www.epa.gov/ttn/atw/combust/utiltox/utilifs.pdf>
- [15] P. A. D'Itri and F. M. D'Itri, " Mercury Contamination: A Human Tragedy," John Wiley & Sons, New York, 1977.
- [16] K. Murata, P. Weihle, S. Araki, E. Budtz-Jorgensen and P. Grandjean, " Evoked Potentials in Faroese Children Prenatally Exposed to Methylmercury," *Neurotoxicology and Teratology*, Vol. 21, No. 4, 1999, pp. 471-72. doi:10.1016/S0892-0362(99)00026-4
- [17] F. Debes, E. Budtz-Jorgensen, P. Weile, R. F. White and P. Grandjean, " Impact of Prenatal Methylmercury Exposure on Neurobehavioral Function at Age 14 Years," *Neurotoxicology and Teratology*, Vol. 28, No. 5, 2006, pp. 536-547. doi:10.1016/j.ntt.2006.02.005
- [18] M. N. Reed, K. M. Banna, W. C. Donlin and C. Newland, " Effects of Gestational Exposure to Methylmercury and Dietary Selenium on Reinforcement Efficacy in Adulthood," *Neurotoxicology and Teratology*, Vol. 30, No. 1, 2008, pp. 29-37. doi:10.1016/j.ntt.2007.10.003
- [19] E. M. Paletz, M. C. Craig-schmidt and C. Newland, " Gestational Exposure to Methylmercury and n-3 Fatty Acids: Effects of High and Low Operant Behavior in Adulthood," *Neurotoxicology and Teratology*, Vol. 28, No. 1, 2006, pp. 59-73. doi:10.1016/j.ntt.2005.11.003
- [20] C. Griffiths, A. McGartland and M. Miller, " A Comparison of the Monetized Impact of IQ Decrements from Mercury Emissions," *Environmental Health Perspectives*, Vol. 115, No. 6, 2007, pp. 841-847. doi:10.1289/ehp.9797
- [21] L. Trasande, P. J. Landrigan and C. Schechter, " Public Health and Economic Consequences of Methyl Mercury Toxicity to the Developing Brain," *Environmental Health Perspectives*, Vol. 113, No. 5, 2005, pp. 590-596. doi:10.1289/ehp.7743
- [22] R. F. Palmer, S. Wood and R. Blanchard, " Proximity to Point Sources of Environmental Mercury Release as a Predictor of Autism," *Health & Place*, Vol. 15, No. 1, 2009, pp. 18-24. doi:10.1016/j.healthplace.2008.02.001
- [23] B. Herut, E. Shefer and Y. Cohen, " Environmental Quality of Israel's Mediterranean Coastal Waters in 2001," *Annual Report of the National Marine Environmental Monitoring Program (IOLR Report H29.2002a)*, 2002. [http://www.sviva.gov.il/Environment/Static/Binaries/index\\_pirsumim/p0125eng\\_1.pdf](http://www.sviva.gov.il/Environment/Static/Binaries/index_pirsumim/p0125eng_1.pdf)

- [24] Y. Hoshino, Y. Tachibana, H. Watanabe, R. Kumashiro, M. Yashima and H. Furukawa, " Early Symptoms of Autistic Children and Its Diagnostic Significance," *Folia Psychiatric Neurology Japan*, Vol. 36, 1982, pp. 367-374.
- [25] H. Haga and N. Miyamoto, " Epidemiological Study of Autistic Children in Kyoto-Fu," *Japanese Journal of Child Psychiatry*, Vol. 12, 1971, pp. 160-166.
- [26] K. A. Bjornberg, M. Vahter, G. K. Peterson, A. Glynn, S. Cnattingius, P. O. Darnerud, S. Atuna, M. Aune, W. Becker and M. Berglund, " Methyl Mercury and Inorganic Mercury in Swedish Pregnant Women and in Cord Blood: Influence of Fish Consumption," *Environmental Health Perspectives*, Vol. 111, 2003, pp. 637-641. doi:10.1289/ehp.5618
- [27] Environmental Protection Agency, " Mercury Study Report to Congress," Executive Summary, Vol. 1, Office of Air Quality Control Planning and Standards and Office of Research and Development, Washington DC, 1997.
- [28] National Atmospheric Deposition Program, " MDN Concentration and Decomposition Maps," 1997. <http://nadp.sws.uiuc.edu/mdn/maps/>
- [29] A. H. Stern and A. E Smith, " An Assessment of the Cord Blood: Maternal Blood Methylmercury Ratio: Implications for Risk Assessment," *Environmental Health Perspectives*, Vol. 111, 2003, pp. 1465-1470. doi:10.1289/ehp.6187
- [30] Environmental Protection Agency, " Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Volume 1 Fish Sampling and Analysis," 2000. <http://water.epa.gov/scitech/swguidance/fishshellfish/tech>